

Crestron **DM-TX1-1G**

Wall Plate DigitalMedia™ CAT

Transmitter

Operations & Installation Guide



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-TX1-1G 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 separation between the equipment and the 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.

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Wall Plate DigitalMedia™ CAT Transmitter: DM-TX1-1G

Introduction

Part of Crestron's DM® product line, the DM-TX1-1G is a DigitalMedia™ CAT transmitter that installs in a single-gang wall box or floor box. It provides one HDMI® input for a computer or high-definition AV source as part of a complete DigitalMedia system.

Features and Functions

- DigitalMedia transmitter and HDMI interface
- DM CAT output supports up to 175 feet (53 meters) cable length¹
- Compact 1-gang wall mount design
- Available colors include black or white
- Provides HDMI digital video/audio input at any location
- Also supports DVI and DisplayPort Multimode sources²
- Affords single-wire connection to a DM-MD switcher (sold separately)
- Supports 3D HDTV signals

1. For DigitalMedia CAT wiring, use DM-CBL DigitalMedia Cable. DM Repeaters (Model DM-DR) are not supported. Refer to the latest version of the Crestron DigitalMedia Design Guide (Doc. 4789) for complete wiring guidelines. It is available from the Crestron® Web site (www.crestron.com/dmresources).
2. HDMI requires an appropriate adapter or interface cable to accommodate a DVI or DisplayPort Multimode signal. CBL-HD-DVI and CBL-DP-HD interface cables available separately.

DigitalMedia

Crestron® has developed DigitalMedia, the first complete HD AV distribution system that takes HDMI to a higher level, and allows virtually any mix of AV sources to be distributed throughout the home, office, school, or virtually any other facility.

DigitalMedia distributes uncompressed digital video and audio signals several hundred feet using DM cable.¹ DigitalMedia manages all of the different signals and devices, matching each source's output to the capabilities of the selected display(s) without using scaling or compression. Every signal is preserved in its native video resolution and audio format, ensuring a pure, lossless signal path throughout.

Multimedia Computer/AV Interface

Via its HDMI input, the DM-TX1-1G handles 1080p60 HDTV with HDCP and multi-channel HD lossless audio. The HDMI input can also handle WUXGA computer resolutions, and supports DVI and DisplayPort Multimode signals using an appropriate adapter or interface cable.²

The DM-TX1-1G connects to the DM CAT input of a DM-MD series switcher, carrying a multimedia computer or AV signal up to 175 feet (53 meters)¹ away. Multiple DM-TX1-1Gs may be installed to enable the distribution of several sources at different locations to feed multiple displays throughout any room or larger facility.

Simple Wall Mount Design

The DM-TX1-1G is designed to be wall mounted using a standard electrical box or plaster ring, or attached to a rack rail in the back of an equipment cabinet. The DM cable is terminated to the rear of the transmitter using screw terminals.

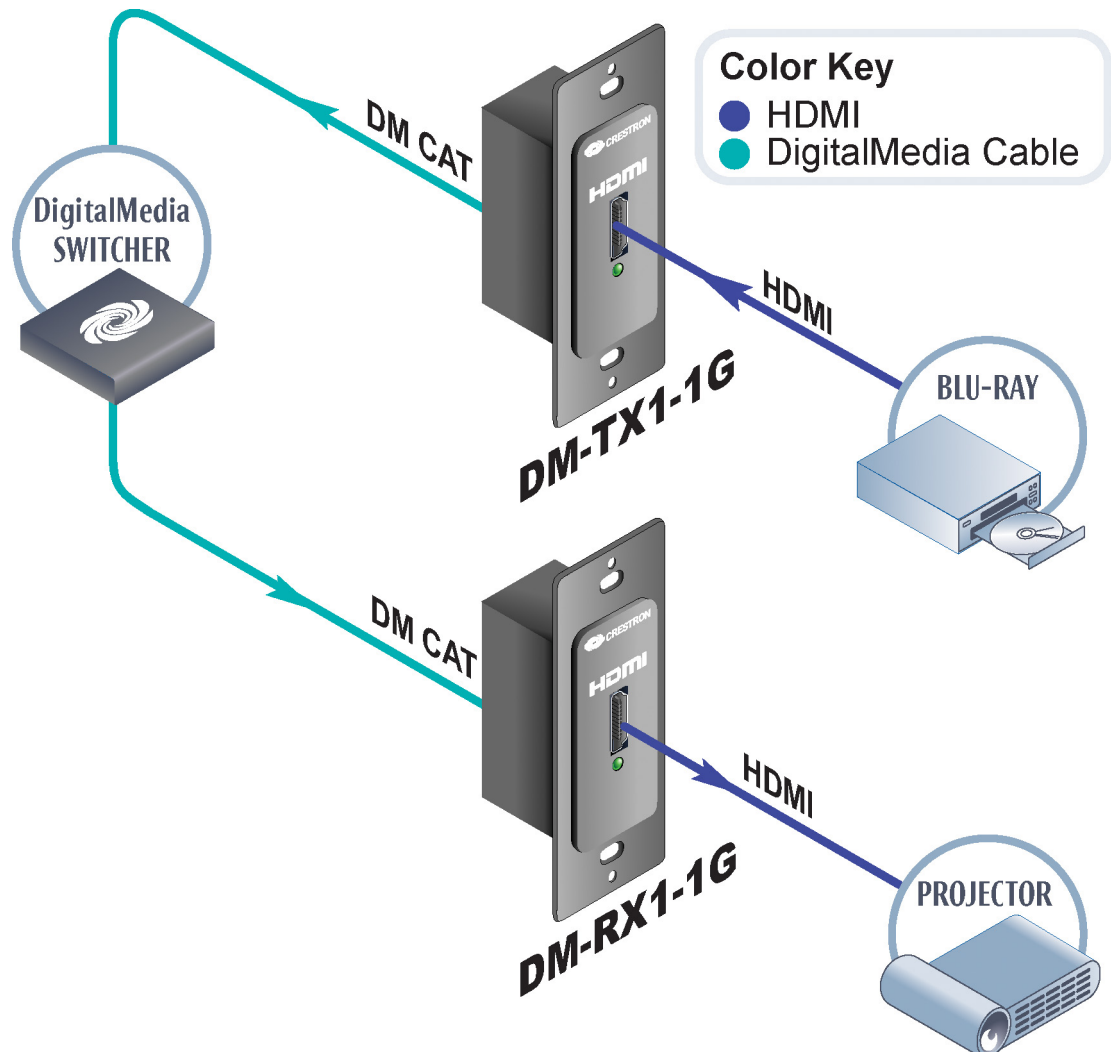
1. For DigitalMedia CAT wiring, use DM-CBL DigitalMedia Cable. DM Repeaters (Model DM-DR) are not supported. Refer to the latest version of the Crestron DigitalMedia Design Guide (Doc. 4789) for complete wiring guidelines.
2. HDMI requires an appropriate adapter or interface cable to accommodate a DVI or DisplayPort Multimode signal. CBL-HD-DVI and CBL-DP-HD interface cables available separately.

