h.264 / h.265 (HEVC)
IPTV Encoder & Streamer series
Preface

About This Manual

This manual is written for system integrators, IT technicians and knowledgeable end users. It provides information for the installation and use of the Product described herein.

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.

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Application Example:

**IMPORTAND NOTE:**
Please connect your PC/Laptop and the Encoder(s) always to the Ethernet with a GbE auto-negotiation Switch (10/100/1000BaseT) in between.

Otherwise you might damage either your laptop or the encoder RJ45 ports(s) or at least get connection problems.

Assure that your switch doesn’t do Multicast-blocking on the ports you connect it – if you use UDP/RTP multicasts.
This manual applies to the following models: (depending on changes in model types and ranges this is a subject to change w/o further notice)

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
</tr>
</thead>
</table>
| **HDE-264** | One channel HDMI h.264 encoder  
- Support h.264Baseline Profile / h.264Main Profile / h.264High Profile  
- Support up to 720P, 1080P HD video input  
- Support 1080P@60fps  
- Support protocol TsoIP, HTTP, UDP, RTP, RTSP, RTMP, ONVIF, HLS |
| **VGE-264** | One channel VGA h.264 encoder  
- Support h.264Baseline Profile / h.264Main Profile / h.264High Profile  
- Support up to 720P, 1080P HD video input  
- Support 1080P@60fps  
- Support protocol HTTP, UDP, RTSP, RTMP, ONVIF |
| **SDE-264** | One channel SDI h.264 encoder, with one channel SDI looping out  
- Support h.264Baseline Profile / h.264Main Profile / h.264High Profile  
- Support up to 720P, 1080P HD video input  
- Support 1080P@60fps  
- Support protocol HTTP, UDP, RTP, RTSP, RTMP, ONVIF, HLS |
| **ADE-264** | Mini HDMI+CVBS h.264 video encoder  
- Support h.264Baseline Profile / h.264Main Profile / h.264High Profile  
- Support up to 720P, 1080P HD video input  
- Support 1080P@60fps  
- Support protocol HTTP, UDP, RTP, HLS, RTSP, RTMP, ONVIF, HLS |
| **VHE-264** | h.264 HDMI+VGA decoder  
- h.264Baseline/High/Main Profile decoding  
- MJPEG/JPEG Baseline decoding  
- Audio decoding MPEG1 Audio Layer 2  
- Support Network interface full-duplex mode 100M  
- 1 channel HDMI/VGA/audio output  
- Support up to 1080P/60hz HD video output  
- Support HTTP, UDP, RTSP, protocols |
| **HDE-16264** **HDE-16265** | Up to 16 channels HDMI h.264/h.265 encoder in 1x 4RU Chassis with dual PSU  
- Support h.264Baseline Profile / h.264Main Profile / h.264High Profile /h.265  
- Support up to 720P, 1080P HD video input  
- Support 1080P@60fps  
- Support protocol HTTP, UDP, RTP,RTSP, RTMP, ONVIF, HLS |

*Please note that the availability and specifications can change without notice.*
<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADE-16264</td>
<td>16 channels HDMI + CVBS h.264 encoder in rack</td>
</tr>
<tr>
<td></td>
<td>• Support h.264Baseline Profile / h.264Main Profile / h.264High Profile</td>
</tr>
<tr>
<td></td>
<td>• Support up to 720P, 1080P HD video input</td>
</tr>
<tr>
<td></td>
<td>• Support 1080P@60fps</td>
</tr>
<tr>
<td></td>
<td>• Support protocol HTTP, UDP, RTP, RTSP, RTMP, ONVIF, HLS</td>
</tr>
<tr>
<td>HDE-4264</td>
<td>4 channels HDMI h.264 video encoder</td>
</tr>
<tr>
<td></td>
<td>• Support h.264Baseline Profile / h.264Main Profile / h.264High Profile</td>
</tr>
<tr>
<td></td>
<td>• Support up to 4x 720P, 1080P HD video input</td>
</tr>
<tr>
<td></td>
<td>• Support 1080P@60fps</td>
</tr>
<tr>
<td></td>
<td>• Support protocol HTTP, UDP, RTP, RTSP, RTMP, ONVIF, HLS</td>
</tr>
<tr>
<td></td>
<td>• Dimensions: 430mm x 250mm x 45mm (LxWxH)</td>
</tr>
<tr>
<td></td>
<td>• Net Weight: 3KG</td>
</tr>
<tr>
<td>ADE-4264</td>
<td>4 channels HDMI + CVBS h.264 video encoder</td>
</tr>
<tr>
<td></td>
<td>• Support h.264Baseline Profile / h.264Main Profile / h.264High Profile</td>
</tr>
<tr>
<td></td>
<td>• Support up to 720P, 1080P HD video input</td>
</tr>
<tr>
<td></td>
<td>• Support 1080P@60fps</td>
</tr>
<tr>
<td></td>
<td>• Support protocol HTTP, UDP, RTP, RTSP, RTMP, ONVIF, HLS</td>
</tr>
<tr>
<td></td>
<td>• Dimensions: 430mm x 250mm x 45mm (LxWxH)</td>
</tr>
<tr>
<td></td>
<td>• Net Weight: 3KG</td>
</tr>
<tr>
<td>SDE-4264</td>
<td>4 channels HD-SDI h.264 video encoder</td>
</tr>
<tr>
<td></td>
<td>• Support h.264Baseline Profile / h.264Main Profile / h.264High Profile</td>
</tr>
<tr>
<td></td>
<td>• Support up to 720P, 1080P HD video input</td>
</tr>
<tr>
<td></td>
<td>• Support 1080P@60fps</td>
</tr>
<tr>
<td></td>
<td>• Support protocol HTTP, UDP, RTP, RTSP, RTMP, ONVIF, HLS</td>
</tr>
<tr>
<td></td>
<td>• Dimensions: 430mm x 250mm x 45mm (LxWxH)</td>
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<tr>
<td></td>
<td>• Net Weight: 3KG</td>
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**19” 1 RU Encoder Series**

