



Transcoder BTR-6000



User Manual

Table of Content

Preface	3
Product Outline.....	3
Technical Data:.....	4
Statement:	5
Application Example	6
Connecting	6
First login and System Menu:.....	7
Network Settings:.....	7
Server-Settings:.....	9
IP Input configuration:	9
Transcoding:.....	15
IP Remux- Menu:.....	19
IP Backup function:	23
EPG-remultiplexing an example.....	26
Example for streaming to VIMEO Live by RTMP by our tiny boxed encoders:.....	32
General notes about Streams:	33
Multicast streams:	33
Registered port	34
Range for Ephemeral port.....	35
Packet structure.....	35
RTP:	36
ANNEX MPEG	37
MPEG PSI/SI Information's:	37
Appendix A.....	38
Safety instructions.....	39
Sicherheitshinweise.....	41
1. Installation.....	41
2. Betrieb.....	41
4. Wartung	42
5. Reparatur	42
6. Verkauf.....	42
7. Entsorgung.....	42
Contact:.....	44

HINWEIS: Bitte erst alle Netzkabel an das Gerat anschlieen (Z.B. an einen oder mehrere GbE Switch) und danach erst Einschalten, da ansonsten die Netzwerk-Eingange vom Gerat evtl. nicht aktiviert werden und erst nach einem REBOOT zur Verfugung stehen.

NOTE: Please connect all network cables to the device first (e.g., to one or more GbE switches) and then switch it on, otherwise the network inputs may not be activated by the device and will only be available after a REBOOT.

Preface

About This Manual

This manual is written for system integrators, IT technicians and knowledgeable end users. It provides information for the installation and use of the Product described herein and in particular the knowledge and skills of Linux OS (Ubuntu 16.0x Server) must be available as for Layer 3 Network switches.

Important Notes!

This manual is for use by qualified personnel only. Handling this device or system requires special electronic technical knowledge. To reduce the risk of electrical shock or damage to the equipment, do not perform any servicing other than the installation and operating instructions contained in this manual unless you are qualified to do so. This device operates in the given voltage and frequency range without requiring manual adjustment.

Do not open the top case w/o unplugged power source because serious injury or death may be the result! Inside are components under risk from electrostatic discharge. To avoid equipment damages do not touch these components or, observe the respective handling rules!

For continued protection against fire, the fuses may only be replaced by identical fuses with the same electrical specifications which are designed for the corresponding fuse positions.

No part of this publication may be reproduced in any form or by any means or used to make any derivative work (such as translation, transformation or adaptation) without the written permission from Blankom / IRENIS GmbH.

IRENIS GmbH reserves the right to revise this publication and make changes in its content from time to time, whereby it shall not be obligatory for IRENIS GmbH to provide notification of such revision or change.

IRENIS GmbH provides this manual without warranty of any kind, neither implied nor expressed, this includes also any warranties regarding the merchantability and fitness for a particular purpose. IRENIS GmbH may improve this manual or make changes in the products described herein at any point of time.

Product Outline

The Transcoder BTR-6000, processes SD/HD efficiently based on the high-performance CPU/GPU designed specifically for IPTV systems with h.264 AVC and additional HEVC/h.265 low bit rate compression. The TV Services can be converted to a low bit rate (< 600kbps) while maintaining the image quality. It supports IP re-multiplexing to MPTS and streaming SPTS. The multiple resolution functions can be used perfectly for multi- screen serving TVs, Smart phones, tablets, PCs, The user-friendly network management Web-IF helps to setup and monitor the working status.

Key Features:

- Video compliant with H.265/HEVC Baseline, MainProfile@L6.2 or less
- H.264 AVC Baseline, Main&High Profile@L5.1 or less
- Audio compliant with MPEG-1 Layer II Audio, AAC transcoding, Multi-audio transcoding and pass through
- Resolution from 96*96 to 4096*2160
- Bitrate from 200Kbps to 20Mbps
- h.265 HEVC capacity: 4K x1/ 1080P x8 / 720P x16 / SD x32 services per chassis
- h.264 AVC capacity: HD x16 / SD x32 services per chassis
- Support local video transcoding and delivery
- Rolling subtitle & Logo insertion
- PCR self-correction
- PSI/SI edition and PID pass through
- Up to 200 MPTS/SPTS output, 100Mbps max for each
- 1+N output backup system
- Web-Interface

Technical Data:

Input	
Input Interface	1000M/100M/10M RJ45 x 4pcs Full Duplex
TS/IP Input Bit Rate	800Mbps - RJ45
Data Protocol	UDP, ICMP, IGMP V1, V2, V3, RTP, HTTP, RTSP, FTP, RTMP, HLS (HTTP Live Streaming)
Transcoder source	IP inputs, Local files (USB 3.0)
IP Protocol	Unicast, Multicast
Video/Audio Format	
Video	H.265/HEVC, H.264/AVC, MPEG-2, MPEG-4
Audio	MPEG-1, MPEG-2, MPEG-4, AAC
Re-Multiplex	
Input	SPTS / MPTS
Null package processing	Zero packet PID 8191dec pass through, insertion and filtering
TS Editing	Service editing PSI/SI editing PID pass through / remapping PCR auto-correction
Maximum bitrate	100Mbps each
Maximum TS count	200 input TS Streams + 200 output TS Streams (with transcoder function disable)

IP Output	
Interface	1000M/100M/10M RJ45 x 4pcs Full Duplex
TS/IP Output	Average per port 800Mbps
Protocols	UDP, RTMP, HLS, FTP, RTP (for MUX only)
IP addressing	Unicast, Multicast
Type	IP Streaming or File
Video/Audio Format for Encoding	
Video Format	HEVC (h.265)/h.264
Audio Format	MPEG-1 Layer 2, MPEG-2 AAC, MPEG-4 AAC
Package Format	MPEG-TS
Bitrate Control	VBR, CBR
Video resolution	4096*2160, 3840*2160, 2560*1440, 1920*1080, 1280*720, 720*576, 720*480, 704*576, 704*288, 640*480, 544*576, 544*480, 480*576, 480*320, 480*270, 360*320, 352*576, 352*288, 320*240, 320*200, 240*160, 192*192, 192*128, 176*144, 128*96, 96*96 ...
Video aspect ratio	Auto, 4:3, 16:9
Video frame rate	Auto, 30fps, 29.97fps, 25fps, 24fps, 23.97fps
Video bitrate	200Kbps ... 20Mbps
Audio sampling rate	32 KHz, 44.1 KHz, 48 KHz
Audio bit rate	32kbps, 64kbps, 96kbps, 128kbps, 192kbps, 256kbps, 384kbps
Control & Monitoring	
Interface	RJ45 x1pcs, 1000M/100M
Protocol	HTTP Web GUI
General	
Power Consumption	AC 110V...240V, 6A, 47...63Hz, max. 350W

Operation temperature	5...45 °C
Storage temperature	-10...65 °C
Dimension	430mm x 335mm x 44mm
Gross Weight	8.7Kg

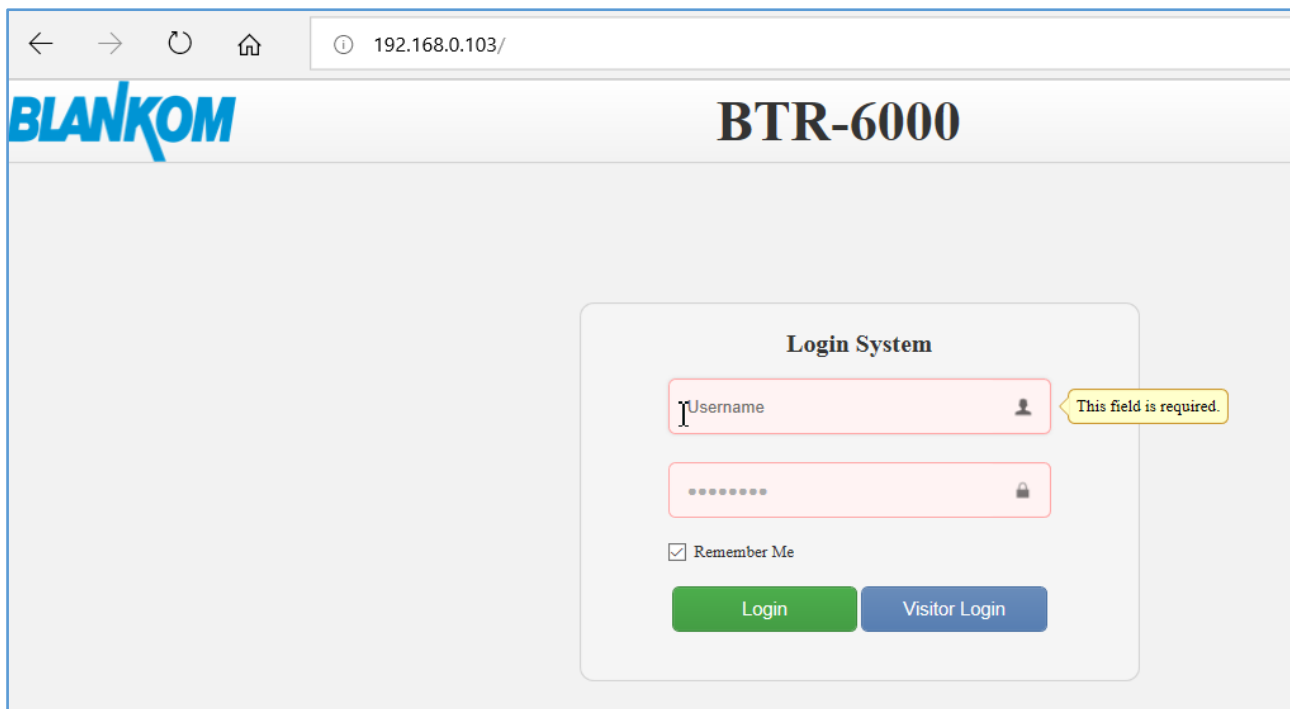
Statement:

Text and pictures herein are subject to changes w/o notifications.

The user manual will be updated in real time without special notice.

This user manual is provided only as a reference guide for technicians as examples.

Default Login: Visitor (*readonly*), admin/admin or root/12345



Default is: root/12345 or admin/admin

Set the administrator's computer IP as: 192.168.0.* to avoid IP conflicting with the units own IP address 192.168.0.103. - Or always shown is the actual IP address of the network management address 'Control' port at the front panel (left) after booting.

192.168.0.*: use an IP setting "*" in the number range 2-254 and except the units default IP.

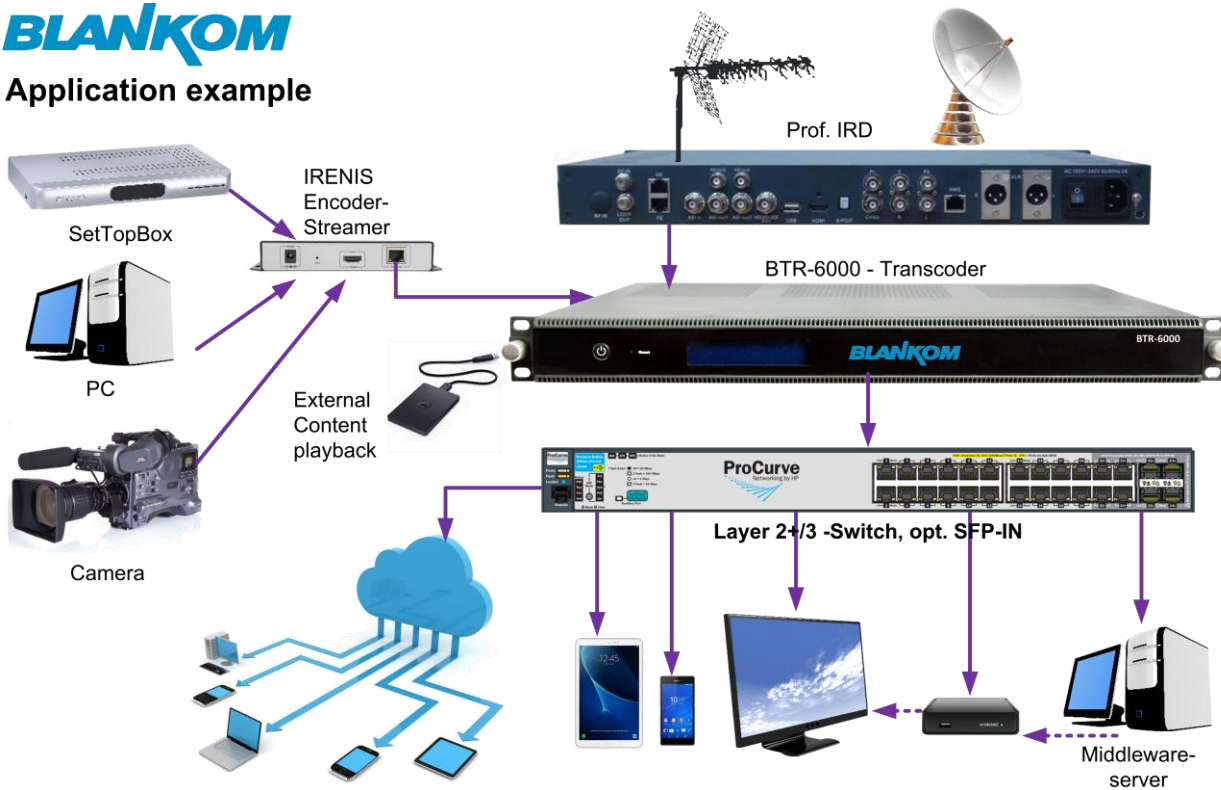
Remark: .0 is often the network router, .1 often the Gateway of the used router, .255 might be a network broadcasting address.

Please change these account settings according to your local policy and network. -> Do not forget to save and backup the configuration by Web-Interface and its related system-sub-menu. The encoder can be always set back to factory default settings by using the RESET-switch in Web-IF.

Application Example



Application example



Connecting

Please connect the Ethernet – ports to a GBE Switch **before you start the Unit** – to assure the physical connection for the initialising of the Ethernet ports correctly and are enabled.

The Transcoder comes with 1x Management RJ45 Interface for Web-access and 3 GbE Ports for the streaming connection:



The USB ports are equipped for future use.

The rear has only one IEC connector for main voltage 110....230VAC.

The Management IP-Address will be shown after booting in the frontpanel display like:



Please adjust your management computer to this range.

Example: Set your IP network connection to 'manual' and use i.e. 10.10.70.100 as the static IP, NM 255.255.255.0, GW 10.10.70.1. Than use a modern browser like Mozilla or Chrome to login.

First login and System Menu:

After entering username and password (root/12345) you should first enter the System menu:

System Info

Device Name	BTR-6000
Version Number	1.1.2.3-b1
Serial Number	8e6f49a6-0a6e-3c7e-9a4d-ba00a872bb6c
Licence Status	Empower Normal

Upgrade List

Name	Version Number	File Size(MB)	Upload Time
6000V-1.1.2.3-b1-20180428	1.1.2.3-b1	34.537	2018-06-26 04:59:29
6000V-1.1.2.1-b1-20180130	1.1.2.1-b1	88.774	2018-06-26 04:56:30

Status Panel:

- Encoder Temp 47°C
- Encoder Memory 3%
- Decoder Usage 5%
- Encoder Usage 16%
- Processor Temp 43°C
- Processor Usage 10%
- Processor Memory 23%
- Run Time 1:21:39

In the System menu you are getting actual status information about the Transcoder and can save or import former stored settings, switch back to factory defaults, reboot and Shutdown. Please do not disconnect power before using the shutdown button here and wait until it will be ready.

Remark: The language selection Menu in the top right corner depends on regions and might be not shown while the default language is always english.

NOTE: We strongly recommend **not to use an old Mozilla Firefox Browser** but CHROME or EDGE or any based on the Chrome-engine because some configuration files might not be visible or accessible. Also a Popup-Blocker should be disabled in the browser settings.

Initial we should take care about the Network ports now. Please keep always in mind, to avoid IP address conflicts with your existing network topology.

Network Settings:

NetworkInterface List

Status	Name	Bootproto	IP	Gateway	Netmask	Type	MAC
Linked	Control	none	192.168.0.103	192.168.0.1	255.255.255.0	Manager	2C:53:4A:05:7C:05
Linked	eth1	none	192.168.1.10	192.168.1.1	255.255.255.0	IP IN/OUT	2C:53:4A:05:7C:04
Linked	eth2	none	192.168.1.20	192.168.1.1	255.255.255.0	IP IN/OUT	2C:53:4A:05:7C:03
Linked	eth3	none	192.168.1.30	192.168.1.1	255.255.255.0	IP IN/OUT	2C:53:4A:05:7C:02

DNS List

Default Route: Contro[192.168.0.103]

Up to 3 x GbE can be connected and selected for IP Inputs and outputs (bi-directional).
 Changes can be done by editing the ports:

The screenshot shows the 'NetworkInterface List' table with four entries. A popup window titled 'Edit NetworkInterface Info' is open for the second entry (eth1). The popup contains the following fields:

- Network Name: eth1
- MAC: 2C:53:4A:05:7C:04
- IPv4 Address: 192.168.1.10
- Netmask: 255.255.255.0
- Gateway: 192.168.1.1
- Netcard Bootproto: Static

Buttons for 'Save', 'Close', 'Apply', and 'Refresh' are visible at the bottom of the interface.

