



Matrox Video

AV-over-IP solutions - based on open standards

Thomas König, Account Manager

Matrox Video: 45 Years of Innovation and Technology

Matrox® Video (<https://www.matrox.com/en/video>) is a leading manufacturer of reliable, high-quality ASICs, boards, appliances, and software for the broadcast and media, live entertainment and AV/IT markets.

Our product offerings span encoders and decoders, KVM extenders, video wall controllers, and broadcast developer products. Matrox is also a trusted supplier of some of the world's leading OEMs, offering a broad product and intellectual property (IP) portfolio to help solution providers accelerate product development, customization, and time to market.

- Private company, incorporated in 1976
- Worldwide Headquarters in Montreal, Canada
- EMEA Sales offices in Munich and London



Matrox Video: Our Verticals



Broadcast & Media



Digital Signage



Education



Enterprise



Government



House of Worship



Medical



Military & Defense



Process Control



Transportation

Current Matrox Product Portfolio

- IP KVM Extension – [Extio 3](#)
- H.264 & H.265 based encoders and decoders – [Maevox 6100 & 7100](#)
- [Videowall Controllers](#) based on output & capture cards
 - Luma Pro Graphics Cards
 - Mura IPX Capture Cards
 - Mura C4K Capture Cards
- Multidisplay Controller – [QuadHead2Go](#)
- OEM Developer Products



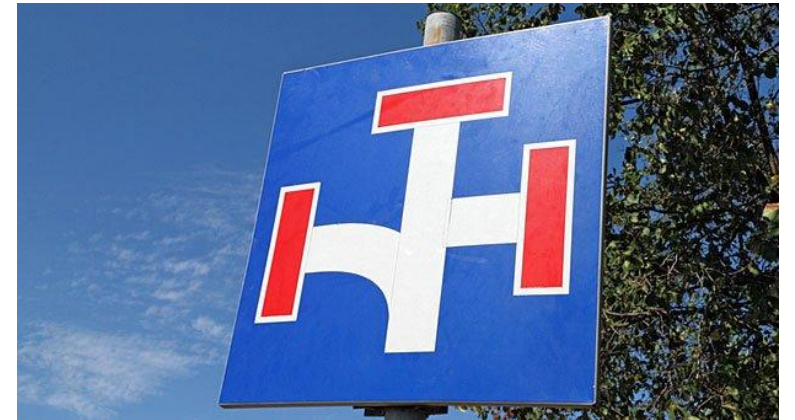
AV-over-IP Solutions Today

You can find a variety of solutions to distribute AV over IP

- Most of them are based on proprietary technology
- No interoperability
- Limited scalability

To name a few examples: HDBaseT, NDI, SDVoE...

They all are developed for a specific use case and do their job but...



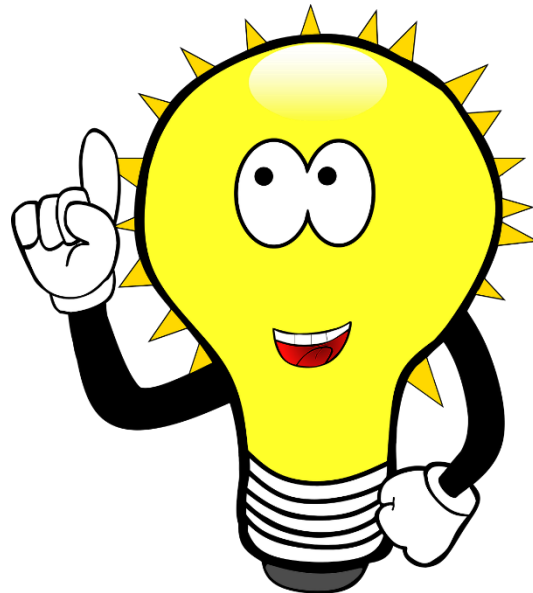
The Result:

Customer is locked to this solution – call it island



Imagine...

- The customer could decide on features and would not be limited by a specific technology
- Update & extension of an installation would be possible – even years later
- There would be a common standard which would allow for interoperability
- And even more this standard would be open and without any license fees...



Standards – SMPTE ST 2110

- ✓ Developed to replace SDI with an IP based solution
- ✓ Widely used in broadcast-market
- ✓ Used for AV signal transport
- ✓ Separate transmission of
 - Video (uncompressed (-20); compressed (-22))
 - Audio (-30)
 - Metadata (-40)
- ✓ Additional transmission of timing (PTP) and description



Standards - NMOS

- ✓ Specification for detection, connection and monitoring of endpoints
 - [IS-04 – Disc. & Reg.](#)
 - [IS-05 – Device Conn. Mgmt.](#)
- ✓ Developed by [AMWA](#)
- ✓ Published openly via GitHub
- ✓ Web-friendly: JSON, REST HTTP, WebSockets, ...
- ✓ Worldwide tested and in use



Networked Media Open Specifications



Advanced Media Workflow Association

Standards - IPMX

- ✓ Based on SMPTE ST 2110 and NMOS
- ✓ Adds additional AV-functionalities
 - Encryption
 - HDCP
 - Additional AV-Codec for 1G-network (TBC)
 - EDID, DisplayID, HotPlugDetection
 - No PTP-Clock mandatory
- ✓ Reduces complexity of network-infrastructure
- ✓ Open standard = no licence fee
- ✓ Interoperability
- ✓ Scalability



<https://ipmx.io/resources/>



IPMX / ST2110 Encoders & Decoders:



Matrox ConvertIP Series & ConductIP

Matrox ConvertIP Series: ST 2110 and IPMX Video Converter

ConvertIP are external senders and receivers, transmitting and converting A/V-Signals over IP.

- Lossless signal-transmission (uncompressed - up to 25Gig)
- Visually lossless signal-transmission (compressed – 1 or 2.5Gig)
- Ultra-Low latency (< 1Frame)
 - 10 lines uncompressed
 - 6-8 ms compressed
- Based on open standards for better compatibility and interoperability
 - IPMX (<https://ipmx.io/resources/>)
 - SMPTE ST2110
 - NMOS ([AMWA](#))



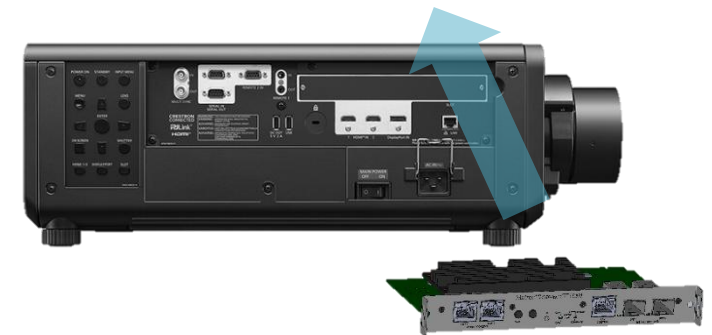
Matrox ConvertIP Series: Specifications

- ✓ Video I/O up to 4K60 4:4:4
 - HDMI
 - SDI or
 - HDBase-T
- ✓ Transmitter (TX) and receiver (RX) identical HW
- ✓ Support for copper or fibre networks
 - RJ45 for 1GB and 2,5GB
 - SFP for 10GB and 25GB
- ✓ Audio
 - Digital via HDMI, SDI or HDBase-T
 - Analog via 3,5 mm connector
- ✓ Power via
 - PoE
 - External power supply (optional)



Award-Winning

Matrox ConvertIP SDM Module



Matrox ConvertIP SDM Module

Same core functionality as CIP

- SMPTE ST 2110 & IPMX
- Rx mode only
- Uncompressed & Compressed
 - Colibri incl.
 - JPEG XS Licensed
- Separate Control/Media networks supported
- 2022-7 redundancy
- Daisy Chain
 - Same core DC functionality as the other CIP-“D”xx SKUs
- Display control IP passthrough



Matrox ConductIP Routing Appliance

- Software for discovery, connection and routing of endpoints
- Intuitive, flexible and easy to use
- Webserver based
- Supports for NMOS compatible endpoints



NMOS



Coming soon

Sneak Preview

NEW
FEATURE

Matrox ConvertIP as AVoIP Gateway

New Feature – same hardware:

- Uncompressed ⇔ JPEG-XS
- Uncompressed ⇔ Colibri
- Uncompressed ⇔ IPMX
 - PTP clock ⇔ non PTP
- Color space conversion ⇔
- Scaling ⇔



Support only on CIP-DSH



**NEW
FEATURE**

Matrox ConvertIP - QUAD Spilt Receive Mode

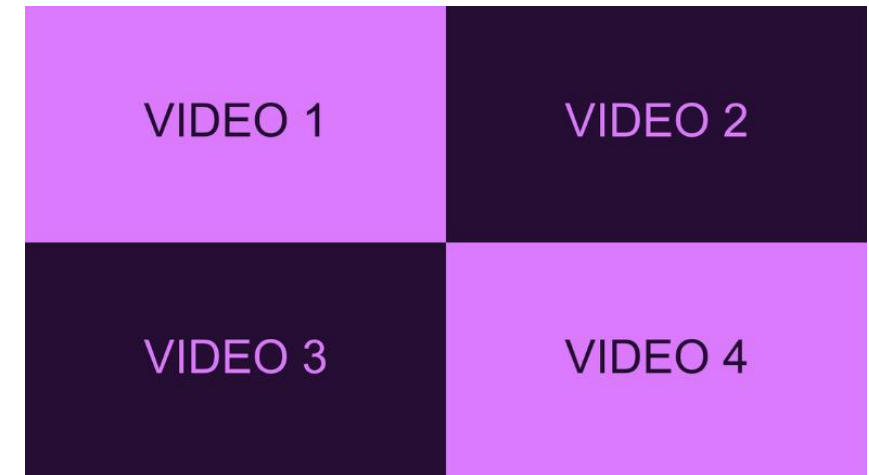
Four IP HD Inputs – One Monitor

For CIP-DSS and CIP-DSH

- All Unc, all JPEG-XS or Mix
- All Unc, all ProAV codec or mix
- YUV and RGB mix

