



VECTOR®

ROTON INSTALLATION AND USER'S MANUAL

VECTOR
Krzemowa 6, 81 - 577 Gdynia, Poland
tel. +48 / 58 77 17 000, fax +48 / 58 77 17 100
www.vector.net

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1. Basic safety instructions

1.1 On manual

This manual contains information necessary for proper installation and usage of the ROTON manufactured by VECTOR Sp. z o.o. with its registered office in Gdynia, Poland (hereinafter respectively: ROTON and VECTOR).

VECTOR reserves the right to make changes in this manual without prior notice. In case of any questions concerning ROTON you may contact us:

(address)	VECTOR Sp. z o.o. ul. Krzemowa 6 81-577 Gdynia
(telephone/fax)	tel.: +48 58 / 77-17-000 fax: +48 58 / 77-17-100
(e-mail)	vector@vector.net

This manual is for personnel responsible for installing, setting up, monitoring and maintaining ROTON. Only appropriately qualified and skilled personnel should attempt to install, operate, maintain, and service the product.

1.2 On copyright

VECTOR Sp. z o.o. 6 Krzemowa Street, Gdynia, Poland

No part of this manual may be reproduced or communicated to the public by any means or in any form, or distributed by sale or otherwise, for any purpose, without the express prior written consent of VECTOR.

VECTOR assumes no responsibility for errors or omissions that may appear in this manual. This manual may not and shall not to be construed as conferring any license or right under any copyright or patent.

2. Important safety instructions

2.1 On General

VECTOR warrants proper functioning of ROTON as long as ROTON is operated in compliance with this manual.

VECTOR warrants that ROTON meets applicable safety standards. ROTON has been designed and tested to comply with applicable safety, laser safety, and EMC regulations, codes, and standards to ensure safe operation in its intended environment. As this is a Class B Information Technology Equipment it may cause radio interference (CENELEC Statement).

However VECTOR shall not be held liable under the warranty or otherwise for any personal injury or equipment damage resulting from improper installation or operation of ROTON. The same applies in case of any modifications or alterations performed by any third party to VECTOR.

VECTOR strongly recommends to read this manual before installing ROTON.

2.2 On inspection

VECTOR recommends to inspect ROTON before installation. Should any problems arise during the inspection, VECTOR advises contact with its sales office for assistance.

Retention of shipping boxes is advisable.

2.3 On storage

ROTON can be stored without any degradation of parameters for a period of 18 months after manufacturing.

Standard atmospheric conditions of storage according to the IEC60068-2-48 norm: temperature 15 ÷ 35°C, humidity 25 ÷ 70%, pressure 860 ÷ 1060hPa.

2.4 On Modification

It is not allowed to make modifications to ROTON on pain of losing a claim.

Furthermore modifications may degrade the level of protection built into ROTON, putting people and property at risk of injury or damage. Maker of any modifications exposes him/herself to the penalties arising from proven non-compliance with regulatory requirements and to civil litigation for compensation in respect of consequential damages or injury.

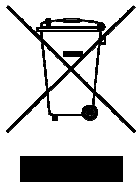
3. Overview

3.1 Introduction

Described in the document ROTON concentrating multiple functions in 1U structure, supports dual-power redundancy backup which makes it an universal solution. ROTON is particularly dedicated to be used at edge locations of cable operator's network and also in application of sale of television offer to hotels, hospitals etc.



ROTON meet CENELEC, EN 60950-1, EN 55022, EN 55024 requirements and ensure electromagnetic compatibility and user safety.



This symbol on the device indicates that the device should not be disposed of as normal household garbage. Do not dispose of your device as unsorted municipal waste. The device should be handed over to a certified collection point for recycling or proper disposal at the end of its life. For more detailed information about the recycling of the device or batteries, contact your local city office, the household waste disposal service, or the retail store where you purchased this device.

The disposal of this device is subject to the Waste from Electrical and Electronic Equipment (WEEE) Directive of the European Union (2002/96/EC). The purpose for separating WEEE and batteries from other waste is to minimize any environmental impact and health hazard due to the presence of hazardous substances.

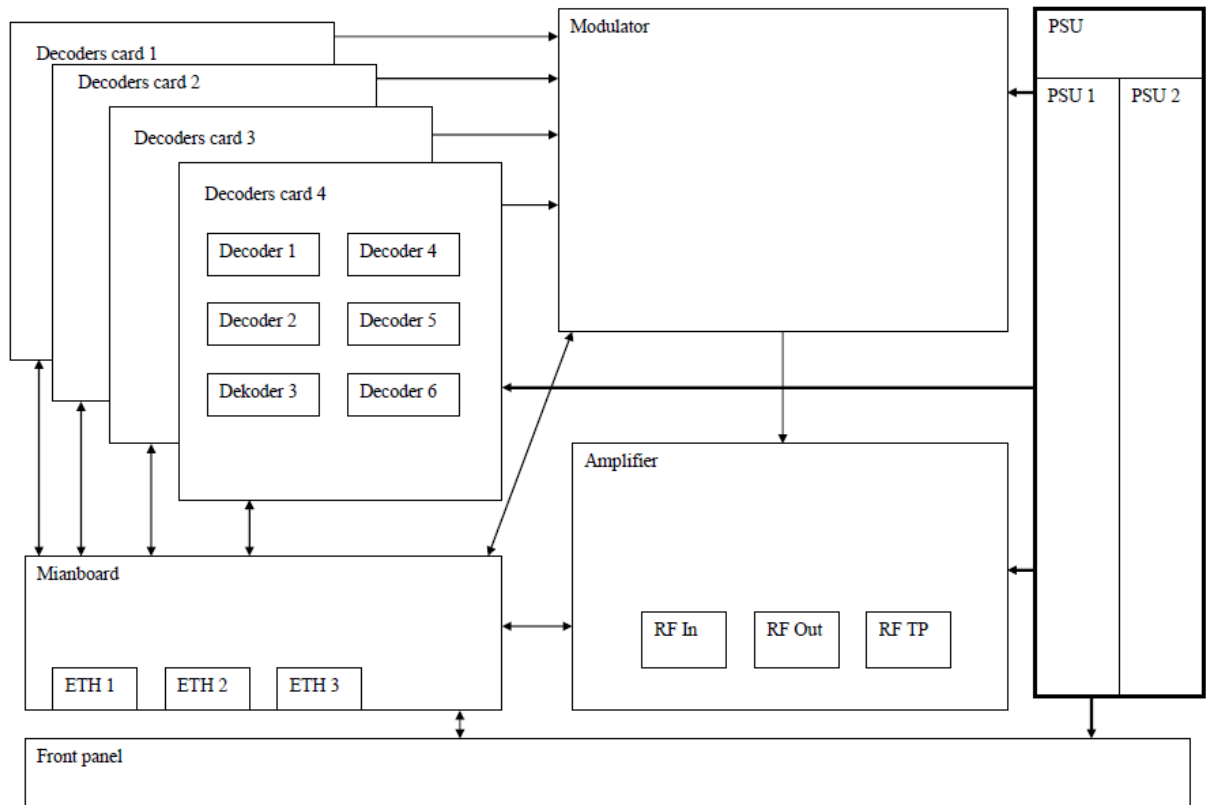
3.2 Main ROTON features

Roton the most important features are as follows:

- standard 19' housing
- IP input with bandwidth up to 450 Mbps
- PAL/SECAM outputs
- 'A2/NICAM' Stereo Audio
- software oriented architecture
- significant RF management simplification
- multi-format modulation from 1 RF output
- flexible output configuration
- not adjacent frequency of output channels
- embedded WEB server
- power supply redundancy
- advanced IP redundancy feature
- scheduler feature

3.3 Internal ROTON architecture

Roton consists of four decoder boards, main-board, amplifier and modulator – its internal architecture can be presented as follows:

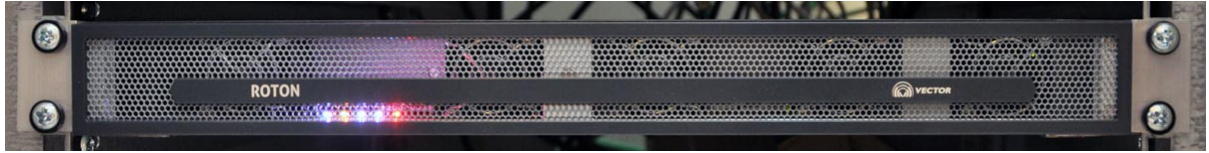


These elements are responsible for the following:

- **decoder's board** – each board is having six decoders. They're responsible for decoding transport streams from MPEG-2/4 to PAL/SECAM
- **main-board** – communication, management, maintenance and FW sending to all internal elements, receiving and multiplexing transport streams
- **modulator** – responsible for output signal modulation
- **amplifier** – gain, attenuation and correction of output signal/loop through input
- **front panel** – fan management, device status signalization (via LED indicators)
- **PSU** – redundant power supply for the whole device

4. ROTON mounting

ROTON should be mounted on rack shelf or rails (cannot be left only on its rack mount ears).



In addition appropriate air flow should be provided (heat dissipation):

- active – fans in rack
- passive – well-ventilated room

To avoid overheating, the temperature inside ROTON should not exceed the internal limit value 85°C.

5. First steps

5.1 ROTON start procedure

After connecting to the power supply the device starts the procedure of working. It is based on loading firmware and configuration file for each module.

This procedure takes up to 6 minutes - only after this time the device is fully functional and controllable.

It should be connected with 2 cables to 230V.

When only one cable is connected, the device will operate, however an audio alarm will be on (it can be turned off by pressing a red button on the power supply close to the powering points). Additionally, in case of the failure of one of the power suppliers, dual power supply provides continuous operation of the device. A change of a speed rotation is normal when the device starts and operates. The speed of fans changes due to the external conditions (which have the influence on the temperature and an air flow) and due to the situation when the device is loaded.

5.2 LED indicators

Front Panel is movable. Under the front panel there are five replacement fans and there is one button. On the front panel there are five LED indicators.

The meaning of the LEDs (from left to right) is shown in the following table:

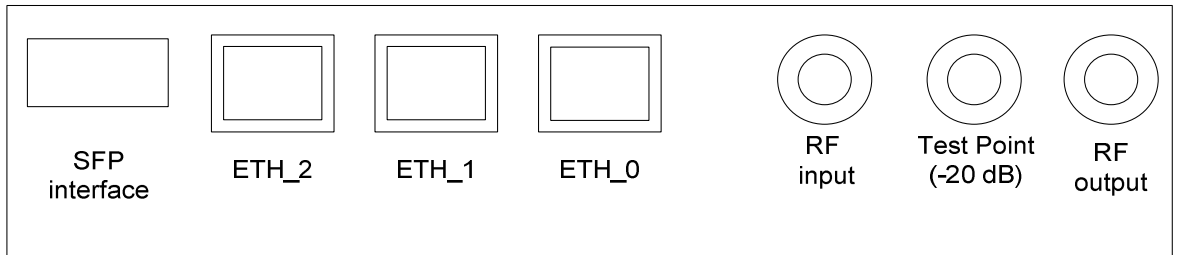
<p>First LED indicator</p>	<p>If the LED color is RED – ROTON is in an emergency mode and should work (remux, decode and send PAL signal), but it is not possible to make changes. It is recommended to export a configuration and reset to a factory.</p> <p>If the LED color is ORANGE – ROTON works in a factory mode. The software should be loaded and set to work.</p> <p>If the LED color is BLUE – the system works appropriately.</p>
<p>Second LED indicator</p>	<p>If the LED color is ORANGE – the IP addresses are set to the default ones.</p> <p>If the LED color is BLUE – the IP addresses were changed to the non-default.</p> <p>If the LED color is RED – there is a configuration error, the network may work incorrectly.</p>
<p>Third LED indicator</p>	<p>If the LED color is blue – this is unused LED.</p>
<p>Fourth LED indicator</p>	<p>If the LED color is blue – this is unused LED.</p>
<p>Fifth LED indicator</p>	<p>If the LED color is BLUE – there are no active alarms.</p> <p>If the LED color is RED – there is at least one alarm.</p>

5.3 ROTON IP interfaces:

The IP interfaces are located on the device rear panel and are as follows:

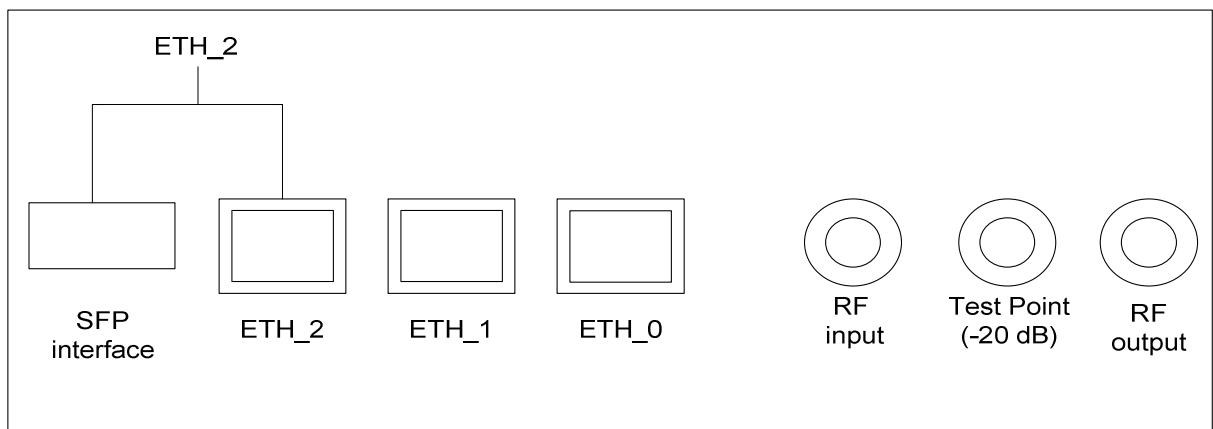
- ETH_0 interface – dedicated to the device management
- ETH_1 interface – dedicated to the IP streams
- ETH_2 and SFP interfaces – dedicated to the IP streams

In order to locate each of them, please refer to the screen below:



5.3.1 SFP and ETH_2 internal connection:

SFP and ETH_2 inputs are connected internally – from the network point of the view are seen as a one interface:



ETH_2 is a preferred input port - if a connection is established (link-up), ROTON does not take into account any traffic from SFP interface. It happens only when ETH_2 link is down and traffic connected to the SFP interface.

Please keep in mind both ETH_2 and SFP interfaces are dedicated to the IP streams.

5.3.2 IP interface default addresses:

The following IP addresses are default ones:

ETH_0 – 192.168.100.100

ETH_1 – 192.168.0.1

ETH_2 – 192.168.1.1

5.3.3 IP interfaces open ports

The following ports are open on every IP port:

31337 – dedicated to SSH

161 – dedicated to SNMP

80 – dedicated to HTTP protocol (WEB access)

5.3.4 IP interfaces link speed

The speed of each IP interface is as follows:

ETH_2 – 1 Gb/s

ETH_1 – 1 Gb/s

ETH_0 – 100 Mb/s

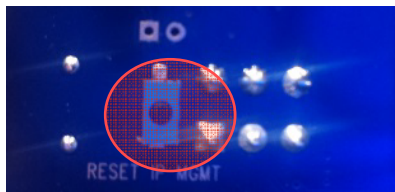
5.3.5 Forbidden IP Address

The following addresses are reserved for ROTON internal communication and cannot be assigned to the IP interfaces:

- 192.168.2.0/24
- 172.16.0.0/24

5.3.6 Reset to the default IP addresses

IP reset button is located under the front panel and is dedicated to reset the IP addresses on whole Ethernet interfaces to default ones:



You should press the IP reset button for around 5 seconds until the second LED color will change to the orange one (which means that the IP addresses were set to the default ones).

After that, it is necessary to reboot the device.

5.4 Roton SD card input

SD card is not supported by the device but its insertion has no influence on the device work.

5.5 Connecting to the device

In order to manage the device you should establish direct connection between your computer and ROTON **ETH_0** interface.

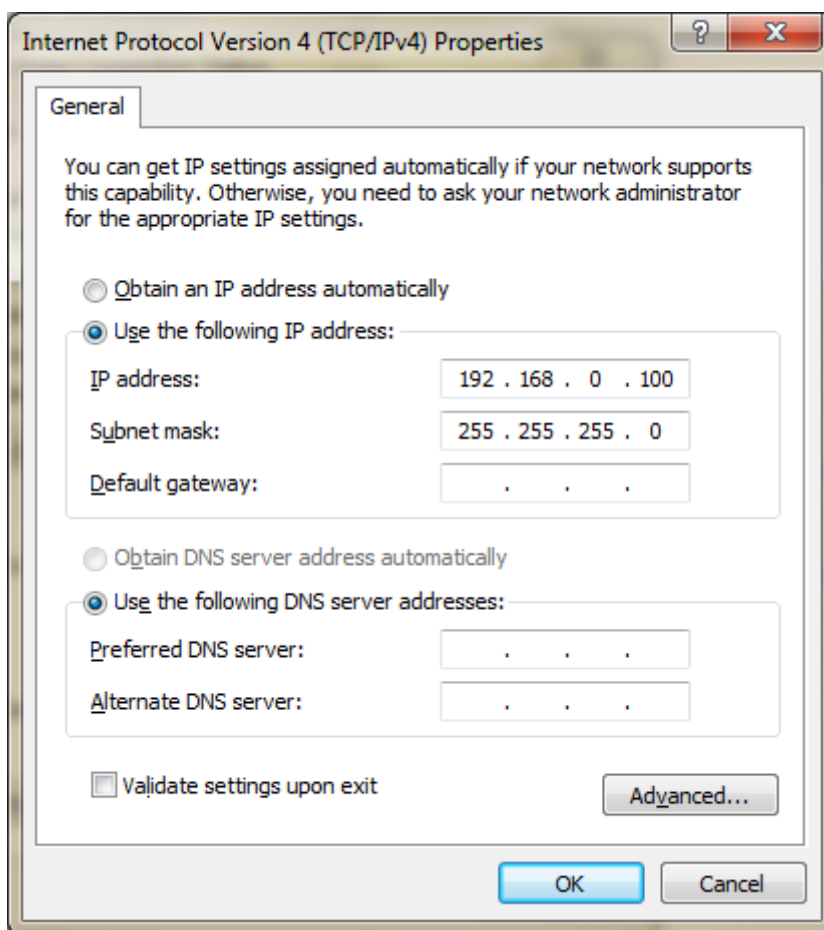
ETH_1 and ETH_2 are dedicated for the IP input streams.

Please identify correct input accordingly to the screen below:



Default IP address of ETH_0 port is set to **192.168.100.100**

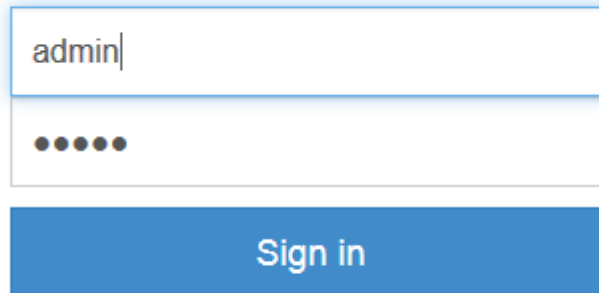
In order to establish communication between ROTON and your computer you need to configure static IP of your Ethernet card to be in the same network (i.e. 192.168.100.150), please see the screen below:



Verify if the communication was set correctly by pinging the **ETH_0** ROTON interface from your computer.

