BLANKOM an IRENIS brand ...selling Signals

HDD-275

4K Decoder & IPTV Receiver with HDMI/SDI/VGA/CVBS-Out

h.265 and h.264 compatible Decoder & IP Receiver

- Inputs: 1x UHD/HD/SD in h.264 or h.265 compatible streams like from our Encoders (actually no MPEG2 support)
- Outputs HDMI, CVBS, VGA and HD-SDI in parallel
- Stereo Audio embedded decoding of AAC and MP1L2, external Audio Output (3.5mm Stereo)
- UHD Resolution 2160p30, 1080p, 720p.... no interlaced
- IP Input: RTSP/RTP/UDP, UDP/RTP, HTTP, adaptive HLS, FLV, RTMP(s), SRT
- MPTS Input with Program selection for decoding
- Reception of Video Camera UHD/HD streams and other source content over LAN or WAN
- Inserting of Text, Logos and scrolling Text as Overlays
- Video-over IP applications (Signal distribution)
- Digital Signage applications
- Video conferencing, Camera streaming
- IPTV on LAN applications, Corporate IPTV for Broadcasters
- Monitoring up to 4 streams on one TV picture (4xMosaic)
- Remote management by an inbuilt Webserver-Interface
- 4-Stream-picture Mosaic in HD or UHD selectable by Web-IF (Audio decoding from 1 of the 4 sources selectable)

BLANKOM HDD-275 decoder serves the distribution of Full-HD and UHD TV/Video content through IP networks in digital quality.
The live Video can be received by this decoder as an IP stream and displays it on to standard TV sets.
Monitoring of 4 Streams in parallel on 1 TV set by a mosaic feature

BLANKOM HDD-275

IPTV Decoder is designed for TV signal reception in excellent quality over LAN and WAN.

The h.265 (HEVC) and h.264 compatible compression technology features low-latency and low bit rates for IPTV system reception. The high-efficient decoding chip saves bandwidth cost through all its resolution range.

Reception of SD, HD and UHD TV channels through the IPTV/OTT network using state-of-art IP technology from almost any kind of video input.

Either 1 Stream in UHD or for Monitoring up to 4 streams on one TV output as Mosaic picture can be arranged.

Excellent video and audio quality. High reliability. Web-Interface.

No regular service and maintenance need during operation.

Application Example

Example output of 4 different encoded streams with Text overlays inserted by the encoders & the decoder

Technical Specifications:

Function	h.265 (HEVC compatible) and h.264 (MPEG4 compatible) Decoder and 4 pic Mosaic-viewer
SYSTEM	Embedded HiLinux System, stable and effective, 7 x 24h
INPUT	RJ45 GbEthernet up to 4 Streams (Mosaic), management by web browser, firmware upgrade by Web-IF
Protocol	Unicast: HTTP / adaptive HLS / FLV / RTSP/UDP / RTMP(s) / **SRT: push & passphrase** Multicast: UDP/RTP
Data Rates	100 kbps – 32 Mbps per stream
Resolution max:	2160p30, 1080p60, 720p and below
Video Decoder	h.265 (HEVC) or h.264 (AVC) in max. 4K@30fps CBR or VBR baseline /main /high profile
Audio Decoder	STEREO AAC/AAC+/AAC++/MP3/MP2/AC3 G711
Audio sample rates	8000/11250/22500/44100/48000Hz
OSD	4 Logo (bmp's with or w/o transparent colour) and Text Insertion as transparent overlays
Picture adjust	Brightness, Hue, Saturation, Contrast, Picture Crop, Rotating 0,90,180,270°
Profiles	H.264/AVC High/Main/Baseline Profile H.265/HEVC main profile MJPEG/JPEG baseline
Audio output	HDMI /HD-SDI embedded Audio (additional 2.5mm Stereo jack out)
HDMI-max out format	3840*2160P@30/1440P@30/1080P@60/1080I@60/1080P@50/1080I@50 1080P30/1080P25/720P60/720P50/576P50/480P60 fps
CVBS Output	PAL 720x576 & NTSC 720x480
HD-SDI	maximum output format = 1080p@60fps
HD-SDI & VGA-Out	1080P@60/1080I@60/1080P@50/1080I@50 1080P30/1080P25/720P60/720P50/576P50/480P60 fps
Maximum decoding Datarate's @ HDMI	1 Picture stream output: 4k@30fps @32mbps
Up to 4 Input streams for Mosaic picture:	1-1080p@60fps bitrate can be up to 32mbps 2-1080p@60fps@10mbps max. for each stream 3-1080p@50fps@10mbps max. for each stream 4-1080p@30fps@20mbps max. for each stream
Relative Humidity	5% to 90% non-condensing
Storage temperature	-20° to 80°C
Operating temperature	-10° to 70°C
Power supply	12V DC, 1A
Dimensions	180x150x25mm
Weight	0,5 kg / incl. Package and PSU: 0,7kg
Consumption	5-10W

Companion products:

- **HDE-275/Q 4x-Encoder 4K/HDMI** compatible **to IP Streaming**
- **HDE-264/265 and SDE-265 boxed encoder series**
- **EMU-Encoder Streamer series**
- **IGA-4400 / IGA-824 IP Stream Gateways/Converters**
- **BTR-6000 Transcoder**

Quickstart:

ATTENTION:

Please do not feed the SDI BNC output port with remote powering like some Camera networks doing it with 12V DC.

Note: Do not mess up with the SDI Output and the CVBS

Notes and Hints:

The Ethernet-port does not support PoE so please take care of not accidently using a PoE switch- you can damage the port and the unit will be not accessible anymore.

We recommend to use an IGMP-V2/3 protocol capable GBE- Switch to avoid flooding your network with unmanaged multicast streams. Also some consumer Internet routers do not like Multicasts (UDP/RTP) and might reboot periodically.

An Internet-connection is not necessary as long as you need to use NTP and does not have an own NTP server in your network (depending on model).

Please assure that your HDMI –Output you like to display is set to max. HD with 2160p30 or lower. Higher values will not work.

The embedded Linux system takes some seconds to fully boot. After the System-LED is on, you can connect your browser to it. We recommend Chrome, Opera, and Mozilla. Sometimes it is helpful to reload the browser – page to get the changed settings and values because of different browser behaviours... Be a little patient, while the decoder needs to react on your changed settings in some seconds.

The RESET button (RST at the front as a hole) will erase all your settings and the unit will be forced to start with factory defaults. Use a thin wire to pass the small hole and press the inside button by it for at least 5-10 seconds until the System LED will go off. The encoder would perform a restart than after releasing the button.

The Web-Interface lookalike may vary between different Versions but basically its self-explaining.

The SDI output supporting only one embedded Stereo-Audio-Pair to be processed.

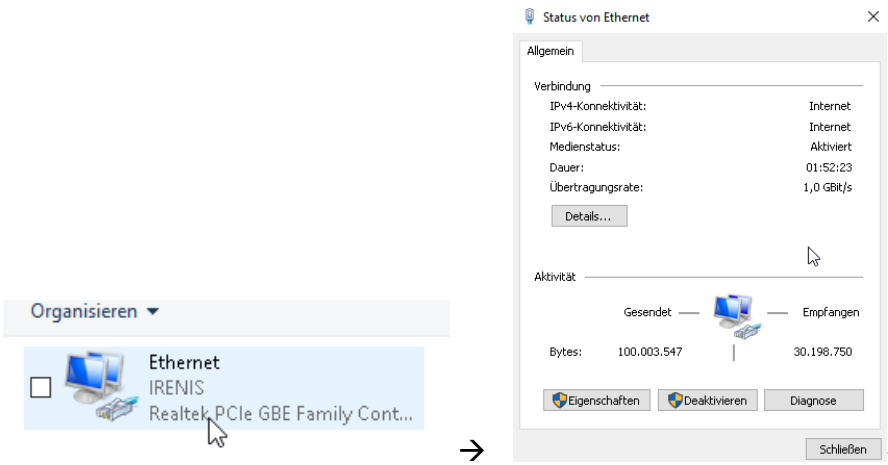
Connecting:

After PSU, Output screen and no Input streams has been configured the Output screen will show a BLUE Screen with the message: No Signal and the LAN IP address of the unit.

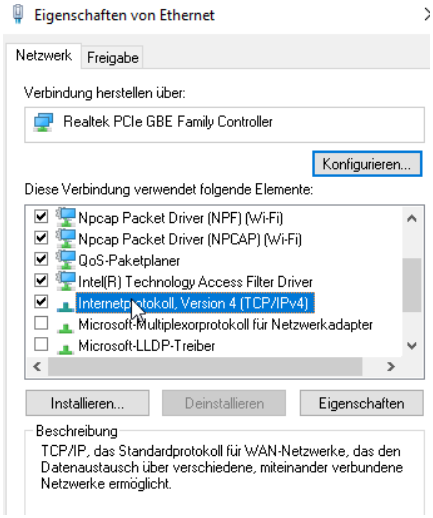
Setting up your PC/Laptop before connecting:

If you use a Windows based PC, you should assign its Ethernet adapter into the same range like the encoder: Use a static IP like follows:

1st: Open your network settings in System Menu:



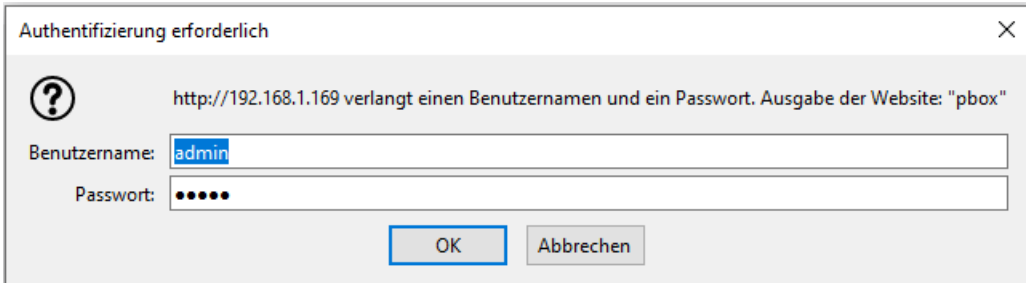
-> Maybe confirm



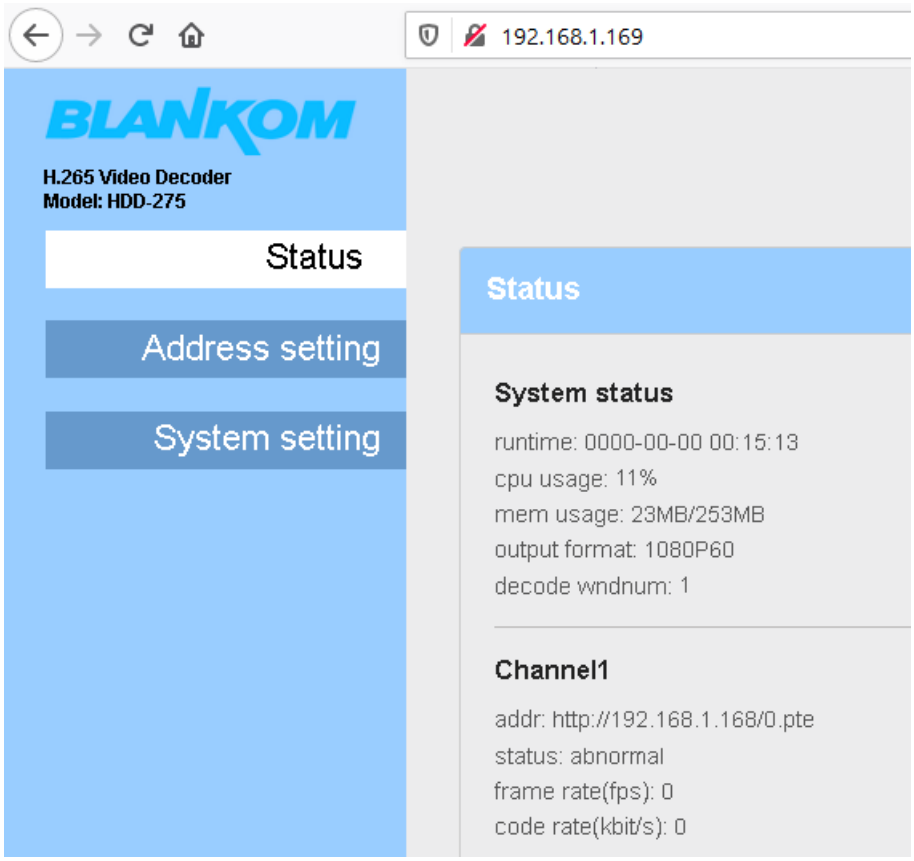
Administrator access-> Change IPv4 settings:

And confirm please. Linux users should know how to change the ethernet or WIFI settings.

