

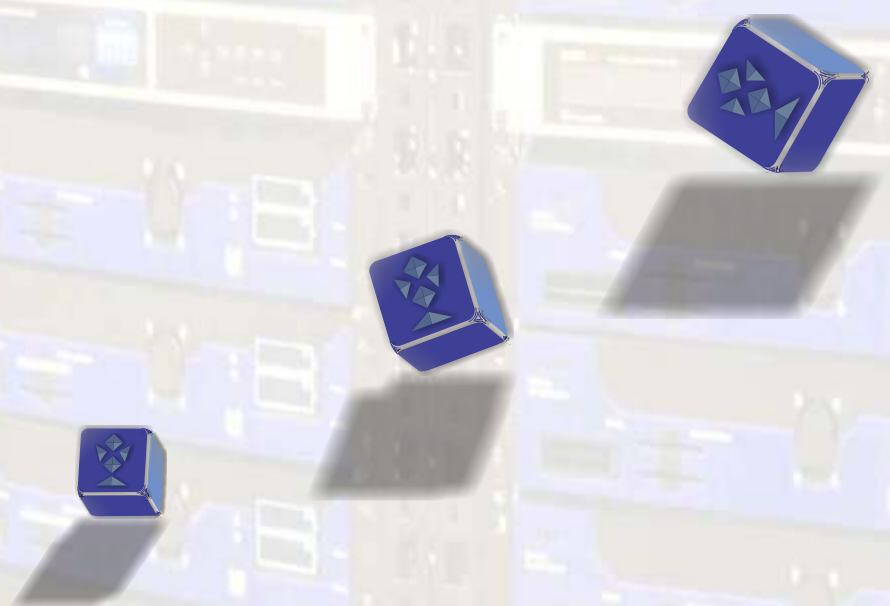
NEW SOLUTION!  
EXCELLENT QUALITY OF PICTURE!  
MINIMUM BIT RATE!

 **TROPHY**



TROPHY MVDS SOLUTION  
(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).

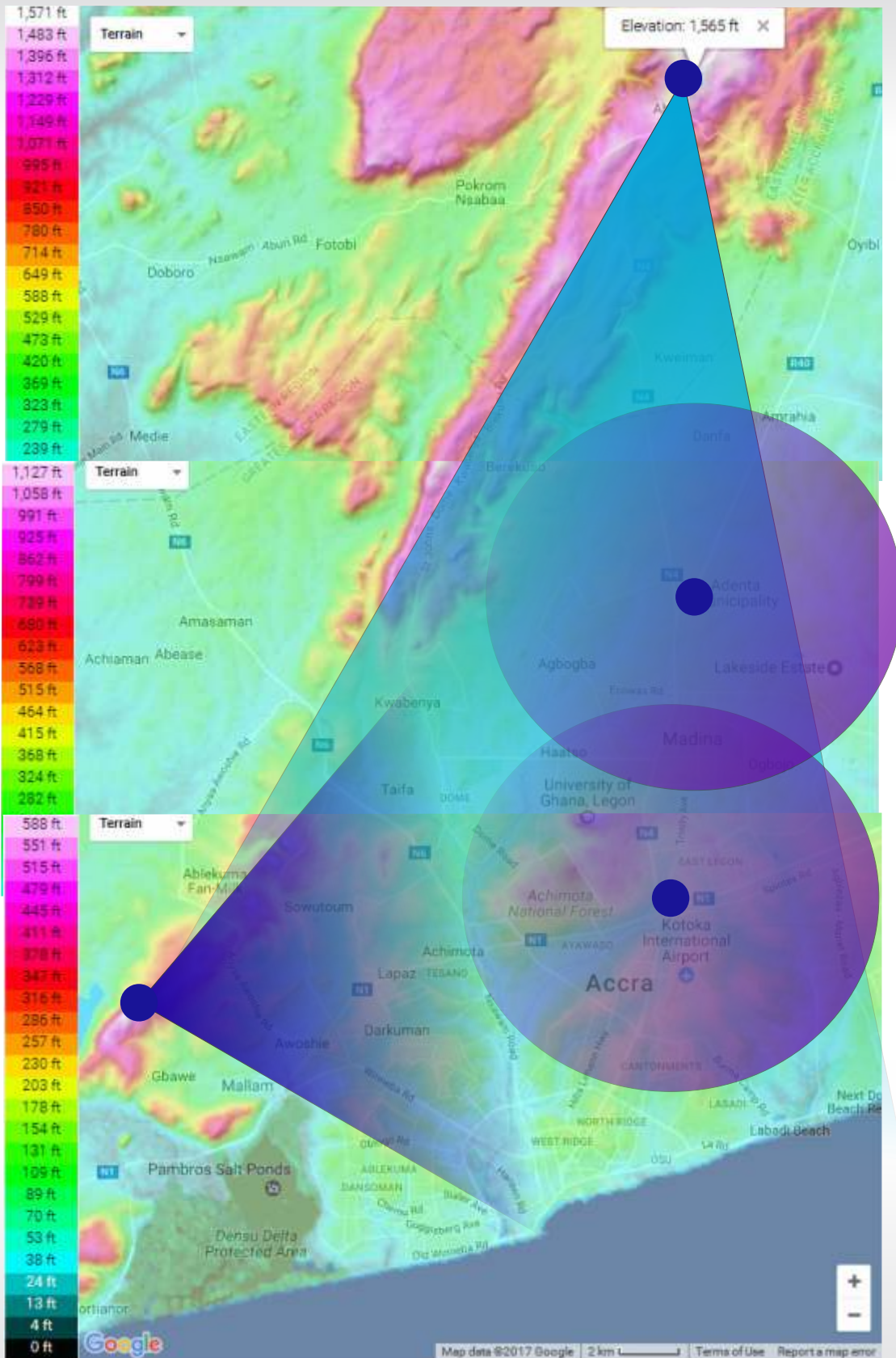
2. Digital wired cable television, built on cluster technology. The source of the signal for a single apartment building or group of buildings is an inexpensive 8PSK-QAM transmodulator.

