MobiBridge-10G

WEB INTERFACE

USER MANUAL
for Web Interface of V-band 10 Gbps Radio

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Contents

DISCLAIMER TO USING MOBIBRIDGE 10G WEB INTERFACE SETTINGS

The following provisions, important to the limitation of ELVA-1's area of responsibility, apply to this document.

- This document is described the web interface of volume MobiBridge-10G products.

- ELVA-1 may, from time to time, make changes to the web interface to improve the user experience.

- ELVA-1 is not responsible for any interruption of MobiBridge-10G wireless connection caused by malfunction of the customer's local network or the Internet, which may interfere with the operation of the MobiBridge-10G.

- ELVA-1 is not responsible for any customer losses that may occur if the MobiBridge-10G wireless connection fails. This covers equipment failure and incorrect setting of operation modes using the web interface.

- Faulty MobiBridge-10G equipment will be repaired or replaced under warranty or at an additional charge by contacting ELVA-1 technical support.

RADIO LINK TERMINOLOGY

- Link – set of two radios, with wireless connection between them
- Radio – fully integrated device for wireless connection with other radio, including 10 Gigabit Ethernet port, modem and RF (radio frequency) components with built-in antenna
- Modem – part of radio, including 10 Gigabit Ethernet components, Transmitter (Tx) and Receiver (Rx) components. Modem transmits and receives data between fiber-optics cable and wireless signal from antenna with RF components.
- Transceiver – set of Transmitter (Tx) and Receiver (Rx)
- RF components – hi-tech set of millimeter wave components, that exchange data flow between modem and antenna.

WEB INTERFACE CONNECTIVITY OVERVIEW

INTRODUCTION

The MobiBridge-10G radios can be accessed by IP addresses via LAN, WAN or directly by cable from a laptop through the RJ-45 port (the radios have a graphical interface). To do this, the MobiBridge-10G must be installed at the site, powered and cables from both radios connected to the LAN on each side of the radio link.

The MobiBridge-10G radio can be accessed via the web interface. Any available web browser may be used, while Google Chrome is recommended. Desktop PCs, notebooks, tablets and smartphones are supported to get web access to MobiBridge-10G radios for either Windows, macOS/iOS and Android operating systems. Please note that the MobiBridge-10G web interface may not be adapted for the mobile device screen.

CONNECTIVITY DIAGRAM

By factory default, each MobiBridge-10G radio has IP address for web access. These IP addresses are different – the device with **even serial number** has internal IP address 192.168.127.254, while **odd serial number** - 192.168.127.253. For actual serial number of your device, check the label on the radio enclosure.
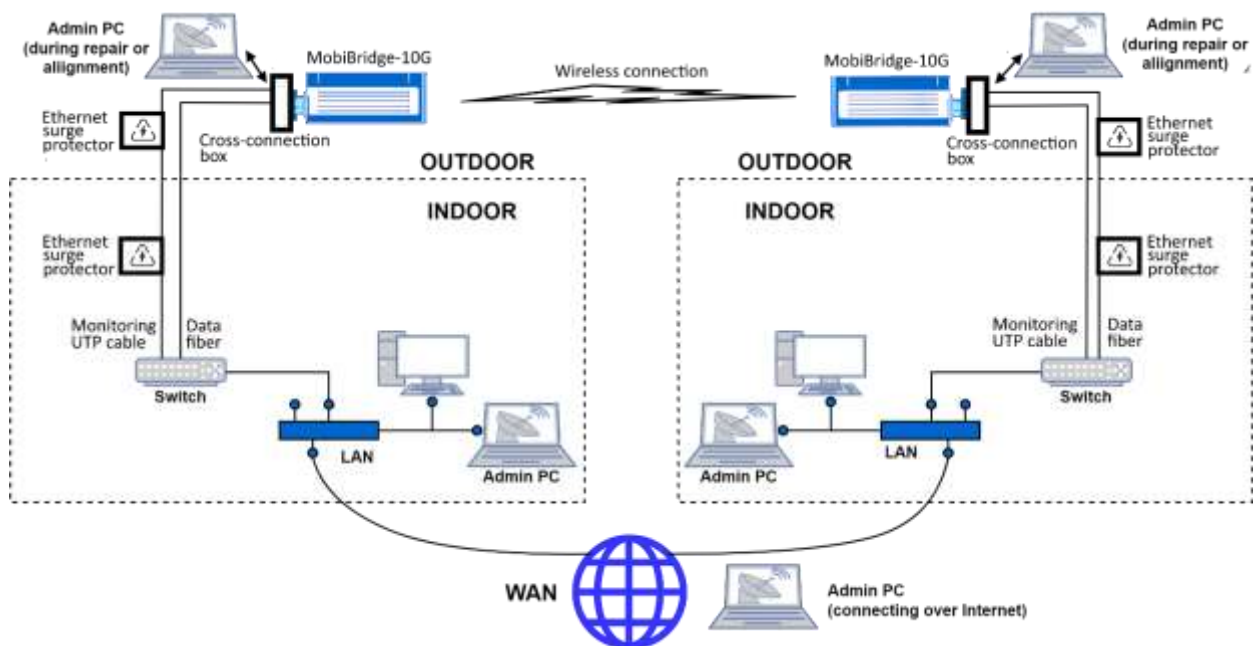

Fig.1. LAN / WAN web access connectivity to radios

The diagram shows all possible cases where a system administrator (aka Admin) can connect to each radio by its IP address in three ways:

1. Connect from Admin PC (notebook or mobile device) to the radio while are in the same LAN.

2. Connect from Admin PC (desktop, notebook or mobile device) to the radio over WAN (over the Internet). In this case both radios have to have static IP addresses accessed globally. Otherwise, Virtual Desktop technology could also be used for remote connection from Internet to a computer inside LAN, then running web browser on this computer and do all works as within LAN.

