

Wireless bridge

WB-3P-PTP5

User manual

Firmware version 2.4.1

IP address: 192.168.1.10

Username: admin

Password: password

1	Introduction	6
1.1	Annotation.....	6
1.2	Document conventions	6
2	Device description	7
2.1	Purpose.....	7
2.2	Device specification	7
2.3	Technical parameters	9
2.4	Technical parameters of offset parabolic antenna	11
2.5	Radiation patterns	12
2.6	Design	14
2.7	Light indication	16
2.8	Restore the default configuration	17
2.9	Supply package	17
3	Rules and recommendations for device installation	18
3.1	Safety rules.....	18
3.2	Installation recommendations.....	18
3.3	Recommendations for lightning protection	21
4	Device preparation	22
5	Device connection.....	23
6	Preliminary setup	24
7	Device installation	24
7.1	Device installation on a pole/post/wall	24
7.2	Installation of the device as part of an offset parabolic antenna	28
8	Device alignment	34
8.1	Alignment of devices mounted on a pole/post/wall.....	34
8.2	Alignment of devices mounted on an offset parabolic antenna	35
9	Final device setup	37
10	Device management via web interface.....	38
10.1	Getting started	38
10.2	User change.....	39
10.3	Applying configuration and discarding changes.....	40
10.4	Test mode.....	41
10.5	Web interface basic elements	42
10.6	"Quick Start" menu	43
10.6.1	"Quick Start" submenu	43
10.7	"Monitoring" menu	46
10.7.1	Wireless Peer/Wireless Clients	46

10.7.2	"Traffic Statistics" submenu.....	49
10.7.3	"Scan Environment" submenu.....	50
10.7.4	"Spectrum Analyzer" submenu.....	51
10.7.5	"Events" submenu	52
10.7.6	"Network Information" submenu	53
10.7.7	"Radio Information" submenu	55
10.7.8	"Device Information" submenu	56
10.8	"Radio" menu	57
10.8.1	"Radio" submenu.....	57
10.8.2	"QoS" submenu.....	61
10.8.3	"Advanced" submenu	62
10.9	"AP" menu	63
10.9.1	"Access Point" submenu	63
10.10	"STA" menu	69
10.10.1	"Station" submenu	69
10.11	"Network Settings" menu.....	72
10.11.1	"System Configuration" submenu	72
10.11.2	"Access" submenu	73
10.12	"System" menu	75
10.12.1	"Device Firmware Upgrade" submenu	75
10.12.2	"Configuration" submenu	76
10.12.3	"Ping Watchdog" submenu	77
10.12.4	"Reboot" submenu	78
10.12.5	"Authentication" submenu	78
10.12.6	"Log" submenu	79
10.12.7	"Date and Time" submenu	80
10.12.8	"LEDs" submenu	82
10.13	"Tools" menu	83
10.13.1	"Antenna Align" submenu	83
10.13.2	"Speed Testing" submenu.....	84
11	Example of the device setup	85
12	Managing the device using the command line.....	87
12.1	Connection to the device.....	87
12.2	Network parameters configuration	88
12.2.1	Network parameters configuration via set-management-vlan-mode utility	89
12.2.2	Configuring 802.1p priority for Management VLAN.....	90
12.2.3	Remote management configuration.....	90

12.2.4	IPv6 network parameters configuration.....	93
12.3	Radio settings.....	94
12.3.1	Advanced Radio settings	96
12.4	Configuring DHCP option 82.....	101
12.5	Configuring wireless network.....	102
12.5.1	Network settings for access point (AP)	103
12.5.2	Advanced settings for access point (AP)	105
12.5.3	Network settings for client (STA).....	113
12.5.4	Advanced settings for client (STA)	115
12.6	LoopBack Detection configuration	122
12.7	BPDU filter configuration.....	123
12.8	MAC address learning limiting.....	123
12.9	Changing the MTU size on interfaces	124
12.10	System settings	124
12.10.1	Device firmware update.....	124
12.10.2	Device configuration management.....	124
12.10.3	Ping watchdog.....	126
12.10.4	Device reboot	126
12.10.5	Authentication mode configuration	127
12.10.6	DCHP-snooping configuration	129
12.10.7	Configuring the date and time	129
12.10.8	Advanced system settings	130
12.11	Monitoring	132
12.11.1	Wireless Peer/Wireless clients	132
12.11.2	Device info	144
12.11.3	Network information	145
12.11.4	Wireless interfaces	146
12.11.5	Event log.....	147
12.11.6	Environment scan	147
12.11.7	Spectrum analyzer	148
13	Auxiliary utilities	149
13.1	Perftest utility.....	149
13.2	Manage-remote utility	149
13.2.1	Rebooting	149
13.2.2	Scanning the air	150
13.2.3	Spectrum analyzer	150
13.3	Traceroute utility	150

13.4	Tcpdump utility.....	151
13.4.1	Enabling traffic capture	151
13.4.2	Capturing traffic from an active interface.....	151
13.4.3	Environment sniffer	152
13.4.4	Uploading a file from device to server	152
13.5	Iperf utility	152
13.6	Antenna alignment	153
14	List of changes.....	154

1 Introduction

1.1 Annotation

Modern tendencies of telecommunication development necessitate operators to search for the most optimal technologies, allowing one to meet rapidly growing needs of subscribers, while maintaining at the same time consistency of business processes, development flexibility and reducing the costs of various services. Wireless technologies are spinning up more and more, and have paced a huge way for short time from unstable low-speed communication networks of low radius to broadband access networks equitable to speed of wired networks with high criteria to the quality of provided services.

WB-3P-PTP5 is a device designed to organize radio bridges over long distances. The radio bridge involves two such devices. WB-3P-PTP5 has a sealed housing, which allows installing the device mainly in open areas in various climatic conditions.

This operating manual describes the purpose, main technical characteristics, design, safety rules for operating the device, as well as recommendations for installing and configuring the wireless bridge WB-3P-PTP5.

1.2 Document conventions

Notes and warnings

✓ Notes contain important information, tips or recommendations on device operation and setup.

✗ Warnings are used to inform the user about harmful situations for the device and the user alike, which could cause malfunction or data loss.

2 Device description

2.1 Purpose

The WB-3P-PTP5 wireless bridge is a next-generation Wi-Fi 6 device designed to provide modern high-speed services.

With support for the IEEE802.11ax standard, the WB-3P-PTP5 wireless bridge provides data transfer rates of up to 2402 Mbps. The use of an offset parabolic antenna makes the WB-3P-PTP5 a universal solution for establishing long-distance radio bridges.

The WB-3P-PTP5 wireless bridge (hereinafter referred to as the "device") supports modern quality of service requirements and enables traffic transmission in priority queues.

WB-3P-PTP5 can operate in a wide range of operating temperatures and high humidity.

2.2 Device specification

Interfaces:

- 1 port of Ethernet 10/100/1000BASE-T (RJ-45);
- Wi-Fi 5 GHz IEEE 802.11a/n/ac/ax.

The power is supplied via 24 V PoE injector from 220 V.

 Using a PoE injector with a voltage different from 24 V will damage the device.

Functions:

WLAN capabilities:

- support for IEEE 802.11a/n/ac/ax;
- data aggregation, including A-MPDU (Tx/Rx) and A-MSDU (Rx);
- WMM-based packet priorities and planning;
- dynamic frequency selection (DFS);
- access point (AP-PTP/AP-PMP) mode;
- client (STA) mode;
- auto-distance detection;
- support for hidden SSID;
- MAC ACL;
- third-party access points detection;
- support for APSD;
- channel list limitation;
- spectrum analyzer;
- support for fixed center frequency;
- support for TDD;
- antenna alignment.

Network features:

- automatic speed negotiation and duplex mode;
- support for VLAN (Access, Trunk, General);
- Management VLAN;
- DHCP client;
- VLAN Mapping;
- Loopback Detection;
- MVR;
- NTP;

- Syslog;
- DHCP snooping;
- IGMP snooping (limit on the maximum number of groups);
- limiting the number of MAC addresses learned (MAC-learning);
- BPDU;
- IPv6;
- LLDP;
- Ping Watchdog.

QoS functions:

- bandwidth limiting;
- configuring WMM parameters for the radio interface;
- priority by 802.1p, DSCP and VLAN ID;
- traffic priority based on MAC/IP address.

Security:

- centralized authorization via RADIUS server (802.1X WPA/WPA2/WPA3 Enterprise);
- WPA/WPA2/WPA3/OWE encryption;
- authorization via RADIUS server when logging.

Figure 1 shows WB-3P-PTP5 application diagram.

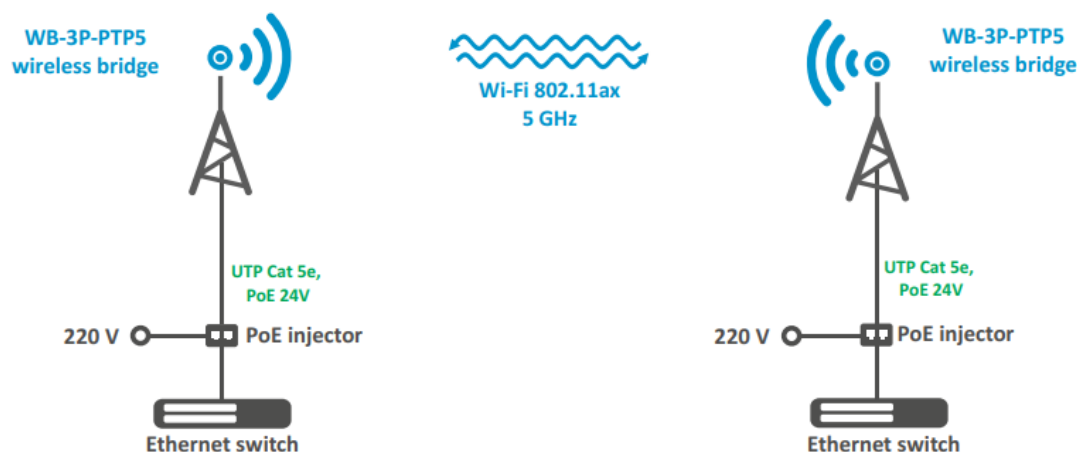


Figure 1 — WB-3P-PTP5 application diagram

2.3 Technical parameters

The main technical parameters of the device are given in Table 1.

Table 1 – Main specifications

Ethernet interface parameters	
Number of ports	1
Electrical connector	RJ-45
Data rate	10/100/1000 Mbps, auto-negotiation
Standards	BASE-T
Wireless interface parameters	
Standards	802.11a/n/ac/ax
Frequency range	5150–5975 MHz
Modulation	BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM
Operating channels ¹	802.11a/n/ac/ax: 32–193 (5150–5975MHz)
Data rate ²	802.11ax: 2402 Mbps
Maximum number of concurrent sessions	5 GHz: 64
Maximum output power of the transmitter ¹	5 GHz: 27 dBm
Receiver sensitivity	5 GHz: up to -96 dBm
Security	WPA/WPA2/WPA3/OWE
Antenna parameters	
Gain	9 dBi
Polarization	linear, H/V
SWR	no more than 2
Beam width (horizontal)	65°
Beam width (vertical)	65°

Management	
Remote management	web interface, CLI, Telnet, SSH, SNMP, NETCONF
Access restriction	by password, authentication via RADIUS server
General parameters	
Flash	128 MB SPI-NAND Flash
RAM	256 MB DDR3 RAM
Power supply	Passive PoE 24 V
Power consumption	no more than 11.5 W
Ingress protection	IP67
Operating temperature range	from -45 to +65 °C
Relative humidity at 25 °C	up to 95 %
Dimensions (W × H × D)	120 × 110 × 89 mm 120 × 110 × 144 mm (with cable gland)
Weight	0.31 kg
Service life	no less than 15 years

¹ The number of channels and the value of the maximum output power will vary according to the rules of radio frequency regulation in your country.

² The maximum wireless data rate is defined according to IEEE 802.11 standards. The real bandwidth can be different. Conditions of the network, environment, the amount of traffic, building materials and constructions and network service data can decrease the real bandwidth. The environment can influence the network coverage range.

2.4 Technical parameters of offset parabolic antenna

The main technical parameters of the offset parabolic antenna are given in Table 2.

Table 2 – Main specifications of offset parabolic antenna

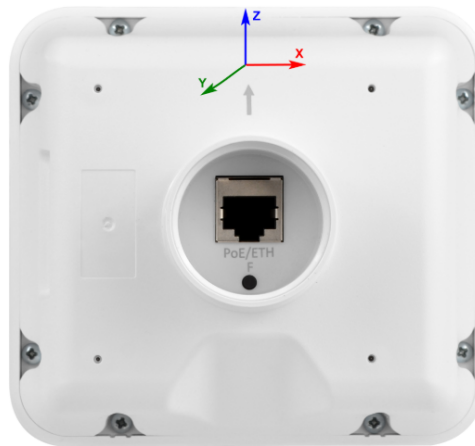
Parameters	Antenna 450 × 495 mm
Gain at 2.4 GHz	25 dBi
Offset angle	24°
Polarization	linear, H/V
Radiation angle	7°
Focal distance	270 mm
Wind load	130 km/h – operating 185 km/h – limit
Reflector dimensions	450 × 495 mm
Dimensions (W × H × D)	450 × 570 × 492 mm
Weight	1.6 kg
Material	steel

2.5 Radiation patterns

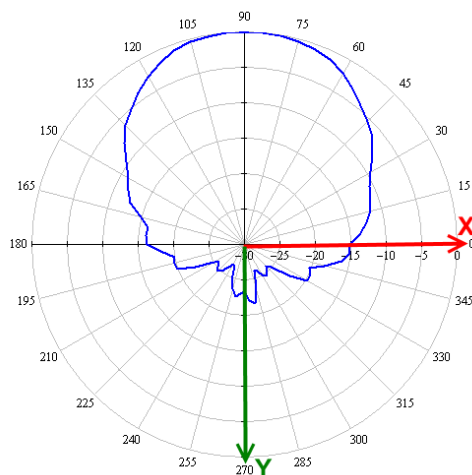
The figures below show the radiation patterns of the device.

WB-3P-PTP5 radiation patterns

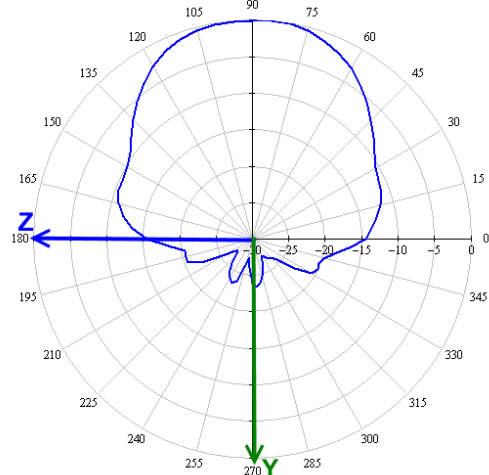
Measurement position

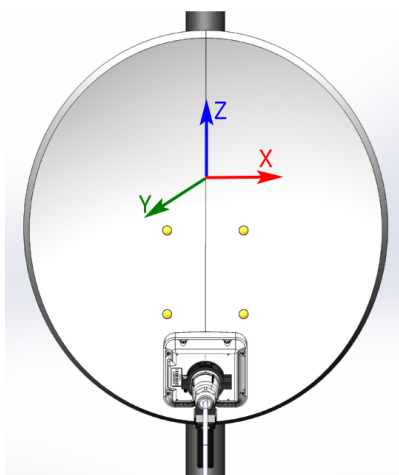
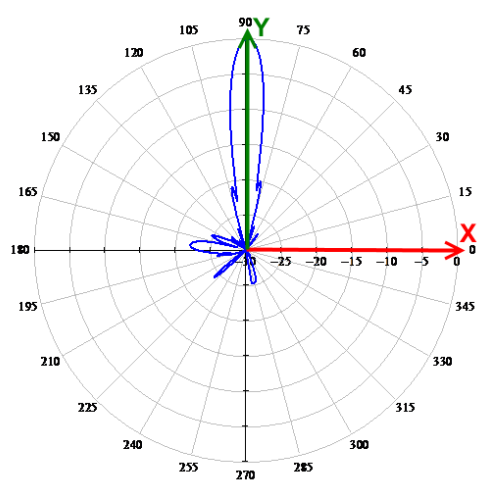
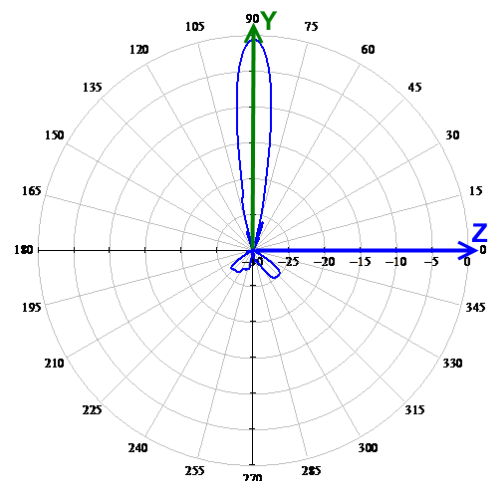


AZIMUTH (XY)



ELEVATION (YZ)



WB-3P-PTP5 radiation patterns**Measurement position****AZIMUTH (XY)****ELEVATION (YZ)**

2.6 Design

The WB-3P-PTP5 device has a plastic housing in industrial design. The main panel layout of WB-3P-PTP5 is shown in Figure 2.



Figure 2 — WB-3P-PTP5 main panel layout

The rear panel of WB-3P-PTP5 is shown in Figure 3.



Figure 3 — WB-3P-PTP5 rear panel

On the rear panel of WB-3P-PTP5 under the cable gland, there is a 10/100/1000BASE-T Ethernet port (RJ-45 connector) for connecting to the network and PoE power supply, as well as a factory reset button "F" (see Figure 4).



Figure 4 – RJ-45 and factory reset button "F"

2.7 Light indication

The layout of the WB-3P-PTP5 indicator panel is shown in Figure 5.



Figure 5 – WB-3P-PTP5 indicator panel

The current state of the device is displayed using indicators located on the side panel. The list of indicators and their states are given in Table 3.

Table 3 – Light indication of device status

	LED	LED status	Description
	WLAN – Received Signal Strength Indicators (RSSI)	solid	device is connected, the signal level from the remote device is greater than -60 dBm
		solid	device is connected, the signal level from the remote device is greater than -70 dBm
		solid	device is connected, the signal level from the remote device is greater than -80 dBm
		solid	device is connected, the signal level from the remote device is greater than -100 dBm
		none of indicators is on	no connection between devices
	LAN – Ethernet port indicator	solid	channel between WB-3P-PTP5 Ethernet interface and connected device is active
		flashing	process of packet data transfer between WB-3P-PTP5 Ethernet interface and connected device
	Power – power and device status indicator	solid	power connected, normal operation
		flashing	device did not receive an address via DHCP

	LED	LED status	Description
		blinks frequently for 3 seconds, then stays on continuously	reboot/factory reset

2.8 Restore the default configuration

There are two ways to reset your device to factory settings.

1. Using the "F" button on the device. When the device is loaded, press and hold the "F" button (about 10–15 seconds) on the device rear panel, until all WLAN indicators start flashing.
2. Using the PoE injector, that is included into the supply package. When the device is loaded, press and hold the "RST" button on the injector (for about 10–15 seconds) until all WLAN indicators start flashing.

✔ The device will be rebooted automatically. DHCP client will be launched by default. If the address is not obtained via DHCP, the device will have the factory IP address — **192.168.1.10**, and the following netmask — **255.255.255.0**; login/password for web interface — **admin/password**.

2.9 Supply package

The basic supply package of WB-3P-PTP5 includes:

- WB-3P-PTP5 wireless bridge;
- Cable gland;
- Power injector Passive PoE 24 V;
- Power cable;
- Patch cord RJ-45, 5e cat., 1.5m;
- User manual on a CD (optional);
- Technical passport.

3 Rules and recommendations for device installation

This section defines safety rules, installation recommendations, setup procedure and starting procedure of the device.

3.1 Safety rules

1. Do not open the device housing. There are no user-serviceable parts inside.
2. Do not install this device during a thunderstorm. There is a risk of lightning strike.
3. The voltage, current and frequency requirements specified in this manual should be observed.
4. Before connecting measuring instruments and a computer to the device, they should be grounded. The potential difference between the equipment and measuring instrument casings should not exceed 1 V.
5. Before turning on the device, ensure that the cables are intact and securely attached to the connectors.
6. Do not install the device near heat sources or in rooms with temperatures below -45°C or above 65°C.
7. When mounting the device on high-rise structures, comply with established standards and requirements for working at height.
8. The device should be operated by specially trained engineering and technical personnel.
9. Connect only suitable auxiliary equipment to the device.

3.2 Installation recommendations

1. The device can be installed on a pole/post, wall or in an offset parabolic antenna holder. The installation height should be at least 1 meter from the underlying surface, the installation distance should be no more than 5 meters from the edge of the surface. If it is impossible to comply with the latter condition, increase the suspension height.
2. Before installing the device and turning it on, check the device for visible mechanical defects. If defects are observed, stop the device installation, fill in the corresponding act and contact the supplier.
3. Estimate the signal level at the receiving point using the formulas for calculating signal propagation in free space.
4. To ensure the best signal level, place the device on a post/pole so that its antenna is pointed as much as possible at the antenna of the remote device. In this case, direct visibility should be ensured between devices, and the Fresnel zone should be clear of obstacles. The highest signal level can be obtained by adjusting the antenna using RSSI indicators, web interface (more details in the "[Antenna Align](#)" submenu) or CLI command.
5. After alignment, make sure that the signal from the remote device is as close as possible to the calculated value and is not lower than the permissible level of -65 ÷ -70 dBm.
6. If the signal exceeds -40 dBm, it is necessary to reduce the transmitter power on the remote device.
7. When installing offset parabolic antennas, take into account the antenna offset angle: to have the direction of maximum radiation parallel to the ground, the tilt angle of the parabolic antenna should be equal to the offset angle.

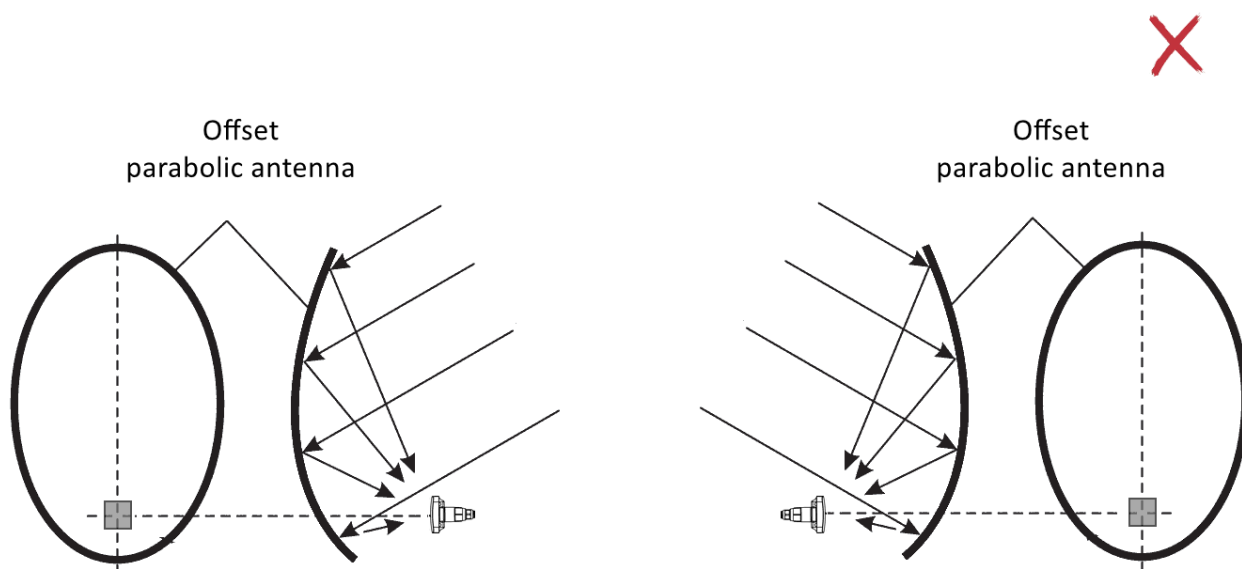


Figure 6 – Incorrect installation of offset parabolic antennas

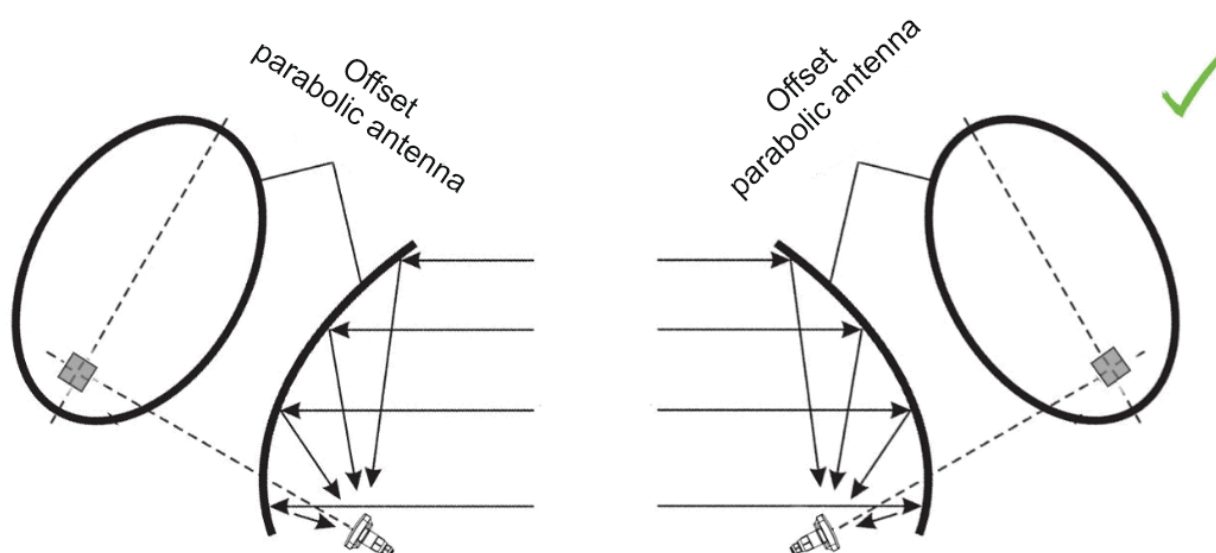


Figure 7 – Correct installation of offset parabolic antennas at the same suspension height

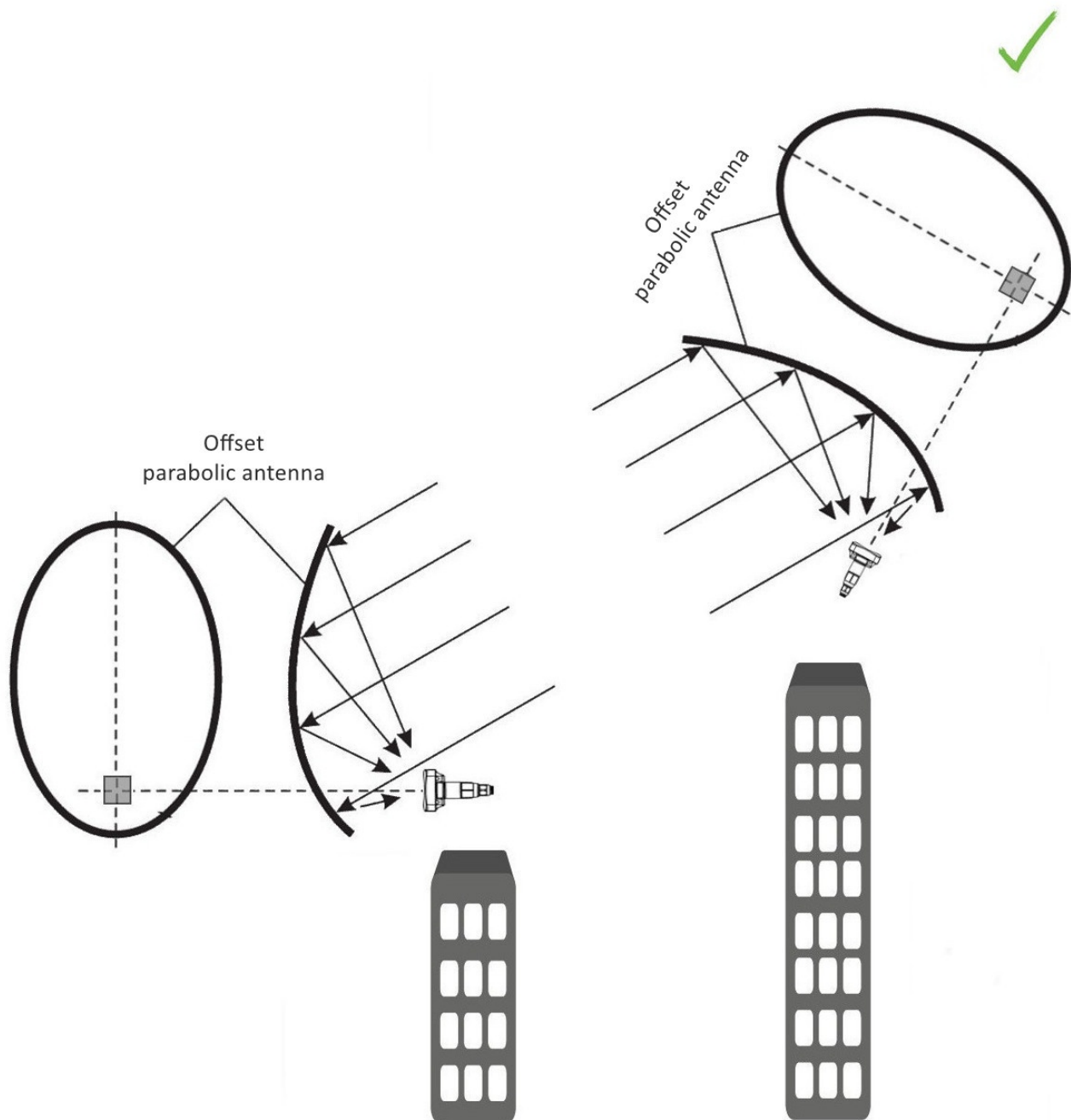


Figure 8 – Correct installation of offset parabolic antennas at different suspension heights

3.3 Recommendations for lightning protection

1. Grounding should be done with an insulated multi-core wire. The grounding device and the cross-section of the grounding wire should comply with the requirements of the Electrical Installation Code.
2. The first outdoor lightning protection should be installed as close as possible to the device, connecting them with a short outdoor FTP cable with shielded connectors.
3. The second outdoor lightning protection should be installed as close as possible to the PoE injector, connecting them with a short outdoor FTP cable with shielded connectors.
4. The lightning protections are connected to each other with an outdoor FTP cable up to 100 m long.
5. The PoE injector should be connected to a 220V grounded electrical outlet.

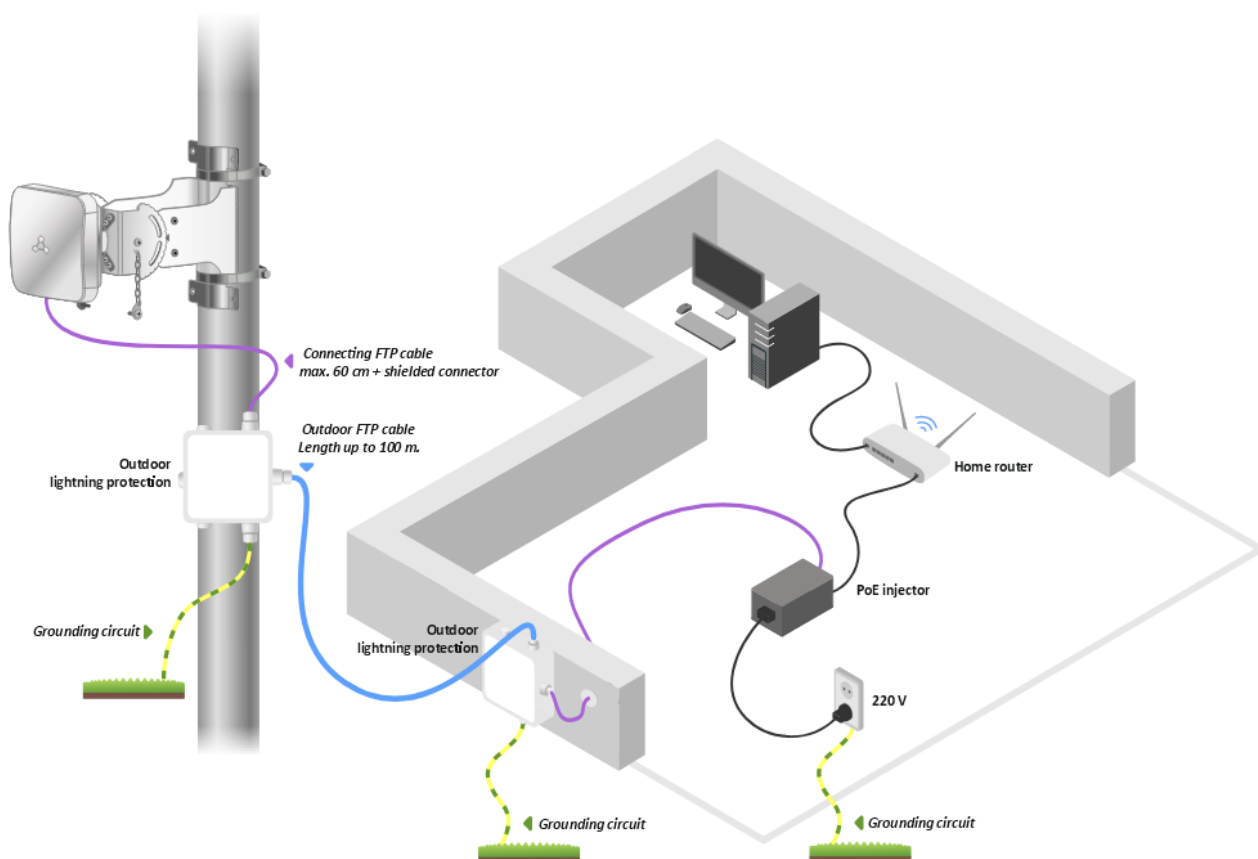


Figure 9 – Device wiring diagram for lightning protection

4 Device preparation

1. Remove the device from the package.
2. Connect the Ethernet cable to the PoE/ETH port.



Figure 10 — RJ-45 connector and "F" button

5 Device connection

1. Connect the Ethernet cable from WB-3P-PTP5 to the PoE port of the injector.



2. Connect the Ethernet cable of your network to the LAN port of the PoE injector.



3. Connect the PoE injector to a 220V outlet using the power cord. After powering on, WB-3P-PTP5 will boot up within a minute.



4. Connect to the WB-3P-PTP5 web configurator using a browser, following the instructions in the section [Device management via web interface](#).
5. If this is the first device start-up, then go to the section [Preliminary setup](#).

6 Preliminary setup

Before installation, perform preliminary setup of the device.

1. Make sure the power is connected.
2. Follow the algorithm from the section [Example of the device setup](#).

Make sure that a wireless connection is established between the devices: the signal strength indicators should light solid. The possible indicator states are described in the section [Light indication](#).

7 Device installation

The WB-3P-PTP5 wireless bridge has three mounting options: on a pole/post, on a wall, and as a part of an offset parabolic antenna.

7.1 Device installation on a pole/post/wall

1. Connect the device to the network and perform preliminary setup following the instructions in the section [Preliminary setup](#). Then disconnect the device from the network and proceed with installation.
2. Remove the bracket, bag with fasteners, and clamps from the package.
3. Fix the bracket on the pole using the Ø60–80 clamp from the package. The final tightening of the clamp Ø60–80 is performed in step [Alignment of devices mounted on a pole/post/wall](#). Fix the screw with the chain onto the bracket, then put the clamp Ø32–50 onto the tightening slats of the bracket. Follow the safety instructions. See [rules and recommendations for device installation](#).



Figure 11 — Mounting the bracket on the pole

4. Disassemble the cable gland – unscrew the sealing nut and remove the split gland from inside.

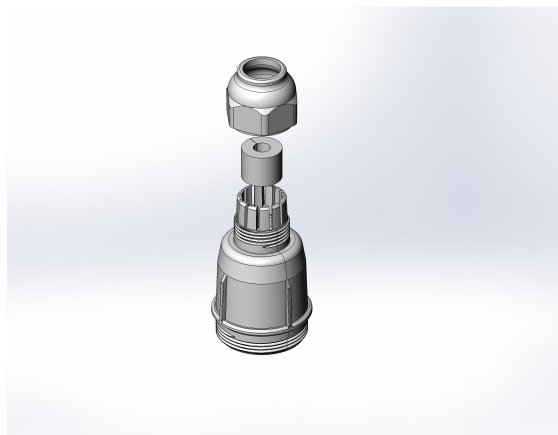


Figure 12 – Dismantling the cable gland

5. Pass the cable through the bracket and the cable gland as shown in Figure 13.

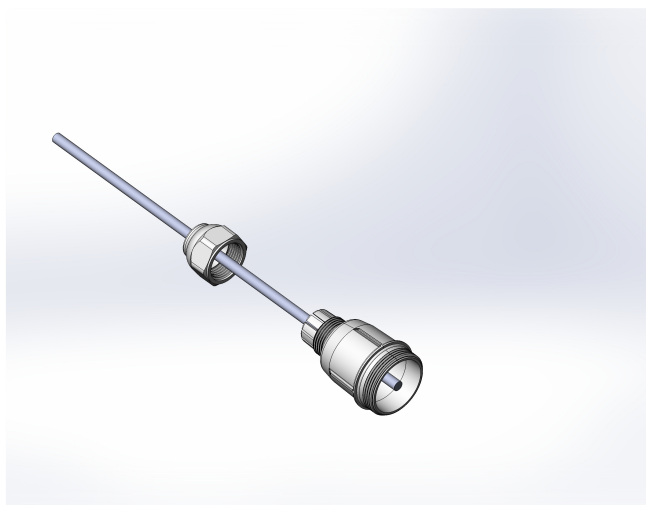


Figure 13 – Cable pulling through the cable gland

6. When installing the device with a deviation of ± 10 degrees, refer to Figure 14 (a). When installing the device with a deviation of $\pm 10-70$ degrees, refer to Figure 14 (b).

