

Crestron **Isys i/O™**
TPMC-15/17 Tilt Series
Touchpanel Media Centers

Operations Guide



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



Crestron Electronics, Inc.

15 Volvo Drive

Rockleigh, NJ 07647

1-888-CRESTRON

Contents

Touchpanel Media Centers: Crestron Isys i/O™ TPMC-15/17 Tilt Series 1

Introduction	1
Features and Functions	1
Applications	6
Internal Block Diagram	8
Specifications	9
Physical Description	12
Industry Compliance	19
Setup	20
Network Wiring	20
Ethernet	20
CAT5 Wiring (CH versions only)	20
QuickMedia Wiring (QM versions only)	20
Identity Code	23
Configuring the Touchpanel	23
Hardware Hookup	54
Cable Management	56
Tilt Angle Tension Adjustment	57
Recommended Cleaning	57
Programming Software	58
Earliest Version Software Requirements for the PC	58
Programming with Crestron SystemBuilder	58
Programming with SIMPL Windows	58
Programming with VisionTools Pro-e	61
Embedded Applications	64
Defaults for Embedded Windows Applications	65
Programming Embedded Windows Applications	66
Example Program	67
Uploading and Upgrading	68
Establishing Communication	68
Programs, Projects and Firmware	69
Program Checks	70
Operation	71
MediaMarker	71
Security Infrastructure	71
Problem Solving	73
Troubleshooting	73
Check Network Wiring	74
Reference Documents	75
Further Inquiries	75
Future Updates	76
Appendix: TPMC-15/17 Multi-Language Pack	77
Software License Agreement	78
Return and Warranty Policies	80
Merchandise Returns / Repair Service	80
CRESTRON Limited Warranty	80
Microsoft® Windows XP® Embedded End User License Agreement	81

Touchpanel Media Centers: Crestron Isys i/O™ TPMC-15/17 Tilt Series

Introduction

The Crestron Isys i/O™ TPMC-15/17-CH/QM Tilt Series of Touchpanel Media Centers (hereinafter referred to as TPMC-15/17) integrates touchpanel control with embedded PC functionality, delivering a unified multimedia presentation solution.

Both the TPMC-15 and TPMC-17 series are available in Crestron Home (hereinafter referred to as CH) and QuickMedia™ (hereinafter referred to as QM) versions.

Features and Functions

- 15 inch (4:3 aspect ratio) and 17 inch (widescreen 15:9 aspect ratio) active matrix touchscreen displays
- Screen resolutions: TPMC-15 series 1024 x 768, TPMC-17 series 1280 x 768
- 16.7 million colors, 24-bit Isys i/O graphics with 8-bit alpha channel and Synapse™ image rendering algorithm
- Fast graphics performance: imported photographs, drawings and icons
- PNG image support enables translucent objects to be placed over still images
- Dynamic Graphics enables the display of images (pictures, CD cover art, etc.) that are hosted externally on a flash memory card or media server
- Windows® XP Embedded operating system
- Onboard PC applications for Web browsing, streaming media, videoconferencing, remote computer control and digital media presentation – no computer required!

(Continued on following page)

Features and Functions (Continued)

- Built-in real-time annotation using Crestron MediaMarker™ allows presenters to write or draw electronically on the touchscreen using a finger or stylus (QM versions only)
- High performance dual window video and RGB display enables simultaneous viewing of any two full-motion (scalable up to full screen) computer images (RGB on QM versions only)¹
- Built-in time base correction for stable video and graphics
- Two balanced video inputs can receive component, composite and S-video inputs; supports NTSC/PAL formats from any Crestron CAT5 balanced video source (CH versions only)
- Two QM inputs can receive audio, microphone, NTSC/PAL composite video, S-video, component video and non-interlaced RGB computer signals over CresCAT-QM cable (QM versions only)
- QM output at native touchpanel resolution acts as transmitter for connection to a QM receiver or switcher (QM versions only)
- Built-in 10 watt biamplified speaker system and microphone (half duplex intercom capable)¹
- Balanced input for audio that can be connected to a Crestron CNX-BIPAD8 or any Crestron CAT5 balanced audio source (CH versions only)
- Balanced output for microphone audio that can be connected to a Crestron CNX-BIPAD8 or any Crestron CAT5 balanced audio device (CH versions only)
- Built-in mixer combines PC audio with selected audio input
- Stereo headphone jack
- Auto compensation automatically recalls microphone EQ settings, source compensation settings and peak and boost preset values of multiple QM origination points when acting as an endpoint (QM versions only)
- Stores and transmits audio parameters for recall by a QM receiver when acting as a QM origination point (QM versions only)
- 10BaseT/100BaseTX high speed Ethernet, 802.3U compliant, full/half duplex, auto-negotiating
- High speed Cresnet® communications
- Two USB ports for connection with USB peripherals
- One RS-232 port for project upload, firmware upgrade and diagnostics
- Two PC Card slots for further expansion including installation of wireless network card
- Up to 4,000 digital and 4,000 analog signals; up to 4000 serial signals
- Support for downloadable fonts – proportional² and non-proportional
- Foreign language text
- 512 MB of SDRAM, 512 MB internal Flash (expandable via external card slot)
- Tiltcase housing with integral rear cover and cable strain relief

1. For QM versions, one or more QuickMedia devices are required to facilitate the input and output of audio, video and RGB signals.
2. With proportional fonts, the width of each character differs with the character's shape, for example, the letter M is wider than the letter I. With non-proportional fonts, all characters are spaced equally.

Isys®

Isys power and beauty are infused throughout Crestron's entire touchpanel lineup. Under the hood, the TPMC-15/17 offers vibrant 24-bit color depth with 8-bit alpha channel transparency to produce incredible 3D graphics using new dynamic menu objects, dynamic graphics, full motion animations, multi-mode objects, PNG translucence and exclusive Synapse™ image rendering - all with astonishing speed.

Synapse™

Crestron's exclusive Synapse Image Rendering Algorithm enables system programmers to produce amazing graphics – faster and easier. Advanced antialiasing delivers crisper, sharper objects and text. Enhanced 3D effects add new depth and style. And because Synapse is native to the touchpanel, memory requirements and upload time are substantially reduced.

Enhanced Touchpanel Control and Presentation

More than a touchpanel, the TPMC-15/17 is also a dynamic resource for managing routine online tasks and enjoying streaming music and video and a high-resolution video monitor with performance rivaling the best LCD flat panel displays available.

The QM version also provides a dynamic presentation source, delivering high-resolution video and audio to any size audience via integrated QuickMedia transport technology.

Embedded PC

The power of Isys i/O™ is in its embedded PC engine, combining rock solid touchpanel performance with enhanced capabilities for surfing the Internet, streaming multimedia and desktop videoconferencing. Running the Microsoft Windows XP Embedded operating system, Isys i/O delivers a reliable and secure platform for touchpanel control with integrated PC functionality. Programmatic control erases the lines between control system and PC, allowing programmers to customize each application's behavior within the touchpanel environment to create a truly powerful and user friendly interface.

With built-in Windows Media® Player, RealPlayer® and Internet Explorer, plus viewers for Word, Excel, PowerPoint® and Adobe® Acrobat®, the TPMC-15/17 provides everything needed for viewing Web pages, enjoying online music and movies and downloading documents without necessitating a separate computer. (The QM version also serves as a multimedia presentation source.) You can also access data and run applications on other computers over the network or Internet via Remote Desktop or use new VNC Viewer support for enhanced cross platform interaction with remote computers, allowing full control of desktop applications with live presentation capability. Onboard NetMeeting® and Skype™ VoIP applications enable duplex telephone and interactive conferencing right on the touchpanel.

Touch-the-PC (QM version only)

In addition to its built-in PC, the TPMC-15/17 is also enabled to display and control externally connected computers. Crestron's exclusive "Touch-the-PC" technology allows real-time touchpanel navigation of any Windows PC through a direct high-speed serial connection.

MediaMarker™ Annotation

Built-in annotation allows presenters to write or draw electronically on the touchscreen using a finger or stylus. Whether drawing freehand or on a whiteboard

screen, highlighting points on a spreadsheet or making notes over motion video or still images, MediaMarker facilitates crystal clear visual communications.

NOTE: The TPMC-15/17-CH does not have video output capability. Therefore, annotation cannot be presented to an audience.

Dual Window HD Video¹ and RGB²

In addition to its internal PC and streaming video applications, the TPMC-15/17 can also simultaneously display two fully scalable, full-motion windows. Each window supports standard video, HDTV and high-resolution RGB (RGB on QM versions only) signals from external AV and computer sources. Discrete video scalers with motion adaptive deinterlacing bring out the finest detail, minimizing visible scan lines and motion artifacts for a truly remarkable picture. Advanced gamma correction and built-in time base correction ensure accurate color reproduction and a jitter-free image.

1. Additional CAT5 balanced AV equipment is required to facilitate the input of more than one external video signal.
2. One or more QuickMedia devices are required to facilitate the input and output of audio, video and RGB signals.

High Quality Audio

An integrated microphone, biamplified speakers, stereo headphone output and PC audio output are all built into the touchpanel to support full AV, intercom, desktop conferencing and multimedia computer capabilities. Customized WAV files can be loaded on the touchpanel to add dimension to the touchscreen graphics with personalized sounds, button feedback and voice prompts.

Crestron Home® CAT5 AV (CH version only)

All audio and video connections are facilitated using inexpensive CAT5 wire, enabling direct connection to Crestron's popular CAT5 balanced audio and video distribution switchers. Two video input ports are provided, each supporting composite, S-video and HDTV/component formats over wiring distances of up to 500 feet. A bidirectional audio port receives stereo program audio and intercom signals and outputs audio from the internal microphone and PC for intercom and whole-house audio distribution. An interface module is included to enable direct connection to conventional video and audio devices.

QuickMedia™ (QM version only)

All audio and video connections are facilitated using Crestron's revolutionary QuickMedia transport, providing a flexible yet remarkably simple wiring solution. Through QuickMedia (QM), the TPMC-15/17 interfaces directly with other QM-based products using inexpensive CAT5e type cable.

The two QM input ports each support non-interlaced RGB up to 1600 x 1200 pixels, as well as composite, S-video and component video signals. QM input #1 includes software adjustable compensation for cable runs up to 450 feet; input #2 supports up to 300 feet for video and HDTV and shorter distances for RGB computer signals. Both QM inputs receive audio signals from external microphone and stereo line level sources.

High-resolution RGB graphics and 24-bit digital audio are output from the internal PC and microphone via the QM output port for audience presentation and intercom purposes.

Connectivity and Expansion

Both Cresnet and high-speed Ethernet are standard on the TPMC-15/17, providing for seamless communications with Crestron control systems, computers, digital media servers and other IP based devices. WiFi wireless networking and memory expansion are easily added through two PC card slots and two USB ports enable the connection of an external mouse and keyboard (not included), as well as CD ROM drives and memory devices.

NOTE: Contact Crestron for a current list of compatible devices and embedded applications. To ensure reliable performance, new device drivers and applications are available only from Crestron through firmware updates.

Cresnet®

Cresnet is the communications backbone for many Crestron touchpanels, keypads, lighting controls and other devices. The Cresnet bus is a simple, yet flexible 4-wire network that provides rock-solid bidirectional communication and power for up to 252 Cresnet devices.

Memory

The TPMC-15/17 touchpanels feature 512 MB SDRAM and 512 MB Flash, with an external card slot that allows flash memory expansion.

Functional Tiltcase Design

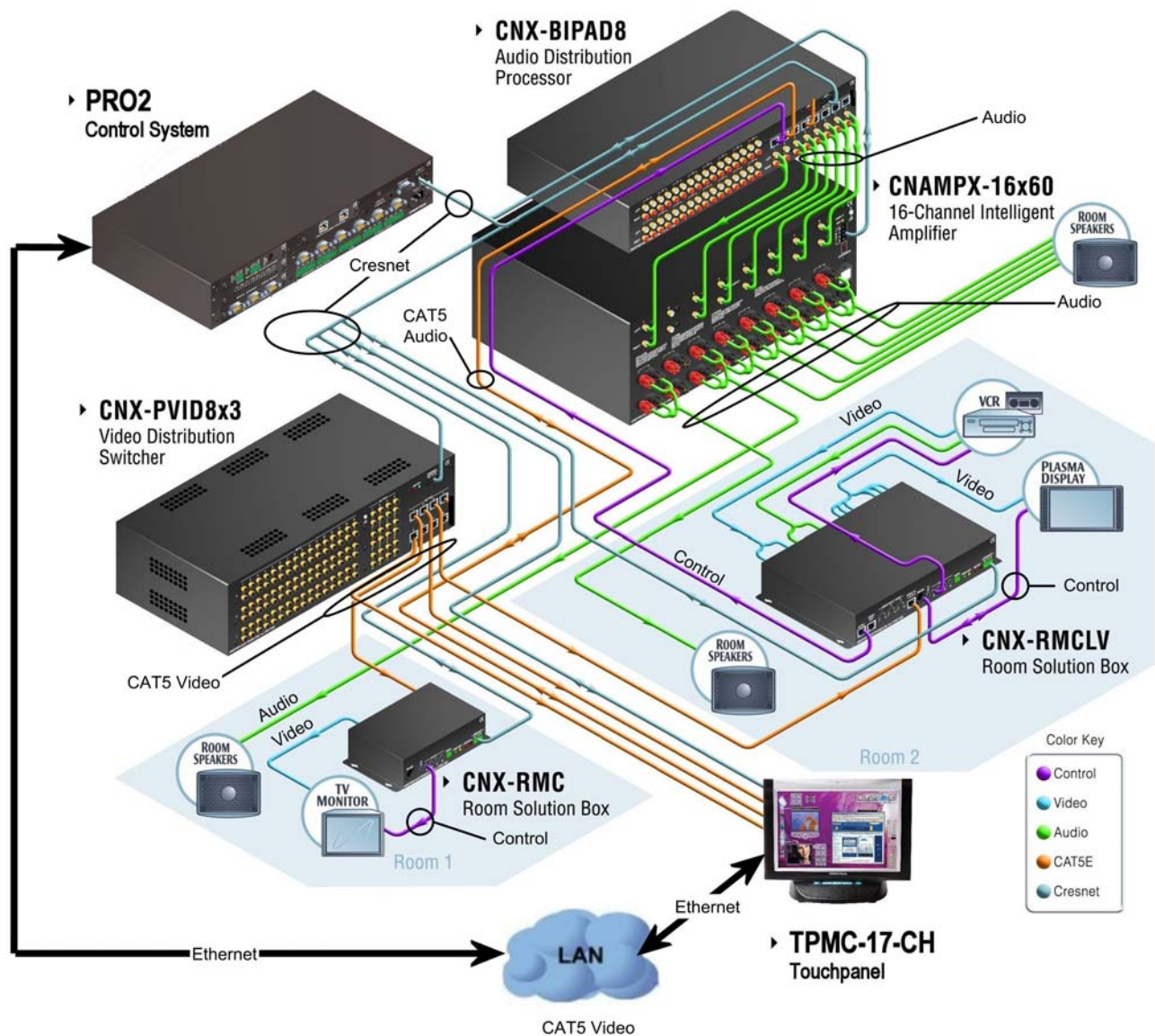
The stylish tiltcase housing allows smooth tilt adjustment from 45 to 90 degrees and features an integral cable strain relief and rear cover to secure and hide the connections at the back of the touchpanel. Five backlit pushbuttons are also provided, allowing for quick access to commonly used functions.

Applications

The TPMC-15-CH and TPMC-17-CH are integral to managing a residential audio/video distribution system. With built-in audio and video connectivity as well as Ethernet communications, the touchpanel can be used to control complex audio/video systems.

The following diagram shows a TPMC-17-CH in a residential audio/video distribution application.

TPMC-17-CH in Residential Audio/Video Distribution Application

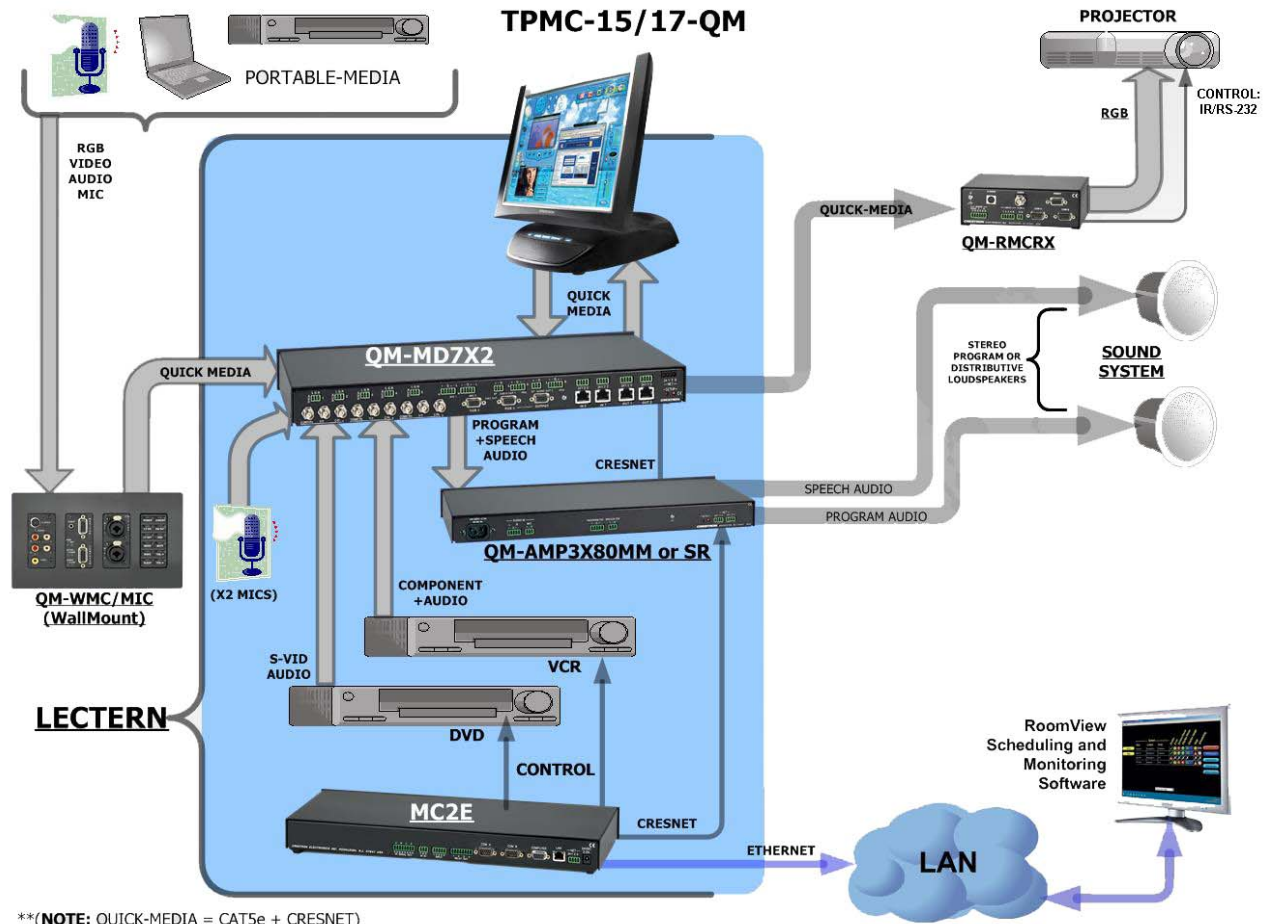


The TPMC-15-QM and TPMC-17-QM are part of the Crestron MediaManager line of integrated presentation solutions. It is ideally suited to work with Crestron’s MediaManager wall plate media centers, FlipTop media centers, receivers and control processors to allow quick switching of multiple A/V sources in a presentation system. MediaManager devices are designed for conference room, auditorium and lecture hall applications or anywhere else where audio, video or computer equipment

needs to be easily connected and disconnected from a presentation system or room control system.

The following diagram shows a TPMC-15/17-QM in a lecture hall application.

TPMC-15/17-QM in Lecture Hall Application

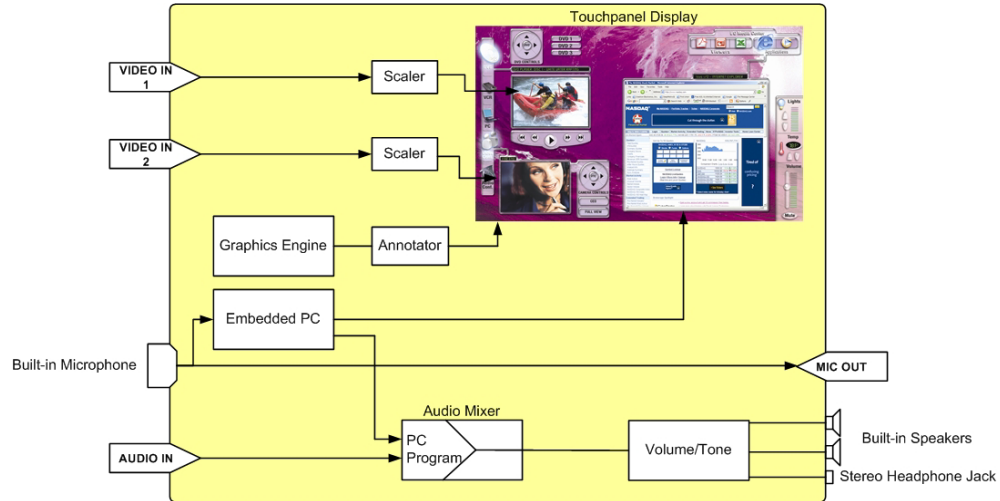


For more information on this and other QM applications, refer to the latest revision of the Crestron MediaManager Applications Guide (Doc. 6244), which is available from the Crestron website (www.crestron.com/manuals).

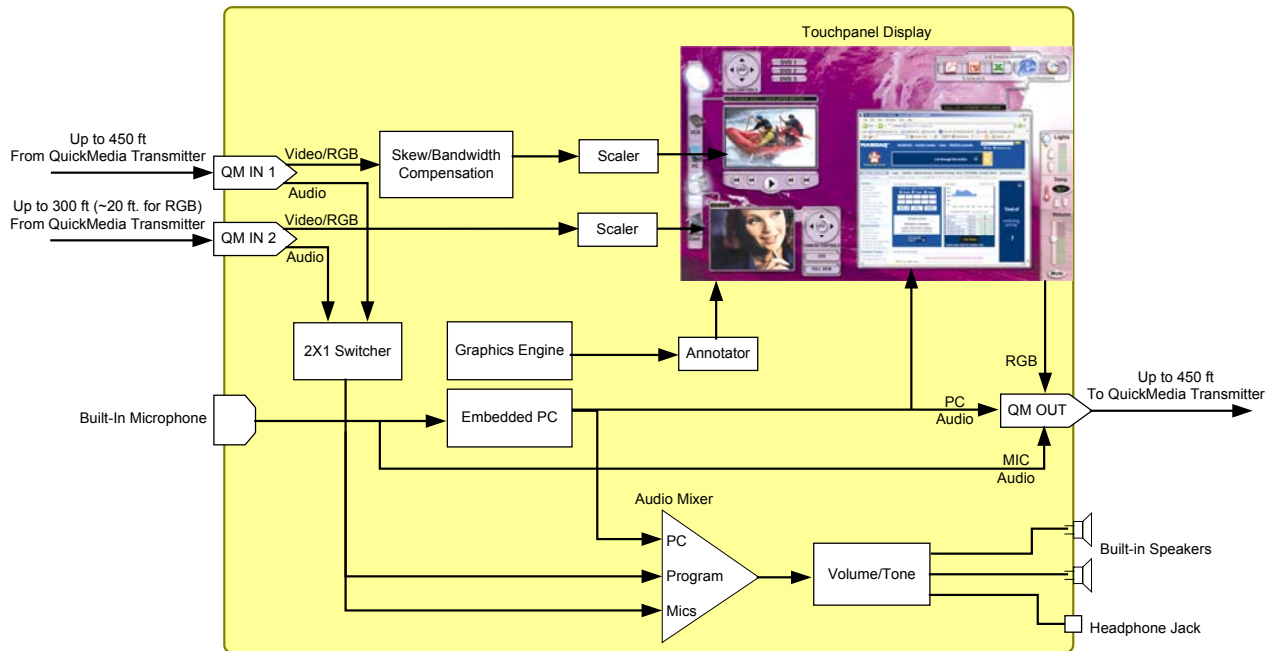
Internal Block Diagram

The following diagrams represent the switching abilities of the TPMC-15/17. The diagrams depict the video, audio and connectivity paths available.

TPMC-15/17-CH Functional Diagram



TPMC-15/17-QM Functional Diagram



Specifications

Specifications for the TPMC-15/17 are listed in the following table.

TPMC-15/17 Specifications

SPECIFICATION	DETAILS
Touchscreen Display Display Type Size Aspect Ratio Resolution Brightness Contrast Color Depth Illumination Viewing Angle Touchscreen	TFT active matrix color LCD TPMC-15: 15 inch (38.1 cm) diagonal TPMC-17: 17 inch (43.2 cm) diagonal TPMC-15: 4:3 XGA TPMC-17: 15:9 WXGA TPMC-15: 1024 x 768 pixels TPMC-17: 1280 x 768 pixels TPMC-15: 400 nits TPMC-15: 350 nits ¹ TPMC-17: 450 nits TPMC-15: 300:1 TPMC-15: 700:1 ¹ TPMC-17: 400:1 24-bit, 16.7M colors Backlit fluorescent TPMC-15: ±85° horizontal and vertical TPMC-17: ±88° horizontal and vertical Resistive membrane
Processor	VIA Eden™ 667 MHz CPU
Memory SDRAM Flash PC Card Maximum Project Size	512 MB 512 MB internal flash memory, expandable via rear panel PC card slots Accepts up to (2) 4 GB Type II PC Cards (not included) 190 MB
Operating System	Microsoft® Windows® XP Embedded
Graphic Engine	Isys i/O engine, VIA Unichrome™ CLE266 chipset, 24 bit non-palette graphics + 8 bit alpha channel translucency, 16.7 million colors, Synapse image rendering algorithm, multi-mode objects, dynamic menu objects, dynamic graphics ² , PNG translucency, full-motion (60 fps) animation, transition effects, color key windowing.
Embedded Software Applications ³	Microsoft Internet Explorer w/Macromedia® Flash® plug-in, Windows Media® Player, RealPlayer®, Axis® Media Control, Crestron MediaMarker™, Remote Desktop, NetMeeting®, Skype™ ⁴ , VNC Viewer ⁵ , Java™ Runtime, DirectX®, Crestron MJPEG Viewer and Axis ActiveX® control, Adobe® Acrobat® Reader, WordPad, plus viewers for MS Word, Excel and PowerPoint®.

