HD-MD8X1-4K

4K Scaling Presentation Switcher

The HD-MD8X1-4K from Crestron® provides an ultra high-definition presentation switcher with advanced features optimally suited for huddle rooms, conference rooms, and classrooms. It integrates the multimedia switcher, 4K video scaler, and audio DSP into one compact device that mounts conveniently under a table or in an equipment rack. Built-in Crestron Connect It™ functionality affords a complete collaboration solution that's easy and affordable to deploy in any small to medium sized meeting space. Without requiring a separate control system or any programming, the HD-MD8X1-4K is easily configurable for a variety of media presentation applications using a choice of touch screen, iPad®, or computer for setup and control.

Auto-switching HDMI®, VGA, and analog audio inputs provide the essential connectivity needed to manage multiple computers and other media sources. The selected input source is routed to one HDMI output and one stereo analog audio output. Built-in 4K scaling ensures the highest possible image quality, and compatibility with the widest range of sources and displays.

In one cost-effective, space saving package, the HD-MD8X1-4K fits neatly into a variety of applications.

- Provides a complete 4K multimedia collaboration system for huddle rooms and small conference rooms — with no control system or programming required!
- Delivers a 4K multi-format auto-switcher solution with built-in DSP that's fully controllable from a Crestron 3-Series Control System® [1]
- Fulfills any application requiring a high-performance 4K scaler with multiple multi-format inputs

> *Ultra high-definition, multi-format 8x1 presentation switcher, scaler, and audio DSP*
> *Out of the box Crestron Connect It™ collaboration system functionality*
> *Supports up to four TT-100 series Crestron Connect It Cable Caddies [2]*
> *Embedded DMPS3 .AV Framework™ software enables customized presentation control without programming [3]*
> *Allows quick and easy setup using just an iPad®, computer, or Crestron touch screen [3]*
> *Affords simple system operation from an iPad, computer, touch screen, or button panel [3]*
> *Includes auto-switching HDMI®, VGA, and stereo analog audio inputs*
> *Also supports DisplayPort Multimode, DVI, and analog video sources [4,5]*
> *Input auto-detection configures each input automatically*
> *QuickSwitch HD® technology manages HDCP keys for fast, reliable switching*
> *Performs automatic AV signal format management via EDID*
> *Provides adjustable input level compensation on each audio input*
> *Provides a single HDMI output*
> *Features a built-in, high-performance 4K scaler*
> *Upscales input signals to match the native resolution of any screen — including 4K and Ultra HD displays!*
> *Downscales 4K, UHD, and ultra high-resolution computer signals to fit 1080p and other lower-resolution displays*
> *Handles any input resolution from standard NTSC 480i or PAL 576i, to UHD and 4K*
> *Provides intelligent frame rate conversion, content-adaptive noise reduction, and motion-adaptive de-interlacing*
> *Provides 3D to 2D signal conversion, and passes 3D video (without scaling) to 3D displays [6]*
> *Provides a balanced stereo audio output with graphic EQ, limiting, and delay*
> *Enables HDMI audio signal extraction and embedding*
> *Handles Dolby® TrueHD, DTS-HD®, and uncompressed 7.1 linear PCM audio [7]*
> *Includes onboard IR and RS-232 control ports [8]*
> *Supports universal remotes via built-in RC-5 compatible IR receiver [8]*
> *Integrates with Crestron Fusion® Enterprise Management Software*
> *Provides a 10/100 Ethernet LAN connection*
> *Includes front panel controls for switching and volume adjustment*
> *Includes customizable front panel label strips*
> *Allows complete AV setup and adjustment via a Web browser*
> *Fully-controllable over Ethernet from a Crestron 3-Series Control System® [1]*
> *Features an internal universal power supply for worldwide compatibility*
> *Mounts under the table or in a single 19" rack space*

HD-MD8X1-4K 4K Scaling Presentation Switcher

HD-MD8X1-4K — Rear View

4K Ultra HD

Support for 4K and Ultra HD video is essential to ensuring support for the latest generation of computers and monitors with native resolutions beyond 1080p and WUXGA.

