Crestron **DM-RMC-200-C**
DigitalMedia 8G+™ Receiver
& Room Controller 200
Operations & Installation Guide

CRESTRON®

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

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Regulatory Compliance

As of the date of manufacture, the DM-RMC-200-C has 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 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

This Class B digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

Contents

DigitalMedia 8G+™ Receiver & Room Controller 200: DM-RMC-200-C

Introduction

The DM-RMC-200-C 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+™ receiver, video scaler, audio amplifier, and expanded control interface, providing a single HDMI® output along with speaker and line level audio, Ethernet, and a variety of control ports. Built-in scaling allows the connected display to handle virtually any video signal regardless of resolution and format. Its compact, low-profile design allows the DM-RMC-200-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

- Enhanced DigitalMedia 8G+™ receiver and display controller
- Includes built-in 30 Watt stereo amplifier
- Provides one HDMI or DVI display output[2]
- 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
- Allows motion-adaptive de-interlacing or interlacing
- Allows adjustable overscan or underscan up to 7.5%

(Continued on following page)

1. For DM 8G+ wiring up to 330 feet (100 meters) between devices, use Crestron DM-CBL-8G DigitalMedia 8G cable, Crestron DM-CBL DigitalMedia cable, Crestron DM-CBL-D DigitalMedia D cable, or generic CAT5e (or better) UTP or STP. Shielded cable and connectors are recommended to safeguard against unpredictable environmental electrical noise which may impact performance at resolutions above 1080p. Refer to the latest version of the Crestron DigitalMedia Infrastructure Guide (Doc. 4556) for complete wiring guidelines and to the Crestron DigitalMedia Design Guide (Doc. 4789) for complete system design guidelines. The manuals are available from the Crestron Web site at www.crestron.com/dmresources. All cable 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)

- Provides automatic 3D-to-2D signal conversion[1]
- Automatically passes 3D video without scaling to 3D capable displays[1]
- Includes content-adaptive noise reduction
- 100% HDCP compliant
- Scalable zoom feature enables 2x2, 3x2, 3x3, 4x3, or 4x4 video wall capability[2]
- Provides analog line and speaker level audio outputs
- DM 8G+ input supports up to 330 foot (100 meter) cable length[3]
- Affords a true one-wire connection to a DM® switcher or transmitter
- Enables device control via CEC, RS-232, IR, or Ethernet
- Provides two relay control ports and two contact sensing inputs
- Provides 10BASE-T/100BASE-TX Ethernet and USB HID (Human Interface Device) mouse/keyboard ports
- Low-profile design mounts to a 2-gang US, UK, or European electrical box
- Includes mounting bracket with integral power pack holder
- Allows quick, easy setup and diagnostics via Crestron Toolbox™ software

DigitalMedia 8G+

DigitalMedia 8G+ provides a true one-wire transport for moving high-definition video, audio, and Ethernet over low-cost twisted pair cable without compression or repeaters. One eight-conductor twisted pair cable (sold separately) is required, supporting distances up to 330 feet (100 meters) using Crestron DM 8G cable or CAT5e.[3]

Multimedia Display Interface

A single HDMI digital AV output port is provided on the DM-RMC-200-C, supporting HDMI with HDCP, Deep Color and 3D[1], handling 1080p60 HDTV with multi-channel HD lossless audio as well as WUXGA computer resolutions—all through a single connection. The HDMI output can also handle DVI signals using an appropriate adapter or interface cable.[4]

Stereo audio outputs are also provided for directly driving a pair of speakers, or for connection to line inputs on the display or a separate amplifier or AV receiver. In addition, RS-232, IR, relay, closure sensing, and Ethernet control ports are provided for controlling the display device and for interfacing with other equipment.

1. Automatically passes 3D video if display device supports it (reverts to pass-through mode without scaling). Provides automatic 3D-to-2D conversion if display device does not support 3D.
2. Video wall processing requires a separate DM-RMC-200-C for each individual display.
3. For DM 8G+ wiring up to 330 feet (100 meters) between devices, use Crestron DM-CBL-8G DigitalMedia 8G cable, Crestron DM-CBL DigitalMedia cable, Crestron DM-CBL-D DigitalMedia D cable, or generic CAT5e (or better) UTP or STP. Shielded cable and connectors are recommended to safeguard against unpredictable environmental electrical noise which may impact performance at resolutions above 1080p. Refer to the latest version of the Crestron DigitalMedia Infrastructure Guide (Doc. 4556) for complete wiring guidelines and to the Crestron DigitalMedia Design Guide (Doc. 4789) for complete system design guidelines. All cable sold separately.
4. HDMI requires an appropriate adapter or interface cable to accommodate a DVI signal. CBL-HD-DVI interface cable sold separately.

A single cable connects the DM-RMC-200-C to a DM® switcher or transmitter (each sold separately), transporting video, audio, control, and networking signals through one RJ-45 connection.[1] Multiple DM-RMC-200-Cs may be installed to handle each display in a multi-room distribution system, all fed from a central DM switcher. Or, a single DM-RMC-200-C can be fed straight from a DM 8G+ 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 delivers the most flexible and user-friendly solution for routing multiple disparate sources to many different display devices. Employing DM receivers with built-in scaling, DM allows an independent high-performance scaler to be installed at every display device, ensuring an optimal image on every screen. Distributed scaling allows a high-definition 3D or high-resolution computer source to be viewed on lower resolution 2D displays without compromising the original signal.

The DM-RMC-200-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 your 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.[2, 3]

Video Wall Processing

The DM-RMC-200-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 2x2, 3x2, 3x3, 4x3, or 4x4 are supported, and all that is required is a separate DM-RMC-200-C for each display, and a DM switcher with sufficient DM 8G+ outputs.

Audio Amplifier

The DM-RMC-200-C is equipped with stereo analog audio outputs, and a built-in 30 Watt stereo amplifier. The output volume is adjustable via a control system using a keypad, touch screen, or handheld remote. The amplifier provides plenty of power to drive a pair of local speakers, or use the line output to connect directly to an input on the display device, a pair of amplified speakers, or a local AV receiver, amplifier, or sound system.

1. For DM 8G+ wiring up to 330 feet (100 meters) between devices, use Crestron DM-CBL-8G DigitalMedia 8G cable, Crestron DM-CBL DigitalMedia cable, Crestron DM-CBL-D DigitalMedia D cable, or generic CAT5e (or better) UTP or STP. Shielded cable and connectors are recommended to safeguard against unpredictable environmental electrical noise which may impact performance at resolutions above 1080p. Refer to the latest version of the Crestron DigitalMedia Infrastructure Guide (Doc. 4556) for complete wiring guidelines and to the Crestron DigitalMedia Design Guide (Doc. 4789) for complete system design guidelines. All cable sold separately.
2. Automatically passes 3D video if display device supports it (reverts to pass-through mode without scaling). Provides automatic 3D-to-2D conversion if display device does not support 3D.
3. 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.

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-200-C includes a 10BASE-T/100BASE-TX Ethernet port, providing a convenient LAN connection for a local network device.

Keyboard/Mouse Extender

The DM-RMC-200-C 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-RMC-200-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 these conventional control methods by harnessing the CEC (Consumer Electronics Control) signal embedded in HDMI. Through its connection to the control system, the DM-RMC-200-C provides a gateway for controlling the display device right through the HDMI connection, potentially eliminating the need for any dedicated control wires or IR probes.

Two low-voltage relay ports are also included on the DM-RMC-200-C for control of a projection screen or lift. In addition, there are two discrete digital input ports to accommodate room occupancy sensors, power sensors, or contact closures for enhanced automation and monitoring.