Than open your browser and enter the http- Address of the box 192.168.1.169 (w/o https):

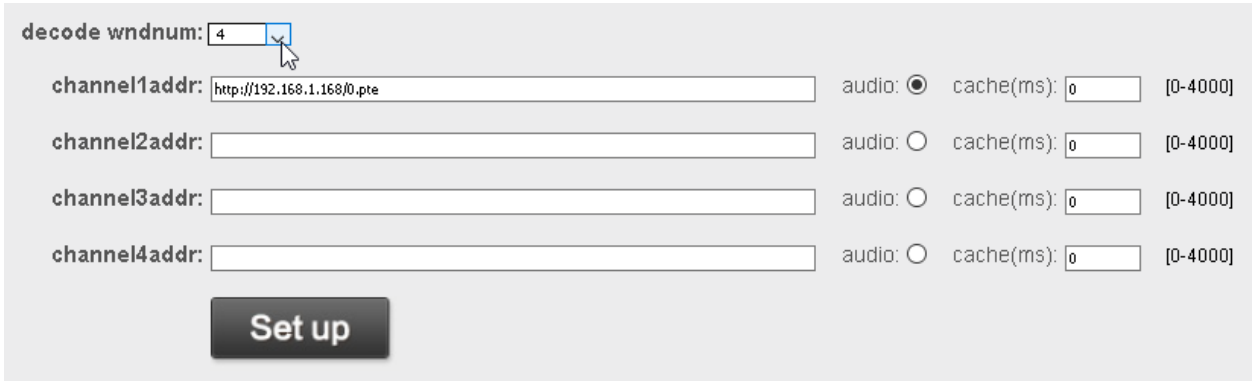


admin / admin



Address:

For 4 screens on the TV you can set up to to 4 different addresses but only one Audio can be selected:

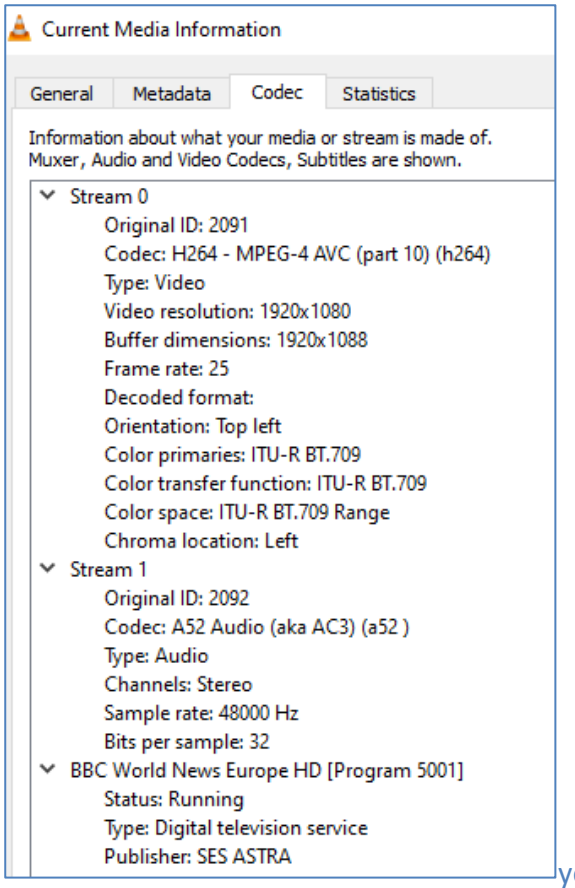


If you use all 4, than note: the capacity of parallel decoding is limited to datarates

1-1080p@60fps bitrate can be up to 32mbps
2-1080p@60fps@10mbps max. for each stream
3-1080p@50fps@10mbps max. for each stream
4-1080p@30fps@20mbps max. for each stream

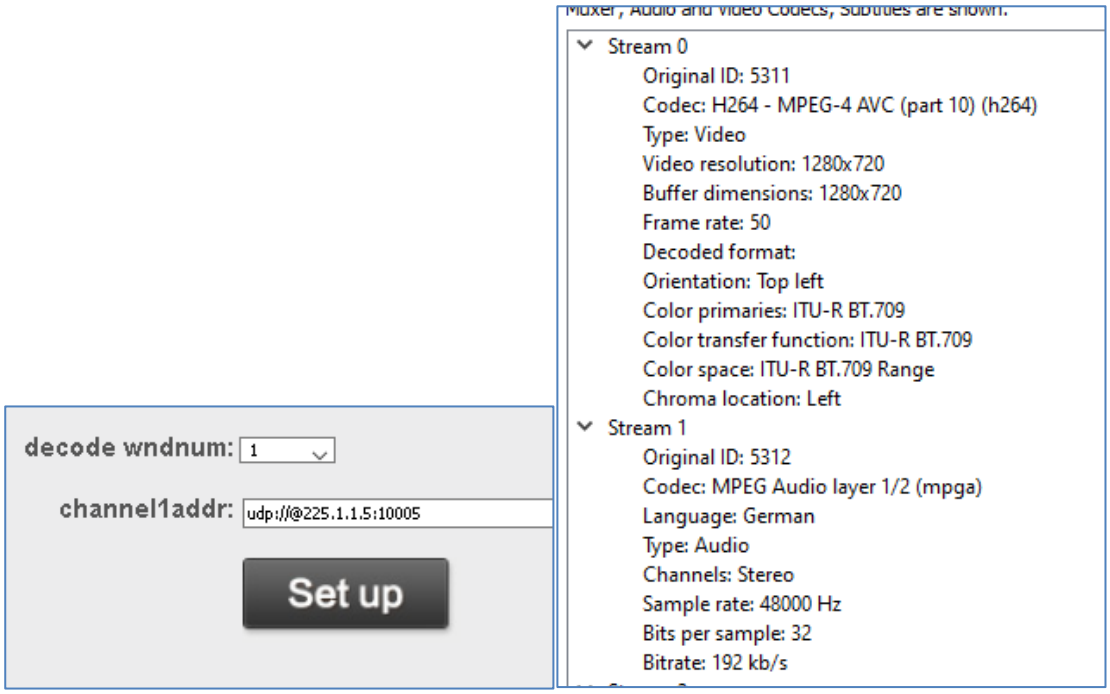
So exceeding these data rates it might be that the pictures in the Mosaic will not be stable.
Example for what is not supported:

Input stream with 1080i50 (displayed as 1080 25fps):



you'll get no decoding output.

But p50 as example works like a charm:



So we recommend to use corresponding ENCODER/STREAMER <-> DECODER values for these couples.

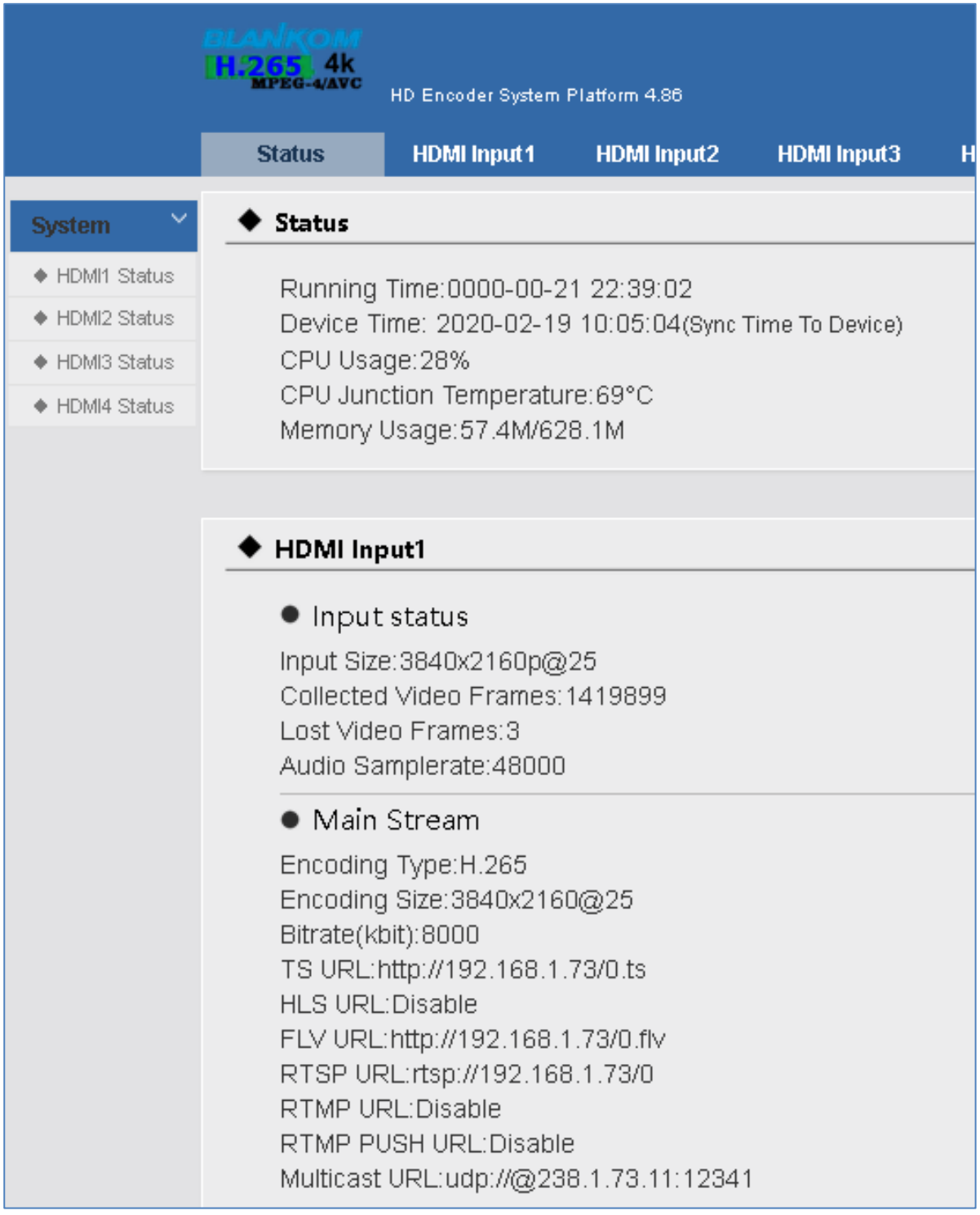
As you can see with this example, the decoder can make use of the @ in the multicast address like VLC demands this mandatory.

BTW: We assume, that you are familiar with all necessary details in streaming technology and know about RTP/UDP, SRT, HTTP, FLV, RTSP, RTMP, adaptive HLS... and all related protocols as well as IGMP V2/3 filtering in your network switches!

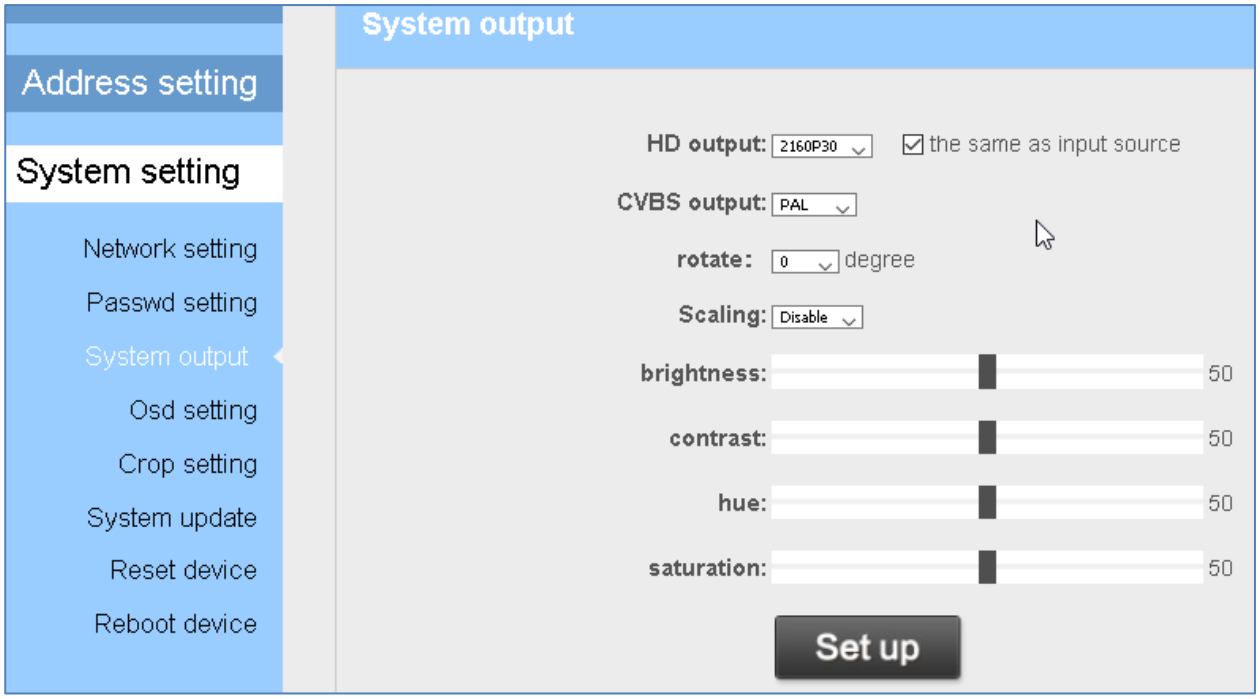
If you aren't familiar with this, you can get an overview from our whitepaper about IPTV.

Recommendation: Using Unicast streams will secure stability of reception because UDP protocol (and also RTP) doesn't care about lost packets.

Example: Source: UHD encoder:



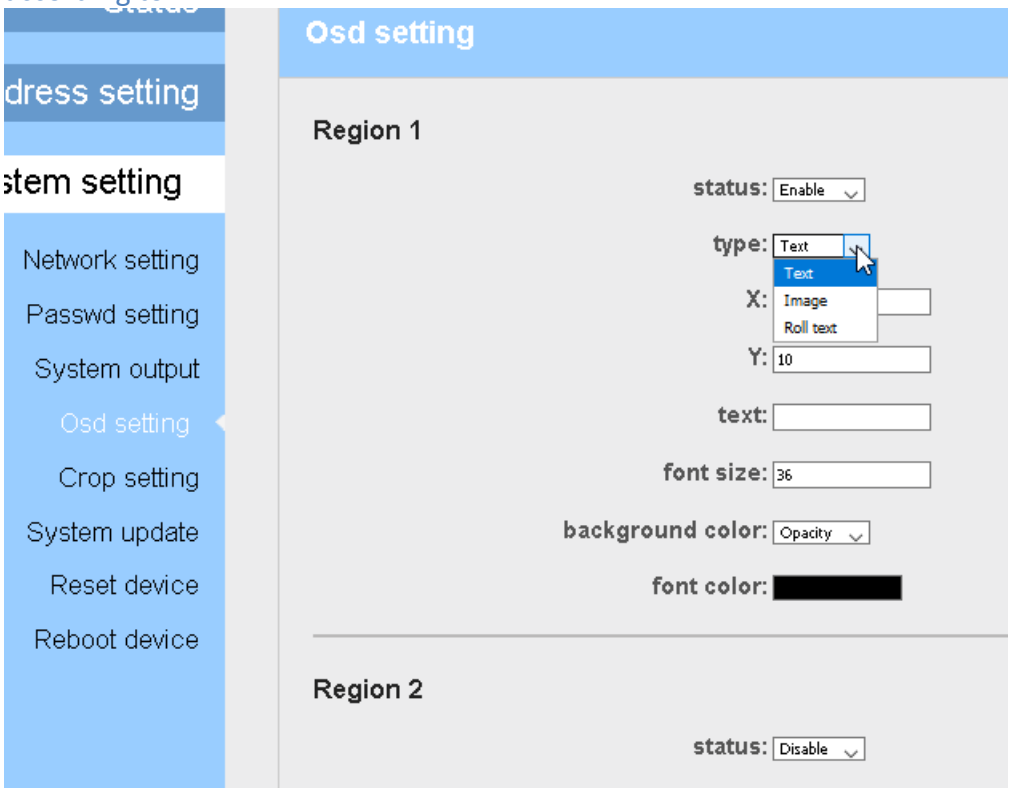
And output set to HDMI UHD resolution like:



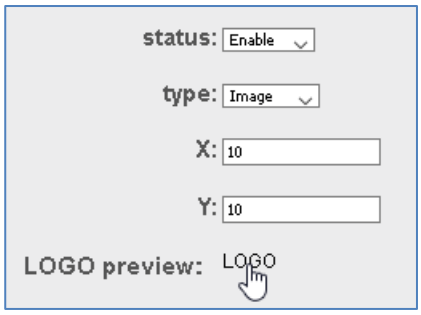
Will do it.
Here you have some options to adjust the picture, rotate or even scale the output.
Please note: HD-SDI and VGA and in particular CVBS outputs are to be downsized and harmonized with the Input stream as well.
Note: For Unicast stream reception both device network IP addresses should be in the same subnet: Decoder = 192.168.1.169, streamer Ethernet = http://192.168.1.73/0.ts or your network routes are set proper to that streaming pathway.

