

IP-8e

Audio over IP Encoder

Datasheet

Highlights

- Multi-format 8-channel audio encoder
- Professional audio distribution with MPEG-TS over IP and ASI
- Up to 8 digital or 4 analog stereo inputs

IP-8e – Audio over IP Encoder



The IP-8e is an 8-channel audio-over-IP encoder. The IP-8e offers reliable audio distribution with MPEG-TS over IP and ASI, compatibility with various AoIP standards and built-in redundancy to ensure a solid and secure connection and distribution.

Flexible in Application – Pay as You Grow

- Versatile in serving various use cases
- Expandable to up to 8 channels, allowing you to pay only for as many as needed
- Supports up to 8 digital channels, up to 4 analog channels, and a mixed operation of up to 4 channels
- Upgradeable with hardware and software options according to your needs

Versatile Compatibility – Complete Audio Encoder Support

- Comprehensive codec support for unmatched interoperability (see Specifications)
- Adaptability for audio contribution in varied network conditions with codecs like Opus, Enhanced aptX (E-aptX) and xHE-AAC.
- Optimized studio-to-transmitter links (STL) with efficient coding formats like MPEG-Layer 2 and AAC-LC; ensure highest fidelity and minimal latency with bit-transparent transmission of digital audio
- Professional audio streaming: Efficient generation of web streams supporting mp3, OGG, Opus and the complete AAC family
- Specialized broadcasting support with DAB+ encoding*

There are certain limitations to some AoIP format and streaming combinations, which may result in the CPU capacity not supporting all 8 possible channels. If you have any further questions, please do not hesitate to contact us.

*optional



Smooth Integration – Compatible with various Audio over IP Formats

- 2wcom provides robust network connections by combining multiple proven technologies to deliver your audio even in stressful conditions.
- Unicast, multiple unicast, and multicast for maximum network control
- Proven multimedia transport protocols such as UDP, RTP and RTSP
- Well-established audio protocols such as AES67, SMPTE ST 2110, Livewire and RAVENNA*
- Support of HLS, Icecast Source Client and Icecast Server for web streaming
- Receive audio from Icecast Source Client und Icecast Server

Advanced Streaming Robustness – Unmatched Broadcast Resilience

- PRO MPEG Forward Error Correction (FEC) and dual streaming for resilient, redundant streams
- Secure and reliable streaming over unpredictable networks with Secure Reliable Transport (SRT)* and Reliable Internet Stream Transport (RIST)
- Manage packet size, buffering, and Quality of Service (QoS) for a robust streaming performance
- Multiple redundancy options and source switching for uninterrupted streaming including Dual Streaming and Stream4Sure

Audio Latency Management – Ensuring Precise Synchronization

- SPN (Synchronous Playout Network): Uses NTP (Network Time Protocol) to synchronize audio input and output across devices, preventing timing drifts (for example, at transmitter sites) with a precision of < 20 ms
- SFN (Single Frequency Network)*: Uses 1PPS or GPS for a precision of < 10 µs, enabling SFN operation for FM broadcasting

Reliable and Uninterrupted Operation

- 2 dedicated IP interfaces for data transmission, along with an extra IP interface for control, allow a dependable IP streaming experience.
- All 3 IP interfaces can be flexibly configured for either data transmission or control.
- Redundant power supplies (90 – 260 VAC or 48 VDC) provide a fail-safe system, ensuring continuous operation even during a power supply failure.

User-Friendly and Streamlined Access

- Modern and easy-to-use web interface
- Uniform operating concept across all 2wcom devices for maximum usability
- LCD menu for direct on-site access
- Audio monitoring via web interface or any web stream client with Live Listening

*optional



Smart Management and Seamless Integration

- Well-established APIs and physical control seamlessly integrate into your current infrastructure: Rest API, Ember+, SNMP, NMOS, and GPI
- Stay informed: Flexibly configurable alarm events and notifications over SNMP, GPO, and front panel LED

Verified IP Security

- High-level security within open IP infrastructures
- Thoroughly examined by independent audit authorities through whitelist/blacklist penetration tests