(Continued on following page)

TPMC-15/17 Specifications (Continued)

SPECIFICATION	DETAILS
Ethernet	10BaseT/100BaseTX, auto-negotiating, full/half duplex TCP/IP, UDP/IP, CIP, DHCP, IEEE 802.3U compliant
Wireless ³	Wireless Ethernet capable using third-party 802.11 PC card; (Wired connections required for power, audio, video and RGB)
Video (CH ⁶ and QM ⁷ versions combined)	
Signal Types	RGB (QM only) and auto-detecting composite, S-video or component video
Formats	SDTV 480i (NTSC) & 576i (PAL), EDTV 480p & 576p, HDTV 720p & 1080i; RGB (VGA) (QM only) up to UXGA 1600 x 1200
Color Depth	24-bit, 16.7M colors
Features	Dual-window each scalable to full screen, time base correction, gamma correction, line doubling, motion adaptive deinterlacing, reverse 3:2/2:2 pulldown
Streaming/File Formats	MPEG4 and MJPEG via Axis Media Control plus all formats supported by the embedded media player applications ³
Audio (CH and QM ⁷ versions combined)	
Hardware Features	Built-in microphone and biamplified speakers, stereo headphone output, internal volume control and audio mixer
Streaming/File Formats	All formats supported by the embedded media player application
Audio Feedback (WAV)	8 & 16 bit PCM, mono & stereo, 8 – 44 kHz sampling rates
D-A / A-D Conversion (via QM only)	Burr Brown 24-bit, 48 kHz
Amplification	Biampified, mono, 5 Watts for high-frequency, 5 Watts for low-frequency
Power Requirements	
Overall	8.4 Amps @ 12.5 Volts DC
External Power Supply (included)	2.2 Amps @ 100-250 Volts AC, 50/60 Hz
Cresnet Power Usage	Does not draw power from Cresnet
Default Net ID ⁸	03
Control System Update Files ^{9, 10} 2-Series Control System	Version 3.137 or later
Environmental	
Temperature	50° to 113°F (10° to 45°C)
Humidity	10% to 90% RH (non-condensing)

(Continued on following page)

TPMC-15/17 Specifications (Continued)

SPECIFICATION	DETAILS
Enclosure	
Construction	High impact black/silver injection-molded case with integral rear cover and cable strain relief
Screen Tilt	Adjustable 45 to 90 degrees
Dimensions	
Height	TPMC-15: 14.17 in (35.99 cm) TPMC-17: 14.17 in (35.99 cm)
Width	TPMC-15: 14.94 in (37.95 cm) TPMC-17: 17.63 in (44.77 cm)
Depth	TPMC-15: 13.74 in (34.90 cm) TPMC-17: 13.74 in (34.90 cm)
Weight	TPMC-15: 15.8 lbs (7.1 kg) TPMC-17: 19.4 lbs (8.8 kg)
Included Accessories	
TPMC-CH-IMC ¹¹	CAT5 Balanced AV Interface Module
PW-1280RU	Power Supply
Available Accessories	
TPMC-CH-IMW ¹¹	CAT5 Balanced AV Interface Wall Plate
QM-TX ¹²	QuickMedia Transmitter
TPS/TPMC-CBL-T	Triamese Interface Cables (15 ft cable included)
SMK-12/15/17	Swivel Mount Kit
CresCAT [®] Q ¹¹	Crestron Home CAT5 AV Cable
CresCAT QM ¹²	QuickMedia Cable
CresCAT IM ¹²	iMedia cable

1. Applies to part numbers 6500248 (in CH series) and 6500249 (in QM series) only.
2. By design, the panel will not load dynamic graphics if they are located on a password protected FTP or HTTP server.
3. Contact Crestron for a current list of compatible devices and embedded applications. To ensure reliable performance, new device drivers and applications are available only from Crestron through firmware updates.
4. The default minimum window size for Skype™ can not be overridden.
5. The supported VNC viewer is UltraVNC version 1.0.2. Other VNC viewers may work but are not guaranteed.
6. Additional CAT5 balanced AV equipment is required to facilitate the input of more than one external video signal.
7. One or more QuickMedia devices are required to facilitate the input and output of audio, video, and RGB signals.
8. Refer to “Identity Code” on page 23 for details.
9. The latest software versions can be obtained from the Crestron website. Refer to the NOTE following these footnotes.
10. Crestron 2-Series control systems include the AV2 and PRO2. Consult the latest Crestron Product Catalog for a complete list of 2-Series control systems.
11. CH series only.
12. QM series only.

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

Physical Description

This section provides information on the connections, controls and indicators available on your TPMC-15/17.

TPMC-15 Physical View

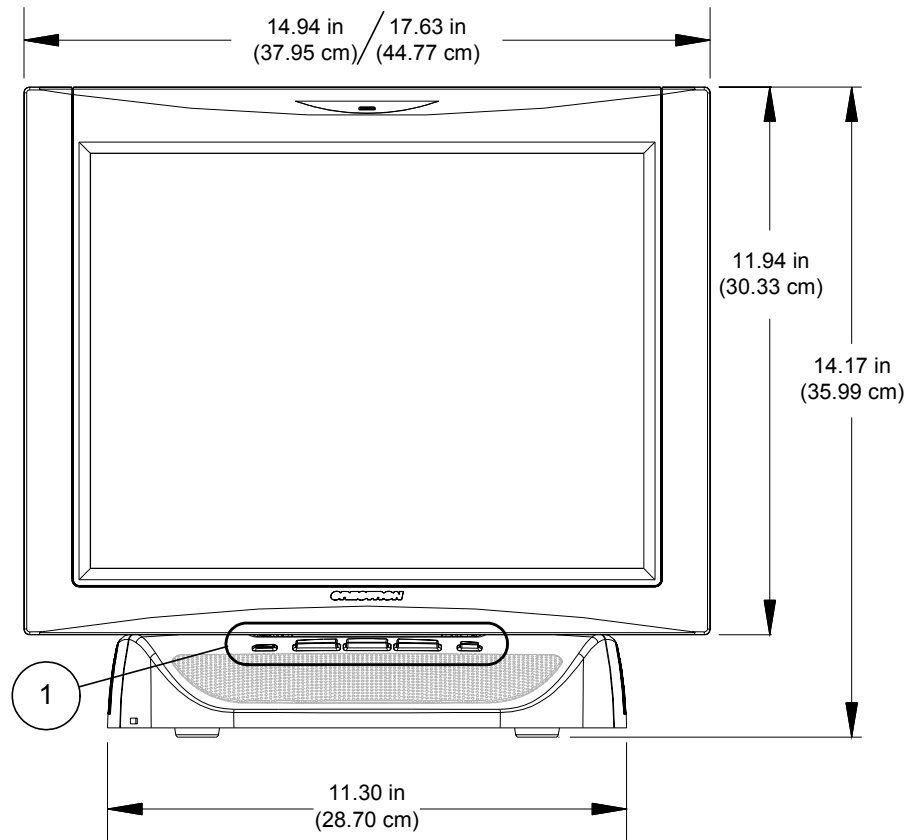


TPMC-17 Physical View

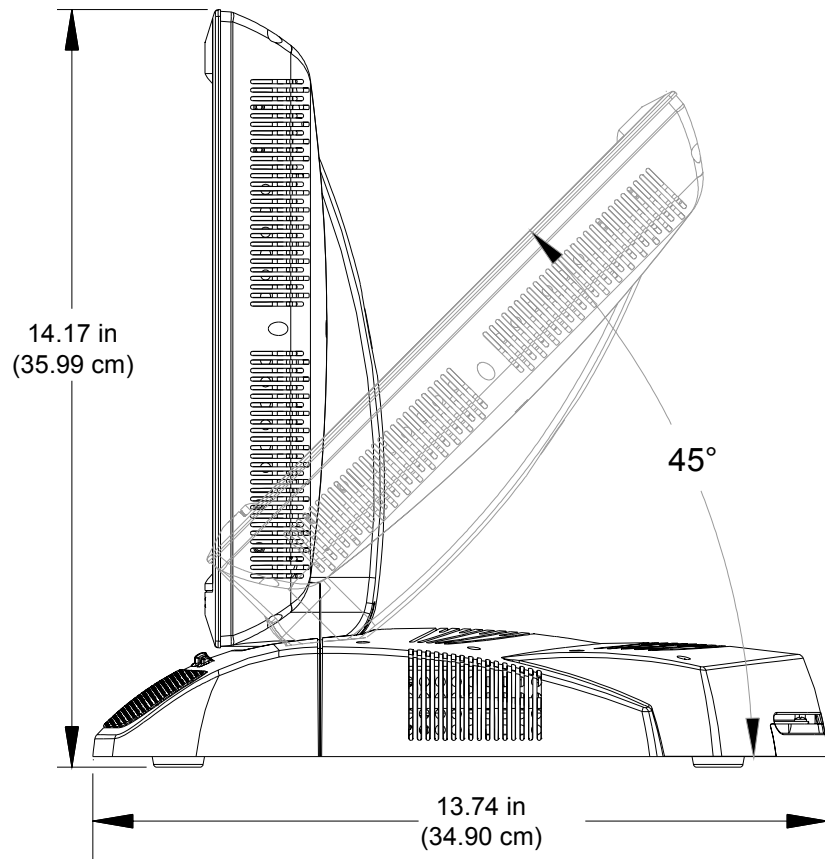


NOTE: In the following illustrations, numbers separated by a diagonal or horizontal line represent differing dimensions between the TPMC-15 and TPMC-17.

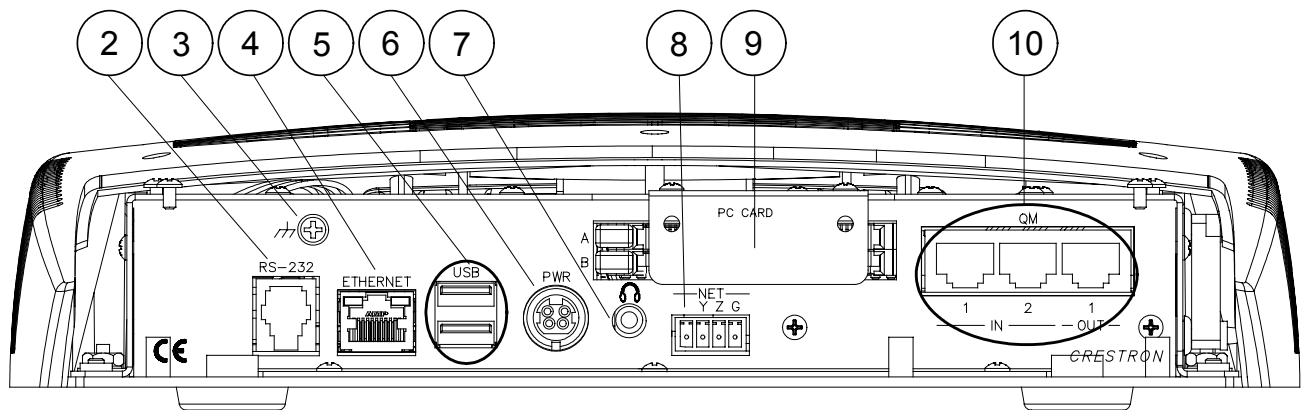
TPMC-15/17 Overall Dimensions (Front View)



TPMC-15/17 Overall Dimensions (Side View)

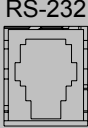
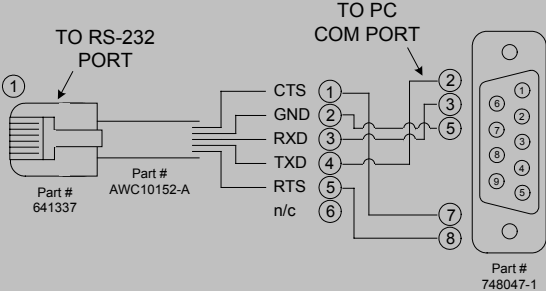

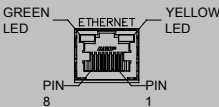


TPMC-15/17 Connectors (QM Version)



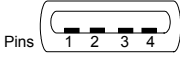


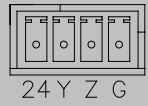
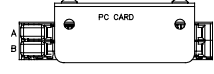

NOTE: Connectors on the TPMC-15/17 CH version are identical to those on the QM version except for item number 10 above. The CH version has **Video IN** and **Audio I/O** ports instead of the **QM IN** and **QM OUT** ports.

Connectors, Controls & Indicators

#	CONNECTORS ¹ , CONTROLS & INDICATORS	DESCRIPTION																				
1	BUTTONS ²	(4) Backlit "softkey" buttons, programmable (1) Backlit hard reset button, reboots the touchpanel																				
2	RS-232 	(1) 6-pin RJ-11 female, computer console port; Bidirectional RS-232 up to 115.2k baud; Hardware and software handshaking support <table border="1"> <thead> <tr> <th>PIN #</th> <th>DESCRIPTION</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>CTS</td> </tr> <tr> <td>2</td> <td>GND</td> </tr> <tr> <td>3</td> <td>RXD</td> </tr> <tr> <td>4</td> <td>TXD</td> </tr> <tr> <td>5</td> <td>RTS</td> </tr> <tr> <td>6</td> <td>N/C (Not connected)</td> </tr> </tbody> </table> <p>In the event that modular cables or an RJ-11 to DB9F adapter is not available, the following diagram provides information so that the cable can be fabricated on site. (Alternatively, Crestron cable number STCP-502PC is sold separately.)</p> 	PIN #	DESCRIPTION	1	CTS	2	GND	3	RXD	4	TXD	5	RTS	6	N/C (Not connected)						
PIN #	DESCRIPTION																					
1	CTS																					
2	GND																					
3	RXD																					
4	TXD																					
5	RTS																					
6	N/C (Not connected)																					
3	G 	(1) 6-32 screw, chassis ground lug.																				
4	ETHERNET 	(1) 8-wire RJ-45 with two LED indicators; 10BaseT/100BaseTX Ethernet port; Green LED indicates link status; Yellow LED indicates Ethernet activity <table border="1"> <thead> <tr> <th>PIN</th> <th>SIGNAL</th> <th>PIN</th> <th>SIGNAL</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>TX +</td> <td>5</td> <td>N/C</td> </tr> <tr> <td>2</td> <td>TX -</td> <td>6</td> <td>RC -</td> </tr> <tr> <td>3</td> <td>RC+</td> <td>7</td> <td>N/C</td> </tr> <tr> <td>4</td> <td>N/C</td> <td>8</td> <td>N/C</td> </tr> </tbody> </table>	PIN	SIGNAL	PIN	SIGNAL	1	TX +	5	N/C	2	TX -	6	RC -	3	RC+	7	N/C	4	N/C	8	N/C
PIN	SIGNAL	PIN	SIGNAL																			
1	TX +	5	N/C																			
2	TX -	6	RC -																			
3	RC+	7	N/C																			
4	N/C	8	N/C																			


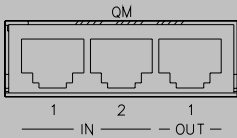
(Continued on following page)

Connectors, Controls & Indicators (Continued)

#	CONNECTORS ¹ , CONTROLS & INDICATORS	DESCRIPTION										
5	<p>USB³</p>  <p>Pins 1 2 3 4</p>	<p>(2) USB Type A female, USB 1.1 ports for mouse, keyboard and storage devices.⁴</p> <table border="1"> <thead> <tr> <th>PIN</th> <th>DESCRIPTION</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>+5 VDC</td> </tr> <tr> <td>2</td> <td>Data -</td> </tr> <tr> <td>3</td> <td>Data +</td> </tr> <tr> <td>4</td> <td>Ground</td> </tr> </tbody> </table>	PIN	DESCRIPTION	1	+5 VDC	2	Data -	3	Data +	4	Ground
PIN	DESCRIPTION											
1	+5 VDC											
2	Data -											
3	Data +											
4	Ground											
6	<p>PWR</p> 	<p>(1) 4-pin DC power jack, 12.5V DC power input (external power supply included).</p>										
7	<p>HEADPHONES</p> 	<p>(1) 3.5 mm TRS mini phone jack; Output power: 105 mW per channel; Minimum impedance: 8 Ω.</p>										
8	<p>NET</p>  <p>24 Y Z G</p>	<p>Four-position terminal block connector for data and power. Connects to Cresnet control network. Pin 1 (24) Power Pin 2 (Y) Data Pin 3 (Z) Data Pin 4 (G) Ground</p>										
9	<p>PC CARD A - B</p> 	<p>(2) Type II PC Card slots for memory expansion, project upload and wireless NIC.</p>										
10 CH	<p>VIDEO IN 1 – 2^{5, 6}</p> 	<p>(2) 8-wire RJ-45 female, CAT5 balanced video input port; Signal types: Auto-detecting component (YP_bP_r), S-video (Y/C) or composite video; Formats: SDTV 480i, (NTSC) & 576i (PAL), EDTV 480p & 576p, HDTV 720p & 1080i; Input impedance: 100 Ω balanced; Connects to any Crestron CAT5 balanced video source(s) or TPS/TPMC-CH-IMC interface module (included) via CresCAT cable or TPS/TPMC-CBL-T “triamese” cable (sold separately); Maximum cable length: 500 feet (component/HDTV), 750 feet (S-video or composite).</p>										

(Continued on following page)

Connectors, Controls & Indicators (Continued)

#	CONNECTORS ¹ , CONTROLS & INDICATORS	DESCRIPTION
10 CH (contd.)	AUDIO I/O ^{5,7} 	(1) 8-wire RJ-45 female, bidirectional CAT5 balanced audio port; Signal types: receives (1) balanced stereo audio signal and transmits (1) balanced stereo audio signal from internal PC or microphone (dynamically selectable); Maximum input level: 4 V _{rms} ; Maximum output level: 2 V _{rms} ; Input/output impedance: 600 Ω; Connects to any other Crestron CAT5 balanced audio port or TPMC-CH-IMC interface module (included) via CresCAT cable or TPS/TPMC-CBL-T “triamese” cable (sold separately); Maximum cable length: 1000 feet.
10 QM	QM IN 1 & 2 ⁸ 	(1 each) 8-wire RJ-45 female, QuickMedia input port; Signal types: Dynamically configurable under system control as: <ul style="list-style-type: none"> • One RGB (VGA) input with stereo program audio and two mic channels or • One auto-detecting component (YP_bP_r), S-video (Y/C) or composite video input with stereo program audio and two mic channels RGB format: RGBHV; RGB input resolution, non-interlaced: 640 x 480 minimum to 1600 x 1200 maximum (60 Hz limit at 1600 x 1200); Video/HDTV formats: 480i (NTSC), 576i (PAL), 480p, 576p, 720p and 1080i; Horizontal frequency: 15 - 100 kHz; Vertical frequency: 50 - 85 Hz; Delay skew compensation: 0 - 22 ns (QM IN 1 only, none on QM IN 2); Connects to QM output port of a QM-TX or other QuickMedia device (sold separately) via CresCAT-QM or CresCAT-IM cable; Maximum cable length: QM IN 1: 450 feet (aggregate distance from QM origination); QM IN 2: (Video/HDTV) 300 feet (aggregate distance from QM origination); (RGB @ 60 Hz) 216 feet for 640 x 480, 140 feet for 800 x 600, 84 feet for 1024 x 768, 70 feet for 1280 x 768, 30 feet for 1600 x 1200 (using CresCAT-QM or CresCAT-IM cable)

(Continued on following page)

Connectors, Controls & Indicators (Continued)

#	CONNECTORS ¹ , CONTROLS & INDICATORS	DESCRIPTION
10 QM (contd.)	QM OUT 1	(1) 8-wire RJ-45 female, QuickMedia output port containing RGB output with stereo audio from internal PC and two discrete channels from internal mic; RGB format: RGBHV; RGB output resolution, non-interlaced: 1024 x 768 pixels @ 60 Hz; Connects to QM input port of any QuickMedia device via CresCAT-QM or CresCAT-IM cable

1. An interface connector for the **NET** port is provided with the unit.
2. Refer to “Hard Button Programming” on page 63 for details.
3. Only generic USB devices (i.e. simple keyboard, mouse and external storage) should be used. Any complex USB devices (e.g. a storage device with a built-in fingerprint scanner) will not have the proper support on the panel.
4. Only standard Windows® XP embedded drivers are included. You cannot load your own driver. The maximum length for a USB cable run is 16.4 feet (5.0 meters).
5. Use only the TPMC-CH-IMC Interface Module when connecting this port. Use of other “IMC” products could damage the panel.
6. This eight-pin RJ-45 port provides connectivity to the CNX-PVID or the TPMC-CH-IMC Interface Module. This port provides component, composite or S-video balanced input to the touchpanel over CAT5 wiring. Refer to the following table for connector pinouts

PIN	WIRE COLORS (568B)	WIRE COLORS (568A)	Composite	S-Video	Component
1	WHITE/ORANGE	WHITE/GREEN	+ Composite	+ Luminance	+ Y
2	ORANGE	GREEN	- Composite	- Luminance	- Y
3	WHITE/GREEN	WHITE/ORANGE	N/A	+ Chrominance	+ P _b
4	BLUE	BLUE	N/A	N/A	+ P _r
5	WHITE/BLUE	WHITE/BLUE	N/A	N/A	- P _r
6	GREEN	ORANGE	N/A	- Chrominance	- P _b
7	WHITE/BROWN	WHITE/BROWN	N/A	N/A	N/A
8	BROWN	BROWN	N/A	N/A	N/A

7. This eight-pin RJ-45 port provides connectivity to the CNX-BIPAD or the TPMC-CH-IMC Interface Module. This port uses CAT5 wiring and provides audio input to the touchpanel and output from the touchpanel’s built-in microphone. Refer to the following table for connector pinouts.

PIN	WIRE COLORS (568B)	WIRE COLORS (568A)	Audio i/O
1	WHITE/ORANGE	WHITE/GREEN	+ Mic Left Out
2	ORANGE	GREEN	- Mic Left Out
3	WHITE/GREEN	WHITE/ORANGE	+ Mic Right Out
4	BLUE	BLUE	+ Audio Left In
5	WHITE/BLUE	WHITE/BLUE	- Audio Left In
6	GREEN	ORANGE	- Mic Right Out
7	WHITE/BROWN	WHITE/BROWN	+ Audio Right In
8	BROWN	BROWN	- Audio Right In

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

RJ-45 PIN NUMBER	WIRE COLORS (EIA 568B)	QM ASSIGNMENT: RGB	QM ASSIGNMENT COMPOSITE, S-VIDEO, COMPONENT AND AUDIO
1	WHITE/ORANGE	- RGB Red	- CHROMINANCE (- P _r)
2	ORANGE	+ RGB Red	+ CHROMINANCE (+ P _r)
3	WHITE/GREEN	- RGB Green	- LUMINANCE (- Y)
4	BLUE	+ Digital Audio	+ AUDIO
5	WHITE/BLUE	- Digital Audio	- AUDIO
6	GREEN	+ RGB Green	+ LUMINANCE (+ Y)
7	WHITE/BROWN	- RGB Blue	- COMPOSITE (- P _b)
8	BROWN	+ RGB Blue	+ COMPOSITE (+ P _b)

Industry Compliance

As of the date of manufacture, the TPMC-15/17 has been tested and found to comply with specifications for CE marking and standards per EMC and Radiocommunications Compliance Labelling.



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.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Setup

Network Wiring

When wiring the network, consider the following:

- Use Crestron Certified Wire.
- Use Crestron power supplies for Crestron equipment.
- Provide sufficient power to the system.

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

- For larger networks, use a Cresnet Hub/Repeater (CNXHUB) to maintain signal quality.

For more details, refer to “Check Network Wiring” on page 74.

Ethernet

The TPMC-15/17 also uses high-speed Ethernet for communications between the device and a control system, computer, digital media server and other IP-based devices.

For information on connecting Ethernet devices in a Crestron system, refer to the latest version of the Crestron e-Control® Reference Guide (Doc. 6052).

CAT5 Wiring (CH versions only)

Category 5 (CAT5) wiring is a twisted pair cable designed for Ethernet networks. These networks operate at speeds of up to 100 Megabits per second (Mbps) using the 100BaseT standard. Crestron takes advantage of this specification for a variety of audio and video applications.

Crestron recommends using CresCAT-IM (or D) wire for transmitting video signals from the CH port.