3. Directly connect from Admin PC (using PC/notebook with Ethernet port) to the radio by UTP cable with RJ-45 connectors. This way usually used only in some situations of initial installation of the link or at link repair works.

See Fig.2 below for radio's sockets identification.
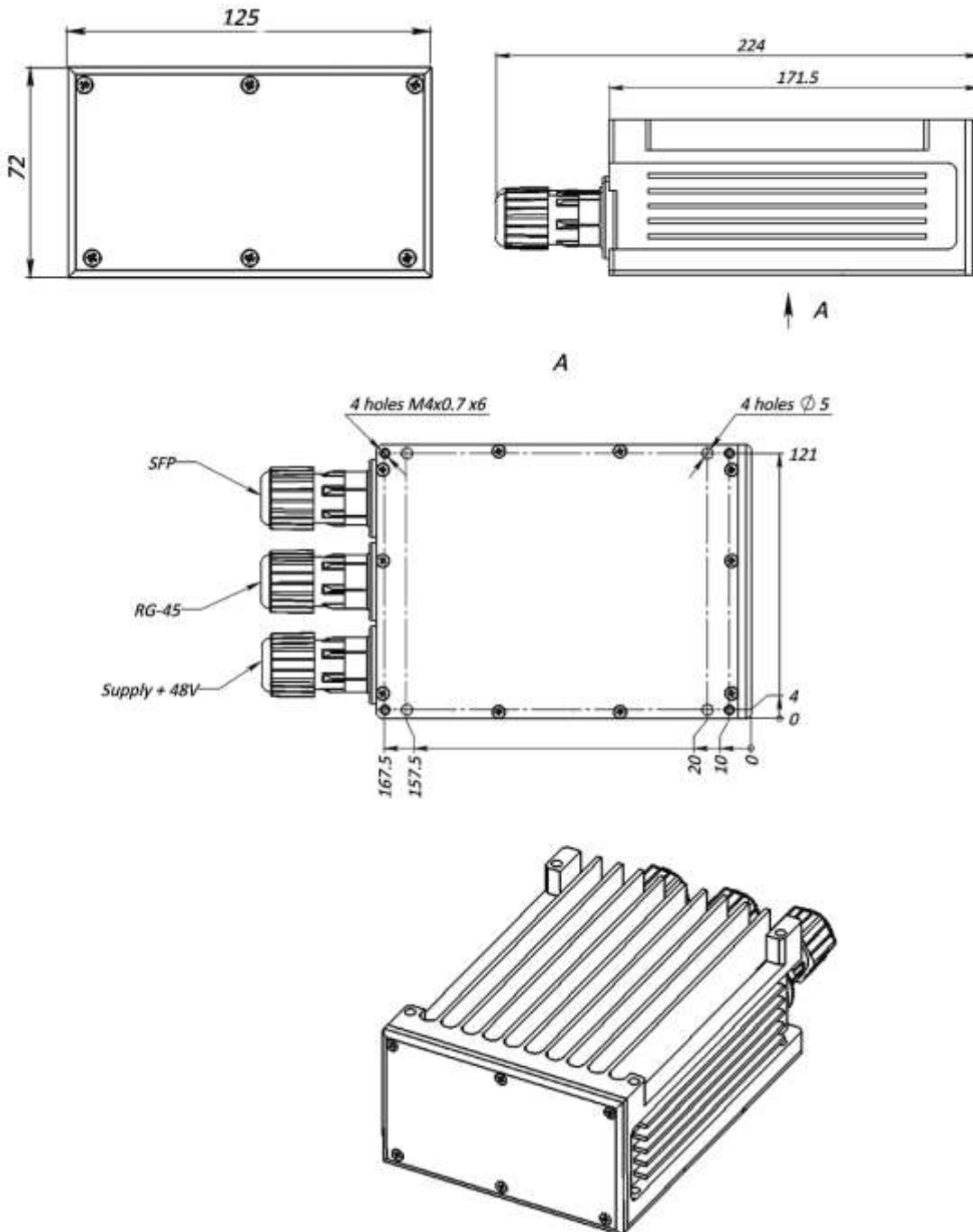
DIMENSIONAL DRAWING OF PRODUCT IN STANDARD CASE

Fig.2. MobiBridge-10G drawing

RUNNING WEB INTERFACE FOR THE FIRST TIME LOGIN

GENERAL INFORMATION

The information in this User Guide is directed to person(s) who will perform or coordinate the tasks associated with the process of installing and administering of MobiBridge-10G connection within LAN/WAN network. In general, this is system administrator or network administrator, named Admin for short.

This guide assumes that Admin has experience with and understanding of the concepts underlying wireless communications and LAN/WAN systems, as well as familiarity with configuring and operating network environment.

During the initial (first time) login and use of the Web Interface, Admin runs the following tasks^

- Switch both radios to fix throughput mode and activate link wireless data transmitting channel,
- Run wireless channel auto-setup for both radios to allow max wireless data rate,
- Switch both radios to Adaptive throughput mode (optional, valid for fixed wireless line),
- Change IP addresses for both radios from default to actual ones,
- Change Admin password for both radios from default to actual ones.