Formats and Protocols

Audio

Codecs (included)	Linear PCM, SMPTE 302M, AM824 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)
Codecs (optional)	MPX Fraunhofer DAB+ (HE-AAC v2, ETSI TS 102 563)
On request	Bit transparent transmission of AES/EBU input
Bit depth	16, 20, 24 bit
Sample rates	16, 22.05, 24, 32, 44.1, 48 kHz (On request: up to 192 kHz)

Streaming

IP protocols	TCP, UDP unicast, multiple unicast & multicast
Audio over IP formats	RTP (RFC 3550, RFC 3551, RFC 3640, RFC 2250) SMPTE ST 2110 (optional) AES67 based on RAVENNA, Livewire, or Dante (optional) Livewire / RAVENNA (SAP/SDP, RTSP, AES67, PTP, PTPv2) (optional) MPEG-TS
Web streaming	Icecast/Shoutcast Client Icecast Source Client Icecast Server HLS encoder (optional)



Transmission robustness	SRT, RIST Pro-MPEG FEC #3 release 2 Dual Streaming 2wcom Stream4Sure μ MPX FEC Adaptive bitrate switching, source switching concept, management of packet size, buffers, QoS
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Synchronization

Internal	free-running
External	1PPS, PTP, PTPv2, NTP
Decoder synchronization between different devices	< 20 ms using SPN via NTP (optional) < 1 μ s using SFN via 1PPS or PTP, PTPv2 (optional)
Sample rate converter	Asynchronous, any ratio

Interfaces

Audio

Digital (in)	8x AES/EBU, 110 Ω balanced integrated XLR female, shared with analog in (configurable)
Analog (in)	4x L/R, > 10 k Ω balanced integrated XLR female, shared with digital in (configurable)
Analog reference level	+9 dBu
Digital reference level	-9 dBFS
Digital Silence detection	-90 – 0 dBFS
Adjustable gain	-9 – +6 dB
Dynamic range	16 Bit: > 89 dB; 24 Bit: > 130 dB
Frequency response	Depends on sample rate. For example: 48 kHz: 0.1 dB; 20 Hz – 22.5 kHz



Interface Extensions

ASI input	75 Ω BNC socket, 270 Mbit/s, MPEG2 TS
ASI output 1	75 Ω BNC socket
ASI output 2	75 Ω BNC socket Note: Configurable to be either ASI output 2 or 1PPS SYNC output.

Ethernet

Connector	3x RJ45 (1x Control, 2x Data)
Type	Auto-switching 10/100/1000 BASE-T

Synchronization

1PPS input	75 Ω BNC socket
1PPS output	75 Ω BNC socket Note: Configurable to be either 1PPS SYNC output or ASI output 2.

Serial and GPIO

DTE	15 pole D-Sub male connector for serial RS-232C data communication
USB	USB 2.0 interface for service, configuration, and firmware updates
GPIO	26 pole D-Sub male; combined connector for inputs (GPI) and outputs (GPO)

Internal Storage

Size	7 GB (optional 128 GB)
Type	eMMC (optional SSD)

Front Panel

Headphone	6.3 mm / 1/4" socket, < 10 Ω
LEDs	Power, Input, Output, Warning
Operation	Display and Jog Wheel
Display	LCD, graphical, 264x64 pixel



General Data

Integrated Web GUI

Languages	English
Web technologies	HTML5, Java Script

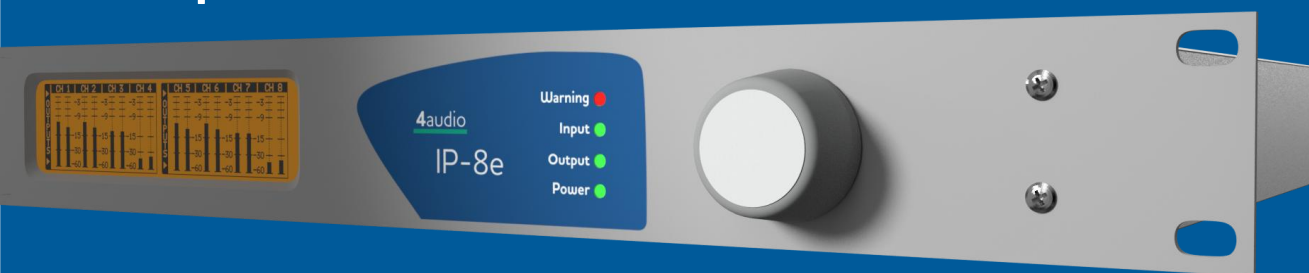
Device

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

Power Supply

Standard AC	1x 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)	1x internal (Neutrik powerCON) voltage range -40 – -60 VDC (nominal -48 VDC)
Dual internal (optional)	2x 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)	2x 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



IP-8e Editions

Choose from our range of software and hardware options to customize your device, or select one of our off-the-shelf option packages. These editions are tailored for specific use cases and offer shorter delivery times.

