

## 4K 2x1 Scaling Auto-Switcher and DM Lite® Extender over CATx Cable



- 4K/60 4:2:0 capability
- Transmitter and receiver with 2x1 AV switching, scaling, and signal extension functionality
- One HDMI® input on transmitter and one HDMI input on receiver
- One 4K scaling HDMI output on receiver
- Automatic switching of inputs
- Signal extension of video, audio, and power over a CATx cable—up to 230 ft (70 m) for resolutions up to 2K or up to 130 ft (40 m) for higher resolutions up to 4K
- EDID management
- HDCP 2.2 management
- Stereo audio de-embedding via the analog audio output
- IR, RS-232, relay, and I/O control ports
- CEC (Consumer Electronics Control) capability
- Gigabit Ethernet connectivity
- USB power port
- Built-in web interface for easy configuration and monitoring
- Compatibility with Crestron® 3-Series® or later control systems
- .AV Framework™ technology support
- Crestron XiO Cloud™ service support
- Low-profile installation
- 100-240 VAC power pack included

The Crestron® HD-MD-4K-200 provides a cost-effective multimedia presentation solution for classrooms and meeting spaces. Consisting of a transmitter (HD-TX-101-C-E) and receiver (HD-RX-4K-210-C-E), the HD-MD-4K-200 extends an HDMI® signal over a CATx (CAT5e or higher) twisted pair cable. For resolutions up to 2K, the maximum transmission distance is 230 ft (70 m). For higher resolutions up to 4K, the maximum transmission distance is 130 ft (40 m).<sup>1</sup>

**NOTE:** Power is transmitted over the CATx cable that connects the transmitter to the receiver.

The transmitter provides one HDMI input. The receiver provides an additional HDMI input that can be connected to a local AV source or to an optional Crestron media presentation wall plate ([MP-WP152](#), sold separately).

### Automatic Switching of Inputs

Automatic switching between the HDMI input on the transmitter and the HDMI input on the receiver can occur based on the last connected input or on the routing priority assigned to each input. Switching behavior is configurable using the web interface or programmable using a Crestron control system. In addition to automatic switching, input selection push buttons on the receiver enable the desired input to be selected manually.

### HDMI Output with 4K Scaler

A single HDMI output with a built-in scaler connects the receiver to a display or other device with an HDMI input. Input resolutions are automatically scaled to match the native resolution of the display device, resulting in optimal image quality. For applications requiring comprehensive EDID management, the web interface can be used to ensure that every input is displayed at its optimal resolution and format. Input resolutions up to 4K60 4:2:0 are supported.

### Audio De-embedding

The analog audio output on the receiver enables the HD-MD-4K-200 to extract the stereo audio signal from digital sources to feed a sound bar, amplified speakers, or a separate sound system. The analog audio output is active only when the input is receiving a 2-channel stereo signal.

### Device Control

Equipped with onboard control ports, the receiver can control various devices in a room. The COM (RS-232) port and CEC over the HDMI output can enable the display device to be turned on or off automatically without the use of a control system. With the use of a control system, the IR port can also control the display device. Two relay ports are provided for controlling a projection screen and other low-voltage contact closure activated equipment. Two Versiport I/O ports enable the integration of devices such as power sensors and motion detectors. An Ethernet port connection to a LAN also provides control by enabling use of the built-in web interface as well as connection to a control system.

**NOTE:** The COM, IR, and Ethernet ports cannot be used to extend signals over the CATx cable connection between the receiver and the transmitter.

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### USB Power Port

A USB power port is included on the transmitter to power USB powered devices (500 mA maximum).

**NOTE:** No USB data is passed through the USB power port. The port cannot be used to extend USB data, video, or audio signals.

### .AV Framework™ Technology Support

In addition to a built-in web interface and control system programming, the built-in .AV Framework technology of the [MPC3-201](#) and [MPC3-302](#) control systems can be used to control the HD-RX-4K-210-C-E as a switcher. (For information about .AV Framework technology, visit [www.crestron.com/avframework](http://www.crestron.com/avframework).)

