

Crestron **DM-RMC-SCALER-S/S2**
DigitalMedia 8G™ Fiber Receiver &
Room Controller with Scaler


Operations & Installation Guide



This document was prepared and written by the Technical Documentation department at:



Important Safety Instructions

- Read these instructions.
- Keep these instructions.
- Heed all warnings.
- Follow all instructions.
- Do not use this apparatus near water.
- Clean only with dry cloth.
- Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
- Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
- Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding-type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
- Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
- Only use attachments/accessories specified by the manufacturer.
- Use only with the cart, stand, tripod, bracket or table specified by the manufacturer or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over. 
- Unplug this apparatus during lightning storms or when unused for long periods of time.
- Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.
- Disconnect power prior to connecting or disconnecting equipment.
- Do not install in direct sunlight.
- The apparatus must be installed in a way that the power cord can be removed either from the wall outlet or from the device itself in order to disconnect the mains power.
- Prevent foreign objects from entering the device.

WARNING:

TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS APPARATUS TO RAIN OR MOISTURE. THE APPARATUS SHALL NOT BE EXPOSED TO DRIPPING OR SPLASHING. OBJECTS FILLED WITH LIQUIDS, SUCH AS VASES, SHOULD NOT BE PLACED ON THE APPARATUS.

WARNING:

TO PREVENT ELECTRIC SHOCK, DO NOT REMOVE COVER. THERE ARE NO USER SERVICEABLE PARTS INSIDE. ONLY QUALIFIED SERVICE PERSONNEL SHOULD PERFORM SERVICE.



AVIS: RISQUE DE CHOC ELECTRIQUE NE PAS OUVRIR



The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

IMPORTANT

This device can be used with Class 2 output wiring.

This device includes an aggregation of separate independent works that are each generally copyrighted by Crestron Electronics, Inc., with all rights reserved. One of those independent works, Linux Bridge Project, is copyrighted under the GNU GENERAL PUBLIC LICENSE, Version 2, reproduced in "GNU General Public License" on page 31, where the corresponding source code is available at: <ftp://ftp.crestron.com/gpl>.

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

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Regulatory Compliance

As of the date of manufacture, the DM-RMC-SCALER-S and DM-RMC-SCALER-S2 have been tested and found to comply with specifications for CE marking and standards per EMC and Radiocommunications Compliance Labelling.



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 A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Industry Canada (IC) Compliance Statement

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

The DM-RMC-SCALER-S and DM-RMC-SCALER-S2 are class 1 laser products. They comply with safety regulations of IEC-60825-1, FDA 21 CFR 1040.11 and FDA 21 CFR 1040.10.



WARNING: Visible and invisible laser radiation when open. Avoid direct exposure to beam.

NOTE: Plug the included dust cap into the optical transceiver when the fiber optic cable is unplugged.

WARNING: These are class A products. In a domestic environment these products may cause radio interference in which case the user may be required to take adequate measures.

Contents

DigitalMedia 8G Fiber Receiver & Room Controller with Scaler: DM-RMC-SCALER-S/ DM-RMC-SCALER-S2	1
Introduction	1
Features and Functions	1
Applications.....	5
Specifications	6
Physical Description.....	10
Setup	16
Network Wiring.....	16
Identity Code	16
Supplied Hardware	17
Installation.....	17
Hardware Hookup	18
Programming Software.....	21
Software Requirements for the PC	21
Programming with SIMPL Windows	21
Uploading and Upgrading.....	24
Establishing Communication.....	24
Firmware	27
IP Configuration	27
Problem Solving	28
Troubleshooting.....	28
Reference Documents.....	29
Further Inquiries	29
Future Updates	29
Return and Warranty Policies	30
Merchandise Returns / Repair Service	30
Crestron Limited Warranty.....	30
GNU General Public License	31

DigitalMedia 8G Fiber Receiver & Room Controller with Scaler: DM-RMC-SCALER-S/ DM-RMC-SCALER-S2

Introduction

The DM-RMC-SCALER-S/DM-RMC-SCALER-S2, hereinafter referred to simply as the DM[®] receiver unless otherwise indicated, provides an advanced one-box interface solution for a single display device as part of a complete Crestron[®] DigitalMedia[™] system. It functions as a DM 8G[®] (DM-RMC-SCALER-S)/DM 8G SM (DM-RMC-SCALER-S2) fiber receiver, video scaler, and control interface, providing a single HDMI[®] output along with Ethernet, USB HID (Human Interface Device), RS-232, and IR control ports. Built-in scaling enables the connected display to handle virtually any video signal. Its compact, low-profile design allows the DM receiver 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 one multimode (DM-RMC-SCALER-S) or single-mode (DM-RMC-SCALER-S2) fiber strand.¹

Features and Functions

- DigitalMedia 8G[™] multimode (DM-RMC-SCALER-S)/single-mode (DM-RMC-SCALER-S2) fiber receiver, high-definition scaler, and display controller
- DM 8G fiber input supports up to 1000 foot (~300 meter) cable length (DM-RMC-SCALER-S)¹
- DM 8G SM fiber input supports up to 7.5 miles (12 km) cable length (DM-RMC-SCALER-S2)¹
- Connects to a DM switcher or transmitter (each sold separately) over one multimode (DM-RMC-SCALER-S)/single-mode (DM-RMC-SCALER-S2) fiber strand²
- Provides one HDMI or DVI display output²

(Continued on following page)

1. For DM 8G wiring, the maximum DigitalMedia 8G fiber cable length is 1000 feet (~300 meters) using CRESFIBER8G fiber optic cable, or 500 feet (~150 meters) using standard CRESFIBER, CRESFIBER-SINGLE-SC, or generic OM3 simplex multimode fiber optic cable. For DM 8G SMF wiring up to 7.5 miles (12 km) between devices, use Crestron CRESFIBER8G-SM or generic G.652.D (or better) single-mode fiber optic cable. Refer to the latest version of the Crestron DigitalMedia Design Guide (Doc. 4546) for complete system design guidelines. The manual is available from the Crestron Web site at www.crestron.com/dmresources. All wire and cables sold separately.
2. HDMI requires an appropriate adapter or interface cable to accommodate a DVI signal. CBL-HD-DVI interface cable sold separately.

Features and Functions

(Continued)

- Accepts any video source from standard NTSC 480i or PAL 576i to HD 1080p60 with Deep Color
- 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
- 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/keyboard ports
- 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
- Universal power pack included

DigitalMedia 8G Multimode/Single-Mode Fiber

DigitalMedia 8G provides a true one-wire transport for moving high-definition video, audio, and Ethernet over fiber optic cable without 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, and 3D¹. Audio capabilities include support for high-bitrate 7.1 audio formats such as Dolby[®] TrueHD and DTS-HD Master Audio[™] as well as uncompressed linear PCM. All DM-RMC-SCALER-S signals are transported over one strand of multimode fiber, supporting distances up to 1000 feet (~300 meters) using CresFiber[®] 8G fiber optic cable.³ All DM-RMC-SCALER-S2 signals are transported over one strand of single-mode fiber, supporting distances up to 7.5 miles (12 km) using CresFiber 8G SM or G.652.D single-mode fiber optic cable.³

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 receiver for each individual display.
3. For DM 8G wiring, the maximum DigitalMedia 8G fiber cable length is 1000 feet (~300 meters) using CRESFIBER8G fiber optic cable, or 500 feet (~150 meters) using standard CRESFIBER, CRESFIBER-SINGLE-SC, or generic OM3 simplex multimode fiber optic cable. For DM 8G SMF wiring up to 7.5 miles (12 km) between devices, use Crestron CRESFIBER8G-SM or generic G.652.D (or better) single-mode fiber optic cable. Refer to the latest version of the Crestron DigitalMedia Design Guide (Doc. 4546) for complete system design guidelines. All wire and cables sold separately.

