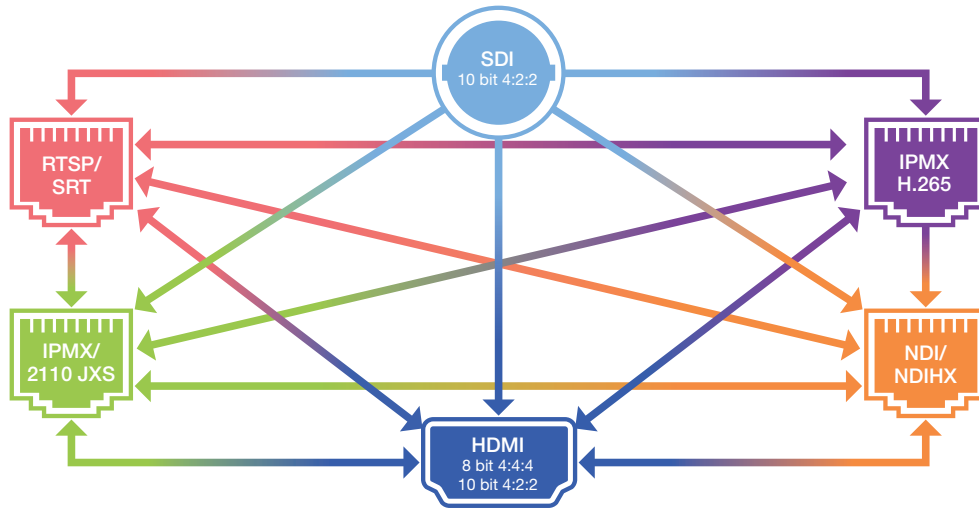# Matrox® **Vion**
Your IP Video Bridge

Matrox Vion is a compact, multi-channel 4K capable IP video gateway for media processing and conversion. Vion provides flexible, low-latency multi-channel encoding, decoding, transcoding, and cross-conversion of IP video formats and codecs like H.264, HEVC, JPEG-XS and NDI. The video gateway supports protocols like ST 2110-22, IPMX, SRT, RTSP, RTP, and MPEG-2 TS for flexible routing workflows, such as transcoding an NDI source for delivery over the web using SRT. With support for 4:2:2 10 bit and 4:4:4 10 bit codecs and optional HDMI 2.0 and 12G-SDI Inputs, Vion can maintain both desktop and broadcast video content details, manages color space conversions, streaming protocols and bitrates, and transmits multiple concurrent streams making it ideal for live production, collaboration, and local/cloud IP workflows.

matrox® video

Encode, Decode, Transcode Your Content

Key features and benefits

IP signal protocol conversion	Efficiently convert, transcode, transmux, transrate, and transceive compressed IP signals to ensure seamless media distribution. With Vion, you can facilitate NDI media and protocol conversion, including seamless conversion between NDI and SRT, as well as NDI and IPMX.
Multi-channel processing	Deliver multiple concurrent and bi-directional streams with advanced multi-channel encoding, decoding, transcoding, and cross-conversion.
4:4:4 color precision	Matrox Vion Series supports 4:4:4-capable codecs (HEVC and JPEG XS) to provide maximum image quality and maximum equipment compatibility. HEVC 4:4:4 ensures low-bitrate transmission of high-quality desktop content over IP, making it ideal for applications that require color accuracy, compression efficiency, and high performance.
Encode from baseband inputs	When looking to process more than IP only sources, acquire video and audio baseband signals from two SDI, two HDMI, and a balanced analog input with Vion EX.
Open standards	Compatible with the IPMX and 2110 suite of open standards and specifications, along with protocols like RTSP, RTP, and MPEG-2 TS, Vion is ideal for connecting these protocols with other popular streaming formats such as NDI and SRT.
Content preview I/O options	Preview and monitor your video inputs/outputs as side by side, quad-split compositions on your HDMI output, as well as an additional IP preview streams.

