IP-8m

Multi-channel Audio over IP Codec

Highlights

- Phase-locked multi-channel audio codec
- Optimized for surround sound and multi-channel applications
- Digital 8-channel inputs and outputs (4x AES3 in and 4x AES3 out)

Your audio. Our solution.

2wcom

IP-8m – Multi-channel Audio over IP Codec (1/3)

Audio networks based on different protocols

- Broadcast based on EBU TECH 3326, SMPTE ST 2110
- AES67 based on RAVENNA, Livewire or Dante

Audio coding – fitting to your needs

High quality multi-channel audio de- / encoding

- Phase-locked audio for surround applications
  - o PCM
  - o E-aptX
  - o AAC
  - o Dolby Digital Plus AC3/E-AC3 (option)
- MPEG-1/2 Layer 2, 3
- G.711, G.722, Linear PCM
- Opus, Ogg Vorbis
- AAC-LC, HE-AAC v1 & v2, AAC-LD, AAC-ELD, AAC-ELDv2, xHE-AAC
- Enhanced aptX (E-aptX)
- Bit transparent transmission of digital audio and MPX*
- Dolby Digital (AC-3), Dolby Digital Plus (E-AC-3), Dolby E on request*
- Bit transparent transmission of digital audio†

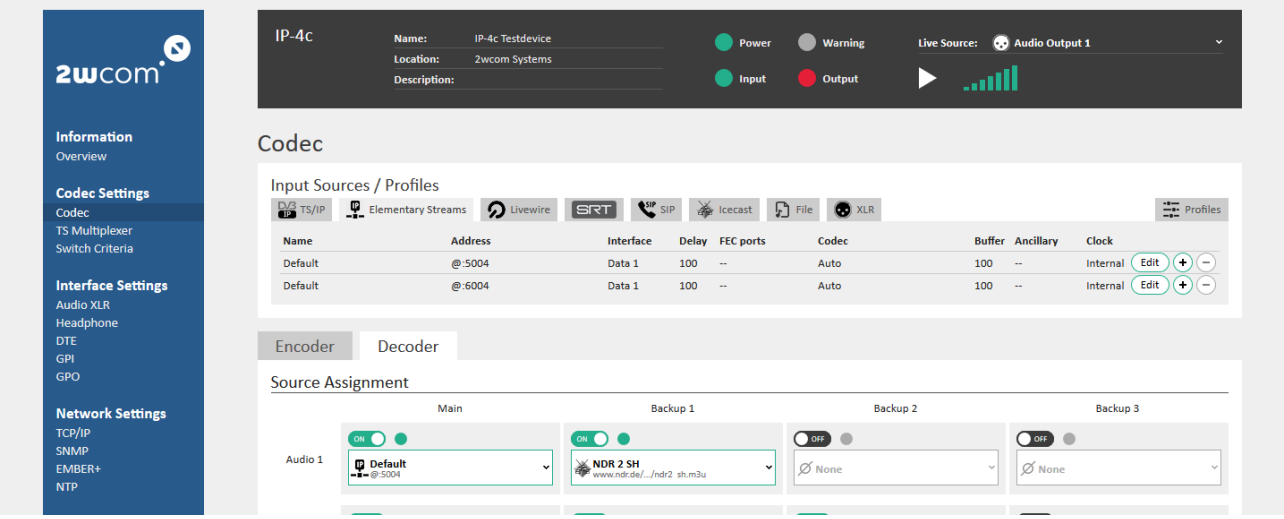
IP streaming (unicast, multiple unicast & multicast)

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)
- TS RTP, UDP and SRT streaming
- SRT Secure Reliable Transport
- PRO MPEG FEC, Dual streaming
- Livewire/ Ravenna (SIP, SAP, RTSP, PTPv2)*
- HLS, Icecast source client (on request)

* This function is optional. Please find the complete list of options at the end of the document.
† This function is optional. Please find the complete list of options at the end of the document.

IP-8m – Multi-channel Audio over IP Codec (2/3)



Backup / advanced redundancy management

- Playing files from internal storage or using alternative streams (Icecast, Shoutcast)
- Dual IP ports for data + 1 IP port for control interface
- Redundant power supply 230 VAC or 48 VDC*

Control

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

Special

- Energy efficient DSP based 24/7 broadcast quality
- Embedded auxiliary data (RBDS/RDS or PAD) and GPIO forwarding
- Perfect network synchronization for SFN applications*

Monitoring

- Headphone output
- Icecast Live Listening

* This function is optional. Please find the complete list of options at the end of the document.

