HD-MD402

4x2 4K60 4:2:0 AV Switcher

- *4K60 4:2:0 digital AV switcher*
- *Four HDMI® inputs*
- *One mirrored HDMI and DM Lite® output and one independent DM Lite output*
- *4K to 1080p downscaling*
- *EDID management*
- *HDCP 2.2 compliance*
- *HDMI audio de-embedding*
- *100BASE-TX Ethernet connectivity*
- *USB power port*
- *Device control*
- *Built-in web interface for easy configuration and monitoring*
- *Compatibility with Crestron® 3-Series® or later control systems*
- *.AV Framework™ technology support (coming soon)*
- *Surface-mountable design*
- *Universal 100-240VAC power pack included*

The HD-MD402 is a 4K60 4:2:0 AV switcher that provides a cost-effective solution for professional AV applications. The HD-MD402 provides four HDMI® inputs, one mirrored HDMI and DM Lite® output, and one independent DM Lite output. The DM Lite outputs extend HDMI signals over a CATx (CAT5e or higher) twisted pair cable. For HD 1080p, WUXGA, and 2K signals, a CATx cable length of up to 230 ft (70 m) is supported. For UHD and 4K signals, a CATx cable length of up to 130 ft (40 m) is supported.[1]

4K to 1080p Downscaling

The mirrored HDMI and DM Lite output and the independent DM Lite output each have a built-in scaler for downscaling 4K to 1080p signals. Input resolutions are automatically downscaled to 1080p regardless of the resolution capabilities of the display device. If desired, downscaling can be disabled. Input resolutions up to 4K60 4:2:0 are supported.

HDMI Audio De-embedding

Embedded HDMI 2-channel LPCM audio can be extracted from the selected HDMI input and transmitted to the AUX stereo audio output. Mute control is configurable for the mirrored HDMI and DM Lite output, the independent DM Lite output, and the AUX audio output independently. Volume control is only configurable for the AUX audio output.

USB Power Port

A USB power port is included on the HD-MD402 to power USB powered devices (500mA 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.

Automatic Display Power

The COM (RS-232) port can enable the display device to be turned on or off automatically without the use of a control system. The port also enables full programmable control of any device with the use of a control system. 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. For more information, see Online Help Answer ID 1000921.

Built-In Web Interface

Configuration of the HD-MD402 can be accomplished by using the built-in web interface. The configuration of a single unit can be downloaded to a computer or mobile device and then uploaded to multiple HD-MD402 units to simplify system installation.

.AV Framework™ Technology Support (Coming Soon)

In addition to a built-in web interface and control system programming, built-in .AV Framework technology of a Crestron control system can be used to configure and control the HD-MD402. For information about .AV Framework technology and the supported Crestron control systems, visit www.crestron.com/avframework.

Surface-Mountable Design

The HD-MD402 can be installed using the included mounting hardware. The device can be mounted onto a wall or other flat surface.

Specifications

Video

Switcher	4x2 manual switching, audio-follows-video, Crestron Auto-Locking® and QuickSwitch HD™ technologies
Input Signal Types	HDMI with Deep Color, 3D and 4K (DVI and Dual-Mode DisplayPort™ interface compatible[3])
Output Signal Types	HDMI and DM Lite with Deep Color, 3D and 4K60 4:2:0 support[1, 2] (DVI compatible[3])
Copy Protection	HDCP 2.2
Maximum 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	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.

Audio - General

Digital-to-Analog Conversion	24-bit 48 kHz
Frequency Response	±0.5 dB, 20 Hz to 20 kHz
THD+N	<0.005%, 1 kHz, 10 dBV
S/N Ratio	>95 dB, 10 dBV, 20 Hz to 20 KHz, A-weighted
Crosstalk	≤90 dB, 1 KHz, for multiple inputs only
Stereo Separation	≤80 dB, 20 Hz to 20 kHz

Audio - Source Inputs

Input Signal Type	HDMI (Dual-Mode DisplayPort interface compatible[3])
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

Audio - Digital Output

Output Signal Type	HDMI
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
Source	-80 dB to +20 dB adjustment range plus Mute
Master Volume	-80 dB to +20 dB adjustment range plus Mute

Audio - Analog Line Output

Output Signal Type/Format	Stereo 2-channel
Volume Control	-80 dB to +20 dB adjustment range plus Mute

Communications

Ethernet	100 Mbps, auto-negotiating, auto-discovery, full/half duplex, DHCP, web browser setup and control, Crestron control system integration
DM Lite	HDCP 2.2 and EDID
USB	To power a USB powered device
HDMI	HDCP 2.2 and EDID

Connectors

HDMI INPUT 1-4	(4) 19-pin Type A connector, female; HDMI digital video/audio inputs (DVI and Dual-Mode DisplayPort interface compatible[3])
HDMI 1 OUTPUT	(1) 19-pin Type A connector, female; HDMI digital video/audio output (DVI compatible[3]); Mirrored with DM LITE 1 output

