

User Guide

PPC-10G Web Interface

Ver. 1.01, January 2017



Copyright © 2017, ELVA-1. All rights reserved.

All information from this User Guide is protected by the related copyright, patent, or intellectual property right. ELVA-1 has the exclusive right to change this information in order to improve performance or usability of the described product. PPC-10G is a trademark of ELVA-1. All other trademarks or product names are the property of their respective owners.

Table of contents:

1	PPC-10G WEB INTERFACE CONNECTIVITY OVERVIEW	3
1.1	Understanding Working Modes of Link Radios	4
1.2	Understanding Network Connection Between Radios	5
1.3	Link Terminology	6
2	RUNNING WEB INTERFACE FOR THE FIRST TIME	7
2.1	Understanding Web Interface Color Indicators	7
2.2	Login to Radios	7
3	OPERATIONAL STATUS MENU	12
3.1	Understanding Operational Status Parameters	12
4	STATISTICS MENU	14
5	DETAILED STATUS MENU	15
5.1	Temperatures Box	15
5.2	Modem Status Box	16
5.3	Device Box	16
5.4	Voltages Box	16
5.5	Self Test Indicators Box	16
6	SETTINGS MENU	17
6.1	Change Key Tab	17
6.2	IP Settings Tab	18
6.3	Password Tab	19
6.4	Time Zone Tab	19
6.5	Profiles Tab	19
6.6	Upgrading Tab	19
6.7	RF Tuning Tab	20
7	SERVICES MENU	22
7.1	FTP Tab	22
7.2	Telnet Tab	23
7.3	Security Tab	24
7.4	WatchDog Tab	25
8	RADIO LINK LOGS MENU	26
8.1	Graph Tab	26
8.2	Download Tab	27
8.3	Settings Tab	28
9	ALARMS MENU	29
10	CONTACTING TECHNICAL SUPPORT	30

1 PPC-10G WEB INTERFACE CONNECTIVITY OVERVIEW

As PPC-10G link is installed on site, and cables from radios are connected to LAN switch at each side of the link, PPC-10G radios can be accessed over LAN using the Web Interface by IP addresses (radios are GUI-enabled).

Any available web browser may be used, but Google Chrome is recommended. Desktop PCs, notebooks, tablets and smartphones are supported to get web access to PPC-10G radios for either Windows, macOS/iOS and Android operating systems.

The GUI feature is independent from the data channel, and does not directly affect the link ability to transmit and receive data through its main data channel. Without the GUI feature enabled, the link performs exactly like an unmonitored fiber optics cable. A network diagram of PPC-10G radios web access connectivity is shown below.

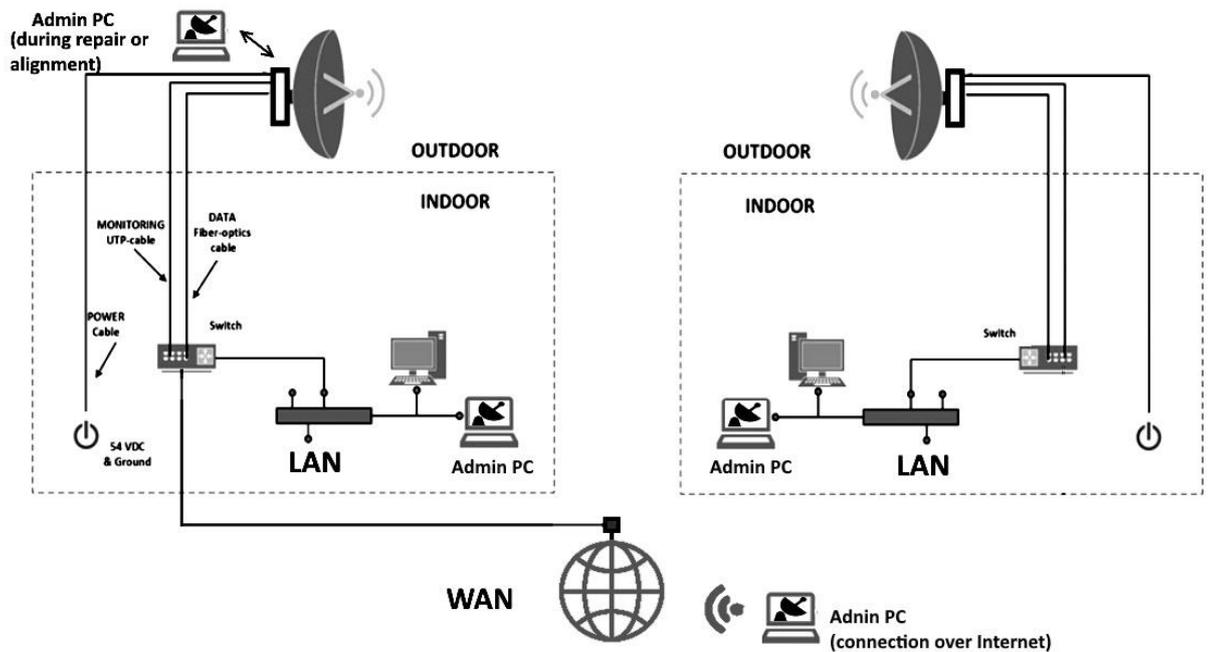


Figure 1: PPC-10G radios LAN / WAN web access connectivity

By factory default, each transceiver has IP address for Web Interface access. These IP addresses are different – so called **Hi** transceiver has internal IP address 192.168.127.254, while **Lo** - 192.168.127.253.



Figure 2: Example of PPC-10G label on the back of the radio body

What are **Hi** or **Lo** symbols mean? The one radio in the link works in the higher part of the allocated frequency band and is called **Hi**, while another radio works in lower band and called **Lo**.

There is label on the back of radio body with **Hi** or **Lo** symbols in the link abbreviation (see illustration Fig.2). To review which radio is **Hi** and which one is **Lo**, check label on the radio body.

Summarizing above mentioned, system administrator (aka Admin) could connect to each radio by its IP address in 3 ways:

1. Connect of the Admin PC (notebook or mobile device) to the radio while are in the same LAN as this radio.
2. Connect of the Admin PC (desktop, notebook or mobile device) to the radio over WAN (over the Internet). In this case **Hi** and **Lo** 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 of the Admin PC (notebook with Ethernet port) to the radio. This way usually used only in some situations of initial installation of the link or at link repair works. Default IP addresses are 192.168.127.254 for **Hi** radio, while **Lo** - 192.168.127.253. Use stationary cable with RJ-45 connector that come from radio to switch and connect it to your notebook. You can also connect notebook to #1 MONITORING socket on the radio directly, using twisted pair cable with RJ-45 connectors if needed (be sure radio's external Power Supply is ON to get access). See Fig.3 below for radio's sockets identification.

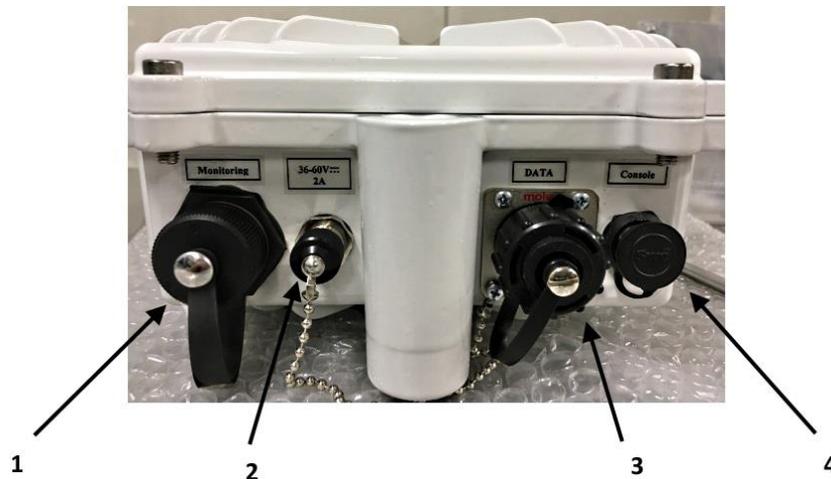


Figure 3: Photo of sockets on the radio body

1. "MONITORING" RJ-45 Connector for cable of WEB Interface
2. "POWER" Connector for 36-60 V DC power cable
3. SFP/SFP+ "DATA" connector for 10 Gbps data transmission cable
4. "CONSOLE" connector for temporary tuning panel, used during antenna alignment

1.1 Understanding Working Modes of Link Radios

Each radio has two general modes for electronic components which are called **Alignment** and **Operational**. These modes could be set by using Web Interface to the radio.

Factory default is **Alignment** mode. This mode is special one to help the personnel to effectively run antenna alignment.

Alignment mode has to be changed to **Operational** mode after alignment of antennas to each other will be done.

1.2 Understanding Network Connection Between Radios

Please mind, until you switched both radios from **Alignment** mode to **Operational** mode using Web Interface, there will be NO wireless connection between radios in network segments A and B (see Fig.4 a,b).

Therefore, if Admin PC is for example in network segment A, connection to radio in network segment B could be only if there is any backup connection to B (Fig.4a). Otherwise, required to come to the site of Segment B and connect to those radio at Segment B locally (Fig.4b). This is “first time login” situation only. Later, with switched both radios into **Operational** mode and wireless connection WAN between radios will be ON, it is possible to connect to any radio from any point of LAN or WAN (including over the Internet).

Note. Be sure **192.168.127.254**, **192.168.127.253** addresses are not occupied in your network by any other devices. Otherwise, release these IP addresses temporary for the “first time login” to radios. In case if releasing of addresses is not possible, bring Admin notebook equipped with Ethernet port to nearby of LAN switch with MONITORING cable from the radio inserted (Fig.1). Disconnect MONITORING cable from the switch and insert this cable RJ-45 jack into notebook’s Ethernet port. Start web browser and proceed as described below in 2.1 section.

Precautions. For successful Web Interface connection to both **Hi** and **Lo** PPC-10G radios, always check that DATA and MONITORING cables from the radios are connected to office LAN switch with Flow Control enabled and radio’s Power Supplies are ON for both radios of the link.

