Crestron's DigitalMedia Switchers Offer Ultimate HDMI/IP Distribution & Control

DM-MD8X8 and DM-MD16X16 switchers fix HDMI problems related to distance, switching lags, HDCP authentication and more. Gig Ethernet switch built in for IP.

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Crestron has a Cat 5 switching solution that apparently fixes everything that is wrong with HDMI, from switching lags to HDCP authentication to distance limitations and more.

The technology is part of Crestron's new DigitalMedia line, which includes the DM-MD8X8 and DM-MD16X16 switchers in 8x8 and 16x16 configurations, respectively.

The switchers are modular solutions with card slots that accommodate virtually any type of input.

System automatically checks all connections from the source to the display, revealing points of failure via the LCD screen and LEDs on the front panel.

A full selection of switcher input cards, wall plate transmitters, and room controllers provides extensive connectivity throughout the home, supporting a complete range of analog and digital signal types.

DigitalMedia manages all of the different signals and devices, matching each source's output to the capabilities of the selected display(s) without using scaling or compression.

Crestron claims that very signal is preserved in its native video resolution and audio format, ensuring a lossless signal path throughout.

The DigitalMedia line can be considered the next generation of Crestron's huge-selling PVID Series of Cat 5-based component distribution systems. Compared to that and other analog-based solutions, DigitalMedia will cost about 30 percent more.

Combining HDMI, IP, Control

A couple of years in the making, Crestron went back to the drawing board to create the DM series, determining the best way to distribute a huge variety of audio/video formats – analog, IP, HDMI and otherwise -- over a pair of Cat 5 cables (or a single fiber cable).

Crestron struggled with how to get streaming video and uncompressed HDMI content out of one box, without compromising video quality, and without requiring digital/audio converters and other processors that add latency and cost.

"We did a study, asking 'Where does content come from?'" says Crestron's Fred Bargetzi, vice president of technology. "If you can get it all in an MPEG format, then you can easily stream it over Ethernet/Cat 5. But sometimes you can't "touch" the content in its digital form, and it comes out in uncompressed HDMI."

If Bargetzi had his choice, he says, "I would want to move it [content] all around over Ethernet."

But if you crunch the numbers, it just doesn't add up.

HDMI 1.3 supports resolutions up to 1440p. "That's 10+ Gbps," Bargetzi says. "To send that over a gigabit Ethernet network requires expensive endpoints just to take something that was compressed (MPEG) and then uncompressed (HDMI), just to compress it again to send it over the network, and finally uncompress it at the display. You get the picture"

Regardless of expense, the process would still introduce latency into the system. Crestron eliminates the latency by maintaining the full HDMI 1.3 stream from point to point – over 450 feet over shielded twisted pair (with optional repeaters or extra cable for power) or 3,280 feet (1K) for fiber.

But it does more than that. The system also streams IP-based content via a built-in gigabit switch. USB mouse and keyboard distribution allows computers, media servers, and video game consoles to be installed out-of-sight and accessed from anywhere in the house.

And naturally, Crestron's control technology is built in for automating the switcher and controlling everything connected to it – no additional wires required.

QuickSwitch Fixes HDMI Lags

If you've ever switched between two HDMI sources, you know the delay can be painful – often up to 10 seconds or so.

That's how long it takes to authenticate a device for proper digital rights management (HDCP).

Crestron's proprietary QuickSwitch HD technology maintains a constant HDCP connection with each HDMI device in the signal path, eliminating the need to re-authenticate each time a different source is selected.

"We maintain the HDMI and HDCP connections from the source to the switcher, and the switcher to the display," says Bargetzi. "Now, when you switch back, instead of it taking eight or 10 seconds, it happens almost immediately."

He tells of a particularly annoying HDMI switching scenario that involves a Blu-ray player. In his tests, it took 11 seconds to switch between a satellite and a Blu-ray source. And that ain't the half of it.

"Imagine you are watching a movie on your Blu-ray player, and switch over to your satellite to check the scores of the game," he says. "A minute later you switch back to the Blu-ray player, only only to find that it went to sleep because it lost its HDMI connection to the display. Worse yet, most Blu-ray players take one or two minutes to start up again, and most don't go back to

where you left off in the movie."

With QuickSwitch, that problem disappears.

In June Silicon Image, developer of HDMI technology, launched a similar technology called InstaPort. But "InstaPort isn't a system-wide solution," says Bargetzi. "Plus, it requires display manufacturers to implement the technology. Our solution is built into a single box serving all displays."