Note. Please mind that actual view of web interface might be slightly differ from described here because of its latest updateы.

WORKING WITH 1 GIGABIT ETHERNET PORTS

If the radios operate with network equipment (LAN switch, etc.) that does not have 10 GE ports (but only 1Gigabit Ethernet ports), each radio can be switched to 1 GE mode by pressing the 1G button using the WEB interface.

Click **1G** button on the screen (it will turn blue to indicate ON), then **Save** button. Repeat this procedure for the second radio.

By factory default, both radios are set to **10G** mode.

UNDERSTANDING WEB INTERFACE COLOR INDICATORS

Color light indicators are used in Web Interface to quickly inform Admin if the value of parameters is within normal limits or not.
- **Green** light means normal work / good quality of signal or this monitored parameter is ON,
- **Red** light requires Admin interruption because of the parameter malfunction, or for information that this parameter is OFF.
- **Blue** color of **Set1G** and **Set10G** buttons indicates which mode is currently ON.

FIRST LOGIN TO RADIOS

To connect to the MobiBridge-10G radio using its IP address, enter the default IP address in the address bar of your browser. You can use any available browser, but Google Chrome is recommended.

The factory default MobiBridge-10G IP addresses are: **192.168.127.254** and **192.168.127.253**.

Consider, that a radio with an **even serial number** has an internal IP address of 192.168.127.254 and an **odd serial number** radio has an internal IP address of 192.168.127.253. Check for the serial number label on the radio case.

At the loading login form, proceed as follows (Fig.3):

- Enter http://192.168.127.254 or http://192.168.127.253 in the browser address bar.
- Choose **User** from drop-down menu as your access level
- Enter the default password: 222222

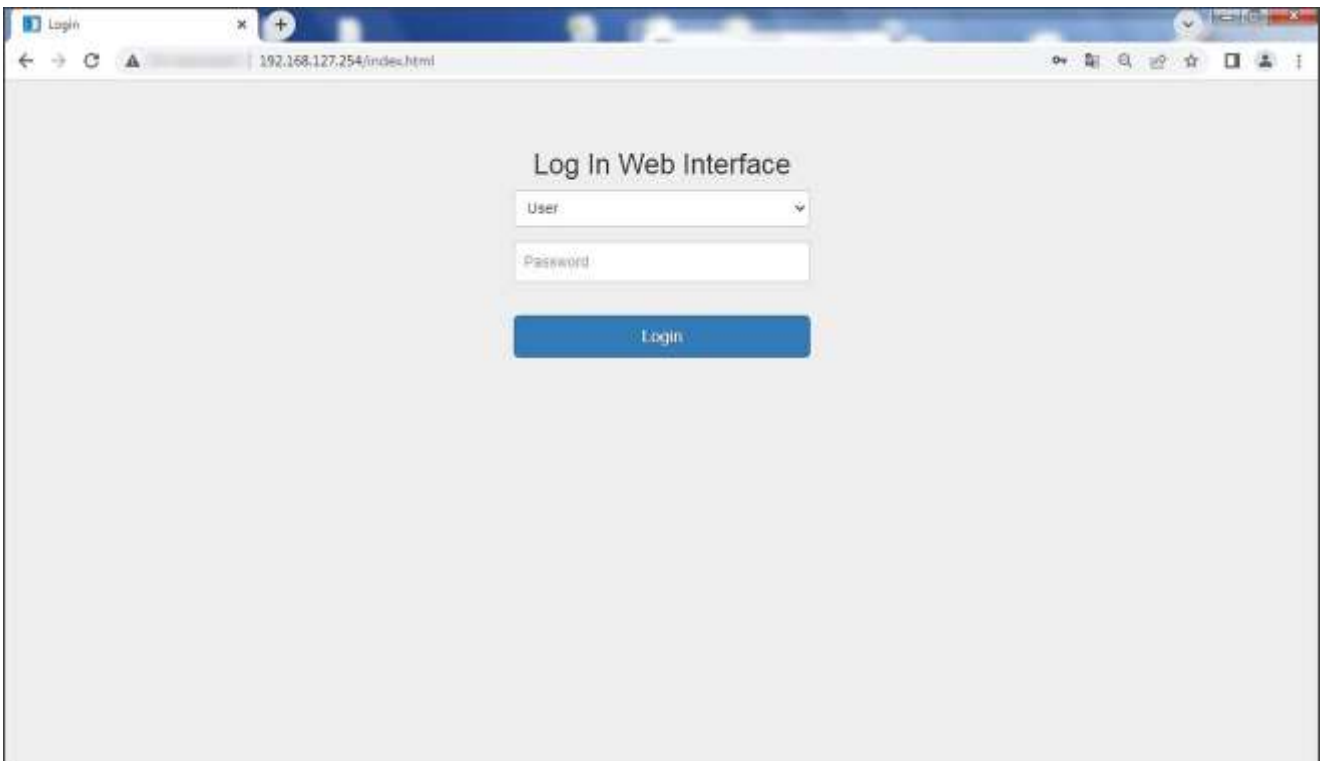**Note**. **Factory Installer** is a username for technical support personnel only.

Fig.3. Example of a login form for radio with even serial number (192.168.127.254)

After successful login a window with a web interface with the main tab **Operational Status** will be opened.

Note. The web interface window operates for each radio separately. To configure the wireless channel (sides A and B of wireless radiolink), you will need to open two web interface windows like on Fig.3, one for the radio on side A and a second window for the radio on side B.

