

IP-8e

# Audio over IP encoder

Professional multi-format 8-channel audio encoder



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## Audio coding fitting to your needs

High quality multi-format audio encoding

- ▶ MPEG 1 / 2 layer 1, 2, 3
- ▶ G.711, G.722, PCM
- ▶ Opus
- ▶ Ogg Vorbis
- ▶ MPEG 2 / 4 AAC LC, HEv1 & v2
- ▶ MPEG 4 AAC-LD/ELD/ELD v2
- ▶ Extended HE-AAC(xHE-AAC)
- ▶ Enhanced aptX(E-aptX)

## IP streaming (unicast, multiple unicast & multicast)

Rock solid network connection even in stress conditions according to standards RFC 3550, RFC 3551, RFC 3640, RFC 2250

- ▶ Professional audio IP streaming using UDP, RTP and SIP/SDP (standardized by EBU N/ACIP Tech 3326)
- ▶ Unicast, Multiple Unicast & Multicast
- ▶ PRO MPEG FEC
- ▶ Dual streaming
- ▶ Optional: Livewire/ Ravenna (SIP, SAP, RTSP, AES67)
- ▶ TS RTP, UDP and SRT streaming
- ▶ SRT Secure Reliable Transport
- ▶ Optional Stream4Sure: 2wcom streaming technology with different codecs/qualities and seamless switching of up to 4 Streams

## Backup / advanced redundancy management

- ▶ Flexible automatic switch over concept with free definition of alternative input sources as redundancy solution in case of failures
- ▶ Playing files from internal storage or using alternative streams ( Icecast / Shoutcast)

- ▶ Dual IP ports for data + 1 IP port for control interface
- ▶ Optional: redundant power supply 230 VAC or 48 VDC

## Control

- ▶ Remote control with various possibilities: HTTP/S, FTP, Telnet, NMS, SNMP,
- ▶ Revised configuration via web user interface for easier setup
- ▶ Insertion of localized advertisement
- ▶ SNMP v2c, relays, inputs

## Special

- ▶ Energy efficient 24/7 broadcast quality
- ▶ RDS decoding (built in RDS/UECP decoder)
- ▶ Embedded auxiliary data (RBDS/RDS or PAD) and GPIO forwarding
- ▶ Optional: Perfect network synchronization for SFN applications

## Monitoring

- ▶ IP and MPEG parameters via SNMP v2c and relay
- ▶ Headphone output
- ▶ Icecast live listening



## IP-8e – Audio over IP encoder

### Advanced control functionalities

High quality multi-format audio de/encoding:

- ▶ HTTP/HTTPS: via web interface
- ▶ FTP: XML file control
- ▶ NMS: Control via centralized network management system

### Highly sophisticated monitoring and alarm concept

- ▶ Adjustable silence detection
- ▶ IP buffer and jitter check
- ▶ PLL control
- ▶ SNMP, alarm, source switch & event logging

### Perfect audio quality

- ▶ Balanced analog and digital AES/EBU (integrated XLR connector)

### Advanced IP robustness functionalities

- ▶ Operates under stressful network conditions
- ▶ PRO MPEG FEC
- ▶ Management of packet size, buffer and QoS
- ▶ Optional: Stream4Sure – 2wcom streaming technology with different codes / qualities and seamless switching of up to 4 streams

### Perfect latency management

- ▶ Optional: GPS/1PPS based 2wcom latency control solution usage in SFN FM networks



## Technical details 1/2



### Audio (encoder)

#### Codex

##### Standard

MPEG 1 / 2 Layer 1, 2, 3  
G.711, G.722, PCM  
Opus, Ogg Vorbis, MPEG  
2 / 4 AAC LC, HEv1 & v2,  
MPEG 4 AAC-LD/ELD/ELD  
v2, extended HE-  
AAC(xHE-AAC), enhanced  
aptX (E-aptX)

##### Optional:

Bit transparent  
transmission of AES/EBU  
input (Audio)