Adding a Logo or text to your Output:

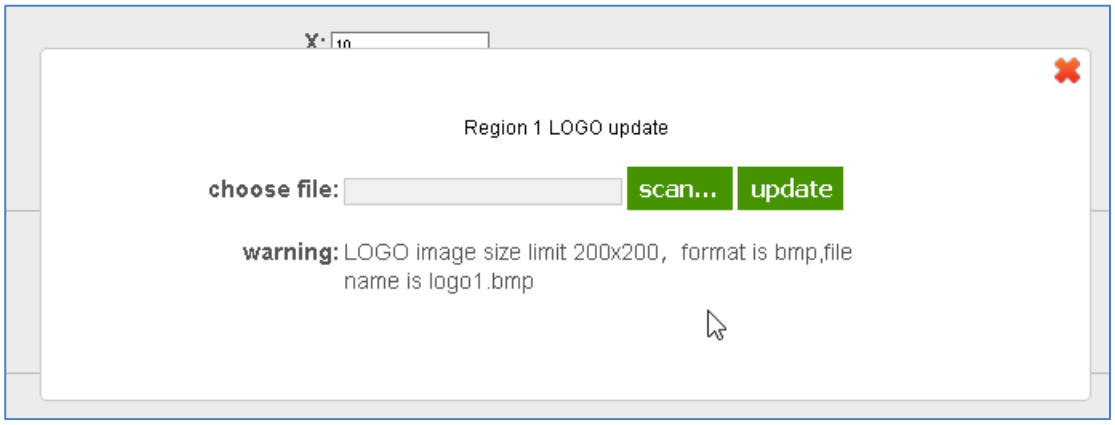
Up to 4 independent regions can be addresses with either LOGO, static Text or rolling Text according to:



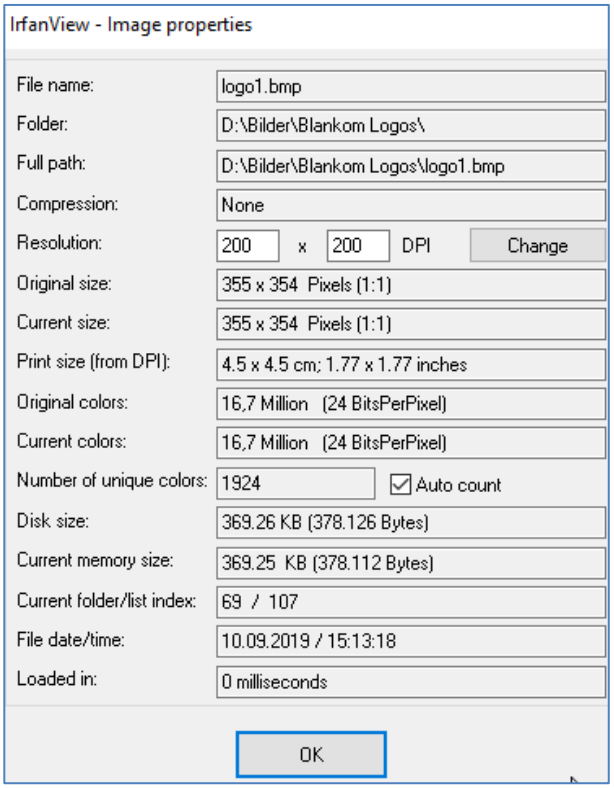
The Logo must have special graphic values like set and upload:



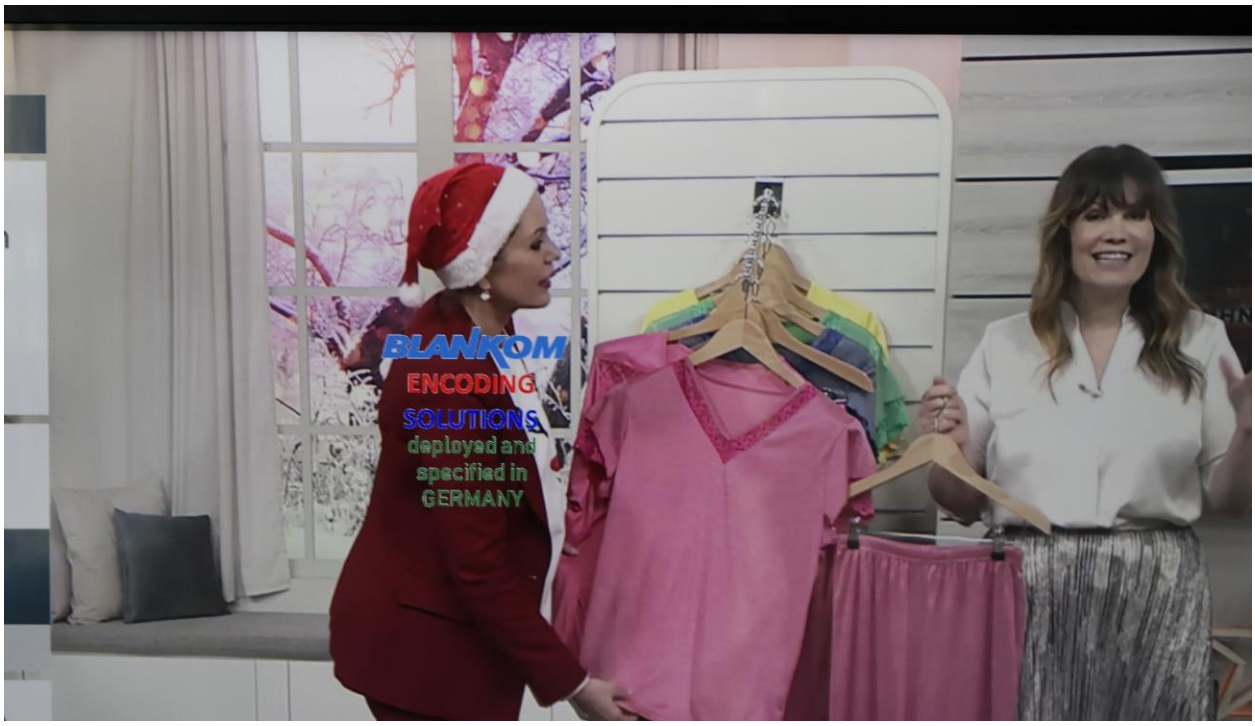
a logo as bmp:



Example:

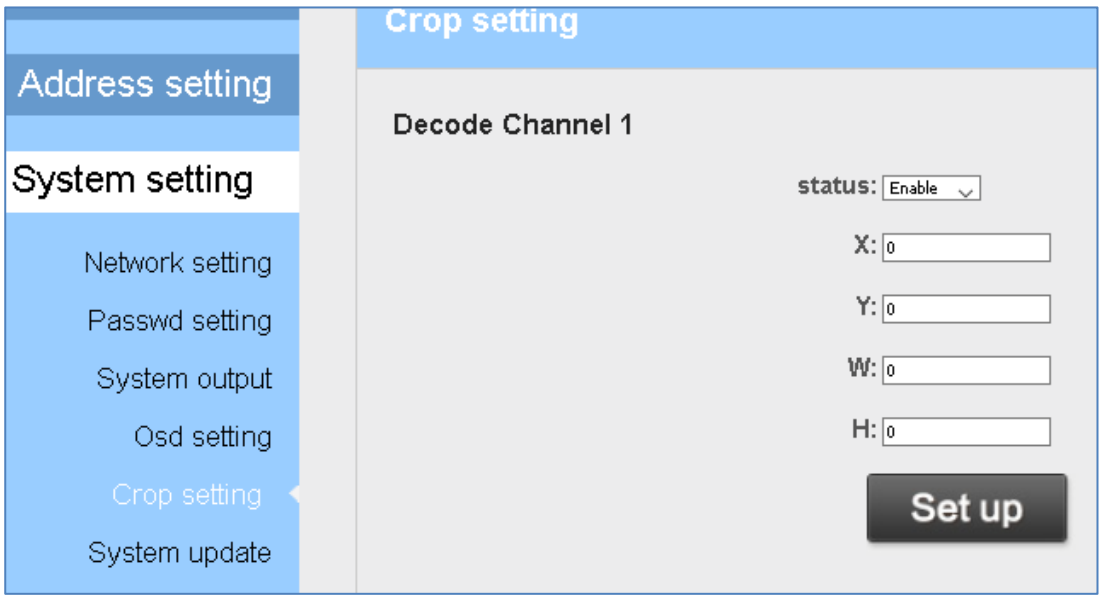


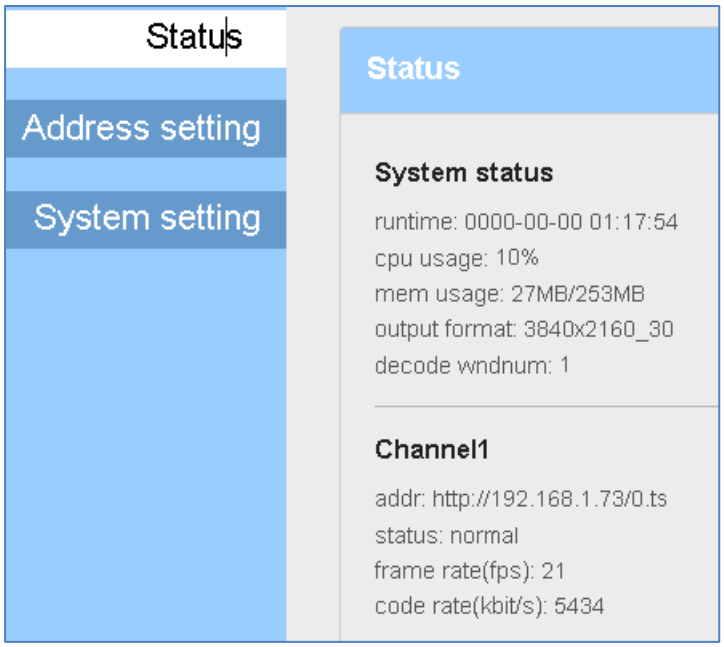
The transparent Background colour must be set to:
24-bit BMP (0xF1F1F1=transparent)
Also the file-size is limited, so do not upload too big ones. Maybe better to reduce the resolution...
->



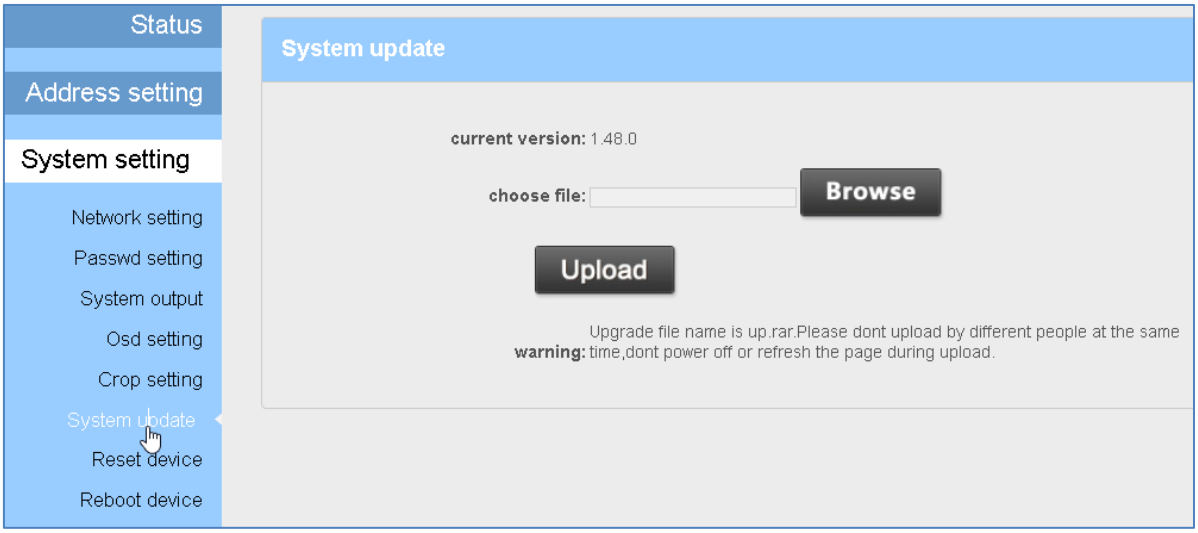
At position and screen UHD out set like above 2160 and to position:

This section will enable you to 'crop' the screen output to your chosen values:

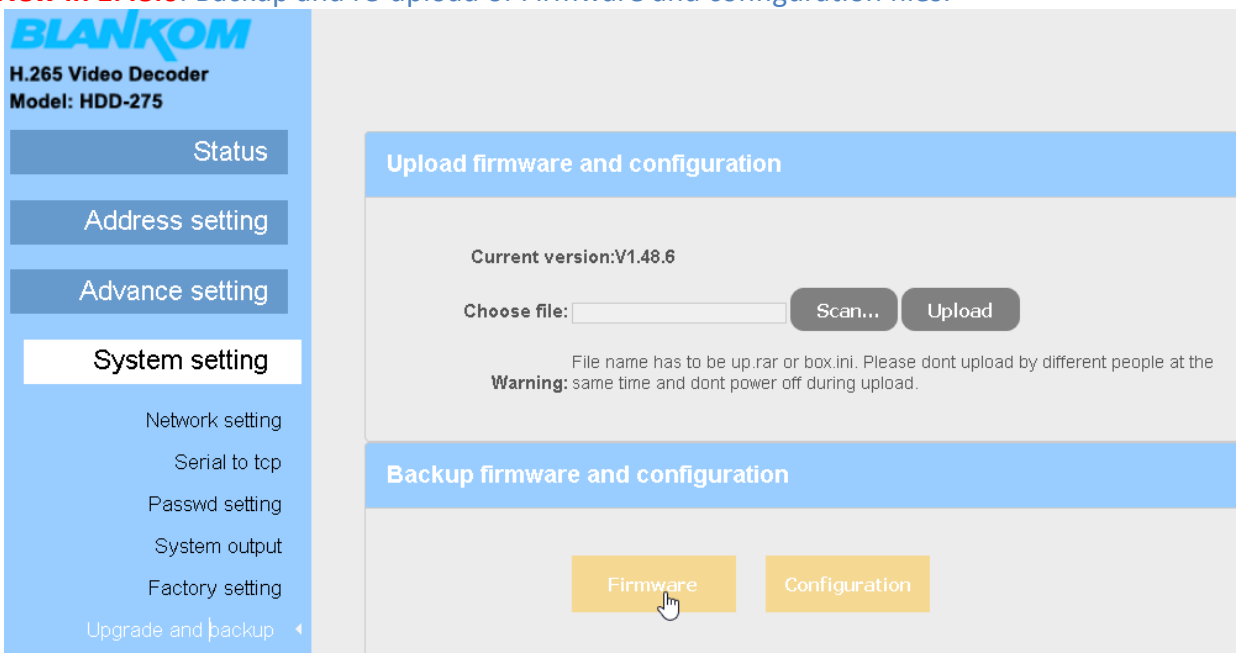




So always gives you the status about the I/O and might be not always correct and need to be refreshed sometimes…



