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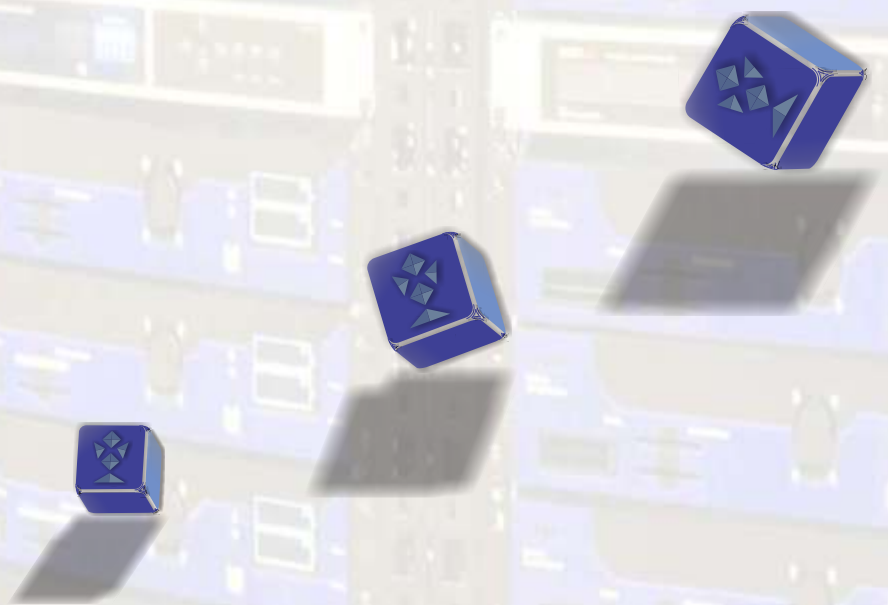


LEADER

multimedia

MVDS SOLUTION_H.264 TRANSCODING
(HDTV TERRESTRIAL DVB-S2 BROADCASTING)

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INTRODUCTION

TROPHY MVDS System is a high-tech, based on know-how, cost-effective business solution. In particular, it helps customers take full advantage of digital TV, but does not require the content of an extensive personnel services provider.

TROPHY MVDS System offers two main services:

1. Wireless Digital TV - direct terrestrial broadcasting of SD and HD H.264 DVB-S2 digital TV in the C-band or Ku-band range. Users of services are private and corporate clients, medium-sized businesses and the hotel industry. Customers based in surrounding area installs: 0.4 ... 0.6 m antenna with LNB; DVB-S2 H.264 receiver with built-in TROPHY-ACCESS decoder (or any DVB-S2 H.264 receiver with COMMON INTERFACE + TROPHY-ACCESS CAM module).

2. Digital wired cable television, built on cluster technology. The source of the signal for a single apartment building or group of buildings is an inexpensive 8PSK-QAM transmodulator.

The screenshot shows the Wikipedia page for MVDS. The article text includes:

MVDS is an acronym for terrestrial **"Multipoint Video Distribution System"**. MVDS currently is a part of broader MWS (Multimedia Wireless System) standards. In European Union MWS works in 10.7 - 13.5 and 40.5 - 43.5 GHz frequency bands. Research for 42 GHz frequency has been done under the European Commission EMBRACE (Efficient Millimetre Broadband Radio Access for Convergence and Evolution) initiative.

Standards

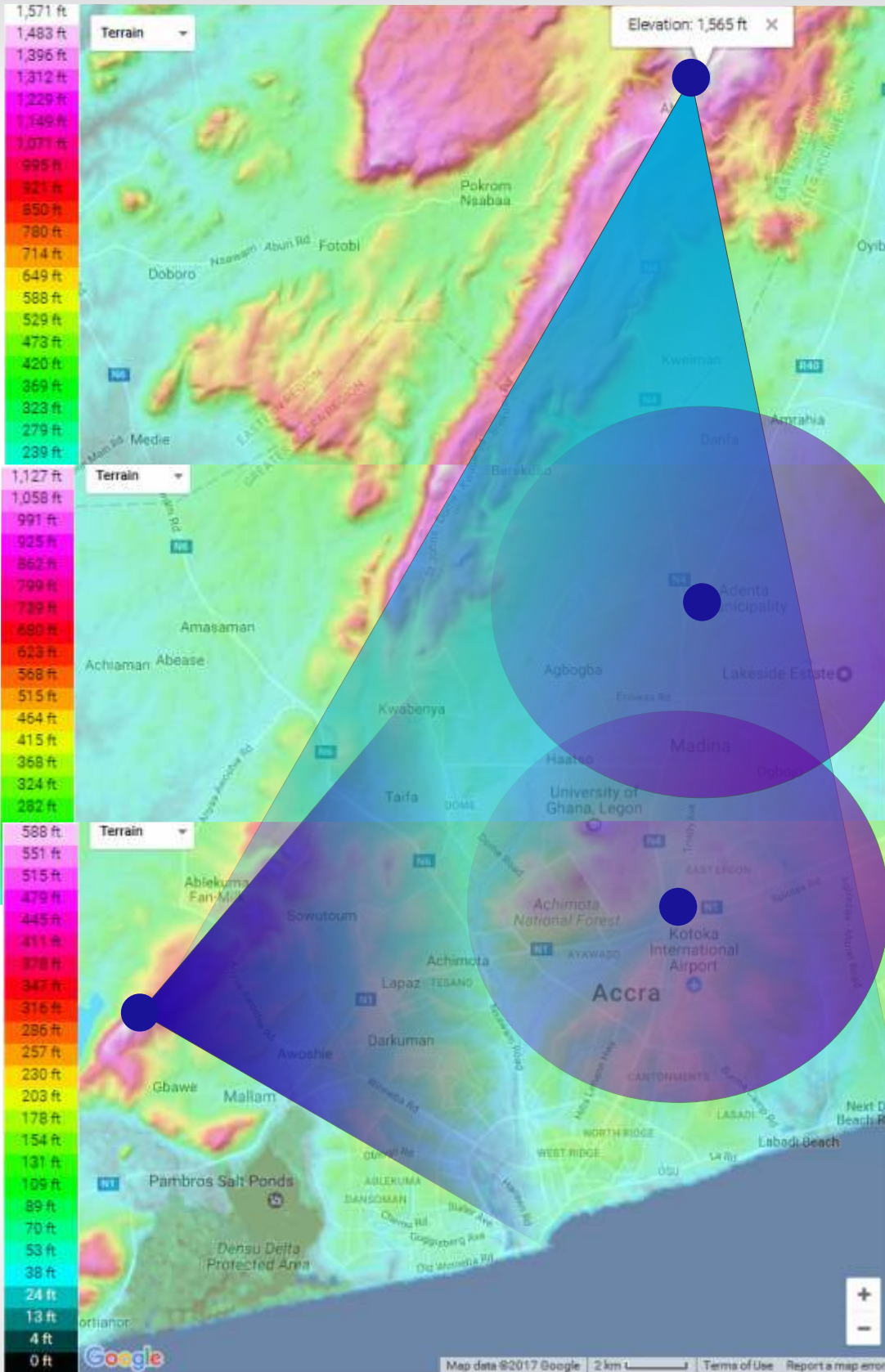
- ETSI**
 - EN 300 748
 - EN 301 215-3
 - EN 301 997-2
- UK Standards**
 - MPT 1500 (obsolete)
 - MPT 1560 (obsolete)
- CEPT**
 - ERC/DEC(99)15
 - ECC/REC(01)04

Manufacturers of MVDS equipment

- MDS America Inc.
- Newtec
- EF Data
- BluWan
- Philips Broadband Network
- Hughes Network systems
- Thales Group (Thomson)
- Trophy electronics**
- Technosystem Digital Network S.p.A (TDN)
- Marconi Technology Centres (GMTT)
- United Monolithic Semiconductors (UMS)
- DOK Ltd (Ewalink)
- Q-par Angus Ltd
- ROKS#

We believe our growth and success in serving our target customer base is a direct result of our competitive advantages, including:

- 100% coverage of the territory of city without the need for cabling. 100% guaranteed delivery to all customers high-quality television service at a competitive price.
- As is known, satellite dish installation in apartment buildings is associated with some difficulties. For this reason, customers are more likely to be connected to a cable TV network. Therefore, the main task of the company is switching its competitors subscribers to the MVDS cluster Cable TV service, which promotes the highest quality of services and the minimum price competitive service.
- unique headend equipment and unique equipment of DVB-S2 to DVB-C transmodulation with descrambling the full transponder package.

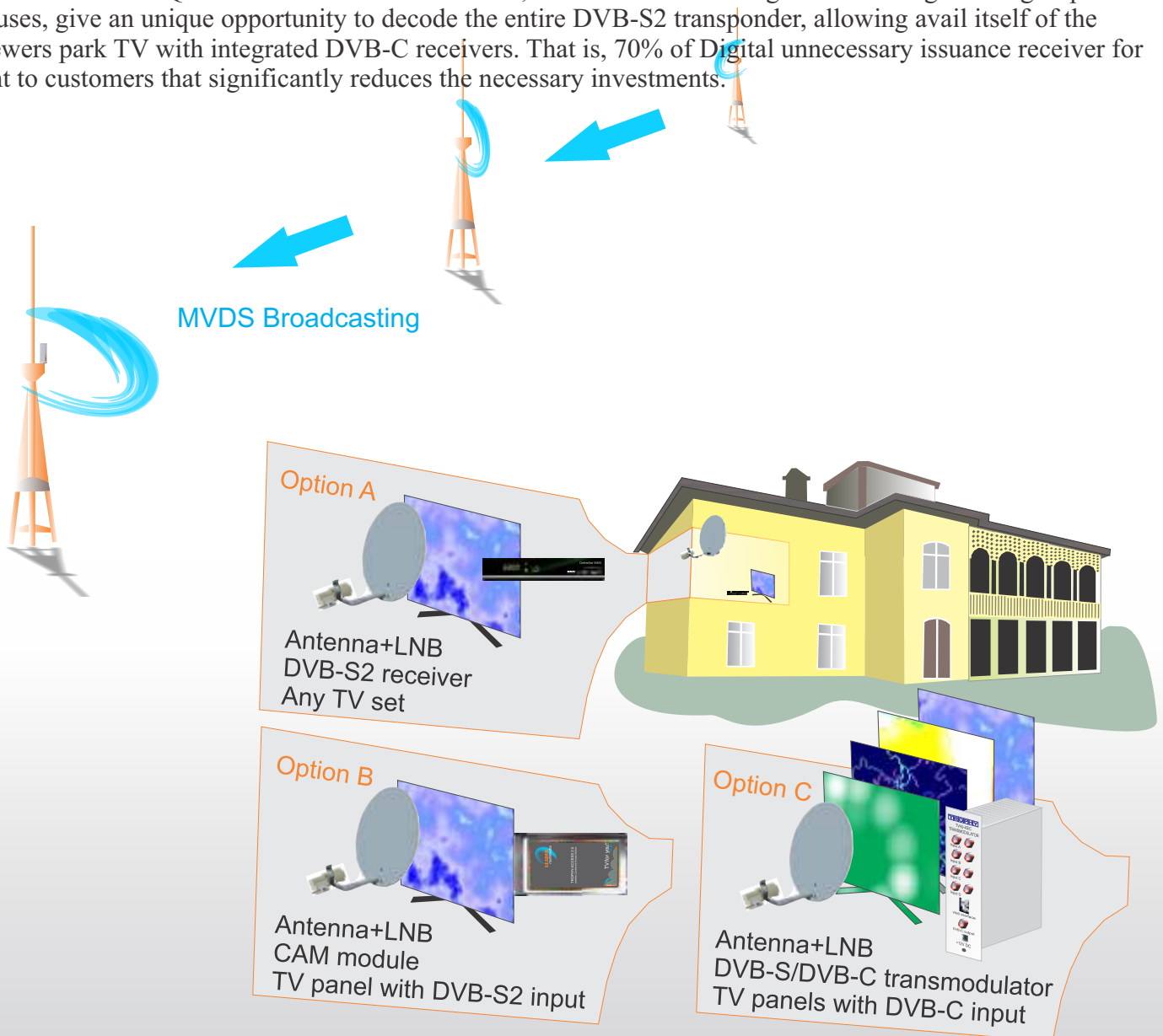


Terrestrial microwave broadcasting implies the obligatory presence of the line of sight between transmitting antenna and receiving antenna of MVDS system subscriber. Fitting locations of repeaters and signal coverage area indicated in the Figure 1. The exact location of the MVDS repeaters must be determined in the special Project Documentation.