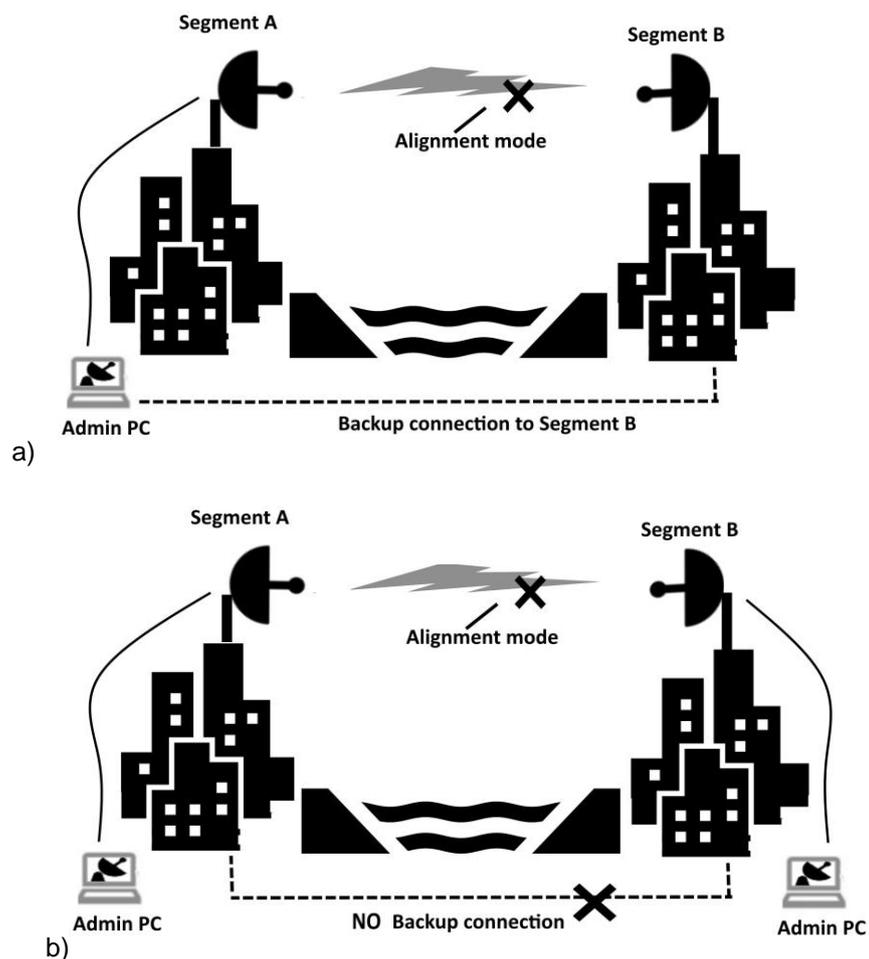


Figure 4: Connection to radios in segments A and B for the “first time login” situation

1.3 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 antenna
- Modem – part of radio, including 10 Gigabit Ethernet components, Transmitter (Tx) and Receiver (Rx) components. Modem transmits and receives data between fiber-optics Ethernet 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.

2 RUNNING WEB INTERFACE FOR THE FIRST TIME

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 PPC-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 networking environment with Flow Control function

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

- Switch both radios from **Alignment** mode to **Operational** mode to activate link wireless data transmitting channel,
- Change Admin password for both radios,
- Set the actual local time for both radios,
- Assign actual IP addresses to **Hi** and **Lo** radios instead of factory default IP addresses.

Note. It is recommended to assign actual IP addresses to **Hi** and **Lo** radios as last operation in your first login session to each radio. When you change IP address, Web Interface will immediately return you “Not found” page, so next time you will need to re-Login using new IP address.

2.1 Understanding Web Interface Color Indicators

Color light indicators are used in Web Interface to quickly inform Admin if the value of parameters are within normal limits or not.

- **Green** light means normal work / good quality of signal or this monitored parameter is ON,
- **Orange** light brings attention of the Admin to this parameter but not yet critical for the link,
- **Red** light requires Admin interruption because of link or parameter failure, or for information that this monitored parameter is just OFF.

Blue color of the underlined parameter name means pop-up tooltip available for short description of the parameter means and/or its value.

2.2 Login to Radios

To connect to radio **Hi** and **Lo** by its IP address, enter it in browser's address line. Any available web browser may be used, but Google Chrome is recommended.

The factory default PPC-10G IP addresses are:

Hi Radio - **192.168.127.254**, **Lo** radio – **192.168.127.253**.

When you arrive at the web page, proceed as follows (Fig.5,6):

- Choose **Installer** from drop-down menu as the Access Level
- Enter the default password: **111111**

Note. Please mind Auto-Logout because on Web Interface inactivity will be after 10 min.

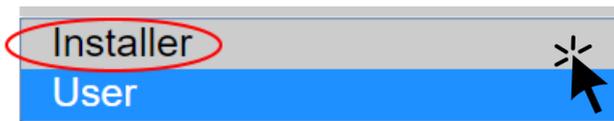


Figure 5: Choose Installer option

Installer is an Admin level access, and has rights to change parameters
User is a reader level access, and has rights to only view parameters.

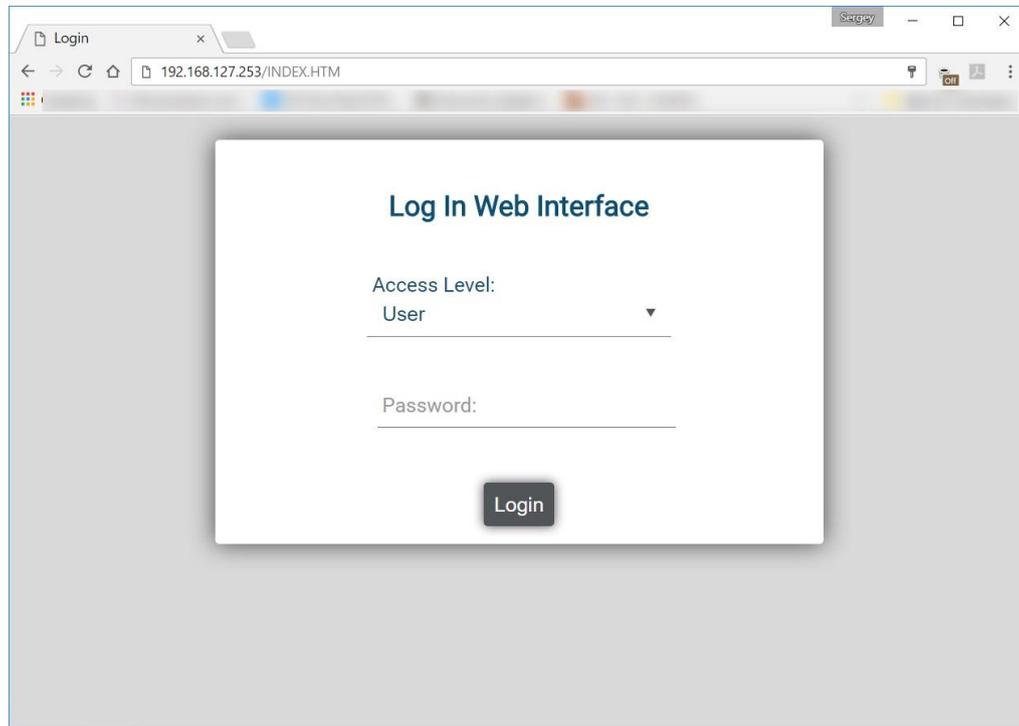


Figure 6: Login as **Installer** with default password 111111

- When enter to the radio Web Interface page (Fig.7), press the **Operational** button in the bottom left of the window. Then press the **APPLY** button and wait until the transceiver restarts. **Operational** button become blue (ie, the normal wireless data transmission mode activated, but only for this radio – to fully activate main data channel, you need to repeat this procedure for another radio as well).
- Change password for Web Interface access to this radio (Fig.8). For this, choose **Settings** on left menu, then **Password** tab at top. Enter new password, retype it, then click **Submit** button. Use only Latin characters and digits, 6 - 20 symbols long.
 - Save new password in the protected file or cloud storage, otherwise just write down on the paper. Don't forget to mark that password is valid for Hi or Lo radio.

Note. Please mind Auto-Logout on inactivity is 10 min.

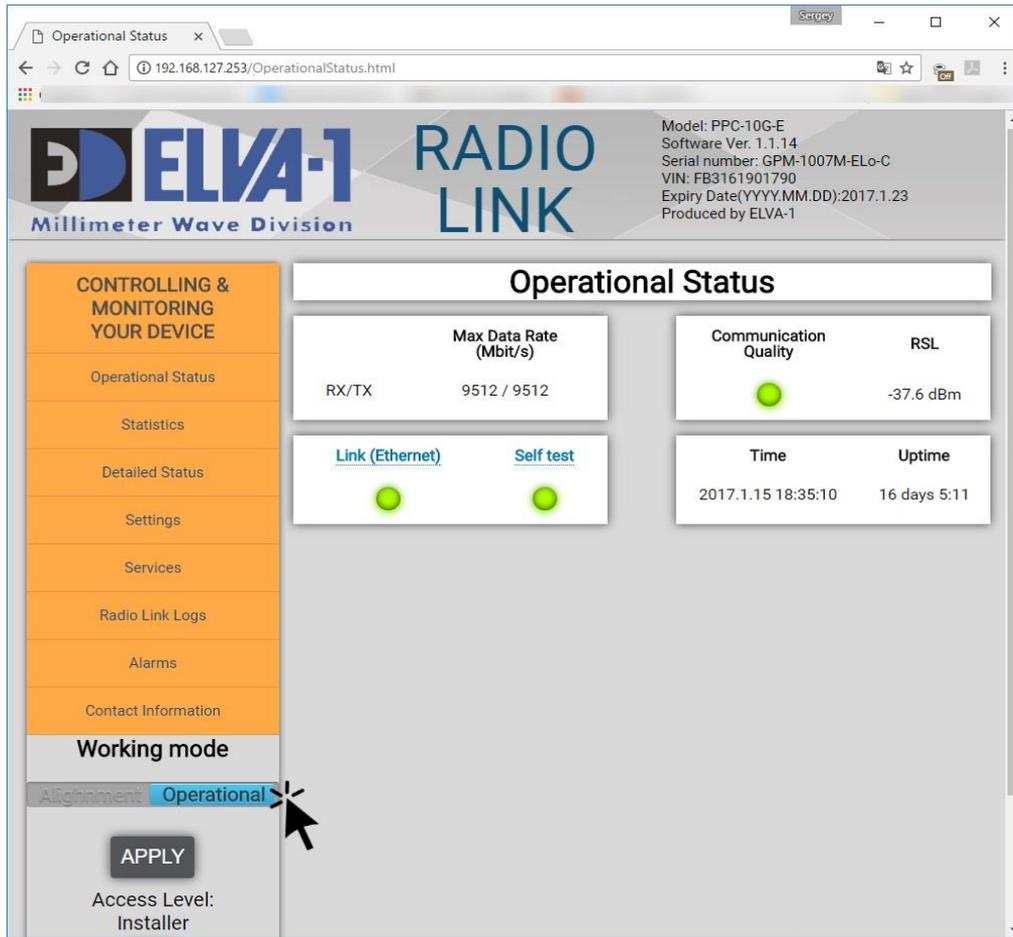


Figure 7: Click **Operational** button, then click **APPLY** button.

