

Crestron **DM-RMC-SCALER-C**
DM 8G+[®] Receiver & Room Controller
with Scaler

Operations & Installation Guide



Regulatory Compliance

As of the date of manufacture, the DM-RMC-SCALER-C has been tested and found to comply with specifications for CE marking.



Federal Communications Commission (FCC) Compliance Statement

This device complies with part 15 of the FCC Rules. Operation is subject to the following conditions: (1) This device may not cause harmful interference and (2) this device must accept any interference received, including interference that may cause undesired operation.

CAUTION: Changes or modifications not expressly approved by the manufacturer responsible for compliance could void the user's authority to operate the equipment.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment and receiver
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected
- Consult the dealer or an experienced radio/TV technician for help

Industry Canada (IC) Compliance Statement

CAN ICES-3(B)/NMB-3(B)

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

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DM 8G+[®] Receiver & Room Controller with Scaler: DM-RMC-SCALER-C

Introduction

The DM-RMC-SCALER-C provides an advanced 1-box interface solution for a single display device as part of a complete Crestron[®] DigitalMedia™ system. It functions as a DM 8G+[®] receiver, video scaler, and control interface, providing a single HDMI[®] output along with Ethernet, USB HID, RS-232, and IR control ports. In addition to DM 8G+ technology, it is also compatible with HDBaseT[®] specifications, allowing it to be connected directly to any HDBaseT compliant source. Built-in scaling enables the connected display to handle virtually any video signal up to HD 1080p and WUXGA resolutions. Its compact, low-profile design allows the DM-RMC-SCALER-C to be installed discreetly behind a flat panel display or above a ceiling mounted projector. It connects to the head end or source location using a single CAT5e or Crestron DM 8G[®] cable.¹

Features and Functions

- DM 8G+[®] receiver, high-definition scaler, and display controller
- DM 8G+ input supports up to 330 foot (100 meter) cable length¹
- Connects to a DM[®] switcher or transmitter (each sold separately) over one CAT5e or Crestron DM 8G cable¹
- HDBaseT certified, which enables direct connection to a third-party HDBaseT source
- Provides one HDMI or DVI display output²
- Includes built-in high-definition video scaler
- Accepts any video source from standard NTSC 480i or PAL 576i to HD 1080p60 with Deep Color
- Also accepts any computer source from VGA to UXGA/WUXGA
- Scales the source to match the native resolution of virtually any popular video display or computer monitor
- Provides intelligent frame rate conversion

(Continued on following page)

1. For DM 8G+ or HDBaseT wiring, use Crestron DM-CBL-8G DigitalMedia 8G™ cable, Crestron DM-CBL DigitalMedia cable, Crestron DM-CBL-D DigitalMedia D cable, or third-party CAT5e (or better) UTP or STP. Maximum DM 8G+ wire length is 330 feet (100 meters) between devices. Shielded cable and connectors are recommended to safeguard against unpredictable environmental electrical noise which may impact performance at resolutions above 1080p. For complete system design guidelines, refer to the Crestron DigitalMedia Design Guide (Doc. 4546) at www.crestron.com/dmresources. DM 8G+ technology is compatible with HDBaseT Alliance specifications for connecting to HDBaseT compliant equipment. All wire and cables sold separately.
2. The HDMI output requires an appropriate adapter or interface cable to accommodate a DVI signal. CBL-HD-DVI interface cables sold separately.

Features and Functions

(Continued)

- Allows motion-adaptive de-interlacing or interlacing
- Allows adjustable overscan or underscan up to 7.5%
- Provides automatic 3D-to-2D signal conversion¹
- Automatically passes 3D video without scaling to 3D capable displays¹
- Includes content-adaptive noise reduction
- 100% HDCP compliant
- Scalable zoom feature enables 2 x 2, 3 x 2, 3 x 3, 4 x 3, or 4 x 4 video wall capability²
- Handles Dolby® TrueHD, DTS-HD Master Audio™, and uncompressed 7.1 linear PCM audio
- Provides 10BASE-T/100BASE-TX Ethernet and USB HID mouse and keyboard ports
- Compatible with Crestron USB Extenders to enable expanded USB device support³
- Enables device control via CEC, IR, RS-232, and Ethernet
- Allows quick, easy setup and diagnostics
- Low-profile design mounts to a 2-gang US, UK, or European electrical box

DM 8G+ Technology

DM 8G+ technology provides a true 1-wire transport for moving high-definition video, audio, and Ethernet over low-cost twisted pair cable without compression or repeaters. Engineered for ultra high bandwidth and ultimate scalability, DM 8G+ technology handles uncompressed video beyond high definition with support for HDCP, Deep Color, and 3D. 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 cable, supporting distances up to 330 feet (100 meters) using Crestron DM 8G cable or CAT5e.⁴

HDBaseT Certified

Crestron DM 8G+ technology is designed using HDBaseT Alliance specifications, ensuring interoperability with third-party HDBaseT products. Via its DM 8G+ input, the DM-RMC-SCALER-C can be connected directly to any HDBaseT compliant source without requiring a DM transmitter. HDBaseT connectivity through the DM-RMC-SCALER-C converges uncompressed full HD digital video, audio, Ethernet, and control signals through a single CAT5e or CAT6 cable over distances up to 330 feet (100 meters).

1. Automatically passes 3D video if display device supports it (reverts to pass-through mode without scaling). Provides automatic 3D-to-2D conversion (with scaling) if display device does not support 3D.
2. Video wall processing requires a separate DM-RMC-SCALER-C for each individual display.
3. Compatible with Crestron USB-EXT-DM-LOCAL and USB-EXT-DM-REMOTE USB Extenders, sold separately.
4. For DM 8G+ or HDBaseT wiring, use Crestron DM-CBL-8G DigitalMedia 8G cable, Crestron DM-CBL DigitalMedia cable, Crestron DM-CBL-D DigitalMedia D cable, or third-party CAT5e (or better) UTP or STP. Maximum DM 8G+ wire length is 330 feet (100 meters) between devices. Shielded cable and connectors are recommended to safeguard against unpredictable environmental electrical noise which may impact performance at resolutions above 1080p. All wire and cables sold separately.

Multimedia Display Interface

A single HDMI digital AV output port is provided on the DM-RMC-SCALER-C, supporting HD 1080p video and WUXGA computer signals with HDCP, Deep Color, 3D,¹ and multichannel HD lossless audio—all through one connection. The HDMI output can also handle DVI signals using an appropriate adapter or interface cable.²

A single cable connects the DM-RMC-SCALER-C to a DM switcher or transmitter or to an HDBaseT source, transporting video, audio, control, and networking signals through one RJ-45 connection.³ Multiple DM-RMC-SCALER-Cs may be installed to handle each display in a multiroom distribution system, all fed from a central DM switcher. Or, a single DM-RMC-SCALER-C can be fed straight from a DM 8G+ or HDBaseT transmitter, affording a simple solution for extending a computer or AV signal to a single display.

High-Definition Scaler

Through a distributed scaler approach, DigitalMedia truly delivers the most flexible and user-friendly solution for routing multiple disparate sources to many different display devices. By placing an independent high-performance scaler at every display device, DM ensures an optimal image on every screen regardless of the sources that are selected. Distributed scaling allows a high-resolution 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.

