



IGS-700

DVB-S2 or C/T/T2 Quad-Receiver IP-Streamer



Rear view with 2x2 Tuner inputs



Rear with 2x 4 Tuner inputs = IGS-700/84

Datasheet & Instruction Manual

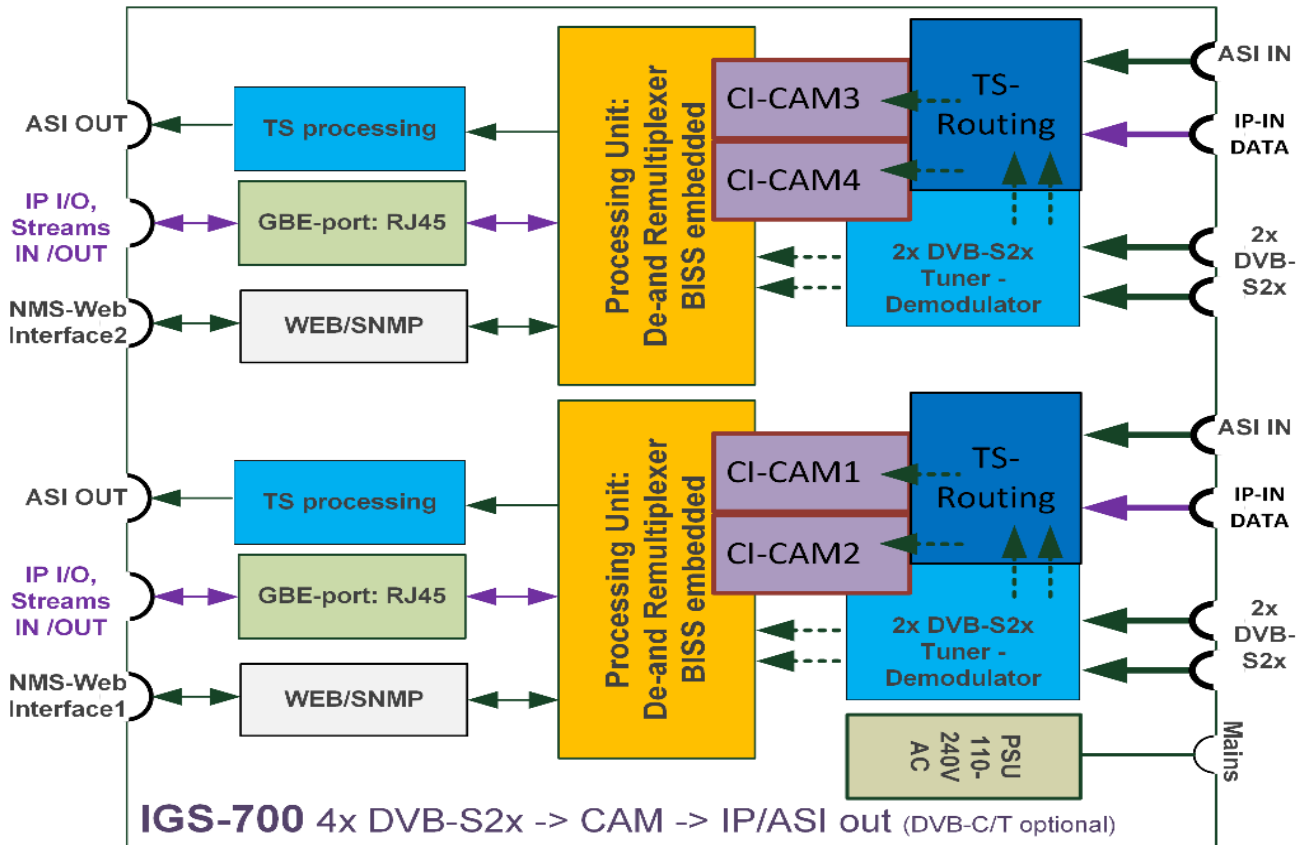
V2.5



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New Layout:



Example with CAM's: Module-Slots right module:

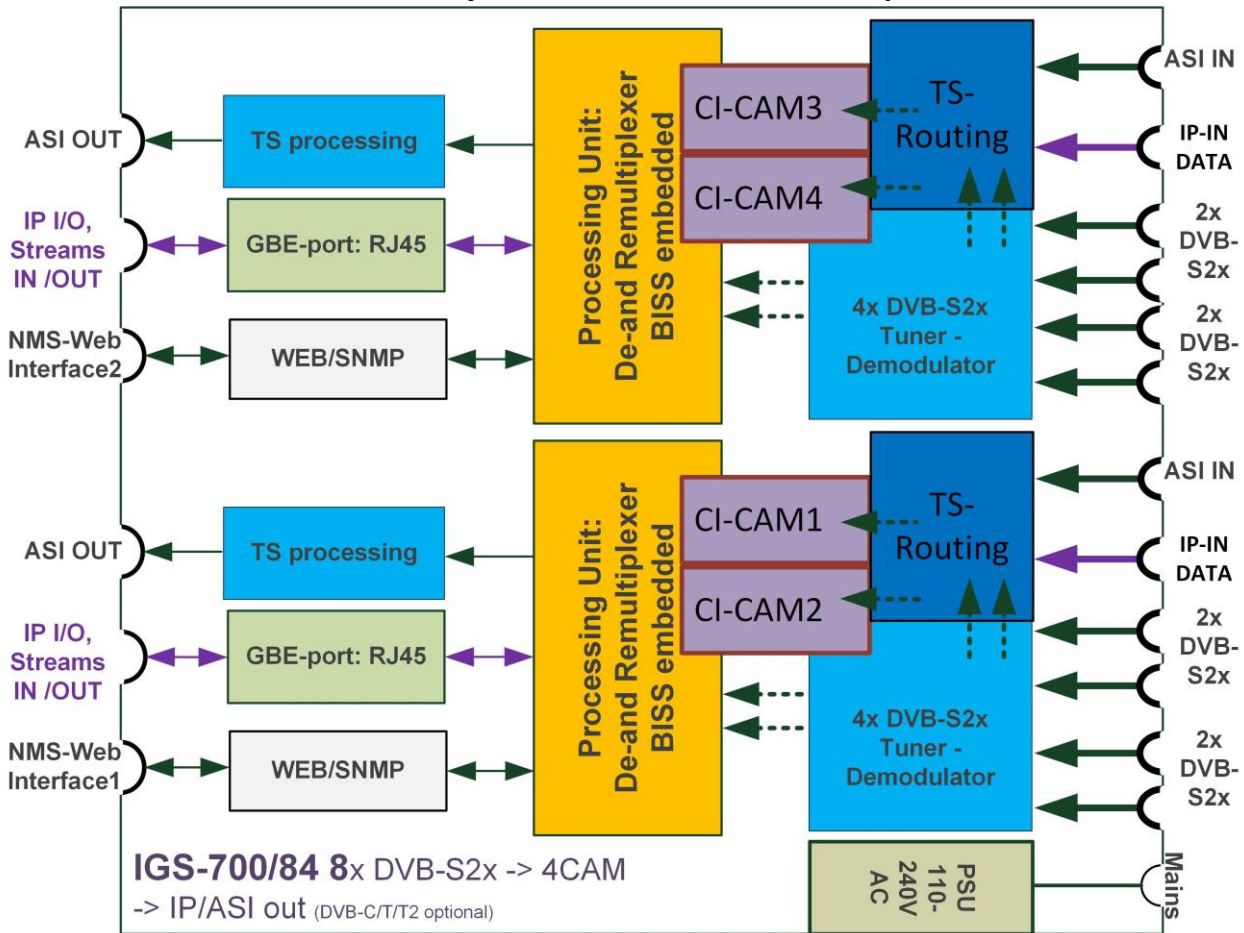


Left:



Both Reception and processing-Modules have to be considered as independent.

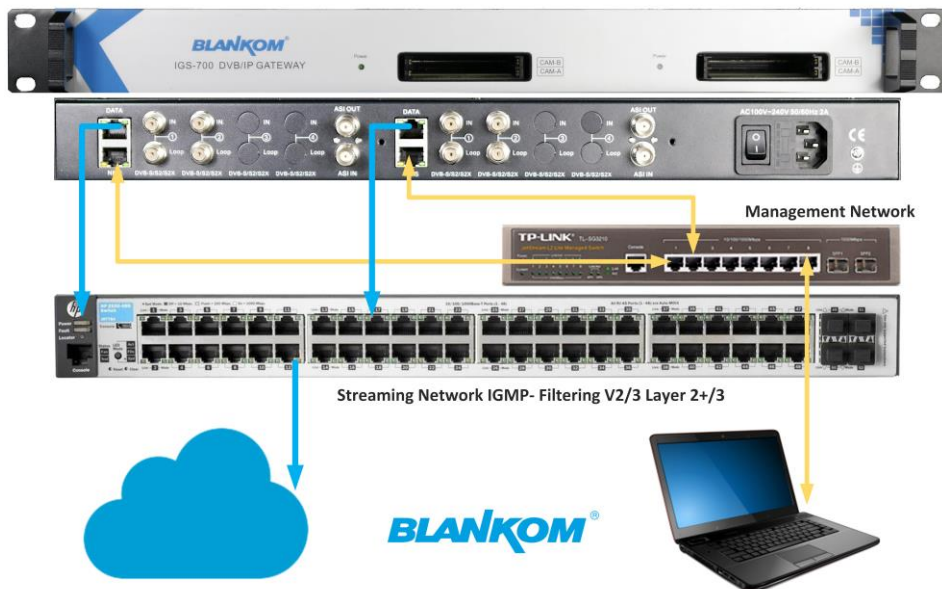
Available as IGS-700/84 Version with 8 Tuner Inputs and 4 CI Slots:



We recommend to **not using** the loop-through tuner connections because of additional attenuation and the looped port must use the same SAT-Position/band/polarisation like its main-port.

Please note:

Both 'Modules' have the same IP-Address settings by factory and so to avoid conflicts please first change their IP addresses after Login, then connect to your NMS switch and the DATA-streaming Switch:



Entering the WEB-IF of a module: 192.168.0.136 admin/admin

The screenshot shows the IGS-700 web interface. On the left is a navigation menu with sections: Summary (Status), Parameters (Tuner, Setting, Output), and System (Network, Password, Configuration, Firmware, Reboot, Date | Time, Log). The main content area is titled 'Network' and contains two configuration sections: 'NMS' and 'DATA'. Each section has input fields for IP Address, Subnet Mask, Gateway, Web Manage Port, and MAC Address.

Module	IP Address	Subnet Mask	Gateway	Web Manage Port	MAC Address
NMS	192.168.0.136	255.255.255.0	192.168.0.1	80	2a:c5:02:1a:01:38
DATA	192.168.2.136	255.255.255.0	192.168.2.1		2a:d5:02:1a:01:38 <input type="checkbox"/>

Press/Click APPLY button after changing. The changings will take effect immediately after pressing apply. You should change the IP access in your browser than like:

This screenshot shows a browser window with the address bar set to 192.168.0.137. The browser tabs include GitHub, Microsoft-Konto, OEM Production-Read..., MLD Multicast IPV6, Kundenbereich „Mein..., MEGA, and Infor. The IGS-700 web interface is displayed, showing the 'Network' configuration page. The 'NMS' section now shows the IP Address field updated to 192.168.0.137.

Module	IP Address	Subnet Mask	Gateway	Web Manage Port	MAC Address
NMS	192.168.0.137	255.255.255.0	192.168.0.1	80	2a:c5:02:1a:01:38

Because both modules will have the same IP addresses as factory defaults, please change them accordingly to different ones before connecting them HOT to your network to avoid IP-Address-conflicts.

Introduction:

The BLANKOM IGS-700 is a 2x2(4) DVB S2x Receiver converting four Satellite transponder to IP streams as SPTS for IPTV applications and MPTS. Equipped with 4 CI Slots for CA Modules, 4 Transport streams (TS) can be decrypted which can be utilized from IP-Input, RF Input, ASI IN or even up to four IP-TS inputs – depending on the capacity of the inserted CAM's.

Features

- 2x GbEthernet RJ45 Data-Streaming Ports
- IP-output-streaming MPTS/SPTS UDP/RTP
- 2x Network-Management-(NMS) Fast Ethernet RJ-45 Ports
- 2 x DVB-Twin-frontends: DVB-S/S2x, optional: DVB-T/C/T2/ISDB-T (other upon request)
- PID remapping and DVB-compliant multiplexing to ASI/SPTS/MPTS
- BISS decryption (Mode1 and E) embedded
- Management & configuration by Web Server GUI (default: <http://192.168.0.136>)
- **2x Dual/Quad(Version /84) Tuner Inputs DVB-S/S2x with loop-outs (not recommended to use)**
 - *Multituner DVB-C,-T/T2/ISDB-T optional available as dual frontends, can be mixed 2x2*
- 2x ASI + 2x MPTS/SPTS IP Inputs (UDP via GbE RJ45)
- 2x2 CAM-CI Slots for professional Multi-Service-Decryption (MSD-CAMs) from RF / ASI / IP
- Embedded BISS decryption Mode1 and E
- IP streaming output as UDP or RTP 2x16 SPTS, 2 MPTS pass or remultiplexed
- CBR / VBR support: TS-Null-Packet in SPTS/MPTS Filter selectable
- CA-Flag-Filter and PID-Remapping
- 2x ASI outputs for re-multiplexed or direct Tuner/IP or decrypted pass-through mode
- Support of max. 128 x PID Re-Mapping for each Input: TS re-multiplexing
- Multiple IP-Stream-Inputs MPTS and SPTS
- Firmware Update remote or local by Web-IF
- Professional Quality and cost effective

This Product is manufactured in PRC (China), HS-Code 2022: 85176200

Technical Data

INPUT	The standard version IGS-700 has 4 Tuners, extended has 8 Tuners (2x4)
RF	2x2(4) RF DVB-S/S2x (Multi-tuner support: DVB-C/T/T2/ISDB-T optional), F type 75 Ohm
	2xASI input for de- /re-mux, BNC interface
IP	Uni- and Multicast as MPTS/SPTS IP input for de-/re-mux
TUNER	
DVB-S	Input frequency: 950-2150 MHz Symbol rate: 2-45 Msps (MegaSymbols/second) Signal strength: -65 -25 dBm Constellation: 1/2, 2/3, 3/4, 5/6, 7/8 QPSK
DVB-S2	Input frequency: 950-2150 MHz Symbol rate: QPSK 1-45 Msps, 8PSK 2-30 Msps Code rate: 1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 8/9, 9/10 Constellation: QPSK, 8PSK
DVB-S2x	Symbol rate: QPSK/8PSK /16APSK :0,5...45 MSps; 8APSK: 0,5...40MSps 32APSK: 0,5...40MSps FEC: QPSK: 1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 8/9, 9/10, 13/45, 9/20, 11/20 8PSK: 3/5, 2/3, 3/4, 5/6, 8/9, 9/10 8APSK: 5/9-L, 26/45-L 16APSK: 2/3, 3/4, 4/5, 5/6, 8/9, 9/10, 1/2-L, 8/15-L, 5/9-L, 26/45, 3/5, 3/5-L, 28/45, 23/36, 2/3-L, 25/36, 13/18, 7/9, 77/90 32APSK: 3/4, 4/5, 5/6, 8/9, 2/3-L, 32/45, 11/15, 7/9
<i>DVB-C/T/T2/ISDB-T (optional)</i>	<i>44 - 1002 MHz Bandwidth: 6, 7, 8 MHz</i>
Decryption	by 2x2 CI slots and embedded BISS Mode1/E multiple TS rates adjustable for different CI-Module usage
OUTPUT	
ASI	2x BNC interface, for Mux -or passthrough
IP	2x2x 16 SPTS over UDP, RTP 2x 1000M Base-T Ethernet interface (unicast/multicast) 2x MPTS over UDP, RTP
SYSTEM	
Control	Network Management (WEB NMS), English menu
Dimensions	482mm × 300mm × 44.5mm, 19" 1U, 3 kg
Power	AC 110V±10%,50/60Hz or AC 220V±10%, 50/60Hz
Temperature	0...45°C (operation)

Safety and other recommendations:

Assure climatic environment rules for electronic machines like this, Grounding rules as well. Installation should be done by a certified electrician.

⚠ Caution:

Before connecting power cord to Tuner to IP Gateway, you should set the power switch to “OFF”.

Do not connect the RF-cable (F-plugs) when the unit is running.

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, identical fuses with the same electrical specifications, which are designed for the corresponding fuse positions, may only replace the fuses.

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Anmerkung:



Alle von uns veröffentlichten Betriebsanleitungen richten sich an den Antennen- und IT-Fachmann, der über grundlegende Kenntnisse der Empfangs-, Netzwerk- und Anlagentechnik verfügt. Die Einhaltung aller relevanten Vorschriften und Richtlinien für den Aufbau und Betrieb von solchen Anlagen obliegt dem Installateur und/oder dem Betreiber. Insbesondere sind die in den jeweiligen Ländern geltenden Vorschriften und Richtlinien für die Inbetriebnahme speziell für den Stromanschluß und alle mit den Produkten in Zusammenhang stehenden und geltenden Normen und Gesetze einzuhalten.

Remark:



All operating instructions published by us are intended for the antenna and IT specialist who has basic knowledge of reception, network and system technology. Compliance with all relevant regulations and guidelines for the installation and operation of such systems is the responsibility of the installer and/or the operator. In particular, the regulations and guidelines applicable in the respective countries for commissioning, especially for the power connection, and all standards and laws related to the products must be complied with.

Annotation :



Tous les modes d'emploi que nous publions sont destinés aux professionnels de l'antenne et de l'informatique qui ont des connaissances de base en matière de réception, de mise en réseau et de technologie des équipements. Le respect de toutes les réglementations et directives pertinentes pour l'installation et l'exploitation de ces systèmes relève de la responsabilité de l'installateur et/ou de l'exploitant. En particulier, il convient de respecter les réglementations et directives applicables dans les pays respectifs pour la mise en service, notamment pour le raccordement électrique, ainsi que toutes les normes et lois relatives aux produits.



Annotazione:

Tutte le istruzioni per l'uso da noi pubblicate sono destinate al professionista dell'antenna e dell'informatica che ha una conoscenza di base della tecnologia di ricezione, di rete e delle apparecchiature. Il rispetto di tutti i regolamenti e le linee guida pertinenti per l'installazione e il funzionamento di tali sistemi è responsabilità dell'installatore e/o dell'operatore. In particolare, devono essere rispettati i regolamenti e le linee guida applicabili nei rispettivi paesi per la messa in funzione, soprattutto per il collegamento alla rete elettrica e tutte le norme e le leggi relative ai prodotti.

Anotación:

Todas las instrucciones de uso publicadas por nosotros se dirigen al profesional de la antena y de la informática que tiene conocimientos básicos de recepción, de redes y de tecnología de equipos. El cumplimiento de todos los reglamentos y directrices pertinentes para la instalación y el funcionamiento de dichos sistemas es responsabilidad del instalador y/o del operador. En particular, deben cumplirse los reglamentos y directrices aplicables en los respectivos países para la puesta en marcha, especialmente para la conexión de la energía y todas las normas y leyes relacionadas con los productos.

Anotação:

Todas as instruções de operação publicadas por nós são destinadas ao profissional de antena e TI que possui conhecimentos básicos de recepção, rede e tecnologia de equipamentos. O cumprimento de todos os regulamentos e diretrizes relevantes para a instalação e operação de tais sistemas é de responsabilidade do instalador e/ou do operador. Em particular, os regulamentos e diretrizes aplicáveis nos respectivos países para comissionamento, especialmente para a conexão de energia e todas as normas e leis relacionadas aos produtos devem ser obedecidas.

