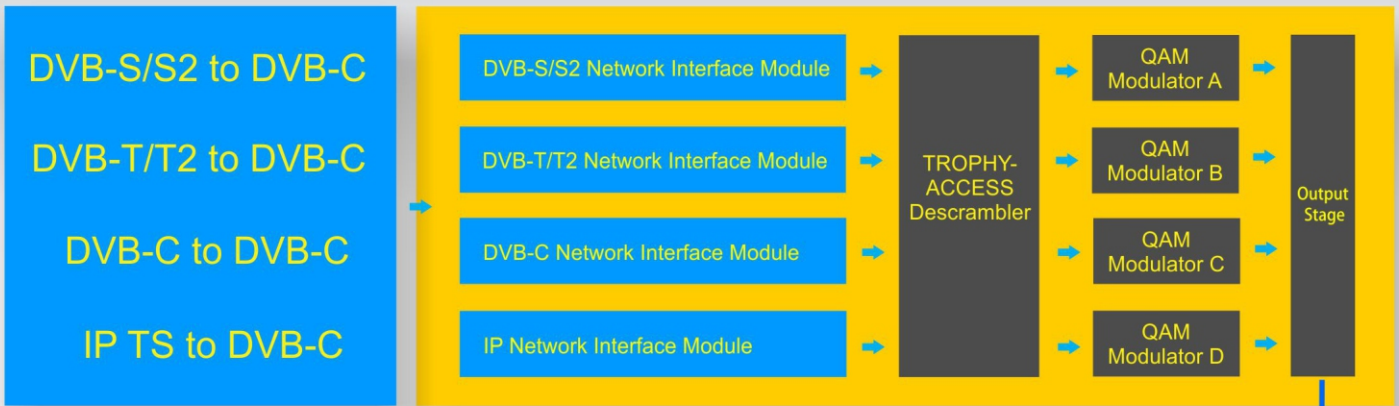


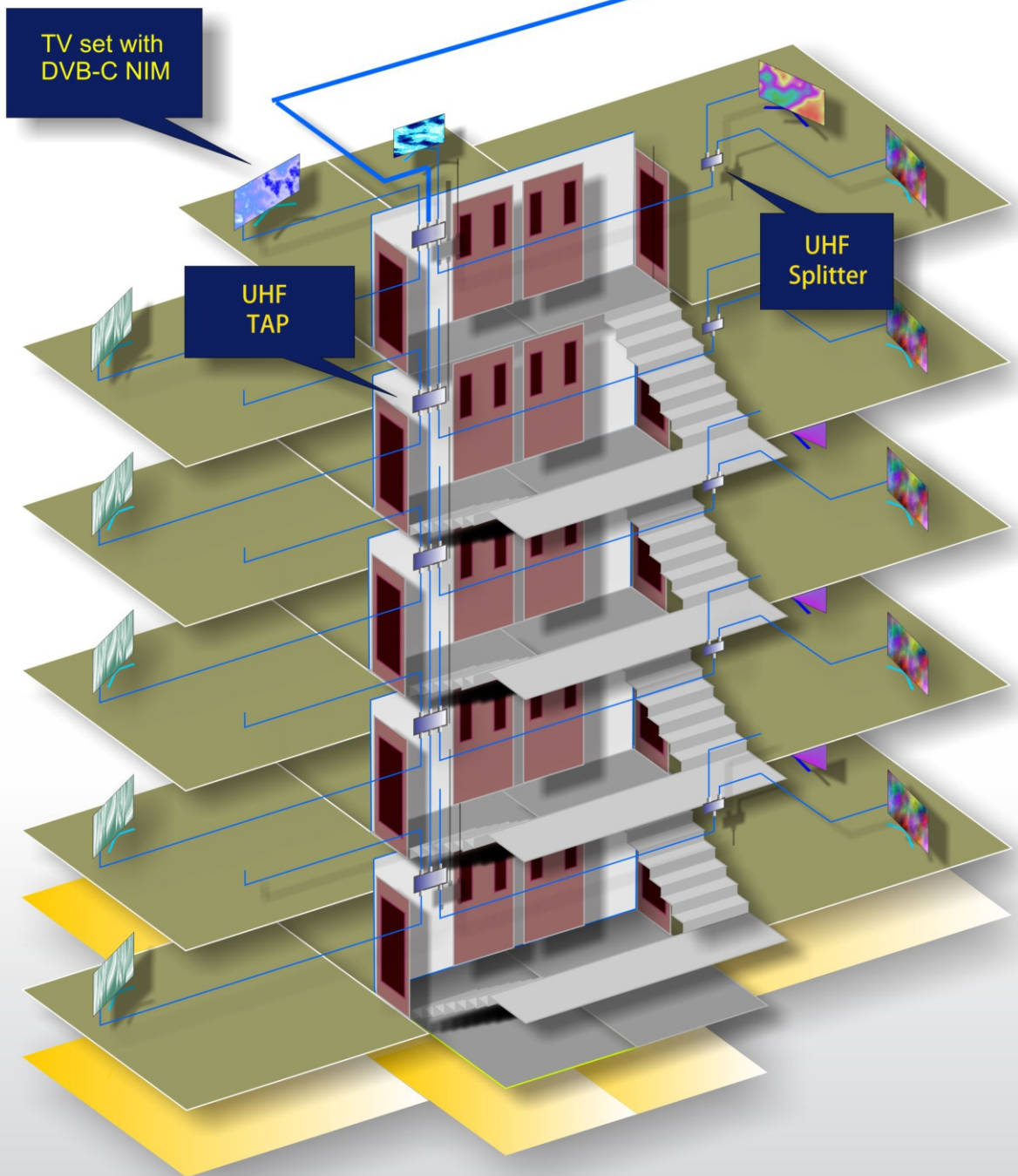
T R O P H Y



TV4U QUAD DVB-S2 to DVB-C TRANSMODULATOR

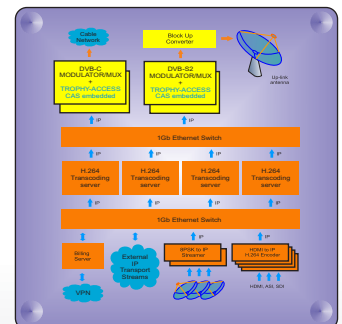
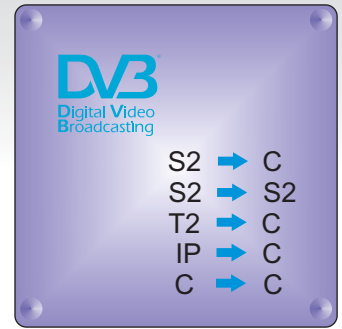


FTA or TROPHY-ACCESS DVB-C Mini-Cable Network



Features of the new DVB-C transmodulators line

- Through the use of the FPGA technology the transmodulators provides the highest performance at the lowest price.
- Four carriers are formed by direct synthesis, whereby is achieved an excellent spectral signal parameters.
- The core of the TROPHY-ACCESS descrambler are integrated into transmodulators.
- For the initialization of descrambler function must purchased an additional license.
- TROPHYACCESS descrambler allows to simultaneously decoding all TROPHY-ACCESS crypted services that offers unique opportunities to corporate networks building.
- For example, if input NIM receives a TROPHY-ACCESS scrambled signal, the output signal can be FTA.
- That is, all the services (or part of services) will be opened. Broadcaster controls built-in TROPHY-ACCESS descrambler by sending of additional service information in the Transport Streams.
- Transmodulators settings are installing through the user-friendly WEB-interface that allows you to control the functions of the device remotely. There is the variant with Command Line Interface.



TV4U QUAD DVB-S2 to DVB-C TRANSMODULATOR

Safety and operating instructions

When installing, starting-up and adjusting the devices, it is necessary to consider the system specific references in the instruction manual.