For CIP DRS, SRS, DRH and SRH

- All JPEG-XS or all ProAV codec
- YUV and RGB mix

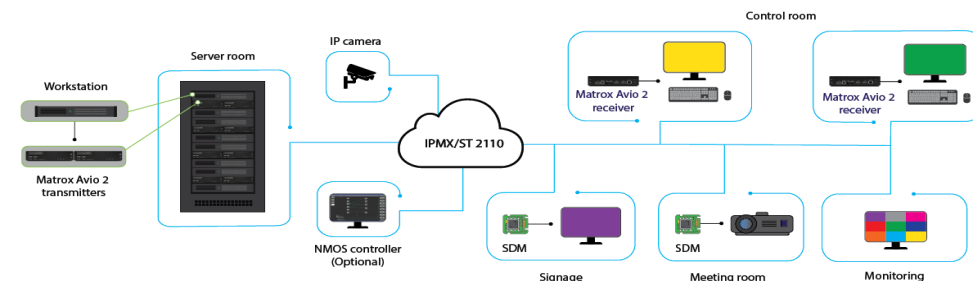


Matrox Avio2 – First ST2110/NMOS/IPMX IP KVM Extender



Matrox Avio2 IP KVM

- 4K HDMI IP KVM
- 3840x2160@60Hz 4:4:4
- IPMX/ST2110 and NMOS aware
- 1GbE/10GbE network
- Uncompressed, Pro AV (Colibri) codec or JPEG XS - optional license upgrade
- Analog audio output, analog mic-in*
- USB HID, USB 2.0 Bulk devices, USB 2.0 speakers
- Optional control port RJ45 with PoE+
- Easy to use browser-base UI to configure and monitor devices
- REST API and NMOS API for routing
- On-screen-Display (OSD) on Rx
- Available Q1/2025 – samples before



Matrox Vion EX & NX – Compact AVoIP Gateways



EX – **with** IO card

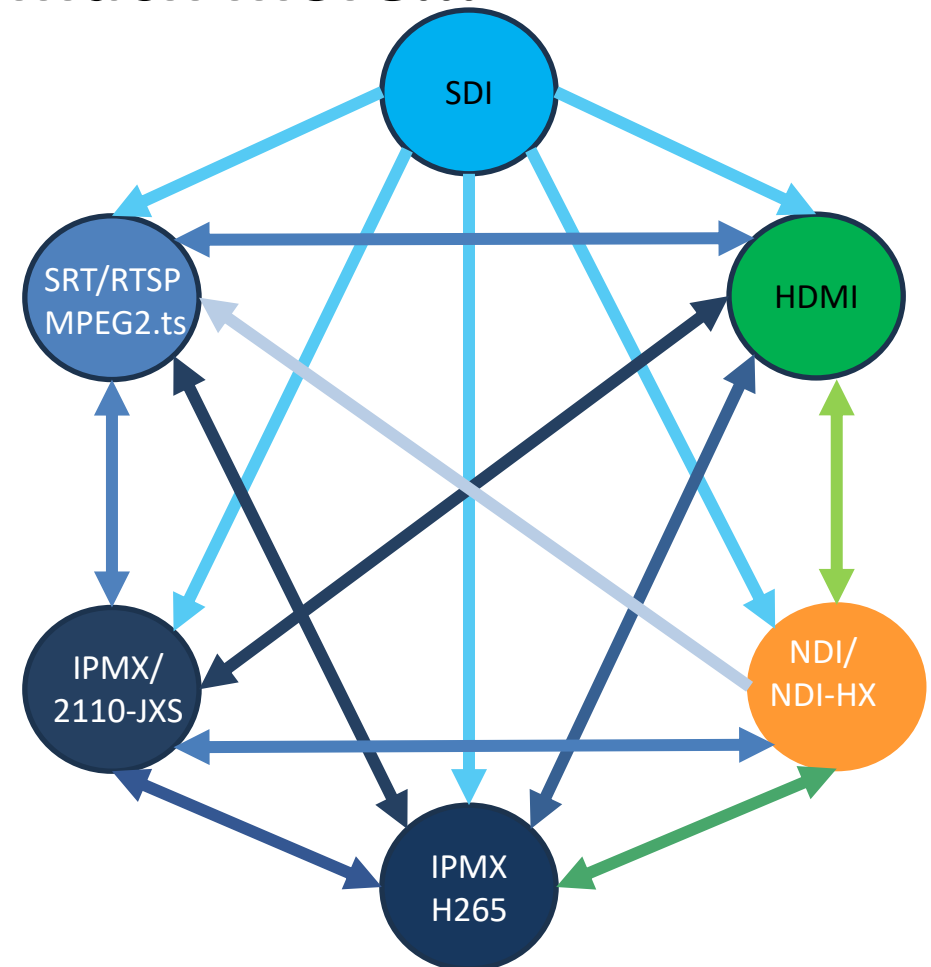


NX – **without** IO card

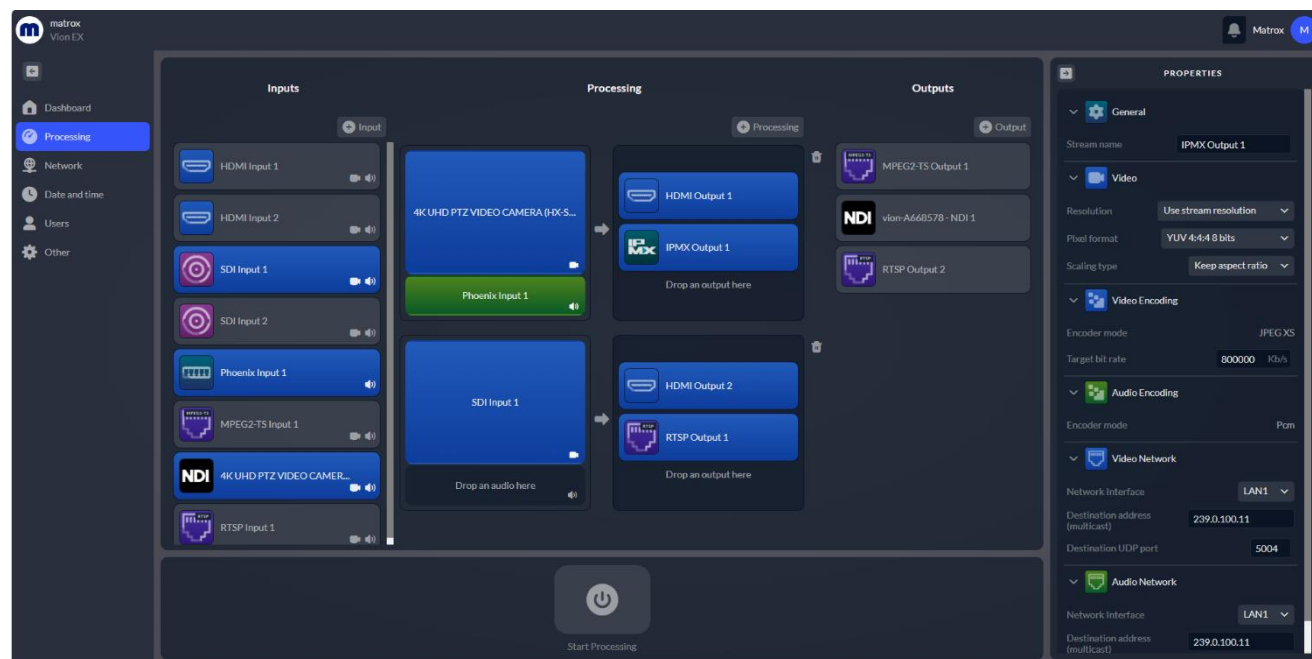
Transcoder and much more...

Matrox Vion EX & NX – Transcoder and much more...

- **Transcoder**
One Codec Format to Another
NDI (SpeedHQ) ← → H265 over RTSP
- **Transmux**
One Streaming Format to Another (same essence)
NDIHX (H264 10 Mbps) ← → RTSP (H264 10 Mbps)
SRT (H265) ← → M2TS (H265)
- **Transrate/Transform**
Same Format, Same codec to Different bitrate
H264 over RTSP (30Mbps) ← → H264 over RTSP (5Mbps)
H265 over RTSP (444 8) ← → H265 over RTSP (420 8)
- **Encoder/Decoder**
Baseband format to/from Streaming format
HDMI/SDI ← → H264 over RTSP



Matrox Vion EX & NX – Transcoder and much more...



