

DVB for ALL!

TROPHY



DATASHEET

CABLE TV

HD&UltraHD TROPHY HEAD-END

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INTRODUCTION

TROPHY CABLE TV HEAD-END is a high-tech, based on know-how, cost-effective business solution. In particular, it helps customers take full advantage of digital TV.

Design of HEAD-END is very simple due to using of IP connection between modules.

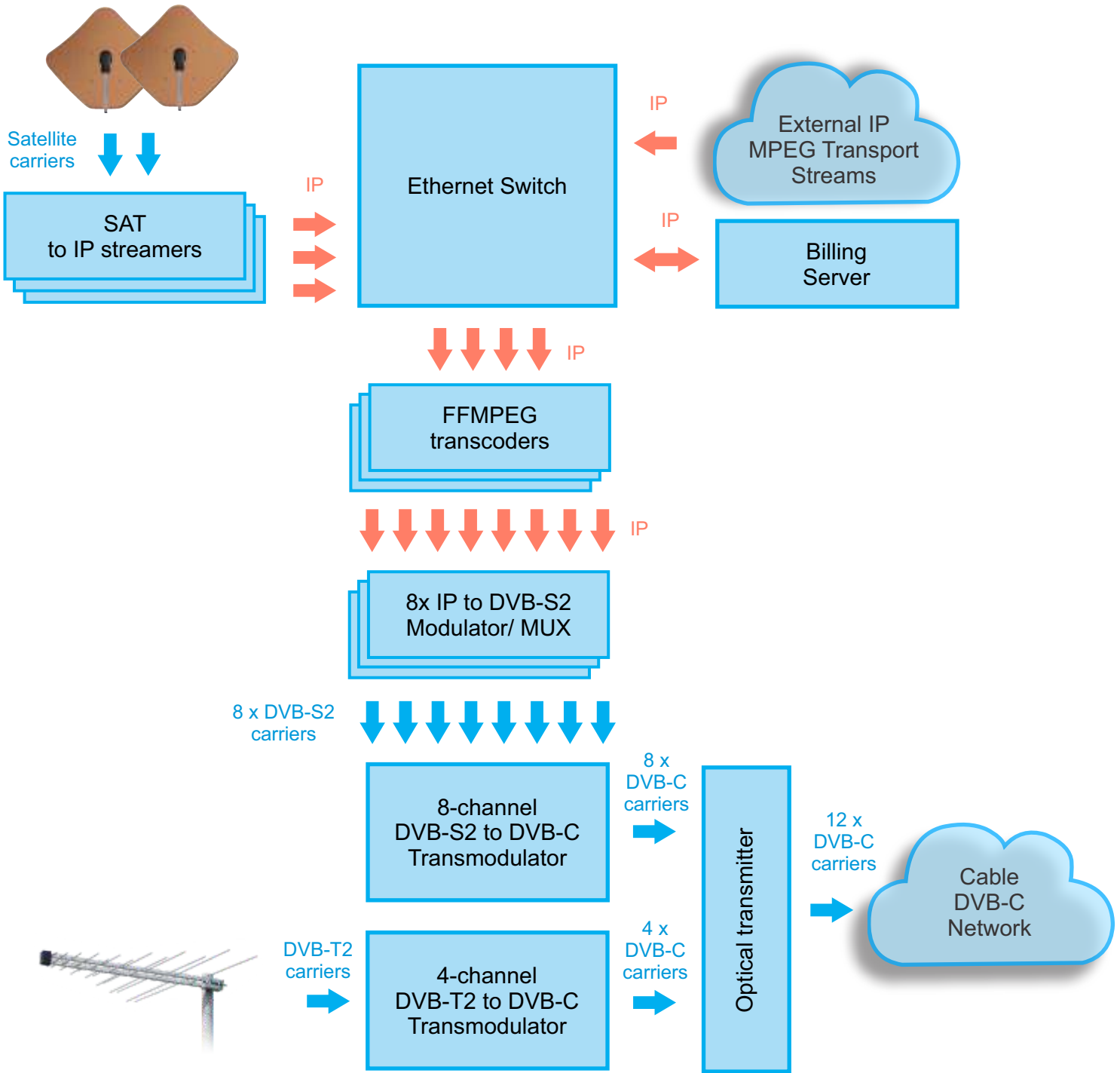
Heart of system is low-cost and high-efficient DVB-S2 Modulator / 120ch Multiplexer.

Almost all the major HEAD-END components are based on the Linux software. For example, the streamers, the demultiplexers, the modulators/multiplexers - all this, in the long run, 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 DVB-C HEAD-END DIAGRAM



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.

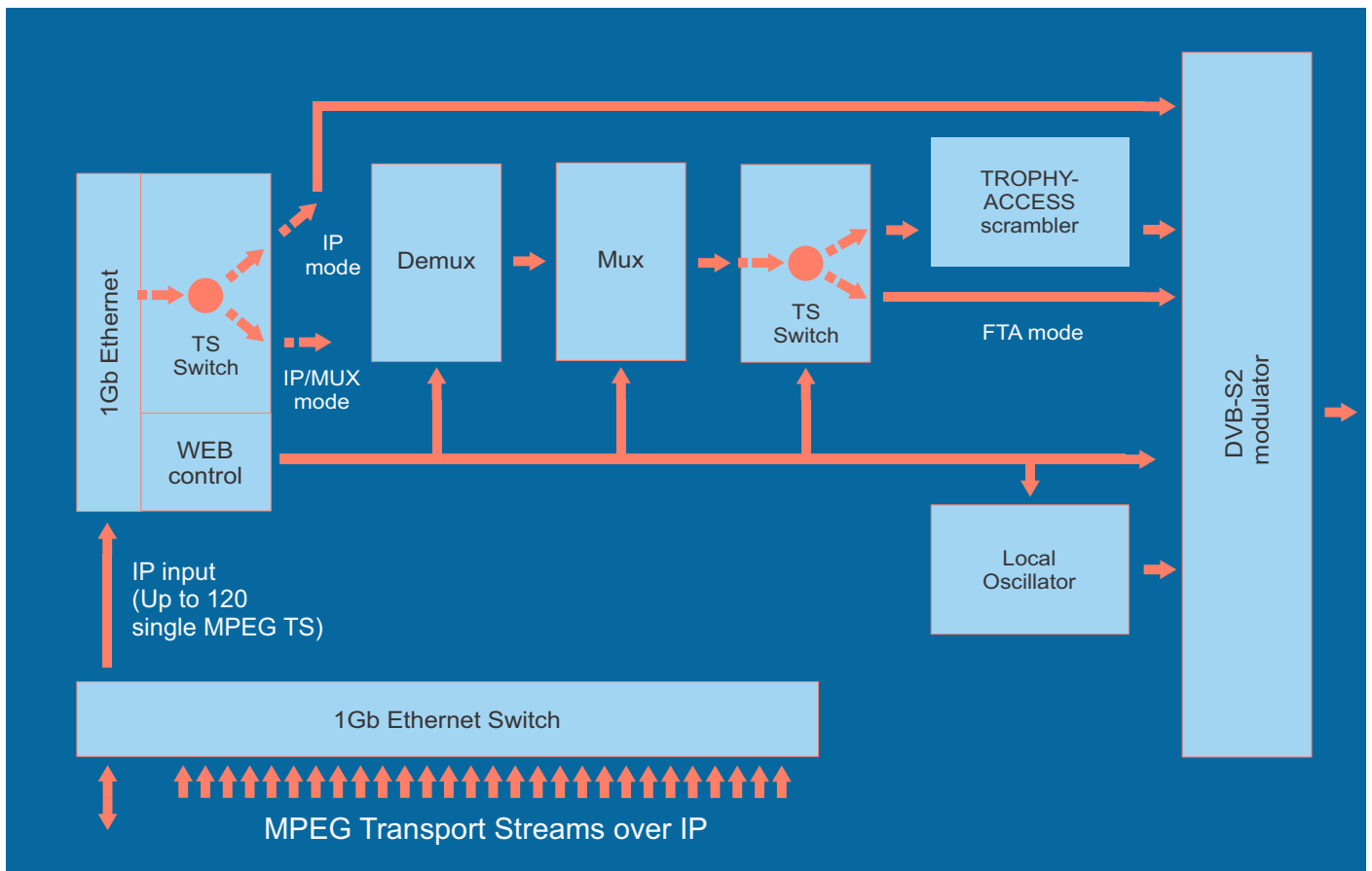
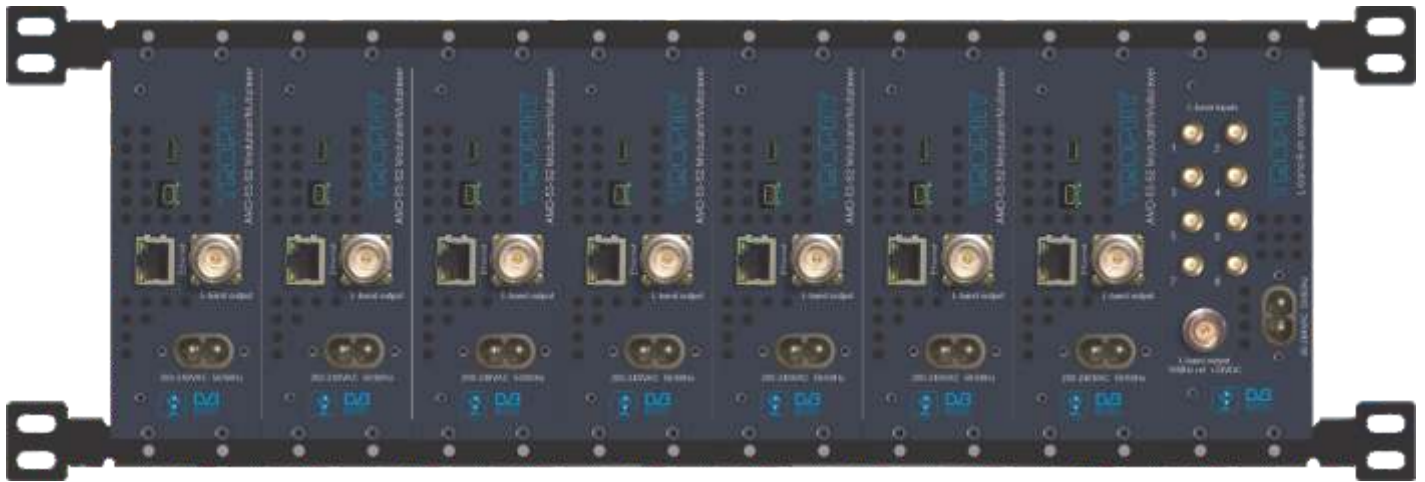


MAIN FUNCTIONS OF AMD-53-S2 MODULATOR / MULTIPLEXER:

- 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.



AMD-53-S2 MODULATOR/ MUX

INSTALLING AND OPERATING INSTRUCTIONS

SAFETY INSTRUCTIONS

When assembling and commissioning the AMD-53-S2 MOD/MUX 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 transport stream multiplexer and DVB-S2 modulator. With them the user's own digital program "bouquets" in the DVB-S2 carrier can be produced. The output signal are provided via RF-output and configurable by IP interface. The signal can be broadcast or fed into the MVDS or satellite TV network. Depending on the application, the device are pre-configured by hardware. Using the integrated user interface, the operating parameters can be varied within wide limits.

Deliveries are made with the following configurations/ device versions:

Features	Part No.			
	1001	1002	1003	1004
TROPHY-ACCESS CAS		+		+
EPG (EIT) supporting			+	+

Up to 120 input elementary transport streams are multiplexed at device and inserted into the output DVB-S2 carrier with maximum bit rate of 100 Mbps and is transmitted via the N-type connector.

The output signal contains all the tables necessary to the program and associated services (PAT, PMT, SDT, NIT and TDT). Part No. 1003 and 1004 supports EPG (EIT tables) too.

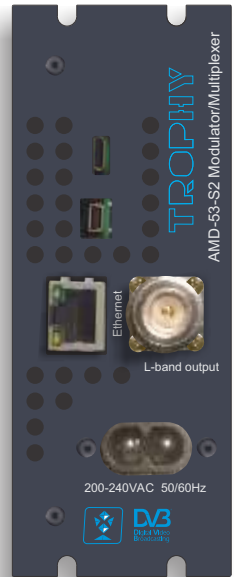
MULTIPLEXER/REMULTIPLEXER/PID FILTER

A multiplexer has been integrated into the AMD-53-S2 device for processing the incoming transport streams. On condition that in these transport streams an adequate transmission rate is available, or additional transport volume is achievable by raising the transport streams bit rate, new services and/or program components can be added.

PID filtering is enable in case of IP-input mode only. A raw MPEG Transport Stream consists data of all the services transmitted on a particular transponders. The task on the remux/mux side is to filter out the interesting packets and schedule them to their target DVB-S2 carrier.

MPEG TS packets are identified by the Packet ID, the PID. This is a 13-bit number located in the 2nd and 3rd byte of a TS packet.

INSTALLING FUNCTIONAL ELEMENTS AND FACTORY SETTINGS



Explanation of the functional elements:	
Power (green LEDs scale)	Switched ON, 30 sec after power restart
Input stream + WEB interface	Ethernet, RJ-45, 1Gb, UDP/RTP
L-band output	N-type connector
200-240 VAC 50/60Hz	SCZ-20 connector

Factory settings:	
IP address:	10.10.10.20
User/password	admin / admin
IP netmask:	255.255.255.0
IP gateway:	10.10.10.1
SNMP trap (IP):	0.0.0.0
System section	
Input mode:	IP-MUX
Scrambler:	Enabled (Part No. 1002, 1004)
EPG support	Enabled (Part No.1003,1004)
Billing Server:	
PSR Restamping:	Enabled
Inputs section	
Protocol/Port:	UNICAST UDP:1234
SI generator section	
Provider name:	no name
Transport Stream ID:	2
Original Network ID:	4
TDT generator:	ON
Auxiliary SI Port:	901
Modulator section	
Output Frequency (MHZ)	1462
Symbol Rate (kSpS)	35000
Modulation – FEC	8PSK 3/4
Roll-off	0,25
FEC Frame length	Normal
Pilot tone	off
Spectrum inversion	off
Output attenuation (dB)	-10

AMD-53-S2 MODULATOR/ MUX

CONFIGURE OF THE OUTPUT PROGRAM LIST IN THE TROPHY MULTIPLEXERS

The program name is the service designation. By default, the multiplexer generates the same name for each program as specified in the incoming stream. You can change the name to another one. The program names will be displayed in the Set-Top-Box table. Names must be unique.

You can select the source of the EIT (EPG):

- the original EIT from the program source;
- not present;
- the information from an external EIT-Server.

Basically, the EIT tables are present in satellite broadcasting. All TROPHY multiplexers processes this information and transmits it to the output stream. In order to use the satellite program tables, it is necessary to specify the ORIGINAL (FROM PROGRAM SOURCE) mode.

If there is no EIT information from the satellite and you do not accept this information from external resources, it is necessary to specify NOT PRESENT mode.

In case of using the TROPHY EIT (EPG) SERVER you must select the PRESENT + SCHEDULE mode.

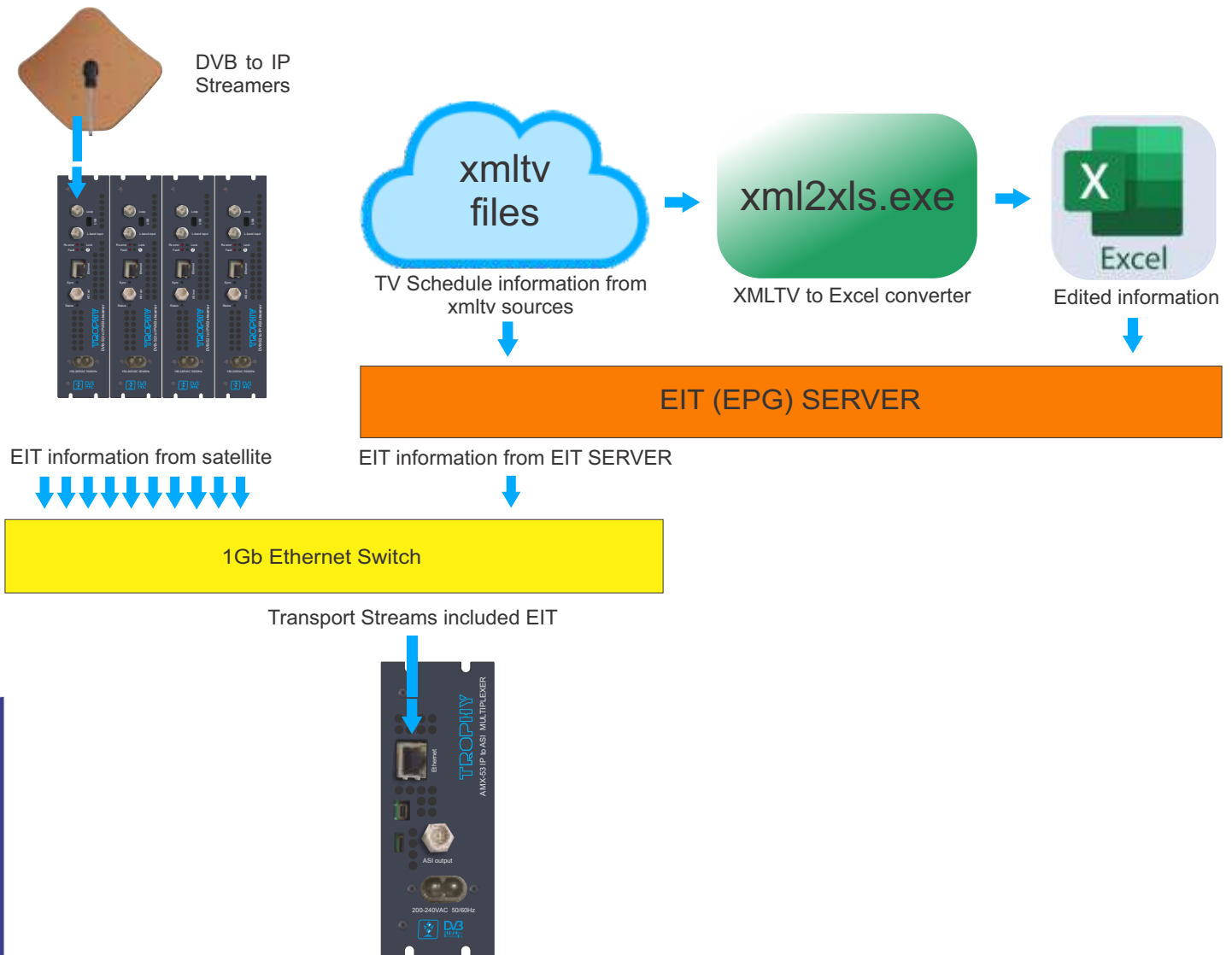
In the case of using other EIT servers, you must specify the mode corresponding to this server.