Crestron Connect It™

Crestron Connect It is a cost-effective, simple-to-use presentation solution that provides tabletop connectivity, cable management, and one-touch control through a system of stylish, easy-to-install devices. The HD-MD8X1-4K accommodates up to four Crestron Connect It Cable Caddies (TT-100 series[2]). Its auto-switching inputs support individual HDMI, VGA, and analog audio connections at each device. Power and communications for each device are provided via four USB ports.

A fully functional Crestron Connect It system is enabled right out of the box by simply connecting the Crestron Connect It devices and input cables. Additional settings and AV adjustments are available through a simple Web browser setup screen.

No Programming Required!

Adding a control surface to the HD-MD8X1-4K is simple, allowing presenters to easily turn the system on and off, select a source, and adjust the volume using a Crestron touch screen, button panel, computer, or iPad®. There's no programming required! Complete system configuration is enabled right from the touch screen, computer, or iPad, allowing the installer to quickly select the control surface(s), specify the display device, and assign user-friendly names and icons to the inputs and output. That's it! Preloaded DMPS3 .AV Framework™ software does all the programming for you, enabling control of a single display device, integration with AirMedia™, and centralized monitoring through Crestron Fusion® Enterprise Management Software.[3]

Multimedia Auto-Switcher

The HD-MD8X1-4K provides high-performance automatic switching between eight inputs. Its video inputs include four HDMI and four VGA. The HDMI inputs are also compatible with DVI and DisplayPort Multimode sources[4], and the VGA inputs can handled RGB, composite, S-Video, and component video sources[5]. Digital audio is supported by the HDMI inputs, plus four unbalanced analog audio inputs are also included. Any analog input may be used in combination with its corresponding VGA or HDMI video input. Input auto-detection eliminates the need to configure the inputs — simply connect your source and the HD-MD8X1-4K selects the right audio and video combination.

4K Scaler

With its high-performance 4K video scaler on board, the HD-MD8X1-4K ensures an optimal image from every video source on practically any display device. It allows SD, HD, and all types of computer sources to look their best on Ultra HD and 4K displays, and it allows sources with resolutions above HD 1080p to be viewed reliably on 1080p and lower resolution displays. It accepts any input resolution, from standard definition NTSC 480i to ultra high-definition 4K DCI, and scales it perfectly to match the native resolution of any screen up to 4K DCI (4096 x 2160). Interlaced sources are converted to progressive scan using motion-adaptive deinterlacing. Intelligent frame rate conversion enables support for 24p and PAL format sources. And, 3D to 2D conversion allows 3D content to be viewed on 2D-only displays.[6]

Flexible Audio Outputs

The switched audio signal is routed to the HDMI output as well as to a separate balanced analog audio output, with individual level adjustments provided for each output. All inputs and outputs support stereo audio, with the option to configure the analog output for mono. Dolby® TrueHD, DTS-HD®, and 7.1 linear PCM audio signals can also be routed through the HDMI inputs and output.[7]

Professional Audio DSP

The analog audio output includes professional digital signal processing, allowing the signal to be adjusted for optimum performance and sound quality. The analog output is ideally designed to be connected to an external power amplifier and used to drive a set of ceiling or wall mount speakers. In addition to volume, bass, treble, and mute controls, the DSP provides 10-band graphic equalization, fully-adjustable limiting, and up to 80 ms of delay. All settings are adjustable using the HD-MD8X1-4K's Web browser user interface for easy setup. The output volume level is also adjustable using the front panel volume knob.

EDID Format Management

The HD-MD8X1-4K provides comprehensive management of the EDID (Extended Display Identification Data) information that passes between display devices and input sources, ensuring that each source gets displayed at its optimal resolution and format. Most applications require no changes to the default settings. For applications requiring custom configuration, the HD-MD8X1-4K allows for easy assessment of each device's format and resolution capabilities, with the ability to configure signals appropriately for the most desirable and predictable behavior.

