



MXnet

NETWORKED VIDEO ECOSYSTEM

A COMPLETE GUIDE TO AVPRO EDGE'S NETWORKED VIDEO ECOSYSTEM



Network A/V comprises up to 4K video, audio, and control signals into a system distributed over a standard Ethernet network. MXNet embodies everything integrators expect from AVPro Edge: stability, engineering, a company founded with deep roots in HDMI testing and troubleshooting technology, with a common connection to a network switch linking Category cabling for installations with limitless possibilities. Any HDMI source device may be switched to any connected display, for full flexibility and interoperability similarly found with direct-connect matrix switchers. This is a perfect system for residential and commercial applications such as larger homes, sports bars, digital signage, control rooms, or any installation where matrix switch limitations cannot be overcome.

USB and control signals travel bidirectionally throughout the MXNet system, providing integrators the capability to send USB signals simultaneously with audio and video. An HDMI signal runs from point A to B, while a USB signal may

be sent from point B back to A.

When we say limitless, we mean limitless. An unlimited number of sources may be sent to an unlimited number of displays, all switched independently and seamlessly, the only requirement being a sufficient number of switch ports. MXNet has its own AVPro Edge in-house designed and manufactured network switches, pre-programmed to be optimized for 4K Audio/Video signals.

MXNet enables any attached video source to be processed as you see fit! Need to duplicate a source? Need video scaling for legacy displays? Need embedded or de-embedded audio? Need to send IR, Serial, or CEC control commands? With MXNet, all of these functions are possible. MXNet compression technology is based on JPEG 2000, hardware-optimized for the best 1G AV-over-IP performance. Encryption is built into all MXNet switches, ensuring signals remain safe and secure.

FEATURES

- Built-in Scaling
- Quick Signal Switching
- Dolby Atmos Downmixing
- DTX-HD/DTS:X Downmixing
- EDID Management
- USB Extension
- Major Control System Drivers
- 4K60 (4:2:0) / 4K30 (4:4:4) support
- Easy Configure, IT knowledge not required
- Fiber or Copper infrastructure Support
- No-Cost Web GUI for set-up and control
- Specialized Control4 Support
- CEC commands built-in
- Display flashing feature for troubleshooting and unit discovery
- OLED display panels provide unit information, such as IP address
- RS-232 passthrough and routing
- IR Control passthrough and routing
- Control Processor supports non-AVPro network switches

THE MXNet ECOSYSTEM

Building an MXNet installation is simple. By combining the products below, integrators can deliver the next-level video distribution experience that you have come to expect from AVPro Edge. Here is a breakdown for the entire family of MXNet 1G products...

THE EVOLUTION I ENCODERS: The Encoding/Transmitting device is where the signal starts. Connected to any HDMI source, the audio/video signal is encoded into data for transport across the network. Encoders are connected directly to an AVPro Edge MXNet switch (or any compatible network switch) via category cable or fiber optics.

- AC-MXNET-1G-E:** MXNet 1G Encoder
- AC-MXNET-1G-AVDM-E:** MXNet 1G Encoder with 8+ Channel Downmixing
- AC-MXNET-1G-DANTE-E:** MXNet 1G Dante Encoder
- AC-MXNET-1G-EWP:** MXNet 1G Wall Plate Encoder

THE EVOLUTION I DECODERS: The Decoding/Receiving device converts the data into an HDMI signal for display on any connected monitor, TV, or projector. Decoders are also connected to MXNet Switches (or compatible 3rd party network switches) via category cable or fiber optics. Connected units receive routed signals from encoders, with rapid switching times to make sure audience attention is never compromised.

- AC-MXNET-1G-D:** MXNet 1G Decoder
- AC-MXNET-1G-D-SEA:** MXNet 1G Weatherproof Decoder



THE EVOLUTION II ENCODERS: MXNet 1G Evolution II represents the next step forward on the evolutionary path for MXNet. It incorporates a newly designed AVPro Edge application-specific integrated circuit (ASIC) that introduces an improved software-based video encoding/decoding engine into the IC for enhanced video processing. Refinements to the IC include native support for 4K/60fps 4:4:4 signals (RGB and YCbCr @10- and 12-bit)

- AC-MXNET-1G-EV2:** MXNet 1G Evolution II Encoder
- AC-MXNET-1G-AVDM-EV2:** MXNet 1G Evolution II Encoder with 8+ CH Downmixing



THE EVOLUTION II DECODERS: The MXNet Evolution II Decoding/Receiving device, incorporates a newly designed AVPro Edge ASIC that introduces an improved software-based video encoding / decoding engine into the IC for enhanced video processing. Refinements to the IC include support for 4K/60fps 4:4:4 signals (RGB and YCbCr @10- and 12-bit), plus extended audio capabilities to support high bitrate multi-channel formats, including Dolby Atmos and DTS:X for IMAX Enhanced soundtracks.

- AC-MXNET-1G-DV2:** MXNet 1G Evolution II Decoder
- AC-MXNET-1G-DV2-SEA:** MXNet 1G Evolution II Weatherproof Decoder



THE CONTROL PROCESSOR: AC-MXNET-CBOX

A CBOX is required for every MXNet installation and is the central system device where control logic is stored and commands are processed from. When connected to the system network switch, nearly all setup work is completed. AVPro Edge has designed this control processor for MXNet MENTOR, an intuitive, developed in-house easy-to-use configuration, troubleshooting, and diagnostic software. No previous IT experience is required, allowing installation personnel at any level to navigate and execute system deployment. CBOX also processes dynamic video walls, dynamic meaning that in the blink of an eye, a 2X2 or 3X3 video wall configuration displayed at multiple locations may be changed to display single sources independently.

