IGS-924 Tuner to IP Gateway

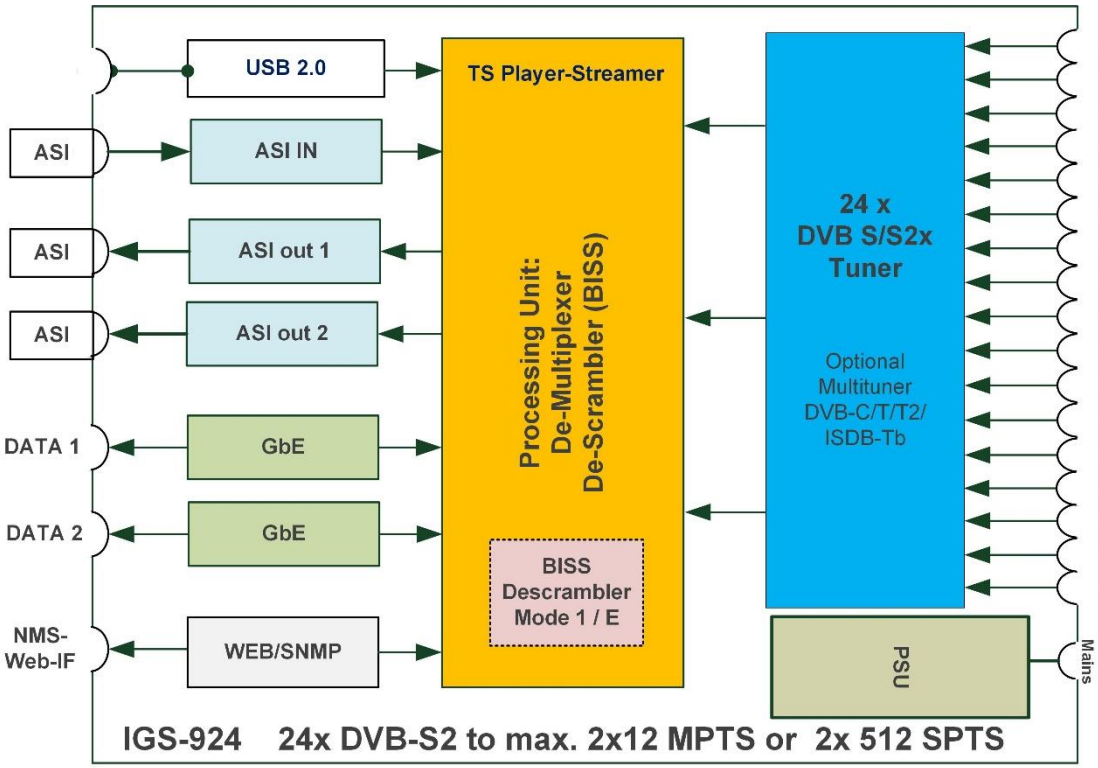
Datasheet and operation Manual

V 1.0

Table of Content

Introduction:

The BLANKOM IGS-924 is a high performance and cost-effective SPTS or MPTS IP streamer.
Equipped with 24 DVB-S/S2x FTA (Free to Air unencrypted) tuner inputs, with BISS de-scrambling capabilities, up to 2x 512 SPTS Stream channels through Gigabit Ethernet ports (parallel operation as redundant stream-I/O). Depending on the chosen mode, the device can operate in SPTS (IPTV) Mode **or** 2x12 pass through MPTS-Mode (DVB over IP) by selecting it (device need to reboot after changing).
To meet customers' various requirements, this device is also equipped with 1 ASI input port which selected services can be streamed to the Gbe output. The ASI out are only used in MPTS mode.
The BLANKOM IGS-924 is also characterized with a high integration level, high performance and very cost effective. This streamer is very adaptable to new generations of IPTV headend systems i.e., in hospitality environments serving FreeToAir (FTA) content and BISS encrypted Services.



Features

- 24 modern Tuner inputs DVB-S/S2/**S2x up to 32APSK** (DVB-C, DVB-T/T2, ATSC/ISDB-Tb optional)
- Supporting DiSEqC commands for up to 4 Satellite positions
- 1 ASI input, 2x parallel ASI out (MPTS)
- IP (2x 512 SPTS or 2x 12 MPTS) over UDP, RTP / RTSP output
- BISS Service de-scrambling Mode 1 and E
- 2 Gigabit Ethernet (GE) output, up to 2x 850 Mbps (SPTS or MPTS)
- 2 independent GE output port, DATA1 + DATA2 (SPTS or MPTS)
- Accurate PCR adjusting (SPTS)
- CA-PIDs filtering and PID re-mapping (SPTS)
- "Null PKT Filter" function (MPTS)
- Webserver for inbuilt Network Management System (NMS) on 100BaseT Rj45
- Updates via WEB-IF

Depending on the region to be delivered, the power cords can be different like EURO or UK versions.

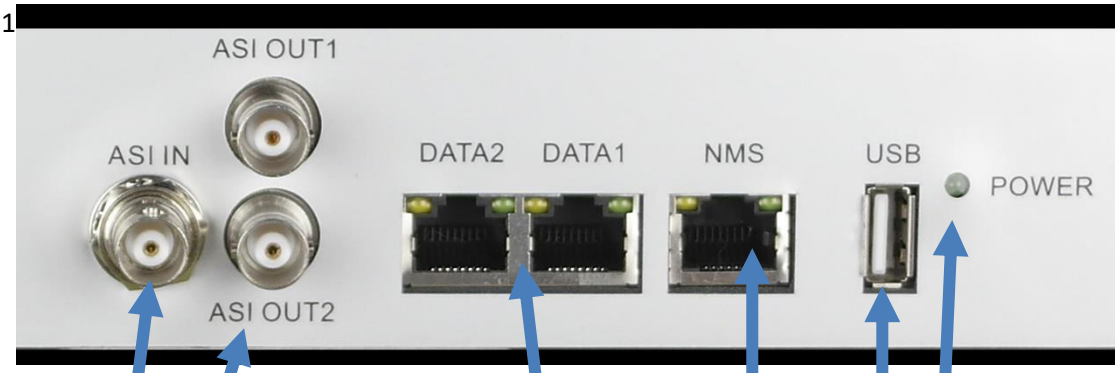
Specifications (DVB-T/T2/C etc. upon request)

Input		24 tuner input + 1x ASI in, TS Player ->SPTS/MPTS output		
Tuner Section	*Option: Multi-mode tuners*	*DVB-C*	*Frequency In*	*60...890MHz*
			Standard	*J.83A(DVB-C), J.83B, J.83C*
			Constellation	*16/32/64/128/256 QAM*
		DVB-T/T2	*Frequency In*	*60...890MHz*
			Bandwidth	*6/7/8 M bandwidth*
		ISDB-T, ATSC	*Frequency In*	*60...890MHz*
	Satellite	**DVB-S**	Frequency In	950...2150MHz
			Symbol rate	0.5...45Msps
			Signal Strength	-65... -25dBm
			FEC	1/2, 2/3, 3/4, 5/6, 7/8
			Constellation	QPSK
			Max input bitrate	≤ 125 Mbps
		DVB-S2	Frequency In	950...2150MHz
			Symbol rate	QPSK/8PSK /16APSK :0.5...45 MSps 32APSK: 0.5...34MSps;
			FEC	QPSK: 1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 8/9, 9/10 8PSK: 3/5, 2/3, 3/4, 5/6, 8/9, 9/10 16APSK: 2/3, 3/4, 4/5, 5/6, 8/9, 9/10 32APSK: 3/4, 4/5, 5/6, 8/9, 9/10
			Constellation	QPSK, 8PSK, 16APSK, 32APSK
			Max input bitrate	≤ 125 Mbps
		DVB-S2X	Frequency In	950...2150MHz
			Symbol rate	QPSK/8PSK /16APSK :0.5...45 Msps 8APSK: 0.5...40Msps 32APSK: 0.5...34Msps
			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, 9/10, 2/3-L, 32/45, 11/15, 7/9
			Constellation	QPSK, 8PSK, 8APSK, 16APSK, 32APSK
			Max input bitrate	≤125 Mbps

BISS Descrambling	Mode 1, Mode E (Up to 850Mbps) (descrambling individual program's)	
Output	2x 512 SPTS IP mirrored output over UDP and RTP/RTSP protocol through GE1 & GE2 port (IP address and port number of GE1 and GE2 are independent), Unicast and Multicast	
	2x12 MPTS IP output (for Tuner/ASI passthrough) over UDP and RTP/RTSP protocol through GE1 and GE2 port, Unicast and Multicast	
	2 ASI output – parallel, TS-Player-Streamer from connected USB-PEN	
System	Web-Server based management via 100BaseT port	
	software upgrade via Web-IF	
Miscellaneous	Dimension	482mm×230mm×44mm (W×L×H)
	Approx weight	3.6kg
	Environment	0...45℃ (working condition); -20...80℃ （in Storage）
	Powerrequirements	100…240VAC, 50/60Hz
	Powerconsumption	20W

Connecting:

1



1	Power indicator
2	NMS port: Network management interface
3	USB port for TS Player
4	DATA 1 +2 port （GE1&GE2）: IP out port
5	ASI input port
6	Parallel ASI-out ports

Power switch, Fuse, IEC Male AC IN,

RF-Inputs F-female 75 Ohm

Bottom: 1 – 12

Top: 13-24

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

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

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

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

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 th must be complied with.

Annotation :

Tous les modes d'emploi que nous publions sont ntenna aux professionnels de l'antenne et de l'informatique qui ont des connaissances de base en matière de ntennao, de mise en ntenn et de technologie des équipements. Le respect de toutes les réglementations et directives pertinentes pour l'installation et l'exploitation de ces ntenna 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 nten 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 nte 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 nte 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 ntennaonal de la ntenna 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 ntennaonal de ntenna 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 almost (! Please check rear) designed for the wide range of 100-230V AC, 50/60Hz; a manual adjustment of the voltage is not necessary.
For some models, the second power connector is feeding another independent power supply for internal redundancy. For a maximum of redundancy, both power supplies should use different circuits.
All the outputs are decoupled from one another. Thus, the circuit does not have any effect on the functioning of the device. Connections that are not required need not to be terminated.
Suggestion: CAT 6E Ethernet cable for Gigabit-Ethernet

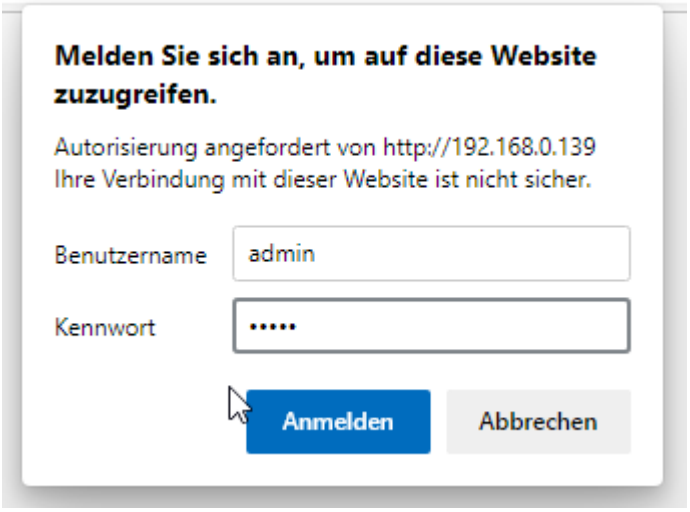
Note:
Ipv4 global scope sessions use **multicast addresses** in the range 224.2.128.0 – 224.2.255.255 with SAP Announcements being sent to 224.2.127.254 Port 9875 (note that 224.2.127.255 is used by the obsolete SAPv0 and MUST NOT be used).
Ipv4 administrative scope sessions using administratively scoped IP multicast. The multicast address to be used for announcements is the highest multicast address in the relevant administrative scope zone.
For example, if the scope range is 239.16.32.0 – 239.16.33.255, then 239.16.33.255 is used for SAP Announcements.

Quick-Start Installation:

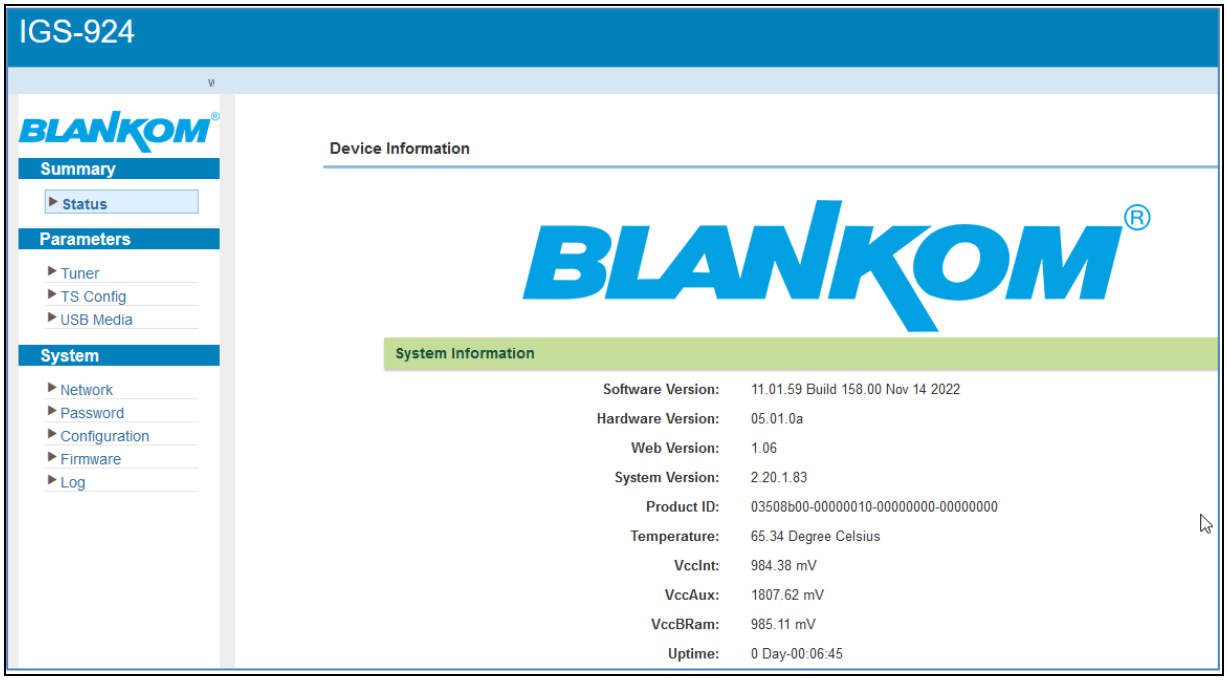
The user can control and set the configuration of the device with any computer by connecting to the web server-Interface (WebIF) by the **100BaseT NMS** Port. The user should ensure that the computer's IP address is different from other device's IP address; otherwise, it might cause an IP conflict. Be sure to set it in the same network range.

Default Login-Data is 192.168.0.136 (default factory address) are **admin/admin**:

Note: We recommend using always the newest version of the browser Firefox.



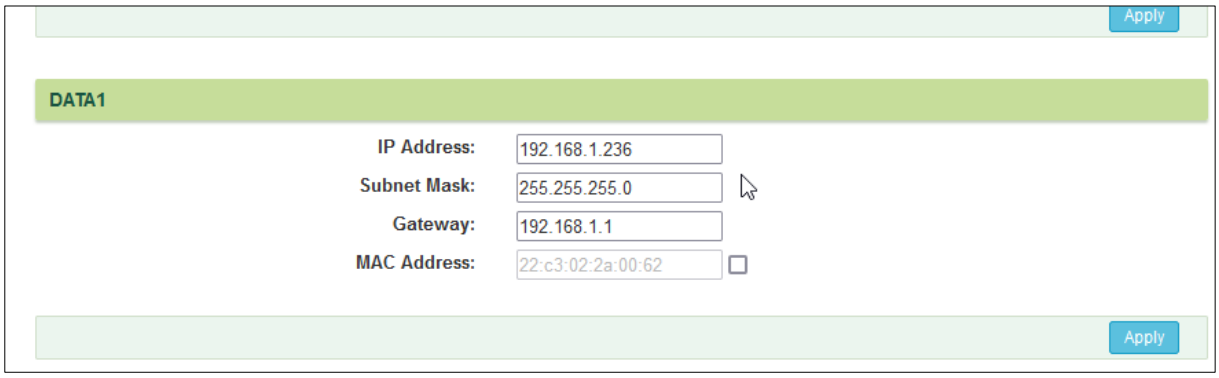
Which lets you start in the STATUS display:



NOTE:

The unit's Web-Interface is also reachable by

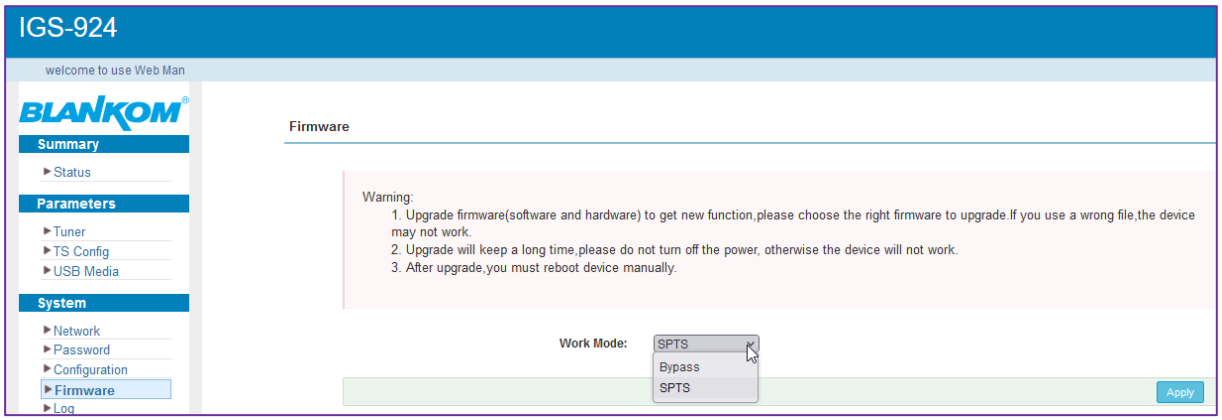
http://IP-Address of connected DATA-Port 1 or 2: (see also network section and later)

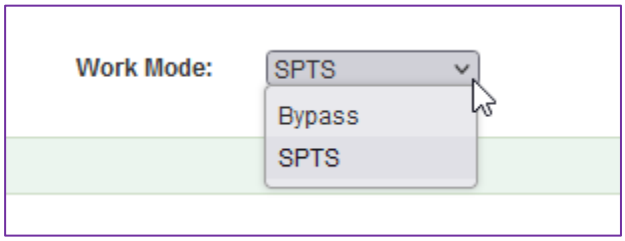


Please note, the DATA-GbE Port default settings are different than shown here.

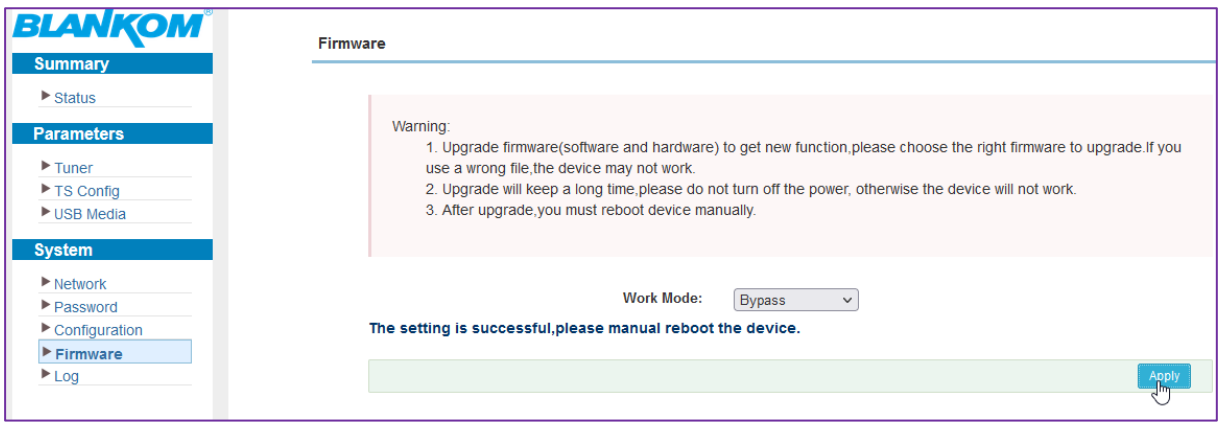
Usually, the device will be shipped in MPTS mode and the config-Menus are different in SPTS and MPTS

Please select the operating mode for SPTS (default) or MPTS in the Firmware section:





Bypass means MPTS 1:1 transponder to IP stream output



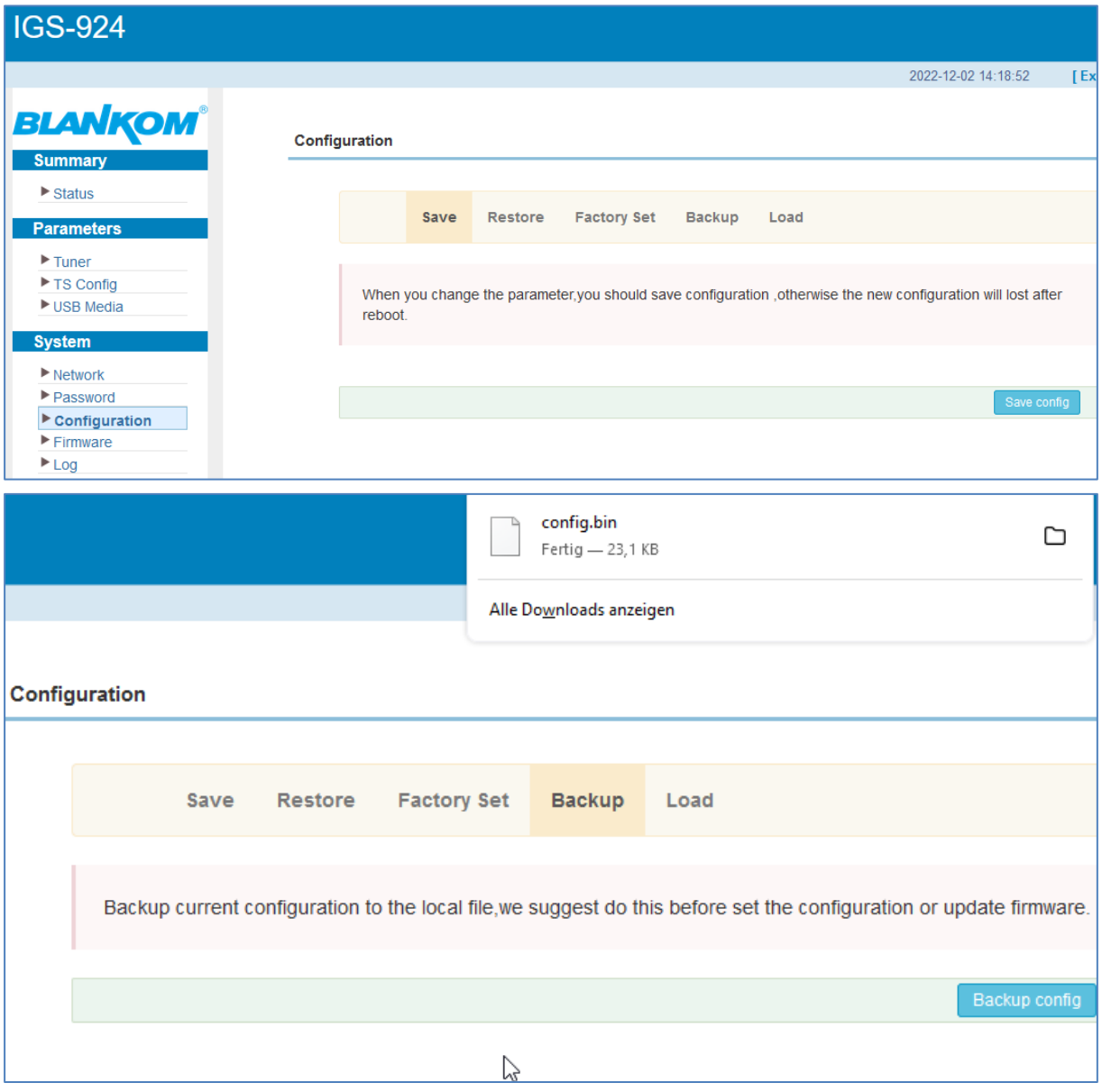
Note:

If you change **the SPTS mode** to **MPTS** (and vice versa) you need to backup your settings before the

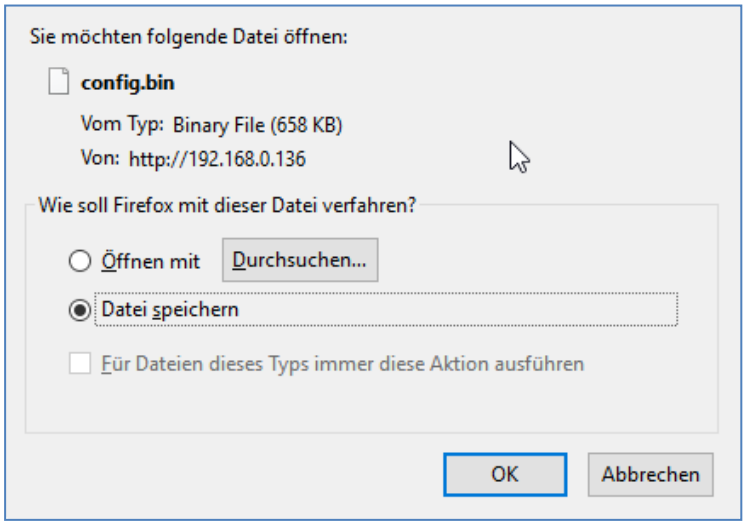
change. It doesn't accept the previous saved settings from the SPTS or MPTS mode because they are different. Sounds logical isn't it?

