Crestron **QM-RX1-2G**
QuickMedia® Receiver with Audio
Operations & Installation Guide

CRESTRON®

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

CRESTRON

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Industry Compliance

As of the date of manufacture, the QM-RX1-2G has been tested and found to comply with specifications for CE marking and standards per EMC and Radiocommunications Compliance Labelling.

CE

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 inot 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

Contents

QuickMedia® Receiver with Audio: QM-RX1-2G

Introduction

Crestron® MediaManager is a comprehensive family of affordable products fusing high performance AV signal distribution, device control and facility-wide system management. MediaManager simplifies the art of Pro AV system design and installation with complete hardware, software and low cost wiring solutions.

The QM-RX1-2G is a QuickMedia® (QM) receiver designed to enable cost effective AV signal routing and control as part of a complete MediaManager AV presentation system. Using the Crestron exclusive QuickMedia transport, the QM-RX1-2G receives RGB, video and audio signals over a single inexpensive CAT5e type cable* from a QM Wall Plate, FlipTop Box or Distribution Center or from an MPS Multimedia Presentation System.

*   For QuickMedia wiring use CresCAT®QM, CresCAT®IM or quality CAT5e/CAT6 cable with a delay skew of ≤ 15 ns per 328 feet (100 meters); 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 in a given QM signal path; exceptions apply, refer to each respective product manual for full details.

Features and Functions

- Low-profile surface mount QuickMedia Receiver
- Single cable interface up to 450 feet (137 meters)
- Composite, S-video, component and RGB outputs
- Balanced stereo audio line output
- Built-in 30 watt stereo amplifier
- Onboard digital audio mixing and equalization
- 22 ns delay skew compensation and self-peaking audio
- RS-232, IR, relay and digital in control ports
- Optional power current sensor or occupancy sensor
- QuickMedia® transport and Cresnet® communications
- Low cost, quick and easy installation
- Available in black or white finishes
- Easy setup using Crestron SystemBuilder™ software

Low Profile Design

Its low profile design makes the QM-RX1-2G 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 and sticks out only one inch (25 mm) from the surface. Connections for the display device and speakers are all positioned at the top

and bottom of the receiver, while the QuickMedia cable and screen/lift connections are made behind the unit within the electrical box. A second pair of speaker connections is also provided on the back.

QuickMedia® Transport

The ingenious QuickMedia transport routes all audio, video and RGB computer signals over a single inexpensive CAT5e type cable. Computer resolutions up to 1920 x 1200 pixels at 60 Hz are supported over cable runs up to 450 feet (137 meters). Stereo audio and microphone signals are transmitted digitally with high performance 24-bit resolution. QuickMedia dramatically simplifies system design and installation, affording a higher level of performance at a lower overall cost.

QuickMedia Receiver

Mounted at the video display or projector location, the QM-RX1-2G receives the QuickMedia signal from any QM Transmitter, Distribution Center or MPS system, breaking out each media signal into its respective format to feed the AV inputs on the display device. Wiring for the QM-RX1-2G is extremely simple, requiring just a single CresCAT®QM cable (sold separately).

High-Res Computer and Video

Separate composite, S-video, component and RGBHV outputs deliver high quality video, HDTV and high-resolution computer graphics to the display device. Signal routing occurs automatically under the command of the control system based upon the input source selected at the QM transmitter. Software controllable compensation maximizes image quality over long cable runs.

Professional Audio Features

In addition to video and RGB, the QuickMedia transport carries four channels of 24-bit digital audio comprising a stereo program signal and two discrete microphone signals. Within the QM-RX1-2G, each of the two incoming microphone signals is processed by its own 4-band speech-optimized graphic equalizer. Versatile 4x2 mixing allows the mic signals and stereo program signal to be precisely mixed and routed to the stereo program output.

The balanced line level outputs can be connected directly to inputs on the display device or used to feed a separate amplifier or external powered speakers. A built-in 30 watt stereo amplifier is also provided to drive a pair of speakers directly.

Digital Audio Signal Processing

The QM-RX1-2G eliminates the need for additional outboard audio processing, providing software adjustable volume, bass, treble and mute, plus 10-band graphic equalization and 2-band parametric equalization right onboard. All audio processing and mixing is performed in the digital domain, adjustable at setup using Crestron QM Tools software (part of Crestron Toolbox™). Many parameters can be controlled in real time from a keypad or touchpanel and numerous presets can be saved for instant recall to reconfigure settings for changing room conditions or varying source material.

Display Device Control

Bi-directional RS-232 and IR/Serial ports are included to enable full control of the display device without additional wiring. Two relay ports are also included for control of a projection screen or lift and the digital input port can accommodate a room occupancy sensor or power sensor for enhanced automation and monitoring.

MediaManager System Integration

Whether using just one QM receiver or several, complete system operation can be made transparent to the end user with all signal routing occurring smoothly under the command of the MediaManager control system. Complete MediaManager systems are easy to design, program and adjust from start to finish using Crestron SystemBuilder™ software.

Applications

The following diagram shows a QM-RX1-2G in a lecture hall.

