

# Dual-Channel H.264 Encoder for Broadcast Streaming and Recording

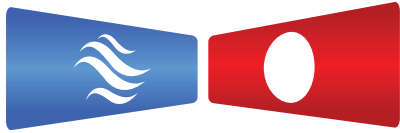


## Matrox® Monarch™ HDX Dual-Channel H.264 Encoder for Broadcast Streaming and Recording.

The Matrox Monarch HDX is a simple and versatile video encoding appliance specifically designed for broadcasters and webcasters who need a flexible solution that is powerful enough to take on today's demanding webcasting and recoding workflows. Monarch HDX offers 3G-SDI and HDMI inputs with frame-synchronization to correct any discontinuity at the input, and two independent H.264 encoders that can be assigned to individual tasks. Webcasting to YouTube and Facebook Live is made easy through its simplified set up for these popular platforms. All that's needed is to pair the device once with these accounts and it's automatically retained for subsequent streams.

## Powerful, high quality H.264 encoding engine

The Monarch HDX can share 30 Mb/s of encoding capacity across the two channels. Each channel benefits from a powerful scaling, de-interlacing, and noise reduction engine to ensure only pristine images are sent to be encoded.



## Simultaneous streaming and recording

The quality of your VOD downloads need never be dictated by the available upload bandwidth. Monarch HDX dual encoders can broadcast a live webstream at one bitrate while simultaneously recording mastering quality H.264 files for immediate availability, such as post event VOD or editing with your NLE of choice.

## Dual-channel streaming

When used as a webcasting encoder, the Monarch HDX generates an H.264-encoded stream compliant with RTSP or RTMP protocols. You can assign each channel separately to deliver what you need, where you need. Each channel can stream up to 10Mb/s, allowing you to simultaneously stream to two destinations or set the device for up to 20Mb/s streaming quality for a single encoding destination.



## Easily webcast to your audience

Monarch HDX can provide live content to CDNs such as YouTube, Facebook Live, and Ustream; media servers such as Adobe Flash and Wowza; or directly to a computer or device found on a LAN. The device is easily configured and paired for YouTube and Facebook accounts with a few short steps. As a certified "Works with Wowza" encoder it allows users to benefit from enhanced integration with the Wowza™ streaming engine via XML files or Wowza tokens. Additionally, Monarch HDX supports XML files generated for use with Flash Live Media Encoder.

## Dual-channel recording

Monarch HDX provides a huge amount of flexibility as an H.264 video recorder. Content is captured as either MOV or MP4 files to ensure that recordings can be played by the viewer's choice of application. Each recording channel can be stored independently to a local SD card or USB drive, or remotely on a network-mapped drive so that files are immediately available to anyone on the network. Recordings can also be encoded at different bitrates should there be a need to deliver content to devices with varying decode or bandwidth capacities.



## Secure back-up with disaster recovery



By targeting local and remote storage simultaneously, Monarch HDX ensures that no action will be lost should the network go down. Furthermore, it provides users with the ability to create split files while recording; particularly useful when recording for extended periods of time. The user can set a specific file segment length and Monarch HDX will automatically stop recording in one file and start a new file once the elapsed time is reached, without losing a single frame. The split file feature also ensures the majority of content will be preserved if disaster hits such as a power failure. All files created up to that moment will be saved and uncorrupted.

## Matrox file consolidator application

Matrox provides a free Java-based utility that allows users to consolidate a sequence of MP4 or MOV files recorded with the "Split File" feature enabled. The application does not transcode but simply rewraps the video data, accelerating the consolidating process. The resulting file will have the same quality as the original and playback seamlessly, even across the file boundaries.



## Selectable HDMI and SDI inputs and simultaneous outputs

Monarch HDX H.264 video recorder can accept signals from HDMI or SDI sources. The input is selected using the web based UI, Matrox Command Center, or directly on the unit itself, allowing for a wide range of connectivity to devices such as cameras, switchers or routers. Additionally, both inputs are complemented by internal frame synchronisers to ensure uninterrupted streaming and recording operations, regardless of the disturbance on the input. The audio is also selectable between the two channels of the embedded video signal or the analog stereo input. Audio may be dynamically muted/unmuted without affecting the video encoding operation.

Regardless of input selection, SDI, HDMI video and embedded and analog audio outputs are live. For SDI workflows, the Monarch HDX recorder has an extremely low pass-through latency with a built-in power-loss relay which, in case of power loss, will route the SDI input directly to the SDI output, ensuring signal path integrity and fail safe design options.



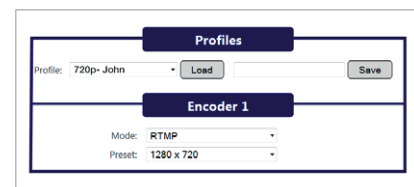
## Closed captioning support



Ideal for broadcasters who require the integration of closed captioning while streaming and/or recording. Monarch HDX retrieves closed captioning data from the SDI VANC or line 21, then embeds the data within the H.264 essence as CEA-608. Caption-enhanced H.264 media can be streamed to video hosting platforms including YouTube Live and Ustream, media servers such as Wowza™, or a variety of content delivery networks (CDNs). MOV/MP4 files recorded with Monarch HDX preserves captions and can be included in VOD or archiving workflows.

## Profiles and presets

Monarch HDX ships with a number of typical streaming and recording presets that define all the encoding parameters including resolution and bitrate. Whether preset or custom parameters are used, they only need to be entered once and saved as a unique profile. A profile not only contains encoding parameters but also destination information detailing where the encoded video is being sent. Multiple profiles can be saved if the device is used in different environments. Each profile can be loaded instantly without having to re-enter data.



