User guide

for Icotera i4882-00 gateways with the firmware version 2.2.5

Published: September 2024

Document version: 1.0

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Product overview

This chapter provides a general overview of the Icotera i4882-00 gateway, its components, features and characteristics. For specifications, see the product datasheet at https://icotera.com.

Physical description

This section describes the physical components of the Icotera i4882-00 gateway, such as connectors, LED indicators, and buttons.

Connector panel

The Icotera i4882-00 connector panel, shown in the following figure, contains the WAN port, LAN ports, USB port, WPS button, power port, on/off switch, and reset button.

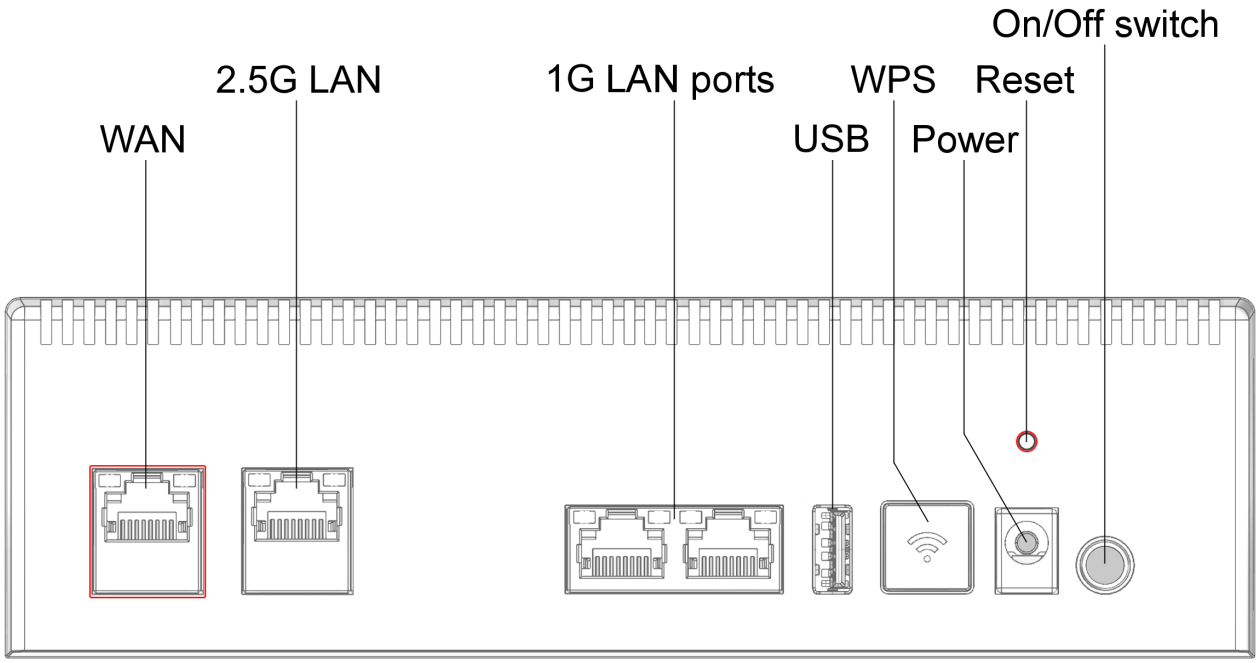

Figure 1. The Icotera i4882-00 connector panel

Status LED indicators

You can see the status LED indicators on the left of the front panel. The middle LED indicator is unused in Icotera i4882-00 gateways.

Also, you can see the link activity and status LED indicators on each of the Ethernet ports of the connector panel.

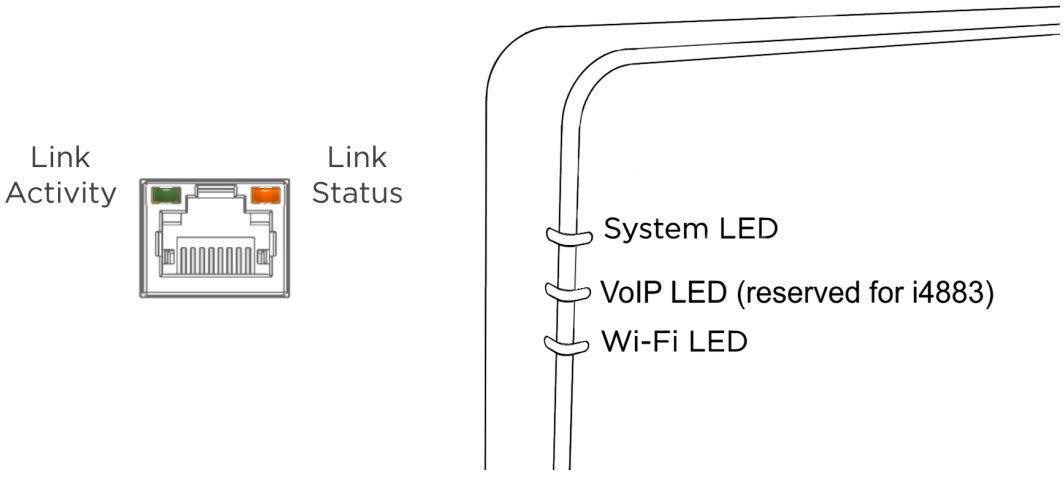

Figure 2. Status LED indicators

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The following table shows the status LED indicator descriptions.

Table 1. The status LED indicator descriptions

LED type	Type	Colour	State	Description
Link activity	Ethernet port activity	Green	Solid	The gateway established a communication link.
			Blinking	Network activity occurs on this port.
			Off	The Ethernet connection is down for this port.
Link status	LAN port status	Orange	Solid	The port operates at 1 Gbps for the 1 Gbps port or 2.5 Gbps for the 2.5 Gbps port.
			Off	The port operates at a lower throughput. For example, the 2.5 Gbps port operates at 10, 100, or 1000 Mbps.
System	System status and activity	N/A	Off	When the auto-off feature is enabled, users can shortly press the WPS button to trigger the system LED indicator.
		Green	Blinking	The firmware upgrade is in progress.
			Solid	The gateway established an Internet connection.
		Red	Blinking	The gateway did not boot, initialise or provision correctly.
			Blinking fast	The firmware upgrade failed.
			Solid	The gateway did not obtain the IP address, or the Internet connection is unavailable.
		Orange	Blinking	The gateway is booting, initialising, or provisioning.
Wi-Fi	Wi-Fi status and activity	N/A	Off	When the auto-off feature is enabled, users can shortly press the WPS button to trigger the Wi-Fi LED indicator.
		Blue	Blinking	The pairing is in progress.
			Blinking fast	The pairing failed. Users can start a new pairing session while the LED indicator blinks.
			Solid	The gateway t completed the pairing. The LED indicator lights solid blue for 15 seconds.
		Green	Solid	Wi-Fi is active.
		Red	Solid	Wi-Fi is active, and users can access the web interface. The gateway did not obtain the IP address, or the Internet connection is unavailable.

Connectors

The i4882-00 connector panel includes 1 RJ45 100/1000/2500 BaseT WAN port, 1 RJ45 connector 100/1000/2500 BaseT LAN port, two RJ45 connectors 10/100/1000 BaseT(x) ports, and 1 USB 2.0 port.

Ethernet ports

The Icotera i4882-00 uses 100/1000/2500 Base Tx and 10/100/1000 BaseTx port connectors configured as MDI/MDIX. The gateway uses auto-sense ports that are designed to operate at 10 Mbps, 100 Mbps, or 1000 Mbps (2500 Mbps WAN), depending on the connecting device. These ports support the IEEE 802.3u auto-negotiation standard, which means that when a port is connected to another device that also supports the IEEE 802.3u standard, then the two devices negotiate the best speed and duplex mode. The 10Base-T/100Base-TX/1000Base-T RJ-45 switch ports also support half- and full-duplex mode operation and can connect to 10 Mbps, 100 Mbps or 1000 Mbps Ethernet segments or nodes.

USB port

The Icotera i4882-00 has one USB 2.0 port that supplies 5 V at 500 mA.

Power port

The power port accepts a DC 12 V power source. Make sure that the power adapter is suitable for your region.

On/Off switch

You can use the On/Off switch to turn on or off the gateway, as well as reboot it and restore the last saved configuration.

Reset button

You can use the reset button to restart the gateway, restore the factory default settings, or switch to a different memory bank.

To restart your working gateway, press the reset button for up to 5 seconds

To restore the factory default settings on your working gateway, press the reset button for 5–30 seconds. To restore the factory default settings on the gateway that is turned off, press the reset button for 5 seconds.

To switch the gateway that is turned off to a different memory bank, press the reset button for more than 30 seconds. The memory in Icotera i4882-00 gateways is divided into two banks. At a single point in time, the gateway can use one of these banks. You might switch to a different memory bank, for example, when the gateway stops responding after a firmware upgrade.

Serial number

The serial number of the Icotera gateway consists of 13 digits. The format of the serial number is `PPPPCCXXXXXXX`, where `PPPP` is the product identifier, `CC` is the product variant, and `XXXXXXX` is the running serial number. For example, `4882001234567` is the serial number of the Icotera i4882-00 gateway with a running number of `1234567`.

Recommended Wi-Fi mesh installation scenarios

This chapter describes possible connection scenarios between your gateway and supported access points. This chapter also includes best practices for creating a mesh network and provides troubleshooting suggestions.

The Icotera i4882 gateways and the Icotera i3560 access point (AP) can support up to four access points in a mesh network with a single controller access point and up to three wired or wireless APs. This configuration helps deliver a strong Wi-Fi signal to virtually every spot of the residential premises.

Turn on SONiQ on your gateway. Make sure that your gateway runs on the firmware version 2.2.0 or higher. Also, make sure that your access points run on the firmware version 1.1.2 or higher.

You can accomplish this configuration by using one of the following scenarios.

Scenario 1: Connecting an Icotera gateway with wired access points

In the first scenario, you use an Icotera i4882 gateway as a controller access point. Optionally, you can use an unmanaged third-party switch that is transparent to 802.1Q VLANs.

You use Ethernet cables to connect up to three wired Icotera i3560 access points to the gateway or the third-party switch.

You can connect wired access points to any available LAN port of the gateway or another access point. The following image shows the architecture of this scenario.

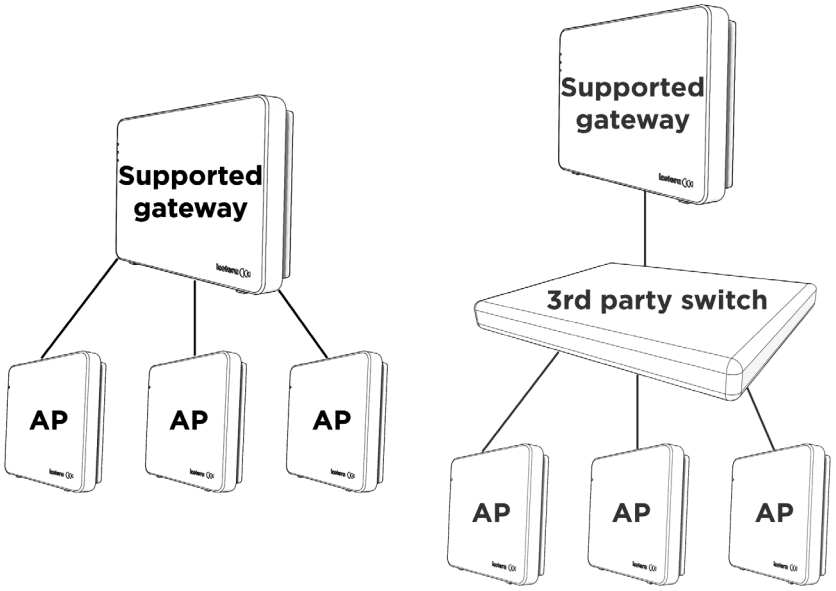

Figure 3. Connecting up to three wired access points to the gateway or switch

Alternatively, you can connect wireless access points to the gateway or another access point by using Wi-Fi. When your Wi-Fi devices move around your premises, they automatically steer to the most suitable access point.

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Scenario 2: Connecting an Icotera gateway with wireless access points

In the second scenario, you also use an Icotera i4882 gateway as a controller access point. You use Wi-Fi to connect up to three wireless Icotera i3560 access points to your gateway.

In this scenario, wireless access points can connect to the gateway or other access points, depending on the controller's guidance.

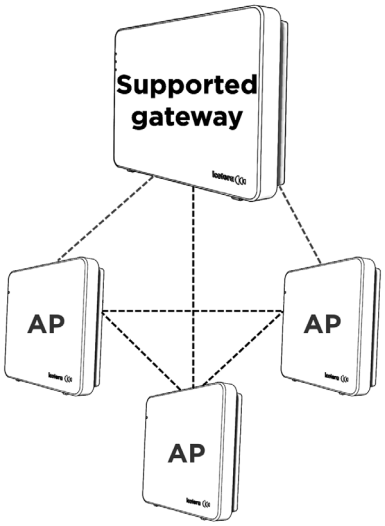

Figure 4. Connecting up to three wireless access points to the gateway

Scenario 3: Connecting an Icotera gateway with wired and wireless access points

In the third scenario, you use an Icotera i4882 gateway as a controller access point. You use an Ethernet cable to connect one access point. Also, you use Wi-Fi to connect up to two wireless Icotera i3560 access points to your gateway. Depending on the controller guidance, wireless access points can connect to the gateway or other access points.

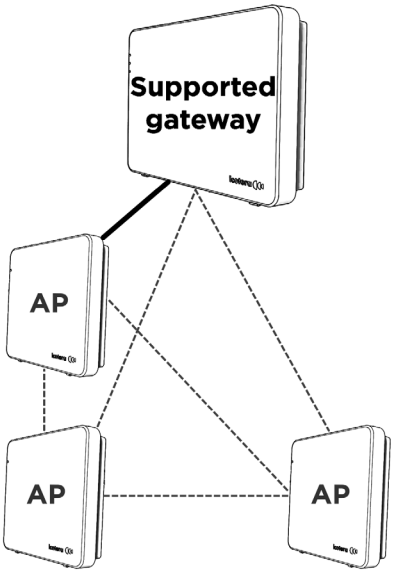

Figure 5. Connecting one wired access point and up to two wireless access points to the gateway

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Setting up the Wi-Fi mesh network

This section describes best practices for creating a mesh network for wired and wireless connections.