If DNS addresses are needed, you can add them as well.

Hint: *Pop up blocker should be disabled in your browser settings.*

If you accidentally try to move this popup window, you might end up in a not reachable status of this setup. Please restart a new login again:

The screenshot shows the BLANKOM BTR-6000 web interface. The 'Network' section is selected in the left sidebar. The main content area displays the 'Network Interface List' table:

Status	Name	Bootproto	IP	Gateway	Netmask	Type	MAC
Linked	Control	none	192.168.0.103	192.168.0.1	255.255.255.0	Manager	2C:53:4A:05:7C:05
Linked	eth1	none	192.168.1.10	192.168.1.1	255.255.255.0	IP IN/OUT	2C:53:4A:05:7C:04
Linked	eth2	none	192.168.1.20	192.168.1.1	255.255.255.0	IP IN/OUT	2C:53:4A:05:7C:03
No Link	eth3	none	192.168.1.30	192.168.1.1	255.255.255.0	IP IN/OUT	2C:53:4A:05:7C:02

Below the table is a 'DNS List' section with an 'Add DNS' button. 'Apply' and 'Refresh' buttons are at the bottom.

Selecting **Status** will popup actual information:

The screenshot shows the 'Status' popup window. It displays a table with network performance metrics for four interfaces:

Control		eth1		eth2		eth3	
Status	Normal	Status	Normal	Status	Normal	Status	Normal
IP	192.168.0.103	IP	192.168.1.10	IP	192.168.1.20	IP	192.168.1.30
Netmask	255.255.255.0	Netmask	255.255.255.0	Netmask	255.255.255.0	Netmask	255.255.255.0
Gateway	192.168.0.1	Gateway	192.168.1.1	Gateway	192.168.1.1	Gateway	192.168.1.1
Rx Speed	0.01(Mbps)	Rx Speed	7.58(Mbps)	Rx Speed	0.01(Mbps)	Rx Speed	0.01(Mbps)
Tx Speed	0.00(Mbps)	Tx Speed	0.00(Mbps)	Tx Speed	0.00(Mbps)	Tx Speed	0.00(Mbps)

Summary statistics at the top: Total Rx Speed 7.58(Mbps), Total Tx Speed 0.00(Mbps). On the left sidebar, 'Encoder Temp 35°C', 'Encoder Memory 0%', and 'Decoder Usage 0%' are displayed.

Remember:

Shutdown the unit always **by its Shutdown button in the Web-Interface please:**

System Info

Device Name: BTR-6000
 Version Number: 1.1.2.3-b1
 Serial Number: 8e6f49a6-0a6e-3c7e-9a4d-ba00a872bb6c
 Licence Status: Empower Normal

Upgrade List

	Name	Version Number	File Size(MB)	Upload Time		
1	6000V-1.1.2.3-b1-20180428	1.1.2.3-b1	34.537	2018-06-26 04:59:29	⬇️	✖️
2	6000V-1.1.2.1-b1-20180130	1.1.2.1-b1	88.774	2018-06-26 04:56:30	⬇️	✖️

Buttons: Apply, Refresh, Import, Export, Factory Setting, Reboot, Shutdown

If you only disconnect power, the unit can be damaged and maybe will show strange behaviors after re-launching it.

Server-Settings:

Distribute Server Setting

Server Status: Normal
 Max Connections: 100
 RTMP Connections: 0
 RTMP Port: 1935
 HTTP Connections: 0
 HTTP Port: 9000

Buttons: Apply, Refresh, Restart Server, Stop Server

In this menu, you can change the http and RTMP ports for streaming to i.e. VIMEO, WOWZA or catching Http streaming.

IP Input configuration:

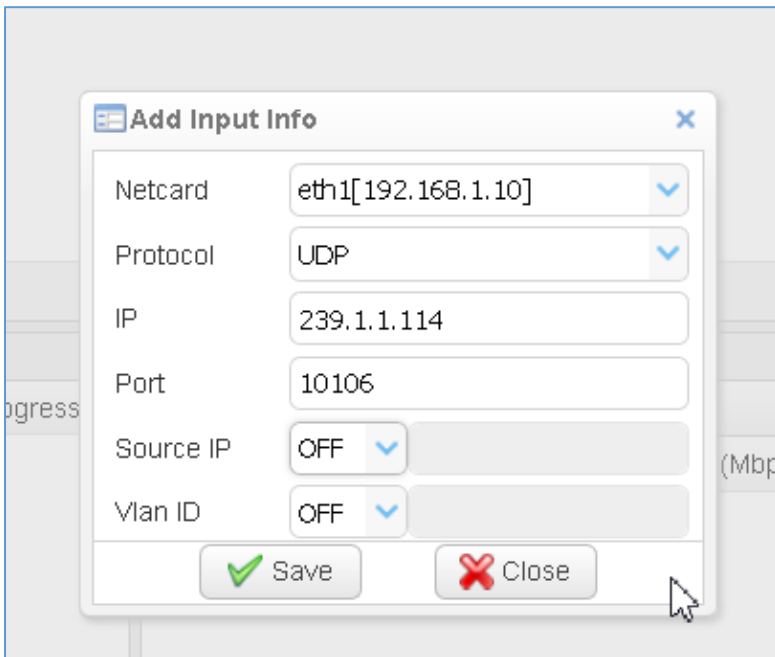
Now we start to get some streams in:

IP Input

Buttons: Add, Adds, Removes, Clear All Error

Status	Channel	NetworkInterface	URL	Total Bitrate(Mbps)	Valid Bitrate(Mbps)	Max Bitrate(Mbps)	Min Bitrate(Mbps)	CC Error
--------	---------	------------------	-----	---------------------	---------------------	-------------------	-------------------	----------

Press add- button or insert multiple with the Adds-button:



This is an MPTS. Source IP as well as VLAN ID can be chosen if applicable. Source IP might be to serve the SSM – feature of your streamer (SSM=Source Specific Multicast).

Filter Display All

<input type="checkbox"/>	Status	Channel	NetworkInterface	URL	Total Bitrate(Mbps)	Valid Bitrate(Mbps)
1	<input checked="" type="checkbox"/> Lock	1001	eth1[192.168.1.10]	udp://239.1.1.114:10106	38.016608	35.24624

10 | Page 1 of 1

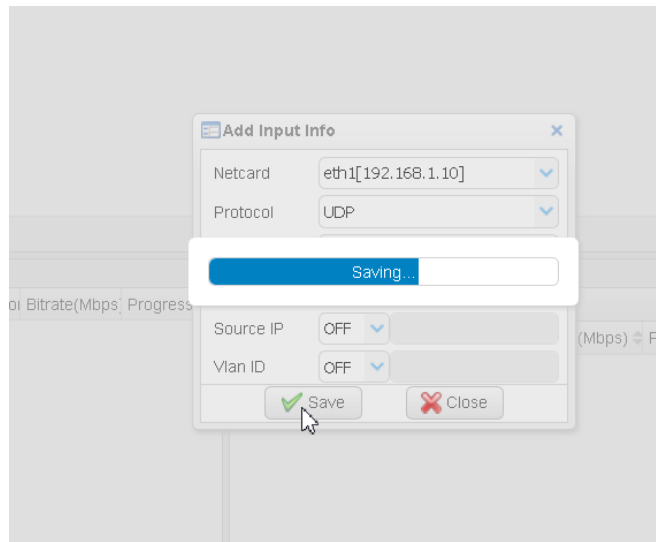
Services PSI/SI

Service Name	Service ID	CC Error	Bitrate(Mbps)	Progress

Info

Add Success

We add some more SPTS now:



Selecting the stream will give you information about the content:

Status	Channel	NetworkInterface	URL	Total Bitrate(Mbps)	Valid Bitrate(Mbps)	Max Bitrate(Mbps)	Min Bitrate(Mbps)	CC Error	
<input checked="" type="checkbox"/>	1001	eth1[192.168.1.10]	udp://239.1.1.114:10106	38.016608	35.25376	43.606976	37.300704	0	
<input type="checkbox"/>	1002	eth1[192.168.1.10]	udp://225.1.2.21:10011	12.254592	12.254592	13.970656	9.604544	0	

Service Name	Service ID	CC Error	Bitrate(Mbps)	Progress
ZDFInfo	28011(0x6d)	0	8.008800	0.07%
KiKA	28008(0x6d)	0	4.570656	2.02%
zdf_neo	28014(0x6d)	0	6.199488	6.31%
DRadio DokDeb	28015(0x6d)	0	0.151904	0.40%
Dif Kultur	28012(0x6d)	0	0.756512	1.99%
Dif	28013(0x6d)	0	0.285760	0.75%
ZDF	28006(0x6d)	0	8.843520	2.26%
3sat	28007(0x6d)	0	4.748128	12.49%
Dif Nova	28017(0x6d)	0	0.287264	0.76%

PID	PID Type	CC Error	Bitrate(Mbps)	Progress
0(0x0)	PAT	0	0.015040	0.04%
1(0x1)	CAT	0	0.015040	0.04%
16(0x10)	NIT-actual	0	0.000000	0.00%
17(0x11)	SDT-actual,BAT	0	0.012032	0.03%
18(0x12)	EIT-actual schedule	0	1.359616	5.8%
20(0x14)	TOT,TDI	0	0.000000	0.00%
84(0x54)	PES Private	0	0.003008	0.01%
100(0x64)	PMT	0	0.015040	0.04%
110(0x6e)	PCR,MPEG-2 Video	0	7.389152	19.44%
120(0x78)	MPEG-1 Audio	0	0.263200	0.69%
121(0x79)	MPEG-1 Audio	0	0.200032	0.53%
122(0x7a)	MPEG-1 Audio	0	0.200032	0.53%

Indicator	Errors
Priority 1	
TS_sync_loss	0
Sync_byte_error	0
PAT_error	0
Continuity_count_error	0
PMT_error	0
PID_error	0
Priority 2	
Transport_error	0
CRC_error	0
PCR_repetition_error	0
PCR_discontinuity_indicator_error	0

Expanding the view by using the '+':

Status	Channel	NetworkInterface	URL	Total Bitrate(Mbps)	Valid Bitrate(Mbps)	Max Bitrate(Mbps)	Min Bitrate(Mbps)	CC Error	
<input type="checkbox"/>	1001	eth1[192.168.1.10]	udp://239.1.1.114:10106	38.016608	35.256768	43.606976	37.300704	0	
<input checked="" type="checkbox"/>	1002	eth1[192.168.1.10]	udp://225.1.2.21:10011	14.223328	14.223328	15.5288	9.433088	0	

Service Name	Service ID	CC Error	Bitrate(Mbps)	Progress
tagesschau24 HD	10375(0x28)	0	14.084960	99.33%
170(0xaa)	PES Private	0	0.010528	0.07%
176(0xb0)	PES Private	0	0.010528	0.07%
2171(0x87b)	PES Private	0	0.150400	1.07%
5400(0x1518)	PMT	0	0.006016	0.04%
5401(0x1519)	PCR,H.264 Video	0	12.765952	90.64%
5402(0x151a)	MPEG-1 Audio	0	0.204544	1.45%
5403(0x151b)	MPEG-1 Audio	0	0.204544	1.45%
5404(0x151c)	Teletext	0	0.263200	1.87%
5406(0x151e)	AC-3 Audio	0	0.469248	3.33%

PID	PID Type	CC Error	Bitrate(Mbps)	Progress
0(0x0)	PAT	0	0.007520	0.05%
17(0x11)	SDT-actual	0	0.001504	0.01%
18(0x12)	EIT-actual schedule	0	0.126336	0.89%
20(0x14)	TOT	0	0.003008	0.02%
170(0xaa)	PES Private	0	0.010528	0.07%
176(0xb0)	PES Private	0	0.010528	0.07%
2171(0x87b)	PES Private	0	0.150400	1.06%
5400(0x1518)	PMT	0	0.006016	0.04%
5401(0x1519)	PCR,H.264 Video	0	12.765952	90.75%
5402(0x151a)	MPEG-1 Audio	0	0.204544	1.44%
5403(0x151b)	MPEG-1 Audio	0	0.204544	1.44%
5404(0x151c)	Teletext	0	0.263200	1.85%
5406(0x151e)	AC-3 Audio	0	0.469248	3.30%

Indicator	Errors
Priority 1	
TS_sync_loss	0
Sync_byte_error	0
PAT_error	0
Continuity_count_error	0
PMT_error	0
PID_error	0
Priority 2	
Transport_error	0
CRC_error	0
PCR_repetition_error	0
PCR_discontinuity_indicator_error	0
PCR_accuracy_error	0
PTS_error	0
CAT_error	0
Priority 3	
NIT_Actual_error	0
NIT_other_error	0

If multiple addresses want to be configured use ADDS:

Get more detailed information of the IP Input stream and even details from the PSI/SI:

You'll get a 'warning' if some stream errors occur:

Status	Channel	NetworkInterface	URL	Total Bitrate(Mbps)	Valid Bitrate(Mbps)	Max Bitrate(Mbps)	Min Bitrate(Mbps)	CC Error	Actions
Warning	1001	eth1[192.168.1.10]	udp://239.1.1.114:10106	38.016608	35.25376	43.606976	34.310752	2	[Warning Icon] [Edit] [Delete]
Lock	1002	eth1[192.168.1.10]	udp://225.1.2.21:10011	13.854848	13.854848	16.455264	9.433088	0	[Lock Icon] [Edit] [Delete]
Lock	1003	eth1[192.168.1.10]	udp://225.1.2.27:10017	8.6856	8.6856	9.52784	8.538208	0	[Lock Icon] [Edit] [Delete]
Lock	1005	eth1[192.168.1.10]	udp://239.2.1.50:1234	11.928224	11.928224	19.171488	11.928224	0	[Lock Icon] [Edit] [Delete]

Service Name	Service ID	CC Error	Bitrate(Mbps)	Progress
ZDFInfo	28011(0x6d1)	0	6.518336	17.15%
KiKA	28008(0x6d0)	0	5.023360	3.21%
zdf_neo	28014(0x6d6)	0	5.435456	4.30%
DRadio DokDeb	28015(0x6d7)	0	0.153408	0.40%
Dif Kultur	28012(0x6d4)	0	0.758016	1.99%
Dif	28013(0x6d5)	0	0.285760	0.75%
ZDF	28006(0x6d0)	0	8.757792	22.04%
3sat	28007(0x6d1)	0	6.643168	17.47%
Dif Nova	28017(0x6d9)	0	0.284256	0.75%

PID	PID Type	CC Error	Bitrate(Mbps)	Progress
0(0x0)	PAT	0	0.015040	0.04%
1(0x1)	CAT	0	0.015040	0.04%
16(0x10)	NIT-actual	0	0.009024	0.02%
17(0x11)	SDT-actual,BAT	1	0.006016	0.02%
18(0x12)	EIT-actual schedule	1	1.349088	5.5%
20(0x14)	TOT,TDI	0	0.000000	0.00%
84(0x54)	PES Private	0	0.004512	0.01%
100(0x64)	PMT	0	0.015040	0.04%
110(0x6e)	PCR,MPEG-2 Video	0	7.306432	22.22%
120(0x78)	MPEG-1 Audio	0	0.263200	0.69%
121(0x79)	MPEG-1 Audio	0	0.200032	0.53%
122(0x7a)	MPEG-1 Audio	0	0.200032	0.53%
125(0x7d)	AC-3 Audio	0	0.460224	1.21%
130(0x82)	Teletext	0	0.300800	0.79%
131(0x83)	Subtitle	0	0.007520	0.02%
200(0xc8)	PMT	0	0.015040	0.04%
210(0xd2)	PCR,MPEG-2 Video	0	5.179776	63%
220(0xdc)	MPEG-1 Audio	0	0.263200	0.69%

Indicator	Errors
Priority 1	
TS_sync_loss	0
Sync_byte_error	0
PAT_error	0
Continuity_count_error	2
PMT_error	0
PID_error	0
Priority 2	
Transport_error	0
CRC_error	0
PCR_repetition_error	0
PCR_discontinuity_indicator_error	0
PCR_accuracy_error	0
PTS_error	0
CAT_error	0
Priority 3	
NIT_Actual_error	0
NIT_other_error	0

CC errors might come up if the receiver streamer input signal got some input weakness like here the DVB-S streamer.... Blankom DRD700 SAT-> IP

Streams containing encryption Information will be shown as well:

You can PID filter in a later step...