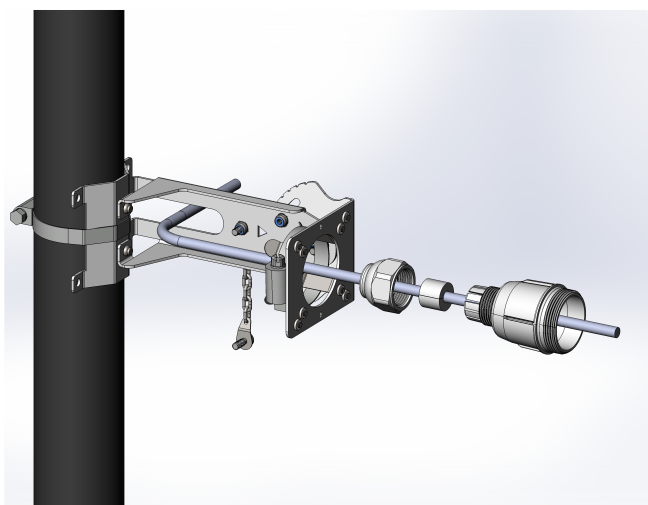


Figure 14 (a)

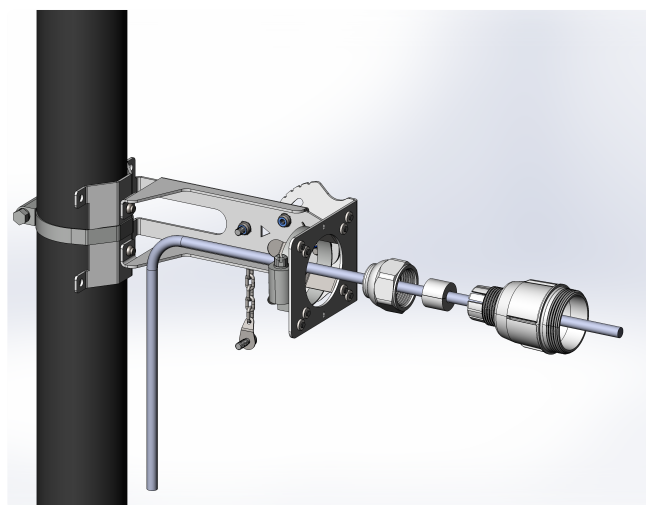


Figure 14 (b)

7. Crimp the RJ-45 connector onto the cable and connect it to the mating part on the device housing.

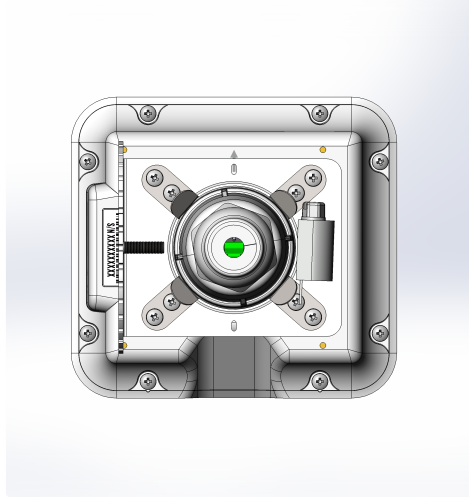


Figure 15 — RJ-45 connector on the device housing

8. Securely tighten the gland body, place the split gland on the cable and insert it into the gland body. Tighten the sealing nut until it stops.

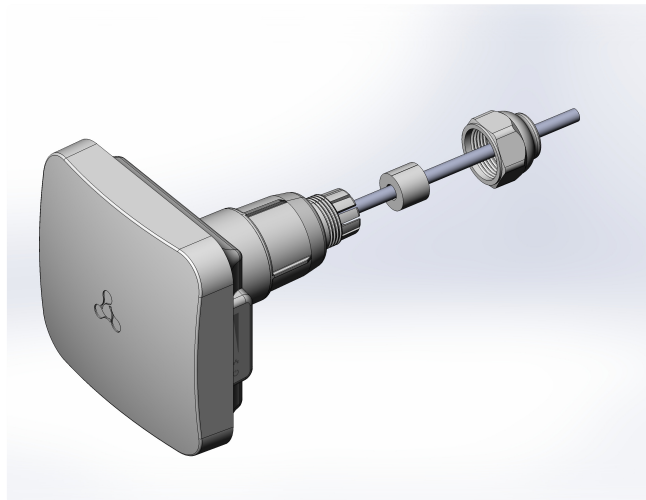


Figure 16 — Installation of the cable gland

✗ Incorrect installation of the cable gland can compromise the device sealing.

9. Insert the device into the bracket slats. Adjust the device by aligning the arrow on the device housing with the hole in the bracket, and tighten the clamp Ø32–50.

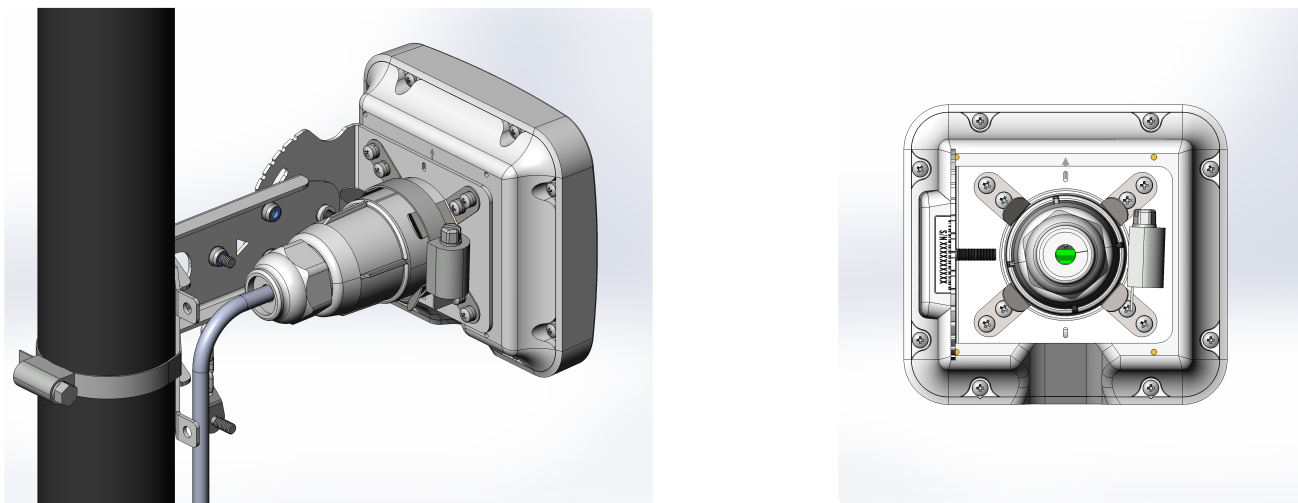


Figure 17 – Installing the device into the bracket

10. After installation, rotate the device to the required angle, using the scale located on the bracket as a reference. The tilt angle can be adjusted from -70 to 70 degrees.

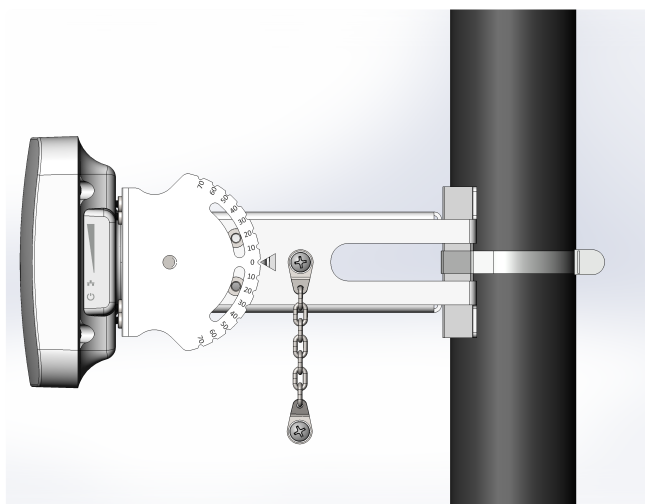


Figure 18 – Setting the required tilt angle

11. It is possible to install the bracket on the wall. When installing on a wall, use screws, self-tapping screws 4×40 mm, and, if necessary, 6×40 mm dowels (Figure 19).

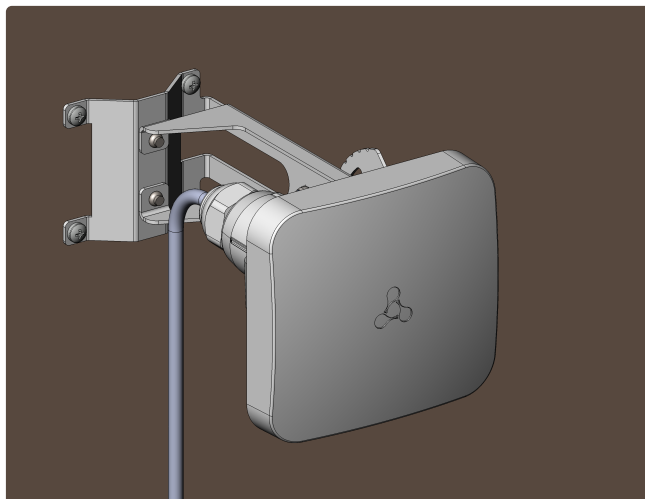


Figure 19 — Mounting the device on the wall

12. Connect the device to the network following the algorithms in the [Device connection](#) sections. Then proceed to [device alignment](#).

✗ To prevent the device failure, it is recommended to use lightning protection.

7.2 Installation of the device as part of an offset parabolic antenna

Supply package:

- WB-3P-PTP5 basic supply package;
- Offset parabolic antenna with mounting kit.

To install the device as part of an offset parabolic antenna, follow these steps:

1. Connect the device to the network and perform preliminary setup following the instructions in the [Preliminary setup](#) section. Then disconnect the device from the network and proceed with installation.
2. Assemble the device holder by inserting the top part axis into the bottom part slots. Install the M4×20 screw with a nut on the right side of the holder.

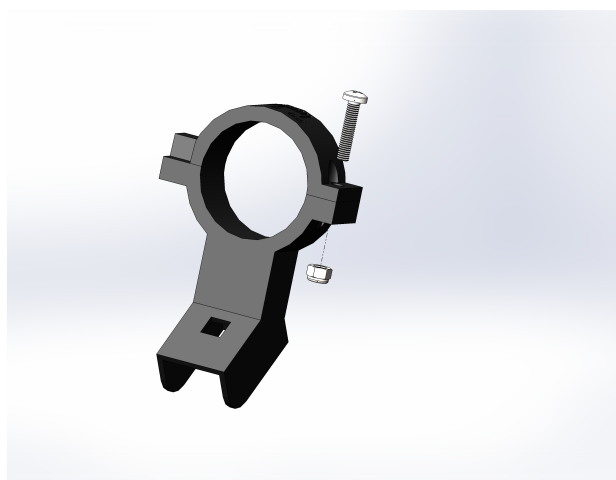


Figure 20 — Assembling the device holder

3. Attach the holder and the movable part of the bracket to the arc using M6×30 bolts, bracket and nuts from the mounting kit. Install the plug on the upper end of the arc.

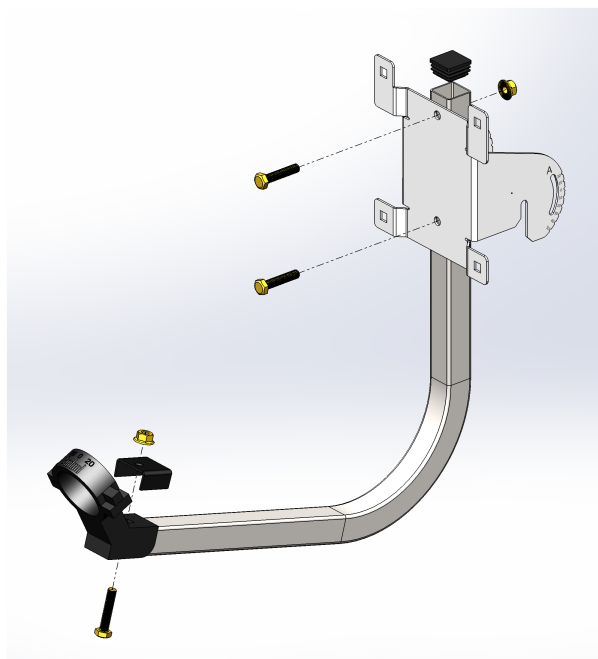


Figure 21 — Fastening the holder and the movable part of the bracket on the arc

4. Connect the movable part of the bracket and the antenna reflector using M6×12 bolts and nuts.

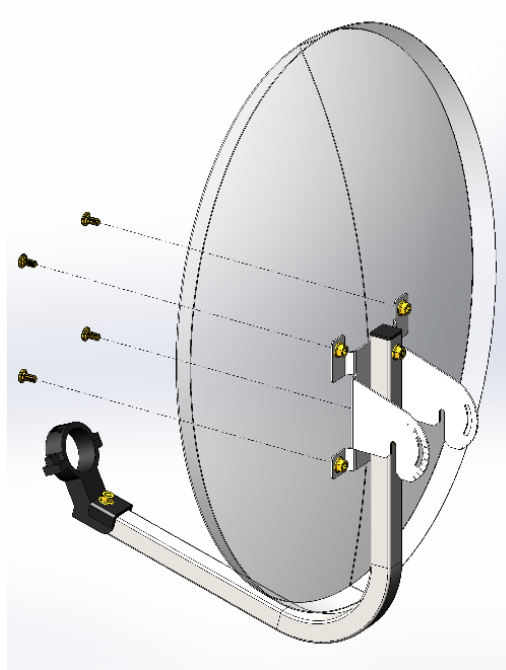


Figure 22 — Mounting the antenna reflector on the movable part of the bracket

5. Disassemble the cable gland – unscrew the sealing nut and remove the split gland from inside.

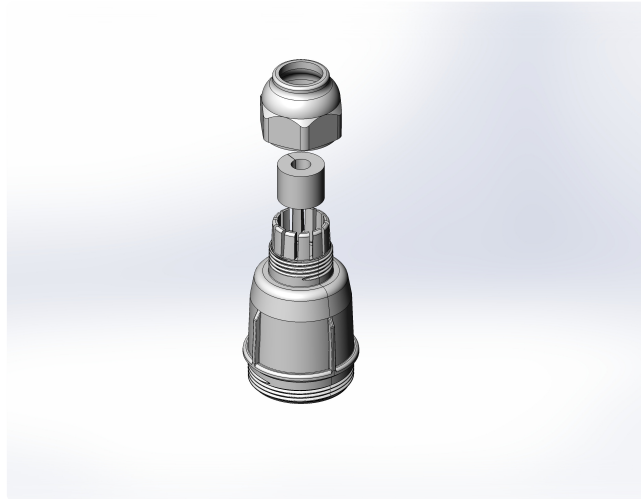


Figure 23 – Dismantling the cable gland

6. Pass the cable through the bracket and the cable gland.

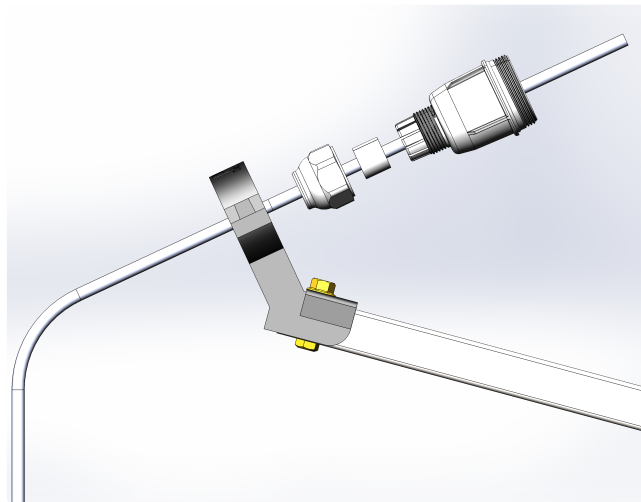


Figure 24 – Cable pulling through the holder and the cable gland

7. Crimp the RJ-45 connector onto the cable and connect it to the mating part on the device housing.

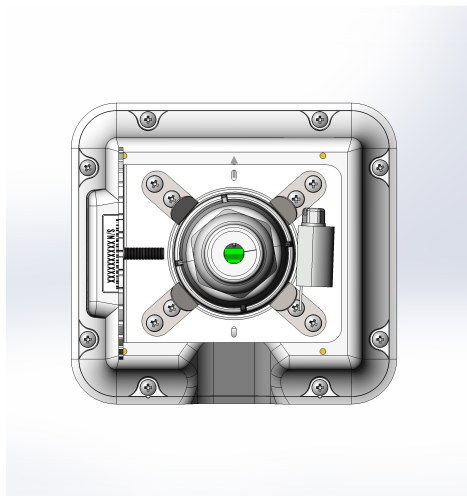


Figure 25 – RJ-45 connector on the device housing

8. Securely tighten the gland body, place the split gland on the cable and insert it into the gland body. Tighten the sealing nut until it stops.

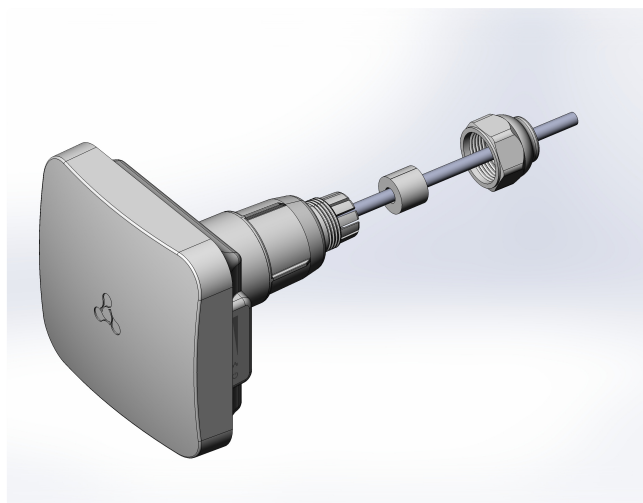


Figure 26 – Installing the cable gland

✗ Incorrect installation of the cable gland can compromise the device sealing.

9. Place the device in the holder and adjust the device to 0° using the holder scale. After adjustment, tighten the screw on the holder.

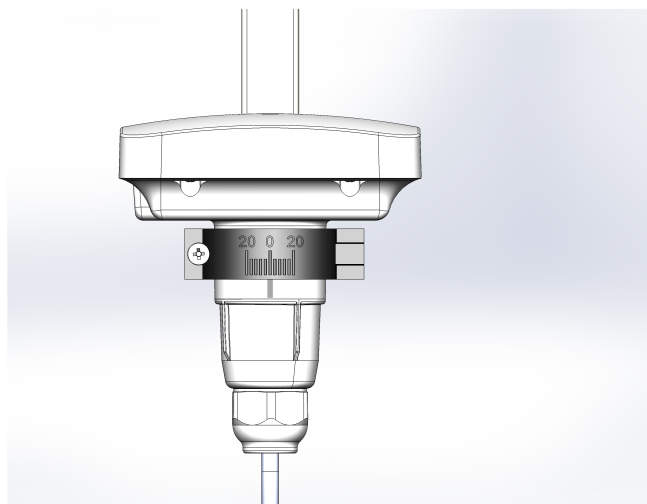
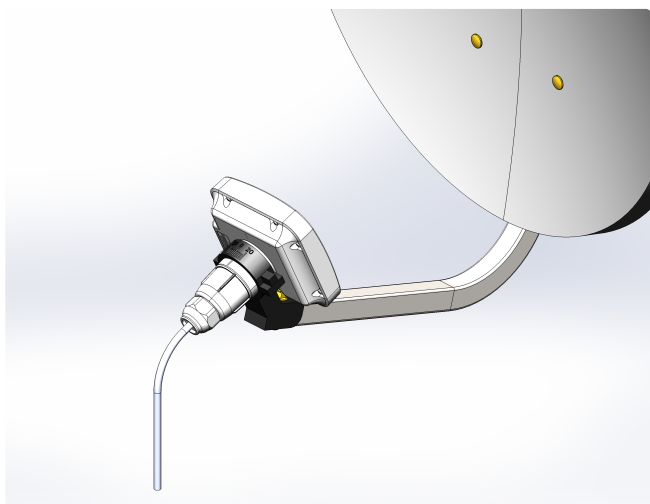


Figure 27 – Installing the device into the holder

10. Place the fixed part of the bracket on the pole as shown in Figure 28 and secure it with the clamps supplied with the device. The final tightening of the clamps is performed in [Alignment of devices mounted on an offset parabolic antenna](#) section. Install the chains; do not tighten the chain screws tightly, leaving a gap for installing the movable part of the bracket. Follow the instructions given in the section [Rules and recommendations for device installation](#).

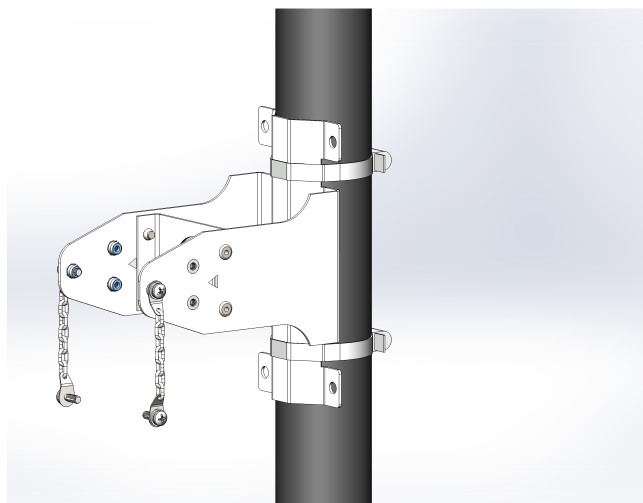


Figure 28 — Installing the fixed part of the bracket

11. Install the reflector on the fixed bracket. During installation, the screws that were not tightened before should fall into the grooves of the movable part of the bracket.

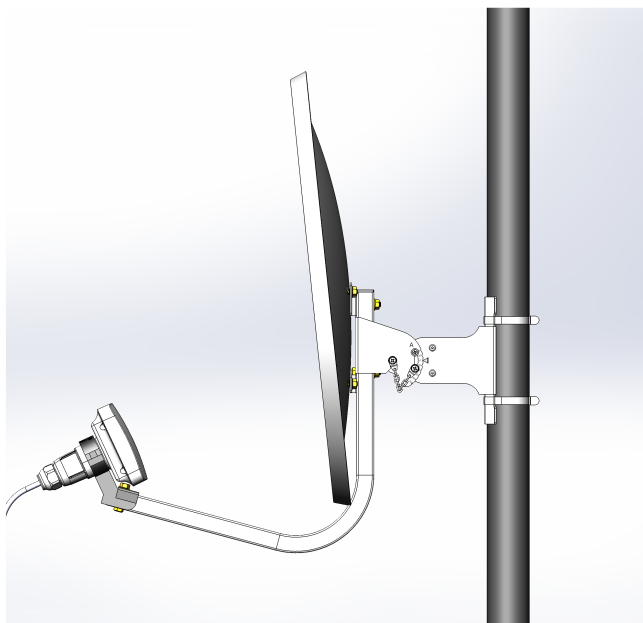


Figure 29 — Installing the reflector on the fixed bracket

12. If necessary, it is possible to install a parabolic antenna on the wall, for example using M6 bolts.



Figure 30 — Mounting a parabolic antenna on the wall

13. Connect the device to the network following the algorithms in the [Device connection](#) section. Then proceed to [device alignment](#).

8 Device alignment

- ✓ First, the horizontal alignment of the device is performed, then the vertical one.

8.1 Alignment of devices mounted on a pole/post/wall

1. Be sure to perform the alignment alternately from both sides, based on the calculated signal level value obtained in the [Installation recommendations](#) section (it is required to get the closest possible value).
2. Adjust the position of the devices by directing the antennas approximately to each other, using maps and optical visibility (for example, using binoculars) to the opposite side.

- ✓ With default settings, the client (STA) does not send a connection request, so to establish a connection, you first need to direct the access point (AP) to the client (STA).

3. In case of establishing connection between the devices, sequentially align the devices, achieving a gradual increase in values on the RSSI scale (LED states are provided in the [Light Indication](#) section) in both vertical and horizontal planes.
4. In the horizontal plane, one side passes a sector of 45–60 degrees — fixes the maximum, the second side repeats the same action.
5. Next, perform the second pass according to the above scheme. Finally tighten the clamp on the bracket. It is necessary to take into account that during alignment, hitting the side lobe of the radiation pattern may be interpreted as reaching the maximum signal level. To avoid this situation, it is necessary to perform a full pass in the sector and note any nonlinear level changes.
6. Repeat steps 4–5 in the vertical plane. Fix the resulting tilt angle using screws on the chain.

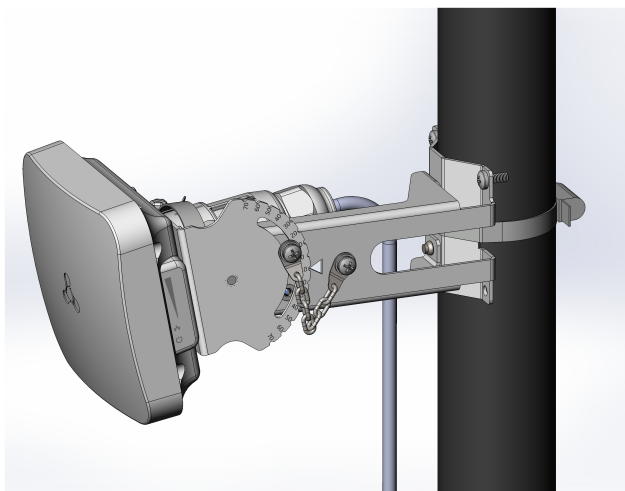


Figure 31 — Setting the required tilt angle

7. For more precise alignment, use the [CLI](#) command or web interface (more details in "Antenna Align" submenu), achieving the maximum signal level values.

8.2 Alignment of devices mounted on an offset parabolic antenna

1. Be sure to perform the alignment alternately from both sides, based on the calculated signal level value obtained in the [Installation recommendations](#) section (it is required to get the closest possible value).
2. Adjust the position of the devices by directing the antennas approximately to each other, using maps and optical visibility (for example, using binoculars) to the opposite side.

✓ With default settings, the client (STA) does not send a connection request, so to establish a connection, you first need to direct the access point (AP) to the client (STA).

3. In case of establishing connection between the devices, sequentially align the devices, achieving a gradual increase in values on the RSSI scale (LED states are provided in the [Light Indication](#) section) in both vertical and horizontal planes.
4. In the horizontal plane, one side passes a sector of 45–60 degrees – fixes the maximum, the second side repeats the same action.
5. Next, perform the second pass according to the above scheme. Finally tighten the clamps on the bracket unmovable part. It is necessary to take into account that during alignment, hitting the side lobe of the radiation pattern may be interpreted as reaching the maximum signal level. To avoid this situation, it is necessary to perform a full pass in the sector and note any nonlinear level changes.
6. In the vertical plane, repeat steps 4–5: rotate the device to the required angle, using "A" and "B" scales located on the bracket as a guide. The "A" scale represents the tilt angle of the parabolic antenna, while the "B" scale represents the elevation angle. Then fix the resulting angle using the screw on the chain.

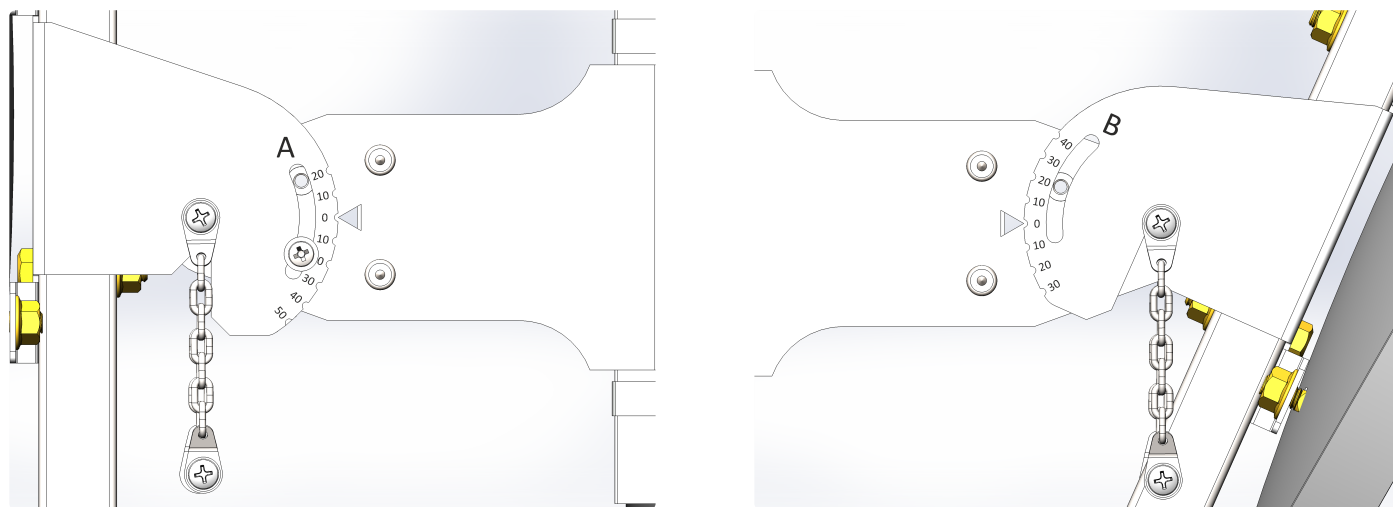


Figure 32 – "A" and "B" scales on the movable part of the bracket

7. When setting the angle on the "A" scale from -10 to 5 degrees, it is recommended to additionally fix the movable part of the bracket with a second screw from the kit.

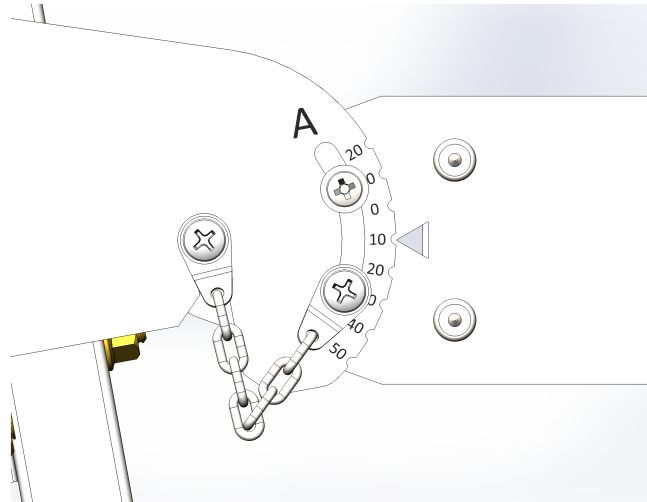


Figure 33 — Additional fixation of the bracket movable part

8. For more precise alignment, use the [CLI](#) command or the web interface (more details in "Antenna Align" submenu), achieving the maximum signal level values.

9 Final device setup

1. It is recommended to select and set a static modulation on this and the opposite devices. To select a static modulation, run a continuous ping to the devices. Then, in the "Monitoring" menu, under "Wireless Peer"/"Wireless Clients," note the automatically set modulation and set it statically in the channel transmission rate settings in the "Radio" menu. For reliability, you can set the modulation a couple of points lower than the automatic setting.
2. Scan the environment with a spectrum analyzer and select the least congested channel.
3. Set the final channel in the "Radio" menu.

10 Device management via web interface

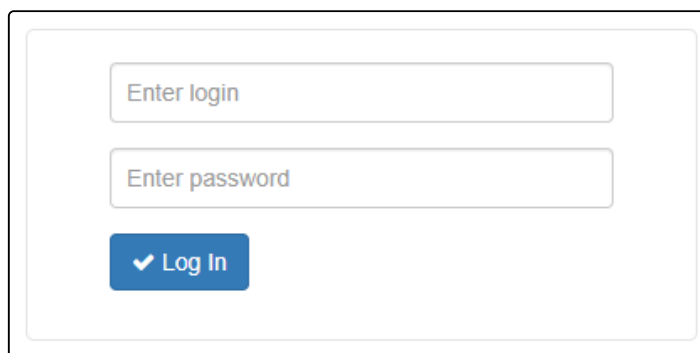
10.1 Getting started

To get started, connect to the device via Ethernet interface using a web browser:

1. Open a web browser, for example, Firefox, Opera, Chrome.
2. Enter the device IP address in the browser address bar.

✓ Factory IP address: **192.168.1.10**, subnet mask: **255.255.255.0**. By default, the device is capable to obtain an IP address via DHCP.

When the device is successfully detected, username and password request page will be shown in the browser window.

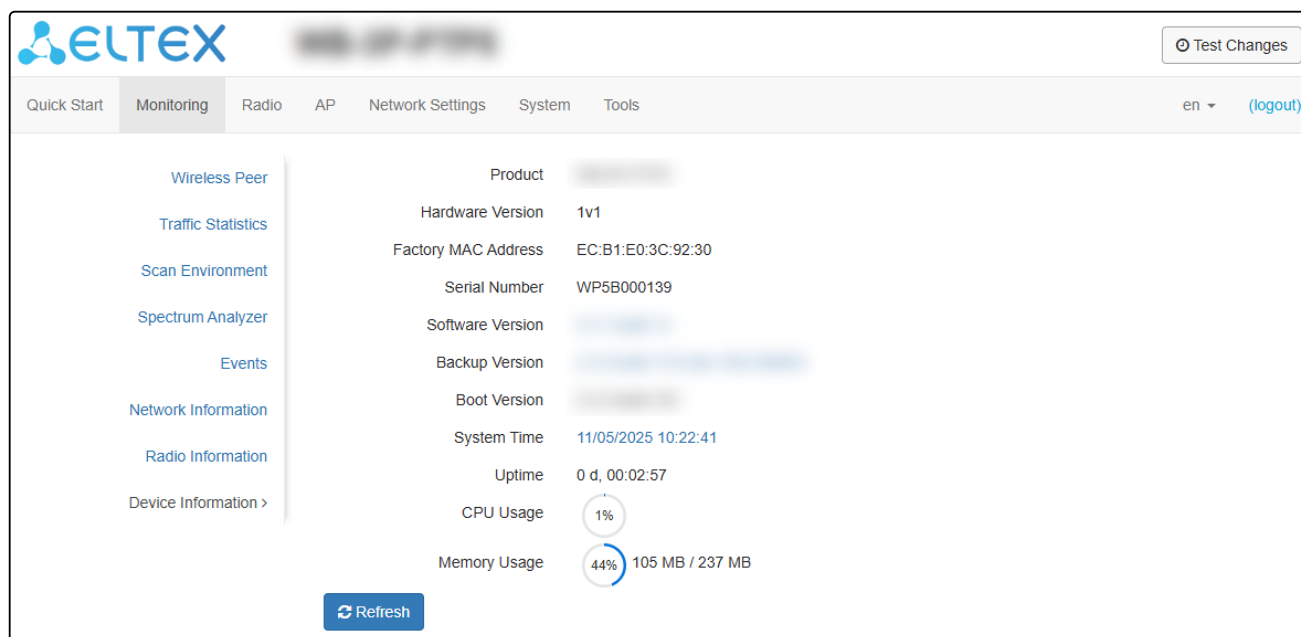


The image shows a login form with two input fields: "Enter login" and "Enter password". Below these fields is a blue button with a checkmark icon and the text "Log In".

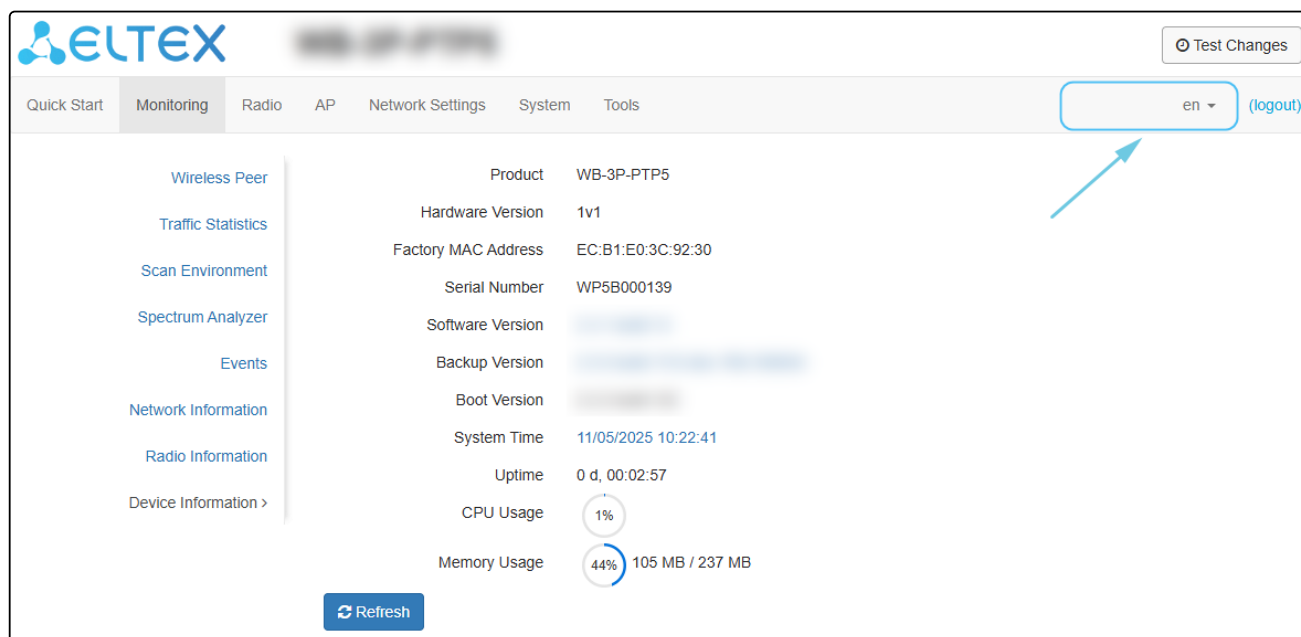
3. Enter username into "Enter Login" and password into "Enter Password" field.

✓ Factory settings: login — **admin**, password — **password**.

4. Click "Log In". The device status monitoring menu will open in a browser window.



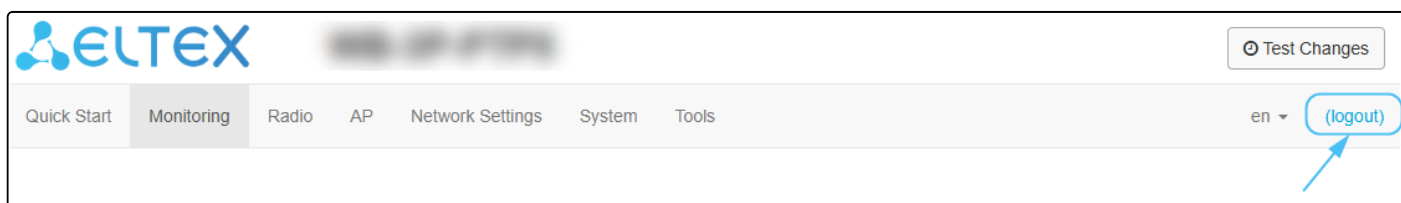
5. If necessary, select the information display language.



10.2 User change

There are two types of users on the device: **admin** and **viewer**:

- **admin** (default password: **password**) has full access to the device: ability to read and write any settings, full monitoring of the device status.
- **viewer** has the right to only view the entire configuration of the device without the ability to edit anything; monitoring of the device status is fully accessible.



If to click the "Logout" button, the current user session will be terminated and the authorization window will be displayed:

The screenshot shows the authorization window. It contains two input fields: 'Enter login' and 'Enter password'. Below these fields is a blue button with a checkmark icon and the text 'Log In'.

To change access, specify the appropriate username and password and click the "Log In" button.

10.3 Applying configuration and discarding changes

1. Applying configuration



Clicking the  button starts the process of saving the configuration to the device flash memory and applying the new settings. All the settings come into operation without device rebooting.

The web interface has a visual indication of the current status of the setting applying process (Table 4).

Table 4 – Visual indication of the current status of the setting application process

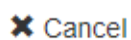
Image	State description
	After clicking "Apply", the process of settings saving to device memory is launched. This is indicated by the  icon in the tab name and on the "Apply" button.
	The  icon in the tab name indicates about successful saving and application of the settings.

2. Discarding changes



The changes can be discarded only before clicking the "Apply" button. If you click the "Apply" button, all the changed parameters will be applied and saved to device memory. After clicking the "Apply" button, return to the previous settings will not be possible.