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QuickSwitch HD® Technology

Handling digital media signals means handling HDCP (High-bandwidth Digital Content Protection), the encryption scheme used by content providers to protect their DVDs, Blu-ray™ discs, and broadcast signals against unauthorized copying. Viewing HDCP encrypted content requires a source device to "authenticate" each display and signal processor in the system and issue it a "key" before delivering an output signal. Crestron QuickSwitch HD manages these keys to ensure fast, reliable switching and immunity to "blackouts."

Embedded Device Control

The HD-MD8X1-4K includes built-in IR, RS-232, and Ethernet control ports, which may all be utilized through integration with a Crestron 3-Series Control System to enable programmable control of local AV equipment and other devices. HDMI devices can also be controlled using CEC (Consumer Electronics Control) signals. Through its connection to the control system, the HD-MD8X1-4K provides a gateway for controlling connected sources and displays right through their HDMI connections. Without a control system, control capabilities are limited to controlling a single display device via CEC, RS-232, or Ethernet.[1,8]

SPECIFICATIONS

Operating System

Embedded DMPS3 .AV Framework™ Base Program[3], out-of-the-box "Crestron Connect It™" functionality

Communications

Ethernet: 10/100 Mbps, auto-switching, auto-negotiating, auto-discovery, full/half duplex, DHCP

USB: USB host ports for Crestron Connect It devices and firmware update via USB flash drive; USB device port for computer console (setup)

RS-232: 2-way device control and monitoring up to 115.2k baud with hardware and software handshaking[8]

IR/Serial: 1-way device control via infrared up to 1.2 MHz or serial TTL/RS-232 (0-5 Volts) up to 115.2k baud; built-in RC-5 compatible IR receiver[8]

HDMI®: HDCP, EDID, CEC

NOTE: Supports management of HDCP and EDID; supports management of CEC between the connected HDMI devices and a 3-Series Control System®

Video

Switcher: 8x1, auto-switching, auto-detecting multi-format digital/analog source inputs, QuickSwitch HD® technology

Scaler: 4K video scaler, motion-adaptive deinterlacer, intelligent frame rate conversion, Deep Color support, 3D to 2D conversion[6], content-adaptive noise reduction, widescreen format selection (zoom, stretch, maintain aspect-ratio, or 1:1)

Input Signal Types: HDMI w/Deep Color, 3D, & 4K (DVI & DisplayPort Multimode compatible[4]); RGB/VGA (RGBHV, RGBS, RGsB); component (YPbPr); S-Video (Y/C), composite (NTSC, PAL)[5]

Output Signal Types: HDMI w/Deep Color, 3D, & 4K (DVI compatible[4])

Analog-To-Digital Conversion: 10-bit 165 MHz per each of 3 channels

Maximum Pass-Through Resolutions:

Input Type	Scan Type	Resolution	Frame Rate	Color Sampling	Color Depth
HDMI	Progressive	4096x2160 4K DCI or 3840x2160 Ultra HD	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 HD1080p	60 Hz	4:4:4	36 bit
	Interlaced	1920x1080 HD1080i	30 Hz	4:4:4	36 bit
RGB/VGA	Progressive	1600x1200 UXGA	60 Hz	n/a	
		1920x1200 WUXGA	60 Hz	n/a	
Component[5]	Progressive	1920x1080 HD1080p	60 Hz	n/a	
	Interlaced	1920x1080 HD1080i	30 Hz	n/a	
Composite or S-Video[5]	Interlaced	480i NTSC or 576i PAL	60 Hz	n/a	

Maximum Scaler Input Resolutions:

Input Type	Scan Type	Resolution	Frame Rate	Color Sampling	Color Depth
HDMI	Progressive	4096x2160 4K DCI or 3840x2160 Ultra HD	24 Hz	4:4:4	30 bit
			30 Hz	4:4:4	24 bit
			30 Hz	4:2:2	36 bit
		2560x1600 WQXGA	60 Hz	4:4:4	36 bit
		1920x1080 HD1080p	60 Hz	4:4:4	36 bit
	Interlaced	1920x1080 HD1080i	30 Hz	4:4:4	36 bit
RGB/VGA	Progressive	1600x1200 UXGA	60 Hz	n/a	
		1920x1200 WUXGA	60 Hz	n/a	
Component[5]	Progressive	1920x1080 HD1080p	60 Hz	n/a	
	Interlaced	1920x1080 HD1080i	30 Hz	n/a	
Composite or S-Video[5]	Interlaced	480i NTSC or 576i PAL	60 Hz	n/a	

