DM-MD128X128

128x128 DigitalMedia™ Switcher

> Provides lossless HD AV signal routing over twisted-pair wire or fiber

> Integrates video, audio, networking, and control over one wire or fiber strand

> Modular design configurable in blades of 8 inputs or outputs

> Enables full matrix switching scalable from 8x8 to 128x128

> Handles HDMI® with Deep Color, 3D, 4K Ultra HD, and high-bitrate 7.1 encoded audio [1]

> HDBaseT® Certified — Enables direct connection to third-party HDBaseT displays and sources [2]

> Supports up to 128 DM 8G® transmitters and 128 DM 8G receivers

> Allows up to 330 ft (100 m) wire distance via DM 8G+™ and HDBaseT [2,4,7]

> Allows up to 1000 ft (300 m) wire distance via DM 8G Fiber [5,7]

> Allows up to 7.5 miles (12 km) wire distance via DM 8G Single-Mode Fiber [6,7]

> QuickSwitch HD® technology manages HDCP keys for fast, reliable switching

> Auto-Locking™ technology achieves rapid switching between disparate sources

> 15" color touch screen enables simplified front panel setup, operation, video preview, and troubleshooting

> Built-in Web server enables full operation from any networked computer

> Allows system monitoring through front panel, Web browser, control system, or Fusion RV®

> Allows independent scaling for every display device through select DM receivers

> Enables device control via CEC

> Distributes USB HID mouse and keyboard signals between transmitters and receivers

> Supports expanded USB device support using USB Extenders [9]

> Includes integrated Gigabit Ethernet switch

> Features hot-swappable redundant power supplies and fan tray with advanced status monitoring

> Hot-swappable I/O blades afford fast restoration of service with minimal disruption

> 24-space 19-inch rack-mountable

Crestron® DM® Switchers provide the foundation for a complete DigitalMedia™ system, delivering an advanced 4K Ultra High-Definition AV signal routing solution that's extremely flexible and installer-friendly. The DM-MD128X128 is a modular matrix switcher designed for large-scale projects demanding ultimate reliability. It delivers ultra fast signal routing and pure, lossless distribution of HDMI® and other signals to support all the Blu-ray Disc® players, HDTV receivers, digital media servers, computers, HD cameras, and high-definition displays that fill any modern facility. DigitalMedia thoughtfully manages all of the disparate AV signals and devices to deliver a transparent user experience, and ensure an optimum video image and audio signal at every location.

Featuring a scalable blade-based design, the DM-MD128X128 affords maximum input and output count in a condensed 24U rack-mountable chassis. The DM-MD128X128 is field-configurable to handle up to 128 inputs and 128 outputs, supporting HDMI, HDBaseT®, analog audio, and all types of DigitalMedia 8G™ signals[1,2]. Through a selection of hot-swappable input and output blades, and a variety of DM 8G transmitters and receivers, the DM-MD128X128 allows extensive connectivity throughout a commercial or residential facility, supporting a wide range of signal types all through one switcher!

Integrated Ethernet networking and USB distribution provide a complete connectivity solution combined with built-in Crestron control[3] for

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managing the displays and other room devices without necessitating any additional wiring. Hot-swappable redundant power supplies and advanced system-wide monitoring ensure continuous, dependable operation for mission-critical applications. User-friendly operation, setup, and trouble-shooting tools are provided through the front panel touch screen or Web browser interface to make setting up a complete multi-room HD system easy.

DigitalMedia 8G™

As the leader in HDMI and control system technologies, Crestron developed DigitalMedia (DM) to deliver the first complete HD AV distribution system to take HDMI to a higher level. DigitalMedia allows virtually any mix of HDMI and other AV sources to be distributed throughout a room, building, or campus.

DigitalMedia 8G is the latest generation of DM, providing a true one-wire transport for moving high-definition video, audio, and Ethernet over low-cost twisted-pair or fiber optic cable without any compression or repeaters. Engineered for ultra high-bandwidth and ultimate scalability, DM 8G® handles uncompressed video beyond high-definition with support for HDCP, Deep Color, 3D, and 4K Ultra HD. Audio capabilities include support for high-bitrate 7.1 audio formats like Dolby® TrueHD and DTS-HD Master Audio™ as well as uncompressed linear PCM. All signals are transported over one 8-conductor twisted-pair wire or one strand of multimode or single-mode fiber. DM 8G enables wire distances up to 330 feet (100 m) via DM 8G+™ (DM 8G over CAT5e)[2,4,7], 1000 ft (300 m) via DM 8G Fiber (DM 8G over multimode fiber)[5,7], or 7.5 miles (12 km) via DM 8G SM Fiber (DM 8G over single-mode fiber)[6,7].