The screenshot shows the Wikipedia page for MVDS. The article is in English and includes a notice that it does not cite any sources. The main text defines MVDS as an acronym for terrestrial 'Multipoint Video Distribution System' and mentions its use in European Union MWS standards. A table of contents lists sections for Standards, ETSI, UK Standards, CEPT, and Manufacturers of MVDS equipment. The 'Manufacturers of MVDS equipment' section lists several companies, with 'Trophy electronics' circled in red.

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.



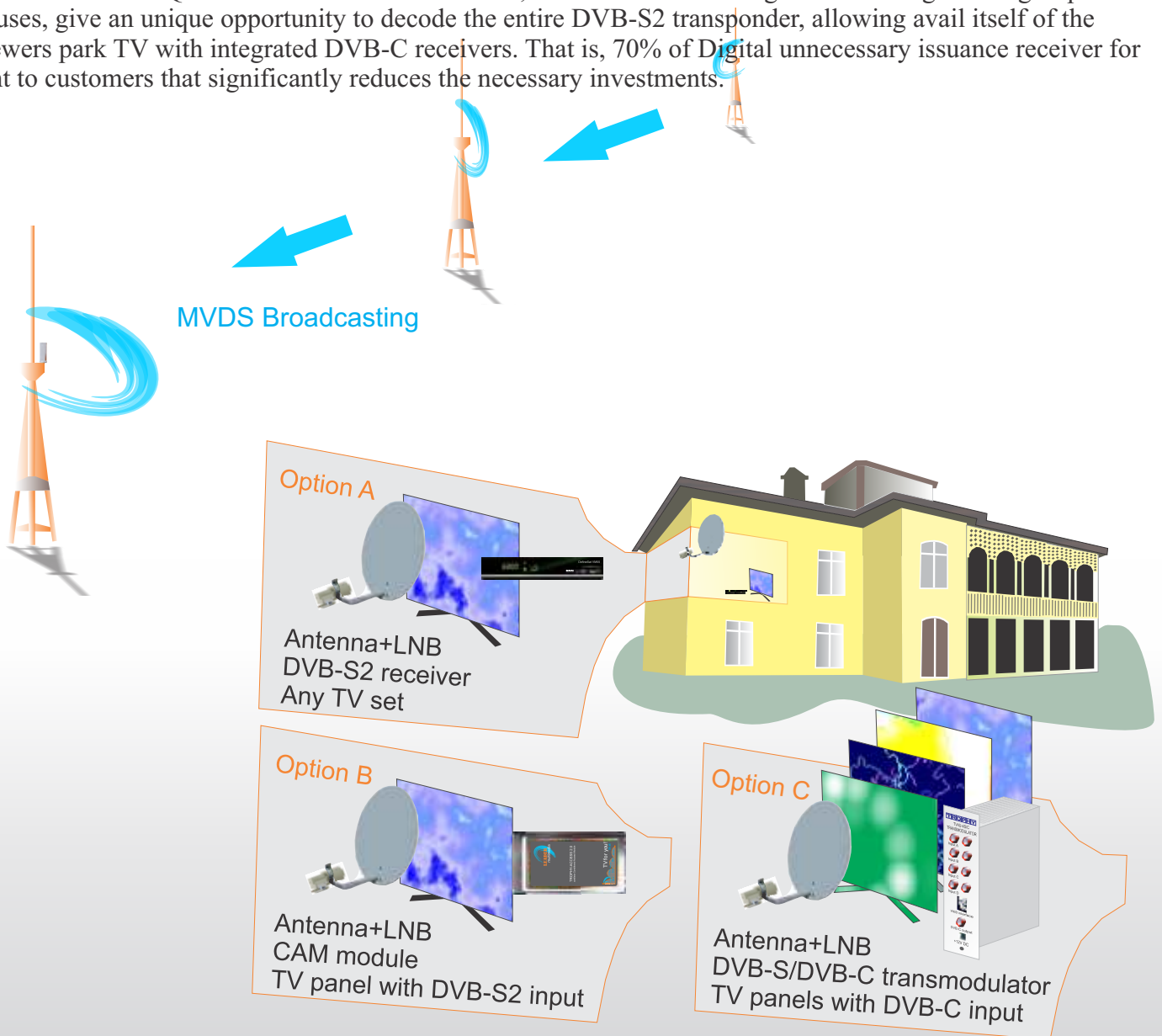


Terrestrial microwave broadcasting implies the obligatory presence of the line of sight between transmitting antenna and receiving antenna of MVDS system subscriber. Fitting locations of repeaters and signal coverage area indicated in the Figure 1. The exact location of the MVDS repeaters must be determined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