QM-RX1-2G in a Lecture Hall Application
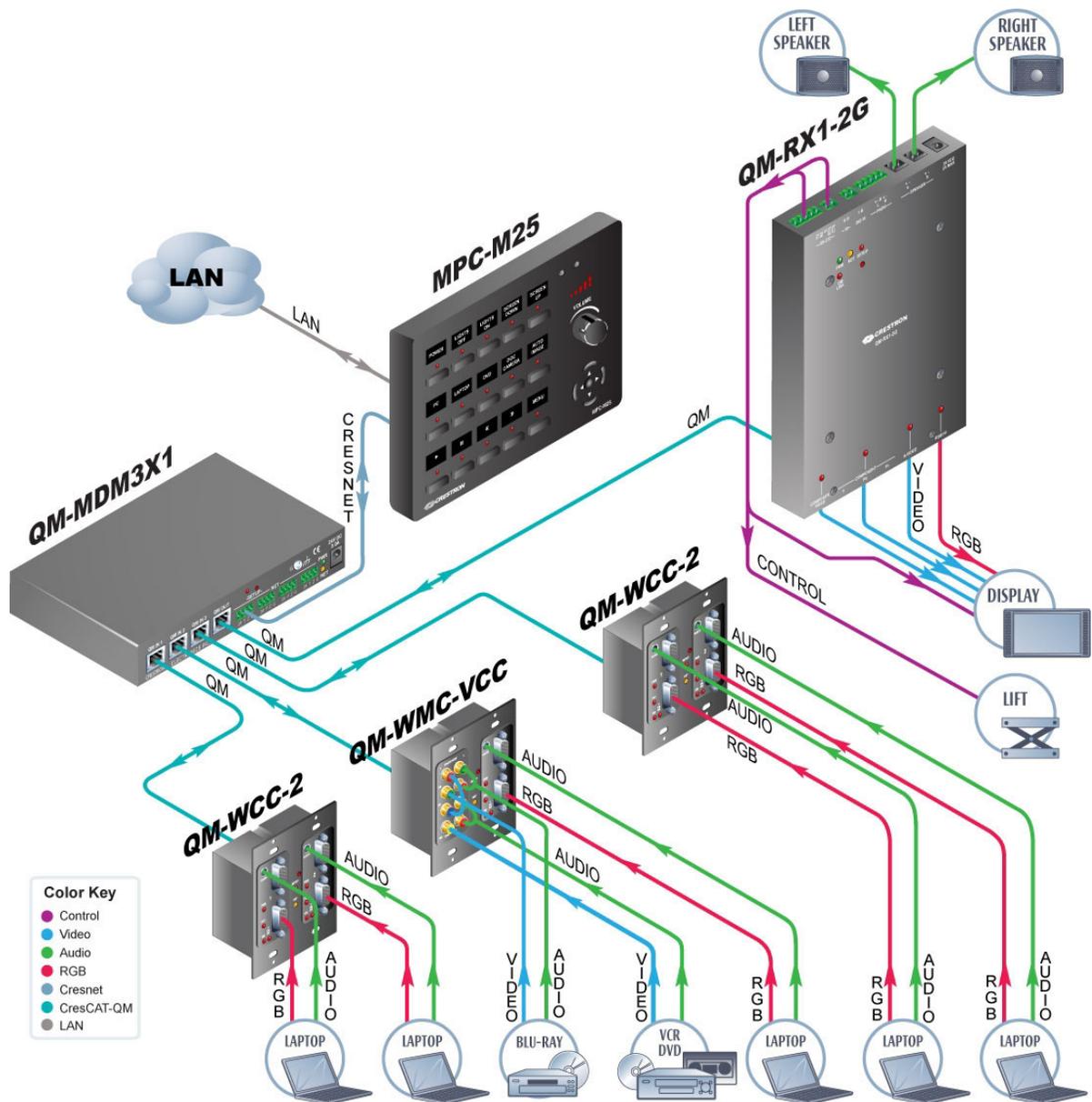
For more information on this and other QM applications, refer to the latest revision of the Crestron MediaManager Applications Guide (Doc. 6244), which is available from the Crestron website (www.crestron.com/manuals).

Specifications

Specifications for the QM-RX1-2G are listed in the following table.

QM-RX1-2G Specifications

SPECIFICATION	DETAILS
Video	
Signal Types	RGB and composite, S-video or component video
Video/HDTV Formats	NTSC or PAL, HDTV up to 1080i/1080p
RGB Formats	RGBHV, RGBS, RG$_S$B
Gain	0 dB (75 Ω terminated)
Maximum Resolution	1920 x 1200 @ 60 Hz (at unity gain) with maximum cable length of 450 feet (137 meters) and maximum compensation
QM Cable Compensation	10-bit digitally controlled PEAK (bandwidth) and BOOST (frequency); 4-bit digitally controlled SKEW delay, 0 to 22 ns (independent for R/P$_r$, G/Y and B/P$_b$)
Audio	
Features	4x2 mic/program matrix mixer, two channels mic EQ, stereo volume/tone control and EQ, integrated power amplifier, QM auto-compensation with self-peaking
D-A Conversion	24-bit, 48 kHz
Output Volume Range	-80 dB to +20 dB, 0.1 dB steps
Mixer Volume Range	-80 dB to 0 dB, 0.1 dB steps
Input Compensation	±10 dB, 0.1 dB steps
Mic EQ Filter Gain	±12 dB, 0.1 dB steps
Mic EQ Filter Center Frequencies	160, 500, 1.2k, 3k Hz
Bass Gain Range	±15 dB @ 100 Hz, 0.5 dB steps
Treble Gain Range	±15 dB @ 10 kHz, 0.5 dB steps
Output Equalization	10-band graphic + 2-band parametric
GEQ Filter Center Frequencies	31, 63, 125, 250, 500, 1K, 2k, 4k, 8k, 16k Hz
GEQ Filter Gain	±12 dB, 0.1 dB steps
PEQ Filter Gain	±12 dB, 0.1 dB steps
PEQ Filter Bandwidth	0.1 to 3.0 octaves, 0.1 octave steps
PEQ Filter Center Frequency	25 Hz to 20 kHz, 1 Hz steps
PEQ Filter Types	Low Pass, High Pass, Peaking EQ, Notch, Treble Shelf, Bass Shelf
Frequency Response	20 Hz to 20 kHz, ±0.5 dB
S/N Ratio	94 dB (line), 90 dB (speaker) 20 Hz to 20 kHz A-weighted
THD+N	0.05% (line, 0.7% (speaker) 20 Hz to 20 kHz

(Continued on following page)

QM-RX1-2G Specifications (Continued)

| SPECIFICATION	DETAILS
Power Requirements	
Power Consumption	2 Amps @ 24 Volts DC (power supply sold separately[1])
Cresnet Power Usage	30 Watts (1.25 Amps @ 24 Volts DC)
Available Cresnet Power	None
Default Net ID	17
Minimum 2-Series Control System Update File[2, 3]	Version 3.155.1240 or later
Environmental	
Temperature	41º to 104º F (5º to 40º C)
Humidity	10% to 90% RH (non-condensing)
Heat Dissipation	102 BTU/Hr
Enclosure	
Chassis	Metal, white or black matte powder coat finish, vented sides
Mounting	Mounts to a 2-gang electrical box, 2-gang UK (BS 4662) electrical box or 2-gang European (DIN 49073) electrical box
Dimensions	
Height	8.33 in (21.15 cm)
Width	5.97 in (15.14 cm)
Depth	1.61 in (4.08 cm)
Weight	31 oz (873 g)
Available Models	
QM-RX1-2G-B-T	QuickMedia Receiver with Audio, Black
QM-RX1-2G-W-T	QuickMedia Receiver with Audio, White
Available Accessories	
CNSP-XX	Custom Serial Interface Cable
CNXRMCS	Current Sensor
CresCAT-IM	iMedia Cable
CresCAT-QM	QuickMedia Cable
Cresnet	Cresnet Control Cable
IRP2	IR Probe
PW-2420RU	50 Watt Regulated Universal Power Supply

1. May be powered by Cresnet or external power supply but not both.
2. The latest software versions can be obtained from the Crestron website. Refer to the NOTE following these footnotes.
3. 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 website 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).
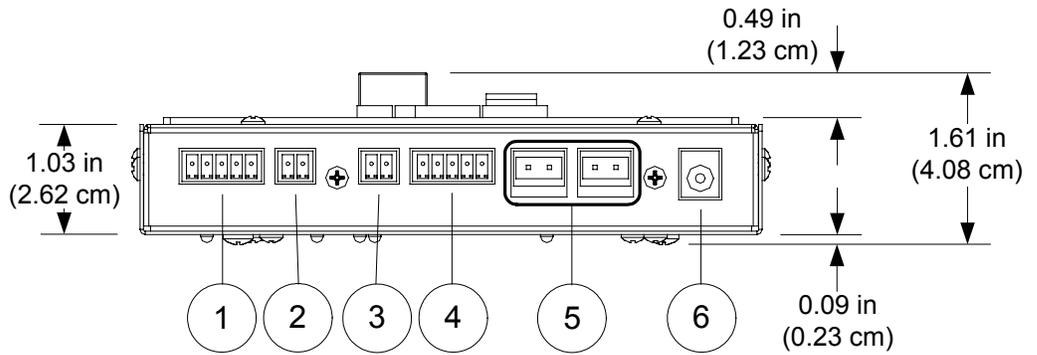
Physical Description

