

DM-MD32X32

32x32 DigitalMedia™ Switcher

Crestron® DM Switchers provide the foundation for a complete **DigitalMedia** system, delivering an advanced, true high-definition multi-room AV signal routing solution that's extremely flexible and installer-friendly. The DM-MD32X32 affords low-latency switching and pure, lossless distribution of HDMI™ and other signals to support the latest Blu-ray Disc™ players, HDTV receivers, digital media servers, computers, and all your other AV devices.

The DM-MD32X32 is field-configurable to handle up to 32 AV sources of virtually any type. The outputs are also field-configurable to provide up to 32 DM room outputs and/or HDMI outputs in a single chassis, with expansion capability possible for up to 160 outputs using multiple chassis. A full selection of DM switcher input cards, DM transmitters, and DM room controllers provides extensive connectivity throughout the home or office, supporting a complete range of analog and digital signal types — all through one switcher! User-friendly setup and troubleshooting tools are provided through the DM-MD32X32 front panel, or via **Crestron Toolbox™** software, to make setting up a complete multi-room HD system easy.

DigitalMedia™

You can't talk about AV and home entertainment today without talking about high-definition, and creating a professional HD AV distribution system means handling the challenges that come with HDMI. HDMI is the new standard for interfacing high-definition AV equipment, but despite its many benefits, wasn't developed with multi-room distribution in mind. So, as the leader in HDMI and control system technologies, Crestron has developed DigitalMedia, the first complete HD AV distribution system that takes HDMI to a higher level, and allows virtually any mix of AV sources to be distributed throughout the home from a centralized rack location.

DigitalMedia (DM) distributes uncompressed digital video and audio signals over a choice of shielded twisted-pair copper wire or multi-mode fiber. DigitalMedia thoughtfully 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. Every signal is preserved in its native video resolution and audio format, ensuring a pure, lossless signal path throughout.

Of course DigitalMedia handles more than just audio and video. Integrated Ethernet and USB HID distribution allows computers and media servers to be installed out-of-sight and accessed from anywhere in the house. And naturally, Crestron control is also built-in for controlling the displays and other room devices without additional wiring.

Modular Architecture

The DM-MD32X32 features a modular architecture with 32 input card slots, and 8 quad output card slots. Each card slot on the DM-MD32X32 is field-installable, allowing for easy and flexible system configuration with the ability to make changes to the system as needs change.

A wide selection of DM input cards is offered to support a complete range of digital and analog AV signal types. Up to 8 output cards may be installed to feed up to 32 DM Receivers/Room Controllers using either **DigitalMedia Cable** or **CresFiber®** fiber optic cable. DigitalMedia allows for cable lengths up to 450 feet (137 m) using DM cable, 1000 feet (300 m) using CresFiber. HDMI outputs are also available for direct connection to centralized audio processors and video monitors.

Output Expansion

An HDMI "pass-thru" output is provided on every input card to allow the



inputs of up to 5 DM switchers to be daisy-chained, enabling the configuration of very large distribution systems with many DM and HDMI outputs. Using five DM-MD32X32 switchers, it is possible to support an incredible 160 separate outputs.

Versatile Audio Routing

HDMI is the key to handling all the latest 7.1 surround sound formats like Dolby® TrueHD and DTS-HD Master Audio™. Great for your high-end home theater, but how do you share that same source with other audio zones in the house?

DigitalMedia provides the answer, allowing for the simultaneous distribution of multi-channel surround sound and two-channel stereo signals from the same HDMI source. Equipped with a **DMC-HD-DSP** input card, the DM-MD32X32 employs onboard DSP processing to derive a stereo down-mix from the original multi-channel signal. Both signals can be routed separately or simultaneously from any of the switcher's DM outputs, allowing either signal to be selected for output at each DM receiver location.

Back at the switcher, the digital stereo signal is also converted to analog to enable sharing with every other room in the house via an **AAE**, **CNX-PAD8A**, or other multi-room audio distribution system. The DM-MD32X32 also allows bulky surround sound processors and amplifiers to be located centrally instead of at the display location via optional local HDMI outputs.

