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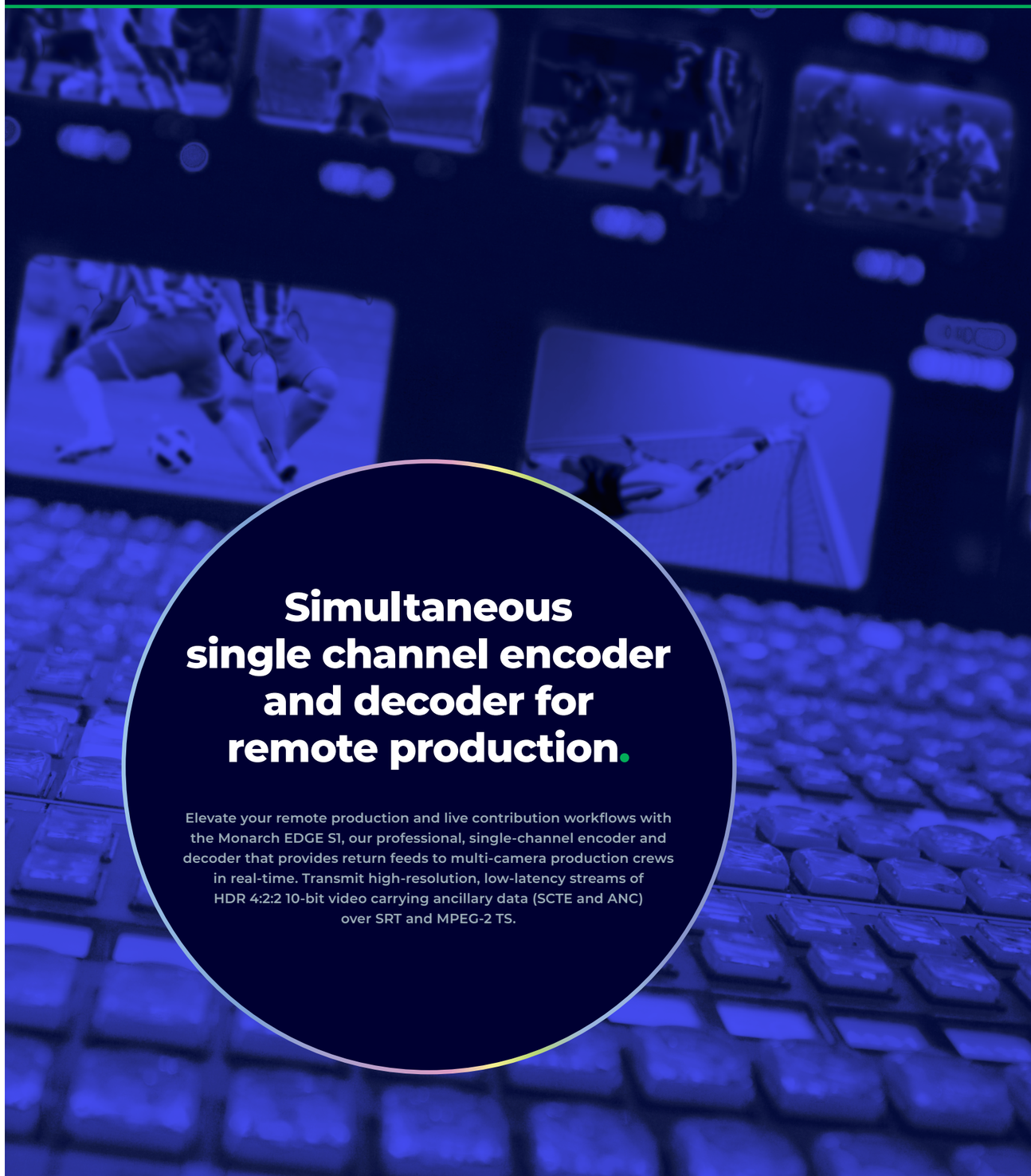
Matrox® **Monarch EDGE S1**



Simultaneous single channel encoder and decoder for remote production.