Applications

The following diagram shows a DM-TX1-1G in a basic application.

NOTE: As shown in the diagram below, the DM-TX1-1G must connect directly to a DM switcher. The DM-TX1-1G cannot be used in a standalone configuration, that is, used without connection to a DM switcher.

DM-TX1-1G in a Basic Application



Specifications

Specifications for the DM-TX1-1G are listed in the following table.

DM-TX1-1G Specifications

SPECIFICATION	DETAILS
Video	
Input Signal Types	HDMI, DVI ¹ DisplayPort Multimode ¹
Output Signal Type	DM CAT ² (DigitalMedia over twisted-pair copper wire)
Formats	HDMI, DVI, HDCP content protection support, 3D
Input Resolutions Progressive	640 x 480 @ 60 Hz 720 x 480 @ 60 Hz (480p) 720 x 576 @ 50Hz (576p) 800 x 600 @ 60Hz 848 x 480 @ 60Hz 1024 x 768 @ 60Hz 1280 x 720 @ 50Hz (720p50) 1280 x 720 @ 60Hz (720p60) 1280 x 768 @ 60Hz 1280 x 800 @ 60Hz 1280 x 960 @ 60Hz 1280 x 1024 @ 60Hz 1360 x 768 @ 60Hz 1366 x 768 @ 60Hz 1400 x 1050 @ 60Hz 1440 x 900 @ 60Hz 1600 x 900 @ 60Hz 1600 x 1200 @ 60Hz 1680 x 1050 @ 60Hz 1920 x 1080 @ 24 Hz (1080p24) 1920 x 1080 @ 50 Hz (1080p50) 1920 x 1080 @ 60 Hz (1080p60) 1920 x 1200 @ 60 Hz

(Continued on following page)

DM-TX1-1G Specifications (Continued)

SPECIFICATION	DETAILS
Input Resolutions Progressive (Continued)	2048 x 1080 @ 24 Hz 2048 x 1152 @ 60 Hz plus any other resolution allowed by HDMI up to 165 MHz pixel clock
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
Output Resolutions	Matched to input
Audio	
Input Signal Types	HDMI, DisplayPort Multimode ¹
Output Signal Type	DM CAT ²
Formats	Dolby® Digital, Dolby Digital EX, Dolby Digital Plus, Dolby TrueHD, DTS®, DTS-ES, DTS 96/24, DTS-HD High Res, DTS-HD Master Audio™, up to 8ch PCM
Power Requirement	
DMNet Power Usage	4 Watts (0.17 Amps @ 24 Volts DC)
Environmental	
Temperature	32° to 104°F (0° to 40°C)
Humidity	10% to 90% RH (non-condensing)
Heat Dissipation	14 BTU/Hr

(Continued on following page)

DM-TX1-1G Specifications (Continued)

SPECIFICATION	DETAILS
Enclosure	
Construction	Metal with black or white finish, includes metal decorator style insert
Flush Wall Mount	1-gang mountable in a standard electrical box (2-1/2 inch / 64 mm deep minimum); requires decorator style faceplate (not included)
Rack Mount	Mountable to a single 19-inch EIA rack rail
Dimensions	
Height	4.12 in (105 mm)
Width	1.72 in (44 mm)
Depth	2.02 in (52 mm)
Weight	6 oz (170 grams)
Available Models	
DM-TX1-1G	Wall Plate DigitalMedia™ CAT Transmitter, Matte Black
DM-TX1-1G-W-T	Wall Plate DigitalMedia™ CAT Transmitter, Matte White
Available Accessories	
CBL-DP-HD	DisplayPort to HDMI® Interface Cable
CBL-HD	HDMI® Interface Cable
CBL-HD-DVI	HDMI® to DVI Interface Cable
DM-CBL	DigitalMedia™ Cable

1. HDMI requires an appropriate adapter or interface cable to accommodate a DVI or DisplayPort Multimode signal. CBL-HD-DVI and CBL-DP-HD interface cables available separately.

2. For DigitalMedia CAT wiring, use DM-CBL DigitalMedia Cable. DM Repeaters (Model DM-DR) are not supported. Refer to the Crestron DigitalMedia Design Guide (Doc. 4789).

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).