Computer Compatibility

Besides handling every available HDTV format supported by HDMI, DigitalMedia also supports the distribution of DVI, DisplayPort Multimode^[1], and RGB computer signals, and is fully compatible with DVI computer monitors up to 1920 x 1200 WUXGA.

Built-in Ethernet Switch

In addition to transporting digital video and audio, DigitalMedia can also extend 10/100 Ethernet out to each display and source device via DM room controllers and select DM transmitters, providing high-speed connectivity for any room device that requires a LAN connection. Its Gigabit Ethernet connection to the external LAN helps maximize bandwidth for each network port. Ethernet is also utilized internally by the Crestron control bus to manage all of the DM devices in the system and provide display control in

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each room.

USB HID Switch

DigitalMedia lets you centralize ALL of your HD sources - not just television receivers and DVD changers, but also media servers and computers. Built-in USB HID (Human Interface Device) signal routing allows USB HID compatible keyboards and mice to be connected at a remote display location, conference table or presentation lectern, extending their signals through to the centralized equipment via USB HID ports provided on select switcher input cards.

EDID Format Management

With HDMI comes a slew of confusing video and audio formats to keep track of, and chances are not every device in your system supports all of the same formats. In a typical one-room system, HDMI attempts to resolve this confusion using EDID (Extended Display Identification Data). When two HDMI devices are connected together, the receiving device (a display or surround sound processor) uses EDID to announce its format capabilities to the source device (a TV tuner or video player), which in turn configures itself to output the most effective format that both devices can support.

But, try to distribute a bunch of disparate sources to a house full of different displays and audio systems, and you're likely to experience some serious conflicts and disappointing picture and sound quality. For instance, the Blu-ray player that's feeding your 1080p projector in the theater may restrict itself to a lower resolution, or even shut off completely, if someone decides to view the same signal on the 20" TV in the kitchen. And, instead of enjoying the incredible 7.1 Dolby TrueHD format supported by your high-end theater sound system, you may find your listening experience limited to Dolby 5.1, or even plain old stereo.

The DM-MD32X32 takes full advantage of EDID to prevent such conflicts, assessing the formats supported by each system device, and then allowing the installer to assign compatible devices in logical arrangements. Conflicting combinations can be prohibited so only the optimum signal formats get delivered to each display and audio system in the house. All DigitalMedia wiring is also tested for integrity and bandwidth capability, optimizing system operation by instructing sources to output only resolutions and formats that the wiring can reliably handle.

QuickSwitch HD Technology

Crestron exclusive QuickSwitch HD technology minimizes the annoying switching latency that plagues typical HDMI switchers. As the move to digital takes hold, more and more movie studios and television service providers are using HDCP (High-bandwidth Digital Content Protection) to protect their DVDs, Blu-ray Discs, and broadcast signals against unauthorized copying. Viewing the HDCP encrypted content in its full high-definition format requires a source device to "authenticate" each display and signal processor in the system through an HDMI connection before delivering an output signal. Normally the authentication process occurs every time any HDMI signal is switched, causing a complete loss of signal for up to 15 seconds whenever a new source or display is selected anywhere in the system.

QuickSwitch HD technology achieves very fast switching of HDMI signals by maintaining a constant HDCP connection with each HDMI device in the system, eliminating the need to re-authenticate each time a different source is selected.

HDCP Key Management

Another aspect to HDCP is its use of "keys" to manage the handshaking that occurs between any two devices. Every HDMI source device has a limit to how many downstream devices it can support, determined by the number of HDCP keys it has available. Rarely is that limit advertised or specified by the manufacturer or service provider, so connect too many displays or processors and the source will simply stop outputting a signal without

warning.

To prevent such surprises, the DM-MD32X32 tests the HDCP limits of each HDMI source, allowing the installer to configure the system around any limitations, or substitute a different component.

CEC Embedded Device Control

The primary objective of every Crestron system is to enable precisely the control desired for a seamless user experience. DigitalMedia provides an alternative to conventional IR and RS-232 device control by harnessing the CEC (Consumer Electronics Control) signal embedded in HDMI. Through its connection to the control system, the DM-MD32X32 provides a gateway for controlling many devices right through their HDMI connections, potentially eliminating the need for any dedicated control wires or IR probes. Through proper CEC signal management, DigitalMedia allows you to take control of each device as you like.