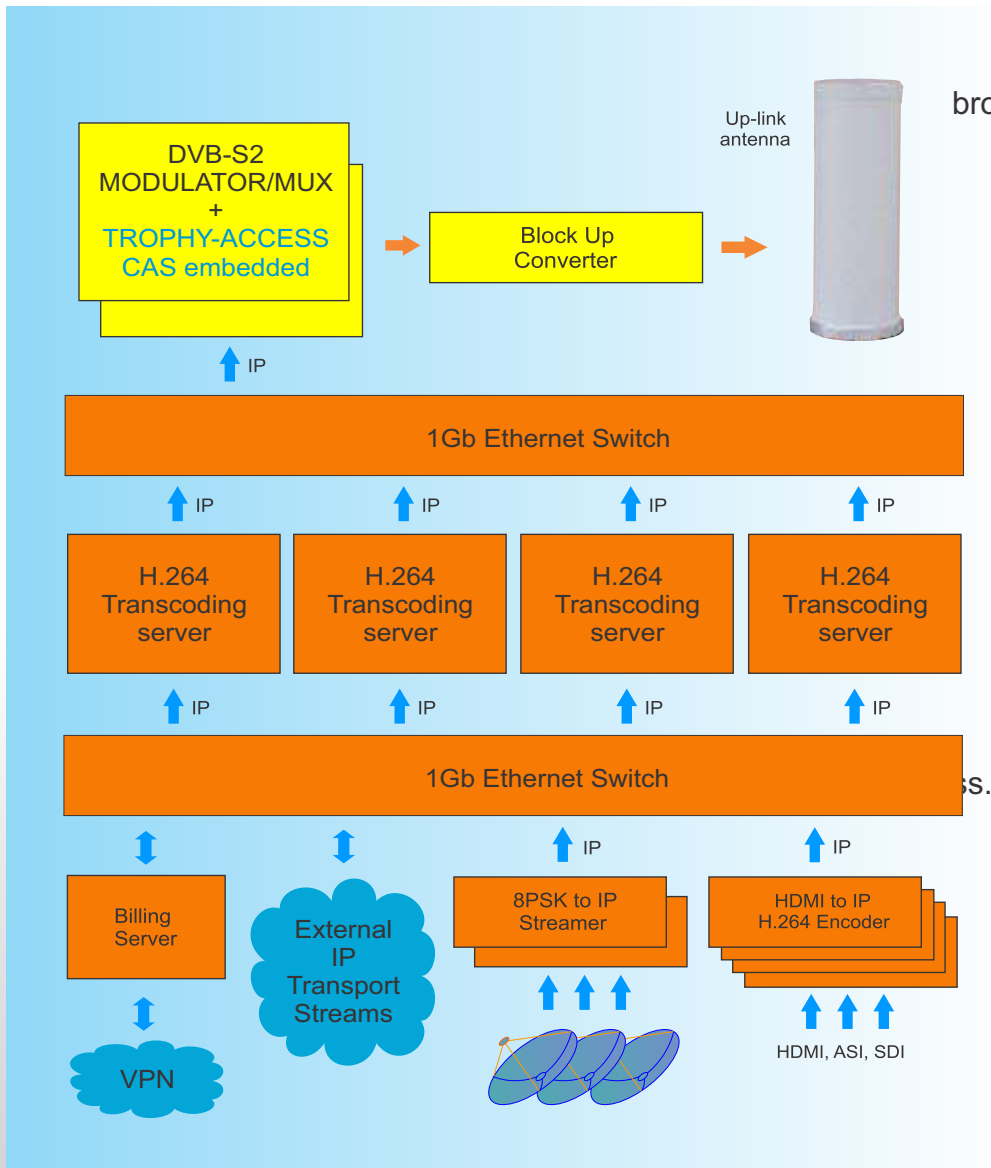
## The advantages of the equipment:

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

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 transport streams including IP transport stream into QPSK/8PSK/16APSK/32APSK signal to transmit them in MVDS transmitter (BUC - Block Up Converter).

DVB-S2 carrier from available 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 120 transport streams from the TROPHY HeadEnd or from another IP sources including 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.