You could find the menu points in the Web-IF to do PID dropping and PID including from input source stream as an example like the below screenshot:

Mux Output Services(1)[238.73.100.1:1234]
Mux Output PSI/SI[238.73.100.1:1234]

TS ID

ON ID

Total Bitrate(Mbps)

PID F

In Cha

100

100

100

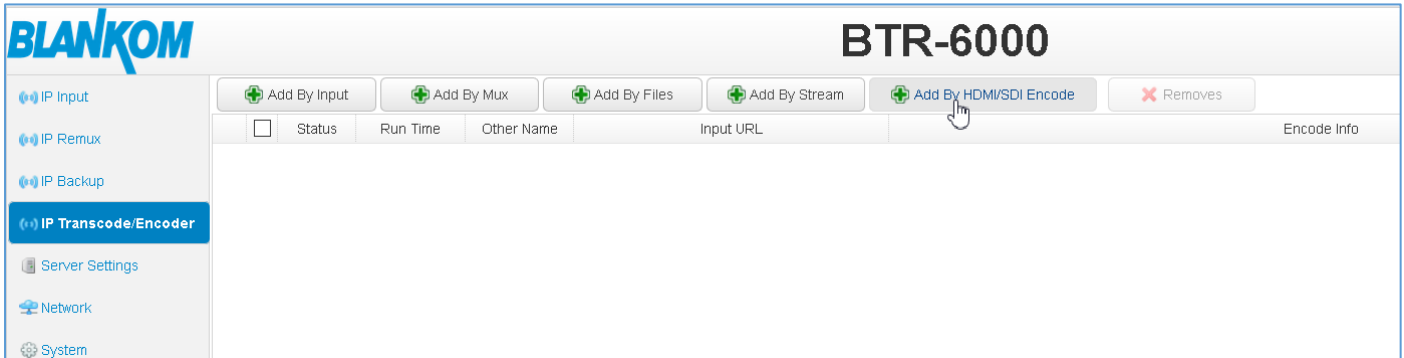
100

Clear All Services
 Other Setting

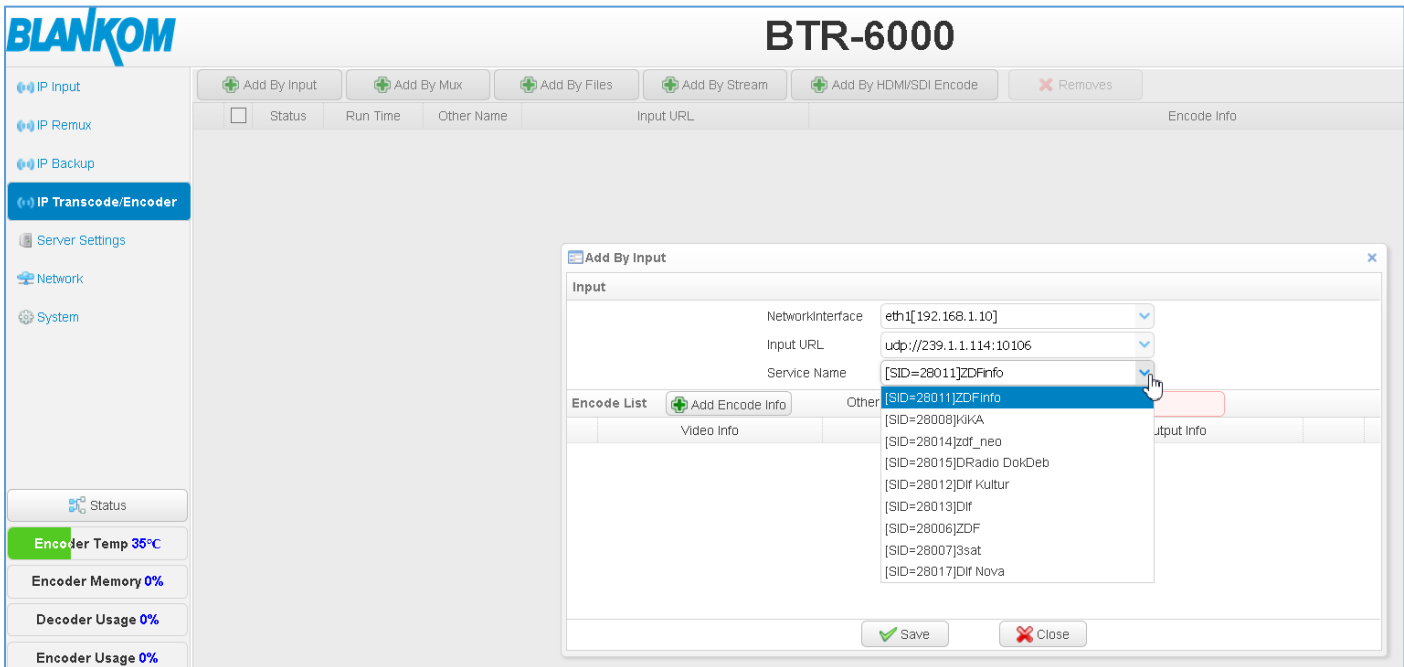
In Channel	Service ID	Service Name	
1004	402	HNSTVHD	-
In PID	Out PID	PID Type	
4025(0xfb9)	4025(0xfb9)	PMT	
4020(0xfb4)	4020(0xfb4)	PCR,H.264 Video	
4021(0xfb5)	4021(0xfb5)	AC-3 Audio	
4022(0xfb6)	4022(0xfb6)	Enhanced AC-3 Audio	

Now that we have some streams coming in we like to transcode them:

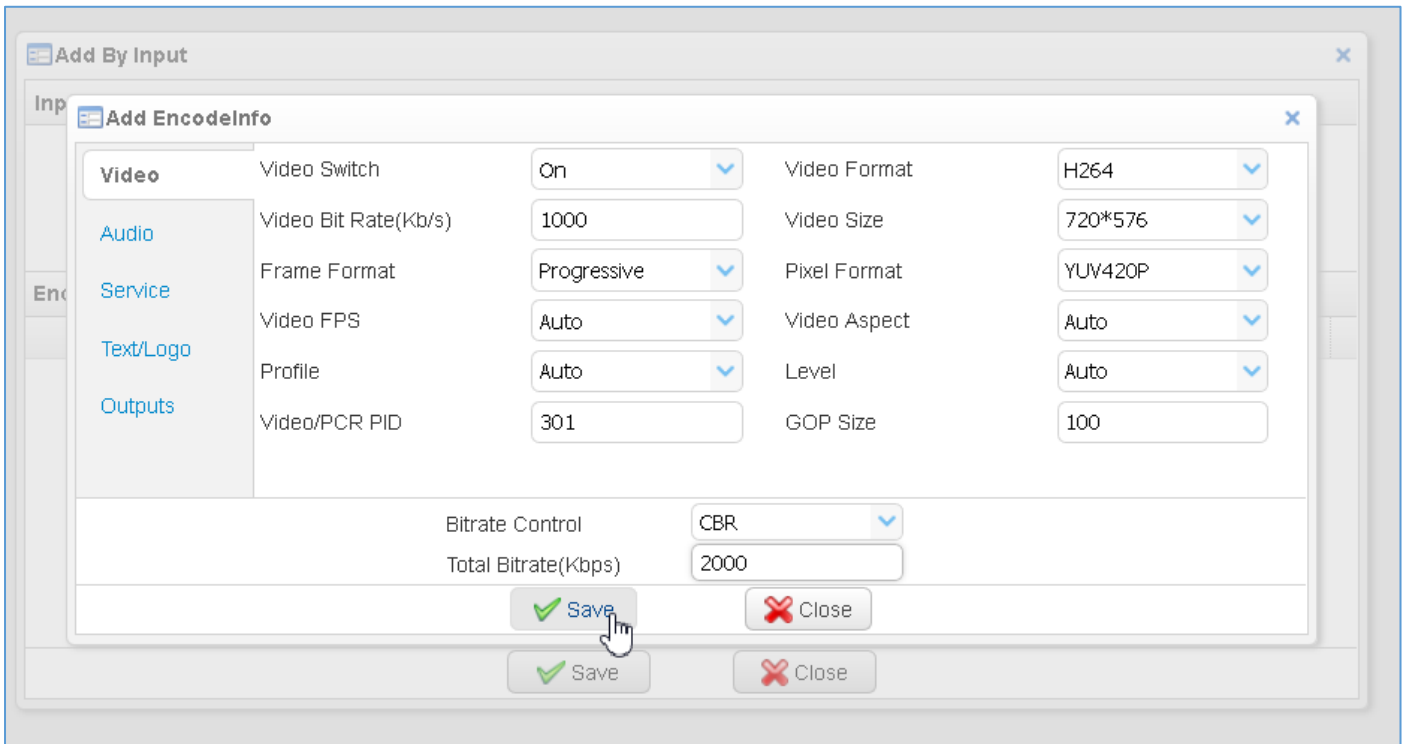
Transcoding:



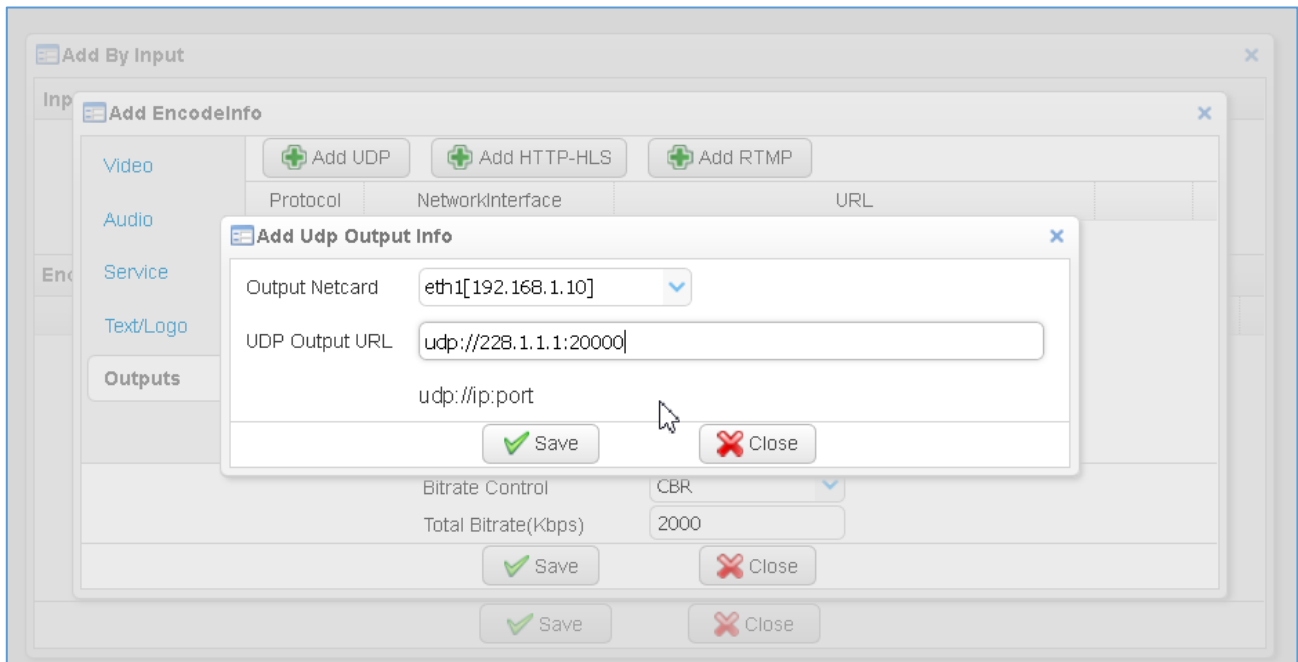
The HDMI/SDI encoding Menu is only for BTR units equipped with either an HDMI Input card or an SDI Input card (optional). Files adding will be also a future release upgrade.



Different Input methods can be chosen –



Set the values according to your needs. Audio, Text Logo Service Informations ... and finally the output stream GbE port (eth1...3) destination and address:



BLANKOM BTR-6000 Language Select: English

Buttons: Add By Input, Add By Mux, Add By Files, Add By Stream, Add By HDMI/SDI Encode, Removes

Status	Run Time	Other Name	Input URL	Encode Info
1	Normal	01:42:24.20	ZDF Info [eth1]udp://239.1.1.114:10106(SID=28011)	H264~1920*1080P~2000K AAC-LC(401)~64(kb/s)~Auto [eth1]udp://239.10.100.1:1234
2	Normal	01:48:06.48	HD [eth1]udp://225.1.2.21:10011(SID=10375)	H264~1920*1080P~2000K (5402)AAC-LC(401)~64(kb/s)~Auto [eth1]udp://239.10.100.2:1234

Edit By Input

Input

NetworkInterface: eth1[192.168.1.10]

Input URL: udp://239.1.1.114:10106

Service Name: [SID=28011]ZDFinfo

Encode List

Video Info	Audio Info	Output Info
1 H264(301)~1920*1080P~2000(kb/s)	AAC-LC(401)~64(kb/s)~Auto	[eth1]udp://239.10.100.1:1234

Buttons: Save, Close

Run Time 1:48:29

Detailed Information about your transcoded Service can be gathered by selecting the leaf-button:

BLANKOM BTR-6000 Language Select: English

Buttons: Add By Input, Add By Mux, Add By Files, Add By Stream, Add By HDMI/SDI Encode, Removes

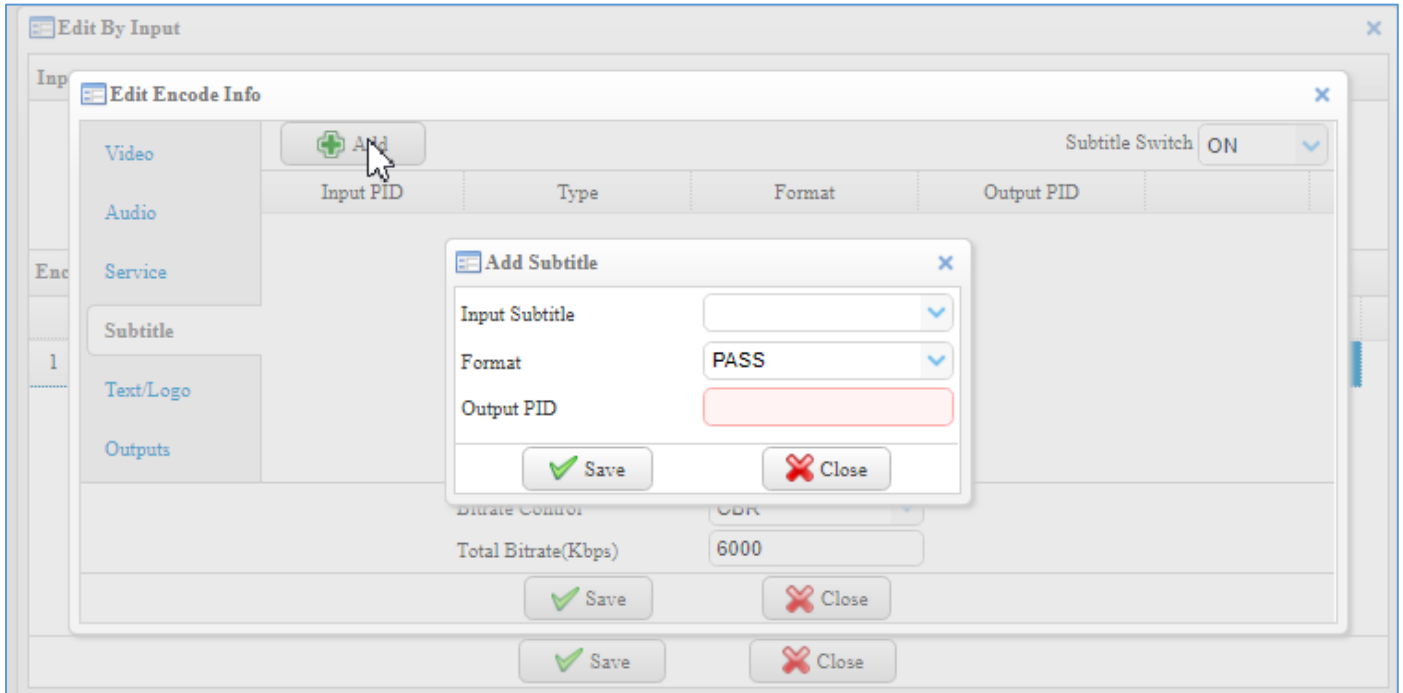
Status	Run Time	Other Name	Input URL	Encode Info
1	Normal	02:43:20.08	ZDF Info [eth1]udp://239.1.1.114:10106(SID=28011)	H264~1920*1080P~2000K AAC-LC(401)~64(kb/s)~Auto [eth1]udp://239.10.100.1:1234
2	Normal	02:49:02.02	HD [eth1]udp://225.1.2.21:10011(SID=10375)	H264~1920*1080P~2000K (5402)AAC-LC(401)~64(kb/s)~Auto [eth1]udp://239.10.100.2:1234
3	Normal	00:29:05.32	hr-sd [eth1]udp://225.1.2.29:10019(SID=28108)	HEVC~1920*1080P~2000K AAC MPEG-1 Layer 2(401)~64(kb/s)~Auto [eth1]udp://233.0.0.1:10002

Show Transcode Info [Other Name = hr-sd]