HDBaseT® Certified

Crestron DigitalMedia 8G+ technology is designed using HDBaseT Alliance specifications, ensuring interoperability with third-party HDBaseT products. Via DM 8G+, the DM-MD128X128 can be connected directly to any HDBaseT compliant device without requiring a DM transmitter or receiver. HDBaseT connectivity through the DM-MD128X128 converges uncompressed full HD digital video, audio, Ethernet, power and control signals through a single CAT5e or CAT6 cable over distances up to 330 ft (100 m).[2]

Modular Architecture

The DM-MD128X128 features a modular architecture with 16 input blade slots and 16 output blade slots. Each blade slot on the DM-MD128X128 is field-installable, allowing for easy and flexible system configuration with the ability to make changes to the system as needs change. The input and output blades are hot-swappable to facilitate servicing without shutting down the whole switcher. I/O blades are offered to support the choice of HDMI, HDBaseT, analog audio, DM 8G+, DM 8G Fiber, and DM 8G Single-Mode Fiber. Each blade provides eight inputs or outputs of any one type. [1,2]

QuickSwitch HD®

Handling high-definition digital media means handling HDCP (High-bandwidth Digital Content Protection), the encryption scheme that content providers use 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 the content can be viewed. Ordinarily
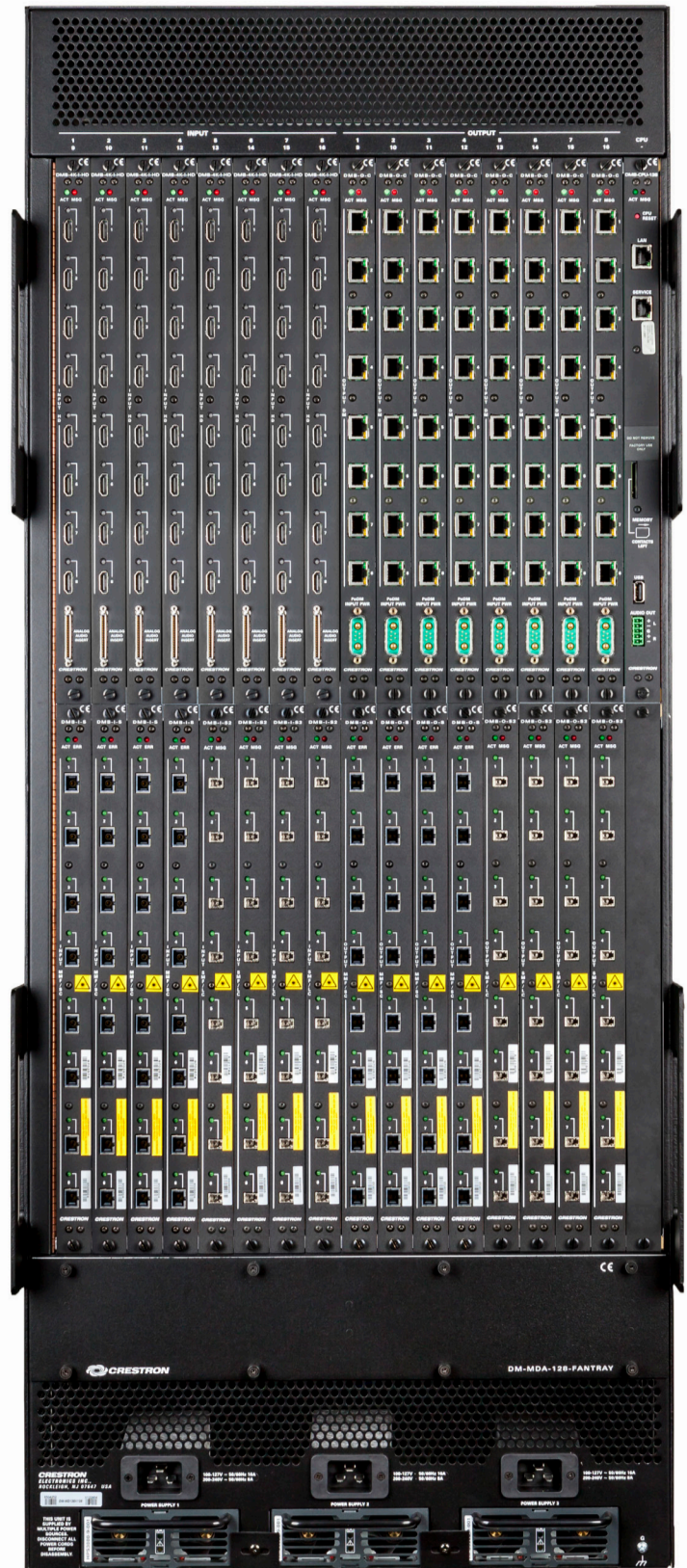
DM-MD128X128 – Rear view with I/O blades installed