Easy Setup

Via the front panel or using Crestron Toolbox software, every step of the DM-MD32X32's setup process is designed to be quick and easy, configuring inputs and outputs automatically while letting the installer make intelligent design decisions along the way. The switcher even tests and measures the length of each DM cable, automatically making the appropriate calibrations for optimal signal transmission to every room. With DigitalMedia, an entire 32x32 system can be commissioned in as little as 15 minutes.

Please refer to the DigitalMedia Design Guide, Doc. #4789 for additional information.

> *Distributes uncompressed digital video and audio over twisted-pair wire or fiber*

> *Supports HDMI™ with Deep Color and 7.1 channel HD lossless audio*

> *Supports video resolutions up to WUXGA 1920x1200 and HD 1080p60*

> *Allows cable length to 450 feet using DigitalMedia™ Cable, 1000 feet (300 m) using CresFiber®*

> *Supports up to 32 DM receivers and room controllers with easy expansion for more outputs*

> *Configurable inputs support a complete range of digital and analog signal types*

> *Detects and displays detailed video and audio input information*

> *QuickSwitch HD technology achieves low-latency HDMI switching*

> *Manages HDCP digital rights management for every device*

> *Performs automatic AV signal format management via EDID*

> *Enables device control via CEC*

> *Distributes USB HID mouse and keyboard signals*

> *Allows full audio and USB breakaway switching*

> *Integrates with analog audio distribution systems*

> *Enables simultaneous output of stereo and surround*

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sound audio

- > Includes integrated Ethernet switch with Gigabit LAN port
- > Includes built-in power distribution for DM transmitters, repeaters, and room controllers
- > Provides easy setup and diagnostics tools via front panel or software
- > 14-space 19-inch rack-mountable

SPECIFICATIONS

Video

Switcher: 32x32 digital matrix, modular input/output cards, Crestron QuickSwitch HD

Input Signal Types: Configurable via modular plug-in cards supporting HDMI™, DisplayPort Multimode^[1], DVI, SDI, RGB, component (YPbPr), S-Video (Y/C), composite video, DM CAT, and DM Fiber

Output Signal Types: Configurable via modular plug-in cards supporting DM CAT, DM Fiber, HDMI, and DVI (All input cards also include HDMI pass-thru outputs)

Formats: HDMI w/Deep Color, DVI, HDCP v.1.2 content protection support, SD-SDI, HD-SDI, 3G-SDI, RGBHV up to UXGA/WUXGA, HDTV up to 1080p60, NTSC or PAL

Input Resolutions, HDMI & DVI, Progressive: 640x480@60Hz, 720x480@60Hz (480p), 720x576@50Hz (576p), 800x600@60Hz, 848x480@60Hz, 852x480@60Hz, 854x480@60Hz, 1024x768@60Hz, 1024x852@60Hz, 1024x1024@60Hz, 1280x720@50Hz (720p50), 1280x720@60Hz (720p60), 1280x768@60Hz, 1280x800@60Hz, 1280x960@60Hz, 1280x1024@60Hz, 1360x768@60Hz, 1365x1024@60Hz, 1366x768@60Hz, 1400x1050@60Hz, 1440x900@60Hz, 1600x900@60Hz, 1600x1200@60Hz, 1680x1050@60Hz, 1920x1080@24Hz (1080p24), 1920x1080@25Hz (1080p25), 1920x1080@50Hz (1080p50), 1920x1080@60Hz (1080p60), 1920x1200@60Hz, 2048x1080@24Hz, 2048x1152@60Hz, plus any other resolution allowed by HDMI up to 165MHz pixel clock

Input Resolutions, HDMI & DVI, Interlaced: 720x480@30Hz (480i), 720x576@25Hz (576i), 1920x1080@25Hz (1080i25), 1920x1080@30Hz (1080i30), plus any other resolution allowed by HDMI up to 165MHz pixel clock