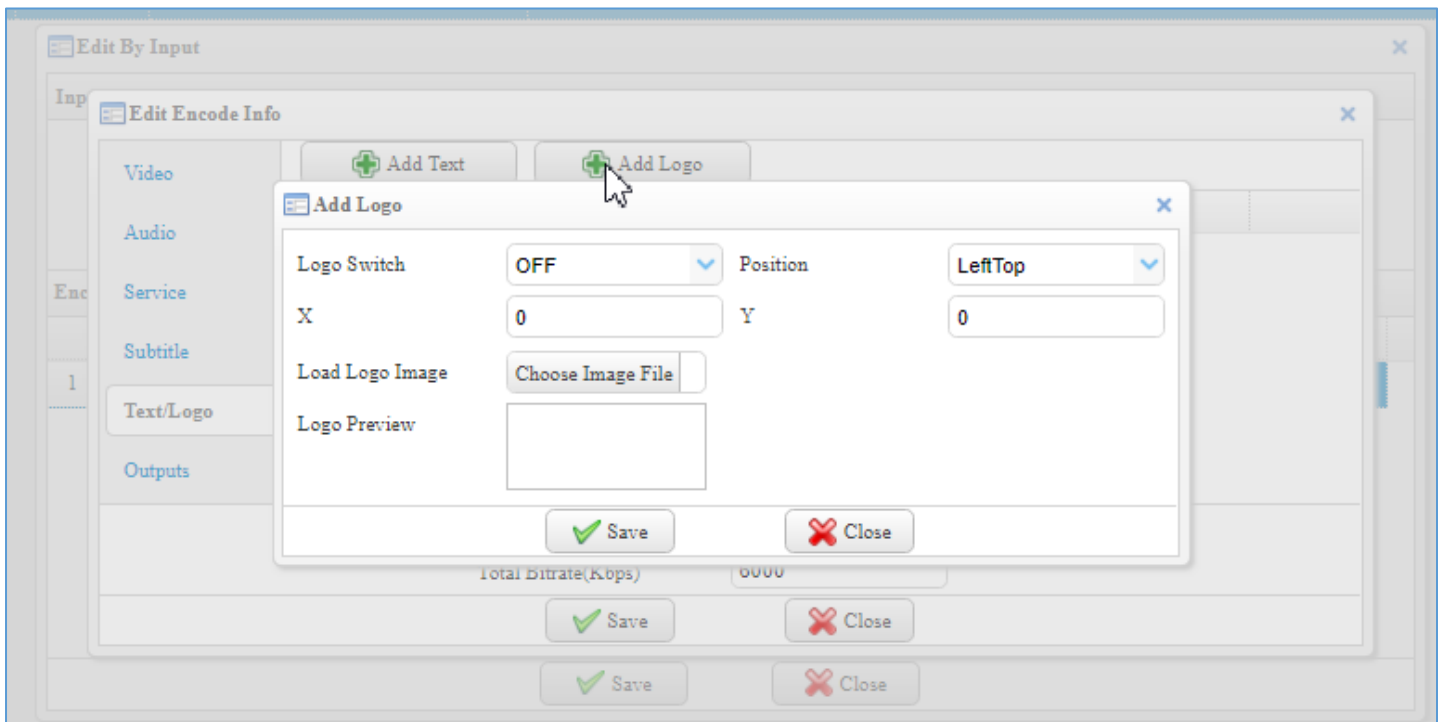
- Input
 - Input NetworkInterface: eth1[192.168.1.10]
 - Input URL: udp://225.1.2.29:10019
 - Input Service Name: hr-fernsehen
 - Input Service ID: 28108
- Encode-1
 - Video Info
 - Video Output PID: 301
 - Video Format: HEVC
 - Video Size: 1920*1080
 - Frame Format: Progressive
 - Video Bitrate: 2000k
 - Video FPS: Auto
 - Video GOP: 100
 - Video Aspect: Auto
 - Level: Auto
 - Video Profile: Auto
 - Video PixelFormat: yuv420p
 - Audio Info(Input PID= 302)
 - Audio Output PID: 401
 - Audio Format: MPEG-1 Layer 2
 - Audio Bitrate: 64k
 - Audio Sample: Auto
 - Audio Volume: 100
 - Audio ALC Switch: OFF
 - Audio ALC Volume: 0
 - Bitrate Mode: VBR
 - TS ID: 1
 - ON ID: 2
 - PMT ID: 201
 - Service ID: 101

Run Time 2:49:29

Subtitles can be passed or injected:



LOGO's ad advertisements or simple Text strings can be added to the transcoded Service as well:



After setting up some encodings, later on they can be changed as well.

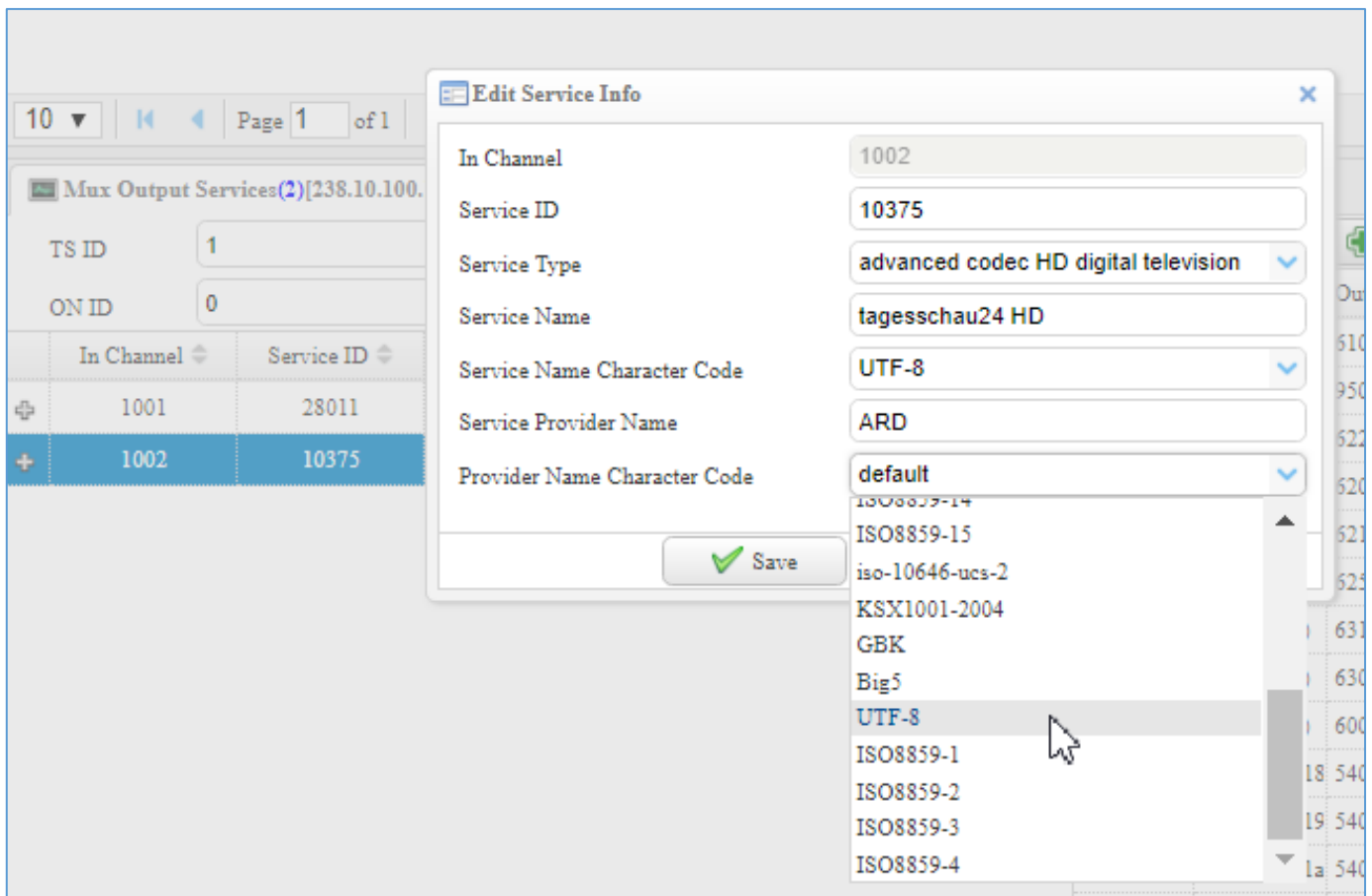
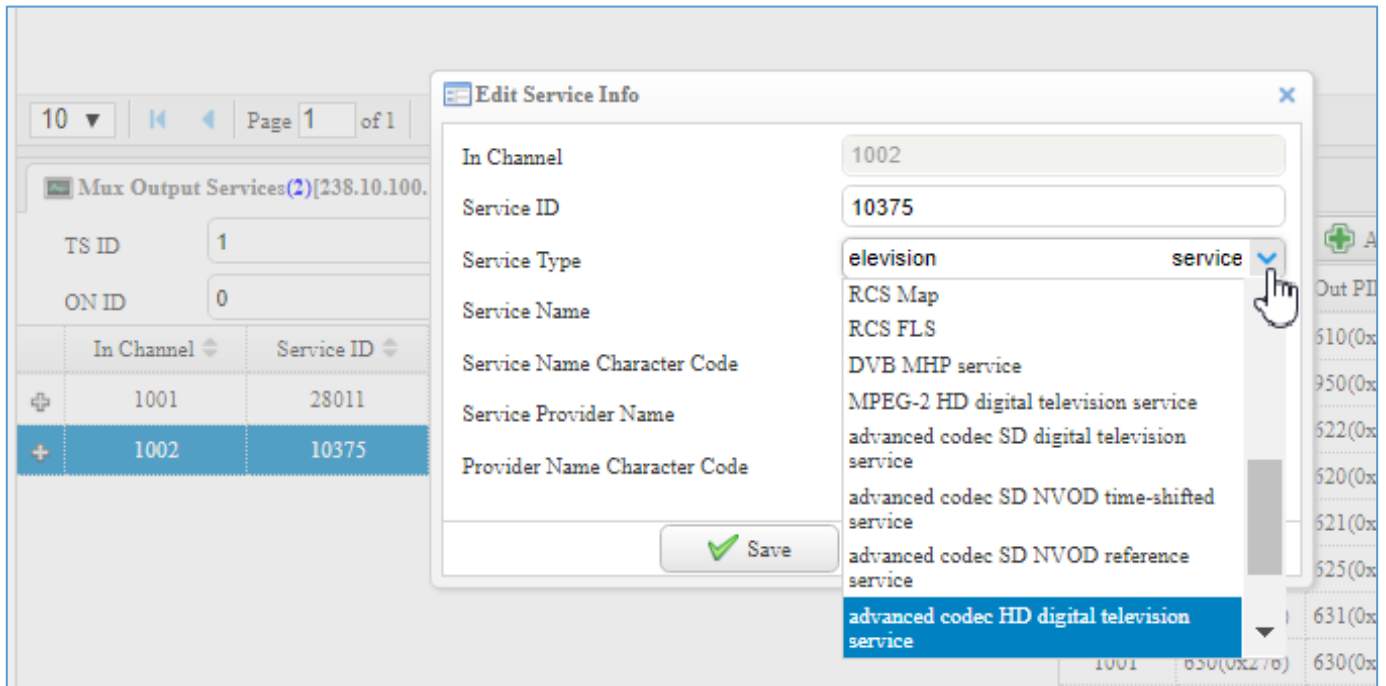
IP Remux- Menu:

Entering this menu, allows the user to use already incoming streams to be remultiplexed to new MPTS:

First off all, you need to setup one or more output streams:

Chose DVB-Mode or IPTV. Than save and you can drag and drop services from the left side (Input streams) to the new mux:

To edit the content just use the PEN:



In the PSI/SI submenu you can edit and add i.e. PSI or other NIT table values:

The screenshot displays the BLANKOM interface. On the left, the 'Input Service List' shows a tree view of services under the IP address 192.168.1.10. The main area is the 'Output List', which contains two entries:

Status	Channel	URL	Mode	NetworkInterface	Total Bitrate(Mbps)	Valid Bitrate(Mbps)	
Normal	5000	udp://230.1.1.10:10000	DVB	eth1[192.168.1.10]	14.444416	13.758592	[edit] [delete]
Normal	5001	udp://238.10.100.1:1234	IPTV	eth1[192.168.1.10]	6.801088	6.801088	[edit] [delete]

Below the table, the configuration for 'Mux Output Services(2)[230.1.1.10:10000]' is shown. The 'NIT' section is expanded, displaying the following parameters:

- table_id = 0x40(64)
- section_syntax_indicator = 0x0(0)
- section_length = 0xd(13)
- network_id = 0x0(0)
- version_number = 0x0(0)
- current_next_indicator = 0x0(0)
- section_number = 0x0(0)
- last_section_number = 0x0(0)
- network_descriptors_length = 0x0(0)
- network_descriptors(0)
- transport_stream_loop_length = 0x0(0)
- nitTransportStreams(0)
- CRC = 0x00,0x00,0x00,0x00

Buttons for 'Save NIT' and 'Refresh NIT' are located at the bottom right of the configuration area.

As well as inserting descriptors:

The 'Add Descriptor' dialog box is shown, allowing the user to select a descriptor from a list. The list contains the following entries:

Tag	Descriptor
74(0x4a)	linkage_descriptor
91(0x5b)	multilingual_network_name_desc
64(0x40)	network_name_descriptor
95(0x5f)	private_data_specifier_descriptor
66(0x42)	stuffing_descriptor
128-271(0x80-0xFE)	user_defined_descriptor

The 'private_data_specifier_descriptor' entry is currently selected. The dialog also shows a 'Select Descriptor:' dropdown menu and a list of existing descriptors in the background, including 'network_descriptors(0)', 'transport_stream_loop_length = 0x0(0)', 'nitTransportStreams(0)', and 'CRC = 0x00,0x00,0x00,0x00'.

and manage i.e. character table corrections:

As well as do PID-Remapping:

Or even PID filtering (dropping):

To add zero-packets (PID8191dec) to the output stream, you need to configure DVB-Mode and then enter a max. Total bitrate in the Mux output Services like:

The screenshot displays the main interface of the BLANKOM BTR-6000. On the left, there is a sidebar with navigation options: IP Input, IP Remux, IP Backup, IP Transcode/Encoder, Server Settings, Network, and System. The main area is divided into two panels. The top-left panel shows the 'Input Service List' with a tree view of services under the 'eth1[192.168.1.10](4)' interface. The top-right panel shows the 'Output List' with a table of output services. Below this, there are controls for 'Mux Output Services' and a 'PID Filter Table'.

Status	Channel	URL	Mode	NetworkInterface	Total Bitrate(Mbps)	Valid Bitrate(Mbps)
<input checked="" type="checkbox"/>	Normal	5000	udp://230.1.1.10:10000	DVB	eth1[192.168.1.10]	20.000000
<input type="checkbox"/>	Normal	5001	udp://238.10.100.1:1234	IPTV	eth1[192.168.1.10]	15.739360

In Channel	In PID	Out PID	PID Type
1001	121(0x79)	121(0x79)	MPEG-1 Audio
1001	330(0x14a)	330(0x14a)	Teletext
1001	100(0x64)	100(0x64)	PMT
1001	310(0x136)	310(0x136)	PCR,MPEG-2 Video
1001	110(0x6e)	110(0x6e)	PCR,MPEG-2 Video

IP Backup function:

The screenshot shows the 'IP Backup' section of the BLANKOM BTR-6000 interface. The sidebar on the left has 'IP Backup' selected. The main area displays a 'Backup List(0)' table with columns for Status, Other Name, and Use. Below the table is a 'Backup Log List(0)' section. On the left sidebar, there are several status indicators: Encoder Temp 52°C, Encoder Memory 5%, Decoder Usage 7%, Encoder Usage 27%, and Processor Temp 44°C.

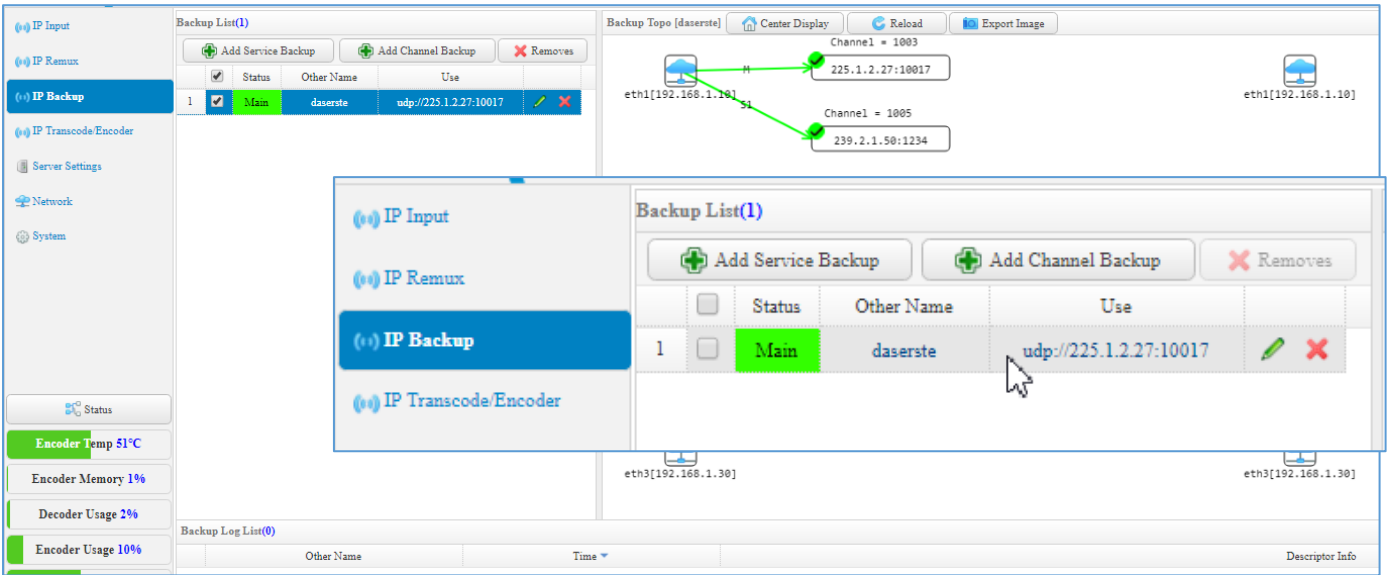
Add a stream first or here we are using existing ones just to show how it works...