5.6 Login to the device

You should be able to access the login page by entering the IP address **192.168.100.100** in your web browser:



The image shows a login form with two input fields. The top field contains the text 'admin|'. The bottom field contains five black dots representing a masked password. Below the input fields is a blue button with the text 'Sign in' in white.

You can log in as one of two possible users:

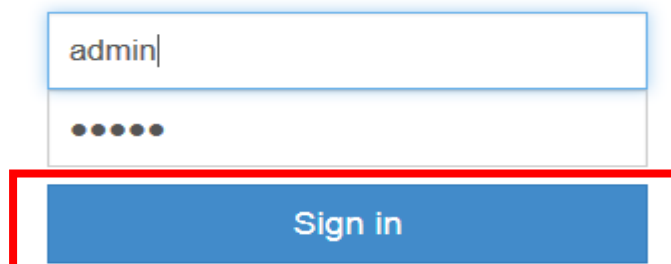
- admin – having all possible rights
- user – having only read access and cannot change any configuration settings

Default credentials for admin:

username: **admin**

password: **admin**

Please press 'Sign in' button in order to access the device:



This image is identical to the one above, showing the login form with the username 'admin' and a masked password field, and a 'Sign in' button. In this version, the 'Sign in' button is highlighted with a red rectangular border.

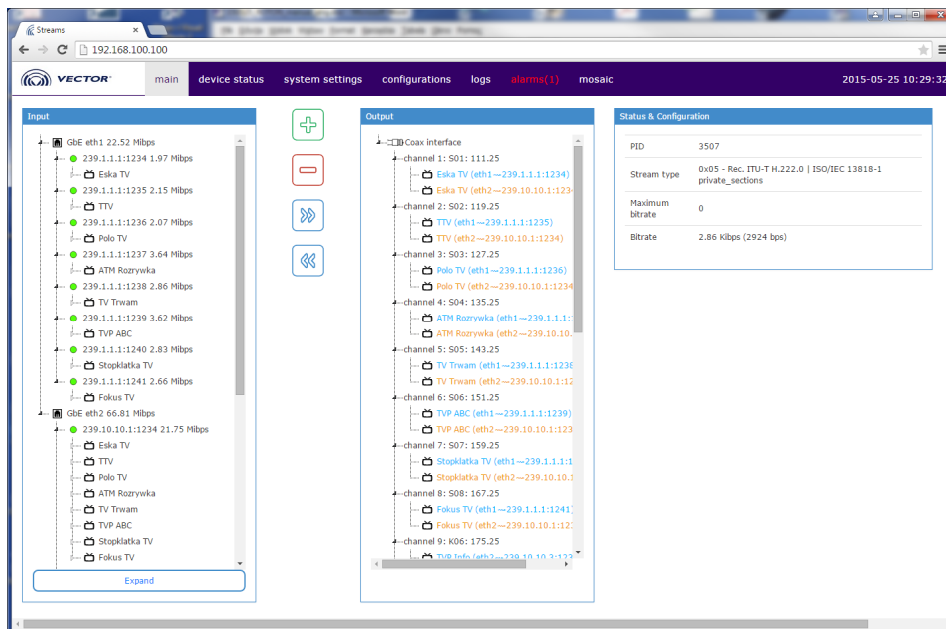
No particular web-browser is recommended, however it's strongly advised to use one of the most popular which should be updated to the newest version (ex. IE 10, Opera 29.0, Chrome 42.0.)

6. Roton WEB interface

Whole device thanks to embedded Web Server can be managed via simple and intuitive Web interface. It consists of seven main sections (explained in details in the next chapters) which can be accessed by selecting the right one on the top menu bar.

6.1 Main window:

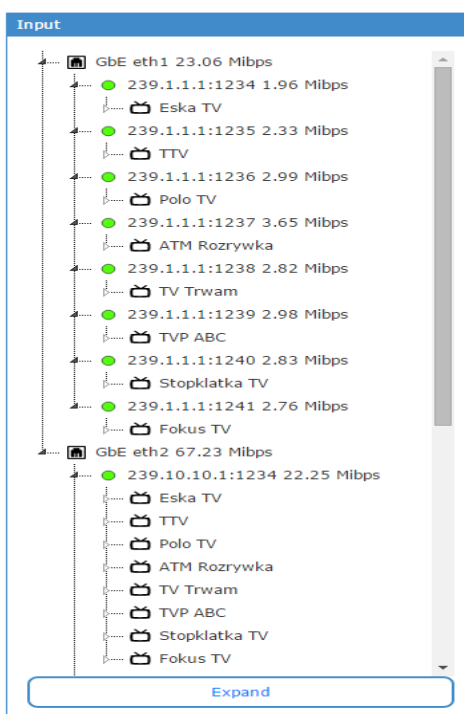
After logging to the device, the main window will be displayed.



The section is dedicated to define multiplexing settings and consists of three parts:

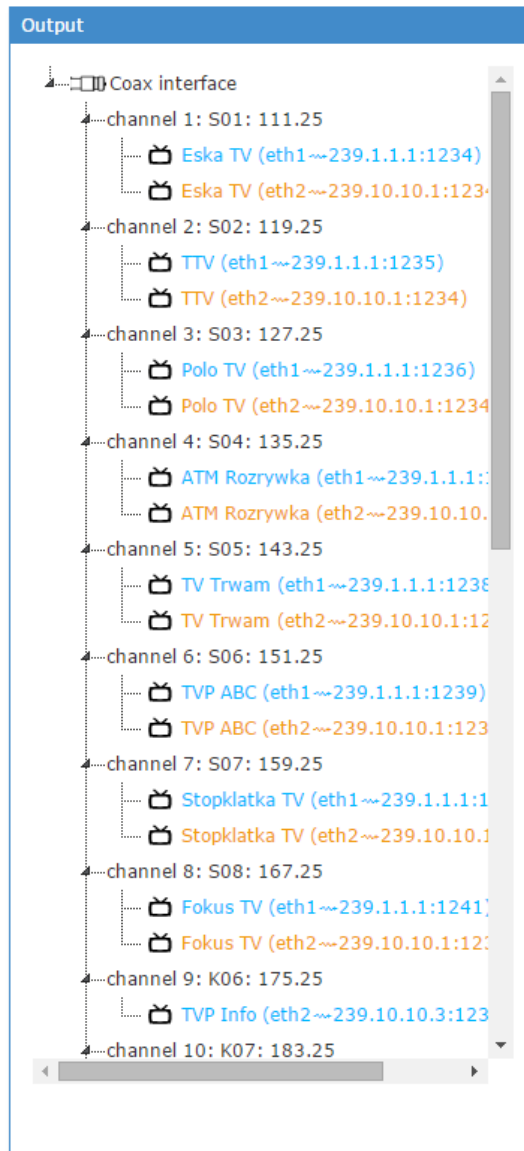
1) IP inputs:

in this part are displayed all defined IP streams with their PIDs as well as their bitrates which are constantly monitored:



2) output channel configuration


In this part device output can be defined which is represented by twenty-four channels:



3) RF parameters settings configuration

In this part the exact output channel settings can be defined.

Status & Configuration

Decoder screenshot 

Output frequency

Carrier level

Colour system

Audio FM level

Audio NICAM level

Audio

Audio switch

Audio volume

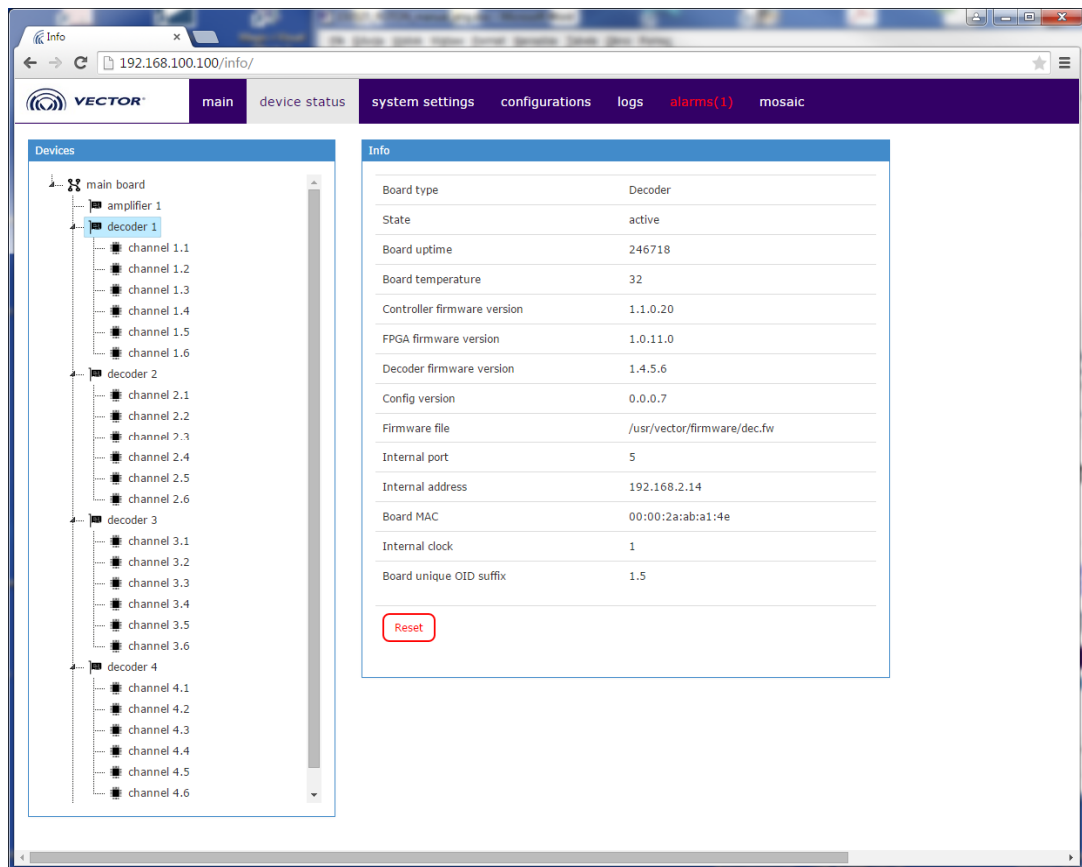
Picture format

Scaling method

OSD

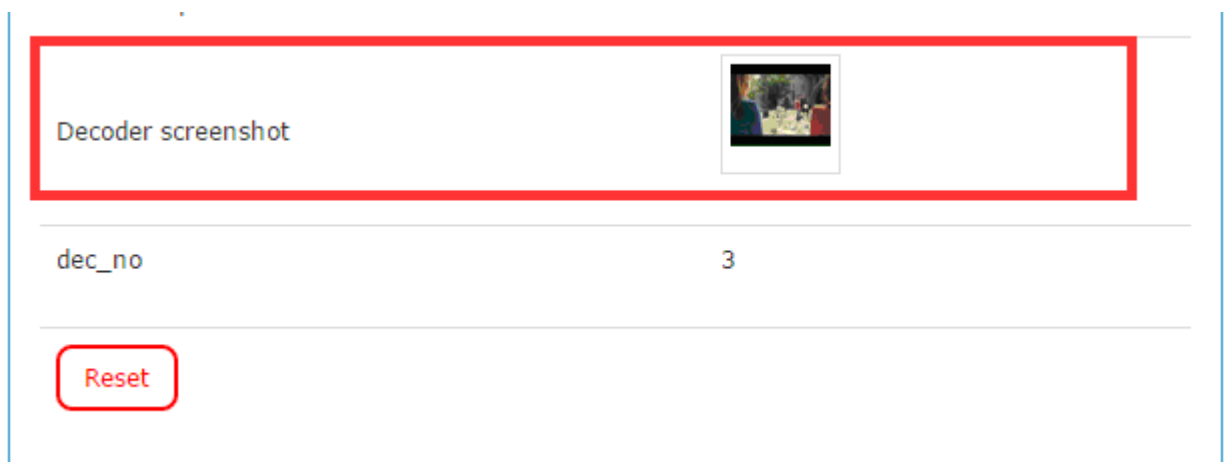
6.2 Device status window:

In this section you can find the different information related to ROTON internal modules such as four decoders, upconverter and amplifier:



In addition, there is a possibility to reset the individual modules and device's decoders independently (without a necessity of resetting the whole ROTON).

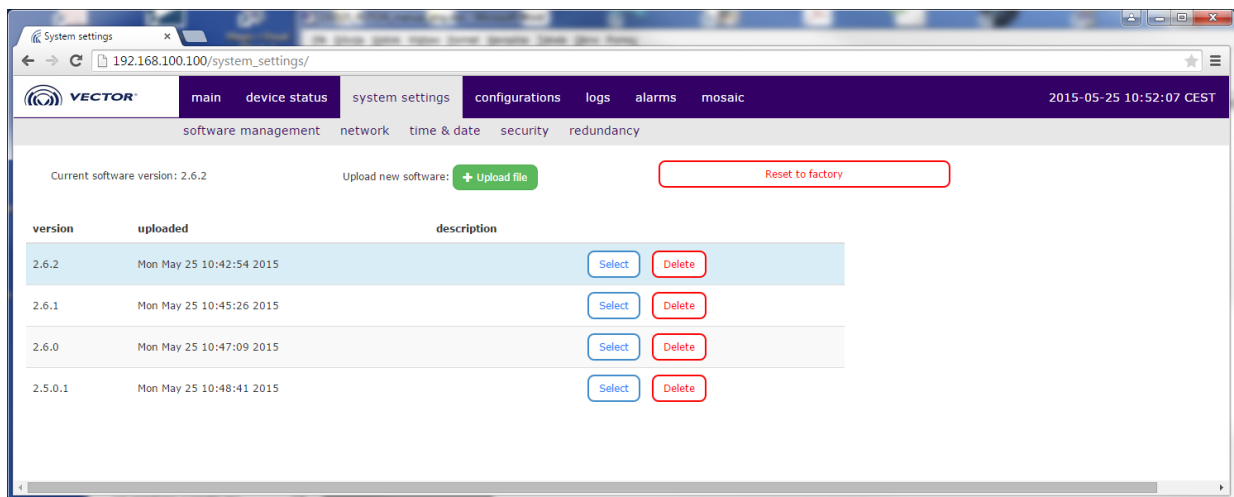
For each decoder there is a picture of replayed (decoded) program:



6.3 System settings window:

This is the part where ROTON configuration can be managed. It consists of the following parts:

- software management – section where correct software can be uploaded and chosen
- network – section where addresses of each ETH interfaces can be set
- time & date – section in which current time and data can be set/changed
- security – part where current password can be changed
- redundancy – place in which additional options related to redundancy feature can be set.

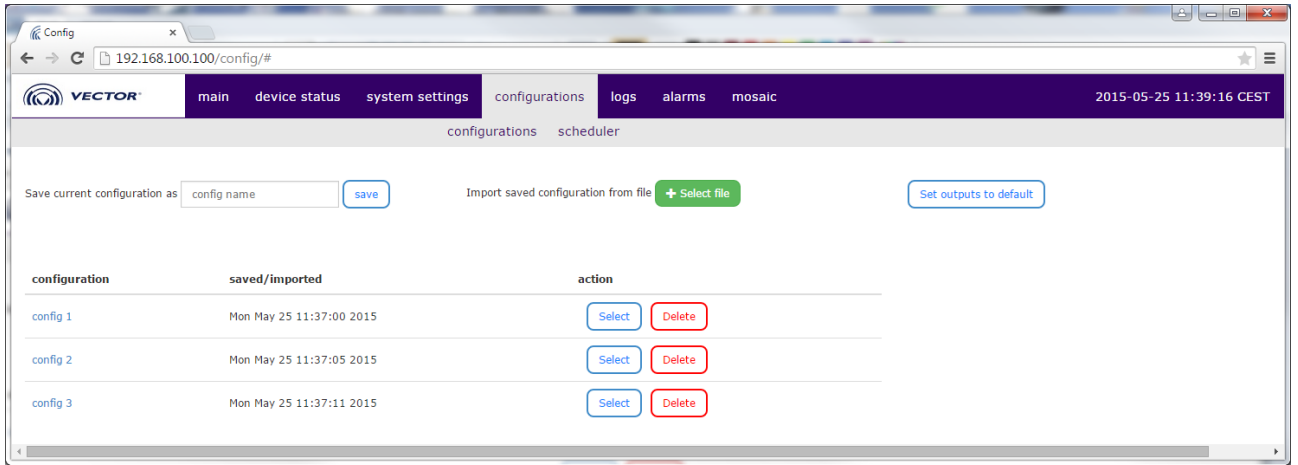


6.4 Configurations window:

In this section you can save and load the configuration which is set in the main page (remuxed services, configuration for the output streams) and choose the configuration which has to be repeatedly loaded.

This section contains three parts:

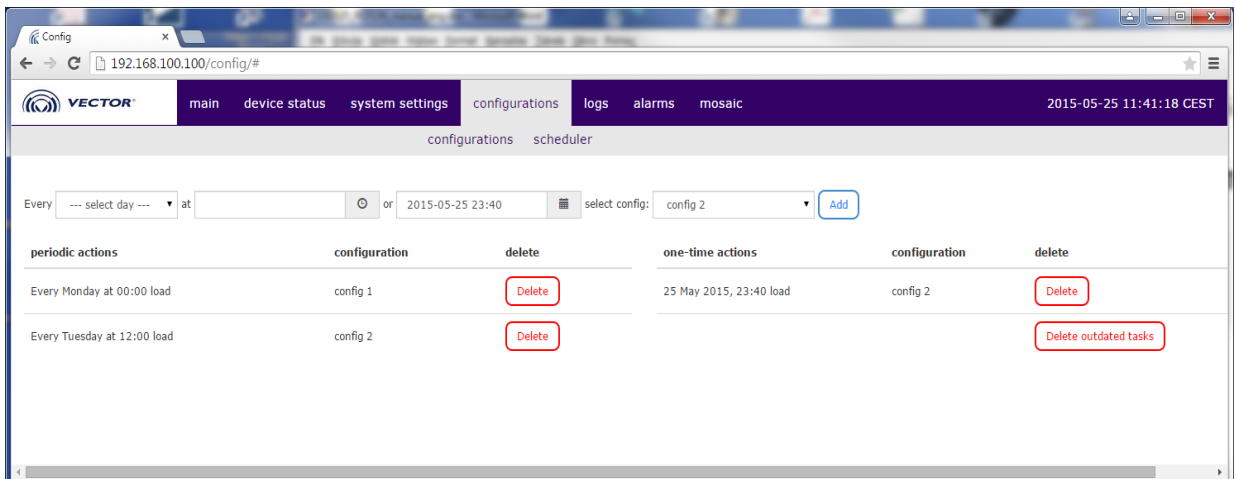
1. configuration selection – in this part you can select and load an earlier saved configuration
2. configuration save – in this part you can save a presently set configuration.



3. scheduler configuration – in this part you can select the configuration, the date and the time in which this configuration will be loaded.

