DVB-C Headend with Satellite and IPTV Input

- **4 Channel DVB-C (QAM) Headend System**
- **8 DVB-S/S2x tuner inputs for up to 8 FTA and 4 scrambled satellite transponders**
- **128 IPTV inputs (UDP, RTP)**
- **4 groups multiplexing + 4 groups scrambling**
- **4 adjacent QAM channel modulating**
- **Excellent RF output performance index, MER ≥ 43 dB**
- **PCR adjusting**
- **PSI/SI editing and inserting**
- **Web management, Updates via web**
- **DiSEqC 1.0 LNB control for up to 4 satellites**
- **Dual power supply (optional)**

BLANKOM HDC-6008CI is a new generation cable-tv headend system in one unit.
Satellite and IPTV channels, decrypted, re-encrypted, and
can be combined in a 4 RF- DVB-C group and distributed over coaxial cable to large networks.

The BLANKOM HDC-6008CI is a cost effective SAT- to QAM TransModulator with SAT & IP to DVB-C QAM including multiplexer and descrambling with 4x CICAM slots
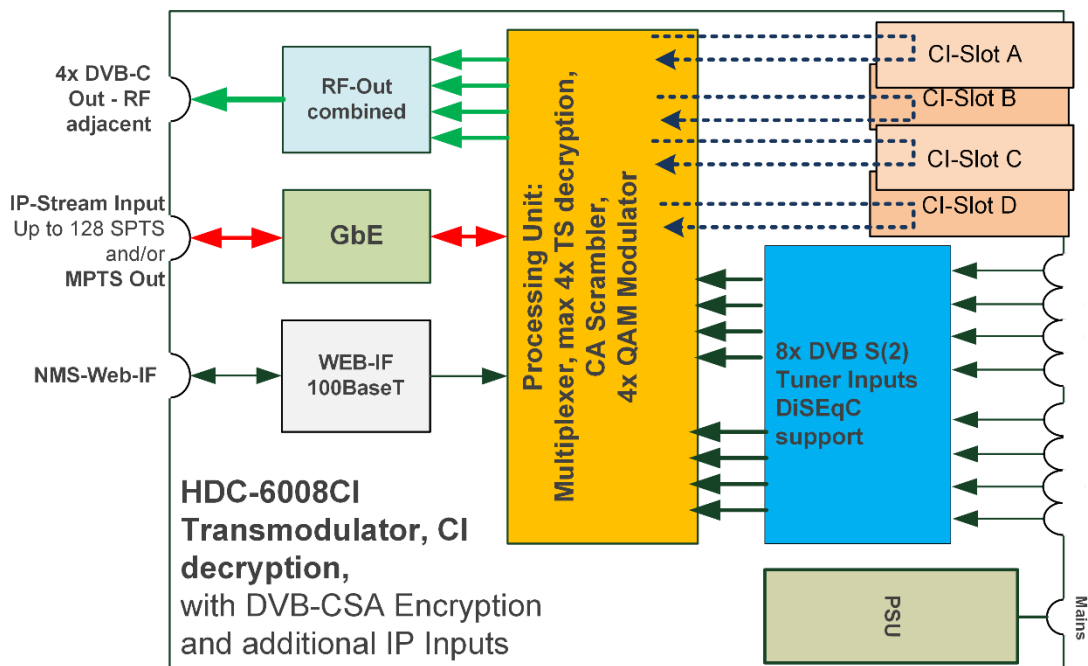.
Equipped with 8 DVB-S/S2 tuner inputs, 4 CI slots for CAMs, 4 groups multiplexing with scrambling, it supports maximum 128 IPTV inputs via GE port and outputs 4 adjacent carriers (50MHz...960MHz) combined via RF output interface in parallel to 4 MPTS outputs.

HDC-6008CI also features high integration level, high performance and effective cost. Dual power supplies for redundant power supply is optional.

This device is perfect for flexible and/or additional cableTV headend concept.

Technical specifications:

| Function	4 channel DVB-C Headend with Satellite & IPTV input
INPUT	8 DVB-S/S2x Tuner (4 of them with CI)
	128 IPTV channels over UDP or RTP protocol, Multi- or Unicast
OUTPUT	4 DVB-C groups which can be multiplexed from any combination of all input channels, NIT configurable, LCN support
Tuner section	8 DVB-S/S2x tuners with input frequency range: 950-2150 MHz
	Symbol rate: 0.5...45 MSps (supports SCPC and MCPC)
	Signal strength: -65...-25dBm
	Supports QPSK, 8PSK, 16/32 APSK; supports DiSEqC 1.0 LNB control for up to 4 satellites
Multiplexing	4 multiplexers, Maximum PID remapping: 128per input channel
	PID remapping (non, automatically or manually), PCR re-clocking, Generation of PSI/SI table automatically, PID – adding manually
Scrambling	Max simulscrypt CA: 4
	Scramble Standards: ETR289, ETSI 101 197, ETSI 103 197
	Local/remote connection
Modulation	4 DVB-C (QAM) channels, Standard EN300 429/ITU-T J.83A/B
	RF frequency 50...960 MHz, 1 kHz step
	RF output level 77...97 dBμV, 0.1 dB step
	Constellation 16/32/64/128/256QAM
	MPTS / SPTS over UDP, 10/100 Base-T Ethernet interface (UDP unicast / multicast)
SYSTEM	
Control	Remote management Web NMS（10M/100M）
Dimensions	482 × 300 × 44.5mm, 19" 1RU, 3.7 kg
Power	AC 110V±10%,50/60Hz ... AC 220V±10%, 50/60Hz, 25 W, (dual power supply optional)
Temperature	0...45 ℃ (operation), -20...80 ℃ (storage)

Table of content

TOC

Outline

The BLANKOM HDC-6008CI Transmodulator is the 5th generation 8x DVB-S2 Receiver – decrypter- Mux-scrambling- modulating and IP-IN/OUT all-in-one device. With 4 multiplexing QAM output channels where every of these can be scrambled with max. 4 simulcrypt Conditional Access Server / CAS and all output as 4x MPTS channels, it supports a maximum of 128 IP input streams through the GbE port and modulate 4 adjacent DVB-C QAM channels (50MHz...960MHz) through the combined RF output. The device is also characterized with high integration level, high performance and a reasonable price.

Application Example
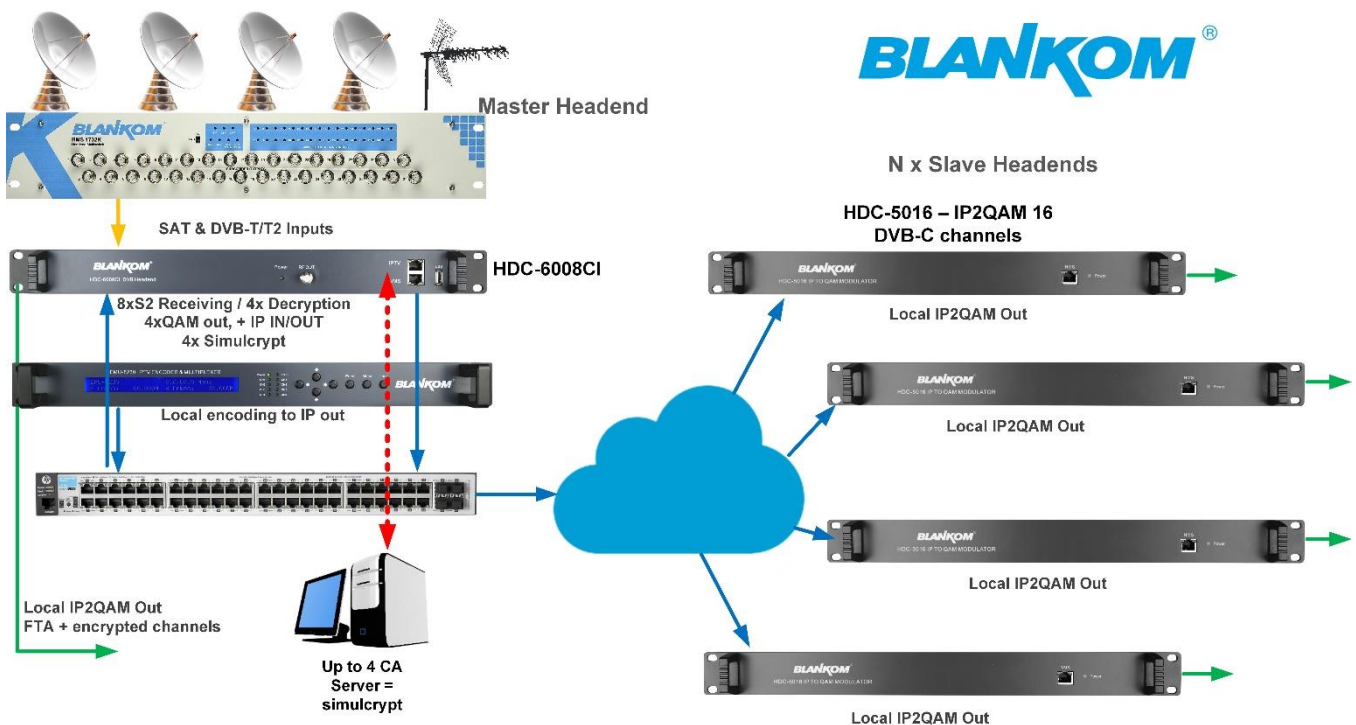
Connection Description

Front:	NMS/CAS, RF Out, GbE IPTV I/O data port, opt. USB port
Rear left	Module1: 2x DVB S2 IN, 2x CI Slots (CardA bottom, Card B top), loop
…	Module2: 2x DVB S2 IN, 2x CI Slots (CardC bottom, Card D top), loop
…	Module3: 4x FTA DVB-S2 Tuner Inputs, loop outputs
…	Power switch, Fuse
…	AC IEC Power Socket
Rear right	Grounding

Installation Preparation

When you install the device, please follow the steps below. The details of the installation will be described after this chapter. You can also refer to the rear panel printing during the installation.

The main steps of the installation include:

● Checking the possible device missing or damage during the transportation
● Preparing relevant environment for installation
● Installing the DVBN-S2 / IP Mux-Scrambling QAM Modulator
● Connecting signal cables
● Connecting communication port for WEB-IF

Be sure to avoid shortage and all cables are installed properly before use the Power-On switch.

Power cord connection

The power socket is located on the right of rear panel, and the power switch is on the left of front panel. User can plug one end of the power cord to the socket and insert the other end to AC power. When the device solely connects to protective ground, it should adopt independent way, say, share the same ground with other devices. When the device adopts united way, the grounding resistance should be smaller than 1Ω.

☞**Caution:** Before connecting power cord to the IP QAM Modulator, user should set the power switch to "OFF".

Grounding Requirement

● Connecting the device's grounding rod to frame's grounding pole with copper wire.
● All function modules' good grounding is the basis of reliability and stability of devices. Also, they are the most important guarantee of lightning arresting and interference rejection. Therefore, the system must follow this rule.
● Coaxial cables' outer conductor and isolation layer should keep proper electric conducting with the metal housing of device.

- Grounding conductor must adopt copper conductor in order to reduce high frequency impedance, and the grounding wire must be as thick and short as possible.
- Users should make sure the 2 ends of grounding wire well electric conducted and be antirust.
- It is prohibited to use any other device as part of grounding electric circuit
- The area of the conduction between grounding wire and device's frame should be no less than 25mm^2.

Signal and Network Management (NMS) Cable Connection

The signal connections include the connection of input signal cable and the connection of output signal cable. Please use at least CAT 5 STP RJ45 LAN Cable for the management port and CAT 6 DSTP for the streaming data ports to avoid electromagnetic influences. For RF cable we recommend double shielded Coax.
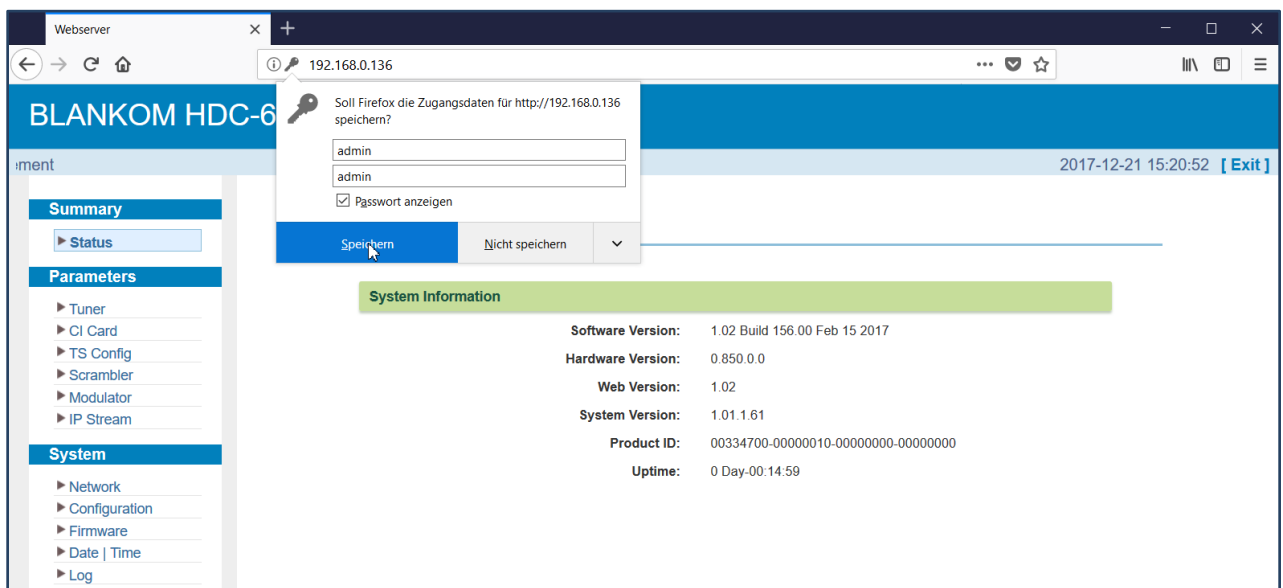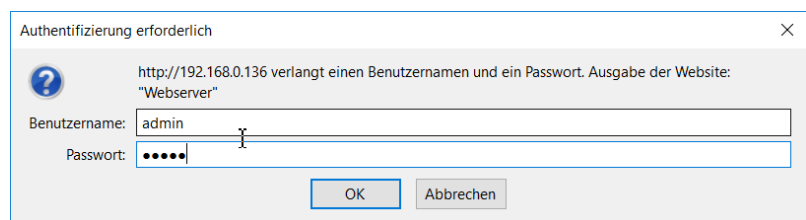
Web NMS Management

This device does not support an LCD operation, and the modification can only be operated with Web NMS by using a standard web-browser. We recommend to use Firefox – latest version.