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
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<tbody>
<tr>
<td>ADE-1264</td>
<td>h.264 Video Encoder into 1 RU case with HDMI input+BNC input+Independent Audio</td>
</tr>
<tr>
<td></td>
<td>• Support 1080P@60fps</td>
</tr>
<tr>
<td></td>
<td>• Single channel IP output</td>
</tr>
<tr>
<td></td>
<td>• Support HTTP, RTMP, UDP, RTP, HLS, ONVIF protocol</td>
</tr>
<tr>
<td></td>
<td>• Support unicast and multicast</td>
</tr>
<tr>
<td>HDE-1265</td>
<td>h.265 Video Encoder into 1 RU case with HDMI input</td>
</tr>
<tr>
<td></td>
<td>• Support h.264BP/MP/HP</td>
</tr>
<tr>
<td></td>
<td>• Support h.265 Main Profile</td>
</tr>
<tr>
<td></td>
<td>• Support up to 720P, 1080P HD video input</td>
</tr>
<tr>
<td></td>
<td>• Support protocol HTTP, UDP, RTP, RTMP, ONVIF, HLS</td>
</tr>
<tr>
<td></td>
<td>• Support 1080P@60fps</td>
</tr>
<tr>
<td>Model</td>
<td>Description</td>
</tr>
<tr>
<td>--------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
| SDE-1265 | h.265 Video Encoder into 1 RU case with HD-SDI input | - Support h.264BP/MP/HP  
- Support h.265 Main Profile  
- Support up to 720P, 1080P HD video input  
- Support protocol HTTP, UDP, RTSP, RTMP, ONVIF, HLS  
- Support 1080p@60fps |
| HDE-4264 | h.264 Video Encoder into 1 RU case with 4CH HDMI input | - Support 1080P@60fps  
- 4 channel IP output  
- Support HTTP, RTMP, RTSP, UDP, RTP, HLS, ONVIF protocols  
- Support unicast and multicast |

**h.265 (HEVC) Video Encoder Series**

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
<th>Specifications</th>
</tr>
</thead>
</table>
| HDE-265 | One channel h.265 HEVC HDMI video encoder | - Support h.264BP/MP/HP  
- Support h.265 Main Profile  
- Support up to 720P, 1080P HD video input  
- Support protocol HTTP, UDP, RTP, RTSP, RTMP, ONVIF, HLS  
- Support 1080p@60fps |
| SDE-265 | One channel h.265 HD-SDI video encoder | - Support h.264BP/MP/HP  
- Support h.265 Main Profile  
- Support up to 720P, 1080P HD video input  
- Support protocol HTTP, UDP, RTP, RTSP, RTMP, ONVIF, HLS  
- Support 1080p@60fps |
| VDE-265 | One channel h.265 VGA video encoder | - Support h.264BP/MP/HP  
- Support h.265 Main Profile  
- Support up to 720P, 1080P HD video input  
- Support HDCP protocol and HD blue-ray  
- Support protocol HTTP, UDP, RTP, RTSP, RTMP, ONVIF, HLS  
- Support 1080p@60fps |
| HDE-1265 | h.265 Video Encoder into 1 RU case with HDMI input | - Support h.264BP/MP/HP  
- Support h.265 Main Profile  
- Support up to 720P, 1080P HD video input  
- Support HDCP protocol and HD blue-ray  
- Support protocol HTTP, UDP, RTSP, RTMP, ONVIF, HLS  
- Support 1080p@60fps |
| SDE-1265 | h.265 Video Encoder into 1 RU case with SDI input | - Support h.264BP/MP/HP  
- Support h.265 Main Profile  
- Support up to 720P, 1080P HD video input  
- Support HDCP protocol and HD blue-ray  
- Support protocol HTTP, UDP, RTSP, RTMP, ONVIF, HLS  
- Support 1080p@60fps |
## h.264 / h.265 Wireless Video Encoder Series

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
<th>Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>SWE-264</td>
<td>1 channel SDI input encoder</td>
<td>• Connect the internet by Wifi or ethernet port</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1 Channel SDI input;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1 channel SDI loop output.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Same specification as SDE-264</td>
</tr>
<tr>
<td>SWE-265</td>
<td>1 channel h.265 SDI video encoder with 1 channel SDI loop output with wifi</td>
<td>• Connect the internet by Wifi or ethernet port</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Support h.264BP/MP/HP</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Support h.265 Main Profile</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Support up to 720P, 1080P HD video input</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Support HDCP protocol and HD blue-ray</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Support protocol HTTP, UDP, RTSP, RTMP, ONVIF, HLS</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Support 1080p@60fps</td>
</tr>
<tr>
<td>HWE-264</td>
<td>One channel HDMI h.264 encoder with wifi</td>
<td>• Support h.264Baseline Profile /h.264Main Profile / h.264High Profile</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Support up to 720P, 1080P HD video input</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Support HDCP protocol and HD blue-ray</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Support protocol HTTP, UDP, RTSP, RTMP, ONVIF, HLS</td>
</tr>
</tbody>
</table>

**New: HDE-4K4 h.264 UHD encoder**

Almost all models with ONVIF support can be used with following protocols:
“ONVIF S,” “ONVIF C” or “ONVIF G”
Statement:

Text and pictures herein are subject to changes w/o notifications.
The user manual will be updated in real time without special notice.
This user manual is provided only as a reference guide for technicians as examples.

Default Values

The factory default administrator account: admin
The factory-default user password: admin
The factory default IP address: 192.168.0.31 or 192.168.1.168

Please change these account settings according to your local policy and network. -> Do not forget to save and backup the configuration.

Product Overview

The h.264/h.265 Encoder is a hardware device used for high-definition video signal (up to 1080p HD resolution) encoding and network transmission, using the latest and high-efficient HD digital video compression technology h.264/H.265, with the characteristics of reliable, high-definition, low bitrate and low latency. Connect the HDMI/SDI/VGA high-definition video signal to start the encoding process, after the compression processing by the DSP chip, the output of the standard TS network stream can be started.
The launch of these devices fills the gap in the industry, which is a direct replacement for the traditional capture card for software coding method, using hard-coded chipsets, the system is more stable, and the picture quality is more perfect. They can be used in a wide variety of demands for high-definition video and high-resolution / high frame rate re-assembling for IP based network transmission. Its powerful scalability makes it more easier to respond to the needs of different industries and can be used as live video encoder.
Industrial controlled, precision design, small size, easy installation, the power is less than 5W, which is energy-saving and more stable.
Product features

High-performance hardware encoding
- h.265 video coding efficiency (depending on Model, downward compatible to h.264)*
- h.264 BP/MP/HP
- AAC / G.711 Advanced Audio Coding format quality (* MP1L2, AAC++, MP3, AC3)
- CBR / VBR encoding rate: 16Kbps ... 12Mbps
- 100BaseT or 1000Mbit/s network interface using full duplex mode (dep. on Model)*
- A mainstream and second stream can be sent to different IP-connections (HDE-4K4/5 up to 4 streams) Supports up to 720P, 1080P @ 60HZ HD video input
- Support image parameter settings
- HTTP, HLS, UDP, RTSP, RTMP, RTP, ONVIF protocol
- The mainstream and second stream can be used with different network protocol for their transmissions
- WEB interface English
- Remote management in WAN/LAN (WEB)
- Support customized settings for the resolution
- Support one step to restore the factory configuration

