Matrox® **Monarch EDGE E4 10-bit**

4K/multi-HD video 10-bit encoder for remote production.

The Monarch EDGE E4 encoder is ideal for demanding, broadcast-quality productions and live, multi-camera events, with encoding of up to four synchronized HD streams or one UHD 4Kp60 stream of securely encrypted, low latency, HDR 10-bit 4:2:2 video on industry-standard transport protocols like SRT. Improve production efficiency with tally and talkback and easily tackle the largest shows with multi-unit synchronization to transmit over 16 camera feeds.

Key features and benefits.

Big productions, small footprint
Easily produce multi-angle live events by extending your production studio to any remote location with a network connection. The Monarch EDGE E4 encodes up to four 3G-SDI camera feeds and can be reconfigured for a single 4K workflow using either 12G-SDI or quad 3G-SDI inputs for when a 4K production is needed. Its compact footprint ensures that two E4 units fit side by side in a single 1RU space, making it perfect for scalable, high-quality remote productions.

Simple, easy-to-use tally and talkbalk
The Monarch EDGE E4 encoder paired with the Monarch EDGE D4 decoder enables tally and bi-directional talkback communication between camera operators and in-studio personnel. Eight tally signals can be sent from the production switcher to the decoder and relayed to the encoder for camera output, while two balanced analog inputs and outputs on each unit integrate seamlessly with local and remote intercom systems.

Versatile recording
Monarch EDGE allows users to record SDI inputs at their preferred quality while simultaneously streaming over their chosen transport protocol. Files can be saved to USB 3.0 storage or network locations using the H.264 codec in MOV or MP4 formats. This feature enables ISO recordings of SDI inputs for post-production editing or as reliable backup copies.

Built for high quality 10-bit H.264 encoding
The Monarch EDGE E4's optimized H.264 engine delivers 10-bit 4:2:2 video at impressively low bitrates and can be encoded up to 120 Mbps when maximum quality is required. With advanced scaling and de-interlacing, each input can be streamed at multiple resolutions and bitrates at once, enabling efficient remote monitoring and flexible production workflows.

Exceptionally low latency
In live environments, high signal transport latencies are detrimental to remote production. Audio and video sync may be hard to maintain and return channels to the field are often too far behind the live action, hindering seamless staff interaction. With glass-to-glass latencies as low as 100ms between encoding and decoding, Monarch EDGE E4 delivers exceptionally low latency over standard 1 GbE networks.