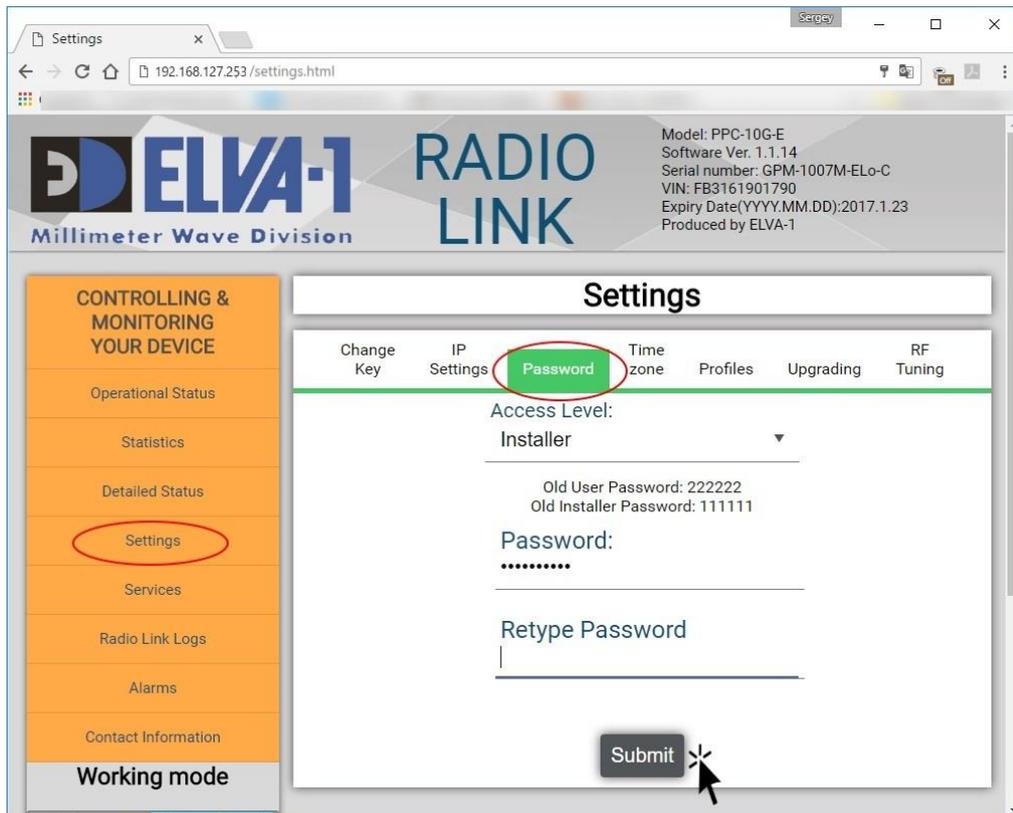


Figure 8: Choose **Settings** from left menu and **Password** tab, enter new password, then click **Submit** button

Note. In case of forgotten password please contact your supplier’s technical support. They will restore factory default password, so you can change it to actual one again. Letter of Authorization may be required from your CEO or CIO to confirm this request for password recovery.

- Set the time for radio to actual local time. By default, “UTC 0” time zone is used. For this, choose **Settings** on left menu, then **Time zone** tab at top. Adjust hours and minutes to local time, then click **Submit** button (Fig.9).
- Change IP address of this radio from default to actual one. For this, choose **Settings** on left menu and **IP Settings** tab at top (Fig.10). Enter the IP parameters of your choice (could use default **Mask** 255.255.255.0 and default **Gateway** 0.0.0.0). Click **Submit** button.
 - Save new IP address in the protected file or cloud storage, otherwise just write down on the paper. Don’t forget to mark this address as valid for Hi or Lo radio.

After you entered new IP address, this Web Interface session will be finished with “Not found” page. To login to the radio next time, use new actual IP address in the browser address bar and new actual password.

Note. If you have backup network connection to LAN segment where another radio is installed (Fig.4a), repeat right now all steps you did in this section to login and setup another radio. Otherwise come to another LAN segment (Fig.4b) and repeat all steps there. The main data channel will be automatically ON when both radios will be switched into **Operational** mode.

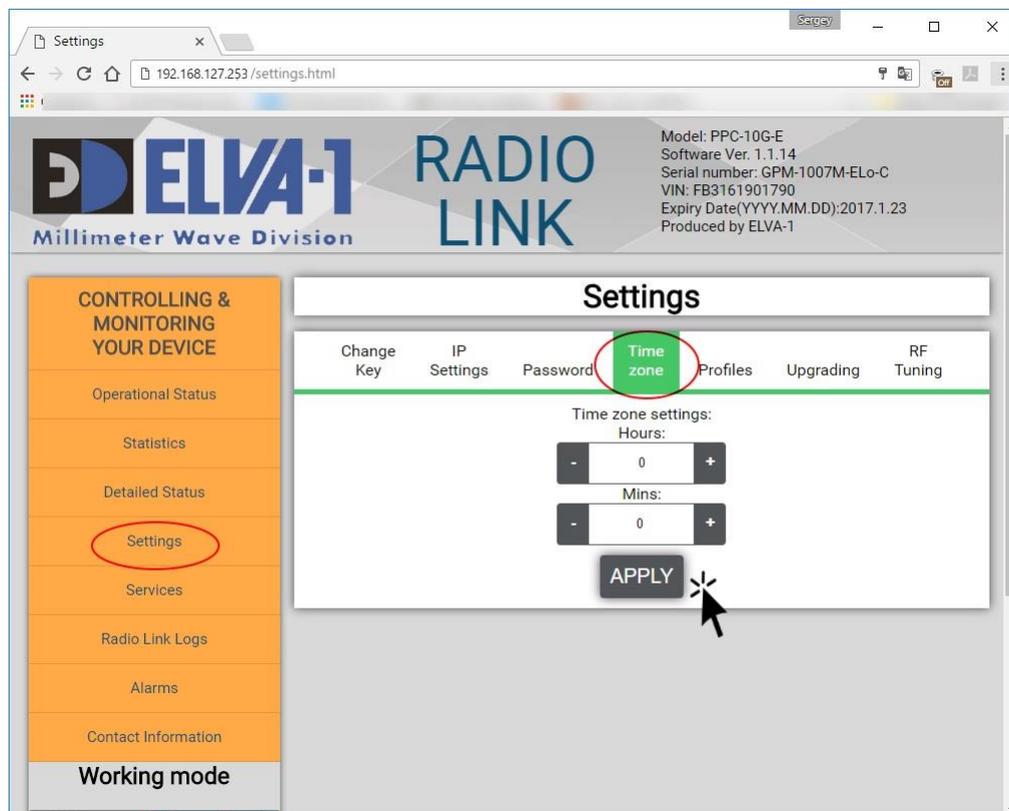


Figure 9: Adjust actual time settings for the radio

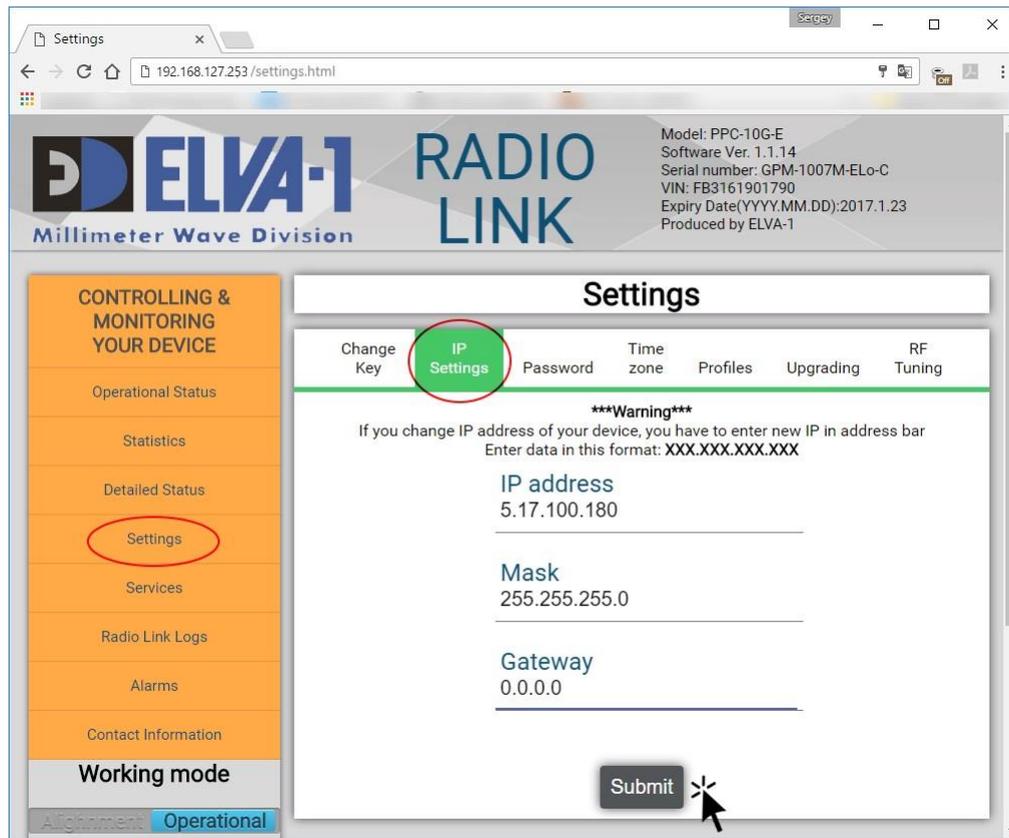


Figure 10: Assign actual IP settings for the rad

To get familiar with all Web Interface menus and tabs, proceed to next sections of this User Manual.

The most important parts of Web Interface windows are framed with red ovals for your attention.

3 OPERATIONAL STATUS MENU

Operational Status window is the default one which you could see after successful login to the radio (see Fig.11). The list of link identification parameters is displayed in the top right part of the window, please mind parameter values listed below could be varying from your link:

Model: PPC-10G-X	(Link trade name)
Software Ver.: X.X.XX	(Version of firmware of this radio)
Serial number: GRM-XXXX-ELo-C	(Ser.Number of the link, with Lo or Hi index of exact radio)
VIN: XXXXXXXXXXXX	(Unique ID of transceiver, for tech support only)
Expire Date: YYYY.MM.DD	(Valid for rented or leased links only, date of link self-OFF)
Produced by ELVA-1	(Manufacturer info).

The most important parts of **Operational Status** window are framed with red ovals for your attention.