The DM-RMC-SCALER-C accepts any video source from standard NTSC 480i to HD 1080p60 with Deep Color, as well as computer sources from VGA to UXGA/WUXGA, and scales them perfectly to match the native resolution of the video display. A range of common output resolutions is supported to work with virtually any popular flat-panel display, projector, or computer monitor. Intelligent frame rate conversion enables support for 24p and PAL format sources, and automatic 3D-to-2D conversion allows 3D content to be fed simultaneously to separate 3D and 2D displays. Setup and use of the scaler is simplified through fully automatic operation utilizing the display's EDID.^{1,4}

A pair of DM-RMC-SCALER-Cs can also be used to facilitate a dual-projector 3D setup, steering just the left eye portion of a 3D signal to one projector, and the right eye portion to the other. This is done using the scaler's 3D-to-2D conversion mode, enabling 3D capability with scaling.

1. Automatically passes 3D video if display device supports it (reverts to pass-through mode without scaling). Provides automatic 3D-to-2D conversion (with scaling) if display device does not support 3D.
2. The HDMI output requires an appropriate adapter or interface cable to accommodate a DVI signal. CBL-HD-DVI interface cables sold separately.
3. For DM 8G+ or HDBaseT wiring, use Crestron DM-CBL-8G DigitalMedia 8G cable, Crestron DM-CBL DigitalMedia cable, Crestron DM-CBL-D DigitalMedia D cable, or third-party CAT5e (or better) UTP or STP. Maximum DM 8G+ wire length is 330 feet (100 meters) between devices. Shielded cable and connectors are recommended to safeguard against unpredictable environmental electrical noise which may impact performance at resolutions above 1080p. For complete system design guidelines, refer to the Crestron DigitalMedia Design Guide (Doc. 4546). DM 8G+ technology is compatible with HDBaseT Alliance specifications for connecting to HDBaseT compliant equipment. All wire and cables sold separately.
4. EDID (Extended Display Identification Data) is data embedded in an HDMI, DVI, or VGA signal that enables a display device to tell the source device what resolutions and formats it can support, allowing the source to configure itself automatically to feed the best signal that both devices can support.

Video Wall Processing

The DM-RMC-SCALER-C also provides zoom capability on its output to display just a portion of the source image. Using this feature, multiple units may be combined to configure a high-definition video wall composed of up to 16 individual displays. Configurations of 2 x 2, 3 x 2, 3 x 3, 4 x 3, or 4 x 4 are supported, and all that is required is a separate DM-RMC-SCALER-C for each display and a DM switcher with sufficient DM 8G+ outputs.

LAN Connectivity

Along with high-definition AV and control, DigitalMedia also integrates high-speed Ethernet networking for a total signal distribution solution. The DM-RMC-SCALER-C includes a 10BASE-T/100BASE-TX Ethernet port, providing a convenient LAN connection for a local network device.

USB Extender

Via its USB HID port, the DM-RMC-SCALER-C functions as a keyboard and mouse extender, allowing a USB HID-compliant keyboard and mouse to be connected at the display location and used to control a computer or other component located at the central equipment rack or some other location. Expanded USB signal routing capability is available using Crestron USB-EXT-DM USB Extenders.*

Embedded Device Control

The DM-RMC-SCALER-C includes built-in RS-232, IR, and Ethernet control ports to allow programmable control of the display device connected to it. It can also provide an alternative to such conventional control methods by harnessing the CEC (Consumer Electronics Control) signal embedded in HDMI. Through its connection to the control system, the DM-RMC-SCALER-C provides a gateway for controlling the display device through the HDMI connection, potentially eliminating the need for any dedicated control wires or IR emitters.

Low-Profile Installation

Its low-profile design makes the DM-RMC-SCALER-C perfect for installation behind a flat panel display or above a ceiling mounted projector. It mounts to a standard 2-gang US, UK, or European electrical box using the mounting bracket provided, affording a clean installation that protrudes only 1 1/8 inches (29 mm) from the mounting surface.

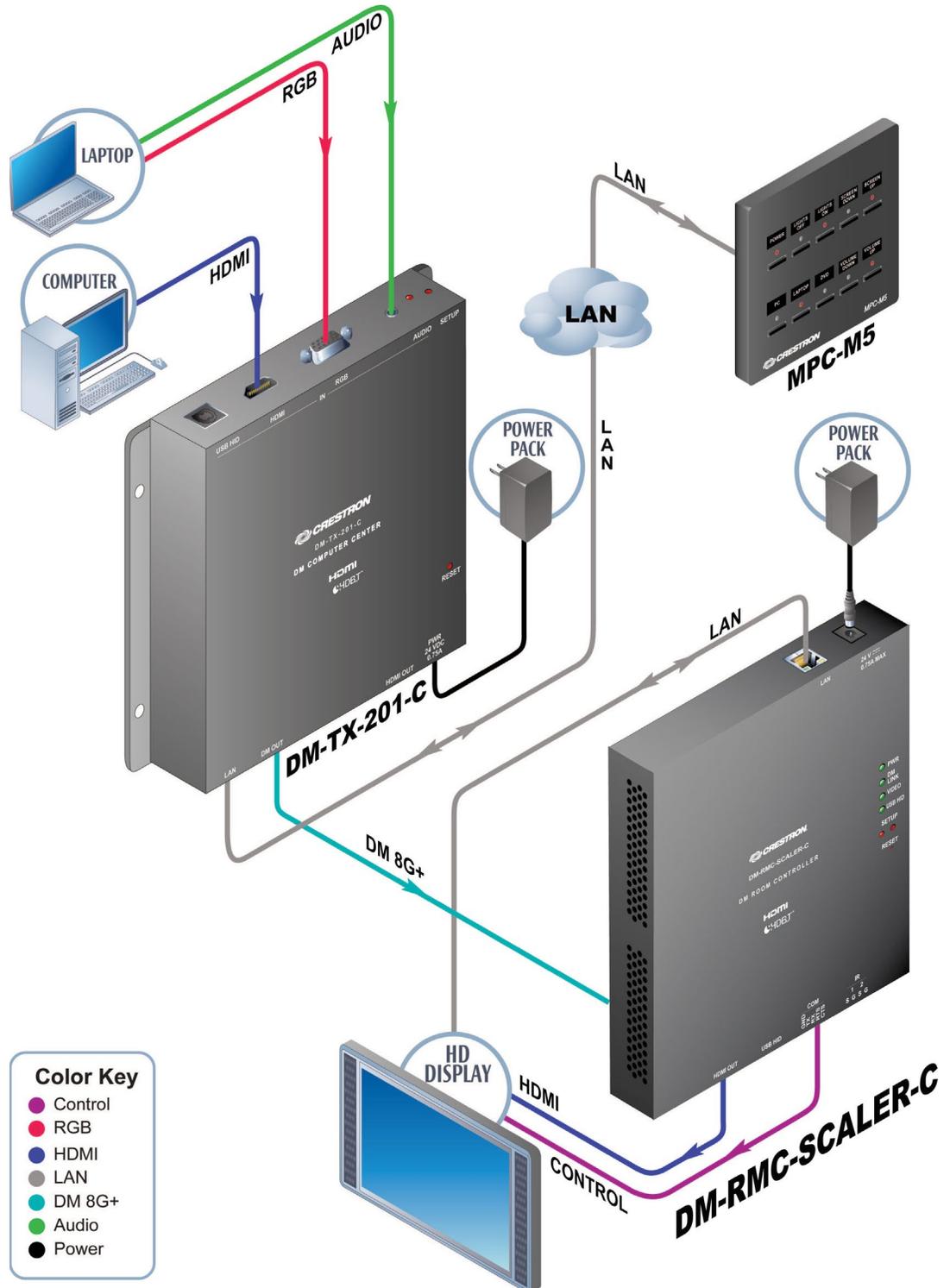
Connections for the display device are positioned along the top and bottom of the unit for a clean, serviceable installation. The DigitalMedia connection is provided on the rear panel within the electrical box. An array of indicators is provided on the front panel for easy setup and troubleshooting.