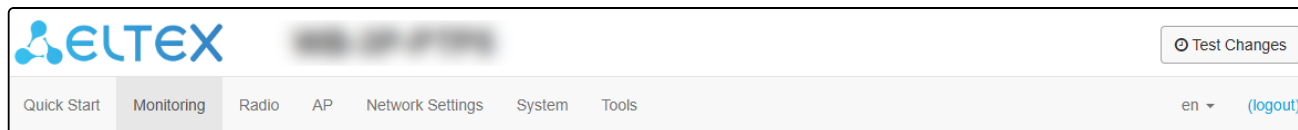
The button for discarding changes appears as follows:



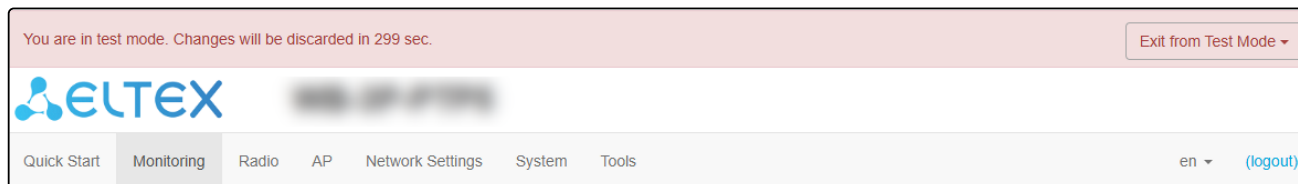
10.4 Test mode

The device has a test mode for testing configurations.

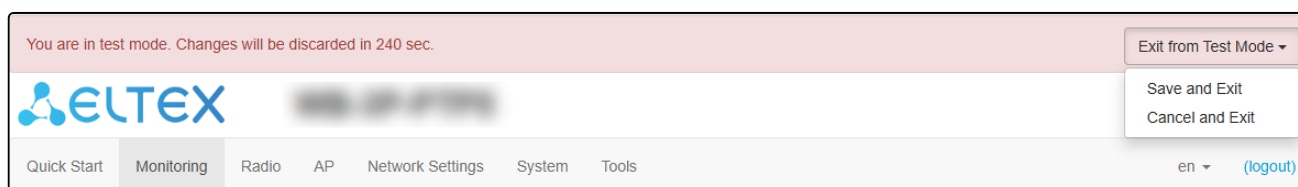
To activate it, click the "Test Mode" button in the top panel of the web interface.



The test mode runs for 300 seconds (5 minutes). During this time, you can navigate the web configurator tabs and make any changes, applying them on each page using the "Apply" button.



After checking the required configuration, click the "Exit from Test Mode" button and select the desired action:

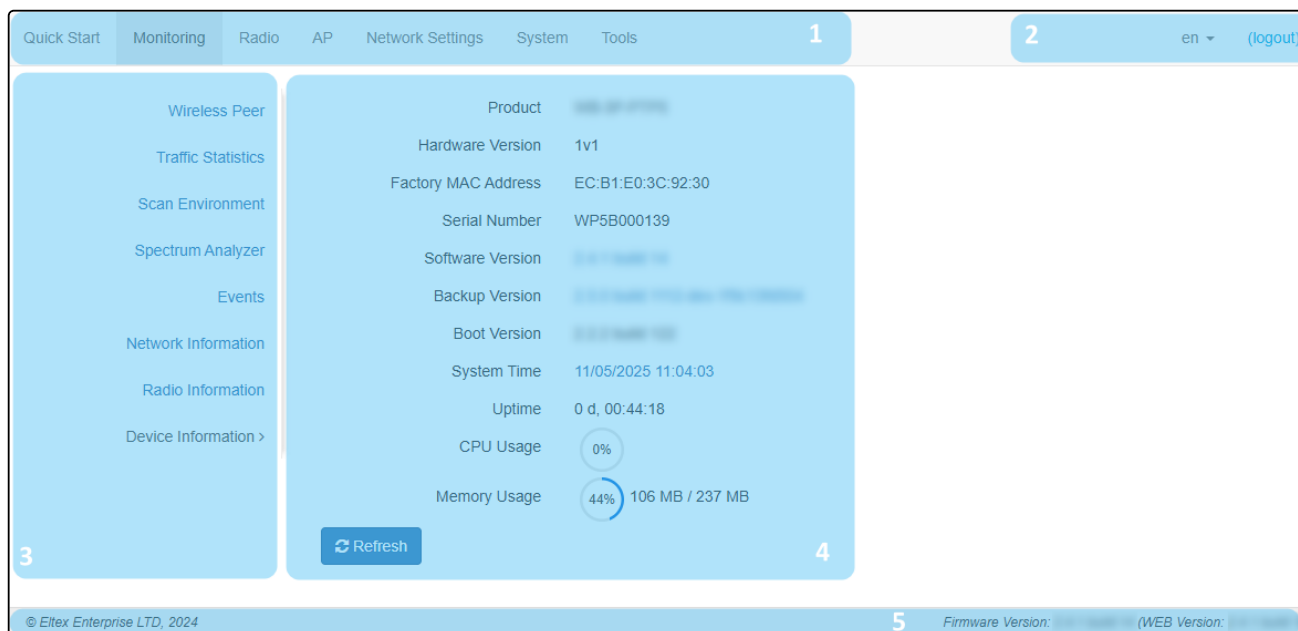


- "Save and Exit" — when pressed, the device will exit test mode and save all configuration changes made and applied in this mode to non-volatile memory. It will be impossible to cancel the changes made in test mode.
- "Cancel and Exit" — when pressed, the device will exit test mode and discard all changes made in this mode. The configuration that was active on the device before enabling test mode will be restored.

If the administrator does not exit test mode within 300 seconds, this will happen automatically, and all changes made in that mode will be undone. After the specified time expires, the configuration will be restored, even if the access to the device was lost as a result of these actions.

10.5 Web interface basic elements

Navigation elements of the web interface are shown in the figure below.



User interface window is divided into five general areas:

1. Menu tabs categorize the submenu tabs: **Quick Start, Monitoring, Radio, AP** (the "AP" menu is only available in the "Access Point PTP" or "Access Point PMP" device mode) or STA (the "STA" menu is only available in the "Station" device mode), **Network Settings, System, Tools**.
2. Interface language selection and Logout button designed to end a session in the web interface under a given user.
3. Submenu tabs allow one to control settings field.
4. Device configuration field displays data and configuration.
5. Information field displays current firmware version.

10.6 "Quick Start" menu

In the **"Quick Start"** menu, the basic configuration of the device is performed.

10.6.1 "Quick Start" submenu

ELTEX WB-3P-PTP5

Quick Start | Monitoring | Radio | AP | Network Settings | System | Tools

en (logout)

Quick Start >

Radio

Device Mode: Access Point PMP

Channel: 36 (5180 MHz)

Channel Bandwidth, MHz: 20

Transmit Power Limit, dBm: 27

Distance, km: 0

Connection Settings

SSID: WB-3P-PTP5-test

Security Mode: OWE

MFP: Required

Network Settings

Hostname: AP

Protocol: Static

Static IP: 192.168.1.10

Netmask: 255.255.255.0

Gateway: XXXX.XXX.XXX.XXX

Device Access

Password:

Confirm Password:

Apply Cancel

Spectrum Analyzer

Scan

Scan will take no more than 67 s.

Last scan was 12/26/2025 06:47:37

Channel Utilization, %

Frequency, MHz

Channel: 40
Frequency: 5200 MHz
Utilization: 76%

Connections

Refresh

#	Hostname	IP Address	MAC	Local Signal, dBm	Remote Signal, dBm	Uptime
1	STA		ec:b1:e0:2e:8b:40	-50 / -28	-46 / -40	0 d, 00:01:58
2	STA		ec:b1:e0:2d:a1:00	-53 / -42	-63 / -41	0 d, 00:01:58

Radio:

In the **"Radio"** section, the main parameters of the device radio interface are configured.

- **Device Mode** – operating mode of the device radio interface. The following modes are available:
 - *Access Point PTP* – Point-to-Point;
 - *Access Point PMP* – Point-to-Multipoint;
 - *Station* – wireless client (STA).
- **Channel** – selecting a data transmission channel. If the "Auto Channel" is checked in the Radio menu, this setting will be locked;
- **Channel Bandwidth, MHz** – channel bandwidth on which the device operates. The parameter can take values of 5, 10, 20, 40, 80 and 160 MHz;
- **Primary Channel** – parameter can only be changed if the bandwidth of a statically specified channel is equal to 40 MHz. The 40 MHz channel can be considered as consisting of two adjacent 20 MHz channels. These two 20 MHz channels are called primary and secondary channels:
 - *Upper* – primary channel will be the upper 20 MHz channel in the 40 MHz band;
 - *Lower* – primary channel will be the lower 20 MHz channel in the 40 MHz band.

- *Fixed Center Frequency* – when checked, all traffic (data and control packets) will be transmitted on the specified channel center frequency with the specified bandwidth (40/80/160 MHz). The function is proprietary, the transmission is not carried out according to IEEE 802.11 standards, which assume the use of different center frequencies for data and control traffic with a channel bandwidth of 40/80/160 MHz;
- *Transmit Power Limit, dBm* – Wi-Fi transmitter signal power adjustment in dBm;
- *Distance, km* – distance between devices in kilometers. Changing the distance value will change the ACK timeout value. The distance should be rounded up. For example, if the distance between devices is 3.2 km, then 4 km should be specified.

✓ The 5 and 10 MHz bandwidths are only available in IEEE 802.11a/n/ac mode. To change the 802.11 mode, go to the Radio menu.

✓ The "Channel", "Channel Width", "Primary Channel" parameters are only available when the device mode is "Access Point PTP" or "Access Point PMP".

Connection Settings:

- *SSID* – virtual wireless network name;
- *Security Mode* – wireless network access security mode:
 - *Off* – do not use encryption for data transfer;
 - *OWE (Opportunistic Wireless Encryption)* – encryption method that provides the security of data transmitted over an unsecured network. In this case, users do not need to do any additional actions and enter a password to connect to the network;
 - *WPA2, WPA3* – encryption methods, when selecting one of the methods, the following setting will be available:
 - *WPA Key* – key/password required to connect to the wireless network. The key length is from 8 to 63 characters.
 - *MFP* – management frame protection (available for WPA2, WPA3 and OWE security modes. When selecting the WPA3 or OWE security mode, MFP is set to Required. When other modes are selected, it is set to Not Required):
 - *Not Required* – management frame protection is disabled;
 - *Capable* – management frame protection works, if a wireless network supports MFP. The device can connect to a network that does not support MFP;
 - *Required* – management frame protection is enabled. The device cannot connect to a wireless network that does not support MFP.

Network Settings:

- *Hostname* – network name of the device, a string of 1–63 characters is specified: Latin uppercase and lowercase letters, digits, the hyphen sign "-" (the hyphen cannot be the last character in the name);
- *Protocol* – protocol for connection of the device via Ethernet interface to service provider network:
 - *DHCP* – operating mode in which IP address, subnet mask, DNS server address, default gateway and other parameters required for operation in the network are obtained from DHCP server automatically;
 - *Static* – operating mode in which IP address and all the necessary parameters for WAN interface are assigned statically. If "Static" is selected, the following parameters will be available to set:
 - *Static IP* – device WAN interface IP address in the provider network;
 - *Netmask* – external subnet mask;
 - *Gateway* – address to which the packet is sent if the route in routing table is not found for it.

Device Access:

In the "**Device Access**" section the password can be changed.

When logging via web interface, administrator (default password: password) has full access to the device: reading and writing any settings, full monitoring of the device status. To change the password, first enter the new password in the "Password" field, then in the "Confirm password" field, and click the "Apply" button to save the new password.

Spectrum Analyzer:

The "**Spectrum Analyzer**" section is used to launch and monitor the spectrum analyzer.

The WB-3P-PTP5 devices can launch the spectrum analyzer on the Radio 5 GHz.

- ✗ When the spectrum analyzer is launched, the radio interface will be switched to scanning mode, which will interrupt all Wi-Fi connections on this radio interface.

To start the spectrum analyzer, click the "Scan" button. The information window located to the right of the button displays the time in seconds that has passed since the start of the scan. The scan on the Radio 5 GHz will take no more than 1.5 minutes.

- *Last scan was...* – date and time of the last scan;
- *Channel Utilization* – information about the radio channel congestion, expressed as a percentage;
- *Frequency* – channel frequency, on which scanning was performed, MHz;
- *Channel* – channel number corresponding to a given frequency.

- ✓ The spectrum analyzer analyzes all channels in the range, regardless of the settings on the radio interface.

Connections:

The "**Connections**" section displays information about the status of connected devices.

- # – number of the connected device in the list;
- *Hostname* – network device name;
- *IP Address* – IP address of the connected device;
- *MAC* – MAC address of the connected device;
- *Local Signal* – received signal level, dBm;
- *Remote Signal* – received signal level of the remote device, dBm;
- *Uptime* – connection time.

To apply a new configuration and save settings to non-volatile memory, click the "Apply" button. Click the "Cancel" button to discard the changes.

10.7 "Monitoring" menu

The **"Monitoring"** menu displays the current system status.

10.7.1 Wireless Peer/Wireless Clients

The **"Wireless Peer"/"Wireless Clients"** submenu displays information about the status of connected devices. Information about connected devices is not displayed in real time. To update the information on the page, click the "Refresh" button.

- ✓ Depending on the device mode, "Access Point PTP" or "Access Point PMP", the **"Wireless Peer"** or **"Wireless Clients"** submenu will be available respectively.

- ✓ For easy monitoring, it is possible to select the parameters to display. To do this, click . If to click the "By Default" button, the default parameters will be displayed. The following filters are available for searching connected devices: by all fields, hostname, IP address, MAC address. To select a filter, click . The functionality is only available in the "Access Point PMP" device mode.

- ✗ If the Link Quality, Link Quality Common, Link Capacity, RSSI and Remote RSSI values are highlighted in orange, the connection quality is deteriorating. If the values are highlighted in red, this indicates a significant deterioration in the connection. It is recommended to take measures to improve the connection conditions.

Below are examples of the **"Wireless Peer"/"Wireless Clients"** submenus in the "Access Point PTP", "Access Point PMP", and "STA" device modes, respectively.

Quick Start

Monitoring

Radio

AP

Network Settings

System

Tools

en + (logout)

Wireless Peer >

Traffic Statistics

Scan Environment

Spectrum Analyzer

Events

Network Information

Radio Information

Device Information

Refresh

#	Hostname	IP Address	MAC	Interface	RSSI, dBm	SNR, dB	Remote RSSI, dBm	Remote SNR, dB	TxRate	RxRate	BW, MHz	Version	Uptime	Action
1	STA	192.168.1.100	AA:BB:CC:DD:EE:FF	wlan0	-48 / -27	41 / 41	-58 / -52	34 / 34	HE NSS2 MCS9 LGI 195	HE NSS2 MCS8 LGI 175.5	20	1.0	0 d, 00:01:18	Kick
Total TX / RX, bytes					43 510 / 3 452		Fails, packets					0		
Total TX / RX, packets					463 / 56		TX Period Retry, packets					1		
Data TX / RX, bytes					40 677 / 1 137		TX Retry Count, packets					45		
Data TX / RX, packets					416 / 7		Actual TX / RX Rate, kbps					3 / 0		
				Rate	TX Packets		RX Packets							
				MCS0	0	0%	4	57%						
				NSS2-MCS8	1	0%	2	29%						
				NSS2-MCS9	303	73%	1	14%						
				NSS2-MCS10	112	27%	0	0%						

Quick Start

Monitoring

Radio

AP

Network Settings

System

Tools

en (logout)

Wireless Clients >

Traffic Statistics

Scan Environment

Spectrum Analyzer

Events

Network Information

Radio Information

Device Information

Refresh

28

#	Hostname	IP Address	MAC	Interface	RSSI, dBm	SNR, dB	Remote RSSI, dBm	Remote SNR, dB	TxRate	RxRate	BW, Mhz	Version	Uptime	Action	
1	STA			wlan0	-49 / -28	38 / 38	-43 / -37	42 / 42	HE NSS2 MCS9 LGI 195	HE NSS2 MCS10 LGI 219.4	20		0 d, 00:04:36	Kick	
					Total TX / RX, bytes	176 835 / 1 915 391					Fails, packets	0			
					Total TX / RX, packets	1 993 / 607					TX Period Retry, packets	1			
					Data TX / RX, bytes	172 984 / 1 911 923					TX Retry Count, packets	153			
					Data TX / RX, packets	1 921 / 535					Actual TX / RX Rate, kbps	0 / 0			
					Rate		TX Packets		RX Packets						
					MCS0		0		0%		4		1%		
					NSS2-MCS7		9		0%		3		1%		
					NSS2-MCS8		40		2%		8		1%		
					NSS2-MCS9		936		49%		329		61%		
					NSS2-MCS10		841		44%		108		20%		
					NSS2-MCS11		95		5%		83		16%		

2	STA			wlan0	-48 / -36	38 / 38	-61 / -40	32 / 32	HE NSS2 MCS9 LGI 195	HE NSS2 MCS8 LGI 175.5	20		0 d, 00:04:36	Kick
---	-----	--	--	-------	-----------	---------	-----------	---------	----------------------	------------------------	----	--	---------------	------

Quick Start

Monitoring

Radio

STA

Network Settings

System

Tools

en (logout)

Wireless Peer >

Traffic Statistics

Scan Environment

Spectrum Analyzer

Events

Network Information

Radio Information

Device Information

Refresh

#	Hostname	IP Address	MAC	Interface	RSSI, dBm	SNR, dB	Remote RSSI, dBm	Remote SNR, dB	TxRate	RxRate	BW, MHz	Version	Uptime	Action
1	AP			wlan0	-46 / -39	41 / 41	-54 / -36	33 / 33	HE NSS2 MCS11 LGI 243.8	HE NSS2 MCS9 LGI 195	20		0 d, 00:05:04	Kick

Total TX / RX, bytes

110 541 / 1 071 829

Fails, packets

0

Total TX / RX, packets

286 / 4 899

TX Period Retry, packets

0

Data TX / RX, bytes

105 266 / 246 654

TX Retry Count, packets

20

Data TX / RX, packets

165 / 1 809

Actual TX / RX Rate, kbps

4 / 4

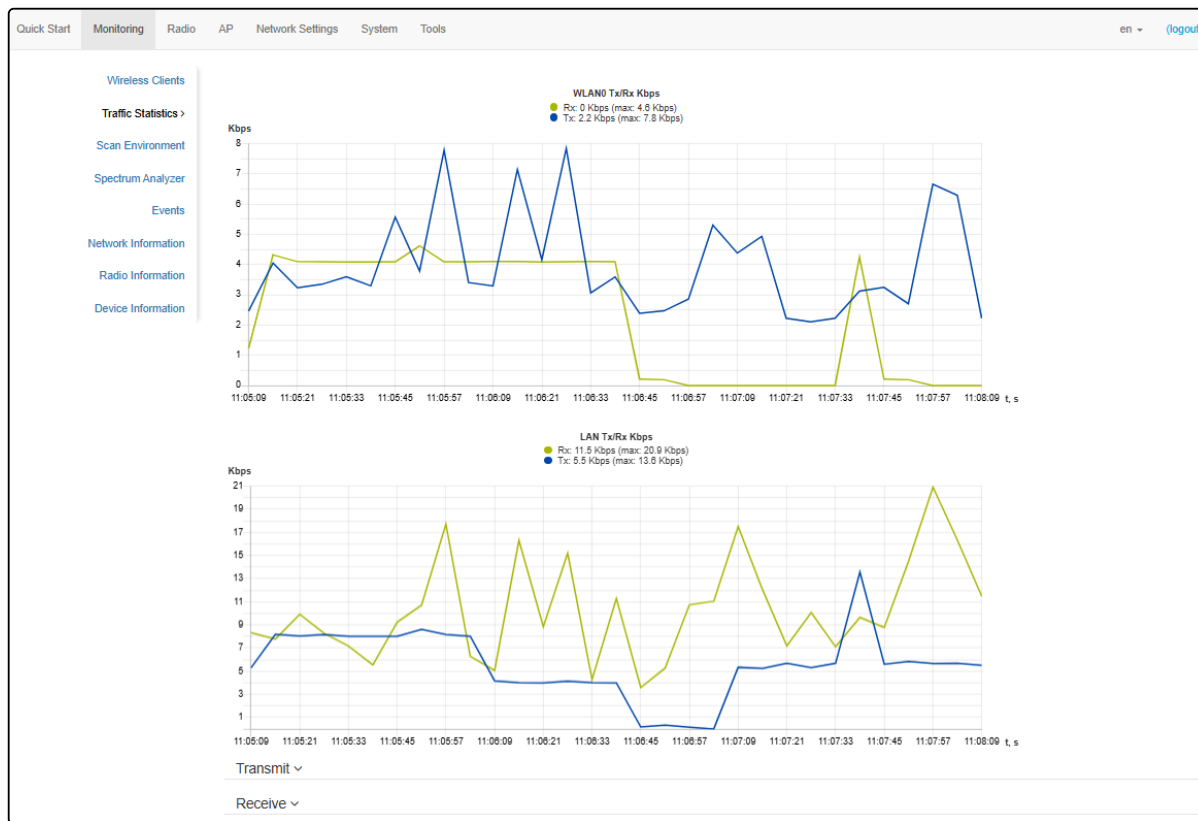
Rate	TX Packets		RX Packets	
MCS0	0	0%	695	38%
NSS2-MCS5	0	0%	1	0%
NSS2-MCS6	0	0%	6	0%
NSS2-MCS7	0	0%	39	2%
NSS2-MCS8	1	1%	121	7%
NSS2-MCS9	11	7%	646	36%
NSS2-MCS10	66	40%	300	17%
NSS2-MCS11	87	53%	1	0%

- **#** – number of the connected device in the list;
- **Hostname** – network device name;
- **IP Address** – IP address of the connected device;
- **MAC** – MAC address of the connected device;
- **Interface** – WB-3P-PTP5 interaction interface with the connected device;
- **Link Capacity** – parameter that displays the efficiency of modulation on the transmission used by the device. It is calculated based on the number of packets transmitted to the client on each modulation, and the reduction factors. The maximum value is 100% (meaning that all packets are transmitted to the client at maximum modulation for the maximum Nss type supported by the client). The minimum value is 2% (in the case when the packets are transmitted on the modulation Nss1MCS0 for a remote device with MIMO 3x3 support). The parameter value is calculated for the last 10 seconds;
- **Link Quality** – parameter that displays the status of the link to the remote device, calculated based on the number of retransmit packets sent to the remote device. The maximum value is 100% (all transmitted packets were sent on the first attempt), the minimum value is 0% (no packets were successfully sent to the remote device). The parameter value is calculated for the last 10 seconds;
- **Link Quality Common** – parameter that displays the status of the link to the remote device, calculated based on the number of retransmit packets sent to the remote device. The maximum value is 100% (all transmitted packets were sent on the first attempt), the minimum value is 0% (no packets were successfully sent to the client). The parameter value is calculated for the entire client connection time;
- **RSSI** – received signal level, dBm;
- **SNR** – signal-to-noise ratio, dB;

- *Remote RSSI* – received signal level of the remote device, dBm;
- *Remote SNR* – signal-to-noise ratio of the remote device, dB;
- *TxRate* – channel data transfer rate, Mbps;
- *RxRate* – channel data reception rate, Mbps;
- *BW* – transmission bandwidth of the wireless channel, MHz;
- *Actual TX Rate* – average data transfer rate over the last 10 seconds, Mbit/s;
- *Actual RX Rate* – average data reception rate over the last 10 seconds, Mbit/s;
- *Version* – firmware version of the connected device;
- *Uptime* – connection time;
- *Action* – if to press "Kick" button, the connection with the connected device will be broken. After disconnecting, the device will reconnect.;
- *Total TX/RX, bytes* – number of bytes sent/received on the connected device;
- *Total TX/RX, packets* – number of packets sent/received on the connected device;
- *Data TX/RX, bytes* – number of data bytes sent/received on the connected device;
- *Data TX/RX, packets* – number of data packets sent/received on the connected device;
- *Fails, packets* – number of packets sent with errors on the connected device;
- *TX Period Retry, packets* – number of transmission retries to the connected device in the last 10 seconds;
- *TX Retry Count, packets* – number of transmission retries to the connected device during the entire connection;
- *Actual TX/RX Rate, Kbps* – current traffic transmission rate at the moment.

10.7.2 "Traffic Statistics" submenu

The **"Traffic Statistics"** submenu displays traffic reception/transmission rate graphs for the last 3 minutes, as well as information on the amount of transmitted/received traffic since the device was turned on.



The LAN Tx/Rx graph shows the rate of the transmitted/received traffic via Ethernet interface of the device for the last 3 minutes. The graph is automatically updated every 6 seconds.

The WLAN0 Tx/Rx graph shows the rate of transmitted/received traffic via radio interface of the device for the last 3 minutes. The graph is automatically updated every 6 seconds.

"Transmit" table description:

- *Interface* – name of the interface;
- *Total Packets* – number of successfully sent packets;
- *Total Bytes* – number of successfully sent bytes;
- *Total Drop* – number of rejected packets;
- *Errors* – number of errors.

Transmit ▾				
Interface	Total Packets	Total Bytes	Total Drop	Errors
LAN	22602	15410134	0	0
WLAN0	3727	376301	0	1

"Receive" table description:

- *Interface* – name of the interface;
- *Total Packets* – number of successfully received packets;
- *Total Bytes* – number of successfully received bytes;
- *Total Drop* – number of rejected packets;
- *Errors* – number of errors.

Receive ▾				
Interface	Total Packets	Total Bytes	Total Drop	Errors
LAN	476101	72765454	0	0
WLAN0	331	179377	0	0

10.7.3 "Scan Environment" submenu

In the "**Scan Environment**" submenu, air scanning and detection of neighboring devices are carried out.

Range	Mode	SSID	Security Mode	MAC	Channel / Bandwidth	RSSI, dBm
5 GHz	AP	[blurred]	Open	EC:B1:E0:29:6B:89	48/20	-39
5 GHz	AP	[blurred]	Open	EC:B1:E0:2B:DC:49	48/20	-45
5 GHz	AP	[blurred]	WPA_1X/WPA2_1X	68:13:E2:0E:85:59	48/20	-65
5 GHz	AP	[blurred]	WPA2	EC:B1:E0:20:AE:19	132/40L	-66
5 GHz	AP	[blurred]	WPA2_1X	EC:B1:E0:20:AE:1A	132/40L	-66
5 GHz	AP	[blurred]	WPA2	EC:B1:E0:20:AE:1B	132/40L	-66
5 GHz	AP	[blurred]	Open	68:13:E2:32:3A:2A	36/20	-68

To start the scanning process, click the "Scan" button. After scanning is complete, a list of detected devices and information about them will appear:

- *Last scan was...* – date and time of the last scan;
- *Range* – specifies the 5 GHz range, in which the device was detected;
- *Mode* – device radio interface operating mode;
- *SSID* – SSID of the detected device;
- *Security mode* – security mode of the detected device;
- *MAC* – MAC address of the detected device;
- *Bandwidth* – radio channel on which the detected device operates;
- *RSSI* – the level with which the device receives the signal of the detected device, dBm.

- ✓ While scanning the environment, the device radio interface will be disabled, which will make it impossible to transfer data to Wi-Fi clients during scanning.

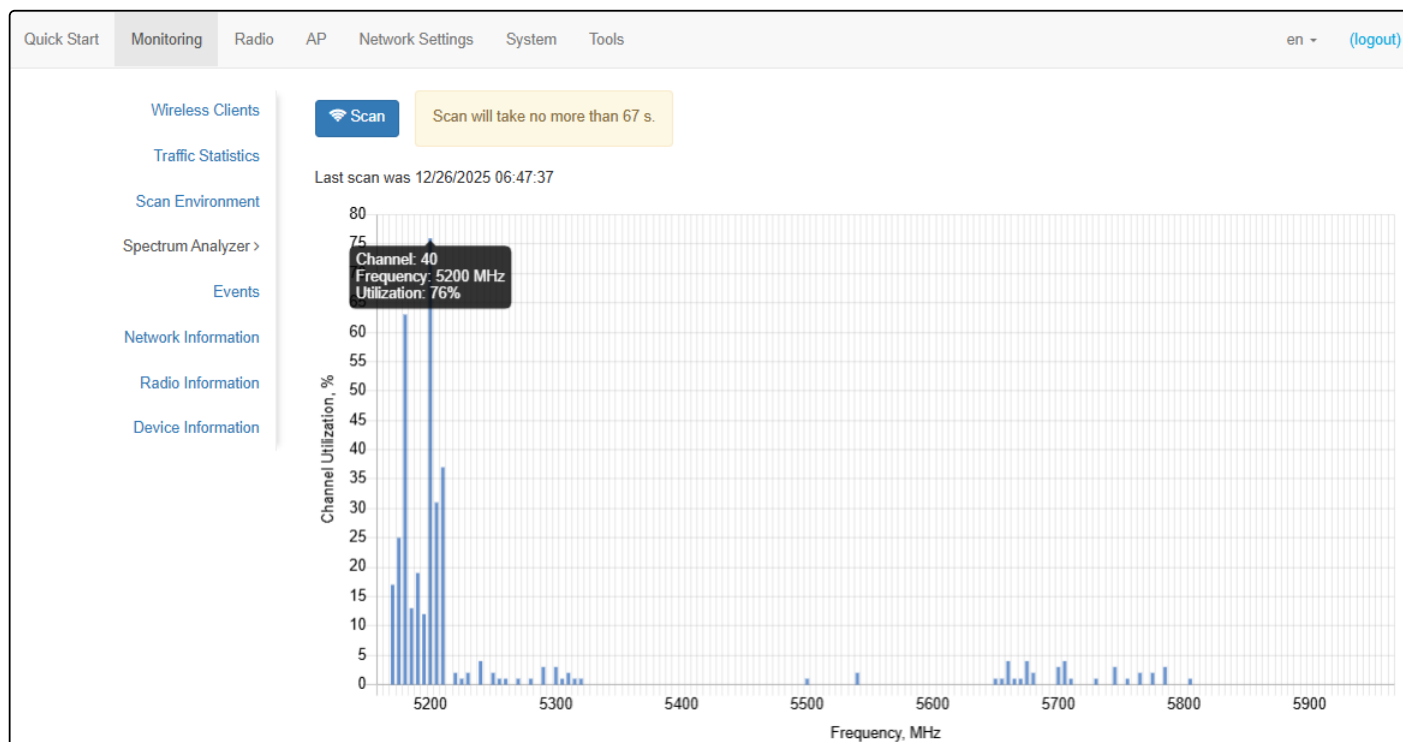
10.7.4 "Spectrum Analyzer" submenu

The **"Spectrum Analyzer"** submenu is used to launch and monitor the spectrum analyzer.

On the WB-3P-PTP5 devices, it is possible to launch the spectrum analyzer on the Radio 5 GHz radio interface.

Launching the spectrum analyzer on the radio interface

- ✗ When the spectrum analyzer is launched, the radio interface will be switched to scanning mode, which will interrupt all Wi-Fi connections on this radio interface.



To start the spectrum analyzer, click the "Scan" button. The information window located to the right of the button displays the time in seconds that has passed since the start of the scan. The spectrum analyzer operation time on Radio 5 GHz is no more than 1.5 minutes.

- *Last scan was...* – date and time of the last scan;
- *Channel Utilization* – information about the radio channel congestion, expressed as a percentage;
- *Frequency, MHz* – channel frequency, on which scanning was performed, MHz;
- *Channel* – channel number corresponding to a given frequency.

- ✓ The spectrum analyzer analyzes all channels in the range, regardless of the radio interface settings.

10.7.5 "Events" submenu

In the **"Events"** submenu, it is possible to view a list of real-time informational messages which contains the following information:

Quick Start	Monitoring	Radio	AP	Network Settings	System	Tools	en (logout)
Wireless Clients	Traffic Statistics	Scan Environment	Spectrum Analyzer	Events >	Network Information	Radio Information	Device Information
Refresh Clear							
Date and Time	Type	Service	Message				
Dec 26 07:14:32	daemon.info	monitord[519]	event: 'disassociated by AP' mac: EC:B1:E0:2D:A1:00 ssid: 'WB-3P-PTP5-test' interface: wlan0 channel: 36 rssi-1: -100 rssi-2: -100 location: 'root' reason: 5 description: 'Unable to handle STA'				
Dec 26 07:14:32	daemon.info	monitord[519]	event: 'authenticated' mac: EC:B1:E0:2D:A1:00 ssid: 'WB-3P-PTP5-test' interface: wlan0 channel: 36 rssi-1: -43 rssi-2: -43 location: 'root' auth-method: 'Open' captive-portal: 'disabled'				
Dec 26 07:13:35	daemon.info	monitord[519]	event: 'IP address was changed by DHCP packet' ip: 10.30.110.136 mac: EC:B1:E0:2E:6B:40 ssid: 'WB-3P-PTP5-test' interface: wlan0 channel: 36 rssi-1: -47 rssi-2: -26 location: 'root' reason: 0				
Dec 26 07:13:34	daemon.info	monitord[519]	event: 'authenticated' mac: EC:B1:E0:2E:6B:40 ssid: 'WB-3P-PTP5-test' interface: wlan0 channel: 36 rssi-1: -34 rssi-2: -34 location: 'root' auth-method: 'Open' captive-portal: 'disabled'				
Dec 26 07:13:34	daemon.info	monitord[519]	event: 'disassociated by AP' ip: 10.30.110.136 mac: EC:B1:E0:2E:6B:40 ssid: 'WB-3P-PTP5-test' interface: wlan0 channel: 36 rssi-1: -48 rssi-2: -28 location: 'root' reason: 29 description: 'STA is exists at (no association)'				

- *Date and Time* – date and time when the event was generated;
- *Type* – category and severity level of the event;
- *Service* – name of the process that generated the message;
- *Message* – event description.

Table 5 – Description of event severity levels

Level	Message severity level	Description
0	Emergency	A critical error has occurred in the system, the system may not work properly
1	Alert	Immediate intervention is required
2	Critical	A critical error has occurred in the system
3	Error	An error has occurred in the system
4	Warning	Warning, non-emergency message
5	Notice	System notice, non-emergency message
6	Informational	Informational system messages
7	Debug	Debugging messages provide the user with information to correctly configure the system

To receive new messages in the event log, click "Refresh".

If necessary, all old messages can be deleted from the log by clicking the "Clear" button.

10.7.6 "Network Information" submenu

In the "**Network Information**" submenu, general network settings of the device can be viewed.

Quick Start

Monitoring

Radio

AP

Network Settings

System

Tools

en

(logout)

Wireless Clients

Traffic Statistics

Scan Environment

Spectrum Analyzer

Events

Network Information >

Radio Information

Device Information

WAN Status

Interface

br0

Protocol

DHCP

IP Address

10.30.110.1

RX Bytes

69.9 MB (73 245 981 bytes)

TX Bytes

14.9 MB (15 574 780 bytes)

Ethernet

Link Status

Up

Speed

1000

Duplex

Full

ARP

#	IP Address	MAC
0	10.30.110.1	F4:F2:6D:02:F7:8A
1	10.30.110.2	60:A4:B7:BB:57:6A
2	10.30.110.3	18:C0:4D:C8:0A:DB
3	10.30.110.4	3C:1E:04:47:A8:54
4	10.30.110.5	D8:5E:D3:60:AD:F2
5	10.30.110.6	90:54:B7:28:6F:EC
6	10.30.110.7	F0:09:0D:BC:26:4B

Routes

#	Interface	Destination	Gateway	Netmask	Flags
0	br0	0.0.0.0	10.30.110.1	0.0.0.0	UG
1	br0	10.30.110.0	0.0.0.0	255.255.255.0	U

WAN Status:

- *Interface* — name of the bridge interface;
- *Protocol* — protocol used for access to WAN;
- *IP address* — device IP address in external network;
- *RX Bytes* — number of bytes received on WAN;
- *TX Bytes* — number of bytes sent from WAN.

Ethernet:

- *Link Status* — Ethernet port status;
- *Speed* — Ethernet port connection speed;
- *Duplex* — data transfer mode:
 - *Full* — full duplex;
 - *Half* — half-duplex.

ARP:

The ARP table contains mapping information between IP and MAC addresses of neighboring network devices:

- *IP address* — device IP address;
- *MAC* — device MAC address.

Routes:

- *Interface* – name of the bridge interface;
- *Destination* – IP address of destination host or subnet that the route is established to;
- *Gateway* – IP address of the gateway through which access to the destination is carried out;
- *Netmask* – subnet mask;
- *Flags* – certain route characteristics.
- The following flag values exist:
 - **U** – means that the route is created and passable;
 - **H** – indicates the route to the specific host;
 - **G** – means that the route lies through the external gateway. System network interface provides routes in the network with direct connection. All other routes lie through the external gateways. G flag is used for all routes except for the routes in the direct connection networks;
 - **R** – indicates that the route was most likely created by a dynamic routing protocol running on the local system using the *reinstall* parameter;
 - **D** – indicates that the route was added as a result of receiving an ICMP Redirect Message. When the system learns the route from the ICMP Redirect message, the route will be added into the routing table in order to exclude redirection for the following packets intended for the same destination;
 - **M** – means that the route was modified – likely by a dynamic routing protocol running on a local system with the *"mod"* parameter applied;
 - **A** – points to a buffered route to which an entry in the ARP table corresponds;
 - **C** – means that the route source is the core routing buffer;
 - **L** – indicates that the destination of the route is one of the addresses of this computer. Such "local routes" exist in the routing buffer only;
 - **B** – means that the route destination is a broadcasting address. Such "broadcast routes" exist in the routing buffer only;
 - **I** – indicates that the route is connected to a ring (loopback) interface for a purpose other than to access the ring network. Such "internal routes" exist in the routing buffer only;
 - **!** – means that datagrams sent to this address will be rejected by the system.

10.7.7 "Radio Information" submenu

In the **"Radio Information"** submenu, the current status of the device radio interface is displayed.

Quick Start	Monitoring	Radio	AP	Network Settings	System	Tools	en	(logout)
Wireless Clients	Radio 5 GHz							
Traffic Statistics			Status	On				
Scan Environment			MAC	EC:B1:E0:2D:A1:F0				
Spectrum Analyzer			Mode	IEEE 802.11ax				
Events			Transmit Power Limit, dBm	27				
Network Information			Channel	36 (5180 MHz)				
Radio Information >			Channel Bandwidth, MHz	20				
Device Information			Noise Level, dBm	-93/-93				
			Channel Utilization, %	1				

The device radio interface can be in two states: "On" and "Off". Depending on the interface status, the following information is available for monitoring:

"Off":

- *Status* – radio interface state;
- *MAC* – radio interface MAC address;

"On":

- *Status* – radio interface state;
- *MAC* – MAC address of radio interface;
- *Mode* – radio interface operating mode according to IEEE 802.11 standards;
- *Transmit Power Limit, dBm* – signal power at which the radio interface operates;
- *Connection status* – connection status of the client (STA) to the access point (AP). It is available for STA mode only;
- *Channel* – number of the wireless channel on which the radio interface is running;
- *Channel Bandwidth, MHz* – channel bandwidth on which the radio interface is running.
- *Noise Level, dBm* – noise level of the channel on which the radio interface operates;
- *Channel Utilization* – information about the radio channel congestion, expressed as a percentage.

10.7.8 "Device Information" submenu

The **"Device Information"** submenu displays main device parameters.

Parameter	Value
Product	[Redacted]
Hardware Version	1v1
Factory MAC Address	EC:B1:E0:3C:92:30
Serial Number	WP5B000139
Software Version	[Redacted]
Backup Version	[Redacted]
Boot Version	[Redacted]
System Time	11/05/2025 10:22:41
Uptime	0 d, 00:02:57
CPU Usage	1%
Memory Usage	44% 105 MB / 237 MB

- *Product* — device model name;
- *Hardware Version* — device hardware version;
- *Factory MAC Address* — device WAN interface MAC address, factory set;
- *Serial Number* — device serial number, factory set;
- *Software Version* — device firmware version;
- *Backup Version* — previously installed firmware version;
- *Boot Version* — device firmware boot version;
- *System Time* — current time and date, set in the system;
- *Uptime* — operating time since the last time the device was turned on or rebooted;
- *CPU Usage* — average percentage of CPU load over the last 5 seconds;
- *Memory Usage* — percentage of device RAM usage.