OPERATIONAL STATUS TAB

The Operational Status tab provides information about the radio's operating mode and the presence of an active wireless connection (Fig.4).
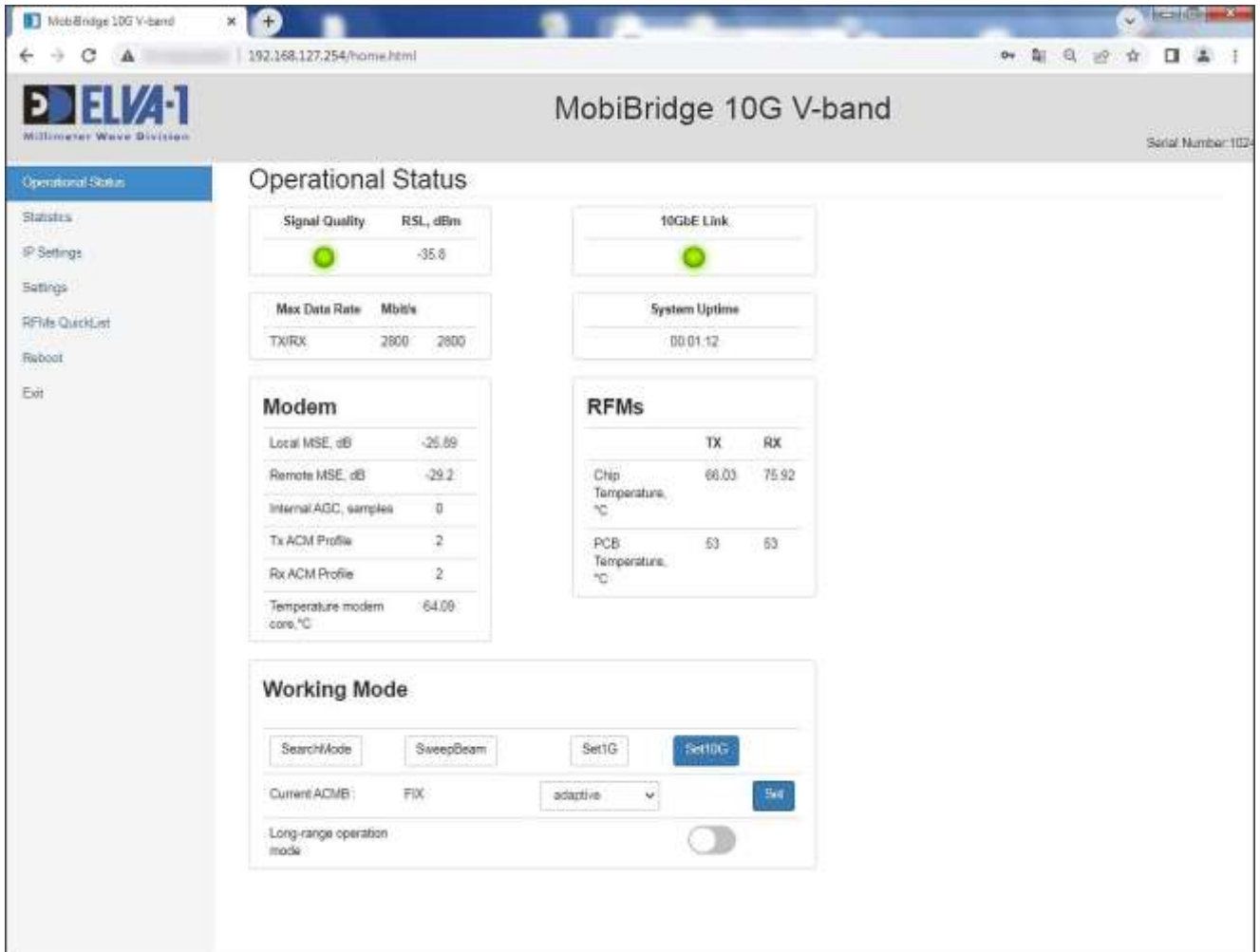

Fig.4. Operational Status tab

- The **Signal Quality** indicator shows whether the modem is working normally for this radio. Green light means the wireless connection between both radios is established, while red light means no connection. Current RSL value corresponds Signal Quality indicator.
- The **Max Data Rate** parameter displays the current bandwidth of the communication channel.

- The **10GbE Link** indicator shows whether the radio is connected to any active 10GbE network equipment. In the normal operation within network, this indicator should be green. If the is no connection to LAN, this indicator will be red.

- The **System Uptime** is a timer which counts uptime for this radio since last boot.

- The group of parameters within **Modem** box describes the modem operation. These parameters are mostly for your information and for technical support.

- The **RFMs** box displays temperature value for chips and PCB boards both for Tx and Rx. RFMs in this context is a block of beamformer registers that are applied as RF blocks.

- The **Set1G** and **Set10G** buttons set the 1Gigabit Ethernet or 10Gigabit Ethernet network connection modes for the data communications port (SFP) to external network equipment.