The devices may be installed and started up by authorized technical personnel only.

When installing the devices into the receiving points, the adherence of the Electro Magnetic Compatibility regulations is to be ensured.

The installing and wiring have to be done without voltage.

With all work the defaults of the EN 50083 standard (Cable networks for television signals, sound signals and interactive services. Part 9: Interfaces for CATV/SMATV headends and similar professional equipment for DVB/MPEG-2 transport streams) have to be considered.

If installing in mounting RACKs an adequate air circulation must be guaranteed. The mounting in closed RACKs without sufficient air flow is not allowed.

The devices are necessary to insert the mains plug into a socket with protective contact.

Device variants

Variant A. TV4U QUAD DVB-S2 to DVB-C **CLI** TRANSMODULATOR:

Setup of input&output parameters by CLI (Command Line Interface).

Variant B. TV4U QUAD DVB-S2 to DVB-C **WEB** TRANSMODULATOR:

Setup of input&output parameters by WEB-Interface.

Software options

TV4U_QUAD_S2_C

TV4U_QUAD_S2_C_TROPHY_ACCESS (TROPHY-ACCESS descrambler activation)

General

TV4U QUAD DVB-S2 to DVB-C *** TRANSMODULATOR is a devices of the CableTV Head-End, which is conceived as a complete system for CableTV broadcasting.

The transmodulator converts DVB-S/S2 transponders into 16QAM/ 32QAM/ 64QAM/ 128QAM/ 256QAM signals to transmit them in cable TV amplifier.

Functional description

The TV4U QUAD DVB-S2 to DVB-C TRANSMODULATOR receives a transport stream via Satellite. It can receive up to 4x120 elementary transport streams.






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.

