



## **DIR-815**

**AC1200 Wave 2 MU-MIMO Wi-Fi Router  
with 3G/LTE Support and USB Port**

## Contents

<b>Chapter 1. Introduction.....</b>	<b>5</b>
<b>Contents and Audience.....</b>	<b>5</b>
<b>Conventions.....</b>	<b>5</b>
<b>Document Structure.....</b>	<b>5</b>
<b>Chapter 2. Overview.....</b>	<b>6</b>
<b>General Information.....</b>	<b>6</b>
<b>Specifications.....</b>	<b>8</b>
<b>Product Appearance.....</b>	<b>16</b>
Upper Panel.....	16
Back and Bottom Panels.....	18
<b>Delivery Package.....</b>	<b>20</b>
<b>Chapter 3. Installation and Connection.....</b>	<b>21</b>
<b>Before You Begin.....</b>	<b>21</b>
<b>Connecting to PC.....</b>	<b>23</b>
PC with Ethernet Adapter.....	23
Obtaining IP Address Automatically (OS Windows 7).....	24
Obtaining IP Address Automatically (OS Windows 10).....	29
PC with Wi-Fi Adapter.....	33
Obtaining IP Address Automatically and Connecting to Wireless Network (OS Windows 7).....	34
Obtaining IP Address Automatically and Connecting to Wireless Network (OS Windows 10).....	37
<b>Connecting to Web-based Interface.....</b>	<b>40</b>
<b>Web-based Interface Structure.....</b>	<b>42</b>
Summary Page.....	42
Home Page.....	44
Menu Sections.....	45
Notifications.....	46
<b>Chapter 4. Configuring via Web-based Interface.....</b>	<b>47</b>
<b>Initial Configuration Wizard.....</b>	<b>47</b>
Selecting Operation Mode.....	49
Router.....	49
Access Point or Repeater.....	51
Creating 3G/LTE WAN Connection.....	53
Changing LAN IPv4 Address.....	54
Wi-Fi Client.....	55
Configuring Wired WAN Connection.....	57
Static IPv4 Connection.....	58
Static IPv6 Connection.....	59
PPPoE, IPv6 PPPoE, PPPoE Dual Stack, PPPoE + Dynamic IP (PPPoE Dual Access) Connections.....	60
PPPoE + Static IP (PPPoE Dual Access) Connection.....	61
PPTP + Dynamic IP or L2TP + Dynamic IP Connection.....	62
PPTP + Static IP or L2TP + Static IP Connection.....	63
Configuring Wireless Network.....	64
Configuring LAN Ports for IPTV/VoIP.....	66
Changing Web-based Interface Password.....	68
<b>Connection of Multimedia Devices.....</b>	<b>70</b>

<b>Statistics</b> .....	<b>73</b>
Network Statistics.....	74
DHCP.....	75
Routing Table.....	76
Clients and Session.....	77
Port Statistics.....	78
Multicast Groups.....	79
IPsec Statistics.....	80
<b>Connections Setup</b> .....	<b>81</b>
WAN.....	81
<i>Creating Dynamic IPv4 or Static IPv4 WAN Connection</i> .....	83
<i>Creating Dynamic IPv6 or Static IPv6 WAN Connection</i> .....	87
<i>Creating PPPoE WAN Connection</i> .....	91
<i>Creating PPTP or L2TP WAN Connection</i> .....	95
<i>Creating PPPoE IPv6 or PPPoE Dual Stack WAN Connection</i> .....	100
<i>Creating 3G WAN Connection</i> .....	105
<i>Creating LTE WAN Connection</i> .....	109
LAN.....	112
IPv4.....	112
IPv6.....	117
WAN Failover.....	120
<b>Wi-Fi</b> .....	<b>122</b>
Basic Settings.....	122
Client Management.....	130
WPS.....	131
<i>Using WPS Function via Web-based Interface</i> .....	133
<i>Using WPS Function without Web-based Interface</i> .....	134
WMM.....	135
Client.....	138
Client Shaping.....	140
Additional.....	142
MAC Filter.....	146
Roaming.....	149
<b>Print Server</b> .....	<b>151</b>
<b>USB Storage</b> .....	<b>152</b>
Information.....	153
USB Users.....	154
Samba.....	156
FTP.....	158
Filebrowser.....	160
DLNA.....	161
Torrent Client.....	163
XUPNPD.....	167
<b>USB Modem</b> .....	<b>168</b>
Basic Settings.....	169
PIN.....	171

<b>Advanced</b> .....	<b>173</b>
VLAN.....	174
DNS.....	176
DDNS.....	178
Ports Settings.....	180
Bandwidth Control.....	183
Redirect.....	184
Routing.....	185
TR-069 Client.....	187
UPnP IGD.....	189
UDPXY.....	190
IGMP/MLD.....	192
ALG/Passthrough.....	194
IPsec.....	196
<b>Firewall</b> .....	<b>202</b>
IP Filter.....	202
Virtual Servers.....	206
DMZ.....	209
MAC Filter.....	210
URL Filter.....	212
DoS Protection.....	214
Remote Access.....	217
<b>System</b> .....	<b>219</b>
Configuration.....	220
Firmware Update.....	222
<i>Local Update</i> .....	223
<i>Remote Update</i> .....	224
Log.....	225
Ping.....	228
Traceroute.....	230
Telnet.....	232
System Time.....	233
<b>Chapter 5. Operation Guidelines</b> .....	<b>235</b>
<b>Safety Rules and Conditions</b> .....	<b>235</b>
<b>Wireless Installation Considerations</b> .....	<b>236</b>
<b>Chapter 6. Abbreviations and Acronyms</b> .....	<b>237</b>


## CHAPTER 1. INTRODUCTION

### Contents and Audience

This manual describes the router DIR-815 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.).
192.168.0.1	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-815 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-815 device is a wireless dual band router with 3G/LTE support. It provides a fast and simple way to create a wireless and wired network at home or in an office.

The router is equipped with a USB port for connecting a USB modem<sup>1</sup>, which can be used to establish connection to the Internet. In addition, to the USB port of the router you can connect a USB storage device, which will be used as a network drive, or a printer.

In order to use the multifunction USB port effectively, the router supports simultaneous operation of several USB devices. For example, you can access multimedia content of the connected HDD storage and at the same time share a USB printer.<sup>2</sup>

Also you are able to connect the wireless router DIR-815 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 4-port switch enables you to connect Ethernet-enabled computers, game consoles, and other devices to your network.

Using the DIR-815 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>3</sup>).

The router supports multiple functions for the wireless interface: several security standards (WEP, WPA/WPA2/WPA3), MAC address filtering, WPS, WMM.

In addition, the device is equipped with a button for switching the Wi-Fi network off/on. If needed, for example, when you leave home, you can easily switch the router's WLAN by pressing the button, and devices connected to the LAN ports of the router will stay online.

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 and maximum rate limitation. 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.

---

1 Not included in the delivery package. D-Link does not guarantee compatibility with all USB modems. For the list of supported USB modems, see the *Specifications* section, page 8.

2 When using a USB hub with external power supply.

3 Up to 300Mbps for 2.4GHz and up to 867Mbps for 5GHz.

The wireless router DIR-815 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.

In addition, the router supports IPsec and allows to create secure VPN tunnels.

You can configure the settings of the wireless router DIR-815 via the user-friendly web-based interface (the interface is available in several languages).

The configuration wizard allows you to quickly switch DIR-815 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-815 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>· RTL8197FN (1GHz)</li> </ul>
<b>RAM</b>	<ul style="list-style-type: none"> <li>· 64MB, DDR2, 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>· 4 10/100BASE-TX LAN ports</li> <li>· USB 2.0 port</li> </ul>
<b>LEDs</b>	<ul style="list-style-type: none"> <li>· Power</li> <li>· Internet</li> <li>· 4 LAN LEDs</li> <li>· 2.4G WLAN</li> <li>· 5G WLAN</li> <li>· WPS</li> <li>· USB</li> </ul>
<b>Buttons</b>	<ul style="list-style-type: none"> <li>· POWER button to power on/power off</li> <li>· WiFi button to enable/disable wireless network</li> <li>· WPS button to set up wireless connection</li> <li>· RESET button to restore factory default settings</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>· LTE (via supported USB modem)</li> <li>· 3G (via supported USB modem)</li> <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>

\* 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).



<b>Software</b>	
<b>Network functions</b>	<ul style="list-style-type: none"> <li>· Support of IEEE 802.1X for Internet connection</li> <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/MLD Proxy</li> <li>· RIP</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>· Autonegotiation of speed, duplex mode, and flow control / Manual speed and duplex mode setup for each Ethernet port</li> <li>· Setup of maximum TX rate for each port of the router</li> <li>· Built-in UDPXY application</li> <li>· XUPNPD plug-in</li> </ul>
<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>· Prevention of ARP and DDoS attacks</li> <li>· Virtual servers</li> </ul>
<b>VPN</b>	<ul style="list-style-type: none"> <li>· IPsec/PPTP/L2TP/PPPoE pass-through</li> <li>· IPsec tunnels                             <ul style="list-style-type: none"> <li>IKEv1 support</li> <li>DES encryption</li> <li>NAT Traversal</li> <li>Support of DPD (Keep-alive for VPN tunnels)</li> </ul> </li> </ul>
<b>USB interface functions</b>	<ul style="list-style-type: none"> <li>· USB modem                             <ul style="list-style-type: none"> <li>Auto connection to available type of supported network (4G/3G/2G)</li> <li>Auto configuration of connection upon plugging in USB modem</li> <li>Enabling/disabling PIN code check, changing PIN code<sup>4</sup></li> </ul> </li> <li>· USB storage                             <ul style="list-style-type: none"> <li>File browser</li> <li>Print server</li> <li>Access to storage via accounts</li> <li>Built-in Samba/FTP/DLNA server</li> <li>Built-in Transmission torrent client; uploading/downloading files from/to USB storage</li> </ul> </li> </ul>

<sup>4</sup> For some models of USB modems.

Software	
<b>Management and monitoring</b>	<ul style="list-style-type: none"> <li>· Local and remote access to settings through 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/connected USB storage</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>· Automatic reboot on schedule</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> </ul>
<b>Frequency range</b>  <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 ~ 5850 MHz</li> </ul>
<b>Wireless connection security</b>	<ul style="list-style-type: none"> <li>· WEP</li> <li>· WPA/WPA2 (Personal/Enterprise)</li> <li>· WPA3 (Personal)</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>· Rate limitation for wireless network/separate MAC addresses</li> <li>· Periodic scan of channels, automatic switch to least loaded channel</li> <li>· Support of 2.4GHz/5GHz 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): from 6.5 to 300Mbps (MCS0–MCS15)</li> <li>· IEEE 802.11n (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**

**Transmitter output power**

*The maximum value of the transmitter output power depends upon the radio frequency regulations applied in your country*

- 802.11a (typical at room temperature 25 °C)  
 14dBm at 6, 9, 12, 18, 24Mbps  
 13dBm at 36Mbps  
 12.5dBm at 48Mbps  
 12dBm at 54Mbps
- 802.11b (typical at room temperature 25 °C)  
 15dBm at 1, 2, 5.5, 11Mbps
- 802.11g (typical at room temperature 25 °C)  
 15dBm at 6, 9, 12, 18, 24, 36, 48, 54Mbps
- 802.11n (typical at room temperature 25 °C)  
 2.4GHz, HT20  
 15dBm at MCS0/8~7/15  
 2.4GHz, HT40  
 15dBm at MCS0/8~7/15  
 5GHz, HT20  
 14dBm at MCS0/8~4/12  
 13dBm at MCS5/13  
 12.5dBm at MCS6/14  
 12dBm at MCS7/15  
 5GHz, HT40  
 14dBm at MCS0/8~2/10  
 13dBm at MCS3/11~4/12  
 12.5dBm at MCS5/13~6/14  
 12dBm at MCS7/15
- 802.11ac (typical at room temperature 25 °C)  
 VHT20  
 14dBm at MCS0~4  
 13dBm at MCS5  
 12dBm at MCS6  
 11dBm at MCS7/8  
 VHT40  
 14dBm at MCS0~2  
 13dBm at MCS3~4  
 12dBm at MCS5~6  
 11dBm at MCS7/8/9  
 VHT80  
 14dBm at MCS0~4  
 13dBm at MCS5~6  
 12dBm at MCS7  
 11dBm at MCS8/9

**Wireless Module Parameters**

**Receiver sensitivity**

- 802.11a (typical at PER = 10% (1000-byte PDUs) at room temperature 25 °C)  
 -82dBm at 6Mbps  
 -81dBm at 9Mbps  
 -79dBm at 12Mbps  
 -77dBm at 18Mbps  
 -74dBm at 24Mbps  
 -70dBm at 36Mbps  
 -66dBm at 48Mbps  
 -65dBm at 54Mbps
  
- 802.11b (typical at PER = 8% (1000-byte PDUs) at room temperature 25 °C)  
 -80dBm at 1Mbps  
 -80dBm at 2Mbps  
 -76dBm at 5.5Mbps  
 -76dBm at 11Mbps
  
- 802.11g (typical at PER < 10% (1000-byte PDUs) at room temperature 25 °C)  
 -82dBm at 6Mbps  
 -81dBm at 9Mbps  
 -79dBm at 12Mbps  
 -77dBm at 18Mbps  
 -74dBm at 24Mbps  
 -70dBm at 36Mbps  
 -66dBm at 48Mbps  
 -65dBm at 54Mbps
  
- 802.11n (typical at PER = 10% (1000-byte PDUs) at room temperature 25 °C)  
 2.4GHz, HT20  
 -82dBm at MCS0/8  
 -79dBm at MCS1/9  
 -77dBm at MCS2/10  
 -74dBm at MCS3/11  
 -70dBm at MCS4/12  
 -66dBm at MCS5/13  
 -65dBm at MCS6/14  
 -64dBm at MCS7/15  
 2.4GHz, HT40  
 -79dBm at MCS0/8  
 -76dBm at MCS1/9  
 -74dBm at MCS2/10  
 -71dBm at MCS3/11  
 -67dBm at MCS4/12  
 -63dBm at MCS5/13  
 -62dBm at MCS6/14  
 -61dBm at MCS7/15  
 5GHz, HT20  
 -82dBm at MCS0/8  
 -79dBm at MCS1/9  
 -77dBm at MCS2/10  
 -74dBm at MCS3/11  
 -70dBm at MCS4/12  
 -66dBm at MCS5/13  
 -65dBm at MCS6/14  
 -64dBm at MCS7/15  
 5GHz, HT40  
 -79dBm at MCS0/8  
 -76dBm at MCS1/9  
 -74dBm at MCS2/10  
 -71dBm at MCS3/11  
 -67dBm at MCS4/12  
 -63dBm at MCS5/13  
 -62dBm at MCS6/14  
 -61dBm at MCS7/15

Wireless Module Parameters	
	<ul style="list-style-type: none"> <li>· 802.11ac (typical at PER = 10% (1000-byte PDUs) at room temperature 25 °C)</li> <li>HT20</li> <li>-82dBm at MCS0</li> <li>-79dBm at MCS1</li> <li>-77dBm at MCS2</li> <li>-74dBm at MCS3</li> <li>-70dBm at MCS4</li> <li>-66dBm at MCS5</li> <li>-65dBm at MCS6</li> <li>-64dBm at MCS7</li> <li>-56dBm at MCS8</li> <li>HT40</li> <li>-79dBm at MCS0</li> <li>-76dBm at MCS1</li> <li>-74dBm at MCS2</li> <li>-71dBm at MCS3</li> <li>-67dBm at MCS4</li> <li>-63dBm at MCS5</li> <li>-62dBm at MCS6</li> <li>-61dBm at MCS7</li> <li>-56dBm at MCS8</li> <li>-54dBm at MCS9</li> <li>HT80</li> <li>-76dBm at MCS0</li> <li>-73dBm at MCS1</li> <li>-71dBm at MCS2</li> <li>-68dBm at MCS3</li> <li>-64dBm at MCS4</li> <li>-60dBm at MCS5</li> <li>-59dBm at MCS6</li> <li>-58dBm at MCS7</li> <li>-53dBm at MCS8</li> <li>-51dBm at MCS9</li> </ul>
<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>	· 205 x 136 x 33 mm (8.07 x 5.35 x 1.3 in)
<b>Weight</b>	· 289 g (0.63 lb)

Operating Environment	
<b>Power</b>	· Output: 12V DC, 1A
<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>

## Supported USB modems<sup>5</sup>

### GSM

- Alcatel X500
- D-Link DWM-152C1
- D-Link DWM-156A6
- D-Link DWM-156A7
- D-Link DWM 156A8
- D-Link DWM-156C1
- D-Link DWM-157B1
- D-Link DWM-157B1 (Velcom)
- D-Link DWM-158D1
- D-Link DWR-710
- Huawei E150
- Huawei E1550
- Huawei E156G
- Huawei E160G
- Huawei E169G
- Huawei E171
- Huawei E173 (Megafon)
- Huawei E220
- Huawei E3131 (MTS 420S)
- Huawei E352 (Megafon)
- Huawei E3531
- Prolink PHS600
- Prolink PHS901
- ZTE MF112
- ZTE MF192
- ZTE MF626
- ZTE MF627
- ZTE MF652
- ZTE MF667
- ZTE MF668
- ZTE MF752

<sup>5</sup> The manufacturer does not guarantee proper operation of the router with every modification of the firmware of USB modems.

<b>Supported USB modems</b>	
<b>LTE</b>	<ul style="list-style-type: none"><li>· Alcatel IK40V</li><li>· D-Link DWM-222</li><li>· Huawei E3131</li><li>· Huawei E3272</li><li>· Huawei E3351</li><li>· Huawei E3372s</li><li>· Huawei E3372h-153</li><li>· Huawei E3372h-320</li><li>· Huawei E367</li><li>· Huawei E392</li><li>· Megafon M100-1</li><li>· Megafon M100-2</li><li>· Megafon M100-3</li><li>· Megafon M100-4</li><li>· Megafon M150-1</li><li>· Megafon M150-2</li><li>· Megafon M150-3</li><li>· Quanta 1K6E (Beeline 1K6E)</li><li>· MTS 824F</li><li>· MTS 827F</li><li>· Yota LU-150</li><li>· Yota WLTUBA-107</li><li>· ZTE MF823</li><li>· ZTE MF823D</li><li>· ZTE MF827</li><li>· ZTE MF833T</li><li>· ZTE MF833V</li></ul>
<b>Smartphones in USB tethering mode</b>	<ul style="list-style-type: none"><li>· Some models of Android smartphones</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.
Internet	<i>Solid green</i>	The cable is connected to the port.
	<i>Blinking green</i>	Data transfer through the WAN port.
	<i>No light</i>	The cable is not connected.



LED	Mode	Description
<b>LAN 1-4</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. When the router is being loaded, the LEDs are blinking one at a time. When the firmware is being upgraded, the LEDs are blinking two at a time.
	<i>No light</i>	The cable is not connected to the relevant port.
<b>2.4G WLAN 5G WLAN</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>Blinking green</i>	Attempting to add a wireless device via the WPS function.
	<i>No light</i>	The WPS function is not in use.
<b>USB</b>	<i>Solid green</i>	A USB device is connected to the router's USB port.
	<i>No light</i>	No USB device.

## Back and Bottom Panels



Figure 2. Back panel view.

Port	Description
<b>WIFI</b>	A button to enable/disable wireless network. To disable the router's wireless network: with the device turned on, press the button and release. The <b>2.4G WLAN</b> and <b>5G WLAN</b> LEDs should turn off.
<b>WPS</b>	A button to set up wireless connection (the WPS function). To use the WPS function: with the device turned on, press the button, hold it for 2 seconds, and release. The <b>WPS</b> LED should start blinking.
<b>LAN 1-4</b>	4 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).

Port	Description
<b>USB</b>	A port for connecting a USB device (modem, storage, printer).
<b>POWER</b>	A button to turn the router on/off.

Also, the power connector is located on the back panel of the router.

The **RESET** button located on the bottom panel of the router is designed to restore the factory default settings. To restore the factory defaults, push the button (with the device turned on), hold it for 10 seconds, and then release the button.

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

## ***Delivery Package***

The following should be included:

- Router DIR-815
- Power adapter DC 12V/1A
- 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 3G/LTE support DIR-815 (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.

## USB Modem

To connect to an LTE or 3G network, you should use a USB modem. Connect it to the USB port of the router, then access the web-based interface of the router, and you will be able to configure a connection to the Internet<sup>6</sup>.

Your USB modem should be equipped with an active SIM card of your operator.

Some operators require subscribers to activate their USB modems prior to using them.



Please, refer to connection guidelines provided by your operator when concluding the agreement or placed on its website.

For some models of USB modems, it is required to disable the PIN code check on the SIM card prior to connecting the USB modem to the router.


---

<sup>6</sup> Contact your operator to get information on the service coverage and fees.

## 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. **To connect via USB modem:** connect your USB modem to the USB port<sup>7</sup> located on the back panel of the router.

 In some cases you will need to reboot the router after connection of the USB modem.

3. 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.
4. Turn on the router by pressing the **POWER** button on its back panel.

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

---

<sup>7</sup> It is recommended to use a USB extension cable to connect a USB modem to the router.

## 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.)

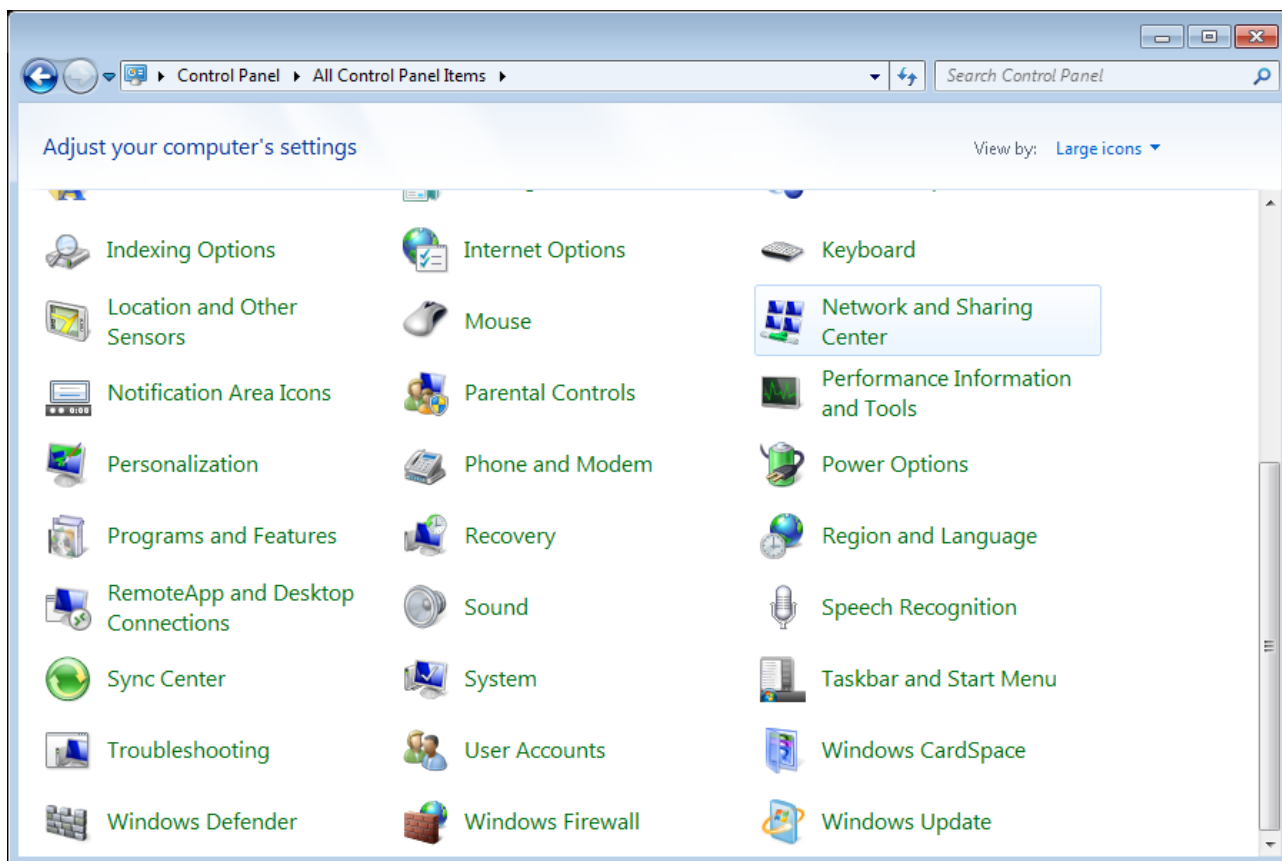


Figure 3. The **Control Panel** window.



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

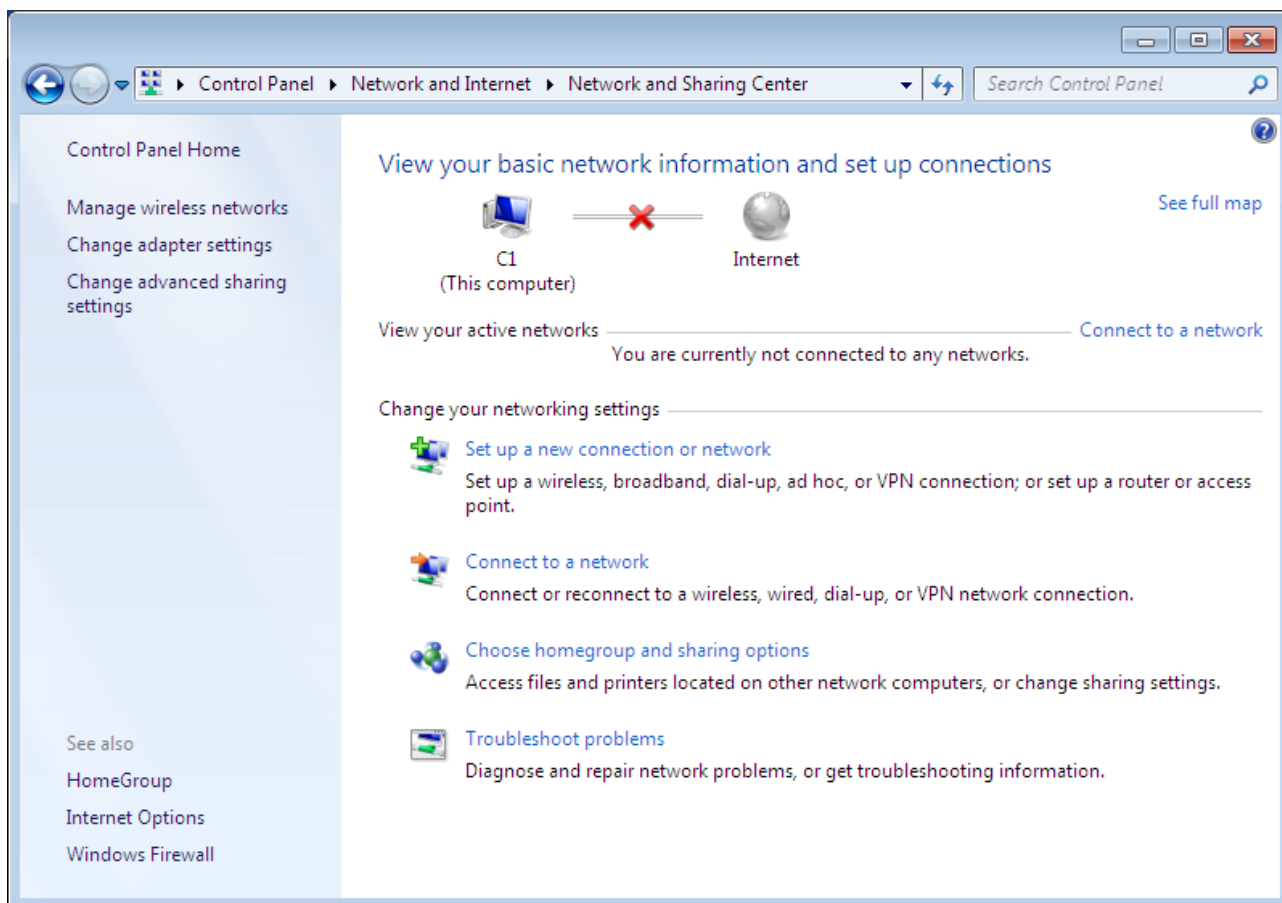


Figure 4. The **Network and Sharing Center** window.

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

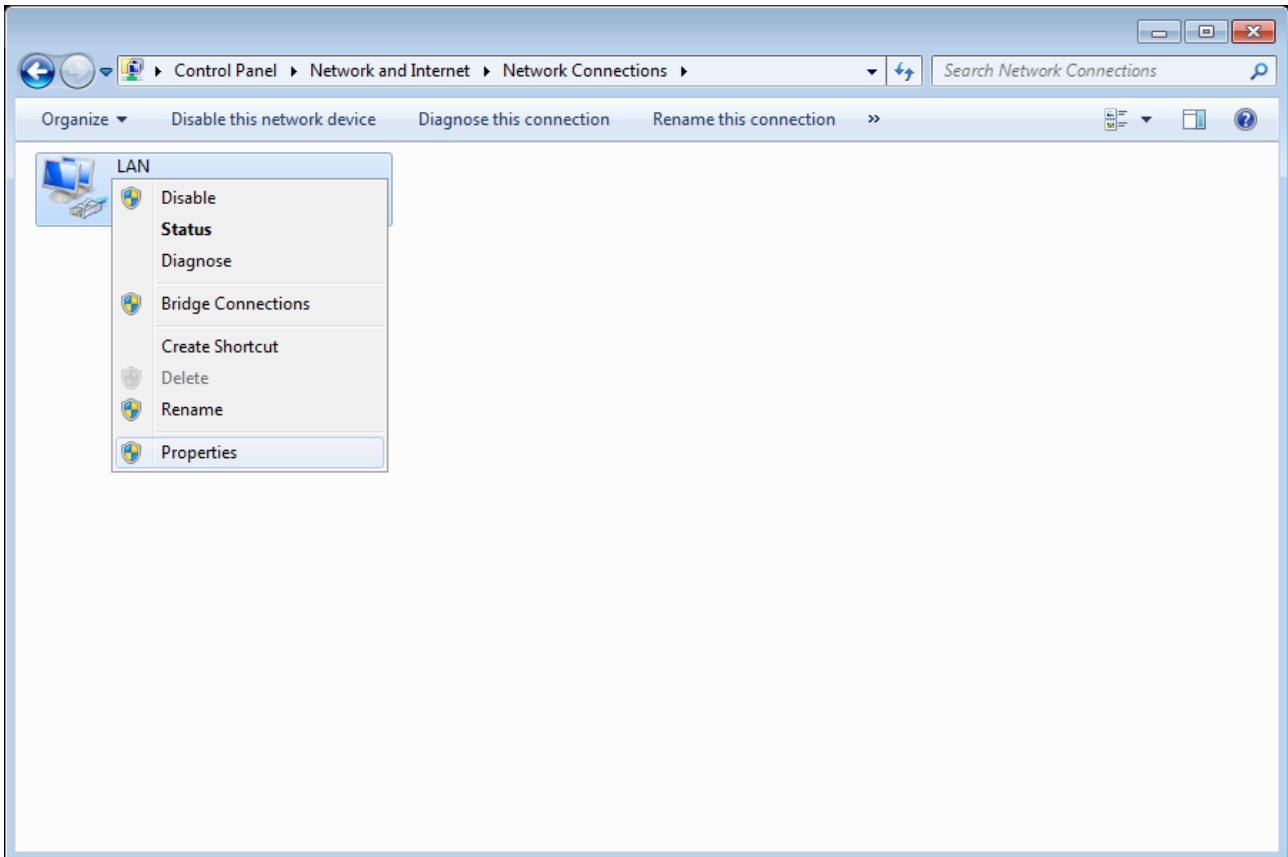


Figure 5. The **Network Connections** window.

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.

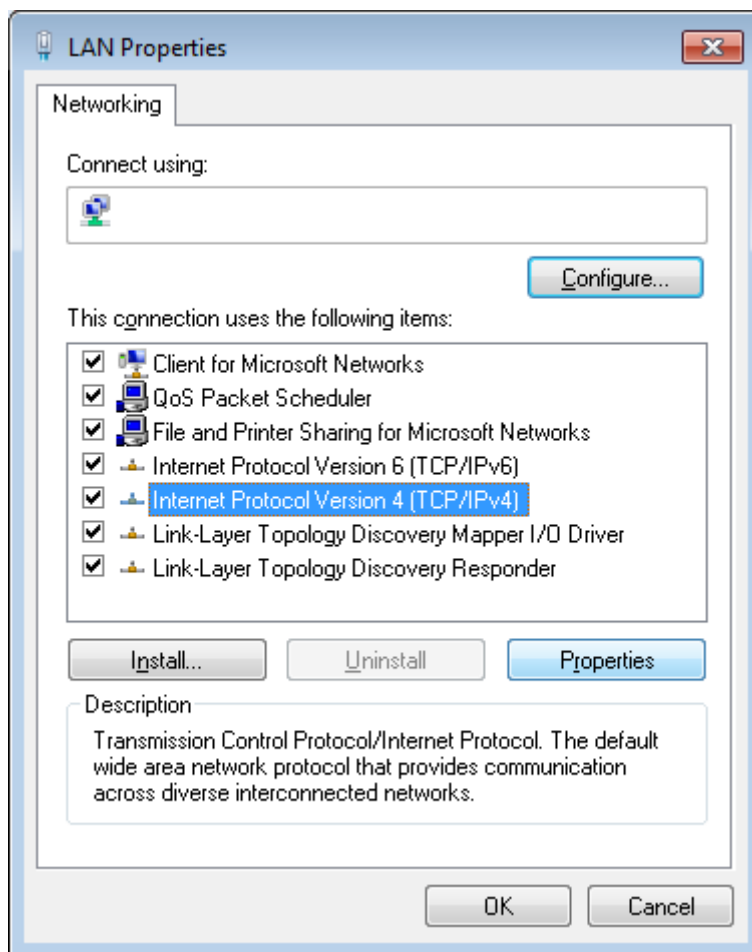


Figure 6. The **Local Area Connection Properties** window.

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.

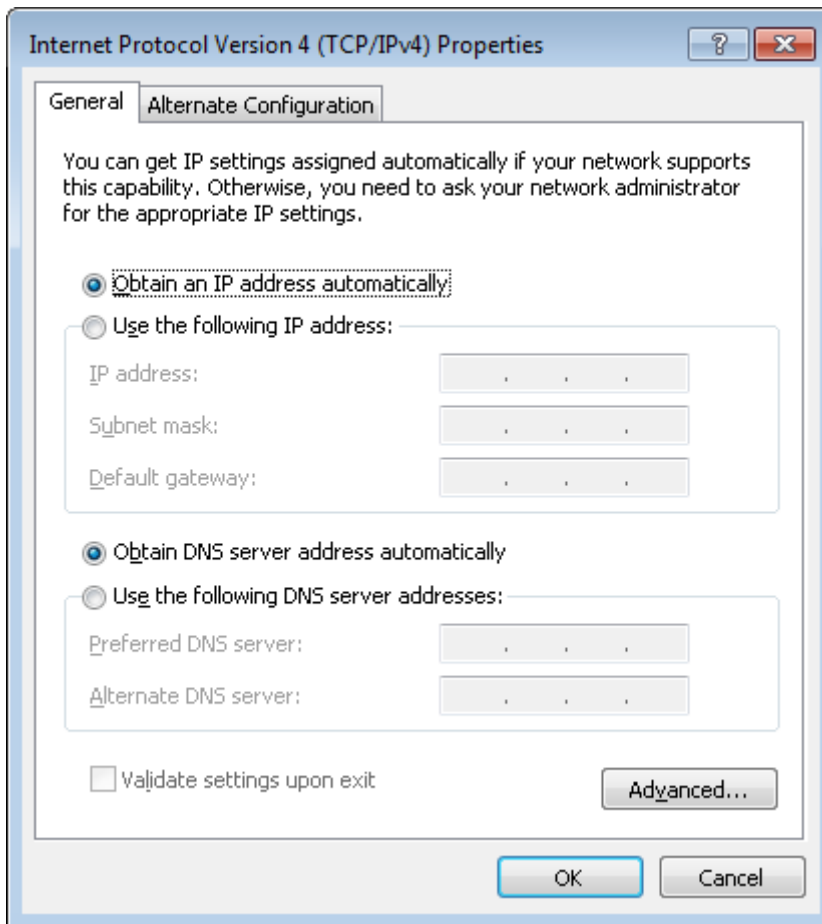


Figure 7. The **Internet Protocol Version 4 (TCP/IPv4) Properties** window.

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.

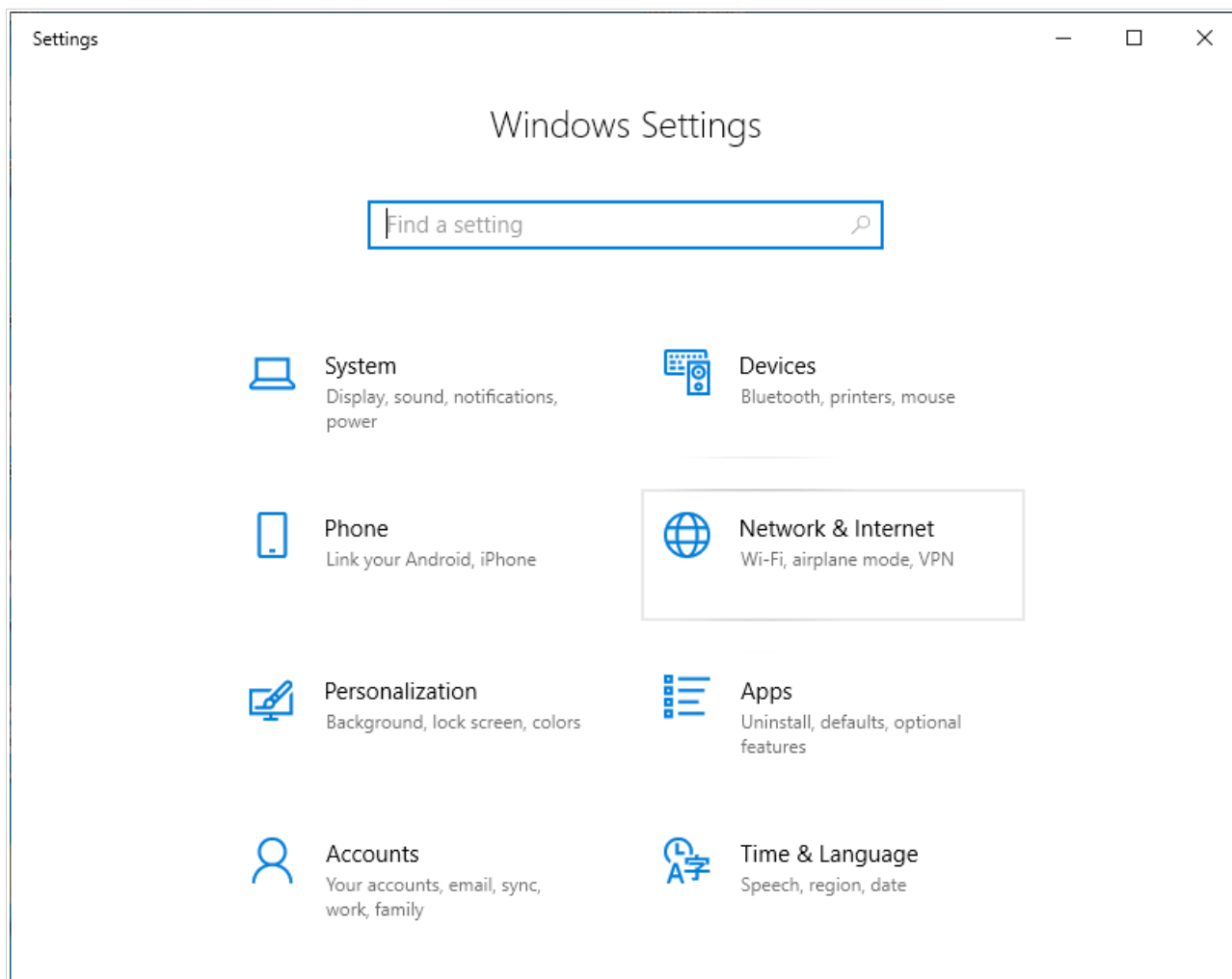


Figure 8. The **Windows Settings** window.

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

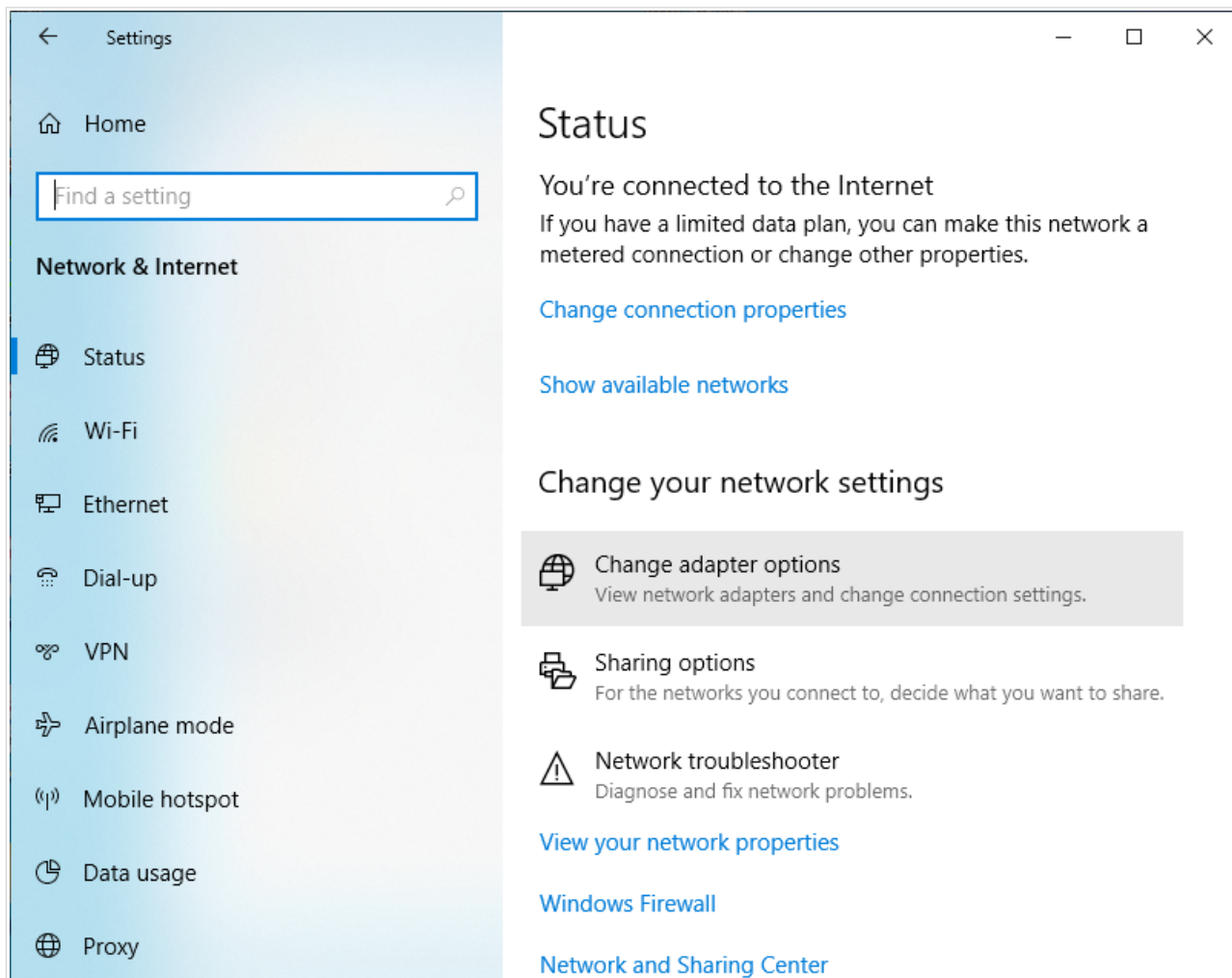


Figure 9. The **Network & Internet** window.