Low-Profile Installation

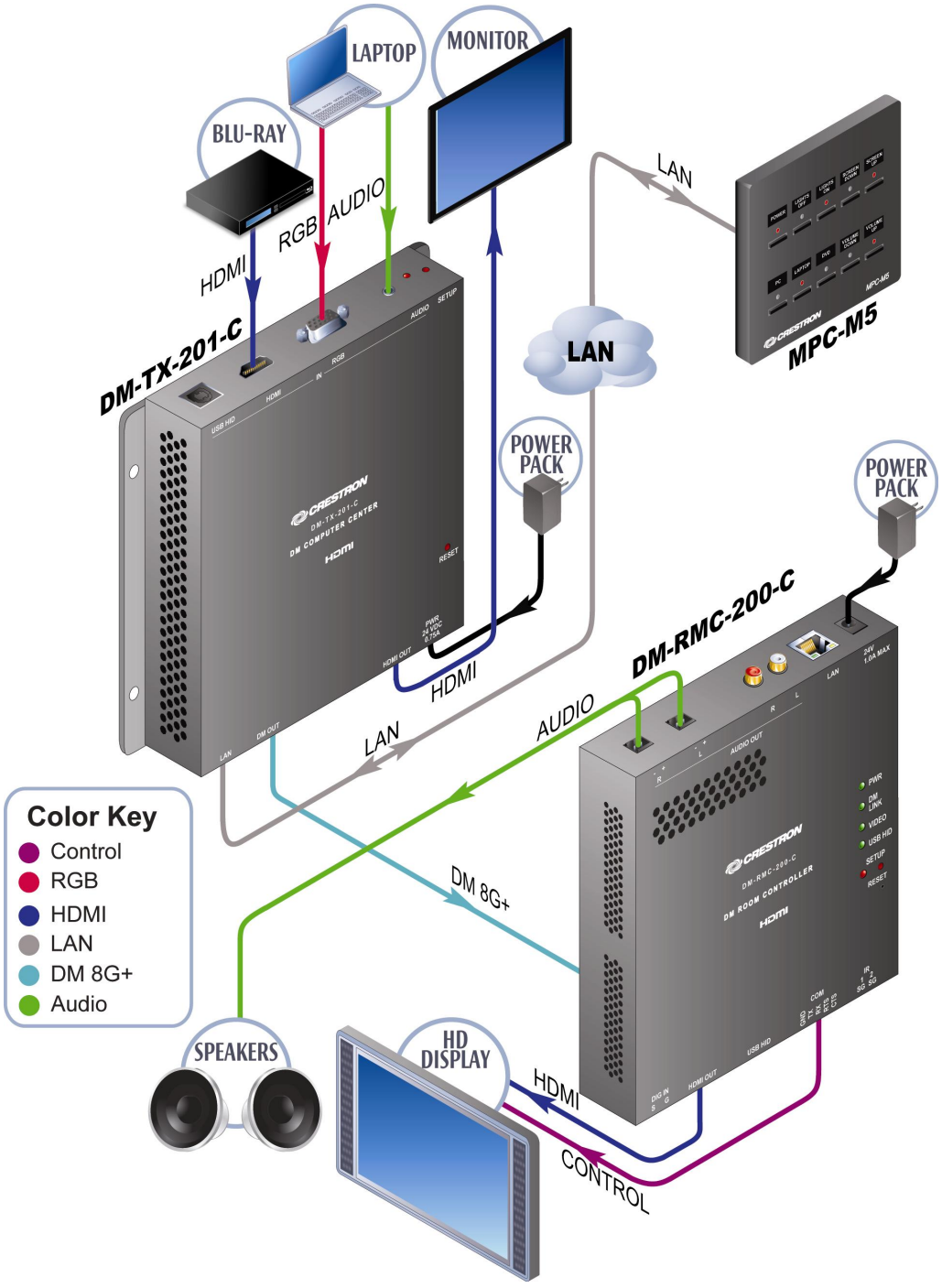
Its low-profile design makes the DM-RMC-200-C perfect for installation behind a flat-panel display or above a ceiling-mounted projector. It mounts to a standard 2-gang US, UK, or European electrical box using the mounting bracket provided. The bracket includes a convenient holder for the external power pack, providing for a clean installation that protrudes only 1.6 inches (~41 mm) from the mounting surface.

Connections for the display device are all positioned along the top and bottom of the unit for a clean, serviceable installation. The DigitalMedia and relay connections are provided on the rear panel within the electrical box. Speakers may be connected to either the top panel or the rear. One of the digital input control ports is located on the rear panel, with the other provided on the bottom. An array of indicators is provided on the front of the DM-RMC-200-C for easy setup and troubleshooting.

Applications

The diagram below shows a DM-RMC-200-C in a standalone application. In this application, the DM-RMC-200-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-200-C in a Standalone Application



Specifications

Specifications for the DM-RMC-200-C are listed in the following table.

DM-RMC-200-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 (2x2, 3x2, 3x3, 4x3, or 4x4)[3]
Input Signal Type	DM 8G+ (DigitalMedia over one CAT5e twisted pair copper wire)[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

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DM-RMC-200-C Specifications (Continued)

SPECIFICATION	DETAILS
Video	
Input Resolutions (Continued)	
Interlaced	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
Scaler Output 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 1024 x 768 @ 60 Hz[6] 1280 x 720 @ 50 Hz (720p50) 1280 x 720 @ 60 Hz (720p60) 1280 x 768 @ 60 Hz 1280 x 800 @ 60 Hz[6] 1280 x 960 @ 60 Hz 1280 x 1024 @ 60Hz 1360 x 768 @ 60 Hz 1366 x 768 @ 60 Hz[6] 1400 x 1050 @ 60 Hz[6] 1440 x 900 @ 60 Hz[6] 1600 x 900 @ 60 Hz[7] 1600 x 1200 @ 60 Hz 1680 x 1050 @ 60 Hz[6] 1920 x 1080 @ 50 Hz (1080p50) 1920 x 1080 @ 60 Hz (1080p60) 1920 x 1200 @ 60 Hz[7]
Interlaced	720 x 480 @ 30 Hz (480i) 720 x 576 @ 25 Hz (576i) 1920 x 1080 @ 25 Hz (1080i25) 1920 x 1080 @ 30 Hz (1080i30)
Pass-Thru Output Resolutions	Matched to input
Audio	
Input Signal Type	DM 8G+
Output Signal Types	HDMI, analog stereo (speaker and line level)
Formats	
HDMI	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
Analog	Stereo 2-Channel
Digital-to-Analog Conversion	24-bit 48 kHz

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DM-RMC-200-C Specifications (Continued)

SPECIFICATION	DETAILS
Audio (Continued)	
Performance (Analog)	
Amplifier Output Power[8]	15 Watts per channel at 8 Ohms
Frequency Response	20 Hz to 20 kHz ±0.5 dB (line), 20 Hz to 16 kHz ±3 dB (speaker)
S/N Ratio	>95 dB (line), >75 dB (speaker) 20 Hz to 20 kHz A-weighted
THD+N	<0.005% @ 1 kHz (line), <0.3% @ 1 kHz (speaker)
Stereo Separation	>90 dB (line), >60 dB (speaker)
Volume Gain Range (Analog)	-80 dB to 0 dB
Communications	
DigitalMedia	DM 8G+, HDCP management, EDID format management, CEC
Ethernet	10BASE-T/100BASE-TX, auto-switching, auto-negotiating, auto-discovery, full/half duplex, TCP/IP, UDP/IP, CIP, DHCP, RSTP
USB	Supports USB HID class devices
Power Requirements	
Power Pack	2 Amps @ 24 Volts DC; 100-240 Volts AC, 50/60 Hz power pack included
Minimum 2-Series Control System Update File[9, 10]	Version 4.003.0015 or later
Environmental	
Temperature	32º to 104º F (0º to 40º C)
Humidity	10% to 90% RH (non-condensing)
Heat Dissipation	Power amp off: 50 BTU/Hr; Power amp on: 60 BTU/Hr (typical), 165 BTU/Hr (maximum)
Enclosure	
Chassis	Metal, black finish, vented sides and front
Mounting	Mounts to a 2-gang electrical box, 2-gang UK (BS 4662) electrical box, or 2-gang European (DIN 49073) electrical box; Bracket includes holder for the included power pack
Dimensions	
Height	7.92 in (202 mm)
Width	10.84 in (276 mm) including bracket
Depth	1.85 in (47 mm) including bracket
Weight	3.3 lb (1.5 kg) including bracket and power pack
Included Accessory	Universal 24 Volt DC Power Pack