* Features may vary between models and Software Versions

Applications

- IPTV
- Digital Signage
- Video Conference
- Hotel IPTV System
- Live Broadcast Feeds
- Campus IPTV System
- IP Recording System
- Medical video broadcast and recording system
- Live video education system
- IP Video Recording (DVR/NVR)
- 4G mobile broadcast HD front capturing

Interface Descriptions

The interfaces of h.264 HDMI encoder and WIFI encoder are almost similar :

The interfaces of h.264 SDI encoder and WIFI encoder are similar :
The interfaces of h.264 VGA encoder and WIFI encoder are similar:

From Left to Right:
A. Power input----- 12V/DC (12V/1A, 5V/2A optional)
B. RST=RESET button ------ useful to reset the device to factory defaults. After power on, press it for about 15 seconds to reset the device to default IP 192.168.0.31 (192.168.1.168 – depending on Model)
C. AUDIO/Video input------ Input HD HDMI, SDI, VGA, Audio signals
D. 100 or 1000BaseT Ethernet port RJ45
E. Status Indicator :
   1) Will flash while pressing the RESET button. Reset is successful when the light turns off. Slow Flashing show: Video input, image capturing and compression is working..
   2) If the indicator light keeps on, the Video source acquisition and compression has some problem like resolution/format our out of Input specification. Sync failed...
   3) If the indicator LED flashes slowly but the output stream is not working, there might be a problem with the streaming server part.
WEB server – Access settings

Step 1: Reset & initialization
Connect the power supply to turn on the encoder and use a pin to press RST on the encoder for min. 10 seconds (better 15), it will be restarted and initialized. The default Route IP of the WEB-IF is 192.168.0.31 or 192.168.1.168 (This default Address may vary depending on model) after initialization and can be recognized from the sticker at the bottom:

Step 2: Change the administrator’s computer IP
Set the administrator’s computer IP as: 192.168.0.* or 192.168.1.* to avoid IP conflicting with the unit's own IP address. IP 192.168.0.*: (use an IP setting “*” in the number range between 2-254 except .0.31 or .1.168) Remark: .0 is often the network router, .1 often the Gateway of the used router.

Step 3: Login the menu with the web browser:
Enter 192.168.0.31 (or 192.168.1.168) in your Browser window.

Default user Name: admin
Default password: admin

You are entering the STATUS window:
You'll get more information if scrolling down:

The sub-menus are at the bottom.
Remark: The PREVIEW popup window is not available in all models...
DHCP might not be a good idea because your local network router would handover an IP Address from his pool which you can only get by entering the router itself.

**Remark:** DNS settings might not be necessary because the device would not need to use them to translate domains <-> IP addresses.

Please change the settings to your local network values and scroll down to save it by pressing SET UP:

You can set the DNS values according to your local router values. The HTTP and RTSP ports should be set for the unicast / http streaming default selected ports.
Enter the SYSTEMS Menu

to reboot your device and to enable the new settings or
do a SW-update, set the time-zone for the NTP – fetcher (UTC+1 = Germany)...  
Rem.: Firmware updates will not be published, so please ask us if you have some problems or want to use
new features implemented like: (1.1.2019): MJPEG encoding support (in particular models), HLS slicing,
RTMP nginx proxy support, ...
CONFIGURE A PLANNED SCHEDULED RESTART:

UPGRADE THE FIRMWARE AND INITIALIZE A REBOOT:

Do not forget to re-adjust your PC/LAPTOP IP-Settings to your local network addresses if you changed the IP address.

Re-enter into the unit's WEB-IF by using the new address.
**STATUS DISPLAY**

**Input status:** When you input the HD signal source, it will show resolution of video input, if it's blank here: No video input detected.

**Main-stream Status:** Showing the resolution of the main-stream you set and multicast address. You can control the multicast address by VLC or other Video receiving software supporting that.

**NTP-TİME AND DATE**

Update can be synchronized to the RealTimeClock (RTC):

See configuration in System Menu:

**SECOND (SUB) STREAM STATUS:**

Showing the resolution of the second-stream and its configured address:
NETWORK SETTINGS - WIFI

You can set the network with either Ethernet or WIFI. Only devices with WIFI support can use a WLAN connection.

Instruction of wifi network Setup: 3 different settings can be chosen

A. Ethernet: Only connected by ethernet (default configuration)
B. Wifi*: Only connect with WLAN. Hint: If you entered the wrong password or SSID during WIFI mode will cause the system being unable to connect to Wireless LAN. Opening the web-Interface will fail. Please press the reset button to restore the default settings to solve the problem.
C. Auto: Automatically detect if you have ethernet or wifi connected *.

a. The Default IP of the device is 192.168.0.32 (depending on model) or 192.168.1.168. If IP setting has been forgotten after changing, you can RST= reset it to default IP following the reset to default settings procedure like explained before.

*Only for devices equipped with WIFI!
b. If you don’t need to use a network cable, and when you reboot the device, it will access to WIFI status if it’s equipped with WIFI. Please kindly note the different features for WIFI versions.

**MAIN STREAM ENCODING SETTINGS:**

We assume, that the user already well knows the relevant terms and abbreviations for Video-Encoding and their technical background.

Chose your codec. (new in 2019: MJPEG support)
MAIN STREAM SETTING:

- Enc type: h.264 & h.265 (is optional dep. on model) or MJPEG (new in 2019)
  
  **Note:** h.264 version can only use h.264 codec, h.265 model can do both

- Profile: baseline profile / main profile / high profile (note: h.265 version choose main profile)

- Frame rate: 5-60 (If the input resolution is 720i/50,1080i50, the frame rate will be set to 25)

- Bitrate mode: VBR / CBR variable or constant while CBR is the better choice

- Group of picture: 5-200, shows picture quality, default setting is almost sufficient

- Bitrate: 16-16000 kbit/s or 32-32000 kbit/s dep. on Model (Network bandwidth setting)

**Note:** You can modify the above parameters without rebooting the encoder

SELECTING YOUR OUTPUT SCREEN SIZE/RESOLUTION:

**Note:** The encoder is not intent to use for upscaling purpose i.e. 720 -> 1080. It always depends on the Input resolution and size. Downscaling is possible:
Mainstream encoding settings