Web-Interface access:

Default IP address = 192.168.0.136

User/pw = admin/admin

Setting NTP-Server and Timezone:

And updated:

Local Time/Date settings are important if an own TDT/TOT table should be generated and inserted in the GENERAL TS-config sub menu for each output – if supported. Please assure the reaching of the NTP server IP-Addresses from this unit.

Setting up Tuner Inputs

Is easy to understand, just "Edit" every Tuner 1....8:
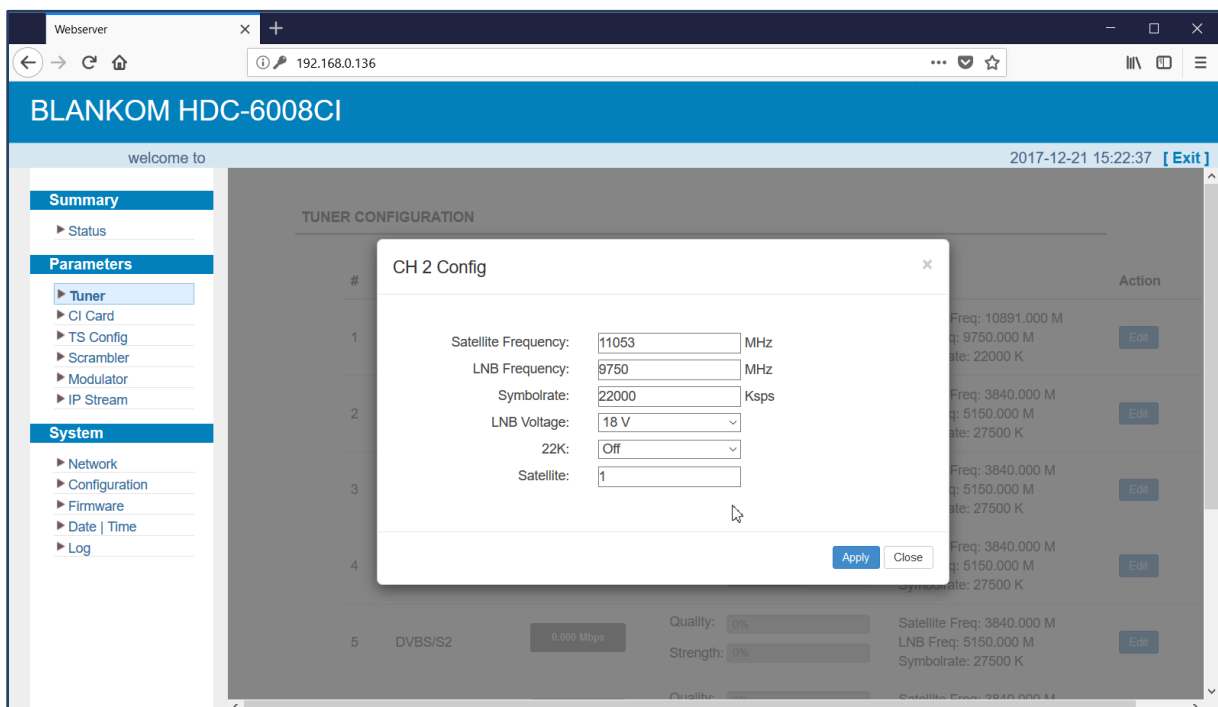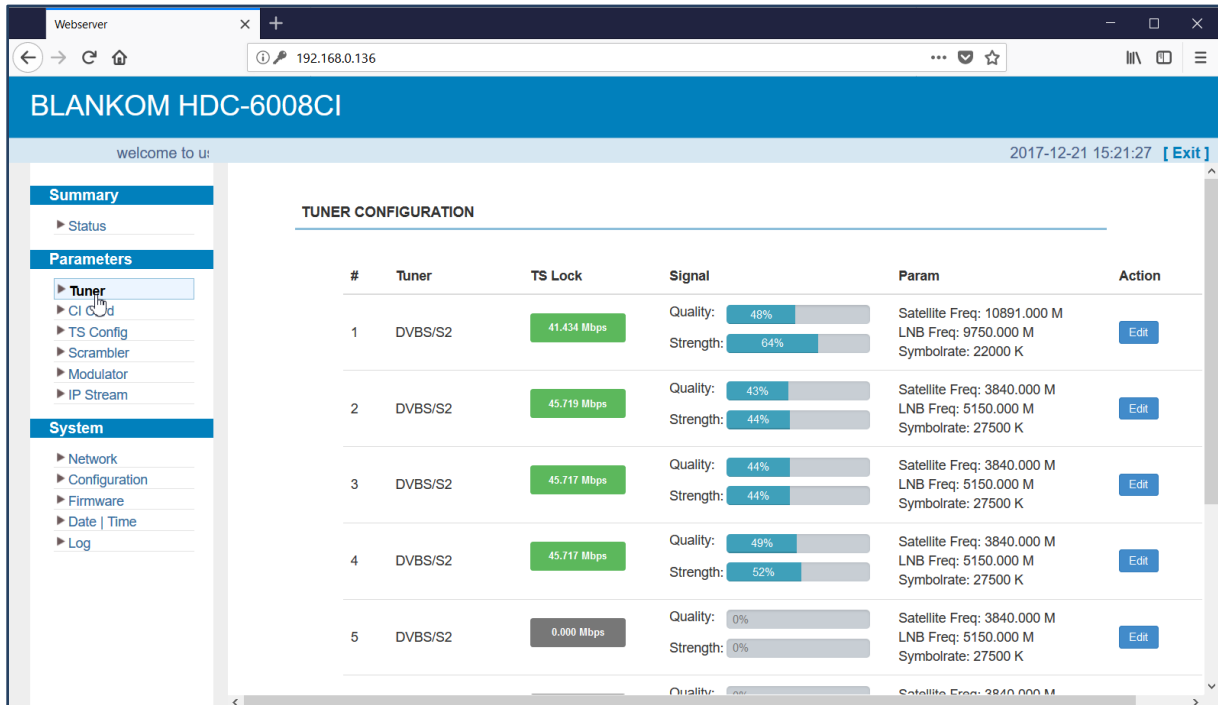
We assume, that the user is familiar with LNB-Settings, SAT-Transponder settings and polarisations V/H = 13V/18V, High-Low-Band (High-Band 22 KHz=ON) and DiSEqC (Satellite 1...4).

Follow every Input and set according to your needs until all Tuner Inputs have been configured:

TUNER CONFIGURATION

| #	Tuner	TS Lock	Signal		Param	Action
1	DVBS/S2	41.395 Mbps	Quality: 48% Strength: 64%		Satellite Freq: 10891.000 M LNB Freq: 9750.000 M Symbolrate: 22000 K	Edit
2	DVBS/S2	41.431 Mbps	Quality: 46% Strength: 62%		Satellite Freq: 11053.000 M LNB Freq: 9750.000 M Symbolrate: 22000 K	Edit
3	DVBS/S2	39.823 Mbps	Quality: 44% Strength: 66%		Satellite Freq: 11229.000 M LNB Freq: 9750.000 M Symbolrate: 22000 K	Edit
4	DVBS/S2	25.183 Mbps	Quality: 44% Strength: 66%		Satellite Freq: 11288.000 M LNB Freq: 9750.000 M Symbolrate: 22000 K	Edit
5	DVBS/S2	33.792 Mbps	Quality: 29% Strength: 68%		Satellite Freq: 11509.000 M LNB Freq: 9750.000 M Symbolrate: 22000 K	Edit
6	DVBS/S2	57.489 Mbps	Quality: 31% Strength: 64%		Satellite Freq: 12399.000 M LNB Freq: 10600.000 M Symbolrate: 29700 K	Edit
7	DVBS/S2	33.790 Mbps	Quality: 29% Strength: 60%		Satellite Freq: 12692.000 M LNB Freq: 10600.000 M Symbolrate: 22000 K	Edit
8	DVBS/S2	42.240 Mbps	Quality: 31% Strength: 64%		Satellite Freq: 11054.000 M LNB Freq: 9750.000 M Symbolrate: 27500 K	Edit

Transportstream TS Config Menu

TS CONFIG

| Output TS 1 ▾ | Stream Select | General | PID Bypass |

Output TS 1
Output TS 2
Output TS 3
Output TS 4

→Lose
⊞ →1: Tu...   [41.4/41.4M]
⊞ →2: Tu...   [41.4/41.4M]
⊞ →3: Tuner 3 (prog: 0/6)   [39.8/39.8M]
⊞ →4: Tuner 4 (prog: 0/3)   [25.1/25.1M]
⊞ →5: Tuner 5 (prog: 0/6)   [14.8/33.8M]
⊞ →6: Tuner 6 (prog: 0/4)   [14.2/57.5M]
⊞ →7: Tuner 7 (prog: 0/19)   [33.2/33.8M]
⊞ →8: Tuner 8 (prog: 0/28)   [34.7/42.2M]

☐ CA Filter
☐ PID Remap
Refresh Input
Refresh Output
===>
<===
All Input
All Output

→Normal → Overflow
⊞ →Output TS 1 (prog: 6)   [41.4/50.9M]

Parse-Select all(SPTS) Parse program   time out: 60 seconds

For every TS-Output the Input sources can be used and selected.

We recommend to use PID-remapping only if you await collisions from different sources.

CA-Filter usage is only recommended if you have CA-related PID's after decryption left in your TS which you do not want to pass to the outputs.

Parse the Inputs for every single one to extract/read the containing services:
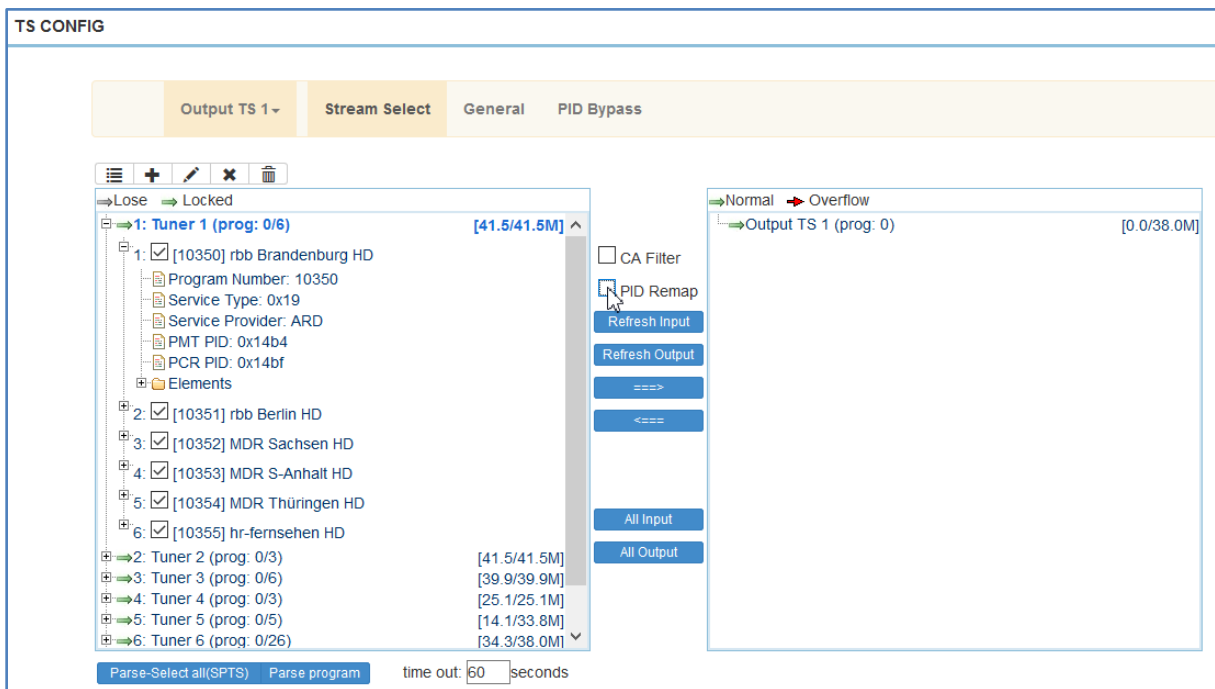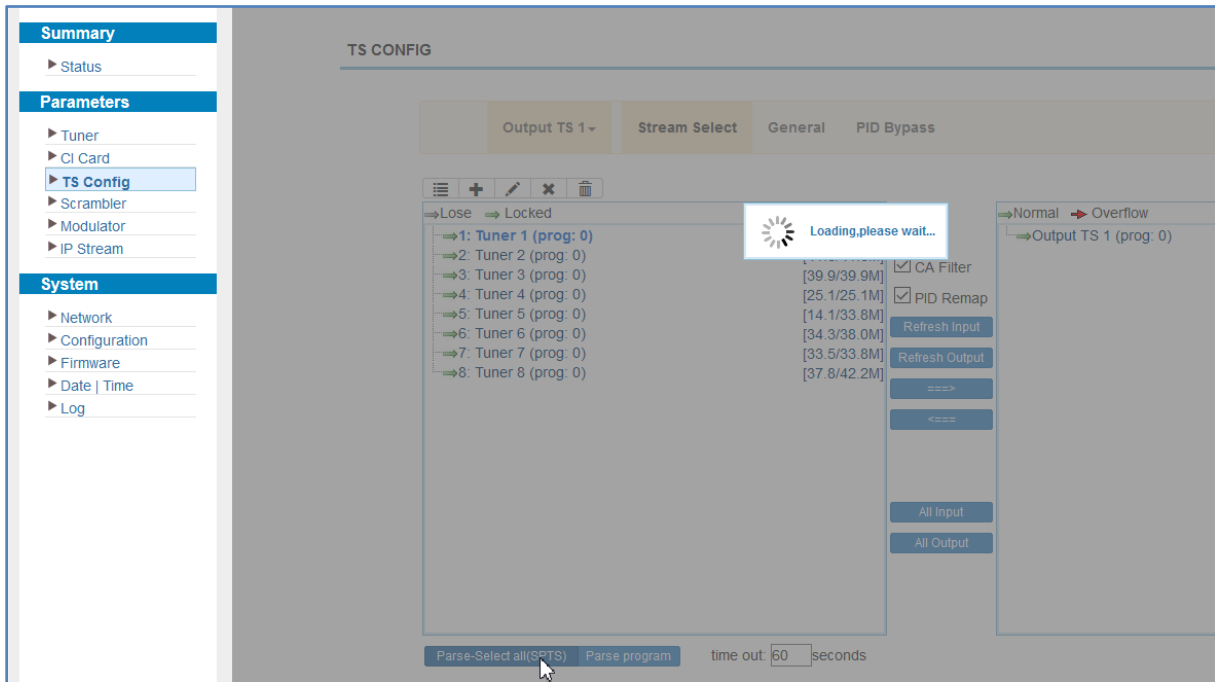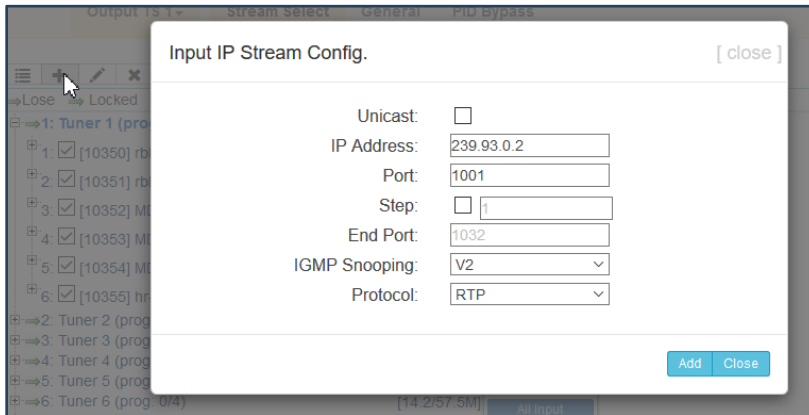