### Crestron XiO Cloud™ Service Support

The HD-MD-4K-200 is compatible with the Crestron XiO Cloud service, which is a platform for remotely provisioning, monitoring, and managing Crestron devices across an enterprise or an entire client base. The service enables installers and IT managers to deploy and manage thousands of devices in the amount of time it previously took to manage a single device. For more information, visit [www.crestron.com/xiocloud](http://www.crestron.com/xiocloud).

### Low-Profile Installation

The transmitter and receiver can be placed on or attached to a flat surface. The transmitter can fit discreetly inside a presentation lectern or be attached to the underside of a table. The receiver can be mounted onto a wall behind a display or onto a ceiling above a projector. The devices can also be attached to a rack rail of an equipment cabinet.

## Specifications

### Video

<b>Switcher</b>	2x1 (1 input at transmitter plus 1 input at receiver x 1 output at receiver) auto-switching or manual, audio-follows-video, Crestron Auto-Locking® and QuickSwitch HD™ technologies
<b>Scaler, HDMI Output</b>	4K video scaler with intelligent frame rate conversion, Deep Color support, content-adaptive noise reduction, 3:2/2:2 pull-down detection and recovery
<b>Input Signal Types</b>	HDMI with Deep Color and 4K (DVI and Dual-Mode DisplayPort™ interface compatible <sup>2</sup> )
<b>Output Signal Types</b>	HDMI with Deep Color and 4K (DVI compatible <sup>3</sup> )
<b>Copy Protection</b>	HDCP 2.2
<b>Maximum Resolutions</b>	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	24 Hz	4:4:4	30 bit
		30 Hz	4:4:4	24 bit
		30 Hz	4:2:2	36 bit
		60 Hz	4:2:0	24 bit
	2560x1600 WQXGA	60 Hz	4:4:4	36 bit
	1920x1080 HD 1080p	60 Hz	4:4:4	36 bit

### NOTES:

- Custom resolutions are supported at pixel clock rates up to 300 MHz.
- Interlaced video sources are not supported.

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### Scaler Resolutions, HDMI Output

Auto (EDID preferred)	3840x2160p@24Hz
1280x720p@50Hz (720p50)	3840x2160p@25Hz
1280x720p@60Hz (720p60)	3840x2160p@30Hz
1920x1080i@25Hz (1080i25)	4096x2160p@24Hz
1920x1080i@30Hz (1080i30)	4096x2160p@25Hz
1920x1080p@30Hz (1080p30)	4096x2160p@30Hz
1920x1080p@25Hz (1080p25)	3840x2160p@50Hz
1920x1080p@24Hz (1080p24)	3840x2160p@60Hz
1920x1080p@50Hz (1080p50)	4096x2160p@50Hz
1920x1080p@60Hz (1080p60)	4096x2160p@60Hz

### Audio

<b>Input Signal Types</b>	HDMI (Dual-Mode DisplayPort interface compatible <sup>2</sup> )
<b>Output Signal Types</b>	HDMI, analog stereo
<b>Digital Formats</b>	2-channel LPCM
<b>Analog Formats</b>	Stereo 2-channel
<b>Digital-to-Analog Conversion</b>	24-bit 48 kHz
<b>Output Impedance</b>	200 ohms balanced, 100 ohms unbalanced
<b>Maximum Output Level</b>	4 Vrms balanced, 2 Vrms unbalanced
<b>Output Volume</b>	-80 to +20 dB level adjustment range plus Mute
<b>Mute</b>	Enable or disable independently for HDMI and analog audio output
<b>Analog Output Performance</b>	Frequency Response: 20 Hz to 20 kHz ±0.5 dB S/N Ratio: >95 dB @ 10 dBV, 20 Hz to 20 kHz, A-weighted THD+N: <0.005% @ 1 kHz and 10 dBV Stereo Separation: 20 Hz to 20 kHz ≤80 dB
<b>Acoustic Noise</b>	Not applicable (fanless)

### Communications

<b>Ethernet</b>	100/1000 Mbps, auto-switching, auto-negotiating, auto-discovery, full/half duplex, CIP, DHCP, web browser setup and control
<b>RS-232</b>	2-way device control and monitoring up to 115.2k baud with hardware and software handshaking

<b>IR</b>	1-way device control via infrared up to 60 kHz
<b>HDMI</b>	HDCP 2.2, EDID, CEC
<b>DM Lite</b>	HDCP 2.2, EDID

### Connectors - Transmitter (HD-TX-101-C-E)

<b>24 VDC</b>	(1) 2x1 x 5.5 mm DC power connector;
<b>1.25 A</b>	24 VDC power input;
	<a href="#">PW-2412WU</a> power pack included

**NOTE:** The power pack powers both the transmitter and the connected HD-RX-4K-210-C-E receiver. A power pack must not be connected to both devices simultaneously.