* Compatible with Crestron USB-EXT-DM-LOCAL and USB-EXT-DM-REMOTE USB Extenders, sold separately.

Applications

The diagram below shows a DM-RMC-SCALER-C in a standalone application. In this type of application, the DM-RMC-SCALER-C is used with a DM 8G+ transmitter such as the DM-TX-201-C and is not used with a DM switcher.

DM-RMC-SCALER-C in a Standalone Application



Specifications

Specifications for the DM-RMC-SCALER-C are listed in the following table.

DM-RMC-SCALER-C Specifications

SPECIFICATION	DETAILS
Video	
Scaler ¹	HD video scaler, motion-adaptive deinterlacer, interlacer, intelligent frame rate conversion, Deep Color support, 3D-to-2D conversion, ² content-adaptive noise reduction, widescreen format selection (zoom, stretch, maintain aspect ratio, or 1:1), video wall processing (2 x 2, 3 x 2, 3 x 3, 4 x 3, or 4 x 4) ³
Input Signal Type	DM 8G+ (DigitalMedia over one CAT5e twisted pair copper wire), HDBaseT ⁴
Output Signal Types	HDMI, DVI ⁵
Formats	HDMI with Deep Color and 3D, ² DVI, HDCP content protection support
Input Resolutions	
Progressive	640 x 480 @ 60 Hz 720 x 480 @ 60 Hz (480p) 720 x 576 @ 50 Hz (576p) 800 x 600 @ 60 Hz 848 x 480 @ 60 Hz 852 x 480 @ 60 Hz 854 x 480 @ 60 Hz 1024 x 768 @ 60 Hz 1024 x 852 @ 60 Hz 1024 x 1024 @ 60 Hz 1280 x 720 @ 50 Hz (720p50) 1280 x 720 @ 60 Hz (720p60) 1280 x 768 @ 60 Hz 1280 x 800 @ 60 Hz 1280 x 960 @ 60 Hz 1280 x 1024 @ 60 Hz 1360 x 768 @ 60 Hz 1365 x 1024 @ 60 Hz 1366 x 768 @ 60 Hz 1400 x 1050 @ 60 Hz 1440 x 900 @ 60 Hz 1600 x 900 @ 60 Hz 1600 x 1200 @ 60 Hz 1680 x 1050 @ 60 Hz 1920 x 1080 @ 24 Hz (1080p24) 1920 x 1080 @ 25 Hz (1080p25) 1920 x 1080 @ 50 Hz (1080p50) 1920 x 1080 @ 60 Hz (1080p60) 1920 x 1200 @ 60 Hz plus any other resolution allowed by HDMI up to 165 MHz pixel clock

(Continued on following page)

DM-RMC-SCALER-C Specifications (Continued)

SPECIFICATION	DETAILS
<p>Video</p> <p> Input Resolutions (Continued)</p> <p> Interlaced</p> <p> Scaler Output Resolutions</p> <p> Progressive</p> <p> Interlaced</p> <p> Pass-Thru Output Resolutions</p>	<p>720 x 480 @ 30 Hz (480i) 720 x 576 @ 25 Hz (576i) 1920 x 1080 @ 25 Hz (1080i25) 1920 x 1080 @ 30 Hz (1080i30) plus any other resolution allowed by HDMI up to 165 MHz pixel clock</p> <p>640 x 480 @ 60 Hz 720 x 480 @ 60 Hz (480p) 720 x 576 @ 50 Hz (576p) 800 x 600 @ 60 Hz 848 x 480 @ 60 Hz 1024 x 768 @ 60 Hz⁶ 1280 x 720 @ 50 Hz (720p50) 1280 x 720 @ 60 Hz (720p60) 1280 x 768 @ 60 Hz 1280 x 800 @ 60 Hz⁶ 1280 x 960 @ 60 Hz 1280 x 1024 @ 60Hz 1360 x 768 @ 60 Hz 1366 x 768 @ 60 Hz⁶ 1400 x 1050 @ 60 Hz⁶ 1440 x 900 @ 60 Hz⁶ 1600 x 900 @ 60 Hz⁶ 1600 x 1200 @ 60 Hz 1680 x 1050 @ 60 Hz⁶ 1920 x 1080 @ 50 Hz (1080p50) 1920 x 1080 @ 60 Hz (1080p60) 1920 x 1200 @ 60 Hz⁷ 2048 x 1152 @ 60 Hz⁷</p> <p>720 x 480 @ 30 Hz (480i) 720 x 576 @ 25 Hz (576i) 1920 x 1080 @ 25 Hz (1080i25) 1920 x 1080 @ 30 Hz (1080i30)</p> <p>Matched to input</p>
<p>Audio</p> <p> Input Signal Type</p> <p> Output Signal Type</p> <p> Formats</p>	<p>DM 8G+, HDBaseT</p> <p>HDMI</p> <p>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</p>

(Continued on following page)

DM-RMC-SCALER-C Specifications (Continued)

SPECIFICATION	DETAILS
Communications DigitalMedia	DM 8G+, HDCP management, EDID format management, CEC, HDBaseT compliant
Ethernet	10BASE-T/100BASE-TX, auto-switching, auto-negotiating, auto-discovery, full/half duplex, DHCP
USB	Supports signal extension of USB HID class devices, expandable to support virtually any USB 1.1 or 2.0 device using Crestron USB-EXT-DM USB Extenders ⁸
Power Requirements Power Pack	0.75 A @ 24 Vdc; 100-240 Vac, 50/60 Hz power pack included
Environmental Temperature	32° to 104° F (0° to 40° C)
Humidity	10% to 90% RH (non-condensing)
Heat Dissipation	41 Btu/h
Enclosure Chassis	Metal, black finish, vented sides
Mounting	Mounts to a 2-gang electrical box, 2-gang UK (BS 4662) electrical box, or 2-gang European (DIN 49073) electrical box
Dimensions Height	7.62 in (194 mm)
Width	7.61 in (194 mm)
Depth	1.46 in (38 mm)
Weight	1.9 lb (0.9 kg)
Included Accessory	Universal 24 Volt DC Power Pack

(Continued on following page)

DM-RMC-SCALER-C Specifications (Continued)

SPECIFICATION	DETAILS
Available Accessories	
CBL Series	Crestron Certified Interface Cables
CNSP-XX	Custom Serial Interface Cable
DM-CBL-8G	DigitalMedia 8G Cable
DM-8G-CONN-100	DigitalMedia 8G Cable Connectors
DM-8G-CONN-WG	DigitalMedia 8G Cable Connector with Wire Guide
DM-8G-CRIMP	Crimping Tool for DM-8G-CONN
DM-8G-CRIMP-WG	Crimping Tool for DM-8G-CONN-WG
IRP2	IR Emitter Probe
MP-WP Series	Media Presentation Wall Plates
MPI-WP Series	Media Presentation Wall Plates – International Version
USB-EXT-DM-LOCAL	USB Extender Module for Host
USB-EXT-DM-REMOTE	USB Extender Module for Devices

1. Using the DMTool in Crestron Toolbox™, the scaler can be enabled/disabled.
2. Automatically passes 3D video if display device supports it (reverts to pass-through mode without scaling). Provides automatic 3D-to-2D conversion (with scaling) if display device does not support 3D.
3. Video wall processing requires a separate DM-RMC-SCALER-C for each individual display.
4. For DM 8G+ or HDBaseT wiring, use Crestron DM-CBL-8G DigitalMedia 8G cable, Crestron DM-CBL DigitalMedia cable, Crestron DM-CBL-D DigitalMedia D cable, or third-party CAT5e (or better) UTP or STP. Maximum DM 8G+ wire length is 330 feet (100 meters) between devices. Shielded cable and connectors are recommended to safeguard against unpredictable environmental electrical noise which may impact performance at resolutions above 1080p. For complete system design guidelines, refer to the Crestron DigitalMedia Design Guide (Doc. 4546). DM 8G+ technology is compatible with HDBaseT Alliance specifications for connecting to HDBaseT compliant equipment. All wire and cables sold separately.
5. The HDMI output requires an appropriate adapter or interface cable to accommodate a DVI signal. CBL-HD-DVI interface cables sold separately.
6. With or without reduced blanking.
7. With reduced blanking only.
8. Compatible with Crestron USB-EXT-DM-LOCAL and USB-EXT-DM-REMOTE USB Extenders, sold separately.