Maximum Scaler Output Resolutions:

Output Type	Scan Type	Resolution	Frame Rate	Color Sampling	Color Depth
HDMI or HDBaseT	Progressive	4096x2160 4K DCI or 3840x2160 Ultra HD	24 Hz	4:4:4	30 bit
			30 Hz	4:4:4	24 bit
			30 Hz	4:2:2	36 bit
		2560x1600 WQXGA	60 Hz	4:4:4	36 bit
		1920x1080 HD1080p	60 Hz	4:4:4	36 bit

NOTE: Common resolutions are shown; other custom resolutions are supported at pixel clock rates up to 300 MHz for digital inputs and outputs, or 165 MHz for analog inputs

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Audio

Switcher: 8x1 stereo source switcher, auto-detecting digital/analog source inputs, stereo DSP for analog output, 4x1 multichannel source switcher, digital audio mixer bypass mode for multichannel pass-through to digital output

Typical of 8 source input channels (Audio Inputs 1 – 4 & HDMI Inputs 1 – 4):

Input Signal Types: Analog 2-channel, HDMI (DisplayPort Multimode compatible [4])

Formats, Analog: Stereo 2-channel

Formats, HDMI & DM: Dolby Digital®, Dolby Digital EX, Dolby Digital Plus, Dolby® TrueHD, DTS®, DTS-ES, DTS 96/24, DTS-HD High Res, DTS-HD Master Audio™, LPCM up to 8 channels [7]

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

Input Compensation: ±10.0 dB [7]

Analog line output w/DSP:

Output Signal Type/Format: Stereo 2-channel

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

Source: -80 to +10 dB Level adjustment range, plus Mute and Balance

Master Volume: -80 to +10 dB Level adjustment range, plus Mute and Mono

Bass: ±12.0 dB

Treble: ±12.0 dB

Equalization: 10-band graphic

GEQ Center Frequencies: 31.5, 63, 125, 250, 500, 1k, 2k, 4k, 8k, 16k Hz

GEQ Gain: ±12.0 dB per band

Delay: 0.0 to 80.0 ms

Limiter Threshold: -80 to 0 dBz

Limiter Ratio: 1:1 to 10:1

Limiter Attack: 1 to 250 ms

Limiter Release: 1 to 1000 ms

Limiter Curve: Hard or soft knee

Frequency Response: 20 Hz to 20 kHz ±0.5 dB (digital source);
20 Hz to 20 kHz ±0.5 dB (analog line source)

S/N Ratio: >108 dB, 1 kHz, A-weighted (digital source);
>103 dB, 1 kHz, A-weighted (analog line source)

THD+N: <0.002%, 20 Hz to 20 kHz (digital source);
<0.005%, 20 Hz to 20 kHz (analog line source)

Stereo Separation: >108 dB (digital source);
>103 dB (analog source)

Digital output (HDMI)

Output Signal Type: HDMI

Formats: Dolby Digital, Dolby Digital EX, Dolby Digital Plus, Dolby TrueHD, DTS, DTS-ES, DTS 96/24, DTS-HD High Res, DTS-HD Master Audio, LPCM up to 8 channels [7]

Source: -80 to +10 dB Level adjustment range, plus Mute and Balance [7]

Master Volume: -80 to +10 dB Level adjustment range, plus Mute [7]

Frequency Response: 20 Hz to 20 kHz ±0.5 dB (digital source);
20 Hz to 20 kHz ±0.5 dB (analog line source)

S/N Ratio: >108 dB, 1 kHz, A-weighted (digital source);
>103 dB, 1 kHz, A-weighted (analog line source)