10.8 "Radio" menu

In the **"Radio"** menu, the wireless interface can be configured.

10.8.1 "Radio" submenu

In the **"Radio"** submenu, the main parameters of the device radio interface can be configured.

The screenshot displays the 'Radio' configuration page. The top navigation bar includes 'Quick Start', 'Monitoring', 'Radio' (selected), 'AP', 'Network Settings', 'System', and 'Tools'. The right side shows 'en' and a '(logout)' link. On the left, a sidebar lists 'Radio >', 'QoS', and 'Advanced'. The main content area is titled 'Common' and contains the following settings:

- Device Mode:** Access Point PTP (dropdown)
- 802.11 Mode:** IEEE 802.11ax (dropdown)
- Auto Channel:** ☒
- Use Limit Channels:** ☒ with a '+ Add Channels' button below it.
- Channel Bandwidth, MHz:** 40 (dropdown)
- Primary Channel:** Upper (dropdown)
- Fixed Center Frequency:** ☐
- Transmit Power Limit, dBm:** (slider/dropdown)
- Fixed Transmit Rate:** Auto (dropdown)
- Maximal Transmit Rate:** Auto (dropdown)
- Maximal Receive Rate:** Auto (dropdown)
- Distance, km:** 0 (text input)
- TDD:** ☐

- **Device Mode** – operating mode of the device radio interface. The following modes are available:
 - *Access Point PTP* – Point-to-Point;
 - *Access Point PMP* – Point-to-Multipoint;
 - *Station* – wireless client (STA).
- **802.11 Mode** – interface operating mode according to standards:
 - *IEEE 802.11ax*;
 - *IEEE 802.11a/n/ac*;
 - *IEEE 802.11a/n/ac/ax*.
- **Auto Channel** – when checked, the device will automatically select the least congested radio channel for the radio interface operation. When unchecked, channel field appears;
- **Channel** – select channel for data transmission;
- **Use Limit Channels** – when checked, the device will use a user-defined list of channels to work in automatic channel selection mode. If "Use Limit channels" is unchecked or there are no channels in the list, the device will select the operation channel from all available channels in the given band. The 5 GHz band channels: 32–193;
- **Limit Channels** – setting is available in the device mode "Station". When checked, the device will use a user-defined list of channels to scan and detect remote devices. If the "Limit Channels" is unchecked or there are no channels in the list, the device will scan all available channels in the given frequency range. The 5 GHz band channels: 32–193;
- **Channel Bandwidth, MHz** – channel bandwidth, on which the device operates. The parameter may take values of 5, 10, 20, 40, 80 and 160 MHz;

- *Primary Channel* – parameter can only be changed if the bandwidth of a statically specified channel is equal to 40 MHz. The 40 MHz channel can be considered as consisting of two 20 MHz channels, which border in the frequency range. These two 20 MHz channels are called primary and secondary channels:
 - *Upper* – primary channel will be the upper 20 MHz channel in the 40 MHz band;
 - *Lower* – primary channel will be the lower 20 MHz channel in the 40 MHz band.
- *Fixed Center Frequency* – when checked, all traffic (data and control packets) will be transmitted at the specified channel center frequency with the specified bandwidth (40 MHz). This feature is proprietary and does not comply with IEEE 802.11 standards, which require the use of different center frequencies for data and control traffic with a channel width of 40 MHz;
- *Transmit Power Limit, dBm* – adjustment of the signal strength of the Wi-Fi transmitter in dBm;
- *Fixed Transmit Rate* – fixed wireless data transfer rate defined by IEEE 802.11a/n/ac/ax standards specifications;
- *Maximal Transmit Rate* – maximal wireless data rate of this device as defined by IEEE 802.11a/n/ac/ax standard specifications;
- *Maximal Receive Rate* – maximal wireless data transfer rate of remote device, determined by IEEE 802.11a/n/ac/ax standards specifications. Available only in the Access Point PTP and STA device modes;
- *Distance, km* – distance between devices in kilometers. Changing the distance value will change the ACK timeout value. The distance should be rounded up. For example, if the distance between devices is 3.2 km, then 4 km should be specified;
- *TDD* – when checked, the option is enabled, otherwise it is disabled. TDD is a collision-free access technology with time division of the channel, which synchronizes data transmission in both directions within a time frame.

✓ The 5 and 10 MHz channel bandwidths are only available in IEEE 802.11a/n/ac modes.

✓ The "Channel", "Channel Bandwidth", "Primary Channel" parameters are only available when the device mode is "Access Point PTP" or "Access Point PMP".

✓ If the "Use Limit Channels" list contains a channel that is not available for selection, it will be marked in grey. In order for the new configuration to be applied to the device, only available (blue highlighted) channels must be specified in the "Use Limit channels" list.

Example. The device has not yet been configured, the default "Channel Bandwidth" for the 5 GHz Radio is set to 20 MHz, and no channels are listed in the "Use Limit Channels" list.

Suppose channels 36, 40, 44, and 48 were manually added to the "Use Limit Channels" list and the "Channel Bandwidth" parameter needs to be set to 40 MHz. When changing this parameter from 20 MHz to 40 MHz, the following happens:

- the "Primary Channel" parameter becomes available for editing and the default value is "Upper";
- 36 and 44 channels in the "Use Limit Channels" list change color from blue to grey.

If you change the "Channel Bandwidth" parameter to 40 MHz and do not remove the "grey" channels from the list, then clicking the "Apply" button in the browser will display the error – "There are errors in data. Changes were not applied". Accordingly, the device configuration will not be changed. This is due to the fact that channels in the "Use Limit channels" list that are highlighted in grey do not fit the definition "Primary Channel" = Upper.

- ✗ The "Maximal **Receive** Rate" parameter is used to specify the maximal channel **transmit** rate to a remote device.
Therefore, when configuring the maximal channel **receive** rate, for example, on the client (STA), there is no need to configure the maximal transmit rate on an access point (AP).

In the "**Advanced**" section, it is possible to configure advanced radio interface parameters of the device.

Advanced ▾

OBSS Coexistence ☒

DFS Support Forced ▾

Short Guard Interval ☒

STBC ☒

Beacon Interval, ms 100

Fragmentation Threshold 2346

RTS Threshold 2347

Frame Aggregation ☒

Short Preamble ☒

DHCP Snooping Mode replace ▾

DHCP Option 82 CID Format APMAC-SSID ▾

DHCP Option 82 RID Format ClientMAC ▾

DHCP Option 82 MAC Format AA:BB:CC:DD:EE:FF ▾

✓ Apply ✗ Cancel

- *OBSS Coexistence* – automatic channel bandwidth reduction when the channel is loaded. When checked, the mode is enabled;
- *DFS Support* – dynamic frequency selection mechanism. Requires wireless devices to scan the air and avoid using channels that overlap with those used by radar systems in the 5 GHz band:
 - *Disabled* – mechanism is disabled. DFS channels are not available for selection;
 - *Enabled* – mechanism is enabled;
 - *Forced* – mechanism is disabled. DFS channels are available for selection.
- *Short Guard Interval* – support for Short Guard Interval. The device transmits data using 400 ns guard interval (instead of 800 ns) to remote devices which also support Short Guard Interval;
- *STBC* – Space-Time Block Coding method dedicated to improve data transmission reliability. When checked, the device transmits one data flow through several antennas. When unchecked, the device does not transmit the same data flow through several antennas;
- *Beacon Interval, ms* – beacon frames transmission period. The frames are sent to detect a remote device in the air. The parameter takes values from 20 to 2000 ms, by default: 100 ms;
- *Fragmentation Threshold* – frame fragmentation threshold, bytes. The parameter takes values 256–2346, by default: 2346;
- *RTS Threshold* – number of bytes over which the Request to Send will be sent. Decreasing this value may improve the performance of the device when there are a lot of connected remote devices. However this reduces general throughput of wireless network. The parameter takes values from 0 to 2347, by default: 2347;
- *Frame Aggregation* – enable support for AMPDU/AMSDU;

- *Short Preamble* – use of the packet short preamble;
- *DHCP Snooping Mode* – selection of DHCP option 82 processing policy. Available values for selection:
 - *ignore* – option 82 processing is disabled. Default value;
 - *remove* – device deletes the value of option 82;
 - *replace* – device substitutes or replaces the value of option 82. When selecting this value to edit, the following parameters are opened:
 - *DHCP Option 82 CID format* – replacement of the CID parameter value, can take values:
 - *APMAC-SSID* – replacement of the CID parameter value to <MAC address of the device>-<SSID name>. Default value;
 - *SSID* – replacement of the parameter value to device SSID name;
 - *custom* – replacement of the CID parameter value to the value specified in the "DHCP Option 82 Custom CID";
 - *DHCP Option 82 Custom CID* – an arbitrary string of up to 52 characters that will be passed to the CID. If the parameter value is not set, the device will change the CID to the default value – APMAC-SSID.
 - *DHCP Option 82 RID format* – replacement of the RID parameter value, can take the following values:
 - *ClientMAC* – change the RID content to the MAC address of the client device. Default value;
 - *APMAC* – change the RID content to the MAC address of the device;
 - *APdomain* – change the RID content to the domain in which the device is located;
 - *custom* – change the RID content to the value specified in the "DHCP Option 82 Custom CID";
 - *Option 82 Unique RID* – an arbitrary string of up to 63 characters that will be passed to the RID. If the parameter value is not set, the device will change the RID to the default value – ClientMAC.
- *DHCP Option 82 MAC Format* – selection of octet delimiters of the MAC address, which is transmitted in CID and RID:
 - *AA:BB:CC:DD:EE:FF* – the delimiter is a colon (:). Default value;
 - *AA-BB-CC-DD-EE-FF* – the delimiter is a dash (-).

To apply a new configuration and save settings to non-volatile memory, click the "Apply" button. Click the "Cancel" button to discard the changes.

10.8.2 "QoS" submenu

The **"QoS"** submenu is used to configure Quality of Service functions.

- *Wi-Fi Multimedia (WMM)* – WMM (Wi-Fi Multimedia) support activation;
- *Enable QoS* – when checked, the setting of Quality of Service functions is available.

Quick Start Monitoring **Radio** AP Network Settings System Tools en (logout)

Radio

QoS >

Advanced

Wi-Fi Multimedia (WMM) ☒

Enable QoS ☒

AP EDCA Parameters

Queue	AIFS	cwMin	cwMax	TXOP Limit
Data 3 (Background)	7	15	1023	0
Data 2 (Best Effort)	3	15	63	0
Data 1 (Video)	1	7	15	94
Data 0 (Voice)	1	3	7	47

Station EDCA Parameters

Queue	AIFS	cwMin	cwMax	TXOP Limit
Data 3 (Background)	7	15	1023	0
Data 2 (Best Effort)	3	15	1023	0
Data 1 (Video)	2	7	15	94
Data 0 (Voice)	2	3	7	47

- *AP EDCA parameters* – device settings (traffic is transmitted to the client device):
 - *Queue* – predefined queues for various kinds of traffic:
 - *Data 3 (Background)* – low priority queue, high bandwidth (802.1p: cs1, cs2 priorities);
 - *Data 2 (Best Effort)* – middle priority queue, middle bandwidth and delay. Most of the traditional IP data is sent to this queue (802.1p: cs0, cs3 priorities);
 - *Data 1 (Video)* – high priority queue, minimal delay. In this queue, time-sensitive video data is automatically processed (802.1p: cs4, cs5 priorities);
 - *Data 0 (Voice)* – high priority queue, minimal delay. In this queue, time sensitive data is automatically processed, such as: VoIP, streaming video (802.1p: cs6, cs7 priorities).
 - *AIFS* – Arbitration Inter-Frame Spacing, defines the waiting time of data frames, measured in slots, takes values 1–255;
 - *cwMin* – initial timeout value before resending a frame, specified in milliseconds, takes the values 1, 3, 7, 15, 31, 63, 127, 255, 511, 1023. The value of cwMin cannot exceed the value of cwMax;
 - *cwMax* – maximum timeout value before resending a frame, specified in milliseconds, takes the values 1, 3, 7, 15, 31, 63, 127, 255, 511, 1023. The value of cwMax must exceed the value of cwMin;
 - *TXOP Limit* – this parameter is used only for data transmitted from the client device. The transmission capability is the time interval, in milliseconds, when the remote WME station has the

rights to initiate data transmission over the wireless medium to the device, the maximum value is 65535 milliseconds;

- *Station EDCA parameters* — table of client device parameter settings (traffic is transmitted from the client device). For description of table fields, see above.

To apply a new configuration and save settings to non-volatile memory, click the "Apply" button. Click the "Cancel" button to discard the changes.

10.8.3 "Advanced" submenu

In the "**Advanced**" submenu, it is possible to configure advanced radio interface parameters of the device.

- *Country* — country of device operation. Select the "Unlock" checkbox to change a country. Depending on the selected value, the channel bandwidth and transmit power limit restrictions will be applied. The list of available frequency channels depends on the selected country, which affects the automatic channel selection in the Channel = Auto mode.

✗ Local country regulations settings, including operation within legal frequency channels and output power, is the installer's responsibility.

✓ Selecting the wrong region may result in compatibility issues with different client devices.

To apply a new configuration and save settings to non-volatile memory, click the "Apply" button. Click the "Cancel" button to discard the changes.

10.9 "AP" menu

In the "AP" menu, the access point (AP – Access Point) (hereinafter AP) can be configured.

- ✓ The "AP" menu is only available when the device mode is "Access Point PTP" or "Access Point PMP".

10.9.1 "Access Point" submenu

The screenshot shows the 'Access Point' configuration page. The top navigation bar includes 'Quick Start', 'Monitoring', 'Radio', 'AP' (selected), 'Network Settings', 'System', and 'Tools'. The right side of the bar shows 'en' and a '(logout)' link. The left sidebar has 'Access Point >'. The main content area is titled 'Common Settings' and contains the following fields:

- Enabled:** A checkbox that is checked.
- SSID:** A text input field containing 'WB-3P-PTP5'.
- Broadcast SSID:** A checkbox that is checked.
- Priority:** A dropdown menu with 'DSCP' selected.
- Minimal Signal:** A checkbox that is checked.
- Minimal Signal Level, dBm:** A text input field containing '-100'.
- Roaming Signal Level, dBm:** A text input field containing '-100'.
- Minimal Signal Timeout, s:** A text input field containing '10'.
- Maximum Stations:** A text input field containing '0'.
- Station Isolation:** A checkbox that is checked.
- Security Mode:** A dropdown menu with 'WPA3' selected.
- WPA Key:** A text input field with masked characters '.....' and a toggle icon.
- MFP:** A dropdown menu with 'Required' selected.

Common Settings:

- **Enabled** – when checked, the access point (AP) is enabled, otherwise it is disabled;
- **SSID** – virtual wireless network name;
- **Broadcast SSID** – when checked, broadcasting to the SSID is enabled, otherwise it is disabled;
- **Priority** – prioritization method. Defines the field based on which traffic transmitted to the radio interface will be distributed among WMM queues:
 - **DSCP** – priority from the DSCP field of IP packet header will be analyzed;
 - **802.1p** – priority from the CoS (Class of Service) field of tagged packets will be analyzed.
- **Minimal Signal** – when checked, the function of disconnecting client devices at a low signal level (Minimal Signal) is enabled. For the functionality to work, the following parameters need to be configured:
 - **Minimal Signal Level, dBm** – signal level, below which the client devices are disconnected from the wireless network;
 - **Roaming Signal Level, dBm** – roaming sensitivity level, below which the client devices switch to another device. The parameter should be higher than the "Minimal Signal Level": if the "Minimal Signal Level" is -75 dBm, then the "Roaming Signal Level" should be, for example, -70 dBm;
 - **Minimal Signal Timeout, s** – the period of time after which a decision is made to disconnect the client equipment from the wireless network.
- **Maximum Stations** – maximum number of client devices allowed to connect to the wireless network;
- **Station Isolation** – when checked, traffic isolation between connected devices is enabled;
- **Security Mode** – wireless network access security mode:
 - **Off** – encryption for data transmission is not used;

- *OWE (Opportunistic Wireless Encryption)* – encryption method that ensures the security of data transmitted over an unsecured network. Users are not required to take any additional actions or enter a password to connect to the network;
- *WPA2, WPA3* – encryption methods, when selecting one of the methods the following setting will be available:
 - *WPA Key* – key/password required to connect to the wireless network. The key length is from 8 to 63 characters.
 - *WPA2-Enterprise, WPA3-Enterprise* – wireless channel encryption mode, in which the device is authorized on the centralized RADIUS server. To configure these security modes, specify the parameters of the RADIUS server. Also specify a key for the RADIUS server. When selecting one of the these methods, the Radius setting will be available (see below).
- *MFP* – management frame protection (available in WPA2, WPA3, WPA2-Enterprise, and WPA3-Enterprise security modes. When WPA3, WPA3-Enterprise is selected, MFP is set to Required; when other security modes are selected, MFP is set to Not Required):
 - *Not Required* – management frame protection is disabled;
 - *Capable* – management frame protection works if the client supports MFP. The clients without MFP support can connect to this AP;
 - *Required* – management frame protection is enabled. The clients that does not support MFP cannot connect to.

✓ "Maximum Stations" and "Station Isolation" are available only in the "Access Point PMP" device mode.

✗ If "Broadcast SSID" is disabled on the access point (AP), the client device will not be able to connect to it without additional configuration of the scanning mode. It is necessary to enable the active scanning mode on the client device (see [Enabling active scanning](#)).

RADIUS:

RADIUS	
Domain	root
Address of RADIUS Server	192.168.0.1
Port of RADIUS Server	1812
Password of RADIUS Server	 
Use Accounting through RADIUS	☒
Use Other Settings For Accounting	☒
IP Address of RADIUS Server for Accounting	192.168.0.1
Port of RADIUS Server for Accounting	1813
Password of RADIUS Server for Accounting	 
Use Periodic Accounting	☒
Accounting Interval	600

- *Domain* — user domain;
- *Address of RADIUS Server* — RADIUS server address;
- *Port of RADIUS Server* — port of RADIUS server that used for authentication and authorization;
- *Password of RADIUS Server* — password for RADIUS server used for authentication and authorization;
- *Use Accounting through RADIUS* — when checked, "Accounting" messages will be sent to the RADIUS server;
- *Use Other Settings For Accounting:*
 - *IP Address of RADIUS Server for Accounting* — address of the RADIUS server, used for accounting;
 - *Password of RADIUS Server for Accounting* — password for the RADIUS server used for accounting.
- *Port of RADIUS Server for Accounting* — port that will be used to collect accounts on the RADIUS server;
- *Use Periodic Accounting* — enable periodic sending of "Accounting" messages to the RADIUS server. The interval for sending messages can be set in the "Accounting Interval" field.

VLAN:

- *Access VLAN ID* – VLAN number from which the tag will be removed when transmitting traffic to client devices. When traffic passes in the opposite direction, untagged traffic from client devices will be tagged with a VLAN ID (available when VLAN Trunk mode is disabled);
- *VLAN Trunk* – when checked, tagged traffic is transmitted to client devices;
- *General Mode* – when checked, client devices are allowed to transmit untagged traffic together with tagged traffic (available when VLAN Trunk mode is enabled);
- *General VLAN ID* – VLAN number from which the tag will be removed when forwarding traffic to client devices. When passing traffic in the opposite direction, untagged traffic from client devices will be tagged with the General VLAN ID (available when VLAN Trunk and General Mode are enabled).

Shapers:

For "Access Point PTP" mode:

- *Enable* – activate the settings field;
- *AP Limit Down* – bandwidth limit in the direction from access point (AP) to client device, Kbps;
- *AP Limit Up* – bandwidth limit in the direction from client device to access point (AP), Kbps;
- *Broadcast Limit Down* – limit of of broadcast packets in the direction from access point (AP) to client device, packets/s;
- *Broadcast Limit Up* – limit of broadcast packets in the direction from client device to access point (AP), packets/s;
- *Multicast Limit Down* – limit of multicast packets in the direction from access point (AP) to client device, packets/s.

For "Access Point PMP" mode:

- *Enable* – activate the settings field;
- *AP Limit Down* – bandwidth limit in the direction from access point (AP) to client devices, Kbps;
- *AP Limit Up* – bandwidth limit in the direction from client devices to access point (AP), Kbps;
- *STA Limit Down* – bandwidth limit in the direction from access point (AP) to each client device, Kbps;
- *STA Limit Up* – bandwidth limit in the direction from each client device to access point (AP), Kbps;
- *Broadcast Limit Down* – limit of broadcast packets in the direction from access point (AP) to client devices, packets/s;
- *Broadcast Limit Up* – limit of broadcast packets in the direction from client devices to access point (AP), packets/s;
- *Multicast Limit Down* – limit of multicast packets in the direction from access point (AP) to client devices, packets/s.

MAC ACL:

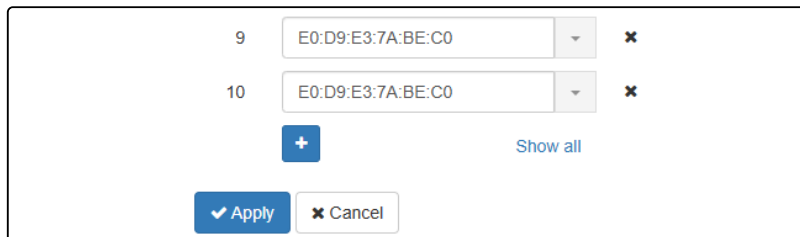
In this subsection, one can configure a list of MAC addresses of remote devices that are allowed or prohibited from connecting to this device, depending on the selected access policy.

- *Enabled* – when checked, the selected access policy will work;
- *Policy* – access policy. Acceptable values:
 - *Deny* – remote devices whose MAC addresses are on the list will be prohibited from connecting to this device. All other devices will be allowed access;
 - *Allow* – only those remote devices whose MAC addresses are in the list will be allowed to connect to this device. All others will be denied access.
- *List of MAC addresses* – list of MAC addresses of remote devices that are allowed or denied access to this device. This list can contain up to 128 addresses.

To add an address to the list, click the button and enter MAC address in the appeared field. To remove an address from the list, click the button in the corresponding line.

If there is a need to add the MAC address of a connected device to the list, click the  button at the end of the line and select the desired address from the list, it will automatically be added to the field.

By default, the list displays up to 10 addresses. To see the full list in case it contains more than 10 addresses, click the "Show all" button.



9	E0:D9:E3:7A:BE:C0	▼	✕
10	E0:D9:E3:7A:BE:C0	▼	✕

+
Show all

✔ Apply
✕ Cancel

To apply a new configuration and save settings to non-volatile memory, click the "Apply" button. Click the "Cancel" button to discard the changes.

- ✔ After changing the "SSID" on the access point "AP", access to client devices may be lost. First, change the "SSID" on client devices in the "STA" menu, and then on the access point (AP) in the "AP" menu.

10.10 "STA" menu

In the **"STA"** menu, the client (STA — Station) (hereinafter STA) can be configured.

✓ The "STA" menu is only available in the "Station" device mode.

10.10.1 "Station" submenu

Connection:

- **Priority** — determines the order in which profiles are used. When searching for a network and connecting, the device uses the profile with the highest priority first. If the priorities are the same, then the device determines the order in which profiles are used based on the encryption mode and RSSI;
- **SSID** — virtual wireless network name;
- **Security Mode** — wireless network access security mode:
 - *Off* — encryption for data transmission is not used;
 - *OWE (Opportunistic Wireless Encryption)* — encryption method that ensures the security of data transmitted over an unsecured network;
 - *WPA2, WPA3* — encryption methods, when choosing one of the methods the following setting will be available:
 - **WPA Key** — key/password required to connect to the wireless network. The key length is from 8 to 63 characters.
 - *WPA2-Enterprise, WPA3-Enterprise* — wireless channel encryption mode, in which the device is authorized on the centralized RADIUS server. To configure these security modes, specify the connection parameters:
 - **Username** — login required for authorization on the RADIUS server;
 - **Password** — key/password required for authorization on the RADIUS server.
- **MFP** — management frame protection (available in WPA2, WPA3, WPA2-Enterprise, WPA3-Enterprise and OWE modes. When selecting the WPA3, WPA3-Enterprise, OWE security mode, MFP is set to the Required state, when selecting other security modes, MFP is set to the Not Required state):

- *Not Required* – management frame protection is disabled;
- *Capable* – management frame protection works if the wireless network supports MFP. The device can connect to a network that does not support MFP;
- *Required* – management frame protection is enabled. The device cannot connect to a wireless network that does not support MFP.

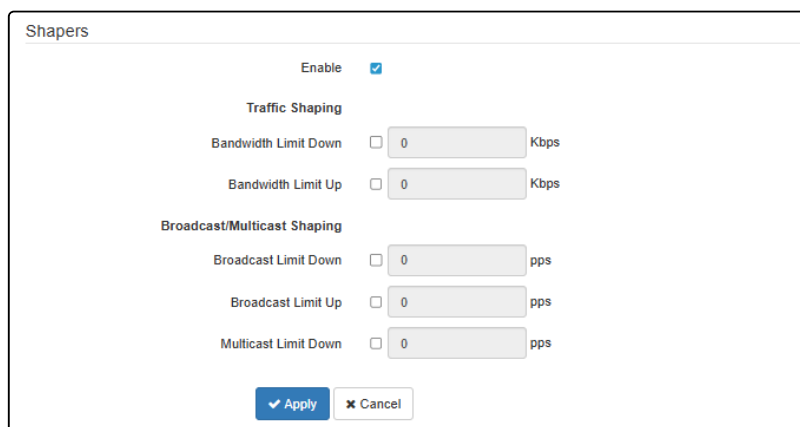
To add a new connection profile, click the "Add profile" button. You can add up to 8 profiles.

VLAN:

- *Access VLAN ID* – VLAN number from which the tag will be removed when forwarding traffic to Ethernet devices connected to the client (STA). When passing traffic in the opposite direction, untagged traffic will be tagged with VLAN ID (available when VLAN Trunk mode is disabled);
- *VLAN Trunk* – when checked, tagged traffic is transmitted to Ethernet devices connected to the client (STA);
- *General Mode* – when checked, Ethernet devices connected to the client (STA) are allowed to transmit untagged traffic with tagged traffic (available when VLAN Trunk mode is enabled);
- *General VLAN ID* – VLAN number from which the tag will be removed when transmitting traffic to Ethernet devices, connected to the client (STA). When traffic passes in the opposite direction, untagged traffic will be tagged with General VLAN ID (available when VLAN Trunk and General Mode are enabled);
- *MVR* – when checked, the MVR (Multicast VLAN Registration) functionality is enabled. Allows to use a separate VLAN for Multicast traffic;
- *MVR VLAN ID* – VLAN number of multicast traffic that will be untagged when transmitted to Ethernet devices connected to the client (STA). When traffic passes in the opposite direction, untagged IGMP packets from clients will be tagged with MVR VLAN ID;
- *MVR 802.1p* – 802.1p priority to be assigned to IGMP packets from Ethernet devices connected to the client (STA).

Advanced:

- *Priority* – prioritization method. Defines the field based on which traffic transmitted to the radio interface will be distributed among WMM queues:
 - *DSCP* – priority from the DSCP field of IP packet header will be analyzed;
 - *802.1p* – priority from the CoS (Class of Service) field of tagged packets will be analyzed.

Shapers:


Shapers

Enable ☒

Traffic Shaping

Bandwidth Limit Down ☐ 0 Kbps

Bandwidth Limit Up ☐ 0 Kbps

Broadcast/Multicast Shaping

Broadcast Limit Down ☐ 0 pps

Broadcast Limit Up ☐ 0 pps

Multicast Limit Down ☐ 0 pps

- *Enable* – activate the settings field;
- *Bandwidth Limit Down* – bandwidth limit in the direction from the client (STA) to the remote device, Kbps;
- *Bandwidth Limit Up* – bandwidth limit in the direction from remote device to client (STA), Kbps;
- *Broadcast Limit Down* – limit of broadcast packets in the direction from client (STA) to remote device, packets/s;
- *Broadcast Limit Up* – limit of broadcast packets in the direction from remote device to client (STA), packets/s;
- *Multicast Limit Down* – limit of multicast packets in the direction from client (STA) to remote device, packets/s.

To apply a new configuration and save settings to non-volatile memory, click the "Apply" button. Click the "Cancel" button to discard the changes.

10.11 "Network Settings" menu

10.11.1 "System Configuration" submenu

Quick Start Monitoring Radio AP **Network Settings** System Tools en (logout)

System Configuration >

Access

Hostname

AP Location root

Management VLAN Terminating

VLAN ID

Protocol Static

Static IP 192.168.1.10

Netmask 255.255.255.0

Gateway XXX:XXX:XXX:XXX

Primary DNS Server XXX:XXX:XXX:XXX

Secondary DNS Server XXX:XXX:XXX:XXX

Local Management via Ethernet

Enabled ☒

Static IP 192.0.3.1

Netmask 255.255.255.0

Apply Cancel

- *Hostname* – network name of the device, specified by string from 1 to 63 characters; Latin uppercase and lowercase letters, digits, hyphen “-” (hyphen can not be the last character in the name);
- *AP Location* – domain where the device is located;
- *Management VLAN*:
 - *Disabled* – Management VLAN is not used;
 - *Terminating* – mode in which the management VLAN is terminated at the device; in this case, remote devices connected via the radio interface do not have access to this VLAN;
 - *Forwarding* – mode in which the management VLAN is also transmitted to the radio interface (with the appropriate AP configuration).
- *VLAN ID* – VLAN identifier used to access the device, takes values 1–4094;
- *Protocol* – select protocol for device connection via Ethernet interface to service provider network:
 - *DHCP* – operating mode, when IP address, subnet mask, DNS server address, default gateway and other parameters required for operation are obtained from DHCP server automatically;
 - *Static* – operating mode, when IP address and all the necessary parameters for WAN interface are assigned statically. If “Static” is selected, the following parameters will be available to set:
 - *Static IP* – IP address of the device WAN interface in the provider network;
 - *Netmask* – external subnet mask;
 - *Gateway* – address, to which the packet is sent, if the route in routing table is not found for it.
- *Primary DNS server, Secondary DNS server* – IP addresses of DNS servers. If addresses of DNS servers are not automatically assigned via DHCP, set them manually.

✗ After configuring the “Management VLAN”, access to the device can be lost.

Local Management via Ethernet:

This subsection is used to configure untagged access to the device via the Ethernet interface.

- *Enabled* – activates the setting;
- *Static IP* – IP address of the device Ethernet interface in the local network (default 192.0.3.1);
- *Network mask* – subnet mask.

To apply a new configuration and save settings to non-volatile memory, click the "Apply" button. Click the "Cancel" button to discard the changes.

10.11.2 "Access" submenu

In the **"Access"** submenu, the access to the device via web interface, Telnet, SSH, NETCONF and SNMP can be configured.

The screenshot shows the 'Access' configuration page. The left sidebar has 'System Configuration' and 'Access >'. The main area has the following settings:

Protocol	Enabled (Checkbox)	Port
WEB	☒	80
WEB-HTTPS	☒	443
Telnet	☒	23
SSH	☒	22
NETCONF	☒	
SNMP	☒	

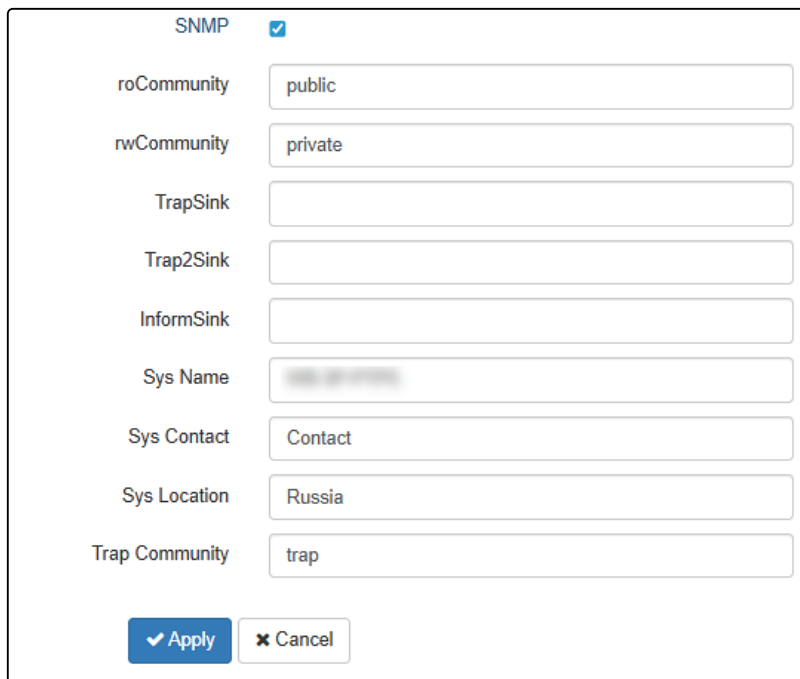
At the bottom, there are 'Apply' and 'Cancel' buttons.

- To enable access to the device via the web interface via HTTP protocol, select the checkbox next to "WEB". In the window that appears, it is possible to change the HTTP port (by default: 80). The range of acceptable values of ports, in addition to the default, is from 1025 to 65535 inclusive;
- To enable access to the device via the web interface via HTTPS protocol, select the checkbox next to "WEB-HTTPS". In the window that appears, it is possible to change the HTTPS port (by default: 443). The range of acceptable values of ports, in addition to the default, is from 1025 to 65535 inclusive;

✓ Note that the ports for the HTTP and HTTPS protocols should not have the same value.

- To enable access to the device via Telnet, select the checkbox next to "Telnet". In the window that appears, it is possible to change the Telnet port (23 by default). The range of acceptable port values, in addition to the default, is from 1025 to 65535 inclusive;
- To enable access to the device via SSH, select the checkbox next to "SSH". In the window that appears, it is possible to change the SSH port (22 by default). The range of acceptable port values, in addition to the default, is from 1025 to 65535 inclusive;
- To enable access to the device via NETCONF, select the checkbox next to "NETCONF".

The WB-3P-PTP5 software allows changing the device configuration, monitoring its status, as well as managing the device using the SNMP protocol.



The image shows a configuration window for SNMP. At the top, there is a tab labeled 'SNMP' with a checked checkbox. Below this, there are several input fields: 'roCommunity' with the value 'public', 'rwCommunity' with the value 'private', 'TrapSink', 'Trap2Sink', and 'InformSink' (all empty), 'Sys Name' with a blurred value, 'Sys Contact' with the value 'Contact', 'Sys Location' with the value 'Russia', and 'Trap Community' with the value 'trap'. At the bottom, there are two buttons: 'Apply' (with a checkmark icon) and 'Cancel' (with an 'X' icon).

The device supports SNMPv1, SNMPv2, SNMPv3 protocols.

To change the SNMP settings, select the checkbox next to "SNMP", the following SNMP agent options become available:

- *roCommunity* – password to read the parameters (by default: *public*);
- *rwCommunity* – password to configure (write) parameters (by default: *private*);
- *TrapSink* – IP address or domain name of SNMPv1-trap message recipient in HOST [COMMUNITY [PORT]] format;
- *Trap2Sink* – IP address or domain name of SNMPv2-trap message recipient in HOST [COMMUNITY [PORT]] format;
- *InformSink* – IP address or domain name of Inform message recipient in HOST [COMMUNITY [PORT]] format;
- *Sys Name* – device name;
- *Sys Contact* – device vendor contact information;
- *Sys Location* – device location information;
- *Trap community* – password enclosed in traps (default value: trap).

The list of objects which are supported for reading and configuring via SNMP is given below:

- eltexLtd.1.127.1 – monitoring of device parameters;
- eltexLtd.1.127.3 – device management;
- eltexLtd.1.127.5 – device configuring.

where eltexLtd – 1.3.6.1.4.1.35265 is Eltex Enterprise ID.

To apply a new configuration and save settings to non-volatile memory, click "Apply". Click "Cancel" to discard the changes.

10.12 "System" menu

In the "**System**" menu, the user can configure the system, time, syslog, change the password, upload/download the configuration, upgrade the firmware, and reboot the device.

10.12.1 "Device Firmware Upgrade" submenu

The "**Device Firmware Upgrade**" submenu is intended for upgrading the device firmware.

The screenshot shows the 'Device Firmware Upgrade' submenu. On the left is a sidebar with links: Configuration, Ping Watchdog, Reboot, Authentication, Log, Date and Time, and LEDs. The main content area has the following elements:

- Active Version:** A text field showing the current installed firmware version.
- Backup Version:** A text field showing the backup firmware version, with a **Set Active** button next to it.
- Latest Firmware:** A message stating 'The latest firmware version is available at: <http://eltex-co.ru/support/downloads/>'.
- Firmware Image:** A text field with a **Choose File** button and the text 'No file chosen'.
- Start Upgrading:** A blue button with an upward arrow icon.

- *Active Version* — installed firmware version, which is operating at the moment;
- *Backup version* — installed firmware version that can be switched to without downloading a firmware file;
 - *Set active* — button that allows making a backup version of the firmware active, this will require a device reboot. The active firmware version will not be set as a backup.

Firmware upgrade

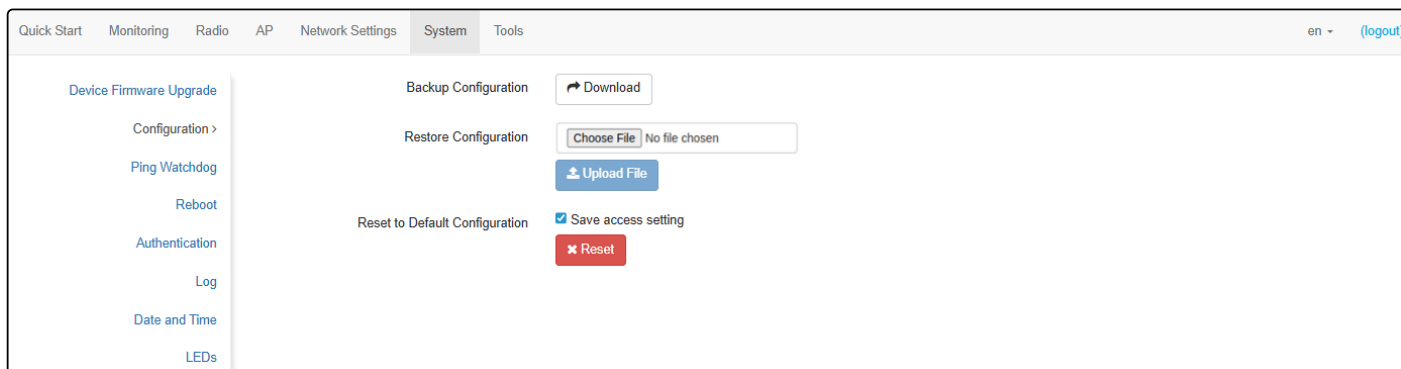
Download the firmware file from <http://eltex-co.com/support/downloads/> and save it on the PC. After that, click "Choose File" in the Firmware Image field and specify the path to the firmware file in .tar.gz format. To start the update process, click the "Start Upgrading" button. The process may take several minutes (its current status will be shown on the page). The device will be automatically rebooted when the upgrade is completed.

✓ The firmware should be upgraded first on the client (STA) and then on the access point (AP).

✗ Do not switch off or reboot the device during a firmware upgrade.

10.12.2 "Configuration" submenu

In the **"Configuration"** submenu, the current configuration can be saved and updated.



Backup Configuration

To save the current device configuration to local computer, click the "Download" button.

Restore Configuration

To upload the configuration file saved on the local computer, use the *Restore Configuration* item. To update the device configuration, click the "Chose File" button, specify a file (in .tar.gz format) and click the "Upload File" button. Uploaded configuration will be applied automatically and does not require device reboot.

