Crestron **QM-FTCC**
FlipTop Computer Center
Operations & Installation Guide

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

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FlipTop Computer Center: QM-FTCC

Introduction

Features and Functions

The QM-FTCC FlipTop Computer Center is part of the Crestron MediaManager™ line of network devices, room control systems and signal routing solutions. It is available in six different models.

Models

DESCRIPTION	MODEL NUMBER	COLOR
Domestic Models with Keypad	QM-FTCC-B	Black
	QM-FTCC-BALUM	Brushed Aluminum
Domestic Models without Keypad	QM-FTCC-NB-B	Black
	QM-FTCC-NB-BALUM	Brushed Aluminum
International Models with Keypad	QMI-FTCC-B	Black
	QMI-FTCC-BALUM	Brushed Aluminum

The international models accommodate a wide variety of international AC adaptors. For simplicity within this guide, the color/button suffix and international designation are omitted and QM-FTCC is used except where noted.

Functional Summary

- Built-in engravable* keypad with 10 to 20 buttons with LEDs
- One AC power passthrough
- One computer RGB connector with component video detect and auto sync sensing
- One computer audio connector
- One RJ-45 Ethernet passthrough port
- Two MIC inputs with phantom power and line level inputs (on the bottom side)
- One QuickMedia RJ-45 connector (on the bottom side)
- Two Cresnet connectors (on the bottom side)

* As an option, custom-engraved buttons can be designed and obtained by using the Crestron Engraver software. Version 2.2.2.3 and Crestron Database 16.3.4 or later are available from the Crestron website (www.crestron.com).

This Cresnet® device uses QuickMedia™ technology to facilitate an uncomplicated connection of audio, video, and computer equipment. All media and control signals are routed via a single QuickMedia cable for simple installation. A complete integrated room solution is created with the addition of a QuickMedia receiver (such as the QM-RMCRX-BA) and optional keypads or touchpanels.

NOTE: The QM-FTCC is compatible with 2-Series control systems only.

QM-FTCC Block Diagram
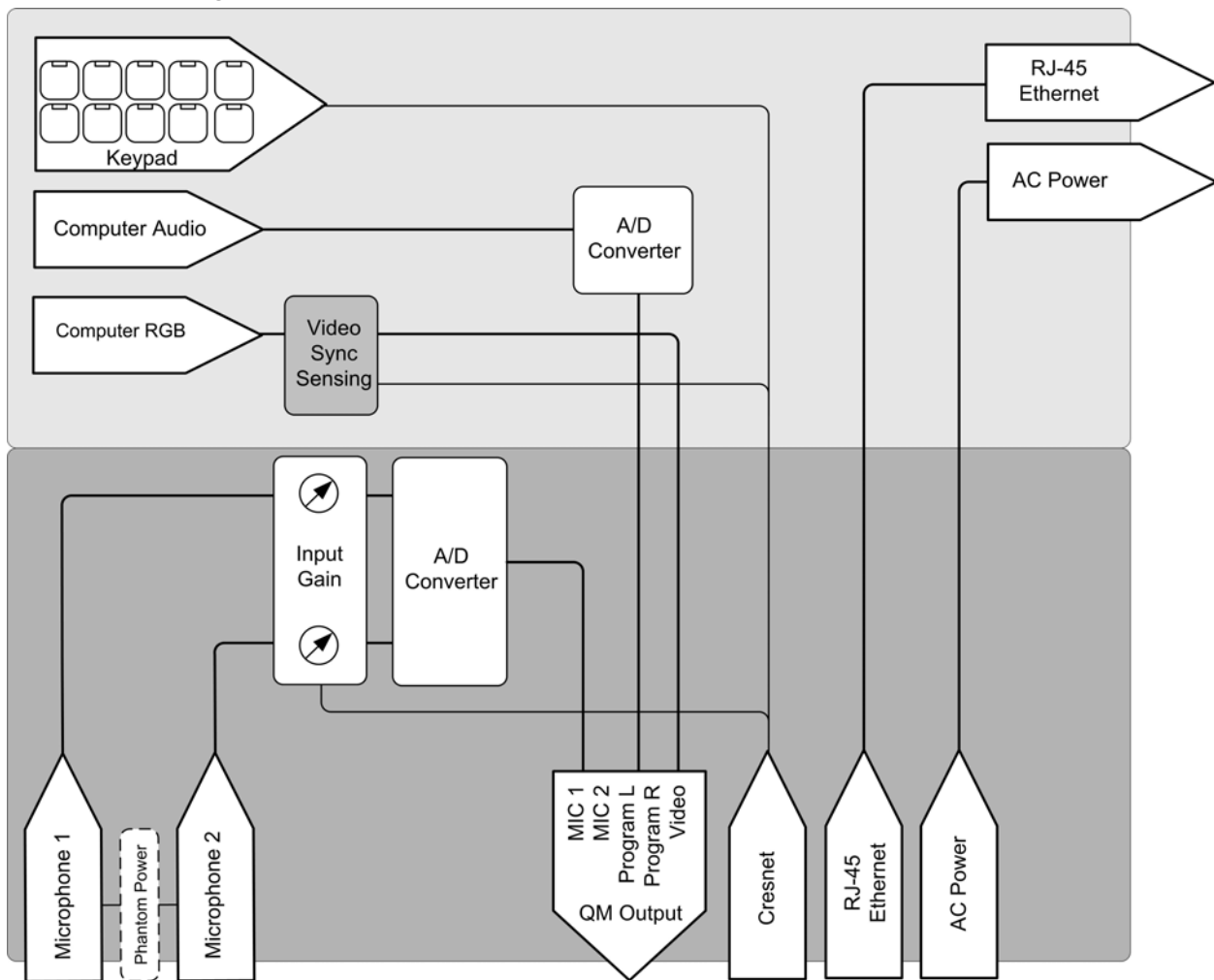
QuickMedia Transport System

Using a new, proprietary signal routing solution, signals such as composite video, S-video, RGBHV, audio, and microphone are all transported using a single cable solution called QuickMedia (QM).

The QM transport system port is capable of managing computer, video, and audio signals simultaneously through one CresCAT-QM cable, simplifying installations.

Routing CresCAT-QM cable is less expensive and much simpler than routing multi-colored, multi-conductor coax cable. All Crestron products using the QM transport system are capable of sending and receiving QM signals via

CresCAT-QM cable. Installation of any QM device is as simple as installing one set of QM wires from output to input. Installations are flexible, affordable, and fast.

The Crestron QuickMedia cable "CresCAT-QM" contains one CAT5E cable and one Cresnet® cable in siamese jackets.

CresCAT-QM Cable

NOTE: Do not untwist the two wires in a single twisted pair for more than 1/3-1/2" (0.84 – 1.27 cm) when making a connection. The twists are critical to canceling out interference between the wires.

The QuickMedia transport mechanism performs delay compensation on each video input to compensate for signal skew, and frequency/bandwidth compensation for cable length. Signal skew occurs when part of the signal is delayed with respect to other signal components. The amount of skew largely depends on the length and design of the wire. Because CAT5 consists of twisted pairs that are twisted together in the cable, unequal wire lengths are created.

The maximum aggregate cable length from QM transmitter to QM receiver is limited by the loss of bandwidth over long distances and the amount of available skew compensation. A cable rated at 15 ns of skew per 100 meters (328 ft.) means that a cable will have no more than a 15 ns difference between the fastest and slowest RGB signals over 100 meters of cable.

To determine the allowable maximum length of installed cable, the installer must first perform a calculation based on the skew rating of the cable. The use of low-resolution signals may allow increased cable length but must be tested with the sources to be used. To ensure sufficient bandwidth to support signal resolutions up to 1600 x 1200, the maximum aggregate cable length should not exceed 328 feet.

Skew compensation is primarily relevant to RGB sources; however, any/all video or VGA 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 particular to either Crestron and/or QuickMedia systems.

The total accumulated skew from QM transmitter to QM receiver must not exceed 15 ns (nanoseconds). Crestron recommends a cable with a rating of less than or equal to 15 ns over its entire length. For example, if using a cable with a rating of 15 ns/100 meters (100 meters = 328 feet), connecting the QM-FTCC transmitter with 150 feet of cable to a QM-MD7x2 switcher, and then using another 150 feet to connect the QM-RMCRX-BA receiver, the accumulated skew over the entire 300 feet should not exceed 15 ns.

Specifications

Specifications for the QM-FTCC are given in the following table.

QM-FTCC Specifications

SPECIFICATION	DETAILS
Cresnet Power Usage	8 Watts (0.33 Amp @ 24 VDC)
Default Network ID	1A
Video Formats	RGBHV (VGA), RGsB, YP_BP_R
Video Detection	Within 2 seconds
Firmware	QM-FTCC.V.3.10.upg or later
2-Series Control System Update Files[1,2]	Version 3.125.CUZ (for QM-RMCRX-BA) or later
Connectors	
Computer Input	(1) DB15HD female, video sensing on H-sync, component sensing (G/Y)
Computer Audio	(1) 3.5mm mini-jack, computer soundcard type
QuickMedia Output	(1) RJ-45 CAT5E/CAT6
Cresnet	(2) 4-pin terminal blocks
Ground	(1) Ground Terminal
Microphone	(2) 5-pin terminal blocks
Operating Temperature and Humidity	41º to 104º F (5º to 40º C) 10 to 90% relative humidity (non-condensing)
Dimensions and Weight (Domestic Models)	Width: 6.75 in (17.13 cm) Height: 5.39 in (13.68 cm) with top closed Depth: 5.71 in (14.49 cm) Weight: 4.05 lbs (1.84 kg)
Dimensions and Weight (International Models)	Width: 8.50 in (21.58 cm) Height: 5.58 in (14.17 cm) with top closed Depth: 6.67 in (16.95 cm) Weight: 4.80 lbs (2.18 kg)
Accessories	QM-FTCMK Cable Management Kit QMI-FTCMK International Cable Management Kit FT-BTNB-L Button Kit FT-BTNB-L-BLANK Button Kit FT-BTNB-S Button Kit FT-BTNB-S-BLANK Button Kit
International Adaptors for QMI-FTCC Models	Refer to Appendix A on page 54

1. The latest software versions can be obtained from the Crestron website. Refer to the NOTE following these footnotes.

2. 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

Refer to the physical views shown below.

QM-FTCC Open View

QM-FTCC Physical Dimensions − Top View

QMI-FTCC Physical Dimensions − Top View

Wire Leads: Brown, Blue,
& Green w/Yellow Stripe
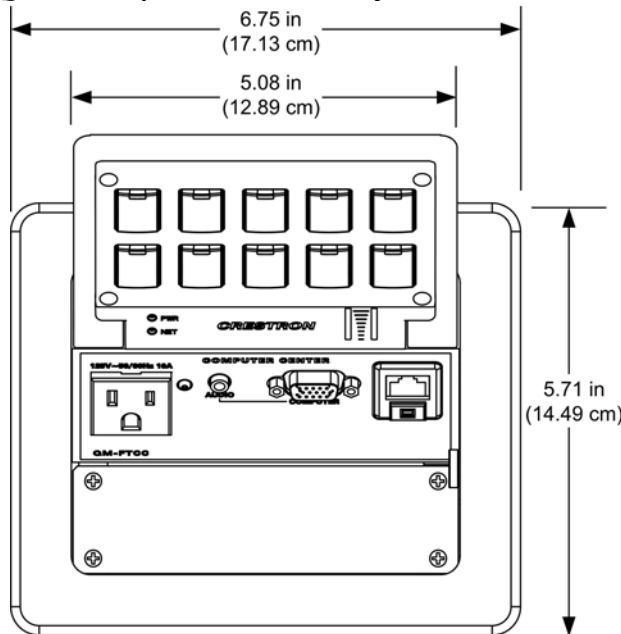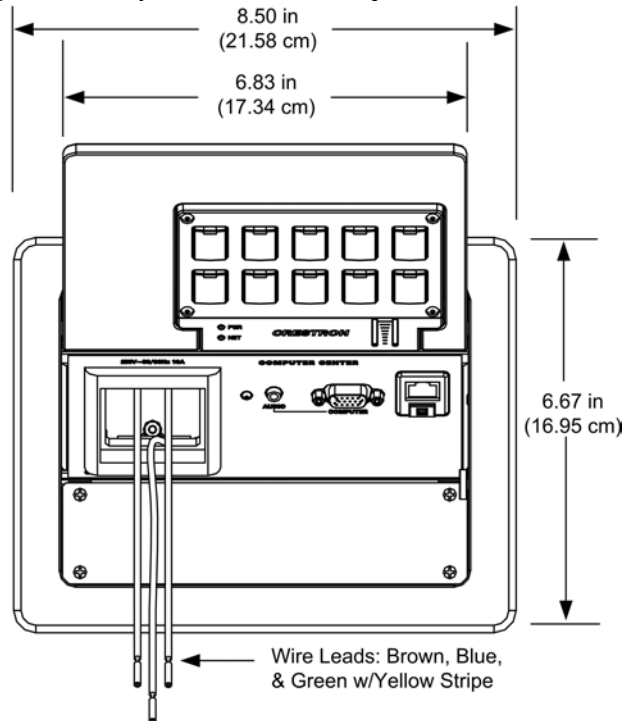
QM-FTCC-NB – Top View
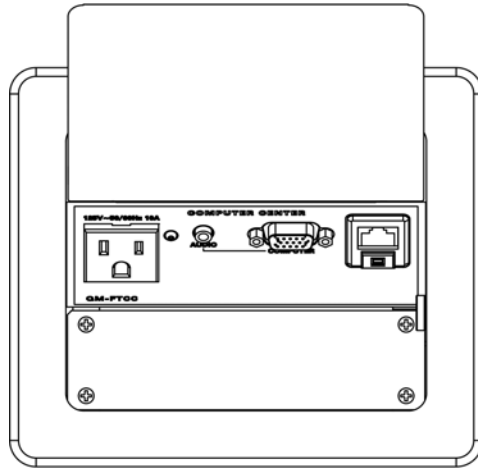
NOTE: The physical dimensions of the NB models are identical to the models with keypad.

QM-FTCC Physical Dimensions - Front View   *QMI-FTCC Physical Dimensions - Front View*

5.21 in
(13.24 cm)

6.25 in
(15.86 cm)

7.04 in
(17.88 cm)

8.00 in
(20.31 cm)
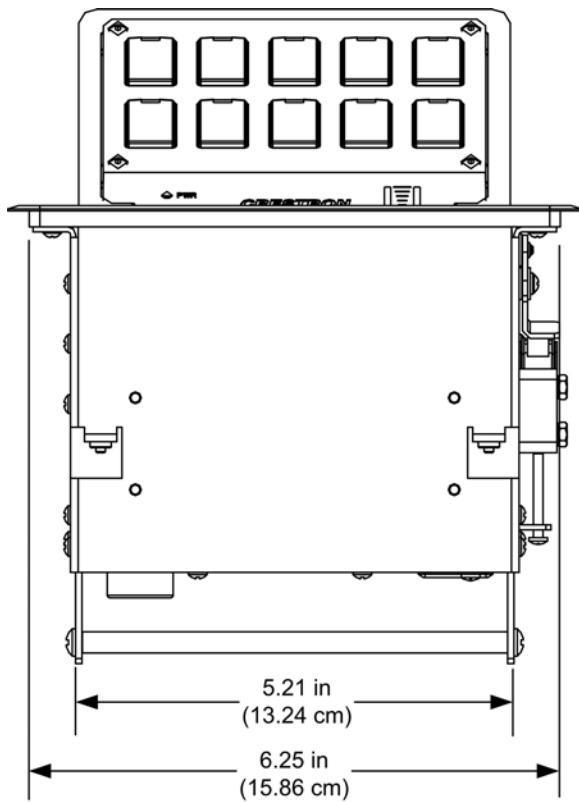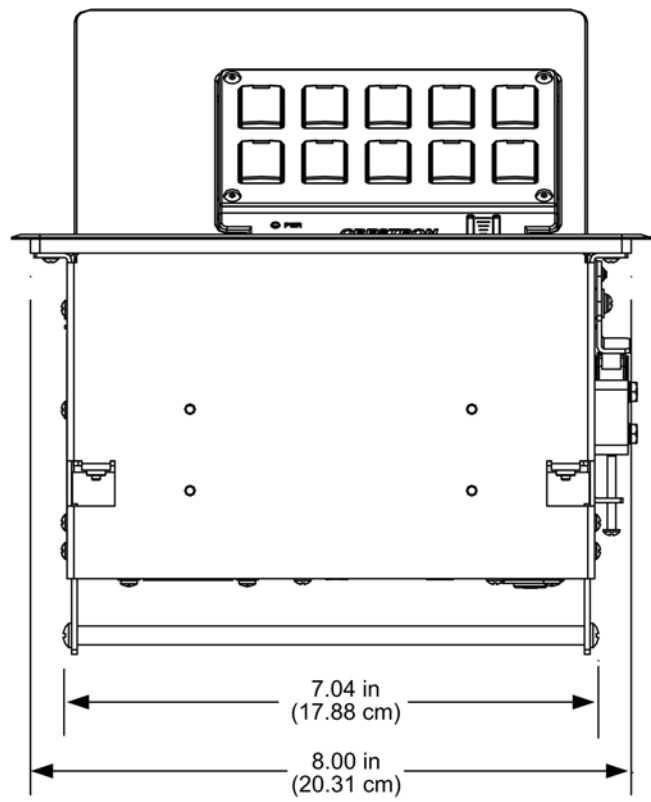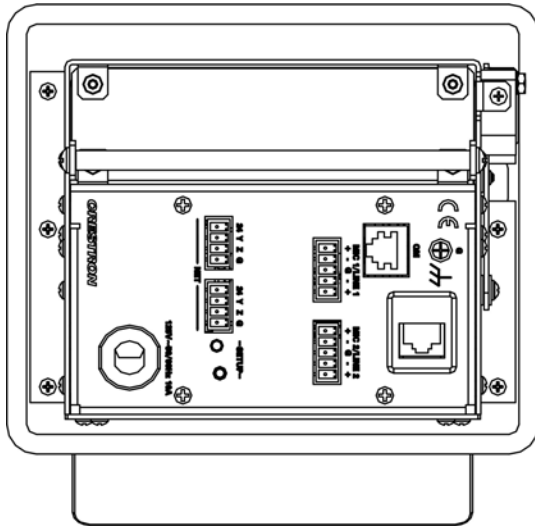
QM-FTCC Bottom View