- **Encoding type:** H.265
- **FPS:** 30 [5-60]
- **GOP:** 30 [5-200]
- **Bitrate (kbps):** 8000 [32-20000]
- **Encoded size:** 1920x1080
- **Rate control:** cbr
- **TS URL:** /0.ts [Enable/Disable]
- **MHS URL:** /0.m3u8 [Disable]
- **FLV URL:** /0.flv [Disable]
- **RTSP URL:** /0 [Disable]
- **RTMP URL:** /0 [Disable]
- **RTMP/RTSP Push URL:** rtmp://192.168.1.50/live/0 [Disable]
- **Multicast IP:** 238.0.0.1 [Disable]
- **Multicast port:** 12340 [1-65535]

**Main stream settings**

- **HTTP:** /main enable/disable
- **HTTP port:** 1-65535 optional
- **RTSP:** /main enable/disable
- **RTSP port:** 1-65535 optional
- **Multicast IP:** 238.0.0.1 disable/RTP/UDP optional
- **Multicast port:** 1-65535 optional
- **RTMP server IP:** can be set according to your streaming media server values
- **RTMP server port:** 1-65535 optional
- **RTMP app name:** can be set by yourself
- **RTMP stream name:** can be set by yourself
- **RTMP user name:** User for your server
- **RTMP password name:** and Password for your server
- **ONVIF:** enable/disable (IP-Camera protocol support)

*Note: ONVIF SETTINGS depending on SW and device model types*

**Main - Stream encoding & protocol settings should be crosschecked with the SYSTEM-Advanced settings because you can set here the common defaults for all stream outputs:**

- **HTTP:** /main enable/disable
- **HTTP port:** 1-65535 optional
- **RTSP:** /main enable/disable
- **RTSP port:** 1-65535 optional
- **Multicast IP:** 238.0.0.1 disable/RTP/UDP optional
- **Multicast port:** 1-65535 optional
- **RTMP server IP:** can be set according to your streaming media server values
- **RTMP server port:** 1-65535 optional
- **RTMP app name:** can be set by yourself
- **RTMP stream name:** can be set by yourself
- **RTMP user name:** User for your server
- **RTMP password name:** and Password for your server
- **ONVIF:** enable/disable (IP-Camera protocol support)

*REM: RTP instead of UDP has to be selected in the SYSTEM Menu*

*Note: ONVIF SETTINGS depending on SW and device model types*
HDMI-encoder ONVIF worked with Genetec VMS like:

I would like to clarify the following:

The Encoder sent to Genetec HQ for integration is a
HDMI.
This has been tested in our lab and works properly.

The Encoders used in the CESAC project are
[DB15 Analog input]
This is the one we have not been able to stream video from.

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Built to evolve: www.genetec.com/bta

Note: We recommend to chose not all streams and protocolls at the same time.
RTMP is not working with h.265 HEVC-Codec because Adobe hasn't included this Codec into its list of valid codecs yet.
Maybe Adobe and also Apple will be more open in the future.

For AC3 audio, RTSP do not support it, so, when you enable AC3, RTSP will use the G711A.
If you choose AC3, you can't disable the G711A audio for ONVIF:

Remark: Getting Information about the HDE-4K4: This product has an own Manual/Datasheet.
Note: For TS URL, HLS URL, RTSP URL, the Network IP address of the device is the Unicast distribution address. You do not need to fill in this address by yourself because it is already related to the RJ45-Ethernet network IP. -264 version have Fast-ethernet only. Multicast IP addresses and ports need to be considered in the IANNA recommended range to avoid conflicts within your local network and router/switches:

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

**TS once pack:**

is the packet size send by the encoder streamer.
Usually we suggest to set it to 7.
For example for UDP:
1 packet is 188, 7 pack size will be 188*7+46=1362
Compatibility with VLC or FFMPEG as well as some basics for TS PIDs can be set.
TS empty packets will insert PID8191dec Zero packets as a factor. So no real TS output with a very stable and constant CBR stream will be created:

But will be needed in systems where finally a CBR is used and remultiplexers are connected. Here the 1.3 would be the best choice:

PID 8191 dec = Zero-packets injected
SCHEDULE RESTART

can re-initialise the unit to a particular time to avoid overflows or any other long-time issues if the Input signal will fluctuate or isn't stable enough over the time being.

SERIAL TO TCP

works in combination with an integrated remserial-1.4 function:

Remserial

The remserial program acts as a communications bridge between a TCP/IP network port and a Linux device such as a serial port. Any character-oriented Linux /dev device will work.

The program can also use pseudo-ttys as the device. A pseudo-tty is like a serial port in that it has a /dev entry that can be opened by a program that expects a serial port device, except that instead of belonging to a physical serial device, the data can be intercepted by another program. The remserial program uses this to connect a network port to the "master" (programming) side of the pseudo-tty allowing the device driver (slave) side to be used by some program expecting a serial port. See example 3 below for details.

The program can operate as a server accepting network connections from other machines, or in some client, connecting to remote machine that is running the remserial program or some other program that accepts a raw network connection. The network connection passes data as-is, there is no control protocol over the network socket.

Multiple copies of the program can run on the same computer at the same time assuming each is using a different network port and device.

Some examples:

1) Give access to a RS232 device over a network.

   The computer with the serial port connected to the device (such as a data acquisition device) runs the remserial program:

   remserial -d -p 23000 -s "9600 raw" /dev/ttyS0 &

   This starts the program in daemon mode so that it runs in the background, it waits for connections on port 23000 and sets up the serial port /dev/ttyS0 at 9600 baud. Network connections to port 23000 from any machine can then read and write to the device attached to the serial port.

   This can be started from /etc/rc.local or as an entry in /etc/inittab or set up as a system service with a file in /etc/rc.init/.

2) Connect an RS232 device to a specified server.

   The computer with the serial port connected to the device (such as a data acquisition device) runs the remserial program:

   remserial -d -r server-name -p 23000 -s "9600 raw" /dev/ttyS0 &

   This would be used with case number 1 above creating an end-to-end serial port connection. What goes in the serial port on one machine would come out the serial port of the other machine. The ports could be running at
different baud rates or other serial port settings.

3) Connect a Linux program that needs a serial port to a remote serial port.

Some programs are written to communicate directly with a serial port such as some data acquisition programs. The remserial program can use pseudo-ttys to fool the program into thinking that it is talking to a real serial port on the local machine:

```
remserial -d -r server-name -p 23000 -l /dev/pts/serial1 /dev/ptmx  &
```

This creates a file called /dev/pts/serial1 which can be used by the data acquisition application as its serial port. Any data sent or received is passed to the remote server-name on port 23000 where a computer configured in case number 1 above passes it to a real serial port.

