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
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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
- 5G-SDI SMPTE 259M-C
- HD-SDI SMPTE 292M
- SMPTE 274M
- SMPTE 290M
- 3G-SDI SMPTE 424M (Level A only)
- SMPTE 425M
- 6G-SDI SMPTE 2081
- 12G-SDI SMPTE 2082

**INPUT VIDEO RESOLUTIONS**

- 3840x2160p60/59.94/50/29.97/25/24 HZ
- 1920x1080p60/59.94/50/29.97/25/24 HZ
- 1920x1080i60/59.94/50 HZ
- 1280x720p60/59.94/50/29.97/25 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)
- 59.94i/50i/29.97i/25i, 60p/59.94p/50p/29.97p/25p frame rate
- H.264/AVC Profiles: MPEG-4 AVC part 10 / ISO/IEC 14496-10
- Baseline, Main and High Profiles up to Level 5.2

**AUDIO ENCODING**

- Embedded Audio:
  - 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)
  - 59.94i/50i/29.97i/25i, 60p/59.94p/50p/29.97p/25p frame rate

**INPUT AUDIO INTERFACES**

- Embedded Audio:
  - SMPTE 336M compliant
  - 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
  - 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)
- Multi unicast streaming
- Advanced Streaming Features:
  - AES encryption 128-bit or 256-bit
  - SRT Latency Control
  - Forward Error Correction (FEC)

**MANAGEMENT INTERFACES**

- 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 / 4.53" W x 5.11" D
  - 115mm D without connectors
  - 115mm D without connectors
  - 60 lbs (26.9 kg)
  - 85 lbs (38.7 kg)
  - 120V DC 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 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.**