QMI-FTCC Bottom View
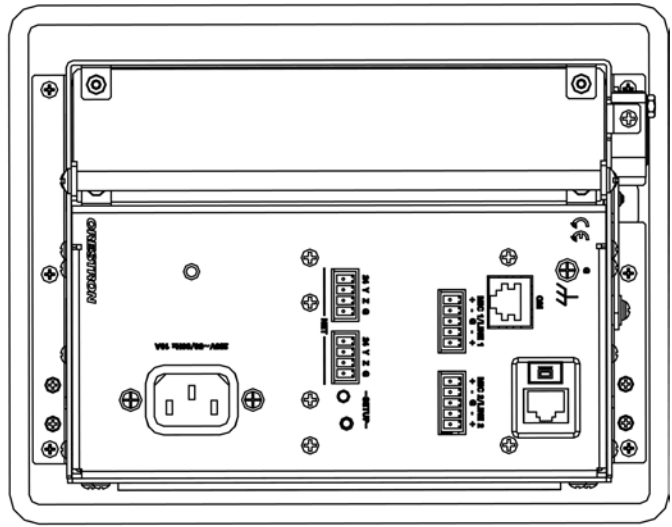
QM-FTCC Physical Dimensions - Back View

2.31 in
(5.88 cm)

4.31 in
(10.95 cm)

5.39 in
(13.68 cm)

QMI-FTCC Physical Dimensions - Back View

2.99 in
(7.60 cm)

4.58 in
(11.62 cm)

5.58 in
(14.17 cm)
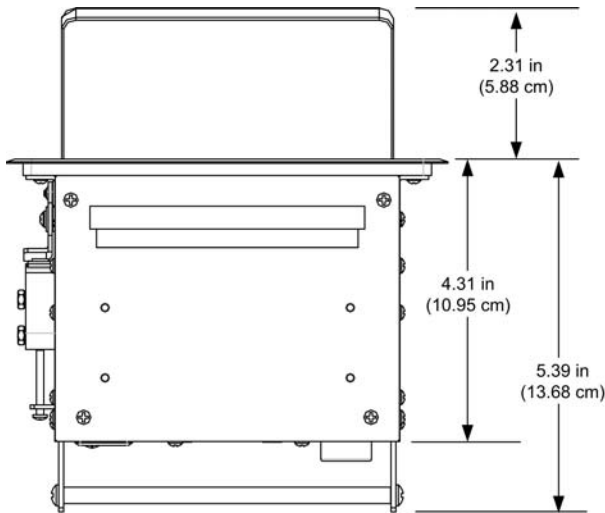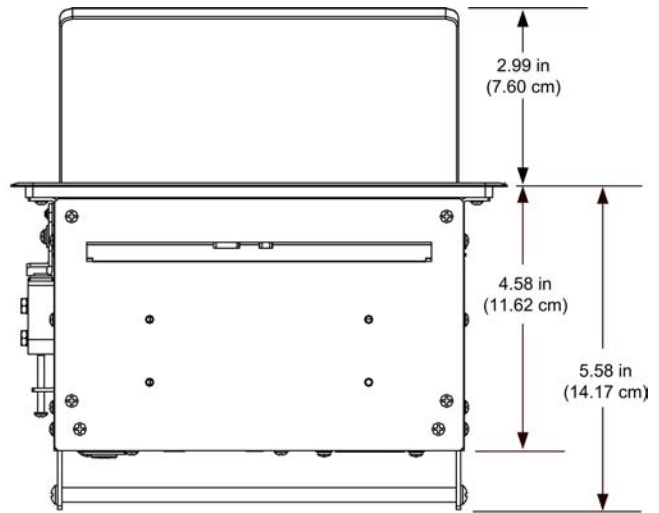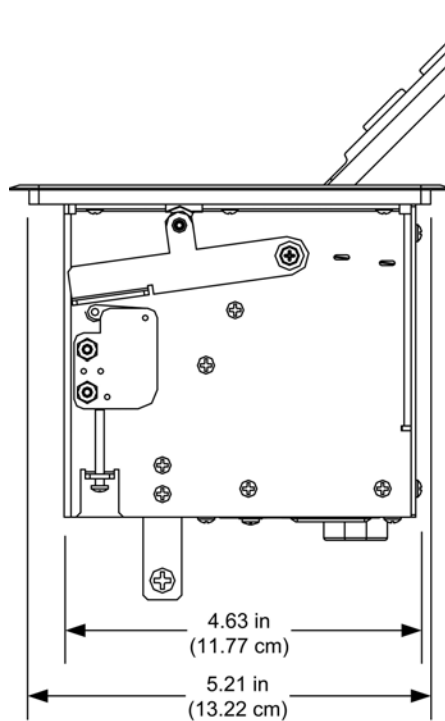
QM-FTCC Physical Dimensions - Side View   *QMI-FTCC Physical Dimensions - Side View*
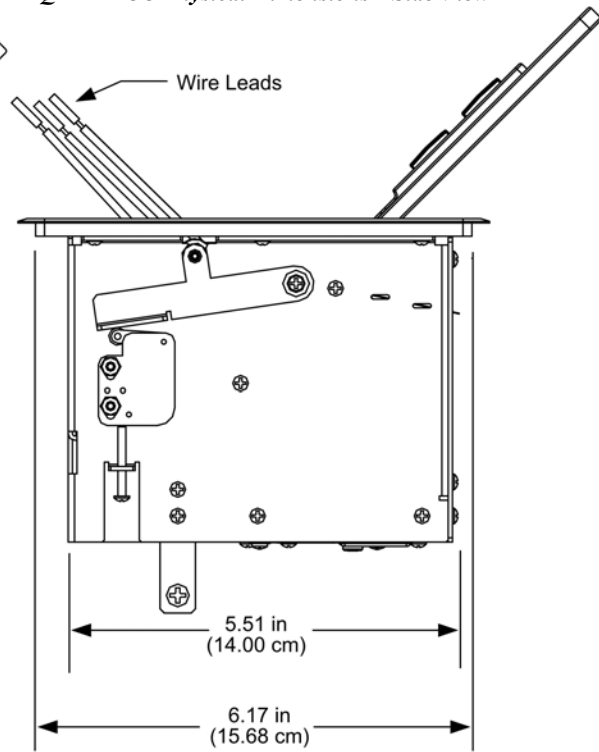
Controls and Ports (Top)

Buttons

The QM-FTCC can have 10 to 20 engravable, replaceable, programmable buttons. All buttons are functionally identical and have light emitting diodes (LEDs) that serve as user feedback indicators. The illumination of each LED (on/off) is independently addressable, and programmable using SIMPL Windows.
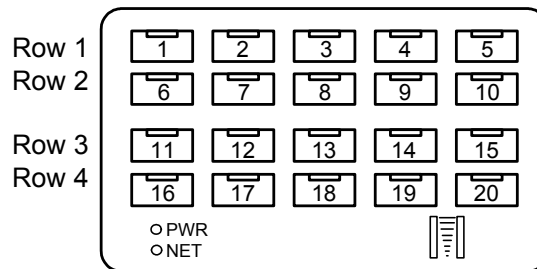
NOTE: Numbers in this illustration are for programming purposes only. SystemBuilder provides three automatic programming selections for the buttons. Refer to page 39 for button programming information.

NOTE: The QM-FTCC is shipped with a set of ten buttons. Additional buttons may be added by ordering button kits (refer to page 16).

NOTE: NB models do not have buttons, LEDs, or bar graphs.

NOTE: These button units do not support audio WAV files.

COMPUTER

This female DB15HD connector is used for connecting a computer's RGB video output to the presentation system. A corresponding 3.5 mm mini-jack is provided for the computer sound card output. This port can automatically detect the presence of an H-sync video signal to support RGBHV and RGBS, and component video detection by sensing the green video signal on pin 2 to support RGsB and Y, P_B, P_R. Refer to the following table for the DB15HD connector pin-assignments.

- 75 Ω terminated (R,G,B)

- Maximum input voltage 1 V_{p-p}

- Maximum H and V Sync: 5.0 V_{p-p} into 1 kΩ
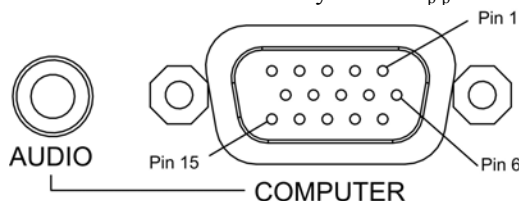
RGB DB15HD Pin Assignments

PIN	FUNCTION	PIN	FUNCTION
1	Red Video	9	No Connect
2	Green Video	10	Ground
3	Blue Video	11	No Connect
4	Reserved	12	Monitor Sense 1
5	Ground	13	Horizontal Sync
6	Red Ground	14	Vertical Sync
7	Green Ground	15	Monitor Sense 2
8	Blue Ground		

The computer audio connector provides an unbalanced stereo line-level audio input (maximum input level 1 V_{RMS}).

AC Outlet
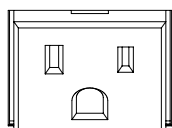
125V – 50/60Hz 10A
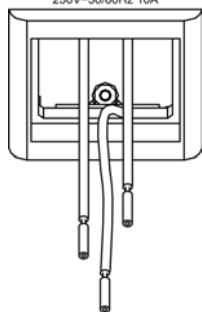
The 3-prong grounded AC outlet is rated 125 VAC @ 10 Amps, 50 – 60 Hz.

250V~50/60Hz 10A

The international version (QMI-FTCC) has a bezel that accepts an adaptor receptacle and three wires that connect to the adaptor; blue, brown, and green with a yellow stripe.

The international AC outlet is rated 250 VAC @ 10 Amps, 50 – 60 Hz.

Refer to "Appendix A" on page 54 for a complete list of international receptacles and applicable countries.

Ethernet
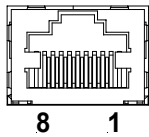
An 8-pin RJ-45 port is used for connection to the Ethernet, providing local area network or Web access (cable is not supplied). Refer to the following table for the Ethernet connector signals and use an appropriate cable.

Ethernet Connector Pinout

PIN	SIGNALS
1	TX + passthrough
2	TX - passthrough
3	RC+ passthrough
4	passthrough
5	passthrough
6	RC - passthrough
7	passthrough
8	passthrough

Ports (Underside)

MIC 1 / MIC 2
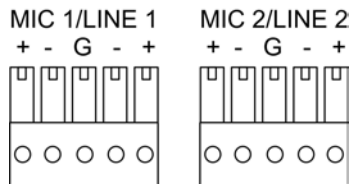
These two 5-pin 3.5 mm detachable terminal blocks provide two microphone and line level audio inputs.

- Balanced microphone input level: -60 to –20 dBV nominal
- Balanced line input level: -28 to +12 dBV, 4 V_{RMS} maximum
- Unbalanced input level: -34 to +6 dBV, 2 V_{RMS} maximum
- Microphone input impedance: 10 kΩ, accepts balanced microphones 60 to 600 Ω
- Line input impedance: 22 kΩ (balanced), 11 kΩ (unbalanced)
- Phantom power: 10 mA (total) at 48 VDC, software enabled for both inputs
- Mic level indicators (via software): 20 dB below clipping (Norm), 6 dB below clipping (Overload)
- Mic Input Gain: 0 to 100% (0 to 40 dB) plus mute
- Gate level (threshold): 0 to 100%
- Attack: 1 to 100 ms
- Decay (release): 1 to 5000 ms
- Analog to Digital conversion: 24-bit, 48 kHz

NET (x2)
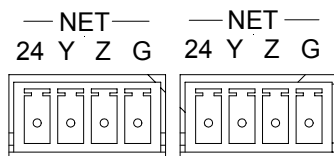
These two 4-pin terminal block connectors, located on the bottom side of the QM-FTCC, are for connection to the Cresnet network. One connector is used to connect to the Cresnet network while the second connector can be used to connect another Cresnet device. Cresnet power to the QM-FTCC is supplied through either of these connectors. For more information, refer to "Network Wiring" on page 13.

QM
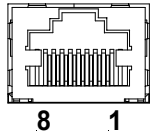
This eight-pin RJ-45 transport port, located on the bottom side of the QM-FTCC, allows connection of the QuickMedia cable. It carries audio, video, and microphone signals over CresCAT-QM cable to a QuickMedia receiver or switcher. For more information on QuickMedia refer to page 2.

RJ-45 QuickMedia Connector Pin Assignments
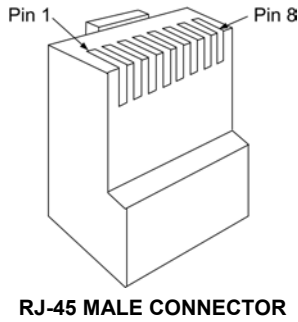
RJ-45 PIN NUMBER	WIRE COLORS (EIA 568B)	QM ASSIGNMENT RGB, COMPOSITE, COMPONENT S-VIDEO, AND AUDIO	
1	WHITE/ORANGE	- RGB RED	(- CHROMINANCE) (-P_R)
2	ORANGE	+ RGB RED	(+ CHROMINANCE) (+P_R)
3	WHITE/GREEN	- RGB GREEN	(- LUMINANCE) (-Y)
4	BLUE	+ AUDIO	
5	WHITE/BLUE	- AUDIO	
6	GREEN	+ RGB GREEN	(+ LUMINANCE) (+Y)
7	WHITE/BROWN	- RGB BLUE	(- COMPOSITE) (-P_B)
8	BROWN	+ RGB BLUE	(+ COMPOSITE) (+P_B)

Pin 1 — **Pin 8**

RJ-45 MALE CONNECTOR

8   1

NOTE: Always use CresCAT-QM cable to make QuickMedia connections.

**NOTE:** CresCAT-QM siamese cable includes four wires for making Cresnet connections.

Ethernet
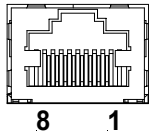
An 8-position RJ-45 port is used for connection to the Ethernet, providing local area network or Web access (cable is not supplied).

8   1

RJ-45 Ethernet Port Pinouts

RJ-45 PIN NUMBER	SIGNALS
1	TD +
2	TD -
3	RD +
4	Connected to pin 5
5	Connected to pin 4
6	RD -
7	Connected to pin 8
8	Connected to pin 7

AC Power
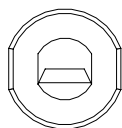
Connect the six-foot (183 cm) grounded AC line cord to supply AC power to the outlet on the topside of the QM-FTCC.
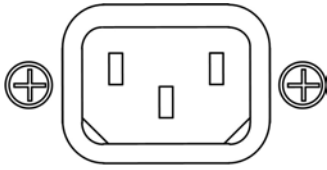
125V – 50/60Hz 10A

250V~50/60Hz 10A

The international version (QMI-FTCC) is equipped with a standard IEC-320 electrical appliance coupler. The IEC (International Electrotechnical Commission) is the international standards and conformity assessment body for all fields of electrotechnology.

Indicators

PWR (Power)

This LED illuminates when 24 volts DC is supplied to the QM-FTCC from Cresnet.

NET

This LED illuminates when communication between the control system and the QM-FTCC is established (the unit is polled on the network). Illumination indicates that the SIMPL Windows program currently loaded has a network device defined at the same Net ID as the QM-FTCC.

Bargraphs

Two sets of eight-segment programmable red LEDs are provided that can be programmed to display audio level settings. The LEDs display is proportional to the input and can be set from zero to 100%. Refer to "Buttons" on page 39 for SIMPL Windows programming details.

NOTE: Indicators are not included with NB models.

SETUP LED and Pushbutton

The QM-FTCC is Touch-Settable ID-ready. A **SETUP** pushbutton is located on the bottom side of the QM-FTCC. The **SETUP** pushbutton and its associated LED are used for setting a units network ID during the initial configuration of a Cresnet system or when the device is being added/replaced.

Industry Compliance

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

CE $\mathcal{C}$

NOTE: This device complies with part 15 of the FCC rules. Operation is subject to the following two 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.

Setup

Network Wiring

CAUTION: 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 as a result of using improper wire.

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 (http://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 a 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))
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 drawing 20 watts should not have a length of run more than 333 feet.

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.

NOTE: 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.

NOTE: For larger networks (i.e., greater than 28 network devices), it may become necessary to add a Cresnet Hub/Repeater (CNXHUB) to maintain signal quality throughout the network. Also, for networks with lengthy cable runs, it may be necessary to add a Hub/Repeater after only 20 devices.

QM Network Wiring

When connecting multiple QM devices, the route between a QM origination point (e.g., QM-FTCC) and a QM endpoint (e.g., QM-RMCRX-BA) cannot have more than two midpoints (e.g., QM-MD7x2 or other QM switchers). Refer to the following diagram when configuring a QM network. Refer to Appendix B on page 55 for additional QuickMedia information.

QM Network Topology
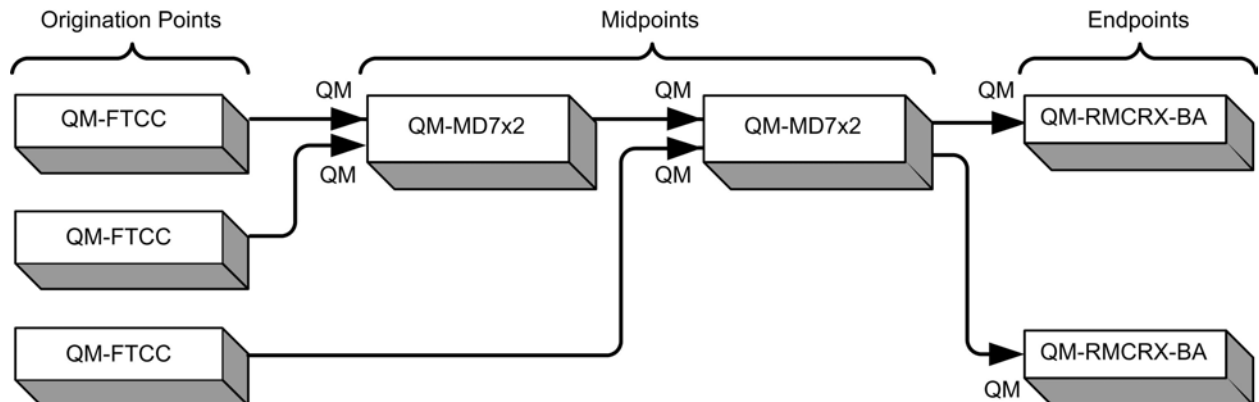
Crestron Toolbox

The Crestron Toolbox (replacement for Crestron Viewport, you may continue to use Viewport if desired) is a broad-based software package that accomplishes multiple system tasks, primarily using an RS-232 or TCP/IP connection between a PC and one or more Crestron control systems.