INDUSTRY. BACKGROUND AND OPPORTUNITIES

TROPHY MVDS technology is an innovative service in terms of broadcast of digital channels on our televisions. Currently, cable operators provide mainly analog signals. Thus, the viewer watching the channel and less with the worst quality. TROPHY MVDS repeater transmits a broadcast signal to the client directly to the subscriber set-top box (STB), which automatically means less noise and problems with the main lines of communication. The image is transmitted with the highest quality and crystal clear sound. Another advantage is that the viewer can watch the program of their choice with a wide range of available channels and packages. Packages may be individually customized based on the viewer's choice. TROPHY MVDS System allows the customer to choose and pay only for what they want, as opposed to a single analog package provided by the cable operator. But, nevertheless, mechanically customers use analogue television services. Customers are extremely reluctant to buy a digital set-top box, especially since cable providers encode digital TV channels and to view the channels requires a specialized set-top-box is that provider. Despite the fact that the vast majority of TV panels (at least 70% of the current Park TV) available to television viewers has mounted digital DVB-C receiver, the application of these detectors is still restricted need to acquire additional decoder equipment.

4-channels 8PSK-QAM TROPHY transmodulators, established in each high-rise building or in a group of houses, give an unique opportunity to decode the entire DVB-S2 transponder, allowing avail itself of the viewers park TV with integrated DVB-C receivers. That is, 70% of Digital unnecessary issuance receiver for rent to customers that significantly reduces the necessary investments.



HEADEND SYSTEM

H.264 TRANSCODING_DVB-S2_TROPHY MVDS HEADEND is the most convient and versatile for digital multichannel satellite&cable solution.

The advantages of the equipment:

Almost all the major HEADEND components are based on the Linux software. For example, the streamers, the demultiplexers, transcoding servers, the multiplexers, the modulators - all this, in the long run, are Linux computers. From this fact derives the main advantage of the HEADEND, 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.

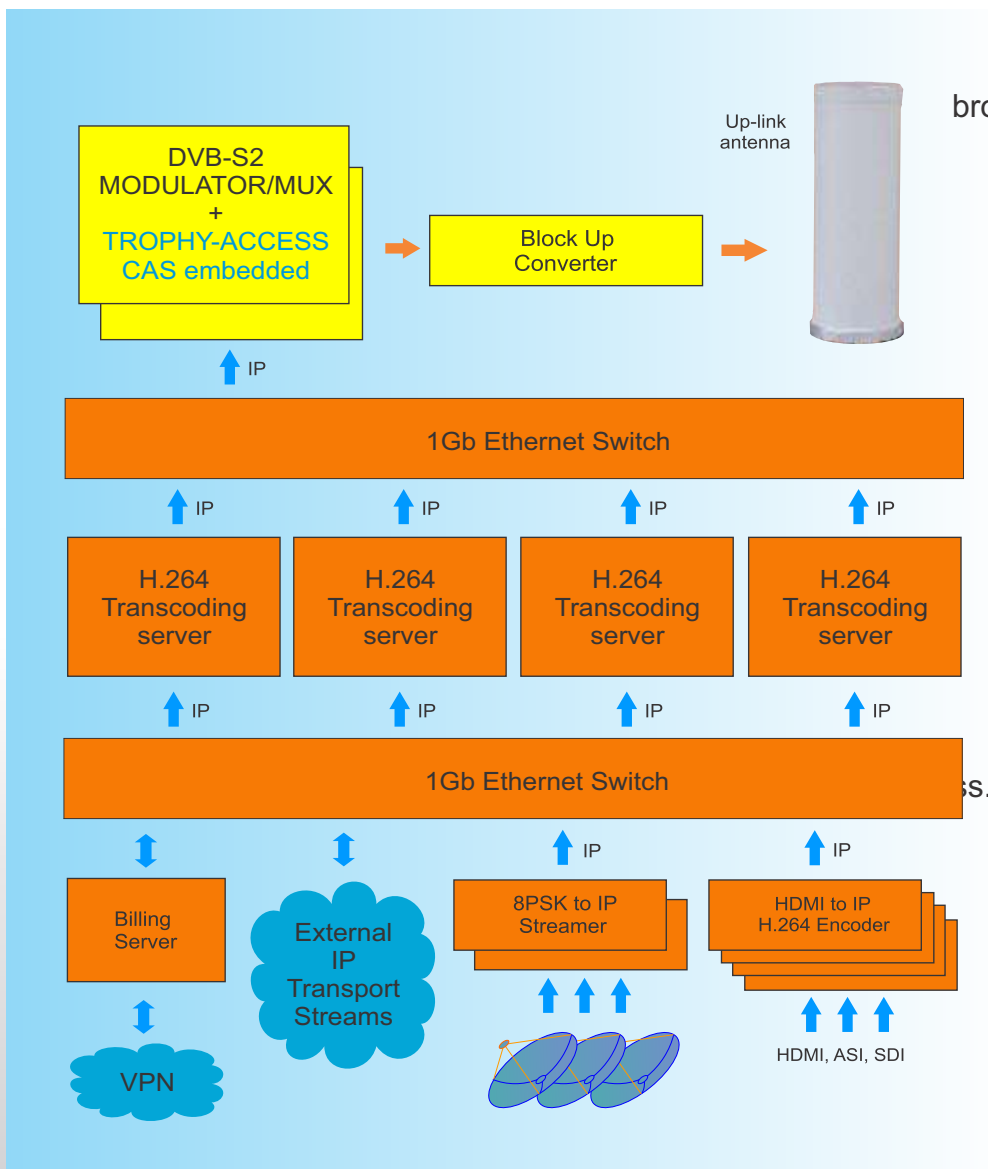
HEADEND intra-protocol of control and data transmission protocol are Ethernet. This determines the high degree of integration with the existing equipment and determines minimum cost of a components.

Using the most advanced mathematical compression methods allows you to broadcast the quality video at a speed of about 0,8 Mbps for SD channels and about 2 Mbps for HD channels.

This advantage is very important for satellite and Internet broadcasters.

The HEADEND is the part of a complete system of commercial broadcasting, which the TROPHY company offers its customers. The Billing System, the Conditional Access System, the system of monitoring of broadcasting quality and the set-top-boxes of its own design allow our customers to get out "turnkey" broadcasting

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.



AMD-53-S2 DVB-S2 MODULATOR / MULTIPLEXER

1. GENERAL INFORMATION

AMD-53-S2 DVB-S2 MODULATOR / MULTIPLEXER is a brand new satellite modulator/multiplexer designed for applications over satellite in full compliance with DVB-S2 standard.

The AMD-53-S2 DVB-S2 MODULATOR / MULTIPLEXER converts transponders included IP or ASI (optional) transport stream into QPSK/8PSK/16APSK/32APSK signal to transmit them in satellite transmitter or 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 or ASI (optional). It can receive up to 120 transport streams from the TROPHY HeadEnd or from another IP sources included MPEG transport streams.

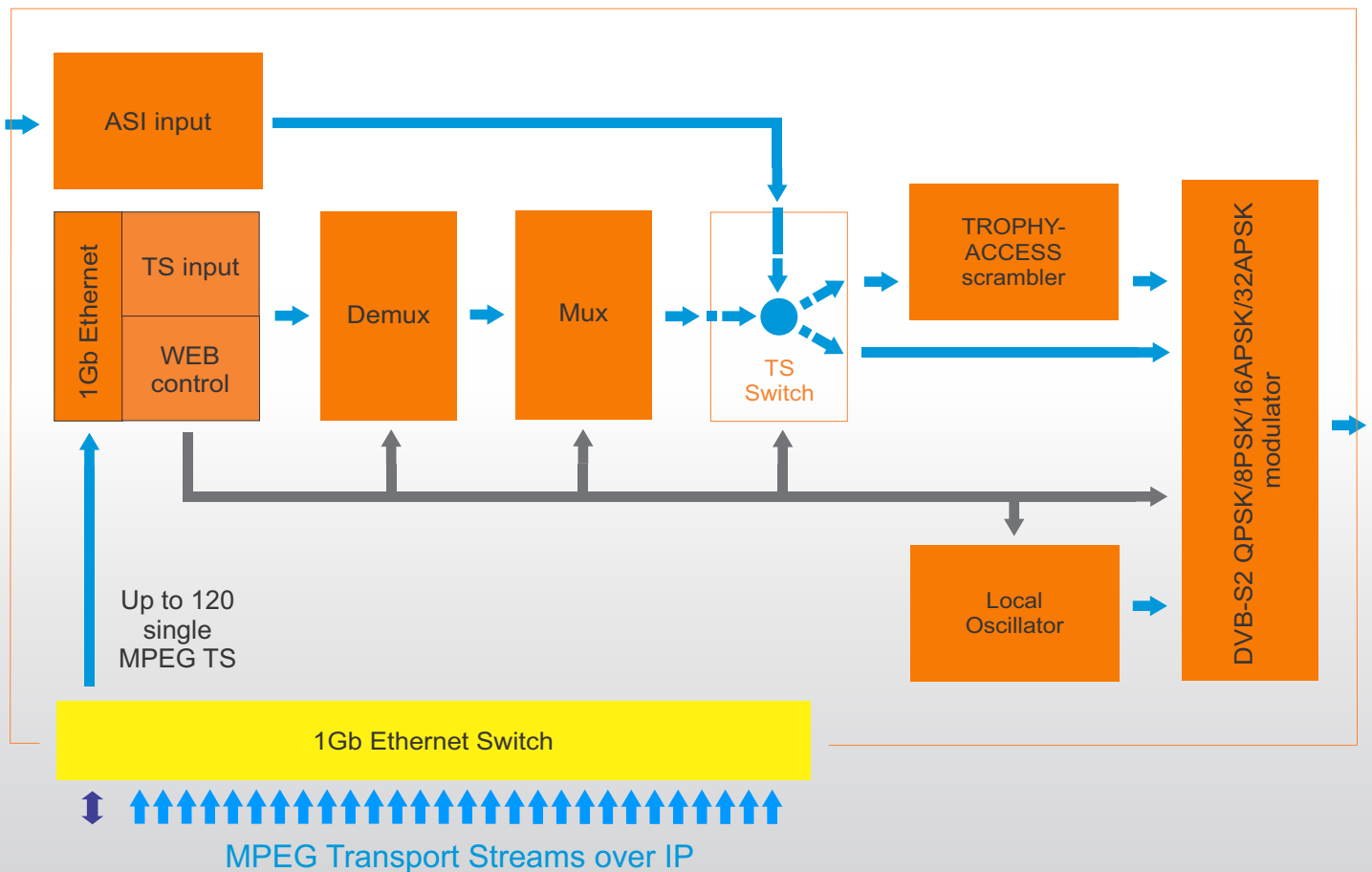
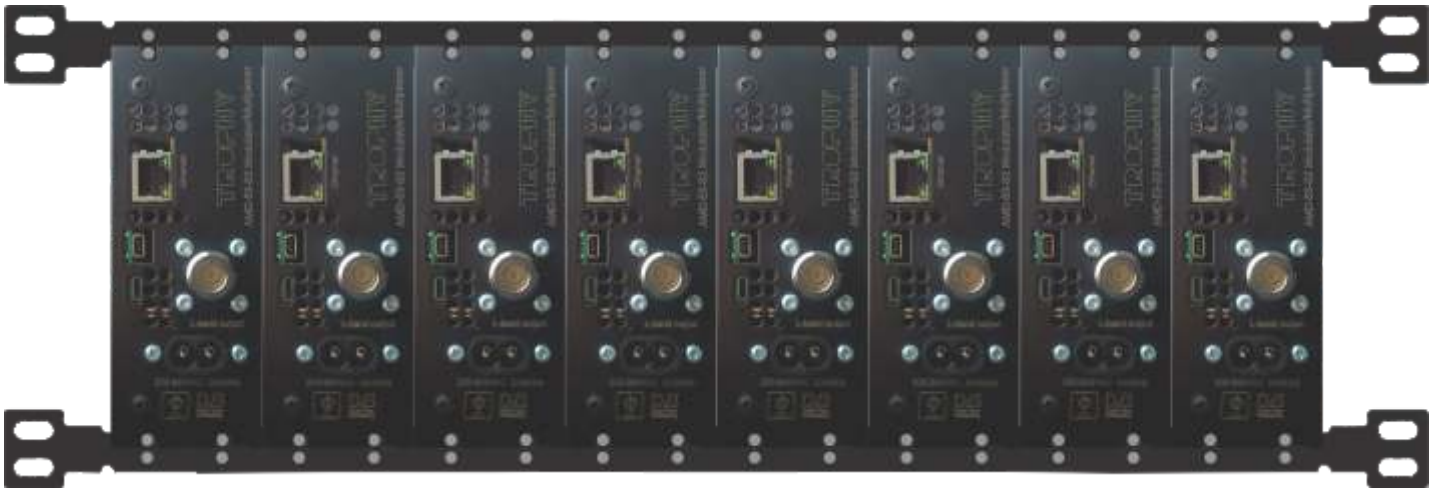
A high-performance FPGA does the analogue TV modulation and the freely adjustable up-conversion into L-band range (950 ... 2150MHz). A high-speed digital→analogue converter (DAC) is responsible for the excellent output signal.