If only date is given – the configuration will be loaded at 00:00 time in the selected date, if only time given – the configuration will be loaded every day at given time.

In each case, restoring the configuration can take up about 6 minutes.



Scheduler allows to program the cyclical actions at the specific time on the specific day of the week as well as to program the one-time action.

The one-time actions, of which the time has passed, may be deleted by the 'delete outdated tasks' button.

Loading of the configuration may continue up to 6 minutes.

If on the particular day there are the one-time actions, a cyclical action will not perform this day.

6.5 Logs window

In this section the different log messages can be found and user can make some actions which are indicated below:

1. User can choose how many entries have to be displayed in the page. Possible options: 20, 50, 100, 200, 500, all.
2. User can sort column by clicking on the arrows (number 2 on screenshot). Priority column is sorted in order: error, warning, info.
3. User can search the logs. Typed phrase is looked for in all of the available columns.
4. User can delete the logs by 'Remove logs' button.

Error messages are highlighted on red color, warning on the orange one and info has no highlight.

The screenshot shows a web browser window displaying the logs page of a Vector device. The page has a navigation menu with options: main, device status, system settings, configurations, logs, alarms, and mosaic. The current page is 'logs'. At the top right, the date and time are '2015-05-25 11:43:57 CEST' and there is a 'logout' button. Below the navigation, there is a 'Show 20 entries' dropdown and a search box with a 'Remove Logs' button. The main content is a table of log entries.

Date	Priority	Program	Message
2015-05-25 11:34:37	warning	sys	Failed to get time from NTP servers 212.244.36.227
2015-05-25 10:55:11	info	sys	Software 2.4.3 successfully installed.
2015-05-25 10:54:46	info	sys	New software file uploaded.
2015-05-25 10:51:08	info	alarm	Alarm deactivated: main board PSU fault 0
2015-05-25 10:49:04	info	sys	Software 2.5.0.1 successfully installed.
2015-05-25 10:48:33	info	sys	New software file uploaded.
2015-05-25 10:47:26	info	sys	Software 2.6.0 successfully installed.
2015-05-25 10:47:00	info	sys	New software file uploaded.
2015-05-25 10:45:45	info	sys	Software 2.6.1 successfully installed.
2015-05-25 10:45:18	info	sys	New software file uploaded.
2015-05-25 10:44:36	err	alarm	Alarm activated: main board PSU fault 1 equals to 1
2015-05-25 10:44:15	info	sys	Software 2.6.2-blue10 successfully uninstalled.
2015-05-25 10:43:57	info	sys	System started
2015-05-25 10:43:57	info	sys	logs cleaned
2015-05-25 10:43:52	info	sys	Software 2.6.2 successfully activated.
2015-05-25 10:43:25	info	sys	Software 2.6.2 successfully selected and will be active after restart.
2015-05-25 10:43:12	info	sys	Software 2.6.2 successfully installed.
2015-05-25 10:42:47	info	sys	New software file uploaded.
2015-05-25 10:29:02	info	web	Created remux 35

6.6 Alarms window

This is the section where ROTON alarms can be defined as well all active ones are reported:

The screenshot displays the ROTON web interface. At the top, there is a navigation menu with the following items: main, device status, system settings, configurations, logs, **alarms**, mosaic. The current date and time are 2015-07-02 11:31:10 CEST, and there is a logout button. Below the navigation menu, there are two tabs: active alarms and alarms configuration. The main content area is divided into two sections: Device alarms and Stream alarms. Each section has a search bar and a table of alarm entries. The Device alarms table shows one entry: main board, PSU fault, 2015-06-26 08:37:27, 1 equals to 1, Error. The Stream alarms table shows two entries: eth1--239.15.15.1:1234, TR 101 290 error, 2015-06-26 13:53:12, PAT repetition interval exceeded 2s, Error; and eth2--239.10.10.5:1234, TR 101 290 error, 2015-06-26 08:37:20, PAT repetition interval exceeded 2s, Error. Both tables have pagination controls showing 1 to 1 and 1 to 2 entries respectively.

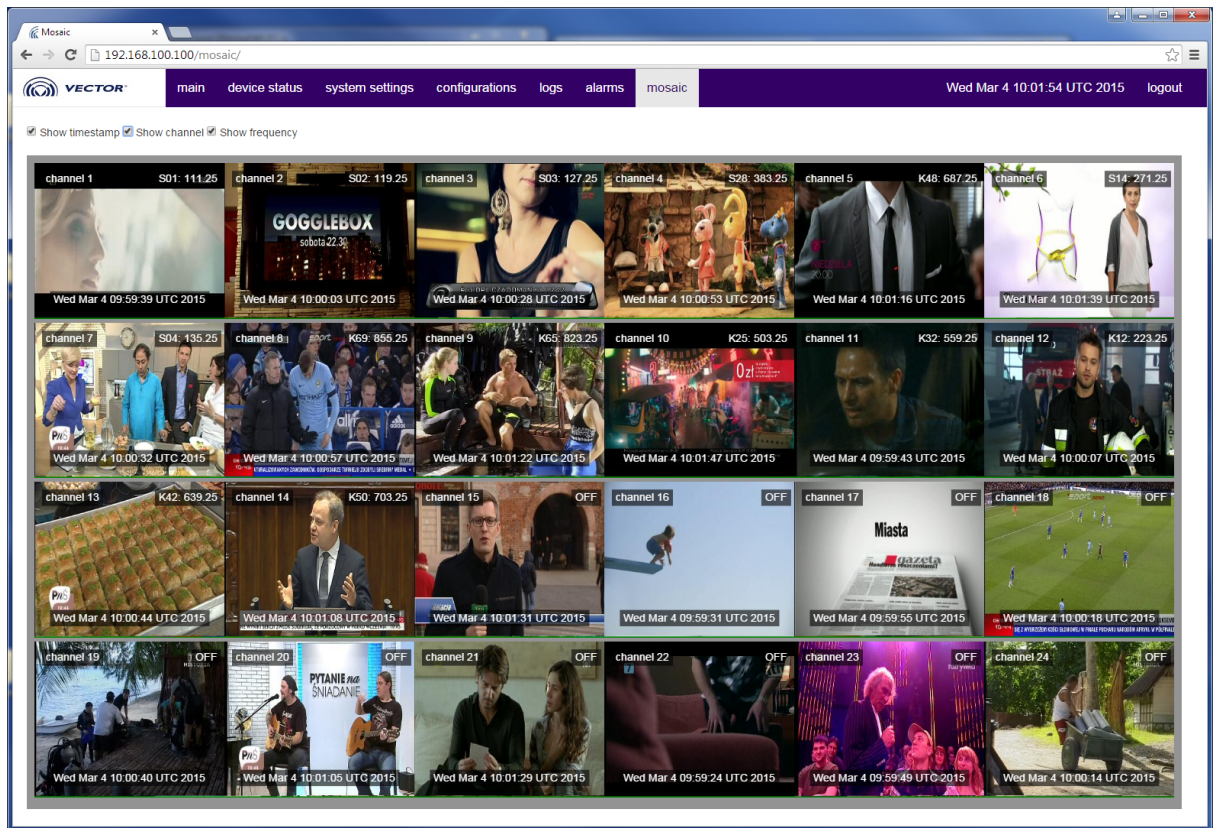
6.7 Mosaic window

In this section all channel outputs can be monitored if are decoded correctly to inform about a content of the decoded streams without the necessity to connect to the TV.

The screens are refreshed independently and approximately every two minutes.

It is possible to switch on/switch off the additional information in the pictures as follows:

- timestamp
- channel – from which decoder
- frequency – on which a channel is played



7. Getting started

7.1 ROTON connections:

Before starting, please make sure your IP stream inputs are correctly connected to ETH_1 or ETH_2 interfaces and your management computer to ETH_0 interface.

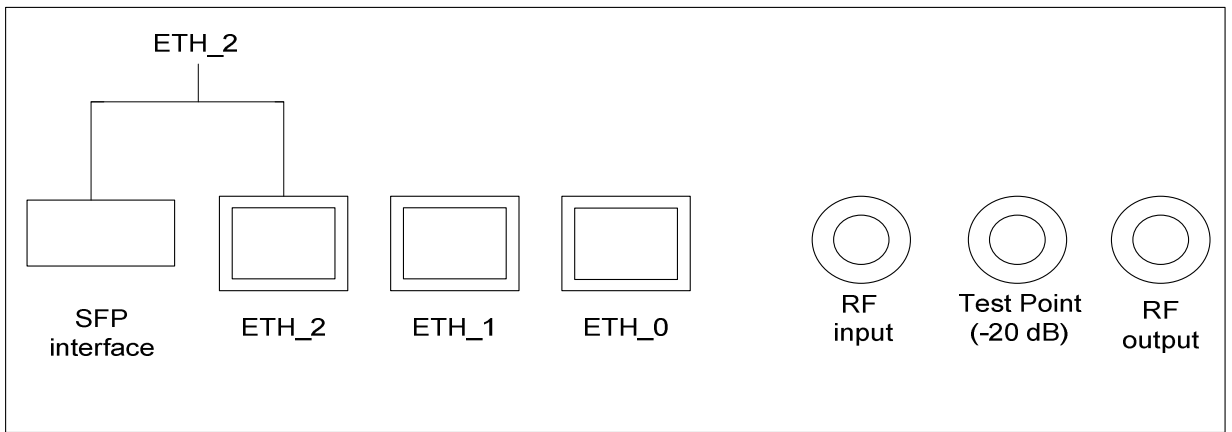
Three F connectors which are at the rear panel are dedicated to:

- RF output - device output
- Test Point – device output (attenuated 20 dB)
- RF input – it's used to connect another devices to be summed-up at the output. (instead of using any external RF splitters)

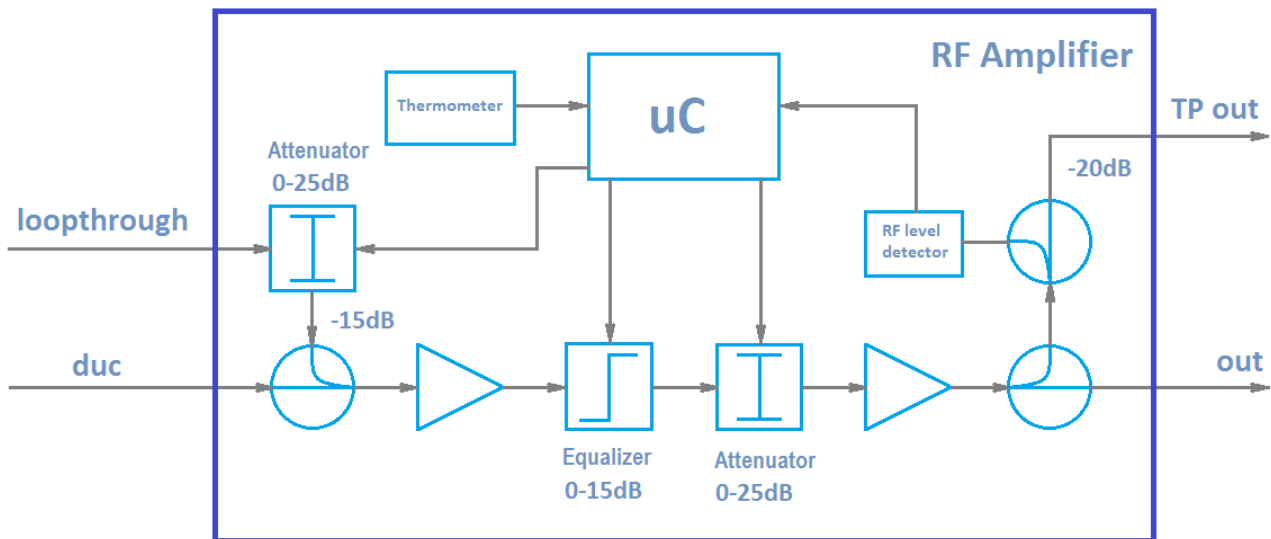
In order to achieve the best signal value/noise ratio allocation of frequencies is recommended and the use of the filter on loop through input which cut the unused frequencies by the device connected to this input.

Connection to this outputs should be via RF cable 75 ohm.

Please identify correct input accordingly to the picture below:



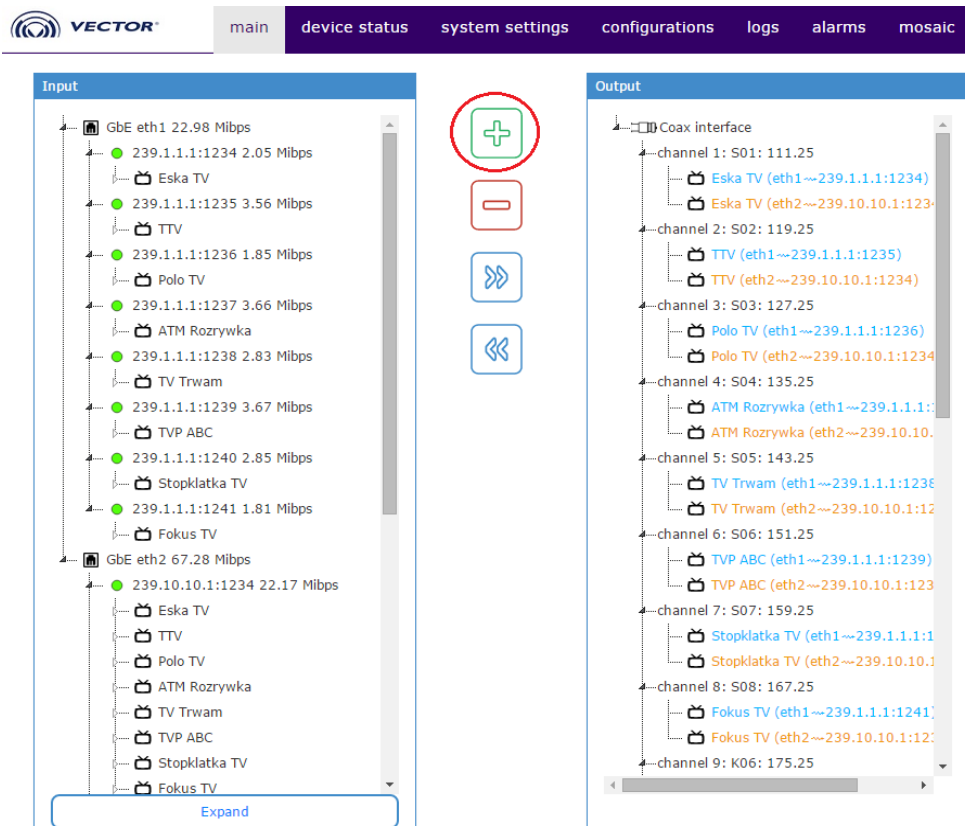
Internal structure of RF output can be presented as follows:



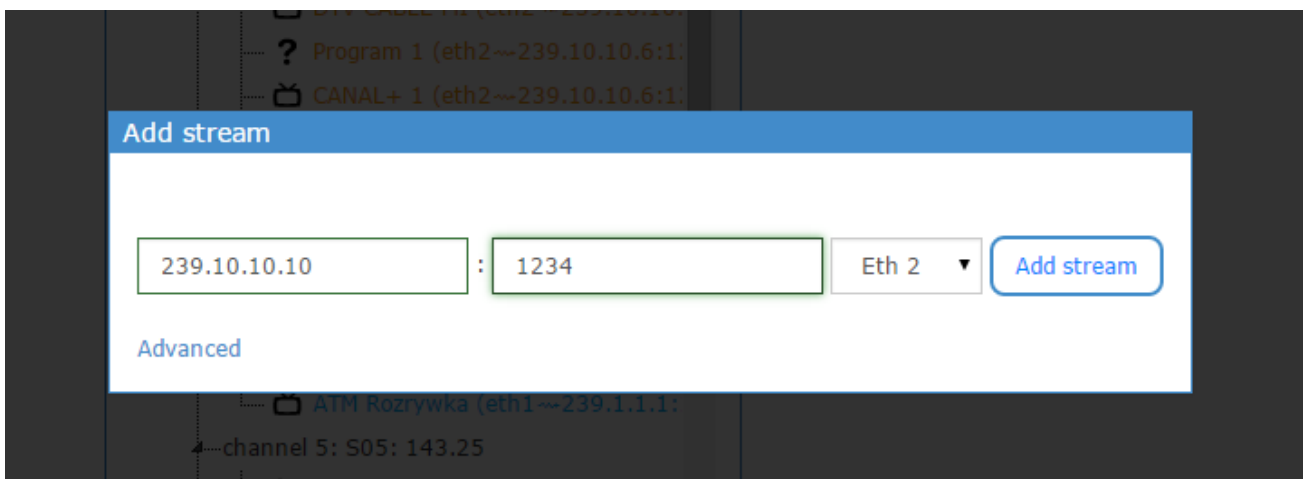
Equalizer starting point is on 1218 MHz. Broadband equalizer measures the power in the whole band at amplifier. The range of amplifier work is 40 – 1218 MHz.

7.2 Adding a new stream

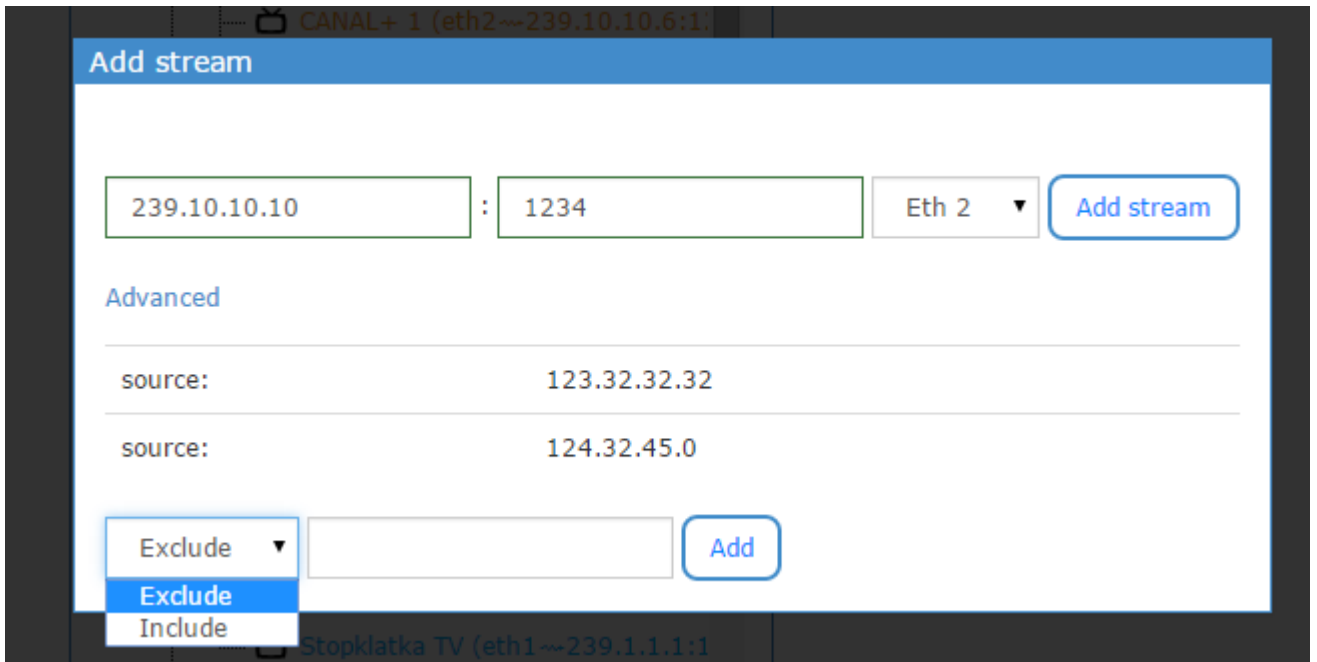
In order to add a new stream “plus” button should be pressed:



In the field 'IP' please specify the correct multicast IP address, in the port field enter a port number and choose the correct ETH interface to be used (ETH_2 or ETH_1).