The screenshot displays the 'Programs' tab in the TROPHY multiplexer software. A table lists programs with columns for SID, Program name, Type, Port:SID, and Rate Mbit/s. A 'Program properties' dialog box is open for program SID 8150, showing fields for Name (BBC World), PMT PID (140), Type (1), and EIT source (Original (from program source)). The Conditional Access dropdown is set to FTA. Below the dialog, two dropdown menus are shown: one for EIT source and one for Conditional Access. The EIT source dropdown includes options like 'Original (from program source)', 'Not present', and 'External: Present'. The Conditional Access dropdown includes 'FTA', 'Type 1', 'Type 2', and 'Type 3'.

AMD-53-S2 MODULATOR/ MUX

EIT (EPG) MODES OF THE MULTIPLEXER

- **ORIGINAL mode.** Basically, the EIT tables are present in satellite or terrestrial broadcasting. All TROPHY multiplexers processes this information and transmits it to the output stream. In order to use the broadcaster program tables, it is necessary to specify the ORIGINAL (FROM PROGRAM SOURCE) mode.
- **NOT PRESENT mode.** If there is no EIT information from the satellite and you do not accept this information from external resources it is necessary to specify NOT PRESENT mode.
- **PRESENT + SCHEDULE mode.** In case of using the TROPHY EIT SERVER you have select the PRESENT + SCHEDULE mode. You can send ready-made XMLTV files to the EIT-Server. Also, you can convert an XMLTV file to an Excel file to edit the content and even add information in other languages for multilingual broadcasting. The edited file can be send directly to the EIT-Server.



AMD-53-S2 MODULATOR/ MUX

EIT-SERVER

The EIT (EPG) Server SoftWare is designed to form multilingual EIT tables from xmltv or Excel sources. The information generated by the server is compatible with all TROPHY multiplexers. The EIT Server Software is sufficient for broadcasting the EIT tables according to the standard.

The main functions of the EIT (EPG) Server SoftWare are:

- convert TV Schedule information from xmltv sources to EIT DVB tables;
- convert TV Schedule information from Excel to EIT DVB tables;
- sending EPG data to the appropriate SIDs of output MUX;
- operative replacement of EPG data in case of changes in xmltv or Excel files.

Software is provided for Windows and Linux Operating Systems:

- linux_arm
- linux_arm64
- linux_x32
- linux_x64
- windows_x32
- windows_x64

INSTALLATION OF EIT-SERVER

*** These actions require root privileges ***

- Install eit-server to /usr/local/sbin
- ```
sudo cp eit-server /usr/local/sbin
```
- Install config file to /etc/dvb
- ```
# sudo mkdir /etc/dvb
```
- ```
cp eit-server.conf /etc/dvb
```
- Edit config - add muxes, programs, etc. Make sure the database path is correct.
  - Install utilities to /usr/local/bin
- ```
# sudo cp eit-import /usr/local/bin
```
- ```
sudo cp xmltv2xlsx /usr/local/bin
```

Let systemd control EIT-Server

- ```
-----
```
- Copy eit-server.service file to /etc/systemd/system
- ```
sudo cp eit-server.service /etc/systemd/system
```
- Reload services
- ```
# sudo systemctl daemon-reload
```
- Enable eit-server to autostart
- ```
sudo systemctl enable eit-server.service
```
- Run server
- ```
# sudo systemctl start eit-server.service
```
- Check eit-server status
- ```
sudo systemctl status eit-server.service
```

## CONFIGURE OF THE EIT-SERVER

Configuring the EIT-Server settings is done using the configuration file. The configuration file structure is indicated below:

```

eit-server.conf.example
1 database: /var/db/eit/eit.db #path to sqlite3 database (mandatory)
2
3 log: debug # log level settings (optional)
4 send-period: 10 # EIT sending period in milliseconds (optional)
5
6 lang-order: geo, eng, ukr, ita # language order (mandatory)
7
8 net-id: 0x77 # original network id - from mux settings (mandatory)
9
10
11 [mux : tcp://10.10.10.20] # multiplexer session begin (mandatory)
12 ts-id: 11 # transport stream id (mandatory)
13 program: 10 : GMS # program specification (mandatory) format: program: service-id : Program name
14 program: 20 : Setanta Sports 1
15 program: 30 : Setanta Sports 2
16 program: 40 : Setanta Sports 3
17 program: 50 : Football TV
18 program: 60 : Rugby TV
19 program: 100 : 1 Arkhi Sport1
20 program: 200 : Promo
21
22 #[mux : 10.10.10.12] # next multiplexer session begin
23 # ts-id: 0x2
24 # program: 200 : <ua>Ukrainian program2
25 # program: 201 : <ge>Georgian program2
26 # program: 202 : <en> English program2
27 # program: 203 : English program2
28
29
30 #[mux :10.10.10.13]
31 # ts-id: 0x3
32 # program: 300 : <ua>Ukrainian program3
33 # program: 301 : <ge>Georgian program3
34 # program: 302 : <en> English program3
35 # program: 303 : English program3
36
37

```

## SI GENERATOR

Service information is a special set of elementary streams that contain a set of database tables describing the structure of transport stream, the services within it and some useful information that digital TV receivers can show the user, such as the name of the service and schedule information for the services. These tables are collectively known as Service Information (SI). Every DVB transport stream has some service information that the MPEG standard declares mandatory.

| System                                | Network | Inputs | Programs | SI Generator        | Modulator                           |
|---------------------------------------|---------|--------|----------|---------------------|-------------------------------------|
|                                       |         |        |          | Transport Stream ID | <input type="text" value="2"/>      |
|                                       |         |        |          | Original Network ID | <input type="text" value="4"/>      |
|                                       |         |        |          | Provider Name       | <input type="text" value="Trophy"/> |
|                                       |         |        |          | TDT generation      | <input type="text" value="On"/>     |
|                                       |         |        |          | Auxiliary SI Port   | <input type="text" value="901"/>    |
| <input type="button" value="Accept"/> |         |        |          |                     |                                     |

Every service in a DVB network can be uniquely identified by three values. These values are the Original Network ID (the ID of the network that originally broadcast the service), the Transport Stream ID (to identify a particular transport stream from that network) and a Service ID to identify a service within that transport stream.

**Transport stream identification (TS-ID):** Unique identification of the transport stream is generated. The TS ID can be any number between 1 and 65 535.

**Original Network ID [1..65535].** Information to identify the origin.

**Time and Date Table (TDT)** provide a time reference for the stream. The TDT contains the current UTC (Universal / GMT) time. The device does not have its own real-time clock. Therefore, if you turned "ON" the function of forming TDT, then you need to provide a connection to the Internet or to a real-time server. You must specify a server name that will synchronize the current time in the NETWORK menu (see page No.6). If this option is not available, you must set "OFF" value in the TDT GENERATION line.

In multiplexer mode, the device automatically generates the following service tables:

**Program Association table (PAT)** - defined by the MPEG standard. The Program Association Table is the fundamental table for service information. It describes which PID contains the Program Map Table for each service (see below) as well as the Network Information Table for the transport stream in those networks that use it.

**Program Map Table (PMT)** - defined by the MPEG standard. The Program Map Table is the table that actually describes how a service is put together. This table describes all the streams in a service, and tells the receiver which stream contains the MPEG Program Clock Reference for the service. The PMT is not broadcast on a fixed PID, and a transport stream will contain one PMT for each service it contains.

Together, the PAT and PMT are known as Program Specific Information (PSI) and are defined by MPEG. All other tables are specific to DVB systems.

**Service Description Table (SDT)**

The Service Description Table gives more user-oriented information about services in a transport stream. Unlike the PMTs, there is only one SDT in a transport stream, and that contains the information for every service. The SDT typically contains information such as the name of the service, the service ID, the status of the service (e.g. running/not running/starting in a few seconds) and whether the service is scrambled or not.

### NIT GENERATOR

Network Information Table (NIT) conveys information relating to the physical organization of the multiplexes carried via a given network, and the characteristics of the network itself. The combination of original\_network\_id and transport\_stream\_id allow each TS to be uniquely identified throughout the ETS application area. Networks are assigned individual network\_id values, which serve as unique identification codes for networks. In the case that the NIT is transmitted on the network on which the TS was originated, the network\_id and the original\_network\_id shall take the same value.

NIT generator supports the NIT transitions between delivery media boundaries, e.g. from satellite to cable or terrestrial systems. IRDs may be able to store the NIT information in non-volatile memory in order to minimize the access time when switching between channels ("channel hopping"). It is also possible to transmit a NIT for other networks in addition to the actual network.

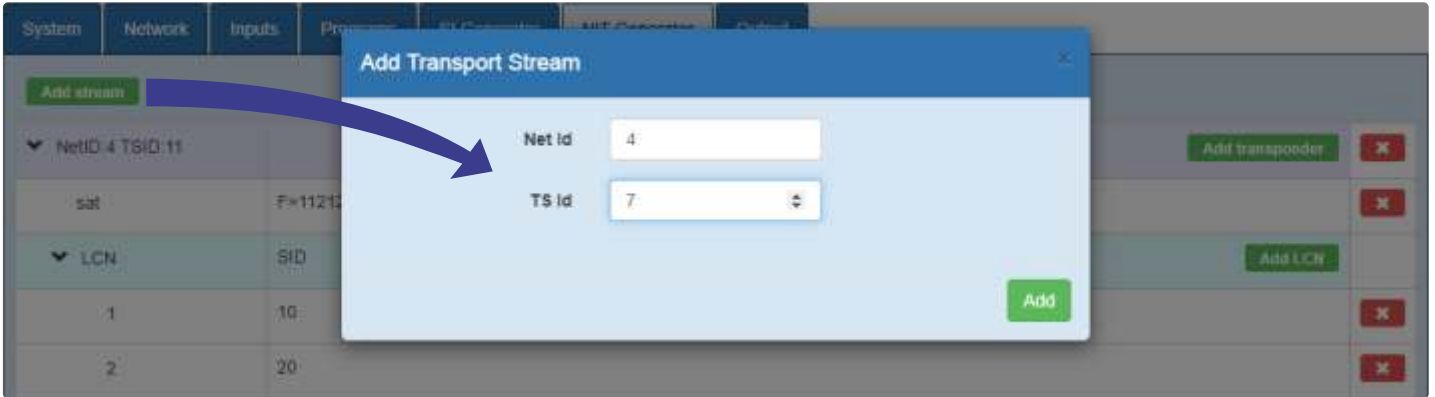
The screenshot shows the 'NIT Generator' tab in a software interface. At the top, there are navigation tabs: System, Network, Inputs, Programs, SI Generator, NIT Generator, and Output. Below these is a table with two main sections: 'NetID:4 TSID:6' and 'LCN'. The 'NetID:4 TSID:6' section has a header row with 'Add transponder' and a delete icon. It contains three rows for 'cab', 'sat', and 'ter' with their respective parameters and delete icons. The 'LCN' section has a header row with 'Add LCN' and a delete icon. It contains three rows with LCN values 1, 2, and 4, and their corresponding SID values 1, 2, and 123, each with a delete icon. At the bottom right, there are 'Export' and 'Import' buttons.

| NetID:4 TSID:6 |                                              | Add transponder | ✕ |
|----------------|----------------------------------------------|-----------------|---|
| cab            | F=562MHz SR=6900 64QAM                       |                 | ✕ |
| sat            | F=11212MHz SR=30000 8PSK 3/4 Position:W2.5 L |                 | ✕ |
| ter            | F=878MHz BW=8MHz QPSK HP:1/2 LP:1/2          |                 | ✕ |
| LCN            |                                              | Add LCN         | ✕ |
| 1              | 1                                            |                 | ✕ |
| 2              | 2                                            |                 | ✕ |
| 4              | 123                                          |                 | ✕ |

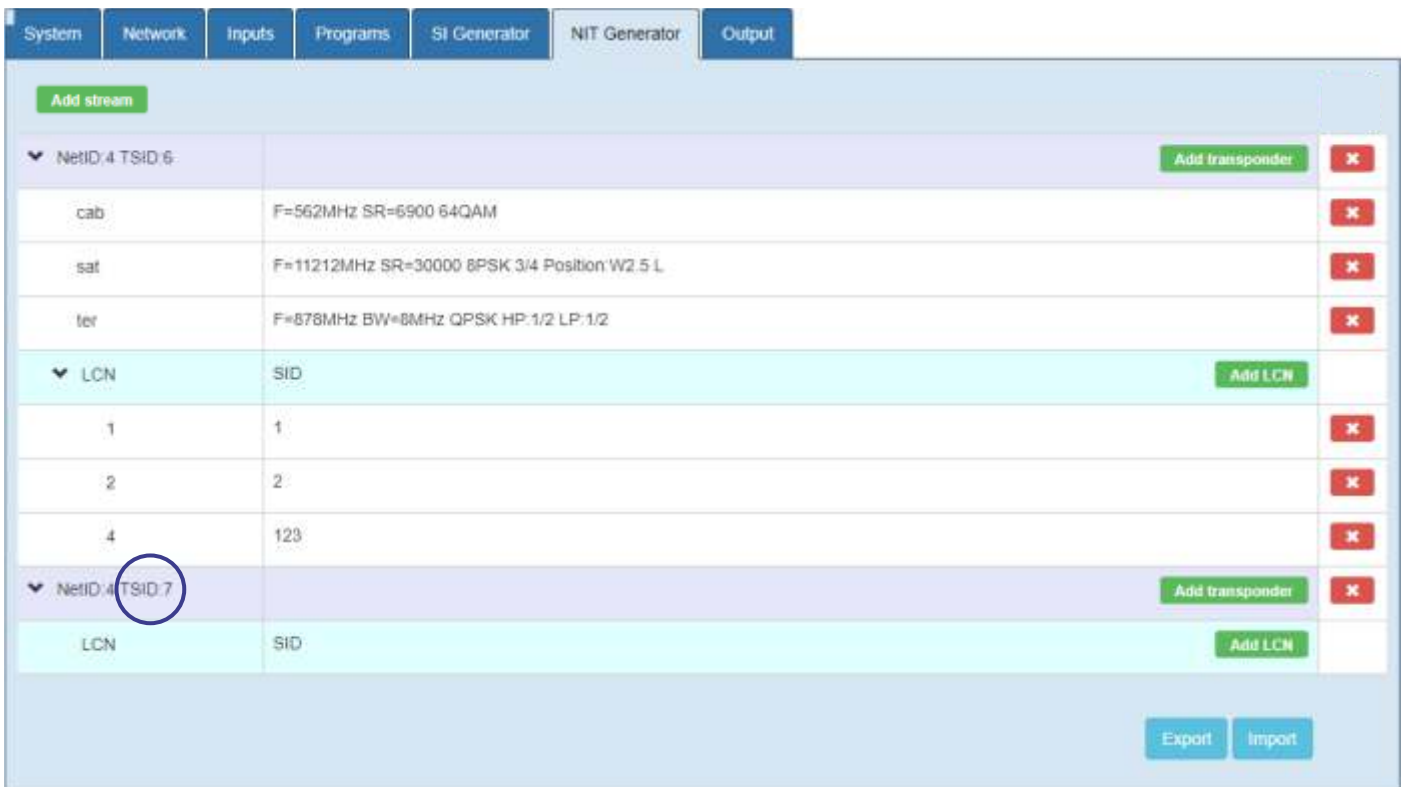
Export Import

### ADDING A TRANSPORT STREAM ID TO THE NIT TABLE

Click the “Add stream” button and specify the Network ID number and original Transport Stream number. Click the “Add” button to save the new Transport Stream ID. To exit without saving press the “x” in the upper right corner.



New transport stream added to the NIT table now.





Specify the transponder parameters for this Transport Stream. You can specify transponder parameters for different DVB standards (DVB-S/S2, DVB-C, DVB-T/T2) if the stream is broadcasted in other networks. Click the “Add” button to save the transponder.