Just to show the difference for MPTS – outputs – only 24 IP streams can be assigned. You should decide whether a stream goes through GbE DATA1 or DATA2 so please balance the MPTS streams if more than 800 Mb/s are to be streamed.

Manually reboot is needed if you switch the modes ByPass MPTS <-> SPTS and maybe **better to safe the config first to external file on a PC…**

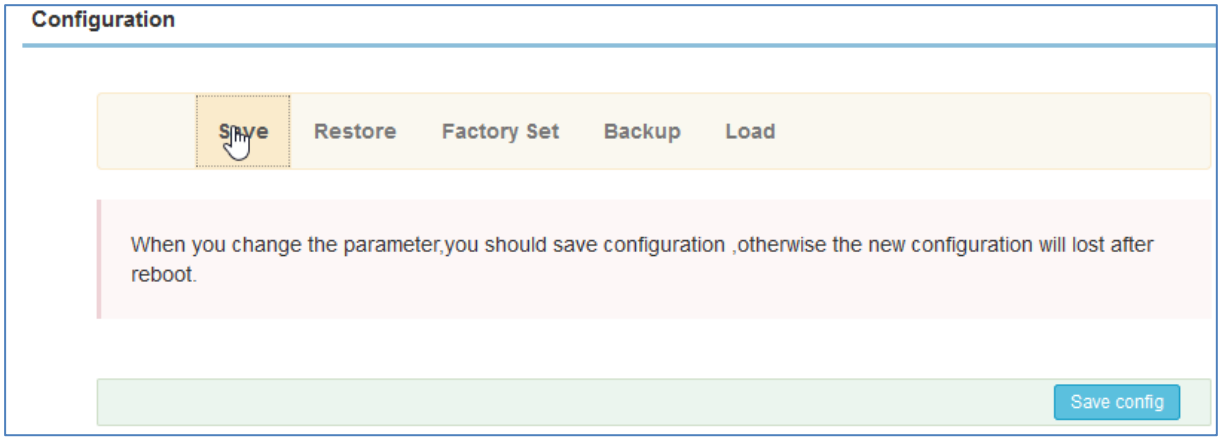


LOAD:

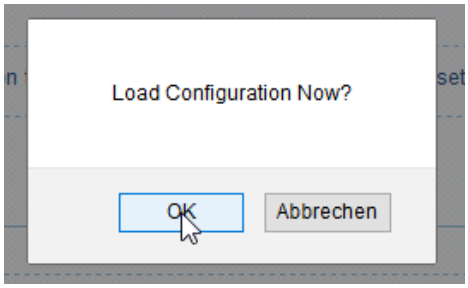


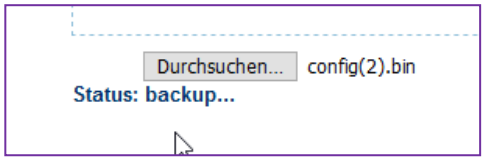
The file can be uploaded by LOAD CONFIGURATION.

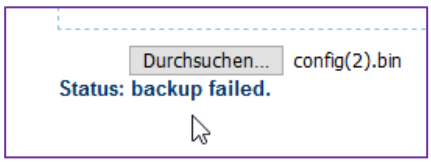
The Safe-Restore menu is self-explaining: It internally SAVEs or RESTORE the settings.



Load an external previously saved config is almost a good idea:

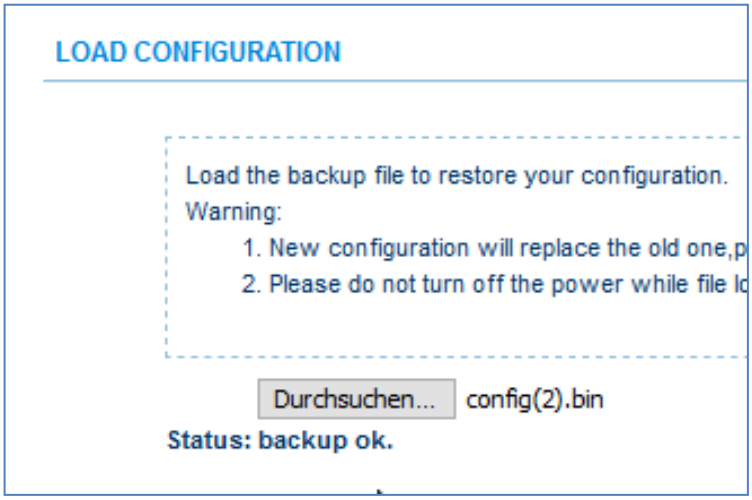




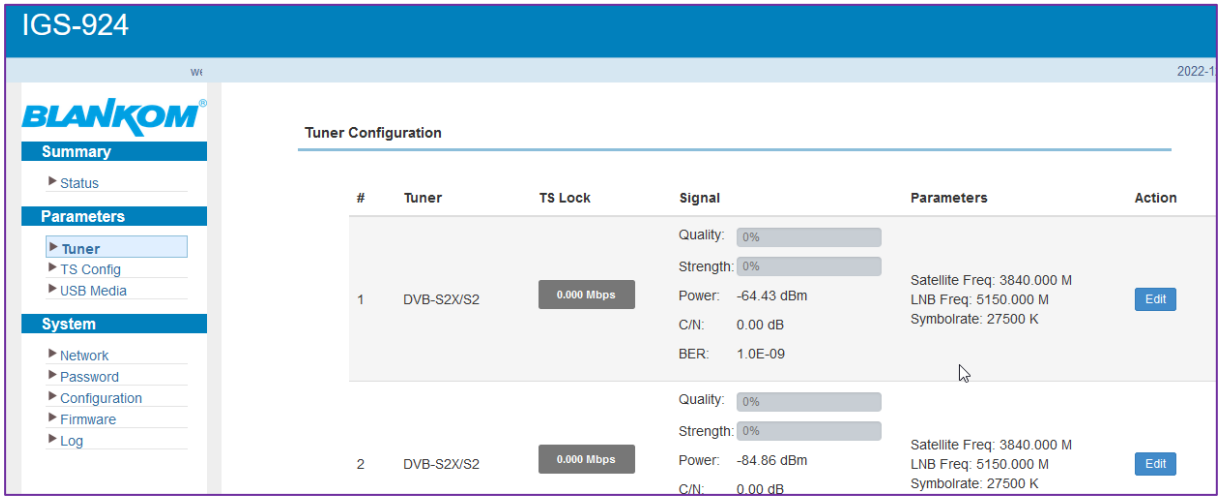


Success…

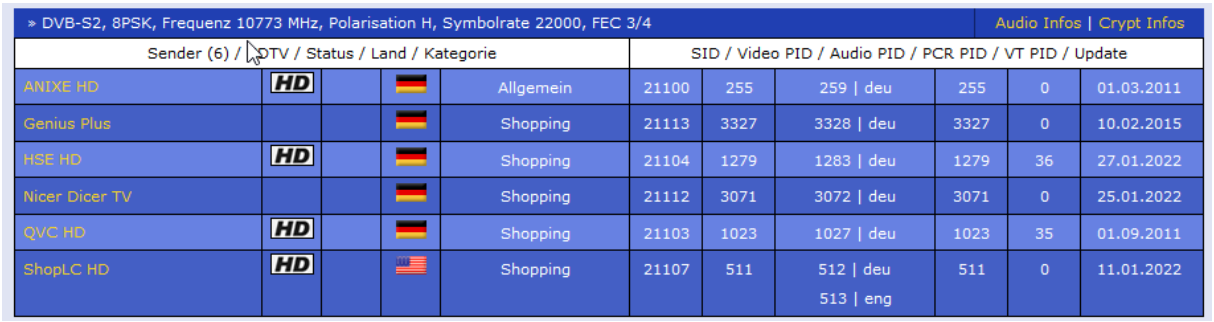
Backup config…



MPTS-Mode:

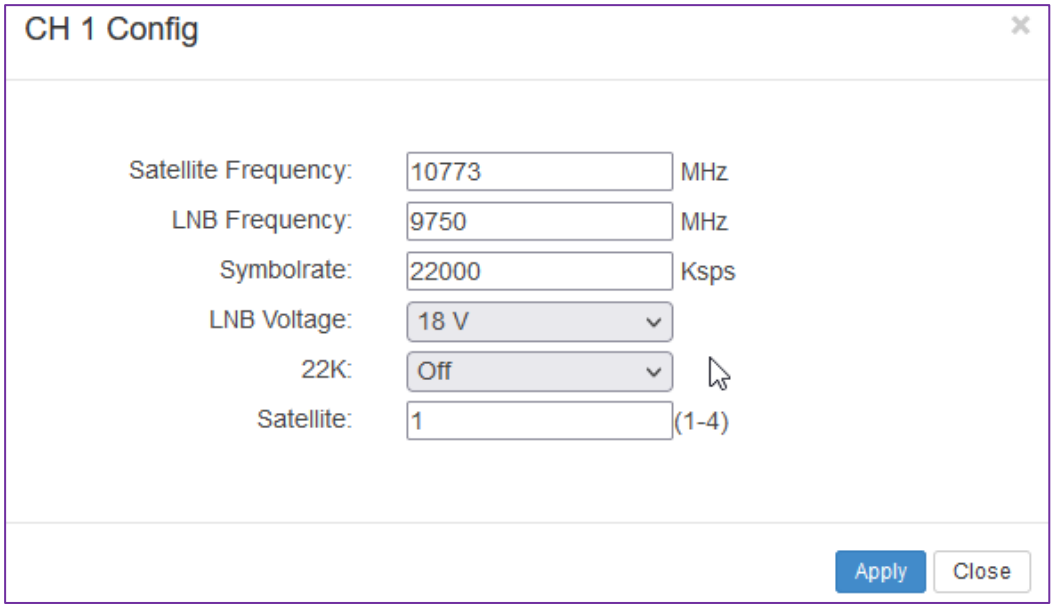


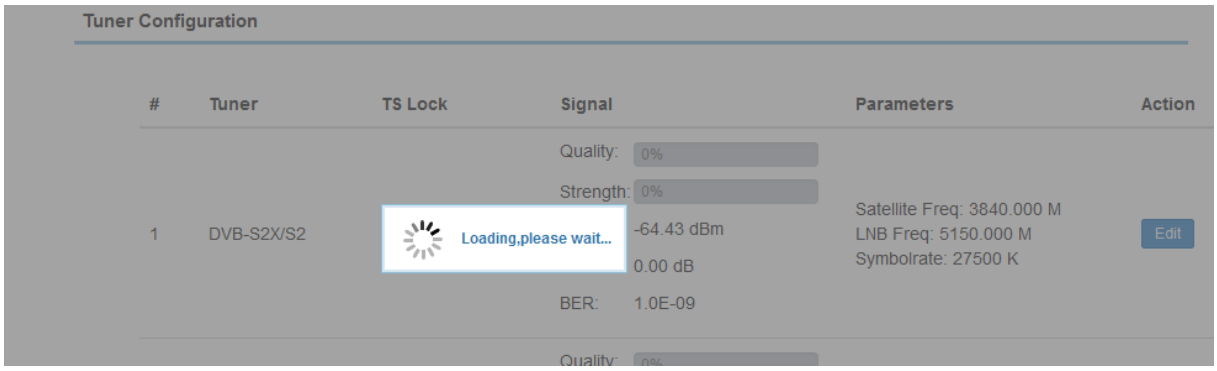
Adjust a tuner input – same like in SPTS :

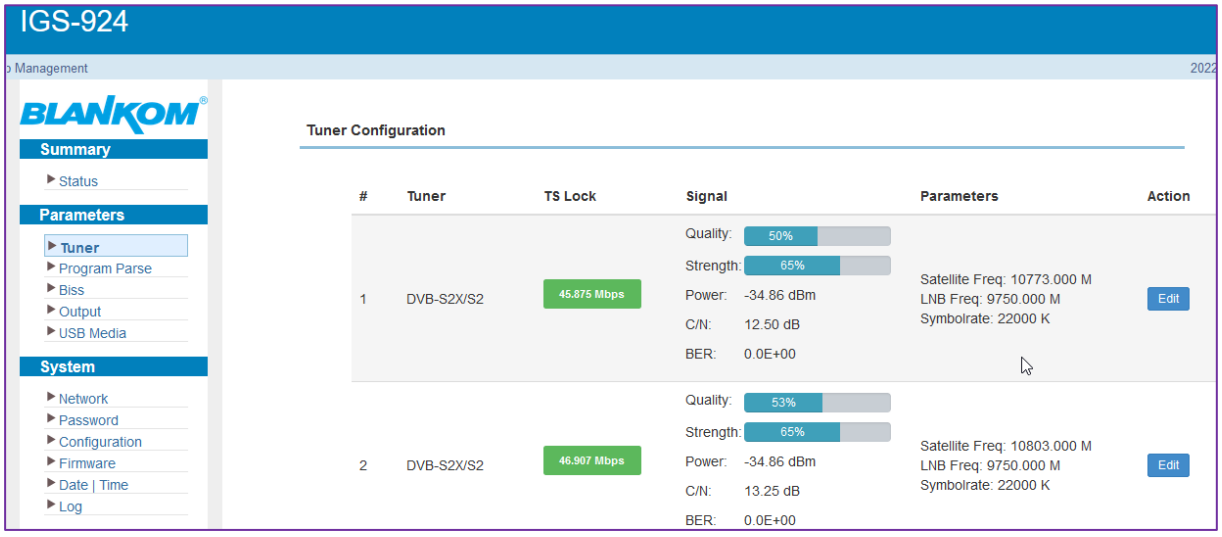


» DVB-S2, 8PSK, Frequenz 10773 MHz, Polarisation H, Symbolrate 22000, FEC 3/4 — Audio Infos | Crypt Infos

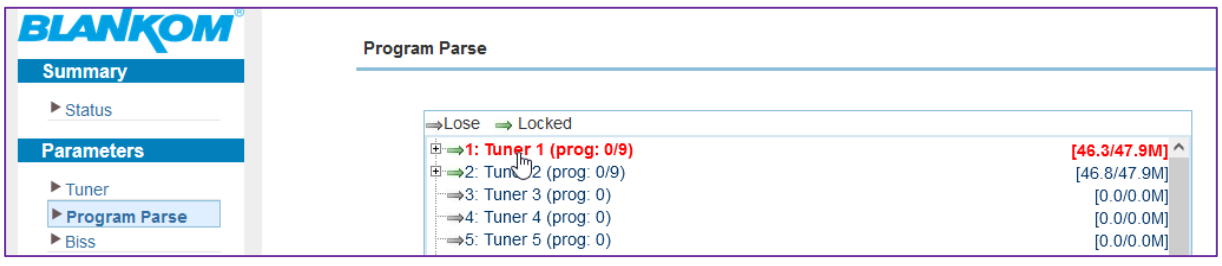
Sender (6) / DTV / Status / Land / Kategorie					SID / Video PID / Audio PID / PCR PID / VT PID / Update					
ANIXE HD	HD			Allgemein	21100	255	259 | deu	255	0	01.03.2011
Genius Plus				Shopping	21113	3327	3328 | deu	3327	0	10.02.2015
HSE HD	HD			Shopping	21104	1279	1283 | deu	1279	36	27.01.2022
Nicer Dicer TV				Shopping	21112	3071	3072 | deu	3071	0	25.01.2022
QVC HD	HD			Shopping	21103	1023	1027 | deu	1023	35	01.09.2011
ShopLC HD	HD			Shopping	21107	511	512 | deu 513 | eng	511	0	11.01.2022



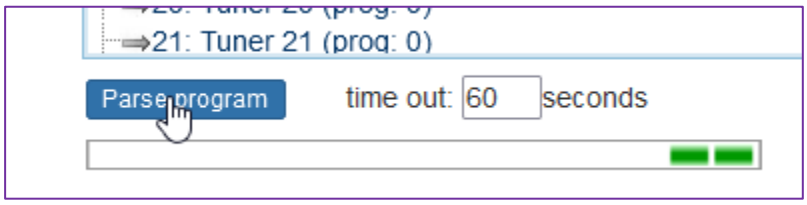




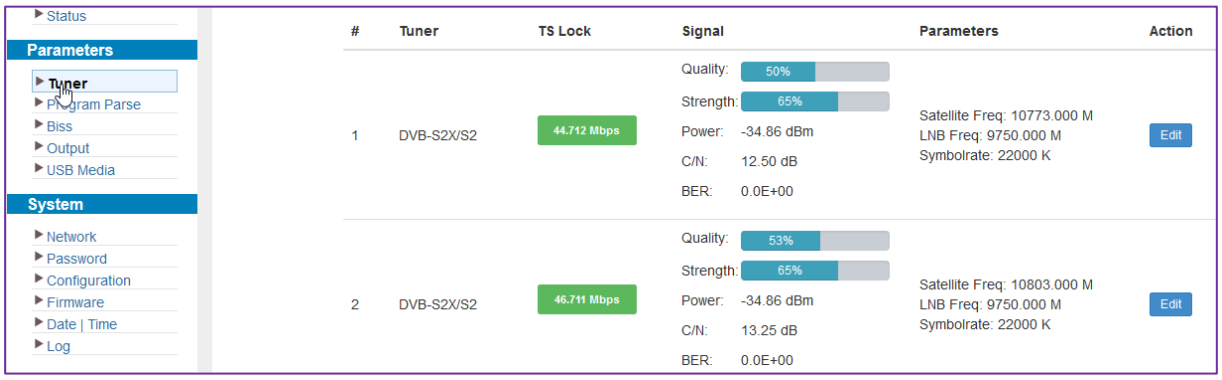
Be patient and sometimes the tuner values appear after you make your Content parsing on:



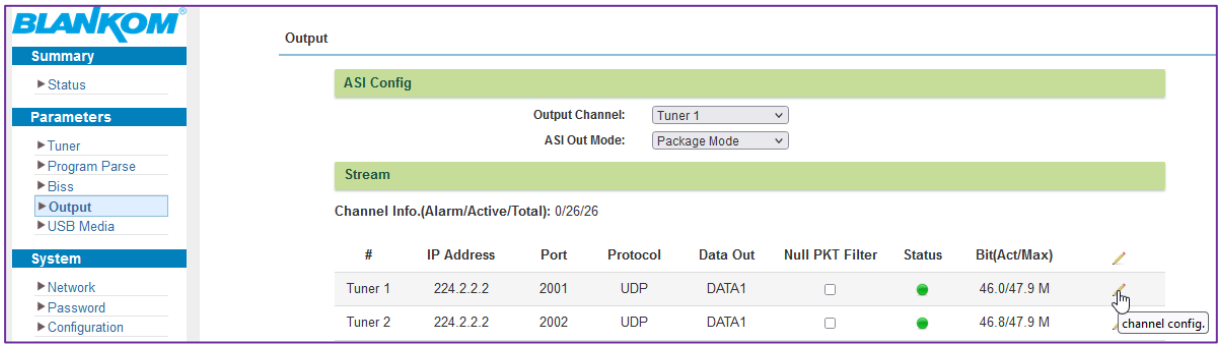
By selecting and PARSE it:



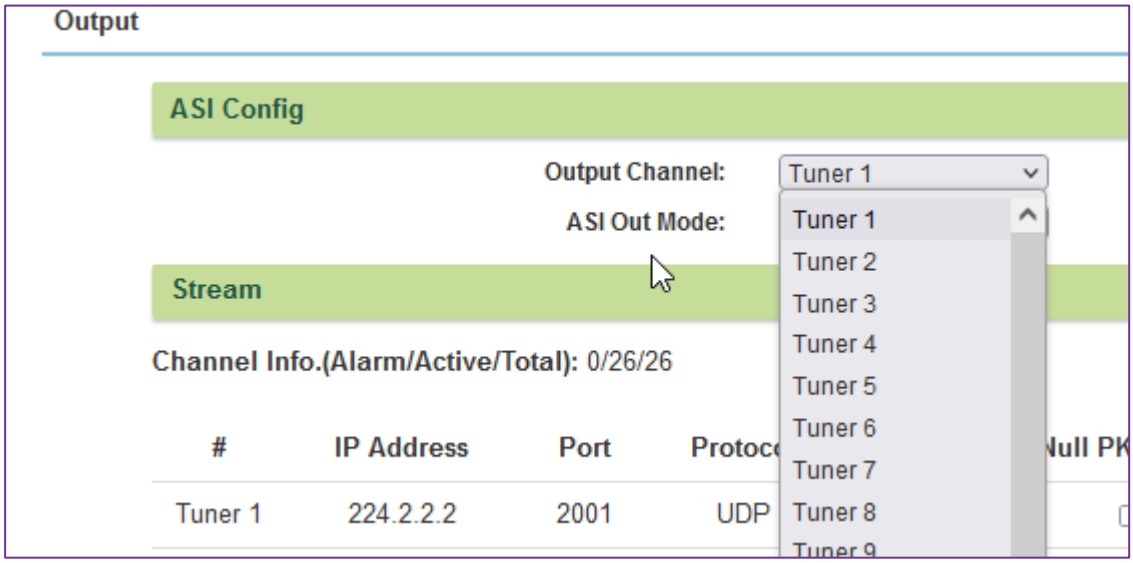
Back to the tuner menu shows its reception:



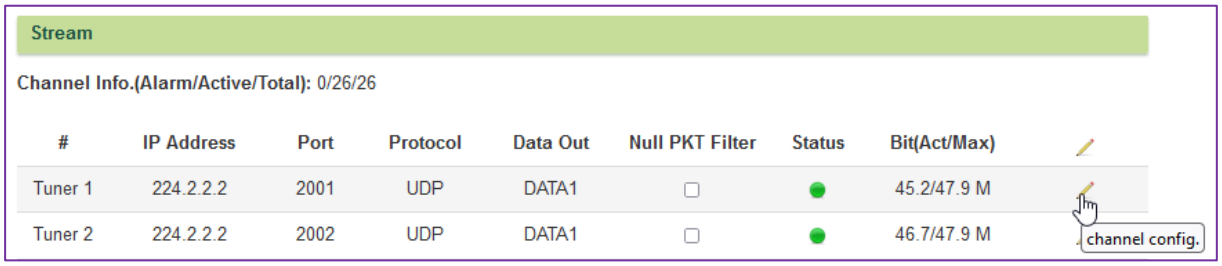
Follow that for every tuner input and maybe ASI IN:



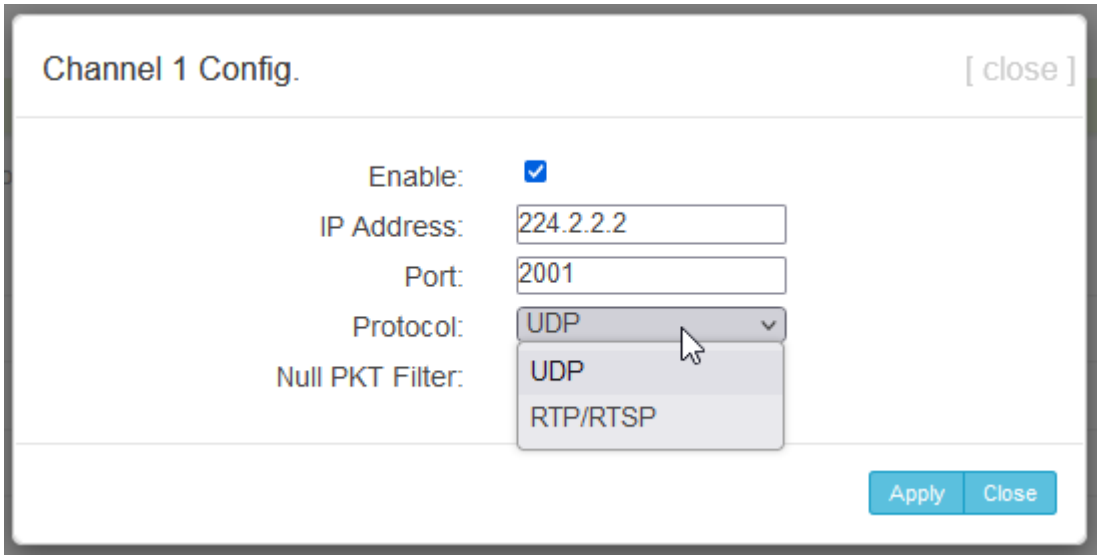
The 2 ASI OUT-ports are double so working in parallel and work only with MPTS.
Select which tuner goes out to ASI:



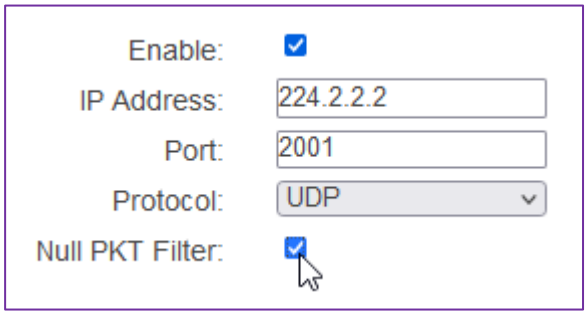
The package or Byte mode can be chosen…



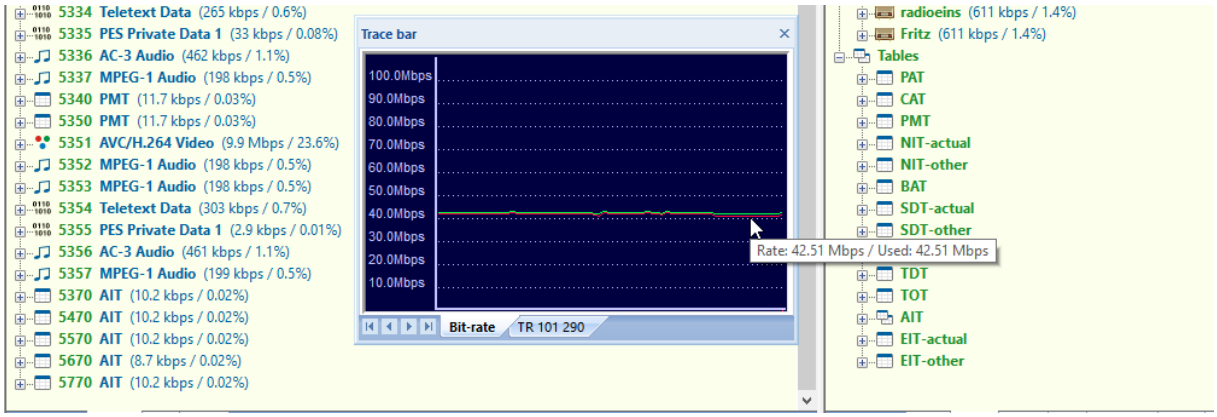
We select the streaming out:



Chose UDP or RTP/RTSP to enable the multicast in parallel with the RTSP unicast (see below in this manual).
Check whether you want to parse the CBR-stream which includes the PID8191 Zero packets for the Constant Bitrate or w/o Zeros as VBR-Stream:

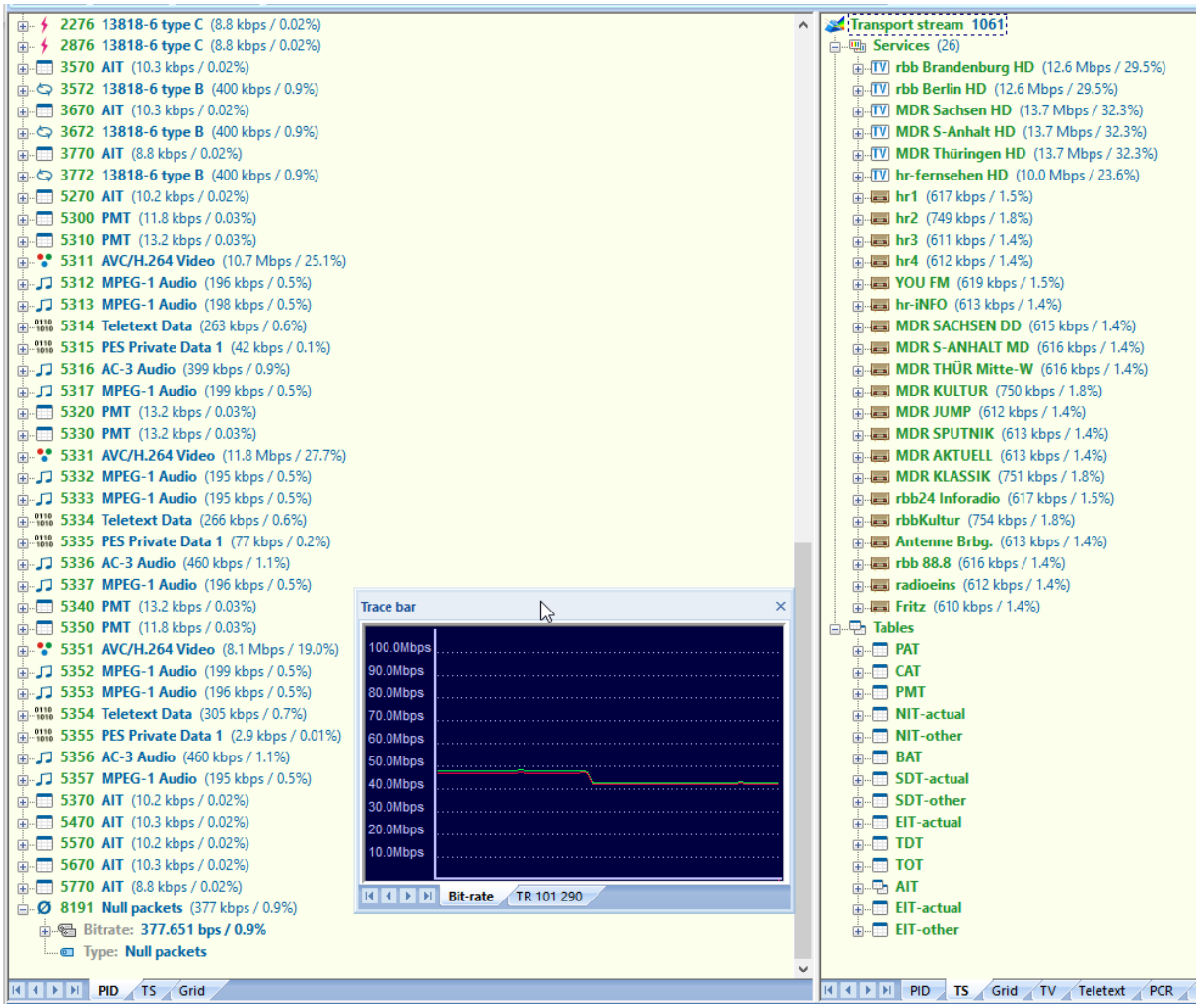


VBR:

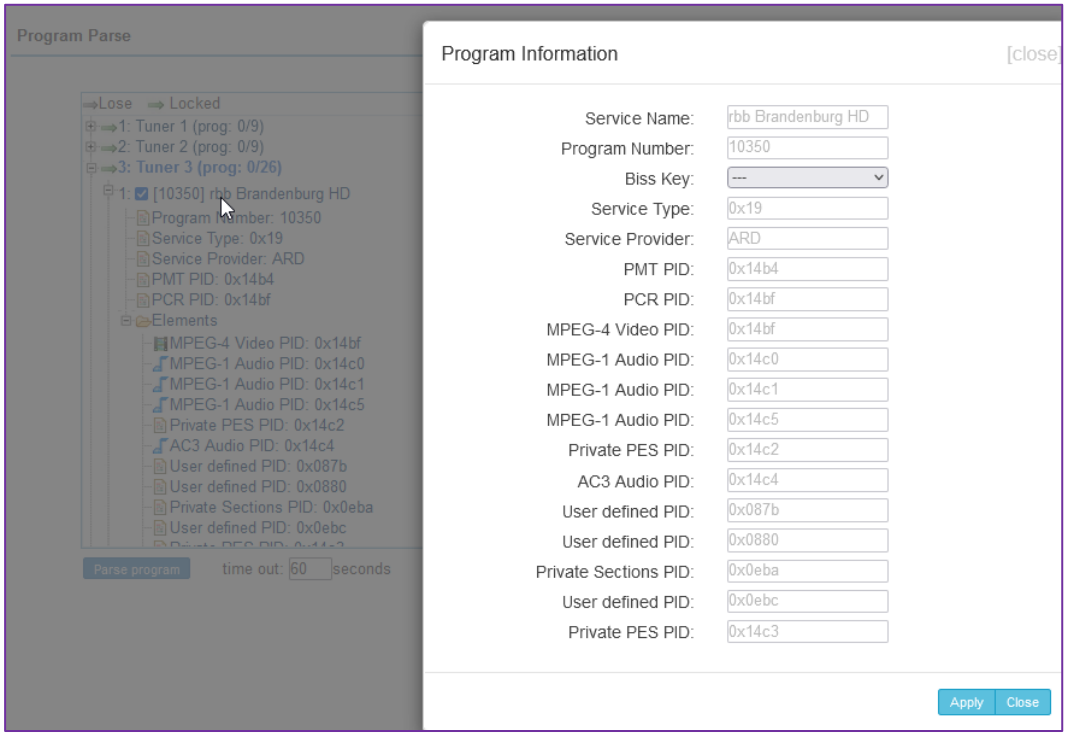


No PID8191dec = no Zero packets

CBR: with PID 8191dec

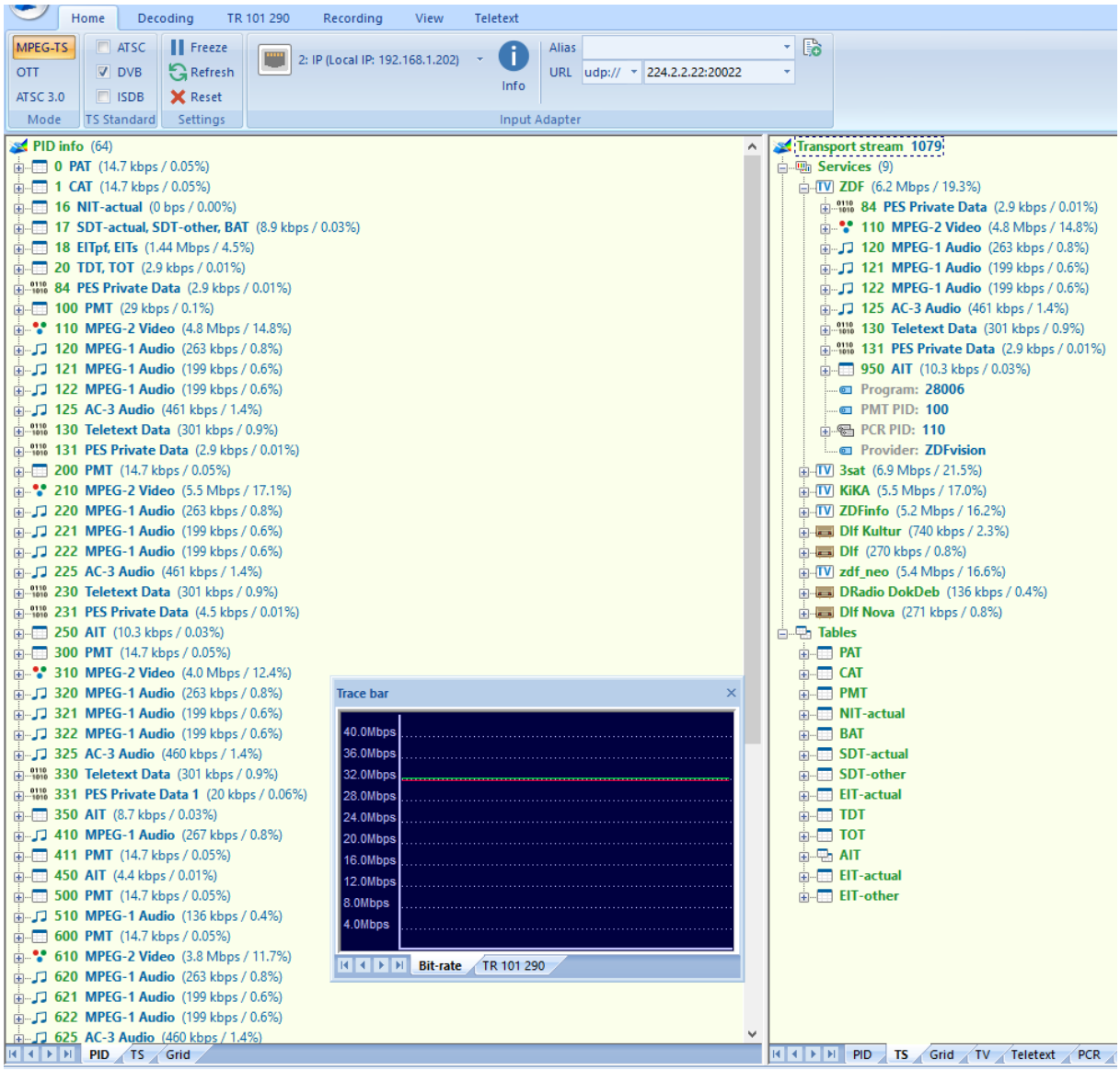


Because we are just transporting 1:1 the TS Input to a Stream output sehr gutno content can be edited except the BISS key (see below in the manual)

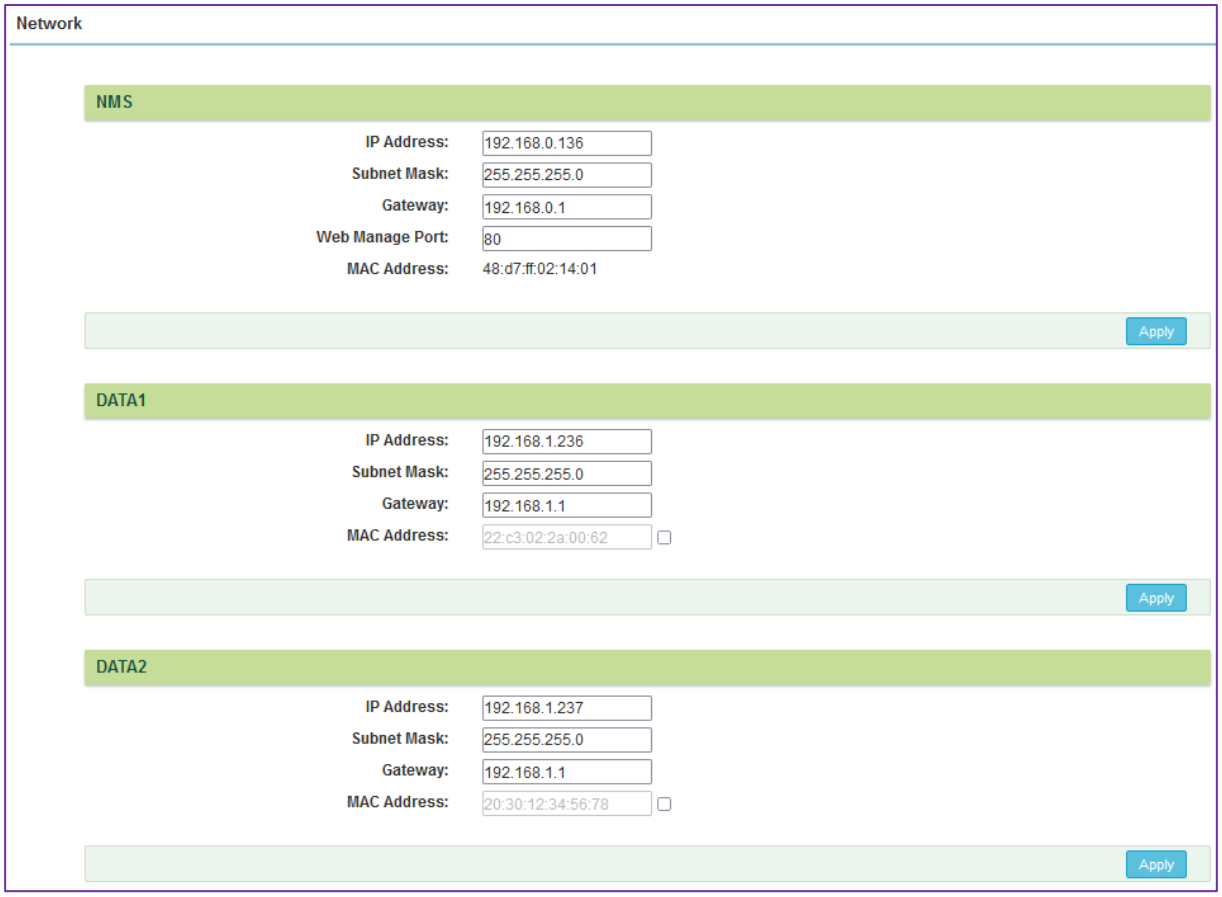


Another VBR example:

Tuner 17	224.2.2.2	2017	UDP	DATA2	☑	●	19.2/42.6 M
Tuner 18	224.2.2.2	2018	UDP	DATA2	☑	●	17.4/33.8 M
Tuner 19	224.2.2.2	2019	UDP	DATA2	☑	●	42.0/42.6 M
Tuner 20	224.2.2.2	2020	UDP	DATA2	☑	●	41.3/42.6 M
Tuner 21	224.2.2.2	2021	UDP	DATA2	☑	●	36.2/38.0 M
Tuner 22	224.2.2.22	20022	UDP	DATA2	☑	●	32.3/38.0 M
Tuner 23	224.2.2.2	2023	UDP	DATA2	☐	●	36.1/38.0 M
Tuner 24	224.2.2.2	2024	UDP	DATA2	☐	●	33.5/38.0 M



Network Setup:



We assume that the user is familiar with IP settings and already knows his own system to connect the unit to. If you use the **Output Streaming**: **We recommend using 2 separate Switches for MNS and Streams**! Attention: The Switch must support IGMP Filtering to not overload the NMS 100 baseT port At least a 100BaseT for the Management NMS RJ45 port and a second one with Gigabit Ethernet 10/100/1000BaseT with at least Layer 2+ 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 (Never ones use 1GbE ports) but too many inputs into a STB can result in side effects. 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.

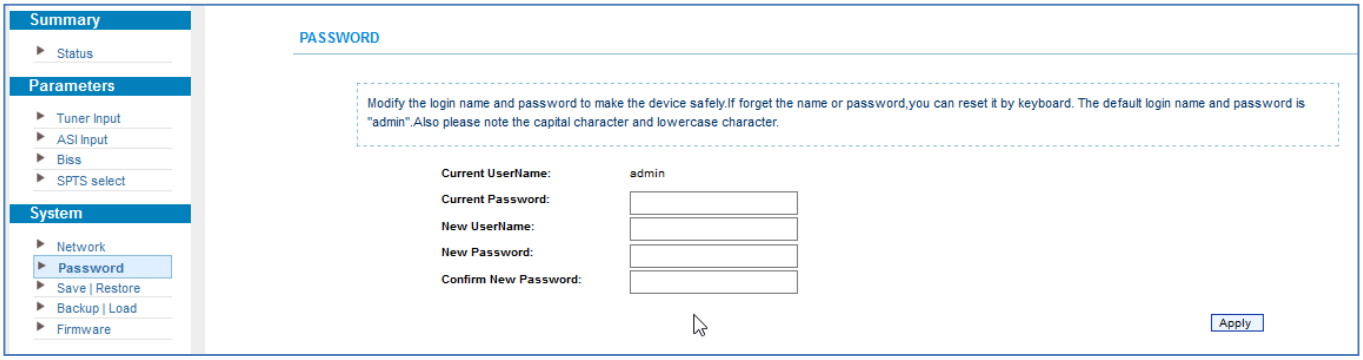
Because to not accidently put DATA and NMS port in the same sub-network, the data – port setting does not allow this by default. Usually, the DATA GbE Ports needing at least own and free IP addresses- otherwise the Switch or the receivers (i.e., IPTV STB's) cannot locate the source of the streams.

Note: DATA1 and 2 are handled by the same Network-hardware and is addressed as (Linux users know that):

eth1 and eth1.1

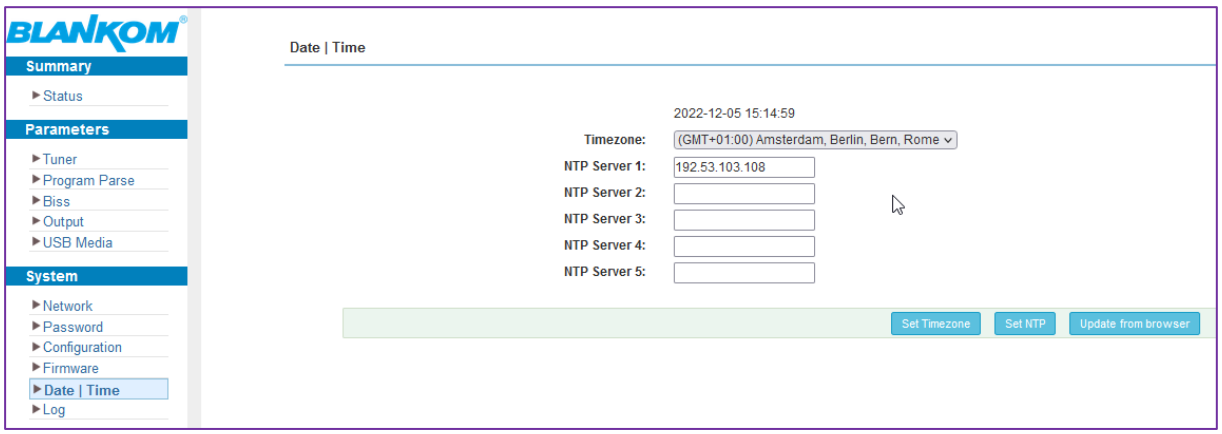
So, they are not fully independent but should work independently. But please assure different IP addresses and avoid network conflicts.

Changing a user-account:



Change it to your needs, but do not forget the password otherwise you would need to reset the unit with the Front-panel RESET switch (press it min. 10…15 sec) to factory default.

Set Date and time as NTP:



Tuner-Setup:

Note: DVB-C / T Tuning is slightly different and you need to enter the center- frequency of the to be received DVB-C/QAM channel. The tuner will detect the inside-channel values. NOTE: a comma in the frequency like 624,25 MHz has to be entered in AMERICAN STYLE as a ‘.’ Instead the ‘,’

So we concentrate on Satellite first:

Basics: We recommend to connect every tuner RF Input to the L-Band network by

-Using a Multiswitch with more than one SAT-position and > 16 SAT-IF outputs: You can set every single Tuner Input individually.

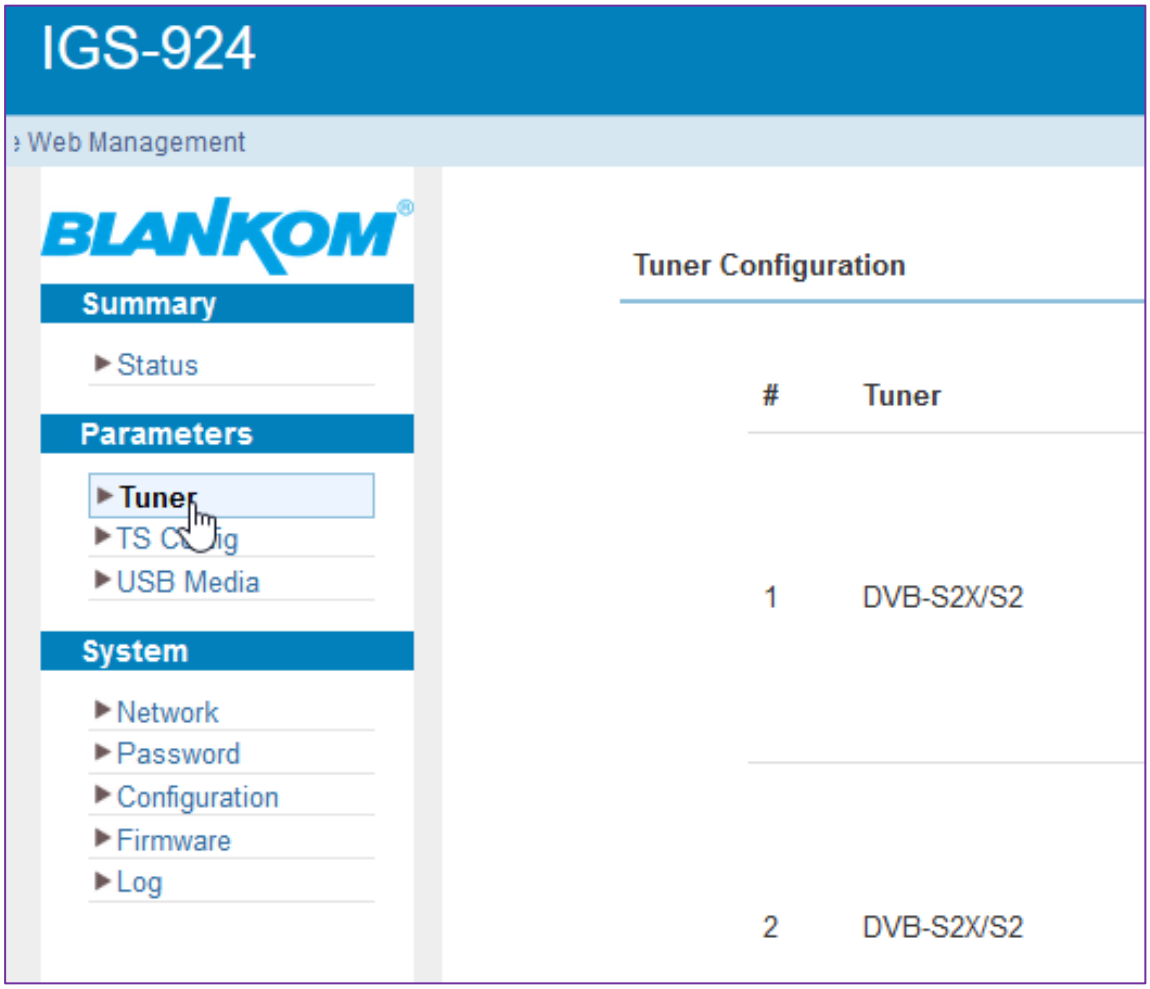
-Using a SAT-Splitter: Be carefully, *active* splitter needs at least one 13V…18V DC connection to it to operate. You should avoid to switch on V/H polarization Voltage 13/18V on every Input port. The active splitter would pass the 13V or 18V to the Multiswitch and assigning the fixed polarization to the Multiswitch. So, all selected Transponders should be either in Vertical (13V) or Horizontal (18V) position.