This section provides information on the connections, controls and indicators available on your QM-RX1-2G.
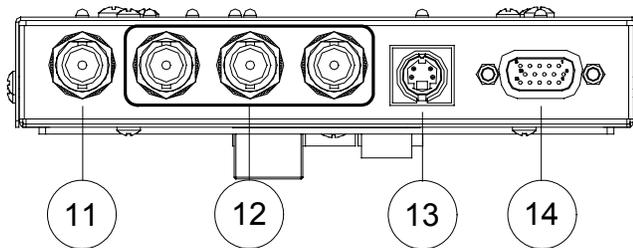
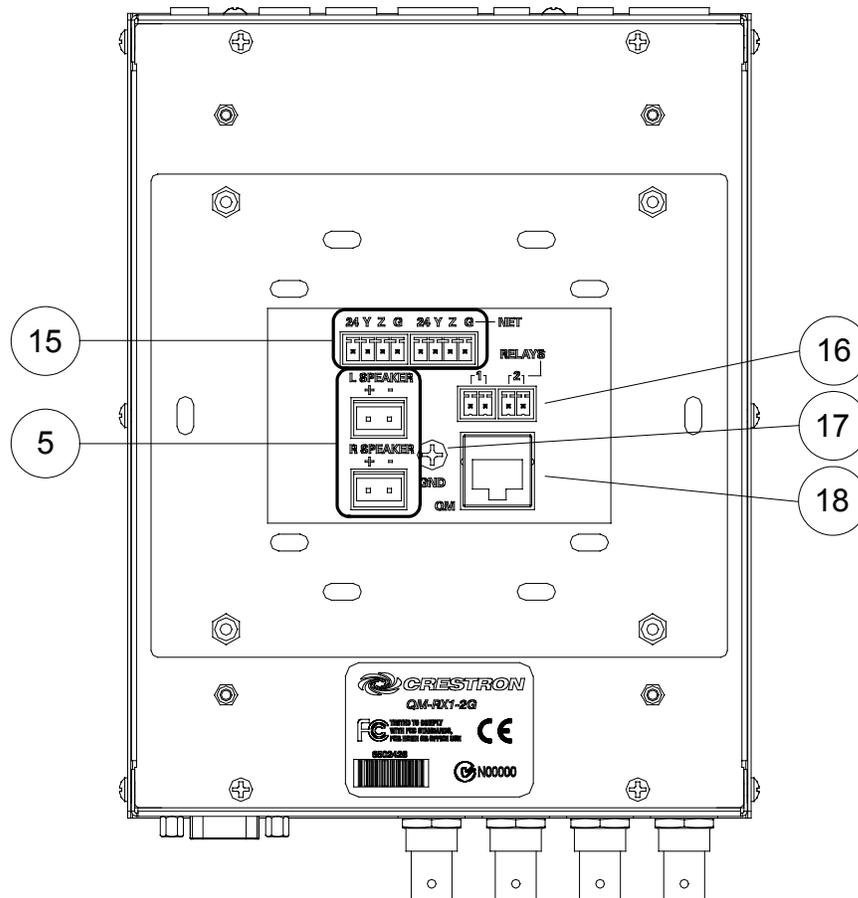*QM-RX1-2G Overall Dimensions (Front View)*
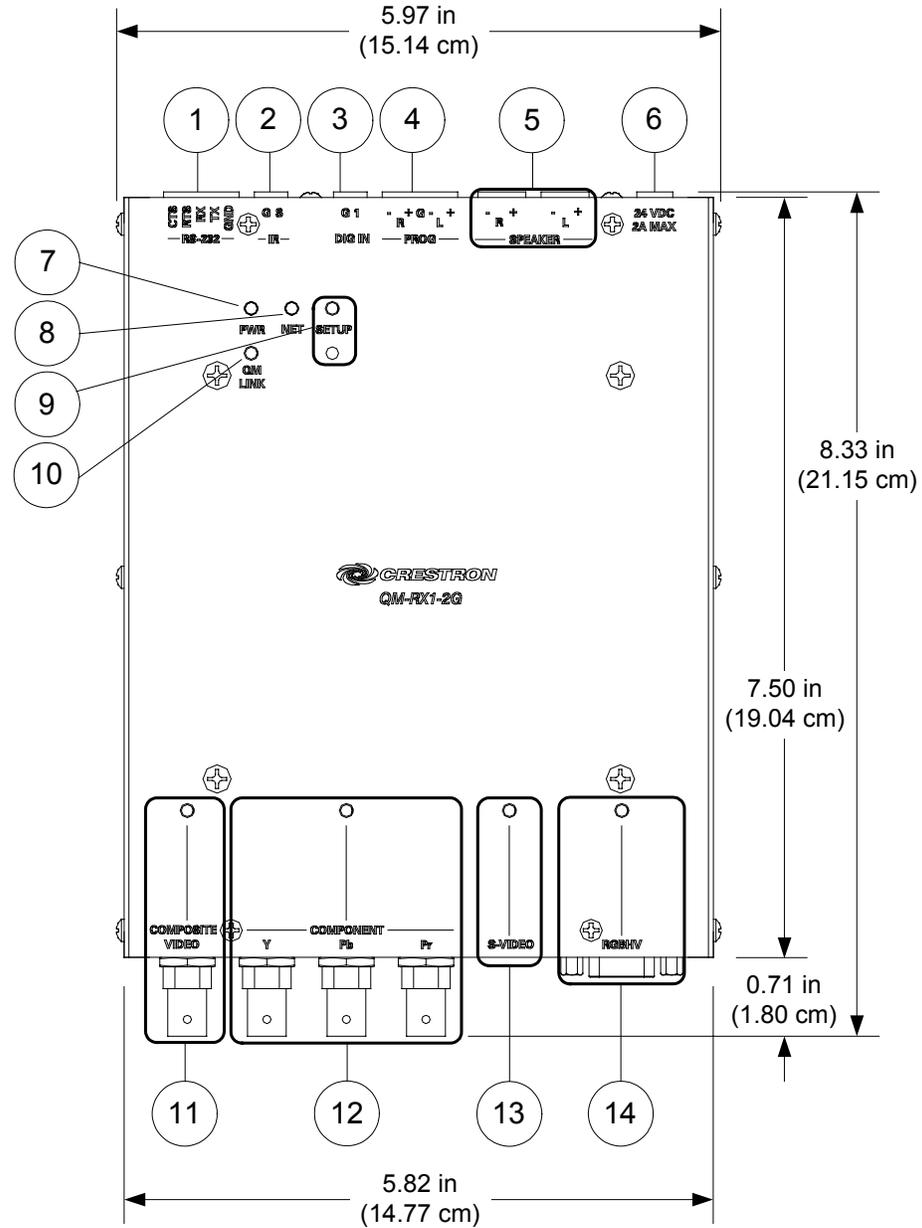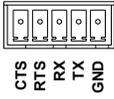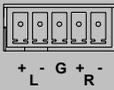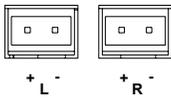
QM-RX1-2G Overall Dimensions (Top View)

