DVB for ALL!

TROPHY

DATA-SHEET

MVDS

HD&UltraHD TERRESTRIAL MICROVAWE DVB-S2 BROADCASTING

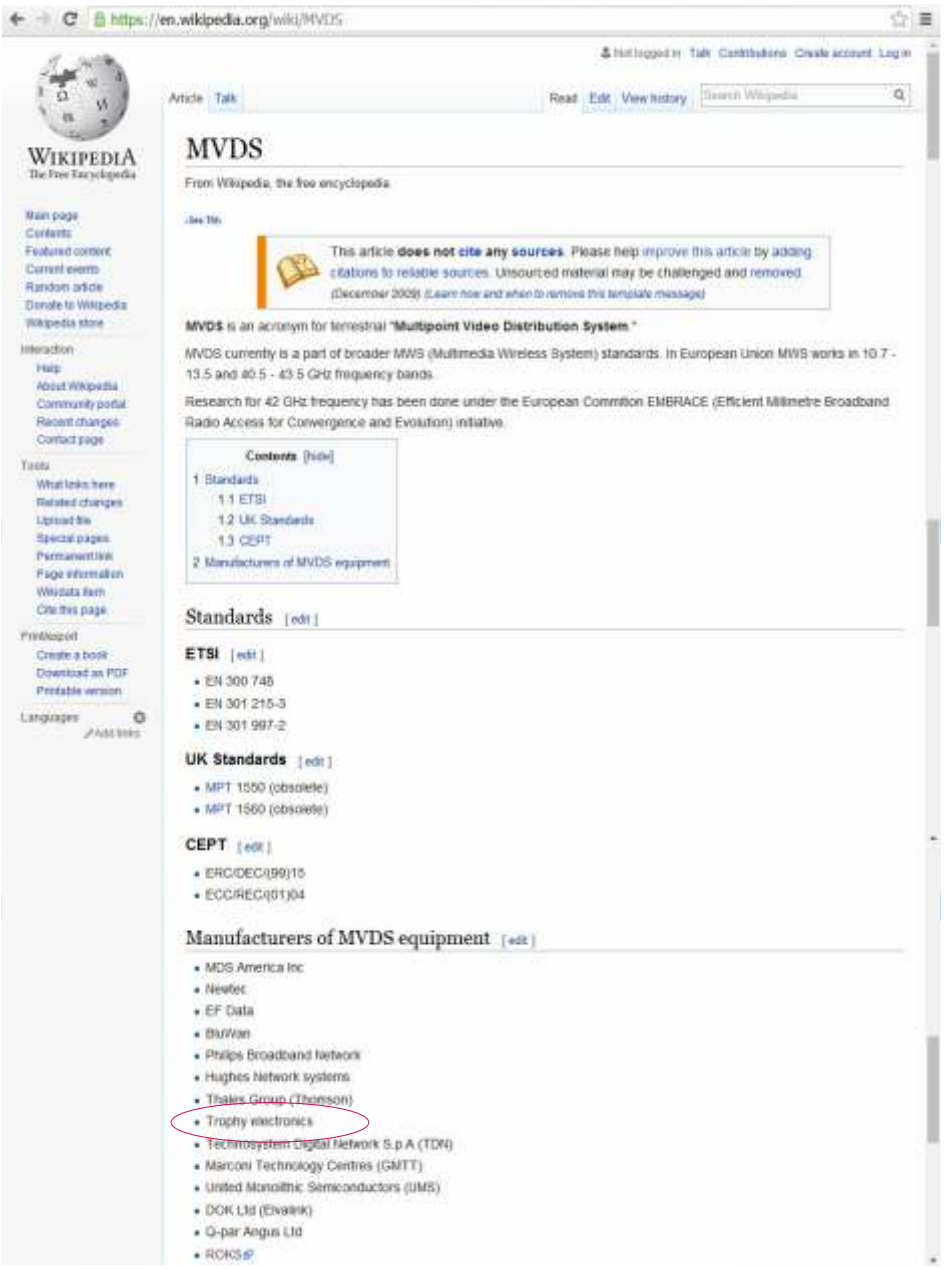
CONTENTS

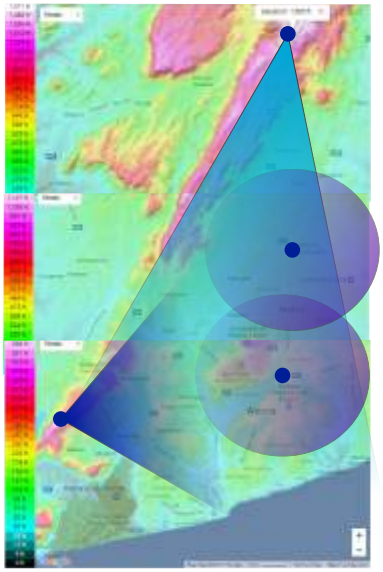
INTRODUCTION

TROPHY MVDS System is a high-tech, based on know-how, cost-effective business solution. In particular, it helps customers take full advantage of digital TV.
TROPHY MVDS System offers two main services:

1. Wireless Digital TV - direct terrestrial broadcasting of SD, HD and Ultra HD DVB-S2 digital TV in any part of the 3.7...30GHz range. Users of services are individual and corporate clients, medium-sized businesses and the hotel industry.
Customers installs:
0.4 ... 0.6 m antenna with LNB;
DVB-S2 Set-Top-Box with embedded TROPHY-ACCESS decoder.

2. Digital wired cable television built on cluster technology. The source of the signal for a single apartment building or group of buildings is an inexpensive DVB-S2 to DVB-C transmodulators.





Advantages of TROPHY MVDS solution:

- 100% coverage of the territory of city without cabling. 100% guaranteed delivery to all customers high-quality television service at a competitive price.
- unique headend equipment and unique equipment of DVB-S2 to DVB-C transmodulation with descrambling of the full transponder package.

Terrestrial microwave broadcasting implies the obligatory presence of the line of sight between transmitting antenna and receiving antenna of subscriber.
The exact location of the MVDS repeaters must be determined in the special Project Documentation.

The advantages of MVDS-TROPHY DVB-S2 terrestrial broadcasting:

1. Extremely low transmitter power (2-4W) to cover a radius up to 30km.

Due to what is achieved such energy efficiency?
The fact is that, for example, in the range of 10.7-12.5 GHz, the gain of a subscriber 0.6m offset antenna is equal to 36 dB or 4000 times in signal power.

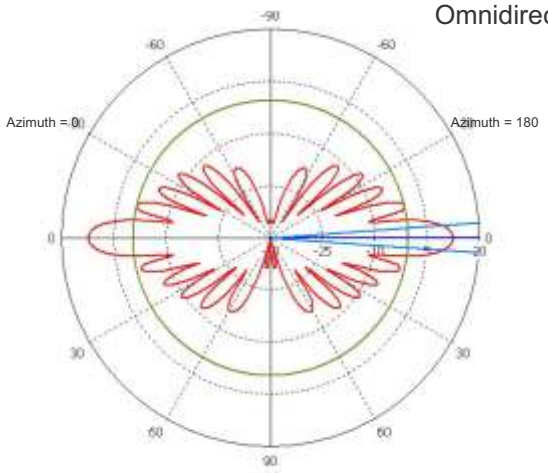
For example, the T2 UHF antenna gain is, on average, 12 dB or 16 times in power.
That is, the transmitter power in the range of 10.7-12.5GHz may be less than the transmitter power in the UHF range by 300 times!

Secondly, for the receiver to work correctly in the DVB-S2 standard, you need to maintain a threshold signal-to-noise ratio above 7dB. To work in DVB-T2, it is necessary to achieve a signal-to-noise ratio above 11dB.

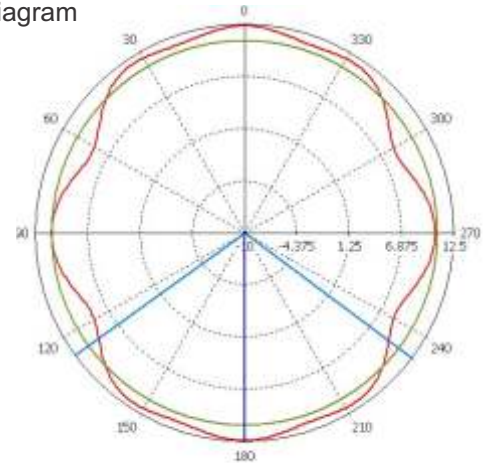
2W transmitting Converter and Omnidirectional Slot Antenna

Thus, the theoretical energy efficiency of DVB-S2 broadcasting is higher by 36 + 4 = 40 dB or 10000 times! That is, the transmitter power in the range of 10.7-12.5GHz may be less than the transmitter power in the UHF band 10 thousand times!
Of course, the losses in the atmosphere in the range of 10.7-12.5 GHz are much higher than the losses in the UHF range. Practical broadcasting showed, however, the energy efficiency of MVDS broadcasting at least 1000 times.
Therefore, MVDS Block Up Converter with a group power of 2W (0.025W on carrier!) serves a territory with a radius up to 30 km.

Omnidirectional Slot Antenna diagram



Elevation / Degree vs. dBi



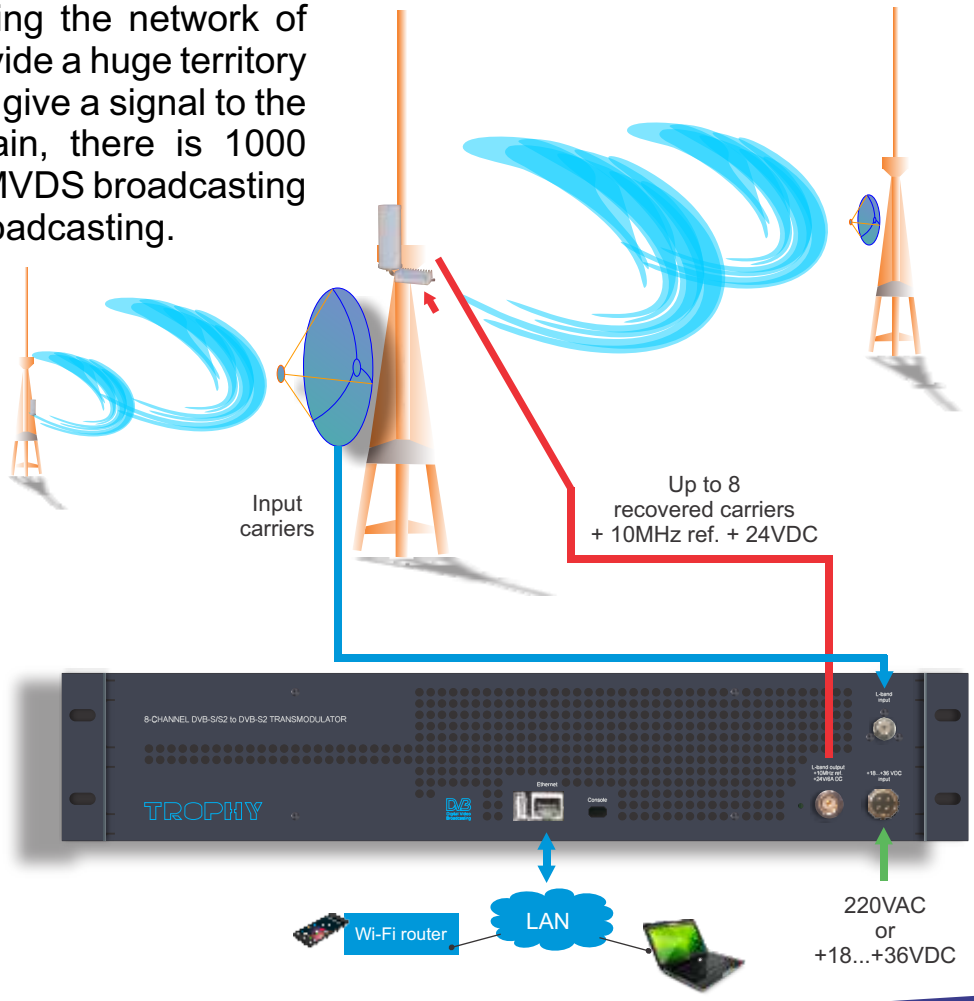
Azimuth / Degree vs. dBi

2. The use of standard LNB's and standard satellite receiving 0.4m-0.6m antennas.

In MVDS, we use two types of signal modulation: QPSK and 8PSK, that is phase modulations. To receive a signal it is sufficient to use inexpensive down-converters with low linear mixer requirements.
For example, in MMDS broadcasting, amplitude modulation methods of the 16QAM and 64QAM signal are used, which implies the use of ultra-linear modes in receiving equipment. And this, in turn, leads to higher prices for down-converters.
The most significant reduction in the cost of creating a subscriber network is achieved in the 10.7-12.75 GHz band. Here can be used household LNB worth $1-2. In other ranges, non-standard converters have to be used, which increases the cost of down-converters and prices become comparable with MMDS converters.

3. Extremely simple and inexpensive way to retransmitting a signal.

ATD-54 transmodulators, 2W transmitting converter and slot antenna are used to retransmit the signal with full carrier recovery. The number of such retransmissions are theoretically unlimited. Using the network of such repeaters we can provide a huge territory with a television signal and give a signal to the "shadow" zones. And again, there is 1000 times energy efficiency of MVDS broadcasting compared with DVB-T2 broadcasting.



4. The presence of a wide frequency spectrum, compared with the UHF range.

Practically, one transmitting converter provides a signal bandwidth up to 800 MHz. With such a band, it is possible to broadcast up to 1700 Mbit of useful data. For example, using multi-pass transcoding technology, it is possible to form a packet of 100SD channels (1 Mbit each) + 300HD channels (2 Mbit each) + 40UltraHD channels (25 Mbit each).

5. Own DVB-S2 modulators/multiplexers, original TROPHY-ACCESS Conditional Access System and low-cost Set-Top-boxes.

This factors allows you to install an extremely inexpensive Head-End with the highest functionality and quality.

List of BUCs which are producing now:

CN : 3.700 ~ 4.200 GHz (LO=5.15 GHz)

CA : 5.850 ~ 6.425 GHz (LO=4.9 GHz)

CF : 5.850 ~ 6.725 GHz (LO=4.9 GHz)

CB : 6.425 ~ 6.725 GHz (LO=5.275 GHz)

CE : 6.425 ~ 7.025 GHz (LO=5.275 GHz)

CC : 6.725 ~ 7.025 GHz (LO=5.75 GHz)

XA : 7.9 ~ 8.4 GHz (LO Freq = 6.95 GHz)

L : 10.7 ~ 11.5 GHz (LO Freq = 9.75GHz)

E : 11.70 ~ 12.50 GHz (LO Freq = 10.75GHz)

D : 12.25 ~ 12.75 GHz (LO Freq. = 11.3GHz)

G : 12.75 ~ 13.25 GHz (LO Freq. = 11.80GHz)

F : 13.00 ~ 13.25 GHz (LO Freq. = 12.05GHz)

B : 13.75 ~ 14.25 GHz (LO Freq = 12.80GHz)

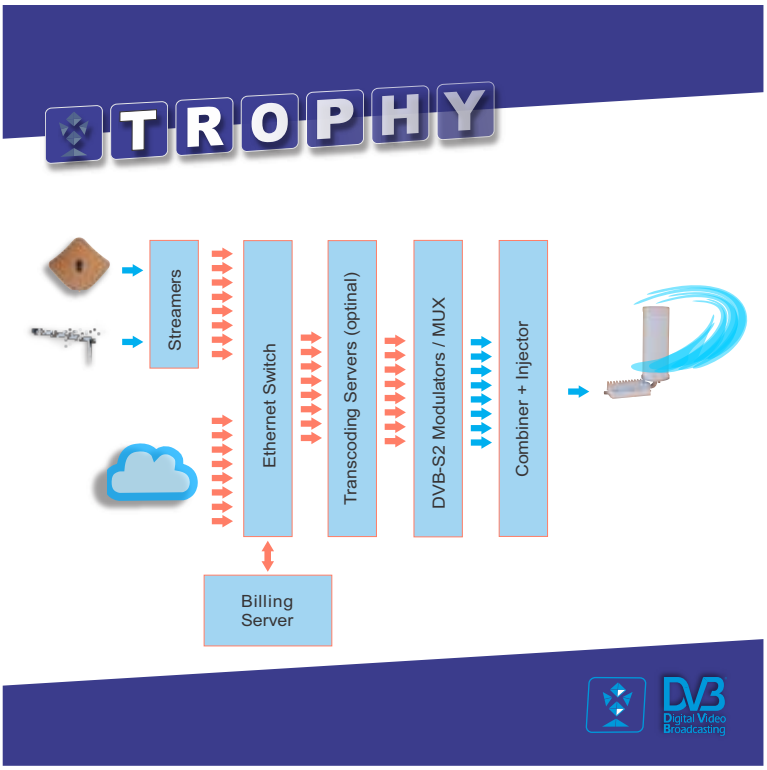
C : 13.75 ~ 14.50 GHz (LO Freq = 12.80GHz)

A : 14.00 ~ 14.50 GHz (LO Freq = 13.05GHz)

R: 14.50 ~ 14.80 GHz (LO Freq = 13.55GHz)

O : 17.30 ~ 17.70 GHz (LO Freq. = 16.35GHz)

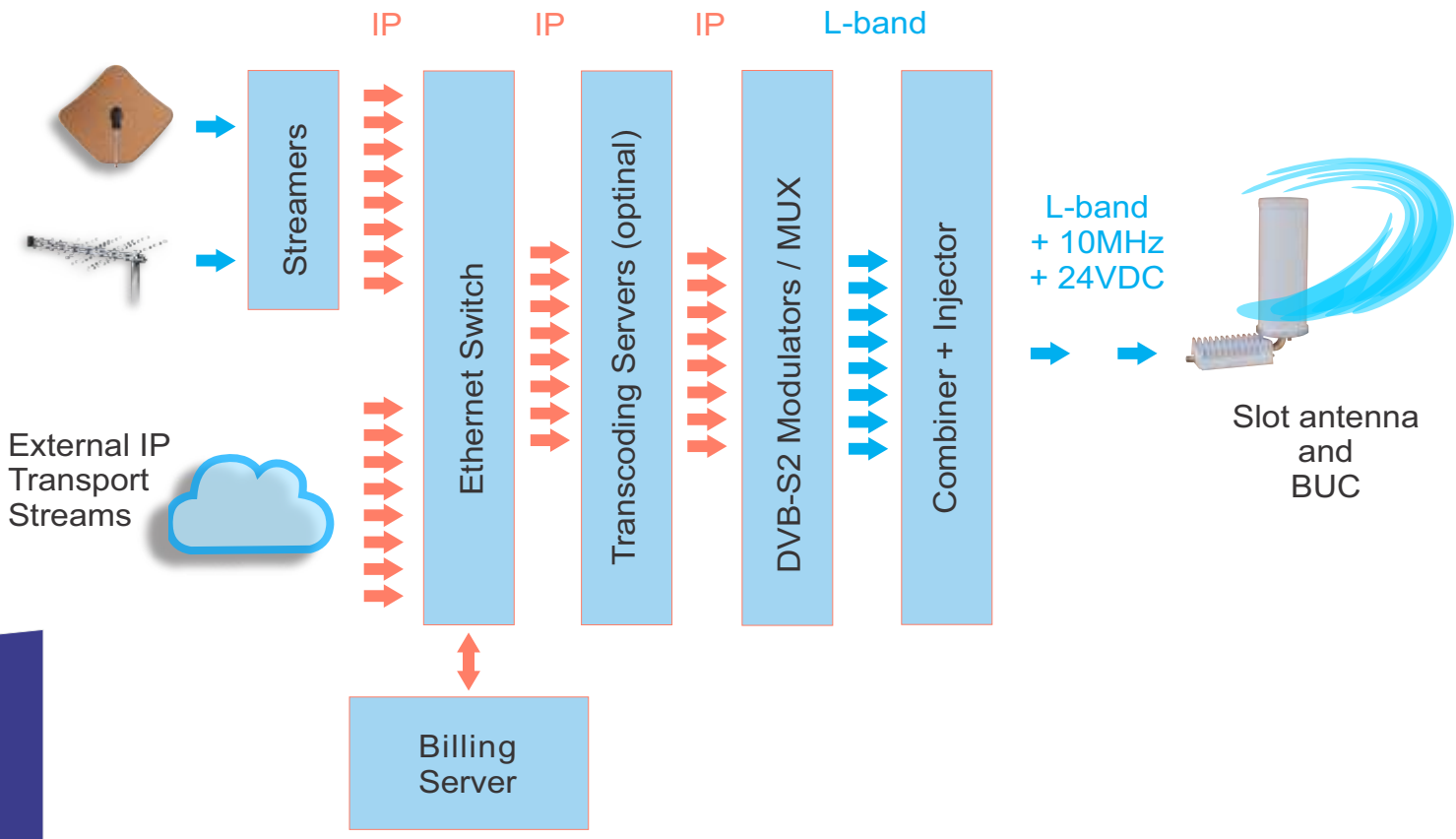
KA : 29.5 ~ 30.0 GHz (LO Freq = 28.55 GHz)



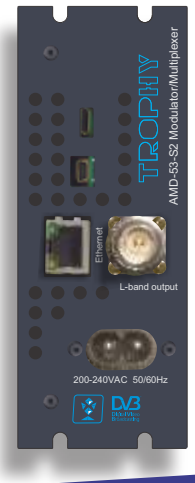
TROPHY MVDS Head End

Design of the TROPHY MVDS Head-End is very simple due to using of IP connection between modules. Heart of system is low-cost and high-efficient DVB-S2 Modulator / 120ch Multiplexer.
Almost all the major Head-End components are based on the Linux software. For example, the streamers, the transcoding servers, the multiplexers, the modulators - all this are Linux computers. From this fact derives the main advantage of the Head-End, namely the fact that due to the constant improvement of the software we allow all our customers to respond quickly to the demands of time.

The Head-End is the part of a complete system of commercial broadcasting, which the TROPHY company offers its customers. The Billing System, the Conditional Access System and the Set-Top-Boxes allow our customers to get out "turnkey" broadcasting business.
Trough the use of modern electronic FPGA components and original software solutions the cost of the equipment is one of the lowest in the market.