Add transponder
✕

Type: Satellite ▼

Frequency (MHz)

Symbol Rate (kSpS)

Modulation  ▼

FEC  ▼

East/West flag  ▼

Orbital position

Polarization  ▼

Add

Add transponder
✕

Type: Terrestrial ▼

Frequency (MHz)

Bandwidth  ▼

Constellation  ▼

Code rate HP  ▼

Code rate LP  ▼

Guard interval  ▼

Transmit mode  ▼

Hierarchy  ▼

Priority  ▼

MPE-FEC  ▼

Time slicing  ▼

Other frequency  ▼

Add transponder
✕

Type: Cable ▼

Frequency (MHz)

Symbol Rate (kSpS)

Modulation  ▼

Add

AMD-53-S2 MODULATOR/ MUX

## ASSIGNING LOCAL CHANNEL NUMBER (LCN) TO PROGRAM (SID)

Some receiver models arrange programs according to the LCN table. To customize this table, click the “Add LCN” button and specify the appropriate LCN and SID numbers in the Transport Stream.

|                |                                              |                 |   |
|----------------|----------------------------------------------|-----------------|---|
| NetID:4 TSID:7 |                                              | Add transponder | ✕ |
| sat            | F=11265MHz SR=35000 8PSK 3/4 Position E5.0 H |                 | ✕ |
| LCN            | SID                                          | Add LCN         |   |

**Add LCN** ✕

LCN:

SID:

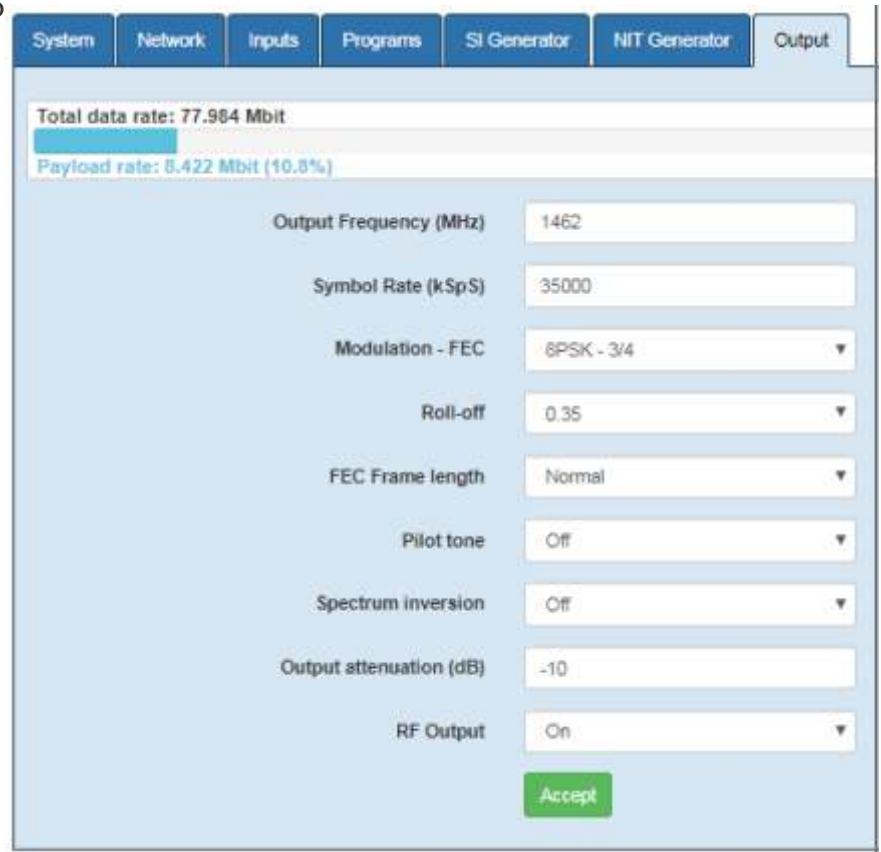
Add

Repeat the operation for all programs of Transport Stream. If several Transport Streams are broadcast on the network you can use the “EXPORT” and “IMPORT” buttons to enter the NIT and LCN tables on other TROPHY AMD-53 modulators.

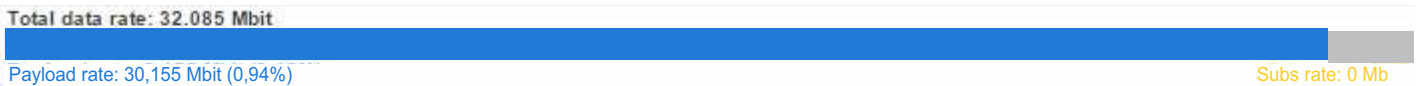
### MODULATOR PARAMETERS

In this menu you need to specify the parameters of the output carrier:

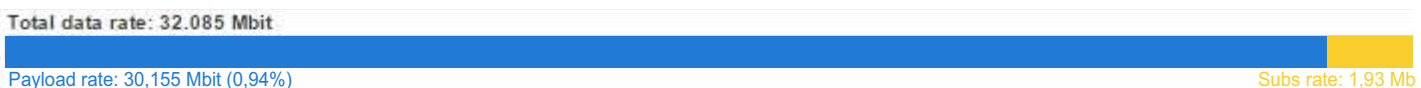
|                    |                                                                                                |
|--------------------|------------------------------------------------------------------------------------------------|
| Output frequency   | up 900 to 2150MHz;                                                                             |
| Symbol Rate        | up 1000 to 35000 kSymb per Second                                                              |
| Modulation/FEC     | QPSK: 1/3, 2/5, 1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 8/9, 9/10<br>8PSK: 3/5, 2/3, 3/4, 5/6, 8/9, 9/10 |
| Roll-off           | 0,2 ; 0,25 ; 0,35                                                                              |
| FEC Frame length   | Normal/short                                                                                   |
| Pilot tone         | On/off                                                                                         |
| Spectrum Inversion | On/off                                                                                         |
| Output attenuation | up to -31.5                                                                                    |
| RF output          | On/Off                                                                                         |



The actual bitrate at the output of the modulator is displayed as a blue scale at the top of the menu. Free capacity of the transponder is filled with zero packets if the subscription data does not come to the modulator from the billing server. The capacity occupied by zero packets is indicated in the form of a gray scale.



Free capacity is filled with subscription packages if the billing server sends TROPHY-ACCESS CAS data to the modulator. The efficiency of data transmission is maximum. The capacity that the subscription data occupies is indicated in the form of a yellow scale. Thanks to this technology, the CAS data transmission efficiency is maximum.



| <b>SPECIFICATIONS</b>               |                                               |
|-------------------------------------|-----------------------------------------------|
| <b>Standards</b>                    |                                               |
| 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) |
| <b>IP input</b>                     |                                               |
| 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)            |
| <b>RF Output</b>                    |                                               |
| 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                |
|                                     |                                               |

|                                   |                                                         |
|-----------------------------------|---------------------------------------------------------|
| <b>Multiplexer</b>                |                                                         |
| Quantity of multiplexed channels  | up to 120                                               |
| PID quantity supported            | All PIDs of input services                              |
| <b>Modulation</b>                 |                                                         |
| 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                     |
|                                   | SeamlessACM: Adaptive Coding and Modulation             |
| DVB-S2 frames                     | Short (16200), Normal (64800)                           |
| Pilots                            | On or Off                                               |
| Variable symbol rate              | From 1 to 35Mbaud, step 1Baud                           |
| <b>Control &amp; Monitoring</b>   | Web Browser Control & Monitoring                        |
|                                   | 10/100/1000 Base-T Ethernet ports                       |
|                                   | 90 to 240VAC/50Hz/15W                                   |
| <b>Physical</b>                   | 2kg Weight                                              |
|                                   | 0°C to 50°C temperature range                           |
| <b>TROPHY-ACCESS 3.0 options</b>  |                                                         |
| Type of CAS                       | FPGA based, doesn't match CSA algorithm                 |
| Size of the decoder address field | 32 bits                                                 |
| Quantity of addressable decoder   | 4,294,967,295                                           |
| 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            |
| Individual addressable message    | up to 120 characters                                    |



# DVB-BILLING PRO software



# 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.

### How is everything arranged inside?

- The system is installed on Linux Debian OS.
- The main components of the system are located in the /opt directory.
- PostgreSQL is a database.
- The database is located in the /var/db directory.

## OPERATORS menu

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

The screenshot shows the OPERATORS menu interface. At the top, there are navigation tabs: Subscribers, Packages, Decoders, Password, Constructor, Currency, Reports, and Operators (which is highlighted). A 'Log Out' button is in the top right corner. Below the tabs is a 'Refresh' button. The main area contains a table with the following columns: User Name, Name, Email, Phone, and Rights. Each row has an 'Edit' button to its right. At the bottom left, there is an 'Add' button. At the bottom right, there is a pagination control showing '1 ... 1 ... 1'.

| User Name     | Name   | Email             | Phone                | Rights |
|---------------|--------|-------------------|----------------------|--------|
| root2         | Andrii | ar[redacted]l.com | 5[redacted]3         | 63     |
| Administrator | Byrlyk | bi[redacted].com  | 2222222222           | 63     |
| testAdmin2    | Birlik | bir[redacted].com | 33333333333333333333 | 63     |
| Operator      | Byrlyk | birli[redacted].m | 1111111111           | 3      |
| TBC           | TBC    | None              | None                 | 4      |

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

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

This form is used to add a new operator. It contains the following fields: User Name, Password, Name, Email, and Phone. At the bottom, there are 'Save' and 'Cancel' buttons.

This form is used to edit an existing operator's information. It contains the following fields: User Name, Name, Email, and Phone. Below these fields is a table of permissions with checkboxes for each: View users (1), View payments (2), Add payments (4), Add currencies rates (8), View operators (16), and Administrator (all rights are included) (32). At the bottom, there are 'Save' and 'Cancel' buttons.

| View users (1)                      | View payments (2)                   | Add payments (4)                    | Add currencies rates (8)            | View operators (16)                 | Administrator (all rights are included) (32) |
|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|----------------------------------------------|
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/>          |



**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.

| Date                | Name of currency | Rate to domestic currency |
|---------------------|------------------|---------------------------|
| 2024-06-15 15:44:16 | GEL              | 1                         |
| 2024-08-29 16:14:36 | USD              | 2.85                      |

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**

```

1
2 http_listen = :8802
3
4 db_host = 127.0.0.1
5 db_name = accn
6 db_user = accn
7 db_password = masterkey
8 db_port = 5432
9 db_max_conn = 10
10
11 currencies = USD, GEL
12
13

```

## 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:

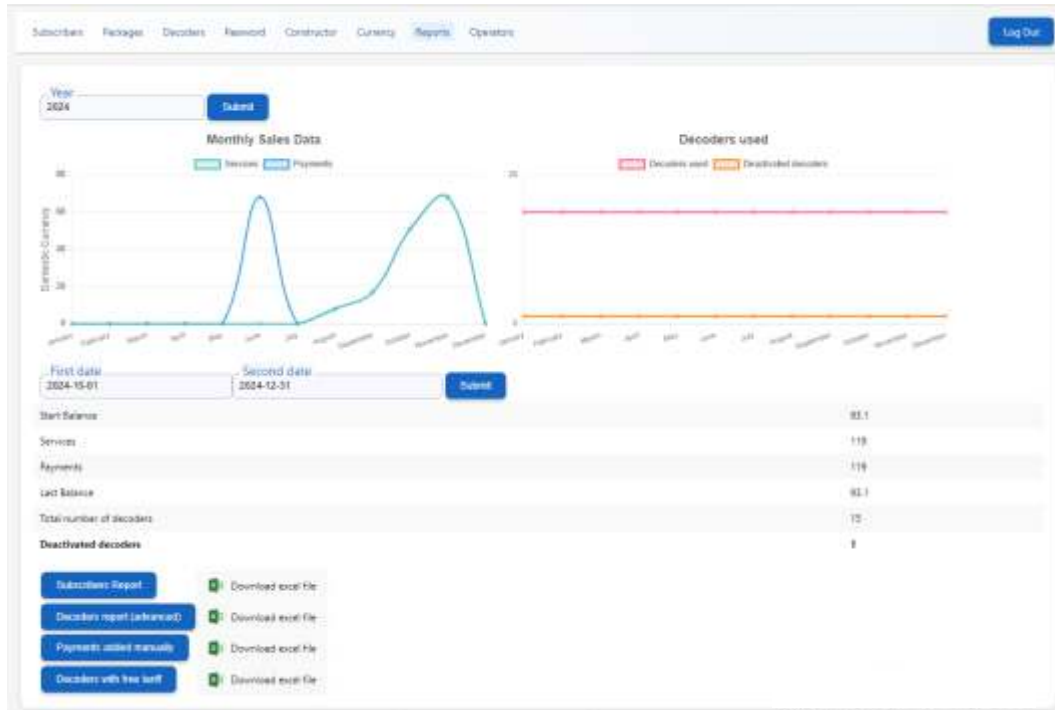
- add a new multiplexer (MUX) by pressing the + button (the next Transport Stream ID value is automatically generated);
- remove multiplexer;
- indicate the group number for the new TS ID in the **Choose group** column:

DVB\_BILLING SOFTWARE

Choose group:

## REPORTS menu

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



You can see the **Monthly Sales Data** and **Decoders Used** diagrams.

Select **Year** and press **Submit** button.

To generate a report, you need to select the start date and end date of the reporting period.

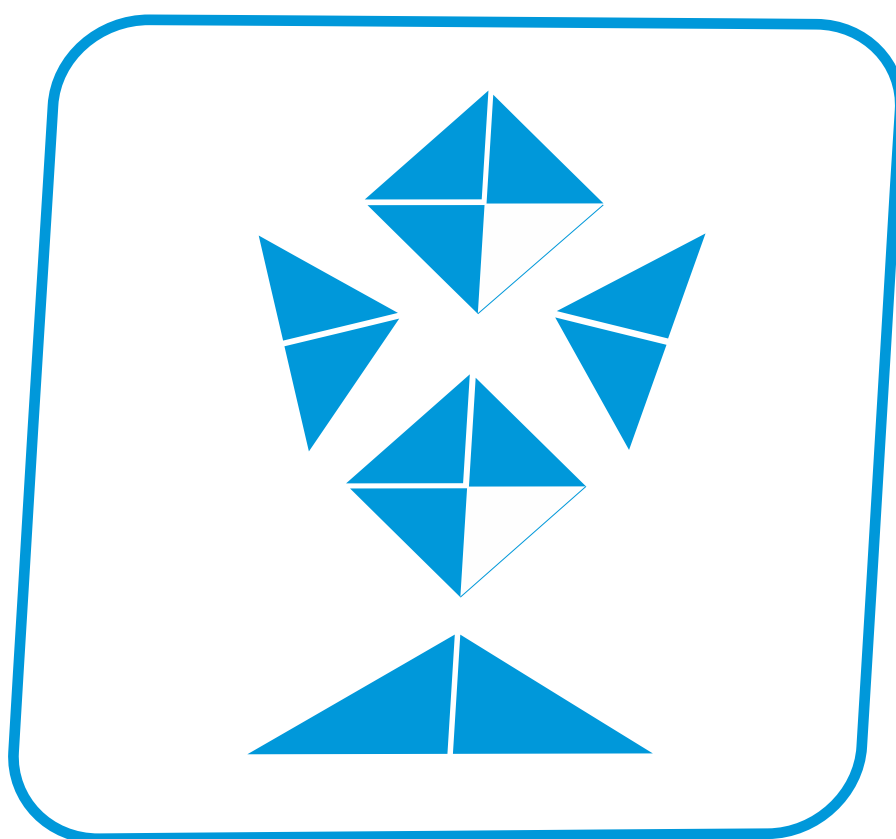
Click the **Submit** button. The results are displayed in the corresponding menu fields:

- **Start Balance**,
- **Services** (funds withdrawn from subscriber accounts for the period),
- **Payments** (payments for the period),
- **Last Balance**,
- **Total numbers of decoders**,
- **Deactivated decoders**.

To generate reports, click one of the buttons:

- **Subscribers report**;
- **Decoders report** (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>

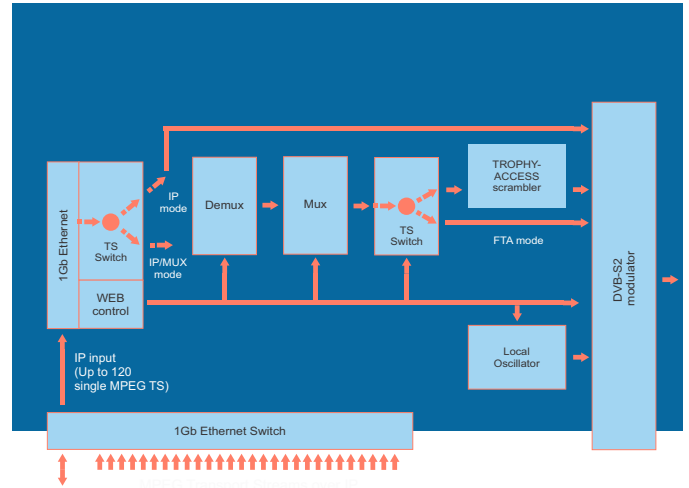
After confirmation of payment, the client is received an unique key, which is generated based on the serial number of your modulator/multiplexer. The **serial number** is indicated in the first line of the System menu of the modulator WEB interface.

The screenshot displays the 'System' menu of the modulator/web interface. The 'Serial No' field contains the value '0x1C0000B0', which is circled in orange. Below it, the 'Hardware ID' is '0x0401'. The 'FW / SW version' is '2.03 / 3.02 build 1134', with an 'Update' button to its right. The 'Input mode' is set to 'IP-MUX'. The 'Scrambler TA-3/9' is set to 'Enabled'. The 'Billing server' is '10.10.20.250'. The 'PCR Restamping' is set to 'Enabled'. At the bottom, the 'System configuration' section includes buttons for 'Backup', 'Restore', 'Add key' (circled in orange), and 'Change password'. An 'Accept' button is located below these options. A temperature indicator 'T=30°C' is visible in the top right corner.