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

- ❖ covers the full L-Band range (950...2150 MHz) or IF Band range 70/140 MHz (optional) and offers bit rate from 0.25 Mbps up to 120 Mbps;
- ❖ provides up to 120 independent multiplexed MPEG transport streams to a single carrier, with built-in support for TROPHY-ACCESS Conditional Access System for content protection. Software license to enable TROPHY-ACCESS scrambler solution;
- ❖ also equipped ASI transport stream input (Optional);
- ❖ 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 120 Mbit/s;
- ❖ supports all PIDs of input services;
- ❖ 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 provides a high performance channel spectrum. This results gives an efficient transmission in QPSK/8PSK/16APSK and 32APSK mode. 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 and PIDs filtering&remaping. WEB-interface also offers monitoring of all input streams.

AMD-53-S2 MODULATOR / MULTIPLEXER integrates the 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.

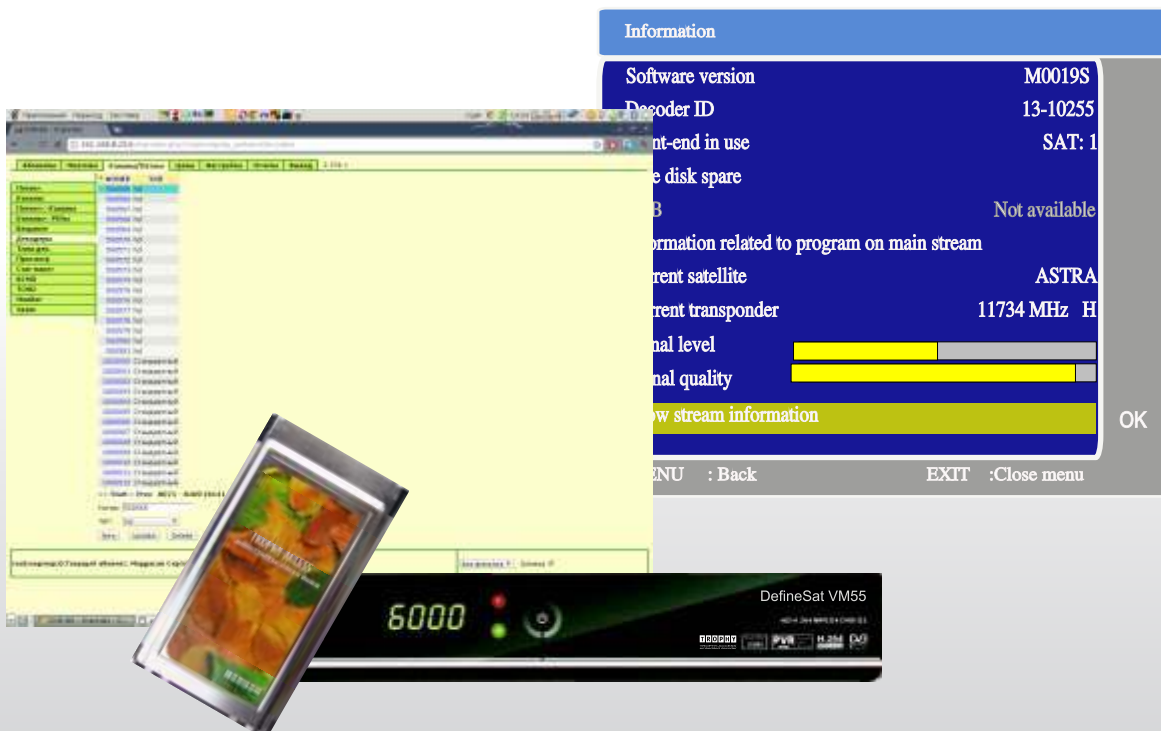


2. TROPHY-ACCESS CAS

The TROPHY-ACCESS CAS (Conditional Access System) developed without CSA algorithm, which ensures high reliability and lack of pirate viewing (named Cardsharing). Scrambler is performed within the hardware of the AMD-53-S2 DVB-S2 MODULATOR/MUX.

The Billing server provides office. The decoder automatically switches off at a zero balance in the subscriber account number. Billing data are fed to the AMD-53-S2 MODULATOR/MUX over Ethernet or ASI.

| 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 | 4,294,967,295 |
| 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 |
| Individual addressable message | up to 120 characters |



3. INSTALLING AND OPERATING INSTRUCTIONS

3.1. 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.

3.2. 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 | 1005 | 1006 | 1007 | 1008 |
| IP input only | + | + | + | + | | | | |
| IP+ASI inputs | | | | | + | + | + | + |
| TROPHY-ACCESS CAS | + | | + | | + | | + | |
| FTA only | | + | | + | | + | | + |
| 950-2150MHz output | + | + | | | + | + | | |
| IF 70MHz output | | | + | + | | | + | + |

Up to 120 input elementary transport streams are multiplexed at device and inserted into the output DVB-S2 carrier with maximum bit rate of 120 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 and TDT).

3.3. 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.

3.4. 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, 10/100/1000, UDP |
| L-band output | N-type connector |
| 200-240 VAC 50/60Hz | SCZ-20 connector |

| | |
|-----------------------------|---|
| Factory settings: | |
| IP address: | 10.10.10.21 |
| IP netmask: | 255.255.255.0 |
| IP gateway: | 0.0.0.0 |
| SNMP trap (IP): | 0.0.0.0 |
| | |
| System section | |
| Input mode: | IP-MUX |
| Scrambler: | Enabled (Part No. 1001,1003,1005,1007) Disabled (Part No. 1002,1004,1006,1008) |
| Billing Server: | |
| PSR Restamping: | Enabled |
| | |
| Inputs section | |
| Protocol/Port: | 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) | 1000 |
| Symbol Rate (kSpS) | 14400 |
| Modulation – FEC | 8PSK 3/4 |
| Roll-off | 0,25 |
| FEC Frame length | Normal |
| Pilot tone | off |
| Spectrum inversion | off |
| Output attenuation (dB) | -3.5 |
| | |



3.5. SETTINGS FOR THE ETHERNET NETWORK INTERFACE

Allocation of IP address, default : 10.10.10.20

One-time at the start an IP address via a DHCP server is requested. If the probe fails, will use the default IP address.

The default IP address is used.

IP-Address: [0.0.0.0 ... 192.168.2.86 ... 255.255.255.255]

A default IP address for the case that “use DHCP” is set to “OFF”, or no DHCP server could be reached.

IP-Subnetmask: [0.0.0.0 ... 255.255.255.0 ... 255.255.255.255]

The mask corresponding to the IP address.

IP-Gateway: [0.0.0.0 .. 255.255.255.255]

A default IP address for the device to a possibly active exploitation of a gateway in the network.

SNMP Trap IP-Addr: [0.0.0.0 .. 255.255.255.255] IP address to a possible used SNMP trap manager.

| System | Network | Inputs | Programs | SI Generator | Modulator |
|--------|---------|--|----------|--------------|-----------------------|
| | | IP address | | | 10.10.10.21 |
| | | Subnet mask | | | 255.255.255.0 |
| | | Default gateway | | | 10.10.10.1 |
| | | DNS Server1 | | | 8.8.8.8 |
| | | DNS Server2 | | | 8.8.4.4 |
| | | NTP Server | | | 0.debian.pool.ntp.org |
| | | <input type="button" value="Save and reboot"/> | | | |

Network Time Protocol (NTP) is a networking protocol for clock synchronization between computer systems over IP. NTP is intended to synchronize all participating computers to Coordinated Universal Time (UTC). You must specify the URL of NTP Server that will synchronize the current time, which will be indicated in the **Time and Date Table (TDT)** and on the subscribers set-top-boxes.

(TDT) provide a time reference for the stream. The TDT contains the current UTC time. The Modulator/MUX does not have its own real-time clock. Therefore, if you turned “ON” the function of forming TDT (in SI GENERATOR menu, see page No.11), then you need to provide a connection to the Internet.

3.6. CONFIGURATIONS VIA THE ETHERNET INTERFACE

If it is necessary to change the basic configuration, the particular HTML user interface must be called up on a computer connected to the device(s). All the settings can be made via Internet Browser. How the user interface works is almost self-explanatory. Any special features of use will be explained in the following chapters.

To use all functions of the device by WEB-interface activate Java Script in your browser settings. Network connection to the computer System requirements: - PC/ laptop with 10/100/1000 Mbit Ethernet interface - any Internet browser, capable JAVA script (Google Chrome is recommended). The device has to be connected to PC network using an Ethernet cable. The default IP address of the device is 192.168.88.21. In order to access the WEB interface of the device from a PC, the PC has to be in the 255.255.255.0 subnet. If multiple devices are connected to the same network each device must be set to its own unique IP address to avoid address conflicts. After these settings, the IP address of the PC has to be adjusted to match the network.

3.7. CONNECTION SETUP

When the IP address for the device has been entered into the address field of the browser, a connection will be made to the relevant device and the appropriate SYSTEM window will be displayed.

There are two options for the menu, depending on the choice of the INPUT MODE line:
IP MODE or **IP->MUX MODE**.

The multiplexer function is not used when the **IP INPUT MODE** is selected. The transport stream is fed to the modulator output unchanged.

The screenshot shows a web interface for system configuration. At the top, there are three tabs: 'System', 'Inputs', and 'Modulator'. The 'Inputs' tab is active. Below the tabs, there are several configuration fields:

- Serial No:** 0x1C00000A
- Hardware ID:** 0x0102
- Input mode:** A dropdown menu with 'IP' selected and circled in orange.
- Scrambler:** A dropdown menu with 'Enabled' selected.
- Billing server:** A text input field containing 'Server address'.

At the bottom, there is a 'System configuration' section with three buttons: 'Backup', 'Restore', and 'Add key'. Below these buttons is a green 'Accept' button.