You can use the Crestron Toolbox to:

- Observe system processes.

- Upload operating systems and firmware.

- Upload programs and touchpanel projects.

- Set or change device Network IDs.

- Change serial numbers.

- Run scripts to automate tasks.

- Perform system diagnostics, and much more.

The Crestron Toolbox allows you to perform these functions using simple graphical views and click and drag methods.

Identity Code

Every piece of equipment and user interface within the network requires a unique identity code (Net ID). These codes are two-digit hexadecimal numbers from 03 to FE (Net ID 02 is reserved for master control units). The Net IDs reside within all Cresnet devices (hardware) and must match the Net ID as specified in the software (SIMPL Windows) that runs the system. Refer to "Setting the Net ID in Device Settings" on page 33 for details of the SIMPL Windows procedure.

The Net ID of the QM-FTCC has been factory set to **1A**. The Net IDs of multiple QM-FTCCs in the same system must be unique. Net IDs can be

changed from a personal computer (PC) using SystemBuilder™ or Crestron Toolbox.

NOTE: For detailed information on establishing communication between the PC and control system, refer to "Communication Settings" on page 44. If communication cannot be established, refer to the "Troubleshooting Communications" section in the latest version of the 2-Series Control System Reference Guide (Doc. 6256), which is available from the Crestron website (http://www.crestron.com/manuals).

The Crestron Toolbox provides several methods to easily set or change device Net IDs for any device on the network. The following method permits you to change the Net ID of any device in the network through the "Network Device Tree" window.

NOTE: This method prevents you from setting duplicate IDs.

This method permits you to manually set the Net ID for any device in the network, can be used to set any known Net IDs that may require changing, and may also be used for non-TSID equipment. This method will not permit you to choose an ID already in use by another device. A warning message will appear if you attempt to use an ID that is already in use.

Duplicate Net ID Warning Message
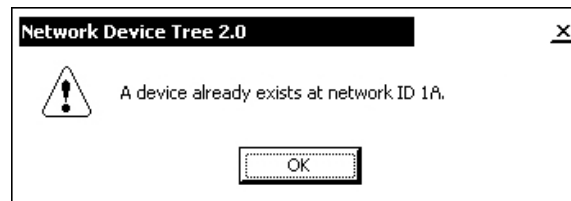
This method does not change the Net ID as assigned in SIMPL windows. Refer to page 33 for the SIMPL Windows ID change procedure.

NOTE: You may also use SystemBuilder to perform Network ID setup. Refer to page 29 for Net ID setup details using SystemBuilder.

1. Ensure that all network devices are connected to the control system.

2. Open Crestron Toolbox and establish communications (refer to page 44).

3. Select the Network Device Tree [icon] icon, or select **Tools | Network Device Tree**.

Network Device Tree

4. Right-click on the device Net ID, and when the sub-menu appears, select **Change Network ID** from the sub-menu.

Network Device Tree – Sub-Menu
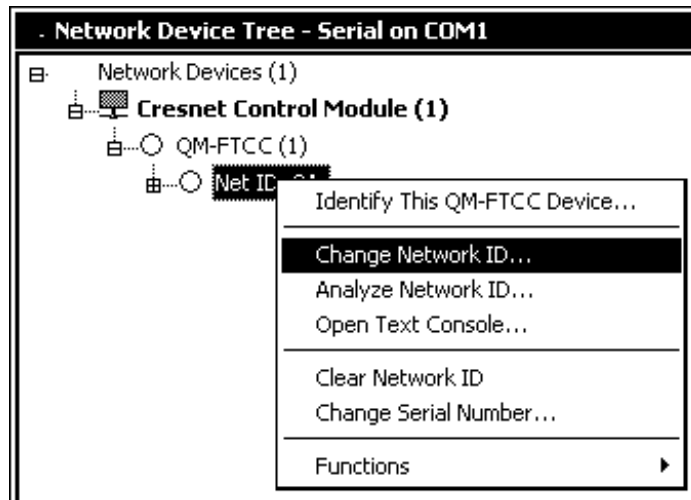
5. Enter a new Net ID and press **Enter**.

Enter New Net ID
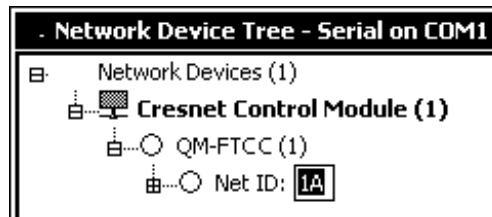
Repeat this procedure for each additional network device requiring a Net ID change.

Installation

NOTE: This section does not apply to NB models.

The QM-FTCC is shipped with ten large blank buttons. You can order a variety of button kits (sold separately) to add as many as 20 engraved or blank buttons.

Button Kits

KIT NUMBER	DESCRIPTION
FT-BTNB-L	One large button engraved as desired
FT-BTNB-L-BLANK	One large button not engraved
FT-BTNB-S	Two small buttons with divider engraved as desired
FT-BTNB-S-BLANK	Two small buttons with divider, not engraved

Button Installation

To replace the large buttons with small buttons, follow this procedure.

A 1/16" Allen (hexhead) wrench is required to remove the button faceplate.

1. Remove the four Allen (hex) screws that secure the button faceplate.

2. While holding adjacent buttons in place, carefully pull the button(s) to be replaced from the rubber membrane.

3. Carefully press the two small replacement buttons in place, making sure LED window faces up. Use care not to dislodge the membrane and circuit board.

NOTE: The removable buttons fit snugly on the rubber membrane. Remove carefully to avoid pulling the membrane from the unit.

4. The divider bar slips into the slots on the back of the faceplate.

5. Replace the faceplate.

Button Installation
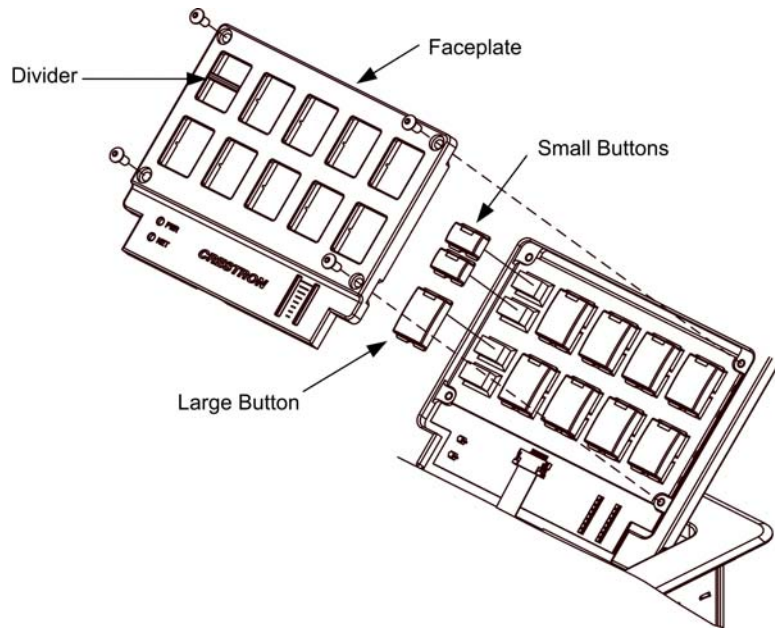
QM-FTCMK Cable Management Plate

The QM-FTCC is shipped with a blank bottom plate. A cable management plate is available to provide a pullout cable solution for the computer input and LAN passthrough cables. The kit contains a six-hole plate, grommets, and two 6-foot cables (computer and computer audio).

- Order the QM-FTCMK Cable Management Kit for domestic models.

- Order the QMI-FTCMK Cable Management Kit for international models.

Parts Supplied with Optional Cable Management Kit

PART DESCRIPTION	QUANTITY
Small Cable Bushing, 5/16 inch ID, 0.5 inch OD	4
Large cable Bushing, 0.55 inch ID, 0.80 inch OD	2
Cable Support Plate	1
Tie Wrap	3
Computer RGB Cable, VGA to VGA, 6 ft long	1
Computer Audio Cable, 3.5 mm Stereo, 6 ft long	1

Tools Required

- Phillips screwdriver
- Small flat-blade screwdriver (for connecting the VGA cable)

The cable support plate must be installed before mounting the QM-FTCC to a surface. The cables are looped through the cable support plate.

1. Remove the blank bottom plate and retain the four #4 x ¼ LG black mounting screws (four #4 x ¼ screws are included with the QMI-FTCMK).

2. Place the bushings on the cables (six bushings supplied). Use the large bushing for the VGA cable.

3. Thread the cables through the appropriate slot on the plate.

4. Snap the bushings into the plate slots.

5. Feed all the excess cable through the opening.

6. Attach the plate using the four #4 x ¼ LG black mounting screws retained in step 1 (use the four #4 x ¼ screws included with the QMI-FTCMK).

7. Connect the cables to the appropriate connector on the front of the QM-FTCC.

8. The cables may be secured to the bottom bar using the supplied tie wraps.

Cable Management Plate Installation
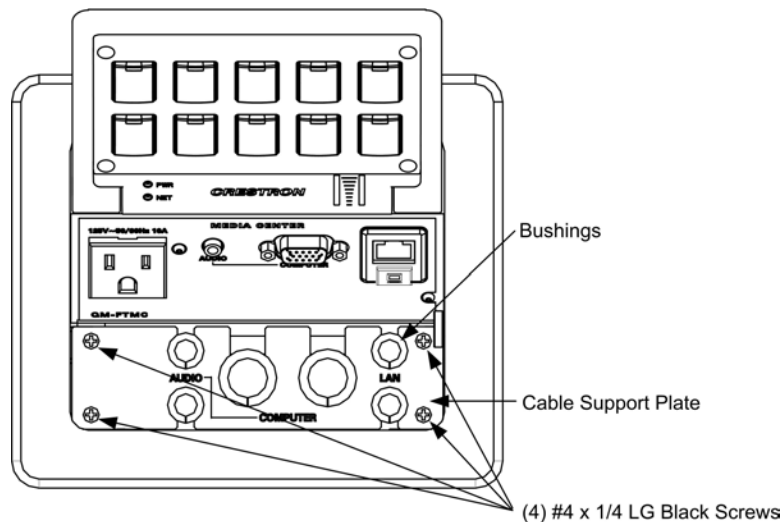
Cable Loops Through the Cable Plate
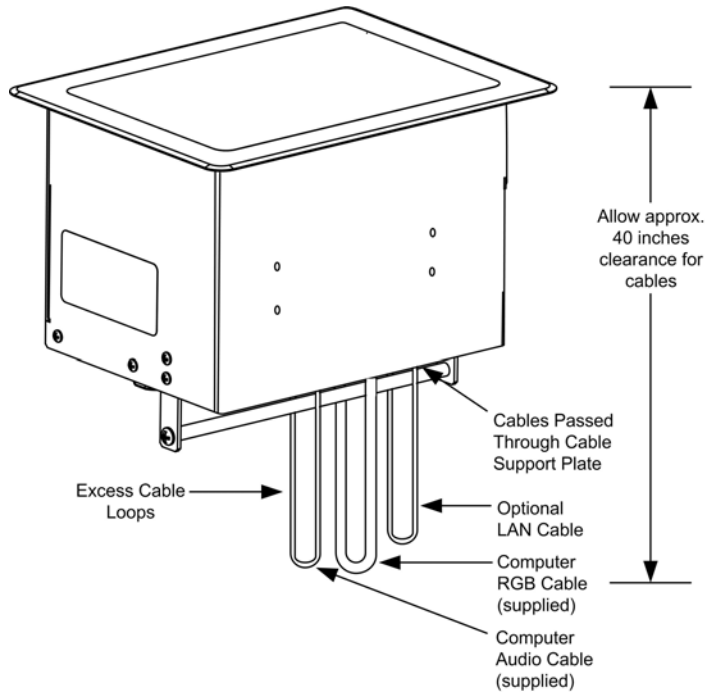
NOTE: Ensure that the cables have sufficient clearance to enable smooth movement. Allow approximately 40 inches (102 cm) from the top surface of the FlipTop box.

Mounting to Surface

The QM-FTCC is designed to mount in a horizontal surface, such as a desk top, lectern, or podium. The following diagram illustrates the required opening size to accommodate the QM-FTCC. A cutout template (4006405 or 4006874) is included.

Cutout Dimensions
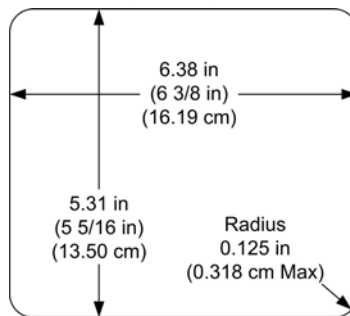
QM-FTCC (4006405)   *QMI-FTCC (4006874)*
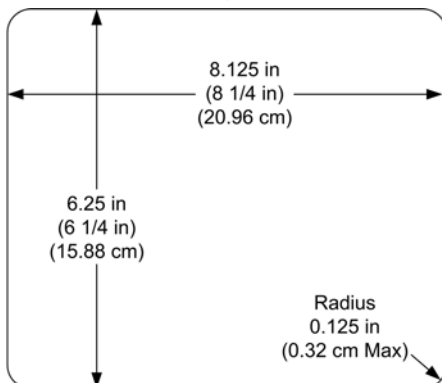
NOTE: Before inserting the QM-FTCC in the mounting hole, ensure that all required cables have been installed.

Mounting Parts Supplied with the QM-FTCC

PART DESCRIPTION	QUANTITY
Screw #6-32, Pan Head, Phillips	8
Screw #10, Pan Head, Phillips	4
Mounting Bracket	2

1. Install the eight supplied #6-32 screws, but do not tighten (four on the front side and four on the rear side). These will be used to secure the front and rear mounting brackets.

2. Position the QM-FTCC in the mounting hole.

Mounting Bracket Screw Locations
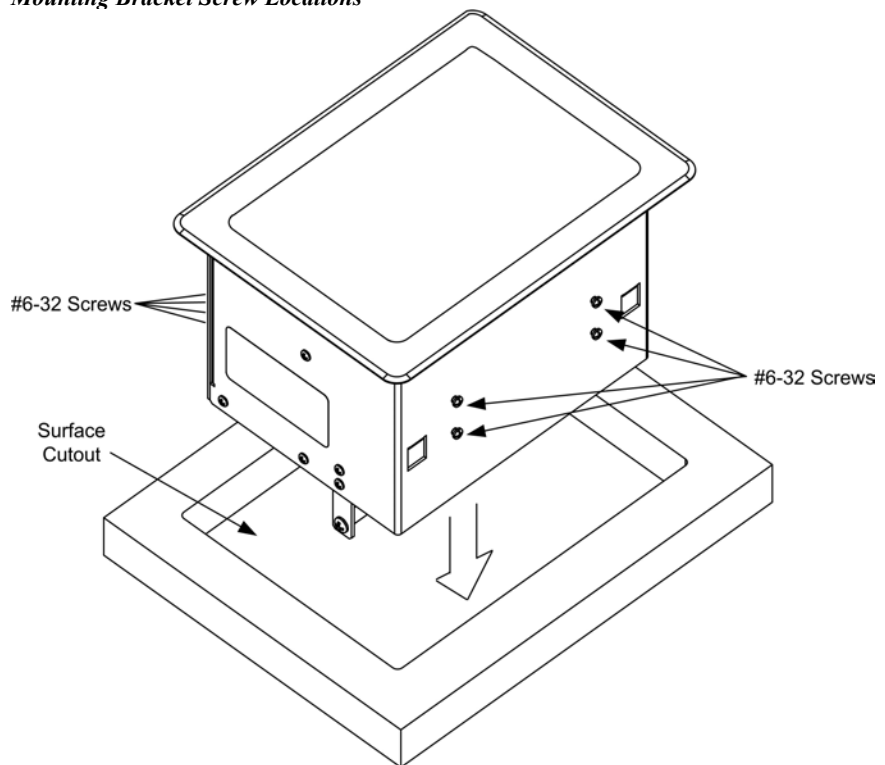
3. Install the four #10 screws in the mounting brackets (two screws per bracket). Refer to the following diagram.

4. Slide the mounting brackets over the #6-32 screws and tighten the #6-32 screws.

5. Turn the four #10 screws equally until they contact the underside of the mounting surface.

NOTE: Do not over-tighten the #10 screws as this may damage the surface and/or the unit.

Mounting Bracket Installation
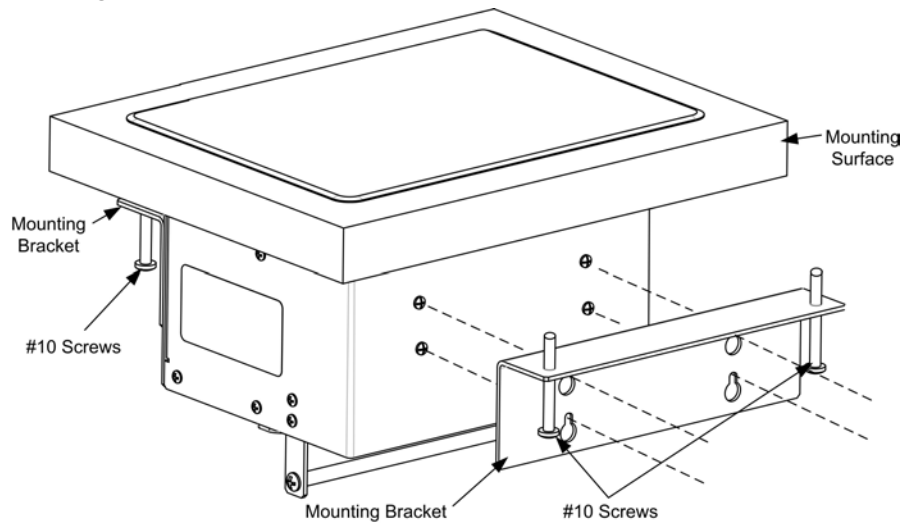
NOTE: Be careful not to press the buttons while closing the FlipTop, even though the buttons are disabled when the FlipTop begins to close and all pressed buttons are released.