The remserial program uses the special pseudo-tty master device /dev/ptmx (see man ptmx) which creates a slave device that looks like a normal serial port named /dev/pts/something. Unfortunately, the actual device name created isn’t consistent, so the remserial program creates a symbolic link from the device name specified with the -l option to the /dev/pts/ name that was created allowing the other application to be configured with a consistent device name.

4) Server farm console control.

Assuming multiple Linux servers (such as web servers) are set up to have a serial port as their console instead of a monitor/keyboard, their serial ports could be connected to a control server using a multi-port serial board. On the control server, a copy of remserial is run for each server:

```
remserial -d -p 23000 -s "115200 raw" /dev/ttyS0  &
remserial -d -p 23001 -s "115200 raw" /dev/ttyS1  &
remserial -d -p 23002 -s "115200 raw" /dev/ttyS2  &
remserial -d -p 23003 -s "115200 raw" /dev/ttyS3  &
```

From any computer on the local network, use a telnet program to connect to the control server on the appropriate port:

```
telnet control-server-name 23002
```

This would connect through the associated serial port to the desired server's console. This example would then give the user console access to the 3rd server.

Careful scripting such as using the Linux "expect" program could allow batches of commands to be run on each server.

Other Linux program useful with remserial
-----------------------------------------

- `nc` - The netcat program is similar to remserial except that it creates connections between network ports and command line standard input and output.

For example, with case number 1 above, the following command run on another computer will send the contents of the named file out the serial port used by the remserial program:

```
nc server-name 23000 <file-name>
```

Similarly, the following command will store incoming serial data in a file until the program is manually interrupted:

```
nc server-name 23000 >file-name
```

- `telnet` - The telnet program is normally used to log into a remote computer, but when used with network ports other than number 23, it operates in a raw data mode.

For example, with case number 1 above, the following command will allow the user of the telnet program to see incoming serial port data and type data on the keyboard to send to the serial port:

```
telnet server-name 23000
```

This is ideal for controlling the device connected to the serial port if it has some sort of command line interface usable over the serial port.

remserial Usage:
---------------

```
remserial [-r machinename] [-p netport] [-s "stty params"] device
```

- `-r machinename` - The remote machine name to connect to. If not specified, then this is the server side.
- `-p netport` - Specify IP port# (default 23000)
- `-s "stty params"` - If serial port, specify stty parameters, see man stty
- `-d` - Run as daemon programs
- `-x debuglevel` - Set debug level, 0 is default, 1,2 give more info
- `-l linkname` - If the device is /dev/ptmx, creates a symbolic link to the corresponding slave pseudo-tty so that another application has a static device name to use.
- `-m max-connections` - Maximum number of simultaneous client connections to allow device.

Character oriented device node such as /dev/ttyS0.
EXAMPLE FOR STREAMING TO VIMEO LIVE BY RTMP:

**Main stream**

Encoding Type:1920x1080/25
Brate(kbit):1800
HLS URL:Disable
PLV URL:Disable
RTSP URL:Disable
Multicast URL:Disable

VIMEO gives the user an RTMP –address with a live token at the end. No username/password is necessary because they handover individual stream-keys which simply needs to be inserted as

```
rtmp://rtmp.cloud.vimeo.com/live?token=**********/streamkey
```

Than you can control it by checking the vimeo live portal of your stream:
MAIN STREAM LIVE VIEW:

You can play the stream address by your computer if you installed i.e. the VLC Player software or use an IPTV STB by setup the RTSP or HTTP stream addresses:

Easiest way: copy and paste the URL from the main window

![Image of VLC media player interface]

and open VLC – network stream:

![Image of VLC media player network stream interface]

Press Play/Wiedergabe:

![Image of live stream interface]

> Unfall auf A9: "Verkettung unfallhafter Umstände" führte zu Busbrand mit 18 Toten
You can check the video information if you like by VLC:

Note: VLC can only receive the stream if your receiving device has only one NetworkCard enabled. If you have a Laptop with WIFI and Ethernet enabled it doesn’t know where to catch the stream from. You can change that by disabling one device or adjust a priority by setup different METRC Values to each of them.
**Second stream Live View:** You can play the stream address by your computer if you installed the Video Lan Client (VLC, freeware for almost all platforms) similar to the shown procedure above.

**CVBS Live View (depending on Model):** You can play the stream address by your computer if you installed the VLC.

---

**OSD SETTINGS (OVERLAY A PICTURE/TXT TO THE ENCODED STREAM)**

To be able to OVERLAY text and advertisements to your encoded stream, the unit supports up to 4 zones:

---

**Note:** You can insert two couples of TEXT and 3 pictures simultaneously overlaying the picture.

- **Text X:** 0-1920 is optional, display the left and right position of the text
- **Text Y:** 0-1080 is optional, display the up and down position of the text
- **Font1 size:** 8-72 is optional
- **Alpha1:** 0-128 is optional, Alpha-blending – transparency setting
- **Color1:** choose the color you want to display
- **Bg1:** choose background color for the text on the video overlay
- **Text:** input the content of the text you want to display
These features are varying depending on model and versions.

| Zone 1 | Zone: Enable ▼ 
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Type:</td>
<td>Text ▼</td>
</tr>
<tr>
<td>X:</td>
<td>10</td>
</tr>
<tr>
<td>Y:</td>
<td>10</td>
</tr>
<tr>
<td>Text:</td>
<td>![Input Text]</td>
</tr>
<tr>
<td>Font size:</td>
<td>![Font Size]</td>
</tr>
<tr>
<td>Background color:</td>
<td>![Background Color]</td>
</tr>
<tr>
<td>Color:</td>
<td>![Selected Color]</td>
</tr>
</tbody>
</table>

or a prepared picture according to the values given in the WEB-IF for uploading to the unit:

Since 2019 software version, the Overlay-Logo insertion can be used as PNG transparent or BMP-pictures.

### OSD Insertion Picture Setting

**Picture1...4:** disable/enable (disable: no images, enable: insert the images)

**Pictures X:** 4-1920 is optional to set the left and right position of the picture

**Pictures Y:** 4-1080 is optional to set the up and down position of the picture

**Alpha:** 0-128 is optional - transparency setting

**Picture name:** display the name of the picture

**Upload picture:** choose to upload the image, supporting *.bmp format of the picture and limited filesize: less than 500kbyte

#### Requirements
- The settings of the three pictures to be inserted must be identical.
- Transparent background of the picture setting:
  - should be of RGB values: R - 177, G - 204, B - 233 or see WEBIF hints

#### Example:
(Please upload PNG or 24-bit BMP (0xF1F1F1 is the transparent colour taken) pictures less than 500 kByte, The file name is logo1.bmp or logo1.png and so on according to the inserted 4 zones logo2...4):

Example: The bitmap BMP:

The light grey background colour is: 0xF1F1F1 and will appear in the TV screen as Transparent.