<b>TO RX (DM Lite)</b>	(1) 8-pin RJ-45 connector, female, shielded; DM Lite® link port for connection to the HD-RX-4K-210-C-E receiver <sup>1</sup>
<b>HDMI IN</b>	(1) HDMI Type A connector, female; HDMI digital video/audio input (DVI and Dual-Mode DisplayPort interface compatible <sup>2</sup> )
<b>POWER ONLY</b>	(1) USB Type A connector, female; USB power port (500 mA maximum output); Supplies power to a USB powered device

### Connectors - Receiver (HD-RX-4K-210-C-E)

<b>HDMI INPUT 1</b>	(1) HDMI Type A connector, female; HDMI digital video/audio input (DVI and Dual-Mode DisplayPort interface compatible <sup>2</sup> )
<b>DM Lite INPUT 2</b>	(1) 8-pin RJ-45 yellow connector, female, shielded; DM Lite link port for connection to the HD-TX-101-C-E transmitter <sup>1</sup>
<b>HDMI OUTPUT</b>	(1) HDMI Type A connector, female; HDMI digital video/audio output (DVI compatible <sup>3</sup> )

**NOTE:** CEC over the HDMI output provides Power On/Off control of the display device without a control system or full programmable control of any device with a control system.

<b>AUDIO L/R</b>	(1) 5-pin 3.5 mm detachable terminal block; Balanced/unbalanced stereo line-level audio output; Maximum Output Level: 4 Vrms balanced, 2 Vrms unbalanced; Output Impedance: 200 ohms balanced, 100 ohms unbalanced
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<b>Ethernet</b>	(1) 8-pin RJ-45 connector, female; 100BASE-TX/1000BASE-T Ethernet port
<b>I/O 1-2</b>	(2) 2-pin detachable terminal blocks; Comprised of 2 Versiport digital input/output or analog input ports (referenced to GND); Digital Input: Rated to 0-24 VDC, input impedance 20k ohms, logic threshold >3.125 V low/0 and <1.875 V high/1; Digital Output: 250 mA sink from maximum 24 VDC, catch diodes for use with real world loads; Analog Input: Rated for 0-10 VDC, protected to 24 VDC maximum, input impedance 21k ohms with pull-up resistor disabled; Programmable 5 V, 2k ohms pull-up resistor per pin
<b>RELAY 1-2</b>	(2) 2-pin detachable terminal blocks; Comprised of 2 normally open, isolated relays; Rated 1 A, 30 VAC/VDC; MOV arc suppression across contacts
<b>IR</b>	(1) 2-pin 3.5 mm detachable terminal block; IR output control port; Supports IR up to 60 kHz; IRP2 emitter sold separately
	<b>NOTE:</b> The IR port provides Power On/Off control of the display device with the use of a control system.
<b>COM</b>	(1) 5-pin 3.5 mm detachable terminal block; Bidirectional RS-232 port; Supports RS-232 up to 115.2k baud with hardware and software handshaking
	<b>NOTE:</b> The COM port provides Power On/Off control of the display device without a control system or full programmable control of any device with a control system.
<b>24V 1.25A</b>	(1) 2.1 x 5.5 mm DC power connector; 24 VDC power input; <a href="#">PW-2412WU</a> power pack included
	<b>NOTE:</b> The power pack can power both the HD-RX-4K-210-C-E receiver and the HD-TX-101-C-E transmitter. A power pack must not be connected to both devices simultaneously.
<b>SERVICE</b>	(1) USB Type A connector, female; For factory use only

### Indicators - Transmitter (HD-TX-101-C-E)

<b>PWR</b>	(1) Green LED, indicates that power is being applied to the HD-TX-101-C-E from the power pack connected to either the HD-TX-101-C-E or the receiver
<b>HDMI IN</b>	(1) Green LED, indicates HDMI input signal presence
<b>LINK</b>	(1) Green LED, indicates the DM Lite link status
<b>TO RX</b>	(2) LEDs on RJ-45 connector. Green LED indicates DM Lite link status. Amber LED indicates a valid video signal.