Hardware Hookup

Refer to the following hookup diagram and, aside from attaching power last, complete the connections in any order.

NOTE: To prevent overheating, do not operate this product in an area that exceeds the environmental temperature range listed in the specifications table. Consideration must be given if installed in a closed or multi-unit rack assembly, inside a closed desk, or in a closed podium since the operating ambient temperature of these environments may be greater than the room ambient. Contact with thermal insulating materials should be avoided on all sides of the unit.

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.

Underside Connections

GROUND

QM OUTPUT:
QUICKMEDIA PORT
CARRIES AUDIO,
VIDEO, RGB, AND
MICROPHONE
SIGNALS TO
QUICKMEDIA
RECEIVER

ETHERNET:
10/100 BASE-T
ETHERNET TO LAN

QM

MIC 1/LINE 1   MIC 2/LINE 2

MIC/LINE LEVEL INPUTS:
CONNECT TO TWO
BALANCED CONDENSER
OR DYNAMIC
MICROPHONES OR
BALANCED/UNBALANCED
LINE LEVEL SOURCES

24 Y Z G   24 Y Z G   --SETUP--

NET

CRESNET:
TO CONTROL
SYSTEM AND
OTHER CRESNET
DEVICES

TSID SETUP BUTTON
AND LED

120 VAC LINE CORD
(DOMESTIC MODELS ONLY)

CRESTRON

IEC-320
ELECTRICAL
APPLIANCE
COUPLER
(INTERNATIONAL
MODELS ONLY

250V~50/60Hz 10A

Ground Wire Connections

Proper grounding is required. Connect the ground from the QM transmitter
(QM-FTCC) to earth ground. Connect the Cresnet shield at the
QM-RMCRX-BA to the chassis ground provided on the QM-RMCRX-BA. The
QM-RMCRX-BA chassis must also be connected to an earth ground (building
steel). Refer to the following grounding diagram.

Ground Wire Connections

QM-RMCRX-BA   QM-FTCC

24
Y
Z
G

Ground
Wire to
Earth
Ground

Shield

Cresnet
Ground Wire

Ground
Terminal
to Earth
Ground
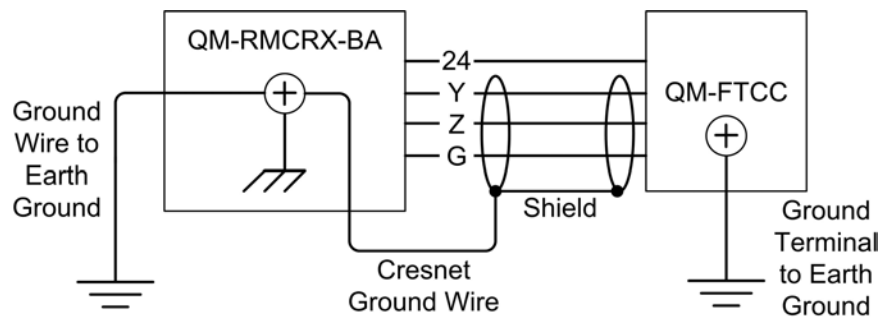
NOTE: Do not connect the shield to earth ground at the QM-FTCC.

Configuration 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.

Use the Crestron programming tool Crestron SystemBuilder™ to create a control program for a QuickMedia control system.

The flexibility of SIMPL Windows requires a much greater degree of programming expertise and is not recommended for this application. However, SIMPL Windows information is included in this guide. Use the advanced techniques available in SIMPL Windows to customize the job only if necessary.

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.

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

The following are the earliest useable software version requirements for the PC:

- (Optional but highly recommended) SystemBuilder version 2.0 (Requires SIMPL Windows, VT Pro-e and Crestron database and Crestron Engraver).

- SIMPL Windows version 2.06 or later. Library 332 and SIMPL+ Cross Compiler version 1.1 are required. Library 346 for NB versions.

- Crestron Database version 17.2 or later (17.3 or later for NB versions). Required by SIMPL Windows.

- Crestron Toolbox version 1.0 or later.

- Crestron Engraver version 2.3.3 or later (only required if using SystemBuilder).

- Crestron RoomView® version 6.0 (required for room management).

NOTE: The NB versions may be programmed with the regular QM FlipTop devices, but will not match during SystemBuilder verification procedure in the finish stage.

Configuring with SystemBuilder

Crestron SystemBuilder offers automatic programming for such residential and commercial applications as audio distribution, home theater, video conferencing, and lighting. The interface of this tool guides you through a few basic steps for designating rooms and specifying the control system, touchpanels, devices, and functionality. Crestron System Builder then programs the system, including all touchpanel projects and control system logic.

Crestron SystemBuilder is fully integrated with Crestron's suite of software development tools, including SIMPL Windows, VT Pro-e, Crestron Database, User IR Database, and User Modules Directory. Crestron System Builder accesses these tools behind the scenes, enabling you to easily create robust systems.

NOTE: Modifications to the program that are made outside of SystemBuilder (for example, in VT Pro-e or SIMPL Windows) are not preserved when you reenter SystemBuilder.

SystemBuilder
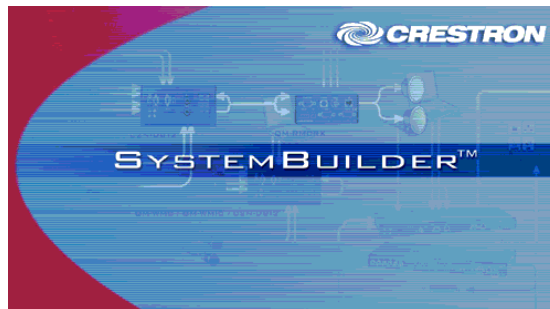
After entering the appropriate information in each step, SystemBuilder creates the control system logic and touchpanel pages, ready to upload to the controller.

NOTE: Crestron SystemBuilder version 2.0 or higher is required.

The following information is a general procedure for setting up a QuickMedia system using SystemBuilder. Refer to the SystemBuilder help file for more detailed instructions.

Creating a QuickMedia System in SystemBuilder

1. Open SystemBuilder and select **File | New**. Select a **Blank System**.

    SystemBuilder – "New" Blank System Option
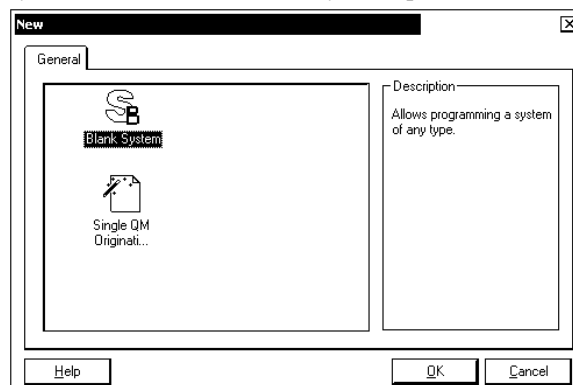
2.   Select the plug-in for a QuickMedia system.

SystemBuilder – "Plug-in Selection" Window
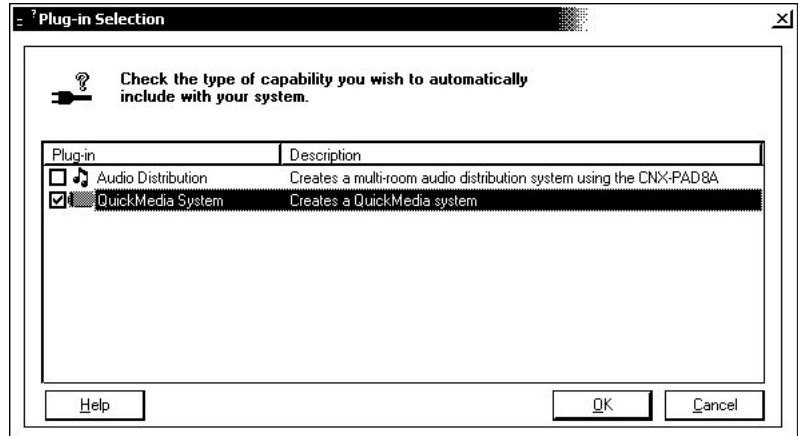
3.   Select the control processor.

NOTE: You can select any 2-Series or QM control processor as the master.

SystemBuilder – Select a Control Processor (As the Master)
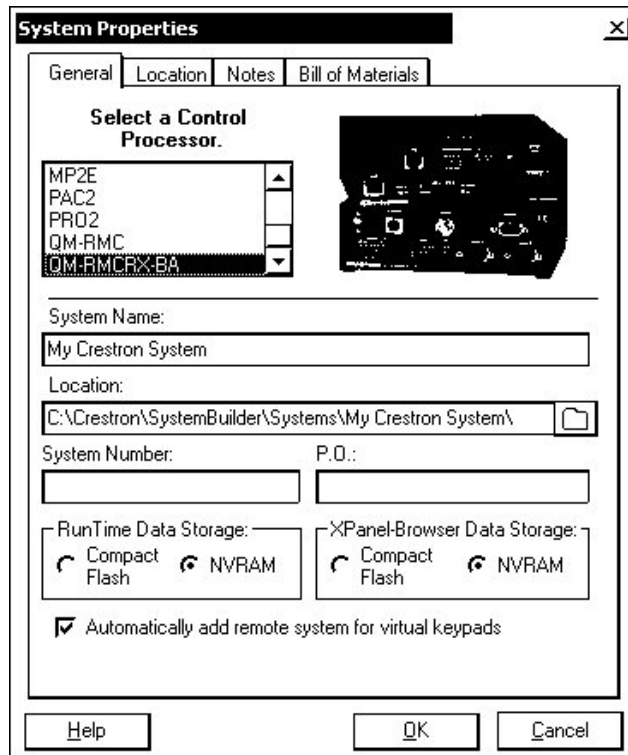
4.   Specify the audio configuration. Choose from the various dialogs
      (stereo program, speech, etc.) and click **Next**. Click **Finish** to continue
      to the next step.

5.   Add RoomView® if desired.

6. Select the device and then click the **Assign QuickMedia Devices and Routing** button located on the menu bar, and drag the QM devices from the library on the right side, to the QM system on the left side.

SystemBuilder – Menu Bar, Assign Quick Media Devices and Routing

As devices are added from the library (on the right) to the system (on the left), they are automatically assigned sequential Net IDs.

SystemBuilder – Equipment Room and Library
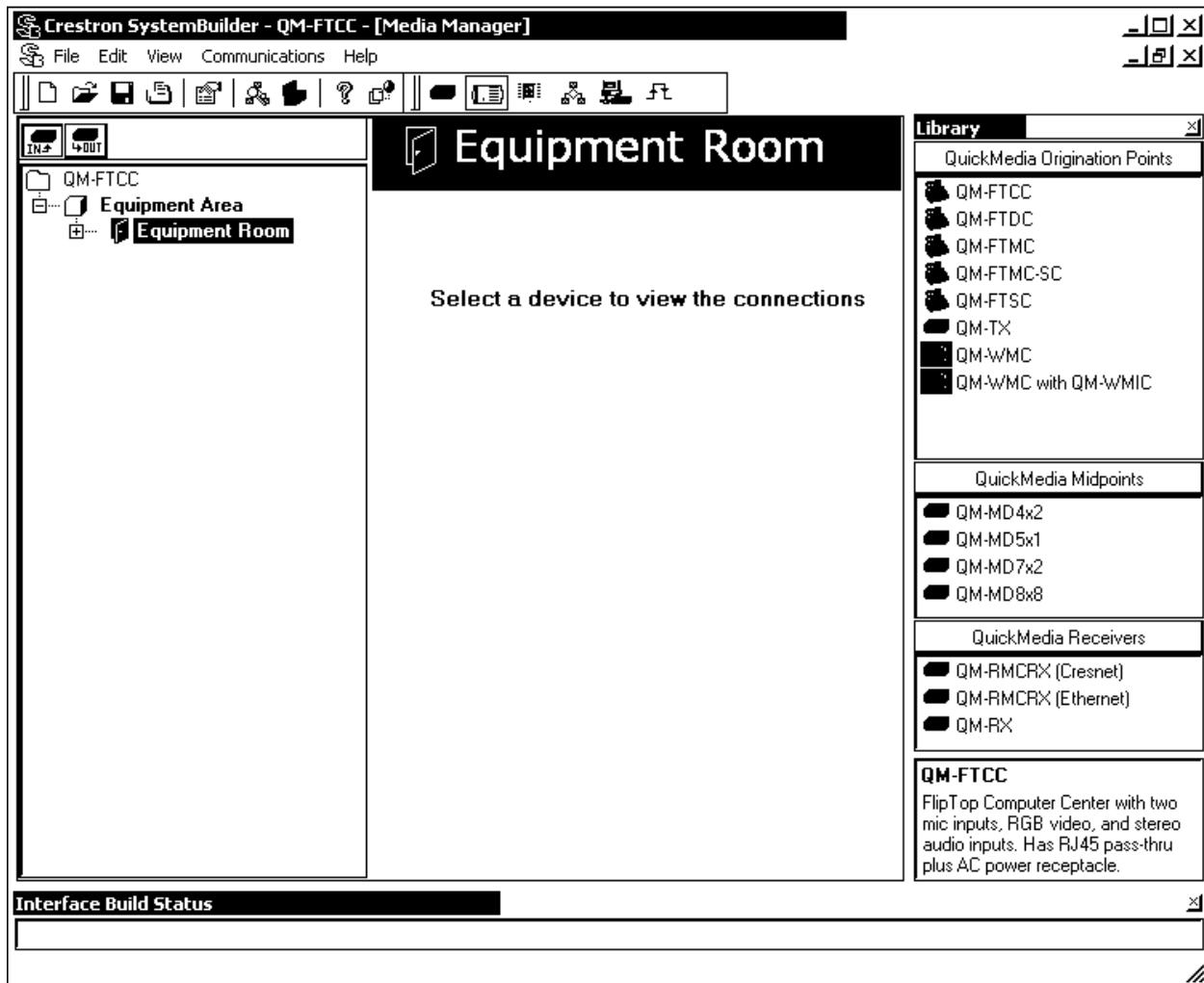
7. The QM-FTCC has three default programming modules already prepared in SystemBuilder. When you choose the QM-FTCC, the following notice is displayed. Click **Yes** to select one of the default modules.

Default Programming Notice
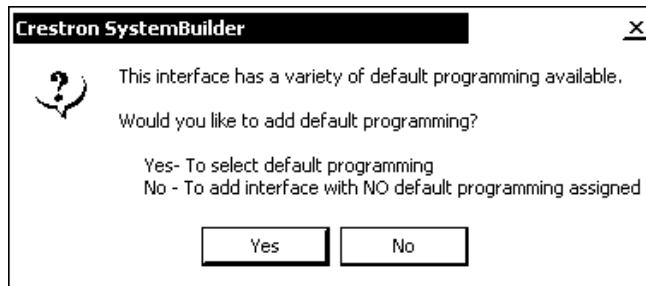
Choosing **Yes** allows you to select one of the three default programming selections. Click the appropriate selection:

- Program and Speech – Dual Volume Control

- Program and Speech – Single Volume Control

- Program Only Volume Control

Click **OK** when finished.

Default Programming Example – Program and Speech, Dual Volume Control
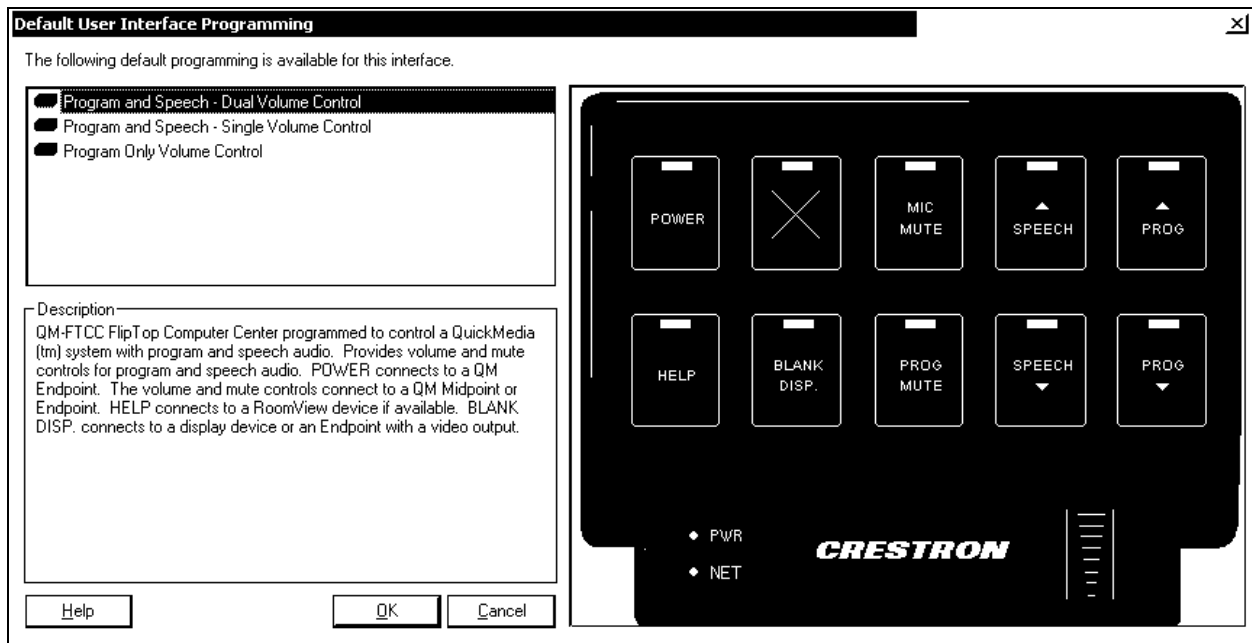
8. Setup the QM network cable routing. Right-click on the connector and select the routing to the desired device. The connectors that are displayed in the following diagram have an exclamation mark (!) if they are selectable for routing.