Appliance overview
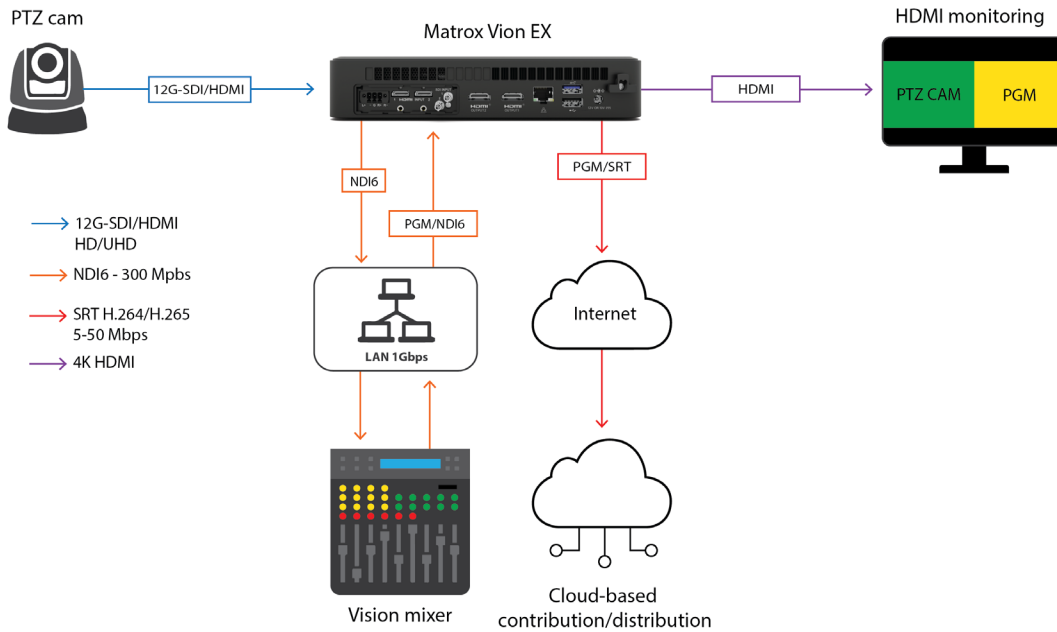

Matrox Vion EX (back view)

Matrox Vion NX (back view)
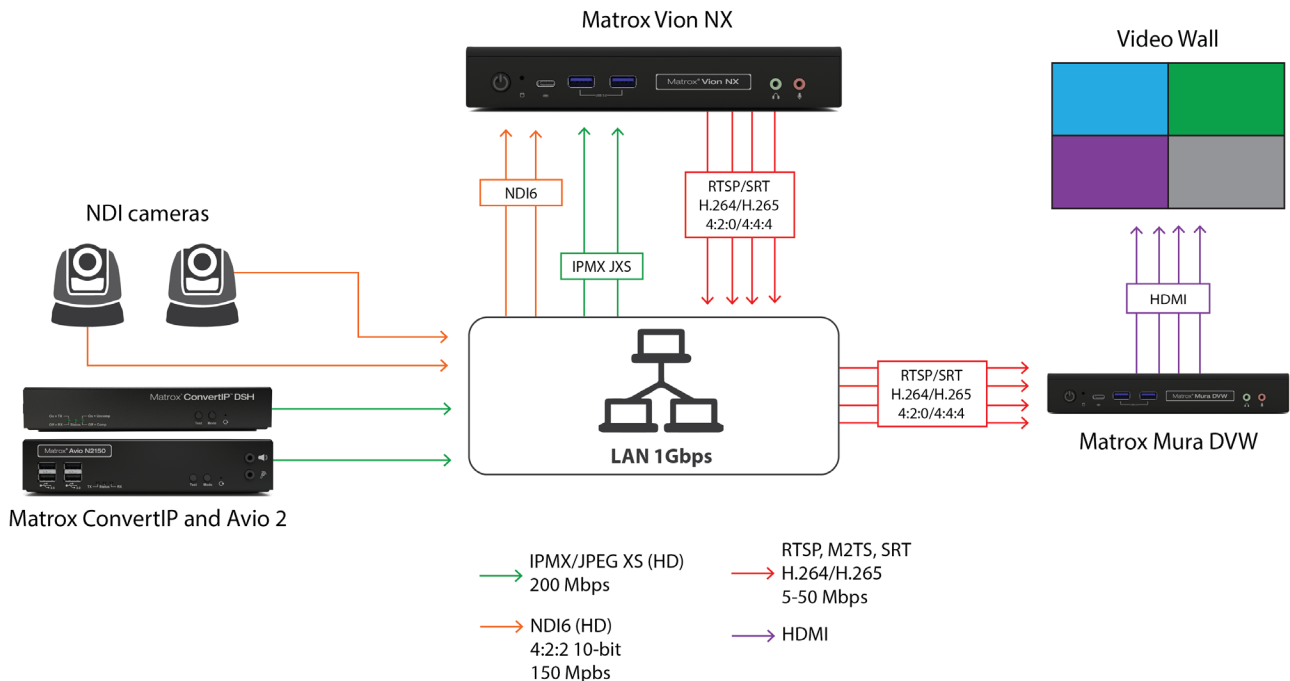
Workflow examples