***Passive* splitters should be used with DC Passthrough and the Voltage should be passed only once as well.**

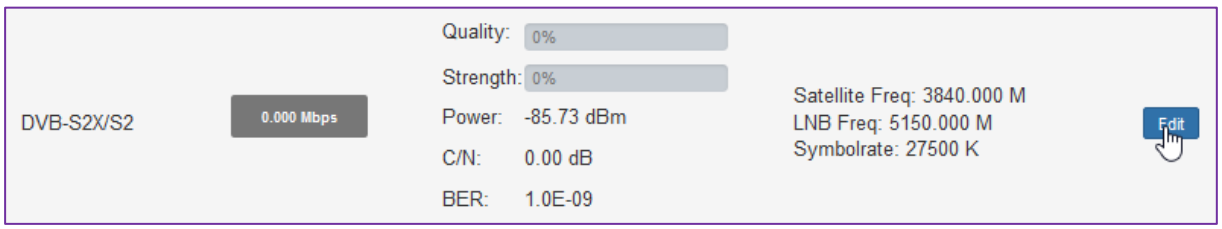
We recommend to check www.lyngsat.com or www.satbeams.org for correct settings.

Example:
https://www.lyngsat.com/Astra-1KR-1L-1M-1N.html
LOW-Band =9750 MHz LNB-IF frequency - while
HIGH-band = 10600.000MHz using 22KHz signal

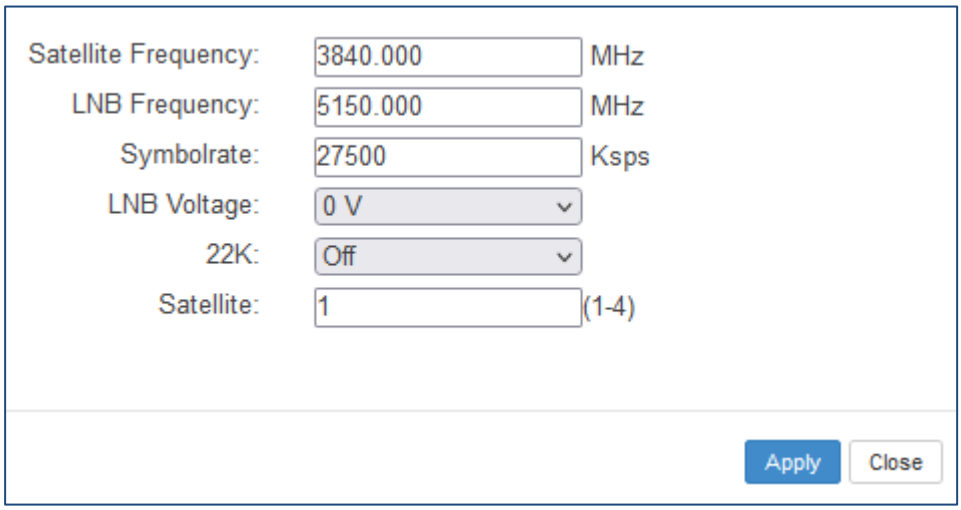
Go to



So you see preset values for a C-Band:



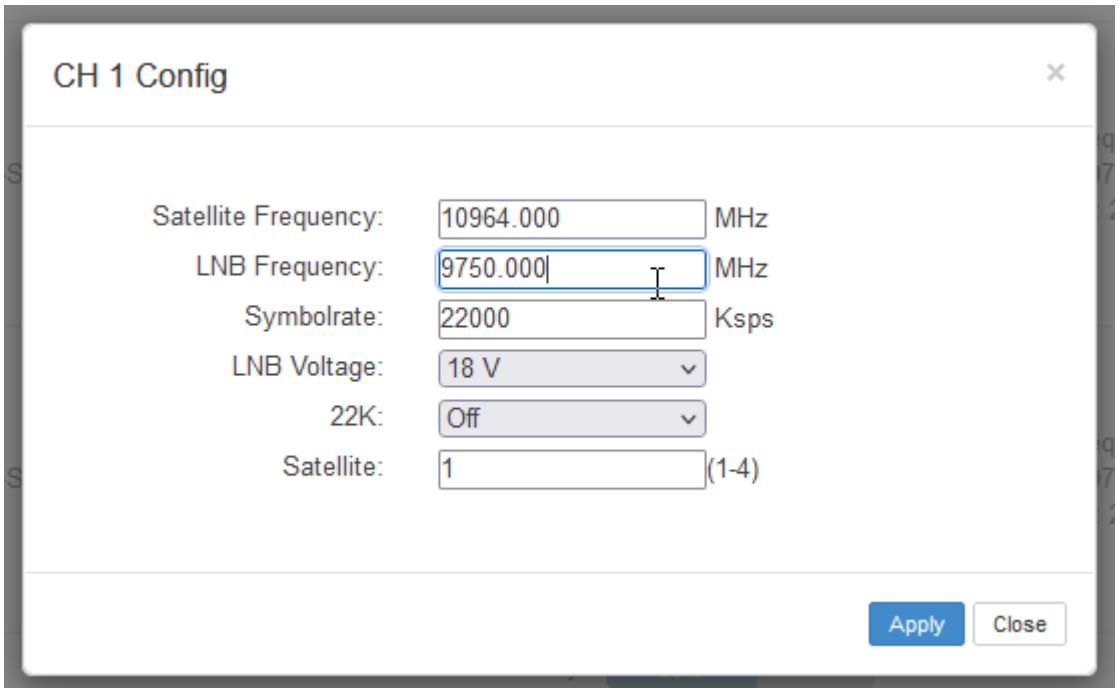
You should click on EDIT opens following config popup:



Here you need to enter the data for your Satellite Transponder you want to receive:
Example ASTRA Satellite (is DiSEqC port A (1) at our Multiswitch): satindex.de - ASTRA

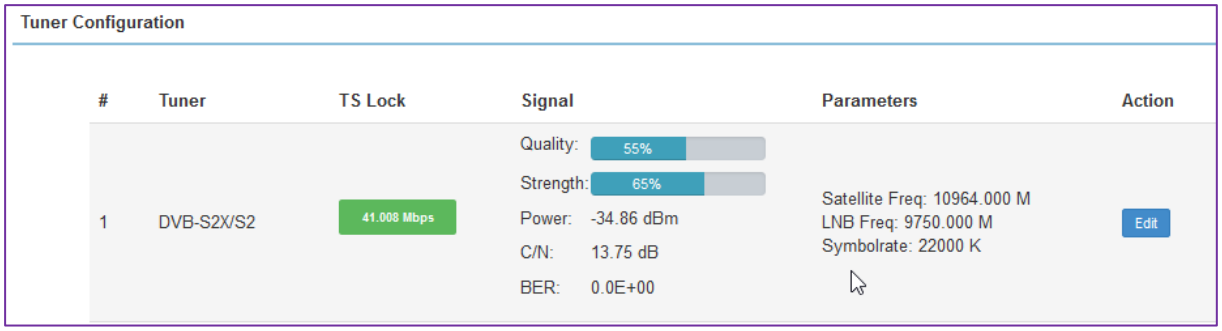
» DVB-S2, 8PSK, Frequenz 10964 MHz, Polarisation H, Symbolrate 22000, FEC 2/3										Audio Infos | Crypt Infos
Sender (8) / HDTV / Status / Land / Kategorie					SID / Video PID / Audio PID / PCR PID / VT PID / Update					
BILD HD	HD			Dokus / Reportagen	10101	511	515 | deu	511	0	28.07.2021
Channel21 HD	HD			Shopping	10104	1279	1283 | deu	1279	0	30.01.2016
Handystar TV HD	HD			Shopping	10102	767	771 | deu	767	0	05.06.2019
MTV HD	HD			Musik	10103	1023	1027 | deu	1023	0	02.09.2014
MTV HD Austria	HD			Musik	10113	1023	1027 | deu	1023	0	01.06.2015
QVC STYLE HD	HD			Shopping	10105	1535	1539 | deu	1535	37	16.01.2020
TLC HD	HD			Allgemein	10100	255	259 | deu	255	32	26.02.2018
TLC HD Austria	HD			Allgemein	10110	255	259 | deu	255	32	26.02.2018

You see 4 of 8 are encrypted and cannot be decrypted by this FTA receiver.:
Entering its values: Transponder Frequency: 10964 , Low band LNB-IF=9750, 22000 KS/s, 18 V = Horizontal, 22KHz High band switching = OFF because we are in low Band (border is 11700 MHz)

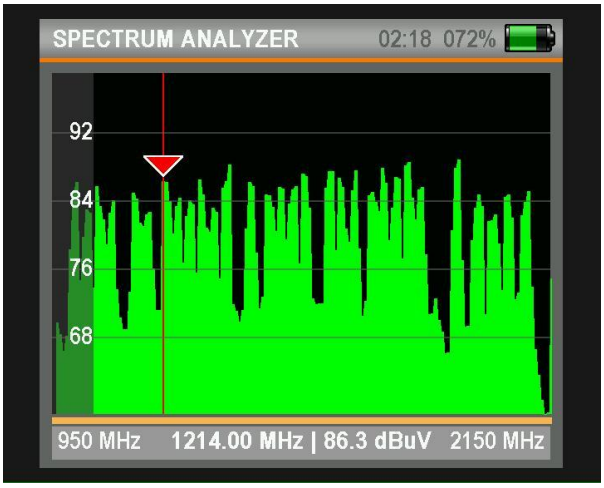


Please be patient, the tuners need to swing into it and it takes a moment until the web-IF

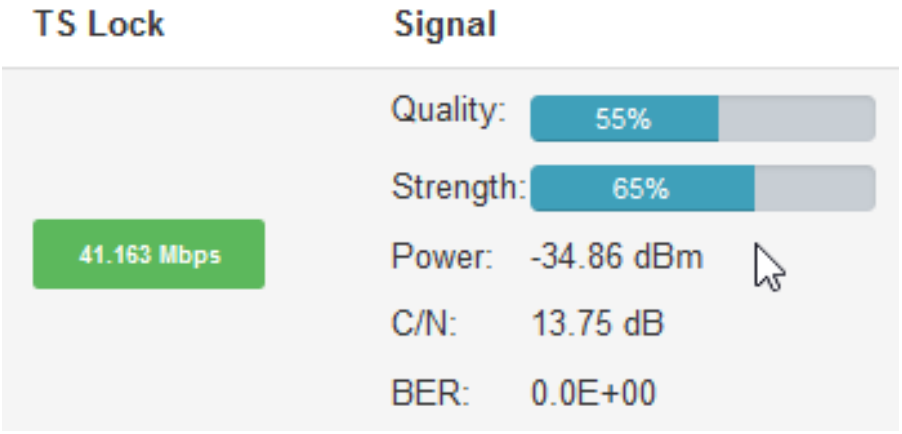
shows the reception (or not):



You are getting some values but do not be irritated because the real reception quality from the Multiswitch directly measured is shown here:



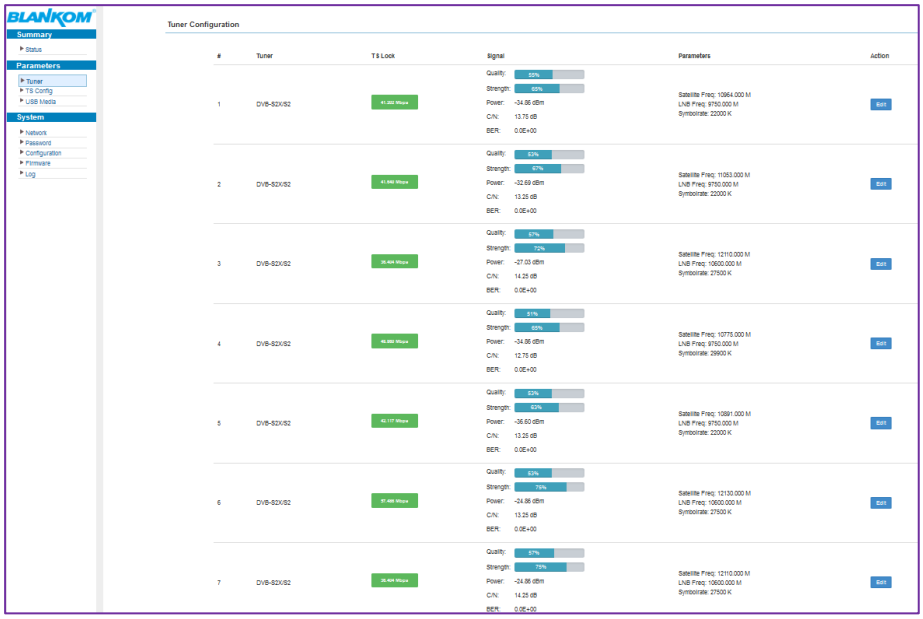
And the IGS-tuner shows lower values:



because *it is not a real measurement instrument* – just showing good or weak is reliable.

If you face CC errors or disturbed pictures at TV IP receiver side it might because the INPUT SIGNAL is too WEAK, so you should amplify the COAX SAT Inputs. This is the case with long coax-cables which causing attenuation every meter by meter.

Anyway, repeat these tuner configurations for every of the to be used inputs of the machine:

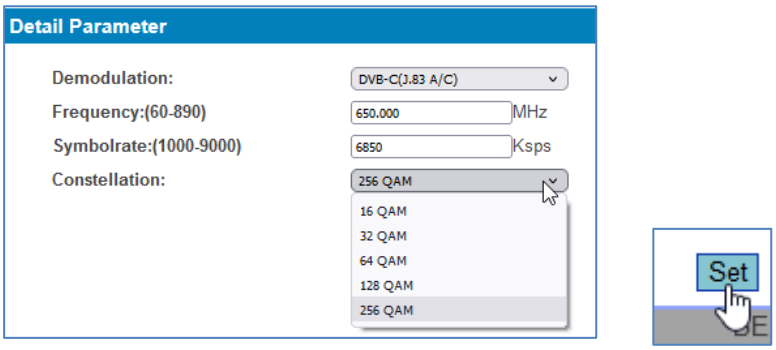


…

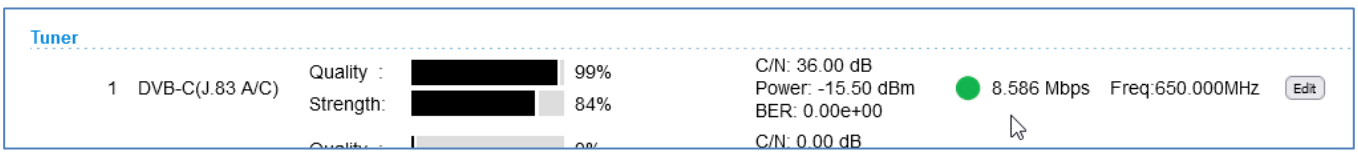
DVB-C or -T Tuning:

Of course, you need the proper DVB-tuner installed instead of SAT: Select your RF-Mode:

Then we enter the known parameter: Modulation here DVB-C-J83A/C, Centre Freq.: 650MHz (unusual = no Cenelec-Channel-Plan), 6850 SR, 256QAM constellation, assure the proper dBm (dBµV)

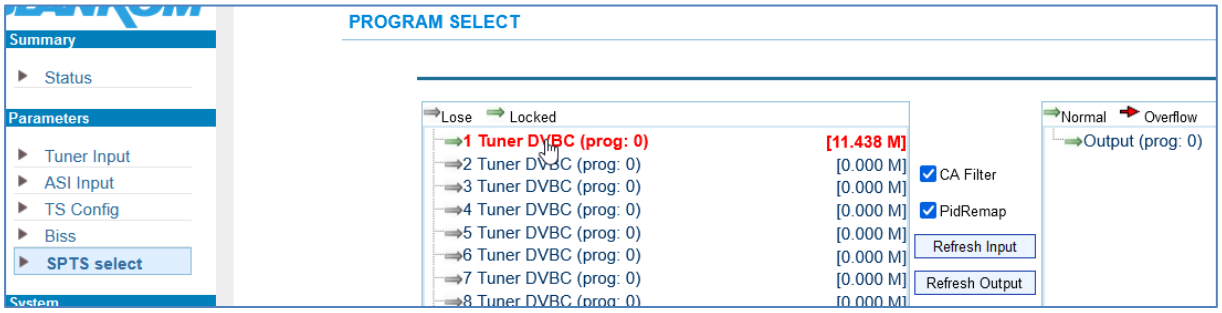


Input values in the Coax-cable…

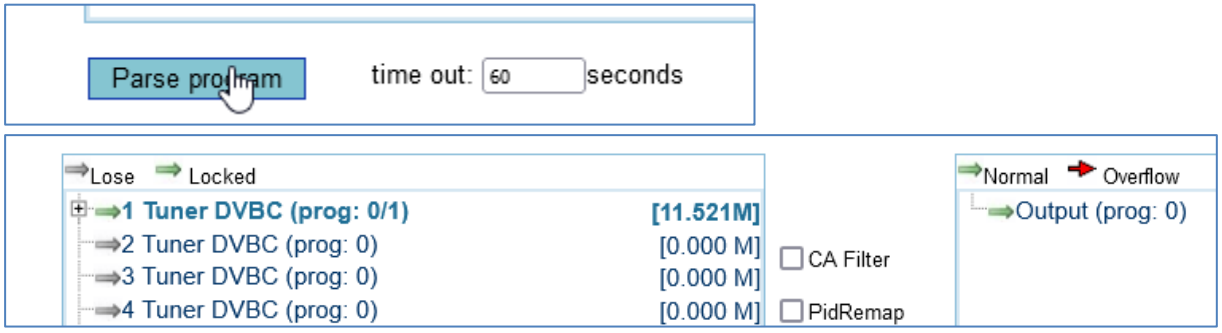


Example here with only one TV Service from our encoder Modulator:

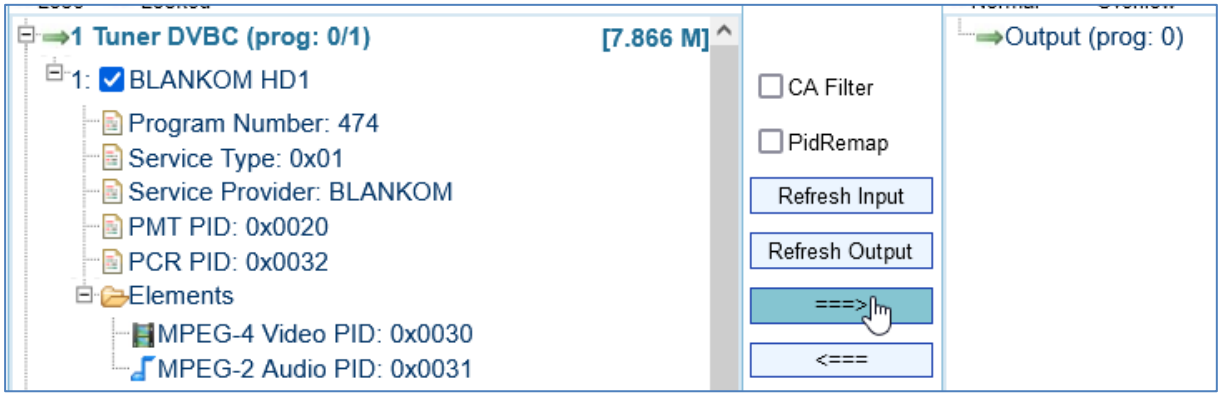
Parse the input to get the content information:



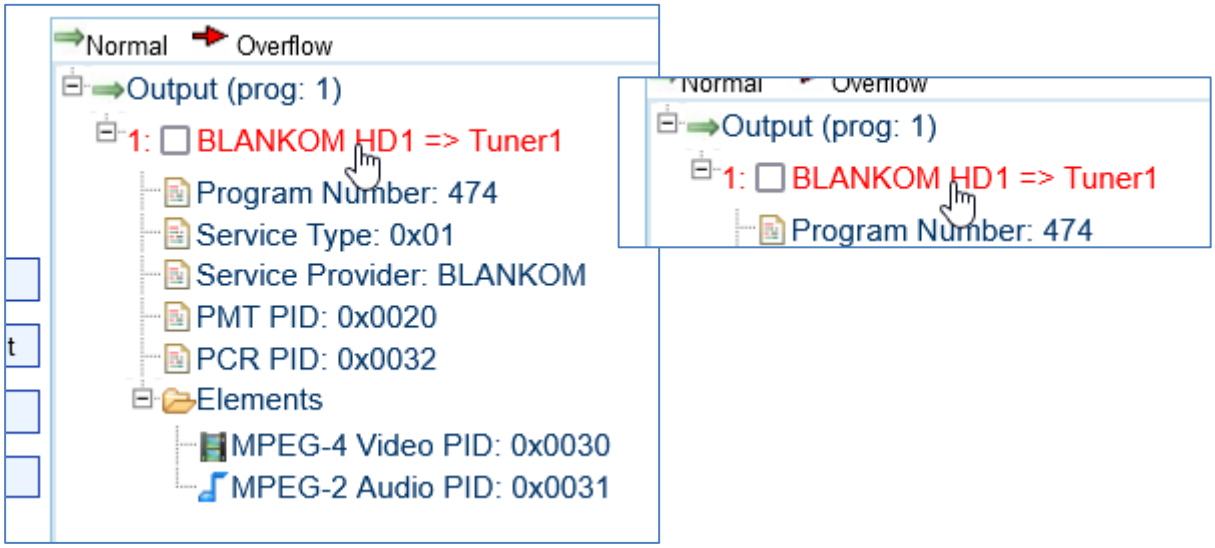
Switch off PID-remap and CA filter if your Input RF does not contain encrypted channel PIDs and does not overlap in PID-numbers with other to be received RF Channels in DVB-C/T/T2 or ISDB-Tb or …



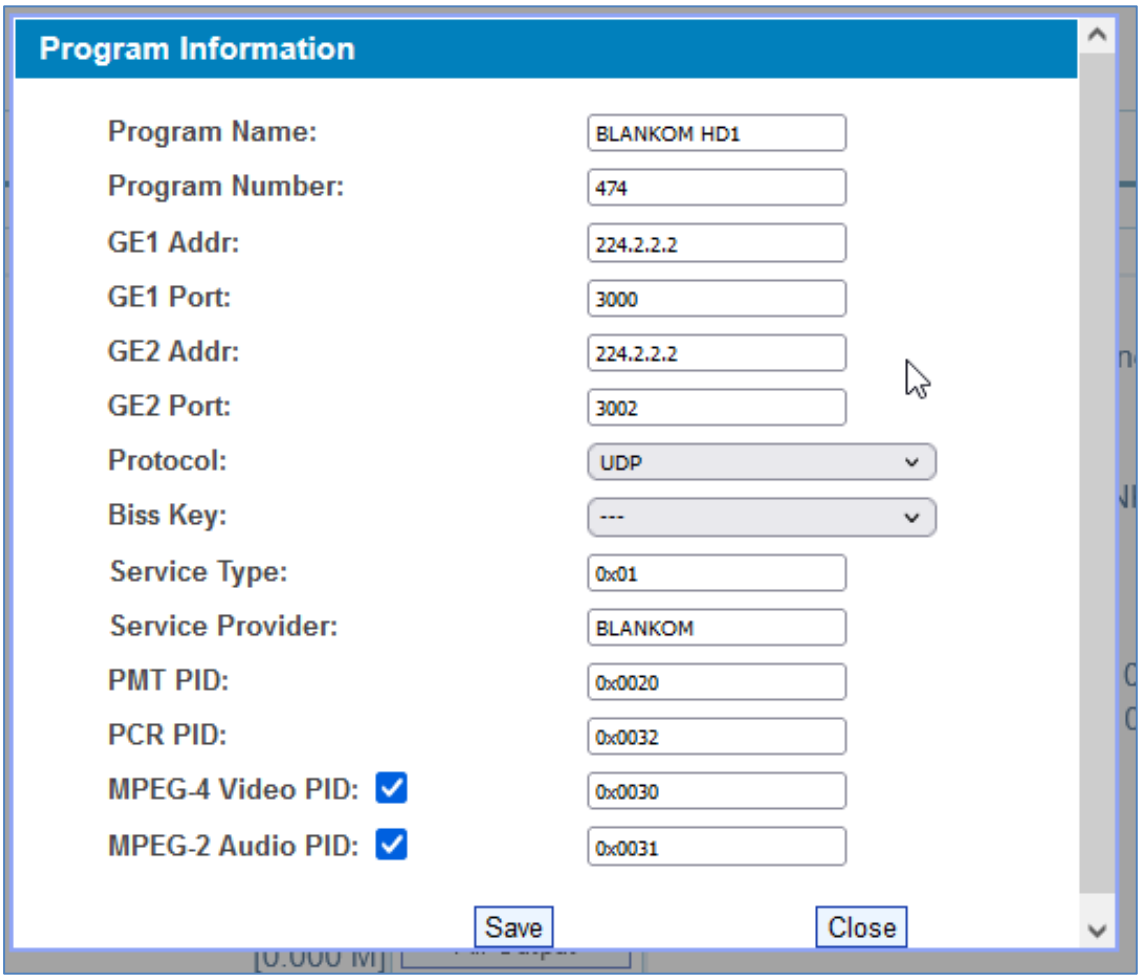
Select and stream it right:



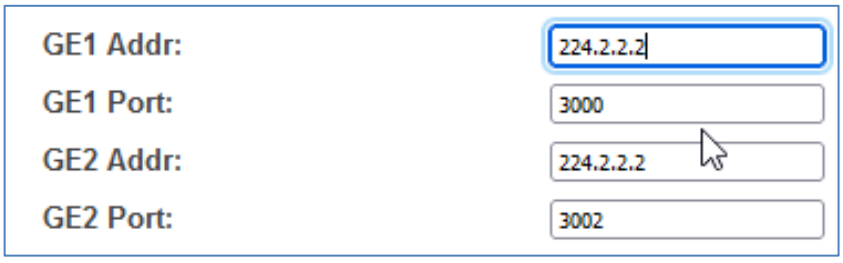
Click on that



and you can modify what you like: click on the passed service opens a popup:



We recommend not to use same MultiCast-IP Addresses but also different ones and so the ports as well: Bad example for GBE1+2:

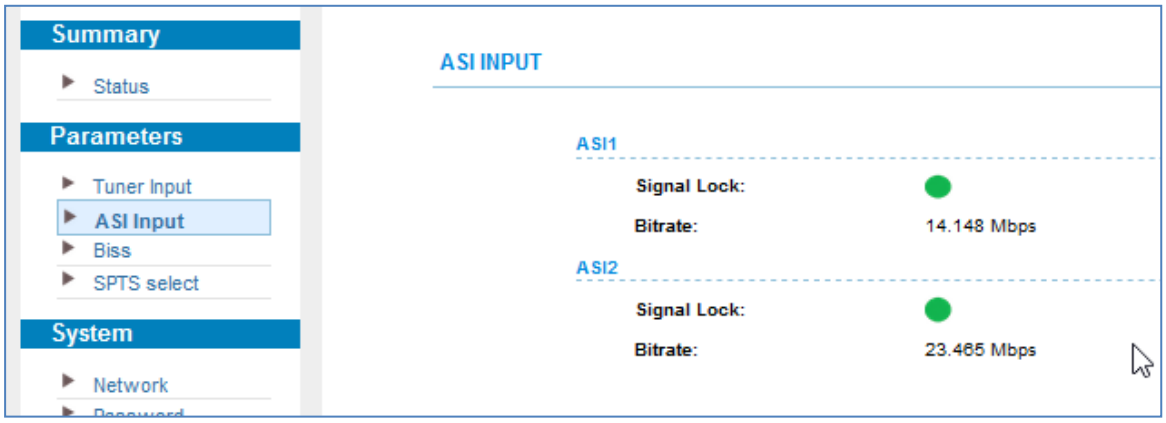


not recommended

Note: The both GbE outputs are some kind of mirrors and are not independent from each other.
Note Samsung Hospitality TV's like to start with 225.x.x.x instead of 224.x.x.x!
So 225.0.0.1:10001 … 225.0.0.2:10002 … is a good idea.
Of course you can have other inputs like ASI to demultiplex and stream to UDP Multicast. Be sure you are able to switchn ON your IGMP-management in your GbE Switches to not flood the network with Multicast's!!!