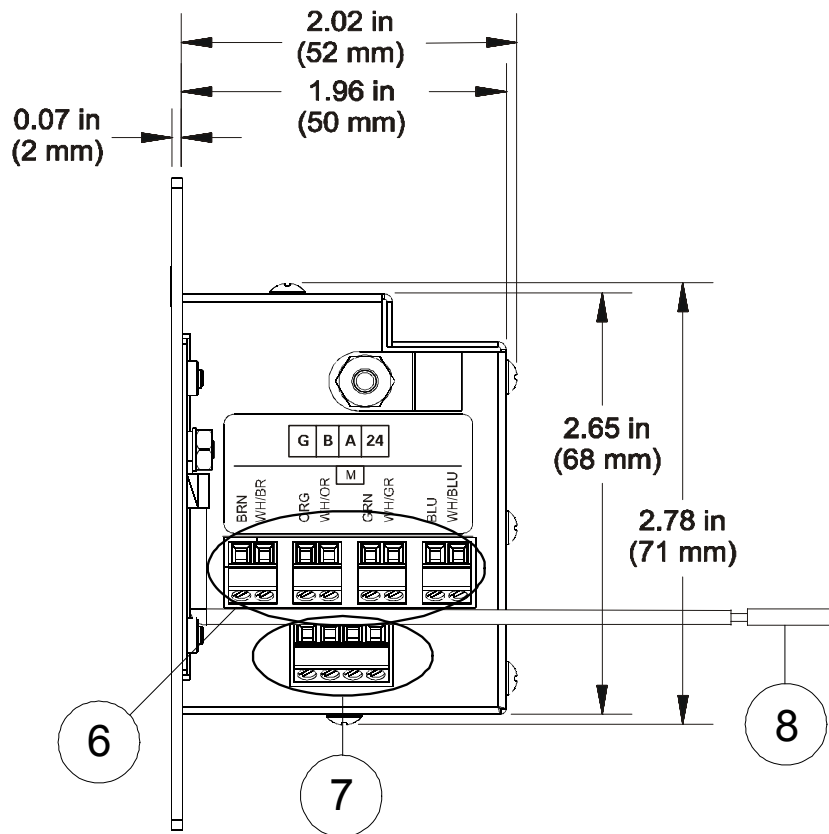
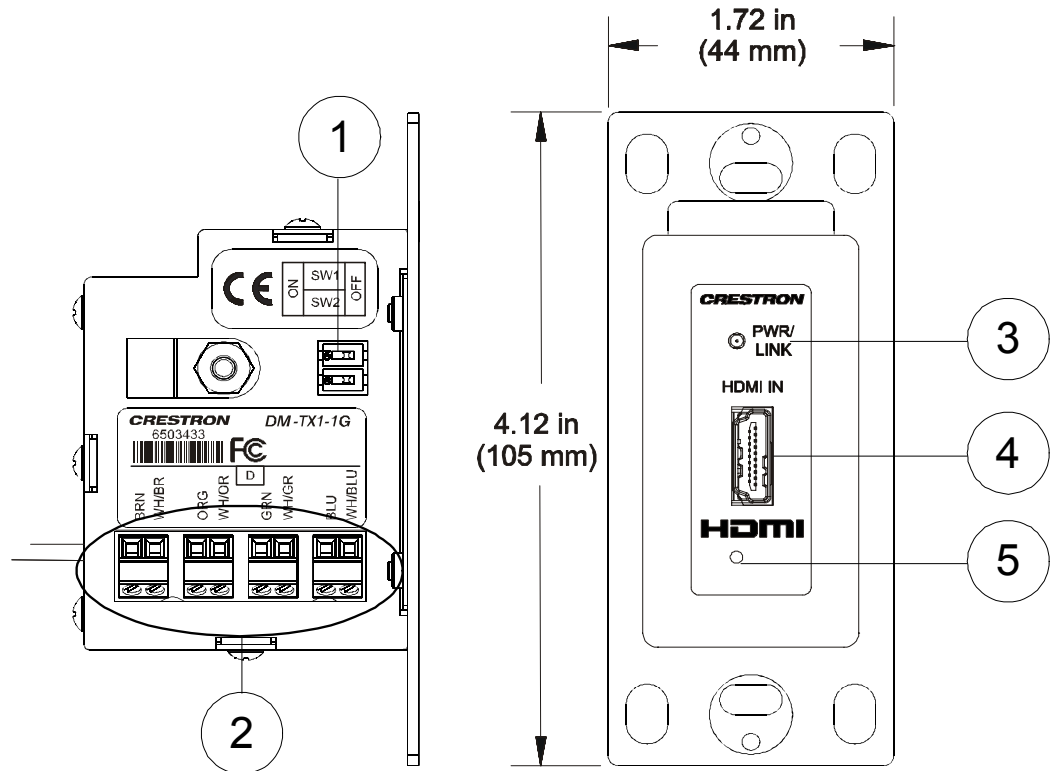
Physical Description

This section provides information on the connections, controls and indicators available on your DM-TX1-1G.

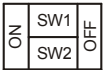
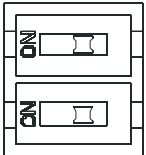
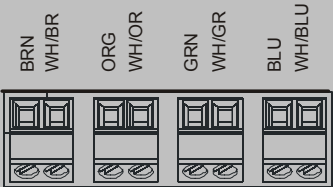

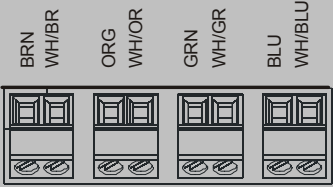
DM-TX1-1G Physical View



DM-TX1-1G Overall Dimensions (Left, Front & Right Views)

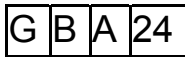
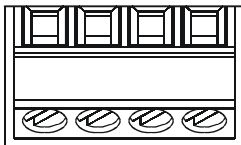


Connectors, Controls & Indicators

#	CONNECTORS, CONTROLS & INDICATORS	DESCRIPTION
1	SW1, SW2  	(2) Toggle DIP switches, used to select the DM wire type, and enable DMNet slave mode to allow firmware update. Refer to “Configuration” on page 14 for more information.
2	D ¹ 	(1) DM CAT output composed of (8) captive screw terminals with (1) grounded strain relief. Connects to DM CAT input of a DM switcher via DM-CBL cable ²
3	PWR / LINK LED	(1) Dual-color amber/green LED, amber indicates operating power supplied via DMNet, green indicates HDMI input signal presence/lock status
4	HDMI IN 	(1) 19-pin Type A HDMI female; HDMI digital video/audio input; Supports DVI and DisplayPort Multimode ³
5	RESET BUTTON	(1) Miniature recessed pushbutton for hardware reset
6	M ¹ 	(1) DM CAT output composed of (8) captive screw terminals with (1) grounded strain relief. Connects to DM CAT input of a DM switcher via DM-CBL cable ²