Reset to Default Configuration

To reset all the settings to default values, click the "Reset" button. If the "Save access setting" checkbox is selected, then those configurations settings, that are responsible for access to the device (IP address settings, Telnet/SSH/SNMP/Netconf/Web access settings) will be saved.

10.12.3 "Ping Watchdog" submenu

The availability monitoring feature detects connectivity issues and reboots the device or its interfaces without user intervention. Restarting an interface also restarts the DHCP client on the current WAN interface.

Quick Start Monitoring Radio AP Network Settings **System** Tools en (logout)

Device Firmware Upgrade

Configuration

Ping Watchdog >

Reboot

Authentication

Log

Date and Time

LEDs

Enabled ☒

Action Reboot Device

Ping Server 192.168.1.1

Startup Delay 300

ICMP Echo-Request Period 300

ICMP Echo-Reply Timeout 1

Maximum Failed Checks 3

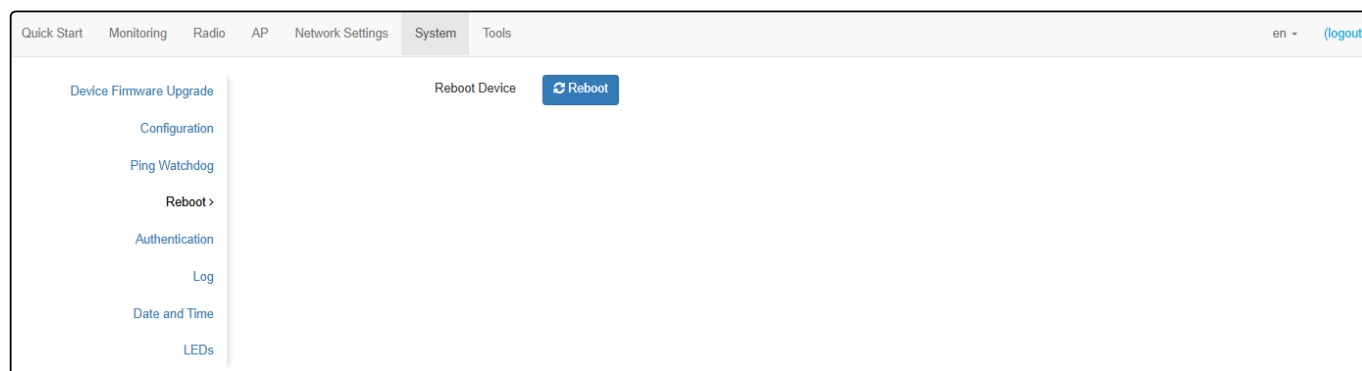
Apply Cancel

- **Enabled** – when checked, the ping watchdog feature is enabled, otherwise it is disabled;
- **Action:**
 - *Restart Ethernet Interface* – if the specified Ping server is unavailable, the device Ethernet interface will restart;
 - *Restart Wireless Interface* – if the specified Ping server is unavailable, the device wireless interface will restart;
 - *Reboot Device* – if the specified Ping server is unavailable, the device will reboot.
- **Ping Server** – IP address or host domain name, where ICMP requests will be sent;
- **Startup Delay** – time in seconds after the device is powered on or the previous trigger, during which the availability monitoring will not operate. Acceptable values: 60–86400 inclusive;
- **ICMP Echo-Request Period** – time in seconds after which an ICMP request will be sent when receiving an ICMP reply or deciding that the previous ICMP request was unsuccessful. Acceptable values: 1–86400 inclusive;
- **ICMP Echo-Reply Timeout** – time in seconds during which an ICMP reply is expected after sending an ICMP request. If an ICMP reply is not received within this time, the ICMP request is considered unsuccessful. Acceptable values: 1–10 inclusive;
- **Maximum Failed Checks** – maximum number of failed ICMP requests. If the number of failed ICMP requests reaches the specified value, the designated action is performed. Acceptable values: 1–86400 inclusive.

To apply a new configuration and save settings to non-volatile memory, click "Apply". Click "Cancel" to discard the changes.

10.12.4 "Reboot" submenu

To reboot the device, click the "Reboot" button. The device reboot process takes about 1 minute.



10.12.5 "Authentication" submenu

The "**Authentication**" submenu is used to configure user authentication.

✔ Factory account for accessing the device: login: **admin**, password: **password**.

It's also possible to create additional accounts with administrator or viewer roles (configuration is only available through the [CLI](#)). Accounts with administrator role have full access to the device, including reading and writing all settings and full monitoring of the device's status. Accounts with viewer role can only monitor.

The "**Local Password**" section is used to change the factory password for admin account. This password is stored on this device. To change the password, enter the new password first in the "Password" field, then in the "Confirm Password" field.

The "**RADIUS Authentication**" section is designed to configure access parameters to the RADIUS server, which will be used to authenticate the user on this device.

- *Radius Authentication* — when checked, authentication will be performed using the account on the RADIUS server;
- *Local Backup Authentication* — when checked, authentication using the local **admin** account is enabled if there is no connection to the RADIUS server;
- *Address of RADIUS Server* — IP address of the RADIUS server;
- *Port of RADIUS Server* — RADIUS server port used for authentication and authorization;
- *Password of RADIUS Server* — RADIUS server key used for authentication and authorization.

- ✓ With the **"Local Backup Authentication"** option disabled, authorization performs only through the RADIUS server. If the RADIUS server is unavailable or the data is incorrect, authorization will fail. With the **"Local Backup Authentication"** option enabled, if there is no connection with the RADIUS server, authorization can be performed using the local admin account. Authorization through other local accounts will not be performed.

- ✓ For authentication through the RADIUS server, accounts with appropriate roles are created only on the server. Accounts can be assigned the following roles:
admin — user with this role will have full access to configuring and monitoring the device;
viewer — user with this role will only have access to monitoring the device.
 On the RADIUS server, the **Cisco-AVPair = "shell:role=<role>"** attribute is used to configure account roles (*where <role> is either admin or viewer*).

To apply a new configuration and save settings to non-volatile memory, click "Apply". Click "Cancel" to discard the changes.

10.12.6 "Log" submenu

The **"Log"** submenu is designed to configure the output of various kinds of system debugging messages in order to detect problem causes in the device operation.

- **Mode** — Syslog agent operation mode:
 - *Local File* — log information is stored in a local file and is available in the the **"Events"** submenu;
 - *Server and File* — log information is sent to a remote Syslog server and stored in a local file.
- **Syslog Server Address** — IP address or domain name of the Syslog server;
- **Syslog Server Port** — port for incoming Syslog server messages (default: 514, acceptable values: from 1 to 65535);
- **File Size, KB** — maximum size of the log file (acceptable values: 1–1000 kB).

To apply a new configuration and save settings to non-volatile memory, click "Apply". Click "Cancel" to discard the changes.

10.12.7 "Date and Time" submenu

In the **"Date and Time"** submenu, it is possible to set the time manually or using the time synchronization protocol (NTP).

10.12.7.1 Manual

The screenshot shows the 'Date and Time' configuration page. The left sidebar contains links: Device Firmware Upgrade, Configuration, Ping Watchdog, Reboot, Authentication, Log, Date and Time >, and LEDs. The main content area has a 'Mode' section with 'Manual' selected and 'NTP Server' as an option. Below this is the 'Date and Time device' field showing '12/26/2025 08:01:42' with an 'Edit' button. The 'Time Zone' is set to 'Moscow, Russia'. The 'Enable daylight saving time' checkbox is checked. The 'DST Start' and 'DST End' fields are currently '(not selected)' with time pickers. The 'DST Offset (minutes)' is set to '60'. At the bottom are 'Apply' and 'Cancel' buttons.

- *Date and Time device* — date and time on the device at the current moment. Click the "Edit" button to make corrections:
 - *Date, Time* — set the current date and time or click the "Set current date and time" button to synchronize with the device;
- *Time Zone* — allows to set the time zone according to the nearest city for your region from the list;
- *Enable daylight saving time* — when selected, automatic daylight saving change will be performed automatically within the defined time period:
 - *DST Start* — day and time, when daylight saving time starts;
 - *DST End* — day and time, when daylight saving time ends;
 - *DST Offset (minutes)* — time period in minutes, on which time offset is performing. The parameter can take a value from 0 to 720 minutes.

To apply a new configuration and save settings to non-volatile memory, click "Apply". Click "Cancel" to discard the changes.

10.12.7.2 NTP Server

- *Date and Time device* — date and time set on the device;
- *NTP Server* — IP address/domain name of the time synchronization server. One can specify an address or select from an existing list;
- *Time Zone* — allows to set the time zone according to the nearest city for your region from the list;
- *Enable daylight saving time* — when selected, automatic daylight saving change will be performed automatically within the defined time period:
 - *DST Start* — day and time, when daylight saving time starts;
 - *DST End* — day and time, when daylight saving time ends;
 - *DST Offset (minutes)* — time period in minutes, on which time offset is performing. The parameter can take a value from 0 to 720 minutes.

To apply a new configuration and save settings to non-volatile memory, click "Apply". Click "Cancel" to discard the changes.

10.12.8 "LEDs" submenu

In the "**LEDs**" submenu, LEDs on the device can be customized.

The screenshot displays the 'LEDs' configuration page. The top navigation bar includes 'Quick Start', 'Monitoring', 'Radio', 'AP', 'Network Settings', 'System', and 'Tools'. The left sidebar lists various system functions, with 'LEDs >' selected. The main panel is divided into two sections: 'Common Settings' and 'RSSI LED Thresholds'. In 'Common Settings', the 'Enabled' checkbox is checked. In 'RSSI LED Thresholds', the 'Enable' checkbox is also checked. Below this, four input fields specify the signal level thresholds for LEDs 4, 3, 2, and 1, with default values of -60, -70, -80, and -100 dBm respectively. 'Apply' and 'Cancel' buttons are located at the bottom of the configuration area.

Common settings:

- *Enabled* – when checked, the indicators are enabled, otherwise they are disabled.

RSSI LED Threshold:

- *Enable* – when checked, the assignment of thresholds for each indicator is enabled, otherwise it is disabled;
- *Threshold LED4, dBm* – minimum signal level of a remote device (RSSI), at which LED4 turns on (by default: -60, acceptable values: -100–0);
- *Threshold LED3, dBm* – minimum signal level of a remote device (RSSI), at which LED3 turns on (by default: -70, acceptable values: -100–0);
- *Threshold LED2, dBm* – minimum signal level of a remote device (RSSI), at which LED2 turns on (by default: -80, acceptable values: -100–0);
- *Threshold LED1, dBm* – minimum signal level of a remote device (RSSI), at which LED1 turns on (by default: -100, acceptable values: -100–0).

To apply a new configuration and save settings to non-volatile memory, click "Apply". Click "Cancel" to discard the changes.

10.13 "Tools" menu

10.13.1 "Antenna Align" submenu

Antenna alignment is the process of setting-up and fine-tuning the antenna to obtain the maximum signal.

To start the alignment, click the "Start" button.

To stop the alignment, click the "Stop" button.

Antenna Align:

- *SSID* – wireless network name;
- *Channel* – data transmission channel;
- *RSSI* – received signal level, dBm;
- *Remote RSSI* – received signal level of the remote device, dBm.



RSSI-H graph shows the change in signal level at the first antenna in dBm over time in seconds.

RSSI-V graph shows the change in signal level at the second antenna in dBm over time in seconds.

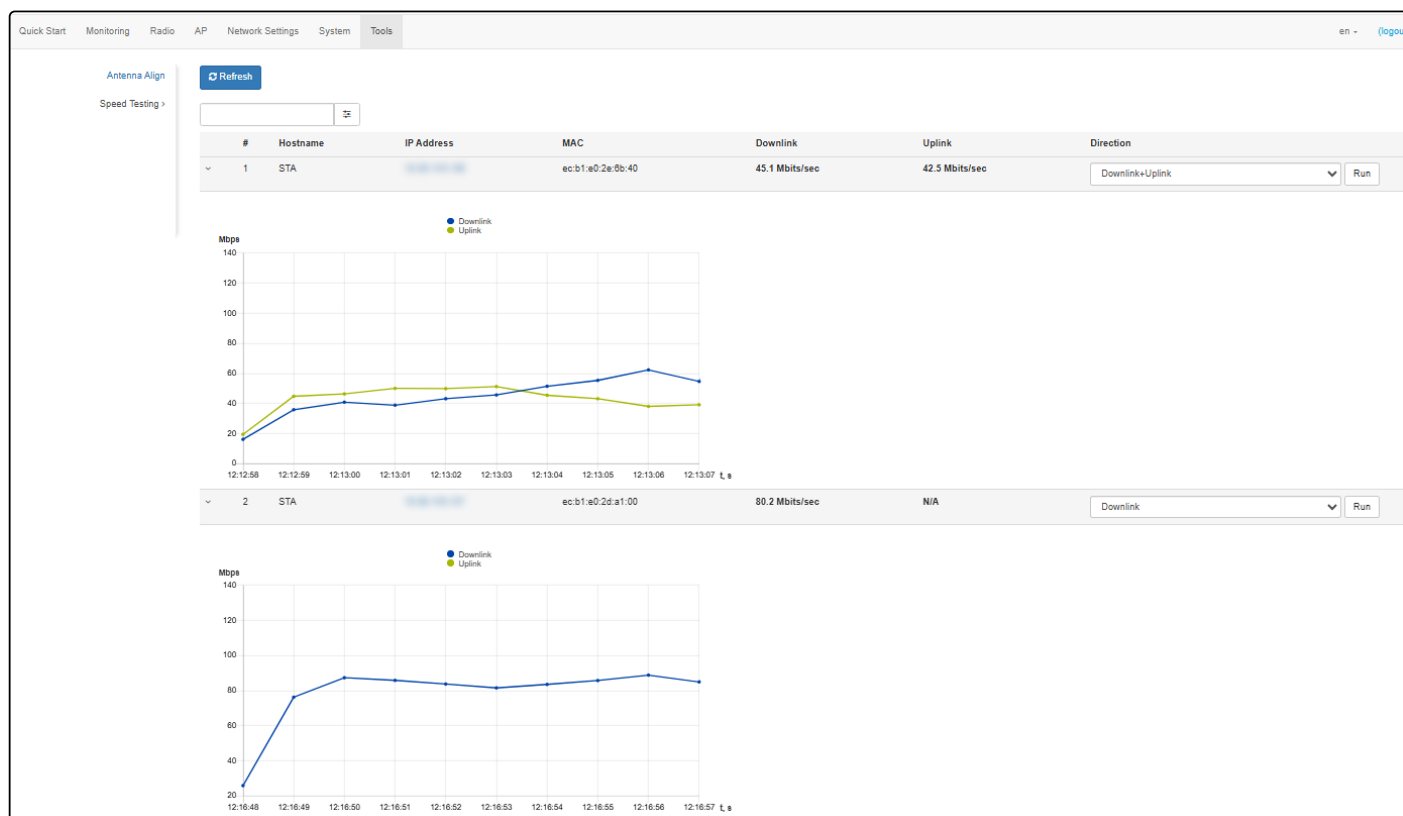
Remote RSSI-H graph shows the change in signal level at the first antenna of the remote device in dBm over time in seconds.

Remote RSSI-V graph shows the change in signal level at the second antenna of the remote device in dBm over time in seconds.

Peak RSSI – maximum signal level in dBm during the measurement period.

10.13.2 "Speed Testing" submenu

The **"Speed Testing"** submenu is designed to test the link speed.



- *Downlink* — speed testing will be performed towards the remote device;
- *Uplink* — speed testing will be performed in the direction from the remote device;
- *Downlink+Uplink* — speed testing will be performed in turn in each direction.

The test is performed by TCP traffic and lasts 10 seconds for one direction. Only one remote device can run the test at a time.

To start, select the test direction and click the "Run" button. After the test is completed, the result will be displayed in the corresponding field and in the graph.

By default, the test uses VLAN 7 and subnet 192.0.4.0/24. If the network already uses such a subnet and VLAN, it is required to change the test settings so that they do not overlap with the existing networks. This can be done via the CLI. The process is described in more detail in the section ["Perftest utility"](#).

- ✓ The following filters are available for searching the connected devices: by all fields, by hostname, by IP address, by MAC address. To select a filter, click . This functionality is only available in the Access Point PMP device mode.

11 Example of the device setup

This section provides an example of the initial setup of devices to organize a wireless bridge.

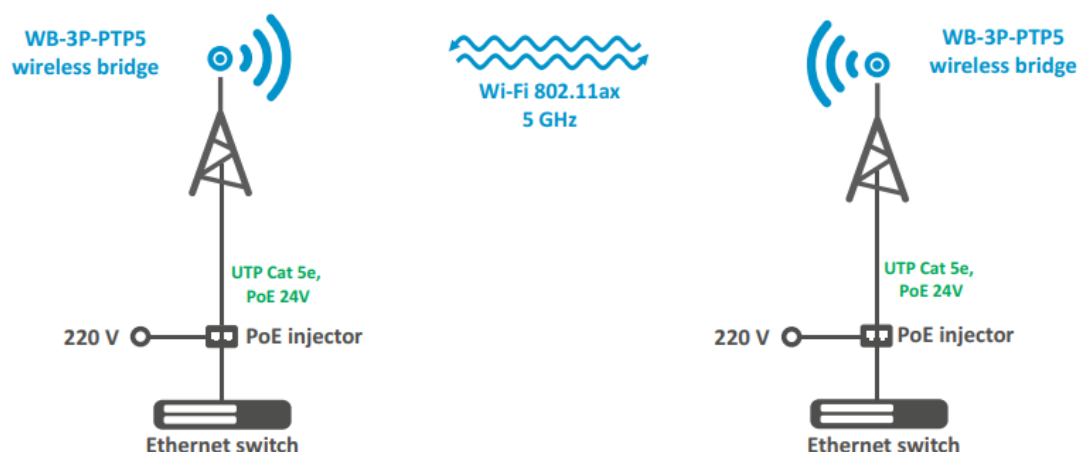


Figure 34 – WB-3P-PTP5 use case

- ✓ In the browser address bar, enter the device IP address (by default **192.168.1.10**, if the device has not received an address via DHCP). If the connection to the device is successful, a window will appear asking for login and password. Fill in the fields and click the "Log In" button. By default – login: **admin**, password: **password**.

The screenshot shows a login interface with two text input fields. The first field is labeled 'Enter login' and the second is labeled 'Enter password'. Below these fields is a blue button with a white checkmark and the text 'Log In'.

If this window does not appear, make sure that your PC is on the same network as the device.

Setting up an access point (AP):

1. By default, WB-3P-PTP5 is configured to receive an address via DHCP. If the address has not been received, one can connect to the device using the factory IP address: **192.168.1.10**, subnet mask: **255.255.255.0**.
2. It is necessary to update the device firmware to the latest version according to the section "[Device Firmware Upgrade](#)" submenu.
3. In the Radio menu, perform preliminary configuration of the radio interface. Select the data transmission channel and specify the distance between the devices in kilometers.
4. Save the settings by clicking the "Apply" button.
5. In the AP menu, in the SSID field, specify the identifier of the wireless network which the client (STA) will connect to.
6. In the "Security Mode" field, select the security mode by which authentication is performed on this network and specify the key if encrypted network is used.
7. Save the settings by clicking the "Apply" button.

Setting up client (STA) to connect to an access point (AP):

1. By default, WB-3P-PTP5 is configured to receive an address via DHCP. If the address has not been received, one can connect to the device using the factory IP address: **192.168.1.10**, subnet mask: **255.255.255.0**.
2. It is necessary to update the device firmware to the latest version according to the section "[Device Firmware Upgrade](#)" submenu.
3. If static or default settings are used to connect to the provider's network, then in the "Network settings" menu, in the "Protocol" field select "Static" and fill in the "Static IP", "Network mask", "Gateway" fields.
4. In the STA menu, in the "SSID" field, specify the identifier of the wireless network which you want to connect to.
5. In the "Security Mode" field, select the security mode by which authentication is performed on this network and specify the key if encrypted network is used.
6. After clicking the "Apply" button, the client (STA) will search for the specified SSID in the air and, if found, will attempt to connect to the access point (AP) with the specified parameters.
7. Check that the access point (AP) has appeared in the "Monitoring" menu in the "Wireless Peer" section. Check the availability of the access point (AP) by going to the device IP address in the browser address bar.

If all the steps described above are completed successfully, then the wireless connection between the devices is configured.

12 Managing the device using the command line

- ✔ To enter configuration mode, issue the **configure** command.
To display the existing settings of a particular configuration section, issue the **show-config** command.
Press the key combination (English layout) – **[Shift + ?]** to get a hint of what value this or that configuration parameter can take.
To get a list of options available for editing in this configuration section, press the **Tab** key.
To save the settings, enter the **save** command.
To go back to the previous configuration section, enter the **exit** command.
To exit configuration mode, enter the **end** command.

- ✘ The setup should be started from the client device to avoid losing connection with it.

12.1 Connection to the device

By default, WB-3P-PTP5 is configured to receive the address via DHCP. If this does not happen, connect to the device using the factory IP address.

- ✔ WB-3P-PTP5 factory default IP address: **192.168.1.10**, subnet mask: **255.255.255.0**.

Connection to the device is performed via SSH:

```
ssh admin@<IP address of the device>, then enter the password
```

12.2 Network parameters configuration

Configuring the static network parameters

```
WB-3P-PTP5(root):/# configure
WB-3P-PTP5(config):/# interface
WB-3P-PTP5(config):/interface# br0
WB-3P-PTP5(config):/interface/br0# common
WB-3P-PTP5(config):/interface/br0/common# static-ip X.X.X.X (where X.X.X.X — device IP address)
WB-3P-PTP5(config):/interface/br0/common# netmask X.X.X.X (where X.X.X.X — subnet mask)
WB-3P-PTP5(config):/interface/br0/common# dns-server-1 X.X.X.X (where X.X.X.X — IP address of the dns
server №1)
WB-3P-PTP5(config):/interface/br0/common# dns-server-2 X.X.X.X (where X.X.X.X — IP address of the dns
server №2)
WB-3P-PTP5(config):/interface/br0/common# protocol static-ip (change operating mode from DHCP to Static-
IP)
WB-3P-PTP5(config):/interface/br0/common# save (save changes)
```

Adding a static route

```
WB-3P-PTP5(config):/interface/br0/common# exit
WB-3P-PTP5(config):/interface/br0# exit
WB-3P-PTP5(config):/interface# exit
WB-3P-PTP5(config):/# route
WB-3P-PTP5(config):/route# default
WB-3P-PTP5(config):/route/default# destination X.X.X.X (where X.X.X.X — IP address of the network or
destination node, for default route — 0.0.0.0)
WB-3P-PTP5(config):/route/default# netmask X.X.X.X (where X.X.X.X — destination network mask, for default
route — 0.0.0.0)
WB-3P-PTP5(config):/route/default# gateway X.X.X.X (where X.X.X.X — gateway IP address)
WB-3P-PTP5(config):/interface/br0/common# save (save changes)
```

Configuring the reception of network parameters via DHCP

```
WB-3P-PTP5(root):/# configure
WB-3P-PTP5(config):/# interface
WB-3P-PTP5(config):/interface# br0
WB-3P-PTP5(config):/interface/br0# common
WB-3P-PTP5(config):/interface/br0/common# protocol dhcp (changing the operating mode from Static-IP to
DHCP)
WB-3P-PTP5(config):/interface/br0/common# save (save changes)
```

12.2.1 Network parameters configuration via set-management-vlan-mode utility

Untagged access

Obtaining the network parameters via DHCP

WB-3P-PTP5(root):/# **set-management-vlan-mode off protocol dhcp**

Static settings

WB-3P-PTP5(root):/# **set-management-vlan-mode off protocol static-ip ip-addr X.X.X.X netmask Y.Y.Y.Y gateway Z.Z.Z.Z** (where X.X.X.X — static IP address, Y.Y.Y.Y — subnet mask, Z.Z.Z.Z — gateway)

Access via Management VLAN in Terminating Mode

Obtaining the network parameters via DHCP

WB-3P-PTP5(root):/# **set-management-vlan-mode terminating vlan-id X protocol dhcp** (where X — VLAN ID, used to access the device. Acceptable values: 1–4094)

Static settings

WB-3P-PTP5(root):/# **set-management-vlan-mode terminating vlan-id X protocol static-ip ip-addr X.X.X.X netmask Y.Y.Y.Y gateway Z.Z.Z.Z** (where X — VLAN ID, used to access the device. Acceptable values: 1–4094; X.X.X.X — static IP address; Y.Y.Y.Y — subnet mask, Z.Z.Z.Z — gateway)

Access via Management VLAN in Forwarding mode

Obtaining the network parameters via DHCP

WB-3P-PTP5(root):/# **set-management-vlan-mode forwarding vlan-id X protocol dhcp** (where X — VLAN ID, used to access the device. Acceptable values: 1–4094)

Static settings

WB-3P-PTP5(root):/# **set-management-vlan-mode forwarding vlan-id X protocol static-ip ip-addr X.X.X.X netmask Y.Y.Y.Y gateway Z.Z.Z.Z** (where X — VLAN ID, used to access the device. Acceptable values: 1–4094; X.X.X.X — static IP address; Y.Y.Y.Y — subnet mask, Z.Z.Z.Z — gateway)

Completing and saving settings

WB-3P-PTP5(root):/# **save** (save changes)

12.2.2 Configuring 802.1p priority for Management VLAN

802.1p priority in Terminating mode

```
WB-3P-PTP5(root):/# configure
WB-3P-PTP5(config):/# interface
WB-3P-PTP5(config):/interface# management-vlan-terminating
WB-3P-PTP5(config):/interface/management-vlan-terminating# priority X (where X — 802.1p priority for management VLAN. Acceptable values: 0–7)
WB-3P-PTP5(config):/interface/management-vlan-terminating# save (save changes)
```

802.1p priority in Forwarding mode

```
WB-3P-PTP5(root):/# configure
WB-3P-PTP5(config):/# interface
WB-3P-PTP5(config):/interface# management-vlan-forwarding
WB-3P-PTP5(config):/interface/management-vlan-forwarding# priority X (where X — 802.1p priority for management VLAN. Acceptable values: 0–7)
WB-3P-PTP5(config):/interface/management-vlan-forwarding# save (save changes)
```

12.2.3 Remote management configuration

SSH configuration

```
WB-3P-PTP5(root):/# configure
WB-3P-PTP5(config):/# ssh
WB-3P-PTP5(config):/ssh# enable true (remote access management via SSH. To disable, enter false. By default: true)
WB-3P-PTP5(config):/ssh# port X (where X — SSH server port. By default: 22)
WB-3P-PTP5(config):/ssh# save (save changes)
```

Telnet configuration

```
WB-3P-PTP5(root):/# configure
WB-3P-PTP5(config):/# telnet
WB-3P-PTP5(config):/telnet# enable true (remote access management via Telnet. To disable, enter false. By default: false)
WB-3P-PTP5(config):/telnet# port X (where X — port. By default: 23)
WB-3P-PTP5(config):/telnet# save (save changes)
```

SNMPv2 configuration

```
WB-3P-PTP5(root):/# configure
WB-3P-PTP5(config):/# snmp
WB-3P-PTP5(config):/snmp# enable true (SNMP management. To disable, enter false. By default: true)
WB-3P-PTP5(config):/snmp# rocommunity public (where public — password to read parameters)
WB-3P-PTP5(config):/snmp# rwcommunity private (where private — password to write parameters)
WB-3P-PTP5(config):/snmp# trapsink X.X.X.X (where X.X.X.X — IP address or domain name of the SNMPv1-
trap message receiver in the format HOST [COMMUNITY [PORT]])
WB-3P-PTP5(config):/snmp# trap2sink X.X.X.X (where X.X.X.X — IP address or domain name of the SNMPv2-
trap message receiver in the format HOST [COMMUNITY [PORT]])
WB-3P-PTP5(config):/snmp# informsink X.X.X.X (where X.X.X.X — IP address or domain name of the Inform
message receiver in the format HOST [COMMUNITY [PORT]])
WB-3P-PTP5(config):/snmp# sysname WB-3P-PTP5 (where WB-3P-PTP5 — system name of the device. By
default: WB-3P-PTP5)
WB-3P-PTP5(config):/snmp# syscontact Contact (where Contact — contact information of the device
manufacturer. By default: Contact)
WB-3P-PTP5(config):/snmp# syslocation Russia (where Russia — device location information. By default:
Russia)
WB-3P-PTP5(config):/snmp# trapcommunity trap (where trap — password contained in traps. By default: trap)
WB-3P-PTP5(config):/snmp# save (save changes)
```

SNMPv3 configuration

```
WB-3P-PTP5(root):/# configure
WB-3P-PTP5(config):/# snmp
WB-3P-PTP5(config):/snmp# enable true (SNMP management. To disable, enter false. By default: true)
WB-3P-PTP5(config):/snmp# view (defines the range of OIDs available to specific user groups)
WB-3P-PTP5(config):/snmp/view# add inc-all
WB-3P-PTP5(config):/snmp/view# inc-all
WB-3P-PTP5(config):/snmp/view/inc-all# rule (defines access rights for different user groups to specific parts of
the MIB)
WB-3P-PTP5(config):/snmp/view/inc-all/rule# add 1
WB-3P-PTP5(config):/snmp/view/inc-all/rule# 1
WB-3P-PTP5(config):/snmp/view/inc-all/rule/1# type included (where included — action type. Acceptable
values: included — adding a given OID, excluded — excluding a given OID)
WB-3P-PTP5(config):/snmp/view/inc-all/rule/1# subtree .1 (where .1 — given OID. If the group uses view with
type = included and OID .1 as read-view, then OID .1 and all its children will be available for reading. If type =
excluded, then all OIDs will be available except .1 and its children)
WB-3P-PTP5(config):/snmp/view/inc-all/rule/1# exit
WB-3P-PTP5(config):/snmp/view/inc-all/rule# exit
WB-3P-PTP5(config):/snmp/view/inc-all# exit
WB-3P-PTP5(config):/snmp/view# exit
WB-3P-PTP5(config):/snmp# group (set OID ranges for reading and writing, determines the security level)
WB-3P-PTP5(config):/snmp/group# add rw (where rw — group name. Used to bind users to a group)
WB-3P-PTP5(config):/snmp/group# rw
WB-3P-PTP5(config):/snmp/group/rw# read-view inc-all (where inc-all — view to read parameters. Defines the
range of OIDs available for reading)
WB-3P-PTP5(config):/snmp/group/rw# write-view inc-all (where inc-all — view to write parameters. Defines the
range of OIDs available for writing)
WB-3P-PTP5(config):/snmp/group/rw# security-level priv (where priv — security level. Acceptable
values: noauth — no security, auth — authorization of requests by username and password, priv —
```

authorization of requests by username and password, as well as encryption of request and response)

WB-3P-PTP5(config):/snmp/group/rw# **auth-type MD5** (where MD5 — authorization method. Acceptable values: **MD5**, **SHA**. It is used, if security-level = auth or priv. If not specified, then MD5 is used)

WB-3P-PTP5(config):/snmp/group/rw# **priv-type DES** (where DES — encryption method. Acceptable values: **DES**, **AES**. It is used, if security-level = priv. If not specified, then DES is used)

WB-3P-PTP5(config):/snmp/group/rw# **exit**

WB-3P-PTP5(config):/snmp/group# **exit**

WB-3P-PTP5(config):/snmp# **user** (user account. It is linked to a specific group and contains the name and passwords for authorization and encryption)

WB-3P-PTP5(config):/snmp/user# **add admin** (where admin — username. Used when authorizing requests, and can also be assigned for target)

WB-3P-PTP5(config):/snmp/user# **admin**

WB-3P-PTP5(config):/snmp/user/admin# **group rw** (where rw — group to which the user is added)

WB-3P-PTP5(config):/snmp/user/admin# **auth-password password** (where password — password for authorization. If the group security-level = auth or priv, and auth-password is not set, then the user will not be available)

WB-3P-PTP5(config):/snmp/user/admin# **priv-password password** (where password — password for encryption. If the group security-level = priv, and priv-password is not set, then the user will not be available)

WB-3P-PTP5(config):/snmp/user/admin# **exit**

WB-3P-PTP5(config):/snmp/user# **exit**

WB-3P-PTP5(config):/snmp# **target** (issue traps to specified hosts. Added optionally. Analog of trapsink and trap2sink for SNMPv3)

WB-3P-PTP5(config):/snmp/target# **add target1**

WB-3P-PTP5(config):/snmp/target# **target1**

WB-3P-PTP5(config):/snmp/target/target1# **host X.X.X.X** (where X.X.X.X — IP address of the host to which traps will be sent)

WB-3P-PTP5(config):/snmp/target/target1# **port X** (where X — number of port to which the traps will be sent)

WB-3P-PTP5(config):/snmp/target/target1# **user admin** (where admin — user name used to issue traps. On the remote side, the user should be configured similarly. If an inactive user is specified (it does not have one of the required passwords set), then the target will also be inactive)

WB-3P-PTP5(config):/snmp/target/target1# **exit**

WB-3P-PTP5(config):/snmp/target# **exit**

WB-3P-PTP5(config):/snmp# **snmpv3-only true** (enable denying access to all OIDs via SNMPv1, SNMPv2. To disable, enter **false**. By default: false)

WB-3P-PTP5(config):/snmp# **save** (save changes)

12.2.4 IPv6 network parameters configuration

✗ Access to the device via IPv6 protocol is disabled by default.

Enabling access to the device via IPv6 protocol

```
WB-3P-PTP5(root):/# configure
WB-3P-PTP5(config):/# interface
WB-3P-PTP5(config):/interface# br0
WB-3P-PTP5(config):/interface/br0# common
WB-3P-PTP5(config):/interface/br0/common# ipv6
WB-3P-PTP5(config):/interface/br0/common/ipv6# protocol dhcp (obtaining IPv6 network parameters via DHCP)
WB-3P-PTP5(config):/interface/br0/common/ipv6# enabled true (enabling access to the device via IPv6 protocol. To disable, enter false)
WB-3P-PTP5(config):/interface/br0/common/ipv6# save (save changes)
```

Configuring static IPv6 network settings

```
WB-3P-PTP5(root):/# configure
WB-3P-PTP5(config):/# interface
WB-3P-PTP5(config):/interface# br0
WB-3P-PTP5(config):/interface/br0# common
WB-3P-PTP5(config):/interface/br0/common# ipv6
WB-3P-PTP5(config):/interface/br0/common/ipv6# address XXXX:XXXX:XXXX:XXXX:XXXX:XXXX:XXXX:XXXX (where XXXX:XXXX:XXXX:XXXX:XXXX:XXXX:XXXX:XXXX — static IPv6 address of the device)
WB-3P-PTP5(config):/interface/br0/common/ipv6# address-prefix-length X (where X — static IPv6 address prefix. Takes values from 0 to 128. By default: 64)
WB-3P-PTP5(config):/interface/br0/common/ipv6# gateway XXXX:XXXX:XXXX:XXXX::/64 (IPv6 prefix is specified, for example 3211:0:0:1234::/64)
WB-3P-PTP5(config):/interface/br0/common/ipv6# dns-server-1 XXXX:XXXX:XXXX:XXXX:XXXX:XXXX:XXXX:XXXX/Y (where XXXX:XXXX:XXXX:XXXX:XXXX:XXXX:XXXX:XXXX/Y — IPv6 address of the DNS server №1 with prefix)
WB-3P-PTP5(config):/interface/br0/common/ipv6# dns-server-2 XXXX:XXXX:XXXX:XXXX:XXXX:XXXX:XXXX:XXXX/Y (where XXXX:XXXX:XXXX:XXXX:XXXX:XXXX:XXXX:XXXX/Y — IPv6 address of the DNS server №2 with prefix)
WB-3P-PTP5(config):/interface/br0/common/ipv6# protocol static-ip (enable use of static IPv6 networks parameters. For obtaining the IPv6 network parameters via DHCP enter dhcp)
WB-3P-PTP5(config):/interface/br0/common/ipv6# enabled true (enable access to the device via IPv6 protocol. To disable, enter false)
WB-3P-PTP5(config):/interface/br0/common/ipv6# save (save changes)
```

12.3 Radio settings

To change the radio channel, channel bandwidth, or power, use the following commands:

Changing the radio channel, bandwidth and power of the radio interface

```
WB-3P-PTP5(root):/# configure
WB-3P-PTP5(config):/# interface
WB-3P-PTP5(config):/interface# wlan0
WB-3P-PTP5(config):/interface/wlan0# wlan
WB-3P-PTP5(config):/interface/wlan0/wlan# radio
WB-3P-PTP5(config):/interface/wlan0/wlan/radio# tx-power X (where X — power level in dBm)
WB-3P-PTP5(config):/interface/wlan0/wlan/radio# channel X (where X — number of the static channel on which
the device will operate)
WB-3P-PTP5(config):/interface/wlan0/wlan/radio# bandwidth X (where X — channel bandwidth)
WB-3P-PTP5(config):/interface/wlan0/wlan/radio# save (save changes)
```

✓ Lists of available channels

In 5 GHz Radio for locations "Russia (RU)"/"No restrictions (ALL)" the following channels are available for selection if DFS forced/auto:

- for 5, 10, 20 MHz channel bandwidth: 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193.
- for 40 MHz channel bandwidth:
 - if "control-sideband" = lower: 36, 44, 52, 60, 68, 76, 84, 92, 100, 108, 116, 124, 132, 140, 149, 157, 165, 173, 181, 189.
 - if "control-sideband" = upper: 40, 48, 56, 64, 72, 80, 88, 96, 104, 112, 120, 128, 136, 144, 153, 161, 169, 177, 185, 193.
- for 80 MHz : 36, 40, 44, 48, 52, 56, 60, 64, 68, 72, 76, 80, 84, 88, 92, 96, 100, 104, 108, 112, 116, 120, 124, 128, 132, 136, 140, 144, 149, 153, 157, 161, 165, 169, 173, 177, 181, 185, 189, 193.
- for 160 MHz : 36, 40, 44, 48, 52, 56, 60, 64, 68, 72, 76, 80, 84, 88, 92, 96, 100, 104, 108, 112, 116, 120, 124, 128, 149, 153, 157, 161, 165, 169, 173, 177.

✓ **In 5 GHz Radio for locations "Russia (RU)"/"No restrictions (ALL)" the following channels are available for selection if DFS forced/auto and fixed center frequency is enabled:**

- for 20 MHz channel bandwidth: 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193.
- for 40 MHz channel bandwidth: 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191.
- for 80 MHz channel bandwidth: 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187.
- for 160 MHz channel bandwidth: 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179.

In 5 GHz Radio for locations "Russia (RU)"/"No restrictions (ALL)" the following channels are available for selection if DFS disabled:

- for 5, 10, 20 MHz channel bandwidth: 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193.
- for 40 MHz channel bandwidth:
 - if "control-sideband" = lower: 36, 44, 149, 157, 165, 173, 181, 189.
 - if "control-sideband" = upper: 40, 48, 153, 161, 169, 177, 185, 193.
- for 80 MHz channel bandwidth: 36, 40, 44, 48, 149, 153, 157, 161, 165, 169, 173, 177, 181, 185, 189, 193.
- for 160 MHz channel bandwidth: 149, 153, 157, 161, 165, 169, 173, 177.

✓ **In 5 GHz Radio for locations "Russia (RU)"/"No restrictions (ALL)" the following channels are available for selection if DFS disabled and fixed center frequency is enabled:**

- for 20 MHz channel bandwidth: 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193.
- for 40 MHz channel bandwidth: 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191.
- for 80 MHz channel bandwidth: 38, 39, 40, 41, 42, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187.
- for 160 MHz channel bandwidth: 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179.