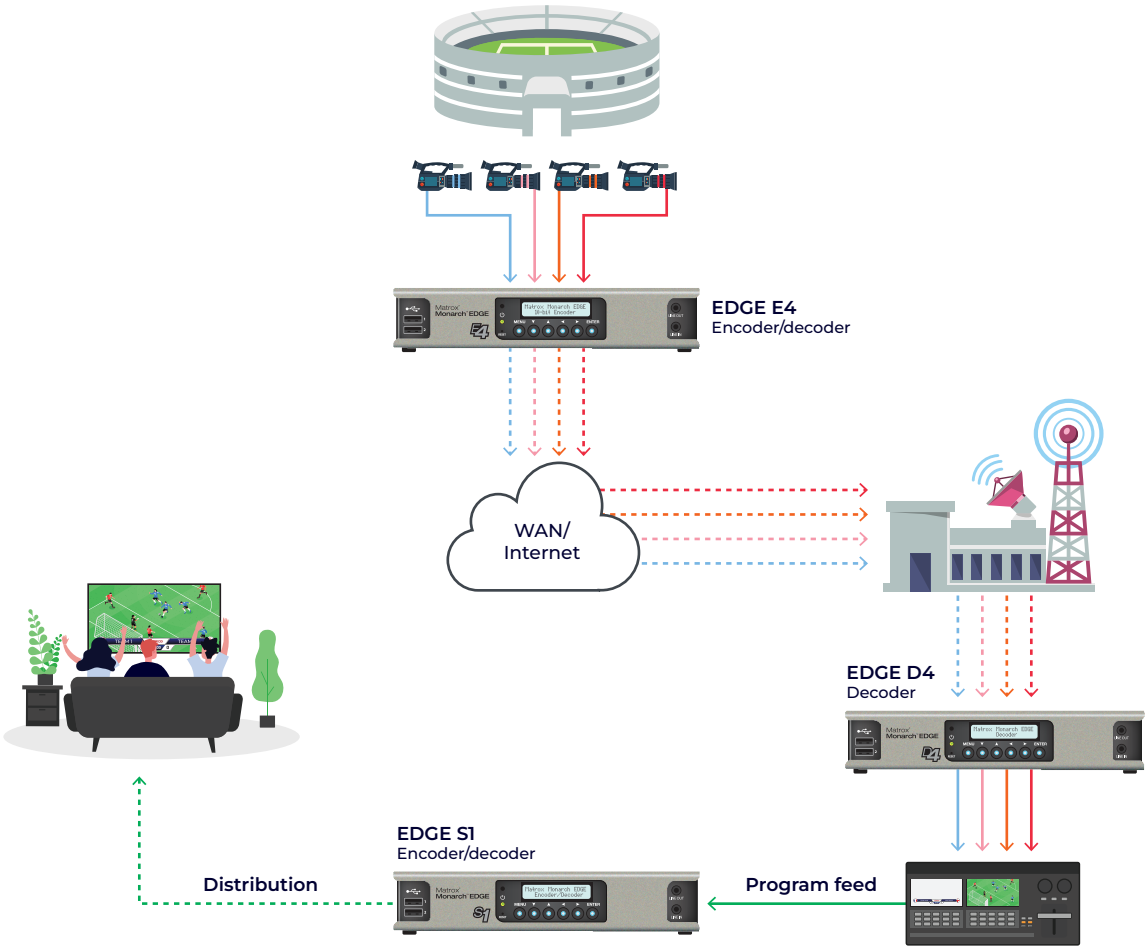
Keep it in-sync
All channels encoded by Monarch EDGE E4 are locked to a single clock, with timestamps that allow the Monarch EDGE D4 decoder to perfectly realign streams on output. For optimal synchronization, Monarch EDGE E4 provides a built-in genlock output to sync your camera feeds without an external generator, ensuring frame-accurate results.

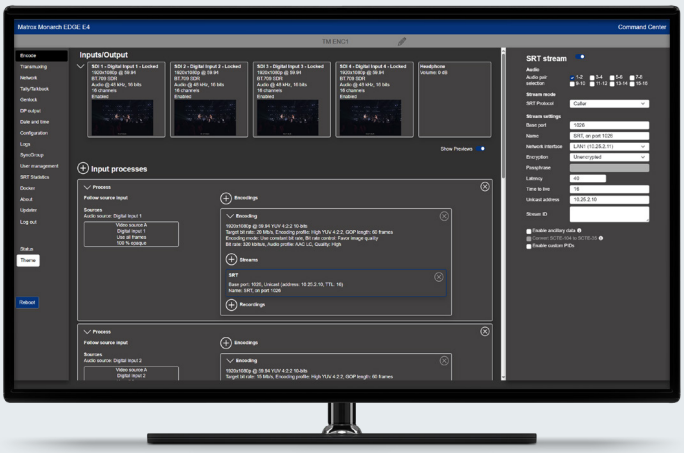
Flexible protocols
Monarch EDGE E4 supports multiple streaming protocols, such as MPEG-2 TS, RTSP, and SRT, to adapt to a wide range of environments. On closed networks, MPEG-2 TS will deliver the lowest latency. For cloud-based destinations, or when the network is congested, SRT may be more appropriate on open networks. SRT streams can also be encrypted if security is a concern.