The Reason of this function is obvious?: If a mayor stream input will fail, the backup address will be used to process it so the output encoding has still content. Usually as an example: If the HD channel you are transcoding will be interrupted somehow, you create the backup channel from i.e. an SD source stream.

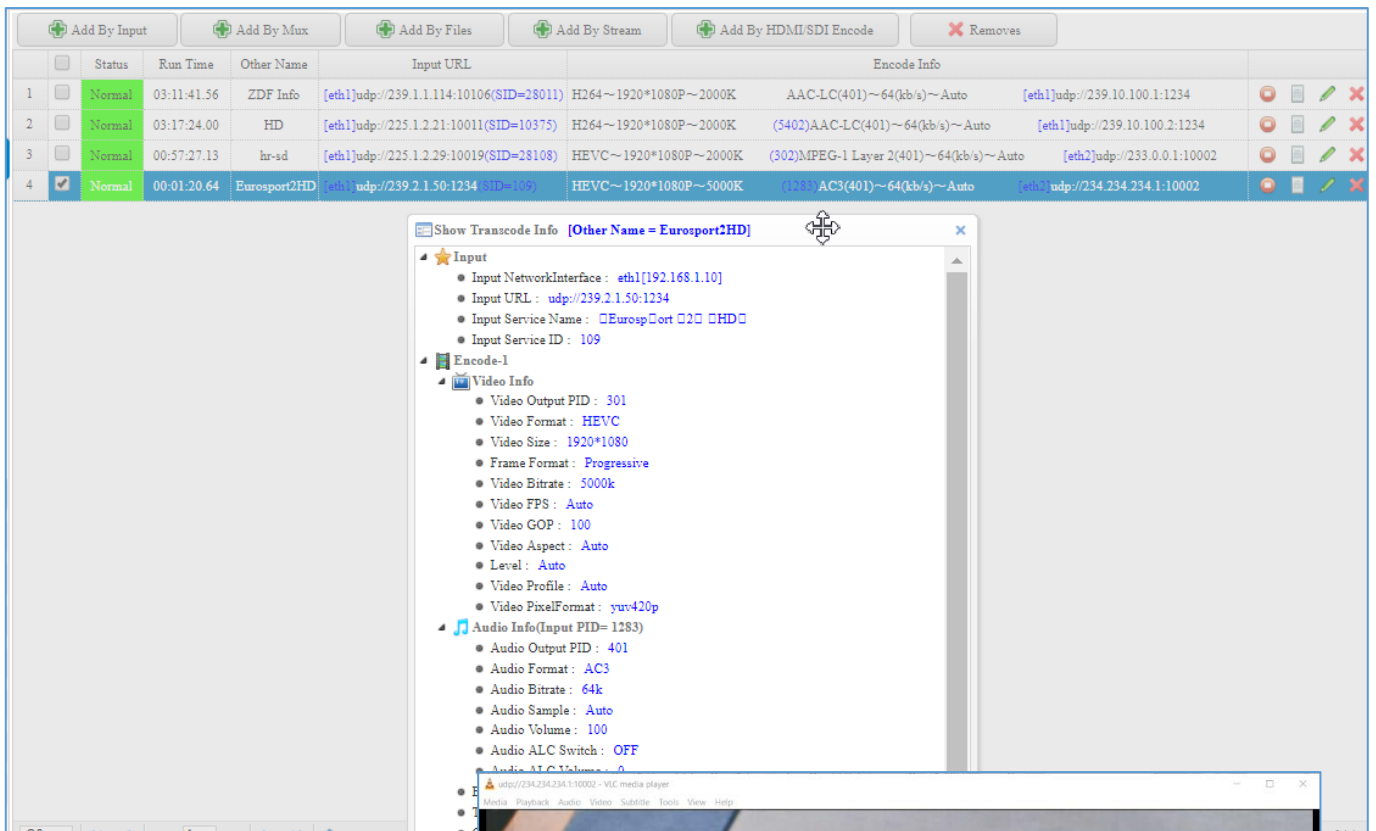
Three sequential screenshots illustrating the process of adding an IP backup input:

- Add Ip Backup By Service:** A dialog box where the 'Backup Name' is set to 'daserste'. The 'Main Info(1)' section has an 'Add' button being clicked.
- Add Ip Backup Input:** A dialog box showing a list of input services. The service '[1005]239.2.1.50:1234 (1)' is selected.
- Add Ip Backup Input:** A dialog box showing the final configuration of the backup input, with the selected service '[1005]239.2.1.50:1234 (1)' highlighted.

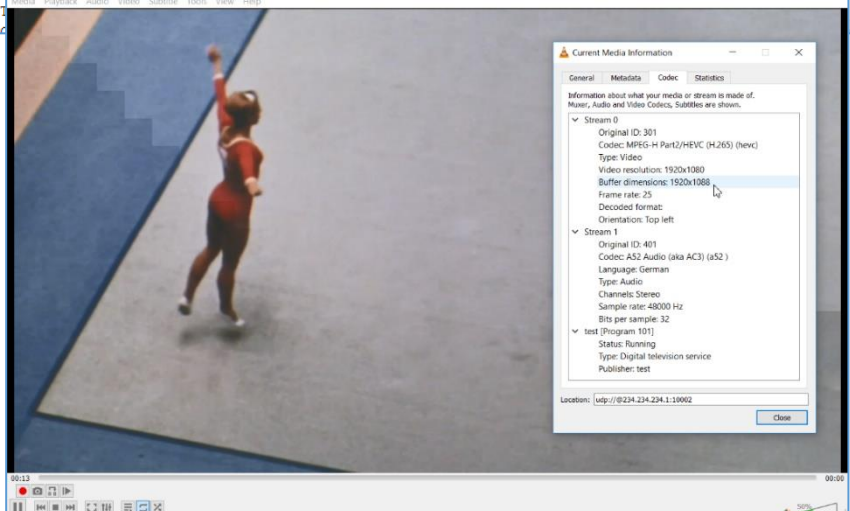
A nice feature is the Topology-Overview:



Example for setup another transcoding h.264 to HEVC:

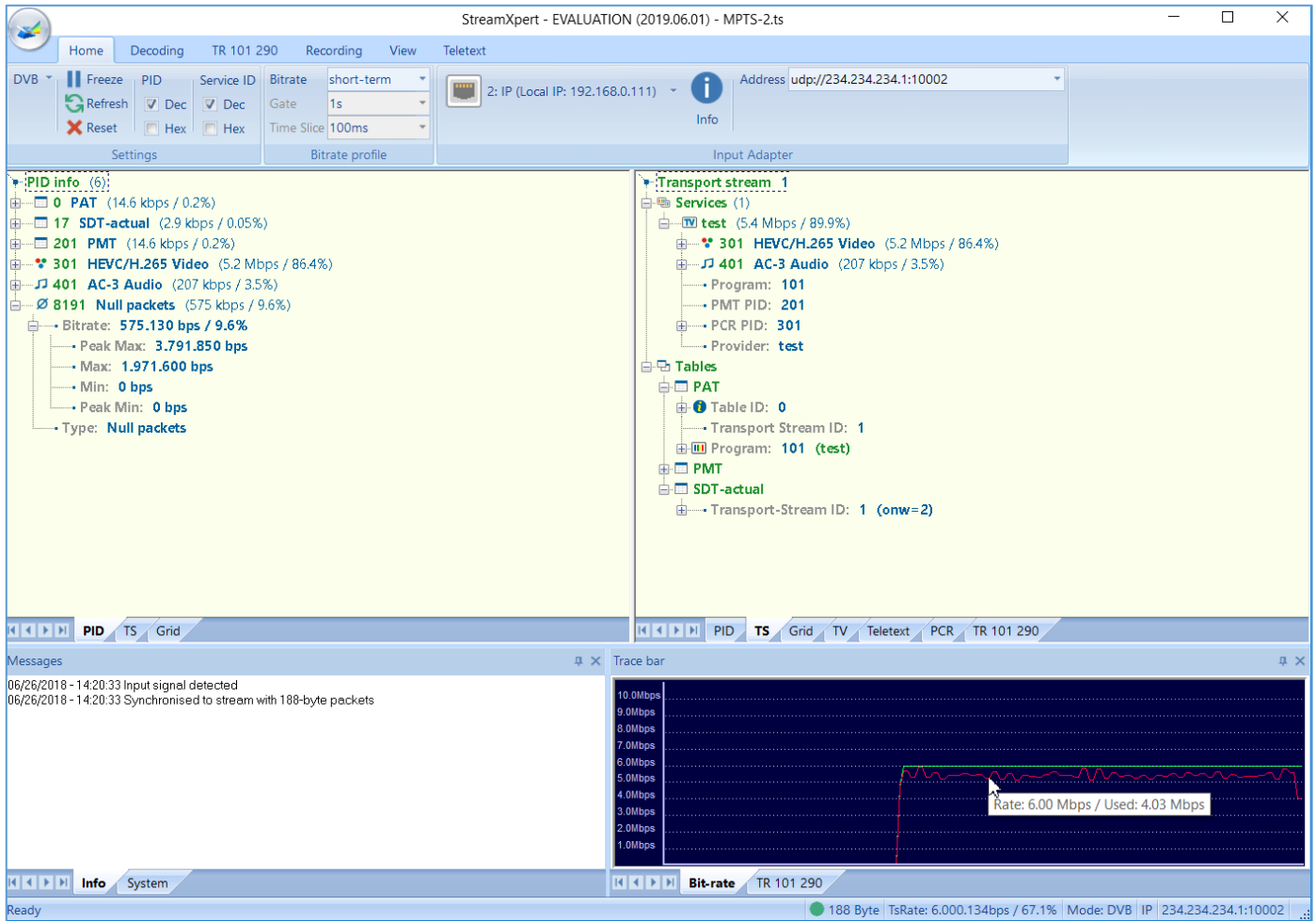


Can be checked by VLC:

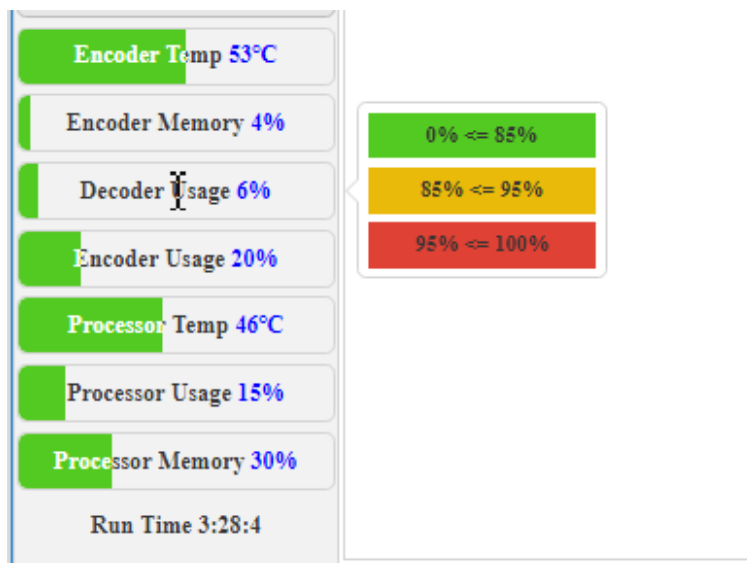


Or by DekTec:

Because we have setup CBR instead of VBR, Null-packets are added on PID8191dec to the encoded IP output:



When editing streams to transcode, please always have an eye on:



It will change colour if the encoder processes are coming to its limits. The max. mix of transcoded and processed services depending on your quality settings.

BTW: We assume, that the user is familiar with the Codecs (Audio/Video) and their settings (GOP etc...) , DVB and IPTV Rules/Tables and of course Network mechanism like IGMP, RTP, etc...

EPG-remultiplexing an example...

Because for that purpose you will create a TS-remultiplex from different sources to stream out to maybe a QAM Modulator to deploy a DVB-C Channel.

In this example we will several inputs as SPTS and 1 MPTS and we remultiplex them together to one MPTS output and we'll look what happens with the EPG. All of these streams will have

Inputs from DRD 700 SPTS + 1 MPTS: (all have EPG de- muxed and carrying...):

DRD 700
Logged in as: [admin \(192.168.0.66\)](#)
[Logout](#)

Output > MPTS

MPTS
SPTS

Set

No.	Source	ASI	IP	Port	Destination Address	Protocol	Output
1	<input checked="" type="radio"/> TS 1 <input type="radio"/> MUX 1	OFF	<input checked="" type="checkbox"/>	1015	239.1.1.115	UDP	LAN 1
2	<input checked="" type="radio"/> TS 2 <input type="radio"/> MUX 2	OFF	<input checked="" type="checkbox"/>	10006	239.1.1.116	UDP	LAN 1
3	<input checked="" type="radio"/> TS 3 <input type="radio"/> MUX 3	OFF	<input checked="" type="checkbox"/>	1017	239.1.1.117	UDP	LAN 1
4	<input checked="" type="radio"/> TS 4 <input type="radio"/> MUX 4	OFF	<input checked="" type="checkbox"/>	5018	239.1.1.118	UDP	LAN 1

Output > SPTS

MPTS
SPTS

Set

EIT Insertion: ON

SAP Insertion: ON

No.	Source	Enabled	Port	Destination Address	Protocol	Output
1	TS 1 - 5001 - BBC World News Europe HD	<input checked="" type="checkbox"/>	10001	225.1.1.1	UDP	LAN 1
2	TS 1 - 5021 - NHK WORLD-JPN	<input checked="" type="checkbox"/>	10002	225.1.1.2	UDP	LAN 1
3	TS 1 - 5031 - Al Jazeera English HD	<input checked="" type="checkbox"/>	10003	225.1.1.3	UDP	LAN 1
4	TS 1 - 5081 - MB LIVE	<input checked="" type="checkbox"/>	10004	225.1.1.4	UDP	LAN 1
5	TS 3 - 17503 - WELT	<input checked="" type="checkbox"/>	10005	225.1.1.5	UDP	LAN 1
6	TS 2 - 10350 - rbb Brandenburg HD	<input checked="" type="checkbox"/>	10006	225.1.1.6	UDP	LAN 1
7	TS 2 - 10355 - hr-fernsehen HD	<input checked="" type="checkbox"/>	10007	225.1.1.7	UDP	LAN 1
8	TS 3 - 17500 - SAT.1	<input checked="" type="checkbox"/>	10015	225.1.1.15	UDP	LAN 1
9	TS 3 - 17501 - ProSieben	<input checked="" type="checkbox"/>	10016	225.1.1.16	UDP	LAN 1
10	TS 3 - 17502 - kabel eins	<input checked="" type="checkbox"/>	10017	225.1.1.17	UDP	LAN 1
11	TS 3 - 17503 - WELT	<input checked="" type="checkbox"/>	10018	225.1.1.18	UDP	LAN 1
12	TS 3 - 17504 - SAT.1 Gold	<input checked="" type="checkbox"/>	10019	225.1.1.19	UDP	LAN 1
13	TS 3 - 17505 - Pro7 MAXX	<input checked="" type="checkbox"/>	10020	225.1.1.20	UDP	LAN 1
14	TS 3 - 17507 - SAT.1 Bayern	<input checked="" type="checkbox"/>	10021	225.1.1.21	UDP	LAN 1
15	TS 3 - 17508 - SAT.1 NRW	<input checked="" type="checkbox"/>	10022	225.1.1.22	UDP	LAN 1
16	TS 4 - 11150 - 3sat HD	<input checked="" type="checkbox"/>	10023	225.1.1.23	UDP	LAN 1
17	TS 4 - 11160 - KiKA HD	<input checked="" type="checkbox"/>	10026	225.1.1.26	UDP	LAN 1
18	TS 4 - 11170 - ZDFinfo HD	<input checked="" type="checkbox"/>	10027	225.1.1.27	UDP	LAN 1

BLANKOM [®] an IRENIS brand		BTR-6000				Filter Display All				IP
Used 5/100		Add	Adds	Removes	Clear All Error					
IP Input	Status	Channel	NetworkInterface	URL	Total Bitrate(Mbps)	Valid Bitrate(Mbps)	Max Bitrate(Mbps)	Min Bitrate(Mbps)		
IP Remux	Lock	1004	eth1[192.168.0.188]	udp://225.1.1.1:10001	8.917216	8.917216	8.917216	8.89616		
IP Backup	Lock	1005	eth1[192.168.0.188]	udp://225.1.1.2:10002	9.117248	9.117248	9.190944	9.011968		
IP Transcode/Encoder	Lock	1007	eth1[192.168.0.188]	udp://225.1.1.6:10006	15.992032	15.992032	16.381568	8.485568		
Server Settings	Lock	1008	eth1[192.168.0.188]	udp://225.1.1.7:10007	14.812896	14.812896	16.52896	9.780512		
	Lock	1010	eth1[192.168.0.188]	udp://239.1.1.118:5018	42.58576	42.271424	42.6008	42.143584		

Just start with before – after:

We are mixing services which do not contain EIT at all: BBC is one of these 'Brexit's':

The screenshot displays two panels of technical data for a transport stream. The left panel, titled 'PID info', shows details for several PIDs: 0 (PAT), 17 (SDT-actual), 20 (TDT, TOT), 212 (PMT), and 2091 (AVC/H.264 Video). The 2091 PID is the primary video stream, with a bitrate of 8.700.827 bps and 97.7% validity. It has a resolution of 1920x1080, SAR of 1:1, and a frame rate of 25.00. The right panel, titled 'Transport stream 1002', shows the overall stream details, including services (BBC World News Europe HD), video (2091 AVC/H.264 Video), audio (2092 AC-3 Audio), and tables (PAT, PMT, SDT-actual, TDT, TOT). The PMT table lists the program as 5001 (BBC World News Europe HD) and the transport stream ID as 1002.