CRESTRON®

DM LITE 1 OUTPUT	(1) Yellow 8-pin RJ-45 connector, female, shielded; DM Lite output port for connection to a DM Lite receiver[4]; Mirrored with HDMI 1 output
DM LITE 2 OUTPUT	(1) Yellow 8-pin RJ-45 connector, female, shielded; DM Lite output port for connection to a DM Lite receiver[4]
AUX	(1) 3-pin 3.5 mm detachable terminal block; Unbalanced stereo line-level audio output; Output Impedance: <100 Ohms; Maximum Output Level: 2 Vrms unbalanced
COM	(1) 3-pin 3.5 mm detachable terminal block; Bidirectional RS-232 port; Supports RS-232 up to 115.2k baud with hardware and software handshaking;

> **NOTE:** The COM port provides power On/Off control of the display device without a control system, or fully programmable control of any device with a control system.

Ethernet	(1) 8-pin RJ-45 connector, female; 100BASE-TX Ethernet port
24V 2.5A	(1) 2.1 x 9.5 mm DC power connector; 24VDC power input; PW-2420RU power pack (included)
SERVICE	(1) USB Type A female; Provides up to 5V 500mA power to USB powered device

Controls and Indicators

INPUT 1-4	(4) Push buttons for manual input selection and (4) LEDs. Green indicates that the corresponding input is routed to an output. Amber indicates that a source is detected at the corresponding input but is not routed to an output.
OUTPUT 1-2	(2) Push buttons for manual output selection and (2) LEDs. Green indicates that a display or other destination device is detected and the corresponding output is transmitting video. Amber indicates that a display or other destination device is detected but no video is routed to the corresponding output.
SETUP	(1) Red LED and (1) push button for display of IP address on connected HDMI and DM Lite outputs

Ethernet	(2) LEDs on RJ-45 connector; Green indicates that a 100BASE-TX link is established. Flashing amber indicates Ethernet activity.
DM LITE 1-2	(2) LEDs on RJ-45 connector; Green indicates that a DM Lite link is established. Flashing amber indicates non-HDCP video. Solid amber indicates HDCP video.
PWR	(1) LED. Amber indicates that the device is booting. Green indicates that the device is operational.

Power

Power Pack (Included)	2.5A @ 24VDC; 100-240VAC, 50/60 Hz; Model: PW-2420RU

> **NOTE:** This power connection powers the HD-MD402 and all devices connected to the DM Lite output ports. Power should not be connected to the HD-MD402 and DM Lite receivers simultaneously.

Power Consumption	26 W typical

Environmental

Temperature	32° to 104°F (0° to 40°C)
Humidity	10% to 90% RH (non-condensing)
Heat Dissipation	89 BTU/hr typical
Acoustic Noise	Not applicable (fanless)

Construction

Chassis	Metal, black finish, vented top and bottom
Mounting	Surface-mountable

Dimensions

Height	1.72 in. (44 mm)
Width	8.66 in. (220 mm)
Depth	6.25 in. (159 mm)

Weight

2.9 lb (1.15 kg)

Compliance

Regulatory Model: M202028001
CE, IC, FCC Part 15 Class B digital device

Model

HD-MD402
4x2 4K60 4:2:0 AV Switcher

Available Accessories

For a list of available accessories, visit the HD-MD402 product page.

Notes:

1. For DM Lite connections, 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 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.

4. Only the HD-RX-101-C-E, HD-RXC-101-C-E, HD-RX-101-C-1G-E, and HD-RXC-101-C-1G-E DM Lite receivers are supported.

   When connected to the DM Lite output ports, the following devices support extension of audio and video signals only: HD-RX-201-C-E, HD-RX-4K-210-C-E, HD-RX-4K-210-C-E-POE, HD-RX-4K-410-C-E, HD-RX-4K-410-C-E-SW4, HD-RX-4K-510-C-E, and HD-RX-4K-510-C-E-SW4. The HD-MD402 user interface does not support configuration of those devices. They require a separate LAN connection and must be configured through their own web interface.

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 or by calling 855-263-8754.

This product is covered under the Crestron standard limited warranty. Refer to www.crestron.com/warranty for full details.

The specific patents that cover Crestron products are listed online at patents.crestron.com.

Certain Crestron products contain open source software. For specific information, please visit www.crestron.com/opensource.
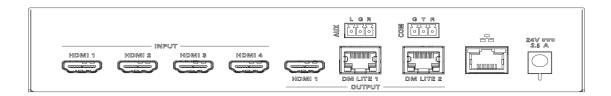
HDMI

Specifications are subject to change without notice.

Rev 05/13/21

INPUT

HDMI 1   HDMI 2   HDMI 3   HDMI 4

L G R
AUX

G T R
COM

24V
2.5 A

HDMI 1   DM LITE 1   DM LITE 2

OUTPUT

6.25 in.
(159 mm)

6.18 in.
(157 mm)

CRESTRON
HD-MD402
4K SWITCHER
HDMI

8.66 in.
(220 mm)

1.72 in.
(44 mm)

PWR

INPUT
1   2   3   4

OUTPUT
1   2

SETUP

SERVICE

CRESTRON