Establishing a wired connection

The following image shows the Wi-Fi coverage of a three-floor house. In this image, the gateway uses an Ethernet cable to connect to WAN and to access points. In turn, access points use an Ethernet cable to connect to devices that require high throughput, such as a gaming computer or a television. With other devices, access points establish wireless connections.

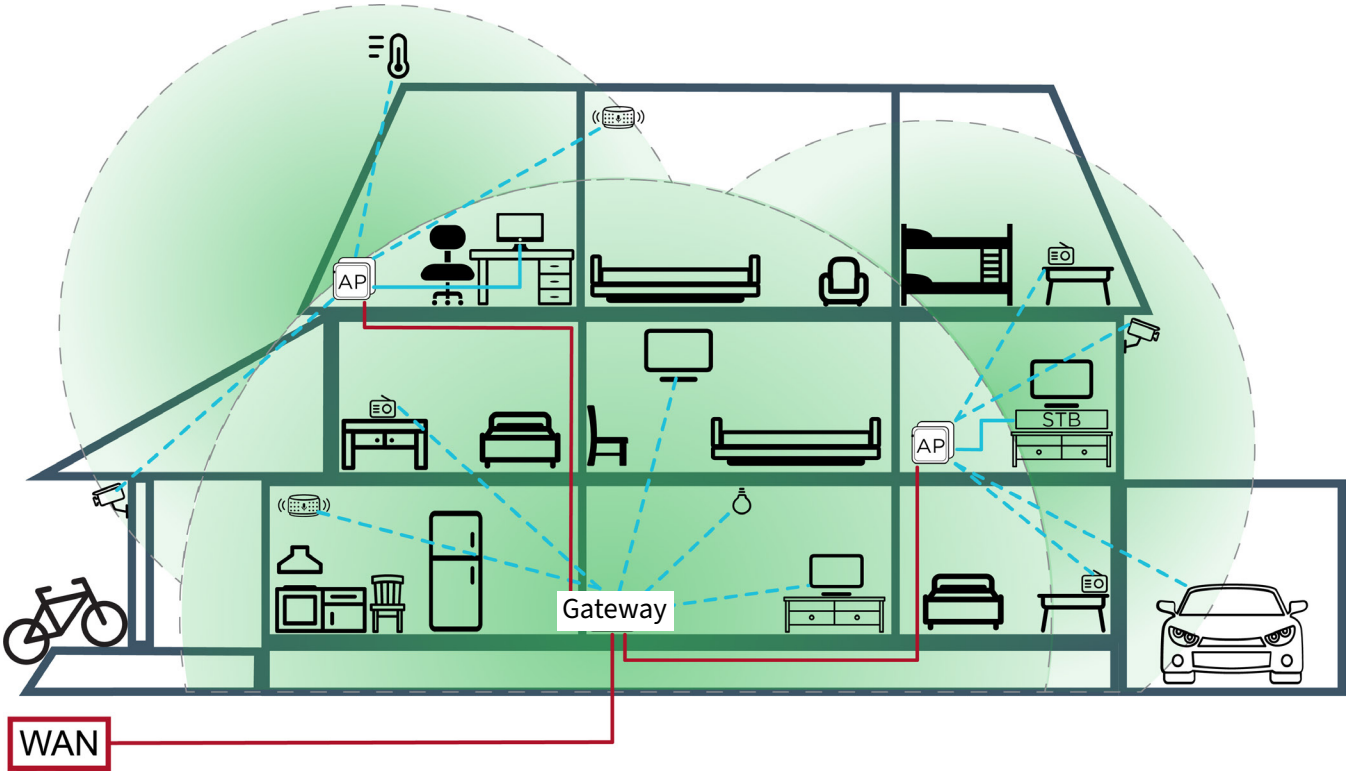


Figure 6. Covering a house with the Wi-Fi signal by using wired access points

In this image, solid lines show connections with an Ethernet cable; dashed lines show wireless connections. The gateway and access points cover the area highlighted in green. In these areas, the Wi-Fi signal strength is less than -82 dBm. User devices connect to the gateway where possible, even when they are closer to the access point.

We recommend using the Ethernet cable to connect all access points to your gateway or switch. Avoid connecting access points with each other.

To ensure a strong Wi-Fi signal, install one access point on each floor and place it centrally. After you install access points in your mesh network, check the download speed at all places of interest and on static Wi-Fi devices. Make sure that you can download data at more than 200 Mbps rate. Cover all places that do not provide such speed with additional access points. To measure the download speed, use the Speedtest application. For more information, see https://www.speedtest.net/.

The coverage areas of wired access points can overlap. In this case, the access points do not interfere and improve seamless roaming.

We recommend that you avoid installing more access points than required to cover the premises. Installing many access points degrades Wi-Fi performance.

Establishing a wireless connection

The following image shows the Wi-Fi coverage of a three-floor house. In this image, the gateway uses an Ethernet cable to connect to WAN. Also, the gateway establishes wireless connections with access points. In turn, access points use an Ethernet cable to connect to devices that require high throughput, such as a gaming computer or a television. With other devices, access points establish wireless connections.

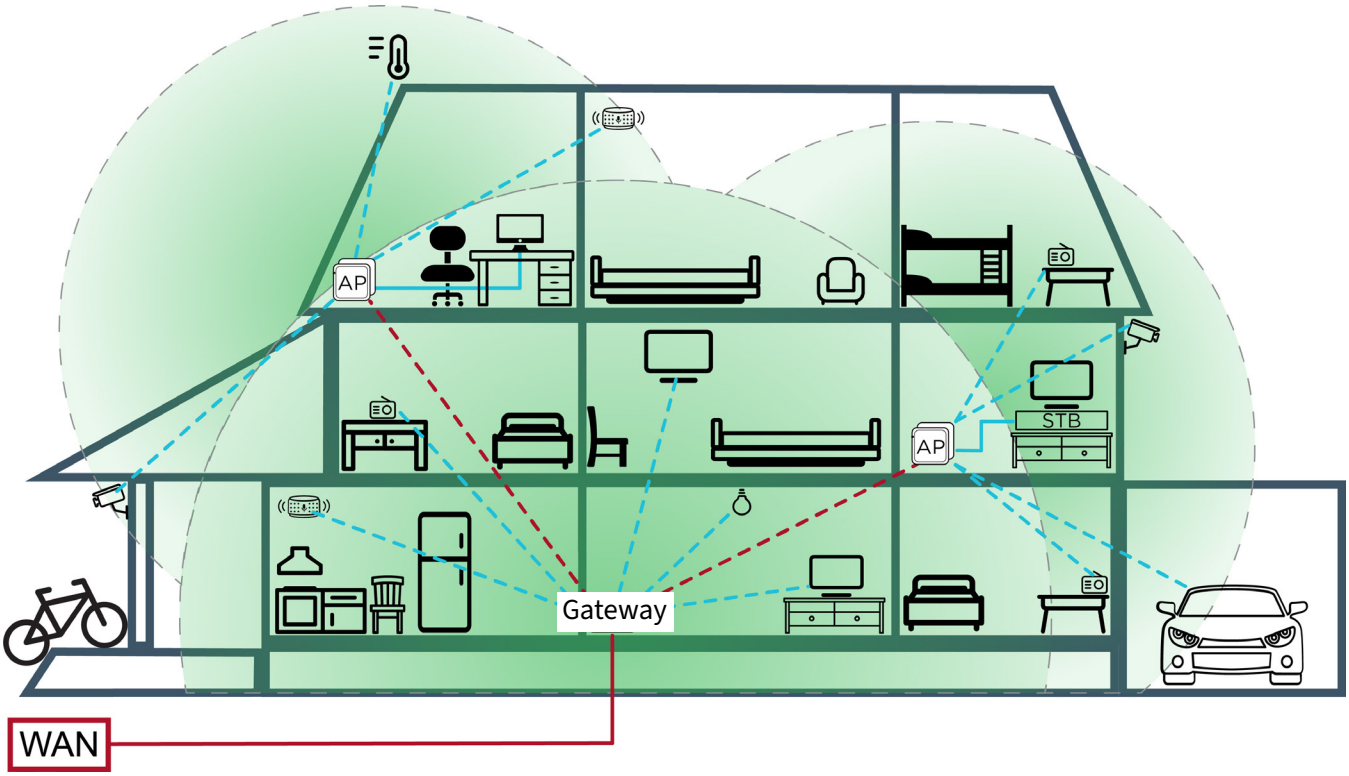


Figure 7. Covering a house with the Wi-Fi signal by using wireless access points

In this image, solid lines show connections with an Ethernet cable; dashed lines show wireless connections. The gateway and access points cover the area highlighted in green. In these areas, the Wi-Fi signal strength is less than -82 dBm. Make sure that you place each access point in the area where the strength of the Wi-Fi signal from the gateway is less than -82 dBm. User devices connect to the gateway where possible, even when they are closer to the access point.

We recommend connecting your access points to the gateway with an Ethernet cable when possible. When you establish a wireless connection between the gateway and an access point, expect up to 50% lower throughput.

Place your gateway so that it can cover most of the house. Add wireless access points only when needed. Installing many access points degrades Wi-Fi performance.

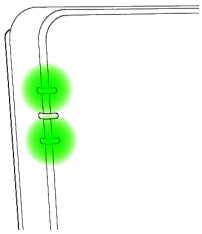
Connect your wireless access points to the gateway or to a wired access point. Avoid connecting a wireless access point to another wireless access point.

After you install access points in your mesh network, check the download speed at all places of interest and on static Wi-Fi devices. Make sure that you can download data at least at a 100 Mbps rate. Cover all places that do not provide such speed with additional access points. To measure the download speed, use the Speedtest application. For more information, see https://www.speedtest.net/.

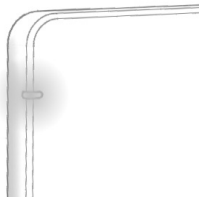
To reduce in-home interference, use an Ethernet cable to connect devices that frequently transfer large files to the access point.

Adding a wired access point

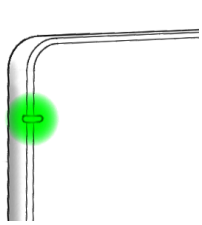
- Check that the system and Wi-Fi LED indicators on the gateway light solid green.



- Power on your Icotera i3560 access point and wait until the LED indicator lights solid white.



- Connect an Ethernet cable to one of the free LAN ports on the supported gateway and one of the free LAN ports on your access point.
- Wait until the LED indicator on the access point lights solid green.



- The wired access point is configured with the same SSID and password as on the gateway. You can use the access point.
- For troubleshooting, see Status LED indicators or contact your ISP support department.

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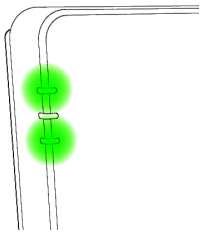
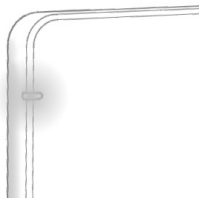
Adding a wireless access point

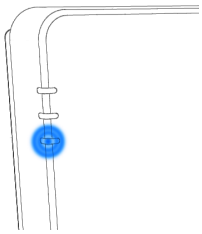
- Check that the system and Wi-Fi LED indicators on the gateway light solid green.



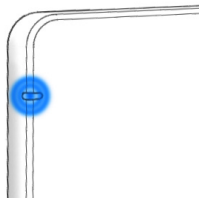
- Place the Icotera i3560 access point in the same room as the gateway. Turn on your access point and wait until the LED indicator on the access point lights solid white. The access point is ready for pairing.



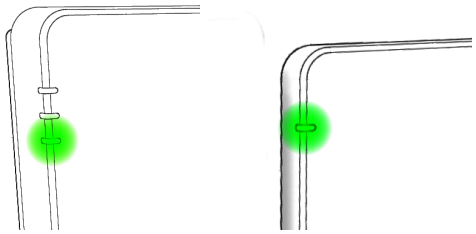
- Press and hold the WPS button on your gateway for at least three seconds until the Wi-Fi LED indicator starts blinking blue. Release the WPS button. The gateway is ready for pairing with the access point.



- Now press and hold the WPS button on the access point for at least three seconds until the Wi-Fi LED indicator starts blinking blue. Release the WPS button.



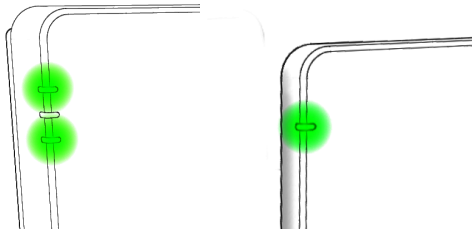
- The pairing process is in progress. This process takes up to two minutes. Wait until the Wi-Fi LED indicators on the router and the access point light solid blue. After 15 seconds, the LED indicator on your access point starts blinking green. Next, the Wi-Fi LED indicators on the router and the access point light solid green.



- The wireless access point is now correctly configured with the same SSID and password as on the gateway. You can turn it off and move it to the target location in your home. After you turn the access point on again, the Wi-Fi LED indicator shows solid green. The access point is in the operation mode.
- For troubleshooting, see the Status LED indicators section or contact your ISP support department.

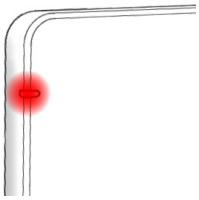
Changing the installation setup of an access point

- Check that the gateway and the access point are correctly configured and fully operational. The system and Wi-Fi LED indicators on the gateway light solid green. The Wi-Fi LED indicator on the access point lights solid green. Now you can change the installation setup for the Icotera i3560 access point.

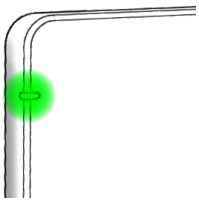


Changing a wired connection to a wireless connection

- The Icotera i3560 access point automatically switches from a wired connection to a wireless connection. Remove the Ethernet cable from the LAN port of your access point. The Wi-Fi LED indicator lights solid red and the access point switches to a wireless connection.



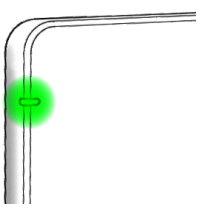
- After up to 5 minutes, the LED indicator lights solid green, which means that the access point is correctly configured and ready to work in the wireless mode.



- You can move the Icotera i3560 access point to a new location. To do so, turn it off, move the access point, and turn it on again. When the Wi-Fi LED indicator lights solid green, you can use your access point.
- For troubleshooting, refer to the LED section or contact your ISP support department.

