



Encode Low Latency Video Up to 4K

Real-time encoding for mission-critical video.

4K UHD Video Encoding Makito FX Encoder is a compact, fanless, and robust video appliance that can encode HDMI or 12G-SDI sources to H.264/AVC and H.265/HEVC. Designed for real-time video distribution over secure networks, the Makito FX features a powerful low-latency encoding engine that supports resolutions up to 4K UHD at up to 60 frames per second, along with 4 channels of digital audio. Easily manage advanced video encoding and streaming settings through a secure browser-based user interface by connecting it to an IP network.

Secure and Reliable Streaming The Makito FX Encoder has been designed to meet the video network security requirements of mission-critical environments. It can be deployed to remote locations to encode and stream live video and computer graphics to command centers at very low latency, enabling real-time analysis and quick decision-making. The Makito FX can also be relied upon for secure streaming of control room displays and common operating pictures to off-site decision makers.

The Makito FX features a hardened operating system, dual network interfaces, and support for IPv6. The two ethernet ports enable operators to keep device management and control separate from a video streaming network or enable hitless failover over two networks. As with all Haivision Makito encoders, the Makito FX natively supports the SRT protocol for reliable and secure video streaming with AES encryption.

FEATURES

BENEFITS

Ultra-Low Latency

Extremely low latency encoding and video streaming for sharing real-time mission-critical imagery over a secure IP network.

4K UHD Video Encoding

Efficient real-time HEVC/H.264 video encoding up to 3840x2160p60 from an HDMI or 12G-SDI source.

Dual Network Interfaces

Ensure live content streaming with path redundancy or keep device management separate from video network.

SRT Support for Secure and Reliable Transport

Receive live streams without packet loss and protect valuable video content by ensuring it is viewed by intended audiences only.

INPUT VIDEO INTERFACES

HDMI 2.1
 1 full size BNC
 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
 12G-SDI SMPTE 2082

INPUT VIDEO RESOLUTIONS

3840x2160p60/59.94/50/30/29.97/25/24/23.98 HZ
 1920x1080p60/59.94/50/30/29.97/25/24/23.98 HZ
 1920x1080i60/59.94/50 HZ
 1280x720p60/59.94/50/30/29.97/25 HZ
 576i50
 480i29.97/30
 (interlaced from HEVC only,
 shown in fields per second)

VIDEO ENCODING

8-bit or 10-bit pixel depth
 Chroma sub-sampling 4:2:0 or 4:2:2
 BT.709 color space and WCG (BT.2020)
 SDR and HDR - HLG or PQ (ST 2084)
 I, IP, IBP, IBBP, IBBBBP, IBBBBBP framing
 Configurable output frame rate
 Slice-based encoding
H.264/AVC Profiles:
 MPEG-4 AVC part 10 / ISO/IEC 14496-10
 Baseline, Main and High Profiles up to Level 5.2
H.265/HEVC Profiles:
 ISO/IEC 23008-2
 Baseline, Main and High Profiles up to Level 5.1

INPUT AUDIO INTERFACES

Embedded Audio:
 SD-SDI SMPTE 272M
 HD/3G-SDI SMPTE 299M
 HDMI (1 stereo)

AUDIO ENCODING

Compression Standard:
 MPEG-2 AAC LC ISO/IEC 13818-7
 MPEG-4 AAC-LC ISO/IEC 14496-3
Audio Channels:
 Up to 4 stereo pairs
Frequency Response:
 From 20 Hz to 22 kHz

METADATA

Input Metadata
 CoT to KLV conversion
 KLV or CoT over UDP
 KLV over SDI
 SMPTE 336M compliant
 MISB 0601.10 compliant
 MISB 0604.2 compliant
 SMPTE ST 352 Payload ID (HDR)
 SMPTE 12M Timecode
 SMPTE 334-1/2 Closed Captioning
Output Metadata
 Asynchronous & synchronous modes
 as per MISB 0604.2
 High precision timecode insertion
 as per MISB 0604.2
 KLV Metadata Processing (SMPTE 336M,
 MISB 0601, 0102 and 0605 support)

IP NETWORK INTERFACES

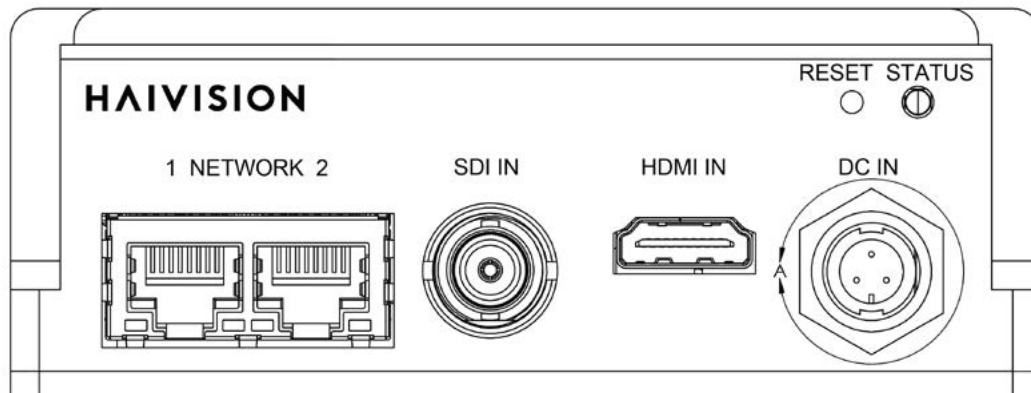
Connectivity:
 2 x RJ45 port Ethernet 10/100/1000 Mbps
Streaming Protocols:
 MPEG-TS over UDP
 MPEG-TS over RTP
 Secure Reliable Transport (SRT)
 Unicast streaming IPv4/IPv6
 Multicast streaming (IGMPv3 & IPv6)
 Multiple unicast streaming
Advanced Streaming Features:
 AES encryption 128-bit or 256-bit
 SRT Latency Control
 Forward Error Correction (FEC)

MANAGEMENT INTERFACES

IP/Ethernet (IPv4 and IPv6)
Management:
 HTTPS (web browser)
 REST API
 Command line over SSH/Telnet
 SFTP/TFTP/SCP
 SNMPv3

APPLIANCE

Dimensions (without brackets):
 43.6mm H x 114mm W x 129.7mm D /
 115mm D without connectors
 (1.72" H x 4.49" W x 5.11" D /
 4.53" D without connectors)
Weight:
 585 g (1.29 lbs)
Power:
 12 VDC nominal, 14.5W
Temperature:
 Operating: 0°C to 50°C (32°F to 122°F)
 Non-Operating: -30°C to 70°C (-22°F to 158°F)

Software version: 1.0

Makito FX Encoder

Makito FX Encoder Product Portfolio & Ordering Information **

Makito FX Encoder

S-MFXE-SDI-HDMI-ISR

Makito FX SDI+HDMI Encoder Appliance - H.264/AVC & H.265/HEVC IP Video/Graphic Encoder - Resolution up to 4K/UHDp60 with KLV Metadata

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