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 RF-input port carries 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: Use at least CAT 6E Ethernet cable for Gigabit-Ethernet

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).

SAP is a simple protocol designed to be used to distribute information about multimedia sessions. A session is advertised by means of a multicast packet sent to a well-known address/port. SAP defines the format that these multicast packets must conform to in order to be identified as SAP announcements..

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, a reserved address is if the scope range is 239.16.32.0 - 239.16.33.255, then 239.16.33.255 is used for **SAP** Announcements.

Installation:



From left to right:

Network Management NMS and Data Streaming port Module 1

DVB RF Inputs 1 and 2, with Loop -outputs, The RF IN ports should be connected by F-male 75 Ohm coming from Multiswitch or SAT-Matrix. We will release another variant with more RF Tuner Inputs soon...

We recommend not using the LOOP-OUT ports because of their additional attenuation. But if you loop the input to another RF Input please consider, that (in case of SAT-Input) only the first one in a serial looping should be configured to serve the Multiswitch with 13/18V/22KHz/DiSEqC signals. Disadvantage is logical:

The following and looped RF Inputs can only make use of the same SAT- parameters as used for the first one. Example: RF IN 1 is set to High-band, Horizontal, and DiSEqC used SAT 2: 18V, 22kHz, DiSEqC 2.

The looped next Inputs can only use same band (High), same polarization (H) and same Satellite position (DiSEqC). 75 Ohm terminating Resistor are recommended to be used for unused open RF loop-ports. In case of DVB-C/T... you can use the loop but consider attenuation increasing's. Finally: **ASI IN and ASI Out-BNC Ports**

Same for Module 2...

Then **ON/OFF Switch, FUSE, IEC C14 male connector, Pictograms and grounding screw.**

Please use this to establish ground/earth contact with your electrical installations according to international norms and rules. If a central grounding is used in a 19" Rack, please connect the unit to it accordingly.

Actual listings about the **SAT-Transponders and Satellites** can be obtained from:

<http://satbeams.com/> and <https://www.lyngsat.com>

CAM-Slots at the front: with Power LED



Each Module has own CAM- Slots:



Be careful when inserting the CAM's! The TOP of the CAM's should be like the TOP of the unit.

ASI-Output:

2x1 ASI-outputs can be used to deliver the configured max 4 TS either as pass-through or remultiplexed to the next units you might use.

ASI-IN= 1 per Module:

Can be used to input another TS where you might use some services from and remux or stream as well as decrypt by an inserted CAM... or simply stream selected content.

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 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 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*

Let's start with the Web-Interface:

Default Login-Data on **192.168.0.136** (default factory address for both modules) are **admin/admin**:

So you end up in the STATUS Display page:

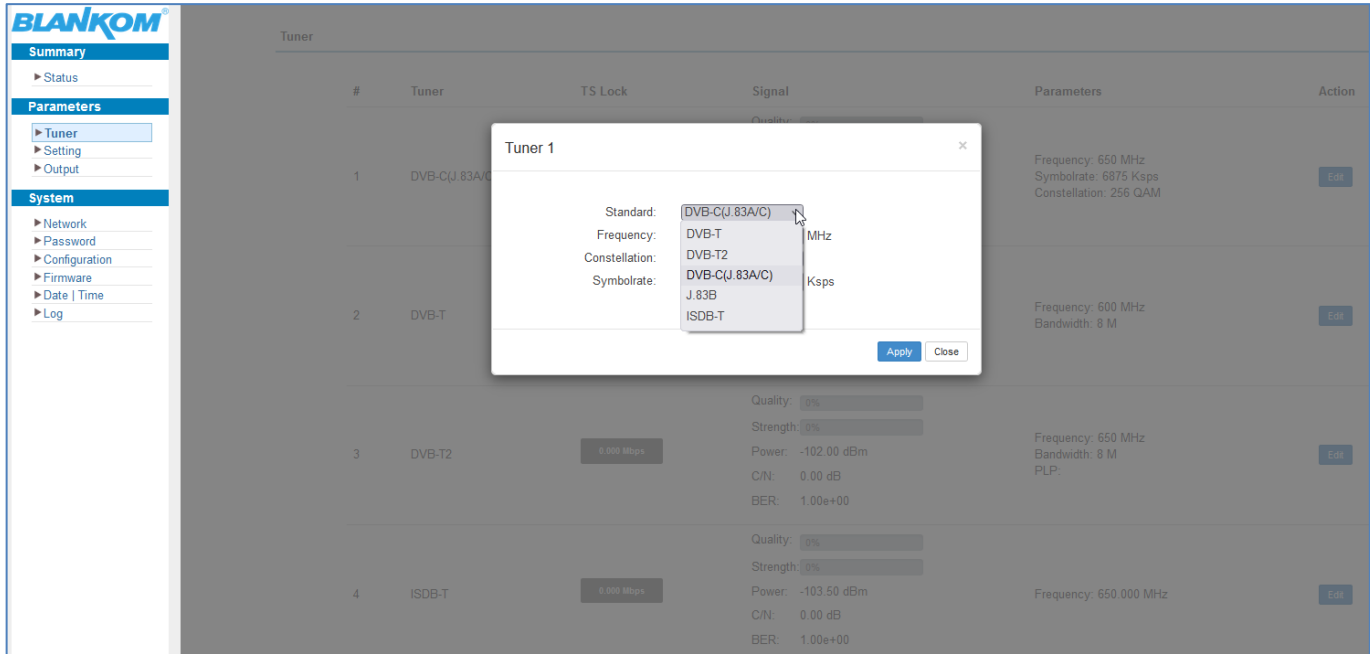
Left frame is the menu-panel to select the different sub-menus. The Status page gives an overview: System information, Input status and output bitrates configured and used.

Starting with the TUNER Section (after you adjust your networks ports to your needs... of course see later):

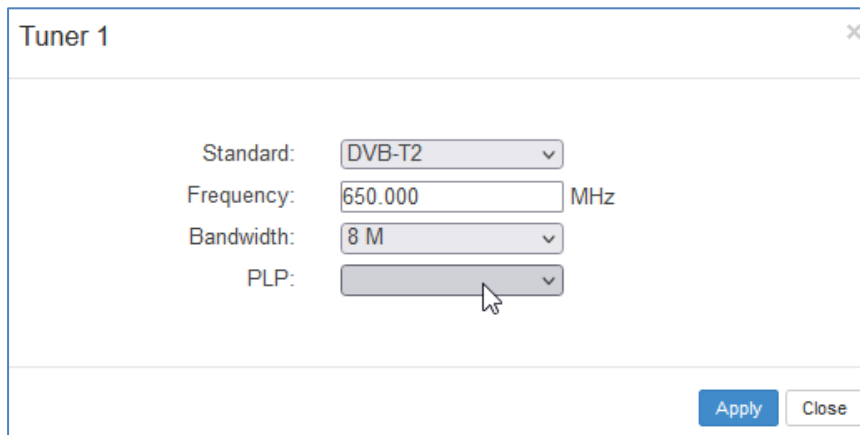
#	Tuner	TS Lock	Signal	Parameters	Action
1	DVB-S2	42.153 Mbps	Quality: 46% Strength: 60% Power: -39.21 dBm C/N: 11.50 dB BER: 0.00e+00	Frequency: 10891.000 MHz LNB Frequency: 9750.000 MHz Symbolrate: 22000 Ksps LNB Voltage: 18V 22K: OFF Satellite: 1	Edit
2	DVB-S2	28.146 Mbps	Quality: 49% Strength: 66% Power: -33.99 dBm C/N: 12.25 dB BER: 0.00e+00	Frequency: 10995.000 MHz LNB Frequency: 9750.000 MHz Symbolrate: 22000 Ksps LNB Voltage: 18V 22K: OFF Satellite: 1	Edit

Factory values are showing C-Band values not like above – so do not wonder. **But American Comma = ‘,’ Might be worth to mention!!! So instead of the ‘,’ please use the US writing: ‘.’**

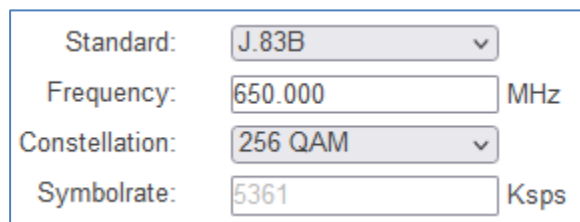
If the IGS-700 is equipped with the DVB- Multituner (DVB-C/-T/-T2/ISDB-T) than the values for the settings are different:



In case DVBN-T2 you can select the PLP to be received after the reception has been confirmed / Locked:



It also supports US-Norm DVB-C Annex B = ITU-J.83B

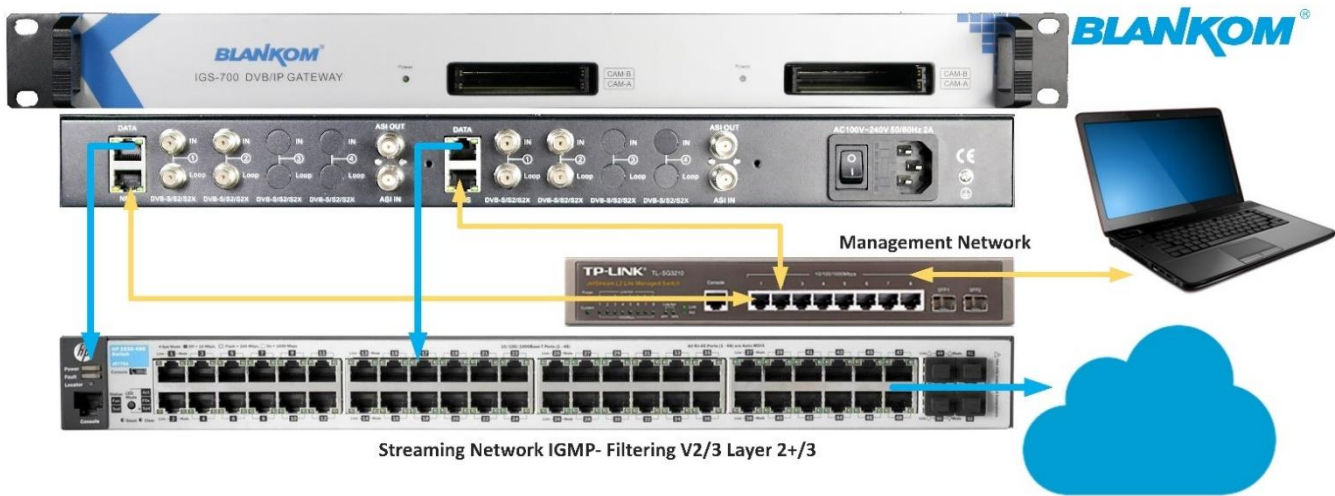


So please **do not** use this if you are not in Korea, US, or some LATAM countries...

We start with the Network settings of NMS- management port:

We assume that the user is familiar with IP settings and already knows his own system to connect the unit to. We recommend using 2 separate Switches: At least a 100BaseT for the Management NMS RJ45 port and a second Gigabit Ethernet 10/100/1000BaseT with at least Layer 2+/3 with IGMP V2 features. Otherwise, you might flood your IP-Streaming network with unnecessary Data, which might overload connected IPTV STB's because they almost have only 100BaseT capacity. If you need to select a Switch, we recommend HP Procurve 2530 24G or 48G which are cost effective, easy to configure, can be trunked and supporting IGMP V2. If the switch needs routing functions, the bigger brother of this series might be the right choice.

We recommend using separate switches for Network Management and Streaming to avoid flooding of the 100BaseT NMS RJ45 port with unnecessary streams and use IGMP switches for that.



Note: IGMP snooping is not equal to IGMP full Filtering support in a GbE Switch! If you like a tech-lesson about it- please ask Ralf.

Network

Summary

- ▶ Status

Parameters

- ▶ Tuner
- ▶ Setting
- ▶ Output

System

- ▶ **Network**
- ▶ Password
- ▶ Configuration
- ▶ Firmware
- ▶ Reboot
- ▶ Date | Time
- ▶ Log

NMS

IP Address:	<input type="text" value="192.168.0.136"/>
Subnet Mask:	<input type="text" value="255.255.255.0"/>
Gateway:	<input type="text" value="192.168.0.1"/>
Web Manage Port:	<input type="text" value="80"/>
MAC Address:	<input type="text" value="2a:c5:02:1a:01:38"/>

DATA

IP Address:	<input type="text" value="192.168.1.196"/>
Subnet Mask:	<input type="text" value="255.255.255.0"/>
Gateway:	<input type="text" value="192.168.1.1"/>
MAC Address:	<input type="text" value="2a:d5:02:1a:01:38"/> <input type="checkbox"/>

Adjust the settings to your need and **APPLY**.

Author: RRI
IGS-700_-84manual_EN-V2.5.docx

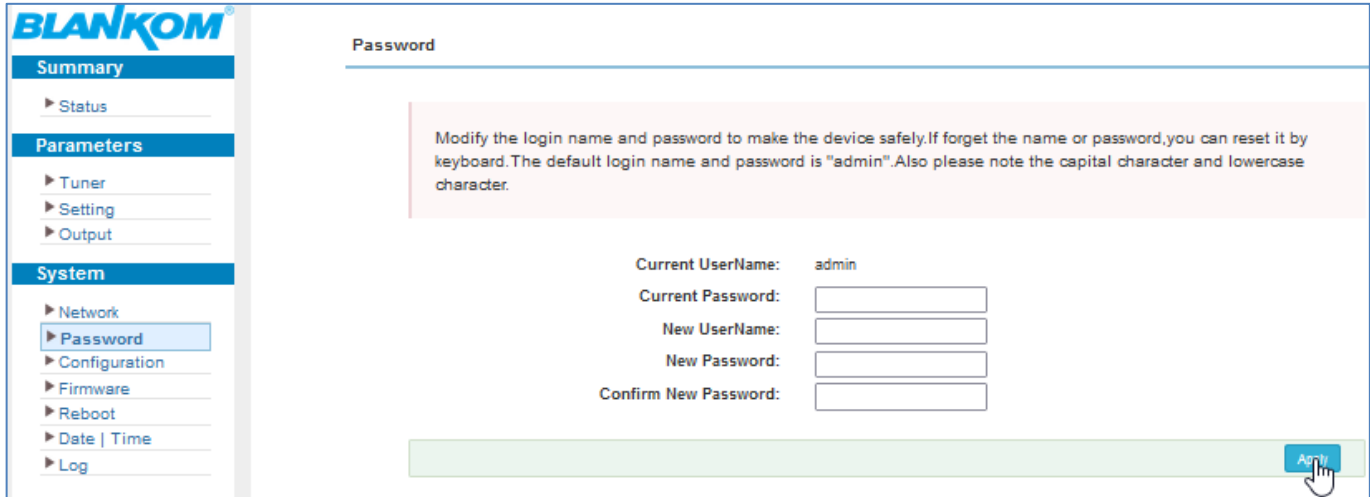
- 14 -

Date: 27. Feb. 2023
Version 2022

Note: The GbE DATA Streaming port has a secure feature and cannot be set to the same IP address range like the NMS port to avoid accidentally flooding the NMS port and your Laptop/PC would not be able to reach the Web-IF.

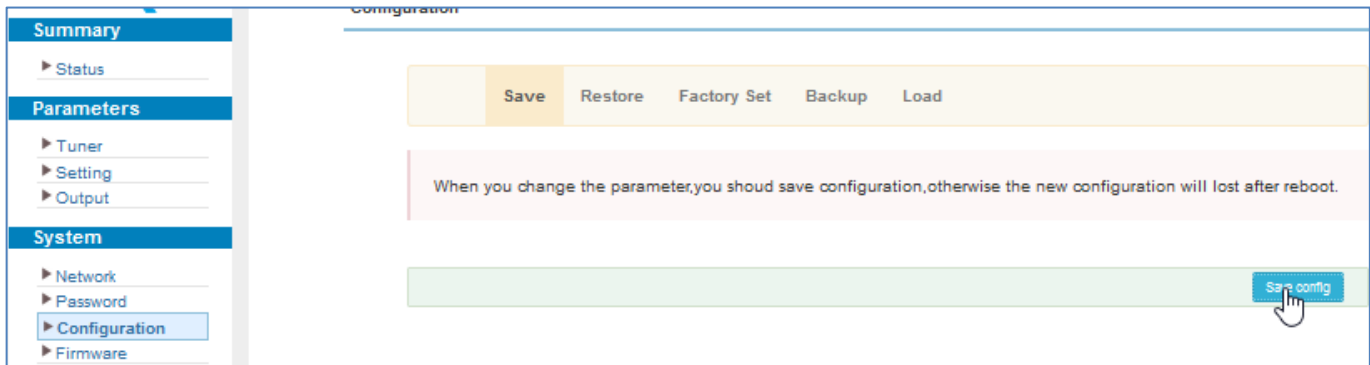
You can also adjust both MAC if you need that.

Password:



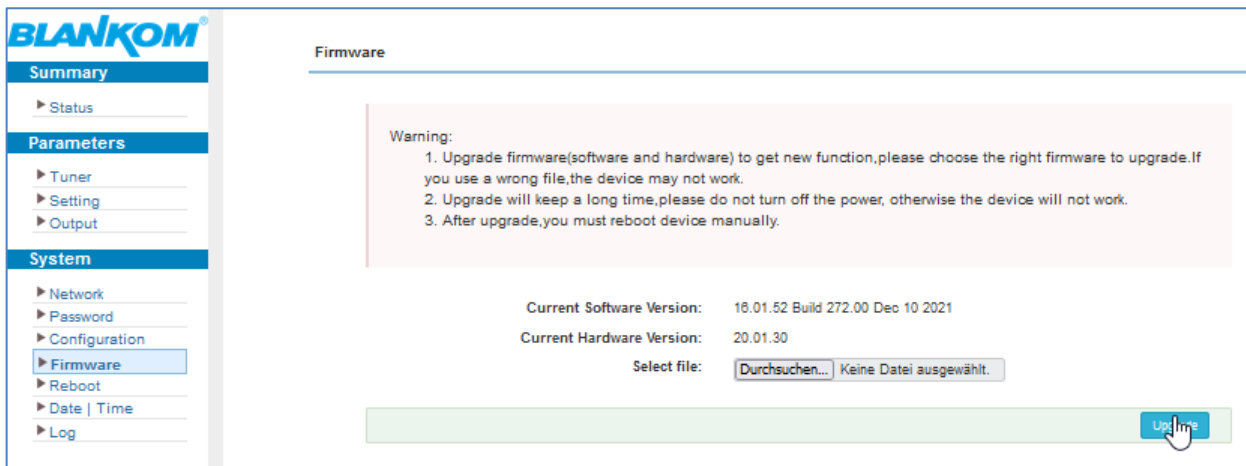
As usual ... Please do not lose your changings and also the IP address!!! Maybe note on paper for your successors? Documentation is always a good idea.

Safe/Restore Configurations:



You should do this after the most intermediate steps and also at the end. External save and load is possible and should be done accordingly.