BACKUP. You can save all settings of the device as a backup.json file.

RESTORE. You can upload a backup.json file to change the device configuration.

ADD KEY. You have the opportunity to make an additional order for the TROPHY-ACCESS license. The received key must be entered after pressing the ADD KEY button.

The multiplexer function is available when the **IP->MUX INPUT MODE** is selected. The transport stream is fed to the modulator output through 120-channel multiplexer.

The screenshot shows the 'Modulator' configuration page. The 'Input mode' dropdown is highlighted with an orange circle and set to 'IP->MUX'. Other fields include Serial No (0x1C00000A), Hardware ID (0x0102), Scrambler (Enabled), Billing server (Server address), and PCR Restamping (Enabled). There are buttons for Backup, Restore, Add key, and Accept.

SERIAL No. is unique for each device. This number must be specified when ordering an additional TROPHY-ACCESS license.

SCRAMBLER function is working if TROPHY-ACCESS license added.

The license can be included in the factory in case of prior order. Otherwise, the license can be installed by entering the text key received from the manufacturer after confirming the license order.

BILLING SERVER address can be specified if a TROPHY-ACCESS scrambled signal is at the modulator/multiplexer output. In this case, the subscription information (list of included decoders and rights to view of program packages) should be present in the stream.

PCR RESTAMPING (PCR - Program Clock Reference)



Synchronization of the receiver System Time Clock (STC) with the transmitter STC depends on transmitting PCRs through a constant-delay portion of the system. Thus, PCRs are inserted following the encoder buffer and extracted before the receiver buffer. PCRs are inserted with a maximum interval of 100ms.

Synchronization can be adversely affected by transmission over links having a variable delay or time jitter (IP transport, for example), and the accuracy of clock recovery must be studied if such an application is contemplated.

PCRs are also affected by the multiplexing of multiple program streams. In this case, there is additional buffering in the multiplexer, and it may become necessary to re-stamp the PCR values of data that is transmitted earlier or later than expected. Although the MPEG standards provide the means to maintain synchronization in this case, they do not specify the jitter limits, suggesting only that it is "intended" to be +/-4 ms maximum in a well-designed system.

3.8. INPUTS

The 120 possible logical stream channels can be defined as a multi-program stream or single program stream and can be operated according to the IP address space specified in multicast mode or singlecast.

| System | Inputs | Modulator | |
|----------|--------|---|---|
| | | | + |
| Protocol | Port | Programs | |
| UDP | 1234 | 8 | × |
| UDP | 1001 |  | × |
| UDP | 12345 |  | × |

In the first step, the IP address, netmask and gateway address of stream sources are assigned to the ETHERNET interface for use in the local network. And Port number of streams are individualized!

The SOURCE settings can be made separately for each stream channel. The port number must be unique and can not be repeated!

After the source of the transport stream has been connected to the ETHERNET switch of the local network, you must press the “+” button and enter the port number of source.

The information about the number of programs found on a specific port is displayed in the PROGRAM column. In the event that there is no correct transport stream on any port, the icon with a rotating scale is displayed in the PROGRAM column. Check the correspondence between the port number and the network parameters of the source and modulator input!

Add source ×

Protocol:

Port:

3.9. PROGRAMS

Program name: The program name is the service designation. By default, for each program, the program name will be automatically generated, which coincides with the name specified in the incoming thread. You can change the name to another one.

These names will be displayed in the table of the receiving devices. They must be unambiguous.

| SID | Program name | Type | In Port:SID | | |
|-----|--------------|--------|-------------|--|--|
| 30 | RUSTAVI2 | 1 (TV) | 1234:8501 | | |
| 60 | CNN | 1 (TV) | 1234:8502 | | |
| 70 | ITV | 1 (TV) | 1234:8505 | | |
| 80 | BBC One | 1 (TV) | 1234:8507 | | |
| 90 | EuroSport | 1 (TV) | 1234:8506 | | |
| 100 | QARTULI TV | 1 (TV) | 1234:8510 | | |
| 110 | KAVKASIA | 1 (TV) | 1234:8504 | | |
| 120 | MARAO | 1 (TV) | 1234:8503 | | |

The position information that was specified in the configuration will form the basis for the allocation of PID Service IDs in ascending order. You can change program names, A PID, VPID, SID and TYPE OF PROGRAM (1-TV, 2-Radio, 3-Teletext, 4-Unknown). VPID and PCR-PID has a same value.

You can change CONDITIONAL ACCESS mode also (FTA, Type1, Type2, Type3)

The multiplex contains a number of different services, where each service contains at least one audio stream, at least one video stream and usually several data streams. You must to indicate the type of the stream (some can't be identified by the software in this case) and the SID number that is the number of the service (or program).

Secondly, you must indicate the PID value for each elementary stream. It's normally good practice to give elementary streams belonging to the same service similar PID values. That way, it's easy to identify which service a given stream belongs to.

The SID/ PID for the slots configured (the programs and channels) is automatically allocated according to a fixed pattern.

Program properties

SID:

Name:

Type: (TV)

Conditional Access:

| Type | Source PID | PID | Enabled |
|-----------------|------------|-----|-------------------------------------|
| MP4 Video (PCR) | 110 | 121 | <input checked="" type="checkbox"/> |
| MP1 Audio (geo) | 121 | 122 | <input checked="" type="checkbox"/> |

3.10. 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 | 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="Provider Name"/> | |
| | | 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. If this option is not available, you must set "OFF" value in the TDT 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.

3.11. 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 30000 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 8PSK: 3/5, 2/3, 3/4, 5/6, 8/9, 9/10 16APSK: 2/3, 3/4, 4/5, 5/6, 8/9, 9/10 32APSK: 3/4, 4/5, 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 -31.5 to 0 dB |
| RF output | On/Off |

System Inputs Programs SI Generator Modulator

Total data rate: 32.085 Mbit

Payload rate: 30,155 Mbit (0,94%) Subs rate: 1,93 Mb

Output Frequency (MHz) 1000

Symbol Rate (kSpS) 14400

Modulation - FEC 8PSK - 3/4

Roll-off 0.25

FEC Frame length Normal

Pilot tone Off

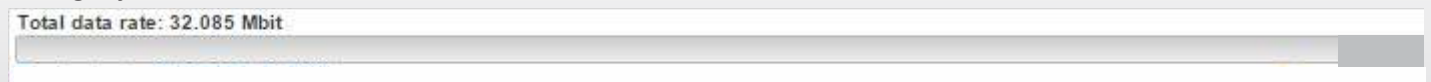
Spectrum inversion Off

Output attenuation (dB) -3.5

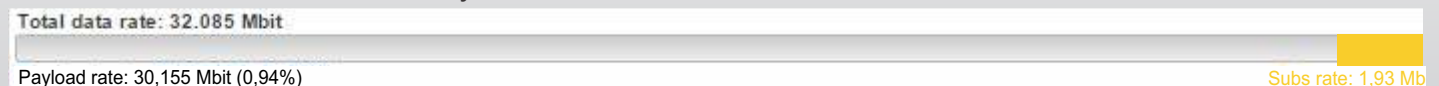
RF Output On

Accept

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.



4. SPECIFICATIONS

| Standards | |
|--|--|
| Carrier ID | ETSI 103 129 |
| DVB-S2 | EN 302 307 |
| MPEG-TS | EN 301 210 |
| DVB MPEG-TS over ASI | EN50083-9; ETSI TR 101 891 |
| DVB MPEG-TS over IP | ETSI TS 102 034 |
| MPEG-2 PSI Tables (PAT&PMT) | EN 300 468 |
| ASI input (optional) | |
| TS transfer format | MPEG-TS, 188 bytes over ASI |
| Level range | 200...880 mV |
| Data rate | 0,625...120 Mbps |
| ASI transfer format | continous, burst |
| Connector | BNC socket |
| Impedance | 75 Ohm |
| IP input (stream port + WEB interface) | |
| Connector | RJ-45 |
| Streaming protocol | UDP |
| Streaming mode | CBR/VBR |
| Encryption 0,25 to 120Mbps | TROPHY-ACCESS (additional license) |
| RF Outputs | |
| L-Band | 900MHz to 2150MHz, 10kHz step |
| IF-Band | 50MHz to 90MHz, 10kHz step (optional) |
| SNR | > 40dB @ 0dBm – 16APSK – 30Mbaud |
| Shoulders rejection | < -50dB @ 0dBm & f/fN=1,5 for 20% roll-off |
| Main RF output | Type N (50Ohm - L-band; 75Ohm – IF-Band) |
| Attenuation range | 0dBm to -20dBm, 0,1dB step |
| Monitoring RF output (-20dB) | Type N (50Ohm - L-band; 75Ohm – IF-Band) |

| | |
|-----------------------------------|---|
| Multiplexer | |
| Quantity of multiplexed channels | up to 120 |
| PID quantity supported | All PIDs of input services |
| Modulation | |
| DVB-S2 | QPSK: 1/3, 2/5, 1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 8/9, 9/10 |
| | 8PSK: 3/5, 2/3, 3/4, 5/6, 8/9, 9/10 |
| | 16APSK: 2/3, 3/4, 4/5, 5/6, 8/9, 9/10 |
| | 32APSK: 3/4, 4/5, 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 0,1 to 30Mbaud, step 1Baud |
| Control & Monitoring | Web Browser Control & Monitoring |
| | 10/100/1000 Base-T Ethernet ports |
| | 90 to 240VAC/50Hz/15W |
| Physical | 2kg Weight |
| | 0°C to 50°C temperature range |
| TROPHY-ACCESS Options | |
| 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-S2 to IP STREAMERS



DB-100 RECEIVER

The device receives DVB-S/S2 signal, descrambling CAS services and transmit a Transport Streams (up to five services, not more then 25Mb) to IP output. There are manage and complete information about the state of the STREAMER by WEB - interface of the HEADEND.



TWIN DB-800 RECEIVER

The device receives two DVB-S/S2 signals, descrambling CAS services and transmit a Transport Streams (up to five services, not more then 25Mb for each port) to IP outputs. There are manage and complete information about the state of the STREAMER by WEB - interface of the HEADEND.



DB-800-CI TWO CHANNEL RECEIVER

The device receives two DVB-S/S2 signals, descrambling CAS services and transmits a Transport Streams (up to five services, not more then 15Mb for each port) to IP output. There are manage and complete information about the state of the STREAMER by WEB - interface of HEADEND. The device is equipped with a two SMART-card readers and two CI-slots.

Options:

| | |
|--------------------|---|
| Input frequency | 950...2150 MHz |
| Input signal level | -65...-25 dBm |
| S/N | Not less than 8 dB |
| Input impedance | 75 Ohm |
| Demodulation | QPSK/8PSK |
| Input symbol rate | 1...45 Msymb/sec (QPSK) 1...37 Msymb/sec (8PSK) |
| FEC | QPSK: 1/2, 2/3, 3/4, 5/6, 7,8 8PSK: 1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 7/8, 8/9, 9/10 |
| Operation temp. | 0°C...32°C |
| Supply voltage | +12V/2A (DB-100&DB-800); 230VAC/0,8A (DB-800CI) |

Interfaces

| | |
|-------------------|-------------------|
| Input interface | Ethernet 100BaseT |
| Control interface | Ethernet 100BaseT |
| Input connector | F-connector |
| Output connector | RJ45 |

All changes to the RECEIVER setting are made through FTP client using FAR MANAGER and TOTAL COMMANDER. To do this, go to the DSC-01 server from the network or by connection a monitor and keyboard.

Going to the RECEIVER via FTP:

Login: root
Password: dreambox

Find the desired file and press <F4>.

Don't forget to save <F2> after making changes.


DVB-S2 to IP STREAMER and BISS encryption

Keys file use for this situation.

