

Crestron **TPMC-V12 & TPMC-V15** V-Panel™

Integrated 12" & 15" HD Touch Screens

Operations Guide



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



Regulatory Compliance

As of the date of manufacture, the TPMC-V12 and TPMC-V15 have been tested and found to comply with specifications for CE marking and standards per EMC and Radiocommunications Compliance Labelling.



Federal Communications Commission (FCC) Compliance Statement

This device complies with part 15 of the FCC rules. Operation is subject to the following conditions: (1) this device may not cause harmful interference and (2) this device must accept any interference received, including interference that may cause undesired operation.

CAUTION: Changes or modifications not expressly approved by the manufacturer responsible for compliance could void the user's authority to operate the equipment.

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

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

Industry Canada (IC) Compliance Statement

This Class B digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

The specific patents that cover Crestron products are listed at patents.crestron.com.

Crestron, the Crestron logo, ADMS Intermedia Delivery System, Core 3, Core 3 UI, CresCAT, Cresnet, Crestron e-Control, Crestron Home, Crestron Toolbox, DigitalMedia, Intermedia Delivery System, QuickMedia, SmartObjects, SystemBuilder, TouchPoint, V-Panel, VisionTools and VT Pro-e are either trademarks or registered trademarks of Crestron Electronics, Inc. in the United States and/or other countries. Acrobat, Adobe and Flash are either trademarks or registered trademarks of Adobe Systems Inc. in the United States and/or other countries. YouTube is a trademark or a registered trademark of Google, Inc. in the United States and/or other countries. Excel, Internet Explorer, Microsoft, PowerPoint, XP, Windows and Windows Media are either trademarks or registered trademarks of Microsoft Corporation in the United States and/or other countries. Netflix is a trademark or registered trademark of Netflix, Inc. in the United States and/or other countries. Java is either a trademark or a registered trademark of Oracle and/or its affiliates in the United States and/or other countries. Other trademarks, registered trademarks and trade names may be used in this document to refer to either the entities claiming the marks and names or their products. Crestron disclaims any proprietary interest in the marks and names of others.

©2012 Crestron Electronics, Inc.

Contents

V-Panel™ Integrated 12" and 15" HD Touch Screens: TPMC-V12/15	1
Introduction	1
Features and Functions	1
Applications.....	5
Specifications	7
Physical Description.....	13
Setup.....	26
Network Wiring.....	26
Identity Code	26
Configuring the V-Panel.....	27
Hardware Hookup	47
Tilt Tension Adjustment.....	49
Recommended Cleaning.....	49
Programming Software.....	50
Software Requirements for the PC	50
Programming with Crestron SystemBuilder.....	50
Programming with SIMPL Windows	50
Programming with VisionTools	53
Embedded Applications.....	57
Defaults for Embedded Windows Applications	59
Programming Embedded Windows Applications.....	59
Uploading and Upgrading.....	61
Establishing Communication.....	61
Programs, Projects and Firmware.....	62
Program Checks	62
Restore.....	62
Operation – Security Infrastructure	63
Problem Solving	64
Troubleshooting.....	64
Check Network Wiring.....	65
Reference Documents.....	66
Further Inquiries	66
Future Updates	66
Return and Warranty Policies.....	67
Merchandise Returns / Repair Service	67
Crestron Limited Warranty.....	67
Microsoft® Windows XP® Embedded End User License Agreement	68

V-Panel™ Integrated 12" and 15" HD Touch Screens: TPMC-V12/15

Introduction

Crestron® V-Panels™ deliver the ultimate touch screen experience, blending style and function with the latest high definition graphics technology powered by our groundbreaking Core 3 UI™. The TPMC-V12 and TPMC-V15 both feature a fully integrated design combining the touch screen display and graphics engine in a single, slim housing. Sleek and beautiful, the TPMC-V12 and TPMC-V15 are perfectly at home sitting on a contemporary table or desktop but are equally suited for all kinds of custom installations, thanks to integral VESA mount compatibility.

The TPMC-V12 and TPMC-V15 deliver a powerful and elegant touch screen control solution featuring brilliant 12" SVGA (TPMC-V12) and 15" widescreen WXGA (TPMC-V15) displays, advanced Core 3 UI tough screen graphics, onboard multimedia, Web browsing and IP intercom.

For simplicity within this guide, the term "TPMC-V12/15" is used except where noted.

Features and Functions

- Sleek, beautiful, versatile
- 12" color (TPMC-V12) and 15" widescreen (TPMC-V15) touch display
- 800 x 600 SVGA (TPMC-V12) and 1280 x 768 WXGA (TPMC-V15) display resolution
- Integrated digital graphics engine
- High definition 24-bit graphics powered by Core 3™
- Onboard PC applications for Web browsing, playing digital media and viewing digital documents
- VNC viewer for remotely accessing and controlling external computers
- Native H.264 streaming video for viewing Web cameras and HD sources
- Wired composite video input
- Crestron IP intercom
- Remote annotation
- Built-in microphone and speakers

(Continued on following page)

Features and Functions

(Continued)

- WAV file customizable audio feedback
- USB keyboard/mouse port
- Onscreen keyboard and mouse capability
- High speed Ethernet and Cresnet®
- VESA compatible mounting affords endless install options
- Tabletop tilt model features clean, modern design
- Wall mount model installs flush in shallow spaces
- Silent fanless operation
- Available in white or black

Advanced Touch Screen Control

A Crestron touch screen offers an ideal user interface for controlling all the technology in a home, boardroom, classroom, courtroom or command center. Touch screens do away with piles of remote controls, cluttered wall switches and cryptic computer screens, simplifying and enhancing the technology. For controlling home theater, multimedia presentation, audio, video, lighting, HVAC and other systems, Crestron touch screens are fully customizable with easy to use controls and icons, true feedback and real time status display, full-motion video windows and advanced navigation of digital media servers, tuners and other devices.

Sleek, Versatile Design

Our V-Panels have been designed with appearance and versatility in mind. At less than 2 inches (51 millimeters) deep, the TPMC-V12/15 can be mounted virtually anywhere using a third-party VESA 75 compliant mounting bracket or stand. Tabletop tilt models (TPMC-V12-TILT and TPMC-V15-TILT) are offered, each supplied with its own ultra stylish, smooth tilt base to deliver a sleek looking, low profile control solution for desktops, counters and other level surfaces. Wall mount models (TPMC-V12-WALL and TPMC-V15-WALL) are also offered, affording the same V-Panel style and function in a thoroughly modern, yet unimposing, flush mount design.

Powered by Core 3

Crestron touch screens have always offered the ultimate user experience. With Core 3™, they also deliver the ultimate value, enabling the creation of dynamically rich user interfaces with incredible efficiency and unparalleled functionality. Using Core 3 UI, programmers can swiftly integrate fluid gesture driven controls, animated feedback, metadata, embedded apps and full motion video for a deeply engaging and ultra-intuitive touch screen experience.

Some Core 3 UI enhancements:

- Cool looking graphical buttons, sliders, knobs and gauges are intuitive and fun to use.
- Kinetic effects enhance the feeling of realism with lists and toolbars that scroll with momentum at the flick of a fingertip.
- Drag and drop objects snap into place offering an easy way to assign AV assets to rooms.

- Desktop widgets personalize the touch screen with animated clocks, calendars, weather, news and other information.
- Customizable themes allow a completely different look and feel for every user, event or season.
- Fully developed SmartObjects™ enable sophisticated control over complex devices with minimal programming.
- Smart resizing scales objects perfectly and instantly for faster GUI development, even across different sized touch screens.

Embedded PC Applications

The TPMC-V12/15 provides everything needed to enjoy online music and videos, browse the Internet and even review digital documents, all on the touch screen display without a separate computer. With Microsoft® Internet Explorer® embedded, there is full access to the entire World Wide Web including sites that use Flash® or Java™. Windows Media® Player ensures broad compatibility for playing most types of digital media. Adobe® Acrobat® Reader and Microsoft® PowerPoint®, Word and Excel® document viewers complete the online experience, allowing downloading and viewing of documents and presentations.

In addition, VNC Viewer support delivers enhanced cross-platform interaction with computers over the network or Internet, allowing remote access and control of desktop applications to unleash a host of possibilities for system integration and multimedia presentation.

HD Streaming Video

High definition streaming video capability makes it possible to view security cameras and other video sources over the network. Native support for MJPEG allows the TPMC-V12/15 to display live video images from Web cameras and servers such as the Crestron CEN-NVS200 Network Video Streamer (sold separately). Also, through its embedded Web browser and media player, it supports a wide variety of other streaming and downloadable video formats, enabling access to all kinds of content from media servers and Web sites like YouTube® and Netflix®*.

A wired video input is also provided to allow viewing of a composite video source. Video images can be displayed full frame or in fully scalable windows anywhere on the touch screen.

IP Intercom

Crestron IP intercom enables 2-way voice communication and room monitoring over Ethernet with other compatible Crestron touch screens.

Speakers and Microphone

Built-in front firing speakers provide clear audio for listening to multimedia, as well as for intercom in combination with the integrated microphone. Customized WAV files can also be loaded on the TPMC-V12/15 to add dimension to the touch screen graphics with personalized sounds, button feedback and voice prompts.

* Accessing Netflix content requires an active Netflix account. Refer to www.netflix.com for details.

Keyboard/Mouse Options

Onscreen keyboard and mouse capabilities enable complete control of the TPMC-V12/15's embedded Web browser and other applications and can also be used to control external network devices like the Crestron ADMS Intermedia Delivery System™ as well as computers running Touchpoint® Virtual Mouse & Keyboard software (VMK-WIN). A USB port is also provided for the connection of a physical keyboard and mouse.

Remote Annotation

Remote annotation capability allows multiple touch screen users to draw with their fingertips over the same video image or whiteboard screen, enabling enhanced interaction between several participants in a courtroom, classroom or council chamber.

Streamlined, Flexible Connectivity

Each TPMC-V12/15 model ships with a compact interface module (TPMC-V-IMCW¹), which may be discreetly mounted in a 1-gang electrical box, equipment rack or any flat surface, providing a single point of connectivity for power, communications and video signals. Connection between the touch screen and interface module can be made using a V-Cable Siamese Cable (TPMC-V-CBL-S²), providing a very clean appearance with lengths available up to 15 feet (4.5 meters). For longer distances up to 330 feet (100 meters), especially for in-wall applications, either a choice of several Crestron wire solutions or generic CAT5e^{3,4} can be used.

The TPMC-V-IMCW interface module provides both Cresnet® and high speed Ethernet ports for control system communications and LAN access. Power can be furnished via Cresnet or an optional power pack (PW-2420RU, sold separately). Wired video connectivity is handled through a single balanced or unbalanced composite input, allowing compatibility with both conventional coaxial and Crestron Home® Balanced AV distribution systems.

The TPMC-V12/15 can also be installed without using the interface module. Connectors on the touch screen allow for direct connection to Ethernet or Cresnet, with power provided via the Cresnet port.

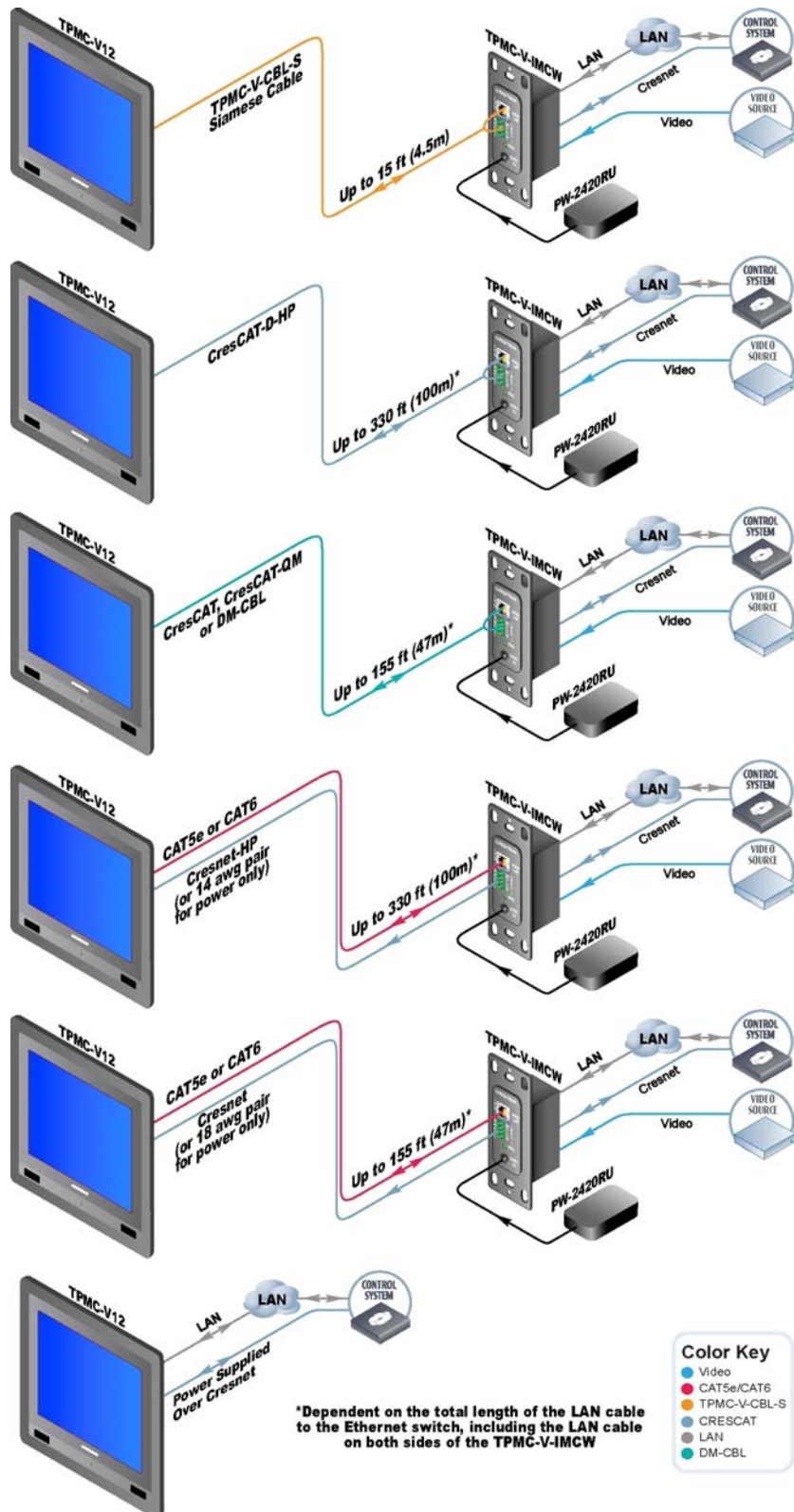
NOTE: Wired video connectivity is only available through the TPMC-V-IMCW interface module.

