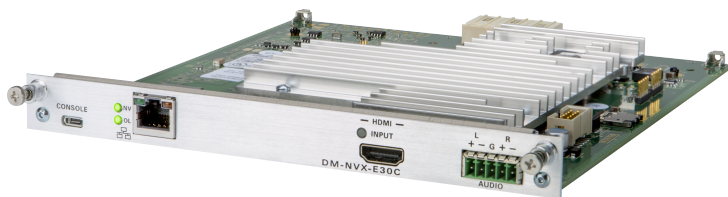


## DM NVX® 4K60 4:4:4 HDR Network AV Encoder Card



- 4K60 4:4:4 video over standard Gigabit Ethernet
- HDR10, HDR10+, and Dolby Vision® video support
- Real-time video performance over the network
- Pixel Perfect Processing technology
- Enterprise-grade security including 802.1X, Active Directory® credential management, TLS, and AES-128
- HDCP 2.3 compliant
- Encoder functionality for use with DM NVX® products that can function as decoders
- One HDMI® input
- Image preview
- Test pattern generator
- Fixed, adaptive, or variable bit rate
- Analog audio de-embedding
- 7.1 surround sound audio
- AES67 audio embedding and de-embedding
- Copper Ethernet connectivity
- Automatic point-to-point connectivity
- CEC device control
- Easy setup via built-in web pages
- Compatibility with Crestron® 3-Series® or later control systems
- Streamlined management using DM NVX Director® virtual switching appliances
- .AV Framework™ technology support
- XiO Cloud® service support
- Crestron Home™ OS support
- API for full control of the DM-NVX-E30C
- Designed for installation into a DMF-CI-8 chassis

**DM NVX®** technology transports ultra high-definition 4K60 4:4:4 video over standard Gigabit Ethernet with no perceptible latency or loss of quality. Using standard network switches and CAT5e UTP wiring, a DM NVX system delivers a high-performance virtual matrix routing solution for any enterprise or campus-wide 4K content distribution application. Support for HDR (High Dynamic Range) and HDCP 2.3 compliance ensures the ultimate in picture quality and compatibility for all of today's varied media sources.<sup>1,2</sup>

The DM-NVX-E30C is an AV over IP encoder that occupies one slot of a [DMF-CI-8](#) card chassis. The card is designed to function as a transmitter in a high-density rack-mount installation. Featuring secure web-based control and management, an HDMI® input, an analog audio output, AES67 transmit and receive capability, and copper Ethernet connectivity, the DM-NVX-E30C offers an encoder solution for a DM NVX network AV installation of any size.<sup>2</sup>

### Real-Time 4K60 Video Distribution

Engineered for demanding conference room and classroom applications, DM NVX technology ensures real-time, full-motion 4K60 video performance for the presentation of multimedia, videoconferencing, and live camera images. Interactive functions such as gameplay and the use of a mouse are fluid and natural.

A DM NVX system is engineered for stability and ultimate reliability. Line-synchronized outputs ensure perfect synchronization of content across multiple displays for applications such as digital signage. Variable Multicast TTL (Time To Live) enables traversing multiple network routers for optimal flexibility.

### Pixel Perfect Processing Technology

A DM NVX system incorporates Pixel Perfect Processing technology, which provides flawless video transport in all applications. The DM-NVX-E30C can encode a video signal to achieve imperceptible end-to-end latency of less than 1 frame. The image quality of the source is maintained across a 1-Gigabit network at any resolution up to 4K60 4:4:4.

### Enterprise-Grade Security

Using advanced security features and protocols such as 802.1X authentication, Active Directory® credential management, AES-128 content encryption, PKI authentication, TLS, SSH, and HTTPS, a DM NVX system delivers a true enterprise-grade network AV solution engineered to fulfill demanding IT policies.

### Encoder Functionality

The DM-NVX-E30C is a basic encoder card with one HDMI input that allows a laptop computer, camera, or other media source to be connected via an HDMI cable and then transmitted over the network to one or many decoders.<sup>1</sup> Compatible with DM NVX products that can function as decoders, the DM-NVX-E30C can be used in any DM NVX network AV design.

### Image Preview

Image preview provides still images (thumbnails) that show the current video being received by an input of a DM NVX encoder. Still images are shown at one frame per second. Image preview supports the maximum resolution of the source and scales the image while maintaining the aspect ratio. Images can be previewed in the DM NVX web interface and accessed remotely using a web browser. The images can also be previewed on a Crestron touch screen or third-party interface.