Multimedia Display Interface

A single HDMI digital AV output port is provided on the DM receiver, supporting HD 1080p60 video and WUXGA computer signals with HDCP, Deep Color, 3D¹, 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 fiber strand connects the DM receiver to a DM switcher or transmitter (each sold separately), transporting video, audio, control, and networking signals through one SC type (DM-RMC-SCALER-S)/LC type (DM-RMC-SCALER-S2) optical connection.³ Multiple DM receivers may be installed to handle each display in a multiroom distribution system, all fed from a central DM switcher (sold separately). Or, a single DM receiver can be fed straight from a DM fiber transmitter (DM 8G transmitter sold separately for the DM-RMC-SCALER-S or DM 8G SM transmitter sold separately for the DM-RMC-SCALER-S2) to extend a computer or AV signal to a single display.

High-Definition Scaler

Through a distributed scaler approach, DigitalMedia delivers a 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 receiver 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 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 receivers can also be used to facilitate a dual-projector 3D setup, steering 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. HDMI requires an appropriate adapter or interface cable to accommodate a DVI signal. CBL-HD-DVI interface cable sold separately.
3. For DM 8G wiring, the maximum DigitalMedia 8G fiber cable length is 1000 feet (~300 meters) using CRESFIBER8G fiber optic cable, or 500 feet (~150 meters) using standard CRESFIBER, CRESFIBER-SINGLE-SC, or generic OM3 simplex multimode fiber optic cable. For DM 8G SMF wiring up to 7.5 miles (12 km) between devices, use Crestron CRESFIBER8G-SM or generic G.652.D (or better) single-mode fiber optic cable. Refer to the latest version of the Crestron DigitalMedia Design Guide (Doc. 4546) for complete system design guidelines. 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 receiver 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 receiver for each display and a DM switcher (sold separately) with sufficient DM 8G/DM 8G SM fiber outputs.

LAN Connectivity

Along with high-definition AV and control, DigitalMedia technology also integrates high-speed Ethernet networking for a total signal distribution solution.

The DM receiver includes a 10BASE-T/100BASE-TX Ethernet port, providing a convenient LAN connection for a local network device.

Keyboard/Mouse Extender

The DM receiver also functions as a keyboard/mouse extender, allowing a USB HID-compliant keyboard and/or 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.

Embedded Device Control

The DM receiver 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 receiver 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

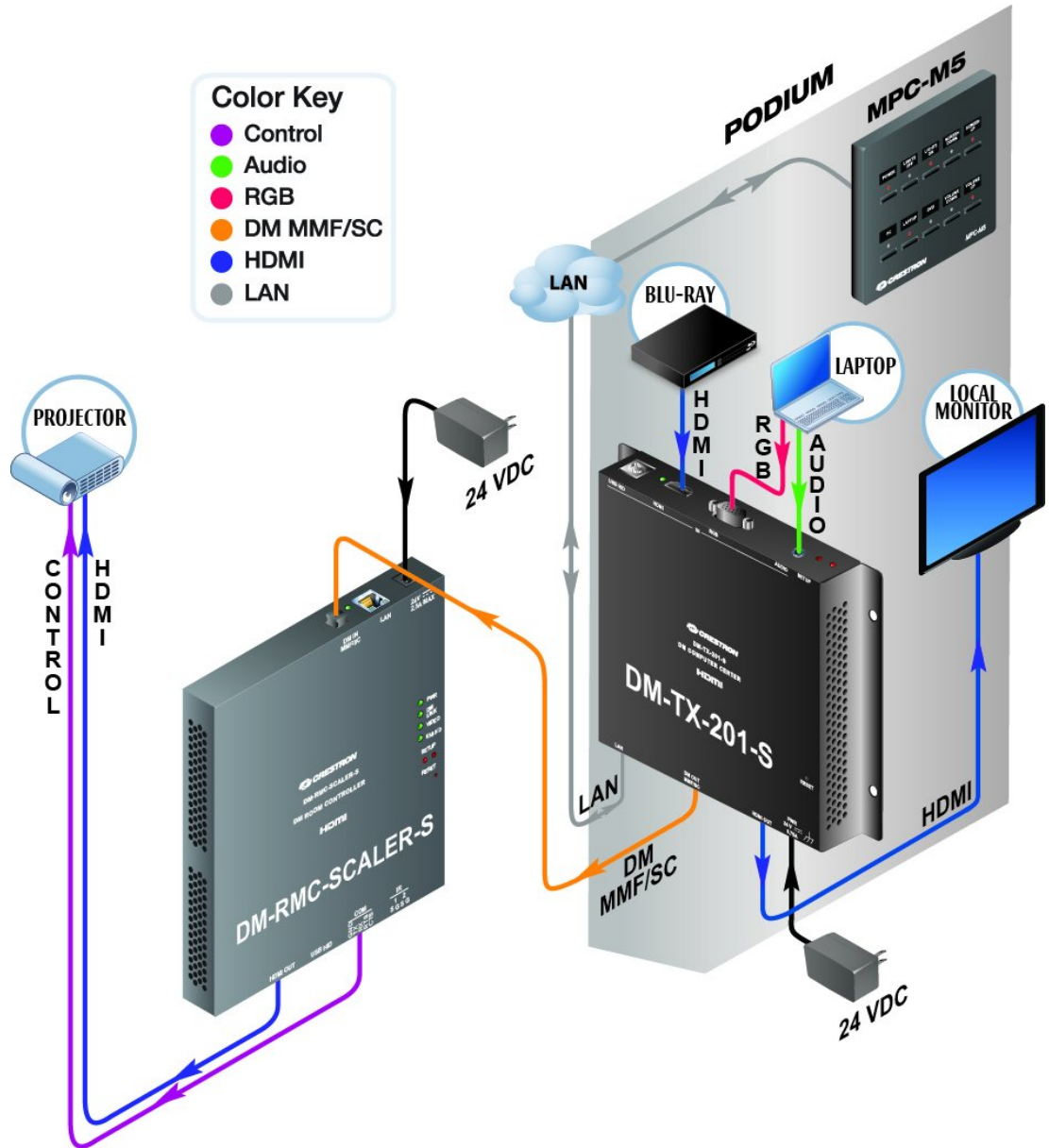
Its low-profile design makes the DM receiver perfect for installation behind a flat panel display or above a ceiling mounted projector. It mounts to a standard 2-gang US, UK, or European electrical box using the mounting bracket provided, affording a clean installation that protrudes less than 1-1/2 inches (~38 mm) from the mounting surface.