Physical Description

This section provides information on the connections, controls, and indicators available on the DM-RMC-SCALER-C.

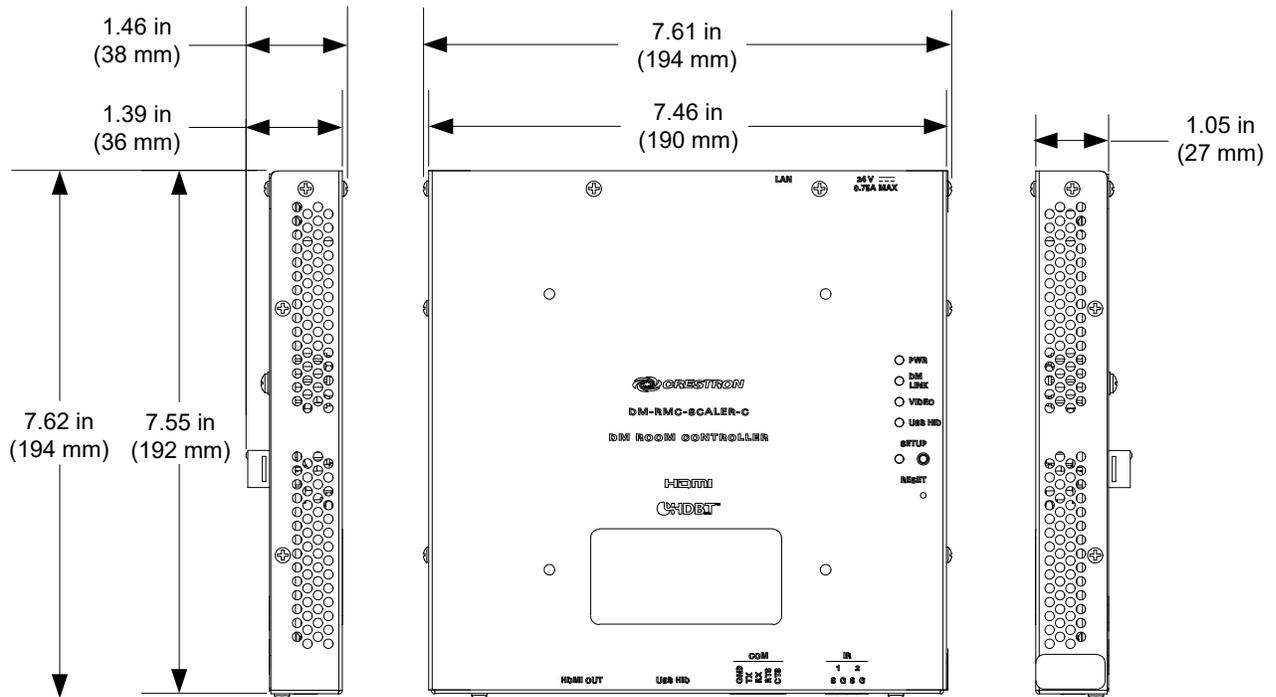
DM-RMC-SCALER-C Physical View (Front Panel)



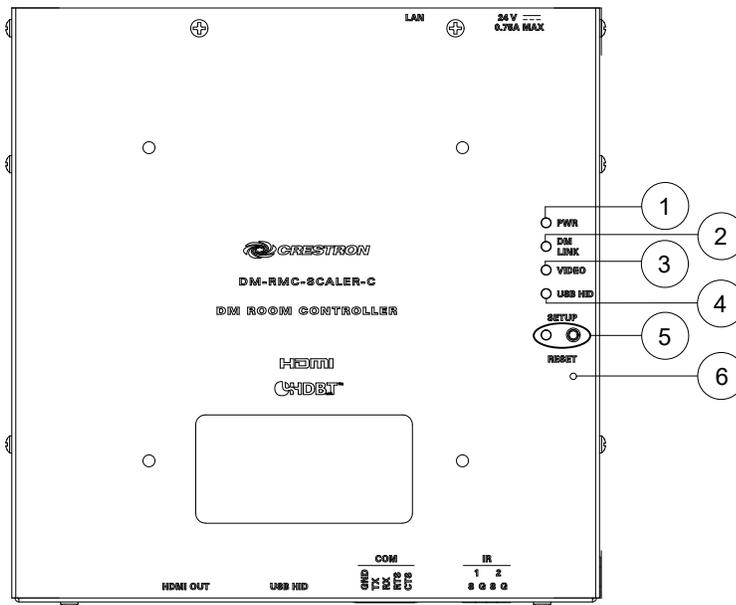
DM-RMC-SCALER-C Physical View (Bottom Panel)



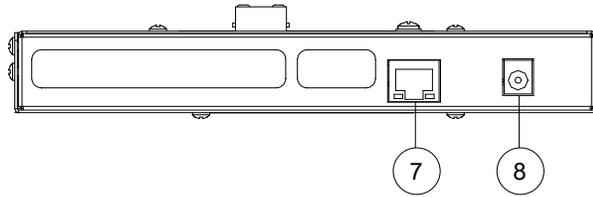
DM-RMC-SCALER-C Overall Dimensions (Front and Side Panels)



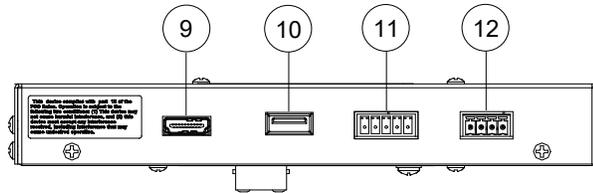
DM-RMC-SCALER-C Connectors, Controls, and Indicators (Front Panel)



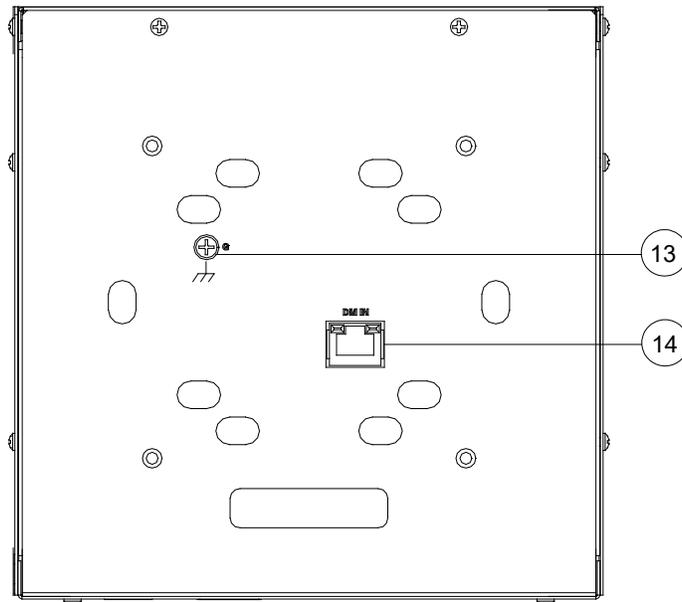
DM-RMC-SCALER-C Connectors, Controls, and Indicators (Top Panel)