NDI contribution and SRT distribution

Users can convert their baseband SDI and HDMI signals to 4:2:2 10-bit NDI (full) streams that can then be fed to their NDI vision mixer. The NDI program output of the vision mixer can also be sent to Matrox Vion EX for encoding to a high compression, web friendly format like SRT.

PTZ cam

Matrox Vion EX

HDMI monitoring

12G-SDI/HDMI

HDMI

PTZ CAM   PGM

NDI6

PGM/SRT

PGM/NDI6

→ 12G-SDI/HDMI
   HD/UHD

→ NDI6 - 300 Mpbs

→ SRT H.264/H.265
   5-50 Mbps

→ 4K HDMI

LAN 1Gbps

Internet

Vision mixer

Cloud-based
contribution/distribution

NDI and IPMX conversion to high compression distributed display walls

Users can convert low compression, IPMX, and NDI feeds to high compression RTSP streams for decode and display on a distributed display wall system.

Matrox Vion NX

Video Wall

NDI cameras

NDI6

RTSP/SRT
H.264/H.265
4:2:0/4:4:4

IPMX JXS

HDMI

Matrox ConvertIP DSH

Matrox Avio N2150

RTSP/SRT
H.264/H.265
4:2:0/4:4:4

LAN 1Gbps

Matrox Mura DVW

Matrox ConvertIP and Avio 2

→ IPMX/JPEG XS (HD)
   200 Mbps

→ RTSP, M2TS, SRT
   H.264/H.265
   5-50 Mbps

→ NDI6 (HD)
   4:2:2 10-bit
   150 Mpbs

→ HDMI

Matrox® **Vion** – Technical specifications

Product	Vion EX	Vion NX
Part number	VION-EXY-NA VION-EXY-EU VION-EXY-UA	VION-NXY-NA VION-NXY-EU VION-NXY-UA
Connectivity		

Input connections	HDMI
	• 2 x mini-HDMI (Type C) with retention screw
	
	SDI
	• 2 x HD BNC 12G-SDI per SMPTE ST 2082.
	  Level A mapping only when 1080p60 input
	• (2 x HDBNC to BNC adapter provided)
	• 8 channels of embedded audio per input
	• Max number of Baseband inputs available
	  at a time limited to two.
	
	Audio
	• 1 x Balanced Stereo input via Phoenix Connector
	• 1 x unbalanced input via 3.5mm (1/8)" TRS connectors	

Output connections	• 2 x Full Size HDMI (Type A) • 8 channel of embedded audio be input • 1 x unbalanced output via 3.5mm (1/8") TRS connectors	
Network	• Lan 1: 100/1000 Base-T RJ45 • Lan 2: 1000/2500 Base-T RJ45	• Lan 1: 1000/2500 Base-T RJ45 • Lan 2: 100/1000 Base-T RJ45
Other	USB • 3 x USB3 type A* • 1 x USB2 type A* • 1 x USB2 type B*	USB • 5 x USB3 type A • 1 x USB-C
Baseband Video Input Formats		