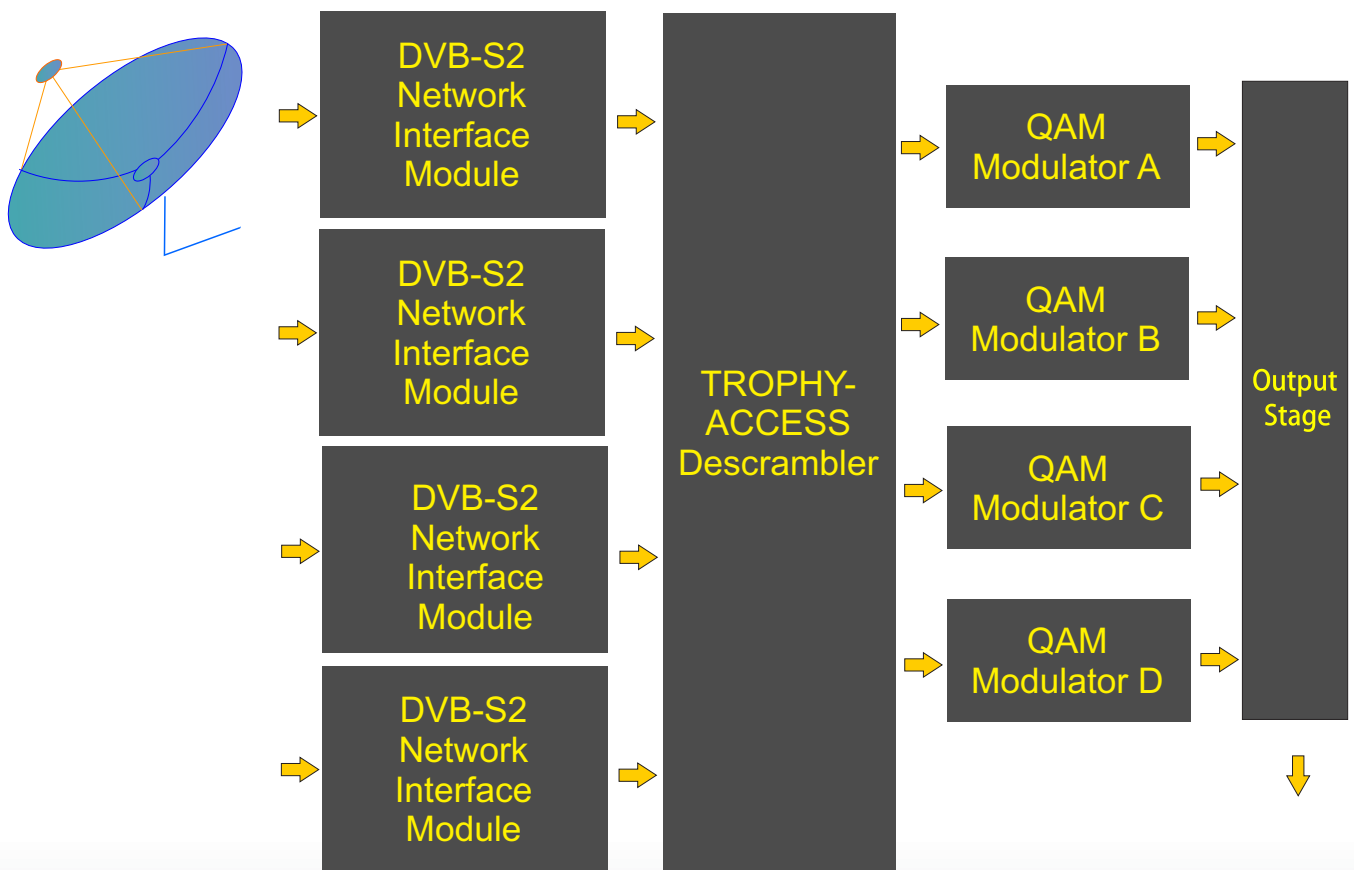
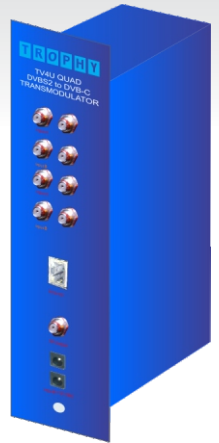
Modulation	Supported bandwidth of DVB-C channel	
	Frequency bandwidth (MHz)	
	6 MHz	8MHz
16QAM	19,23 Mbit	25,64 Mbit
32QAM	24,04 Mbit	32,05 Mbit
64QAM	28,85 Mbit	38,47 Mbit
128QAM	33,66 Mbit	44,88 Mbit
256QAM	38,47 Mbit	51,29 Mbit

-  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
Cable special band II			42	638..646	642
S11	230..238	234	43	646..654	650
S12	238..246	242	44	654..662	658
S13	246..254	250	45	662..670	666
S14	254..262	258	46	670..678	674
S15	262..270	266	47	678..686	682
S16	270..278	274	48	686..694	690
S17	278..286	282	49	694..702	698
S18	286..294	290	50	702..710	706
S19	294..302	298	51	710..718	714
UHF Hyperband special band III			52	718..726	722
S20	302..310	306	53	726..734	730
S21	310..318	314	54	734..742	738
S22	318..326	322	55	742..750	746
S23	326..334	330	56	750..758	754
S24	334..342	338	57	758..766	762
S25	342..350	346	58	766..774	770
S26	350..358	354	59	774..782	778
S27	358..366	362	60	782..790	786
			Additional UHF band		
S28	366..374	370	61	790..798	794
S29	374..382	378	62	798..806	802
S30	382..390	386	63	806..814	810
S31	390..398	394	64	814..822	818
S32	398..406	402	65	822..830	826
S33	406..414	410	66	830..838	834
S34	414..422	418	67	838..846	842
S35	422..430	426	68	846..854	850
S36	430..438	434	69	854..862	858
S37	438..446	442			
S38	446..454	450			
S39	454..462	458			
S40	462..470	466			

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). Descrambler is performed into the TV4U QUAD DVB-S2 to DVB-C TRANSMODULATOR.

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