If you like to keep EIT and other addon tables somehow, do not do PID Remapping. CA filter is for deleting unnecessary encryption tables and EMM/ECM PID's if decryption will be done by CAM's.
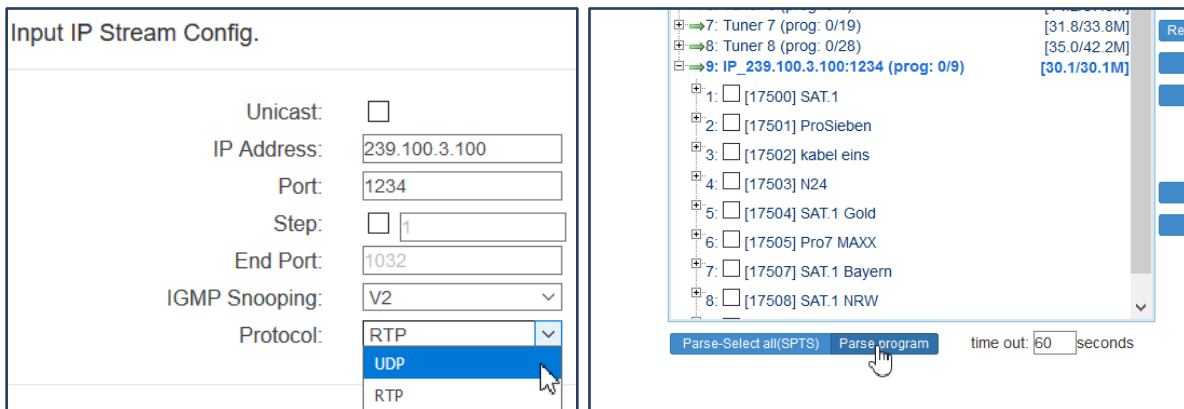
Importing a pre-stored listing is also possible:
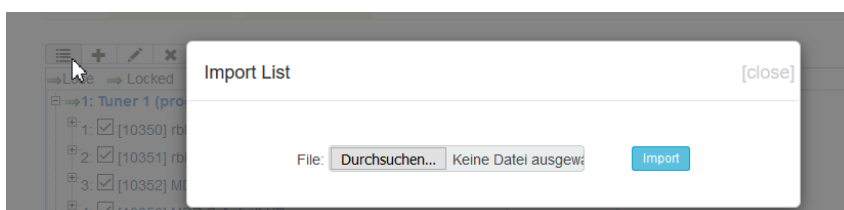
Setting up incoming IP streams as Input sources works with the usage of the "+" button:

Use your stream addresses and methods... you can also insert multiple addresses in one shot by using the step counter. Than parse the content:

Remark: The IP Input stream is always only valid for your former selected ouput TS number. Next TS one: You need to import it again or select a different one:
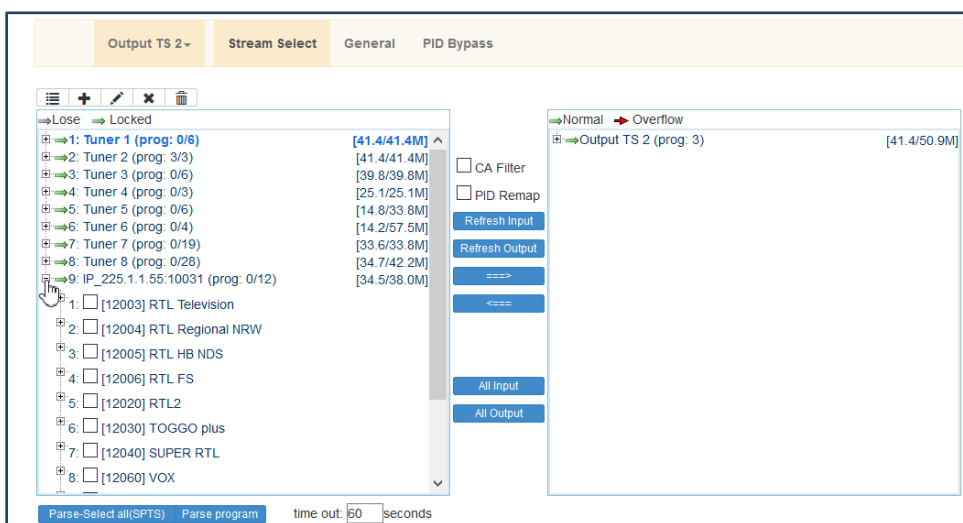
parsing !!!

MPTS or SPTS as Input stream seems to be OK. The only limit will probably be restricted by the GbE Input capacity and the internal stream-processor capacity.
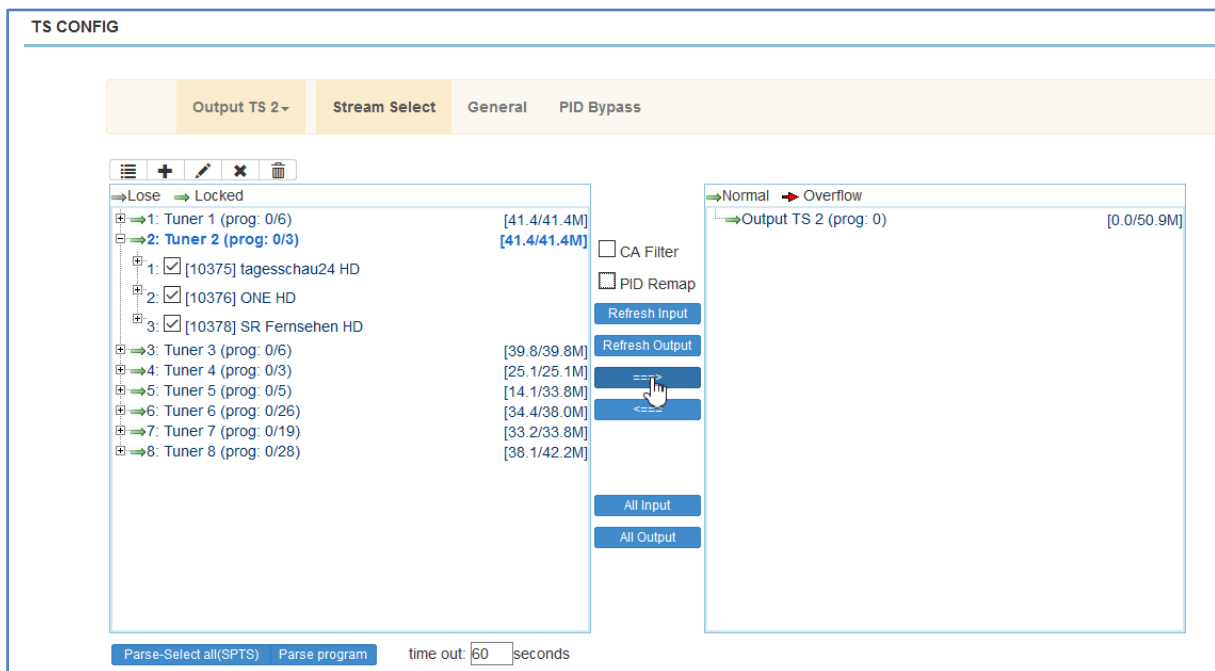
Now we have several methods to create the QAM outputs either as pass-through or multiplex mode:

In passthrough the NIT which is carried by the SAT-Tuner and maybe be carried by the IP Input as well would also be passed to the output but is probably the wrong one for a CATV network. So this method is not recommended or the input chosen is an IP stream MPTS which doesn't contain one and the NIT will be passed by another channel for the receivers in the cable network.

In MuX mode you can select any pre-configured Inpuits stream from Tuner 1...8 and IP IN and create your individual QAM-TS output. Advantage: You can add single PID's from the sources but the EIT = EPG Information cannot be created by this device: EIT remultiplexing isn't supported.

Passthrough:

we use tuner 2 Input as example:

TS CONFIG

| Output TS 2▾ | Stream Select | General | PID Bypass |

⇒Lose ⇒ Locked
⊞⇒1: Tuner 1 (prog: 0/6) [41.4/41.4M]
⊟⇒**2: Tuner 2 (prog: 0/3)** **[41.4/41.4M]**
  ⊞ 1: ☑ [10375] tagesschau24 HD
  ⊞ 2: ☑ [10376] ONE HD
  ⊞ 3: ☑ [10378] SR Fernsehen HD
⊞⇒3: Tuner 3 (prog: 0/6) [39.8/39.8M]
⊞⇒4: Tuner 4 (prog: 0/3) [25.1/25.1M]
⊞⇒5: Tuner 5 (prog: 0/5) [14.1/33.8M]
⊞⇒6: Tuner 6 (prog: 0/26) [34.4/38.0M]
⊞⇒7: Tuner 7 (prog: 0/19) [33.2/33.8M]
⊞⇒8: Tuner 8 (prog: 0/28) [38.1/42.2M]

☐ CA Filter
☐ PID Remap
Refresh Input
Refresh Output
==▷
◁==
All Input
All Output

⇒Normal ➡ Overflow
⇒Output TS 2 (prog: 0) [0.0/50.9M]

Parse-Select all(SPTS) | Parse program | time out: 60 seconds

Before we need to know whats all coming in by Stream-Expert from another parallel source using a DekTec Fantasi with the software StreamExpert (we arer selling DekTec if you wish):

PID info (34)
- 0x0000 **PAT** (20.0 kbps / 0.05%)
- 0x0001 **CAT** (5.7 kbps / 0.01%)
- 0x0010 **NIT-actual, NIT-other** (4.2 kbps / 0.01%)
- 0x0011 **SDT-actual, SDT-other, BAT** (10.0 kbps / 0.02%)
- 0x0012 **EITpf, EITs** (630 kbps / 1.5%)
- 0x0014 **TDT, TOT** (2.9 kbps / 0.01%)
- 0x00AA **AIT** (10.1 kbps / 0.02%)
- 0x00B0 **13818-6 type C** (10.0 kbps / 0.02%)
- 0x010E **AIT** (10.0 kbps / 0.02%)
- 0x0114 **13818-6 type C** (10.0 kbps / 0.02%)
- 0x087B **13818-6 type B** (149 kbps / 0.4%)
- 0x0B9A **AIT** (10.0 kbps / 0.02%)
- 0x0BA0 **13818-6 type C** (10.0 kbps / 0.02%)
- 0x1518 **PMT** (5.6 kbps / 0.01%)
- 0x1519 **AVC/H.264 Video** (13.5 Mbps / 31.7%)
- 0x151A **MPEG-1 Audio** (203 kbps / 0.5%)
- 0x151B **MPEG-1 Audio** (203 kbps / 0.5%)
- 0x151C **Teletext Data** (262 kbps / 0.6%)
- 0x151E **AC-3 Audio** (470 kbps / 1.1%)
- 0x1522 **PMT** (7.0 kbps / 0.02%)
- 0x1523 **AVC/H.264 Video** (12.3 Mbps / 28.8%)
- 0x1524 **MPEG-1 Audio** (203 kbps / 0.5%)
- 0x1525 **MPEG-1 Audio** (203 kbps / 0.5%)
- 0x1526 **Teletext Data** (259 kbps / 0.6%)
- 0x1527 **PES Private Data** (2.9 kbps / 0.01%)
- 0x1528 **AC-3 Audio** (469 kbps / 1.1%)
- 0x1536 **PMT** (5.6 kbps / 0.01%)
- 0x1537 **AVC/H.264 Video** (11.3 Mbps / 26.6%)
- 0x1538 **MPEG-1 Audio** (203 kbps / 0.5%)
- 0x1539 **MPEG-1 Audio** (203 kbps / 0.5%)
- 0x153A **Teletext Data** (258 kbps / 0.6%)
- 0x153B **PES Private Data** (2.8 kbps / 0.01%)
- 0x153C **AC-3 Audio** (470 kbps / 1.1%)
- 0x1FFF **Null packets** (1.16 Mbps / 2.7%)