### Controls and Indicators - Receiver (HD-RX-4K-210-C-E)

<b>PWR</b>	(1) LED, indicates that power is being applied to the HD-RX-4K-210-C-E from the power pack connected to either the HD-RX-4K-210-C-E or the transmitter. Amber indicates that the HD-RX-4K-210-C-E is booting. Green indicates that the HD-RX-4K-210-C-E is operational.
<b>INPUT 1-2</b>	(2) Push buttons for manual input selection and (2) LEDs. Green indicates that video is switched. Amber indicates that video is detected but is not switched.
<b>AUTO</b>	(1) Push button to enable or disable automatic switching and (1) green LED to indicate that automatic switching is enabled
<b>SETUP</b>	(1) Red LED and (1) push button for display of IP address on the HDMI output
<b>DM Lite</b>	(2) LEDs on RJ-45 connector. Green indicates that a DM Lite link is established. Flashing amber indicates non-HDCP video, and solid amber indicates HDCP video.
<b>Ethernet</b>	(2) LEDs on RJ-45 connector. Green indicates that an Ethernet link is established. Flashing amber indicates Ethernet activity.

### Power

<b>Power Pack (Included with Transmitter and Receiver)</b>	Input: 100-240 VAC, 50/60 Hz Output: 1.25 A @ 24 VDC Model: <a href="#">PW-2412WU</a>
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**NOTE:** A single power pack powers both the transmitter and receiver. A power pack must not be connected to both devices simultaneously.

## 4K 2x1 Scaling Auto-Switcher and DM Lite® Extender over CATx Cable

**Power Consumption** 14.8 W typical

### Environmental

**Temperature** 32° to 104° F (0° to 40° C)  
**Humidity** Transmitter: 20% to 90% RH (non-condensing);  
 Receiver: 10% to 90% RH (non-condensing)  
**Heat Dissipation** 50.5 BTU/hr