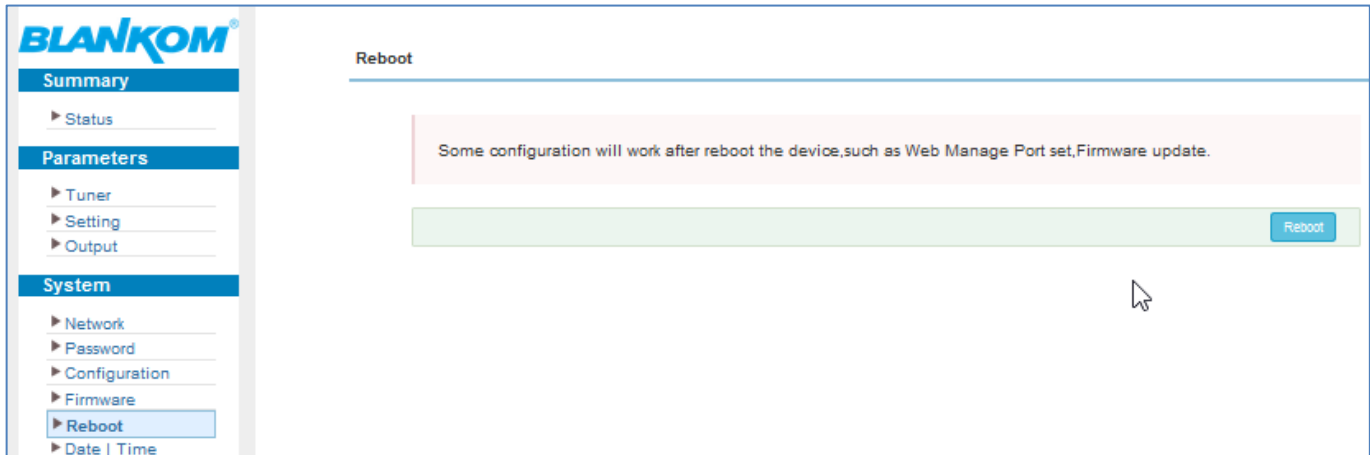
Firmware update:



Never change a running system! If you got problems reporting with details are necessary and we pass this to R&D.

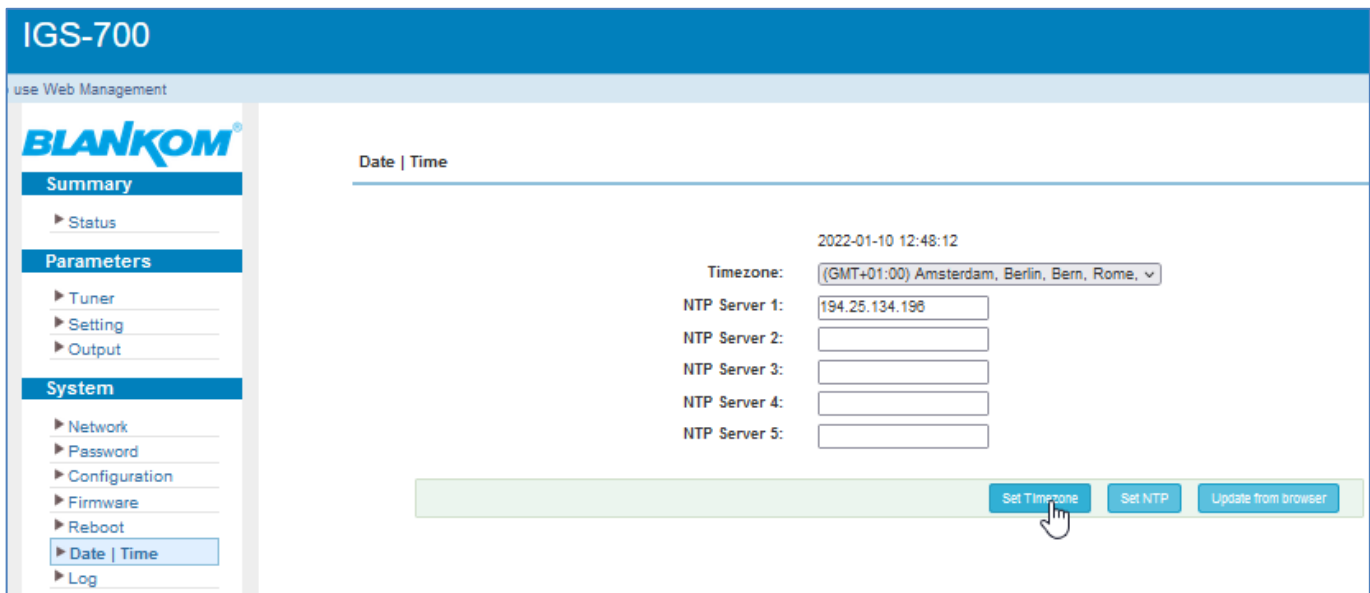
Rebooting

can be handled remotely:



But sometimes it is recommended to use the ON/OFF switch as a hard reboot is more reliable.

Date and Time:



Are managed by NTP and/or directly acquiring from your PC from your browser.

Above an example for grabbing from an Internet NTP server 194.25.134.196 which belongs to :

IP-Adresse: 194.25.134.196
PTR Resource Record: ntp1.sul.t-online.de
Unternehmen: Deutsche Telekom AG

LOG-System/kernel:

The screenshot shows the BLANKOM web interface. On the left, a sidebar contains a 'Log' menu item. The main content area is titled 'Log' and features a 'Log Type' dropdown menu currently set to 'Kernel Log'. Below the dropdown, a scrollable log window displays the following text:

```
[ 0.000000] Kernel Log
[ 0.000000] System Log
[ 0.000000] CPU: ARMv7 Processor [413fc090] revision 0 (ARMv7), cr=18c5387d
[ 0.000000] CPU: PIPT / VIPT nonaliasing data cache, VIPT aliasing instruction cache
[ 0.000000] Machine model: xlnx,zynq-7000
[ 0.000000] cma: Reserved 16 MiB at 0x0d800000
[ 0.000000] Memory policy: Data cache writealloc
[ 0.000000] On node 0 totalpages: 65536
[ 0.000000] free_area_init_node: node 0, pgdat 40596180, node_mem_map 4fd0000
[ 0.000000] Normal zone: 512 pages used for memmap
[ 0.000000] Normal zone: 0 pages reserved
[ 0.000000] Normal zone: 65536 pages, LIFO batch:15
[ 0.000000] PERCPU: Embedded 9 pages/cpu @4fdd4000 s8128 r8192 d20544 u36864
[ 0.000000] pcpu-alloc: s8128 r8192 d20544 u36864 alloc=9*4096
[ 0.000000] pcpu-alloc: [0] 0 [0] 1
[ 0.000000] Built 1 zonelists in Zone order, mobility grouping on. Total pages: 65024
[ 0.000000] Kernel command line: console=ttyPS0,115200 root=/dev/ram rw earlyprintk
[ 0.000000] log_buf_len individual max cpu contribution: 131072 bytes
[ 0.000000] log_buf_len total cpu_extra contributions: 131072 bytes
[ 0.000000] log_buf_len min size: 131072 bytes
[ 0.000000] log_buf_len: 262144 bytes
[ 0.000000] early log buf free: 129664(98%)
[ 0.000000] PID hash table entries: 1024 (order: 0, 4096 bytes)
[ 0.000000] Dentry cache hash table entries: 32768 (order: 5, 131072 bytes)
[ 0.000000] Inode-cache hash table entries: 16384 (order: 4, 65536 bytes)
[ 0.000000] Memory: 228340K/262144K available (3790K kernel code, 219K rwdata, 1488K rodata, 192K init, 291K
[ 0.000000] Virtual kernel memory layout:
[ 0.000000] vector : 0xffff0000 - 0xffff1000 ( 4 kB)
[ 0.000000] fixmap : 0xffc00000 - 0xff000000 (3072 kB)
[ 0.000000] vmalloc : 0x50800000 - 0xff000000 (2792 MB)
[ 0.000000] lowmem : 0x40000000 - 0x50000000 ( 256 MB)
[ 0.000000] pkmap : 0x3fe00000 - 0x40000000 ( 2 MB)
[ 0.000000] modules : 0x3f000000 - 0x3fe00000 ( 14 MB)
[ 0.000000] .text : 0x40008000 - 0x4052fa90 (5279 kB)
[ 0.000000] .init : 0x40530000 - 0x40560000 ( 192 kB)
[ 0.000000] .data : 0x40560000 - 0x40596ee0 ( 220 kB)
[ 0.000000] .bss : 0x40596ee0 - 0x405dfda8 ( 292 kB)
[ 0.000000] Preemptible hierarchical RCU implementation.
[ 0.000000] RCU restricting CPUs from NR_CPUS=4 to nr_cpu_ids=2
```

Is very helpful to export them and sent to us with details (Screenshots and settings) when asking for new firmware because of some request.

Input configuration

Tuner first:

#	Tuner	TS Lock	Signal	Parameters	Action
1	DVB-S2	42.082 Mbps	Quality: 45% Strength: 60% Power: -39.21 dBm C/N: 11.25 dB BER: 0.00e+00	Frequency: 10891.000 MHz LNB Frequency: 9750.000 MHz Symbolrate: 22000 Ksps LNB Voltage: 18V 22K: OFF Satellite: 1	Edit
2	DVB-S2	28.811 Mbps	Quality: 48% Strength: 65% Power: -34.43 dBm C/N: 12.00 dB BER: 0.00e+00	Frequency: 10995.000 MHz LNB Frequency: 9750.000 MHz Symbolrate: 22000 Ksps LNB Voltage: 18V 22K: OFF Satellite: 1	Edit

EDIT

Of course these are usual LNB-settings you

need to do: Transponder frequency, **(attention, the American comma = ',')**

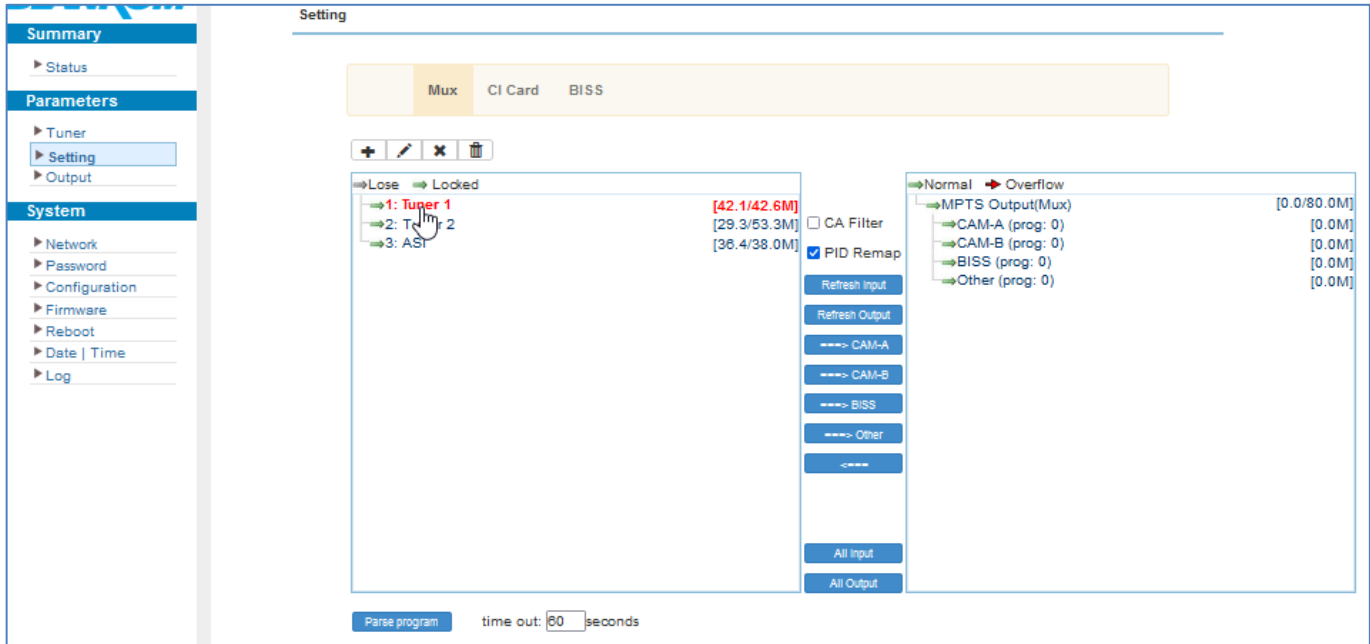
Pretty easy and self explaining for the SAT-Tuners:

13/18/0 Volt setting, Low Band 0kHz, High-Band 22KHz support, and DiSEqC to choose from which SAT 1...4 the connected Multiswitch should operate. If using splitters we recommend to serve the LNB power just by one of the combined Input RF-ports!!! The other ones should be set to 0V and no 22KHz.

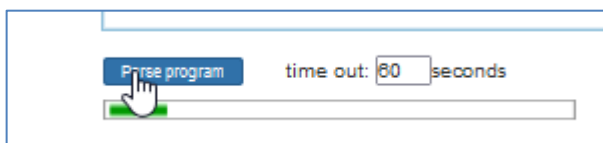
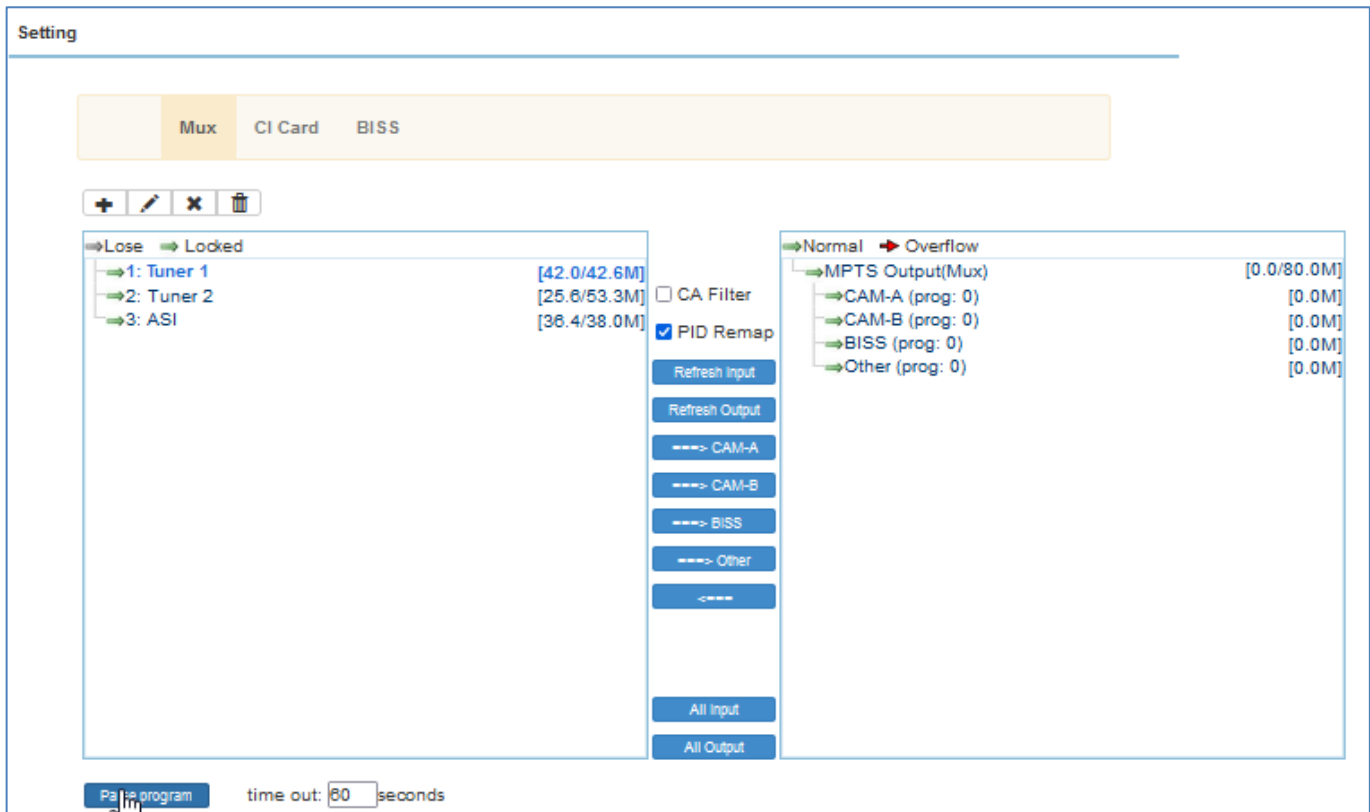
Do not forget to APPLY.

After that you need to enter the

SETTINGS Menu:

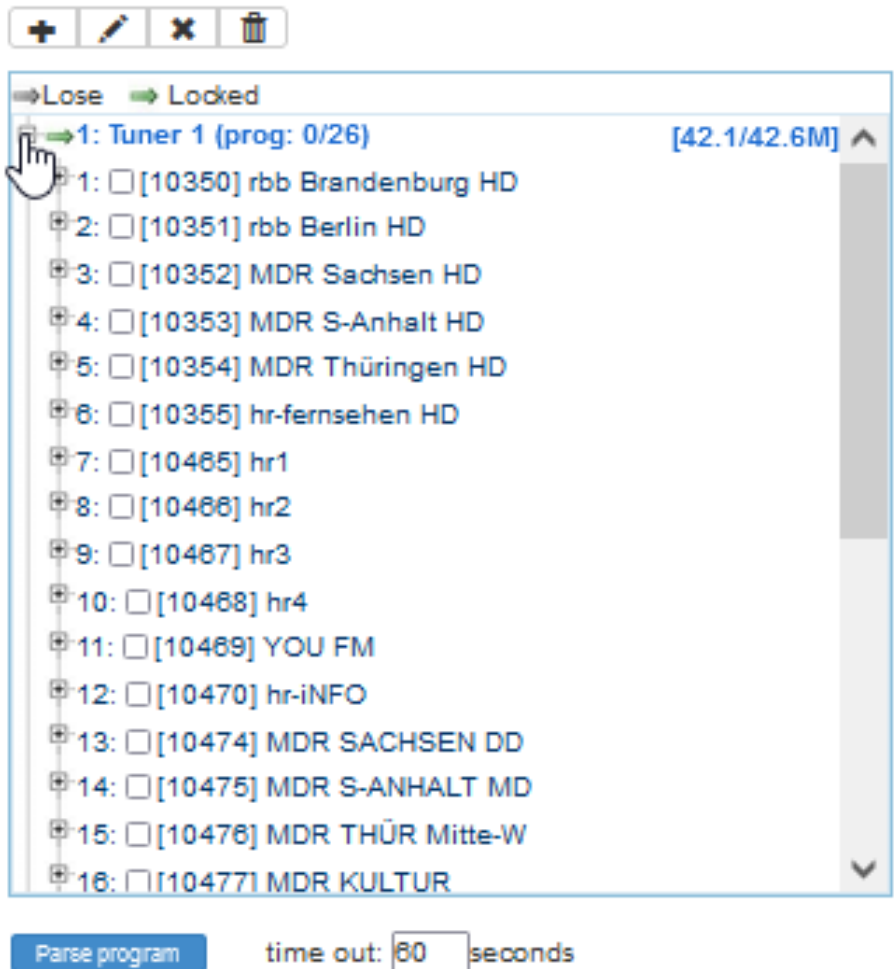


PARSE PROGRAM (Blue button) the CONTENT INPUTS -> than you'll see the single services:



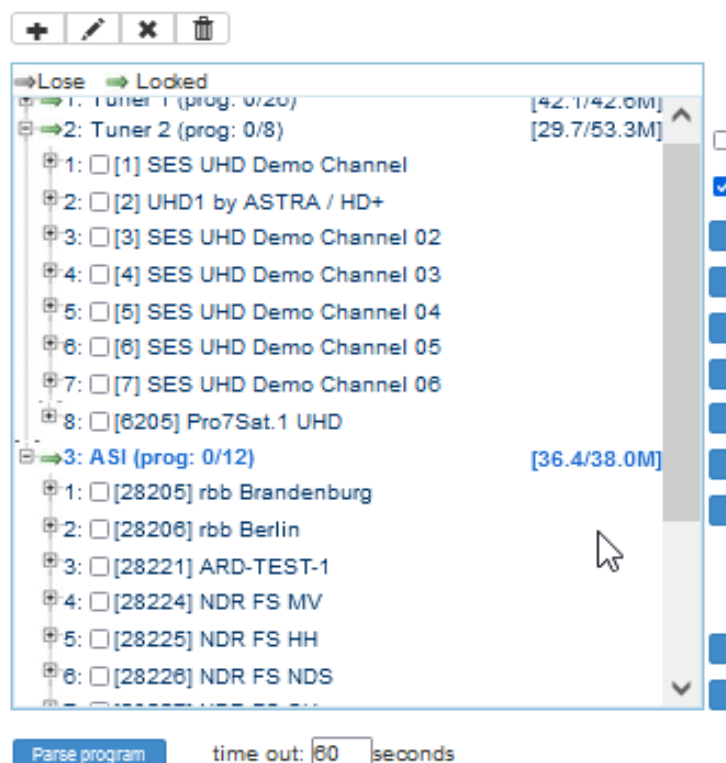
the green search bar will appear

Opening the chapter Tuner1 by click on the '+':

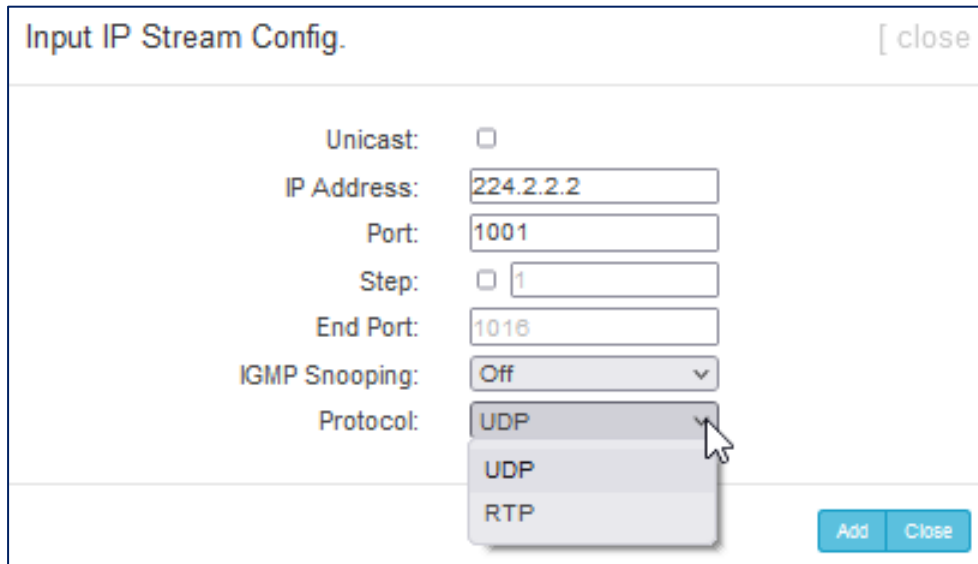
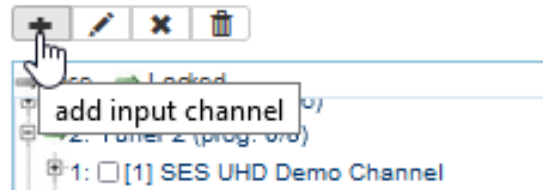


IP and ASI -inputs:

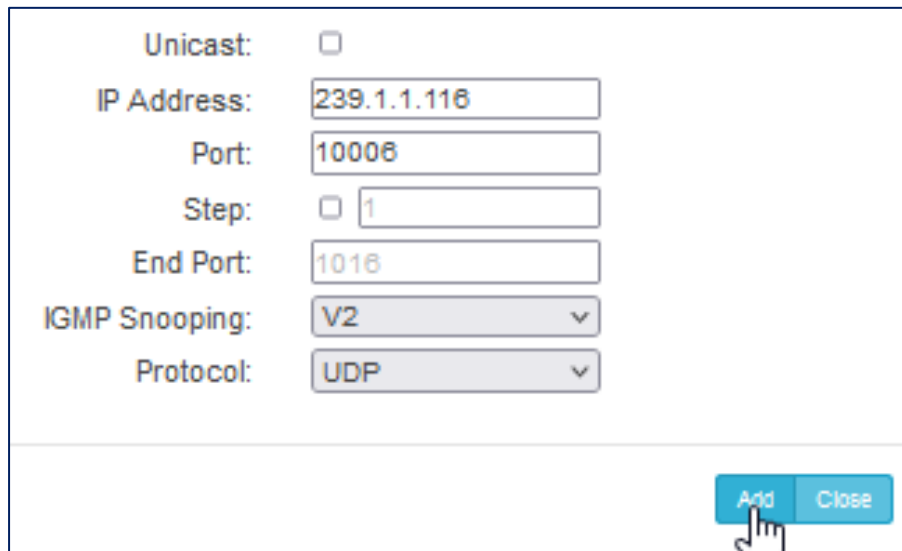
Parse the others as well:



If ASI IN is connected than just PARSE the CONTENT INPUTS from the different sources. Same for IP but you have to ADD it before:

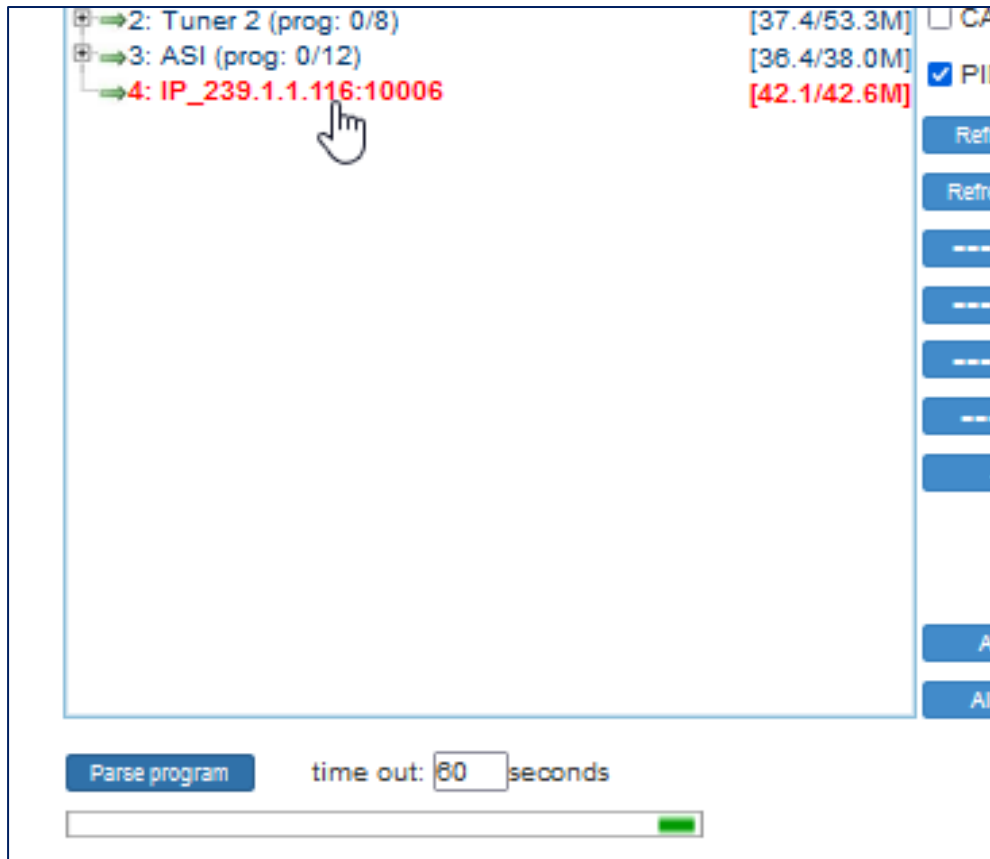


Same for a received MPTS from the GbEthernet DATA Input port. We recommend switching IGMP to ON:

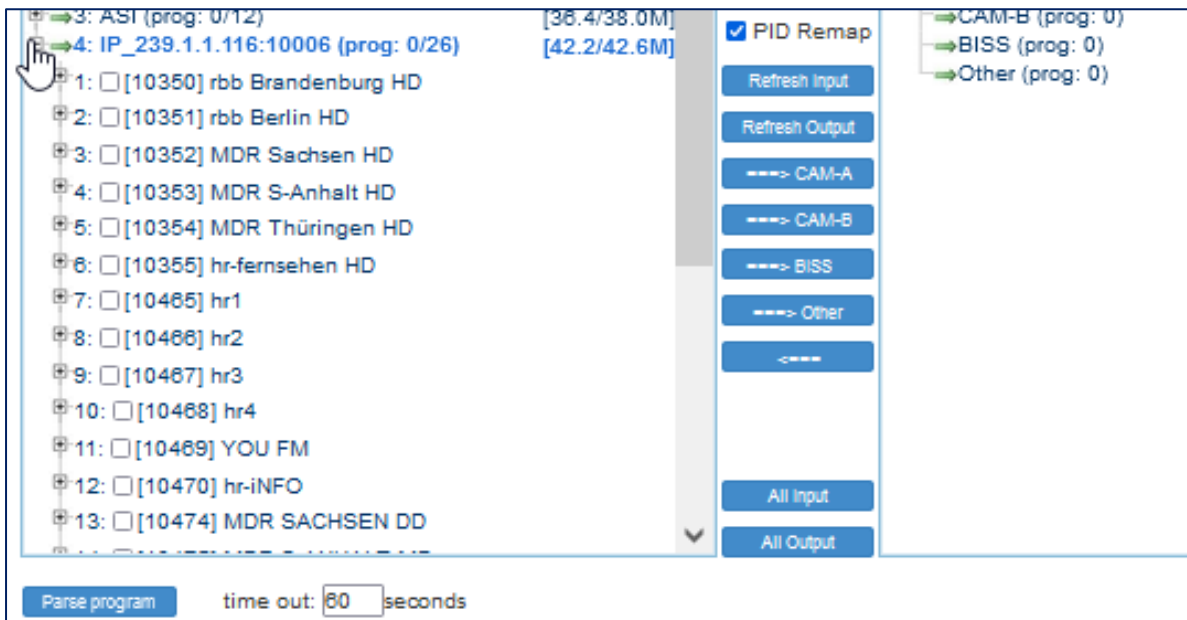


The IGMP version (here V2) should harmonize with your used GbE Switch (Layer 2+ or better). UDP or RTP can be chosen as well depending on your Streaming Source configuration.

Back to the mux menu...



PARSING this MPTS !!!!!!! :



Adding a SPTS



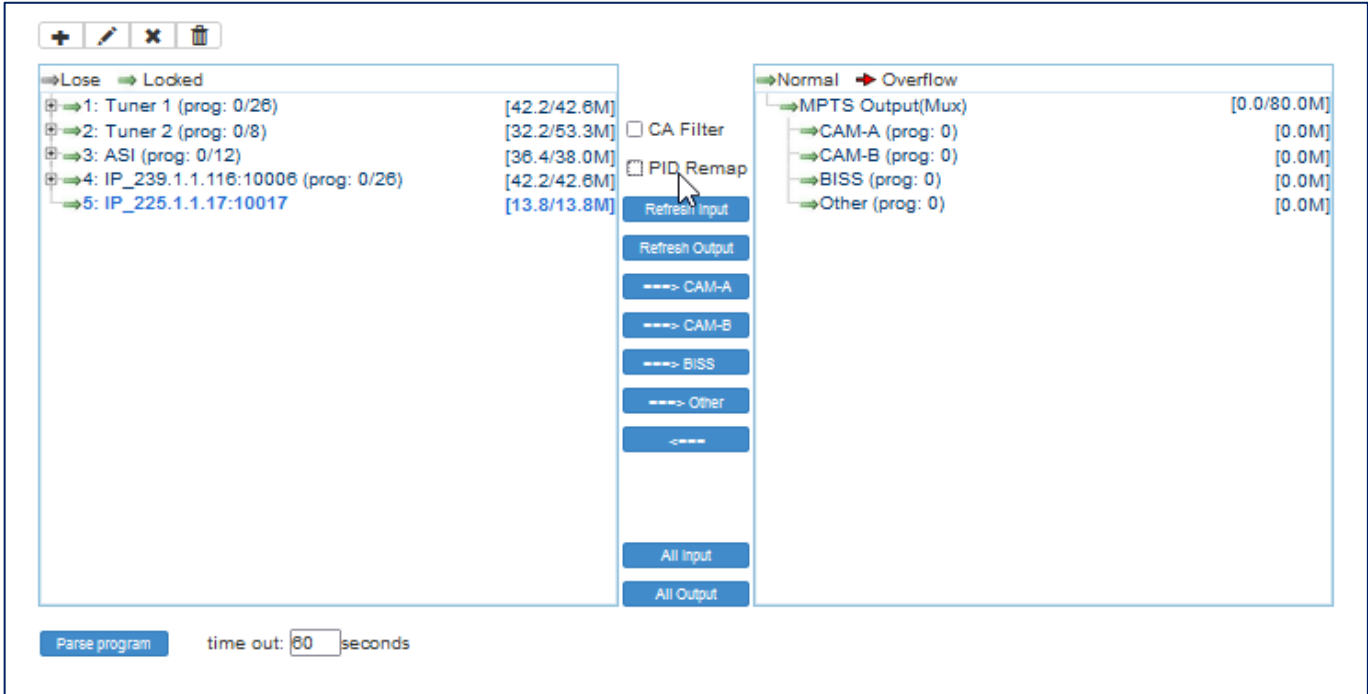
PARSING AGAIN please 😊

Now we have 5 Inputs in this module: 2 Tuner + 1x ASI + 1x MPTS-IP + 1x SPTS IP.

You still can add some more IP's.

Now its time to select the outputs to the right.

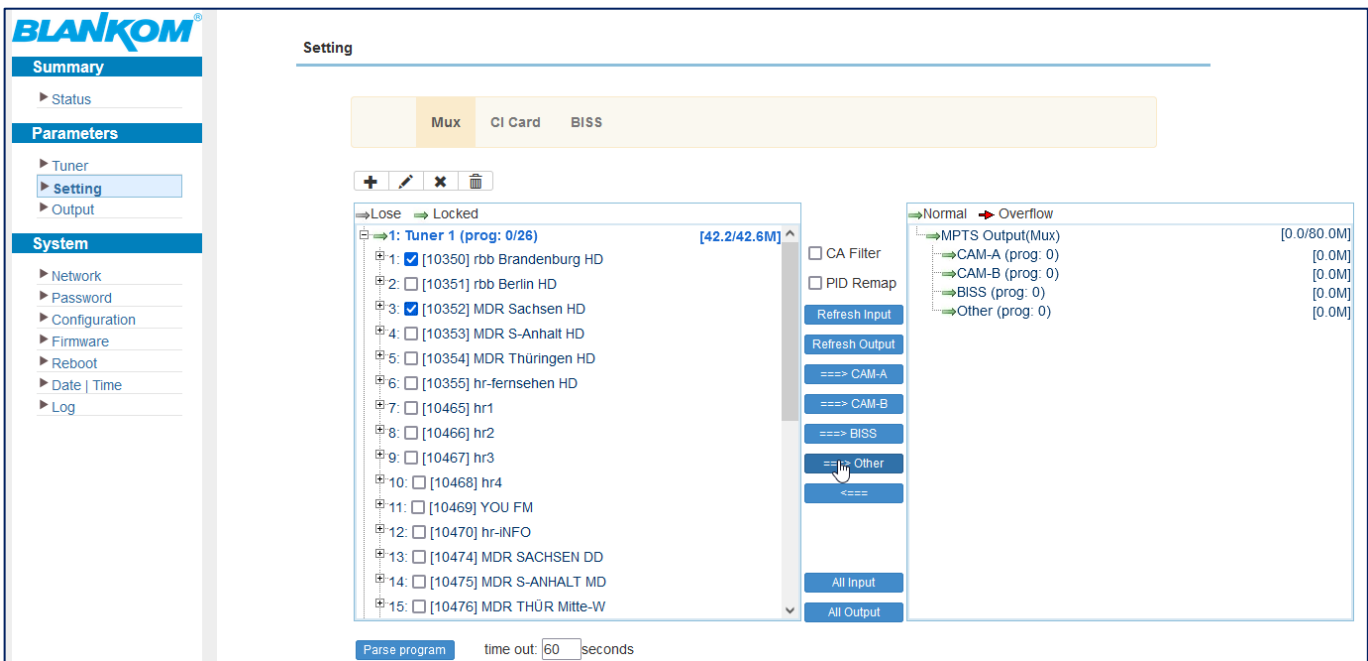
PID-remapping can be switched off if you are sure the source TS-PID's will not collide into a conflict:



So now you can select single services on the left and parse them to the right into the corresponding sections:

MPTS is all, CAM A or B of the Module if you need to decrypt them by CAM, or to the embedded BISS decryption:

Or to OTHERS:

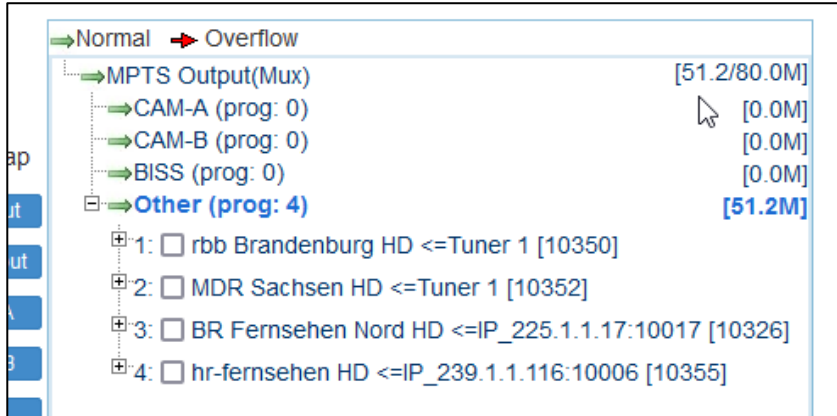


This dialog and arrows are the multiplexing workers:

You can proceed with every selected inputs...

Once the configured and selected Inputs are shown on the left, you need to select each Input TS in particular and execute "**Parse program**" to read in the services and PID's of each Input.

The MPTS Multiplex output (selectable under outputs) is counting the total data-rates:



Remark: NIT and EIT (EPG) will not be processed by this simple re-multiplexing functions. Same for single PID-Filtering: not supported. There are some external tools for some models available -> Just ask please.