Routing Example – Right-Click on QM Connector
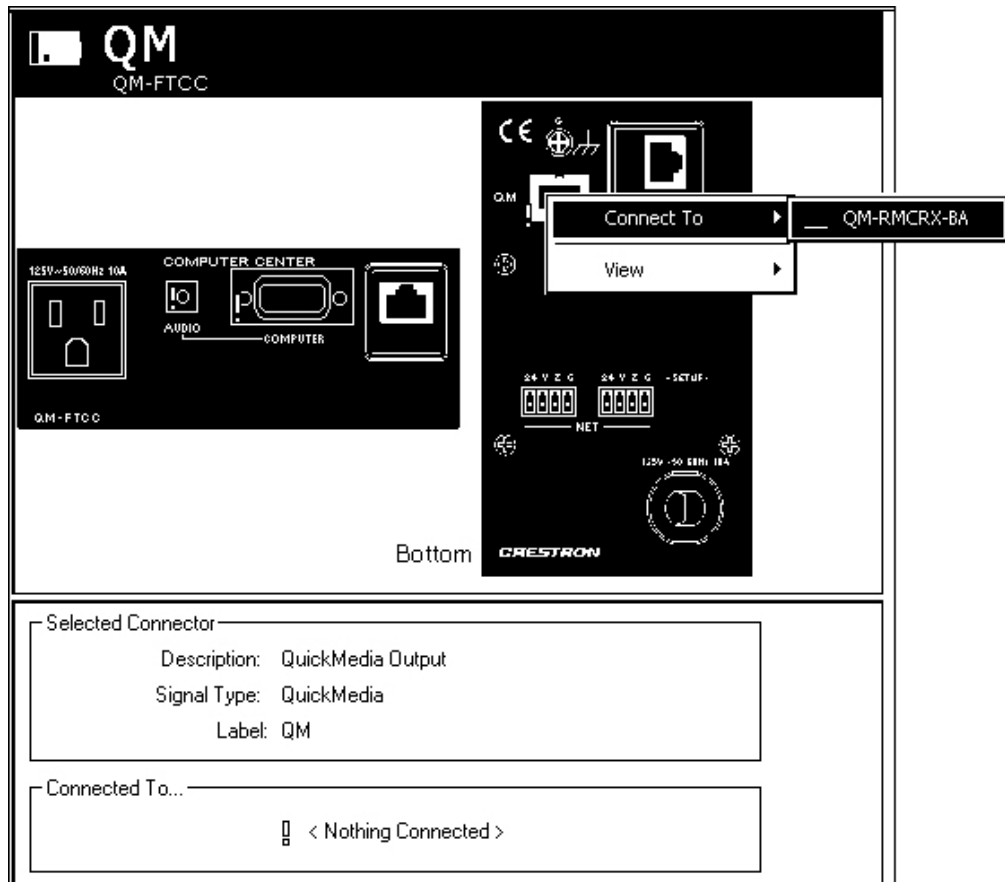
9. Build the program. The "Finish" window affords an opportunity to set/reset network IDs and verify hardware network IDs.

10. After completing your SystemBuilder program, click the **Build** and **Upload System** button 🖳.

SystemBuilder – "Finish" Window
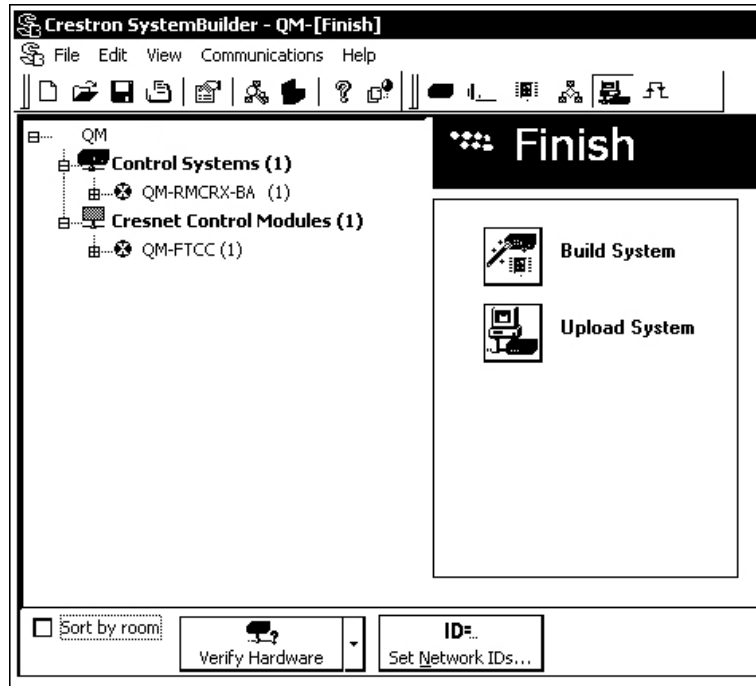
Setting Net IDs in SystemBuilder

SystemBuilder provides a convenient method of selecting and assigning Net IDs to devices.

1. Ensure that all network devices are connected to the control system.

2. After completing your SystemBuilder program, click the **Build and Upload** button .

SystemBuilder – "Finish" Window
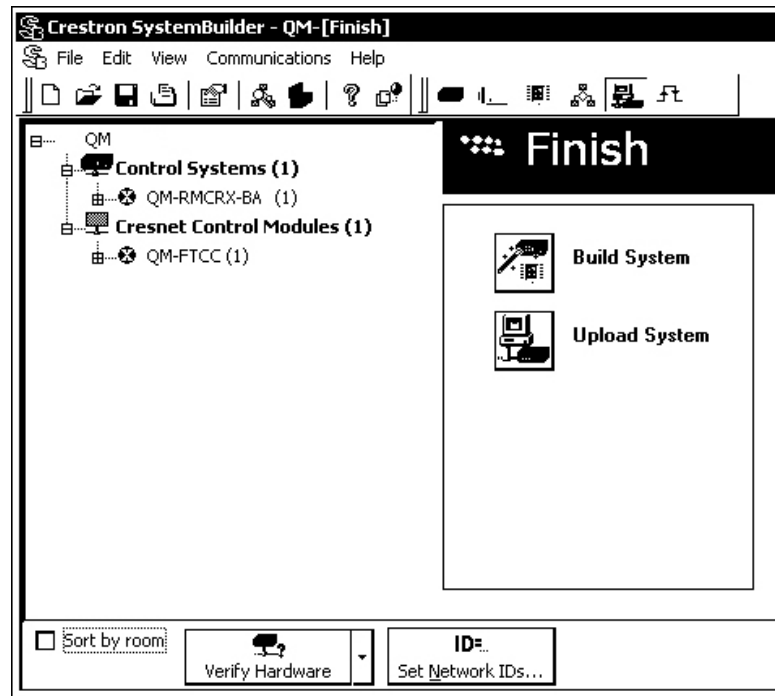
3. On the "Finish" window, click the **Set Network IDs…** button to assign the network IDs. SystemBuilder provides three methods for assigning Net IDs.

- Drag and drop a device from the program tree on the left onto the device in the network tree on the right.

- Right-click a device the program tree on the left and select **Setup** from the sub-menu.

- Right-click on a device in the network tree on the right and set the Net ID directly.

SystemBuilder – "Set Network IDs" Window
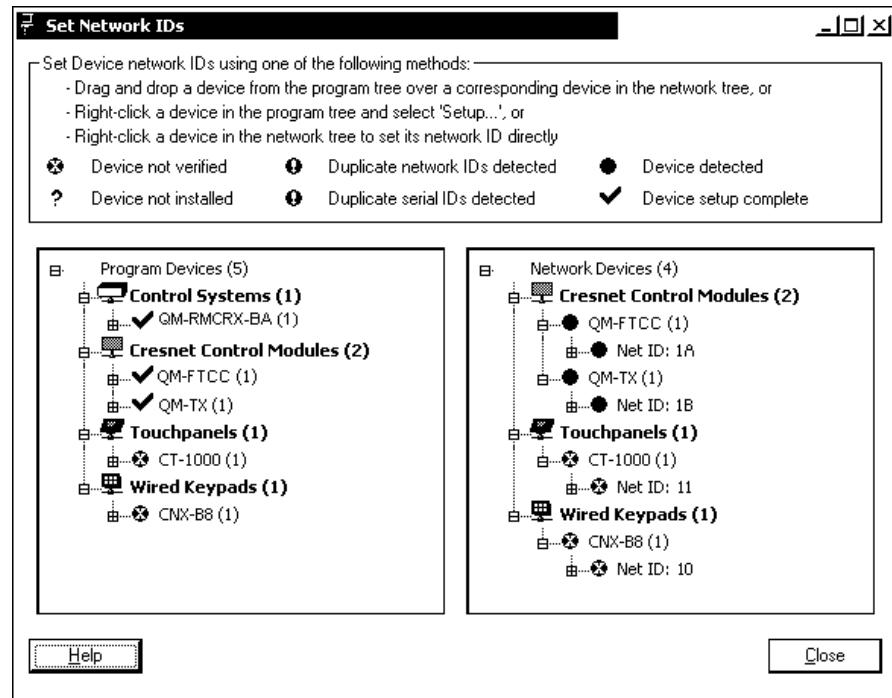
Configuring with SIMPL Windows

NOTE: While SIMPL Windows can be used to configure the QM-FTCC, Crestron recommends SystemBuilder software for configuring and tuning a QuickMedia system.

NOTE: The following are acceptable file extensions for programs that include a QM-RMCRX-BA and QM-FTCC, developed for specific control system types:

.smw   *projectname*.smw (source file)
.spz   *projectname*.spz   (compiled file for 2-Series)
.usp   *projectname*.usp   (source code module for SIMPL+)
.ir   *projectname*.ir   (user IR)
.umc   *projectname*.umc   (user macro)
.ush   *projectname*.ush   (completed SIMPL+)

SIMPL Windows is the Crestron graphical, Windows®-based development tool for programming control systems. The SIMPL Windows interface provides two workspaces: the Configuration Manager, for configuring the control system, touchpanels, and controlled network devices; and Program Manager, for designing the logic and functionality of the control system.

In addition, you can use the powerful Crestron Toolbox utility to accomplish multiple system tasks, such as uploading the program to the control system and performing diagnostic functions. Together with the Crestron Database, these tools provide you with the essential components you need to program the QM-RMCRX-BA and QM-FTCC. Crestron software is available from the Crestron website, registration is required for downloading.

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).

NOTE: The information in this section assumes that the reader has knowledge of SIMPL Windows. If not, refer to the extensive help information provided with the software.

NOTE: In the following example, a QM-RMCRX-BA is used as the QuickMedia receiver for the QM-FTCC.

In Configuration Manager, drag the QM-RMCRX-BA from the Control Systems folder of the *Device Library* to *System Views*.

QM-RMCRX-BA in the Device Library

System View of QM-RMCRX-BA
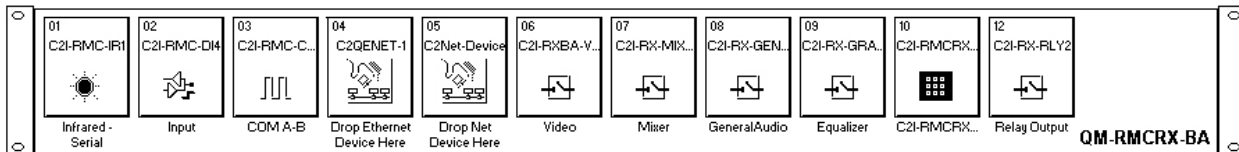
C2Net-Device Slot in Configuration Manager

The C2Net-Device slot (05) enables the QM-RMCRX-BA to control up to 252 Cresnet devices. Each Cresnet device is assigned a unique identifier called a Net ID, which is a hexadecimal value ranging from 03 to FE.

To view the list of supported devices, expand the control system in the bottom pane of *System Views* and double-click the C2Net-Device slot, the desired Net ID, or right-click and select **Add Item** from the submenu. Then select the device you want to add. Alternatively, you can drag the device from the Cresnet Control Modules folder onto the Net ID. Supported devices include network control modules, lighting modules and a variety of Crestron wired touchpanels.

In Program Manager, the C2Net-Device symbol contains no signals; to program a controlled Cresnet device, expand C2Net-Device in *Program View*. Then drag the device to *Detail View*.

Locate the QM-FTCC in the Cresnet Control Modules.

QM-FTCC Control Module
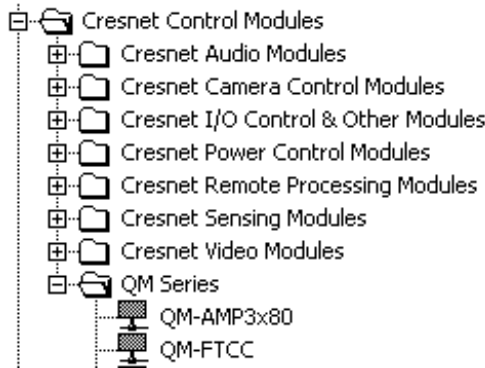
Within this module are three slots, Basic Control, Microphone Controls and Buttons. Drag and drop the QM-FTCC module onto the C2Net-Device slot. This symbol has default Net ID 1A.

C2Net-Device, Slot 5
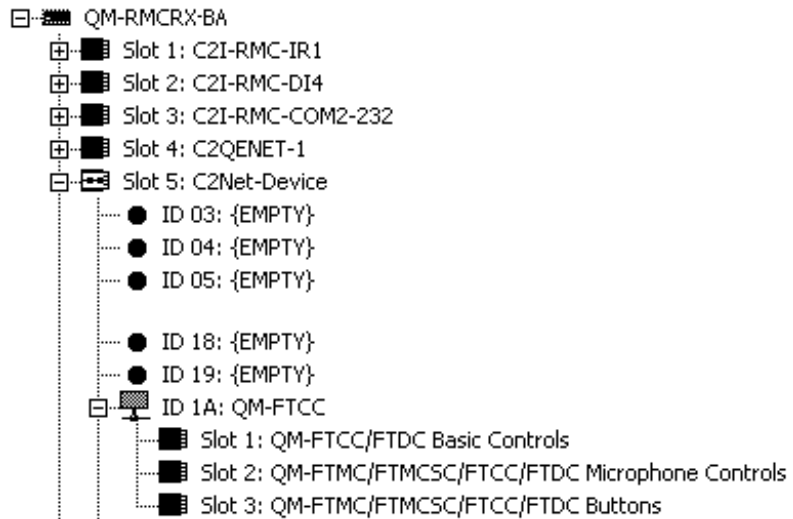
Setting the Net ID in Device Settings

Double-click the QM-FTCC icon in the upper pane to open the "Device Settings" window. This window displays QM-FTCC device information. The Net ID can be changed in this window using the *Net ID* tab, as shown in the following figure.

"Device Settings" Window
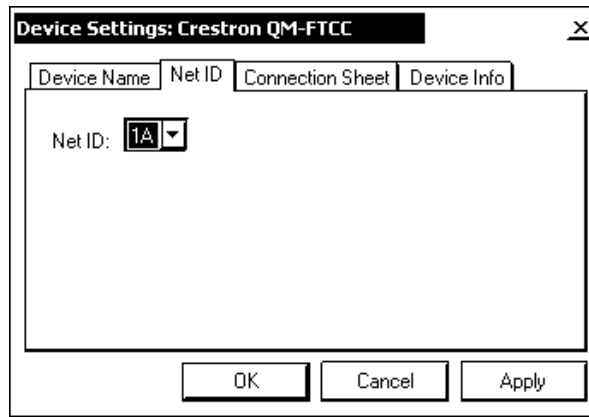
NOTE: This procedure sets the Net ID for the QM-FTCC in the program only. It does not automatically set the Net ID for the QM-FTCC hardware. SIMPL Windows automatically changes Net ID values of a device added to a program if a duplicate device or a device with the same Net ID already exists in the program. Always ensure that the hardware and software settings of the Net ID match. For Net ID hardware setting details, refer to "Identity Code" on page 14.

Symbols in Programming Manager

Three symbols make up the QM-FTCC: Basic Controls, Microphone Controls, and Buttons. These symbols may be opened in *Detail View*. Following each symbol, a table lists the symbol input and output signals, respectively, and their functional description.

Basic Controls

The Basic Controls module is built into slot 01 of the QM-FTCC.

- The QM-FTCC provides one RGB video input labeled COMPUTER, which accepts one computer or component video source.

- The QM-FTCC provides one stereo line-level input labeled COMPUTER AUDIO.

- In addition to the stereo audio, the QM-FTCC provides two microphone/line-level inputs.

- The QM-FTCC provides one QM output that transmits the RGB or component video together with the program audio and one or both microphones via CresCAT-QM.

QM-FTCC Symbol – Detail View of Basic Controls
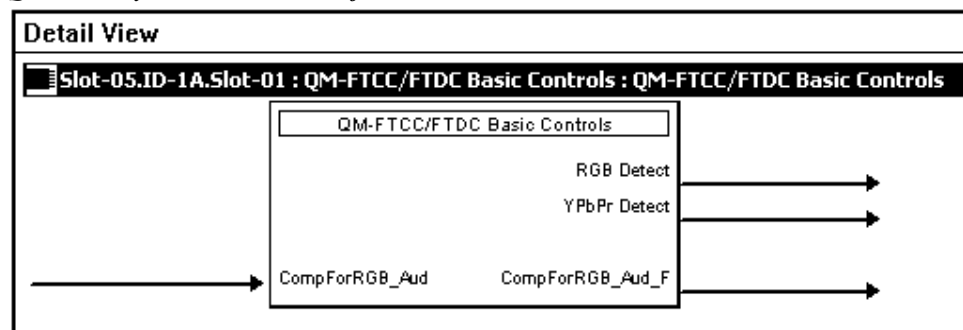
NOTE: Use an Analog Initialize to send a decimal input signal to the symbol.

QM-FTCC Basic Controls – Signal Descriptions

SIGNAL TYPE AND NAME	DESCRIPTION
Digital output: <**RGB Detect**>	Indicates that TTL H-sync is detected on the COMPUTER input. The feedback remains high for as long as video is detected. High/1 = Computer video detected; Low/0 = No video detected
Digital output: <**YPbPr Detect**>	Indicates that G/Y-sync is detected on the COMPUTER input. The feedback remains high for as long as video is detected. High/1 = Component video detected; Low/0 = No video detected
Analog input: <**CompForRGB_Aud**>	Sets the source gain compensation for the COMPUTER AUDIO source. Valid analog values range from -100d (-10dB) to +100d (+10dB), adjustable in increments of 0.1dB (1d = 0.1dB).
Analog output: <**CompForRGB_Aud_F**>	Indicates the source gain compensation being applied to the COMPUTER AUDIO source.