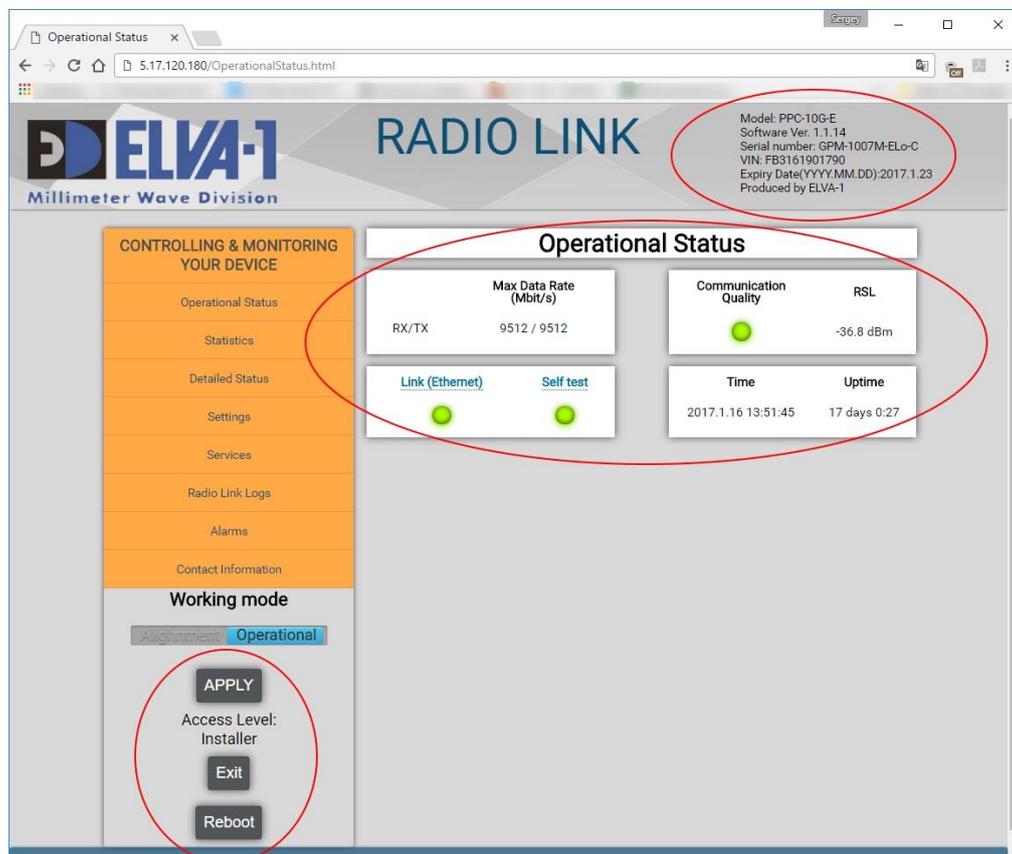


Figure 11: Operational Status window

3.1 Understanding Operational Status Parameters

There are link general parameters shown under **Operational Status** header in main part of the window. These parameters are the following:

- **Max Data Rate (Mbit/s)** — shows current Receiver (RX) / Transmitter (TX) data rate according to modulation, bandwidth, weather and distance conditions, and other parameters.

- **Communication Quality** — Green light means good quality, Red light – bad quality.
 - The most often reason of bad quality could be rainy weather. If this indicator is constantly Red even at clear weather, do the following:
 - Check RSL value shown in the same box, it should not be less than -80 dBm for both Hi and Lo radios. If so, repeat antenna alignment (don't forget to switch both radios into **Alignment** mode), if this will not help, then contact technical support of your supplier (see more on technical support in the end section of User Manual).
- **RSL** (received signal level), this is signal level at a receiver input. The RSL is usually expressed in dB with respect to 1 mW, i.e., in dBm.
 - Usual **RSL** value is along -30 dBm to -40 dBm. **RSL** value in this box corresponds to **RSL** value shown at Tuning Panel during antenna alignment, considered this has been done at clear weather conditions.
- **Link (Ethernet)** indicator — normally Green — shows the integrity of fiber optics cable from link DATA socket (Fig. 1, 3) to indoor network device (switch).
- **Self Test** indicator confirms that self-test during boot process was OK.
 - If any of these indicators are Red, press **Reboot** button at left bottom part of the window, if this will not help, then contact technical support of your supplier.
- **Time** shows current time settings of this radio and used mostly for log timestamps.
 - Please mind **Time** settings of this radio are not synchronized to **Time** settings of another radio of this link.
- **Uptime** shows summarized period from last Turn ON or from last **Reboot** of the link.



Figure 12: Buttons at Operational Status window

There are following buttons at left bottom part of the window (Fig.12):

- **Alignment / Operational** buttons under **Working mode** header
 - **Alignment** mode is used during antenna alignment procedure only,
 - **Operational** mode is used constantly to get wireless data transmitting channel ON.
- **APPLY** button confirms switching between **Alignment** mode and **Operational** mode, when pressing **APPLY** button you reboot the link with new mode,
- **Exit** button closes current Web Interface session. You can also close the session just clicking on Close icon at right top of the browser tab.
- **Reboot** button fully reboots the link as an equivalent of Turn ON/OFF of the link power. All previously made settings will be saved during reboot.

4 STATISTICS MENU

Statistics window could be opened by clicking **Statistics** in left menu. The window consists of two boxes with statistics on 10 Gigabit Ethernet and link itself.

Most important part of **Statistics** window is framed with red oval for your attention.

The screenshot shows the 'Statistic' window with the following data:

Ethernet Statistics		
Statistic	RX	TX
packets per sec	141476	132355
packets total	2424845157	1795524895
PHY-bytes per sec	1273311000	2375583776
PHY-bytes total	1877249478129000	1750289022758608
unicast	4294967295	4294967295
broadcast	0	0
multicast	596738573	596738573
CRC error	35	0
undersize	0	0
64 Bytes	0	596738573
65-127 Bytes	0	0
128-255 Bytes	0	0
256-511 Bytes	0	0
512-1023 Bytes	0	0
1024-1518 Bytes	0	0
above 1519 bytes	2424845157	1198786322
PER total	1.4e-08	0.0e+00

Link Statistics		
Statistic	RX	TX
Frequency Offset	-3.8 KHz	
MSE	-27.9 dB	
Bandwidth	2000 MHz	2000 MHz
Modulation	128QAM	128QAM
Accumulated Seconds: 15053244 Sec		

Figure 13: **Statistics** window

Ethernet Statistics is displayed for Receiver (Rx) and Transmitter (Tx) of this radio separately.

Link Statistics shows service parameters for Receiver (Rx) and Transmitter (Tx),

- **Frequency Offset** is an intentional slight shift of broadcast radio frequency (RF), to reduce interference with other transmitters (for technical support only),
- **MSE** is a parameter to evaluate signal-to-noise ratio (for technical support only),
- **Bandwidth** is allocated frequency for Receiver (Rx) and Transmitter (Tx),
- **Modulation** shows current type of RF modulation,
- **Accumulated Seconds** summarizes time from last link reboot or last pressing on **Reset** button at this window.

Reset button in this window restarts statistics only. This button doesn't affect any link's work.

5 DETAILED STATUS MENU

Detailed Status window displayed various info on work of electronic components inside radio. For Admin, most important are **Temperatures**, **Power Supply** voltages (Fig.14).

You can also remotely Turn ON/OFF of **Modem** and internal **Heater** at this window.

Most important parts of **Detailed Status** window are framed with red ovals for your attention.

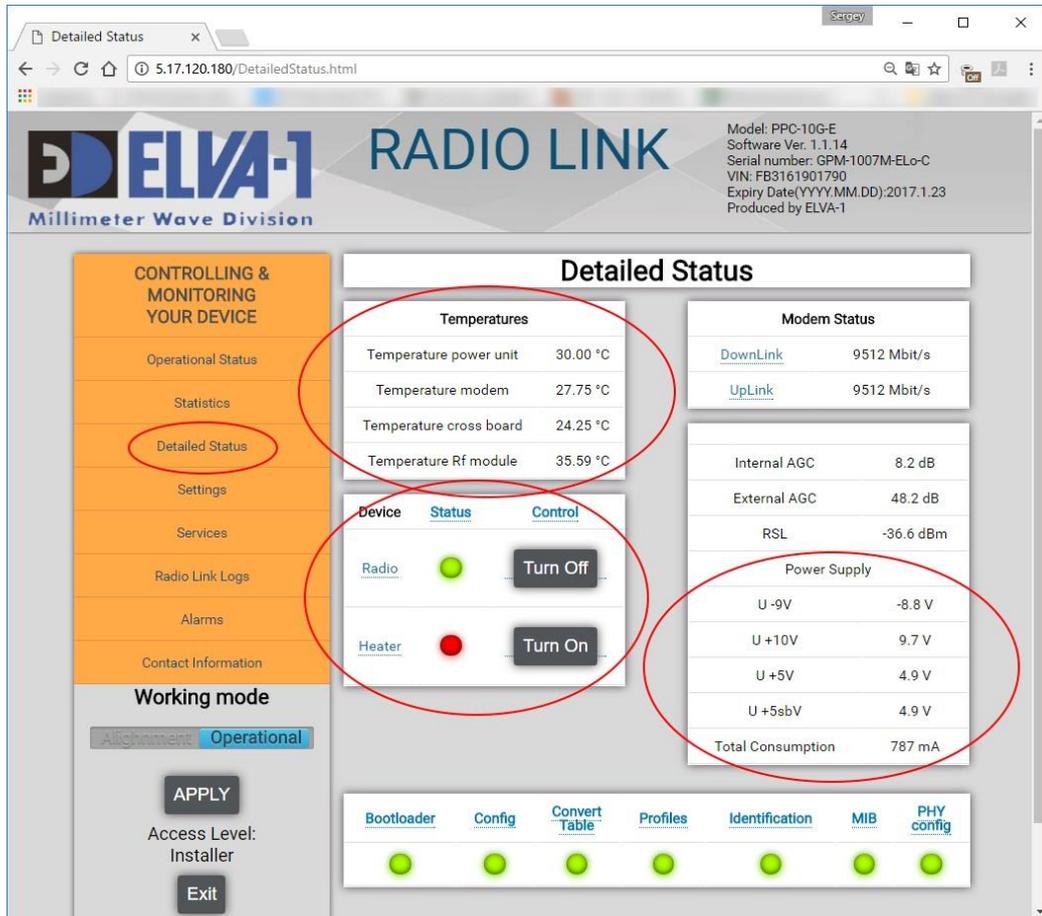


Figure 14: **Detailed Status** window

5.1 Temperatures Box

Temperatures box lists real-time temperatures registered by internal sensors on critically important components of the radio. These temperature values are displayed for technical support purposes.

Please mind that radio will be automatically switched OFF if a temperature of any listed at **Temperatures** box components will exceed +90°C (194°F) or fall down below -5°C (23°F).

For environment with cold outdoor temperatures, each radio contains automatically activated heater inside the radio body. If you turn ON the radio power while outside temperature is cold enough yet (so called “cold start”), the internal microprocessor will activate the heater and delay the wireless data transmission until temperatures on critically important components will rise to at least 0°C (32°F). This is featured to prevent damage of expensive electronic components of the radio.

5.2 Modem Status Box

Modem Status box displays max wireless data rate for Receiver (Rx) and Transmitter (Tx).

5.3 Device Box

There are color light indicators and buttons **Turn ON / OFF** for radio modem and heater.

Indicators display real-time status of modem and heater (Green – On / Red – OFF).

Buttons **Turn ON / OFF** allow temporary **Turn ON / OFF** either modem and/or heater for 30 seconds only. This is for technical support only.

