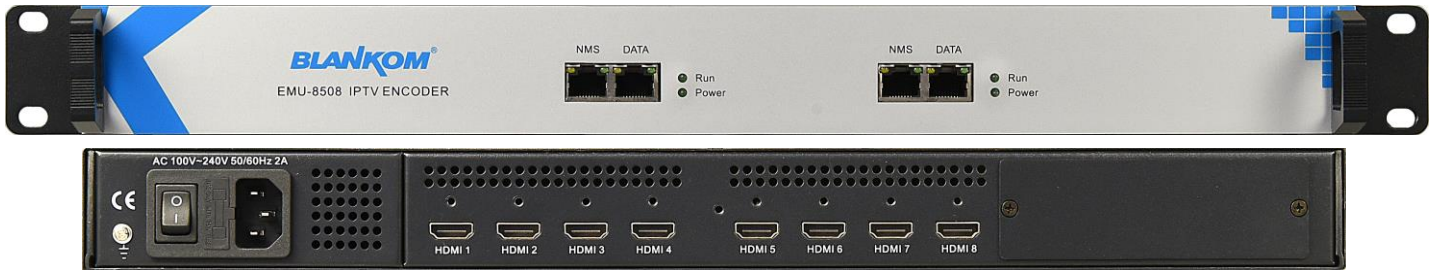


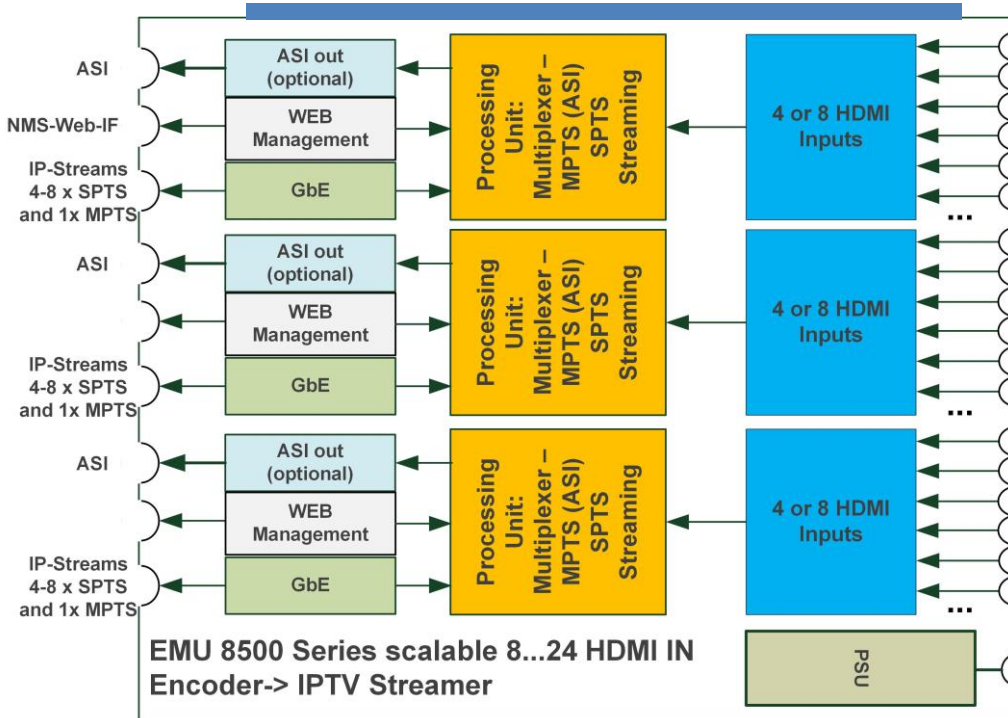
IPTV Encoder with 8/16/24 Inputs



Example EMU-8508 with 2 Modules and 2x4=8 HDMI Inputs

- 8 HDMI* input, 2x4 SPTS IPTV and 2 MPTS output (EMU 8508)
- 12 HDMI* input, 3x4 SPTS IPTV and 3 MPTS output (EMU 8512)
- 16 HDMI* input, 2x8 SPTS IPTV and 2 MPTS output (EMU 8516)
- 24 HDMI* input, 2x8 SPTS IPTV and 3 MPTS output (EMU 8524)
- 1 ASI output (optional) (Copy of the MPTS)
- On-Screen Graphics, Scrolling Text, QR Code insertion
- Accurate PCR adjusting
- PID filtering and re-mapping
- PSI/SI rebuilding and editing
- “Null PKT Filter” function
- Remote control by a modern Web based management
- Updates via Web-interface

*8 ... 24 HDMI input IPTV Encoder
with Text or Graphic Logo-Insertion*



BLANKOM EMU 8500 series:
MPEG4 AVC/H.264 HD IP Encoder is a professional HD audio & video encoding and multiplexing device. Input: 8 ... 24 HDMI compatible Video input interfaces, supporting MPEG-4 Video encoding and MPEG 1 Layer 2 audio encoding.

This very compact Encoder simultaneously encodes up to 8 ... 24 HDMI compatible HD Audio & Video channels to IP output as a multiplexed 1 MPTS and 8 ... 24 SPTS IP SPTS output streams as UDP/RTP Multicast. Every encoded Video-picture can be added with Text, Graphic or QR-code overlays. High integrated and cost effective design fits perfect into widely use cases in varieties of digital distribution systems such as cable TV digital head-end, satellite digital TV broadcasting etc.