TROPHY



AMD-53-S2 Modulator / MUX

GENERAL INFORMATION

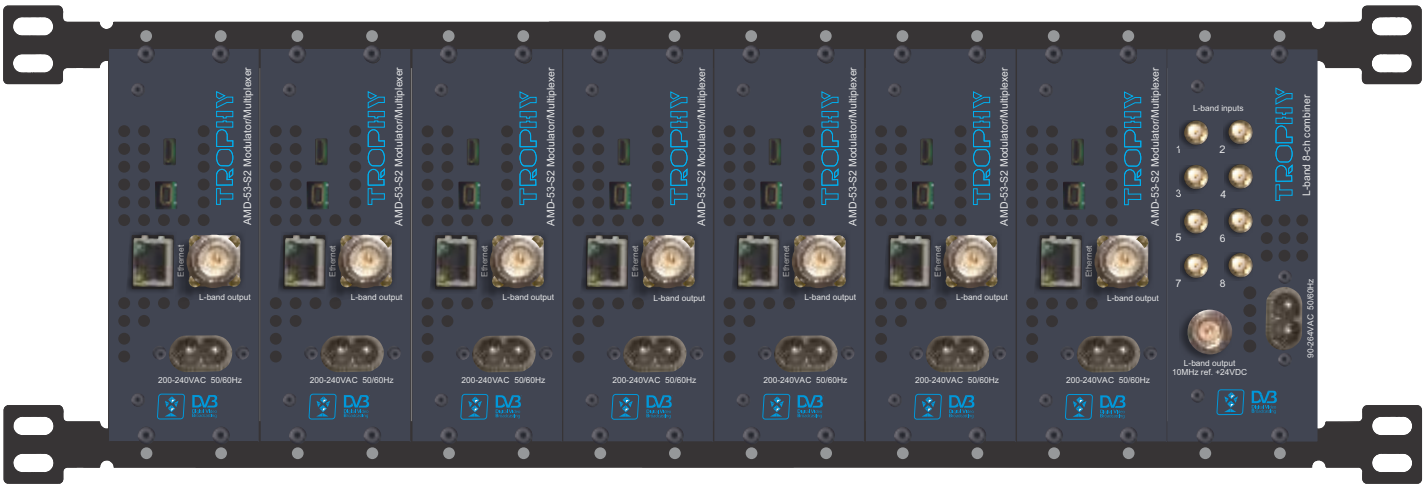
- AMD-53-S2 DVB-S2 MODULATOR / MULTIPLEXER is a brand new modulator/multiplexer designed for applications over satellite in full compliance with DVB-S2 standard.
- The AMD-53-S2 DVB-S2 MODULATOR / MULTIPLEXER converts MPEG Transport Stream over IP into QPSK/8PSK signal to transmit them in MVDS Block UP Converter (BUC).
- DVB-S2 carrier from available up to 120 transport streams are multiplexed and generated. The internal processing allows the output of DVB signals in full HD resolution.
- The device receives a data stream via Gigabit Ethernet. It can receive up to 120 transport streams from the TROPHY HeadEnd or from another IP sources included MPEG transport streams.
- A high-performance FPGA does the analogue TV modulation and the freely adjustable up-conversion into L-band range (950 ... 2150MHz). A high-speed digital→analogue converter (DAC) is responsible for the excellent output signal.

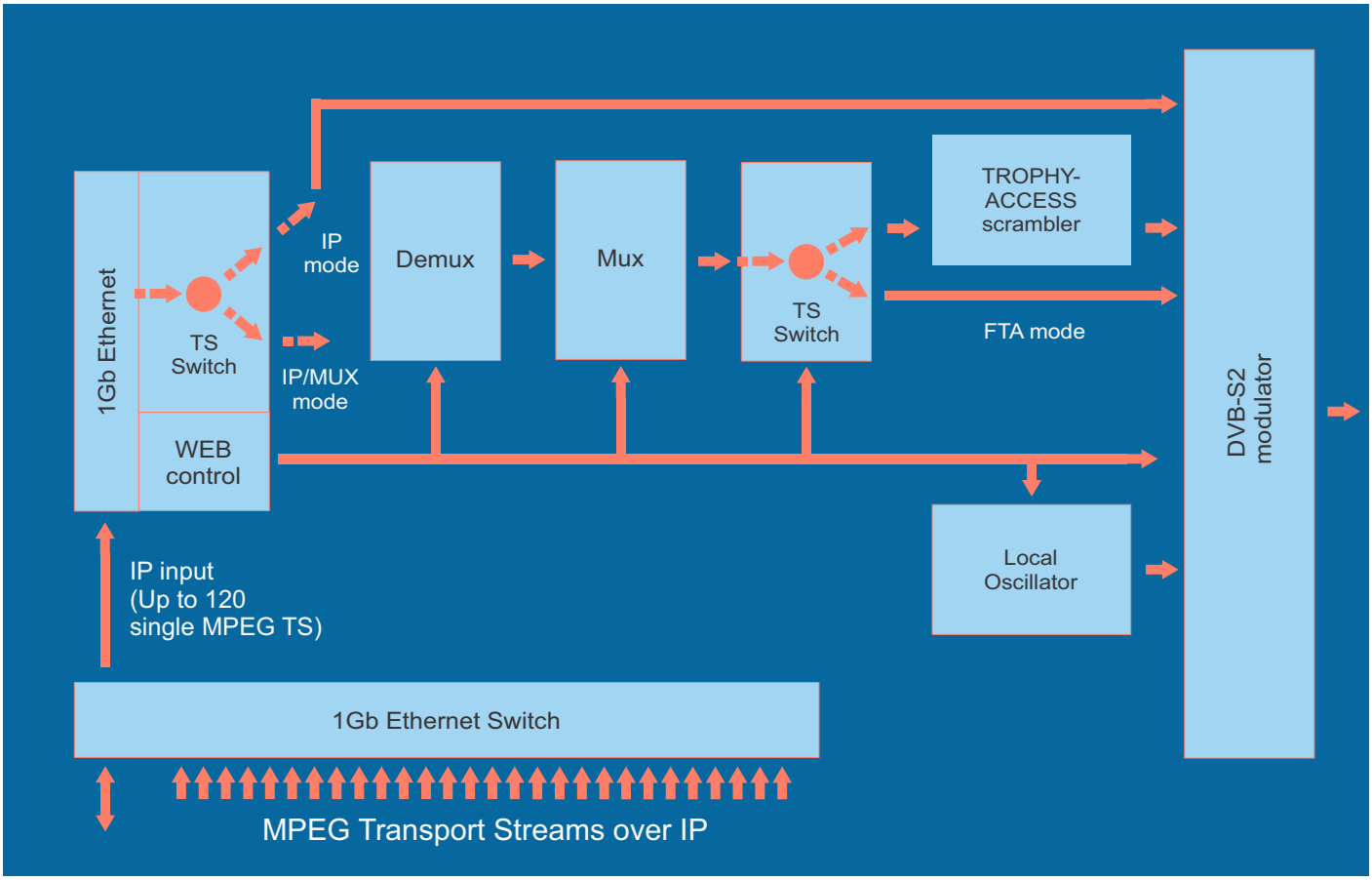
MAIN FUNCTIONS OF AMD-53-S2 MODULATOR / MULTIPLEXER:

- covers the full L-Band range (950...2150 MHZ) and offers bit rate from 2 Mbps up to 100 Mbps; provides up to 120 independent multiplexed MPEG transport streams to a single carrier, with built-in support for TROPHY-ACCESS 3.0 Conditional Access System for content protection.
- software license to enable TROPHY-ACCESS 3.0 scrambler solution;
- takes full advantages of the IP technology to provide a cost effective, highly reliable and flexible solution;
- has highly efficient multiplexing algorithms with PCR correction;
- provides transport Stream rates up to 100 Mbit/s;
- supports all PIDs of services, including EIT and LCN;
- supports Full PID remapping;
- provides effective compensation of network jitter;
- supports Control and Set-Up via WEB-interface;
- has high performance and reliability.

AMD-53-S2 MODULATOR/MULTIPLEXER integrates the CycloneV core technology required to perform high quality modulation based on TROPHY expertise. It provides customers with a best in class performance, providing a high SNR value, excellent shoulder levels and lowest phase noise.

AMD-53-S2 MODULATOR / MULTIPLEXER provides a high performance channel spectrum. This results gives an efficient transmission in QPSK and 8PSK modes. The user-friendly Embedded Web Browser ensures ease of use and enables full configuration of the modulator and multiplexer, including signal input management, selection of modulation type, control of the mute/unmute conditions for the RF output signal, PIDs filtering&remaping and PCR correction. WEB-interface also offers monitoring of all input streams.





SPECIFICATIONS	
Standards	
Carrier ID	ETSI 103 129
DVB-S2	EN 302 307
MPEG-TS	EN 301 210
DVB MPEG-TS over IP	ETSI TS 102 034
MPEG-2 PSI Tables (PAT,PMT,NIT etc)	EN 300 468 (additional license for EPG table)
IP input	
Stream port + WEB interface	Ethernet, 10/100/1000 Base-T
Connector	RJ-45
Streaming protocol	UDP/RTP, Unicast/Multicast
Streaming mode	CBR/VBR
Encryption 0,25 to 120Mbps	TROPHY-ACCESS (additional license)
RF Output	
L-Band	900MHz to 2150MHz, 10kHz step
SNR	> 40dB @ -10dBm – 8PSK – 30Mbaud
Shoulders rejection	< -50dB @ -10dBm & f/fN=1,5 for 20% roll-off
Main RF output	N Type, 50 Ohm
Attenuation range	-10dBm to -41.5dBm; 0,1dB step

Multiplexer	
Quantity of multiplexed channels	up to 120
PID quantity supported	All PIDs of input sevices
Modulation	
DVB-S2	QPSK: 1/3, 2/5, 1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 8/9, 9/10
	8PSK: 3/5, 2/3, 3/4, 5/6, 8/9, 9/10
Supported DVB modes	CCM: Constant Coding and Modulation
	VCM: Variable Coding and Modulation
	Seamless ACM: Adaptive Coding and Modulation
DVB-S2 frames	Short (16200), Normal (64800)
Pilots	On or Off
Variable symbol rate	From 1 to 35Mbaud, step 1Baud
Control & Monitoring	Web Browser Control & Monitoring
	10/100/1000 Base-T Ethernet ports
	90 to 240VAC/50Hz/15W
Physical	2kg Weight
	0°C to 50°C temperature range
TROPHY-ACCESS 3.0 options	
Type of CAS	FPGA based, doesn't match CSA algorithm
Size of the decoder address field	32 bits
Quantity of addressable decoder	16 millions
The number of serviced channels	without any restrictions
The number of packets serviced	without any restrictions
Automatic decoder disconnection	with zero balances in the subscriber account

DVB BILLING PRO SoftWare

DVB-BILLING PRO Software and Statistics Server

The DVB-BILLING PRO program is designed to manage the subscriber base and manage subscriber decoders in large commercial DVB broadcasting networks using the TROPHY-ACCESS 3.0 Conditional Access System.
The DVB-BILLING PRO software is supplied with the Billing Server. Depending on the order, the Billing Server can be either the simplest (demo version) or the most complex, up to a group of servers assembled using cluster technology.

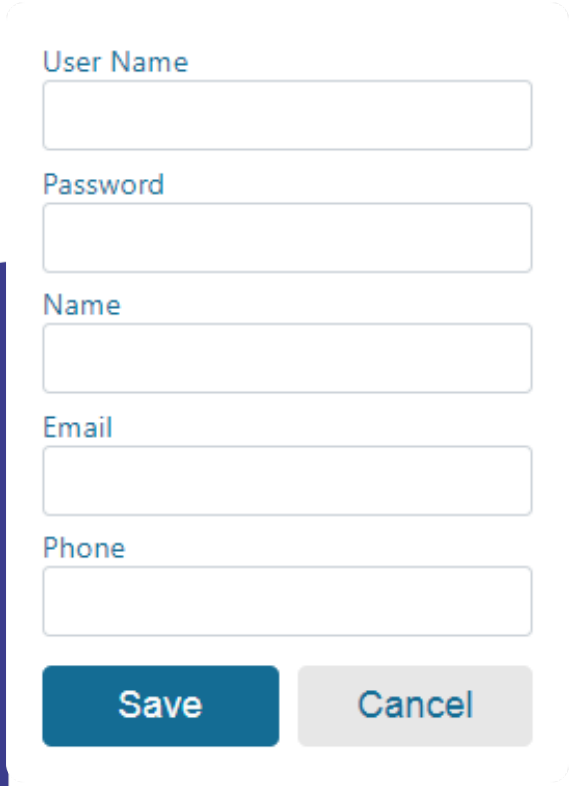
The main functions of the Statistics Server are:

- management of subscriber decoders;
- keeping records of subscriber payments;
- creating various reports on payments;
- integration of the Billing Server with the system of bank payment terminals and bank acquiring.

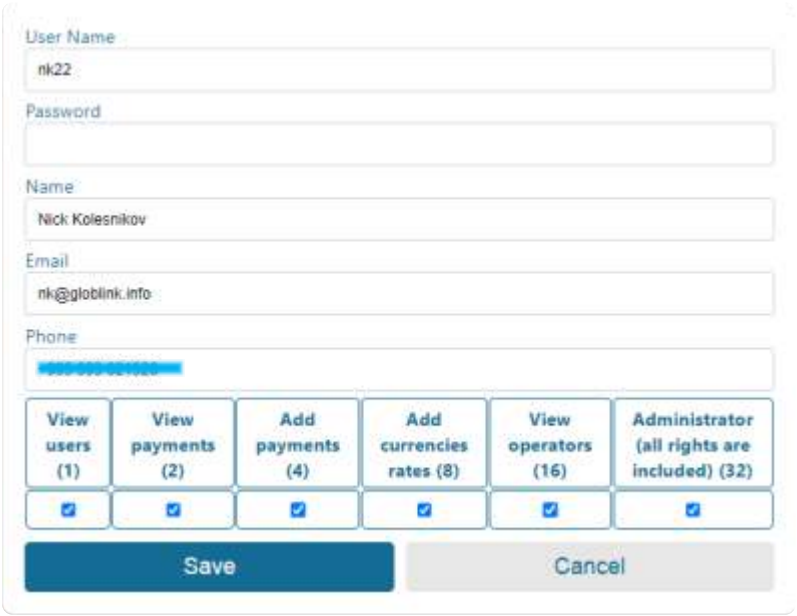
OPERATORS menu

Press the **OPERATORS** button to enter the menu. The administrator has the right to add operators and set Rights.

Click the **Add** button to add a new Operator.



Click the **Edit** button to edit Operator information.



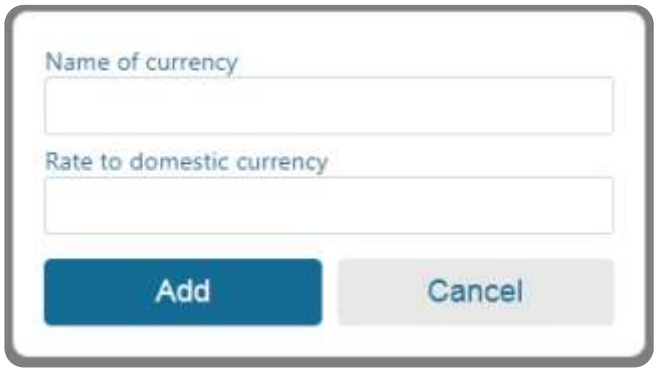
CURRENCY menu

Press the **CURRENCY** button to enter the menu.

The Administrator has the right to indicate the name of the payment currencies and the current exchange rate to the internal currency of the billing program.

The cost of packages is indicated in internal currency. Payment archive is stored in internal currency. If there is no new exchange rate for the payment currency to the internal currency on the current date, the program applies the last saved rate. If the exchange rate of the internal currency to any state currency is equal to 1.00, then, in fact, the billing program will keep records in this state currency.

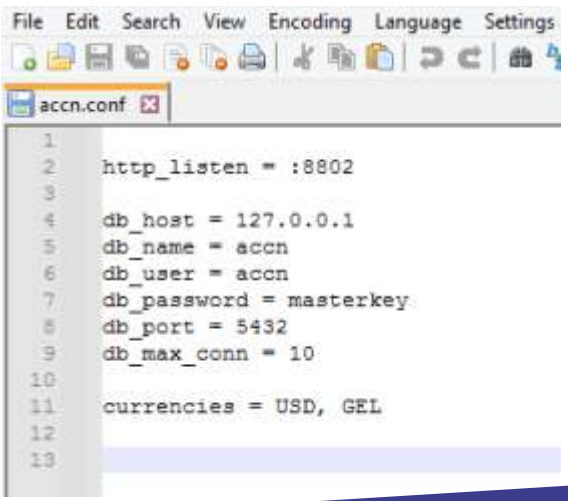
The Administrator has the right to indicate the current exchange rate to the internal currency of the billing program



The list of the state currencies available to the Administrator is indicated in the **accn.conf** file.

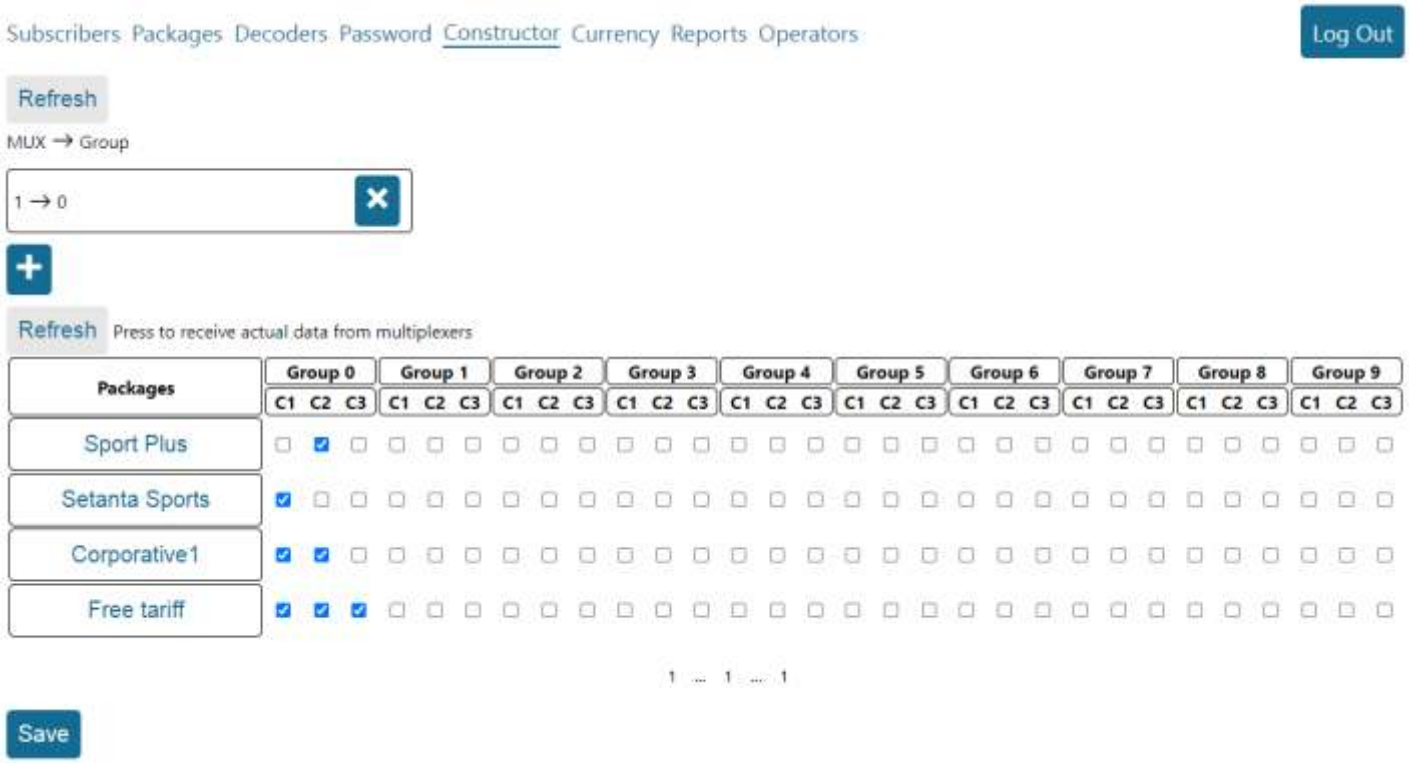
The names of currencies are entered separated by commas in the currencies line, for example:

currencies = USD, GEL



CONSTRUCTOR of Packages

Attention! Changes to the **Constructor** can only be made by the Administrator.
This page is hidden from Operators.



The administrator, when installing the system, can perform the following actions:

- add a new multiplexer (MUX) by pressing the **+** button (the next Transport Stream ID value is automatically generated);
- remove multiplexer;
- indicate the group number for the new TS ID in the **Choose group** column:

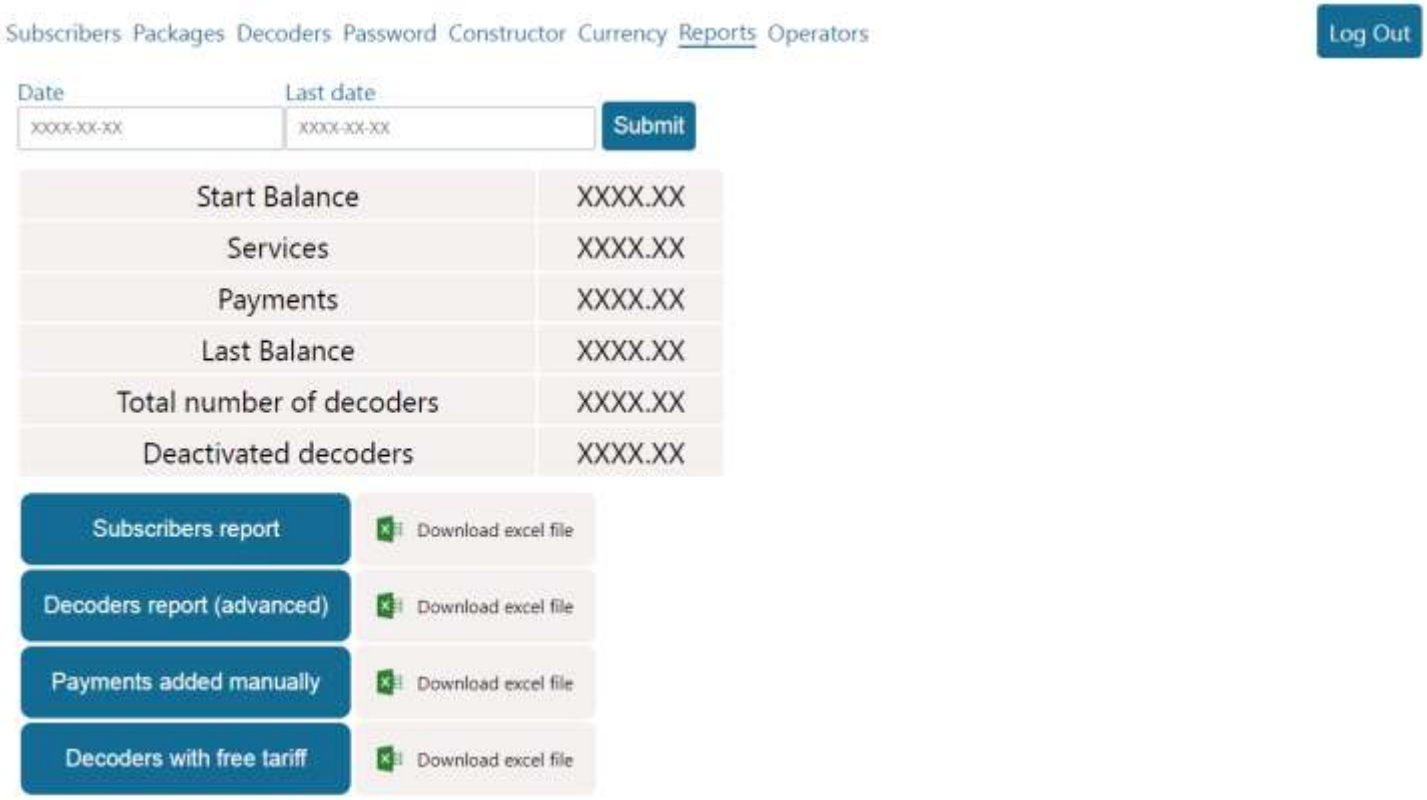
REPORTS menu

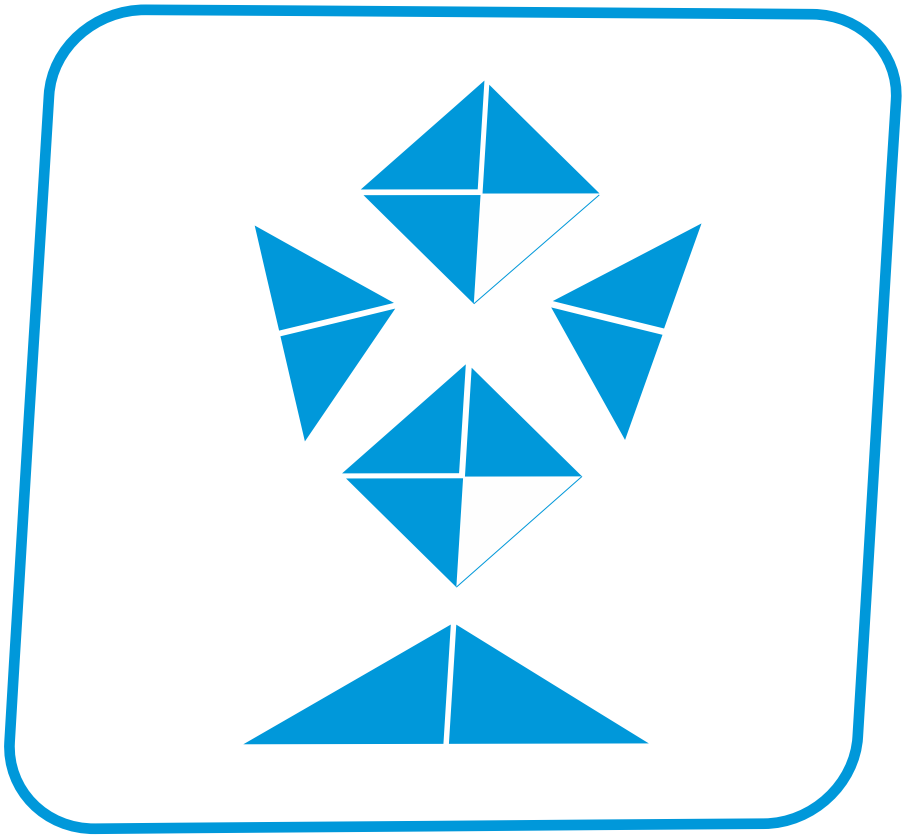
Press the **REPORTS** button to enter the menu. To generate a report, you need to select the start date and end date of the reporting period. Click the **Submit** button. The results are displayed in the corresponding menu fields - **Start Balance**, **Services** (funds withdrawn from subscriber accounts for the period), **Payments** (payments for the period), **Last Balance**.