The Japanese have more EPG than BBC ;-):

DVB
Freeze
Refresh
Reset

PID
Service ID
Bitrate
short-term

2: IP (Local IP: 192.168.0.66)
Info

Address
udp://225.1.1.2:10002

Settings
Bitrate profile
Input Adapter

PID info (7)

- 0 PAT (7.2 kbps / 0.08%)
- 17 SDT-actual (1.47 kbps / 0.02%)
 - Bitrate: 1.465 bps / 0.02%
 - PCR: No
 - Scrambled: No
 - CC Errors: 0
 - Type: SDT-actual
- 18 EIT-actual p/f, EIT-actual day 0..3 (102 kbps / 1.1%)
 - Bitrate: 102.033 bps / 1.1%
 - Peak Max: 381.054 bps
 - Max: 144.230 bps
 - Min: 20.756 bps
 - Peak Min: 0 bps
 - PCR: No
 - Scrambled: No
 - CC Errors: 0
 - Type: EIT-actual p/f, EIT-actual day 0..3
- 20 TDT, TOT (0 bps / 0.00%)
- 1720 MPEG-1 Audio (140 kbps / 1.5%)
- 1760 AVC/H.264 Video (8.9 Mbps / 97.2%)
- 5071 PMT (2.8 kbps / 0.03%)
 - Bitrate: 2.836 bps / 0.03%
 - PCR: No
 - Scrambled: No
 - CC Errors: 0
 - Type: PMT

Transport stream 1002

- Services (1)
 - NHK WORLD-JPN (9.0 Mbps / 98.8%)
- Tables
 - PAT
 - Table ID: 0
 - Table PID: 0
 - Table version: 1
 - Repetition rate: 4.0Hz
 - Table interval: 0.25s
 - Number of sections: 1
 - Section length: 16 bytes
 - Transport Stream ID: 1002
 - Program: 5021 (NHK WORLD-JPN)
 - PMT
 - Program: 5021 (NHK WORLD-JPN)
 - SDT-actual
 - Transport-Stream ID: 1002 (onw=1)
 - EIT-actual
 - EIT-actual p/f
 - Service: NHK WORLD-JPN
 - Table ID: 78
 - Service ID: 5021 (NHK WORLD-JPN)
 - Transport-Stream ID: 1002
 - Original Network ID: 1
 - Section: 0 (present event)
 - No events
 - Section: 1 (following event)
 - Event ID: 3709
 - EIT-actual schedule
 - EIT-actual day 0..3
 - Service: NHK WORLD-JPN
 - TDT
 - TOT

DVB
Freeze
Refresh
Reset

PID
Service ID
Bitrate
short-term

2: IP (Local IP: 192.168.0.66)
Info

Address
udp://225.1.1.6:10006

Settings
Bitrate profile
Input Adapter

PID info (14)

- 0 PAT (5.7 kbps / 0.04%)
- 17 SDT-actual (1.45 kbps / 0.01%)
 - Bitrate: 1.447 bps / 0.01%
 - PCR: No
 - Scrambled: No
 - CC Errors: 1
 - Type: SDT-actual
- 18 EIT-actual p/f, EIT-actual day 0..3, EIT-actual day 4..7 (184 kbps / 1.2%)
 - Bitrate: 184.686 bps / 1.2%
 - Peak Max: 787.987 bps
 - Max: 194.345 bps
 - Min: 65.576 bps
 - Peak Min: 0 bps
 - PCR: No
 - Scrambled: No
 - CC Errors: 1
 - Type: EIT-actual p/f, EIT-actual day 0..3, EIT-actual day 4..7
- 20 TDT, TOT (2.9 kbps / 0.02%)
- 670 AIT (10.1 kbps / 0.07%)
- 2171 13818-6 type B (152 kbps / 1.0%)
- 2176 13818-6 type C (10.1 kbps / 0.07%)
- 5300 PMT (7.2 kbps / 0.05%)
- 5311 AVC/H.264 Video (13.8 Mbps / 89.1%)
- 5312 MPEG-1 Audio (205 kbps / 1.3%)
- 5313 MPEG-1 Audio (205 kbps / 1.3%)
- 5314 Teletext Data (264 kbps / 1.7%)
- 5315 PES Private Data 1 (2.9 kbps / 0.02%)
- 5316 AC-3 Audio (404 kbps / 2.6%)

Transport stream 1061

- Services (1)
 - rbb Brandenburg HD (15.0 Mbps / 97.2%)
- Tables
 - PAT
 - Table ID: 0
 - Table PID: 0
 - Table version: 1
 - Repetition rate: 4.0Hz
 - Table interval: 0.25s
 - Number of sections: 1
 - Section length: 16 bytes
 - Transport Stream ID: 1061
 - Program: 10350 (rbb Brandenburg HD)
 - PMT
 - SDT-actual
 - Service: rbb Brandenburg HD
 - EIT-actual
 - EIT-actual p/f
 - EIT-actual schedule
 - EIT-actual day 0..3
 - EIT-actual day 4..7
 - TDT
 - TOT
 - AIT
 - PID 670

Settings | **Bitrate profile** | **Input Adapter**

DVB: Freeze | Refresh | Reset | PID: Dec | Hex | Service ID: Dec | Hex | Bitrate: short-term | Gate: 1s | Time Slice: 100ms | Address: udp://225.1.1.7:10007

PID info (15)

- 0 PAT (5.9 kbps / 0.04%)
- 17 SDT-actual (1.50 kbps / 0.01%)
 - Bitrate: 1.495 bps / 0.01%
 - PCR: No
 - Scrambled: No
 - CC Errors: 2
 - Type: SDT-actual
- 18 EIT-actual p/f, EIT-actual day 0..3, EIT-actual day 4..7 (162 kbps / 1.1%)
 - Bitrate: 162.828 bps / 1.1%
 - Peak Max: 787.987 bps
 - Max: 200.566 bps
 - Min: 89.835 bps
 - Peak Min: 0 bps
 - PCR: No
 - Scrambled: No
 - CC Errors: 2
 - Type: EIT-actual p/f, EIT-actual day 0..3, EIT-actual day 4..7
- 20 TDT, TOT (2.9 kbps / 0.02%)
- 670 AIT (0 bps / 0.00%)
- 2171 13818-6 type B (147 kbps / 1.0%)
- 2270 AIT (10.3 kbps / 0.07%)
- 2276 13818-6 type C (10.4 kbps / 0.07%)
- 5350 PMT (5.9 kbps / 0.04%)
- 5351 AVC/H.264 Video (13.6 Mbps / 89.5%)
- 5352 MPEG-1 Audio (198 kbps / 1.3%)
- 5353 MPEG-1 Audio (198 kbps / 1.3%)
- 5354 Teletext Data (256 kbps / 1.7%)
- 5355 PES Private Data 1 (3.0 kbps / 0.02%)
- 5356 AC-3 Audio (460 kbps / 3.0%)

Transport stream 1061

- Services (1)
 - hr-fernsehen HD (14.9 Mbps / 97.9%)
- Tables
 - PAT
 - Table ID: 0
 - Table PID: 0
 - Table version: 1
 - Repetition rate: 4.0Hz
 - Table interval: 0.25s
 - Number of sections: 1
 - Section length: 16 bytes
 - Transport Stream ID: 1061
 - PMT
 - Program: 10355 (hr-fernsehen HD)
 - SDT-actual
 - EIT-actual
 - EIT-actual p/f
 - Service: 10350
 - Service: hr-fernsehen HD
 - EIT-actual schedule
 - EIT-actual day 0..3
 - EIT-actual day 4..7
 - TDT
 - TOT
 - AIT
 - PID 670
 - PID 2270

Settings | **Bitrate profile** | **Input Adapter**

DVB: Freeze | Refresh | Reset | PID: Dec | Hex | Service ID: Dec | Hex | Bitrate: short-term | Gate: 1s | Time Slice: 100ms | Address: udp://239.1.1.118:5018

PID info (33)

- 0 PAT (14.7 kbps / 0.03%)
- 1 CAT (14.7 kbps / 0.03%)
- 16 NIT-actual (3.0 kbps / 0.01%)
- 17 SDT-actual, SDT-other, BAT (26 kbps / 0.06%)
 - Bitrate: 26.425 bps / 0.06%
 - PCR: No
 - Scrambled: No
 - CC Errors: 2
 - Type: SDT-actual, SDT-other, BAT
- 18 EITpf, EITs (1.45 Mbps / 3.4%)
 - Bitrate: 1.452.312 bps / 3.4%
 - Peak Max: 1.886.461 bps
 - Max: 1.464.109 bps
 - Min: 1.440.652 bps
 - Peak Min: 0 bps
 - PCR: No
 - Scrambled: No
 - CC Errors: 3
 - Type: EITpf, EITs
- 20 TDT, TOT (0 bps / 0.00%)
- 6500 PMT (14.7 kbps / 0.03%)
- 6510 AVC/H.264 Video (10.4 Mbps / 24.5%)
- 6520 MPEG-1 Audio (264 kbps / 0.6%)
- 6521 MPEG-1 Audio (201 kbps / 0.5%)
- 6522 AC-3 Audio (464 kbps / 1.1%)
- 6523 MPEG-1 Audio (200 kbps / 0.5%)
- 6530 Teletext Data (296 kbps / 0.7%)
- 6531 PES Private Data (4.4 kbps / 0.01%)
- 6570 AIT (10.2 kbps / 0.02%)
- 6600 PMT (16.1 kbps / 0.04%)
- 6610 AVC/H.264 Video (12.1 Mbps / 28.5%)
- 6620 MPEG-1 Audio (262 kbps / 0.6%)
- 6621 MPEG-1 Audio (200 kbps / 0.5%)
- 6622 AC-3 Audio (460 kbps / 1.1%)
- 6630 Teletext Data (298 kbps / 0.7%)

Transport stream 1010

- Services (3)
 - 3sat HD (11.9 Mbps / 27.9%)
 - KiKA HD (13.4 Mbps / 31.4%)
 - ZDFInfo HD (15.5 Mbps / 36.3%)
- Tables
 - PAT
 - CAT
 - PMT
 - NIT-actual
 - BAT
 - SDT-actual
 - SDT-other
 - EIT-actual
 - EIT-actual p/f
 - Service: 3sat HD
 - Service: KiKA HD
 - Service: ZDFInfo HD
 - EIT-actual schedule
 - EIT-actual day 0..3
 - EIT-actual day 4..7
 - EIT-actual day 8..11
 - EIT-actual day 12..15
 - EIT-actual day 16..19
 - EIT-actual day 20..23
 - EIT-other
 - EIT-other p/f
 - TDT
 - TOT
 - AIT
 - PID 6570
 - PID 6670
 - PID 6770

Because this last one is the MPTS we want to forward AIT as well.... We'll use it as the basic Remux TS:
 We need to create an output first:

Drag&Drop works after selecting them:

In Channel	Service ID	Service Name		
1010	11150	3sat HD	✓	✗
1010	11170	ZDFinfo HD	✓	✗
1010	11160	KiKA HD	✓	✗

In Channel	In PID	Out PID	PID Type
1010	6500(0x1964)	6500(0x1964)	PMT
1010	6510(0x196e)	6510(0x196e)	PCR.H.264 Video
1010	6520(0x1978)	6520(0x1978)	MPEG-1 Audio
1010	6521(0x1979)	6521(0x1979)	MPEG-1 Audio
1010	6522(0x197a)	6522(0x197a)	AC-3 Audio
1010	6523(0x197b)	6523(0x197b)	MPEG-1 Audio
1010	6530(0x1982)	6530(0x1982)	Teletext
1010	6531(0x1983)	6531(0x1983)	Subtitle

The screenshot shows the 'Mux Output Services' configuration window. At the top, there are fields for TS ID (1), ON ID (0), and Total Bitrate (102.000000). Below these are two tables: 'Mux Output Services' and 'PID Filter Table'. The 'Mux Output Services' table lists various services like '3sat HD', 'ZDFinfo HD', and 'KiKA HD'. The 'PID Filter Table' lists various PIDs and their corresponding types. A 'Mux Other Settings' dialog box is open in the foreground, showing 'Insert EIT' set to 'ON' and buttons for 'Save' and 'Close'.

In Channel	Service ID	Service Name
1010	11150	3sat HD
1010	11170	ZDFinfo HD
1010	11160	KiKA HD
1008	10355	hr-fernsehen HD
1007	10350	rbb Brandenburg HD
1004	5001	BBC World News Europe HD
1005	5021	NHK WORLD-JPN
1007	10351	rbb Brandenburg HD

In Channel	In PID	Out PID	PID Type
1010	6500(0x1964)	6500(0x1964)	PMT
1010	6510(0x196e)	6510(0x196e)	PCR,H.264 Video
1010	6520(0x1978)	6520(0x1978)	MPEG-1 Audio
1010	6521(0x1979)	6521(0x1979)	MPEG-1 Audio
1010	6522(0x197a)	6522(0x197a)	AC-3 Audio
1010	6523(0x197b)	6523(0x197b)	MPEG-1 Audio
1010	6530(0x1982)	6530(0x1982)	Teletext
1010	6531(0x1983)	6531(0x1983)	Subtitle
1010	6570(0x19aa)	6570(0x19aa)	PES Private
1010	6700(0x1a2c)	6700(0x1a2c)	PMT
1010	6710(0x1a36)	6710(0x1a36)	PCR,H.264 Video
1010	6720(0x1a40)	6720(0x1a40)	MPEG-1 Audio
1010	6721(0x1a41)	6721(0x1a41)	MPEG-1 Audio
1010	6722(0x1a42)	6722(0x1a42)	AC-3 Audio
1010	6723(0x1a43)	6723(0x1a43)	MPEG-1 Audio

Other settings:

This is a close-up of the 'Mux Other Settings' dialog box. It features a single setting: 'Insert EIT' with a dropdown menu currently showing 'ON'. At the bottom of the dialog, there are two buttons: a green 'Save' button with a checkmark icon and a red 'Close' button with an 'X' icon.