### AMD-53-S2 MODULATOR / MULTIPLEXER:

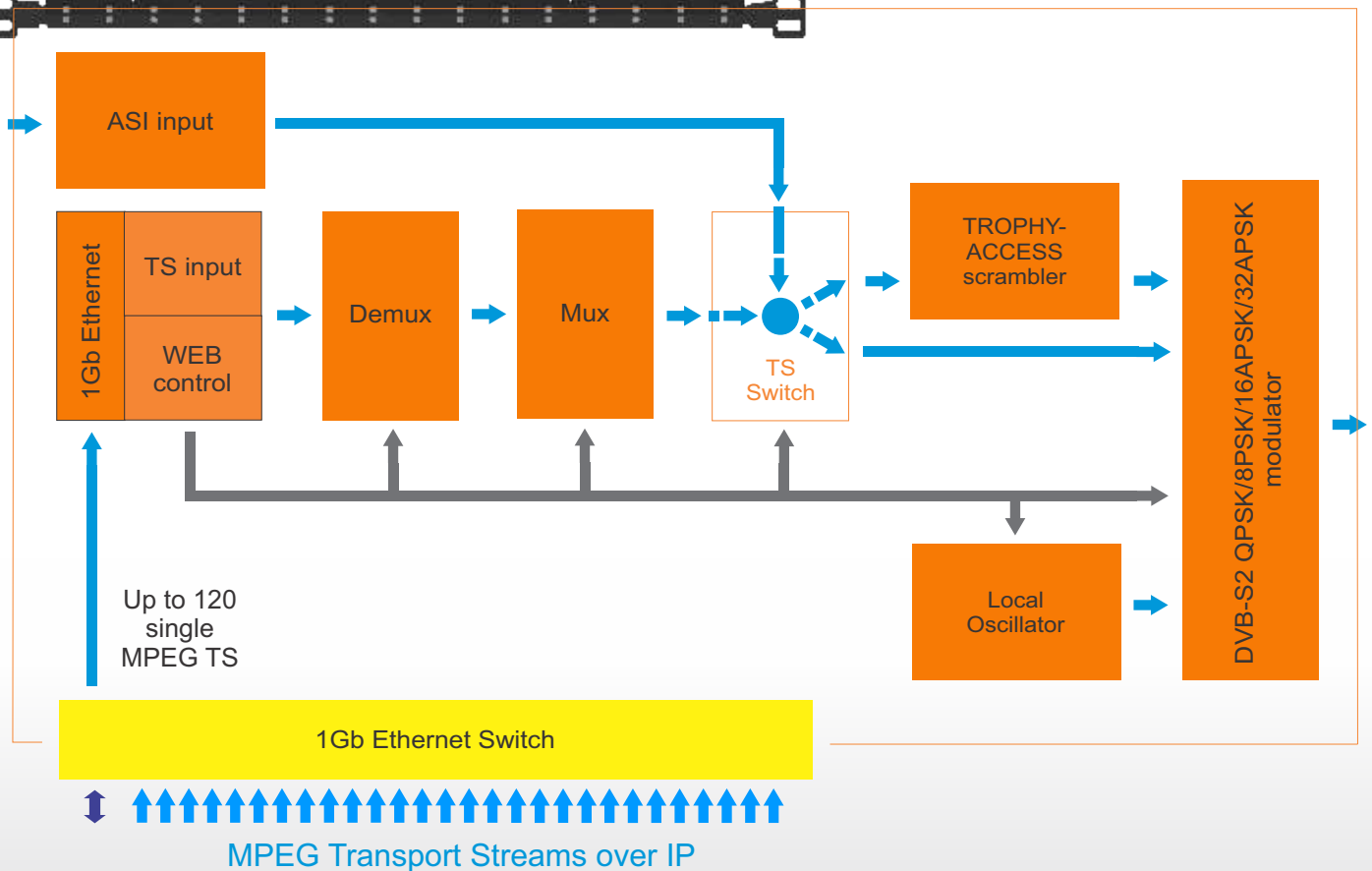
- ❖ covers the full L-Band range (950...2150 MHz) and offers bit rate from 0.25 Mbps up to 130 Mbps;
- ❖ has the capability to drive a Block Up Converter (BUC) via High Stability 10MHz reference and/or a DC Voltage power supply available on the L-Band RF output signal;
- ❖ provides up to 120 independent 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;
- ❖ takes full advantages of the IP technology to provide a cost effective, highly reliable and flexible solution;
- ❖ has highly efficient multiplexing algorithms;
- ❖ provides transport Stream rates up to 130 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 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/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.



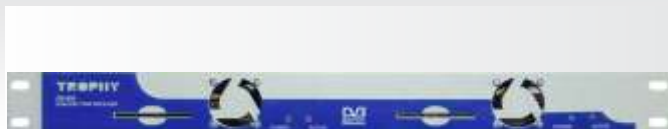
To use all functions of the device by WEB-interface activate Java Script in your browser settings. Network connection to the computer System requirements: - PC/ laptop with 10/100/1000 Mbit Ethernet interface - any Internet browser, capable JAVA script. The device has to be connected to PC network using 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.



<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 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
<b>ASI input (optional)</b>	EN 50083-9
TS transfer format	MPEG-TS, 188 bytes over ASI
Level range	200...880 mV
Data rate	0,625...75 Mbps
ASI transfer format	continous, burst
Connector	BNC socket
Impedance	75 Ohm
<b>IP input (stream port + WEB interface)</b>	Ethernet, 10/100/1000 Base-T
Connector	RJ-45
Streaming protocol	UDP
Streaming mode	CBR/VBR
Encryption 0,25 to 200Mbps	TROPHY-ACCESS (additional license)
<b>RF Outputs</b>	
L-Band	950MHz to 2150MHz, 10kHz step
IF-Band	50MHz to 180MHz, 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)

<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
	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
<b>Control &amp; Monitoring</b>	Web Browser Control & Monitoring
	10/100/1000 Base-T Ethernet ports
	90 to 240VAC/50Hz/30W (+12V DC optional)
<b>Physical</b>	2kg Weight
	0°C to 50°C temperature range
<b>TROPHY-ACCESS 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

## 8PSK to IP STREAMERS



### 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 than 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 CHANNELS RECEIVER

The device receives two DVB-S/S2 signals, descrambling CAS services and transmits a Transport Streams (up to five services, not more than 15Mb for each port) to IP outputs. 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
	8PSK
	1/2, 2/3, 3/4, 5/6, 7,8
	1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 7/8, 8/9, 9/10
Video Compression	MPEG-2, H.264
Operation temp.	0°C...32°C
Supply voltage	+12V/2A (DB-800); 230VAC/0,8A (DB-800CI)
Interfaces	
Input interface	Ethernet 100BaseT
Control interface	Ethernet 100BaseT
Input connector	F-connector
Output connector	RG45

 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.



## 8PSK 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





## TWIN DB-800 RECEIVER 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 shows the OSCAM 1.20 web interface. The main content is a table of streamers. The table has the following columns: Source, Lock, UE, DEM, DET, SEF, SENF, SID, Rate (bps), Name, Out, Remap, F, Encrypt, Level, SNR. The table is divided into two sections: 'Source 10.10.10.18' and 'Source 10.10.10.19'. The first section lists channels like 'Россия 1' and 'Eurosport HD'. The second section lists channels like 'Eurosport HD', 'Discovery World', and 'Cartoon Network'. The table also shows various parameters like 'Rate (bps)', 'Out', 'Remap', 'F', 'Encrypt', 'Level', and 'SNR'. At the bottom of the page, there is a status bar that says 'root:root:0:User is not selected' and 'Unfiltered Deleted'.