QM-RX1-2G Overall Dimensions (Bottom View)
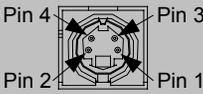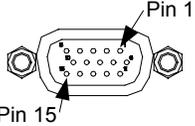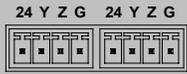

QM-RX1-2G Overall Dimensions (Rear View)

Connectors, Controls & Indicators

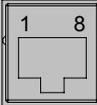| #	CONNECTORS[1], CONTROLS & INDICATORS	DESCRIPTION
1	RS-232 CTS RTS RX TX GND	(1) 5-pin 3.5 mm detachable terminal block; Bidirectional RS-232 port; Up to 115.2k baud, hardware and software handshaking support <table><tr><th>PIN</th><th>DESCRIPTION</th></tr><tr><td>1</td><td>GND</td></tr><tr><td>2</td><td>TX</td></tr><tr><td>3</td><td>RX</td></tr><tr><td>4</td><td>RTS</td></tr><tr><td>5</td><td>CTS</td></tr></table>
2	IR[2] S G	(1) 2-pin 3.5 mm detachable terminal block; IR/Serial output port; IR output up to 1.1 MHz; 1-way serial TTL/RS-232 (0 - 5 Volts) up to 115.2k baud
3	DIG IN 1 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 2.2 kΩ pulled up to 5 Volts DC; Logic threshold 2.5 Volts DC nominal with 1 Volt hysteresis band
4	PROG + - G + - L R	(1) 5-pin 3.5 mm detachable terminal block; Stereo balanced line level audio output; Output impedance: 200 Ω balanced, 100 Ω unbalanced; Maximum output level: 4 V_{rms} balanced, 2 V_{rms} unbalanced
5	SPEAKER + - + - L R	(2) 2-pin 5 mm detachable terminal blocks; Left and right speaker level audio outputs; Rear and bottom **SPEAKER** connectors are paralleled; Wire size: Connector accepts 12 AWG maximum; Output power: 15 watts per channel at 8 Ω (4 Ω stable)
6	24 VDC 2A MAX[3]	(1) 2.1 mm barrel DC power jack, 24 Volt DC power input (power supply sold separately)
7	PWR LED	(1) Green LED, indicates operating power supplied from Cresnet network or external power supply
8	NET LED	(1) Amber LED, indicates communication with the Cresnet system
9	SETUP (LED and button)	(1) Red LED and pushbutton, used to set up connection with the control system via Cresnet

(Continued on following page)

Connectors, Controls & Indicators (Continued)

#	CONNECTORS[1], CONTROLS & INDICATORS	DESCRIPTION
10	QM LINK LED	(1) Red LED, indicates presence of a digital audio signal to signify a valid QM connection
11	COMPOSITE VIDEO (and LED)	(1) BNC female, composite video output; Output level: 1.0 V_{p-p}; Output impedance: 75 Ω; (1) Red LED, indicates **COMPOSITE VIDEO** output is active
12	COMPONENT Y, P_b, P_r (and LED)	(3) BNC female, component (YP_bP_r) video output; Output level: 1.0 V_{p-p}; Output impedance: 75 Ω; (1) Red LED, indicates **COMPONENT** output is active
13	S-VIDEO (and LED) Pin 4 Pin 3 Pin 2 Pin 1	(1) 4-pin mini DIN female, S-video (Y/C) output; Output level: 1.0 V_{p-p} (luma), 0.7 V_{p-p} (chroma) Output impedance: 75 Ω; (1) Red LED, indicates **S-VIDEO** output is active *S-video DIN connector pin assignments*
14	RGBHV[4] (and LED) Pin 1 Pin 15	(1) DB15HD female, RGB video output; Formats: RGBHV, RGBS, RG_SB, YP_bP_r Output level: 1 V_{p-p} nominal; Sync level: 5 V_{p-p} nominal; Output impedance: 75 Ω; H/V Sync impedance: 100 Ω; (1) Red LED, indicates **RGBHV** output is active
15	NET[3] 24 Y Z G 24 Y Z G	(2) 4-pin 3.5 mm detachable terminal blocks; Cresnet slave ports (paralleled) Connect to Cresnet control network via CresCAT-QM or Cresnet cable **24**: Power (24 Volts DC) **Y**: Data **Z**: Data **G**: Ground
16	RELAYS ⌐1⌐ ⌐2⌐	(2) 2-pin 3.5 mm detachable terminal blocks; Normally open, isolated relays; Rated 1 Amp, 30 Volts AC/DC; MOV arc suppression across contacts

S-video DIN connector pin assignments

PIN	DESCRIPTION
1	Luminance Ground
2	Chrominance Ground
3	Luminance
4	Chrominance

(Continued on following page)

Connectors, Controls & Indicators (Continued)

#	CONNECTORS[1], CONTROLS & INDICATORS	DESCRIPTION
17	GND ⊚	(1) 6-32 screw, chassis ground lug
18	QM[5] 1 8	(1) 8-wire RJ-45 female, QuickMedia input port; Connects to QM output port of any QuickMedia device via CresCAT-QM or CresCAT-IM cable[6]

1. Interface connectors for **RS-232**, **IR**, **DIG IN**, **PROG**, **NET, SPEAKER** and **RELAY** ports are provided with the unit.
2. Transmission levels on the infrared – serial output connectors are in the 0 to +5 VDC range, which may not be compatible with all RS-232 devices.
3. The QM-RX1-2G can be powered via the **24 VDC** jack or the **NET** port. Be sure to use a Crestron approved power supply as another may cause damage.
4. Refer to the following table for RGBHV connector pinouts.

PIN	DESCRIPTION	PIN	DESCRIPTION
1	Red Signal	9	N/C
2	Green Signal	10	Sync Ground
3	Blue Signal	11	ID0 (Ground)
4	Reserved	12	ID1 (No Connection)
5	Ground	13	Horizontal Sync
6	Red Ground	14	Vertical Sync
7	Green Ground	15	No Connection
8	Blue Ground		

5. The eight-pin RJ-45 QuickMedia transport port accepts CAT5E/CAT6 carrying audio, video and microphone signals. The QM input port conforms 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 ($+ P_b$)

6. For QuickMedia wiring use CresCAT-QM, CresCAT-IM or quality CAT5e/CAT6 cable with a delay skew of $\leq$ 15 ns per 328 feet (100 meters); 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 in a given QM signal path; exceptions apply, refer to each respective product manual for full 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 24.