this causes a complete loss of signal for up to 15 seconds each time a new source or display is selected anywhere in the system. To make matters worse, every source device has a limited number of keys available, so connect too many displays and the source will simply stop outputting a signal without warning.

Not to worry — Crestron QuickSwitch HD manages the keys for every HDCP-compliant device in the system, maintaining continuous authentication for each device to ensure fast, reliable routing of any source to any number of display devices.

Auto-Locking™ Technology

Crestron Auto-Locking Technology enables super fast signal switching by instantaneously configuring every device in the signal path as soon as the signal hits the first device. Whether switching between sources or TV channels, Auto-Locking significantly reduces the time it takes each device to sense the new signal and configure itself to handle the changes, virtually eliminating any noticeable gap while switching.

EDID Format Management

With all of today's varied AV sources comes a multitude 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. Such conflicts can wreak havoc any time you route one source to more than one display or audio component. 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 a 20" TV in another room. And, instead of enjoying your theater's incredible 7.1 surround sound, you may find yourself limited to 5.1 or even plain old stereo.

DigitalMedia eliminates such conflicts by managing the EDID (Extended Display Identification Data) that modern digital devices use to communicate their capabilities. Through the DM-MD128X128, the format and resolution capabilities of each device can be assessed, allowing the installer to configure EDID appropriately for the most desirable and predictable behavior.

A Scaler for Every Display

Scaling capability can be added to any DM system using select DM receivers with built in high-definition scalers. By placing an independent high-performance scaler at every display device, DigitalMedia truly delivers the most flexible and user-friendly solution for routing multiple disparate sources to many different display devices. This "Distributed Scaler Approach" ensures an optimal image on every screen no matter what sources are selected. Distributed scaling allows a high-res computer source to be viewed on any display in the building. It also allows a high-definition 3D source to be viewed on lower-resolution 2D displays without compromising the original signal, letting you share your theater's full HD 1080p 3D image with smaller, lesser displays in other rooms.

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 select DM receivers and transmitters, providing high-speed connectivity for any room device that requires a LAN connection. 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 each room. Through its Gigabit Ethernet port, the DM-MD128X128 provides a single-point connection to a corporate LAN or home network, requiring just one IP address for the complete DM system.

USB Switch

Along with video, audio, and Ethernet, DigitalMedia also provides for the routing of USB HID (Human Interface Device) signals, allowing a USB HID compliant keyboard and/or mouse at one location to control a computer or media server in another location, whether just across the room or in another building. USB HID connectivity is provided through select DM receivers and transmitters.

Crestron also offers USB Extenders to enable the routing of virtually any type of USB peripheral to any host device, all managed through the DigitalMedia system. Connect a "local" extender module (USB-EXT-DM-LOCAL[8]) to each computer, media server, game system, annotator, and any other host that you want to control or communicate with. Then, install a "remote" extender module (USB-EXT-DM-REMOTE[8]) at every display location to connect keyboards, mice, game controllers, whiteboards, flash drives, cameras, and mobile devices. Every module communicates with the DM switcher over the local Ethernet network or via a direct connection to the LAN port of a DM transmitter or receiver.

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-MD128X128 provides a gateway for controlling many devices right through their HDMI (or HDBaseT) connections, potentially eliminating the need for any dedicated control wires or IR emitters. Through proper CEC signal management, DigitalMedia allows you to take control of each device as you like.