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

### Multiplexers (Transport 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 group number have the same subscription information. The system can have up to 10 groups with numbers 0...9. You assign the group number to which the modulator/multiplexer belongs, based on the tariff plan scheme and channel viewing rights. When installing a Head-end with multiple modulators/multiplexers, you will need to plan what programs will be included in the packages, then distribute them across streams (modulators), subscription groups, etc. As a first step, simply assign port "0" to all multiplexers.



Example:

- TSID 1: 0 # multiplexer TSID 1 belongs to the group 0
- TSID 2: 0 # multiplexer TSID 2 belongs to the group 0
- TSID 3: 1 # multiplexer TSID 3 belongs to the group 1
- TSID 4: 2 # multiplexer TSID 4 belongs to the group 2

MUX → Group

|       |   |
|-------|---|
| 1 → 0 | X |
| 2 → 0 | X |
| 3 → 1 | X |
| 4 → 2 | X |

### 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 Properties** 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.

| SID | Program name        | Type   | In Address:Port: SID |  |  |
|-----|---------------------|--------|----------------------|--|--|
| 10  | GEOSAT radio        | 1 (TV) | 0.0.0.0:1234:8509    |  |  |
| 20  | ITV                 | 1 (TV) | 0.0.0.0:1234:8507    |  |  |
| 30  | BBC One             | 1 (TV) | 0.0.0.0:1234:8508    |  |  |
| 40  | DW                  | 1 (TV) | 0.0.0.0:1234:8505    |  |  |
| 50  | KAVKASIA            | 1 (TV) | 0.0.0.0:1234:8504    |  |  |
| 60  | RUSTAVI2            | 1 (TV) | 0.0.0.0:1234:8501    |  |  |
| 70  | COMEDY              | 1 (TV) | 0.0.0.0:1234:8502    |  |  |
| 80  | MARAO               | 1 (TV) | 0.0.0.0:1234:8503    |  |  |
| 90  | Nat Geo Wild Europe | 1 (TV) | 0.0.0.0:12345:101    |  |  |
| 100 | BNT World           | 1 (TV) | 0.0.0.0:12345:102    |  |  |
| 110 | Lucky Balls         | 1 (TV) | 0.0.0.0:12345:201    |  |  |
| 120 | Dog Racing          | 1 (TV) | 0.0.0.0:12345:202    |  |  |
| 130 | Virtual Football    | 1 (TV) | 0.0.0.0:12345:203    |  |  |

**Program properties**

SID:

Name:

Type:  (TV)

Conditional Access:

| Type              | PID | Enabled                  |
|-------------------|-----|--------------------------|
| MP4 (video) (PCR) | 121 | <input type="checkbox"/> |
| MP1 Audio (geo)   | 122 | <input type="checkbox"/> |

FTA  
Type 1  
Type 2  
Type 3



Email: cab1@localian

User name:

Last name:

Country:

Phone number:

Password change:

Decoders:

|                          |        |                                       |
|--------------------------|--------|---------------------------------------|
| <input type="checkbox"/> | 214000 | <input type="button" value="Delete"/> |
| <input type="checkbox"/> | 214000 | <input type="button" value="Delete"/> |
| <input type="checkbox"/> | 214000 | <input type="button" value="Delete"/> |
| <input type="checkbox"/> | 214000 | <input type="button" value="Delete"/> |
| <input type="checkbox"/> | 214000 | <input type="button" value="Delete"/> |
| <input type="checkbox"/> | 214000 | <input type="button" value="Delete"/> |
| <input type="checkbox"/> | 214000 | <input type="button" value="Delete"/> |
| <input type="checkbox"/> | 214000 | <input type="button" value="Delete"/> |

# 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.



 A screenshot of the PROFILE page interface. On the left, there are input fields for:
 

- Email: cab1@local.lan
- User name: Darth
- Last name: Vader
- Country: Georgia
- Phone number: +906 55555555

 On the right, under the heading "Password change", there is a "Decoders:" section. It shows a list of decoders with the first one having ID "95" and serial number "2560446", and a "Delete" button next to it. Below the list is a red "+" button to add a new decoder. At the bottom right of the form is a "Save changings" button.

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 screenshot displays the 'BALANCE' management interface. At the top, it shows the 'Current balance: 0.0' and 'Amount refill' options with buttons for '0.0000', '0.0000', '0.0000', and '0.0000'. Below this, there is a 'Virtual recommended amount' field with a value of '0.0000'. The main section lists four decoders, each with a 'Decoder id' and a 'Packages' table. Each decoder's packages table includes columns for package name, price, and activation date. A 'Deactivate all packages' button is located below each decoder's package list.

| Decoder id | Package | Price               | Activation Date  |
|------------|---------|---------------------|------------------|
| 95-27637   | Sport4+ | USD 3 per 30 days   | January 09, 2024 |
|            | Sport3+ | USD 1.2 per 30 days | January 17, 2024 |
|            | Sport1+ | USD 2.8 per 30 days | Inactive         |
|            | Sport2+ | USD 3.3 per 30 days | Inactive         |
| 95-27661   | Sport4+ | USD 3 per 30 days   | January 14, 2024 |
|            | Sport1+ | USD 3.8 per 30 days | Inactive         |
|            | Sport2+ | USD 1.3 per 30 days | Inactive         |
|            | Sport3+ | USD 1.2 per 30 days | Inactive         |
| 95-27219   | Sport3+ | USD 1.2 per 30 days | January 19, 2024 |
|            | Sport4+ | USD 3 per 30 days   | January 26, 2024 |
|            | Sport1+ | USD 2.8 per 30 days | Inactive         |
|            | Sport2+ | USD 3.3 per 30 days | Inactive         |
| 95-27933   | Sport1+ | USD 3 per 30 days   | January 17, 2024 |
|            | Sport1+ | USD 2.8 per 30 days | Inactive         |
|            | Sport2+ | USD 3.3 per 30 days | Inactive         |
|            | Sport3+ | USD 1.2 per 30 days | Inactive         |
|            | Sport4+ | USD 3 per 30 days   | Inactive         |

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.



Current balance: 20 \$

Amount refill:

30 days 60 days 90 days 360 days

Minimal recommended amount

\$ 0

In the top window you can see your current balance.

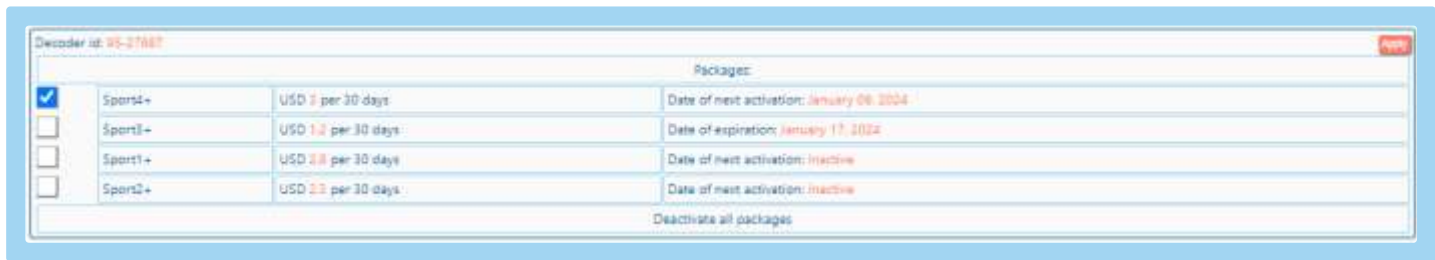
Here you can top up your balance for 30, 60, 90 or 360 days.

In addition, you can deposit any amount. Please note that the payment period is a multiple of 30 days. If the remaining amount is not enough to activate the next 30 days of the service, the service will be deactivated and the remaining amount will remain on the client's balance until the appropriate replenishment of the amount.

The front-end calculates the minimum replenishment amount for the next 30 days and this amount is displayed in the payment entry window. The recommended minimum payment amount is calculated using the formula:

- The current tariff is multiplied by the number of 30-day payment periods (1, 2, 3 or 12, depending on the choice of payment period) and the current balance is subtracted from this amount. The default period is 30 days.

You can pay for the service using a **Visa/Master card** by selecting the appropriate icon. When you click the **Bank Transfer** button, an Invoice is generated and will be sent to your email address.



In the following windows you can see information about the Decoders that you have registered in the **Profile** menu:

- Decoder serial number;
- Date of next activation or deactivation of packages;
- Current packages for this Decoder;
- List of available packets.
- Button for deactivating all packets (disabling the Decoder).
- 

Note. The package is activated immediately if there is a sufficient balance. Deactivation of the package will take effect the next time the tariff is activated, which occurs every 30 days at 00:00 UTC. You can see the next activation date in the same window. Also, you have the opportunity to add packages. These changes take effect immediately and the cost of the new package will be debited from your balance. The programs in each package will be available for viewing until the next package activation date, which occurs every 30 days.

If, when adding a package, there are not enough funds on the balance, the front-end displays a message:

**Attention. Please, fill your balance before next payment cycle**

If the subscriber has turned-off one of the packages for the Decoder or pressed the **DELETE ALL PACKAGES** button, the text of the “**Date of next activation:**” line will change to “**Date of expiration:**”.





# 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.

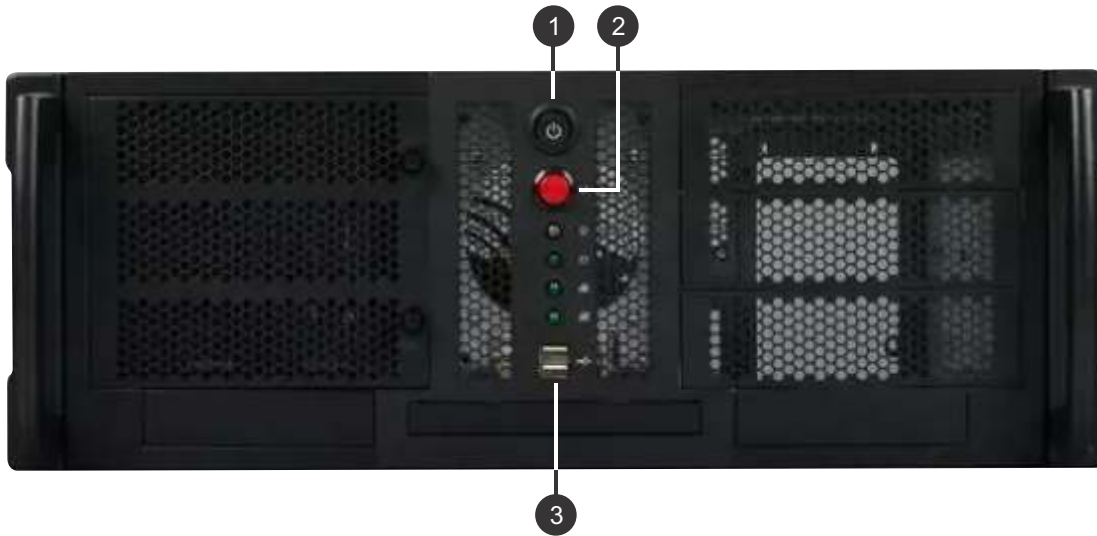
Module are intended for indoor use only.

### 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.

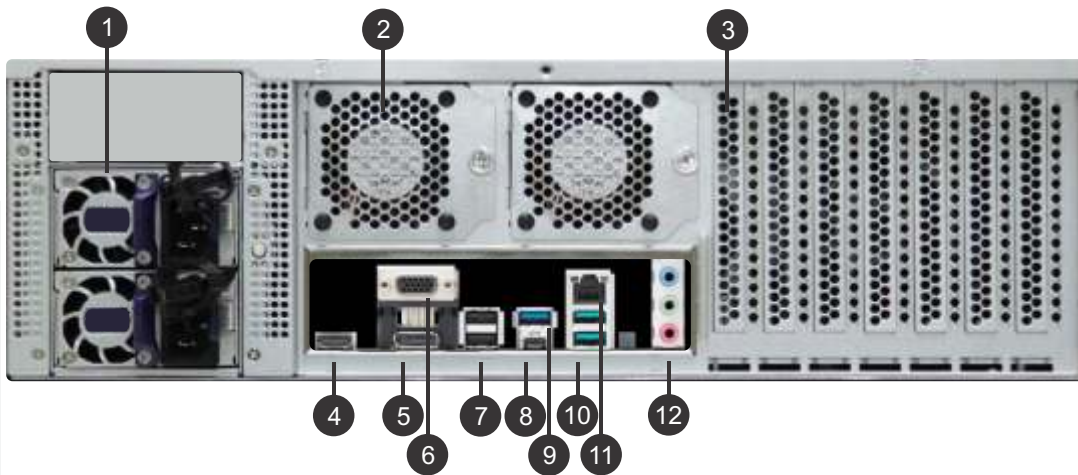
| HardWare               |                                |
|------------------------|--------------------------------|
| Processor              | Intel i9-14900K                |
| RAM                    | 16G DDR5                       |
| SSD                    | 256G                           |
| 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            |

FFMPEG TRANSCODER

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 || buttons.

You can delete the service using ✖ button.

Stream #1 ▶ Start/stop ✖ Delete service

Hardware acceleration

Timeout, ms

Auto restart

Input URL

Read input at native frame rate

Pixel format  Same as source  Other

Keyframe interval, frames  Same as source  Other

Video scaling, px  Same as source  Other  Width  Height

Optional parameters

Video encoder  H.264  H.265  Other

Bitrate, Mb

Optional parameters

Audio encoder  AAC  MPEG1  Other

Bitrate, kb

Optional parameters

Output stream format  MPEGTS  Other

Output destination

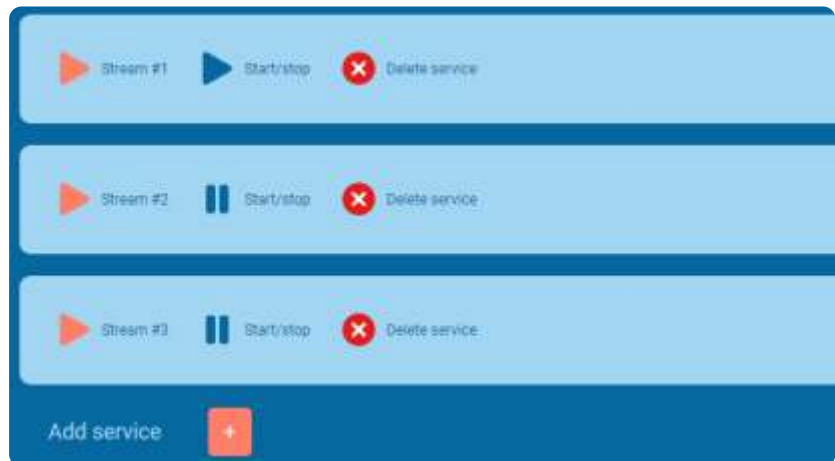
Log level  Quiet  Error  Warning  Info  Verbose  Debug

Logs

Add service

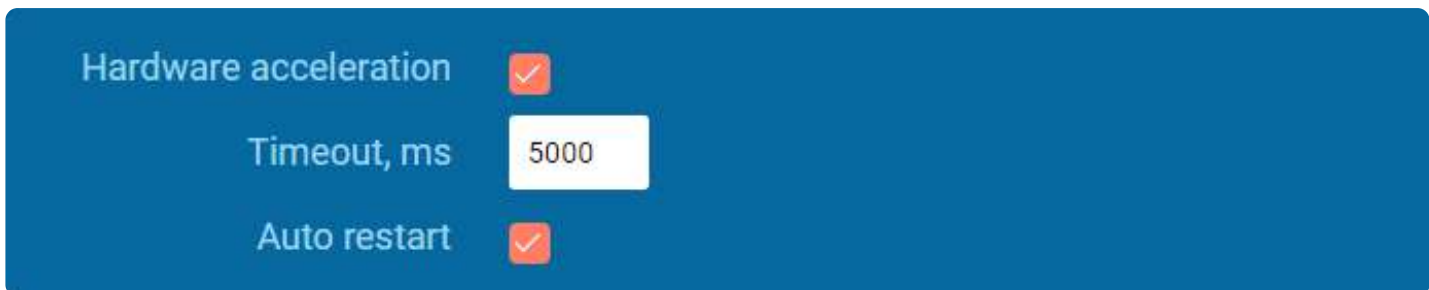
## Parameters menu

Select the Service and press ► button to expand the list of the service parameters.



## Hardware acceleration

You can use the Graphics Processing 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.



## Timeout and Auto restart

For some reason the service may be missing data. You can set the time to stopping the service by **Timeout**. In this case, the corresponding information will sent to the log.

If the **Auto restart** mode is enabled then in this case the service starts again automatically.