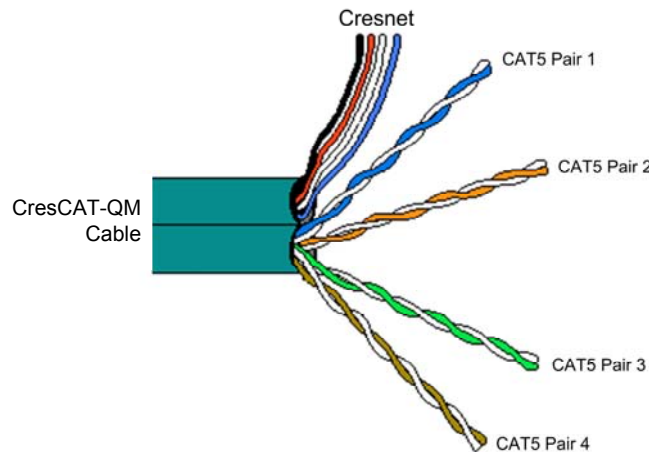
When using a Crestron wiring solution, the CresCAT-IM (or D) wire can carry audio and video signals up to 500 feet (observe distance limitations based upon power consumption for the device in use).

For more information, refer to the latest version of the Crestron CAT5 Wiring Reference Guide (Doc. 6137).

QuickMedia Wiring (QM versions only)

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

CresCAT-QM Cable



NOTE: Do not untwist the two wires in a single 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 aggregate cable length of a signal path originating at a QM transmitter and terminating at the TPMC-15/17 must not exceed 450 feet (137 meters). Video signals may experience a loss of quality over very long lengths of cable. This phenomenon is due to the added resistance and capacitance of longer cable lengths and is not peculiar to either Crestron and/or QuickMedia systems. To ensure sufficient bandwidth, the maximum aggregate cable length should not exceed 450 feet. The use of lower-resolution signals may allow increased cable length but must be tested by the installer with the sources to be used. The QM pin assignment is based on the EIA/TIA 568B RJ-45 Jack standard.

NOTE: **QM IN 2** does not have delay skew compensation (as does **QM IN 1**), so the maximum cable length varies based upon resolution and should not exceed 300 feet (90 meters) for standard definition video. Refer to the QM Input #2 Maximum Cable Length table that follows.

QM Input # 2 Maximum Cable Length

SIGNAL TYPE	RESOLUTION	MAXIMUM CABLE LENGTH* (FEET)
Video/S-video	480i	300
Component	480p	300
Component	720p	300
Component	1080i	300
RGB	1024 x 768 @ 75 Hz	69
RGB	1280 x 1024 @ 75 Hz	40
RGB	1600 x 1200 @ 60 Hz	30
RGB	640 x 480 @ 60 Hz	216
RGB	800 x 600 @ 60Hz	140
RGB	1024 x 768 @ 60Hz	84
RGB	1280 x 768 @ 60Hz	70

* With CresCAT-QM cable, available from Crestron. Using other may adversely affect performance and is not recommended.

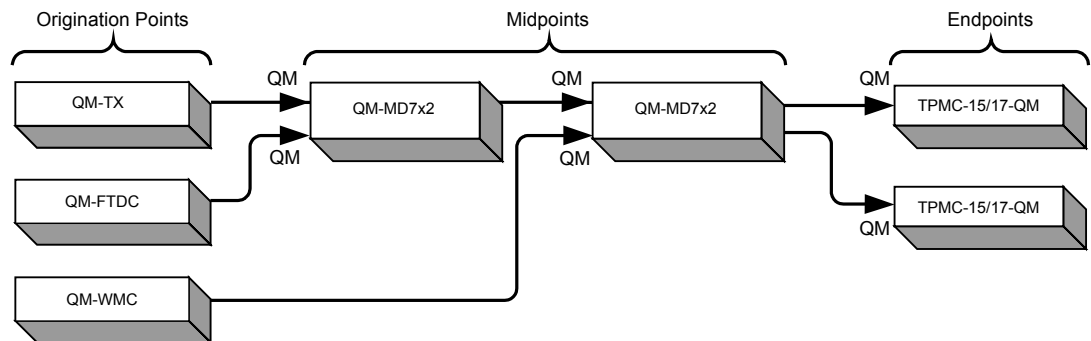
NOTE: When transmitting S-video, luminance uses the green video pathway and chrominance uses the red video pathway. When transmitting composite video, the signal is carried on the blue video pathway.

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

When connecting multiple QM devices, the route between a QM origination point (transmitter) and a QM endpoint (receiver) cannot have more than two midpoints (e.g. QM-MD7x2 or other QM switchers). Refer to the following diagram when configuring a QM network.

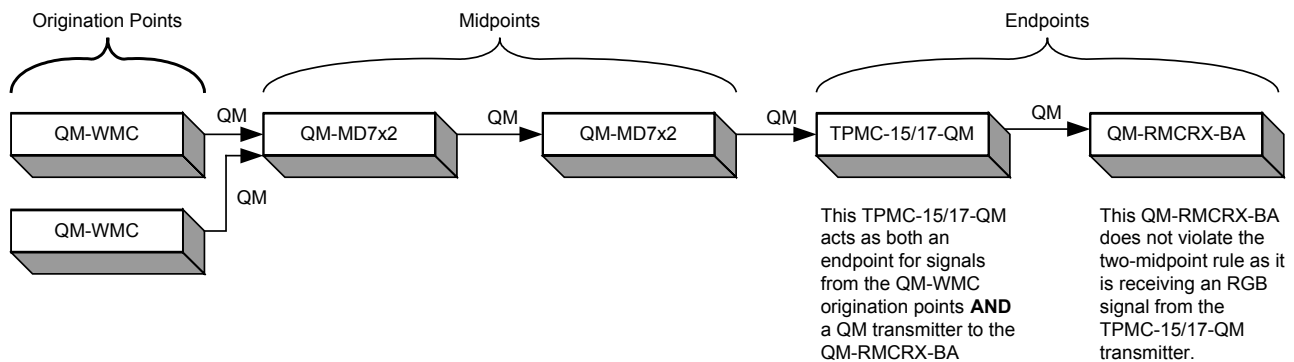
NOTE: The aggregate length from transmitter to receiver cannot have a delay skew of more than 22 ns.

QM Network Topology



The TPMC-15/17-QM is not a switcher, but a transmitter/endpoint. Therefore, even when designated as the endpoint from two midpoint switchers, the QM output of the TPMC-15/17-QM can become another transmitter sending RGB video at the touchpanel’s native resolution and aspect ratio. Refer to the following diagram.

QM Network Topology with TPMC-15/17 Acting as an Endpoint and a Transmitter



Identity Code

Net ID

The Net ID of the TPMC-15/17 has been factory set to **03**. The Net IDs of multiple TPMC-15/17 devices in the same system must be unique. The NET ID is set using the internal setup menu (refer to “Cresnet” on page 27). Net ID may also be set from a personal computer (PC) via the Crestron Toolbox™ (refer to “Establishing Communication” on page 68).

When setting the Net ID, consider the following:

- The Net ID of each unit must match an ID code specified in the SIMPL™ Windows® program.
- Each network device must have a unique Net ID.

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

IP ID

The IP ID is set within the TPMC-15/17's table using Crestron Toolbox. For information on setting an IP table, refer to the Crestron Toolbox help file. The IP IDs of multiple TPMC-15/17 devices in the same system must be unique.

When setting the IP ID, consider the following:

- The IP ID of each unit must match an IP ID specified in the SIMPL Windows program.
- Each device using IP to communicate with a control system must have a unique IP ID.

Configuring the Touchpanel

NOTE: The only connection required to configure the touchpanel is power. Refer to “Hardware Hookup” on page 54 for details.

The TPMC-15/17 is configured from the SETUP MENU.

NOTE: If no project has been loaded or if an invalid project has been loaded, the touchpanel displays an error message and defaults to the SETUP MENU screen.

If a project is running, the SETUP MENU can be accessed using one of two methods: USB keyboard or Crestron Toolbox.

Via USB Keyboard

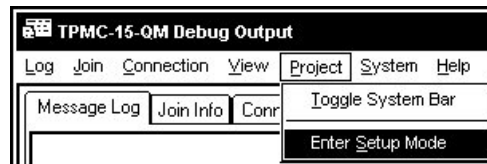
1. Attach a USB keyboard (refer to “Hardware Hookup” which starts on page 54 for details).
2. Open the “Validate User Account Info” window (shown on the following page) by pressing **Ctrl+Alt+Shift** on the keyboard.

“Validate User Account Info” Window

3. Enter the user account *tpmadmin*, and the password *tpmadmin* and click **Validate**.

NOTE: The password is case sensitive. After logging in, the password can be changed from the “Security” window. Refer to “Security” on page 25 for more information.

4. When the “TPMC Debug Output” window appears (shown in the following diagram), select **Project | Enter Setup Mode** to enter the SETUP MENU (refer to “SETUP MENU Details” on page 25).

“TPMC-15-QM Debug Output” Window

Via Crestron Toolbox

1. Establish communication with the touchpanel (refer to “Establishing Communication” on page 68 for details).
2. Right-click on the device and select **Functions | Setup Mode....**

“Setup/Calibrate” Window

3. Select **Enter Setup Mode**. The SETUP MENU will be displayed as shown in the diagram on the following page.

NOTE: Select **Exit Setup Mode** to exit the SETUP MENU.

TPMC-15/17 SETUP MENU

The SETUP MENU provides access to all basic functions and parameters. It is divided into *SETUP*, *ETHERNET*, *STANDBY TIMEOUT*, *HARD KEY FEEDBACK*, *MISC. CONTROLS*, *SCREEN BRIGHTNESS*, *HARD KEY BACKLIGHT* and *SHUTDOWN* sections. An **Install & Uninstall** button is also provided for adding third-party software applications like Skype™ and for installing wireless network cards.

NOTE: To allow the touchpanel to upload projects, Standby Timeout is disabled until approximately five minutes after the project is loaded.

To exit the SETUP MENU and return to the program, press **Exit**, located at the bottom of the SETUP MENU. To reboot the touchpanel, press **Save & Reboot**, located in the *SHUTDOWN* section of the SETUP MENU.

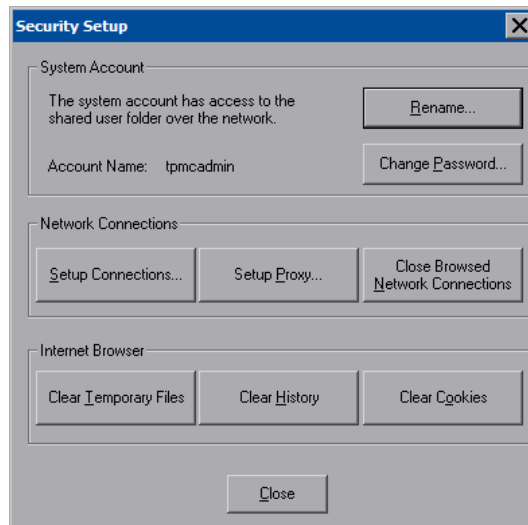
SETUP MENU Details

The SETUP MENU allows configuration of the touchpanel's settings for security, Cresnet, RS-232 communications, display, runtime project, video, audio, annotation and embedded applications.

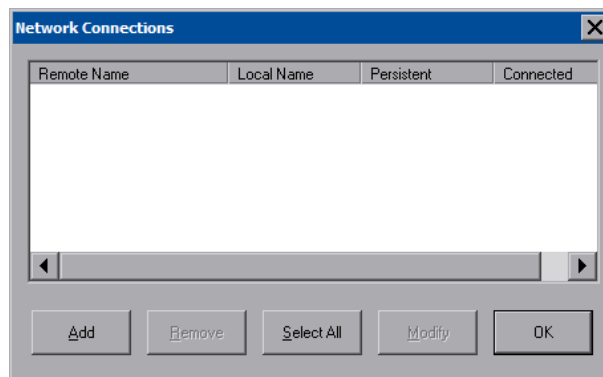
Security

The **Security** button opens the “Security Setup” window, which allows the user to change the username and password of the system account, setup and close network connections and clear Internet browser temporary files, history and cookies.

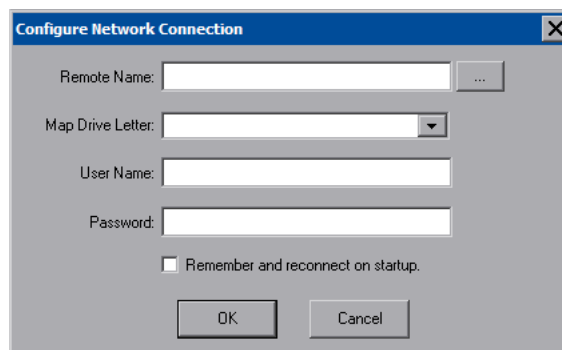
NOTE: To use the on-screen keyboard for security settings, press **Show Keyboard** on the STARTUP MENU before pressing **Security**.


“Security Setup” Window

Click **Setup Connections...** to open the “Network Connections” window. This window is used to map to a network drive. A mapped network drive permits easy access to embedded application files (Word, Excel, PowerPoint, MediaMarker, etc.) and provides a location to save files. To further customize the installation, network drives containing compiled touchpanel project files can also be mapped.

“Network Connections” Window

To add a new network connection, click **Add...**

“Configure Network Connection” Window

To add a network drive, click  to browse for the new network connection.

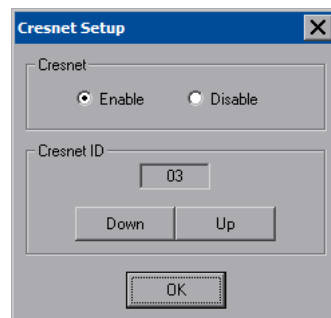
1. Map this connection by selecting a drive letter from the *Map Drive Letter* drop box.
2. Enter a User Name and Password.
3. Click the *Remember and reconnect on startup* checkbox if so desired.
4. Click **OK** to enable the new network connection and return to the “Network Connections” window.

Once all changes to network connections have been completed, click **OK** to return to the “Security Setup” window. Then press **Close** to return to the SETUP MENU.

Cresnet

Pressing the **Cresnet** button opens the “Cresnet Setup” window, which allows you to enable or disable Cresnet and permits changing the Cresnet ID.

“Cresnet Setup” Window



Select **Enable** for normal Cresnet communication mode and **Disable** when the touchpanel is connected to a control system via Ethernet. Communication mode is factory set to **Enable**.

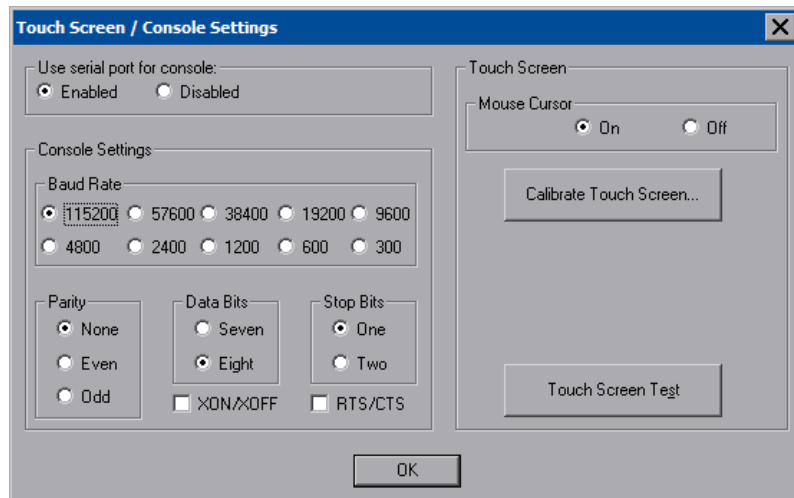
The Cresnet network identity number (*Cresnet ID*) is displayed in the “Cresnet Setup” window. Cresnet ID is the two-digit hexadecimal number. The hexadecimal number can range from 03 to FE and must correspond to the Net ID set in the SIMPL Windows program of the Cresnet system. Matching IDs between touchpanel and SIMPL Windows program is required if data is to be successfully transferred. The Net ID for the TPMC-15/17 is factory set to 03. No two devices in the same system can have the same Net ID.

Two buttons below the hexadecimal display, **Down** and **Up**, decrease and increase the Cresnet ID by one, respectively.

Select **OK** to accept the changes and return to the SETUP MENU.

Touch Screen

The **Touch Screen** button opens the “Touch Screen/Console Settings” window, which is used to determine if the RS-232 serial port is used for communicating with other devices. **Enabled** must be selected to establish communications and upload programming via the serial connection. The “Touch Screen /Console Settings” window also provides access to touch screen calibration when you press **Calibrate Touch Screen...**

“Touch Screen/Console Settings” Window

When the serial port is enabled, parameters for serial communications can be set in the *Console Settings* section of the window.

To view the mouse cursor on the touchpanel, select **On** in the *Mouse Cursor* section of the window. The mouse cursor will only be displayed if a mouse is connected to the touchpanel.

When **Calibrate Touch Screen...** is pressed, the calibration screen will be displayed. Touch the screen to begin the calibration process. If the screen is not pressed within sixty seconds, the calibration sequence will stop and the screen will return to the “Touch Screen/Console Settings” window.

If the screen is touched before the sixty second timeout, the screen instructs you to touch the center of each target as it appears. There will be a series of crosshairs on the panel, starting near the upper left corner. Touch the center of the first crosshair to initiate calibration. As each new crosshair is touched, the next will appear. After the upper left, crosshairs will appear in the upper center, upper right, middle left, screen center, middle right, lower left, lower center and finally lower right. Touch the center of the crosshair in the lower right of the screen to conclude calibration and return to the “Touch Screen/Console Settings” window.

NOTE: When touching the screen during calibration, be as accurate as possible. Use the tip of a capped pen or the eraser end of a pencil. To cancel calibration and return to the “Touch Screen/Console Settings” window without saving calibration data, create a calibration error by touching the screen in the same spot for each calibration point.

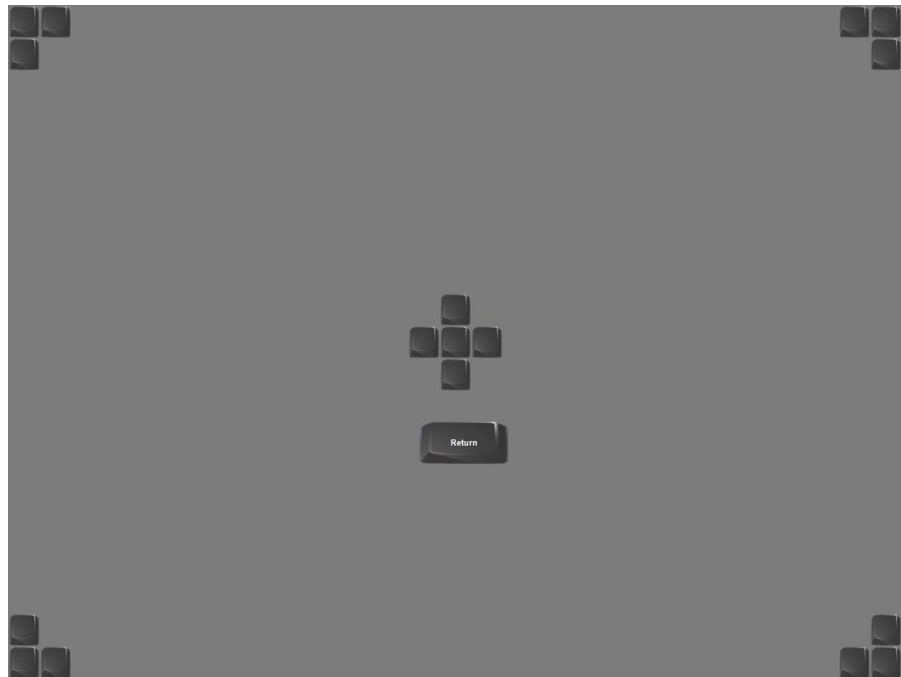
NOTE: The touchpanel’s calibration routine can also be accessed through Crestron Toolbox if the touchpanel is connected to a control system via Cresnet and/or TCP/IP or to a PC via RS-232 by selecting the device from the Network Device Tree and right-clicking the device to select **Functions | Setup Mode....** Select **Enter Calibration Mode** to begin calibration.

Press **OK** to accept the changes and return to the SETUP MENU. A window will appear to remind you that you must reboot for the changes to take effect.

When **Touch Screen Test** is pressed, the test screen will be displayed (refer to illustration on the following page). This screen allows the user to test the touch

screen response at 17 points on the screen. Each button on the screen will light when pressed. Press **Return** to exit the test screen.

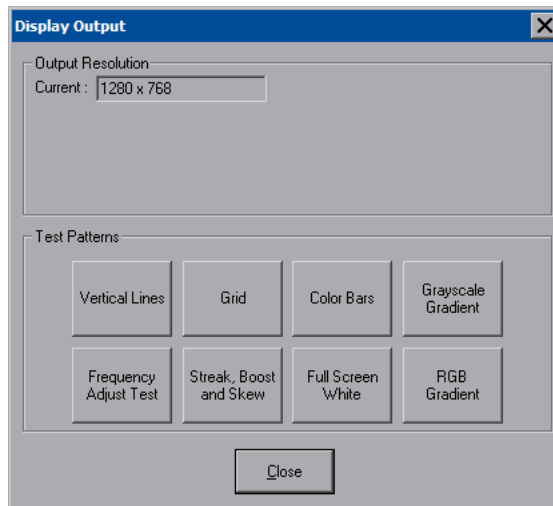
Touch Screen Test Window



Display Output (QM Versions Only)

Pressing **Display Output** shows the output resolution of the touchpanel and provides test charts for adjusting skew, peak and boost settings on a remote display.

“Display Output” Window



Select the following *Test Patterns*, in the following order and adjust the display as necessary.

1. **Vertical Lines**
2. **Grid**

3. **Color Bars**
4. **Grayscale Gradient**
5. **Frequency Adjust Test**
6. **Streak, Boost and Skew**
7. **Full Screen White**
8. **RGB Gradient**

Select Project

The **Select Project** button permits the selection of the touchpanel program, a .vtz file. The “Select Project” window is divided into two sections: *Project To Load* and *Project Working Path*.

In the *Project Working Path* section, you can choose the location where your uncompressed project files will be stored. The default file location is the internal flash.

In the *Project To Load* section, press **Browse** and select the compiled project (i.e. the .vtz file) to be loaded from a network drive, USB device or flash drive. Press **Load** to uncompress the project file, place it in the destination selected in *Project Working Path* and display it on the touchpanel.

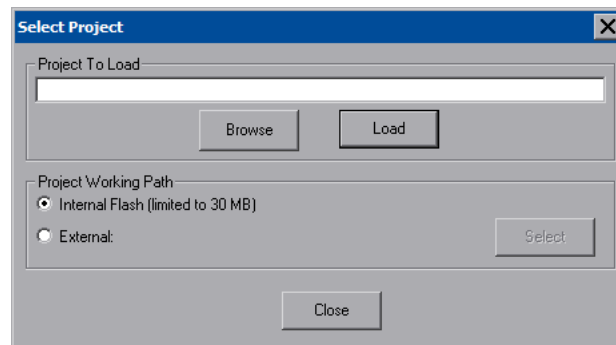
NOTE: If there is a mapped network drive on the touchpanel, the first time you select **Browse**, it may take some time for the “Open” window to appear.

NOTE: When selecting **Browse**, the contents of the “Recent” folder will not be available.

NOTE: Projects can also be loaded via Crestron Toolbox.

NOTE: If **External** is checked, the display list cannot be viewed via Crestron Toolbox.

“Select Project” Window – Project to Load



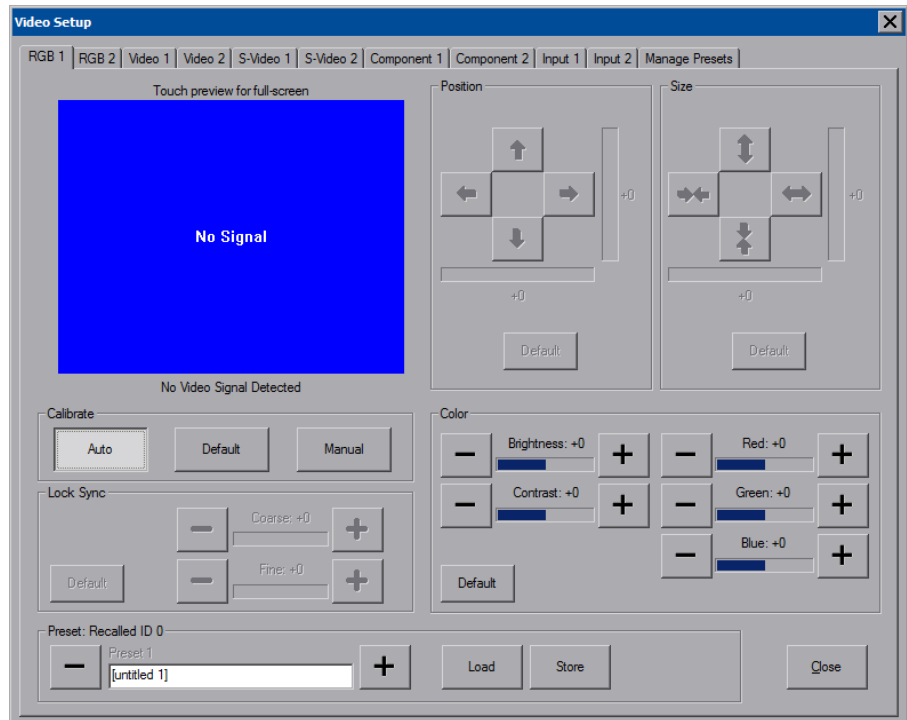
Video

Each one of the RGB (QM versions only) and video inputs is selected and adjusted from this window. Click on an input tab and adjust the settings for the selected input.

RGB Setup (QM versions only)

The setup screen for an RGB source contains the settings as displayed in the following illustration. Changes are made in real time.

“Video Setup” Window - RGB 1 Tab (QM versions only)



RGB is setup using the *Position*, *Size*, *Color*, and *Lock Sync* controls. The following test patterns are recommended for adjustment.

Position and *Size* – A vertical/horizontal line grid screen test pattern is recommended when adjusting for position and size.