Keys file is placed in a folder with the setting of the OSCAM: **/etc/tuxbox/config**
Name of the file is **oscam.keys**. We enter into this file the needed keys.

For example, keys for BISS decryption has format:

F <SID of channel><Video PID of channel> 00 <key>

F <SID of channel ><Video PID of channel> 01 <key>

Channel SID and Video PID you can see here: <http://www.lyngsat.com>

For example, for TET channel (4.8°E) (<http://www.lyngsat.com/astra4a.html>)

SID-VPID => 6110 and 6111 (in decimal system)

You need to convert these numbers into HEX system: 6110 & 6111 DEC => 17DE & 17DF HEX

Thus, you should write into file:

F 17DE17DF 00 xxxxxxxxxxxxxxxxxxxx

F 17DE17DF 01 xxxxxxxxxxxxxxxxxxxx

You should write official BISS key instead.

If you'll write 1FFF instead "Video PID of channel", it will be right.

For example:

F 17DE1FFF 01 xxxxxxxxxxxxxxxxxxxx

F 19781979 00 1A1A1A001A1A1A00 ;1 auto ua (4.8E)

F 19781979 01 1A1A1A001A1A1A00 ;1 auto ua (4.8E)

F 00011FFF 00 CBA987FB654321C9 ; TV Canaria tonytr 2008-05-14 02:06:36

F 00011FFF 01 CBA987FB654321C9 ; TV Canaria tonytr 2008-05-14 02:06:36

F 17ED1FFF 00 1A2B3C814D5E6F1A ; 1+1 International ricky 2011-06-11 22:30:09

F 17ED1FFF 01 1A2B3C814D5E6F1A ; 1+1 International ricky 2011-06-11 22:30:09

F 17e817e9 00 0902190063230600 ;2+2



DVB-S2 STREAMERS and conditional access cards

You enter into **directory /usr/bin** and you must to edit **streamts.sh** script. You must comment out (# symbol) the lines:

```
#!/bin/sh
if [ ! -e /var/keys ] ; then
    ln -s /etc/keys /var/keys
fi
killall camd3
killall oscam
killall streamts
sleep 3
#/usr/bin/camd3
/usr/bin/oscam -b
sleep 2
/usr/bin/streamts
#/var/bin/fbiss,
#/usr/bin/oscam -b
```

And you must to remove the comment in line:

`/var/bin/camd3`

or you must to add the line, if line is not.

Save the file.

It are files into `/var/keys` directory:

```
camd3.config
BOXTYPE=4
HTTP_PORT=9080
HTTP_ADMIN=admin
HTTP_PASSWORD=camd3
DESCR_DELAY=500
SLOT=/dev/sci0:2:1:1:1:999:slotunten:password3 # server
```

```
camd3.filter
0500:023700:FFFF:FFFF:1:1
```

```
camd3.ignore
0500:020710:FFFF:FFFF
0500:040600:FFFF:FFFF
0500:030600:FFFF:FFFF
```

```
camd3.servers
#cs357x://dm1:dm1:SERVICES=/var/keys/camd3.filter@10.10.10.100:20248 #client
```

```
camd3.users
dm1:dm1:SERVICES=/var/keys/camd3.filter
```

This is example for camd3 configuration for **local** encryption of the services and for keys distribution on the network. Distribution conducted using filtering of non-23700 idents. Client configuration differs only in the absence of # symbol into the first position of the camd3.servers file. You can see IP address of receiver (10.10.10.100, conditional access card is inserted), where camd3 is launched

Stream 0x11 "Dreambox 224"

| Name of the stream (used for logging only)
 SID of programs from the satellite.

Remap 0x300 base PID for program PID remapping.

DubIP 239.1.1.6 eth3 11111

239.1.1.6 This parameter is used for multicast or unicast IP broadcast organization
eth3 multicast group or unicast address
 in the case of multicast, the output interface through which IP traffic is
 sent
11111 destination port

DubTTL 16 TTL applies in the case of multicast broadcasting

</ Tuner> end of section

<Output>

id 0 Number of output

#

OutAddr 192.168.1.200 222

Destination address and port

PacketSize 380

Packet size

</ Output>

<Tuner>

Dreambox224

TunerIP 10.10.10.223

ServerIP 10.10.10.11

Freq 12242 27500 3

LNB 10600

LNBI 1

<service>

stream 0x283D BBC

Remap 0x310

Out 1

encrypt 1

</service>

<service>

stream 0x283E ITV

Remap 0x330

Out 1

encrypt 2

</service>

</Tuner>

Monitoring of the STREAMERS

Go to the Billing server address: 10.10.10.254

Login: **aj**

Password: **aj**

We recommend to replace the name and password to confidential.

Open the "Channels / streams" and MONITOR menu item.

You can see the IP-address table and receivers current state, namely

The screenshot displays the 'Channels / Streams' monitoring interface. The main table shows the following data:

| Source | Lock | UE | DEM | DET | SEF | SENF | SID | Rate (bps) | Name | Out | Remap | F | Encrypt | Level | SNR |
|--------------|------|----|-------------|--------|-----|------|----------|------------|-------------------|-----|-------|-----|---------|-------|-----|
| 10.10.10.51 | 0 | 0 | 0 | | | | 2840 | 3533127 | Россия 1* | 0 | 0300y | FTA | 83 | -2 | |
| 10.10.10.55 | 0 | 0 | 0 | | | | 2848 | 0 | ds* | 0 | 0310y | FTA | 0 | 0 | |
| 10.10.10.57 | 0 | 0 | 11 | | | | 2840 | 3533127 | Россия 1* | 0 | 0320y | FTA | 90 | -1 | |
| 10.10.10.59 | 1 | 0 | 13 | | | | 2840 | 3535231 | Россия 1* | 0 | 0330y | FTA | 89 | -1 | |
| 10.10.10.18 | 0 | 0 | 0 | | | | 10601485 | | | | | | | | |
| 10.10.10.19 | 0 | 0 | 0 | | | | 0 | 283e | ds* | 0 | 0300y | FTA | 0 | 0 | |
| 10.10.10.100 | 0 | 0 | 6 | | | | 0514 | 1633454 | Euroling* | 0 | 0310y | FTA | -40 | 12 | |
| 10.10.10.113 | 0 | 0 | 3372 | | | | 003d | 6646274 | MTVM HD* | 0 | 0320y | FTA | -42 | 14 | |
| 10.10.10.58 | 0 | 0 | 5 | | | | 0138d | 3780662 | TV 3* | 0 | 0330y | FTA | 91 | 0 | |
| 10.10.10.61 | 0 | 0 | 2 | | | | 0272e | 2909164 | REN-TV* | 0 | 0340y | FTA | 90 | -1 | |
| 10.10.10.103 | 0 | 0 | 0 | | | | 0283e | 0 | ds* | 0 | 0350y | FTA | 0 | 0 | |
| 10.10.10.242 | 0 | 0 | 0 | | | | 0001e | 0 | Eurosport HD* | 0 | 0360y | FTA | 0 | 0 | |
| 10.10.10.56 | 0 | 0 | 0 | | | | 01490 | 0 | ds* | 0 | 0370y | FTA | 0 | 0 | |
| 10.10.10.104 | 1 | 0 | 6 | | | | 0283e | 2401247 | THT* | 0 | 0380y | FTA | 89 | -1 | |
| 10.10.10.101 | 0 | 0 | (+4) 239 | | | | 02840 | 3464569 | Россия 1* | 0 | 0390y | FTA | -64 | 12 | |
| 10.10.10.60 | 2 | 0 | (+2) 2011 | | | | 0002 | 2688241 | DRIVE* | 0 | 0300y | FTA | 96 | 0 | |
| 10.10.10.52 | 53 | 0 | 16804 | | | | 0508e | 1913978 | Cartoon Network** | 0 | 0340y | FTA | 89 | 0 | |
| 10.10.10.54 | 287 | 0 | (+6) 130161 | 130156 | | | 05087 | 2328983 | Discovery World* | 0 | 0300y | FTA | 90 | -1 | |
| 10.10.10.50 | 32 | 0 | 11529 | 11524 | | | 0508e | 1913978 | Cartoon Network** | 1 | 0300y | FTA | -35 | 13 | |
| 10.10.10.51 | 1 | 0 | 2210 | 133 | | | 0508e | 1913978 | Cartoon Network** | 3 | 0300y | FTA | 91 | -1 | |
| | | | | | | | | 1913978 | | | | | | | |

Additional interface elements include a navigation menu (Customers, Payments, Channels/Streams, Prices, Settings, Reports, Exit), a filter dropdown (ALL), and a status bar at the bottom showing 'root:root:0:User is not selected' and 'Unfiltered Deleted'.

| | |
|----------------|---|
| LOCK | SAT signal LOCK indicate. GREEN is LOCK on, RED is LOCK off, GREY. Receiver is not available for monitoring. |
| UE | (UNLOCK ERRORS) Amount of signal loss since the last power-up. |
| DEM | (DISCONTINUOUS ERROR of MULTIPLEXER) Loss of signal at multiplexer input. |
| DET | (DISCONTINUOUS ERROR of TUNER) Loss of signal at receiver output. Thus, if there is a difference between the DEM and DET values, you need to look for problems in the HEADEND Ethernet network. |
| SEF | Data sinchronization errors into receiver. If it is not zero receiver is defective. |
| SID | (SERVICE ID) – Satellite channel SID |
| RATE | Bit rate of the service. The table also indicates the total service rate of transponder. |
| NAME | Name of channel (display on subscriber receiver). |
| OUT | DSC-01 Ethernet output number (0...4). |
| REMAP | Service PID on the Headend output. |
| F | Found or not in the satellite signal the SID from configuration file (Y- yes, N- no). |
| ENCRYPT | Free or not free signal on the Headend output. |
| LEVEL | Satellite signal level on the receiver input (% or dBm). |
| SNR | Signal to noise rate at the receiver input. |

H.264 TRANSCODER

H.264 TRANSCODER is professional multi-channel transcoding solution, which provides powerful transcoding capability with lowest latency. It has full support of commonly used media formats today, such as G.7xx, MP2/3, AMR, AAC, AC3, H.263(+), H.264(AVC), H.265(HEVC), MPEG-1, MPEG-2 and MPEG-4, also including the HTML5 video - VP8/VP9.

H.264 TRANSCODER accepts all kinds of media materials as transcoding sources, pre-recorded media files, TV tuner cards and network streams such as HTTP, MMS, RTSP, RTMP (flash video),



FEATURES:

Streaming from HTTP/RTSP/MMS/RTMP URLs
 Streaming from Local Media Files & Folders
 Streaming from DirectShow Compatible Capture Device
 RTMP Stream Pulling & Pushing with Adobe/limelight Authentication
 File/Folder Loop Streaming
 Streaming on UDP Multicast Address
 Fail-safe Streaming

| Input Formats Supported | Output Formats Supported |
|---|---|
| HTTP/HTTPS | RTMP/RTMPE/RTMPS/RTMPT |
| MMS over TCP / HTTP tunnelling | MPEG-2 TS over UDP |
| RTSP over UDP/TCP | MPEG-2 TS over HTTP |
| RTMP/RTMPE/RTMPS/RTMPT | m3u8 Playlist (Apple HTTP Live Streaming) |
| RTP (Real-Time Transport Protocol) | Native RTP (Real-Time Transport Protocol) |
| MPEG-2 TS over UDP | |
| MPEG-2 TS over HTTP | |
| MPEG-2 TS over RTP NEW | Output Video Resolution |
| Microsoft DirectShow Compatible Capture Device | SQCIF (128x96) |
| USB Webcam | QCIF (176x144) |
| Digital (Video) Camera (firewire cable connected) | QVGA (320x240) |
| PCI-E Video Capture Card | CIF (352x288) |
| Multimedia File | VGA (640x480) |
| Audio Files: .pcm/.wav/.mp3/.amr/.wma/.voc/.ogg/ | 4CIF (704x576) |
| Video Files: .avi/.mpg/.mp4/.mov/.mkv/.wmv/.3gp/ | SDTV (720x576) |
| .vob/.flv/.swf/.rm/.rmvb/.webm | HDTV (1280x720) |
| Picture Files: .bmp/.jpg/.gif/.png/.tif | Custom/User-specified (H.263+/H.264/MPEG-4) |



| Video Codecs Supported | Audio Codecs Supported |
|--|------------------------|
| H.263 | G.7xx |
| H.263+/++ (aka H.263-1998/2000) | MP2/MP3 |
| H.264/AVC (Baseline/Main/High/High 10/High 4:2:2/High 4:4:4) | MP4A/AAC |
| | AMR |
| H.265/HEVC NEW | Ac3 |
| JPEG/MJPEG | Real Audio |
| MPEG-1 Video | Windows Media Audio |
| MPEG-2 Video | |
| MPEG-4/Visual | |
| Real Video | |
| Windows Media Video | |
| On2 Vp6 | |
| Webm Vp8 | |
| Webm VP9 | |

H.264 TRANSCODER provides on-demand media file streaming as well. It can stream from any pre-recorded movie clips on your local disk, with transcoding on the fly. Any media file type with any codec is supported. What's more, you can schedule stream play list via streaming from folder.

