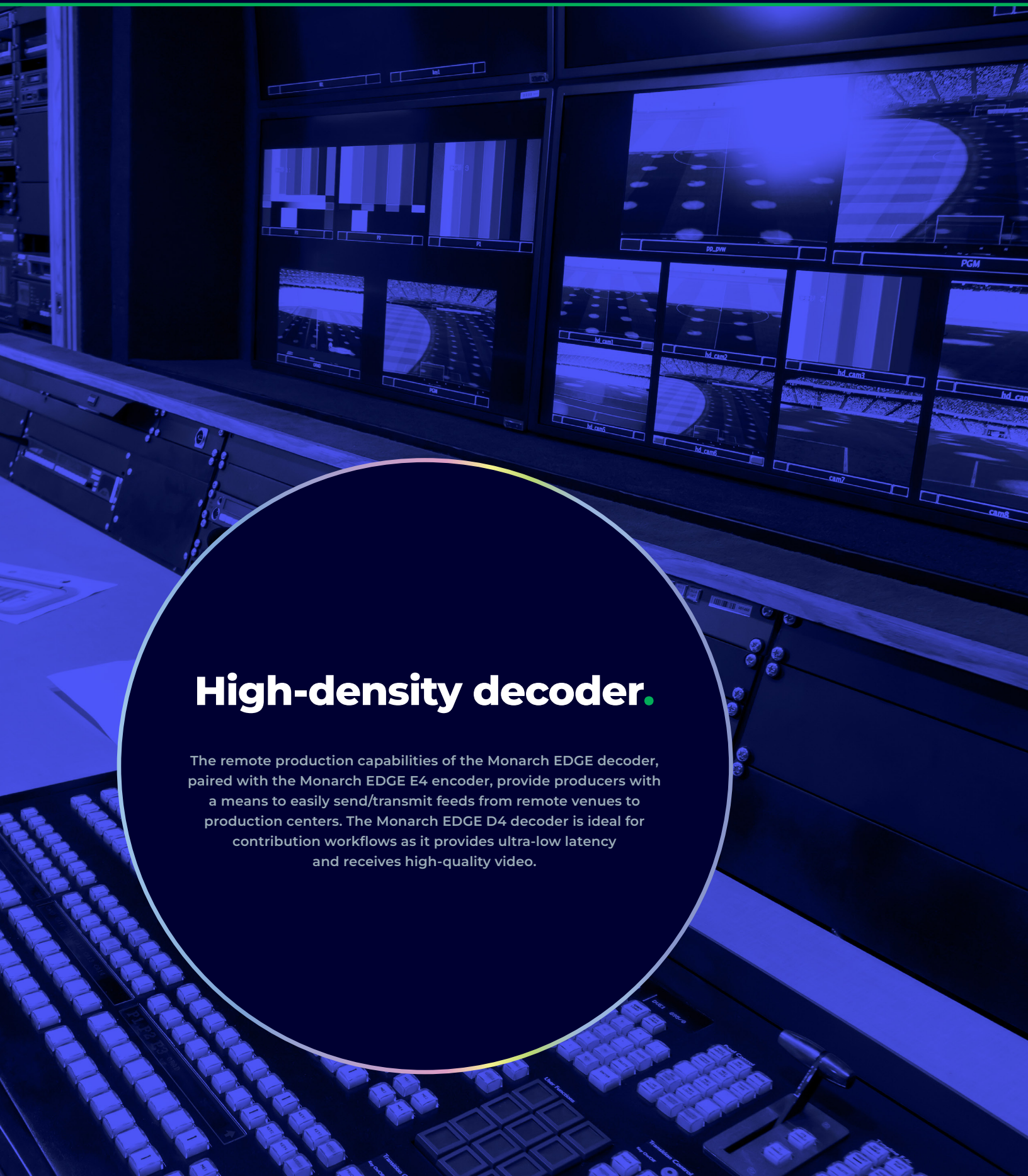
Matrox® **Monarch EDGE D4**



High-density decoder.

The remote production capabilities of the Monarch EDGE decoder, paired with the Monarch EDGE E4 encoder, provide producers with a means to easily send/transmit feeds from remote venues to production centers. The Monarch EDGE D4 decoder is ideal for contribution workflows as it provides ultra-low latency and receives high-quality video.