IP-8m – Multi-channel Audio over IP Codec (3/3)

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

Perfect audio quality

- Balanced digital AES/EBU (integrated XLR connector)

Advanced IP robustness functionalities

- Even to operate in standard IP networks
- PRO MPEG FEC
- Management of packet size, buffer and QoS
- Stream4Sure – 2wcom streaming technology with different codes / qualities and seamless switching of up to 4 streams*

Perfect audio & latency management

- GPS based 2wcom latency control solution usage in SFN FM networks*
- ACIP compliant high audio quality and extremely low latency (PTPv2 network synchronization

Highly sophisticated monitoring and alarm concept

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

* This function is optional. Please find the complete list of options at the end of the document.

Technical details (1/3)

Audio (encoder / decoder)

Codecs

Standard	Linear PCM, G.711, G.722 Opus, Ogg Vorbis MPEG 1/2 Layer 2, 3 MPEG-2/MPEG-4 AAC-LC, MPEG-4 HE-AAC v1 & v2, MPEG-4/MPEG-D xHE-AAC MPEG-4 AAC-LD/ELD/ELDv2 Enhanced aptX (E-aptX) Dolby Digital (AC-3), Dolby Digital Plus (E-AC-3), Dolby E on request. (optional)
On request	Bit transparent transmission of AES/EBU input
Sample rates	16, 22.05, 24, 32, 44.1, 48 kHz (On request: up to 192 kHz)

Interfaces

Performance

Digital (in)	4x AES/EBU, 110 Ω balanced integrated XLR female, shared with analog in (configurable)
Digital (out)	4x AES/EBU, 110 Ω balanced integrated XLR male, shared with analog out (configurable)
Analog (in)	2x L/R, > 10 kΩ balanced integrated XLR female, shared with digital in (configurable)
Analog (out)	2x L/R, < 20 Ω balanced integrated XLR female, shared with digital in (configurable)
Headphone (out)	L/R, < 10 Ω, 6,3 mm
Digital reference input	No dedicated input, selectable by user
Digital reference level	-9 dBFS
Gain	-9 – +6 dB
Dynamic range	16 Bit: > 89 dB; 24 Bit: > 130 dB
Frequency response	Depends on sample rate – e.g. 48 kHz: 0.1 dB; 20 Hz … 22.5 kHz
Phase locking	2 – 8 Mono channels can be phase locked to provide up to 7.1 surround sound

Technical details (2/3)

Ethernet

Data	Audio, serial data and GPIO transmission, controlling and setup functions
Connector	3x RJ45
Type	Auto switching 10/100/1000 BASE-T
Protocol	RTP/RTCP/UDP, SRT Secure Reliable Transport, IGMP, ICMP, DHCP, HTTPS, SFTP, SNMP, NTP, TCP (Icecast), HLS, PTPv2, SMTP ST 2110

Serial

Interface	8x RS-232C (rear), Sub D-15 (breakout cable needed)
Data	Private data, MPEG ancillary data, UECP/RDS (acc.to TR 101 154)
Transmission rate	8x RS-232C (rear), Sub D-15 (breakout cable needed)
USB	1x USB 2.0 interface for service

Contact closure

Connector	26 pole sub-D male
Inputs	8 inputs
Outputs	7+1 floating relays 7 relays SPST (from A) 1 relay SPDT (from C) DC: max. 30 V, 1 A, 10 W

Internal storage

Data	internal audio files
Size	7 GB (optional 1000 GB)
Type	eMMC (optional SSD)

Time synchronization (optional)

PTPv2	Network synchronization according to IEEE 1588-2008
1PPS	SMA connector

Technical details (3/3)

Control & monitor

Ethernet

User interface	Integrated Web GUI, LCD display
Data	Control and setup functions
USB	USB 2.0 interface for service, configuration and firmware updates
Protocol	2wcom NMS, Telnet, HTTPS, SNMP, UDP, RTCP, SRT Secure Reliable Transport, SFTP IGMP, ICMP, NTP, DHCP, SNMP, SSH, PTPv2, TCP (Icecast, HLS)