12.3.1 Advanced Radio settings

Changing country

WB-3P-PTP5(config):/interface/wlan0/wlan/radio# **country X** (parameter X can take a value: **RU, ALL**)

Changing the radio interface operating mode

WB-3P-PTP5(config):/interface/wlan0/wlan/radio# **work-mode X** (where X — radio interface operating mode according to the IEEE 802.11 standard. Acceptable values: **anacax, anac, ax**)

Changing the primary channel

WB-3P-PTP5(config):/interface/wlan0/wlan/radio# **control-sideband lower** (parameter can take a value: **lower, upper**. By default: **lower**)

Enabling fixed center frequency

WB-3P-PTP5(config):/interface/wlan0/wlan/radio# **center-frequency true** (enable fixed center frequency. To disable, enter **false**)

Enabling short guard interval

WB-3P-PTP5(config):/interface/wlan0/wlan/radio# **sgi true** (enable the use of a Short Guard Interval for data transmission of 400 ns instead of 800 ns. To disable, enter **false**)

Configuring the limited list of channels

WB-3P-PTP5(config):/interface/wlan0/wlan/radio# **use-limit-channels true** (enable the use of limited list of channels. To disable, enter **false**)
 WB-3P-PTP5(config):/interface/wlan0/wlan/radio# **limit-channels '50 51 52** (where 50 51 52 — are channels of range in which the configurable radio interface can operate)

Configuring DFS

Configuration is performed only for Radio 5 GHz

WB-3P-PTP5(config):/interface/wlan1/wlan/radio# **dfs X** (where X — DFS operating mode. Acceptable values: **forced** — DFS is disabled, DFS channels are available for selection; **auto** — DFS is enabled; **disabled** — DFS is disabled, DFS channels are not available for selection)

Enabling STBC

WB-3P-PTP5(config):/interface/wlan0/wlan/radio# **stbc true** (enable the space-time block coding (STBC) method, which is aimed at increasing the reliability of data transmission. To disable, enter **false**)

Enabling aggregation

WB-3P-PTP5(config):/interface/wlan0/wlan/radio# **aggregation true** (enable aggregation on Radio — support for AMPDU/AMSDU. To disable, enter **false**)

Enabling the short preamble

WB-3P-PTP5(config):/interface/wlan0/wlan/radio# **short-preamble true** (enable the short packet preamble. To disable, enter **false**)

Enabling fixed rate

WB-3P-PTP5(config):/interface/wlan0/wlan/radio# **fixed-rate X** (where X — modulation name in capital letters without spaces, for example, OFDM54, MCS15. The acceptable values are determined by the operating mode of the radio interface and the channel bandwidth)
 WB-3P-PTP5(config):/interface/wlan0/wlan/radio# **enable-fixed-rate true** (enable fixed channel transfer rate. To disable, enter **false**)

Enabling maximal transmit rate

WB-3P-PTP5(config):/interface/wlan0/wlan/radio# **maximal-rate-tx**

WB-3P-PTP5(config):/interface/wlan0/wlan/radio/maximal-rate-tx# **he X** (where X — modulation name in capital letters without spaces, for example, NSS2-MCS11. The parameter is used when connecting devices in IEEE 802.11ax mode)

WB-3P-PTP5(config):/interface/wlan0/wlan/radio/maximal-rate-tx# **vht X** (where X — modulation name in capital letters without spaces, for example, NSS2-MCS11. The parameter is used when connecting devices in IEEE 802.11ac mode)

WB-3P-PTP5(config):/interface/wlan0/wlan/radio/maximal-rate-tx# **ht X** (where X — modulation name in capital letters without spaces, for example, MCS15. The parameter is used when connecting devices in IEEE 802.11n mode)

WB-3P-PTP5(config):/interface/wlan0/wlan/radio/maximal-rate-tx# **legacy X** (where X — modulation name in capital letters without spaces, for example, OFDM54. The parameter is used when connecting devices in IEEE 802.11a mode)

WB-3P-PTP5(config):/interface/wlan0/wlan/radio/maximal-rate-tx# **enable true** (enable maximal transmit rate. To disable, enter **false**)

WB-3P-PTP5(config):/interface/wlan0/wlan/radio/qos# **save** (save changes)

Enabling maximal receive rate

WB-3P-PTP5(config):/interface/wlan0/wlan/radio# **maximal-rate-rx**

WB-3P-PTP5(config):/interface/wlan0/wlan/radio/maximal-rate-rx# **he X** (where X — modulation name in capital letters without spaces, for example, NSS2-MCS11. The parameter is used when connecting devices in IEEE 802.11ax mode)

WB-3P-PTP5(config):/interface/wlan0/wlan/radio/maximal-rate-rx# **vht X** (where X — modulation name in capital letters without spaces, for example, NSS2-MCS11. The parameter is used when connecting devices in IEEE 802.11ac mode)

WB-3P-PTP5(config):/interface/wlan0/wlan/radio/maximal-rate-rx# **ht X** (where X — modulation name in capital letters without spaces, for example, MCS15. The parameter is used when connecting devices in IEEE 802.11n mode)

WB-3P-PTP5(config):/interface/wlan0/wlan/radio/maximal-rate-rx# **legacy X** (where X — modulation name in capital letters without spaces, for example, OFDM54. The parameter is used when connecting devices in IEEE 802.11a mode)

WB-3P-PTP5(config):/interface/wlan0/wlan/radio/maximal-rate-rx# **enable true** (enable maximal receive rate. To disable, enter **false**. Available only for **ap-ptp** and **sta** modes)

WB-3P-PTP5(config):/interface/wlan0/wlan/radio/qos# **save** (save changes)

Enabling minimal transmit rate

```
WB-3P-PTP5(config):/interface/wlan0/wlan/radio# minimal-rate-tx
WB-3P-PTP5(config):/interface/wlan0/wlan/radio/minimal-rate-tx# he X (where X — modulation name in capital letters without spaces, for example, NSS1-MCS0. The parameter is used when connecting devices in IEEE 802.11ax mode)
WB-3P-PTP5(config):/interface/wlan0/wlan/radio/minimal-rate-tx# vht X (where X — modulation name in capital letters without spaces, for example, NSS1-MCS0. The parameter is used when connecting devices in IEEE 802.11ac mode)
WB-3P-PTP5(config):/interface/wlan0/wlan/radio/minimal-rate-tx# ht X (where X — modulation name in capital letters without spaces, for example, MCS0. The parameter is used when connecting devices in IEEE 802.11n mode)
WB-3P-PTP5(config):/interface/wlan0/wlan/radio/minimal-rate-tx# legacy X (where X — modulation name in capital letters without spaces, for example, OFDM6. The parameter is used when connecting devices in IEEE 802.11a mode)
WB-3P-PTP5(config):/interface/wlan0/wlan/radio/minimal-rate-tx# enable true (enable minimal transmit rate. To disable, enter false)
WB-3P-PTP5(config):/interface/wlan0/wlan/radio/qos# save (save changes)
```

Enabling minimal receive rate

```
WB-3P-PTP5(config):/interface/wlan0/wlan/radio# minimal-rate-rx
WB-3P-PTP5(config):/interface/wlan0/wlan/radio/minimal-rate-rx# he X (where X — modulation name in capital letters without spaces, for example, NSS1-MCS0. The parameter is used when connecting devices in IEEE 802.11ax mode)
WB-3P-PTP5(config):/interface/wlan0/wlan/radio/minimal-rate-rx# vht X (where X — modulation name in capital letters without spaces, for example, NSS1-MCS0. The parameter is used when connecting devices in IEEE 802.11ac mode)
WB-3P-PTP5(config):/interface/wlan0/wlan/radio/minimal-rate-rx# ht X (where X — modulation name in capital letters without spaces, for example, MCS0. The parameter is used when connecting devices in IEEE 802.11n mode)
WB-3P-PTP5(config):/interface/wlan0/wlan/radio/minimal-rate-rx# legacy X (where X — modulation name in capital letters without spaces, for example, OFDM6. The parameter is used when connecting devices in IEEE 802.11a mode)
WB-3P-PTP5(config):/interface/wlan0/wlan/radio/minimal-rate-rx# enable true (enable the minimal receive rate. To disable it, enter false. Available only for ap-ptp and sta modes)
WB-3P-PTP5(config):/interface/wlan0/wlan/radio/qos# save (save changes)
```

- ✓ The maximal and minimal **receive** rate parameters are used to specify the maximal and minimal **transmit** rate to a remote device. Therefore, when configuring maximal and/or minimal **receive** rate, for example, on a client (STA), there is no need to configure maximal and/or minimal **transmit** rate on an access point (AP).

Configuring Distance

WB-3P-PTP5(config):/interface/wlan0/wlan/radio# **auto-distance true** (enable automatic distance calculation between devices. To disable, enter **false**)

WB-3P-PTP5(config):/interface/wlan0/wlan/radio# **max-distance X** (where X — distance between devices in kilometers. The parameter is used when auto-distance is disabled. Acceptable values: 0–34. By default: 0)

Configuring TDD

WB-3P-PTP5(config):/interface/wlan0/wlan/radio/tdd# **enable true** (enable collision-free time-division access technology, which synchronizes data transmission in both directions within a time frame. To disable, enter **false**)

WB-3P-PTP5(config):/interface/wlan0/wlan/radio/tdd# **tx-ratio X** (where X — percentage of a timeslot in a TDD frame allocated for transmitting Downlink traffic. Acceptable values: 10, 20, 30, 40, 50, 60, 70, 80, 90. By default: 50)

WB-3P-PTP5(config):/interface/wlan0/wlan/radio/tdd# **frame-length X** (where X — TDD frame duration in milliseconds. Acceptable values: 5, 10. By default: 10)

WB-3P-PTP5(config):/interface/wlan0/wlan/radio/qos# **save** (save changes)

Configuring DTIM interval

WB-3P-PTP5(config):/interface/wlan0/wlan/radio# **dtim-interval X** (where X — DTIM interval. Acceptable values: 1–255. By default: 64)

Enabling QoS and parameter changes

```
WB-3P-PTP5(config):/interface/wlan0/wlan/radio# qos
WB-3P-PTP5(config):/interface/wlan0/wlan/radio/qos# enable true (when this option is enabled, the EDCA
parameters specified in the configuration are applied. To disable it, enter false)
WB-3P-PTP5(config):/interface/wlan0/wlan/radio/qos# edca-ap (configuring device QoS parameters (traffic is
transmitted towards the client device))
WB-3P-PTP5(config):/interface/wlan0/wlan/radio/qos/edca-ap# bk (configuring EDCA parameters for low-
priority queue (802.1p priorities: cs1, cs2))
WB-3P-PTP5(config):/interface/wlan0/wlan/radio/qos/edca-ap/bk# aifs X (where X — waiting time for frames of
data, measured in slots. Acceptable values: 1–255)
WB-3P-PTP5(config):/interface/wlan0/wlan/radio/qos/edca-ap/bk# cwmin X (where X — initial timeout value
before resending a frame, specified in milliseconds. Acceptable values: 1, 3, 7, 15, 31, 63, 127, 255, 511, 1023. The
cwMin value cannot exceed the cwMax value)
WB-3P-PTP5(config):/interface/wlan0/wlan/radio/qos/edca-ap/bk# cwmax X (where X — maximum timeout
value before resending a frame, specified in milliseconds. Acceptable values: 1, 3, 7, 15, 31, 63, 127, 255, 511,
1023. The cwMax value should be greater than the cwMin value)
WB-3P-PTP5(config):/interface/wlan0/wlan/radio/qos/edca-ap/bk# txop X (where X — time interval, in
milliseconds, during which a WME station is allowed to initiate data transmission over wireless medium to the
device. Maximum value is 65535 milliseconds)
WB-3P-PTP5(config):/interface/wlan0/wlan/radio/qos/edca-ap/bk# exit
WB-3P-PTP5(config):/interface/wlan0/wlan/radio/qos/edca-ap# exit
WB-3P-PTP5(config):/interface/wlan0/wlan/radio/qos# edca-sta (configuring QoS parameters of a client device
(traffic is transmitted from a client device))
WB-3P-PTP5(config):/interface/wlan0/wlan/radio/qos# save (save changes)
```

The configuration method of **edca-sta** is the same as that of **edca-ap**.

Parameters configuration for queues **be**, **vi**, **vo** is similar to parameters configuration for queue **bk**.

Enabling active scanning

```
WB-3P-PTP5(config):/interface/wlan0/wlan/radio# force-passive-scan false (enable active scanning mode. To
disable, enter true. By default: true)
```

✗ After enabling active scanning, the client device starts sending Probe Request packets to all available channels to search for a network. This may create additional load on the air.

12.4 Configuring DHCP option 82

DHCP snooping operating modes:

- **ignore** – option 82 processing is disabled. Default value;
- **replace** – device substitutes or replaces the value of option 82;
- **remove** – device removes the value of option 82.

Changing the DHCP Option 82 Operation Mode

```
WB-3P-PTP5(root):/# configure
WB-3P-PTP5(config):/# interface
WB-3P-PTP5(config):/interface# wlan0
WB-3P-PTP5(config):/interface/wlan0# common
WB-3P-PTP5(config):/interface/wlan0/common# dhcp-snooping
WB-3P-PTP5(config):/interface/wlan0/common/dhcp-snooping# dhcp-snooping-mode replace (selection of
DHCP snooping operation in the mode of replacement or substitution of option 82)
WB-3P-PTP5(config):/interface/wlan0/common/dhcp-snooping# save (save changes)
```

If on the radio interface, the 82 option processing policy is configured to **replace**, the following parameters become available for configuration:

Configuring Option 82 parameters

```
WB-3P-PTP5(config):/interface/wlan0/common/dhcp-snooping# dhcp-option-82-CID-format custom (where
custom — replacement of the CID content with the value specified in the dhcp-option-82-customCID
parameter. The parameter can take values: APMAC-SSID — replacement of the CID content with <MAC address
of the device>-<SSID name>. SSID — replacement of the CID content with SSID name. By default: APMAC-SSID)
WB-3P-PTP5(config):/interface/wlan0/common/dhcp-snooping# dhcp-option-82-RID-format custom (where
custom — replacement of the RID content with the value specified in the dhcp-option-82-custom-RID
parameter. The parameter can take values: ClientMAC — replacement of the RID content with MAC address of
the client device. APMAC — replacement of the RID content with MAC address of the device. APdomain —
replacement of the RID content with the domain where the device is located. By default: ClientMAC)
WB-3P-PTP5(config):/interface/wlan0/common/dhcp-snooping# dhcp-option-82-custom-CID longstring
(where longstring — value from 1 to 52 characters, which will be transmitted in CID. If the value of dhcp-
option-82-custom-CID parameter is not defined, the device will change the CID to the default value: <MAC
address of the device>-<SSID name>)
WB-3P-PTP5(config):/interface/wlan0/common/dhcp-snooping# dhcp-option-82-custom-RID longstring
(where longstring — value from 1 to 63 characters, which will be transmitted in RID. If the value of dhcp-
option-82-custom-RID parameter is not defined, the device will change the RID to the default value: <MAC
address of the client device>)
WB-3P-PTP5(config):/interface/wlan0/common/dhcp-snooping# dhcp-option-82-MAC-format radius (selecting
octet delimiter of the MAC address which is transmitted in RID and CID. radius — a dash is used as a delimiter:
AA-BB-CC-DD-EE-FF; default — a colon is used as a delimiter: AA:BB:CC:DD:EE:FF)
WB-3P-PTP5(config):/interface/wlan0/common/dhcp-snooping# save (save changes)
```

12.5 Configuring wireless network

Table 6 — Commands for configuring device operating mode

Device	Operating mode	Command to set operating mode
Access point (AP)	Access point PTP	mode ap-ptp
Access point (AP)	Access point PMP	mode ap-pmp
Client (STA)	Station	mode sta

Table 7 – Commands for configuring security mode

Security mode	Command to set the security mode
Off	mode off
WPA	mode WPA
WPA2	mode WPA2
WPA/WPA2	mode WPA_WPA2
WPA3	mode WPA3
WPA2/WPA3	mode WPA2_WPA3
OWE	mode OWE
WPA-Enterprise	mode WPA_1X
WPA2-Enterprise	mode WPA2_1X
WPA/WPA2-Enterprise	mode WPA_WPA2_1X
WPA2/WPA3-Enterprise	mode WPA2_WPA3_1X
WPA3-Enterprise	mode WPA3_1X

12.5.1 Network settings for access point (AP)

Configuring access point (AP) without encryption

```
WB-3P-PTP5(root):/# configure
WB-3P-PTP5(config):/# interface
WB-3P-PTP5(config):/interface# wlan0
WB-3P-PTP5(config):/interface/wlan0# wlan
WB-3P-PTP5(config):/interface/wlan0/wlan# mode ap-ptp (select the device mode)
WB-3P-PTP5(config):/interface/wlan0/wlan# ap
WB-3P-PTP5(config):/interface/wlan0/wlan0/ap# ssid WB-3P-PTP5 (change SSID name)
WB-3P-PTP5(config):/interface/wlan0/wlan0/ap# ap-security (enter the section of security mode settings)
WB-3P-PTP5(config):/interface/wlan0/wlan0/ap/ap-security# mode off (encryption mode off — without password)
WB-3P-PTP5(config):/interface/wlan0/wlan0/ap/ap-security# save (save changes)
```

Configuring access point (AP) with OWE

```
WB-3P-PTP5(root):/# configure
WB-3P-PTP5(config):/# interface
WB-3P-PTP5(config):/interface# wlan0
WB-3P-PTP5(config):/interface/wlan0# wlan
WB-3P-PTP5(config):/interface/wlan0/wlan# mode ap-ptp (select the device mode)
WB-3P-PTP5(config):/interface/wlan0/wlan# ap
WB-3P-PTP5(config):/interface/wlan0/wlan0/ap# ssid WB-3P-PTP5 (change SSID name)
WB-3P-PTP5(config):/interface/wlan0/wlan0/ap# ap-security (enter the section of security mode settings)
WB-3P-PTP5(config):/interface/wlan0/wlan0/ap/ap-security# mode OWE (encryption mode OWE — encrypted connection without entering a password. Only Wi-Fi 6 clients will be able to connect in this mode)
WB-3P-PTP5(config):/interface/wlan0/wlan0/ap/ap-security# exit
WB-3P-PTP5(config):/interface/wlan0/wlan0/ap# save (save changes)
```

Configuring access point (AP) with WPA-Personal

```
WB-3P-PTP5(root):/# configure
WB-3P-PTP5(config):/# interface
WB-3P-PTP5(config):/interface# wlan0
WB-3P-PTP5(config):/interface/wlan0# wlan
WB-3P-PTP5(config):/interface/wlan0/wlan# mode ap-ptp (select the device mode)
WB-3P-PTP5(config):/interface/wlan0/wlan# ap
WB-3P-PTP5(config):/interface/wlan0/wlan0/ap# ssid WB-3P-PTP5 (change SSID name)
WB-3P-PTP5(config):/interface/wlan0/wlan0/ap# ap-security (enter the section of security mode settings)
WB-3P-PTP5(config):/interface/wlan0/wlan0/ap/ap-security# mode WPA3 (encryption mode — WPA3)
WB-3P-PTP5(config):/interface/wlan0/wlan0/ap/ap# key-wpa password123 (where password123 — key/password required to connect to the wireless network. The key should be between 8 and 63 characters long)
WB-3P-PTP5(config):/interface/wlan0/wlan0/ap# save (save changes)
```

Configuring access point (AP) with Enterprise authorization

```
WB-3P-PTP5(root):/# configure
WB-3P-PTP5(config):/# interface
WB-3P-PTP5(config):/interface# wlan0
WB-3P-PTP5(config):/interface/wlan0# wlan
WB-3P-PTP5(config):/interface/wlan0/wlan# mode ap-ptp (select the device mode)
WB-3P-PTP5(config):/interface/wlan0/wlan# ap
WB-3P-PTP5(config):/interface/wlan0/wlan0/ap# ssid WB-3P-PTP5 (change SSID name)
WB-3P-PTP5(config):/interface/wlan0/wlan0/ap# ap-security (enter the section of security mode settings)
WB-3P-PTP5(config):/interface/wlan0/wlan0/ap/ap-security# mode WPA3_1X (encryption mode — WPA3-Enterprise)
WB-3P-PTP5(config):/interface/wlan0/wlan0/ap/ap-security# exit
WB-3P-PTP5(config):/interface/wlan0/wlan0/ap# radius
WB-3P-PTP5(config):/interface/wlan0/wlan0/ap/radius# domain root (where root — user domain)
WB-3P-PTP5(config):/interface/wlan0/wlan0/ap/radius# auth-address X.X.X.X (where X.X.X.X — IP address of RADIUS server)
WB-3P-PTP5(config):/interface/wlan0/wlan0/ap/radius# auth-port X (where X — port of RADIUS server, used for authentication and authorization. By default: 1812)
WB-3P-PTP5(config):/interface/wlan0/wlan0/ap/radius# auth-password secret (where secret — password of RADIUS server, used for authentication and authorization)
WB-3P-PTP5(config):/interface/wlan0/wlan0/ap/radius# acct-enable true (enable sending "Accounting" messages to the RADIUS server. By default: false)
WB-3P-PTP5(config):/interface/wlan0/wlan0/ap/radius# acct-address X.X.X.X (where X.X.X.X — IP address of RADIUS server, used for accounting)
WB-3P-PTP5(config):/interface/wlan0/wlan0/ap/radius# acct-password secret (where secret — password of RADIUS server, used for accounting)
WB-3P-PTP5(config):/interface/wlan0/wlan0/ap/radius# acct-periodic true (enable periodic sending of "Accounting" messages to the RADIUS server. By default: false)
WB-3P-PTP5(config):/interface/wlan0/wlan0/ap/radius# acct-interval 600 (interval for sending "Accounting" messages to the RADIUS server)
WB-3P-PTP5(config):/interface/wlan0/wlan0/ap/radius# save (save changes)
```

12.5.2 Advanced settings for access point (AP)

Assigning VLAN-ID

```
WB-3P-PTP5(config):/interface/wlan0/wlan/ap# vlan-id X (where X — VLAN-ID number)
```

Enabling VLAN trunk

```
WB-3P-PTP5(config):/interface/wlan0/wlan/ap# vlan-trunk true (enable VLAN Trunk. To disable, enter false)
```

Enabling General VLAN

```
WB-3P-PTP5(config):/interface/wlan0/wlan/ap# general-vlan-mode true (enable General VLAN on SSID. To disable, enter false)
WB-3P-PTP5(config):/interface/wlan0/wlan/ap# general-vlan-id X (where X — General VLAN number)
```

Selecting prioritization method

WB-3P-PTP5(config):/interface/wlan0/wlan/ap# **priority-by-dscp false** (priority analysis from CoS field (Class of Service) of the tagged packets. Default value: true. In this case, the priority from DSCP header field of the IP packet is analyzed)

Enabling hidden SSID

WB-3P-PTP5(config):/interface/wlan0/wlan/ap# **hidden true** (enable hidden SSID. To disable, enter **false**)

Enabling Minimal Signal and Roaming Signal

WB-3P-PTP5(config):/interface/wlan0/wlan/ap# **check-signal-enable true** (enable Minimal Signal. To disable, enter **false**)

WB-3P-PTP5(config):/interface/wlan0/wlan/ap# **min-signal X** (where X — RSSI threshold value, when reached, the client devices will be disconnected from the wireless network. The parameter can take values from -100 to -1)

WB-3P-PTP5(config):/interface/wlan0/wlan/ap# **check-signal-timeout X** (where X — time period in seconds, after which the decision is made to disconnect the client devices from the wireless network)

WB-3P-PTP5(config):/interface/wlan0/wlan/ap# **roaming-signal X** (where X — RSSI threshold value, when reached, the client devices are switched to another device. The parameter can take values from -100 to -1. The roaming-signal parameter should be lower than min-signal, if min-signal= -75 dBm, then roaming-signal should be equal to -70 dBm, for example)

WB-3P-PTP5(config):/interface/wlan0/wlan/ap# **save** (save changes)

Configuring data rate limit for the whole radio interface

Configuring the shaper in the direction from client (STA) to access point (AP):

WB-3P-PTP5(config):/interface/wlan0/wlan/ap# **shaper-per-vap-rx**

WB-3P-PTP5(config):/interface/wlan0/wlan/ap/shaper-per-vap-rx# **value X** (where X — maximum rate in kbps or packets/s)

WB-3P-PTP5(config):/interface/wlan0/wlan/ap/shaper-per-vap-rx# **mode kbps** (enable shaper. Acceptable values: **kbps** — kilobits per second, **pps** — packets per second, **off** — disabled)

WB-3P-PTP5(config):/interface/wlan0/wlan/ap/shaper-per-vap-rx# **exit**

WB-3P-PTP5(config):/interface/wlan0/wlan/ap# **save** (save changes)

Configuring the shaper in the direction from access point (AP) to client (STA):

WB-3P-PTP5(config):/interface/wlan0/wlan/ap# **shaper-per-vap-tx**

WB-3P-PTP5(config):/interface/wlan0/wlan/ap/shaper-per-vap-tx# **value X** (where X — maximum rate in kbps or packets/s)

WB-3P-PTP5(config):/interface/wlan0/wlan/ap/shaper-per-vap-tx# **mode kbps** (enable shaper. Acceptable values: **kbps** — kilobits per second, **pps** — packets per second, **off** — disabled)

WB-3P-PTP5(config):/interface/wlan0/wlan/ap/shaper-per-vap-tx# **exit**

WB-3P-PTP5(config):/interface/wlan0/wlan/ap# **save** (save changes)

Configuring data rate limit for each client (STA)

Configuring the shaper in the direction from client (STA) to access point (AP):

WB-3P-PTP5(config):/interface/wlan0/wlan/ap# **shaper-per-sta-rx**

WB-3P-PTP5(config):/interface/wlan0/wlan/ap/shaper-per-sta-rx# **value X** (where X — maximum rate in kbps or packets/s)

WB-3P-PTP5(config):/interface/wlan0/wlan/ap/shaper-per-sta-rx# **mode kbps** (enable shaper. Acceptable values: **kbps** — kilobits per second, **pps** — packets per second, **off** — disabled. Available only in device mode **ap-pmp**)

WB-3P-PTP5(config):/interface/wlan0/wlan/ap/shaper-per-sta-rx# **exit**

WB-3P-PTP5(config):/interface/wlan0/wlan/ap# **save** (save changes)

Configuring the shaper in the direction from access point (AP) to client (STA):

WB-3P-PTP5(config):/interface/wlan0/wlan/ap# **shaper-per-sta-tx**

WB-3P-PTP5(config):/interface/wlan0/wlan/ap/shaper-per-sta-tx# **value X** (where X — maximum rate in kbps or packets/s)

WB-3P-PTP5(config):/interface/wlan0/wlan/ap/shaper-per-sta-tx# **mode kbps** (enable shaper. Acceptable values: **kbps** — kilobits per second, **pps** — packets per second, **off** — disabled. Available only in device mode **ap-pmp**)

WB-3P-PTP5(config):/interface/wlan0/wlan/ap/shaper-per-sta-tx# **exit**

WB-3P-PTP5(config):/interface/wlan0/wlan/ap# **save** (save changes)

Configuring broadcast traffic limit

Configuring the shaper in the direction from client (STA) to access point (AP):

WB-3P-PTP5(config):/interface/wlan0/wlan/ap# **shaper-bcast-rx**

WB-3P-PTP5(config):/interface/wlan0/wlan/ap/shaper-bcast-rx# **value X** (where X — maximum rate in kbps or packets/s)

WB-3P-PTP5(config):/interface/wlan0/wlan/ap/shaper-bcast-rx# **mode kbps** (enable shaper. Acceptable values: **kbps** — kilobits per second, **pps** — packets per second, **off** — disabled)

WB-3P-PTP5(config):/interface/wlan0/wlan/ap/shaper-bcast-rx# **exit**

WB-3P-PTP5(config):/interface/wlan0/wlan/ap# **save** (save changes)

Configuring the shaper in the direction from access point (AP) to client (STA):

WB-3P-PTP5(config):/interface/wlan0/wlan/ap# **shaper-bcast-tx**

WB-3P-PTP5(config):/interface/wlan0/wlan/ap/shaper-bcast-tx# **value X** (where X — maximum rate in kbps or packets/s)

WB-3P-PTP5(config):/interface/wlan0/wlan/ap/shaper-bcast-tx# **mode kbps** (enable shaper. Acceptable values: **kbps** — kilobits per second, **pps** — packets per second, **off** — disabled)

WB-3P-PTP5(config):/interface/wlan0/wlan/ap/shaper-bcast-tx# **exit**

WB-3P-PTP5(config):/interface/wlan0/wlan/ap# **save** (save changes)

Configuring multicast traffic limit

Configuring the shaper in the direction from access point (AP) to client (STA):

```
WB-3P-PTP5(config):/interface/wlan0/wlan/ap# shaper-mcast-tx
WB-3P-PTP5(config):/interface/wlan0/wlan/ap/shaper-mcast-tx# value X (where X — maximum rate in kbps or packets/s)
WB-3P-PTP5(config):/interface/wlan0/wlan/ap/shaper-mcast-tx# mode kbps (enable shaper. Acceptable values: kbps — kilobits per second, pps — packets per second, off — disabled)
WB-3P-PTP5(config):/interface/wlan0/wlan/ap/shaper-mcast-tx# exit
WB-3P-PTP5(config):/interface/wlan0/wlan/ap# save (save changes)
```

Configuring unknown traffic limit

Configuring the shaper in the direction from access point (AP) to client (STA):

```
WB-3P-PTP5(config):/interface/wlan0/wlan/ap# shaper-unknown-ucast-tx
WB-3P-PTP5(config):/interface/wlan0/wlan/ap/shaper-unknown-ucast-tx:# value X (where X — maximum rate in kbps or packets/s)
WB-3P-PTP5(config):/interface/wlan0/wlan/ap/shaper-unknown-ucast-tx:# mode kbps (enable shaper. Acceptable values: kbps — kilobits per second, pps — packets per second, off — disabled)
WB-3P-PTP5(config):/interface/wlan0/wlan/ap/shaper-unknown-ucast-tx:# exit
WB-3P-PTP5(config):/interface/wlan0/wlan/ap# save (save changes)
```

Configuring STA limit

```
WB-3P-PTP5(config):/interface/wlan0/wlan/ap# sta-limit X (where X — maximum number of client devices allowed to connect to the wireless network. Available only in ap-pmp device mode)
```

Enabling STA isolation

```
WB-3P-PTP5(config):/interface/wlan0/wlan/ap# station-isolation true (enable traffic isolation between connected devices. To disable, enter false. Available only in ap-pmp device mode)
```

Configuring MAC access control

```
WB-3P-PTP5(config):/interface/wlan0/wlan/ap# acl
WB-3P-PTP5(config):/interface/wlan0/wlan/ap/acl# mac
WB-3P-PTP5(config):/interface/wlan0/wlan/ap/acl/mac# add XX:XX:XX:XX:XX:XX (where XX:XX:XX:XX:XX:XX — MAC address of the device, to which it is required to allow/deny access. To remove an address from the list, use the del command)
WB-3P-PTP5(config):/interface/wlan0/wlan/ap/acl/mac# exit
WB-3P-PTP5(config):/interface/wlan0/wlan/ap/acl# policy allow (policy selection. Acceptable values: allow — allow connections only for devices with MAC addresses included in the list; deny — deny connections for devices with MAC addresses included in the list. By default: deny)
WB-3P-PTP5(config):/interface/wlan0/wlan/ap/acl# enable true (enable MAC access control. To disable, enter false)
WB-3P-PTP5(config):/interface/wlan0/wlan/ap/acl# save (save changes)
```


VLAN mapping

```
WB-3P-PTP5(config):/interface/wlan0/wlan/ap# vlan-mapping
WB-3P-PTP5(config):/interface/wlan0/wlan/ap/vlan-mapping# rule
WB-3P-PTP5(config):/interface/wlan0/wlan/ap/vlan-mapping/rule# add name1 (where name1 — name of the
mapping rule. To delete a rule, use the del command)
WB-3P-PTP5(config):/interface/wlan0/wlan/ap/vlan-mapping/rule# name1
WB-3P-PTP5(config):/interface/wlan0/wlan/ap/vlan-mapping/rule/name1# eth-vlan-id X (where X — VLAN ID in
Ethernet)
WB-3P-PTP5(config):/interface/wlan0/wlan/ap/vlan-mapping/rule/name1# eth-priority X (where X — 802.1P
priority when transmitting to Ethernet. Acceptable values: 0–7, auto. If the priority is auto or not specified in this
option, the initial will be used)
WB-3P-PTP5(config):/interface/wlan0/wlan/ap/vlan-mapping/rule/name1# wlan-vlan-id X (where X — VLAN ID
in WLAN)
WB-3P-PTP5(config):/interface/wlan0/wlan/ap/vlan-mapping/rule/name1# wlan-priority X (where X — 802.1P
priority when transmitting to WLAN. Acceptable values: 0–7, auto. If the priority is auto or not specified in this
option, the initial will be used)
WB-3P-PTP5(config):/interface/wlan0/wlan/ap/vlan-mapping/rule/name1# exit
WB-3P-PTP5(config):/interface/wlan0/wlan/ap/vlan-mapping/rule# exit
WB-3P-PTP5(config):/interface/wlan0/wlan/ap/vlan-mapping# enable true (enable vlan-mapping. To disable,
enter false)
WB-3P-PTP5(config):/interface/wlan0/wlan/ap/vlan-mapping# save (save changes)
```

- ✓ There is a predefined rule in the vlan-mapping configuration — default-rule. It is used to change the 802.1p priority and WMM queue of all packets whose VLAN number does not match the user-defined rules.

Configuring default-rule

```
WB-3P-PTP5(config):/interface/wlan0/wlan/ap# vlan-mapping
WB-3P-PTP5(config):/interface/wlan0/wlan/ap/vlan-mapping# default-rule
WB-3P-PTP5(config):/interface/wlan0/wlan/ap/vlan-mapping/default-rule# eth-priority X (where X — 802.1P
priority when transmitting to Ethernet. Acceptable values: 0–7, auto. If the priority is auto or not specified in this
option, the initial will be used)
WB-3P-PTP5(config):/interface/wlan0/wlan/ap/vlan-mapping/default-rule# wlan-priority X (where X — 802.1P
priority when transmitting to WLAN. Acceptable values: 0–7, auto. If the priority is auto or not specified in this
option, the initial will be used)
WB-3P-PTP5(config):/interface/wlan0/wlan/ap/vlan-mapping/default-rule# wmm-queue X (where X — WMM
queue for this rule. Acceptable values: bk, be, vi, vo, auto. If the auto queue is not specified in this option, the
DSCP priority in the packet will be analyzed)
WB-3P-PTP5(config):/interface/wlan0/wlan/ap/vlan-mapping/default-rule# enable true (enable default-rule. To
disable, enter false)
WB-3P-PTP5(config):/interface/wlan0/wlan/ap/vlan-mapping/default-rule# save (save changes)
```

MAC address prioritization

Configuring a rule for tagged traffic

```
WB-3P-PTP5(config):/interface/wlan0/wlan/ap# mac-priority
WB-3P-PTP5(config):/interface/wlan0/wlan/ap/mac-priority# rule
WB-3P-PTP5(config):/interface/wlan0/wlan/ap/mac-priority/rule# add name1 (where name1 — name of the
MAC prioritization rule. To delete a rule, use the del command)
WB-3P-PTP5(config):/interface/wlan0/wlan/ap/mac-priority/rule# name1
WB-3P-PTP5(config):/interface/wlan0/wlan/ap/mac-priority/rule/name1# src-mac XX:XX:XX:XX:XX:XX (where
XX:XX:XX:XX:XX:XX — MAC address of the source or the client (STA) (see the hint below for more information on
configuring MAC addresses). If the parameter is not specified or its value is an empty string, it will not be used
when checking for matches)
WB-3P-PTP5(config):/interface/wlan0/wlan/ap/mac-priority/rule/name1# dst-mac XX:XX:XX:XX:XX:XX (where
XX:XX:XX:XX:XX:XX — MAC address of the recipient or the client STA (see the hint below for more information on
configuring MAC addresses). If the parameter is not specified or its value is an empty string, it will not be used
when checking for matches)
WB-3P-PTP5(config):/interface/wlan0/wlan/ap/mac-priority/rule/name1# wlan-priority X (where X — 802.1P
priority when transmitting to WLAN. Acceptable values: 0–7, auto. If the priority is auto or not specified in this
option, the initial will be used)
WB-3P-PTP5(config):/interface/wlan0/wlan/ap/mac-priority/rule/name1# eth-priority X (where X — 802.1P
priority when transmitting to Ethernet. Acceptable values: 0–7, auto. If the priority is auto or not specified in this
option, the initial will be used)
WB-3P-PTP5(config):/interface/wlan0/wlan/ap/mac-priority/rule/name1# exit
WB-3P-PTP5(config):/interface/wlan0/wlan/ap/mac-priority/rule# exit
WB-3P-PTP5(config):/interface/wlan0/wlan/ap/mac-priority# enable true (enable mac-priority. To disable,
enter false)
WB-3P-PTP5(config):/interface/wlan0/wlan/ap/mac-priority# save (save changes)
```

Configuring a rule for untagged traffic

```
WB-3P-PTP5(config):/interface/wlan0/wlan/ap# mac-priority
WB-3P-PTP5(config):/interface/wlan0/wlan/ap/mac-priority# rule
WB-3P-PTP5(config):/interface/wlan0/wlan/ap/mac-priority/rule# add name1 (where name1 — name of the
MAC prioritization rule. To delete a rule, use the del command)
WB-3P-PTP5(config):/interface/wlan0/wlan/ap/mac-priority/rule# name1
WB-3P-PTP5(config):/interface/wlan0/wlan/ap/mac-priority/rule/name1# src-mac XX:XX:XX:XX:XX:XX (where
XX:XX:XX:XX:XX:XX — MAC address of the source or the client (STA) (see the hint below for more information on
configuring MAC addresses). If the parameter is not specified or its value is an empty string, it will not be used
when checking for matches)
WB-3P-PTP5(config):/interface/wlan0/wlan/ap/mac-priority/rule/name1# dst-mac XX:XX:XX:XX:XX:XX (where
XX:XX:XX:XX:XX:XX — MAC address of the recipient or the client STA (see the hint below for more information on
configuring MAC addresses). If the parameter is not specified or its value is an empty string, it will not be used
when checking for matches)
WB-3P-PTP5(config):/interface/wlan0/wlan/ap/mac-priority/rule/name1# wmm-queue X (where X — WMM
queue for this rule. Acceptable values: bk, be, vi, vo, auto. If the auto queue is not specified in this option, the
DSCP priority in the packet will be analyzed)
WB-3P-PTP5(config):/interface/wlan0/wlan/ap/mac-priority/rule/name1# exit
WB-3P-PTP5(config):/interface/wlan0/wlan/ap/mac-priority/rule# exit
WB-3P-PTP5(config):/interface/wlan0/wlan/ap/mac-priority# enable true (enable mac-priority. To disable,
enter false)
WB-3P-PTP5(config):/interface/wlan0/wlan/ap/mac-priority# save (save changes)
```

- ✓ For packets going from access point (AP) to client (STA), **src-mac** is the source MAC address, **dst-mac** is the MAC address of the client (STA).
For packets going from client (STA) to access point (AP), **src-mac** is the MAC address of the client (STA), **dst-mac** is the destination MAC address.