You can use GIMP or any other graphic software to change your logos background accordingly. PNG has a transparency option – BMP doesn’t.
PICTURE QUALITY SETTING (DEP. ON MODEL)

Brightness: 0-100 is optional (to adjust the brightness of the image)
Contrast: 0-100 is optional (to adjust the contrast of the image)
Hue: 0-100 is optional (to adjust the hue of the image)
Saturation: 0-100 is optional (to adjust the saturation of the image)

Text can be chosen with different combinations:
is for Video color, Contrast & brightness settings just in case the user want to change them apart from the original passed Picture settings.

HINT: If you change parameters or enable features, following popup message will appear:

If this above message appears:

**This doesn’t mean to restart your encoder!** – It means your *Receiver* should be tuned again (restarted) to the stream i.e. switch or reload the channel on your IRENIS/BLANKOM IPTV SetTopBox to re-initialize the decoding process or restart VLC.
SECOND (SUB) STREAM OUTPUT SETTINGS

Note: The method of the setting is nearly the same with mainstream code setting:

The sub-Stream has some slightly different setup:

Because the RTMP Server can only obtain a stream once from the same IP address.
Please assure the corresponding picture settings if downscaling i.e. from 16:9 to 5:4 would squeeze the picture:
CVBS ENCODING SETTINGS (DEP. ON MODEL)

Audio bitrates: 48k, 64k, 128k, 160k, 192k, 256k (depending on chosen following codec)
Audio type: AAC ...(depending on model) and more...
Audio digital gain: 2x, 4x, 8x, used to adjust volume
Audio input mode: digital/analog

Example 1:

Audio codec support depends on Model and SW-Version

Example 2:
WIFI SETTING HINTS

Hint shown above: If you want to configure the HD encoder, you need to set the fixed IP of the computer first. See chapter above – similar to Ethernet Settings.

HD WIRELESS ENCODER SETTINGS

Connect the HD Encoders by the network cable, then open the browser to enter the network setting chapter. Default setting as shown below can be modified to your needs:

Note:

1) Default IP of wifi can be 192.168.0.32. When wifi connected successfully, you can access to web control panel by 192.168.0.32.

2) Wifi Encryption : WPA/WPA2 (Note: Some wireless routers have different encryption mode, please select WPA/WPA2 for the encryption)

3) Input the WEP/WPA password string of the wireless router
**TECHNICAL SPECIFICATIONS (DEP. ON MODEL)**

<table>
<thead>
<tr>
<th><strong>Video</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Input</strong></td>
<td>HDMI, SDI, CVBS according to the chosen model</td>
</tr>
<tr>
<td><strong>Resolution</strong></td>
<td>1920×1080_60i/60P, 1920×1080_50i, 1280×720_60p, 1280×720_50p and below</td>
</tr>
<tr>
<td><strong>Encoding</strong></td>
<td>h.264/AVC Main Profile/High Profile; H.265/HEVC Baseline Profile;</td>
</tr>
<tr>
<td><strong>Data Rate</strong></td>
<td>0.8 Mbps ... 12 Mbps (32kbs ...32Mbps)</td>
</tr>
<tr>
<td><strong>Rate Control</strong></td>
<td>CBR/VBR</td>
</tr>
<tr>
<td><strong>GOP Structure</strong></td>
<td>IBBP</td>
</tr>
<tr>
<td><strong>Advanced Pretreatment</strong></td>
<td>De-interlacing, Noise Reduction, Sharpening</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Audio</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Encoding</strong></td>
<td>AAC (+,++,...), MP3, AC3, MP2/3 ... dep. on model</td>
</tr>
<tr>
<td><strong>Sampling Rate</strong></td>
<td>Auto</td>
</tr>
<tr>
<td><strong>Bit-rate</strong></td>
<td>48K/64K/96K/128K/160K/192K/256k</td>
</tr>
<tr>
<td><strong>Sampling Precision</strong></td>
<td>16 bit</td>
</tr>
<tr>
<td><strong>Data Rate</strong></td>
<td>64 Kbps ~ 384 Kbps</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>System</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Operating System</strong></td>
<td>HiLinux embedded OS</td>
</tr>
<tr>
<td><strong>Ethernet/RJ45</strong></td>
<td>100BaseT (h.264 only version), 1000Base-T RJ45 h.265 versions</td>
</tr>
<tr>
<td><strong>Protocol</strong></td>
<td>HTTP, UDP, RTP, HLS, RTSP, RTMP, ONVIF (prot.: S,C,G)</td>
</tr>
<tr>
<td><strong>Control Interface</strong></td>
<td>100/1000BaseT by WEB-Browser</td>
</tr>
</tbody>
</table>
Installation Notes
All types of the IRENIS-BLANKOM family are partly 19“ devices with 1 RU height designed for installation in 19” racks. In addition to the front panel screws an internal module support is required at the rack. Depending on the Frontend used and the operating adjustments, the SAT-RF-input ports carrying DC Voltage (13V /18V, max. 400 mA). By connecting a mains cable, the device can become functional without any auxiliary appliances. The power supply units are designed for the wide range of 100-230V AC; a manual adjustment of the voltage is not necessary. For some models the second power connector is feeding another independent power supply for internal redundancy. For a maximum of redundancy both power supplies should use different circuits. All the outputs are decoupled from one another. Thus, the circuit does not have any effect on the functioning of the device. Connections that are not required need not to be terminated.

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

Note:
IPv4 global scope sessions use multicast addresses in the range 224.2.128.0 - 224.2.255.255 with SAP Announcements being sent to 224.2.127.254 Port 9875 (note that 224.2.127.255 is used by the obsolete SAPv0 and MUST NOT be used).
IPv4 administrative scope sessions using administratively scoped IP multicast. The multicast address to be used for announcements is the highest multicast address in the relevant administrative scope zone.
For example, if the scope range is 239.16.32.0 - 239.16.33.255, then 239.16.33.255 is used for SAP Announcements.

Sources:
http://www.etsi.org/deliver/etsi_en/300400_300499/300468/01.15.01_60/en_300468v011501p.pdf
https://www.dvb.org/standards

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. 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 - 224.0.2.255)
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 65535. For more information on Windows see http://support.microsoft.com/kb/929851 Care should also be taken to avoid system ports 0 to 1024. See http://www.iana.org/assignments/service-names-port-numbers/service-names-port-numbers.xml Generally one of the unassigned User Ports (1024-49151) should be used, you can run the netstat -anb (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, or by USC/ISI before 1998) for use with a certain protocol or application.