Microphone Controls

The Microphone Controls module is built into slot 02 of the QM-FTCC. The unit provides two microphone/line level inputs labeled MIC 1/LINE 1 and MIC 2/LINE 2, with muting, phantom power, noise gating, and level monitoring. In addition, auto-compensation models provide 4 bands of equalization (160Hz, 500Hz, 1.2kHz, and 3kHz).

The microphone audio is routed to the MIC 1 and MIC 2 channels of the QM output together with video and stereo program audio.

QM-FTCC Symbol – Detail View of Microphone Controls

```
Detail View
┌─────────────────────────────────────────────────────────────────────┐
│ ▓ Slot-05.ID-0A.Slot-02 : QM-FTMC/FTMCSC/FTCC/FTDC Microphone Controls │
└─────────────────────────────────────────────────────────────────────┘

              ┌──────────────────────────┐
              │  QM-FTMC/FTMCSC/FTCC/FTDC │
  ──────────→ │ Mic1Mute         Mic1Mute-F │ ──────→
  ──────────→ │ Mic2Mute         Mic2Mute-F │ ──────→
  ──────────→ │ Mic1GatingEnable  Mic1GatingEnable-F │ ──────→
  ──────────→ │ Mic2GatingEnable  Mic2GatingEnable-F │ ──────→
              │                   Mic1Gate │ ──────→
              │                   Mic1Nominal │ ──────→
              │                   Mic1Clip │ ──────→
              │                   Mic2Gate │ ──────→
              │                   Mic2Nominal │ ──────→
              │                   Mic2Clip │ ──────→
  ──────────→ │ PhantomEnable     PhantomEnable-F │ ──────→
  ──────────→ │ Mic1GatingLevel   Mic1GatingLevel-F │ ──────→
  ──────────→ │ Mic2GatingLevel   Mic2GatingLevel-F │ ──────→
  ──────────→ │ Mic1Gain          Mic1Gain-F │ ──────→
  ──────────→ │ Mic2Gain          Mic2Gain-F │ ──────→
  ──────────→ │ AttackTime        AttackTime-F │ ──────→
  ──────────→ │ DecayTime         DecayTime-F │ ──────→
  ──────────→ │ Mic1EQTrim1       Mic1EQTrim1-F │ ──────→
  ──────────→ │ Mic1EQTrim2       Mic1EQTrim2-F │ ──────→
  ──────────→ │ Mic1EQTrim3       Mic1EQTrim3-F │ ──────→
  ──────────→ │ Mic1EQTrim4       Mic1EQTrim4-F │ ──────→
  ──────────→ │ Mic2EQTrim1       Mic2EQTrim1-F │ ──────→
  ──────────→ │ Mic2EQTrim2       Mic2EQTrim2-F │ ──────→
  ──────────→ │ Mic2EQTrim3       Mic2EQTrim3-F │ ──────→
  ──────────→ │ Mic2EQTrim4       Mic2EQTrim4-F │ ──────→
              └──────────────────────────┘
```

The parameters that are associated with QM inputs are stored in the transmitter. Input compensation and Mic EQ are examples of this. This information is then transmitted along with the digital audio. The DSP that does the compensation and EQ are in the receiver, but the settings now travel with the audio signal.

When you have switchers in-between the transmitter and receiver, the program does not have to keep track of the routes and recall the preset in the receiver for these functions. Now the receiver automatically gets this information when the route is made, with no programming required. In addition we send the Cresnet ID (or a user defined number for systems with multiple Cresnets), which will be used by the receiver to automatically recall the video peaking/gain/skew parameters.

QM-FTCC Microphone Control – Signal Descriptions

SIGNAL TYPE AND NAME	DESCRIPTION
Digital inputs: **\<Mic1Mute\>** **\<Mic2Mute\>**	Mutes the MIC 1/LINE 1 or MIC 2/LINE 2 audio for as long as the input is high. High/1 (level sensitive) = Mute audio; Low/0 = Un-mute audio
Digital outputs: **\<Mic1Mute-F\>** **\<Mic2Mute-F\>**	Indicates that the corresponding MIC/LINE input is muted. High/1 = Mic audio is muted; Low/0 = Mic audio is not muted
Digital inputs: **\<Mic1GatingEnable\>** **\<Mic2GatingEnable\>**	Enables noise gating for MIC 1/LINE 1 or MIC 2/LINE 2, for as long as the input is high. Gating eliminates unwanted background noise that could prove distracting when amplified. The noise gate will not pass an audio signal unless it is above the threshold, set by the **\<GatingLevel\>** input. High/1 (level sensitive) = Enable gating; Low/0 = Disable gating
Digital outputs: **\<Mic1GatingEnable-F\>** **\<Mic2GatingEnable-F\>**	Indicates the current status of the noise gate for the corresponding MIC/LINE input. High/1 = Gating is enabled; Low/0 = Gating is disabled
Digital outputs: **\<Mic1Gate\>**, **\<Mic2Gate\>**	Indicates that the signal level on MIC 1/LINE 1 or MIC 2/LINE 2 has exceeded the **\<GatingLevel\>**. High/1 = Gating level exceeded; Low/0 = Gating level not exceeded
Digital outputs: **\<Mic1Nominal\>** **\<Mic2Nominal\>**	Indicates that the signal level on MIC 1/LINE 1 or MIC 2/LINE 2 has exceeded the nominal level. The nominal indication is reported at 10% of the maximum level supported by the hardware, or 20dB below the input clip level. High/1 = Nominal level exceeded; Low/0 = Nominal level not exceeded
Digital outputs: **\<Mic1Clip\>** **\<Mic2Clip\>**	Indicates that the signal level on MIC 1/LINE 1 or MIC 2/LINE 2 has exceeded 50% of the maximum level supported by the hardware, or 6dB below the input clip level. This signifies a mic level that is too hot. High/1 = Mic signal clipping; Low/0 = Mic level not clipping
Digital input: **\<PhantomEnable\>**	Enables the 48V phantom power supply for as long as the input remains high. (Phantom power is required by condenser microphones, but should be disengaged for dynamic microphones.) High/1 (level sensitive) = Enable phantom power; Low/0 = Disable phantom power
Digital output: **\<PhantomEnable-F\>**	Indicates that phantom power has been enabled. High/1 = Phantom power is on; Low/0 = Phantom power is off
Analog inputs: **\<Mic1GatingLevel\>** **\<Mic2GatingLevel\>**	Sets the threshold for gating. The noise gate is enabled for as long as the **\<GatingEnable\>** input is high. Valid gating values range from 0% to 100%. Once the microphone audio rises above **\<GatingLevel\>** the gate opens, allowing the signal to pass through. If the **\<MicNominal\>** feedback pulses while the **\<MicGate\>** feedback remains low, this indicates a threshold that is set too high.

Continued on the following page

QM-FTCC Microphone Control – Signal Descriptions (continued)

SIGNAL TYPE AND NAME	DESCRIPTION
Analog outputs: **<Mic1GatingLevel-F>** **<Mic2GatingLevel-F>**	Indicates the gating level for the corresponding MIC/LINE input.
Analog inputs: **<Mic1Gain>** **<Mic2Gain>**	Adjusts the gain of the MIC 1/LINE 1 or MIC 2/LINE 2 input. Valid values range from 0% to 100%. This maps into the following range: Mic level input: -60dBV to -20dBV Line level input: -28dBV to +12dBV
Analog outputs: **<Mic1Gain-F>** **<Mic2Gain-F>**	Indicates the gain being applied to the corresponding MIC/LINE input.
Analog input: **<AttackTime>**	Sets the time, in milliseconds, that it takes for the noise gate to fully open after the signal exceeds the **<GatingLevel>**. This prevents short spikes in the input signal level, such as coughing, from opening the gate. The attack time applies to both microphones. Valid analog values range from 0d (0ms) to 100d (100ms), with 10d to 40d being the most usable range. Out of range values are ignored.
Analog output: **<AttackTime-F>**	Indicates the attack time.
Analog input: **<DecayTime>**	Sets the time, in milliseconds, over which the noise gate will close. This prevents the sound from stopping too abruptly—for example, during brief pauses in speech. The decay time applies to both microphones. Valid analog values range from 0d (0ms) to 5000d (5000ms, or 5s), with 1000d to 3000d (1000s to 3000s, or 1s to 3s) being the most usable range. Out of range values are ignored.
Analog output: **<DecayTime-F>**	Indicates the decay time.
Analog inputs: **<Mic1EQTrim1>** through **<Mic1EQTrim4>** (auto-compensation models)	Sets the four MIC 1 EQ trims (at 160Hz, 500Hz, 1.2kHz, and 3kHz). Valid analog values range from -120d (-12dB) to +120d (+12dB), adjustable in increments of 0.1dB (1d = 0.1dB). A trim of 0d (0dB) means that the signal will pass unaffected.
Analog outputs: **<Mic1EQTrim1-F>** through **<Mic1EQTrim4-F>**	Indicates the trim being applied to each band of the MIC 1 equalizer.
Analog inputs: **<Mic2EQTrim1>** through **<Mic2EQTrim4>**	Sets the four MIC 2 EQ trims (at 160Hz, 500Hz, 1.2kHz, and 3kHz). Valid analog values range from -120d (-12dB) to +120d (+12dB), adjustable in increments of 0.1dB (1d = 0.1dB). A trim of 0d (0dB) means that the signal will pass unaffected.
Analog outputs: **<Mic2EQTrim1-F>** through **<Mic2EQTrim4-F>**	Indicates the trim being applied to each band of the MIC 2 equalizer.

NOTE: Phantom power is applied to the connectors of both microphone inputs. It cannot be switched on an individual microphone input.

NOTE: <**AttackTime**> and <**DecayTime**> are applied to both microphone inputs.

NOTE: The gating level indicators will still function even if the gating function is not enabled.

NOTE: Nominal indication is reported at 20 dB below input clip level. Clip indication is reported at 6 dB below input clip level.

NOTE: Returned values match values that were selected for the <**Mic1GatingLevel**>, <**Mic2GatingLevel**>, <**Mic1Gain**>, <**Mic2Gain**>, <**AttackTime**> and <**DecayTime**> inputs.

NOTE: Refer to page 41 for adjustment details of the microphone inputs.

Buttons

The Buttons module is built into slot 03 of the QM-FTCC. It consists of a keypad 10 to 20 buttons with LED indicators, and two bar graphs. The button presses are fixed and map to <press> outputs on the symbol detail, as follows:

Row 1	1	2	3	4	5
Row 2	6	7	8	9	10
Row 3	11	12	13	14	15
Row 4	16	17	18	19	20

○ PWR
○ NET
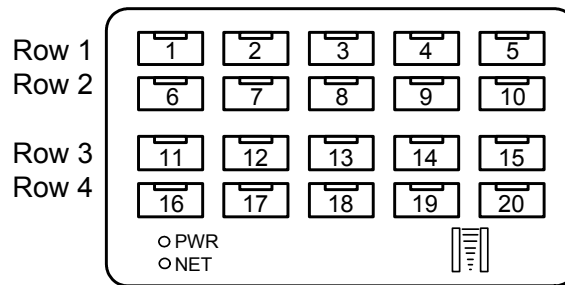
NOTE: Numbers in this illustration are for programming purposes only.

NOTE: Not applicable to NB models.

The buttons on rows 1 and 2 can be combined vertically to form one larger button. For example, the button caps for buttons #1 and #6 can be replaced with one larger button cap. Similarly, the vertical pairs on rows 3 and 4 can be combined to form one larger button. For example, buttons #13 and #18 can be combined. No other combinations are valid. That is, two buttons cannot be combined horizontally; the buttons on rows 2 and 3 cannot be combined.

QM-FTCC Symbol – Detail View of Buttons

QM-FTCC Buttons – Signal Descriptions

SIGNAL TYPE AND NAME	DESCRIPTION
Digital Outputs: Button presses/vertical pair <**Press1**>, <**Press6**> Button presses/vertical pair <**Press2**>, <**Press7**> Button presses/vertical pair <**Press3**>, <**Press8**> Button presses/vertical pair <**Press4**>, <**Press9**> Button presses/vertical pair <**Press5**>, <**Press10**> Button presses/vertical pair <**Press11**>, <**Press16**> Button presses/vertical pair <**Press12**>, <**Press17**> Button presses/vertical pair <**Press13**>, <**Press18**> Button presses/vertical pair <**Press14**>, <**Press19**> Button presses/vertical pair <**Press15**>, <**Press20**>	Indicates that the corresponding button has been pressed. The signal remains high for the duration of the button press. If the FlipTop cover is not fully open the buttons are disabled and the unit will not report any button presses, and will release any button that is already pressed. The status of the cover is given by the <**FlipTopOpen**> output. If two buttons are combined to form one larger button, the same signal should be attached to both button presses. High/1 = Button pressed; Low/0 = Button released
Digital Inputs: <**fb1**> through <**fb20**>	Activates the corresponding LED for as long as the input is high. If two buttons are combined, then only the LED for the top button in the vertical pair will be visible. High/1 (level sensitive) = Activate LED feedback; Low/0 = Turn off LED

Continued on the following page

QM-FTCC Buttons – Signal Descriptions (continued)

SIGNAL TYPE AND NAME	DESCRIPTION
Digital output: <**FlipTopOpen**>	Indicates that the FlipTop cover is fully open. The feedback remains high for as long as the cover is open. If the cover is not fully open the signal will go low, the keypad buttons will be disabled and the unit will not report any button presses. High/1 = FlipTop open; Low/0 = FlipTop not fully open
Analog input: <**Bargraph1**>	Sets the levels that will be displayed on the left bargraph. The bargraph is an 8-segment LED and is proportional to the input. Valid values range from 0% to 100%.
Analog input: <**Bargraph2**>	Sets the levels that will be displayed on the right bargraph. The bargraph is an 8-segment LED and is proportional to the input. Valid values range from 0% to 100%.

Example Program

An example program for the QM-FTCC is available from the "Example Program" section of the Crestron website (www.crestron.com/exampleprograms). Search for QM-FTCC.ZIP.

Adjusting the QM-FTCC Microphone Inputs

Once a QM-FTCC is installed and configured, settings for gain, gating level, attack time, and decay time should be set using the SystemBuilder finish tab.

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.

Definitions

The QM-FTCC allows for adjustments to be made to microphone input signals. The following are definitions of terms that are commonly used when making adjustments.

Attack Time

The time it takes (in milliseconds) from when an input signal rises above the gating level until the microphone output signal is enabled.

Clipping

A condition in which a signal level exceeds the maximum level (the clipping level) a circuit can handle. This is usually caused by improper gating parameters and gain settings.

Decay Time

The time (in milliseconds) from when an input signal falls below the gating level until the microphone output signal is muted.

Gain

An adjustable amplification to accommodate varying input signal levels.

Gating

Gating is a function that mutes a microphone signal when the input sound level is below a user-set threshold (gating level).

The following diagram demonstrates clipping, attack time, decay time, and gating level.

Visual Representation of Gating Level, Clipping Level, Attack Time, and Decay Time

SIGNAL LEVEL

MICROPHONE
INPUT
SIGNAL

Clipping Level

Mic On

Gating Level

Mic Off

TIME

Attack Time   Decay Time

SIGNAL LEVEL

QM
OUTPUT
SIGNAL

Gating Level
Reached

Gating Level Reached

Mic On

Mic Off

TIME

Attack Time   Decay Time
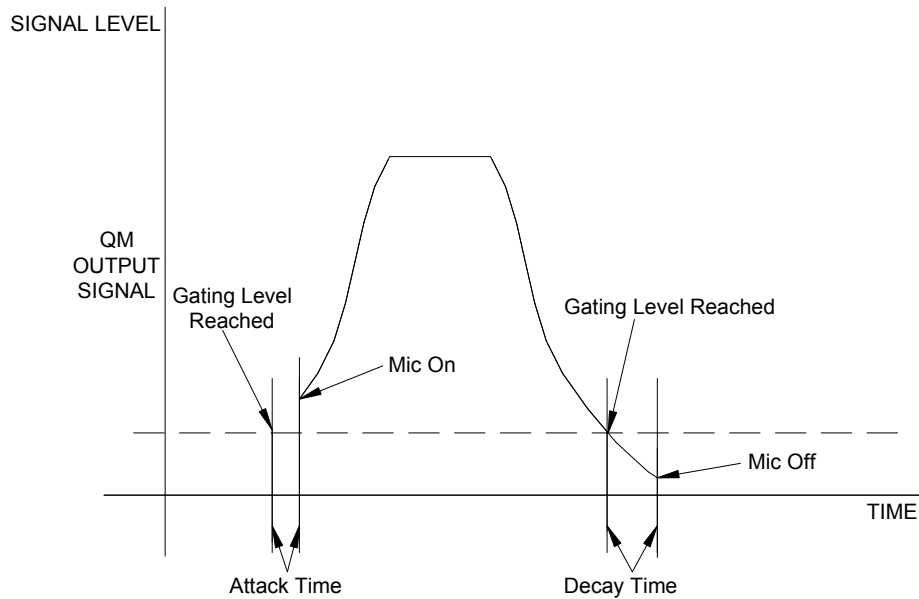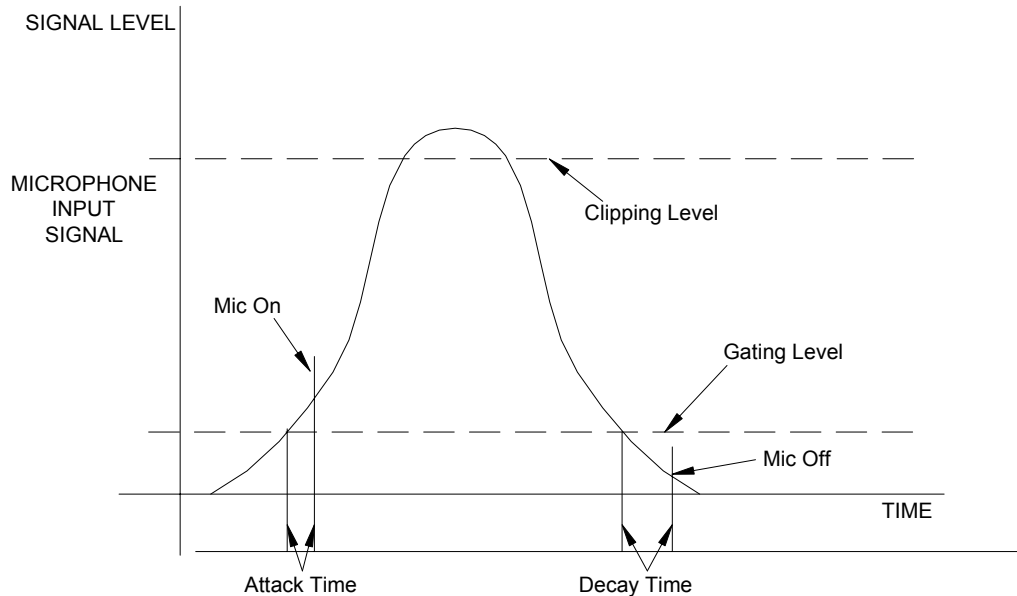
Setting Microphone Gain

The QM-FTCC provides variable gain on the microphone inputs. The following procedure is used to set the optimal gain for a microphone input.

