



4K UHD and HD Video Encoder for Low Latency, Broadcast Quality Streaming

Secure, low-latency, broadcast quality video encoders for live sports and news broadcasters, corporate video producers, and mission critical ISR deployments.

Haivision Makito X4 is a highly versatile real-time HEVC/H.265 and AVC/H.264 video encoder available as a compact standalone appliance or as a rackmountable blade. Designed for the most demanding live video applications, the Makito X4 can ingest up to four 1080p50/60 HD inputs or a full 2160p50/60 4K UHD video source with 10-bit pixel depth, 4:2:2 chroma subsampling, as well as up to 32 channels of digital audio. Robust and reliable, the Makito X4 offers 8 powerful encoding cores that can securely deliver simultaneous low latency multi-bitrate streams over any network, including the public internet.

4K Broadcast Quality Video Encode live video in HD or 4K for streaming over IP networks. Whether encoding with 8- or 10-bit pixel depth, the Makito X4 delivers excellent picture quality, even at low bitrates, making it ideal for a broad range of live video applications. For workflows where color precision is needed, the Makito X4 offers 4:2:2 chroma subsampling to ensure that color fidelity can be maintained, and artefacts prevented, in downstream workflows.

Ultra Low Latency Streaming Up to 8 encoding cores can encode and stream HEVC and H.264 video with very low latency, which makes the Makito X4 ideally suited for interactive video applications such as field contribution, live interviews, return feed confidence monitoring as well as streaming synchronized camera feeds for remote productions.

High Density HEVC Encoding Processing video from multiple cameras is challenging when physical space is limited. The Makito X4 is a compact, easily portable appliance making it perfect to deploy in remote locations and on mobile platforms. When used in conjunction with Haivision rack-mountable enclosures, the Makito X4 offers the highest channel density available, giving facilities up to 84 HD or 21 UHD video sources within a single 4RU rack module.

Flexible and Future Proof With a powerful encoding engine built on top of a programmable platform, the Makito X4 addresses a wide range of live video applications today and tomorrow, including 4K and IP-based production workflows, ensuring that your encoding workflows address today's critical needs, and are flexible enough to adapt to your future infrastructure requirements.

Secure Content Encryption, Reliable Streaming The Makito X4 can encrypt video streams with up to 256-bit AES key lengths using the SRT protocol, which is critical when sharing valuable content over the internet. Moreover, to ensure reliable and continuous streaming, even when network conditions are unpredictable, the Makito X4 Encoder adapts to fluctuating network bandwidth in real-time, limiting packet loss and ensuring uninterrupted high-quality video.

FEATURES

BENEFITS

4K UHD Video

Efficient real-time HEVC/H.265 and H.264/AVC video encoding up to 3840x2160p 50/60 with 4:2:2 pixel depth and 10-bit pixel depth for impeccable picture quality.

Ultra Low Latency

Extremely low latency encoding and streaming enabling interactivity for live bi-directional interviews and field contribution.

High-Density Form Factor

4 inputs per appliance/blade, up to 84 inputs and 168 encoding cores per 4RU rack ideal for constrained spaces and high-density environments where Size, Weight and Power considerations are critical.

Flexible and Future Proof

The versatility of the Makito X4 enables future migration from HD to 4K and SDI to IP video workflows.

Secure, Encrypted Video

Protect valuable video content with SRT and AES-128/256 encryption.

SRT Protocol for Reliable Streaming

Deliver live streams without packet loss over fluctuating bandwidth networks including the internet.

MAKITO X4 ENCODER SPECIFICATIONS

VIDEO INTERFACES

(Quad BNC Inputs)

SD-SDI	SMPTE 259M-C
HD-SDI	SMPTE 292M
	SMPTE 274M
	SMPTE 296M
3G-SDI	SMPTE 424M (Level A Only)
	SMPTE 425M
6G-SDI	SMPTE 2081 (1 input only)
12G-SDI	SMPTE 2082 (1 input only)

VIDEO RESOLUTIONS

3840x2160p 60/59.94/50/30/29.97/25 Hz
 1920x1080p 60/59.94/50/30/29.97/25/24/23.98 Hz
 1920x1080i 60/59.94/50 Hz
 1280x720p 60/59.94/50/30/29.97/25 Hz
 720x480/576i 60/59.94/50 Hz
 (interlaced shown in fields per second)

H.264/AVC VIDEO ENCODING

MPEG-4 AVC part 10 / ISO/IEC 14496-10
 Baseline, Main, and High Profiles up to Level 5.2
 (1080p60) and lower intermediate levels
 I, IP, IBBP Framing
 8-bit or 10-bit pixel depth
 Chroma sub-sampling 4:2:0 or 4:2:2
 Bitrates from 32 kbps to 30 Mbps

H.265/HEVC VIDEO ENCODING

ISO/IEC 23008-2
 IP Framing
 Main Profile Up to Level 5.1
 8-bit or 10-bit pixel depth
 Chroma sub-sampling 4:2:0 or 4:2:2
 Bitrates from 32 kbps to 30 Mbps