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	1	13				2840	3535231	Россия 1*	0	0330y		FTA	89	-1
								10601485							
Source 10.10.10.19	Lock	UE	DEM	DET	SEF	SENF	SID	Rate (bps)	Name	Out	Remap	F	Encrypt	Level	SNR
10.10.10.102	0	0	0	0	0	0	283e	0*	dm*	0	0300y		FTA	0	0
10.10.10.100	0	0	6	0	0	0	0514	1633454	Eurosport*	0	0310y		FTA	-40	12
10.10.10.113	0	0	3372	0	0	0	003d	6646274	MTVM HD*	0	0320y		FTA	-42	14
10.10.10.98	0	0	5	0	0	0	138d	3780662	TV 3*	0	0330y		FTA	91	0
10.10.10.61	0	0	2	2	0	0	277e	2909164	REN-TV*	0	0340y		FTA	90	-1
10.10.10.103	0	0	0	0	0	0	283e	0*	dm*	0	0350y		FTA	0	0
10.10.10.242	0	0	0	0	0	0	001e	0*	Eurosport HD*	0	0360y		FTA	0	0
10.10.10.56	0	0	0	0	0	0	1490	0*	dm*	0	0370y		FTA	0	0
10.10.10.104	1	1	6	0	0	0	283e	2401247	THT*	0	0380y		FTA	89	-1
10.10.10.101	0	0	(+4) 239	0	0	0	2840	3464569	Россия 1*	0	0390y		FTA	-64	12
10.10.10.60	2	2	(+2) 2011	0	0	0	0002	2688241	DRIVE*	0	0300y		FTA	96	0
10.10.10.52	53	53	16804	0	0	0	508e	1913978	Cartoon Network**	0	0340y		FTA	89	0
10.10.10.54	287	287	(+6) 130161	130156	0	0	5087	2328583	Discovery World*	0	0300y		FTA	90	-1
								27972572							
10.10.10.90	32	32	11529	11524	0	0	508e	1913978	Cartoon Network**	1	0300y		FTA	-35	13
								1913978							
10.10.10.51	1	1	2210	133	0	0	508e	1913978	Cartoon Network**	3	0300y		FTA	91	-1
								1913978							

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



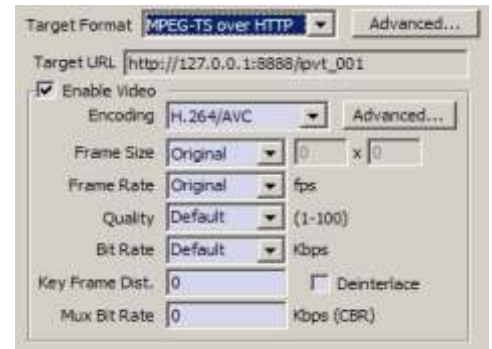
To output stream in MPEG-TS over HTTP format.

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.

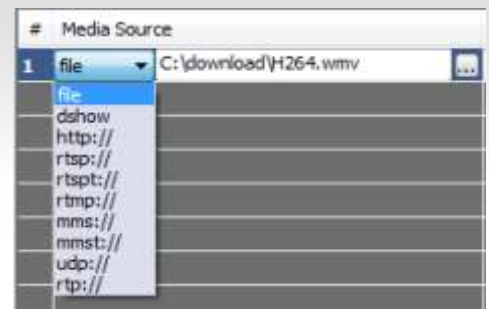



Start Streaming!


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: rtsp://<username>:<password>@<server\_ip>:<port>/stream

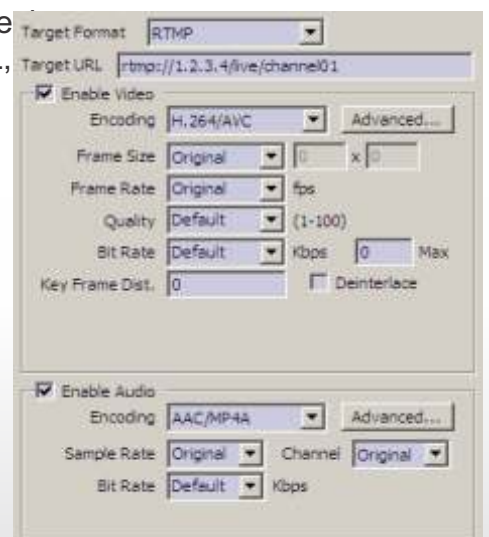
 To stream from Flash video sources. Choose "rtmp" and enter the stream URL in swf player, e.g. rtmp://192.168.0.1/vod/sample, rtmp://192.168.0.1/live/stream. Secured RTMP URLs including rtmps, rtmpe, rtspt are also supported. If RTMP authentication is required, please enter username / password in the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

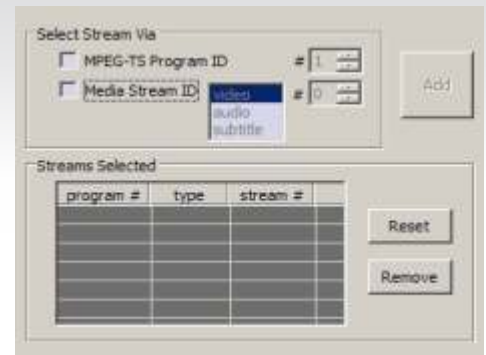


## Advanced Settings



### 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)

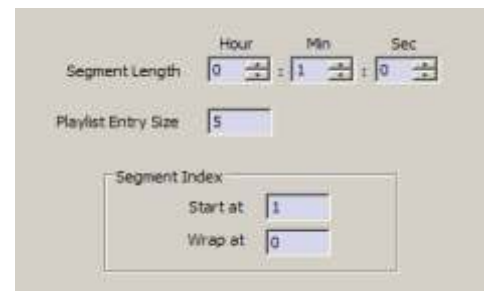
**SWF URL Verify** RTMP stream URL for server verification (leave it empty if you are not sure)