##### Sample rates

32 kHz, 44.1 kHz, 48 kHz

##### Digital audio bandwidth

10 Hz through to 22.5  
kHz mono & stereo  
@48kHz sample rate

##### Sample rate converter

8:1 (up) and 1:7,5 (down)  
with bypass modes

### Interfaces

#### Audio

##### Digital (in)

8x AES/EBU, 110  $\Omega$  bal.,  
integrated XLR

##### Analog (in)

4x L/R, > 10k  $\Omega$  bal.,  
integrated XLR

##### Headphone (out)

L/R, < 10  $\Omega$ , 6,3 mm

##### Analog reference level

+9dBu (max. +18dBu)

##### Digital reference level

-9 dBFS (adjustable)

##### Dynamic range

16 Bit, > 89 dB  
24 Bit, > 130 dB

##### Frequency response

0,1 dB; 20 Hz...20 kHz

#### Ethernet

##### Data

Audio, serial data and  
GPIO transmission,  
controlling and setup  
functions

##### Optional:

Private data, MPEG  
ancillary data (IRT)

##### Connector

3x RJ45

##### Type

Auto switching

##### Protocol

10/100/1000 BASE-T  
RTP/RTCP/UDP, IGMP,  
ICMP, DHCP, HTTP, FTP,  
SNMPv2c, NTP, SMTP  
(mail), TCP (Icecast)

#### Serial

##### Interface

8x RS-232 Sub D-9 using  
break-out cable

##### Data transmission format

MPEG ancillary data  
embedded in audio (IRT)  
own IP link

##### Transmission rate

1200 to 115200 baud,  
asynchronous

#### Transport stream

##### ASI IN

BNC – 75  $\Omega$

##### ASI OUT 1

BNC – 75  $\Omega$

##### ASI OUT 2

BNC – 75  $\Omega$  -  
configurable to be either  
ASI OUT or SYNC OUT  
(e.g. 1PPS)



## Technical details 2/2

### Interfaces

#### Contact closure

<b>Inputs</b>	8 inputs
<b>Outputs</b>	8 floating relays (7x SPST, 1x SPDT) (for DC: max. 30 V, 0.5 A) 26 pole sub-D male
<b>Optional:</b>	24 floating relays (replaces: 8x serial inputs)

#### Internal storage

<b>Data</b>	internal audio files
<b>Size</b>	7 GB

#### Time synchronization (optional)

<b>PTP</b>	Network synchronization according to IEEE 1588-2008
<b>SYNC IN</b>	BNC – 75 Ω - 1PPS / 10MHz
<b>SYNC OUT</b>	BNC – 75 Ω - 1PPS / 10MHz configurable to be either ASI OUT or SYNC OUT

### Control & monitor

#### Ethernet

<b>Data</b>	Controlling and setup functions
<b>Protocol</b>	2wcom NMS, Telnet, HTTP/HTTPS, SNMPv2c, UDP, IGMP, ICMP, DHCP, FTP, SNMPv2c

#### Front panel

<b>LCDisplay</b>	Graphical, 264x64 pixel
<b>Jog wheel</b>	Impulse, enter button
<b>4 duo LEDs</b>	Power, input, output, warning

### General data

<b>Power consumption</b>	<40 VA (<20W)
<b>Case dimensions</b>	19", 1 HU, Depth: 310 mm, Width: 424 mm, Front panel: 484 mm
<b>Weight</b>	< 6 kg
<b>Material</b>	Steel plate (aluminium-zinc coated)
<b>Operating temp. range</b>	0...+45°C
<b>Storage temp. range</b>	-40...+70°C
<b>Languages</b>	English

#### Power supply

<b>Standard</b>	1x internal, 90...260 VAC, 47...63 Hz, 1x power port (rubber connector)
<b>Optional</b>	Redundant power supply 230 VAC: 1x internal 90...260 VAC 47...63 Hz, 1x power port (rubber connector), aut. switchover
<b>Optional</b>	Redundant power supply 48 VDC: 1x internal 40...60 VDC, 1x power port (Neutrik powerCON), aut. switchover