Changing a wireless connection to a wired connection

- The Icotera i3560 access point automatically switches from a wireless connection to a wired connection. You can connect an Ethernet cable to one of the free LAN ports on the access point and one of the free LAN ports on the gateway. After up to 5 minutes, the access point establishes a wired connection and the LED indicator lights solid green.

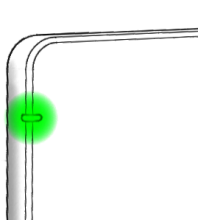


- The access point is correctly configured and ready to work in the wired mode.
- You can move the Icotera i3560 access point to a new location. To do so, turn it off, move the access point, connect an Ethernet cable, and turn it on again. When the Wi-Fi LED indicator lights solid green, you can use your access point.
- For troubleshooting, see the Status LED indicators section or contact your ISP support department.

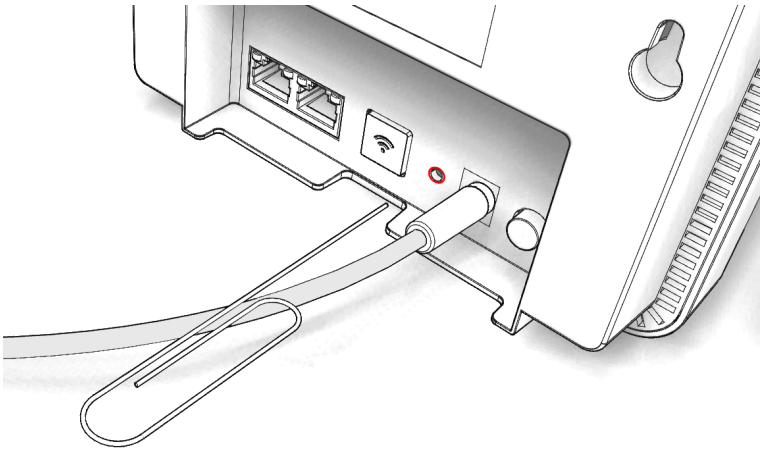
Resetting your Icotera i3560 access point

To use your Icotera i3560 access point on another Wi-Fi network, you must do a factory reset.

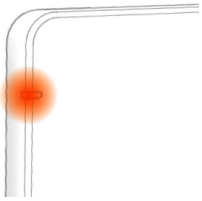
- Check that the Wi-Fi LED indicator on your access point lights solid green. You can do a factory reset.



- Take a thin rod (such as a paper clip) and insert it into the Reset hole to press the hidden button.



- Keep the Reset button pressed for more than 5 seconds until the LED indicator lights solid orange.



- Release the Reset button.
- Wait until the access point completes the factory reset boot-up. When the Wi-Fi LED indicator lights solid white, the Icotera i3560 access point is ready for a new installation.

Troubleshooting

- The Icotera i4882 system LED indicator blinks red:
  - The gateway did not initialize or provision correctly.
- The Icotera i4882 system LED indicator lights solid red:
  - The gateway did not obtain the IP address or the Internet connection is unavailable.
- The Icotera i4882 Wi-Fi LED indicator lights solid red:
  - The Wi-Fi connection might be established with stations, but they do not have any service.
- The Icotera i3560 Wi-Fi LED indicator blinks red:
  - The access point established an Internet connection but the strength of the backhaul connection is less than -82 dBm. Try to move your Icotera i3560 access point closer to the gateway or another access point.
- The i3560 Wi-Fi LED indicator shows solid red:
  - The access point did not obtain the IP address or the Internet connection is unavailable.

Configuring and managing the gateway

This chapter provides an overview of the Icotera gateway configuration and management features. It focuses on using the web interface to manage the gateway settings.

Logging in to the web interface

To log in to the web interface, complete the following steps.

1. Enter **`router/`** or the IP address of your gateway in your web browser. The browser displays the following dialogue box.

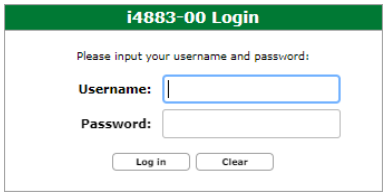


Figure 8. Logging in to the web interface

2. Enter your username and password.
3. Choose ***Log in*** to log in. Alternatively, choose ***Clear*** to delete credentials and enter them again.

Note

The first time you log in, use the username and password provided by your network operator. After the first login, you can change your password in the ***Administration/UI login password*** menu.

Overview

After a successful login, the browser displays the start window of the web interface. By default, it is the ***Connected devices*** section of the ***Status*** menu. The following figure presents the structure of the web interface.

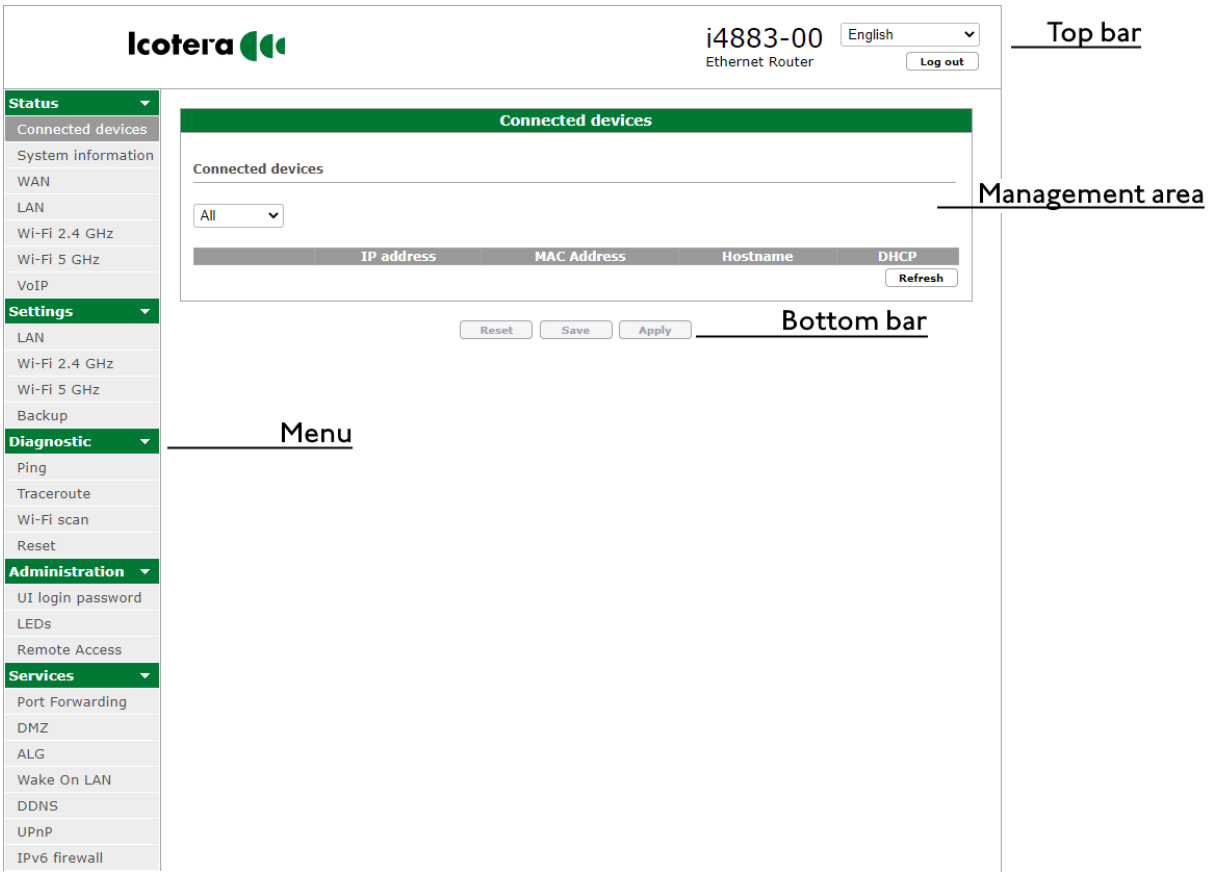


Figure 9. Web Interface start screen

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Top bar

The top bar contains the Icotera logo, device designation, a dropdown list where you can choose the interface language, and the ***Log out*** button.

Menu

The menu is a collapsible list of available options, which are grouped into two levels: main and secondary. The main level provides access to general gateway management categories. The secondary level presents a submenu of available options for a given category. By default, the web interface expands all menu options. To collapse a menu section, click on its name.

Note Depending on the particular configuration, the menu layout varies. Internet service providers can customize and turn off specific menu sections.

Management area

The management area is where all the gateway management and status information are displayed and modified. Depending on the selected option, it can display a set of particular configuration options or a list of current gateway status information.

Bottom bar

In the centre of the bottom bar, there are three buttons:

- ***Reset***: resets all changes made in the current session.
- ***Save***: saves all changes made in the current session.
- ***Apply***: applies all changes saved during the current session.

Viewing status information

The ***Status*** menu provides tools for listing connected devices, viewing general gateway system information, as well as to obtain information about WAN, LAN and wireless interfaces operating on the device. You can also view phone info, VoIP call log, and information about the WDS status and associated clients in this menu.

Connected devices

The ***Connected devices*** section of the ***Status*** menu contains information about devices connected to the gateway.

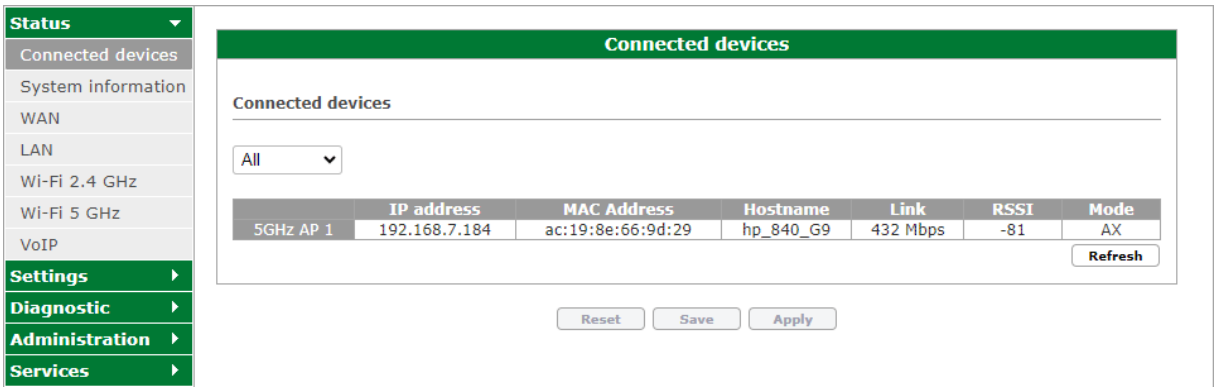

*Figure 10. The **Connected devices** section of the **Status** menu*

You can use the dropdown lists to choose a particular interface. The table woth connected devices contains the following information.

- The ***IP address*** column shows the IP address of the connected device,
- The ***MAC address*** column shows the physical address of the connected device.
- The ***Hostname*** column shows the name of the connected device.
- The ***Link*** column shows the data transfer rate.
- The ***RSSI*** column shows the received signal strength indicator in dBm.
- The ***Mode*** column shows the wireless network mode.

To refresh the data in this table, choose ***Refresh***.

Because this menu does not include any configurable options, the ***Reset***, ***Save***, and ***Apply*** buttons are inactive.

General system information

To access general information about the gateway go to the ***Status/System information*** menu section.

The ***System information*** section contains general information about the gateway state.

- ***Current time***: current time and date,
- ***Uptime***: duration the device has been powered up,
- ***Firmware version***: the current software version operating on the device,
- ***WAN MAC***: the physical address of the device's WAN interface,
- ***WAN IP***: the IP address of the WAN interface,
- ***Device name***: the name of the device,
- ***Serial number***: the serial number of the device,
- ***Configuration mode***: ***Unconfigured*** (no steering or configuration propagation between the gateway and i3550) or ***Master*** (steering and configuration propagation active between the gateway and i3550),
- ***Wi-Fi 2.4 GHz***: the status of the 2.4 GHz wireless interface, either ***On*** or ***Off***,
- ***Wi-Fi 5 GHz***: the status of the 5 GHz wireless interface, either ***On*** or ***Off***.

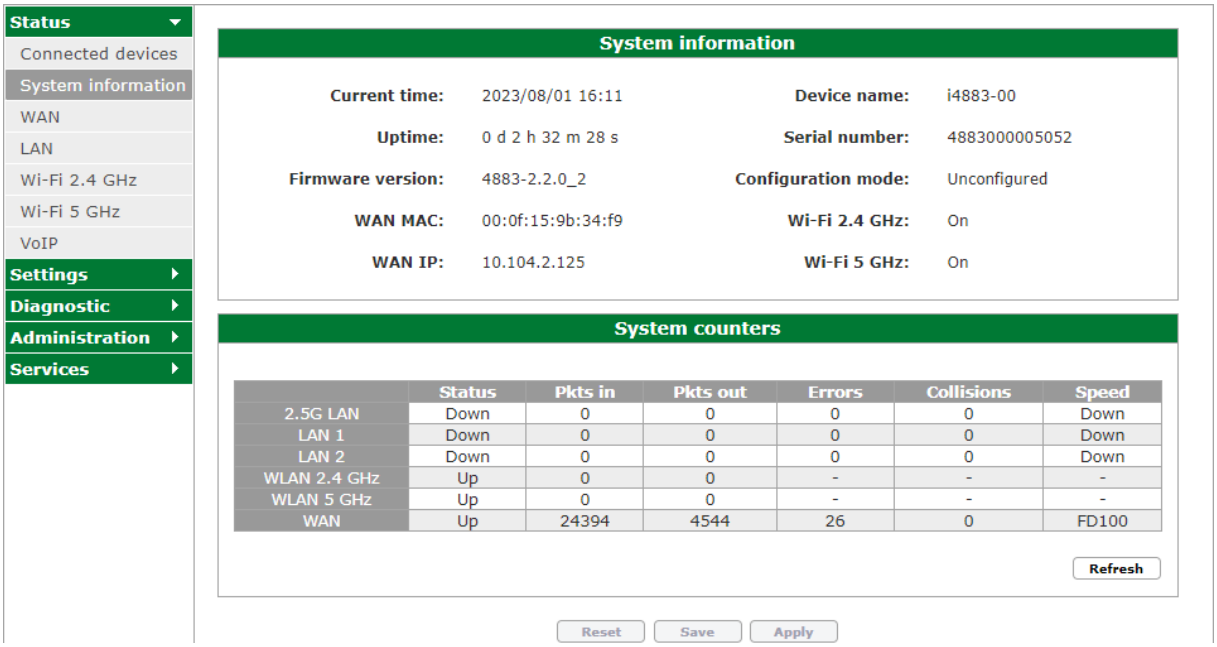

Figure 11. ***System information*** *section of the* ***Status*** *menu*

The ***System counters*** section contains statistical information about data entering and leaving the interfaces of the gateway, as well as error and collision counters:

- ***Status***: current status of a given interface, either ***Up*** or ***Down***,
- ***Pkts in***: number of incoming packets in the current session,
- ***Pkts out***: number of outgoing packets in the current session,
- ***Errors***: transmission error counter,
- ***Collisions***: collision counter,
- ***Speed***: negotiated speed (***FD1000*** - Full Duplex at 1000Mbps, ***FD100*** - Full Duplex at 100Mbps, ***FD10*** - Full Duplex at 10Mbps, ***HD100*** - Half Duplex at 100Mbps, ***HD10*** - Half Duplex at 10Mbps).