Input Resolutions, RGB: 640x480@60Hz, 720x480@60Hz (480p), 720x576@50Hz (576p), 800x600@60Hz, 848x480@60Hz, 1024x768@60Hz, 1280x720@50Hz (720p50), 1280x720@60Hz (720p60), 1280x768@60Hz, 1280x800@60Hz, 1280x960@60Hz, 1280x1024@60Hz, 1360x768@60Hz, 1366x768@60Hz, 1400x1050@60Hz, 1440x900@60Hz, 1600x1200@60Hz, 1680x1050@60Hz, 1920x1080@24Hz (1080p24), 1920x1080@50Hz (1080p50), 1920x1080@60Hz (1080p60), 1920x1200@60Hz, 2048x1080@24Hz, 2048x1152@60Hz

Input Resolutions, Component: 480i, 576i, 480p, 576p, 720p50, 720p60, 1080i25 (1125 lines), 1080i30, 1080p30, 1080p50 (1125 lines), 1080p60

Input Resolutions, Composite and S-Video: 480i, 576i

Input Resolutions, SDI: (see DMC-SDI spec sheet)

Output Resolutions: Matched to inputs

Backplane Data Rate: 12.5 Gbps

Audio

Switcher: 32x32 digital multi-channel audio-follow-video matrix switching, plus independent 32x32 stereo matrix for audio breakaway

Input Signal Types: Configurable via modular plug-in cards supporting HDMI, DisplayPort Multimode^[1], SDI, analog (stereo 2-channel), SPDIF, DM CAT, and DM Fiber

Output Signal Types: Configurable via modular plug-in cards supporting DM CAT, DM Fiber, HDMI, and analog (stereo 2-channel); (All input cards also include HDMI pass-thru outputs, and some input cards also include analog stereo pass-thru audio outputs)

Formats, HDMI only: Dolby Digital Plus, Dolby® TrueHD, DTS-HD High Res, DTS-

Formats, SDI: (see DMC-SDI spec sheet)

Communications

DigitalMedia: DM Fiber, DM CAT, DMNet, HDCP management, EDID format management, CEC

Ethernet: 10/100/1000BaseT, auto-switching, auto-negotiating, auto-discovery, full/half duplex, TCP/IP, UDP/IP, CIP, DHCP, RSTP

USB: Supports USB HID class devices

Ethernet Switch

Provides (1) onboard 10/100/1000BaseT Gigabit Ethernet port, (1) internal 10BaseT/100BaseTX Ethernet port for the switcher, and (64) remote 10BaseT/100BaseTX Ethernet ports via select outboard devices

USB Switch

32x32 matrix

Card Slots

1 - 32: (32) DM switcher input card slots;

Each slot accepts (1) DMC-series input card

DM OUTPUTS (SLOT 1 - 8): (8) DM switcher output card slots;

Each slot accepts (1) DMC0-series output card

Connectors

LAN: (1) 8-wire RJ45 female w/2 LED indicators;

10/100/1000BaseT Ethernet port;

Green LED indicates link status;

Yellow LED indicates Ethernet activity

24ABG / EIG 1 - 4 (SLOT 1 - 8): (32) sets of (1) 4-pin and (1) 3-pin 3.5mm detachable terminal blocks;

Comprises (32) DMNet ports with "EIG" power selection ports, each set associated with a corresponding DM output port on the output card in either output slot;

Each DMNet port provides power and communications for a DM device connected via DM cable;

Each EIG port connects to an external power supply^[2], or to the internal power source via a jumper, to power the DM device connected to the corresponding DMNet port;

Maximum Load: 40 Watts (1.66 Amps @ 24 Volts DC) per port, limited to available DMNet power from internal power supply (see "Power Requirements" below) or external power supply^[2]

100-240V~1100VA 50/60Hz: (1) IEC C14 male chassis plug, main power input;

Mates with removable power cord, included

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

COMPUTER (front): (1) USB Type B female;

USB 1.1 computer console port (6 ft cable included)

LCD Display

Green LCD dot matrix, 128 x 64 resolution, adjustable LED backlight;

Displays inputs/outputs by name, video & audio signal information, Ethernet configuration and setup menus