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DM-RMC-200-C Specifications (Continued)

SPECIFICATION	DETAILS
Available Accessories	
CBL-HD	Crestron Certified HDMI Interface Cable
CBL-HD-DVI	Crestron Certified HDMI to DVI Interface Cable
CBL-RCA2	Crestron® Certified RCA Stereo Audio Interface Cable
CBL-SPK-P-35	Speaker Cable, 16 AWG, Plenum, 35 ft
CNSP-XX	Custom Serial Interface Cable
DM-CBL-8G	DigitalMedia 8G Cable
DM-8G-CONN-100	DigitalMedia 8G Cable Connectors
Excite™ Series	In-Wall and In-Ceiling Speakers
FS6	6.5" 2-Way Surface Mount Speakers, Pair
FSDI8	8" Drop-in Ceiling Speakers, Pair
IRP2	IR Emitter Probe
MP-WP100	Media Presentation Wall Plate – RCA Stereo Audio
MP-WP140	Media Presentation Wall Plate – DVI with Mini-TRS Stereo Audio
MP-WP152	Media Presentation Wall Plate – HDMI
MP-WP181-C	Media Presentation Wall Plate – DigitalMedia 8G+
MPI-WP100	Media Presentation Wall Plate – International Version – RCA Stereo Audio
MPI-WP150	Media Presentation Wall Plate – International Version – HDMI
MPI-WP181-C	Media Presentation Wall Plate – International Version – DigitalMedia 8G+

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 if display device does not support 3D.
3. Video wall processing requires a separate DM-RMC-200-C for each individual display.
4. For DM 8G+ wiring up to 330 feet (100 meters) between devices, use Crestron DM-CBL-8G DigitalMedia 8G cable, Crestron DM-CBL DigitalMedia cable, Crestron DM-CBL-D DigitalMedia D cable, or generic CAT5e (or better) UTP or STP. Shielded cable and connectors are recommended to safeguard against unpredictable environmental electrical noise which may impact performance at resolutions above 1080p. Refer to the latest version of the Crestron DigitalMedia Infrastructure Guide (Doc. 4556) for complete wiring guidelines and to the Crestron DigitalMedia Design Guide (Doc. 4789) for complete system design guidelines.
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. Using the DMTool in Crestron Toolbox, the amplifier can be enabled/disabled.
9. The latest software versions can be obtained from the Crestron Web site. Refer to the NOTE following these footnotes.
10. 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 (CAIP) only. New users may be required to register to obtain access to certain areas of the site (including the FTP site).

Physical Description

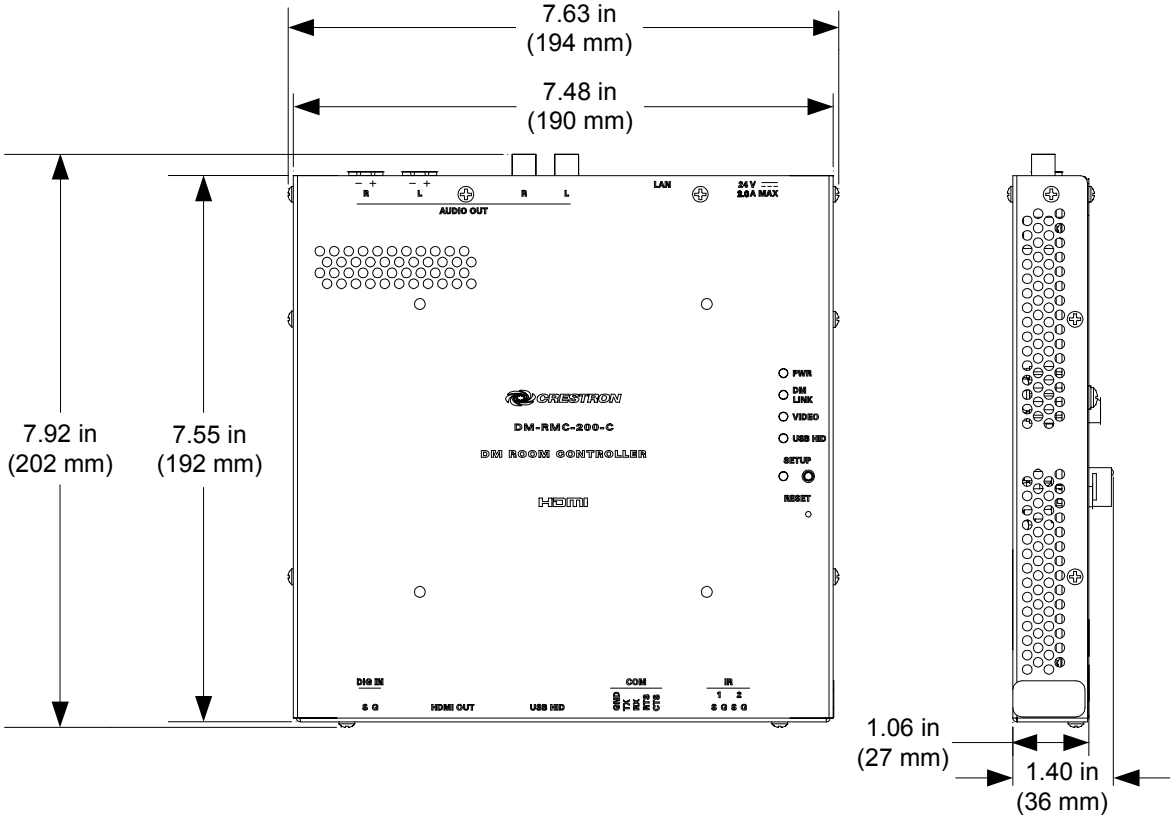
This section provides information on the connections, controls and indicators available on your DM-RMC-200-C.

DM-RMC-200-C Physical View (Front Panel View)