Select – chose CA filter and or PID re-mapper, and enable them to swap it to the right window

The Output Streams:

BLANKOM®

Summary

- ▶ Status
- Parameters
- ▶ Tuner
- ▶ Setting
- ▶ Output
- System
- ▶ Network
- ▶ Password
- ▶ Configuration
- ▶ Firmware
- ▶ Reboot
- ▶ Date | Time
- ▶ Log

Output

General

Character Encoding: MPTS Output Bitrate: Mbps

MPTS Output Mode: ASI Output Mode:

[Apply](#)

IP Output

#	Output Enable	IP Address	Port	Protocol	Null_PKT Filter	Program	Output Bitrate	Status	Bit(Act/Max)
MPTS	<input checked="" type="checkbox"/>	<input type="text" value="224.2.2.2"/>	<input type="text" value="2001"/>	<input type="text" value="UDP"/>	<input type="checkbox"/>			●	0.0/80.0 M
SPTS-1	<input checked="" type="checkbox"/>	<input type="text" value="224.2.2.2"/>	<input type="text" value="3001"/>	<input type="text" value="UDP"/>	<input checked="" type="checkbox"/>	<input type="text" value="NULL"/>	<input type="text" value="15"/>	●	0.0/15.0 M
SPTS-2	<input checked="" type="checkbox"/>	<input type="text" value="224.2.2.2"/>	<input type="text" value="3002"/>	<input type="text" value="UDP"/>	<input checked="" type="checkbox"/>	<input type="text" value="NULL"/>	<input type="text" value="15"/>	●	0.0/15.0 M
SPTS-3	<input checked="" type="checkbox"/>	<input type="text" value="224.2.2.2"/>	<input type="text" value="3003"/>	<input type="text" value="UDP"/>	<input checked="" type="checkbox"/>	<input type="text" value="NULL"/>	<input type="text" value="15"/>	●	0.0/15.0 M
SPTS-4	<input type="checkbox"/>	<input type="text" value="224.2.2.2"/>	<input type="text" value="3004"/>	<input type="text" value="UDP"/>	<input checked="" type="checkbox"/>	<input type="text" value="NULL"/>	<input type="text" value="15"/>	●	0.0/15.0 M
SPTS-5	<input type="checkbox"/>	<input type="text" value="224.2.2.2"/>	<input type="text" value="3005"/>	<input type="text" value="UDP"/>	<input checked="" type="checkbox"/>	<input type="text" value="NULL"/>	<input type="text" value="15"/>	●	0.0/15.0 M
SPTS-6	<input type="checkbox"/>	<input type="text" value="224.2.2.2"/>	<input type="text" value="3006"/>	<input type="text" value="UDP"/>	<input checked="" type="checkbox"/>	<input type="text" value="NULL"/>	<input type="text" value="15"/>	●	0.0/15.0 M
SPTS-7	<input type="checkbox"/>	<input type="text" value="224.2.2.2"/>	<input type="text" value="3007"/>	<input type="text" value="UDP"/>	<input checked="" type="checkbox"/>	<input type="text" value="NULL"/>	<input type="text" value="15"/>	●	0.0/15.0 M
SPTS-8	<input type="checkbox"/>	<input type="text" value="224.2.2.2"/>	<input type="text" value="3008"/>	<input type="text" value="UDP"/>	<input checked="" type="checkbox"/>	<input type="text" value="NULL"/>	<input type="text" value="15"/>	●	0.0/15.0 M
SPTS-9	<input type="checkbox"/>	<input type="text" value="224.2.2.2"/>	<input type="text" value="3009"/>	<input type="text" value="UDP"/>	<input checked="" type="checkbox"/>	<input type="text" value="NULL"/>	<input type="text" value="15"/>	●	0.0/15.0 M
SPTS-10	<input type="checkbox"/>	<input type="text" value="224.2.2.2"/>	<input type="text" value="3010"/>	<input type="text" value="UDP"/>	<input checked="" type="checkbox"/>	<input type="text" value="NULL"/>	<input type="text" value="15"/>	●	0.0/15.0 M
SPTS-11	<input type="checkbox"/>	<input type="text" value="224.2.2.2"/>	<input type="text" value="3011"/>	<input type="text" value="UDP"/>	<input checked="" type="checkbox"/>	<input type="text" value="NULL"/>	<input type="text" value="15"/>	●	0.0/15.0 M
SPTS-12	<input type="checkbox"/>	<input type="text" value="224.2.2.2"/>	<input type="text" value="3012"/>	<input type="text" value="UDP"/>	<input checked="" type="checkbox"/>	<input type="text" value="NULL"/>	<input type="text" value="15"/>	●	0.0/15.0 M
SPTS-13	<input type="checkbox"/>	<input type="text" value="224.2.2.2"/>	<input type="text" value="3013"/>	<input type="text" value="UDP"/>	<input checked="" type="checkbox"/>	<input type="text" value="NULL"/>	<input type="text" value="15"/>	●	0.0/15.0 M
SPTS-14	<input type="checkbox"/>	<input type="text" value="224.2.2.2"/>	<input type="text" value="3014"/>	<input type="text" value="UDP"/>	<input checked="" type="checkbox"/>	<input type="text" value="NULL"/>	<input type="text" value="15"/>	●	0.0/15.0 M
SPTS-15	<input type="checkbox"/>	<input type="text" value="224.2.2.2"/>	<input type="text" value="3015"/>	<input type="text" value="UDP"/>	<input checked="" type="checkbox"/>	<input type="text" value="NULL"/>	<input type="text" value="15"/>	●	0.0/15.0 M
SPTS-16	<input type="checkbox"/>	<input type="text" value="224.2.2.2"/>	<input type="text" value="3016"/>	<input type="text" value="UDP"/>	<input checked="" type="checkbox"/>	<input type="text" value="NULL"/>	<input type="text" value="15"/>	●	0.0/15.0 M

[Apply](#)

The Output- streams (and ASI out) should be configured when Input has been finally done proper.

Every Output stream can carry the Zero-packets (Null-Packets) – if needed (not for IPTV but DVB-units). They are injected to the TS (SPTS or MPTS) as PID8191dec (dec=decimal, hex=hexadecimal notation) and should not be injected if they are not necessary because they are consuming bandwidth.

So, for IPTV you should filter them out. If not, they will fill up the stream to the given data rate (see above MPTS= 80Mb/s, SPTS= 15.0Mbit/s) to guarantee a Constant Bitrate stream (CBR).

RTSP with MPTS and SPTS: (Make sure the MAC-Address of DATA-Ethernet-Port is not FFFFFFFF !!! otherwise it won't work)

Note: Depending on Hard- and Software-version of the IGS-700 machine, RTSP might be not supported.

Technical data are subject to change without notice...

Try&Error:

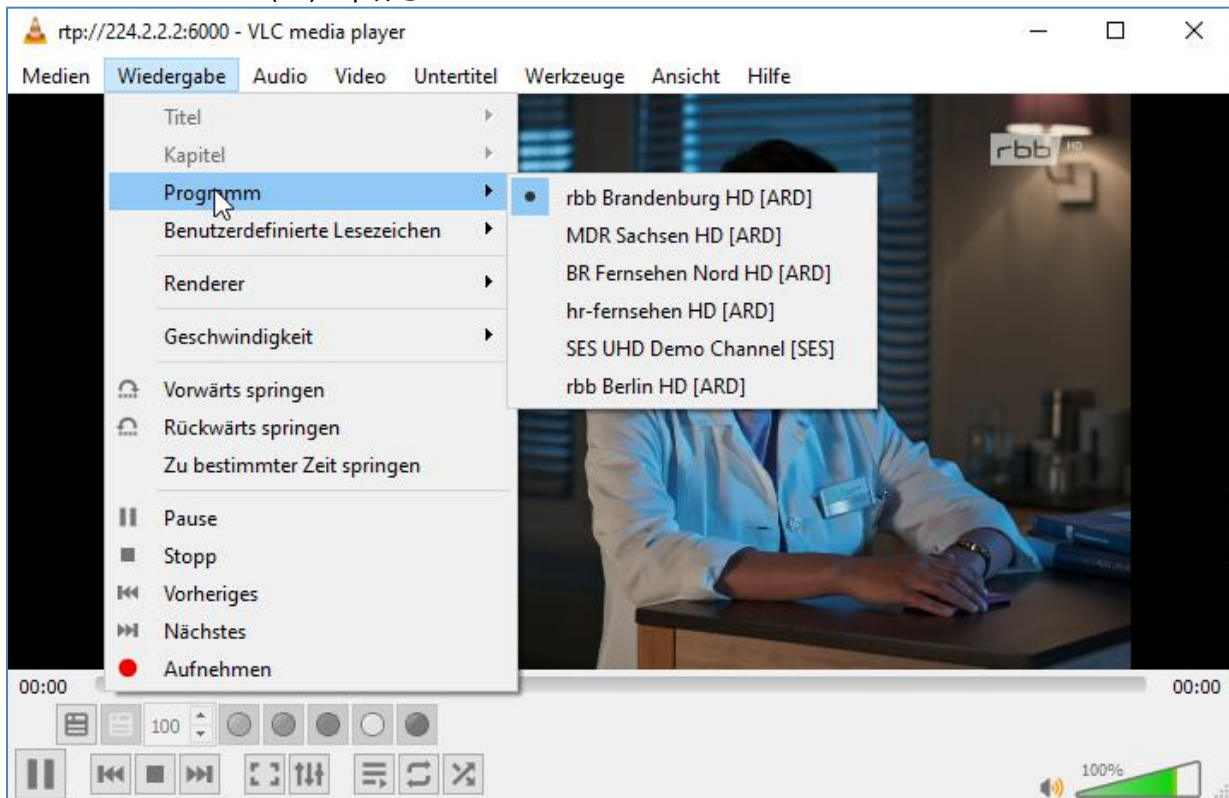
Please set MPTS out as RTP protocol for checking, port number as >5002 (see RTP-specification RFC) etc.

Here is one example for RTSP in Steps:

1. Set the device DATA-Port IP to be in the range between the source (this streamer and the Destination – the receiving unit (STB, PC, TV, ...) 192.168.1.196:

The screenshot shows a configuration window titled "DATA" with a light green header. It contains two input fields: "IP Address:" with the value "192.168.1.196" and "Subnet Mask:" with the value "255.255.255.0". A mouse cursor is visible over the Subnet Mask field.

2. Set the output IP address to 224.2.2.2:6000,
Note: port should be an even number (RTP-demanded – see RFC).
3. RTP address in VLC (PC): rtp://@224.2.2.2:6000 to check multicast works:

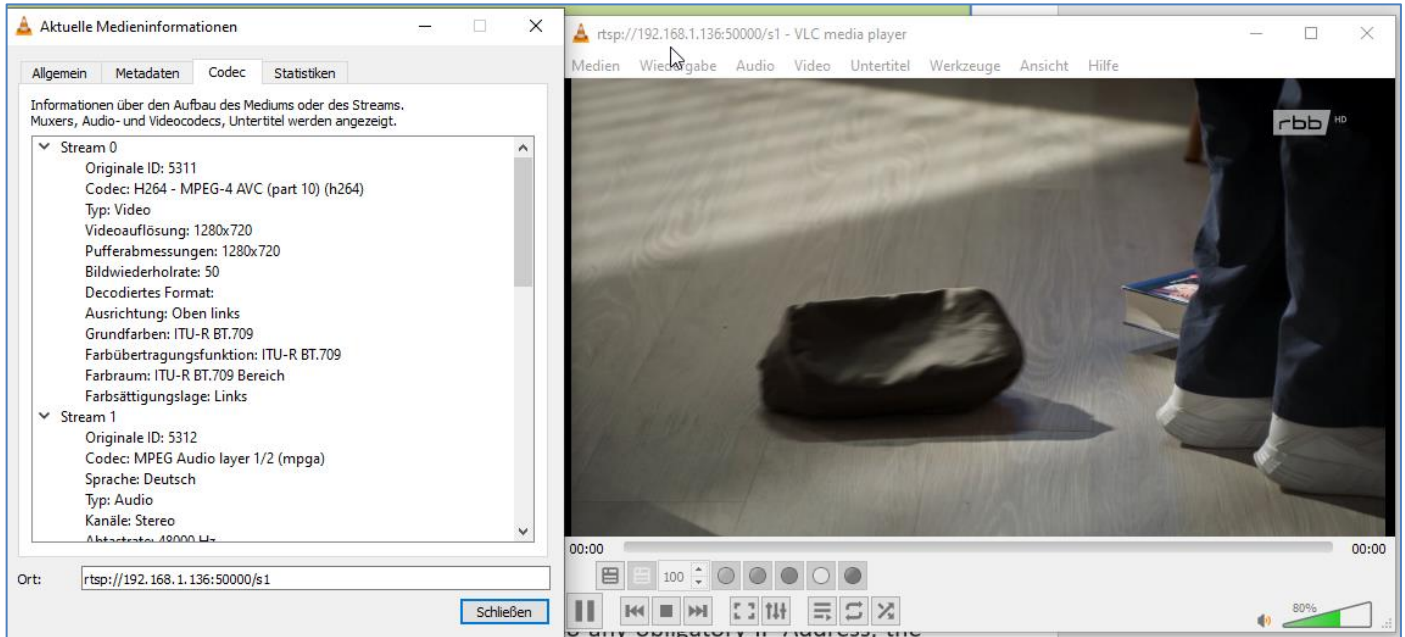


4. RTSP address in VLC: rtp://192.168.1.196:50000/**m1**
5. MPTS output can be received on: rtp://192.168.1.196:50000/**m1**
6. And SPTS output CH1 to CH16 = rtp://192.168.1.196:50000/**s1** ... rtp://192.168.1.196:50000/**s16**

#	Output Enable	IP Address	Port	Protocol	Null_PKT Filter	Program	TS ID	ON ID	Output Bitrate	Status	Bit(Act/Max)
MPTS	<input checked="" type="checkbox"/>	224.2.2.1	30000	RTP/RTS	<input checked="" type="checkbox"/>		1	1		●	69.8/80.0 M
SPTS-1	<input checked="" type="checkbox"/>	225.2.2.2	30002	UDP	<input checked="" type="checkbox"/>	rbb Branc	1	1	15	●	15.0/15.0 M
SPTS-2	<input checked="" type="checkbox"/>	225.2.2.2	30004	RTP/RTSP	<input checked="" type="checkbox"/>	rbb Berlin	1	1	15	●	15.0/15.0 M

The SPTS settings will **all** change if you select RTP/RTSP (same for UDP... they are all depending on the protocol output)

We check the RTSP:



Note: You should increase the default Bitrate settings of the MC-streams according to your service data rates. If you set them too low (i.e. stream a HD channel with 12 Mb/s but bitrate like above is set to 8) the streams may be corrupt and show macro blockings and video may be periodically interrupted.

Set your output stream destinations (multicast addresses and Port-No.) scroll down up to:

Like explained above, the IP-Range must be in a different Subnet than the NMS port. It automatically avoids that... already explained ... Maybe we will change that "secures" in a future release to give the user the chance to use one switch and use IGMP or port isolation / Multicast blocking setup methods to avoid flooding..

The reason why the streaming port definitely needs an IP address is simple: W/o any obligatory IP Address, the connected network would not be aware of this port. Also - it's mandatory if you want to stream in Unicast mode. Destination and Sender must be defined properly.

We will continue with the streaming settings later after finishing the Inputs.

Service IP:	<input type="text" value="192.168.1.139"/>
Subnet Mask:	<input type="text" value="255.255.255.0"/>
Gateway:	<input type="text" value="192.168.1.0"/>
Output Protocol:	<input type="text" value="UDP"/> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> UDP <input type="checkbox"/> RTP/RTSP

For CBR (incl. Zero packets), a fixed Bitrate can be chosen. Note: Calculate 10...15% overhead for stream – because of potential data peaks in the Video

The Outputs can even carry more:

Output

General

Character Encoding: NORMAL
MPTS Output Mode: MUX
MPTS Output Bitrate: 80 Mbps
ASI Output Mode: Packet Mode

IP Output

#	Output Enable	IP Address	Port	Protocol	Null_PKT Filter	Program	Output Bitrate	Status	Bit(Act/Max)
MPTS	<input checked="" type="checkbox"/>	224.2.2.2	2001	UDP	<input type="checkbox"/>			●	50.6/80.0 M
SPTS-1	<input checked="" type="checkbox"/>	224.2.2.2	3001	UDP	<input checked="" type="checkbox"/>	NULL	15	●	0.0/15.0 M

So we increased the MPTS to 150Mb/s as example:

Output

General

Character Encoding: NORMAL
MPTS Output Mode: MUX
MPTS Output Bitrate: 150 Mbps
ASI Output Mode: Packet Mode

BTW: The Character table can be selected:

General

Character Encoding: [NORMAL] (dropdown menu open showing: NORMAL, GBK, UCS-2, ISO-8859-5)
MPTS Output Mode: NORMAL
MPTS Output Bitrate: 120 Mbps
ASI Output Mode: Packet Mode

and MPTS passing Tuner inputs or Mux:

General

Character Encoding: NORMAL
MPTS Output Mode: [MUX] (dropdown menu open showing: MUX, Tuner 1, Tuner 2, Tuner 3, Tuner 4)
MPTS Output Bitrate: 120 Mbps
ASI Output Mode: [Packet Mode] (dropdown menu open showing: Packet Mode, Byte Mode, Packet Mode)

DVB-experts will know what this Byte/Packet modes are good for. If you do not know, use the defaults.

Now we check the output as multicast:

General

Character Encoding: MPTS Output Bitrate: Mbps
MPTS Output Mode: ASI Output Mode:

IP Output

#	Output Enable	IP Address	Port	Protocol	Null_PKT Filter	Program	Output Bitrate	Status	Bit(Act/Max)
MPTS	<input checked="" type="checkbox"/>	224.2.2.2	2001	UDP	<input checked="" type="checkbox"/>			●	51.7/150.0 M
SPTS-1	<input checked="" type="checkbox"/>	224.2.2.2	3001	UDP	<input checked="" type="checkbox"/>	NULL	15	●	0.0/15.0 M
				UDP	<input checked="" type="checkbox"/>	NULL	15	●	0.0/15.0 M
				UDP	<input checked="" type="checkbox"/>	NULL	15	●	0.0/15.0 M
				UDP	<input checked="" type="checkbox"/>	NULL	15	●	0.0/15.0 M
				UDP	<input checked="" type="checkbox"/>	NULL	15	●	0.0/15.0 M
				UDP	<input checked="" type="checkbox"/>	NULL	15	●	0.0/15.0 M
				UDP	<input checked="" type="checkbox"/>	NULL	15	●	0.0/15.0 M
				UDP	<input checked="" type="checkbox"/>	NULL	15	●	0.0/15.0 M
				UDP	<input checked="" type="checkbox"/>	NULL	15	●	0.0/15.0 M
				UDP	<input checked="" type="checkbox"/>	NULL	15	●	0.0/15.0 M
				UDP	<input checked="" type="checkbox"/>	NULL	15	●	0.0/15.0 M
				UDP	<input checked="" type="checkbox"/>	NULL	15	●	0.0/15.0 M
				UDP	<input checked="" type="checkbox"/>	NULL	15	●	0.0/15.0 M

udp://224.2.2.2:2001 - VLC media player

Medien **Wiedergabe** Audio Video Untertitel Werkzeuge Ansicht Hilfe

- Titel
- Kapitel
- Programme**
 - rbb Brandenburg HD [ARD]
 - MDR Sachsen HD [ARD]
 - BR Fernsehen Nord HD [ARD]
 - hr-fernsehen HD [ARD]
- Benutzerdefinierte Lesezeichen
- Renderer
- Geschwindigkeit
- Vorwärts springen
- Rückwärts springen
- Zu bestimmter Zeit springen
- Pause
- Stopp
- Vorheriges
- Nächstes
- Aufnehmen

The MPTS can also carry the mux'ed from the right or Tuner 1 or 2... as passthrough.