Performance	Vion EX	Vion NX
Encode/Decode	<ul style="list-style-type: none"> • JPEG XS: 1x 4Kp60 encode or decode, 4x 1080p60 encode or decode • NDI6[Full]: 1x 4Kp60 encode or decode, 4x 1080p60 encode or decode • H.264: 2x 4Kp60 encode or decode, 8x 1080p60 encode or decode • H.265 4:2:0 and 4:4:4 8/10-bit: 2x 4Kp60 encode or decode, 8x 1080p60 encode or decode • H.265 4:2:2 10-bit: 2x HD encode and decode <p>Note that there are only two HDMI outputs that are enabled, output of more than two decodes will need to be viewed in composition mode.</p>	
Transcode Combinations	<ul style="list-style-type: none"> • JPEG XS<---->NDI, 1x 4Kp60 transcode, 3x 1080p60 transcodes • JPEG XS<---->H264, 1x 4Kp60 transcode, 4x 1080p60 transcodes • JPEG XS<---->H265 4:2:0, 4:4:4, 1x 4Kp60 transcode, 4x 1080p60 transcodes • JPEG XS<---->H265 4:2:2 10-bit, 2x 1080p60 transcodes • NDI6<---->H264 (including NDIHX3), 2x 4Kp60 transcode, 4x 1080p60 transcodes* • NDI6<---->H265 420 or 444(Including NDIHX3), 2x 4Kp60 transcode, 4x 1080p60 transcodes* • NDI6<---->H2656 4:2:2 10-bit, 2x 1080p60 transcodes • H264<---->H265, 1x 4Kp60 transcode, 4x 1080p60 transcodes <p>Many simultaneous encodes and transcodes possible. The above combinations provide guidelines as to what the limits might be. When resolutions and frame rates are further reduced to 1080i/25/30 or 720p50/60, even more options can be done. NDI and JPEG XS codecs have a hard limit of 4 simultaneous operations each. These limits are independent of each other. ie, 4x NDI<-->JPEG XS transcodes are possible however only 2x NDI6<-->NDIHX3 transcodes are possible.</p>	

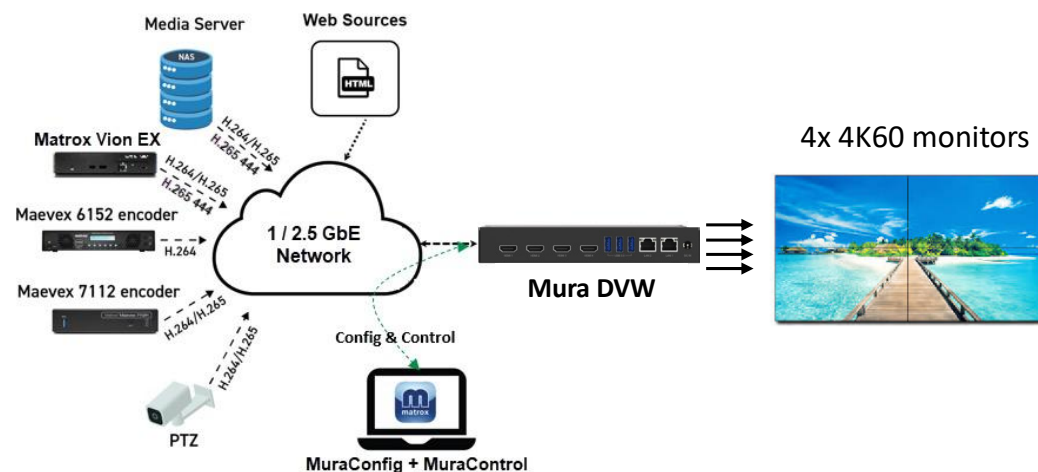
Distributed VideoWall - DWC



Matrox Mura Distributed Video Wall

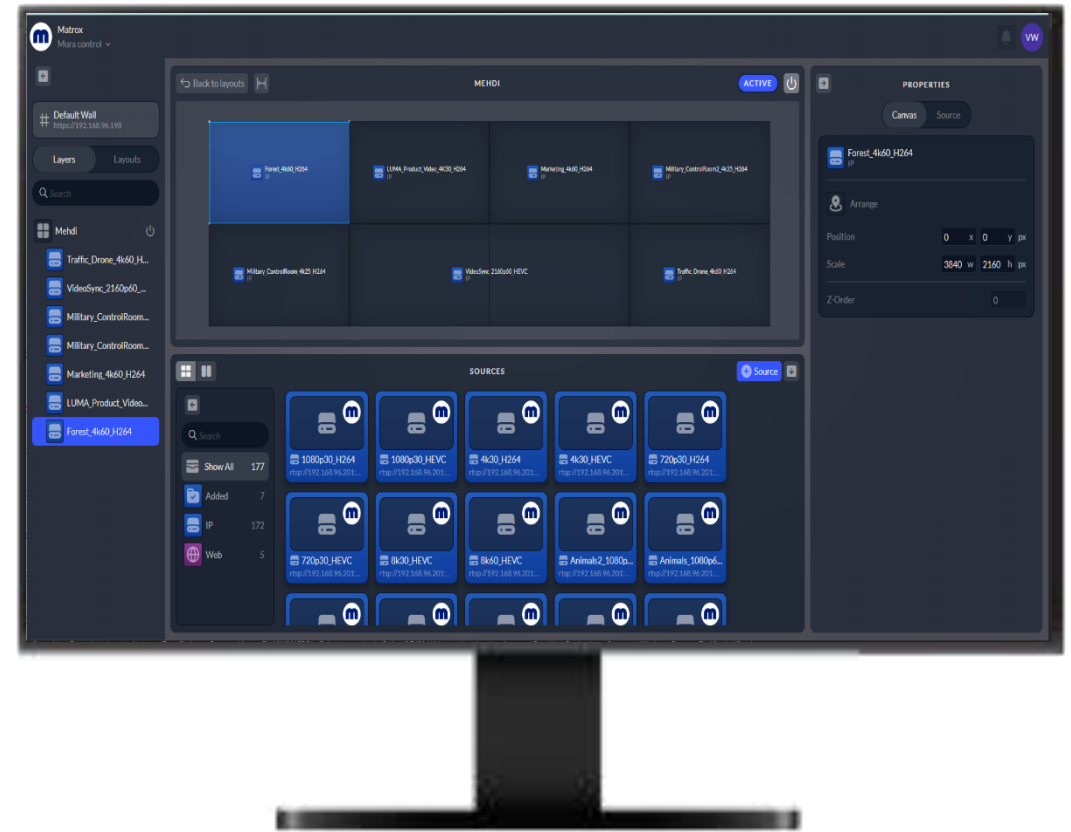
Performance	H264 420 8-bit	H265 420 8-bit	H265 444 8-bit
8k60	N/A	1	1
4k60	4	4	2
1080p60	16	16	8
1080p30	26	26	8

- Designed specifically for managing and controlling video walls.
- Supports the arrangement of any number of displays to create a single large canvas up to 4K60 per screen.
- Integrates advanced computing, networking, H.264/H.265 video decoding and graphical processing capabilities to deliver seamless visual experiences.
- Targets command centers, control rooms, large-scale advertising and public information displays.
- Built on proven and established Matrox Mura APIs.

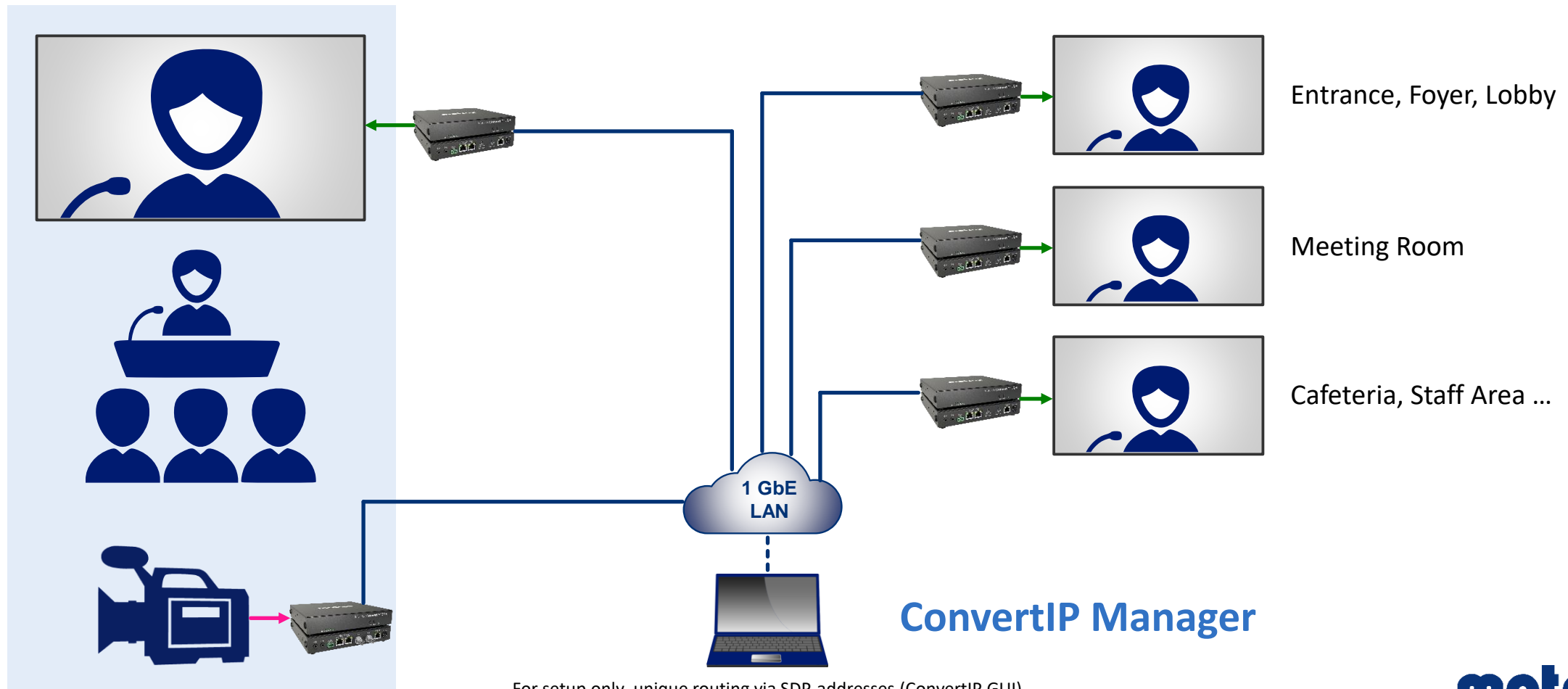


DVW Mura Control Demo

- Served from the DVW
- Layouts, Windows and Sources management
- Basic Security (Single, authenticated user)
- Select basic features (Text overlay, Demo Sources)
- OEM Customizable
- Ship in Q2 2025
- Targeting:
 - Small Control Room VideoWalls
 - Simple Signage applications (Lobbies, Stores/Shopping Centers)
 - MuraControl for Ipad App users