To generate reports, click one of the buttons:

- **Subscribers report**;
- **Decoders report** (advanced) (full information about payments, decoders and subscribers);
- **Payments added manually**;
- **Decoders with free tariff** (information about service decoders).

After you have selected the period and type of report, the billing server will prepare the corresponding file in Excel format.





TROPHY ACCESS CAS

TROPHY-ACCESS CAS

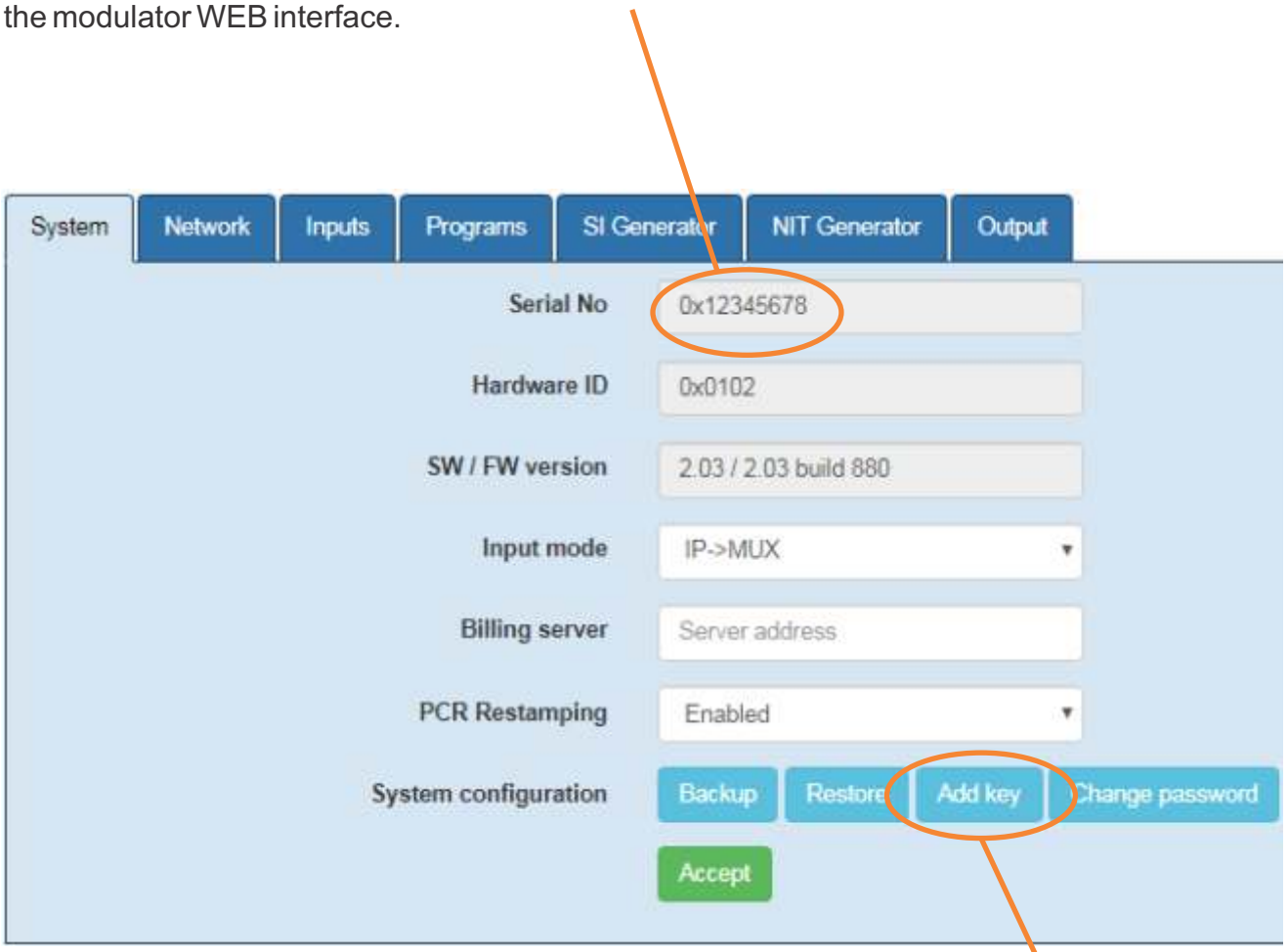
The TROPHY-ACCESS 3.0 Conditional Access System does not use the CSA algorithm, which ensures high reliability and the absence of the possibility of pirated viewing, called Card-sharing.
The scrambler is integrated into the hardware of TROPHY brand modulators/multiplexers.
The Decoder is integrated into the hardware of TROPHY DVB Set-Top-Boxes.
The Billing Server and DVB-BILLING PRO software provide the ability to manage subscriptions. The Decoder automatically turns off if the subscriber account balance is insufficient.
Subscription data is transmitted to the MODULATOR/MULTIPLEXER via Ethernet.

Options	
Type of CAS	Cardless, doesn't match CSA algorithm
Polynomial length	2048 bits
The size of the decoder address field	32 bits
Quantity of addressable decoders	16 millions
The number of serviced channels	without any restrictions
The number of packets serviced	without any restrictions
Automatic disconnection of the decoder	with zero balances in the account

TROPHY-ACCESS Conditional Access System (CAS) integrated into the modulator/multiplexer

The TROPHY-ACCESS 3.0 scrambler is built into the modulator/multiplexer FPGA. In order for the TROPHY-ACCESS 3.0 scrambling function to be available in the modulator, you must purchase a special license:
http://dvb4all.com/?product=software-license-to-enable-trophy-access-scrambler-solution

After confirmation of payment, the client is received an unique key, which is generated based on the serial number of your modulator/multiplexer. The serial number is indicated in the first line of the **System menu** of the modulator WEB interface.



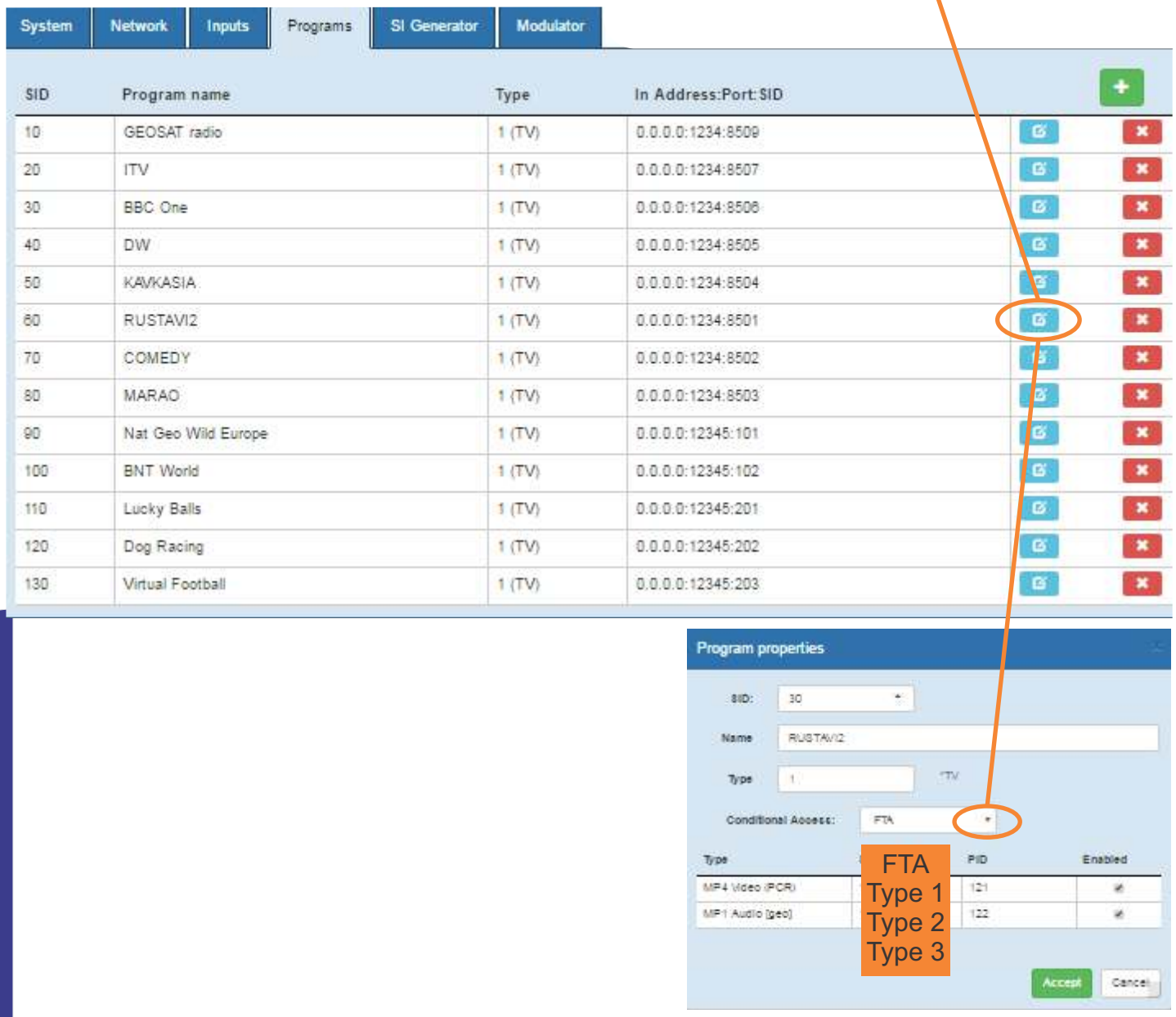
After receiving the key, you can enter its number in the **System menu** by clicking the **Add key** button.

Modulators (streams) and groups (ports)

Modulators/multiplexers are grouped depending on the broadcasting features. For example, it is necessary to transmit streams in different ranges or in different standards. For this purpose, separate groups of modulators are created. A group located on one Port can have any number of modulators. All modulators with the same Port Number have the same subscription information. The system can have up to 10 Ports numbered 0...9. You assign the Port number to which the modulator/multiplexer belongs, based on the Tariff Plan scheme and channel viewing rights.
When installing a headend with multiple modulators, you will need to plan what programs will be included in the Packages, then distribute them across streams (modulators), subscription Ports, etc. As a first step, simply assign Port "0" to all modulators/multiplexers.

Enabling scrambling mode

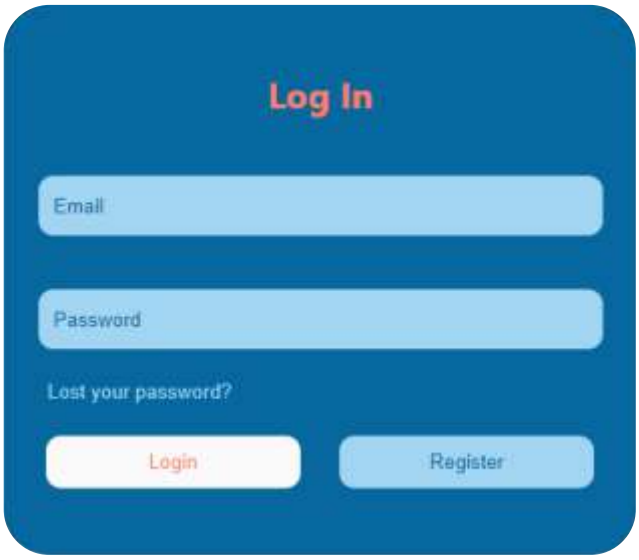
The modulator/multiplexer can transmit programs in FTA or encrypted form. In order for the program to be encrypted, the scrambling function of the program(s) must be enabled.
In the **Programs** menu, in the line of each program, click the **Program Propeties icon** and specify the scrambling type (Type 1, Type2, Type3).
The modulator sends subscription information to Decoders, which allows or denies viewing of encrypted programs.



TROPHY ACCESS CAS

Personal account of Subscriber

LOGIN TO YOUR PERSONAL ACCOUNT

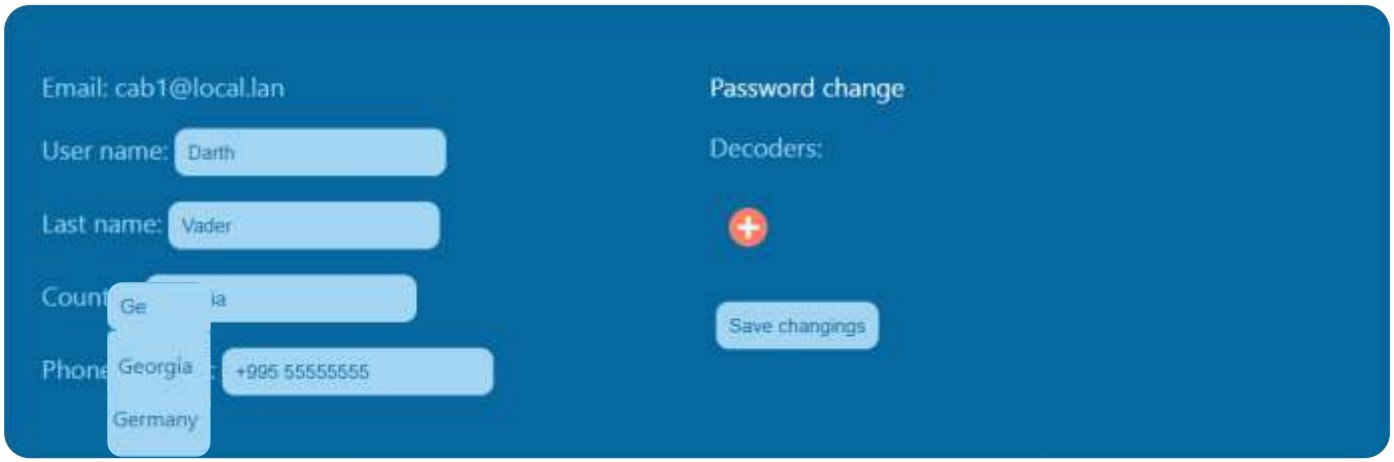


After receiving your password by email, enter your email address and the received generated password. Click the **Login** button to log in to the your account page.

The following pages will be available in your personal account:

- **Balance**
- **Profile**

You can log out of your account by clicking the **Logout** button.



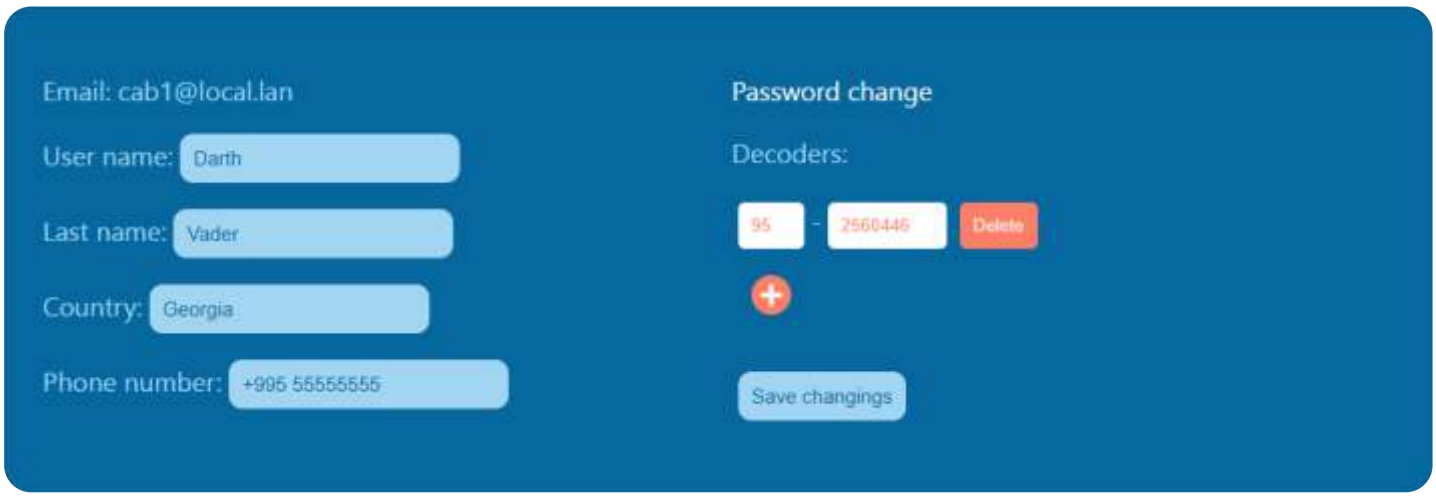
Enter your first name, last name, country of residence and phone number.

When you enter the first letters of the country name, a list of countries appears from which you must select your country. The list is generated according to the ISO_3166-1 standard. The front-end displays the name of the country and the database receives a 2-digit country identifier. Please note that selecting a country is required. If this line is not filled in, you will not be able to assign program packages to your decoders in the **Balance** menu.

Entering the decoder number on the PROFILE page

Enter the serial number of your Decoder (or Decoders).

The decoder serial number is located on a sticker on the bottom cover of the Set-Top-Box.



You can add a new decoder serial number by clicking the button.

The Billing Administrator must enter all decoder numbers into the database in advance. When the Subscriber enters a decoder on the **Profile** page, the following checks occur:

- checking the checksum to avoid number entry errors (checked on the front-end);
- the decoder number should not contain more than 12 characters (checked on the front-end);
- presence of the decoder number in the database;
- whether the decoder is free or already in use.

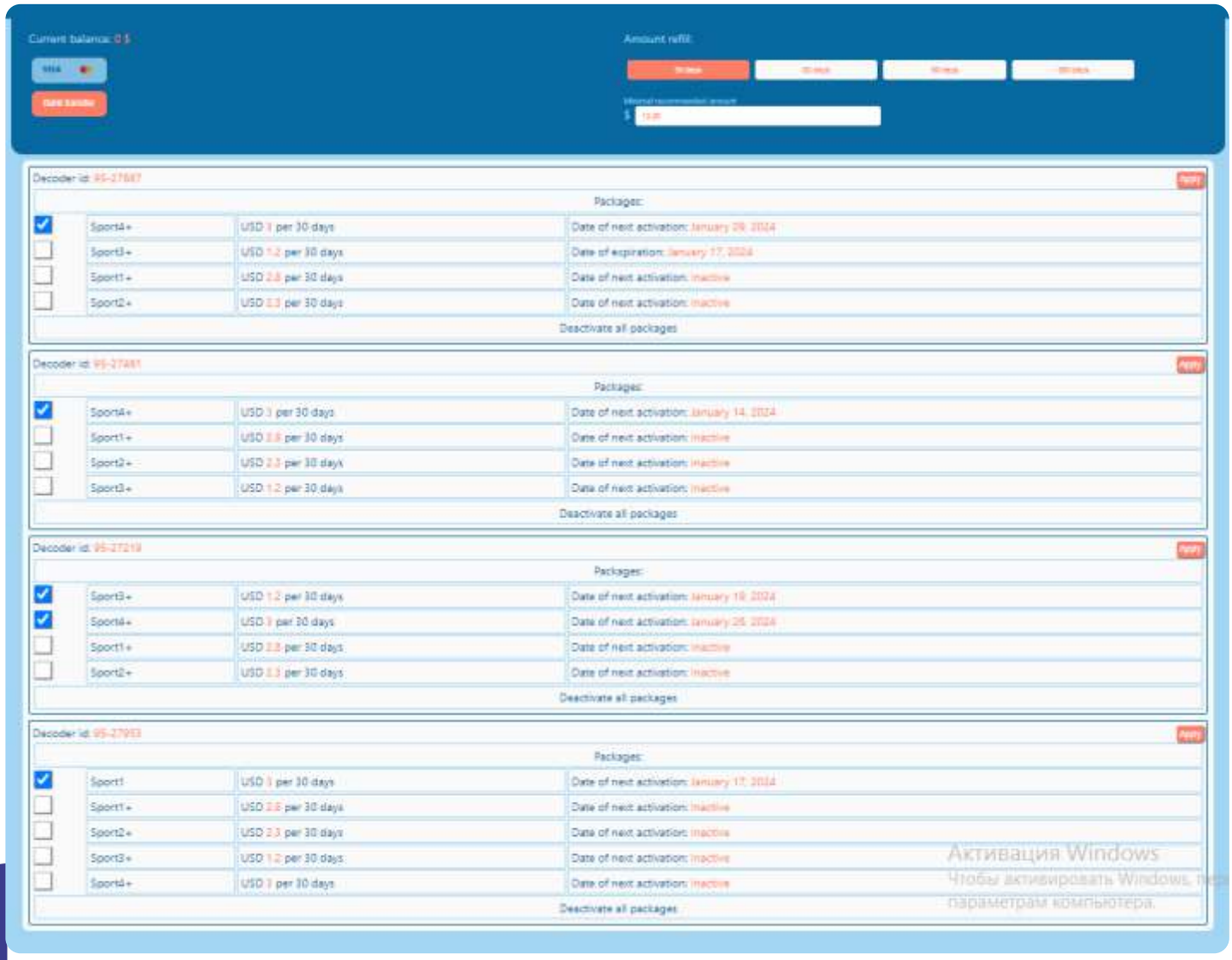
If you specified an incorrect decoder number, the program will display the following error message:

“There is no decoder with this number or it is already in use”

Here you can remove the decoder. Confirm decoder removal by clicking **OK**. If the decoder has a prepaid package, then disabling the decoder will take effect during the next tariff activation, which occurs every 30 days. You can see the next activation date on the **Balance** page.

BALANCE

On this page you can see the current balance of your account, current packages and the number of each Decoder. Here you can top up your balance, turn-on or turn-off the packages.



The list of available packages is sent to the frontend from the billing database.