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

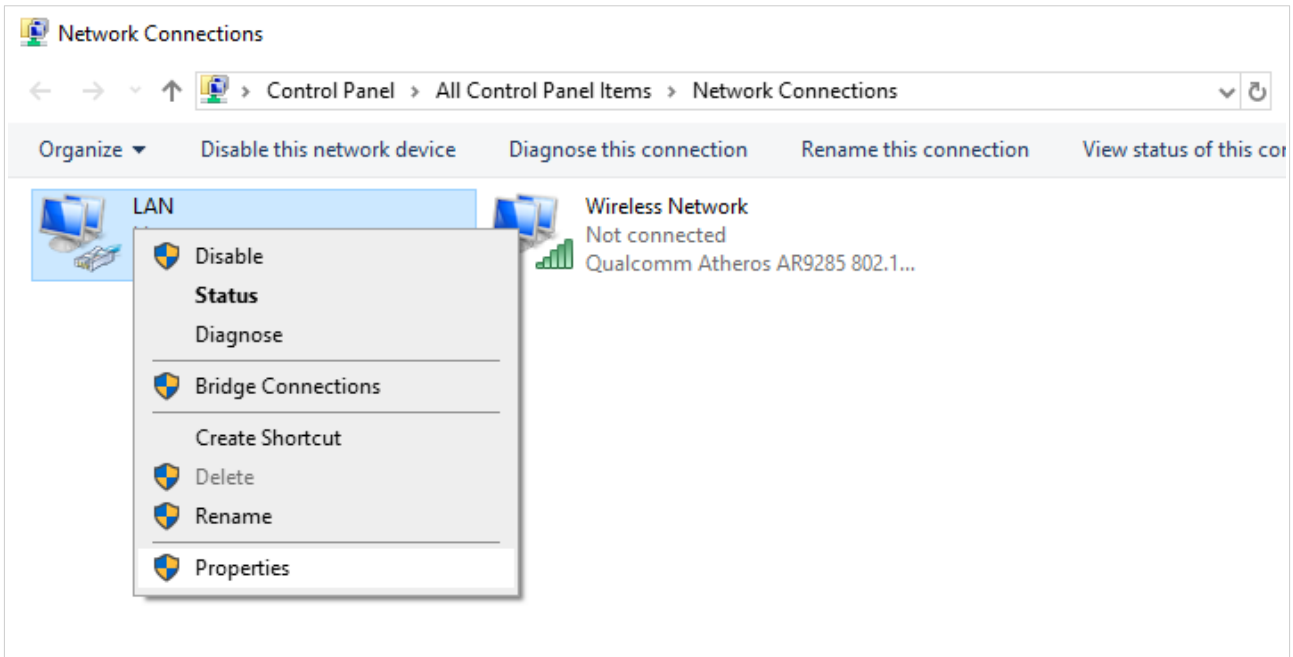


Figure 10. The **Network Connections** window.

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.

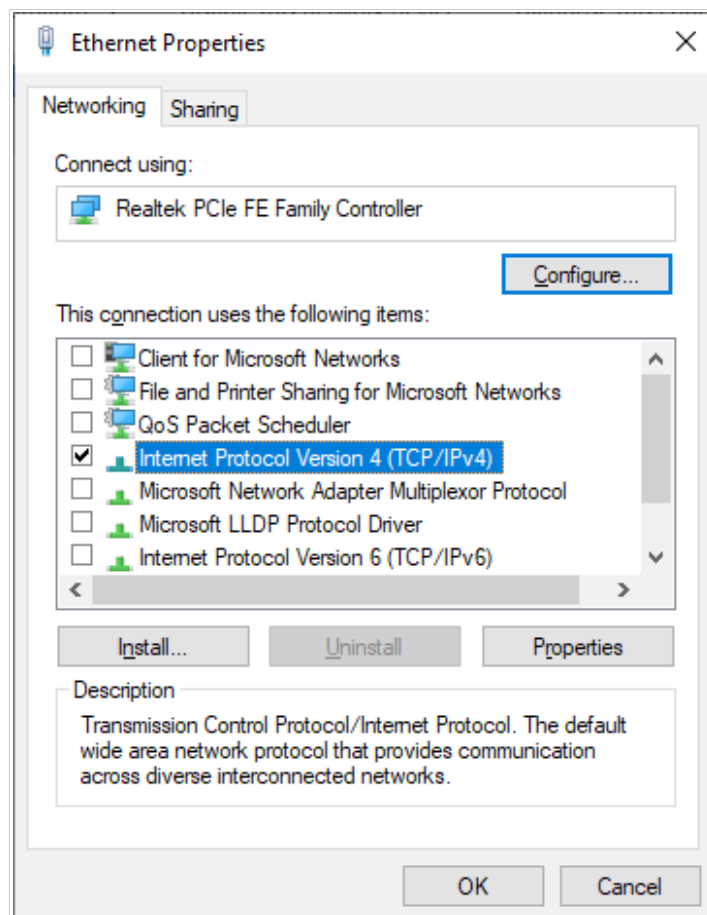


Figure 11. The local area connection properties window.

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.

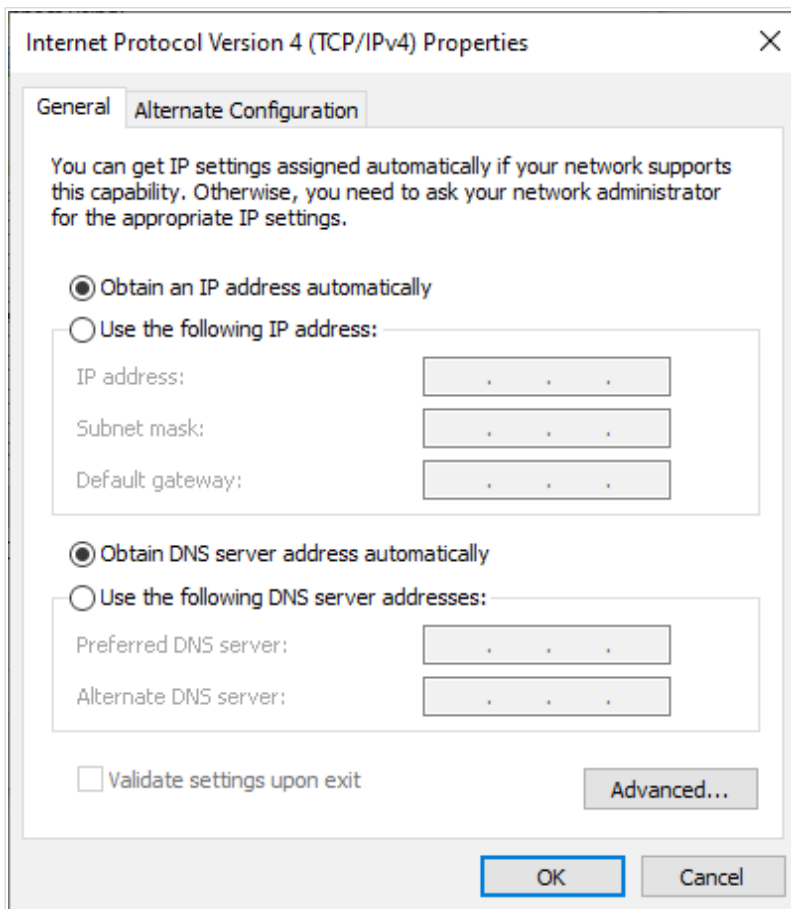


Figure 12. The **Internet Protocol Version 4 (TCP/IPv4) Properties** window.

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



## PC with Wi-Fi Adapter

1. **To connect via USB modem:** connect your USB modem to the USB port<sup>8</sup> located on the back panel of the router.



In some cases you will need to reboot the router after connection of the USB modem.

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.
3. Turn on the router by pressing the **POWER** button on its back panel.
4. 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).

---

<sup>8</sup> It is recommended to use a USB extension cable to connect a USB modem to the router.

## 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.)

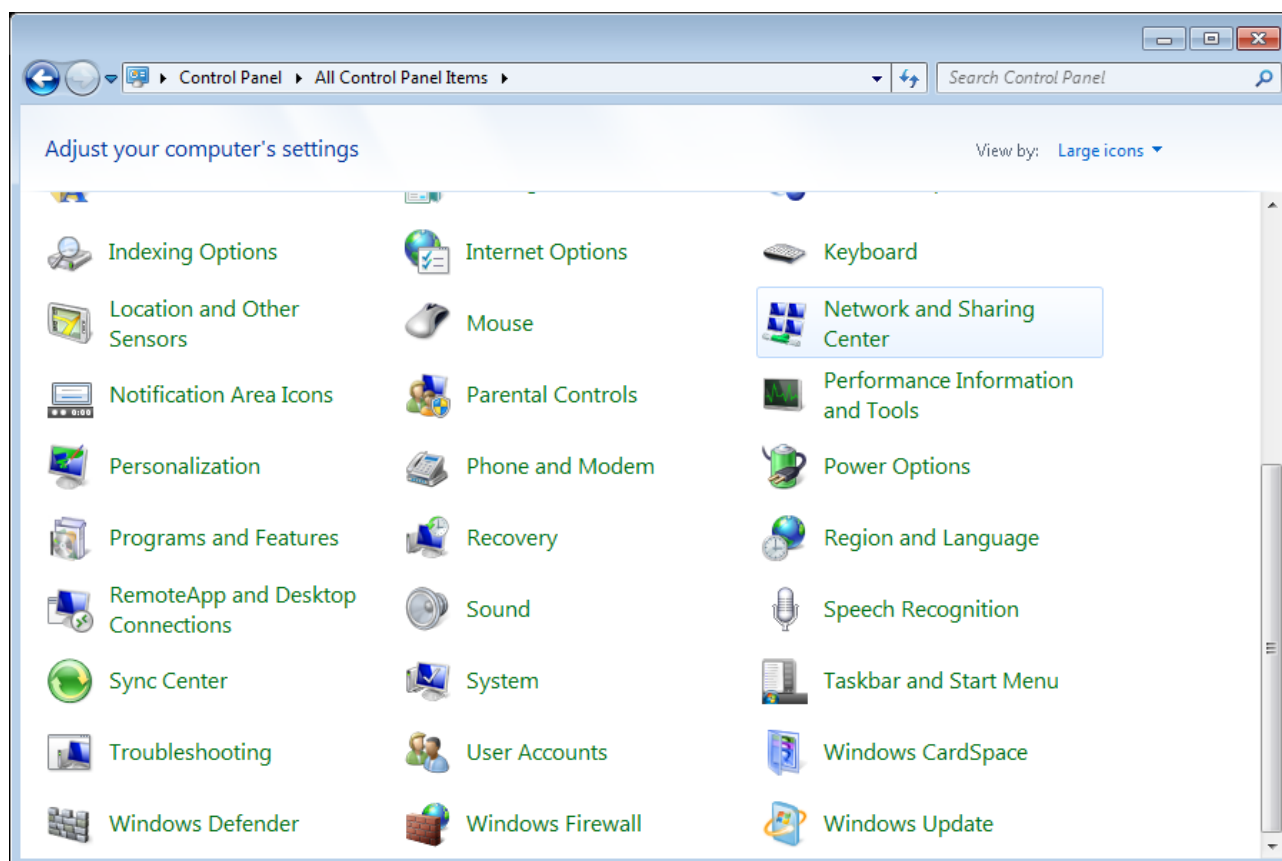


Figure 13. The **Control Panel** window.

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.

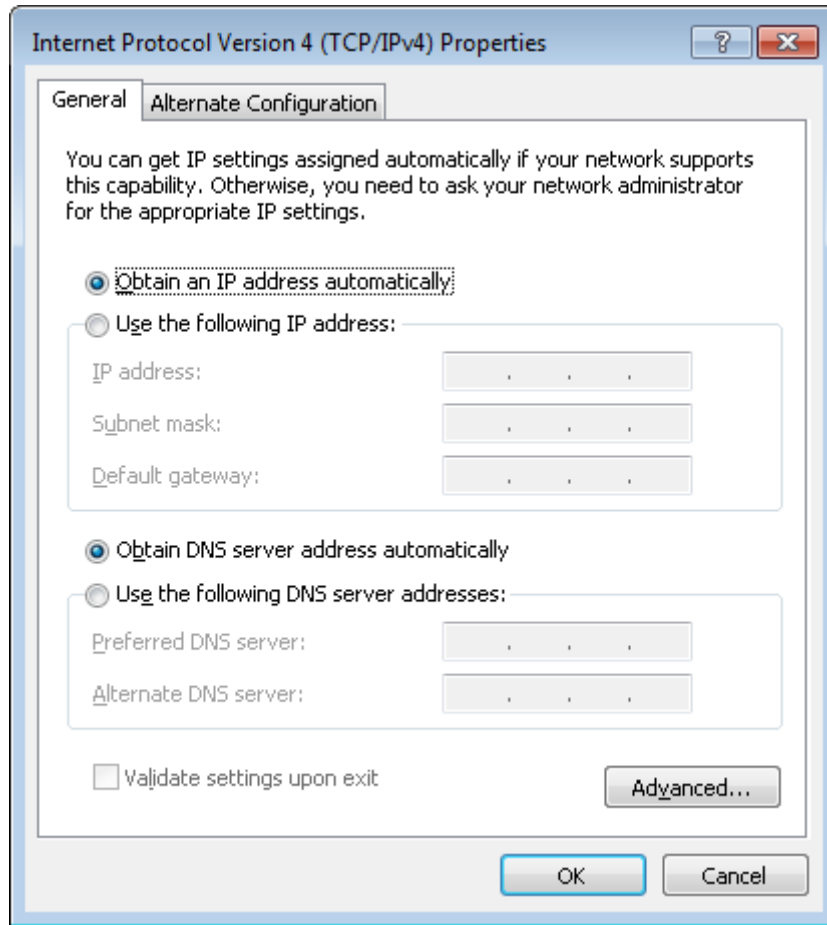


Figure 14. The **Internet Protocol Version 4 (TCP/IPv4) Properties** window.

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.

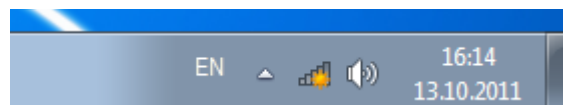


Figure 15. The notification area of the taskbar.

- In the opened **Wireless Network Connection** window, select the wireless network **DIR-815** (for operating in the 2.4GHz band) or **DIR-815-5G** (for operating in the 5GHz band) and click the **Connect** button.

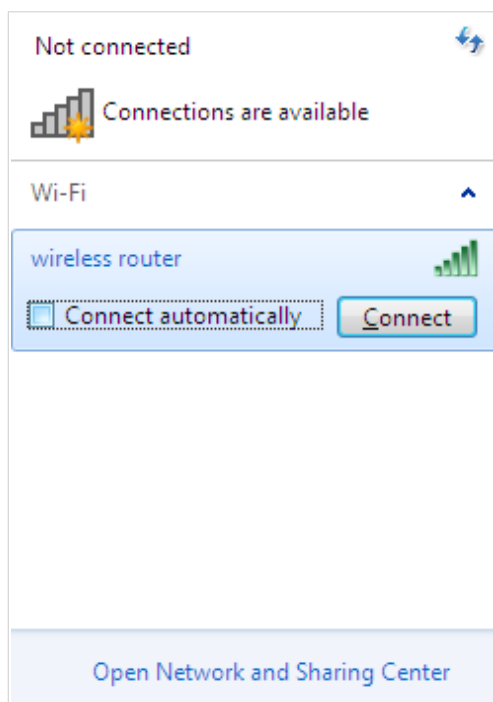


Figure 16. The list of available networks.

- 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.

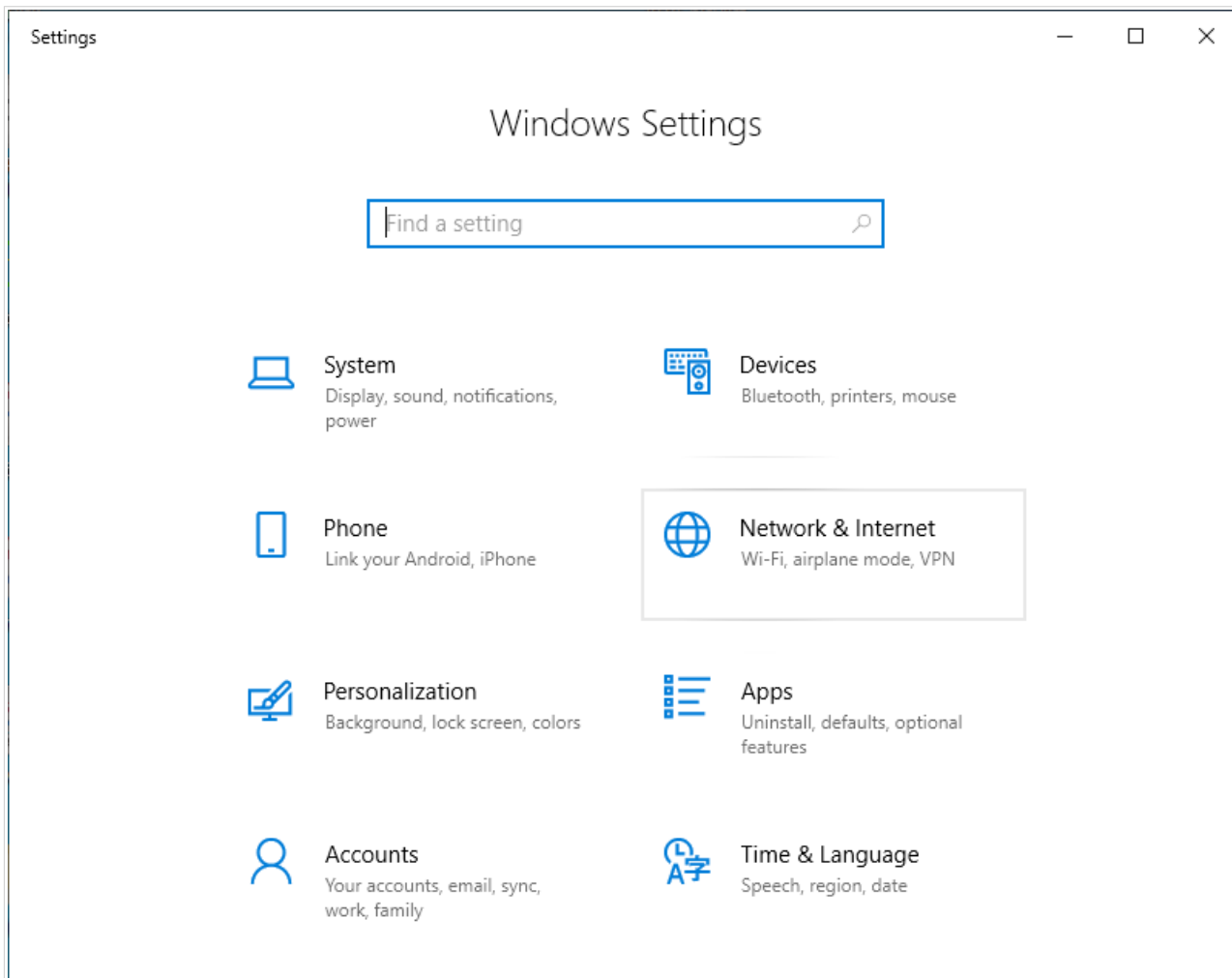


Figure 17. The **Windows Settings** window.

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.

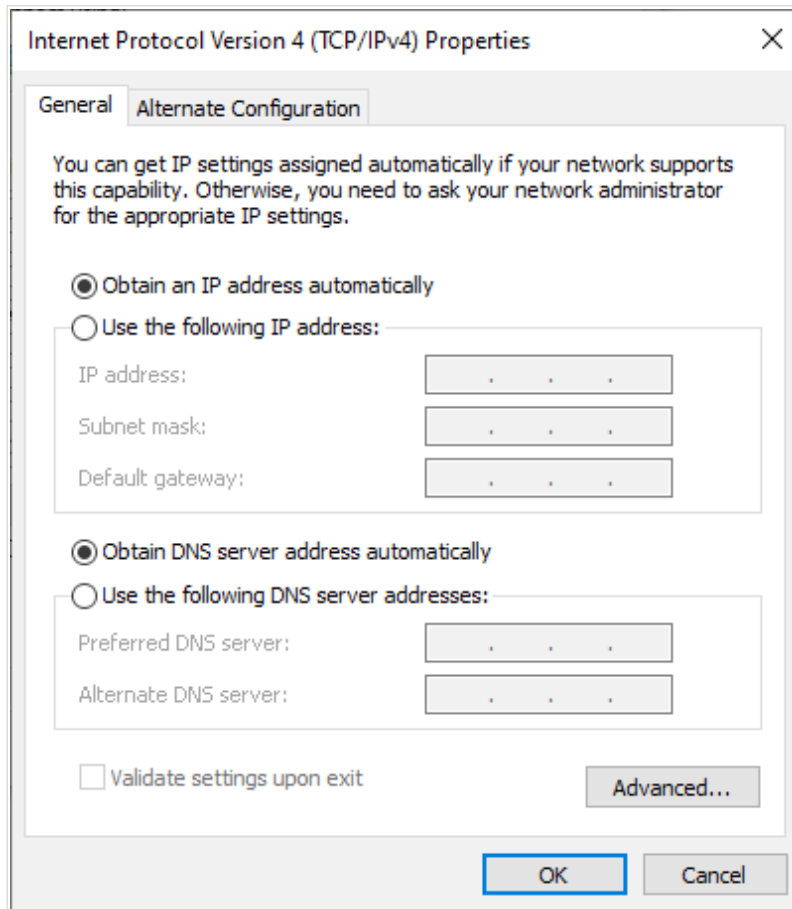


Figure 18. The **Internet Protocol Version 4 (TCP/IPv4) Properties** window.

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.

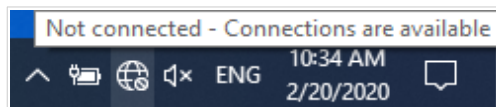


Figure 19. The notification area of the taskbar.

9. In the opened **Wireless Network Connection** window, select the wireless network **DIR-815** (for operating in the 2.4GHz band) or **DIR-815-5G** (for operating in the 5GHz band) and click the **Connect** button.

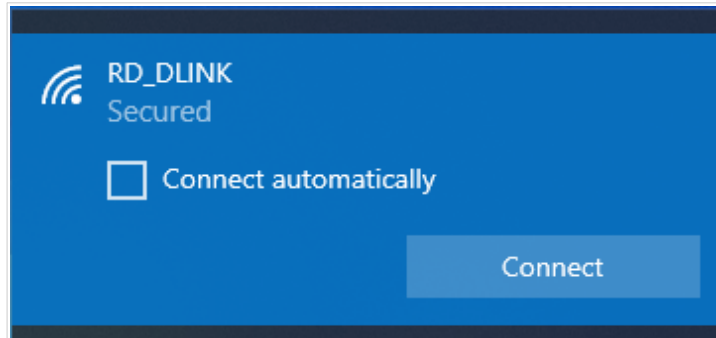


Figure 20. The list of available networks.

10. 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.
11. Allow or forbid your PC to be discoverable by other devices on this network (**Yes / No**).

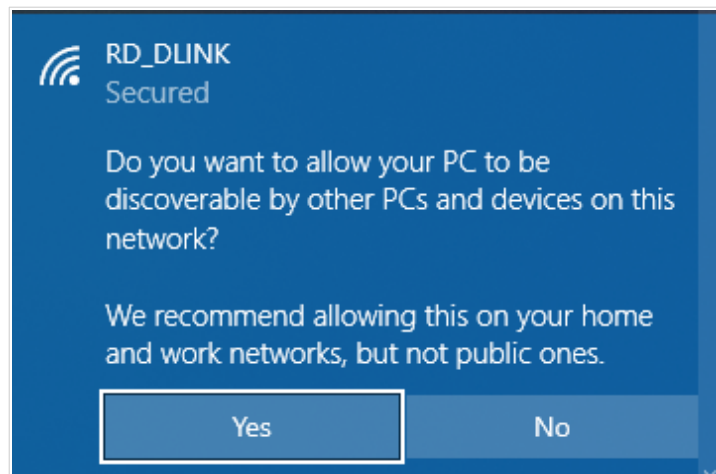


Figure 21. PC discovery settings.

12. 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-815 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 21). 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-815 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 47).

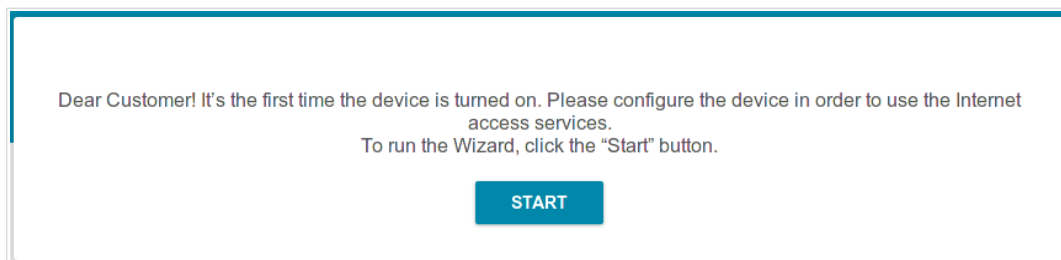
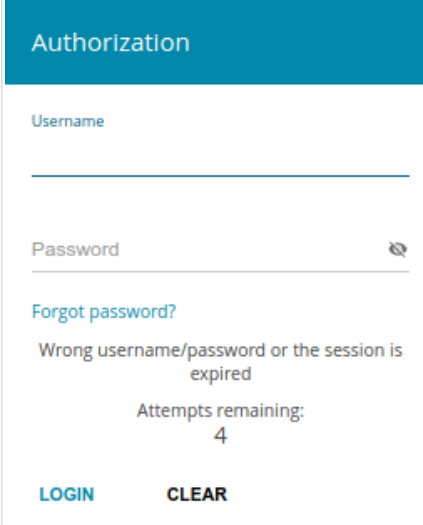


Figure 23. The page for running the Initial Configuration Wizard.



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.



Authorization

Username

Password

[Forgot password?](#)

Wrong username/password or the session is expired

Attempts remaining:  
4

**LOGIN**      **CLEAR**

Figure 24. The login page.

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 shows the 'Summary' page of the DIR-815 web interface. The page has a teal header with a 'Home' button and a 'Summary' title. The content is organized into several panels:

- Device Information:** Model: DIR-815, Hardware version: R1, Firmware version: 3.0.2, Build time: Tue Jul 12 2022 1:04:08 PM MSK, UI version: 1.32.0.ad5eb5b-embedded, Vendor: D-Link Russia, Serial number: 1234567890123, Support: support@dlink.ru, Summary: Root filesystem image for DIR-815, Uptime: 3 h. 36 min., Device mode: Router, Enable LEDs:
- WAN IPv4:** Connection type: Dynamic IPv4, Status: Connected (green dot), MAC address: 00:44:33:55:55:12, IP address: 192.168.161.234
- LAN:** LAN IPv4: 192.168.0.1, LAN IPv6: fd01::1/64, Wireless connections: -, Wired connections: 1
- LAN Ports:** LAN1: Off (grey dot), LAN2: 100M-Full (green dot), LAN3: Off (grey dot), LAN4: Off (grey dot)
- Wi-Fi 2.4 GHz:** Status: On (green dot), Broadcasting: On (green dot), Additional networks: 0, Network name (SSID): DIR-XXX, Security: WPA2-PSK (lock icon)
- Wi-Fi 5 GHz:** Status: On (green dot), Broadcasting: On (green dot), Additional networks: 0, Network name (SSID): DIR-XXX-5G, Security: WPA2-PSK (lock icon)
- USB Devices:** No connected devices (info icon)

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 setup wizard** link (for the detailed description of the Wizard, see the *Initial Configuration Wizard* section, page 47).

If needed, you can disable the LEDs of the device (except the **Power** LED). To do this, move the **Enable LEDs** switch to the left. In order to enable the LEDs, move the switch to the right and reboot the device.

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 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.

The **USB Devices** section displays the device connected to the USB port of the router.

## Home Page

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

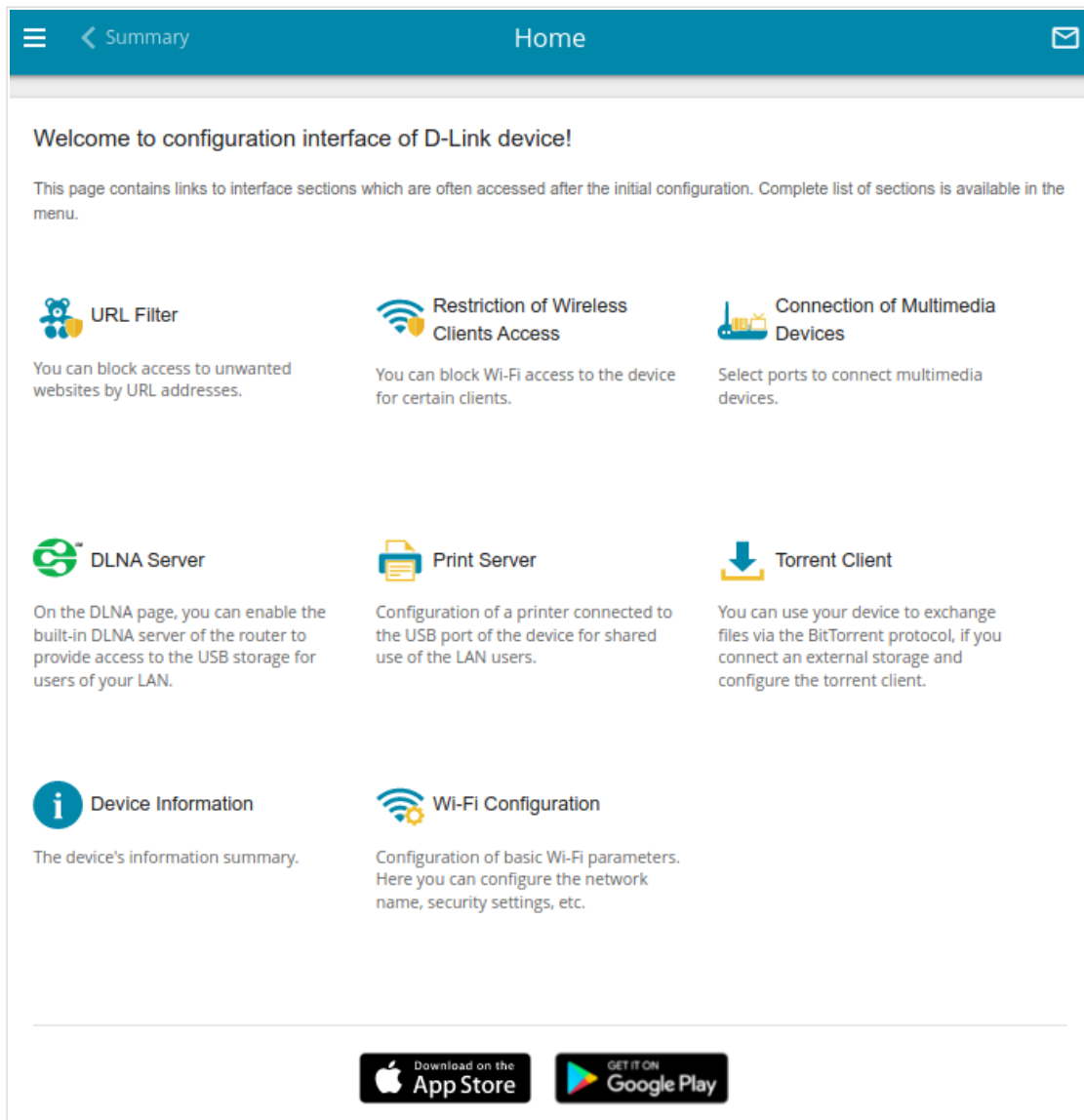


Figure 26. The **Home** page.

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 47).

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 73).

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 81).

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 122).

The **Print Server** section is designed for configuring the router as a print server (see the *Print Server* section, page 151).

The pages of the **USB Storage** section are designed for operating the connected USB storage (for the description of the pages, see the *USB Storage* section, page 152).

The pages of the **USB Modem** section are designed for operating the connected 3G or LTE USB modem (for the description of the pages, see the *USB Modem* section, page 168).

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 173).

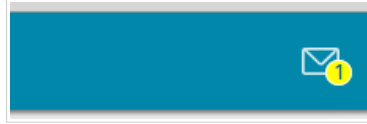
The pages of the **Firewall** section are designed for configuring the firewall of the router (for the description of the pages, see the *Firewall* section, page 202).

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 219).

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.



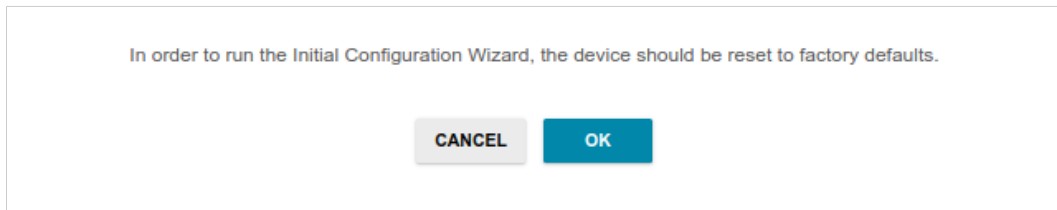
*Figure 27. The web-based interface notifications.*

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

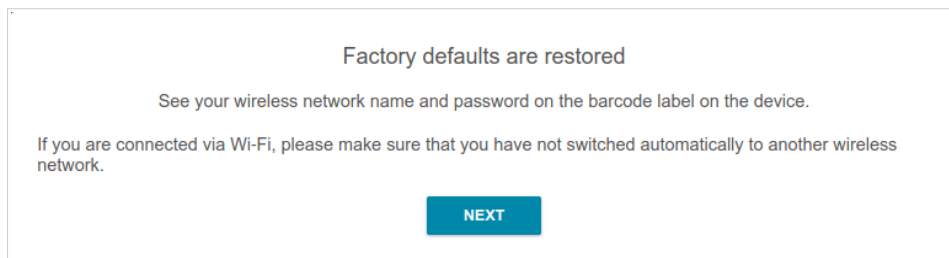
### *Initial Configuration Wizard*

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.



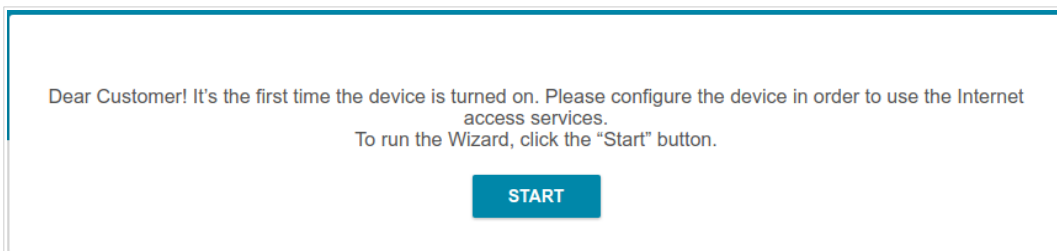
*Figure 28. Restoring the default settings in the Wizard.*

If you perform initial configuration of the router via Wi-Fi connection, please make sure that you are connected to the wireless network **DIR-815** (for operating in the 2.4GHz band) or **DIR-815-5G** (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.

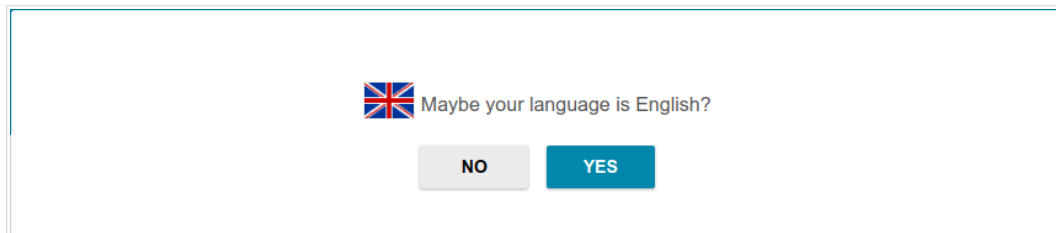


Figure 31. Selecting a language.

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.

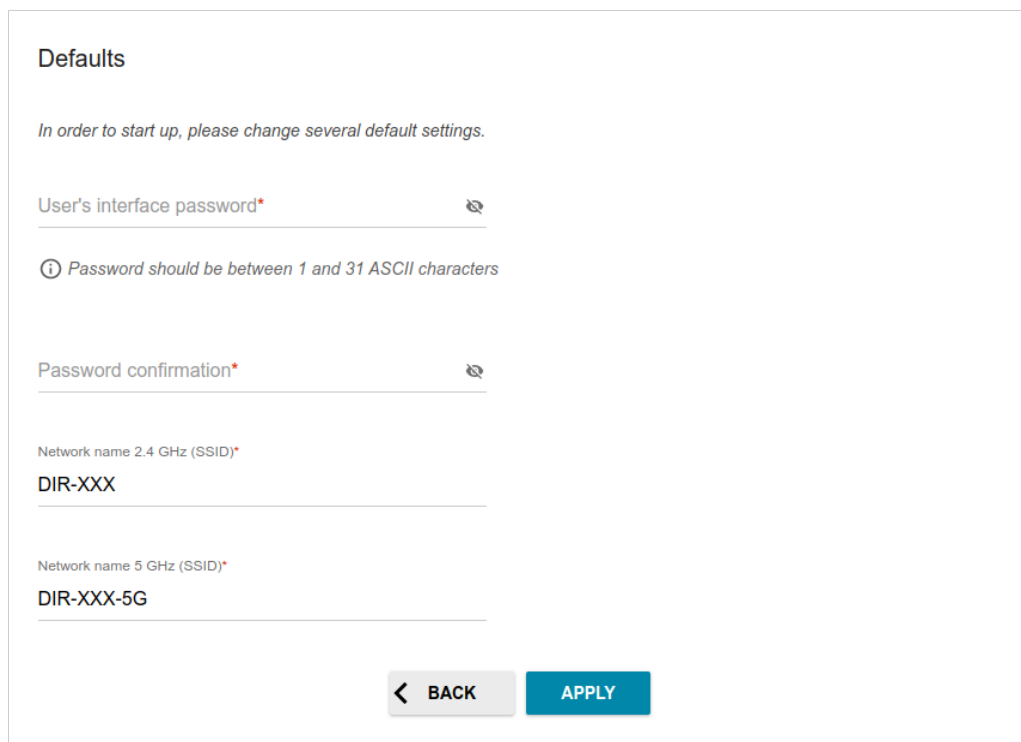


Figure 32. Changing the default settings.

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.

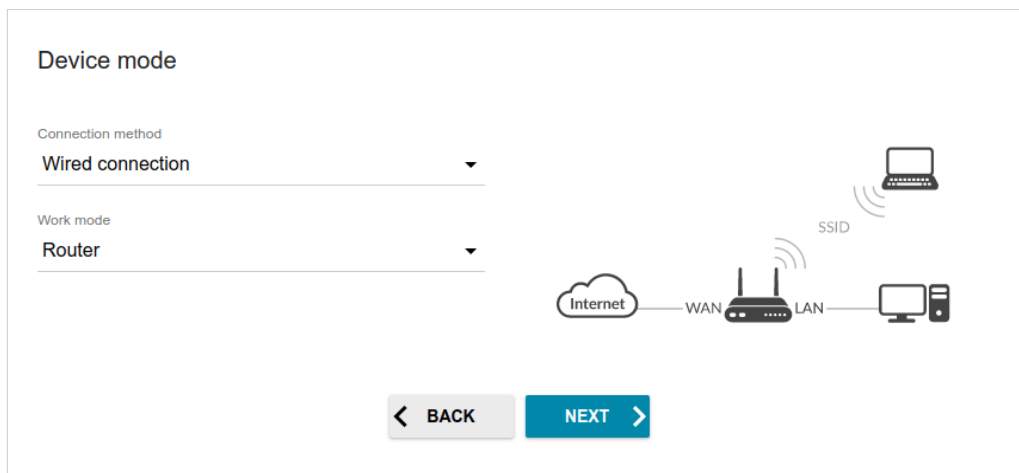


Figure 33. Selecting an operation mode. The **Router** mode.

In order to connect your device to the network of a 3G or LTE operator, on the **Device mode** page, from the **Connection method** list, select the **3G/LTE modem** value. In this mode you can configure a 3G/LTE 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.

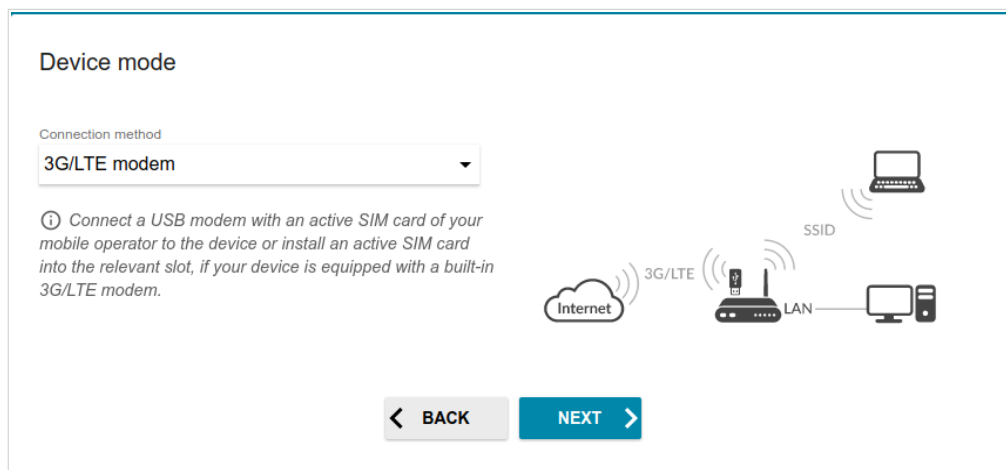


Figure 34. Selecting an operation mode. The **3G/LTE modem** mode.

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.

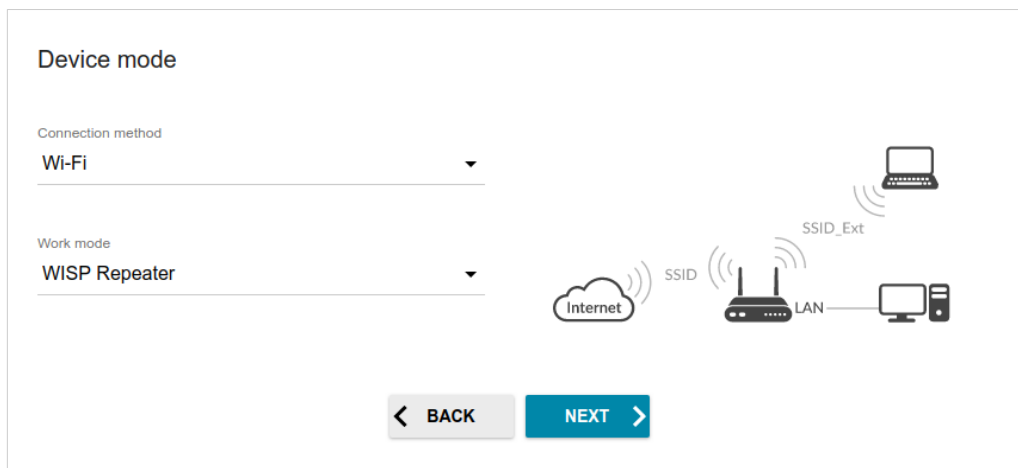


Figure 35. Selecting an operation mode. The **WISP Repeater** mode.

## 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.

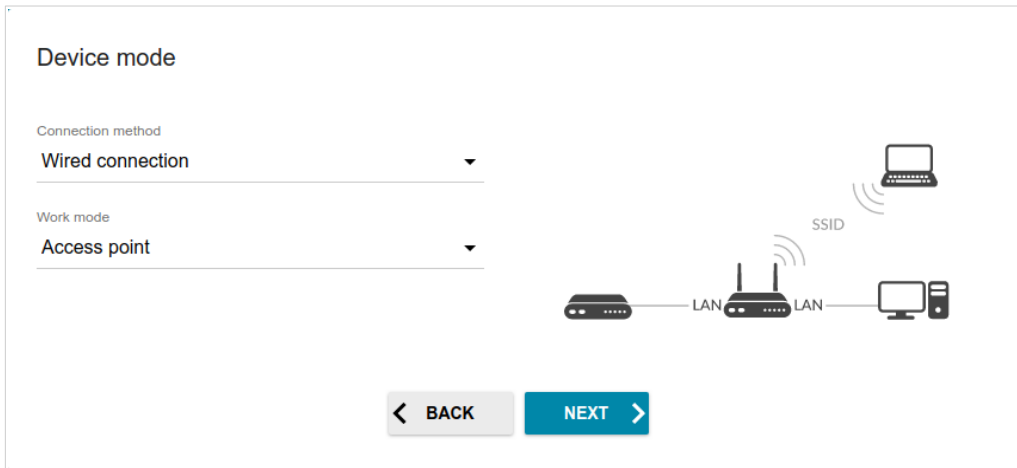


Figure 36. Selecting an operation mode. The **Access point** mode.

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.

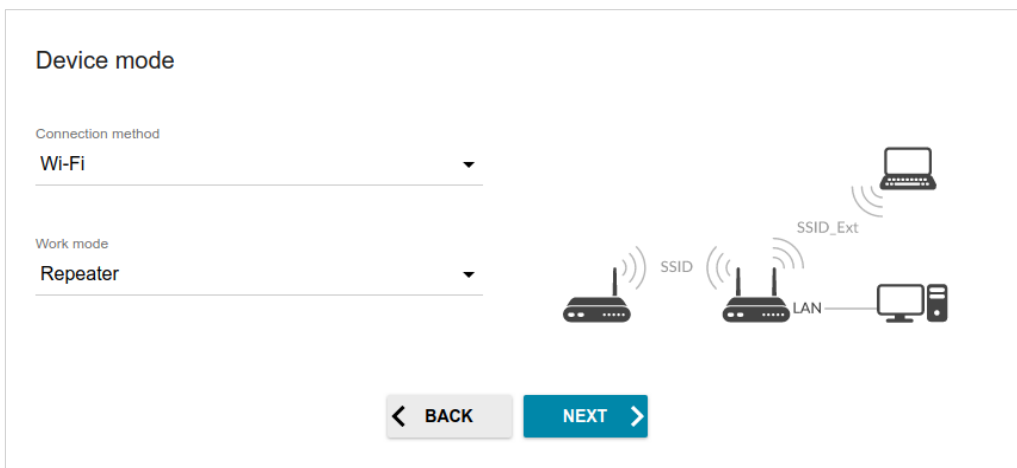


Figure 37. Selecting an operation mode. The **Repeater** mode.

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.