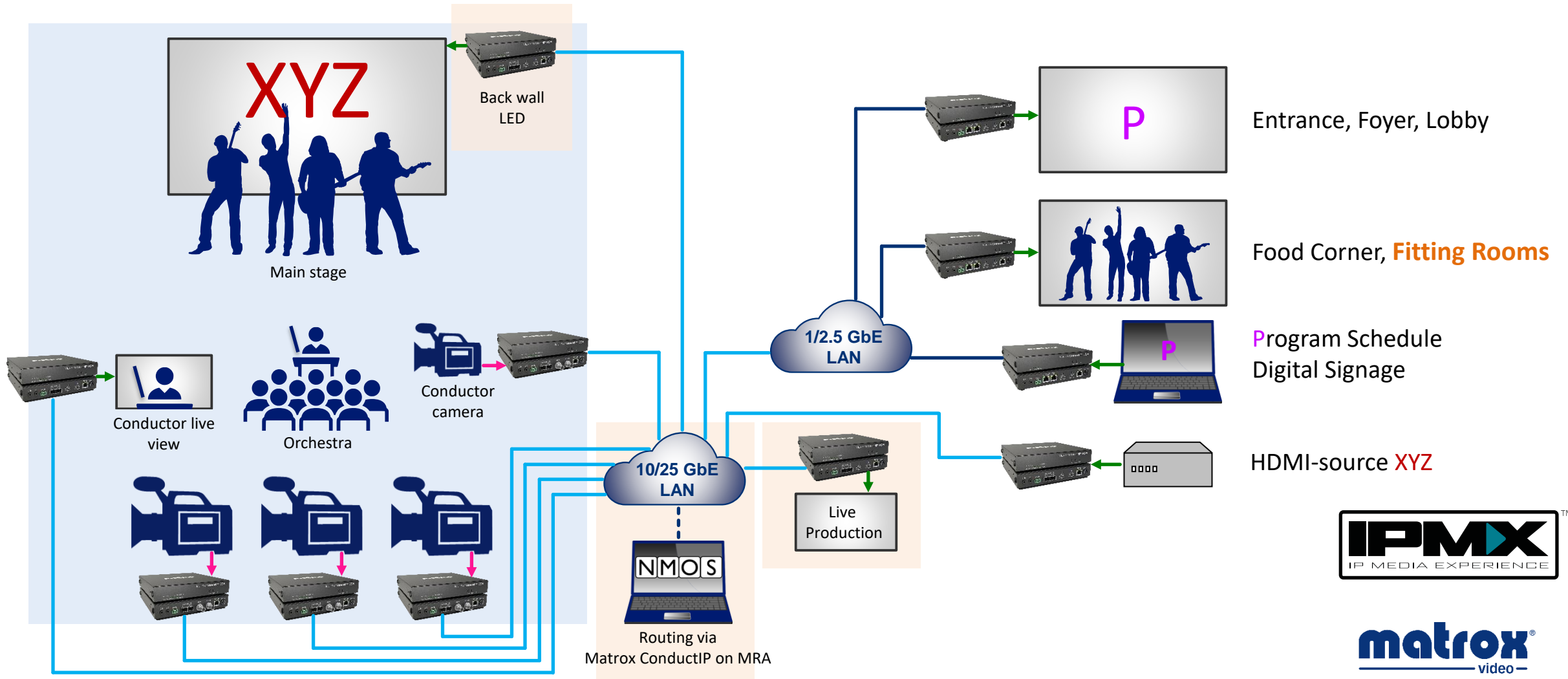


Single Source, Video Distribution, static Setup: Church, Townhall ...



For setup only, unique routing via SDP-addresses (ConvertIP GUI)

Uncompressed and Compressed: Opera, Theater, Concert, Convention Center



спасибо 谢谢
GRACIAS
THANK YOU
ありがとうございました MERCI
DANKE धन्यवाद
شُكراً OBRIGADO



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matrox
— video —

IP KVM Extender:



Matrox Extio3 Series

Matrox Extio3 Series: High Performance IP KVM Extender

- DisplayPort IP KVM, Fiber-optic and copper
- 4Kp60 4:4:4 and up to quad 1080p60 support (N3408)
- Dual 1080p60 (N3208)
- Standard 1GbE network infrastructure
- Multicast, unicast, and multi-unicast
- Longer distances over WAN and Internet
- Encrypted audio, video and USB signals
- Stereo analog audio and digital embedded audio
- Link redundancy
- EDID management
- Direct point-to-point or over IP operation



Extio 3 N3408
4Kp60, dual 4kp30 or quad 1080p60 video

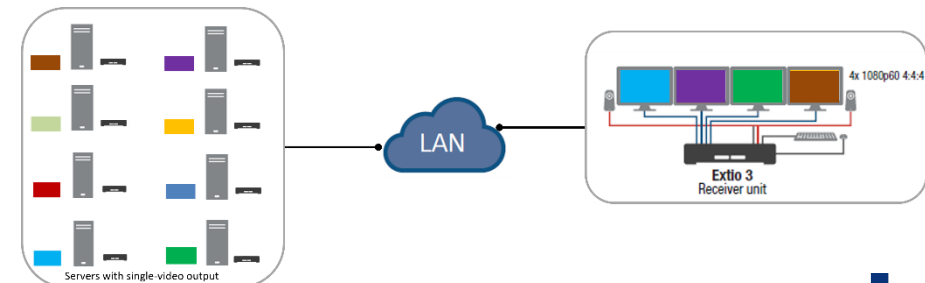
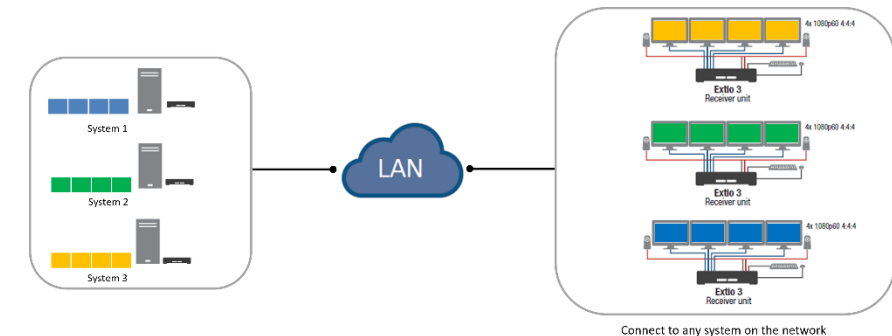
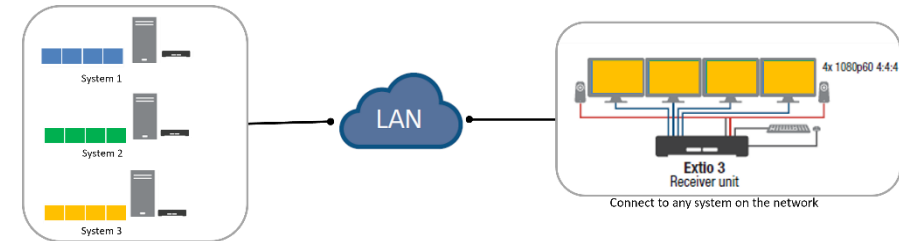
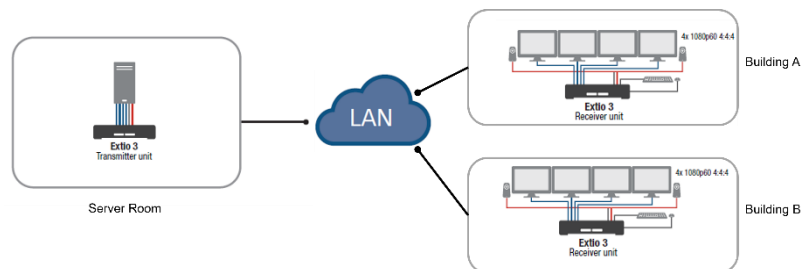


Extio 3 N3208
Dual 1080p60 video

More details: <https://video.matrox.com/en/products/kvm-extenders/extio-3-series>