Touch Screen Front Panel

Simplified setup and operation of the DM-MD128X128 is provided through a large 15" color touch screen. Through its user-friendly graphical interface, the touch screen enables the routing of AV signals with the ability to view resolution and format information for every input and output signal, and even preview a live video image of any input. Configuration and diagnostics capabilities include monitoring of the status for each i/o blade, fan tray and power supply, configuration of Ethernet settings, and updating of the firmware for all connected devices.

Web Browser Control

The DM-MD128X128 also includes a built-in Web server, enabling full operation and monitoring through any networked computer with a Web browser. Password protection prevents unauthorized access to this feature.

Hot-Swappable Redundant Power Supplies

The DM-MD128X128 delivers enhanced reliability for mission critical applications, employing hot-swappable redundant power supplies to ensure continuous operation throughout the life of the system. Each of its three onboard power supplies has a demonstrated MTBF (Mean Time Between Failures) of over a half million hours, and in the unlikely event of an individual power supply fault, the switcher will continue to operate unhindered on only two power supplies. Clear indication of such a fault

is provided on the unit's front panel, and the power supplies can even be remotely monitored via a control system touch screen, mobile device, or Crestron Fusion RV® Remote Asset Management Software. A modular hot-swappable plug-in design allows any supply to be replaced in seconds without ever shutting down the switcher or removing it from the equipment rack.

Please refer to the DigitalMedia Resources Webpage at http://www.crestron.com/dmresources/ for additional design tools and reference documents.

SPECIFICATIONS

Video

Switcher: 128x128 digital matrix, modular input/output blades, Crestron QuickSwitch HD®
Input Signal Types: Configurable via modular plug-in blades supporting HDMI®, DisplayPort Multimode[10], DVI[10], HDBaseT®[2], DM 8G+™[2], DM 8G® Fiber, and DM 8G SM Fiber
Output Signal Types: Configurable via modular plug-in blades supporting HDMI[1], DVI[10], HDBaseT, DM 8G+, DM 8G Fiber, and DM 8G SM Fiber
Formats: HDMI, HDBaseT, or DM 8G w/Deep Color, 3D, & 4K; DVI; HDCP content protection support
Input Resolutions: Refer to the specifications for each input blade
Output Resolutions: Refer to the specifications for each output blade

Audio

Switcher: 128x128 digital multi-channel audio-follow-video matrix switching, monitor output;
Note: Audio breakaway is not supported
Input Signal Types: Configurable via modular plug-in blades supporting HDMI, DisplayPort Multimode[10], HDBaseT[2], analog (stereo 2-channel)[1], DM 8G+[2], DM 8G Fiber, and DM 8G SM Fiber
Output Signal Types: Configurable via modular plug-in blades supporting HDMI[1], HDBaseT, analog (stereo 2-channel)[1], DM 8G+, DM 8G Fiber, and DM 8G SM Fiber
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™, up to 8ch PCM

Communications

Ethernet: 10/100/1000 Mbps, auto-switching, auto-negotiating, auto-discovery, full/half duplex, DHCP, Web server for remote configuration and operation
USB: USB signal routing via select transmitters, receivers, and extenders; USB service port for computer console
DigitalMedia: DM 8G+ (HDBaseT compliant)[2], DM 8G Fiber, DM 8G SM Fiber, HDCP management, EDID format management, CEC

Ethernet Switch

35-port switch with Private Network Mode; provides (1) rear panel 10Base-T/100Base-TX/1000Base-T LAN port, (1) 10Base-T/ 100Base-TX/1000Base-T rear panel Service port, (32) internal 1000 Mbps ports for the I/O blades, and (1) internal 100 Mbps port for the CPU

USB Switch

128x128 matrix, follow video or breakaway

Blade Slots

INPUT 1 – 16: (16) DM switcher input blade slots, hot-swappable; Each slot accepts (1) DMB-I series input blade
OUTPUT 1 –16: (16) DM switcher output blade slots, hot-swappable; Each slot accepts (1) DMB-O series output blade
CPU: Accepts (1) DMB-CPU-128 CPU blade (included)

Connectors – CPU

LAN: (1) 8-wire RJ45 female;
10Base-T/100Base-TX/1000Base-T Ethernet port
SERVICE: (1) 8-wire RJ45 female;
Computer console port
MEMORY: (1) SD memory card slot;
Accepts one SD[a] or SDHC[a] card up to 32 GB for memory expansion (2 GB SD card included);
For save/load of configuration and EDID settings and for firmware update
USB: (1) USB Type A female;
USB 2.0 host port for connection of a USB flash drive;
For save/load of configuration and EDID settings and for firmware update
AUDIO OUT: (1) 5-pin 3.5mm detachable terminal block;
Balanced/unbalanced stereo line-level output;
Output Impedance: 200 Ohms balanced, 100 Ohms unbalanced;
Maximum Output Level: 4 Vrms balanced, 2 Vrms unbalanced