ASI-INPUT(s): (IGS-924 has one only):

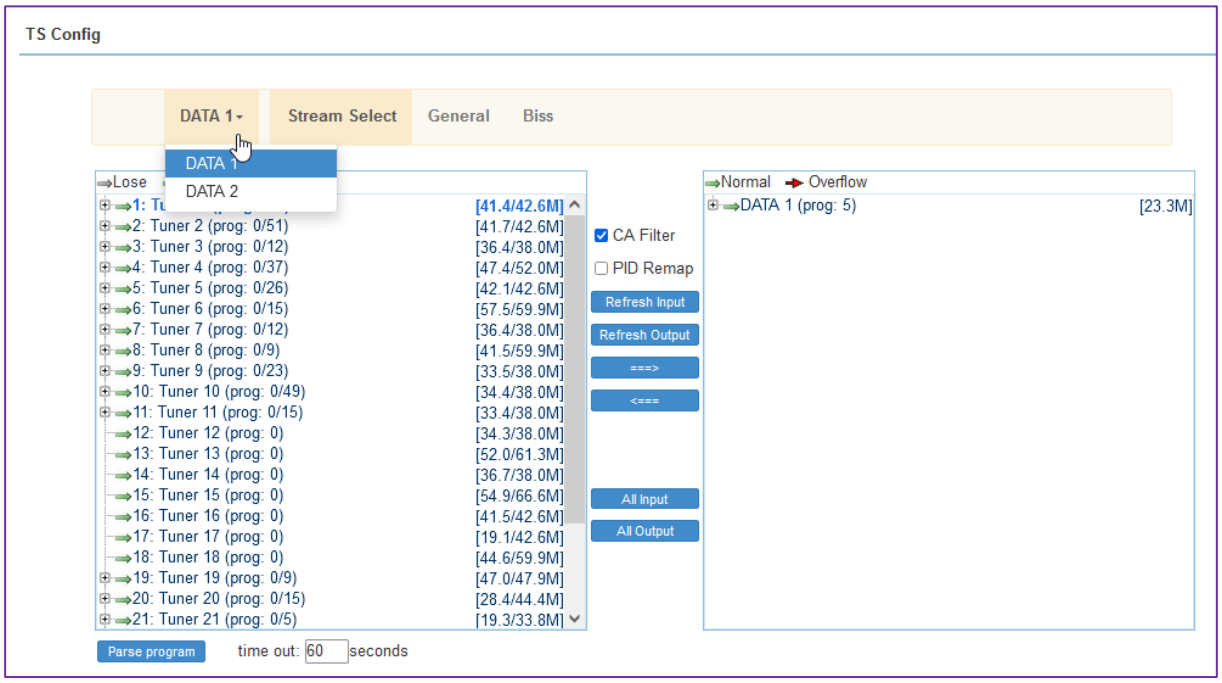
As soon as you connect the ASI IN-Ports:



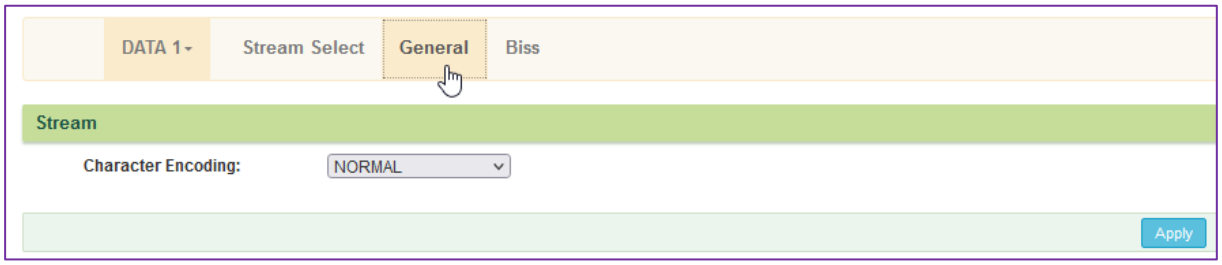
Now we have configured SAT Inputs and like to stream selected Services to IP out:

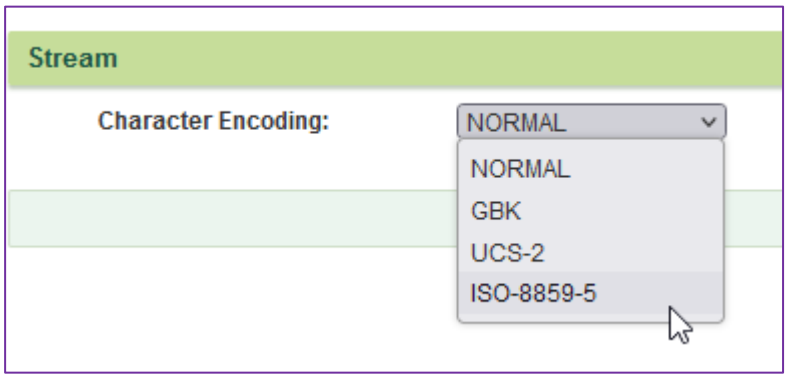
SPTS output Settings:

CA Filter and PID-Remap are ON by default.
CA-Filter: If you do not need to filter decrypted unnecessary EMM/ECM PIDs from the Input Streams, please uncheck them.
PID Remapping isn't almost necessary for SPTS streaming. In MPTS mode it can avoid overlapping PID-Re-Multiplex problems. DVB-professionals know that …
With DATA 1 and 2 you can select which GbE port you want to stream the in- to the output interfaces:

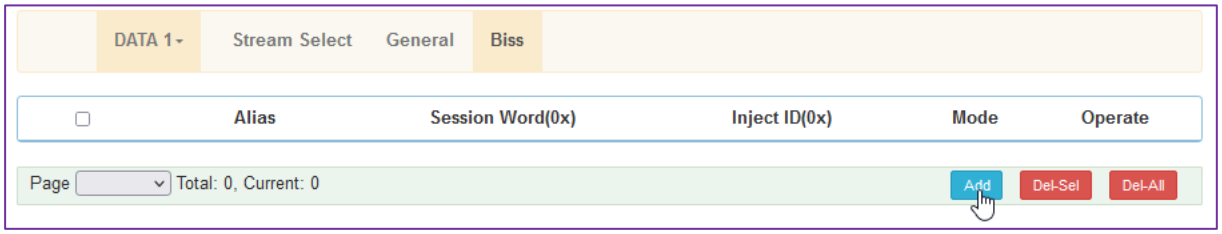


You can set the character encodings of the Transponder Text (note: äöüß are germans) so switch it if they are shown wrong:

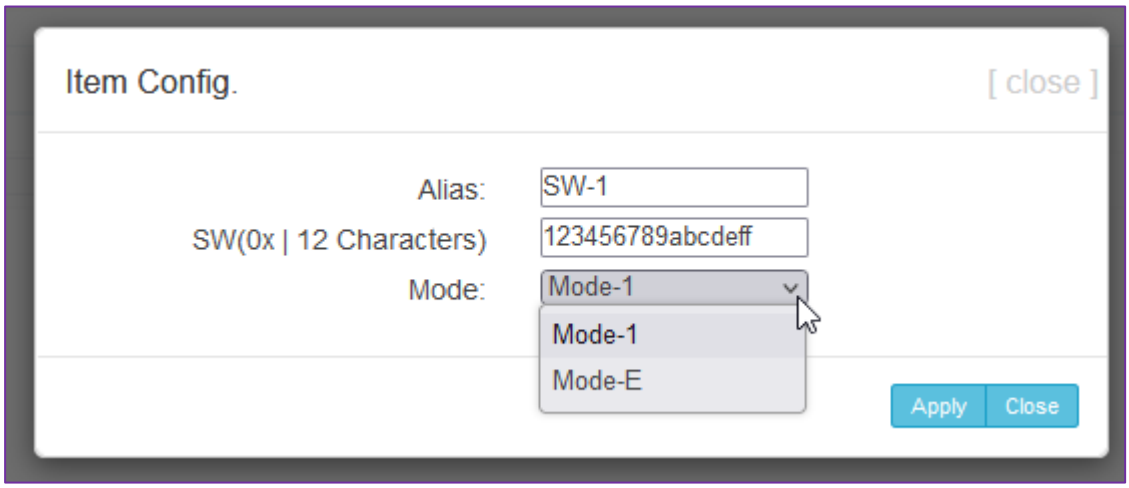




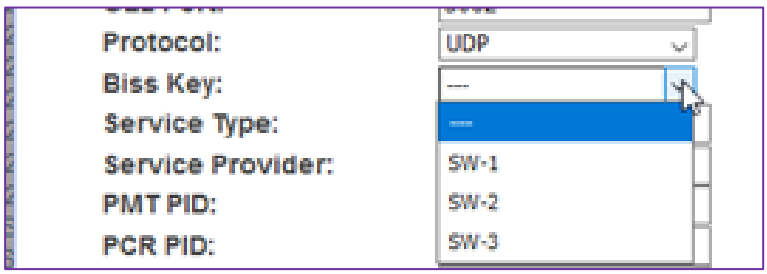
BISS embedded decryption needs known keys and the select mode:



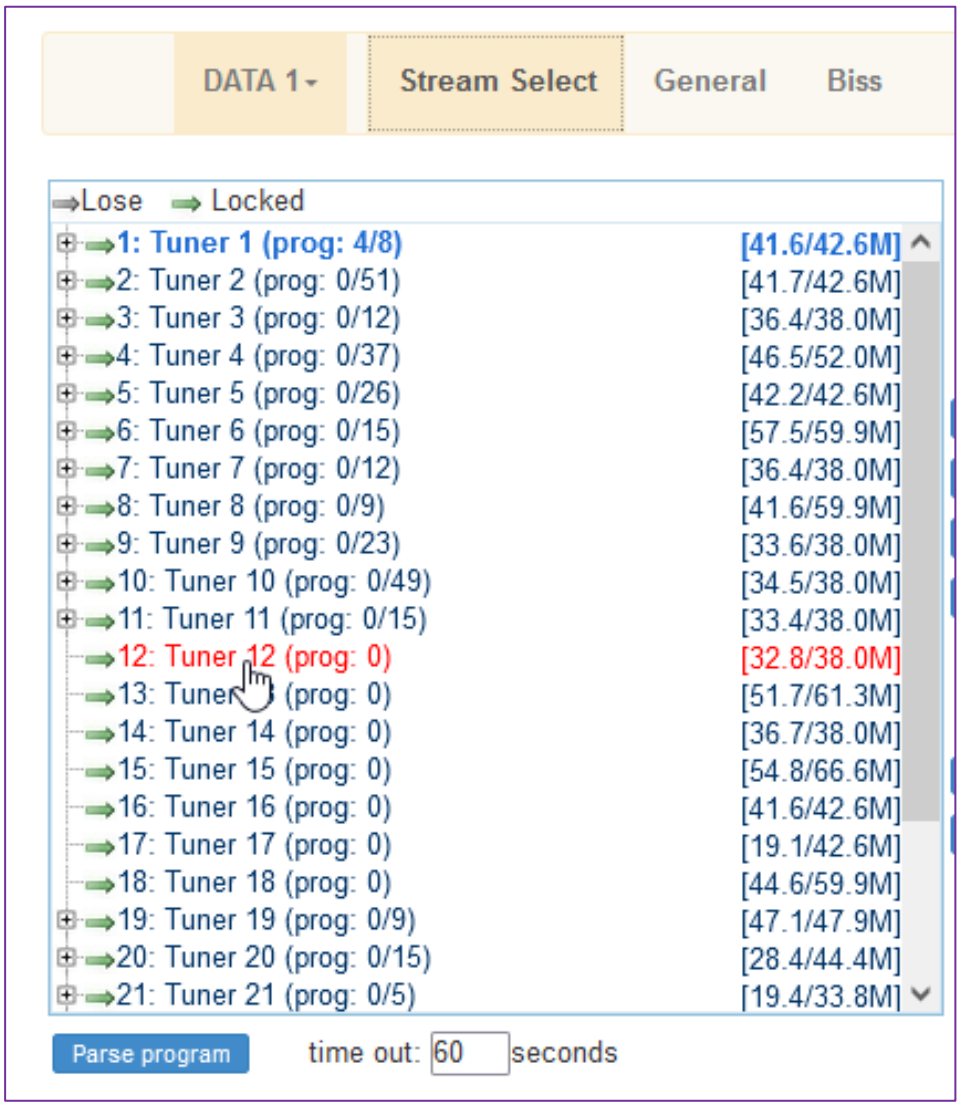
Popup:



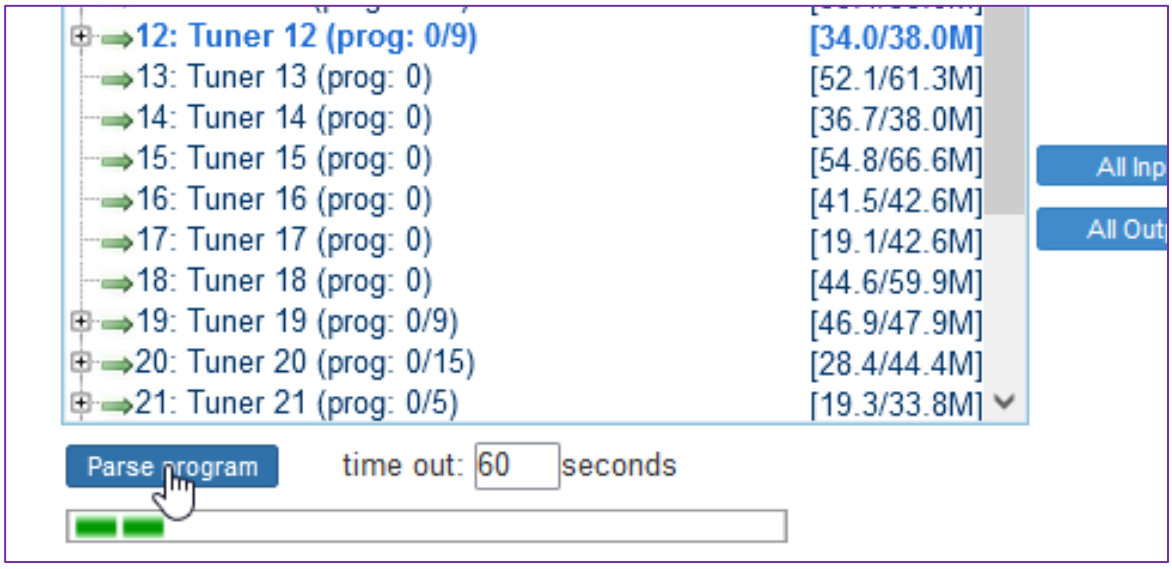
The key can later than be selected in the stream – popup:



Back to the Input TS from every tuner:

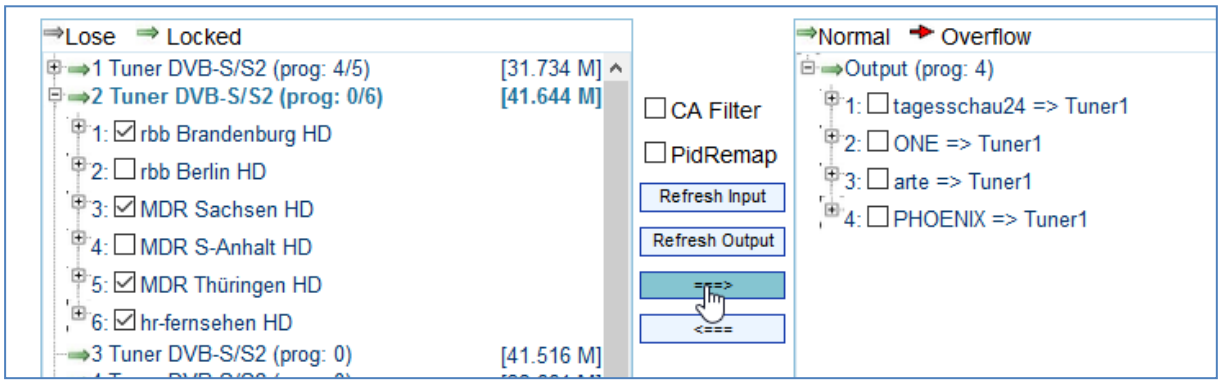


You need to parse every single Input content by selecting the Input (Tuner/ASI) and PARSE it so the machine detects every single TV/Radio Service from the Inputs select it (red) and PARSE PROGRAM:

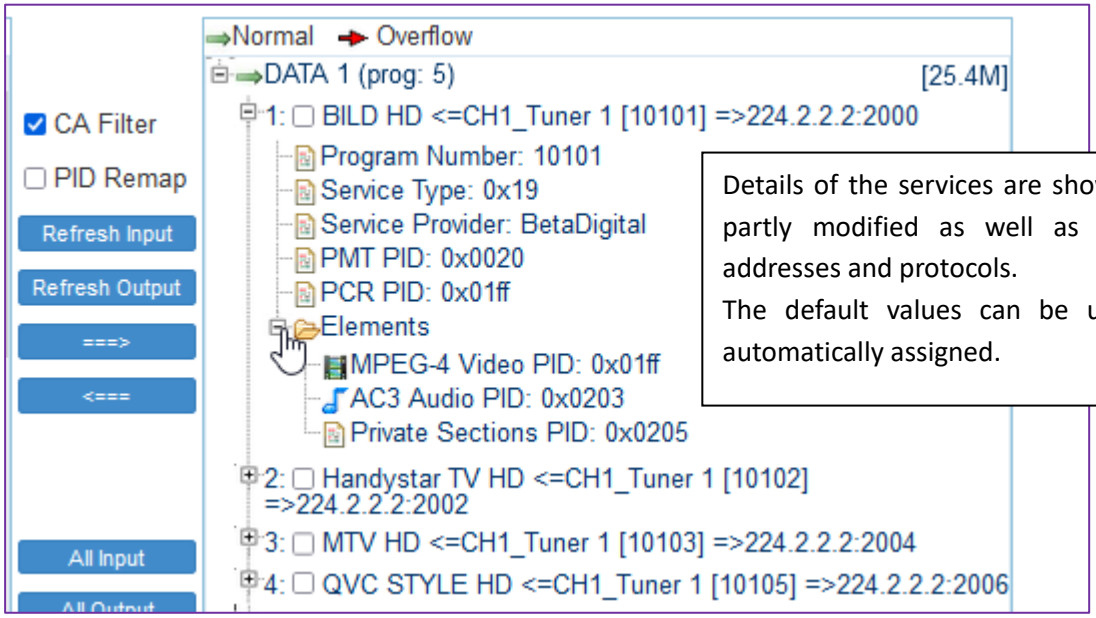


You will see the number of detected programs: Open the '+':

Than select the services you want to stream and PUSH them to the right:

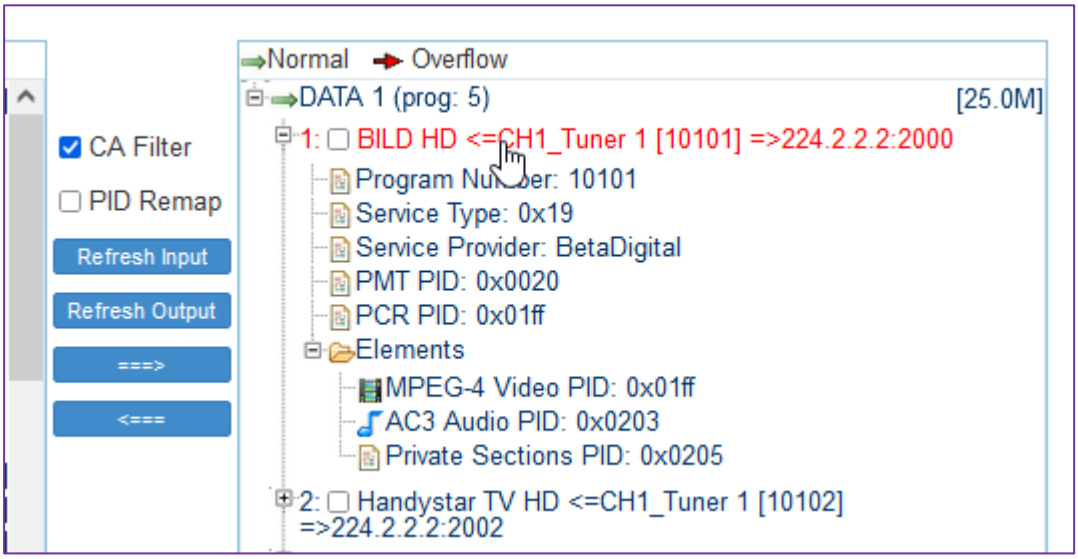


see the content and more info on the right side by open it.
with the '+' you see the details:



Details of the services are shown and can be partly modified as well as the streaming addresses and protocols.
The default values can be used, they are automatically assigned.