5.4 Voltages Box

Parameters displayed in this box are for technical support information only.

- **RSL** (received signal level) is already displayed in **Operational Status** window. This is signal level at a receiver input. The **RSL** is usually expressed in dB with respect to 1 mW, i.e., in dBm.
- **Internal AGC / External AGC** (Automatic Gain Control) are for technical support information only.
- **Power Supply** parameters are also for technical support information only. Normally, all listed voltages should not be varying to $\pm 1V$ from their standard values.

5.5 Self Test Indicators Box

There is a number of color light indicators at the box on bottom of the window. All they are devoted to various firmware modules to be successfully loaded (or failed to load) during link self test, at turn ON power or **Reboot**. These indicators are for technical support information only.

Normally, all indicators have to be Green. Red light means this firmware module has not been loaded successfully during link self test. Contact your suppliers technical support for more details and instructions.

6 SETTINGS MENU

Settings window is one of most important at Web interface. It allows to setup the most critically important parameters of the radio:

- IP address of Web Interface access
- Password for access of the link over Web Interface
- Time zone settings
- Upgrade radio's firmware
- Run RF tunings for the radio
- Etc.

To enter **Settings** windows, choose **Settings** in left menu.

6.1 Change Key Tab

Change Key tab is intended only for the case if the link is on rent or lease (Fig.15).

Note. Admin could ignore this tab if the link has been already paid in full before shipment.

At this situation, the supplier could limit the period of link operability by issuing special license keys which valid for period of time that has been paid. The expected date of license expiration is displayed on this tab. When this period of time will be over, the link will be automatically OFF.

To continue using of the link, Admin has to enter new license key, press **Apply** key and repeat this again and again when current key will be about to expire. Don't forget do this for both radios.

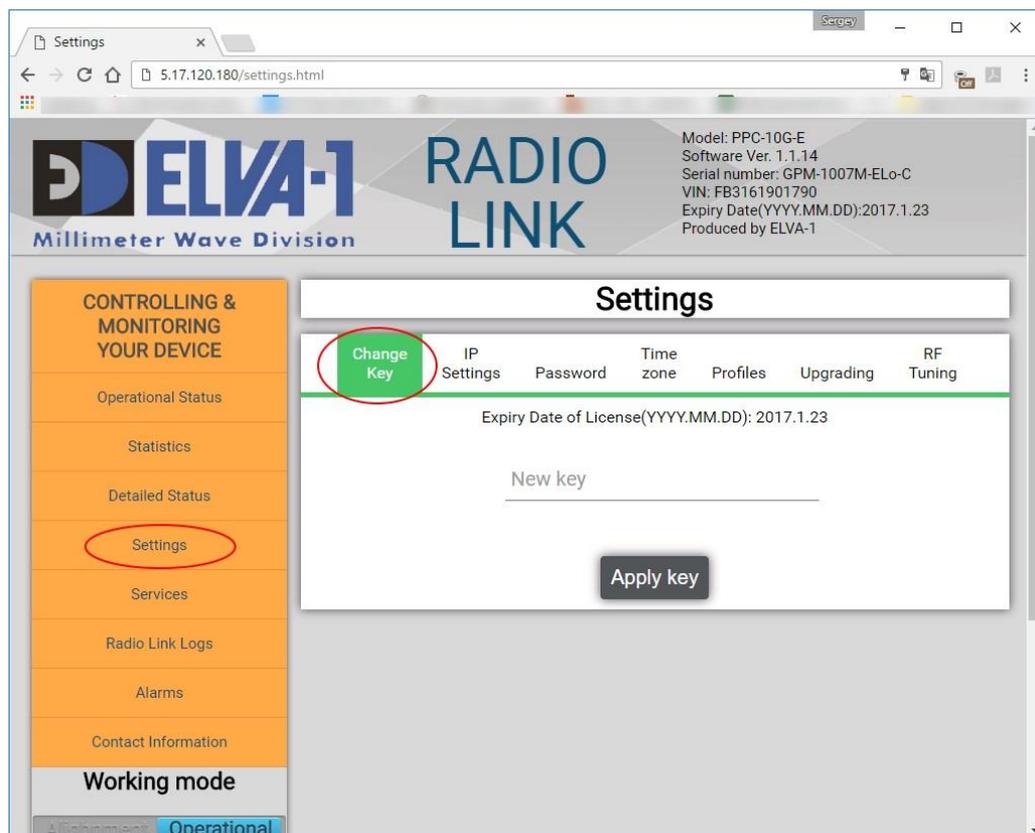


Figure 15: Change key tab

6.2 IP Settings Tab

At **IP Settings** tab you can change IP address, and do settings to subnet mask and default gateway (Fig.).

- Choose **Settings** on left menu and **IP Settings** tab at top (Fig.16). Enter the IP address of your choice,
- Enter values for subnet mask and default gateway (could use default subnet **Mask** 255.255.255.0 and default **Gateway** 0.0.0.0).
- Click **Submit** button.
 - Save new IP address in the protected file or cloud storage, otherwise just write down on the paper. Don't forget to mark this address as valid for **Hi** or **Lo** radio.

After you entered new IP address, this Web Interface session will be finished with "Not found" page. To login to the radio next time, use new actual IP address in the browser address bar and new actual password (see Fig.6).

Repeat IP address changes for another radio if required. Each radio has its own IP address to Web Interface access.

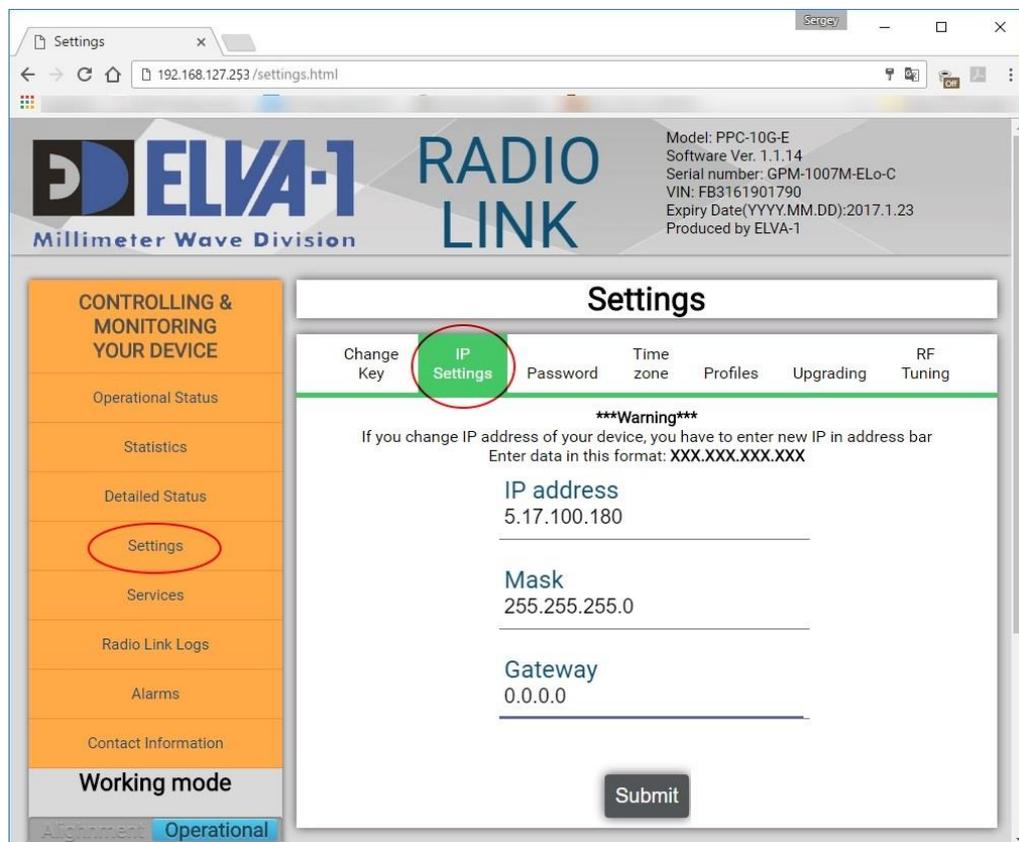


Figure 16: IP Settings tab

Note. In case of forgotten IP address please contact your supplier's technical support. They will restore factory default IP, so you can change it to actual address again. Letter of Authorization may be required from your CEO or CIO to confirm this request for IP recovery.

6.3 Password Tab

At **Password** tab you can change password for Web Interface access to this radio (Fig.8). Please mind the password entered at this tab is valid only for this exact radio. Another radio of the link has its own password to Web Interface Access. Of course you can enter same password for both radios.

For this, choose **Settings** on left menu, then **Password** tab at top. Enter new password, retype it, then click **Submit** button (Fig.8). Use only Latin characters and digits, 6 to 20 symbols long.

Repeat password changes for another radio if required. Each radio has its own password to Web Interface access.

- Save new password in the protected file or cloud storage, otherwise just write down on the paper. Don't forget to mark that password is valid for **Hi** or **Lo** radio.

Note. In case of forgotten password please contact your supplier's technical support. They restore factory default password, so you can change it to actual one again. Letter of Authorization may be required from your CEO or CIO to confirm this request for password recovery.

Note. Please mind Auto-Logout period on inactivity is 10 min.

6.4 Time Zone Tab

At **Time Zone** tab you can enter time settings for this radio (Fig.9). Please mind the time settings entered at this tab are valid only for this exact radio. Time settings for another radio of the link have to be adjusted separately as they are not synchronized automatically.

Set the time for radio to actual local time. By default, "UTC 0" time zone is used. For this, choose **Settings** on left menu, then **Time zone** tab at top. Adjust hours and minutes to local time, then click **Submit** button (Fig.9).

6.5 Profiles Tab

Profiles tab is FYI (for your information) only. It consists a table of all possible modulation modes of this exact radio, max data rates at these modes and RSL for these data rates.

6.6 Upgrading Tab

Upgrading tab allows to install new version of radio firmware.

- Get firmware update file "_APP.s19" from your supplier's technical support by e-mail or download it to your disk.
- Then, click **Choose File** button, pick the file from the disk and click **Apply** button,
- Reboot the radio by clicking **Reboot** button on the bottom left part of the window.
- Repeat this procedure for another radio.

6.7 RF Tuning Tab

RF Tuning tab is intended for use in some special situations in accordance with your supplier's technical support instructions (Fig.17).

There are few most often cases of RF Tuning:

- Adjusting transmitter (Tx) and receiver (Rx) center frequencies (aka nominal frequencies) to comply with local frequency licensing policy of the country.

For example, while default center frequencies for PPC-10G-E (E-band) are 75/85 GHz, some countries like Sweden and Nigeria allocate only 71-74/81-84 GHz spectrum for point-to-point links. Thus, when installed PPC-10G-E in such countries, it is required to make central frequency tuning to comply to local legislation.

- Adjust Rx gain level according to distance between radios (High or Low).