**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.



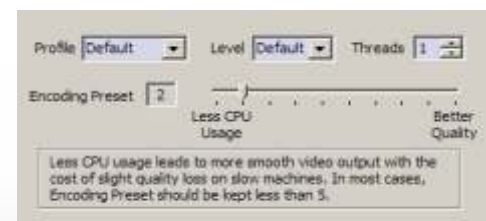
### H.264 Encoding

**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.

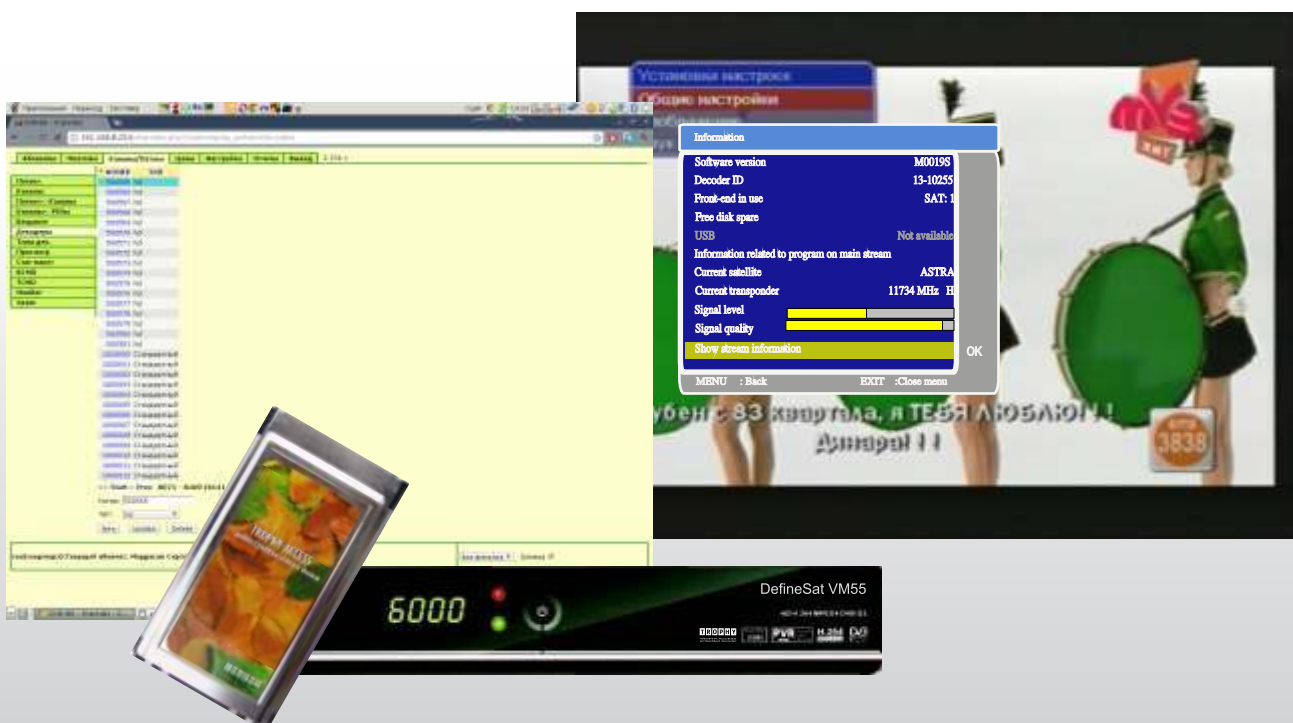
## TROPHY-ACCESS CAS

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.

❖ There is ASI to ASI TROPHY-ACCESS scrambler too.

The Billing server provides office. The decoder automatically switches off at a zero balance in the subscriber account number.

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



## 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.

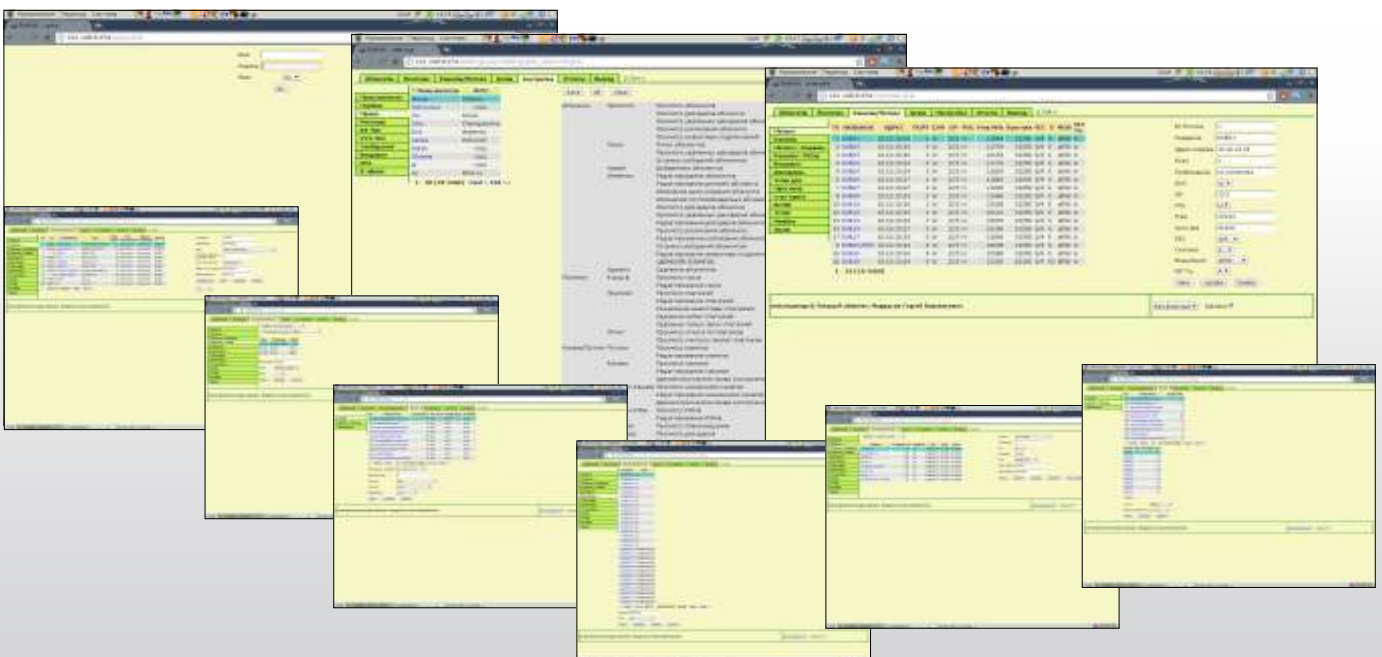
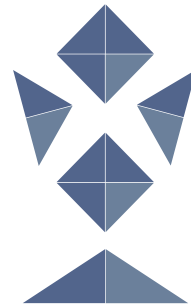