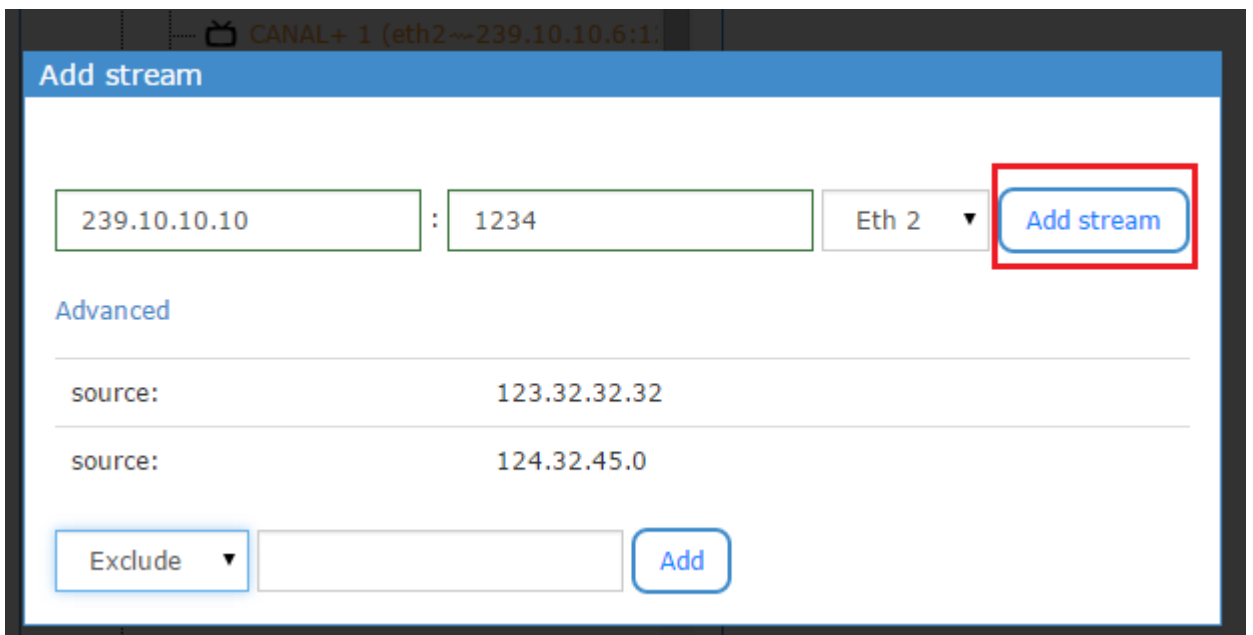


In addition, it's possible to add IGMPv3 parameters - **include** (accepted IP multicast address sources) or **exclude** (excluded IP multicast address sources).

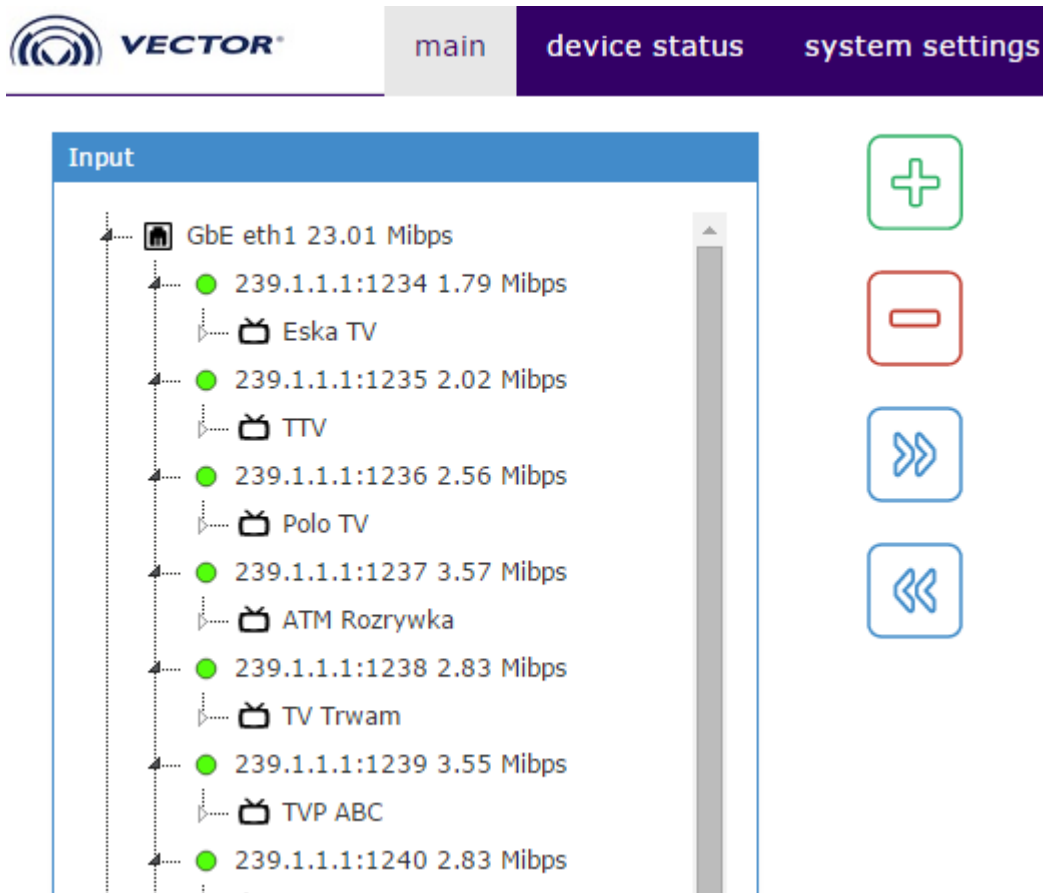


It is possible to add many IP, but all of them will have the same type (include or exclude) and the same as is chosen on drop-down list while pressing 'Add stream' button.

Confirm your choice by pressing 'Add stream' button:



After a while your stream should be visible with services it contains:

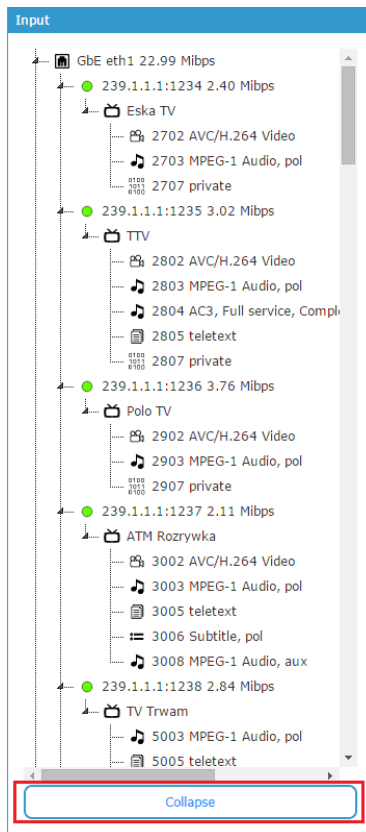


Streams are ordered by IP addresses and port number. You can add 24 IP inputs stream to the one port ETH_1 or ETH_2 (max 48 IP addresses in total).

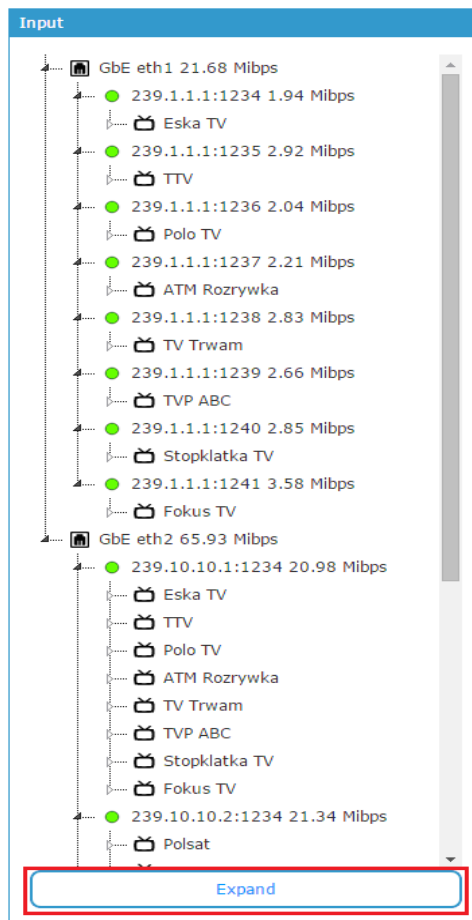
The streams you will add later (after these 48), will appear in the list, but their content will not be visible.

7.3 Collapsing/Expanding input streams

If there's lot of the elementary streams in the services it can be comfortable to hide them by collapsing what can be simply done by clicking on the "collapse" button which is on the bottom of the main page:

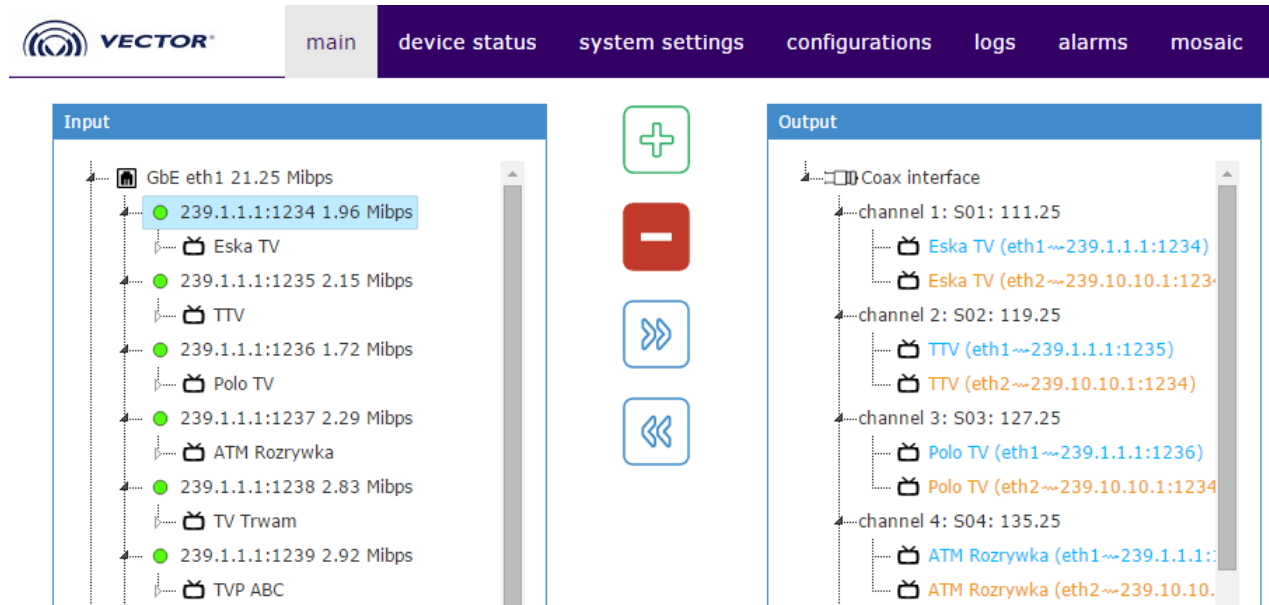


In order to expand services to see elementary streams press the “Expand” button:

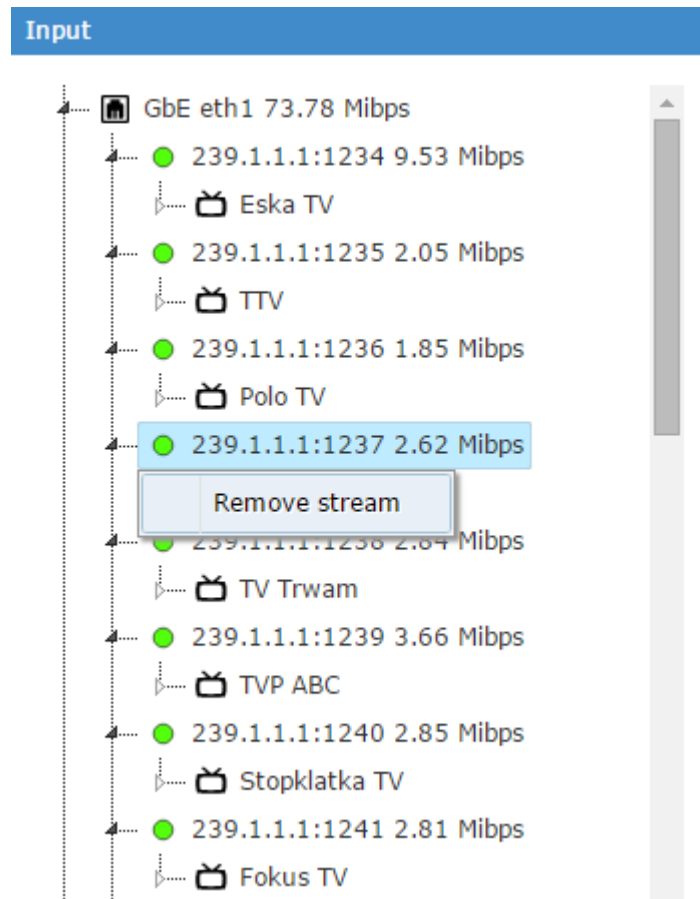


7.4 Stream deletion

In order to delete a stream firstly select it (after selection will have blue background color). After selection, click minus button and stream will be removed after few seconds.



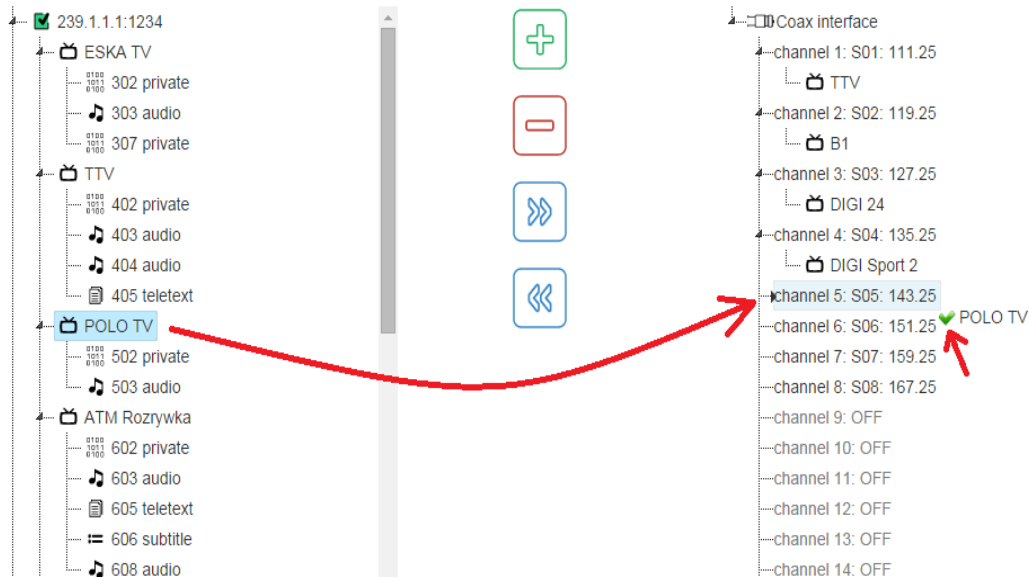
Deleting streams is also possible using the context menu - access to it is possible by clicking on IP of input stream using right button and selecting 'Remove stream'



7.5 Creating multiplexing connection

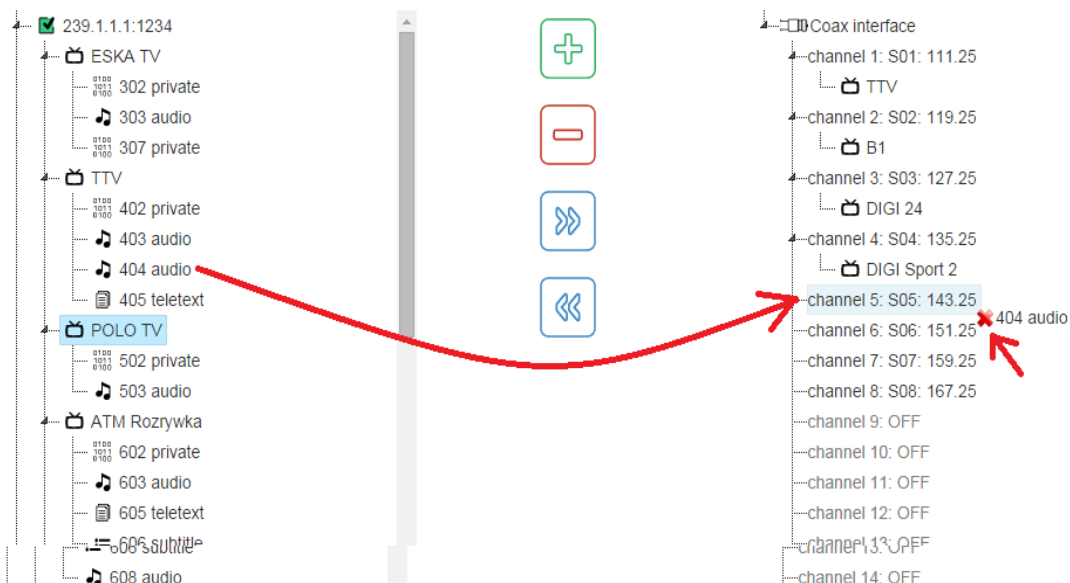
Multiplexing connection can be created in two possible ways:

1) by **drag & drop** – you should drag desired service to the output of your choice. If multiplexing connection can be created you should see green mark next to service you are dragging:



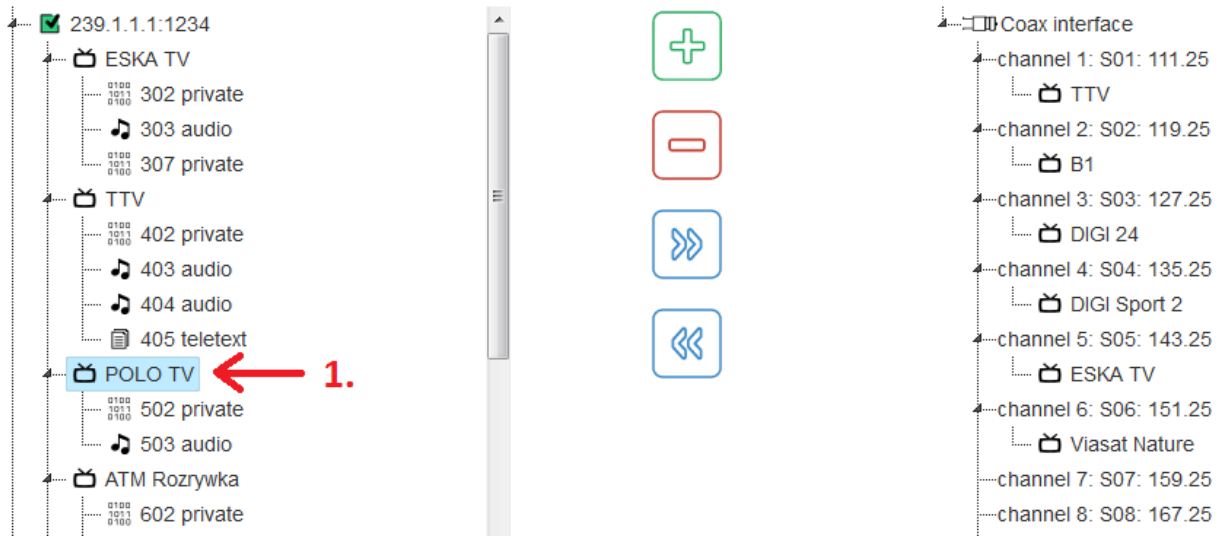
In the case above the connection between POLO TV and channel 5 will be created (PoloTV multiplexed to frequency defined for the channel 5).