1. Item included; refer to individual product specifications for additional information.
2. The TPMC-V12/15 models include (1) TPMC-V-CBL-S3 3 foot (0.9 meter) Siamese Cable. The TPMC-V12/15-TILT models include (1) TPMC-V-CBL-S6 6 foot (1.8 meter) Siamese Cable. The TPMC-V12/15-WALL models do not include any cable.
3. For wiring between the TPMC-V12 and interface module, use a TPMC-V-CBL-S Siamese Cable, CresCAT®, CresCAT-D-HP, CresCAT-QM, DM-CBL or quality CAT5e/CAT6. CAT5e/6 requires an additional CRESNET or CRESNET-HP for Cresnet and power or else a single wire pair for power only. The maximum length for CRESCAT-D-HP, CAT5e/6 + CRESNET-HP or CAT5e/6 + 14 AWG power wire is 330 feet (100 meters) minus the length of any Ethernet cable connected to the LAN jack on the rear of the interface module. The maximum length for CresCAT, CresCAT-QM, DM-CBL, CAT5e/6 + CRESNET or CAT5e/6 + 18 AWG power wire is 155 feet (47 meters) minus the length of any additional Ethernet cable beyond 175 feet (53 meters).
4. For wiring between the TPMC-V15 and interface module, use a TPMC-V-CBL-S Siamese Cable, CresCAT, CresCAT-D-HP, CresCAT-QM, DM-CBL or quality CAT5e/CAT6. CAT5e/6 requires an additional CRESNET or CRESNET-HP for Cresnet and power or else a single wire pair for power only. The maximum length for CRESCAT-D-HP, CAT5e/6 + CRESNET-HP or CAT5e/6 + 14 AWG power wire is 330 feet (100 meters) minus the length of any Ethernet cable connected to the LAN jack on the rear of the interface module. The maximum length for CresCAT, CresCAT-QM, DM-CBL, CAT5e/6 + CRESNET or CAT5e/6 + 18 AWG power wire is 148 feet (45 meters) minus the length of any additional Ethernet cable beyond 182 feet (55 meters).

Applications

The following diagrams show a TPMC-V12 in a typical application.

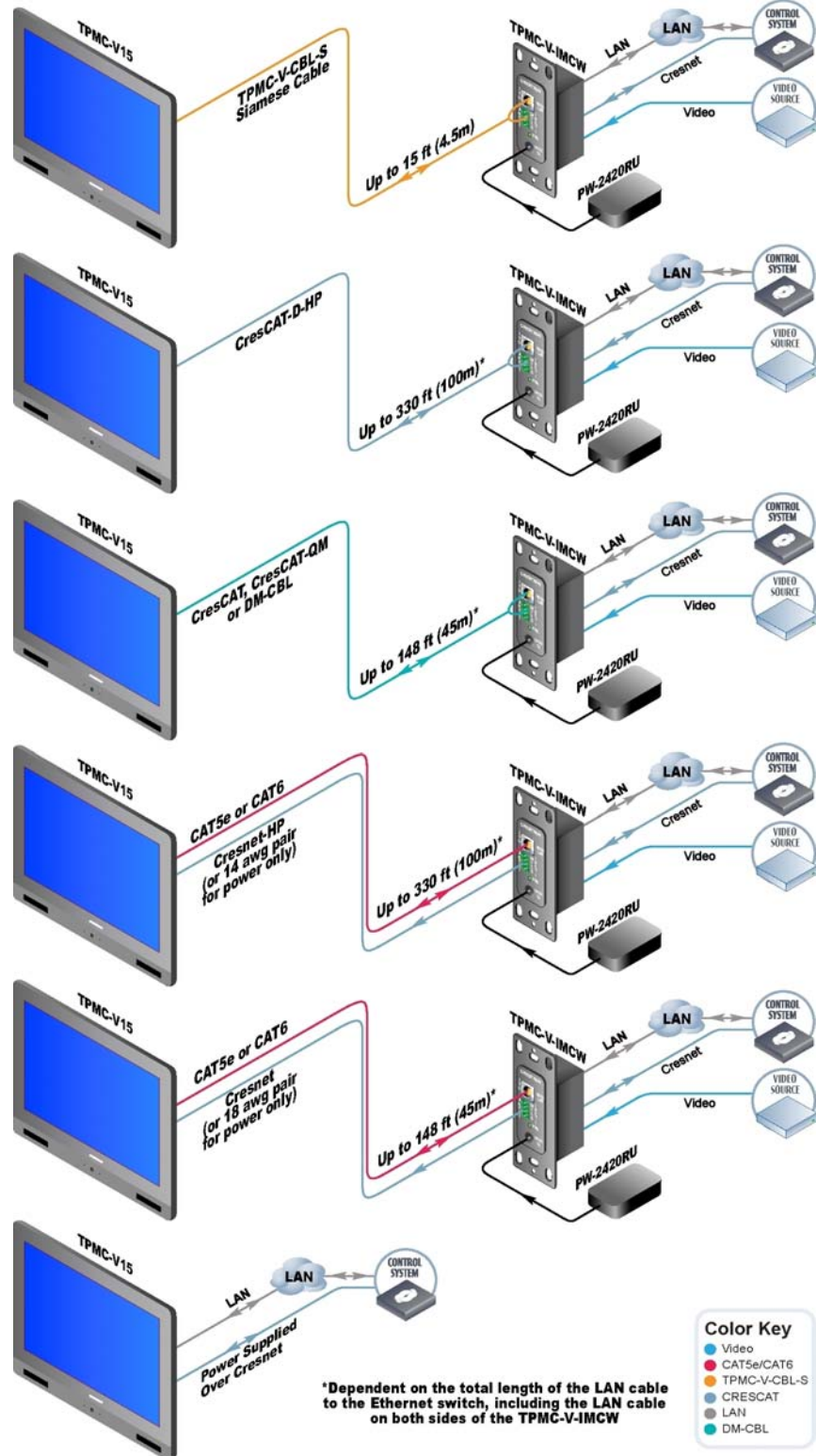
TPMC-V12 in a Typical Application (Each Diagram Varies with LAN Cable Length)*



V-Panel™ Integrated 12" & 15" HD Touch Screens Crestron TPMC-V12/V15

The following diagrams show a TPMC-V15 in a typical application.

TPMC-V15 in a Typical Application (Each Diagram Varies with LAN Cable Length)*



Specifications

Specifications for the TPMC-V12/15 are listed in the following table.

TPMC-V12/15 Specifications

SPECIFICATION	DETAILS
Touch Screen Display	
Display Type	TFT Active Matrix Color Display
Size	
TPMC-V12	12 inch (305 mm) diagonal
TPMC-V15	15 inch (381 mm) diagonal
Aspect Ratio	
TPMC-V12	4:3 SVGA
TPMC-V15	15:9 WXGA
Resolution	
TPMC-V12	800 x 600 pixels
TPMC-V15	1280 x 768 pixels
Brightness	
TPMC-V12	450 nits
TPMC-V15	470 nits
Contrast	
TPMC-V12	1000:1
TPMC-V15	700:1
Color Depth	24-bit, 16.7 million colors
Illumination	Backlit fluorescent
Viewing Angle	
TPMC-V12	±89° horizontal, ±89° vertical
TPMC-V15	±85° horizontal, ±85° vertical
Touch Screen	Resistive membrane
Memory	
SDRAM	1 GB
Flash	2 GB
Memory Card	Expandable up to 32 GB using MMC compatible card (not included)
Maximum Project Size	120 MB
Graphics Engine	Core 3 UI, 24-bit color depth (non-palette), 8-bit alpha channel transparency, color key video windowing, remote annotation, VT Pro-e® programmable, supports Core 3 projects
Embedded Applications ¹	Microsoft Internet Explorer with Adobe Flash plug-in and Java Runtime plug-in, Windows Media Player, Remote Desktop, VNC Viewer, Adobe Acrobat Reader, WordPad, MS Word Viewer 2007, Excel Viewer 2007, PowerPoint Viewer 2007

(Continued on following page)

TPMC-V12/15 Specifications (Continued)

SPECIFICATION	DETAILS
Languages ²	Arabic, Chinese Simplified, Chinese Traditional, Croatian, Czech, Danish, Dutch, English, Estonian, Finnish, French, German, Greek, Hebrew, Hungarian, Icelandic, Indonesian, Italian, Japanese, Korean, Latvian, Lithuanian, Norwegian, Polish, Portuguese, Romanian, Russian, Serbian, Slovak, Slovenian, Spanish, Swedish, Turkish
Communications Ethernet Cresnet USB	10/100 Mbps, auto-switching, auto-negotiating, auto-discovery, full/half duplex, DHCP, for control and console Cresnet slave mode for control and console USB 2.0 host, supports USB HID (Human Interface Device) class devices, USB flash drives ³
Video Analog Input Signal Types Analog Formats Analog Input Resolutions Color Depth Streaming/File Formats	Composite NTSC or PAL 480i, 576i 24-bit, 16.7 million colors H.264 (MPEG-4 part 10 AVC), MJPEG, plus all other formats supported by Windows Media Player
Audio Features Streaming/File Formats Audio Feedback	Built-in microphone and amplified speakers (Refer to illustrations on pages 17, 19, 21 and 23 for microphone location) As supported by Windows Media Player WAV format, 8 & 16-bit PCM, 8-44.1 kHz sampling rates, mono and stereo
Power Requirements ⁴ Cresnet Power Usage TPMC-V12 TPMC-V15 Power Pack	43 Watts (1.8 Amps @ 24 Volts DC) with or without TPMC-V-IMCW module ⁵ 45 Watts (1.9 Amps @ 24 Volts DC) with or without TPMC-V-IMCW module ⁵ 2 Amps @ 24 Volts DC; 100-240 Volts AC, 50/60 Hz; Power pack sold separately
Default Net ID	03
Minimum 2-Series Control System Update File ^{6,7}	Version 4.001.1012 or later

(Continued on following page)

TPMC-V12/15 Specifications (Continued)

SPECIFICATION	DETAILS
Environmental	
Temperature	41° to 113° F (5° to 45° C)
Humidity	10% to 90% RH (non-condensing)
Heat Dissipation	
TPMC-V12	147 BTU/Hr
TPMC-V15	154 BTU/Hr
Enclosure	
TPMC-V12	Plastic case, VESA 75 x 75 mm mountable; TPMC-V12-TILT model includes tabletop tilt stand with 0° to 35° adjustable screen tilt, optional swivel mount sold separately; TPMC-V12-WALL model includes WMKC-V12 wall mount conversion kit with plastic front bezel; additional mounting accessories sold separately
TPMC-V15	Plastic case, VESA 75 x 75 mm mountable; TPMC-V15-TILT model includes tabletop tilt stand with 0° to 35° adjustable screen tilt, optional swivel mount sold separately; TPMC-V15-WALL model includes WMKC-V15 wall mount conversion kit with plastic front bezel; additional mounting accessories sold separately
Dimensions	
TPMC-V12	
Height	10.22 in (260 mm)
Width	11.72 in (298 mm)
Depth	1.66 in (42 mm)
TPMC-V12-TILT	
Height	10.81 in (275 mm) max at 0° tilt
Width	11.72 in (298 mm)
Depth	8.11 in (206 mm)
TPMC-V12-WALL ⁸	
Height	11.54 in (293 mm)
Width	13.04 in (332 mm)
Depth	2.03 in (52 mm)
TPMC-V15	
Height	11.10 in (282 mm)
Width	15.33 in (390 mm)
Depth	1.85 in (47 mm)

(Continued on following page)

TPMC-V12/15 Specifications (Continued)