VIDEO ENCODING

Configurable Group of Picture (GOP) size
 Configurable frame rate

AUDIO INTERFACES

Embedded Audio:

SD-SDI SMPTE 272M HD/3D-SDI SMPTE 299M
 AUDIO ENCODING
 Compression Standard:
 MPEG-2 AAC-LC ISO/IEC 13818-7
 MPEG-4 AAC-LC ISO/IEC 14496-3

Audio Channels:

32 (16 stereo pairs) embedded (SDI) audio inputs

Bit Rates:

From 56 to 320 kbps per audio pair

Frequency Response:

From 20 Hz to 22 kHz

ISR METADATA (OPTIONAL)

Input Metadata:

CoT to KLV conversion
 KLV or CoT over UDP
 KLV over SDI (SMPTE 336)
 SMPTE 336M compliant
 MISB 0601.10 compliant
 MISB 0604.2 compliant

Output Metadata:

Asynchronous & synchronous modes
 as per MISB 0604.2
 High precision timecode insertion
 as per MISB 0604.2
 KLV Metadata Processing (SMPTE 336,
 MISB 0601, 0102 and 0605 support)
 Time Code Support (SMPTE 12M)
 Closed Captioning (SMPTE 334-1/2)

STANDARD COMPLIANCE

STANAG 4609

IP NETWORK INTERFACES

Standard:

Single Ethernet 10/100/1000
 Base-T, auto-detect, Half/Full-duplex
 Unicast streaming IPv4/IPv6
 Multicast streaming (IGMPv3 & IPv6)
 Multiple unicast streaming
 10G SFP Port (future use)

H.264 Streaming Protocols:

MPEG Transport Stream
 Secure Reliable Transport (SRT)
 TS over SRT, UDP or RTP

HEVC Streaming Protocols:

MPEG Transport Stream
 Secure Reliable Transport (SRT)
 TS over SRT, UDP or RTP

MANAGEMENT INTERFACES

IP/Ethernet (IPv4 and IPv6)

Management:

HTTPS (web browser)
 Command line over SSH/Telnet
 SFTP/TFTP/SCP
 SNMP v3

SIZE, WEIGHT, POWER

(single height appliance)

Dimensions:

21mm H x 129mm W x 196mm D
 (0.83" H x 5.1" W x 7.7" D)

Weight:

1.14 kg (2.55 lbs)

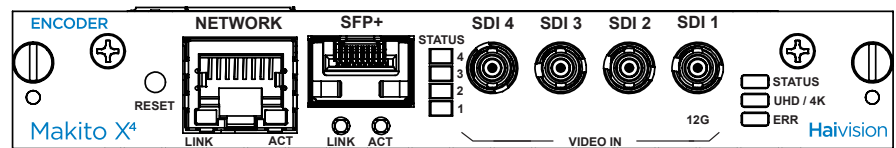
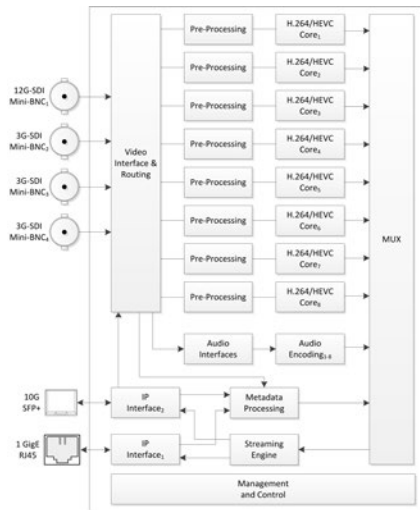
Power:

12 VDC Nominal, 18W

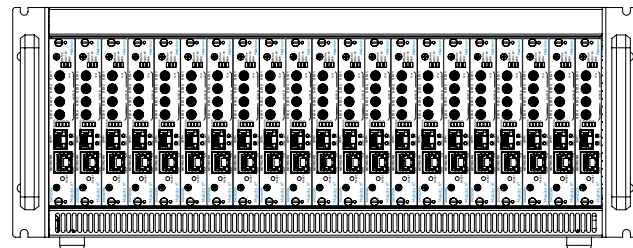
Temperature:

Operating: 0° to 40°C (32° to 104°F)
 Non-operating: -30° to 70°C (-22° to 158°F)
 Humidity: 0-95% non-condensing

Compatible with Haivision MB6x and MB21x
 multi-blade chassis.



Makito X4 Encoder



Compatible with Haivision MB21x multi-blade chassis

Makito X4 Product Portfolio & Ordering Information **

Makito X4 Blade B-MX4E-SDI4

Makito X4 SDI Encoder Blade - H.264/AVC & H.265/HEVC IP Video Encoder - Quad channel 3G/HD/SD-SDI

Makito X4 Appliance S-MX4E-SDI4

Makito X4 SDI Encoder Appliance - H.264/AVC & H.265/HEVC IP Video Encoder - Quad channel 3G/HD/SD-SDI

** For complete pricing and ordering, contact us at sales@haivision.com or your certified Haivision reseller.



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