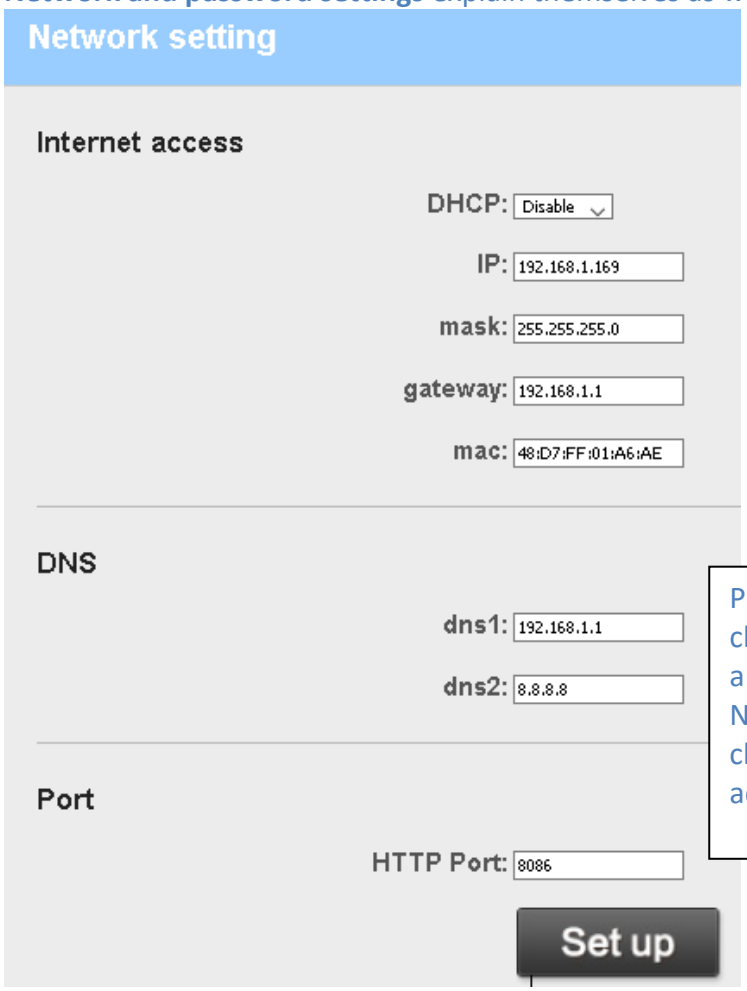
New in 1.48.6: Backup and re-upload of Firmware and configuration files:



Show the current version and the hints for updating the firmware ***if necessary and available … ask us…***

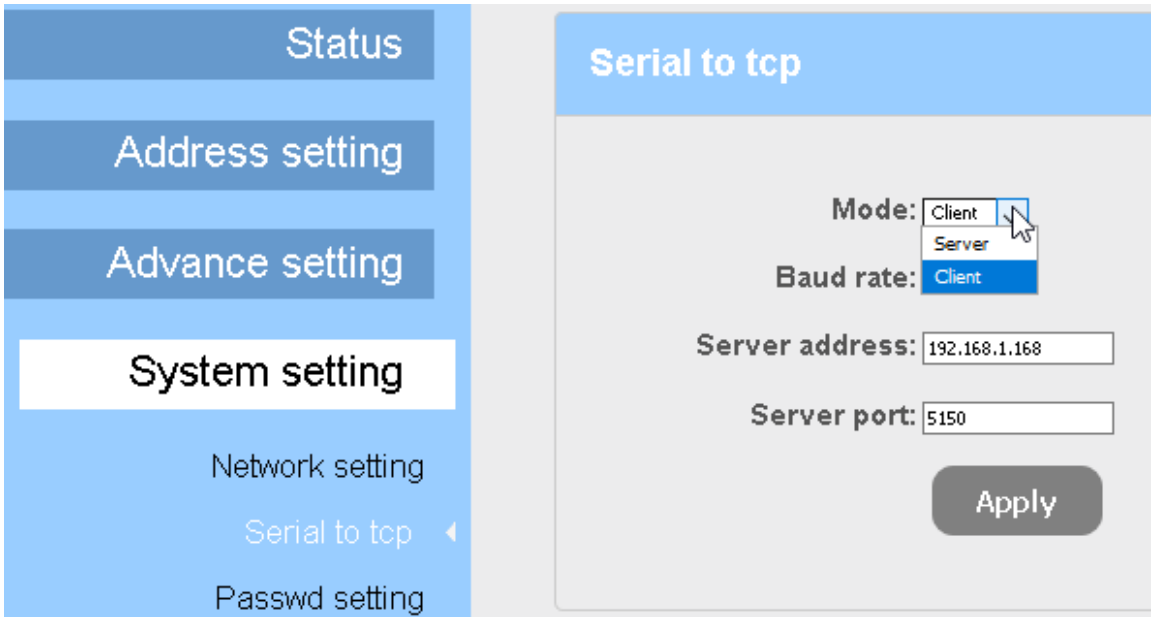
So if you have two identical decoder units, you can download the Firmware from the newer one (currently Version 1.52 with improved decoder functions is released) and upload it to the other unit. Or ask us, sent an email.

Network and password settings explain themselves as well as Reset and Reboot.



Please note the http port can be changed… We recommend to use a static IP address and not DHCP. Note: Sometimes after essential changes a reboot might help to re-adjust the unit…

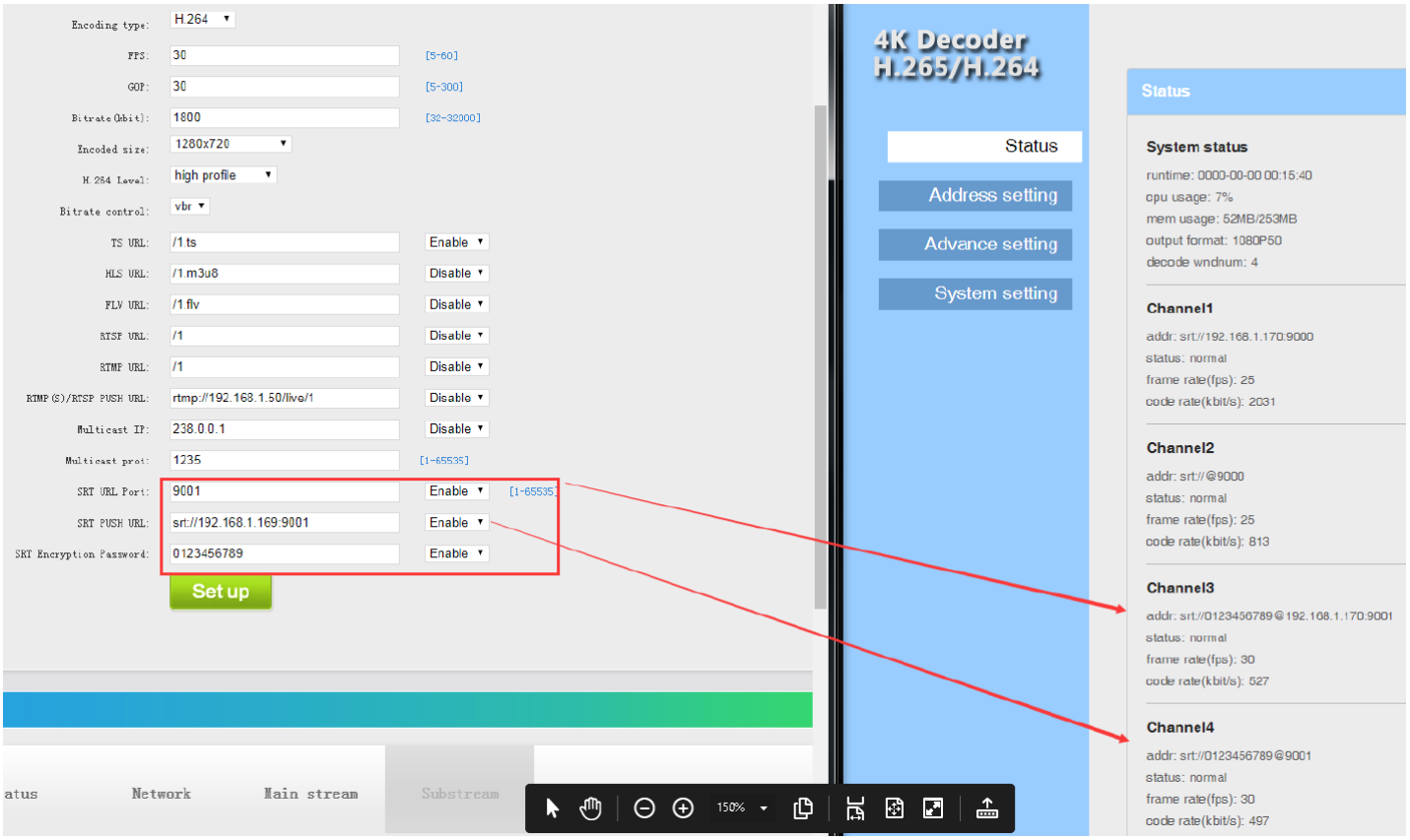
Additional serial over TCP port has been integrated in 1.48.6:



This can correspond with the serial-tcp feature of our encoders but need extra hardware (TCP-Serial-Interfaces)

SRT-support corresponding with encoder/decoder couple:

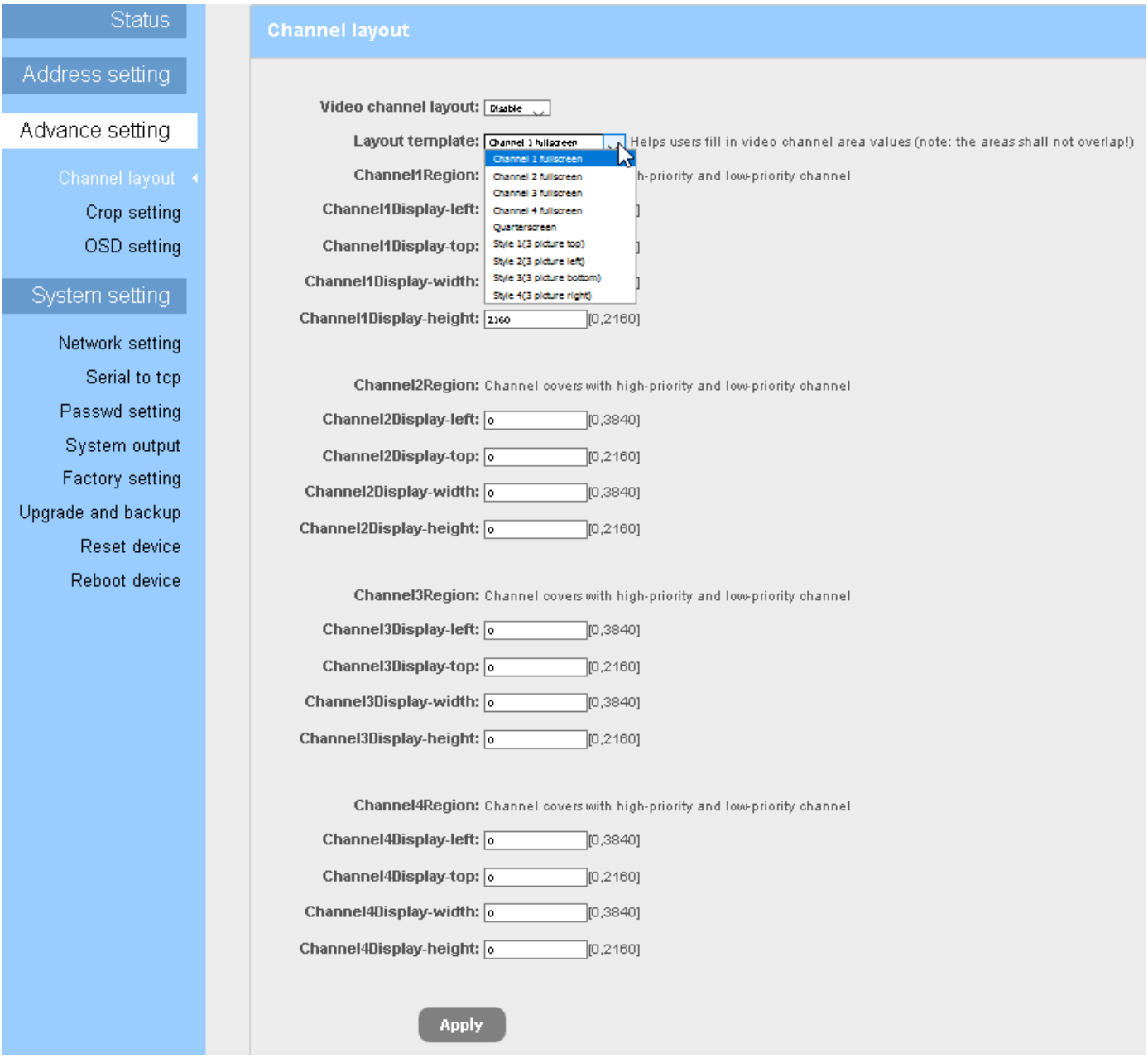
Support h264 & h265 with its playout url as
Srt://ip:port // encoder as Listener, decoder get srt from encoder, here 'ip' is the Encoder IP.
srt://port or **srt://@port** // encoder mode as caller, push srt to the decoder.
with passphrase/Encryption, its play url
srt://passphrase@ip:port // encoder as Listener, decoder get srt from encoder, here 'ip' is the Encoder IP. **srt://passphrase@port** // encoder mode as caller, push srt to the decoder.