Example for streaming to VIMEO Live by RTMP by our tiny boxed encoders:

```

Main stream

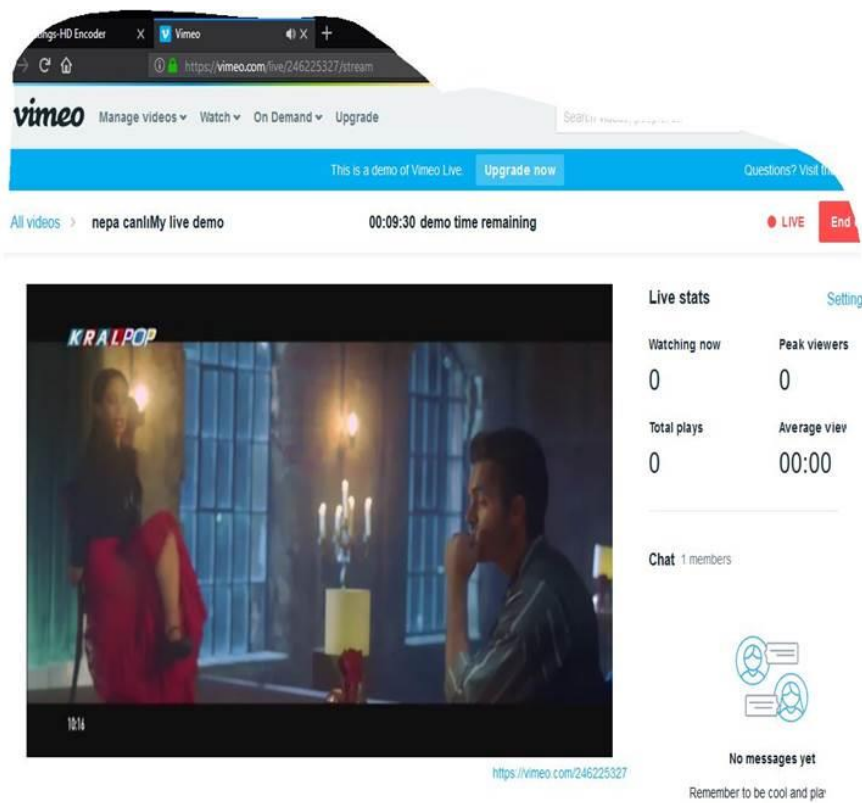
Encoding Type:1920x1080@25
Bitrate(kbit):1800
TS URL: http://192.168.2.168/0.ts http://192.168.2.168:8080/0.ts
HLS URL:Disable
FLV URL:Disable
RTSP URL:Disable

RTMP PUBLISH URL(Connected):rtmp://rtmp.cloud.vimeo.com/live?token=45dfd48b-9e8b-49bf-8539-90aa29aaf7a2/dcfe39e7-5912-4388-8507-347daac833f8
Multicast URL:Disable
    
```

VIMEO gives the user an RTMP –address with a live token at the end. No username/password is necessary because they handover individual stream-keys which simply needs to be inserted as

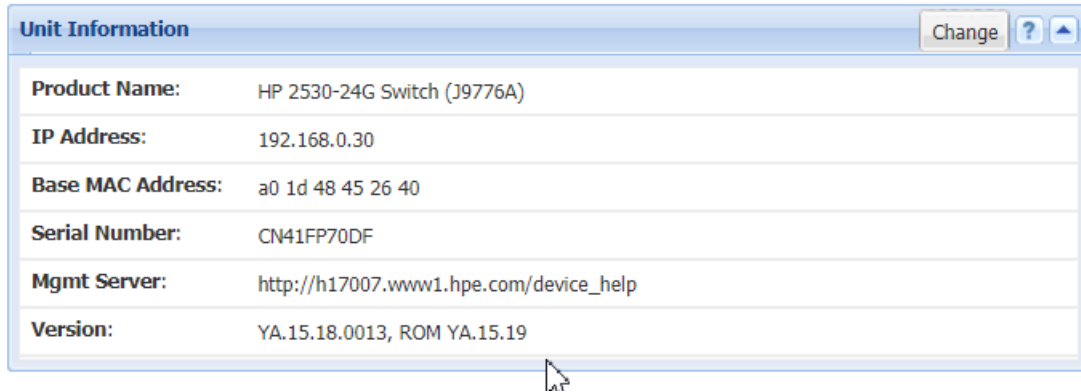
rtmp://rtmp.cloud.vimeo.com/live?token=***/streamkey**

Than you can control it by checking the vimeo live portal of your stream:



As a **Multicast capable Switch** we recommend is the HP (ARUVA) 2530 24G or 48G.

(For Floor switches we have an own branded one and support IGMP as well) IGMP should be set to ON in the port configs. The latest HP Firmware might not be the best choice. Better to test IGMP functions before installation into a HOT running System and eventually do a downgrade of the Firmware. This one works:



General notes about Streams:

Multicast streams:

Multicast Address Ranges:

We recommend, that the addressing of your Multicast streams should be in conjunction with this listings to avoid conflicts with other network equipment or protocols.

<https://www.iana.org/assignments/multicast-addresses/multicast-addresses.xhtml>

One small part from this:

IPv4 Multicast Address Space Registry

Last Updated

2018-01-05

Expert(s)

Stig Venaas

Note

Host Extensions for IP Multicasting [RFC1112] specifies the extensions required of a host implementation of the Internet Protocol (IP) to support multicasting. The multicast addresses are in the range 224.0.0.0 through 239.255.255.255. Address assignments are listed below.

The range of addresses between 224.0.0.0 and 224.0.0.255, inclusive, is reserved for the use of routing protocols and other low-level topology discovery or maintenance protocols, such as gateway discovery and group membership reporting. Multicast routers should not forward any multicast datagram with destination addresses in this range, regardless of its TTL.

Available Formats  [XML](#)  [HTML](#)  [Plain text](#)

Registries included below

- [Local Network Control Block \(224.0.0.0 - 224.0.0.255 \(224.0.0/24\)\)](#)
- [Internetwork Control Block \(224.0.1.0 - 224.0.1.255 \(224.0.1/24\)\)](#)

- [AD-HOC Block I \(224.0.2.0 - 224.0.255.255\)](#)
- [RESERVED \(224.1.0.0-224.1.255.255 \(224.1/16\)\)](#)
- [SDP/SAP Block \(224.2.0.0-224.2.255.255 \(224.2/16\)\)](#)
- [AD-HOC Block II \(224.3.0.0-224.4.255.255 \(224.3/16, 224.4/16\)\)](#)
- [RESERVED \(224.5.0.0-224.251.255.255 \(251 /16s\)\)](#)
- [DIS Transient Groups 224.252.0.0-224.255.255.255 \(224.252/14\)\)](#)
- [RESERVED \(225.0.0.0-231.255.255.255 \(7 /8s\)\)](#)
- [Source-Specific Multicast Block \(232.0.0.0-232.255.255.255 \(232/8\)\)](#)
- [GLOP Block](#)
- [AD-HOC Block III \(233.252.0.0-233.255.255.255 \(233.252/14\)\)](#)
- [Unicast-Prefix-based IPv4 Multicast Addresses](#)
- [Scoped Multicast Ranges](#)
- [Relative Addresses used with Scoped Multicast Addresses](#)

Multicast (as opposed to unicast) is used to send UDP packets from 1 source to multiple destination servers. This is useful for example for streaming from a satellite/DVB-T receiver to multiple receiving PCs for playback. Multicast can also be used on the output of an encoder to feed multiple streaming servers. Multicast only works with UDP and is not possible with TCP due to the 2 way nature of TCP, most commonly multicast is used with RTP and MPEG2-TS.

A multicast IP address must be chosen according to IANA information, we recommend using an address in the range **239.0.0.0 to 239.255.255.255** as this is reserved for private use. Using multicast addresses in the 224.0.0.0 range may clash with existing services and cause your stream to fail. For more details see <http://www.iana.org/assignments/multicast-addresses/multicast-addresses.xml>

Choosing a UDP port number for multicast streams is also important. Even if you use a different multicast IP for each of your streams, we strongly recommend using different UDP port numbers as well. This is because a server and all software running on the server receives ALL multicast traffic on an open port and extra processing is required to filter out the required traffic. If the each stream arrives on a different port, the server can safely ignore any traffic on ports that are not open. Port numbers MUST be chosen so that don't clash with any existing services or ephemeral ranges. The ephemeral range for Windows Vista, 7, 2008 is 49152 to 65535, for older Windows it is 1025 to 5000 and for Linux it is 32768 to 61000. For more information on Windows see <http://support.microsoft.com/kb/929851> Care should also be taken to avoid system ports 0 to 1024. See <http://www.iana.org/assignments/service-names-port-numbers/service-names-port-numbers.xml> Generally one of the unassigned User Ports (**1024-49151**) should be used, you can run the *netstat -abn* (as admin under windows) command to see which ports are currently in use.

Registered port

A **registered port** is a [network port](#) (a sub-address defined within the [Internet Protocol](#), in the range 1024–49151) assigned by the [Internet Assigned Numbers Authority](#) (IANA) (or by [Internet Corporation for Assigned Names and Numbers](#) (ICANN) before March 21, 2001,^[1] or by USC/ISI before 1998) for use with a certain protocol or application.

Ports with numbers 0–1023 are called *system or well-known ports*; ports with numbers 1024-49151 are called *user or registered ports*, and ports with numbers 49152-65535 are called *dynamic and/or private*

ports.^[2] Both system and user ports are used by transport protocols (TCP, UDP, DCCP, SCTP) to indicate an application or service.

- **Ports 0–1023** – system or [well-known ports](#)
- **Ports 1024–49151** – user or registered ports
- **Ports >49151** – dynamic / private ports

https://en.wikipedia.org/wiki/List_of_TCP_and_UDP_port_numbers

Range for Ephemeral port

The [Internet Assigned Numbers Authority](#) (IANA) suggests the range 49152 to 65535 ($2^{15}+2^{14}$ to $2^{16}-1$) for dynamic or private ports.^[1]

Many [Linux kernels](#) use the port range 32768 to 61000.^[note 2] [FreeBSD](#) has used the IANA port range since release 4.6. Previous versions, including the [Berkeley Software Distribution](#) (BSD), use ports 1024 to 5000 as ephemeral ports.^{[2][3]}

[Microsoft Windows](#) operating systems through XP use the range 1025–5000 as ephemeral ports by default.^[4] [Windows Vista](#), [Windows 7](#), and [Server 2008](#) use the IANA range by default.^[5] [Windows Server 2003](#) uses the range 1025–5000 by default, until Microsoft security update MS08-037 from 2008 is installed, after which it uses the IANA range by default.^[6] Windows Server 2008 with Exchange Server 2007 installed has a default port range of 1025–60000.^[7] In addition to the default range, all versions of Windows since Windows 2000 have the option of specifying a custom range anywhere within 1025–65535.^{[8][9]}

Packet structure

		UDP Header																															
Offsets	Octet	0								1								2								3							
Octet	Bit	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
0	0	Source port																Destination port															
4	32	Length																Checksum															

The UDP header consists of 4 fields, each of which is 2 bytes (16 bits).^[1] The use of the fields "Checksum" and "Source port" is optional in IPv4 (pink background in table). In IPv6 only the source port is optional (see below).

Source port number

This field identifies the sender's port when meaningful and should be assumed to be the port to reply to if needed. If not used, then it should be zero. If the source host is the client, the port number is likely to be an ephemeral port number. If the source host is the server, the port number is likely to be a well-known port number.^[4]

Destination port number

This field identifies the receiver's port and is required. Similar to source port number, if the client is the destination host then the port number will likely be an ephemeral port number and if the destination host is the server then the port number will likely be a well-known port number.^[4]

Length

A field that specifies the length in bytes of the UDP header and UDP data. The minimum length is 8 bytes because that is the length of the header. The field size sets a theoretical limit of 65,535 bytes (8 byte header + 65,527 bytes of data)

for a UDP datagram. However the actual limit for the data length, which is imposed by the underlying [IPv4](#) protocol, is 65,507 bytes (65,535 – 8 byte UDP header – 20 byte [IP header](#)).^[4]

In IPv6 [jumbograms](#) it is possible to have UDP packets of size greater than 65,535 bytes.^[5] [RFC 2675](#) specifies that the length field is set to zero if the length of the UDP header plus UDP data is greater than 65,535.

Checksum

The [checksum](#) field may be used for error-checking of the header and data. This field is optional in IPv4, and mandatory in IPv6.^[6] The field carries all-zeros if unused.^[7]

RTP:

a part from: <https://tools.ietf.org/html/rfc3550>

Chapter 11:

RTP relies on the underlying protocol(s) to provide demultiplexing of RTP data and RTCP control streams. For UDP and similar protocols, **RTP SHOULD use an even destination port number and the corresponding RTCP stream SHOULD use the next higher (odd) destination port number.** For applications that take a single port number as a parameter and derive the RTP and RTCP port pair from that number, if an odd number is supplied then the application SHOULD replace that number with the next lower (even) number to use as the base of the port pair. For applications in which the RTP and RTCP destination port numbers are specified via explicit, separate parameters (using a signaling protocol or other means), the application MAY disregard the restrictions that the port numbers be even/odd and consecutive although the use of an even/odd port pair is still encouraged. The RTP and RTCP port numbers MUST NOT be the same since RTP relies on the port numbers to demultiplex the RTP data and RTCP control streams. In a unicast session, both participants need to identify a port pair for receiving RTP and RTCP packets. Both participants MAY use the same port pair. A participant MUST NOT assume that the source port of the incoming RTP or RTCP packet can be used as the destination port for outgoing RTP or RTCP packets. When RTP data packets are being sent in both directions, each participant's RTCP SR packets MUST be sent to the port that the other participant has specified for reception of RTCP. The RTCP SR packets combine sender information for the outgoing data plus reception report information for the incoming data. If a side is not actively sending data (see [Section 6.4](#)), an RTCP RR packet is sent instead.

RTP (Real-Time Transport Protocol)	
Familie:	Netzwerkprotokoll
Einsatzgebiet:	Transport von Medien-Streams
Port:	beliebiger freier, gerader Port größer 1024
RTP im TCP/IP-Protokollstapel:	
Anwendung	RTP
Transport	UDP
Internet	IP (IPv4, IPv6)
Netzzugang	Ethernet Token Bus Token Ring FDDI ...
Standard:	RFC 3550 (RTP: A Transport Protocol for Real-Time Applications, 2003)

any port (even, not odd > 1024)

ANNEX MPEG

MPEG PSI/SI Information's:

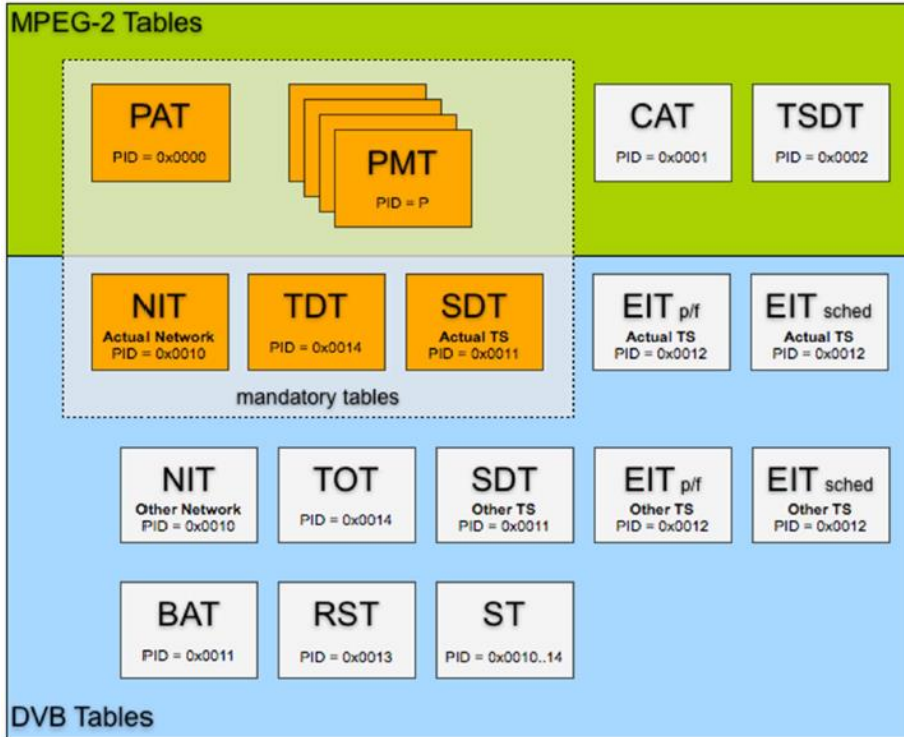


Table 1: PID allocation for SI

Table	PID value
PAT	0x0000
CAT	0x0001
TSDT	0x0002
reserved	0x0003 to 0x000F
NIT, ST	0x0010
SDT, BAT, ST	0x0011
EIT, ST, CIT (ETSI TS 102 323 [13])	0x0012
RST, ST	0x0013
TDT, TOT, ST	0x0014
network synchronization	0x0015
RNT (ETSI TS 102 323 [13])	0x0016
reserved for future use	0x0017 to 0x001B
link-local inband signalling	0x001C
measurement	0x001D
DIT	0x001E
SIT	0x001F

We assume, that the user is familiar with all abbreviations mentioned in this manual.

Appendix A



Product Disposal

Warning! Ultimate disposal of this product should be handled according to all national laws and regulations.

製品の廃棄

この製品を廃棄処分する場合、国の関係する全ての法律・条例に従い処理する必要があります。

警告

本产品的废弃处理应根据所有国家的法律和规章进行。

警告

本產品的廢棄處理應根據所有國家的法律和規章進行。

Warnung

Die Entsorgung dieses Produkts sollte gemäß allen Bestimmungen und Gesetzen des Landes erfolgen.

¡Advertencia!

Al deshacerse por completo de este producto debe seguir todas las leyes y reglamentos nacionales.

Attention

La mise au rebut ou le recyclage de ce produit sont généralement soumis à des lois et/ou directives de respect de

סביבתנו

!אזהרה

סילוק כוזב של סכסוך זה יגרום לזיהום סביבתנו ולפגיעה בסביבה.

l'environnement. Renseignez-vous auprès de l'organisme compétent.

عند التخلص النهائي من هذا المنتج ينبغي التعامل معه وفقاً لجميع القوانين واللوائح الوطنية

경고!

이 제품은 해당 국가의 관련 법규 및 규정에 따라 폐기되어야 합니다.



Waarschuwing

De uiteindelijke verwijdering van dit product dient te geschieden in overeenstemming met alle nationale wetten en reglementen.