However, if you drag from inputs something what is not allowed to be muxed, you will see red cross sign.

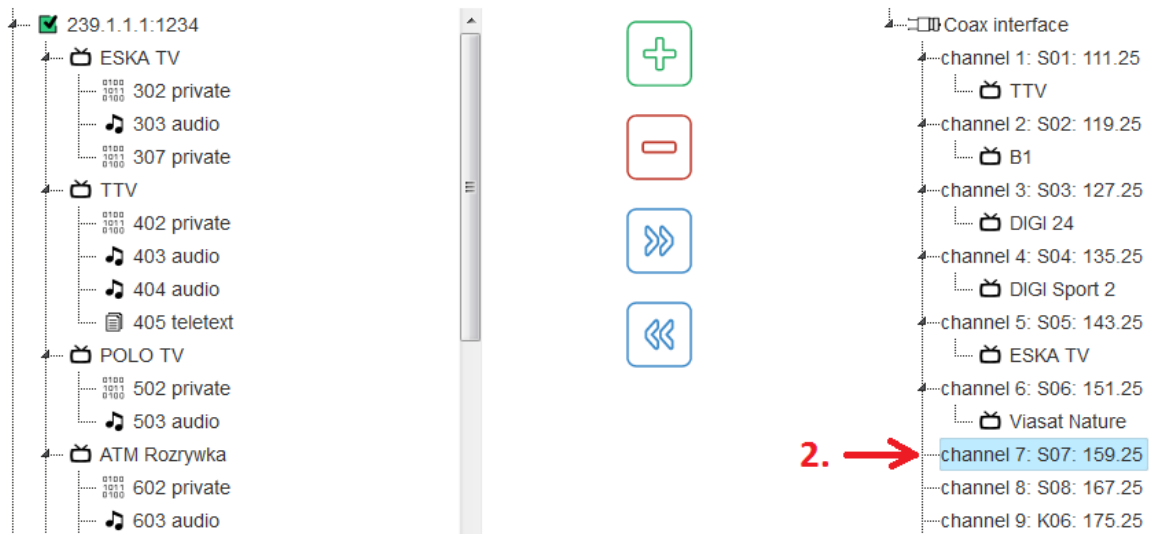


In the case above, after dropping 404 audio no connection will be created, because dragged node was invalid.

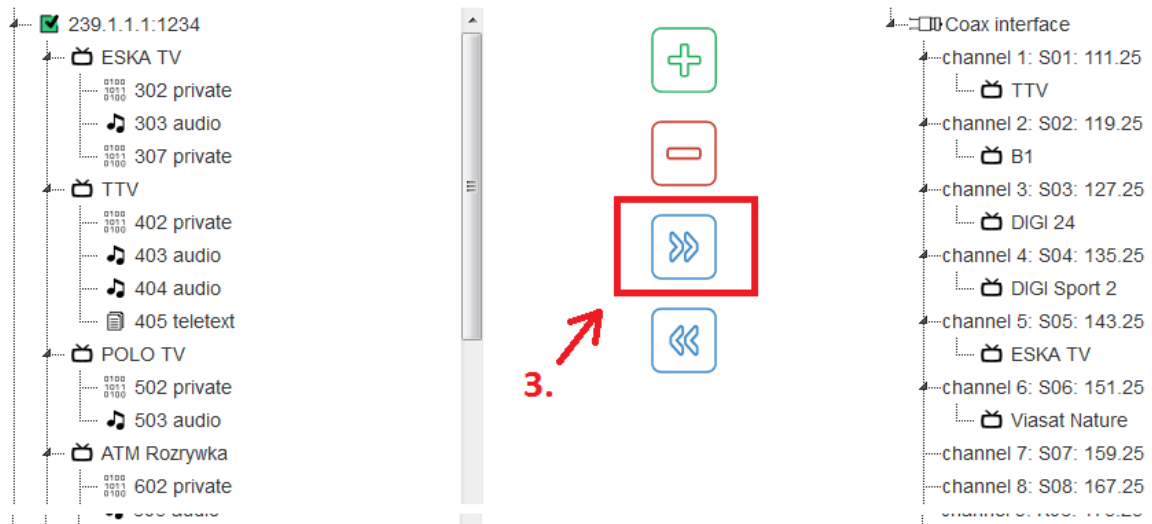
2) by **selecting and clicking '+' button** – you should select (by single click) service from inputs



then, in the same way, select output on which you want to mux your service



Then click button with right white arrow as showed in pictures below:



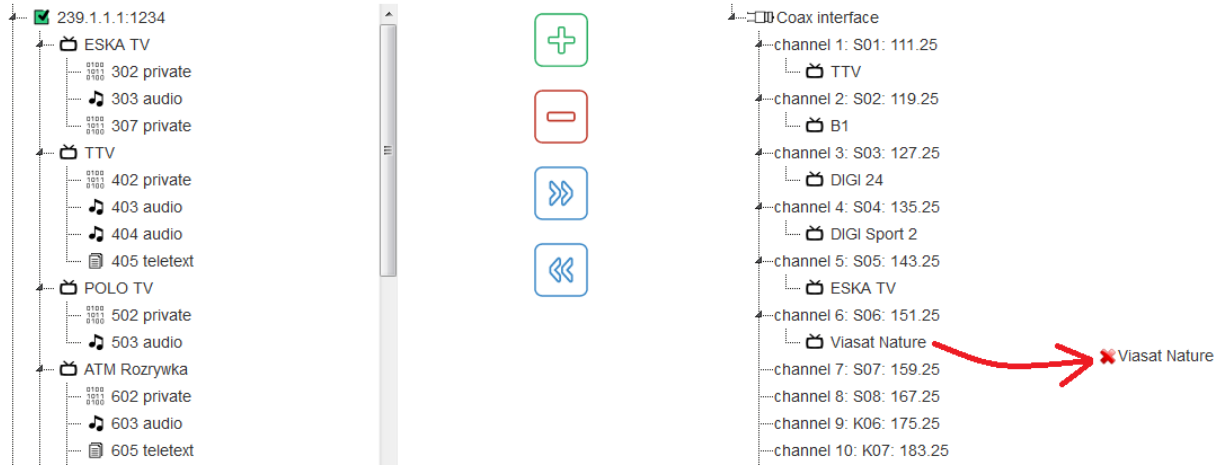
After a while a multiplexing connection will be created



7.6 Multiplexing connections deletion

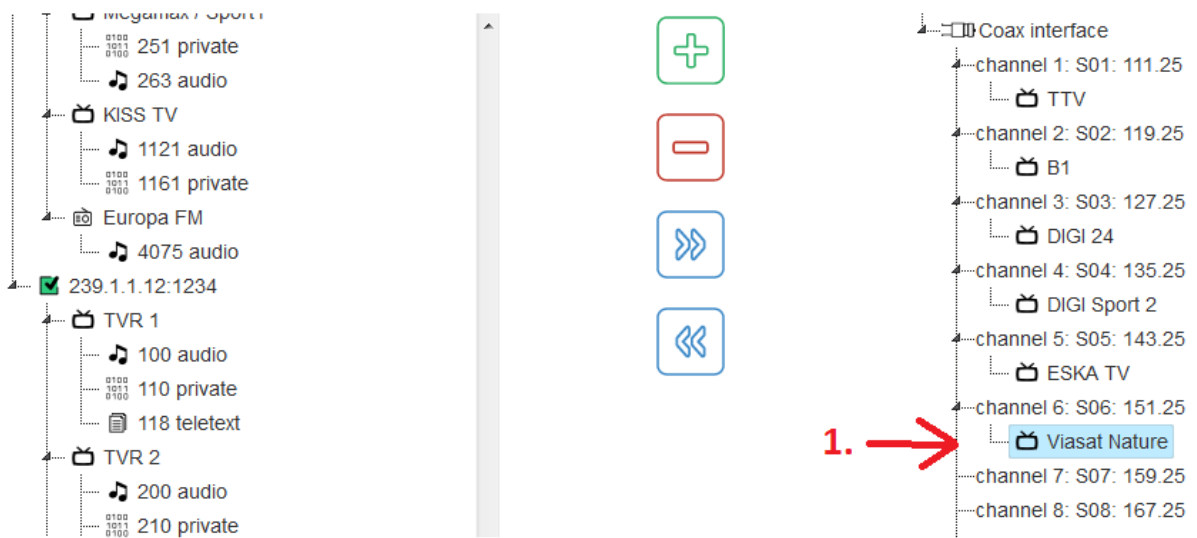
Multiplexing connection can be deleted in two possible ways:

1) by **drag & drop** – you should drag a remuxed service from the outputs and drop in the empty space next to the outputs as shown in picture below:

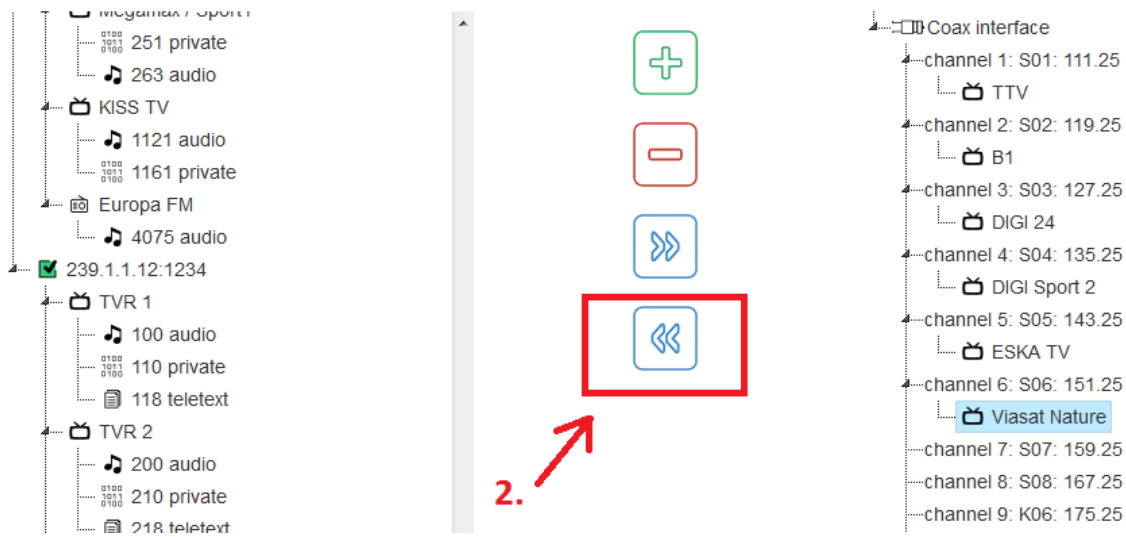


You should not worry about red mark next to the dragged service – it concerns only creating multiplexing connection. When you drop this service, it will be deleted.

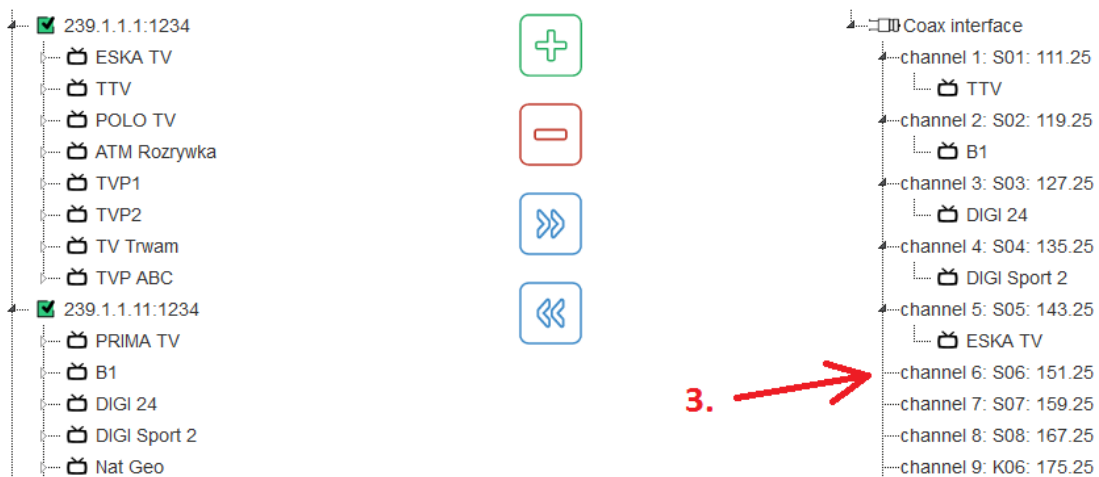
2) by **selecting and clicking “-“ button** – you should select, by single click, the service from the outputs which has to be deleted:



then press left arrow button as showed in pictures below:

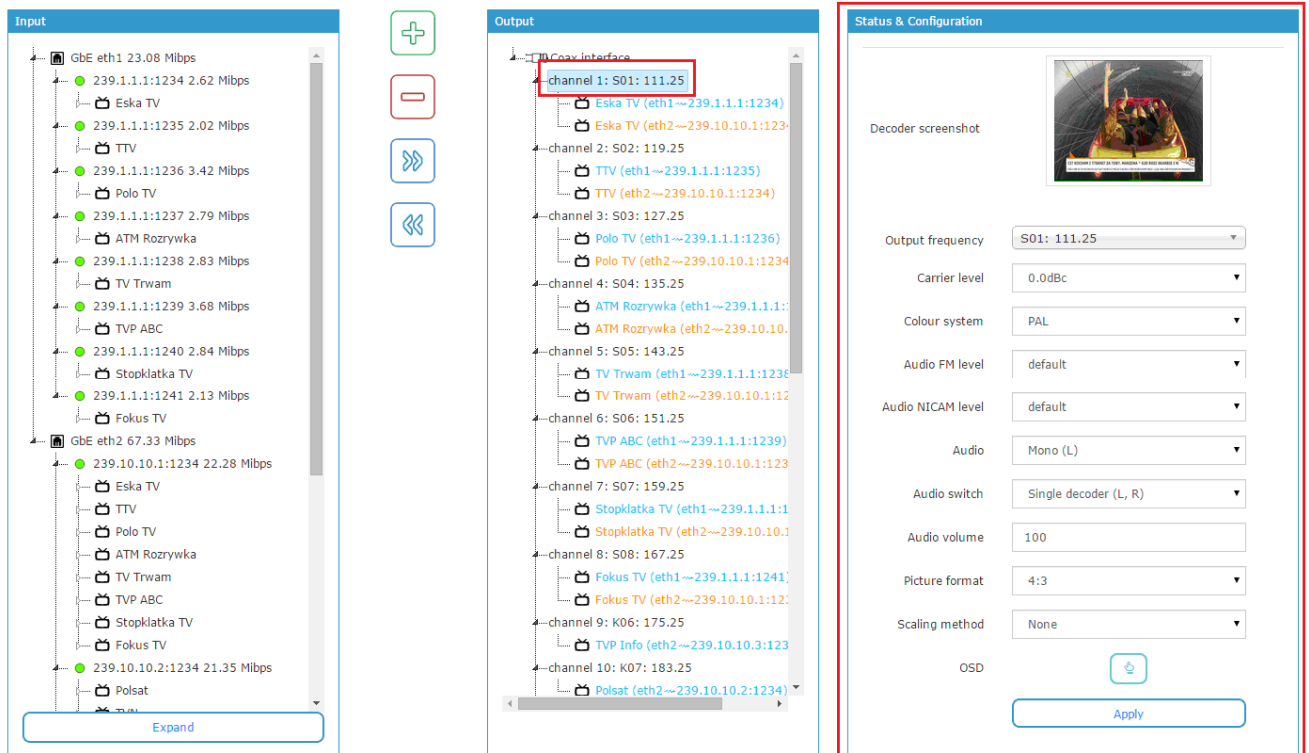


Wait for a while – the connection will be removed:



8. Output parameters settings:

Output channel parameters can be configured in the main right window, which will appear after channel selection:

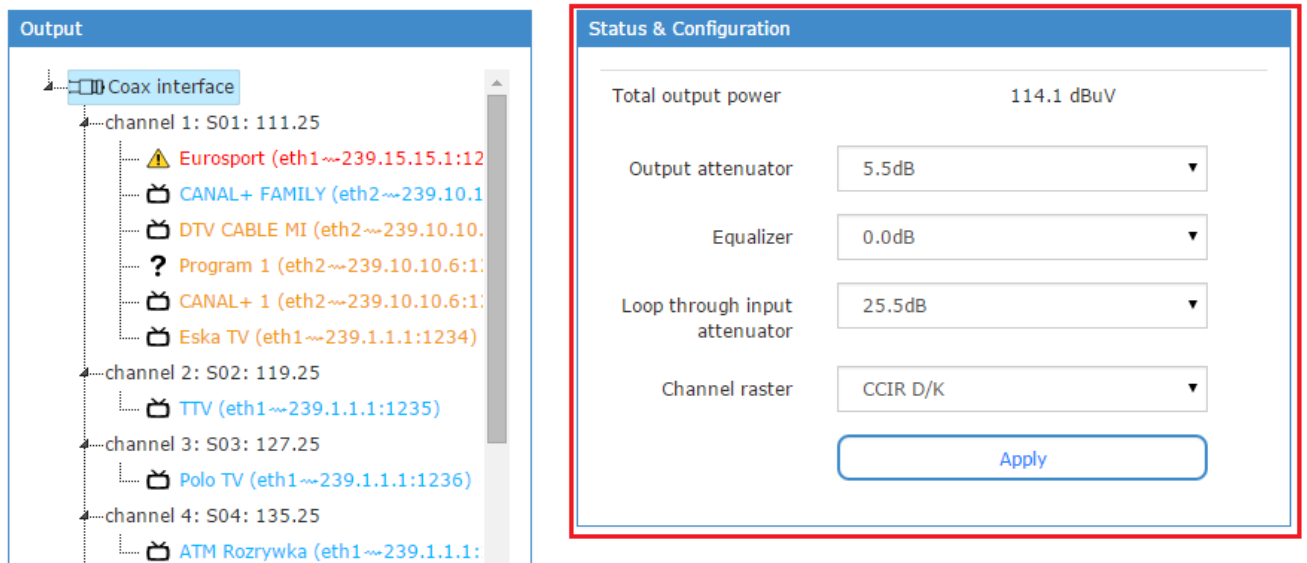


The following possibilities can be set for each output channel:

- Output frequency for CCIRDK: 111.25 MHz – 855.25 MHz (94 channels or 95 channels, according to which raster is selected)
- Carrier level - 0dBc ...-6dBc (each carrier may be regulated individually)
- Color system: PAL / SECAM.
- Audio FM level: default, -9 dB, ..., -18 dB.
- Audio 'NICAM' level: default, -17 dB, -18 dB, ..., -23dB.
- Audio: A2 stereo, Mono(L + R), Mono(L), Mono(R), A2 dual mono(L,R), 'NICAM' stereo, 'NICAM' dual mono(L), 'NICAM' dual mono(R).
- Audio switch: Single decoder(L, R), Single decoder(R, L), Two decoders (L + R, L' + R').
- Audio volume: 1 – 100.
- Picture format: 4:3, 16:9.
- Scaling method: None, Letterbox, FS zoom, Center-cut, TV audio.
- On Screen Display Text which will be displayed on the output

8.1 Coax interface settings

In order to change coax interface settings press the “Coax interface”:



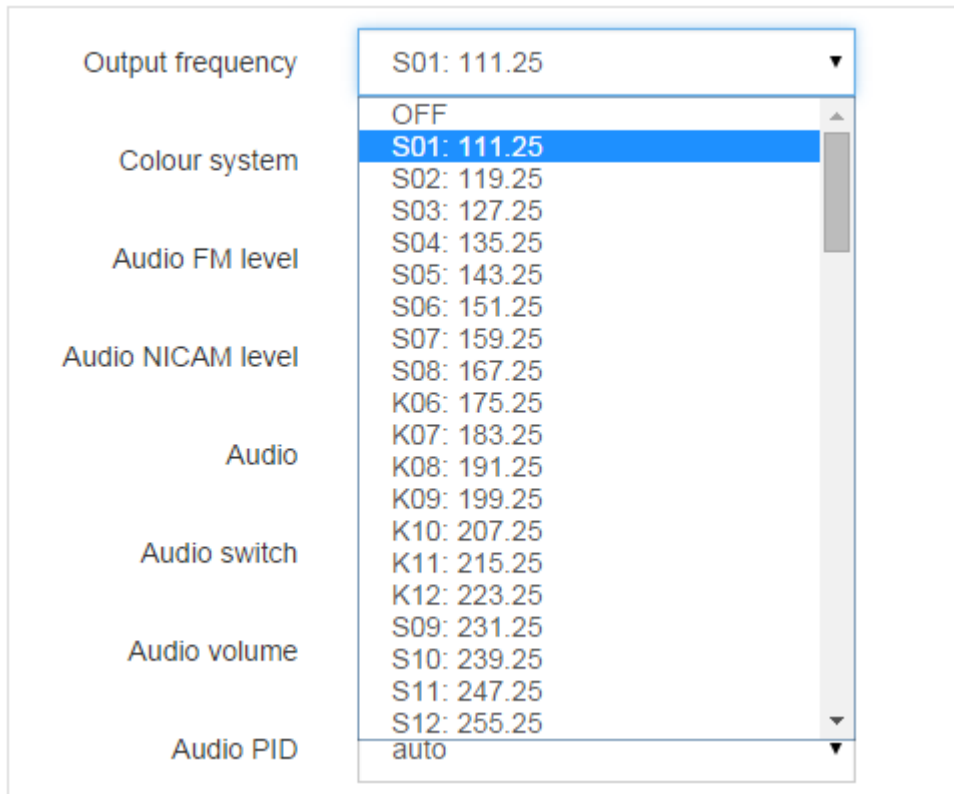
On the right window you can find:

- current total output power value measured on the device's output
- output attenuator settings defining
- equalizer output settings
- loop through input attenuator settings
- channel raster settings (CCIR D/K, CCIR B/G, OIRT D/K)

Please note that after changing the raster, the device will restart and load the new settings. The process can take up to 15 minutes. Only after that, you can continue to configure the device. All frequency settings and output settings (except multiplexing connections) will be deleted.

8.2 Channel output frequency settings

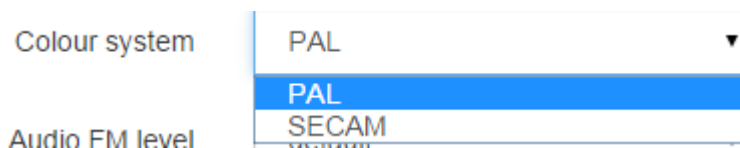
Frequency can be set to be OFF (channel switched-off) or selected from 94 frequency channels (in case if D/K raster is selected) or from 95 (raster B/G chosen).



After choosing the correct frequency it should be validated by pressing the Apply button.

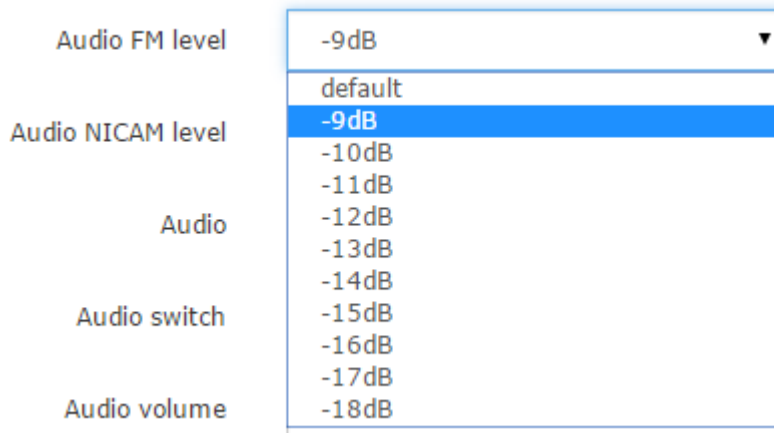
8.3 Color system

In this window you can define the type of color system you want to use:



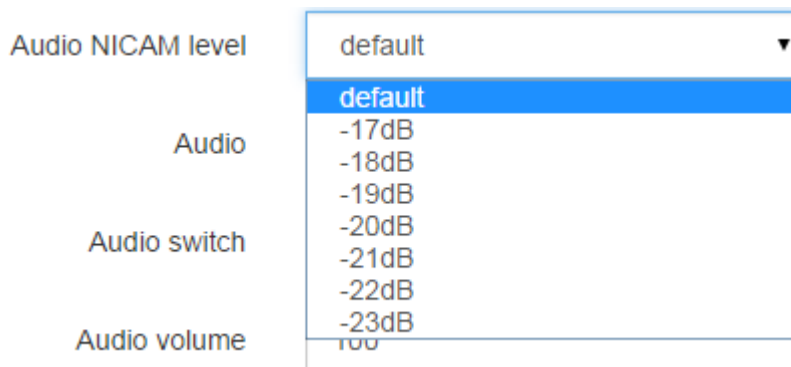
8.4 Audio FM level

This option is used for changing the attenuation of the audio carrier:



8.5 Audio 'NICAM' level

This option is used for changing the attenuation of the 'NICAM' audio carrier.



8.6 Audio

In dual audio, the decoder outputs are respectively grouped by two. Additionally, the decoders from the different boards cannot be combined in pairs. There is a possibility to have decoders in pairs as follows: 1..6, 7..12, 13..18, 19..24. Ex. 1 and 2, 5 and 6. 20 and 21. It is not allowed to have pairs of: 6 and 7, 12 and 13, 18 and 19.

On two decoders for ex. 1 and 2 we mux the same program. In the first we set the frequency, the second should be off (because is destined for decoding the second Audio path). Decoder 1 is set to AUDIO PID as first (for ex. Polish ver.) Decoder 2 is set to AUDIO PID for the second soundtrack (for ex. the original).

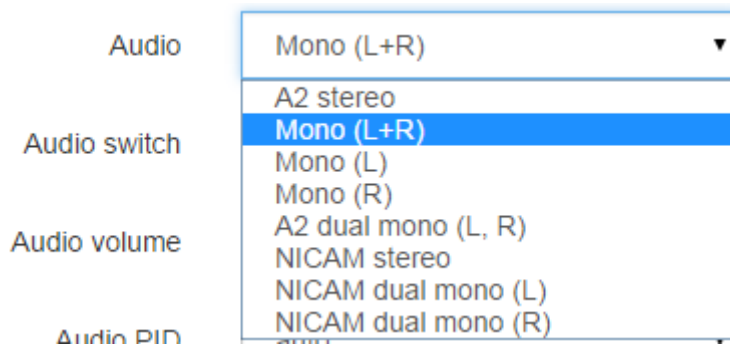
At first we set:

Audio -> A2 dual mono (L, R) or 'NICAM' if necessary - 'NICAM' dual mono (FM L)

Audio switch -> Two decoders (L+R, L'+R')

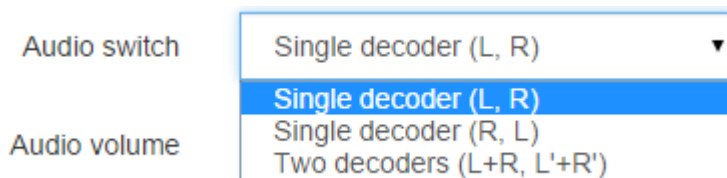
At this moment we have the choice of two soundtracks on TV.

Option for audio selection:



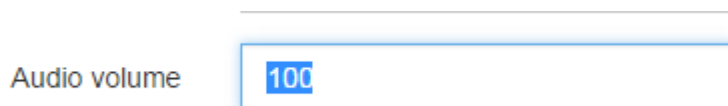
8.7 Audio switch

Audio mode selection:



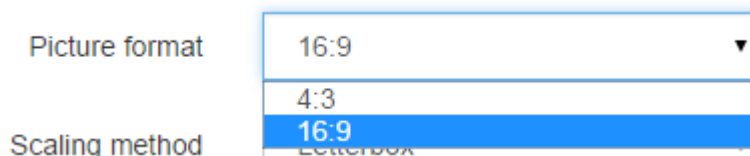
8.8 Audio volume

In this window you can choose the audio level from range: 1 – 100, where 100 means the audio with the same level as received from the input stream and 0 means the level set to 0 (silence):



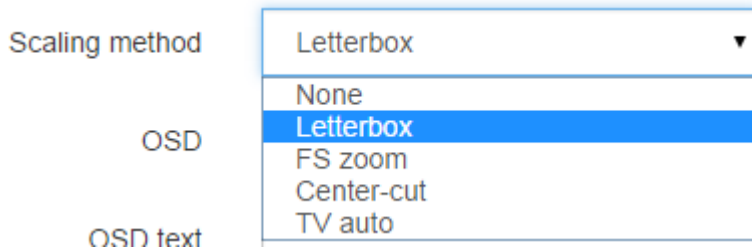
8.9 Picture format

In this window you can choose the type of format you want to use at your output:



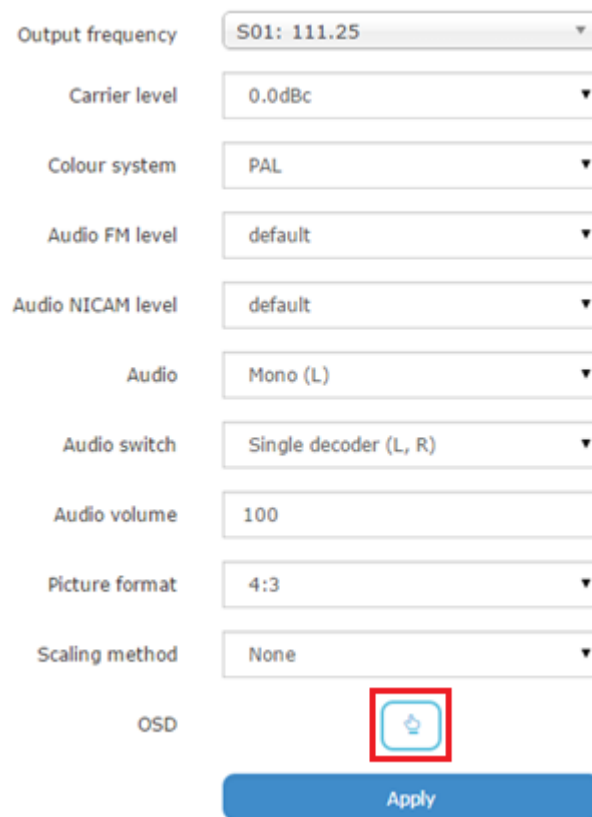
8.10 Scaling method

In this window you can select the type of scaling you want to use:



8.11 On Screen Display

After clicking on the icon which is situated on the right across from the OSD, the submenu will appear:



The following possibilities for OSD can be chosen:

- OSD: Off, Debug, ON
- OSD timeout: time in the seconds during the OSD will be displayed on the screen
- OSD text: text to display (max. 200 characters)
- OSD font size: 1..299
- OSD font color: (color picker)
- OSD background color: (color picker)

- OSD position: 1..100 %
- OSD height: 1..400 (OSD Height has to be higher than OSD Font size)

OSD

OSD	<input type="text" value="On"/>
OSD timeout	<input type="text" value="0"/>
OSD text	<input style="border: 1px solid #0070c0;" type="text" value="Channel Message"/> 15 (left: 185)
OSD font size	<input type="text" value="54"/>
OSD font color	<input type="text" value="#ffffff"/>
OSD background color	<input type="text" value="#000000"/>
OSD position	<input type="text" value="80"/>
OSD height	<input type="text" value="120"/>

8.12 Service output settings

For each service (primary and a backup one) it is possible to chose an audio PID, subtitle PID or the way PCR will be treated.

Output

- Coax interface
 - channel 1: S01: 111.25
 - Eska TV (eth1~239.1.1.1:1234)
 - Eska TV (eth2~239.10.10.1:1234)
 - channel 2: S02: 119.25
 - TTV (eth1~239.1.1.1:1235)
 - TTV (eth2~239.10.10.1:1234)
 - channel 3: S03: 127.25
 - Polo TV (eth1~239.1.1.1:1236)
 - Polo TV (eth2~239.10.10.1:1234)

Status & Configuration

Audio PID	<input type="text" value="auto"/>
Subtitle PID	<input type="text" value="none"/>
PCR sync	<input type="text" value="auto"/>

- Audio PID: auto, none – if an output has no multiplexing connection. If has a multiplexing connection, there are available the additional PIDs you can select which come from the service which is remuxed to the output.
- Subtitle PID: similar as Audio PID – auto, none if an output has no multiplexing connection. If it has a multiplexing connection there are additional PIDs available analogous as for Audio PIDS (if service has any).
- PCR sync – normally set on AUTO. OFF – only in the exceptional (testing) situations, when the input stream have a PCR value which is out of the permitted standard.

9. Redundancy

ROTON offers advanced redundancy feature of each output channel at single service level (independently of ETH input interface).

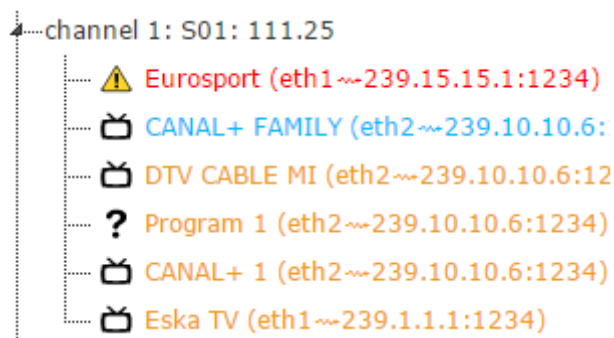
9.1 Setting-up

In order to set-up the redundancy for channels, services from IP inputs should be dragged and dropped to each output:



Primary service is displayed in blue, the others which are redundant are in orange.

In case if the primary service fails it will change to the next one which meet set conditions:



The service which doesn't work is displayed in red.

9.2 Redundancy switching conditions

ROTON redundancy can be triggered by two alarm types:

- missing PAT table in a stream
- bitrate decrease below defined threshold

The first switching condition related to missing PAT table is defined by default in the software. In case if the given service is missing the switch to back-up will take place.

The second switching condition related to bitrate decrease can be defined by user. The alarms must be at ERROR or CRITICAL level.

9.3 Redundancy global settings

Redundancy global settings can be found in the section: **settings** → **redundancy** :

The screenshot shows the VECTOR web interface with the 'redundancy' section selected. A 'Change settings' dialog box is open, containing the following fields:

- Timeout before switching to higher priority service: 10
- Timeout before switching to lower priority service: 20
- Automatically switch to higher priority service:

A 'Set' button is located at the bottom right of the dialog.

These settings allow to define:

- 1) timeout before switching to higher priority service – allows to define the reaction time of switching to a service with higher priority
- 2) timeout before switching to lower priority service – allows to define the reaction time of switching to a service with lower priority
- 3) automatically switch to higher priority service - when you uncheck this setting, return to service having higher priority is locked. So if the primary service returns it will play current service to output. If it is checked, the backup works normally (coming back to a service with higher priority).

9.4 Redundancy description

For each decoder it is possible to assign a lot of services from ETH_1/ETH_2 input.

After muxing many services to the decoder, when all of the services are received correctly, the service is replayed on the first position (the highest priority).

Without an additional configuration switching occurs when the error on TR stream will appear in 2 seconds.