Key features and benefits.

Exceptionally low latency
In live productions, long encode, transmission, and decode latencies can have adverse effects on production. With glass-to-glass latencies as low as 100ms between encoding and decoding, Monarch EDGE D4 when paired with the E4 delivers exceptionally low latency over standard 1 GbE networks.

Keep it in-sync
All channels decoded by Monarch EDGE D4 are referencing timestamps from the Monarch EDGE E4 encoder to align streams on output. For optimal synchronization, Monarch EDGE D4 provides a built-in genlock input ensuring it aligns perfectly with other in-house production equipment.

Simple, easy-to-use tally and talkbalk
The Monarch EDGE D4 decoder paired with the Monarch EDGE E4 encoder 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.

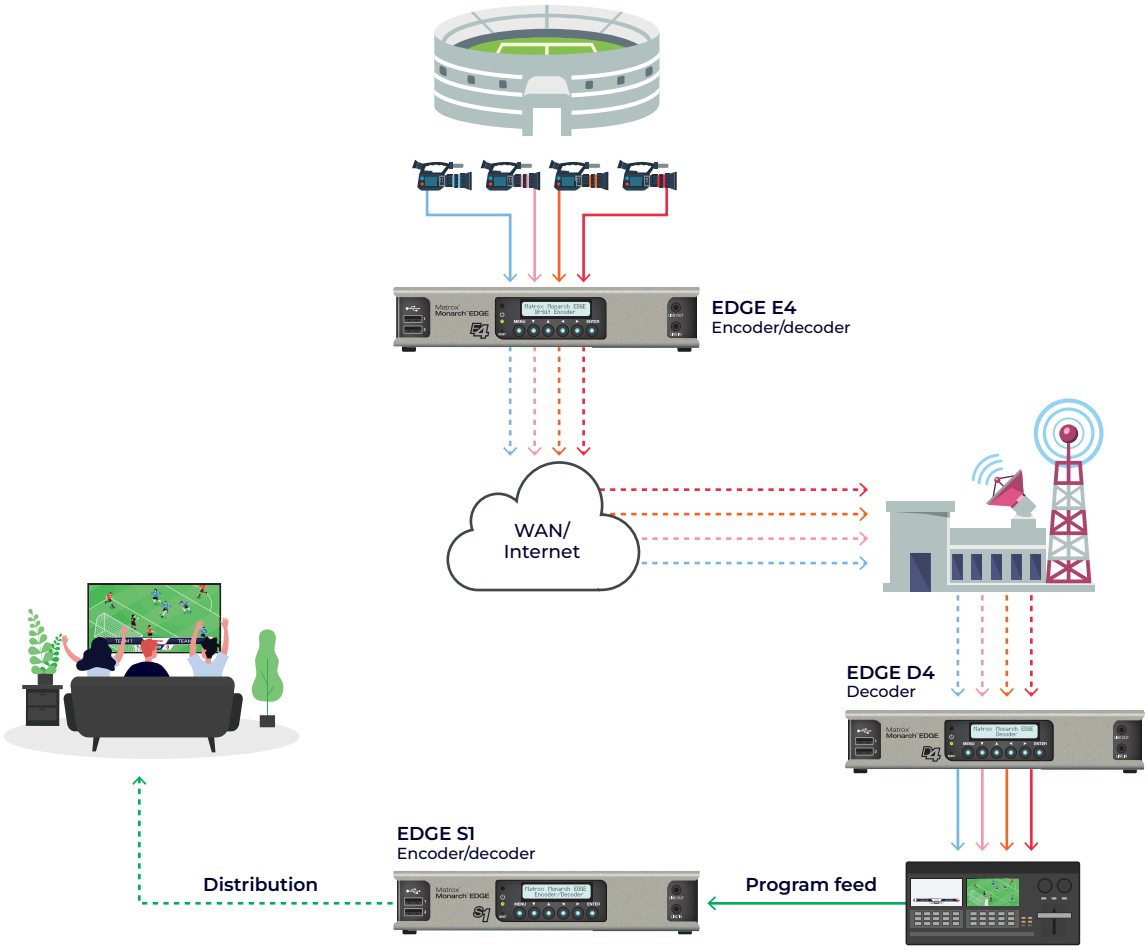
Flexible protocols
There are a variety of streaming protocols available to Monarch EDGE users. On closed networks, MPEG-2 TS or RTSP streams can be selected for delivery. For cloud-based destinations, or when the network is congested, SRT may be more appropriate. SRT streams can also be encrypted if security is a concern. The Monarch EDGE D4 decoder supports the processing of MPEG-2 TS, RTSP, and SRT.