Various types of decoders are possible, both individual and corporate. For all types of decoders, the Administrator creates special packages, depending on the terms of the contract with subscribers. The Billing program offers only packages authorized by the Administrator for the decoder. Typically, only a single special package is available to a corporate subscriber.

Please note that selecting a country on the Profile page is required. If this line is not filled in, you will not be able to assign packages to your decoders.

TROPHY

FFMPEG Transcoder

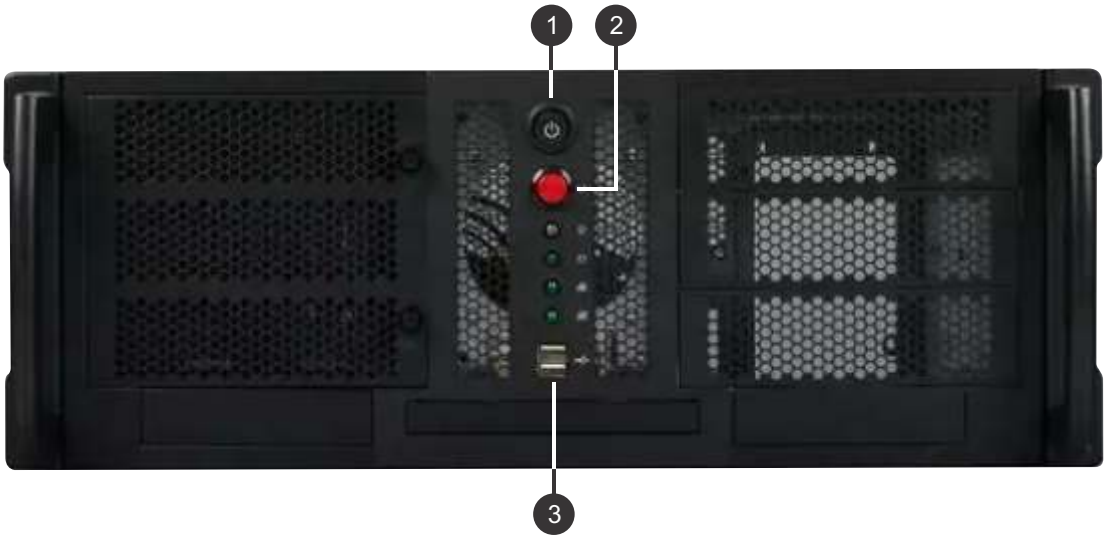
FFMPEG Multichannel Transcoder designed to digital-to-digital conversion of one type of encoded data (video or audio) to another using FFMPEG solution.
Module are intended for indoor use only.

Characteristics:

- LINUX OS.
- Transcoder converts audio or video formats. Device has possibility to transcode up to 14 HDTV services. It can encode in real-time from various hardware and software sources.
- Convenient WEB-interface for setting transcoding parameters.
- Possibility to enter advanced FFMPEG commands using the command-line for video and audio editing: FFMPEG provides a variety of editing features, such as cutting, merging, and trimming video and audio files. Users can also add or remove audio tracks, adjust volume levels, and modify other properties, such as framerate and resolution.

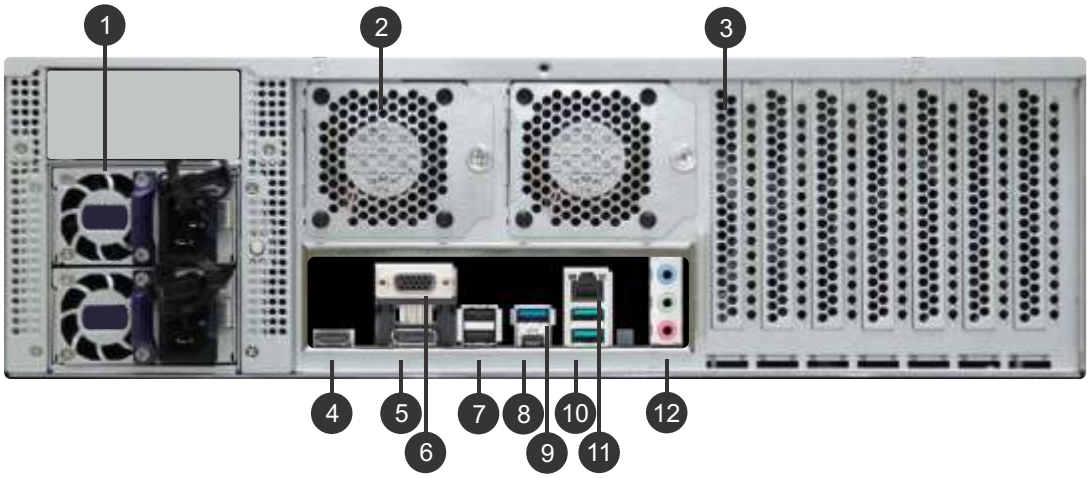
HardWare	
Processor	Intel i9-14900K
RAM	16G DDR5
SSD	256G
Front panel connectors	
LAN	Realtek Ethernet 2.5Gb
HDMI	HDMI 2.0
DisplayPort	DP 2.0
Rear panel connectors	
USB	4*3.2USB, 4*2.0USB
TypeC	1*TypeC
Mic	3*3.5mm Jack
Control&Monitoring	
WEB	Web browser control
USB Virtual COM-port	USB connector
SoftWare	
OS	Linux / Ubuntu
FFMPEG	Version _____
Phisical	
Interface language	English
Supply voltage	220VAC
Wattage	up to 500W
Temperature range	0...40 C
Dimensions	4U, 465.2 x 430.0 x 176.0 (mm)
Gross Weight	15 kg

Front Panel

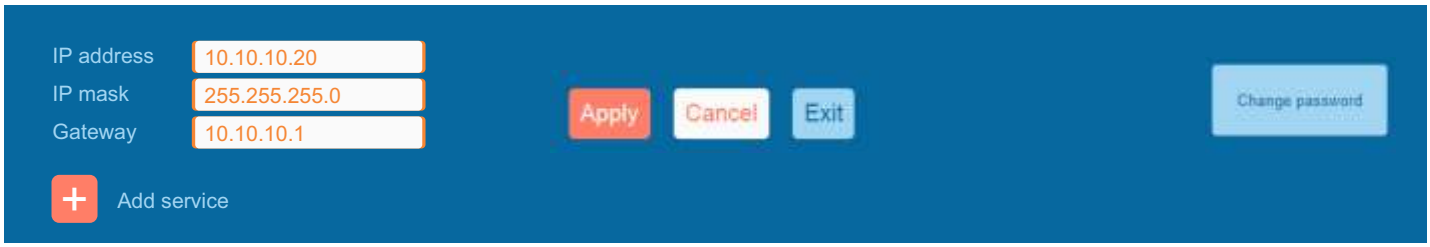


1	Power on/off
2	Reset button
3	2*USB2.0 ports

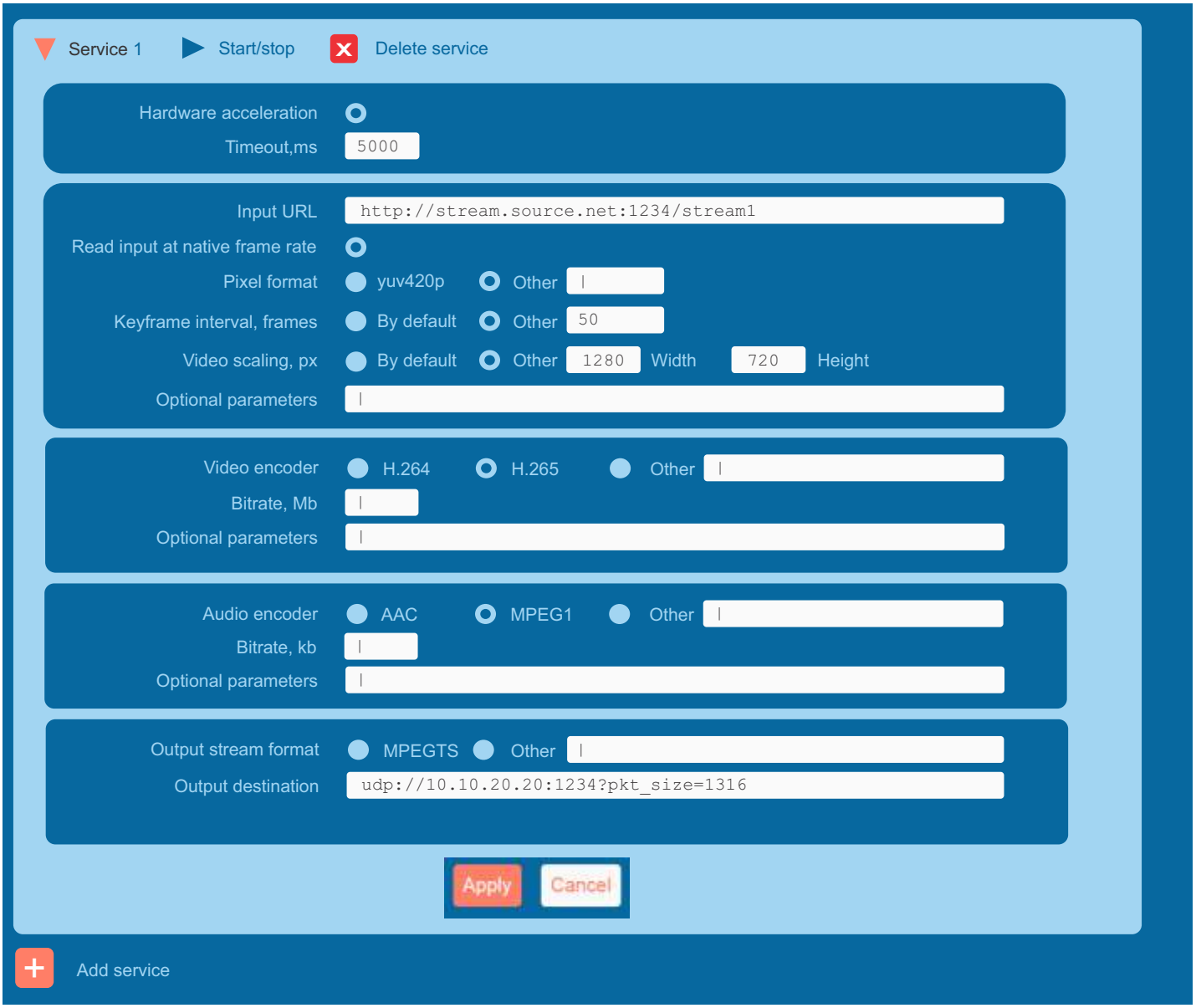
Rear Panel



1	Power supply	7	2*USB2.0 ports
2	FANs	8	USB3.2 Gen2x2 TypeC
3	1*PCIe 5.0, 3*PCIe 4.0 slots	9	USB3.2 Gen1 port TypeA
4	HDMI	10	2*USB3.2 Gen2 port TypeA
5	Display Port	11	Realtek 2.5Gb Ethernet
6	VGA port	12	3*Audio jacks



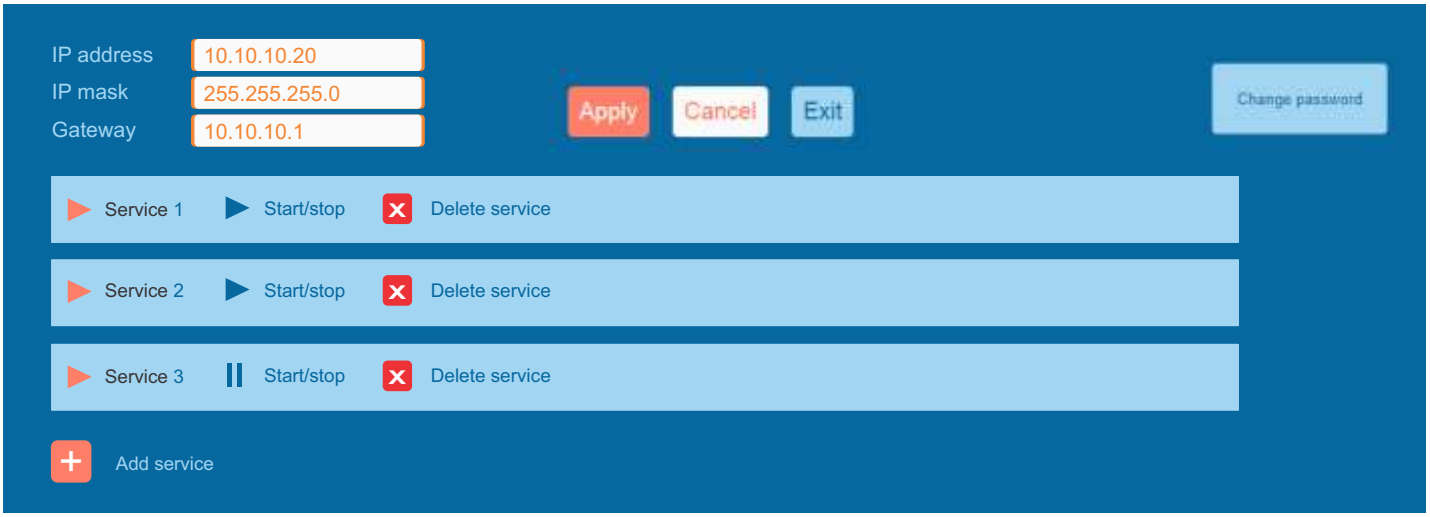
Press **Add service** button to create new transcoding service.



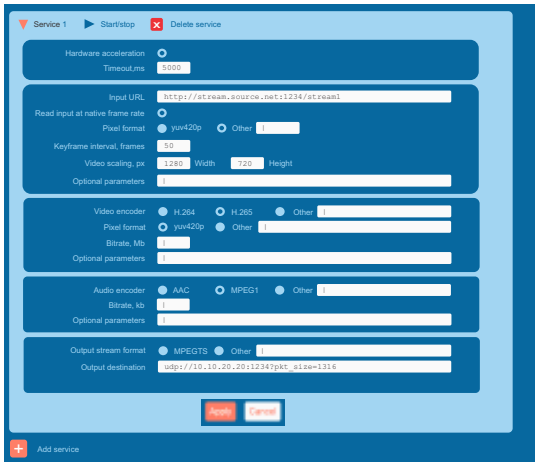
The ▶ and ▼ buttons allows you to expand and collapse the lists of parameters.
Use **Apply** button to save the parameters.
You can start/stop the service using ▶ and ⏸ button.

You can delete the service using ✕ button.

Parameters menu



Choose the service and press ▶ button to expand the list of the service parameters.



Hardware acceleration

You can use the Graphics Processor Unit (GPU) of the device to transcoding the stream. To do this, select the **Hardware accelerator** option. Note that the WEB-interface does not show the percentage of GPU load. Use LINUX commands to see this parameter.

10 MHz and DC Injectors

GENERAL INFORMATION

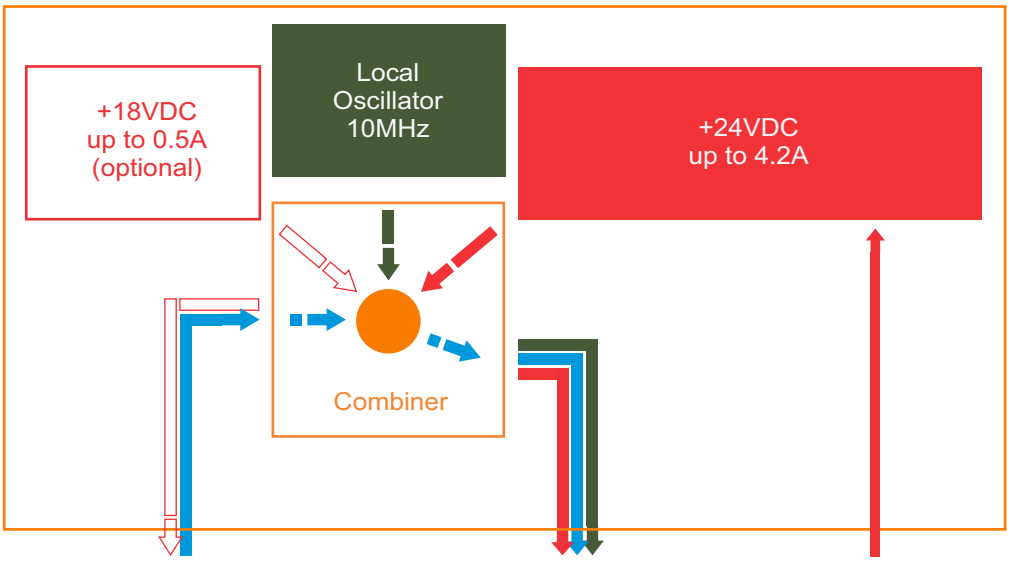
AMD series DC & 10MHz reference INJECTOR passes L-band signal and injects 10MHz reference signal and 24VDC voltage for feeding of BUC (Block Up Converter). Injector has 24V / 4.2A power supply unit sourced by 220 VAC or 18~36VDC, or 33.6 ~ 62.4VDC (see the Part. No table). Injector has embedded 18V / 0.5A source for feeding of LNB (optional, Part No.8002, 8004,8006). Modules are intended for indoor use only.

GENERAL DESCRIPTION OF FUNCTIONS

The device is DC&10MHz reference INJECTOR. The input and output signals are provided via N-connectors.

Deliveries are made with the following configurations/ device versions:

Features	Part No.					
	8001	8002	8003	8004	8005	8006
Powered by 220VAC	+	+				
Powered by 18 ~ 36VDC			+	+		
Powered by 33.6 ~ 62.4VDC					+	+
Embedded +18DC for LNB		+		+		+



L- band input
+18VDC output
(optional)

L-band output
+24VDC
+10MHz ref.

Power source
220VAC
or 18 ~ 36VDC
or 33.6 ~ 62.4VDC
(optional)

SPECIFICATIONS	
Input signal frequency range	950...2150MHz
Insert loss 950...2150MHz	9 dB max
10MHz reference stability	+/- 10ppm
10 MHz ref. level	+5 dBm
RF interface	2 x N-connectors, 50 Ohm
Injection DC voltage	+ 24VDC / 4.2A
LNB feeding voltage (optional)	+ 18VDC / 0.5A
Cooling	2 FANs, 40x40mm, 12V/24V
Power Factor	Part No 8001, 8002 90...264VAC/150W
	Part No 8003, 8004 18 ~ 36VDC/150W
	Part No 8005, 8006 33.6 ~ 62.4VDC/150W
Physical	
Working temperature	0°C to +60°C
Dimensions	245x132x51mm
Weight	2kg Weight

TROPHY

Auto Gain Control Injectors

The AGC Injector is produced in follow modifications:

Features	Part No.					
	5001	5002	5003	5004	5005	5006
Powered by 220VAC	+			+		
Powered by 18 ~ 36VDC		+			+	
Powered by 33.6 ~ 62.4VDC			+			+
Indoor enclosure	+	+	+			
Outdoor waterproof enclosure				+	+	+

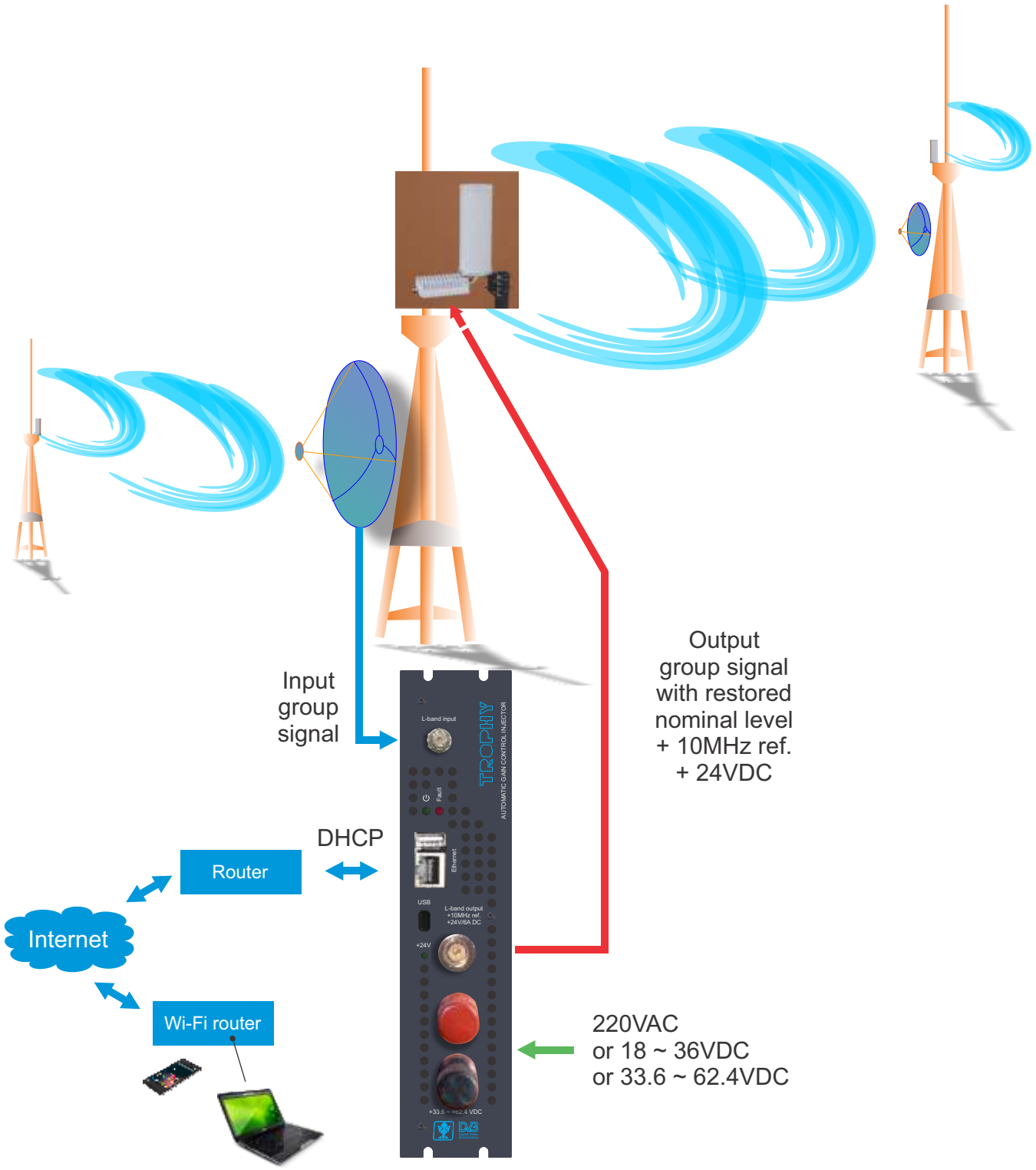
INSTALLING AND OPERATING INSTRUCTIONS

SAFETY INSTRUCTIONS

When assembling and commissioning the INJECTOR and executing the settings, always follow the accompanying instructions exactly. The devices are not to be assembled and brought into use by anybody who is not an authorised technician. When components are being installed in areas where reception is important, ensure that EMC regulations are observed. All assembly, installation and cable connection must take place when no electricity has been connected.
The provisions of DIN EN 50083 must be observed at all times when working with the equipment. In particular, DIN EN 60728-11 regarding safety may on no account be ignored.

THE MAIN APPLICATION OF AGC INJECTOR

Experience of MVDS terrestrial broadcasting shows that DVB-S2 carrier can be retransmitted 2 times using Automatic Gain Control device which has a function of monitoring of transponders level.