SPECIFICATION	DETAILS
Dimensions (Continued) TPMC-V15-TILT Height Width Depth TPMC-V15-WALL ⁹ Height Width Depth	11.69 in (297 mm) max at 0° tilt 15.33 in (390 mm) 8.11 in (206 mm) 8.35 in (212 mm) max at 35° tilt 12.44 in (316 mm) 16.67 in (424 mm) 2.22 in (57 mm)
Weight TPMC-V12 TPMC-V12-TILT TPMC-V12-WALL TPMC-V15 TPMC-V15-TILT TPMC-V15-WALL	5.3 lbs (2.4 kg) 9.1 lbs (4.2 kg) 8.6 lbs (3.9 kg) 8.1 lbs (3.7 kg) 11.9 lbs (5.4 kg) 12.4 lbs (5.6 kg)
Available Models TPMC-V12-B TPMC-V12-W TPMC-V12-TILT-B TPMC-V12-TILT-W TPMC-V12-WALL-B TPMC-V12-WALL-W TPMC-V15-B TPMC-V15-W TPMC-V15-TILT-B TPMC-V15-TILT-W TPMC-V15-WALL-B TPMC-V15-WALL-W	V-Panel Integrated 12" VESA Mount HD Touch Screen, Black V-Panel Integrated 12" VESA Mount HD Touch Screen, White V-Panel Integrated 12" Tilt HD Touch Screen, Black V-Panel Integrated 12" Tilt HD Touch Screen, White V-Panel Integrated 12" Wall Mount HD Touch Screen, Black V-Panel Integrated 12" Wall Mount HD Touch Screen, White V-Panel Integrated 15" VESA Mount HD Touch Screen, Black V-Panel Integrated 15" VESA Mount HD Touch Screen, White V-Panel Integrated 15" Tilt HD Touch Screen, Black V-Panel Integrated 15" Tilt HD Touch Screen, White V-Panel Integrated 15" Wall Mount HD Touch Screen, Black V-Panel Integrated 15" Wall Mount HD Touch Screen, White

(Continued on following page)

TPMC-V12/15 Specifications (Continued)

SPECIFICATION	DETAILS
Included Accessories	
TPMC-V12	
TPMC-V-CBL-S3	V-Cable Siamese Cable, 3 feet (~0.9 meters) (Included with TPMC-V12 models only)
TPMC-V-CBL-S6	V-Cable Siamese Cable, 6 feet (~1.8 meters) (Included with TPMC-V12-TILT models only)
TPMC-V-IMCW	Interface Module
WMKC-V12	Wall Mount Conversion Kit for TPMC-V12 (Included with TPMC-V12-WALL models only)
TPMC-V15	
TPMC-V-CBL-S3	V-Cable Siamese Cable, 3 feet (~0.9 meters) (Included with TPMC-V15 models only)
TPMC-V-CBL-S6	V-Cable Siamese Cable, 6 feet (~1.8 meters) (Included with TPMC-V15-TILT models only)
TPMC-V-IMCW	Interface Module
WMKC-V15	Wall Mount Conversion Kit for TPMC-V15 (Included with TPMC-V15-WALL models only)
Available Accessories	
BB-V12	Pre-Construction Wall Mount Back Box for TPMC-V12-WALL
BB-V15	Pre-Construction Wall Mount Back Box for TPMC-V15-WALL
BBI-V12	Pre-Construction Wall Mount Back Box for TPMC-V12-WALL – International Version
BBI-V15	Pre-Construction Wall Mount Back Box for TPMC-V15-WALL – International Version
CEN-NVS200	Network Video Streamer
CRESCAT	Crestron Home CAT5 AV Cable
CRESCAT-D-HP	Crestron Home “High Power” CAT5 AV Cable
CRESCAT-QM	QuickMedia® Cable
CRESNET	Cresnet Control Cable
CRESNET-HP	Cresnet “High Power” Control Cable
DM-CBL	DigitalMedia™ Cable
DM-CONN	DigitalMedia™ Cable Connectors
MMK-V12	Mud Ring for BB-V12 or PMK-V12
MMK-V15	Mud Ring for BB-V15 or PMK-V15
PMK-V12	Pre-Construction Wall Mounting Kit for TPMC-V12-WALL
PMK-V15	Pre-Construction Wall Mounting Kit for TPMC-V15-WALL
PW-2420RU	24 Volt Power Pack, Universal
SMK-V15	Swivel Mount Kit for TPMC-V12-TILT and TPMC-V15-TILT
TPMC-V-CBL-S	V-Cable Siamese Cables
VMK-WIN	Touchpoint Virtual Mouse & Keyboard Software for Windows®

(Continued on following page)

TPMC-V12/15 Specifications (Continued)

SPECIFICATION	DETAILS
Available Accessories (Continued) WMKC-V12 WMKC-V15 WMKM-V12 WMKM-V15 WMKT-V12 WMKT-V15	Wall Mount Conversion Kit for TPMC-V12 Wall Mount Conversion Kit for TPMC-V15 Post-Construction Wall Mounting Kit with Mud Ring for TPMC-V12-WALL Post-Construction Wall Mounting Kit with Mud Ring for TPMC-V15-WALL Post-Construction Wall Mounting Kit with Trim Ring for TPMC-V12-WALL Post-Construction Wall Mounting Kit with Trim Ring for TPMC-V15-WALL

1. Contact Crestron for a current list of embedded applications. To ensure reliable performance, new device drivers and applications are available only from Crestron through firmware updates.
2. Refer to “Additional Language Fonts” which starts on page 56.
3. USB port can also be used to load projects or firmware via a USB flash drive.
4. May be powered by power pack or Cresnet network power, not both.
5. Item included; refer to individual product specifications for additional information.
6. The latest software versions can be obtained from the Crestron Web site. Refer to the NOTE following these footnotes.
7. 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.
8. For more information about the TPMC-V12-WALL refer to the TPMC-V12-WALL, V12-WALL & WMKC-V12 Installation Guide (Doc. 6893). It is available from the Crestron Web site (www.crestron.com/manuals).
9. For more information about the TPMC-V15-WALL refer to the TPMC-V15-WALL, V15-WALL & WMKC-V15 Installation Guide (Doc. 6884).

NOTE: Crestron software and any files on the Web site are for authorized Crestron dealers and Crestron Authorized Independent Programmers (CAIPs) only. New users must 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 the TPMC-V12/15.

TPMC-V12-TILT Physical View (Shown in Black)



TPMC-V12-WALL Physical View (Shown in White)



TPMC-V15-TILT Physical View (Shown in Black)



V-Panel™ Integrated 12" & 15" HD Touch Screens Crestron **TPMC-V12/V15**

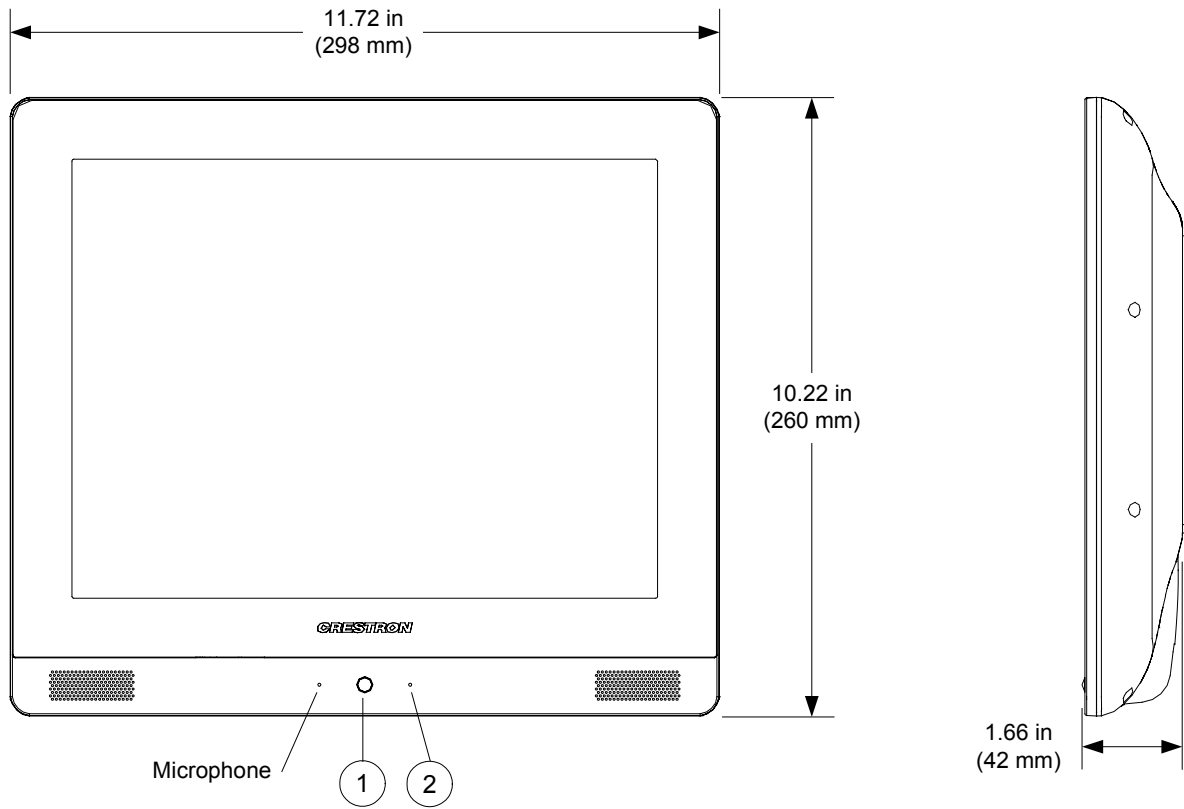
TPMC-V15-WALL Physical View (Shown in White)



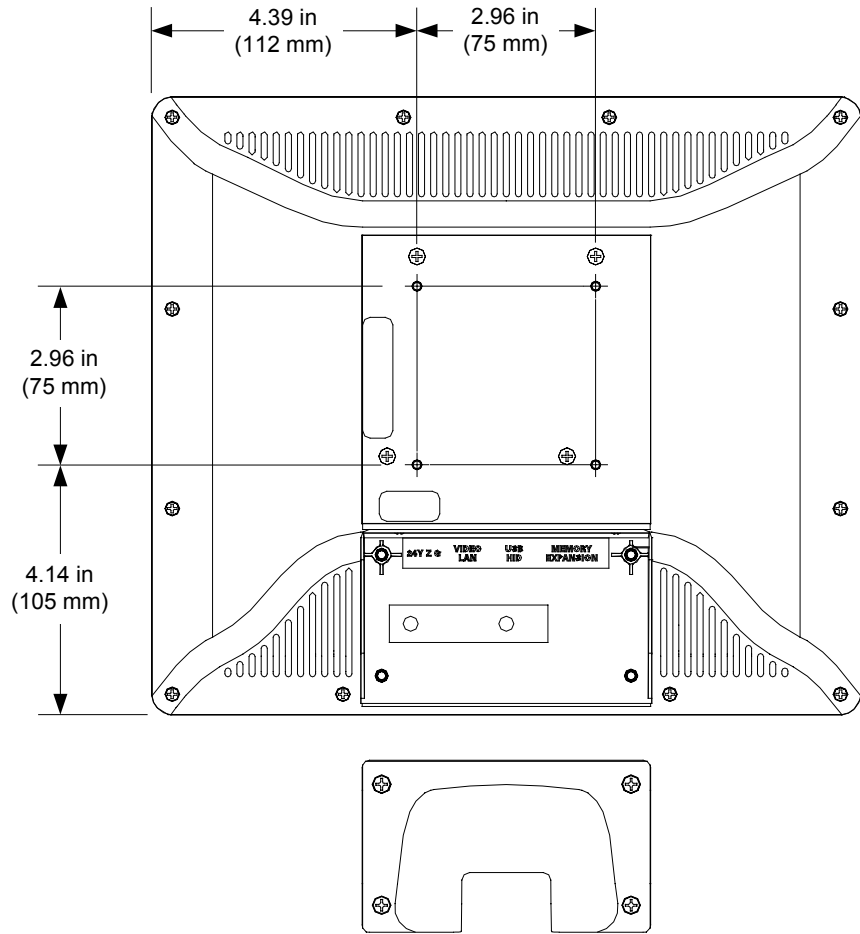
TPMC-V15 Physical View (Rear Showing Connector Ports)



TPMC-V12 Overall Dimensions (Front and Side Views)