Safety instructions

Read the safety instructions carefully before assembling or commissioning the device and ensure that you comply with them

1. Installation



- **Danger:** The device may **only** be installed and started up by competent people (see EN 60065). 
- **Danger:** The device and the peripheral distribution devices must be earthed properly (potential equalization) in accordance with EN 60728-11 **before Commissioning** and remain earthed even when the device is dismantled.
- **Danger:** The device may not be installed on a flammable base (**risk of fire**).
- **Danger:** Only connect the device to a socket that is installed correctly and connected to devices that has an earth conductor
(Depending on Model and Usage).
- **Danger:** Plan the assembly or installation location to ensure that children cannot play with the device and its connections.
There is a risk of electric shock (**Danger of death**).
- **Danger:** Select an assembly or installation location in which fluids or objects cannot get into the device under any circumstances (e.g. condensation, water for watering plants, etc.).
- **Danger:** Ventilation slots and refrigeration units are important function elements on the devices. If devices have refrigeration units or ventilation slots, you must ensure that they are never covered or built over. Also ensure that there is sufficient air circulation around the device. This prevents possible damage to the device and the **risk of fire due** to overheating. Ensure a minimum of **clearance of 20cm** between the device and other objects.
- **Danger:** The assembly or installation location must allow all connected cables to be laid safely. Cables and power supply cables must not be damaged or crushed by any objects. Furthermore, ensure that cables are not laid in the immediate vicinity of sources of heat (e.g. radiators, other electrical devices, fireplaces, etc.) (**Risk of fire**), (**risk of electric shock danger of death**)
- **Danger:** In order to prevent damage to the device, as well as possible subsequent damage (**risk of fire**), devices intended for installation on the wall are only permitted to be installed on a level surface and not **above head height**.
- **Warning:** (Only for optical transmitters and their peripheral distribution devices) Never look directly or indirectly into the laser beam. Only connect the device to the power supply once all optical lines are connected securely. 
- **Warning:** The safety regulations in the relevant current standards EN 60728-11 and EN 60065 must be complied with.
- **Warning:** Comply with all applicable national safety regulations and standards.
- **Warning:** The device's mains plug must be easily accessible at all times.
- **Warning:** Follow all instructions in the device-specific operating manual

2. Operation


- **Danger:** The device is only permitted to be operated in dry rooms in a non-tropical climate. In damp rooms or outdoors, there is the risk of short circuits (**risk of fire**) or electric shock (**danger of death**).
- **Danger:** Do not insert any objects through the ventilation slot. Risk of electric shock (**danger of death**). 
- **Danger:** Do not put any containers filled with liquid (e.g. vases) on the device. There is a risk of electric shock (**danger of death**) or (**risk of fire**).
- **Danger:** No open sources of fire such as burning candles are permitted to be placed on the device (**risk of fire**).
- **Danger:** Ensure that there is a clearance of at least **20cm** around the device. The device ventilation is not permitted to be impaired by covering the


- Ventilation openings with objects such as newspapers, tablecloths, curtains, etc. (**risk of fire**).
- **Warning:** Follow all instructions in the device-specific operating manual.

3. Maintenance


- **Danger:** Maintenance tasks must always be carried out by competent people (**see EN 60065**). 
- **Danger:** Do not carry out servicing work during thunderstorms. There is a risk of electric shock (**danger of death**).
- **Warning:** (Only for devices with batteries): **Risk of explosion if** the battery is replaced improperly. Only replace with the same type!
- **Warning:** Batteries must not be subjected to excessive heat such as sunlight, fire or similar (**risk of explosion**).
- **Warning:** Only use the manufacturer's accessories or accessories with identical technical properties.
- **Warning:** (For optical transmitters and their peripheral distribution devices) unplug the mains plug before dismantling the device. 

4. Repairs


- **Danger:** The device may only be opened by competent people (see EN 60065). Before opening the device, unplug the mains plug or disconnect the power supply; otherwise there is a danger of death! The device is only permitted to be connected to the power and operated when the mains adaptor cover is installed. This also applies when you clean the device or work on the connections. 
- **Danger:** Repairs on the device may only be carried out by a specialist (**see EN 60065**) observing **the applicable VDE (German Association for Electrical, Electronic & Information Technologies) guidelines**.
- **Danger:** Only use components of the same type and with identical technical properties for the repair. Otherwise, there is a risk of electric shock (**danger of death**) and **risk of fire**.
- **Warning:** (For optical transmitters and their peripheral distribution devices) unplug the mains plug before dismantling the device.

If you have any queries regarding repairs, please contact our company service: E-mail: info@blankom.de, contact: www.blankom.de 

5. Sale

- **Caution:** If the device is sold, these safety instructions and the operating manual for the relevant device must be handed over to the purchaser. 

6. Disposal

- **Caution:** Dispose of the device in accordance with the applicable environmental regulations. 
- **Caution:** Dispose of batteries (if present) in accordance with the applicable environmental regulations.
- Cartons and all pcs. of the packaging can be sent back to us for recycling for sustainable environment protection.

Sicherheitshinweise



Sicherheitshinweise bitte vor Montage bzw. Inbetriebnahme des Gerätes sorgfältig lesen und befolgen.

1. Installation

Gefahr: Das Gerät darf ausschließlich von sachverständigen Personen (siehe EN 60065), installiert und in Betrieb genommen werden.

Gefahr: Das Gerät und/oder die Verteilperipherie muß vor Inbetriebnahme gemäß EN 60728-11 vorschriftsmäßig geerdet sein (Potentialausgleich) und bleiben, auch wenn das Gerät ausgebaut wird.

Gefahr: Das Gerät darf nicht auf brennbarem Untergrund montiert werden (Brandgefahr).

Gefahr: Schließen Sie das Gerät nur an eine vorschriftsmäßig installierte Steckdose mit Schutzleiter an.

Gefahr: Planen Sie den Montage - bzw. Aufstellungsort so, daß Kinder nicht am Gerät und dessen Anschlüssen spielen können.

Es droht Gefahr durch elektrischen Schlag (Lebensgefahr).

Gefahr: Wählen Sie einen Montage - bzw. Aufstellungsort, an dem unter keinen Umständen Flüssigkeiten oder Gegenstände in das Gerät gelangen können (z.B.

Kondenswasser, Gießwasser etc.).

Gefahr: Lüftungsschlitze und Kühlkörper sind wichtige Funktionselemente an den Geräten. Bei Geräten, die Kühlkörper oder Lüftungsschlitze haben, muß daher unbedingt darauf geachtet werden, daß diese keinesfalls abgedeckt oder zugebaut werden. Sorgen Sie außerdem für eine großzügig bemessene Luftzirkulation um das Gerät. Damit verhindern Sie mögliche Schäden am Gerät sowie Brandgefahr durch Überhitzung. Gewährleisten Sie einen Mindestabstand von 20cm um das Gerät zu anderen Gegenständen.

Gefahr: Der Montage- bzw. Aufstellort muß eine sichere Verlegung aller angeschlossenen Kabel zulassen. Stromversorgungskabel sowie Zuführungskabel dürfen nicht durch irgendwelche Gegenstände beschädigt oder gequetscht werden. Es ist darüber hinaus unbedingt darauf zu achten, daß Kabel nicht in die direkte Nähe von Wärmequellen verlegt werden (z.B. Heizkörper, andere Elektrogeräte, Kamin etc.) (Brandgefahr), (Gefahr durch elektrischen Schlag).

Gefahr: Um sowohl Beschädigungen am Gerät als auch mögliche Folgeschäden (Brandgefahr) zu vermeiden, dürfen für Wandmontage vorgesehene Geräte nur auf einer ebenen Grundfläche montiert werden und nicht über Kopf.

Warnung: (Nur für optische Sender sowie deren Verteilperipherie) Blicken Sie auf keinen Fall direkt oder indirekt in den Laserstrahl. Schließen Sie das Gerät erst an die Stromversorgung an, wenn alle elektrischen und optischen Leitungen sicher verbunden sind.

Warnung: Die Sicherheitsbestimmungen der jeweils aktuellen Normen EN 60728-11 und EN 60065 sind zwingend einzuhalten.

Warnung: Befolgen Sie auch alle anwendbaren nationalen Sicherheitsvorschriften und Normen.

Warnung: Der Netzstecker des Gerätes muß jederzeit leicht erreichbar sein.

Warnung: Befolgen Sie alle Instruktionen in den gerätespezifischen Bedienungsanleitungen

2. Betrieb

Gefahr: Das Gerät darf nur in trockenen Räumen bei nicht tropischem Klima betrieben werden. In feuchten Räumen oder im Freien besteht die Gefahr von

Kurzschluß (Brandgefahr) oder elektrischen Schlag (Lebensgefahr).

Gefahr: Stecken Sie keine Gegenstände durch die Lüftungsschlitze. Gefahr durch elektrischen Schlag (Lebensgefahr).

Gefahr: Stellen Sie keine mit Flüssigkeit gefüllten Gefäße (wie z. B. Vasen) auf das Gerät. Es droht Gefahr durch elektrischen Schlag (Lebensgefahr) oder (Brandgefahr).

Gefahr: Es dürfen keine offenen Brandquellen, wie z. B. brennende Kerzen, auf das Gerät gestellt werden (Brandgefahr).

Gefahr: Sorgen Sie für einen Freiraum von mindestens 20cm um das Gerät. Die Belüftung des Gerätes darf nicht durch Abdecken der Belüftungsöffnungen mit Gegenständen wie z. B. Zeitungen, Tischdecken, Gardinen usw. behindert werden (Brandgefahr).

Warnung: Befolgen Sie alle Instruktionen in der gerätespezifischen Bedienungsanleitung.

4. Wartung

Gefahr: Wartungsarbeiten sind stets von sachverständigen Personen (siehe EN 60065) vorzunehmen.

Gefahr: Keine Servicearbeiten bei Gewitter. Es droht Gefahr eines elektrischen Schlags (Lebensgefahr).

Warnung: (nur für Geräte mit Batterie): Explosionsgefahr bei unsachgemäßem Auswechseln der Batterie. Ersatz nur durch den gleichen Typ!

Warnung: Batterien dürfen nicht übermäßiger Wärme wie Sonnenschein, Feuer oder dergleichen ausgesetzt werden (Explosionsgefahr).

Warnung: Verwenden Sie nur das Zubehör des Herstellers oder Zubehör mit identischen technischen Eigenschaften.

Warnung: (Bei optischen Sendern sowie deren Verteilperipherie) ziehen Sie den Netzstecker bevor das Gerät ausgebaut wird.

5. Reparatur

Gefahr: Das Gerät darf nur durch sachverständige Personen (siehe EN 60065) geöffnet werden. Vor Öffnen des Gerätes Netzstecker ziehen

bzw. Stromzuführung entfernen, andernfalls besteht Lebensgefahr! Das Gerät darf nur mit montierter Netzteilabdeckung an Spannung angeschlossen und betrieben werden. Dies gilt auch, wenn Sie das Gerät reinigen oder an den Anschlüssen arbeiten.

Gefahr: Reparaturen am Gerät sind ausschließlich vom Fachmann (siehe EN 60065) unter Beachtung der geltenden VDE-Richtlinien durchzuführen.

Gefahr: Verwenden Sie nur Bauteile des gleichen Typs und mit identischen technischen Eigenschaften für die Reparatur, andernfalls droht Gefahr eines elektrischen Schlags (Lebensgefahr) und Brandgefahr.

Warnung: (Bei optischen Sendern sowie deren Verteilperipherie) ziehen Sie den Netzstecker bevor das Gerät ausgebaut wird.

Bei Fragen zur Reparatur wenden Sie sich an den IRENIS-Service:

E-Mail: info@blankom.de, Kontakt: www.blankom.de

6. Verkauf

Vorsicht: Im Falle eines Verkaufs müssen diese Sicherheitshinweise und die Bedienungsanleitung des entsprechenden Geräts dem Käufer ausgehändigt werden.

7. Entsorgung

Vorsicht: Entsorgen Sie das Gerät entsprechend den geltenden umweltrechtlichen Bestimmungen. Elektrische und elektronische Geräte dürfen nicht in den Hausmüll!

Vorsicht: Entsorgen Sie Batterien (falls vorhanden), entsprechend den geltenden umweltrechtlichen Bestimmungen.

Verpackungen können an uns zurückgeschickt werden. Wir kümmern uns um Recycling und/oder fachgerechte Entsorgung.

Installation and safety instructions / Montage und Sicherheitshinweise

- Die beschriebenen Geräte dienen ausschließlich der Installation von Satelliten-Empfangsanlagen.
- *The equipment described is designed solely for the installation of satellite receiver systems.*
- Jegliche anderweitige Nutzung oder die Nichtbeachtung dieses Anwendungshinweises hat den Verlust der Gewährleistung bzw. Garantie zur Folge.
- *Any other use, or failure to comply with these instructions, will result in voiding of warranty cover.*
- Die Geräte dürfen nur in trockenen Innenräumen montiert werden. Nicht auf oder an leicht entzündlichen Materialien montieren.
- *The equipment may only be installed in dry indoor areas. Do not mount on or against highly combustible materials.*
- Die Geräte sind mit einer Potenzial-Ausgleichsleitung (Cu, mindestens 4 mm²) zu versehen.
- *The equipment must be provided with an earthing wire (Cu, at least 4 mm²).*
- Die Sicherheitsbestimmungen der jeweils aktuellen Normen EN 60728-11 und EN 60065 sind zu beachten.
- *The safety regulations set out in the current EN 60728-11 and EN 60065 standards must be complied with*
- Verbindungsstecker: HF-Stecker 75 Ohm (Serie F) nach EN 61169-24
- *Connector: HF plug 75 Ohm (series F) to EN 61169-24.*
- **Nicht benutzte Teilnehmerausgänge** sollten mit 75-Ohm Widerständen (z. B. EMK 03) abgeschlossen werden. (Verringerung der terrestrischen Signalwelligkeit)
- *Unused subscriber ports should be closed off by 75 Ohm resistors (e.g. EMK 03).*
- **Nicht benutzte Kaskadenausgänge** sind mit 75 Ohm Widerständen inkl. DC-Blocker abzuschließen. 75 Ohm Widerstände ohne Gleichspannungssperren können das Gerät beschädigen!
- *Unused trunk outputs must be terminated with 75Ohm resistors including DC Blocker. Otherwise the device may be inoperable or damaged.*
- Bitte überprüfen Sie die Anlage vor Inbetriebnahme auf evtl. Kurzschlüsse der Koaxial-Kabel. Es ist darauf zu achten, dass die Eingangspiegel der SAT-Ebenen möglichst gleich hoch sind. Power-LEDs zeigen den Betrieb an. Falls die nicht leuchten, bitte die Stromzufuhr kontrollieren.
- *Please check the installation against shortage in coax cables and connectors before switching on. The input levels should be adjusted accordingly. Power-LED's showing operational mode. If this is not illuminated, please check the power source.*
- **Stromführendes Gerät**
- **Current-carrying unit**
- Nicht öffnen oder am Gerät manipulieren!
- *Do not open or tamper with the unit!*
- Bei Arbeiten an der Anlage immer die Netzstecker aus der Steckdose ziehen!
- *When working on the system always unplug the mains plug from the wall socket!*
- Auf ausreichenden Abstand achten! Nach allen Seiten mind. 5 cm!
- *Ensure adequate clearance! Min. 5 cm to all sides!*
- Nicht über Kopf montieren.
- *Do not install overhead.*
- Für die Geräteentwärmung muss freie Luftzirkulation möglich sein. Überhitzungsgefahr!
- *Free circulation of air must be possible to discharge the heat emitted by the unit. Risk of overheating!*
- Zulässige Umgebungstemperatur -20 bis +50°C
- *Permissible ambient temperature -20 to +50°C*

Important notes: / Zur Beachtung

- Auf das Netzgerät dürfen keine mit Flüssigkeit gefüllten Gegenstände gestellt werden.
- *No liquid-filled items may be placed on top of the power supply unit.*
- Das Netzgerät darf nicht Tropf- oder Spritzwasser ausgesetzt sein.
- *The power supply unit must not be exposed to dripping or splashing water.*
- Der Netzstecker muss ohne Schwierigkeiten zugänglich und benutzbar sein.
- *The mains plug must be easily accessible and operable.*
- Das Gerät kann nur durch Ziehen des Netzsteckers vom Netz getrennt werden.
- *The only reliable method of disconnecting the unit from the mains is to unplug it.*
- Bei größerem Durchmesser des Kabel- Innenleiters als 1,2 mm bzw. Grat können die Gerätebuchsen zerstört werden.
- *If the inner cable conductor diameter is greater than 1.2 mm or in case of burr, the device sockets may be destroyed.*

Bitte installieren Sie die Anschlüsse gemäß dem Aufdruck

Please install according to the sticker on the Multiswitch

Hinweis: Elektrische Installationen sollten nur durch geschultes Fachpersonal vorgenommen werden!

Note: Electrical installations should only be done by well-educated and skilled technicians!

Contact:

First Aid, Ralf Riedel: ralf.riedel@blankom.de

IRENIS GmbH

Hauptstr. 29

D-31171 Nordstemmen- Germany

Managing Director: Dipl.Ing. Murad ÖnoI

Commercial Register: HRB 130657 / District Court Hamburg

Web: www.blankom.de **E-Mail:** info@blankom.de

Office Nordstemmen:

Hauptstr. 29

31171 Nordstemmen

+49 5069 48097 81