To refresh the information in this section, choose ***Refresh***.

Because this menu does not include any configurable options, the ***Reset***, ***Save***, and ***Apply*** buttons are inactive.

WAN information

The ***WAN*** section of the ***Status*** menu lists basic information about the WAN interface and the statistics of data carried through the interface.

The ***WAN*** section presents basic information about the WAN interface:

- ***WAN IP type***: IP address type of the WAN interface,

- ***IP address***: IP address used by the WAN interface,
- ***Subnet mask***: subnet mask used by the WAN interface,
- ***Default gateway***: default gateway configured for the WAN interface,
- ***MAC address***: interface's physical address,
- ***DNS***: two IP addresses are displayed; 0.0.0.0 is shown if the DHCP server option provides only a single DNS server.

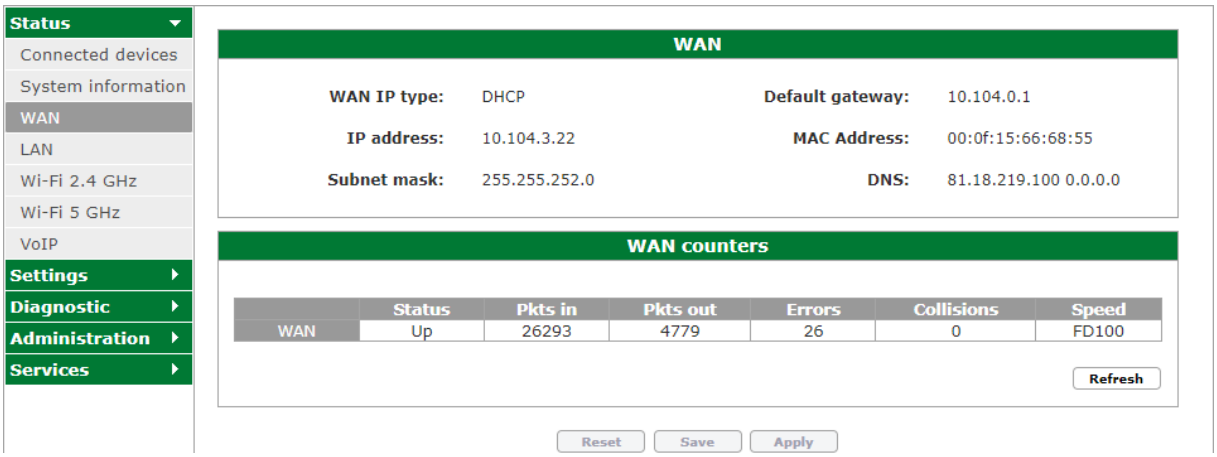

*Figure 12. The **WAN** section of the **Status** menu*

The ***WAN counters*** section displays statistical information about data:

- ***Status***: current status of a given interface, either ***Up*** or ***Down***,
- ***Pkts in***: number of incoming packets in the current session,
- ***Pkts out***: number of outgoing packets in the current session,
- ***Errors***: transmission error counter,
- ***Collisions***: collision counter,
- ***Speed***: negotiated speed (***FD1000*** - Full Duplex at 1000Mbps, ***FD100*** - Full Duplex at 100Mbps, ***FD10*** - Full Duplex at 10Mbps, ***HD100*** - Half Duplex at 100Mbps, ***HD10*** - Half Duplex at 10Mbps).

To refresh the WAN information, choose ***Refresh***.

Because this menu does not include any configurable options, the ***Reset***, ***Save***, and ***Apply*** buttons are inactive.

LAN information

You can use the ***LAN*** section of the ***Status*** main menu to obtain information about the LAN interfaces and to configure static IP leases for connected devices.

The ***LAN*** section contains the following general information about the LAN interface:

- ***IP type***: IP type of the LAN interface,
- ***IP address***: IP address used by the LAN interface,
- ***Subnet mask***: subnet mask used by the LAN interface,
- ***Default gateway***: default gateway configured for the LAN interface,
- ***MAC address***: interface's physical address.

The ***Counters*** section displays statistical information about data:

- ***Status***: current status of a given interface, either ***Up*** or ***Down***,
- ***Pkts in***: number of incoming packets,
- ***Pkts out***: number of outgoing packets,
- ***Errors***: transmission error counter,
- ***Collisions***: collision counter,
- ***Speed***: negotiated speed (***FD1000*** - Full Duplex at 1000Mbps, ***FD100*** - Full Duplex at 100Mbps, ***FD10*** - Full Duplex at 10Mbps, ***HD100*** - Half Duplex at 100Mbps, ***HD10*** - Half Duplex at 10Mbps).

The ***Dynamic Leases*** section contains information about devices connected to LAN interfaces which have dynamically assigned IP addresses. Each device is described with the following parameters:

- ***IP address***: IP address assigned to a device,
- ***MAC Address***: physical address of a connected device,
- ***Hostname***: connected device's hostname,
- ***Expires***: lease time of the device's address,
- ***Remember***: to turn a dynamic lease into a static lease, choose ***Make static***. After you do so, you can see the entry in the ***Static Leases*** section.

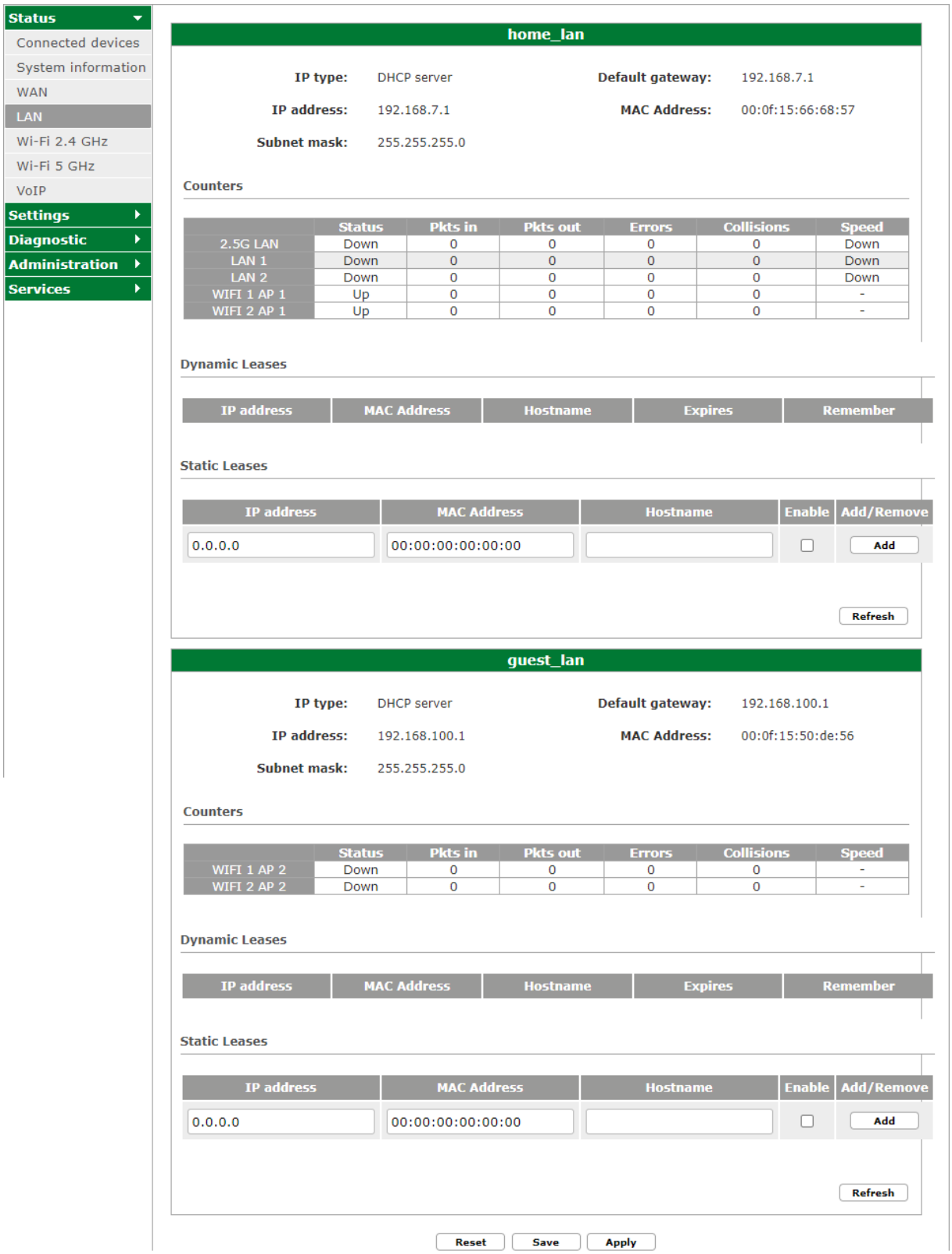

*Figure 13. The **LAN** section of the **Status** menu*

In the ***Static Leases*** section, you can manually add a static lease. To do so, apply the following steps.

1. For ***IP address***, enter the IP address of a device to connect.
2. For ***MAC Address***, enter the MAC address of the device.
3. For ***Hostname***, enter the name of the device.
4. Check ***Enable*** to turn on the lease immediately. Keep the box unchecked to turn on the lease later.
5. To add the lease to the list, choose ***Add***.
6. To save changes, choose ***Save***.
7. To apply changes, choose ***Apply***.

To refresh the LAN information, choose ***Refresh***.

Wi-Fi information

The ***Wi-Fi 2.4 GHz*** and ***Wi-Fi 5 GHz*** menu sections contain information about the gateway wireless interfaces and their access points. Their layout is similar, and the ***Wi-Fi 5 GHz*** contains an additional ***Channel availability overview*** section as well ***Rescan*** button which are not present in the ***Wi-Fi 2.4 GHz*** section.

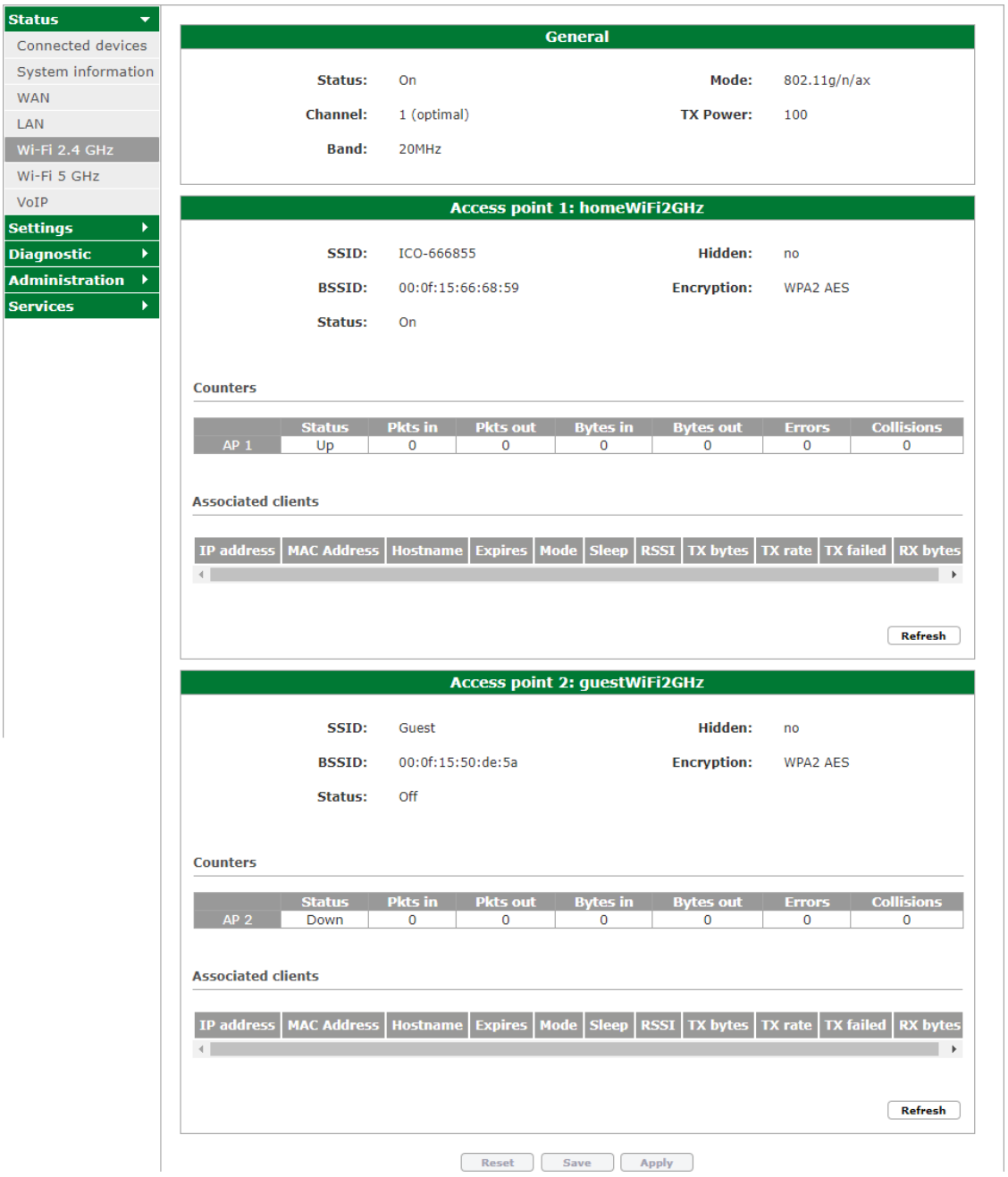

*Figure 14. The **Wi-Fi 2.4 GHz** section of the **Status** menu*

The ***General*** section contains the following information about the Wi-Fi interfaces:

- ***Status***: interface status, either ***On*** or ***Off***,
- ***Channel***: wireless channel on which the interface operates (choose ***Reselect*** to reselect channel if the ***Channel*** option in the ***Settings/Wi-Fi*** menu section is set to ***auto***),
- ***Band***: radio channel width used by the interface,
- ***Mode***: wireless mode of the wireless interface (802.11ax, 802.11ac/ax, 802.11n/ac/ax or 802.11a/n/ac/ax),
- ***Tx Power***: transmission power value (percentage) for the wireless interface.