Zero packets can be filtered out from the mux to save bandwidth:

#	Output Enable	IP Address	Port	Protocol	Null_PKT Filter	Program	Output Bitrate	Status	Bit(Act/Max)
MPTS	<input checked="" type="checkbox"/>	224.2.2.2	2001	UDP	<input checked="" type="checkbox"/>			●	52.5/150.0 M

Otherwise, they will be inserted as **PID 8191dec** in the Transportstream: here without:

The screenshot displays the StreamXpert software interface. The main window is titled "StreamXpert - EVALUATION (2022.06.18) - No record file". The interface is divided into several sections:

- Top Bar:** Contains navigation tabs (Home, Decoding, TR 101 290, Recording, View, Teletext) and a toolbar with buttons for MPEG-TS, ATSC, Freeze, Refresh, Reset, and Settings.
- Left Panel:** A list of PID streams with their respective names and bit rates. Examples include:
 - 2176 13818-6 type C (10.3 kbps / 0.02%)
 - 2276 13818-6 type C (10.3 kbps / 0.02%)
 - 2876 13818-6 type C (10.3 kbps / 0.02%)
 - 3570 AIT (10.3 kbps / 0.02%)
 - 3572 13818-6 type B (399 kbps / 0.8%)
 - 3670 AIT (10.3 kbps / 0.02%)
 - 3672 13818-6 type B (399 kbps / 0.8%)
 - 3770 AIT (10.3 kbps / 0.02%)
 - 3772 13818-6 type B (399 kbps / 0.8%)
 - 5201 AVC/H.264 Video (15.0 Mbps / 28.6%)
 - 5202 MPEG-1 Audio (195 kbps / 0.4%)
 - 5203 MPEG-1 Audio (196 kbps / 0.4%)
 - 5204 Teletext Data (299 kbps / 0.6%)
 - 5205 PES Private Data 1 (3.0 kbps / 0.01%)
 - 5206 AC-3 Audio (465 kbps / 0.9%)
 - 5209 PES Private Data 1 (29 kbps / 0.06%)
 - 5210 PMT (14.7 kbps / 0.03%)
 - 5275 13818-6 type B (399 kbps / 0.8%)
 - 5300 PMT (14.7 kbps / 0.03%)
 - 5311 AVC/H.264 Video (11.9 Mbps / 22.7%)
 - 5312 MPEG-1 Audio (196 kbps / 0.4%)
 - 5313 MPEG-1 Audio (195 kbps / 0.4%)
 - 5314 Teletext Data (271 kbps / 0.5%)
 - 5315 PES Private Data 1 (4.4 kbps / 0.01%)
 - 5316 AC-3 Audio (398 kbps / 0.8%)
 - 5320 PMT (14.7 kbps / 0.03%)
 - 5331 AVC/H.264 Video (12.9 Mbps / 24.6%)
 - 5332 MPEG-1 Audio (198 kbps / 0.4%)
 - 5333 MPEG-1 Audio (198 kbps / 0.4%)
 - 5334 Teletext Data (261 kbps / 0.5%)
 - 5335 PES Private Data 1 (27 kbps / 0.05%)
 - 5336 AC-3 Audio (460 kbps / 0.9%)
 - 5350 PMT (14.7 kbps / 0.03%)
 - 5351 AVC/H.264 Video (5.8 Mbps / 11.1%)
 - 5352 MPEG-1 Audio (199 kbps / 0.4%)
 - 5353 MPEG-1 Audio (199 kbps / 0.4%)
 - 5354 Teletext Data (298 kbps / 0.6%)
 - 5355 PES Private Data 1 (4.3 kbps / 0.01%)
 - 5356 AC-3 Audio (463 kbps / 0.9%)
- Right Panel:** A detailed view of "Transport stream 4". It shows:
 - Services (4):** BR Fernsehen Nord HD (16.8 Mbps / 32.0%), rbb Brandenburg HD (13.6 Mbps / 25.8%), MDR Sachsen HD (14.7 Mbps / 27.9%), and hr-fernsehen HD (7.6 Mbps / 14.4%).
 - Tables:** PAT, PMT, SDT-actual, TDT, and TOT.
 - Programs:** 10326 (BR Fernsehen Nord HD), 10350 (rbb Brandenburg HD), 10352 (MDR Sachsen HD), and 10355 (hr-fernsehen HD).
 - Service List:** 10350 (rbb Brandenburg HD), 10352 (MDR Sachsen HD), 10326 (BR Fernsehen Nord HD), and 10355 (hr-fernsehen HD).
 - TDT:** Table ID: 112, UTC time: 2022/01/10 14:25:59.
 - TOT:** Table ID: 115, UTC time: 2022/01/10 14:26:14, No time-offset descriptors.
 - AIT:** PID 1570, PID 3570, PID 3670, PID 3770.
- Bottom Panel:** A "Messages" window showing system logs and a "Trace bar" showing a bit-rate graph. The status bar at the very bottom indicates "Ready" and "188 Byte 52.536.782bps / 100.0% MPEG-TS IP 224.2.2.2:2001".

Remark: The AIT and TDT/TOT are tables from the Inputs and are passed to the output.

And as example **with the Null packets PID8191dec**:

The screenshot displays the StreamXpert software interface. The top menu includes Home, Decoding, TR 101 290, Recording, View, and Teletext. The main window is divided into several sections:

- Left Panel:** A list of packets with their PIDs and bit rates. The last entry is '8191 Null packets (37.4 Mbps / 41.5%)'. The overall bitrate is shown as 37.372.832 bps / 41.5%.
- Right Panel:** A detailed view of 'Transport stream 4'. It shows services (BR Fernsehen Nord HD, rbb Brandenburg HD, MDR Sachsen HD, hr-fernsehen HD), tables (PAT, PMT, SDT-actual, TDT, TOT, AIT), and PID lists (1570, 3570, 3670, 3770).
- Bottom Panel:** A 'Trace bar' showing a bit-rate graph. The y-axis ranges from 50.0Mbps to 100.0Mbps. A tooltip indicates 'Rate: 90.02 Mbps / Used: 52.65 Mbps'. Below the graph, the status bar shows 'Ready', '188 Byte', '90.023.692bps / 58.5%', 'MPEG-TS', 'IP', and '224.2.2.2:2001'.

You should only add these null packets to serve a Constant Bitrate Stream (CBR) to a connected IP to DVB/ATSC/ISDB – Modulator who needs it otherwise you are wasting streaming bandwidth.

Therefore, **SPTS** usually needs **no Null-Packets** at all and so are Variable Bitrate's (VBR). Safe Bandwidth please.

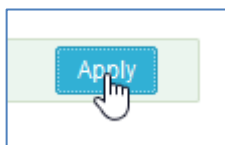
SPTS streaming's:

IP Output										
#	Output Enable	IP Address	Port	Protocol	Null_PKT Filter	Program	Output Bitrate	Status	Bit(Act/Max)	
MPTS	<input checked="" type="checkbox"/>	224.2.2.2	2001	UDP	<input type="checkbox"/>			●	48.2/90.0 M	
SPTS-1	<input checked="" type="checkbox"/>	224.2.2.2	3001	UDP	<input checked="" type="checkbox"/>	NULL	15	●	0.0/15.0 M	
SPTS-2	<input checked="" type="checkbox"/>	224.2.2.2	3002	UDP	<input checked="" type="checkbox"/>	NULL	15	●	0.0/15.0 M	
SPTS-3	<input checked="" type="checkbox"/>	224.2.2.2	3003	UDP	<input checked="" type="checkbox"/>	NULL	15	●	0.0/15.0 M	

After you have added the selected inputs from the left to the right, you can assign it to the 16 SPTS per module:

SPTS-1	<input checked="" type="checkbox"/>	224.2.2.2	3001	UDP	<input checked="" type="checkbox"/>	NULL	15	●	0.0/15.0 M	
SPTS-2	<input checked="" type="checkbox"/>	224.2.2.2	3002	UDP	<input checked="" type="checkbox"/>	NULL		●	0.0/15.0 M	
SPTS-3	<input checked="" type="checkbox"/>	224.2.2.2	3003	UDP	<input checked="" type="checkbox"/>	NULL		●	0.0/15.0 M	
SPTS-4	<input type="checkbox"/>	224.2.2.2	3004	UDP	<input checked="" type="checkbox"/>	NULL		●	0.0/15.0 M	

SPTS-1	<input checked="" type="checkbox"/>	224.2.2.2	3001	UDP	<input checked="" type="checkbox"/>	rbb Branc	15	●	15.0/15.0 M	
SPTS-2	<input checked="" type="checkbox"/>	224.2.2.2	3002	UDP	<input checked="" type="checkbox"/>	MDR Sac	15	●	13.3/15.0 M	
SPTS-3	<input checked="" type="checkbox"/>	224.2.2.2	3003	UDP	<input checked="" type="checkbox"/>	BR Ferns	15	●	15.0/15.0 M	
SPTS-4	<input type="checkbox"/>	224.2.2.2	3004	UDP	<input checked="" type="checkbox"/>	hr-fermse	15	●	0.0/15.0 M	
SPTS-5	<input type="checkbox"/>	224.2.2.2	3005	UDP	<input checked="" type="checkbox"/>	NULL		●	0.0/15.0 M	
SPTS-6	<input type="checkbox"/>	224.2.2.2	3006	UDP	<input checked="" type="checkbox"/>	MDR Sachsen HD		●	0.0/15.0 M	
SPTS-7	<input type="checkbox"/>	224.2.2.2	3007	UDP	<input checked="" type="checkbox"/>	BR Fernsehen Nord HD		●	0.0/15.0 M	



The bitrates showing up now:

SPTS-1	<input checked="" type="checkbox"/>	224.2.2.2	3001	UDP	<input checked="" type="checkbox"/>	rbb Branc	15	●	11.6/15.0 M	
SPTS-2	<input checked="" type="checkbox"/>	224.2.2.2	3002	UDP	<input checked="" type="checkbox"/>	MDR Sac	15	●	15.0/15.0 M	
SPTS-3	<input checked="" type="checkbox"/>	224.2.2.2	3003	UDP	<input checked="" type="checkbox"/>	BR Ferns	15	●	15.0/15.0 M	
SPTS-4	<input checked="" type="checkbox"/>	224.2.2.2	3004	UDP	<input checked="" type="checkbox"/>	hr-fermse	15	●	8.1/15.0 M	

You should select your highest bitrate (here it is default 15 for the SPTS) so high that the peaks from the content do not overcome that. The 15 Maximum is only working with Null Packets added (Filter not checked) it will be a CBR then.

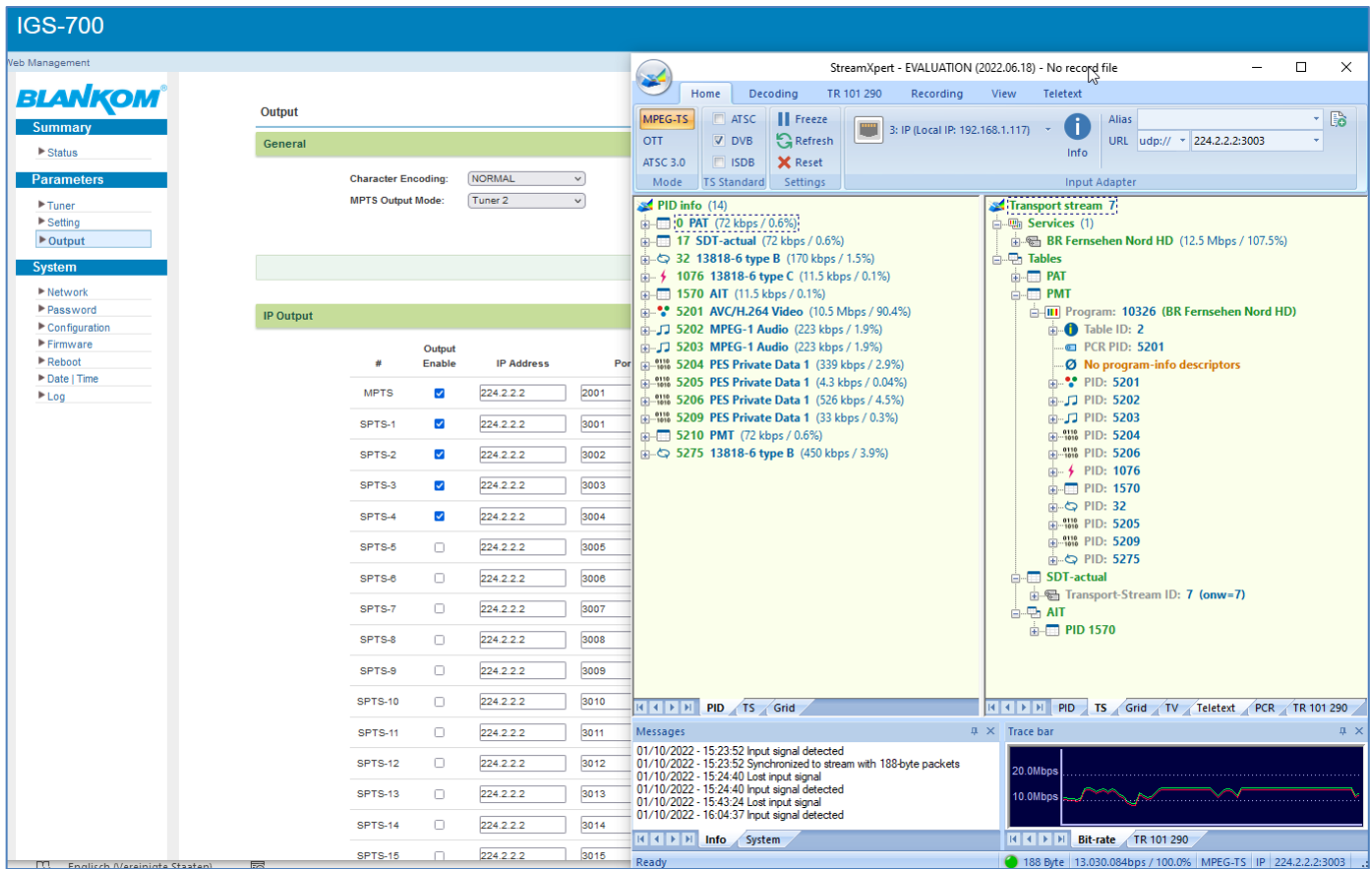
Check SPTS:

The screenshot displays the IGS-700 software interface with the following components:

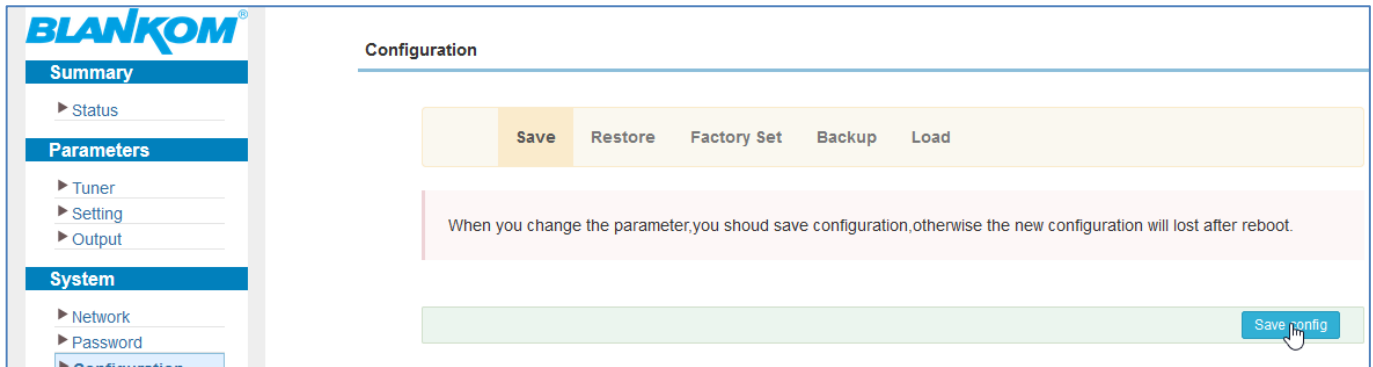
- Top Panel:** Includes settings for MPEG-TS, OTT, ATSC 3.0, and Mode. It also shows the IP address (3: IP (Local IP: 192.168.1.117)), Alias, and URL (udp:// 224.2.2.2:3001).
- PID info (13):** A tree view showing various PIDs:
 - 0 PAT (64 kbps / 0.6%)
 - 17 SDT-actual (64 kbps / 0.6%)
 - 2171 13818-6 type B (148 kbps / 1.4%)
 - 2176 13818-6 type C (10.2 kbps / 0.1%)
 - 3770 AIT (8.8 kbps / 0.08%)
 - 3772 13818-6 type B (395 kbps / 3.8%)
 - 5300 PMT (64 kbps / 0.6%)
 - 5311 AVC/H.264 Video (8.8 Mbps / 84.0%)
 - Bitrate: 8.836.424 bps / 84.0%
 - ES Info
 - PCR: Yes
 - Scrambled: No
 - CC Errors: 1
 - Type: AVC/H.264 Video
 - Stream ID: 224
 - 5312 MPEG-1 Audio (197 kbps / 1.9%)
 - Bitrate: 197.040 bps / 1.9%
 - ES Info
 - PCR: No
 - Scrambled: No
 - CC Errors: 1
 - Type: MPEG-1 Audio
 - Stream ID: 192
 - 5313 MPEG-1 Audio (197 kbps / 1.9%)
 - Bitrate: 197.054 bps / 1.9%
 - ES Info
 - PCR: No
 - Scrambled: No
 - CC Errors: 1
 - Type: MPEG-1 Audio
 - Stream ID: 192
 - 5314 PES Private Data 1 (260 kbps / 2.5%)
 - 5315 PES Private Data 1 (20 kbps / 0.2%)
 - 5316 PES Private Data 1 (396 kbps / 3.8%)
- Transport stream 5:** A tree view showing services and tables:
 - Services (1)
 - rbb Brandenburg HD (10.5 Mbps / 99.5%)
 - 2171 13818-6 type B (148 kbps / 1.4%)
 - 2176 13818-6 type C (10.2 kbps / 0.1%)
 - 3770 AIT (8.8 kbps / 0.08%)
 - 3772 13818-6 type B (395 kbps / 3.8%)
 - 5311 AVC/H.264 Video (8.8 Mbps / 84.0%)
 - 5312 MPEG-1 Audio (197 kbps / 1.9%)
 - 5313 MPEG-1 Audio (197 kbps / 1.9%)
 - 5314 PES Private Data 1 (260 kbps / 2.5%)
 - 5315 PES Private Data 1 (20 kbps / 0.2%)
 - 5316 PES Private Data 1 (396 kbps / 3.8%)
 - Program: 10350
 - PMT PID: 5300
 - PCR PID: 5311
 - Provider: ARD
 - Tables
 - PAT
 - PMT
 - Program: 10350 (rbb Brandenburg HD)
 - Table ID: 2
 - PCR PID: 5311
 - No program-info descriptors
 - PID: 5311
 - PID: 5312
 - PID: 5313
 - PID: 5314
 - PID: 5316
 - PID: 2171
 - PID: 2176
 - PID: 3770
 - PID: 3772
 - PID: 5315
 - SDT-actual
 - Transport-Stream ID: 5 (onw=5)
 - Dummy
 - AIT
 - PID 3770

- Messages:** A log showing input signal detection and synchronization events on 01/10/2022.
- Trace bar:** A graph showing bit-rate over time, with a peak at 100.0Mbps and a current value around 50.0Mbps.
- Status Bar:** Shows 'Ready' and system information: 188 Byte, 10,579.865bps / 100.0%, MPEG-TS, IP, 224.2.2.2:3001.