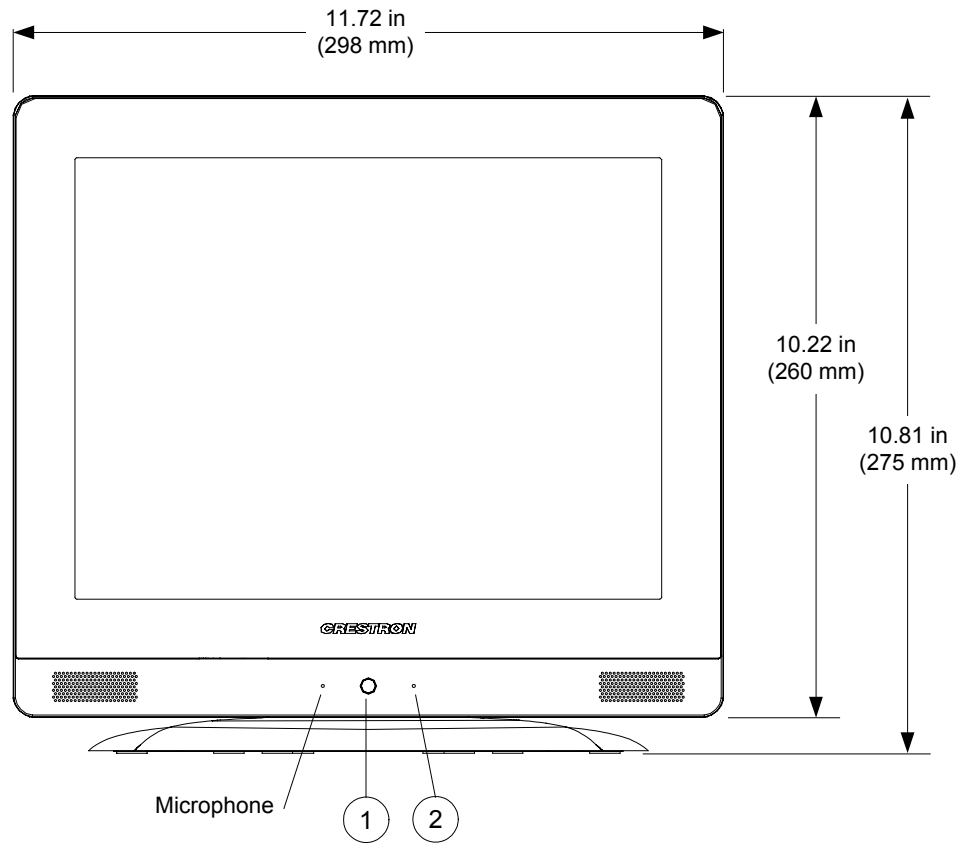


TPMC-V12 Overall Dimensions (Rear View)

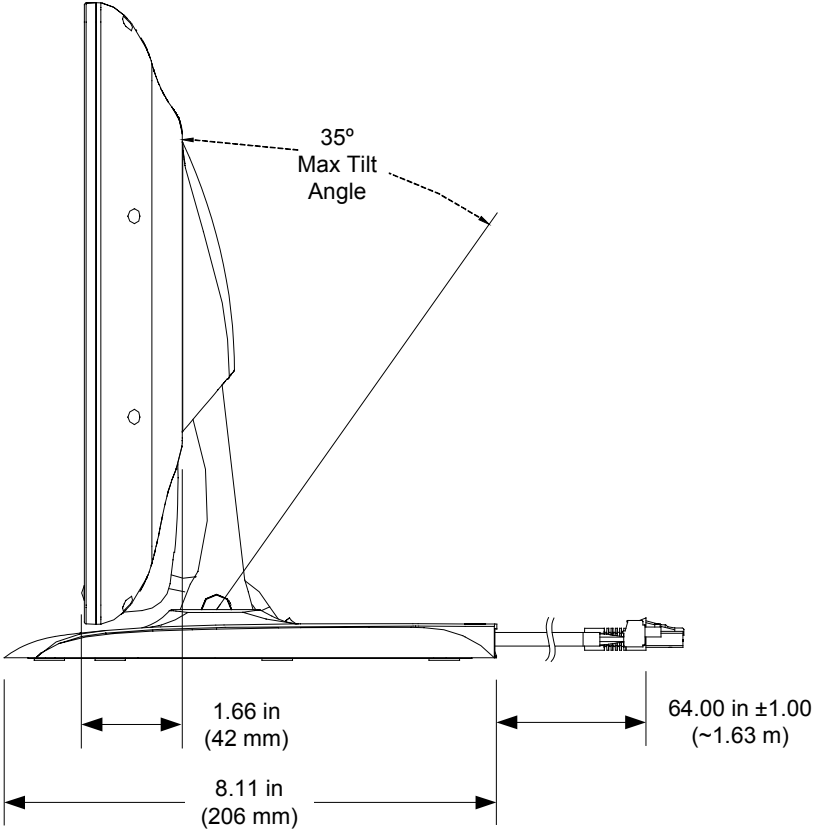


NOTE: In the illustration above, the TPMC-V12 is shown with the rear cover removed. When making cable connections to the TPMC-V12, first removing the four screws holding the cover in place, then remove the cover. Replace the cover when connections have been made.

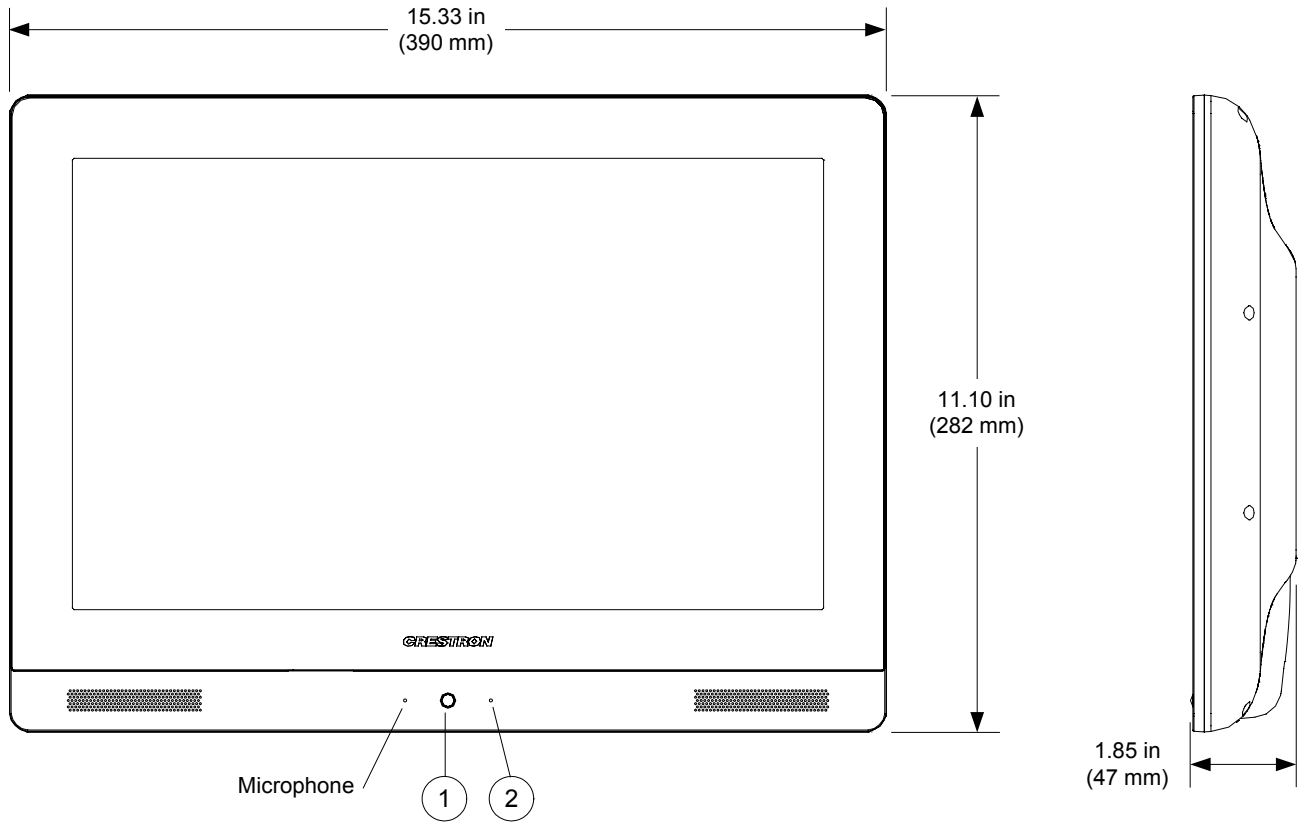
TPMC-V12-TILT Overall Dimensions (Front View)



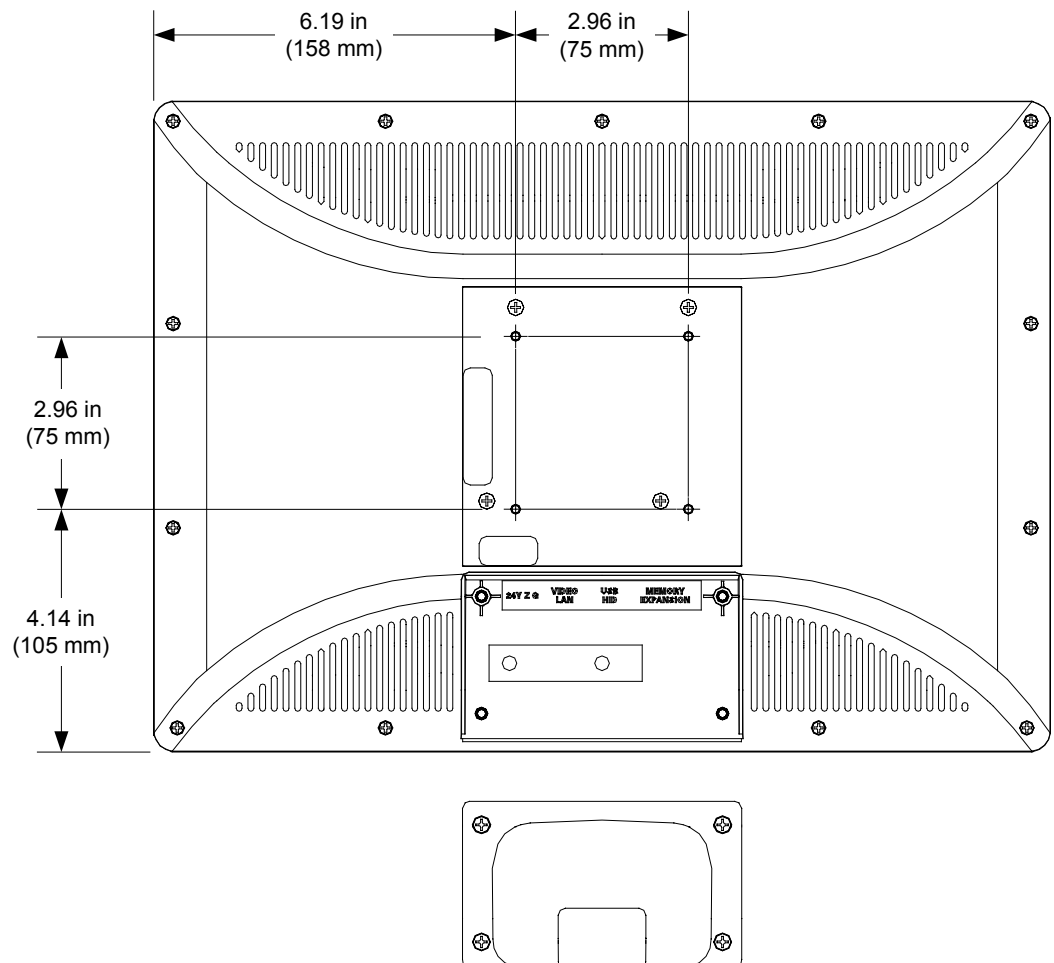
TPMC-V12-TILT Overall Dimensions (Side View)



TPMC-V15 Overall Dimensions (Front and Side Views)

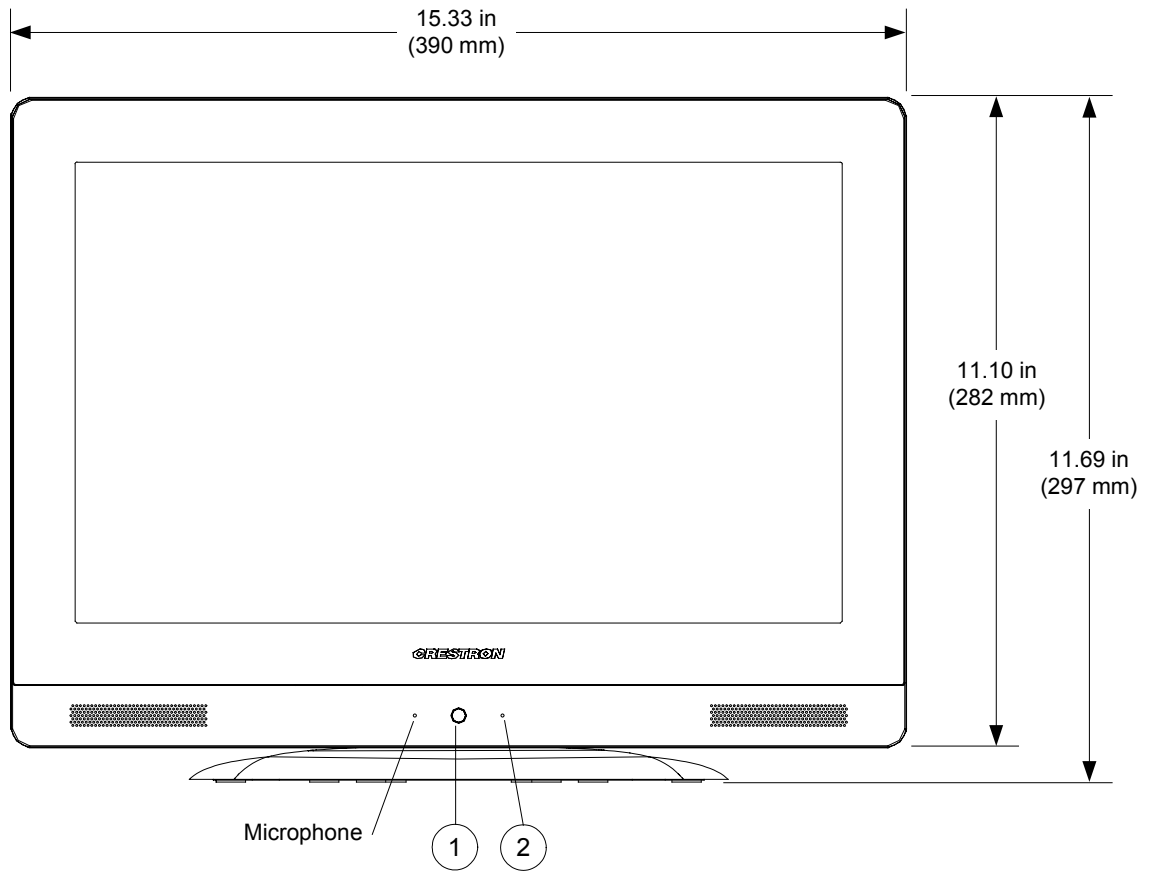


TPMC-V15 Overall Dimensions (Rear View)