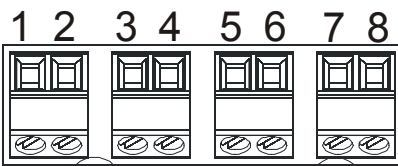
(Continued on following page)

Connectors, Controls, & Indicators (Continued)

#	CONNECTORS, CONTROLS & INDICATORS	DESCRIPTION
7	<p>G B A 24⁴</p>  	<p>(1) DMNet terminal block composed of (4) captive screw terminals.</p> <p>Connects to DMNet port of a DM switcher via DM-CBL cable^{2, 5}</p>
8	GROUNDING WIRE	(1) Flying lead, chassis ground connection ⁶

1. Refer to the following table for the D and M Port terminal block pinouts.

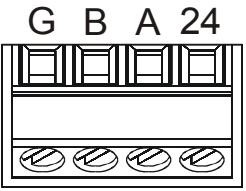
D and M Terminal Block(s)

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

- For DigitalMedia CAT wiring, use DM-CBL DigitalMedia Cable. DM Repeaters (Model DM-DR) are not supported. Refer to the latest version of the Crestron DigitalMedia Design Guide (Doc. 4789) for complete wiring guidelines.
- HDMI requires an appropriate adapter or interface cable to accommodate a DVI or DisplayPort Multimode signal. CBL-HD-DVI and CBL-DP-HD interface cables available separately.

4. Refer to the following table for the G B A 24 connector pinouts.

G B A 24 Terminal Block

			
PIN #	SIGNAL	Description	Wire Color
G	Ground	DC Ground	Black and Ground
B	DMNet-	DMNet	Gray
A	DMNet+	DMNet	Orange
24	24V DC	DC Power	Red

5. DMNet wiring is not compatible with Cresnet wiring. DMNet wiring cannot be daisy chained.
6. A grounding lead is provided for connection to earth ground (building steel). This ground connection is recommended to provide a common ground reference for signals provided to the DM-TX-1G, and to reduce the incidence of possible damage to the unit from static discharge.

Setup

Network Wiring

When wiring the DM network, consider the following:

NOTE: DMNet wiring and Cresnet® wiring are not compatible.

- Use Crestron Certified Wire.
- Use Crestron power supplies for Crestron equipment.
- Provide sufficient power to the system.
- For DigitalMedia CAT wiring, use DM-CBL DigitalMedia Cable. Refer to the latest version of the Crestron DigitalMedia Design Guide (Doc. 4789) for complete wiring guidelines.

CAUTION: Insufficient power can lead to unpredictable results or damage to the equipment. Please use the Crestron Power Calculator to help calculate how much power is needed for the system (www.crestron.com/calculators).

For more details, refer to “Check Network Wiring”, which starts on page 24.

Supplied Hardware

The hardware supplied with the DM-TX1-1G is listed in the following table.

Supplied Hardware for the DM-TX1-1G

DESCRIPTION	PART NUMBER	QUANTITY
Assy, Insert, with Tape, Black	4510566	1
Assy, Insert, with Tape, White	4512253	1
Screw, #06-32 X 3/4", Oval, Slot	2009684	2

Configuration

Cable Selection

The DM-TX1-1G must be configured to accept the type of cable used during installation. DIP switches are provided on the unit to indicate the installed cable type. Refer to the table below for DIP switch settings.

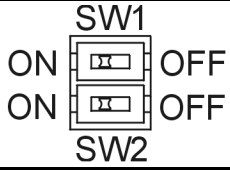
Master/Slave Mode

The DIP switches on the DM-TX1-1G can be used to switch the unit into DMNet *Master* mode or DMNet *Slave* mode. Selecting the appropriate DMNet mode will allow the unit to receive firmware updates from other Crestron devices.

- In DMNet *Master* mode, a DM-MD8X8 or other DM switcher (sold separately) equipped with a DMC-CAT card can be used to update the firmware.
- In DMNet *Slave* mode, a control system such as the PRO2 can be used to update the firmware.

Refer to the following table below to set the *Master/Slave* mode.

DIP Switch Settings

	SW1	SW2
DM-CBL DigitalMedia Cable (DMNet <i>Master</i> mode)	OFF	OFF
Video inactive (DMNet <i>Slave</i> mode)	ON	ON
Reserved for factory use only	ON OFF	OFF ON

Installation

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

To install the DM-TX1-1G, the following tools and accessories are required for installation:

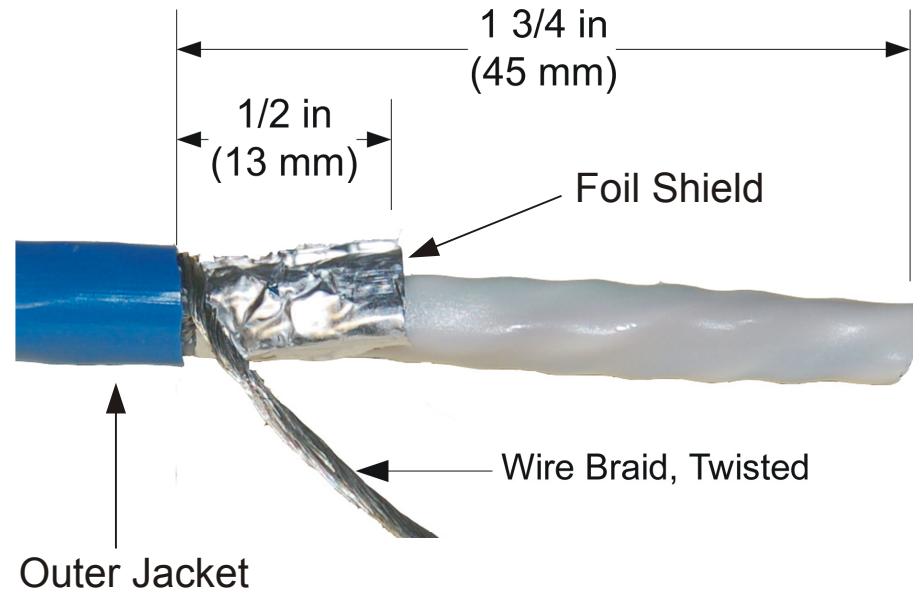
- DM-CBL DigitalMedia Cable (not supplied.) Refer to “Network Wiring” on page 13.
- Phillips screwdriver (not supplied)
- Adjustable wrench (not supplied)
- Miniature flat head screwdriver (not supplied)
- Two #06-32 x 3/4" oval head slotted screws (2009684, included)
- Decorative-style faceplate (not supplied)
- Insert (4510566 or 4512253, included)