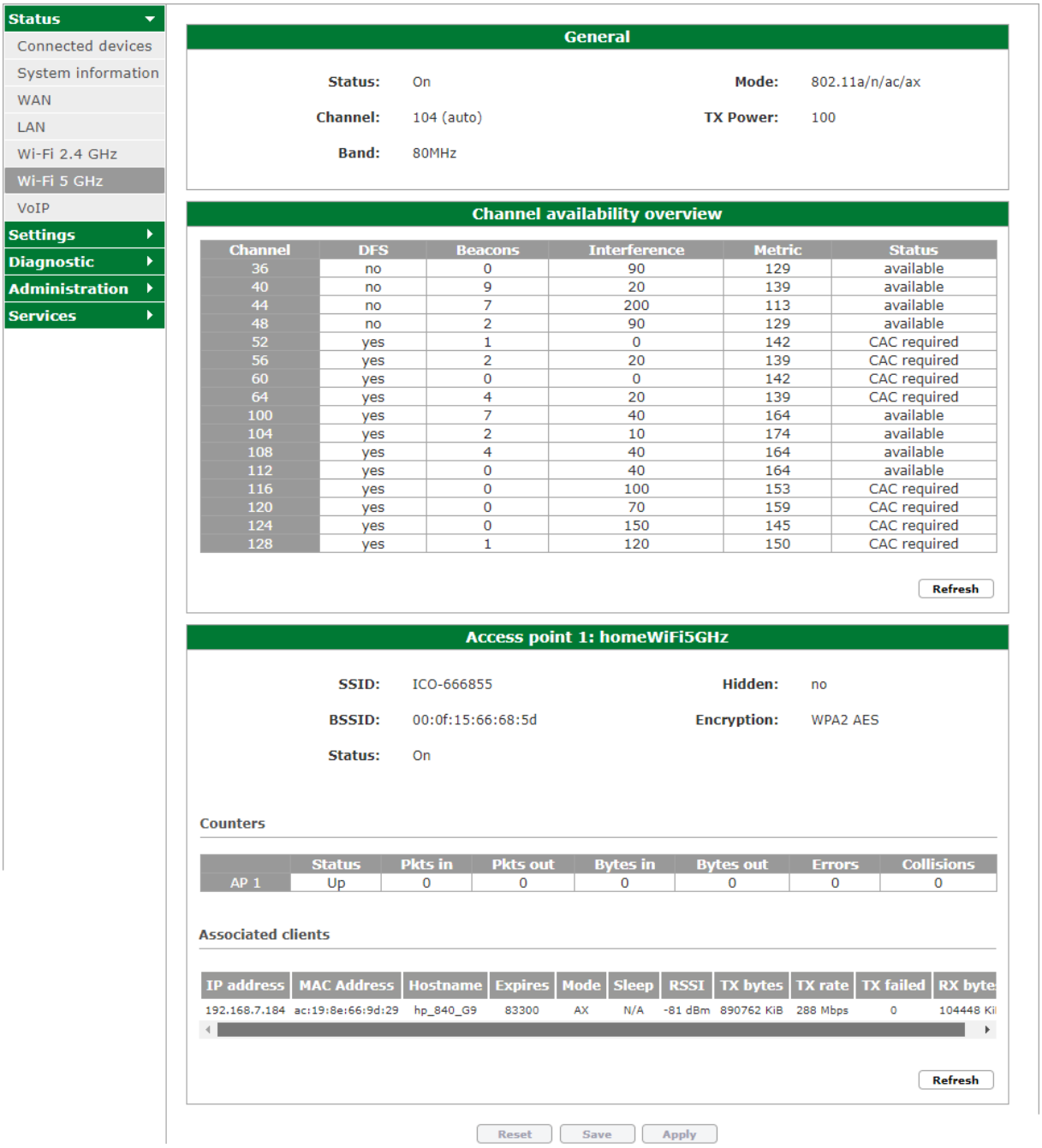

*Figure 15. The **Wi-Fi 5 GHz** section of the **Status** menu*

The ***Access point*** sections contain the following information about every configured Wi-Fi access point:

- ***SSID***: Service Set Identifier of the access point (Wi-Fi network name),
- ***BSSID***: MAC address of the access point (Basic Service Set Identifier),
- ***Status***: access point status, either ***On*** or ***Off***,
- ***Hidden***: visibility setting of the access point,
- ***Encryption***: data encryption algorithm of the access point.

The ***Counters*** section contains statistical information about data entering and leaving the interfaces per access point:

- ***Status***: current status of a given interface, either ***Up*** or ***Down***,
- ***Pkts in***: number of incoming packets,
- ***Pkts out***: number of outgoing packets,
- ***Bytes in***: number of incoming bytes,
- ***Bytes out***: number of outgoing bytes,
- ***Errors***: transmission error counter,
- ***Collisions***: collision counter.

The ***Associated clients*** section lists all devices connected to the particular access point. Each device is described with the following parameters:

- ***IP address***: IP address assigned to the device,
- ***MAC Address***: physical address of the connected device,
- ***Hostname***: connected device's hostname,
- ***Expires***: lease time of the device's address,
- ***Mode***: mode of operation,
- ***Sleep***: when set to ***Yes***, the client is present but does not exchange traffic with the host; when set to ***No***, the client is present and active,
- ***RSSI***: Received Signal Strength Indicator,
- ***Tx bytes***: transmitted bytes,
- ***Tx rate***: transmission rate,
- ***Tx failed***: transmission failures,
- ***Rx bytes***: received bytes.

To refresh the wireless interface information section, choose ***Refresh***.

Because this menu does not include any configurable options, the ***Reset***, ***Save***, and ***Apply*** buttons are inactive.

Managing LAN and Wi-Fi settings

The ***Settings*** menu provides advanced configuration options to control Layer 3 network parameters of the LAN and Wi-Fi networks. You can also upload and download configuration files.

LAN settings

In the ***LAN*** section of the ***Settings*** menu, you can modify the parameters of the Local Area Network.

- ***IPv4 Type***: if the ***DHCP server*** option is selected (default configuration), all hosts connected to LAN ports or over the Wi-Fi interface will obtain their IP addresses and other necessary information automatically. To change this setting choose the ***Static*** option from the drop-down menu and enter all network parameters manually,
- ***IP address***: specifies the IP address of your network,
- ***IP netmask***: specifies the network mask,
- ***Gateway*** (only for dynamic IP configuration): specifies the IP address of your network gateway,
- ***Primary DNS*** (only for dynamic IP configuration): specifies the primary Domain Name System server to be used to resolve DNS queries,
- ***Secondary DNS*** (only for dynamic IP configuration): specifies the secondary Domain Name System server to be used to resolve DNS queries,
- ***WINS*** (only for dynamic IP configuration): specifies the IP address of the Windows Internet Name Service server. This server is typically used in office environments,
- ***IP range***: specifies the pool of IP addresses that the DHCP server can allocate.
- ***Lease time***: specifies DHCP lease renewal time in seconds. The value in this field must range from 60 to 86400 and cannot be higher than the value in the ***Max lease time*** field. It is recommended to leave this value at its default setting.
- ***Max lease time***: specifies the maximum time in seconds which can be assigned to a client, if it asks for a longer lease time than the standard one. The value in this field must range from 60 to 86400 and cannot be lower than the value in the ***Lease time*** field. It is recommended to leave this value at its default setting.

- ***Enable Local Easy HostName***: when this box is checked, the web browser recognizes selected names from the list and opens the gateway web interface when you enter any of these names in the address bar.
- ***IPv6 Router Advertisement***: when enabled, messages are sent by the router periodically and in response to Neighbor Solicitation packets.
- To reset all changes made during the current session, choose ***Reset***. To save all changes made during the current session, choose ***Save***. To applies all changes saved during the current session, choose ***Apply***.

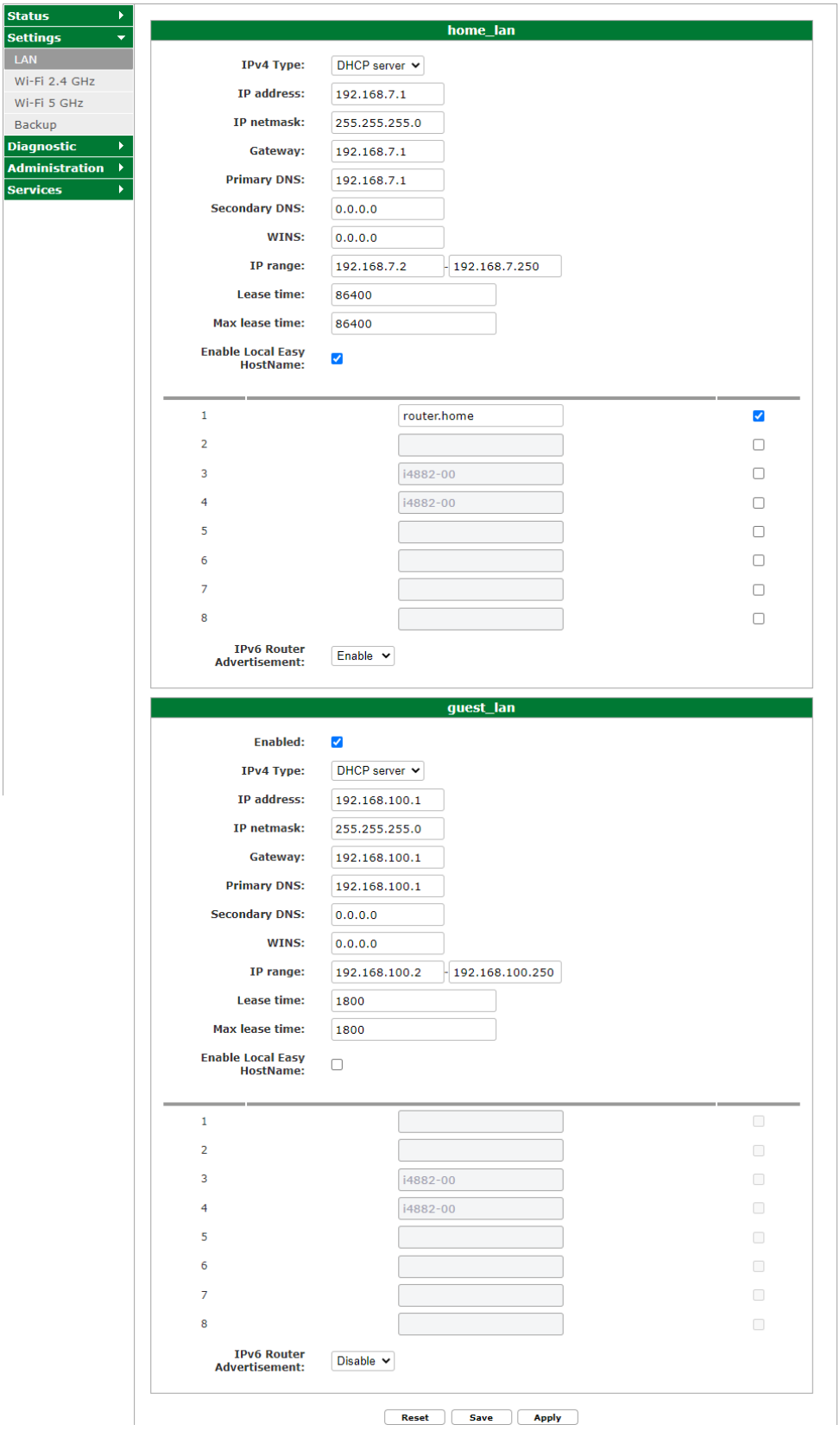

*Figure 16. The **LAN** section of the **Settings** menu*

Wi-Fi settings

In the ***Wi-Fi*** sections of the ***Settings*** menu, you can configure the general settings of the wireless interfaces, set access point parameters, as well as define Wi-Fi schedules and access lists.

Note

The gateway displays the warning message that disabling Wi-Fi can disturb Wi-Fi extenders when the user unchecks the ***Enable*** check box for the 5 GHz interface and the **`wifidomain mode`** parameter is set to **`master`**. When the **`wifidomain mode`** is set to **`disabled`**, the gateway does not display the warning message.