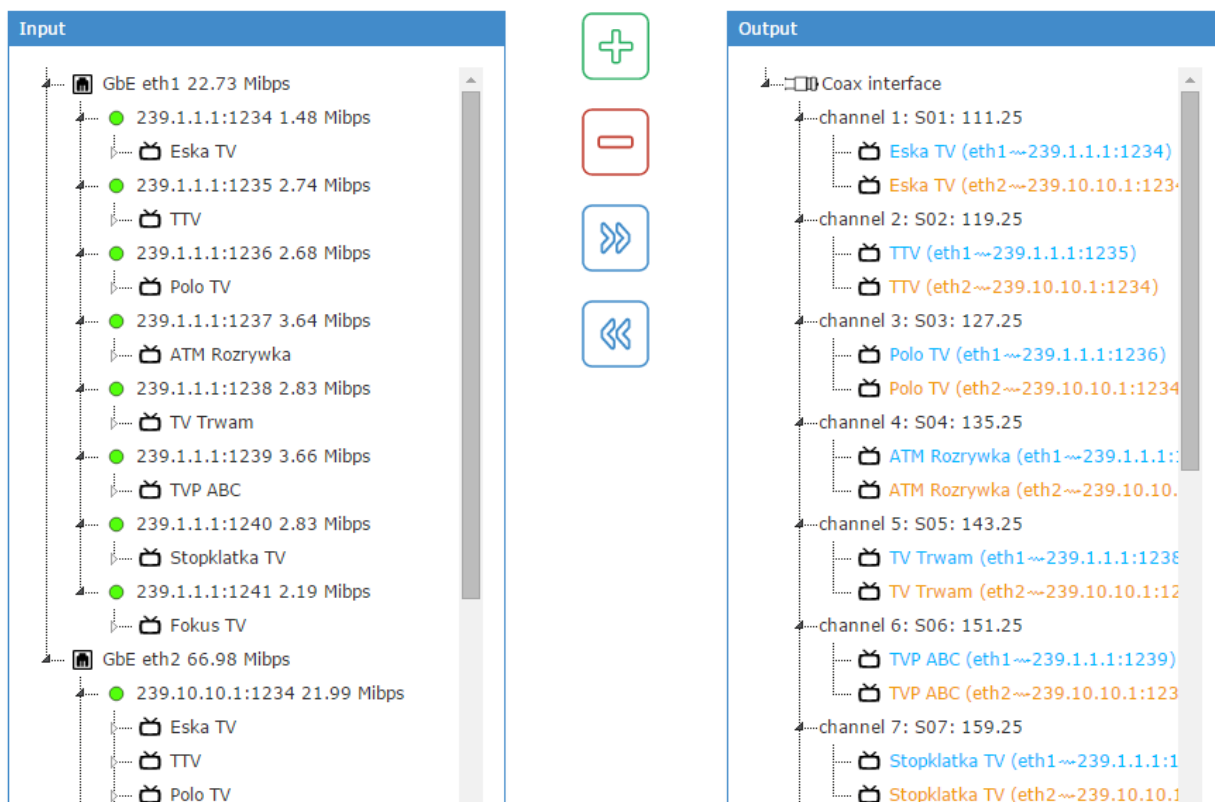
It is possible to modify the alarm operation to be sensitive to, for example video bitrate reduction, by adding the alarm for an appropriate Video SID. The alarm from the bitrate is at

ERROR level or at CRITICAL level.

Redundancy displays a multistage work, for example if we have 5 services assigned to the one decoder and if 4 services with the higher priorities do not work correctly, the fifth one will be decoded.

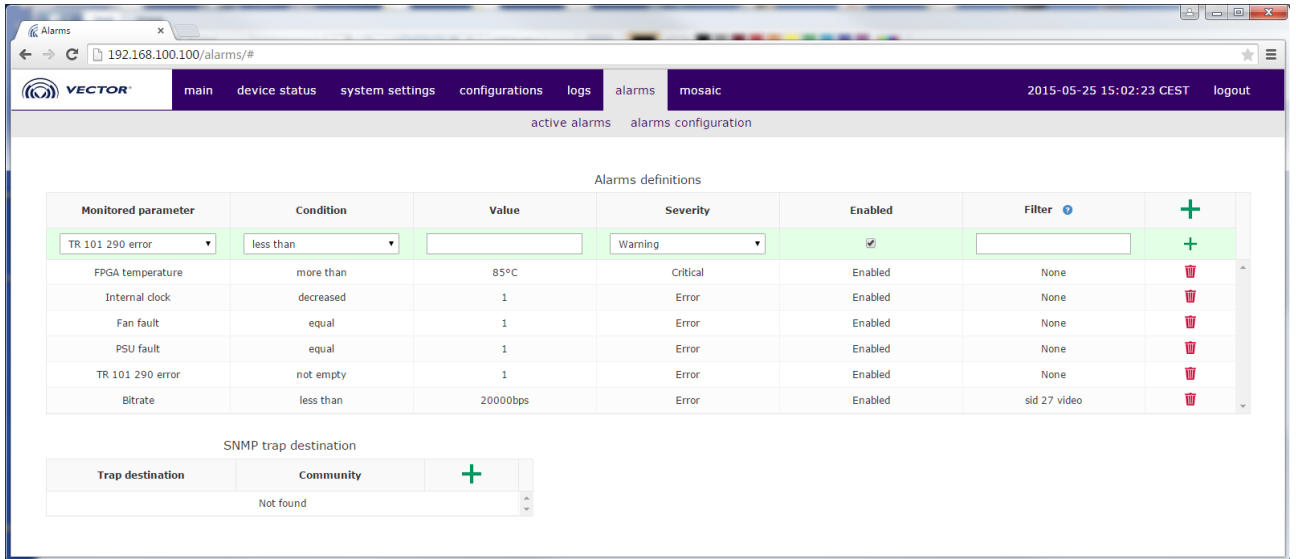
It is possible to receive the same TS stream on ETH_1 and ETH_2 simultaneously and to mux them on the one decoder. That is the way of taking precautions against losing the ETH_1 or ETH_2 link (hardware failure precaution).

Muxing in 'Main' tab should be appropriately configured for switching work.

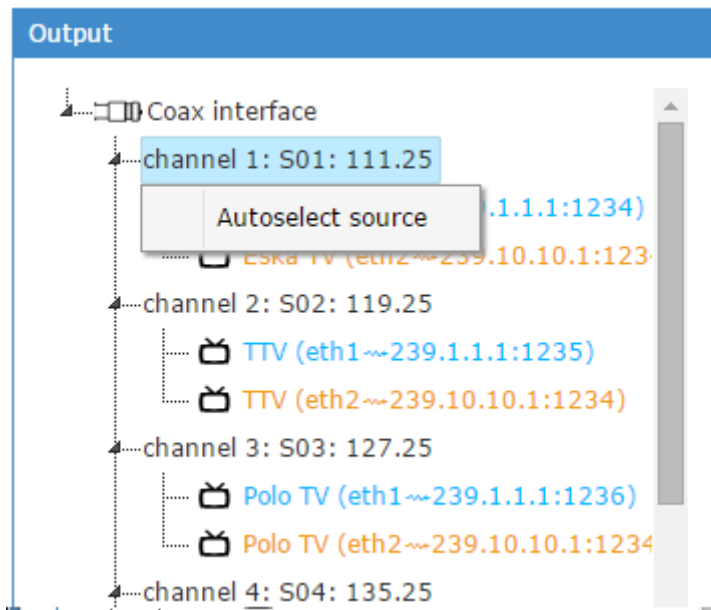


Above configuration ensures switching on the backup in case the Eth interface or streaming will be totally disconnected.

When you want to respond to the bitrate decrease for audio/video PID of a specific stream, the alarm on SID for this service should be defined.



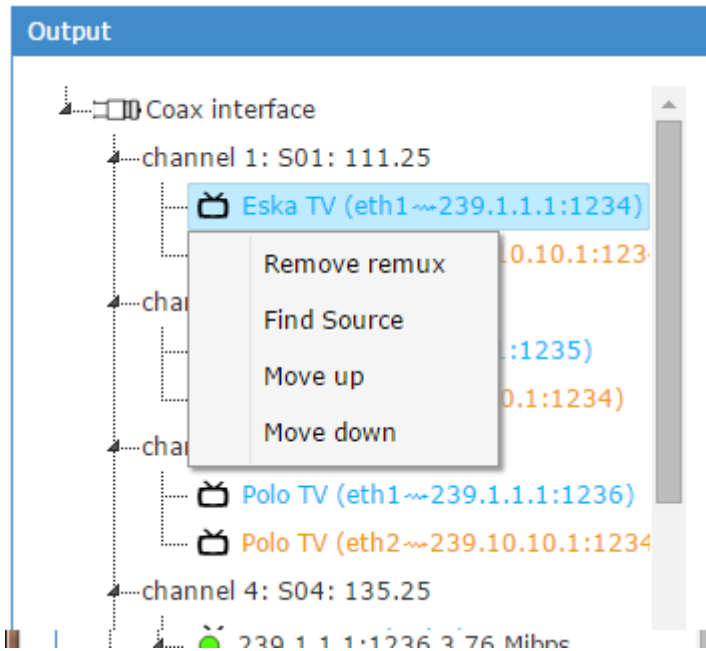
When we have switching for higher priority locked it is possible to use a manual reset of the mechanism using the context menu. Click the right mouse button on the channel on which you are interested in and choose 'Autoselect source' option. In case the source with higher priority is correct, switching on this stream will occur.



It is possible to change the priorities of replaying particular services. It may be achieved in two ways:

In the first way you should pull the appropriate service up or down (within the decoder).

In the second way you should use the context menu. Click the right mouse button on the service and choose 'Move up' or 'Move down' accordingly to the situation.



10. Advanced settings

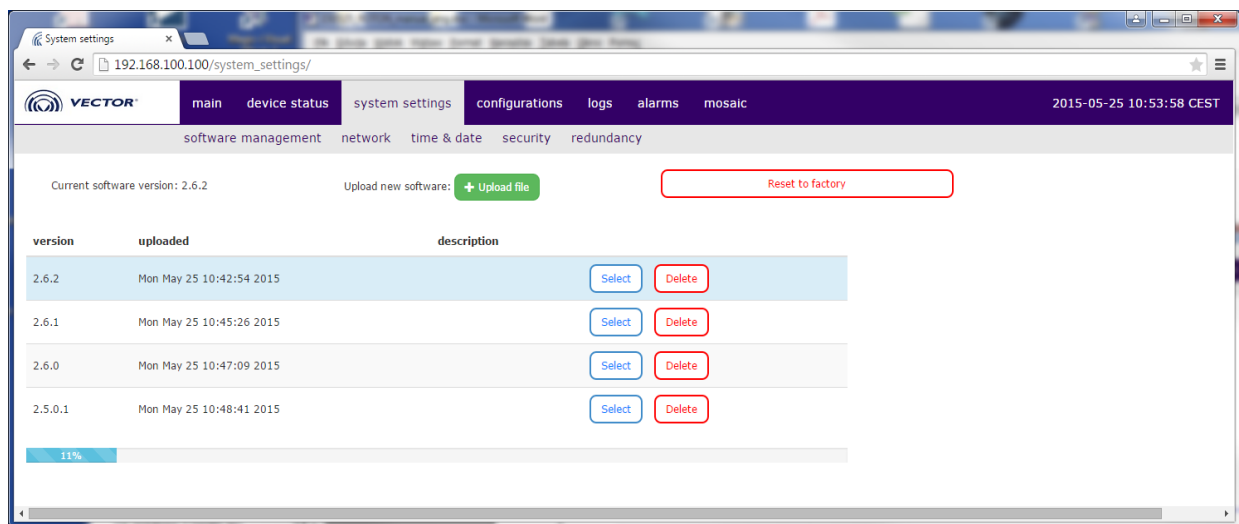
10.1 ROTON upgrade

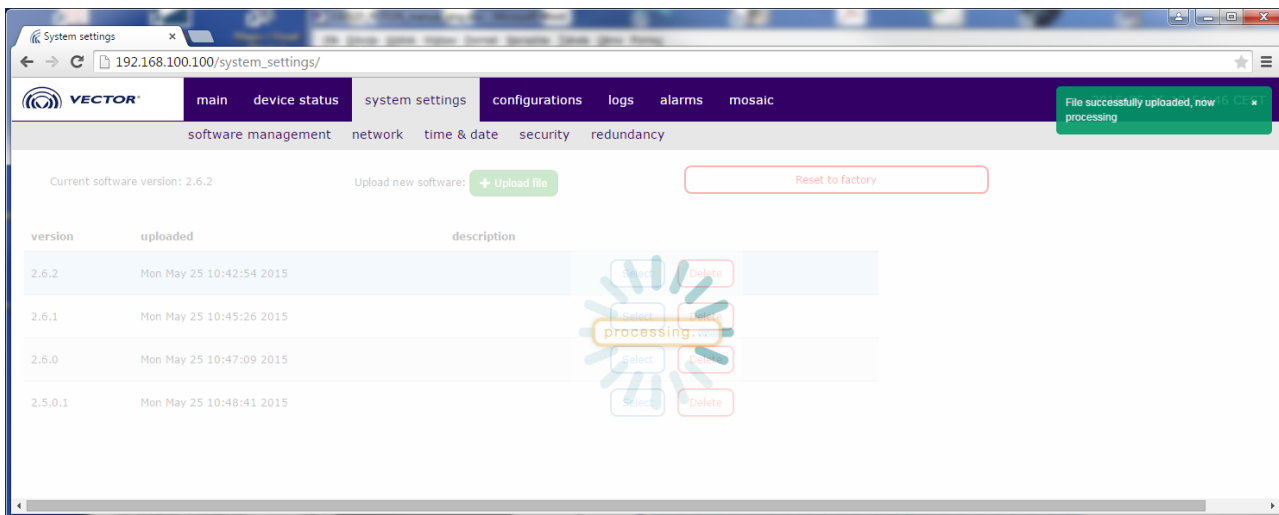
10.1.1 Uploading a new software

If you want to change your present software version and software that you want to select does not exist on the device, you have to upload it first. To do this, click on 'Upload file' button and select the software file with .bin extension.



There is the only one button, click on it to move to the file selection and to FW download.





These pictures show how FW is loaded. After reaching 100% of checking, the file is added successfully and if everything is OK (CRC is correct) it will be uploaded to the list.

Firstly, uploaded file is loaded to a browser, then it is sent to a server and processed, so it can take some time before the new software version will appear on the select software list.

version	uploaded	description
2.6.2	Mon May 25 10:42:54 2015	Select Delete
2.6.1	Mon May 25 10:45:26 2015	Select Delete
2.6.0	Mon May 25 10:47:09 2015	Select Delete
2.5.0.1	Mon May 25 10:48:41 2015	Select Delete
2.4.3	Mon May 25 10:54:54 2015	Select Delete

Next to each FW uploaded, there are 2 buttons: 'select ' and 'delete'.

10.1.2 Select software & management

Currently used the software version is above. Also, available softwares are listed below.

To change presently used software you have to click the radio button next to the software version you want to load and click 'Select'. Changing the software takes a while, when it is done you are redirected to the 'System is restarting' page and when the device is rebooted you are redirected to the login page.

After clicking on the 'select' with appropriate FW, the procedure of upgrading will start.

It is recommended to wait 15 minutes. After that, please disconnect the device and then connect again. After approximately 10 minutes, the device should be fully operational and work on the new FW.

Please check the device status on the website to verify if all the cards are visible on the list.

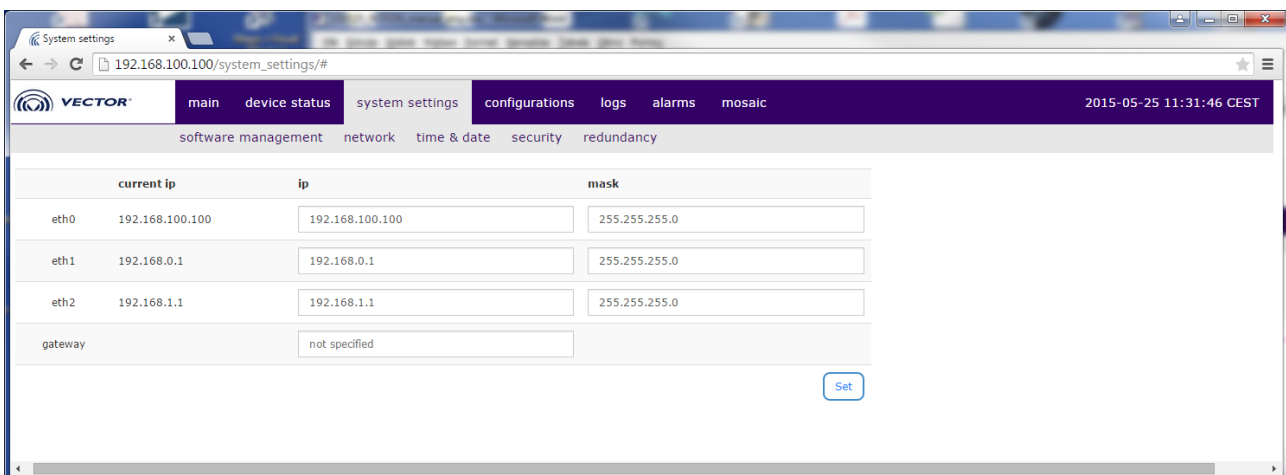
To delete the software from the device select the software which has to be removed and click 'Delete' and it will be removed.

It is not possible to delete FW on which the device is actually working.

10.2 System settings

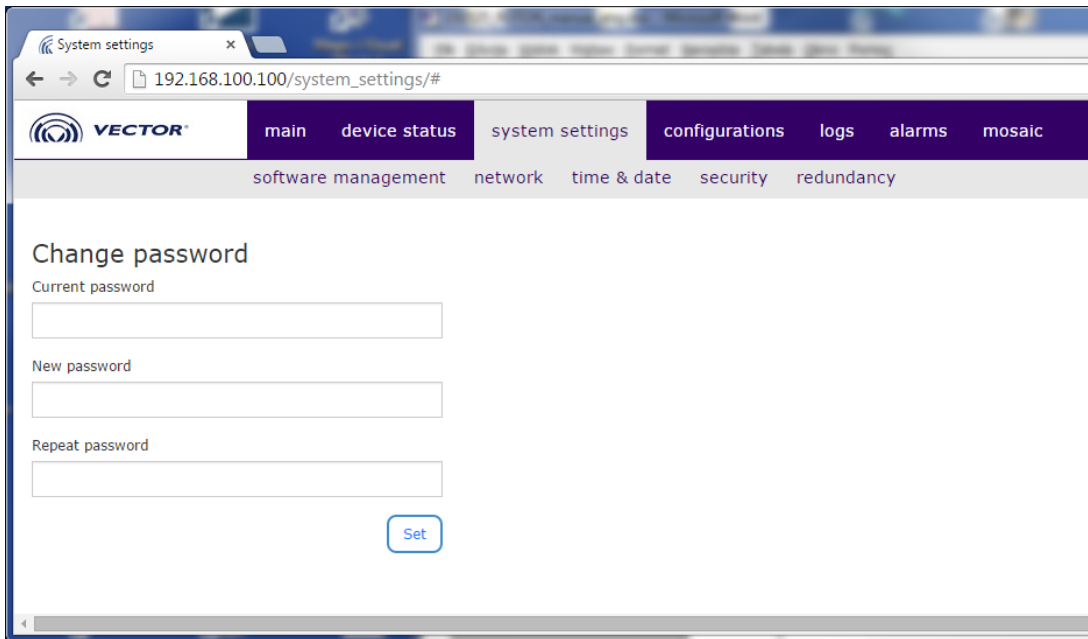
10.2.1 System settings - network

In this section you can change the startup configuration, which may differ from running configuration (if differs, particular row is highlighted on orange color). Please remember to reboot ROTON once you set a correct IP address (changes will be activated after reboot).