## Control from anywhere

Matrox Monarch HDX can be controlled and configured via the Monarch HDX Command Center using any device on the network that supports a standard web browsing application such as a computer, smart phone or tablet. Designed for operator ease-of-use, master controls provide one-click operation to start streaming, recording or both from anywhere within the user interface.

The device also provides convenient controls directly on the unit itself to stop/start recording or streaming, and an additional button to assign the input.

## Matrox Utils application

The Matrox Utils application allows operators to remotely scan and find all Monarch HDX's present on their network. The Utils application will also scan the attached Monarch HDX and notify the operator if the unit is up to date with its installed firmware version and will also update the device automatically to ensure that it has the latest software release installed. The Matrox Utils application can also be used to reboot Monarch HDX devices present on the network.



## H.264 preview stream

Monarch HDX H.264 encoder provides a very useful low bitrate preview stream of the input directly in the Command Center UI. This same preview can be viewed using software players such as VLC or on third-party devices, such as Crestron control panels. This stream is available independently of the two encoder channels allowing you to check your video signal before your webcast goes live.

## Integrate Matrox Monarch HDX into your own application or environment

Broadcasters, network or cloud-based video management platform developers, A/V integrators and value-added resellers can use Monarch HDX Dev Tools, which include automatic configuration tools and the Monarch HDX Control API, to provide a unified, consistent and branded user experience. Individual users need not interact with the Monarch HDX Command Center web UI, which can simplify enterprise-level and centrally administered deployments.



Automatic configuration tools can be used to set all Monarch HDX encoding and destination settings by simply loading a properly formatted configuration file. For example, specialized CDNs and video platform providers who wish to offer a branded plug-and-play user experience can use the automatic configuration tools to give their customers a very simple installation procedure. The customer only needs to insert a USB key containing the customized automatic configuration file, boot the new Monarch HDX and the device will be ready to stream at exactly the right settings. Similarly, IT administrators in broadcast, corporate and education environments with deployments of multiple Monarch HDX units on a network can use the tools to manage all of the units from a single application or portal. This can be done automatically by having each Monarch HDX access a defined webpage for configuration settings at boot up. Alternatively, the task of fetching configuration settings can be triggered manually from the Monarch HDX Command Center.

Monarch HDX Control API is an HTTP-based API that lets system integrators create their own control software to start, to stop, to set streaming bitrates and destinations, and to get the status of a Monarch HDX device. The Monarch HDX Command Center or the automatic configuration tools are used to initially configure devices with complete streaming and recording parameters. Once set up, units can be controlled using the custom application, on-device buttons only or the Command Center.



**ROSS**



## Integrate with Crestron or ROSS DashBoard

The Monarch HDX Control API is an ideal way to integrate Monarch HDX functionality into an existing broadcast facility, classroom, boardroom or other space equipped with a Crestron control system. Broadcasters who use ROSS equipment can take advantage of our ROSS DashBoard network control and monitoring integration. Monarch HDX registered users are invited to download a sample SIMPL module written to run on Crestron 2-Series® and 3-Series® Room Media Controllers or our ROSS DashBoard module for use with ROSS DashBoard Control Systems.

## Robust and practical design

Powerful and robust, Monarch HDX offers simple, one touch stream and record push buttons, input selection, and a locking power connector. Monarch HDX's HDMI or SDI outputs makes it easy to monitor what you are streaming and recording, regardless of signal source. All eight channels of embedded audio can be passed from any input to any output. When embedded audio is selected, all eighth channels are passed from input to output. When Analog audio is selected, it is both looped out as well as embedded in video outputs. Its design allows Monarch HDX to be just as easily located on a desktop as in a rack - up to two units can fit in a single 1RU tray. The storage and button controls are conveniently located on the front of the unit while the power and I/O ports are found at the back. Finally, the Monarch HDX also features a wide input voltage range of 9 to 24 volts. It can be powered using the Matrox supplied power supply or DC sources such as standard field batteries.

## Matrox Monarch HDX connections



Front view



Back view

- |  |  |   |
|--|--|---|
| <ol style="list-style-type: none"> <li>1. Power LED</li> <li>2. Input Section Button</li> <li>3. Start/Stop Encoder 1</li> <li>4. Start/Stop Encoder 2</li> <li>5. USB 2.0 Ports</li> <li>6. SD Card Slot</li> <li>7. Power Connector</li> </ol> | <ol style="list-style-type: none"> <li>8. Gigabit Ethernet Port</li> <li>9. RS-232 Connector</li> <li>10. HDMI Output Connector (with embedded audio)</li> <li>11. HDMI Input Connector (with embedded audio)</li> <li>12. SDI Output Connector (with embedded audio)</li> </ol> | <ol style="list-style-type: none"> <li>13. SDI Input Connector (with embedded audio)</li> <li>14. Auxiliary Input Connector</li> <li>15. Analog Audio Output (stereo)</li> <li>16. Analog Audio Input (stereo)</li> </ol> |
|--|--|---|

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Matrox is a market leader in the 4K and HD digital video hardware and software fields, offering accelerated H.264 encoding, streaming, AV signal conversion, capture/payout servers, and CGs. Matrox's Emmy award-winning technology powers a range of multi-screen content creation and delivery platforms used by broadcasters, telcos, cable operators, post-production facilities, live event producers, videographers, and AV professionals worldwide. Founded in 1976, Matrox is a privately held company headquartered in Montreal, Canada. For more information, visit [www.matrox.com/video](http://www.matrox.com/video).

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