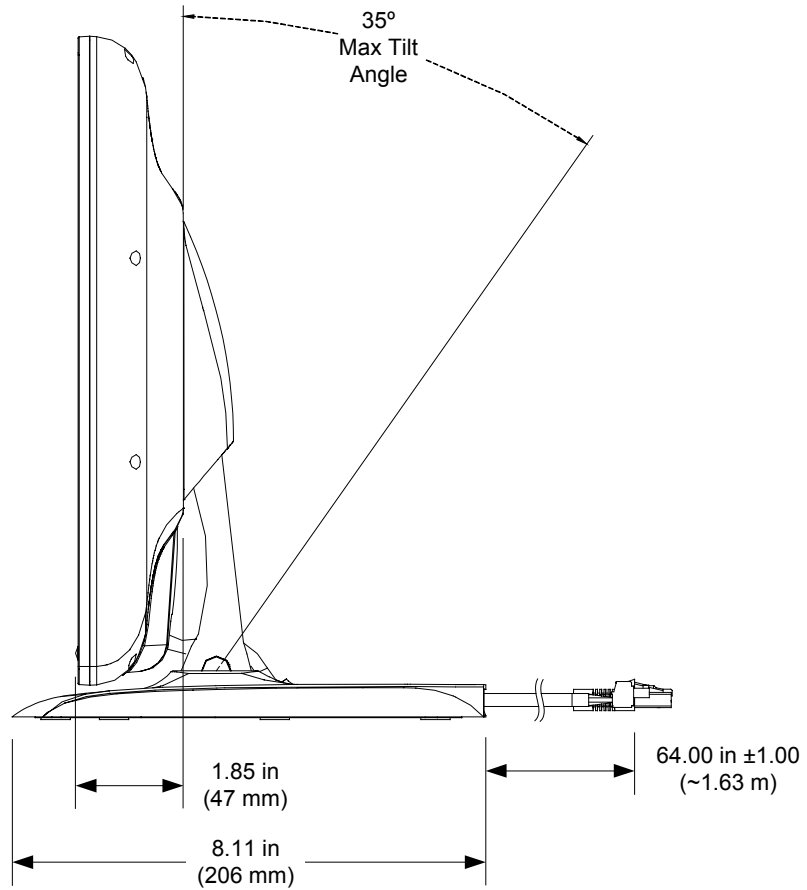


NOTE: In the illustration above, the TPMC-V15 is shown with the rear cover removed. When making cable connections to the TPMC-V15, first removing the four screws holding the cover in place, then remove the cover. Replace the cover when connections have been made.

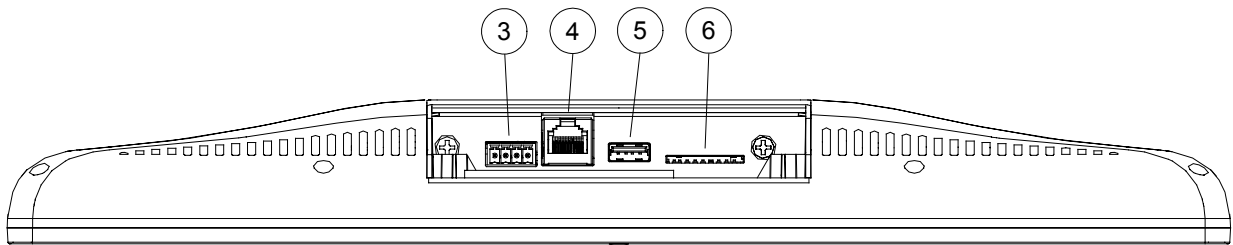
TPMC-V15-TILT Overall Dimensions (Front View)




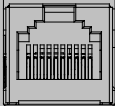


TPMC-V15-TILT Overall Dimensions (Side View)



TPMC-V12/15 Overall Dimensions (Rear View – V15 Shown)



Connectors, Controls & Indicators

#	CONNECTORS ¹ , CONTROLS & INDICATORS	DESCRIPTION
1	Hard Key	(1) Programmable push button, also reboots the touch screen if held for six seconds
2	Power LED	(1) Green LED, indicates touch screen is in active state
3	24 Y Z G 	(1) 4-pin 3.5 mm detachable terminal block, Cresnet slave port and power input; Normally connects to TPMC-V-IMCW interface module ² via TPMC-V-CBL-S, CRESCAT, CRESCAT-D-HP, CRESCAT-QM, DB-CBL, CRESNET or CRESNET-HP cable ^{3,4,5} ; Refer to TPMC-V-IMCW interface module specifications for other connectors; May also be connected directly to a Cresnet network or power supply
4	VIDEO/LAN 	(1) Shielded 10P8C modular jack (RJ-45 or RJ-50 compatible); 10/BASE-T/100BASE-TX Ethernet and balanced video port; Normally connects to TPMC-V-IMCW interface module ² via TPMC-V-CBL-S, CRESCAT, CRESCAT-D-HP, CRESCAT-QM, DB-CBL or generic CAT5e/6 cable ^{3,4,5} ; Refer to TPMC-V-IMCW interface module specifications for other connectors; May also be connected directly to an Ethernet LAN (negates TPMC-V-IMCS and video connectivity)
5	USB 	(1) USB Type A female; USB 2.0 host port for USB HID (Human Interface Device) compliant mouse/keyboard or USB flash drive
6	MEMORY EXPANSION 	(1) MMC compatible card slot; Accepts Multimedia Memory Card (MMC) up to 32 GB for memory expansion

1. Interface connectors for **24 Y Z G** and **VIDEO/LAN** ports are provided with the unit.
2. Item included; refer to individual product specifications for additional information.
3. The TPMC-V12/15 models include (1) TPMC-V-CBL-S3 3 foot (0.9 meter) Siamese Cable. The TPMC-V12/15-TILT models include (1) TPMC-V-CBL-S6 6 foot (1.8 meter) Siamese Cable. The TPMC-V12/15-WALL models do not include any cable.
4. For wiring between the TPMC-V12 and interface module, use a TPMC-V-CBL-S Siamese Cable, CresCAT, CresCAT-D-HP, CresCAT-QM, DM-CBL or quality CAT5e/CAT6. CAT5e/6 requires an additional CRESNET or CRESNET-HP for Cresnet and power or else a single wire pair for power only. The maximum length for CRESCAT-D-HP, CAT5e/6 + CRESNET-HP or CAT5e/6 + 14 AWG power wire is 330 feet (100 meters) minus the length of any Ethernet cable connected to the LAN jack on the rear of the interface module. The maximum length for CresCAT, CresCAT-QM, DM-CBL, CAT5e/6 + CRESNET or CAT5e/6 + 18 AWG power wire is 155 feet (47 meters) minus the length of any additional Ethernet cable beyond 175 feet (53 meters).
5. For wiring between the TPMC-V15 and interface module, use a TPMC-V-CBL-S Siamese Cable, CresCAT, CresCAT-D-HP, CresCAT-QM, DM-CBL or quality CAT5e/CAT6. CAT5e/6 requires an additional CRESNET or CRESNET-HP for Cresnet and power or else a single wire pair for power only. The maximum length for CRESCAT-D-HP, CAT5e/6 + CRESNET-HP or CAT5e/6 + 14 AWG power wire is 330 feet (100 meters) minus the length of any Ethernet cable connected to the LAN jack on the rear of the interface module. The maximum length for CresCAT, CresCAT-QM, DM-CBL, CAT5e/6 + CRESNET or CAT5e/6 + 18 AWG power wire is 148 feet (45 meters) minus the length of any additional Ethernet cable beyond 182 feet (55 meters).

Setup

Network Wiring

When wiring the Cresnet network, consider the following:

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

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

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

For more details, refer to “Check Network Wiring” which starts on page 65.

The TPMC-V12/15 can also use high-speed Ethernet for communications between the device and a control system, computer, 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).

Identity Code

Net ID

The Net ID of the TPMC-V12/15 has been factory set to **03**. The Net IDs of multiple TPMC-V12/15 devices in the same system must be unique. The Net ID is set using the internal setup menu (refer to “Cresnet” on page 31). Net ID may also be set from a personal computer (PC) via Crestron Toolbox™ (refer to “Establishing Communication” on page 61).

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 using the Internet setup menu (refer to “IP Table” on page 42). IP ID may also be set within the TPMC-V12/15’s IP table using Crestron Toolbox. For information on setting an IP table, refer to the Crestron Toolbox help file. The IP IDs of multiple TPMC-V12/15 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 V-Panel

NOTE: The only connection required to configure the touch screen is power. Refer to “Hardware Hookup” which starts on page 47 for details.

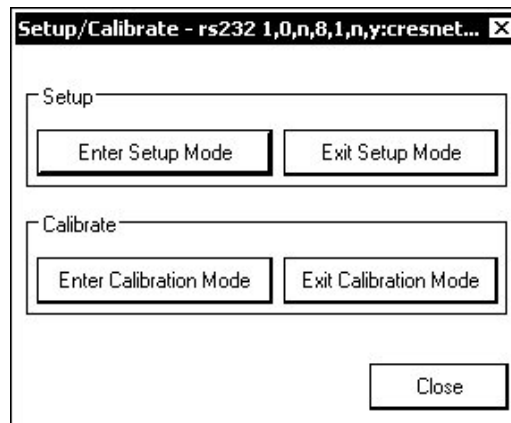
The TPMC-V12/15 is configured from the setup menu.

NOTE: If no project has been loaded or if an invalid project has been loaded, the touch screen 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 three methods:

1. Touch the screen during boot up when the “Preparing to Load Project” message is visible. Maintain touch until after the countdown, when the message changes to “Loading Setup Screen”.
2. If the project has a button defined for this purpose, touching the button provides entry into the setup menu.
3. Crestron Toolbox can be also used to enter the setup menu:
 - a. Establish communication with the touch screen (refer to “Establishing Communication” on page 61 for details).
 - b. Right-click on the device and select **Functions | Setup Mode...**

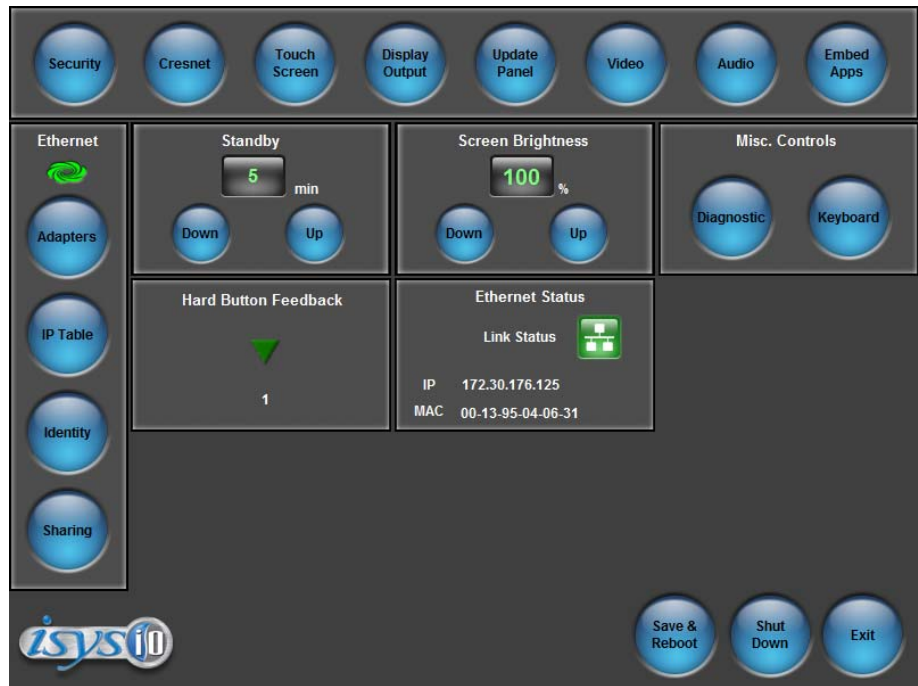
“Setup/Calibrate” Window



- c. Select **Enter Setup Mode**. The setup menu opens as shown in the following diagram.