Technical specifications*:

| | | | |
|------------------------|---|---|---|
| Input | 8 / 12/ 16 / 24 HDMI compatible inputs | | |
| Video | Resolution | input | 1920×1080_60P, 1920×1080_60i, 1920×1080_50P, 1920×1080_50i, 1280×720_60P, 1280×720_50P, 720×576_50i, 720×480_60i, |
| | | output | 1920×1080_30P, 1920×1080_25P, 1280×720_30P, 1280×720_25P, 720×576_25P, 720×480_30P, |
| | Encoding | MPEG-4 AVC/H.264 or h.265 HEVC | |
| | Bitrate | 1Mbps...13Mbps each channel | |
| | Encoding Rate Control | CBR/VBR | |
| | GOP Structure | IPPP, IBBP | |
| Audio | Encoding | MPEG-1 L2, LC-AAC, HE-AAC, HE-V2 and AC3 Pass through | |
| | Sampling rate | 48KHz- 384KHz dep. on codec | |
| | Resolution | 24-bit | |
| | Audio Gain adjustable | 0...255 | |
| | HE-AAC Bitrate V2: | 24/48/56/64/80/96/112/128 kbps 18...56kbps | |
| | LC-AAC Bitrate | 48/56/64/80/96/112/128/160/192/224/256/320/384 kbps | |
| | MPEG-1 L2 Bitrate | 48/56/64/80/96/112/128/160/192/224/256/320/384 kbps | |
| Multiplexing | Maximum PID Remapping | 180 input per channel | |
| | Function | PID remapping (automatically or manually) | |
| | | PCR adjusting | |
| | | Generation of PSI/SI table automatically | |
| Stream output | 4 or 8 SPTS and 1MPTS output over UDP or RTP (per each Module) 1x 1000Base-T Ethernet interface ASI output (optional) as copy of the multiplexed MPTS | | |
| System function | Network management (WEB-IF) | | |
| | English language menu | | |
| | Firmware upgrade by Web-Browser | | |
| Miscellaneous | Dimension(W×L×H) | 482mm×410mm×44mm * | |
| | Approx weight | 8kg * | |
| | Environmental cond. | 0...45°C (work) ; -20...80°C (Storage) | |
| | Power requirements | AC 110V± 10%, 50/60Hz, AC 220 ± 10%, 50/60Hz | |
| | Power consumption | 70W * | |

*) depending on Model, every detail might be subject to change w/o notifications

Corresponding products:

- IP to 16 QAM DVB-C Modulator HDC-5016
- HDC-5004 IP to QAM Modulator with remuxed TV services i.e. for hospitality content addons to existing networks
- Digital Signage: IP Decoder HDD-275
- IPTV Middleware Server OMNISCREENTV + SetTopBoxes or Hospitality TV Sets from tested vendors
- BLANKOM IPTV STB: 6800+
- OmniscreenTV STB M15 (h.264/MPEG2, FullHD, Multicast UDP only)

THIS IS A PRELIMINARY QUICKSTART-MANUAL.

Attention: The NMS-ports of each Module have same IP address: 192.168.0.36 for login

The screenshot shows the web interface for EMU-8508. The browser address bar shows 192.168.0.136. The page title is EMU-8508. A sidebar on the left contains a menu with sections: Summary (Status), Parameters (Encoder, IP Stream, OSD), and System (Network, Account, Configuration, Firmware, Date | Time, Log). The main content area is titled 'Network' and contains two sections: 'NMS' and 'DATA'. The 'NMS' section has input fields for IP Address (192.168.0.136), Subnet Mask (255.255.255.0), Gateway (192.168.0.1), Web Management Port (80), and MAC Address (2a:c3:42:1a:00:85). The 'DATA' section has input fields for IP Address (192.168.1.138), Subnet Mask (255.255.255.0), Gateway (192.168.1.1), and MAC Address (2a:d3:42:1a:00:85). Both sections have an 'Apply' button at the bottom right.

So please change one or both before connecting bot to a switch!
admin/admin is default user/pw.