Transport stream 1039
- **Services** (3)
  - **tagesschau24 HD** (13.9 Mbps / 32.7%)
  - **ONE HD** (11.9 Mbps / 28.0%)
  - **SR Fernsehen HD** (15.2 Mbps / 35.7%)
- **Tables**
  - **PAT**
  - **CAT**
  - **PMT**
  - **NIT-actual**
  - **NIT-other**
  - **BAT**
  - **SDT-actual**
  - **SDT-other**
  - **EIT-actual**
  - **EIT-other**
  - **TDT**
  - **TOT**
  - **AIT**
    - **PID 170**
    - **PID 270**
    - **PID 2970**

⇒Lose ⇒ Locked

⇒1: Tuner 1 (prog: 0/6) [41.4/41.4M]
⇒**2: Tuner 2 (prog: 3/3)** **[41.4/41.4M]**
- 1: ☑ [10375] tagesschau24 HD
  - 📄 Program Number: 10375
  - 📄 Service Type: 0x19
  - 📄 Service Provider: ARD
  - 📄 PMT PID: 0x1518
  - 📄 PCR PID: 0x1519
  - 📁 Elements
    - MPEG-4 Video PID: 0x1519
    - MPEG-1 Audio PID: 0x151a
    - MPEG-1 Audio PID: 0x151b
    - Private PES PID: 0x151c
    - AC3 Audio PID: 0x151e
    - Private Sections PID: 0x00aa
    - User defined PID: 0x00b0
    - User defined PID: 0x087b
- 2: ☑ [10376] ONE HD
- 3: ☑ [10378] SR Fernsehen HD

☐ CA Filter
☐ PID Remap

Refresh Input
Refresh Output
===>
<===

All Input
All Output

⇒Normal ⇒ Overflow

⇒Output TS 2 (prog: 3) [40.8/50.9M]
- 1: ☐ tagesschau24 HD <=CH2_Tuner 2 [10375]
  - 📄 Program Number: 10375
  - 📄 Logic Channel Number: 1
  - 📄 Service Type: 0x19
  - 📄 Service Provider: ARD
  - 📄 PMT PID: 0x0020
  - 📄 PCR PID: 0x1519
  - 📁 Elements
    - MPEG-4 Video PID: 0x1519
    - MPEG-1 Audio PID: 0x151a
    - MPEG-1 Audio PID: 0x151b
    - Private PES PID: 0x151c
    - AC3 Audio PID: 0x151e
    - Private Sections PID: 0x00aa
    - User defined PID: 0x00b0
    - User defined PID: 0x087b
- 2: ☐ ONE HD <=CH2_Tuner 2 [10376]
- 3: ☐ SR Fernsehen HD <=CH2_Tuner 2 [10378]

Parse-Select all(SPTS) Parse program time out: 60 seconds

Actually we do no NIT creation at all: That should be done at the end when all QAM channels are ready. But we like to pass all necessary information from SAT IN to QAM out. To just remark these both Tables has PID-No.:

EIT: PID 0x0012hex

TDT/TOT: PID 0x0014hex   and can be added to the mux from its source stream later like:

Now, in QAM **Mux –mode** CH2 output, the EIT + TDT TOT should be inserted.

We might be able to check this by using the **IP stream** output:

IP STREAM

Channel Info.(Alarm/Active/Total): 0/1/4

#	IP Address	Port	Protocol	Pkt Length	Null PKT Filter	Status	Bit(Act/Max)	
1	224.2.2.2	2001	UDP	7	☐	●	41.4/50.9 M	✎
2	224.22.22.22	20022	UDP	7	☐	●	41.4/50.9 M	✎
3	224.2.2.2	2003	UDP	7	☐	●	0.0/50.9 M	✎
4	224.2.2.2	2004	UDP	7	☐	●	0.0/50.9 M	✎

Home | Decoding | TR 101 290 | Recording | View

DVB | Freeze | PID | Service ID | Bitrate short-term | | 2: IP (Local IP: 192.168.0.108) | Info | Address udp://224.22.22.22:20022
Refresh | ☐ Dec | ☐ Dec | Gate 1s
Reset | ☑ Hex | ☑ Hex | Time Slice 100ms

Settings | Bitrate profile | Input Adapter

PID info (34)
- 0x0000 PAT (18.8 kbps / 0.04%)
- 0x0001 CAT (5.8 kbps / 0.01%)
- 0x0010 NIT-actual, NIT-other (2.9 kbps / 0.01%)
- 0x0011 SDT-actual, SDT-other, BAT (7.2 kbps / 0.01%)
- 0x0012 EITpf, EITs (629 kbps / 1.2%)
- 0x0014 TDT, TOT (3.0 kbps / 0.01%)
- 0x00AA AIT (10.2 kbps / 0.02%)
- 0x00B0 13818-6 type C (10.2 kbps / 0.02%)
- 0x010E AIT (10.2 kbps / 0.02%)
- 0x0114 13818-6 type C (10.2 kbps / 0.02%)
- 0x087B 13818-6 type B (149 kbps / 0.3%)
- 0x0B9A AIT (10.1 kbps / 0.02%)
- 0x0BA0 13818-6 type C (10.2 kbps / 0.02%)
- 0x1518 PMT (7.2 kbps / 0.01%)
- 0x1519 AVC/H.264 Video (13.0 Mbps / 25.5%)
- 0x151A MPEG-1 Audio (204 kbps / 0.4%)
- 0x151B MPEG-1 Audio (204 kbps / 0.4%)
- 0x151C Teletext Data (264 kbps / 0.5%)
- 0x151E AC-3 Audio (470 kbps / 0.9%)
- 0x1522 PMT (7.2 kbps / 0.01%)
- 0x1523 AVC/H.264 Video (13.8 Mbps / 27.0%)
- 0x1524 MPEG-1 Audio (204 kbps / 0.4%)
- 0x1525 MPEG-1 Audio (204 kbps / 0.4%)
- 0x1526 Teletext Data (263 kbps / 0.5%)
- 0x1527 PES Private Data (4.3 kbps / 0.01%)
- 0x1528 AC-3 Audio (470 kbps / 0.9%)
- 0x1536 PMT (7.2 kbps / 0.01%)
- 0x1537 AVC/H.264 Video (10.4 Mbps / 20.4%)
- 0x1538 MPEG-1 Audio (204 kbps / 0.4%)
- 0x1539 MPEG-1 Audio (204 kbps / 0.4%)
- 0x153A Teletext Data (263 kbps / 0.5%)

PID | TS | Grid

Transport stream 1039
- Services (3)
  - tagesschau24 HD (14.3 Mbps / 28.0%)
  - ONE HD (15.1 Mbps / 29.6%)
  - SR Fernsehen HD (11.7 Mbps / 23.0%)
- Tables
  - PAT
  - CAT
  - PMT
  - NIT-actual
  - NIT-other
  - BAT
  - SDT-actual
  - SDT-other
  - EIT-actual
  - EIT-other
  - TDT
  - TOT
  - AIT
    - PID 170
    - PID 270
    - PID 2970

PID | TS | Grid | TV | PCR | TR 101 290

As to bee seen, EIT and TDT/TOT are there.

We delete both:

Output TS 2 ▾ | Stream Select | General | **PID Bypass**

Index	Input Channel	Input PID(0x)	Output PID(0x)	+
1	2	0x0012	0x0012	🗑

And they are still there. (from the original source)

Because we accidently used the passthrough mode and therefore the manual PID adding has no effect. We better change to mux mode:
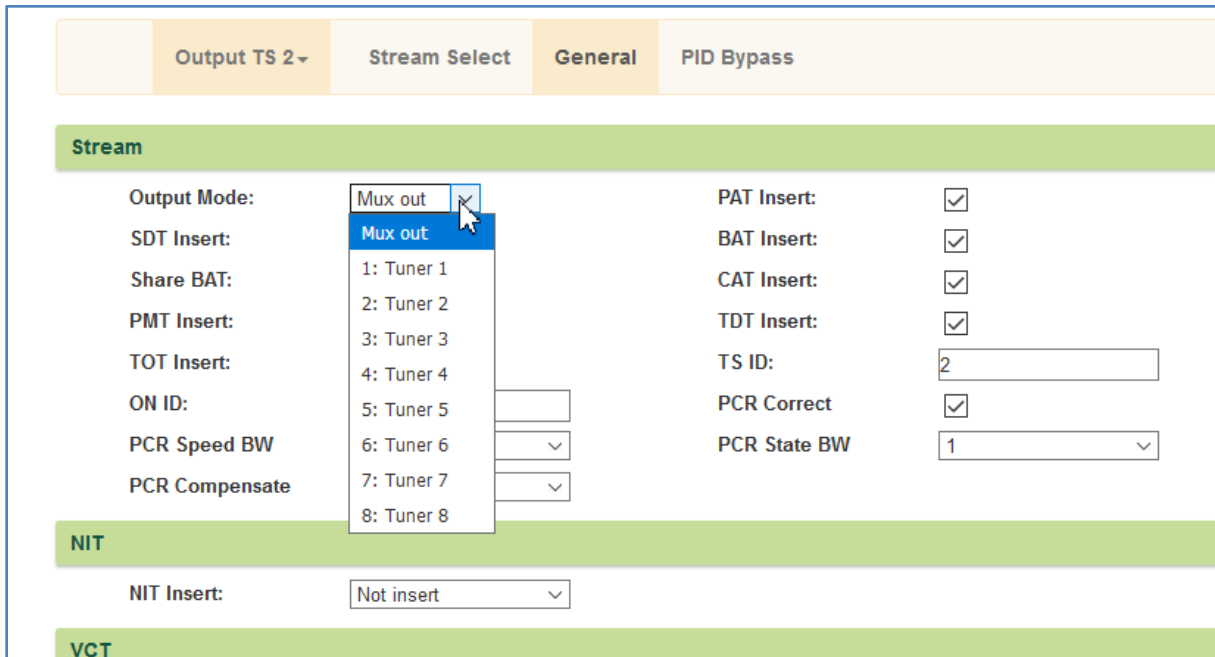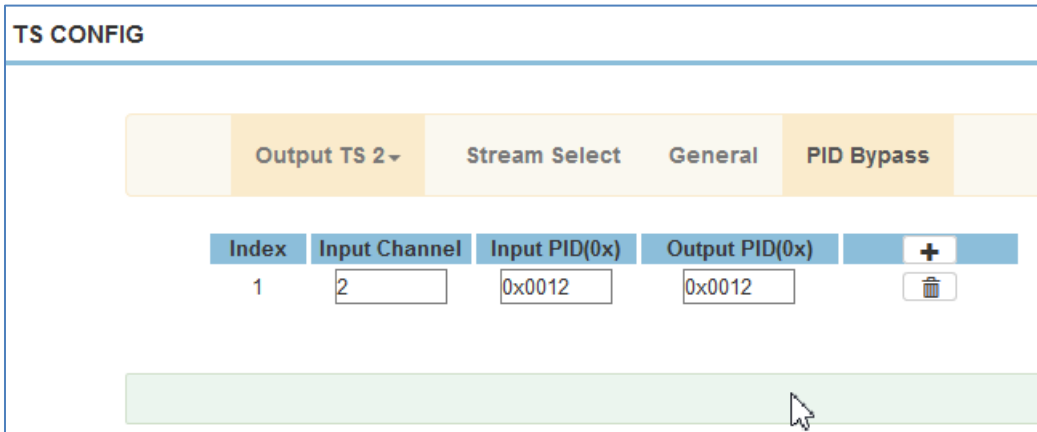