Elevate your remote production and live contribution workflows with the Monarch EDGE S1, our professional, single-channel encoder and decoder that provides return feeds to multi-camera production crews in real-time. Transmit high-resolution, low-latency streams of HDR 4:2:2 10-bit video carrying ancillary data (SCTE and ANC) over SRT and MPEG-2 TS.

Key features and benefits.

Reliable return feeds for remote production
Monarch EDGE S1 delivers high-quality, low-latency return feeds that keep on-site staff and camera operators perfectly in-sync with the live program. As a simultaneous encoder and decoder, the S1 efficiently sends program feeds from the studio back to the remote venue, giving production teams real-time visibility and the confidence they need to produce high-quality remote broadcasts.

Big productions, small footprint
Bringing remote guests and talent together from separate locations into live productions has never been easier. With simultaneous encode/decode capability, Monarch EDGE S1 provides remote participants with a single encoding contribution feed while decoding a return feed. This feature, combined with its low latency performance over public internet, allows remote participants to easily interact with the live show and panel in real-time.

Built for high quality 10-bit H.264 encoding
The optimized H.264 engine powering Monarch EDGE S1 keeps bitrates exceptionally low without sacrificing quality. The input can be streamed at resolutions up to 1080p60. Furthermore, multiple processes can be performed on the input via a powerful scaling and de-interlacing engine. This enables the input to be streamed at multiple resolutions and bitrates simultaneously, making it ideal for remote monitoring.

Exceptionally low latency
With glass-to-glass latencies as low as 100 ms between Monarch EDGE S1 devices, staff at the production venue can benefit from viewing return feeds of the live broadcast in near-real time. Furthermore, when a live production has remote guest requirements, these ultra-low latencies can facilitate near-real time interactions between speakers.

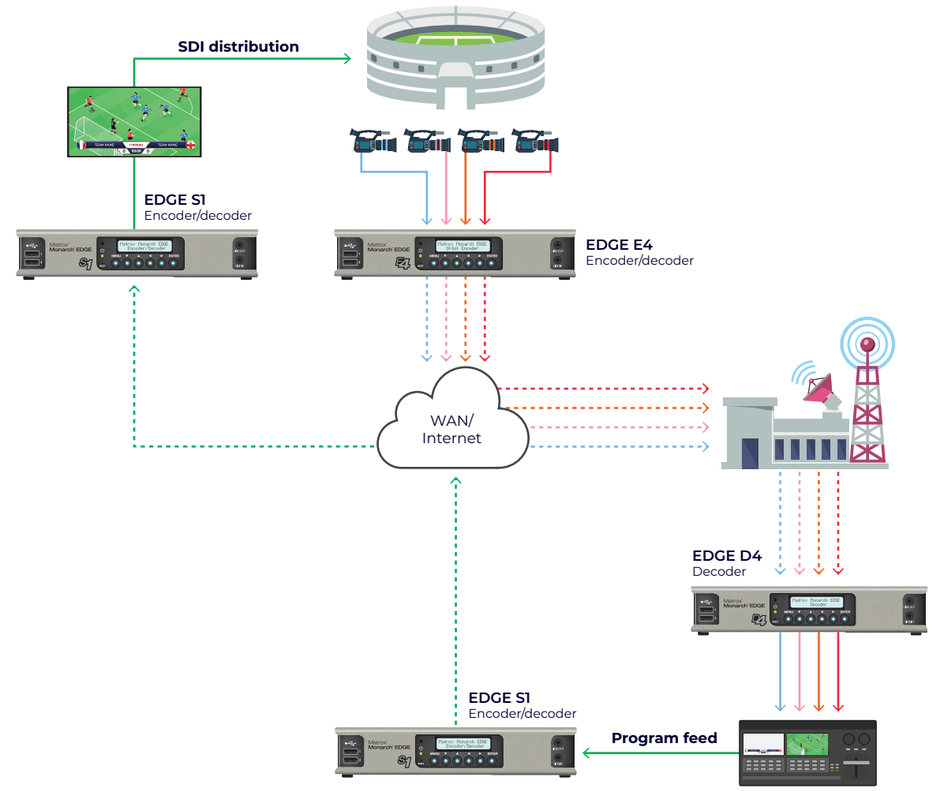
Flexible protocols, secure streaming
Monarch EDGE S1 supports multiple streaming protocols, such as MPEG-2 TS, RTSP, and SRT, to adapt to a wide range of environments. On closed networks, MPEG-2 TS will deliver the lowest latency. For cloud-based destinations, or when the network is congested, SRT may be more appropriate to reduce latency on open networks. SRT streams can also be encrypted if security is a concern.