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 revision of the Crestron MediaManager Applications Guide (Doc. 6244), which is available from the Crestron website.

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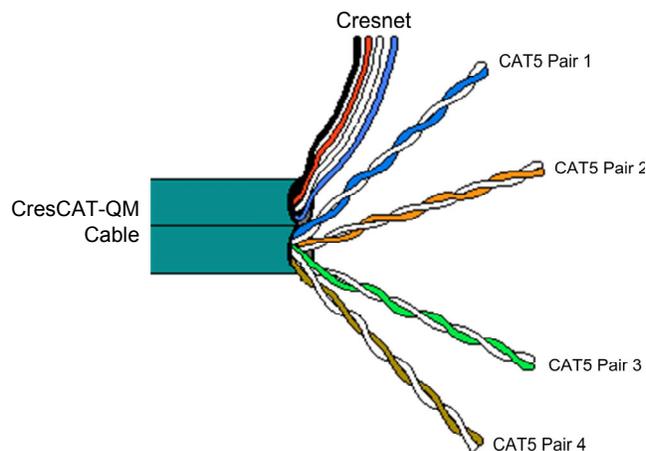
NOTE: Do not untwist the two wires in a single pair for more than 1/3-1/2" (8-12 mm) when making a connection. The twists are critical to canceling out interference between the wires.

The aggregate cable length of a signal path originating at a QM transmitter and terminating at a QM-RX1-2G 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-MD7x2 or other QM switchers). 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
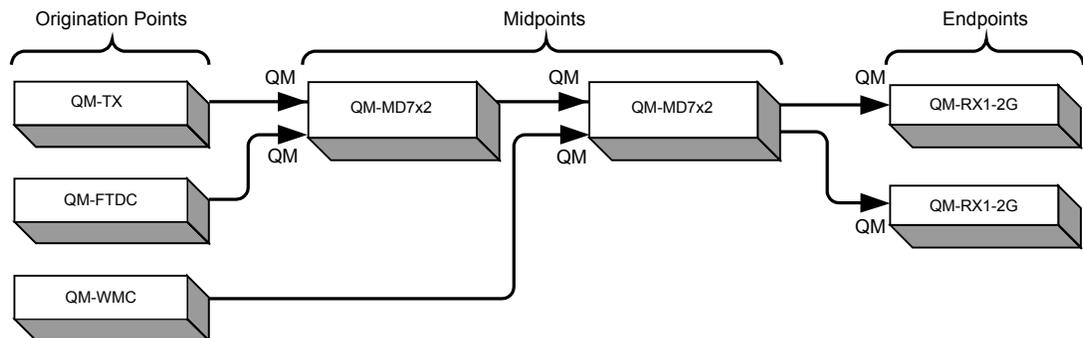
Identity Code

The Net ID of the QM-RX1-2G has been factory set to **17**. The Net IDs of multiple QM-RX1-2G devices in the same system must be unique. Net IDs are changed from a personal computer (PC) via Crestron Toolbox™ (refer to "Establishing Communication" on page 21).

When setting the Net ID, consider the following:

- The Net ID of each unit must match an ID code specified in the SIMPL™ Windows® program.

- Each network device must have a unique Net ID.

For more details, refer to the Crestron Toolbox help file.

Supplied Hardware

The hardware supplied with the QM-RX1-2G is listed in the following table.

Supplied Hardware for the QM-RX1-2G

DESCRIPTION	PART NUMBER	QUANTITY
Mounting Plate	2021253	1
Screws, 06-32 x 1", Slot	2013235	4
Screws, 06-32 x 1", Pan, Phil	2007250	4

Installation

The QM-RX1-2G should be used in a well-ventilated area. The venting holes should not be obstructed under any circumstances.

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

The following tools are required for installation of a QM-RX1-2G:

- Standard 2-gang electrical box (not included)
- Slot screwdriver
- Phillips screwdriver

After the wiring has been installed and verified, using the following procedure to install the QM-RX1-2G in a standard, 2-gang electrical box. Refer to the illustration on the following page.

1. Turn system power **OFF**.

2. Use the four included 06-32 x 1" slot head screws (2013235) to attach the mounting plate (2021253) to the electrical box.

NOTE: Ensure the unit is properly grounded.

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3. Attach cables to the rear of the QM-RX1-2G. Refer to "Hardware Hookup" which starts on page 15.

4. Use the four included 06-32 x 1" Phillips head screws (2007250) to attach the QM-RX1-2G to the mounting plate.

CAUTION: Excess wire that is pinched between the QM-RX1-2G and the electrical box could short out. Make sure all excess wire is completely inside the electrical box and not between the box and the QM-RX1-2G.

Installing the QM-RX1-2G

2-Gang Electrical Box
(Not supplied)

Screws (4) 06-32 x 1"
(2013235)

Screws (4) 06-32 x 1"
(2007250)

Mounting Plate
(2021253)
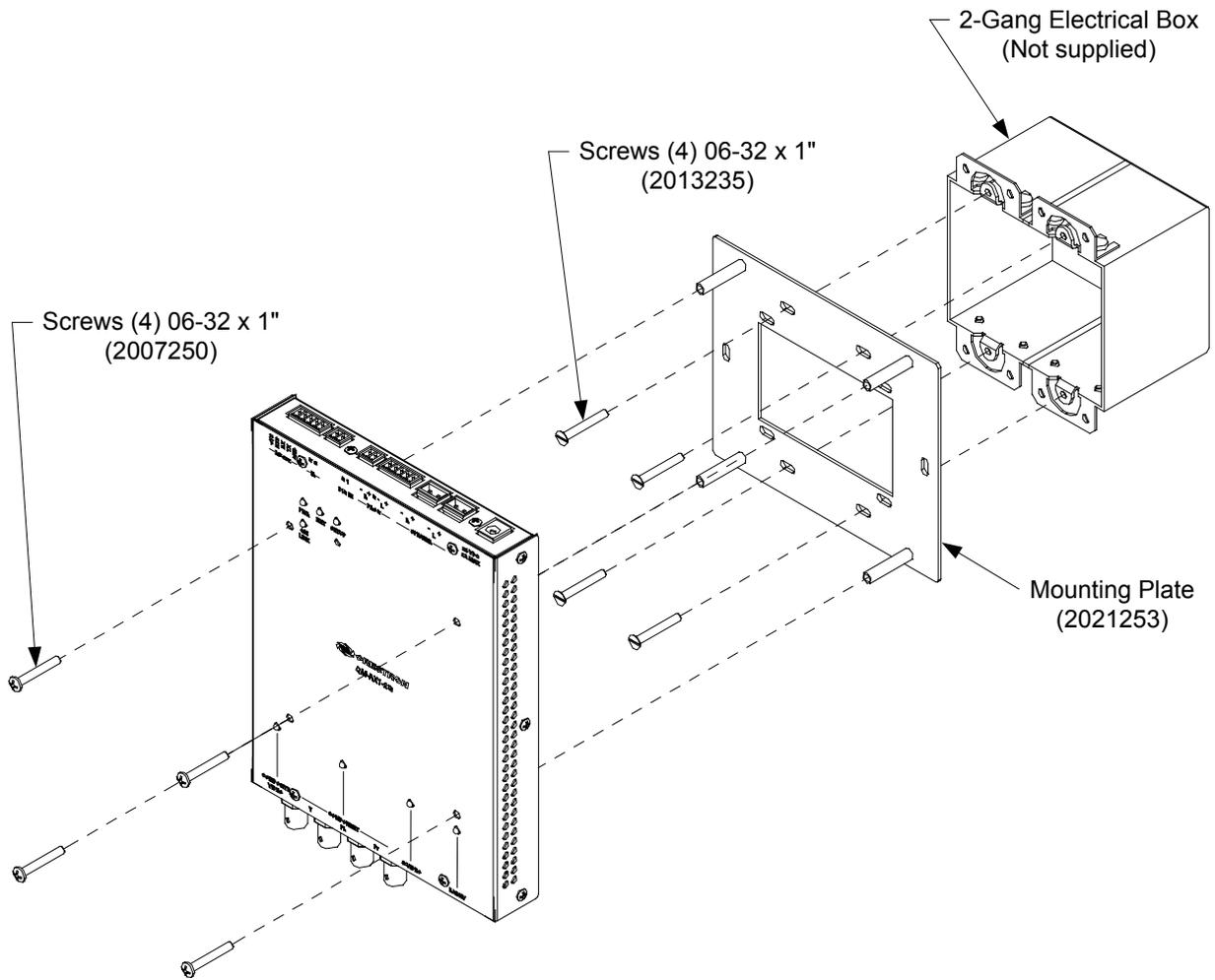
Hardware Hookup