New features in Version 1.602:

- Adaptive HLS support and
- RTSP with UDP

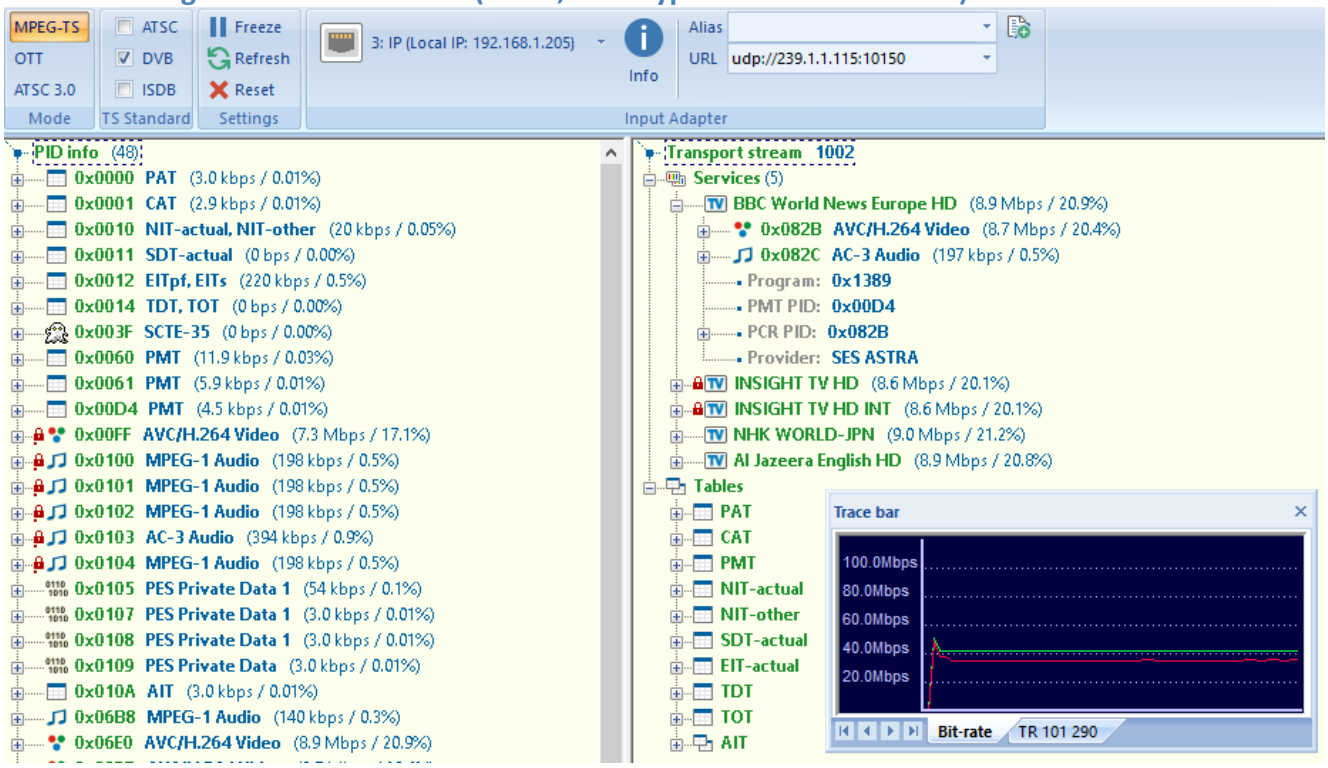
Resolution and Mosaic settings (> Version 1.48.6):



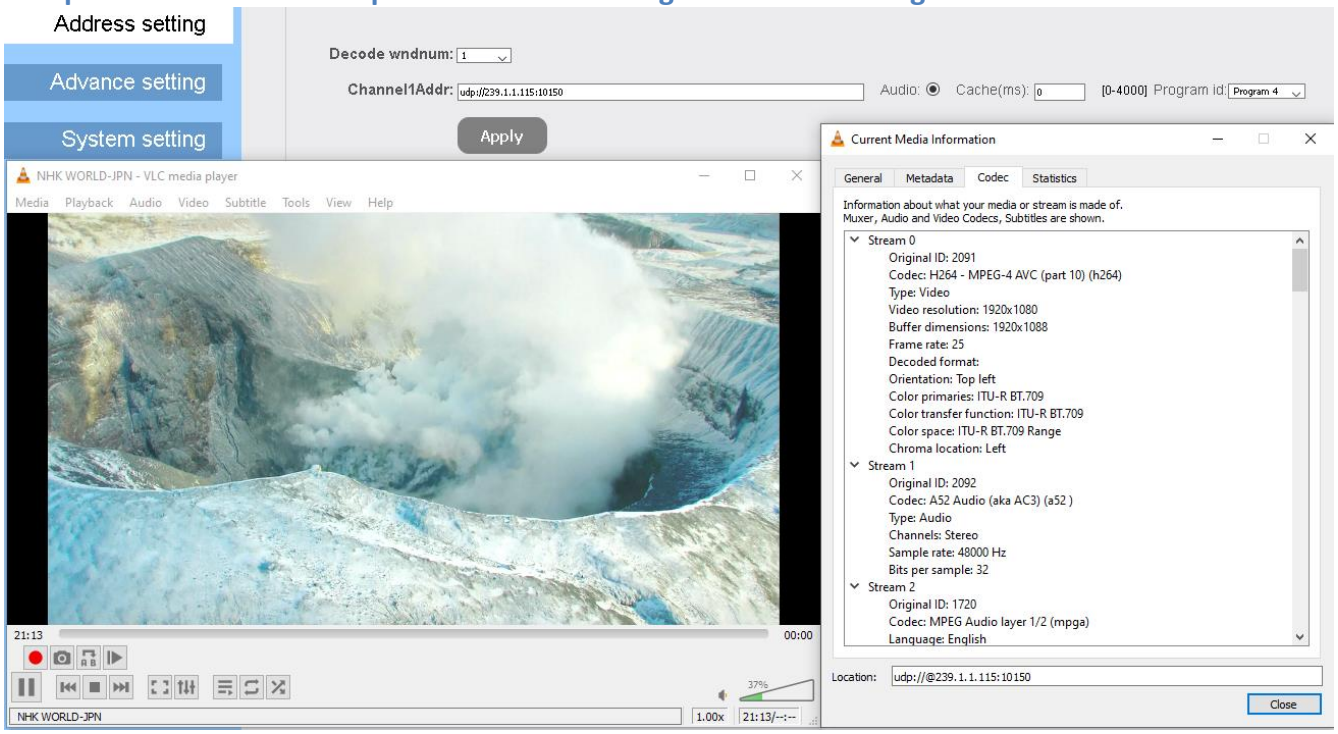
New since version 1.48.6: MPTS stream reception and decoding:

Example, stream reception of an MPTS coming from a SAT streamer and selecting the Program number for decoding means it demultiplex an MPTS (FTA) and the selected Program will be displayed on TV:

This is the original Stream content: (3 FTA, 2 encrypted – non decodable)



Compared with VLC PC reception: and set the Program 4 for decoding in the HDD-275:



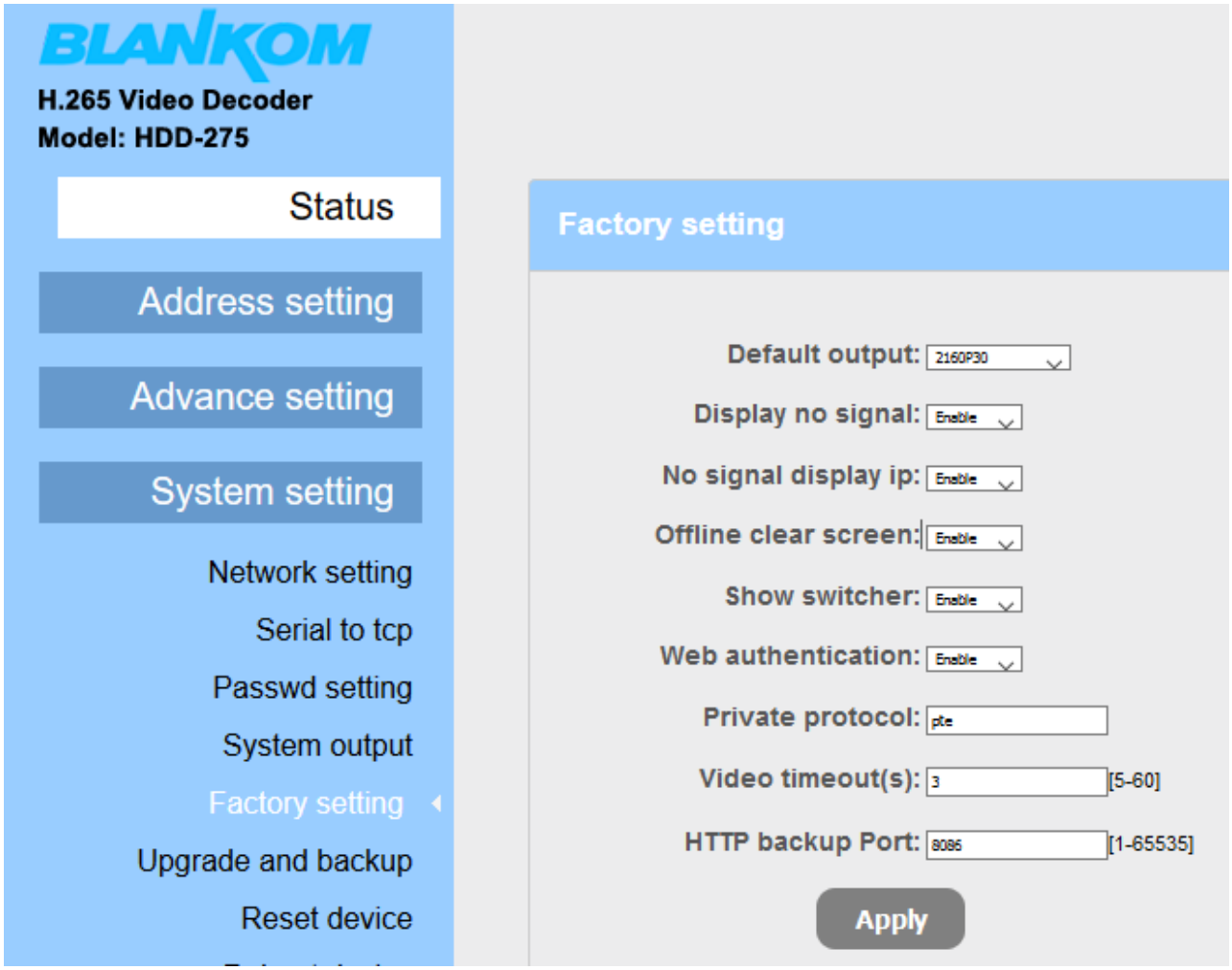
Put the NHK HD-Service on the TV incl. Audio.

The Program number (1…32) to be selected in the web-if (here NHK=4) must not be the same like in the DVB-MPTS-stream so try and error recommended.

Be patient, the decoder need seconds to react when switching. **Note: Not all DVB-TV-Resolutions/Codecs and Hz/framerates are supported for decoding (Example: Audio in MP2).**

Some more details about the new features from Current Firmware version:V1.48.6

Factory Settings = Default settings permanently stored and recovered after OFF -> ON



When the network has been accidently disconnected (No Signal on IP) or no Video output can be decoded (wrong codecs/format/FPS), then the unit will show our 'No Signal' Test-Picture on the HDMI-Out.

Offline-clear screen re-sets the HDMI out to a blue screen instead of a freeze picture with the last frame as content. Web authentication ON/OFF is self-explaining isn't it?

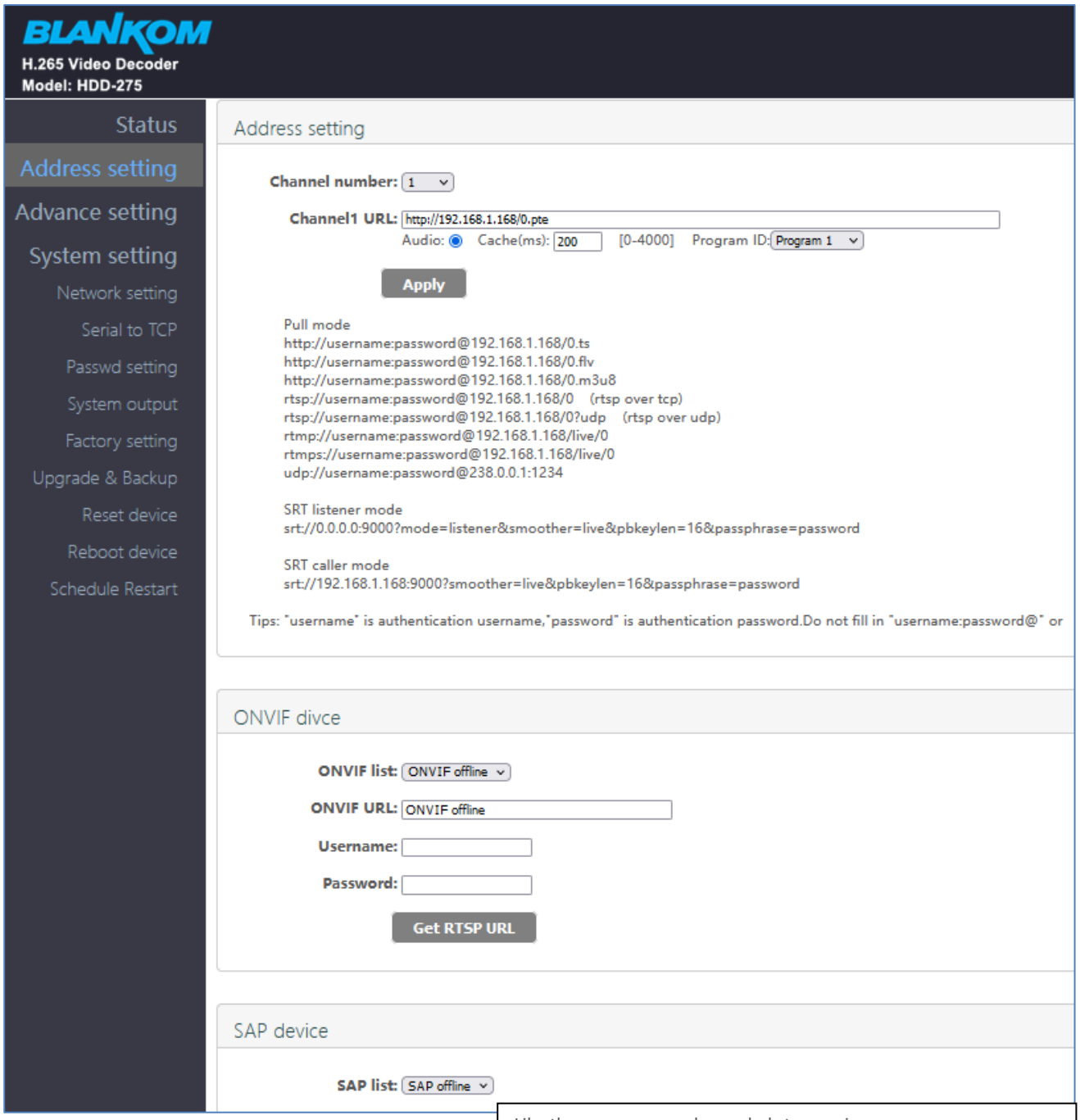
Private protocol PTE is made for a 'private' streaming protocol.

