Q9X-E IP Audio Encoder

Applications

- Encoding for DVB (DVB-S, DVB-S2, DVB-T2, DVB-C)
- Encoding for Internet Radio Distribution (Icecast2, HLS, DASH)
- Studio-Transmitter-Link
- Contribution for radio stations
- MPX Transport

Features

- Up to 16 AES3 or 8 analog inputs in 1RU
- RAVENNA/AES67/Livewire+/ ST2110-30/-31 inputs
- Quad 10/100/1000 Ethernet interfaces with dynamic role assignment
- Highly energy efficient
- Remote control using REST API, SNMPv2c, EmBER+, NMOS IS-04/IS-05
- State-of-the-art security

The highest density audio encoder in the market.

Building on the success of the Q8V Codec System software platform, the Q9X-E is the new IP Audio Encoder from Qbit.

Featuring the highest density of baseband audio interfaces in the industry, the device allows up to 16 AES/EBU or 8 analog inputs in 1RU. Additionally, it supports RAVENNA, AES67, ST2110-30 and Livewire+ for customers wishing to transition to Audio-over-IP inputs in the future.

The Q9X-E can produce a variety of output formats, such as a DVB-compliant MPEG-2 Transport Stream or Elementary Stream. It may also be used to encode signals for Internet Radio Streaming, in Icecast2, HLS and MPEG-DASH formats.

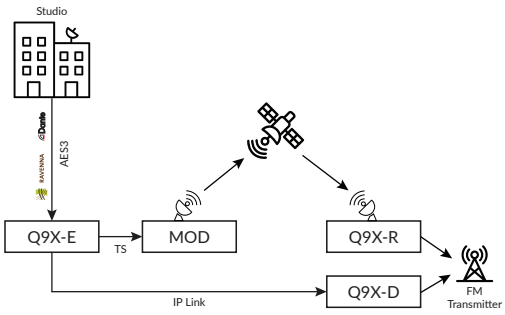
State-of-the-art encoding algorithms such as xHE-AAC® and well-established algorithms such as MPEG-1 Layer II/III and AAC are supported.

With an optional license, the device may be used for MPX transport, either uncompressed or using the MicroMPX codec, with data rates as low as 320 kbps for a full MPX signal.

The system has a flexible licensing model that allows field upgrading of channel counts and options as all devices are always delivered with a full channel configuration.

If you need more than 16 channels and/or you need no baseband audio interfaces, we recommend you have a look at our Q8V Codec System instead.

Example Application: Studio-to-Transmitter Link



In combination with one or more Q9X-D/Q9X-R, an audio signal may be transported to a FM transmitter site using either a direct IP link, over the internet using SRT or over the air using satellite communication. In case of satellite communication, an external modulator is required.

WE TRANSPORT YOUR AUDIO

Q9X-E IP Audio Encoder

Specifications

Baseband Audio Input

Digital	● 8x AES/EBU, XLR (IEC 958), shared with analog inputs 1-4 ● 4x AES/EBU, on 1x Sub-D 25 (TASCAM pin assignment) ○ 4x AES/EBU, on 1x Sub-D 25 (TASCAM pin assignment), shared with analog inputs 5-8
Performance (Digital)	● Asynchronous sample rate converter
Analog	○ 4x Stereo Channels, on 8x XLR, shared with digital inputs 1-8 ○ 4x Stereo Channels, on 1x Sub-D 25 (TASCAM pin assignment), shared with digital inputs 13-16
Performance (Analog)	● 24-bit high quality A/D converters ● THD+N: < 0.01 % @ 1 kHz ● Crosstalk attenuation: > 100 dB @ 1 kHz ● S/N ratio (weighted): > 80 dB
Sample Rates (Digital/Analog)	32, 48, 96, 192 kHz
Channel Configurations	● Mono (L/R/Mix) ● Dual Mono ● Stereo, Joint Stereo

Audio-over-IP Input/Output

Standards	RAVENNA, AES67, SMPTE ST2110-30/-31, Axia Livewire+™, Dante® in AES67 mode
Supported Formats	L24, L16, AM824
Number of Channels	Up to 64 per Stream
Sample Rates	32, 48, 96, 192 kHz
Discovery	mDNS, SAP, Manual Configuration
Channel assignment by internal crossbar	
Seamless Protection Switching (according to SMPTE ST2022-7)	

Ancillary Data Input

Hardware	● 8x RS232 Inputs, on 1x SUB-D 26 ○ Breakout cable (SUB-D 26 -> 8x SUB-D 9)
UDP	● 16x UECP-over-UDP inputs (according to UECP v7.1)
Other formats on request	