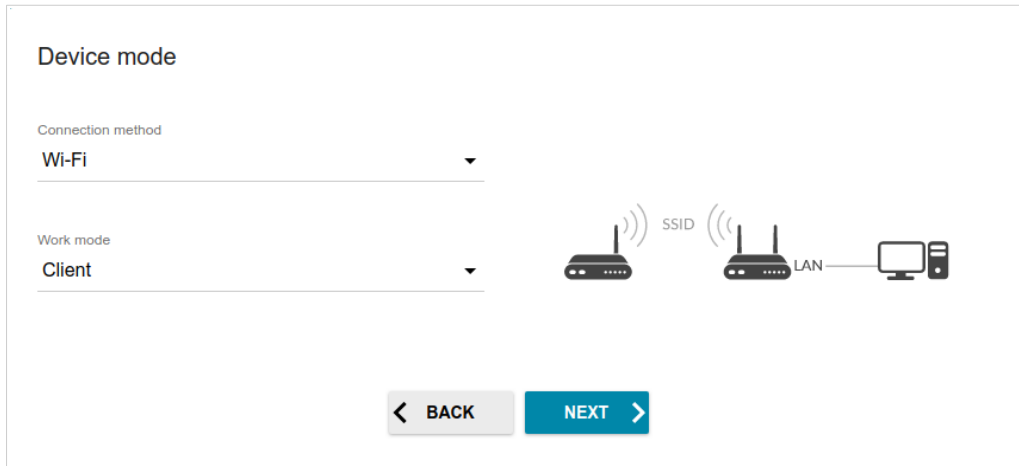
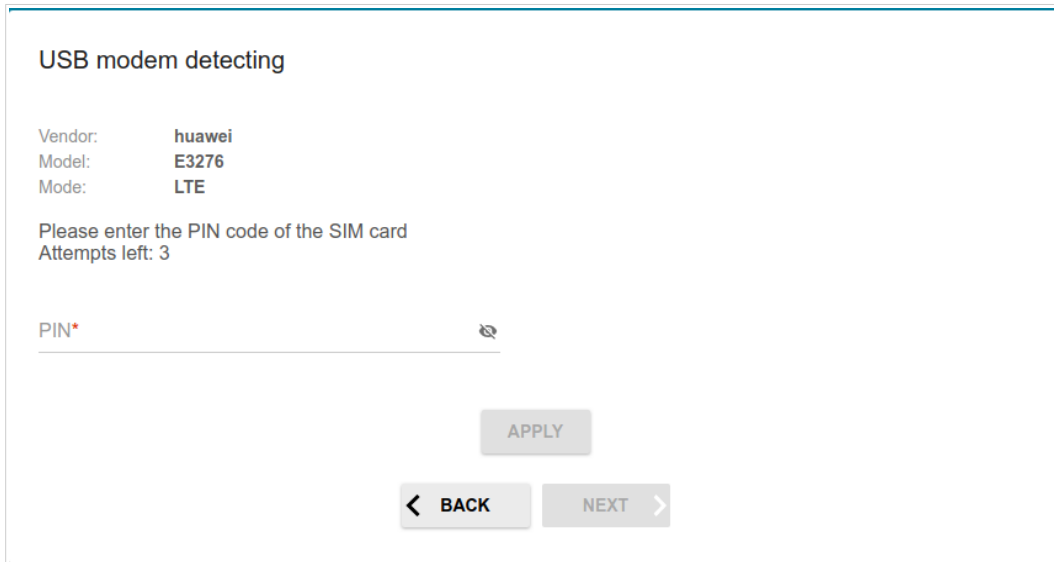


Figure 38. Selecting an operation mode. The **Client** mode.

## Creating 3G/LTE WAN Connection

This configuration step is available for the **3G/LTE modem** mode.

1. If the PIN code check is enabled for the SIM card inserted into your USB modem, enter the PIN code in the **PIN** field and click the **APPLY** button.



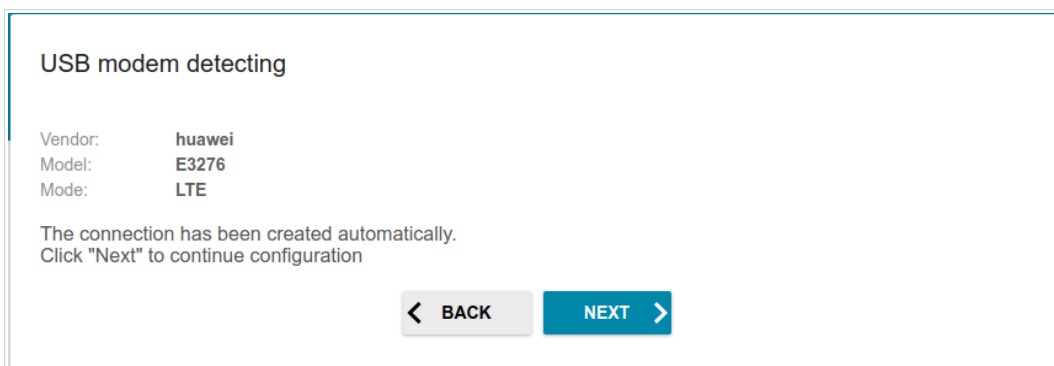
The screenshot shows a web interface titled "USB modem detecting". It displays the following information:

- Vendor: huawei
- Model: E3276
- Mode: LTE

Below this information, it says "Please enter the PIN code of the SIM card" and "Attempts left: 3". There is a text input field labeled "PIN\*" with a small eye icon to its right. At the bottom of the form, there are three buttons: "APPLY", "< BACK", and "NEXT >".

Figure 39. The page for entering the PIN code.

2. Please wait while the router automatically creates a WAN connection for your mobile operator.



The screenshot shows the same "USB modem detecting" page. The modem details are the same. The message now says "The connection has been created automatically. Click 'Next' to continue configuration". The "APPLY" button is no longer visible. The "BACK" and "NEXT" buttons are still present at the bottom.

Figure 40. The page for creating 3G/LTE connection.

3. Click the **NEXT** button to continue or click the **BACK** button to return to the previous page. If the router failed to create a WAN connection automatically, click the **CONFIGURE MANUALLY** button. On the **Internet connection type** page, configure all needed settings and click the **NEXT** button.

## 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-815 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-815, do not select the **Automatic obtainment of IPv4 address** checkbox and fill in the **IP address**, **Subnet mask**, **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

Hostname\*

dlinkap6b2e.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 41. 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.

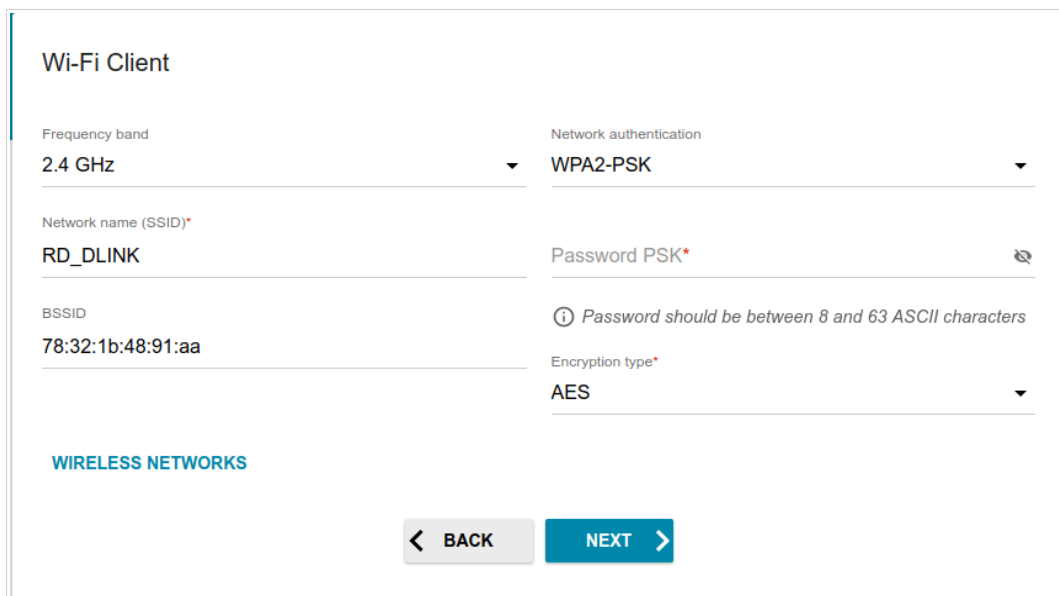


Figure 42. The page for configuring the Wi-Fi client.

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> 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**, **WPA-PSK/WPA2-PSK mixed**, **WPA3-SAE**, or **WPA2-PSK/WPA3-SAE 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> . <i>TKIP and TKIP+AES encryption types are not available for WPA3-SAE and WPA2-PSK/WPA3-SAE mixed authentication types.</i>

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



## Configuring Wired 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, manually select the needed value from the **Connection type** list.
2. Specify the settings necessary for the connection of the selected type.
3. If a particular MAC address was registered by your ISP upon concluding the agreement, from the **MAC address assignment method** drop-down list (available for the **Router** mode only), select the **Manual** value and enter this address in the **MAC address** field. Choose the **Clone MAC address of your device** value to place the MAC address of your network interface card in the field, or leave the **Default MAC address** value to place the router's WAN interface MAC address in the field.
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

The screenshot shows a configuration page titled "Internet connection type". At the top, there is a dropdown menu for "Connection type" with "Static IPv4" 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." The main configuration area contains several input fields: "IP address\*", "Subnet mask\*", "Gateway IP address\*", and "DNS IP address\*", each with a red asterisk indicating it is required. Below these is a dropdown for "MAC address assignment method" with "Default MAC address" selected. Underneath is a "MAC address" field containing "00:44:33:55:55:12" and a lock icon. Another information icon and note state: "In some ISP's networks, it is required to register a certain MAC address in order to get access to the Internet." At the bottom, there are several checkboxes: "Use VLAN" (unchecked), "Use IGMP" (checked), "Ping" (unchecked), and "Enable automatic creation of Mobile Internet connection" (checked). A note explains: "Internet Group Management Protocol is designed to manage multicast traffic in IP-based networks." At the very bottom, there are two buttons: "BACK" and "NEXT".

Figure 43. 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

### Internet connection type

Connection type  
Static IPv6

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

IP address\*

Prefix\*

Gateway IP address\*

DNS IP address\*

MAC address assignment method  
Default MAC address

MAC address  
00:44:33:55:55:12

*(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.*

Ping

Enable automatic creation of Mobile Internet connection

[← BACK](#) [NEXT →](#)

Figure 44. 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


Internet connection type

Connection type  
PPPoE

*i* A connection of this type requires a user name and password.


Without authorization

Username\*

Password\* 

Service name

MAC address assignment method  
Default MAC address

MAC address  
00:44:33:55:55:12 

*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.

Ping

Enable automatic creation of Mobile Internet connection

[< BACK](#) [NEXT >](#)

Figure 45. 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


**Internet connection type**

Connection type  
PPPoE + Static IP (PPPoE Dual Access) ▼

*ⓘ A connection of this type requires a user name, password, and a fixed IP address provided by your ISP.*

Without authorization

Username\*

Password\* 

Service name


IP address\*

Subnet mask\*

Gateway IP address\*

DNS IP address\*

Figure 46. 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

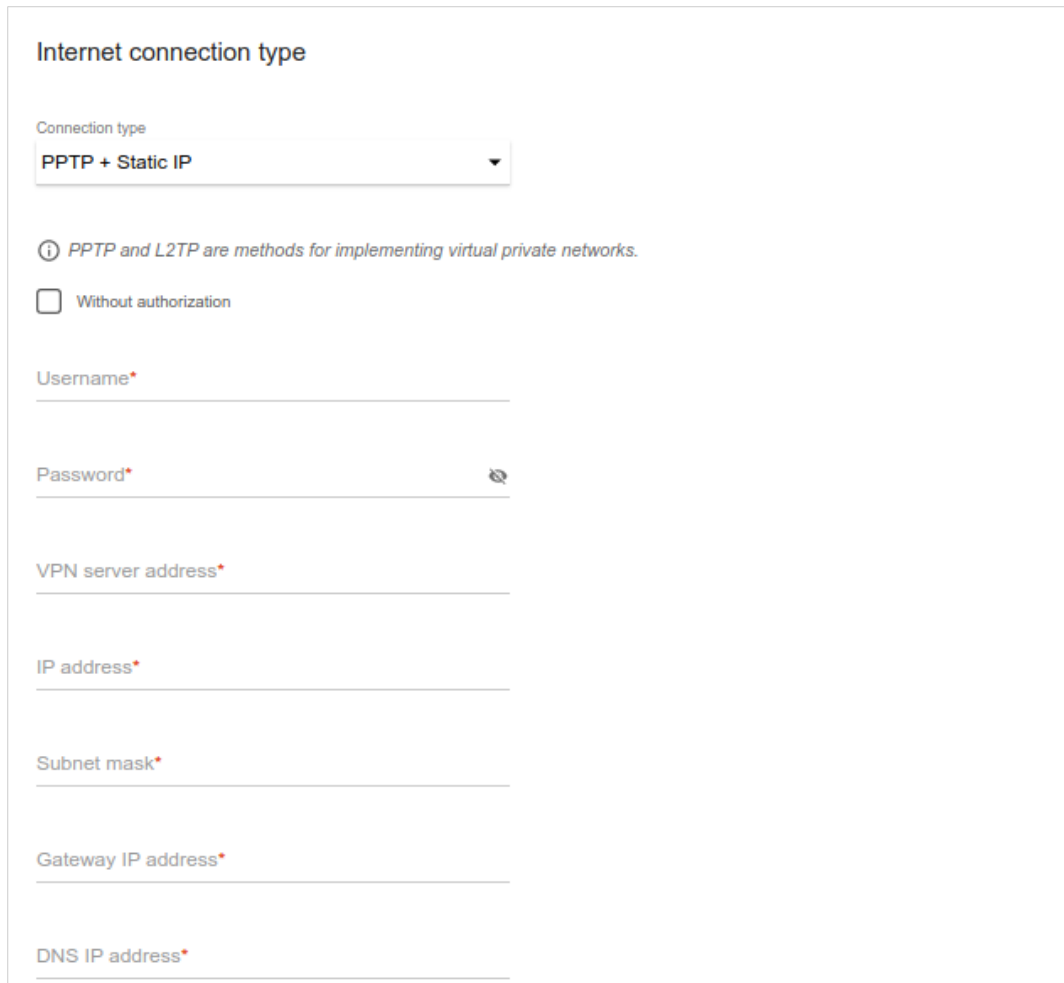
The screenshot shows a configuration page titled "Internet connection type". The "Connection type" dropdown menu is set to "PPTP + Dynamic IP". Below this, there is an information icon and text: "PPTP and L2TP are methods for implementing virtual private networks." There is a checkbox labeled "Without authorization" which is currently unchecked. The "Username" field is empty. The "Password" field is empty and has a "Show" icon (an eye with a slash) to its right. The "VPN server address" field is empty. The "MAC address assignment method" dropdown menu is set to "Default MAC address". The "MAC address" field contains "00:44:33:55:55:12" and has a lock icon to its right. Below the MAC address field, there is 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." There are three checkboxes: "Use VLAN" (unchecked), "Use IGMP" (checked), and "Ping" (unchecked). Below the "Use IGMP" checkbox, there is an information icon and text: "Internet Group Management Protocol is designed to manage multicast traffic in IP-based networks." At the bottom, there are two checkboxes: "Enable automatic creation of Mobile Internet connection" (checked) and "Enable automatic creation of Mobile Internet connection" (checked). At the very bottom, there are two buttons: "BACK" and "NEXT".

Figure 47. 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-based configuration interface for setting up a PPTP + Static IP WAN connection. The page is titled "Internet connection type" and features a dropdown menu for "Connection type" with "PPTP + Static IP" selected. Below this, there is an information icon and a note: "PPTP and L2TP are methods for implementing virtual private networks." A checkbox labeled "Without authorization" is present. The form includes several text input fields, each with a red asterisk indicating it is required: "Username\*", "Password\*" (with a "Show" icon), "VPN server address\*", "IP address\*", "Subnet mask\*", "Gateway IP address\*", and "DNS IP address\*".

Figure 48. 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.

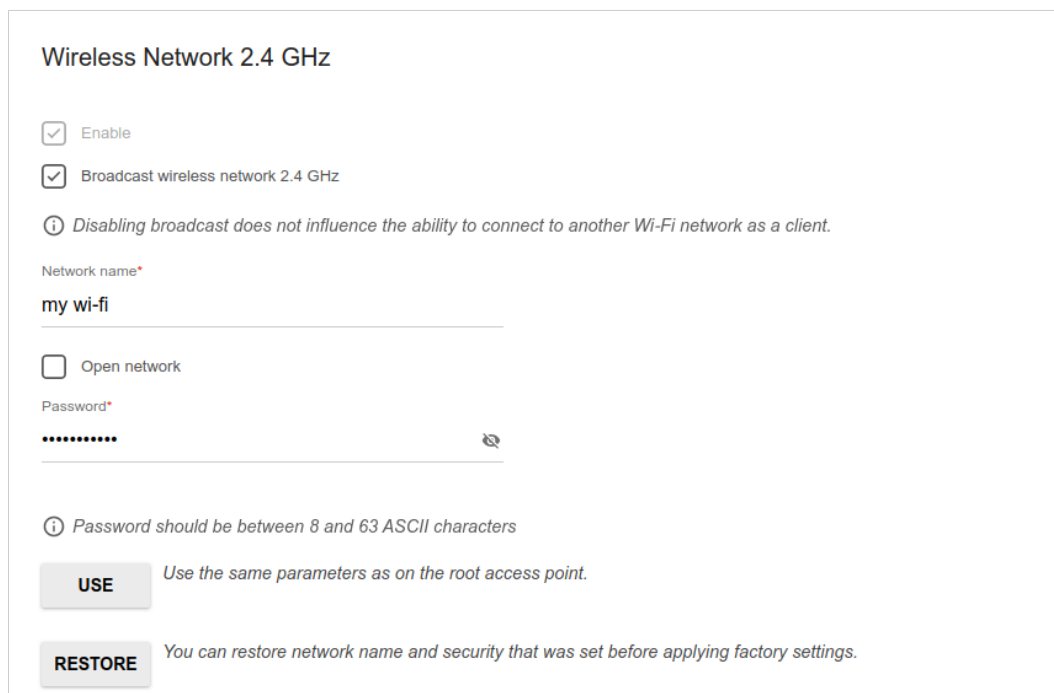
In the **VPN server address** field, enter the IP or URL address of the PPTP or L2TP authentication server.

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 **3G/LTE modem**, **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*

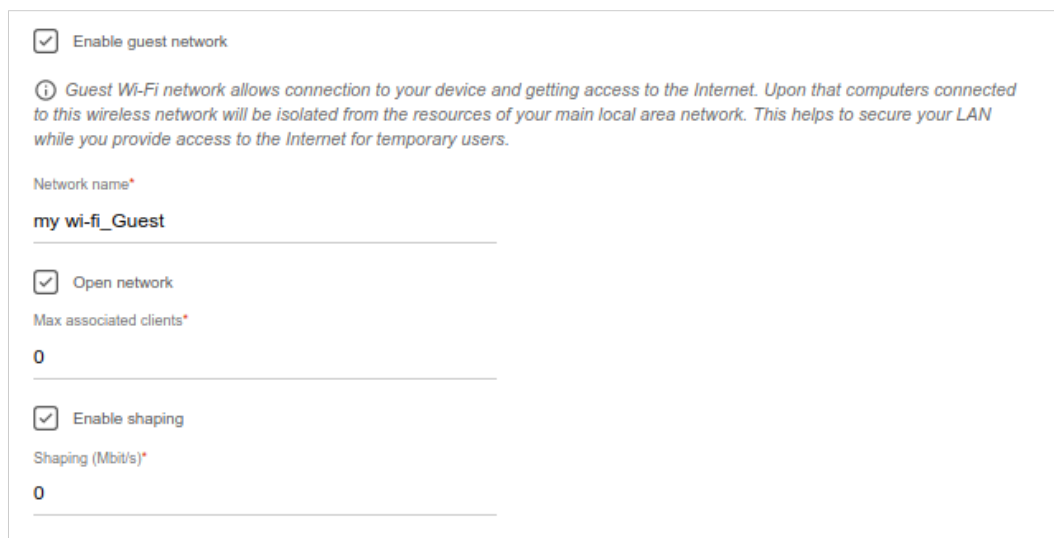
**USE** Use the same parameters as on the root access point.

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

Figure 49. 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 **3G/LTE modem**, **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

Enable shaping

Shaping (Mbit/s)\*

0

Figure 50. 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. If you want to limit the bandwidth of the guest wireless network, select the **Enable shaping** checkbox and fill in the **Shaping** field.
9. Click the **NEXT** button to continue or click the **BACK** button to specify other settings.
10. 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.

IPTV

Is an STB connected to the device?

*Information icon* If your ISP provides IPTV service, you can connect an STB directly to the router without additional equipment

Use VLAN ID

VLAN ID\*

*Information icon* Information about the VLAN ID can be found in the contract.

LAN4 LAN3 LAN2 LAN1 WAN

BACK NEXT

Figure 51. 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.

VoIP

Is an IP phone connected to the device?

*ⓘ If your ISP provides VoIP service, you can connect an IP phone directly to the router without additional equipment*

Use VLAN ID

VLAN ID\*

*ⓘ Information about the VLAN ID can be found in the contract.*

LAN4 LAN3 LAN2 LAN1 WAN

Figure 52. 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>9</sup>

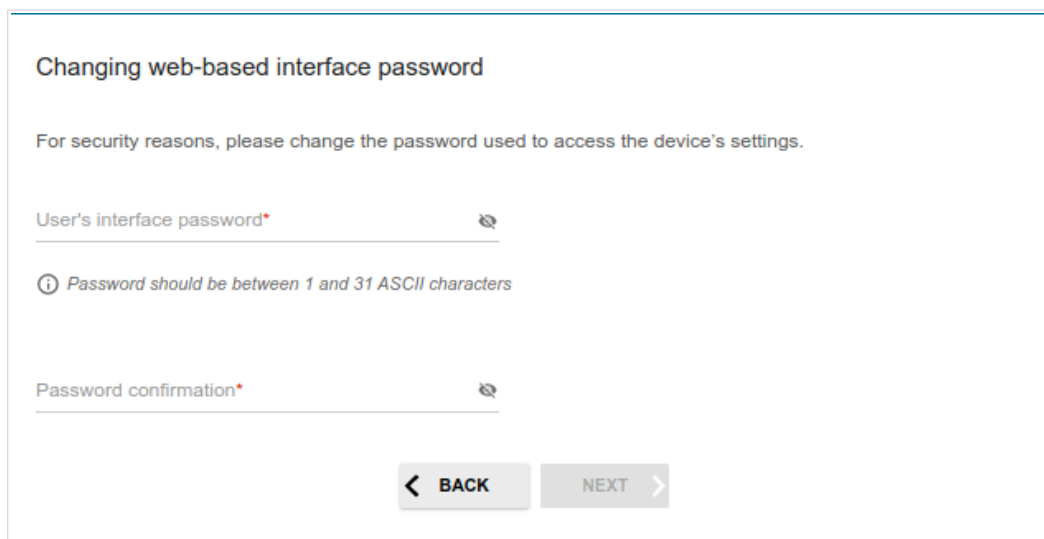


Figure 53. The page for changing the web-based interface password.



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 **RESET** 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>9</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.

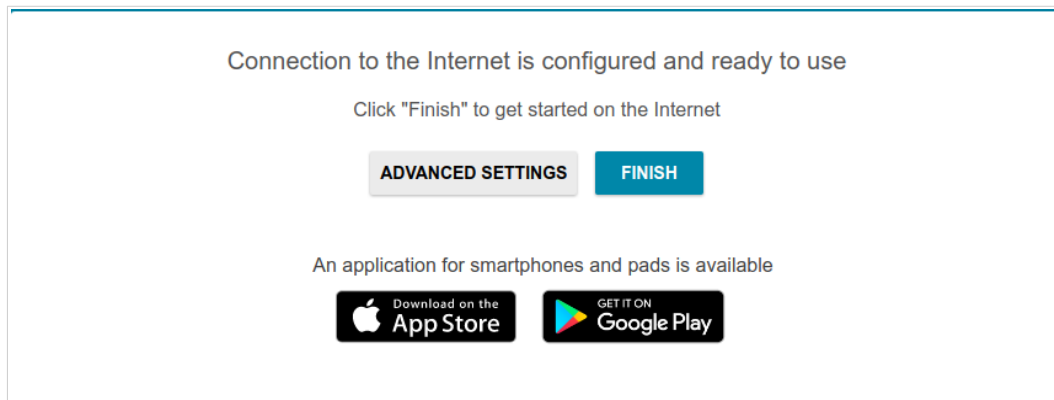


Figure 54. Checking the Internet availability.

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 44).

## Connection of Multimedia Devices

The Multimedia Devices Connection Wizard helps to configure LAN ports or available wireless interfaces 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-815 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 or wireless interface 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.

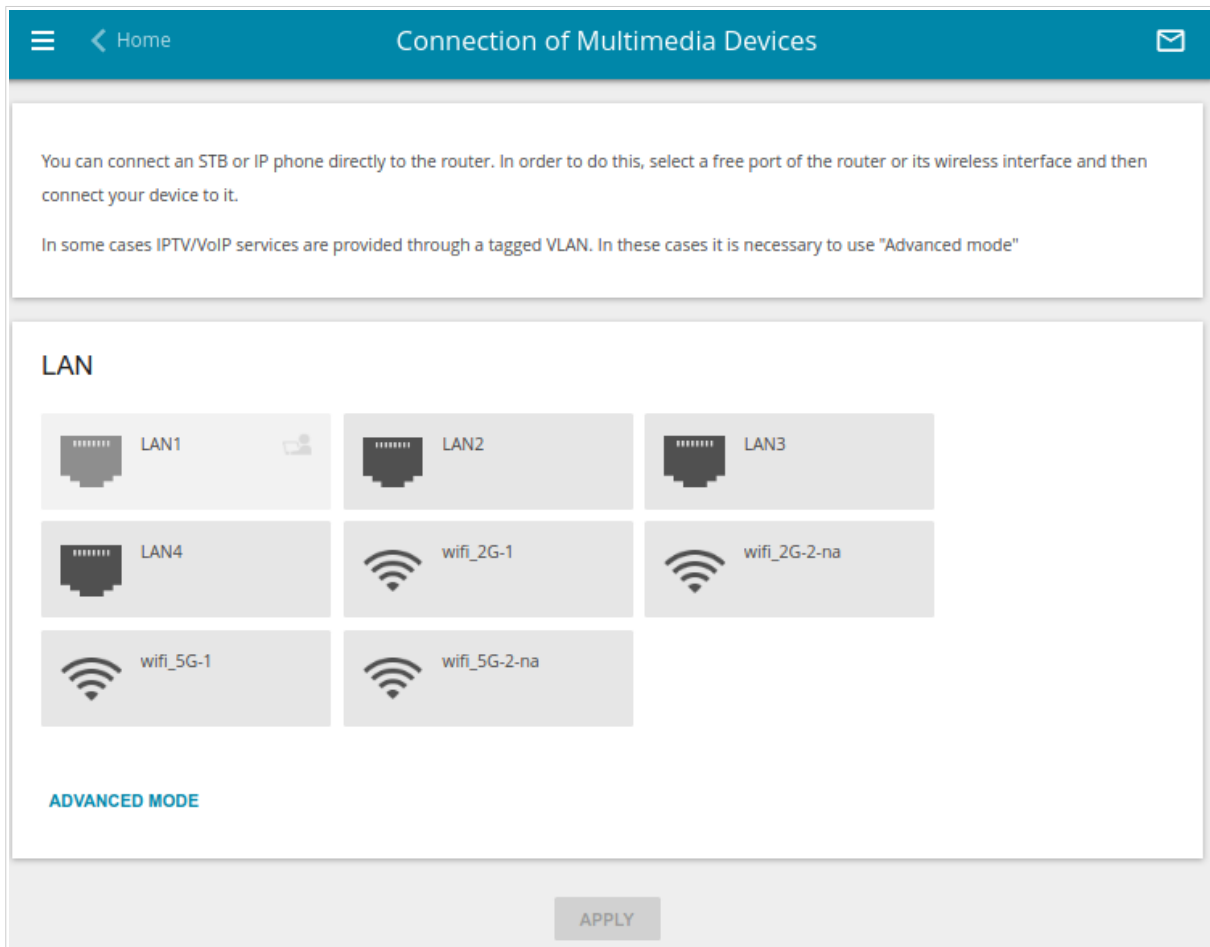


Figure 55. The Multimedia Devices Connection Wizard. The simplified mode.

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

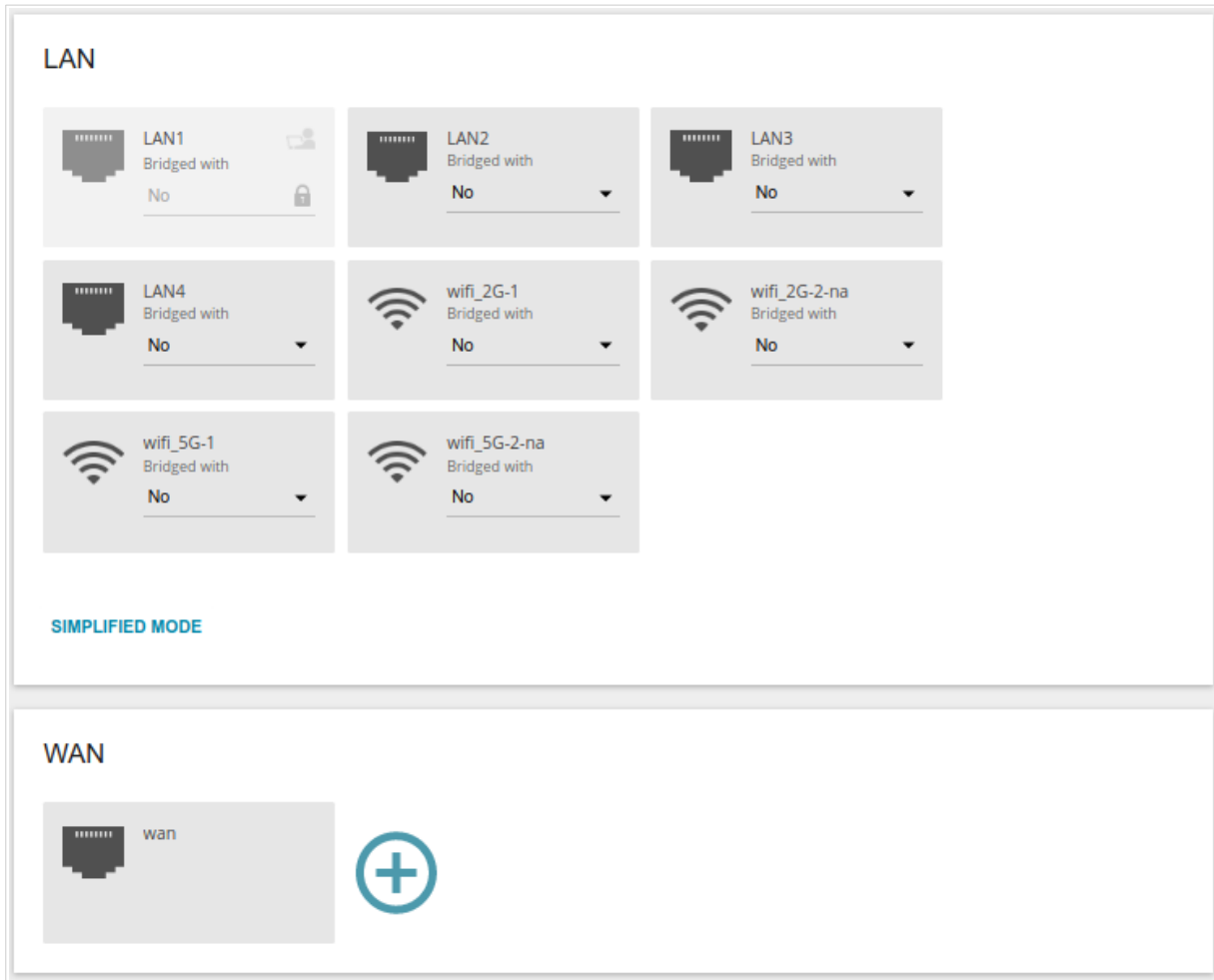


Figure 56. The Multimedia Devices Connection Wizard. The advanced mode.

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

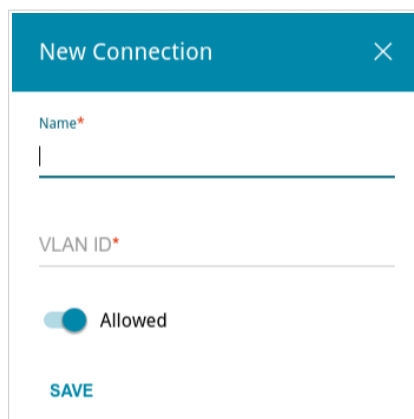



Figure 57. Adding a connection.

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 or wireless interface to which the additional device is connected, select the created connection. Click the **APPLY** button.

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

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

To deselect the port or wireless interface in the advanced mode, select the **No** value from the **Bridged with** drop-down list of the element corresponding to the needed LAN port or interface. 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.



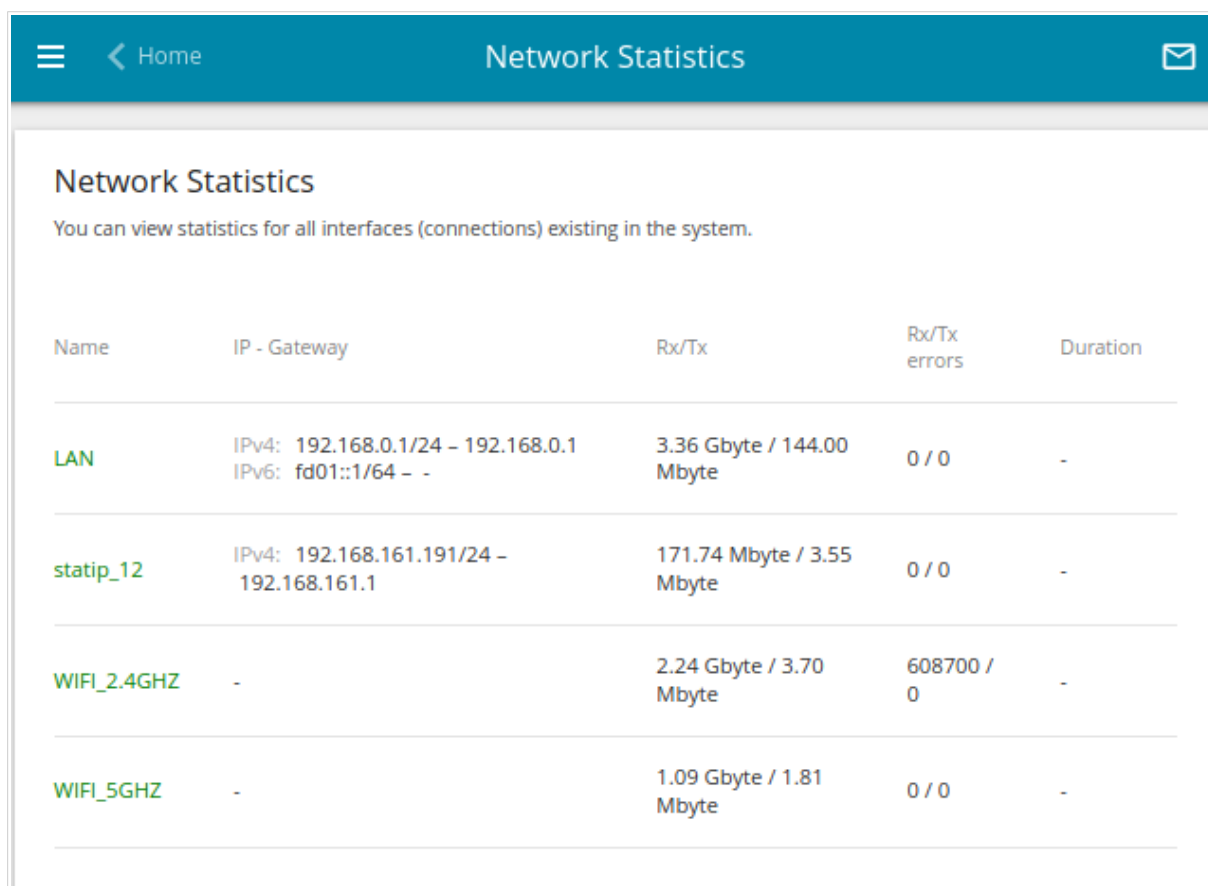
## ***Statistics***

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 table
- data on devices connected to the router's network and its web-based interface, and information on current sessions of these devices
- statistics for traffic passing through ports of the router
- addresses of active multicast groups
- statistics for IPsec tunnels of the router.

## 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).



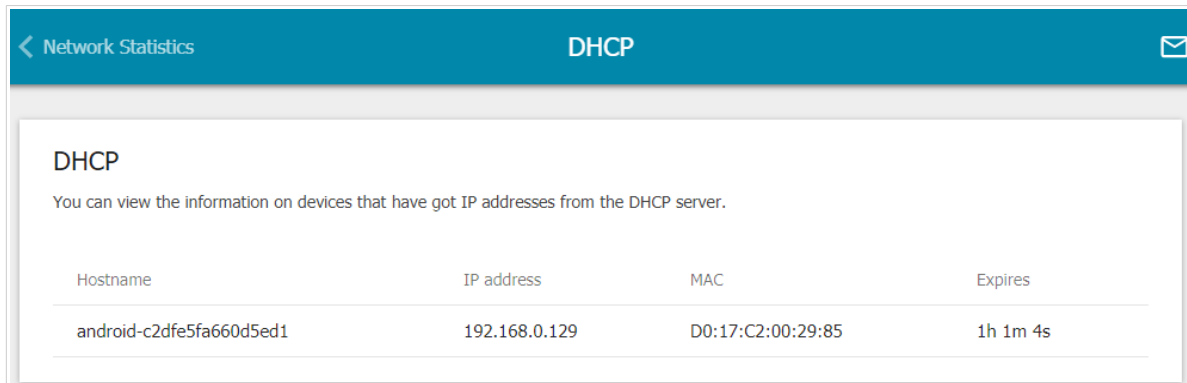
Name	IP - Gateway	Rx/Tx	Rx/Tx errors	Duration
LAN	IPv4: 192.168.0.1/24 – 192.168.0.1 IPv6: fd01::1/64 – -	3.36 Gbyte / 144.00 Mbyte	0 / 0	-
statip_12	IPv4: 192.168.161.191/24 – 192.168.161.1	171.74 Mbyte / 3.55 Mbyte	0 / 0	-
WIFI_2.4GHZ	-	2.24 Gbyte / 3.70 Mbyte	608700 / 0	-
WIFI_5GHZ	-	1.09 Gbyte / 1.81 Mbyte	0 / 0	-

Figure 58. 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.

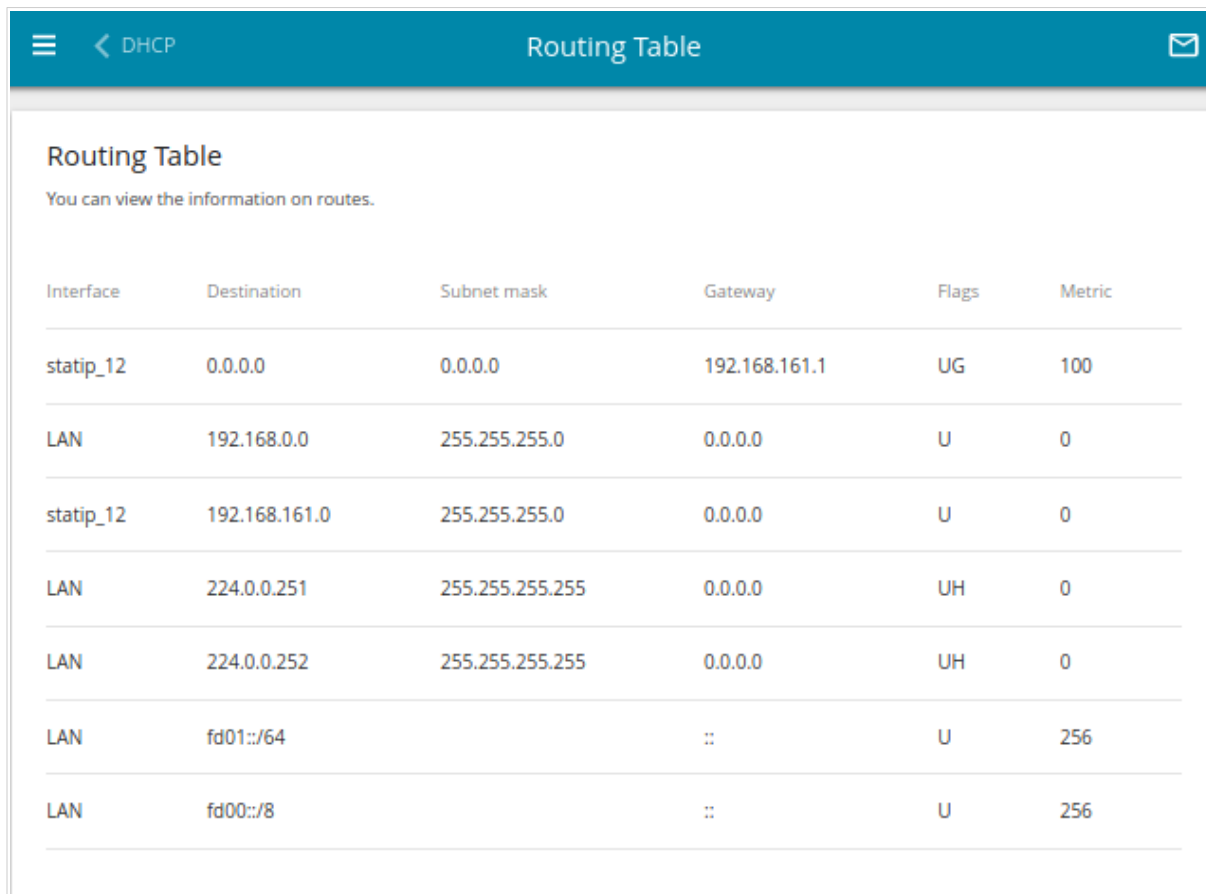


Hostname	IP address	MAC	Expires
android-c2dfe5fa660d5ed1	192.168.0.129	D0:17:C2:00:29:85	1h 1m 4s

Figure 59. The **Statistics / DHCP** page.

## Routing Table

The **Statistics / Routing Table** page displays the information on routes. The table contains destination IP addresses, gateways, subnet masks, and other data.

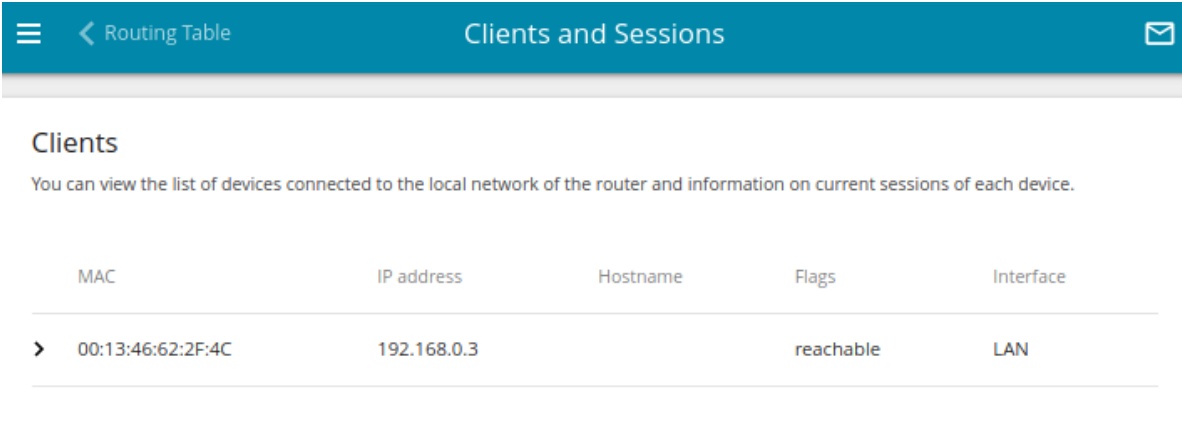


Interface	Destination	Subnet mask	Gateway	Flags	Metric
statip_12	0.0.0.0	0.0.0.0	192.168.161.1	UG	100
LAN	192.168.0.0	255.255.255.0	0.0.0.0	U	0
statip_12	192.168.161.0	255.255.255.0	0.0.0.0	U	0
LAN	224.0.0.251	255.255.255.255	0.0.0.0	UH	0
LAN	224.0.0.252	255.255.255.255	0.0.0.0	UH	0
LAN	fd01::/64		::	U	256
LAN	fd00::/8		::	U	256

Figure 60. The **Statistics / Routing Table** page.