# DM NVX® 4K60 4:4:4 HDR Network AV Encoder Card

## Test Pattern Generator

The built-in test pattern generator can be used during setup to ensure that video streaming is functional and can also be used as a tool for the adjustment, calibration, and alignment of displays, projectors, and video walls. The DM NVX encoder can send the test pattern to any routed DM NVX decoder.

## Fixed, Adaptive, or Variable Bit Rate

The bit rate of a stream can be set to fixed, adaptive, or variable:

- A fixed bit rate, also referred to as Constant Bit Rate (CBR), is user specified and can be set to a value ranging from 200 Mbps to 950 Mbps.<sup>3</sup>
- Adaptive bit rate (ABR) enables the encoder to automatically set a fixed bit rate based on the input resolution of the stream. For example, the adaptive bit rate for a common resolution such as 1920x1080p@60Hz (1080p60) would automatically be set to 400 Mbps. Adaptive bit rate makes better use of the available bandwidth than a user-specified fixed bit rate.
- Variable bit rate (VBR) enables the encoder to automatically vary the bit rate based on the content and input resolution of the stream. The bit rate can vary from less than 150 Mbps to a maximum of 750 Mbps. A variable bit rate results in the use of less bandwidth to produce the same image quality as a user-specified fixed bit rate or an adaptive bit rate.

The web interface or a control system can be used to set a fixed bit rate or to enable adaptive or variable bit rate functionality.

## Analog Audio De-embedding

The analog audio output provides a stereo line-level signal to feed a local sound system or sound bar. The output volume is adjustable via a control system or web browser.<sup>4</sup>

## 7.1 Surround Sound Audio

DM NVX technology supports the lossless transport of 7.1 surround sound audio signals, including Dolby® TrueHD, Dolby Atmos®, DTS HD®, DTS:X®, and uncompressed linear PCM.

## AES67 Audio Embedding and De-Embedding

AES67 support enables the HDMI source to be transmitted as a 2-channel AES67 audio stream while another 2-channel AES67 audio stream is received from a Crestron DSP or other third-party device. The received AES67 audio stream can be output via the analog audio output.

**NOTE:** An AES67 audio stream that is received by a DM NVX endpoint cannot be transmitted from that endpoint.

## Copper Ethernet Connectivity

The DM-NVX-E30C includes one RJ-45 1000BASE-T Ethernet port.<sup>2</sup> For information about network requirements and guidelines, refer to the [DM NVX AV-over-IP System Design Guide](#), Doc. 7977.

## Automatic Point-to-Point Connectivity

Point-to-point connectivity enables the DM-NVX-E30C to be connected directly to a DM NVX 4K60 4:4:4 decoder to stream video and audio. Rather than being connected to an Ethernet switch, the 1000BASE-T Ethernet port of the encoder is connected directly to a 1000BASE-T port of a decoder.

By default, point-to-point mode automatically detects whether the DM-NVX-E30C is connected directly to a DM NVX 4K60 4:4:4 decoder or to a 1000BASE-T switch. When a direct connection between the DM-NVX-E30C and a decoder is detected, the devices operate in point-to-point mode without the need for additional configuration; however, a control system is required for CEC (Consumer Electronics Control).

## CEC Device Control

Under the management of a control system, the DM-NVX-E30C can control a source device via CEC over the HDMI connection, potentially eliminating the need for dedicated serial cables or IR emitters.

## Web-Based Setup

Setup of the DM-NVX-E30C is accomplished by using a web browser. Full control and monitoring of the card is enabled through integration with a control system or with a DM NVX Director® virtual switching appliance.

## Streamlined Management Using DM NVX Director Virtual Switching Appliances

For applications that are small to moderate in size, a network of DM NVX endpoints can be configured and controlled with the use of a control system. For larger enterprise and campus-wide signal routing applications, adding a DM NVX Director virtual switching appliance ([DM-NVX-DIR-80](#), [DM-NVX-DIR-160](#), or [DM-NVX-DIR-ENT](#)) enhances and streamlines the entire configuration and control process. A DM NVX Director appliance provides a central point of management and enables the creation of multiple virtual matrix switchers through one easy-to-use web-based portal.

## High-Density Card-Based Solution

The DM-NVX-E30C is designed for installation into a [DMF-CI-8](#) card chassis, which provides a high-density solution for applications requiring multiple encoders and decoders in one equipment rack.

For additional design tools and reference documents, refer to the DM NVX web page at [www.crestron.com/nvx](http://www.crestron.com/nvx).