Robust and practical design
The Monarch EDGE E4 encoder was built with reliability in mind. An LCD screen on the front of the appliance allows the user to quickly access its status and basic configuration settings. A locking power connector safeguards against connection loss during production. Redundant 1 GbE Ethernet ports allow for media and control. Monarch EDGE's compact design ensures it can be installed in a fly-pack or with a second Monarch EDGE unit in a 1RU-rack space.

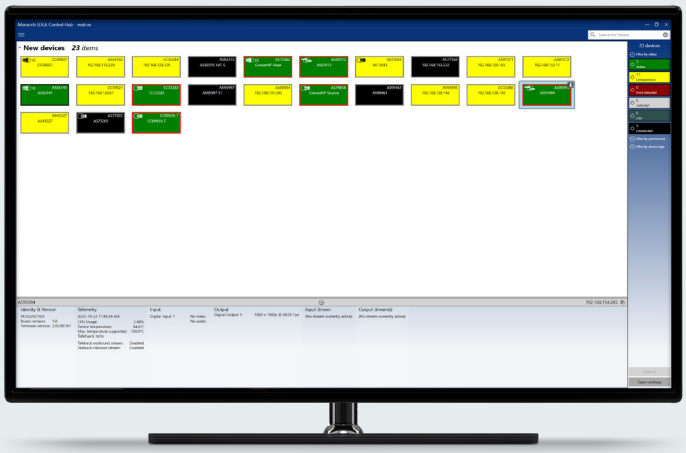
Remote production encoding and decoding.

Coupled with the powerful Monarch EDGE D4 decoder, the Monarch EDGE E4 encoder offers exceptional quality at the lowest latency while securely transporting your video feeds from the event to the centralized production facility. This compact, robust, and low-power remote production encoder/decoder pair has made producing live, multi-camera events more affordable than ever by keeping talent in-house.