## Clients and Session

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



The screenshot shows a web interface for 'Clients and Sessions'. The page has a blue header with a back arrow labeled 'Routing Table' and a title 'Clients and Sessions'. Below the header, there is a section titled 'Clients' with a subtitle: 'You can view the list of devices connected to the local network of the router and information on current sessions of each device.' Below this is a table with the following data:

MAC	IP address	Hostname	Flags	Interface
> 00:13:46:62:2F:4C	192.168.0.3		reachable	LAN

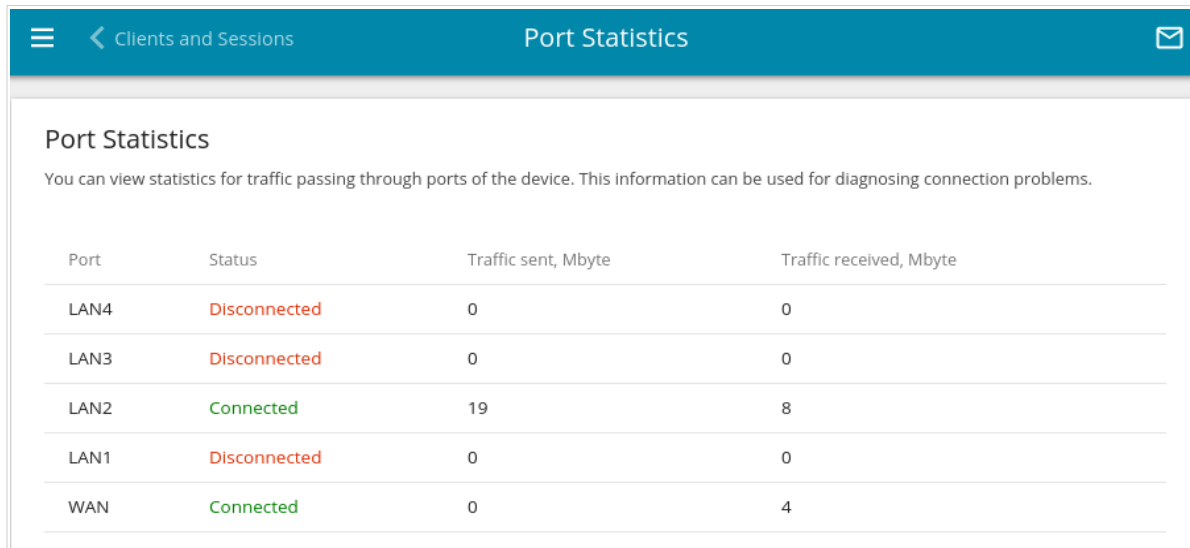
Figure 61. The **Statistics / Clients and Session** page.

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.

## Port Statistics

On the **Statistics / Port Statistics** page, you can view statistics for traffic passing through ports of the router. The information shown on the page can be used for diagnosing connection problems.



Port	Status	Traffic sent, Mbyte	Traffic received, Mbyte
LAN4	Disconnected	0	0
LAN3	Disconnected	0	0
LAN2	Connected	19	8
LAN1	Disconnected	0	0
WAN	Connected	0	4

Figure 62. The **Statistics / Port Statistics** page.

To view the full list of counters for a port, click the line corresponding to this 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.

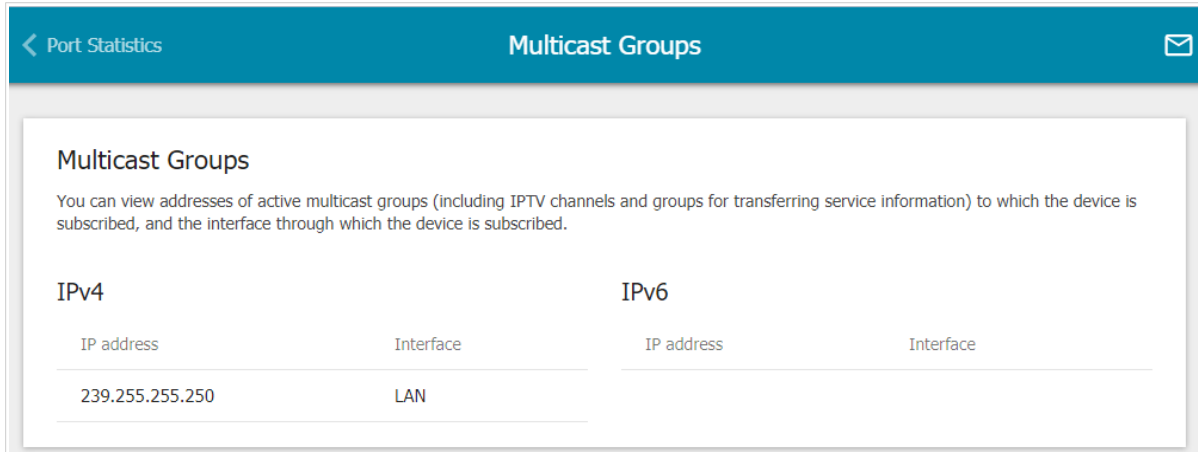
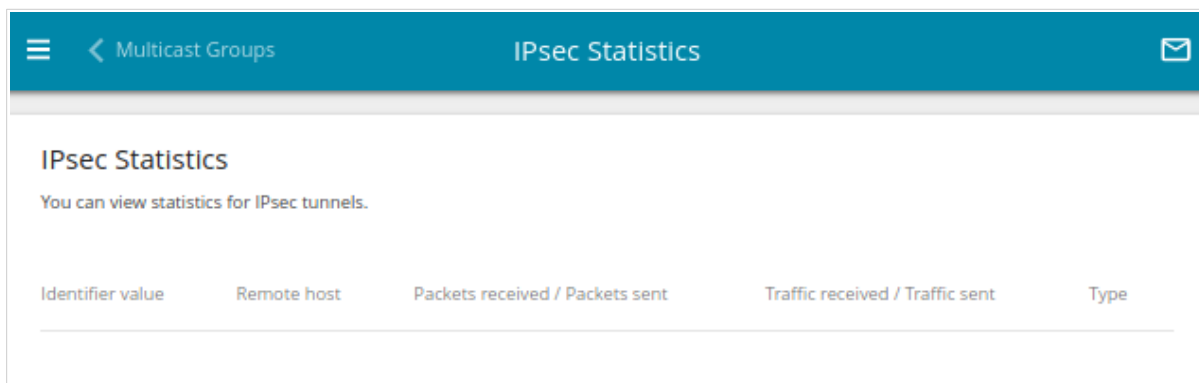


Figure 63. The **Statistics / Multicast Groups** page.

## IPsec Statistics

On the **Statistics / IPsec Statistics** page, you can view statistics for IPsec tunnels of the router. For each tunnel 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), remote host address or domain name, operation mode, and number of packets and volume of data received and transmitted.



Identifier value	Remote host	Packets received / Packets sent	Traffic received / Traffic sent	Type
------------------	-------------	---------------------------------	---------------------------------	------

Figure 64. The **Statistics / IPsec Statistics** page.

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



## 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.

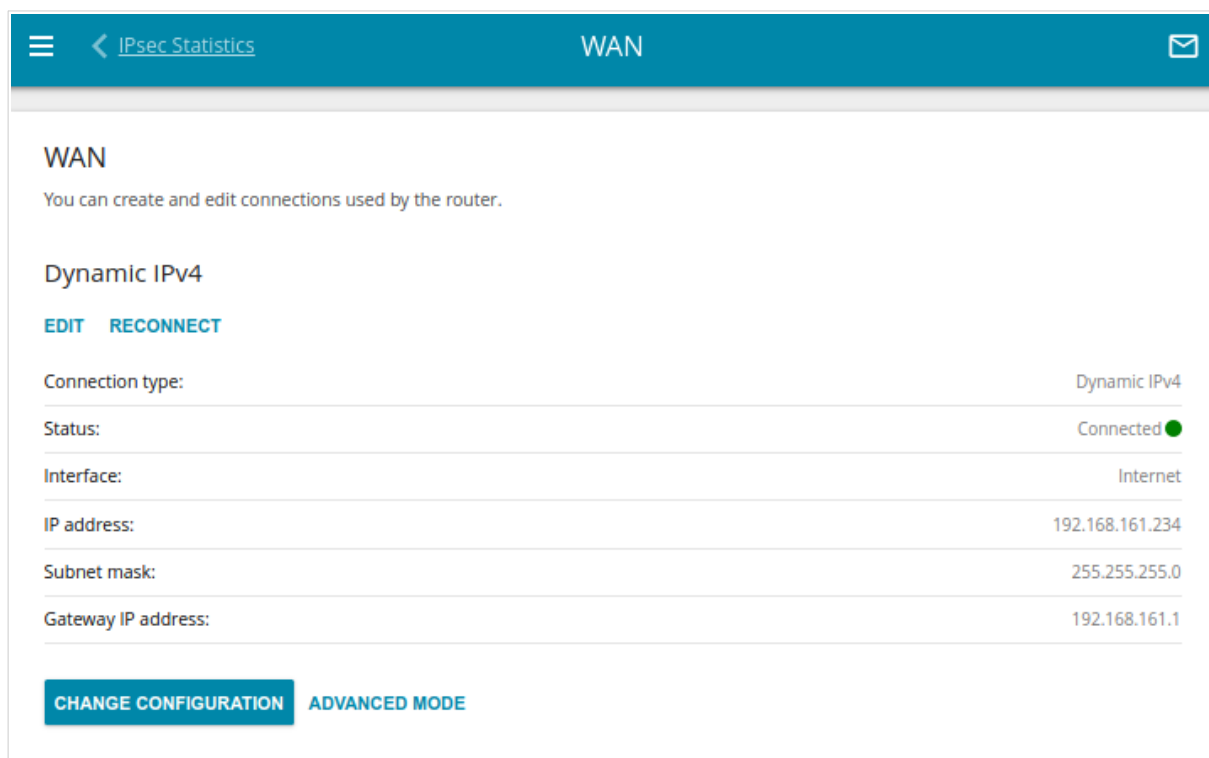


Figure 65. The **Connections Setup / WAN** page. The simplified mode.

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.

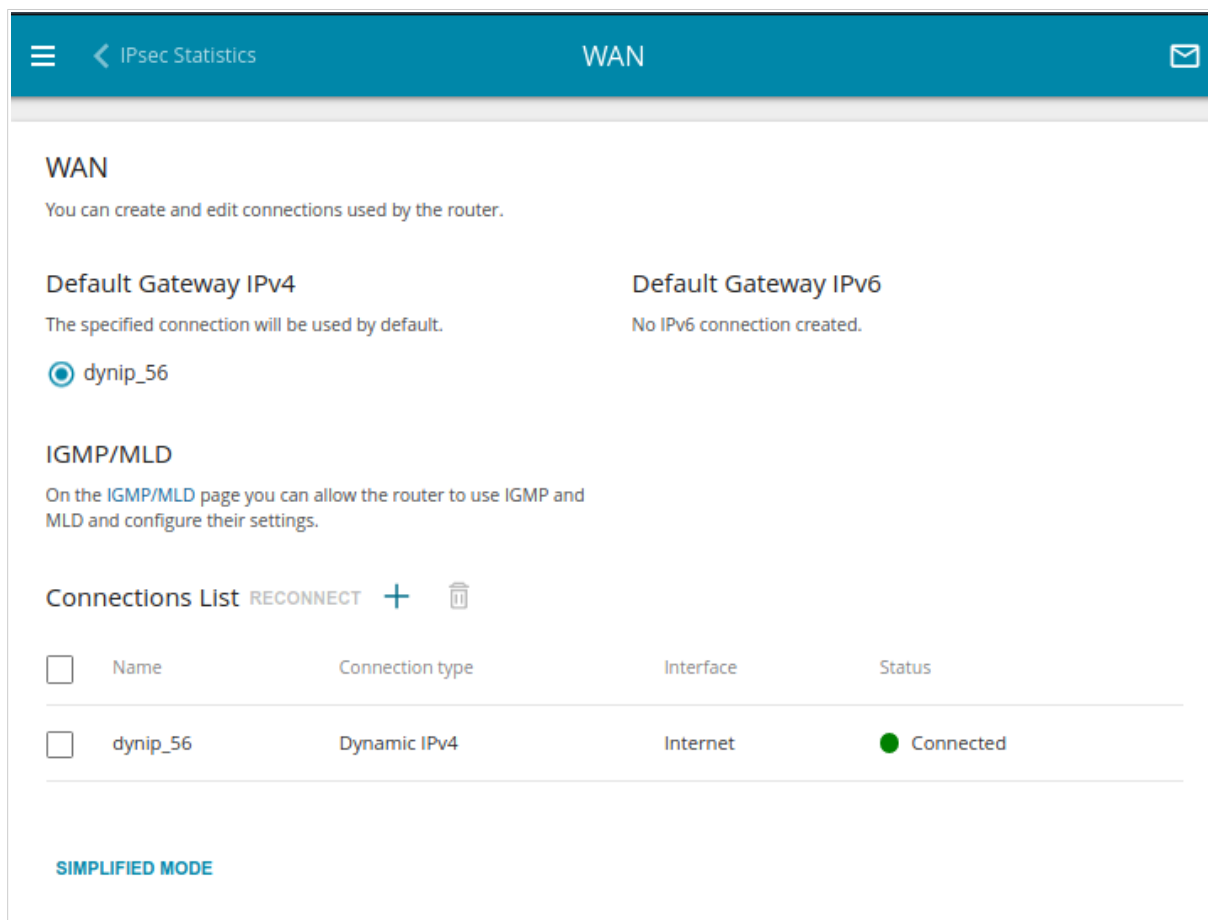




Figure 66. The **Connections Setup / WAN** page. The advanced mode.

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/MLD** link (for the description of the page, see the **IGMP/MLD** section, page 192).

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.

**General Settings**

Connection type  
**Static IPv4**

Interface  
**Internet**

Connection name\*  
**statip\_70**

(i) The number of characters should not exceed 32

**Enable connection**

**NAT**

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

**Firewall**

(i) Protection against external connections for the LAN devices. For security reasons, it is recommended not to disable.

**Ping**

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

**RIP**

**Isolate connection**

(i) Use of an alternate routing table for this connection. It is recommended not to enable unless your ISP requires it.

Figure 67. 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. 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.

Parameter	Description
<b>Firewall</b>	If the switch is moved to the right, protection against external connections for the LAN devices is enabled (for example, against attempts to get information about the LAN devices or to hack a device from the LAN). For security reasons, it is recommended not to disable this function.
<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.
<b>RIP</b>	Move the switch to the right to allow using RIP for this connection.
<b>Isolate connection</b>	If the switch is moved to the right, the router uses an alternate routing table for this connection. Enable this function only when your ISP requires this.

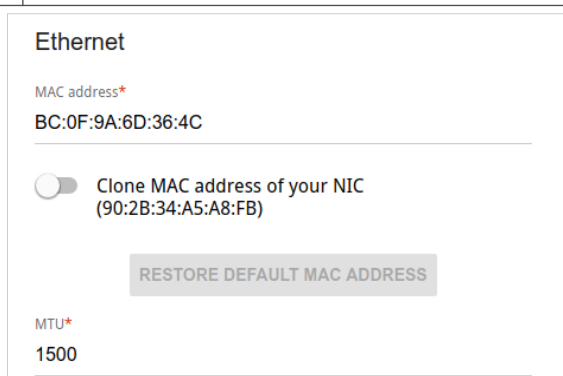


Figure 68. The page for creating a new **Static IPv4** connection. The **Ethernet** section.

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\*  
192.168.161.244

---

Subnet mask\*  
255.255.255.0

---

Gateway IP address\*  
192.168.161.1

---

Primary DNS\*  
1.1.1.1

---

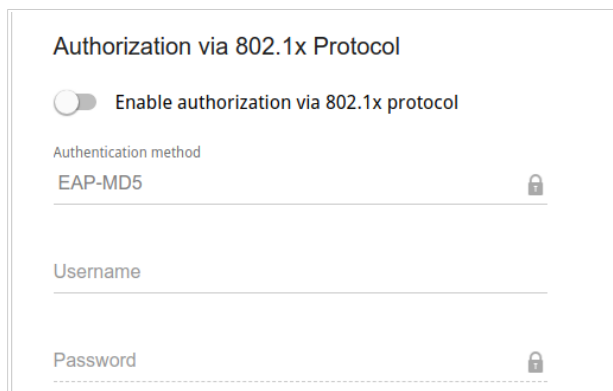
Secondary DNS  
1.0.0.1

---

ⓘ 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 69. 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 / 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 / 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>



Authorization via 802.1x Protocol

Enable authorization via 802.1x protocol

Authentication method  
EAP-MD5

Username

Password

Figure 70. The page for creating a new **Static IPv4** connection. The **Authorization via 802.1x Protocol** section.

Parameter	Description
<b>Authorization via 802.1x Protocol</b>	
<b>Enable authorization via 802.1x protocol</b>	Move the switch to the right to allow authorization in the ISP's network via the 802.1x protocol.
<b>Authentication method</b>	Select a needed authentication method from the drop-down list.
<b>Username</b>	Enter the username provided by your ISP.
<b>Password</b>	Enter the password provided by your ISP.

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.

**General Settings**

Connection type  
 Static IPv6

Interface  
 Internet

Connection name\*  
 stativ6\_71

① The number of characters should not exceed 32

Enable connection

Firewall

① Protection against external connections for the LAN devices. For security reasons, it is recommended not to disable.

Ping

① WAN Ping Respond allows the device to respond to ping requests from the external network.

RIP

Isolate connection

① Use of an alternate routing table for this connection. It is recommended not to enable unless your ISP requires it.

Figure 71. 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. Move the switch to the left to disable the connection.
<b>Firewall</b>	If the switch is moved to the right, protection against external connections for the LAN devices is enabled (for example, against attempts to get information about the LAN devices or to hack a device from the LAN). For security reasons, it is recommended not to disable this function.

Parameter	Description
<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.
<b>RIP</b>	Move the switch to the right to allow using RIP for this connection.
<b>Isolate connection</b>	If the switch is moved to the right, the router uses an alternate routing table for this connection. Enable this function only when your ISP requires this.

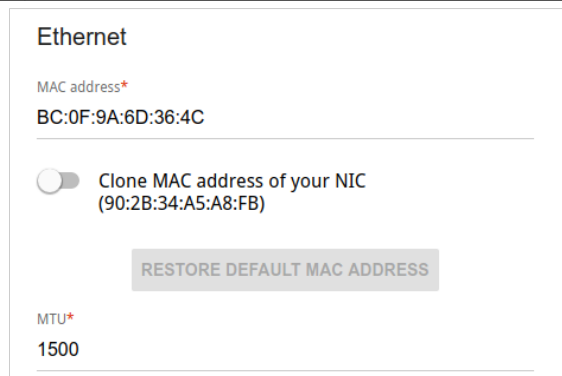


Figure 72. The page for creating a new **Static IPv6** connection. The **Ethernet** section.

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.



The screenshot shows a web-based configuration interface for IPv6. At the top, the title 'IPv6' is displayed. Below it, there are five input fields, each with a red asterisk indicating a required field: 'IPv6 address\*', 'Prefix\*', 'Gateway IPv6 address\*', 'Primary IPv6 DNS server\*', and 'Secondary IPv6 DNS server'. Each field is followed by a horizontal line for text entry.

Figure 73. 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>Gateway by SLAAC</b>	Move the switch to the right to automatically assign the IPv6 gateway address with help of SLAAC ( <i>Stateless Address Autoconfiguration</i> ).
<b>Gateway IPv6 address</b>	The address of the IPv6 gateway. The field is available for editing if the <b>Gateway by SLAAC</b> switch is moved to the left.
<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.

## 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.

**General Settings**

Connection type  
PPPoE

Interface  
Internet

Connection name\*  
pppoe\_48

*The number of characters should not exceed 32*

Enable connection

NAT

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

Firewall

*Protection against external connections for the LAN devices. For security reasons, it is recommended not to disable.*

Ping

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

RIP

Isolate connection

*Use of an alternate routing table for this connection. It is recommended not to enable unless your ISP requires it.*

Figure 74. 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. 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.

Parameter	Description
<b>Firewall</b>	If the switch is moved to the right, protection against external connections for the LAN devices is enabled (for example, against attempts to get information about the LAN devices or to hack a device from the LAN). For security reasons, it is recommended not to disable this function.
<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.
<b>RIP</b>	Move the switch to the right to allow using RIP for this connection.
<b>Isolate connection</b>	If the switch is moved to the right, the router uses an alternate routing table for this connection. Enable this function only when your ISP requires this.

Ethernet

MAC address\*

00:11:00:33:16:40

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

RESTORE DEFAULT MAC ADDRESS

MTU\*

1500

Figure 75. 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.

Figure 76. 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.
<b>Authentication protocol</b>	Select a required authentication method from the drop-down list or leave the <b>AUTO</b> value.

Parameter	Description
<b>Keep Alive</b>	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.
<b>Dial on demand</b>	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.
<b>PPP IP extension</b>	This option is used by some ISPs. Contact your ISP to clarify if this option needs to be enabled. If it is required, move the switch to the right.
<b>PPP debug</b>	Move the switch to the right if you want to log all data on PPP connection debugging.

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\_80**

① The number of characters should not exceed 32

Enable connection

NAT

① The network address translation function. It is recommended not to disable unless your ISP requires it.

Firewall

① Protection against external connections for the LAN devices. For security reasons, it is recommended not to disable.

Ping

① WAN Ping Respond allows the device to respond to ping requests from the external network.

RIP

Isolate connection

① Use of an alternate routing table for this connection. It is recommended not to enable unless your ISP requires it.

Figure 77. 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. 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.

Parameter	Description
<b>Firewall</b>	If the switch is moved to the right, protection against external connections for the LAN devices is enabled (for example, against attempts to get information about the LAN devices or to hack a device from the LAN). For security reasons, it is recommended not to disable this function.
<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.
<b>RIP</b>	Move the switch to the right to allow using RIP for this connection.
<b>Isolate connection</b>	If the switch is moved to the right, the router uses an alternate routing table for this connection. Enable this function only when your ISP requires this.



**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) 🔒

---

Extra options

PPP debug

Enable MPPC

Figure 78. 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>Extra options</b>	<p>Advanced options of the pppd daemon which need to be specified for this connection. <i>Optional.</i></p>
<b>PPP debug</b>	<p>Move the switch to the right if you want to log all data on PPP connection debugging.</p>
<b>Enable MPPC</b>	<p><i>(Microsoft Point-to-Point Compression)</i> <i>For the <b>PPTP</b> type only.</i></p> <p>Move the switch to the right if it is necessary to use the data compression function in order to configure the connection.</p> <p>Move the switch to the left to disable the function.</p>

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  
Internet

Connection name\*  
pppoev6\_69

(i) The number of characters should not exceed 32

Enable connection

Firewall

(i) Protection against external connections for the LAN devices. For security reasons, it is recommended not to disable.

Ping

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

RIP

Isolate connection

(i) Use of an alternate routing table for this connection. It is recommended not to enable unless your ISP requires it.

Figure 79. 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. Move the switch to the left to disable the connection.
<b>NAT</b>	<i>For the PPPoE Dual Stack type only.</i> 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.

Parameter	Description
<b>Firewall</b>	If the switch is moved to the right, protection against external connections for the LAN devices is enabled (for example, against attempts to get information about the LAN devices or to hack a device from the LAN). For security reasons, it is recommended not to disable this function.
<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.
<b>RIP</b>	Move the switch to the right to allow using RIP for this connection.
<b>Isolate connection</b>	If the switch is moved to the right, the router uses an alternate routing table for this connection. Enable this function only when your ISP requires this.

Ethernet

MAC address\*

00:11:00:33:16:40

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

RESTORE DEFAULT MAC ADDRESS

MTU\*

1500

Figure 80. 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

\_\_\_\_\_

Authentication protocol

AUTO ▼

\_\_\_\_\_

Keep Alive

LCP interval\*

30

\_\_\_\_\_

LCP fails\*

3

\_\_\_\_\_

Dial on demand

Maximum idle time (in seconds) 🔒

-----

PPP IP extension

PPP debug

Figure 81. 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.
<b>Authentication protocol</b>	Select a required authentication method from the drop-down list or leave the <b>AUTO</b> value.

Parameter	Description
<b>Keep Alive</b>	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.
<b>Dial on demand</b>	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.
<b>PPP IP extension</b>	This option is used by some ISPs. Contact your ISP to clarify if this option needs to be enabled. If it is required, move the switch to the right.
<b>PPP debug</b>	Move the switch to the right if you want to log all data on PPP connection debugging.

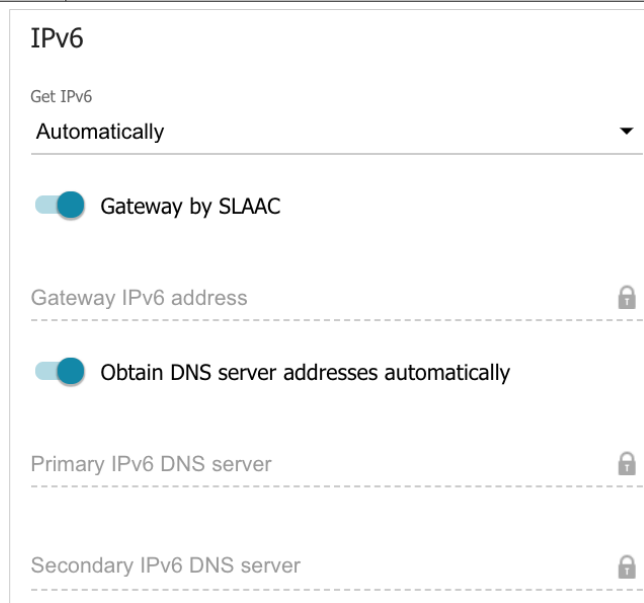


Figure 82. The page for creating a new **PPPoE Pv6** connection. The **IPv6** section.

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>Gateway by SLAAC</b>	Move the switch to the right to automatically assign the IPv6 gateway address with help of SLAAC ( <i>Stateless Address Autoconfiguration</i> ).

Parameter	Description
<b>Gateway IPv6 address</b>	The address of the IPv6 gateway. The field is available for editing if the <b>Gateway by SLAAC</b> switch is moved to the left.
<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 3G WAN Connection

If the PIN code check is enabled for the SIM card inserted into your USB modem, then prior to creating a 3G WAN connection, go to the **USB Modem** menu and enter the PIN code<sup>10</sup> on the page displayed (see the *USB Modem* section, page 168). Then 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  
3G

Interface  
USB

Connection name\*  
3g\_74

i The number of characters should not exceed 32

Enable connection

NAT

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

Firewall

i Protection against external connections for the LAN devices. For security reasons, it is recommended not to disable.

Ping

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

RIP

Isolate connection

i Use of an alternate routing table for this connection. It is recommended not to enable unless your ISP requires it.

Figure 83. The page for creating a new 3G 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. Move the switch to the left to disable the connection.

<sup>10</sup> For some models of 3G USB modems it is required to disable the PIN code check on the SIM card prior to connecting the USB modem to the router.

Parameter	Description
<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>Firewall</b>	If the switch is moved to the right, protection against external connections for the LAN devices is enabled (for example, against attempts to get information about the LAN devices or to hack a device from the LAN). For security reasons, it is recommended not to disable this function.
<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.
<b>RIP</b>	Move the switch to the right to allow using RIP for this connection.
<b>Isolate connection</b>	If the switch is moved to the right, the router uses an alternate routing table for this connection. Enable this function only when your ISP requires this.

USB Modem

Mode  
Auto ▼

---

APN

---

Dial number\*

---

Figure 84. The page for creating a new 3G connection. The **USB Modem** section.

Parameter	Description
<b>USB Modem</b>	
<b>Mode</b>	The value of the field specifies the type of the network to which the router connects. Leave the <b>Auto</b> value to let the router connect automatically to an available type of network, or select a needed value from the drop-down list.
<b>APN</b>	An access point name.
<b>Dial number</b>	A number dialed to connect to the authorization server of the operator.

Figure 85. The page for creating a new 3G connection. The **PPP** section.

Parameter	Description
<b>PPP</b>	
<b>Without authorization</b>	Move the switch to the right if your operator does not require authorization.
<b>Username</b>	A username (login) to connect to the network of the operator.
<b>Password</b>	A password to connect to the network of the operator. 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.
<b>Authentication protocol</b>	Select a required authentication method from the drop-down list or leave the <b>AUTO</b> value.

Parameter	Description
<b>Keep Alive</b>	Move the switch to the right if you want the router to keep you connected to the network of your operator even when the connection has been inactive for a specified period of time. When the checkbox is selected, the <b>LCP interval</b> and <b>LCP fails</b> fields are available. Specify the required values.
<b>Dial on demand</b>	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.
<b>PPP debug</b>	Move the switch to the right if you want to log all data on PPP connection debugging.

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

## Creating LTE WAN Connection

If the PIN code check is enabled for the SIM card inserted into your USB modem, then prior to creating an LTE WAN connection, go to the **USB Modem** menu and enter the PIN code<sup>11</sup> on the page displayed (see the *USB Modem* section, page 168). Then 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  
LTE

Interface  
USB

Connection name\*  
lte\_61

The number of characters should not exceed 32

Enable connection

NAT

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

Firewall

Protection against external connections for the LAN devices. For security reasons, it is recommended not to disable.

Ping

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

Isolate connection

Use of an alternate routing table for this connection. It is recommended not to enable unless your ISP requires it.

Figure 86. The page for creating a new LTE 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. 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.

<sup>11</sup> For some models of LTE USB modems it is required to disable the PIN code check on the SIM card prior to connecting the USB modem to the router.

Parameter	Description
<b>Firewall</b>	If the switch is moved to the right, protection against external connections for the LAN devices is enabled (for example, against attempts to get information about the LAN devices or to hack a device from the LAN). For security reasons, it is recommended not to disable this function.
<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.
<b>Isolate connection</b>	If the switch is moved to the right, the router uses an alternate routing table for this connection. Enable this function only when your ISP requires this.

Figure 87. The page for creating a new **LTE** connection. The **USB Modem** section.

Parameter	Description
<b>USB Modem</b>	
<b>Mode</b>	The value of the field specifies the type of the network to which the router connects. Leave the <b>Auto</b> value to let the router connect automatically to an available type of network, or select a needed value from the drop-down list. <sup>12</sup>
<b>APN</b>	An access point name.
<b>Without authorization</b>	Move the switch to the right if your operator does not require authorization.

<sup>12</sup> Some LTE USB modems do not support network type selection and work in the **Auto** mode regardless of the value selected from the drop-down list.

Parameter	Description
<b>Authentication protocol</b>	Select a required authentication method from the drop-down list.
<b>Username</b>	A username (login) to connect to the network of the operator.
<b>Password</b>	A password to connect to the network of the operator. Click the <b>Show</b> icon (🔍) to display the entered password.

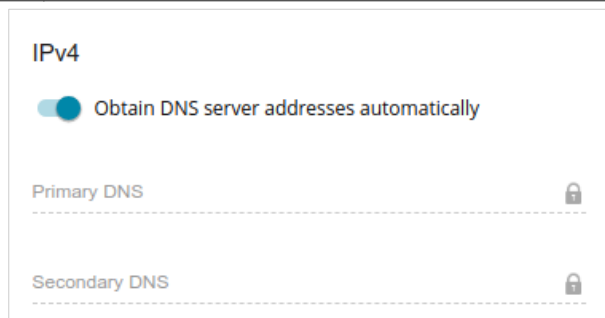


Figure 88. The page for creating a new **LTE** connection. The **IPv4** section.

Parameter	Description
<b>IPv4</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.

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 IPv4 address, configure the built-in DHCP server, or specify MAC address and IPv4 address pairs.

**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 89. 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, Repeater, or 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> .
<b>Gateway IP address</b>	<p>Available if the <b>Access point, Repeater, or Client</b> mode was selected in the Initial Configuration Wizard.</p> <p>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>.</p>
<b>Hostname</b>	The name of the device assigned to its IP address in the local subnet.



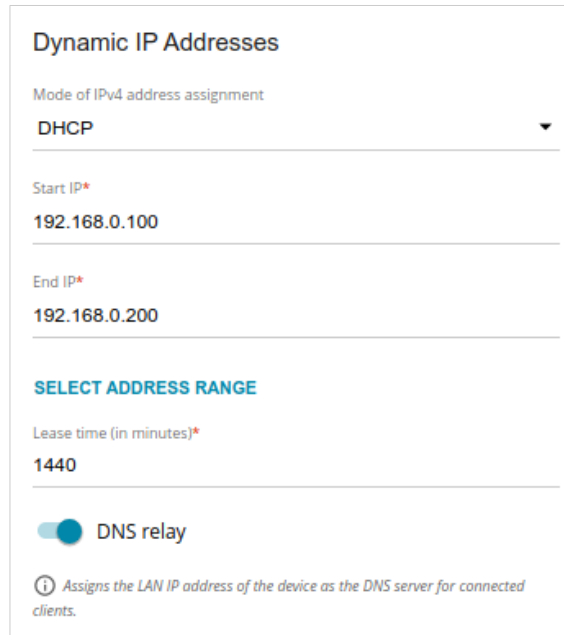



Figure 90. Configuring the local interface. The IPv4 tab. The Dynamic IP Addresses section.

Parameter	Description
<b>Dynamic IP Addresses</b>	
<b>Mode of IPv4 address assignment</b>	<p>An operating mode of the router's DHCP server.</p> <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>DHCP</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, the <b>SELECT ADDRESS RANGE</b> button, and the <b>DNS relay</b> switch are displayed on the tab. Also when this value is selected, the <b>DHCP Options</b> and <b>Static IP Addresses</b> sections are displayed on the tab.</li> <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> and <b>Option 82 Remote 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 pool used by the DHCP server to distribute IP addresses to clients.
<b>End IP</b>	The end IP address of the address pool used by the DHCP server to distribute IP addresses to clients.

Parameter	Description
<b>SELECT ADDRESS RANGE</b>	Use the button to set one of the available IP address ranges. In the window displayed, select the needed range and click the <b>SELECT</b> button to automatically fill in the <b>Start IP</b> and <b>End IP</b> fields.
<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>	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. 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.
<b>External DHCP server IP</b>	The IP address of the external DHCP server which assigns IP addresses to the router's clients. To specify several IPv4 addresses, click the <b>ADD</b> button, and in the line displayed, enter an IP address. To remove the IP address, click the <b>Delete</b> button (  ) in the line of the address.
<b>Option 82 Remote ID</b>	The value of the Remote ID field of DHCP option 82 in accordance with RFC3046. Do not fill in the field unless your ISP or the administrator of the external DHCP server provided this value.

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.

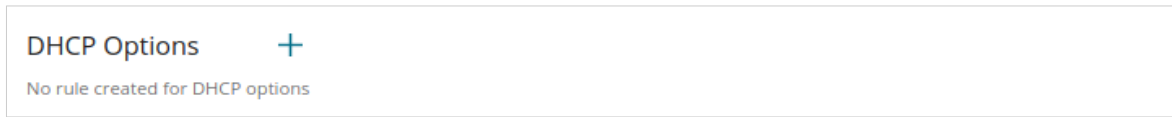


Figure 91. Configuring the local interface. The **IPv4** tab. The section for configuring DHCP options.

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

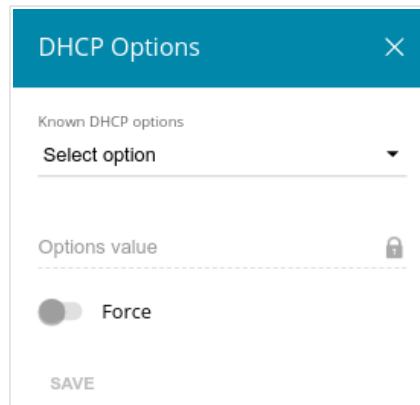



Figure 92. Configuring the local interface. The **IPv4** tab. The window for configuring a DHCP option.

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. 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 **SAVE** 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 **SAVE** 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 **DHCP** value is selected from the **Mode of IPv4 address assignment** drop-down list).

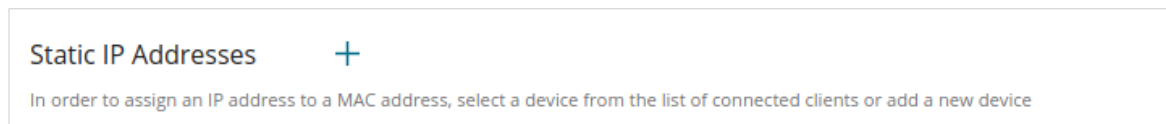




Figure 93. Configuring the local interface. The **IPv4** tab. The section for creating MAC-IPv4 pairs.

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. To limit the time of the specified IPv4 address assignment, specify the required value in the **Lease time** field. Click the **SAVE** 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 **SAVE** 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.

## IPv6

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

Figure 94. Configuring the local interface. The **IPv6** tab. The **Local IPv6 Address** section.

Parameter	Description
<b>Local IPv6 Address</b>	
<b>Mode of local IP address assignment</b>	Select the needed value from the drop-down list. <ul style="list-style-type: none"> <li><b>Static:</b> An IPv6 address and a prefix are specified manually.</li> <li><b>Prefix delegation:</b> The router requests a prefix to configure an IPv6 address from a delegating router.</li> </ul>
<b>IPv6 address</b>	The IPv6 address of the router in the local subnet with a decimal value of the prefix length. By default, the following value is specified: <b>fd01::1/64</b> . The field is available for editing if the <b>Static</b> value is selected from the <b>Mode of local IPv6 address assignment</b> drop-down list.
<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> 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>
<b>Hostname</b>	The name of the device assigned to its IP address in the local subnet.

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

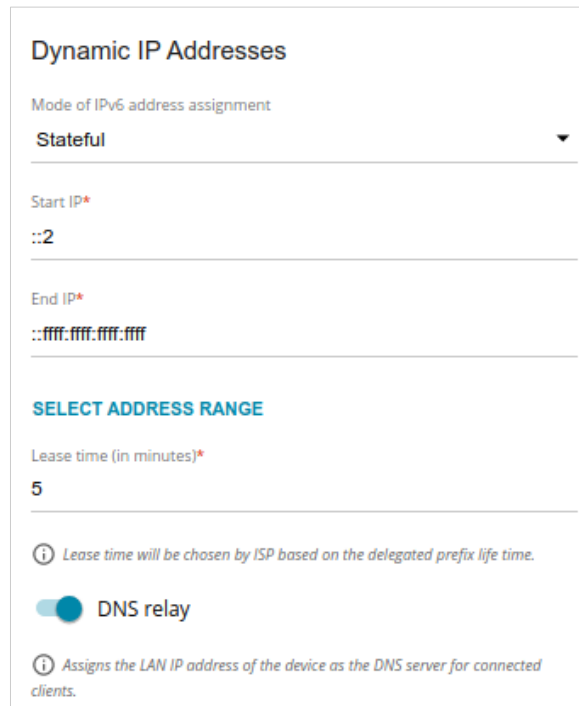


Figure 95. Configuring the local interface. The IPv6 tab. The **Dynamic IP Addresses** section.

Parameter	Description
<b>Dynamic IPv6 Addresses</b>	
<b>Mode of 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>Stateless</b>: Clients themselves configure IPv6 addresses using the prefix.</li> <li>• <b>Stateful</b>: The built-in DHCPv6 server of the router allocates addresses from the range specified in the <b>Start IP</b> and <b>End IP</b> fields. Also when this value is selected, the <b>Static IP Addresses</b> section is displayed on the tab.</li> </ul>
<b>Start IP / End IP</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>SELECT ADDRESS RANGE</b>	Use the button to set one of the available IPv6 address ranges. In the window displayed, select the needed range and click the <b>SELECT</b> button to automatically fill in the <b>Start IP</b> and <b>End IP</b> fields.
<b>Lease time</b>	The lifetime of IPv6 addresses provided to clients.

Parameter	Description
<b>DNS relay</b>	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. 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.

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 IPv6 address assignment** drop-down list in the **Dynamic IP Addresses** section.

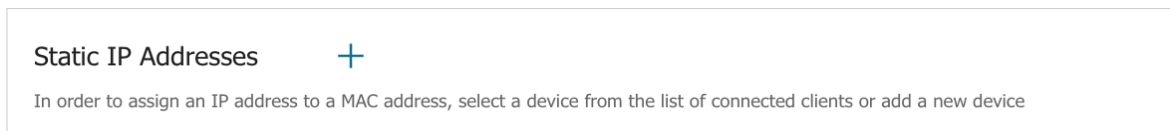




Figure 96. Configuring the local interface. The **IPv6** tab. The section for creating MAC-IPv6 pairs.

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. To limit the time of the specified IPv6 address assignment, specify the required value in the **Lease time** field. Click the **SAVE** 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 **SAVE** 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.

## 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.

Figure 97. The **Connections Setup / WAN Failover** page.

To activate the backup function, create the main and the reserve WAN connections. After that go to the **Connections Setup / WAN Reservation** page, move the **Enable** switch to the right, and specify the needed values in the fields displayed on the page.

Parameter	Description
<b>Basic connection</b>	From the drop-down list, select a WAN connection which will be used as the main one.
<b>Backup connection</b>	From the drop-down list, select a WAN connection which will be used as the reserve one.
<b>Test host</b>	An IP address that the router will check for availability via ICMP ping mechanism.
<b>Interval between checks</b>	A time period (in seconds) between attempts to check the status of the main connection. By default, the value <b>10</b> is specified.



Parameter	Description
<b>Timeout check</b>	A time period (in seconds) for an attempt to check the status of the main connection. At the end of this period the router's internal system makes a decision to enable/disable the reserve channel. By default, the value <b>3</b> is specified.
<b>Number of inspections of active connection</b>	A number of requests that will be sent in order to analyze the status of the main connection when the connection is active (the router uses the main connection as a default gateway).
<b>Number of inspections of inactive connection</b>	A number of requests that will be sent in order to analyze the status of the main connection when the connection is inactive (the router uses the reserve connection as a default gateway).

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.

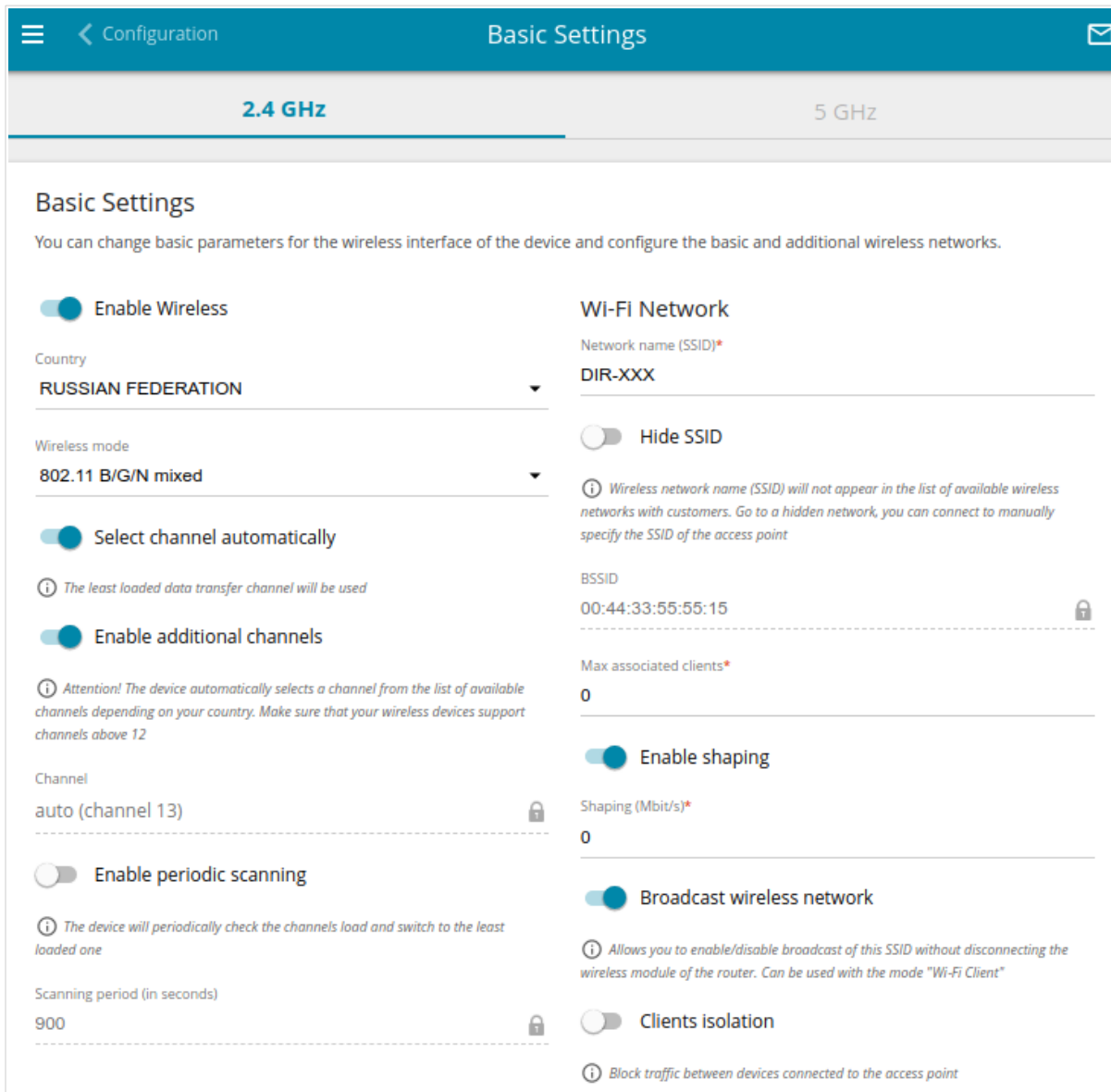


Figure 98. Basic settings of the wireless LAN in the 2.4GHz band.

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

Parameter	Description
<b>Enable Wireless</b>	To enable Wi-Fi connection, move the switch to the right. To disable Wi-Fi connection, move the switch to the left.