Check IP-output stream: A lot of things are missing because only related Tables are processed :
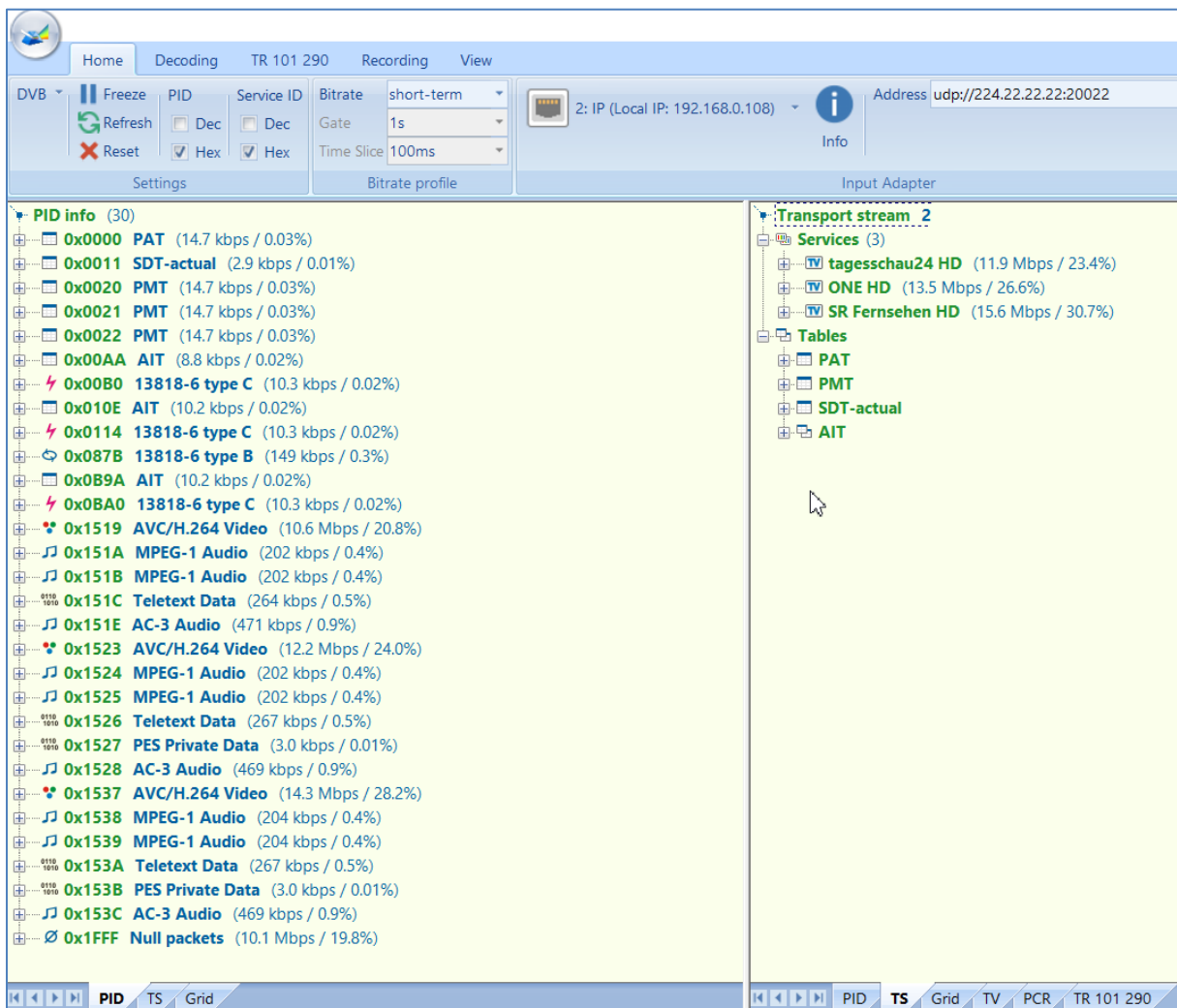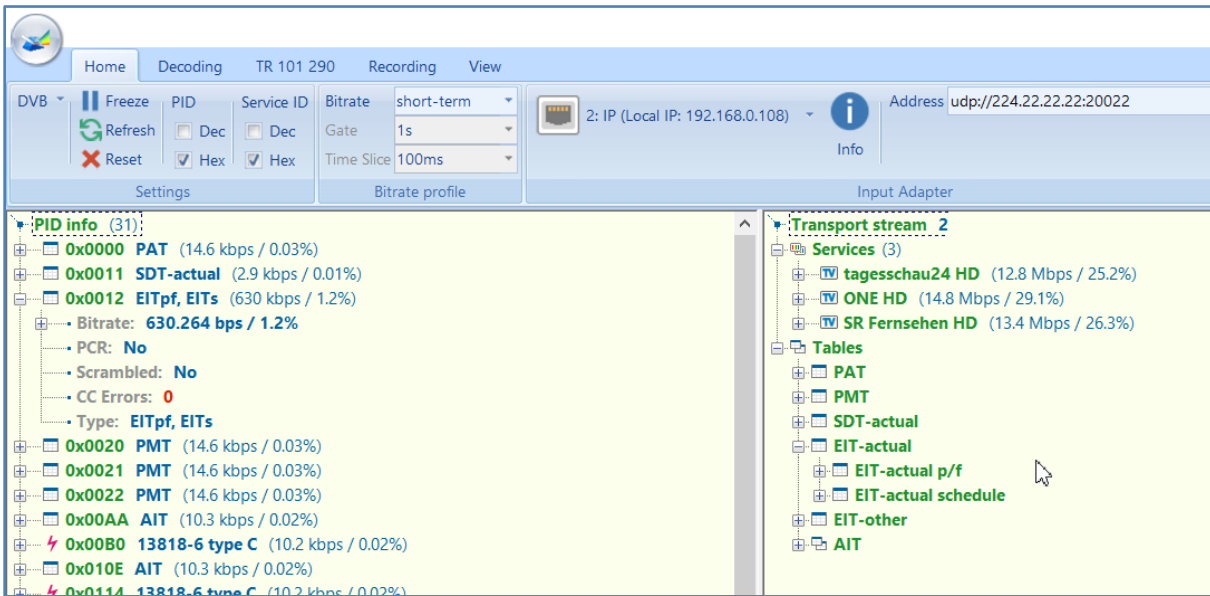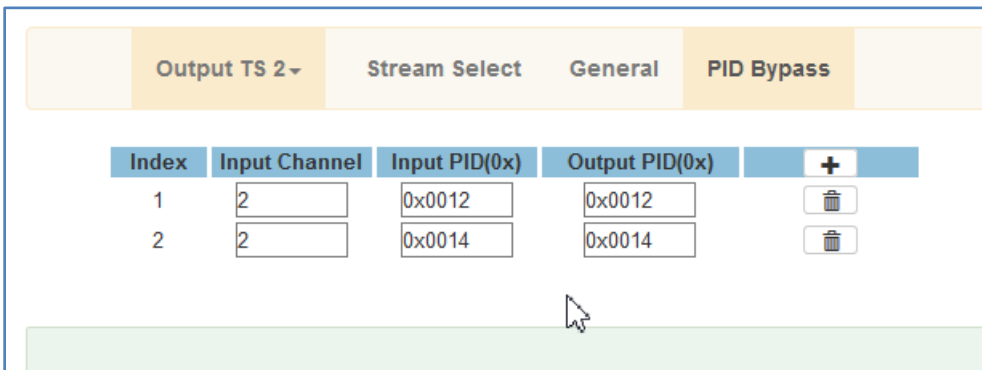
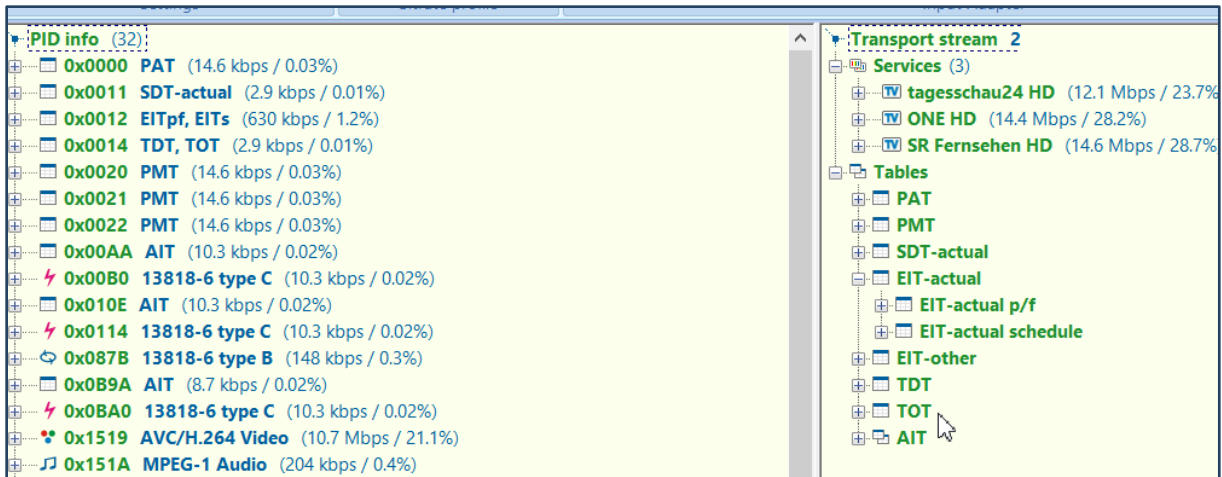So again we go into **PID-Bypass**

Adding the EIT PID number 0x0012 from source input 2.

Yes, that works

We can do this for the SAT-based Time and date + offset tables TDT/TOT 0x0014:

BAT and CAT are missing, CAT isn't that critical because the transponder isn't crypted at all.

All "other" named tables as well- but that is a must have filter when you transmodulate from SAT to DVB-C anyway, because the network is different – and so the NIT.

In general:

TSID, ONID and some private PID's should be observed and if needed : PID injected.

But: The most tables are somehow cross referencing. If you change a SID or remap a PID, the EIT is not valid any more. AIT as well. BAT might also not fully work in the output network.

Also adding a TV Service from another source input cannot add it's data to the existing EIT or other tables.

This would be a job for an advanced Remultiplexer-Processor unit which is much more expensive than this Transmodulator.

Note:

Be carefull for mixing TS – SAT In/outs and IP streams: To not overflow the final multiplexed QAM output capacity which practical maximum is around 51 Mb/s (minus peak-overhead reserve 10...15% recommended) Example:
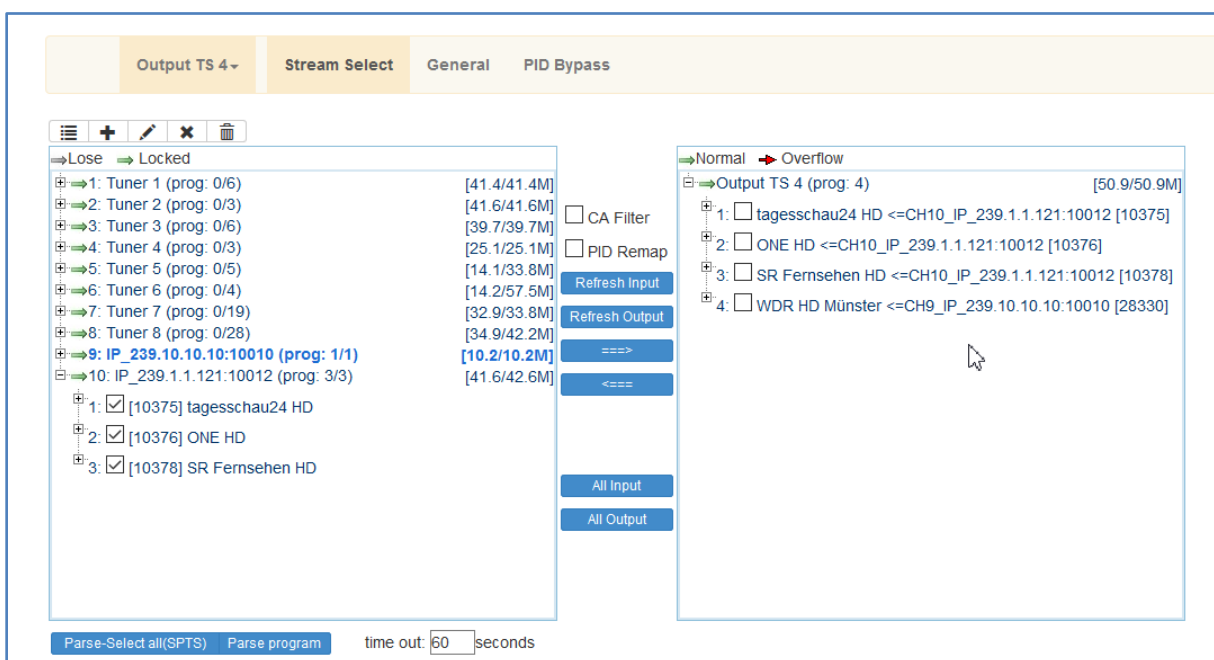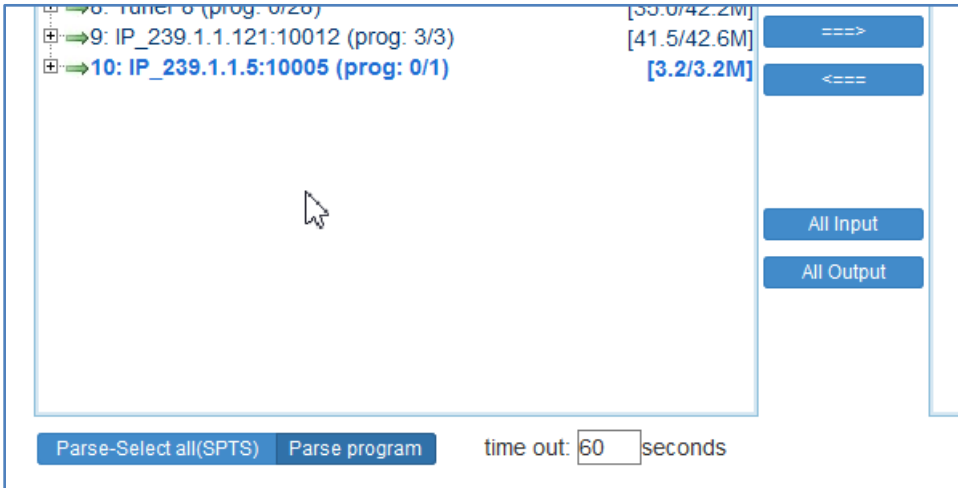
The arrow of OVERFLOW in the right side changes to RED if an overflow is happening.
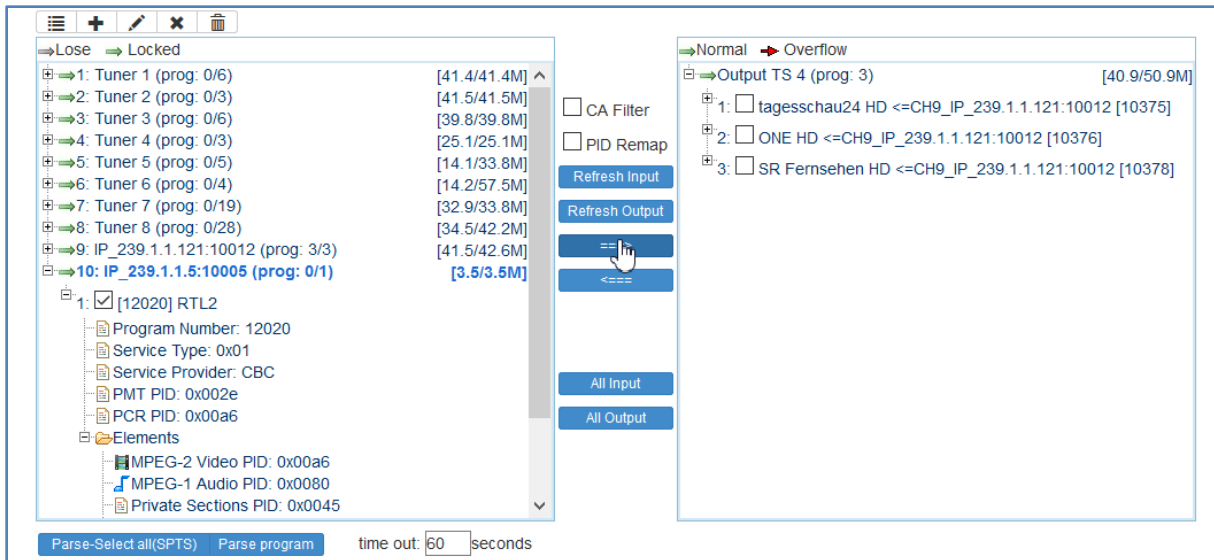
So we try an SD channel to inject here:

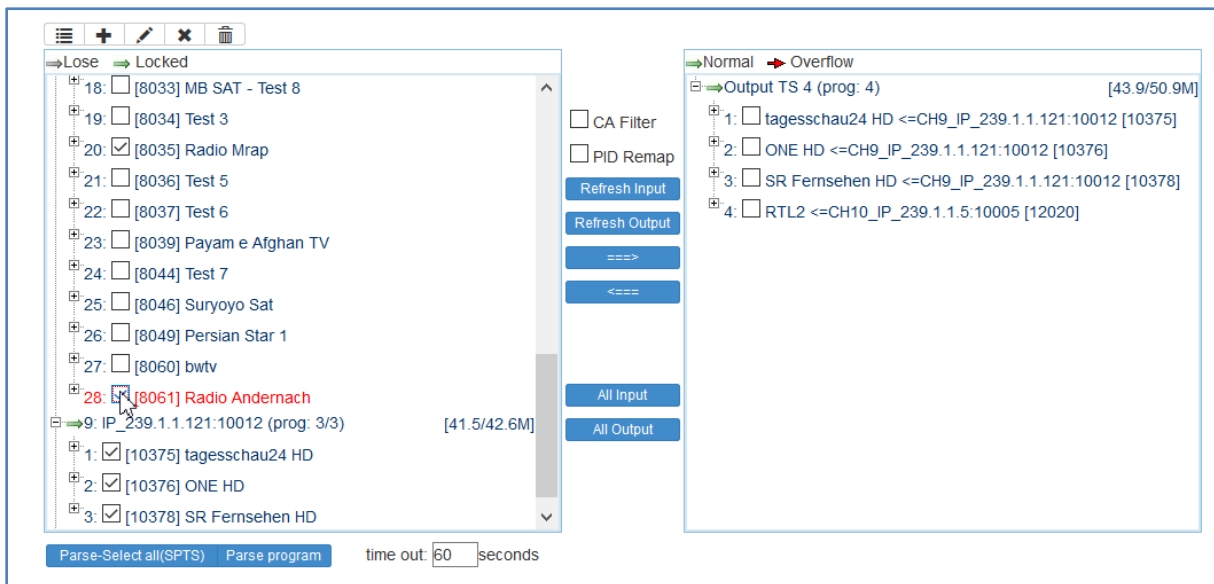Remove, than delete the input SPTS and use another:
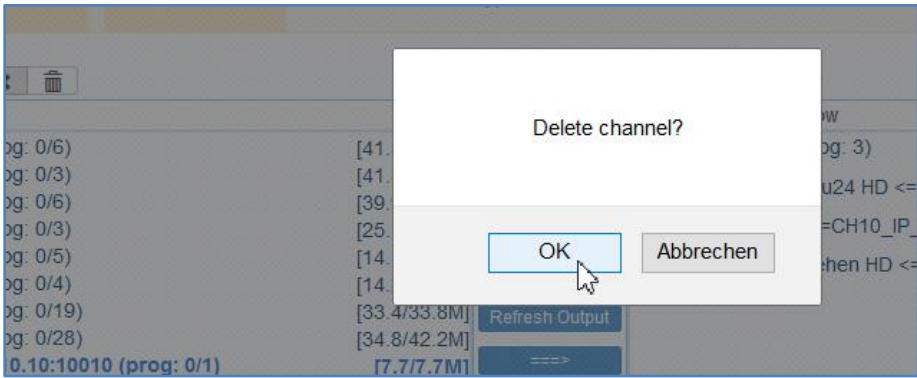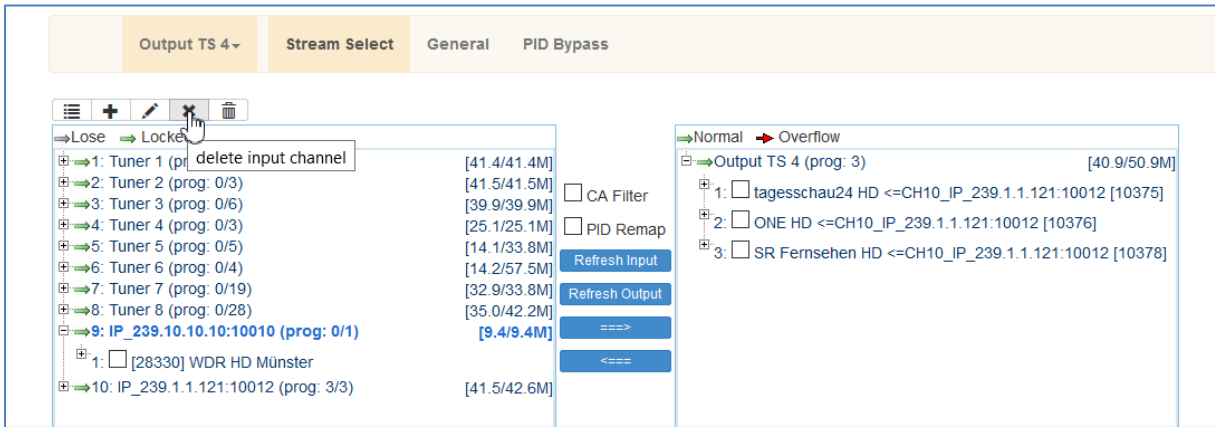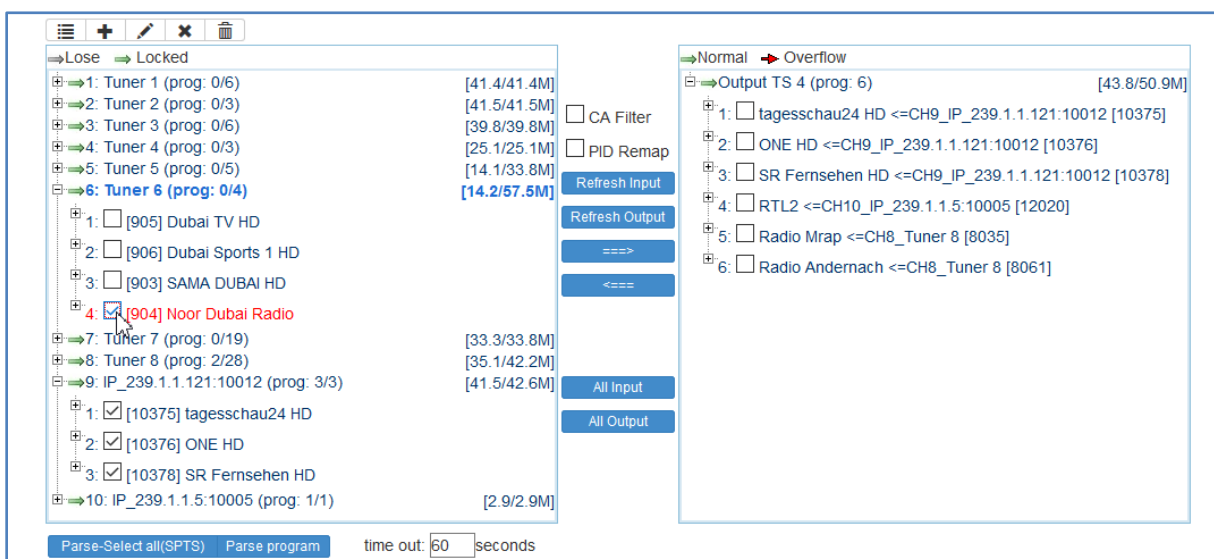

Add another and parse input content:

We might have still some space and insert another – considering the bitrate...: Some radios will fit:

Even from different input sources:

Off course for such a multiplex you can only use the **MUX setting in General**:

An IPTV Input as MPTS can be passed to the output as well:

Remark: VCT settings are only valid if you use the american DVB-C AnnexB ITU norm.

CI-Card using – Decryption by CAM:

After all TS Inputs are configured, the CI – Modules inserted can be used for every of the Input streams – either from the Tuners or the IP Input Streams:

HDC 6008CI

CI CARD CONFIGURATION

Card A **Card B** Card C Card D

⇒Lose ⇒ Locked — All prg.
⊞⇒Tuner 1 (prog: 0/6) — 41.4M

Input Source: Tuner 1

| Tuner 1 |
| Tuner 2 |
| Tuner 3 |
| Tuner 4 |
| Tuner 5 |
| Tuner 6 |
| Tuner 7 |
| Tuner 8 |
| IP_239.1.1.121:10012 |
| IP_239.1.1.5:10005 |
| IP_239.100.3.100:1234 |
| IP_225.1.1.55:10031 |

CI TS Mode:
CI Max Bitrate:
CI Card Error Check:
CI card delay(0-20):
Debug Mode:

Rom Version:
CI Card Status:
Descramble Error:
Program Counts:
TS Status: 0.000 Mbps

Default config   Set config

Set program   Set descramble

CI Card Log:

Card A Card B Card C Card D

⇒Lose ⇒ Locked — All prg.
⊟⇒IP_239.1.1.121:10012 (prog: 0/3) — 41.5M
  1: ☐ [10375] tagesschau24 HD
  2: ☐ [10376] ONE HD
  3: ☐ [10378] SR Fernsehen HD

Input Source: IP_239.1.1.121:10012 ∨

CI TS Mode: Skip CI Card ∨
CI Max Bitrate: 80 Mbps ∨
CI Card Error Check: ☑
CI card delay(0-20): 5
Debug Mode: ☑

Rom Version: 8.6.5.9
CI Card Status: 🟢
Descramble Error: 🟢

Select the Services to be decrypted and Set programm:

SET it and:

The log-window displays status and the services and datrates will be shown which are routed now through the CAM.

Modulator settings:

The QAM channels are connected to the 4x IP MPTS output streams. They will contain exactly the same Transportstream we remultiplexed for all of these 4 channels:

Because there bitrates depends from the QAM setups.

IP STREAM

Channel Info.(Alarm/Active/Total): 0/1/4

#	IP Address	Port	Protocol	Pkt Length	Null PKT Filter	Status	Bit(Act/Max)	
1	224.2.2.2	2001	UDP	7	☐	●	41.5/50.9 M	Quickly Config.
2	224.22.22.22	20022	UDP	7	☐	●	41.4/50.9 M	✎
3	224.2.2.2	2003	UDP	7	☐	●	39.7/50.9 M	✎
4	224.2.2.2	2004	UDP	7	☐	●	45.7/50.9 M	✎

To change the configuration parameters we can access the Quickly config for all:

where we set start center frequency (other will follow it), the common channel level, DVB-C mode (Annex A/C or ITU american AnnexB named), bandwidth, constlleation 64...256 QAM and symbol rate.

Single settings can be accessed individually but becasue we have a common modulator for all and adjacent: the single setting will affect the others:

Center Frequency: 662.000 MHz　　Standard: J.83A(DVB-C)
Level(All Carriers): -15.0 dBm　　Channel Info.(Alarm/Active/Total): 0/4/4

#	Frequency	Constellation	Symbol Rate	Channel Level	Status	Bit(Act/Max)	✎
1	650.000 MHz	256 QAM	6900 Ksps	-21.0 dB	●	41.4/50.9 M	✎
2	658.000 MHz	256 QAM	6900 Ksps	-21.0 dB	●	41.5/50.9 M	✎
3	666.000 MHz	256 QAM	6900 Ksps	-21.0 dB	●	39.9/50.9 M	✎
4	674.000 MHz	256 QAM	6900 Ksps	-21.0 dB	●	45.1/50.9 M	✎

The **IPstream settings** are more flexible:
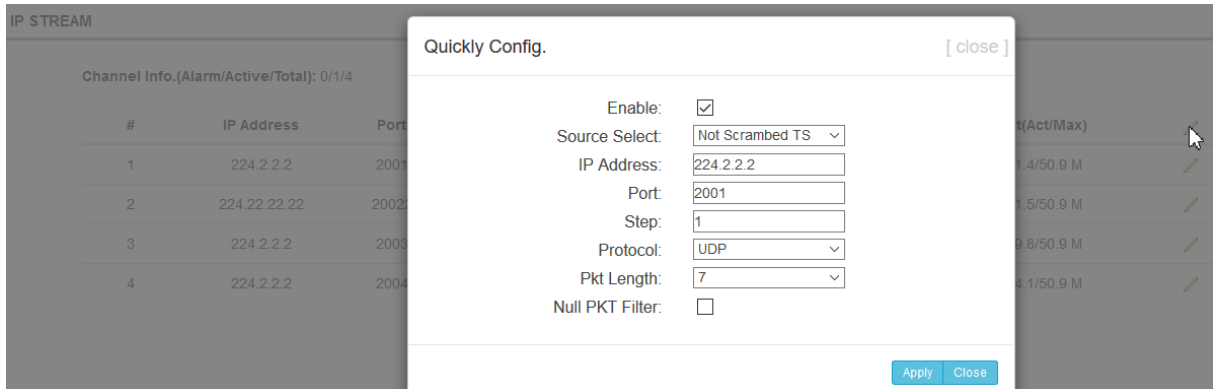
NullPkt Filter: The PID 8192dec (0x1FFF hex) can be filtered out -> You would sent a VBR instead of a CBR stream. This safes bandwidth but can cause problems in stupid IP 2 QAM devices in sub headends. UDP or RTP can be chosen:
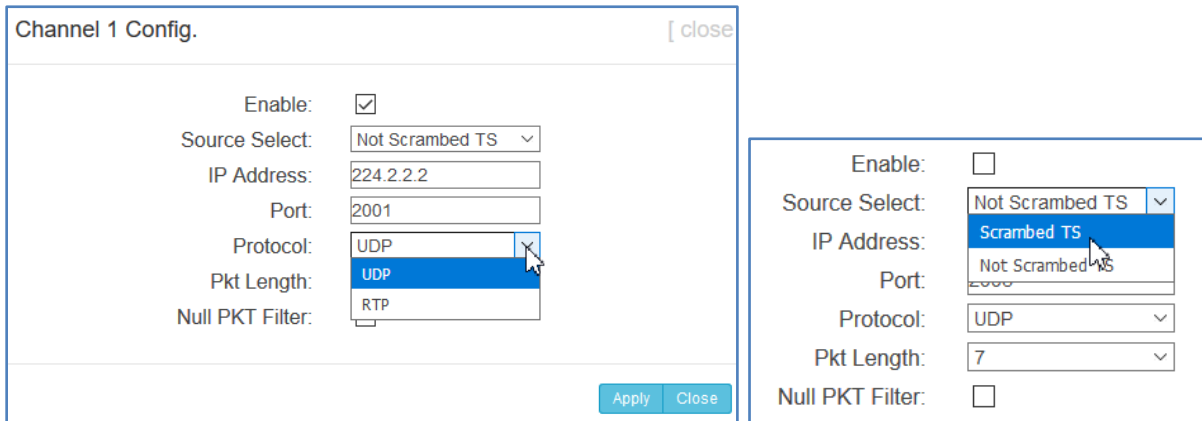
Scrambled TS (by usage of the Scrambler menu and connection to CASystems) or unscrambled can be chosen to forward as IP out.