The DM-TX1-1G can be installed in either a 1-gang electrical box or rack mounted.

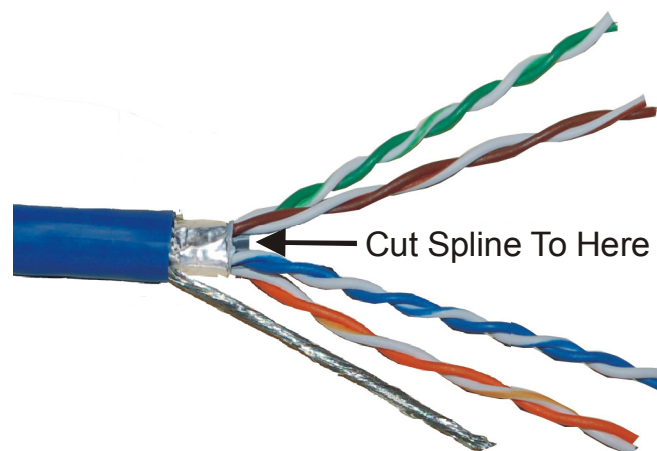
Installing in a 1-Gang Box

An extra-deep box is recommended (2-1/2 inch (64 mm) deep minimum). It is assumed that the required cable has been fed through an installed 1-gang electrical box (not supplied), and wiring has been verified. Use the following procedure to install the DM-TX1-1G.

1. Confirm that DMNet system power is OFF.
2. Strip 3 inches (77 mm) of the DigitalMedia Cable to expose the three inner cables.
3. Strip the outer jacket of the blue “D” cable 1 3/4 inch (45 mm) from end. Gather and twist the wire braid. Refer to the illustration at the top of the next page.

“D” Cable (Stripping the Outer Jacket)

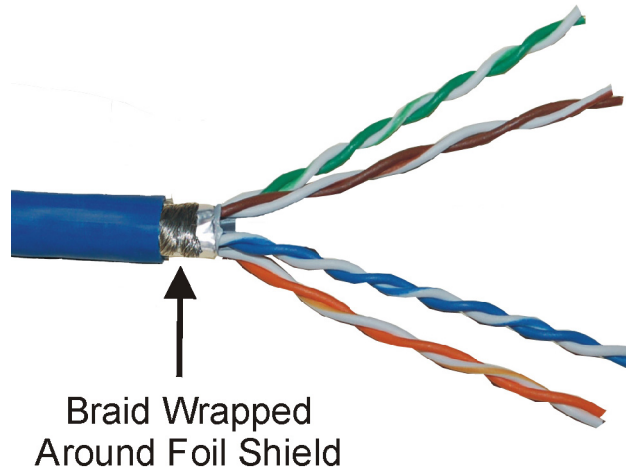
4. Trim foil shield to 1/2 inch (13 mm).
5. Remove the white neoprene sheath and separate the twisted pairs to expose the spline. Cut the spline so that it is near flush with the foil shield as shown in the following diagram. Return twisted pairs to original position.

“D” Cable (Cutting the Spline)

6. Neatly wrap the twisted braid around the foil shield as shown in the following diagram. Only the silver side of foil shield is conductive.

NOTE: Braid should wind neatly around foil shield. Loose braid may cause shorts.

“D” Cable (Wrapping the Twisted Braid)



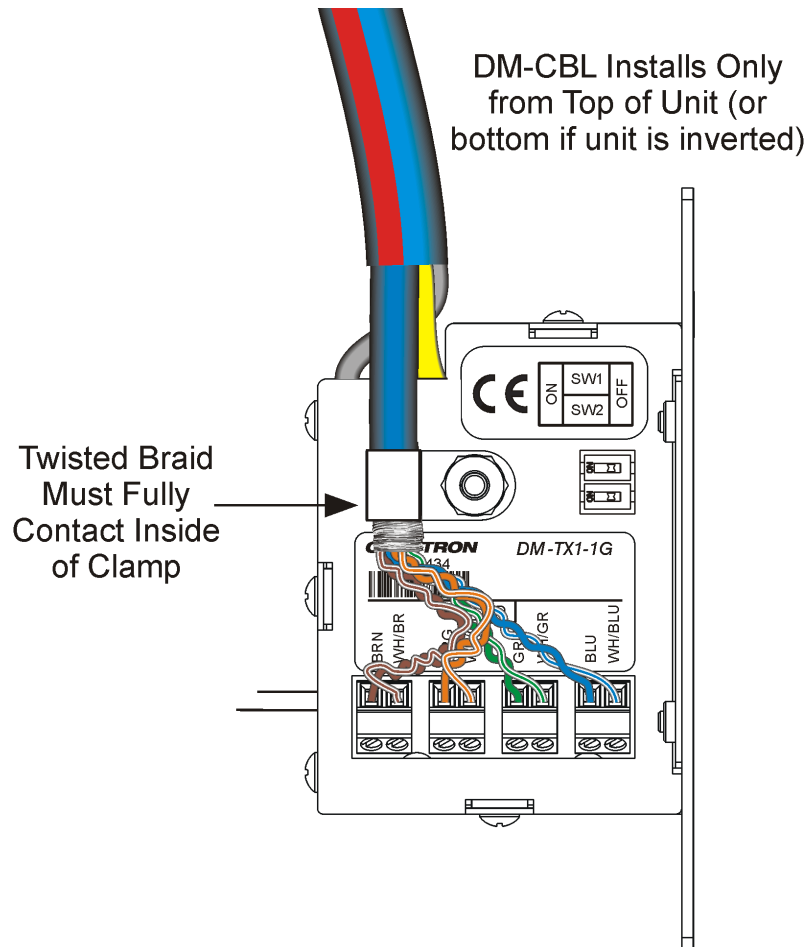
7. Strip the insulation from the ends of each wire, exposing approximately 3/16 inch (5 mm) of bare copper.