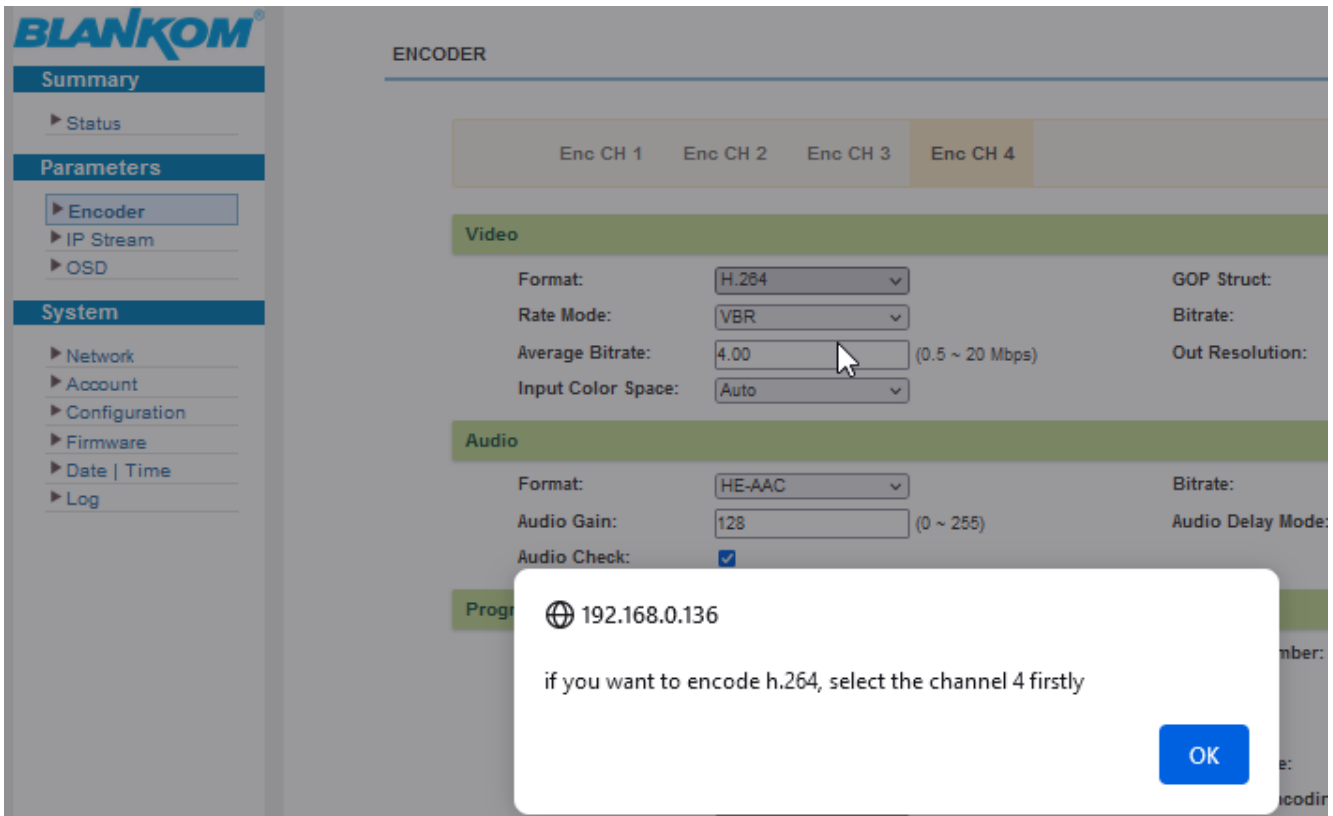
Attention: This encoder is optimized for HEVC-h.265 Codec usage.

Therefore, the capacity of this Quad-encoder chipset is limited to only 2 Encoding processes when you need to go for MPEG4 (**h.264 AVC**): **Only Input 3 and 4** are working. The other (1+2) can only forward the Audio PID.

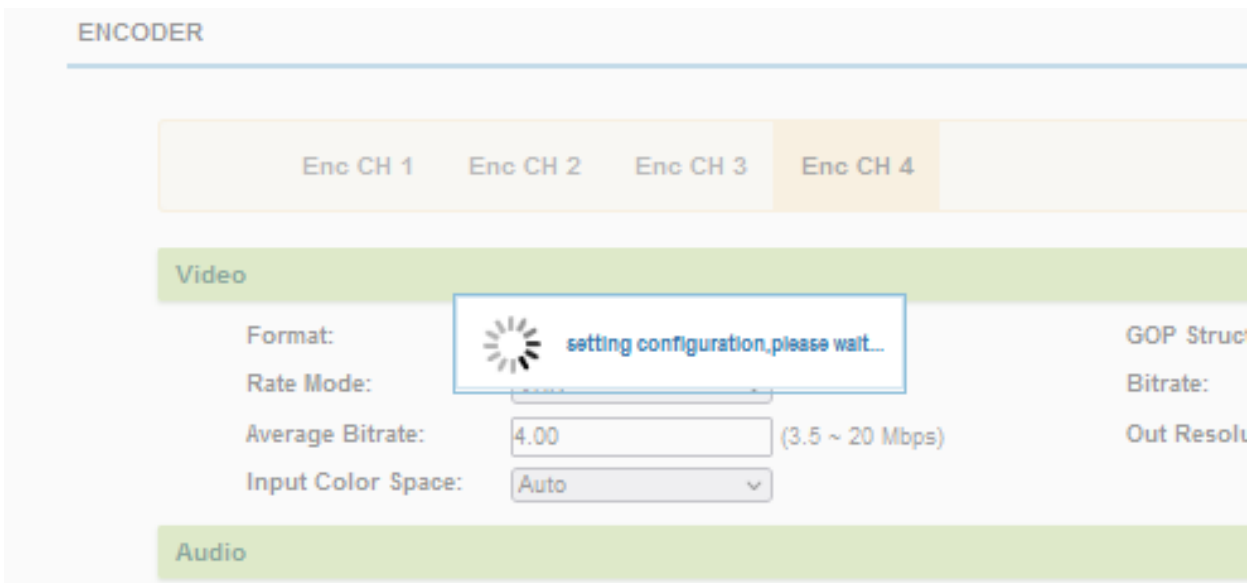
This is different if your mayor encoding channel is in 720 mode, all others will be downscaled but than all Inputs are working again even with h.264.

Please note, that this Encoder modules have a **common encoding Chipset** for four channels but this limits the HDMI Input to an always common value:

HDMI 1-4 must have the same resolution. All settings will be valid for all 4 encoding channels like:



So, Channel 4 is the mayor: Example change to h.264 Codec:



This describes the setting per Module, so you have to do it for every module finally.