- The **Long-range operation mode** switch enables the highest transmitter signal gain and receiver sensitivity to enable connection over 10 m distance. Maximum 10 Gbps throughput is guaranteed at MobiBridge-10G operating ranges from 0.5 m to 10 m, with radios' maximum range of up to 400 m (see Figure 5).
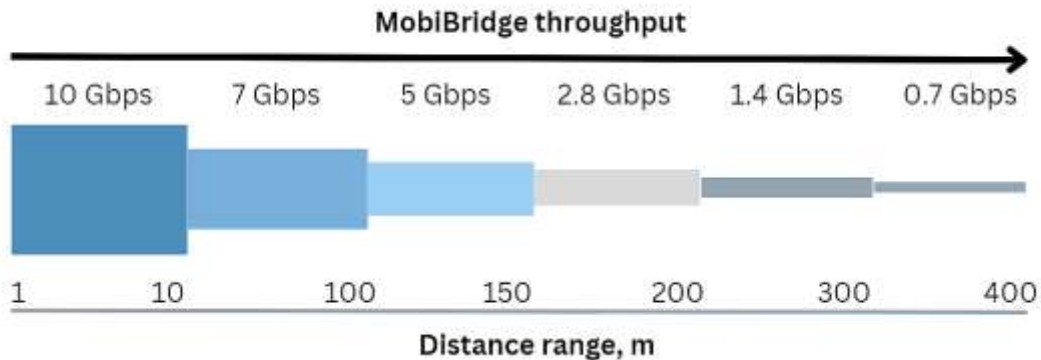

Fig.5. Throughput vs. Distance diagram for MobiBridge-10G radio

To configure the MobiBridge-10G operation mode for the wireless link (sides A and B), it is firstly recommended to open a similar second web-interface window for another radio and check the setting of the fixed connection rate mode for both radios. To do this, in the **Current ACMB** row, select **FIX** mode from the **Adaptive/FIX** drop-down list. Click the **Set** button to make the fixed link rate mode active. The signal quality indicator may briefly turn red during setup. Repeat the procedure for the second radio.

Then press the **SearchMode** button to set the optimal modem mode. Repeat the procedure for the second radio.

Press the **SweepBeam** button to automatically select the best angle of the built-in antenna beam for the best signal quality. Repeat the procedure for the second radio.

If you plan to use both radios as a fixed wireless line (not for installation on vehicles), select adaptive modulation for the highest data rate. To do this, from **the Adaptive/FIX** drop-down list, select **Adaptive** mode and press the **Set** button to make the adaptive link rate mode active. The signal quality indicator may briefly turn red during setup. Repeat for the second PPC.

STATISTICS TAB

The **Statistics** tab collects information about the operation of this radio link, the data is accumulated at a frequency of once per second.

If the admin wants to test the operation of the radio link, then should first reset the packet counters with the **Reset** button, and then conduct a test of a certain duration (for example, 24 hours). After that, evaluate the statistics to analyze how many packets and what type of packets were transmitted through the interface.

The **Statistics** tab is a useful tool in case of radio link diagnostics. Having of statistics by packet size, type, etc. helps to analyze the wireless connection performance with the help of such tools.
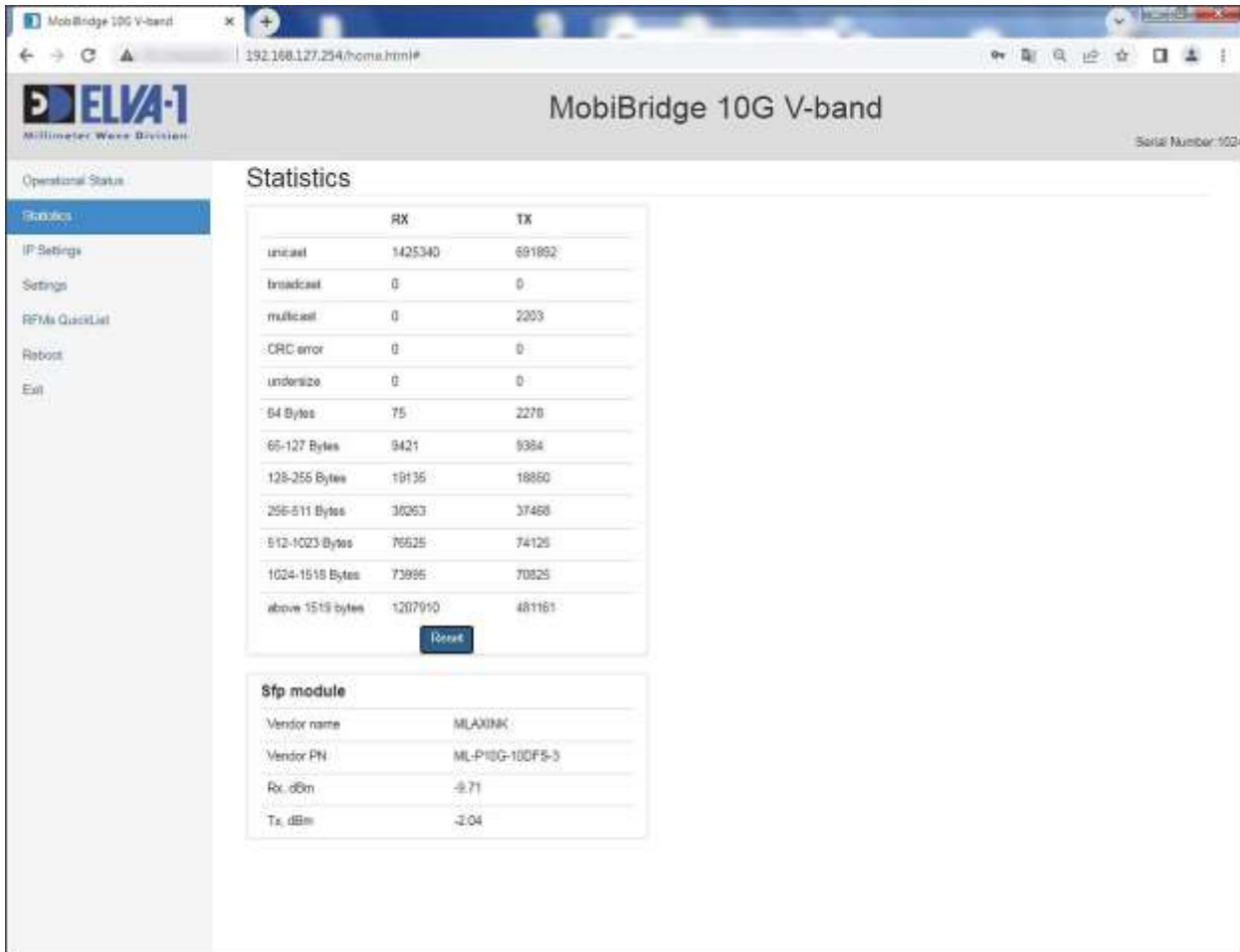
The