# 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;

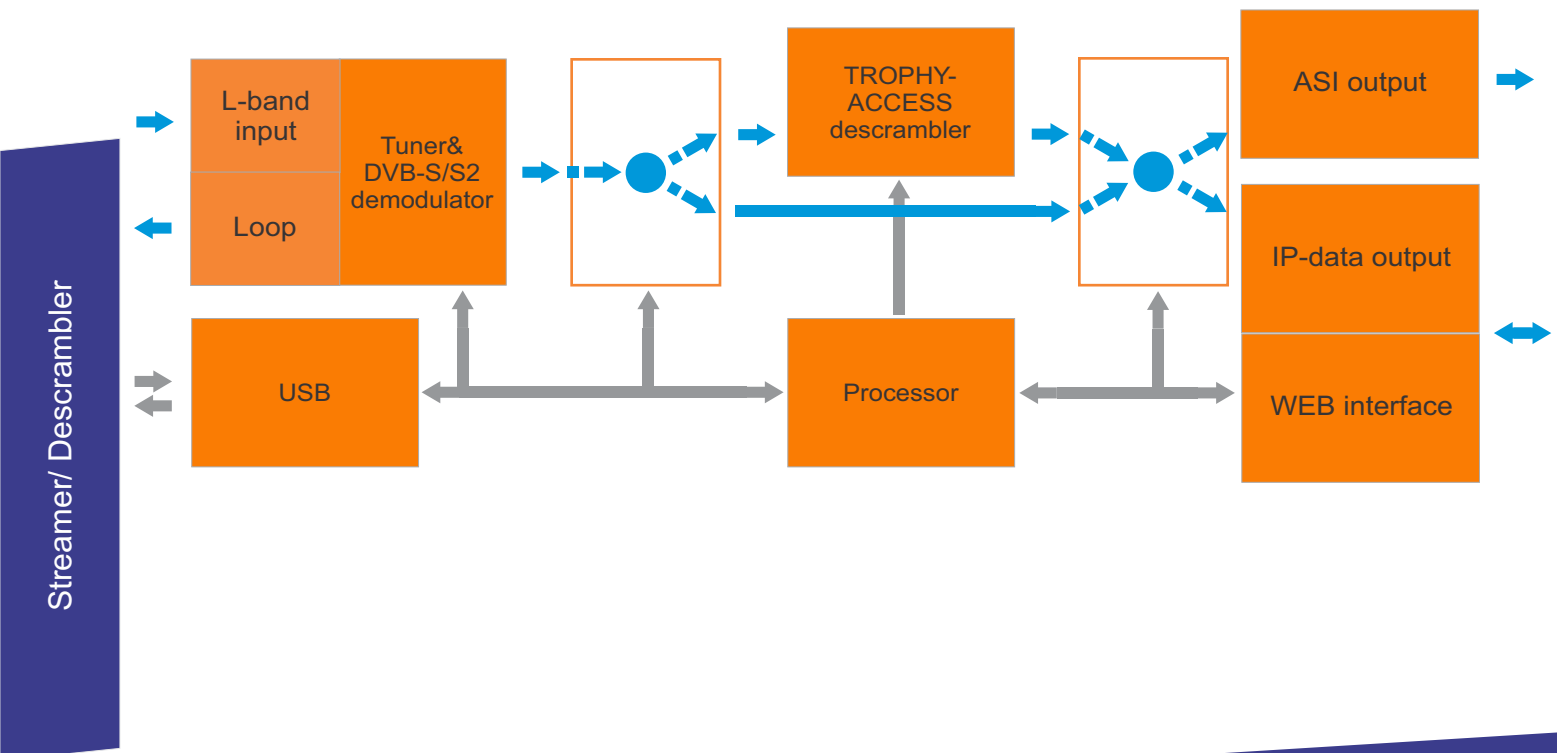
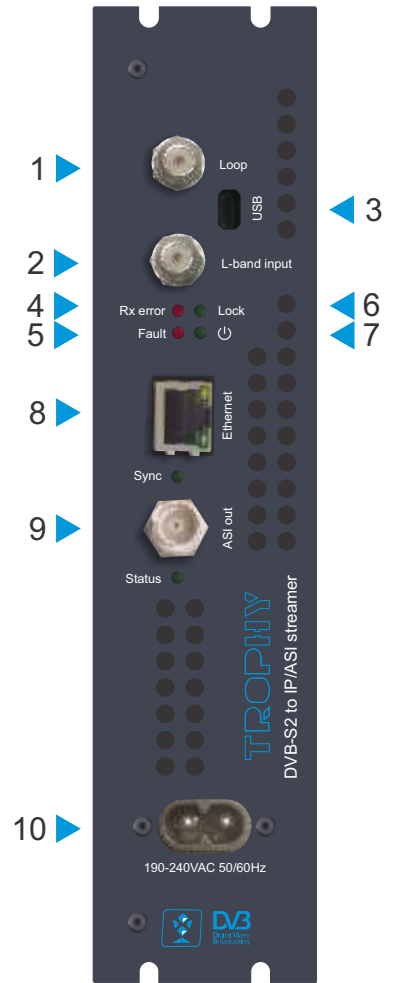
encapsulate Transport Stream to unicast/multicast UDP/RTP-packets;

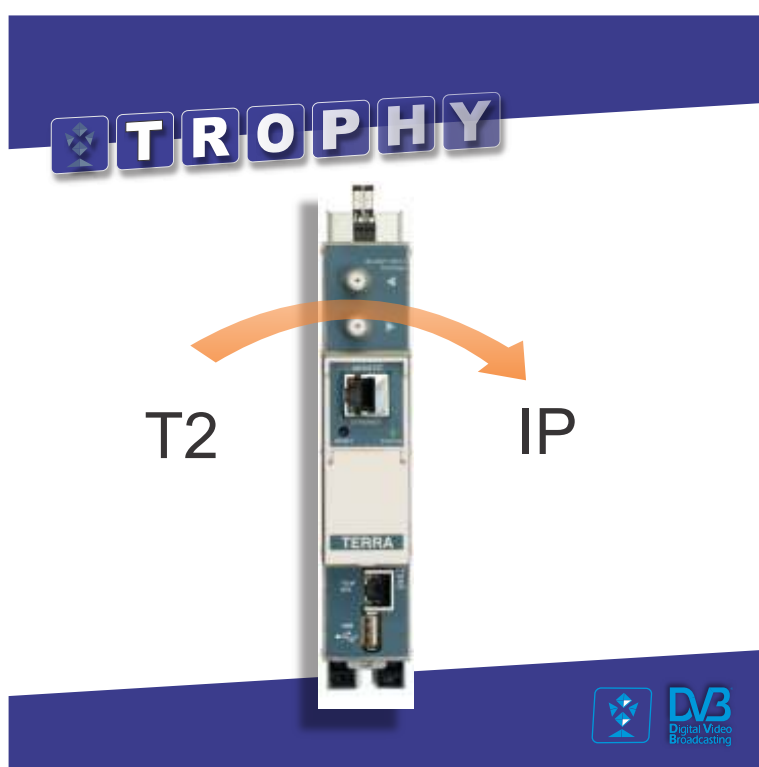
transmit Transport Stream to ASI-output;

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





**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

#### Input services

Input source  
Demod. 1 ✕
Demod. 2 ✕
Demod. 3 ✕
+  
Demod. 4 ✕
USB 1 ✕

| Demod. 1          | Bitrate |   |
|-------------------|---------|---|
| All TS Demod. 1   | 19.13   | + |
| LRT TELEVIZIJA HD | 4.94    | + |
| LRT TELEVIZIJA    | 1.75    | + |
| LRT PLIUS         | 3.39    | + |
| LRT PLIUS HD      | 8.44    | + |

| Demod. 2        | Bitrate |   |
|-----------------|---------|---|
| All TS Demod. 2 | 18.76   | + |
| Lietuvos Rytas  | 1.13    | + |
| CurrentTime     | 2.39    | + |
| LNK             | 1.16    | + |
| Info TV         | 1.58    | + |
| 2TV             | 1.48    | + |
| TV8             | 2.25    | + |
| TV1             | 1.59    | + |
| TV3             | 2.37    | + |
| TV6             | 1.03    | + |
| BTV             | 0.70    | + |
| Delfi TV        | 2.47    | + |

| Demod. 3        | Bitrate |   |
|-----------------|---------|---|
| All TS Demod. 3 | 0.10    | + |
| SLO-TV1         | 0.00    | + |
| SLO-TV2         | 0.00    | + |
| TV K-C          | 0.00    | + |
| SLO-TV3         | 0.00    | + |
| HRT-TV1         | 0.00    | + |
| HRT-HR1         | 0.00    | + |
| RBC-TV          | 0.00    | + |

| Demod. 4        | Bitrate |   |
|-----------------|---------|---|
| All TS Demod. 4 | 0.00    | + |
| SLO-TV1         | 0.00    | + |
| SLO-TV2         | 0.00    | + |
| TV K-C          | 0.00    | + |
| SLO-TV3         | 0.00    | + |
| HRT-TV1         | 0.00    | + |
| HRT-HR1         | 0.00    | + |
| RBC-TV          | 0.00    | + |

| USB 1     | Bitrate |   |
|-----------|---------|---|
| LTV World | 3.60    | + |

#### Output streams

| Services          | IP address   | IP port | Bitrate | Enable |
|-------------------|--------------|---------|---------|--------|
| LRT TELEVIZIJA HD | 239.192.11.0 | 1234    | 4.94    | ✓      |
| LRT PLIUS HD      | 239.192.11.4 | 1234    | 8.44    | ✓      |
| LNK               | 239.192.11.2 | 1234    | 1.16    | ✓      |
| Info TV           | 239.192.11.3 | 1234    | 1.58    | ✓      |
| 2TV               | 239.192.11.5 | 1234    | 1.48    | ✓      |
| SLO-TV1           | 239.192.11.6 | 1234    | 0.00    | ✓      |
| SLO-TV2           | 239.192.11.7 | 1234    | 0.00    | ✓      |
| LTV World         | 239.192.11.8 | 1234    | 3.60    | ✓      |
| LTV World         | 239.192.11.9 | 1234    |         | Append |

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<br>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

|                             |                                                                                               |
|-----------------------------|-----------------------------------------------------------------------------------------------|
| <b>RF input</b>             |                                                                                               |
| 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)<br>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                                                                                         |
| <b>IP output</b>            |                                                                                               |
| 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<br>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 |   | <input type="checkbox"/> |           |           |                |                   |             |                |       |

**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.

| Input services |            |
|----------------|------------|
| Input source   |            |
| Demod. 1 x     | Demod. 2 x |
| Demod. 3 x     | Demod. 4 x |
| Demod. 5 x     | Demod. 6 x |
| Demod. 7 x     | Demod. 8 x |

| Output streams                |               |         |         |        |        |
|-------------------------------|---------------|---------|---------|--------|--------|
| Services                      | IP address    | IP port | Bitrate | Enable |        |
| ▶ HD Rai 1 HD                 | 239.192.11.2  | 1234    | 7.85    | ✓      |        |
| ▶ HD Rai 2 HD                 | 239.192.11.3  | 1234    | 7.86    | ✓      |        |
| ▶ HD Rai 3 HD                 | 239.192.11.4  | 1234    | 6.48    | ✓      |        |
| ▶ HD Rai Sport + HD           | 239.192.11.5  | 1234    | 6.15    | ✓      |        |
| ▶ HD Rai 4 HD                 | 239.192.11.6  | 1234    | 5.64    | ✓      |        |
| ▶ HD Rai Movie HD             | 239.192.11.7  | 1234    | 4.21    | ✓      |        |
| ▶ SD Rai Movie                | 239.192.11.8  | 1234    | 1.50    | ✓      |        |
| ▶ SD Rai 4                    | 239.192.11.9  | 1234    | 1.54    | ✓      |        |
| ▶ HD MDR Sachsen HD           | 239.192.11.11 | 1234    | 12.30   | ✓      |        |
| ▶ HD hr-fernsehen HD          | 239.192.11.12 | 1234    | 9.36    | ✓      |        |
| ▶ HD tagesschau24 HD          | 239.192.11.13 | 1234    | 5.69    | ✓      |        |
| ▶ HD ONE HD                   | 239.192.11.14 | 1234    | 5.93    | ✓      |        |
| ▶ HD ARD alpha HD             | 239.192.11.15 | 1234    | 6.10    | ✓      |        |
| ▶ HD SR Fernsehen HD          | 239.192.11.16 | 1234    | 9.34    | ✓      |        |
| ▶ HD Radio Bremen HD          | 239.192.11.17 | 1234    | 3.44    | ✓      |        |
| ▶ SD BBC World News Europe HD | 239.192.11.18 | 1234    | 8.90    | ✓      |        |
| ▶ SD NHK WORLD-JPN            | 239.192.11.19 | 1234    | 9.05    | ✓      |        |
| ▶ HD Al Jazeera English HD    | 239.192.11.20 | 1234    | 7.89    | ✓      |        |
| ▶ HD 3sat HD                  | 239.192.11.21 | 1234    | 15.42   | ✓      |        |
| TVRUS                         | 239.192.11.55 | 1234    |         |        | Append |

| Demod. 1              | Bitrate |     |
|-----------------------|---------|-----|
| All TS Demod. 1       | 63.99   | +   |
| ▶ HD Rai 1 HD         | 8.35    | + 📺 |
| ▶ HD Rai 2 HD         | 7.60    | + 📺 |
| ▶ HD Rai 3 HD         | 6.25    | + 📺 |
| ▶ HD Rai Sport + HD   | 6.16    | + 📺 |
| ▶ HD Rai 4 HD         | 5.65    | + 📺 |
| ▶ HD Rai Movie HD     | 4.19    | + 📺 |
| ▶ 4K Rai 4K           | 22.80   | + 📺 |
| ▶ Rai Radio 1         | 0.36    | + 📻 |
| ▶ Rai Radio 2         | 0.36    | + 📻 |
| ▶ Rai Radio 3         | 0.36    | + 📻 |
| ▶ Rai Radio3 Classica | 0.36    | + 📻 |
| ▶ Rai GR Parlamento   | 0.30    | + 📻 |
| ▶ Rai Isoradio        | 0.30    | + 📻 |
| ▶ Rai Radio           | 0.36    | + 📻 |

DVB-S2 to IP STREAMER

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 .

**TDX-480**  
**TDQ-480**  
**8 DVB-S/S2 to**  
**8 DVB-T/C**  
**transmodulators**



8-ch S2 to T/C TRANSMODULATOR

## Product description

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.

The devices are transmodulators:

- with 2 DVB-S/S2 input channels and 2 DVB-C output channels (tdq420, tdq420C-two CAMs);
- with 2 DVB-T/T2/C input channels and 2 DVB-C output channels (ttq420, ttq420C-two CAMs);
- with 4 DVB-T/T2 input channels and 4 DVB-C output channels (ttq440);
- with 8 DVB-S/S2 input channels (Integrated 2×8 multiswitch) and 4 DVB-C output channels (tdq440);
- with 8 DVB-S/S2 input channels (Integrated 2×8 multiswitch) and 8 DVB-C output channels (tdq480).

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

| VHF band I                     |          |     |
|--------------------------------|----------|-----|
| 1                              | -        | -   |
| 2                              | 58..66   | 62  |
| VHF band II                    |          |     |
| 3                              | 76..84   | 80  |
| 4                              | 84..92   | 88  |
| 5                              | 92..100  | 96  |
| Cable special band I           |          |     |
| S1                             | 110..118 | 114 |
| S2                             | 118..126 | 122 |
| S3                             | 126..134 | 130 |
| S4                             | 134..142 | 138 |
| S5                             | 142..150 | 146 |
| S6                             | 150..158 | 154 |
| S7                             | 158..166 | 162 |
| VHF band III                   |          |     |
| 6                              | 174..182 | 178 |
| 7                              | 182..190 | 186 |
| 8                              | 190..198 | 194 |
| 9                              | 198..206 | 202 |
| 10                             | 206..214 | 210 |
| 11                             | 214..222 | 218 |
| 12                             | 222..230 | 226 |
| Cable special band II          |          |     |
| S11                            | 230..238 | 234 |
| S12                            | 238..246 | 242 |
| S13                            | 246..254 | 250 |
| S14                            | 254..262 | 258 |
| S15                            | 262..270 | 266 |
| S16                            | 270..278 | 274 |
| S17                            | 278..286 | 282 |
| S18                            | 286..294 | 290 |
| S19                            | 294..302 | 298 |
| UHF Hyperband special band III |          |     |
| S20                            | 302..310 | 306 |
| S21                            | 310..318 | 314 |
| S22                            | 318..326 | 322 |
| S23                            | 326..334 | 330 |
| S24                            | 334..342 | 338 |
| S25                            | 342..350 | 346 |
| S26                            | 350..358 | 354 |
| S27                            | 358..366 | 362 |
| S28                            | 366..374 | 370 |
| S29                            | 374..382 | 378 |
| S30                            | 382..390 | 386 |
| S31                            | 390..398 | 394 |
| S32                            | 398..406 | 402 |
| S33                            | 406..414 | 410 |
| S34                            | 414..422 | 418 |
| S35                            | 422..430 | 426 |
| S36                            | 430..438 | 434 |
| S37                            | 438..446 | 442 |
| S38                            | 446..454 | 450 |
| S39                            | 454..462 | 458 |
| S40                            | 462..470 | 466 |