Use the Realtime Mode in SystemBuilder to control phantom power, gain and gate settings, and to monitor the gate, normal, and clip level indicators. For information on using SystemBuilder software, refer to the extensive help information provided with the software.

NOTE: The input gain is independent of the system's output volume level.

---

1. To adjust the input gain, set the gain and noise gate to their lowest settings. Disable the "Mute" function by removing the check from the *Mute* checkbox.

2. Connect a microphone and enable phantom power if required.

3. Increase the gain while providing a "normal" sound level input to the microphone. When the "Norm" indicator shows fairly consistent activity, you've reached a good signal level for the QM-FTCC.

NOTE: The "clip" indicator shows that the signal is clipping. Let your ears be the judge, but when the clip indicator is active, you are approaching or have reached distortion in your QM-FTCC signal. Occasional clip indications on loud input are expected, but constant clip indicator activity is a sign that the gain may be set too high.

---

4. Set the system output volume to a desirable listening level and verify the gain settings by listening to the system output. Some minor gain adjustment may be required for the "best sound" in any specific configuration.

Setting the Gating Level

The QM-FTCC provides an input level gating function that will mute a microphone signal when the input sound level is below a user-set threshold. This function can be enabled or disabled via software commands.

Use the Realtime Mode in SystemBuilder to control phantom power, gain and gate settings, and to monitor the gate, normal, and clip level indicators. For information on using SystemBuilder software, refer to the extensive help information provided with the software.

The following procedure sets the optimal "gate level" for the microphone inputs:

1. Follow the "Setting Microphone Gain" procedure on page 42 to set the gain for each microphone input.

2. Set the noise gate level, attack and decay times to minimum. Disable the "Mute" function by removing the check from the *Mute* checkbox.

3. While providing a level to the microphone that is equivalent to the background noise that should be gated out, increase the noise gate level until the Gated indicator turns off. When the input sound levels are at or below the established noise gate level, the microphone output signal will be gated off.

4. Set the "attack time" to the minimum level and the "decay time" to the maximum level. These settings provide the shortest time to enable the microphone output when an input is above the gating level, and the longest time before disabling the microphone after such an input.

NOTE: The "attack" and "decay times" are applied to both microphone inputs.

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5. Set the system output volume to a desirable listening level. While providing realistic voice input and background noise levels, adjust the gating level and attack/decay times to eliminate undesired input while providing the best content quality.

Uploading and Upgrading

NOTE: Crestron recommends using the latest programming software and that each device contains the latest firmware to take advantage of the most recently released features. Please check the Crestron website (http://www.crestron.com/updates) for the latest versions of software and firmware. New users are required to register to obtain access to this site.

Assuming a PC is properly connected to the entire system, Crestron programming software allows the programmer to upload programs and projects to the system and touchpanel and firmware to the wall plates after their development. However, there are times when the files for the program and projects are compiled and not uploaded. Instead, compiled files may be distributed from programmers to installers, from Crestron to dealers, etc. Even firmware upgrades are available from the Crestron website as new features are developed after product releases. In those instances, one has the option to upload via the programming software or to upload and upgrade via the Crestron Toolbox.

The following sections define how one would upload a SIMPL Windows program to the control system, or upgrade the firmware of the QM-FTCC. However, before attempting to upload or upgrade, it is necessary to establish communications.

Communication Settings

NOTE: For laptops and other PCs without a built-in RS-232 port, Crestron recommends the use of PCMCIA cards, rather than USB-to-serial adapters. If a USB-to-serial adapter must be used, Crestron has tested the following devices with good results:

> Belkin (large model) F5U103
>
> I/O Gear GUC232A (discontinued)
>
> Keyspan USA-19QW (discontinued)

Other models, even from the same manufacturer, may not yield the same results.

NOTE: Even with these recommended models, results may vary on the computer being used.

Establishing communications is an essential step when setting up the control system. Once communications are established with the control system, you can upload programming, update firmware, and use all the diagnostic tools available in Crestron Toolbox.

Communications can be established using a serial (RS-323) connection, or by using a TCP/IP connection. For additional connection details, refer to "Establishing Communications with the Control System" in the latest version of the 2-Series Control Systems Reference Guide, Doc. 6256.

The following serial connection is unique to the QM-RMCRX-BA.

Null Modem Cable

Pins		Pins
2	⤬	2
3		3
5	——	5
7	⤬	7
8		8
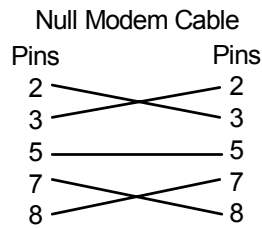
Connect the COM B port on the QM-RMCRX-BA control system to one of the COM ports (usually COM 1) on the PC. The QM-RMCRX-BA requires the use of a null-modem RS-232 cable with DB9 female connectors on both ends. Most commercially available cables are acceptable; they should have at least five pins for transmit, receive, ground, and hardware handshaking (pins 2, 3, 5, 7 and 8).

The procedure in this section provides details for RS-232 communication between the PC and the control system. If TCP/IP communication is preferred, consult the latest version of the QM-RMCRX-BA QuickMedia Receiver/Processor Operations Guide (Doc. 6332) or the Crestron e-Control Reference Guide (Doc. 6052). These documents are available from the Crestron website. Refer to the following figure for a typical connection diagram when uploading files.

Typical Connection Diagram when Uploading
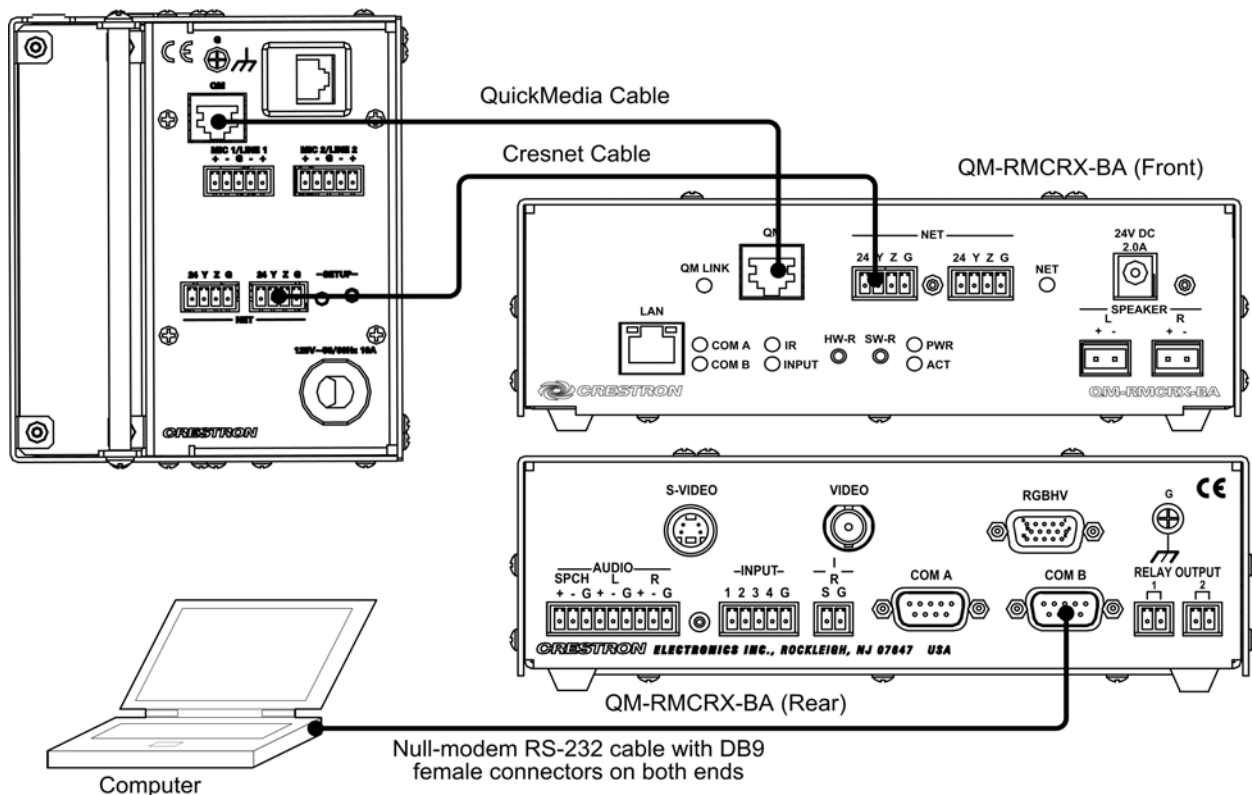
NOTE: Use a standard DB9 "Null-Modem" cable for connection to a QM-Series processor. Use a straight-through serial cable for connection to a 2-Series processor.

1. Open Crestron Toolbox and click **Tools | Manage Address Book** to display the communications settings. The DefaultAddressBook.adr file contains several default address settings. Select **Serial on COM 1** for serial communication.

Crestron Toolbox – "Address Book" Window

The PC communication settings specified in the address book should match the protocol that the QM-RMCRX-BA expects. The settings are as follows:

- Port = COM 1 through COM 8. Select the correct COM port on the PC.

- Baud rate = Auto Detect.

- Parity = None.

- Number of data bits = 8.

- Number of stop bits = 1.

- Hardware handshaking (RTS/CTS) enabled.

- Software handshaking (XON/XOFF) not enabled.

2. After setting the correct parameters, click **OK** to return to the Crestron Toolbox main window.

3. Select **Tools | System Info**. If the connection is successful, the *System Info* window displays the processor and device information.

System Info Window

```
┌─ Crestron Toolbox ──────────────────────────────────────────── _□☒ ┐
│ File  View  Tools  Window  Help  System Info  Functions             │
│ ☞ | ◧ ☒ ▦ | i  ▥ ▟ ▶ ◉ ▶ ▣ ▦                                        │
│ ┌─ System Info - Serial on COM1 ──────────────────────────── _□☒ ┐ │
│ │ ⊞  ┌─────────┐  Status: Retrieval Complete.                  ▲ │ │
│ │ ⊟  │Refresh (F5)│                                              │ │
│ │    └─────────┘                                                 │ │
│ │ ┌─ ⊟ Product Info ─────────────── ▣ ▶ ┐ ┌─ ⊟ Program ───── ▣ ▶ ┐ │
│ │ │   Device Name: PRO2               │ │ │  MinimumCUZ :      ▲│ │
│ │ │      Version: 3.122 (Build=23)    │ │ │  TargetRack : QM-RMCRX-BA│
│ │ │     Category: Control System      │ │ │ ProgramBootDir : \SIMPL│
│ │ ├─ ⊟ Ethernet ─────────────── ▣ ▶ ─┤ │ │   SourceFile : C:\Crestron\Simpl\Programs\m│
│ │ │   LAN A: ●          LAN B: ●      │ │ │  ProgramFile : mnet.smw│
│ │ │ IP Address: 132.149.2.163  IP Address: 192.168.16.16│ │ SystemName : {Not Specified}▼│
│ │ │ IP Mask: 255.255.255.0  IP Mask: 0.0.0.0│ │ ◄───────────────► │
│ │ │ Negotiation: Auto   Negotiation: Auto │ ├─ ⊟ Device IDs ── ▣ ▶ ┤ │
│ │ │ MAC Address 00.10.7f.00.18.dc  MAC Address 00.10.7f.00.18.dd│ │ Cresnet ID : 02 │
│ │ │                                   │ │ Touch Settable ID  7F0018DC│
│ │ │   Def Router: 0.0.0.0             │ │   Serial Number : OG0006364│
│ │ │     Hostname:                     │ ├─ ⊟ Error Log ──── ▣ ▶ ┤ │
│ │ │  Domain Name:                     │ │ No Errors Have been Logged. ▲│
│ │ │         DHCP:                     │ │                        │ │
│ │ │          SSL:                     │ │                        │ │
│ │ ├─ ⊟ Cresnet Devices ─────── ▣ ─────┤ │                        │ │
│ │ │ ┌───────────────────────────────┐▲│ │                        ▼│ │
│ │ │ │51:  QM-FTCC QuickMedia Transmitter [v3.05,#F029E9│ ◄──────► │
│ │ │ │                               │ │ ├─ ⊟ Compact Flash Usage ▣ ▶┤│
│ │ │ │                               │▼│ │ ● Not Inserted │ │
│ │ │ └───────────────────────────────┘ │ │                        ▼│ │
│ │ │ ◄─────────────────────────────► │ │                          │ │
│ │ ┌────┐ ┌─────────────┐ ┌──┐ ┌──┐┌──┐ ┌──────────┐ ┌─────────────┐│
│ │ │▦│ │Serial on COM1│▼│ ✎ │ ✐▼│ │Connected.│ │rs232 1,0,n,8,1,n,y││
│ │ └────┘ └─────────────┘ └──┘ └──┘└──┘ └──────────┘ └─────────────┘│
│ Ready                                                             ╱│
└───────────────────────────────────────────────────────────────────┘
```

NOTE: To enter the console mode, click the console mode icon ▥ .

Uploading a SIMPL Windows Program

A control system source file has the extension .smw. A compiled SIMPL Windows file has the extension .spz for a 2-Series control system.

The SIMPL Windows file can be uploaded to the control system using SIMPL Windows or via the Crestron Toolbox.

Upload via SIMPL Windows

1. Start SIMPL Windows.

2. Select **File | Open** to view the "Open" window, navigate to the SIMPL Window file (.smw), and click **Open**.

3. Select **Project | Transfer Program**.

Upload via Crestron Toolbox

1. Verify that the procedure for "Communication Settings" that begins on page 44 has been performed.

2. Once communication is established, click **Tools | System Info.** The *Functions* menu becomes available.

Crestron Toolbox– Tools | System Info

Crestron Toolbox

| File | View | Tools | Window | Help |

Manage Address Book...

Analyzer Control
File Manager
System Info
Network Device Tree
Script Manager
SMW Program Tree
Ethernet Device Tree
Text Console
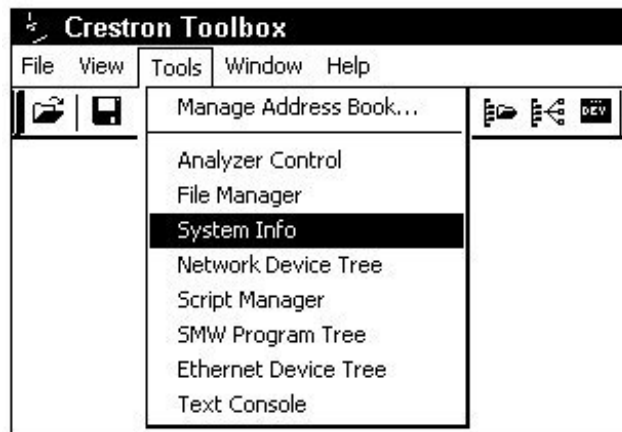
3. Select **Functions | SIMPL Program...**

Functions Menu – SIMPL Program Selection

Functions

Compact Flash...
Cresnet ID...
Cresnet Master...
DNS Management...
Device Info...
Device Reset...
Display Message...
Error Log...
Ethernet Addressing...
File System...
Firmware...
IP Table Setup...
Identify Transmitter...
NAT Management...
NVRAM Disk...
Program NVRAM...
SIMPL Program...
SSL Management...
Serial Communications...
System Clock...
Web Pages...

NOTE: The available functions depend on the type of device.

The "SIMPL Program" window permits you to browse for a compiled program file (.spz), and allows you to upload to internal flash or compact flash.

"SIMPL Program" Window
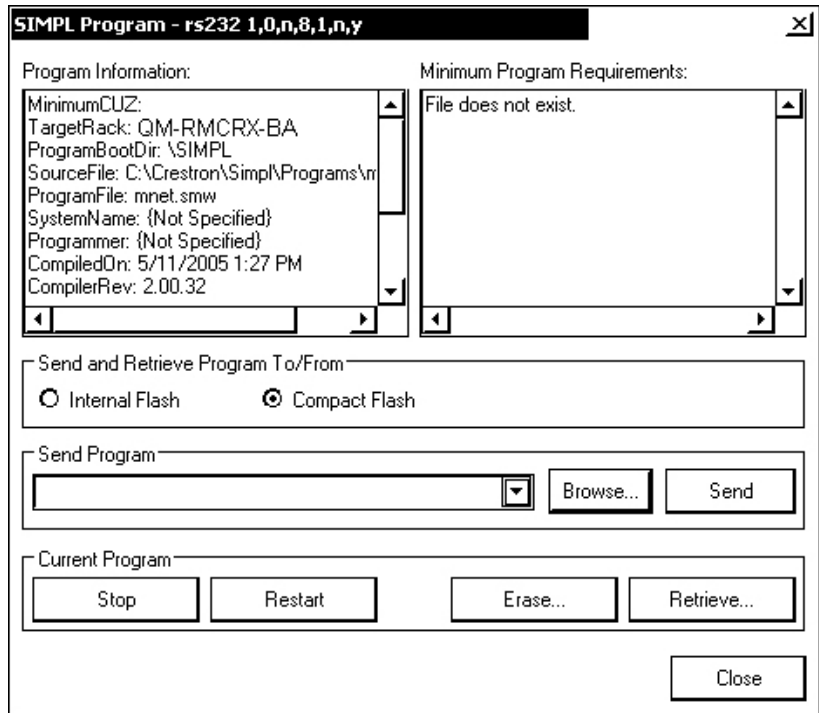
4. Browse for the appropriate .spz file in the "Open" window, and click
    Open.