Parameter	Description
<b>Country</b>	The country you are in. Select a value from the drop-down list.
<b>Wireless mode</b>	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.
<b>Select channel automatically</b>	Move the switch to the right to let the router itself choose the channel with the least interference.
<b>Enable additional channels</b>	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.
<b>Channel</b>	The wireless channel number. 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.
<b>Enable periodic scanning</b>	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.
<b>Scanning period</b>	Specify a period of time (in seconds) after which the router rescans channels.

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 99. 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.

Parameter	Description
<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.
<b>Enable shaping</b>	Move the switch to the right to limit the maximum bandwidth of the wireless network. In the <b>Shaping</b> field displayed, specify the maximum value of speed (Mbps). Move the switch to the left not to limit the maximum bandwidth.
<b>Broadcast wireless network</b>	If the switch is moved to the left, devices cannot connect to the wireless network. Upon that the router can connect to another access point as a wireless client.
<b>Clients isolation</b>	Move the switch to the right to forbid wireless clients of this wireless network to communicate to each other.
<b>Enable guest network</b>	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.

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.

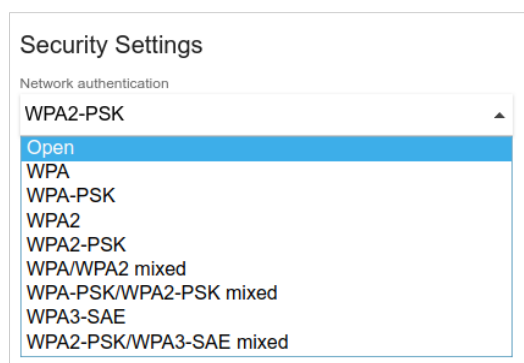


Figure 100. Network authentication types supported by the router.

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.

Authentication type	Description
<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.
<b>WPA3-SAE</b>	WPA3-based authentication using a PSK and SAE method.
<b>WPA2-PSK/WPA3-SAE mixed</b>	A mixed type of authentication. When this value is selected, devices using the <b>WPA2-PSK</b> authentication type and devices using the <b>WPA3-SAE</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. Under 'Network authentication', the 'Open' option is selected in a drop-down menu. Below this, there is a toggle switch for 'Enable encryption WEP' which is turned on. A 'Default key ID' drop-down menu 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 switch for 'Encryption key WEP as HEX' which is turned off. Another note states: 'Length of WEP key should be 5 or 13 characters.' At the bottom, there are four input fields labeled '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 101. 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. 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**, **WPA-PSK/WPA2-PSK mixed**, **WPA3-SAE**, or **WPA2-PSK/WPA3-SAE mixed** value is selected, the following fields are displayed on the page:

Figure 102. 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>13</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> . <i>TKIP and TKIP+AES encryption types are not available for WPA3-SAE and WPA2-PSK/WPA3-SAE mixed authentication types.</i>
<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>13</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. At the top, 'Network authentication' is set to 'WPA2'. Below this is a toggle for 'WPA2 Pre-authentication' which is currently turned off. There are four input fields: 'IP address RADIUS server\*' with the value '192.168.0.254', 'RADIUS server port\*' with the value '1812', 'RADIUS encryption key\*' with the value 'dlink', and 'Encryption type\*' set to 'AES'. At the bottom, 'Group key update interval (in seconds)\*' is set to '3600'.

Figure 103. 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.

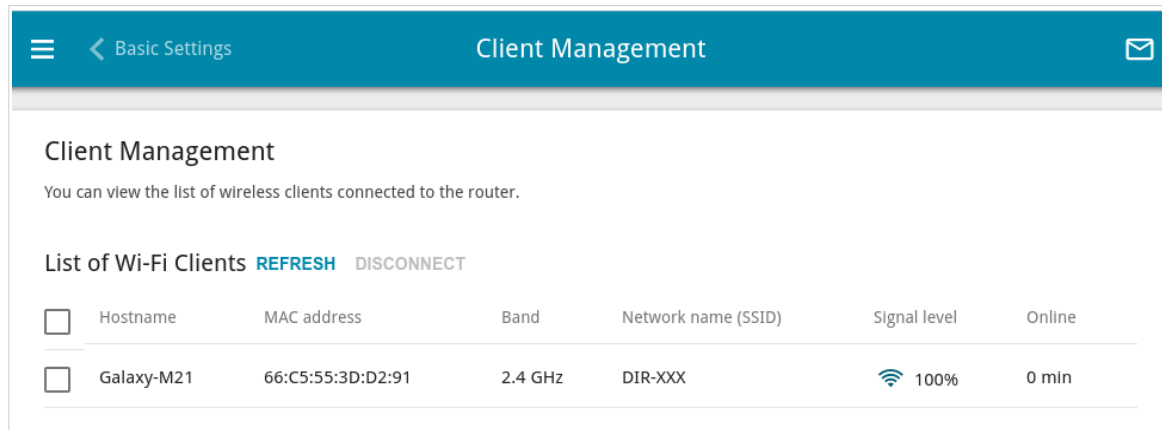


Figure 104. The page for managing the wireless clients.

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.

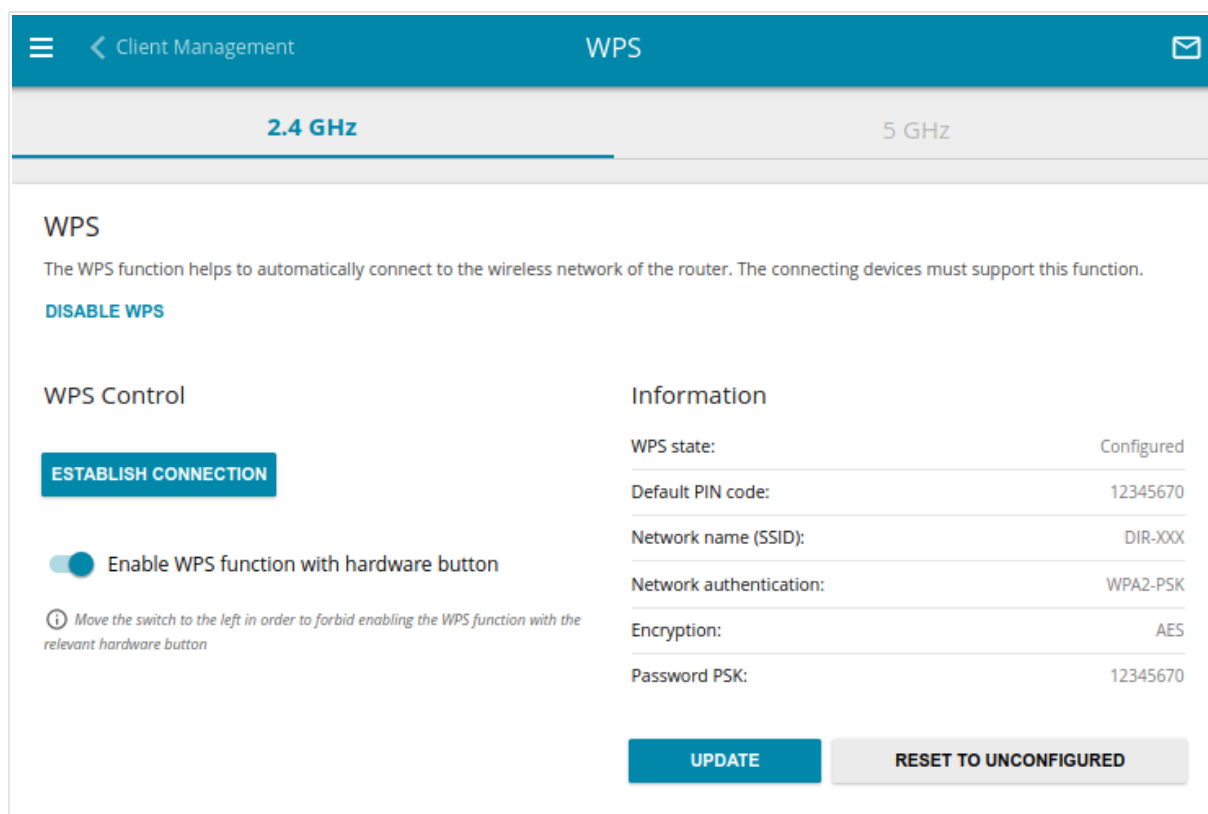


Figure 105. The page for configuring the WPS function.

You can activate the WPS function via the web-based interface or the hardware **WPS** 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, press the button, hold it for 2 seconds, and release. The **WPS** LED should start blinking. 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.
<b>RESET TO UNCONFIGURED</b>	Click the button to reset the parameters of the WPS function.

## **Using WPS Function via Web-based Interface**

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

1. 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** 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** button of the router and release. The **WPS** LED will start blinking.

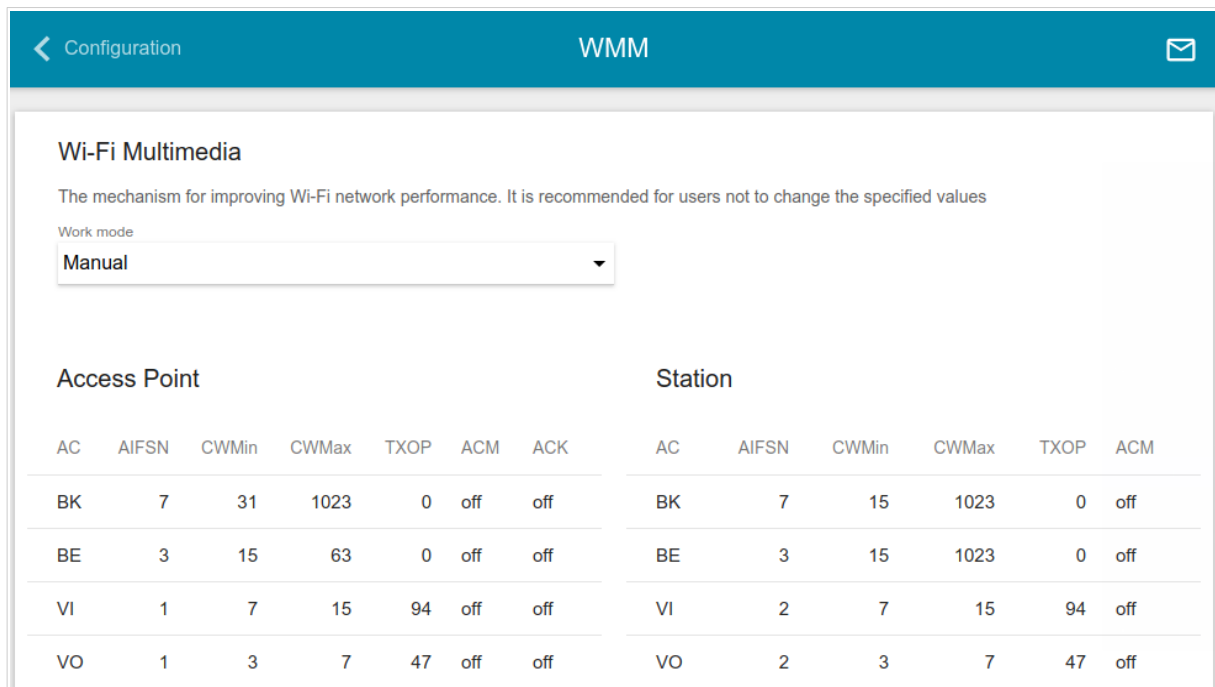
## WMM

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

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

Select the needed action from the drop-down list in the **Work mode** section 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.
- **Disabled**: the WMM function is disabled.



Access Point							Station					
AC	AIFSN	CWMin	CWMax	TXOP	ACM	ACK	AC	AIFSN	CWMin	CWMax	TXOP	ACM
BK	7	31	1023	0	off	off	BK	7	15	1023	0	off
BE	3	15	63	0	off	off	BE	3	15	1023	0	off
VI	1	7	15	94	off	off	VI	2	7	15	94	off
VO	1	3	7	47	off	off	VO	2	3	7	47	off

Figure 106. 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.

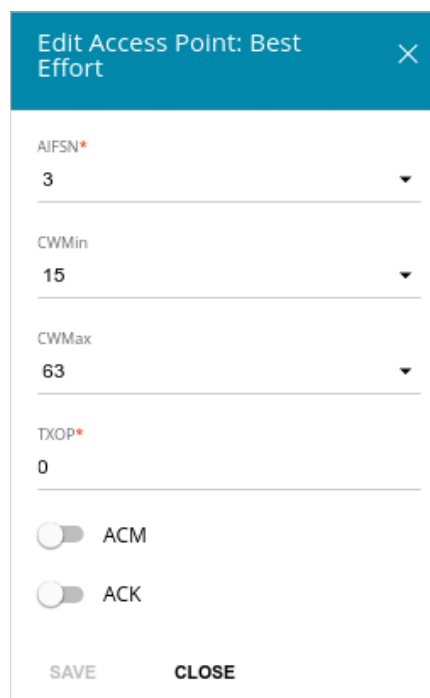


Figure 107. The window for changing parameters of the WMM function.

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.



Parameter	Description
<b>ACM</b>	<i>Admission Control Mandatory.</i> If the switch is moved to the right, the device cannot use the relevant Access Category.
<b>ACK</b>	<i>Acknowledgment.</i> Answering response requests while transmitting. Displayed only in the <b>Access Point</b> section. If the switch is moved to the left, the router answers requests. 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.

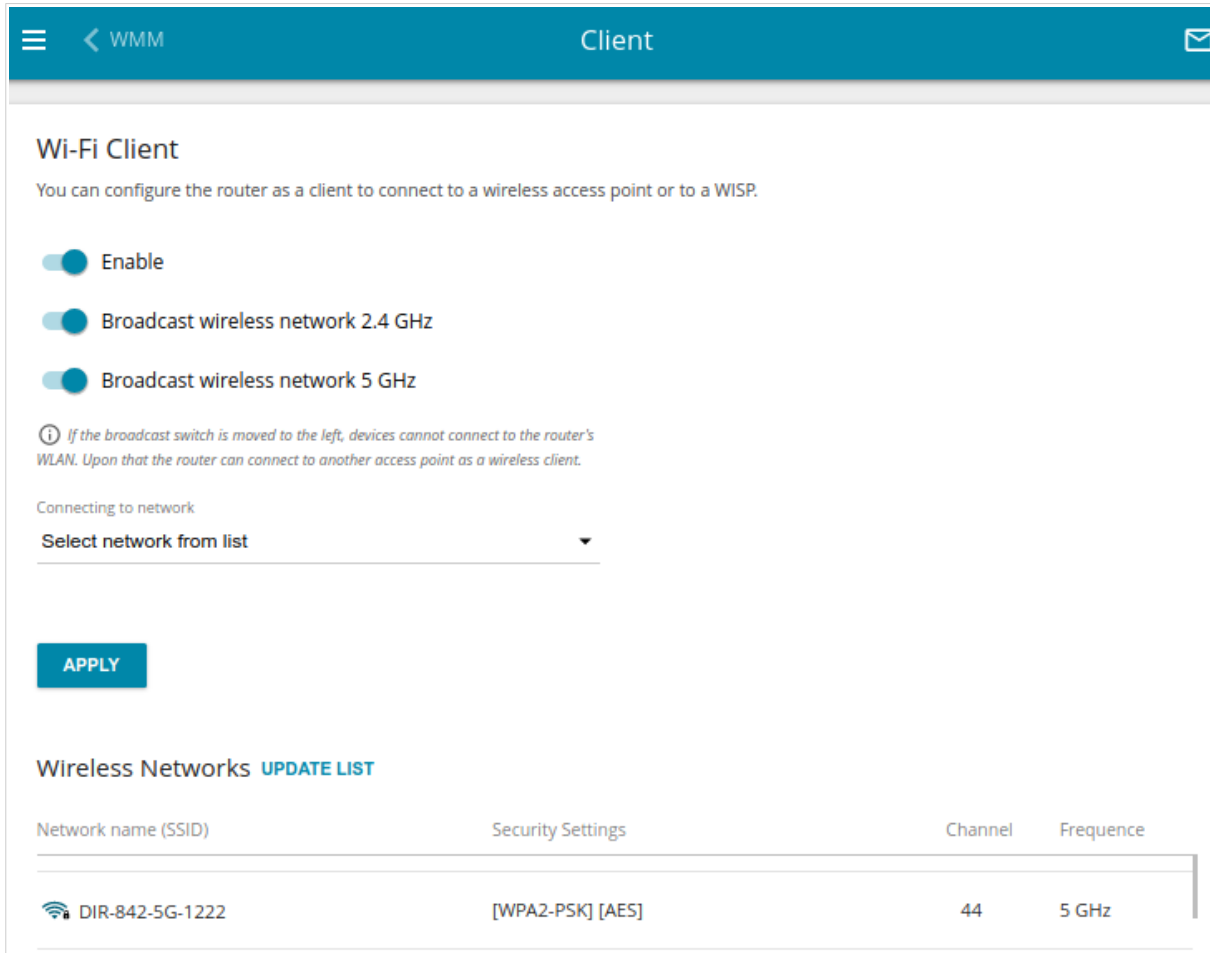


Figure 108. The page for configuring the client mode.

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. Select the band where the hidden network operates from the **Frequency band** list and enter the network name 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> 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**, **WPA-PSK/WPA2-PSK mixed**, **WPA3-SAE**, or **WPA2-PSK/WPA3-SAE 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> . <i><b>TKIP</b> and <b>TKIP+AES</b> encryption types are not available for <b>WPA3-SAE</b> and <b>WPA2-PSK/WPA3-SAE mixed</b> authentication types.</i>

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

When connecting to a wireless access point, the wireless channel of DIR-815 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** interface in 2.4GHz and 5GHz bands.

## Client Shaping

On the **Wi-Fi / Client Shaping** page, you can limit the maximum bandwidth of upstream and downstream traffic for each wireless client of the router by its MAC address.

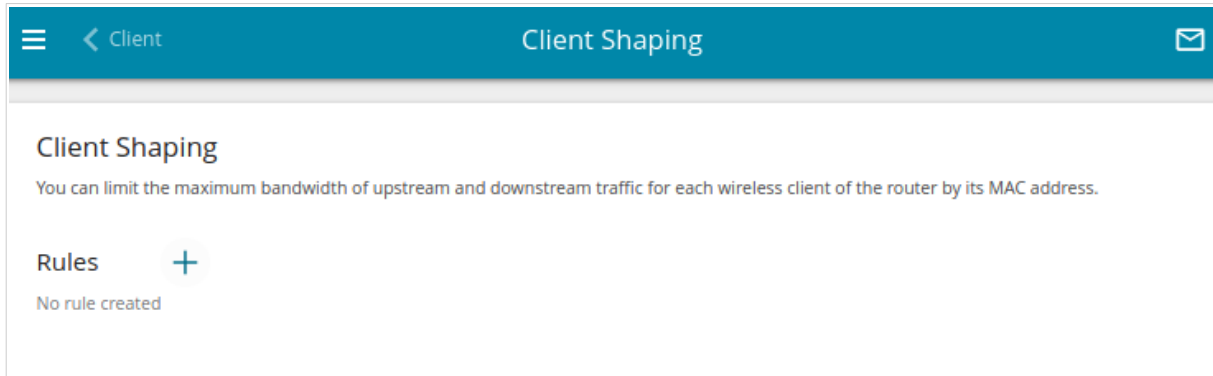


Figure 109. The **Wi-Fi / Client Shaping** page.

If you want to limit the maximum bandwidth of traffic for the router's wireless client, create a relevant rule. To do this, click the **ADD** button ( **+** ).

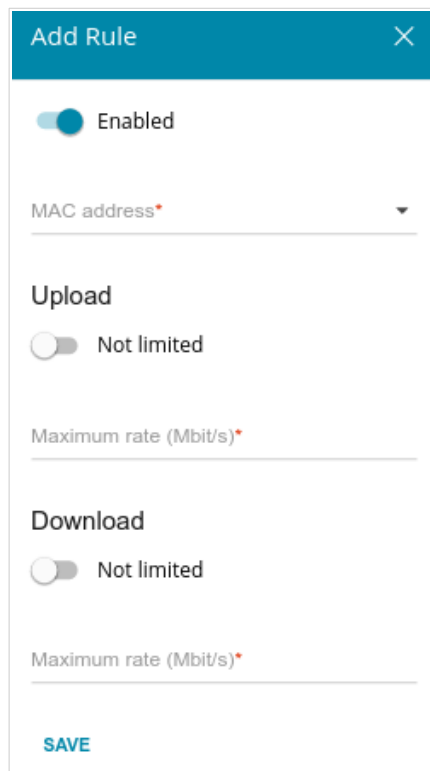



Figure 110. The window for setting up rate limit.

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

Parameter	Description
<b>Enabled</b>	If the switch is moved to the right, the rule is active. Move the switch to the left to disable the rule.
<b>MAC address</b>	In the field, enter the MAC address to which the rule will be applied. 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>Upload</b>	
<b>Maximum rate</b>	Specify the maximum value of the upstream traffic rate (Mbps) or move the <b>Not limited</b> switch to the right not to limit the maximum bandwidth of upstream traffic.
<b>Download</b>	
<b>Maximum rate</b>	Specify the maximum value of the downstream traffic rate (Mbps) or move the <b>Not limited</b> switch to the right not to limit the maximum bandwidth of downstream traffic.

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

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

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

## 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 (20/40 MHz), Autonegotiation 20/40 (Coexistence) (disabled), TX power (in percent) (100), Drop multicast (disabled), Enable TX Beamforming (enabled), Adaptivity mode (disabled), and STBC (disabled). The right column includes: B/G protection (Auto), Short GI (Enable), Method of channel auto select (BSS (by signal level)), 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 111. 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> </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> </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> 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>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/MLD</b> page.</p>
<b>Enable TX Beamforming</b>	<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>Adaptivity mode</b>	<p>Move the switch to the right to let the router switch from the channels at which radars and other mobile or stationary radio systems operate in case it interferes with these devices. Such a setting can slow down the router's WLAN.</p> <p>In order to use the adaptivity mode, the automatic channel selection should be enabled (on the <b>Wi-Fi / Basic Settings</b> page).</p>

Parameter	Description
<b>Reduce power on OFDM modulation</b>	<p><i>Available on the <b>5 GHz</b> tab.</i></p> <p>Move the switch to the right to lower service signals strength for improving the quality of their transmission. Use the setting in case of problems with connecting wireless clients to the router.</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>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>



Parameter	Description
<b>Method of channel auto select</b>	<p>A method of automatic channel selection.</p> <ul style="list-style-type: none"><li>• <b>BSS (by signal level)</b> (<i>Basic Service Set</i>): When this value is selected, the router analyzes the signal levels of the neighboring wireless networks and selects a channel with the minimum value of the total level of interference from these networks.</li><li>• <b>FA &amp; CCA (by volume of data transmitted)</b> (<i>False Alarm and Clear Channel Assessment</i>): When this value is selected, the router analyzes the volume of data transmitted in the neighboring wireless networks and selects a channel with the minimum value of the total number of packets transmitted in these networks upon scanning them.</li></ul>
<b>Beacon period</b>	The time interval (in milliseconds) between packets sent to synchronize the wireless network.
<b>RTS threshold</b>	The minimum size (in bytes) of a packet for which an RTS frame is transmitted.
<b>Frag threshold</b>	The maximum size (in bytes) of a non-fragmented packet. Larger packets are fragmented (divided).
<b>DTIM period</b>	The number of beacon frames between sending DTIM messages (messages notifying on broadcast or multicast transmission).
<b>Station Keep Alive</b>	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.

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-815.

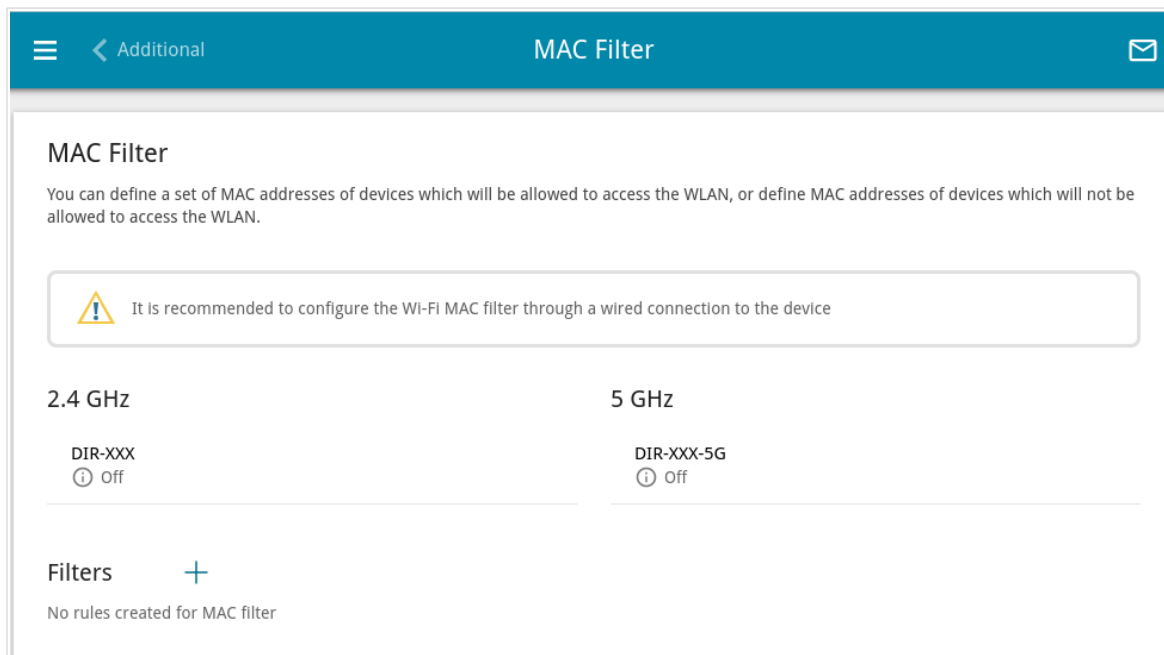


Figure 112. The page for configuring the MAC filter for the wireless network.

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 113. 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>Name</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. 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.

## 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.

Smart Adjustment of Wi-Fi Clients

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.

**DISABLE**

Port\*  
7890

Use multicast for service data exchange  
Select the checkbox if APs are located in different subn

2.4 GHz	5 GHz
Maximum time of storing data (in seconds)* 60	Maximum time of storing data (in seconds)* 60
Maximum time of storing data on adjacent clients	Maximum time of storing data on adjacent clients
Minimum level of connection quality (in percent)* 50	Minimum level of connection quality (in percent)* 50
Dead zone (from -50% to 50%)* 15	Dead zone (from -50% to 50%)* 15
Threshold value of connection quality (in percent)* 40	Threshold value of connection quality (in percent)* 40

APPLY

Figure 114. 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.  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.

## Print Server

On the **Print Server** page, you can configure the router as a print server. Being configured in this way, the router will allow your LAN users to share the printer connected to the USB port of the router.

To connect a printer to the router, power off both devices. Connect the printer to the USB port of the router, power on the printer, then power on the router.

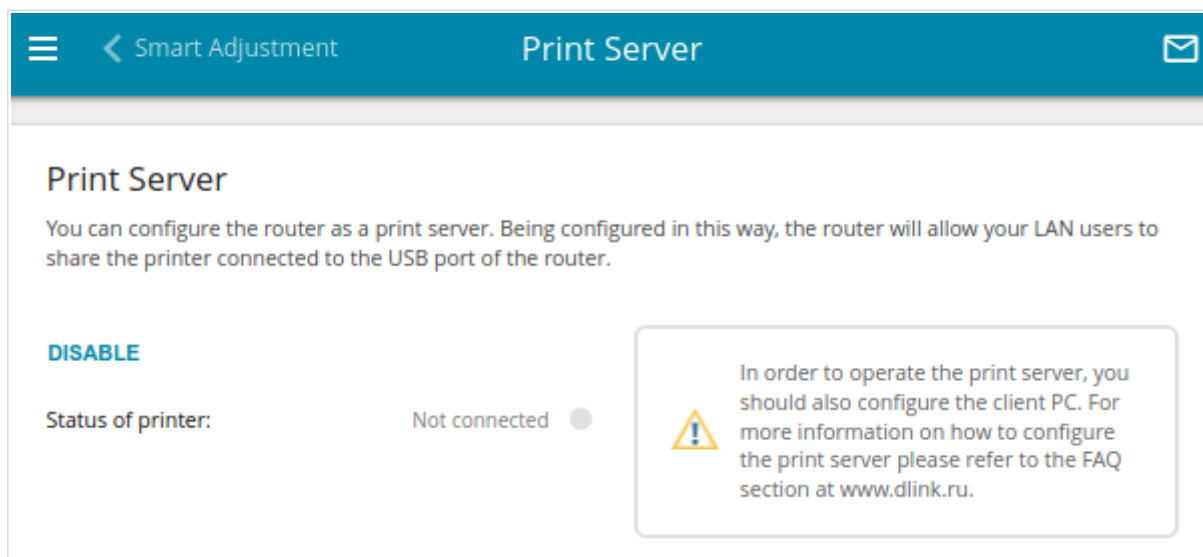


Figure 115. The **Print Server** page.

To configure the router as a print server, click the **ENABLE** button. Upon that the **Status of printer** field is displayed on the page.

If you don't want to use the router as a print server, click the **DISABLE** button.

## ***USB Storage***

This menu is designed to operate USB storages. Here you can do the following:

- view data on the connected USB storage
- create accounts for users to allow access to the content of the USB storage
- enable the built-in Samba server of the router
- enable the built-in FTP server of the router
- view content of the connected USB storage
- enable the built-in DLNA server of the router
- configure the built-in Transmission torrent client and manage distributing and downloading processes
- enable the XUPNPD plug-in.



## Information

On the **USB Storage / Information** page, you can view data on the USB storage connected to the router.

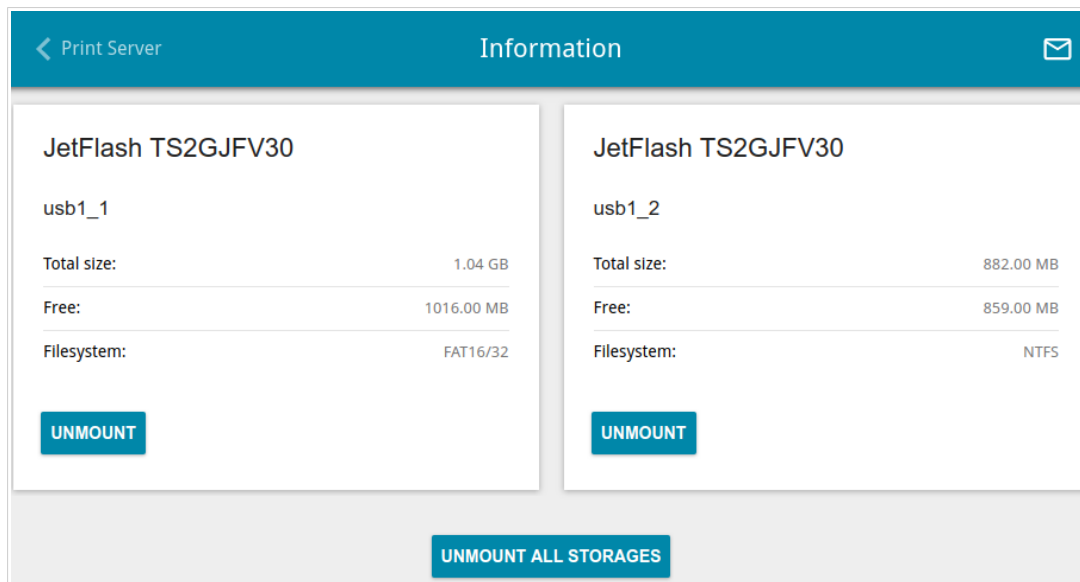


Figure 116. The **USB Storage / Information** page.

The following data are presented on the page: the name, total and free space of the storage, and the type of its file system (supported file systems: FAT16/32, NTFS, and ext2/3).

If the USB storage is divided into volumes, a section for every volume (partition) of the USB storage is displayed on the page.

To safely disconnect the USB storage or a volume of the USB storage, click the **UNMOUNT** button in the relevant section and wait for several seconds.

To disconnect all volumes of the USB storage, click the **UNMOUNT ALL STORAGE** button.

## USB Users

On the **USB Storage / USB Users** page, you can create user accounts to provide access to data on the USB storage connected to the router.

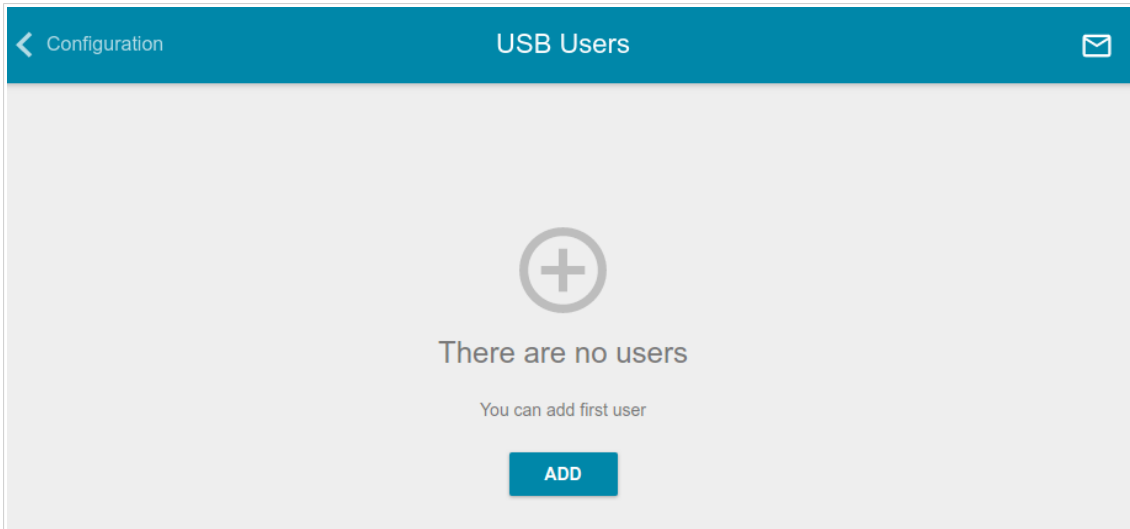



Figure 117. The **USB Storage / USB users** page.

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

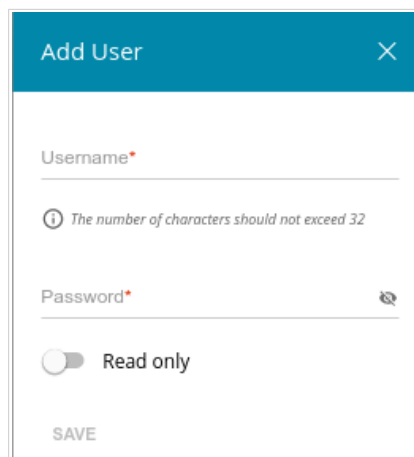


Figure 118. The window for adding a user.

In the opened window, in the **Username** field, specify a username, and in the **Password** field – the password for the account. Use digits, Latin letters (uppercase and/or lowercase), and other characters available in the US keyboard layout.<sup>14</sup>

**!** You cannot create accounts with the following usernames: admin, support, user, nobody.


For ext2, ext3, or FAT storages or storage partitions, it is possible to create users with limited rights. Move the **Read only** switch to the right not to let the user create, change, or delete files.

Click the **SAVE** button.

To view passwords of all user accounts, move the **Show password** switch to the right.

<sup>14</sup> 0-9, A-Z, a-z, space, !"#%&'()\*+,-./:;<=>?@[]^\_`{|}~.

To change the password of an account, select the relevant line in the table. In the opened window, enter a new value in the **Password** field, and then click the **SAVE** button.

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

## Samba

On the **USB Storage / Samba** page, you can enable the built-in Samba server of the router to provide access to the USB storage for users of your LAN.

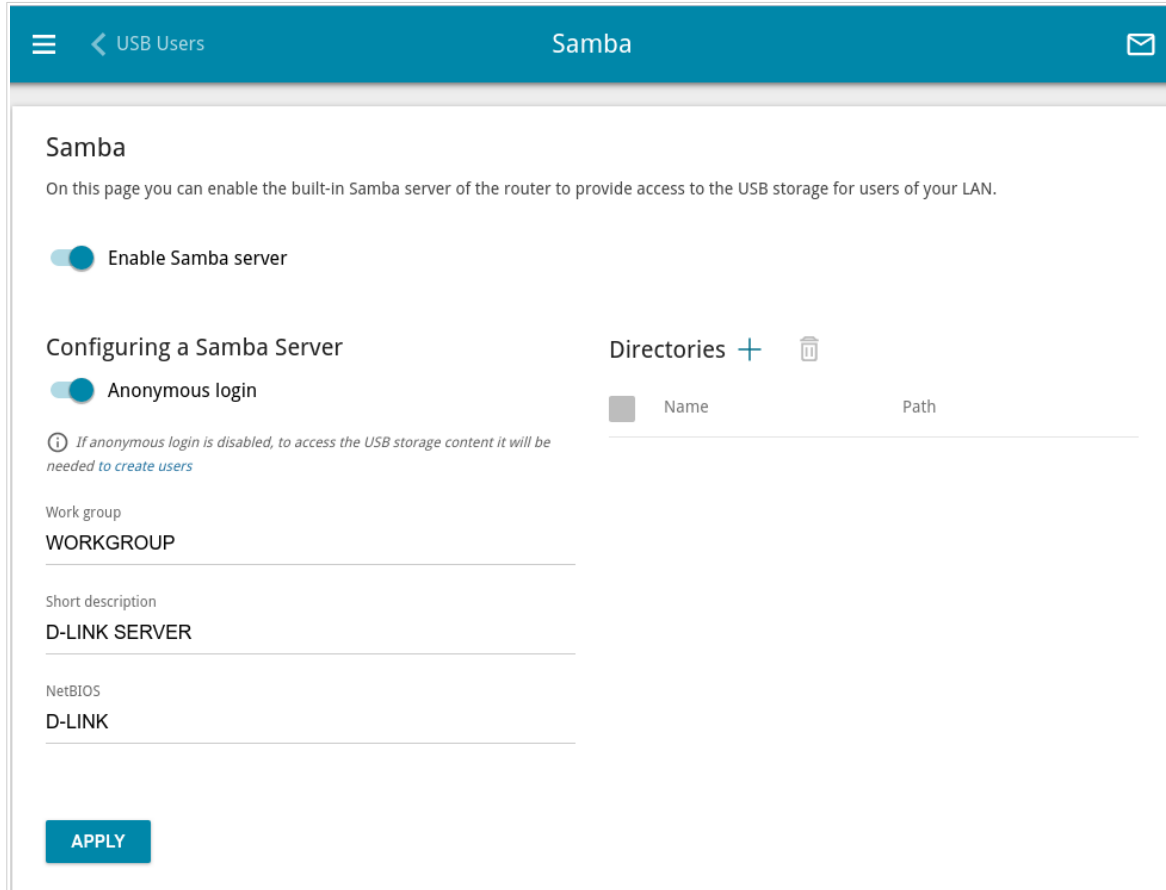


Figure 119. The **USB Storage / Samba** page.

To enable the Samba server, move the **Enable Samba server** switch to the right.

The **Anonymous login** switch (by default, the switch is moved to the right) allows anonymous access to the content of the USB storage for users of your LAN.

If you want to provide authorized access to the content of the USB storage for users of your LAN, move the switch to the left. After applying the parameters on this page, go to the **USB Storage / USB Users** page and create needed accounts.

In the **Work group** field, leave the value specified by default (**WORKGROUP**) or specify a new name of a workgroup which participants will have access to the content of the USB storage.

In the **Short description** field, you can specify an additional description for the USB storage. This value will be displayed in some operating systems. Use digits and/or Latin characters.

In the **NetBIOS** field, specify a name of the USB storage which will be displayed for users of your LAN. Use digits and/or Latin characters.

To allow access only to a certain folder of the USB storage, click the **ADD (+)** button in the **Directories** section.

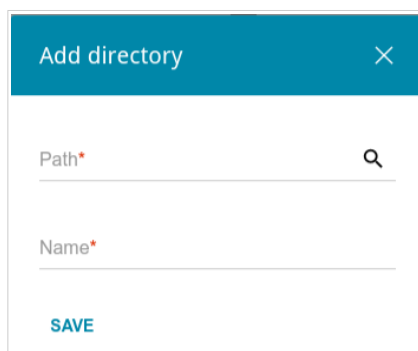


Figure 120. Specifying a folder.

In the opened window, locate a folder containing files. To do this, click the **Search** icon (🔍) in the **Path** field. Then go to the needed folder and click the **SELECT** button.

In the **Name** field, specify a name of the selected folder which will be displayed for users of your LAN. Use digits and/or Latin characters.

Click the **SAVE** button.

To remove a folder from the list in the **Directories** section, 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.

To disable the built-in Samba server of the router, move the **Enable Samba server** switch to the left and click the **APPLY** button.

## FTP

On the **USB Storage / FTP** page, you can enable the built-in FTP server of the router to provide access to the USB storage for users of your LAN.

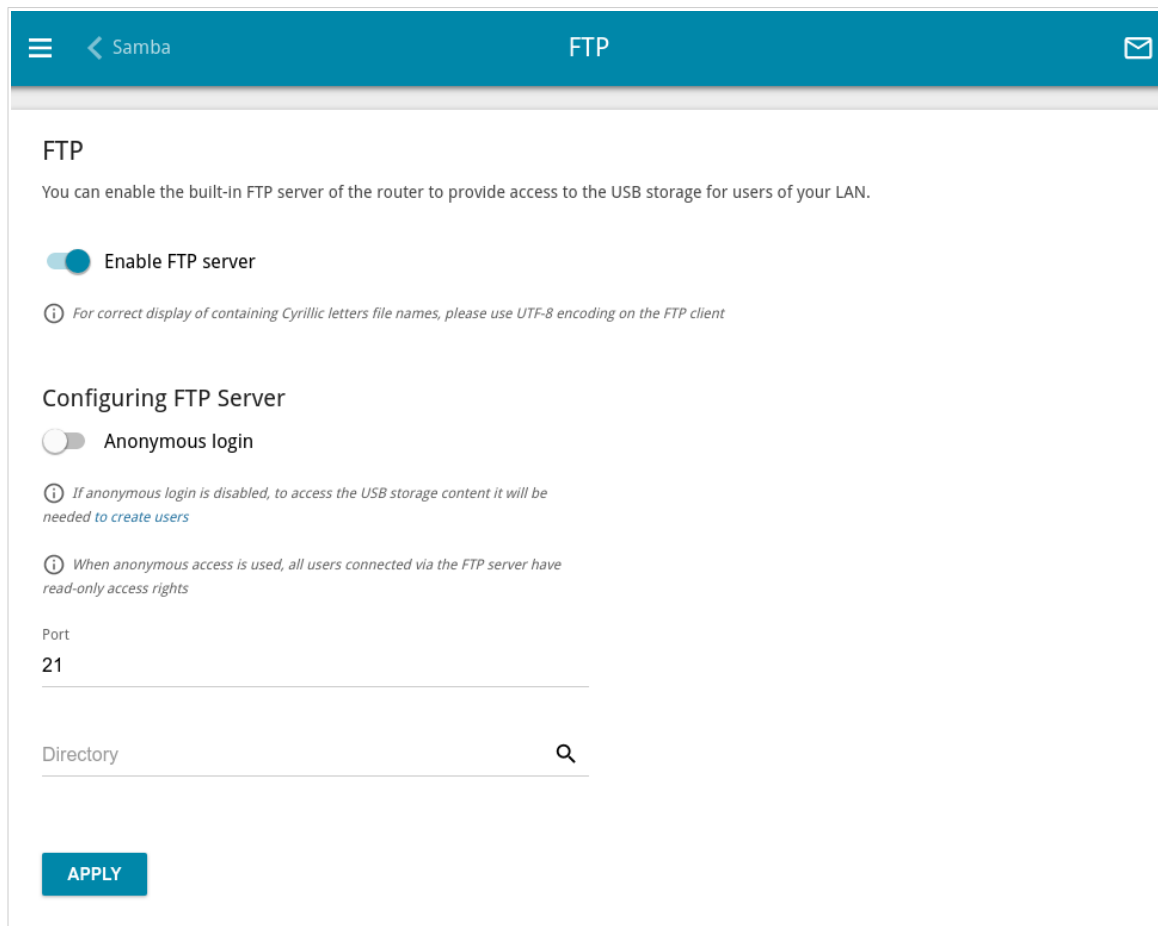



Figure 121. The **USB Storage / FTP** page.

To enable the FTP server, move the **Enable FTP server** switch to the right.

Move the **Anonymous login** switch to the right to allow anonymous access to the content of the USB storage for users of your LAN. If you want to provide authorized access to the content of the USB storage for users of your LAN, move the switch to the left. After applying the parameters on this page, go to the **USB Storage / USB Users** page and create needed accounts.

If needed, change the router's port used by the FTP server in the **Port** field (by default, the standard port **21** is specified).

To allow access only to a certain folder of the USB storage for users of your LAN, locate a folder containing files. To do this, click the **Search** icon (  ) in the **Directory** field. Then go to the needed folder and click the **SELECT** button.

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

To allow access to all the content of the USB storage for users of your LAN again, remove the value specified in the **Directory** field and click the **APPLY** button.

To disable the built-in FTP server of the router, move the **Enable FTP server** switch to the left and click the **APPLY** button.

## Filebrowser

On the **USB Storage / Filebrowser** page, you can view the content of your USB storage connected to the router and remove separate folders and files from the USB storage.

