APPLICATIONS

- Encoding
- Transcoding
- Decoding
- Multiplexing
- Web Streaming
- POD Casting
- Audio Monitoring

FEATURES

- Available as
  - o Appliance
  - o Software
  - o VM image
- IP Inputs Supported
  - o AES-67
  - o RAVENNA
  - o Livewire+
  - o MPTS
- Up to 100 stereo channels
- MPEG Transport Stream over IP output
- CODECs
  - o MPEG Layer II
  - o MPEG2 & MPEG4 AAC
  - o more (see specifications)
- MPE Encapsulation
- DVB compliant
- RDS ancillary data
  - o DVB standard TR 101 154
  - o UECP
- Remote control
  - o browser GUI
  - o SNMP
- MPTS or Elementary Stream over IP output

ENC6000

MultiChannel Audio Codec System

The **ENC6000** enables the encoding of up to 100 audio stereo channels in three possible configurations: a 19" 1RU appliance, customer provided bare metal server or in a customer provided Virtual Machine environment. A modular software architecture and a flexible license model form the basis of three **ENC6000** variants for use in audio contribution and audio distribution applications.

ENC6000 - Appliance with up to 100 stereo audio channels in 19 "1RU design and redundant power supply option.

ENC6000 - Server for operation on customer-furnished bare-metal computers. The number of stereo audio channels supported depends on the CPU performance of the COTS system used (several hundred stereo channels when using a 24-core processor).

ENC6000 - VM Image with up to 50 stereo audio channels for virtual operation in a data center.

Front Panel View

Inputs

The **ENC6000** can handle various types of audio signals for inputs including web radio, DVB-TS over IP, Audio over IP (Livewire+/ RAVENNA/AES67), MPEG Elementary Stream, audio files and metadata.

The integrated input redundancy ensures that if the signal is lost, the system can automatically switch to an alternative signal. This function increases the service availability for higher Service Level Agreements and lower operating costs.

Processing

The processing section provides up to 100 audio encoder / decoder instances. The audio signals are encoded, transcoded or decoded with an extensive variety of audio codecs and configuration parameters codec algorithms, audio levels and bit rates.

The transcoder functionality can normalize all radio programs to the requirements of the respective audio distribution network. This achieves a uniform user experience for all end devices in the network.

The encoder can process metadata from web radio streams as well as external UECP data, e.g. RDS, and insert them into the audio stream.

Output

The output section generates the necessary audio output protocols for the respective audio application. Any number of SPTS, MPTS and Elementary Streams can be generated for MPEG2 TS over IP DVB applications.

The integrated transport stream multiplexer function generates all SI tables for DVB compliant integration.

The DVB transport stream multiplexer and the embedded RDS data transmission are compatible with the common IP-to-FM modulators and DVB end devices.

Monitoring

The audio monitoring section monitors the input signals applied to the system and shows the audio levels before and after the encoder.

Uniform loudness across all encoded programs provides a high degree of QoS from the radio consumer's point of view. **ENC6000** offers loudness monitoring in accordance with EBU R128.

Some CDN streaming providers define dedicated loudness values that must be adhered to for the delivery of web radio streams. **ENC6000** supports this quality assurance with its monitoring functions.

Scalability

ENC6000 adapts to your network's needs. The simple licensing concept, starting with 1 stereo audio encoder / transcoder license up to 100 licenses per system, is accessible to every customer.

With the **ENC6000** – Server you may use your own PC / server hardware. For example, an Intel NUC i3 is powerful enough for up to 20 encoder / transcoder instances. If you need to use more instances, simply transfer the **ENC6000** – Server to a more powerful server hardware of your choice.

If you prefer a performance optimized system, the **ENC6000** Appliance is the best choice. A high performance multichannel audio codec system for up to 100 encoder / transcoder licenses 'ready-to-use'.

Cloud-based architectures are supported with **ENC6000** VM (Virtual Machine). In a VM environment, it may be preferable to distribute the encoder / transcoder licenses over several 'small' **ENC6000** VM instances. The system availability is significantly increased by the functions of the VM environment itself, and by using several small **ENC6000** VM instances. Each **ENC6000** instance usually has power reserves that can be used for adhoc license extensions.

Rear Panel View

TECHNICAL

INPUT	
Audio Digital	• AES67 / RAVENNA, Livewire+ (Ethernet interface) • MPEG2 TS • Internet Radio Formats (Icecast, SHOUTcast, HLS, DASH) • Audio Files (MP3, WAV, others on request)
Sampling Rate	32, 48kHz
Number of stereo channels	1 - 100 (scalable by license)
Ancillary Data	• Private Stream in MPEG2 Transport Stream • Embedded in Audio Elementary Stream • Icecast meta data • others on request
Ancillary - Data Port	Ethernet interface

OUTPUT	
Audio Digital	• AES67 / RAVENNA, Livewire+ (Ethernet interface) • MPEG2 TS • Internet Radio Formats (Icecast, HLS) • RTMP
Sampling Rate	32, 48kHz
Number of stereo channels	1 - 100 (scalable by license)
Ancillary Data Output	• Private Stream in MPEG2 Transport Stream • Embedded in Audio Elementary Stream • Icecast Metadata • others on request
Ancillary Data Port	Ethernet interface

AUDIO PROCESSING	
Audio Encoding / Compression Audio Decoding / Decompression	• MPEG 1 Layer 2 (ISO/IEC 11172 3, 13818 3) • MPEG 1 Layer 3 (MP3) (ISO/IEC 11172 3, 13818 3) (optional) • MPEG 2/4 AAC-LC, HE-AAC v1/v2 (ISO/IEC 13818 7, 14496 3) (optional) • AAC-LD/ELD/ELDv2 (optional) • xHE-AAC (Fraunhofer IIS) (optional) • Linear PCM 16/24bit • Enhanced aptX (optional) • Opus (optional) • others on request

STREAM INPUT / OUTPUT TRANSPORT PROTOCOLS	
via IP	• Streaming of elementary streams compliant to RFC3550/3551, RFC3016, RFC3640 (RTP, UDP) • MPEG 2 Transport Stream (compliant to Pro MPEG Code of Practice #3 release 2 / SMPTE ST2022) including service information according to ETSI EN 300 468 (RTP, UDP) • SRT (Secure Reliable Transport)

NETWORK INTERFACES	
Ethernet	8 Ethernet interfaces (GbE), configurable as Management, AES67/RAVENNA/Livewire+ or Data Interfaces. Optional: 4 x Ethernet RJ-45, 4 x SFP sockets Connectors: RJ-45

SYSTEM CONFIGURATION & MONITORING	
Management / Monitoring	• Web UI (Browser: Firefox, Chrome, Edge) • SNMP • REST API

MODELS	
Hardware	ENC6000 Appliance, up to 100 channels, 19" device, 1RU
Virtual Machine	Image as OVF Format, compatible with VMware ESXi (others on request)
Server	ENC6000 Server (OS + Application) for bare metal COTS (USBStick or SSD)

POWER SUPPLY	
Voltages	• 100 - 240VAC +/- 10%, 50 - 60Hz • 48V DC (optional) • Redundant Power Supply possible (optional)
Power Consumption	< 75W (encoding up to 100 channels)

DIMENSION	
Chassis	19" 1RU
Size	Width: 483mm Depth: 400mm Height: 44mm
Weight	5kg
Connectors	Back panel: • 8x RJ-45 (Ethernet) • 2x IEC-60320 C14 (Power)

ENVIRONMENT	
Environment Temperature (Operation)	0 - 45˚C
Environment Temperature (Storage)	-20 - 70˚C
Humidity	< 95% (non-condensing)