Color – Color bar and gray scale screen test patterns are recommended for color adjustments. All inputs are adjusted for brightness and contrast. Red, green and blue are individually adjusted for an RGB input. Hue and saturation are adjusted for composite, S-video and component video inputs.

NOTE: Changes made in the SIMPL windows program override these color adjustments.

NOTE: When **Default** is selected, all controls are set to zero.

Lock Sync – A vertical (alternating black/white lines) line test pattern screen is recommended. Lock Sync is available for RGB only.

NOTE: The vertical line test pattern should look uniform. If you see dark vertical bars in the test pattern, adjust ‘Coarse’ to eliminate bands. If you see only horizontal

noise, adjust 'Fine' to reduce or eliminate noise. You may also need to perform this vertical line adjustment again after changing the size of the display image.

Calibrate - Auto, Default and Manual

Auto calibrate is the preferred setup method for RGB. Auto calibrate automatically adjusts the input setting every time the source is selected. It looks at the sync for "front and back porch" and sets them for the selected input. Auto calibrate is a one-time setting that is performed in the "Video Setup" window for each RGB input. You must select the source and have it display before selecting **Auto** from the *Calibrate* area. You can return to this setup screen when you want to perform auto calibrate in the future.

If this selection does not look correct, select **Default** calibrate, which sets the input setting to the factory defaults.

Manual calibrate permits you to manually adjust the controls.

NOTE: If you are unable to obtain a stable RGB window using **Auto** or **Default**, perform the manual lock sync adjustment (coarse and fine) before continuing with the color size and position adjustments.

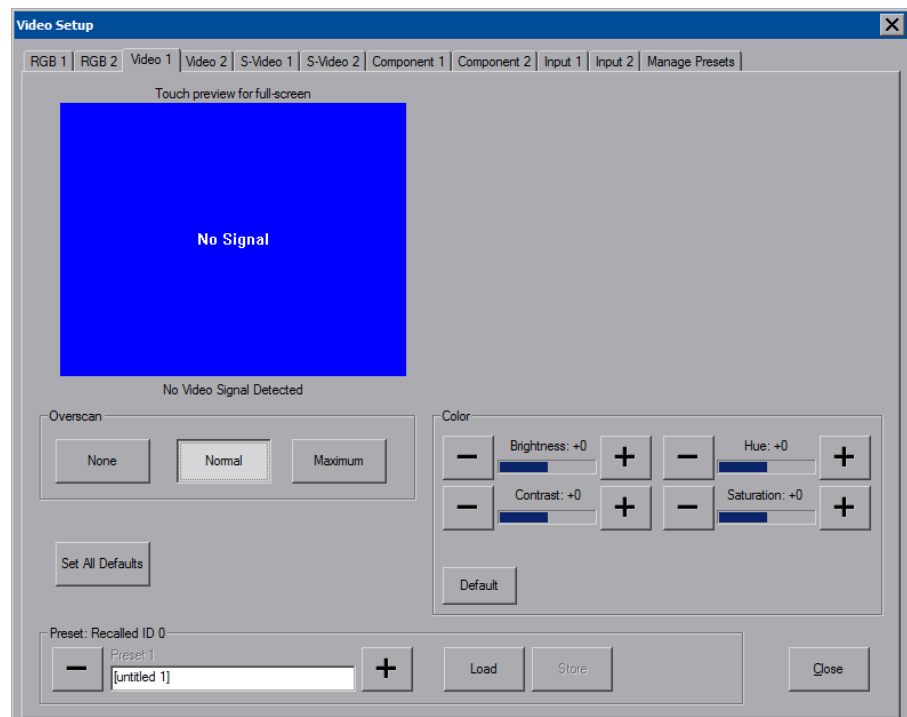
Presets

Up to 30 presets may be stored for future retrieval. Press **Load** to load the settings of the preset location displayed. Press **Store** to store the settings in the preset location displayed.

Video Setup (CH & QM versions)

The setup screen for each video source contains the settings as displayed in the following illustration. Changes are made in real time.

"Video Setup" Window - Video 1 Tab



Video is setup using the *Overscan* and *Color* controls. The following test patterns are recommended for adjustment.

Overscan

Overscan is the active image area in a video picture that is outside the edges of the display device (does not apply to RGB). Overscan adjustment first came about because of noise and other artifacts at the beginning and end of the scan lines. To reliably eliminate the noise and fill the screen with a picture, the outside edge of the active picture area was pushed out past the edge of the display area. The average or targeted over-scan loss is about 5 to 10% of the image on each edge. Digital images have nearly eliminated the noise and other artifacts at the edge of the picture, so more of the video image can be safely shown. The **Normal** setting is usually the correct choice for most video inputs.

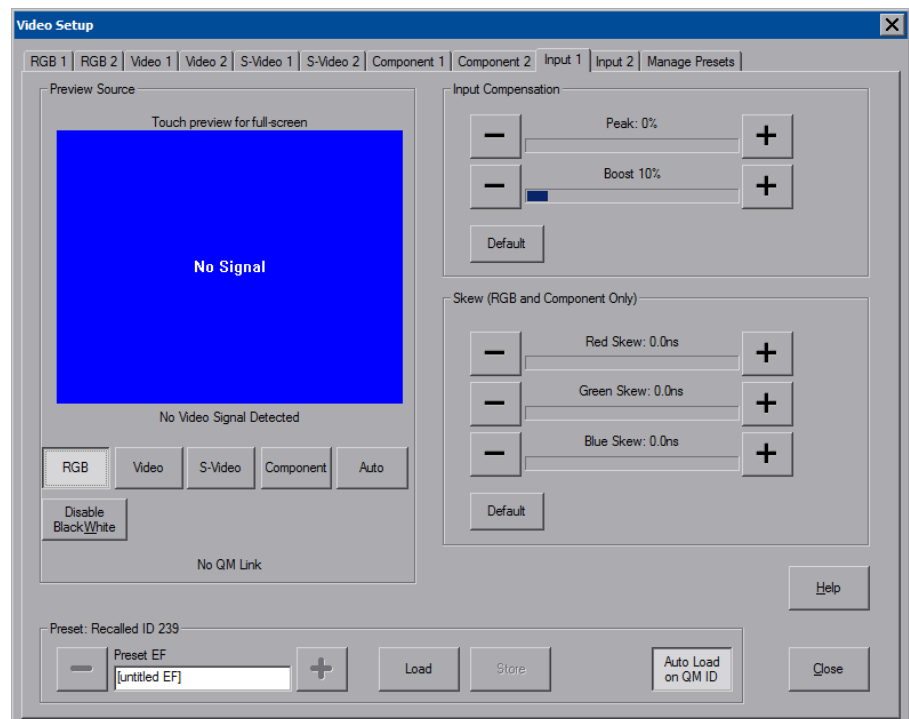
Presets

Up to 30 presets may be stored for future retrieval.

Input 1 & Input 2

The “Video Setup” window has controls for adjusting peak, boost, skew (QM Input #1 only) and presets for each of the inputs as shown in the following illustration. Changes are made in real time.

“Video Setup” Window - Input 1 Tab – QM Version



The **Auto** button can be used to auto detect video when a single video source (per input) is connected.

Adjust *Peak* and *Boost* to compensate for white or black streaking. On Input #1 of QM versions, adjustments for red, green and blue skew are available to compensate for the varying distances that a video signal must travel in a QM cable.

NOTE: QM Input #2 on the TPMC-15/17-QM does not have adjustments for skew compensation.

Up to 255 preset locations are available to store settings for peak, boost and skew. In QM systems using auto compensation, the touchpanel can be set to automatically recall preset values upon receipt of a QM ID by selecting **Auto Load on QM ID**.

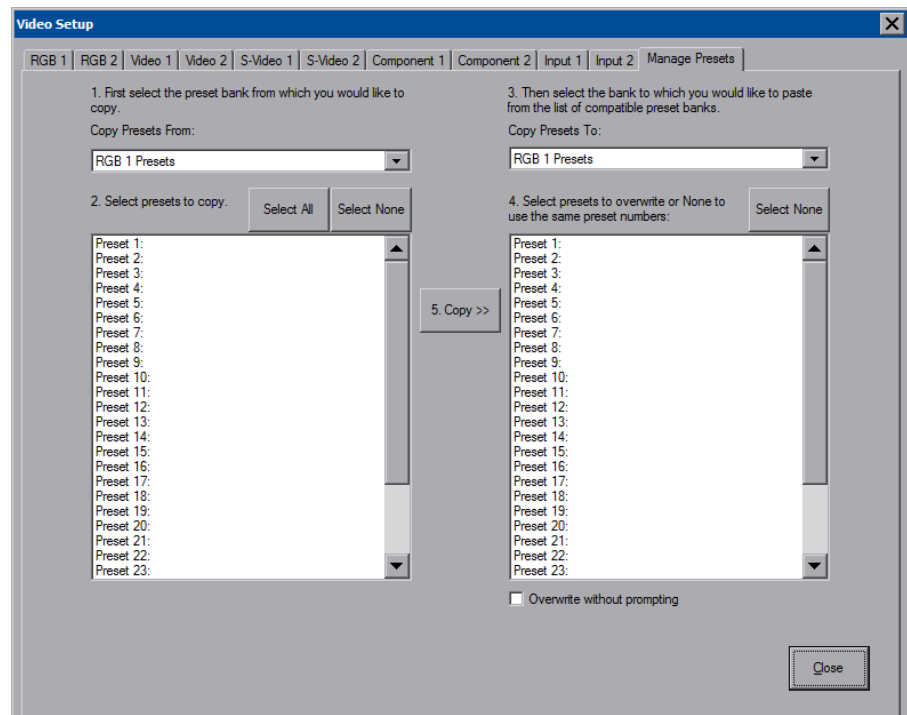
In order to manually load preset values, make sure **Auto Load on QM ID** is not selected.

For more information on peak, boost and skew settings, refer to the latest revision of the Crestron MediaManager Applications Guide (Doc. 6244).

Manage Presets

Use the *Manage Presets* tab to copy presets for position, size and color for one source to other sources.

“Video Setup” Window – Manage Presets Tab



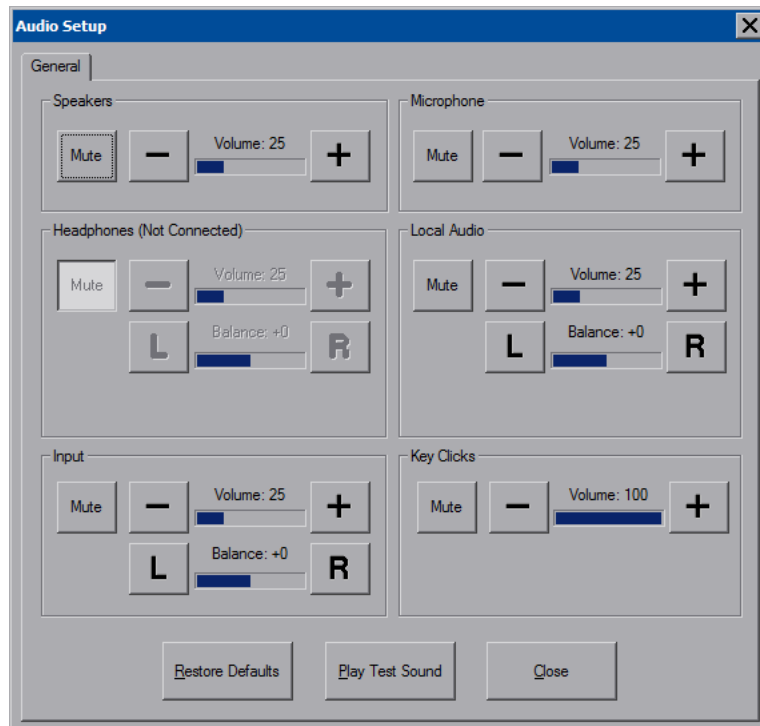
Audio

For all versions of the TPMC-15/17, pressing **Play Test Sound** plays a short internal audio file. In addition to the overall *Speakers* volume control, volume adjustment is available for *Microphone* input and volume and balance controls are available for the *Headphones* and *Local Audio* inputs. The key click sound has its own volume and mute controls. Defaults are 25 for volume and zero for balance.

Changes to audio settings are made in real time.

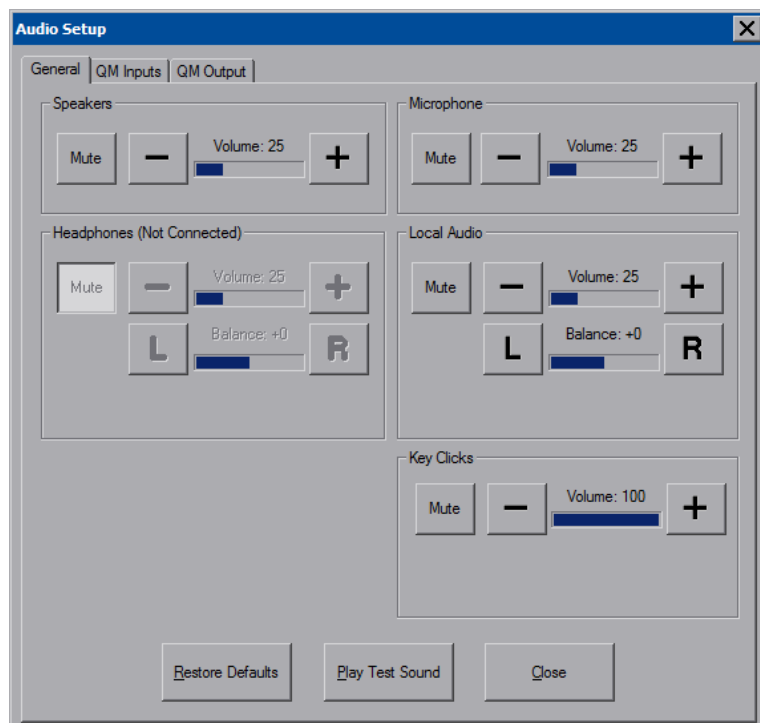
The “Audio Setup” window on CH versions includes volume and balance controls for the line input, labeled *Input*, as shown in the illustration on the following page.

“Audio Setup” Window-CH Version



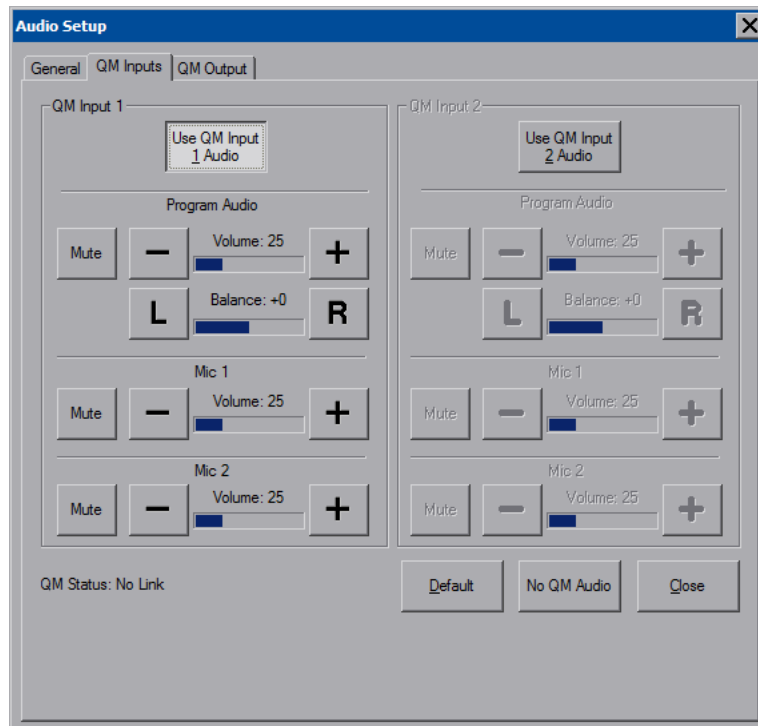
The “Audio Setup” window on QM versions is shown in the following illustration. It includes tabs containing controls for the QM inputs and the QM output.

“Audio Setup” Window-QM Version



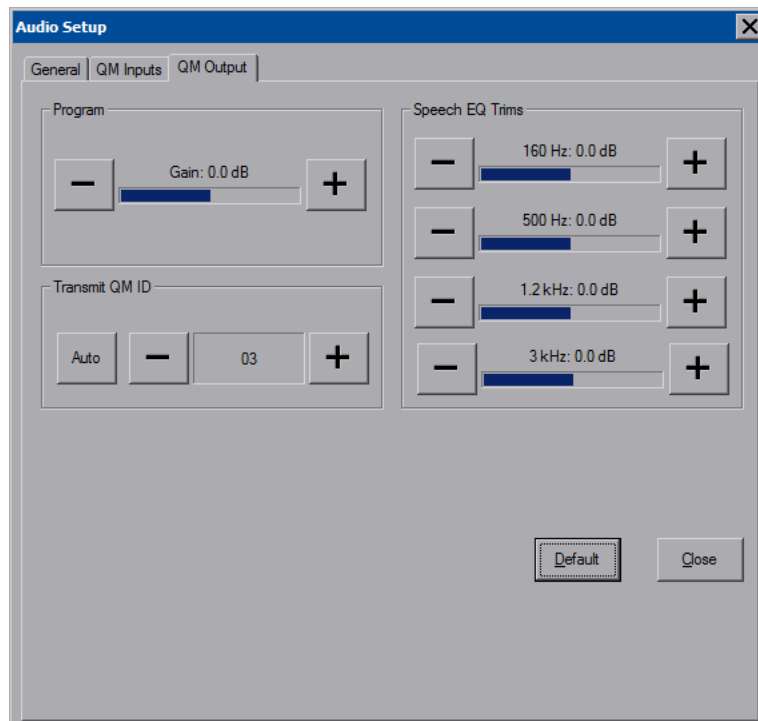
From the *QM Inputs* tab, volume levels for the program and microphone audio can be adjusted for each of the QM inputs. (Refer to illustration on the following page.)

“Audio Setup” Window – QM Inputs Tab



From the *QM Output* tab, gain for the program audio output and the EQ settings for the speech output can be adjusted as shown in the following illustration. Additionally, the touchpanel can be set to transmit the touchpanel’s actual QM ID or a specific QM ID for use in QM systems using auto compensation.

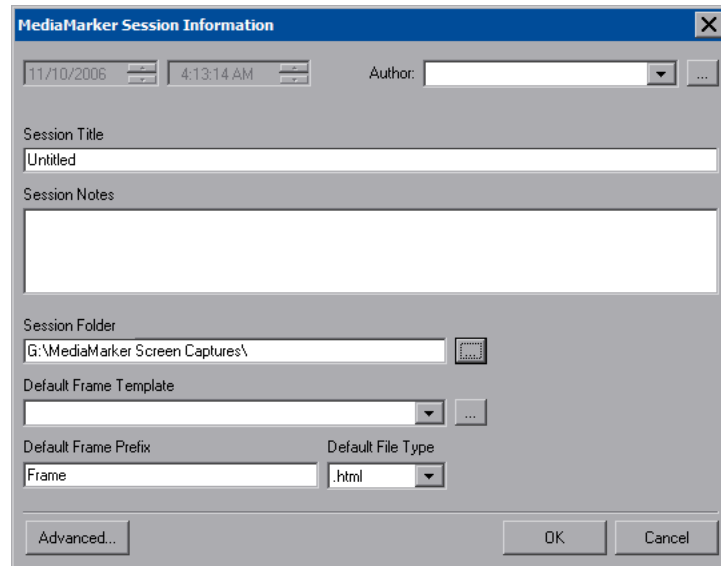
“Audio Setup” Window – QM Output Tab



Annotation

The **Annotation** button displays the “MediaMarker Session Information” window.

“MediaMarker Session Information” Window



The “MediaMarker Session Information” window allows the date, time, author name, session title and session notes to be stored for the current frame. The *Author* dropdown list box contains all the authors available on the system. Authors can be added and removed from the **Edit | Preferences | Authors** menu within MediaMarker, or by pressing

The *Session Folder* browse button permits searching other folders. You may select a flash memory card, a network drive or a USB drive.

The *Default Frame Template* browse button permits you to search for templates. For Crestron provided templates, choose from the pulldown list.

Frames created during the annotation session will use a default annotation template file, frame prefix and frame output file type.

Each new frame title will contain the frame prefix followed by a sequential frame number.

The frame template serves as a starting point for each new frame. Crestron supplies some ready-made templates or you can use one of your own.

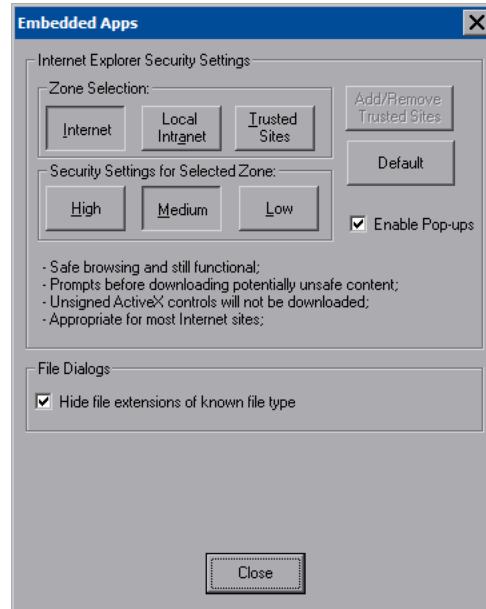
Screen captures can automatically save the contents of the current annotation frame to an image file. The file will be saved as the *Default File Type* (.html, .jpg, .bmp, .png or .tif) as specified in the session folder.

For additional information, refer to “MediaMarker” on page 71 and the help file included with the MediaMarker software.

Embedded Apps (Embedded Applications)

The “Embedded Apps” window permits you to set internet security to different levels for different types of internet sites.

“Embedded Apps” Window



For each of the three zones (**Internet**, **Local Intranet**, and **Trusted Sites**), one of three security levels (**High**, **Medium** or **Low**) can be selected. The security levels are defined as:

- **High:** The safest way to browse but also the least functional. Less secure features are disabled. Appropriate for sites that may have harmful content.
- **Medium:** Safe browsing and still functional. Prompts before downloading potentially unsafe content. Unsigned ActiveX controls will not be downloaded. Appropriate for most internet sites.
- **Low:** Minimal safeguards and warning prompts are provided. Most content is downloaded and run without prompts. All active content can run. Appropriate for sites you absolutely trust.

Press **Default** to restore the default security settings. By default, security is set to **Medium** for **Internet** and **Local Intranet** and **Low** for **Trusted Sites**.

The “Embedded Apps” window also permits you to enable the popup windows (child windows) that open when you are in Internet Explorer (not the popup windows of the embedded applications).

NOTE: If there is a mapped network drive on the touchpanel, the first time you select **Browse**, it may take some time for the “Open” window to appear.

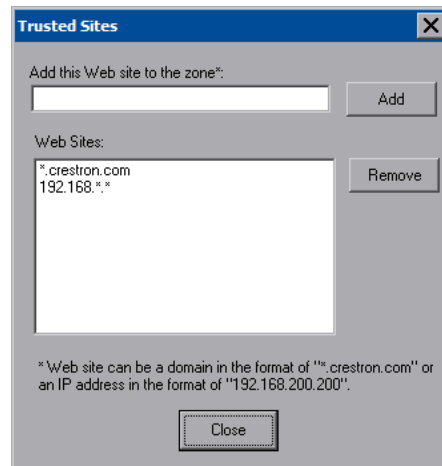
The currently supported version of Skype is 2.0.0.107.

Some applications (for example Skype) will sometimes display a pop up window asking if you would like to obtain a newer version. Before installing a newer version, the old version must first be uninstalled. The newer version can then be installed using the regular install process. (Refer to “Install & Uninstall Details” on page 49 for details.)

Press **Close** after all changes have been made. The touchpanel must be rebooted for changes to take effect. Press **Save & Reboot**, located in the SHUTDOWN section of the SETUP MENU.

A list of trusted sites can be created and edited by pressing **Add/Remove Trusted Sites**. Pressing this button will open the “Trusted Sites” window. From here, trusted sites can be added and edited. Sites are listed by domain name or IP address. Once all sites have been entered, press **Close**.

“Trusted Sites” Window



NOTE: **Save & Reboot** on the SETUP MENU must be selected for Embedded Apps changes to take effect.

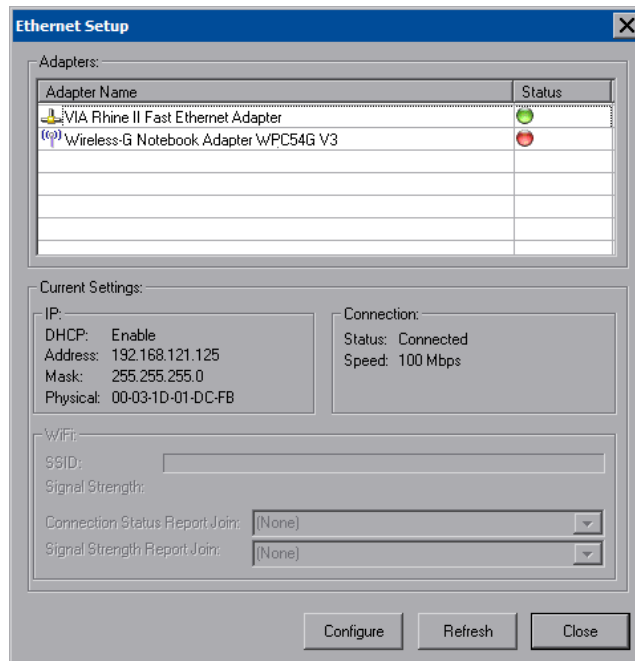
NOTE: While browsing the Internet with the TPMC-15/17, clicking on a link may cause a message box titled “Restrictions” to appear that contains the text “This operation has been cancelled due to restrictions in effect on this computer. Please contact your system administrator.” If this message appears, checking *Enable Pop-ups* in the “Embedded Apps” window may correct this error. Other restrictions may also cause this error, so this may not prevent all occurrences.