Scrambling Menu:
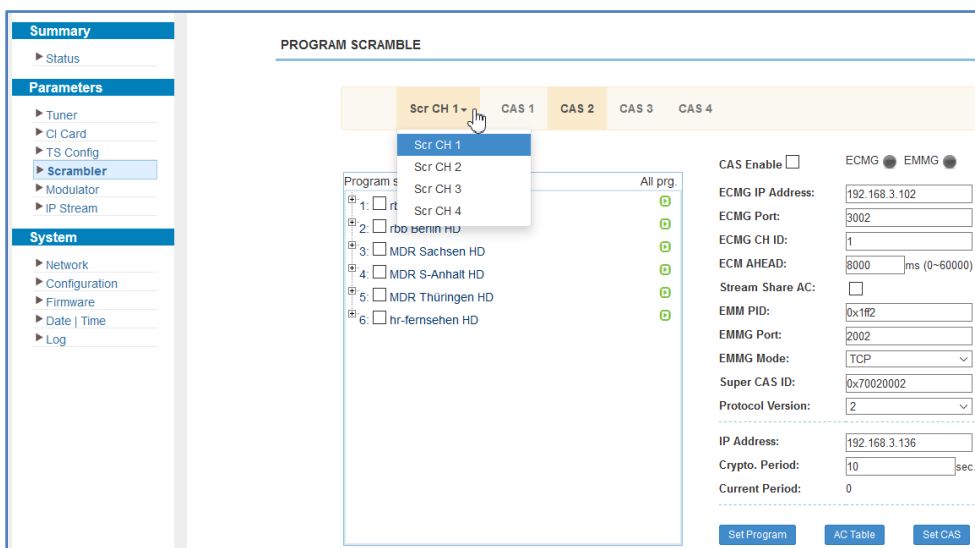
4 independent scrambling – encryption channels can be designed with up to 4 times simulcrypt:

Single PID's can be chosen individually to encrypt them.

Which need to be setup in conjunction with the setup of the **Network interfaces**:

The **Device Configuration** can be safed,restored, backupped:
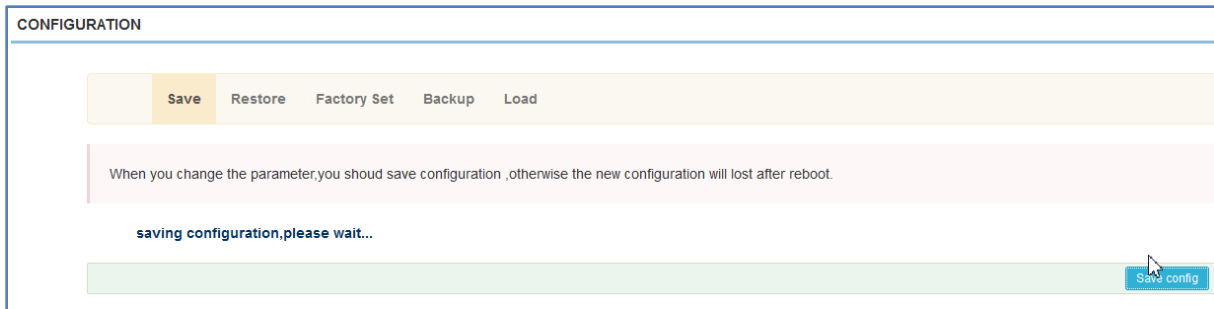
Firmware upgrades can be installed by this Web –Interface:
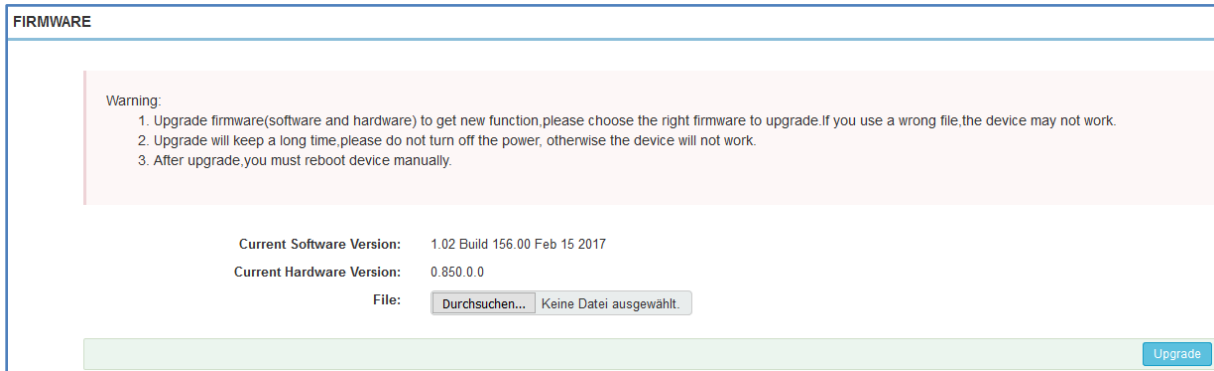
And the Log-files can be sent if probelms occur:
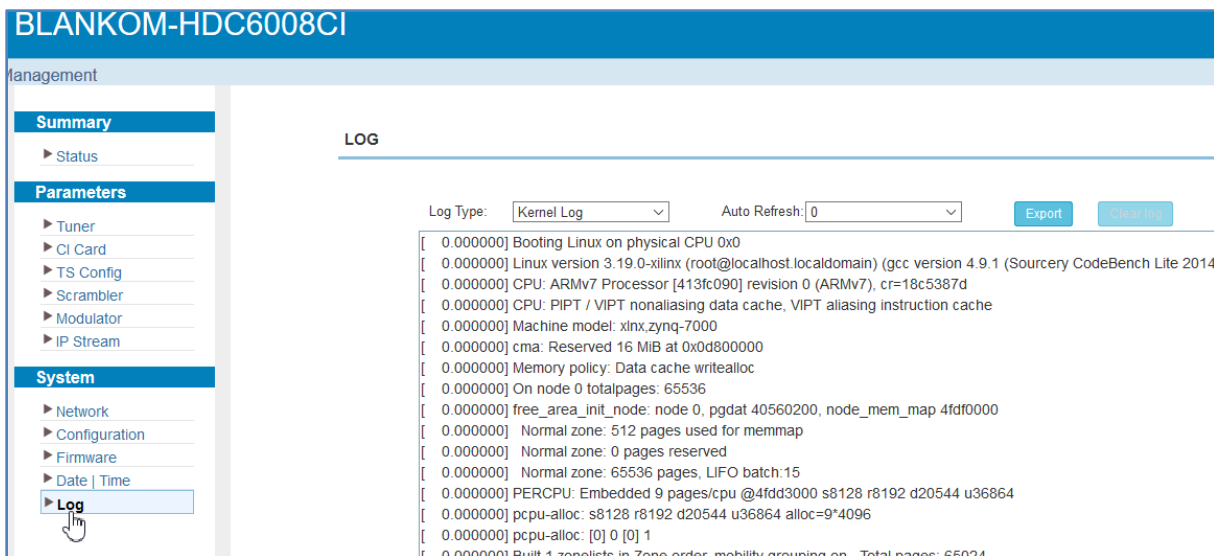
Troubleshooting

Our ISO9001 quality assurance system has been approved by CQC organization. We guarantee the products' quality, reliability and stability. All of our products have been passed the testing and inspection before shipping out from factory. The testing and inspection scheme already covers all the Optical, Electronic and Mechanical criteria which have been published by us. To prevent potential hazard, please strictly follow the operational conditions.

Installation pre-conditions

- Installing the device at the place in which environment temperature between 0 to 45 °C
- Making sure good ventilation for the heat-sink on the rear panel and other heat-sink bores if necessary
- Checking the input AC voltage within the power supply working range and the connection is correct before switching on device
- Checking the RF output level varies within tolerant range if it is necessary
- Checking all signal cables have been properly connected
- Frequently switching on/off device is prohibited; the interval between every switching on/off must greater than 10 seconds.

Conditions need to unplug power cord

- Power cord or socket damaged.
- Any liquid flowed into device.
- Any stuff causes circuit short
- Device in damp environment
- Device was suffered from physical damage
- Longtime idle.
- After switching on and restoring to factory setting, device still cannot work properly.
- Maintenance needed

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.

Installation Notes

All types of the IRENIS-BLANKOM family are 19"devices with 1 RU height designed for installation in 19" racks. In addition to the front panel screws an internal module support is required at the rack.

Depending on the Frontend used and the operating adjustments, the SAT-RF-input ports carrying DC Voltage (13V /18V, max. 400 mA).

By connecting a mains cable, the device can become functional without any auxiliary appliances. The power supply units are designed for the wide range of 100-230V AC; a manual adjustment of the voltage is not necessary.

For some models the second power connector is feeding another independent power supply for internal redundancy. For a maximum of redundancy both power supplies should use different circuits.

All the outputs are decoupled from one another. Thus, the circuit does not have any effect on the functioning of the device. Connections that are not required need not to be terminated.

Suggestion: CAT 6E Ethernet cable for GbEthernet, DSTP (double shielded twisted pair) for the streaming ports

Note:

IPv4 global scope sessions use multicast addresses in the range 224.2.128.0 - 224.2.255.255 with SAP Announcements being sent to 224.2.127.254 Port 9875 (note that 224.2.127.255 is used by the obsolete SAPv0 and MUST NOT be used).

IPv4 administrative scope sessions using administratively scoped IP multicast. The multicast address to be used for announcements is the highest multicast address in the relevant administrative scope zone.

For example, if the scope range is 239.16.32.0 - 239.16.33.255, then 239.16.33.255 is used for SAP Announcements.

Sources:

http://www.etsi.org/deliver/etsi_en/300400_300499/300468/01.15.01_60/en_300468v011501p.pdf
https://www.dvb.org/standards
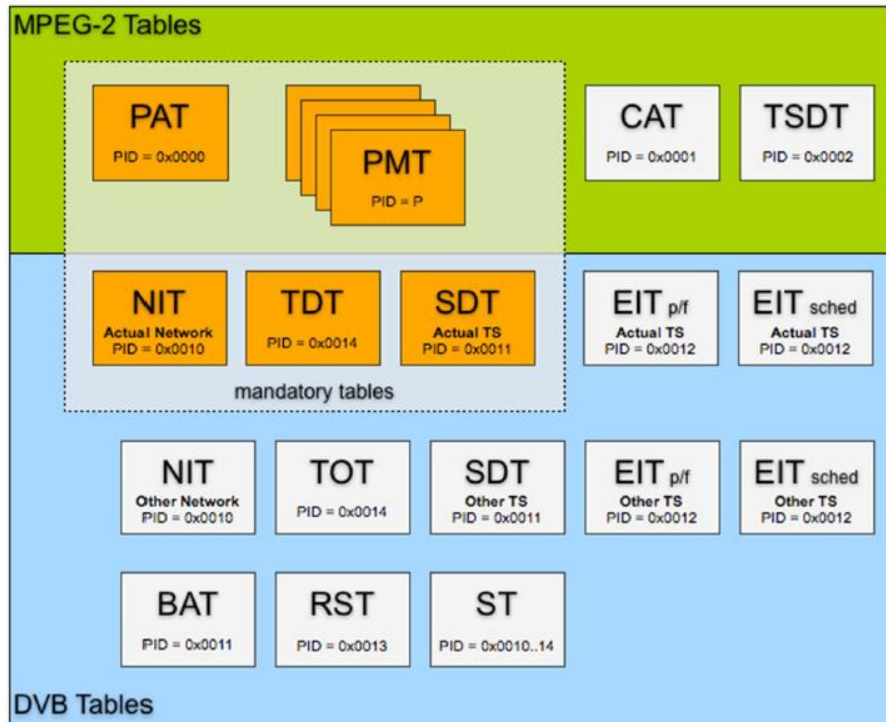
Table 1: PID allocation for SI

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.

Contact:

IRENIS GmbH
Hauptstr. 29
31171 Nordstemmen- Germany
Phone: +49 5069 4809781
IRENIS technical hotline VoIP +49 5069 4399 -860 or -8601
Managing Director: Dipl.Ing. Murad Önol
Commercial Register: HRB 206370 / District Court Hildesheim

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

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

אזהרה מוצר!