Connections are positioned on the top and bottom of the unit. The design of the mounting bracket allows wires up to 0.23 inches (~6 mm) in diameter to extend from the electrical box as needed. An array of indicators is provided on the front of the DM receiver for easy setup and troubleshooting.

Applications

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

DM-RMC-SCALER-S in a Standalone Application



In a DM-RMC-SCALER-S2 standalone application, the DM-RMC-SCALER-S2 is used with a DM 8G SM fiber transmitter such as the DM-TX-201-S2 (sold separately) and is not used with a DM switcher.

Specifications

Specifications for the DM receiver are listed in the following table.

DM-RMC-SCALER-S/DM-RMC-SCALER-S2 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-RMC-SCALER-S: DM 8G fiber (DigitalMedia over one multimode fiber optic strand) ⁴ DM-RMC-SCALER-S2: DM 8G SMF (DigitalMedia over one single-mode fiber optic strand) ⁴
Output Signal Types	HDMI, DVI ⁵
Formats	HDMI with Deep Color & 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-S/DM-RMC-SCALER-S2 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 Hz⁷ 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-RMC-SCALER-S: DM 8G fiber DM-RMC-SCALER-S2: DM 8G SMF</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-S/DM-RMC-SCALER-S2 Specifications (Continued)

SPECIFICATION	DETAILS
Communications	
DigitalMedia	DM 8G fiber (DM-RMC-SCALER-S)/ DM 8G SMF (DM-RMC-SCALER-S2), HDCP management, EDID format management, CEC
Ethernet	10BASE-T/100BASE-TX, auto-switching, auto-negotiating, auto-discovery, full/half duplex, DHCP
USB	Supports USB HID class devices
Power Requirements	
Power Pack	0.75 A @ 24 volts dc; 100-240 volts ac, 50/60 Hz power pack included
Minimum 2-Series Control System Update File ^{8,9}	Version 4.003.0029 or later
Environmental	
Temperature	32° to 104° F (0° to 40° C)
Humidity	10% to 90% RH (non-condensing)
Heat Dissipation	45 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	7.69 in (196 mm)
Width	7.60 in (193 mm)
Depth	1.44 in (37 mm) with mounting bracket
Weight	2.1 lbs (1.0 kg) with mounting bracket
Included Accessory	Universal 24 Volt DC Power Pack
Available Accessories	
CBL Series	Crestron Certified Interface Cable
CNSP-XX	Custom Serial Interface Cable
CRESFIBER-CONN- SC50UM-12	CresFiber Fiber Optic Cable Connector
CRESFIBER-SINGLE- SC	CresFiber Simplex Fiber Optic Cable Assembly, 50/125, SC
CRESFIBER-SINGLE- SC-ARMORED	CresFiber ARMORED Simplex Fiber Optic Cable Assembly, 50/125, SC
CRESFIBER-SINGLE- SC-CLEAR	CresFiber CLEAR Simplex Fiber Optic Cable Assembly, 50/125, SC
CRESFIBER-TK	CresFiber Termination Kit
CRESFIBER8G	CresFiber 8G Fiber Optic Cable
IRP2	IR Emitter Probe
MP-WP Series	Media Presentation Wall Plates
MPI-WP Series	Media Presentation Wall Plates – International Version

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 receiver for each individual display.
4. For DM 8G wiring, the maximum DigitalMedia 8G fiber cable length is 1000 feet (~300 meters) using CRESFIBER8G fiber optic cable, or 500 feet (~150 meters) using standard CRESFIBER, CRESFIBER-SINGLE-SC, or generic OM3 simplex multimode fiber optic cable. For DM 8G SMF wiring up to 7.5 miles (12 km) between devices, use Crestron CRESFIBER8G-SM or generic G.652.D (or better) single-mode fiber optic cable. Refer to the latest version of the Crestron DigitalMedia Design Guide (Doc. 4546) for complete system design guidelines. All wire and cables sold separately.
5. HDMI requires an appropriate adapter or interface cable to accommodate a DVI signal. CBL-HD-DVI interface cable sold separately.
6. With or without reduced blanking.
7. With reduced blanking only.
8. The latest software versions can be obtained from the Crestron Web site. Refer to the NOTE following these footnotes.
9. Crestron 2-Series control systems include the AV2 and PRO2. Consult the latest Crestron Product Catalog for a complete list of 2-Series control systems.

NOTE: Crestron software and any files on the Web site are for authorized Crestron dealers and Crestron Authorized Independent Programmers (CAIPs) only. New users may be required to register to obtain access to certain areas of the site (including the FTP site).

Physical Description

This section provides information on the connections, controls and indicators available on the DM receiver.

DM-RMC-SCALER-S/DM-RMC-SCALER-S2 Physical View (Front Panel)

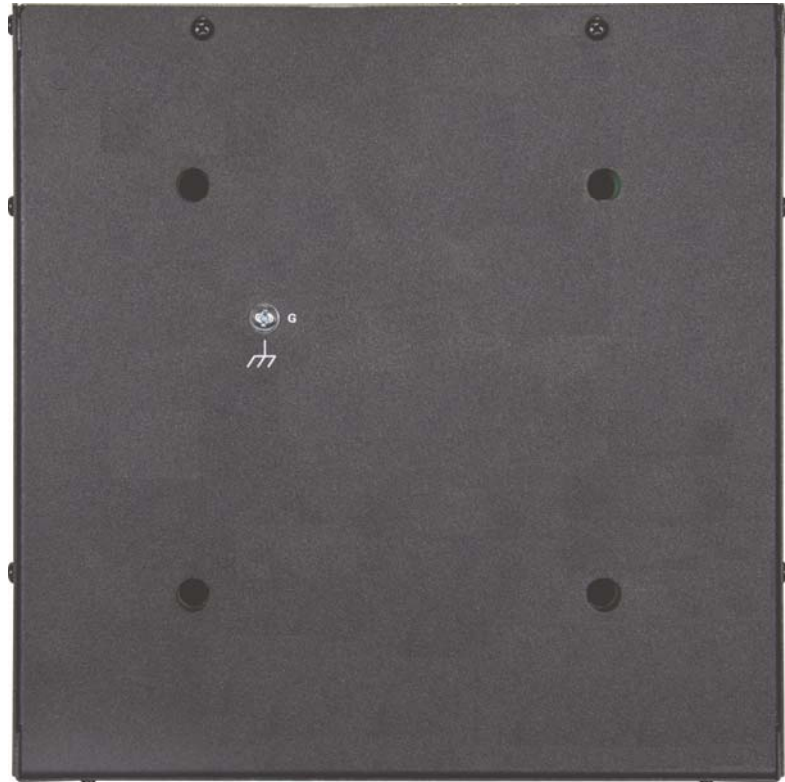
DM-RMC-SCALER-S



DM-RMC-SCALER-S2



DM-RMC-SCALER-S/DM-RMC-SCALER-S2 Physical View (Rear Panel)



DM-RMC-SCALER-S/DM-RMC-SCALER-S2 Physical View (Top Panel)