FUNCTIONAL ELEMENTS

Explanation of the functional elements:	
L-band input	F-connector
Power ⏻	Power LED
Fault	Fault LED*
Ethernet	WEB interface, RJ-45
USB (Console)	Micro-USB connector
+24 V	+24V BUC Power LED
L-band output + 10MHz ref.+ 24VDC	N-type connector
DC supply (part No.5002,5003)	Banana connector
220VAC supply (part No.5001,5004)	314 A AC connector

* The FAULT LED is red in case of:
1. The device cannot find any transponder. In this situation, the Injector pathes a signal to the output with zero attenuation.
2. Hardware failure of the device. Try to replace the Micro SD memory with the recorded image (see page https://dvb4all.com/?product=automatic-gain-control-injector).

WEB interface, RJ-45 patch-cord

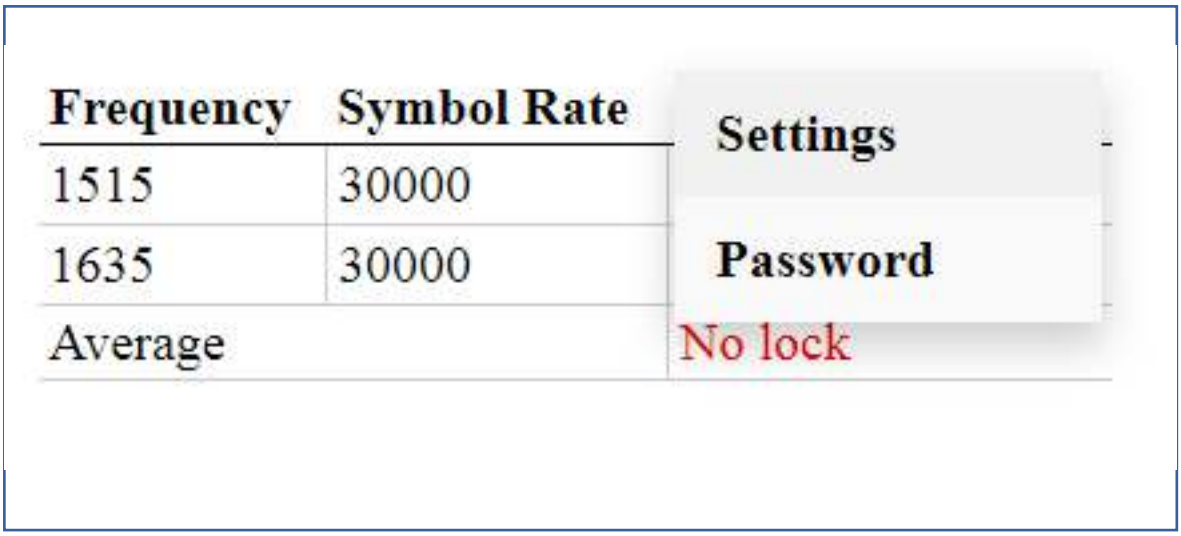
L-band input

L-band output + 10MHz ref.+ 24VDC

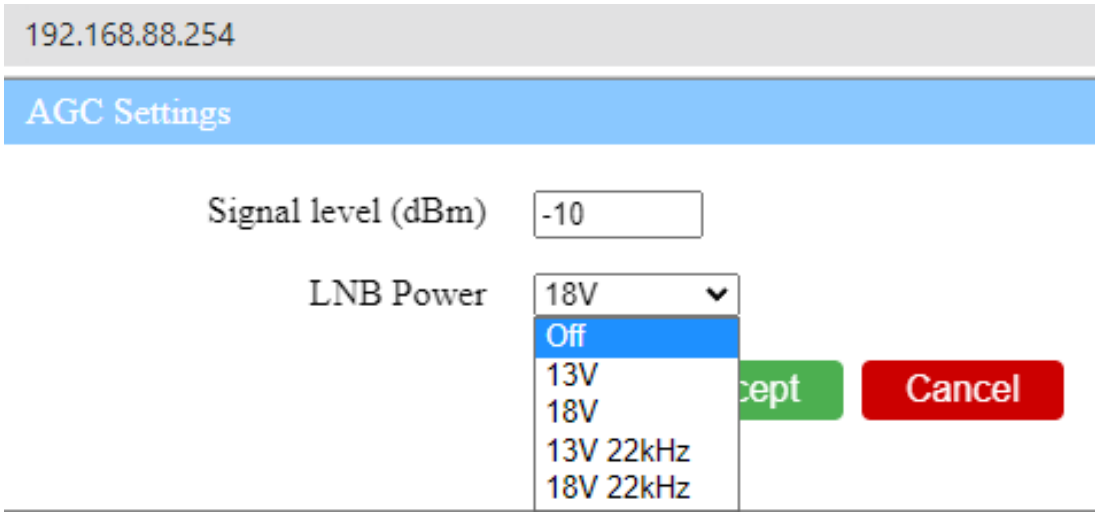
DC supply (part No.5005,5006). Pin1 (+), Pin2 (-)

SETTINGS MENU

Press button in MAIN menu



Press SETTINGS button. You can see the AGC SETTINGS menu.



Signal Level The average level of the signal (in dBm) that you want to have at the output of the Injector. If the real signal is higher than this value then the attenuator will reduce this value to the level specified in the menu. The attenuation range can vary within 0dB to 31.5dB.

LNB Power Managing of LNB voltage and 22kHz tone.

Accept Save the settings

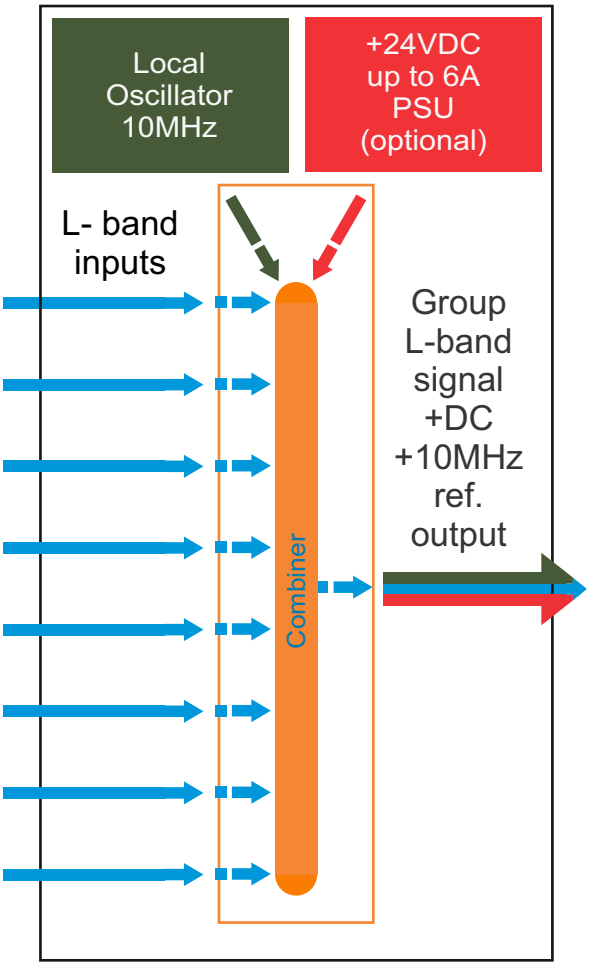
Cancel Exit without saving

Standards	
Carrier ID	ETSI 103 129
DVB-S2	EN 302 307
Control&Monitoring	
WEB-Interface	Ethernet 10/100 Mb, RJ-45 connector
Virtual COM-port	Micro USB connector
RF input	
L-band	900MHz to 2150MHz, 1MHz step
Input signal	DVB-S/S2, from 1 to 45MSymb/s
LNB control	13/18V, on/off, 22 kHz
Connectors	F-connector, 75Ω
RF Output	
L-Band	900MHz to 2150MHz
Connector	N-Type, 50Ω
Insert loss of Combiner	4dB (own loss) and 0...31.5dB (attenuation control)
10 MHz Local Oscillator; +24VDC / 6A	0...+5dBm, injected to output signal
Physical	18~36VDC; 33.6 ~ 62.4VDC or 220VAC optional
	up to 100W;
	Indoor: 0°C to 60°C; 31*22*5cm; 2kg
	Outdoor: -20°C to 50°C; 29*21*8cm; 2.5kg

8-channel Combiner

GENERAL INFORMATION

AMD series L-BAND 8-CHANNELS COMBINER/ DC&10MHZ REFERENCE combines eight L-band carriers, injects 10MHz reference signal and 24VDC voltage (optional) and passes group signal for feeding of MVDS or VSAT BUC (Block Up Converter). COMBINER has embedded 24V / 6A power supply unit (optional).
Modules are intended for indoor use only.



INSTALLING AND OPERATING INSTRUCTIONS

SAFETY INSTRUCTIONS

When assembling and commissioning the COMBINER and executing the settings, always follow the accompanying instructions exactly.
The devices are not to be assembled and brought into use by anybody who is not an authorised technician.
When components are being installed in areas where reception is important, ensure that EMC regulations are observed.
All assembly, installation and cable connection must take place when no electricity has been connected.
The provisions of DIN EN 50083 must be observed at all times when working with the equipment. In particular, DIN EN 60728-11 regarding safety may on no account be ignored.

GENERAL DESCRIPTION OF FUNCTIONS

The device is L-BAND 8-CHANNELS COMBINER/ DC&10MHZ REFERENCE. The input signals are provide via SMA-connectors and output signal is provided via N-connector.

Deliveries are made with the following configurations/ device versions:

Features	Part No.		
	12001	12002	12003
24 VDC embedded PSU	+	+	
Embedded FANs		+	

SPECIFICATIONS	
Input signal frequency range	950...2150MHz
Number of inputs	Eight
Insert loss 950...2150MHz	18 dB
10MHz reference stability	10ppm
10 MHz ref. level	+5 dBm
RF interfaces	8 x SMA connectors, 1 x N-connectors, 50 Ohm
Injection DC voltage	+ 24VDC (Part No. 8001,8002)
DC rated current (convection)	0...4.2A (Part No. 8001)
DC rated current (optional FANs)	0...6.25A (Part No. 8002)
Rated power (convection)	100W
Rated power (optional FANs)	150W
DC Ripple & Noise (max.)	240mVp-p
Input AC voltage	90...264VAC/150W
Power Factor	PF>0.95/230VAC PF>0.98/115VAC at full load
AC current	1.8A/115VAC 1 A/230VAC
AC frequency range	47...63Hz
Physical	
Working temperature	0°C to +70°C
Dimensions	245x132x51mm
Weight	2kg Weight

DVB-S/S2 to IP/ASI streamer

GENERAL INFORMATION

DVB-S/S2 to IP/ASI Streamer/Descrambler designed to broadcast in unicast/multicast on an IP network or ASI interface the services (TV or Radio programs) issued from FTA or TROPHY-ACCESS digital reception; in case of TROPHY-ACCESS encrypted signal, a Software license to enable TROPHY-ACCESS professional descrambler solution has been enabled. The IP streams can be viewed using an IPTV set-top box or a software video player.
Modules are intended for indoor use only.

Characteristics:

Input: one DVB transport stream (MPTS).
Output: up to 120 simultaneous, IP-encapsulated services (TV or Radio programs), with individual multicast addresses and one MPTS stream.
Descrambling up to 120 TROPHY-ACCESS channels.
Information filtering of DVB tables.
UDP & RTP transmission protocols.
Web interface for configuration and setting.
PID filtering.
PSI/SI parsing.
PAT, PMT and SDT table regeneration.
Routing or blocking for CAT, EIT, TDT tables.

Streamer/Descrambler is designed to:

receive full DVB-S/S2 transponder;
encapsulate Transport Stream to unicast/multicast UDP/RTP-packets;
transmit Transport Stream to ASI-output;
descrambling all TROPHY-ACCESS services.

FUNCTIONAL ELEMENTS

1 - RF output (input signal loop-through). F socket

2 - Input of SAT IF signal, DC output for LNB

3 - Virtual COM-port, micro USB

4 - Rx error (red) Input signal error

5 - Fault (red)
Blinking frequently *(Boot process or HardWare error)*
Blinking slowly *(Default configuration or Configure error)*
Light constantly *(Data overflow)*

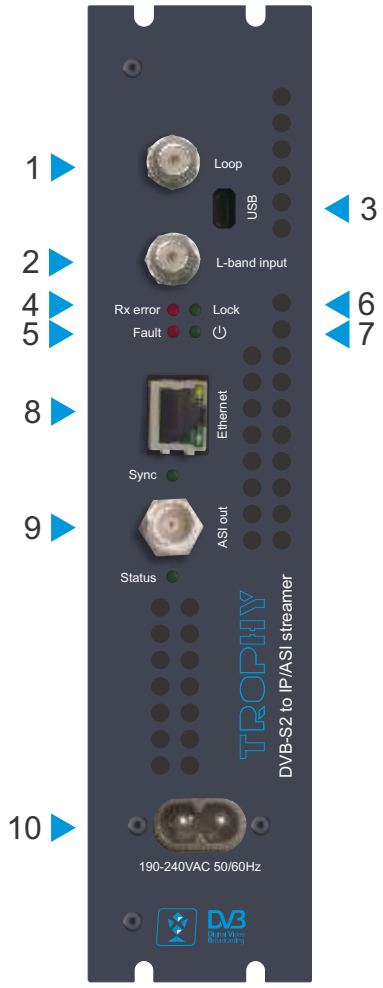
6 - Lock (green) Input signal lock

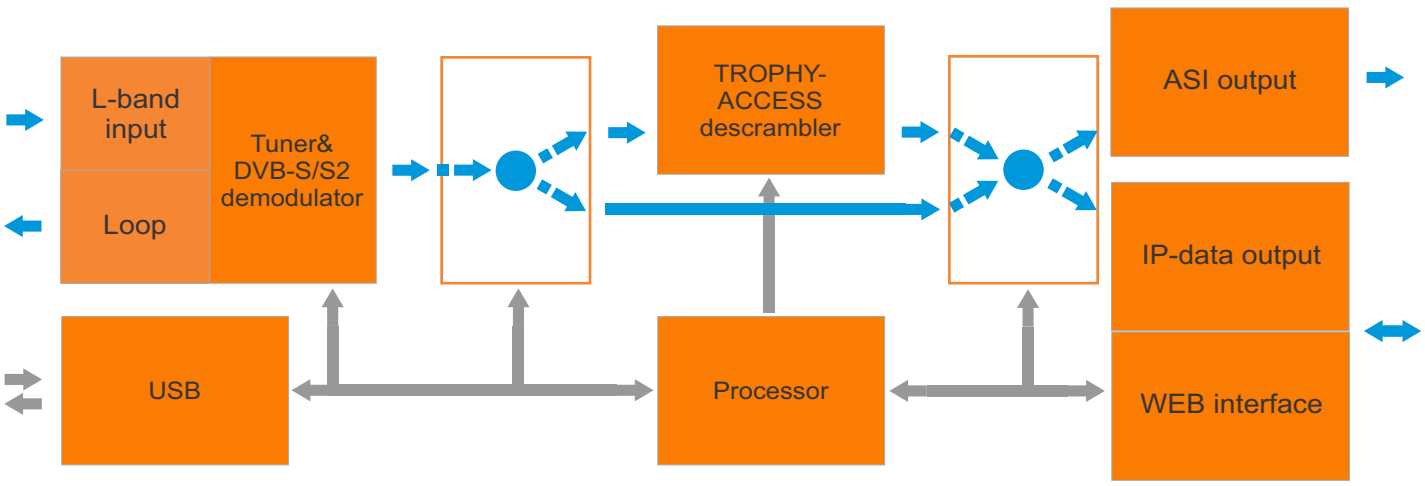
7 - Power (green) Power ON/OFF

8 - ETHERNET - interface. RJ45 socket

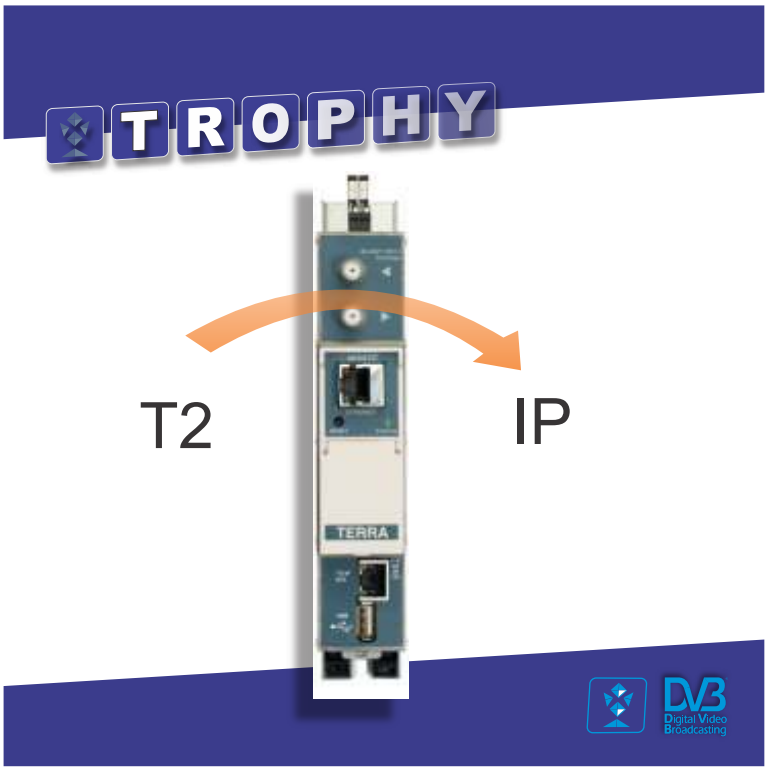
9 - ASI - interface. BNC connector

10 - Power connector





Streamer/ Descrambler



4 x DVB-T/T2/C to IP streamer

Product description

STI441C DVB-T/T2/C to IP streamer designed to broadcast in multicast on an IP network the services (TV or Radio programmes) issued from FTA or encrypted digital reception. The IP streams can be viewed using an IPTV set-top-box or a software video player. The streamer can descramble encrypted services by two conditional access (CA) modules.
Modules are intended for indoor use only.

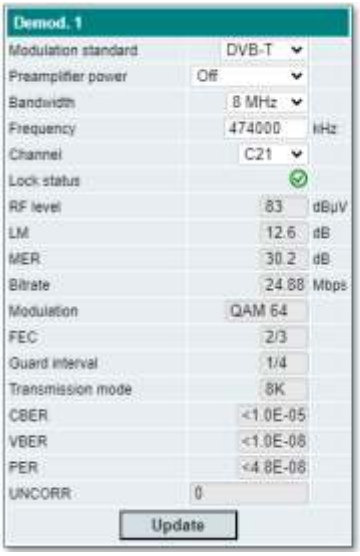
Characteristics:

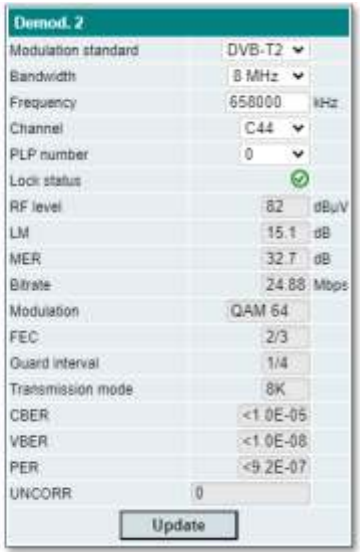
- Input: four DVB multi program transport streams (MPTS).
- Output: up to 256 simultaneous, IP-encapsulated services (TV or Radio programs), with individual multicast addresses and 4 MPTS streams.
- • Information filtering of DVB tables.
- • UDP & RTP transmission protocols.
- • Web interface for configuration and setting.
- • SAP & SDP protocols that facilitate automatic service selection on the user's STB and provide information to external servers.
- • PID filtering.
- • PSI/SI parsing.
- • Transparent ECM & EMM messaging.
- • PAT, PMT and SDT table regeneration.
- • Routing of CAT, EIT, TDT tables.
- • Configurable QoS marking.
- • Configurable Time To Live.
- • TS file streaming from USB flash.
- • Single cable interface (EN50494, EN50607) support.

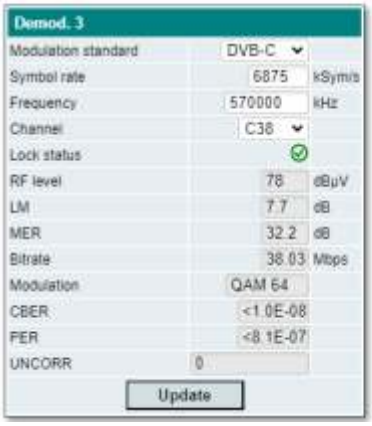
Initial program screen

The first screen that appears when the module accessed contains the "Main" window, which gives general information on the device.
In the left of each configuration screen you will see a main menu table. Using it, you can switch between the different configuration menus. The “RF inputs” and “System menu” lines contains several submenu. Also common elements for all screens is module title and login information strings. The module title can be changed after pressing the “Change” button in the “Device information” table.

RF inputs

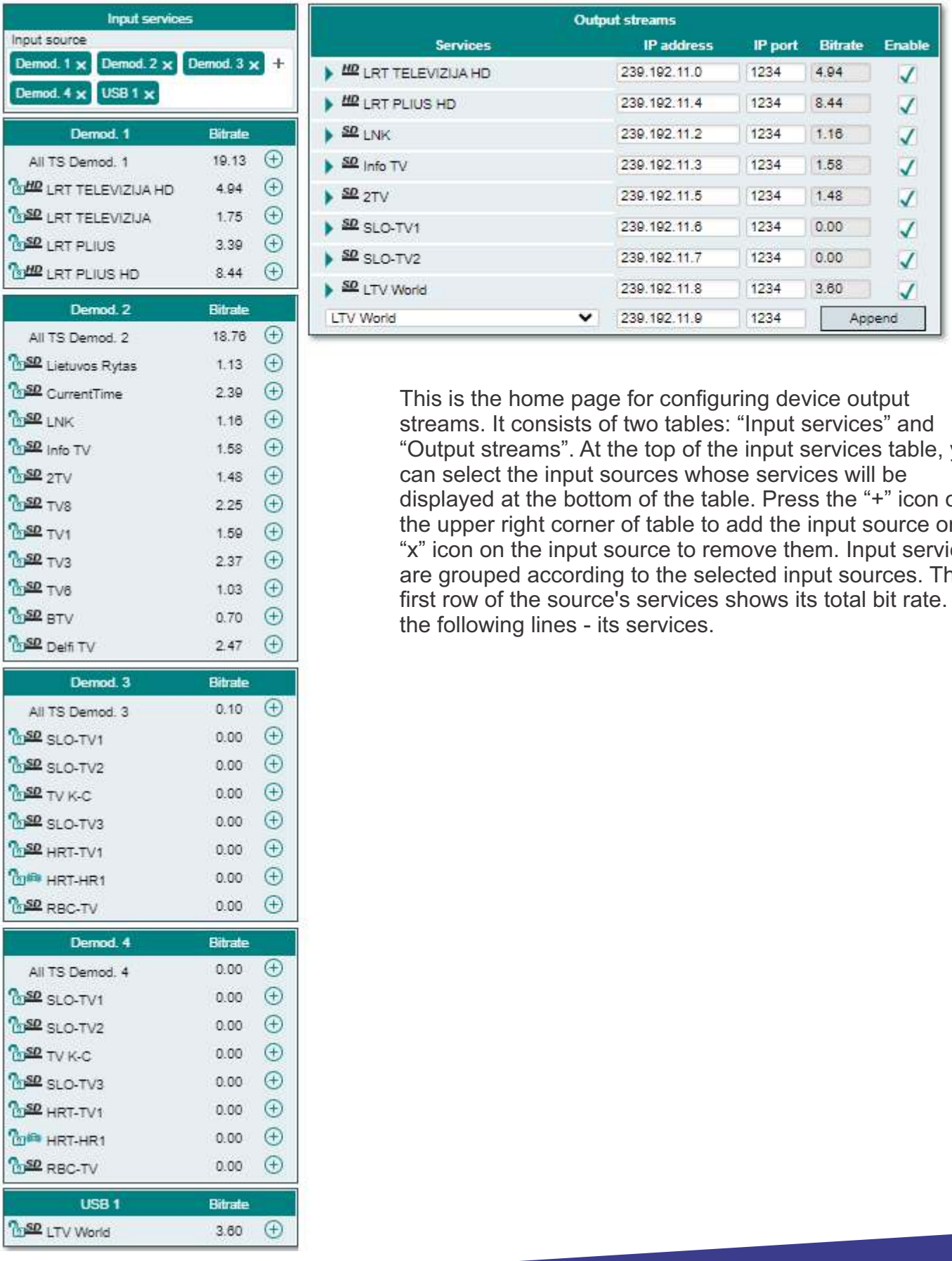






Four demodulators can be set up in this section. Each demodulator has a corresponding input table.