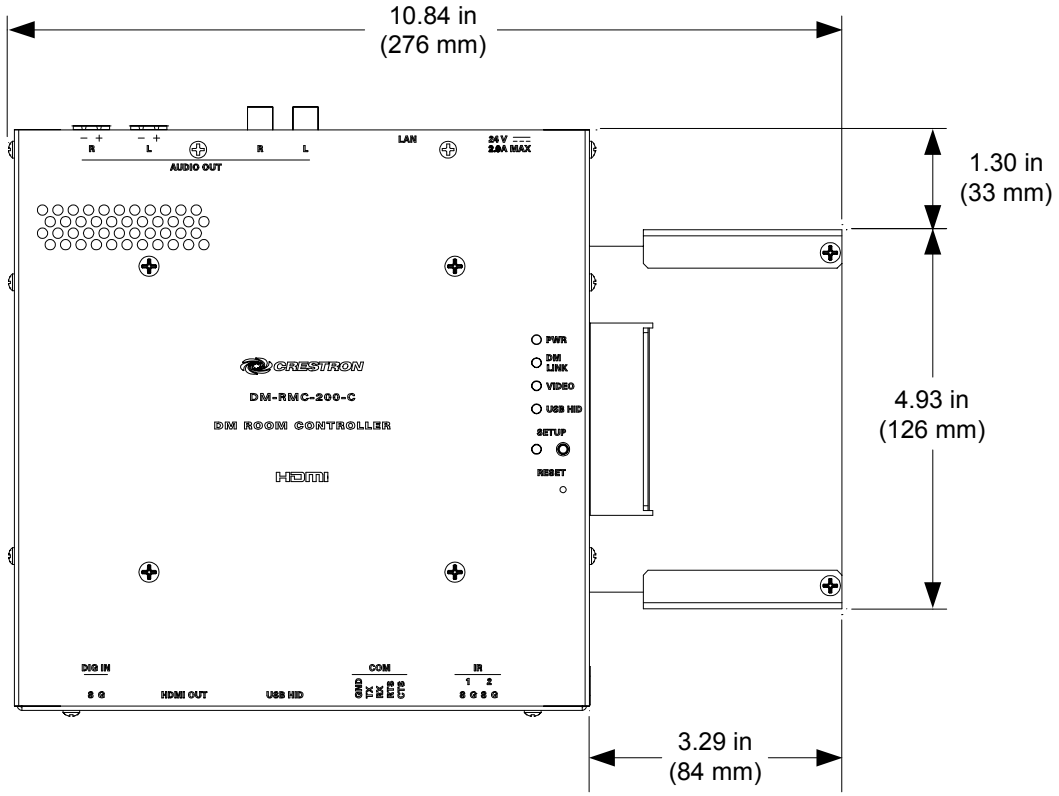
DM-RMC-200-C Physical Views (Top Panel View)

DM-RMC-200-C Physical Views (Bottom and Rear Panel View)

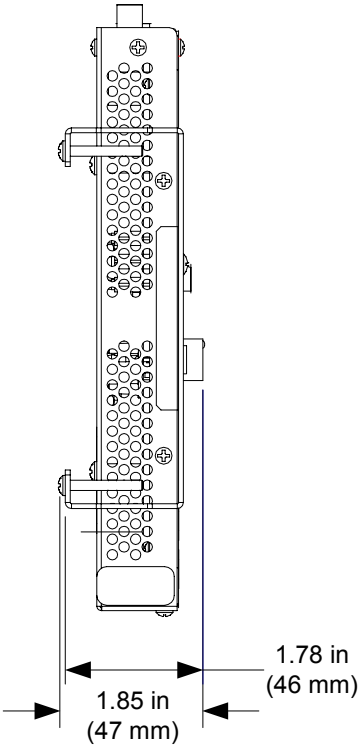
DM-RMC-200-C Overall Dimensions (Front and Side Panel Views without Mounting Bracket Installed)



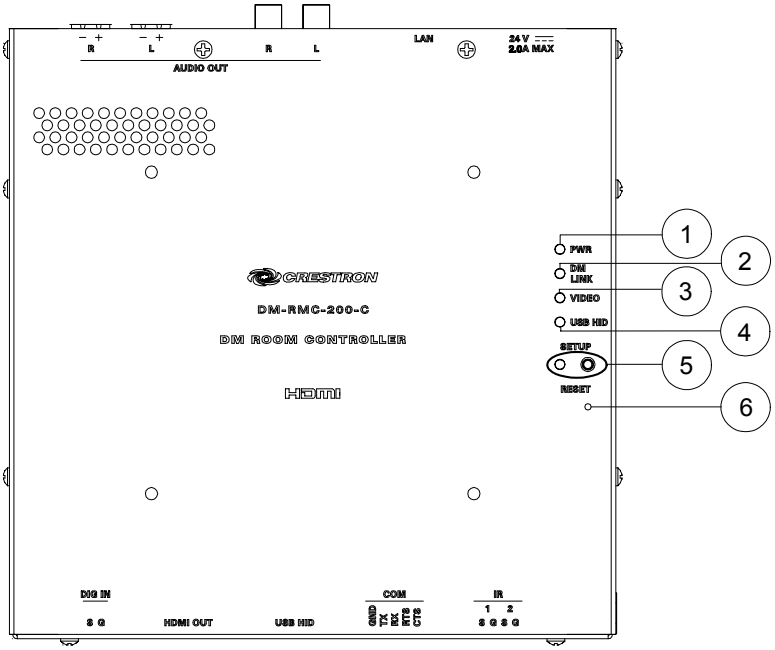
DM-RMC-200-C Overall Dimensions (Front Panel View with Mounting Bracket Installed)



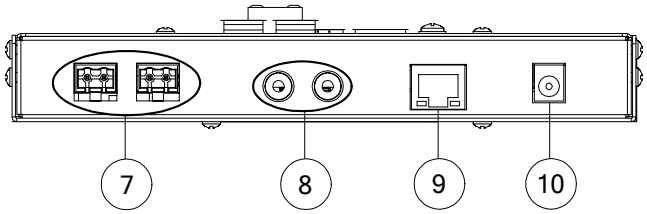
DM-RMC-200-C Overall Dimensions (Side Panel View with Mounting Bracket Installed)



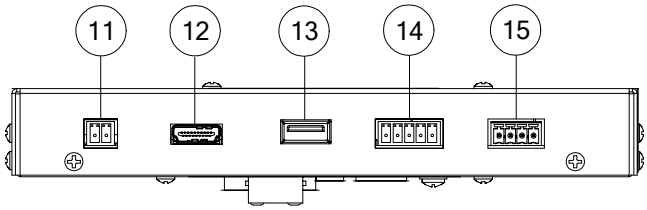
DM-RMC-200-C Connectors, Controls & Indicators (Front Panel View)



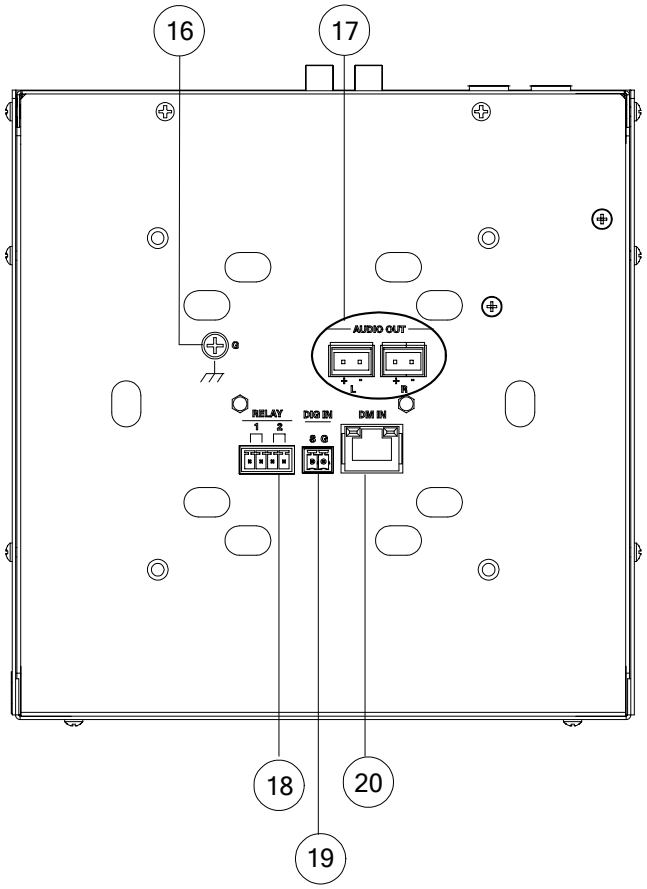
DM-RMC-200-C Connectors, Controls & Indicators (Top Panel View)



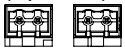
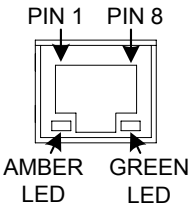
DM-RMC-200-C Connectors, Controls & Indicators (Bottom Panel View)