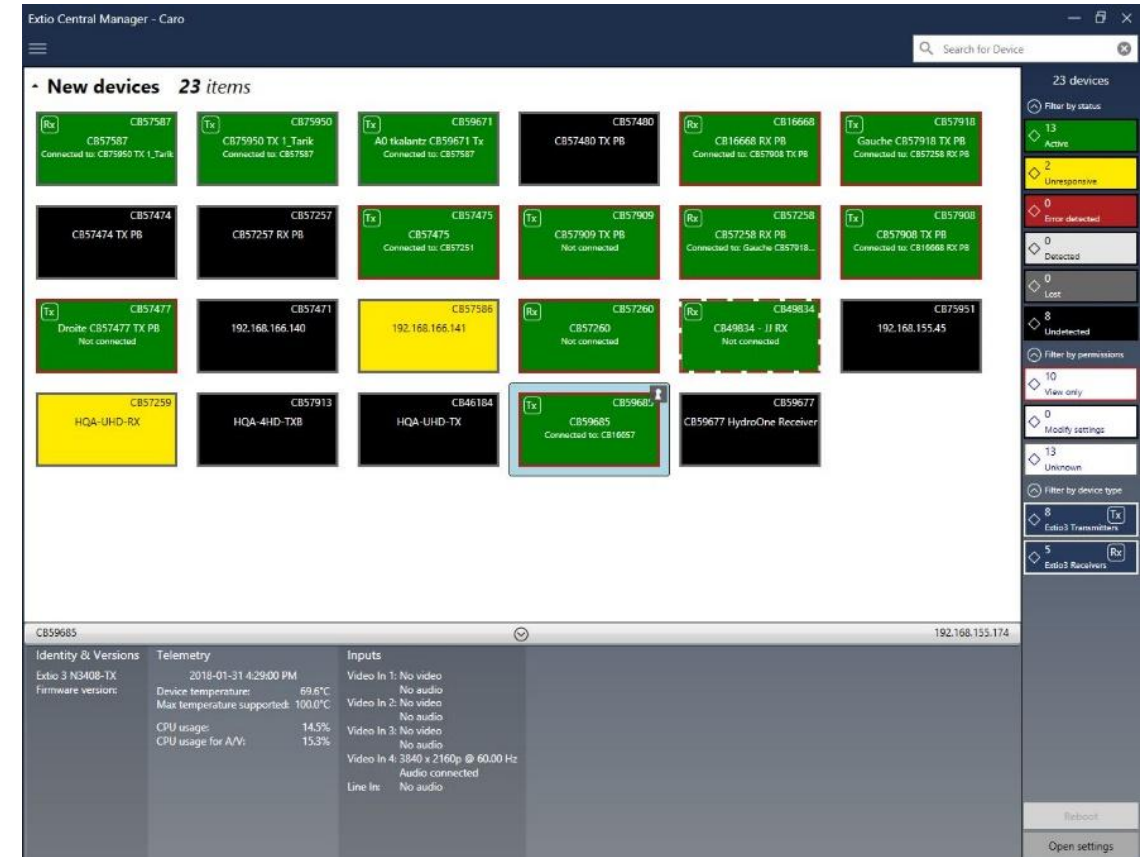
Matrox Extio3 Series: Flexible Operating Modes

- Point-to-Point (direct)
- Point-to-Point (networked)
- One-to-many
- Many-to-One
- Many-to-Many
- Aggregator Mode
 - Multi-system control in Aggregator mode
 - Share a single set of keyboard and mouse across system
- Tile-View Mode
 - Position and control up to 4 systems on a single display

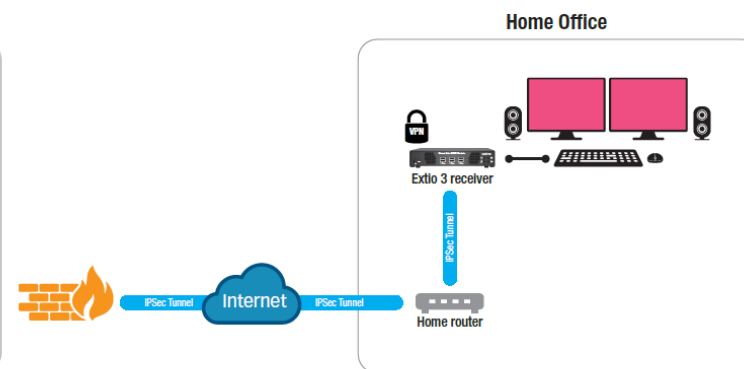
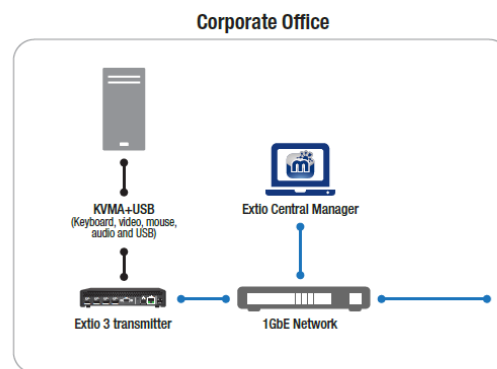
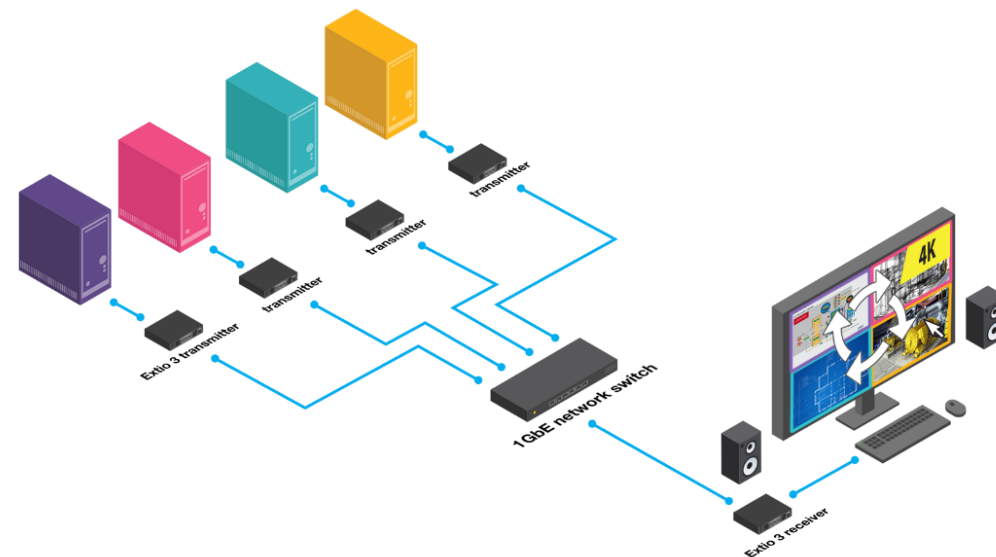
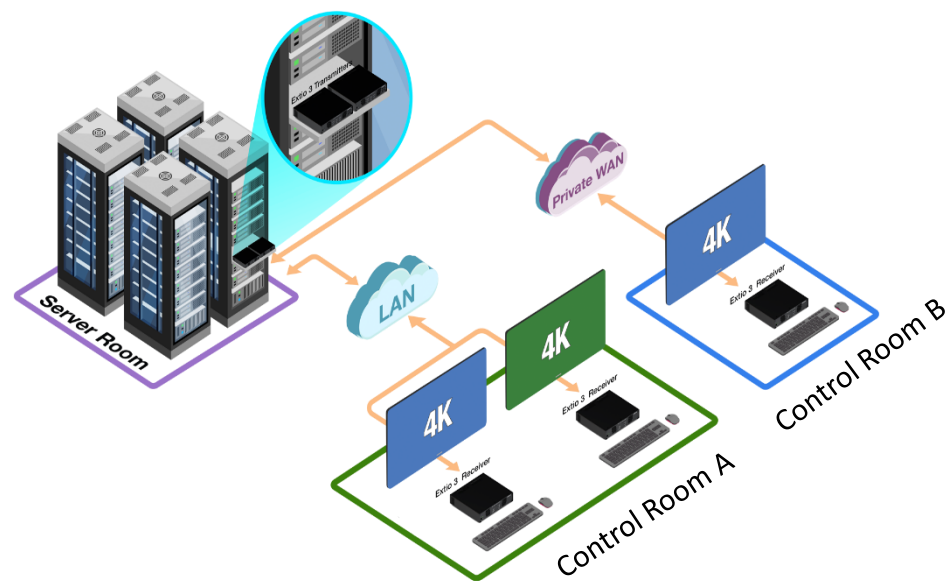


Matrox Extio Central Manager

- Easy to use and intuitive software to configure, manage and monitor all devices
- Define Tx/Rx links, user access rights, and various device settings
- Distributed model – settings and parameters reside locally in each transmitter and receiver device
- Complimentary software, no licensing fees
- .NET and REST API available for developers