ETHERNET Details

The Ethernet Menu allows configuration of the touchpanel settings for Ethernet communications.

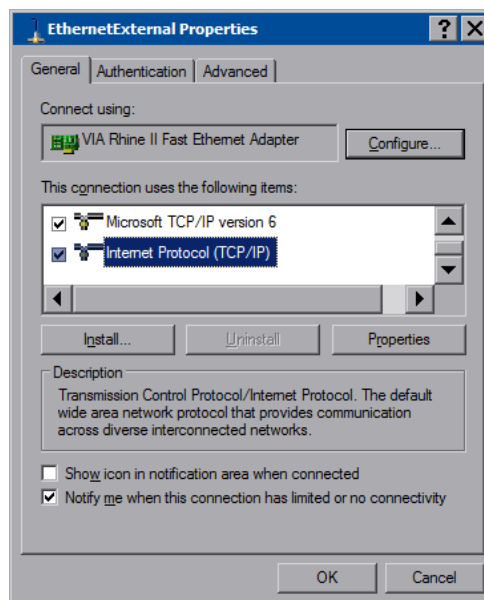
Ethernet

Press the **Ethernet** button to access the “Ethernet Setup” window. Changes are made in real time and there is typically no need to reboot. The Ethernet address and mask are displayed on this screen.

“Ethernet Setup” Window

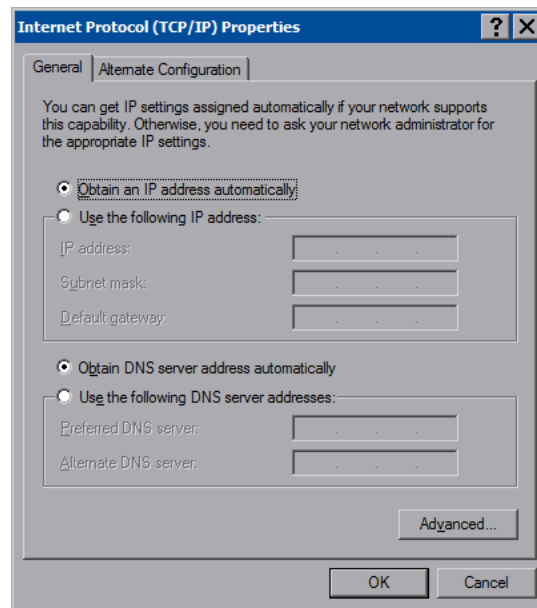
To configure the Ethernet adapter, click once on its name to select it in the *Adapter Name* list. Then, click **Configure** to open the “EthernetExternal Properties” window. This window displays the connection and related required items.

NOTE: When configuring an adapter, only one item can be modified at a time. For example, to modify an IP address and also change authentication, press **Configure** and modify the IP address, then press **OK** (you must return to the “Ethernet Setup” window). Press **Configure** again, change authentication, then press **OK**. The order in which modifications are performed does not matter.

“EthernetExternal Properties” Window

To establish dynamic or static processing, select **Internet Protocol (TCP/IP)** and click **Properties**.

“Internet Protocol (TCP/IP) Properties” Window



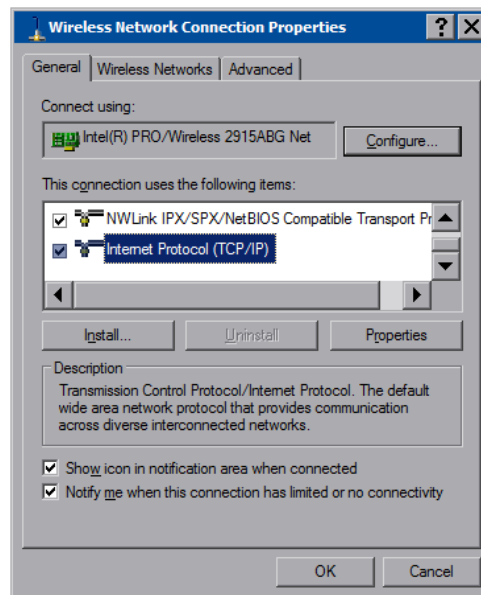
Transmission Control Protocol/Internet Protocol (TCP/IP) is a set of protocols that defines how to transfer data between two computers. TCP monitors and ensures correct transfer of data. IP receives the data from TCP, breaks it up into packets and ships it off to a network. The IP address is a unique number consisting of four parts separated by dots, e.g., 165.113.245.2.

Dynamic Host Configuration Protocol (DHCP) is a protocol for assigning dynamic IP addresses to devices on a network. With dynamic addressing, a device can have a different IP address every time it connects to the network. In some systems, the IP address of the device can even change while it is still connected. DHCP also supports a mix of static and dynamic IP addresses.

Dynamic addressing simplifies network administration because the software keeps track of IP addresses rather than requiring an administrator to manage the task. New computers can be added to a network without manually assigning each one a unique IP address.

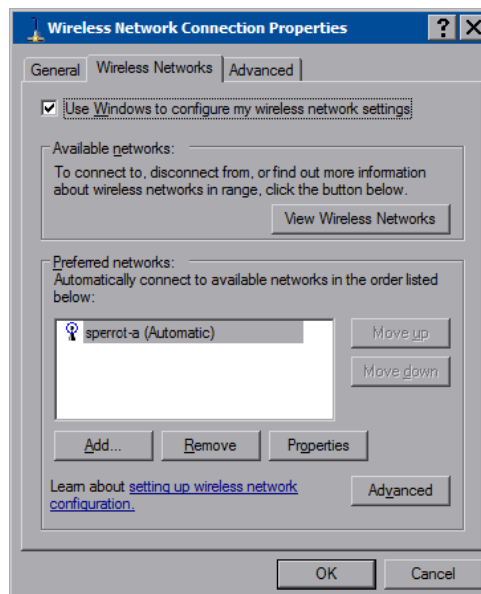
To configure a wireless network adapter, click once on its name to select it in the *Adapter Name* list in the “Ethernet Setup” window (refer to illustration on page 40). Then, click **Configure** to open the “Wireless Network Connection Properties” window. This window displays the connection and related required items.

NOTE: The illustration of the “Ethernet Setup” window shows one example of a wireless network adapter on the second line in the *Adapter Name* list. The text may vary depending on the particular adapter card you have installed.

“Wireless Network Connection Properties” Window (General)

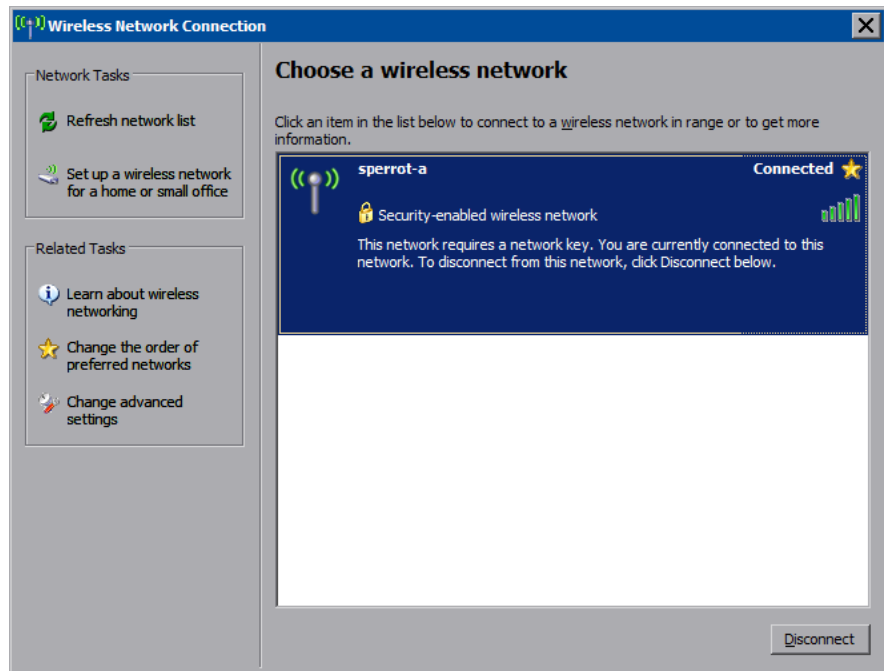
NOTE:
The *Advanced* tab
is not supported
at this time.

Click on the *Wireless Networks* tab.

“Wireless Network Connection Properties” Window (Wireless Networks)

NOTE: The link at the bottom of the window which says “Learn about setting up a wireless network configuration” is not supported at this time.

From here you can add or remove wireless access points (WAPs) or routers. To view wireless networks being accessed or scan for access points, click **View Wireless Networks** to open the “Wireless Network Connection” window.

“Wireless Network Connection” Window

Click **Refresh network list** to scan for available access points.

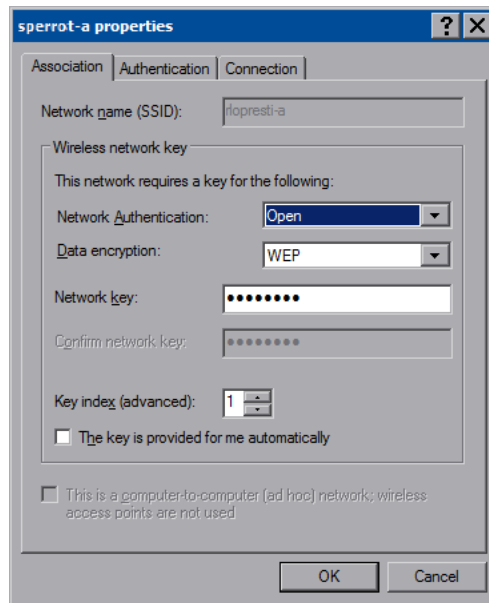
The TPMC-15/17 is already configured for DHCP. To establish static processing or to switch between DHCP and static IP, use the *General* tab of the “Wireless Network Connections” window (refer to illustration on page 42), select **Internet Protocol (TCP/IP)** and click **Properties**.

Click **Set up a wireless network for a home or small office** to start the Wireless Network Setup Wizard.

The Wireless Network Setup Wizard will create a network with the *Network Authentication* value set to **Open**. If your Wireless Access Point is configured with a value other than **Open**, you must set this value manually, using the *Wireless Networks* tab of the “Wireless Network Connection Properties” window (refer to illustration on page 42).

To manually configure your Wireless Access Point, perform the following procedure:

1. In the *Preferred Networks* section of the window, select your network and click **Properties** to open the “Properties” window for your network.

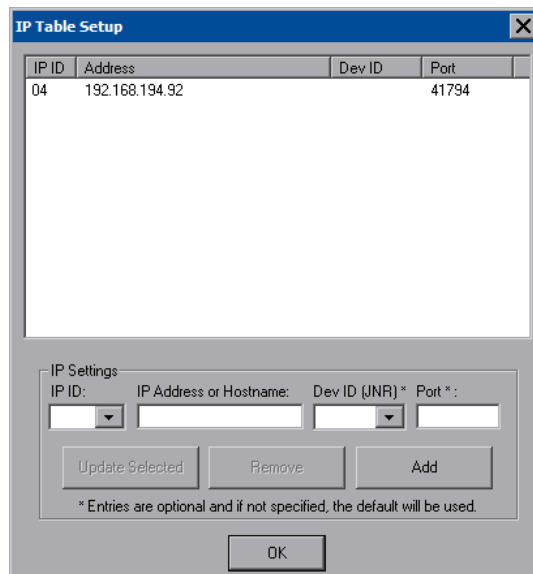
“Network (your network name) Properties” Window

2. With *Data encryption* set to **WEP**, select **Open** from the *Network Authentication* dropdown list.
3. Enter and confirm the *Network key*.
4. Click **OK**.

IP Table

Edit, remove or enter a control system’s IP address in the IP table to enable communication between the touchpanel and a control system. The touchpanel can communicate with multiple control systems.

For more information on IP tables, refer to the latest version of the Crestron 2-Series Control Systems Reference Guide (Doc. 6256).

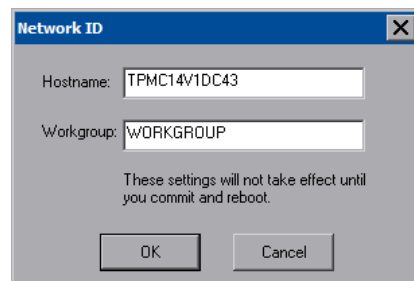
“IP Table Setup” Window

The IP ID is the ID number that is used to identify the touchpanel in the control system's IP table. The IP ID should match the IP ID set in the SIMPL Windows program.

Identity

Press **Identity** to open the "Network ID" window. The "Network ID" window displays the hostname and workgroup that identify the touchpanel on the network. The hostname may be used when transferring a program over Ethernet using Crestron Toolbox. This window permits editing of the hostname and workgroup.

"Network ID" Window

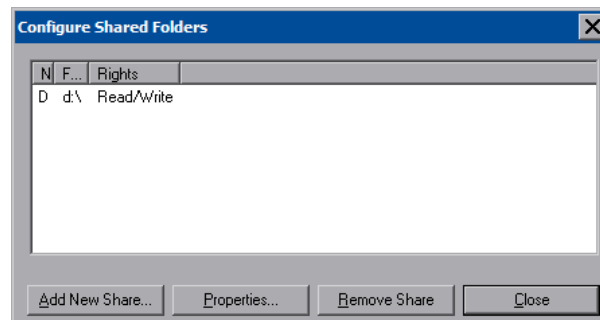


NOTE: The hostname is required for Ethernet communication.

Sharing

Press **Sharing** to open the "Configure Shared Folders" window. This window is used to set up shared folders. Sharing enables remote computers to view and/or modify files stored on the touchpanel.

"Configure Shared Folders" Window



Click **Add New Share...** to browse and add directories with permission to read-only or read/write. Click **Close** after adding all folders to be shared.

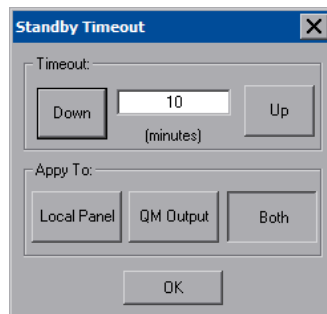
NOTE: For security reasons, there is no persistence of the shared drive(s) after the panel is rebooted.

STANDBY TIMEOUT Details

The STANDBY TIMEOUT function can turn off the touchpanel display when the screen has not been touched for a specified time frame (minutes). When the touchpanel is activated, the last screen to be displayed reappears. Minutes can vary

from 0 to 120, where 0 disables the timeout. Press **Modify** to adjust the timeout period. This will open the “Standby Timeout” window.

“Standby Timeout” Window (QM Versions)



To decrease the timeout period, press **Down**. To increase the timeout period, press **Up**.

QM versions can select whether the display is turned off, the QM output is turned off or both the display and the QM output are turned off.

HARD KEY FEEDBACK Details

The HARD KEY FEEDBACK section of the SETUP MENU provides visual feedback for all hard button presses. Pressing any of the hard buttons (except Reset) will result in its corresponding icon on the screen illuminating in bright green.

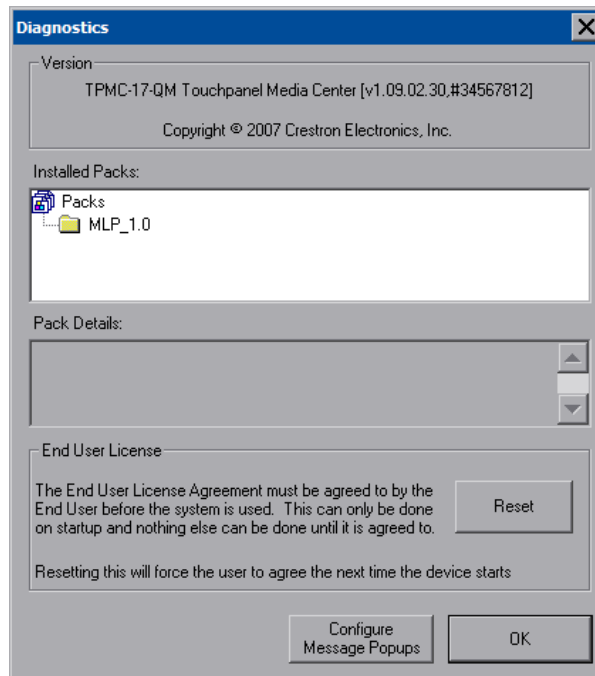
MISC. CONTROLS Details

The MISC. CONTROLS section of the SETUP MENU contains the **Diagnostics** and **Show Keyboard** buttons.

Diagnostics

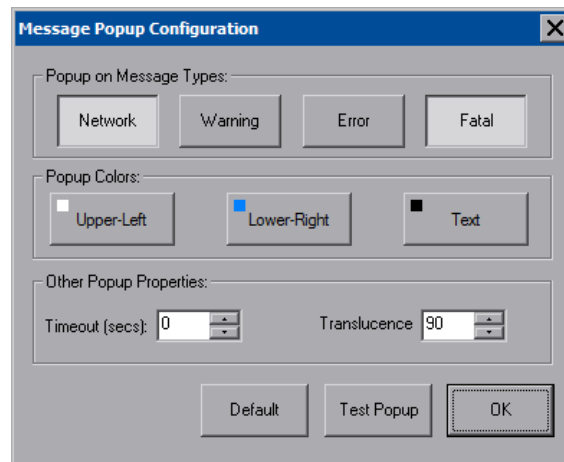
Press the **Diagnostics** button to display the firmware version number, see *Installed Packs* and to reset the end user license from the “Diagnostics” window.

“Diagnostics” Window



To configure the appearance of popup messages, press **Configure Message Popups**. The “Message Popup Configuration” window will open.

“Message Popup Configuration” Window



There are various types of popup messages. The button associated with each type (**Network**, **Warning**, **Error** and **Fatal**) allows you to set which types are displayed. Following are definitions of each message type:

- **Network:** There is an issue with the status of the connection to the control system.
- **Warning:** An event occurred that may affect the normal operation of the unit.
- **Error:** An operation has failed.
- **Fatal:** An event occurred which will require the unit to be reset.

The *Popup Colors* controls allow you to determine the background and text color of popup messages. Also provided are controls for popup message *Timeout* and *Translucence*.

The **Default** button restores the original *Colors*, *Timeout* and *Translucence* settings, as well as enabling display of Network and Fatal messages. A **Test Popup** button lets you see the changes to popup message timing, appearance and position. Press **Close** to close the popup window.

NOTE: The default values for *Color* are white for *Upper Left*, blue for *Lower-Right* and black for *Text*. The default values for *Timeout* and *Translucence* are 0 and 90 respectively.

Show Keyboard

Click the **Show Keyboard** button to display the on-screen keyboard.

The on-screen keyboard can be used in an identical manner to a physically connected keyboard. It can be used in any of the embedded applications, for example, to enter a web address or to enter data into a spreadsheet, etc.

The on-screen keyboard also has a few special keys:



Volume down



Volume up



Right click: simulates right-click of mouse



Size: toggles on-screen keyboard size (small, medium, large)

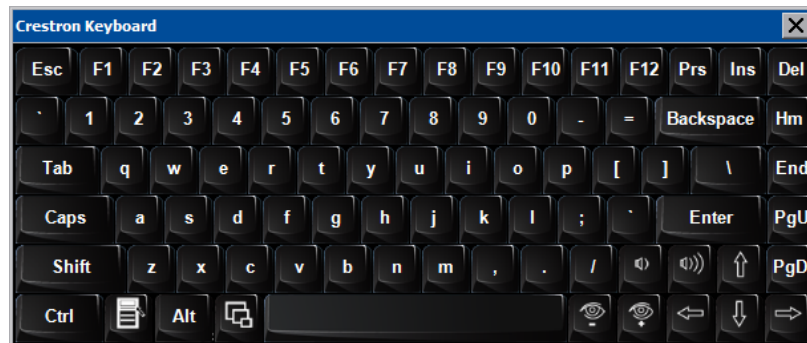


Keyboard transluence down: decreases keyboard transluence



Keyboard transluence up: increases keyboard transluence

On-Screen Keyboard



The initial position of the on-screen keyboard is determined by the VisionTools® Pro-e program or SIMPL Windows settings. The on-screen keyboard will default to its largest size.

In use, when the on-screen keyboard is moved and/or resized and then closed, it will re-open in the same position it was in and at the same size it was when closed. This position and size will remain in memory until the touchpanel is re-booted or it is re-set by the SIMPL Windows program. After reboot, the position of the on-screen keyboard will revert to the defaults set in the VisionTools Pro-e or SIMPL Windows program. The size will revert to the largest as determined by the firmware installed in the touchpanel.

Exit the on-screen keyboard by selecting **File | Exit** or by pressing the “X” close button in the upper right corner of the keyboard window.

SCREEN BRIGHTNESS Details

The SCREEN BRIGHTNESS can be varied from 0 to 100. To increase the brightness, press **Up**. To decrease the brightness, press **Down**.

HARD KEY BACKLIGHT Details

Use the **Up** and **Down** buttons to adjust the brightness of the button lights on the touchpanel base.

SHUTDOWN Details

To save any changes and reboot the touchpanel, press **Save & Reboot**, located in the SHUTDOWN section of the SETUP MENU.

To turn off the touchpanel, press **Shut Down**, located in the SHUTDOWN section of the SETUP MENU. This is the recommended method for shutting down the

touchpanel. After the touchpanel has shut down, the power supply can be safely removed from the touchpanel.

Install & Uninstall Details

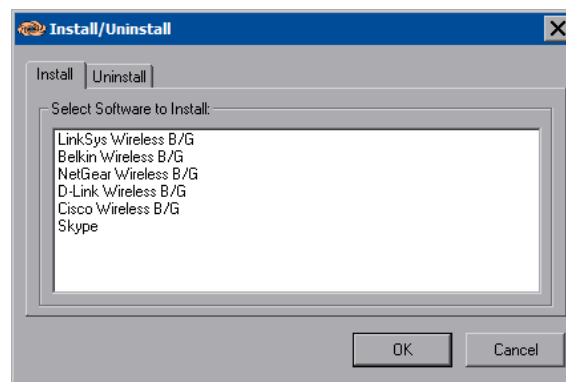
Some third-party hardware driver files (such as those for wireless network adapter cards) as well as third-party software applications (such as Skype) are not pre-installed on the TPMC-15/17. The **Install & Uninstall** button provides facilities for adding these to your TPMC-15/17. It also provides a means for uninstalling these.

There are pre-installation and post-installation procedures that are common to all the installation processes. Begin by following the pre-installation procedures, then follow the steps unique to each install and complete the process with the post-installation procedures.

Pre-installation

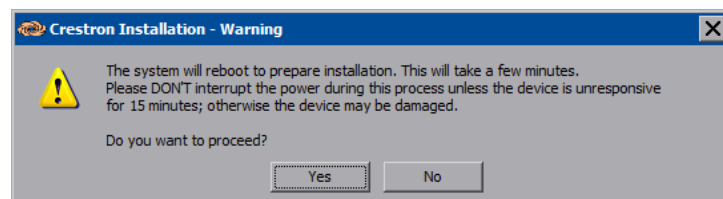
Clicking on the **Install & Uninstall** button will open the “Install/Uninstall” window.

“Install/Uninstall” Window



After selecting the item you wish to install and clicking the **OK** button, the panel will display the “Crestron Installation – Warning” window to warn you that the touchpanel will reboot to prepare for installation and that this will take a few minutes.

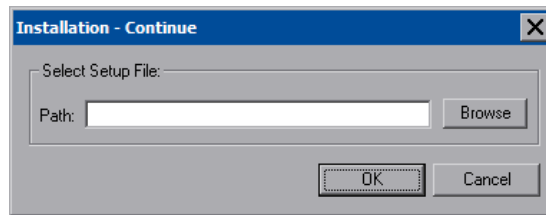
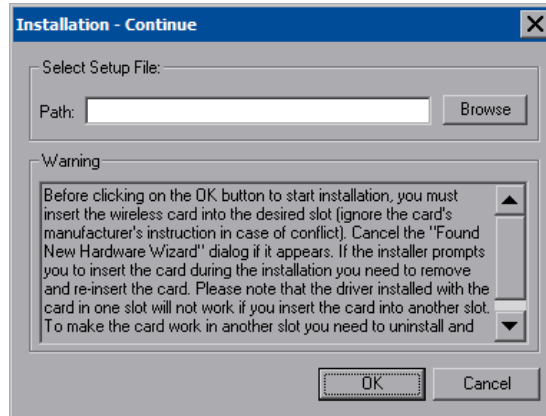
“Crestron Installation – Warning” Window



Click **Yes** and the “Installation – Continue” window will open. This window contains a **Browse** button to allow you to navigate to the location of the application or driver file you want to install. Installation files can be on a flash card or a network drive.

NOTE: If there is a mapped network drive on the touchpanel, the first time you select **Browse**, it may take some time for the “Open” window to appear.

NOTE: Crestron recommends that you copy driver and/or installation files to a flash card or a USB drive connected to the touchpanel prior to installation and perform the installation from one of these.

“Installation – Continue” Window (for Applications)*“Installation – Continue” Window (for Wireless Adapters)*

When installing a wireless adapter, the “Installation – Continue” window also contains a warning for wireless adapter installation. The warning says that before clicking **OK** to start the installation, you must insert the wireless card into the desired slot on the rear of the touchpanel. The installers for some wireless cards will prompt you to insert the card during the installation. In such cases, you will need to remove and re-insert the card.

Cancel the “Found New Hardware Wizard” window if it appears after installing the wireless card.