Fig.6. Statistics tab

IP SETTINGS TAB

On the **IP Settings** tab you can set IP parameters for this radio. These settings have to be settled for each radio separately.

Change **IP address** of this radio from default to actual one. For this, choose **IP Settings** tab in left menu (Fig.6). Enter the IP parameters of your choice (could use default **Mask** 255.255.255.0 and default **Gateway** 0.0.0.0). Click **Save** button.

After changing the IP address, this new address will automatically appear in the browser address bar, so that the administrator can continue to work with the web interface of this radio.

Save the new IP addresses for both radios in a secure file or a cloud password manager, or simply write them down on paper to make sure that new IP addresses will not be forgotten.
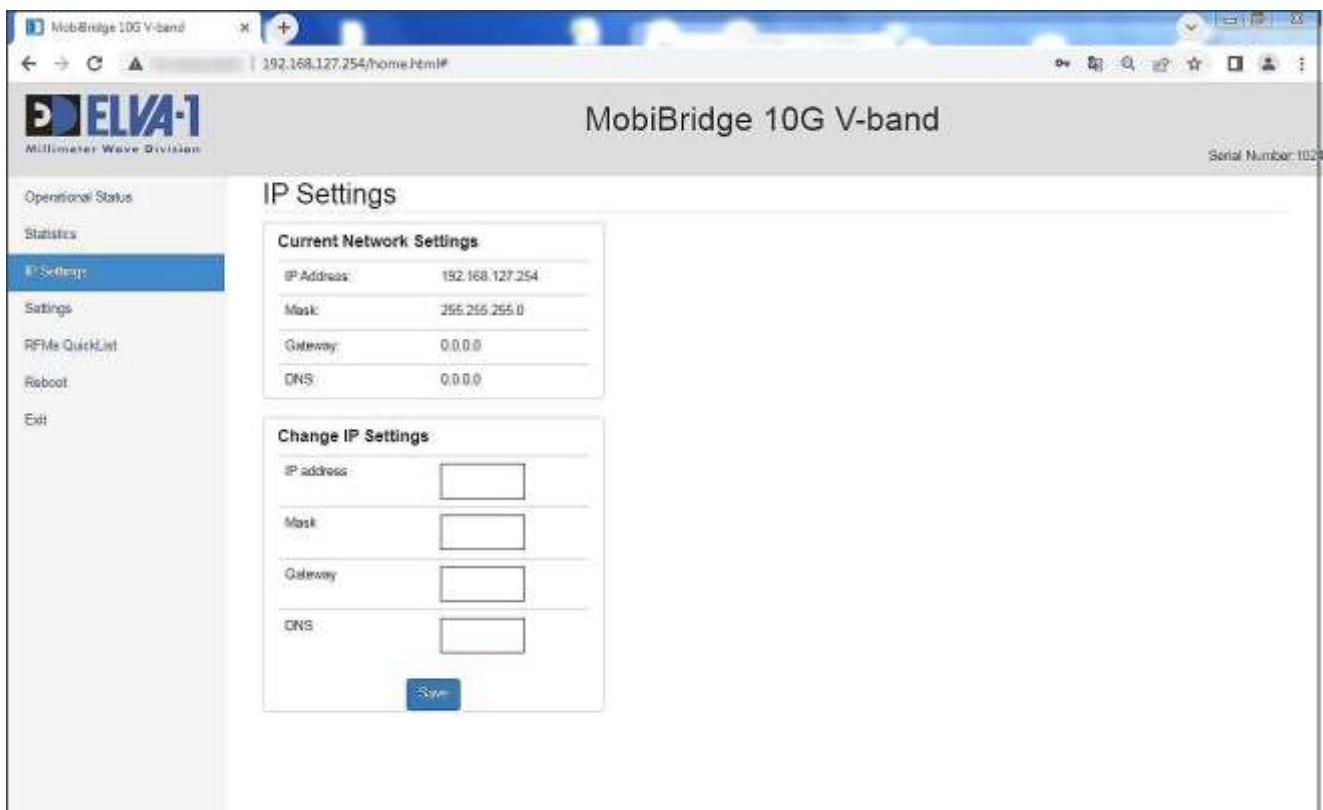
Fig.7. IP Settings tab

SETTINGS TAB

On the **Settings** tab you can set unique **User password** for this radio. The password has to be settled for each radio separately. You can use uppercase and lowercase letters, numbers and special characters. Enter new password, also confirm it, then press **Submit** button.

About Device is the info-box about this radio, also **Firmware** box displays current version of Firmware.