Matrox Extio3 Series: Workflows



NEW

Keyboard & Mouse Switch

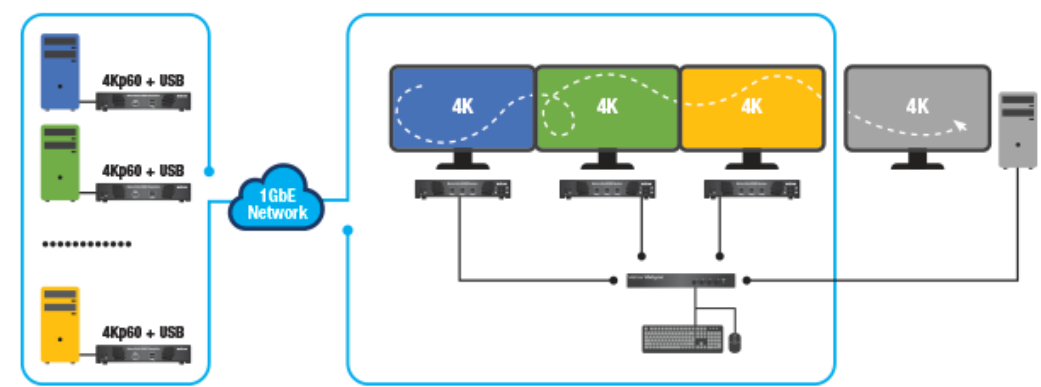
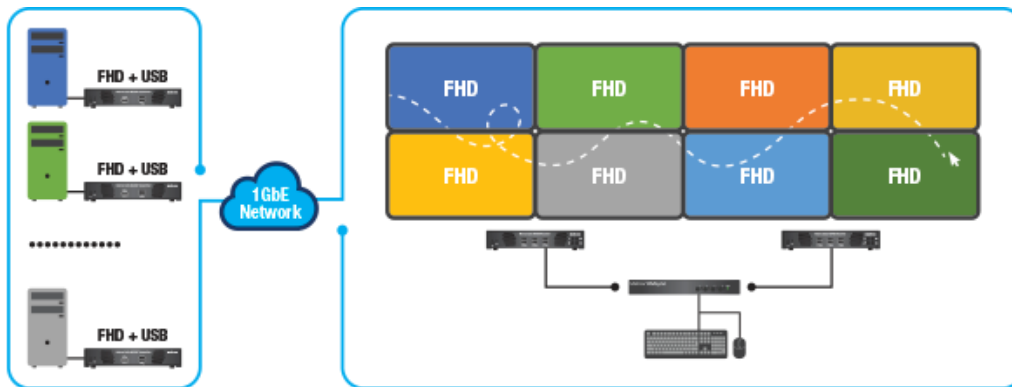


Matrox KMLync

Matrox KMLync: Keyboard & Mouse Switch

Control multiple systems with one set of keyboard & mouse

- 4-port keyboard & mouse switch appliance
- Supports seamless mouse across multiple systems
- Can be used in combination with:
 - Up to 4 Extio3 receiver devices
 - Up to 4 workstations/systems
 - A mix of both



More details: <https://video.matrox.com/en/products/kvm-extenders/keyboard-mouse-switch/kmlync>



H.264 & H.265 based Encoders & Decoder:



Matrox Maevex Series

Matrox Maevex 6100 Series H.264 Encoders

- Quad & Dual appliances, and Quad PCIe card
- High density encoding:
 - Appliances: 4Kp60 input capture with zero-latency pass-through
 - Rack mountable - 1U, ½ width, quiet
 - PCIe x16 card: 4Kp30 input capture
- Streaming and Recording
 - Simultaneous **capture, encode, stream, record**
 - Protocols: RTP, MPEG2.TS, RTSP, RTMP, SRT, HLS
 - Record locally and/or on network
 - HDCP 1.4 & 2.2 support (MVX-to-MVX appliances only)
 - Multi Chroma subsampling support
 - Multiple fixed compositing
 - Individual encode settings (GOP, QP, profile, VBR/CBR)
 - User definable bitrate – 50 Kbps to 120 Mbps per stream



More details: <https://video.matrox.com/en/products/encoders-decoders/maevex-6100-series>

Matrox Maevox 7100 Series H.264 & H.265 Encoders

- Single-Channel encoder appliances
 - 7112A: AVC/H.264
 - 7112H: AVC/H.264 & HEVC/H.265
- 4K60 capture & encode with zero-latency pass-thru
- Fanless (zero noise)
- HDR support
- Streaming and Recording
 - Simultaneous **capture, encode, stream, record**
 - Protocols: RTP, MPEG2.TS, RTSP, RTMP, SRT
 - Record on network (NAS/NVR)
 - Individual encode settings (GOP, VBR/CBR)
 - User definable bitrate – 64 Kbps to 60 Mbps per stream
- Support for HDR, 802.1x, IGMPv2&v3



More details: <https://video.matrox.com/en/products/encoders-decoders/maevex-7100-series>

Matrox Maevex 6152 H.264 Decoder

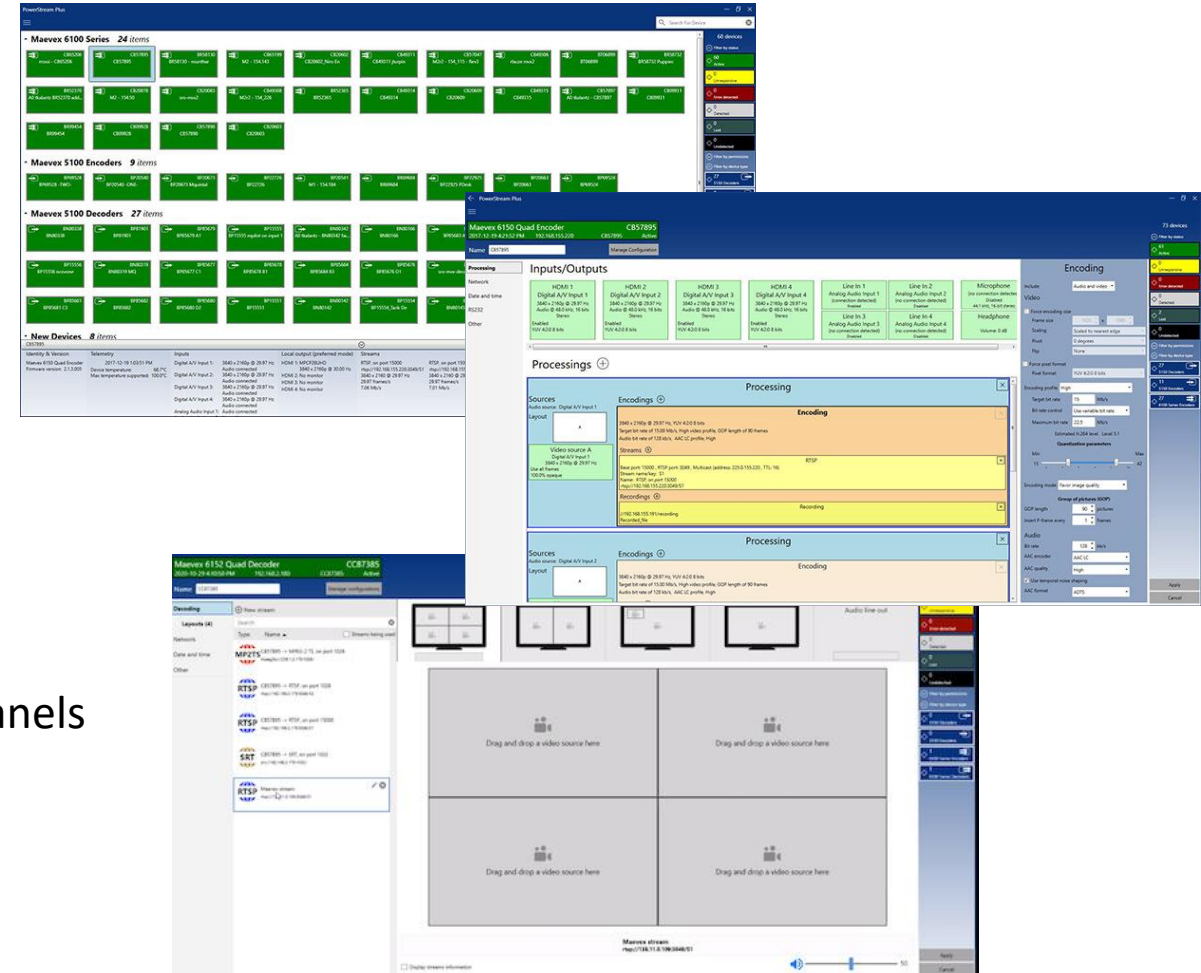
- Quad Decoder appliance
- 4x HDMI 2.0 output
 - Decode of 2x 4Kp60, 4x 4Kp30/60
- HDMI stereo audio for each output
- 1x analog stereo line-out, Mic-in, USB
- Low Latency Maevex to Maevex:
 - Video only ~50ms; Video & audio ~85ms
- Multiple preset layouts
 - Composite support (2x2, PiP, side-by-side, etc.)
 - User-defined/created layouts via API
- Decode and display:
 - 3rd party encoders
 - PTZ Cameras
 - Software encoders