THE NETWORK SWITCHES: 48, 24, AND 10-PORT SWITCHES

The backbone for an MXNet audio/video distribution system is the network switch. MXNet network switches are designed and manufactured by AVPro Edge and are optimized for packetized A/V, not simply internet data traffic, to efficiently route signals from encoders to decoders. Expansion beyond 47 ports is a breeze with built-in cascading allowing for unlimited inputs and outputs. Model numbers are AC-MXNET-SW48, ACMXNET-SW24, and AC-MXNET-SW10.



BENEFITS OF USING MXNET

QUICK SWITCHING

End-users appreciate MXNet's quick-switching technology, enabling rapid switching between sources.

USB/KVM EXTENSION

Users may send USB signals bidirectionally. One example is a teacher sitting with students in a classroom viewing a video presentation while controlling a laptop 150 meters away in a secured location.

DOLBY AUDIO & DTS BITSTREAM DOWNMIXING

AVPro Edge has a close working relationship with Dolby and DTS, with both using our Murideo 8K SEVEN Generator in their labs for compliance testing. Through these partnerships, we have developed a precision 8-channel audio downmixing process. Not every area in an installation is equipped to handle audio surround codecs. Our downmixing circuit dissects 3D immersive audio soundtracks, extracting left and right full high-fidelity stereo information, while retaining the multi-channel codec for passthrough over the HDMI connection.



A/V LOGIC FOR NETWORK SWITCH

We would never expect A/V integrators to get their master's degree in IP overnight, nor should they be required to! During MXNet factory setup, elements involving IP are performed, freeing integrators to configure system routing parameters with familiar software and in a similar protocol as with an AVPro Edge 4K matrix switcher.

MXNet MENTOR

MXNet Mentor software was developed synergistically in tandem with MXNet system hardware for the industry's most comprehensive approach to a uniform ecosystem design. Mentor provides complete command over system deployment including endpoint naming, signal analysis, source preview, and EDID management. Uniquely equipped with an extensive array of diagnostic tools, Mentor greatly simplifies every facet of system troubleshooting.

DATA WINDOW

Encoders, decoders, and the CBOX controller are equipped with OLED screens for a quick glance outside of Mentor at vital information so users may work smarter, not harder. These Data Windows display IP and MAC addresses, or the custom name assigned to that device in Mentor. Locating and identifying a device is deceptively easy using Mentor's display Flash function.



UNLIMITED VIDEO WALLS

MXNet gives integrators the ability to design and display an unlimited number of video walls with a variety of layout configurations. Most AV-o-IP systems set a system limit for video walls due to the additional processing required by each wall. AVPro Edge engineers made MXNet unique in this regard, providing ultimate flexibility for commercial installations. Video wall main features include no panel rotation, or options for 180 and 270 degrees for layout creativity, plus Genlock to synchronize all devices in a designated group to a reference video frame, eliminating latency between individual video wall decoders while maintaining audio sync, when applicable.



CONSTRUCT, CONFIGURE, CREATE, AND CONTROL WITH MXNet MENTOR

Onboard the MXNet CBOX is Mentor, our powerful software that guides users intuitively through each step of the MXNet system deployment process:



CONSTRUCT

Build the system by auto-finding encoders and decoders replicating the layout of the physical system in a digital space. When all devices are connected to the network, MAC addresses are discovered, IP addresses are auto-assigned, and CBOX places downstream devices into multicast mode.

CONFIGURE

Custom names may be assigned for easy identification of encoder sources or decoder location descriptions. Per-channel EDID management and output scaling utilities assist in dialing-in system performance. Network switch critical diagnosis and monitoring functions include link quality, link speed, and color-coded signal quality assessment.

CREATE

Mentor makes customized video walls easy to configure. One unique layout is with 4 identical displays rotated to 45 degrees and parallel side-by-side, for a perfect 16:9 aspect ratio. A mixture of varying panel sizes may be creatively used with Mentor controlling cropping, bezel dimensions, and scaling to size.

CONTROL

At a minimum MXNet emulates a matrix switch, free of limitations and with enhanced control utilities. KVM, IR, RS-232, encapsulated RS-232, plus RS-232 over IP may be extended to all system destinations. Mentor's bidirectional serial routing manages all control signal types including CEC and is made easy by the built-in preview screen which updates source content every 15 seconds.

PROPRIETARY HARDWARE FEATURES

Integration-friendly utilities are implemented into MXNet and accessed via Mentor. Device light control can extinguish the OLED display on a decoder, preventing distractions in an otherwise ideal viewing environment. Source preview simplifies video routing, especially convenient with enterprise-level systems. An EDID copy button on encoders and decoders aids in troubleshooting systems with mixed legacy displays. AVPro Edge MXNet network switches are specifically designed for more demanding A/V-level data, unlike conventional switches for internet and email use. Every MXNet component stands uniquely apart from those of conventional AV-o-IP systems.

AUTO SET UP ENCODERS AND DECODERS

Common AV-o-IP setup methods required by other manufacturers task the user to configure system encoders, decoders, the controlling computer, and switches. MXNet negates placing this burden squarely on the integrator, rather, we do the heavy lifting on our end. All we request is the integrator follows our Switch Guide when connecting encoders and decoders. When MXNet Mentor software is opened, all connected devices are configured automatically—eliminating countless setup hours! Built-in Mentor utilities assist in finishing the installation quickly and accurately, conserving on-site labor time.





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