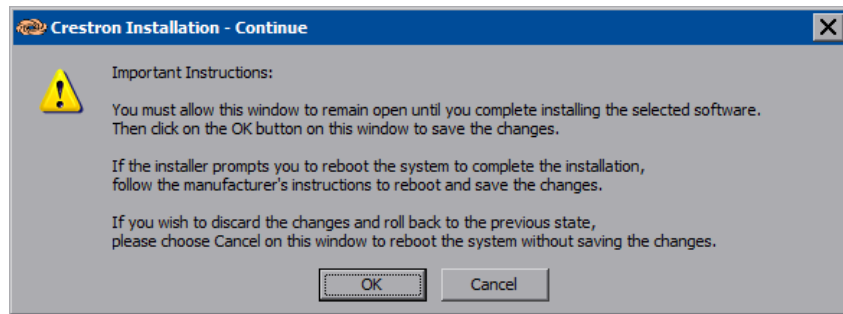
CAUTION: For proper operation and to avoid possible equipment damage, wireless network adapter cards should be installed face down. To allow easier access to the second card slot, Crestron recommends installing your wireless network adapter card in the bottom slot.

NOTE: The wireless card will work only in the slot in which it is inserted during driver installation. To make the card work in the other slot, you need to uninstall its driver and then re-install it while the card is inserted in the other slot.

NOTE: Do not configure wireless adapters using the installer’s utility. Instead, wait until installation has completed and committed. Then use the utility available from the *ETHERNET* section of the SETUP MENU (refer to “Ethernet” which starts on page 39).

When you have browsed to and selected the desired installation file, the path to the file will show in the *Select Setup File* section of the window. Click **OK** to open the “Crestron Installation - Continue” window.

“Crestron Installation – Continue” Window



The “Crestron Installation – Continue” window is used after installation is complete. It will allow you to validate the install and commit the changes. This window also allows you to cancel an installation and discard any changes.

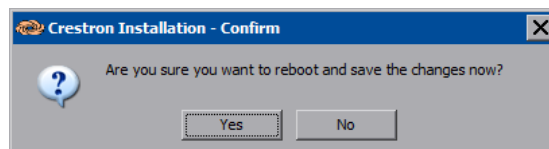
NOTE: Do not click **OK** until the installation of the selected software is complete.

Proceed with the directions for the particular hardware or software you are installing (refer to the following pages). Then return to the post-installation procedure on the following page to complete the process.

Post-installation

When installation program is complete, click **OK** in the “Crestron Installation – Continue” window. The “Crestron Installation – Confirm” window will appear asking you if you want to reboot and save the changes. Click **Yes**.

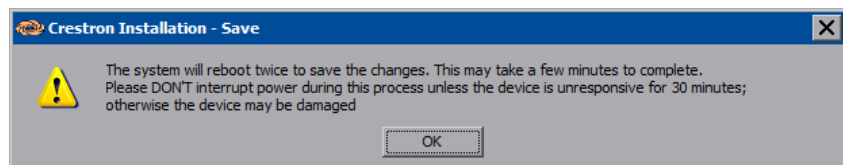
“Crestron Installation – Confirm” Window



The final window will be the “Crestron Installation – Save” window to inform you the system will reboot twice to commit the changes.

NOTE: This may take a few minutes to complete and should not be interrupted unless the device is unresponsive for 30 minutes.

“Crestron Installation – Save” Window



After the second reboot, software installation is complete. If you have installed a wireless network adapter and need to configure your network, refer to “Ethernet” which starts on page 39.

Installing LinkSys Wireless B/G

Follow the instructions on the manufacturer's website or those that came with your adapter card.

When installing the software, consider the following:

- The network adapter card must be installed face down in the slot (refer to Caution and Notes on page 50).
- If the installation software asks you to insert the adapter card, eject the wireless adapter card and re-insert it into the slot on the rear of the TPMC-15/17. Cancel the "Found New Hardware Wizard" window if it appears.
- If the installation software asks you to create a profile, skip this step by clicking **Exit**.

To complete the final installation steps, follow the procedure in the "Post-installation" section (refer to page 51).

Installing Belkin Wireless B/G

Follow the instructions on the manufacturer's website or those that came with your adapter card.

When installing the software, consider the following:

- The network adapter card must be installed face down in the slot (refer to Caution and Notes on page 50).
- If the installation software asks you to insert the adapter card, eject the wireless adapter card and re-insert it into the slot on the rear of the TPMC-15/17. Cancel the "Found New Hardware Wizard" window if it appears.

To complete the final installation steps, follow the procedure in the "Post-installation" section (refer to page 51).

Installing NetGear Wireless B/G

Follow the instructions on the manufacturer's website or those that came with your adapter card.

When installing the software, consider the following:

- The network adapter card must be installed face down in the slot (refer to Caution and Notes on page 50).
- If the installation software asks you to enable the NETGEAR SMART WIZARD, skip this step by clicking **No**.

To complete the final installation steps, follow the procedure in the "Post-installation" section (refer to page 51).

Installing D-Link Wireless B/G

Follow the instructions on the manufacturer's website or those that came with your adapter card.

When installing the software, consider the following:

- The network adapter card must be installed face down in the slot (refer to Caution and Notes on page 50).
- If the installation software asks you to insert the adapter card, eject the wireless adapter card and re-insert it into the slot on the rear of the TPMC-15/17. Cancel the “Found New Hardware Wizard” window if it appears.
- If the installation software asks you if you would like to use the Windows Zero Configuration Utility, click **Yes**, then click **Next**.
- If the installation software asks you to enter a wireless network name, skip this step by clicking **Exit**.

To complete the final installation steps, follow the procedure in the “Post-installation” section (refer to page 51).

Installing Cisco Wireless B/G

Follow the instructions on the manufacturer’s website or those that came with your adapter card.

When installing the software, consider the following:

- The network adapter card must be installed face down in the slot (refer to Caution and Notes on page 50).
- If the installation software asks you to choose the setup type, select **Install Driver Only**, then click **Next**.
- If the installation software asks you if you wish to install the Cisco Aironet Site Survey Utility, be sure to leave the check box blank (i.e. unchecked), then click **Next**.
- If the installation software asks you to insert the adapter card, eject the wireless adapter card and re-insert it into the slot on the rear of the TPMC-15/17. Cancel the “Found New Hardware Wizard” window if it appears.

To complete the final installation steps, follow the procedure in the “Post-installation” section (refer to page 51).

Installing Skype

Follow the instructions on the manufacturer’s website or those that came with your software.

When installing the software, consider the following:

- If the installation software asks you if you wish to create a desktop icon or if you wish to “Start Skype when the computer starts”, be sure to leave the check boxes blank (i.e. unchecked) as these are not supported by the TPMC-15/17. Then click **Next**.
- If the installation software displays a “Launch Skype” check box, be sure to leave the check box blank (i.e. unchecked). Then click **Finish**.

To complete the final installation steps, follow the procedure in the “Post-installation” section (refer to page 51).

Exit Details

Press **Exit** to leave the SETUP MENU and return to the project. If no project has been loaded, the touchpanel will display an error message and return to the SETUP MENU.

Hardware Hookup

Ventilation

The TPMC-15/17 should be used in a well-ventilated area. The venting holes should not be obstructed under any circumstances. If the TPMC-15/17 is hot to the touch, consider using forced air ventilation.

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

Connect the Device

Make the necessary connections as called out in the following illustrations. Refer to “Network Wiring”, “CAT5 Wiring (CH versions only)” and “QuickMedia Wiring (QM versions only)” on page 20 before applying power. If the TPMC-CH-IMC is to be used (CH versions only) for connecting CAT5 audio and CAT5 video, refer to the latest revision of the TPMC-CH-IMC Operations Guide (Doc. 6345) for more information.

CAUTION: Do not apply excessive pressure to the touchscreen display during handling. Doing so can crack the screen and damage the touchpanel.

CAUTION: PC Cards should be installed with the label facing down.

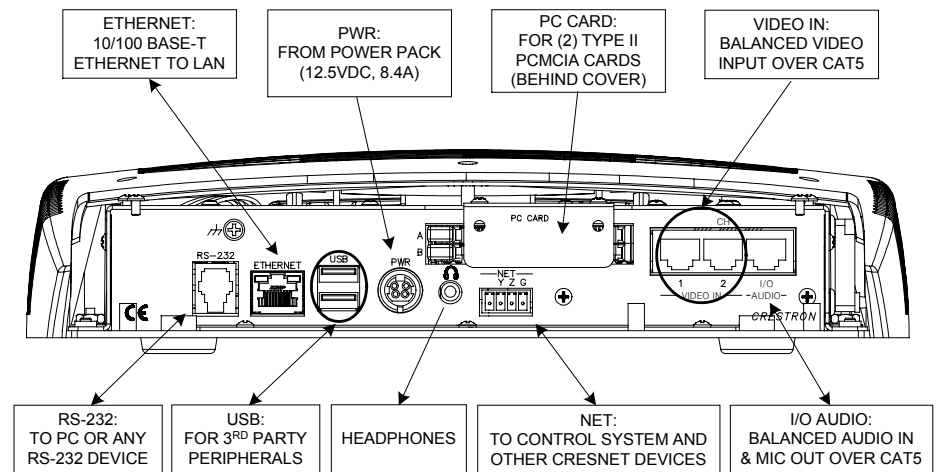
NOTE: The maximum continuous current from equipment under any external load conditions shall not exceed a current limit that is suitable for the minimum wire gauge used in interconnecting cables. The ratings on the connecting unit's supply input should be considered to prevent overloading the wiring.

NOTE: The headphone output is for WAV and Line audio only. It does not carry the microphone signal.

NOTE: For CAT5 and QuickMedia connections, use Crestron Certified Wire.

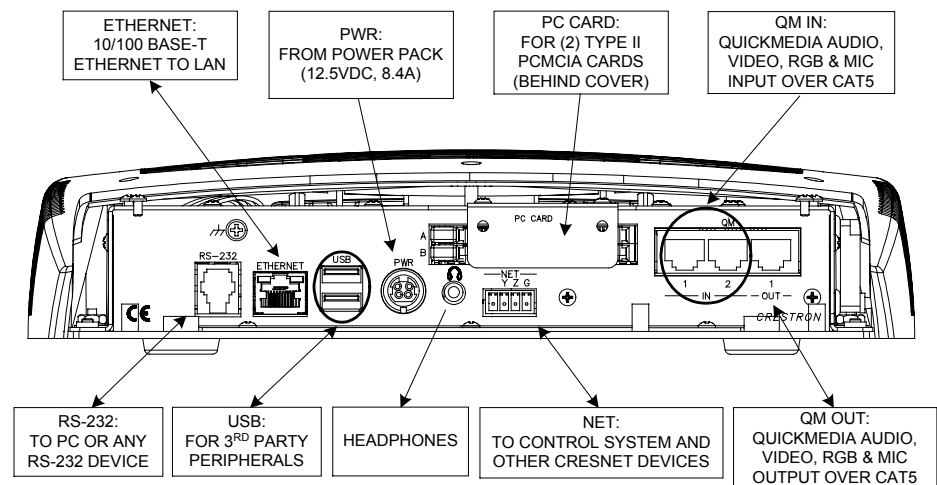
NOTE: Crestron recommends an independent power supply for the touchpanel.

Hardware Connections for the TPMC-15/17-CH



CAUTION: When using an interface module to connect video signals to the touchpanel, only use the TPMC-CH-IMC Interface module. Use of other “IMC” products could damage the panel.

Hardware Connections for the TPMC-15/17-QM



TPMC-CH-IMC Interface Module (CH Versions Only)

For networks without CAT5 audio and video, the TPMC-CH-IMC (included with CH series) is available to convert unbalanced video sent over coax cable and balanced/unbalanced audio sent over shielded, twisted-pair wiring to Crestron Certified Wire for connection to the touchpanels.

NOTE: When using a TPMC-CH-IMC to provide video and audio to the touchpanel, any source that is to use the second input will only be able to send video to the touchpanel as the audio port will be connected to the audio output of the TPMC-CH-IMC. To maximize the usability of the touchpanel’s A/V ports, Crestron recommends connecting the touchpanel’s video inputs to the CAT5 outputs of a CNX-PVID8x4 (or similar device) and the audio port to a CAT5 port of a

CNX-BIPAD8 (or similar device). Contact Crestron's True Blue Support for a solution that is specific to your system.

The TPMC-15/17-CH includes a "triamese" cable that provides one CAT5 video line, one CAT5 audio line and one Cresnet connection between the touchpanel and the TPMC-CH-IMC.

For more information on the TPMC-CH-IMC, refer to the latest version of the TPMC-CH-IMC Interface Module Operations Guide (Doc. 6345).

QM-TX QuickMedia Transmitter (QM Versions Only)

The QM-TX QuickMedia Transmitter (sold separately) can be used to connect an RGB, video or audio source to a QuickMedia network without a locally available QM transmitter (such as the QM-WMC).

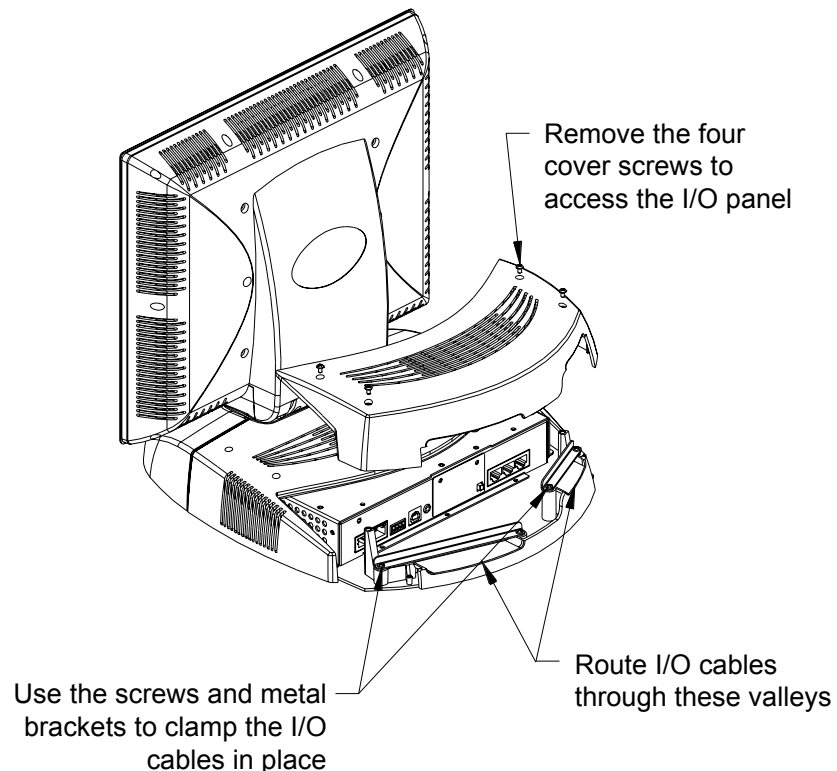
The QM-TX accepts composite video, S-video, component video, RGBHV and audio signals. These signals are converted to the QuickMedia standard and fed over a CAT5E or CAT6 cable to a QM receiver (such as the TPMC-15/17-QM). All signal routing occurs automatically under the command of the control system.

For more information, refer to the latest version of the QuickMedia Transmitter: QM-TX Operations Guide (Doc. 6334).

Cable Management

The TPMC-15/17 uses a built-in strain relief to prevent accidental disconnection of vital cables and provide strain-relief for connectors on cables and the touchpanel. Refer to the following illustration to use the built-in strain relief mechanism to secure cables to the touchpanel.

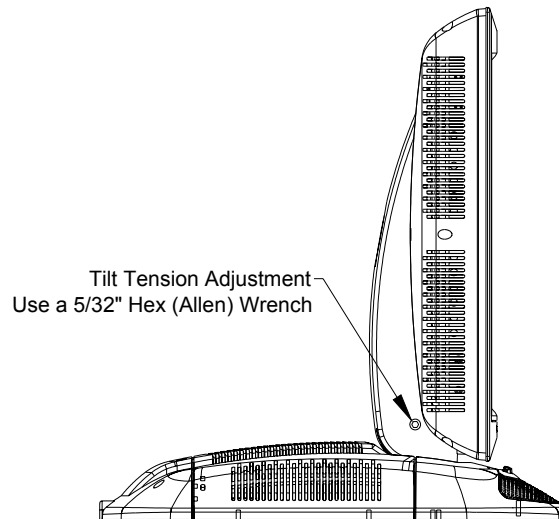
TPMC-15/17 Cable Management



Tilt Angle Tension Adjustment

Use a 5/32 inch socket (not included) with a hex drive key (Allen wrench) to increase or decrease pivot tension at the base of the touchscreen. Turning the key clockwise increases tension, counterclockwise decreases tension.

Tension Adjustment Screw



Recommended Cleaning

Keep the surface of the touchscreen free of dirt, dust or other materials that could degrade optical properties. Long-term contact with abrasive materials can scratch the surface, which may have a detrimental effect on image quality.

For best cleaning results use a clean, damp, non-abrasive cloth with any commercially available non-ammonia glass cleaner. Bezels may not provide a complete watertight seal. Therefore, apply cleaning solution to the cloth rather than the surface of the touchscreen. Wipe touchscreen clean and avoid getting moisture beneath the bezels.

Programming Software

Have a question or comment about Crestron software?

Answers to frequently asked questions (FAQs) can be viewed in the Online Help section of the Crestron website. To post a question or view questions you have submitted to Crestron's True Blue Support, log in at <http://support.crestron.com>. First-time users will need to establish a user account.

Earliest Version Software Requirements for the PC

NOTE: Crestron recommends that you use the latest software to take advantage of the most recently released features. The latest software is available from the Crestron website.

Crestron has developed an assortment of Windows®-based software tools to develop a Cresnet system. The following are the minimum recommended software versions for the PC:

Software

TASK	REQUIRED SOFTWARE VERSION
Program control system to operate TPMC-15/17.	SIMPL Windows version 2.07 or later. Also requires Crestron Database version 17.3.3 or later.
Upload program and firmware.	Crestron Toolbox 1.1.2.0 or later.
Design touchpanel pages (optional)	Crestron VisionTools® Pro-e version 3.7 or later.
Program with simple wizards for QuickMedia systems using a TPMC-15/17 (optional but recommended).	Crestron SystemBuilder™ version 3.1.15 or later with SystemBuilder Templates version 3.1.7 or later. Refer to software release notes or Crestron website for other required Crestron software packages.

Programming with Crestron SystemBuilder

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

Programming with SIMPL Windows

NOTE: While SIMPL Windows can be used to program the TPMC-15/17, it is recommended to use SystemBuilder for configuring and tuning a QuickMedia system.

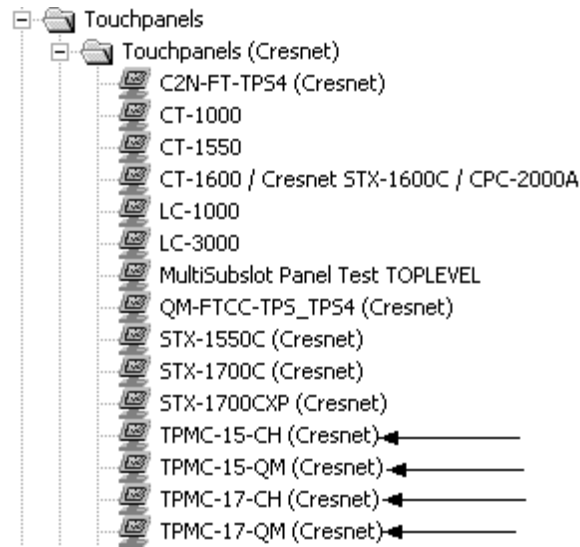
SIMPL Windows is Crestron's premier software for programming Crestron control systems. It is organized into two separate but equally important "Managers".

Configuration Manager

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

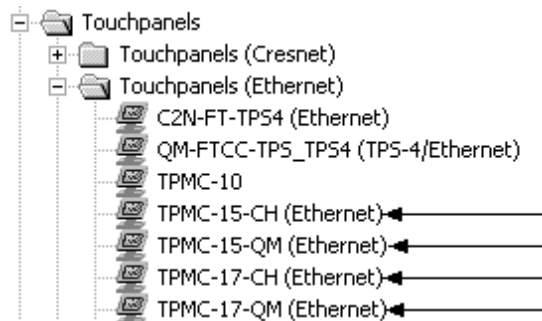
- To incorporate the TPMC-15/17 (Cresnet) into the system, drag the TPMC-15/17 from the Touchpanels | Touchpanels (Cresnet) folder of the *Device Library* and drop it in the *System Views*.

Locating the TPMC-15/17 (Cresnet) in the Device Library



- To incorporate the TPMC-15/17 (Ethernet) into the system, drag the TPMC-15/17 from the Touchpanels | Touchpanels (Ethernet) folder of the *Device Library* and drop it in the *System Views*.

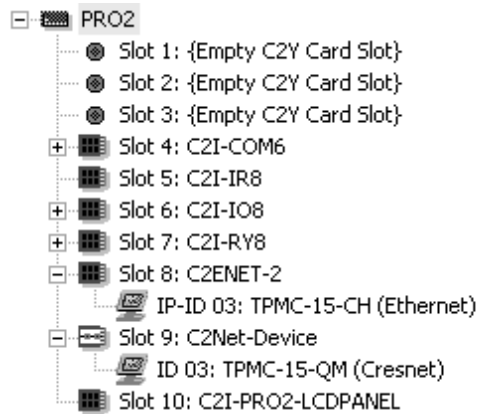
Locating the TPMC-15/17 (Ethernet) in the Device Library



- The system tree of the control system displays the device in the appropriate slot with a default Net ID or IP ID as shown in the following illustration.

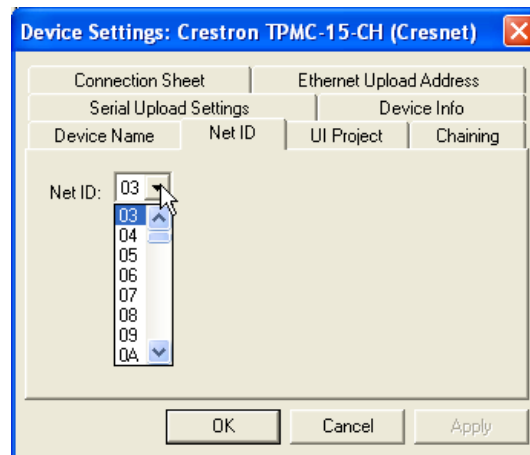
NOTE: Observe that there is both an Ethernet device in Slot 8 and a Cresnet device in Slot 9 of the illustration on the following page. It is possible to have both types of device attached to a control system so long as the control system has either a built-in or expansion Ethernet interface.

C2Net Device, Slots 8 and 9

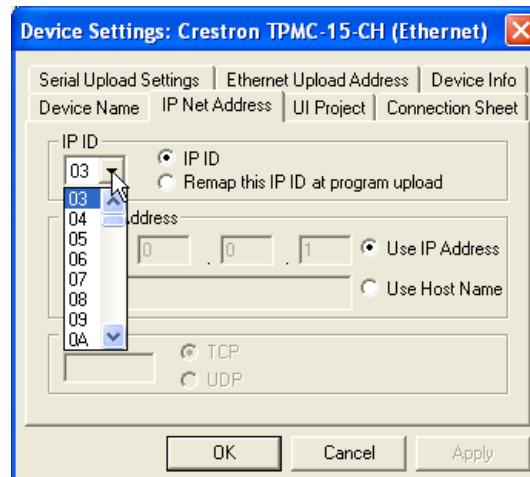


- Additional TPMC-15/17 devices are assigned different Net ID (for Cresnet devices) or IP ID (for Ethernet devices) numbers as they are added.
- If necessary, double click a device to open the “Device Settings” window and change the Net ID or IP ID, as shown in the following figures.

“TPMC-15/17 (Cresnet) Device Settings” Window



“TPMC-15/17 Ethernet Device Settings” Window



- The ID code specified in the SIMPL Windows program must match the Net ID or IP ID of each unit.

Program Manager

Program Manager is the view where programmers “program” a Crestron control system by assigning signals to symbols. The symbol can be viewed by double clicking on the icon or dragging it into *Detail View*. Each signal in the symbol is described in the SIMPL Windows help file (F1).

Programming with VisionTools Pro-e

Touchpanel screens should be created in VisionTools Pro-e to allow accessing the embedded applications, switching of source signals to desired outputs as well as selection of the system mode. There are no special programming requirements to use the functions of the TPMC-15/17 in a room-control system.

Multi-Mode Objects

Multi-mode objects offer high-performance programming!

The single most-advanced VisionTools Pro-e high-performance programming technique involving the TPMC-15/17 is the concept of multi-mode objects. A multi-mode object (i.e. button, legend, etc.) is an object drawn on a VisionTools Pro-e page that can have one or more active and inactive visible settings (*modes*).

For examples, refer to www.crestron.com/exampleprograms and search for multi-mode object examples. This file contains the VisionTools Pro-e touchpanel files and SIMPL Windows files that illustrate the high-performance capabilities of multi-mode objects.

WAV File Audio Messages

The TPMC-15/17 touchpanels are capable of playing audio messages as system prompts and responses. These files are recorded as WAV files on a PC using an audio utility such as Sound Recorder that is packaged with Microsoft Windows 95/98/Me/XP/NT/2000/Vista™. Files from other sources may also be converted to an acceptable format by using this or a similar utility. Many other audio utilities are available commercially or as shareware. The TPMC-15/17 touchpanels only accept the following WAV file formats: **8 and 16 bit PCM, mono and stereo, 8 - 44kHz**. For more information about how to use Sound Recorder, refer to its User’s Guide and extensive help information provided with the software. Also refer to the help file in VisionTools Pro-e to learn how to use its audio tool, Sound Manager, to attach WAV files to a touchpanel project.