SDI	Resolutions
	• 4096 x 2160 progressive*, 23.98, 24, 25, 29.97,
	  30, 50, 59.94, 59 fps
	• 3840 x 2160 progressive, 23.98*, 24*, 25*, 29.97*,
	  30*, 50, 59.94, 60 fps
	• 1920 x 1080 progressive, 23.98*, 24*, 25, 29.97,
	  30, 50, 59.94,60 fps
	• 1920 x 1080 Interlaced, 25, 29.97,30 fps
	• 1280 x 720 progressive, 50, 59.94, 60 fps
	
	Color sampling
	• YCrCb 4:2:2 10 bit	

HDMI	Resolutions
	• 3840 x 2160 progressive, 23.98*, 24*, 25*, 29.97*,
	  30*, 50, 59.94, 60 fps
	• 2560x1440 progressive, 30, 60 fps
	• 1920 x 1080 interlaced, 25, 29.97,30 fps
	• 1920 x 1080 progressive, 23.98*, 24*, 25, 29.97,
	  30, 50, 59.94,60 fps
	• 1280 x 720 progressive, 25, 29.97,30 fps
	• 1024 x 768, 30,60 fps
	• 800 x 600, 30,60 fps
	• 640 x 480, 30,60 fps
	• A number of other non 16:9 resolution can be supported.
	
	Color sampling
	• YCrCb 4:2:2 10 bit, sRGB 4:4:4 8bit/10bit	

Supported Codecs		
Codecs	• H264/MPEG-4 part 10 (AVC): 4:2:0 8/10 bit up to 100 Mbps • H265 (HEVC), 4:2:0 8/10 bit: 4:2:2 8/10 bit, 4:4:4: 8/10 bit up to 100 Mbps • JXS (TR-07): 4:2:2 8/10 bit, 4:4:4: 8/10 bit up to 2000Mbps • NDI6 - [SpeedHQ]: 4:2:2 8/10 bit up to 300Mbps • NDIHX3 [H264/H265]: 4:2:0 8/10 bit up to 100 Mbps • Uncompressed audio: for IPMX/2110 and NDI streaming formats • AAC - LC/HE: 32 to 256 kbps per stereo pair	
Supported Streaming Formats		
Streaming formats	• RTP/RTSP: Using H264 and H265 codec only • SRT [caller, sender and rendez-vous]: Using H264 and H265 codec only • MPEG-2 TS: Using H264 and H265 codec only • NDI6: Using Speed HQ • NDIHX3: Using H264 or H265 • IPMX: With JPEG-XS codec • SMPTE ST -2110 – 22: With JPEG-XS codec	

Performance	Vion EX	Vion NX
Encode/Decode	• JPEG XS: 1 x 4Kp60 encode or decode, 4 x 1080p60 encode or decode • NDI6[Full]: 1 x 4Kp60 encode or decode, 4 x 1080p60 encode or decode • H.264: 2 x 4Kp60 encode or decode, 8 x 1080p60 encode or decode • H.265 4:2:0 and 4:4:4 8/10 bit: 2 x 4Kp60 encode or decode, 8 x 1080p60 encode or decode • H.265 4:2:2 10 bit: 2 x HD encode and decode 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.	
Transcode Combinations	• JPEG XS <----->NDI , 1 x 4Kp60 transcode, 3 x 1080p60 transcodes • JPEG-XS <----->H264, 1 x 4Kp60 transcode, 4 x 1080p60 transcodes • JPEG XS <-----> H265 4:2:0, 4:4:4, 1 x 4Kp60 transcode, 4 x 1080p60 transcodes • JPEG XS <-----> H265 4:2:2 10 bit, 2 x 1080p60 transcodes • NDI6<----->H264(including NDIHX3), 2 x 4Kp60 transcode, 4 x 1080p60 transcodes* • NDI6<----->H265 420 or 444(Including NDIHX3), 2 x 4Kp60 transcode, 4 x 1080p60 transcodes* • NDI6<----->H2656 4:2:2 10 bit, 2 x 1080p60 transcodes • H264<----->H265 , 1 x 4Kp60 transcode, 4 x 1080p60 transcodes 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 opertions can be done. NDI and JPEG-XS codecs have a hard limit of 4 simultaneous opertions each. These limits are independent of each other. ie, 4 x NDI<-->JPEGXS transcodes are possible however only 2 x NDI6<-->NDIHX3 transcodes are possible.	

