Crestron **QM-DA-2**
QuickMedia™ Distribution Amplifier

Operations Guide

CRESTRON®

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

CRESTRON

Crestron Electronics, Inc.
15 Volvo Drive
Rockleigh, NJ 07647
1-888-CRESTRON

Contents

QuickMedia™ Distribution Amplifier: QM-DA-2

Introduction

The QM-DA-2 is a QuickMedia™ (QM) distribution amplifier designed to distribute a single QM signal to two QM receivers. All signal distribution is provided over inexpensive CAT5e type cable via Crestron® exclusive QM transport, supporting high resolution RGB, video, stereo audio and microphone signals up to a total distance of 450 feet (137 meters).

Up to two QM distribution amplifiers, matrix switchers and distribution centers may be cascaded in a given QM signal path to support versatile system configurations.

Both QuickMedia ports on the bottom panel are accompanied by Cresnet® ports with 24Volt DC power distribution built in to simplify termination of the QuickMedia and Cresnet wiring.

Features and Functions

- 1 to 2 QuickMedia signal distribution amp
- Easy single cable connections
- No control or adjustments necessary
- Built-in Cresnet® distribution

Specifications

Specifications for the QM-DA-2 are listed in the following table.

QM-DA-2 Specifications

SPECIFICATION	DETAILS
Video/RGB	
DA	Distribution amplifier, distributes QM video input signal to both outputs
Gain	0 dB
Audio	
DA	Distribution amplifier, distributes QM audio input signal to both outputs
Gain	0 dB
Power	
Cresnet Power Usage	6 Watts (0.25 Amps @ 24 Volts DC)
Environmental	
Temperature	41º to 104º F (5º to 40º C)
Humidity	10% to 90% RH (non-condensing)
Heat Dissipation	20 BTU/Hr
Enclosure	
Chassis	Aluminum, with integral mounting flanges
Mounting	Freestanding, surface or rack rail mount
Dimensions	
Height	4.32 in (110 mm)
Width	4.56 in (116 mm)
Depth	1.43 in (37 mm)
Weight	11 oz (305 g)

Physical Description

This section provides information on the connections, controls and indicators available on your QM-DA-2.

QM-DA-2 Physical View

QM-DA-2 Overall Dimensions (Top, Front and Bottom Views)
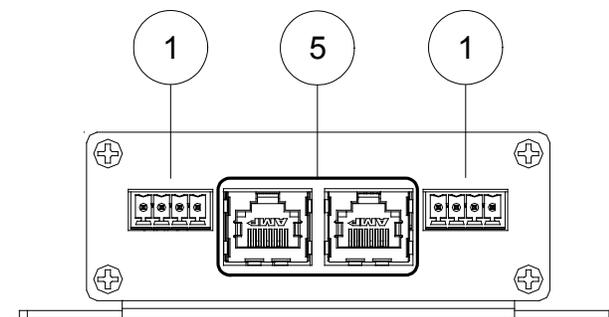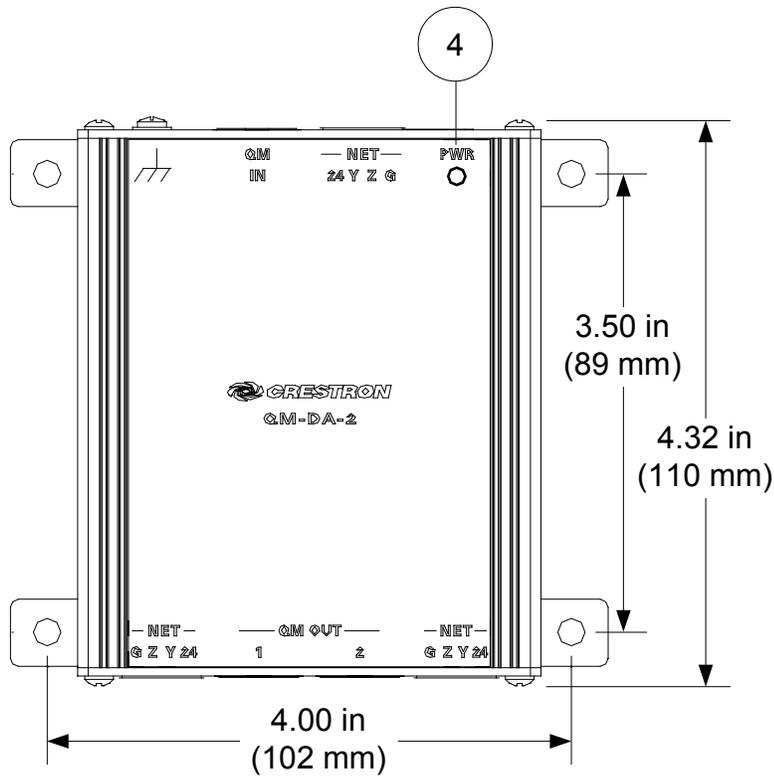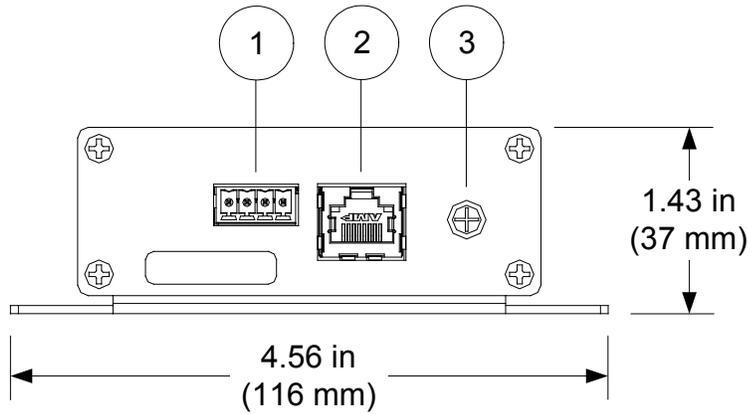
Connectors, Controls & Indicators