ENCODER

Enc CH 1 Enc CH 2 Enc CH 3 **Enc CH 4**

Video

Format: GOP Struct:

Rate Mode: Bitrate: (4 ~ 20 Mbps)

Average Bitrate: (3.5 ~ 20 Mbps) Out Resolution: Auto

Input Color Space:

Audio

Format: Bitrate:

Audio Gain: (0 ~ 255) Audio Delay Mode:

Audio Check:

Now all are in h.264:

Enc CH 1 Enc CH 2 Enc CH 3 Enc CH 4

Video

Format: GOP Struct:

Rate Mode: Bitrate: (4 ~ 20 Mbps)

Average Bitrate: (3.5 ~ 20 Mbps) Out Resolution: Auto

Input Color Space:

EMU-8512

me to use Web Management 2022-03-14 12:05:50

BLANKOM

Summary

- Status

Parameters

- Encoder
- IP Stream**
- OSD

System

- Network
- Account
- Configuration
- Firmware
- Date | Time
- Log

IP STREAM

| # | IP Address | Port | Protocol | Pkt Length | Null PKT Filter | Status | Bit(Act/Max) | |
|--------|--------------|-------|----------|------------|-------------------------------------|--------------------------------------|--------------|--|
| MPTS 1 | 224.2.2.22 | 20002 | UDP | 7 | <input checked="" type="checkbox"/> | ● | 18.7/32.0 M | |
| SPTS 1 | 224.22.22.22 | 30002 | UDP | 7 | <input checked="" type="checkbox"/> | ● | 3.9/10.0 M | |
| SPTS 2 | 224.2.2.2 | 3002 | UDP | 7 | <input checked="" type="checkbox"/> | ● | 3.9/12.0 M | |
| SPTS 3 | 224.2.2.2 | 3004 | UDP | 7 | <input checked="" type="checkbox"/> | ● | 3.9/12.0 M | |
| SPTS 4 | 224.2.2.2 | 3008 | UDP | 7 | <input checked="" type="checkbox"/> | ● | 3.9/12.0 M | |

channel config.

Attention: The max bitrate has to be calculated as for an MPTS including PID8191dec Null packets (CBR-Stream). If you stream w/o Null Packets PID8191dec, the **Max bitrate** must be set higher than the act. Bitrate configured in the menu:

To separate them: There is an Encoding bitrate related to the encoding process and a streaming bitrate:

Video

| | | | |
|--------------------|---|-----------------|--|
| Format: | <input type="text" value="H.264"/> | GOP Struct: | <input type="text" value="IBBP"/> |
| Rate Mode: | <input type="text" value="VBR"/> | Bitrate: | <input type="text" value="12.00"/> (4 ~ 20 Mbps) |
| Average Bitrate: | <input type="text" value="3.50"/> (3.5 ~ 20 Mbps) | Out Resolution: | <input type="text"/> |
| Input Color Space: | <input type="text" value="Auto"/> | | |

Audio

| | | | |
|--------------|--|-------------------|---------------------------------------|
| Format: | <input type="text" value="HE-AAC"/> | Bitrate: | <input type="text" value="128 Kbps"/> |
| Audio Gain: | <input type="text" value="128"/> (0 ~ 255) | Audio Delay Mode: | <input type="text" value="Mode 1"/> |
| Audio Check: | <input checked="" type="checkbox"/> | | |

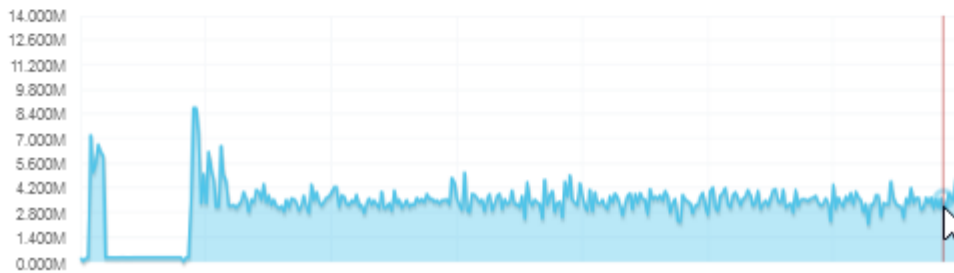
Program

| | | | |
|-------------------|-------------------------------------|---------------------|-------------------------------------|
| Program Output: | <input checked="" type="checkbox"/> | Program Number: | <input type="text" value="101"/> |
| PMT PID: | <input type="text" value="0x0064"/> | PCR PID: | <input type="text" value="0x0067"/> |
| Video PID: | <input type="text" value="0x0065"/> | Audio PID: | <input type="text" value="0x0068"/> |
| VCT Insert: | <input type="checkbox"/> | Service Name: | <input type="text" value="servus"/> |
| Service Provider: | <input type="text" value="test1"/> | Character Encoding: | <input type="text" value="UCS-2"/> |

Status

| | |
|--|---|
| Encoder Chip Version: 00.0E.01.28 | Interface Version: HDMI 08.06VA |
| Input Lock: ● | Encode Status: ● |
| Input Information: 1920 x 1080i 50fps | Bitrate: 4.814 Mbps |

■ Bitrate: 3.435Mbps



The DVB/MPEG-Tables and content characters can be changed i.e. to support German ÖÄÜ:

Program

| | | | |
|-------------------|-------------------------------------|---------------------|-------------------------------------|
| Program Output: | <input checked="" type="checkbox"/> | Program Number: | <input type="text" value="101"/> |
| PMT PID: | <input type="text" value="0x0064"/> | PCR PID: | <input type="text" value="0x0067"/> |
| Video PID: | <input type="text" value="0x0065"/> | Audio PID: | <input type="text" value="0x0068"/> |
| VCT Insert: | <input type="checkbox"/> | Service Name: | <input type="text" value="ÖÄÜ"/> |
| Service Provider: | <input type="text" value="test1"/> | Character Encoding: | <input type="text" value="UCS-2"/> |