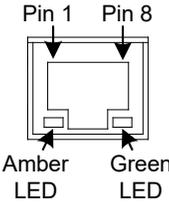
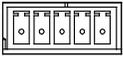
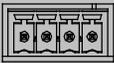
DM-RMC-SCALER-C Connectors, Controls, and Indicators (Bottom Panel)



DM-RMC-SCALER-C Connectors, Controls, and Indicators (Rear Panel)

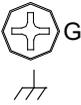
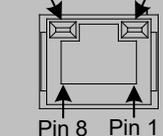


Connectors, Controls, and Indicators

#	CONNECTORS, ¹ CONTROLS, AND INDICATORS	DESCRIPTION																				
1	PWR LED	(1) Green LED, indicates operating power supplied from local power pack																				
2	DM LINK LED	(1) Green LED, indicates connection to an upstream DM device																				
3	VIDEO LED	(1) Green LED, indicates video signal presence and lock status																				
4	USB HID LED	1) Green LED, indicates a valid device connection and activity on the USB HID port																				
5	SETUP (LED and Button)	(1) Red LED and (1) miniature recessed push button for Ethernet setup																				
6	RESET	(1) Miniature recessed push button for hardware reset																				
7	<p>LAN</p> 	<p>(1) 8-pin RJ-45 female, shielded, with two LED indicators; 10BASE-T/100BASE-TX Ethernet port; Green LED indicates Ethernet link status; Amber LED indicates Ethernet activity</p> <table border="1"> <thead> <tr> <th>PIN</th> <th>SIGNAL</th> <th>PIN</th> <th>SIGNAL</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>TX +</td> <td>5</td> <td>N/C</td> </tr> <tr> <td>2</td> <td>TX -</td> <td>6</td> <td>RX -</td> </tr> <tr> <td>3</td> <td>RX +</td> <td>7</td> <td>N/C</td> </tr> <tr> <td>4</td> <td>N/C</td> <td>8</td> <td>N/C</td> </tr> </tbody> </table>	PIN	SIGNAL	PIN	SIGNAL	1	TX +	5	N/C	2	TX -	6	RX -	3	RX +	7	N/C	4	N/C	8	N/C
PIN	SIGNAL	PIN	SIGNAL																			
1	TX +	5	N/C																			
2	TX -	6	RX -																			
3	RX +	7	N/C																			
4	N/C	8	N/C																			
8	<p>24 V 0.75A MAX</p> 	(1) 2.1 mm barrel dc power jack; 24 Vdc power input; Power pack included																				
9	<p>HDMI OUT</p> 	(1) 19-pin Type A HDMI female; HDMI digital video/audio output; Supports DVI ²																				
10	<p>USB HID</p> 	(1) USB Type A female; USB 2.0 host port for connection of a mouse and keyboard or other USB HID compliant device																				
11	<p>COM</p> 	(1) 5-pin 3.5 mm detachable terminal block, bidirectional RS-232 port; Up to 115.2 kBd, hardware and software handshaking support																				
12	<p>IR 1-2</p> 	(1) 4-pin 3.5 mm detachable terminal block comprising two IR/Serial ports: IR output up to 1.1 MHz; 1-way serial TTL/RS-232 (0-5 volts) up to 19200 baud ³																				

(Continued on following page)

Connectors, Controls, and Indicators (Continued)

#	CONNECTORS, ¹ CONTROLS, AND INDICATORS	DESCRIPTION
13		(1) 6-32 screw, chassis ground lug
14	<p>DM IN⁴</p> <p>Amber LED Green LED</p> 	(1) 8-pin RJ-45 female, shielded, with two LED indicators; DM 8G+ input, HDBaseT compliant; Connects to DM 8G+ output of a DM switcher, transmitter, or other DM device or to an HDBaseT device via CAT5e or Crestron DM-CBL-8G cable; ⁵ Green LED indicates DM link status; Solid amber LED indicates HDCP video; Blinking amber LED indicates non-HDCP video

- Interface connectors for the **COM** and **IR** ports are provided with the unit.
- The HDMI output requires an appropriate adapter or interface cable to accommodate a DVI signal. CBL-HD-DVI interface cables sold separately.
- Maximum string length for serial commands sent via the **IR** port should be no greater than 40 characters.
- The **DM IN** port consists of one RJ-45 connector. Refer to the following table for the connector pinouts.

DM IN Connector Pinouts

			
PIN #	WIRE COLOR	PIN #	WIRE COLOR
1	Orange/White	5	Blue/White
2	Orange	6	Green
3	Green/White	7	Brown/White
4	Blue	8	Brown

- For DM 8G+ or HDBaseT wiring, use Crestron DM-CBL-8G DigitalMedia 8G cable, Crestron DM-CBL DigitalMedia cable, Crestron DM-CBL-D DigitalMedia D cable, or third-party CAT5e (or better) UTP or STP. Maximum DM 8G+ wire length is 330 feet (100 meters) between devices. Shielded cable and connectors are recommended to safeguard against unpredictable environmental electrical noise which may impact performance at resolutions above 1080p. For complete system design guidelines, refer to the Crestron DigitalMedia Design Guide (Doc. 4546). DM 8G+ technology is compatible with HDBaseT Alliance specifications for connecting to HDBaseT compliant equipment. All wire and cables sold separately.

Setup

Network Wiring

When wiring the DM network, consider the following:

- Use Crestron Certified Wire.
- Use Crestron power supplies for Crestron equipment.

CAUTION: Failure to use Crestron power supplies could cause equipment damage or void the Crestron warranty.

- Provide sufficient power to the system.
- For DM 8G+ or HDBaseT wiring, use Crestron DM-CBL-8G DigitalMedia 8G cable, Crestron DM-CBL DigitalMedia cable, Crestron DM-CBL-D DigitalMedia D cable, or third-party CAT5e (or better) UTP or STP. Maximum DM 8G+ wire length is 330 feet (100 meters) between devices. Shielded cable and connectors are recommended to safeguard against unpredictable environmental electrical noise which may impact performance at resolutions above 1080p. For complete system design guidelines, refer to the Crestron DigitalMedia Design Guide (Doc. 4546). DM 8G+ technology is compatible with HDBaseT Alliance specifications for connecting to HDBaseT compliant equipment.

The DM-RMC-SCALER-C also uses high-speed Ethernet for communications between the device and a control system, computer, media server, and other IP-based devices. For general information on connecting Ethernet devices in a Crestron system, refer to the Crestron e-Control® Reference Guide (Doc. 6052) at www.crestron.com/manuals. For information specifically related to Ethernet connectivity using DigitalMedia devices, refer to the Crestron IP Considerations Guide for the IT Professional (Doc. 4579) at www.crestron.com/dmresources.

Identity Code

NOTE: The latest software can be downloaded at www.crestron.com/software.

NOTE: In the Crestron Studio™ or SIMPL Windows program, the IP ID of the DM-RMC-SCALER-C is assigned automatically and does not require additional programming when the DM-RMC-SCALER-C is dropped onto an output card of a DM switcher. Use the information below when the DM-RMC-SCALER-C is dropped directly into an Ethernet slot on the control system in Crestron Studio or SIMPL Windows without a DM switcher.

The IP ID is set within the DM-RMC-SCALER-C IP table using Crestron Toolbox™. For information on setting an IP table, refer to the Crestron Toolbox help file. The IP IDs of multiple DM-RMC-SCALER-C devices in the same system must be unique.

When setting the IP ID, consider the following:

- The IP ID of each unit must match an IP ID specified in the Crestron Studio or SIMPL Windows program.
- Each device using IP to communicate with a control system must have a unique IP ID.