For example, when the link distance is short enough like half-mile, it is recommended to set Rx gain to low. This is to avoid overloading of Rx electronics by too strong incoming wireless signal.

- Switching transmitter (Tx) OFF and ON.

In case technical personnel come to the roof or mast to clean the radio from dust, ice, etc., it is possible to Turn OFF the transmitter for the time of this work and avoid RF emission harm for people standing in front of antenna.

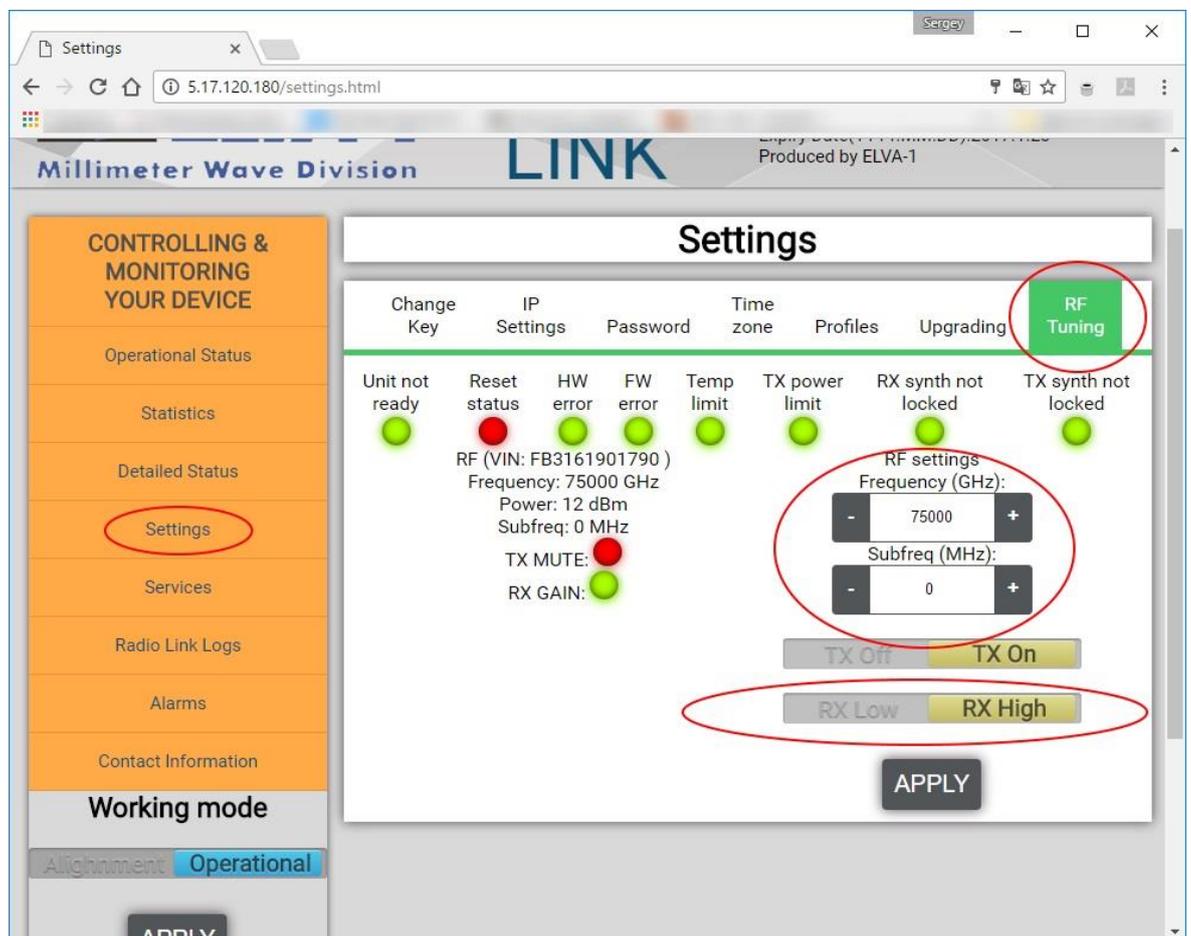


Figure 17: RF Tunings tab

There is a number of color indicators in **RF Tuning** tab, all there are for technical support information.

If you need to adjust transmitter (Tx) and receiver (Rx) center frequencies (aka nominal frequencies), do the following (Fig.17):

- Click + or – on the main **RF Settings** frequency slider. The frequency will be changed in 125 MHz steps. Adjust sub-frequency slider if needed. The frequency will be changed in 31 MHz steps.
Mind that you can change Tx center frequency only, while Rx of the same radio will be adjusted automatically and always be at 10 GHz gap.
- When get the required center frequency value, click **APPLY** button.
- Repeat this procedure for another radio considering 10 GHz gap between Tx frequency for **Lo** and **Hi** radios.

Example: You need to set Tx center frequency for **Lo** radio to 72.5 GHz and therefor Tx center frequency for **Hi** radio to 82.5 GHz (i.e., allocate 72.5 / 82.5 GHz band).

To do this,

1. Login to **Lo** radio.
2. Click **Settings** menu, enter **RF Tuning** tab and click “–” on the main **RF Settings** frequency slider so many times until slider shows 72500 MHz (72.5 GHz). Click **APPLY** to confirm. That’s all with this first radio.
3. Login to **Hi** radio.
4. Click **Settings** menu, enter **RF Tuning** tab. Because your **Lo** radio receiver (Rx) center frequency automatically became 82500 MHz (82.5 GHz) at above point 2., you need also set Tx center frequency for **Hi** radio to same 82500 MHz (82.5 GHz). Click “+” on the main **RF Settings** frequency slider so many times until slider shows 82500 MHz (82.5 GHz). Click **APPLY** to confirm. That’s all with this second radio.
5. Congratulations – your link now allocates 72.5 / 82.5 GHz band.

If you need to switch transmitter (Tx) OFF, click **Tx Off** button, then click **APPLY** to confirm. Alternatively, click **Tx On** button, then click **APPLY** when you need to get transmitter ON again.

Please mind this setting **Tx On** / **Tx Off** has been done for one radio only. Re-login and repeat this for another radio if needed.

By factory default, transmitter (Tx) is always ON.

If you need to switch receiver (Rx) gain level to low, click **Rx Low** button, then click **APPLY** to confirm. Alternatively, click **Rx High** button, then click **APPLY** when you need to get receiver (Rx) gain level to high again.

Don’t forget to re-login and repeat this for another radio.

By factory default, receiver (Rx) gain level is always high.

7 SERVICES MENU

Services window allows Admin to get access to radio by different network protocols.

Note. While it is possible to use FTP protocol of web browser and built-in Telnet client (command prompt) of Windows, more advanced software like FileZilla (FTP client) and PuTTY (Telnet client) are recommended as they allow better flexibility and work under all Windows, Linux, Mac OS X.

7.1 FTP Tab

FTP tab allows to setup new password for FTP access to radio file storage by FTP (Fig.18). This functionality may be used to download log files of the radio for the purpose of technical support.

Please mind built-in Telnet client in Windows 7/8/10 (in cmd - command prompt) is disabled by default. To activate it, check manual at Microsoft website, or ask Google. It is recommended to install FileZilla (FTP client) on Admin computer for access to radio using credentials listed below.

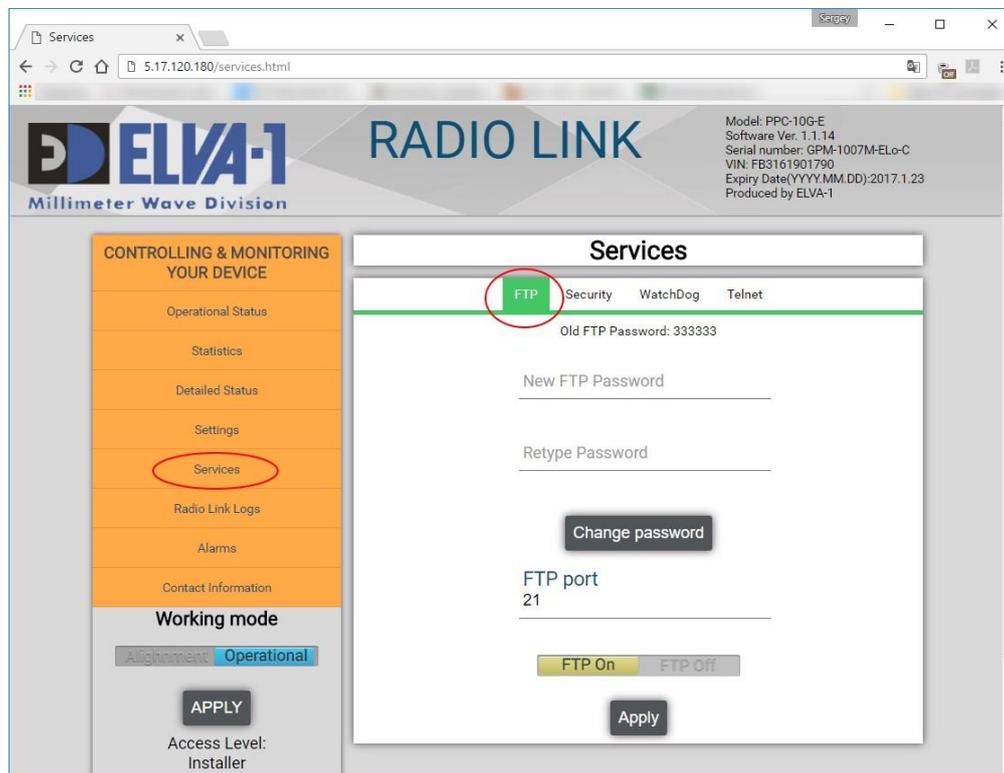


Figure 18: FTP tab

Default credentials for FTP client are the following,

- Login: ftpuser (do not change this value)
- Password: 333333
- FTP port: 21 (do not change this value)
- Server type: FTP (do not use "SFTP")
- Security type: Without encryption
- Login type: Normal (do not use "anonymous")

To change password for FTP access, do the following,

- Type new password, Latin characters and digits only, 6 - 20 symbols long,
- Re-type password,
- Click **Change password** button.

It is possible fully disable FTP access to radio by clicking FTP Off button, then Apply button.

By factory default, FTP access to radio is ON.

Re-login and repeat this procedure for another radio if needed. **Lo** and **Hi** radios could have same or different FTP passwords accordingly the choice of Admin.

For more instruction on downloading log files by FTP, contact your supplier's technical support. To restore forgotten FTP password to its default value, also contact technical support.

7.2 Telnet Tab

Telnet tab allows to setup new password for Telnet access to manage radio remotely (Fig.19). This functionality may be useful to Admin with wide experience of command prompt usage.

It is recommended to install PuTTY or other advanced Telnet client on Admin computer for access to radio using Telnet credentials listed below.