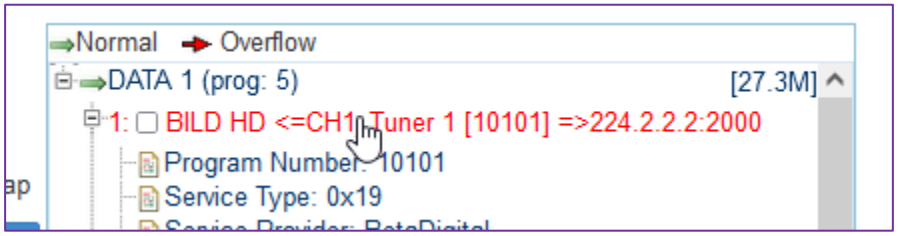
proceed with all Inputs on the left: PARSE first than selecting the services and push them to the right to generate your favorite Streams…
Finally, you'll get an overview how many you have selected from which input left to the outputs right:



Now it's time to configure your

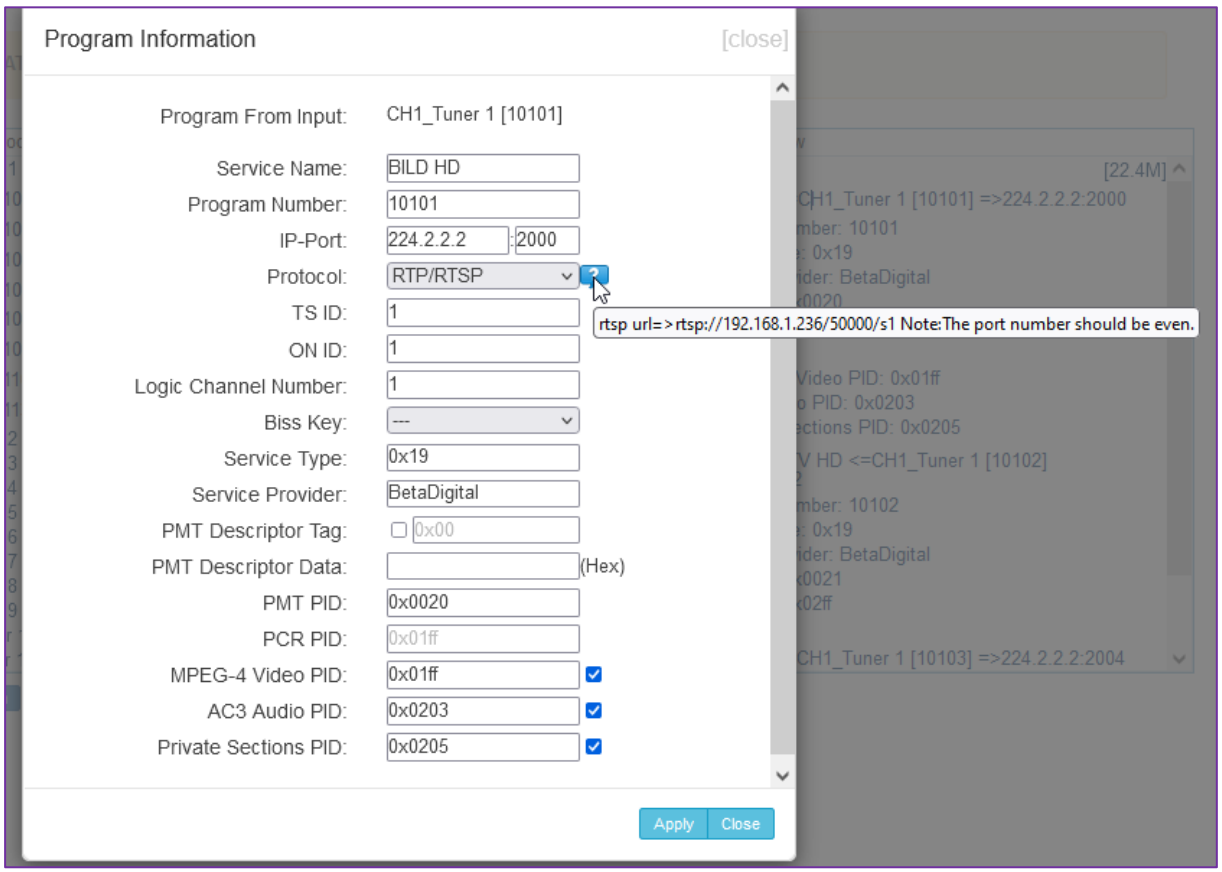
Stream output settings in SPTS:

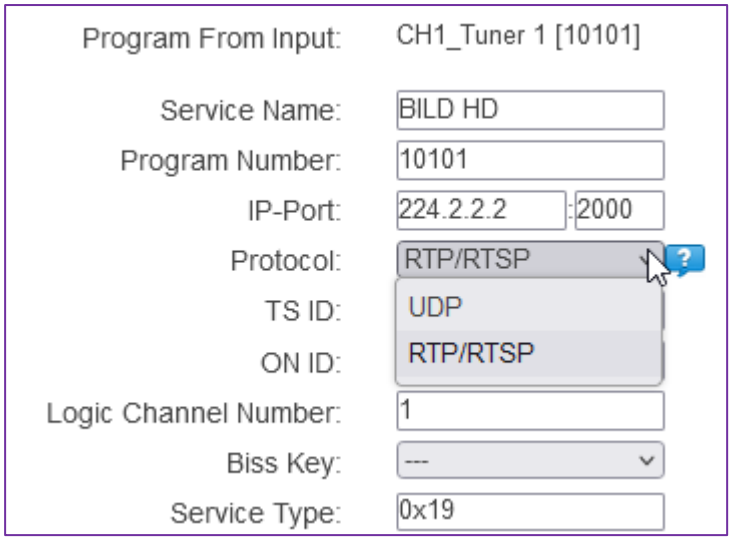
by selecting the output service



click

a popup will follow:

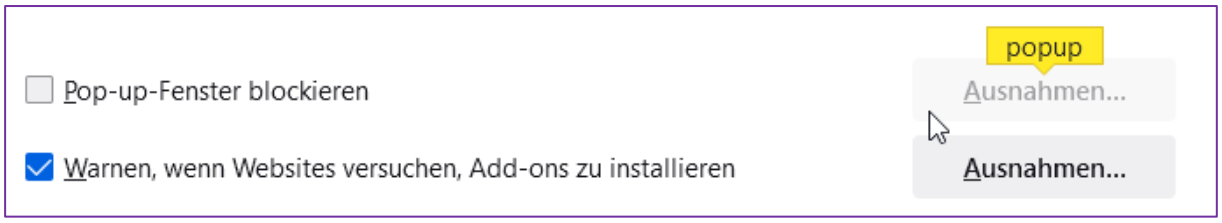




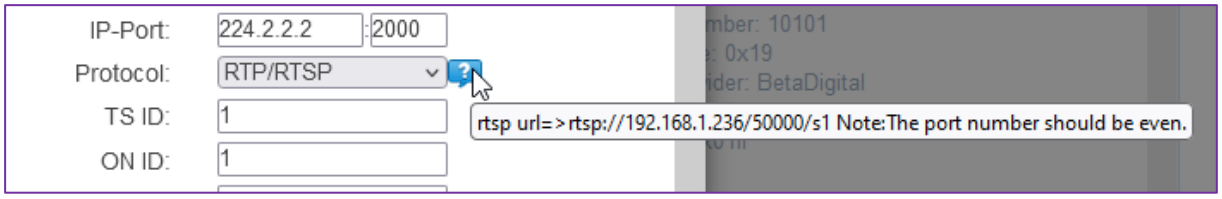
you can edit most of them…

If you change to RTP / RTSP streaming, a '?' appears. This one gives a hint how to address the Reception of the RTSP-ULR in your Unicast receiver.

If you do not see this, enable popups in your browser (here firefox 😊) settings:



Then it shows the hint:
By mouseover:

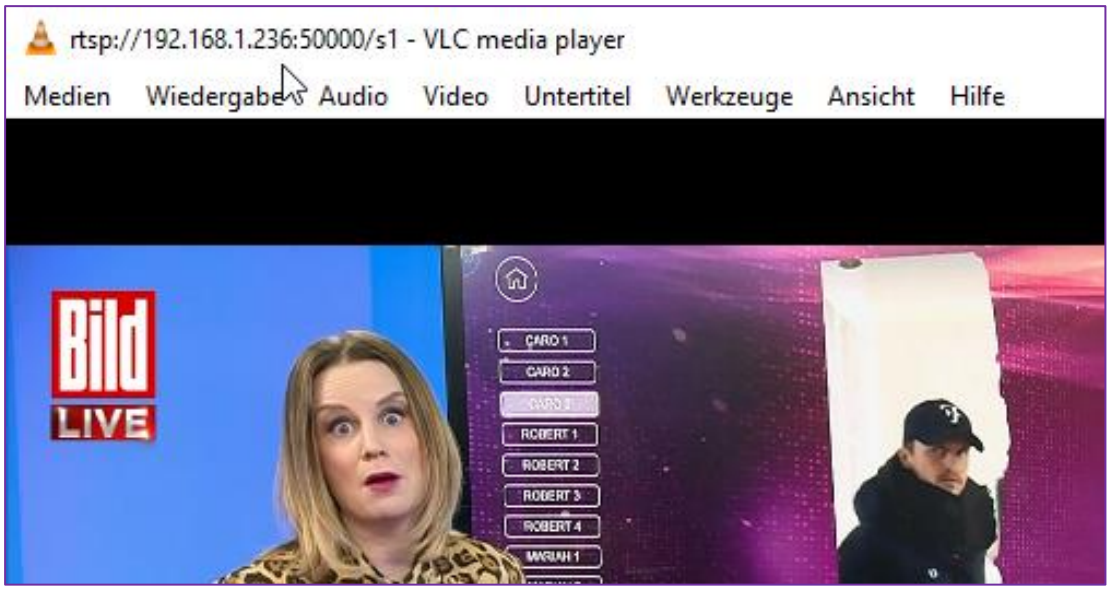


Proceed with all of them, filter unwanted PIDs, I hope you know what you are doing …
SAVE and go.
Check RTP-stream Multicast: (RTP-streams from the specification: use even port numbers because it sends a CRC – Info 2nd stream on PORT +1 – so avoid using that by another stream- and they recommend to use Ports above 5000)

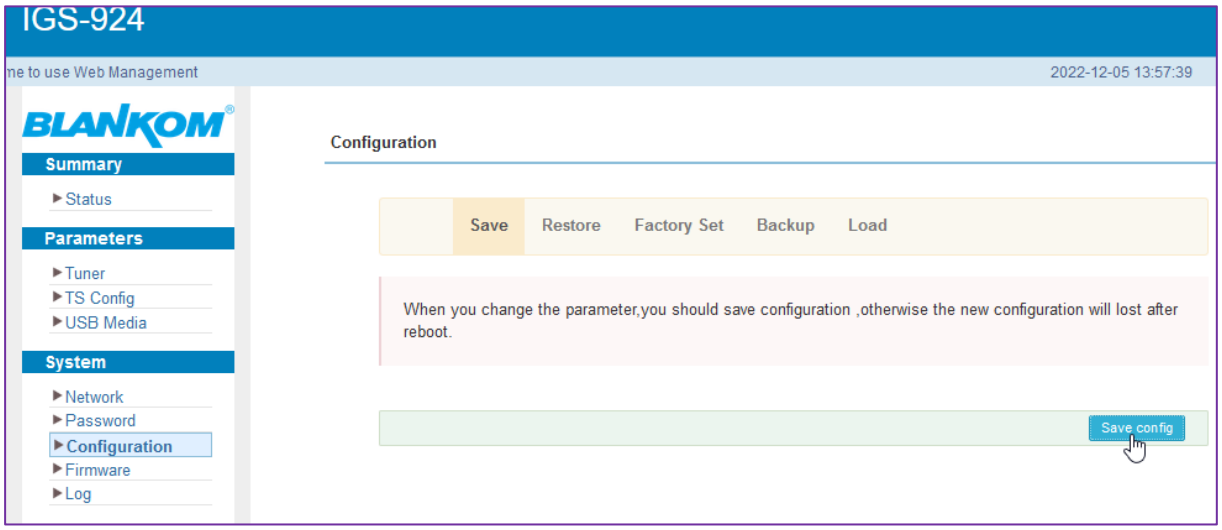
Check RTSP:

The **RTSP-streams** can be unicast received from DATA1 out or DATA2 out:
rtsp://GE_ip:50000/sx
DATA1: x is 0...511(SPTS), 0...11(MPTS);
DATA2: x is 512...1023(SPTS), 12...23(MPTS).
while in MPTS mode
The single streams are /0 … /511 only, but consider which output you have directed them to.

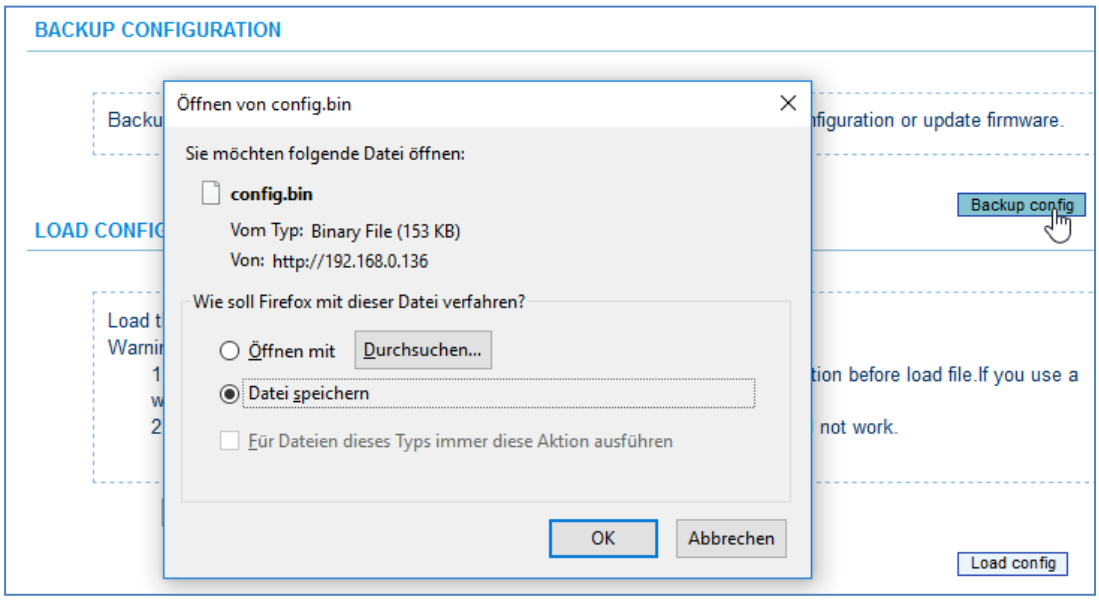
Or in some models the stream starts counting from 1 instead of '0'.
The popup shows the right RTSP config.



Now it is Time to SAFE yourself before your kid is cutting the power source accidently:

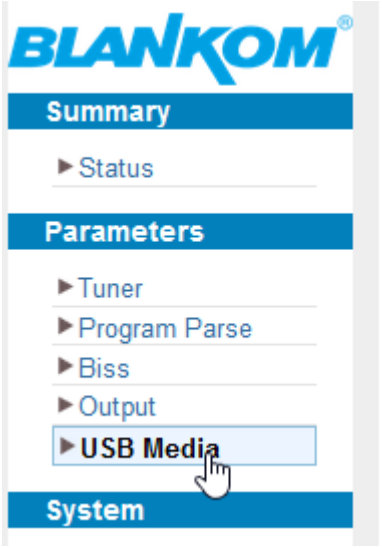


And maybe locally:

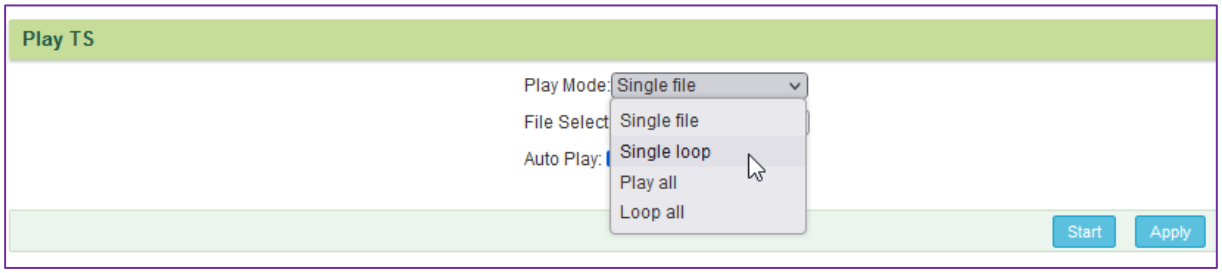


Playback Info-Channel from USB-PEN:

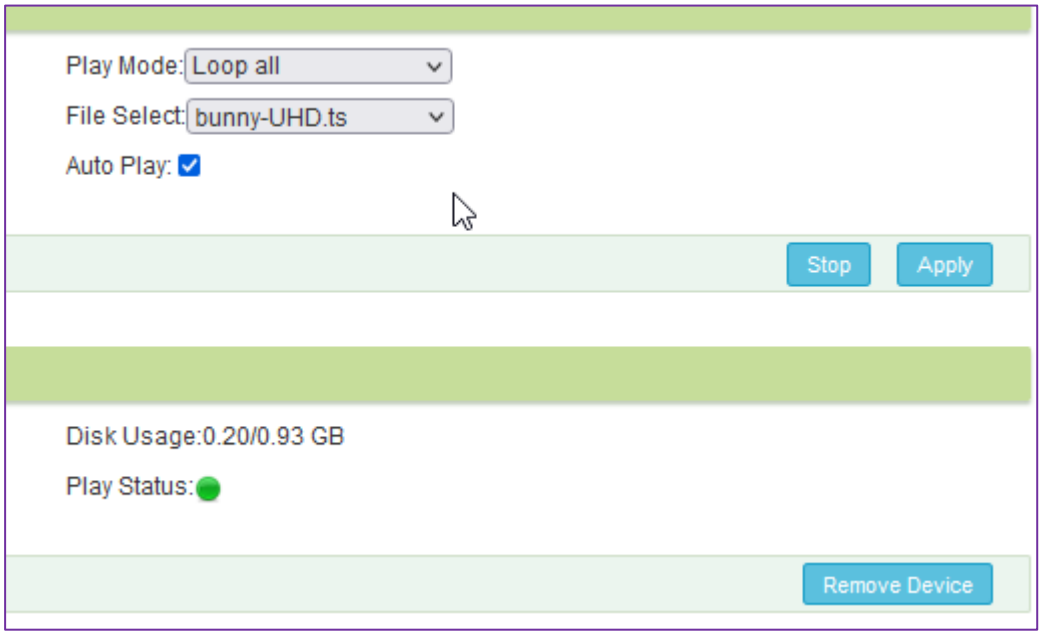
Need to be formatted as FAT32 (or different … check what's supported):



USB inserted here with one TS file:



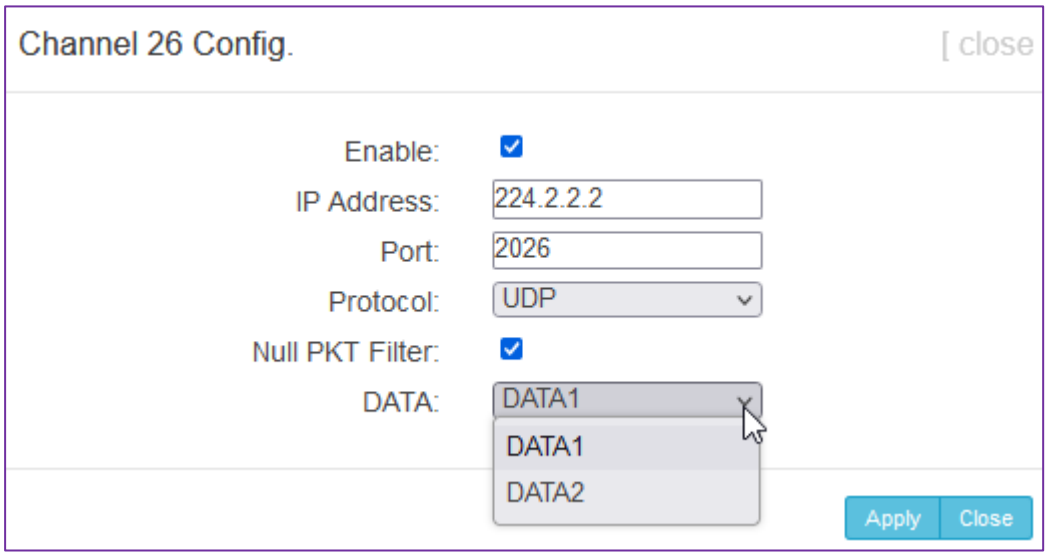
Self-explaining:



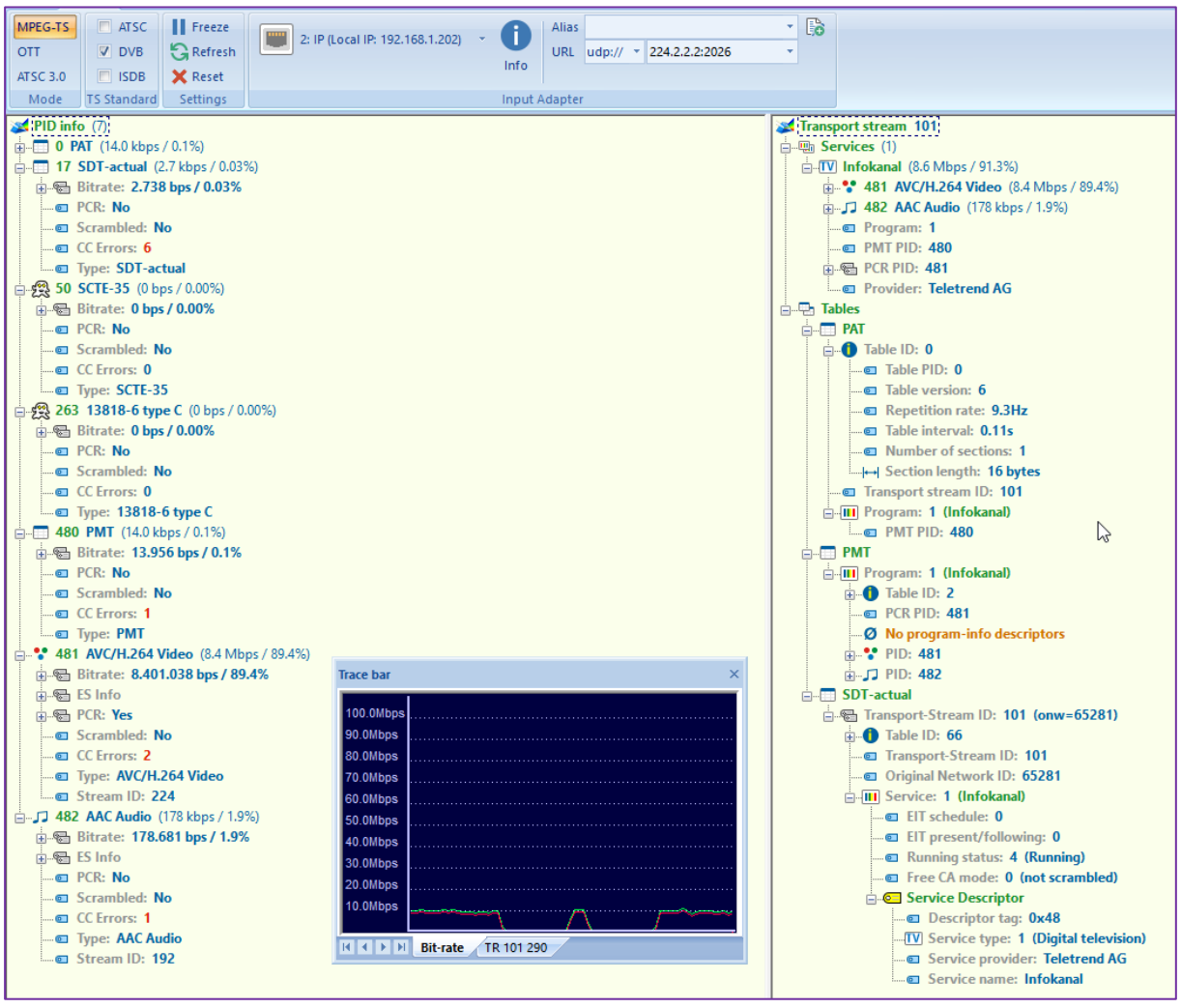
Stream:

It's the 26th output:

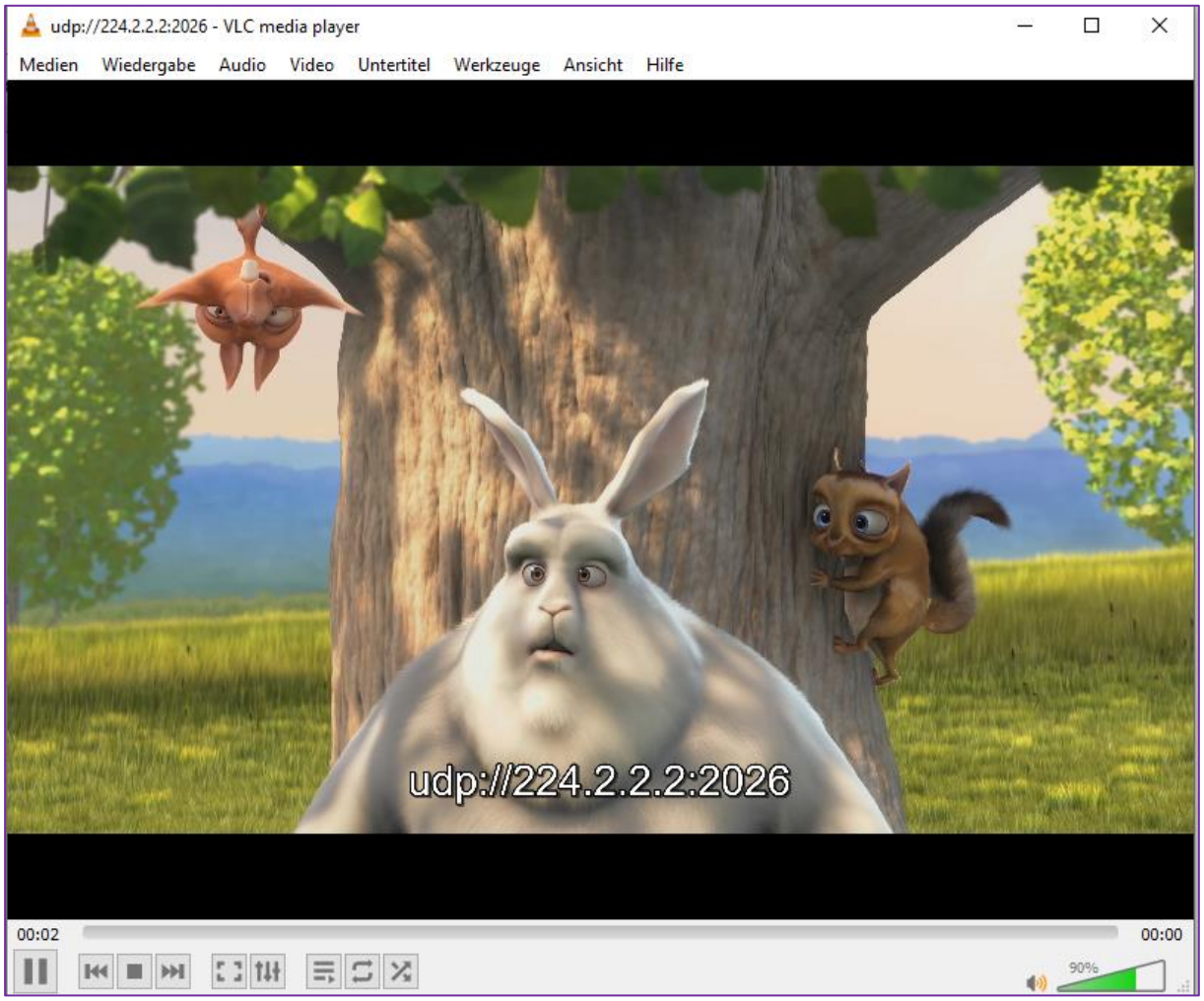
Tuner 24	224.2.2.2	2024	UDP	DATA2	☐	●	0.0/0.0 M	✎
ASI 25	224.2.2.2	2025	UDP	DATA1	☐	●	0.0/0.0 M	✎
USB 26	224.2.2.2	2026	UDP	DATA1	☑	●	10.3/25.2 M	✎