Status

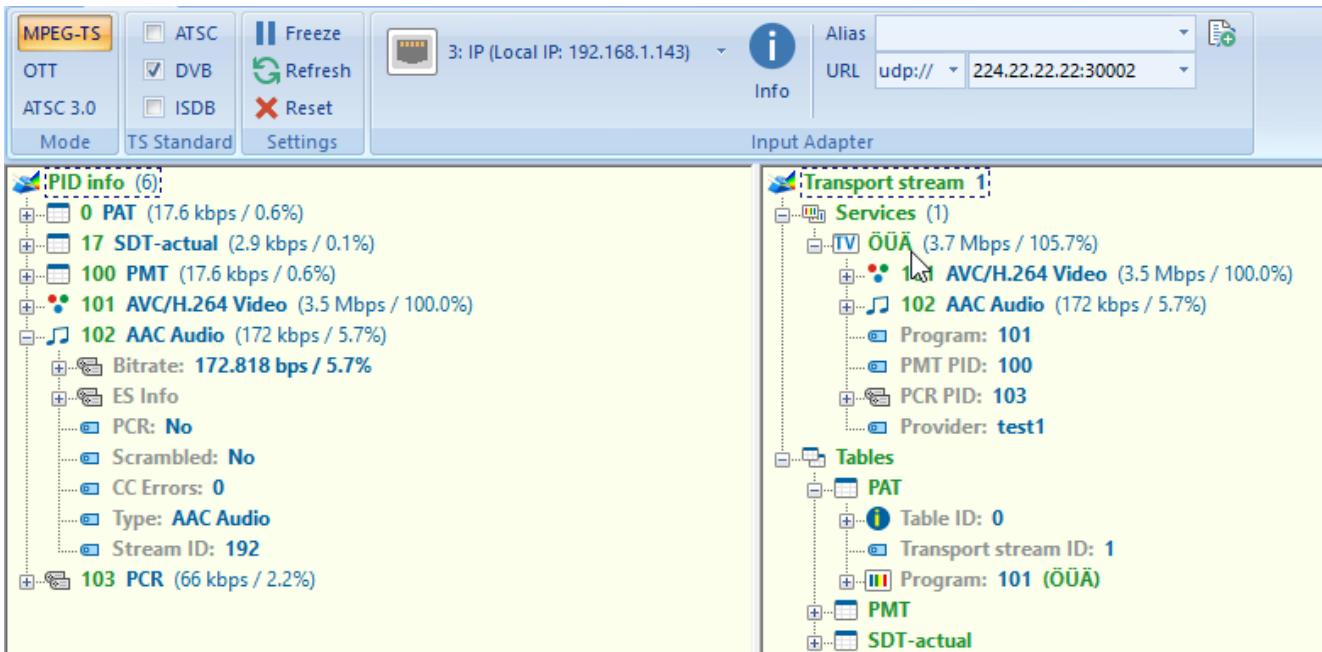
Encoder Chip Version: 00.0E.01.28

Interface Version:

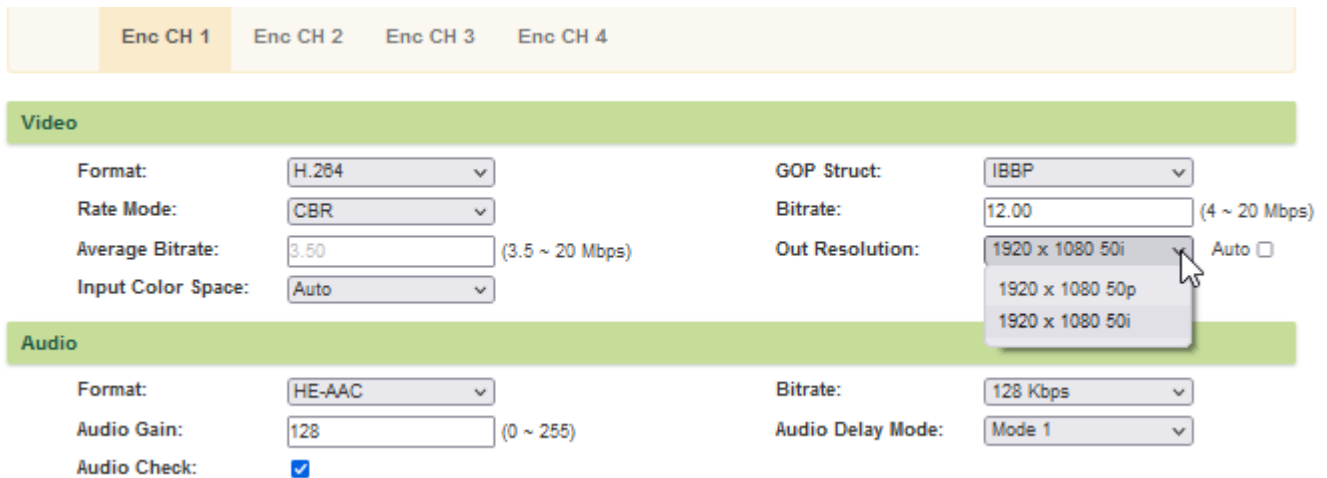
UCS-2

GBK

ISO-8859-5



The output resolution follows the HDMI-Input.
But you can make P(rogressiv) out of an I(nterlaced) Picture:



Average Bitrate settings applies only for the VBR-encoding method!