For output, H.264 TRANSCODER supports the most popular streaming protocol today - RTMP pushing to Adobe Flash Media Server, Wowza Media Server or Red5 Media Server. MPEG-TS outputting in constant bit rate (CBR) is possible for best compatibility with most

H.264 TRANSCODER gives you full control of video and audio encoding profiles as per your system requirements. Video resolution, quality, frame rate and bit rate, you can reshape your video stream fast and simple. H.264 TRANSCODER also provides professional video post process functions such as logging, watermarking and subtitle overlay.

For example, an RTMP live stream URL:

rtmp://192.168.0.1:1935/live/stream

And an Adobe FMS HLS stream URL:

rtmp://192.168.0.1:1935/livepkgr/livestream?adbe-live-event=liveevent

If RTMP authentication is required, please open Format Advanced -> RTMP Config and enter confidentials there. (See RTMP Config in Advanced Settings below)



To output stream in MPEG-TS over UDP format

Please enter UDP address (IP:Port) of the destination (receiver), for example
udp://192.168.0.1:1234 (unicast), orudp://224.0.0.1:1234 (multicast).

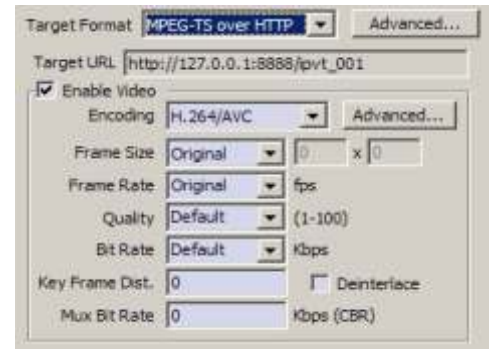


To output stream in MPEG-TS over HTTP format.

Please configure HTTP Port in Global Settings first. The default port number is 8888. Change it if necessary and make sure the port is not occupied by any other applications on your machine. Restarting program is required once HTTP Port changes.

Target URL is not required to enter in this case. The output URL is fixed to

http://<Local IP>:<HTTP Port>/ipvt_<channel#>, for example http://192.168.1.1:8888/ipvt_001. The URL can then be used to feed to streaming servers, or to be played in streaming players like VLC. Remember IP 127.0.0.1 is just for demonstration, you can use ALL IP addresses bound to the machine as <Local IP> in the URL to access the output stream.



To output stream in m3u8 playlist (Apple HTTP Live Streaming) format

Please understand IPVTL DOES NOT output Apple HLS directly. Instead it outputs stream in mpeg-ts segment files and .m3u8 playlist file on your local disk. To broadcast .ts files on the fly you need web server like [Nginx](#), Apache or Microsoft IIS.

The default output file name is C:\stream.m3u8 and the default .ts files generated will be named as C:\stream1.ts, C:\stream2.ts, ... You can edit in Target URL and replace them with preferred folder and file name.

There are more m3u8 related settings in Format Advanced Settings. You can define ts segment length, index rules, etc. Remember if the segment length is very short, like a few seconds, you probably need to set video key frame distance to a low level as well.





To output stream in Native RTP format

You may import and export media attributes through SDP format (See IETF RFC 2327) files by clicking Import SDP and Export SDP buttons. That makes configuration much easier. SDP is a universal method to describe media streams in RTP format. It is widely used together with other multimedia transporting protocols such as SIP and RTSP. Many network stream media players like VLC and QuickTime support SDP file playback.

Once you've finished with the settings, click Apply button to validate and save your configuration. You can always change transcoding settings by clicking Edit button at a later time. But remember setting changes won't make effect to a live channel, until the channel is restarted.

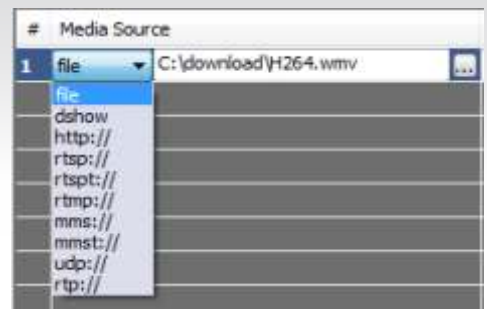



Start Streaming!


After a new transcoding channel is set up, you may enter some memo about the channel in the list to keep it simple to identify. The red light in the last column  indicates the channel is not started yet. Click Start button to start transcoding. If everything is OK, the status light will switch to green , which means the channel is running good now.


Select Your Media Source


Be sure to make clear your media source type before anything. Click New Channel button to create a new transcoding channel with default settings. In the channel list panel, select appropriate streaming protocol and enter the URL of the media source.





 To stream from pre-recorded media file or file folder. Choose "file" as source type, enter the full path of the file or click "..." button to browse for the file. If a file folder instead of a single file is selected, the channel is set to "play list" streaming mode. All supported media files in that folder will be streamed in sequence. Play list controls like forward/backward is available during real time streaming.

 To stream from Microsoft Windows Media Service. Choose "mms" (mms http tunnelling) as source type, enter the URL that can be played in Windows Media Player, e.g. mms://192.168.0.1/vod/playlist.wsx

 To stream from Real Time Media Service like Helix Server and most IP cameras. Choose "rtsp" or "rtspt" accordingly and enter the URL that can be played in VLC player. Note RTSP over TCP (rtspt) (if supported by the source) is recommended in lossy network environment. For RTSP source with authentication, please enter username / password in the following format: rtspt://<username>:<password>@<server_ip>:<port>/stream

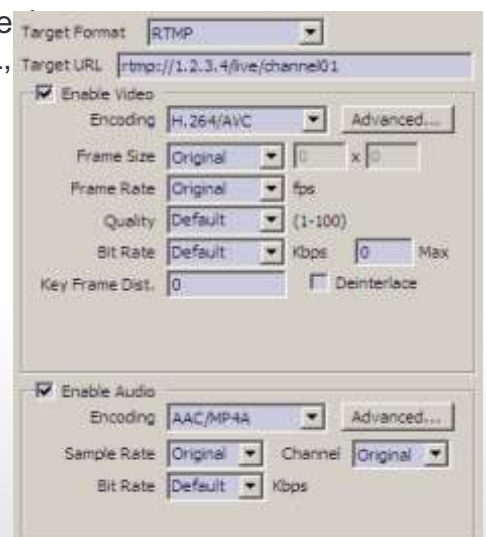
 To stream from Flash video sources. Choose "rtmp" and enter the stream URL in swf player, e.g. rtmp://192.168.0.1/vod/sample, rtmp://192.168.0.1/live/stream. Secured RTMP URLs including rtmpts, rtmpe, rtspt are also supported. If RTMP authentication is required, please enter username / password in the following format: rtmp://<username>:<password>@<server_ip>:<port>/<app>/<stream>

 To stream from MPEG-TS from Dreambox-like DVB-S de. Choose "udp", "rtp" or "http" accordingly, and enter source URL, udp://0.0.0.0:1234 (mpeg-ts over udp unicast)
udp://224.0.0.1:1234 (mpeg-ts over udp multicast)
rtp://224.0.0.1:1234 (mpeg-ts over rtp multicast)
http://192.168.0.1/mpegts (mpeg-ts over http)

 To stream from DirectShow capture devices. Choose "dshow" and click "..." button to enumerate and choose your video / audio capture devices available to stream.

Setup Output Stream

First, select target stream format you demand appropriately, among RTMP, MPEG-TS over UDP, MPEG-TS over HTTP, m3u8 Playlist (HLS) and Native RTP. Then enter target address and modify encoding details if necessary. You can change video resolution, frame rate, quality level, encoding bit rate and audio sample rate, etc.



To output stream in RTMP format

Before setting up RTMP output you need to figure out the proper RTMP publish URL first. Verifying the rtmp address using Adobe Flash Media Live Encoder is recommended.

The format of a full RTMP publish URL is usually like:

rtmp://<server domain/ip>:<port>/<app>/<stream name>

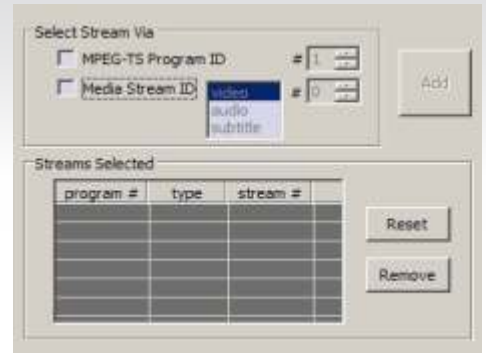
<Tip> A Full RTMP publish URL = <FMS URL> + "/" + <Stream> in Adobe Flash Media Live Encoder.

Advanced Settings



Source Stream Selection

If you are streaming from Multi Program Transport Stream (MPTS), you are able to decide which programs / channels in the source stream are to be output. Selection via either Program ID or media (video/audio/subtitle) stream ID is supported. Remember Program ID starts from 1 and media stream ID starts from 0.



RTMP Config

Flash Version String Customized identification for publishing client (leave it empty if you are not sure)

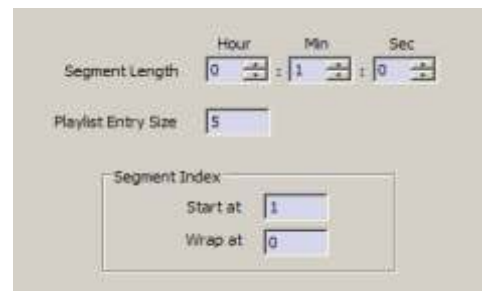
SWF URL Verify RTMP stream URL for server verification (leave it empty if you are not sure)

Publish Username / Password Publishing authentication required by RTMP server (Both Adobe and Limelight authenticating methods are supported)



m3u8 Playlist

If you are streaming into m3u8 playlist, you can define more details about generated .ts segment file here, including segment length, playlist entry size and the rule of segment index number.



Time Shifting

Set time delay and cache file folder for output stream. The input stream will be cached and delayed exactly the time you enter before being output. Please make sure there's sufficient disk space for cache files.



H.264 Encoding

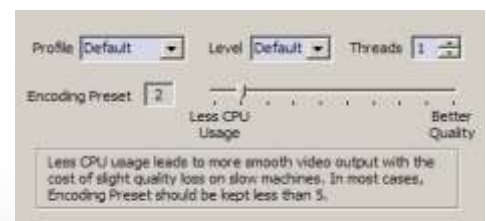
Profile & Level H.264 encoding conformance.

Please refer to

Threads <http://en.wikipedia.org/wiki/H.264#Profiles>

Specify how many threads are to be used for encoding. This setting can be used to fine tune encoding performance.