IP address prioritization

Configuring a rule for tagged traffic

```
WB-3P-PTP5(config):/interface/wlan0/wlan/ap# ip-priority
WB-3P-PTP5(config):/interface/wlan0/wlan/ap/ip-priority# rule
WB-3P-PTP5(config):/interface/wlan0/wlan/ap/ip-priority/rule# add name1 (where name1 — name of the IP
prioritization rule. To delete a rule, use the del command)
WB-3P-PTP5(config):/interface/wlan0/wlan/ap/ip-priority/rule# name1
WB-3P-PTP5(config):/interface/wlan0/wlan/ap/ip-priority/rule/name1# src-ip X.X.X.X (where X.X.X.X — IP
address of the source, if the parameter is not specified or its value is an empty string, it will not be used when
checking for matches)
WB-3P-PTP5(config):/interface/wlan0/wlan/ap/ip-priority/rule/name1# dst-ip X.X.X.X (where X.X.X.X — IP
address of the recipient, if the parameter is not specified or its value is an empty string, it will not be used when
checking for matches)
WB-3P-PTP5(config):/interface/wlan0/wlan/ap/ip-priority/rule/name1# wlan-priority X (where X — 802.1P
priority when transmitting to WLAN. Acceptable values: 0–7, auto. If the priority is auto or not specified in this
option, the initial will be used)
WB-3P-PTP5(config):/interface/wlan0/wlan/ap/ip-priority/rule/name1# eth-priority X (where X — 802.1P
priority when transmitting to Ethernet. Acceptable values: 0–7, auto. If the priority is auto or not specified in this
option, the initial will be used)
WB-3P-PTP5(config):/interface/wlan0/wlan/ap/ip-priority/rule/name1# exit
WB-3P-PTP5(config):/interface/wlan0/wlan/ap/ip-priority/rule# exit
WB-3P-PTP5(config):/interface/wlan0/wlan/ap/ip-priority# enable true (enable ip-priority. To disable,
enter false)
WB-3P-PTP5(config):/interface/wlan0/wlan/ap/ip-priority# save (save changes)
```

Configuring a rule for untagged traffic

```
WB-3P-PTP5(config):/interface/wlan0/wlan/ap# ip-priority
WB-3P-PTP5(config):/interface/wlan0/wlan/ap/ip-priority# rule
WB-3P-PTP5(config):/interface/wlan0/wlan/ap/ip-priority/rule# add name1 (where name1 — name of the IP
prioritization rule. To delete a rule, use the del command)
WB-3P-PTP5(config):/interface/wlan0/wlan/ap/ip-priority/rule# name1
WB-3P-PTP5(config):/interface/wlan0/wlan/ap/ip-priority/rule/name1# src-ip X.X.X.X (where X.X.X.X — IP
address of the source, if the parameter is not specified or its value is an empty string, it will not be used when
checking for matches)
WB-3P-PTP5(config):/interface/wlan0/wlan/ap/ip-priority/rule/name1# dst-ip X.X.X.X (where X.X.X.X — IP
address of the recipient, if the parameter is not specified or its value is an empty string, it will not be used when
checking for matches)
WB-3P-PTP5(config):/interface/wlan0/wlan/ap/ip-priority/rule/name1# wmm-queue X (where X — WMM queue
for this rule. Acceptable values: bk, be, vi, vo, auto. If the auto queue is not specified in this option, the DSCP
priority in the packet will be analyzed)
WB-3P-PTP5(config):/interface/wlan0/wlan/ap/ip-priority/rule/name1# exit
WB-3P-PTP5(config):/interface/wlan0/wlan/ap/ip-priority/rule# exit
WB-3P-PTP5(config):/interface/wlan0/wlan/ap/ip-priority# enable true (enable ip-priority. To disable,
enter false)
WB-3P-PTP5(config):/interface/wlan0/wlan/ap/ip-priority# save (save changes)
```

- ✓ If a packet matches more than one of the Vlan-Mapping, MAC-Priority, and IP-Priority rule types at the same time, the 802.1P priority assignment decision will be made based on the Priority-Order of the rule type, where 1 is the minimum priority and 100 is the maximum priority. For example, if a packet matches a Vlan-Mapping rule with Priority-Order of 1, a MAC-priority with Priority-Order of 25, and an IP-priority with Priority-Order of 80, then this packet will be assigned a priority according to the IP-Priority rule, since it has the highest Priority-Order.

Prioritization order

```
WB-3P-PTP5(config):/interface/wlan0/wlan/ap# priority-order
WB-3P-PTP5(config):/interface/wlan0/wlan/ap/priority-order# mac X (where X — priority of this rule. Acceptable values: 1–100. The highest priority is 100)
WB-3P-PTP5(config):/interface/wlan0/wlan/ap/priority-order# ip X (where X — priority of this rule. Acceptable values: 1–100. The highest priority is 100)
WB-3P-PTP5(config):/interface/wlan0/wlan/ap/priority-order# vlan X (where X — priority of this rule. Acceptable values: 1–100. The highest priority is 100)
WB-3P-PTP5(config):/interface/wlan0/wlan/ap/priority-order# save (save changes)
```

12.5.3 Network settings for client (STA)

- ✓ In **sta** device mode, multiple access point (AP) connection profiles can be configured (up to 8 profiles).

Configuring a client (STA) without encryption

```
WB-3P-PTP5(root):/# configure
WB-3P-PTP5(config):/# interface
WB-3P-PTP5(config):/interface# wlan0
WB-3P-PTP5(config):/interface/wlan0# wlan
WB-3P-PTP5(config):/interface/wlan0/wlan# mode sta (select the device mode)
WB-3P-PTP5(config):/interface/wlan0/wlan# sta
WB-3P-PTP5(config):/interface/wlan0/wlan/sta# connection-profile
WB-3P-PTP5(config):/interface/wlan0/wlan/sta/connection-profile# profile
WB-3P-PTP5(config):/interface/wlan0/wlan/sta/connection-profile/profile# add profile1 (add a new profile.
profile1 — AP connection profile name. To delete a profile, use the del command)
WB-3P-PTP5(config):/interface/wlan0/wlan/sta/connection-profile/profile# profile1
WB-3P-PTP5(config):/interface/wlan0/wlan/sta/connection-profile/profile/profile1# enable true (enable profile)
WB-3P-PTP5(config):/interface/wlan0/wlan/sta/connection-profile/profile/profile1# ssid WB-3P-PTP5 (change
SSID name )
WB-3P-PTP5(config):/interface/wlan0/wlan/sta/connection-profile/profile/profile1# security-mode
off (encryption mode off — without password)
WB-3P-PTP5(config):/interface/wlan0/wlan/sta/connection-profile/profile/profile1# priority X (where X —
profile priority. Determines the order in which profiles are used. Acceptable values: 0–7. The highest priority is 7.
When connecting a client (STA) the profile with the highest priority will be used first)
WB-3P-PTP5(config):/interface/wlan0/wlan/sta/connection-profile/profile/profile1# save (save changes)
```

Configuring a client (STA) with OWE

```
WB-3P-PTP5(root):/# configure
WB-3P-PTP5(config):/# interface
WB-3P-PTP5(config):/interface# wlan0
WB-3P-PTP5(config):/interface/wlan0# wlan
WB-3P-PTP5(config):/interface/wlan0/wlan# mode sta (select the device mode)
WB-3P-PTP5(config):/interface/wlan0/wlan# sta
WB-3P-PTP5(config):/interface/wlan0/wlan/sta# connection-profile
WB-3P-PTP5(config):/interface/wlan0/wlan/sta/connection-profile# profile
WB-3P-PTP5(config):/interface/wlan0/wlan/sta/connection-profile/profile# add profile1 (add a new profile.
profile1 — AP connection profile name. To delete a profile, use the del command)
WB-3P-PTP5(config):/interface/wlan0/wlan/sta/connection-profile/profile# profile1
WB-3P-PTP5(config):/interface/wlan0/wlan/sta/connection-profile/profile/profile1# enable true (enable profile)
WB-3P-PTP5(config):/interface/wlan0/wlan/sta/connection-profile/profile/profile1# ssid WB-3P-PTP5 (change
SSID name)
WB-3P-PTP5(config):/interface/wlan0/wlan/sta/connection-profile/profile/profile1# security-mode OWE (OWE
encryption mode — encrypted connection without entering a password. Only Wi-Fi 6 clients will be able to
connect in this mode)
WB-3P-PTP5(config):/interface/wlan0/wlan/sta/connection-profile/profile/profile1# priority X (where X —
profile priority. Determines the order in which profiles are used. Acceptable values: 0–7. The highest priority is 7.
When connecting a client (STA) the profile with the highest priority will be used first)
WB-3P-PTP5(config):/interface/wlan0/wlan/sta/connection-profile/profile/profile1# save (save changes)
```

Configuring a client (STA) with WPA-Personal

```
WB-3P-PTP5(root):/# configure
WB-3P-PTP5(config):/# interface
WB-3P-PTP5(config):/interface# wlan0
WB-3P-PTP5(config):/interface/wlan0# wlan
WB-3P-PTP5(config):/interface/wlan0/wlan# mode sta (select the device mode)
WB-3P-PTP5(config):/interface/wlan0/wlan# sta
WB-3P-PTP5(config):/interface/wlan0/wlan/sta# connection-profile
WB-3P-PTP5(config):/interface/wlan0/wlan/sta/connection-profile# profile
WB-3P-PTP5(config):/interface/wlan0/wlan/sta/connection-profile/profile# add profile1 (add a new profile.
profile1 — AP connection profile name. To delete a profile, use the del command)
WB-3P-PTP5(config):/interface/wlan0/wlan/sta/connection-profile/profile# profile1
WB-3P-PTP5(config):/interface/wlan0/wlan/sta/connection-profile/profile/profile1# enable true (enable profile)
WB-3P-PTP5(config):/interface/wlan0/wlan/sta/connection-profile/profile/profile1# ssid WB-3P-PTP5 (change
SSID name)
WB-3P-PTP5(config):/interface/wlan0/wlan/sta/connection-profile/profile/profile1# security-mode
WPA3 (encryption mode — WPA3)
WB-3P-PTP5(config):/interface/wlan0/wlan/sta/connection-profile/profile/profile1# key-
wpa password123 (where password123 — key/password required to connect to the wireless network The key
should be between 8 and 63 characters long)
WB-3P-PTP5(config):/interface/wlan0/wlan/sta/connection-profile/profile/profile1# priority X (where X —
profile priority. Determines the order in which profiles are used. Acceptable values: 0–7. The highest priority is 7.
When connecting a client (STA) the profile with the highest priority will be used first)
WB-3P-PTP5(config):/interface/wlan0/wlan/sta/connection-profile/profile/profile1# save (save changes)
```


Configuring a client (STA) with Enterprise authorization

```
WB-3P-PTP5(root):/# configure
WB-3P-PTP5(config):/# interface
WB-3P-PTP5(config):/interface# wlan0
WB-3P-PTP5(config):/interface/wlan0# wlan
WB-3P-PTP5(config):/interface/wlan0/wlan# mode sta (select the device mode)
WB-3P-PTP5(config):/interface/wlan0/wlan# sta
WB-3P-PTP5(config):/interface/wlan0/wlan/sta# connection-profile
WB-3P-PTP5(config):/interface/wlan0/wlan/sta/connection-profile# profile
WB-3P-PTP5(config):/interface/wlan0/wlan/sta/connection-profile/profile# add profile1 (add a new profile.
profile1 — AP connection profile name. To delete a profile, use the del command)
WB-3P-PTP5(config):/interface/wlan0/wlan/sta/connection-profile/profile# profile1
WB-3P-PTP5(config):/interface/wlan0/wlan/sta/connection-profile/profile/profile1# enable true (enable profile)
WB-3P-PTP5(config):/interface/wlan0/wlan/sta/connection-profile/profile/profile1# ssid WB-3P-PTP5 (change
SSID name)
WB-3P-PTP5(config):/interface/wlan0/wlan/sta/connection-profile/profile/profile1# security-mode
WPA3_1X (encryption mode — WPA3-Enterprise)
WB-3P-PTP5(config):/interface/wlan0/wlan/sta/connection-profile/profile/profile1# radius
WB-3P-PTP5(config):/interface/wlan0/wlan/sta/connection-profile/profile/profile1/
radius# username user (where user — login required for authorization on the RADIUS server)
WB-3P-PTP5(config):/interface/wlan0/wlan/sta/connection-profile/profile/profile1/
radius# password password (where password — key/password required for authorization on the RADIUS
server)
WB-3P-PTP5(config):/interface/wlan0/wlan/sta/connection-profile/profile/profile1# priority X (where X —
profile priority. Determines the order in which profiles are used. Acceptable values: 0–7. The highest priority is 7.
When connecting a client (STA) the profile with the highest priority will be used first)
WB-3P-PTP5(config):/interface/wlan0/wlan/sta/connection-profile/profile/profile1/radius# save (save changes)
```

12.5.4 Advanced settings for client (STA)

Assigning VLAN-ID

```
WB-3P-PTP5(config):/interface/wlan0/wlan/sta# vlan-id X (where X — VLAN-ID number)
```

Enabling VLAN trunk

```
WB-3P-PTP5(config):/interface/wlan0/wlan/sta# vlan-trunk true (enable VLAN Trunk. To disable, enter false)
```

Enabling General VLAN

```
WB-3P-PTP5(config):/interface/wlan0/wlan/sta# general-vlan-mode true (enable General VLAN on SSID. To
disable, enter false)
WB-3P-PTP5(config):/interface/wlan0/wlan/sta# general-vlan-id X (where X — General VLAN number)
```

Enabling MVR

```
WB-3P-PTP5(config):/interface/wlan0/wlan/sta# mvr-enable true (enable MVR. To disable, enter false)
WB-3P-PTP5(config):/interface/wlan0/wlan/sta# mvr-vlan-id X (where X — VLAN number for Multicast traffic)
WB-3P-PTP5(config):/interface/wlan0/wlan/sta# mvr-vlan-priority X (where X — 802.1p priority for IGMP
packets from Ethernet devices, connected to a client (STA). Acceptable values: 0–7)
```

Selecting prioritization method

```
WB-3P-PTP5(config):/interface/wlan0/wlan/sta# priority-by-dscp false (priority analysis from CoS field (Class of
Service) of the tagged packets. Default value: true. In this case, the priority from DSCP header field of the IP
packet is analyzed)
```

Configuring data rate limit

Configuring the shaper in the direction from client (STA) to access point (AP):

```
WB-3P-PTP5(config):/interface/wlan0/wlan/sta# shaper-tx
WB-3P-PTP5(config):/interface/wlan0/wlan/sta/shaper-tx# value X (where X — maximum rate in kbps or
packets/s)
WB-3P-PTP5(config):/interface/wlan0/wlan/sta/shaper-tx# mode kbps (enable shaper. Acceptable values: kbps
— kilobits per second, pps — packets per second, off — disabled)
WB-3P-PTP5(config):/interface/wlan0/wlan/sta/shaper-tx# exit
WB-3P-PTP5(config):/interface/wlan0/wlan/sta# save (save changes)
```

Configuring the shaper in the direction from access point (AP) to client (STA):

```
WB-3P-PTP5(config):/interface/wlan0/wlan/sta# shaper-rx
WB-3P-PTP5(config):/interface/wlan0/wlan/sta/shaper-rx# value X (where X — maximum rate in kbps or
packets/s)
WB-3P-PTP5(config):/interface/wlan0/wlan/sta/shaper-rx# mode kbps (enable shaper. Acceptable values: kbps
— kilobits per second, pps — packets per second, off — disabled)
WB-3P-PTP5(config):/interface/wlan0/wlan/sta/shaper-rx# exit
WB-3P-PTP5(config):/interface/wlan0/wlan/sta# save (save changes)
```


Configuring broadcast traffic limit

Configuring the shaper in the direction from access point (AP) to client (STA):

WB-3P-PTP5(config):/interface/wlan0/wlan/sta# **shaper-bcast-rx**

WB-3P-PTP5(config):/interface/wlan0/wlan/sta/shaper-bcast-rx# **value X** (where X — maximum rate in kbps or packets/s)

WB-3P-PTP5(config):/interface/wlan0/wlan/sta/shaper-bcast-rx# **mode kbps** (enable shaper. Acceptable values: **kbps** — kilobits per second, **pps** — packets per second, **off** — disabled)

WB-3P-PTP5(config):/interface/wlan0/wlan/sta/shaper-bcast-rx# **exit**

WB-3P-PTP5(config):/interface/wlan0/wlan/sta# **save** (save changes)

Configuring the shaper in the direction from client (STA) to access point (AP):

WB-3P-PTP5(config):/interface/wlan0/wlan/sta# **shaper-bcast-tx**

WB-3P-PTP5(config):/interface/wlan0/wlan/sta/shaper-bcast-rx# **value X** (where X — maximum rate in kbps or packets/s)

WB-3P-PTP5(config):/interface/wlan0/wlan/sta/shaper-bcast-rx# **mode kbps** (enable shaper. Acceptable values: **kbps** — kilobits per second, **pps** — packets per second, **off** — disabled)

WB-3P-PTP5(config):/interface/wlan0/wlan/sta/shaper-bcast-rx# **exit**

WB-3P-PTP5(config):/interface/wlan0/wlan/sta# **save** (save changes)

Configuring multicast traffic limit

Configuring the shaper in the direction from access point (AP) to client (STA):

WB-3P-PTP5(config):/interface/wlan0/wlan/sta# **shaper-mcast-rx**

WB-3P-PTP5(config):/interface/wlan0/wlan/sta/shaper-mcast-rx# **value X** (where X — maximum rate in kbps or packets/s)

WB-3P-PTP5(config):/interface/wlan0/wlan/sta/shaper-mcast-rx# **mode kbps** (enable shaper. Acceptable values: **kbps** — kilobits per second, **pps** — packets per second, **off** — disabled)

WB-3P-PTP5(config):/interface/wlan0/wlan/sta/shaper-mcast-rx# **exit**

WB-3P-PTP5(config):/interface/wlan0/wlan/sta# **save** (save changes)

Configuring unknown traffic limit

Configuring the shaper in the direction from client (STA) to access point (AP):

```
WB-3P-PTP5(config):/interface/wlan0/wlan/sta# shaper-unknown-ucast-tx
WB-3P-PTP5(config):/interface/wlan0/wlan/sta/shaper-unknown-ucast-tx:# value X (where X — maximum rate
in kbps or packets/s)
WB-3P-PTP5(config):/interface/wlan0/wlan/sta/shaper-unknown-ucast-tx:# mode kbps (enable shaper. To
disable, enter off)
WB-3P-PTP5(config):/interface/wlan0/wlan/sta/shaper-unknown-ucast-tx:# exit
WB-3P-PTP5(config):/interface/wlan0/wlan/sta# save (save changes)
```

Configuring the remote device is done in a similar way.

Increasing MTU on interfaces

```
WB-3P-PTP5(config):/interface# eth0
WB-3P-PTP5(config):/interface/eth0# common
WB-3P-PTP5(config):/interface/eth0/common# mtu X (where X — MTU value. Maximum value is 2400)
WB-3P-PTP5(config):/interface/eth0/common# exit
WB-3P-PTP5(config):/interface/eth0# exit
WB-3P-PTP5(config):/interface# wlan0
WB-3P-PTP5(config):/interface/wlan0# common
WB-3P-PTP5(config):/interface/wlan0/common# mtu X (where X — MTU value. Maximum value is 2400)
WB-3P-PTP5(config):/interface/wlan0/common# save (save changes)
```

VLAN mapping

```
WB-3P-PTP5(config):/interface/wlan0/wlan/sta# vlan-mapping
WB-3P-PTP5(config):/interface/wlan0/wlan/sta/vlan-mapping# rule
WB-3P-PTP5(config):/interface/wlan0/wlan/sta/vlan-mapping/rule# add name1 (where name1 — mapping rule
name. To delete a rule, use the del command)
WB-3P-PTP5(config):/interface/wlan0/wlan/sta/vlan-mapping/rule# name1
WB-3P-PTP5(config):/interface/wlan0/wlan/sta/vlan-mapping/rule/name1# eth-vlan-id X (where X — VLAN ID in
Ethernet)
WB-3P-PTP5(config):/interface/wlan0/wlan/sta/vlan-mapping/rule/name1# eth-priority X (where X — 802.1P
priority when transmitting to Ethernet. Acceptable values: 0–7, auto. If the priority is auto or not specified in this
option, the initial will be used)
WB-3P-PTP5(config):/interface/wlan0/wlan/sta/vlan-mapping/rule/name1# wlan-vlan-id X (where X — VLAN ID
in WLAN)
WB-3P-PTP5(config):/interface/wlan0/wlan/sta/vlan-mapping/rule/name1# wlan-priority X (where X — 802.1P
priority when transmitting to WLAN. Acceptable values: 0–7, auto. If the priority is auto or not specified in this
option, the initial will be used)
WB-3P-PTP5(config):/interface/wlan0/wlan/sta/vlan-mapping/rule/name1# exit
WB-3P-PTP5(config):/interface/wlan0/wlan/sta/vlan-mapping/rule# exit
WB-3P-PTP5(config):/interface/wlan0/wlan/sta/vlan-mapping# enable true (enable vlan-mapping. To disable,
enter false)
WB-3P-PTP5(config):/interface/wlan0/wlan/sta/vlan-mapping# save (save changes)
```

- ✓ There is a predefined rule in the vlan-mapping configuration — default-rule. It is used to change the 802.1p priority and WMM queue of all packets whose VLAN number does not match the user-defined rules.

Configuring default-rule

```
WB-3P-PTP5(config):/interface/wlan0/wlan/sta# vlan-mapping
WB-3P-PTP5(config):/interface/wlan0/wlan/sta/vlan-mapping# default-rule
WB-3P-PTP5(config):/interface/wlan0/wlan/sta/vlan-mapping/default-rule# eth-priority X (where X — 802.1P
priority when transmitting to Ethernet. Acceptable values: 0–7, auto. If the priority is auto or not specified in this
option, the initial will be used)
WB-3P-PTP5(config):/interface/wlan0/wlan/sta/vlan-mapping/default-rule# wlan-priority X (where X — 802.1P
priority when transmitting to WLAN. Acceptable values: 0–7, auto. If the priority is auto or not specified in this
option, the initial will be used)
WB-3P-PTP5(config):/interface/wlan0/wlan/sta/vlan-mapping/default-rule# wmm-queue X (where X — WMM
queue for this rule. Acceptable values: bk, be, vi, vo, auto. If the auto queue is not specified in this option, the
DSCP priority in the packet will be analyzed)
WB-3P-PTP5(config):/interface/wlan0/wlan/sta/vlan-mapping/default-rule# enable true (enable default-rule.
To disable, enter false)
WB-3P-PTP5(config):/interface/wlan0/wlan/sta/vlan-mapping/default-rule# save (save changes)
```

MAC address prioritization

Configuring a rule for tagged traffic

```
WB-3P-PTP5(config):/interface/wlan0/wlan/sta# mac-priority
WB-3P-PTP5(config):/interface/wlan0/wlan/sta/mac-priority# rule
WB-3P-PTP5(config):/interface/wlan0/wlan/sta/mac-priority/rule# add name1 (where name1 — name of the
MAC prioritization rule. To delete a rule, use the del command)
WB-3P-PTP5(config):/interface/wlan0/wlan/sta/mac-priority/rule# name1
WB-3P-PTP5(config):/interface/wlan0/wlan/sta/mac-priority/rule/name1# src-mac XX:XX:XX:XX:XX:XX (where
XX:XX:XX:XX:XX:XX — MAC address of the source or access point (AP) (see the hint below for more information on
configuring MAC addresses). If the parameter is not specified or its value is an empty string, it will not be used
when checking for matches)
WB-3P-PTP5(config):/interface/wlan0/wlan/sta/mac-priority/rule/name1# dst-mac XX:XX:XX:XX:XX:XX (where
XX:XX:XX:XX:XX:XX — MAC address of the recipient or access point (AP) (see the hint below for more information
on configuring MAC addresses). If the parameter is not specified or its value is an empty string, it will not be used
when checking for matches)
WB-3P-PTP5(config):/interface/wlan0/wlan/sta/mac-priority/rule/name1# wlan-priority X (where X — 802.1P
priority when transmitting to WLAN. Acceptable values: 0–7, auto. If the priority is auto or not specified in this
option, the initial will be used)
WB-3P-PTP5(config):/interface/wlan0/wlan/sta/mac-priority/rule/name1# eth-priority X (where X — 802.1P
priority when transmitting to Ethernet. Acceptable values: 0–7, auto. If the priority is auto or not specified in this
option, the initial will be used)
WB-3P-PTP5(config):/interface/wlan0/wlan/sta/mac-priority/rule/name1# exit
WB-3P-PTP5(config):/interface/wlan0/wlan/sta/mac-priority/rule# exit
WB-3P-PTP5(config):/interface/wlan0/wlan/sta/mac-priority# enable true (enable mac-priority. To disable,
enter false)
WB-3P-PTP5(config):/interface/wlan0/wlan/sta/mac-priority# save (save changes)
```

Configuring a rule for untagged traffic

```
WB-3P-PTP5(config):/interface/wlan0/wlan/sta# mac-priority
WB-3P-PTP5(config):/interface/wlan0/wlan/sta/mac-priority# rule
WB-3P-PTP5(config):/interface/wlan0/wlan/sta/mac-priority/rule# add name1 (where name1 — name of the
MAC prioritization rule. To delete a rule, use the del command)
WB-3P-PTP5(config):/interface/wlan0/wlan/sta/mac-priority/rule# name1
WB-3P-PTP5(config):/interface/wlan0/wlan/sta/mac-priority/rule/name1# src-mac XX:XX:XX:XX:XX:XX (where
XX:XX:XX:XX:XX:XX — MAC address of the source or access point (AP) (see the hint below for more information on
configuring MAC addresses). If the parameter is not specified or its value is an empty string, it will not be used
when checking for matches)
WB-3P-PTP5(config):/interface/wlan0/wlan/sta/mac-priority/rule/name1# dst-mac XX:XX:XX:XX:XX:XX (where
XX:XX:XX:XX:XX:XX — MAC address of the recipient or access point (AP) (see the hint below for more information
on configuring MAC addresses). If the parameter is not specified or its value is an empty string, it will not be used
when checking for matches)
WB-3P-PTP5(config):/interface/wlan0/wlan/sta/mac-priority/rule/name1# wmm-queue X (where X — WMM
queue for this rule. Acceptable values: bk, be, vi, vo, auto. If the auto queue is not specified in this option, the
DSCP priority in the packet will be analyzed)
WB-3P-PTP5(config):/interface/wlan0/wlan/sta/mac-priority/rule/name1# exit
WB-3P-PTP5(config):/interface/wlan0/wlan/sta/mac-priority/rule# exit
WB-3P-PTP5(config):/interface/wlan0/wlan/sta/mac-priority# enable true (enable mac-priority. To disable,
enter false)
WB-3P-PTP5(config):/interface/wlan0/wlan/sta/mac-priority# save (save changes)
```

- ✓ For packets going from access point (AP) to client (STA), **src-mac** is the MAC address of the access point (AP), **dst-mac** is the destination MAC address.
For packets going from client (STA) to access point (AP), **src-mac** is the source MAC address, **dst-mac** is the MAC address of the access point (AP).

IP address prioritization

Configuring a rule for tagged traffic

```
WB-3P-PTP5(config):/interface/wlan0/wlan/sta# ip-priority
WB-3P-PTP5(config):/interface/wlan0/wlan/sta/ip-priority# rule
WB-3P-PTP5(config):/interface/wlan0/wlan/sta/ip-priority/rule# add name1 (where name1 — name of the IP
prioritization rule. To delete a rule, use the del command)
WB-3P-PTP5(config):/interface/wlan0/wlan/sta/ip-priority/rule# name1
WB-3P-PTP5(config):/interface/wlan0/wlan/sta/ip-priority/rule/name1# src-ip X.X.X.X (where X.X.X.X — IP
address of the source, if not specified or its value is an empty string, it will not be used when checking for
matches)
WB-3P-PTP5(config):/interface/wlan0/wlan/sta/ip-priority/rule/name1# dst-ip X.X.X.X (where X.X.X.X — IP
address of the recipient, if the parameter is not specified or its value is an empty string, it will not be used when
checking for matches)
WB-3P-PTP5(config):/interface/wlan0/wlan/sta/ip-priority/rule/name1# wlan-priority X (where X — 802.1P
priority when transmitting to WLAN. Acceptable values: 0–7, auto. If the priority is auto or not specified in this
option, the initial will be used)
WB-3P-PTP5(config):/interface/wlan0/wlan/sta/ip-priority/rule/name1# eth-priority X (where X — 802.1P
priority when transmitting to Ethernet. Acceptable values: 0–7, auto. If the priority is auto or not specified in this
option, the initial will be used)
WB-3P-PTP5(config):/interface/wlan0/wlan/sta/ip-priority/rule/name1# exit
WB-3P-PTP5(config):/interface/wlan0/wlan/sta/ip-priority/rule# exit
WB-3P-PTP5(config):/interface/wlan0/wlan/sta/ip-priority# enable true (enable ip-priority. To disable,
enter false)
WB-3P-PTP5(config):/interface/wlan0/wlan/sta/ip-priority# save (save changes)
```

Configuring a rule for untagged traffic

```
WB-3P-PTP5(config):/interface/wlan0/wlan/sta# ip-priority
WB-3P-PTP5(config):/interface/wlan0/wlan/sta/ip-priority# rule
WB-3P-PTP5(config):/interface/wlan0/wlan/sta/ip-priority/rule# add name1 (where name1 — name of the IP
prioritization rule. To delete a rule, use the del command )
WB-3P-PTP5(config):/interface/wlan0/wlan/sta/ip-priority/rule# name1
WB-3P-PTP5(config):/interface/wlan0/wlan/sta/ip-priority/rule/name1# src-ip X.X.X.X (where X.X.X.X — IP
address of the source, if not specified or its value is an empty string, it will not be used when checking for
matches)
WB-3P-PTP5(config):/interface/wlan0/wlan/sta/ip-priority/rule/name1# dst-ip X.X.X.X (where X.X.X.X — IP
address of the recipient, if the parameter is not specified or its value is an empty string, it will not be used when
checking for matches)
WB-3P-PTP5(config):/interface/wlan0/wlan/sta/ip-priority/rule/name1# wmm-queue X (where X — WMM queue
for this rule. Acceptable values: bk, be, vi, vo, auto. If the auto queue is not specified in this option, the DSCP
priority in the packet will be analyzed)
WB-3P-PTP5(config):/interface/wlan0/wlan/sta/ip-priority/rule/name1# exit
WB-3P-PTP5(config):/interface/wlan0/wlan/sta/ip-priority/rule# exit
WB-3P-PTP5(config):/interface/wlan0/wlan/sta/ip-priority# enable true (enable ip-priority. To disable, enter
false)
WB-3P-PTP5(config):/interface/wlan0/wlan/sta/ip-priority# save (save changes)
```

- ✓ If a packet matches more than one of the Vlan-Mapping, MAC-Priority, and IP-Priority rule types at the same time, the 802.1P priority assignment decision will be made based on the Priority-Order of the rule type, where 1 is the minimum priority and 100 is the maximum priority. For example, if a packet matches a Vlan-Mapping rule with Priority-Order of 1, a MAC-priority with Priority-Order of 25, and an IP-priority with Priority-Order of 80, then this packet will be assigned a priority according to the IP-Priority rule, since it has the highest Priority-Order.

Prioritization order

```
WB-3P-PTP5(config):/interface/wlan0/wlan/sta# priority-order
WB-3P-PTP5(config):/interface/wlan0/wlan/sta/priority-order# mac X (where X — priority of this rule. Acceptable values: 1–100. The highest priority is 100)
WB-3P-PTP5(config):/interface/wlan0/wlan/sta/priority-order# ip X (where X — priority of this rule. Acceptable values: 1–100. The highest priority is 100)
WB-3P-PTP5(config):/interface/wlan0/wlan/sta/priority-order# vlan X (where X — priority of this rule. Acceptable values: 1–100. The highest priority is 100)
WB-3P-PTP5(config):/interface/wlan0/wlan/sta/priority-order# save (save changes)
```

12.6 LoopBack Detection configuration

- ✓ This functionality can be configured only in the **sta** device mode.

- ✗ If a loop is detected on downstream equipment, the device blocks the Ethernet interface for the time specified in the configuration.

If the functionality is enabled, the the client (STA) checks for loops on downstream equipment and, if any are detected, blocks the Ethernet interface for the time specified in the device configuration. The presence of loops is checked by sending special packets to the LAN network with the destination address cf:00:00:00:00:00.

Configuring LoopBack Detection

```
WB-3P-PTP5(root):/# configure
WB-3P-PTP5(config):/# loopback-detection
WB-3P-PTP5(config):/loopback-detection# interval X (where X — time interval between sending loop detection packets)
WB-3P-PTP5(config):/loopback-detection# recovery-timer X (where X — time during which the Ethernet interface will be blocked)
WB-3P-PTP5(config):/loopback-detection# vlan-id X (where X — VLAN ID tag that will be attached to the test packets. Acceptable values: 0–4094)
WB-3P-PTP5(config):/loopback-detection# enabled true (enable LoopBack Detection. To disable, enter false)
WB-3P-PTP5(config):/loopback-detection# save (save changes)
```


12.7 BPDU filter configuration

Configuring BPDU packet filtering for wlan0 interface

```
WB-3P-PTP5(root):/# configure
WB-3P-PTP5(config):/# interface
WB-3P-PTP5(config):/interface# wlan0
WB-3P-PTP5(config):/interface/wlan0# common
WB-3P-PTP5(config):/interface/wlan0/common# bpdu-filter true (enable BPDU. To disable, enter false)
WB-3P-PTP5(config):/interface/wlan0/common# save (save changes)
```

Configuring BPDU packet filtering for eth0 interface

```
WB-3P-PTP5(root):/# configure
WB-3P-PTP5(config):/# interface
WB-3P-PTP5(config):/interface# eth0
WB-3P-PTP5(config):/interface/eth0# common
WB-3P-PTP5(config):/interface/eth0/common# bpdu-filter true (enable BPDU. To disable, enter false)
WB-3P-PTP5(config):/interface/eth0/common# save (save changes)
```

12.8 MAC address learning limiting

MAC address learning limit

```
WB-3P-PTP5(root):/# configure
WB-3P-PTP5(config):/# mac-learning
WB-3P-PTP5(config):/mac-learning# enabled true (enable MAC address learning limiting. By default: false)
WB-3P-PTP5(config):/mac-learning# mac-learning-limit X (where X — global limitation of MAC
addresses number (Wi-Fi + Ethernet). Acceptable values: 1–2048. By default: 2048, not recommended to change)
WB-3P-PTP5(config):/mac-learning# wifi-mac-learning-limit X (where X — MAC address limiting from Wi-Fi.
Acceptable values: 1–2048. By default: 2048)
WB-3P-PTP5(config):/mac-learning# eth-mac-learning-limit X (where X — MAC address limiting from Ethernet.
Acceptable values: 1–2048. By default: 2048)
WB-3P-PTP5(config):/mac-learning# drop-unknown-unicast-src true (enable the prohibition of traffic
transmission from devices MAC addresses of which have not been learned due to exceeding any limitation of
learned MAC addresses. To disable, enter false)
WB-3P-PTP5(config):/mac-learning# drop-unknown-unicast true (enable the prohibition of traffic transmission
to unlearned MAC addresses (unicast only). To disable, enter false)
WB-3P-PTP5(config):/mac-learning# save (save changes)
```

12.9 Changing the MTU size on interfaces

The remote device is configured in a similar way.

Changing MTU size on interfaces

```
WB-3P-PTP5(root):/# configure
WB-3P-PTP5(config):/# interface
WB-3P-PTP5(config):/interface# eth0
WB-3P-PTP5(config):/interface/eth0# common
WB-3P-PTP5(config):/interface/eth0/common# mtu X (where X — MTU size in bytes. Acceptable values: 68–2000.
By default: 1500)
WB-3P-PTP5(config):/interface/eth0/common# save (save changes)
```

- ✓ The MTU value on the **br0**, **nas0** interfaces is set automatically, in accordance with the value on **eth0**. The MTU value on the **wlan0** interface is fixed and equals 2000.

12.10 System settings

12.10.1 Device firmware update

Device firmware update via TFTP

```
WB-3P-PTP5(root):/# firmware upload tftp <IP address of TFTP server><Firmware file name> (example:
firmware upload tftp 192.168.1.15 WB-3P-PTP5-2.4.1_build_X.tar.gz)
WB-3P-PTP5(root):/# firmware upgrade
```

Device firmware update via HTTP

```
WB-3P-PTP5(root):/# firmware upload http <URL for firmware uploading> (example: firmware upload https://
eltex-co.ru/upload/iblock/c41/WB-3P-PTP5-2.4.1_build_X.tar.gz)
WB-3P-PTP5(root):/# firmware upgrade
```

Switching to the firmware backup

```
WB-3P-PTP5(root):/# firmware switch
```

12.10.2 Device configuration management

Restoring the default configuration without saving the access parameters

```
WB-3P-PTP5(root):/# manage-config reset-to-default
```


Restoring the default configuration with saving the access parameters

```
WB-3P-PTP5(root):/# manage-config reset-to-default-without-management
```

Download the device configuration file to TFTP server

```
WB-3P-PTP5(root):/# manage-config download tftp <IP address of TFTP server> (example: manage-config download tftp 192.168.1.15)
```

Download the device configuration file to the server/PC via scp

```
scp <User>@<IP address of the device>:/etc/config/config.json config.json (example: scp admin@192.168.1.15:/etc/config/config.json config.json. This command is executed on the server/PC)
```

Upload configuration file from TFTP server to the device

```
WB-3P-PTP5(root):/# manage-config upload tftp <IP address of TFTP server> <Firmware file name>  
(example: manage-config upload tftp 192.168.1.15 config.json)  
WB-3P-PTP5(root):/# manage-config apply (apply configuration)
```

12.10.3 Ping watchdog

The availability control feature (ping watchdog) allows one to detect a loss of network connectivity and reboot the device or its interfaces without user intervention. When an interface restarts, the DHCP client on the current WAN interface also restarts.

Configuring ping watchdog

```
WB-3P-PTP5(config):/ping-watchdog# enable true (enable ping watchdog. By default: false)
WB-3P-PTP5(config):/ping-watchdog# host X.X.X.X (where X.X.X.X — IP address of the ICMP request recipient)
WB-3P-PTP5(config):/ping-watchdog# ping-interval X (where X — time in seconds after which an ICMP request will be sent after receiving an ICMP response or deciding that the previous ICMP request failed. Acceptable values: 1–86400. By default: 300)
WB-3P-PTP5(config):/ping-watchdog# startup-delay X (where X — time in seconds after the device is turned on or previously triggered, during which the ping watchdog will not work. Acceptable values: 60–86400. By default: 300)
WB-3P-PTP5(config):/ping-watchdog# ping-timeout X (where X — time in seconds during which an ICMP response to a sent ICMP request is expected. If no ICMP response is received after the time has elapsed, the ICMP request is considered unsuccessful. Acceptable values: 1–10. By default: 1)
WB-3P-PTP5(config):/ping-watchdog# max-retry X (where X — maximum number of failed ICMP requests. If the number of failed ICMP requests reaches the specified number, the specified action is performed. Acceptable values: 1–86400. By default: 3)
WB-3P-PTP5(config):/ping-watchdog# action X (where X — action. Acceptable values: device-restart — device restart — if the specified ping server is unavailable, the device will restart; ethernet-restart — ethernet interface restart — if the specified ping server is unavailable, the device Ethernet interface will restart; wireless-restart — wireless interface restart — if the specified ping server is unavailable, the device wireless interface will restart)
WB-3P-PTP5(config):/ping-watchdog# save (save changes)
```

12.10.4 Device reboot

Command to reboot the device

```
WB-3P-PTP5(root):/# reboot
```

Delayed reboot of the device

```
WB-3P-PTP5(root):/# reboot delay X (where X — time in seconds after which the device will reboot in a delayed manner. Acceptable values: 0–86400)
```

Scheduled reboot of the device at a specific time

```
WB-3P-PTP5(root):/# reboot at hh:mm:ss (where hh:mm:ss — time at which the scheduled reboot of the device will occur. Acceptable values: hh:mm, hh:mm:ss)
```

Command to cancel a delayed device reboot

```
WB-3P-PTP5(root):/# reboot cancel
```

12.10.5 Authentication mode configuration

The device has a factory account **admin** with the password **password**. This account cannot be deleted. The password can be changed using the commands below.