סילוק מוחלט של מוצר זה צריך להתבצע בהתאם לכל החוקים והתקנות הלאומיים.

compétent.

عند التخلص النهائي من هذا المنتج يتعين التعامل معه وفقا 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.

ANNEX ChannelPlan

CATV channel plan:

Bereich / Bands	Kanal / Channel	Kanal-frequenzen Channel frequency	Mitten-frequenz Middle frequency	Bild-träger Picture carrier	Ton-träger Sound carrier
B I	2	47...54	50,50	48,25	53,75
	3	54...61	57,50	55,25	60,75
	4	61...68	64,50	62,25	67,75
USB Unterer Sonder-kanal-bereich Midband channels	S 02	111...118	114,50	112,25	117,75
	S 03	118...125	121,50	119,25	124,75
	S 04	125...132	128,50	126,25	131,75
	S 05	132...139	135,50	133,25	138,75
	S 06	139...146	142,50	140,25	145,75
	S 07	146...153	149,50	147,25	152,75
	S 08	153...160	156,50	154,25	159,75
	S 09	160...167	163,50	161,25	166,75
	S 10	167...174	170,50	168,25	173,75
B III	5	174...181	177,50	175,25	180,75
	6	181...188	184,50	182,25	187,75
	7	188...195	191,50	189,25	194,75
	8	195...202	198,50	196,25	201,75
	9	202...209	205,50	203 25	208,75
	10	209...216	212,50	210,25	215,75
	11	216...223	218,50	217,25	222,75
	12	223...230	226,50	224,25	229,75
OSB Oberer Sonder-kanal-bereich Superband channels	S 11	230...237	233,50	231,25	236,75
	S 12	237...244	240,50	238,25	243,75
	S 13	244...251	247,50	245,25	250,75
	S 14	251...258	254,50	252,25	257,75
	S 15	258...265	261,50	259,25	264,75
	S 16	265...272	268,50	266,25	271,75
	S 17	272...279	275,50	273,25	278,75
	S 18	279...286	282,50	280,25	285,75
	S 19	286...293	289,50	287,25	292,75
	S 20	293...300	296,50	294,25	299,75
ESB Erweiterter Sonder-kanal-bereich Hyperband channels	S 21	302...310	306,00	303,25	308,75
	S 22	310...318	314,00	311,25	316,75
	S 23	318...326	322,00	319,25	324,75
	S 24	326...334	330,00	327,25	332,75
	S 25	334...342	338,00	335,25	340,75
	S 26	342...350	346,00	343,25	348,75
	S 27	350...358	354,00	351,25	356,75
	S 28	358...366	362,00	359,25	364,75
	S 29	366...374	370,00	367,25	372,75
	S 30	374...382	378,00	375,25	380,75
	S 31	382...390	386,00	383,25	388,75
	S 32	390...398	394,00	391,25	396,75
	S 33	398...406	402,00	399,25	404,75
	S 34	406...414	410,00	407,25	412,75
	S 35	414...422	418,00	415,25	420, 75
	S 36	422...430	426,00	423,25	428,75
	S 37	430...438	434,00	431,25	436,75
	S 38	438...446	442,00	439,25	444,75
	S 39	446...454	450,00	447,25	452,75
	S 40	454...462	458,00	455,25	460,75
	S 41	462...470	466,00	463,25	468,75

Bereich / Bands	Kanal / Channel	Kanal-frequenzen Channel frequency	Mitten-frequenz Middle frequency	Bild-träger Picture carrier	Ton-träger Sound carrier
B IV	2	470...478	474,00	471,25	476,75
	2	478...486	482,00	479.25	484,75
	2	486...494	490,00	487,25	492,75
	2	494...502	498,00	495,25	500,75
	2	502...510	506,00	503,25	508,75
	2	510...518	514,00	511,25	516,75
	2	518...526	522,00	519,25	524,75
	2	526...534	530,00	527,25	532,75
	2	534...542	538,00	535,25	540,75
	3	542...550	546,00	543,25	548,75
	3	550...558	554,00	551,25	556,75
	3	558...566	562,00	559,25	564,75
	3	566...574	570,00	567,25	572,75
	3	574...582	578,00	575,25	580,75
	3	582...590	586,00	583,25	588,75
	3	590...598	594,00	591,25	596,75
	3	598...606	602,00	599,25	604,75
B V	3	606...614	610,00	607,25	612,75
	3	614...622	618,00	615,25	620,75
	4	622...630	626,00	623,25	628,75
	4	630...638	634,00	631,25	636,75
	4	638...646	642,00	639,25	644,75
	4	646...654	650,00	647,25	652,75
	4	654...662	658,00	655,25	660,75
	4	662...670	666,00	663,25	668,75
	4	670...678	674,00	671,26	676,75
	4	678...686	682,00	679,25	684,75
	4	686...694	690,00	687,25	692,75
	4	694...702	698,00	695,25	700,75
	5	702...710	706,00	703,25	708,75
	5	710...718	714,00	711,25	716,75
	5	718...726	722,00	719,25	724,75
	5	726...734	730,00	727,25	732,75
	5	734...742	738,00	735,25	740,75
	5	742...750	746,00	743,25	748,75
	5	750...758	754,00	751,25	756,75
	5	758...766	762,00	759,25	764,75
	5	766...774	770,00	767,25	772,75
	5	774...782	778,00	775,25	780,75
	6	782...790	786,00	783,25	788,75
	6	790...798	794,00	791,25	796,75
	6	798...806	802,00	799,25	804,75
	6	806...814	810,00	807,25	812,75
	6	814...822	818,00	815,25	820,75
	6	822...830	826,00	823,25	828,75
	6	830...838	834,00	831,25	836,75
	6	838...846	842,00	839,25	844,75
	6	846...854	850,00	847,25	852,75
	6	854...862	858,00	855,25	860,75

...

Elektronische Geräte gehören nicht in den Hausmüll, sondern müssen - gemäß Richtlinie 2002/96/EG DES EUROPÄISCHEN PARLAMENTS UND DES RATES vom 27. Januar 2003 über Elektro- und Elektronik-Altgeräte fachgerecht entsorgt werden.

Bitte geben Sie dieses Gerät am Ende seiner Verwendung zur Entsorgung an den dafür vorgesehenen öffentlichen Sammelstellen ab.

Electronic equipment is not household waste - in accordance with directive 2002/96/EC OF THE EUROPEAN PARLIAMENT AND THE COUNCIL dated 27th January 2003 on used electrical and electronic equipment, it must be disposed of properly.

At the end of its service life, take this unit for disposal to an appropriate official collection point

Montage und Sicherheitshinweise / Installation and safety instructions

- 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 mm^2) 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 Eingangspegel 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 Gerätekühlung 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*

Wir empfehlen die Benutzung von Gleitschienen bevor der BMS im 19 '' Schrank installiert und angeschlossen wird.
We recommend using and installing 19'' rails in your rack before you mount the BMS and install the F-connectors and cables.

Zur Beachtung / *Important notes*:

- 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.*
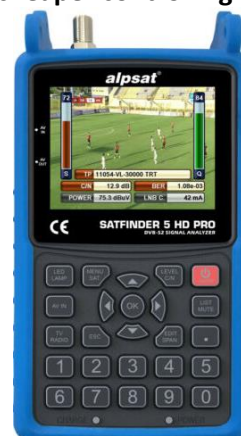
Please use appropriate measurement equipment when installing and do not use coax length > 50m between Dish-Farm and the Multiswitch to secure signal quality and less slope.
Using a handy instrument from i.e. PROMAX or for the cheaper controlling an ALPSAT:

Professional   and   Semi-professional

Example Spectrums:
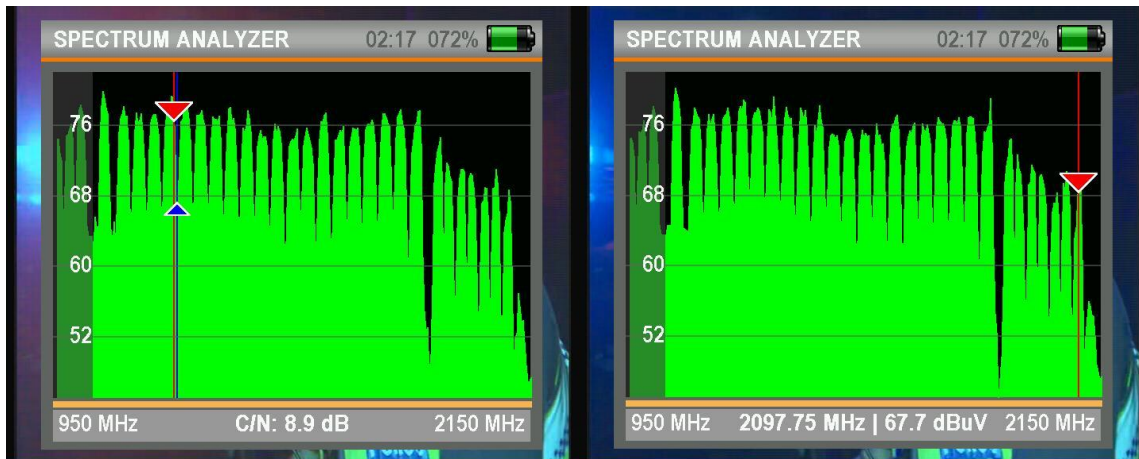
Left: C/N measuring. **You see the SLOPE** = higher attenuation on higher frequencies? Right: Level
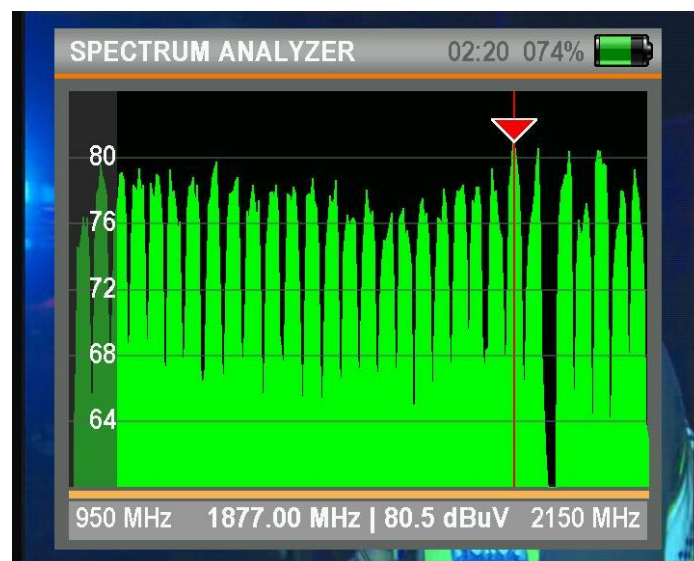
Shown is a good quality output level of 80 dBµV directly from a BLANKOM 32 -> 32 -Multiswitch cascaded output. The first 2 showing ASTRA Satellite high band while the 3rd shows Eutelsat Hotbird 13°E on DiSEqC SAT Pos. 2 with a better adjusted LNB at the dish(es). So your signal quality depends on: Dish direction and angles, LNB focus and angle and also its LNB-quality and the cable length and quality.

Annex: Table for Conversions of Power @ 75Ω

dBmV	dBµV	dBm 75Ω	mV$_{RMS}$	mW 75Ω
8	68	-40.75	2.51	8.4E-05
9	69	-39.75	2.82	1.1E-04
10	70	-38.75	3.16	1.3E-04
11	71	-37.75	3.55	1.7E-04
12	72	-36.75	3.98	2.1E-04
13	73	-35.75	4.47	2.7E-04
14	74	-34.75	5.01	3.3E-04
15	75	-33.75	5.62	4.2E-04
16	76	-32.75	6.31	5.3E-04
17	77	-31.75	7.08	6.7E-04
18	78	-30.75	7.94	8.4E-04
19	79	-29.75	8.91	1.1E-03
20	80	-28.75	10.00	1.3E-03
21	81	-27.75	11.22	1.7E-03
22	82	-26.75	12.59	2.1E-03
23	83	-25.75	14.13	2.7E-03
24	84	-24.75	15.85	3.3E-03
25	85	-23.75	17.78	4.2E-03
26	86	-22.75	19.95	5.3E-03
27	87	-21.75	22.39	6.7E-03
28	88	-20.75	25.12	8.4E-03
29	89	-19.75	28.18	0.011
30	90	-18.75	31.62	0.013
31	91	-17.75	35.48	0.017
32	92	-16.75	39.81	0.021
33	93	-15.75	44.67	0.027
34	94	-14.75	50.12	0.033
35	95	-13.75	56.23	0.042
36	96	-12.75	63.10	0.053
37	97	-11.75	70.79	0.067
38	98	-10.75	79.43	0.084
39	99	-9.75	89.13	0.106
40	100	-8.75	100.00	0.133
41	101	-7.75	112.20	0.168
42	102	-6.75	125.89	0.211

dBmV	dBμV	dBm 75Ω	mV$_{RMS}$	mW 75Ω
43	103	-5.75	141.25	0.266
44	104	-4.75	158.49	0.335
45	105	-3.75	177.83	0.422
46	106	-2.75	199.53	0.531
47	107	-1.75	223.87	0.668
48	108	-0.75	251.19	0.841
49	109	0.25	281.84	1.059
50	110	1.25	316.23	1.333
51	111	2.25	354.81	1.679
52	112	3.25	398.11	2.113
53	113	4.25	446.68	2.660
54	114	5.25	501.19	3.349
55	115	6.25	562.34	4.216
56	116	7.25	630.96	5.308
57	117	8.25	707.95	6.683
58	118	9.25	794.33	8.413
59	119	10.25	891.25	10.591
60	120	11.25	1000.00	13.333
61	121	12.25	1122.02	16.786
62	122	13.25	1258.93	21.132
63	123	14.25	1412.54	26.604
64	124	15.25	1584.89	33.492
65	125	16.25	1778.28	42.164
66	126	17.25	1995.26	53.081
67	127	18.25	2238.72	66.825
68	128	19.25	2511.89	84.128