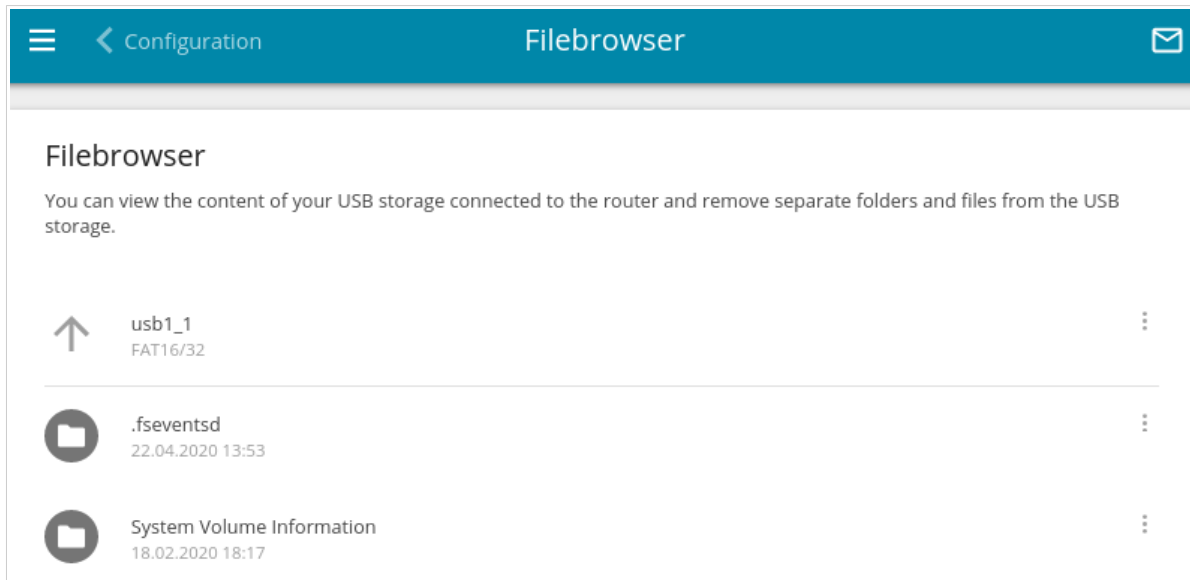




Figure 122. The **USB Storage / Filebrowser** page.

To view the content of the USB storage, click the icon of the storage or storage partition. The list of folders and files will be displayed on the page.

To go to a folder, click the line corresponding to this folder.

To refresh the folder contents, click the **Actions** icon (  ) in the line corresponding to this folder and select the **Refresh** value.

To remove a folder or file, click the **Actions** icon (  ) in the line corresponding to this folder or file and select the **Delete** value.



## DLNA

On the **USB Storage / DLNA** page, you can enable the built-in DLNA server of the router to provide access to the USB storage for users of your LAN.

The built-in media server allows DLNA certified devices of your LAN to play multimedia content of the USB storage. Multimedia content can be played only when a USB storage is connected to the router.

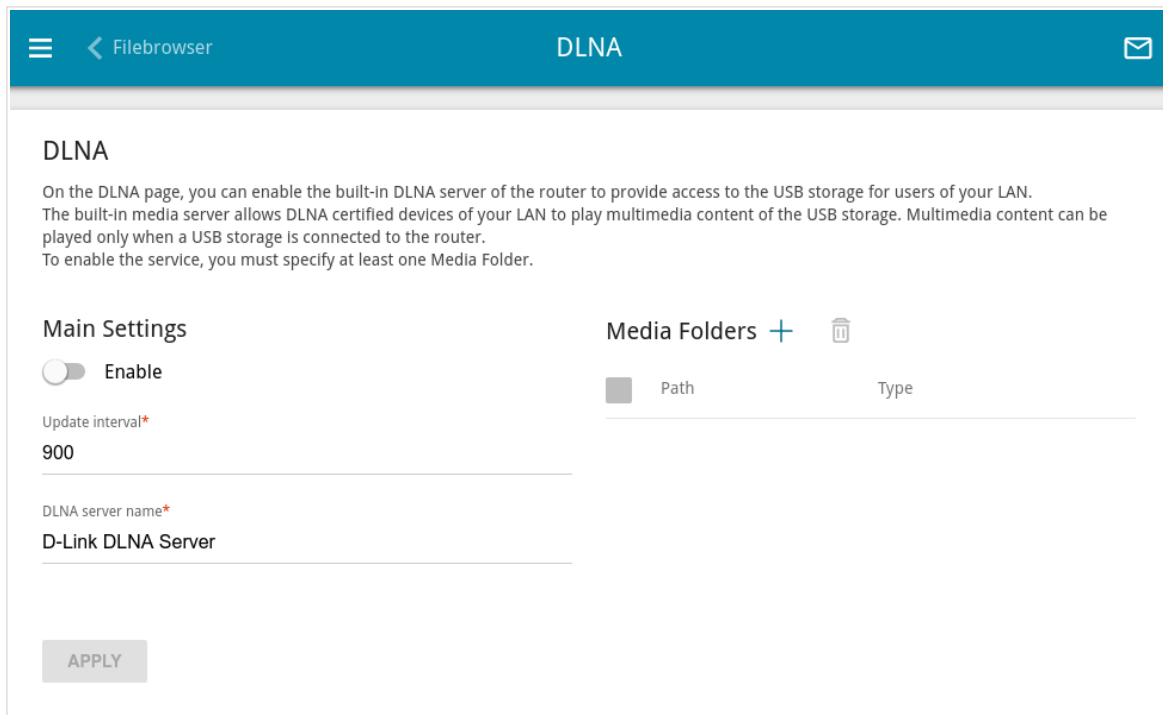


Figure 123. The **USB Storage / DLNA** page.

To enable the DLNA server, move the **Enable** switch to the right.

In the **Update interval** field, specify the time period (in seconds) at the end of which the media server sends an SSDP notification of its availability to the LAN clients or leave the value specified by default (**900**).

In the **DLNA server name** field, specify a name of the DLNA server which will be displayed for users of your LAN or leave the value specified by default (**D-Link DLNA Server**). Use digits and/or Latin characters.

To allow access to the content of the USB storage for users of your LAN, click the **ADD (+)** button in the **Media Folders** section.

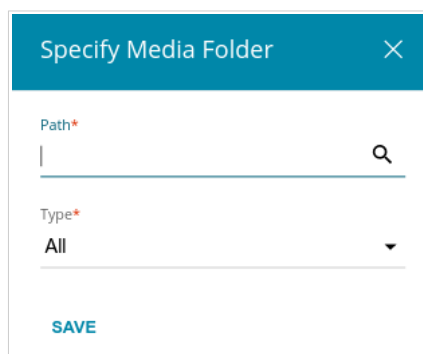



Figure 124. Specifying a media folder.

In the opened window, locate a folder containing files. To do this, click the **Search** icon (  ) in the **Path** field. Then go to the needed folder and click the **SELECT** button.

**!** When selecting a folder which contains a large amount of files, use of the DLNA server can lead to unstable operation of the device.

For each folder you can define the type of files which will be available for users of your LAN. To do this, select the needed type of files from the **Type** drop-down list. To share all files of a folder, select the **All** value from the **Type** drop-down list.

Click the **SAVE** button.

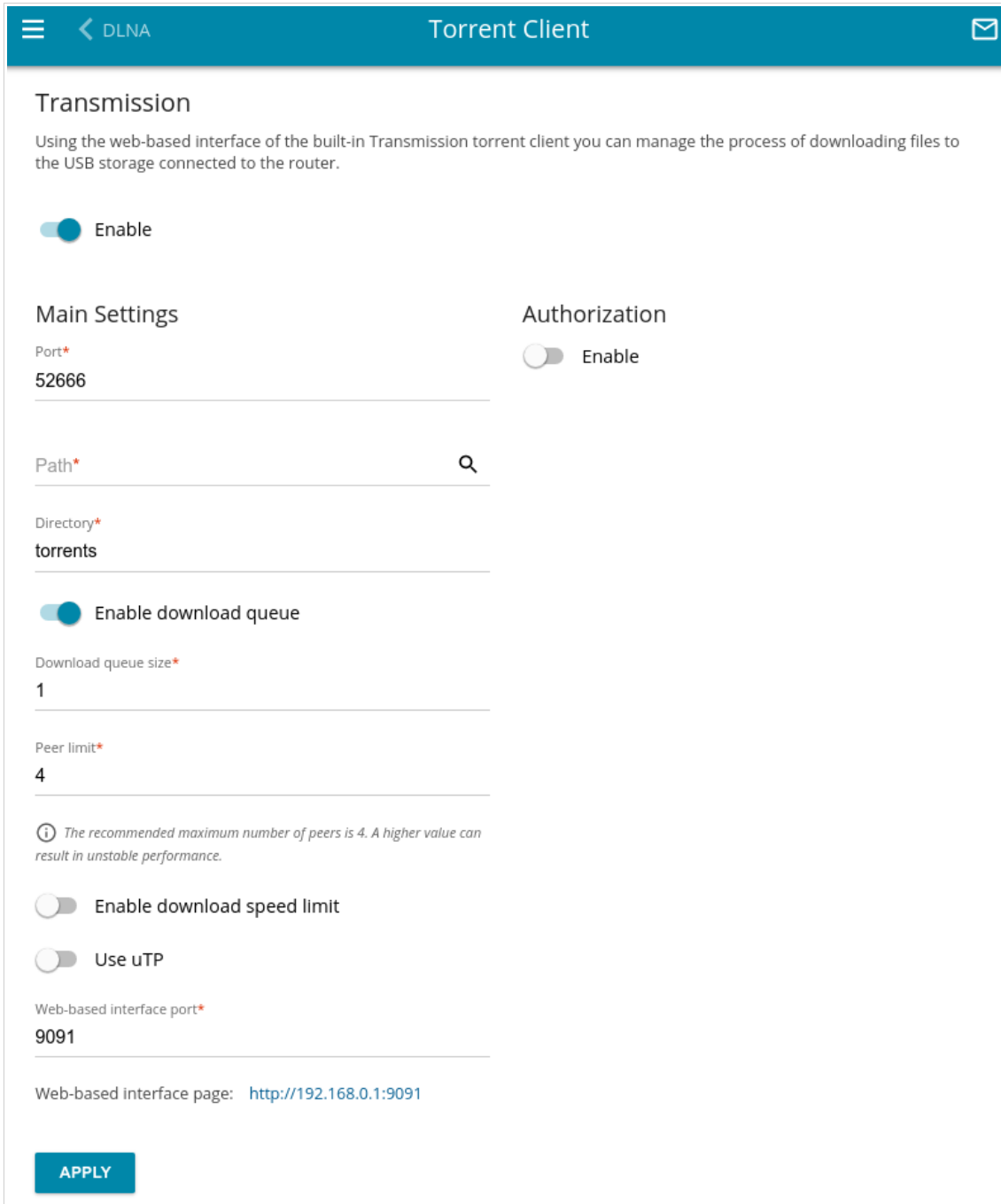
To remove a folder from the list in the **Media Folders** section, select the checkbox located to the left of the relevant line in the table and click the **DELETE** (  ) button.

After specifying all needed settings on the **USB Storage / DLNA** page, click the **APPLY** button.

To disable the built-in DLNA server of the router, move the **Enable** switch to the left and click the **APPLY** button.

## Torrent Client


On the **USB Storage / Torrent Client** page, you can configure all needed settings for the built-in Transmission client.



The screenshot shows the 'Torrent Client' configuration page. At the top, there is a blue header with a menu icon, a back arrow labeled 'DLNA', the title 'Torrent Client', and an envelope icon. Below the header, the page is titled 'Transmission' and includes a descriptive paragraph: 'Using the web-based interface of the built-in Transmission torrent client you can manage the process of downloading files to the USB storage connected to the router.' The main settings are organized into two columns. The left column contains: an 'Enable' toggle switch (checked); 'Main Settings' section with 'Port\*' set to '52666', 'Path\*' with a search icon, 'Directory\*' set to 'torrents', 'Enable download queue' toggle (checked), 'Download queue size\*' set to '1', and 'Peer limit\*' set to '4'. An information icon and note state: 'The recommended maximum number of peers is 4. A higher value can result in unstable performance.' Below this are 'Enable download speed limit' and 'Use uTP' toggle switches (both unchecked). The right column contains: an 'Authorization' section with an 'Enable' toggle switch (unchecked). At the bottom of the left column, 'Web-based interface port\*' is set to '9091', and the 'Web-based interface page:' is shown as 'http://192.168.0.1:9091'. A blue 'APPLY' button is located at the bottom left of the form area.

Figure 125. The **USB Storage / Torrent Client** page.

You can specify the following parameters:

Parameter	Description
<b>Transmission</b>	
<b>Enable</b>	Move the switch to the right to activate the Transmission client.
<b>Main Settings</b>	
<b>Port</b>	The router's port which will be used by the Transmission client.
<b>Path</b>	Locate data of the Transmission client. To do this, click the <b>Search</b> icon (  ), select the needed value, and click the <b>SELECT</b> button.
<b>Directory</b>	The folder on the USB storage where data of the Transmission client will be stored.
<b>Enable download queue</b>	Move the switch to the right if you want to limit the number of simultaneous downloads. Upon that the <b>Download queue size</b> field will be displayed. Move the switch to the left not to limit the number of simultaneous downloads.
<b>Download queue size</b>	The maximum number of simultaneous downloads. By default, the value <b>1</b> is specified.
<b>Peer limit</b>	The maximum number of the service users from which you can download files.
<b>Enable download speed limit</b>	Move the switch to the right to limit the maximum file download speed. In the <b>Download speed limit</b> field displayed, specify the maximum value of speed (KBps). Move the switch to the left not to limit the maximum download speed.
<b>Use uTP</b>	Move the switch to the right to enable $\mu$ TP ( <i>Micro Transport Protocol, a transport protocol for file sharing</i> ). Such a setting can increase the load on the router. Move the switch to the left to disable $\mu$ TP.
<b>Web-based interface port</b>	The port on which the web-based interface of the Transmission client is available.
<b>Authorization</b>	
<b>Enable</b>	Move the switch to the right if you want the Transmission client to request for username and password when accessing its web-based interface. Then fill in the <b>Username</b> and <b>Password</b> fields.

Parameter	Description
<b>Username</b>	The username to access the web-based interface of the Transmission client.
<b>Password</b>	The password to access the web-based interface of the Transmission client. Click the <b>Show</b> icon (👁) to display the entered password.

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

In the **Web-based interface page** field, the address of the web-based interface of the Transmission client is displayed. To access the web-based interface of the Transmission client, click the link.

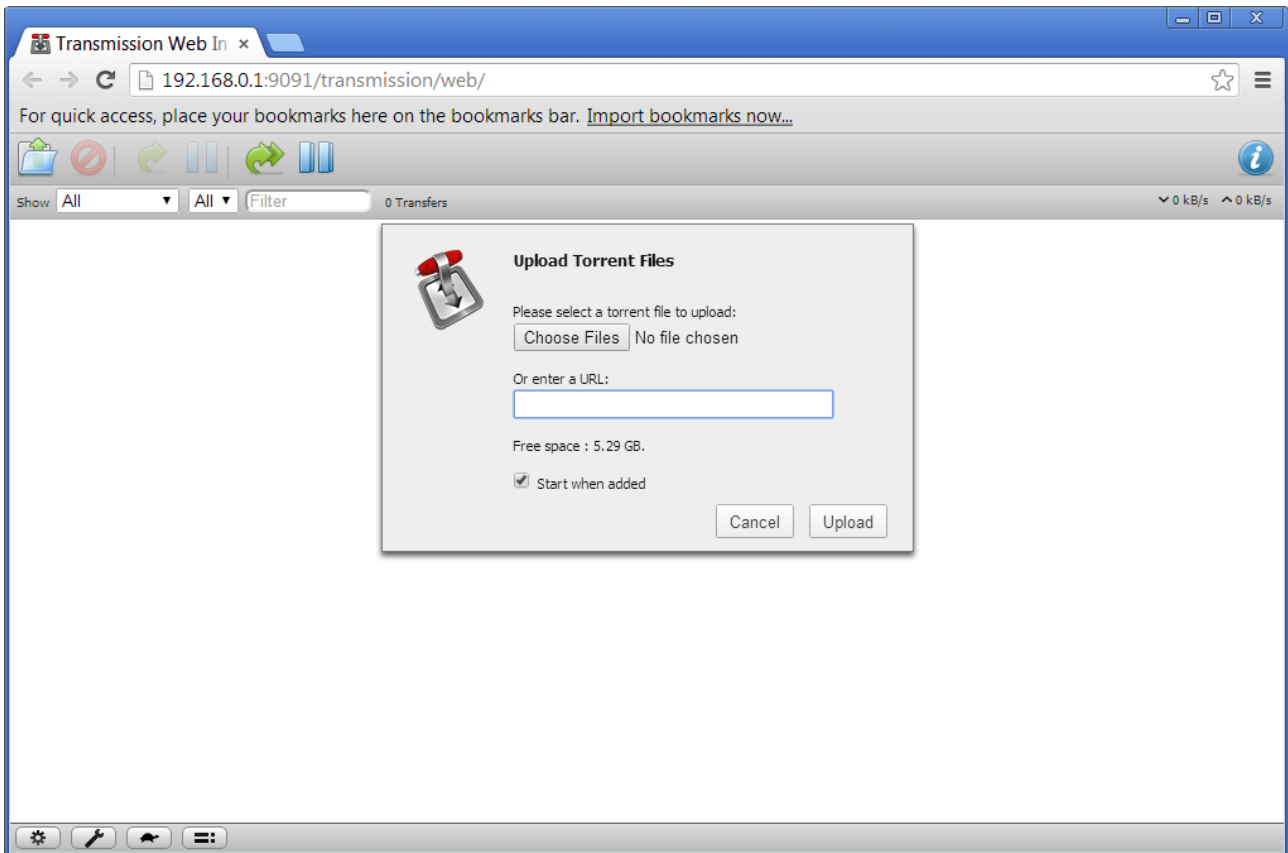









Figure 126. The web-based interface of the Transmission torrent client.

Using the web-based interface of the built-in Transmission torrent client you can manage the process of downloading files to the USB storage connected to the router.

The following buttons are available on the page:

Parameter	Description
 <b>Open Torrent</b>	Click the button to add a new torrent file (a metadata file according to which the Transmission client downloads files) to the download queue. In the dialog box appeared, select a file stored on your PC and click the <b>Upload</b> button.
 <b>Remove Selected Torrents</b>	Select the torrent file which you want to remove from the download queue and click the button.
 <b>Start Selected Torrents</b>	Select the torrent file corresponding to the download which should be restarted and click the button.
 <b>Start All Torrents</b>	Click the button to restart all downloads. If you limited the maximum number of simultaneous downloads, the Transmission client starts processing of the specified number of torrent files; after completing download of the first one, the client proceeds to the next file in the queue.
 <b>Pause Selected Torrents</b>	Select the torrent file corresponding to the download which should be stopped and click the button.
 <b>Pause All Torrents</b>	Click the button to stop all downloads.
 <b>Toggle Inspector</b>	Select a torrent file and click the button to view its data.

## XUPNPD

On the **USB Storage / XUPNPD** page, you can enable the XUPNPD plug-in. It allows to broadcast media content received from the Internet sources or IPTV service to DLNA-certified devices of your LAN.

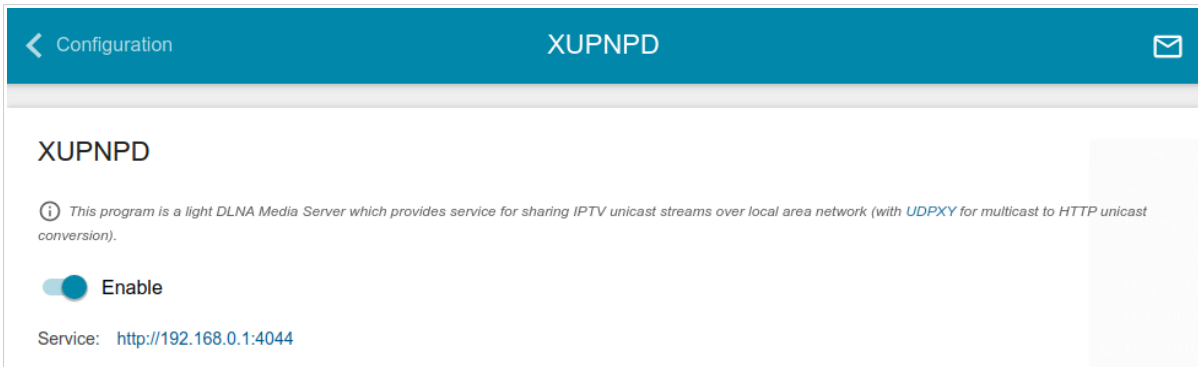


Figure 127. The **USB Storage / XUPNPD** page.

To use the XUPNPD plug-in, connect a USB storage to the router and move the **Enable** switch to the right.

**!** To let IPTV services operate using the XUPNPD plug-in, enable the UDPXY application.

In the **Service** field, the address of the web-based interface of the XUPNPD plug-in is displayed. To access the page of the XUPNPD plug-in and configure all needed settings, click the link.

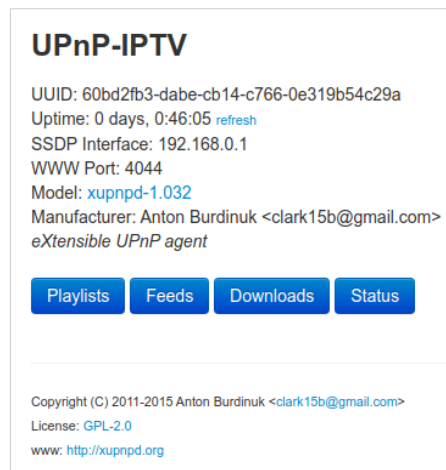


Figure 128. The XUPNPD plug-in page.

## USB Modem

This menu is designed to operate USB modems.

If the PIN code check for the SIM card inserted into your USB modem is not disabled, the relevant notification will be displayed in the top right corner of the page.

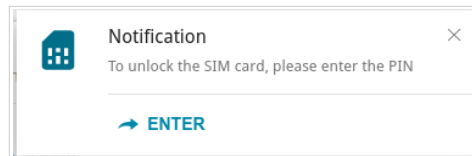


Figure 129. The notification on the PIN code check.

Click the **ENTER** button. When the **USB Modem / PIN** page opens, enter the PIN code in the **Authorization** section<sup>15</sup>. Click the **Show** icon (👁) to display the entered code. Then click the **APPLY** button.

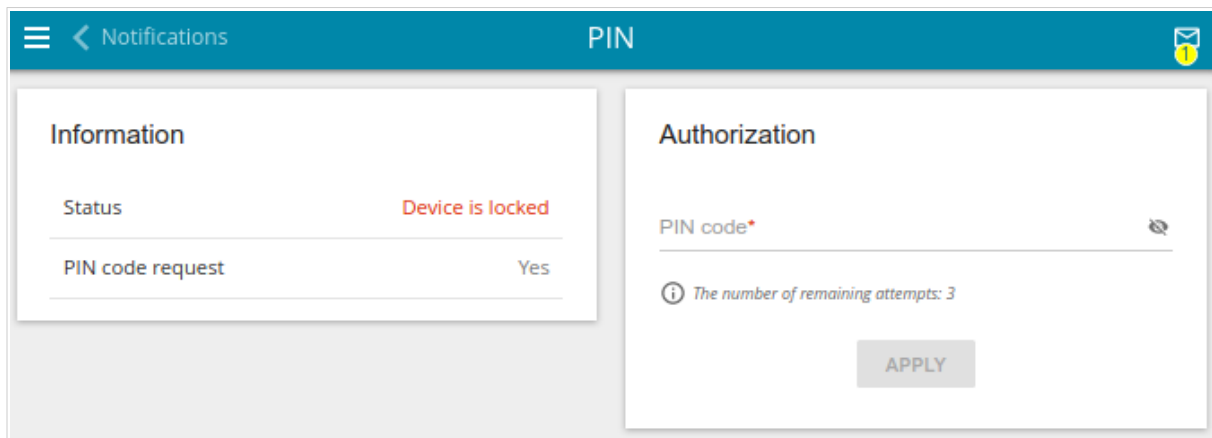


Figure 130. Entering the PIN code.

Some USB modems in the router mode and Android smartphones in the modem mode have an IP address from the subnet which coincides with the router's local subnet. In this case, the router's web-based interface can be unavailable. For correct operation, disconnect the device from the USB port and reboot the router. Then access the web-based interface, go to the **Connections Setup / LAN** page, and change the value of the **IP address** field on the **IPv4** tab (for example, specify the value **192 . 168 . 2 . 1**). Wait until the router is rebooted.

<sup>15</sup> For some models of USB modems it is required to disable the PIN code check on the SIM card prior to connecting the USB modem to the router.



## Basic Settings

On the **USB Modem / Basic Settings** page, you can view data on the USB modem connected to the router and enable/disable the function for automatic creation of 3G/LTE WAN connection upon plugging a USB modem into the router.

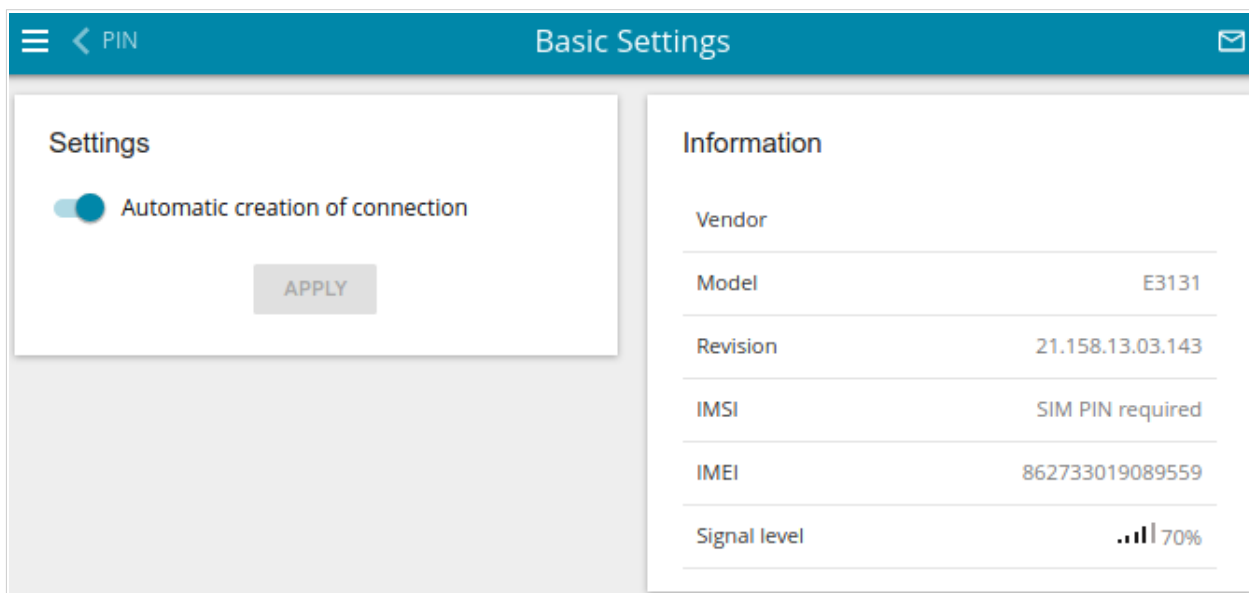


Figure 131. The **USB Modem / Basic Settings** page.

If the **Automatic creation of connection** switch is moved to the right and the PIN code check for the SIM card inserted into your USB modem is disabled, then an active WAN connection with default settings (for LTE modems) or the operator's settings (for GSM modems) will be automatically created when plugging the USB modem into the router. The connection will be displayed on the **Connections Setup / WAN** page.

If you don't want to use this function, move the **Automatic creation of connection** switch to the right and click the **APPLY** button.

When a USB modem is connected to the router, the following data are displayed in the **Information** section:

Parameter	Description
<b>Vendor</b>	The manufacturer of your USB modem.
<b>Model</b>	The alphanumeric code of the model of your USB modem.
<b>Revision</b>	The revision of the firmware of your USB modem.
<b>IMSI</b>	The code stored in the SIM card inserted to your USB modem.
<b>IMEI</b>	The code stored in the memory of the USB modem.
<b>Signal level</b>	The signal level at the input of the modem's receiver. The zero signal level shows that you are out of the coverage area of the selected operator's network.

Parameter	Description
<b>Operator name</b>	When the needed network is available, the name of the operator is displayed in this field.
<b>Mode</b>	A type of the network to which the USB modem is connected.

## PIN

On the **USB Modem / PIN** page, you can change the PIN code of the SIM card inserted into your USB modem, disable or enable the check of the PIN code.

**!** The operations presented on this page are unavailable for some models of USB modems.

The current state of the SIM card inserted into your USB modem is displayed in the **Status** field. If the PIN code is entered incorrectly or the PIN code is not entered when the PIN code check is enabled, the **Device is locked** value is displayed in the **Status** field. If the PIN code is entered correctly or the PIN check is disabled, the **Device is unlocked** value is displayed in the **Status** field.

If the PIN code check for the SIM card inserted into your USB modem is not disabled, the **Yes** value is displayed in the **PIN code request** field. If the PIN check is disabled, the **No** value is displayed in the **PIN code request** field.

The screenshot shows the 'PIN' configuration page. The top header is blue with a back arrow and 'Basic Settings' on the left, and an envelope icon on the right. The main content is divided into two columns. The left column has two sections: 'Information' and 'PIN Code Request'. The 'Information' section shows 'Status' as 'Device is unlocked' and 'PIN code request' as 'Yes'. The 'PIN Code Request' section has a 'PIN code\*' field with a clear icon and a 'DISABLE' button below it. The right column has a 'Changing PIN Code' section with three fields: 'PIN code\*', 'New PIN code\*', and 'New PIN code confirmation\*', each with a clear icon. A 'SAVE' button is at the bottom of this section.

Figure 132. The **USB Modem / PIN** page.

To disable the PIN code check, in the **PIN Code Request** section, enter the current PIN code in the **PIN code** field and click the **DISABLE** button (the button is displayed if the PIN code check is enabled).

To enable the PIN code check, in the **PIN Code Request** section, enter the PIN code used before disabling the check in the **PIN code** field and click the **ENABLE** button (the button is displayed if the PIN code check is disabled).

To change the PIN code, in the **Changing PIN Code** section, enter the current code in the **PIN code** field, then enter a new code in the **New PIN code** and **New PIN code confirmation** fields and click the **SAVE** button.

If you have exceeded the permissible amount of errors upon entering a value in the **PIN code** field (the number of remaining attempts is displayed on the page), the SIM card inserted into your USB modem is blocked.

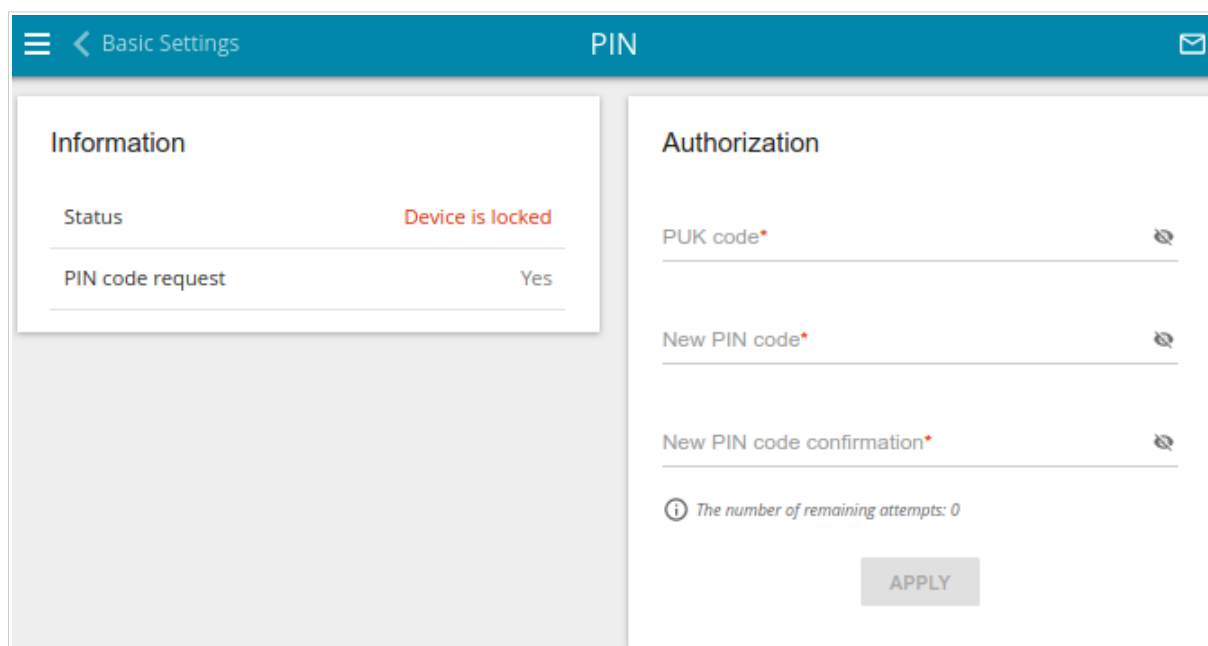


Figure 133. The **USB Modem / PIN** page. The PUK code request.

For further use of the card, in the **Authorization** section, enter the PUK code in the relevant field, and then specify a new PIN code for your SIM card in the **New PIN code** and **New PIN code confirmation** field. Click the **APPLY** button.

## ***Advanced***

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

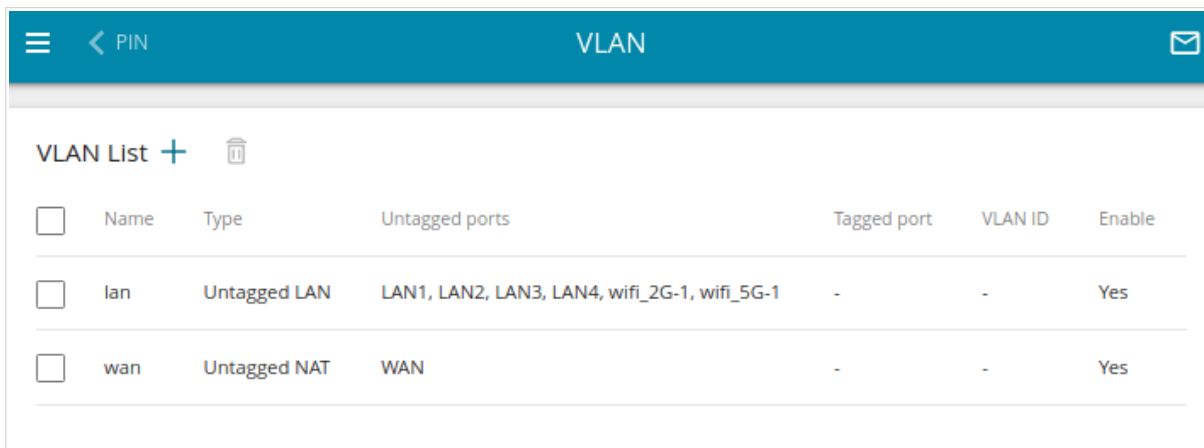
- create or edit VLANs
- add name servers
- configure a DDNS service
- configure autonegotiation or manually configure speed and duplex mode for each Ethernet port of the router
- setup the rate limit for traffic transmitted from every port of the router
- configure notifications on the reason of the 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 and MLD
- allow the router to use RTSP, enable the SIP ALG, the PPPoE/PPTP/L2TP/IPsec pass through functions for the router
- configure VPN tunnels based on IPsec protocol.

## 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**: or the WAN interface; it includes the **WAN** port. You can edit or delete this VLAN.

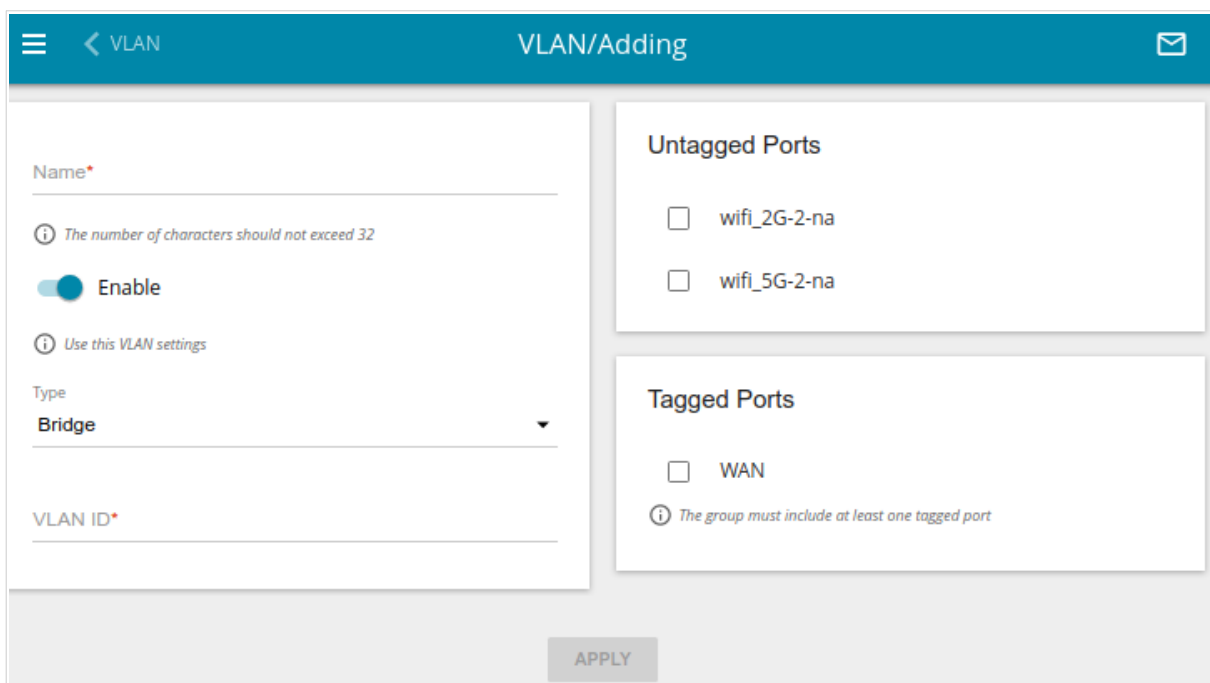


<input type="checkbox"/>	Name	Type	Untagged ports	Tagged port	VLAN ID	Enable
<input type="checkbox"/>	lan	Untagged LAN	LAN1, LAN2, LAN3, LAN4, wifi_2G-1, wifi_5G-1	-	-	Yes
<input type="checkbox"/>	wan	Untagged NAT	WAN	-	-	Yes

Figure 134. The **Advanced / VLAN** page.

If you want to create a VLAN including LAN ports or available Wi-Fi networks of the router, first delete relevant records from the **lan** network on this page. To do this, select the **lan** line. On the opened page, in the **Untagged Ports** section, deselect the checkbox located to the left of the relevant element, and click the **APPLY** button.

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



**VLAN/Adding**

Name\*  
The number of characters should not exceed 32

Enable

Use this VLAN settings

Type  
Bridge

VLAN ID\*

**Untagged Ports**

wifi\_2G-2-na

wifi\_5G-2-na

**Tagged Ports**

WAN

The group must include at least one tagged port

APPLY


Figure 135. 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>Enable</b>	Move the switch to the right to allow using this VLAN.
<b>Type</b>	<p>The type of the VLAN.</p> <ul style="list-style-type: none"> <li>• <b>Untagged NAT:</b> The VLAN of this type is an external connection with address translation. It is mostly used to transmit untagged traffic. When this value is selected, the <b>VLAN ID</b> field and the <b>Tagged Ports</b> section are not displayed. Only one VLAN of this type can exist in the system.</li> <li>• <b>Tagged NAT:</b> The VLAN of this type is an external connection with address translation. It is mostly used to connect to the Internet. Later the network which identifier is specified in the <b>VLAN ID</b> field is used as an interface to create a WAN connection (on the <b>Connections Setup / WAN</b> page). When this value is selected, the <b>Untagged Ports</b> section is not displayed.</li> <li>• <b>Bridge:</b> The VLAN of this type is a transparent connection between an internal port and an external connection. It is mostly used to connect IPTV set-top boxes.</li> </ul>
<b>VLAN ID</b>	An identifier of the VLAN.
<b>Untagged Ports</b>	<p>The section includes the ports and Wi-Fi networks that can be added to the VLAN.</p> <p>To add an element, select the checkbox located to the left of it.</p> <p>To remove an element, deselect the checkbox located to the left of it.</p>
<b>Tagged Ports</b>	Select an available value to assign it to this VLAN. To do this, select the checkbox located to the left of the relevant port.

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 ().

## DNS

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

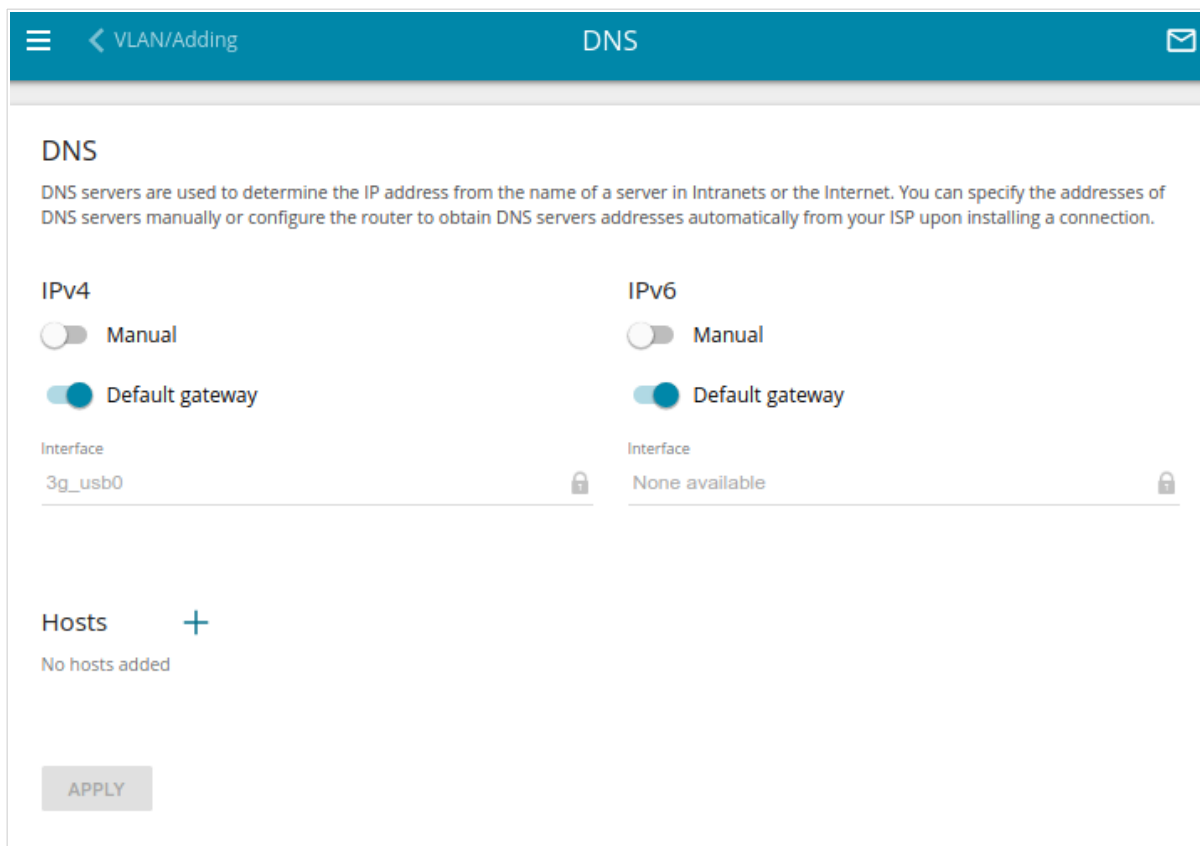


Figure 136. The **Advanced / DNS** page.

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.

**!** 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. Then click the **APPLY** button.

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. Then click the **APPLY** button.



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

If needed, you can add your own address resource record. To do this, click the **ADD** button (+) in the **Hosts** section.

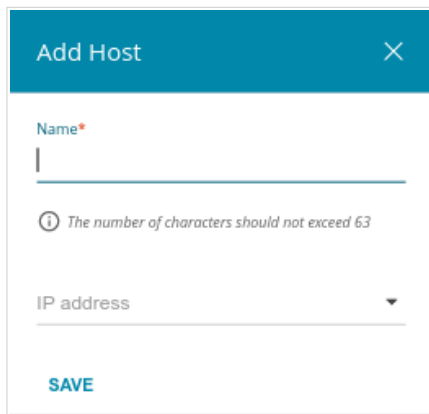


Figure 137. The window for adding a DNS record.

In the **Name** field, specify the domain name to which the specified IP address will correspond. 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 IP address from the drop-down list (the field will be filled in automatically). 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.