Self Diagnostics Optimize HDMI

After you set up your system, press a button on the DM unit and it runs through a "Systems Commissioning" routine that includes a variety of diagnostic tests to ensure users get the most of their sources and displays.

"It checks all connections from the source to display so it can tell you if there's any point of failure," Bargetzi says.

Optimizing the Display

The switcher polls the EDID (Extended Display Identification Data) for each display to find out the optimum resolution and frequency.

Bargetzi explains, "It will come back and say, 'If you want to route every display to every source, here is the optimal resolution. Do you want me to set it?'"

The system offers a choice so, for example, if you want to route some sources just to the home theater, "you don't have to dumb down the resolution," Bargetzi says.

Confirming HDCP Keys

"The problem with sources today," says Bargetzi, "is that many of them cannot hold enough HDCP keys to work in a whole system."

A source can play simultaneously only on the number of displays for which it has keys.

If a source can only implement four keys (a common scenario), then it can only play on four TVs simultaneously.

The problem is that many integrators test their multiroom video systems one source at a time. "What often happens," Bargetzi says, "is that they'll put in an 8x8 switcher and test one source to each display. It all works great. But later the customer decides he wants to show Blu-ray on all of the displays simultaneously. After he gets past the fourth display, not only does nothing show up on the fifth display, but all four of the previous displays go black until you de-select the fifth display."

Phew.

As part of its diagnostics, the Crestron DM switchers "identify issues like that," Bargetzi says. "It would tell you up front that the Blu-ray only holds four keys, so you can address these issues in the installation phase rather than when you get that 'special call' from your customer."

Crestron plans to create an online database of devices, posting the number HDCP keys they accommodate. He suggests that dealers may want to pick sources based on the number of displays they can support.

Bargetzi says that very few dealers know about these issues, "which suggests that dealers really aren't implementing whole-house HDMI distribution."

DigitalMedia Switchers – Features

- Distributes uncompressed digital audio and video over CAT5e/6 or fiber
- Supports HDMI 1.3 with Deep Color and 7.1 channel HD lossless audio
- Supports video resolutions up to 1920x1200 or 1080p/60
- Allows full 1080p/60 up to 450 feet using cat5e or cat6 cable
- Extended distances for native 1080i or 1080p/24 formats
- Supports both (50/125) and (62.5/125) multimode fiber for distances up to 3km
- Full audio and USB breakaway
- Advanced video detection on every video type, including resolution, frame rate and color depth
- QuickSwitch HD technology minimizes HDMI switching latency
- Configurable inputs support a complete range of digital and analog signal types
- Supports up to 16 DM room controllers
- Built-in power distribution for DM wall plates, repeaters, and room controllers
- HDMI loop-thru for easy system expansion
- Integrates with analog audio distribution systems
- Enables simultaneous output of stereo and surround sound
- Manages HDCP digital rights management for every device
- Performs automatic resolution management via EDID
- Enables device control over HDMI connection using CEC signal
- Includes integrated Gigabit Ethernet switch
- Distributes USB mouse and keyboard (HID) signals
- Easy software setup tool
- LCD front panel diagnostics
- 19-inch rack-mountable

DigitalMedia Switcher Input Cards

All input cards provide an HDMI loop output for switcher expansion

- **DMC-HD HDMI Input card**
  Includes HDMI input, RCA analog audio output (breaks out the embedded HDMI audio to feed a multi-room audio distribution system), and USB HID port (passes a remote mouse/keyboard signal to the source device, i.e. computer, game console, etc.)
- **DMC-HD-DSP HDMI Input Card w/DSP**
  Similar to DMC-HD, but includes internal DSP processing to simultaneously provide both uncompressed 7.1 channel HD surround sound and 2-channel audio for distribution via the RCA analog audio output and other stereo outputs.
- **DMC-VID-RCA-D RCA Analog Video Input Card w/SPDIF Audio**
  Includes multi-format RCA inputs supporting component, S-Video, and composite video signals. Also includes S/PDIF digital audio input.
- **DMC-VID-RCA-A RCA Analog Video Input Card w/Analog Audio**
  Includes multi-format RCA inputs supporting component, S-Video, and composite video signals. Also includes RCA analog audio input.
- **DMC-VID-BNC BNC Analog Video Input Card**
  Includes multi-format BNC inputs supporting component, S-Video, and composite video signals. Also includes balanced analog audio input.
- **DMC-VID4 Security Camera Input Card**
  Includes 4 RCA composite video inputs w/built-in sequential switcher and quad processor. Supports dynamic colored text overlay on all four video windows for easy identification.
- **DMC-DVI DVI + RGBHV Input Card**
  Includes DVI-I input with breakout cable supporting DVI, RGBHV, component, S-Video, and composite video signals. Also includes balanced analog audio input and USB HID port.
- **DMC-CAT DM Input Card**
  Receives a DM signal from a DM transmitter via CAT5e/6 or DigitalMedia cable. Includes DigitalMedia input ports, and RCA analog audio output to break out audio embedded in the DigitalMedia signal.
- **DMC-CAT-DSP DM Input Card w/DSP**