Ancillary data for automation and viewer experience
Monarch EDGE supports contribution 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.

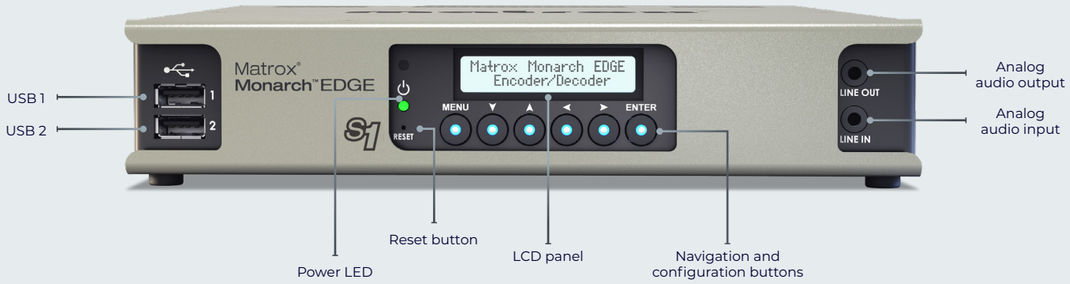
Robust and practical design
The Monarch EDGE S1 encoder/decoder was built with reliability in mind. An LCD screen on the front of the appliance allows the user to quickly access its status and basic configuration settings. A locking power connector safeguards against connection loss during production. Redundant 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.

Multi-camera production with return fee.

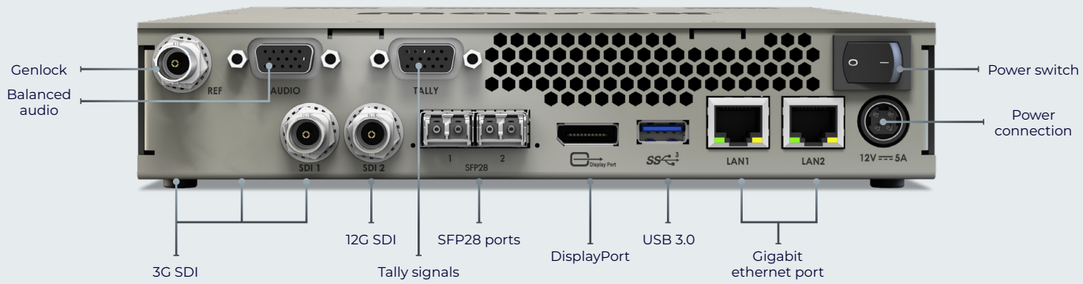
Use Monarch EDGE E4, D4, and S1 units to send multi-camera feeds to the studio and return the program output to the venue, enabling synchronized, low-latency multi-camera production.