Output Protocols

MPEG-2 Transport Stream (according to ISO 13818-1)	● SRT, RIST, RTP, Plain UDP ● Forward Error Correction (according to Pro-MPEG Code of Practice #3, release 2) ● Unicast, Multicast (IGMPv2/v3) ● Up to 256 Services per Stream ● Service Information (according to ETSI EN 300 468) ● Fully DVB compliant
Elementary Stream (according to RFC3550, RFC3551, RFC3016, RFC3640)	● SRT, RIST, RTP, Plain UDP ● Unicast, Multicast (IGMPv2/v3)

Output Protocols: Internet Radio Streaming

Icecast2/SHOUTcast	Tested with Xiph Icecast 2.4.4, Icecast-kh 2.4.0-kh11 and Rocket Streaming Audio Server 1.0.4
HLS	● HTTP PUSH and HTTP PULL support ● Up to 8 bitrates per program ● Delta Playlist Support ● Akamai MSL 4.0 certified
MPEG-DASH (future option)	
RTMP	

Encoding Algorithms

- MPEG-1/2 Layer 2 (according to ISO 11172-3, ISO 13818-3)
- MPEG-1/2 Layer 3 (according to ISO 11172-3, ISO 13818-3)
- AAC-LC, HE-AACv1, HE-AACv2, AAC-LD, AAC-ELD (ADTS and LOAS framing, according to ISO 13818-7, ISO 14496-3)
- xHE-AAC® (according to ISO 23003-3, ISO 14496-3/Amd 3)
- AC-3/E-AC-3 (according to ATSC A/52)
- Opus
- G.711 µ-Law/A-Law, G.722
- MicroMPX®
- Others on request

Audio Channel Configurations (dependant on algorithm)	● Stereo, Joint Stereo ● Mono (Extract/Mixdown) ● 5.0/5.1 ● 7.0/7.1
Embedded Metadata	● RDS/UECP for DVB ● ID3 Tags

Network Interfaces

4x Ethernet interfaces (IEEE 802.3, RJ-45, 10/100/1000 Mbps)

Isolation of all networks by integrated firewall

Roles can be freely assigned to any of the interfaces (Management, Data, etc.)

Specifications (continued)

System Configuration, Control and Monitoring	
HTML5 Web UI	
Remote Control	● REST API ● EmBER+ ● NMOS IS-04/IS-05 ● SNMPv2c
User Management	● Fine-grained permission control ● LDAP(S) authentication

Power Requirements	
Connectors	● 1x IEC60320 C14 ○ 1x IEC60320 C14 (for 2nd power supply 100-230 V AC) ○ 1x Neutrik powerCON (for 2nd power supply -48 V DC)
Power Supply	● 100 to 240 V AC +/- 10%, 50 to 60 Hz ○ -48 V DC ○ Redundant Power Supply
Power Consumption	< 20 W

Physical Parameters	
Chassis	19”, 1 RU
Size (W/D/H)	483 mm / 360 mm / 44 mm
Weight	6 kg

Environmental Conditions	
Operating Temperature	0 to 45 °C
Storage Temperature	-20 to 70 °C
Humidity	< 95 % (non-condensing)

Legend: ● Default ○ Optional

Ordering Options

Article Number	Name	Description
25020001	Q9X-E IP Audio Encoder 12D Basic	IP Audio Encoder with up to 4 digital-only input channels
25020002	Q9X-E IP Audio Encoder 12D High-Performance	IP Audio Encoder with up to 12 digital-only input channels
25020003	Q9X-E IP Audio Encoder 4A12D Basic	IP Audio Encoder with up to 4 analog or digital input channels
25020004	Q9X-E IP Audio Encoder 4A12D High-Performance	IP Audio Encoder with up to 4 analog or 12 digital input channels

Hardware Options

Article Number	Name	Description
25030002	Q9X-E - Redundant Power Supply (AC)	Adds a second 100-230 V AC power supply for redundancy.
25030004	Q9X-E - Extension Board 4D	Adds another 4 digital input channels, only for Q9X-E 12D
25030005	Q9X-E - Extension Board 4A4D	Adds another 4 analog/digital input channels, only for Q9X-E 4A12D
25030008	Q9X-E - GPI24	Adds 24 switching contact inputs

Software Options

Article Number	Name	Description
25040001	Q9X-E - Encoder Channel	This software option unlocks a single encoder channel. Up to 4 channels may be licensed on a Basic device, up to 16 channels may be licensed on a High-Performance device
25040003	Q9X-E - ASI Output	Unlocks the ASI output
25040004	Q9X-E - RAVENNA/AES67/Livewire	Unlock Audio-over-IP inputs as per RAVENNA/AES67/Livewire
25040005	Q9X-E - SRT/RIST I/O	Unlock SRT and RIST Input/Output
25040006	Q9X-E - Audio Mixer	Unlock the audio mixing function that allows combining multiple inputs
25040010	Q9X-E - Icecast/HLS/DASH Output	Unlock Internet Radio Streaming Outputs

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