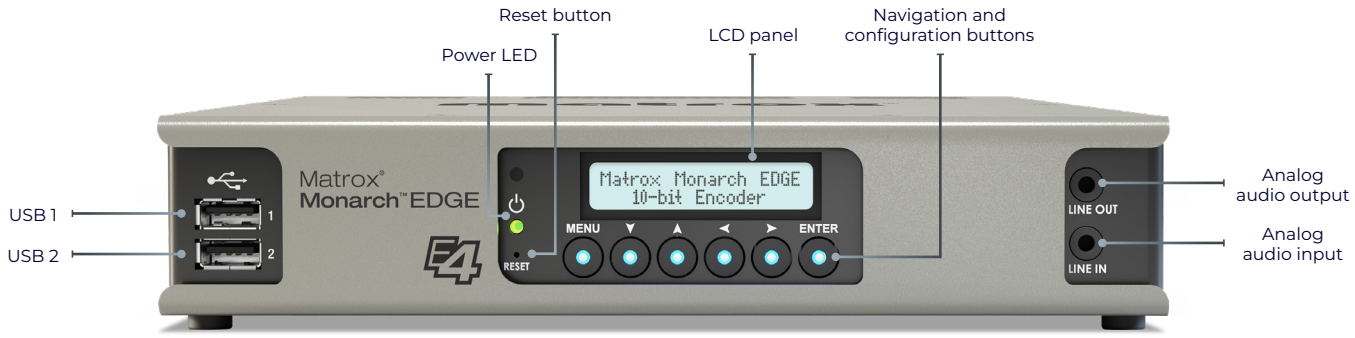


Monarch EDGE **Command Center**

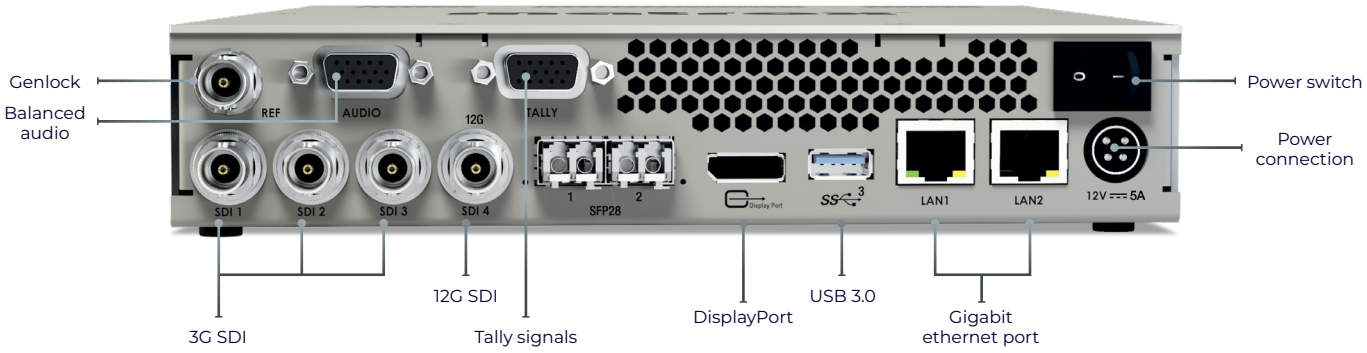


Monarch EDGE **Control Hub**

Appliance overview



Matrox Monarch EDGE E4 (front view)



Matrox Monarch EDGE E4 (back view)

Monarch EDGE Command Center.

Enhance your experience with Monarch EDGE devices with Monarch EDGE Command Center. Manage and access your Monarch EDGE devices locally or online via a web browser, without additional software installation requirements. Benefit from web-based firmware updates and included technical support to ensure your devices are up-to-date and running smoothly.

Monarch EDGE Control Hub.

Take control of your workflows with Monarch EDGE Control Hub. This software enables you to discover all Monarch EDGE units on a local network through a Windows® desktop application.

Technical specifications

Product	Monarch EDGE E4 10-bit encoder
Part number	· **MDG4/E10/I2** (4:2:0 8-bit, 4:2:0 10-bit, and 4:2:2 10-bit encoding) · **MDG4/E8/I2** (4:2:0 8-bit encoding)
Connectivity	
Input connections	· 1x 12G SDI per SMPTE ST 2082 · 3x 3G SDI per SMPTE ST 425 (Level A and B mapping) · UHD support using 4x SDI per SMPTE ST 425-5 - Square division
Resolutions	· 2160p at 50, 59.94, 60 fps · 1080p at 23.98, 24, 25, 29.97, 30, 50, 59.94, 60 fps · 1080i at 25, 29.97, 30 fps · 720p at 50, 59.94, 60 fps
Genlock	· Bi-level reprogrammable genlock output (encoder)
Digital audio	· 16x channels of embedded SDI audio is supported per input · 16x channels of audio support per encode using SRT or MPEG2-TS
Analog audio[1]	· 2x channels of balanced analog audio input via XLR connector
Audio processing	· Embedded or analog audio channels can be compressed as a stereo pair or processed as PCM (uncompressed audio) · Multi-channel audio support as separate audio pairs
USB ports	· 2x USB 2.0 (front) · 1x USB 3.0 (back)
Confidence preview	· 1x DisplayPort 1.1 · Maximum resolution: 1920x1080
Multi-unit synchronization support	· Yes
Reconfigurable I/O	· Yes
Control and management	
Access	· Matrox Monarch EDGE Command Center (web UI) · Monarch EDGE Control Hub dedicated Windows® application · RESTful HTTP API[2]
Physical	· On-device buttons and screen for basic set up and monitoring operations
Compression	
Codecs	· Video: H.264/MPEG-4 part 10 (AVC) · Audio: AAC-HE, and AAC-LC, and PCM S302M
Bitrate per stream	· Video: Up to 120 Mbps · Audio: From 32 to 256 Kbps
Chroma sub-sampling	· 4:2:2 (8-bit and 10-bit), 4:2:0 (8-bit and 10-bit)
Encoding controls	· Up to 5.2 level support · GOP size and structure · Variable and constant bit rate support · Average max/min data rate controls · Encoding frame rates offered independent of input frame rates
Profile	· Up to High 4:2:2 profile (Hi422P)
Latency	· Encode latency as low as 100ms glass-to-glass (network transfers not included in value)
Encode density/ workflow examples	· 4:2:2 workflows - 1x 3840x2160p @60fps Plus 1x 1080p30 proxy stream (8-bit) or - 4x 1920x1080p @60fps Plus 4x 720p30 proxy stream (8-bit) · 4:2:0 workflows - 2x 3840x2160p @60fps or 8x 1920x1080p @60fps or 16x 1920x1080p @30fps