Appliance overview



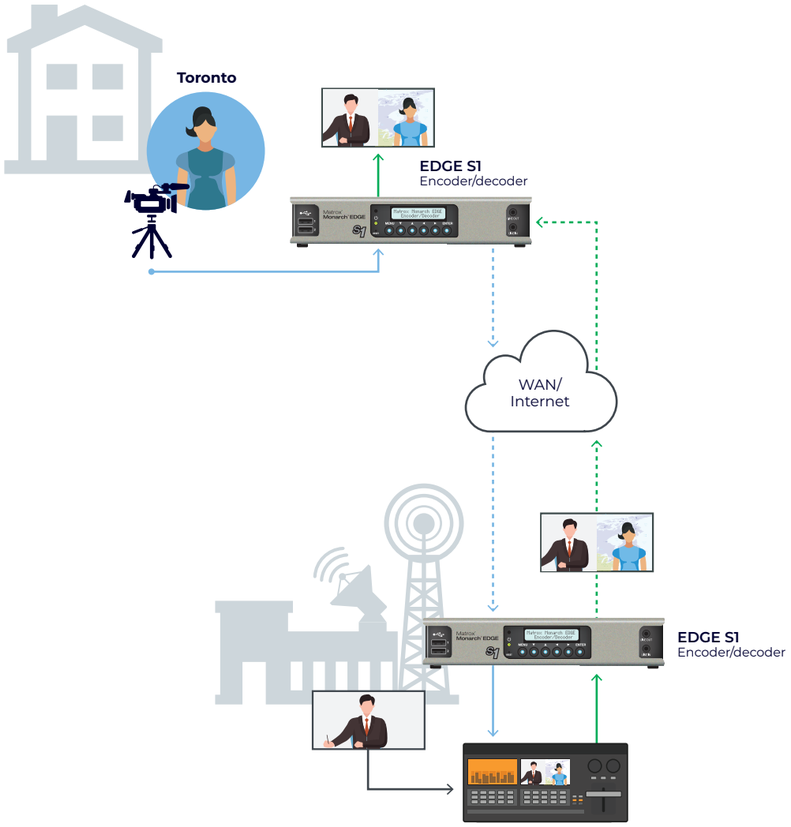
Matrox Monarch EDGE S1 (front view)



Matrox Monarch EDGE S1 (back view)

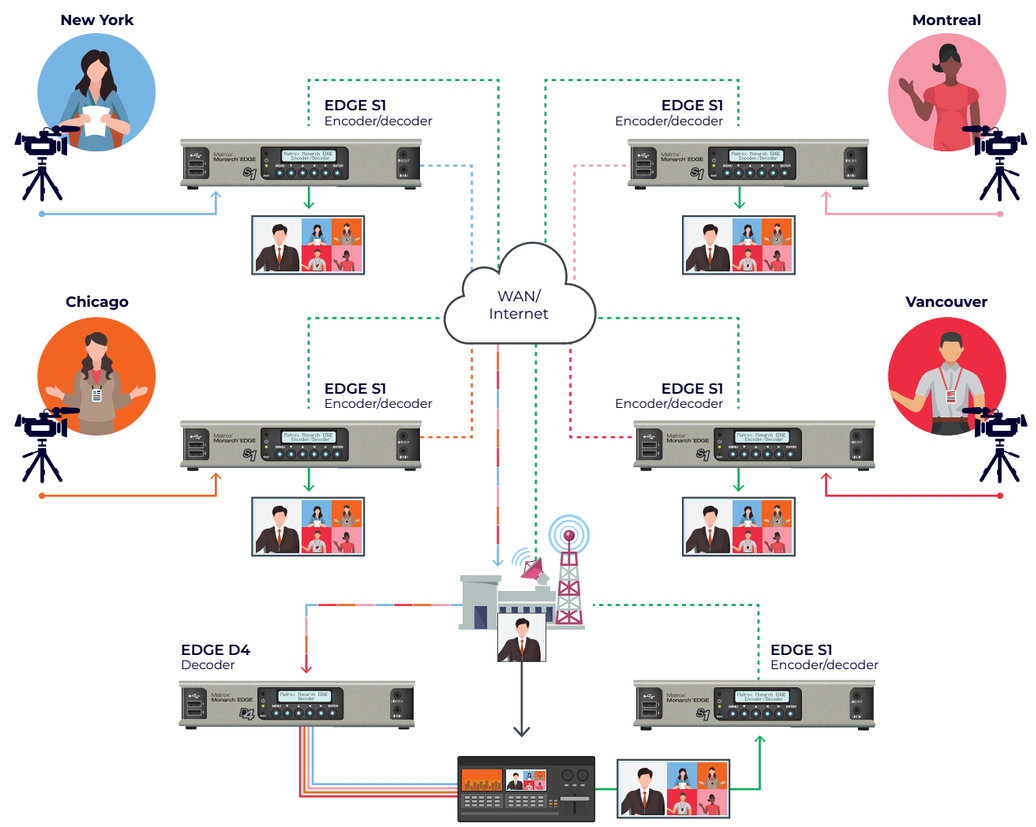
Remote contributor.