## DDNS

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

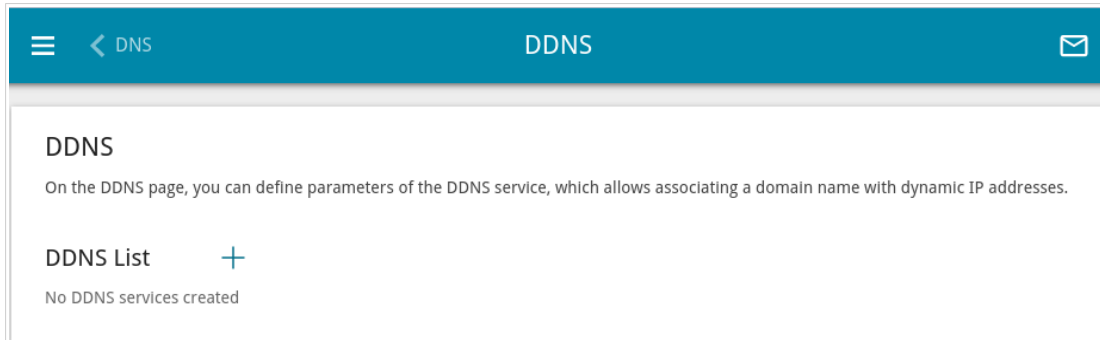



Figure 138. The **Advanced / DDNS** page.

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


Figure 139. The page for adding a DDNS service.

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

Parameter	Description
<b>Hostname</b>	The full domain name registered at your DDNS provider.
<b>DDNS service</b>	Select a DDNS provider from the drop-down list.
<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>Update period</b>	An interval (in minutes) between sending data on the router's external IP address to the relevant DDNS service.

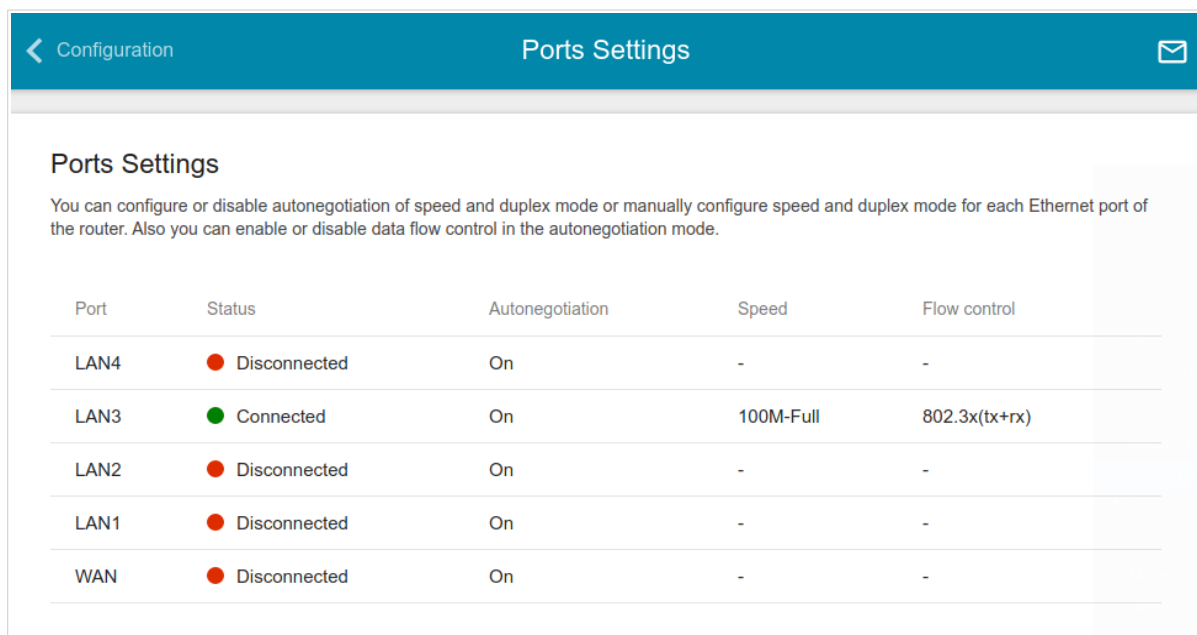
After specifying the needed parameters, click the **SAVE** button.

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
LAN4	● Disconnected	On	-	-
LAN3	● Connected	On	100M-Full	802.3x(tx+rx)
LAN2	● Disconnected	On	-	-
LAN1	● Disconnected	On	-	-
WAN	● Disconnected	On	-	-

Figure 140. 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.

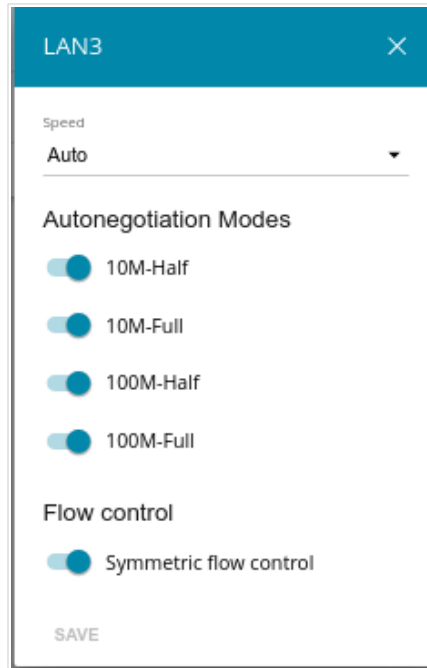


Figure 141. The window for changing the settings of the router's port.

In the opened window, specify the needed parameters:

Parameter	Description
<p><b>Speed</b></p>	<p>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>
<p><b>Autonegotiation Modes</b></p>	
<p>To enable the needed data transfer modes, move relevant switches to the right.</p>	

Parameter	Description
<b>Flow control</b>	
<b>Symmetric flow control</b>	Move the switch to the right to enable the flow control function for the port. 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.

## Bandwidth Control

On the **Advanced / Bandwidth Control** page, you can setup the rate limit for traffic transmitted from every port of the router.

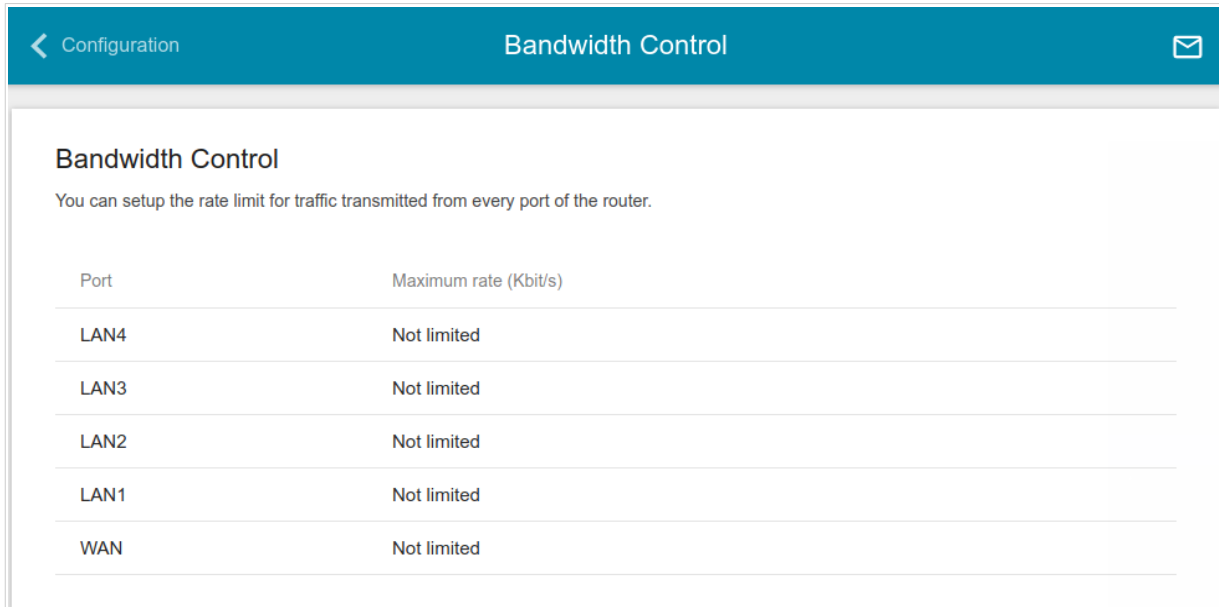


Figure 142. The **Advanced / Bandwidth Control** page.

By default, the rate is not limited. If you want to limit the rate for traffic transmitted from a port, select the line corresponding to this port.

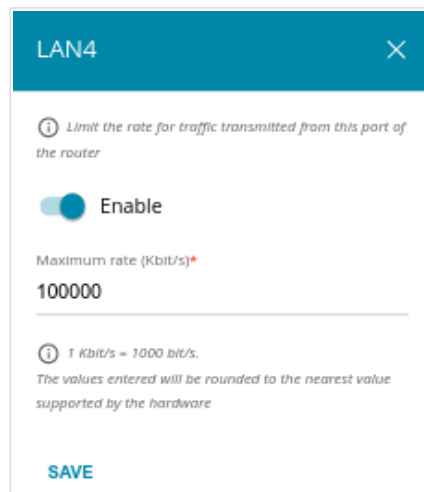


Figure 143. The window for setting up rate limit.

In the opened window, move the **Enable** switch to the right and enter the maximum value of the transmitted traffic rate for this port in the **Maximum rate** field. Then click the **SAVE** button.

If you want to remove the rate limit for this port, move the **Enable** switch to the left 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.

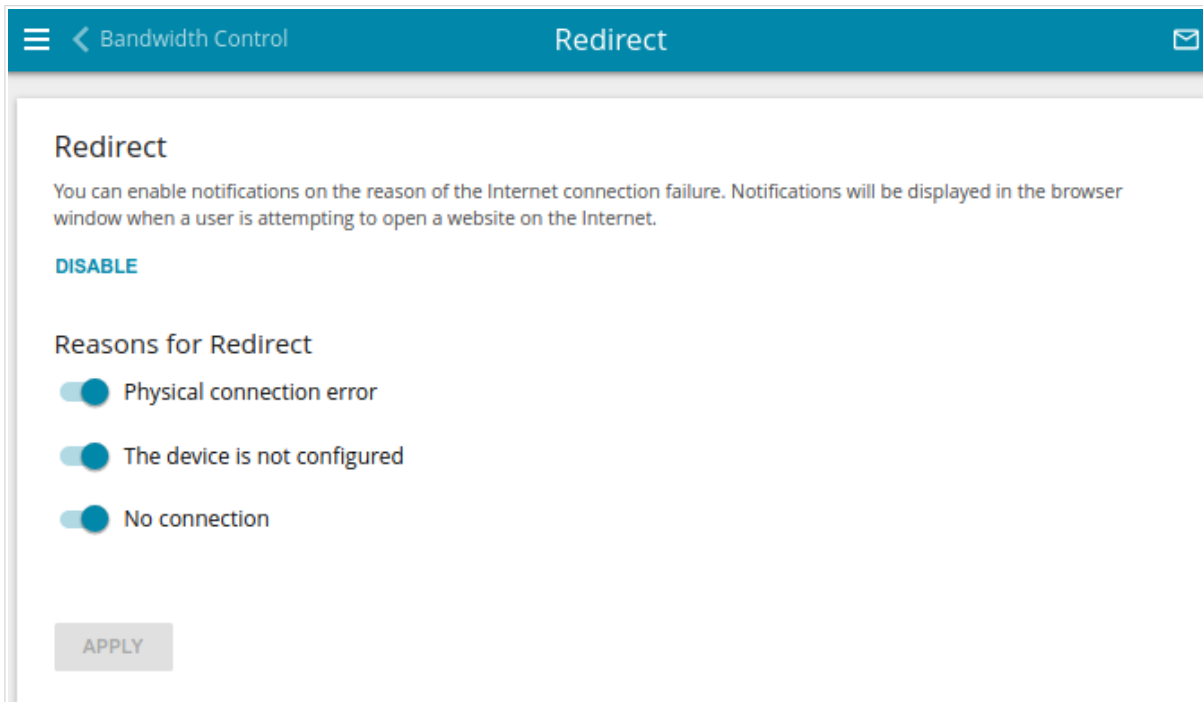


Figure 144. The **Advanced / Redirect** page.

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>The device is not configured</b>	Notifications in case when the device works with default settings.
<b>No connection</b>	Notifications in case of problems of the default WAN connection (authorization error, the IPS's server does not respond, etc.).

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.

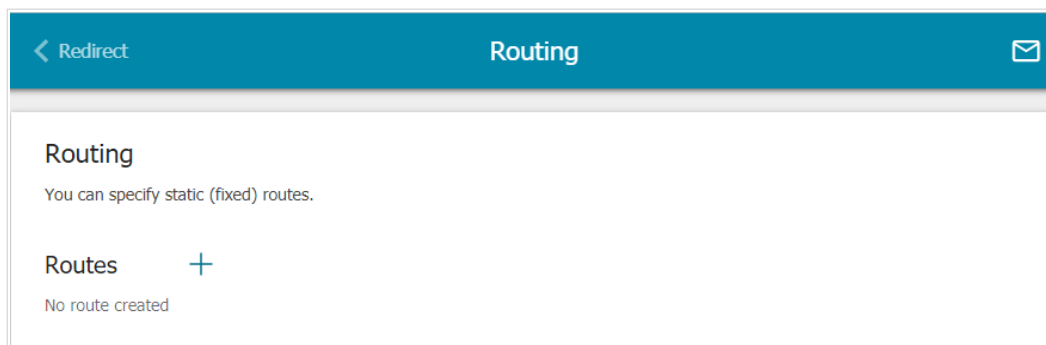


Figure 145. The **Advanced / Routing** page.

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

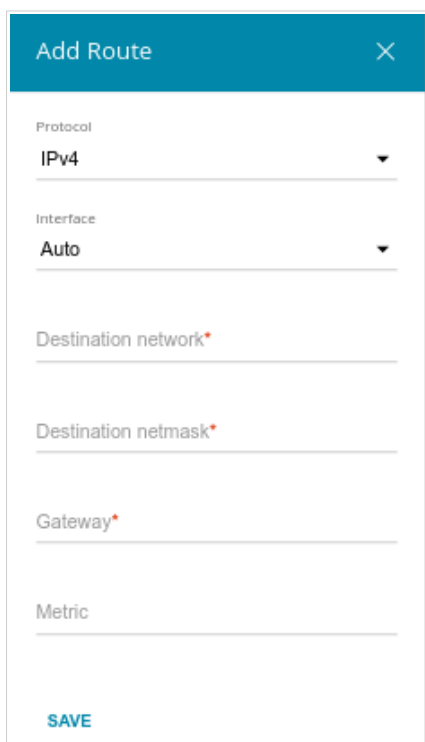
The screenshot shows a modal dialog window titled 'Add Route' with a close button (X) in the top right corner. The form contains several fields: 'Protocol' is a dropdown menu with 'IPv4' selected; 'Interface' is a dropdown menu with 'Auto' selected; 'Destination network\*' is a text input field; 'Destination netmask\*' is a text input field; 'Gateway\*' is a text input field; and 'Metric' is a text input field. At the bottom left of the dialog, there is a blue 'SAVE' button.


Figure 146. The window for adding a new route.

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

Parameter	Description
<b>Protocol</b>	An IP version.
<b>Interface</b>	From the drop-down list, select an interface through which the destination network can be accessed. If you have selected the <b>Auto</b> value, the router itself sets the interface on the basis of data on connected networks.
<b>Destination network</b>	A destination network to which this route is assigned. You can specify an IPv4 or IPv6 address. You can specify an IPv6 address ( <b>2001:db8:1234::1</b> ) or an IPv6 address with a prefix ( <b>2001:db8:1234::/64</b> ).
<b>Destination netmask</b>	<i>For IPv4 protocol only.</i> 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>

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 147. 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>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.

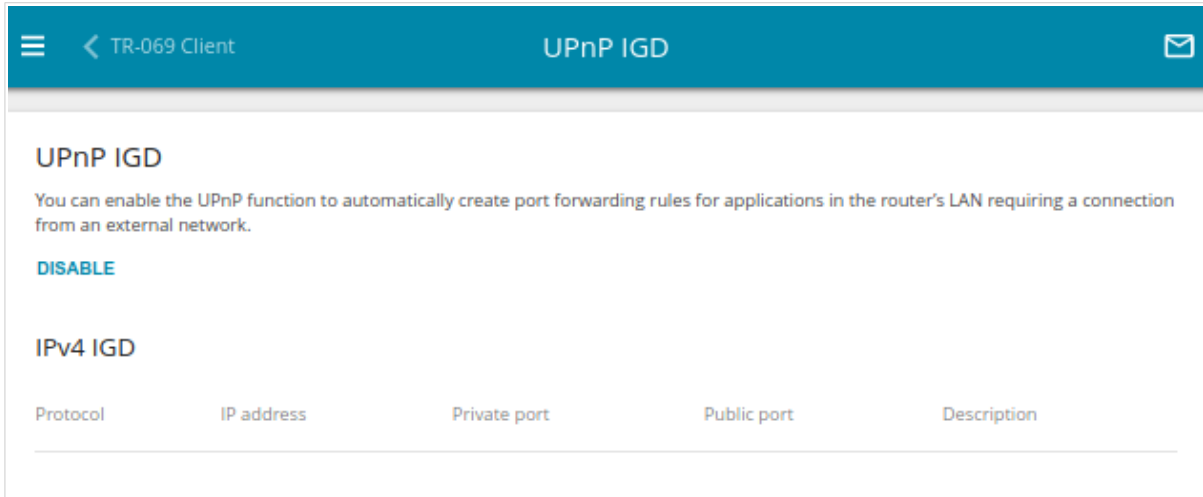


Figure 148. The **Advanced / UPnP IGD** page.

If you want to manually specify all parameters needed for network applications, click the **DISABLE** button. Then go to the **Firewall / Virtual Servers** page and specify needed settings.

If you want to enable the UPnP IGD protocol in the router, click the **ENABLE** button.

When the protocol is enabled, the router's parameters configured automatically 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.

## 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.

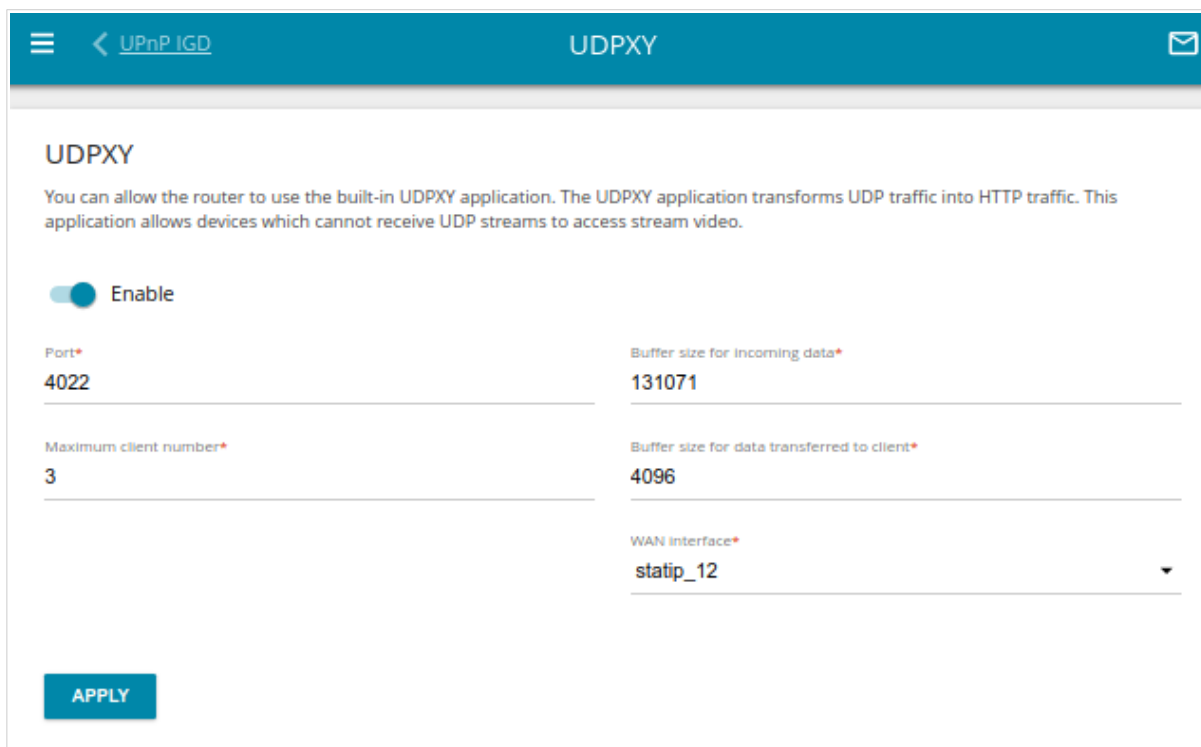


Figure 149. The **Advanced / UDPXY** page.

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. By default, the minimum acceptable value is specified.
<b>Buffer size for data transferred to client</b>	Size of intermediate buffer for transmitted data. 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
2443	192.168.0.1:4022	202.254.1.2	0

Restart

**Available HTTP requests:**

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

udpxy v. 1.0 (Build 23) standard - [Thu Jan 1 00:31:30 1970]  
udpxy and udprec are Copyright (C) 2008-2013 Pavel V. Cherenkov and licensed under GNU GPLv3

Figure 150. The UDPXY application status page.

## IGMP/MLD

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

IGMP and MLD are used for managing multicast traffic (transferring data to a group of destinations) in IPv4 and IPv6 networks correspondingly. These protocols allow using network resources for some applications, e.g., for streaming video, more efficiently.

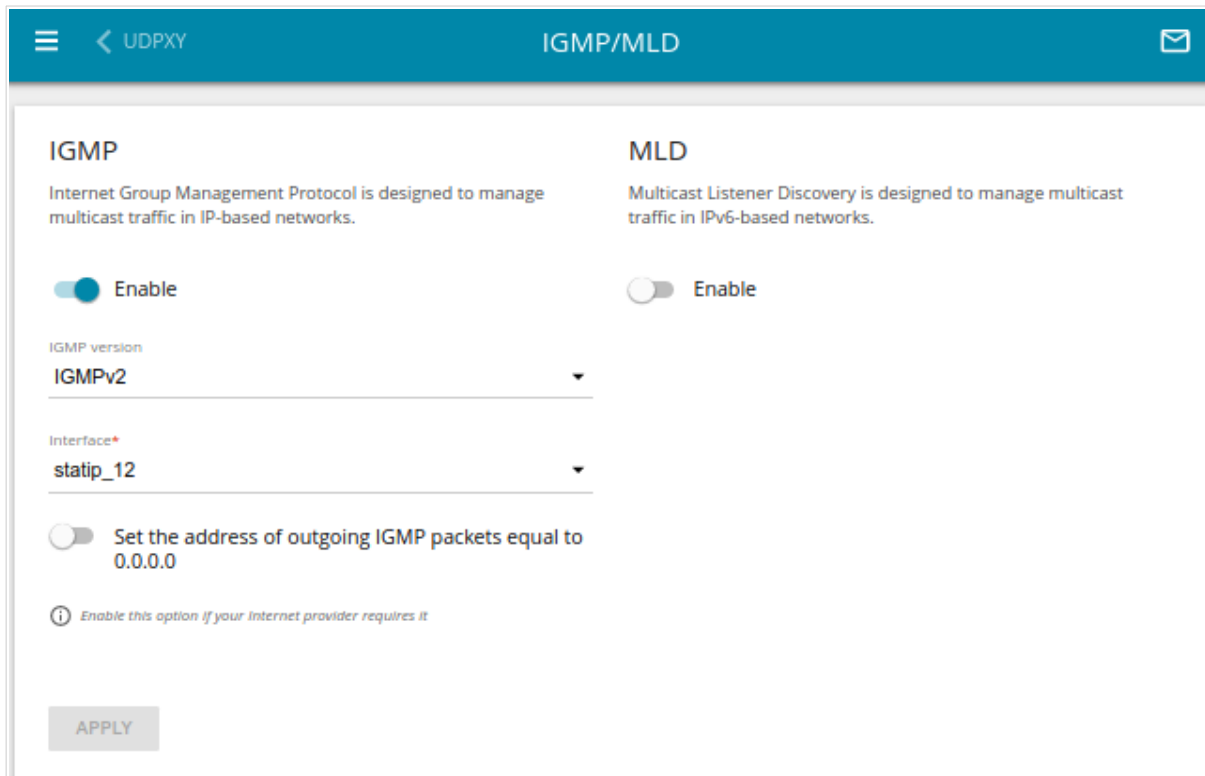


Figure 151. The **Advanced / IGMP/MLD** page.

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).
<b>Set the address of outgoing IGMP packets equal to 0.0.0.0</b>	Move the switch to the right if you want all outgoing IGMP packets to have the IP address 0.0.0.0.



Parameter	Description
<b>MLD</b>	
<b>Enable</b>	Move the switch to the right to enable MLD.
<b>MLD version</b>	Select a version of MLD from the drop-down list.
<b>Interface</b>	From the drop-down list, select a connection of the Dynamic IPv6 or Static IPv6 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.

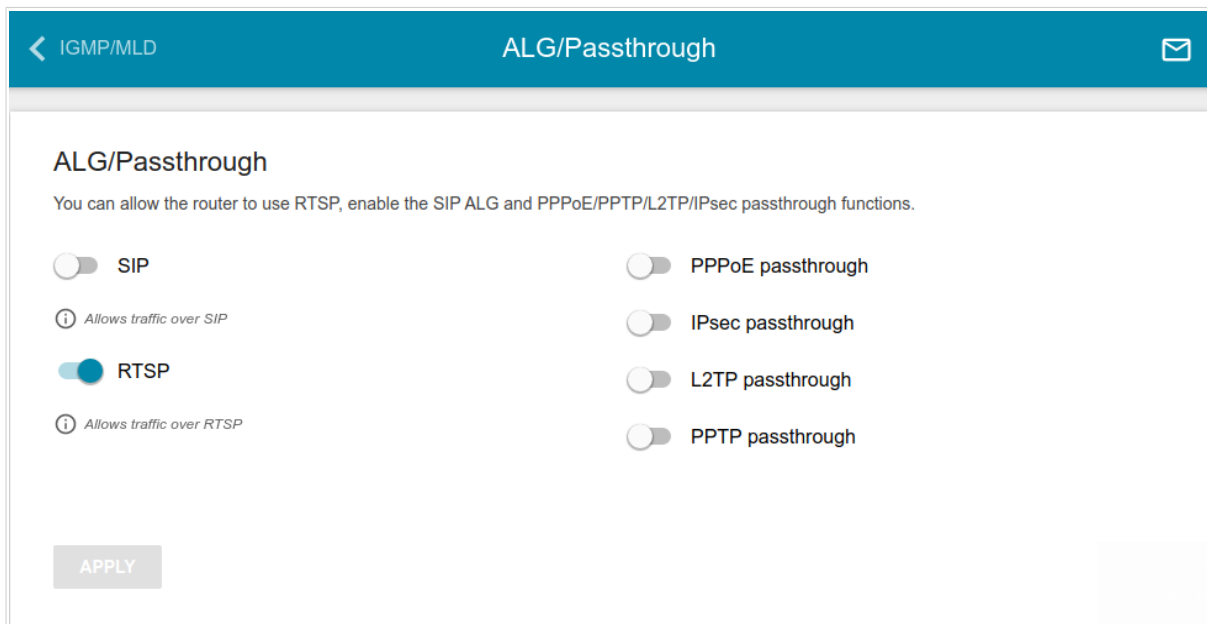


Figure 152. The **Advanced / ALG/Passthrough** page.

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>16</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>16</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).

## IPsec

On the **Advanced / IPsec** page, you can configure VPN tunnels based on IPsec protocol. IPsec is a protocol suite for securing IP communications.

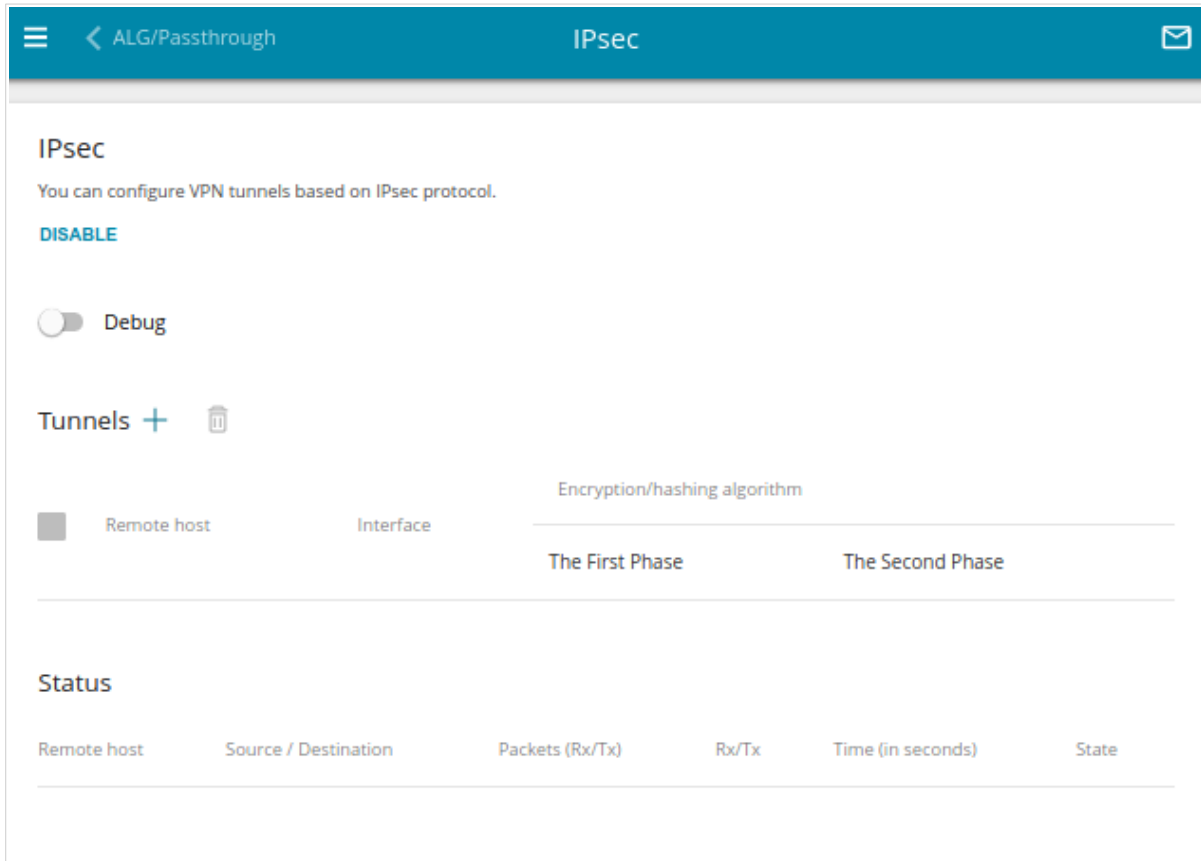



Figure 153. The **Advanced / IPsec** page.

To allow IPsec tunnels, move the **ENABLE** button. Upon that the **Tunnels** and **Status** sections are displayed on the page.

If you want to log all data on IPsec tunnel debugging, move the **Debug** switch to the right.

In the **Status** section, the current state of an existing tunnel is displayed.

To create a new tunnel, click the **ADD** button (  ) in the **Tunnels** section.

 Setting for both devices which establish the tunnel should be the same.

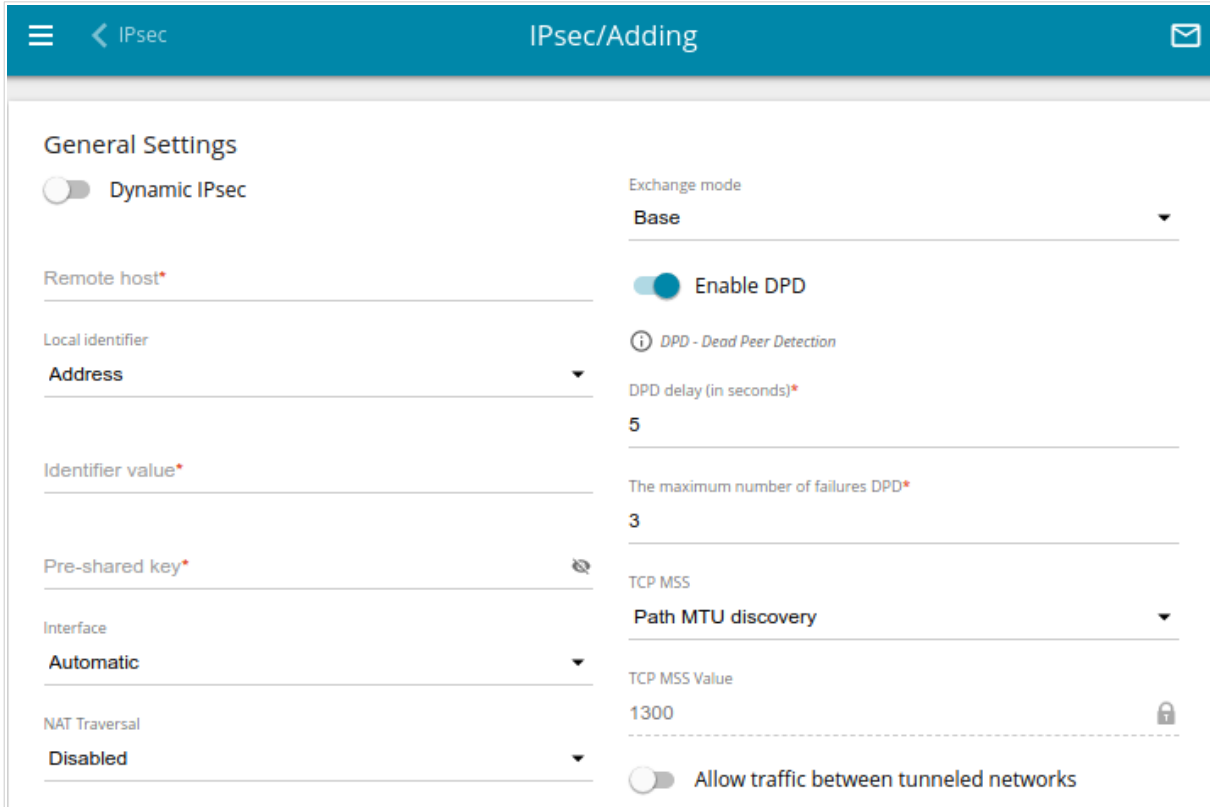


Figure 154. The page for adding an IPsec tunnel. The **General Settings** section.

You can specify the following parameters:

Parameter	Description
<b>General Settings</b>	
<b>Dynamic IPsec</b>	Move the switch to the right to allow a remote host with any public IP address to connect to the router via IPsec protocol. Such a setting can be specified for one tunnel only. Connection requests via this tunnel can be sent by a remote host only.
<b>Remote host</b>	A remote subnet VPN gateway IP address. The field is available, if the <b>Dynamic IPsec</b> switch is moved to the left.
<b>Local identifier</b>	Select an identification method for the local host (router) from the drop-down list: <ul style="list-style-type: none"> <li>• <b>Address:</b> The local host is identified by its IP address.</li> <li>• <b>FQDN:</b> The local host is identified by its domain name. The value is unavailable, if the <b>Main</b> value is selected from the <b>Exchange mode</b> list.</li> </ul>

Parameter	Description
<b>Identifier value</b>	Specify the local host identifier.
<b>Pre-shared key</b>	A key for mutual authentication of the parties.
<b>Interface</b>	Select a WAN connection through which the tunnel will pass. When the <b>Automatic</b> value is selected, the router uses the default WAN connection.
<b>NAT Traversal</b>	<p>The NAT Traversal function allows VPN traffic to pass through the NAT-enabled router.</p> <p>Select the <b>Disabled</b> value to disable the function.</p> <p>Select the <b>Enabled</b> value to enable the function if it is supported by a remote host.</p> <p>Select the <b>Force</b> value to make the function be always on, even if it is not supported by a remote host.</p>
<b>Exchange mode</b>	<p>Select the mode of negotiation from the drop-down list:</p> <ul style="list-style-type: none"> <li>• <b>Main:</b> The mode provides the most secure communication between the parties in the course of negotiation of the authentication procedures.</li> <li>• <b>Base:</b> The draft negotiation mode with preliminary authentication of a host.</li> <li>• <b>Aggressive:</b> The mode provides faster operation as it skips several stages of negotiation of the authentication procedures.</li> </ul>
<b>Enable DPD</b>	Move the switch to the right to enable using DPD protocol for this tunnel. Such a setting allows to check the status of a remote host: if encrypted packets exchange between the router and the remote host breaks down, the router starts sending DPD messages to the remote host. If the switch is moved to to the left, the <b>DPD delay</b> and <b>The maximum number of failures DPD</b> fields are not available for editing.
<b>DPD delay</b>	A time period (in seconds) between attempts to check the status of a remote host. By default, the value <b>5</b> is specified.
<b>The maximum number of failures DPD</b>	A number of DPD messages that were sent to check the status of a remote host and left unanswered. By default, the value <b>3</b> is specified. If a remote host does not answer the specified number of messages, the router breaks down the tunnel connection, removes the encryption keys, and tries to activate the connection.

Parameter	Description
<b>TCP MSS</b>	<p><i>Maximum Segment Size of a TCP packet.</i> This parameter influences the size of a TCP packet which will be sent from a remote host to the router.</p> <p>If the <b>Manual</b> value is selected, you can specify the parameter in the <b>TCP MSS Value</b> field.</p> <p>If the <b>Path MTU discovery</b> value is selected, the parameter will be configured automatically.</p>
<b>TCP MSS Value</b>	The maximum size (in bytes) of a non-fragmented packet. The field is available for editing when the <b>Manual</b> value is selected from the <b>TCP MSS</b> drop-down list.
<b>Allow traffic between tunneled networks</b>	Move the switch to the right to allow data exchange between subnets with which IPsec tunnels have been created.


The First Phase	The Second Phase
First phase encryption algorithm DES	Second phase encryption algorithm DES
Hashing algorithm MD5	Authentication algorithm HMAC-MD5
First phase DHgroup type modp768	<input checked="" type="checkbox"/> Enable PFS
IKE-SA lifetime* 28800	Second phase PFSgroup type modp768
	IPsec-SA lifetime* 3600

Figure 155. The page for adding an IPsec tunnel. **The First Phase / The Second Phase** sections.

Parameter	Description
<b>The First Phase</b>	
<b>First phase encryption algorithm</b>	Select encryption algorithm from the drop-down list.
<b>Hashing algorithm</b>	Select hashing algorithm from the drop-down list.
<b>First phase DHgroup type</b>	A Diffie-Hellman key group for Phase 1. Select a value from the drop-down list.
<b>IKE-SA lifetime</b>	The lifetime of IKE-SA keys in seconds. After the specified period it is required to renegotiate the keys. The value specified in this field should exceed the value specified in the <b>IPsec-SA lifetime</b> field. Specify <b>0</b> if you don't want to limit the lifetime of the keys.
<b>The Second Phase</b>	
<b>Second phase encryption algorithm</b>	Select encryption algorithm from the drop-down list.
<b>Authentication algorithm</b>	Select authentication algorithm from the drop-down list.
<b>Enable PFS</b>	Move the switch to the right to enable the PFS option ( <i>Perfect Forward Secrecy</i> ). If the switch is moved to the right, a new encryption key exchange will be used for Phase 2. This option increases the security level of data transfer.
<b>Second phase PFSgroup type</b>	A Diffie-Hellman key group for Phase 2. Select a value from the drop-down list. The field is available, if the <b>Enable PFS</b> switch is moved to the right.



Parameter	Description
<b>IPsec-SA lifetime</b>	The lifetime of IPsec-SA keys in seconds. After the specified period it is required to renegotiate the keys. Specify <b>0</b> if you don't want to limit the lifetime of the keys.

If you need to specify IP addresses of local and remote subnets for creating a tunnel, click the **ADD** button (  ) in the **Tunneled Networks** section.

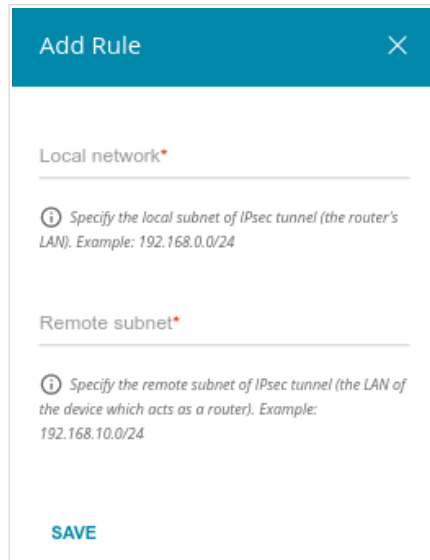



Figure 156. The page for adding an IPsec tunnel. The window for adding a tunneled network.

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


Parameter	Description
<b>Local network</b>	A local subnet IP address and mask.
<b>Remote subnet</b>	A remote subnet IP address and mask.

To edit fields in the **Tunneled Networks** section, select the relevant line in the table. In the opened window, change the needed parameters and click the **SAVE** button.

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

After configuring all needed settings for the IPsec tunnel, click the **APPLY** button.

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

To remove an existing tunnel, select the checkbox located to the left of the relevant line in the table and click the **DELETE** button (  ). Also you can remove a tunnel on the editing page.

To disable VPN tunnels based on IPsec protocol, click the **DISABLE** button.

## 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
- configure protection against DoS attacks
- 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.

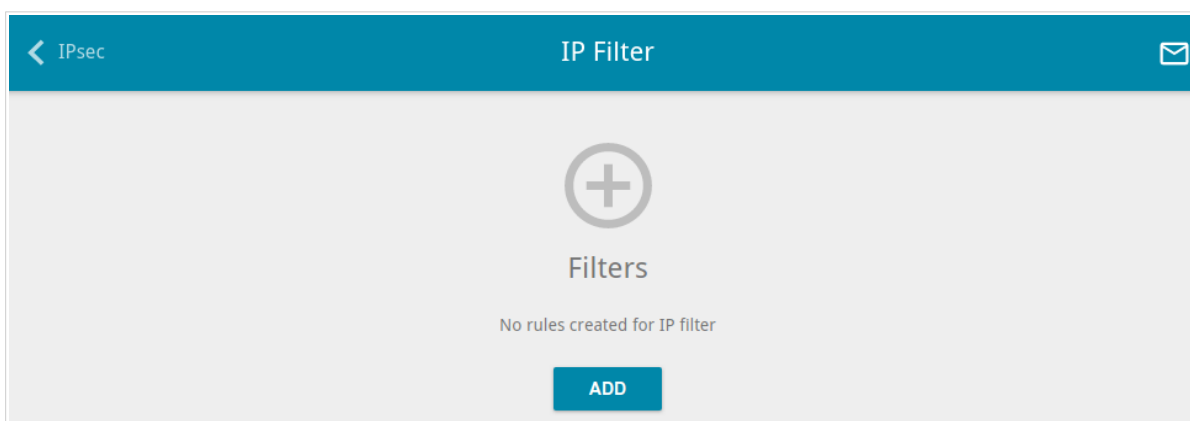


Figure 157. The **Firewall / IP Filter** page.

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

Figure 158. 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. 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>	Select an action for the rule. <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>	A protocol for network packet transmission. Select a value from the drop-down list.
<b>IP version</b>	An IP version to which the rule will be applied. Select the relevant value from the drop-down list.
<b>Source 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 source host start IPv4 or IPv6 address. If it is necessary to specify a single address, leave the <b>End IPv4 address / End IPv6 address</b> field blank. 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 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. If it is necessary to specify a single address, leave the <b>End IPv4 address / End IPv6 address</b> field blank. 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.

Parameter	Description
<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 edit a rule for IP filtering, select the relevant line in the table. On the opened page, change the needed parameters and click the **APPLY** 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.

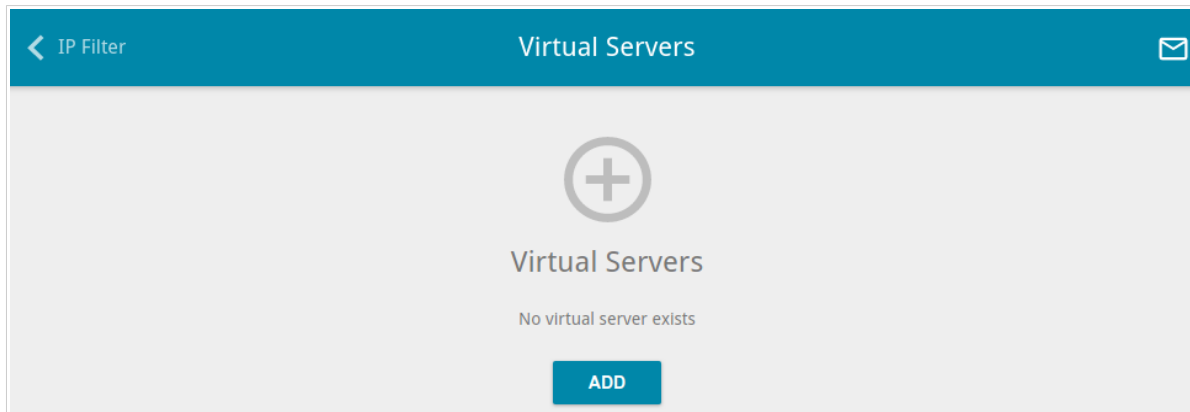


Figure 159. The **Firewall / Virtual Servers** page.

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

Figure 160. The page for adding a virtual server.


You can specify the following parameters:

Parameter	Description
<b>General Settings</b>	
<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.

Parameter	Description
<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. To add one more IP address, click the <b>ADD REMOTE IP</b> button and enter the address in the displayed line. To remove the IP address, click the <b>Delete</b> icon (✕) in the line of the address.
<b>Public port (start) / Public port (end)</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. Specify the start and the end value for the port range. If you need to specify one port, enter the needed value in the <b>Public port (start)</b> field and leave the <b>Public port (end)</b> field blank.
<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 (start) / Private port (end)</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> . Specify the start and the end value for the port range. If you need to specify one port, enter the needed value in the <b>Private port (start)</b> field and leave the <b>Private port (end)</b> field blank.