NOTE: Select **Exit Setup Mode** to exit the setup menu.

TPMC-V12/15 Setup Menu



The setup menu provides access to all basic functions and parameters. It is divided into *Setup*, *Ethernet*, *Standby*, *Screen Brightness*, *Misc. Controls*, *Hard Button Feedback* and *Ethernet Status* sections. There are also buttons for **Save & Reboot**, **Shut Down** and **Exit**.

NOTE: To allow the touch screen to upload projects with status displayed on the screen, standby timeout is disabled until approximately five minutes after the project load process has completed. Standby is then enabled again.

To exit the setup menu and return to the program, touch **Exit**, located at the bottom of the setup menu. To save any changes and reboot the touch screen, touch **Save & Reboot**, located at the bottom of the setup menu. Use the **Shut Down** button to turn off the touch screen.

Setup Menu Details

The setup menu allows configuration of the touch screen’s settings for security, Cresnet ID, touch screen calibration, runtime project, video, audio, embedded applications and diagnostics. The setup menu also has a button that toggles the on-screen keyboard on and off.

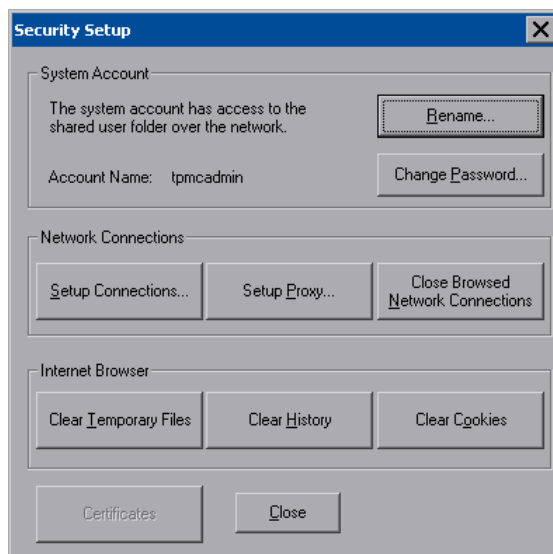
Security

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, setup a proxy server, close network connections and clear Internet browser temporary files, history and cookies.

NOTE: **Clear History** only takes effect after restarting Internet Explorer.

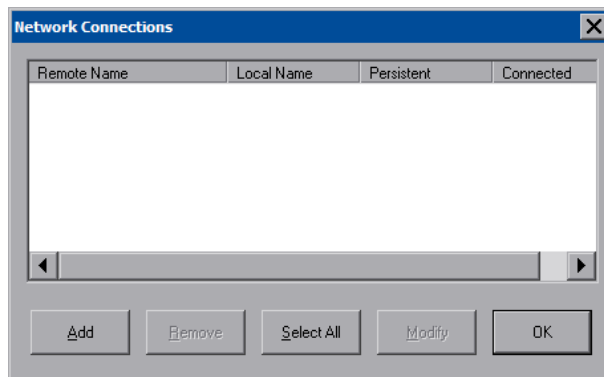
NOTE: To use the on-screen keyboard for security settings, touch **Keyboard** on the startup menu before touching **Security**.

“Security Setup” Window



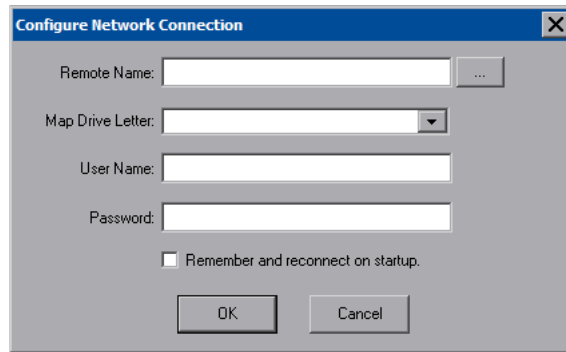
Touch **Setup Connections...** to open the “Network Connections” window. This window is used to map to a network drive. A mapped network drive permits easy access to embedded application files (Word, Excel, PowerPoint, etc.) and provides a location to save files. To further customize the installation,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

“Network Connections” Window




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

“Configure Network Connection” Window



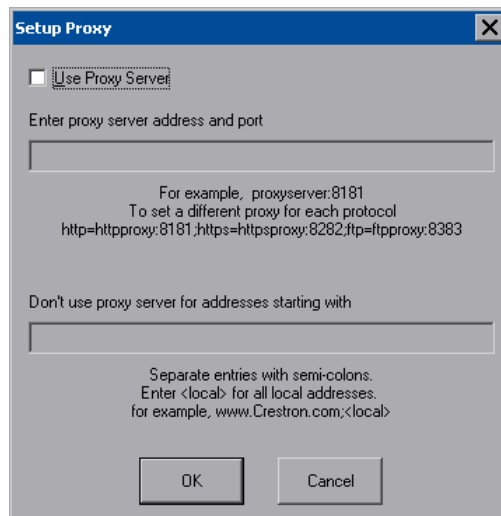
To add a network drive, perform the following procedure:

1. Touch  to browse for the new network connection. If the remote shareable folder name does not appear on the list, it can be entered manually in the *Remote Name* field, using the following format:
`\\Remote host name\Shareable folder name`
2. Map this connection by selecting a drive letter from the *Map Drive Letter* drop box.
3. Enter a user name and password.
4. Touch the *Remember and reconnect on startup* checkbox if so desired.
5. Touch **OK** to enable the new network connection and return to the “Network Connections” window.

Once all changes to network connections have been completed, touch **OK** to return to the “Security Setup” window.

Touch **Setup Proxy...** to open the “Setup Proxy” window. This window is used to point to a proxy server for Internet access. A proxy server acts as an intermediary between the internal network (intranet) and the Internet, retrieving files from remote Web servers.

“Setup Proxy” Window



To setup a proxy server, select *Use Proxy Server*.

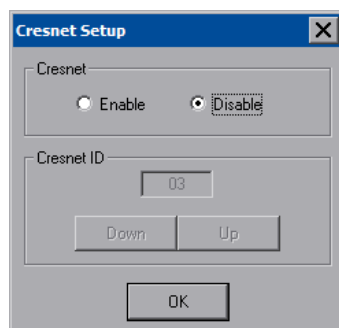
1. Enter the IP address or name of the proxy server.
2. If desired, specify addresses that should not use the proxy server (i.e., intranet addresses).

Touch **OK** to enable the proxy server connection and return to the “Security Setup” window. Then touch **Close** to return to the setup menu.

Cresnet

The **Cresnet** button opens the “Cresnet Setup” window, which allows enabling or disabling Cresnet and permits changing the Cresnet ID.

“Cresnet Setup” Window



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

The Cresnet network identity number (*Cresnet ID*) is displayed in the “Cresnet Setup” window. Cresnet ID is a 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 touch screen and SIMPL Windows program is required if data is to be successfully transferred. The Net ID for the TPMC-V12/15 is factory set to 03. No two devices in the same system can have the same Net ID.

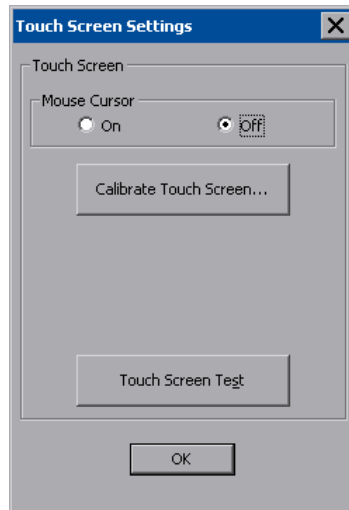
Two buttons below the hexadecimal display, **Down** and **Up**, decrease and increase the Cresnet ID by one, respectively.

Select **OK** to accept the changes and return to the setup menu.

Touch Screen

The **Touch Screen** button opens the “Touch Screen Settings” window, which provides access to touch screen calibration when **Calibrate Touch Screen...** is touched.

“Touch Screen Settings” Window



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

When **Calibrate Touch Screen...** is touched, the calibration screen opens. Touch the screen to begin the calibration process. If the screen is not touched within sixty seconds, the calibration sequence stops and the screen returns to the “Touch Screen Settings” window.

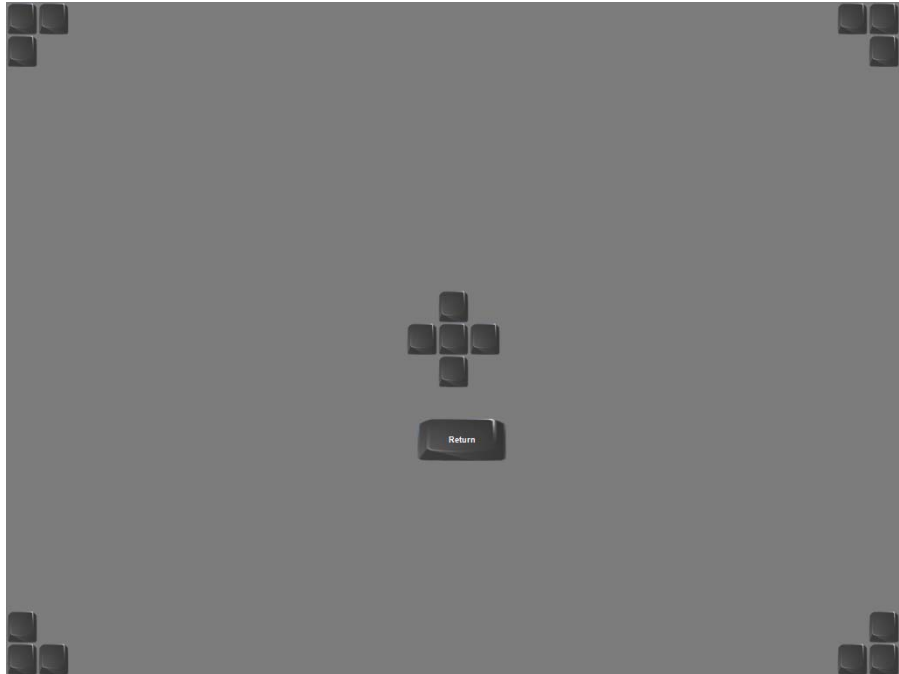
If the screen is touched before the sixty second timeout, the screen instructs the user to touch the center of each target as it appears. A series of crosshairs appears on the screen, starting near the upper left corner. Touch the center of the first crosshair to initiate calibration. As each new crosshair is touched, the next appears. After the upper left, crosshairs 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 Settings” window. Touch **OK** to accept the changes and return to the setup menu.

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 Settings” window without saving calibration data, create a calibration error by touching the screen in the same spot for each calibration point.

NOTE: The touch screen’s calibration routine can also be accessed through Crestron Toolbox if the touch screen is connected to a control system via Cresnet and/or TCP/IP 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.

When **Touch Screen Test** is touched, the test screen opens (refer to illustration below). This screen allows the user to test the touch screen response at 17 points on the screen. Each button on the screen lights when touched. Touch **Return** to exit the test screen.

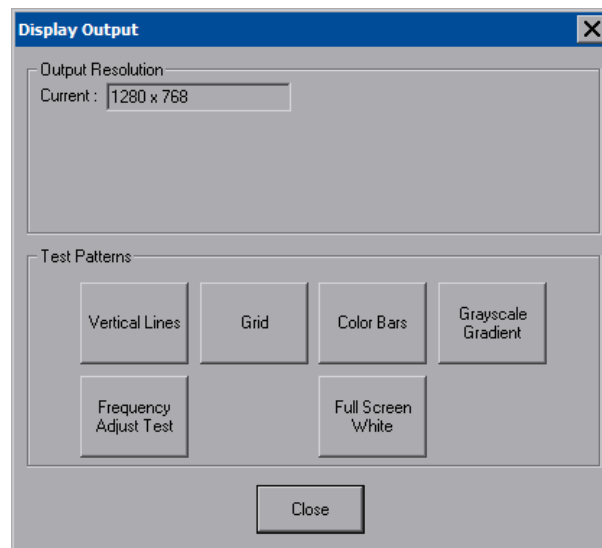
Touch Screen Test Window



Display Output

Touching **Display Output** shows the display resolution of the touch screen and provides charts for testing the display.

“Display Output” Window



Update Panel

The **Update Panel** button permits the selection of the touch screen program, a .vtz file. It is also used to upgrade firmware.

The *Project* tab of the “Project and Firmware” window is divided into two sections: *Current Loaded Project* and *Load New Project*.

Current Loaded Project displays the name and creation time of the current project.

In the *Load New Project* section, touch **Browse** and select the compiled project (i.e., the .vtz file) to be loaded from a network drive, USB device or flash drive, then touch **Open** to show the source file in the “Project and Firmware” window. Touch **Load** to uncompress the project file, place it in the destination selected in *Target Location to Load the Project to* and display it on the touch screen.

In the *Target Location to Load the Project to* area of the *Load New Project* section, the location where uncompressed project files are to be stored can be chosen. The default file location is the internal flash.