DM-RMC-SCALER-S



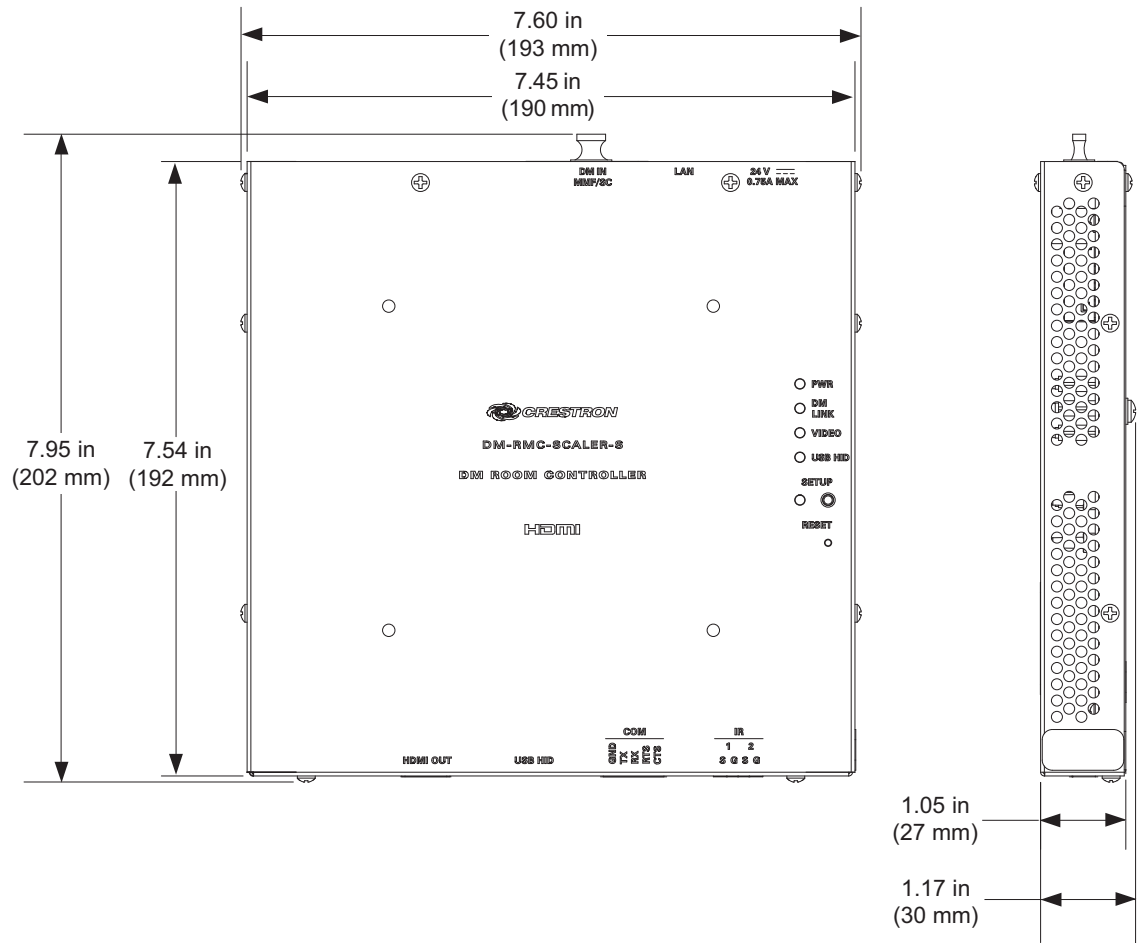
DM-RMC-SCALER-S2



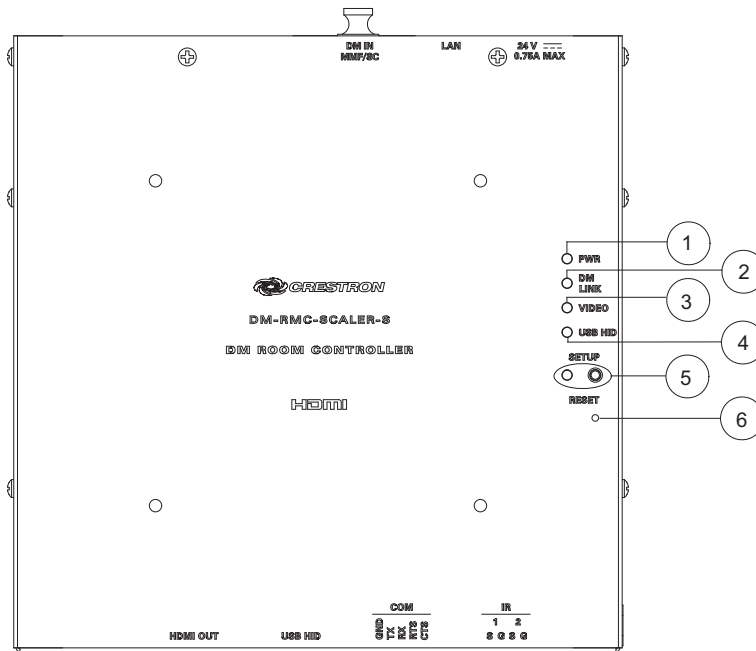
DM-RMC-SCALER-S/DM-RMC-SCALER-S2 Physical View (Bottom Panel)



DM-RMC-SCALER-S/DM-RMC-SCALER-S2 Overall Dimensions (Front and Side Panels)

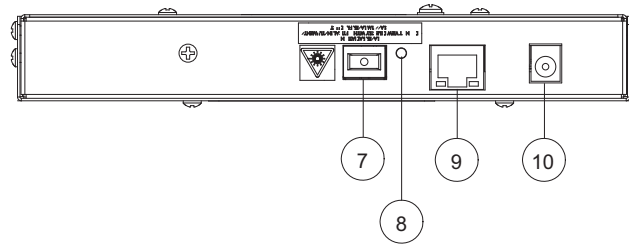


DM-RMC-SCALER-S/DM-RMC-SCALER-S2 Connectors, Controls & Indicators (Front Panel)

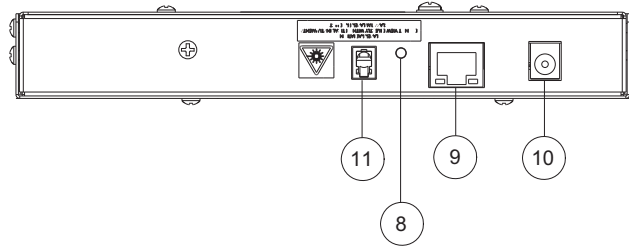


DM-RMC-SCALER-S/DM-RMC-SCALER-S2 Connectors, Controls & Indicators (Top Panel)