NOTE: Do not allow the twisted pairs to untwist for more than 1/2 inch (13 mm).

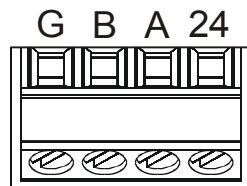
NOTE: Maintain equal wire lengths within 1/8 inch (3 mm).

8. Using an adjustable wrench, clamp the prepared cable to the unit as shown in the following diagram.

NOTE: Twisted braid and foil shield must be in full contact with inside of clamp.

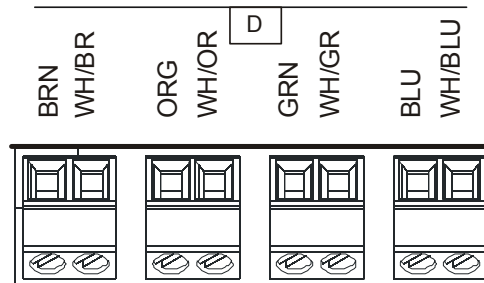
Clamping the Cable to the Unit

9. Repeat steps 3 through 8 for the yellow “M” cable.
10. Using a miniature flat head screwdriver (not supplied), make the connections as specified, using the labels on the unit as a guide.
 - a. Insert the twisted pairs of the gray DMNet cable into the **G B A 24** terminal block and tighten each screw base. Refer to footnote 4 on page 12 for details.

G B A 24 Terminal Block

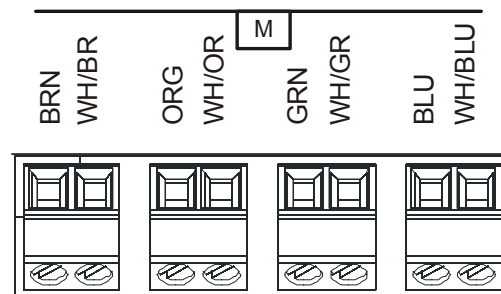
- b. Insert the twisted pairs of the blue “D” cable into the **D** terminal block and tighten each screw base. Refer to footnote 1 on page 11 for details.

D Terminal Block



- c. Insert the twisted pairs of the yellow “M” cable into the **M** terminal block and tighten each screw base. Refer to footnote 1 on page 11 for details.