Running of the program is as follows:  
`cd / dvbserver / bin`  
`killall camserver`  
`./ Camserver dvbX`, where X - number of the flow.

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.



<b>Billing program options</b>	
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



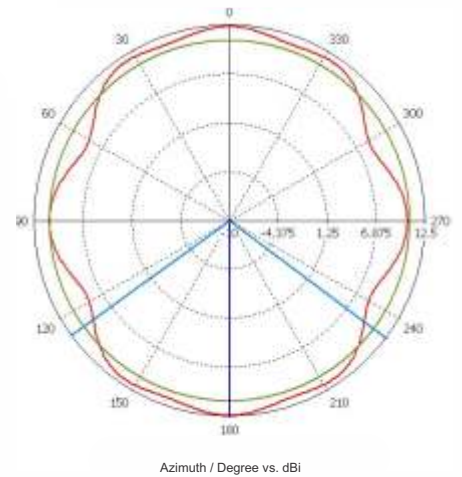
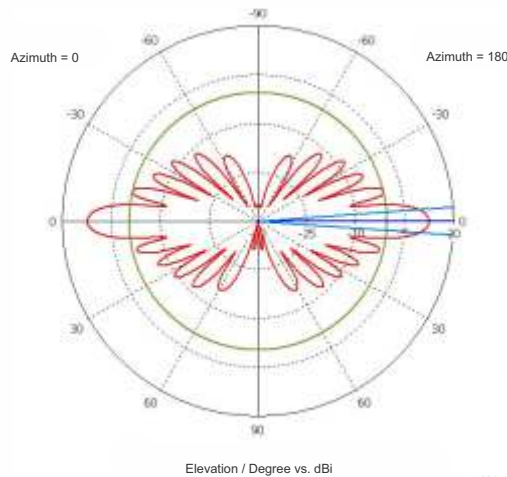
### Specifications

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
<b>Interfaces</b>	
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.