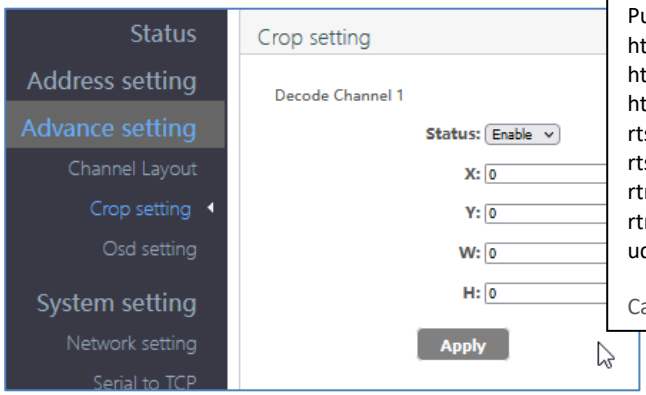
Video time out(s) can be adjusted to force the unit to wait for a broken stream recovering.

HTTP backup port: You can open the admin page by http://192.168.1.169 as well as with the 2nd enabled backup port such as http://192.168.1.169:8086

Version 1.52 has got decoding improvements.

With Version 1.56 (Summer 2022) we added some more features and changed the User-Interface:

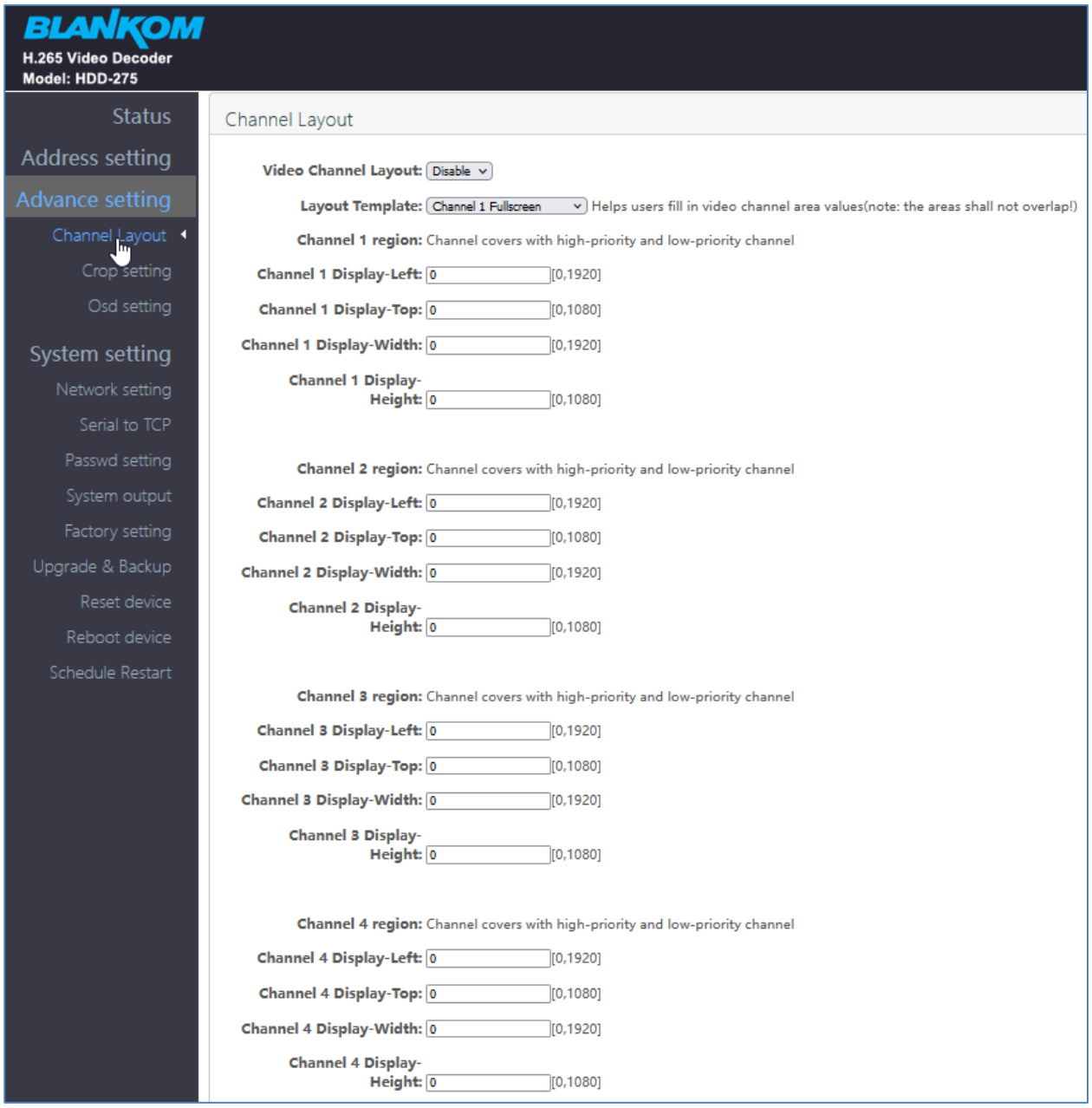




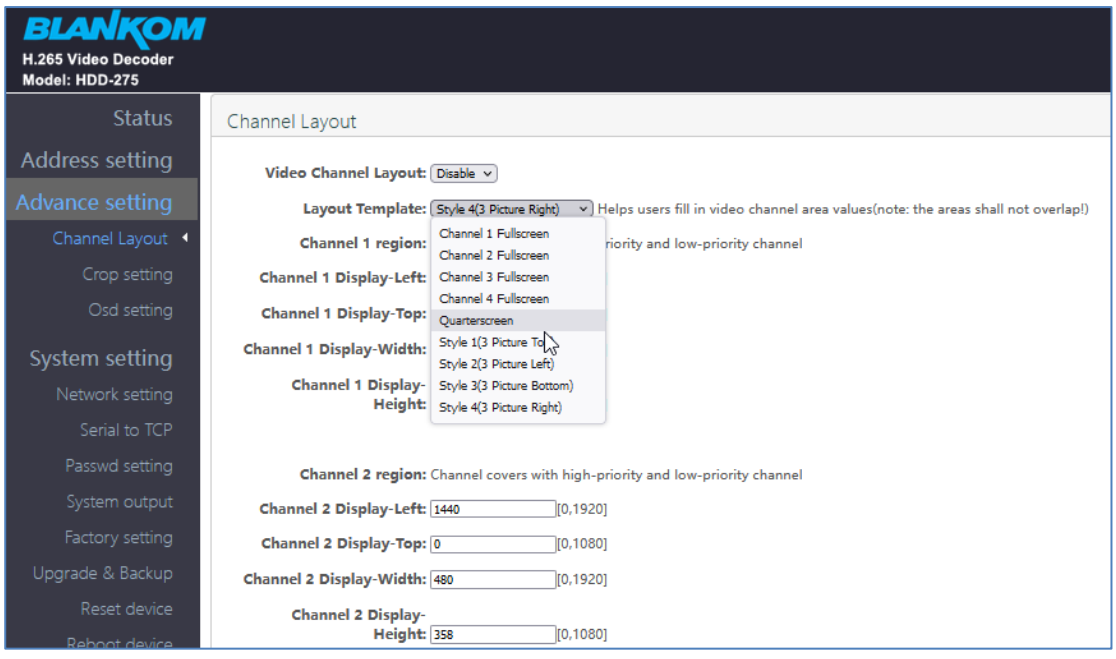
Like the user-password encoded streams in
Pull mode
http://username:password@192.168.1.168/0.ts
http://username:password@192.168.1.168/0.flv
http://username:password@192.168.1.168/0.m3u8
rtsp://username:password@192.168.1.168/0 (rtsp over tcp)
rtsp://username:password@192.168.1.168/0?udp (rtsp over udp)
rtmp://username:password@192.168.1.168/live/0
rtmps://username:password@192.168.1.168/live/0
udp://username:password@238.0.0.1:1234

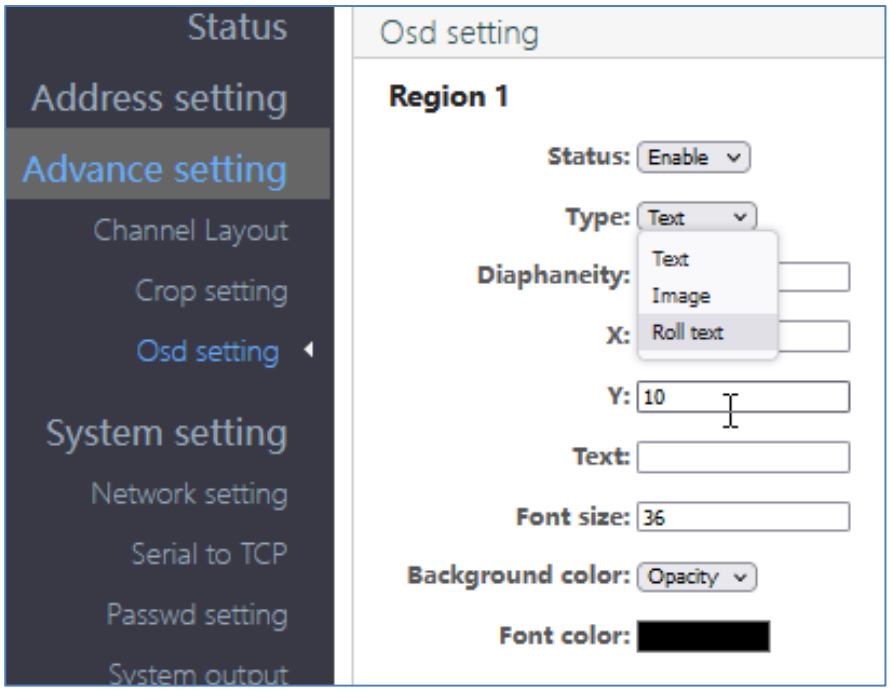
Can be used to receive secured streams from our encoders

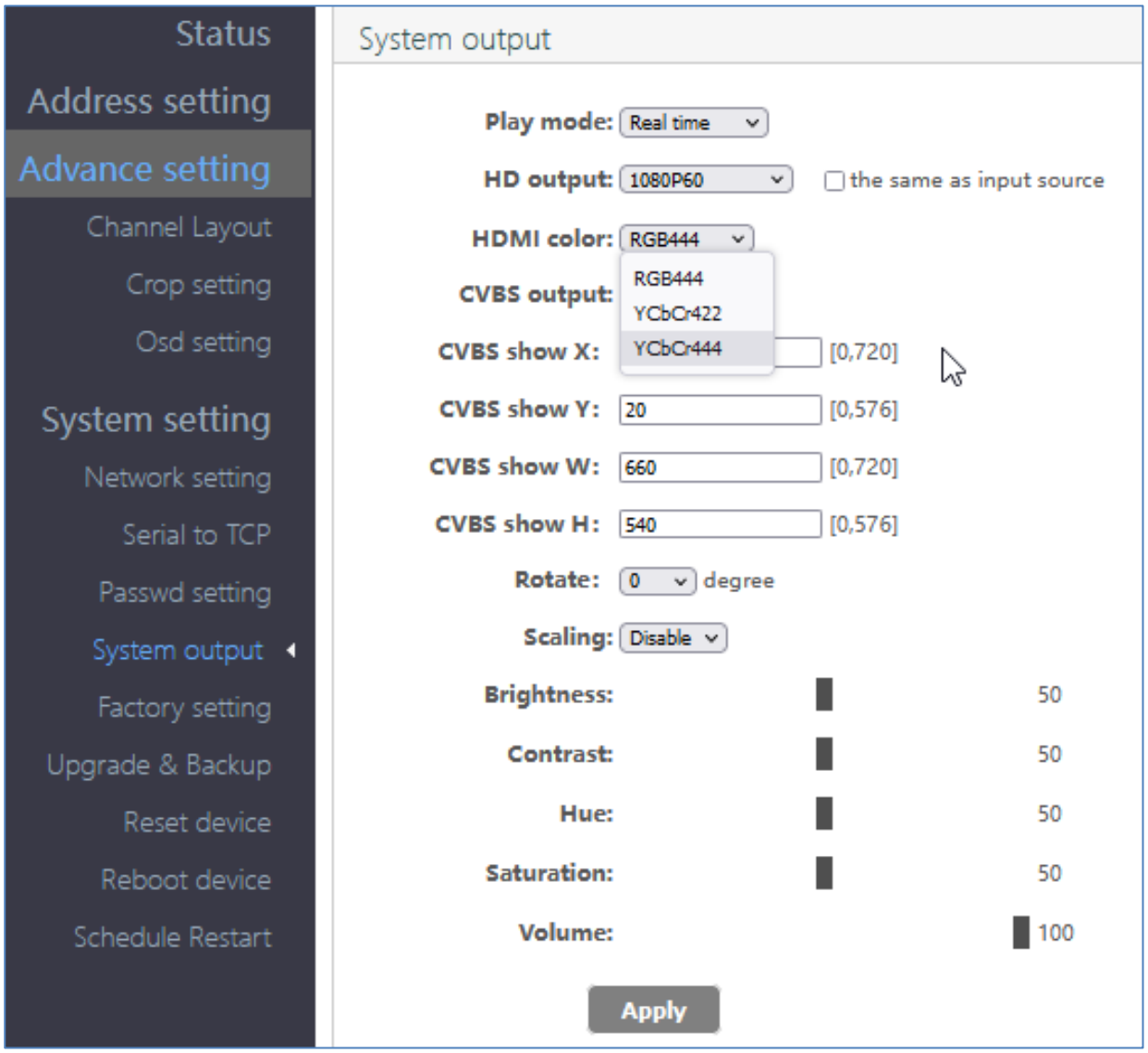
Connection to ONVIF and SAP-grabbing MC-Addresses from the network (If encoders are set to do SAP).