Front panel

Display: LCD	Graphical, 264x64 pixel
Jog wheel	Impulse, enter button
4 Duo LEDs	Power, input, output, warning

General data

Power consumption	< 20 W
Case dimensions	19'', 1 RU, depth: 310 mm, width: 424 mm, front panel: 484 mm
Weight	< 5 kg
Material	Steel plate (aluminum-zinc coated)
Operating temp. range	0 – +45°C
Storage temp. range	-40 – +70°C
Languages	English

Power supply

Standard AC	1 internal IEC power connector voltage range 90 – 260 VAC (nominal 100 – 240 VAC) frequency range 47 – 63 Hz (nominal 50 – 60 Hz)
Standard DC (optional)	1 internal (Neutrik powerCON) voltage range -40 – -60 VDC (nominal -48 VDC)
Dual internal (optional)	Two internal redundant power supplies (AC or DC) automatic switchover and prioritization AC: 90 – 260 VAC (nominal 100 – 240 VAC), 47 – 63 Hz (nominal 50 – 60 Hz) DC: -40 – -60 VDC (nominal -48 VDC)
Dual hot-plug (optional)	Two hot-swappable redundant power supplies (AC or DC) automatic switchover and prioritization AC: 90 – 260 VAC (nominal 100 – 240 VAC), 47 – 63 Hz (nominal 50 – 60 Hz) DC: -40 – -60 VDC (nominal -48 VDC)

Options (1/2)

IP-8m base unit variations

Each base unit includes encoders and decoders for 4 stereo channels. You can choose between the following base unit variations:

Article no.	Name
VER68801	Base unit IP-8m with 1x internal AC power supply
VER68802	Base unit IP-8m with 2x internal AC power supplies
VER68803	Base unit IP-8m with slot for 2x hot-plug power supply ▸ 2x hot-plug power supplies AC / DC not included. ▸ Please order 2 hot-plug power supplies AC (VER45851) or DC (VER45852).
VER68804	Base unit IP-8m with 1x AC / 1x DC (DC leading) internal power supplies

IP-8m hardware options

Please note that hardware options are installed at the factory in Flensburg, Germany, and can only be retrofitted independently in individual cases.

Article no.	Name	Description
VER45851	Hot-plug AC power supply	Power supply with automatic switch over in case of failure. ▸ 90 – 260 VAC (nominal 100 – 240 VAC), ▸ 47 – 63 Hz (nominal 50 – 60 Hz)
VER45852	Hot-plug DC power supply	Power supply with automatic switch over in case of failure. ▸ 40 – -60 VDC (nominal -48 VDC)

IP-8m software options

Please note that software options can be retrofitted remotely.

Article no.	Name	Description
VER68815	Ravenna, AES67, PTP	According to the standard Ravenna of audio over IP interoperability (including AES67, SAP, RTSP, PTP). Price per activated mono pair.
VER68817	EBU Tech 3326	According to the standard of audio over IP interoperability EBU Tech 3326 (including SDP, SIP, SIP phonebook, 2wcom Easy2connect). Price per activated mono pair.

Options (2/2)

Article no.	Name	Description
VER68819	Live listening	Audio monitoring via web interface or any web stream client. Price per activated mono pair.
VER68820	MPEG-2 TS decoder	Decoding of a MPEG-2 TS (transport stream) according to ISO/IEC 13818-1 or ITU-T Rec. H.222.0. Price per activated mono pair.
VER68821	MPEG-2 TS encoder	Encoding of a MPEG-2 TS (transport stream) according to ISO/IEC 13818-1 or ITU-T Rec. H.222.0. Price per activated mono pair.
VER68822	SRT/RIST decoder	SRT functionality for decoder according to SRT standard of the SRT Alliance (including UDP). RIST functionality for decoder according to IETF standard "RIST Simple Profile" and RFC 4585. Price per activated mono pair.
VER68823	SRT/RIST encoder	SRT functionality for encoder according to SRT standard of the SRT Alliance (including UDP). RIST functionality for encoder according to IETF standard "RIST Simple Profile" and RFC 4585. Price per activated mono pair.