#	CONNECTORS[1], CONTROLS & INDICATORS	DESCRIPTION
1	NET[2] 24 Y Z G	(3) 4-pin 3.5 mm detachable terminal blocks; Connects to Cresnet control network **24**: Power (24 Volts DC) **Y**: Data **Z**: Data **G**: Ground
2	QM IN[3, 4, 5] 1 8	(1) 8-wire RJ-45 female, QuickMedia input port; Connects to QM output port of a QM-TX or other QuickMedia device via CresCAT-QM or CresCAT-IM cable
3	GROUND	(1) 6-32 screw, chassis ground lug
4	PWR LED	(1) Green LED, indicates 24 Volts DC power supplied from Cresnet control network
5	QM OUT (1 - 2)[3, 4, 5] 1 8	(2) 8-wire RJ-45 female, QuickMedia output ports; Connect to QM input port of any QuickMedia device via CresCAT-QM or CresCAT-IM cable
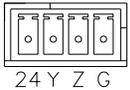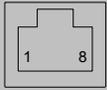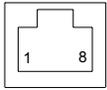
1. Interface connectors for **NET** ports are provided with the unit.
2. Do not connect 24 Volt power to more than one of the **NET** connectors on the QM-DA-2.

3. The eight-pin RJ-45 QuickMedia transport port accepts CAT5E/CAT6 carrying audio, video and microphone signals. The QM ports conform to the 568B wiring standard. Refer to the following table for connector pinouts.

RJ-45 PIN NUMBER	WIRE COLORS (EIA 568B)	QM ASSIGNMENT: RGB	QM ASSIGNMENT: COMPOSITE, S-VIDEO, COMPONENT AND AUDIO
1	WHITE/ORANGE	- RGB RED	- CHROMINANCE ($- P_r$)
2	ORANGE	+ RGB RED	+ CHROMINANCE ($+ P_r$)
3	WHITE/GREEN	- RGB GREEN	- LUMINANCE (- Y)
4	BLUE	+ DIGITAL AUDIO	+ DIGITAL AUDIO
5	WHITE/BLUE	- DIGITAL AUDIO	- DIGITAL AUDIO
6	GREEN	+ RGB GREEN	+ LUMINANCE (+ Y)
7	WHITE/BROWN	- RGB BLUE	- COMPOSITE ($- P_b$)
8	BROWN	+ RGB BLUE	+ COMPOSITE ($+ P_b$)

4. To determine which is pin 1 on the cable, hold the cable so that the end of the eight pin modular jack is facing away from you, with the clip down and the copper side up. Pin 1 is on the far left.

5. For QM wiring, use CresCAT-QM, CresCAT-IM or quality CAT5e/CAT6 cable with a maximum delay skew of 15 ns per 100 m. The maximum aggregate cable length and delay skew between any QM transmitter (origination point) and QM receiver (endpoint) is 450 feet (137 meters) and 22 ns. A maximum of two QM midpoint devices may be inserted into a given QM signal path. Exceptions apply; refer to each respective product manual for details.