VANC ancillary data transport as per ST-2038	

	· Closed captioning (CC) embedded as CEA-608/708
	· SCTE-104 messages (Matrox encoder to decoder)
	  - SCTE-104 to SCTE-35 translation
	  - SCTE-35 to SCTE-104 translation
	· Vertical interval timecode (ST 12-2)
	· HDR and colorimetry metadata

Tally[3]	
	· 8x tally signals (sent to cameras – encoder) · Tally ports available via a 15-pin D-SUB Connector
Streaming protocols	
	· MPEG-2 TS over UDP or RTP · RTP/RTSP · Native RTP (unicast or multicast) · SRT (Caller, Listener, Rendez-Vous, Stream ID, and Connection Bonding modes) · RTMP (encoder only)
Network	
	· 2x RJ45, 100/1000BASE-T Ethernet
Physical and power	
Product dimensions	· 8.53 (L) x 7.45 (W) x 1.68 (H) in 21.7 (L) x 18.9 (W) x 4.3 (H) cm · Rack-mountable; two Monarch EDGE appliances can fit in 1 RU space
Product weight	· 3.65 lbs (1,660 g)
Operating conditions	· 32 to 104 deg. F (0 to 40 deg. C), 20 to 80% relative humidity (non-condensing)
Power	· Line voltage: 12 volts · Total power consumption: 45 watts [avg.] · Connector: DIN 4
Power supply	· Line voltage: 100-240 VAC · Frequency: 50-60 Hz · Input: external AC/DC adapter – IEC320-C14 · DIN4 locking power connector
Regulatory	· EMI: FCC Class A, CE Mark Class A, ACMA C-Tick Mark, VCCI - Power-supply safety: UL/CUL(UL60950-1), TUV-GS(EN60950-1), T-LICENSE(BS EN60950-1), CCC(GB4943.1-2011), PSE(J60950), SAA(AS/NZS60950-1), KC-MARK(K60950), S-MARK(IEC60950-1) · RoHS directive 2002/95/EC
Warranty	· Two-year limited warranty with free online or telephone support
Ordering information	
MDG4/E10/I2	· Monarch EDGE appliance with 4:2:0 10-bit, and 4:2:2 10-bit encoding · Includes IEC-C14 power cord (US, UK, AUS, EUR)
MRCH/RACK/KIT	· Monarch Rack Mount Kit. Can fit up to two Monarch EDGE units in a 1RU space
PWR/SUP/MDG	· Monarch EDGE power supply unit. Does not include IEC-C14 power cord. These cables must be sourced locally.
MDG/AUD/CBL	· Monarch EDGE break out audio cable. Provides two input channels and two output channels. DB15 to XLR I/O.
Accessories	
NRG Redundant Power Supply	· NRG-5-1DB: Rack tray with one NRG RPSU pre-installed · NRG-5-2DB: Rack tray with two NRG RPSU pre-installed

1. Available via optional audio cable.
2. Contact your Matrox Video representative.
3. This feature is offered via a 15 Position Pin D-Sub Standard Connector.

With the help of a Pinout diagram, a cable can be assembled to interface to any tally output interface on the vision mixer.

Contact Matrox Video
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