DM-RMC-200-C Connectors, Controls & Indicators (Rear Panel View)



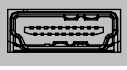
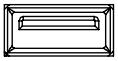
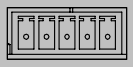
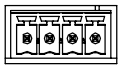
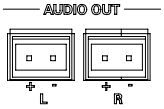
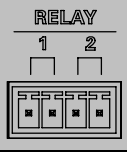
Connectors, Controls & Indicators

#	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 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	AUDIO OUT R, L (Speaker)[2] 	(2) 2-pin 5 mm detachable terminal blocks; Left and Right speaker-level audio outputs; Paralleled with rear panel **AUDIO OUT** connectors; Wire Size: Connector accepts 12 AWG maximum; Output Power: 15 Watts per channel at 8 Ohms
8	AUDIO OUT R, L (Line) 	(2) RCA female; Stereo unbalanced line-level audio output; Output Impedance: 100 Ohms nominal; Maximum Output Level: 2 V_{rms}
9	LAN[3] 	(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
10	24 V 2.0A MAX 	(1) 2.1 mm barrel DC power jack; 24 Volt DC power input; Power pack included

PIN	SIGNAL	PIN	SIGNAL
1	TX +	5	N/C
2	TX -	6	RX -
3	RX +	7	N/C
4	N/C	8	N/C

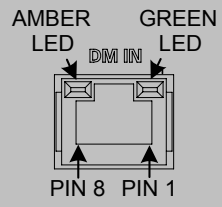
(Continued on following page)

Connectors, Controls & Indicators (Continued)

#	CONNECTORS[1], CONTROLS & INDICATORS	DESCRIPTION
11	DIG IN 	(1) 2-pin 3.5 mm detachable terminal block; Digital/contact closure sensing input; Rated for 0-24 Volts DC, referenced to GND; Input Impedance: 2.2k Ohms pulled up to 5 Volts DC; Logic Threshold: 2.5 Volts DC nominal with 1 Volt hysteresis band
12	HDMI OUT 	(1) 19-pin Type A HDMI female; HDMI digital video/audio output; Also supports DVI[4]
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
14	COM 	(1) 5-pin 3.5 mm detachable terminal block, bidirectional RS-232 port; Up to 115.2k baud, hardware and software handshaking support
15	IR 1-2 	(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[5]
16		(1) 6-32 screw, chassis ground lug
17	AUDIO OUT L, R (Speaker)[2] 	(2) 2-pin 5 mm detachable terminal blocks; Left and Right speaker-level audio outputs; Paralleled with top panel **AUDIO OUT** (Speaker) connectors; Wire Size: Connector accepts 12 AWG maximum; Output Power: 15 Watts per channel at 8 Ohms
18	RELAY 1-2 	(1) 4-pin 3.5 mm detachable terminal block comprising two normally open, isolated relays; Rated 1 Amp, 30 Volts AC/DC; MOV arc suppression across contacts

(Continued on following page)

Connectors, Controls & Indicators (Continued)

#	CONNECTORS[1], CONTROLS & INDICATORS	DESCRIPTION
19	DIG IN DIG IN S G 	(1) 2-pin 3.5 mm detachable terminal block; Digital/contact closure sensing input; Rated for 0-24 Volts DC, referenced to GND; Input Impedance: 2.2k Ohms pulled up to 5 Volts DC; Logic Threshold: 2.5 Volts DC nominal with 1 Volt hysteresis band
20	DM IN[6] 	(1) 8-pin RJ-45 female, shielded, with two LED indicators; DM 8G+ input; Connects to DM 8G+ output of a DM switcher, transmitter, or other DM device via CAT5e or Crestron DM-CBL-8G cable[7]; Green LED indicates DM link status; Solid amber LED indicates HDCP video; Blinking amber LED indicates non-HDCP video

1. Interface connectors for the **AUDIO OUT (Speaker)**, **DIG IN**, **COM, IR,** and **RELAY** ports are provided with the unit.
2. The set of speaker-level audio outputs on the top panel and the set of speaker-level audio outputs on the rear panel cannot be used simultaneously. Either set of speaker-level audio outputs should be used at one time.
3. To determine which is pin 1 on the cable, hold the cable so that the end of the eight pin modular plug is facing away from you, with the clip down and copper side up. Pin 1 is on the far left.
4. HDMI requires an appropriate adapter or interface cable to accommodate a DVI signal. CBL-HD-DVI interface cable sold separately.
5. Maximum string length for serial commands sent via the **IR** port should be no greater than 40 characters.
6. 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

7. For DM 8G+ wiring up to 330 feet (100 meters) between devices, use Crestron DM-CBL-8G DigitalMedia 8G cable, Crestron DM-CBL DigitalMedia cable, Crestron DM-CBL-D DigitalMedia D cable, or generic CAT5e (or better) UTP or STP. Shielded cable and connectors are recommended to safeguard against unpredictable environmental electrical noise which may impact performance at resolutions above 1080p. Refer to the latest version of the Crestron DigitalMedia Infrastructure Guide (Doc. 4556) for complete wiring guidelines and to the Crestron DigitalMedia Design Guide (Doc. 4789) for complete system design guidelines. All cable 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+ wiring up to 330 feet (100 meters) between devices, use Crestron DM-CBL-8G DigitalMedia 8G cable, Crestron DM-CBL DigitalMedia cable, Crestron DM-CBL-D DigitalMedia D cable, or generic CAT5e (or better) UTP or STP. Shielded cable and connectors are recommended to safeguard against unpredictable environmental electrical noise which may impact performance at resolutions above 1080p. Refer to the latest version of the Crestron DigitalMedia Infrastructure Guide (Doc. 4556) for complete wiring guidelines and to the Crestron DigitalMedia Design Guide (Doc. 4789) for complete system design guidelines. The manuals are available from the Crestron Web site at www.crestron.com/dmresources.

The DM-RMC-200-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 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-RMC-200-C is assigned automatically and does not require additional programming when the DM-RMC-200-C is dropped onto an output card of a DM switcher. Use the information below when the DM-RMC-200-C 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 DM-RMC-200-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-200-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 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-200-C is listed in the following table.

Supplied Hardware for the DM-RMC-200-C

DESCRIPTION	PART NUMBER	QUANTITY
Mounting Bracket	2029286	1
Screws, 6-32 x 1", Pan, Phil	2007250	6
Screws, 6-32 x 3/4", Slot	2009211	4
Tie Wraps	2013608	2

Installation

Ventilation

The DM-RMC-200-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.