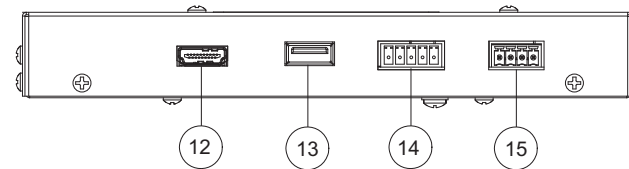
DM-RMC-SCALER-S



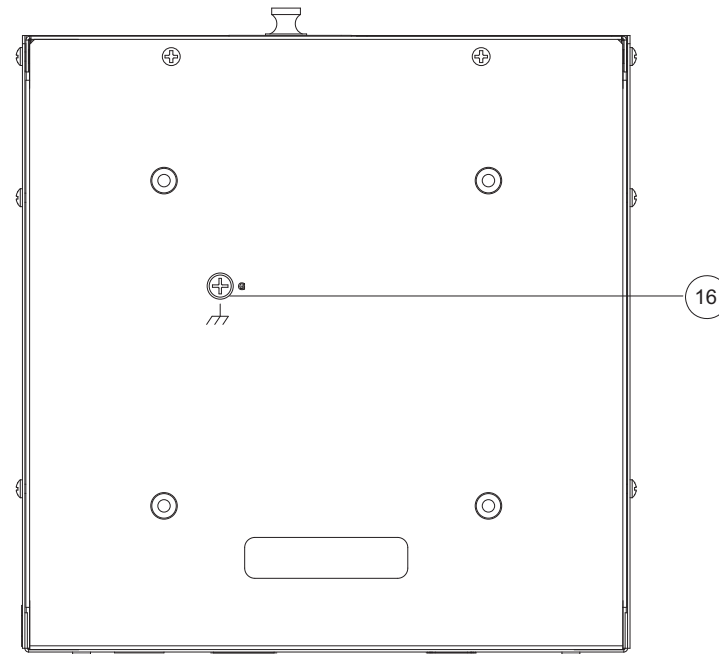
DM-RMC-SCALER-S2




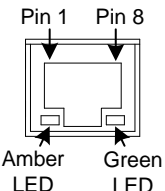



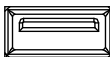
DM-RMC-SCALER-S/DM-RMC-SCALER-S2 Connectors, Controls & Indicators (Bottom Panel)



DM-RMC-SCALER-S/DM-RMC-SCALER-S2 Connectors, Controls & Indicators (Rear Panel)

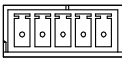




Connectors, Controls & Indicators

#	CONNECTORS ¹ , CONTROLS & INDICATORS	DESCRIPTION																				
1	PWR LED	(1) Green LED, indicates operating power supplied from local power pack																				
2	DM LINK LED	(1) Green LED, indicates DM link status																				
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	DM IN MMF/SC 	(DM-RMC-SCALER-S only) (1) SC female optical fiber connector; DM 8G fiber input; Connects to DM 8G fiber output of a DM switcher, transmitter, or other DM device (each sold separately) via CresFiber 8G fiber optic cable ²																				
8	DM IN LED	(1) Green LED, indicates DM link status																				
9	LAN Pin 1 Pin 8 	(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																				
		<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																			
10	24 V 0.75A MAX 	(1) 2.1 x 5.5 mm dc power connector; 24 volt dc power input; Power pack included																				
11	DM IN SMF/LC 	(DM-RMC-SCALER-S2 only) (1) LC female optical fiber connector; DM 8G single-mode fiber input; Connects to DM 8G SMF output of a DM switcher, transmitter, or other DM device via CresFiber 8G SM single-mode fiber optic cable ²																				
12	HDMI OUT 	(1) 19-pin Type A HDMI female; HDMI digital video/audio output; Supports DVI ³																				
13	USB HID 	(1) USB Type A female; USB 2.0 host port for connection of a mouse/keyboard or other USB HID-compliant device																				

(Continued on following page)

Connectors, Controls & Indicators (Continued)

#	CONNECTORS ¹ , CONTROLS & INDICATORS	DESCRIPTION
14	<p style="text-align: center;">COM</p> 	<p>(1) 5-pin 3.5 mm detachable terminal block, bidirectional RS-232 port; Up to 115.2k baud, hardware and software handshaking support</p>
15	<p style="text-align: center;">IR 1-2</p> 	<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 baud⁴</p>
16		<p>(1) 06-32 screw, chassis ground lug</p>

1. Interface connectors for the **COM** and **IR** ports are provided with the unit.
2. For DM 8G wiring, the maximum DigitalMedia 8G fiber cable length is 1000 feet (~300 meters) using CRESFIBER8G fiber optic cable, or 500 feet (~150 meters) using standard CRESFIBER, CRESFIBER-SINGLE-SC, or generic OM3 simplex multimode fiber optic cable. For DM 8G SMF wiring up to 7.5 miles (12 km) between devices, use Crestron CRESFIBER8G-SM or generic G.652.D (or better) single-mode fiber optic cable. Refer to the latest version of the Crestron DigitalMedia Design Guide (Doc. 4546) for complete system design guidelines. All wire and cables sold separately.
3. HDMI requires an appropriate adapter or interface cable to accommodate a DVI signal. CBL-HD-DVI interface cable sold separately.
4. Maximum string length for serial commands sent via the **IR** port should be no greater than 40 characters.

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 DigitalMedia 8G multimode fiber wiring, CresFiber 8G is recommended. Refer to the following table for the maximum transmission distance of CresFiber 8G and other fiber optic cable.

DigitalMedia 8G Multimode Fiber Wiring and Maximum Transmission Distance

CABLE TYPE	MAXIMUM TRANSMISSION DISTANCE
CresFiber 8G	1000 feet (~300 meters)
CresFiber	500 feet (~150 meters)
Generic OM3	500 feet (~150 meters)

- For DigitalMedia 8G single-mode fiber wiring, CresFiber 8G SM is recommended. The maximum transmission distance of CresFiber 8G SM or generic G.652.D (or better) single-mode fiber optic cable is 7.5 miles (12 km).

Refer to the latest version of the Crestron DigitalMedia Design Guide (Doc. 4546) for complete system design guidelines.

The DM receiver 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 latest version of the Crestron e-Control[®] Reference Guide (Doc. 6052), which is available from the Crestron Web site (www.crestron.com/manuals). For information specifically related to Ethernet connectivity using DigitalMedia devices, refer to the latest version of the Crestron IP Considerations Guide for the IT Professional (Doc. 4579), which is also available from the Crestron Web site (www.crestron.com/dmresources).

Identity Code

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

The IP ID is set within the IP table of the DM receiver using Crestron Toolbox™. For information on setting an IP table, refer to the Crestron Toolbox help file. The IP IDs of multiple DM receivers 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 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 receiver is listed in the following table.