Ports with numbers 0–1023 are called system or well-known ports; ports with numbers 1024-49151 are called user or registered ports, and ports with numbers 49152-65535 are called dynamic and/or private ports. Both system and user ports are used by transport protocols (TCP, UDP, DCCP, SCTP) to indicate an application or service.

- Ports 0–1023 – system or well-known ports
- Ports 1024–49151 – user or registered ports
- Ports 49151 – dynamic / private ports


Range for Ephemeral port

The Internet Assigned Numbers Authority (IANA) suggests the range 49152 to 65535 (2^14 to 2^16–1) for dynamic or private ports.

Many Linux kernels use the port range 32768 to 61000. FreeBSD has used the IANA port range since release 4.6. Previous versions, including the Berkeley Software Distribution (BSD), uses ports 1024 to 5000 as ephemeral ports.

Microsoft Windows operating systems through XP use the range 1025–5000 as ephemeral ports by default. Windows Vista, Windows 7, and Server 2008 use the IANA range by default. 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. Windows Server 2008 with Exchange Server 2007 installed has a default port range of 1025–60000. 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.
Packet structure

<table>
<thead>
<tr>
<th>Offsets</th>
<th>Octet</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Bit</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>32</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

UDP Header

<table>
<thead>
<tr>
<th>Octet</th>
<th>Bit</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>32</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The UDP header consists of 4 fields, each of which is 2 bytes (16 bits). 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.

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.

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).

In IPv6 jumbograms it is possible to have UDP packets of size greater than 65,535 bytes. 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. The field carries all-zeros if unused.

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.
ANNEX MPEG

MPEG PSI/SI Information’s:

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

<table>
<thead>
<tr>
<th>Table 1: PID allocation for SI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Table</td>
</tr>
<tr>
<td>PAT</td>
</tr>
<tr>
<td>CAT</td>
</tr>
<tr>
<td>TSDT</td>
</tr>
<tr>
<td>reserved</td>
</tr>
<tr>
<td>NIT, ST</td>
</tr>
<tr>
<td>SDT, BAT, ST</td>
</tr>
<tr>
<td>EIT, ST, CIT (ETSI TS 102 323 (13))</td>
</tr>
<tr>
<td>RST, ST</td>
</tr>
<tr>
<td>TDT, TOT, ST</td>
</tr>
<tr>
<td>network synchronization</td>
</tr>
<tr>
<td>RNT (ETSI TS 102 323 (13))</td>
</tr>
<tr>
<td>reserved for future use</td>
</tr>
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### Appendix DB

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

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</table>
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 법률 및 규정에 따라 폐기되어야 합니다.

Waarschuwing

De uiteindelijke verwijdering van dit product dient te geschieden in overeenstemming met alle nationale wetten en reglementen.
Safety instructions

Read the safety instructions carefully before assembling or commissioning the device and ensure that you comply with them.

1. Installation
   - **Danger:** The device may only be installed and started up by competent people (see EN 60605).
   - **Danger:** The device and the peripheral distribution devices must be earthed properly (potential equalization) in accordance with EN 60728-11 before Commissioning and remain earthed even when the device is dismantled.
   - **Danger:** The device may not be installed on a flammable base (risk of fire).
   - **Danger:** Only connect the device to a socket that is installed correctly and connected to devices that has an earth conductor (Depending on Model and Usage).
   - **Danger:** Plan the assembly or installation location to ensure that children cannot play with the device and its connections. There is a risk of electric shock (danger of death).
   - **Danger:** Select an assembly or installation location in which fluids or objects cannot get into the device under any circumstances (e.g. condensation, water for watering plants, etc.).
   - **Danger:** Ventilation slots and refrigeration units are important function elements on the devices. If devices have refrigeration units or ventilation slots, you must ensure that they are never covered or built over. Also ensure that there is sufficient air circulation around the device. This prevents possible damage to the device and the risk of fire due to overheating. Ensure a minimum of clearance of 20cm between the device and other objects.
   - **Danger:** The assembly or installation location must allow all connected cables to be laid safely. Cables and power supply cables must not be damaged or crushed by any objects. Furthermore, ensure that cables are not laid in the immediate vicinity of sources of heat (e.g. radiators, other electrical devices, fireplaces, etc.) (Risk of fire). (Risk of electric shock danger of death)
   - **Danger:** In order to prevent damage to the device, as well as possible subsequent damage (risk of fire), devices intended for installation on the wall are only permitted to be installed on a level surface and not above head height.
   - **Warning:** (Only for optical transmitters and their peripheral distribution devices) Never look directly or indirectly into the laser beam. Only connect the device to the power supply once all optical lines are connected securely.
   - **Warning:** The safety regulations in the relevant current standards EN 60728-11 and EN 60605 must be complied with.
   - **Warning:** Comply with all applicable national safety regulations and standards.
   - **Warning:** The device’s mains plug must be easily accessible at all times.
   - **Warning:** Follow all instructions in the device-specific operating manual.

2. Operation
   - **Danger:** The device is only permitted to be operated in dry rooms in a non-tropical climate. In damp rooms or outdoors, there is the risk of short circuits (risk of fire) or electric shock (danger of death).
   - **Danger:** Do not insert any objects through the ventilation slot. Risk of electric shock (danger of death).
   - **Danger:** Do not put any containers filled with liquid (e.g. vases) on the device. There is a risk of electric shock (danger of death) or (risk of fire).
   - **Danger:** No open sources of fire such as burning candles are permitted to be placed on the device (risk of fire).
   - **Danger:** Ensure that there is a clearance of at least 20cm around the device. The device ventilation is not permitted to be impaired by covering the ventilation openings with objects such as newspapers, tablecloths, curtains, etc. (risk of fire).
   - **Warning:** Follow all instructions in the device-specific operating manual.

3. Maintenance
   - **Danger:** Maintenance tasks must always be carried out by competent people (see EN 60605).
   - **Danger:** Do not carry out servicing work during thunderstorms. There is a risk of electric shock (danger of death).
   - **Warning:** (Only for devices with batteries): Risk of explosion if the battery is replaced Improperly. Only replace with the same type!
   - **Warning:** Batteries must not be subjected to excessive heat such as sunlight, fire or similar (risk of explosion).
   - **Warning:** Only use the manufacturer's accessories or accessories with identical technical properties.
   - **Warning:** (For optical transmitters and their peripheral distribution devices) unplug the mains plug before dismantling the device.