Click the **APPLY** 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 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 server 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.

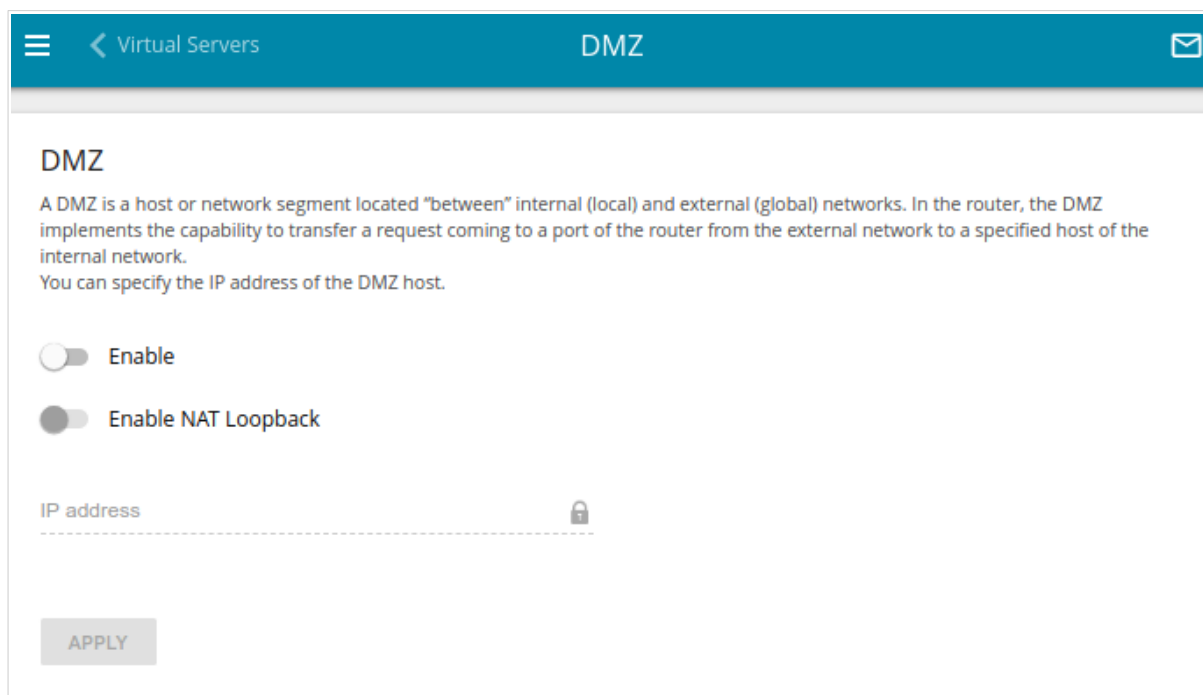


Figure 161. The **Firewall / DMZ** page.

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 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.

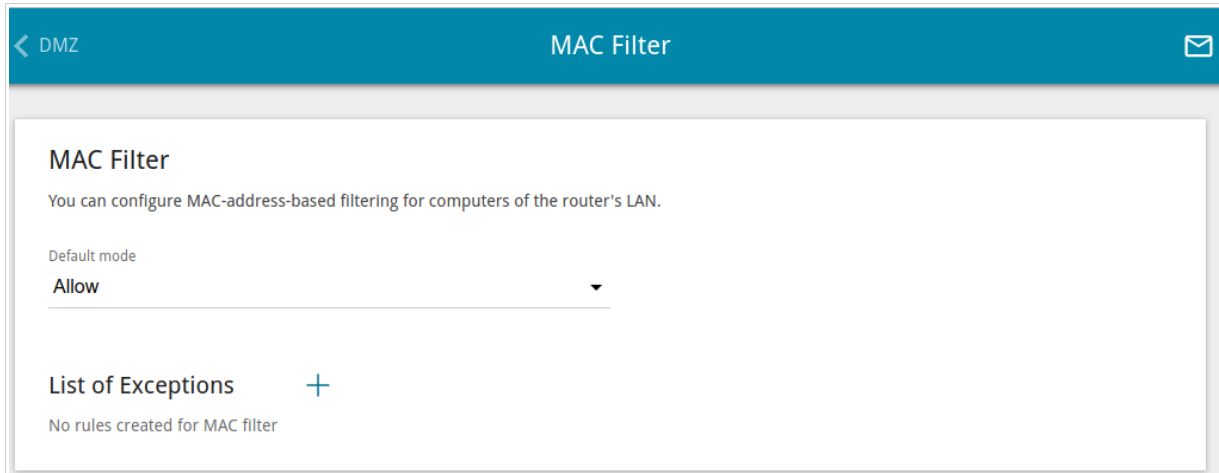


Figure 162. The **Firewall / MAC Filter** page.

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 ( **+** ).

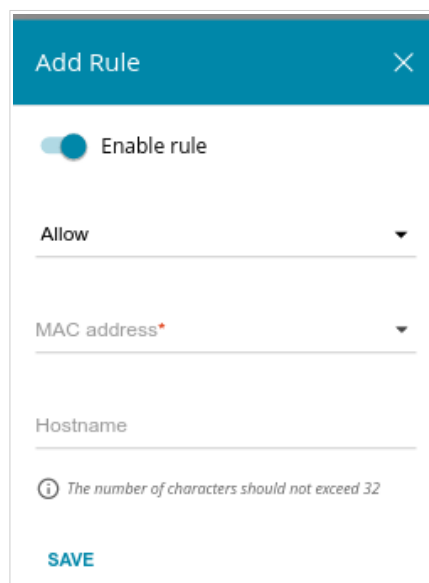



Figure 163. The window for adding a rule for the MAC filter.

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. 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>Hostname</b>	The name of the device for easier identification. You can specify any name.

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

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

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

## 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.

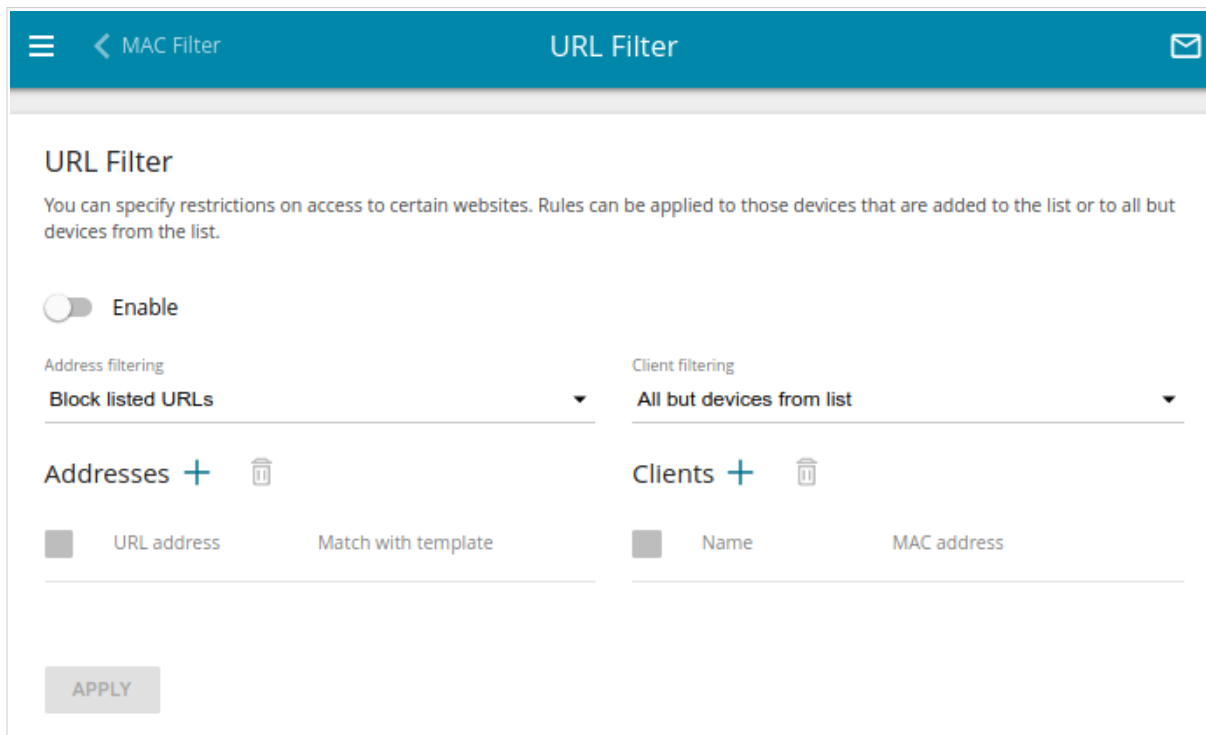


Figure 164. The **Firewall / URL Filter** page.

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). Then specify a name of the device for easier identification in the **Name** field 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.

## DoS Protection

On the **Firewall / DoS Protection** page, you can configure protection against DoS attacks of different types.

DoS (*Denial of Service*) attacks are network attacks during which the router and devices connected to it are flooded with more requests than they can handle, which leads to significant reduce of performance or even their malfunction.

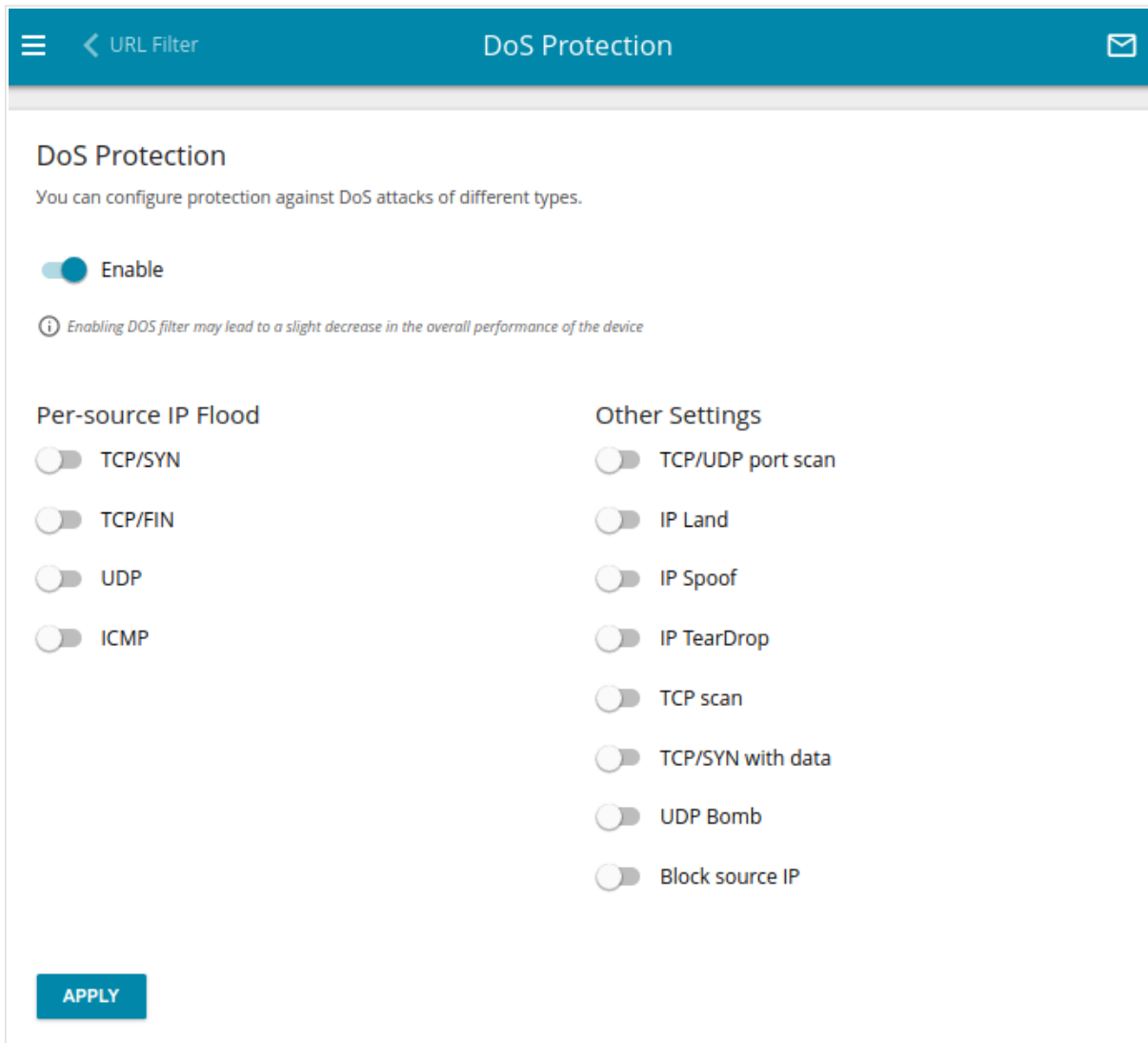


Figure 165. The **Firewall / DoS Protection** page.

To enable protection against DoS attacks, move the **Enable** switch to the right. Upon that the **Per-source IP Flood** and **Other Settings** sections are displayed on the page.

In the **Per-source IP Flood** section, you can enable protection against main types of DoS attacks.

Parameter	Description
<b>TCP/SYN</b>	Enables protection against a flood with connection requests (TCP packets with the SYN flag).
<b>TCP/FIN</b>	Enables protection against a flood with requests for connection termination (TCP packets with the FIN flag).
<b>UDP</b>	Enables protection against a flood with UDP packets.
<b>ICMP</b>	Enables protection against a flood with ICMP packets.

Move the relevant switches to the right. In the **threshold** field corresponding to the switch, specify the maximum number of packets which arrive from one IP address within one second. The value of the field should be greater than zero (for example, **200**). Then, in the **Other Settings** section, move the **Block source IP** switch to the right, and in the **Block time** field, specify the time period (in seconds) during which the source IP address will be blocked. For example, you can specify **120**. When the threshold value is exceeded, the source of packets will be blocked for the specified time period.

In the **Other Settings** section, you can activate additional protection methods.

Parameter	Description
<b>TCP/UDP port scan</b>	Blocks the source of TCP or UDP packets which check the ports state if the router receives more than 200 requests per second from one IP address. The source of packets will be blocked during the time period specified in the <b>Block time</b> field (the field is displayed if the <b>Block source IP</b> switch is moved to the right). If the switch is moved to the right, the <b>High sensitivity</b> switch is displayed on the page. Activate the setting to let the router block the source if it sends more than 10 requests per second.
<b>IP Land</b>	Blocks TCP packets with the SYN flag in which the source IP address and port coincides with the destination IP address and port.
<b>IP Spoof</b>	Block packets in which the source IP address coincides with the router's LAN IP address.
<b>IP TearDrop</b>	Blocks fragmented IP packets if errors can occur upon assembling these packets.
<b>TCP scan</b>	Blocks TCP packets with invalid flags.
<b>TCP/SYN with data</b>	Blocks TCP packets with the SYN flag if they are fragmented or contain data.
<b>UDP Bomb</b>	Blocks UDP packets if they contain incorrect service data.

Parameter	Description
<b>Block source IP</b>	Move the switch to the right to block the sources of packets protection against which is activated in the <b>Other Settings</b> section for a certain time period. Then, in the <b>Block time</b> field displayed, specify the needed value (in seconds).

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

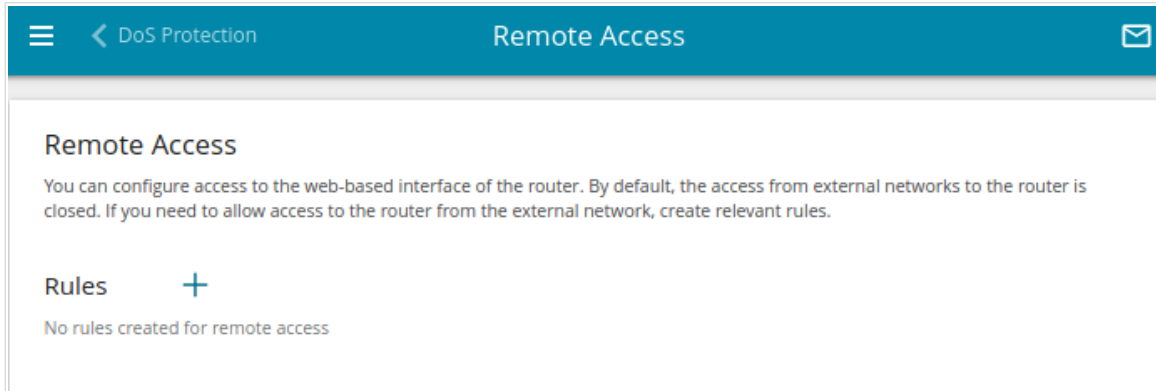


Figure 166. The **Firewall / Remote Access** page.

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


Figure 167. 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> The mask of the subnet.
<b>Public port</b>	<i>For the IPv4-based network only.</i> 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 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 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 or configure automatic reboot on a schedule
- change the web-based interface language
- update the firmware of the router
- configure automatic notification on new firmware version
- view the system log; configure sending the system log to a remote host and/or a USB storage connected to the router
- 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
- configure automatic synchronization of the system time or manually configure the date and time for the router.

## 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, 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, change the web-based interface language, or configure automatic reboot of the device on a schedule.

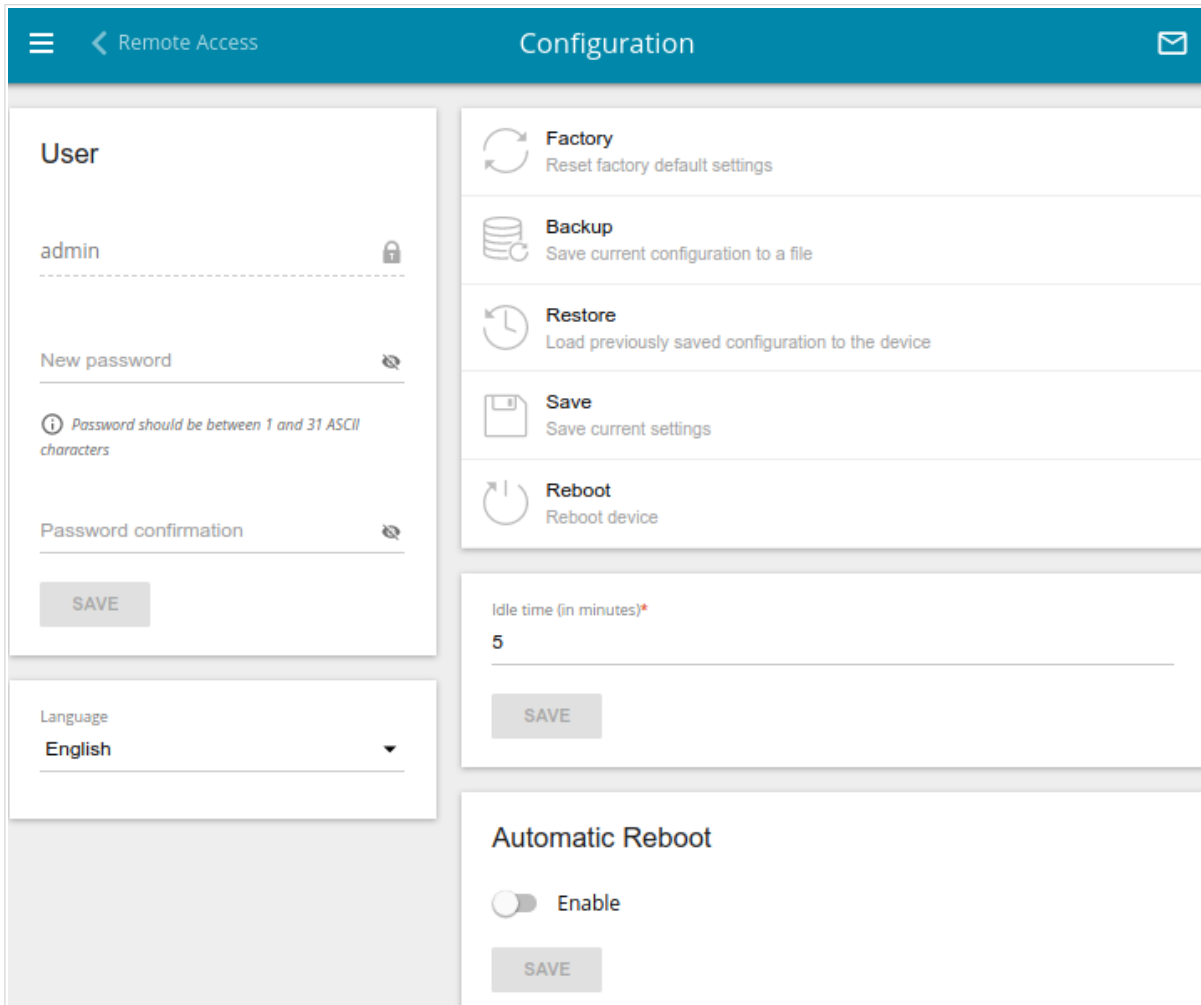


Figure 168. The **System / Configuration** page.

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>17</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 **RESET** button. This procedure wipes out all settings that you have configured for your router.

<sup>17</sup> 0-9, A-Z, a-z, space, !"#\$%&'()\*+,-./:;<=>?@[\\]^\_`{|}~.

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

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>RESET</b> button (see the <i>Back and Bottom Panels</i> section, page 18).
<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. 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.

To configure automatic reboot of the device on a schedule, in the **Automatic Reboot** section, move the **Enable** switch to the right and specify the time period for the device's reboot (in seconds) in the **Period** field. Click the **SAVE** button.

To disable automatic reboot of the device on a schedule, in the **Automatic Reboot** section, move the **Enable** switch to the left and 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.

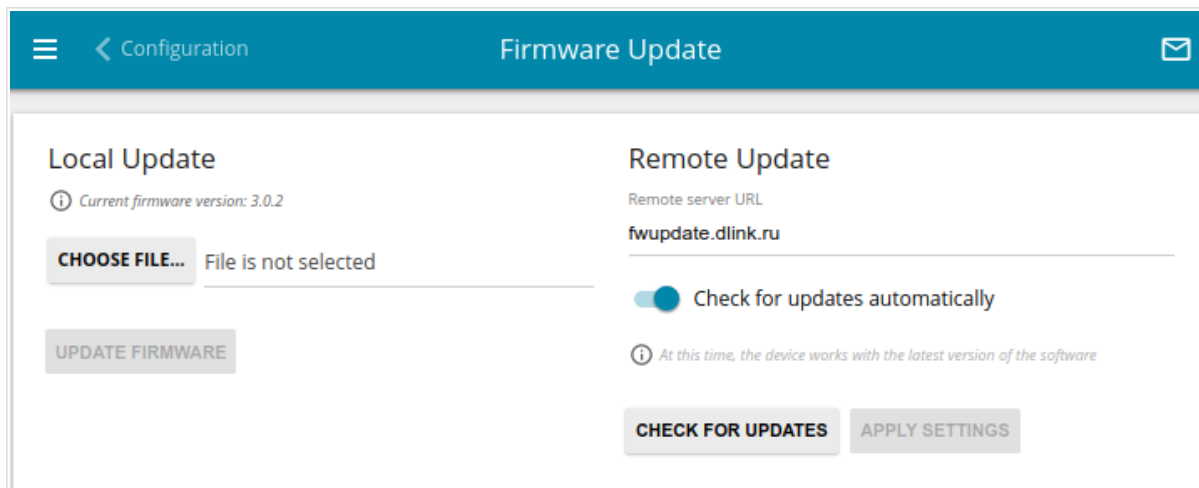


Figure 169. The **System / Firmware Update** page.

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 a firmware update is available, a notification will be displayed in the top right corner of the page.

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

To enable the automatic check for firmware updates, in the **Remote Update** section, move the **Check for updates automatically** switch to the right and click the **APPLY SETTINGS** button.

By default, in the **Remote server URL** field, the D-Link update server address (`fwupdate.dlink.ru`) is specified.

You can update the firmware of the 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. Click the **UPDATE FIRMWARE** button.
4. Wait until the router is rebooted (about one and a half or two minutes).
5. Log into the web-based interface using the login (**admin**) and the current password.

If after updating the firmware the 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.




## Log

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

The screenshot displays the 'Log' configuration page in the 'Settings' tab. At the top, there is a navigation bar with a back arrow, 'Configuration', 'Log', and a mail icon. Below this is a sub-header with 'Log' and 'Settings' tabs. The main content area is titled 'Logging' and includes the instruction: 'You can set the system log options.' A toggle switch for 'Enable' is turned on. Below this are two dropdown menus: 'Type' set to 'Remote and local' and 'Level' set to 'Informational messages'. An information icon and text state: 'The system log is stored in the router's memory and sent to the remote host specified in the "Server" field'. There are input fields for 'Server\*' and 'Port\*' with the value '514'. The 'Record to USB' section has a sub-instruction: 'You can configure sending the system log to a USB storage connected to the router.' and a toggle switch for 'Save log to a USB storage' which is currently off. The 'USB Storage' section shows a USB icon, 'Transcend 8GB usb1\_1', and an 'UNMOUNT' button. A note below says: 'Unmount the USB storage device before removing'. At the bottom left is a blue 'APPLY' button.

Figure 170. 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.
<b>Record to USB</b>	
<b>USB Storage</b>	<p>If a USB storage is connected to the router, its name is displayed in the field.</p> <p>To safely disconnect the USB storage, click the <b>UNMOUNT</b> button.</p>
<b>Save log to a USB storage</b>	Move the switch to the right so that the device could send the system log to the USB storage connected to it. Upon that the <b>Path</b> , <b>File name</b> , <b>The maximum size of one file</b> , and <b>Number of files to keep</b> fields are displayed.
<b>Path</b>	Click the <b>Search</b> icon (  ) located to the right of the field in order to locate the folder where system log files will be stored.
<b>File name</b>	A name for system log files.
<b>The maximum size of one file</b>	The maximum size (in kilobytes) of one system log file.
<b>Number of files to keep</b>	The maximum number of files allowed to be recorded on the USB storage. When this number is exceeded, the file containing the oldest data will be deleted. The field is available for editing if the value specified in the <b>The maximum size of one file</b> field is greater than zero.

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.

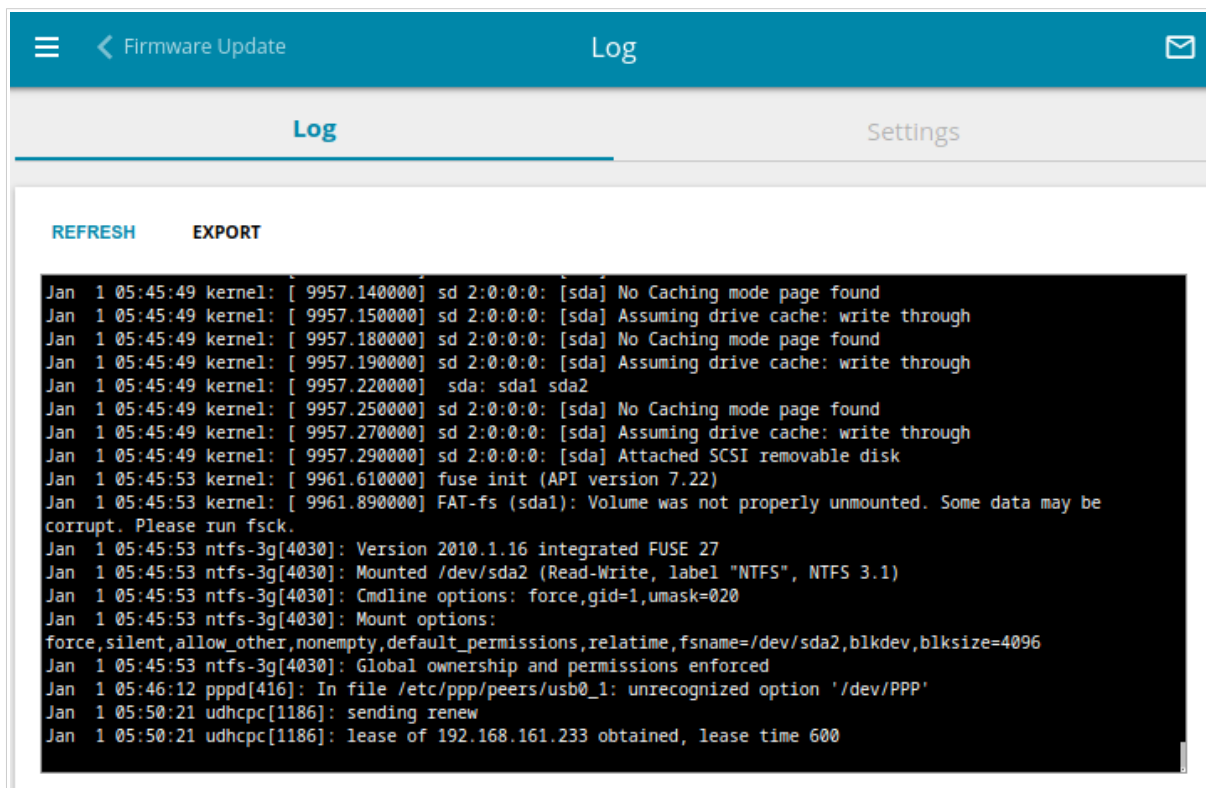


Figure 171. The **System / Log** page. The **Log** tab.

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.

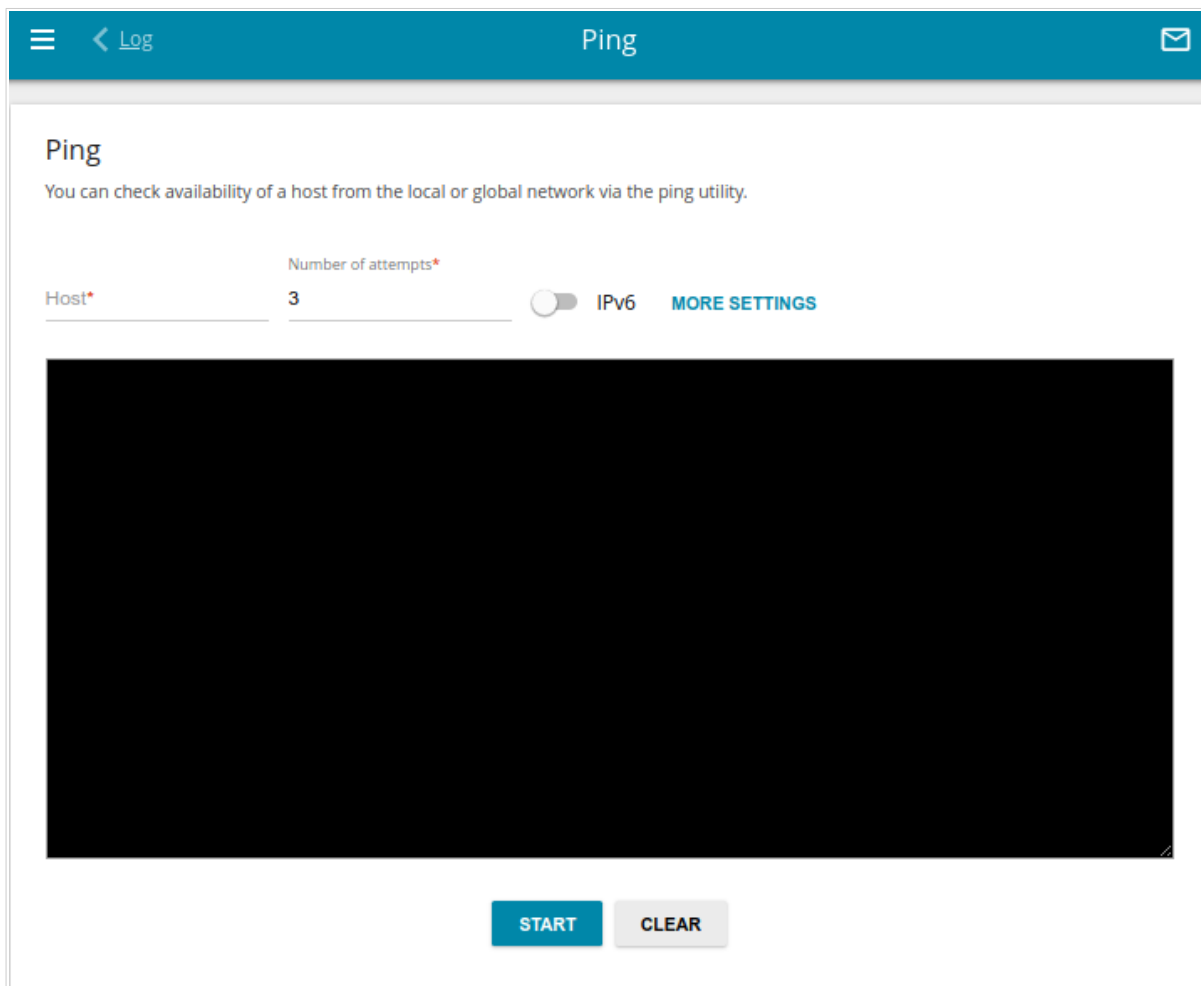
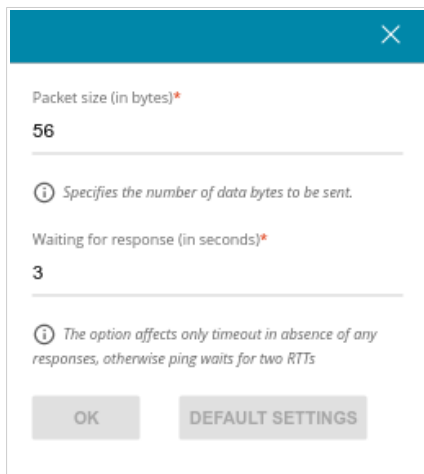


Figure 172. The **System / Ping** page.

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 173. 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.

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.

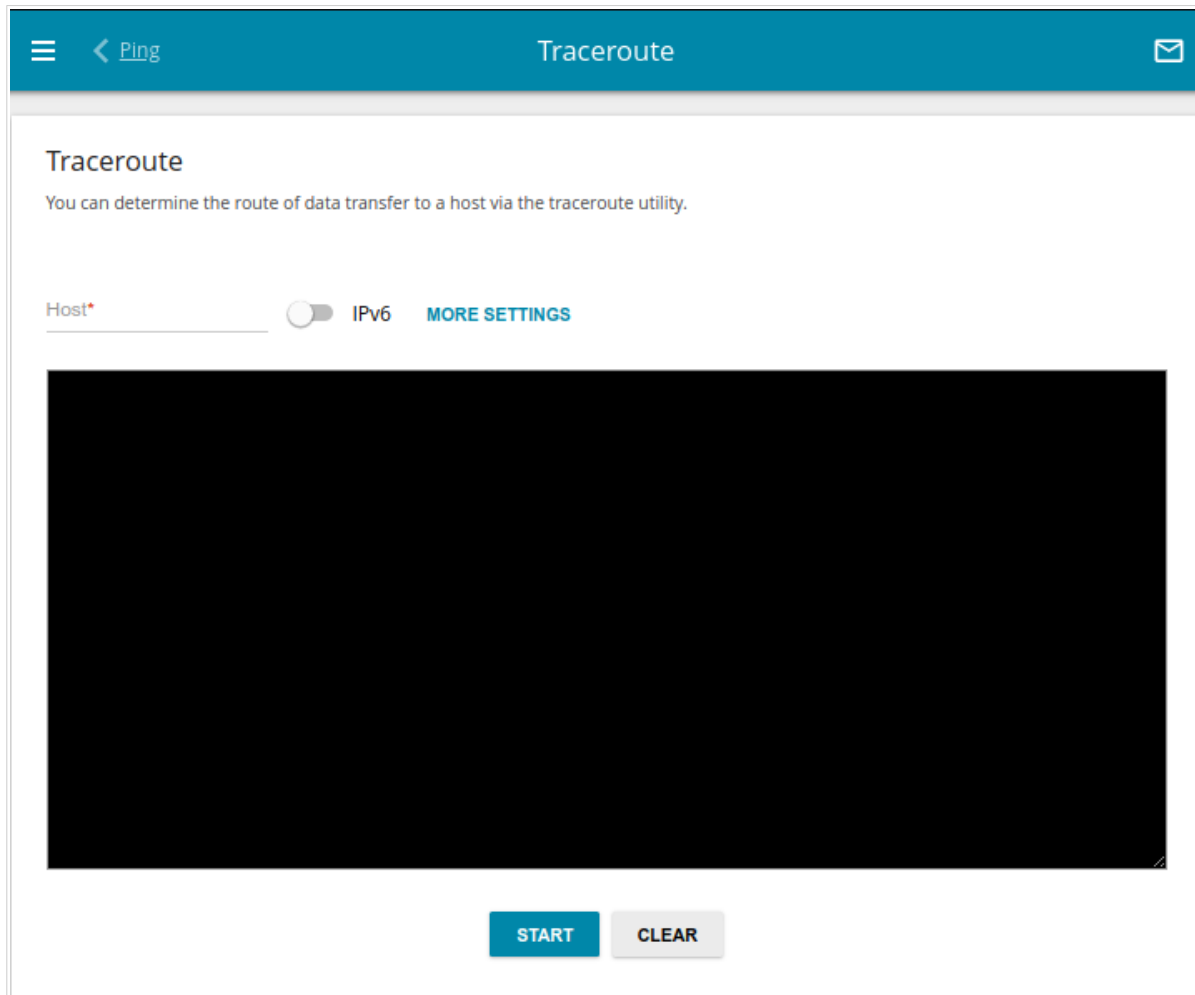


Figure 174. The **System / Traceroute** page.

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.

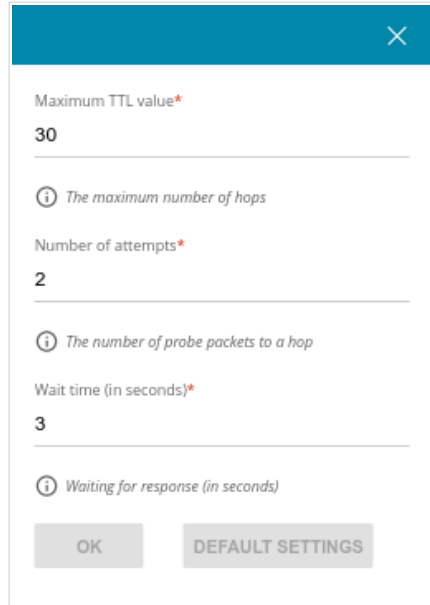


Figure 175. The **System / Traceroute** page. The additional settings window.

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 30.
<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.

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

## Telnet

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

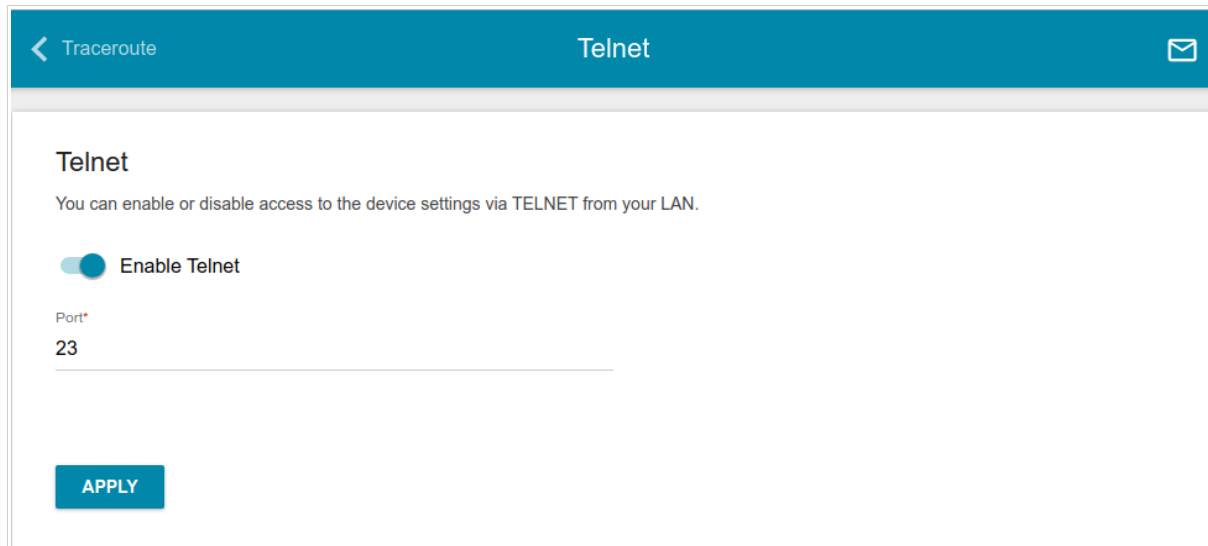


Figure 176. The **System / Telnet** page.

To enable access via TELNET, move the **Enable Telnet** 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). Then click the **APPLY** button.

To disable access via TELNET again, move the **Enable Telnet** 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.

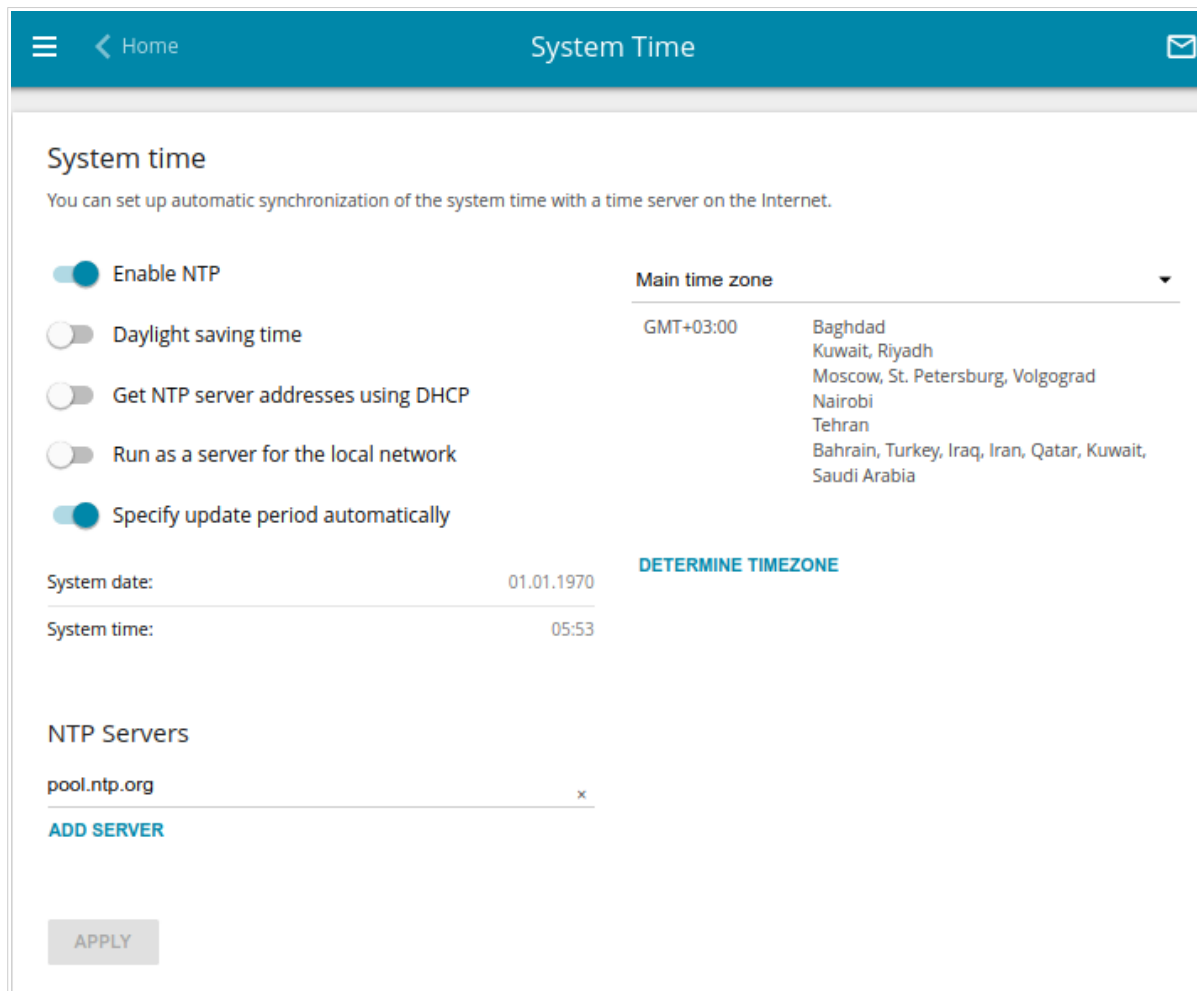


Figure 177. The **System / System Time** page.

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 **Main 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.

To enable the router to automatically adjust to daylight saving time, move the **Daylight saving time** switch to the right. From the **Daylight saving time zone** drop-down list, select the time zone that will be used during summer time and specify the needed values in the **Beginning of daylight saving time** and **End of daylight saving time** sections. Click the **APPLY** button.

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

To allow connected devices to use the IP address of the router in the local subnet as a time server, move the **Run as a server for the local network** switch to the right and click the **APPLY** button.

By default, the system is configured to automatically determine the system time synchronization interval. Upon that the **Specify update period automatically** switch is moved to the right. To configure the synchronization interval of the system time manually, move the **Specify update period automatically** switch to the left, and in the **Update period** field, specify the needed value (in minutes).

 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).

## 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-815 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-815 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