Pre-recorded WAV files for voice prompts and responses are available from Crestron. These files can be stored into and programmed for use in the touchpanel directly or may be edited with the Sound Recorder. For example, the individual files can be combined to create custom messages.

NOTE: Touchpanel WAV files can be obtained from the Wave LC Library of the Crestron FTP site.

Bit Depth and File Size

A bit depth refers to the number of memory bits used to store color data for each pixel in a raster image. A touchpanel raster image consists of a rectangular grid of picture elements (pixels). Each pixel uses the same amount of memory to store its color data. The amount of memory is called the bit depth of the image.

Greater bit depths are required to represent finer gradations of color. Increasing bit depth necessarily increases file size. A black and white drawing requires only one bit per pixel to store all the available color information. Using a 32-bit per pixel bit

depth for a black and white image increases the file size 32 times without adding anything to the black and white image quality.

In an 8-bit per pixel system, the associated 8-bits of video memory for every screen pixel contain a value referring to a location in an 8-bit color table. In this way any one of the specific 256 color table locations is assigned to a pixel.

A 16-bit highcolor system is considered sufficient to provide life-like colors. It is encoded using 5-bits to represent red, 5-bits to represent blue and (since the human eye is more sensitive to the color green) 6-bits to represent 64 levels of green. These can therefore be combined to provide 65,536 mixed colors ($32 \times 32 \times 64 = 65,536$).

In a 24-bit graphics display, the video memory allocates 24 bits for each pixel on the screen enabling each pixel to take on any one of a possible 16.7 million colors. Each 24-bit value is composed of 8-bits for red, 8-bits for green and 8-bits for blue. These triplets of 8-bit values are also referred to as the red, green and blue color planes. A 24-bit image is actually composed of three component images which combine to create the truecolor picture. The reason this is called truecolor is that this is near the maximum number of colors the human eye is able to detect.

Truecolor images are sometimes represented by a 32-bit value. The extra 8-bits do not enhance the precision of the color representation but act as an alpha channel that represents pixel translucence. 32-bit truecolor has become popular on the computer desktop to provide effects such as translucent windows, fading menus and shadows.

In graphics intensive applications such as touchpanels, raising or lowering the color depth of the displayed graphics can achieve a balance of performance and quality. Lower color depths do not require as much frame buffer memory or display bandwidth, allowing them to be generated and displayed more quickly. Increasing color depth results in higher color quality at the expense of display speed and responsiveness. By using mostly 8-bit or 16-bit graphics and holding 32-bit graphics to a minimum (e.g. for a family photo, etc.), you can create a sophisticated project that will fit in the memory space provided and have the touchpanel remain very responsive.

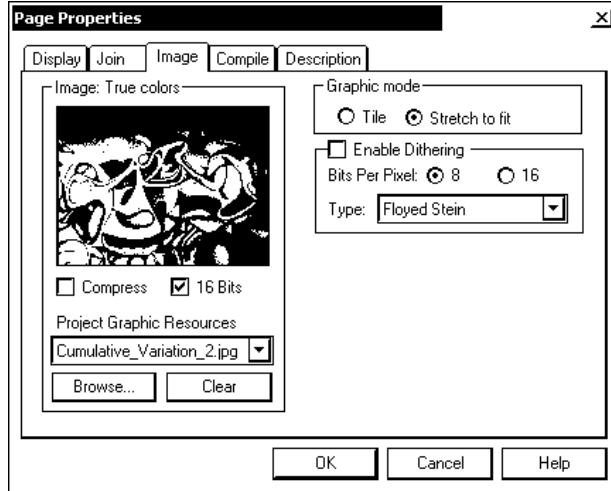
Relationship of Bits to Colors

NUMBER OF BITS	NUMBER OF COLORS
1 bit	Black and White
2 bits	4 Colors
4 bits	16 Colors
8 bits	256 Colors
16 bits	65,536 Colors (Highcolor)
24 bits	16.7 million Colors (Truecolor)
32 bits	16.7 million Colors plus Transparency

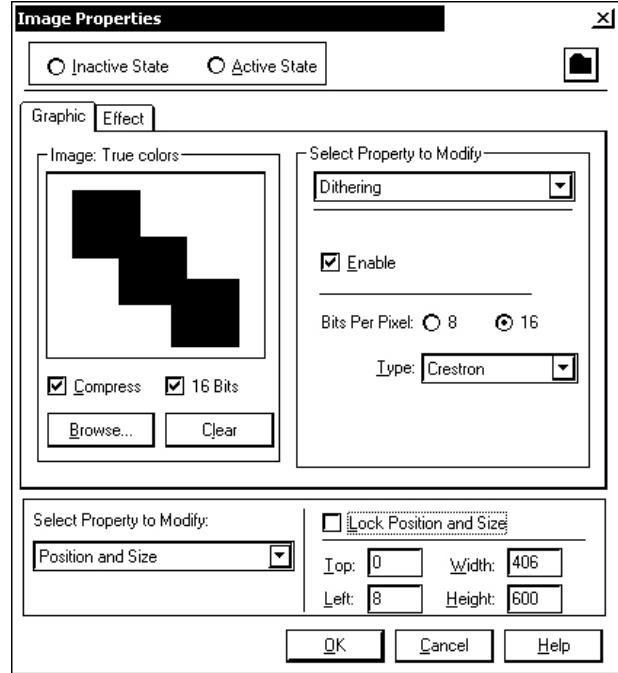
When creating a VisionTools Pro-e project you can elect to compress and reduce the image size in the “Page Properties” window for the entire page and/or perform the same function of reducing the image size using the “Image Properties” window. A reduction in image size will save a considerable amount of memory space for your project.

In VisionTools Pro-e, the **Compress** checkbox permits the image to be compressed when compiling. The **16 Bits** checkbox converts a 24-bit or 32-bit image to 16 bits. This conversion to a 16-bit image may cause the loss of some subtle shading. To compensate for this, use the dithering to simulate the original shading. Various dithering types are available. (Refer to illustrations on the following page.)

VT Pro-e “Page Properties” Window – Bit Depth Selection



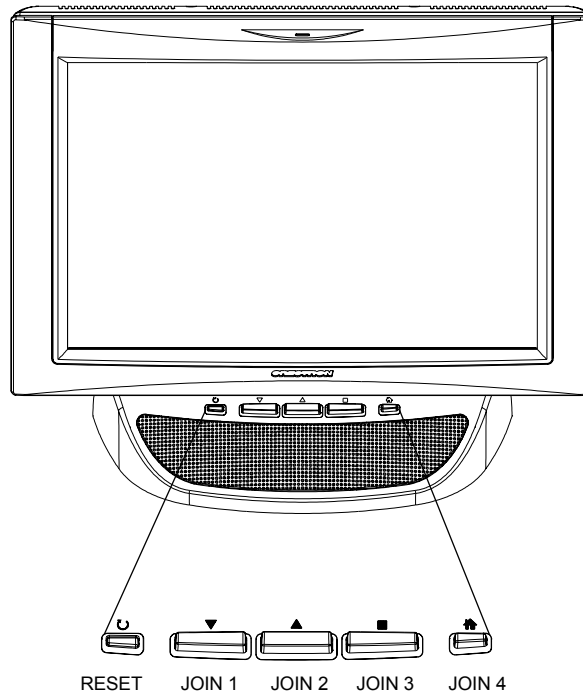
VT Pro-e “Image Properties” Window – Bit Depth Selection



Hard Button Programming

Four of the buttons can be programmed to access any frequently used command. Each button has a permanently fixed digital join number. The sequence of digital join numbers is (left to right) 1 through 4. Refer to the following illustration for their assigned join numbers. A description for each button signal is described in the SIMPL Windows help file (F1).

Pushbutton Layout and Join Number Assignment



MultiByte International Characters

Most languages use a single byte of eight bits to represent a character, e.g. English, French, German, Hebrew, Russian, Thai, etc.

Multibyte character fonts require more than the usual eight bits to specify a character. This occurs when a language has more than 256 characters (2^8) in a font. For example, Chinese fonts contain several thousand characters. Other multibyte languages include Japanese and Korean.

There are two separate applications with multibyte characters – static text on buttons and indirect text on buttons. No Isys touchpanel firmware changes are required in either case.

Indirect text on a button is entered in VisionTools Pro-e and the actual string to be displayed is entered in SIMPL Windows. As of this publication date only completely single byte or completely multibyte strings may be entered or they will not be compiled correctly in SIMPL Windows. In other words, you cannot enter Chinese characters interspersed with numbers. You can enter Chinese characters or numbers in separate strings or you can pad each number with “\x00” to make it multibyte and then combine it with Chinese characters in the same string.

Of course you can always use the workaround of showing a graphic that displays the string but it is not dynamic. To compile and use multibyte characters it is essential that the operating system understand the language. Windows XP and Vista are available in many international languages and add-on software is available for other versions of Windows.

Embedded Applications

A number of third-party or in-house applications are embedded in a VT Pro-e TPMC-15/17 project. (Refer to illustration on the following page.)

- Adobe Reader
- MediaMarker
- Microsoft Excel Viewer
- Microsoft Internet Explorer
- Microsoft Word Viewer
- MJPEG Viewer
- NetMeeting
- PowerPoint Viewer
- Real Player
- Remote Desktop
- Skype
- VNC Viewer
- Windows Media Player
- WordPad

The embedded applications have the following features:

- All embedded applications listed in the VT Pro-e *ProjectView* workspace are created by default for a new TPMC-15/17 project.

- All applications are created at project-level – one instance per project.
- The static position and size of each application can be viewed from any page.
- Four analog joins can be assigned to each application to dynamically change position and size.
- One digital feedback join or one analog join can be assigned to dynamically show/hide an application.

Embedded Applications in ProjectView (TPMC-17-QM Shown)



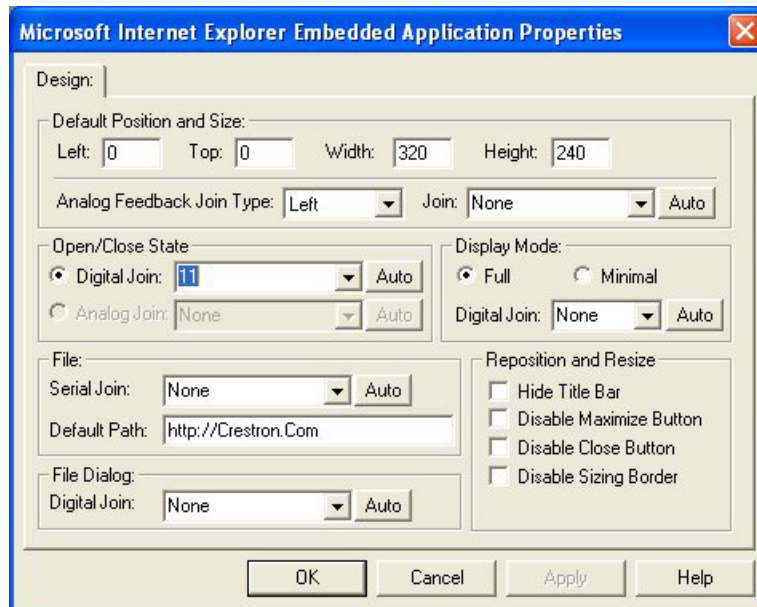
Right-click on any of the applications in the *Project View* and select **Properties** to open the “Embedded Application Property” window (refer to illustration on the following page). This window permits a choice of positions on the screen, assignment of an analog touch join type and number and a show/hide join number.

Defaults for Embedded Windows Applications

Use the *Default Path* text box in the “Embedded Applications Properties” window to enter the default document for the application.

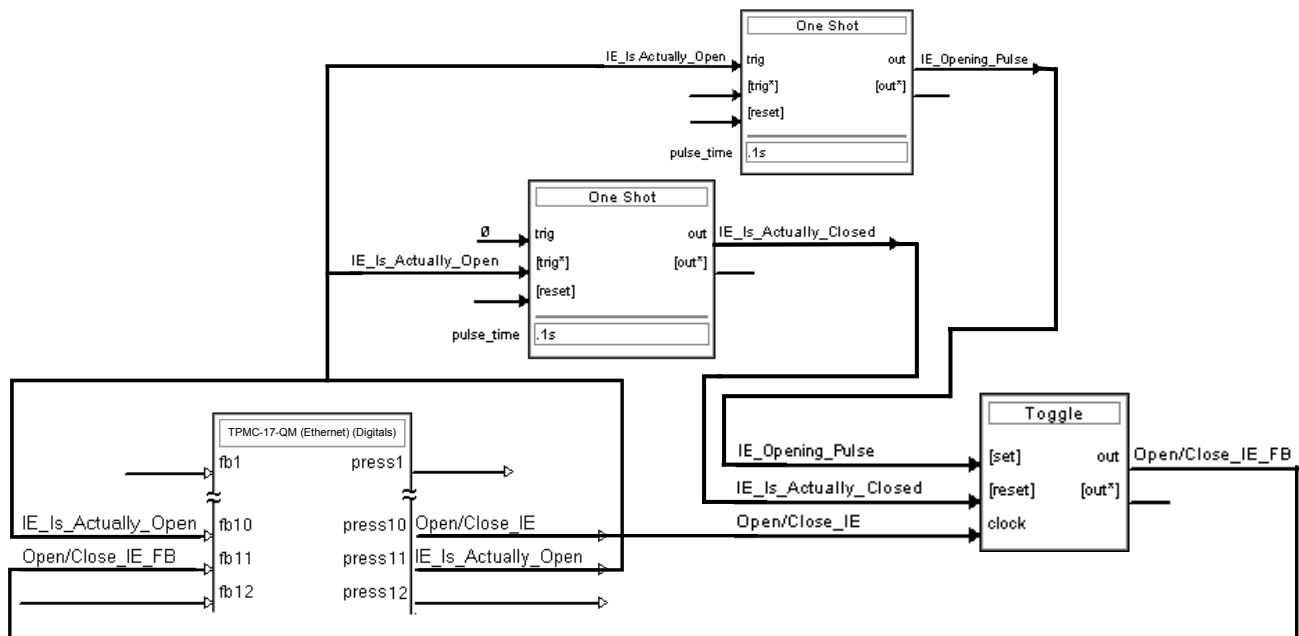
Edit the *Default Position and Size* in the “Embedded Application Properties” window to point to your new location.

Sample of an "Embedded Application Properties" Window



Programming Embedded Windows Applications

The following diagram (TPMC-17-QM shown) is an example of a basic SIMPL program that enables you to open/close an embedded application. The example program is discussed following the diagram.



The example has Join #10 assigned to a button that is used to toggle the state of Internet Explorer. Press11 is routed to the clock line of a Toggle symbol. The output of the toggle is routed to fb11. Join #11 is referred to as the "Open/Close State Digital Join." The feedback signal of the Open/Close State Digital Join is used to Open/Close the application. In this example, when fb11 goes high, Internet Explorer opens, and when fb11 goes low, Internet Explorer closes. However, since the

application can also be closed by pressing the "X" in the upper right hand corner of Internet Explorer, we must keep the logic synchronized. If we do not, the toggle will get out of sync. Similarly, using the reserved join to launch the embedded application would result in the application being open, but the state of the toggle remaining low, so a one-shot is used to set the state of the toggle if the embedded application is opened in this way.

For example, the user presses button #10 and the output of the toggle (<Open/Close_IE_FB>) is high. If the user presses the "X" on IE, IE closes. The next time they touch button #10, <Open/Close_IE_FB> will go low, which tries to close the application. However, the application is already closed. We need to reset the state of the toggle to keep in sync with the actual state of the application.

The "Press" signal of the Open Close State Digital Join can be used to know the true state of the application. When Press11 goes high, in this example, IE is open. When Press11 goes low, IE is closed. Here, we use the falling edge of Press10 through a One-Shot to reset the state of the Toggle symbol. Now the toggle is properly synchronized if the user closes the application from the panel itself.

Example Program

An example program for the TPMC-15/17 is available from the Crestron website (www.crestron.com/exampleprograms).

Uploading and Upgrading

Crestron recommends using the latest programming software and that each device contains the latest firmware to take advantage of the most recently released features. However, before attempting to upload or upgrade it is necessary to establish communication. Once communication has been established, files (for example, programs, projects or firmware) can be transferred to the control system (and/or device). Finally, program checks can be performed (such as changing the device ID or creating an IP table) to ensure proper functioning.

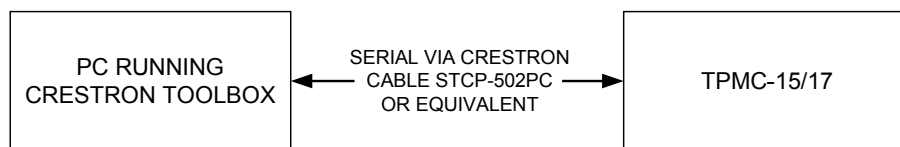
Establishing Communication


Use Crestron Toolbox for communicating with the TPMC-15/17; refer to the Crestron Toolbox help file for details. There are three methods of communication.

Direct Serial Communication

NOTE: Required for initial setup of Ethernet parameters.

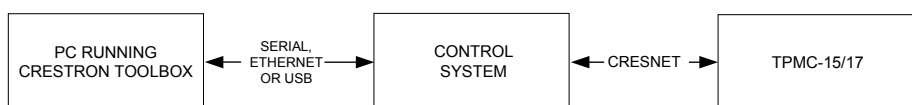
Direct Serial Communication




- The **RS-232** port on the TPMC-15/17 connects to the serial port on the PC via a serial cable (Crestron STCP-502PC or equivalent).
- Use the Address Book in Crestron Toolbox to create an entry using the expected serial communication protocol (RS-232, auto-detect baud rate, no parity, 8 data bits, 1 stop bit, XON/XOFF disabled, RTS/CTS disabled).
- Display the TPMC-15/17's "System Info" window (click the  icon); communications are confirmed when the device information is displayed.

Indirect Serial Communication

Indirect Serial Communication




- TPMC-15/17 connects to control system via Cresnet.
- Establish communications between the PC and the control system as described in the latest version of the 2-Series Control Systems Reference Guide (Doc. 6256).
- Use the Address Book in Crestron Toolbox to create an entry for the TPMC-15/17 using the expected communication protocol (Indirect). Select the Cresnet ID of the TPMC-15/17 and the address book entry of the control system that is connected to the TPMC-15/17.
- Display the TPMC-15/17's "System Info" window (click the  icon); communications are confirmed when the device information is displayed.

TCP/IP Communication

NOTE: Required for operation with a Crestron control system.

Ethernet Communication

- Establish serial communication between TPMC-15/17 and PC.
- Enter the *IP address*, *Subnet mask* and *Default gateway* of the TPMC-15/17; in the “Internet Protocol (TCP/IP) Properties” window (refer to “ETHERNET Details” which starts on page 39).
- Confirm Ethernet connections between TPMC-15/17 and PC. If connecting through a hub or router, use CAT5 straight through cables with 8-pin RJ-45 connectors. Alternatively, use a CAT5 crossover cable to connect the two **LAN** ports directly without using a hub or router.
- Use the Address Book in the Crestron Toolbox to create an entry for the TPMC-15/17 with the TPMC-15/17’s TCP/IP communication parameters.
- Display the “System Info” window (click the  icon) and select the TPMC-15/17 entry.

Programs, Projects and Firmware

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

SIMPL Windows

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

VisionTools Pro-e

Upload the VisionTools Pro-e file to the touchpanel using VisionTools Pro-e or Crestron Toolbox. If loading a project to a touchpanel that has an external compact flash slot, please use Crestron Toolbox.

Firmware

Check the Crestron website to find the latest firmware. (New users may be required to register to obtain access to certain areas of the site, including the FTP site.)

Upgrade TPMC-15/17 firmware via Crestron Toolbox.

- Establish serial or TCP/IP communications with the TPMC-15/17 and display the “System Info” window.
- Select **Functions | Firmware...** to upgrade the TPMC-15/17 firmware.


Program Checks

Actions that can be performed on the TPMC-15/17 vary depending on whether it is connected via Cresnet or Ethernet.

Cresnet Connections

For Cresnet connections, display the network device tree (**Tools | Network Device Tree**) to show all network devices connected to the control system. Right-click on the TPMC-15/17 to display actions that can be performed on the TPMC-15/17.

Ethernet Connections

For Ethernet connections, display the “System Info window (click the  icon) and select the **Functions** menu to display actions that can be performed on the TPMC-15/17.

Be sure to use the Crestron Toolbox to create the TPMC-15/17 IP table.

- Select **Functions | IP Table Setup**.
- Add, modify or delete entries in the IP table. The TPMC-15/17 can have only one IP table entry.
- A defined IP table can be saved to a file or sent to the device.

Edit the control system’s IP table to include an entry for the TPMC-15/17. The entry should list the TPMC-15/17’s IP ID (specified on the TPMC-15/17’s IP table) and the internal gateway IP address 127.0.0.1.

Operation

MediaMarker

Crestron's MediaMarker software is used to create, organize and save presentations. A presenter can devise an entire lecture or demonstration and save it to the notebook. At the presenter's discretion, the audience may view the presentation complete with annotation in real-time.

MediaMarker can be used with the TPMC-15/17 or on a personal computer.

In addition to containing the tools required for object creation, MediaMarker can import graphics and text from many other applications. Importable objects include: html, jpg, bmp, png and tif.

MediaMarker projects can be saved to and retrieved from a disk or a "notebook" (Export and Import functions in the **File** menu).

File | Export Project – Archives the project into one file.

File | Import Project – Opens and extracts all files from a previously exported project into an active folder.

NOTE: When saving a project, the background images are stored as external graphic files. The graphic file type (html, jpg, bmp, png and tif) can be set within **Edit | Preferences | Application Settings**.

Additional information is available in the MediaMarker help file.

Security Infrastructure

Since the TPMC-15/17 does not use a traditional hard drive but rather an image that is restored every time the touchpanel is rebooted, any virus infection is cleared immediately after a reboot. However, using the currently available tools and techniques, Crestron has provided an infrastructure that protects against possible virus infections.

1. Executables/Scripts brought in on external media
The implementation of the TPMC-15/17 series has restrictions on starting any application or script. The only applications that can be started are those allowed by Crestron and these can only be started from the Crestron project.
2. Downloaded Program/Script
The browser is customized in such a way that files cannot be downloaded. The only files the browser can open are the files it has plug-ins for, such as PDF, etc. The user cannot change the options, as this dialog box has been disabled.
3. Browser Hijack and Browser vulnerability
Crestron has patched all currently known hijacks and vulnerabilities. Future updates can be downloaded from the Crestron website.
4. Email Viruses
There is no e-mail client installed on the TPMC-15/17, so email-based viruses cannot be executed.
5. Viruses that attack web/FTP servers
The TPMC-15/17 does not run a web or FTP server and is therefore not listening

to port 21 or 80. The only ports the system listens to are the ports registered to Crestron.

6. Virus from other machines on the network
Since drives on the TPMC-15/17 can be shared on the network, it is possible that a virus can write itself to files/folders on these shares. Our recommendation therefore is to share as “Read-Only”, so that viruses cannot attach themselves to files on the TPMC-15/17.
7. ActiveX and Java
The TPMC-15/17 has ActiveX disabled and has no Java Virtual Machine installed. These applets cannot run on the TPMC-15/17.

NOTE: While browsing the Internet with the TPMC-15/17, clicking on a link may cause a message box titled “Restrictions” to appear that contains the text “This operation has been cancelled due to restrictions in effect on this computer. Please contact your system administrator.” If this message appears, checking *Enable Pop-ups* in the “Embedded Apps” window (refer to “Embedded Apps” on page 38) may correct this error. Other restrictions may also cause this error, so this may not prevent all occurrences.

Problem Solving

Troubleshooting

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

TPMC-15/17 Troubleshooting

TROUBLE	POSSIBLE CAUSE(S)	CORRECTIVE ACTION
Touchpanel does not function.	Touchpanel is not communicating with the network.	Use Crestron Toolbox (via SIMPL Windows or VisionTools Pro-e) to poll the network. Verify network connection to the touchpanel.
	Touchpanel is not receiving power from a Crestron power source.	Use the included Crestron power supply.
	Touchpanel is incorrectly calibrated.	Enter "SETUP MODE" or use Crestron Toolbox to initiate the calibration sequence and recalibrate.
Touchpanel is not responding.	Incorrect network wiring.	Touch the screen to remove any message and verify correct wiring to all connectors.
	Touchpanel Cresnet ID is not set to match the Net ID in the SIMPL program.	Use Crestron Toolbox to poll the network. Verify that the Cresnet ID for the touchpanel is properly set to match the Net ID in the SIMPL program.
	Touchpanel Cresnet ID is not unique; two or more units share the same ID.	Use Crestron Toolbox to poll the network and verify that each ID is used only once.
Touchpanel display is dark.	Standby timeout has elapsed.	Touch the screen to reactivate.
	Screen brightness is improperly set.	Enter "SETUP MODE" and alter screen brightness from the SETUP MENU.
Unexpected response from the touchpanel.	Touchpanel is incorrectly calibrated.	Enter "SETUP MODE" or use Crestron Toolbox to initiate the calibration sequence and recalibrate.
Touchpanel does not communicate with RS-232 devices.	Incorrect RS-232 settings.	Match communication settings of touchpanel to peripheral device.

(Continued on following page)

TPMC-15/17 Troubleshooting (Continued)

TROUBLE	POSSIBLE CAUSE(S)	CORRECTIVE ACTION
Video window touchpanel has no display.	Improper video connection.	Verify proper connections on the touchpanel.
	Incorrect video cable used.	Verify that the correct video cable is being used.
	Incorrect video format selection.	Select the proper video input configuration in the touchpanel configuration SETUP MENU.
	Incorrect VisionTools Pro-e project file loaded.	Make sure that video window object resides in project, re-compile and reload.
Video does not lock, video rolls, video distorts or "No signal" message is displayed.	<i>Peak</i> adjustment may be too high.	Decrease <i>Peak</i> control level (refer to "Input 1 & Input 2" on page 33).
Communications via the LAN port is not functioning.	Improper Ethernet connection (IEC).	Verify proper connection at touchpanel LAN port.
	Incorrect touchpanel selected in SIMPL Windows.	Select "Touchpanel (Ethernet)" instead of "Touchpanel (Cresnet)".
	Another device set to the same IP address.	Obtain new touchpanel static IP address.
	Possible bad port on the hub.	Use crossover cable to connect directly to the Ethernet port on a PC and ping the IP address of the touchpanel to confirm communication. If it is good, confirm hub port by testing with another Ethernet device.