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

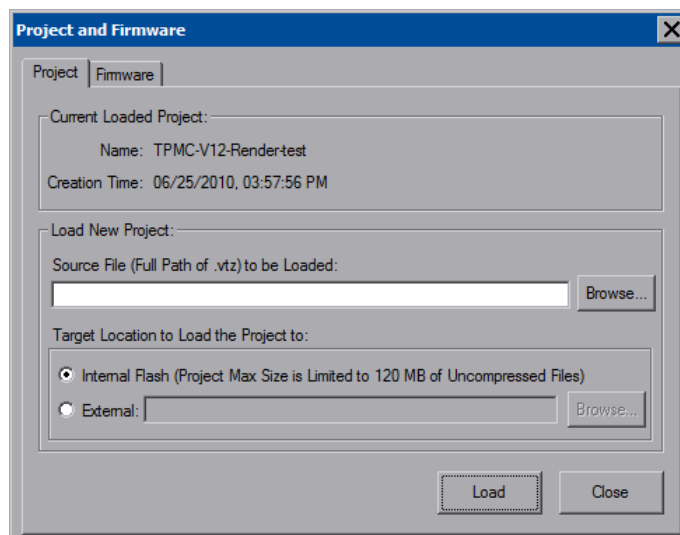
NOTE: When selecting **Browse**, the contents of the “Recent” folder are not available.

NOTE: Projects can also be loaded via Crestron Toolbox.

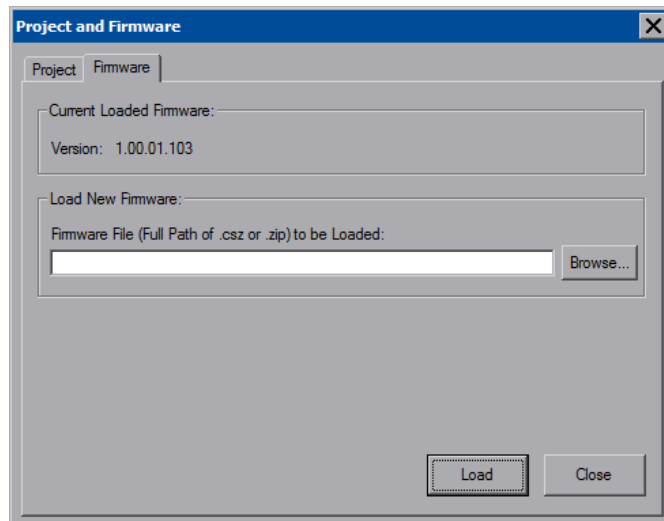
NOTE: If **External** is checked, the display list cannot be viewed via Crestron Toolbox.

NOTE: When loading a project to an external storage device (e.g. MMC card or flash drive), a subdirectory (not the root) must be used as the working path. Otherwise, the upload may fail.

“Project and Firmware” Window (Project Tab)



The *Firmware* tab of the “Project and Firmware” window (refer to illustration that follows) displays the *Current Loaded Firmware* and also has a *Load New Firmware* section.

“Project and Firmware” Window (Firmware Tab)

Current Loaded Firmware displays the version of the current firmware.

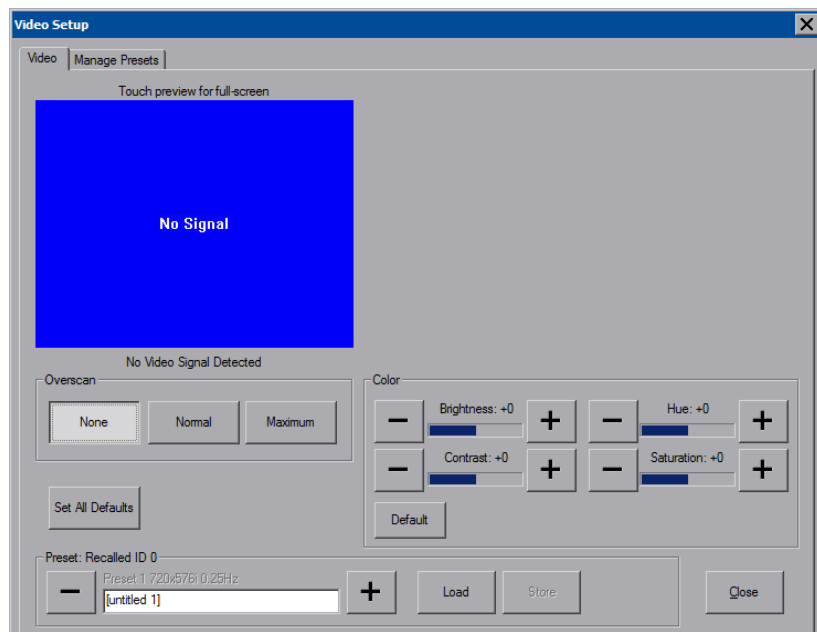
In the *Load New Firmware* section, touch **Browse** and select the firmware file (i.e., the .csz or .zip file) to be loaded from a network drive, USB device or flash drive. Touch **Load** to load the new firmware.

Video

Video input is selected and adjusted from this window. If it is not already selected, touch the *Video* tab to access the settings for the video input.

Video Setup

The setup screen for the video source is displayed in the following illustration. Changes are made in real time.

“Video Setup” Window (Video Tab)

Video is setup using the *Overscan* and *Color* controls (for *Brightness*, *Hue*, *Contrast* and *Saturation*).

Overscan

Overscan is the active image area in a video picture that is outside the edges of the display device. 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 overscan 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.

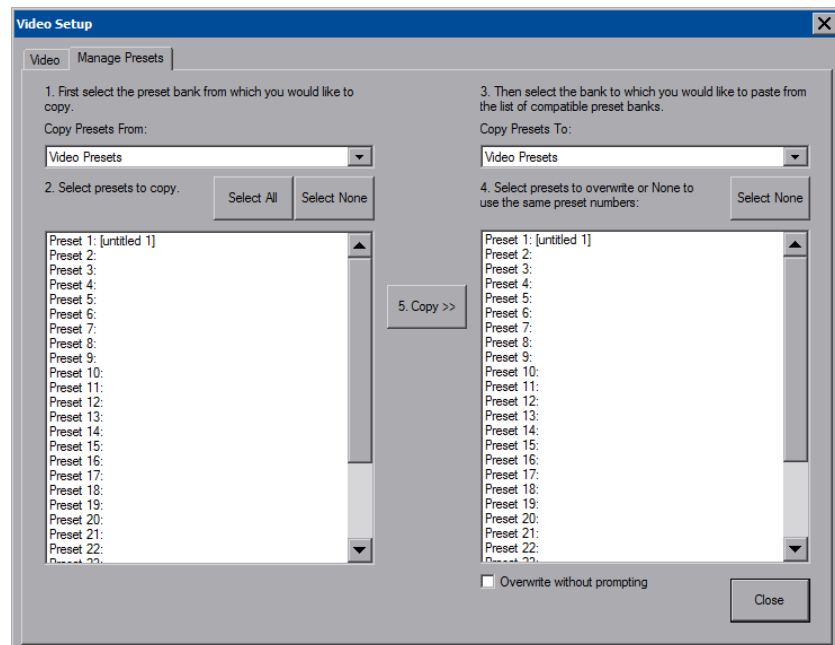
Presets

Up to 30 presets may be stored for future retrieval.

Manage Presets

Use the *Manage Presets* tab to copy presets for one source to other sources.

“Video Setup” Window (Manage Presets Tab)



Audio

Touch **Audio** to open the “Audio Setup” window, shown in the illustration that follows.

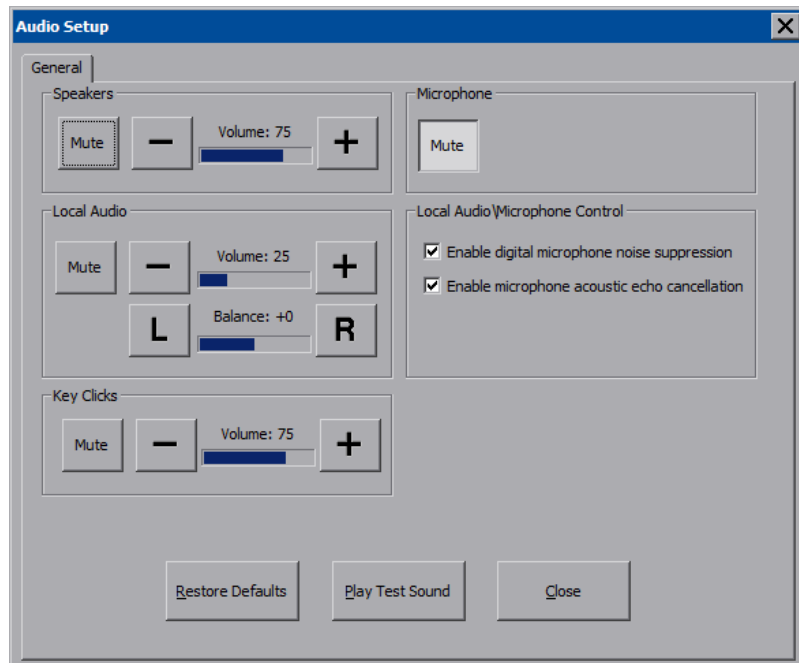
Volume controls and **Mute** buttons are available for *Speakers*, *Local Audio* and *Key Clicks*, as well as a **Mute** button for the *Microphone* input.

For *Local Audio/Microphone Control*, check boxes are provided to *Enable digital microphone noise suppression* and *Enable microphone acoustic echo cancellation*.

Touching **Play Test Sound** plays a short internal audio file.

Changes to audio settings are made in real time.

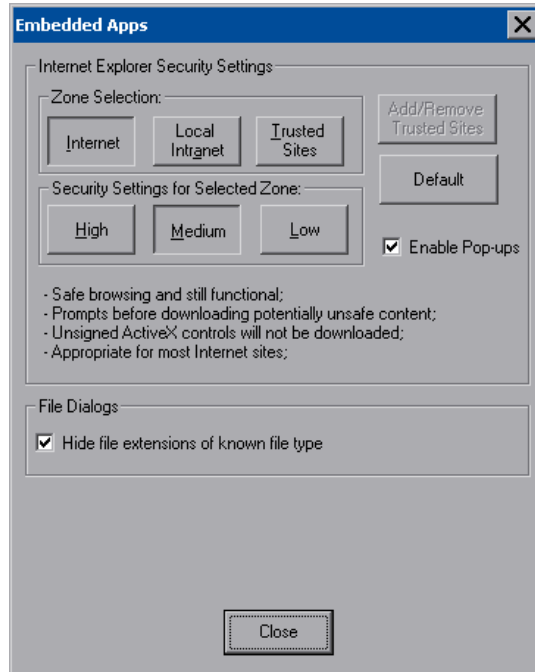
“Audio Setup” Window



Embed Apps (Embedded Applications)

Touch **Embed Apps** to open the “Embedded Apps” window, which permits setting 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 are not 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 that are absolutely trusted.

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

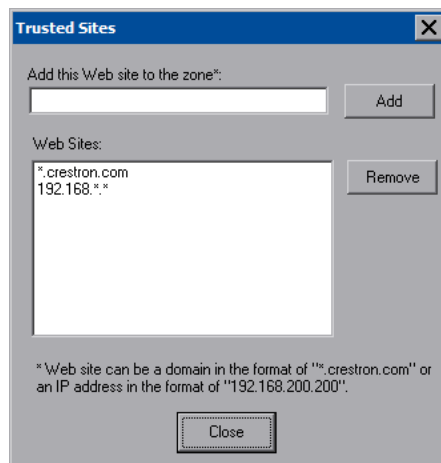
The “Embedded Apps” window also permits the user to enable the popup windows (child windows) that open when in Internet Explorer (not the popup windows of the embedded applications).

NOTE: Refer to the Crestron Web site (www.crestron.com), Online Help Answer ID 4190, for information on the latest versions of the software.

Touch **Close** after all changes have been made. The touch screen must be rebooted for changes to take effect. Touch **Save & Reboot**, located in the shutdown section of the setup menu.

A list of trusted sites can be created and edited by touching **Add/Remove Trusted Sites**. Touching this button opens 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, touch **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-V12/15, 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 the 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.


NOTE: The TPMC-V12/15 supports automatic connection to the VNC server when the VNC View application is opened. For automatic connection without having to enter the server location and password every time the VNC viewer is opened, launch the application and using a USB mouse, right-click on the VNC viewer window, then select **Save configuration info as...**

NOTE: Refer to the Crestron Web site, Online Help Answer ID 4627, for information on how to set up the VNC viewer. Refer to Answer ID 3345 for information on how to program the MJPEG viewer. Refer to Answer ID 4640 for information about the default paths for embedded applications and dynamic graphics.

NOTE: When using the embedded applications, only one document window can be open at a time. Opening a second document window causes the first document window to close.

ETHERNET Details

The Ethernet portion of the setup menu allows configuration of the touch screen settings for Ethernet communications.