10.2.2 System settings - security

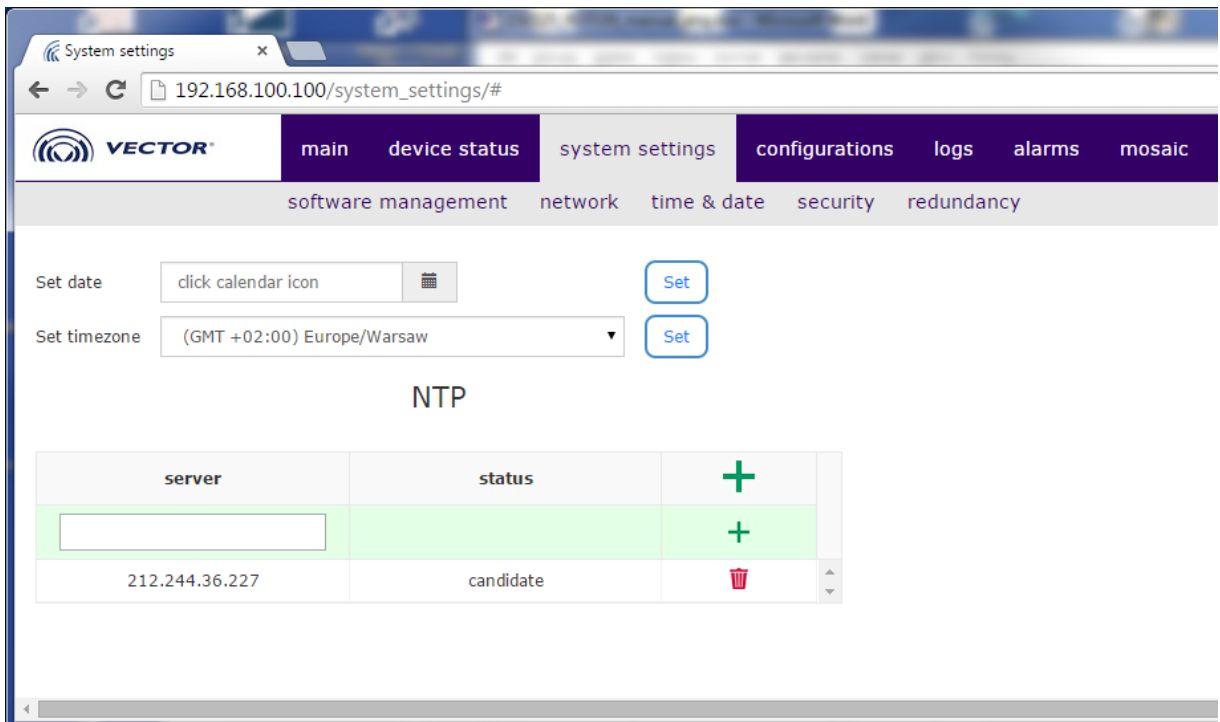
In this section you can change a password of current logged user.



10.2.3 System settings - time management

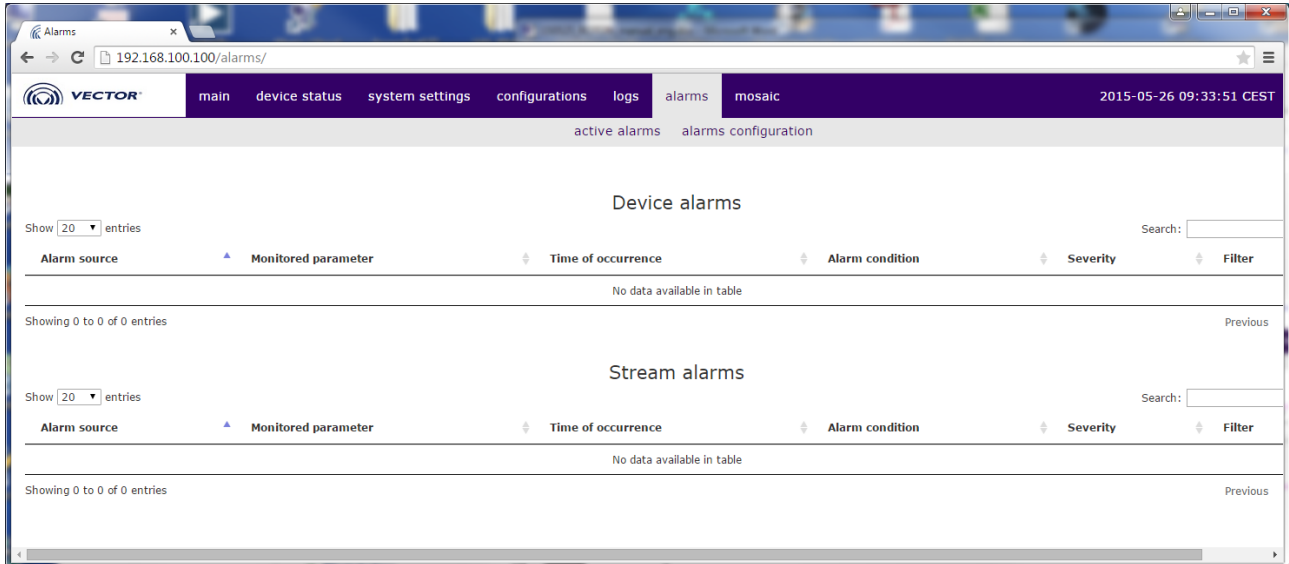
In this section you can change currently used time management.

It is possible to add (and it is recommended) the address of the NTP server, to which ROTON will be able to synchronize.

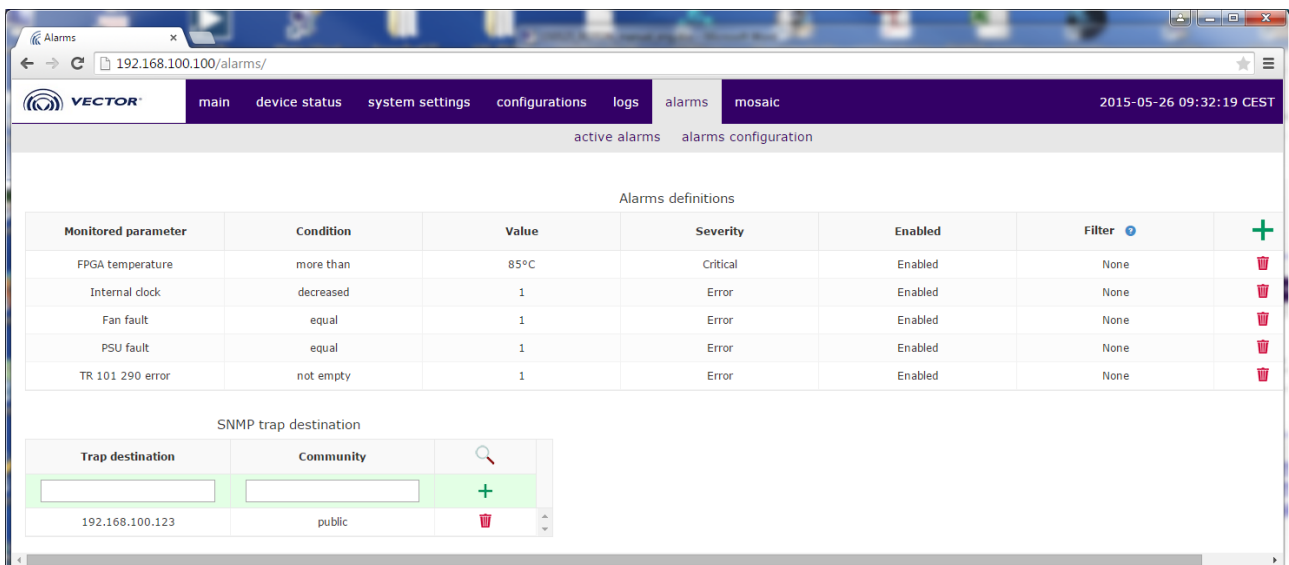


11. Alarms

In the active alarms tab, the active alarms will appear (defined on the 'alarms configuration') so the actions for which a condition is met (True). When the action is over, the information will disappear from the tab. In addition, the information about the alarms occurrence / resignation is saved in the logs available in the logs tab.



Alarms configuration:



Trap destination (IP) should be set. It is IP on which SNMP alarm traps will be generated. It is possible to add many of such IP addresses.

Explanation of the particular alarms:

1. FPGA temperature:

- Purpose: monitoring of the most critical (in terms of a damage due to the temperature) piece of the device (FPAG DUC). This alarm is used to protect the device against overheating. In case of its occurrence in the older hardware versions, DUC module will move to a sleep mode (restart is necessary). In the newer hardware version, the whole device will be switched off (restart is also necessary).
- Condition -> more than
- Value -> 85
- Severity -> critical

2. Internal clock:

- Purpose: monitors if the decoder's boards receive a correct clock signal from DUC. If the decoder's board does not receive a correct clock signal, it will not operate properly and the services which are decoded by the decoders on this board will not appear in RF output signal.
- Condition -> decreased
- Value -> 1
- Severity -> error

3. Fan speed:

- Purpose: monitoring of the fan speed. When this alarm occurs it means that the fan is worn out (the fan does not work properly).
- Condition -> less than
- Value -> 1000
- Severity -> error

4. Fan fault:

- Purpose: monitors if the fans work properly. If this alarm occurs it means that the fan does not work (or is switched off).
- Condition -> equal
- Value -> 1
- Severity -> error

5. PSU fault:

- Purpose: monitors if the power supply works properly. This alarm indicates an inappropriate operation (or disconnection) of one of the power supply module.
- Condition -> equal

- Value -> 1
- Severity -> error

6. TR 101 290 error:

- Purpose: alarm monitors if PAT, PMT and SDT boards are received properly. When this alarm occurs it means that a stream does not contain correct TS MPEG2 stream data or there is lack of any board mentioned above, or these boards are sent at too much time intervals.
- Condition -> equal
- Value -> 1
- Severity -> error

7. Total output power:

- Purpose: monitoring of the RF signal power measured at the device's output. This signal contains an upconverter signal and (alternatively) an output signal added to the device by RF loop through input.
- Condition -> less than
- Value -> to meet the needs (normally about 110 dB μ V)

8. Board uptime:

- Purpose: monitors the time of working of the particular device's boards. When the time decreased it means that the restart of the board has occurred.
- Condition -> decreased
- Value -> 1
- Severity -> error

9. CPU temperature:

- Purpose: monitors a processor temperature on the main board.
- Condition -> more than
- Value -> 60
- Severity -> Error

10. Board temperature:

- Purpose: monitors a temperature on the particular boards: mainboard, amplifier, decoders boards, upconverter.
- Condition -> more than
- Value -> 60
- Severity -> error

11. Bitrate:

- Purpose: monitoring of bitrates on: interfaces, IP, on streams on particular PID, SID. Filter tab relates to the bitrate alarms.
- Condition -> less than
- Value -> suitable for the specific type of monitored interface/stream/PID
- Severity -> error
- Attention: the filters in column Filter relate to this type of an alarm. Description of the alarms is available after clicking "?" at a column's heading. The alarm with the filter will monitor the values according to the specific filter. Setting this alarm has an influence on the redundancy operation. When the Bitrate alarm at ERROR or CRITICAL level occurs, the stream will be switched on backup (as such exists).

Five alarms are permanently switched on:

- FPGA temperature
- Internal clock
- Fan fault
- PSU fault (works only in a new hardware version in which PSU monitoring is possible)
- TR 101 290 error

It is possible to add monitoring:

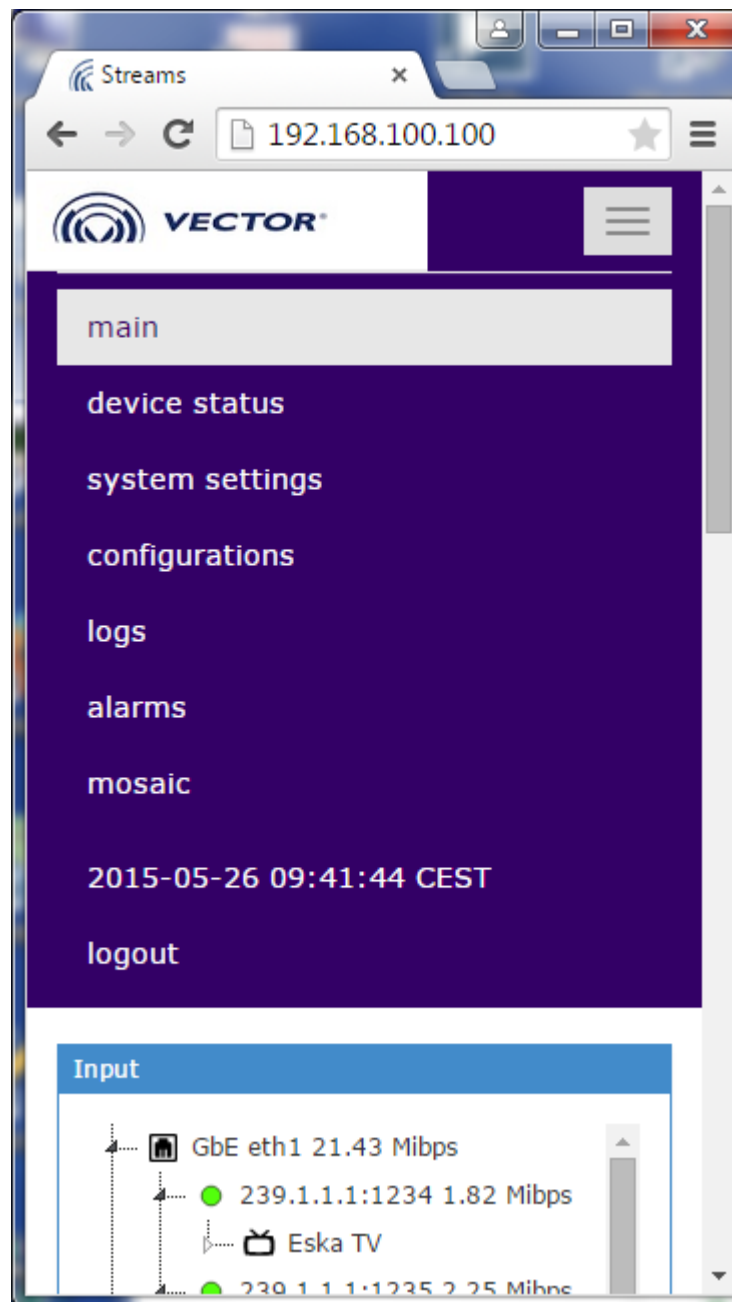
- TR 101 290 error
- Bitrate
- Total output power
- Board uptime
- Board temperature
- FPGA temperature
- CPU temperature
- Fan speed
- Fan fault
- PSU fault
- Internal clock

If the alarm is on, at 'alarms' button displays the number which define the amount of the alarms and at alarm tab shows the alarms which are active. According to this, the trap will be generated to the Trap destination (IP) with the information of the alarm reason.

Additionally, occurring 'TR 101 290 error' and the bitrate errors cause work of redundancy mechanism which means that the streams will be switched on the backup.

12. Using GUI on small screens

ROTON GUI can be used as well on small screens – it changes its layout to be more convenient in use. Navigation menu changes its orientation from horizontal to vertical as below:

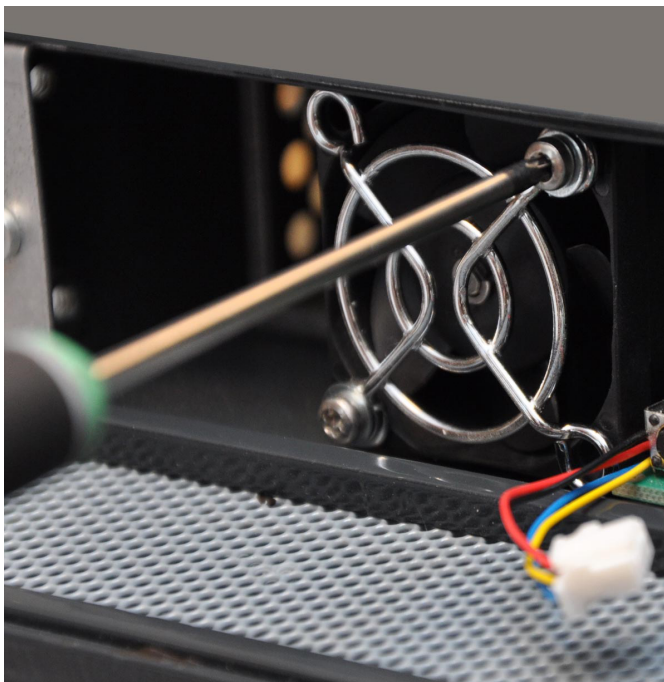
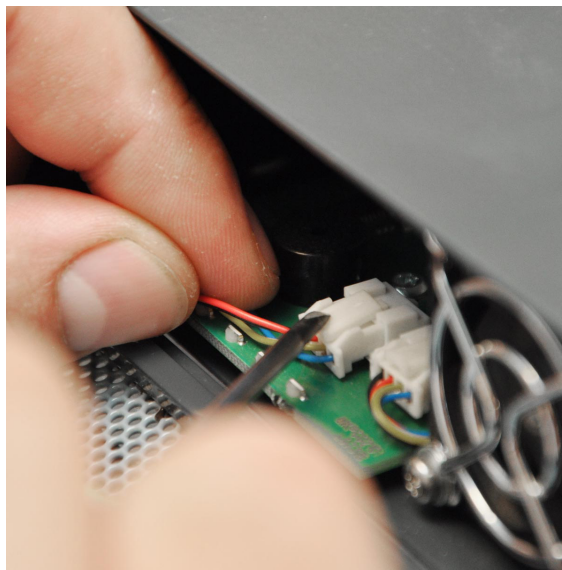


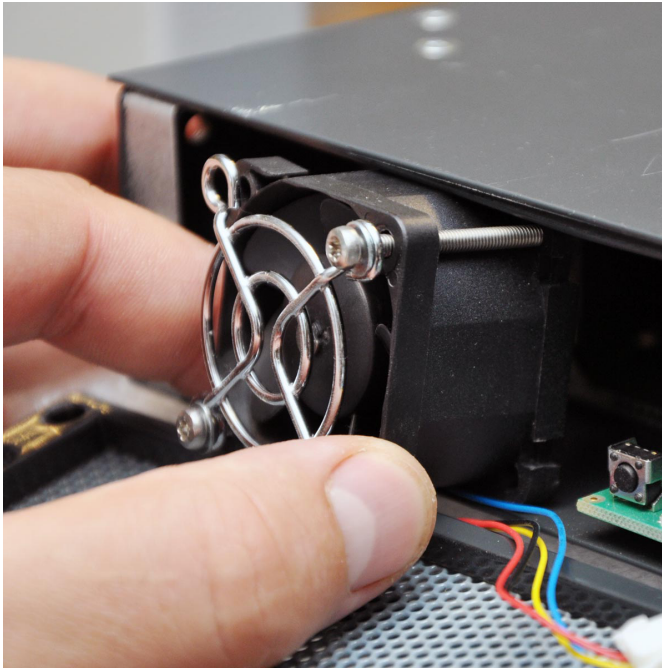
13. ROTON troubleshooting

13.1 Fan replacement

Necessary tools: torx 10

- After taking off the front panel the power plug should be removed
- The LED should light red (next to the plug of damaged fan)
- Remove four screws which secure the fan
- Take out the fan
- Insert a new fan and follow the above steps in reverse order





13.2 Overheating device

In case of the failure after switching off the device due to the overheating you should :

- Take off the power plug-ins
- Check the reason
- Eliminate the reason of a failure
- Wait until the device will cool down and put the plug-ins again

14. Customer Support Information

In case of any questions, technical problems or applications for devices repair please contact via post-sales platform - VECTOR Technical Support: http://techsupport.vector.com.pl/techsupport_enu/, by email: techsupport@vector.com.pl or by phone: +48 58 77 17 439, +48 58 77 17 436, +48 58 77 17 431.