For individual positioning of the multiscreen-layouts with different presets:

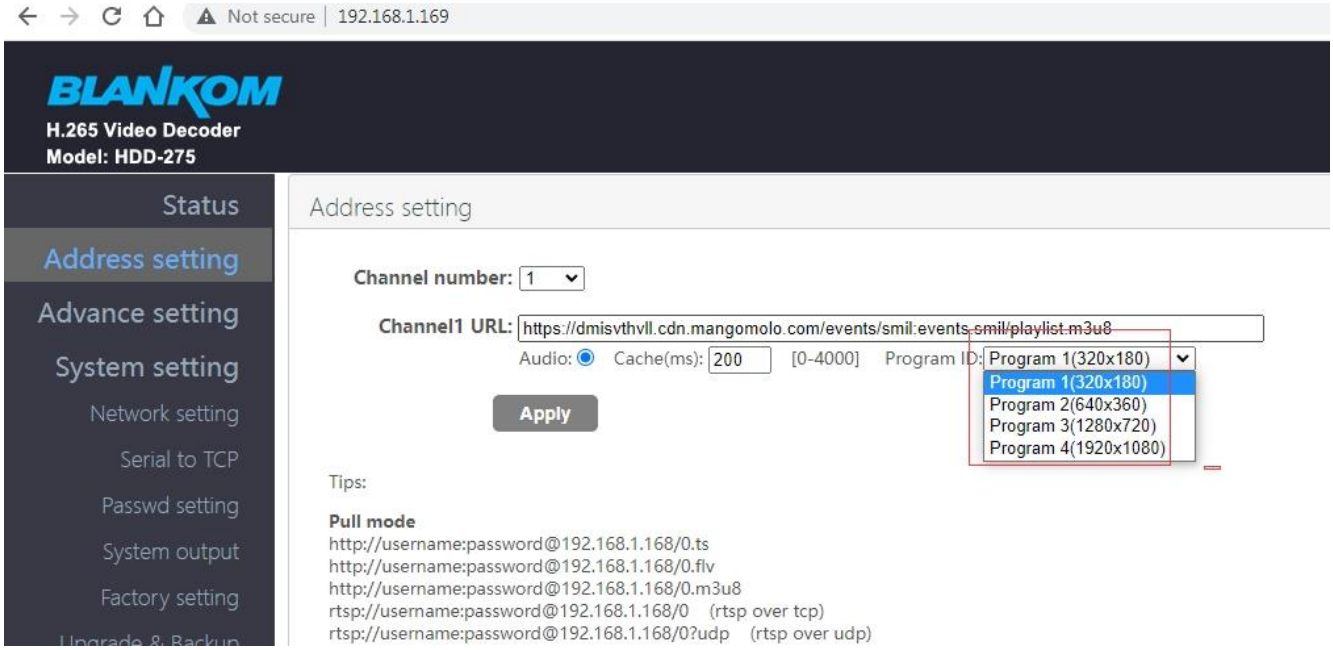






Adaptive HLS usage from a Media-Server:

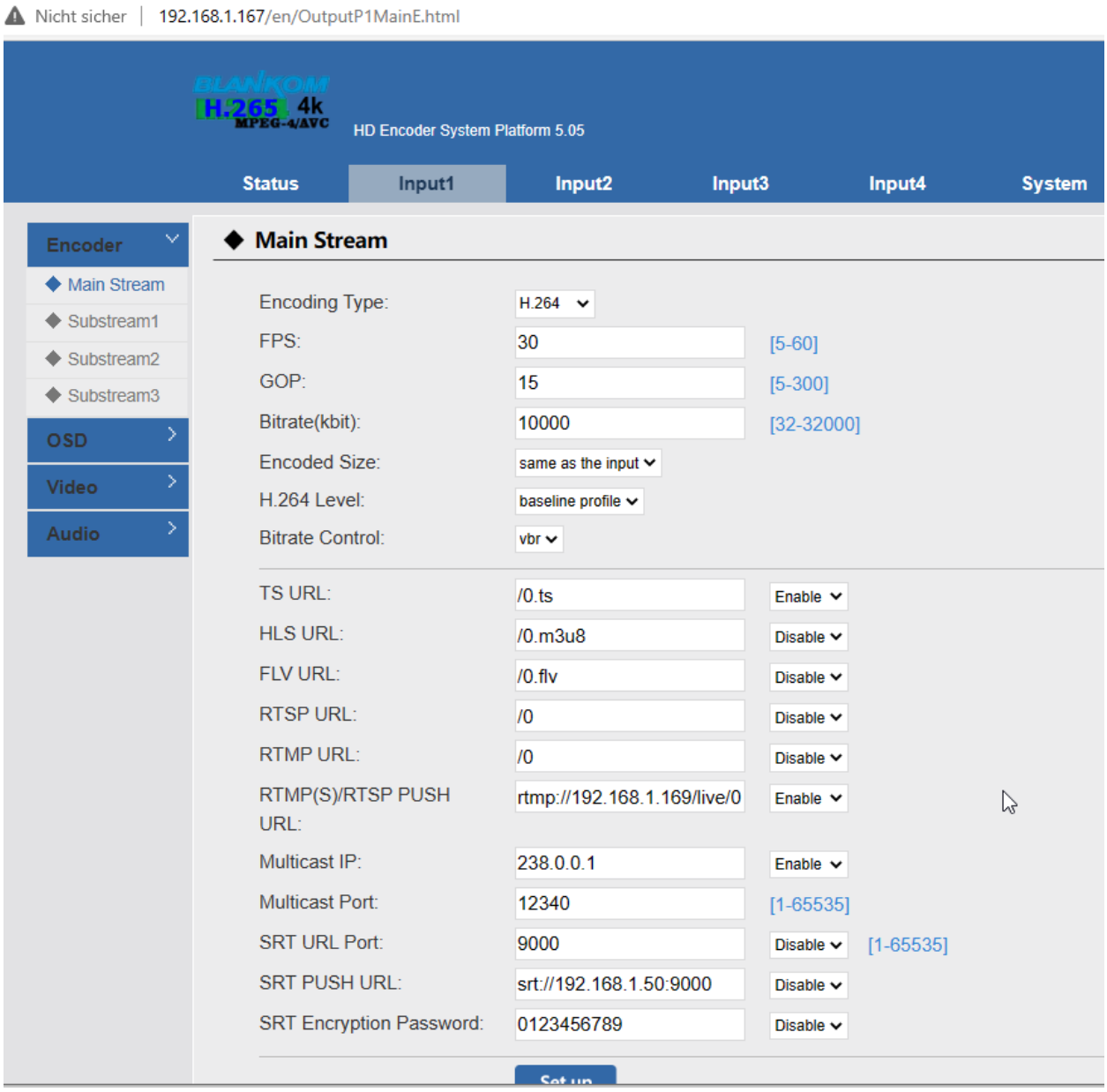
Because the HLS playlists containing information about the different (adaptive) screen resolutions/bitrates for serving bandwidth check tools in the receiver to adaptive react to the network, usually the automatic software in the boxes increasing them seamlessly if the network speed allows but not such a Stream-Decoder, so the decoder user can chose from that m3u-list:



Example to connect a RTMP-Source to the Decoder:

Streamer is a HDE-275Q here with 4K p30: Please note: RTMP almost **only supports h.264** codec (Thanks to Adobe – the original RTMP inventor).

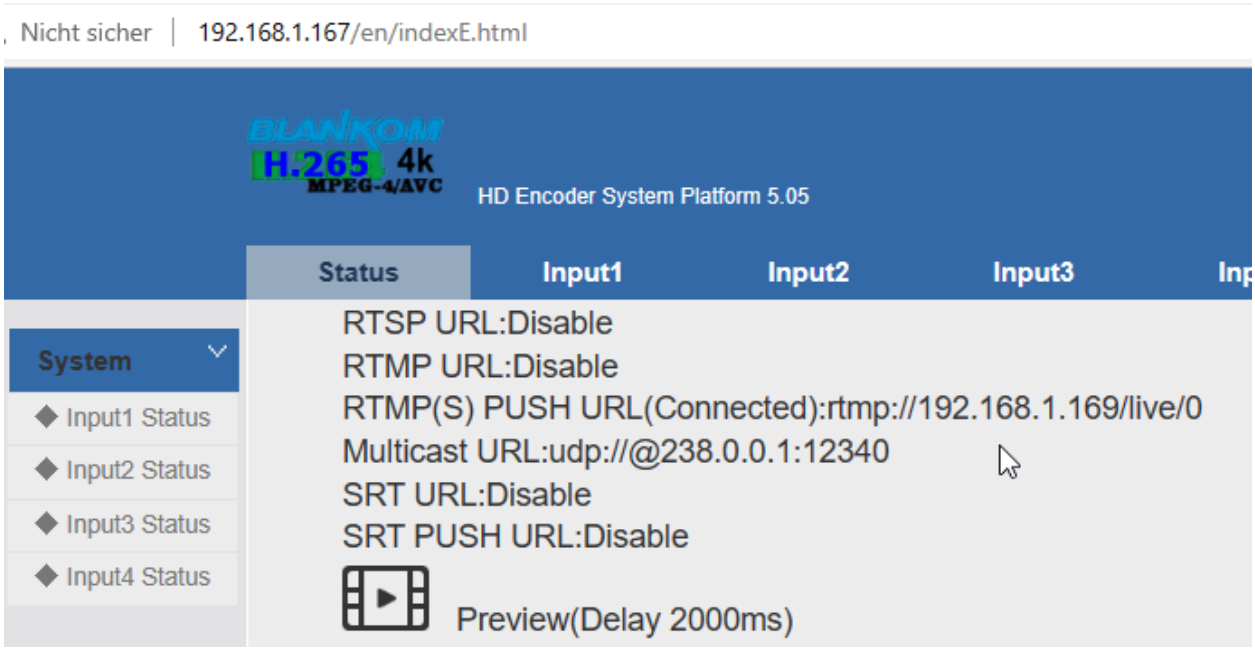
IP Address of the streamer: 192.168.1.167:



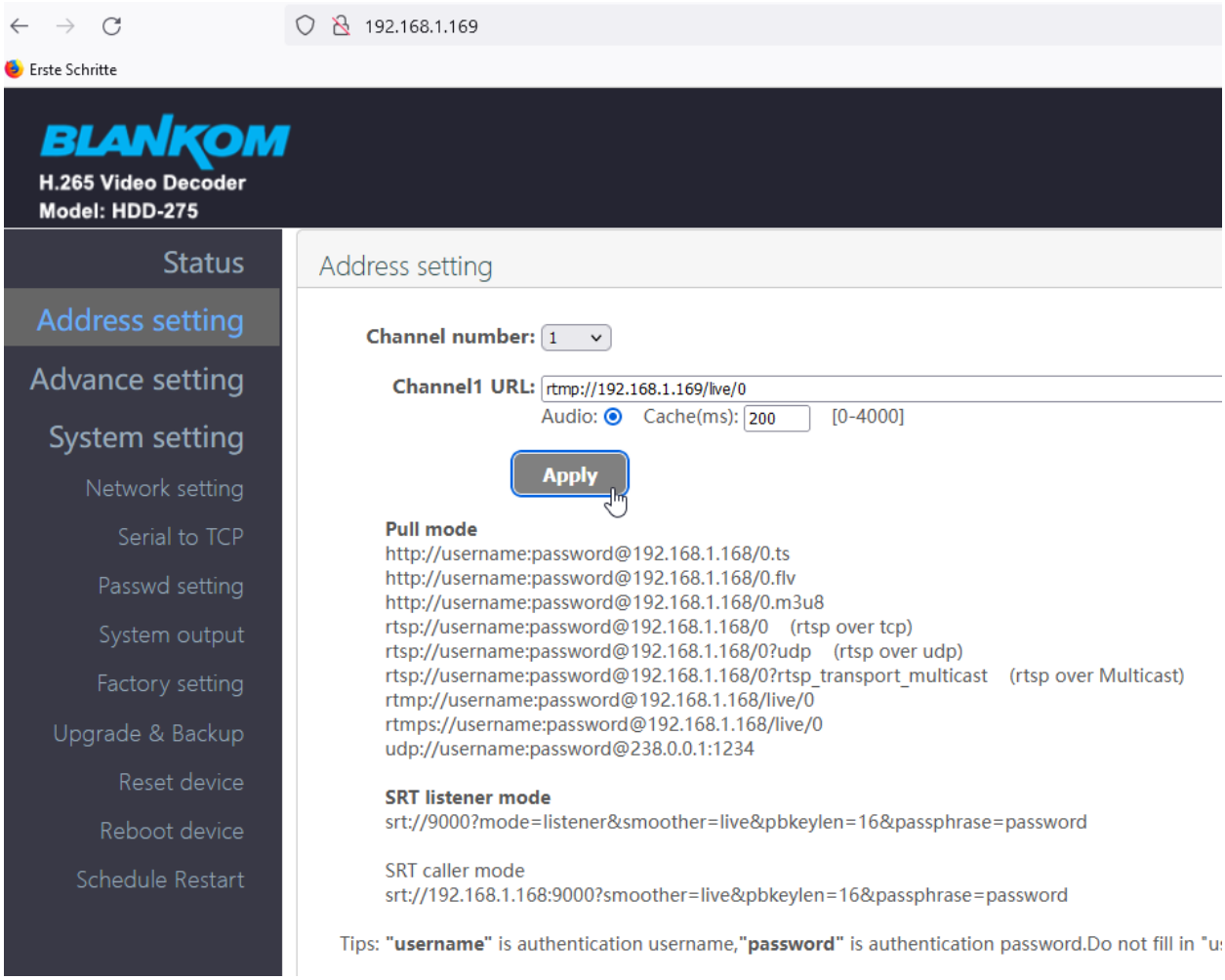
Here no username/password is set and the RTMP-Push URL is the address of the Decoder:

rtmp://192.168.1.169/live/0

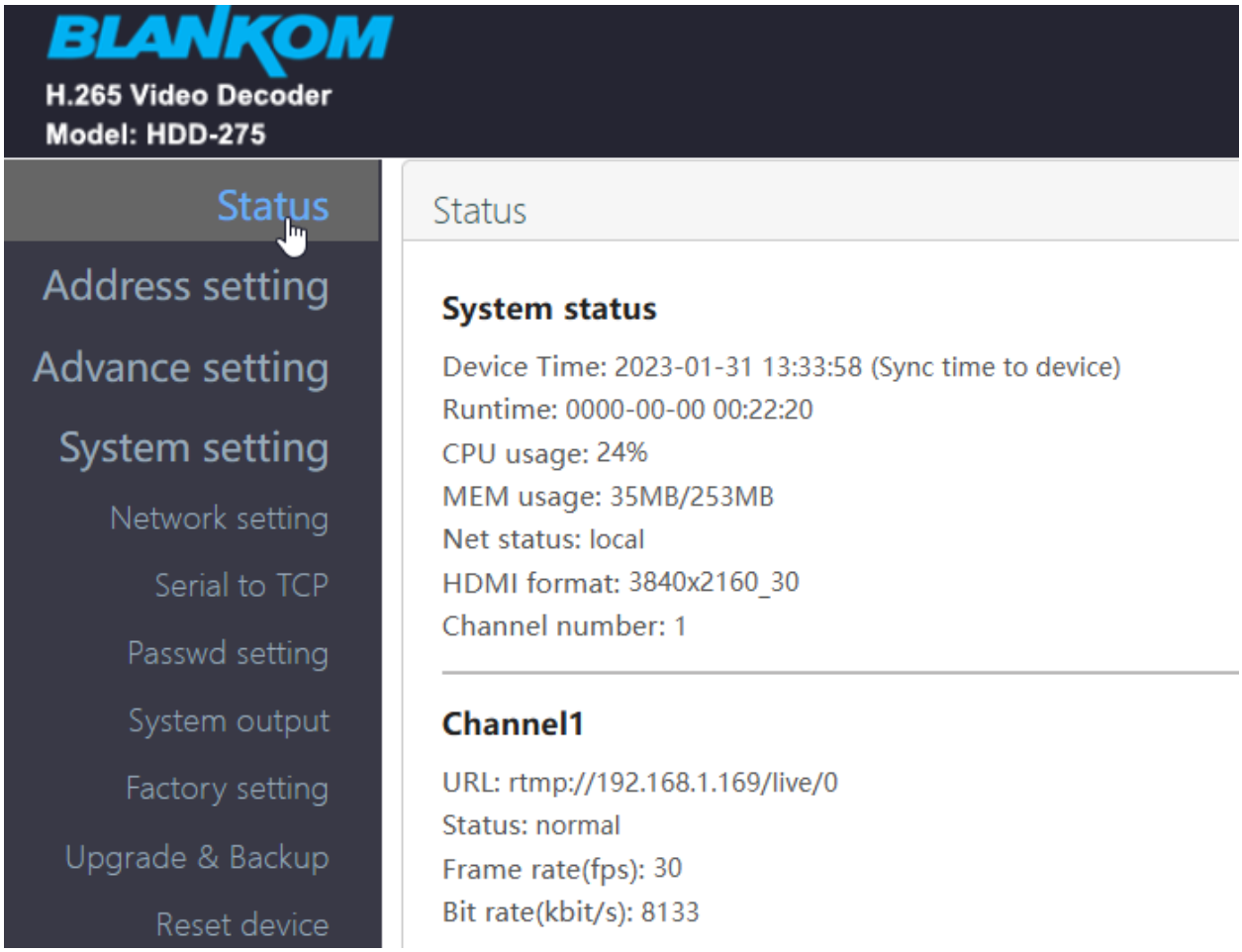
The streamer will show if both are connected:



Because we have to setup the Decoder Address-Field to its own push – address given from the source:



Check Status Window of the decoder:



So if you want to use h.265 encoded streams, do not use RTMP ;-).

Finally some essential information about streams:

Recommendation: Video streaming Multicast addresses should be setup according to the IANNA recommendations skipping reserved addresses like in the ranges of the 239.x.y.z: 10000 and IP addresses should be different like counting 239.1.1.1 … 239.1.1.2 …. As well as the Port numbers too (> 10000, 10001, 10002, 10003, ….)

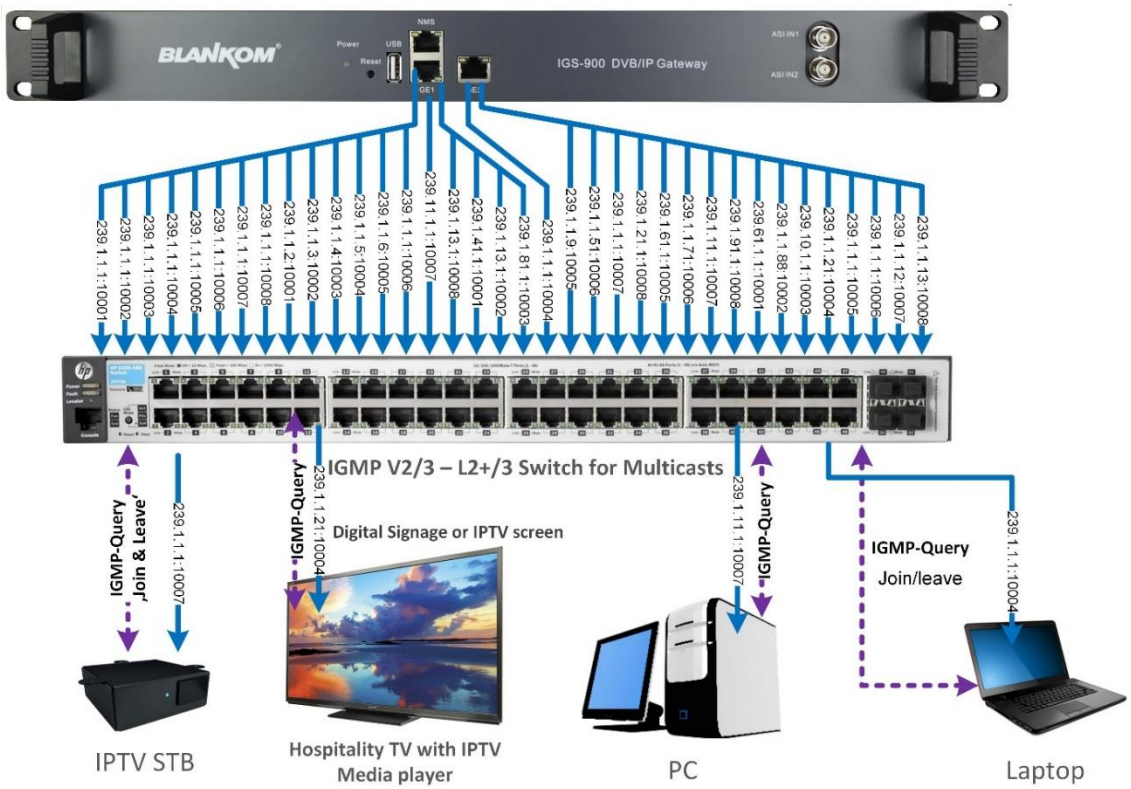
Note: We usually are not offering the network equipment for the projects because our partners -the local system- integrators- are almost serving this.

So highly recommendation for multicasts: IGMP is the key. Many STB's or TV sets have only 100BaseT Ethernet RJ45 and the Headend streams are almost in total up to 850-max 920 Mb/s so Gigabit-ports. If they would get all streams they will be overloaded. Example with 2 GbE output, 200 Streams with an average of 6-8 Mb/s (SD and HD TV Services mixed) = 1,4Gbit /s as streams.

What is IGMP Querying

and IGMP Snooping and why would I need it on my network?

IGMP is a network layer (Layer 3) protocol used to establish membership in a Multicast group and can register a router to receive specific Multicast traffic. (Refer to RFC 1112 and RFC 2236 for information on IGMP versions 2 and 3). Multicast aware switches are slowly making their way into the network cores for businesses and universities that have heavy traffic to move through their networks. Multicast filtering is achieved by dynamic group control management. By default, all Multicast traffic should be blocked until requested by a Multicast group member. (Default behaviour depends on switch manufacturer.) **The master of the IGMP filter lists is the router or switch that is configured to act as the IGMP Query.** The responsibility of the Query is to send out IGMP group membership queries on a timed interval, to retrieve IGMP membership reports from active members, and to allow updating of the group membership tables. A ***Layer 2*** switch supporting IGMP Snooping can ***passively snoop*** on IGMP Query, Report, and Leave (IGMP version 2) packets transferred between IP Multicast routers/switches and IP Multicast hosts to determine the IP Multicast group membership. IGMP snooping checks IGMP packets passing through the network, picks out the group registration, and configures Multicasting accordingly. See illustration:



Without IGMP Querying/Snooping, Multicast traffic is treated in the same manner as a Broadcast transmission, which forwards packets to all ports on the network. With IGMP Querying/Snooping, Multicast traffic is only forwarded to ports that are members of that Multicast group. IGMP Snooping generates no additional network traffic, which significantly reduces the Multicast traffic passing through your switch.

If your network distribution core does not support IGMP Querying/Snooping, the AVN streams will still function as designed but your network may be subjected to high traffic loads and condensed collision domain due to the broadcasting action used by the older switch or hub. If this is the case, you may wish to isolate the streaming nodes within the network so that the streams may be viewed without crossing the normal network traffic along its path.

Recommendation: Not only Snooping but IGMP V2 or V3 switches with Layer2+ (the + stand for extra features like IGMP full support) so better Layer 3 is the best solution.

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 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:

apart 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 signalling 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 de-multiplex 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.

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 wh 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'ante 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' 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 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.

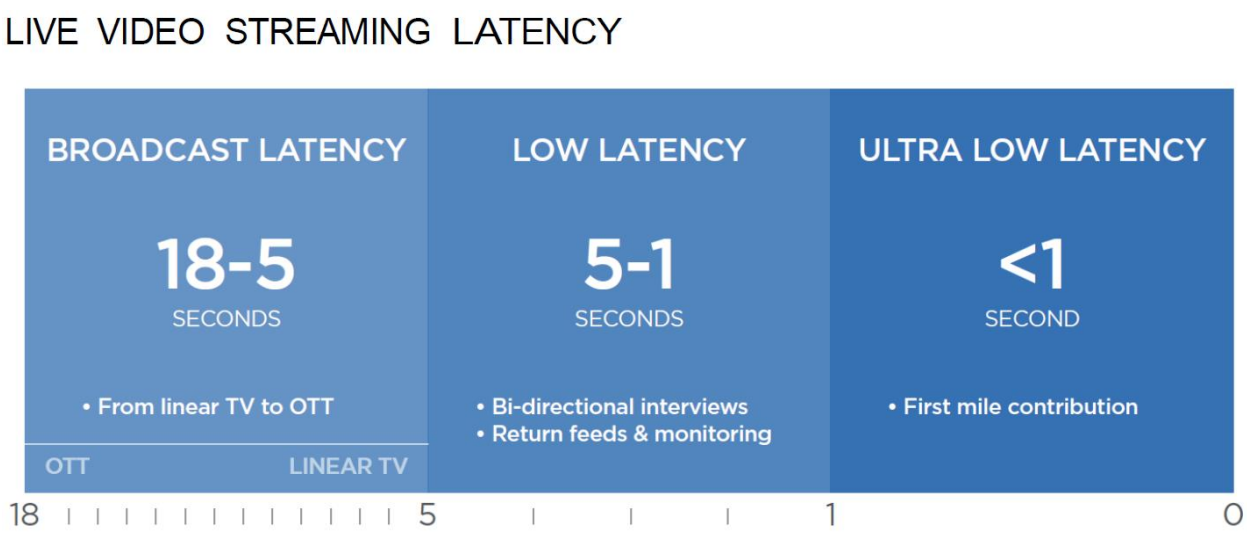
Zur Beachtung / *Important notes:*

- 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.*

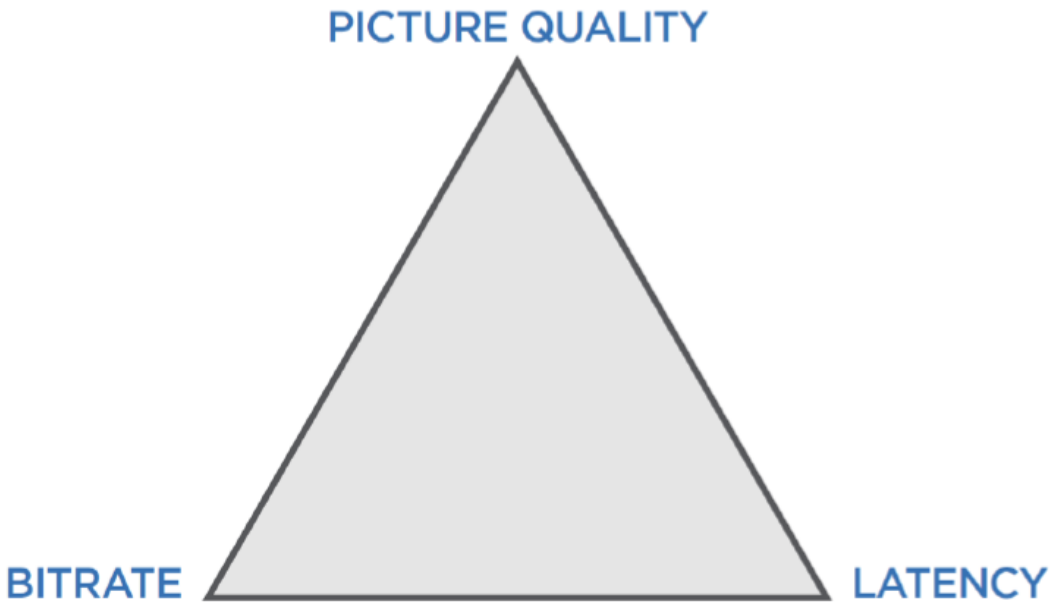
Bitte installieren Sie die Anschlüsse gemäß dem Aufdruck

Please install according to the sticker on the Multiswitch

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



Balancing Latency with Picture Quality and Bandwidth Availability



Balancing Bitrate, Latency, and Picture Quality

These three factors need to be taken into consideration when encoding and streaming live content.

Any video encoder used for broadcast quality live video streaming should allow users to change bitrate, picture quality, and latency settings. Ultimately, the individual targeted use case will determine the best balance within this triangle of video encoding and streaming considerations.

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