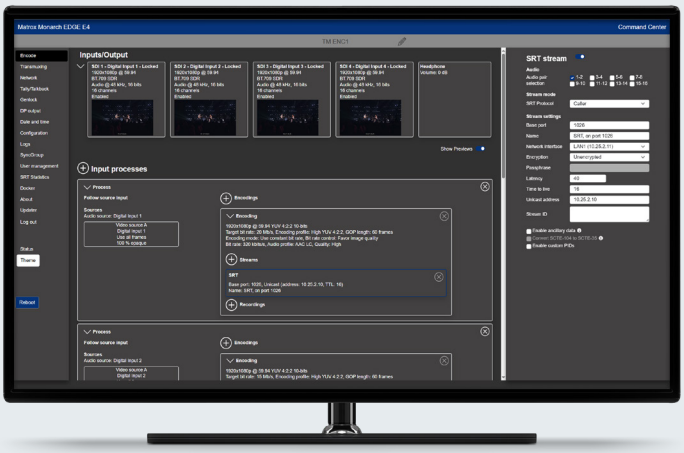
Ancillary data for automation and viewer experience
Monarch EDGE D4 supports contribution and distribution workflows by sending and receiving ancillary data, including closed captioning and SCTE messaging. Easily integrate into automated workflows for playout and ad insertion and transmit closed captions to enhance audience engagement. Monarch EDGE improves operational efficiency and strengthens the overall viewer experience, all with the highest video quality, making it a trusted choice for broadcasters.

Robust and practical design
The Monarch EDGE D4 decoder 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 1Gbe 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.

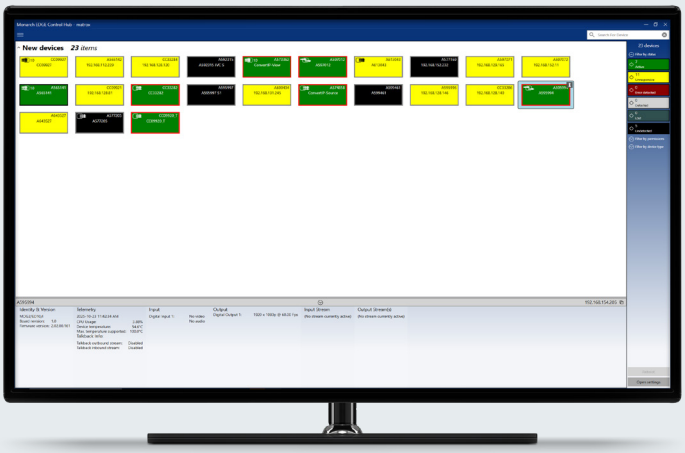
Remote production encoding and decoding workflow.

Decode live, multi-camera video streams at resolutions up to 4K or quad HD with confidence using the powerful Matrox Monarch EDGE decoder. This compact, robust, and low-power remote production decoder has made producing live, multi-camera events more affordable than ever by keeping talent in-house. Monarch EDGE securely decodes REMI streams to your master control room with remarkably low latency. Allowing for 4:2:0 8-bit or 4:2:2 10-bit encode/ decode, the Monarch EDGE encoder and decoder pairing is Ideal for demanding REMI broadcast workflows or providing backhaul feeds to your broadcast network.