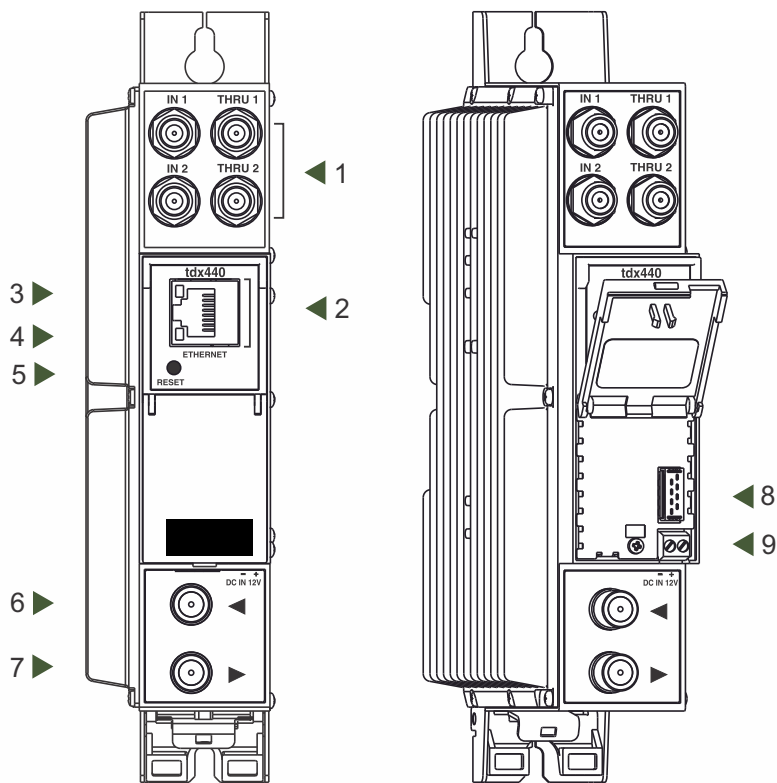
| IV UHF band         |          |     |
|---------------------|----------|-----|
| 21                  | 470..478 | 474 |
| 22                  | 478..486 | 482 |
| 23                  | 486..494 | 490 |
| 24                  | 494..502 | 498 |
| 25                  | 502..510 | 506 |
| 26                  | 510..518 | 514 |
| 27                  | 518..526 | 522 |
| 28                  | 526..534 | 530 |
| 29                  | 534..542 | 538 |
| 30                  | 542..550 | 546 |
| 31                  | 550..558 | 554 |
| 32                  | 558..566 | 562 |
| 33                  | 566..574 | 570 |
| 34                  | 574..582 | 578 |
| V UHF band          |          |     |
| 35                  | 582..590 | 586 |
| 36                  | 590..598 | 594 |
| 37                  | 598..606 | 602 |
| 38                  | 606..614 | 610 |
| 39                  | 614..622 | 618 |
| 40                  | 622..630 | 626 |
| 41                  | 630..638 | 634 |
| 42                  | 638..646 | 642 |
| 43                  | 646..654 | 650 |
| 44                  | 654..662 | 658 |
| 45                  | 662..670 | 666 |
| 46                  | 670..678 | 674 |
| 47                  | 678..686 | 682 |
| 48                  | 686..694 | 690 |
| 49                  | 694..702 | 698 |
| 50                  | 702..710 | 706 |
| 51                  | 710..718 | 714 |
| 52                  | 718..726 | 722 |
| 53                  | 726..734 | 730 |
| 54                  | 734..742 | 738 |
| 55                  | 742..750 | 746 |
| 56                  | 750..758 | 754 |
| 57                  | 758..766 | 762 |
| 58                  | 766..774 | 770 |
| 59                  | 774..782 | 778 |
| 60                  | 782..790 | 786 |
| Additional UHF band |          |     |
| 61                  | 790..798 | 794 |
| 62                  | 798..806 | 802 |
| 63                  | 806..814 | 810 |
| 64                  | 814..822 | 818 |
| 65                  | 822..830 | 826 |
| 66                  | 830..838 | 834 |
| 67                  | 838..846 | 842 |
| 68                  | 846..854 | 850 |
| 69                  | 854..862 | 858 |

## Specifications

| RF input              |                                                                           |                         |
|-----------------------|---------------------------------------------------------------------------|-------------------------|
| Demodulation          | QPSK, 8PSK                                                                |                         |
| Input level           | 55...95 dBuV                                                              |                         |
| Input resistance      | 75 Ohm                                                                    |                         |
| Symbol rate           | 2...45 Msymb/s (QPSK)<br>2... 37 Msymb/s (8PSK)                           |                         |
| FEC                   | 1/2_2/3_3/4_5/6_6/7_7/8 (QPSK)<br>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                                                    |                         |

| MODULATION | Supported bandwidth of DVB-C channel |            |
|------------|--------------------------------------|------------|
|            | Frequency bandwidth (MHz)            |            |
|            | 6 MHz                                | 8MHz       |
| 16QAM      | 19,23 Mbit                           | 25,64 Mbit |
| 32QAM      | 24,04 Mbit                           | 32,05 Mbit |
| 64QAM      | 28,85 Mbit                           | 38,47 Mbit |
| 128QAM     | 33,66 Mbit                           | 44,88 Mbit |
| 256QAM     | 38,47 Mbit                           | 51,29 Mbit |

## Front Panel



- 1 - IN 1, IN 2 - RF input of SAT IF signal, DC output for LNB. F sockets.  
THRU 1, THRU 2 - RF output (input signal loop-through). F sockets.
- 2 - ETHERNET - control Ethernet interface. RJ45 socket.
- 3 - ACTIVITY (yellow) indicator of the control Ethernet interface.
- 4 - LINK (green) indicator of the control Ethernet interface
- 5 - RESET button. Press this button shortly to restart the module.  
Press this button for more than three seconds to set default IP address of the control Ethernet interface.
- 6 - RF input (output signal loop-through). F socket.
- 7 - RF output. F socket.
- 8 - Power distribution bus connector.
- 9 - +12 V DC powering input. Screw terminal.

### Installation instructions:

Read the safety instruction first.

All settings can be changed using the web browser via control Ethernet interface. Disconnect power supply unit from the mains before making any changes in the connections of the module. Fasten the module on DIN RAIL or individual holder. The module or mounting bracket must be fixed with steel screws Ø 3.5-4 mm. The screws are not included in a package.

Connect all necessary RF, powering and control cables. Shielded Ethernet cable is recommended.

Connect the 75 W load to the unused RF output F sockets.

Connect power supply in to the mains.

Within 30-40 seconds of powering the module will run in normal operation mode.

Comments of the front panel indicators:

the LINK [4] green indicator is on when the link with the control Ethernet interface is established. Indicator is off when there is no link.

the ACTIVITY [3] indicator blinks, if communication via the control Ethernet interface is active.

8-ch S2 to T/C TRANSMODULATOR



## OPERATING

**Initial configuration**

All modules leave the factory with this control Ethernet interface IP address: 192.168.1.10. In order to avoid conflicts with other IP addresses, it is necessary to perform an initial configuration in local mode. Subsequently, it will be possible to access the modules via the local area network (LAN), either to re-programme it or to check its operating status.

The modules leave the factory with the following Control Ethernet

IP address of the control interface: **192.168.1.10**  
 Subnet mask: **255.255.255.0**  
 Default Gateway: **192.168.1.1**  
 Username: **admin**  
 Password: **admin**

To access each module, use a PC or MAC personal computer equipped with an Ethernet card and RJ-45 cable (CAT-5E or CAT-6). The IP address of the PC/MAC must be configured within the following range: 192.168.1.2 - 192.168.1.254 (do not use 192.168.1.10, since this is the IP address of the module to be configured). To start the configuration of the module, open your web browser and type in the following direction: <http://192.168.1.10>. The login prompt will appear on the screen.

Access to the site is protected by user name and password. The default user name and password is admin. Enter the user name and password and click on "Login" button.

Note: the default password - admin - can (and must) be changed as explained on section 12.

During initial configuration you need to change the default control and streaming Ethernet interfaces TCP/IP configuration as explained on section 6.12.

NOTE: If you are using Internet Explorer Web browser, supported versions are version 10 or higher. Control interface IP address reset to default procedure: press the "RESET" [5] button for more than 3 seconds. When the LINK [4] indicator will start blinking, release it. After this operation the control interface IP address will be set to 192.168.1.10, user name and password set to admin.

## General configuration

### Initial Web interface screen

The first screen that appears when the module accessed is the "Main" window, which gives general information on the device.

The screenshot displays the initial web interface with the following elements:

- Navigation Tabs [1]:** Main (highlighted in yellow), RF inputs, Transport Streams, NIT, RF outputs, IP parameters, and System menu.
- Device information:**

|                   |                      |        |
|-------------------|----------------------|--------|
| Device model:     | tdq440               |        |
| Serial number:    | tdq4400170605025     |        |
| Title:            | DVB-S to DVB-T       | Change |
| Region:           | LT                   | Change |
| Software version: | 1.09                 |        |
| FPGA version:     | 1.01                 |        |
| IP:               | 192.168.1.20         |        |
| System time:      | 2017-03-16, 14:21:30 |        |
| Up time:          | 0:02:27              |        |
- Output bitrates:**

|    |    |              |
|----|----|--------------|
| #1 | 0% | 0.0/31.0Mbps |
| #2 |    | 0.0/0.0Mbps  |
- Diagnostic information:** Demodulator 1 unlocked
- System status:**
  - Internal temperature: 46 C
  - Processor load: 1%
  - Main supply voltage: 12.1 V
- Other devices in the network:**
  - 52C16P: Demodulator 1 unlocked, Demodulator 2 unlocked
  - tdq440 (T1T2, C -> C): No errors

In the top of each configuration screen you will see a main menu tabs [1]. Using it, you can switch between the different configuration menu. The tab highlighted in yellow shows which menu is active at a given moment. The "System menu" tab contains several submenu items. Common elements for all screens are module title [2] and login information strings [3]. Pressing on the "Logout" string you can logout from module control.

### Device information table

This shows the following data of module:

"Device model": model of the module.

"Serial number": serial number of the module.

"Software version": module software version number.

"Title": user may assign a title to the device for easier management. Press the button "Change" to modify it. This title will be written at [2] place. Also it will be visible in other devices, and by computers in network devices (if PC supports SSDP).

"Regions": Device supports several preinstalled regions. The RF channel list depends on which region is selected. Region can be changed without restarting the device. Just select needed region by pressing "Change" button in "Device information" table. Additional regions can be installed under request. Contact our distributors for such possibility.

"Software version": module software version number.

"System time": current time, synchronized from the TDT table of the input stream or NTP server. Local time offset can be selected in the System menu/Date, Time.

"Up time": time passed from last power-up or restart of the module.

**Output bitrates table**

It displays the output bitrate status of each channel in real time, Horizontal bar shows the percentage of used available bandwidth in the channel. The 1st number right to the bar shows actual bitrate in Mbps. Next number shows maximum allowed bitrate in the channel and it depends on modulation parameters. Ensure that actual bitrate would not reach more than 95% of available bandwidth. Otherwise bitrate overflow may occur.

**System status table**

It represents the following parameters at real time: Processor load in percents, internal temperature in degrees of Celsius, power voltage in Volts.

**Other device in the network**

If there are any modules in the network their status and diagnostic information will be displayed as it is in Figure 7 "General information screen". If modules status is red press the down arrow and diagnostic errors will be displayed. Make sure, that Ethernet router is configured properly to pass SSDP packets (239.255.255.250:1900 and 239.255.255.246:7900). Also make sure that all modules are connected to the same Ethernet network.

**Diagnostic information table**

It displays all module errors and comments (if possible) how to eliminate them.

| Diagnostic Information |  |
|------------------------|--|
| Demodulator 2 unlocked |  |
| Demodulator 1 unlocked |  |



### Input status table

|                | Lock status | RF level | Modulation | FEC | SNR     | VBER    | PER    | Input bitrate |
|----------------|-------------|----------|------------|-----|---------|---------|--------|---------------|
| Input 1 status | Locked      | 76 dBuV  | QPSK       | 5/6 | 13.9 dB | <1.8E-9 |        | 33791 kbps    |
| Input 2 status | Locked      | 69 dBuV  | QPSK       | 5/6 | 14.0 dB | <1.8E-9 |        | 33791 kbps    |
| Input 3 status | Locked      | 73 dBuV  | QPSK       | 5/6 | 12.4 dB | <1.8E-9 |        | 33790 kbps    |
| Input 4 status | Locked      | 70 dBuV  | QPSK       | 5/6 | 14.5 dB | <1.8E-9 |        | 33791 kbps    |
| Input 5 status | Locked      | 71 dBuV  | 8PSK       | 2/3 | 14.7 dB |         | 1.4E-9 | 42573 kbps    |
| Input 6 status | Locked      | 74 dBuV  | 8PSK       | 2/3 | 15.1 dB |         | 1.4E-9 | 42573 kbps    |
| Input 7 status | Locked      | 75 dBuV  | 8PSK       | 2/3 | 14.0 dB |         | 1.4E-9 | 42591 kbps    |
| Input 8 status | Locked      | 75 dBuV  | QPSK       | 5/6 | 14.9 dB | <1.8E-9 |        | 33791 kbps    |

### Transport Streams

One input channel at a time can be configured in this page. Select proper channel from the list at „Choose input channel" combobox. A list of services in the selected channel will appear ("List of services").

List of services

| Service title         | Bitrate  | LCN                            | Service ID | Descramble               | Enable                                  |
|-----------------------|----------|--------------------------------|------------|--------------------------|-----------------------------------------|
| TLC HD                | 7.5 Mbps | <input type="text" value="0"/> | 10100      | <input type="checkbox"/> | Output 1 <input type="text" value="v"/> |
| Zee One HD            | 8.1 Mbps | <input type="text" value="0"/> | 10101      | <input type="checkbox"/> | Output 1 <input type="text" value="v"/> |
| mediaspar HD          | 6.6 Mbps | <input type="text" value="0"/> | 10102      | <input type="checkbox"/> | Output 2 <input type="text" value="v"/> |
| MTV HD                | 4.1 Mbps | <input type="text" value="0"/> | 10103      | <input type="checkbox"/> | Output 2 <input type="text" value="v"/> |
| Channel21 HD          | 5.3 Mbps | <input type="text" value="0"/> | 10104      | <input type="checkbox"/> | Output 3 <input type="text" value="v"/> |
| QVC BEAUTY & STYLE HD | 7.7 Mbps | <input type="text" value="0"/> | 10105      | <input type="checkbox"/> | Output 4 <input type="text" value="v"/> |
| TLC HD Austria        | 7.5 Mbps | <input type="text" value="0"/> | 10110      | <input type="checkbox"/> | Off <input type="text" value="v"/>      |
| MTV HD Austria        | 4.1 Mbps | <input type="text" value="0"/> | 10113      | <input type="checkbox"/> | Off <input type="text" value="v"/>      |
| SES Demo              | 0.0 Mbps | <input type="text" value="0"/> | 10121      | <input type="checkbox"/> | Off <input type="text" value="v"/>      |

**Update**

Select all to channel 1  
 Select all to channel 2  
 Select all to channel 3  
 Select all to channel 4

„List of services" table shows a list of available services. Icon before the service name indicates service type. Bitrate of each service is measured in real time. Services that currently are not running will be displayed as grayed. They can be selected and will be outputted normally when the services starts running. „LCN" field is a Logical Channel Number. Every service can have a „channel number" and TV will sort channels according to it. Just ensure, that all services in all channels have different numbers. Value "0" means, that LCN for that service is not used at all and TV will sort these channels according to it's own rules.

Services can be passed to any output number, independing on the input demodulator number. BISS scrambled services have a checkbox for descrambling.

Press “+” icon onto sign and service information will be extended (see Figure "Service details" below).

1+1 International      2.0 Mbps        6125        Enable

|                        |                   |                       |                                                                                |
|------------------------|-------------------|-----------------------|--------------------------------------------------------------------------------|
| Service title:         | 1+1 International | New service title:    | <input type="text" value="1+1 International"/>                                 |
| Service provider:      | 1plus1 Media      | New service provider: | <input type="text" value="1plus1 Media"/>                                      |
| Service ID:            | 6125              | Scrambled flag:       | <input checked="" type="checkbox"/> Other ID <input type="text" value="6125"/> |
| PMT PID:               | 6125              | BISS Code:            | <input type="text" value="-----"/> Other PID <input type="text" value="6125"/> |
| H.264 Video PID:       | 6126              | Enable                | <input checked="" type="checkbox"/>                                            |
| MPEG1 Audio (ukr) PID: | 6127              | Enable                | <input checked="" type="checkbox"/>                                            |
| PCR PID:               | 6126              |                       |                                                                                |

**RF inputs**

**Input type selection**

**Input source type = dSCR**

**Input source type = SCR**

“**Input type selection**” table consists of the following parameters:

“LNB LO frequency” - the LNB local oscillator lower frequency in megahertz. Use 9750 MHz for the universal converter.

“LNB HI frequency” - the LNB local oscillator upper frequency in megahertz. Use 10600 MHz for the universal converter.

“LNB Power” - power supply of the converter – can be set to “0”, “13V”, “18V”, “13V/22kHz”, “18V/22kHz”.

“Polarization” - the polarization of converter. Can be “Horizontal” or “Vertical”.

“Source type” - the LNB types, there are several: Universal, Quadro, DiSEqC, dSCR EN50607, SCR EN50494 - see **Input source type = dSCR**.

dSCR and SCR options are available in “Input 1” only.

“Universal LNB” - power supply voltage of the converter is chosen according to the selected polarization – 18 V Horizontal, 13 V Vertical; the 22 kHz is set depending on given “LNB HI frequency” “LNB LO frequency” and “Input frequency” parameters.

“DiSEqC” - then DISEQC commands are used to select the satellite. Possible commands: “Satellite A”, “Satellite B”, “Satellite C”, “Satellite D”, Vertical or Horizontal polarization.

“dSCR” – first select source type as shown in Figure, then select “dSCR/SCR mode” Master or Slave (Master for module which has direct connection to Unicable multiswitch or LNB and Slave for modules connected by loop through). If Slave was selected, additionally type the IP address of Master module. All the modules in the dSCR/SCR group must be in the same Ethernet network. Next select “SAT input” and “User band”, type in frequencies, symbol rate press “Update” button and observe “dSCR” status.

“SCR” - same as “dSCR”, just the user band frequencies must be typed in manually.

„SAT input” - a parameter that can switch demodulator off or connect to any available RF input.

“User band” - parameter used in dSCR/SCR switches.

“Modulation standard” - a selection between DVB-S and DVB-S2 standards;

„Input frequency” - parameter is a frequency of transponder in MHz.