Transport streams



This is the home page for configuring device output streams. It consists of two tables: “Input services” and “Output streams”. At the top of the input services table, you can select the input sources whose services will be displayed at the bottom of the table. Press the “+” icon on the upper right corner of table to add the input source or the “x” icon on the input source to remove them. Input services are grouped according to the selected input sources. The first row of the source's services shows its total bit rate. In the following lines - its services.

Specifications

RF input	
Standard	DVB-T/T2/C
AGC range	45…80 dBuV
Number of channels	4
Input frequency range	47...862 MHz
Impedance	75Ohm
DC output for preamplifier	12V / 100mA
IP output	
Standard	IEE802.3 1000 Base-T (10/100 Base-T is not supported)
Stream rate	up to 200 Mbps
Transmission protocols	UDP/RTP
multicast, MPTS, SPTS	Yes
CA modules	2 slots
Control port	IEE802.3 10/100 Base-T
Current consumption	12V / 0.6A without external DC feeding and CAM 1.1A with two CAM's and maximal external load
Operating temperature range	0 ÷ +50 C
Dimensions/Weight (packed)	36x198x112 mm/0.84 kg

8 x DVB-S/S2/S2X to IP streamer

Product description

SDI482C DVB-S/S2/S2X to IP streamer designed to broadcast in multicast on an IP network the services (TV or Radio programmes) issued from FTA or encrypted digital reception. The IP streams can be viewed using an IPTV set-top-box or a software video player. The streamer can descramble encrypted services by two conditional access (CA) modules.
Modules are intended for indoor use only.

Characteristics:

- Input: eight (sdi482C) DVB multi program transport streams (MPTS).
- Output: up to 512 simultaneous, IP-encapsulated services (TV or Radio programs), with individual multicast addresses and 8 MPTS streams.
- • Information filtering of DVB tables.
- • UDP & RTP transmission protocols.
- • Web interface for configuration and setting.
- • SAP & SDP protocols that facilitate automatic service selection on the user's STB and provide information to external servers.
- • PID filtering.
- • PSI/SI parsing.
- • Transparent ECM & EMM messaging.
- • PAT, PMT and SDT table regeneration.
- • Routing of CAT, EIT, TDT tables.
- • Configurable QoS marking.
- • Configurable Time To Live.
- • TS file streaming from USB flash.
- • Single cable interface (EN50494, EN50607) support.

Specifications

RF input	
Standard	DVB-S/S2/S2X
AGC range	45…85 dBuV
Symbol rate	2...45 Msymb/s
FEC	1/2_2/3_3/4_5/6_7/8 (QPSK) 1/2_3/5_2/3_3/4_4/5_5/6_8/9_9/10 (8PSK)
Number of channels	8
Input frequency range	950...2150 MHz
Impedance	75Ohm
IP output	
Standard	IEE802.3 1000 Base-T (10/100 Base-T is not supported)
Stream rate	up to 0.6Gbps
Transmission protocols	UDP/RTP
multicast, MPTS, SPTS	Yes
CA modules	2 slots
Control port	IEE802.3 10/100 Base-T
Current consumption	12V / 1A without external DC feeding and CAM 3.2A with two CAM's and maximal external load
Operating temperature range	0 ÷ +50 C
Dimensions/Weight (packed)	48.5x198x112 mm/0.97 kg

Initial program screen

The first screen that appears when the module accessed contains the "Main" window, which gives general information on the device.
In the left of each configuration screen you will see a main menu table. Using it, you can switch between the different configuration menus. The “RF inputs” and “System menu” lines contains several submenu. Also common elements for all screens is module title and login information strings. The module title can be changed after pressing the “Change” button in the “Device information” table.

Input settings

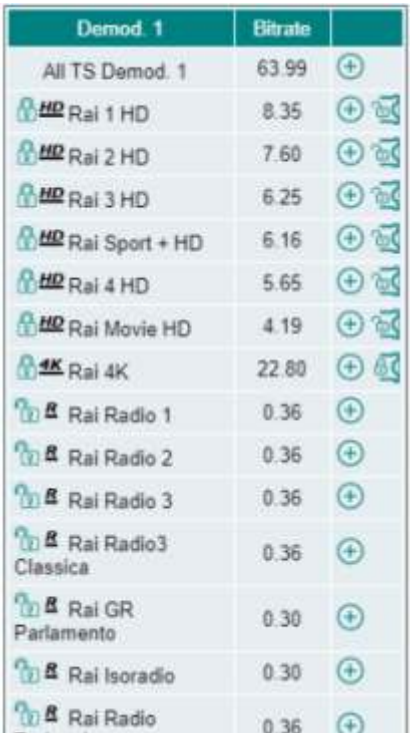
All demodulators of module can be set up in this section.
“Enable“ - used to activate the demodulator.
“SAT input“ – used to select input of the SCIF switch.
“User band“ - used to select the user band of SCIF switch. The „SAT input“ and “User band“ columns are shown when the “Source type” set to “SCR” or “dSCR”.
“Frequency“ - the frequency of transponder in MHz. Ensure, that SAT IF frequency (FR transponder - LNB Lo/Hi) fits into demodulator's input frequency range.
“Symbol rate“ - the symbol rate of transponder in kSym/s.
Press the “Update“ button to set new parameters.
There are tree status columns in the “Input settings“ table.
“Lock status“ can have following icons:
- empty, when the input channel (demodulator) is turned off;
- green icon, when demodulator is locked to the transponder;
- red icon, when demodulator is unlocked. This state generates error in diagnostic window as well. If the channel is not used, it's recommended to turn it off instead of leaving unlocked. It will save power consumption. “RF level“ and “LM“ (Link Margin) are measured parameters of the input signal.

		Enable	SAT input	User band	Frequency, MHz	Symbol rate, Ks/s	Lock status	RF level, dBµV	LM,dB
Demod. 1	▶	✓	B V/Hi	UB 1	11766	29900	✓	85	4.4
Demod. 2	▶	✓	B V/Lo	UB 2	10992	27500	✓	81	9.4
Demod. 3	▶	✓	A H/Lo	UB 3	10891	22000	✓	80	6.2
Demod. 4	▶	✓	A H/Lo	UB 4	11053	22000	✓	83	8.3
Demod. 5	▶	✓	A V/Lo	UB 5	11229	22000	✓	83	6.9
Demod. 6	▶	✓	A V/Lo	UB 6	11347	22000	✓	80	7.5
Demod. 7	▶	✓	A H/Lo	UB 7	11362	22000	✓	81	7.4
Demod. 8	▶	✓	A V/Lo	UB 8	11377	22000	✓	82	5.9
Select all		☐							

Update

Transport streams

This is the home page for configuring device output streams. It consists of two tables: “Input services” and “Output streams”. At the top of the input services table, you can select the input sources whose services will be displayed at the bottom of the table. Press the “+” icon on the upper right corner of table to add the input source or the “x” icon on the input source to remove them. Input services are grouped according to the selected input sources. The first row of the source's services shows its total bit rate. In the following lines - its services.



Press the ⊕ icon to add the input service as new stream to output streams. Also you can drag and drop the input service to the output streams table “Services” column. This method allows you to form a multiple program output transport stream. Scrambled services are displayed with icon. After pressing on this icon additional submenu appears. This submenu allows to descramble service with selected CA module. When the service is selected for descrambling, the icon changes to .

TROPHY

Block Up Converters

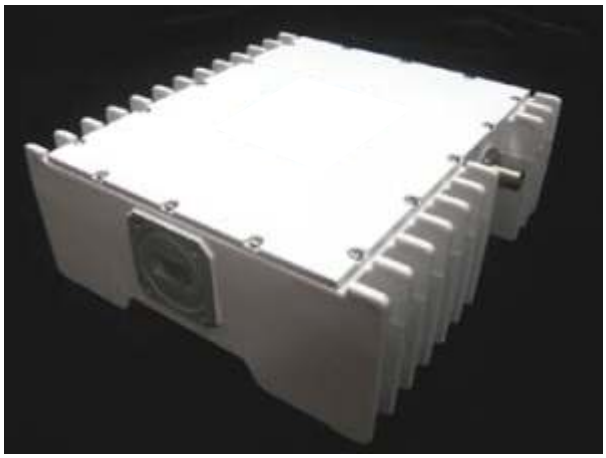
2W KU-BAND BLOCK-UP-CONVERTER (BUC)

The BUC converts a 950...1750 MHz range signal to the 10,9...11,7GHz or 11,7...12,5 GHz range

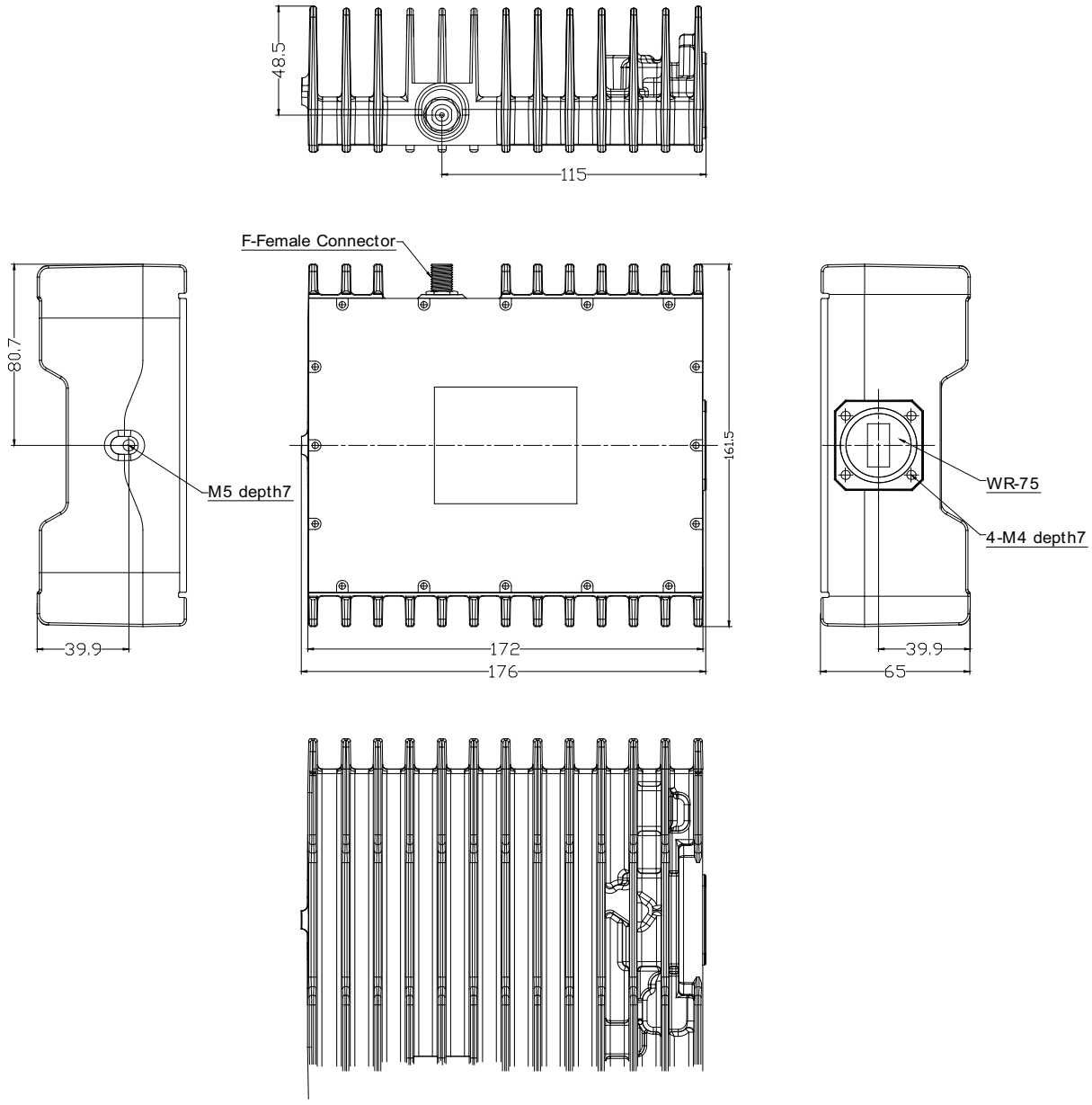
Specifications	
Input frequency range	950 … 1750 MHz
Output frequency range	10700 … 11500 MHz (Variant A)
	11700 … 12500 MHz (Variant B)
L.O. frequency	9750,00 MHz (Variant A)
	10750,00 MHz (Variant B)
Gain	55.0 dB (typical)
Nonuniformity of the gain	1.0 dB
L.O. temperature instability	2*10-6
L.O. 10MHz level	-5 … +5 dBm
Output power	2W (33dBm)
Power supply voltage	+18 … +24V
Current comsumption	1,4 A
Typical input signal level	70dB
Input impedance	50 Ohm
Operation temperature	-40 … +55 C
Dimensions, mm	181,4 x 106,7 x 50
Weight	1,2 kg
Interfaces	
Input interface	N-type
Output interface	WR75G

4W KU-BAND BLOCK-UP-CONVERTER (BUC)

The 4W BUC converts a 950...1750 MHz range signal to the 10,7...11,5GHz or 11,7...12,5 GHz range.



- BUC is ideal for Broadband VSAT RF terminals and MVDS broadcasting;
- 36dBm output power;
- Optional Internal Reference source;
- RoHS Compliant;
- Small Size & Mass;
- Power Consumption : 35W Max;
- Air Humidity : up to 100%;



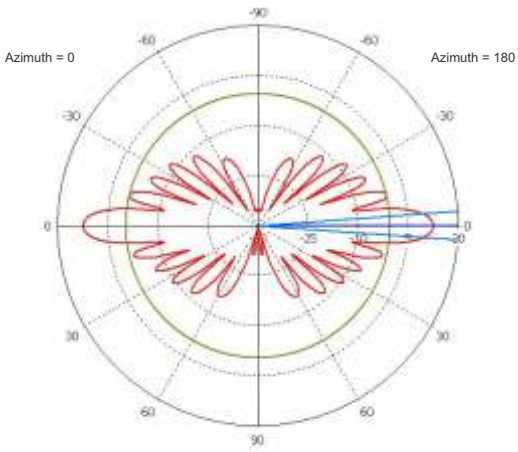
Specifications		
Input frequency range		950 … 1750 MHz
Output frequency range		10700 … 11500 MHz (Variant A)
		11700 … 12500 MHz (Variant B)
L.O. frequency		9750,00 MHz (Variant A)
		10750,00 MHz (Variant B)
Linear Gain		58.0 dB (typical)
Nonuniformity of the gain		1.0 dB
Frequency Sense		Non-inverted
Spurious	In band	-60dBc
	Out of band	-50dBc
Phase Noise	100Hz	-60dBc/Hz
	1kHz	-70dBc/Hz
	10kHz	-80dBc/Hz
	100kHz	-90dBc/Hz
10MHz External Reference level		-5 … +5 dBm
Output power		4W (36dBm min 1dB Compression Point)
Operating voltage		+15 … +24VDC
Power comsumption		35W
Typical input signal level		70dB/uV
Input impedance		75 Ohm ; 50 Ohm
Operation temperature		-40 … +55 °C
Dimensions, mm / Weight, kg		176,1 x 161,5 x 65 / 1,8
Interfaces		
Input interface		F-connector or N-type
Output interface		WR75G

TROPHY

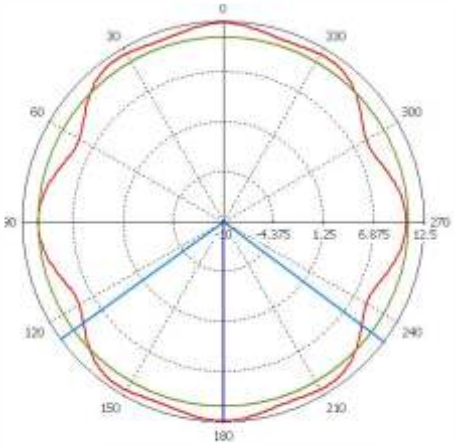
Omnidirectional Slotted Antenna

OMNIDIRECTIONAL SLOT ANTENNA

Antenna is used like transmit outdoor antenna for terrestrial Ku-band broadcasting.



Elevation / Degree vs. dBi



Azimuth / Degree vs. dBi

Specifications	
Operation band	
Variant A	10,75...11,5 GHz
Variant B	11,7...12,5 GHz
Signal polarization	Horizontal
Gain	12,3 dBi max
Elevation plane Beamwidth	8,3 degrees
VSWR in operation band	No more than 1,6
Tipe of flange	WR75G
Weight	2 kg
Tipe of performance	Waterproof

DVB-S2 to DVB-S2 Transmodulator

GENERAL INFORMATION

ATD-54-S/S2 to DVB-S2 TRANSMODULATOR is a brand new transmodulator from DVB-S/S2 to DVB-S2 designed for applications over satellite or MVDS in full compliance with DVB-S2 standard.

The ATD-54-S/S2 to DVB-S2 TRANSMODULATOR:
- receives&demodulates DVB-S or DVB-S2 transponder;
- descrambles all TROPHY-ACCESS channels (optionally);
- modulates new DVB-S2 transponder to transmit in satellite transmitter or MVDS Block UP Converter (BUC). As a result, the maximum MER value for the new carrier is restored. The form and quality of the repeater signal becomes the same as that of the base station signal.

Attention! Symbol rate of output transponder must be equal to or bigger than symbol rate of input transponder. But output symbol rate must not exceed more than 20% value of input symbol rate.

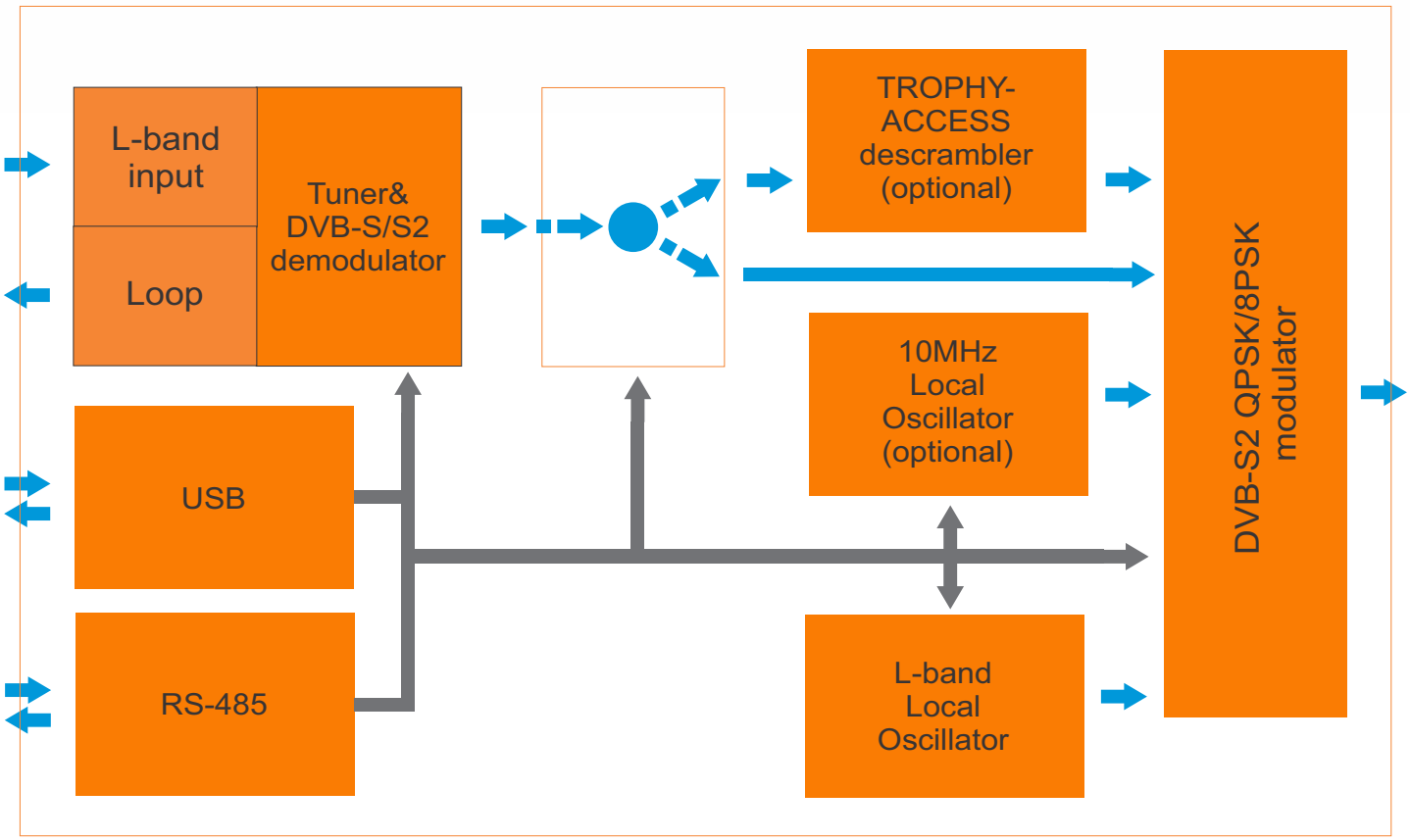
A high-performance FPGA does the analogue TV modulation and the freely adjustable up-conversion into L-band range (950 ... 2150MHz). A high-speed digital→analogue converter (DAC) is responsible for the excellent output signal.

MAIN FUNCTIONS OF ATD-54-S/S2 to DVB-S2 TRANSMODULATOR:

- covers the full L-Band range (900...2150 MHz) and offers bit rate from1 Mbps up to 94 Mbps;
- provides all input channels to a single carrier, with built-in support for TROPHY-ACCESS descrambler (optionally). Software license to enable TROPHY-ACCESS descrambler solution;
- provides transport Stream rates up to 94 Mbit/s;
- supports all PIDs of input services;
- supports Control and Set-Up via USB and RS-485 interfaces;
- has high performance and reliability.
- network management is optional, using a special Remote Access Controller. The Remote Access Controller provides WEB monitoring of the input parameters of the transmodulator/ transmodulators.

ATD-54-S/S2 to DVB-S2 TRANSMODULATOR integrates the CycloneV core technology required to perform high quality modulation based on TROPHY expertise. It provides customers with a best in class performance, providing a high SNR value, excellent shoulder levels and lowest phase noise.