Supplied Hardware

The hardware supplied with the DM-RMC-SCALER-C is listed in the following table.

Supplied Hardware for the DM-RMC-SCALER-C

DESCRIPTION	PART NUMBER	QUANTITY
Mounting Bracket	2021253	1
Screws, 6-32 x 1", Pan, Phil	2007250	4
Screws, 6-32 x 3/4", Slot	2009211	4

Installation

Ventilation

The DM-RMC-SCALER-C should be used in a well-ventilated area. The venting holes should not be obstructed under any circumstances.

To prevent overheating, do not operate this product in an area that exceeds the environmental temperature range listed in the table of specifications.

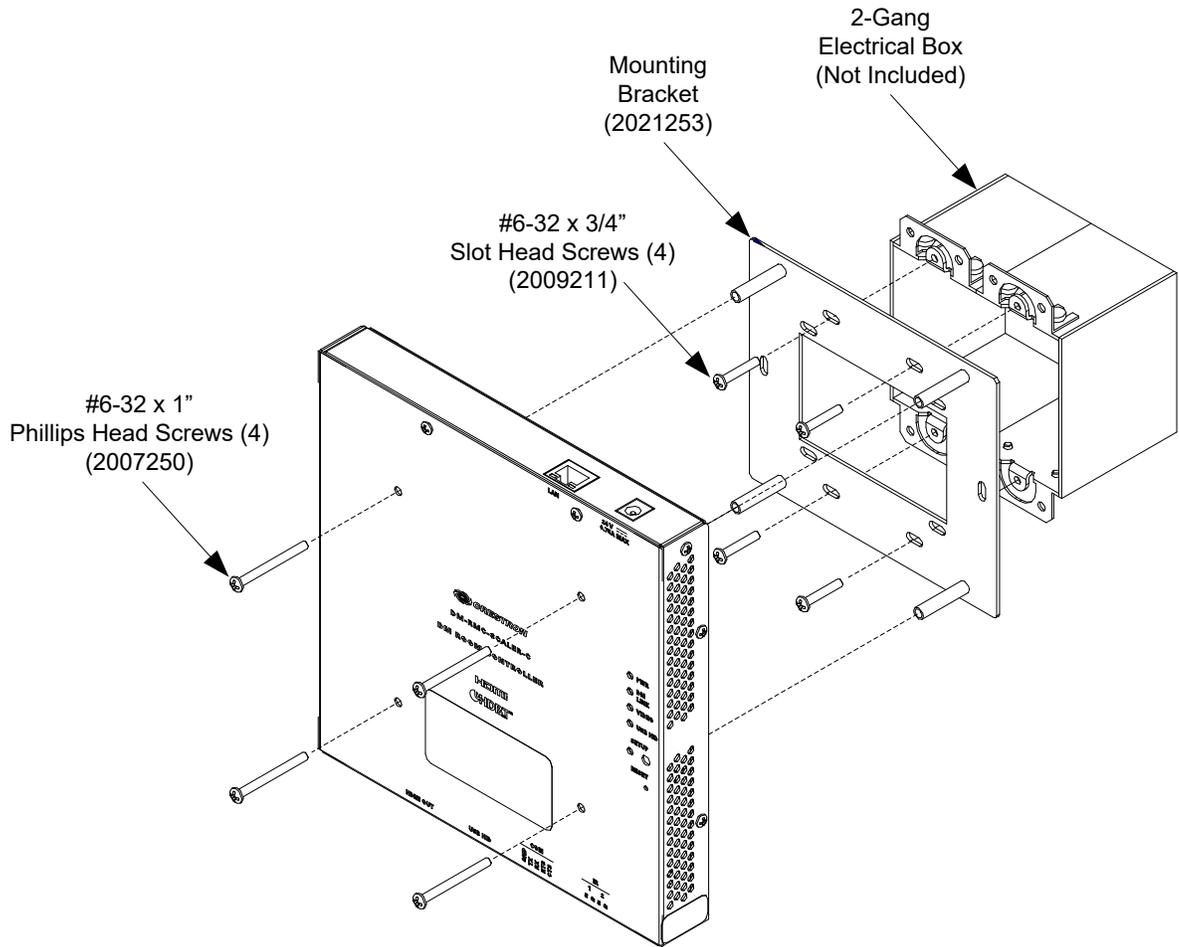
Mounting the DM-RMC-SCALER-C

The DM-RMC-SCALER-C mounts to a 2-gang electrical box (not included). To mount the DM-RMC-SCALER-C, perform the following steps (refer to the illustration on the following page):

1. Using the four included 6-32 x 3/4" (2009211) slot head screws, attach the included mounting bracket to the electrical box.
2. Ground the DM-RMC-SCALER-C and attach the proper cable to the rear of the unit (refer to "Hardware Hookup" on page 17 for information).
3. Using the four included 6-32 x 1" (2007250) Phillips head screws, attach the DM-RMC-SCALER-C to the mounting bracket.

CAUTION: Excess wire that is pinched between the DM-RMC-SCALER-C and the electrical box can short out. Ensure that all excess wire is completely inside the electrical box and is not between the box and the DM-RMC-SCALER-C.

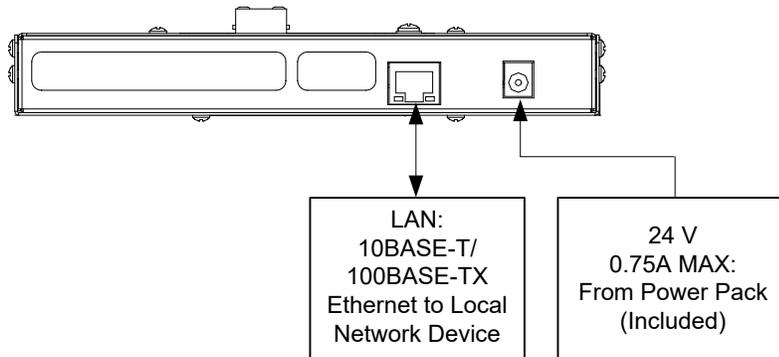
Mounting the DM-RMC-SCALER-C

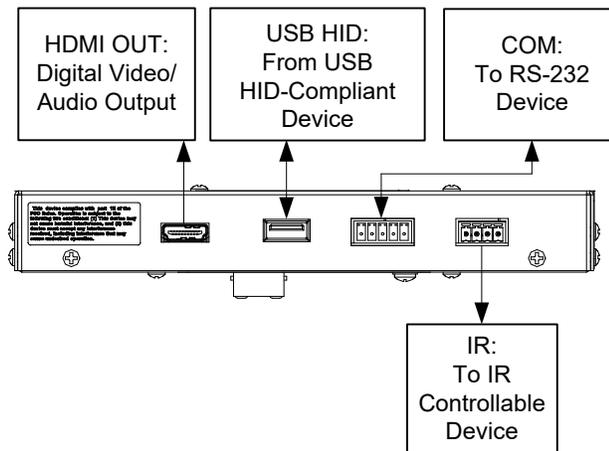
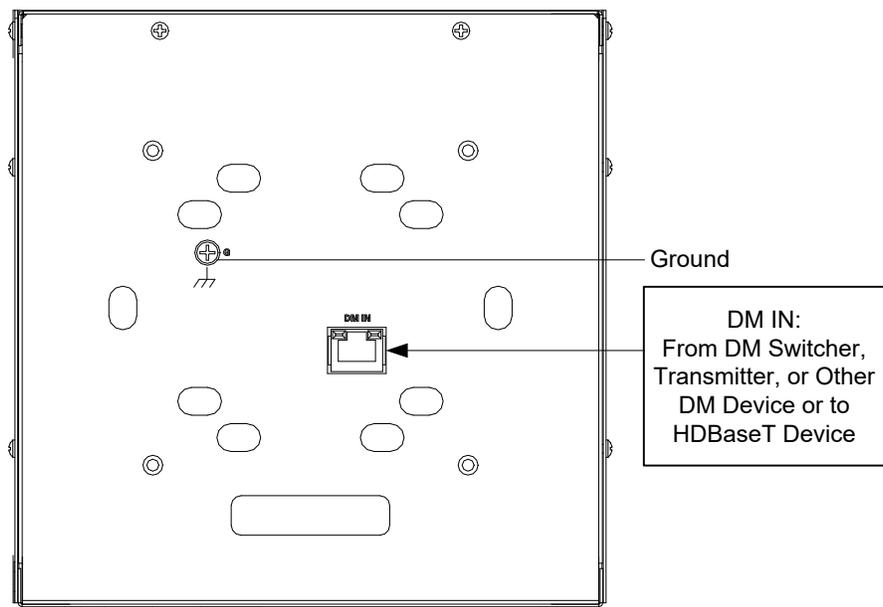