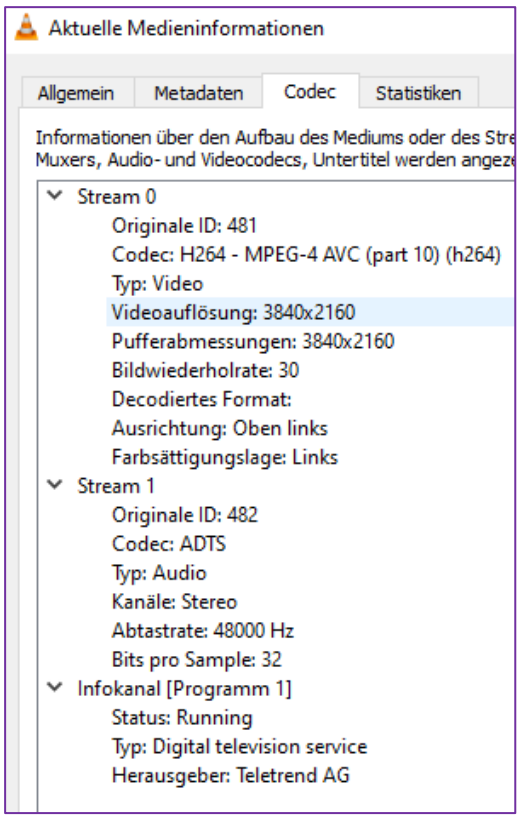


Can be VBR or with zeros:

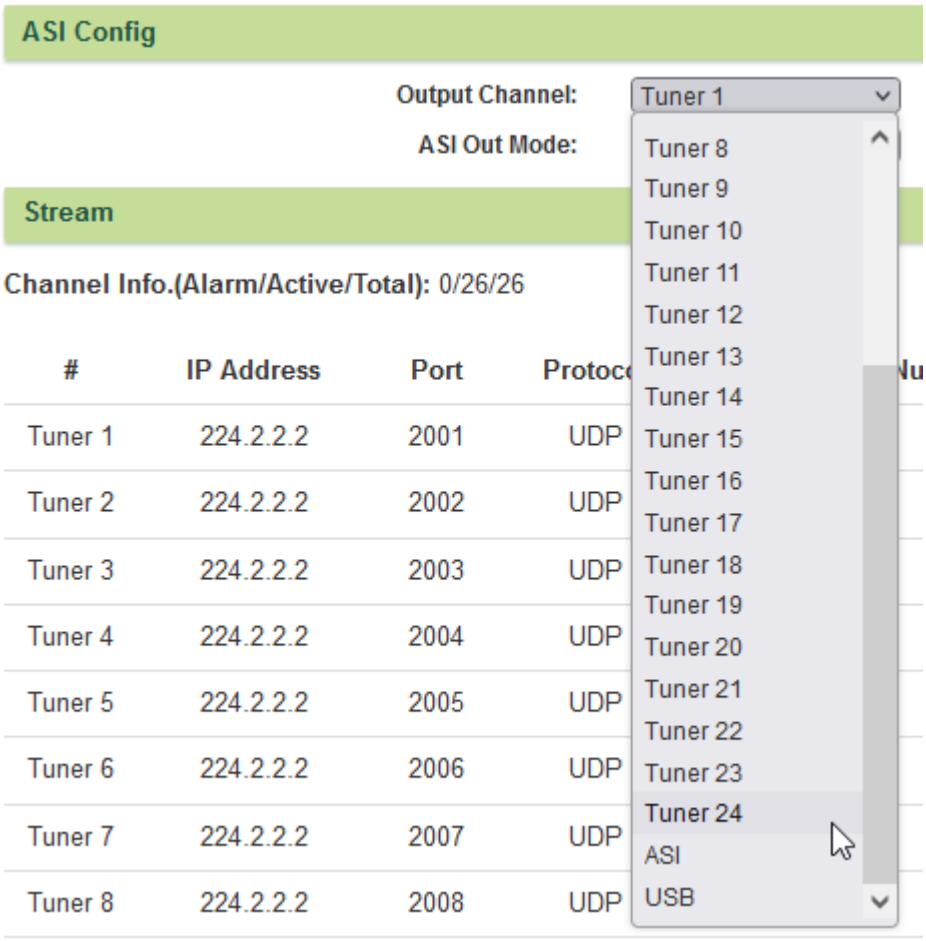


VLC check:


udp://224.2.2.2:2026 - VLC media player
Medien Wiedergabe Audio Video Untertitel Werkzeuge Ansicht Hilfe
udp://224.2.2.2:2026
00:02
00:00
90%


Aktuelle Medieninformationen
Allgemein
Metadaten
Codec
Statistiken
Informationen über den Aufbau des Mediums oder des Stre
Muxers, Audio- und Videocodecs, Untertitel werden angeze
Stream 0
Originale ID: 481
Codec: H264 - MPEG-4 AVC (part 10) (h264)
Typ: Video
Videoauflösung: 3840x2160
Pufferabmessungen: 3840x2160
Bildwiederholrate: 30
Decodiertes Format:
Ausrichtung: Oben links
Farbsättigungslage: Links
Stream 1
Originale ID: 482
Codec: ADTS
Typ: Audio
Kanäle: Stereo
Abtastrate: 48000 Hz
Bits pro Sample: 32
Infokanal [Programm 1]
Status: Running
Typ: Digital television service
Herausgeber: Teletrend AG

The USB-PEN TS Infochannel streams can also by pushed to ASI-Out:



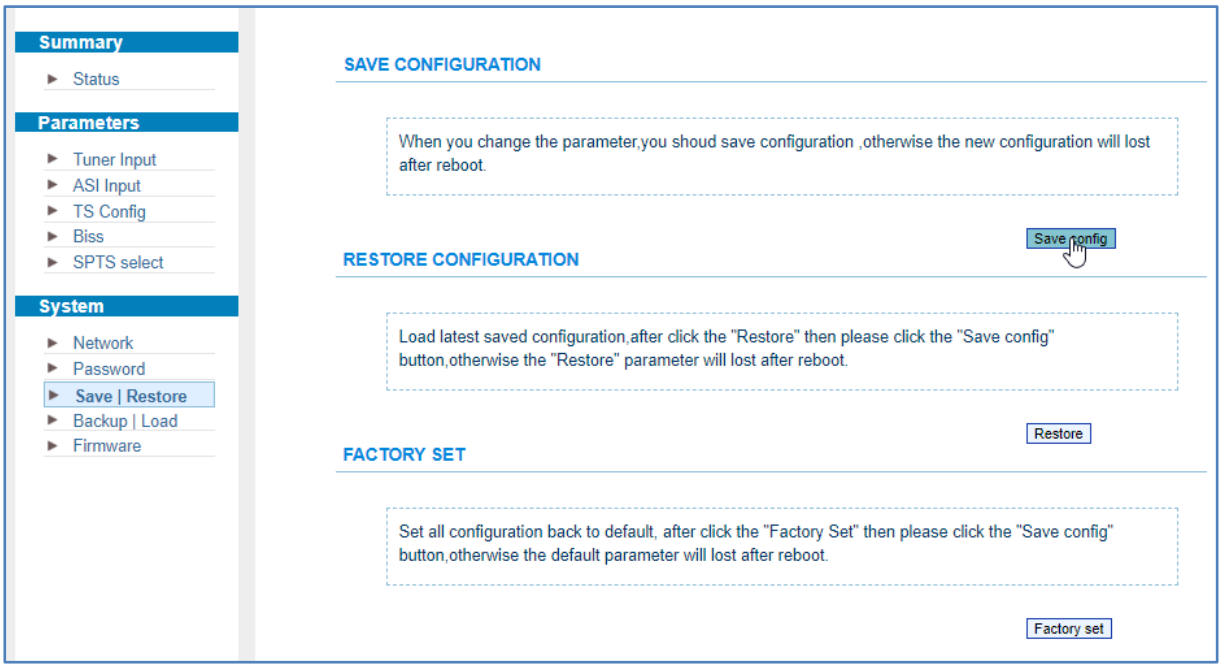
Software Updates:

Example from its little brother IGS-900 with 16 tuner buts its nearly identically:

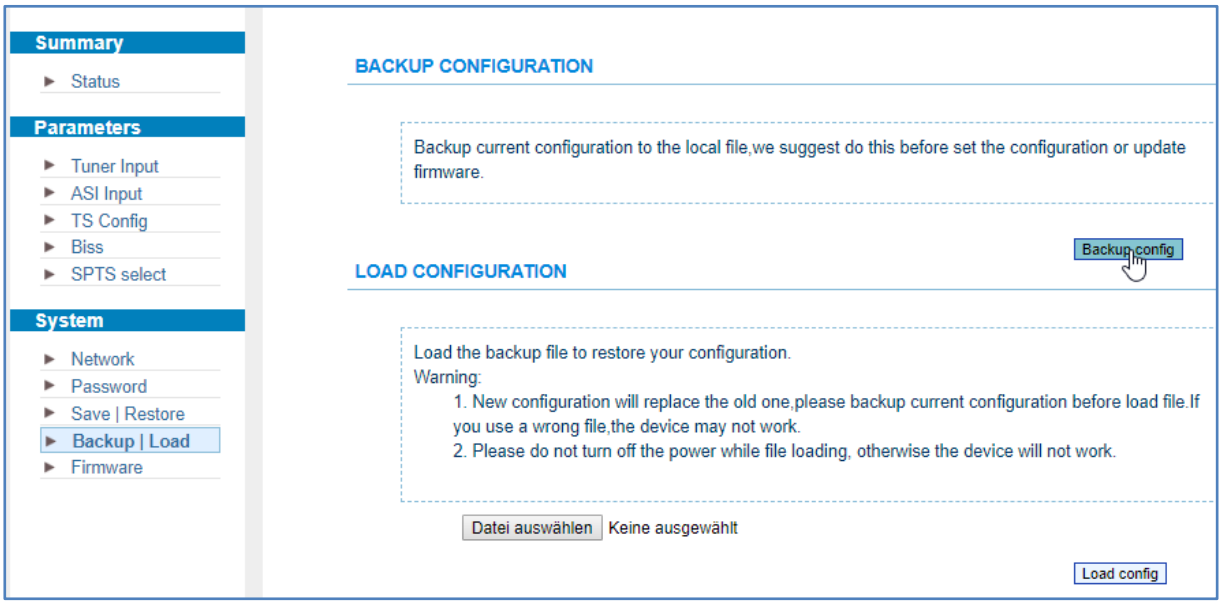
IRENIS GmbH does not publish Soft- and Firmware-upgrades online. If you face some problems, please sent us a bug-report along with all necessary data of the device(s). Nevertheless, here how it works for this unit:

The update files are 3. Almost packed as rar-files, so first you'll need to unzip them. Windows inbuilt zip function might not work, but you can try the freeware 7zip which works with rar-files:

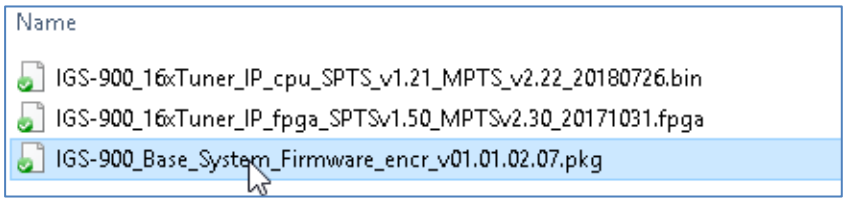
1.enter the WEB GUI-->Firmware-Menu, update, maybe a good idea to safe your config locally first:

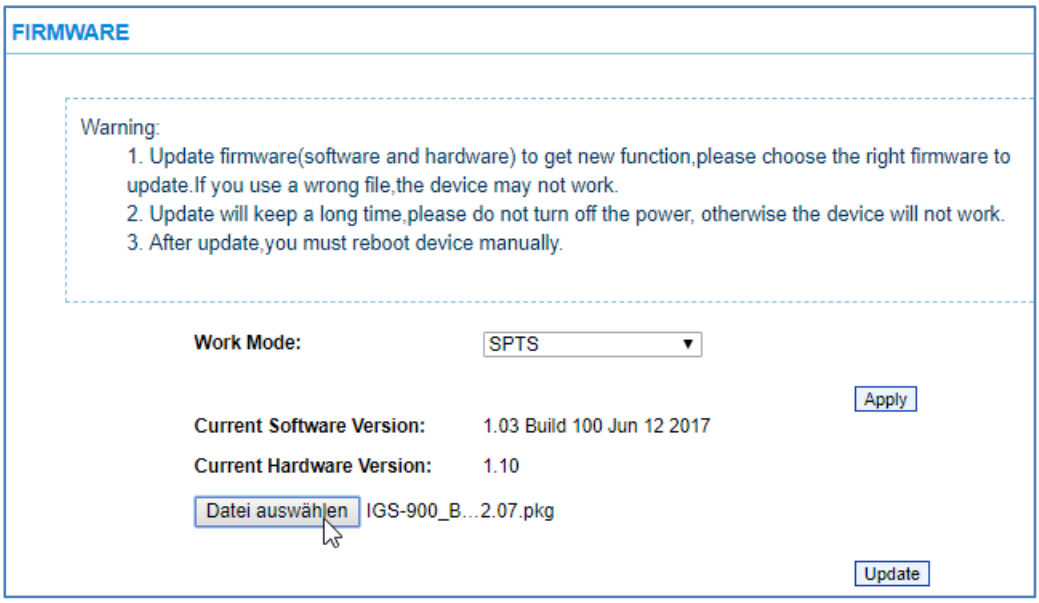


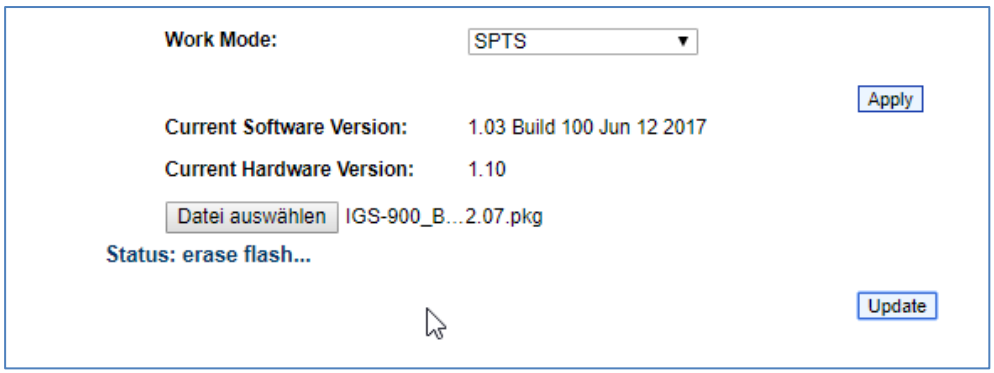
+ safe to file:



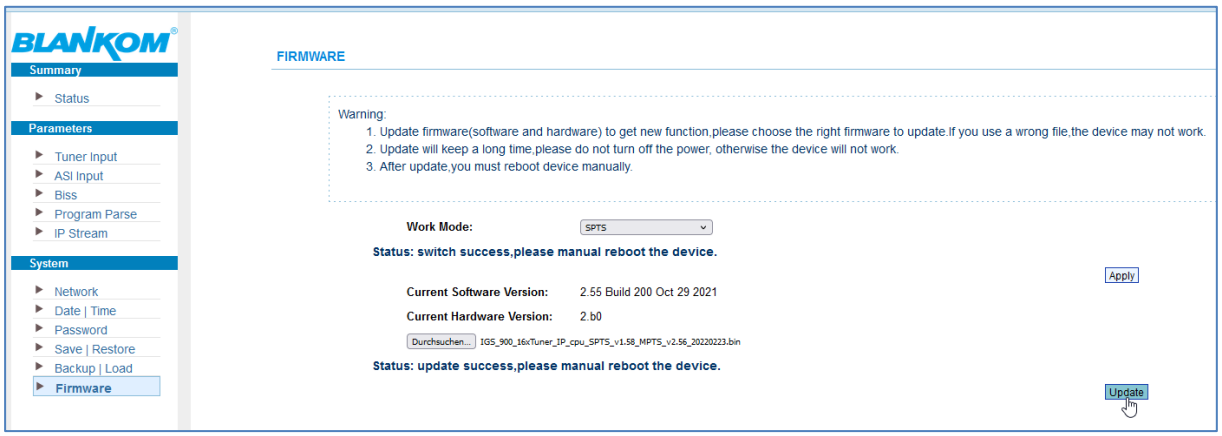
Then update IGS-900_Base_System_Firmware_encr_v01.01.02.07.pkg first:



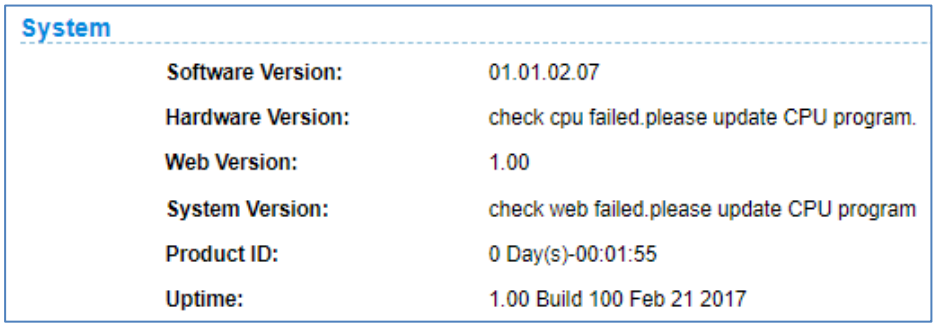




Status: update success,please manual reboot the device.

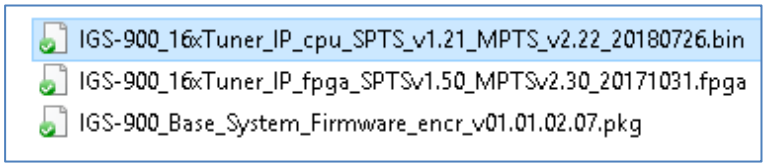


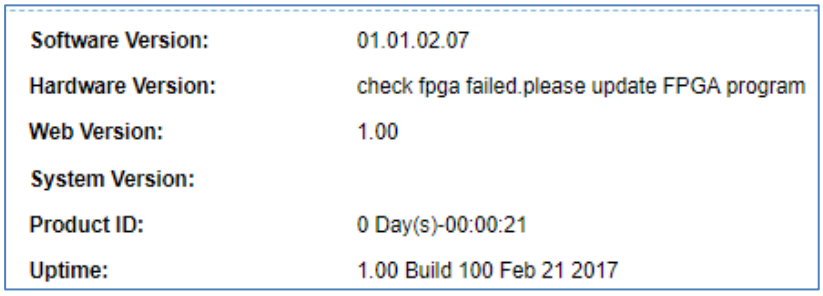
2. Power off and on.
3. Default IP is 192.168.0.136, enter WEB GUI



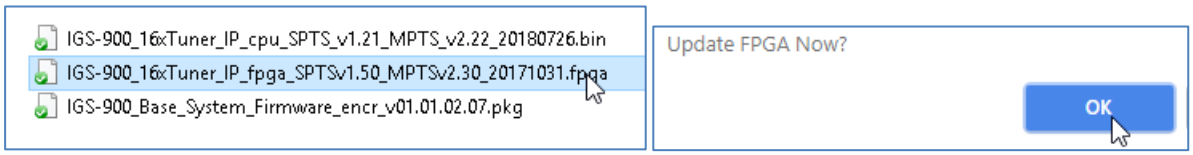
-->Firmware - Menu,

update IGS-900_16xTuner_IP_cpu_SPTS_v1.21_MPTS_v2.22_20180726.bin

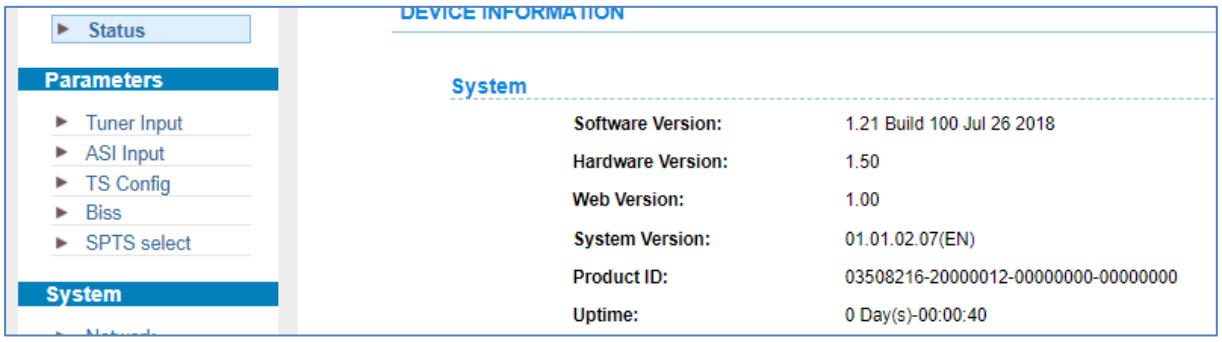




and IGS-900_16xTuner_IP_fpga_SPTSv1.50_MPTSv2.30_20171031.fpga.