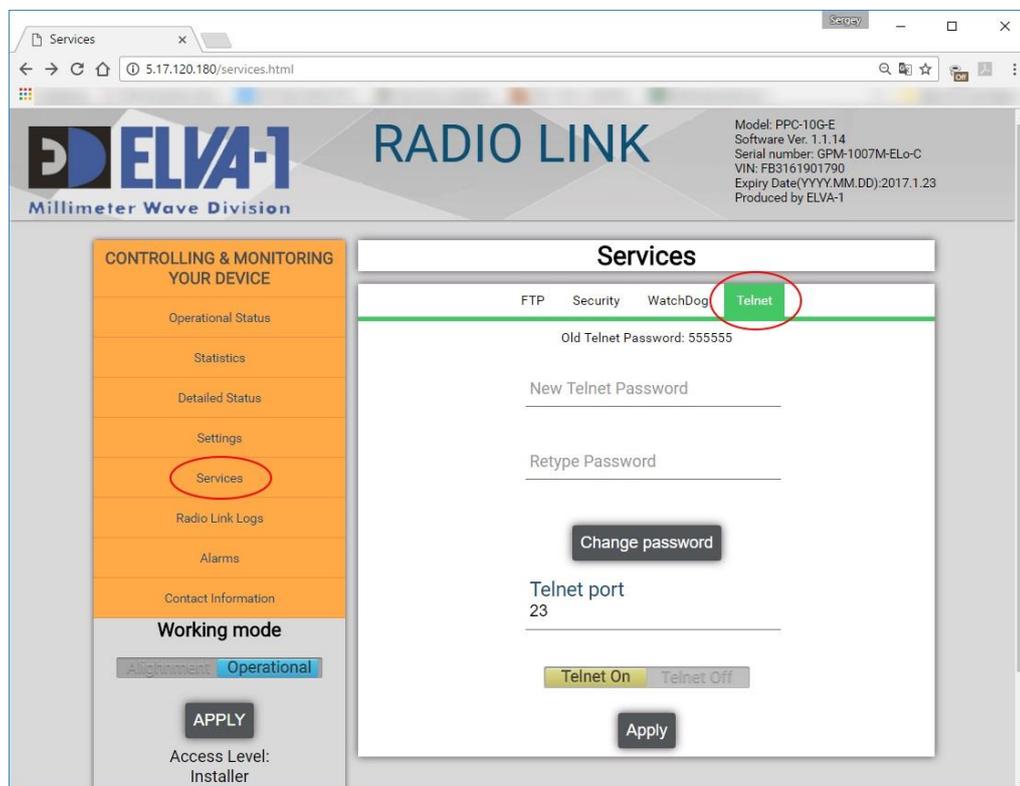


Figure 19: **Telnet** tab

Default credentials for Telnet client are the following,

- Login: user (do not change this value)
- Password: 555555
- Telnet port: 23 (do not change this value)

To change password for Telnet access, do the following,

- Type new password, Latin characters and digits only, 6 - 20 symbols long,
- Re-type password,
- Click **Change password** button.

It is possible fully disable Telnet access to radio by clicking **Telnet Off** button, then **Apply** button.

By factory default, Telnet access to radio is ON.

Re-login and repeat this procedure for another radio if needed. **Lo** and **Hi** radios could have same or different Telnet passwords accordingly the choice of Admin.

For more instruction on managing radios by Telnet, contact your supplier's technical support.

To restore forgotten Telnet password to its default value, also contact technical support.

7.3 Security Tab

Security tab allows to build White list or Black list for IP addresses, where radios allowed or prohibited to access from (Fig.20).

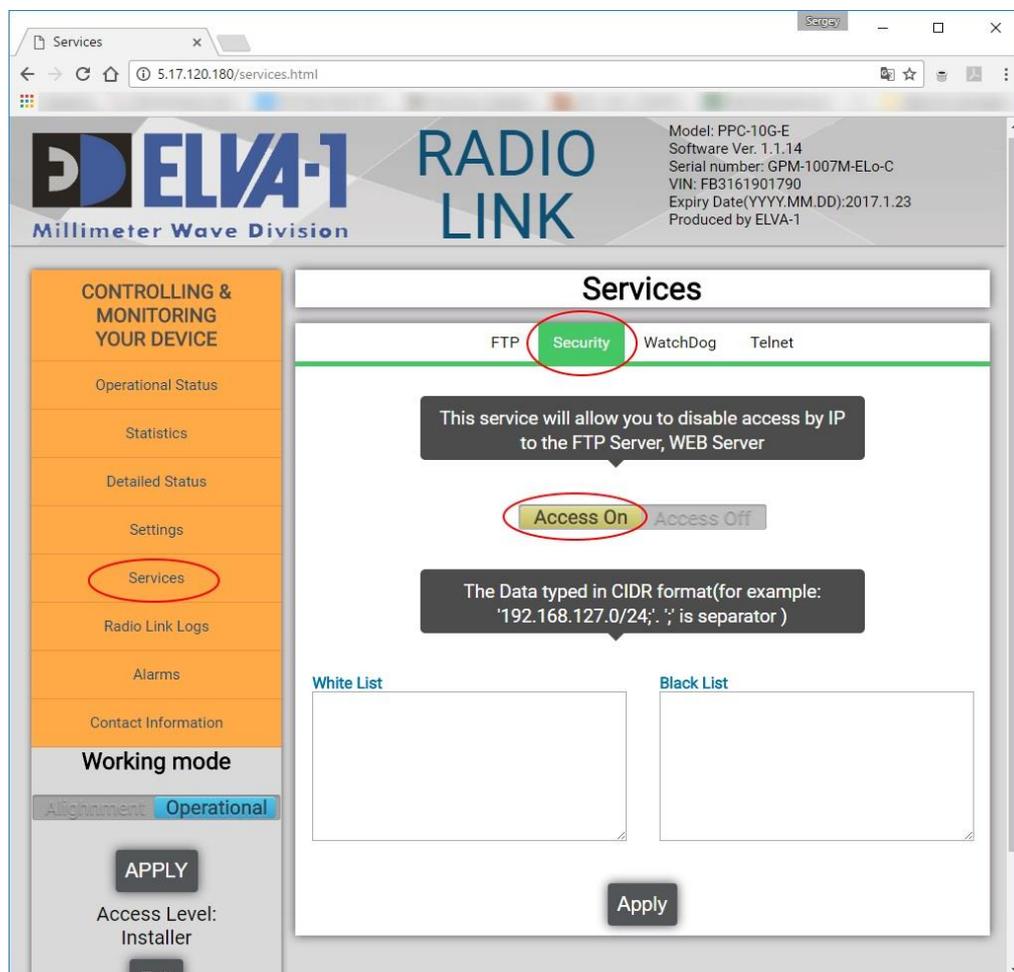


Figure 20: **Security** tab with **Access On** button activated

By factory default, security feature is OFF. To build White list or Black list of IP addresses, activate this feature by doing the following,

- Click **Access On** button, then **Apply** button.
- Build White list or Black list accordingly to the rules displayed on the window.

Note. It is possible to build **only** White List or **only** Black List of IP addresses by following rules,

- For non-empty White List, only IP addresses listed here are allowed to access radio from.
- For non-empty Black List, all IP addresses are allowed to access to radio from, except IP addresses listed here in Black List.

Re-login and repeat this procedure for another radio if needed. **Lo** and **Hi** radios could have the same or different White List / Black List accordingly the choice of Admin.

For more instruction on building White List / Black List, contact your supplier's technical support.

7.4 WatchDog Tab

WatchDog tab allows to run firmware operability monitoring for critical errors. In case of error, the radio will be automatically reboot (Fig.21). This auto rebooting will save all previous settings, – the same way like manual rebooting by clicking **Reboot** button at bottom left part of the window.

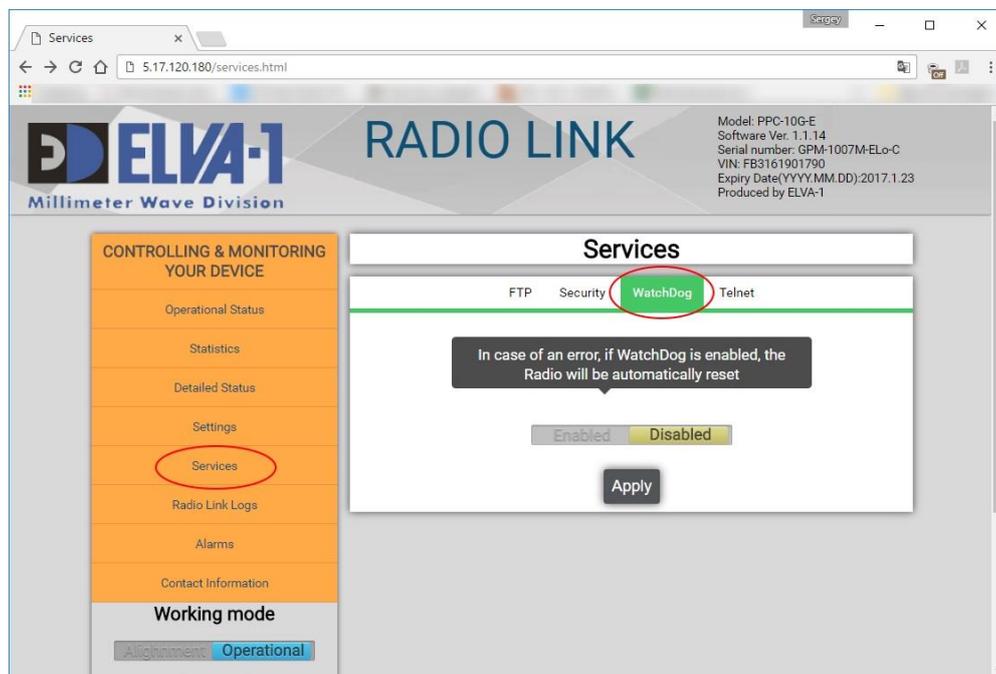


Figure 20: **WatchDog** tab

By factory default, **WatchDog** monitoring feature is OFF. To activate this feature, do the following,

- Click **Enabled** button, then **Apply** button.

Re-login and repeat this procedure for another radio if needed. **Lo** and **Hi** radios could have the same or different **WatchDog** status accordingly the choice of Admin.

For more instruction on **WatchDog**, contact your supplier's technical support.

8 RADIO LINK LOGS MENU

Radio Link Logs window allows Admin to view and manage log files on radio availability and its parameters values over some periods of time (time slots).

Log files are written automatically, each one for period of one day.

8.1 Graph Tab

Graph tab allows to view graphical representation of parameters values over time slots (Fig.22).