Connect the Device

Make the necessary connections as called out in the illustration that follows this paragraph. Refer to "Network Wiring" on page 11 before attaching the 4-position terminal block connector. Apply power after all connections have been made.

When making connections to the QM-RX1-2G, use Crestron power supplies for Crestron equipment.

Hardware Connections for the QM-RX1-2G (Top View)
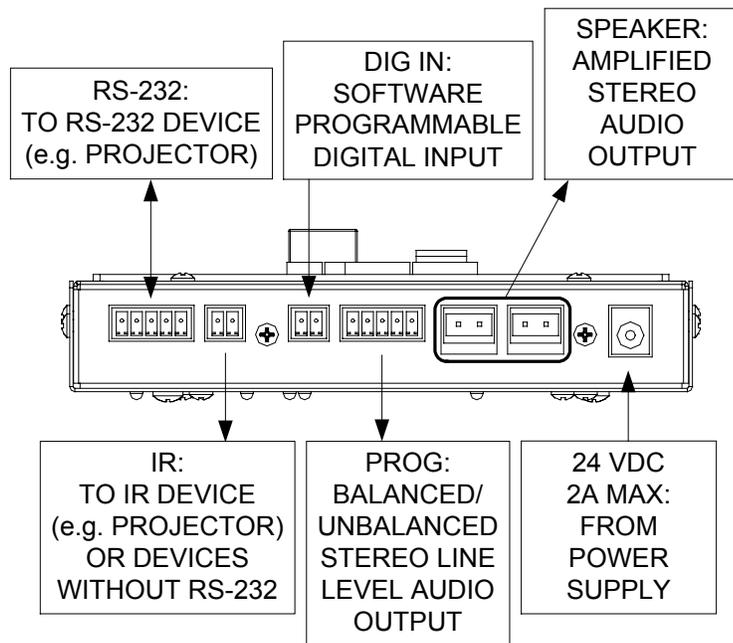
Hardware Connections for the QM-RX1-2G (Bottom View)
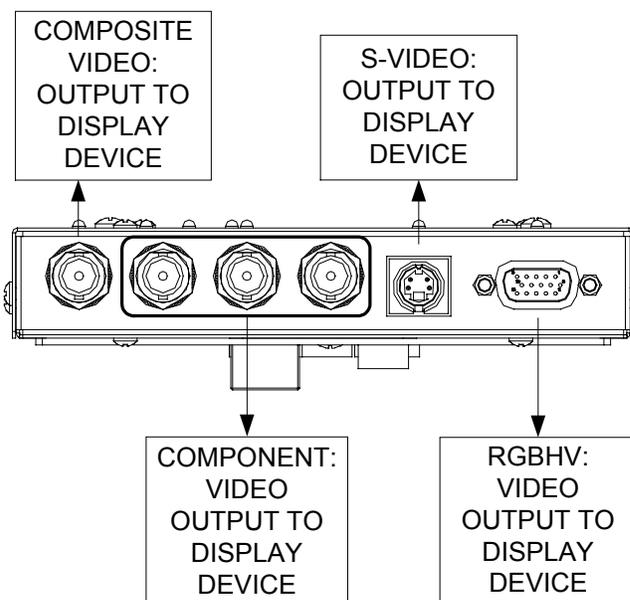
Hardware Connections for the QM-RX1-2G (Rear View)

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

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.
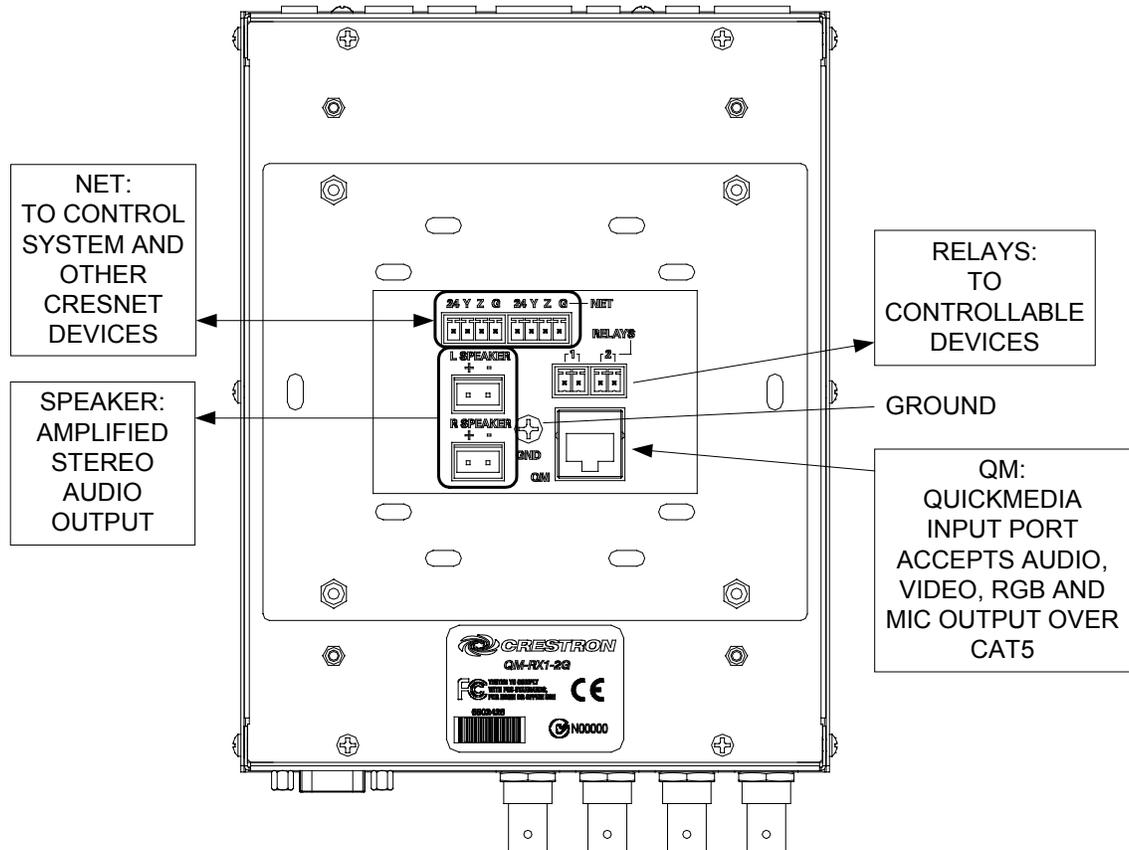
NOTE: The maximum continuous current from equipment under any external load conditions shall not exceed a current limit that is suitable for the minimum wire gauge used in interconnecting cables. The ratings on the connecting unit's supply input should be considered to prevent overloading the wiring.

