

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



- 4K60 4:4:4 video over standard Gigabit Ethernet
- HDR10 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 compliance
- Encoder functionality for use with DM NVX® products that can function as decoders
- DM® input for interoperability with DM 8G+® output devices and DM Lite® transmitters, including DM 8G+ and DM Lite wall plate transmitters
- HDBaseT® certification
- 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 and fiber Ethernet connectivity
- Network port selection
- Automatic point-to-point connectivity
- 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-E760C
- 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 High Dynamic Range (HDR10) 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-E760C includes a DM® input that provides interoperability with DM 8G+® output devices and DM Lite® transmitters. Certified using HDBaseT® technology, the DM input is also compatible with third-party HDBaseT products.

### 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-E760C 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

The DM-NVX-E760C includes advanced security features and protocols. Using 802.1X authentication, Active Directory® credential management, AES-128 content encryption, PKI authentication, TLS, SSH, and HTTPS, a DM NVX system provides a true enterprise-grade network AV solution engineered to fulfill demanding IT policies.

### Encoder Functionality

The DM-NVX-E760C is an encoder that is compatible with DM NVX products that can function as decoders. The DM-NVX-E760C enables AV signals from the DM input to be transmitted over the network to one or many decoders. Encoder functionality of the DM-NVX-E760C can be used in any DM NVX network AV design.

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## Interoperability with DM 8G+ Output Devices and DM Lite Transmitters

The DM input of the DM-NVX-E760C can be connected to the DM 8G+ output of a DM switcher, transmitter, or other DM device. Supported DM 8G+ output devices are the DMC-4KZ-CO-HD and DMB-4K-O-C of DM switchers, the DM-TX-4KZ-100-C-1G transmitter, and the DMPS3-4K-350-C and DMPS3-4K-250-C presentation systems.

The DM input can also be connected to the DM Lite port of a DM Lite transmitter. Supported DM Lite transmitters are the HD-TX-101-C-E and the HD-TX-101-C-1G-E.

## HDBaseT Certification

Crestron DM 8G+ technology of the DM input is designed using [HDBaseT Alliance](#) specifications, ensuring interoperability with other HDBaseT certified products. The DM input of the DM-NVX-E760C can be connected directly to an HDBaseT compliant source. The DM-NVX-E760C provides the capability to bridge an HDBaseT system with AV over IP, resulting in a hybrid system design and a smooth migration path for existing DM or HDBaseT solutions. Investment protection is achieved for applications that require integration of AV over IP with existing HDBaseT systems or expansion of an existing room system for broader distribution.

**NOTE:** *The DM input will support Ethernet and control signals in a future release.*

## Image Preview

Image preview provides still images (thumbnails) that show the current video being received by the DM input of the DM-NVX-E760C. Still images are shown at 1 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 by using a web browser. The images can also be previewed on a Crestron touch screen or third-party interface.

## 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-E760C 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 balanced or unbalanced stereo line level signal to feed a local sound system or sound bar. The output volume is adjustable using the web interface or a control system.<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 an HDBaseT 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 and Fiber Ethernet Connectivity

The DM-NVX-E760C includes two RJ-45 1000BASE T Ethernet ports (Ethernet ports 1 and 2) and one SFP port (Ethernet port 3). The SFP port enables connection to a fiber-optic network with the use of the appropriate Crestron [SFP-1G](#) Series transceiver module (sold separately). A selection of modules is offered to accommodate various multimode and single-mode fiber types.

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Ethernet port 1, 2, or 3 can be used to transport video over a Gigabit Ethernet network. The remaining Ethernet ports can be used to provide connections to local network devices or to daisy-chain multiple endpoints.

A DM NVX system can be deployed on an existing corporate or campus network or on a dedicated network. For information about network requirements and guidelines, refer to the [DM NVX AV-over-IP System Design Guide](#).

## Network Port Selection

Network port selection enables network traffic to be managed and segregated based on traffic type. Internal VLANs are used to route different traffic types to specific external Ethernet ports, which can then be assigned to the various traffic types. AES67 audio can be separated from the primary video and control network resulting in a dedicated audio network.

## Automatic Point-to-Point Connectivity

Point-to-point connectivity enables the DM-NVX-E760C 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, a 1000BASE-T Ethernet port of the DM-NVX-E760C is connected directly to a 1000BASE-T port of a decoder.

By default, point-to-point mode automatically detects whether the DM-NVX-E760C 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-E760C and a decoder is detected, the devices operate in point-to-point mode without the need for additional configuration. The web interface or a control system can be used to disable point-to-point mode or to enable automatic detection of point-to-point connectivity.

## Web-Based Setup

Setup of the DM-NVX-E760C is accomplished by using the built-in web interface. Full control and monitoring of the device 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

Use of a DM NVX Director virtual switching appliance ([DM-NVX-DIR-80](#), [DM-NVX-DIR-160](#), or [DM-NVX-DIR-ENT](#)) 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-E760C 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).*

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## Specifications

### Encoding

<b>Stream Type</b>	Pixel Perfect Processing (default) or DM-NVX-D10/D20/D200 Series <sup>5</sup>
<b>Video Resolutions</b>	Up to 4096x2160@60Hz (DCI 4K60), 4:4:4 color sampling, HDR10, and Deep Color support
<b>Audio Formats</b>	Multichannel (up to 8 channel LPCM or encoded HBR 7.1 surround sound)
<b>Bit Rates</b>	Fixed (200 to 950 Mbps - user specified) <sup>3</sup> , Adaptive (dependent on input resolution of the stream), or Variable (less than 150 Mbps to maximum of 750 Mbps, dependent on content and input resolution of the stream)
<b>Streaming Protocols</b>	RTP, SDP
<b>Container</b>	MPEG 2 transport stream (.ts)
<b>Session Initiation</b>	Multicast via secure RTSP
<b>Copy Protection</b>	HDCP 2.3 <sup>6</sup> , AES-128, PKI

### Video

<b>Input Signal Types</b>	DM 8G+ and HDBaseT with HDR10, Deep Color, and 4K60 4:4:4 support; DM Lite with 4K60 4:2:0 support <sup>7</sup>
<b>Copy Protection</b>	HDCP 2.3 <sup>6</sup>
<b>Resolutions</b>	Common resolutions of the DM-NVX-E760C are listed in the following table. <sup>8</sup>

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	12 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.