Encoding Preset Bigger value results in better video quality, at the cost of higher cpu utilization. Choose smaller values to make output more smooth on slow machines. In most cases this value should be kept less than 5.



Quality

Output video picture quality value from 1 to 100. The higher the better quality is. An "Original" string value indicates the same quality as input. A better quality also results in a higher encoding bit rate. Setting both video quality and video bit rate is NOT recommended.



Bit Rate

Video/Audio encoding bit rate in Kbps. Note that low encoding bit rate also results in low video/audio quality. Setting both video bit rate and video quality is NOT recommended.

To setup CBR MPEG-TS output, enter appropriate values for both Bit Rate and Mux Bit Rate. Note that Mux Bit Rate must be larger than the actual output video bit rate plus audio bit rate. For example, set video bit rate to 800kbps and mux bit rate to 1200kbps.

BILLING SERVER

The BILLING SERVER provides the data flow of EPG, PAT, PMT, CAT, TSDT, NIT, SDT, EIT, TDT service information (formed in full accordance with EN 300 468 specification) to the DSC-01 servers.

BILLING SERVER manages the 8PSK to IP STREAMERS and monitors the work of the 8PSK to IP STREAMERS. The BILLING SERVER data enter to the DSC-01 servers using *dvbserver* software.

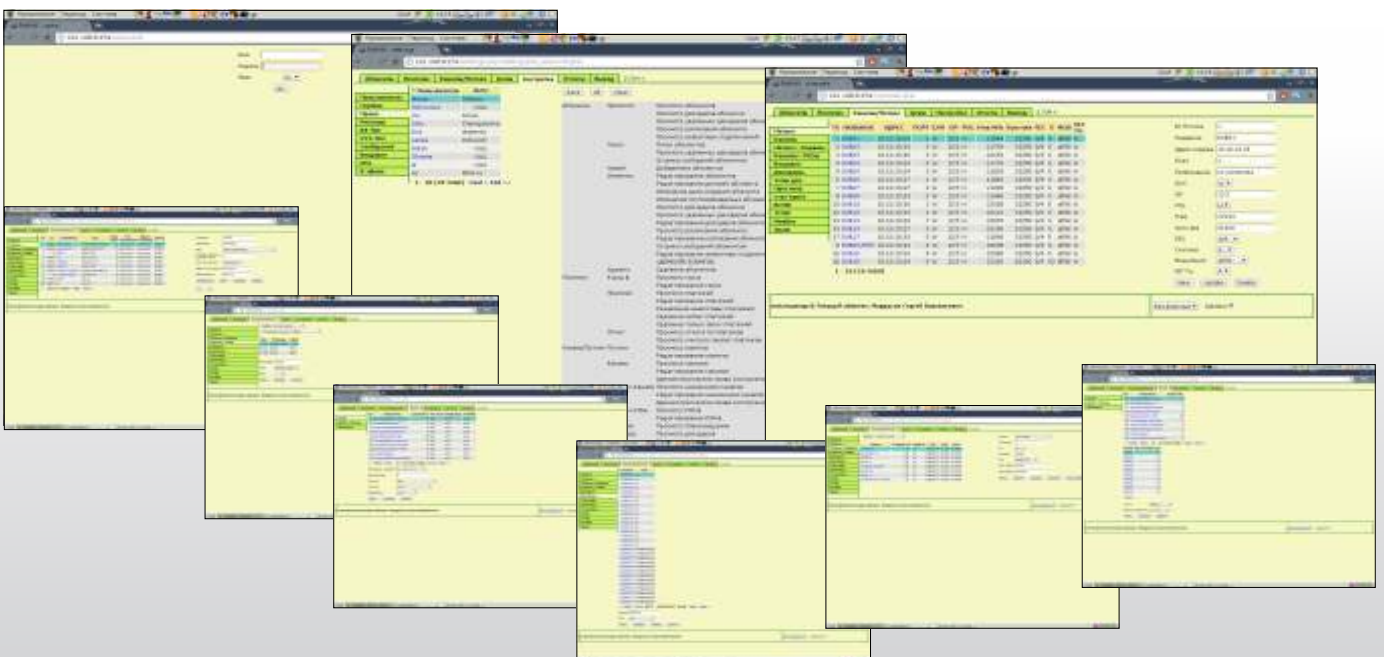


Running of the program is as follows:
`cd / dvbserver / bin`
`killall camserver`
`./ Camserver dvbX`, where X - number of the flow.

Repeat the sequence of commands on all transponders.

Address of the BILLING SERVER is 10.10.10.254.
 Name: root
 Password: 12345678

We recommend to replace the name and password confidential.



| Billing program options | |
|---|--|
| Number of serviced channels. | no restriction |
| Number of serviced packages. | no restriction |
| Number of concurrent clients. | no restriction |
| Customer information. | Contract number, name, street name, house number, apartment number, № phone, notes. |
| Automatically add dates of the contract. | there is |
| Automatically add Registration Date after assigning number of decoder. | there is |
| Automatically closing of the decoder at zero balance on the subscriber account. | there is |
| Program brings money instantly to the account of the customer and shows by how many paid when making a payment. | in VIEW mode |
| The ability to quickly search customer by any criteria specified in the search list. | there is |
| The ability to report output to print. | there is |
| Ability to enter different tariffs. | there is |
| The ability to temporarily disable the automatic inclusion and at a specified time. | there is |
| Types of reports. | Payments for the period of service, at the rates on the balance sheet, on viewing channels for disabled customers on a certain date. |
| Interface Type | WEB |
| Type of architecture | Open |

Ku-band Block-Up-Converter

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

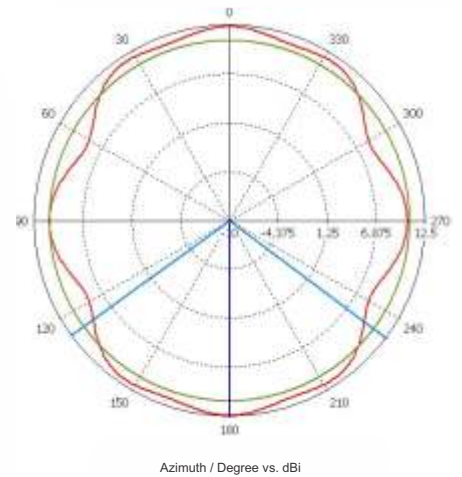
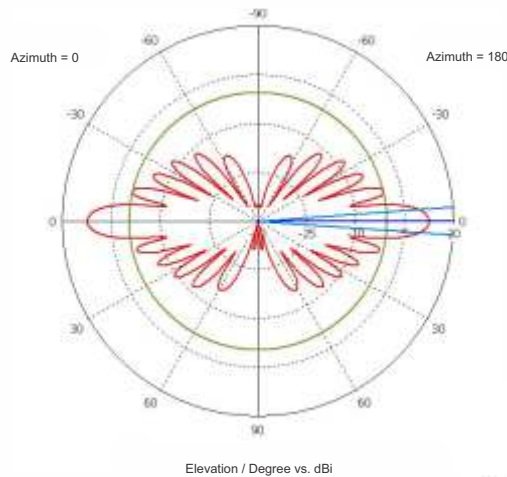


Specifications

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

OMNIDIRECTIONAL SLOT ANTENNA

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



Specifications

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






TV4U QUAD DVB-S2 to DVB-C TRANSMODULATOR is a brand new transmodulator designed for applications over cable network in full compliance with DVB-C standard.

The TV4U QUAD DVB-S2 to DVB-C TRANSMODULATOR converts four DVB-S/S2 transponders into 16QAM/32QAM/64QAM/128QAM/256QAM signal to transmit them in Cable amplifier or Cable optical transmitter.



The device receives a data stream via Satellite. It can receive up to 4x120 elementary MPEG transport streams.

A high-performance FPGA does the analogue TV modulation and the freely adjustable up-conversion into -band range (58 ... 862MHz). A high-speed digital→analogue converter (DAC) is responsible for the excellent output signal.

TV4U QUAD DVB-S2 to DVB-C TRANSMODULATOR:

-  covers the 58...862 MHz range and offers bit rate from 0.1 MSymb up to 7 Msymb;
-  provides up to 4x120 independent MPEG transport streams to a four carriers, with built-in support for TROPHY-ACCESS Conditional Access System for content protection. Software license to enable TROPHY-ACCESS descrambler solution;
-  takes full advantages of the DVB technology to provide a cost effective, highly reliable and flexible solution;
-  provides transport Stream Symbol Rate up to 7 MSymb/s;
-  supports all PIDs of input services, but necessary to use PID filtering for the limit of total input bitrate according limit of QAM output carrier. The table below contains QAM channel bandwidth at different modulation levels. It is necessary to limit the total rate of input services to avoid QAM carrier overflow.

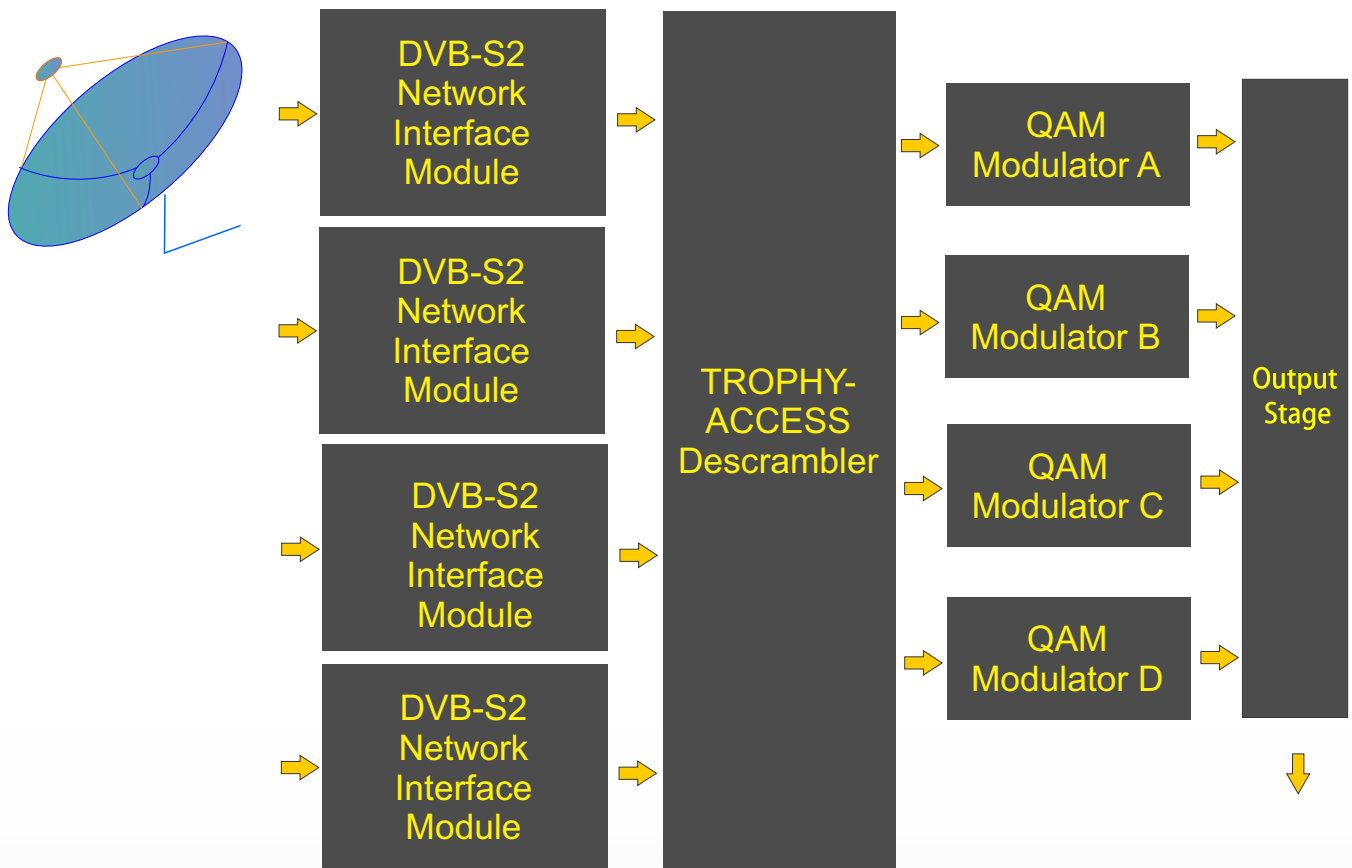
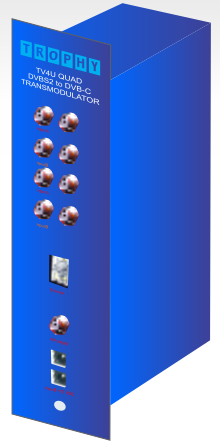
| Modulation | Supported bandwidth of DVB-C channel | |
|------------|--------------------------------------|------------|
| | Frequency bandwidth (MHz) | |
| | 6 MHz | 8MHz |
| 16QAM | 19,23 Mbit | 25,64 Mbit |
| 32QAM | 24,04 Mbit | 32,05 Mbit |
| 64QAM | 28,85 Mbit | 38,47 Mbit |
| 128QAM | 33,66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

-  supports Control and Set-Up via WEB-interface or Command Line Interface;
-  has high performance and reliability.