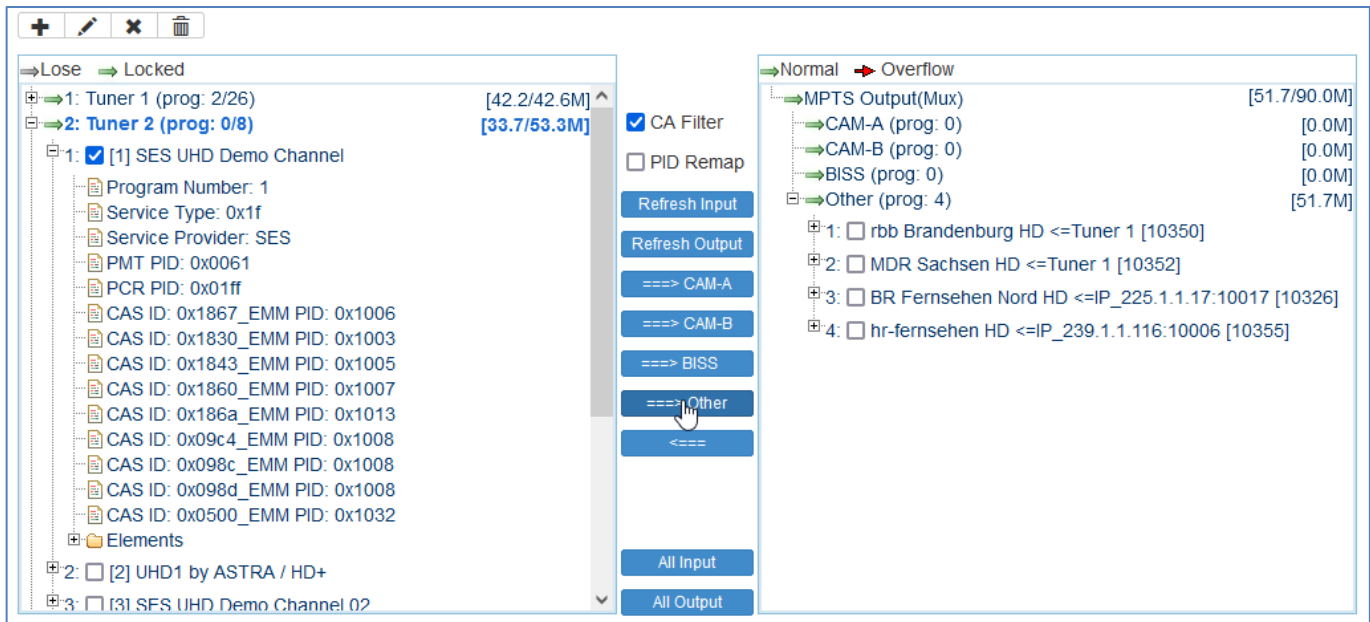
AIT (HbbTV) and private data will be passed also to SPTS. Attention: From different sources PIDs can conflict.



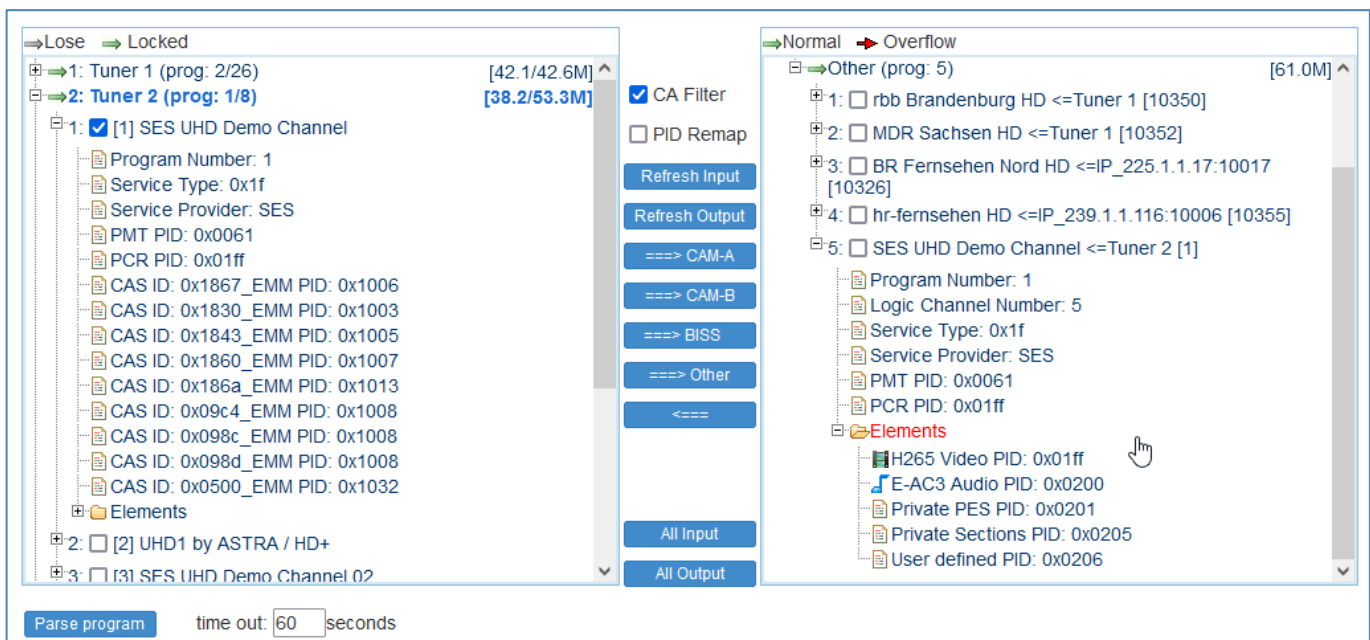
It is time to Save your config now – otherwise Power OFF will let you stay at the last saving status...



If you are passing encrypted/decrypted programs from the Input, you can filter out the CA-PID's which are not necessary any more:

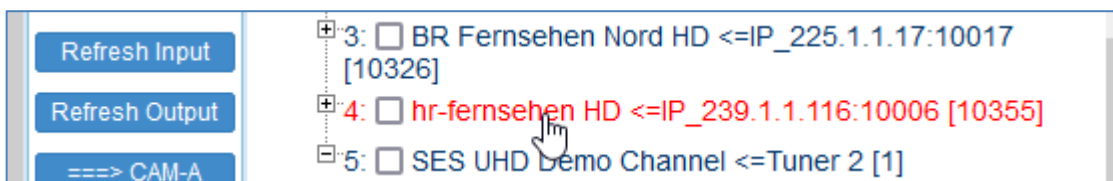


So no CAS PIDs any more in the output:

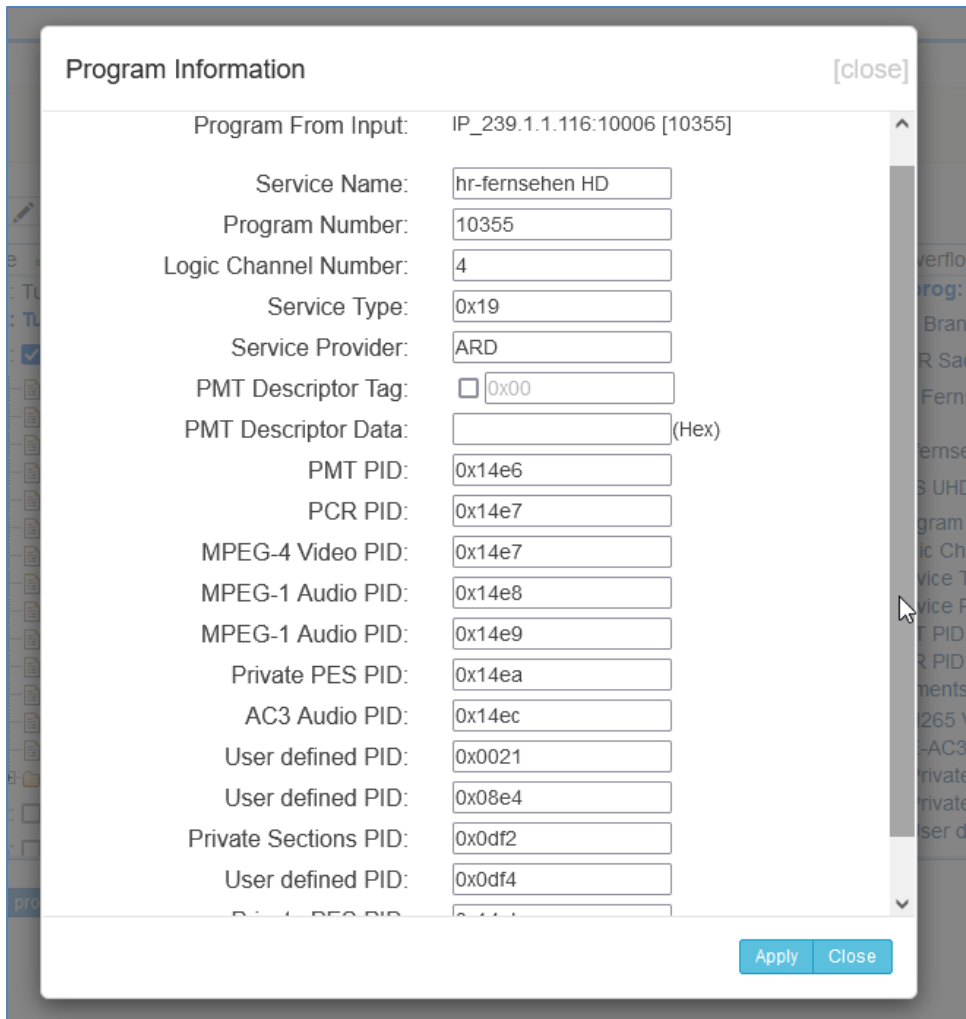


Every stream output can be manipulated and should only be done by experts:

Just click on it:



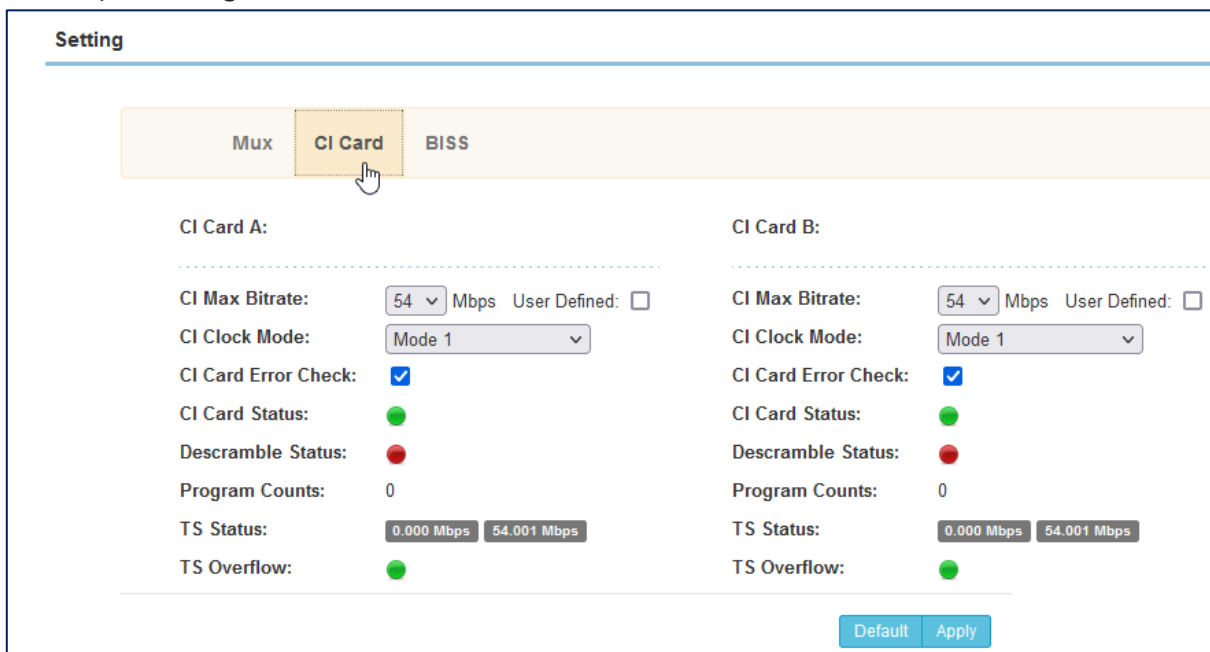
And a POPUP comes up:



You should be familiar with HEXA- and DECIMAL values and the structures and tables of DVB/MPEG.

CI- Modules:

After inserting CAM's, you should be patient because it takes some time after the CAM's will react (Slower ASIC processors inside). Accessing it at:



You can play with the bitrates of the CAM-Transport-stream (TS) because the CAM-models differ:

CI Card A:	CI Card B:
CI Max Bitrate: 54 Mbps User Defined: <input type="checkbox"/>	CI Max Bitrate: 54 Mbps User Defined: <input type="checkbox"/>
CI Clock Mode: 54	CI Clock Mode: Mode 1
CI Card Error Check: 64	CI Card Error Check: <input checked="" type="checkbox"/>
CI Card Status: 72	CI Card Status: ●
Descramble Status: 80	Descramble Status: ●
Program Counts: 108	Program Counts: 0
TS Status: 0.000 Mbps 54.001 Mbps	TS Status: 0.000 Mbps 54.001 Mbps
TS Overflow: ●	TS Overflow: ●
<input type="button" value="Default"/> <input type="button" value="Apply"/>	

Here we haven't assigned any parts for decryption and it highly depends on your operator/provider and system and Mode of the CAM-vendor in use by them.

Therefore, there is no general using to be described.... Individually you need to do a lot of try and error we believe. Some hot remarks: CI+ is not supported in Headend units like this. It is per definition in DVB only for consumer products.

TS Limits according to different available CA-Module capabilities can be set and need to be considered: 48... 108 Mbps

To guarantee a reliable function we recommend using **professional** CA modules (CAM) from the following manufactures:

- MASCOM (Alphacrypt Family) - PANACCESS
- ASTON
- SMiT
- NAGRA / SMARTV
- XCRYPT (might have some timing issues)

IMPORTANT: CI+ is only for consumer devices (TV/STB) and excluded by DVB for Headend products like this IGS-700.

Please pay attention to use the latest software- / hardware version. Note: There are Consumer CAM's and professional CAM's on the market. Consumer CAM's often can only decrypt up to 2 TV Services so as CI+ can often do 4 PIDs! So not to mess up between PID's and complete TV services (which can be 2 or many more PID's i.e., with Multilanguage's).

The CA module diversity of other manufactures is increasing permanently, the using of them might be possible but BLANKOM / IRENIS is not able to guarantee for faultless operating in all cases. Because there are so many good and bad CI modules, we are not able to test them all and do workarounds for special cases.

Note: The CAM-Slots can be assigned flexible to the Input Transport-streams, so you should understand the steps as following:

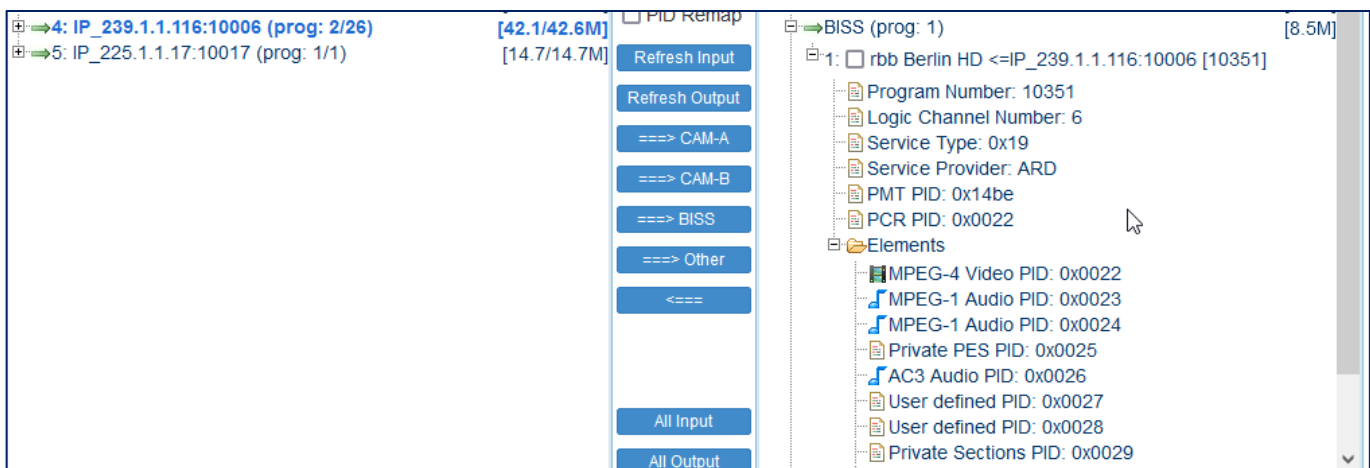
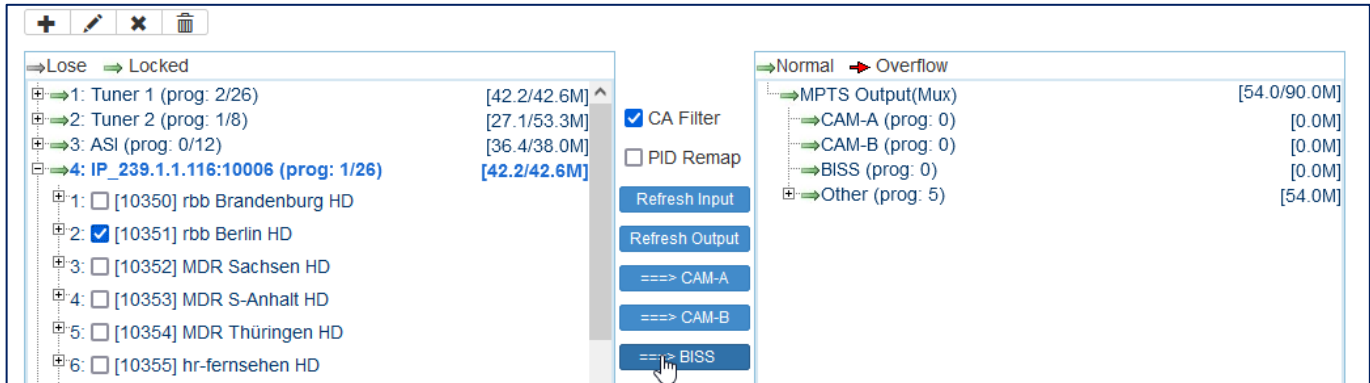
First the Input TS must be assigned properly, as soon as they are detected and the content has been 'parsed', the CI-Menu can be used to assigned the right CI-Slots and CAM to the right Input TS.

The Log-Window will show status messages – make sure the **Smartcard** inserted has been **already enabled**. Sometimes it helps to enable it by using the CI-Module and SC in another device (like a TV set or STB supporting CAM slots) than tune to the main Channel of the PayTV operator (like SKY-Cinema). It can take appr. 30 minutes until the SmartCard will be enabled by the EMM/ECM-PIDs- coming along with the Transport-Stream. The TV or STB will decrypt it and show the decrypted service when enabled.