Controls and Indicators

SOFTKEYS: (4) pushbuttons for activation of LCD driven functions

HW-R: (1) recessed miniature pushbutton for hardware reset, reboots the switcher

ROUTE: (1) pushbutton and red LED, selects ROUTE mode to allow routing changes

VIEW: (1) pushbutton and red LED, selects VIEW mode for viewing current routes

INFO: (1) pushbutton and red LED, selects INFO mode for viewing AV and device info

MENU: (1) pushbutton, steps menu back one level

ENTER: (1) pushbutton, executes highlighted menu or value

AUDIO: (1) pushbutton & red LED, selects audio routing view

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VIDEO: (1) pushbutton & red LED, selects video routing view
USB: (1) pushbutton & red LED, selects USB routing view
Quick-Adjust Knob: (1) continuous turn rotary encoder, adjusts menu parameters
IN 1 - 32: (32) pushbuttons and red LEDs, select input for routing
OUT 1 - 32: (32) pushbuttons and red LEDs, select output for routing

Power Requirements

Main Power: 1100 Watts @ 100-240 Volts AC, 50/60 Hz
Available DMNet Power: 220 Watts (9.2 Amps @ 24 Volts DC) from internal power supply

Environmental

Temperature: 32° to 104°F (0° to 40°C)
Humidity: 10% to 90% RH (non-condensing)
Heat Dissipation: 3000 BTU/Hr

Enclosure

Chassis: Metal with black finish, integrated rack ears, vented sides, fan-cooled
Faceplate: Metal, black finish with polycarbonate label overlay
Mounting: 14U 19-inch rack-mountable (rack ears built in)

Dimensions

Height: 24.44 in (621 mm)
Width: 19.16 in (487 mm)
Depth: 15.75 in (400 mm) without cards

Weight

28.4 lb (12.9 kg) without cards

Available Models

DM-MD32X32: 32x32 DigitalMedia™ Switcher
[Available May, 2010]

Available Accessories

DMC-HD: HDMI Input Card for DM Switchers
DMC-HD-DSP: HDMI Input Card w/Down-mixing for DM Switchers
DMC-DVI: DVI/RGB Input Card for DM Switchers
DMC-VID-RCA-A: RCA Analog Video Input Card w/Analog Audio for DM Switchers
DMC-VID-RCA-D: RCA Analog Video Input Card w/SPDIF Audio for DM Switchers
DMC-VID-BNC: BNC Analog Video Input Card for DM Switchers
DMC-VID4: Quad Video Input Card for DM Switchers
DMC-SDI: SDI Input Card for DM Switchers
[Available May, 2010]
DMC-CAT: DM CAT Input Card for DM Switchers
DMC-CAT-DSP: DM CAT Input Card w/Down-mixing for DM Switchers
DMC-F: DM Fiber Input Card for DM Switchers
DMC-F-DSP: DM Fiber Input Card w/Down-mixing for DM Switchers
DMCO-10: Output Card for DM-MD8X8 & DM-MD32X32, provides 2 DM Fiber Outputs
DMCO-11: Output Card for DM-MD8X8 & DM-MD32X32, provides 4 DM Fiber Outputs
DMCO-12: Output Card for DM-MD8X8 & DM-MD32X32, provides 2 DM Fiber & 2 DM CAT w/1 HDMI Outputs
DMCO-13: Output Card for DM-MD8X8 & DM-MD32X32, provides 2 DM Fiber & 2 HDMI w/2 Stereo Analog Audio Outputs
DMCO-20: Output Card for DM-MD8X8 & DM-MD32X32, provides 2 DM CAT w/1 HDMI Outputs
DMCO-22: Output Card for DM-MD8X8 & DM-MD32X32, provides 4 DM CAT w/2 HDMI Outputs
DMCO-23: Output Card for DM-MD8X8 & DM-MD32X32, provides 2 DM CAT w/1 HDMI & 2 HDMI w/2 Stereo Analog Audio Outputs