Scaling and Color Space Conversion Operations

	Vion EX	Vion NX

Color space conversion	Input video format
	• YCrCb BT 709 (over SDI or HDMI):
	  Convert from any baseband format to any codec format.
	• YCrCb BT 2020 (over SDI or HDMI)
	• sRGB (over HDMI)
	Codec formats
	• YUV 4:2:0 8/10 bit:
	  Convert from one codec format to the other
	• YUV 4:2:2 8/10 bit
	• RGB 4:4:4 8/10 bit
		Codec formats
		• YUV 4:2:0 8/10 bit:
		  Convert from one codec format to the other
		• YUV 4:2:2 8/10 bit
		• RGB 4:4:4 8/10 bit

Scaling and frame rate conversion	• Upscaling/Downscaling, Anamophic scaling to HD<----->4K • Deinterlacing, interlace to progressive conversion • Frame rate conversion, Skip and repeat of frames	

General

	Vion EX	Vion NX

Physical	• Product Dimensions:
	  L:190mm (7.48in) W:148 mm (5.83in) x H:30mm (1.18in)
	• Weight: Device only ~1.5 kg (3.3 lbs)
	• Operating Conditions: 0 - 35Deg. C (32-95Deg.F)
	• Power supply: 120-240v, 120w
	• Power input: 19volts - 5.5 Amps max (4 amps typical)
		• Product Dimensions:
		  L: 210mm (8.27in) W:175 mm (6.89in) x H: 42mm (1.65in)
		• Weight: Device only ~1.0 kg (2.2 lbs)
		• Operating Conditions: 0 - 35Deg. C (32-95Deg.F)
		• Power supply: 120-240v, 90w
		• Power input: 19volts - 4.5 Amps max

Regulatory	• CE(EU), FCC(US), ICES-003(Canada), KC(Korea), RCM(Aud/Nz) • REACH, EU ROHS, REACH • UL 60950 & UL 62368-1, CSA c22.2 No. 60950-1 % 62368-1, TUV EN-60950-1 & EN-62368-1 • GB9254-2008, GB4943-1-2011, GB17625.1-2012	

Hardware and Software

	Vion EX	Vion NX
Hardware included	• Power supply: 120W power supply Power cords • VION-EXY-NA NEMA 5-15 North Amercian power cord (North America) • VION-EXY-EU CEE 7/7 European Union power cord (European Union) • VION-EXY-UA (UK and AUS/Nz power cord) Adapters • 2 x 12" HDBNC to BNC cable adapters for SDI connectivity Other • One mounting plate with screws	• Power supply: 90W power supply Power cords • VION-NXY-NA NEMA 5-15 North Amercian power cord (North America) • VION-NXY-EU CEE 7/7 European Union power cord (European Union) • VION-NXY-UA (UK and AUS/Nz power cord) Adapters • 2 x 12" HDBNC to BNC cable adapters for SDI connectivity Other • One mounting plate with screws
User Interfaces	• Matrox Update Utility: Free Application to find and update VION devices connected to network. • Web UI: Principal GUI to configuration and monitoring • NMOS IS-04 and IS-05 API: Discovery and routing of IPMX and ST-2110 signals	
Warranty	• Standard warranty: 2 years • Extended Warranty: Contact a Matrox sales representative	
Accessories and Options	• Rack Kit: Rack kit part number • ConductIP Media Routing Appliance: CDTCIP-MRA • HD BNC adapter cables: HDBNC/I	• Rack Kit: Rack kit part number • ConductIP Media Routing Appliance: CDTCIP-MRA

*   *Future use.*

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