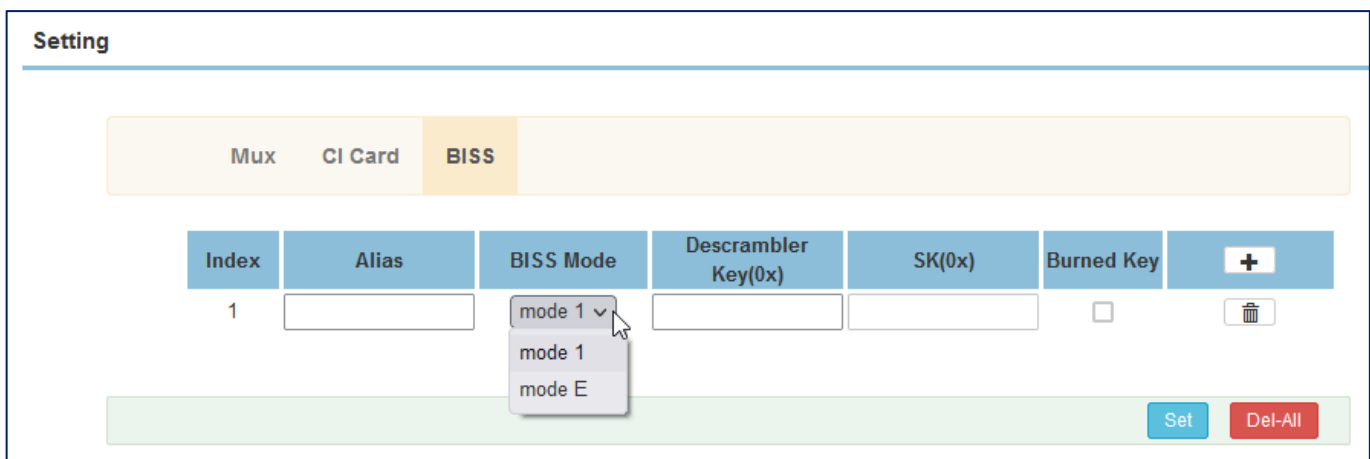
Nearly Similar settings can be considered for the embedded BISS decryption:

BISS decryption menu:

First pass a service left to BISS right:

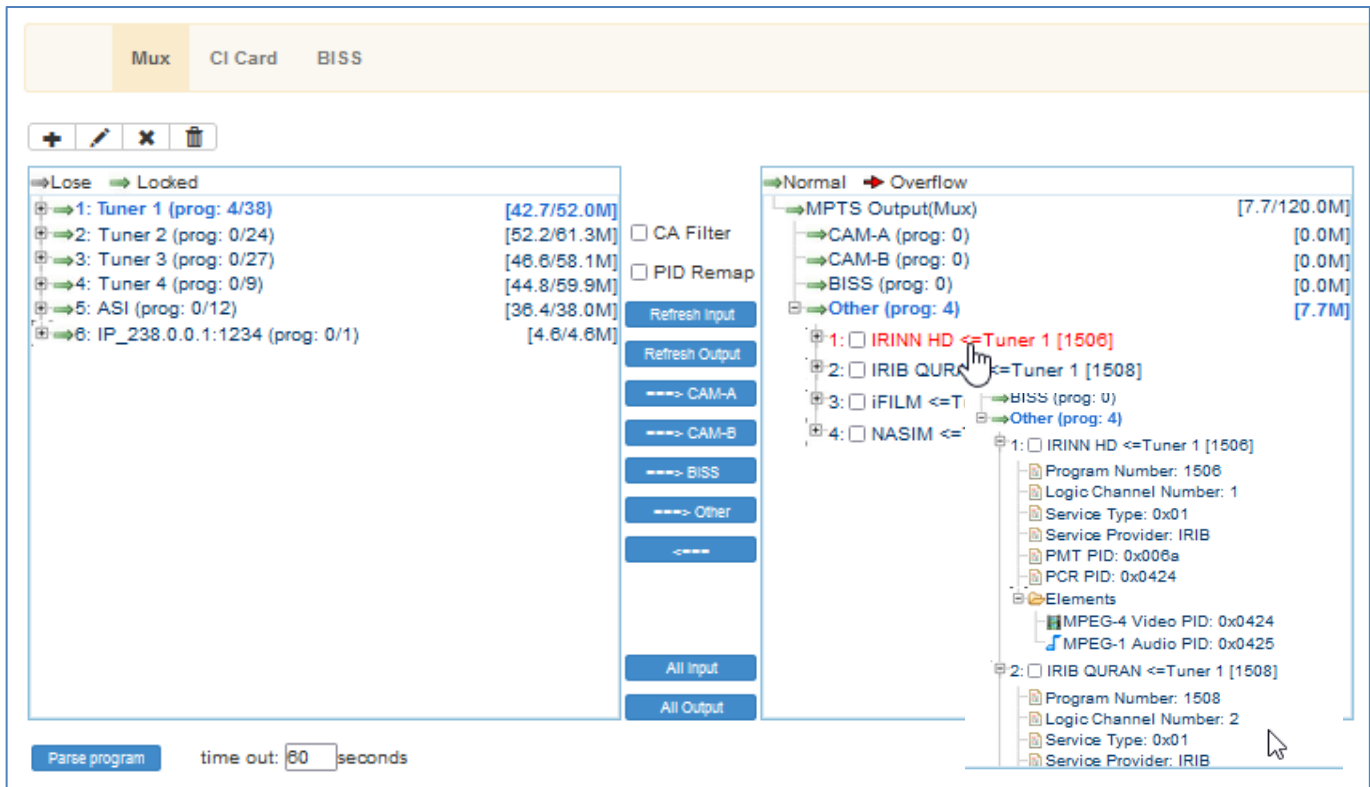


Then enter BISS settings:

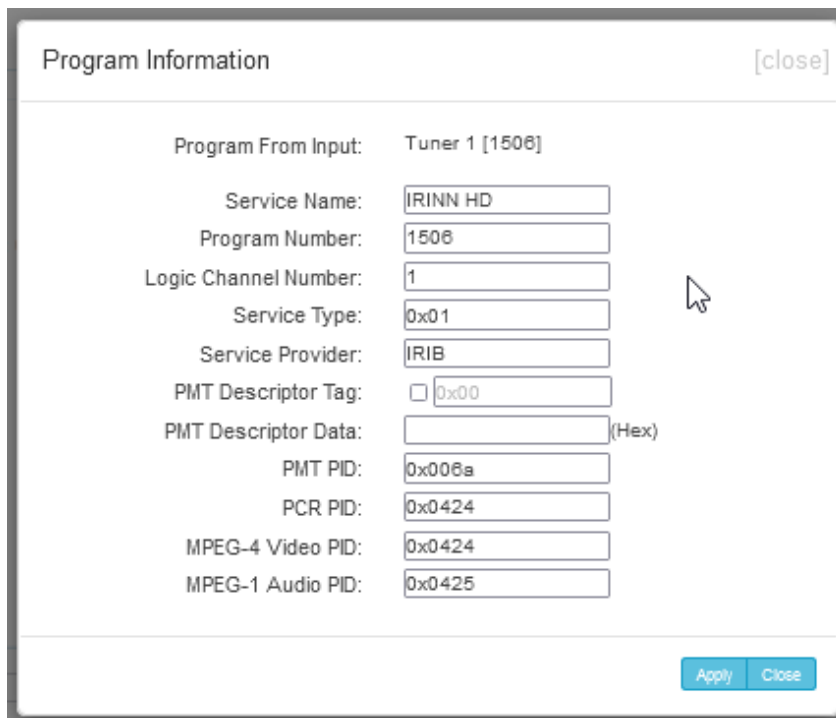


Give it names (Alias) and of course you need to know the mode (1 or E) and the KEY-Values the operator is using. If you are the Operator, you know it 😊. SET, Del-All are self-explaining, or isn't it? Also, you as operator should know whether you are using a burned key or not.

The both modules have identical configurations....

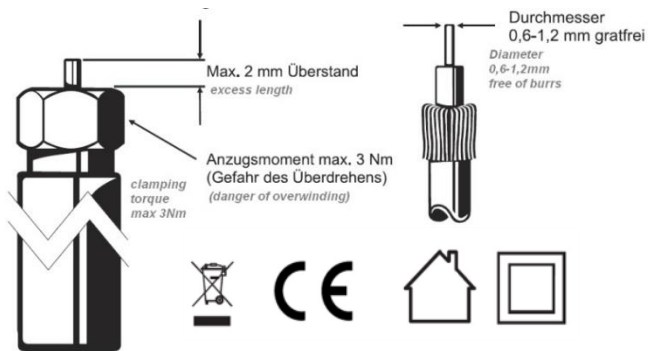


The single stream values can be easily changed by click: -> opens a popup:



Logical Channel Number is automatically given but it is obsolete because it will not be used in streaming out SPTS. It is a part of a NIT and this IGS does not make use of an output multiplexer /modulator.

Installationshinweis für den F-Anschluss: / *Installation guide for F-connectors:*



Die LNB-Anschlüsse sind meist entsprechend gekennzeichnet

The LNC-connectors are almost marked as:

HH= Horizontal High-Band

HL= Horizontal Low-Band = LH

VL= Vertical Low-Band = LV

VH= Vertical High-Band = HV

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

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.

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 Gerätes 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.

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.*

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:

IRENIS GmbH

Hauptstr. 29

D-31171 Nordstemmen - Germany

Änderungen vorbehalten / Subject to change w/o notifications

Commercial Register: HRB 206370 / District Court Hildesheim

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

Irenis-Direct Phone: +49 5069 4809781 **Technical Hotline:** +49 5069 43998601

Recommended GbEthernet-Switch:

As a Multicast capable Switch, we recommend is the HP (ARUBA) 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:

Unit Information	
Product Name:	HP 2530-24G Switch (J9776A)
IP Address:	192.168.0.30
Base MAC Address:	a0 1d 48 45 26 40
Serial Number:	CN41FP70DF
Mgmt Server:	http://h17007.www1.hp.com/device_help
Version:	YA.15.18.0013, ROM YA.15.19

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:

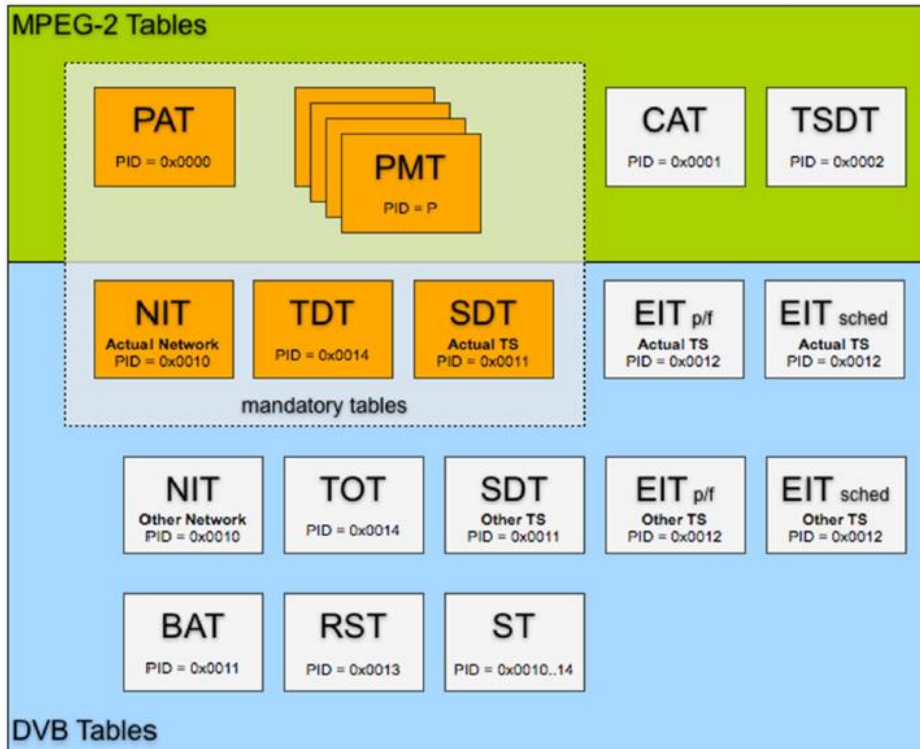


Table 1: PID allocation for SI

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

אזהרה

אזהרה!

סילוק מוצרי של כנסת זה חייב להיות בטוח ולתאמת חוקי המדינה

عند التخلص النهائي من هذا المنتج ينبغي التعامل معه وفقا لجميع القوانين والقرارات 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.

Appendix DB

Umrechnungstabelle dB μ V <-> dBm / *Conversions of Power @ 75 Ω*

dBmV	dB μ V	dBm 75 Ω	mV _{RMS}	mW 75 Ω
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

dBmV	dBμV	dBm 75Ω	mV_{RMS}	mW 75Ω
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
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

ANNEX Channel Plan

CATV channel plan – needful for DVB-C tuner versions:

Bereich	Kanal	Kanal- frequenzen	Mitten- frequenz	Bild- träger	Ton- träger	Bereich	Kanal	Kanal- frequenzen	Mitten- frequenz	Bild- träger	Ton- träger	
Bands	Channel	Channel frequency	Middle frequency	Picture carrier	Sound carrier	Bands	Channel	Channel frequency	Middle frequency	Picture carrier	Sound carrier	
B I	2	47...54	50,50	48,25	53,75	B IV	21	470...478	474,00	471,25	476,75	
	3	54...61	57,50	55,25	60,75		22	478...486	482,00	479,25	484,75	
	4	61...68	64,50	62,25	67,75		23	486...494	490,00	487,25	492,75	
	USB Unterer	S 02	111...118	114,50	112,25		117,75	24	494...502	498,00	495,25	500,75
		S 03	118...125	121,50	119,25		124,75	25	502...510	506,00	503,25	508,75
		S 04	125...132	128,50	126,25		131,75	26	510...518	514,00	511,25	516,75
		S 05	132...139	135,50	133,25		138,75	27	518...526	522,00	519,25	524,75
	Sonder- kanal- bereich	S 06	139...146	142,50	140,25		145,75	28	526...534	530,00	527,25	532,75
		S 07	146...153	149,50	147,25		152,75	29	534...542	538,00	535,25	540,75
		S 08	153...160	156,50	154,25		159,75	30	542...550	546,00	543,25	548,75
S 09		160...167	163,50	161,25	166,75	31	550...558	554,00	551,25	556,75		
S 10		167...174	170,50	168,25	173,75	32	558...566	562,00	559,25	564,75		
Midband channels	5	174...181	177,50	175,25	180,75	33	566...574	570,00	567,25	572,75		
	6	181...188	184,50	182,25	187,75	34	574...582	578,00	575,25	580,75		
	7	188...195	191,50	189,25	194,75	35	582...590	586,00	583,25	588,75		
	8	195...202	198,50	196,25	201,75	36	590...598	594,00	591,25	596,75		
	9	202...209	205,50	203,25	208,75	37	598...606	602,00	599,25	604,75		
	10	209...216	212,50	210,25	215,75	B V	38	606...614	610,00	607,25	612,75	
	11	216...223	218,50	217,25	222,75		39	614...622	618,00	615,25	620,75	
	12	223...230	226,50	224,25	229,75	40	622...630	626,00	623,25	628,75		
	OSB Oberer	S 11	230...237	233,50	231,25	236,75	41	630...638	634,00	631,25	636,75	
		S 12	237...244	240,50	238,25	243,75	42	638...646	642,00	639,25	644,75	
		S 13	244...251	247,50	245,25	250,75	43	646...654	650,00	647,25	652,75	
		S 14	251...258	254,50	252,25	257,75	44	654...662	658,00	655,25	660,75	
Sonder- kanal- bereich		S 15	258...265	261,50	259,25	264,75	45	662...670	666,00	663,25	668,75	
		S 16	265...272	268,50	266,25	271,75	46	670...678	674,00	671,25	676,75	
		S 17	272...279	275,50	273,25	278,75	47	678...686	682,00	679,25	684,75	
		S 18	279...286	282,50	280,25	285,75	48	686...694	690,00	687,25	692,75	
Superband channels		S 19	286...293	289,50	287,25	292,75	49	694...702	698,00	695,25	700,75	
		S 20	293...300	296,50	294,25	299,75	50	702...710	706,00	703,25	708,75	
	S 21	302...310	306,00	303,25	308,75	51	710...718	714,00	711,25	716,75		
	ESB	S 22	310...318	314,00	311,25	316,75	52	718...726	722,00	719,25	724,75	
		S 23	318...326	322,00	319,25	324,75	53	726...734	730,00	727,25	732,75	
	Erweiterter Sonder- kanal- bereich	S 24	326...334	330,00	327,25	332,75	54	734...742	738,00	735,25	740,75	
		S 25	334...342	338,00	335,25	340,75	55	742...750	746,00	743,25	748,75	
		S 26	342...350	346,00	343,25	348,75	56	750...758	754,00	751,25	756,75	
		S 27	350...358	354,00	351,25	356,75	57	758...766	762,00	759,25	764,75	
		S 28	358...366	362,00	359,25	364,75	58	766...774	770,00	767,25	772,75	
		S 29	366...374	370,00	367,25	372,75	59	774...782	778,00	775,25	780,75	
		S 30	374...382	378,00	375,25	380,75	60	782...790	786,00	783,25	788,75	
S 31		382...390	386,00	383,25	388,75	61	790...798	794,00	791,25	796,75		
S 32		390...398	394,00	391,25	396,75	62	798...806	802,00	799,25	804,75		
S 33		398...406	402,00	399,25	404,75	63	806...814	810,00	807,25	812,75		
Hyperband channels	S 34	406...414	410,00	407,25	412,75	64	814...822	818,00	815,25	820,75		
	S 35	414...422	418,00	415,25	420,75	65	822...830	826,00	823,25	828,75		
	S 36	422...430	426,00	423,25	428,75	66	830...838	834,00	831,25	836,75		
	S 37	430...438	434,00	431,25	436,75	67	838...846	842,00	839,25	844,75		
	S 38	438...446	442,00	439,25	444,75	68	846...854	850,00	847,25	852,75		
	S 39	446...454	450,00	447,25	452,75	69	854...862	858,00	855,25	860,75		
	S 40	454...462	458,00	455,25	460,75							
	S 41	462...470	466,00	463,25	468,75							

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EU Declaration of Conformity

1. **Product model:** BLANKOM IGS 700

2. **Name and address of the manufacturer or his authorised representative:**

IRENIS GmbH
Hauptstr. 29
31171 Nordstemmen/Germany
+49 (0) 5069 4809 783
info@blankom.de

3. **This declaration of conformity is issued under the sole responsibility of the manufacturer.**

4. **Object of the declaration:**

Equipment: DVB/IP GATEWAY, IRD
Brand name: BLANKOM
Model/type: IGS-700

5. **The object of the declaration described above is in conformity with the relevant Union harmonization legislation:**

Low Voltage Directive (LVD) 2006/95/EC,
Electromagnetic Compatibility Directive (EMC) 2014/30/EU,

6. **References to the relevant harmonised standards used or references to the other technical specifications in relation to which conformity is declared:**

LVD: EN 60950-1:2006+A11:2009+A1:2010+A12:2011+A2:2013

EMC: EN 55022: 2010+AC:2011
EN 61000-3-2:2014, EN 61000-3-3:2013
EN 55024: 2010
EN 61000-4-2: 2009, EN 61000-4-3: 2006+A1:2008+A2:2010
EN 61000-4-4: 2012, EN 61000-4-5: 2014
EN 61000-4-6: 2014, EN 61000-4-8: 2010, EN 61000-4-11: 2004

7. **Signed for and on behalf of:**

At Nordstemmen, 11th of September, 2019

Authorised representative:
IRENIS GmbH

IRENIS GmbH
Hauptstr. 29
31171 Nordstemmen

Dipl.-Ing. Murad Onor, Managing Director