Supplied Hardware for the DM-RMC-SCALER-S/DM-RMC-SCALER-S2

DESCRIPTION	PART NUMBER	QUANTITY
Mounting Bracket	2032709	1
Screws, 06-32 x 1/4", Pan, Phil	2007215	4
Screws, 06-32 x 3/4", Slot	2009211	4
Standoffs, 06-32 x 1-1/4"	2007056	4

Installation

Ventilation

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

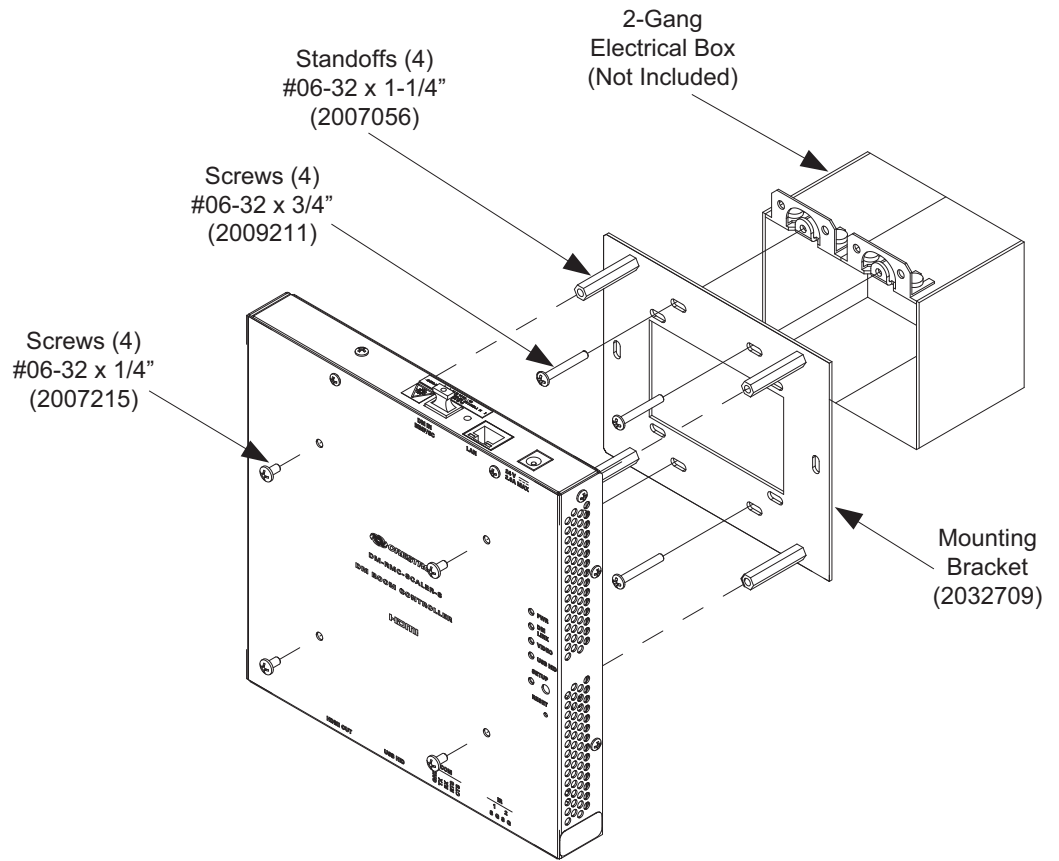
To prevent overheating, do not operate this product in an area that exceeds the environmental temperature range listed in the table of specifications.

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

1. Attach the four included 06-32 x 1-1/4" standoffs (2007056) to the studs of the included mounting bracket (2032709).
2. Using the four included 06-32 x 3/4" slot head screws (2009211), attach the included mounting bracket (2032709) to the electrical box.
3. Ground the DM receiver (refer to "Hardware Hookup," which starts on page 18 for information).
4. Using the four included 06-32 x 1/4" Phillips pan head screws (2007215), attach the DM receiver to the standoffs (2007056).

CAUTION: Excess wire that is pinched between the DM receiver 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 receiver.

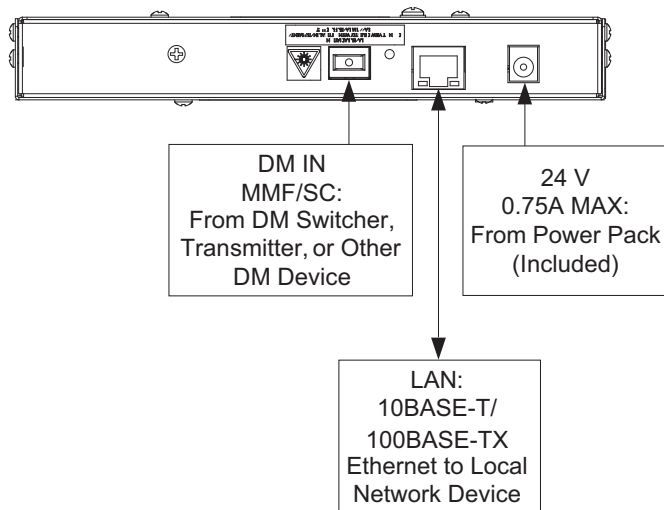
Mounting the DM-RMC-SCALER-S/DM-RMC-SCALER-S2



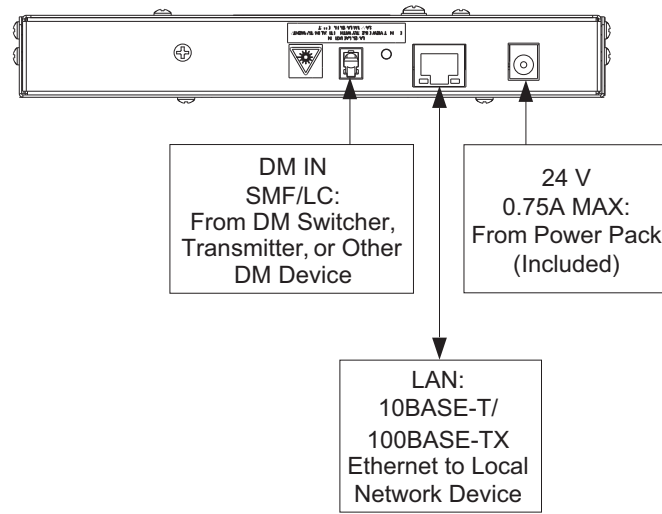
Hardware Hookup

Make the necessary connections as called out in the following illustrations. Refer to “Network Wiring” on page 16. Apply power after all connections have been made.

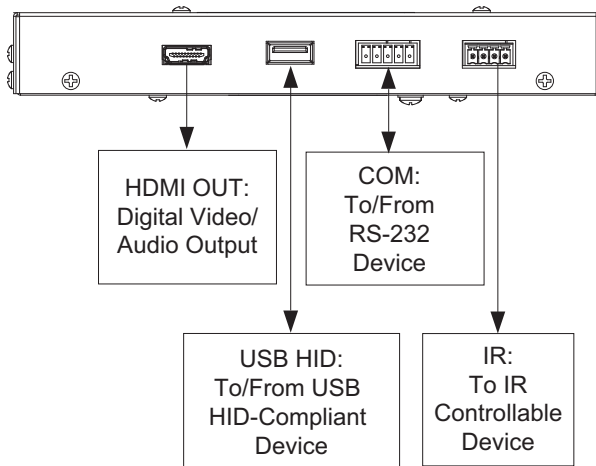
Hardware Connections for the DM-RMC-SCALER-S (Top Panel)