In the **Loopback** box, you can set the modes **OFF** by default, or select from a drop-down list either **Line** mode to test the optical cable from the external active network equipment to the MobiBridge or **Terminal** mode.

Loopback mode is useful for link failure troubleshooting or when installing the device on a wireless path. The mode allows you to independently test different sections of traffic route.

Loopback mode has different configurations:

- **Line**, where traffic coming over the optical cable to the radio unit is not passed to the wireless, but is looped back. In this way, the admin can check the optical section from the server room to the radio unit at the installation site, taking into account all sockets and connections.
- **Terminal**, where all traffic that came over the wireless channel is not transmitted to the optics, but is wrapped back to the wireless channel.

By selecting these modes, the administrator can check the sections of traffic passing sequentially. For example: first check the optical line on side A, without affecting the radio channel and the

optics on side B. Then check the optics on side A and the radio channel, without touching the optics of B. Then do the same thing from side B.
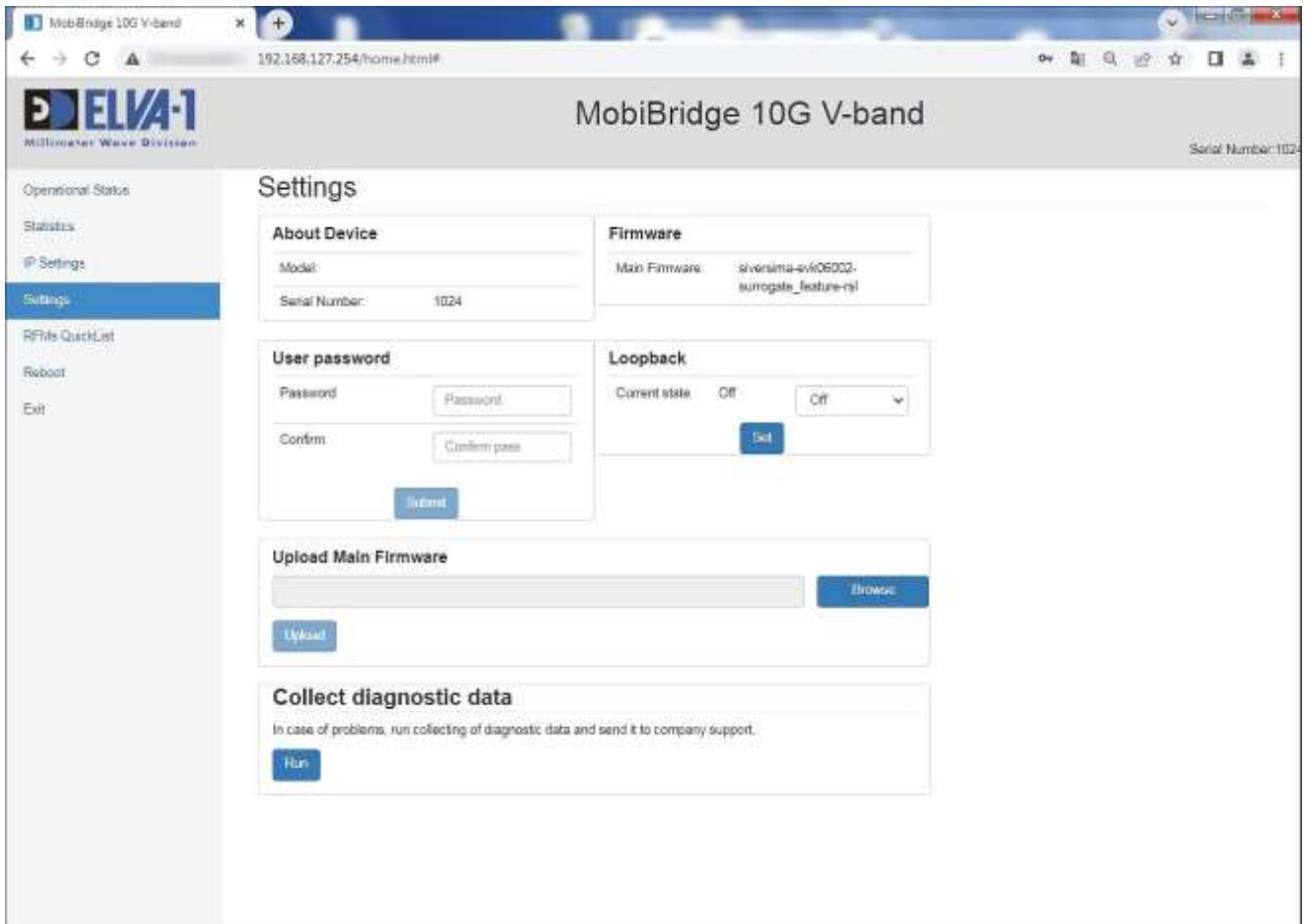

Fig.8. Settings tab

The **Upload Main Firmware** section allows to update the firmware. To do this,

- Upload the firmware to your computer, then select that file using the **Browse** button.
- Then click the **Upload** button, and the firmware will be updated for this radio. Repeat the firmware update procedure for the other radio.

The **Collect diagnostics data** section is for Mobibridge 10G manufacturer's technical support personnel only. To collect the data for support team, the Administrator follows additional instructions from the manufacturer's technical support.

RFMS QUICKLIST TAB

On the **RFMs QuickList** tab you can set the sub-bands of operating frequencies for the receiver and transmitter, as well as change the angle of rotation of the built-in antenna (to be performed for each radio separately).