THD+N: <0.002%, 20 Hz to 20 kHz (digital source);
<0.005%, 20 Hz to 20 kHz (analog line source)

Stereo Separation: >108 dB (digital source);
>103 dB (analog source)

Connectors – Audio/Video Inputs

VGA IN 1 – 4: (4) DB15HD female, analog RGB/video inputs;
Signal Types: RGBHV, component, S-Video, or composite [5];
Formats: RGBHV, RGBS, RGsB, YPbPr, Y/C, NTSC or PAL;
Input Level: 0.5 to 1.5 Vp-p with built-in DC restoration;
Input Impedance: 75 Ohms nominal;
Sync Detection: RGBHV, RGBS, RGsB, YPbPr;
Sync Input Level: 3 to 5 Vp-p;
Sync Input Impedance: 2.2k Ohms

AUDIO IN 1 – 4: (4) 3.5mm TRS mini phone jacks;
Unbalanced stereo line-level analog audio inputs;
Input Impedance: 32k Ohms unbalanced;
Maximum Input Level: 2.8 Vrms unbalanced;
Note: If an HDMI input is selected but no digital audio signal is detected, the corresponding analog audio input is activated (AUDIO 1 for HDMI 1, etc.)

HDMI IN 1 – 4: (4) 19-pin Type A HDMI female, digital video/audio inputs;
Signal Types: HDMI, DVI, or DisplayPort Multimode [4,5]

Connectors – Audio/Video Outputs

HDMI OUT: (1) 19-pin Type A HDMI female, digital video/audio output;
Signal Types: HDMI, DVI [4]

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

Connectors - Control & Power

IR OUT: (1) 3.5mm mini-phone jack, IR/Serial output port [8];
IR output up to 1.2 MHz;
1-way serial TTL/RS-232 (0-5 Volts) up to 115.2k baud

COM: (1) 5-pin 3.5mm detachable terminal, bidirectional RS-232 port [8];
Up to 115.2k baud, hardware and software handshaking support

LAN: (1) 8-wire RJ45 female;
10Base-T/100Base-TX Ethernet port

USB 1 – 4: (4) USB Type A female;
USB 2.0 host ports for TT-100 series Crestron Connect It Cable Caddies [2];
Also enables firmware update via USB flash drive

G: (1) 6-32 screw, chassis ground lug

100-240V~1.4A 50/60Hz: (1) IEC 60320 C14 main power inlet;
Mates with removable power cord, included

COMPUTER (front): (1) USB Type B female;
USB computer console port;
For setup only

IR IN (front): (1) infrared sensor [8];
IR Frequency: 36 to 38 kHz;
IR Formats: Crestron format, RC5;
Allows control from IR wireless remotes using the Crestron or RC-5 command sets

Controls & Indicators

PWR: (1) bicolor green/amber LED, indicates operating power supplied from AC line power, turns amber while booting and green when operating
MSG: (1) red LED, indicates internal control system has generated an error message
HW-R: (1) recessed miniature pushbutton for hardware reset, reboots the control system
SW-R: (1) recessed miniature pushbutton for software reset, restarts the software program
AUTO INPUT SELECT: (1) pushbutton and bicolor green/amber LED, selects auto-switching mode
VGA INPUT SELECT 1 – 4: (4) pushbuttons for manual input selection, and (4) bicolor green/amber LEDs to indicate the current active input and signal presence at each corresponding VGA input
HDMI INPUT SELECT 1 – 4: (4) pushbuttons for manual input selection, and (4) bicolor green/amber LEDs to indicate the current active input and signal presence at each corresponding HDMI input
VOLUME: (1) continuous turn rotary encoder, adjusts the analog audio output volume
LAN (rear): (2) LEDs, bicolor LED (left) indicates Ethernet speed and activity, green LED (right) indicates Ethernet link status

Power Requirements

Main Power: 1.4 Amps @ 100-240 Volts AC, 50/60 Hz
Power Consumption: 33 Watts typical, 26 Watts idle