## DM NVX® 4K60 4:4:4 HDR Network AV Encoder Card

## Specifications

## Encoding

**Stream Type:** Pixel Perfect Processing (default) or DM-NVX-D10/D20 Series<sup>5</sup>

**Video Resolutions:** Up to 4096x2160@60Hz (DCI 4K60), 4:4:4 color sampling, HDR10, HDR10+, Dolby Vision®, and Deep Color support

**Audio Formats:** Multichannel (up to 8-channel LPCM or encoded HBR 7.1 surround sound)

**Bit Rates:** Fixed: 200 to 950 Mbps (user specified)<sup>3</sup>  
Adaptive: Dependent on input resolution of the stream  
Variable: Less than 150 Mbps to maximum of 750 Mbps (dependent on content and input resolution of the stream)

**Streaming Protocols:** RTP, SDP

**Container:** MPEG-2 transport stream (.ts)

**Session Initiation:** Multicast via secure RTSP

**Copy Protection:** HDCP 2.3, AES-128, PKI

## Video

**Input Signal Types:** HDMI with HDR10, HDR10+, Dolby Vision, Deep Color, and 4K60 4:4:4 support<sup>1,6</sup> (Dual-Mode DisplayPort™ interface and DVI compatible<sup>7</sup>)

**Copy Protection:** HDCP 2.3

**Resolutions:** Common resolutions are listed in the following table.

Scan Type	Resolution	Frame Rate	Color Sampling	Color Depth
Progressive	4096x2160 DCI 4K and 3840x2160 4K UHD	30 Hz	4:4:4	12 bit
		60 Hz	4:2:0	12 bit
		60 Hz	4:2:2	12 bit
		60 Hz	4:4:4	8 bit
	2560x1600 WQXGA Reduced Blanking	60 Hz	4:4:4	8 bit
	2560x1440 WQHD Reduced Blanking	60 Hz	4:4:4	8 bit
		120 Hz	4:4:4	8 bit
	2560x1080 UWFHD	60 Hz	4:4:4	8 bit
	2048x1152 QWXGA	60 Hz	4:4:4	12 bit
	2048x1080 DCI 2K	60 Hz	4:4:4	12 bit
	1600x1200 UXGA	60 Hz	4:4:4	12 bit
	1920x1200 WUXGA	60 Hz	4:4:4	12 bit
		1920x1080 FHD 1080p	60 Hz	4:4:4
120 Hz			4:4:4	8 bit
	240 Hz	4:4:4	8 bit	
Interlaced	1920x1080 HD 1080i	30 Hz	4:4:4	12 bit

**NOTE:** The maximum supported resolution is 4096x2160 at 60 Hz with 4:4:4 color sampling. Custom resolutions are supported at pixel clock rates up to 600 MHz.

## DM NVX® 4K60 4:4:4 HDR Network AV Encoder Card

### Audio

**Input Signal Types:** HDMI (Dual-Mode DisplayPort interface compatible<sup>7</sup>)

**Digital Formats:** Dolby Digital®, Dolby Digital EX, Dolby Digital Plus, Dolby TrueHD, Dolby Atmos, DTS®, DTS ES, DTS 96/24, DTS HD High Res, DTS HD Master Audio, DTS:X, LPCM up to 8 channels

**Analog Formats:** Stereo 2-channel

**Digital-To-Analog Conversion:** 24-bit 48 kHz

**AES67:** 24-bit 48 kHz

**Analog Performance:**

Frequency Response: 20 Hz to 20 kHz ±0.5 dB  
S/N Ratio: >95 dB 20 Hz to 20 kHz A-weighted  
THD+N: <0.005% @ 1 kHz  
Stereo Separation: >90 dB

**Analog Output Volume Adjustment:** -80 to +20 dB

### Communications

**Ethernet:** 100/1000 Mbps, auto-switching, auto-negotiating, auto-discovery, full/half duplex, TCP/IP, UDP/IP, CIP, DHCP, SSL, TLS, SSH, SFTP (SSH File Transfer Protocol), IEEE 802.1X, IPv4 only or both IPv4 and IPv6, Active Directory authentication, variable Multicast TTL, HTTPS web browser setup and control, Crestron 3-Series or later control system integration

**USB:** USB 2.0 computer console (for setup)

**HDMI:** HDCP 2.3, EDID, CEC

**DM NVX (via Ethernet):** HDCP 2.3, AES-128 AV content encryption with PKI authentication, RTP, secure RTSP, SDP, ONVIF, IGMPv2, IGMPv3, SMPTE 2022, FEC (Forward Error Correction)