Article No.	Name	Description
VER65100-DAB	DAB edition	DAB+ audio encoder. Base unit with dual power supplies, including one audio channel with DAB+ Encoder (VER65117), FhG MuxEnc (VER65119) and RAVENNA, AES67, PTP (VER65101). Output stream format specific for DAB (DCP) only.

IP-8e Base Unit Variations

To customize your device, start by selecting a base unit variation, then choose from our range of hardware and software options to fit your needs. Each unit includes one audio channel by default. You can choose from the following base unit variations:

Article no.	Name
VER65001	Base unit IP-8e with 1x internal AC power supply
VER65002	Base unit IP-8e with 2x internal AC power supplies
VER65003	Base unit IP-8e with slot for 2x hot-plug power supplies Note: 2x hot-plug power supplies AC/DC not included. Please order 2x hot-plug power supplies AC (VER45851) or DC (VER45852).
VER65004	Base unit IP-8e with 1x AC and 1x DC (DC leading) internal power supplies
VER65005	Base unit IP-8e with 1x DC internal power supply



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
VER65108	Breakout cable RS232 8-times	Cable for in- and output of 8 ancillary data (for example UECP RDS data) via RS232 cable.
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)

Software Options

Please note that software options can be retrofitted remotely.

Article no.	Name	Description
VER65100	Activation of additional audio channel	Activation of additional audio channel of the base unit incl. all ordered audio codecs. The channels five through eight are only available as digital channels.
VER65114	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 channel.
VER65115	SRT/RIST encoder	SRT functionality for encoder 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 channel.
VER65112	MPEG-2 TS decoder	Decoding of a MPEG-2 TS (transport stream) according to ISO/IEC 13818-1 or ITU-T Rec. H.220.0. Price per activated channel.
VER65113	MPEG-2 TS encoder	Encoding of a MPEG-2 TS (transport stream) according to ISO/IEC 13818-1 or ITU-T Rec. H.220.0. Price per activated channel.



Article no.	Name	Description
VER65117	DAB+ encoder license (*)	FRAUNHOFER Professional DAB+ Codec with EDI/STI-D output. Local insertion of PAD (DLS, SLS), TA, PTY. Price per DAB subchannel instance. (*) Requires option audio channel (VER65100).
VER65118	DAB classic encoder license	MPEG 1 Layer 2 with EDI/STI-D output. Local insertion of PAD (DLS, SLS), TA, PTY. Price per DAB subchannel instance. (*) Requires option audio channel (VER65100).
VER65116	HLS encoder	Adds HLS, HTTP Live Streaming Encoder function. Max. number of output coding qualities and number of playlists per container: 2 per activated channel. Price per activated stereo channel.
VER65101	RAVENNA, AES67, PTP	Audio input according to the RAVENNA technology for audio over IP interoperability (including AES67, SAP/SDP, RTSP, PTP, PTPv2). Price per activated channel.
VER65110	Livewire+	According to the standard of audio over IP interoperability Livewire+ (including AES67, LWCP, Livewire Advertisement). Price per activated channel.
VER63024	MPE	MPE (Multiprotocol Encapsulation) encoding/decoding. Price per unit.
VER65103	SFN (single frequency network)	Perfect timing and network synchronization suitable for FM-SFN networks. Timing sources: • 1PPS • PTP, PTPv2 (*) (*) Requires option Ravenna, AES67, PTP (VER65101). Price per unit.
VER65119	Fraunhofer MuxEnc license	For connection to Fraunhofer DAB ContentServer. With central configuration, PAD insertion and monitoring of the DAB/DAB+ encoders at the multiplexer. Price per unit.