Connectors – Main Chassis

100-127V~50/60Hz 16A, 200-240V~50/60Hz 8A:
(3) IEC 60320 C-20 main power inlets;
Mate with removable power cords, included
G: (1) 6-32 screw, chassis ground lug
COMPUTER (front): (1) USB Type B female;
USB computer console port (6 ft cable included)

Touch Screen

15 inch (381 mm) diagonal TFT active matrix color LCD, 15:9 WXGA, 1280 x 768 pixels, resistive touch membrane, amplified speakers; Provides signal routing, video input preview, video and audio signal information, system diagnostics, setup and configuration

Controls & Indicators

Touch Screen Hard Key: (1) pushbutton, not used
POWER SUPPLIES, 1 –3: (3) green LEDs, indicate when each corresponding supply is functioning

POWER SUPPLIES, FAULT: (1) red flashing LED, indicates a fault with any supply

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

ACT (rear, CPU): (1) green LED, indicates CPU activity

MSG (rear, CPU): (1) red LED, indicates CPU has generated an error message

CPU RESET (rear, CPU): (1) recessed miniature pushbutton, reboots the CPU and front panel

LAN (rear, CPU): (2) LEDs, green LED indicates Ethernet link status, amber LED indicates Ethernet activity

SERVICE (rear, CPU): (2) LEDs, green LED indicates Ethernet link status, amber LED indicates Ethernet activity

OK (rear, power supplies): (3) green LEDs, indicate when each corresponding supply is powered and functioning

! (rear, power supplies): (3) amber LEDs, each indicates a fault with the corresponding supply

Power Requirements

Main Power: 16 Amps @ 100-127 Volts AC or 8 Amps @ 200-240 Volts AC, 50/60 Hz;
Requires (3) 20 Amp @ 100-127V, or (3) 10 Amp @ 200-240V, AC circuits

Redundant Power Supplies

Quantity/Type: (2) high efficiency (>90%), hot-swappable, variable speed fan cooled, Crestron model DM-MDA-128-PWS (included)

Demonstrated MTBF: >500,000 hours per power supply

Redundancy: Complete unit continues to operate at full capacity on one or more functioning power supplies

Environmental

Temperature: 32° to 104°F (0° to 40°C)

Humidity: 10% to 90% RH (non-condensing)

Heat Dissipation: 10920 BTU/hr maximum, 6000 BTU/hr typical, with all blade slots occupied

Enclosure

Chassis: Metal with black finish, integrated rack ears, vented sides and rear, fan-cooled

Faceplate: Metal, black finish with polycarbonate label overlay, plastic touch screen bezel

Mounting: 24U 19-inch rack-mountable (rack ears built in)

Dimensions

Height: 41.97 in (1066 mm)

Width: 19.00 in (483 mm)

Depth: 16.26 in (413 mm) without I/O blades;
19.55 in (497 mm) including front and rear handles

Weight

86.0 lb (39.0 kg) without I/O blades

MODELS & ACCESSORIES

Available Models

DM-MD128X128: 128x128 DigitalMedia™ Switcher

Included Accessories

DMB-CPU-128: CPU Blade for DM-MD128X128 (Qty. 1 included)
DM-MDA-128-FANTRAY: Fan Tray for DM-MD128X128 (Qty. 1 included)
DM-MDA-128-PWS: Power Supply for DM-MD128X128 (Qty. 3 included)