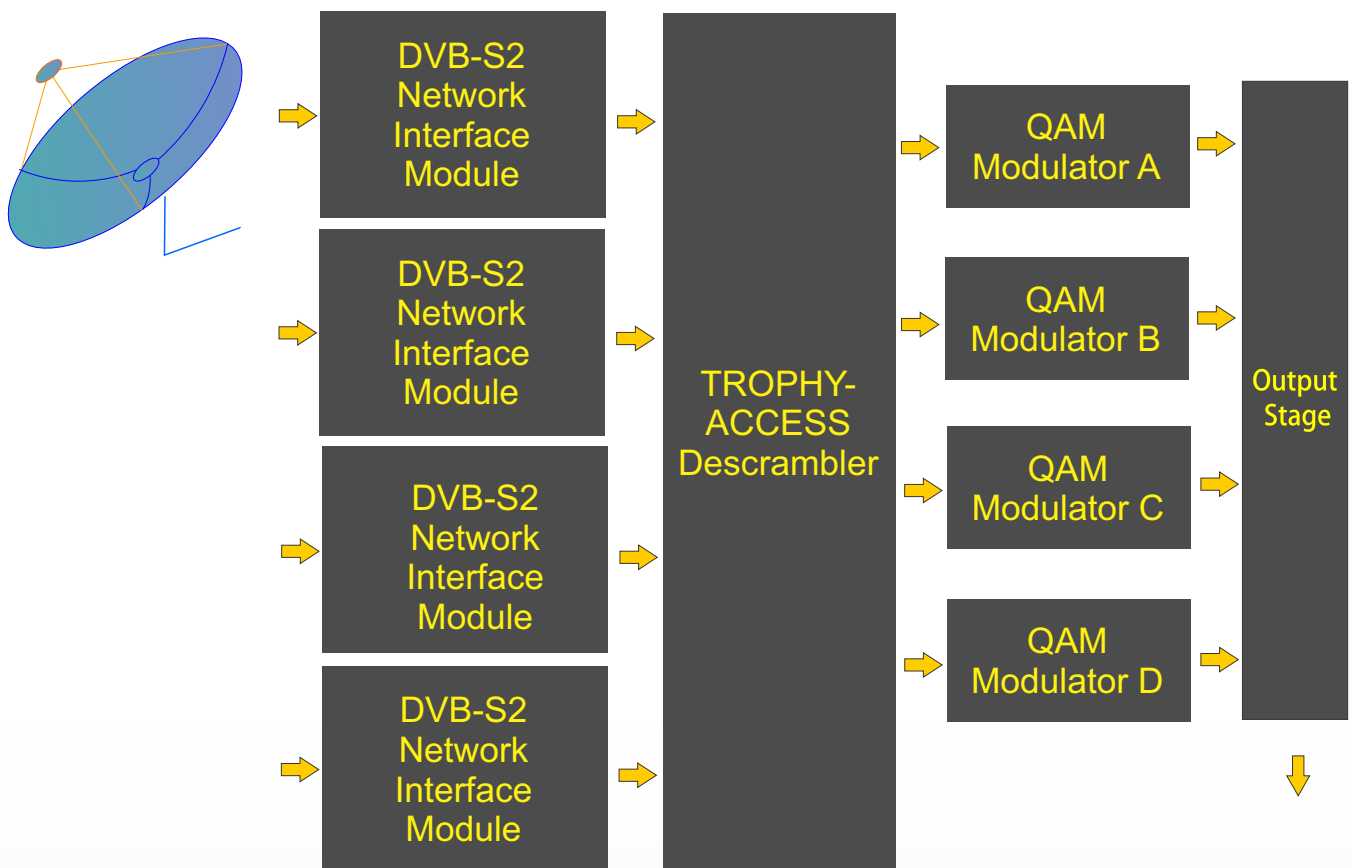
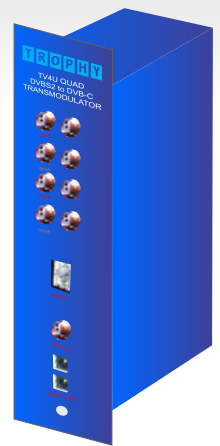
Modulation	Supported bandwidth of DVB-C channel	
	Frequency bandwidth (MHz)	
	6 MHz	8MHz
16QAM	19,23 Mbit	25,64 Mbit
32QAM	24,04 Mbit	32,05 Mbit
64QAM	28,85 Mbit	38,47 Mbit
128QAM	33,66 Mbit	44,88 Mbit
256QAM	38,47 Mbit	51,29 Mbit

-  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

<b>Modulation</b>	
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
<b>Control &amp; Monitoring</b>	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)
<b>Physical</b>	1kg Weight
	0°C to 50°C temperature range
<b>TROPHY-ACCESS 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



★ **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.**

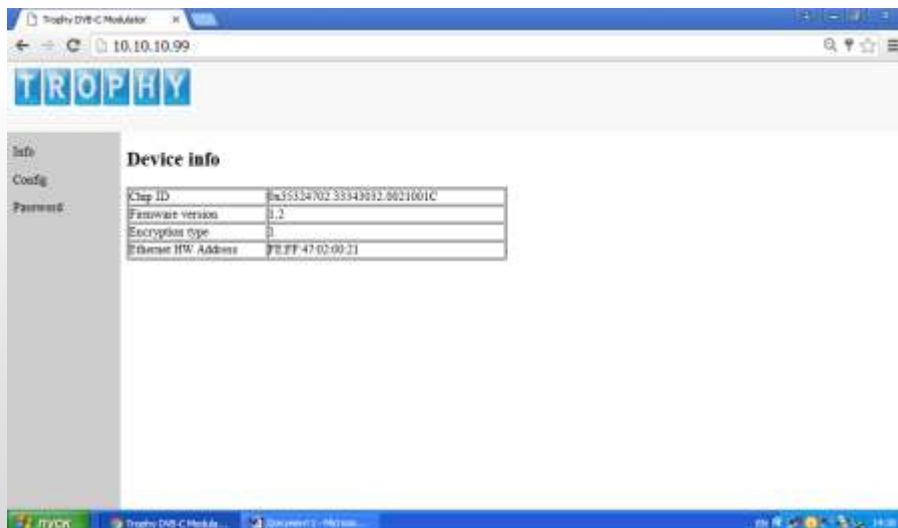
If the LED is green, the device is in normally. If the **STATUS** LED briefly blinks in red it indicates that the incoming transport stream has a bitrate greater than the bandwidth ability of DVB-C channel. You need to either go to the higher levels of QAM modulation or decrease the amount of data arriving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

The screenshot displays the 'DVB-C Modulator configuration' web interface. The settings are as follows:

- IP Address: 10.10.10.99
- Subnet Mask: 255.255.255.0
- Default Gateway: 10.10.10.1
- Input: UDP
- UDP Port: 1000
- Single-packet mode:
- Scrambler Enable:
- Modulation: 128QAM
- Symbol Rate: 6800 kSps
- Output Frequency: 800000 kHz
- Output Attenuation: -2 dB

Callout boxes provide the following details:

- UDP ASI:** Points to the 'Input' dropdown menu.
- From 1 to 7 DVB-packets can be encapsulated into one IP packet. DVB packets are processed separately if this option is active.** Points to the 'Single-packet mode' checkbox.
- Function of DVB-C carrier scrambling turn on/ turn off.** Points to the 'Scrambler Enable' checkbox.
- 16QAM, 64QAM, 128QAM, 256QAM** lists the available modulation options for the 'Modulation' dropdown.

## ★ 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.

The screenshot displays the 'Change password' web interface. It contains the following elements:

- Two input fields for 'New Password' and 'Confirm Password'.
- 'Change' and 'Cancel' buttons.