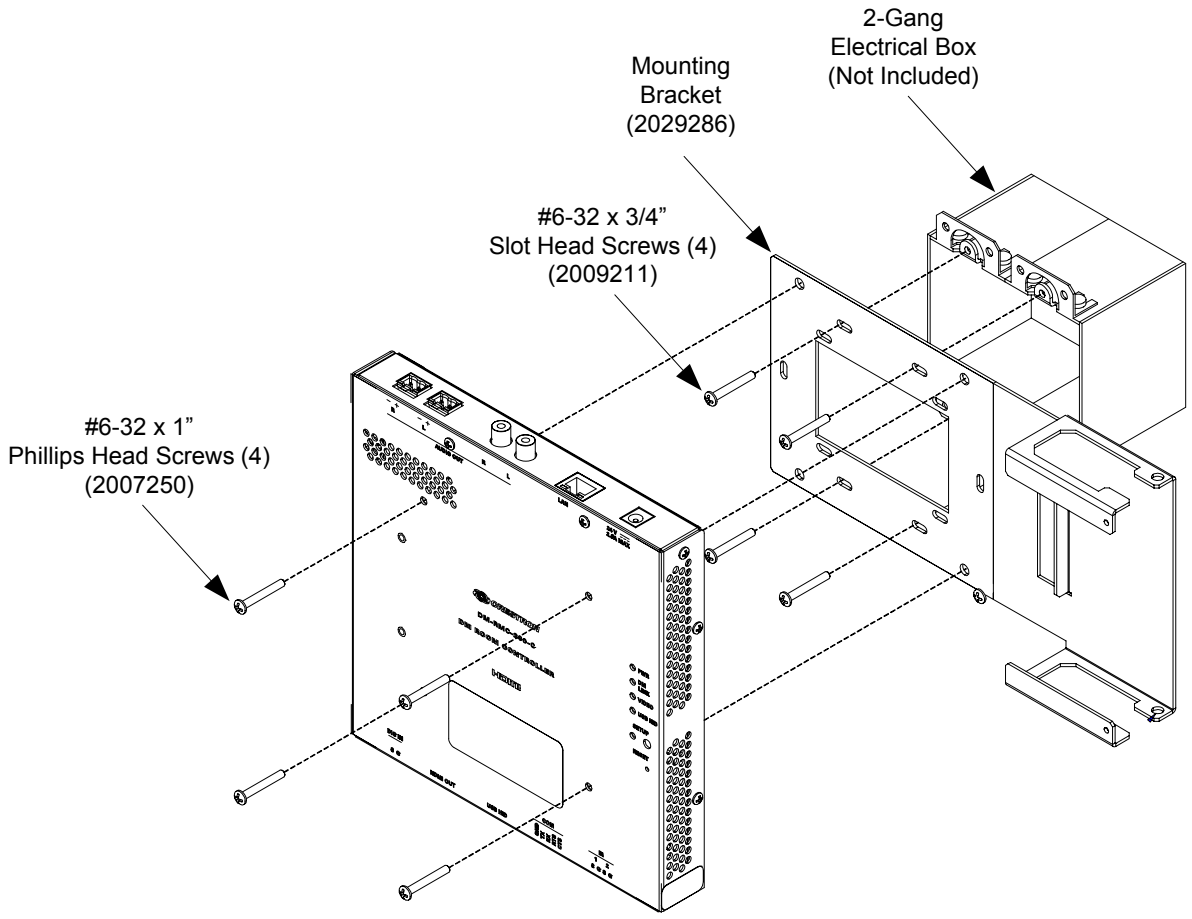
Mounting the DM-RMC-200-C

The DM-RMC-200-C mounts to a 2-gang electrical box (not included). To mount the DM-RMC-200-C, perform the following steps (refer to the illustration on the following page):

1. Using the four included 6-32 x 3/4" slot head screws (2009211), attach the included mounting bracket to the electrical box.
2. Ground the DM-RMC-200-C and attach the proper cables to the rear of the unit (refer to "Hardware Hookup" on page 21 for information).
3. Using four of the included 6-32 x 1" Phillips head screws (2007250), attach the DM-RMC-200-C to the mounting bracket.

CAUTION: Excess wire that is pinched between the DM-RMC-200-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-200-C.

Mounting the DM-RMC-200-C

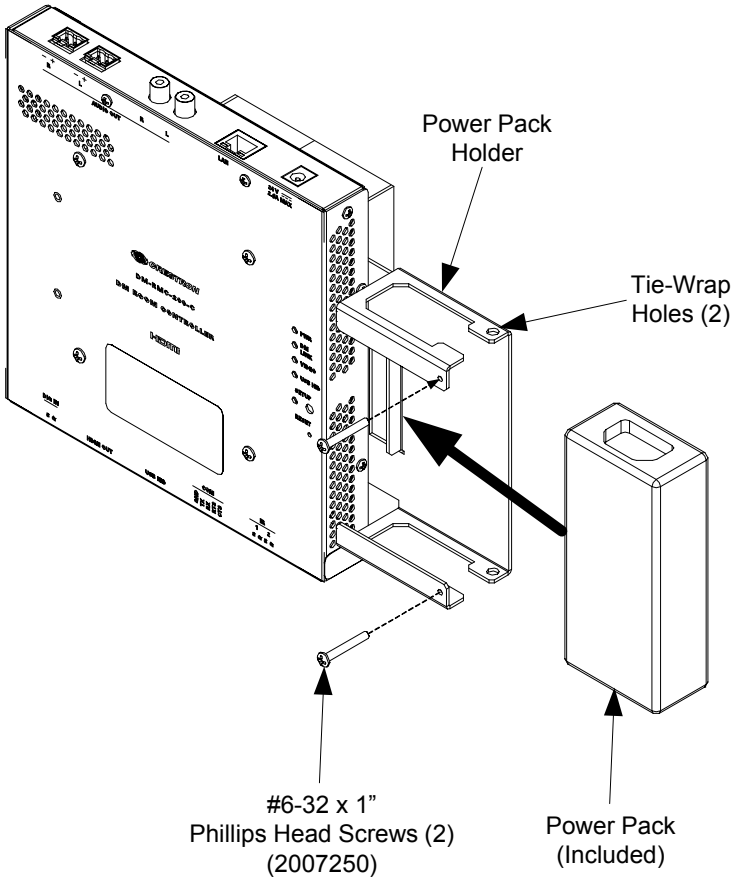


Installing the Power Pack

The included mounting bracket (2029286), which is used to attach the DM-RMC-200-C to an electrical box, provides a holder for the included power pack. To install the power pack, perform the following steps (refer to the illustration on the following page):

1. Slide the power pack into the holder.
2. Using two of the included 6-32 x 1" Phillips head screws (2007250), thread the screws through the two holes on the front of the power pack holder to hold the power pack in place.
3. Using the two included tie wraps, thread a tie wrap through the hole on the top and bottom of the holder, and then fasten the tie wraps to the power pack cable.

Installing the Power Pack



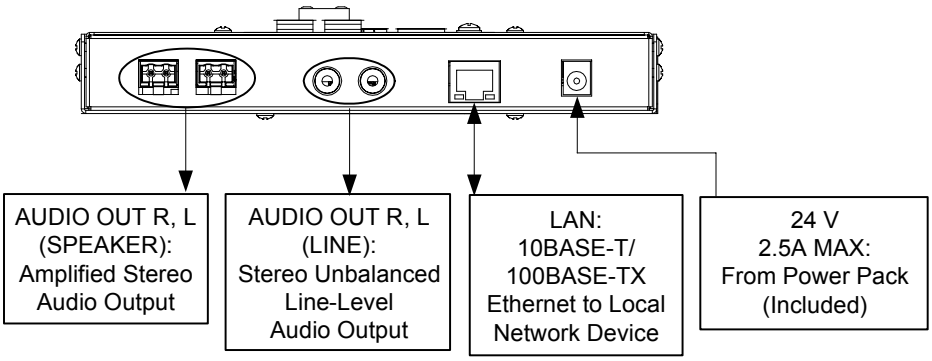
Installation of the power pack in the holder is shown below.

Power Pack Installed in Holder of DM-RMC-200-C Mounting Bracket

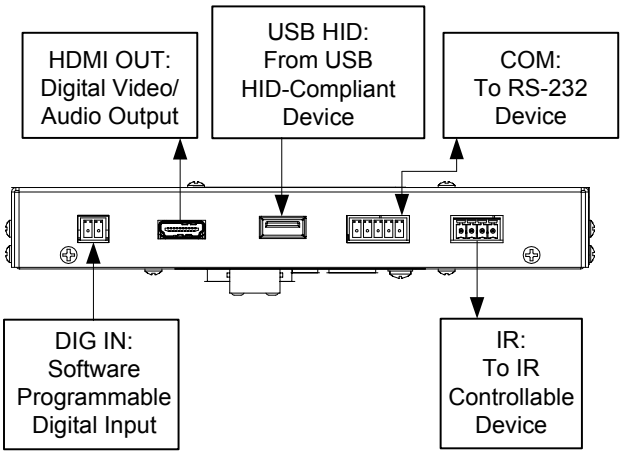
Hardware Hookup

Make the necessary connections as called out in the following illustrations. Refer to "Network Wiring" on page 17. Apply power after all connections have been made.