Check Network Wiring

Use the Right Wire

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

Calculate Power

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

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

When calculating the length of wire for a particular Cresnet run, the wire gauge and the Cresnet power usage of each network unit to be connected must be taken into consideration. Use Crestron Certified Wire only. If Cresnet units are to be daisy-chained on the run, the Cresnet power usage of each network unit to be daisy-chained must be added together to determine the Cresnet power usage of the entire chain. If the unit is home-run from a Crestron system power supply network port, the

Cresnet power usage of that unit is the Cresnet power usage of the entire run. The wire gauge and the Cresnet power usage of the run should be used in the following equation to calculate the cable length value on the equation's left side.

Cable Length Equation

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

Where: L = Length of run (or chain) in feet
 R = 6 Ohms (Crestron Certified Wire: 18 AWG (0.75 MM²))
 or 1.6 Ohms (Cresnet HP: 12 AWG (4 MM²))
 P = Cresnet power usage of entire run (or chain)

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

Strip and Tin Wire

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

Add Hubs

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.

Reference Documents

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

List of Related Reference Documents

DOCUMENT TITLE
2-Series Control Systems Reference Guide
CAT5 Wiring Reference Guide
Crestron e-Control Reference Guide
MediaManager Applications Guide
QM-TX QuickMedia Transmitter
TPMC-CH-IMC Interface Module

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/offices) for a listing of Crestron worldwide offices.

You can also log onto the online help section of the Crestron website (www.crestron.com/onlinehelp) to ask questions about Crestron products. First-time users will need to establish a user account to fully benefit from all available features.

Future Updates

As Crestron improves functions, adds new features and extends the capabilities of the TPMC-15/17, 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: TPMC-15/17 Multi-Language Pack

The TPMC-15/17 Multi-Language Pack adds support for 32 international languages in addition to the default English language support in the TPMC-15/17. This allows the user to view documents written in those languages by all the embedded apps in the touchpanel.

The 32 international languages added by the Multi-Language Pack are: Arabic, Chinese (simplified), Chinese (traditional), Croatian, Czech, Danish, Dutch, Estonian, Finnish, French, German, Greek, Hebrew, Hungarian, Icelandic, Indonesian, Italian, Japanese, Korean, Latvian, Lithuanian, Norwegian, Polish, Portuguese, Romanian, Russian, Serbian, Slovak, Slovenian, Spanish, Swedish and Turkish.

The Multi-Language Pack is available as a special firmware build (TPMC-15_TPMC-17_MLP_2.0.csz or later) for the TPMC-15/17. For details on how to upgrade firmware, refer to “Programs, Projects and Firmware” on page 69.

NOTE: Once installed, the TPMC-15/17 Multi-Language Pack cannot be removed without sending the TPMC-15/17 back to Crestron.

Software License Agreement

This License Agreement (“Agreement”) is a legal contract between you (either an individual or a single business entity) and Crestron Electronics, Inc. (“Crestron”) for software referenced in this guide, which includes computer software and as applicable, associated media, printed materials and “online” or electronic documentation (the “Software”).

BY INSTALLING, COPYING OR OTHERWISE USING THE SOFTWARE, YOU REPRESENT THAT YOU ARE AN AUTHORIZED DEALER OF CRESTRON PRODUCTS OR A CRESTRON AUTHORIZED INDEPENDENT PROGRAMMER AND YOU AGREE TO BE BOUND BY THE TERMS OF THIS AGREEMENT. IF YOU DO NOT AGREE TO THE TERMS OF THIS AGREEMENT, DO NOT INSTALL OR USE THE SOFTWARE.

IF YOU HAVE PAID A FEE FOR THIS LICENSE AND DO NOT ACCEPT THE TERMS OF THIS AGREEMENT, CRESTRON WILL REFUND THE FEE TO YOU PROVIDED YOU (1) CLICK THE DO NOT ACCEPT BUTTON, (2) DO NOT INSTALL THE SOFTWARE AND (3) RETURN ALL SOFTWARE, MEDIA AND OTHER DOCUMENTATION AND MATERIALS PROVIDED WITH THE SOFTWARE TO CRESTRON AT: CRESTRON ELECTRONICS, INC., 15 VOLVO DRIVE, ROCKLEIGH, NEW JERSEY 07647, WITHIN 30 DAYS OF PAYMENT.

LICENSE TERMS

Crestron hereby grants You and You accept a nonexclusive, nontransferable license to use the Software (a) in machine readable object code together with the related explanatory written materials provided by Crestron (b) on a central processing unit (“CPU”) owned or leased or otherwise controlled exclusively by You and (c) only as authorized in this Agreement and the related explanatory files and written materials provided by Crestron.

If this software requires payment for a license, you may make one backup copy of the Software, provided Your backup copy is not installed or used on any CPU. You may not transfer the rights of this Agreement to a backup copy unless the installed copy of the Software is destroyed or otherwise inoperable and You transfer all rights in the Software.

You may not transfer the license granted pursuant to this Agreement or assign this Agreement without the express written consent of Crestron.

If this software requires payment for a license, the total number of CPU’s on which all versions of the Software are installed may not exceed one per license fee (1) and no concurrent, server or network use of the Software (including any permitted back-up copies) is permitted, including but not limited to using the Software (a) either directly or through commands, data or instructions from or to another computer (b) for local, campus or wide area network, internet or web hosting services or (c) pursuant to any rental, sharing or “service bureau” arrangement.

The Software is designed as a software development and customization tool. As such Crestron cannot and does not guarantee any results of use of the Software or that the Software will operate error free and You acknowledge that any development that You perform using the Software or Host Application is done entirely at Your own risk.

The Software is licensed and not sold. Crestron retains ownership of the Software and all copies of the Software and reserves all rights not expressly granted in writing.

OTHER LIMITATIONS

You must be an Authorized Dealer of Crestron products or a Crestron Authorized Independent Programmer to install or use the Software. If Your status as a Crestron Authorized Dealer or Crestron Authorized Independent Programmer is terminated, Your license is also terminated.

You may not rent, lease, lend, sublicense, distribute or otherwise transfer or assign any interest in or to the Software.

You may not reverse engineer, decompile or disassemble the Software.

You agree that the Software will not be shipped, transferred or exported into any country or used in any manner prohibited by the United States Export Administration Act or any other export laws, restrictions or regulations (“Export Laws”). By downloading or installing the Software You (a) are certifying that You are not a national of Cuba, Iran, Iraq, Libya, North Korea, Sudan, Syria or any country to which the United States embargoes goods (b) are certifying that You are not otherwise prohibited from receiving the Software and (c) You agree to comply with the Export Laws.

If any part of this Agreement is found void and unenforceable, it will not affect the validity of the balance of the Agreement, which shall remain valid and enforceable according to its terms. This Agreement may only be modified by a writing signed by an authorized officer of Crestron. Updates may be licensed to You by Crestron with additional or different terms. This is the entire agreement between Crestron and You relating to the Software and it supersedes any prior representations, discussions, undertakings, communications or advertising relating to the Software. The failure of either party to enforce any right or take any action in the event of a breach hereunder shall constitute a waiver unless expressly acknowledged and set forth in writing by the party alleged to have provided such waiver.

If You are a business or organization, You agree that upon request from Crestron or its authorized agent, You will within thirty (30) days fully document and certify that use of any and all Software at the time of the request is in conformity with Your valid licenses from Crestron or its authorized agent.

Without prejudice to any other rights, Crestron may terminate this Agreement immediately upon notice if you fail to comply with the terms and conditions of this Agreement. In such event, you must destroy all copies of the Software and all of its component parts.

PROPRIETARY RIGHTS

Copyright. All title and copyrights in and to the Software (including, without limitation, any images, photographs, animations, video, audio, music, text and “applets” incorporated into the Software), the accompanying media and printed materials and any copies of the Software are owned by Crestron or its suppliers. The Software is protected by copyright laws and international treaty provisions. Therefore, you must treat the Software like any other copyrighted material, subject to the provisions of this Agreement.

Submissions. Should you decide to transmit to Crestron’s website by any means or by any media any materials or other information (including, without limitation, ideas, concepts or techniques for new or improved services and products), whether as information, feedback, data, questions, comments, suggestions or the like, you agree such submissions are unrestricted and shall be deemed non-confidential and you automatically grant Crestron and its assigns a non-exclusive, royalty-free, worldwide, perpetual, irrevocable license, with the right to sublicense, to use, copy, transmit, distribute, create derivative works of, display and perform the same.

Trademarks. CRESTRON and the Swirl Logo are registered trademarks of Crestron Electronics, Inc. You shall not remove or conceal any trademark or proprietary notice of Crestron from the Software including any back-up copy.

GOVERNING LAW

This Agreement shall be governed by the laws of the State of New Jersey, without regard to conflicts of laws principles. Any disputes between the parties to the Agreement shall be brought in the state courts in Bergen County, New Jersey or the federal courts located in the District of New Jersey. The United Nations Convention on Contracts for the International Sale of Goods shall not apply to this Agreement.

CRESTRON LIMITED WARRANTY

CRESTRON warrants that: (a) the Software will perform substantially in accordance with the published specifications for a period of ninety (90) days from the date of receipt and (b) that any hardware accompanying the Software will be subject to its own limited warranty as stated in its accompanying written material. Crestron shall, at its option, repair or replace or refund the license fee for any Software found defective by Crestron if notified by you within the warranty period. The foregoing remedy shall be your exclusive remedy for any claim or loss arising from the Software.

CRESTRON shall not be liable to honor warranty terms if the product has been used in any application other than that for which it was intended or if it as 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 or license code altered, defaced, improperly obtained or removed.

Notwithstanding any agreement to maintain or correct errors or defects, Crestron shall have no obligation to service or correct any error or defect that is not reproducible by Crestron or is deemed in Crestron’s reasonable discretion to have resulted from (1) accident; unusual stress; neglect; misuse; failure of electric power, operation of the Software with other media not meeting or not maintained in accordance with the manufacturer’s specifications or causes other than ordinary use; (2) improper installation by anyone other than Crestron or its authorized agents of the Software that deviates from any operating procedures established by Crestron in the material and files provided to You by Crestron or its authorized agent; (3) use of the Software on unauthorized hardware or (4) modification of, alteration of or additions to the Software undertaken by persons other than Crestron or Crestron’s authorized agents.

ANY LIABILITY OF CRESTRON FOR A DEFECTIVE COPY OF THE SOFTWARE WILL BE LIMITED EXCLUSIVELY TO REPAIR OR REPLACEMENT OF YOUR COPY OF THE SOFTWARE WITH ANOTHER COPY OR REFUND OF THE INITIAL LICENSE FEE CRESTRON RECEIVED FROM YOU FOR THE DEFECTIVE COPY OF THE PRODUCT. THIS WARRANTY SHALL BE THE SOLE AND EXCLUSIVE REMEDY TO YOU. IN NO EVENT SHALL CRESTRON BE LIABLE FOR INCIDENTAL, CONSEQUENTIAL, SPECIAL OR PUNITIVE DAMAGES OF ANY KIND (PROPERTY OR ECONOMIC DAMAGES INCLUSIVE), EVEN IF A CRESTRON REPRESENTATIVE HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES OR OF ANY CLAIM BY ANY THIRD PARTY. CRESTRON MAKES NO WARRANTIES, EXPRESS OR IMPLIED, AS TO TITLE OR INFRINGEMENT OF THIRD-PARTY RIGHTS, MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE, OR ANY OTHER WARRANTIES, NOR AUTHORIZES ANY OTHER PARTY TO OFFER ANY WARRANTIES, INCLUDING WARRANTIES OF MERCHANTABILITY FOR THIS PRODUCT. THIS WARRANTY STATEMENT SUPERSEDES ALL PREVIOUS WARRANTIES.

Return and Warranty Policies

Merchandise Returns / Repair Service

1. No merchandise may be returned for credit, exchange or service without prior authorization from CRESTRON. To obtain warranty service for CRESTRON products, contact an authorized CRESTRON dealer. Only authorized CRESTRON dealers may contact the factory and request an RMA (Return Merchandise Authorization) number. Enclose a note specifying the nature of the problem, name and phone number of contact person, RMA number and return address.
2. Products may be returned for credit, exchange or service with a CRESTRON Return Merchandise Authorization (RMA) number. Authorized returns must be shipped freight prepaid to CRESTRON, 6 Volvo Drive, Rockleigh, N.J. or its authorized subsidiaries, with RMA number clearly marked on the outside of all cartons. Shipments arriving freight collect or without an RMA number shall be subject to refusal. CRESTRON reserves the right in its sole and absolute discretion to charge a 15% restocking fee plus shipping costs on any products returned with an RMA.
3. Return freight charges following repair of items under warranty shall be paid by CRESTRON, shipping by standard ground carrier. In the event repairs are found to be non-warranty, return freight costs shall be paid by the purchaser.

CRESTRON Limited Warranty

CRESTRON ELECTRONICS, Inc. warrants its products to be free from manufacturing defects in materials and workmanship under normal use for a period of three (3) years from the date of purchase from CRESTRON, with the following exceptions: disk drives and any other moving or rotating mechanical parts, pan/tilt heads and power supplies are covered for a period of one (1) year; touchscreen display and overlay components are covered for 90 days; batteries and incandescent lamps are not covered.

This warranty extends to products purchased directly from CRESTRON or an authorized CRESTRON dealer. Purchasers should inquire of the dealer regarding the nature and extent of the dealer's warranty, if any.

CRESTRON shall not be liable to honor the terms of this warranty if the product has been used in any application other than that for which it was intended or if it has been subjected to misuse, accidental damage, modification or improper installation procedures. Furthermore, this warranty does not cover any product that has had the serial number altered, defaced or removed.

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

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

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

Trademark Information

All brand names, product names and trademarks are the sole property of their respective owners. Windows is a registered trademark of Microsoft Corporation. Windows95/98/Me/XP/Vista and WindowsNT/2000 are trademarks of Microsoft Corporation.

Microsoft® Windows XP® Embedded End User License Agreement

- You have acquired a device (“DEVICE”) that includes software licensed by Crestron Electronics from Microsoft Licensing Inc. or its affiliates (“MS”). Those installed software products of MS origin, as well as associated media, printed materials, and “online” or electronic documentation (“SOFTWARE”), are protected by international intellectual property laws and treaties. The SOFTWARE is licensed, not sold. All rights reserved.
- IF YOU DO NOT AGREE TO THIS END USER LICENSE AGREEMENT (“EULA”), DO NOT USE THE DEVICE OR COPY THE SOFTWARE. INSTEAD, PROMPTLY CONTACT CRESTRON ELECTRONICS FOR INSTRUCTIONS ON RETURN OF THE UNUSED DEVICE(S) FOR A REFUND. **ANY USE OF THE SOFTWARE, INCLUDING BUT NOT LIMITED TO USE ON THE DEVICE, WILL CONSTITUTE YOUR AGREEMENT TO THIS EULA (OR RATIFICATION OF ANY PREVIOUS CONSENT).**
- **GRANT OF SOFTWARE LICENSE.** This EULA grants you the following license:
 - You may use the SOFTWARE only on the DEVICE.
 - **NOT FAULT TOLERANT.** THE SOFTWARE IS NOT FAULT TOLERANT. CRESTRON ELECTRONICS HAS INDEPENDENTLY DETERMINED HOW TO USE THE SOFTWARE IN THE DEVICE, AND MS HAS RELIED UPON CRESTRON ELECTRONICS TO CONDUCT SUFFICIENT TESTING TO DETERMINE THAT THE SOFTWARE IS SUITABLE FOR SUCH USE.
 - **NO WARRANTIES FOR THE SOFTWARE. THE SOFTWARE IS PROVIDED “AS IS” AND WITH ALL FAULTS. THE ENTIRE RISK AS TO SATISFACTORY QUALITY, PERFORMANCE, ACCURACY, AND EFFORT (INCLUDING LACK OF NEGLIGENCE) IS WITH YOU. ALSO, THERE IS NO WARRANTY AGAINST INTERFERENCE WITH YOUR ENJOYMENT OF THE SOFTWARE OR AGAINST INFRINGEMENT. IF YOU HAVE RECEIVED ANY WARRANTIES REGARDING THE DEVICE OR THE SOFTWARE, THOSE WARRANTIES DO NOT ORIGINATE FROM, AND ARE NOT BINDING ON, MS.**
 - **No Liability for Certain Damages. EXCEPT AS PROHIBITED BY LAW, MS SHALL HAVE NO LIABILITY FOR ANY INDIRECT, SPECIAL, CONSEQUENTIAL OR INCIDENTAL DAMAGES ARISING FROM OR IN CONNECTION WITH THE USE OR PERFORMANCE OF THE SOFTWARE. THIS LIMITATION SHALL APPLY EVEN IF ANY REMEDY FAILS OF ITS ESSENTIAL PURPOSE. IN NO EVENT SHALL MS BE LIABLE FOR ANY AMOUNT IN EXCESS OF U.S. TWO HUNDRED FIFTY DOLLARS (U.S. \$250.00).**
 - **Limitations on Reverse Engineering, Decompilation, and Disassembly.** You may not reverse engineer, decompile, or disassemble the SOFTWARE, except and only to the extent that such activity is expressly permitted by applicable law notwithstanding this limitation.
 - **SOFTWARE TRANSFER ALLOWED BUT WITH RESTRICTIONS.** You may permanently transfer rights under this EULA only as part of a permanent sale or transfer of the Device, and only if the recipient agrees to this EULA. If the SOFTWARE is an upgrade, any transfer must also include all prior versions of the SOFTWARE.
 - **EXPORT RESTRICTIONS.** You acknowledge that SOFTWARE is subject to U.S. export jurisdiction. You agree to comply with all applicable international and national laws that apply to the SOFTWARE, including the U.S. Export Administration Regulations, as well as end-user, end-use and destination restrictions issued by U.S. and other governments. For additional information, see www.microsoft.com/exporting.
- **Limited Use of Particular SOFTWARE Services.** Provided that the DEVICE continues to comply with the terms of the “Restricted Functionality” paragraph below, without limiting the number of computers or other electronic devices that might connect to the DEVICE to access or utilize other software or SOFTWARE services on the DEVICE, you may permit a maximum of ten (10) computers or other electronic devices to connect to the DEVICE to utilize the services of the SOFTWARE for (a) file and print services, (b) Internet information services, and/or (c) remote access (including connection sharing). The ten (10) connections maximum includes any indirect connections made through “multiplexing” or other software or hardware which pools or aggregates connections.
- If you use the DEVICE to access or utilize the services or functionality of Microsoft Windows Server products (such as Microsoft Windows NT Server 4.0 (all editions) or Microsoft Windows 2000 Server (all editions)), or use the DEVICE to permit workstation or computing devices to access or utilize the services or functionality of Microsoft Windows Server products, you may be required to obtain a Client Access License for the DEVICE and/or each such workstation or computing device. Please refer to the End-User License Agreement for your Microsoft Windows Server product for additional information.
- **Restricted Deployment.** The SOFTWARE is not designed or intended for use or resale in hazardous environments requiring fail-safe performance, such as in the operation of nuclear facilities, aircraft navigation or communication systems, air traffic control, or other devices or systems in which a malfunction of the SOFTWARE would result in foreseeable risk of injury or death to the operator of the device or system, or to others.
- **Restricted Functionality.** You are licensed to use the SOFTWARE to provide only the limited functionality (specific tasks or processes) for which the DEVICE has been designed and marketed by Crestron. This license specifically prohibits any other use of the SOFTWARE, or inclusion of additional software programs or functions, on the DEVICE. Subject to the terms of the “Limited Use of Particular Services” paragraph above, you may use the SOFTWARE on the DEVICE to interact with other computers or electronic devices.

- **Maximum Number of Processors.** The SOFTWARE may not be used by more than two (2) processors at any one time on the DEVICE.
- **Remote Boot Feature.** Your DEVICE may be enabled with a Remote Boot feature which includes Remote Boot Installation Services tool. You may use the Remote Boot Installation Services tool only to deploy the SOFTWARE to one or more DEVICES on which you are licensed to run the SOFTWARE (i.e. DEVICES to which the appropriate Certificate of Authenticity is affixed). Please refer to the DEVICE documentation, if provided with your DEVICE, or contact Crestron for additional information.
- **Security Updates.** Content providers are using the digital rights management technology (“Microsoft DRM”) contained in this SOFTWARE to protect the integrity of their content (“Secure Content”) so that their intellectual property, including copyright, in such content is not misappropriated. Owners of such Secure Content (“Secure Content Owners”) may, from time to time, request MS, Microsoft Corporation, or their subsidiaries to provide security related updates to the Microsoft DRM components of the SOFTWARE (“Security Updates”) that may affect your ability to copy, display, and/or play Secure Content through Microsoft software or third-party applications that utilize Microsoft DRM. You therefore agree that, if you elect to download a license from the Internet, which enables our use of Secure Content, MS, Microsoft Corporation, or their subsidiaries may, in conjunction with such license, also download onto your DEVICE such Security Updates that a Secure Content Owner has requested that MS, Microsoft Corporation, or their subsidiaries distribute. MS, Microsoft Corporation, or their subsidiaries will not retrieve any personally identifiable information, or any other information, from your DEVICE by downloading such Security Updates.
- **NetMeeting/Remote Assistance/Remote Desktop Features.** The SOFTWARE may contain NetMeeting, Remote Assistance, and Remote Desktop technologies that enable the SOFTWARE or other applications installed on the Device to be used remotely between two or more computing devices, even if the SOFTWARE or application is installed on only one Device. You may use NetMeeting, Remote Assistance, and Remote Desktop with all Microsoft products; provided, however, use of these technologies with certain Microsoft products may require an additional license. For both Microsoft products and non-Microsoft products, you should consult the license agreement accompanying the applicable product or contact the applicable licensor to determine whether use of NetMeeting, Remote Assistance, or Remote Desktop is permitted without an additional license.
- **Consent to Use of Data.** You agree that MS, Microsoft Corporation, and their affiliates may collect and use technical information gathered in any manner as part of product support services related to the SOFTWARE. MS, Microsoft Corporation, and their affiliates may use this information solely to improve their products or to provide customized services or technologies to you. MS, Microsoft Corporation, and their affiliates may disclose this information to others, but not in a form that personally identifies you.
- **Internet Gaming/Update Features.** If the SOFTWARE provides, and you choose to utilize, the Internet gaming or update features within the SOFTWARE, it is necessary to use certain computer system, hardware, and software information to implement the features. By using these features, you explicitly authorize MS, Microsoft Corporation, and/or their designated agent to use this information solely to improve their products or to provide customized services or technologies to you. MS or Microsoft Corporation may disclose this information to others, but not in a form that personally identifies you.
- **Internet –Based Services Components.** The SOFTWARE may contain components that enable and facilitate the use of certain Internet-based services. You acknowledge and agree that MS, Microsoft Corporation, or their affiliates may automatically check the version of the SOFTWARE and/or its components that you are utilizing and may provide upgrades or supplements to the SOFTWARE that may be automatically downloaded to your Device.
- **Links to Third-Party Sites.** The SOFTWARE may provide you with the ability to link to third-party sites through the use of the SOFTWARE. The third-party sites are not under the control of MS, Microsoft Corporation, or their affiliates. Neither MS nor Microsoft Corporation nor their affiliates are responsible for (i) the contents of any third-party sites, any links contained in third-party sites, or any changes or updates to third-party sites, or (ii) webcasting or any other form of transmission received from any third-party sites. If the SOFTWARE provides links to third-party sites, those links are provided to you only as a convenience, and the inclusion of any link does not imply an endorsement of the third-party site by MS, Microsoft Corporation, or their affiliates.
- **Additional Software/Services.** The SOFTWARE may permit Crestron, MS, Microsoft Corporation, or their affiliates to provide or make available to you SOFTWARE updates, supplements, add-on components, or Internet-based services components of the SOFTWARE after the date you obtain your initial copy of the SOFTWARE (“Supplemental Components”).
 - If Crestron provides or makes available to you Supplemental Components and no other EULA terms are provided along with the Supplemental Components, then the terms of this EULA shall apply.
 - If MS, Microsoft Corporation, or their affiliates make available Supplemental Components, and no other EULA terms are provided, then the terms of this EULA shall apply, except that the MS, Microsoft Corporation, or affiliate entity providing the Supplemental Component(s) shall be the licensor of the Supplemental Component(s).

Crestron, MS, Microsoft Corporation, and their affiliates reserve the right to discontinue any Internet-based services provided to you or made available to you through the use of the SOFTWARE.

This EULA does not grant you any rights to use the Windows Media Format Software Development Kit (“WMFSDK”) components contained in the SOFTWARE to develop a software application that uses Windows Media technology. If you wish to use the WMFSDK to develop such an application, visit <http://msdn.Microsoft.com/workshop/imedia/windowsmedia/sdk/wmsdk.asp>, accept a separate license for the WMFSDK, download the appropriate WMFSDK, and install it on your system.

This page is intentionally left blank.



Crestron Electronics, Inc.
15 Volvo Drive Rockleigh, NJ 07647
Tel: 888.CRESTRON
Fax: 201.767.7576
www.crestron.com

Operations Guide – DOC. 6344B
(2012991)
10.07
Specifications subject to
change without notice.