Change password for admin account

```
WB-3P-PTP5(root):/# configure
WB-3P-PTP5(config):/# authentication
WB-3P-PTP5(config):/authentication# admin-password <New password for admin account>
(from 1 to 64 characters, including Latin letters and digits)
WB-3P-PTP5(config):/authentication# save (save changes)
```

It is possible to create additional users for local authentication, as well as authentication via RADIUS.

- ✔ New users should be assigned one of two roles:
 - admin** — a user with this role will have full access to configure and monitor the device;
 - viewer** — a user with this role will only have access to monitor the device.

Creating additional users is performed with the following commands:

Adding new users

```
WB-3P-PTP5(root):/# configure
WB-3P-PTP5(config):/# authentication
WB-3P-PTP5(config):/authentication# user
WB-3P-PTP5(config):/authentication/user# add userX (where userX — new account name. To delete, use the del
command)
WB-3P-PTP5(config):/authentication/user# userX
WB-3P-PTP5(config):/authentication/user/userX# login userX (where userX — new account name)
WB-3P-PTP5(config):/authentication/user/userX# password <Password for userX account> (from 1 to 64
characters, including Latin letters and digits)
WB-3P-PTP5(config):/authentication/user/userX# role admin (user is granted configuration rights. Acceptable
value: viewer — the account will only have access to monitoring)
WB-3P-PTP5(config):/authentication/user/userX# save (save changes)
```

To authenticate via RADIUS server, access parameters should be configured:

Configuring access parameters to the RADIUS server

```
WB-3P-PTP5(root):/# configure
WB-3P-PTP5(config):/# authentication
WB-3P-PTP5(config):/authentication# radius
WB-3P-PTP5(config):/authentication/radius# auth-address X.X.X.X (where X.X.X.X — IP address of the RADIUS server)
WB-3P-PTP5(config):/authentication/radius# auth-port X (where X — RADIUS server port used for authentication and authorization. By default: 1812)
WB-3P-PTP5(config):/authentication/radius# auth-password secret (where secret — key for the RADIUS server used for authentication and authorization)
WB-3P-PTP5(config):/authentication/radius# exit
WB-3P-PTP5(config):/authentication# radius-local-fallback true (enables authentication using the local admin account when there is no connection to the RADIUS server. To disable, enter false. By default: false)
WB-3P-PTP5(config):/authentication# radius-auth true (enable authentication mode via RADIUS server. To disable, enter false. By default: false)
WB-3P-PTP5(config):/authentication# save (save changes)
```

- ✓ With **radius-local-fallback** disabled, authorization occurs only via the RADIUS server. If the server is unavailable or the credentials are incorrect, authorization will fail.
With **radius-local-fallback** enabled, if there is no connection to the RADIUS server, authorization can be performed using the local **admin** account. Authorization through other local accounts will fail.

- ✓ For authentication via RADIUS server, accounts with appropriate roles are created only on the server. Accounts can be assigned the following roles:
admin — a user with this role will have full access to configuring and monitoring the device;
viewer — a user with this role will only have access to monitoring the device.
On the RADIUS server, the **Cisco-AVPair = "shell:role=<role>"** attribute is used to configure account roles (where **<role>** is either **admin** or **viewer**).

12.10.6 DHCP-snooping configuration

Commands to configure DHCP snooping

```
WB-3P-PTP5(root):/# configure
WB-3P-PTP5(config):/# dhcp-snooping
WB-3P-PTP5(config):/dhcp-snooping# enable true (enable DHCP-snooping. To disable, enter false)
WB-3P-PTP5(config):/dhcp-snooping# vlan (configuring DHCP snooping for tagged traffic)
WB-3P-PTP5(config):/dhcp-snooping/vlan# add vlan-group (where vlan-group — VLAN group name for which
DHCP snooping will work)
WB-3P-PTP5(config):/dhcp-snooping/vlan# vlan-group
WB-3P-PTP5(config):/dhcp-snooping/vlan/vlan-group# vid 'X;Y-Z' (where X — VLAN number, Y-Z — range of
VLANs that will be included in the vlan-group and for which DHCP snooping will work. Example of VLAN list
configuration: vid '10;100-110')
WB-3P-PTP5(config):/dhcp-snooping/vlan/vlan-group# exit
WB-3P-PTP5(config):/dhcp-snooping/vlan# exit
WB-3P-PTP5(config):/dhcp-snooping# untag true (enable DHCP-snooping for untagged traffic. To disable, enter
false)
WB-3P-PTP5(config):/dhcp-snooping# save (save changes)
```

✓ By default, only eth0 is considered a trusted port.

12.10.7 Configuring the date and time

Commands to configure NTP server time synchronization

```
WB-3P-PTP5(root):/# configure
WB-3P-PTP5(config):/# date-time
WB-3P-PTP5(config):/date-time# mode ntp (enable NTP operating mode. Acceptable value: manual — setting
time manually)
WB-3P-PTP5(config):/date-time# ntp
WB-3P-PTP5(config):/date-time/ntp# server <IP address of NTP server> (NTP server configuration)
WB-3P-PTP5(config):/date-time/ntp# alt-servers (configuring additional NTP servers)
WB-3P-PTP5(config):/date-time/ntp/alt-servers# add <Domain name/IP address of NTP server in the
configuration> (creating a configuration section for an additional NTP server. Maximum number: 8.
To delete, enter the del command)
WB-3P-PTP5(config):/date-time/ntp/alt-servers# exit
WB-3P-PTP5(config):/date-time/ntp# exit
WB-3P-PTP5(config):/date-time# common
WB-3P-PTP5(config):/date-time/common# timezone 'Asia/Novosibirsk (Novosibirsk)' (time zone
configuration)
WB-3P-PTP5(config):/date-time/common# save (save changes)
```

12.10.8 Advanced system settings

Changing device name

```
WB-3P-PTP5(root):/# configure
WB-3P-PTP5(config):/# system
WB-3P-PTP5(config):/system# hostname WB-3P-PTP5_2 (where WB-3P-PTP5_2 is a new device name. The
parameter can accept values from 1 to 63 characters: capital and lowercase Latin letters, digits, hyphen
character "-" (hyphen can not be the last character in name). By default: WB-3P-PTP5)
WB-3P-PTP5(config):/system# save (save changes)
```

Changing geographical domain

```
WB-3P-PTP5(root):/# configure
WB-3P-PTP5(config):/# system
WB-3P-PTP5(config):/system# ap-location ap.test.root (where ap.test.root — device tree node domain of the
management system. By default: root)
WB-3P-PTP5(config):/system# save (save changes)
```

Changing Radius NAS-ID

```
WB-3P-PTP5(root):/# configure
WB-3P-PTP5(config):/# system
WB-3P-PTP5(config):/system# nas-id Lenina_1.Novosibirsk.root (where Lenina_1.Novosibirsk.root — device
identifier. The parameter is intended to identify the device on the RADIUS server if RADIUS expects a value other
than the MAC address. By default: MAC address of the device)
WB-3P-PTP5(config):/system# save (save changes)
```

Configuring LLDP

```
WB-3P-PTP5(root):/# configure
WB-3P-PTP5(config):/# lldp
WB-3P-PTP5(config):/lldp# enabled true (enable LLDP. To disable, enter false. By default: true)
WB-3P-PTP5(config):/lldp# tx-interval X (where X — changing the period for sending LLDP messages.
Acceptable values: 1–86400. By default: 30)
WB-3P-PTP5(config):/lldp# system-name WB-3P-PTP5_reserv (where WB-3P-PTP5_reserv — new device
name. By default: WB-3P-PTP5)
WB-3P-PTP5(config):/lldp# save (save changes)
```

Configuring LEDs

```
WB-3P-PTP5(root):/# configure
WB-3P-PTP5(config):/# led-manager
WB-3P-PTP5(config):/led-manager# enabled all (enable indication. Acceptable values: all — all LEDs are on, none — all LEDs are off. By default: all)
WB-3P-PTP5(config):/led-manager# enable-rssi-threshold-override true (enable control of RSSI indicator thresholds. To disable, enter false. By default: false)
WB-3P-PTP5(config):/led-manager# led1-threshold X (where X — minimum signal level from the remote device at which the LED1 indicator turns on. Acceptable values: -100-0. By default: -100)
WB-3P-PTP5(config):/led-manager# led2-threshold X (where X — minimum signal level from the remote device at which the LED2 indicator turns on. Acceptable values: -100-0. By default: -80)
WB-3P-PTP5(config):/led-manager# led3-threshold X (where X — minimum signal level from the remote device at which the LED3 indicator turns on. Acceptable values: -100-0. By default: -70)
WB-3P-PTP5(config):/led-manager# led4-threshold X (where X — minimum signal level from the remote device at which the LED4 indicator turns on. Acceptable values: -100-0. By default: -60)
WB-3P-PTP5(config):/led-manager# save (save changes)
```

12.11 Monitoring

12.11.1 Wireless Peer/Wireless clients

12.11.1.1 Device mode ap-ntp

Displaying useful information about the wireless peer status from the access point (AP):

WB-3P-PTP5(root):/# **monitoring wireless-peer**

```

index                | 0
hw-addr              | ec:b1:e0:2d:a1:00
interface          | wlan0
band                 | 5
state                | ASSOC AUTH_SUCCESS
frequency            | 5180
distance             | 0
fbwa-mode            | ptp-sta
serial-number        | WP44000027
eltex-board-type     | WB-3P-PTP5
eltex-firmware-version | 2.4.1 build X
factory-mac          | EC:B1:E0:2D:A1:00
ssid                 | WB-3P-PTP5-test
ip-addr              | 192.168.1.15
hostname             | WB-3P-PTP5-STA
rssi-h               | -60
rssi-v               | -51
snr-h                | 35
snr-v                | 35
noise-h              | -95
noise-v              | -86
rssi-remote-h        | -60
rssi-remote-v        | -46
snr-remote-h         | 33
snr-remote-v         | 33
link-quality-remote  | 100
memory-usage-remote  | 47
cpu-usage-remote     | 2.0
noise-remote-h       | -93
noise-remote-v       | -93
tx-rate              | HE NSS2 MCS9 LGI 195
rx-rate              | HE NSS2 MCS7 LGI 146.3
tx-bw                | 20M
rx-bw                | 20M
uptime               | 00:08:48
wireless-mode         | ax
link-quality          | 96
link-quality-common   | 96
actual-tx-rate        | 3
actual-rx-rate        | 0
link-capacity         | 83

```


Displaying brief information about the wireless peer status in horizontal view from the access point (AP):

WB-3P-PTP5(root):/# **monitoring wireless-peer brief**

Hostname	IP MAC	RSSI SNR	r-RSSI r-SNR	RX rate TX rate	Uptime
WB-3P-PTP5-STA	192.168.1.15 ec:b1:e0:2d:a1:00	-61/-51 34/34	-58/-46 34/34	HE NSS2 MCS8 LGI 175.5 HE NSS2 MCS9 LGI 195	00:14:46

Displaying full information about the wireless peer status from the access point (AP):

WB-3P-PTP5(root):/# **monitoring wireless-peer detailed**

```

index                | 0
hw-addr              | ec:b1:e0:2d:a1:00
interface          | wlan0
rfid                 | -1
wid                  | -1
band                 | 5
distance             | 0
frequency            | 5180
serial-number        | WP44000027
eltex-board-type     | WB-3P-PTP5
eltex-firmware-version | 2.4.1 build X
factory-mac          | EC:B1:E0:2D:A1:00
state                | ASSOC AUTH_SUCCESS
fbwa-mode            | ptp-sta
ssid                 | WB-3P-PTP5-test
vlan-id              | 900
ip-addr              | 192.168.1.15
hostname             | WB-3P-PTP5-STA
dhcp-request-status  | requested
rx-retry-count       | 0
tx-fails             | 0
tx-period-retry      | 0
tx-retry-count       | 67
rssi-h               | -61
rssi-v               | -52
rssi                 | -61
max-rssi-h           | -54
max-rssi-v           | -46
max-rssi             | -46
snr-h                | 35
snr-v                | 35
snr                  | 35
noise-h              | -96
noise-v              | -87
noise                | -87
rssi-remote-h        | -60
rssi-remote-v        | -46
rssi-remote          | -60
snr-remote-h         | 34
snr-remote-v         | 34
snr-remote           | 34
link-quality-remote  | 100
memory-usage-remote  | 47
cpu-usage-remote     | 2.0
tx-retry-ratio-remote | 0
rx-retry-ratio-remote | 0
noise-remote-h       | -93
noise-remote-v       | -93
noise-remote         | -93
tx-rate              | HE NSS2 MCS10 LGI 219.4
tx-rate-numeric      | 219.4
rx-rate              | HE NSS2 MCS9 LGI 195

```

```

rx-rate-numeric      | 195
rx-bw-all           | 20M
tx-bw                | 20M
rx-bw                | 20M
uptime              | 00:29:48
mfp                  | true
wireless-mode        | ax
perftest-capable     | true
snr-rssi-capable     | true
link-quality         | 97
link-quality-common  | 96
tx-retry-ratio       | 0
rx-retry-ratio       | 0
actual-tx-rate       | 3
actual-rx-rate       | 0
shaped-rx-rate       | 0
actual-tx-pps        | 12
actual-rx-pps        | 0
shaped-rx-pps        | 0
link-capacity        | 86
multicast-groups-count | 1
using-802.11r        | no
using-802.11k        | no
using-802.11v        | no
twi-support          | none
name                 | 0

```

Counter	Transmitted	Received
Total Packets:	2238	54
TX success:	100	
Total Bytes:	147921	4176
Data Packets:	2202	19
Data Bytes:	145542	2425
Mgmt Packets:	36	35
Mgmt Bytes:	2379	1751
Dropped Packets:	0	0
Dropped Bytes:	0	0
Lost Packets:	0	

Rate	Transmitted	Received
nss2-mcs0	0 0%	6 31%
nss2-mcs5	0 0%	1 5%
nss2-mcs6	0 0%	2 10%
nss2-mcs7	106 4%	4 21%
nss2-mcs8	119 5%	4 21%
nss2-mcs9	994 45%	2 10%
nss2-mcs10	841 38%	0 0%
nss2-mcs11	142 6%	0 0%

Multicast groups		Clients	
MAC	IP	Count	IP
01:00:5e:00:00:6a	xxx.0.0.106	1	192.168.1.10(0)

12.11.1.2 Device mode ap-pmp

Displaying useful information about the wireless clients (STA) from the access point (AP):

WB-3P-PTP5(root):/# **monitoring clients station**

```

index                | 0
hw-addr              | ec:b1:e0:2d:a1:00
interface          | wlan0
band                 | 5
state                | ASSOC AUTH_SUCCESS
frequency            | 5180
distance             | 0
fbwa-mode            | pmp-sta
serial-number        | WP44000027
eltex-board-type     | WB-3P-PTP5
eltex-firmware-version | 2.4.1 build X
factory-mac          | EC:B1:E0:2D:A1:00
ssid                 | WB-3P-PTP5-test
ip-addr              | 192.168.1.15
hostname             | WB-3P-PTP5-STA
rssi-h               | -63
rssi-v               | -51
snr-h                | 32
snr-v                | 32
noise-h              | -95
noise-v              | -83
rssi-remote-h        | -60
rssi-remote-v        | -46
snr-remote-h         | 34
snr-remote-v         | 34
link-quality-remote  | 100
memory-usage-remote  | 47
cpu-usage-remote     | 1.0
noise-remote-h       | -93
noise-remote-v       | -93
tx-rate              | HE NSS2 MCS9 LGI 195
rx-rate              | HE NSS2 MCS9 LGI 195
tx-bw                | 20M
rx-bw                | 20M
uptime               | 00:08:48
wireless-mode         | ax
link-quality          | 97
link-quality-common   | 97
actual-tx-rate        | 3
actual-rx-rate        | 0
link-capacity         | 87

```

Displaying brief information about the wireless clients (STA) from the access point (AP) in horizontal view:

WB-3P-PTP5(root):/# **monitoring clients brief**

Hostname	IP MAC	RSSI SNR	r-RSSI r-SNR	RX rate TX rate	Uptime
WB-3P-PTP5-STA	192.168.1.15 ec:b1:e0:2d:a1:00	-64/-52 33/33	-62/-47 31/31	HE NSS2 MCS10 LGI 219.4 HE NSS2 MCS8 LGI 175.5	00:14:46

Displaying full information about the wireless clients (STA) from the access point (AP):

WB-3P-PTP5(root):/# **monitoring clients detailed**

```

index                | 0
hw-addr              | ec:b1:e0:2d:a1:00
interface          | wlan0
rfid                 | -1
wid                  | -1
band                 | 5
distance             | 0
frequency            | 5180
serial-number        | WP44000027
eltex-board-type     | WB-3P-PTP5
eltex-firmware-version | 2.4.1 build X
factory-mac          | EC:B1:E0:2D:A1:00
state                | ASSOC AUTH_SUCCESS
fbwa-mode            | pmp-sta
ssid                 | WB-3P-PTP5-test
vlan-id              | 900
ip-addr              | 192.168.1.15
hostname             | WB-3P-PTP5-STA
dhcp-request-status  | requested
rx-retry-count       | 22
tx-fails             | 0
tx-period-retry      | 0
tx-retry-count       | 552
rssi-h               | -63
rssi-v               | -52
rssi                 | -63
max-rssi-h           | -52
max-rssi-v           | -48
max-rssi              | -48
snr-h                | 34
snr-v                | 34
snr                   | 34
noise-h              | -97
noise-v              | -86
noise                 | -86
rssi-remote-h        | -58
rssi-remote-v        | -47
rssi-remote           | -58
snr-remote-h         | 35
snr-remote-v         | 35
snr-remote            | 35
link-quality-remote  | 100
memory-usage-remote  | 47
cpu-usage-remote     | 1.0
tx-retry-ratio-remote | 0
rx-retry-ratio-remote | 6
noise-remote-h       | -93
noise-remote-v       | -93
noise-remote          | -93
tx-rate               | HE NSS2 MCS10 LGI 219.4
tx-rate-numeric       | 219.4
rx-rate               | HE NSS2 MCS10 LGI 219.4

```

```

rx-rate-numeric      | 219.4
rx-bw-all           | 20M
tx-bw                | 20M
rx-bw                | 20M
uptime              | 00:29:48
mfp                 | true
wireless-mode        | ax
perftest-capable     | true
snr-rssi-capable     | true
link-quality         | 97
link-quality-common  | 97
tx-retry-ratio       | 0
rx-retry-ratio       | 0
actual-tx-rate       | 3
actual-rx-rate       | 0
shaped-rx-rate       | 0
actual-tx-pps        | 9
actual-rx-pps        | 0
shaped-rx-pps        | 0
link-capacity        | 83
multicast-groups-count | 1
using-802.11r        | no
using-802.11k        | no
using-802.11v        | no
twi-support          | none
name                 | 0

```

Counter	Transmitted	Received
Total Packets:	25705	692
TX success:	100	
Total Bytes:	1656801	39314
Data Packets:	25192	180
Data Bytes:	1637549	16589
Mgmt Packets:	513	512
Mgmt Bytes:	19252	22725
Dropped Packets:	0	0
Dropped Bytes:	0	0
Lost Packets:	0	

Rate	Transmitted		Received	
nss2-mcs0	0	0%	7	3%
nss2-mcs5	0	0%	2	1%
nss2-mcs6	1	0%	2	1%
nss2-mcs7	461	1%	9	5%
nss2-mcs8	2627	10%	27	15%
nss2-mcs9	12725	50%	66	36%
nss2-mcs10	7634	30%	54	30%
nss2-mcs11	1744	6%	13	7%

Multicast groups		Clients	
MAC	IP	Count	IP
01:00:5e:00:00:6a	xxx.0.0.106	1	192.168.1.10(0)

12.11.1.3 Device mode sta

Displaying information about the wireless peer status from the client (STA):

WB-3P-PTP5(root):/# **monitoring wireless-peer**

```

index                | 0
hw-addr              | ec:b1:e0:2d:a1:f0
interface          | wlan0
band                 | 5
state                | ASSOC AUTH_SUCCESS
frequency            | 5180
distance              | 0
fbwa-mode             | ptp-ap
serial-number        | WP44000027
eltex-board-type     | WB-3P-PTP5
eltex-firmware-version | 2.4.1 build X
factory-mac          | EC:B1:E0:2D:A1:F0
ssid                 | WB-3P-PTP5-test
ip-addr              | 192.168.1.20
hostname             | WB-3P-PTP5-AP
rssi-h               | -58
rssi-v               | -47
snr-h                | 35
snr-v                | 35
noise-h              | -93
noise-v              | -82
rssi-remote-h        | -62
rssi-remote-v        | -51
snr-remote-h         | 34
snr-remote-v         | 34
link-quality-remote  | 93
memory-usage-remote  | 49
cpu-usage-remote     | 1.0
noise-remote-h       | -93
noise-remote-v       | -93
tx-rate              | HE NSS2 MCS11 LGI 243.8
rx-rate              | HE NSS2 MCS0 LGI 14.6
tx-bw                | 20M
rx-bw                | 20M
uptime               | 00:08:48
wireless-mode         | ax
link-quality          | 100
link-quality-common   | 97
actual-tx-rate        | 0
actual-rx-rate        | 15
link-capacity         | 100

```


Displaying brief information about the wireless peer status in horizontal view from the client (STA):

WB-3P-PTP5(root):/# **monitoring wireless-peer brief**

Hostname	IP MAC	RSSI SNR	r-RSSI r-SNR	RX rate TX rate	Uptime
WB-3P-PTP5-AP	192.168.1.20 ec:b1:e0:2d:a1:f0	-56/-47 36/36	-60/-54 35/35	HE NSS2 MCS0 LGI 14.6 HE NSS2 MCS10 LGI 219.4	00:14:46

Displaying full information about the wireless peer status from the client (STA):

WB-3P-PTP5(root):/# **monitoring wireless-peer detailed**

```

index                | 0
hw-addr              | ec:b1:e0:2d:a1:f0
interface          | wlan0
rfid                 | -1
wid                  | -1
band                 | 5
distance             | 0
frequency            | 5180
serial-number        | WP44000027
eltex-board-type     | WB-3P-PTP5
eltex-firmware-version | 2.4.1 build X
factory-mac          | EC:B1:E0:2D:A1:F0
state                | ASSOC AUTH_SUCCESS
fbwa-mode            | ptp-ap
ssid                 | WB-3P-PTP5-test
vlan-id              | 900
ip-addr              | 192.168.1.20
hostname             | WB-3P-PTP5-AP
dhcp-request-status  | requested
rx-retry-count       | 439
tx-fails             | 0
tx-period-retry      | 0
tx-retry-count       | 10
rssi-h               | -59
rssi-v               | -47
rssi                 | -59
max-rssi-h           | -32
max-rssi-v           | -28
max-rssi              | -28
snr-h                | 34
snr-v                | 34
snr                   | 34
noise-h              | -93
noise-v              | -81
noise                 | -81
rssi-remote-h        | -58
rssi-remote-v        | -51
rssi-remote           | -58
snr-remote-h         | 35
snr-remote-v         | 35
snr-remote            | 35
link-quality-remote  | 97
memory-usage-remote  | 49
cpu-usage-remote     | 1.0
tx-retry-ratio-remote | 16
rx-retry-ratio-remote | 100
noise-remote-h       | -93
noise-remote-v       | -93
noise-remote          | -93
tx-rate              | HE NSS2 MCS10 LGI 219.4
tx-rate-numeric      | 219.4
rx-rate              | HE NSS2 MCS0 LGI 14.6

```

```

rx-rate-numeric      | 14.6
rx-bw-all           | 20M
tx-bw                | 20M
rx-bw                | 20M
uptime              | 00:16:02
mfp                 | true
wireless-mode        | ax
perftest-capable     | true
snr-rssi-capable     | true
link-quality         | 71
link-quality-common  | 95
tx-retry-ratio       | 0
rx-retry-ratio       | 11
actual-tx-rate       | 0
actual-rx-rate       | 7
shaped-rx-rate       | 6
actual-tx-pps        | 0
actual-rx-pps        | 9
shaped-rx-pps        | 9
link-capacity        | 91
multicast-groups-count | 0
using-802.11r        | no
using-802.11k        | no
using-802.11v        | no
twl-support          | none
name                 | 0

```

Counter	Transmitted	Received
Total Packets:	222	21795
TX success:	100	
Total Bytes:	8850	3749762
Data Packets:	93	12564
Data Bytes:	3773	1573822
Mgmt Packets:	129	9231
Mgmt Bytes:	5077	2175940
Dropped Packets:	0	0
Dropped Bytes:	0	0
Lost Packets:	0	

Rate	Transmitted	Received
nss2-mcs0	0 0%	8687 69%
nss2-mcs4	0 0%	1 0%
nss2-mcs5	0 0%	1 0%
nss2-mcs6	1 1%	3 0%
nss2-mcs7	13 13%	51 0%
nss2-mcs8	4 4%	277 2%
nss2-mcs9	8 8%	2047 16%
nss2-mcs10	37 39%	930 7%
nss2-mcs11	30 32%	567 4%

Multicast groups: none

12.11.2 Device info

WB-3P-PTP5(root):/# **monitoring information**

```

system-time           | 10:11:07 25.04.2025
uptime                | 03:31:02
hostname              | WB-3P-PTP5
software-version      | 2.4.1 build X
secondary-software-version | 2.4.1 build X
boot-version          | 2.4.1 build X
memory-usage          | 49
memory-free           | 120
memory-used           | 117
memory-total          | 237
cpu-load              | 1.2
cpu-average            | 1.22
is-default-config     | false
vendor                | Eltex
device-type           | Wireless Bridge
board-type             | WB-3P-PTP5
hw-platform           | WB-3P-PTP5
factory-wan-mac        | EC:B1:E0:xx:xx:xx
factory-lan-mac        | EC:B1:E0:xx:xx:xx
factory-serial-number  | WP5C000030
hw-revision            | 1v0
session-password-initialized | false
ott-mode              | false
last-reboot-reason     | firmware update
test-changes-mode      | false

```

12.11.3 Network information

WB-3P-PTP5(root):/# **monitoring wan-status**

Common information:

```

interface           | br0.1000
mac                   | ec:b1:e0:xx:xx:xx
vlan                  | 1000
rx-bytes               | 667443
rx-packets             | 7210
tx-bytes               | 1903365
tx-packets             | 1514

```

IPv4 information:

```

protocol              | dhcp
ip-address             | 192.168.1.15
netmask                | 255.255.255.0
gateway                | 192.168.1.1
DNS-1                  | 192.168.1.100
DNS-2                  | 8.8.8.8

```

WB-3P-PTP5(root):/# **monitoring ethernet**

```

link: up
speed: 1000
duplex: enabled
rx-bytes: 38612981
rx-packets: 519188
tx-bytes: 17381155
tx-packets: 101899

```

WB-3P-PTP5(root):/# **monitoring arp**

#	IP	MAC
0	192.168.1.1	02:00:48:xx:xx:xx
1	192.168.1.151	2c:fd:a1:xx:xx:xx

WB-3P-PTP5(root):/# **monitoring route**

Destination	Gateway	Mask	Flags	Interface
0.0.0.0	192.168.1.1	0.0.0.0	UG	br0
192.168.1.0	0.0.0.0	255.255.255.0	U	br0

WB-3P-PTP5(root):/# **monitoring lldp**

System capability legend:

B - Bridge; R - Router; W - Wlan Access Point; T - Telephone;
 D - DOCSIS Cable Device; H - Host; r - Repeater; O - Other;

Port	Device ID	Port ID	System Name	Capabilities	TTL
-----	-----	-----	-----	-----	---
eth0	50:eb:e3:xx:xx:xx	gi 0/10	PC-16487	B,W,R,H	120

12.11.4 Wireless interfaces

WB-3P-PTP5(root):/# **monitoring radio-interface**

```

name           | wlan0
rfid           | 0
status        | on
band           | 5 GHz
hwaddr        | EC:B1:E0:xx:xx:xx
tx-power       | 27 dBm
connection status | AP mode
operation mode | ap-ptp
noise-h        | -93 dBm
noise-v        | -93 dBm
channel        | 36
frequency      | 5180 MHz
bandwidth      | 20 MHz
utilization    | 32%
mode           | ax
thermal        | 51

```

12.11.5 Event log

WB-3P-PTP5(root):/# monitoring events

```

Apr 25 10:21:07 WB-3P-PTP5 daemon.info configd[171]: The AP running configuration was
updated successfully by admin
Apr 25 10:21:07 WB-3P-PTP5 daemon.info configd[171]: The AP startup configuration was
updated successfully by admin
Apr 25 10:22:01 WB-3P-PTP5 user.info monitord: start spectrum analyzer on interface 'wlan0'
Apr 25 10:22:57 WB-3P-PTP5 user.info monitord: spectrum analyzer on interface 'wlan0'
finished
Apr 25 10:23:38 WB-3P-PTP5 daemon.info scanwlan[1320]: start scan on interface 'wlan0'
Apr 25 10:26:36 WB-3P-PTP5 daemon.info scanwlan[1320]: scan on interface 'wlan0' finished
Apr 25 10:28:44 WB-3P-PTP5 daemon.info monitord[596]: event: 'authenticated' ip: 0.0.0.0
mac: EC:B1:E0:2E:68:50 ssid: 'WB-3P-PTP5' interface: wlan0 channel: 1 rssi-1: -43 rssi-2:
-31 location: 'root' auth-method: 'Personal' captive-portal: 'disabled'
Apr 25 10:35:17 WB-3P-PTP5 daemon.info monitord[596]: event: 'deauthenticated by AP' ip:
192.168.1.20 mac: EC:B1:E0:2E:68:50 ssid: 'WB-3P-PTP5' interface: wlan0 channel: 1 rssi-1:
-22 rssi-2: -19 location: 'root' reason: 4 description: 'Inactivity'

```

12.11.6 Environment scan

✖ While scanning the environment, the device radio interface will be disabled, which will make it impossible to transfer data to client devices during scanning.

WB-3P-PTP5(root):/# monitoring scan-wifi

SSID	Mode	Security	BSSID	Channel	RSSI, dBm	Bandwidth, MHz
default-wifi	AP	wpa2-1x	E0:D9:E3:48:68:20	36	-87	80
Test_WiFi_1	AP	off	68:13:E2:35:C3:99	36	-78	20
Test_WiFi_2	AP	off	E8:28:C1:E1:90:0A	36	-69	20
Test_WiFi_3	AP	off	E4:5A:D4:F0:5B:5F	36	-78	80
Test_WiFi_4	AP	wpa2	68:13:E2:0F:45:49	44	-63	40L
Test_WiFi_5	AP	off	CC:9D:A2:DF:41:6A	36	-86	20
WB-3P-PTP5	PTP	off	EC:B1:E0:2D:A1:90	36	-89	20

12.11.7 Spectrum analyzer

The spectrum analyzer provides information on channel congestion. The analysis time for all radio channels in the range is approximately 1.5 minutes.

- ✗ While the spectrum analyzer is running, client devices disconnect. The client devices will only reconnect when the spectrum analyzer has finished its work.

As a result of the spectrum analyzer operation, information about the load of each channel (in percent) will be displayed on the console:

WB-3P-PTP5(root):/# **monitoring spectrum-analyzer**

Channel	CCA
32	17%
33	1%
34	8%
35	6%
36	24%
37	9%
38	16%
39	27%
40	17%
41	12%
42	8%
43	12%
44	5%
45	10%
46	6%
47	15%
48	9%
49	8%
50	5%
51	4%

...

13 Auxiliary utilities

13.1 Perfctest utility

The perfctest utility performs a built-in radio link speed test.

Configuring perfctest

```
WB-3P-PTP5(root):/# configure
WB-3P-PTP5(config):/# perfctest
WB-3P-PTP5(config):/perfctest# server-ip X.X.X.X (where X.X.X.X is the IP address that will be assigned to the
remote device interface for testing. By default: 192.0.4.1. It is recommended to configure a subnet that is not
used on the current network)
WB-3P-PTP5(config):/perfctest# client-ip X.X.X.X (where X.X.X.X — IP address that will be assigned to the device
interface where the utility is running for testing. By default: 192.0.4.2. It is recommended to configure a subnet
that is not used on the current network)
WB-3P-PTP5(config):/perfctest# netmask X.X.X.X (where X.X.X.X — subnet mask used for the test. By default:
255.255.255.0)
WB-3P-PTP5(config):/perfctest# vlan-id X (where X — VLAN ID, used for test. By default: 7. It is recommended to
configure VLAN ID that is not used on the current network)
WB-3P-PTP5(config):/date-time/common# save (save changes)
```

The perfctest utility can be run with the following commands:

Command to run perfctest

```
perf-test station <MAC address of the remote device> downlink — run speed testing towards the remote device
(Downlink)
perf-test station <MAC address of the remote device> uplink — run speed testing from the remote device(Uplink)
perf-test station <MAC address of the remote device> bidirectional — run speed testing in both directions at the
same time (Downlink + Uplink)
```

13.2 Manage-remote utility

The manage-remote utility allows running commands from access point (AP) on client (STA).

- ✓ These commands can be executed when there is no access to the client (STA) via IP address.

13.2.1 Rebooting

For device mode **ap-ptp**:

Command to reboot a remote device

```
WB-3P-PTP5(root):/# manage-remote reboot
```

For device mode **ap-pmp**:

Command to reboot a remote device

WB-3P-PTP5(root):/# **manage-remote reboot station XX:XX:XX:XX:XX:XX** (where XX:XX:XX:XX:XX:XX — MAC address of the device to be rebooted)

13.2.2 Scanning the air

For device mode **ap-ptp**:

Command to scan the air from a remote device

WB-3P-PTP5(root):/# **manage-remote scan-wifi**

For device mode **ap-pmp**:

Command to scan the air from a remote device

WB-3P-PTP5(root):/# **manage-remote scan-wifi station XX:XX:XX:XX:XX:XX** (where XX:XX:XX:XX:XX:XX — MAC address of the device on which the air scanning will be performed)

13.2.3 Spectrum analyzer

For device mode **ap-ptp**:

Command to run on a remote device

WB-3P-PTP5(root):/# **manage-remote spectrum-analyzer**

For device mode **ap-pmp**:

Command to run on a remote device

WB-3P-PTP5(root):/# **manage-remote spectrum-analyzer station XX:XX:XX:XX:XX:XX** (where XX:XX:XX:XX:XX:XX — MAC address of the device on which the spectrum analysis will be performed)

13.3 Traceroute utility

The utility shows which nodes (routers) the packet passes through, how much time it takes to process the packet at each node.

Command to start tracing

WB-3P-PTP5(root):/# **traceroute <tested host>**

Example of useWB-3P-PTP5(root):/# **traceroute eltex-co.ru**

```

traceroute to eltex-co.ru (62.109.1.166), 30 hops max, 38 byte packets
 1 100.109.0.1 (100.109.0.1) 0.346 ms 0.233 ms 0.184 ms
 2 * 192.168.48.1 (192.168.48.1) 0.651 ms *
 3 95.167.221.129 (95.167.221.129) 0.576 ms 0.486 ms 0.410 ms
 4 b-internet.92.125.152.57.snt.ru (92.125.152.57) 1.427 ms 2.621 ms 1.604 ms

```

13.4 Tcpdump utility

The tcpdump utility allows capturing packets on the specified interface.

To get a hint on how to work with the utility use the command:

WB-3P-PTP5(config):/# **tcpdump --help**

13.4.1 Enabling traffic capture

By default, the tcpdump utility is disabled. Before using this functionality, you must run the tcpdump command. This functionality is automatically disabled after a device reboot.

Enabling tcpdumpWB-3P-PTP5(config):/# **tcpdump-enable****Disabling tcpdump**WB-3P-PTP5(config):/# **tcpdump-disable**

13.4.2 Capturing traffic from an active interface

Capturing packets from the Ethernet interface.

WB-3P-PTP5(root):/# **tcpdump -i eth0**

Capturing Ethernet interface packets and saving to file.

WB-3P-PTP5(root):/# **tcpdump -i eth0 -env -w tcpdump.pcap**

13.4.3 Environment sniffer

It is necessary to enable a special interface that captures packets from the air on the device working channel.

Commands

```
WB-3P-PTP5(root):/# configure
WB-3P-PTP5(config):/# interface
WB-3P-PTP5(config):/interface# radio0
WB-3P-PTP5(config):/interface/radioX# common
WB-3P-PTP5(config):/interface/radioX/common# enabled true
```

Capturing packets on the radio0 interface.

```
WB-3P-PTP5(root):/# tcpdump -i radio0
```

Capturing packets on the radio0 interface and saving to file.

```
WB-3P-PTP5(root):/# tcpdump -i radio0 -env -w tcpdump.pcap
```

13.4.4 Uploading a file from device to server

This command is executed on the server/PC.

```
scp <User>@<IP address of the device>:tcpdump.pcap tcpdump.pcap (example: scp admin@192.168.1.15:tcpdump.pcap tcpdump.pcap)
```

13.5 Iperf utility

This utility is used to start a traffic flow from one device to another. The sending side is called the client, the receiving side is called the server.

To get a hint on how to work with the utility use the command:

```
WB-3P-PTP5(root):/# iperf --help
```

Example of starting a traffic flow from the device to the server:

Configuring the server to receive traffic

```
root@server:/# iperf -s
```

Starting traffic from the AP-client towards the server

```
WB-3P-PTP5(root):/# iperf -c X.X.X.X (where X.X.X.X — IP address of the server)
```

13.6 Antenna alignment

Antenna alignment is the process of positioning a device antenna in space to achieve the maximum possible signal.

WB-3P-PTP5(root):/# **antenna-align**

ssid		WB-3P-PTP5
channel		32
frequency		5160
rssi-h		-77
rssi-v		-71
rssi-remote-h		-47
rssi-remote-v		-47

14 List of changes

Document version	Issue date	Revisions
Version 1.2	10.2025	Synchronization with firmware version 2.4.1 Added: 10.4 Test mode 10.12.3 Ping Watchdog submenu 10.12.5 Authentication submenu 12.10.3 Ping Watchdog 12.10.5 Authentication mode configuration 13.4.1 Enabling traffic capture 13.4.4 Uploading a file from a device to the server Changed: 12.3.1 Advanced Radio settings
Version 1.1	07.2025	Synchronization with firmware version 2.3.1 Added: 10.11.7 LEDs submenu 10.12.2 Speed Testing submenu 12.7 BPDU filter configuration 12.8 Changing the MTU size on interfaces Changed: 10.6.1 Wireless Peer/Wireless Clients submenu 10.6.3 Scan environment submenu 10.8.1 AP submenu 10.9.1 STA submenu 12.2.3 Remote management configuration 12.3 Radio settings 12.3.1 Advanced Radio settings 12.5 Wireless network settings 12.5.2 Advanced settings for AP 12.5.3 Network settings for STA 12.5.4 Advanced settings for STA 12.10.4 Device reboot 12.10.5 Authentication mode configuration 12.10.8 Advanced system settings
Version 1.0	05.2025	First issue
Firmware version 2.4.1		

TECHNICAL SUPPORT

For technical assistance in issues related to handling Eltex Ltd. equipment, please, address to Service Center of the company:

<https://eltex-co.com/support/>

You are welcome to visit Eltex official website to get the relevant technical documentation and software, to use our knowledge base or consult a Service Center Specialist.

<http://www.eltex-co.com/>

<http://www.eltex-co.com/support/downloads/>