„Symbol rate” - parameter is a symbol rate of transponder in kSymb/s.

**Demodulator settings table**

|          | SAT input | User band | Modulation standard | Input frequency, MHz | Symbol rate, Ks/s |
|----------|-----------|-----------|---------------------|----------------------|-------------------|
| Demod. 1 | Input 1   | Off       | DVB-S2              | 10773                | 22000             |
| Demod. 2 | Input 2   | Off       | DVB-S2              | 10773                | 22000             |
| Demod. 3 | Input 1   | Off       | DVB-S               | 10744                | 22000             |
| Demod. 4 | Input 2   | Off       | DVB-S               | 10744                | 22000             |
| Demod. 5 | Input 1   | Off       | DVB-S               | 10744                | 22000             |
| Demod. 6 | Input 2   | Off       | DVB-S               | 10744                | 22000             |
| Demod. 7 | Input 1   | Off       | DVB-S2              | 10773                | 22000             |
| Demod. 8 | Input 2   | Off       | DVB-S2              | 10773                | 22000             |

Service title and provider can be edited (multilanguage character support). „Scrambled flag" will be inserted into SDT (Service Description Table). Unchecking this checkbox will not descramble the content. It only carries information about the scrambling status of the service.

BISS scrambled services have a BISS key input field "BISS Code". Enter the BISS code (12 or 16 characters) in hex format.

Individual streams can be disabled as well. PID number can be remapped manually by selecting checkbox "Other PID". Keep in mind that PID must be unique, otherwise PID remapping is done automatically.

Press onto „Update" button to save changes and execute.

NOTE: If transparent mode is selected, all services of transponder will be passed to the output, including original PAT, SDT, PMT, EIT, CAT, NIT tables. All changes that were made to these tables (new titles, LCN) will be disregarded. No more than 95% of output bandwidth usage is recommended, otherwise bitrate overflow might occur.

**NIT**

Several tables related to NIT generation exist in this section. Figure 16 "Global TS parameters" describes following TS parameters:

"Network ID": is unique number within the geographical region defined by the "country code". For a cable network usually this is a single country code plus 0x2000 (8192). If there are more connected modulators in the network, they must have the same Network ID.

Proper value depending on your country and operator can be found here:

[http://www.dvbservices.com/identifiers/network\\_id?page=1](http://www.dvbservices.com/identifiers/network_id?page=1)

"Private data specifier (in hex format)": can be inserted in the NIT table for proper LCN description. This value is described in TS 101162 specification. NorDig standard requires 00 00 00 29 value, UK should use 00 00 23 3A value.

Other options can be found here:

[http://www.dvbservices.com/identifiers/private\\_data\\_spec\\_id?page=1](http://www.dvbservices.com/identifiers/private_data_spec_id?page=1)

The parameter will not be inserted into NIT if value is set to zero.

„Network name" is the name of the network.

The 2nd table in the page describes Transport stream ID and Original network ID of each channel (see Figure below).

|          | RF output parameters | Original network ID | Transport stream ID |
|----------|----------------------|---------------------|---------------------|
| Output 1 | C21, 8MHz, QAM-64    | 1                   | 1                   |
| Output 2 | C22, 8MHz, QAM-64    | 1                   | 2                   |
| Output 3 | C23, 8MHz, QAM-64    | 1                   | 3                   |
| Output 4 | C24, 8MHz, QAM-64    | 1                   | 4                   |
| Output 5 | C66, 8MHz, QAM-64    | 1                   | 5                   |
| Output 6 | C67, 8MHz, QAM-64    | 1                   | 6                   |
| Output 7 | C68, 8MHz, QAM-64    | 1                   | 7                   |
| Output 8 | C69, 8MHz, QAM-64    | 1                   | 8                   |

Each stream in a network must have unique ID, called „Transport stream ID". An Original\_Network\_ID is defined as the "unique identifier of a network". It can be linked to NetworkID or used value from this location:

[http://www.dvbservices.com/identifiers/original\\_network\\_id?page=1](http://www.dvbservices.com/identifiers/original_network_id?page=1)

Every channel in the network must be described in NIT. Otherwise TV automatic channel tuning function will not find all channels. All other modules in the network will be monitored via standard SSDP protocol. NIT tables will be regenerated if any change is detected in other modulators with the same Network ID. Make sure, that Ethernet router is configured properly to pass SSDP packets (239.255.255.250:1900 and 239.255.255.246:7900). Also make sure that control ports of all modules are connected to the same Ethernet network.

**RF outputs**

Transmodulator has two independent groups of four adjacent channels.

|          | Constellation | Bandwidth | Guard interval | Code Rate | Cell ID | Output frequency, MHz (Channel) |     | Attenuator, dB | Enable                              |
|----------|---------------|-----------|----------------|-----------|---------|---------------------------------|-----|----------------|-------------------------------------|
| Output 1 | QAM-64        | 8 MHz     | 1/32           | 7/8       | 0       | 474.0                           | C21 | 0              | <input checked="" type="checkbox"/> |
| Output 2 | QAM-64        | 8 MHz     | 1/32           | 7/8       | 0       | 482.0                           | C22 | 0              | <input checked="" type="checkbox"/> |
| Output 3 | QAM-64        | 8 MHz     | 1/32           | 7/8       | 0       | 490.0                           | C23 | 0              | <input checked="" type="checkbox"/> |
| Output 4 | QAM-64        | 8 MHz     | 1/32           | 7/8       | 0       | 498.0                           | C24 | 0              | <input checked="" type="checkbox"/> |
| Output 5 | QAM-64        | 8 MHz     | 1/32           | 7/8       | 0       | 506.0                           | C25 | 0              | <input checked="" type="checkbox"/> |
| Output 6 | QAM-64        | 8 MHz     | 1/32           | 7/8       | 0       | 514.0                           | C26 | 0              | <input checked="" type="checkbox"/> |
| Output 7 | QAM-64        | 8 MHz     | 1/32           | 7/8       | 0       | 522.0                           | C27 | 0              | <input checked="" type="checkbox"/> |
| Output 8 | QAM-64        | 8 MHz     | 1/32           | 7/8       | 0       | 530.0                           | C28 | 0              | <input checked="" type="checkbox"/> |

**Update** Select all

"Output frequency" parameter can be entered manually or selected as a channel from combobox. Channels that can be selected from the list depend on which region is selected. If you need any other frequency – select "Manual" and type the needed frequency. Frequency step is 0.1 MHz. „Enable" checkbox will enable channel to the output. Global attenuator can be entered up to 15 dB. Also there is individual precise attenuator up to 2.5 dB in step of 0.5 dB.

Press „Update" to change settings. In case, if any modulation parameter was changed, both channels will be restarted with new settings. Exception is „Attenuator", changes in this parameter will not restart the modulator.

|          | Constellation | Symbol rate | Output frequency, MHz (Channel) |     | Attenuator, dB | Enable                   |
|----------|---------------|-------------|---------------------------------|-----|----------------|--------------------------|
| Output 1 | QAM-64        | 6875        | 474.0                           | C21 | 0              | <input type="checkbox"/> |
| Output 2 | QAM-64        | 6875        | 482.0                           | C22 | 0              | <input type="checkbox"/> |
| Output 3 | QAM-64        | 6875        | 490.0                           | C23 | 0              | <input type="checkbox"/> |
| Output 4 | QAM-64        | 6875        | 498.0                           | C24 | 0              | <input type="checkbox"/> |
| Step     |               |             | 8.0 MHz                         |     |                |                          |

**Update** Select all

Figure above shows DVB-C output settings. The step of RF channels can be selected to one of these values: 7.0, 7.5, 8.0, 8.3, 8.5 MHz. Actual bandwidth of each channel depends on the symbol rate, and can be calculated as SR x 1.15 (1.15 here is roll off factor of 15%). Symbol rates of all channels must be the same, from the range of 3500..7200 kSym/s.

Output channel enumeration depends on the region selected from the main page. However, it's allowed to enter any frequency you want in a range of 100..858 MHz in all devices.

Only the first output frequency/channel of the group can be entered by the user. Other frequencies will be calculated automatically according to the selected step/bandwidth.

### IP settings

All device IP settings can be configured here – IP address, subnet mask, gateway, DNS (Domain Name System), see Figure. IP parameters will be updated immediately after pressing „Update" button and redirect to new location.

NOTE: IP address can be reset to default (192.168.1.10) by pressing RESET button for at least 3 seconds. Ethernet "link" led will start to blink quickly to inform, that the reset IP address request has been accepted. Device will be restarted with default IP address.

The screenshot shows a web interface for configuring IP parameters. It includes fields for MAC address (00:1C:A3:00:00:00), IP address (192.168.1.222), Subnet mask (255.255.255.0), Gateway (192.168.1.1), and DNS (8.8.8.8). An 'Update' button is located at the bottom right.

### E-mail-settings

The device can send e-mail reports if errors were detected. SMTP protocol is used for that. Figure "E-mail settings table" shows parameters related to this feature. "Enable e-mail error report" checkbox enables error monitoring. All errors within "timeout" period will be gathered, and send to the e-mail address, provided in "Receiver e-mail address" input box. Comma separated e-mail addresses can be used to send report to multiple addresses. The timer will be started as soon, as the first error is detected, and stopped when e-mail is sent. The timer will be restarted again if a new error will appear.

"Sender e-mail address" can be used as authentication in the SMTP server side.

SSL (SMTPS) protocol is not supported.

The screenshot shows a web interface for configuring e-mail settings. It includes a checkbox for 'Enable e-mail error report', fields for SMTP server (192.168.1.1), SMTP port (25), Sender e-mail address (no\_reply@domain.com), Receiver e-mail address, and Timeout for errors in minutes (5). A 'Send last message' link and an 'Update' button are also present.

### SNMP settings

"SNMP settings table" is located in "IP parameters" tab.

The description of the SNMP configuration parameters:

"Read Community" - community name acts as a password that is shared by multiple SNMP agents and one or more SNMP managers. "Read Community" password is used for read-only access to the modules parameters.

"Write Community" - is the password used for read-write access to the modules parameters.

"Enable TRAP" - SNMP traps are alerts generated by agents on a managed device. Check this box to enable TRAP generation. The module generates traps when the diagnostic message occurs.

"TRAP Community" - is the password used for accessing of TRAPS.

"Host IP #1", "Host IP #2", "Host IP #3" - IP addresses of hosts with SNMP managers, where TRAPS will be send.

The screenshot shows a web interface for configuring SNMP settings. It includes a checkbox for 'Enable TRAP', fields for Trap community (public), Read community (public), Write community (private), and three Trap IP address fields (all set to 0.0.0.0). An 'Update' button is located at the bottom right.

## System menu

This menu tab contains following submenu items: "Event logs", "Export parameters", "Import parameters", "Firmware upgrade", "User management", "Restore defaults", "Reset the device", "Date,Time", "Language". Mouse over to show the list of this submenu.

## Event logs

Various important events, errors, warnings will be logged into "Event logs". Each record has an event type, which can be used to filter particular messages. Just select checkboxes in the „Logs filtering" table and press „apply". Other messages will be hidden.

„Erase logs" button will erase all logs from the system.

"Export logs" button forms the file (log.html) which will be downloaded to PC.

Each record has a log time when the event appeared. Refer to 6.10.8 "Date, Time" settings for instructions how to configure time settings.

| Date/Time           | Event type | Event description                                     |
|---------------------|------------|-------------------------------------------------------|
| 2016-09-07 10:30:48 | Event      | Bitrate overflow restored back for channel 2          |
| 2016-09-07 10:30:15 | Event      | PMT (Test-R) version change detected in channel 1     |
| 2016-09-07 10:30:14 | Error      | Channel 2 bitrate overflow                            |
| 2016-09-07 10:28:39 | Event      | Control ETH interface link up: 100Base-TX full-duplex |
| 2016-09-07 10:28:39 | Event      | System time updated                                   |
| 2007-01-01 00:00:05 | Event      | Power option restart occurred                         |
| 2016-09-07 10:28:15 | Event      | PMT (Test-R) version change detected in channel 1     |
| 2016-09-07 10:26:14 | Event      | PMT (Test-R) version change detected in channel 1     |
| 2016-09-07 10:24:25 | Event      | Logs erased                                           |

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## Export parameters

All settings of transmodulator can be exported for backup or copying to another device. Press "Export parameters" and "parameters.xml" file will be downloaded to PC. This file can be imported only to the same type of device.

## Import parameters

Exported parameters can be imported back to the device. Press onto "Click to select file" button (see "Import parameters") to select exported file.

Press "Upload" button to send the file to the device. It will take several seconds to update all parameters after file upload. After that, device will function with new configuration. No restart is required.

Import parameters

Click to select file

Expected file name:

Upload

## Firmware upgrade

Device firmware can be upgraded via web browser. Press the "Click to select file" button and select firmware binary file. If valid file was selected, a version number of new firmware will be displayed. Otherwise an error message will appear. Press the "Upload" button to upload new firmware to the device. Upload progress bar will appear and may take several seconds to upload, depending on the size of a file and a network connection speed. A message will be displayed asking to restart the device when the file was sent to the device. New firmware will be programmed into the device only after restart. It may take additional minute or more to flash new program. Device will start up with a new firmware and continue to operate with previous parameters. Additional new firmware features (if any) may need to setup additionally to take effect.

Avoid power supply interruption when a programming process is going on.

Device has possibility to load software revision history and check availability for new software release. Click the "Check online" link. If computer (not device!) has internet access, it will show a list of all software releases with links to binary files. Binary file can be downloaded and saved to computer (see Figure below). After that, use the firmware upgrade method as described above.

**TROPHY**

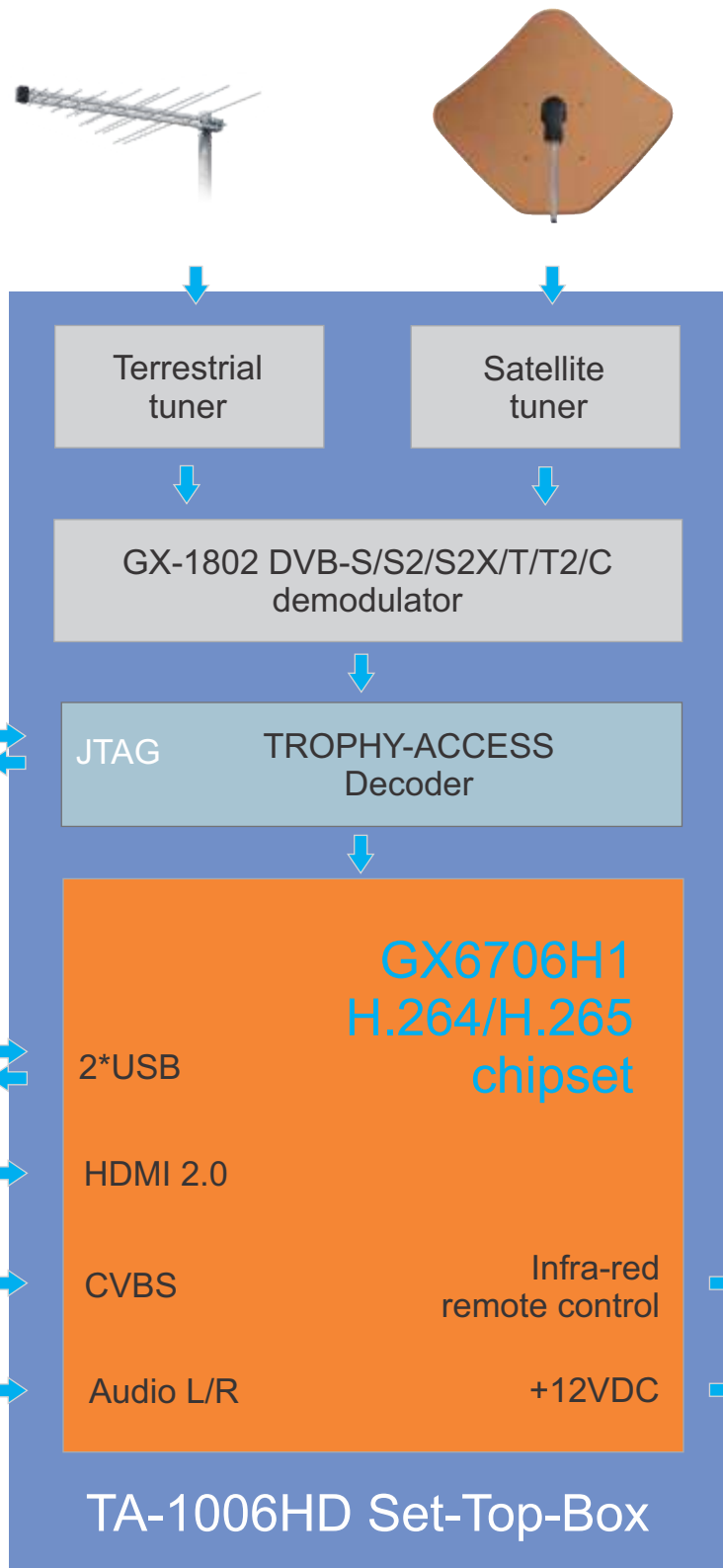


# TROPHY-ACCESS Set-Top-Box

## Specifications

|                           |                                                                       |
|---------------------------|-----------------------------------------------------------------------|
| <b>Satellite mode</b>     |                                                                       |
| Standards                 | EN 300 421 (DVB-S); EN 302 307 (DVB-S2); EN 302 307-2V1.4.1 (DVB-S2X) |
| 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)<br>1/2_3/5_2/3_3/4_4/5_5/6_8/9_9/10 (8PSK) |
| Input frequency range     | 950...2150 MHz                                                        |
| <b>Terrestrial mode</b>   |                                                                       |
| Standard                  | EN 300 744 (DVB-T); EN 302 755 v1.3.1 (DVB-T2)                        |
| 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                                                         |
| <b>Cable mode</b>         |                                                                       |
| Standard                  | EN 300 429 ITU J.83 Anex A/B/C (DVB-C)                                |
| Demodulation              | 64/128/256QAM                                                         |
| Symbol rate               | 5~7.1Mbauds                                                           |
| Input frequency range     | 62~858MHz                                                             |
| <b>Common specs</b>       |                                                                       |
| 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, 2*USB2.0, JTAG                       |
| Output resolution         | up to 1920×1080p@60fps                                                |
| Color system              | PAL, NTSC YUV4:2:2/YUV4:4:4                                           |
| Sound                     | MPEGI/II, MP3, AAC                                                    |
| Trophy-Access 3.0 Decoder | Embedded FPGA IC                                                      |
| Chipset                   | GX6706H1                                                              |
| EPG                       | Multilanguage                                                         |
| Interface language        | 6 languages                                                           |
| Supply voltage            | +12VDC 2A, external                                                   |
| Wattage                   | up to 14W                                                             |
| Dimensions                | 180x120x45                                                            |
| Weight                    | 1 kg                                                                  |