Environmental

Temperature: 41° to 104°F (5° to 40°C)
Humidity: 10% to 90% RH (non-condensing)
Heat Dissipation: 112 BTU/hr typical, 88 BTU/hr idle

Enclosure

Chassis: Metal, black finish, fan-cooled, vented sides
Front Panel: Metal, black finish with polycarbonate label overlay
Mounting: Freestanding, 1U 19-inch rackmount, or under-table mount (adhesive feet, rack ears, and under-table mounting brackets included)

Dimensions

Height: 1.74 in (45 mm) without feet
Width: 17.28 in (439 mm);
18.94 in (482 mm) with rack ears
Depth: 10.47 in (266 mm)

Weight

6.4 lb (2.9 kg)

MODELS & ACCESSORIES

Available Models

HD-MD8X1-4K: 4K Scaling Presentation Switcher

Available Accessories

TT-100 Series: Crestron Connect It™ Cable Caddy
TSW-752-B-DMPS3_PAK: 7" Touch Screen Package for DMPS3 Series, Black; Includes: TSW-752-B-S, TSW-750-TTK-B-S, & Preloaded Software
MP-B10: Media Presentation Button Panel B10
AM-100: AirMedia™ Presentation Gateway
MP-AMP30: Media Presentation Audio Amplifier
MP-AMP40 Series: Media Presentation Audio Amplifiers, 70 or 100 Volt
AMP Series: Commercial Power Amplifiers
CRESTRON-APP-PAD: Crestron® App for iPad®
XPANEL: Crestron Control® for Computers
STIRP: IR Emitter Probe w/3.5mm Mini Phone Plug
CNSP-XX: Custom Serial Interface Cable
CBL Series: Crestron® Certified Interface Cables
MP-WP Series: Media Presentation Wall Plates
MPI-WP Series: Media Presentation Wall Plates - International Version

Notes:

1. Compatible with 3-Series® control systems only. Not compatible with 2-Series or prior generation control systems.
2. Item(s) sold separately.
3. The DMPS3 .AV Framework Base Program enables setup and control of the HD-MD8X1-4K without programming. It comes embedded on the HD-MD8X1-4K and cannot be overwritten. To configure this feature requires one of the following user interface options: A) a Crestron TSW-752-B-DMPS3 PAK touch screen package (sold separately), B) a Crestron TSW-752 touch screen (sold separately) with the DMPS3 .AV Framework Project for TSW-752 loaded, C) an Apple iPad running the Crestron App (full paid version required, sold separately) with the DMPS3 .AV Framework Project for iPad loaded, or D) a Windows® or Mac® computer with the DMPS3 .AV Framework Project for XPanel installed. Any of these options may also be used by the end-user to control the system. Crestron MP-B10 button panels are also supported. Up to two button panels and one touch screen may be used together. To enable both button panels requires one to be connected via Cresnet and the other via Ethernet. Some functions described in this spec sheet may not be supported using the DMPS3 .AV Framework Base Program feature. For additional resources and a list of supported display devices, please visit: www.crestron.com/dmps.
4. HDMI requires an appropriate adapter or interface cable to accommodate a DVI or DisplayPort Multimode signal. CBL-HD-DVI interface cables are available separately.
5. The VGA inputs can accept component, composite, and S-Video signals using an appropriate adapter (not included). However, input sync detection is not provided for composite or S-Video signal types.
6. Automatically passes 3D video if the display device supports it (reverts to pass-through mode without scaling). Provides automatic 3D-to-2D conversion (with scaling) if the display device does not support 3D.
7. Routing of a multichannel audio signal via a digital input and output (HDMI) requires the input to be set for "mixer bypass" mode. When that input is selected, all audio controls on the digital output are disabled. Mixer bypass mode also disables the Input Compensation control on that input.
8. When using the .AV Framework Base Program, the IR OUT port and IR IN sensor are not utilized, and the COM port supports only basic display device control. The IR OUT port, IR IN sensor, and COM port may all be utilized for fully-customizable applications through integration with an external 3-Series Control System with custom programming.