NOTE: If power is applied to the QM-RX1-2G while it is connected to a control system that is not running a program, connected to a control system that is running a program where the device is not defined or it is not connected to a control system, it will route any video signal it receives to the appropriate outputs. As an indication, all the video LEDs on the front panel will be illuminated. This allows the installer to test all video outputs prior to loading the program.

A balanced/unbalanced audio output is provided, utilizing a five-pin terminal block connector. For connection details, refer to the following table and diagrams.

Audio Connections

SIGNAL NAME	BALANCED AUDIO OUTPUT	UNBALANCED AUDIO OUTPUT
+	1 +	1 + Out
-	1 -	Open
G	Shield/ground	Common ground
+	2 +	2 + Out
-	2 -	Open

Typical Balanced/Unbalanced Outputs
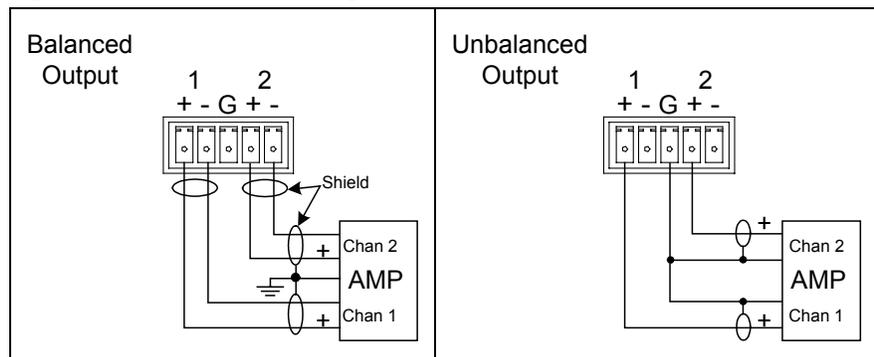
Ground Wire Connections

Proper grounding is required. Connect the ground from the QM transmitter to earth ground. Connect the Cresnet shield at the QM-RX1-2G to the chassis ground provided on the QM-RX1-2G. The QM-RX1-2G chassis must also be connected to an earth ground (building steel). Refer to the following grounding diagram.
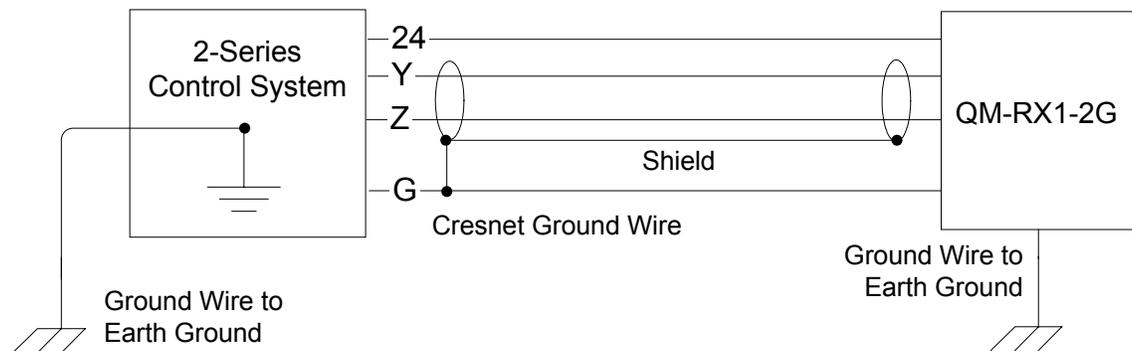
Ground Wire Connections

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 website. To post a question or view questions you have submitted to Crestron's True Blue Support, log in at http://support.crestron.com. 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 website.

Crestron has developed an assortment of Windows®-based software tools to develop a Cresnet system. For the minimum recommended software versions, visit the Version Tracker page of the Crestron website (www.crestron.com/versiontracker).

Programming with Crestron SystemBuilder

Crestron SystemBuilder is the easiest method of programming but does not offer as much flexibility as SIMPL Windows. For additional details, download SystemBuilder from the Crestron website and examine the extensive help file.

Programming with SIMPL Windows

NOTE: While SIMPL Windows can be used to program the QM-RX1-2G, it is recommended to use SystemBuilder and Digital Media Tools software for configuring a QuickMedia system.

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

Configuration Manager

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

- To incorporate the QM-RX1-2G into the system, drag the QM-RX1-2G from the Cresnet Control Modules | QM Series folder of the *Device Library* and drop it in the *System Views*.

Locating the QM-RX1-2G in the Device Library

Crestron Devices (DvcLib 584)
  Control Systems
  Cresnet Control Modules
      Cresnet Audio Modules
      Cresnet Camera Control Modules
      Cresnet I/O Control & Other Modules