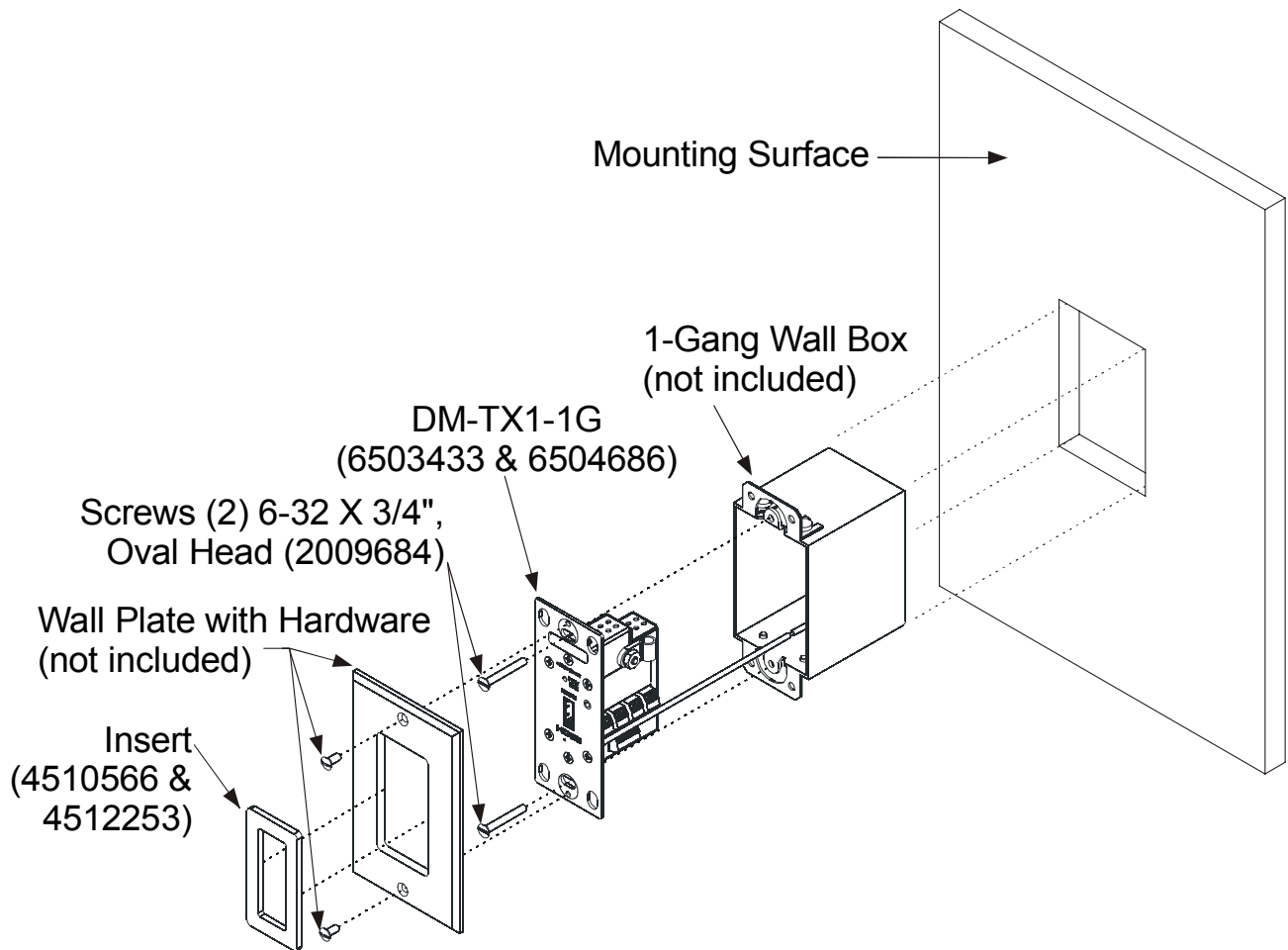
M Terminal Block



11. Remove the pre-cut insulation from the grounding wire and connect it to the electrical box or a ground wire in the electrical box (the electrical box must be earth grounded).
12. Attach the unit to the electrical box using the two included #06-32 x 3/4" oval head slotted screws as shown in the illustration on the following page.

CAUTION: Excess wire pinched between the unit and electrical box could cause a short. Make sure that all excess wire is completely inside the electrical box and not between the box and the side of the unit.

13. Attach an appropriate decorative-style faceplate (not supplied).
14. Remove the backing from the tape on the back of the insert. Affix the insert plate into the proper opening in the wallplate.

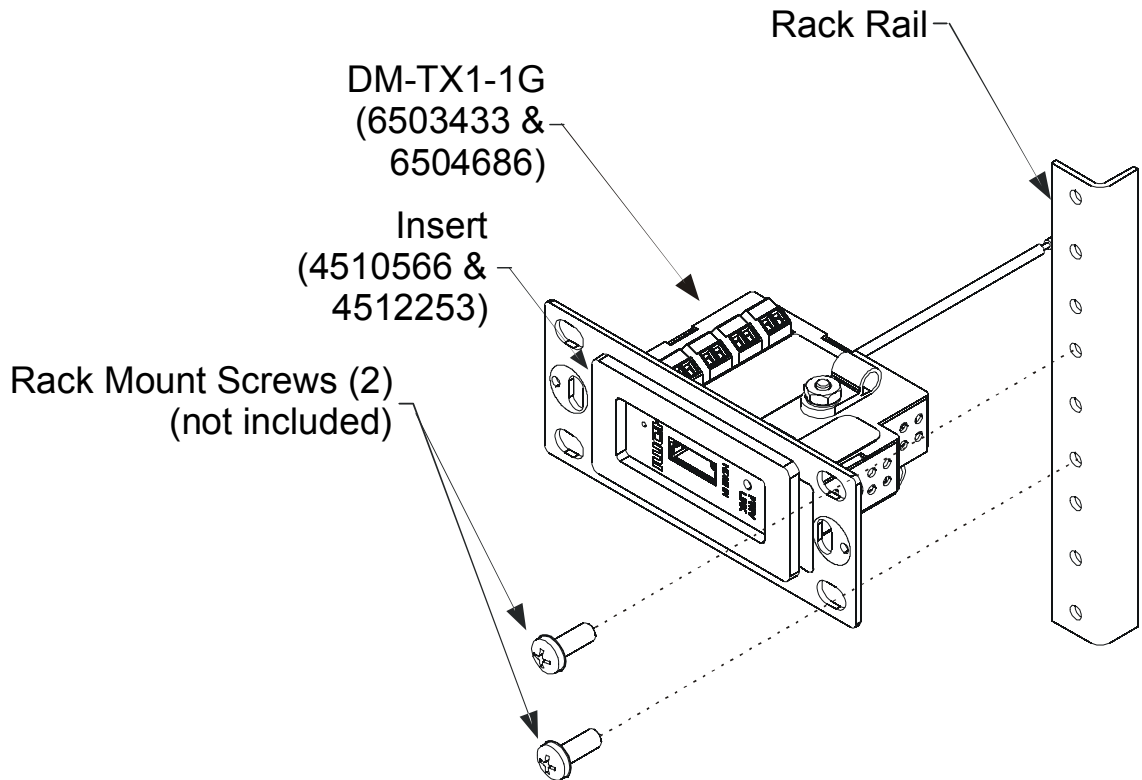
DM-TX1-1G in 1-Gang Box (Exploded View)**Rack Mounting**

The DM-TX1-1G can be mounted in a rack with other equipment using the two mounting holes on either corner of the unit. It is assumed that the required cable has been installed and wiring has been verified.

1. Follow steps 1 through 10 in the procedure outlined for installing the DM-TX1-1G in a 1-gang box, which begins on page 15.
2. Attach the unit to the rack using the rack mount screws (not supplied) as shown in the following diagram.
3. Remove the pre-cut insulation from the grounding wire and connect it to an appropriate earth ground.

4. Remove the backing from the tape on the back of the insert. Affix the insert plate onto the unit as shown. Refer to the following diagram.