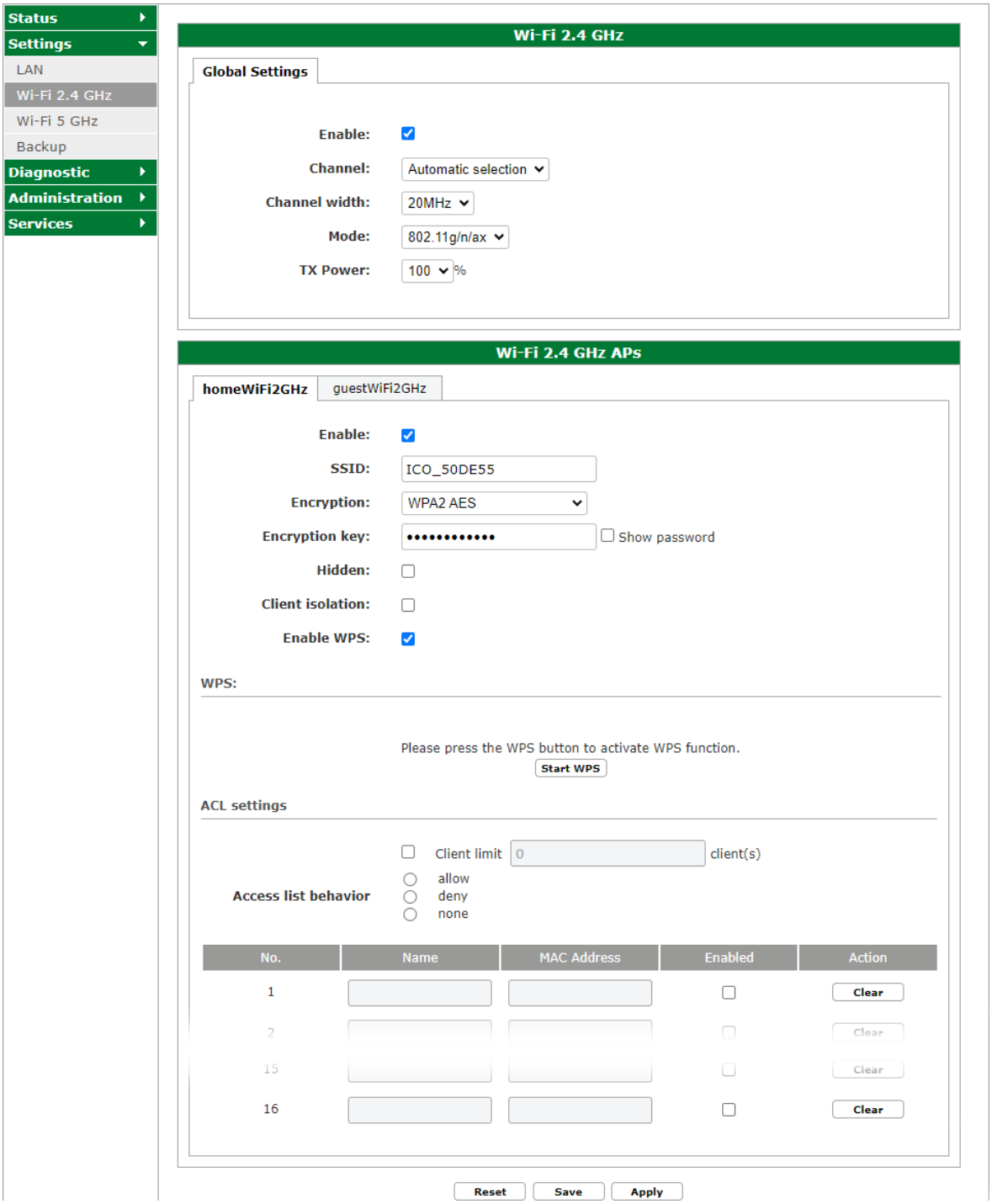

*Figure 17. The **Wi-Fi 2.4 GHz** section of the **Settings** menu*

The ***Global Settings*** section provides the general Wi-Fi performance settings, common for both 2.4 GHz and 5 GHz interfaces:

- ***Enable***: enables or disables the radio interface,
- ***Channel***: sets the channel number manually or relies on the automatic channel selection option,

- ***Channel width***: channel width in MHz,
- ***Mode***: available networking mode,
- ***TX power***: Tx power level (percentage),
- ***DFS Channel Cleaning mode***: use the dropdown list to choose when DFS and weather channels will be cleared:
  * ***Auto***: when Wi-Fi is not being used,
  * ***Nightly-non-disruptive***: at night.

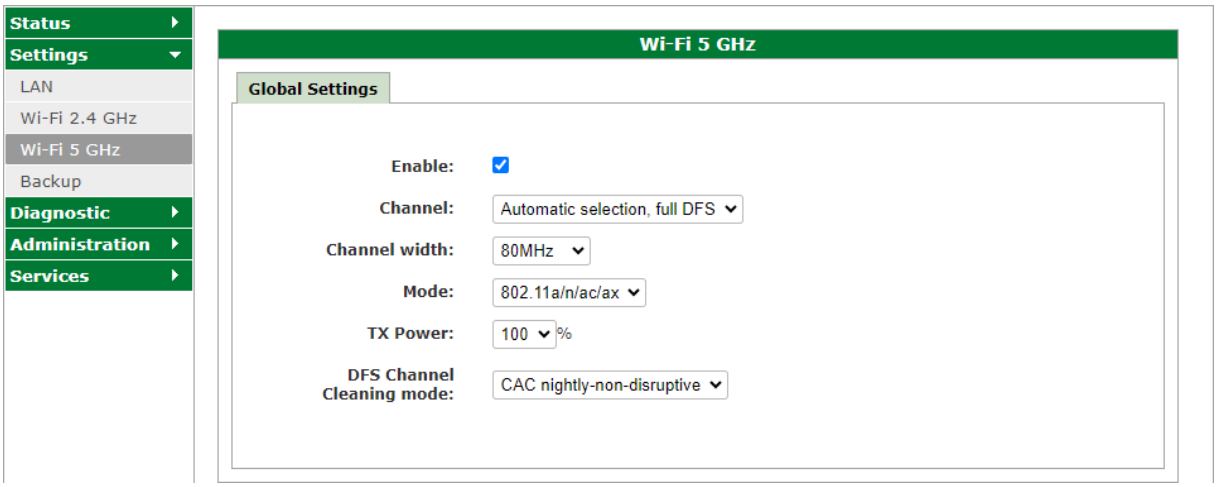

*Figure 18. The **Wi-Fi 5 GHz** section of the **Settings** menu (remaining sections omitted)*

The ***APs*** sections, common for both 2.4 GHz and 5 GHz interfaces, provide the following settings for every configured access point:

- ***Enable***: enables or disables the particular access point,
- ***SSID***: access point name that will be seen when scanning for available Wi-Fi networks,
- ***Encryption***: type of encryption key and encryption algorithm used to secure Wi-Fi transmission between the access point and its clients. Available choices are ***None***, ***WPA2 AES***, ***WPA3 AES*** and ***WPA3-TRANSITION AES***. Please note that ***None*** leaves the wireless AP unsecured and open for access from any Wi-Fi device.
- ***Encryption key***: the password used to connect to the access point. The browser displays the entered characters when the ***Show password*** checkbox is turned on.
- ***Hidden***: when checked, the chosen access point will not be detected by simple network scanning. We recommend keeping this box unchecked because hiding the access point name does not improve security
- ***Client isolation***: when checked, the traffic between clients of the access point is blocked. You can use this option to create a guest access point. All devices connected to the guest access point are isolated.
- ***Enable WPS***: turns on or off WPS.

In the ***WPS*** section, you can establish a WPS connection,

- ***Start WPS***: activates the WPS procedure.
- ***Reset***: resets all changes made to access point settings during the current session; ***Save***: saves all changes made during the current session; ***Apply***: applies all changes saved during the current session.

In the ***ACL settings*** section, you can configure the ACL protocol for a particular access point of a selected Wi-Fi interface.

- ***Client limit***: the number of devices that can connect to the access point. Select the checkbox and enter the number of connected devices. The maximum value is 32 devices.
- ***Access list behaviour***: defines the behaviour of the access list.
  * ***allow***: only devices in the access list can connect to the gateway.
  * ***deny***: prevents devices in the access list from connecting to the gateway. All other devices can connect to the gateway.
  * ***none***: turns off the access list.
- ***Name***: alias name for the MAC address.
- ***MAC Address***: the physical address of the wireless adapter in a client device.
- ***Enabled***: includes the device in the current access list. To temporarily exclude the device from the access list, uncheck it.

- ***Clear***: removes the device from the access list.

Note You can connect up to 255 devices to your gateway.

Backup

The ***Backup*** section of the ***Settings*** menu provides tools for uploading and downloading the gateway configuration files.

In the ***Upload config from local file*** section, you can read the configuration from a local file:

- Choose ***Choose file*** to select a configuration file on your device. The gateway uploads the configuration from the chosen file.
- Check ***Status*** to see the status of the upload operation, such as ***no operation done*** or ***nothing to change***.

In the ***Download file*** section, you can save the current configuration to a local drive:

- Choose ***Save*** to generate and save the file with the current gateway configuration.

Note The backup file consists of the configuration and data modified by the user.

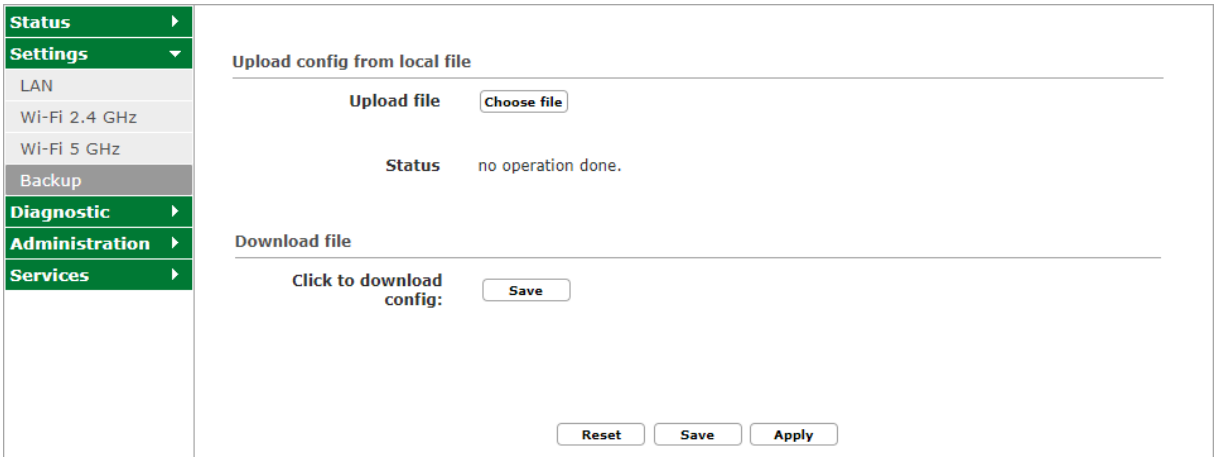

*Figure 19. The **Backup** section of the **Settings** menu*

Using network diagnostic tools

The ***Diagnostic*** menu contains ***Ping***, ***Traceroute***, ***Wi-Fi scan***, and ***Reset*** sections. You can use these menu sections to troubleshoot connection problems or reboot the gateway.

Because this menu does not include any configurable options, the ***Reset***, ***Save***, and ***Apply*** buttons are inactive.

Ping

You can use the ***Ping*** diagnostic tool to test the reachability of a host in an IP network.

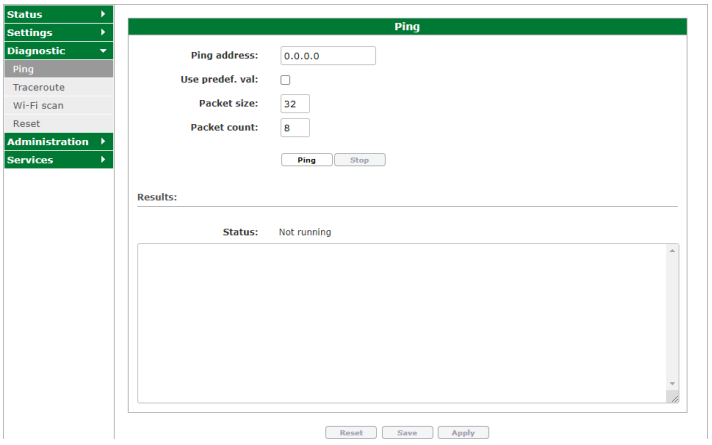

*Figure 20. The **Ping** tool of the **Diagnostic** menu*

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Document version: 1.0

- ***Ping address*** – the IPv4 address or hostname to ping.
- ***Use predef. val*** – uses default ping parameters. By default, the ping operation sends 10 packets of 64 bytes each. If the ***Use predef. val*** option is inactive, then you can specify custom ping parameters.
  * ***Packet size*** – the number of bytes in each ping packet.
  * ***Packet count*** – the number of packets to be sent.
- ***Ping*** – starts sending ping packets to the specified address.
- ***Stop*** – interrupts the ping command.
- ***Results*** – displays the output of the ping operation.
- ***Status*** – shows the current state of the ping operation, such as ***Running*** or ***Not running***.

Traceroute

You can use the ***Traceroute*** diagnostic tool to display the route and measure transit delays of packets across an IP network.

- ***Address*** – the IPv4 address or hostname of the destination where the command sends the ICMP packets.
- ***Diag*** – starts tracing the route to the destination.
- ***Stop*** – interrupts the traceroute operation.
- ***Results*** – displays the output of the traceroute operation.
- ***Status*** – shows the current state of the traceroute operation, such as ***Running*** or ***Not running***.

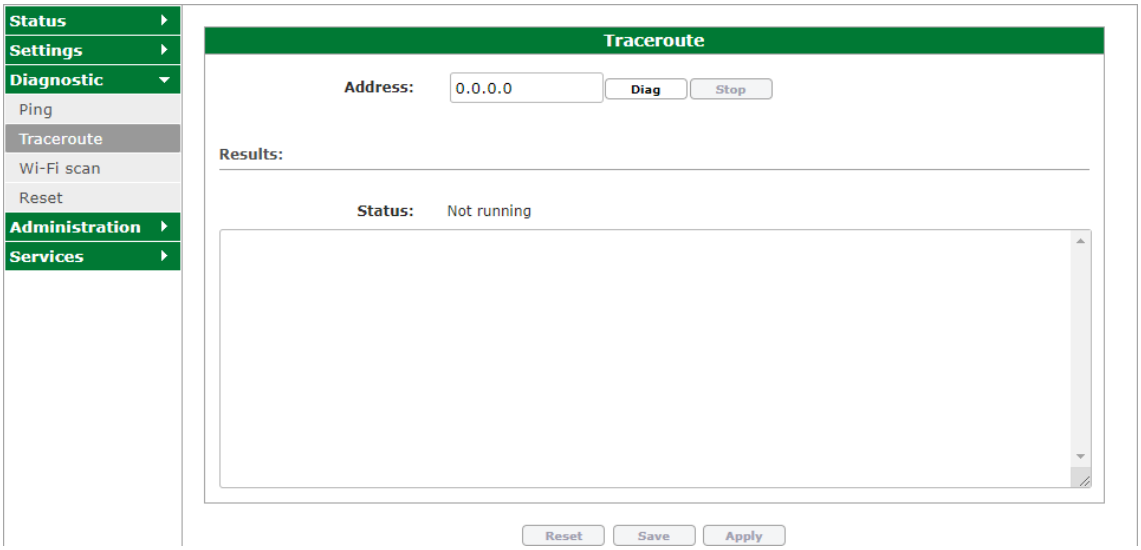

*Figure 21. The **Traceroute** tool of the **Diagnostic** menu*

Wi-Fi scan

You can use the ***Wi-Fi scan*** tool to run a site survey for all wireless networks in the neighbourhood. As a result of this survey, the web interface displays a list of scanned access points. You can use two separate scanners for both radio interfaces.