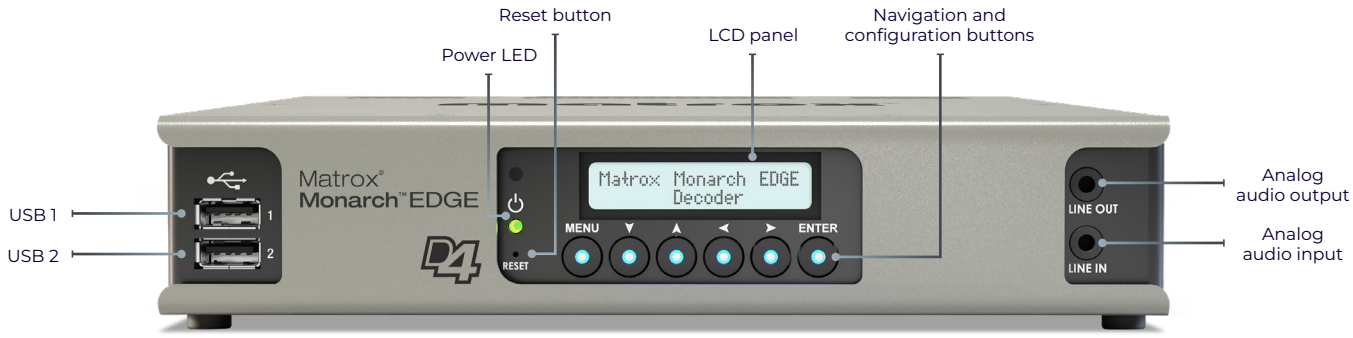


Monarch EDGE **Command Center**

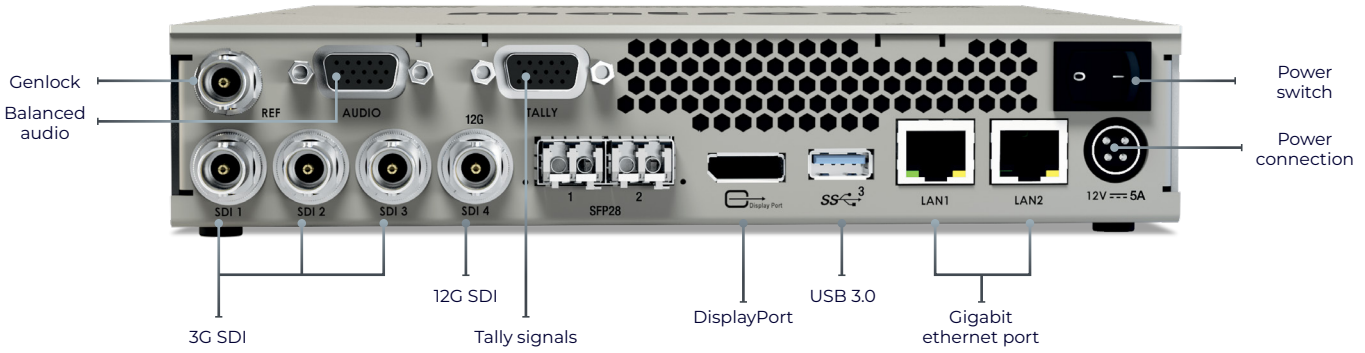


Monarch EDGE **Control Hub**

Appliance overview



Matrox Monarch EDGE D4 (front view)



Matrox Monarch EDGE D4 (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 D4 decoder
Part number	• **MDG4/D/I2** (4:2:0 8-bit, 4:2:0 10-bit, and 4:2:2 10-bit decoding)
Connectivity	
Output connections	• 1x 12G SDI per SMPTE ST 2082 • 3x 3G SDI per SMPTE ST 425 (Level A mapping only) • UHD support using 12G SDI per SMPTE ST 2082 - 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 or tri-level genlock input (decoder)
Digital audio	• 16x channels of embedded SDI audio is supported per output • 16x channels of audio support per decode using SRT or MPEG2-TS
Analog audio[1]	• 2x channels of balanced analog audio output via XLR connector • 1 channel of unbalanced stereo audio output via 1/8” TRS connector
USB ports	• 2x USB 2.0 (front) • 1x USB 3.0 (back)
Confidence preview	• 1x DisplayPort 1.1 • Maximum resolution: 1920x1080
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, 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)
Decoding controls	• Scaling of HD/UHD resolutions • Frame rate conversions
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]	
Bitrate per stream	• 8x tally signals (sent from switcher – decoder) • 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/D/I2	· Monarch EDGE appliance with 4:2:0 8-bit, 4:2:0 10-bit, and 4:2:2 10-bit decoding · 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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