Since the wireless connection realized by Mobibridge-10G is a full duplex channel, the transmitter and receiver work on different frequency channels. There is no hard bundle of duplex frequency diversity in the product. On the contrary, the flexibility of frequency channel configuration is realized. The administrator has the ability to choose which frequency channels will be used.

In total, Mobibridge-10G has 6 frequency channels. In different countries it may be allowed to use from 3 frequency channels to all 6 frequency channels available in the radios. Thus, on the **RFMs QuickList** tab the administrator can select the desired frequency plan and use it in the device.
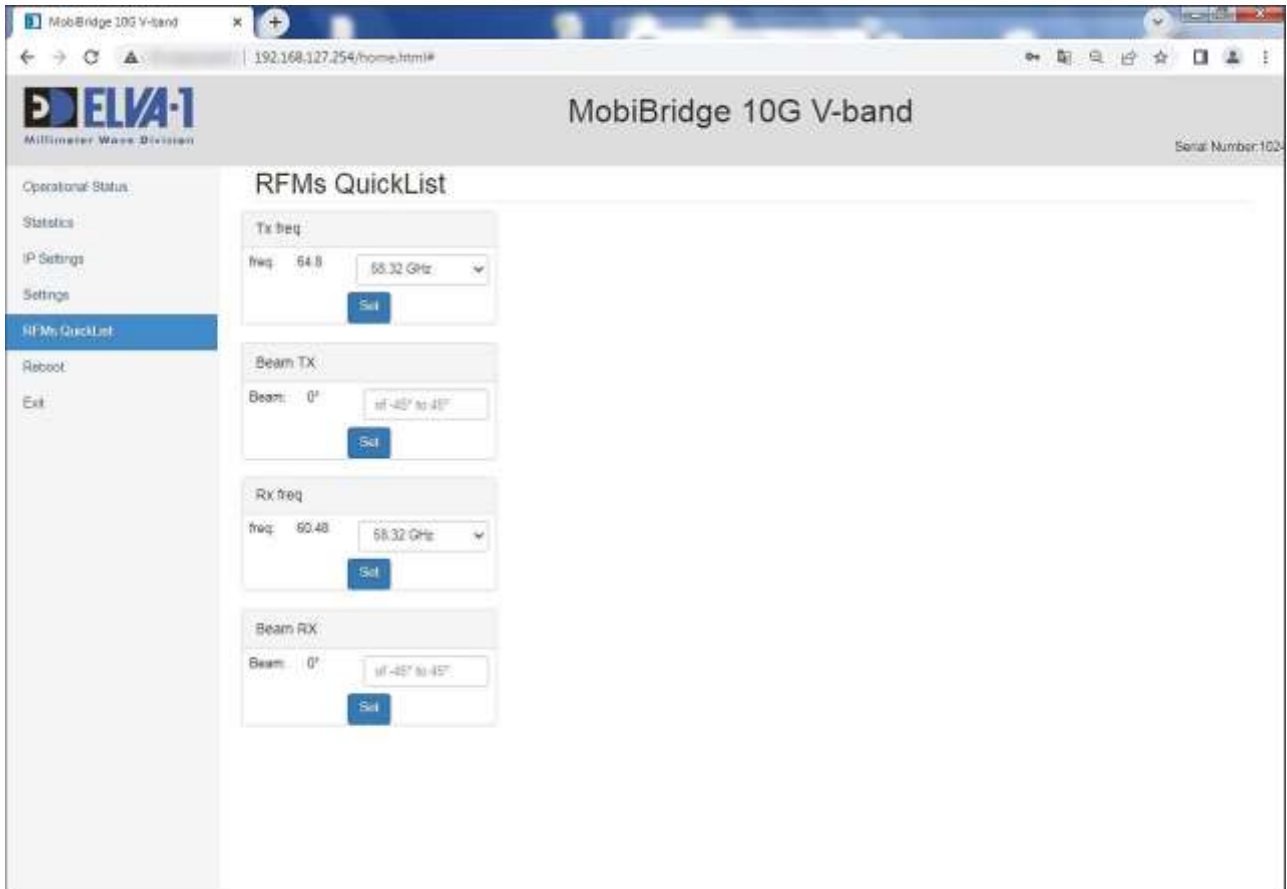

Fig.9. RFMs QuickList tab

Note. It is important to understand the mirror principle of frequency channel assignment. If, for example, the frequencies Tx 61GHz; Rx 57GHz are set to radio on side A, the mirror variant Tx 57GHz; Rx 61GHz must be selected to the radio on side B.

The antenna beam angle is rotated in manual mode. The **Beam TX** (Transmitter Beam) and **Beam RX** (Receiver Beam) fields are used for this purpose. Beam shifting using these settings can help to increase the data rate when the orientation of the Mobibridge-10G faceplates to each other is largely inconsistent. Then the antenna pointing can be adjusted using these software controls.

REBOOT AND EXIT

By selecting the menu item **Reboot** in the left menu, the Host controller is restarted and the firmware of all chips and modules is reloaded, with new settings applied. Each radio can be rebooted independently of the operation of the other radio.

When selecting the **Exit** menu item in the left menu, the web interface session is terminated for this radio and access to it is closed. To re-enter the web interface, you will need to re-type the current login and password. The operation of the web interface of the given radio is terminated independently of the operation of the web iinterface of another responding radio.

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For any inquiries regarding the web interface, please contact ELVA-1 by email support@elva-1.com.