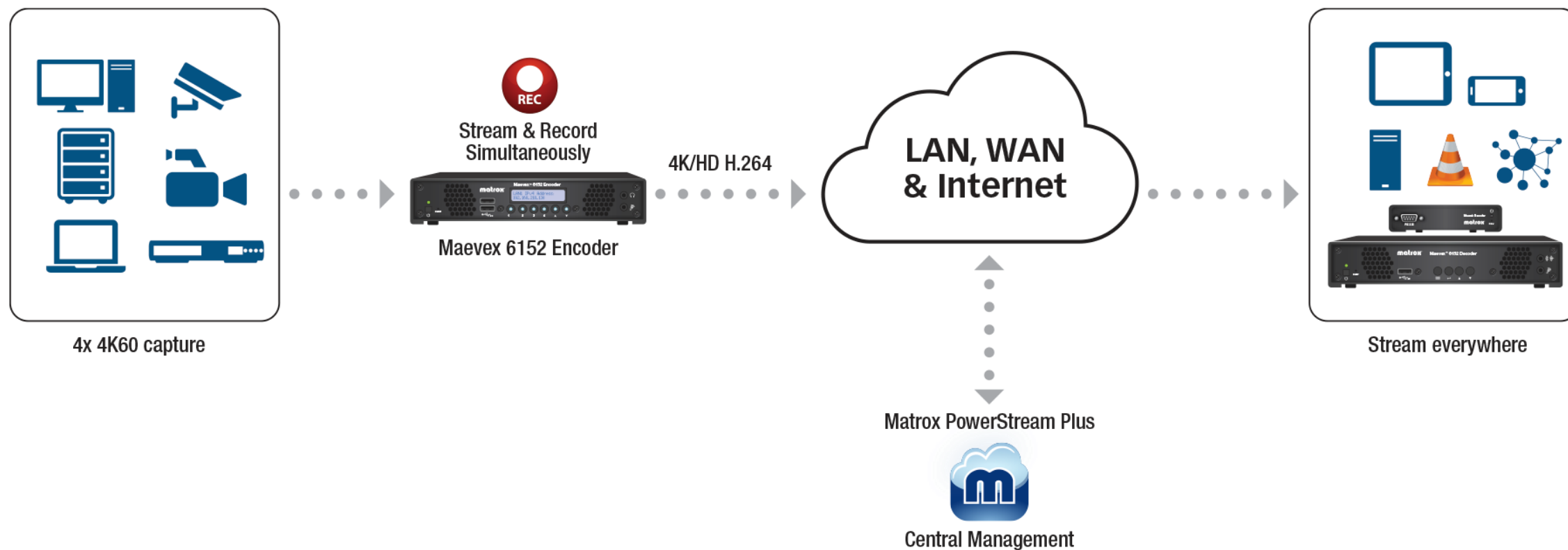
More details: <https://video.matrox.com/en/products/encoders-decoders/maevex-6100-series>

Matrox Maeve 6100 Series: Management

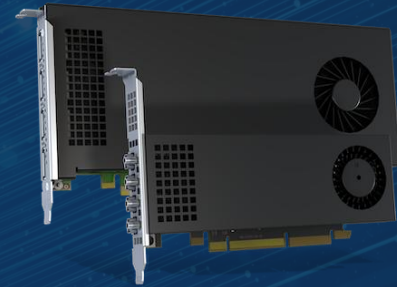
- PowerStream Plus Application
 - Windows app for management & setup
 - Easy to use
 - Free of charge
- APIs for custom implementation
 - PowerStream Plus API Windows & Linux
 - REST API for rapid customization
 - RS-232 API for easy implementation for control panels



Matrox Maevex 6100 Series: Workflow



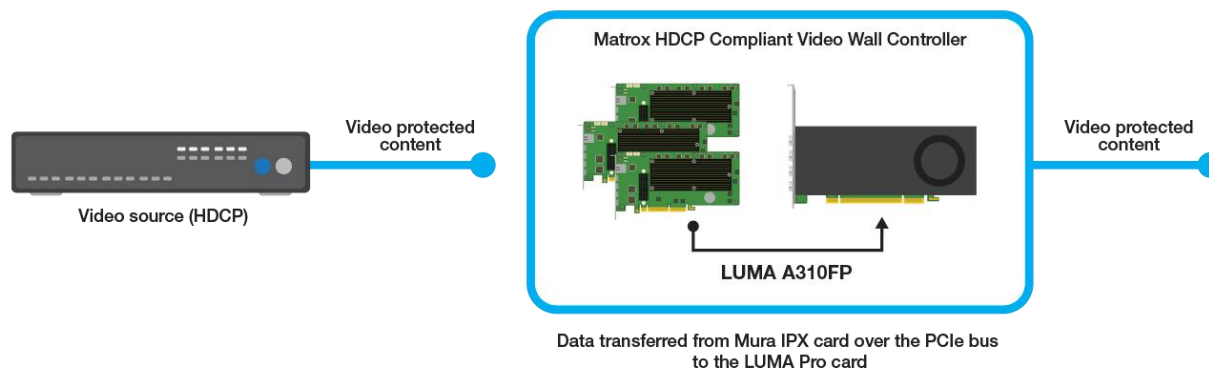
Video Wall Products:



Matrox LUMA Pro & MURA Series

Matrox LUMA-Series Pro: Output cards for your video wall

- Specifications see Matrox LUMA Series
- Frame-lock capability with up to 4 cards per system
- Create a single large canvas using multiple cards
- Native HDCP compatibility with Matrox HDMI capture cards
- GPU H.264 & H.265 streams decoding supported by Mura libraries



Matrox LUMA Series: Overview

	LUMA Pro A310 Quad	LUMA Pro A380 Quad	LUMA Pro A380 Octal
SKU	LUMA-A310FP	LUMA-A380P	LUMA-A380P8
Bus type	PCIe 4.0 x8 (x16 Physical)		PCIe 4.0 x16
Memory	4GB GDDR6	6GB GDDR6	12GB GDDR6
GPU	Intel A310E	Intel A380E	Dual Intel A380E
Form Factor	Low Profile	Single Slot ATX	Single Slot ATX
Outputs	4x Mini DisplayPort 2.0	4x DisplayPort 2.0	8x Mini DisplayPort 2.0
Resolution	2x 8K60/5K120 or 4x 5K60		4x 8K60/5K120 or 8x 5K60
Bit depth	Up to 36 bpp (Bits per Pixel) YCbCR 4:4:4*, YCbCR 4:2:0, RGB*		
Power Consumption	50W	75W	130W

More details: <https://video.matrox.com/en/products/graphics-cards/luma-series>

And <https://video.matrox.com/en/products/video-walls/luma-pro-series>

Matrox PowerDesk Software

- Robust, field-proven Matrox PowerDesk desktop management software for Windows
- Let users easily configure and manage multi-display setups
- Included with all LUMA graphics cards



Stretched Desktop

Create a single surface across a GPU to span applications across its screens



Independent Desktop

Set displays independently from one another to open different applications within each screen.



Bezel Management

Compensate for the physical space created by monitor bezels to output a continuous image across multiple displays.



Edge Overlap

Adjust the number of overlapping pixels between edge blending projectors to build a seamless, unified image.



Pivot Mode

Select any combination of portrait or landscape and set the orientation that works best for you.



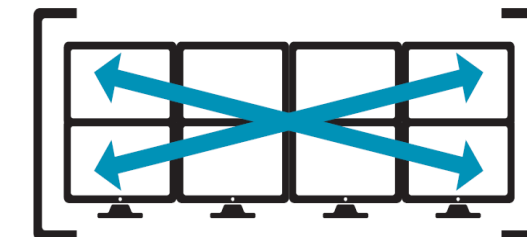
EDID Management

Provide consistent EDID signal to the graphics card to ensure video is displayed correctly.



Clone Mode

Duplicate content to show the same information on all displays.



Join Mode*

Create an ultra-large desktop spanning multiple GPUs to expand applications across all screens

*Join Mode available only on the LUMA Pro models

Matrox MURA IPX-Series: 4K Capture and IP Encode/Decode cards

- 4K Video Input Capture
 - Quad mini HDMI connectors or
 - Dual DP connectors or
 - Quad SDI connectors
- Video Decoding & Encoding
 - Supports H.264 up to L5.2
 - Support up to dual 4K60, quad 4K30, eight 1080p60, 16 1080p30 and many more SDs (in YUV 4:2:0) on a single board
 - Support for YUV 4:2:0, 4:2:2 and 4:4:4, RGB 8:8:8 and 10:10:10 color space
 - 8 and 10 bit per pixel color depth
 - Bit Rates: CBR, VBR and VBR with Constraints
- HDCP support in combination with Matrox D-Series and LUMA Pro
- RJ45 connector for separate network
- PCIe x8 Gen2 Host Interface (electrically). PCIe x16 mechanically.



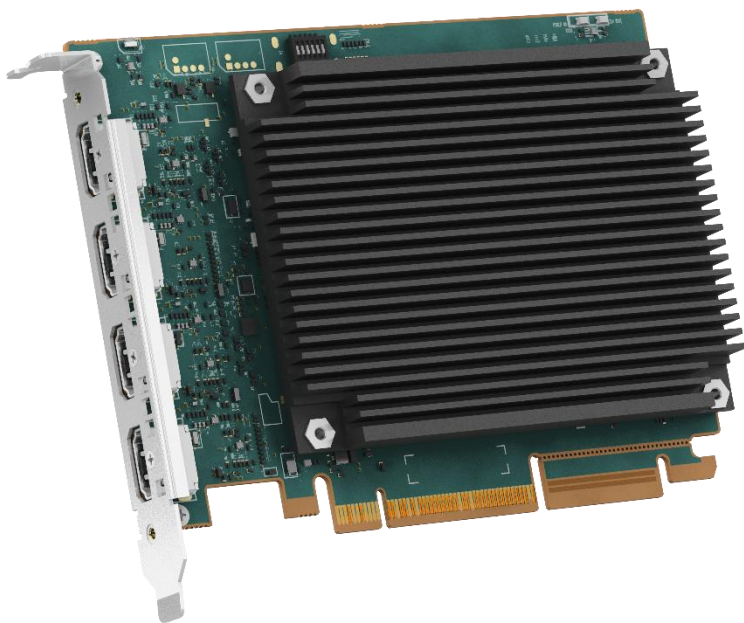
More details: <https://video.matrox.com/en/products/video-walls/mura-ipx-series>

Matrox Mura C4K - Next Gen 4K Capture Cards

- Four independent HDMI 2.1 capture channels with HDCP 2.3 support.
- Support resolution up to 4K60 HDR with full 4:4:4 color sampling
- Full 10-bits signal processing supporting HDR and Metadata
- Up to 2 L-PCM audio channels per input
- Full height, half-length single-slot PCIe Gen 3 x16 (x8 electrical)
- Available in both Fan and passive heatsink SKU to ensure excellent reliability, stability and ease of deployment
- Includes Mura Developer tools



Matrox Mura C4K - Overview



MURA-C4KH Fanless card

0.66 lbs. (298 grams)



MURA-C4K Fan card

0.58 lbs. (264 grams)

32 Watt Max

5.953 (L) x 4.724 (H) inches

15.120 (L) x 12.615 (H) centimeters

Matrox MuraControl Application for Video Wall Control

Matrox® MuraControl™ is a low-cost, premium performance, video wall management software that provides an easy and intuitive way to manage Matrox-based video wall, multi-viewer, or personal video wall locally or remotely.