Setup

Network Wiring

When wiring the Cresnet® network, consider the following:

- Use Crestron Certified Wire.

- Use Crestron power supplies for Crestron equipment.

- Provide sufficient power to the system.

  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 networks with 20 or more devices, use a Cresnet Hub/Repeater (CNXHUB) to maintain signal quality

For more details, refer to "Check Network Wiring" which starts on page 12.

QuickMedia Wiring

The Crestron QuickMedia cable (sold under the name "CresCAT-QM") contains one CAT5E cable and one Cresnet cable in Siamese jackets. Installation of any QM device is as simple as installing CresCAT-QM wires from the output of one device to the input of another. Installations are flexible, affordable and fast. For more information, refer to the latest version of the Crestron MediaManager Applications Guide (Doc. 6244), which is available from the Crestron website (www.crestron.com/manuals).

CresCAT-QM Cable
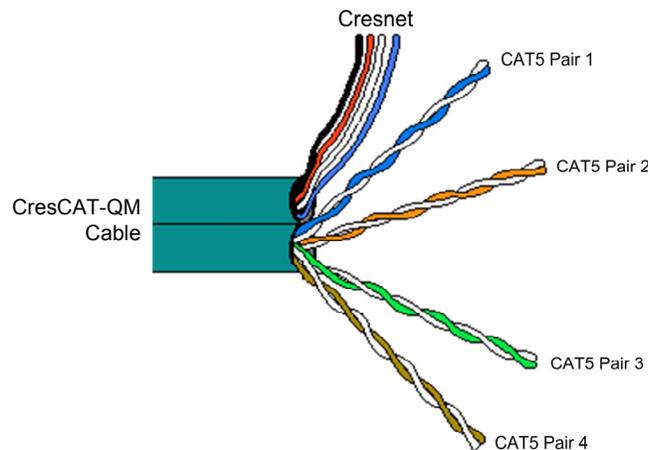
NOTE: Do not untwist the two wires in a single pair for more than 1/3-1/2" (8–12 mm) when making a connection. The twists are critical to canceling out interference between the wires.

The aggregate cable length of a signal path originating at a QM transmitter and terminating at a QM receiver (with a QM-DA-2 in between) must not exceed 450 feet (137 meters). Video signals may experience a loss of quality over very long lengths of cable. This phenomenon is due to the added resistance and capacitance of longer cable lengths and is not peculiar to either Crestron and/or QuickMedia systems. To ensure sufficient bandwidth, the maximum aggregate cable length should not exceed 450 feet. The use of lower-resolution signals may allow increased cable length but must be tested by the installer with the sources to be used. The QM pin assignment is based on the EIA/TIA 568B RJ-45 Jack standard.

NOTE: When transmitting S-video, luminance uses the green video pathway and chrominance uses the red video pathway. When transmitting composite video, the signal is carried on the blue video pathway.

NOTE: When using CresCAT-QM wiring, four additional wires are included for making Cresnet connections.

When connecting multiple QM devices, the route between a QM origination point (transmitter) and a QM endpoint (receiver) cannot have more than two midpoints (e.g. QM-DA-2, QM-MD7x2 or other QM

switchers or distribution amplifiers). Refer to the following diagram when configuring a QM network.

NOTE: The aggregate length from transmitter to receiver cannot have a delay skew of more than 22 ns.

QM Network Topology
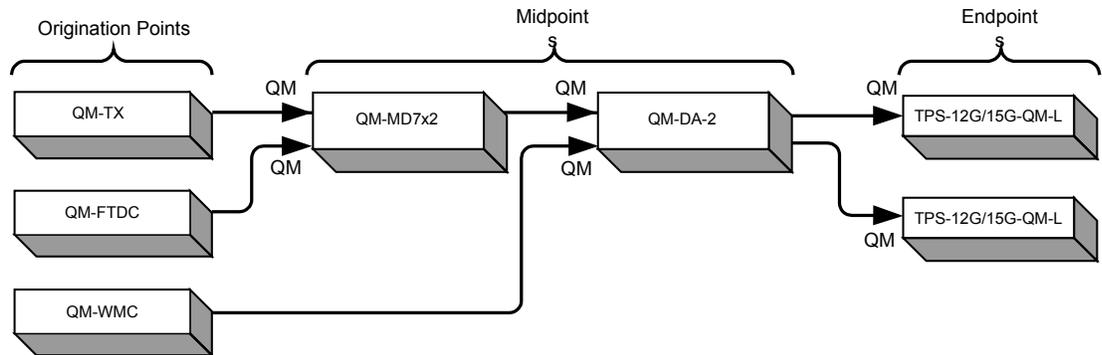
Hardware Hookup

Make the necessary connections as called out in the illustrations that follow this paragraph. Refer to "Network Wiring" on page 7 before attaching the 4-position terminal block connector. Apply power after all connections have been made.