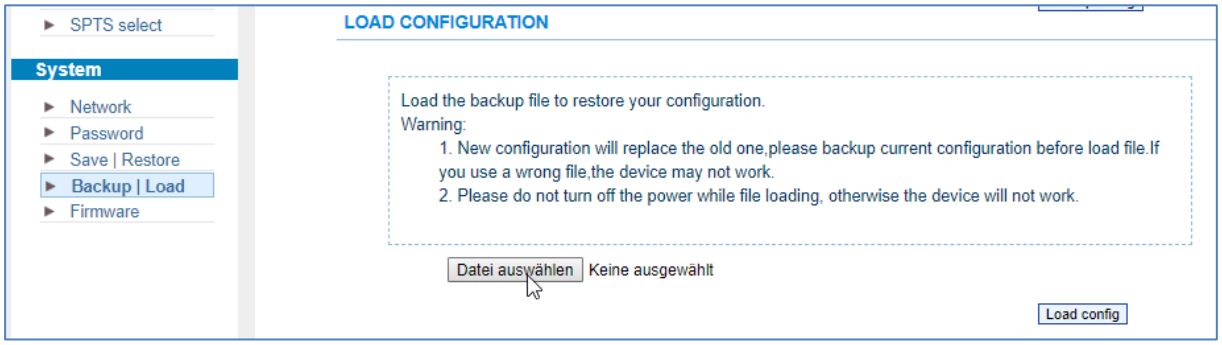


4. Power off and on again. Finished:

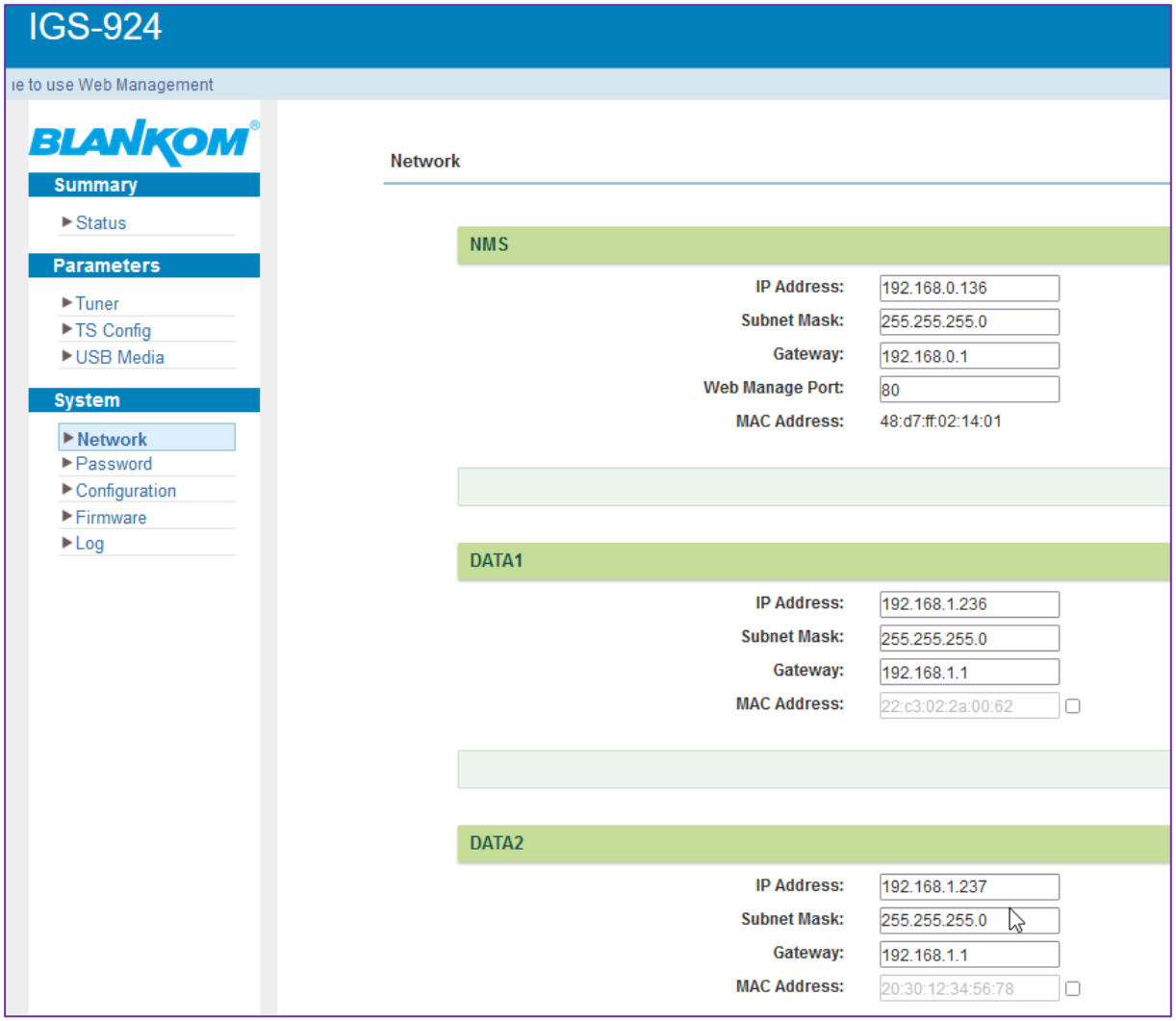


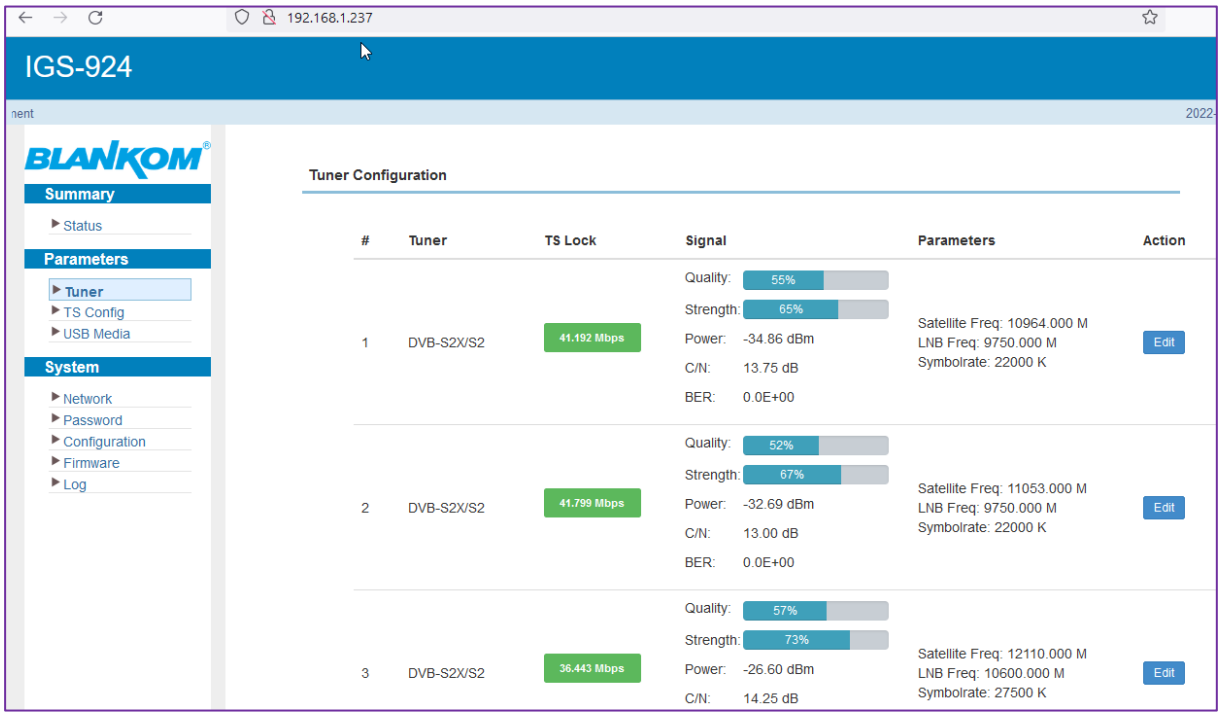
Don't be confused, 'Hardware-Version' shows actual FPGA –Software version.

5. Default IP is still 192.168.0.136.

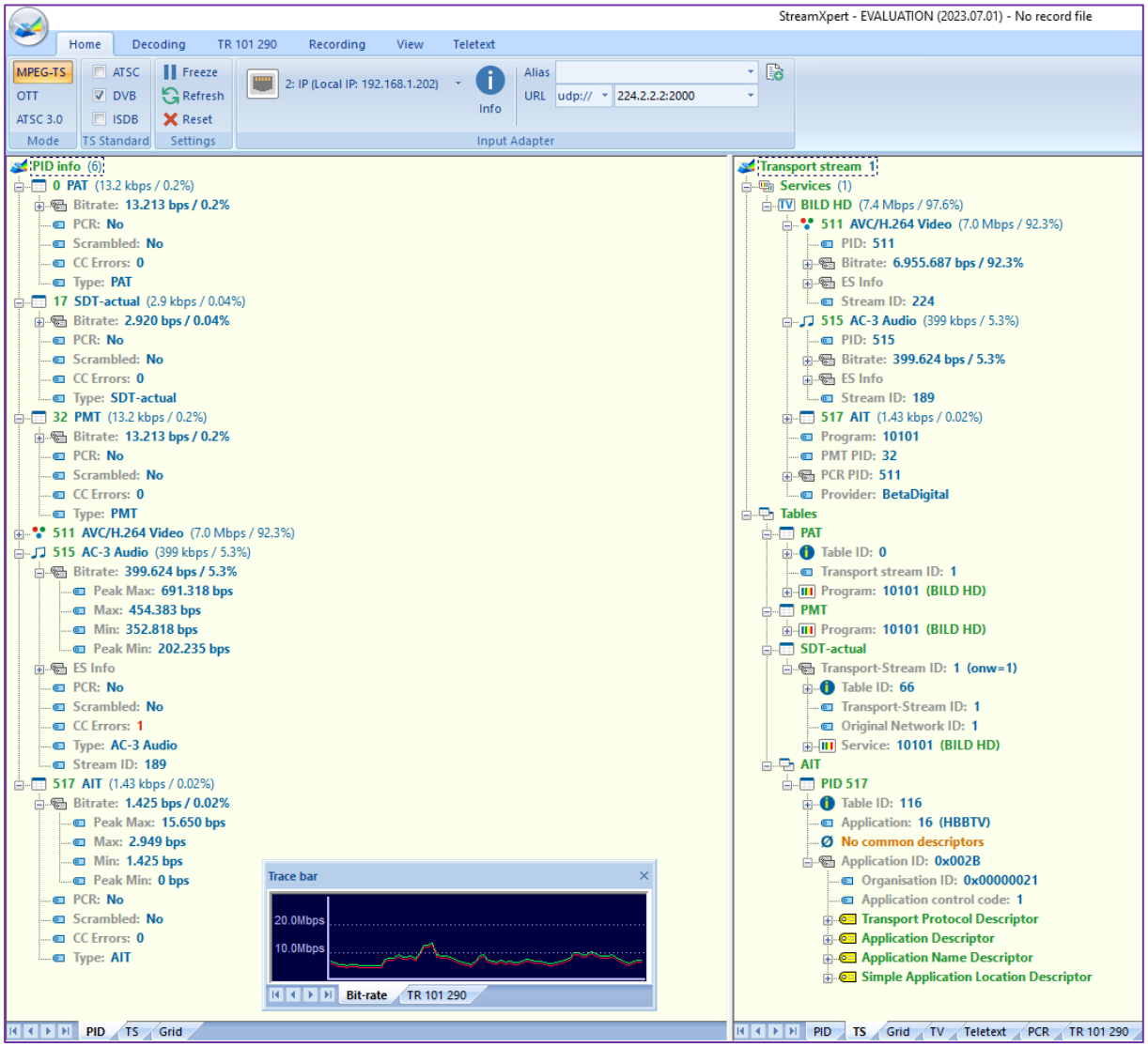


If you accidently cannot access your web-Interface by the NMS 100BaseT port, try the DATA ports: It works as well:



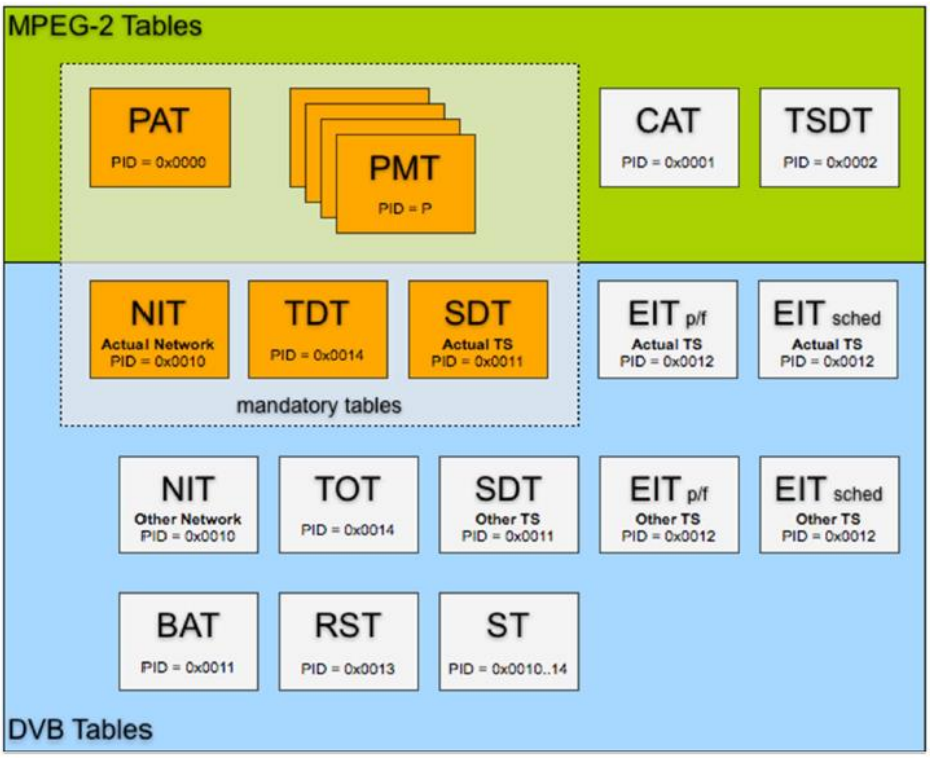


Check by a DekTec TS-Analyzer:



ANNEX MPEG

MPEG PSI/SI Information's:



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

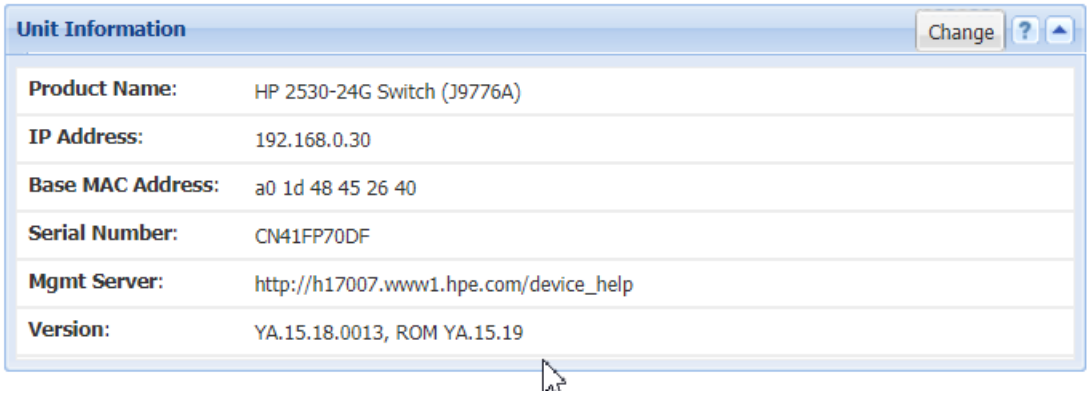
Table 1: PID allocation for SI

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

Recommendations:

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

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



General notes about Streams:

Multicast streams:

Multicast Address Ranges:

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

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

One small part from this:

IPv4 Multicast Address Space Registry

Last Updated

2018-01-05

Expert(s)

Stig Venaas

Note

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

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

Available Formats XML HTML Plain text

Registries included below

- Local Network Control Block (224.0.0.0 - 224.0.0.255 (224.0.0/24))
- Internetwork Control Block (224.0.1.0 - 224.0.1.255 (224.0.1/24))
- AD-HOC Block I (224.0.2.0 - 224.0.255.255)
- RESERVED (224.1.0.0-224.1.255.255 (224.1/16))
- SDP/SAP Block (224.2.0.0-224.2.255.255 (224.2/16))
- AD-HOC Block II (224.3.0.0-224.4.255.255 (224.3/16, 224.4/16))
- RESERVED (224.5.0.0-224.251.255.255 (251 /16s))
- DIS Transient Groups 224.252.0.0-224.255.255.255 (224.252/14))
- RESERVED (225.0.0.0-231.255.255.255 (7 /8s))
- Source-Specific Multicast Block (232.0.0.0-232.255.255.255 (232/8))
- GLOP Block
- AD-HOC Block III (233.252.0.0-233.255.255.255 (233.252/14))
- Unicast-Prefix-based IPv4 Multicast Addresses
- Scoped Multicast Ranges
- Relative Addresses used with Scoped Multicast Addresses

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

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

Choosing a UDP port number for multicast streams is also important. Even if you use a different multicast IP for each of your streams, we strongly recommend using different UDP port numbers as well. This is because a server and all software running on the server receives ALL multicast traffic on an open port and extra processing is required to filter out the required traffic. If the each stream arrives on a different port, the server can safely ignore any traffic on ports that are not open. Port numbers MUST be chosen so that don't clash with any existing services or ephemeral ranges. The ephemeral range for Windows Vista, 7, 2008 is 49152 to 65535, for older Windows it is 1025 to 5000 and for Linux it is 32768 to 61000. For more information on Windows see http://support.microsoft.com/kb/929851 Care should also be taken to avoid system ports 0 to 1024. See http://www.iana.org/assignments/service-names-port-numbers/service-names-port-numbers.xml Generally one of the unassigned You 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 *you or registered ports*, and ports with numbers 49152-65535 are called *dynamic and/or private ports*.[2] Both system and you 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** – you 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:	
Standard:	RFC 3550 (RTP: A Transport Protocol for Real-Time Applications, 2003)

Anwendung	RTP				
Transport	UDP				
Internet	IP (IPv4, IPv6)				
Netzzugang	Ethernet	Token Bus	Token Ring	FDDI	…

any port (even, not odd > 1024)

Note: Regarding SAP (Session Announcement Protocol)

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

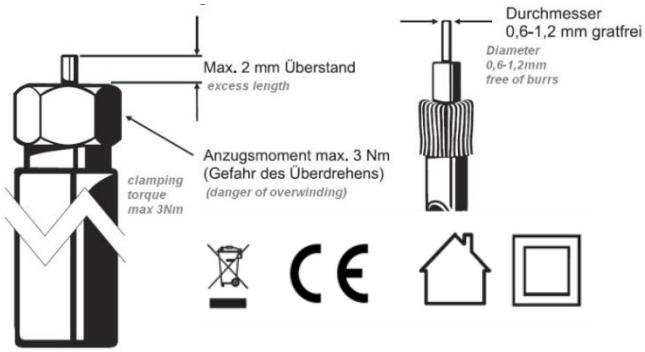
IPv4 administrative scope sessions using administratively scoped IP multicast. The multicast address to be used for SAP announcements is the highest multicast address in the relevant administrative scope zone.

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

We assume, that this professional unit is used by professional technicians knowing all relevant norms, regulations, abbreviations (i.e. DVB, ATSC …) and specifications.

Installation guide for F-connectors:

/ Installationshinweis für den F-Anschluß:



The LNC –connectors are almost marked as:

Die LNB-Anschlüsse sind meist entsprechend gekennzeichnet

HH= Horizontal High-Band
HL = Horizontal Low-Band = LH
VL = Vertical Low-Band = LV
VH= Vertical High-Band = HV

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

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.

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.

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.

Installation and safety instructions / Montage und Sicherheitshinweise

- Die beschriebenen Geräte dienen ausschließlich der Installation von Satelliten-Empfangsanlagen.
- *The equipment described is designed solely for the installation of satellite receiver systems.*
- Jegliche anderweitige Nutzung oder die Nichtbeachtung dieses Anwendungshinweises hat den Verlust der Gewährleistung bzw. Garantie zur Folge.
- *Any other use, or failure to comply with these instructions, will result in voiding of warranty cover.*
- Die Geräte dürfen nur in trockenen Innenräumen montiert werden. Nicht auf oder an leichtentzündlichen Materialien montieren.
- *The equipment may only be installed in dry indoor areas. Do not mount on or against highly combustible materials.*
- Die Geräte sind mit einer Potenzial-Ausgleichsleitung (Cu, mindestens 4 mm^2) zu versehen.
- *The equipment must be provided with an earthing wire (Cu, at least 4 mm2).*
- Die Sicherheitsbestimmungen der jeweils aktuellen Normen EN 60728-11 und EN 60065 sind zu beachten.
- *The safety regulations set out in the current EN 60728-11 and EN 60065 standards must be complied with*
- Verbindungsstecker: HF-Stecker 75 Ohm (Serie F) nach EN 61169-24
- *Connector: HF plug 75 Ohm (series F) to EN 61169-24.*
- **Nicht benutzte Teilnehmerausgänge** sollten mit 75-Ohm Widerständen (z. B. EMK 03) abgeschlossen werden. (Verringerung der terrestrischen Signalwelligkeit)
- ***Unused subscriber ports*** *should be closed off by 75 Ohm resistors (e.g. EMK 03).*
- **Nicht benutzte Kaskadenausgänge** sind mit 75 Ohm Widerständen inkl. DC-Blocker abzuschließen. 75 Ohm Widerstände ohne Gleichspannungssperren können das Gerät beschädigen!
- ***Unused trunk outputs*** *must be terminated with 75Ohm resistors including DC Blocker. Otherwise the device may be inoperable or damaged.*
- Bitte überprüfen Sie die Anlage vor Inbetriebnahme auf evtl. Kurzschlüsse der Koaxial-Kabel. Es ist darauf zu achten, daß die Eingangspegel der SAT-Ebenen möglichst gleich hoch sind. Power-LEDs zeigen den Betrieb an. Falls die nicht leuchten, bitte die Stromzufuhr kontrollieren.
- *Please check the installation against shortage in coax cables and connectors before switching on. The input levels should be adjusted accordingly. Power-LED's showing operational mode. If this is not illuminated, please check the power source.*
- **Stromführendes Gerät**
- ***Current-carrying unit***
- Nicht öffnen oder am Gerät manipulieren!
- *Do not open or tamper with the unit!*
- Bei Arbeiten an der Anlage immer die Netzstecker aus der Steckdose ziehen!
- *When working on the system always unplug the mains plug from the wall socket!*
- Auf ausreichenden Abstand achten! Nach allen Seiten mind. 5 cm!
- *Ensure adequate clearance! Min. 5 cm to all sides!*
- Nicht über Kopf montieren.
- *Do not install overhead.*

- Für die Gerätekühlung muß freie Luftzirkulation möglich sein. Überhitzungsgefahr!
- *Free circulation of air must be possible to discharge the heat emitted by the unit. Risk of overheating!*
- Zulässige Umgebungstemperatur -20 bis +50°C
- *Permissible ambient temperature -20 to +50°C*

Important notes: / Zur Beachtung

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

Bitte installieren Sie die Anschlüsse gemäß dem Aufdruck auf den Geräten – falls vorhanden
Please install according to the sticker on the devices if shown.
Hinweis: Elektrische Installationen sollten nur durch geschultes Fachpersonal vorgenommen werden!
Note: Electrical installations should only be done by well-educated and skilled technicians!

Umrechnungstabelle dBµV <-> dBm / *Conversions of Power @ 75Ω*

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

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

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.

3.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.

4.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

5. Verkauf

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

6. 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.

Contact:

IRENIS GmbH
Hauptstr. 29
31171 Nordstemmen- Germany
Phone: +49 5069 4809781

Managing Director: Dipl.Ing. Murad Önol
Commercial Register: HRB 206370 / District Court Hildesheim

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Document History:

Initial: November 2022	First release	RRI

DVB-C Channel plan

Anyway, we should adjust the QAM Channels according to the ITU Cenelec Channel line ups, so that TV sets can easier tune by using the default channel lists:
Example starting with

Analog Kanal	Analog-frequenz in MHz (7 MHz-Raster)	Digital Kanal	Digital-frequenz in MHz (8 MHz-Raster)
~~S01~~	~~105,25~~		
S02	112,25	D114	114±4
S03	119,25	D122	122±4
S04	126,25	D130	130±4
S05	133,25		
S06	140,25	D138	138±4
S07	147,25	D146	146±4
S08	154,25	D154	154±4
S09	161,25	D162	162±4
S10	168,25	D170	170±4

Superband[36]

Analog Kanal	Analog-frequenz in MHz (7 MHz-Raster)	Digital Kanal	Digital-frequenz in MHz (8 MHz-Raster)
S11	231,25	(D234)	(234±4)
S12	238,25		
S13	245,25	(D242)	(242±4)
S14	252,25	(D250)	(250±4)
S15	259,25	(D258)	(258±4)
S16	266,25	(D266)	(266±4)
S17	273,25	(D274)	(274±4)
S18	280,25	(D282)	(282±4)
S19	287,25	(D290)	(290±4)
S20	294,25	(D298)	(298±4)

That's enough for 16 channels.

Next page full plan….
This might have been changed over the time because of CATV operators using DOCSIS 3.x

Technical Appendix
Telekom/CENELEC Channel Plan

The output levels for broadband implifiers have been determined in conformity with the following channel allocations:

TV Bands	Channel PAL	(MHz)	Telekom[1] channel plan 36 Channels	CENELEC-Plan[2] 19/29/42 Channels
I	2	48,25	•	•
	3	55,25		
	4	62,25	•	
	Pilot	80,15	(•)	
Midband	S 2	112,25		
	S 3	119,25		•
	S 4	126,25		
	S 5	133,25	•	
	S 6	140,25	•	
	S 7	147,25	•	
	S 8	154,25	•	
	S 9	161,25	•	
	S10	168,25		
III	5	175,25	•	•
	6	182,25		
	7	189,25	•	
		191,25		•
	8	196,25		
	9	203,25	•	
		207,25		•
	10	210,25		
	11	217,25	•	
		223,25		•
	12	224,25		
Superband	S 11	231,25	•	•
	S 12	238,25	•	
	S 13	245,25	•	
		247,25		•
	S 14	252,25	•	
	S 15	259,25	•	
		263,25		•
	S 16	266,25	•	
	S 17	273,25	•	
	S 18	280,25	•	
	S 19	287,25	(•)	•
	S 20	294,25	•	
Extended Superband	S 21	303,25	•	
	S 22	311,25	•	•
	S 23	319,25	•	
	S 24	327,25	•	•
	S 25	335,25	•	
	S 26	343,25		•
	S 27	351,25	•	
	S 28	359,25	•	•
	S 29	367,25	•	
	S 30	375,25	•	•
	S 31	383,25	•	
	S 32	391,25	•	•
	S 33	399,25		
	S 34	407,25	•	•
	S 35	415,25	•	
	S 36	423,25	•	•
	S 37	431,25	•	
Extended Superband	S 38	439,25	•	•
	S 39	447,25		•
	S 40	455,25		
	S 41	463,25		•
IV	21	471,25	•	
	22	479,25	•	•
	23	487,25	•	
	24	495,25	•	•
	25	503,25	•	
	26	511,25	•	•
	27	519,25	•	
	28	527,25	•	•
	29	535,25	•	
	30	543,25	•	•
	31	551,25	•	
	32	559,25	•	
	33	567,25	•	•
	34	575,25	•	
	35	583,25	•	•
	36	591,25	•	
	37	599,25	•	•
V	38	607,25		
	39	615,25		
	40	623,25		
	41	631,25		
	42	639,25		
	43	647,25		
	44	655,25		
	45	663,25		•
	46	671,25		
	47	679,25		•
	48	687,25		
	49	**695,25**		•
	50	703,25		
	51	711,25		•
	52	719,25		
	53	727,25		•
	54	735,25		
	55	743,25		•
	56	751,25		
	57	759,25		•
	58	767,25		
	59	775,25		•
	60	783,25		
	61	791,25		•
	62	799,25		
	63	807,25		•
	64	815,25		
	65	823,25		•
	66	831,25		
	67	839,25		•
	68	847,25		
	69	855,25		•

[1]) accord. to FTZ 156 TR 4, Telekom channel plan 7/8 MHz (450 MHz). 54 channels up to 606 MHz.
[2]) accord. to DIN EN 50083-3, 19 channels up to 450 MHz, 29 channels up to 606 MHz, 42 channels up to 862 MHz.