- ***Scan*** – starts the site survey process.
- ***Site survey*** – information about detected networks.
  * ***CH*** – the number of the operating channel.
  * ***Type*** – the connection type.
  * ***SSID*** – the access point name.
  * ***BSSID*** – the MAC address of the access point.
  * ***Encryption*** – the encryption type and method.
  * ***Signal [dBm]*** – the signal strength in dBm.

To refresh the site survey list, choose ***Scan***.

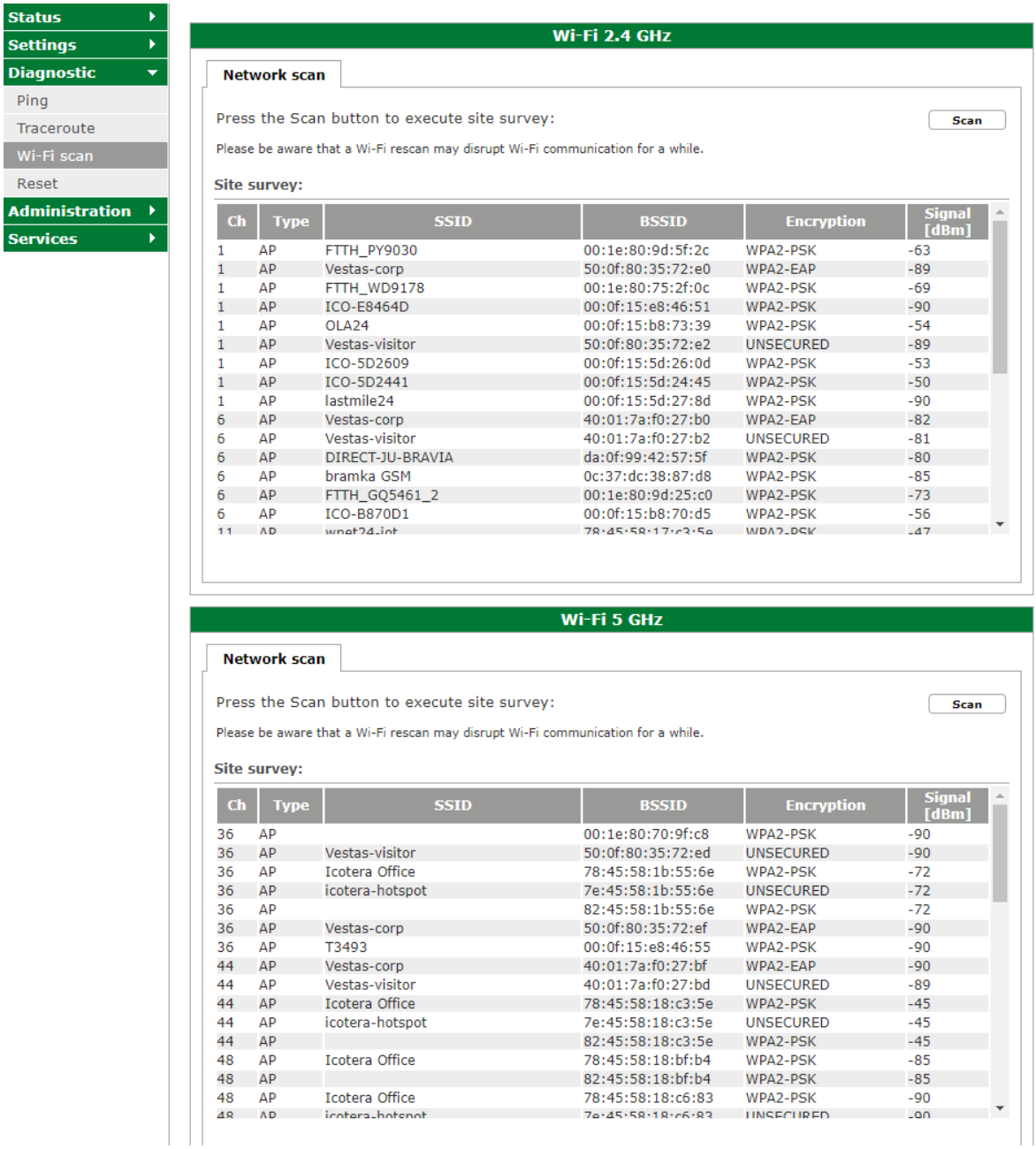

*Figure 22. The **Wi-Fi scan** tool of the **Diagnostic** menu*

Reset

The ***Diagnostic*** menu also includes the ***Reset*** tab.

To reboot the gateway, choose ***Reboot***.

To reset the gateway to the factory default settings, choose ***Factory reset***.

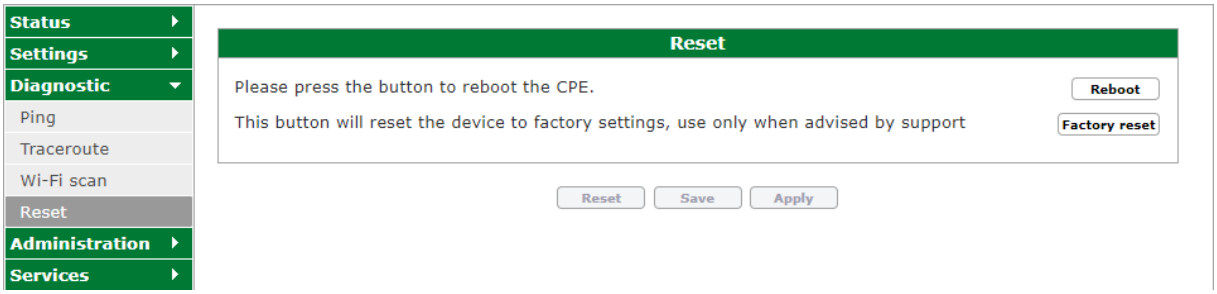

*Figure 23. The **Reset** section of the **Diagnostic** menu*

Next, confirm the reset or reboot of the gateway.

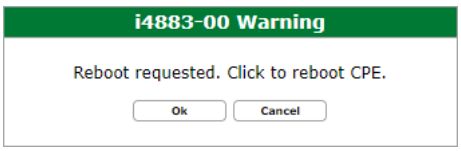

Figure 24. Request for reboot confirmation

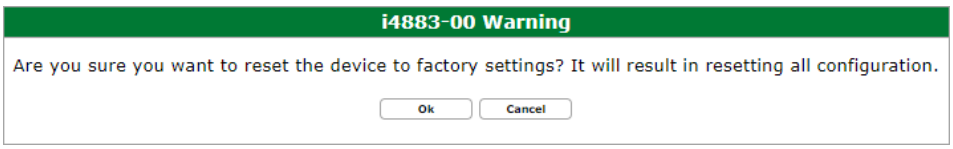

Figure 25. Request for reset confirmation

Because this menu does not include any configurable options, the ***Reset***, ***Save***, and ***Apply*** buttons are inactive.

Configuring administrator settings

The ***Administration*** menu provides options for changing user credentials, managing the behaviour of LED indicators, and configuring remote access to the gateway. To restore the default values for these settings, choose ***Reset***. Next, choose ***Save*** or ***Apply***.

Managing user credentials

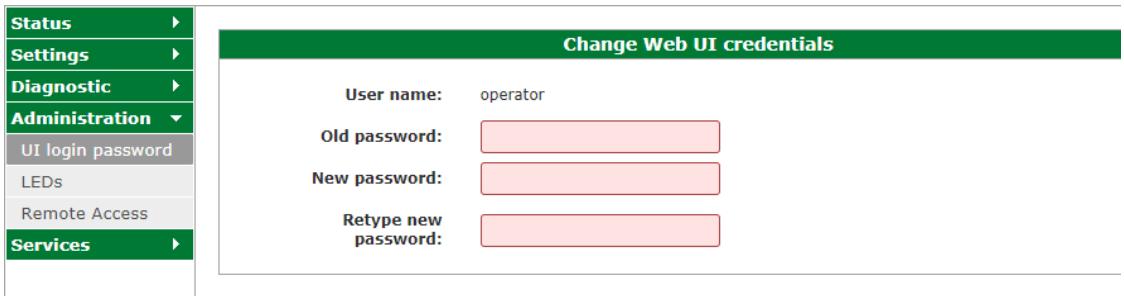

*Figure 26. Changing password in the **Administration** menu*

You can use the ***UI login password*** tab of the ***Administration*** menu to change the password. To do so, enter your ***Old password***. Next, enter your ***New password***, and confirm it in the ***Retype new password*** input field.

Managing the behaviour of LED indicators

You can control the behaviour of LED indicators in the ***LEDs*** tab of the ***Administration*** menu.

- ***LEDs*** – determines the behaviour of the LED indicators.
  - ***turn on*** – LED indicators remain turned on all the time.
  - ***turn off - LEDs will be turned on again only if an event occurs*** – LED indicators remain turned off except in case of an event.
  - ***turn off - LEDs will be turned on again only if an error occurs*** – LED indicators remain turned off except in case of an error.
  - ***always off - LEDs will be off after system will be up*** – all LED indicators are off after the gateway boots up.
- ***LEDs' brightness*** – determines the brightness level of LED indicators,
  - ***high*** – LED indicators are visible in daylight.
  - ***medium*** – LED indicators are barely visible in daylight.
  - ***low*** – LED indicators are visible in darkness but not in daylight.

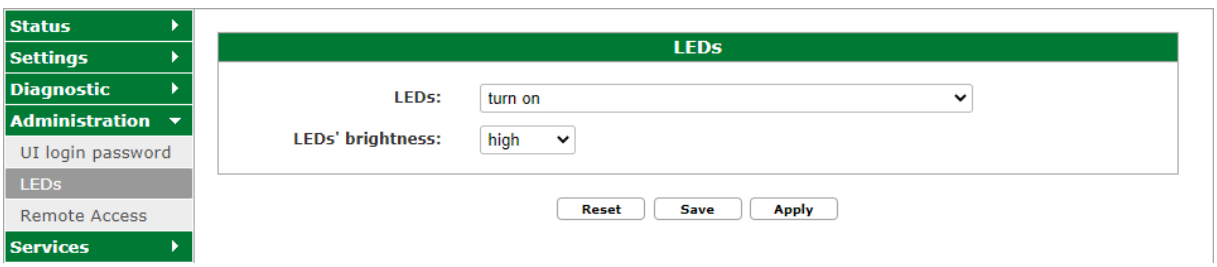

*Figure 27. The **LEDs** section of the **Administration** menu*

Configuring remote access

You can use the ***Remote Access*** tab of the ***Administration*** menu to configure access to the gateway from a WAN interface.

- To turn on the remote access by using the HTTPS protocol, select ***Enable*** in the ***HTTPS settings*** section.
- For ***Port***, enter the port number for the remote access. The default value is 443.
- To turn on the remote access from the Internet, select ***Enable*** in the ***Remote access from Internet*** section. The ***Public URLs*** field displays the URL of the web interface that you can access from the public Internet.

To restore default values for the remote access settings, choose ***Reset***. Next, choose ***Save*** or ***Apply***.

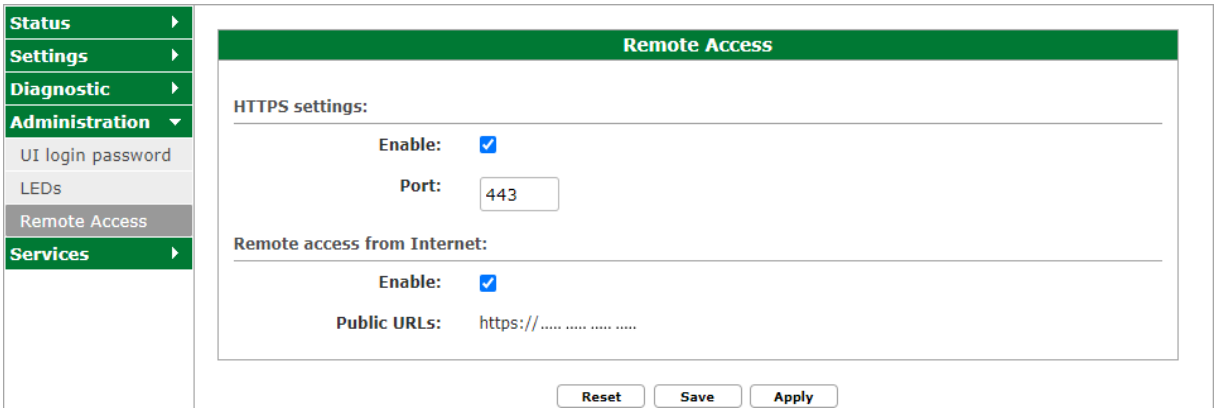

*Figure 28. The **Remote Access** section of the **Administration** menu*

Managing services

The ***Services*** menu provides configuration options for controlling port forwarding, ALG, and UPnP.

Port forwarding

You can configure port forwarding rules in the ***Port forwarding*** tab of the ***Services*** menu.

By default, all rules are disabled and inactive. To configure the fields of a rule, select its checkbox.

You can define up to 128 rules.

- ***Name*** – the name of a rule.
- ***Protocols*** – one of the available protocols. Possible options include ***TCP***, ***UDP***, and ***BOTH.***
- ***Ext. ports*** – the external ports range.
- ***Int. IP*** – the internal IP address.
- ***Int. port*** – the internal port number. When you use a port range, the internal port number is a starting point for this range.
- ***Loopback*** – turns on or off the NAT loopback feature for a given port. The NAT loopback, also known as NAT hairpinning, is a feature which permits access to service via the WAN IP address (often public IP address) from inside the local network. By default NAT loopback option for each port forwarding rule is disabled.
- ***Enabled*** – turns on or off the port forwarding rule for editing. When you turn off this option, then the rule is inactive and not editable.