When making connections to the QM-DA-2, use Crestron power supplies for Creston equipment.

Hardware Connections for the QM-DA-2 (Top View)
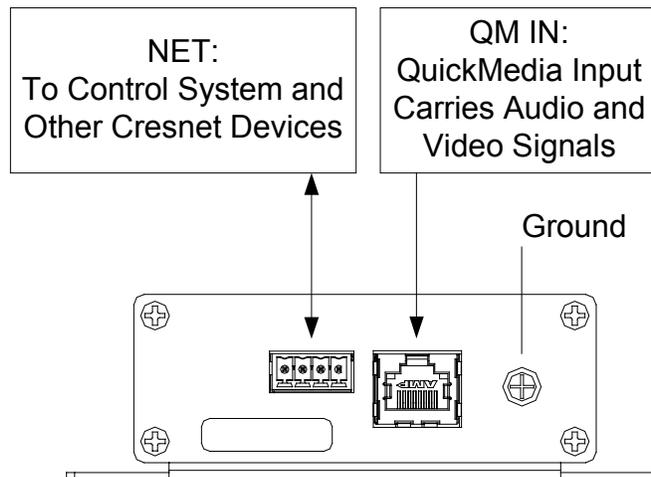
Hardware Connections for the QM-DA-2 (Bottom View)
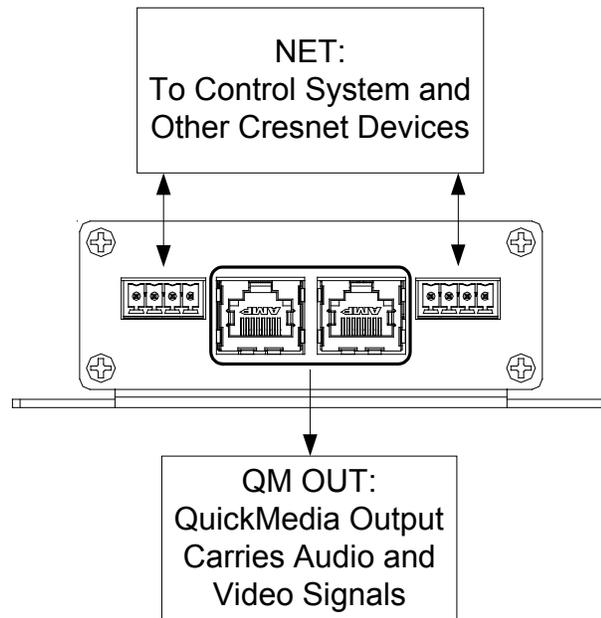
NOTE: Do not connect 24 Volt power to more than one of the **NET** connectors on the QM-DA-2.

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

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

NOTE: For optimum performance, Crestron strongly recommends using CresCAT-QM cable, available from Crestron. Other high quality/low skew CAT5e/CAT6 wiring may also be used with varying performance.

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.

QM-DA-2 Troubleshooting

TROUBLE	POSSIBLE CAUSE(S)	CORRECTIVE ACTION
Device does not function.	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.
	Power is not being supplied via Cresnet.	Ensure power is supplied via one of the Cresnet ports.
Connected QM devices are not receiving power.	Power is not supplied to branch.	Apply sufficient power to branch.
Poor picture or sound quality.	Cables improperly connected.	Verify all QM cables are secure.
	Incorrect skew settings in associated devices.	Use QM Tools software to set correct skew settings for each QM-RMCRX-BA in the system.

(Continued on following page)

QM-DA-2 Troubleshooting (Continued)

TROUBLE	POSSIBLE CAUSE(S)	CORRECTIVE ACTION
Loss of functionality due to electrostatic discharge.	Improper grounding.	Check that all ground connections have been made properly.

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. Please use the Crestron Power Calculator to help calculate how much power is needed for the system (www.crestron.com/calculators).