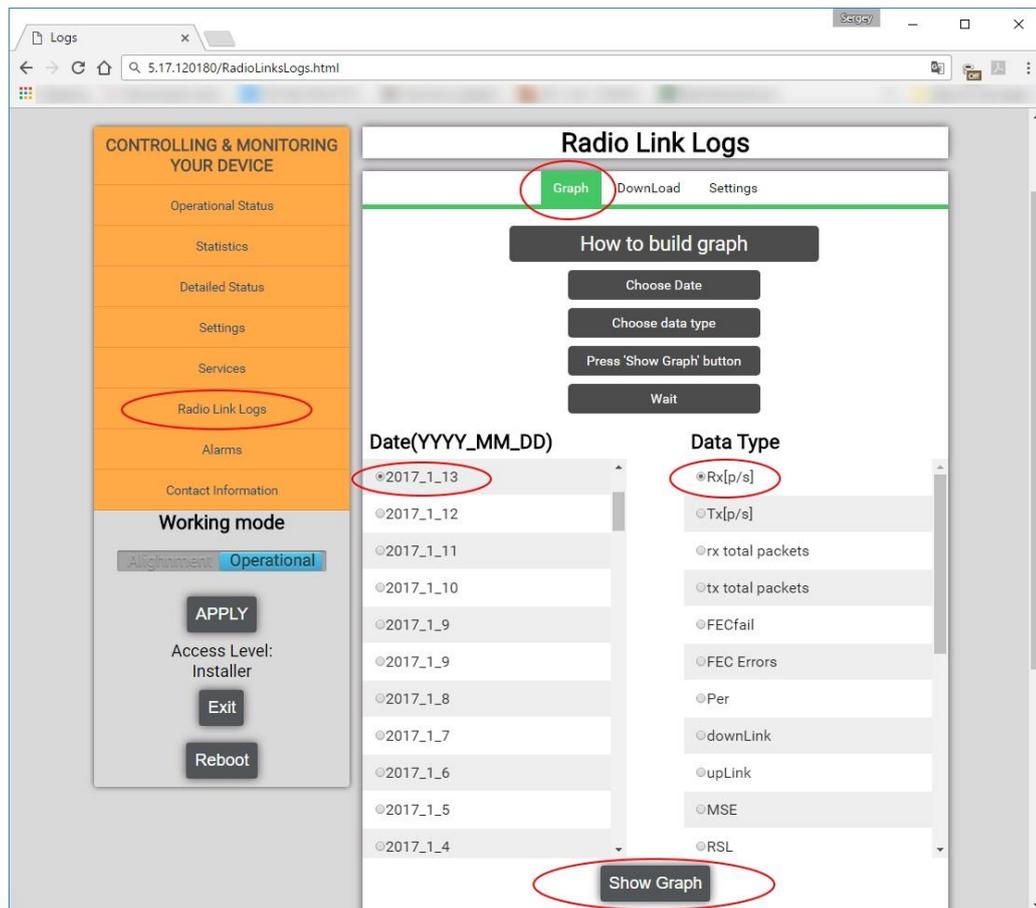


Figure 22: **Graph** tab

Log files are written automatically over time and listed in the left column at this window.

For every log file from the list in the left column, it is possible to choose one parameter from right list to build a graph.

Do the following,

- Choose **Graph** tab,
- Choose the log file from the list named **Date (YYYY_MM_DD)**, only one log file could be chosen at every moment of time,
- Choose parameter from the list named **Data Type**, only one parameter could be chosen at every moment of time,
- Click **Show Graph** button and wait for a couple of seconds.

The graphical representation of chosen parameter value over time will be displayed below in this window. Repeat for other log files and other parameters if needed.

8.2 Download Tab

Download tab allows Admin to see the whole list of currently available log files and download some or all of them (Fig.23). Please mind that log files could also be downloaded by FTP, as described above in 7.1 section.

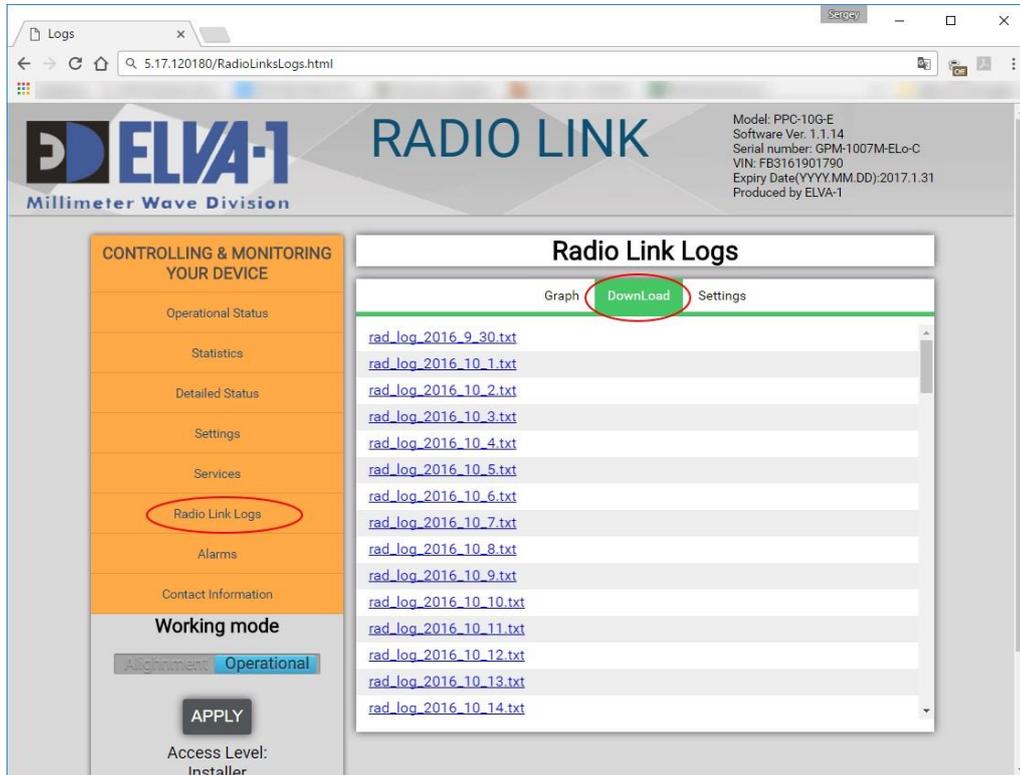


Figure 23: **Download** tab

To download log file, just click on it.

By default, log files are in .txt format to be opened in Notepad, that is not convenient to analyze.

To analyze the log file, it is recommended to import this log file to Excel spreadsheet to build graphics and run various data sorting (Fig.24). Use “import from text” feature of Excel menu.

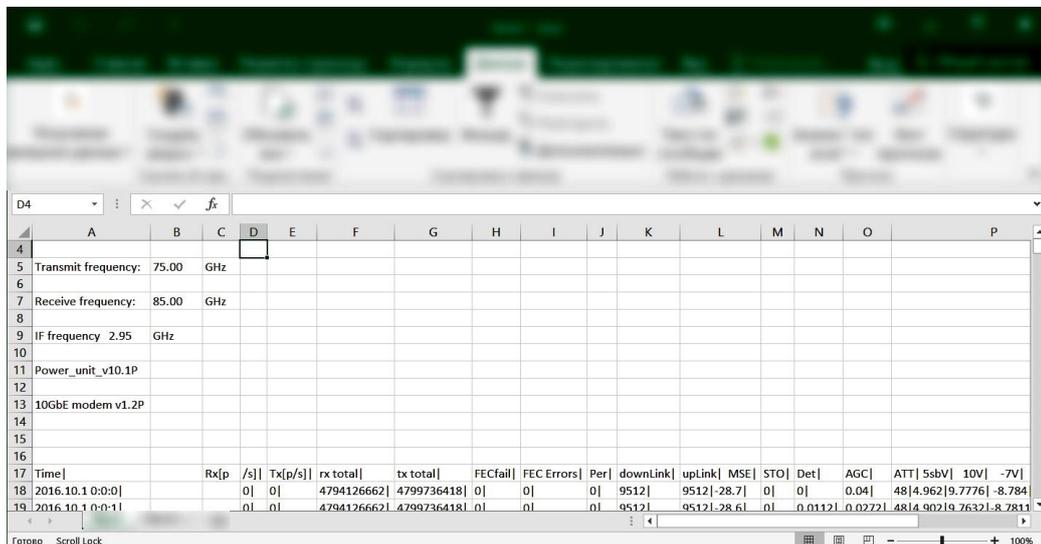


Figure 24: Log files could be exported to Microsoft Excel to analyze

8.3 Settings Tab

Settings tab of **Radio Link Logs** menu is just complimentary to **Download** tap.

By default, log files are in .txt format and their sizes are big enough – 10 MB and more.

With **Settings** tab, it is possible to compress log files into .zip format for faster downloading (Fig.25).



Figure 25: **Settings** tab of **Radio link Logs** menu

To compress log files to .zip format, choose **On** radio-button and press **Apply** button.

Note. Please mind, all already available log files listed in **Download** tab, now will be converted to .zip, also future log files will also be in .zip.

If later decided to return to uncompressed .txt format by choosing **Off** radio-button and pressing **Apply** button, all already available log files listed in **Download** tab, will stay converted to .zip, but only new log files will be in .txt format.

Re-login and repeat this procedure for another radio if needed. Log files for **Lo** and **Hi** radios could have the same or different **Settings** status (uncompressed / compressed) accordingly the choice of Admin.

For more instruction on viewing and managing log files, contact your supplier's technical support.

9 ALARMS MENU

Alarms window allows Admin to view log files on few critical radio parameters, as they come out of limits.

Currently, the functionality of **Alarms** window is under re-development.

The description of **Alarms** window will be available soon.

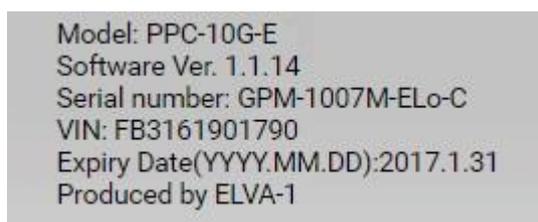
10 CONTACTING TECHNICAL SUPPORT

For technical support help, contact your supplier support personnel first.

Some issues may be escalated to ELVA-1 to email support@elva-1.com

When contacting technical support, either your supplier or ELVA-1, prepare the following information about reported incident with the PPC-10G link,

- Identification information for both radios of the link, displayed in the top right part of the Web Interface window, see example in Fig. 26 and its description in section 3,



```
Model: PPC-10G-E
Software Ver. 1.1.14
Serial number: GPM-1007M-ELo-C
VIN: FB3161901790
Expiry Date(YYYY.MM.DD):2017.1.31
Produced by ELVA-1
```

Figure 26: Example of Identification information

- Description of the problem written as detailed as possible,
- Attach log files for dates associated with the problem to e-mail to technical support, or provide them remote access to your radios. See section 8.2 how to download log files.
For remote access enabling, assign static IPs to both radios and allow remote access to these IP addresses.
- Provide e-mail and telephone number of Admin whom to be contacted by technical support personnel.

In case of forgotten passwords please contact your supplier's technical support. They will restore factory default passwords, so you can change it to actual one again.

Letter of Authorization may be required from your CEO or CIO to confirm this request for password recovery.