DM-TX1-1G Rack Mount (Exploded View)



WARNING: To prevent bodily injury when mounting or servicing this unit in a rack, take special precautions to ensure that the system remains stable. The following guidelines are provided to ensure your safety:

- When mounting this unit in a partially filled rack, load the rack from the bottom to the top with the heaviest component at the bottom of the rack.
 - If the rack is provided with stabilizing devices, install the stabilizers before mounting or servicing the unit in the rack.
-

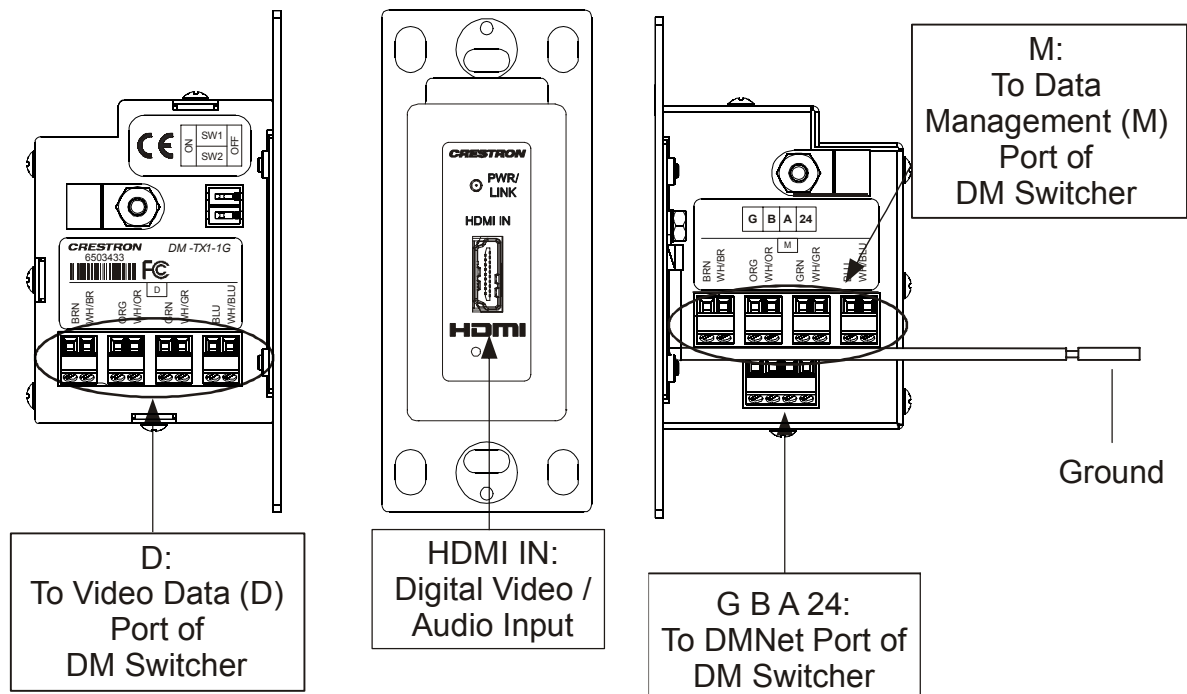
Hardware Hookup

Connect the Device

Make the necessary connections as called out in the illustration that follows this paragraph. Refer to “Network Wiring” on page 13 before attaching the DMNet cable. Apply power after all connections have been made.

When making connections to the DM-TX1-1G, use Crestron power supplies for Crestron equipment.

Hardware Connections for the DM-TX1-1G



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

NOTE: Minimum recommended length for DM-CBL DigitalMedia Cable is 15 feet (~4.6 meters).

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-TX1-1G Troubleshooting

TROUBLE	POSSIBLE CAUSE(S)	CORRECTIVE ACTION
Device does not function.	Device is not communicating with the network.	Use Crestron Toolbox™ to poll the network. Verify network connection to the device.
	Device is not receiving power from a Crestron power source.	Use the provided Crestron power source. Verify connections.
	Device is not receiving sufficient power.	Use the Crestron Power Calculator to help calculate how much power is needed for the system.
PWR / LINK LED does not illuminate green or amber.	Device is not receiving power	Verify power connections are properly attached.

(Continued on following page)

DM-TX1-1G Troubleshooting (Continued)

TROUBLE	POSSIBLE CAUSE(S)	CORRECTIVE ACTION
PWR / LINK LED does not illuminate amber.	Device is not receiving/ transmitting DMNet signal.	Verify D and M connections are properly attached.
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 DM tool in Crestron Toolbox.

Check Network Wiring

Use the Right Wire

In order to ensure optimum performance over the full range of your installation topology, Crestron Certified Wire and only Crestron Certified Wire may be used. Failure to do so may incur additional charges if support is required to identify performance deficiencies because of using improper wire.

Calculate Power

CAUTION: Use only Crestron power supplies for Crestron equipment. Failure to do so could cause equipment damage or void the Crestron warranty.

CAUTION: Provide sufficient power to the system. Insufficient power can lead to unpredictable results or damage to the equipment. The **EIG** connector on the DM switcher is used to bring in external power. Additional power is rarely required as switchers provide enough power for their maximum configuration of room controllers and repeaters. Please use the DMNet Power Calculator to help calculate how much power is needed for the system (www.crestron.com/calculators).

Refer to the following table for commonly used resolutions and maximum DM-CBL cable lengths.

Commonly Used Resolutions and Maximum DM-CBL Cable Lengths

RESOLUTION	DM-CBL CABLE LENGTH
720p, 1080i, 1080p24	175 ft (53 m)
1024 x 768 @ 75 Hz	175 ft (53 m)
1080p60	125 ft (38 m)
1280 x 1024 @ 75 Hz	125 ft (38 m)
1920 x 1200 @ 60 Hz	125 ft (38 m)
1600 x 1200 @ 60 Hz	100 ft (30 m)
1080p60 Deep Color	Not supported

NOTE: All Crestron certified DMNet wiring must consist of two twisted pairs. One twisted pair is the +24V conductor and the GND conductor and the other twisted pair is the A conductor and the B conductor.

Reference Documents

The latest version of all documents mentioned within the guide can be obtained from the Crestron Web site (www.crestron.com/manuals). This link will provide a list of product manuals arranged in alphabetical order by model number.

List of Related Reference Documents

DOCUMENT TITLE
Crestron DigitalMedia Design Guide

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-TX1-1G, 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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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.

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