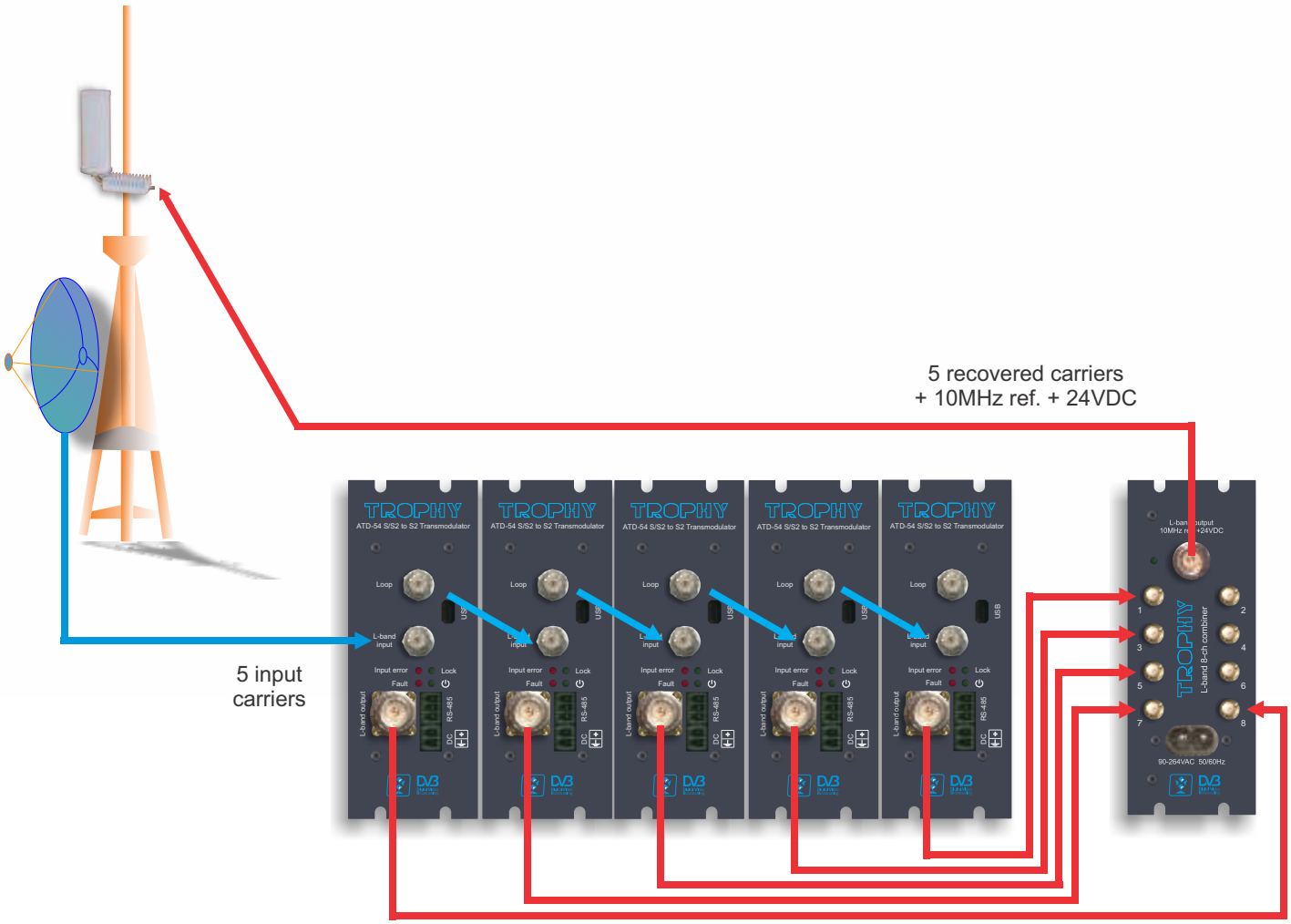
ATD-54 S/S2 to S2 TRANSMODULATOR provides a high performance channel spectrum. This results gives an efficient transmission in QPSK and 8PSK modes. The USB interface ensures ease of use and enables full configuration of the transmodulator, including signal input management, selection of modulation parameters, control of the mute/unmute conditions for the RF output signal. The Remote Access Controller provides WEB monitoring of the input parameters of the transmodulator (transmodulators).



ATD-54 S2 to S2 TRANSMODULATOR

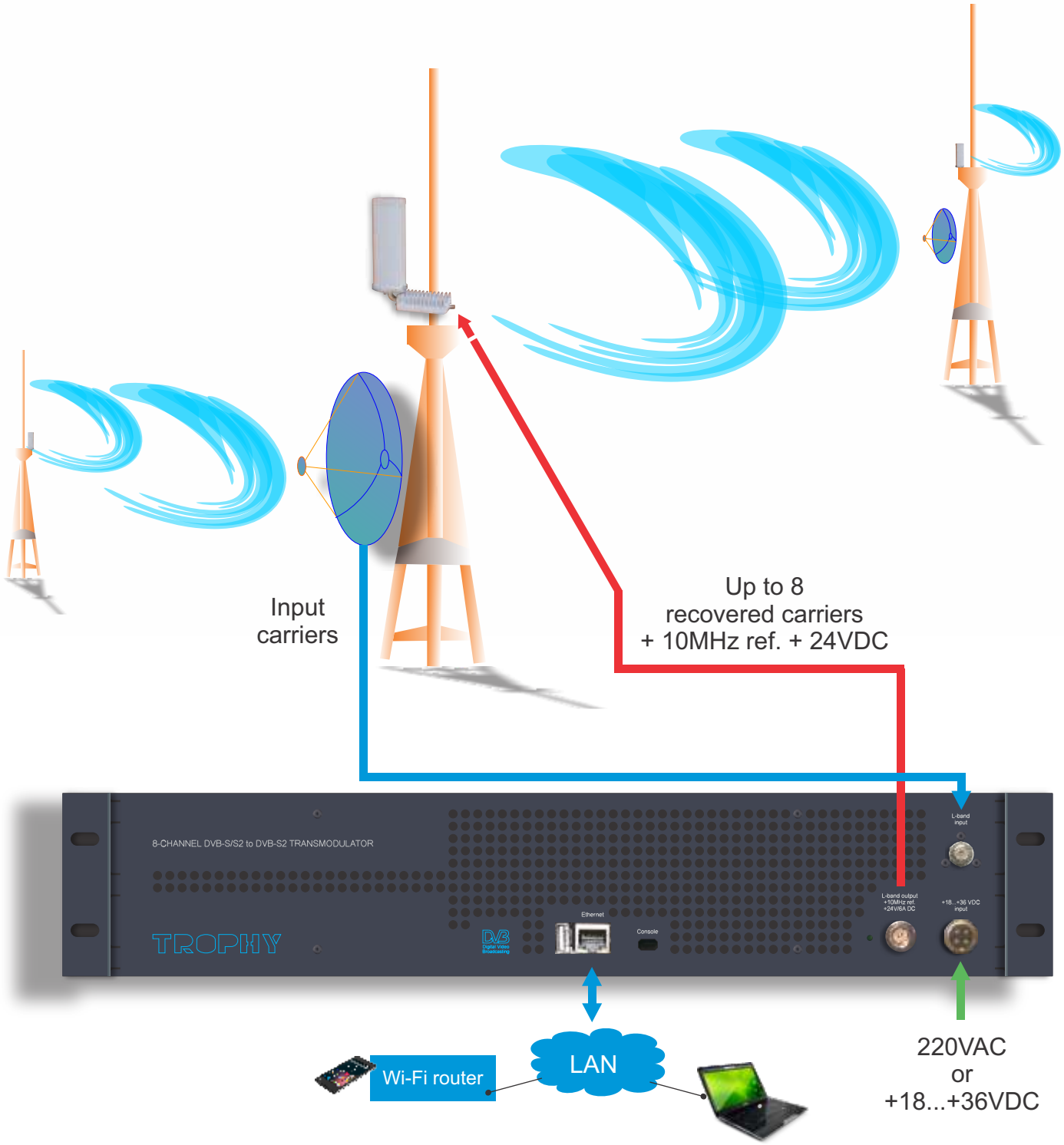
THE MAIN APPLICATION OF DVB-S/S2 to DVB-S2 TRANSMODULATORS

Experience of MVDS terrestrial broadcasting shows that DVB-S2 carrier must be restored after a second signal receiving/transmission. This fully restored signal parameters. The output signal coincides with the signal characteristics (MER, VBER, CBER, C/N etc.), which is transmitted from the Head-End.
In addition, possible to form a new frequency grid, if necessary.



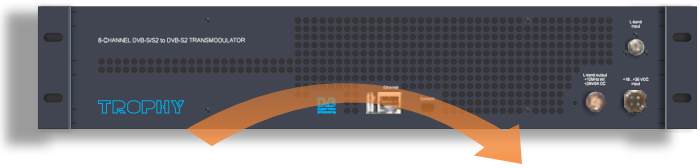
The Remote Access Controller provides WEB monitoring of the input parameters of the transmodulator (transmodulators).

The Remote Access Controller is embedded to the special 19-inch box with up to eight of ATD-54 DVB-S/S2 to S2 TRANSMODULATOR modules.



SPECIFICATIONS	
Standards	
Carrier ID	ETSI 103 129
DVB-S2	EN 302 307
Control&Monitoring	
USB Virtual COM-port	Micro USB
WEB-Interface / RS-485	By REMOTE ACCESS CONTROLLER connected via RS-485 BUS
Descrambler mode	TROPHY-ACCESS (additional license)
RF Input	
L-band	900MHz to 2150MHz, 1MHz step
Input Symbol rate	From 1 to 45MSymb/s, 1KSymb/s step
LNB control	13/18V(on/off), 22 kHz
Connectors	2xF-connectors, 50Ω (IN+LOOP)
RF Output	
L-Band	900MHz to 2150MHz, 1MHz step
Connector	N-Type, 50Ω
10 MHz Local Oscillator (optional)	0...+5dBm, injected to output signal
SNR	> 40dB @ 0dBm
Attenuation range	0dB to -31.5dB, 0.5dB step
Modulation	
DVB-S2	QPSK:1/3, 2/5, 1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 8/9, 9/10 8PSK: 3/5, 2/3, 3/4, 5/6, 8/9, 9/10
Output Symbol rate	From 1 to 35MSymb/s,equal to or higher (not more 20%) than the input Symbol Rate
Symbol rate step	1KSymb/s
Physical	12V DC/15W, 1kg Weight, 0°C to 50°C

TROPHY



S2 S2

8-ch box for Transmodulators

GENERAL INFORMATION

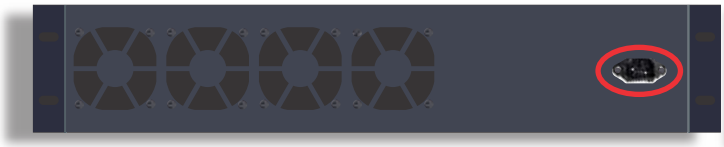
8-CHANNEL 2U/19” BOX FOR DVB-S/S2 to DVB-S2 TRANSMODULATORS designed for MVDS retransmitters.

2U/19” BOX has:

- Embedded Remote Access Controller;
- Embedded 8-channel L-band Combiner;
- Embedded 24VDC/6A Power Supply for Block Up Converter feeding;
- Embedded 10MHz ref. Injector;
- 8 slots for ATD-54 Transmodulator modules installing;
- Embedded 12VDC/6A Power Supply for Transmodulators feeding;
- 4x60mm FANs.

The BOX is produced in two modifications:

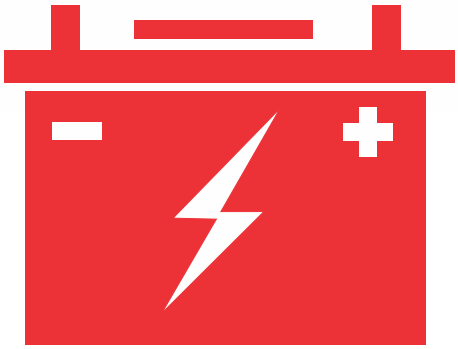
powered by 220VAC



220 VAC

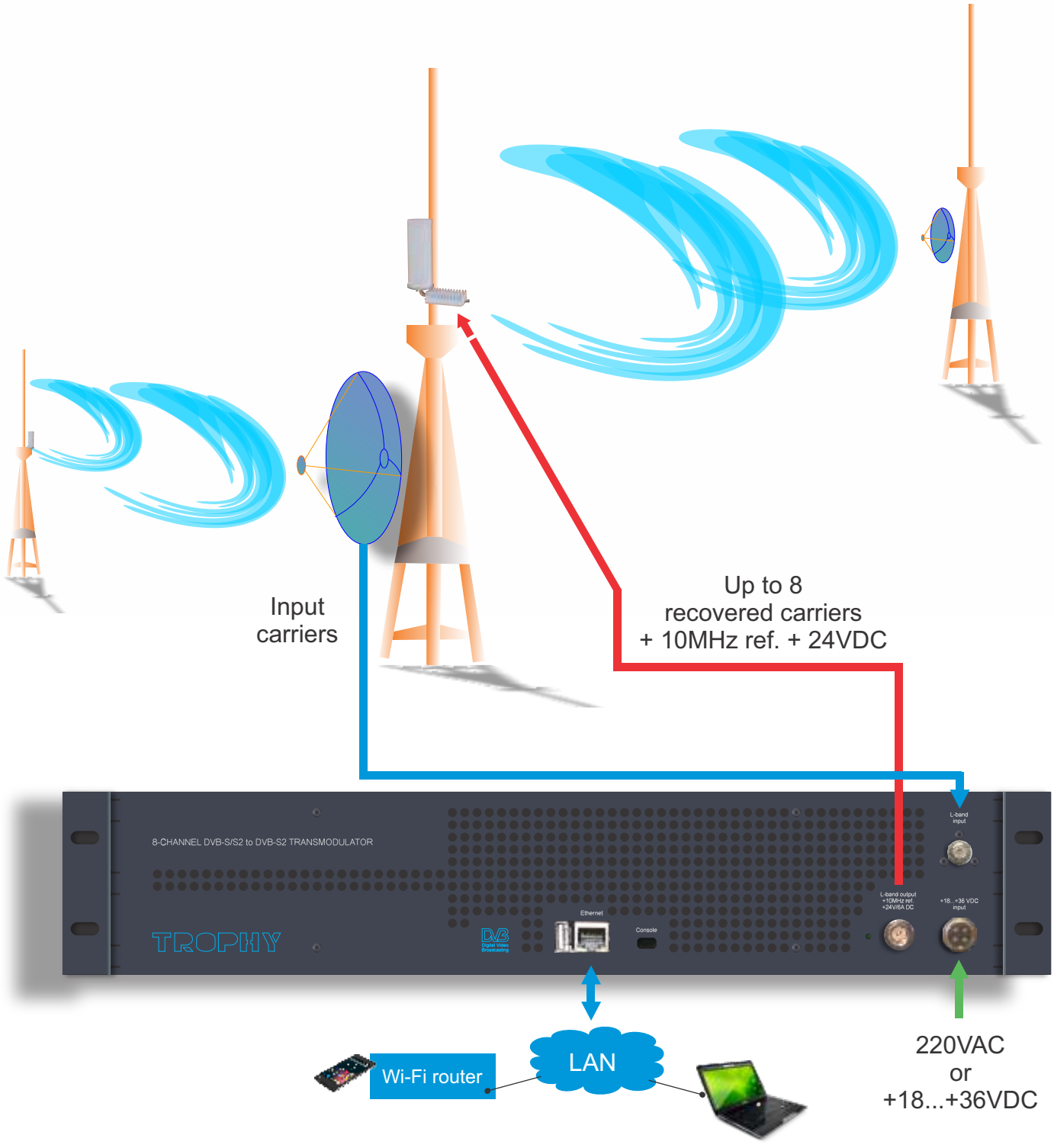
powered by 18 ... 36VDC supply

24 VDC

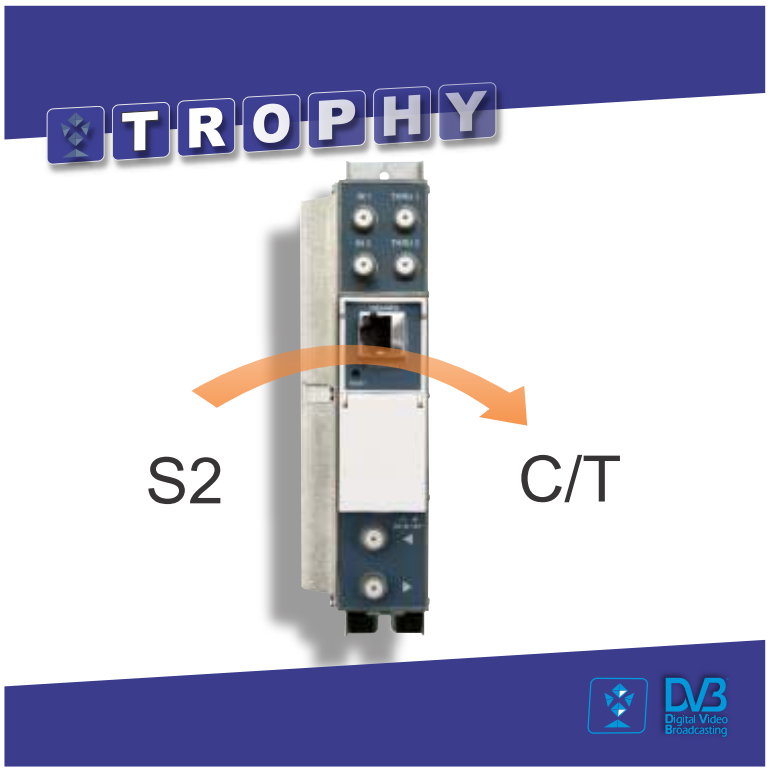


THE MAIN APPLICATION OF DVB-S2 to DVB-S2 TRANSMODULATORS

Experience of MVDS terrestrial broadcasting shows that DVB-S2 carrier must be restored after a second signal receiving/transmission. This fully restored signal parameters. The output signal coincides with the signal characteristics (MER, VBER, CBER, C/N etc.) which is transmitted from the Head-End.
In addition, possible to form a new frequency grid, if necessary.

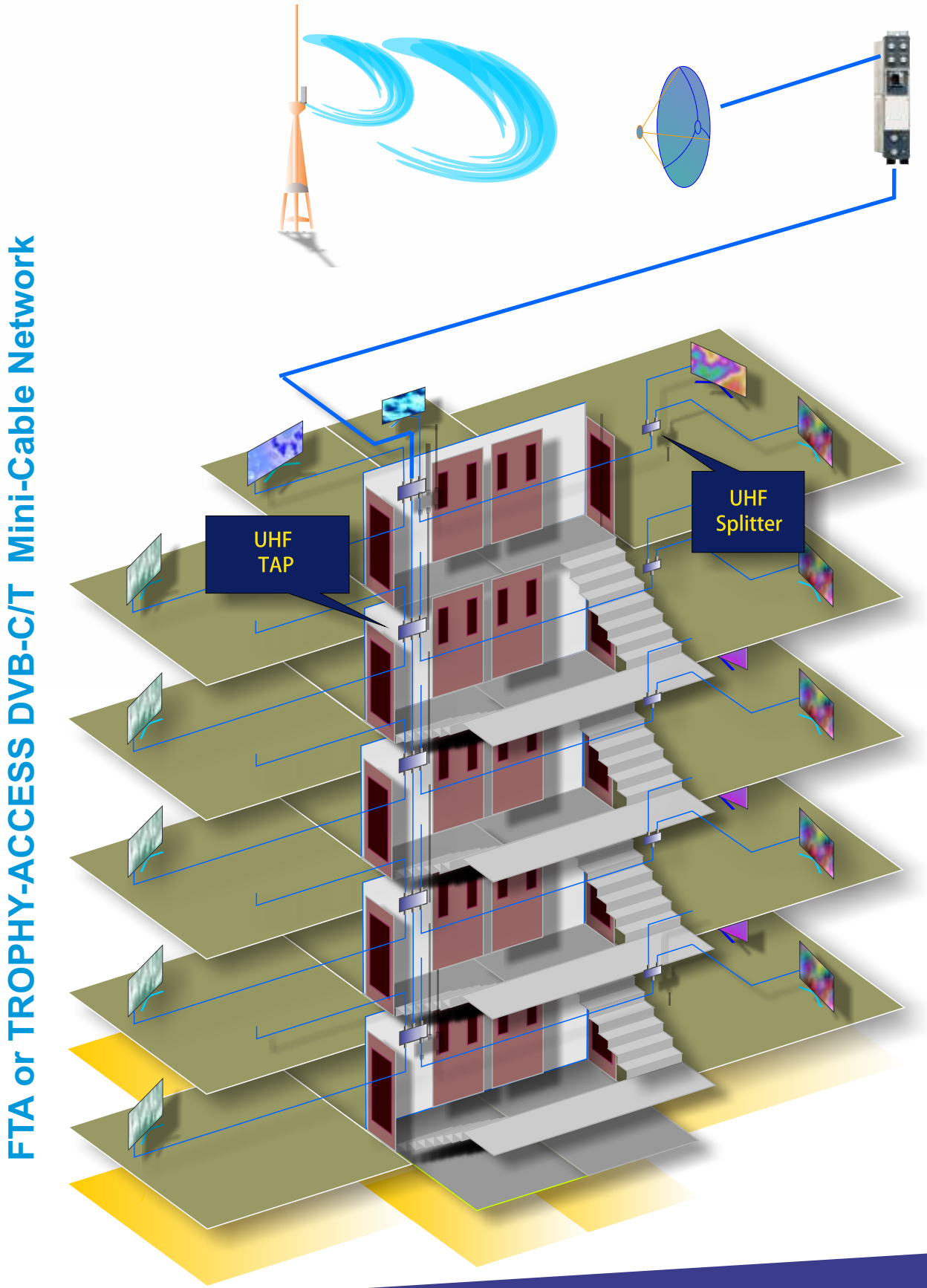


Standards	
Carrier ID	ETSI 103 129
DVB-S2	EN 302 307
Control&Monitoring	
WEB-Interface	Ethernet 10/100 Mb, RJ-45 connector
Virtual COM-port	Micro USB connector
Descrambler mode	TROPHY-ACCESS (additional licenses)
RF input	
L-band	900MHz to 2150MHz, 1MHz step
Input Symbol rate	From 1 to 45MSymb/s, 1KSymb/s step
LNB control	13/18V, on/off, 22 kHz
Connectors	F-connector, 75Ω
RF Output	
L-Band	900MHz to 2150MHz, 1MHz step, up to 8 carriers
Connector	N-Type, 50Ω
Output level of each Transmodulator	0 dB
Insert loss of Combiner	18 dB
10 MHz Local Oscillator; +24VDC / 6A	0...+5dBm, injected to output signal
SNR	> 40dB @ 0dBm
Attenuation range	From 0dB to -31.5dB; 0.5dB step
DVB-S2	QPSK:1/3, 2/5, 1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 8/9, 9/10 8PSK: 3/5, 2/3, 3/4, 5/6, 8/9, 9/10
Output Symbol rate	From 1 to 35MSymb/s,1KSymb/s
	equal to or higher than the input Symbol Rate
Physical	+18V...+36VDC or 220VAC optional
	up to 250W; 6kg Weight; 0°C to 60°C



DVB-S2 to DVB-C/T Transmodulators

“Last mile” of MVDS broadcasting can be Digital Cable TV, built on cluster technology.
The source of the signal for a single apartment building or group of buildings is a DVB-S2 to DVB-C/T transmodulators.