### Connectors

**Ethernet:** (1) 8-pin RJ-45 connector, female; 100BASE-TX/1000BASE-T Ethernet port<sup>2</sup>

**HDMI INPUT:** (1) HDMI Type A connector, female; HDMI digital video/audio input (DVI and Dual-Mode DisplayPort interface compatible<sup>7</sup>)

**AUDIO:** (1) 5-pin 3.5 mm detachable terminal block; Balanced/unbalanced stereo line-level audio output;<sup>4</sup> Output Impedance: 200 Ohms balanced, 100 Ohms unbalanced; Maximum Output Level: 4 Vrms balanced, 2 Vrms unbalanced

**CONSOLE, USB:** (1) Micro USB connector, female; USB 2.0 computer console port (for setup)

### Controls and Indicators

**NV:** (1) Green LED, indicates unit is encoding (transmitting) network video

**OL:** (1) Green LED, indicates an online connection to a control system via Ethernet

**Ethernet:** (2) LEDs, green indicates Ethernet link status, amber indicates Ethernet activity

**HDMI INPUT:** (1) Green LED, indicates sync detection at the HDMI input

### Construction

Plug-in card, occupies (1) card slot in a DMF-CI-8 card chassis, includes metal faceplate

### Weight

14.4 oz (409 g)

### Compliance

UL® Listed for US and Canada, IC, CE, FCC Part 15 Class B digital device

### Model

**DM-NVX-E30C:** DM NVX 4K60 4:4:4 HDR Network AV Encoder Card

### Management Tools

**DM-NVX-DIR-80:** DM NVX Director Virtual Switching Appliance for 80 Endpoints

**DM-NVX-DIR-160:** DM NVX Director Virtual Switching Appliance for 160 Endpoints

**DM-NVX-DIR-ENT:** DM NVX Director Virtual Switching Appliance for 1000 Endpoints

### Accessories

For a list of accessories, visit the [DM-NVX-E30C](#) product page.

## DM NVX® 4K60 4:4:4 HDR Network AV Encoder Card

## Notes:

1. 4K60 4:4:4 performance and HDR support require the use of HDMI cables and couplers with a minimum TMDS bandwidth of 18 Gbps. If 4K60 4:2:0 or 4K30 4:4:4 performance is acceptable, cables and couplers with a minimum bandwidth of 10.2 Gbps may be used. Bandwidth loss is cumulative; therefore, performance may be reduced when inserting multiple cables and couplers inline.
2. The minimum cable required for DM NVX AV over 1000BASE-T Ethernet (copper) is unshielded CAT5e. The Ethernet port on the DM-NVX-E30C is for connection to an Ethernet network or device—the port cannot be connected to the DM® port of other Crestron devices.  
  
A nonblocking network is required for DM NVX devices.
3. The minimum bit rate for 4K60 video is 350 Mbps. A bit rate below 350 Mbps may display a black screen.
4. The analog audio output is functional only when the DM-NVX-E30C is receiving a 2-channel stereo input signal.
5. The stream type of a DM NVX 4K60 4:4:4 encoder must be set by using the web interface or a control system. The default setting is **Pixel Perfect Processing** for interoperability with DM NVX 4K60 4:4:4 decoders. For interoperability with a DM-NVX-D10, DM-NVX-D20, or DM-NVX-D200 decoder, the stream type of the DM NVX 4K60 4:4:4 encoder must be set to **DM-NVX-D10/D20 Series**. In addition, the resolution of the encoder must be set so that it does not exceed the maximum resolution of the DM-NVX-D10, DM-NVX-D20, or DM-NVX-D200 decoder.
6. 3D formats are not supported.
7. HDMI connections require an appropriate adapter or interface cable to accommodate a DVI or Dual-Mode DisplayPort signal. CBL-HD-DVI interface cables are available separately.

This product may be purchased from select authorized Crestron dealers and distributors. To find a dealer or distributor, please contact the Crestron sales representative for your area. A list of sales representatives is available online at [www.crestron.com/How-To-Buy/Find-a-Representative](http://www.crestron.com/How-To-Buy/Find-a-Representative) or contact us for additional information by visiting [www.crestron.com/contact/our-locations](http://www.crestron.com/contact/our-locations) for your local contact.

This product is covered under the Crestron standard limited warranty. Refer to [www.crestron.com/warranty](http://www.crestron.com/warranty) for full details.

The specific patents that cover Crestron products are listed online at [patents.crestron.com](http://patents.crestron.com).

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## HDMI

Specifications are subject to change without notice.

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