Hardware Hookup

Make the necessary connections as called out in the following illustrations. Refer to "Network Wiring" on page 15. Apply power after all connections have been made.

Hardware Connections for the DM-RMC-SCALER-C (Top Panel View)



Hardware Connections for the DM-RMC-SCALER-C (Bottom Panel View)*Hardware Connections for the DM-RMC-SCALER-C (Rear Panel View)*

NOTE: Ensure that the unit is properly grounded by connecting the chassis ground lug to an earth ground (building steel).

NOTE: For DM 8G+ or HDBaseT wiring, use Crestron DM-CBL-8G DigitalMedia 8G cable, Crestron DM-CBL DigitalMedia cable, Crestron DM-CBL-D DigitalMedia D cable, or third-party CAT5e (or better) UTP or STP. Maximum DM 8G+ wire length is 330 feet (100 meters) between devices. Shielded cable and connectors are recommended to safeguard against unpredictable environmental electrical noise which may impact performance at resolutions above 1080p. For complete system design guidelines, refer to the Crestron DigitalMedia Design Guide (Doc. 4546). DM 8G+ technology is compatible with HDBaseT Alliance specifications for connecting to HDBaseT compliant equipment. All wire and cables sold separately.

Uploading and Upgrading

Crestron recommends using the latest programming software and that each device contains the latest firmware to take advantage of the most recently released features. However, before attempting to upload or upgrade it is necessary to establish communication. Once communication has been established, files (for example, firmware) can be transferred to the device. In addition, the IP table of the device can be configured.

NOTE: Crestron software and any files on the website are for authorized Crestron dealers and Crestron Service Providers (CSPs) only. New users must register to obtain access to certain areas of the site (including the FTP site).

Establishing Communication

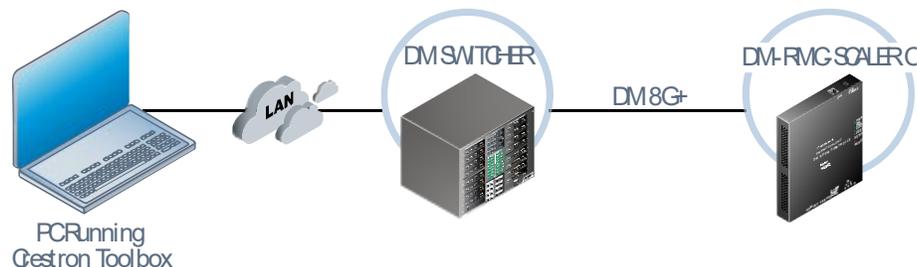
Use Crestron Toolbox for communicating with the DM-RMC-SCALER-C; refer to the Crestron Toolbox help file for details.

A PC running Crestron Toolbox communicates with the DM-RMC-SCALER-C in the following ways:

- Via a DM switcher using TCP/IP or USB communication. TCP/IP provides a faster method of communication than USB.
- Via the LAN port of the DM-RMC-SCALER-C using TCP/IP communication. In this scenario, the DM-RMC-SCALER-C is used in a standalone configuration (a DM switcher is not used).

Via DM Switcher

TCP/IP Communication via DM Switcher



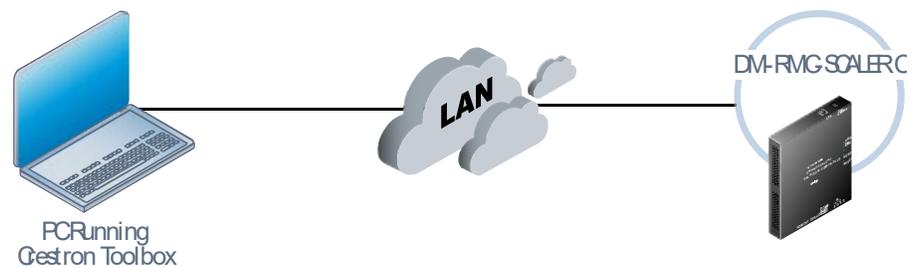
To establish TCP/IP communication between the PC and the DM-RMC-SCALER-C via the DM switcher:

1. Establish communication between the PC and the DM switcher as described in the DigitalMedia Switchers Operations Guide (Doc. 6755).
2. Use the Device Discovery Tool in Crestron Toolbox to find the IP address of the DM-RMC-SCALER-C. The tool is available in Toolbox version 1.15.143 or later.
3. Use the Address Book in Crestron Toolbox to create an entry for the DM-RMC-SCALER-C using the *TCP* connection type, and enter the IP address of the DM-RMC-SCALER-C.
4. Display the DM-RMC-SCALER-C's "System Info" window (**Tools | System Info**); communications are confirmed when the device information is displayed.

USB Communication via DM Switcher

To establish USB communication between the PC and the DM-RMC-SCALER-C via a DM switcher:

1. Use the Address Book in Crestron Toolbox to create an entry using the expected communication protocol (USB). When multiple USB devices are connected, identify the DM switcher by entering “DM-MD8X8”, “DM-MD16X16”, or “DM-MD32X32” in the *Model* text box, the unit’s serial number in the *Serial* text box, or the unit’s hostname in the *Hostname* text box. The hostname can be found in the “System Info” window in the section marked *Ethernet*; however, communications must be established in order to see this information in the “System Info” window.
2. Display the DM-RMC-SCALER-C’s “System Info” window (**Tools | System Info**); communications are confirmed when the device information is displayed.

Via LAN Port*TCP/IP Communication via LAN Port of DM-RMC-SCALER-C*

To establish TCP/IP communication between the PC and the DM-RMC-SCALER-C via the LAN port of the DM-RMC-SCALER-C:

1. Use the Device Discovery Tool in Crestron Toolbox to find the IP address of the DM-RMC-SCALER-C. The tool is available in Toolbox version 1.15.143 or later.

NOTE: When the DM-RMC-SCALER-C is used in a standalone configuration (without a DM switcher), DHCP is enabled by default. If desired, a default IP address (192.168.1.245) can be assigned by holding down its **SETUP** button while applying power. This IP address overwrites any previous settings and remains until it is changed manually.

2. Use the Address Book in Crestron Toolbox to create an entry for the DM-RMC-SCALER-C using the *TCP* connection type, and enter the IP address of the DM-RMC-SCALER-C.
3. Display the DM-RMC-SCALER-C’s “System Info” window (**Tools | System Info**); communications are confirmed when the device information is displayed.