Enc CH 1 Enc CH 2 **Enc CH 3** Enc CH 4

Video

| | | | |
|--------------------|---|-----------------|--|
| Format: | <input type="text" value="H.264"/> | GOP Struct: | <input type="text" value="IBBP"/> |
| Rate Mode: | <input type="text" value="CBR"/> | Bitrate: | <input type="text" value="12.00"/> (4 ~ 20 Mbps) |
| Average Bitrate: | <input type="text" value="3.50"/> (3.5 ~ 20 Mbps) | Out Resolution: | <input type="text" value="1920 x 1080 50p"/> Auto <input type="checkbox"/> |
| Input Color Space: | <input type="text" value="Auto"/> | | |

Audio

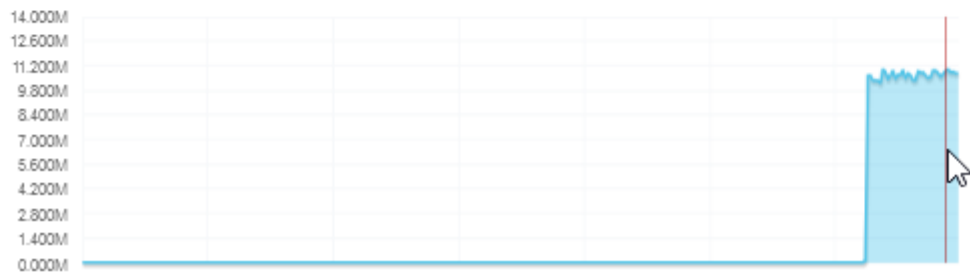
| | | | |
|--------------|--|-------------------|---------------------------------------|
| Format: | <input type="text" value="HE-AAC"/> | Bitrate: | <input type="text" value="128 Kbps"/> |
| Audio Gain: | <input type="text" value="128"/> (0 ~ 255) | Audio Delay Mode: | <input type="text" value="Mode 1"/> |
| Audio Check: | <input checked="" type="checkbox"/> | | |

Program

| | | | |
|-------------------|--|---------------------|-------------------------------------|
| Program Output: | <input checked="" type="checkbox"/> | Program Number: | <input type="text" value="103"/> |
| PMT PID: | <input type="text" value="0x006c"/> | PCR PID: | <input type="text" value="0x006f"/> |
| Video PID: | <input type="text" value="0x006d"/> | Audio PID: | <input type="text" value="0x006e"/> |
| VCT Insert: | <input type="checkbox"/> | Service Name: | <input type="text" value="TV-103"/> |
| Service Provider: | <input type="text" value="TV-Provider"/> | Character Encoding: | <input type="text" value="UCS-2"/> |

Status

| | | | |
|-----------------------|--------------------------------------|--------------------|--|
| Encoder Chip Version: | 00.0E.01.28 | Interface Version: | HDMI 08.06VA |
| Input Lock: | ● | Encode Status: | ● |
| Input Information: | 1920 x 1080I 50fps | Bitrate: | 10.893 Mbps |
| Bitrate: | 10.799Mbps | | |



Audio delays can be adjusted:

Audio

| | | | |
|--------------|--|-------------------|--|
| Format: | <input type="text" value="HE-AAC"/> | Bitrate: | <input type="text" value="128 Kbps"/> |
| Audio Gain: | <input type="text" value="128"/> (0 ~ 255) | Audio Delay Mode: | <input type="text" value="Custom"/> |
| Audio Check: | <input checked="" type="checkbox"/> | | |
| Audio Delay: | <input type="text" value="40"/> (0 ~ 50) | Audio PTS Offset: | <input type="text" value="0"/> (0~90000) |

Program

This is like Try & Error... to find the best fitting Audio / Video LipSync combination.

BLANKOM[®]

Summary

- ▶ Status

Parameters

- ▶ Encoder
- ▶ IP Stream
- ▶ OSD

System

- ▶ Network
- ▶ Account
- ▶ Configuration
- ▶ Firmware
- ▶ Date | Time
- ▶ Log

ENCODER

| Enc CH 1 | Enc CH 2 | Enc CH 3 | Enc CH 4 |
|-----------------------|--------------------------------------|---------------------|--|
| Video | | | |
| Format: | H.265 | GOP Struct: | IBBP |
| Rate Mode: | VBR | Bitrate: | 8.00 (0.5 ~ 20 Mbps) |
| Average Bitrate: | 4.00 (0.5 ~ 20 Mbps) | Out Resolution: | 1920 x 1080 50p Auto <input checked="" type="checkbox"/> |
| Input Color Space: | Auto | | |
| Audio | | | |
| Format: | HE-AAC | Bitrate: | 128 Kbps |
| Audio Gain: | 128 (0 ~ 255) | Audio Delay Mode: | Mode 1 |
| Audio Check: | <input checked="" type="checkbox"/> | | |
| Program | | | |
| Program Output: | <input checked="" type="checkbox"/> | Program Number: | 101 |
| PMT PID: | 0x0084 | PCR PID: | 0x0087 |
| Video PID: | 0x0085 | Audio PID: | 0x0088 |
| VCT Insert: | <input type="checkbox"/> | Service Name: | servus |
| Service Provider: | test1 | Character Encoding: | UCS-2 |
| Status | | | |
| Encoder Chip Version: | 00.0E.01.28 | Interface Version: | HDMI 08.08VA |
| Input Lock: | ● | Encode Status: | ● |
| Input Information: | 1920 x 1080i 50fps | Bitrate: | 6.472 Mbps |

The encoder tries to keep the average bitrate in VBR-Mode. As higher than better picture quality ...