Similar to DMC-CAT with internal DSP processing to enable simultaneous 7.1 and 2-channel audio output.

- **DMC-F Fiber Input Card**
  Receives a DM signal from a DM transmitter via multimode optical fiber cable. Includes DigitalMedia fiber input and RCA analog audio output.
- **DMC-F-DSP Fiber Input Card w/DSP**
  Similar to DMC-F with internal DSP processing to enable simultaneous 7.1 and 2-channel audio output.

DigitalMedia Switcher Output Cards

- **DMC-CATO Quad DM Output Card**
  Provides (4) DM outputs to feed up to four individual DM receivers via CAT5e/6 or DigitalMedia cable.
- **DMC-CATO-HD Quad DM Output Card w/Dual HDMI Out**
  Similar to DMC-CATO with HDMI outputs added on DM outputs 1 & 3 to feed local devices. Each HDMI output is active simultaneously with the corresponding DM output to drive two separate devices.
- **DMC-FO Quad DM Fiber Output Card**
  Provides (4) DM outputs to feed up to four individual DM receivers via multimode optical fiber cable.
- **DMC-F-DSP Fiber Input Card w/DSP**
  Similar to DMC-F with internal DSP processing to enable simultaneous 7.1 and 2-channel audio output.

DigitalMedia Room Controllers

The DM Room Controller features a low-profile design, perfect for installation behind flat panel displays and above ceiling mounted projectors. It mounts to a standard 2-gang or 85mm European electrical box, and sticks out only one inch from the surface. Connections for the display are all positioned on the side of the receiver, while the DM and LAN connection are made behind the unit within the electrical box.

DM-RMC-100 + DM-RMC-100-F

- DigitalMedia receiver and display controller
- Low-profile design
- Mounts to a 2-gang or Euro electrical box
- Meets requirements for plenum-rated ceilings
- Choice of standard DM or DM Fiber inputs
- HDMI display output
- USB HID keyboard/mouse port
- RS-232, IR, digital in, & relay control ports
- Optional power current sensor

Input Wall Plates

DM-TX-100 DigitalMedia HDMI *(Updated with new specs 9/2)*

- DigitalMedia transmitter
- 1-gang Decora style wall plate
- Connects to DigitalMedia switcher or receiver via DM cable
- HDMI Input
- USB HID port
- Rear panel IR OUT port

DM-TX-200 DigitalMedia HDMI + Component Input Wall Plate *(Updated with new specs 9/2)*

- DigitalMedia transmitter
- 2-gang Decora style wall plate
- Connects to DigitalMedia switcher or receiver via DM cable or fiber
- HDMI input
- HDMI monitor pass-thru
- 1 SPDIF digital audio input
- 2 analog stereo audio inputs (1 RCA, 1 mini-TRS)
- Component/S-Video/composite video input
- USB HID port
- Rear panel IR OUT port

DM-TX-205 + DM-TX-205-F DigitalMedia DVI + Component Input Wall Plates *(Updated with new specs 9/2)*

- DigitalMedia transmitter
- 2-gang Decora style wall plate
- Connects to DigitalMedia switcher or receiver via DM cable or fiber
- DVI-I input (DVI, HDMI, & RGBHV compatible)
- HDMI monitor pass-thru
- 1 SPDIF digital audio input
- 2 analog stereo audio inputs (1 RCA, 1 mini-TRS)
- Component/S-Video/composite video input
- USB HID port
- Rear panel IR OUT port

DM-TX-210 DigitalMedia Dual DVI Input Wall Plate

- DigitalMedia transmitter
- 2-gang Decora style wall plate

- Connects to DigitalMedia switcher or receiver via DM cable
- 2 DVI-I inputs (DVI, HDMI, & RGBHV compatible)
- HDMI monitor pass-thru
- 2 mini-TRS analog stereo audio inputs
- USB HID port
- Rear panel IR OUT port

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