### Enclosure

**Chassis** Metal, black finish, vented sides, 2 mounting flanges  
**Mounting** Surface or rack rail mount

### Dimensions - Transmitter (HD-TX-101-C-E)

**Height** 1.26 in. (32 mm)  
**Width** 4.21 in. (107 mm) with integral mounting flanges  
**Depth** 4.05 in. (103 mm)

### Dimensions - Receiver (HD-RX-4K-210-C-E)

**Height** 5.11 in. (130 mm)  
**Width** 10.53 in. (268 mm) with mounting flanges attached  
**Depth** 1.10 in. (28 mm)

### Weight

**Transmitter** 9.92 oz (281 g)  
**Receiver** 2.3 lb (1.05 kg)

### Compliance

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

### Model

**HD-MD-4K-200**  
 4K 2x1 Scaling Auto-Switcher and DM Lite Extender over CATx Cable

### Included Accessories

**PW-2412WU**  
 (2) Wall Mount Power Pack, 24 VDC, 1.25 A, 2.1 mm, Universal

### Available Accessories

- AMP-X300**  
X Series Amplifier
- AMP-150-70**  
Single-Channel Modular Power Amplifier, 50 W, 70 V
- AMP-150-100**  
Single-Channel Modular Power Amplifier, 50 W, 100 V
- AMP-2100**  
Dual-Channel Modular Power Amplifier, 100W/Ch., 4/8Ω
- AMP-2100-70**  
Dual-Channel Modular Power Amplifier, 100W/Ch., 70 V
- AMP-2100-100**  
Dual-Channel Modular Power Amplifier, 100W/Ch., 100 V
- AMP-225**  
Dual-Channel Modular Power Amplifier, 25 W/Ch., 4/8 Ω
- AMP-X50MP**  
X Series Media Presentation Amplifier
- SAROS SB-200-P-B**  
Saros® Sound Bar 200, Powered, Black
- IRP2**  
IR Emitter Probe with Terminal Block Connector
- AM-200**  
AirMedia® Presentation System 200
- MPC3-201-B**  
3-Series® Media Presentation Controller 201, Black
- MPC3-302-B, -W**  
3-Series Media Presentation Controller 302, Black or White
- CBL-HD-1.5, -3, -6, -12, -20**  
Crestron Certified HDMI Interface Cable, 18 Gbps, 1.5 ft (0.45 m), 3 ft (0.91 m), 6 ft (1.8 m), 12 ft (3.6 m), or 20 ft (6.1 m)
- CBL-HD-30**  
Crestron Certified HDMI Interface Cable, 10.2 Gbps, 30 ft (9.1 m)
- CBL-HD-DVI-1.5, -3, -6, -12, -20, -30**  
Crestron Certified HDMI to DVI Interface Cable, 1.5 ft, 3 ft, 6 ft, 12 ft, 20 ft, or 30 ft
- CBL-HD-LOCK-2, -4, -8, -16**  
Locking High-Speed HDMI Cable, 10.2 Gbps, 2 ft (0.6 m), 4 ft (1.2 m), 8 ft (2.4 m), or 16 ft (4.8 m)
- CBL-HD-THIN-HS-6**  
HDMI Cable, Thin, Type A Male-to-Male, 6 ft (1.83 m)
- CBL-4K-DP-HD-6, -12**  
Active Converter Cable, DisplayPort to HDMI, 18 Gbps, 6 ft (1.8 m) or 12 ft (3.6 m)

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### **CBL-4K-MDP-HD-6, -12**

Active Converter Cable, Mini DisplayPort to HDMI, 18 Gbps, 6 ft (1.8 m) or 12 ft (3.6 m)

### **DM-8G-CONN-WG-100**

Connectors with Wire Guide for DM-CBL-8G DigitalMedia 8G™ Cable, 100-Pack

### **DM-8G-CRIMP-WG**

Crimping Tool for DM-8G-CONN-WG

### **DM-CBL-8G-NP-SP1000**

DigitalMedia 8G™ Cable, non-plenum, 1000 ft spool

### **DM-CBL-8G-P-SP1000**

DigitalMedia 8G Cable, plenum, 1000 ft spool

### **DM-CBL-ULTRA-LSZH-SP1000**

DigitalMedia™ Ultra Cable, Low Smoke Zero Halogen, 1000 ft spool (Available only in Europe)

### **DM-CBL-ULTRA-NP-SP1000**

DigitalMedia Ultra Cable, Non-Plenum Type CMR, 1000 ft spool

### **DM-CBL-ULTRA-PC-5, -50**

DigitalMedia Ultra Patch Cable, 5 ft (1.5 m) or 50 ft (15 m)

### **DM-CBL-ULTRA-P-SP1000**

DigitalMedia Ultra Cable, Plenum Type CMP, 1000 ft spool

### **DM-CONN-20**

Connectors for DM-CBL DigitalMedia Cable and DM-CBL-ULTRA DigitalMedia Ultra Cable, 20-Pack

### **DM-CONN-ULTRA-RECP-20**

DigitalMedia Ultra Keystone RJ45 Jack, 20-Pack with Termination Tool

### **DM-RPP-K24**

DigitalMedia 24-Port Keystone Patch Panel

### **MP-WP152-B, -W, -A**

Media Presentation Wall Plate – HDMI Connectivity, Black, White, or Almond

### Notes

1. For the DM Lite CATx cable connection, use Crestron DM-CBL-8G, Crestron DM-CBL-ULTRA, or third-party CAT5e or higher cable. To safeguard against unpredictable environmental electrical noise that may impact performance at resolutions above 1080p, shielded cable and connectors are recommended for all applications and are required when bundling multiple cables in a wire run. Wire and cables are sold separately. DM Lite ports are not compatible with DigitalMedia 8G+®, HDBaseT®, PoE, or PoDM technology or any other type of CATx based interface or network.
2. The HDMI input requires an appropriate adapter or interface cable to accommodate a DVI or Dual-Mode DisplayPort signal. CBL-HDI-DVI interface cables are available separately.
3. The HDMI output requires an appropriate adapter or interface cable to accommodate a DVI signal. CBL-HDI-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 by calling 855-263-8754.

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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