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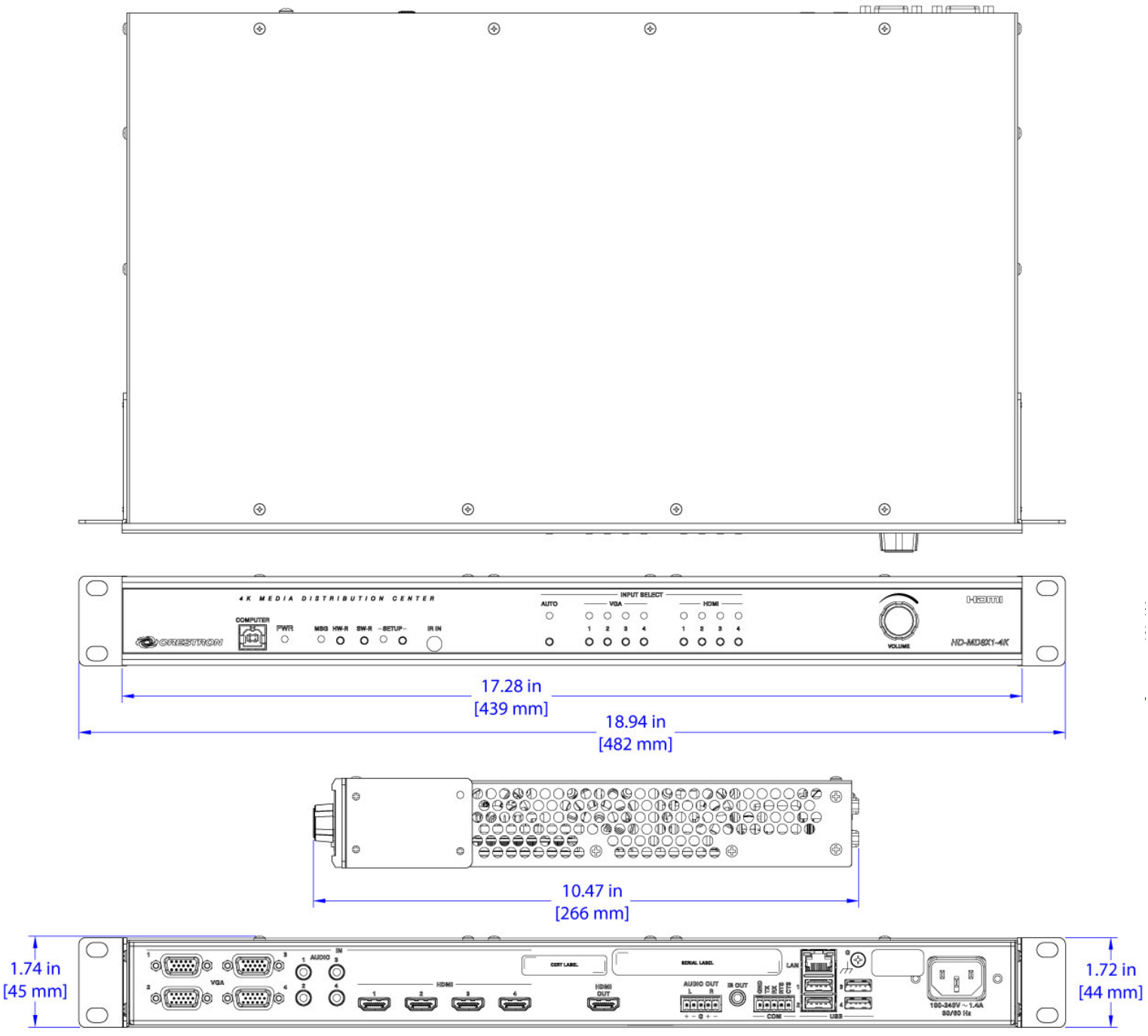
This product may be purchased from an authorized Crestron dealer. To find a dealer, please contact the Crestron sales representative for your area. A list of sales representatives is available online at www.crestron.com/salesreps or by calling 800-237-2041.

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.



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Specifications subject to change without notice. Revised 08/27/15