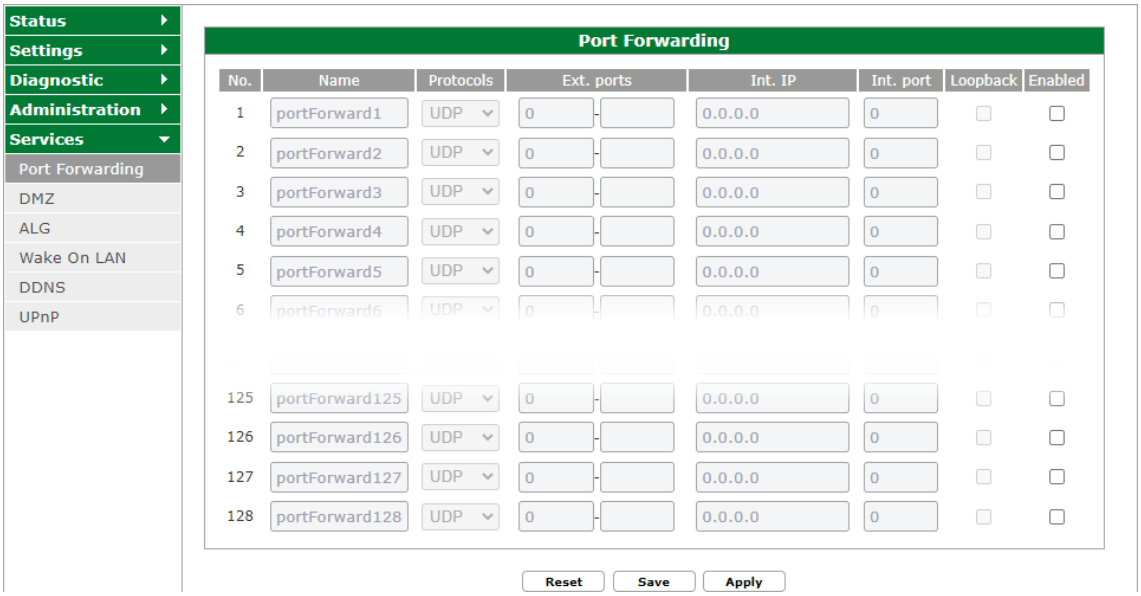

*Figure 29. The **Port forwarding** section of the **Services** menu*

DMZ

You can configure a demilitarized zone in the ***DMZ*** section of the ***Services*** menu.

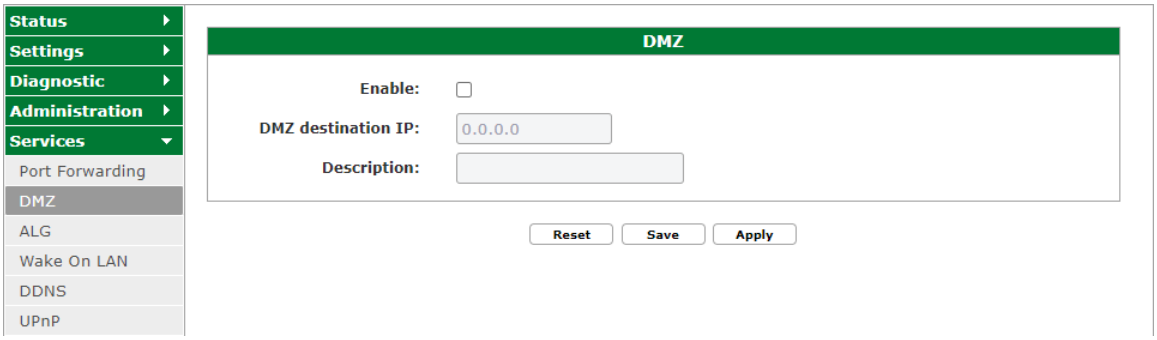

*Figure 30. The **DMZ** section of the **Services** menu*

- Select ***Enable*** to activate DMZ.
- For ***DMZ destination IP***, enter the IP address of the DMZ destination.
- For ***Description***, enter the DMZ description. You can use up to 64 characters in this description.

ALG

Application-level gateway options are available in the ***ALG*** tab of the ***Services*** menu. Select the appropriate check-box to activate or deactivate a chosen protocol.

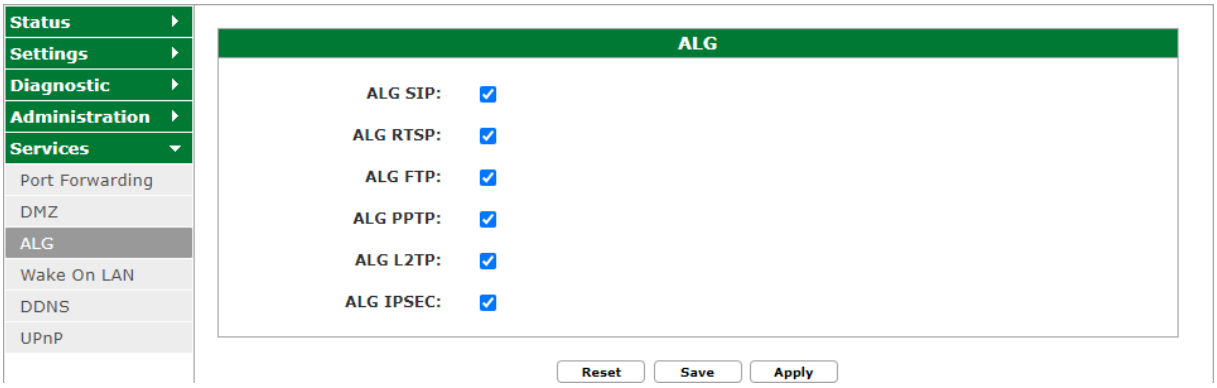

*Figure 31. The **ALG** section of the **Services** menu*

Wake On LAN

You can use the ***Wake On LAN*** feature to send a magic packet to a chosen device.

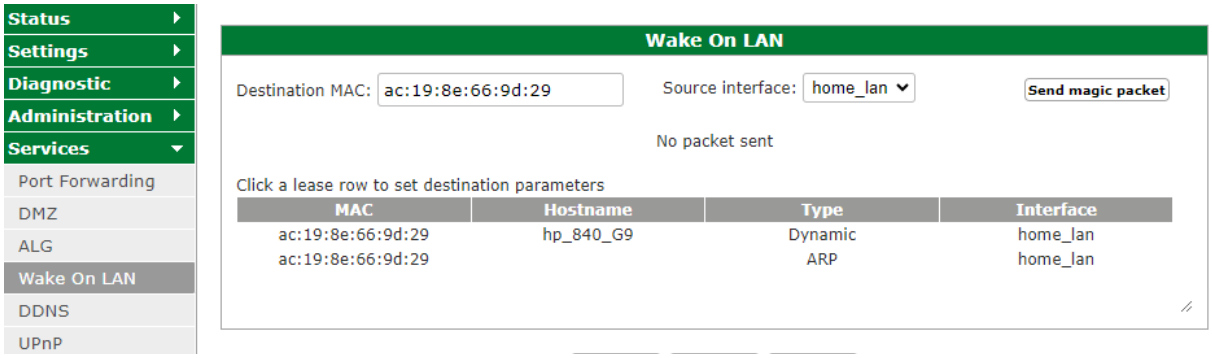

*Figure 32. The **Wake On LAN** section of the **Services** menu*

- ***Destination MAC*** – the MAC address to which the gateway sends a magic packet. Choose a matching entry from a list of MAC addresses to set destination parameters. You can also send a magic packet to a host which is not in the list, for example, a device that is connected to a LAN port but is not operating,
- ***Source interface*** – the interface from which to send a magic packet.
- ***Send magic packet*** – sends a magic packet.

Because this menu does not include any configurable options, the ***Reset***, ***Save***, and ***Apply*** buttons are inactive.

DDNS

You can use the ***DDNS*** menu to manage the Dynamic DNS feature.

To configure the DDNS feature, enter your information in the following fields.

- To use the DDNS feature, select ***Enabled***.
- For ***Update interval***, enter the time after which the gateway updates the DDNS settings.
- For ***Force update interval***, enter the time after which the gateway forces the update of the DDNS settings.
- For ***Select active profile***, choose one of the following options: ***custom***, ***opendns***, ***no-ip***, ***freedns***, ***changeip***, ***dynu***.
- For ***User login***, enter your dyndns.org username.
- For ***User password***, enter your dyndns.org password.
- For ***User domain***, enter the fully-qualified domain name (FQDN) of the domain that you registered at dyndns.org.
- For ***Service URL***, enter the URL of your DDNS.
- To display information about special sequences which you can enter in the fields of this section, choose ***Show help***. The gateway substitutes these sequences with appropriate configuration data.

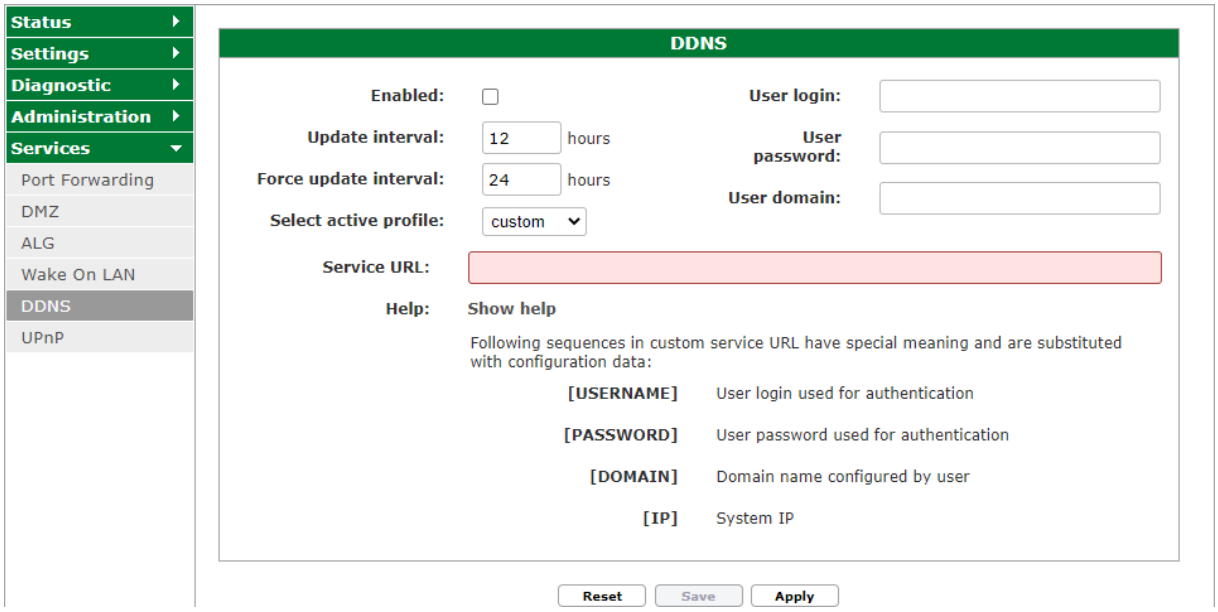

*Figure 33. The **DDNS** section of the **Services** menu with help displayed*

UPnP

You can activate the Universal Plug-and-Play feature in the ***UPnP*** section of the ***Services*** menu:

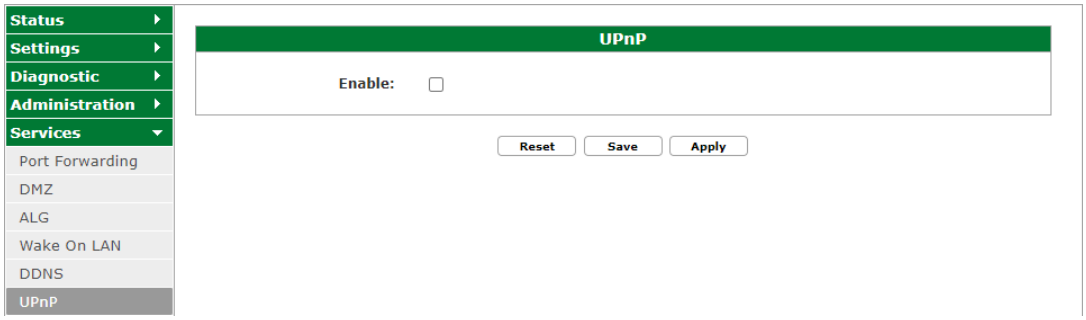

*Figure 34. The **UPnP** section of the **Services** menu*

IPv6 firewall

In the ***IPv6 firewall*** section of the ***Services*** menu, you can manually specify exceptions to the stateful IPv6 firewall.

- ***Use firewall exceptions***: activate IPv6 firewall exceptions,
- ***Description***: description of a given rule,
- ***Protocols***: one of the available protocols:
  - ***TCP***,
  - ***UDP***,
  - ***ANY***.
- ***Destination ports***: single destination port or range of ports,
- ***Source IPv6***: source IPv6 address,
- ***Destination IPv6***: destination IPv6 address,
- ***Enabled***: - enables or disables chosen exception.

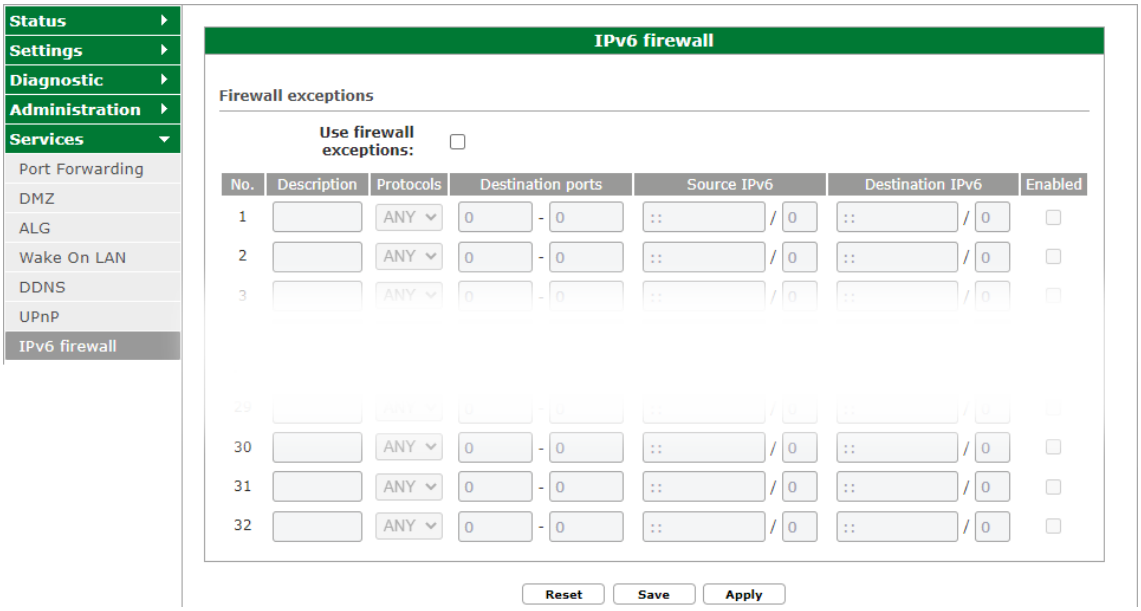

*Figure 35. The **IPv6** section of the **Services** menu*

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Document version: 1.0

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