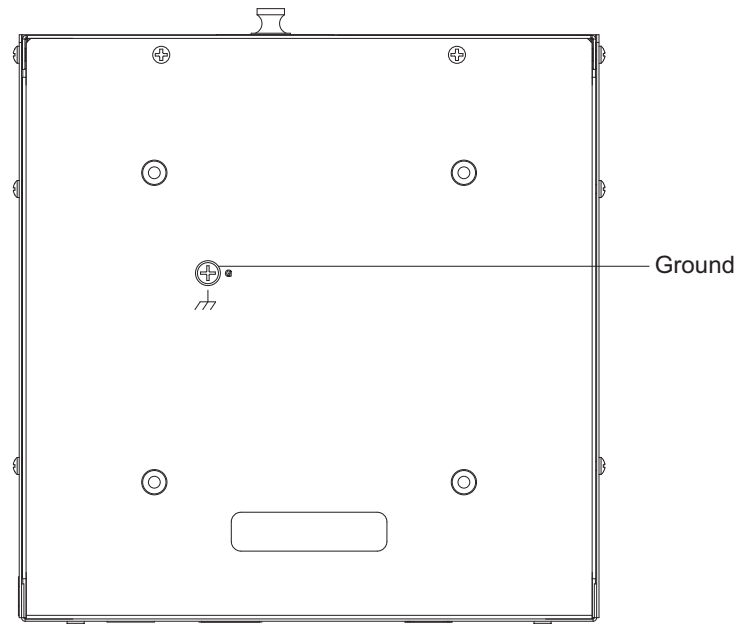


Hardware Connections for the DM-RMC-SCALER-S2 (Top Panel)



Hardware Connections for the DM-RMC-SCALER-S/DM-RMC-SCALER-S2 (Bottom Panel)



Hardware Connections for the DM-RMC-SCALER-S/DM-RMC-SCALER-S2 (Rear Panel)

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

NOTE: For optimum performance, Crestron recommends using CresFiber 8G fiber optic cable for the DM-RMC-SCALER-S and CresFiber 8G SM fiber optic cable for the DM-RMC-SCALER-S2.

NOTE: Fiber optic cable connectors and cable ends should be protected from contamination and scratching at all times. When cable is not connected, protect the optical receiver on the DM receiver by using the included cap. Fiber ends should be handled carefully and the cable should not be bent or coiled tightly.

Programming Software

Have a question or comment about Crestron software?

Answers to frequently asked questions (FAQs) can be viewed in the Online Help section of the Crestron Web site. To post a question or to view questions submitted to Crestron's True Blue Support, log in at www.crestron.com/onlinehelp. First-time users must establish a user account to fully benefit from all available features.

Software Requirements for the PC

NOTE: The latest software can be downloaded from the Crestron Web site (www.crestron.com/software).

Crestron provides an assortment of Windows[®]-based software tools to develop a customized system. Use Crestron SIMPL Windows to create a program to control the DM receiver.

Programming with SIMPL Windows

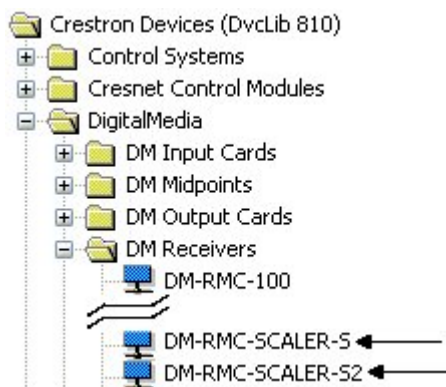
SIMPL Windows is Crestron's premier software for programming Crestron control systems. It is organized into two separate but equally important "Managers": Configuration and Program.

Configuration Manager

Configuration Manager is the view where programmers "build" a Crestron control system by selecting hardware from the *Device Library*.

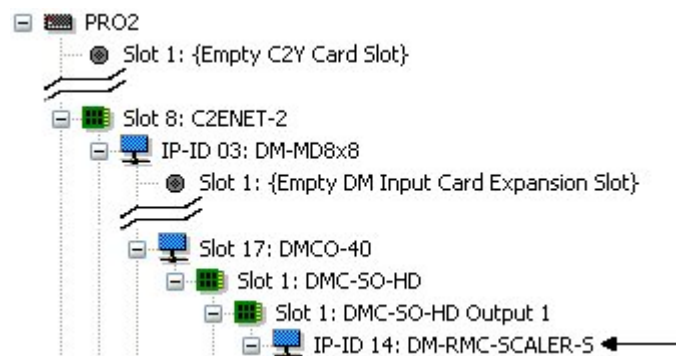
1. To incorporate the DM receiver into the system, drag the DM receiver from the DigitalMedia | DM Receivers folder of the *Device Library* and drop it into either of the following in *System Views*:
 - A compatible output card of a DM switcher
 - Directly to a card in the Ethernet slot of the control system (used without a DM switcher)

Locating the DM-RMC-SCALER-S/DM-RMC-SCALER-S2 in the Device Library

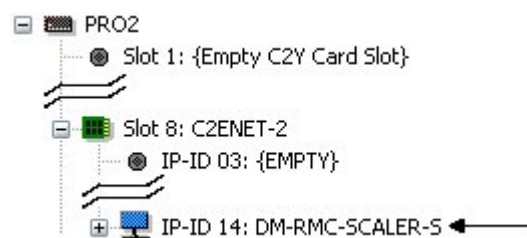


The system tree of the control system displays the DM receiver in the appropriate slot with a default IP ID as shown in the following illustrations. In the first example, the DM-RMC-SCALER-S is used with the DMCO-40 output card in a DM-MD8X8 switcher. In the second example, the DM-RMC-SCALER-S is used with the C2ENET-2 card in an Ethernet slot on the control system.

C2ENET-2 Device, Slot 8 (Using Output Card in a DM Switcher)

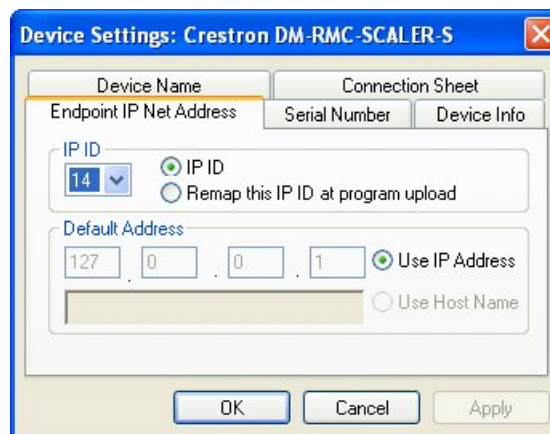


C2ENET-2 Device, Slot 8 (Using Ethernet Slot on Control System)



2. If additional DM receivers are to be added, repeat step 1 for each device. Each DM receiver is assigned a different IP ID.
3. If necessary, double-click a device to open the “Device Settings” window and change the IP ID as shown in the following illustration.

“Device Settings: Crestron DM-RMC-SCALER-S” Window



NOTE: The ID code specified in the SIMPL Windows program must match the IP ID of each unit. Refer to “Identity Code,” which starts on page 16.

Program Manager

Program Manager is the view where programmers “program” a Crestron control system by assigning signals to symbols.

The symbol can be viewed by double-clicking the icon or dragging it into *Detail View*. Each signal in the symbol is described in the SIMPL Windows help file (**F1**).

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.