"Open" Window
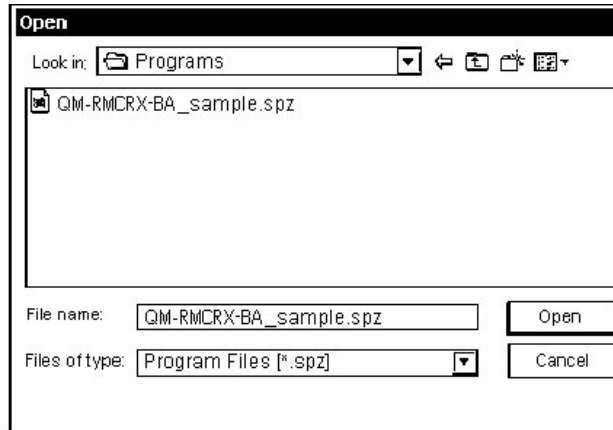
5. When the "SIMPL Program" window reappears, click **Send**.

6. To verify that the program has been transferred successfully, select
    Functions | SIMPL Program. Details about the current program
    loaded in the control system are displayed in the upper left corner of the
    "SIMPL Program" window.

Firmware Upgrade

A firmware upgrade file has the extension .upg.

To take advantage of all the QM-FTCC features, it is important that the unit contains the latest firmware available. Please check the Crestron website for the latest version of firmware. Not every product has a firmware upgrade, but as Crestron improves functions, adds new features, and extends the capabilities of its products, firmware upgrades are posted.

To upgrade the firmware, complete the following steps.

NOTE: A firmware upgrade file has the extension .upg.
The following is the acceptable file extension for a firmware update file.

.upg   QM-FTCC.V.XXXXX.upg

1. Make sure that "Communication Settings," which begins on page 44, has been performed.

2. Open Crestron Toolbox.

3. Once communication is established, click **Tools | System Info.** The *Functions* menu becomes available.

4. As shown after this step, select **Functions | Firmware**.

Functions Menu - Firmware Selection

Functions
Compact Flash…
Cresnet ID…
Cresnet Master…
DNS Management…
Device Info…
Device Reset…
Display Message…
Error Log…
Ethernet Addressing…
File System…
Firmware…
IP Table Setup…
Identify Transmitter…
NAT Management…
NVRAM Disk…
Program NVRAM…
SIMPL Program…
SSL Management…
Serial Communications…
System Clock…
Web Pages…

5. The "Firmware" window displays the model and current firmware version. Click **Upload New Firmware**.

"Firmware" Window
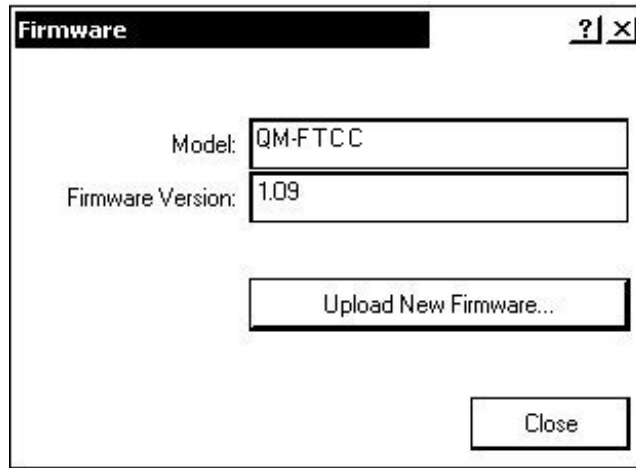
6. The Open window allows you to browse to the desired filename (.upg) file. Click **Open** to begin the transfer.

"Open" Window
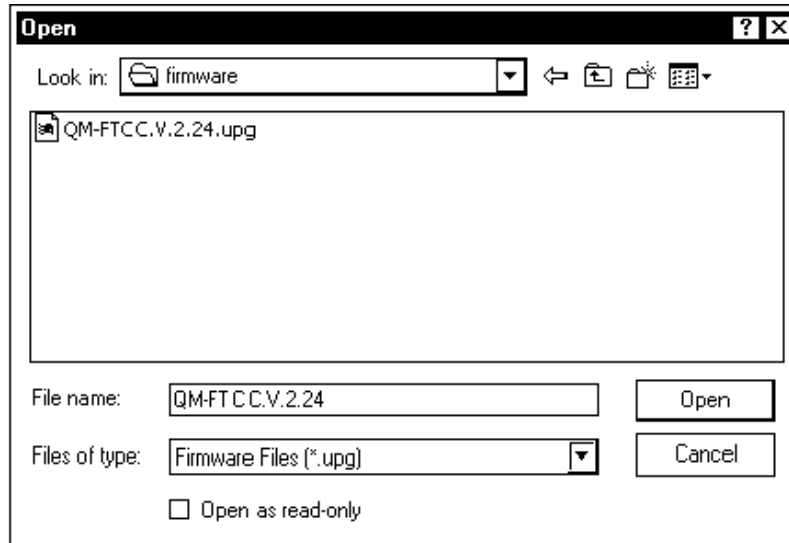
7. The "Firmware" window reopens and indicates the new firmware version.

NOTE: If problems arise when transferring any Cresnet file (touchpanel project/firmware), lower the port speed baud rate to 38400 to match the Cresnet bus speed.

Problem Solving

The following table provides corrective action for possible trouble situations. If further assistance is required, please contact a Crestron customer service representative.

QM-FTCC Troubleshooting

TROUBLE	POSSIBLE CAUSE(S)	CORRECTIVE ACTION
QM-FTCC not functioning.	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 SIMPL Windows program for setting Net ID.
	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 that Cresnet is properly attached.
No video output displayed.	Incorrect cable connection.	Verify RGB, video, S-video output cable connection.
		Verify QM input cable connection is secure.
Wrong source or video displayed.	Wrong SystemBuilder or SIMPL Windows programs.	Verify and upload correct programs.
	SystemBuilder project not set up correctly.	Verify proper video set up for each video input.
Video from RGB source is garbled or no output.	Incorrect cable connections.	Verify 15-pin output cable connection. Verify QM input cable connections.
	Signal skew due to cable length or unequal pair length.	Verify maximum QM cable length and compensation for skew.
Poor RGB or video image quality.	Incorrect peak and/or boost setting.	Adjust SystemBuilder peak or boost controls until image quality is improved.
Hum on audio and/or mic.	Grounding problem.	Refer to ground wire connection instructions on page 22.
Intermittent or no audio/mic output.	Incorrect peak setting.	Adjust SystemBuilder peak control until audio is restored.
Microphone does not produce sound.	Microphone requires phantom power or cannot use phantom power.	Enable or disable phantom power as necessary using controls created in the SystemBuilder project.
	Incorrect gain, gating level, attack time or decay time settings.	Adjust gain, gating level, attack time, or decay time settings as required.
	Incorrect volume and/or mixer settings on QM-RMCRX-BA.	Adjust volume and/or mixer settings on QM-RMCRX-BA as required.

Continued on the following page

QM-FTCC Troubleshooting (continued)

TROUBLE	POSSIBLE CAUSE(S)	CORRECTIVE ACTION
Intermittent microphone output.	Incorrect peak setting.	Adjust QM-RMCRX-BA peak control until audio is restored. For more information refer to the latest version of the QM-RMCRX-BA Operations Guide (Doc. 6332).
	Poor cable connection.	Verify all cable connections.
	Gating setting too high.	Adjust gating level.
Microphone produces harsh, distorted sound.	Input gain is set too high.	Lower microphone input gain.
Buttons do not function when pressed.	Net ID incorrect or does not match SIMPL Windows program.	In Toolbox, check **Functions	CresnetID** to verify Net ID. Verify SIMPL Windows program ID.
Button press yields incorrect result.	Incorrect programming.	Verify SIMPL Windows program.
Button LED does not illuminate.	Feedback signal names incorrect in SIMPL Windows.	Verify SIMPL Windows feedback signal names.

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 the Crestron corporate headquarters at 1-888-CRESTRON [1-888-273-7876]. For assistance in your local time zone, refer to the Crestron website (www.crestron.com) for a listing of Crestron worldwide offices.

You can also log onto the online help section of the Crestron website 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-FTCC, 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.

Appendix A: International Receptacles

PART NUMBER	DESCRIPTION	COUNTRIES
6003287	PWR-AU-B POWER RECEPTACLE, AUSTRALIA, 250V, 10A, BLK	Australia, Fiji, New Zealand, Papua New Guinea
6003288	PWR-EU-B POWER RECEPTACLE, EUROPEAN "SCHUKO", 250V, 16A, BLK	Austria, Azerbaijan, Belarus, Bosnia and Herzegovina, Brunei, Bulgaria, Burundi, Cape Verde, Chad, Croatia, Czech Republic, Egypt, Eritrea, Finland, Georgia, Germany, Greece, Greenland, Guinea-Bissau, Hungary, Iceland, Jordan, Kazakhstan, Korea (South), Kyrgyzstan, Liechtenstein, Luxemburg, Macedonia, Monaco, Montserrat, Morocco, Mozambique, Netherlands, Netherlands Antilles, New Caledonia, Norway, Poland, Portugal, Reunion, Romania, Russia, San Marino, Senegal, Serbia and Montenegro, Slovenia, Spain, Suriname, Sweden, Syria, Tunisia, Turkey, Ukraine, Vietnam
6003289	PWR-IT-B POWER RECEPTACLE, ITALIAN, 250V, 16A, BLK	Chile, Ethiopia, Italy, Libya
6003290	PWR-UK-B POWER RECEPTACLE, UK, 250V, 13A, BLK	Anguilla, Bahrain, Botswana, Burma (Myanmar), Cyprus, Dominica, Falkland Islands (Malvinas), Gambia, Ghana, Gibraltar, Hong Kong, Iraq, Ireland, Kenya, Kuwait, Liberia, Malawi, Malaysia, Malta, Mauritius, Nigeria, Northern Ireland, Oman, Qatar, St. Kits-Nevis, St. Lucia, St. Vincent, Seychelles, Sierra Leone, Singapore, Sudan, Tanzania, Uganda, United Arab Emirates, United Kingdom, Yemen, Zambia, Zimbabwe
6003291	PWR-FR-B POWER RECEPTACLE, FRENCH, 250V, 16A, BLK	Algeria, Belgium, Cameroon, Central African Republic, Comoros, Congo Democratic Republic, Djibouti, France, French Guiana, Gabon, Guadeloupe, Guinea, Indonesia, Madagascar, Mali, Martinique, Togo

Appendix B: QuickMedia Installation and Compensation

Installation Notes

You must pass audio through from transmitters to receivers even if you are not using the audio signal. The information required for auto-compensation is transmitted along with the audio. In addition, the QM Link signal indicates that the QM cable is connected and that an audio signal is present on the cable. If a unit does not receive an audio signal, the QM Link signal will not go high, and a valid QM Link connection cannot be detected (video can still be displayed if auto compensation is not used).

Certain devices terminate and re-initialize the audio path within the unit; however, they pass on the video untouched. This creates different path lengths for the video and audio. This difference in path length creates different peak and boost levels for audio and video. When audio-breakaway is implemented, the audio and video paths are likely to be different.

Compensation

Inherently, twisted pair cables experience a loss of bandwidth and signal strength over distance. When the loss is within certain limits, the reduced signal can be restored through peak and boost compensation adjustments. The amount of required compensation is directly dependent on the length of the cable. Therefore, each device in a network requires a specific amount of compensation.

Manual Compensation

In a manual compensation system, the compensation parameters, along with microphone equalization settings, are stored in the receiver in a *preset* file. When the program switches to a new transmitter, the program recalls the compensation settings associated with the new transmitter. In large systems containing multiple transmitters and receivers, these parameters must be stored in multiple locations, creating a complex arrangement.

Auto Compensation

In a system utilizing auto compensation, the peak and boost values are stored in a *preset* file at the receiver. The transmitter stores the input compensation and microphone EQ settings. When the program switches to a new transmitter, the transmitter ID, input compensation, and microphone EQ settings are sent over the audio channel of the QM cable to the receiver. The receiver is equipped with a hunt algorithm to search for the proper peak and boost settings. Once the receiver acquires a QM Link signal, it can receive the audio signal containing the transmitter ID, input compensation, and microphone EQ settings. After receiving the transmitter ID, the receiver recalls the peak and boost preset and uses these values to properly adjust the video signal.

NOTE: If auto compensation is used in your QM system, all QM devices must use it. If it is not used in your QM system, it must not be used for any of the QM devices.

Auto Compensation with a Self-Peaking Receiver

Crestron's innovative self-peaking audio circuit eliminates the need to peak the audio signal.

Without self-peaking the same peak and boost values are applied equally to the video and audio signals. When these signals travel the same path, this arrangement is satisfactory. However, when video and audio travel to a receiver from different paths, unequal cable lengths are created. The self-peaking feature eliminates the need to hunt for peak and boost values by allowing the receiver to read the ID, input compensation and microphone EQ from the audio channel regardless of the peaking and boost values applied. Then using the transmitter ID, the receiver recalls the preset containing the proper peak and boost settings for the video, and implements the correct input compensation and microphone EQ settings.

NOTE: QM devices that do not have self-peaking include:

- QM-RMCRX
- QM-MD7x2
- QM-MD5x1
- TPMC-15-QM
- TPMC-17-QM

Switchers

The QM-MD7x2 and the QM-MD5x1 terminate and re-initialize the audio path within the unit, however, they pass on the video untouched. This creates different path lengths for the video and audio. This difference in path length creates different peak and boost levels for audio and video. In the initial QM receivers the video and audio circuits, peak/boost have the same settings for the audio and video. The initial QM receivers cannot accommodate different settings, and may experience difficulties resolving the signals.

The QM-MD8x8 and QM-MD4x2 are simply analog switches. When audio-breakaway is implemented, the audio and video paths are likely to be different. For receivers without self-peaking audio, a probable conflict exists. For receivers with self-peaking, auto compensation is still problematic when audio-breakaway is done since the transmitter ID is that of the audio source and the video source is from a different device with a different transmitter ID.

The self-peaking audio circuit resolves the problem of unequal cable lengths. Because no audio setting is required, the video can have an independent peak/boost as set by the program.

QM-AE Audio Extractor

The QM-AE is an audio-only device. The QM cable loops through the QM-AE from the input connector to the output connector. The QM-AE taps only the audio signals of the QM cable. The QM-AE is a self-peaking receiver, so peaking is not required.

Compatibility Charts

Under certain circumstances, the audio and video may be acceptably peaked even though the audio and video path lengths are different. Because the audio signal is digital, and more forgiving than the video signal, it may be possible to peak the video and have functioning audio. It is difficult to predict outcomes because it is dependent on the difference in cable lengths, the video rates, and acceptable video quality.

The following Auto Compensation and Audio Breakaway compatibility charts are arranged with transmitters listed on the left and receivers listed across the top. The QM cable exits the transmitter and the QM cable enters the receiver.

NOTE: The cable exiting the QM-AE is a loop-through and is not listed as a transmitter.

NOTE: QM wallplates and fliptop boxes are not included because the audio and video cable lengths are always equal.

KEY: ✓ = Good operation.
    1. = Operation depends on video rates and if the audio and video cable lengths are closely matched.
    2. = In these cases, if the audio and video (although from different sources), switch together consistently, the system will operate normally. If the audio and video switch inconsistently, operation then depends on the video rates and how closely the audio and video cable lengths match.
    * = Device with self-peaking.

Auto Compensation without Audio Breakaway

		QM RECEIVERS							
		QM-RMCRX	QM-RMCRX-BA*	QM-RXA*	QM-MD7x2	QM-MD5x1	QM-AE*	QM-RX*	TPMC
QM TRANSMITTERS	QM-MD8x8	✓	✓	✓	✓	✓	✓	✓	✓
	QM-MD4x2	✓	✓	✓	✓	✓	✓	✓	✓
	QM-MD7x2	1	✓	✓	✓	✓	✓	✓	1
	QM-MD5x1	1	✓	✓	✓	✓	✓	✓	1

Auto Compensation with Audio Breakaway

		QM RECEIVERS							
		QM-RMCRX	QM-RMCRX-BA*	QM-RXA*	QM-MD7x2	QM-MD5x1	QM-AE*	QM-RX*	TPMC
QM TRANSMITTERS	QM-MD8x8	1	2	2	✓	✓	✓	2	1
	QM-MD4x2	1	2	2	✓	✓	✓	2	1
	QM-MD7x2	1	✓	✓	✓	✓	✓	✓	1
	QM-MD5x1	1	✓	✓	✓	✓	✓	✓	1

KEY: ✓ = Good operation.
    1. = Operation depends on video rates and if the audio and video cable lengths are closely matched.
    2. = In these cases, if the audio and video (although from different sources), switch together consistently, the system will operate normally. If the audio and video switch inconsistently, operation then depends on the video rates and how closely the audio and video cable lengths match.
    * = Device with self-peaking.

Manual Compensation without Audio Breakaway

		QM RECEIVERS							
		QM-RMCRX	QM-RMCRX-BA*	QM-RXA*	QM-MD7x2	QM-MD5x1	QM-AE*	QM-RX*	TPMC
QM TRANSMITTERS	QM-MD8x8	✓	✓	✓	✓	✓	✓	✓	✓
	QM-MD4x2	✓	✓	✓	✓	✓	✓	✓	✓
	QM-MD7x2	1	✓	✓	✓	✓	✓	✓	1
	QM-MD5x1	1	✓	✓	✓	✓	✓	✓	1

Manual Compensation with Audio Breakaway

		QM RECEIVERS							
		QM-RMCRX	QM-RMCRX-BA*	QM-RXA*	QM-MD7x2	QM-MD5x1	QM-AE*	QM-RX*	TPMC
QM TRANSMITTERS	QM-MD8x8	1	✓	✓	✓	✓	✓	✓	1
	QM-MD4x2	1	✓	✓	✓	✓	✓	✓	1
	QM-MD7x2	1	✓	✓	✓	✓	✓	✓	1
	QM-MD5x1	1	✓	✓	✓	✓	✓	✓	1

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 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. 07647, 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 supercedes all previous warranties.

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