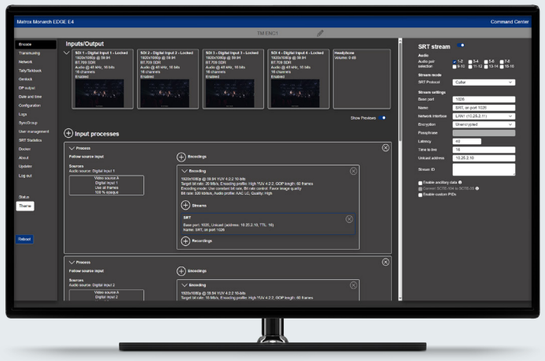
A single Monarch EDGE S1 sends the contribution feed to the studio and receives the program return, delivering low-latency, two-way communication for seamless remote contribution.



Remote collaboration.

Monarch EDGE S1 delivers low-latency, bi-directional video for remote collaboration, allowing talent in multiple locations to interact in real time with the studio and each other.





Monarch EDGE **Commander Center**

Monarch EDGE **Control Hub**

Monarch EDGE Commander Center.

Enhance your experience with Monarch EDGE devices with Monarch EDGE Commander 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 S1
Part number	· **MDG2/ED10/I2** (4:2:0 8-bit, 4:2:0 10-bit, and 4:2:2 10-bit encoding/decoding)
Connectivity	
Input connections	[available simulataneously with output operation] · 1x 3G SDI per SMPTE ST 425 (Level A and B mapping)
Output connections	[available simulataneously with output operation] · 1x 3G SDI per SMPTE ST 425 (Level A mapping only)
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	· Selectable Bi-level genlock output, or Bi-level or tri-level genlock input
Digital audio	· 16x channels of embedded SDI audio · 16x channels of audio support per encode using SRT or MPEG2-TS
Analog audio[2]	· 2x channels of balanced analog audio input via XLR connector · 2x channels of balanced analog audio output via XLR connector · 1 channel of unbalanced stereo audio output via 1/8" TRS connector
Audio processing	· Embedded or analog audio channels can be compressed as a stereo pair or processed as PCM[1] (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 (Monarch EDGE E4 10-bit SKU only)
Control and management	
Access	· Matrox Monarch EDGE Command Center (web UI) · Monarch EDGE Control Hub dedicated Windows® application · RESTful HTTP API[3]
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 rate
Decoding controls	· Scaling of HD/UHD resolutions · Frame rate conversions
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	· 4:2:2/4:2:0 workflows - 4x 1920x1080p @60fps (different bitrates) Plus 1x 720p30 proxy stream

VANC ancillary data transport as per ST-2038	
	· 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[4]	
	· 4 x Tally (GPIO) Inputs · 4 x Tally (GPIO) outputs · 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 and Rendez-Vous and Stream ID modes) · RTMP (encoder only)
Network	
	· 2x RJ45, 100/1000BASE-T Ethernet · 2x MSA-compatible SFP28 cage supporting 10 GbE and 25 GbE modules[1]
Physical and power	
Product dimensions	· 8.53 (L) x7.45 (W) x1.68 (H) in 21.7 (L) x18.9 (W) x4.3 (H) cm · Rack-mountable; two Monarch EDGE appliances can fit in 1 RU space
Product weight	· 3.65 lbs (1,660 g)
Operating conditions	· 33 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 5
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	
MDG2/ED10/I2	· 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. Enabled with future firmware update.
2. Available via optional audio cable.
3. Contact your Matrox Video representative.
4. 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.