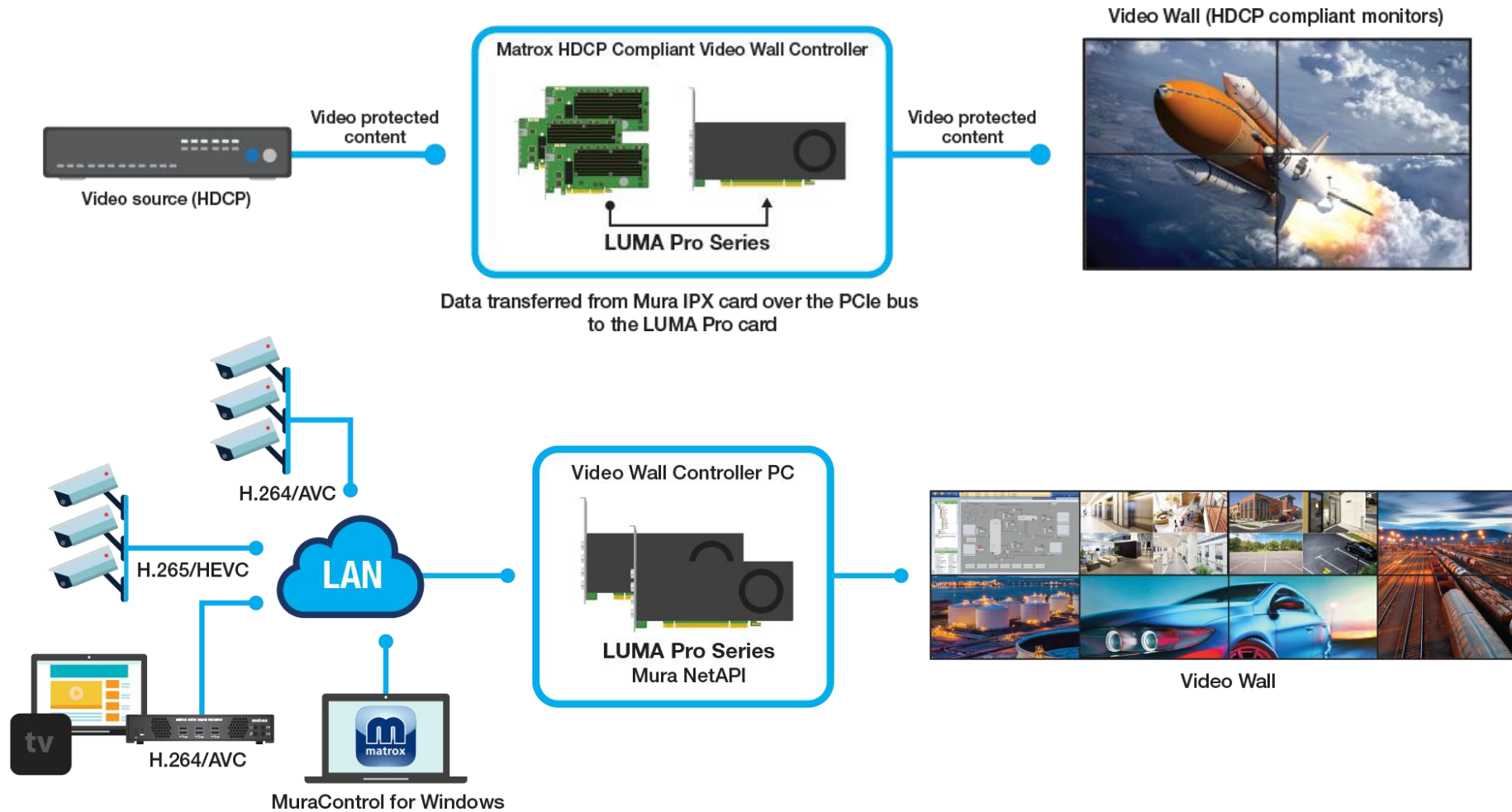
- Fully compatible with LUMA series cards
- Supports Windows 10 and 11
- Free 21-day trial software available
- Free application on iPad



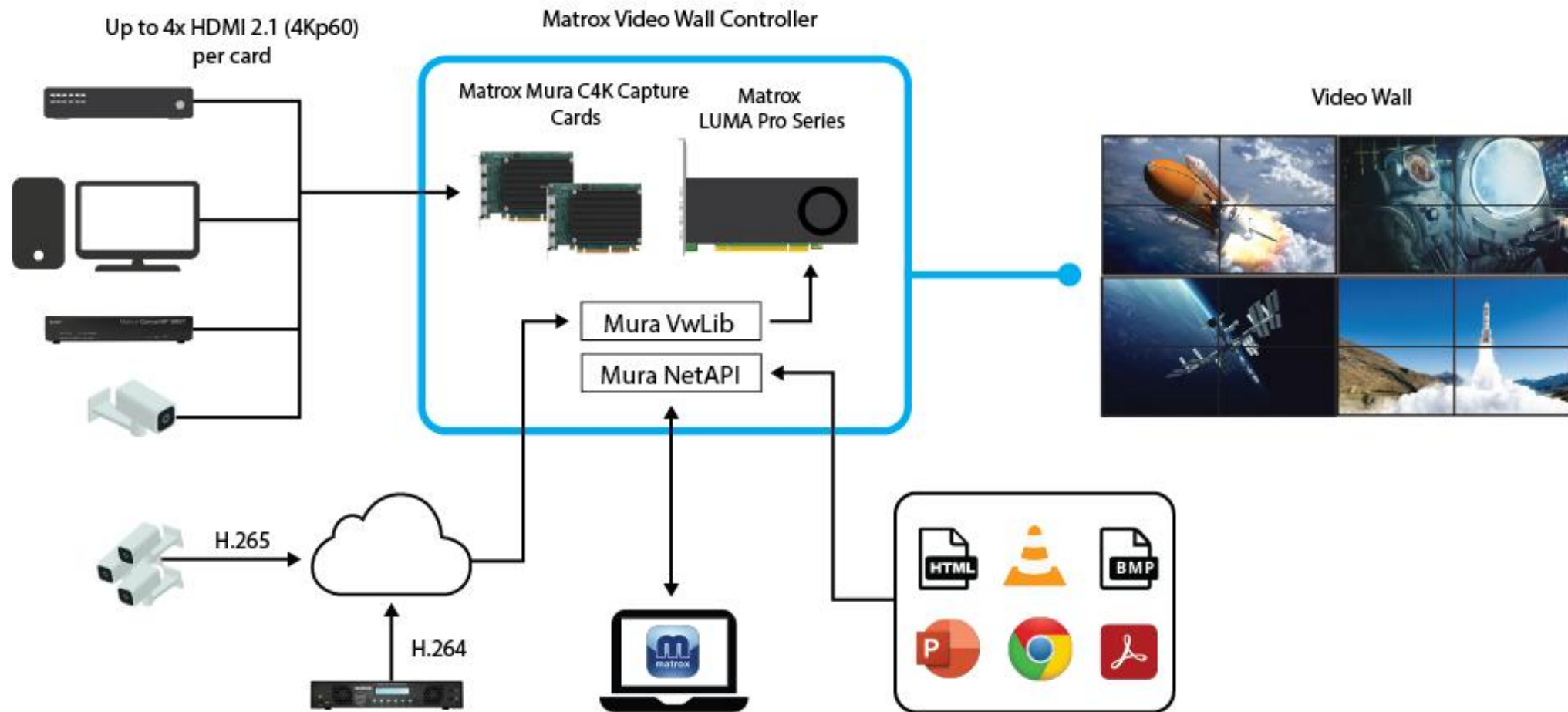
Additional Management via SDK & API



Video Wall Products: Workflows



Video Wall Products: Workflows with Mura Capture Series



Multi-Monitor- Controller:



Matrox QuadHead2Go Series

Matrox QuadHead2Go – Multi Monitor Controller

- QuadHead2Go is a 4K video wall appliance or PCIe card designed to
 - display a single video source across dual, triple and quad-displays,
 - in 2x2, 2x1, 3x1, 4x1, 1x2, 1x3, 1x4 or other (artistic) configurations.
- Drive up to four pristine quality Full HD displays from a single 4Kp60 video signal.
- Expand to a video wall configuration of any size by using multiple QuadHead2Go units.
- Create a video wall from **any content source** with a valid video and audio signal.
- Design modern and artistic video wall layouts
 - each output can have its own resolution, be independently rotated (90, 180, and 270 degrees), cropped, upscaled, downscaled, and positioned anywhere.
- Easy to configure – either with push-buttons or with PowerWall software



More details: <https://video.matrox.com/en/products/video-walls/quadhead2go-series>