4. (Optional) If additional changes to TCP/IP settings are desired, do the following:
 - a. Assign an IP address, IP mask, and default router for the DM-RMC-SCALER-C via the Crestron Toolbox (**Functions | Ethernet Addressing**).
 - b. Close the “System Info” window.
 - c. In Crestron Toolbox, change the Address Book entry for the DM-RMC-SCALER-C so that it uses the IP address assigned in step 4a.
 - d. Display the DM-RMC-SCALER-C’s “System Info” window (**Tools | System Info**); communications are confirmed when the device information is displayed.

Firmware

Firmware files may be distributed from programmers to installers or from Crestron to dealers. Firmware upgrades are available from the Crestron website as new features are developed after product releases. For details on upgrading, refer to the Crestron Toolbox help file.

Check the Crestron website to find the latest firmware. (New users must register to obtain access to certain areas of the site, including the FTP site.)

To upgrade DM-RMC-SCALER-C firmware:

1. Do either of the following:
 - If the DM-RMC-SCALER-C is connected to a DM switcher, use the Device Discovery Tool in Crestron Toolbox to find the IP address of the switcher.
 - If the DM-RMC-SCALER-C is used in a standalone configuration (without a DM switcher), use the Device Discovery Tool to find the IP address of the DM-RMC-SCALER-C.
2. Add the IP address found in step 1 to the Address Book in Toolbox.
3. Download the appropriate .puf file from the Crestron website to the PC.
4. Double-click the .puf file. The Toolbox Address Book opens.
5. From the list in the Address Book, select the DM switcher (if the DM-RMC-SCALER-C is connected to a switcher) or the DM-RMC-SCALER-C (if the DM-RMC-SCALER-C is used in a standalone configuration), and then click **OK**.

Either of the following occurs:

- If the DM switcher was selected, a DM device list is displayed that allows upgrading all DM devices connected to the switcher.
- If the DM-RMC-SCALER-C was selected, a DM device list is displayed that allows upgrading of the DM-RMC-SCALER-C only.

In the DM device lists that are displayed, the checkbox of any item that needs to be upgraded is automatically selected.

6. Click **Update**.
7. After the process is complete, click **Recheck** to verify the upgrade.

IP Configuration

If the DM-RMC-SCALER-C is used in a standalone configuration (without a DM switcher), use Crestron Toolbox to create the IP table entry of the DM-RMC-SCALER-C.

NOTE: If the DM-RMC-SCALER-C is connected to a DM switcher, the IP table entry of the DM-RMC-SCALER-C is created automatically.

1. Use the Device Discovery Tool to find the IP address of the DM-RMC-SCALER-C. Then, display the “System Info” window (**Tools | System Info**) and select the DM-RMC-SCALER-C entry from the Address Book.
2. Select **Functions | IP Table Setup**.
3. Add, modify, or delete entries in the IP table. The DM-RMC-SCALER-C can have only one IP table entry.
4. A defined IP table can be saved to a file or sent to the device.

Problem Solving

Troubleshooting

The following table provides corrective action for possible trouble situations. If further assistance is required, please contact a Crestron customer service representative.

DM-RMC-SCALER-C Troubleshooting

TROUBLE	POSSIBLE CAUSE(S)	CORRECTIVE ACTION
PWR LED does not illuminate.	Device is not receiving power.	Verify power supply connections to the device and to the power outlet.
PWR LED flashes.	Memory test fails while the device boots up.	Power cycle the device.
DM LINK LED does not illuminate.	Device cannot establish a link to the device connected to the DM IN port.	Verify cable connection to the DM IN port.
VIDEO LED does not illuminate.	Device is not receiving video signal.	Ensure proper video signal is routed to device.
	Device connected to the HDMI OUT port has not sent the hotplug signal.	Power on device connected to the HDMI OUT port and ensure that it is switched to the correct input.
VIDEO LED is green but video on connected display is black.	HDCP is blanking the video output.	Verify that device connected to HDMI output supports HDCP.
Green LED on LAN port does not illuminate.	LAN network cable is not connected to the LAN port or to the 10BASE-T/100BASE-TX compatible device.	Verify LAN network cable connection to the LAN port and to the compatible network device.
	LAN network cable is not the proper type.	Verify that network cable complies with EIA/TIA 568 and the CAT5 specification.
	LAN network cable is not the proper length.	Verify that network cable is the proper length. Cable length must not exceed 330 feet (100 meters).
	10BASE-T/100BASE-TX compatible device is not receiving power.	Apply power to the network device.
Device loses functionality due to electrostatic discharge.	Device is improperly grounded.	Check that all ground connections have been made properly.

NOTE: For more advanced diagnostics, use the DMTool in Crestron Toolbox.

Reference Documents

All documents mentioned in this guide are available at www.crestron.com/manuals.

List of Related Reference Documents

DOCUMENT TITLE
Crestron DigitalMedia Design Guide (www.crestron.com/dmresources)
Crestron DigitalMedia Switchers Operations Guide (www.crestron.com/manuals)
Crestron e-Control Reference Guide (www.crestron.com/manuals)
Crestron IP Considerations Guide for the IT Professional (www.crestron.com/dmresources)

Further Inquiries

To locate specific information or resolve questions after reviewing this guide, contact Crestron's True Blue Support at 1-888-CRESTRON [1-888-273-7876] or, for assistance within a particular geographic region, refer to the listing of Crestron worldwide offices at www.crestron.com/offices.

To post a question about Crestron products, log onto Crestron's Online Help at www.crestron.com/onlinehelp. First-time users must establish a user account to fully benefit from all available features.

Future Updates

As Crestron improves functions, adds new features, and extends the capabilities of the DM-RMC-SCALER-C, additional information may be made available as manual updates. These updates are solely electronic and serve as intermediary supplements prior to the release of a complete technical documentation revision.

Check the Crestron website periodically for manual update availability and its relevance. Updates are identified as an "Addendum" in the Download column.

Return and Warranty Policies

Merchandise Returns / Repair Service

1. No merchandise may be returned for credit, exchange or service without prior authorization from Crestron. To obtain warranty service for Crestron products, contact an authorized Crestron dealer. Only authorized Crestron dealers may contact the factory and request an RMA (Return Merchandise Authorization) number. Enclose a note specifying the nature of the problem, name and phone number of contact person, RMA number and return address.
2. Products may be returned for credit, exchange or service with a Crestron Return Merchandise Authorization (RMA) number. Authorized returns must be shipped freight prepaid to Crestron, 6 Volvo Drive, Rockleigh, N.J. or its authorized subsidiaries, with RMA number clearly marked on the outside of all cartons. Shipments arriving freight collect or without an RMA number shall be subject to refusal. Crestron reserves the right in its sole and absolute discretion to charge a 15% restocking fee plus shipping costs on any products returned with an RMA.
3. Return freight charges following repair of items under warranty shall be paid by Crestron, shipping by standard ground carrier. In the event repairs are found to be non-warranty, return freight costs shall be paid by the purchaser.

Crestron Limited Warranty

Crestron Electronics, Inc. warrants its products to be free from manufacturing defects in materials and workmanship under normal use for a period of three (3) years from the date of purchase from Crestron, with the following exceptions: disk drives and any other moving or rotating mechanical parts, pan/tilt heads and power supplies are covered for a period of one (1) year; touch screen display and overlay components are covered for 90 days; batteries and incandescent lamps are not covered.

This warranty extends to products purchased directly from Crestron or an authorized Crestron dealer. Purchasers should inquire of the dealer regarding the nature and extent of the dealer's warranty, if any.

Crestron shall not be liable to honor the terms of this warranty if the product has been used in any application other than that for which it was intended or if it has been subjected to misuse, accidental damage, modification or improper installation procedures. Furthermore, this warranty does not cover any product that has had the serial number altered, defaced or removed.

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Version 2, June 1991

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