Available Accessories

DMB-4K-I-HD: 8-Channel HDMI® Input Blade for DM® Switchers
DMB-I-S: 8-Channel DM 8G® Fiber Input Blade for DM® Switchers
DMB-I-S2: 8-Channel DM 8G® Single-Mode Fiber Input Blade for DM® Switchers
DMB-4K-O-C: 8-Channel DM 8G+™ Output Blade for DM® Switchers
DMB-O-S: 8-Channel DM 8G® Fiber Output Blade for DM® Switchers
DMB-O-S2: 8-Channel DM 8G® Single-Mode Fiber Output Blade for DM® Switchers
DM-CBL-8G-NP: DigitalMedia 8G™ Cable, non-plenum
DM-CBL-8G-P: DigitalMedia 8G™ Cable, plenum
DM-8G-CONN: DigitalMedia 8G™ Cable Connector
DM-8G-CRIMP: Crimping Tool for DM-8G-CONN
DM-8G-CONN-WG: DigitalMedia 8G™ Cable Connector with Wire Guide
DM-8G-CRIMP-WG: Crimping Tool for DM-8G-CONN-WG
CRESFIBER8G-NP: CresFiber® 8G Multimode Fiber Optic Cable, 50/125 x4 breakout, non-plenum
CRESFIBER8G-P: CresFiber® 8G Multimode Fiber Optic Cable, 50/125 x4 breakout, plenum
CRESFIBER-CONN-SC50UM-12: CresFiber® Fiber Optic Cable Connector (AFL Telecommunications®), SC 50μm
CRESFIBER8G-SM-P: CresFiber® 8G Single-Mode Fiber Optic Cable, plenum
CRESFIBER8G-SM-CONN-LC-12: CresFiber® 8G Single-Mode Fiber Optic Cable Connector, LC
CRESFIBER-TK: CresFiber® Termination Kit (AFL Telecommunications®)
CRESFIBER-SINGLE-SC-P: CresFiber® Simplex Fiber Optic Cable Assemblies, 50/125, SC, Plenum
CRESFIBER-SINGLE-SC-ARMORED-P: CresFiber® ARMORED Simplex Fiber Optic Cable Assemblies, 50/125, SC, Armored, Plenum
CRESFIBER-SINGLE-SC-CLEAR-NP: CresFiber® CLEAR Simplex Fiber Optic Cable Assemblies, 50/125, SC, Non-Plenum
USB-EXT-DM-REMOTE: USB Extender Module for Devices
USB-EXT-DM-LOCAL: USB Extender Module for Host
AMP-2210S: 2x210W Commercial Power Amplifier, 4/8Ω
AIR SR6: AIR® 6.5" 2-Way Surface Mount Outdoor Speakers, Pair

Notes:

1. Onboard HDMI output, and analog audio input and output, are future features that will be enabled through a future output blade and other components.
2. DM 8G+ and HDBaseT input is a future feature that will be enabled through a future input blade.
3. Crestron control via the DM network requires a Crestron control system, sold separately.
4. The maximum cable length for DigitalMedia 8G+ (DM 8G+) or HDBaseT is 330 ft (100 m) for resolutions up to 1600x1200 and 1920x1200 (including 1080p60 and 2K) using DM-CBL-8G DigitalMedia 8G cable, DM-CBL DigitalMedia Cable, DM-CBL-D DigitalMedia D Cable, or third-party CAT5e (or better) UTP or STP. For higher resolutions (including 4K), the maximum wire length is 230 ft (70 m) using DM-CBL-8G, or 165 ft (50 m) using DM-CBL, DM-CBL-D, or CAT5e. Shielded cable and connectors are recommended to safeguard against unpredictable environmental electrical noise which may impact performance at resolutions above 1080p. DM 8G+ is compatible with HDBaseT Alliance specifications for connecting to HDBaseT compliant equipment.
5. The maximum cable length for DigitalMedia 8G Fiber (DM 8G Fiber) is 1000 ft (300 m) using CRESFIBER8G fiber optic cable, or 500 ft (150 m) using standard CRESFIBER, CRESFIBER-SINGLE-SC, or third-party OM3 simplex multimode fiber optic cable.
6. The maximum cable length for DigitalMedia 8G Single-Mode Fiber (DM 8G SM Fiber) is 7.5 miles (12 km) using CRESFIBER8G-SM or third-party G.652.D (or better) single-mode fiber optic cable.
7. Refer to the Crestron DigitalMedia Design Guide, Doc. #4546 for complete system design guidelines. All wire and cables sold separately.
8. Item(s) sold separately.
9. Expanded USB signal routing capability is available using USB-EXT-DM USB Extenders, sold separately.
10. DVI and DisplayPort Multimode connectivity is supported via an HDMI input port using a suitable adapter or interface cable. DVI output is supported via an HDMI output port using a suitable adapter or interface cable. CBL-HD-DVI interface cables are available separately.

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.

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