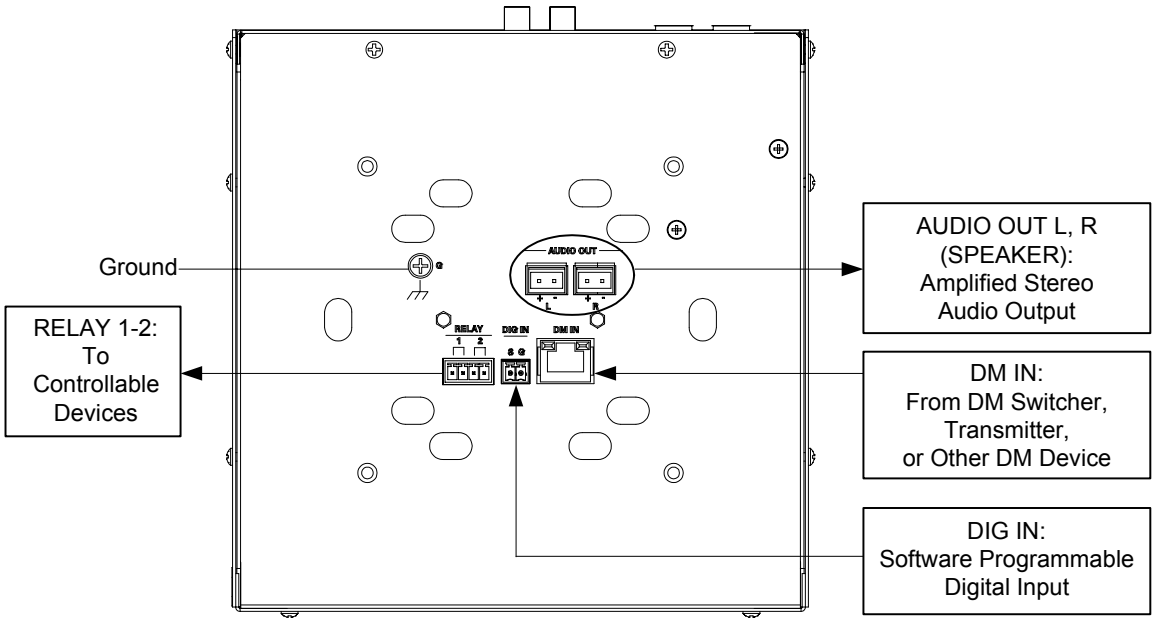
Hardware Connections for the DM-RMC-200-C (Top Panel View)



Hardware Connections for the DM-RMC-200-C (Bottom Panel View)



Hardware Connections for the DM-RMC-200-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: Do not connect the set of speaker-level audio outputs on the top panel and the set of speaker-level audio outputs on the rear panel simultaneously. Only one set of speaker-level audio outputs can be used at one time.

NOTE: For DM 8G+ wiring up to 330 feet (100 meters) between devices, use Crestron DM-CBL-8G DigitalMedia 8G cable, Crestron DM-CBL DigitalMedia cable, Crestron DM-CBL-D DigitalMedia D cable, or generic CAT5e (or better) UTP or STP. Shielded cable and connectors are recommended to safeguard against unpredictable environmental electrical noise which may impact performance at resolutions above 1080p. Refer to the latest version of the Crestron DigitalMedia Infrastructure Guide (Doc. 4556) for complete wiring guidelines and to the Crestron DigitalMedia Design Guide (Doc. 4789) for complete system design guidelines.

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 view questions you have submitted to Crestron's True Blue Support, log in at www.crestron.com/support. First-time users will need to establish a user account.

Earliest Version Software Requirements for the PC

NOTE: Crestron recommends that you use the latest software to take advantage of the most recently released features. The latest software is available 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-RMC-200-C.

Programming with SIMPL Windows

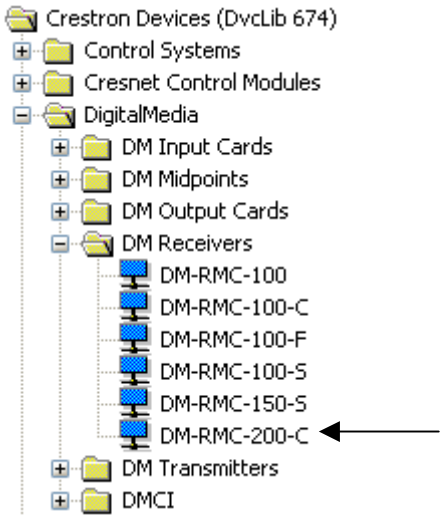
SIMPL Windows is Crestron's premier software for programming Crestron control systems. It is organized into two separate but equally important "Managers": Configuration and Program.

Configuration Manager

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

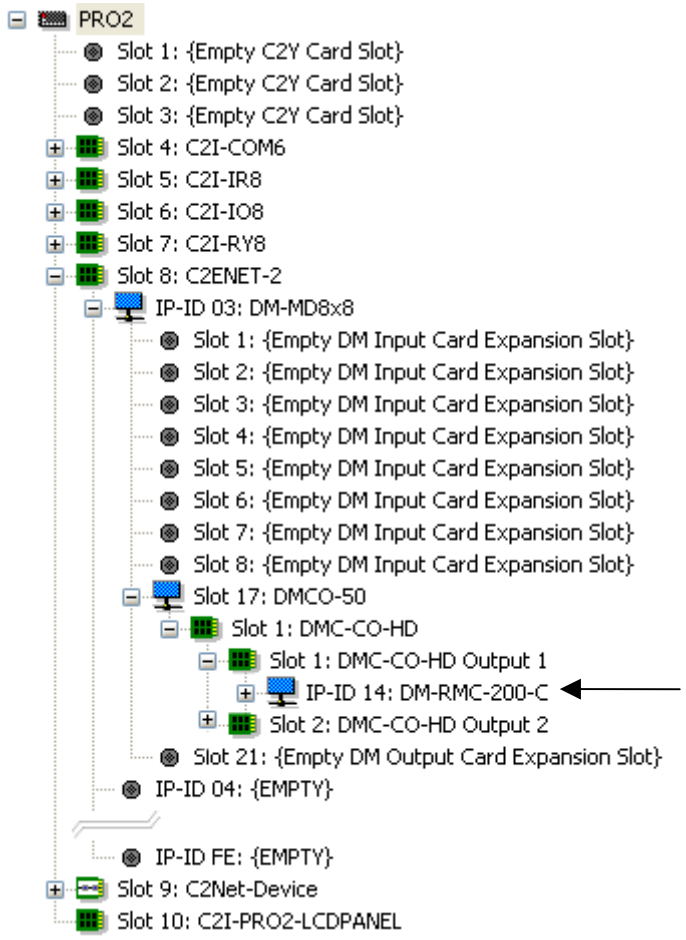
1. To incorporate the DM-RMC-200-C into the system, drag the DM-RMC-200-C from the DigitalMedia | DM Receivers folder of the *Device Library* and drop it into either of the following in *System Views*:
   - A compatible output card of a DM switcher
   - Directly to a card in the Ethernet slot of the control system (used without a DM switcher)

Locating the DM-RMC-200-C in the Device Library

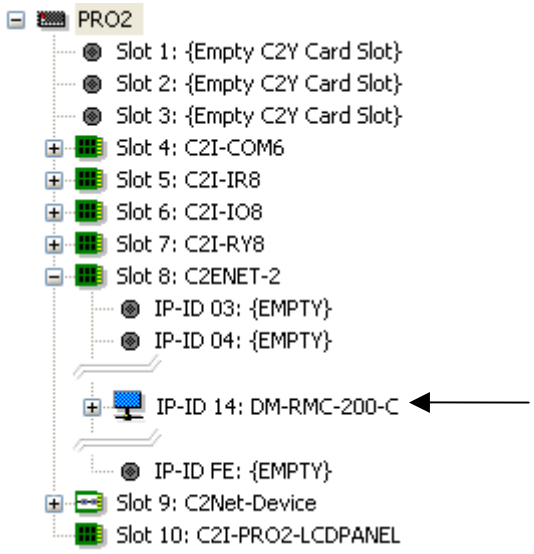


The system tree of the control system displays the DM-RMC-200-C in the appropriate slot with a default IP ID as shown in the following illustrations. In the first example, the DM-RMC-200-C is used with the DMCO-50 output card in a DM-MD8X8 switcher. In the second example, the DM-RMC-200-C is used with the C2ENET-2 card in an Ethernet slot on the control system.