Attention again: This encoder is **optimized for HEVC-h.265** Codec usage.

Therefore, the capacity of this Quad-encoder chipset is limited to only 2 Encoding processes when you need to go for MPEG4 (h.264 AVC): Only Input 3 and 4 are working. The other (1+2) can only forward the Audio PID.

This is different if your mayor encoding channel is in 720 modes, all others will be downscaled but then all Inputs are working again even with h.264.

Enc CH 1 Enc CH 2 **Enc CH 3** Enc CH 4

Video

Format: GOP Struct:
 Rate Mode: Bitrate: (4 ~ 20 Mbps)
 Average Bitrate: (3.5 ~ 20 Mbps) Out Resolution:
 Input Color Space:

Audio

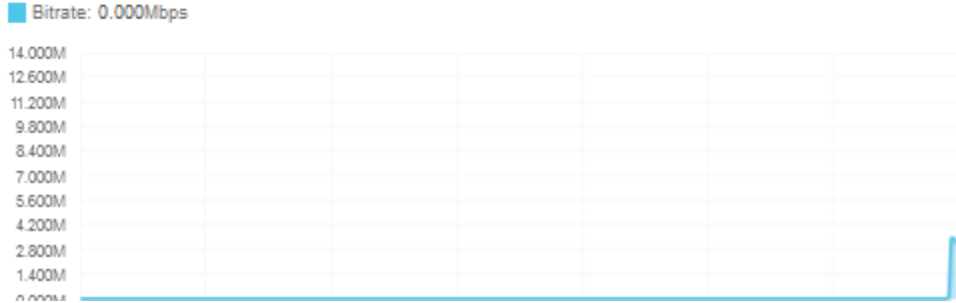
Format: Bitrate:
 Audio Gain: (0 ~ 255) Audio Delay Mode:
 Audio Check:

Program

Program Output: Program Number:
 PMT PID: PCR PID:
 Video PID: Audio PID:
 VCT Insert: Service Name:
 Service Provider: Character Encoding:

Status

Encoder Chip Version: 00.0E.01.28 Interface Version: HDMI 08.06VA
 Input Lock: ● Encode Status: ●
 Input Information: 1920 x 1080P 50fps Different Input Signals Bitrate: 3.228 Mbps



The screenshot displays the BLANKOM EMU 8500.2 software interface. At the top, there are control panels for 'MPEG-TS' (with options for ATSC, DVBS, ISDB, and Mode), 'Freeze/Refresh/Reset', and 'Input Adapter' (showing IP: 192.168.1.143 and URL: udp://224.2.2.2:3006). The main area is split into two panes: ':PID info (0):' on the left and ':Transport stream 1:' on the right. The left pane shows a tree of PIDs including PAT, SDT-actual, PMT, and AVC/H.264 Video (113) with detailed ES Info (Resolution: 1280x720, Frame Rate: 50.00Hz). The right pane shows 'Services (1)' including TV-104 and AVC/H.264 Video (113) with similar ES Info, plus AAC Audio (114) and PCR (115). A 'Tables' section at the bottom right lists PAT, PMT, and SDT-actual. At the bottom, there are 'Messages' and 'Trace bar' windows. The Messages window shows log entries for signal detection and synchronization. The Trace bar window shows a graph of bit rate over time, with a scale from 0 to 20.0Mbps.

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

- Input Adapter:** Shows the input source as '3: IP (Local IP: 192.168.1.143)' with an alias 'emu-mpts' and URL 'udp://224.2.2.22:20002'.
- PID info (18):** Lists various PID streams including PAT, SDT-actual, PMT, HEVC/H.265 Video, AAC Audio, and PCR.
- Transport stream 1:** Shows service details for 'servus' and 'TV-102' through 'TV-104', including HEVC/H.265 Video and AAC Audio streams. It also lists tables like PAT, PMT, and SDT-actual.
- Messages:** Displays system messages such as 'Input signal detected' and 'Synchronized to stream with 188-byte packets'.
- Trace bar:** A graph showing bit-rate over time, with a peak around 25.0Mbps.
- System/Bit-rate:** Shows system status and bit-rate for TR 101 290, indicating 188 Byte packets at 14,473,594bps (100.0% utilization).

IP-stream Outputs:

| # | IP Address | Port | Protocol | Pkt Length | Null PKT Filter | Status | Bit(Act/Max) |
|--------|--------------|-------|----------|------------|-------------------------------------|--------|--------------|
| MPTS 1 | 224.2.2.22 | 20002 | UDP | 7 | <input checked="" type="checkbox"/> | ● | 22.1/32.0 M |
| SPTS 1 | 224.22.22.22 | 30002 | UDP | 7 | <input checked="" type="checkbox"/> | ● | 0.2/10.0 M |
| SPTS 2 | 224.2.2.2 | 3002 | UDP | 7 | <input checked="" type="checkbox"/> | ● | 0.2/12.0 M |
| SPTS 3 | 224.2.2.2 | 3004 | UDP | 7 | <input checked="" type="checkbox"/> | ● | 11.2/12.0 M |
| SPTS 4 | 224.2.2.2 | 3006 | UDP | 7 | <input checked="" type="checkbox"/> | ● | 11.0/12.0 M |

All HDMI IN per module should have same Input resolution like 1080i50.