      QM Series
          QM-AE
          QM-AMP3x80
          QM-FTCC

          QM-RX1-2G ←
          QM-TX
          QM-TX2-CC

  Wireless Receivers
  Wireless Remotes
  User Devices
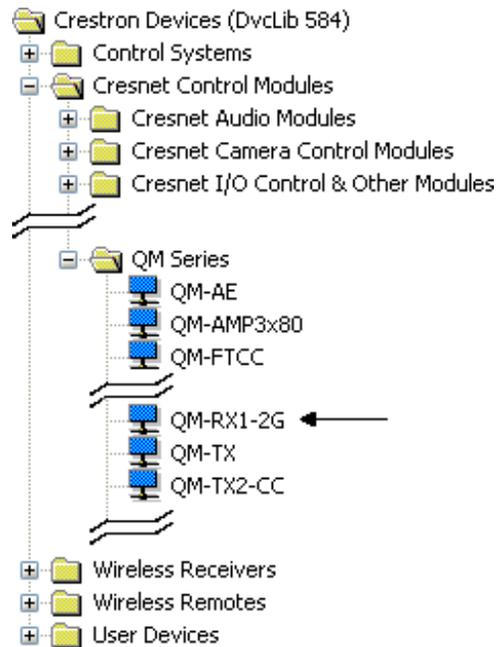
- The system tree of the control system displays the device in the appropriate slot with a default Net ID as shown in the following illustration.
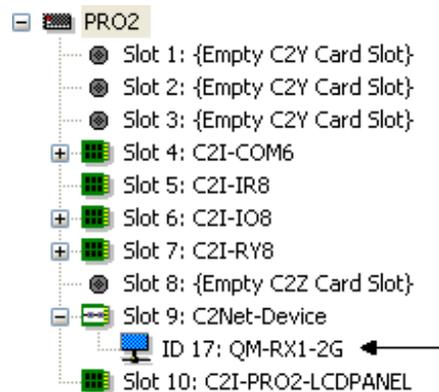
C2Net Device, Slot 9

PRO2
    Slot 1: {Empty C2Y Card Slot}
    Slot 2: {Empty C2Y Card Slot}
    Slot 3: {Empty C2Y Card Slot}
    Slot 4: C2I-COM6
    Slot 5: C2I-IR8
    Slot 6: C2I-IO8
    Slot 7: C2I-RY8
    Slot 8: {Empty C2Z Card Slot}
    Slot 9: C2Net-Device
        ID 17: QM-RX1-2G ←
    Slot 10: C2I-PRO2-LCDPANEL

- Additional QM-RX1-2G devices are assigned different Net ID numbers as they are added.

- If necessary, double click a device to open the "Device Settings" window and change the Net ID, as shown in the following figure.

"QM-RX1-2G Device Settings" Window
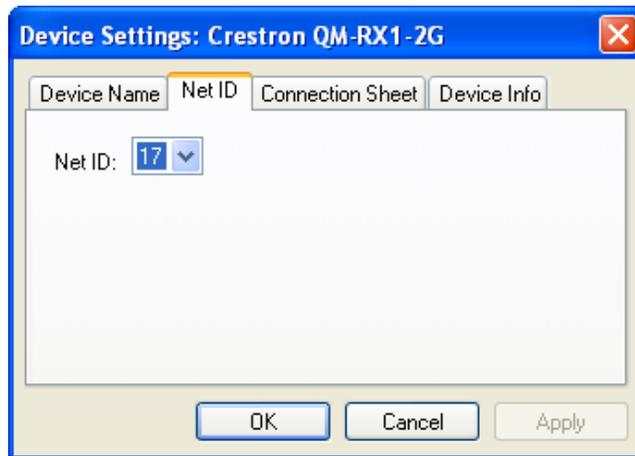
- The ID code specified in the SIMPL Windows program must match the Net ID of each unit. Refer to "Identity Code" on page 12.

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 on the icon or dragging it into *Detail View*. Each signal in the symbol is described in the SIMPL Windows help file (**F1**).

Example Program

An example program for the QM-RX1-2G is available from the Crestron website (www.crestron.com/exampleprograms).

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, programs or firmware) can be transferred to the control system (and/or device). Finally, program checks can be performed (such as changing the device ID or creating an IP table) to ensure proper functioning.

Establishing Communication

Use Crestron Toolbox for communicating with the QM-RX1-2G; refer to the Crestron Toolbox help file for details. There is a single method of communication: indirect communication.

Indirect Communication
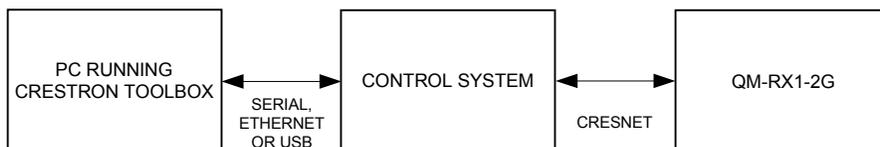
QM-RX1-2G connects to control system via Cresnet:

1. Establish communication between the PC and the control system as described in the latest version of the 2-Series Control Systems Reference Guide (Doc. 6256).

2. Use the Address Book in Crestron Toolbox to create an entry for the QM-RX1-2G using the expected communication protocol (Indirect). Select the Cresnet ID of the QM-RX1-2G and the address book entry of the control system that is connected to the QM-RX1-2G.

3. Display the QM-RX1-2G's "System Info" window (click the ![icon] icon); communications are confirmed when the device information is displayed.

Programs and Firmware

Program or firmware files may be distributed from programmers to installers or from Crestron to dealers. Firmware upgrades are available from the Crestron website as new features are developed after product releases. One has the option to upload programs via the programming software or to upload and upgrade via the Crestron Toolbox. For details on uploading and upgrading, refer to the SIMPL Windows help file or the Crestron Toolbox help file.

SIMPL Windows

If a SIMPL Windows program is provided, it can be uploaded to the control system using SIMPL Windows or Crestron Toolbox.

Firmware

Check the Crestron website 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.)

Upgrade QM-RX1-2G firmware via Crestron Toolbox.

1. Establish communication with the QM-RX1-2G and display the "System Info" window.

2. Select **Functions | Firmware…** to upgrade the QM-RX1-2G firmware.

Program Checks

Using Crestron Toolbox, display the network device tree (**Tools | Network Device Tree**) to show all network devices connected to the control system. Right-click on the QM-RX1-2G to display actions that can be performed on the QM-RX1-2G.

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-RX1-2G 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.
	Net ID is not correct.	Verify the Net ID in Toolbox.
	Net ID is not set to match the Net ID specified in SIMPL Windows.	Verify Net ID matches the Net ID set in the SIMPL Windows program.
	Net ID is the same as another device's Net ID	Assign a different Net ID.
PWR LED does not illuminate.	Not receiving power.	Verify Cresnet (or included power supply) is properly attached.
No video output displayed.	Incorrect cable connection.	Verify video, S-video, RGB output cable connection.
		Verify QM input cable connection is secure.
Wrong source or video displayed.	Wrong SystemBuilder or SIMPL Windows program.	Verify and upload correct program.
	SystemBuilder project not set up correctly.	Verify proper video set up for each video output.
Video from RGB source is garbled or no output..	Incorrect cable connections.	Verify 15-pin output cable connection. Verify QM input cable connection.
	Signal skew due to cable length or unequal pair length.	Verify maximum QM cable length and compensation for skew.

(Continued on following page)

TROUBLE	POSSIBLE CAUSE(S)	CORRECTIVE ACTION
Hum on audio and/or mic.	Grounding problem.	Check that all ground connections have been made properly. Refer to "Ground Wire Connections" on page 17.
Loss of functionality due to electrostatic discharge.		

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
2-Series Control Systems Reference Guide
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-RX1-2G, 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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