Establishing Communication

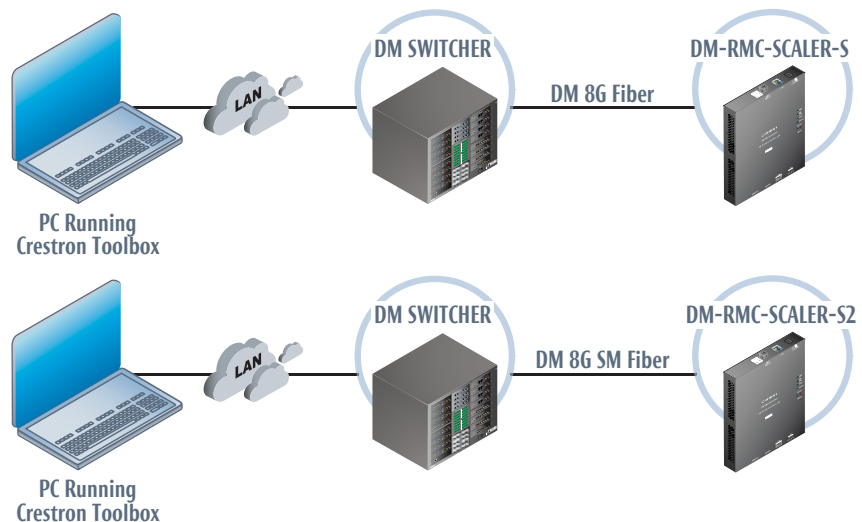
Use Crestron Toolbox for communicating with the DM receiver; refer to the Crestron Toolbox help file for details.

A PC running Crestron Toolbox communicates with the DM receiver 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 receiver using TCP/IP communication. In this scenario, the DM receiver is used in a standalone configuration (i.e., a DM switcher is not used).

Via DM Switcher

TCP/IP Communication via DM Switcher

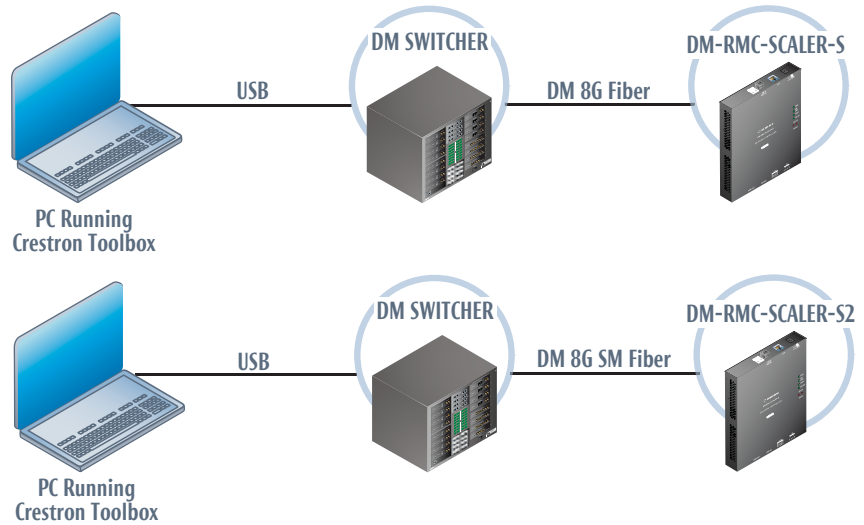


To establish TCP/IP communication between the PC and the DM receiver via the DM switcher:

1. Establish communication between the PC and the DM switcher as described in the latest version of the DigitalMedia Switchers Operations Guide (Doc. 6755).
2. Use the Device Discovery Tool in Crestron Toolbox to find the IP address of the DM receiver. 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 receiver using the *TCP* connection type, and enter the IP address of the DM receiver.
4. Display the “System Info” window of the DM receiver (click the **i** icon); communications are confirmed when the device information is displayed.

USB Communication via DM Switcher

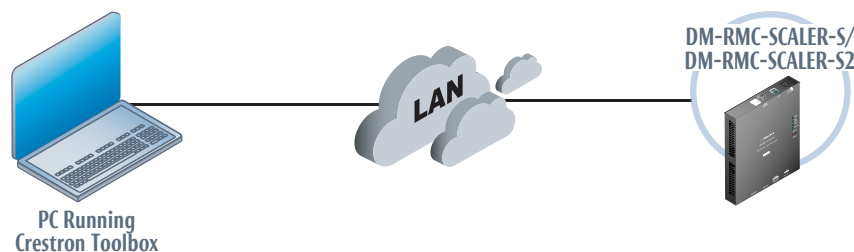


To establish USB communication between the PC and the DM switcher:

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* textbox, the unit’s serial number in the *Serial* textbox, or the unit’s hostname in the *Hostname* textbox. 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 “System Info” window (click the **i** icon); communications are confirmed when the device information is displayed.

Via LAN Port



TCP/IP Communication via LAN Port of DM-RMC-SCALER-S/DM-RMC-SCALER-S2



To establish TCP/IP communication between the PC and the DM receiver via the LAN port of the DM receiver:

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

NOTE: When the DM receiver is used in a standalone configuration (i.e., without a DM switcher), DHCP is enabled by default. If desired, a default IP address (192.168.1.249) 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 receiver using the *TCP* connection type, and enter the IP address of the DM receiver.
3. Display the “System Info” window of the DM receiver (click the  icon); 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 receiver 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 receiver so that it uses the IP address assigned in step 4a.
 - d. Display the “System Info” window of the DM receiver (click the  icon); 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 Web site as new features are developed after product releases. For details on upgrading, refer to the Crestron Toolbox help file.

Check the Crestron Web site to find the latest firmware. (New users may be required to register to obtain access to certain areas of the site, including the FTP site.)

To upgrade DM receiver firmware:

1. Do either of the following:
 - If the DM receiver 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 receiver is being used in a standalone configuration (not used with a DM switcher), use the Device Discovery Tool to find the IP address of the DM receiver.
2. Add the IP address found in step 1 to the Address Book in Toolbox.
3. Download the appropriate .puf file from the Crestron Web site 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 receiver is connected to a switcher) or the DM receiver (if the DM receiver 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 an upgrade to DM devices connected to the switcher.
- If the DM receiver was selected, a DM device list is displayed that allows an upgrade to the DM receiver 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 receiver is used in a standalone configuration (i.e., not connected to a DM switcher), use Crestron Toolbox to create the IP table entry of the DM receiver.

NOTE: If the DM receiver is connected to a DM switcher, the IP table entry of the DM receiver is created automatically.

1. Use the Device Discovery Tool to find the IP address of the DM receiver. Then, display the “System Info” window (click the  icon) and select the DM receiver entry from the Address Book.
2. Select **Functions | IP Table Setup**.
3. Add, modify or delete entries in the IP table. The DM receiver 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-S/DM-RMC-SCALER-S2 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 328 feet (100 meters).
	10BASE-T/100BASE-TX compatible device is not receiving power.	Apply power to the network device.
Loss of functionality due to electrostatic discharge.	Improper grounding.	Check that all ground connections have been made properly.

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

Reference Documents

The latest version of all documents mentioned within the guide can be obtained from the Crestron Web site.

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

To post a question about Crestron products, log onto the Online Help section of the Crestron Web site (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-S/DM-RMC-SCALER-S2, 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 Web site 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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