When calculating the length of wire for a particular Cresnet run, the wire gauge and the Cresnet power usage of each network unit to be connected must be taken into consideration. Use Crestron Certified Wire only. If Cresnet units are to be daisy-chained on the run, the Cresnet power usage of each network unit to be daisy-chained must be added together to determine the Cresnet power usage of the entire chain. If the unit is home-run from a Crestron system power supply network port, the Cresnet power usage of that unit is the Cresnet power usage of the entire run. The wire gauge and the Cresnet power usage of the run should be used in the following equation to calculate the cable length value on the equation's left side.

Cable Length Equation

$$L < \frac{40,000}{R \times P}$$

Where: L = Length of run (or chain) in feet
        R = 6 Ohms (Crestron Certified Wire: 18 AWG (0.75 MM^2))
           or 1.6 Ohms (Cresnet HP: 12 AWG (4 MM^2))
        P = Cresnet power usage of entire run (or chain)

Make sure the cable length value is less than the value calculated on the right side of the equation. For example, a Cresnet run using 18 AWG Crestron Certified Wire and drawing 20 watts should not have a length of run more than 333 feet (101 meters). If Cresnet HP is used for the same run, its length could extend to 1250 feet (381 meters).

NOTE: All Crestron certified Cresnet 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 Y conductor and the Z conductor.

Strip and Tin Wire

When daisy-chaining Cresnet units, strip the ends of the wires carefully to avoid nicking the conductors. Twist together the ends of the wires that share a pin on the network connector and tin the twisted connection. Apply solder only to the ends of the twisted wires. Avoid tinning too far up the wires or the end becomes brittle. Insert the tinned connection into the Cresnet connector and tighten the retaining screw. Repeat the procedure for the other three conductors.

Add Hubs

Use of a Cresnet Hub/Repeater (CNXHUB) is advised whenever the number of Cresnet devices on a network exceeds 20 or when the combined total length of Cresnet cable exceeds 3000 feet (914 meters).

Reference Documents

The latest version of all documents mentioned within the guide can be obtained from the Crestron website (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
MediaManager Applications 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].

You can also log onto the online help section of the Crestron website (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 QM-DA-2, additional information may be made available as manual updates. These updates are solely electronic and serve as intermediary supplements prior to the release of a complete technical documentation revision.

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

Return and Warranty Policies

Merchandise Returns / Repair Service

1. No merchandise may be returned for credit, exchange or service without prior authorization from CRESTRON. To obtain warranty service for CRESTRON products, contact an authorized CRESTRON dealer. Only authorized CRESTRON dealers may contact the factory and request an RMA (Return Merchandise Authorization) number. Enclose a note specifying the nature of the problem, name and phone number of contact person, RMA number and return address.

2. Products may be returned for credit, exchange or service with a CRESTRON Return Merchandise Authorization (RMA) number. Authorized returns must be shipped freight prepaid to CRESTRON, 6 Volvo Drive, Rockleigh, N.J. or its authorized subsidiaries, with RMA number clearly marked on the outside of all cartons. Shipments arriving freight collect or without an RMA number shall be subject to refusal. CRESTRON reserves the right in its sole and absolute discretion to charge a 15% restocking fee plus shipping costs on any products returned with an RMA.

3. Return freight charges following repair of items under warranty shall be paid by CRESTRON, shipping by standard ground carrier. In the event repairs are found to be non-warranty, return freight costs shall be paid by the purchaser.

CRESTRON Limited Warranty

CRESTRON ELECTRONICS, Inc. warrants its products to be free from manufacturing defects in materials and workmanship under normal use for a period of three (3) years from the date of purchase from CRESTRON, with the following exceptions: disk drives and any other moving or rotating mechanical parts, pan/tilt heads and power supplies are covered for a period of one (1) year; touchscreen 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.

This warranty shall be the sole and exclusive remedy to the original purchaser. In no event shall CRESTRON be liable for incidental or consequential damages of any kind (property or economic damages inclusive) arising from the sale or use of this equipment. CRESTRON is not liable for any claim made by a third party or made by the purchaser for a third party.

CRESTRON shall, at its option, repair or replace any product found defective, without charge for parts or labor. Repaired or replaced equipment and parts supplied under this warranty shall be covered only by the unexpired portion of the warranty.

Except as expressly set forth in this warranty, CRESTRON makes no other warranties, expressed or implied, nor authorizes any other party to offer any warranty, including any implied warranties of merchantability or fitness for a particular purpose. Any implied warranties that may be imposed by law are limited to the terms of this limited warranty. This warranty statement supersedes all previous warranties.

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