**NOTE:** 1920x1080 FHD 1080p at 120 Hz and 240 Hz are not supported due to HDBaseT limitations.

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Audio	
<b>Input Signal Types</b>	DM 8G+, HDBaseT, DM Lite
<b>Digital Formats</b>	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
<b>Analog Format</b>	Stereo 2 channel
<b>Digital-to-Analog Conversion</b>	24 bit 48 kHz
<b>AES67</b>	24-bit 48 kHz
<b>Analog Performance</b>	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
<b>Analog Output Volume Adjustment</b>	-80 to +24 dB
Communications	
<b>Ethernet</b>	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
<b>DigitalMedia™</b>	DM 8G+, DM Lite, HDCP 2.3 <sup>6</sup> , EDID, PoDM+
<b>HDBaseT</b>	HDCP 2.3, EDID, PoE+
<b>USB</b>	USB 2.0 computer console (for setup)
<b>DM NVX (via Ethernet)</b>	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	
<b>Ethernet 1</b>	(1) 8-pin RJ-45 connector, female; 100BASE-TX/1000BASE-T Ethernet port; <sup>2</sup>
<b>Ethernet 2</b>	(1) 8-pin RJ-45 connector, female; 100BASE-TX/1000BASE-T Ethernet port <sup>2</sup>
<b>Ethernet 3</b>	(1) SFP port; Accepts one Crestron <a href="#">SFP-1G</a> Series transceiver module (sold separately) <sup>9</sup>
<b>DM INPUT</b>	(1) 8-pin RJ-45 connector, female, shielded; DM 8G+ (HDBaseT standard compliant) or DM Lite input; PoDM+ (HDBaseT PoE+ compatible) PSE (power sourcing equipment) port or DM Lite power port; <sup>10</sup> Connects to the DM 8G+ output of a DM switcher, transmitter or other DM device; to the DM Lite port of a DM Lite transmitter; or to an HDBaseT device via CAT5e, Crestron DM-CBL-8G, or Crestron DM-CBL-ULTRA cable <sup>11</sup>
<b>AUDIO OUT</b>	(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
<b>CONSOLE</b>	(1) Micro USB connector, female; USB 2.0 computer console port (for setup)
Controls and Indicators	
<b>OL</b>	(1) LED, green indicates an online connection to a control system via Ethernet
<b>NV</b>	(1) LED, green indicates unit is encoding (transmitting) network video
<b>Ethernet 1-2</b>	(2) LEDs per port, green indicates Ethernet link status, amber indicates Ethernet activity
<b>Ethernet 3 LINK</b>	(1) LED, green indicates Ethernet link status
<b>Ethernet 3 ACT</b>	(1) LED, green indicates Ethernet activity
<b>DM INPUT</b>	(2) LEDs, green indicates DM link status, amber indicates video and HDCP signal presence
Construction	
Plug-in card, occupies (1) card slot in a DMF-CI-8 card chassis, includes metal faceplate	
Weight	
15.1 oz (427 g)	

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## Compliance

**Regulatory Model** M201910003

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

## Model

### DM-NVX-E760C

DM NVX 4K60 4:4:4 HDR Network AV Encoder Card with DM Input

## 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

## Available Accessories

For a list of available accessories, visit the [DM-NVX-E760C](#) product page.

## Notes

- 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.
- The minimum cable required for DM NVX over 1000BASE-T Ethernet (copper) is unshielded CAT5e. Ethernet ports 1 and 2 are used for connection to an Ethernet network or device. The Ethernet ports cannot be connected to the DM ports of other Crestron devices.  
A nonblocking network is required for DM NVX devices.
- The minimum bit rate for 4K60 video is 350 Mbps. A bit rate below 350 Mbps may display a black screen.
- The analog audio output is functional only when the DM-NVX-E760C is receiving a 2-channel stereo input signal.
- 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-E760C encoder must be set to **DM-NVX-D10/D20/D200 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.

- The DM-NVX-E760C supports HDCP 2.3. Refer to the product page of the DM 8G+ output device or DM Lite transmitter at [www.crestron.com](http://www.crestron.com) for the HDCP version supported by those devices.
- 3D formats are not supported.
- Refer to the product page of the DM 8G+ output device or DM Lite transmitter at [www.crestron.com](http://www.crestron.com) for information about the maximum resolution supported by those devices.
- The SFP port can only be connected to an Ethernet network or device—the port cannot be connected to the DM ports of other Crestron devices.
- The DM INPUT port can be used to power DM 8G+ and DM Lite transmitters only when those devices are not connected to a 24 VDC power pack.  
Wiring that connects to a PoDM+ or HDBaseT PoE+ PSE port or to a DM Lite port is designed for intrabuilding use only.
- Refer to the product page of the DM 8G+ output device or DM Lite transmitter at [www.crestron.com](http://www.crestron.com) for cable length information.

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).

Certain Crestron products contain open source software. For specific information, please visit [www.crestron.com/opensource](http://www.crestron.com/opensource).

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