4. Repairs
   - **Danger:** The device may only be opened by competent people (see EN 60605). Before opening the device, unplug the mains plug or disconnect the power supply; otherwise there is a danger of death! The device is only permitted to be connected to the power and operated when the mains adapter cover is installed. This also applies when you clean the device or work on the connections.
   - **Danger:** Repairs on the device may only be carried out by a specialist (see EN 60605) observing the applicable VDE (German Association for Electrical, Electronic & Information Technologies) guidelines.
   - **Danger:** Only use components of the same type and with identical technical properties for the repair. Otherwise, there is a risk of electric shock (danger of death) and risk of fire.
   - **Warning:** (For optical transmitters and their peripheral distribution devices) unplug the mains plug before dismantling the device.

5. Sale
   - **Caution:** If the device is sold, these safety instructions and the operating manual for the relevant device must be handed over to the purchaser.

6. Disposal
   - **Caution:** Dispose of the device in accordance with the applicable environmental regulations.
   - **Caution:** Dispose of batteries (if present) in accordance with the applicable environmental regulations.

If you have any queries regarding repairs, please contact our company service: E-mail: info@blankom.de, contact: www.blankom.de
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 Verteilereinheit muß vor Inbetriebnahme gemäß EN 60728-11 vorschriftsmäßig geerdet sein (Potentiausgleich) 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: Der Montage- bzw. Aufstellort muß eine sichere Verlegung aller angeschlossenen Kabel zulassen. Stromversorgungskabel sowie Zuleitungenkabel 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 Verteilereinheit) 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 Anleitungen 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 nie einen Freizeitpark, 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 Anleitungen in der gerätespezifischen Bedienungsanleitung

4. Wartung
Gefahr: Wartungsarbeiten sind stets von sachverständigen Personen (siehe EN 60065) vorzunehmen.
Gefahr: Keine Servicearbeiten bei Gewitter. Es droht Gefahr eines elektrischen Schlags (Lebensgefahr).
Warnung: (nur für Geräte mit Batterie): Explosionsgefahr bei unsachgemäßem Auswechseln der Batterie. Ersatz nur durch den gleichen Typ!
Warnung: Batterien dürfen nicht übermäßigem Wärme wie Sonnenschein, Feuer oder dergleichen ausgesetzt werden (Explosionsgefahr).
Warnung: (Bei optischen Sendern sowie deren Verteilereinheit) Sorgen Sie, daß der Netzstecker des Gerätes nie aus der Wandsteckdose herausgerissen wird. Der Netzstecker des Gerätes darf nur durch einen Netzstecker ersetzt werden, der die gleichen technischen Eigenschaften (wie z. B. Buchse, Nennleistung) hat.
Warnung: (Bei optischen Sendern sowie deren Verteilereinheit) Sorgen Sie, daß die Geräte nicht an einem Ort montiert werden, an dem sie einer direkten Sonneneinstrahlung ausgesetzt sind. Die Geräte sollten so montiert werden, daß die Sonneneinstrahlung auf die Gehäuseoberfläche einwirkt.
Warnung: (Bei optischen Sendern sowie deren Verteilereinheit) Sorgen Sie, daß die Geräte nicht in der Nähe von Feuerstellen montiert werden. Die Geräte sollten so montiert werden, daß die Heizkörper und andere Wärmequellen aus dem direkten Strahlungsbereich der Geräte entfernt sind.
Warnung: (Bei optischen Sendern sowie deren Verteilereinheit) Sorgen Sie, daß die Geräte nicht in der Nähe von Feuerstellen montiert werden. Die Geräte sollten so montiert werden, daß die Heizkörper und andere Wärmequellen aus dem direkten Strahlungsbereich der Geräte entfernt sind.

5. Reparatur
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 Verteilereinheit) Sorgen Sie, daß die Geräte nicht in der Nähe von Feuerstellen montiert werden. Die Geräte sollten so montiert werden, daß die Heizkörper und andere Wärmequellen aus dem direkten Strahlungsbereich der Geräte entfernt sind.

Bei Fragen zur Reparatur wenden Sie sich an den IRENIS-Service:
E-Mail: info@blankom.de , Kontakt: www.blankom.de

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

7. Entsorgung
Vorsicht: Entsorgen Sie das Gerät entsprechend den geltenden umweltrechtlichen Bestimmungen. Elektrische und elektronische Geräte dürfen nicht in den Hausmüll!
Vorsicht: Entsorgen Sie Batterien (falls vorhanden), entsprechend den geltenden umweltrechtlichen Bestimmungen.
### Montage und Sicherheitshinweise / Installation and safety instructions

- Die beschriebenen Geräte dienen ausschließlich der Installation von Satelliten-Empfangsanlagen.
- The equipment described is designed solely for the installation of satellite receiver systems.
- Any other use, or failure to comply with these instructions, will result in voiding of warranty cover.
- Die Geräte dürfen nur in trockenen Innenräumen montiert werden. Nicht auf oder an leicht entzündlichen Materialien montieren.
- The equipment may only be installed in dry indoor areas. Do not mount on or against highly combustible materials.
- Die Geräte sind mit einer Potenzial-Ausgleichsleitung (Cu, mindestens 4 mm²) zu versehen.
- The equipment must be provided with an earthing wire (Cu, at least 4 mm²).
- Die Sicherheitsbestimmungen der jeweils aktuellen Normen EN 60728-11 und EN 60065 sind zu beachten.
- The safety regulations set out in the current EN 60728-11 and EN 60065 standards must be complied with.
- Verbindungsstecker: HF-Stecker 75 Ohm (Serie F) nach EN 61169-24
- Connector: HF plug 75 Ohm (series F) to EN 61169-24.
- Nicht benutzte Teilnehmerausgänge sollten mit 75-Ohm Widerständen (z. B. EMK 03) abgeschlossen werden. (Verringerung der terrestrischen Signalwelligkeit)
- Unused subscriber ports should be closed off by 75 Ohm resistors (e.g. EMK 03).
- Nicht benutzte Kaskadenausgänge sind mit 75 Ohm Widerständen inkl. DC-Blocker abzuschließen. 75 Ohm Widerstände ohne Gleichspannungssperren können das Gerät beschädigen!
- Unused trunk outputs must be terminated with 75Ohm resistors including DC Blocker. Otherwise the device may be inoperable or damaged.
- 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 Geräteeintwärmung 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

Zur Beachtung / Important notes:

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

Bitte installieren Sie die Anschlüsse gemäß dem Aufdruck
Please install according to the sticker on the Multiswitch
Hinweis: Elektrische Installationen sollten nur durch geschultes Fachpersonal vorgenommen werden!
Note: Electrical installations should only be done by well-educated and skilled technicians!

Änderungen vorbehalten / Subject to change w/o notifications
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