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

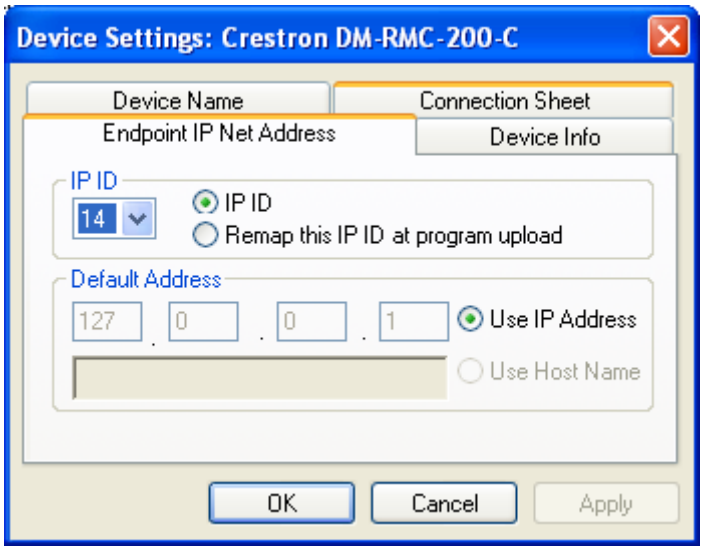


C2ENET-2 Device, Slot 8 (Using Ethernet Slot on Control System)



2. If additional DM-RMC-200-C devices are to be added, repeat step 1 for each device. Each DM-RMC-200-C device 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-200-C" Window



NOTE: The ID code specified in the SIMPL Windows program must match the IP ID of each unit. Refer to "Identity Code" on page 17.

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

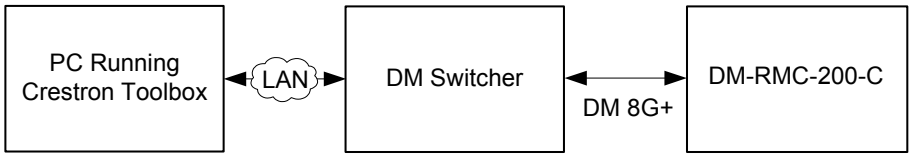
Use Crestron Toolbox for communicating with the DM-RMC-200-C; refer to the Crestron Toolbox help file for details.

A PC running Crestron Toolbox communicates with the DM-RMC-200-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-200-C using TCP/IP communication. In this scenario, the DM-RMC-200-C is used in a standalone configuration (i.e., a DM switcher is not used).

Via DM Switcher

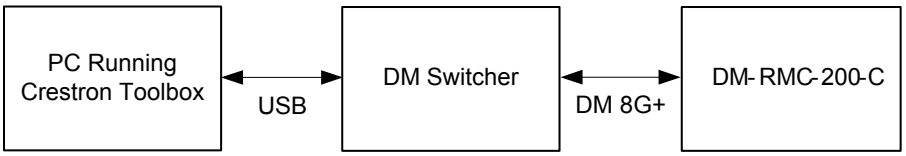
TCP/IP Communication via DM Switcher



To establish TCP/IP communication between the PC and the DM-RMC-200-C 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-RMC-200-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-200-C using the *TCP* connection type, and enter the IP address of the DM-RMC-200-C.
4. Display the "System Info" window of the DM-RMC-200-C (click the icon); communications are confirmed when the device information is displayed.

USB Communication via DM Switcher

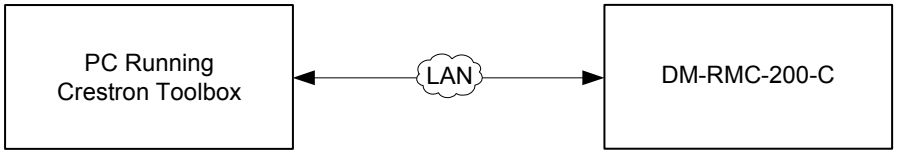


To establish USB communication between the PC and the DM switcher:

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 icon); communications are confirmed when the device information is displayed.

Via LAN Port

TCP/IP Communication via LAN Port of DM-RMC-200-C



To establish TCP/IP communication between the PC and the DM-RMC-200-C via the **LAN** port of the DM-RMC-200-C:

1. Use the Device Discovery Tool in Crestron Toolbox to find the IP address of the DM-RMC-200-C. The tool is available in Toolbox version 1.15.143 or later.

   NOTE: When the DM-RMC-200-C is used in a standalone configuration (i.e., without a DM switcher), DHCP is enabled by default. If desired, a default IP address (192.168.1.245) 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-200-C using the *TCP* connection type, and enter the IP address of the DM-RMC-200-C.
3. Display the "System Info" window of the DM-RMC-200-C (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-RMC-200-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-200-C so that it uses the IP address assigned in step 4a.
    d. Display the "System Info" window of the DM-RMC-200-C (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-RMC-200-C firmware:

1. Do either of the following:
    - If the DM-RMC-200-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-200-C 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-RMC-200-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 Web site to your 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-200-C is connected to a switcher) or the DM-RMC-200-C (if the DM-RMC-200-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 you to upgrade all DM devices connected to the switcher.
    - If the DM-RMC-200-C was selected, a DM device list is displayed that allows you to upgrade the DM-RMC-200-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-200-C 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-RMC-200-C.

NOTE: If the DM-RMC-200-C is connected to a DM switcher, the IP table entry of the DM-RMC-200-C is created automatically.

1. Use the Device Discovery Tool to find the IP address of the DM-RMC-200-C. Then, in the Toolbox, display the "System Info" window (click the  icon) and select the DM-RMC-200-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-200-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-200-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.
Green LED on **DM IN** port 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.
There is no sound from connected speakers.	Amplifier is turned off or EDID is not configured properly.	In DMTool, confirm that *Enable Analog Audio Output* is selected.
	Volume is turned down.	In DMTool, move the volume slider up as necessary to increase the volume.

(Continued on following page)

DM-RMC-200-C Troubleshooting (Continued)

TROUBLE	POSSIBLE CAUSE(S)	CORRECTIVE ACTION
LAN LED does not illuminate green.	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 Infrastructure 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

If you cannot locate specific information or have questions after reviewing this guide, please take advantage of Crestron's award winning customer service team by calling Crestron at 1-888-CRESTRON [1-888-273-7876]. For assistance in your region, please refer to the Crestron Web site (www.crestron.com) for a listing of Crestron worldwide offices.

You can also log onto the online help section of the Crestron Web site (www.crestron.com/onlinehelp) to ask questions about Crestron products. First-time users will need to 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-200-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 Web site periodically for manual update availability and its relevance. Updates are identified as an "Addendum" in the Download column.

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