TV4U QUAD DVB-S2 to DVB-C TRANSMODULATOR integrates the Cyclone V 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.

TV4U QUAD DVB-S2 to DVB-C TRANSMODULATOR provides a high performance channel spectrum. This results gives an efficient transmission in 16QAM, 32QAM, 64QAM, 128QAM, 256QAM mode. The user-friendly Embedded Web Browser ensures ease of use and enables full configuration of the transmodulator, including signal input management, selection of modulation type, control of the mute/unmute conditions for the RF output signal and PIDs filtering. WEB-interface also offers monitoring of all input streams.

TV4U QUAD DVB-S2 to DVB-C TRANSMODULATOR integrates the core technology required to perform high quality modulation based on TROPHY expertise.



To use all functions of the device by WEB-interface activate Java Script in your browser settings. Network connection to the computer System requirements: - PC/ laptop with 10/100/1000 Mbit Ethernet interface - any Internet browser, capable JAVA script. The device has to be connected to PC network using an Ethernet cable. The default IP address of the device is 10.10.10.99. In order to access the WEB interface of the device from a PC, the PC has to be in the same subnet (10.10.10.XX), where XX is not used by any other device in this subnet. If multiple devices are connected to the same network each device must be set to its own unique IP address to avoid address conflicts. After these settings, the IP address of the PC has to be adjusted to match the network.

| Specifications | |
|--------------------------------------|--|
| Standards | |
| DVB-C | EN 300429 |
| MPEG-TS | EN 301 210 |
| DVB-S/S2 inputs | |
| Input connectors | 4xF-connectors INPUT, 4xF-connectors LOOP |
| Types of demodulation | QPSK/8PSK |
| FEC | 1/2, 2/3, 3/4, 5/6, 6/7, 7/8, (QPSK) |
| | 1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 8/9, 9/10 (8PSK) |
| Input signal level | -65...-25 dBm |
| Input signal frequency range | 950...2150 Mhz |
| Frequency tuning step | 1MHz |
| Configuration interface | CLI (Variant A) |
| | WEB (Variant B) |
| TS bitrate | Up to 51,29 Mbit |
| Embedded Encryption/Decryption | TROPHY-ACCESS (additional license) |
| RF Output (one for four carriers) | |
| Channels S1-S7, 6-12, S11-S40, 21-69 | 110MHz to 862MHz, 10kHz step |
| Output level | -15...-35 dBm |
| MER | > 43 dB |
| C/N | >78 dB |
| Attenuation step | 0,5 dB |
| Max output level instability | +/- 0,5 dB |
| Max frequency instability | +/- 30kHz |

| | |
|-----------------------------------|--|
| Modulation | |
| DVB-C | QAM16, QAM32, QAM64, QAM128, QAM256 |
| Supported DVB modes | CCM: Constant Coding and Modulation |
| | VCM: Variable Coding and Modulation |
| | SeamlessACM: Adaptive Coding and Modulation |
| Variable symbol rate | From 0,1 to 7 MSymb, 100 kSymb step |
| Control & Monitoring | Variant A : CLI (Command Line Interface) Control |
| | Variant B : Web Browser Control & Monitoring |
| | 10/100/1000 Base-T Ethernet ports |
| | 90 to 240VAC/50Hz/30W (+12V DC optional) |
| Physical | 1kg Weight |
| | 0°C to 50°C temperature range |
| TROPHY-ACCESS Options | |
| 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 |

★ **Modulator is controlled by a WEB interface.**

Factory settings:
IP address: **10.10.10.99**
Login: **admin**
Password: **admin**

★ **Reset of settings to the factory configuration.**

If you forgot the IP address of the modulator this function will help you. RESET button is mounted in the front panel of the modulator. If you turn on the modulator power when the button is pressed, the modulator configuration will correspond to the factory settings. At the same time the **STATUS** LED will blink of green color. You can set now the required parameters and save the new settings using the ACCEPT button of screen menu.

★ **STATUS LED.**

If the LED is green, the device is in normally. If the **STATUS** LED briefly blinks in red it indicates that the incoming transport stream has a bitrate greater than the bandwidth ability of DVB-C channel. You need to either go to the higher levels of QAM modulation or decrease the amount of data arriving at the input of the modulator.

★ **SYNK LED.**

If the LED is green correct ASI transport stream enters to modulator ASI input.

★ **DEVICE INFO menu.**

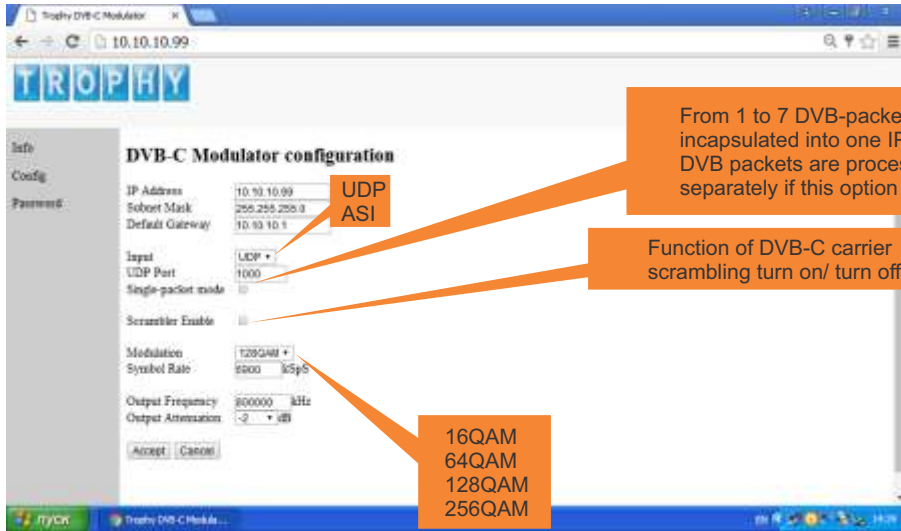
This menu is for information only. You can get information here about the software version of modulator. In addition, the type of TROPHY-ACCESS CAS is indicate. The value can be ranging from 1 to 15. You must specify what type of encoding used on your network in case of ordering of modulator.



| VHF band I | | | IV UHF band | | |
|--------------------------------|----------|-----|---------------------|----------|-----|
| 1 | - | - | 21 | 470..478 | 474 |
| 2 | 58..66 | 62 | 22 | 478..486 | 482 |
| VHF band II | | | 23 | 486..494 | 490 |
| 3 | 76..84 | 80 | 24 | 494..502 | 498 |
| 4 | 84..92 | 88 | 25 | 502..510 | 506 |
| 5 | 92..100 | 96 | 26 | 510..518 | 514 |
| Cable special band I | | | 27 | 518..526 | 522 |
| S1 | 110..118 | 114 | 28 | 526..534 | 530 |
| S2 | 118..126 | 122 | 29 | 534..542 | 538 |
| S3 | 126..134 | 130 | 30 | 542..550 | 546 |
| S4 | 134..142 | 138 | 31 | 550..558 | 554 |
| S5 | 142..150 | 146 | 32 | 558..566 | 562 |
| S6 | 150..158 | 154 | 33 | 566..574 | 570 |
| S7 | 158..166 | 162 | 34 | 574..582 | 578 |
| VHF band III | | | V UHF band | | |
| 6 | 174..182 | 178 | 35 | 582..590 | 586 |
| 7 | 182..190 | 186 | 36 | 590..598 | 594 |
| 8 | 190..198 | 194 | 37 | 598..606 | 602 |
| 9 | 198..206 | 202 | 38 | 606..614 | 610 |
| 10 | 206..214 | 210 | 39 | 614..622 | 618 |
| 11 | 214..222 | 218 | 40 | 622..630 | 626 |
| 12 | 222..230 | 226 | 41 | 630..638 | 634 |
| | | | 42 | 638..646 | 642 |
| Cable special band II | | | 43 | 646..654 | 650 |
| S11 | 230..238 | 234 | 44 | 654..662 | 658 |
| S12 | 238..246 | 242 | 45 | 662..670 | 666 |
| S13 | 246..254 | 250 | 46 | 670..678 | 674 |
| S14 | 254..262 | 258 | 47 | 678..686 | 682 |
| S15 | 262..270 | 266 | 48 | 686..694 | 690 |
| S16 | 270..278 | 274 | 49 | 694..702 | 698 |
| S17 | 278..286 | 282 | 50 | 702..710 | 706 |
| S18 | 286..294 | 290 | 51 | 710..718 | 714 |
| S19 | 294..302 | 298 | 52 | 718..726 | 722 |
| | | | 53 | 726..734 | 730 |
| UHF Hyperband special band III | | | 54 | 734..742 | 738 |
| S20 | 302..310 | 306 | 55 | 742..750 | 746 |
| S21 | 310..318 | 314 | 56 | 750..758 | 754 |
| S22 | 318..326 | 322 | 57 | 758..766 | 762 |
| S23 | 326..334 | 330 | 58 | 766..774 | 770 |
| S24 | 334..342 | 338 | 59 | 774..782 | 778 |
| S25 | 342..350 | 346 | 60 | 782..790 | 786 |
| | | | Additional UHF band | | |
| S26 | 350..358 | 354 | 61 | 790..798 | 794 |
| S27 | 358..366 | 362 | 62 | 798..806 | 802 |
| S28 | 366..374 | 370 | 63 | 806..814 | 810 |
| S29 | 374..382 | 378 | 64 | 814..822 | 818 |
| S30 | 382..390 | 386 | 65 | 822..830 | 826 |
| S31 | 390..398 | 394 | 66 | 830..838 | 834 |
| S32 | 398..406 | 402 | 67 | 838..846 | 842 |
| S33 | 406..414 | 410 | 68 | 846..854 | 850 |
| S34 | 414..422 | 418 | 69 | 854..862 | 858 |
| S35 | 422..430 | 426 | | | |
| S36 | 430..438 | 434 | | | |
| S37 | 438..446 | 442 | | | |
| S38 | 446..454 | 450 | | | |
| S39 | 454..462 | 458 | | | |
| S40 | 462..470 | 466 | | | |

★ CONFIG menu

You can specify the parameters of the modulator in the configuration menu. You can save the new settings by clicking on the ACCEPT button of menu.



★ PASSWORD menu

In this menu you can change the password on the privacy for restrictions of unauthorized access to the configuration menu of the modulator.