DMCO-30: Output Card for DM-MD8X8 & DM-MD32X32, provides 2 HDMI w/2 Stereo Analog Audio Outputs
DMCO-33: Output Card for DM-MD8X8 & DM-MD32X32, provides 4 HDMI w/4 Stereo Analog Audio Outputs
DM-CBL-NP-SP500: DigitalMedia™ Cable, non-plenum, 500 ft spool
DM-CBL-P-SP500: DigitalMedia™ Cable, plenum-rated, 500 ft spool
DM-CONN-20: DigitalMedia™ Cable Connectors, 20-Pack
DM-DR: DigitalMedia™ Repeater
CRESFIBER-NP-SP500: CresFiber® Fiber Optic Cable, 50/125 x4 breakout, non-plenum, 500 ft spool
CRESFIBER-NP-SP1000: CresFiber® Fiber Optic Cable, 50/125 x4 breakout, non-plenum, 1000 ft spool
CRESFIBER-P-SP500: CresFiber® Fiber Optic Cable, 50/125 x4 breakout, plenum, 500 ft spool
CRESFIBER-P-SP1000: CresFiber® Fiber Optic Cable, 50/125 x4 breakout, plenum, 1000 ft spool
CRESFIBER-CONN-SC50UM-12: CresFiber® Fiber Optic Cable Connector (AFL Telecommunications), SC 50µm, 12-Pack
CRESFIBER-DUAL-SC-P-1.5: CresFiber® Duplex Fiber Optic Cable Assembly, 50/125, SC, Plenum, 1.5 ft
[Release Date: TBA]
CRESFIBER-DUAL-SC-P-3: CresFiber® Duplex Fiber Optic Cable Assembly, 50/125, SC, Plenum, 3 ft
[Release Date: TBA]
CRESFIBER-DUAL-SC-P-6: CresFiber® Duplex Fiber Optic Cable Assembly, 50/125, SC, Plenum, 6 ft
[Release Date: TBA]
CRESFIBER-DUAL-SC-P-12: CresFiber® Duplex Fiber Optic Cable Assembly, 50/125, SC, Plenum, 12 ft
[Release Date: TBA]
CRESFIBER-DUAL-SC-P-20: CresFiber® Duplex Fiber Optic Cable Assembly, 50/125, SC, Plenum, 20 ft
[Release Date: TBA]
CRESFIBER-DUAL-SC-P-30: CresFiber® Duplex Fiber Optic Cable Assembly, 50/125, SC, Plenum, 30 ft
[Release Date: TBA]
CRESFIBER-DUAL-SC-ARMORED-P-60: CresFiber® ARMORED Duplex Fiber Optic Cable Assembly, 50/125, SC, Armored, Plenum, 60 ft
CRESFIBER-DUAL-SC-ARMORED-P-100: CresFiber® ARMORED Duplex Fiber Optic Cable Assembly, 50/125, SC, Armored, Plenum, 100 ft
CRESFIBER-DUAL-SC-ARMORED-P-200: CresFiber® ARMORED Duplex Fiber Optic Cable Assembly, 50/125, SC, Armored, Plenum, 200 ft
CRESFIBER-DUAL-SC-ARMORED-P-300: CresFiber® ARMORED Duplex Fiber Optic Cable Assembly, 50/125, SC, Armored, Plenum, 300 ft
CRESFIBER-SINGLE-SC-CLEAR-NP-30: CresFiber® CLEAR Simplex Fiber Optic Cable Assembly, 50/125, SC, Non-Plenum, 30 ft
CRESFIBER-SINGLE-SC-CLEAR-NP-60: CresFiber® CLEAR Simplex Fiber Optic Cable Assembly, 50/125, SC, Non-Plenum, 60 ft
CRESFIBER-SINGLE-SC-CLEAR-NP-100: CresFiber® CLEAR Simplex Fiber Optic Cable Assembly, 50/125, SC, Non-Plenum, 100 ft

Notes:

1. DisplayPort Multimode connectivity is supported via an HDMI or DVI input port using a suitable adapter or interface cable (not included).
2. For external DMNet power, use a Crestron CNPWS-75, C2N-SPWS300, or other Cresnet power supply as required. Do not interconnect DMNet with Cresnet.

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