Here an example what happens if not - Mismatching Inputs:

Encoder 3 set to 1080i60, the others are 720p50:

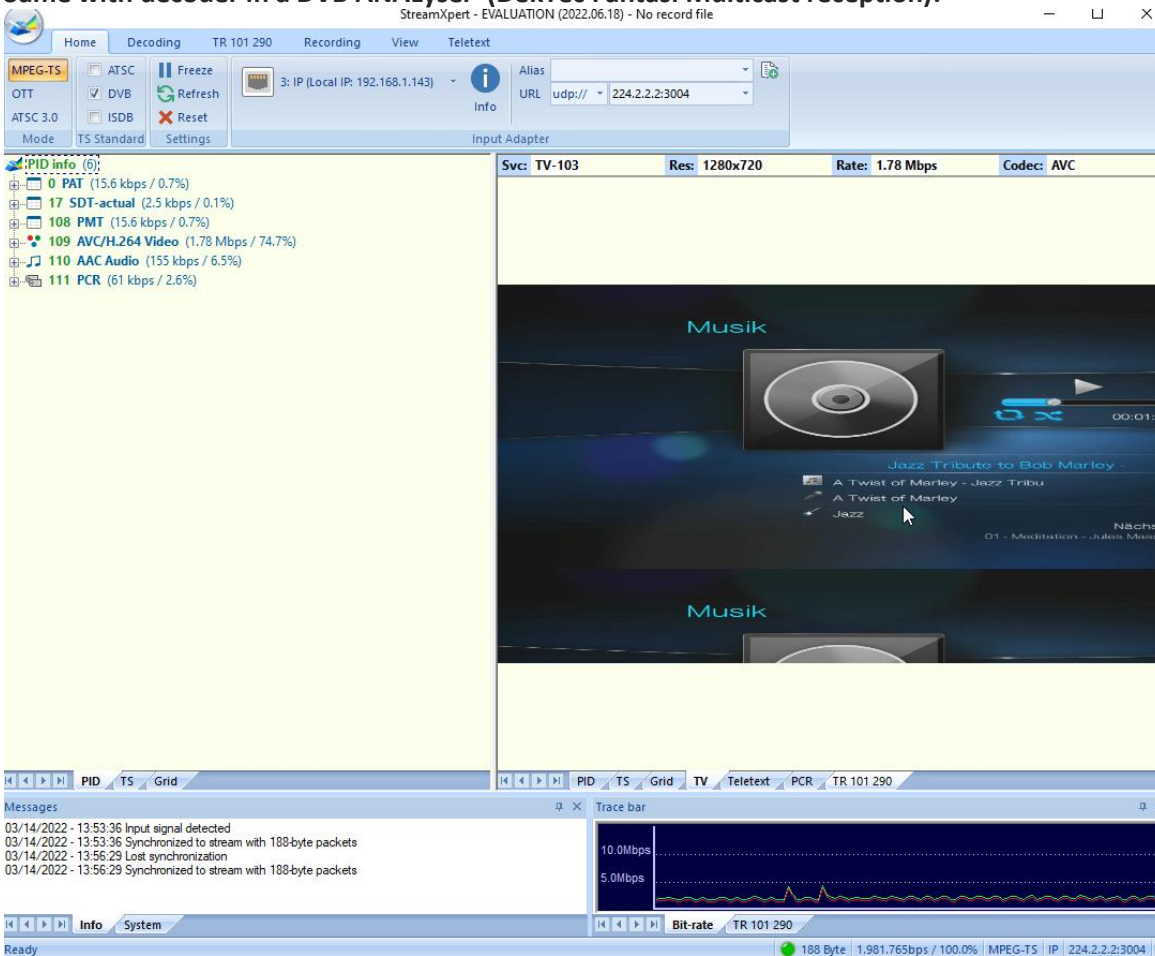
| Enc CH 1 | Enc CH 2 | Enc CH 3 | Enc CH 4 |
|---|----------|---|----------|
| Video | | | |
| Format: H.264 | | GOP Struct: IBBP | |
| Rate Mode: VBR | | Bitrate: 12.00 (4 ~ 20 Mbps) | |
| Average Bitrate: 3.50 (3.5 ~ 20 Mbps) | | Out Resolution: 1280 x 720 50p | |
| Input Color Space: Auto | | | |
| Audio | | | |
| Format: HE-AAC | | Bitrate: 128 Kbps | |
| Audio Gain: 128 (0 ~ 255) | | Audio Delay Mode: Mode 1 | |
| Audio Check: <input checked="" type="checkbox"/> | | | |
| Program | | | |
| Program Output: <input checked="" type="checkbox"/> | | Program Number: 103 | |
| PMT PID: 0x006c | | PCR PID: 0x006f | |
| Video PID: 0x006d | | Audio PID: 0x006e | |
| VCT Insert: <input type="checkbox"/> | | Service Name: TV-103 | |
| Service Provider: TV-Provider | | Character Encoding: UCS-2 | |
| Status | | | |
| Encoder Chip Version: 00.0E.01.28 | | Interface Version: HDMI 08.08VA | |
| Input Lock: ● | | Encode Status: ● | |
| Input Information: 1920 x 1080i 60/59.94fps Different Input Signals | | Bitrate: 2.418 Mbps | |
| Bitrate: 0.000Mbps | | | |

The other Output-stream will be forced to 720p50!

But the picture of the 1920 will be cropped:



Same with decoder in a DVB ANALYSER (DekTec Fantasi Multicast reception):



So its not a real downscaling but cropping.