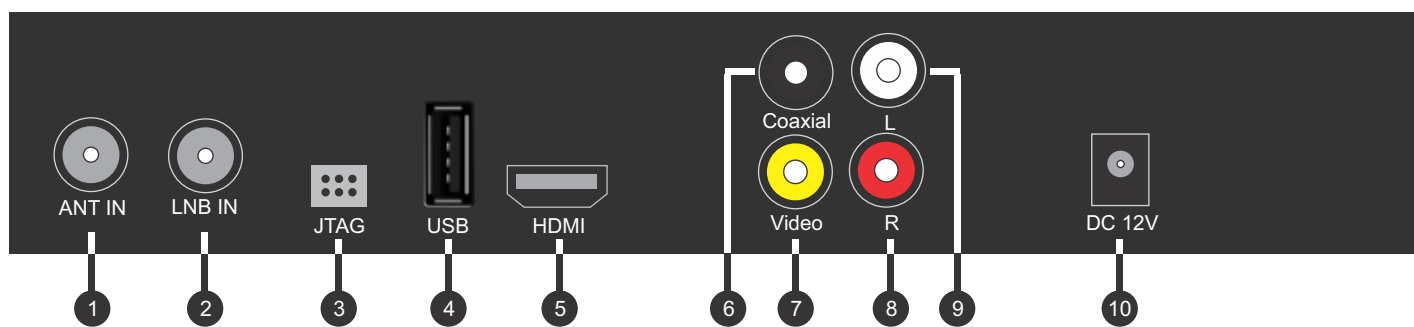
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## Front Panel



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

## Back Panel

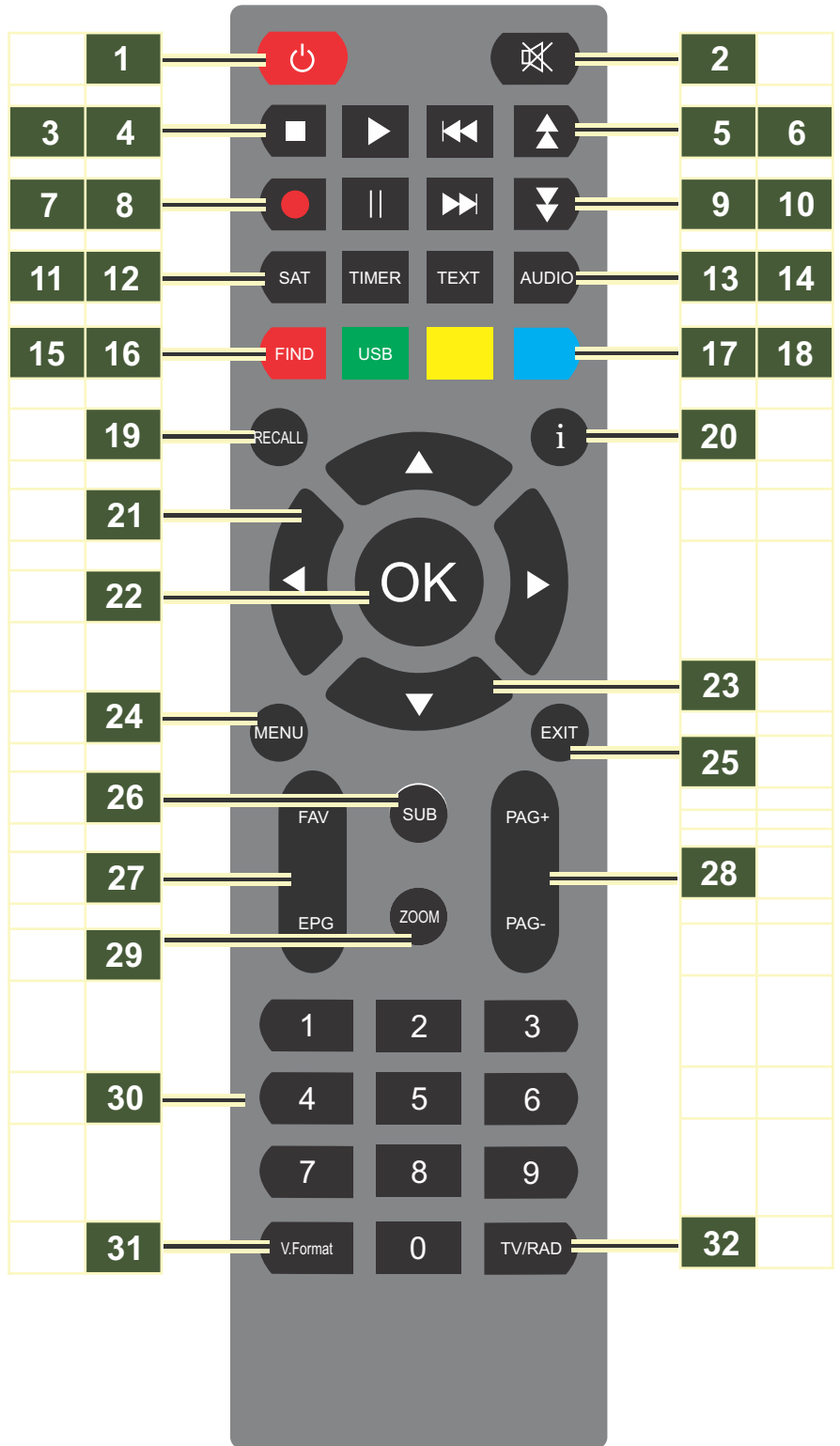


|     |                                  |
|-----|----------------------------------|
| 1   | Terrestrial / cable signal input |
| 2   | LNB input                        |
| 3   | JTAG connector                   |
| 4   | Rear USB port                    |
| 5   | HDMI output                      |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

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# 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



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## Installation Guide

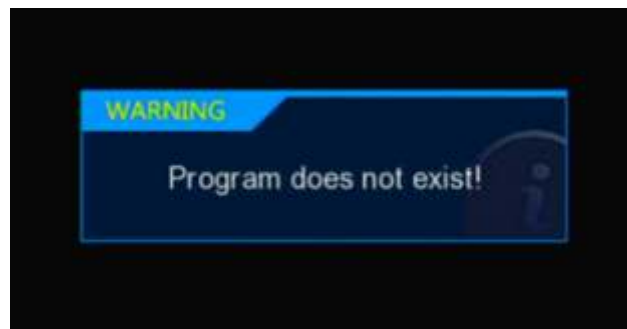
After connecting:

- the signal cable (s),
- the HDMI cord (or the video/audio cord),
- and the power supply unit,

"boot" appears on the front panel LED display and the receiver's download process begins.

After several seconds the device is ready for use.

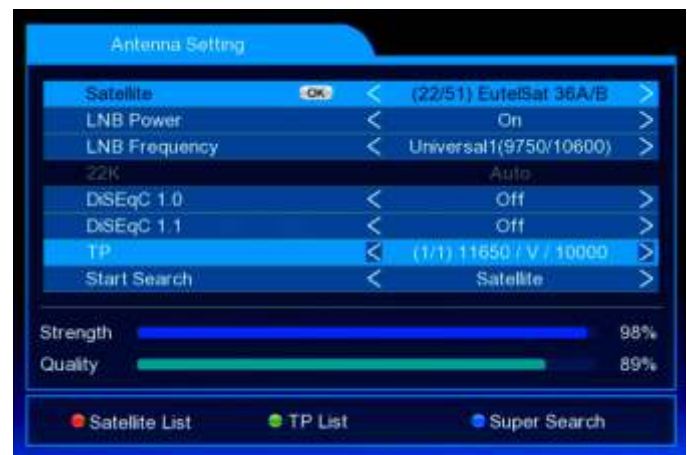
If Set-Top-Box was turned on with an empty list of programs, the WARNING text will appear on the screen.



## Satellite TV Installation

Press the Menu button to go to the Installation page. Select the Antenna Setting line and press the OK button.

Select the Satellite line and press the OK button.



## Satellite TV Installation

Select the satellite name, Eutelsat 36, for example and press the **OK** button.



Install the LNB and DiSEqC parameters. Press the **GREEN** button.



You will see the **Transponder List** menu. Press the **GREEN** button to add a transponder.



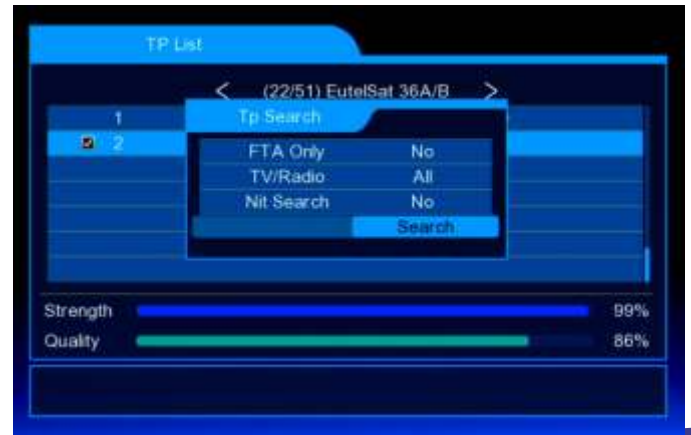
Enter the parameters of the new Transponder.



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

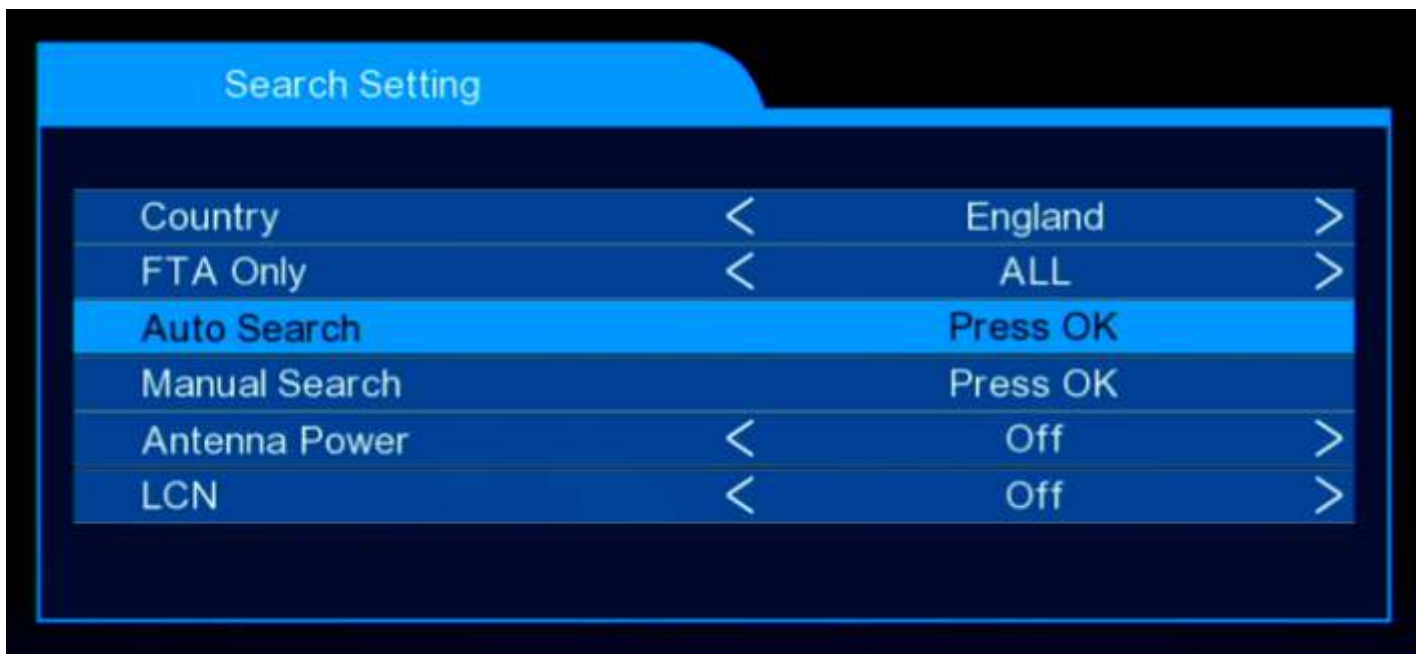


Press the **BLUE** button to start searching for programs.

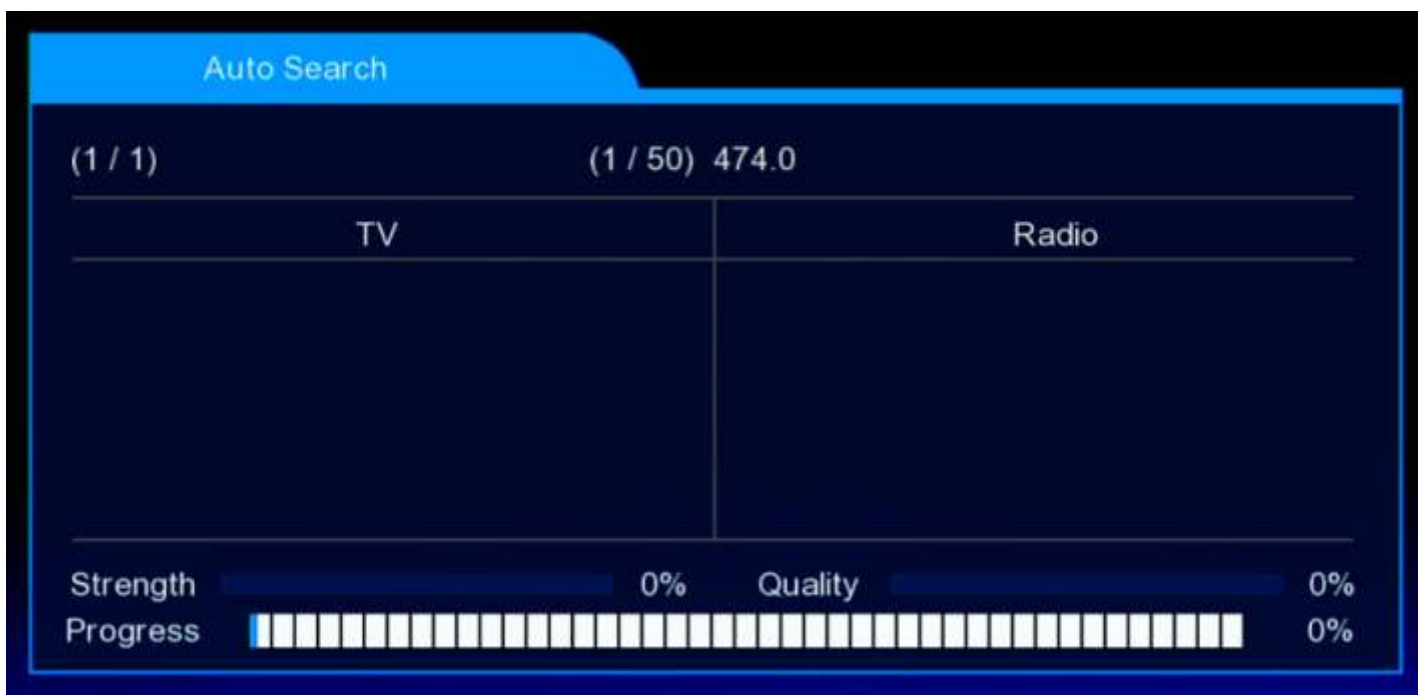


## Terrestrial TV Installation

Select the **Auto Search** line and press the **OK** button.



An automatic search for terrestrial channels will begin, according to the frequency plan adopted in your country. At the end of the search, the terrestrial channels will be added to the general list of programs.



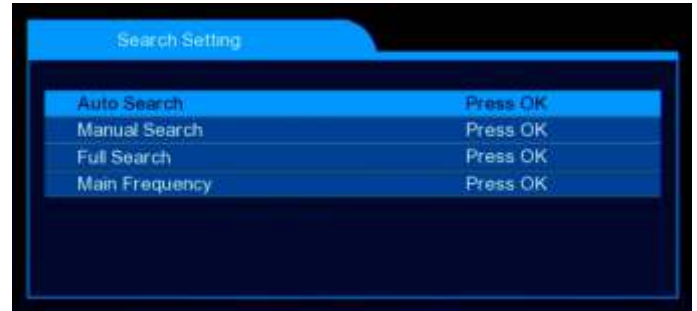
## Cable TV Installation

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.



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## 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.