FTA or TROPHY-ACCESS DVB-C/T Mini-Cable Network

The devices are transmodulators with 8 DVB-S/S2 input channels and 8 DVB-T (tdx480) or 8 DVB-C (tdq480) output channels. The devices are designed for digital transmodulation with Transport Stream Processing of TV or Radio programmes issued from FTA (Free to air) or encrypted digital reception. Devices filter services, modify SI (Service Information), generate NIT (Network Information table), LCN (Local Channel Number), can remultiplex services from any input to any output. All of the configurations can be changed by using the Web Interface.

tdx480 – octal transmodulator - with eight DVB-S/S2 input channels and eight DVB-T output channels.
tdq480 – octal transmodulator - with eight DVB-S/S2 input channels and eight DVB-C output channels.

Transmodulators can be used as stand alone devices.
The product is intended for indoor usage only.

Characteristics:

- Integrated 2x8 multiswitch
- TS processing: any service to any output
- PCR restamping
- service filtering
- PSI/SI regeneration
- NIT generation
- PMT version monitoring
- BISS descrambling
- Web control and SNMP monitoring
- loop through RF distributing at input and output
- DIN rail or wall mounting
- robust die-cast housing
- connectors:

RF input/output - type F
Ethernet control interface - RJ-45
screw terminal block for DC entry power distribution bus

Specifications

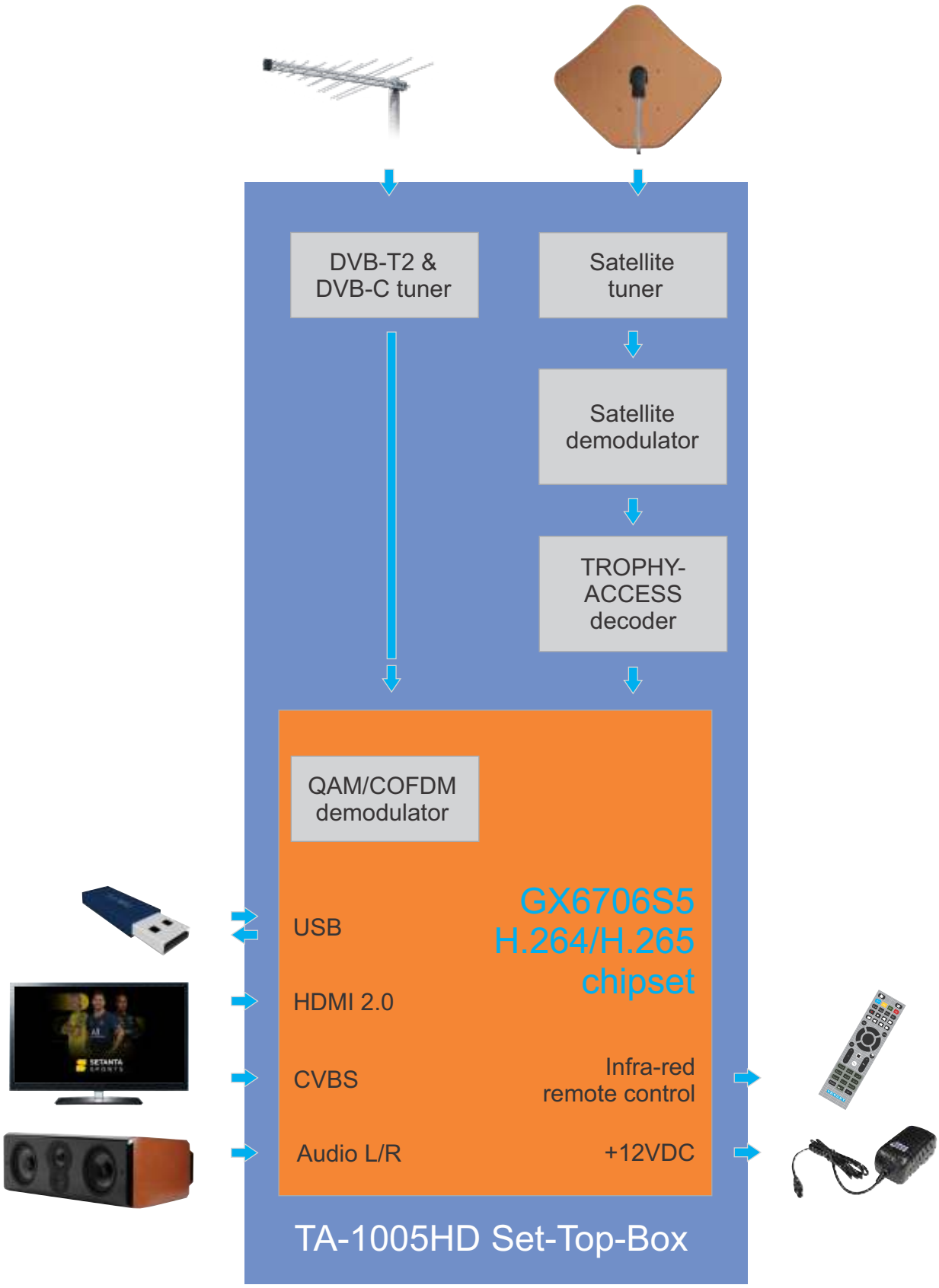
RF input		
Demodulation	QPSK, 8PSK	
Input level	55…95 dBuV	
Input resistance	75 Ohm	
Symbol rate	2...45 Msymb/s (QPSK) 2… 37 Msymb/s (8PSK)	
FEC	1/2_2/3_3/4_5/6_6/7_7/8 (QPSK) 1/2_3/5_2/3_3/4_4/5_5/6_8/9_9/10 (8PSK)	
Input frequency range	950...2150 MHz	
Tuning step	1 MHz	
LNB control	0/14/18 V, 300 mA max, DiSEqC 1.0	EN50494, EN50607
RF output	**TDX480**	**TDQ480**
DVB standard	OFDM (DVB-T)	QAM (DVB-C)
Frequency range	170-230 MHz / 470-862 MHz	96-862 MHZ
Channel allocation	4 + 4	
Level / impedance	90 dBuV (0 ÷ -15.0 dB by 1 dB step) / 75 Ohm	
TS bit rate	< 31 Mbit/s	< 53 Mbit/s
MER	35dB	40dB
Modulation	QPSK, QAM16, QAM64	QAM16, 32, 64,128, 256
Channel bandwidth	7MHz / 8MHz	4...8,3MHz
Guard Interval	1/32, 1/16, 1/8, 1/4	
FEC	1/2, 2/3, 3/4, 5/6, 7/8	
Symbol Rate		3.5...7.2 Msymb/s
Transmission mode	2K	
Management port	standard IEE802.3 10/100 Base T	
Current consumption	12V / 1A	12V / 1.1A
Temperature range	0° ÷ +45°C	
Dimensions / Weight	48.5x198x112 mm/0.9 kg	

TROPHY-ACCESS Set-Top-Box

Specifications

Satellite mode	
Demodulation	QPSK, 8PSK
Input level	-65…-25 dBm
Symbol rate	1...55 Msymb/s (QPSK); 1… 45 Msymb/s (8PSK)
FEC	1/2_2/3_3/4_5/6_7/8 (QPSK) 1/2_3/5_2/3_3/4_4/5_5/6_8/9_9/10 (8PSK)
Input frequency range	950...2150 MHz
Terrestrial mode	
Demodulation	BPSK/QPSK/16QAM/64QAM/256QAM
Minimum input level	from -96dBm(QPSK, 1/2) to -76dBm (256QAM, 5/6)
Symbol rate	0.45～8.5Mbauds
Guard interval	1/4,19/256,1/8,19/128,1/16,1/32,1/128
Pilot pattern	PP1~PP8
FFT mode	1k,2k,4k,8k,16k,32k
Bandwidth	7MHz/ 8MHz
Input frequency range	470...870 MHz
Cable mode	
Demodulation	64/128/256QAM
Symbol rate	5～7.1Mbauds
Input frequency range	62～858MHz
Common specs	
Input resistance	75 Ohm
Tuning step	1 MHz
Video Coding	MPEG-2/ H.264/ H.265
Picture ratio	4:3; 16:9
Connectors	LNB in, RF in, HDMI, A/V output, USB2.0, JTAG
Output resolution	480p_60 / 480i_30 / 576h_50 /576i_50/ 720p_60 / 720p_50 / 1080i_30 / 1080i_50 / 1080p_60 / 1080p_50
Color system	PAL, NTSC
Sound	MPEGI/II, MP3, MPEG4 AAC
Trophy-Access 3.0 Decoder	Embedded FPGA IC
Chipset	GX6706S5
EPG	yes
Interface language	13 languages
Supply voltage	+12VDC 2A, external
Wattage	up to 14W
Dimensions	180x120x45
Weight	1 kg

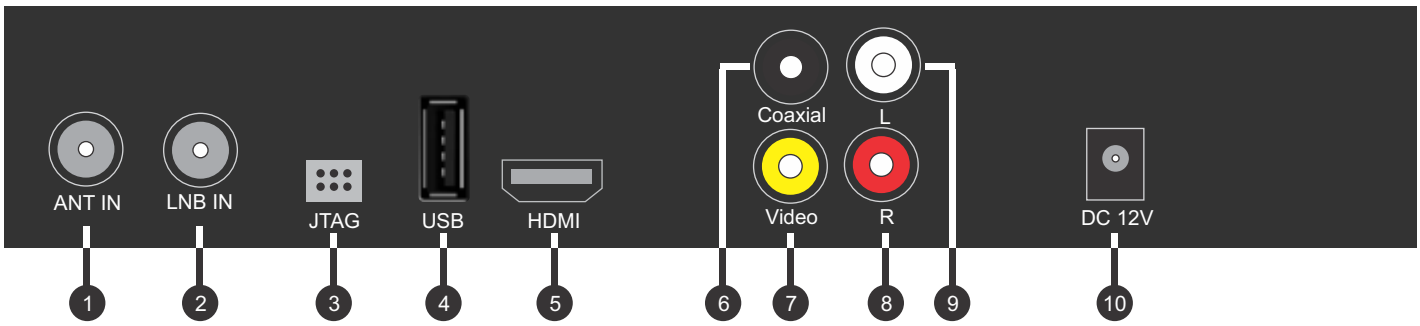
Set-Top-Box connections



Front Panel

1	Power on/off
2	Menu button
3	USB port
4	LED display
5	Channel Down
6	Channel Up
7	Sound level Down
8	Sound level UP
9	OK

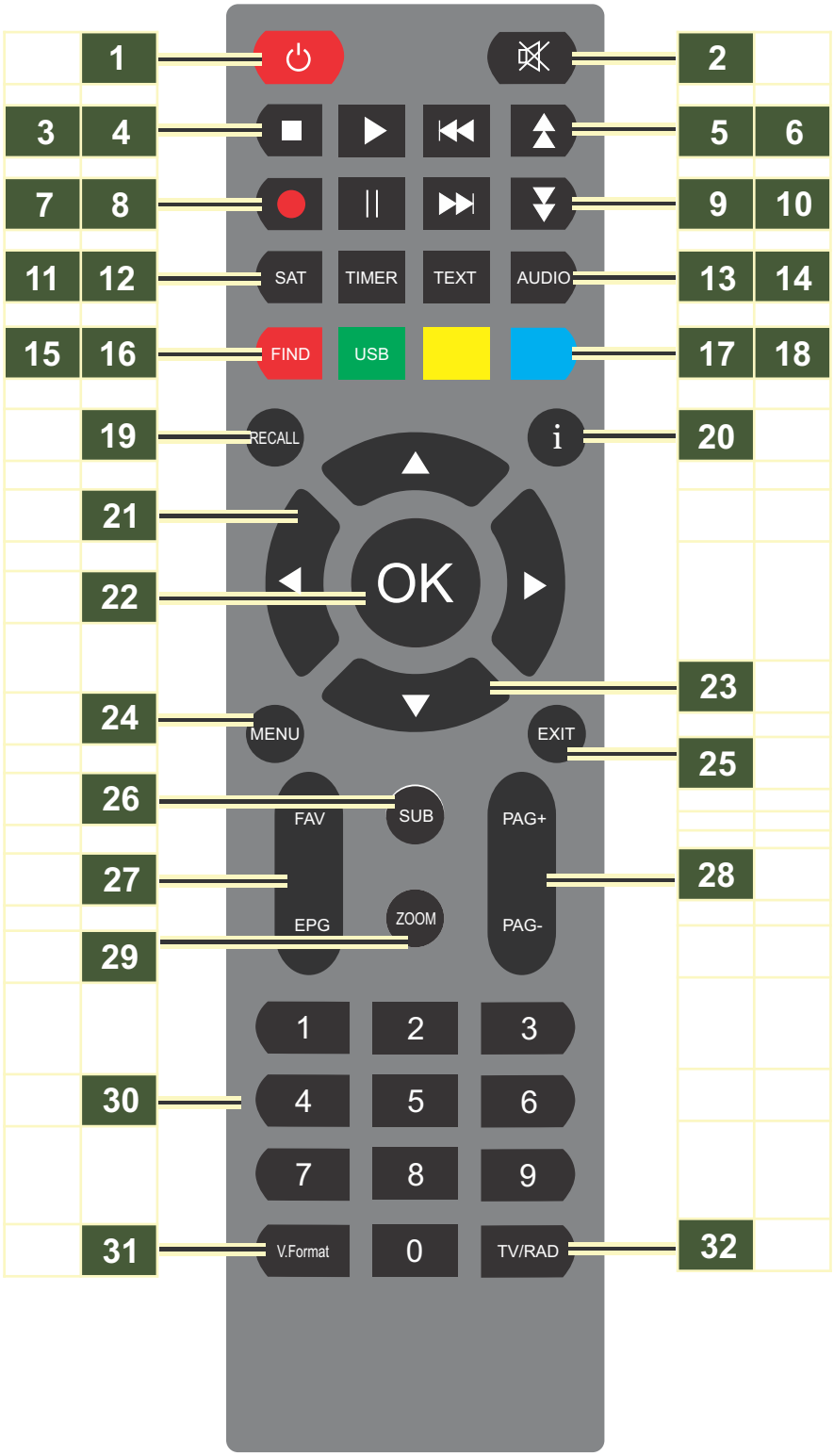
Back Panel



1	Terrestrial / cable signal input
2	LNB input
3	JTAG connector
4	USB connector
5	HDMI output
6	Coaxial audio output
7	Composite VIDEO output
8 9	Left/Right audio channel output
10	DC 12V connector

Remote Control Unit

1	STANDBY mode button
2	MUTE button
3	STOP button
4	PLAY button
5	BACK button
6	PAGE UP button
7	RECORD button
8	PAUSE button
9	FORWARD button
10	PAGE DOWN button
11	SAT button
12	TIMER button
13	TEXT button
14	AUDIO button
15	RED button
16	GREEN button
17	YELLOW button
18	BLUE button
19	RECALL button
20	INFO button
21	VOLUME up/down buttons
22	OK button
23	CHANNEL up/down buttons
24	MENU button
25	EXIT button
26	SUB button
27	VOLUME up/down button
28	CHANNEL up/down button
29	ZOOM button
30	Digits 0 to 9
31	VIDEO FORMAT button
32	TV/RADIO button



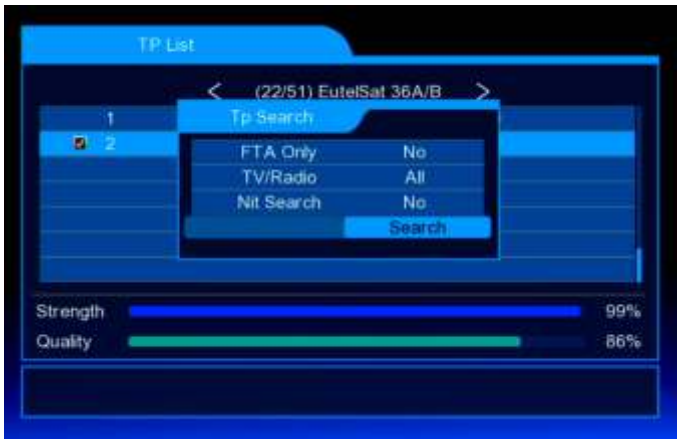
Satellite TV Installation

Press the **GREEN** button to add a transponder

Enter the parameters of the new Transponder

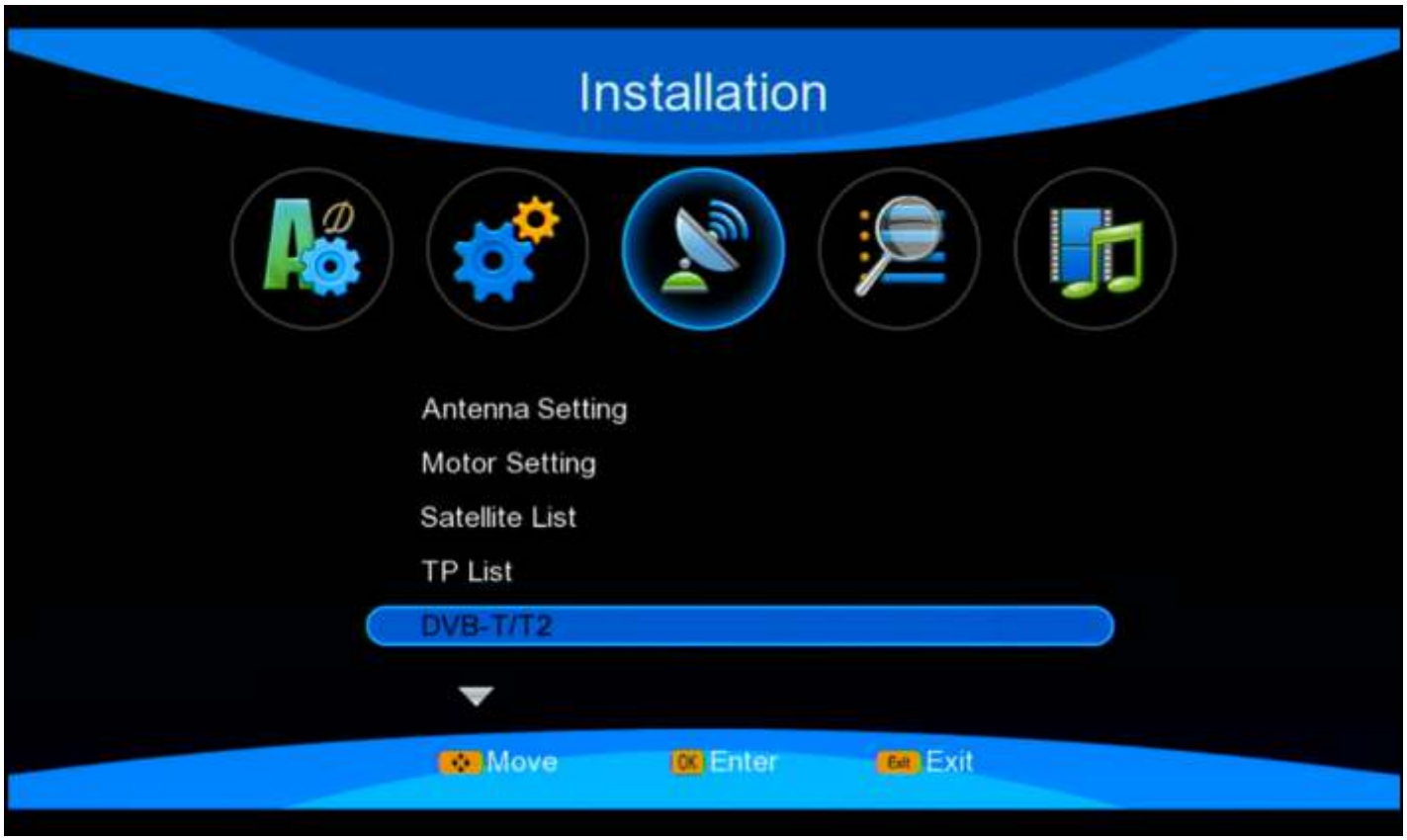
Click **OK**. If the parameters you entered were correct, the Quality scale will turn green.

Press the **BLUE** button to start searching for programs.

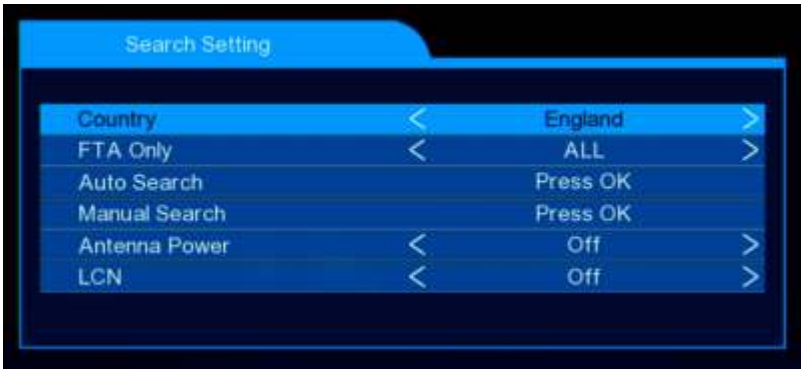


Terrestrial TV Installation

You have the opportunity to receive not only satellite channels, but also digital terrestrial programs. Select the **DVB-T/T2** line and press the **OK** button.



Select:
- country
- type of accepted programs (only FTA ones or all)
- supply +5V power to the antenna (Be careful. Read the characteristics of the antenna before turning on the power!)
- generate a list of channels according to the broadcaster's LCN table

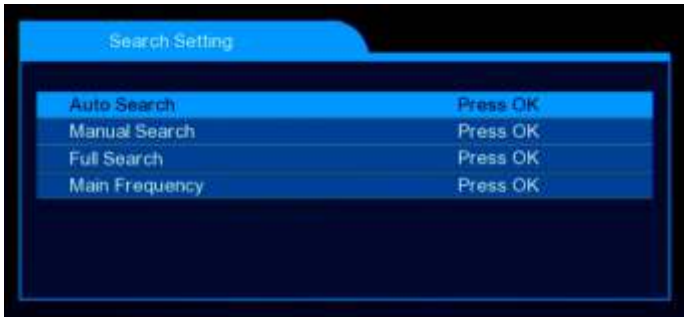


Cable TV Installation

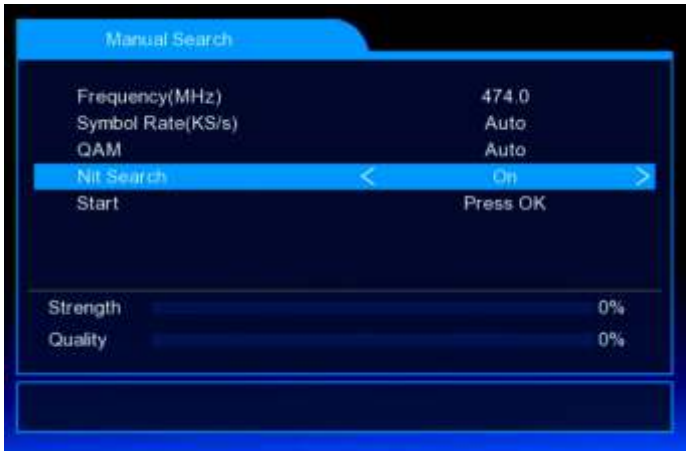
You have the opportunity to receive digital cable programs. Select the **DVB-C** line and press the **OK** button.

Select the **Manual Search** line

Or select the **Auto Search** line



Specify the starting frequency and NIT search mode using the cable operator's table. Click **OK** on the **Start** line.



Click **OK**. An automatic search will begin.

TROPHY-ACCESS decoder number

The decoder serial number is located on a sticker on the bottom cover of the device.

95 - 000396

INFO menu and Decoder ID

The decoder serial number is located on the INFO menu. Click button twice to see the Decoder ID into the advanced INFO menu.