The Crestron Swirl logo  at the top of the Ethernet portion of the setup menu illuminates to indicate the status of the connection to the control system(s):

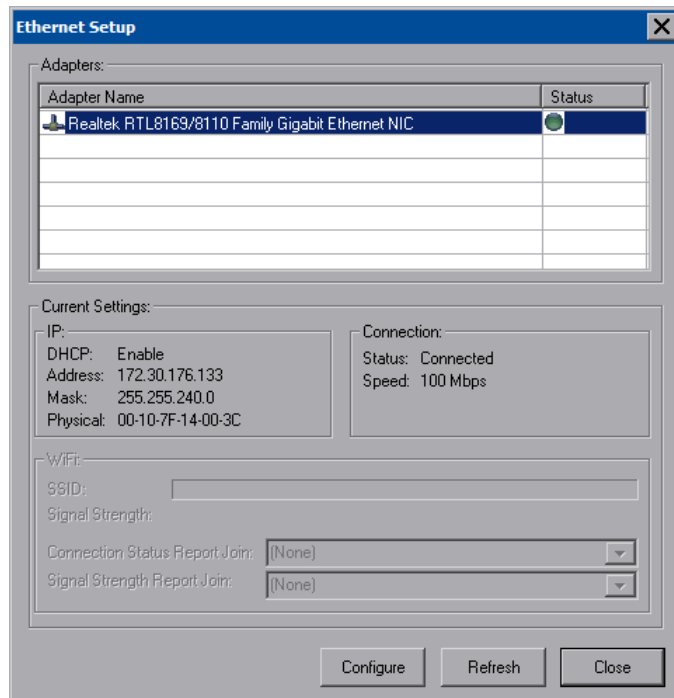
- Green Connected
- Yellow Network trouble
- Orange Connected to some but not all of the control systems (listed in IP table)
- Red Not connected to any control system (listed in the IP table)

NOTE: After configuring Ethernet settings (e.g. changing IP address, etc.), wait at least five seconds after seeing the change in the *Ethernet Status* section of the main setup menu before initiating a **Save & Reboot** to save the new settings.

Adapters

Touch the **Adapters** button to access the “Ethernet Setup” window, shown in the illustration below. 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

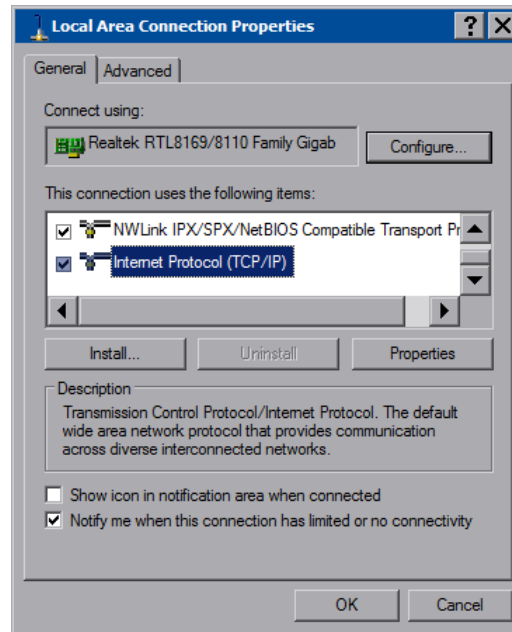


To configure the Ethernet adapter, touch its name once to select it in the *Adapter Name* list. Then, touch **Configure** to open the “Local Area Connection Properties” window. This window displays the connection and related required items.

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, touch **Configure**

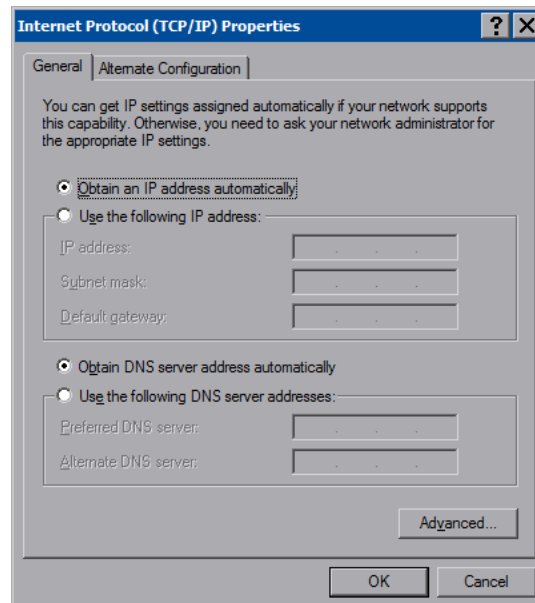
and modify the IP address, then touch **OK** (the user must return to the “Ethernet Setup” window). Touch **Configure** again, change authentication, then touch **OK**. The order in which modifications are performed does not matter.

“Local Area Connection Properties” Window



To establish dynamic or static processing, select **Internet Protocol (TCP/IP)** and touch **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 (called “octets”) 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.

NOTE: The TPMC-V12/15 ships with DHCP enabled.

Static IP addresses on a dedicated AV/control system allow the integrator to have a fixed/controllable network. This helps maintain communication stability between Ethernet devices.

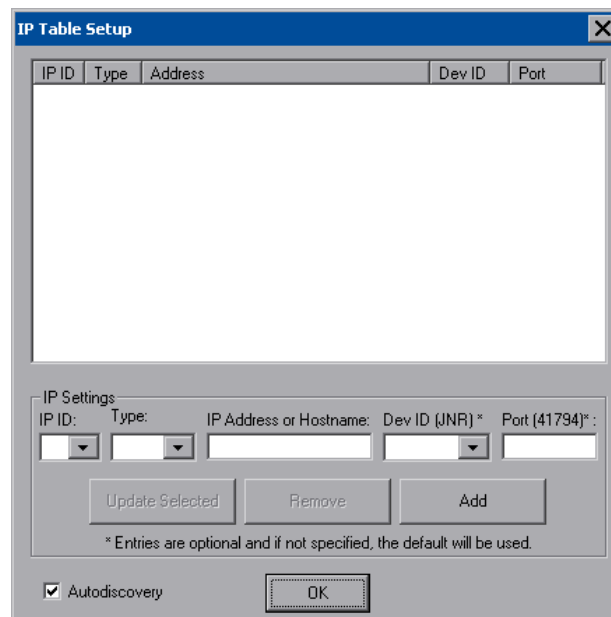
IP Table

Touch **IP Table** on the setup menu to open the “IP Table Setup” window.

Edit, remove or enter a control system’s IP address in the IP table to enable communication between the touch screen and a control system. The touch screen 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

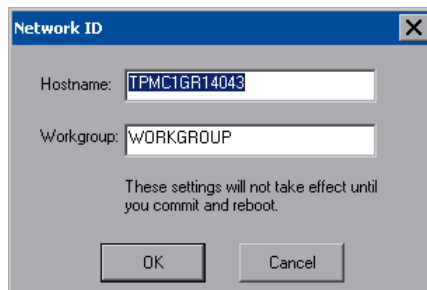


The IP ID is the ID number that is used to identify the touch screen in the control system’s IP table. The IP ID should match the IP ID set in the SIMPL Windows program.

Identity

Touch **Identity** to open the “Network ID” window. The “Network ID” window displays the hostname and workgroup that identify the touch screen 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

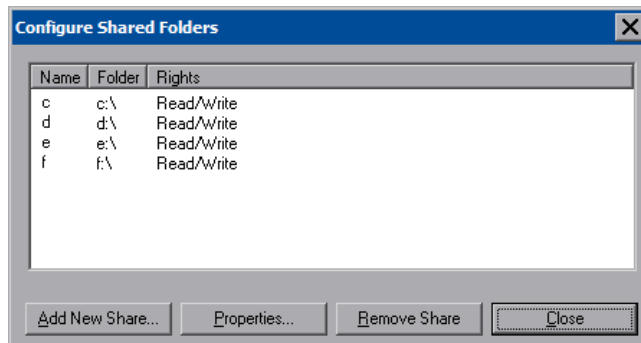


NOTE: The hostname is required for Ethernet communication.

Sharing

Touch **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 touch screen.

“Configure Shared Folders” Window



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

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

Standby Details

The *Standby* function turns off the backlight when the touch screen is inactive for a specified time. Use the **Up** and **Down** buttons to set the *Standby* from 0 through 120 minutes, where 0 disables the timeout. Touch the screen to reactivate the touch screen from standby mode. When the touch screen is reactivated, the last screen to be displayed reappears.

NOTE: The hard buttons still function when the touch screen is in standby mode but do not cause it to awaken from standby. The screen must be touched to reactivate the touch screen.

Screen Brightness Details

The *Screen Brightness* can be varied from 0 to 100. To increase the brightness, touch **Up**. To decrease the brightness, touch **Down**.

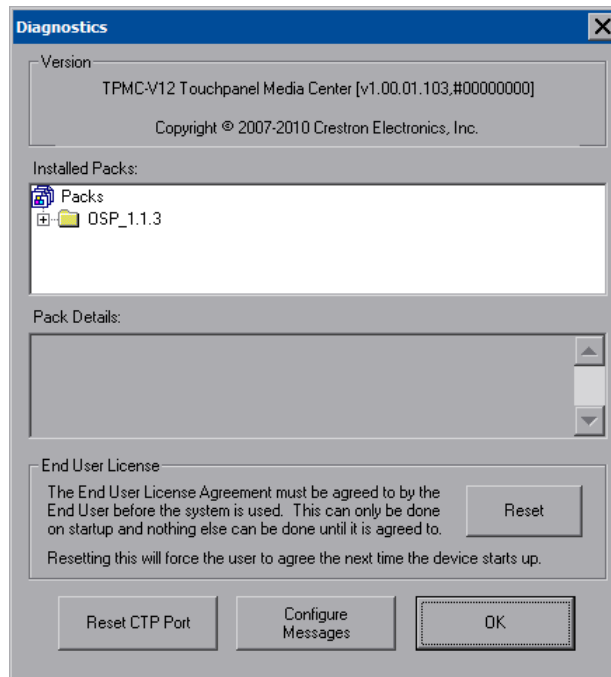
Misc. Controls Details

The *Misc. Controls* section of the setup menu contains the **Diagnostics** and **Keyboard** buttons.

Diagnostics

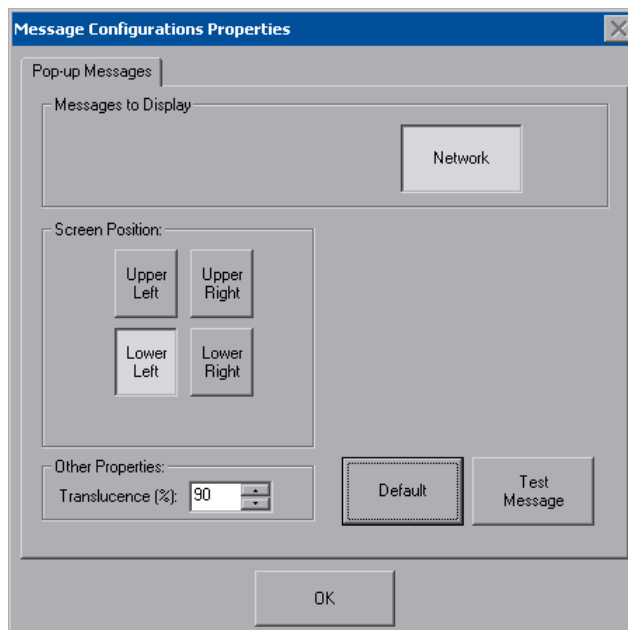
Touch **Diagnostic** to display the firmware version number, see *Installed Packs* and to reset the end user license from the “Diagnostics” window.

“Diagnostics” Window



Reset CTP Port resets the default value of the CTP port to 41795, for terminal connection using Crestron Toolbox.

To configure the appearance of popup messages, touch **Configure Messages**. The “Message Popup Configuration” window opens.

“Message Popup Configuration” Window

There are three types of **Network** popup messages. Following are definitions of each message type:

- **Connected:** A green popup message appears when the touch screen is connected to the control system.
- **Checking Connection:** A yellow popup message appears when the touch screen is experiencing network issues.
- **Disconnected, Trying to Reconnect...:** A red popup message appears when the touch screen loses connection with the control system.

A control for popup message *Translucence* is also provided. Translucence ranges from 25% to 100%, with a default value of 90%.

The **Default** button restores the original *Screen Position* and *Translucence* settings, as well as enabling display of *Network* messages. A **Test Message** button lets the user see the changes to popup message position and translucence. Touch **Close** to close the popup window.

NOTE: The default value for *Screen Position* is *Lower Left*.

Keyboard

Touch the **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)

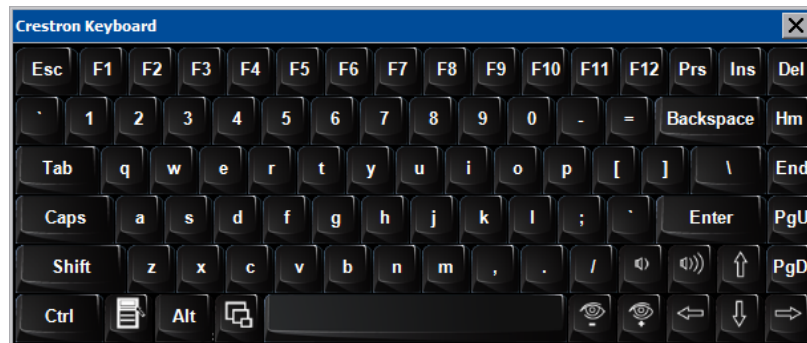


Keyboard translucence down: decreases keyboard translucence



Keyboard translucence up: increases keyboard translucence

On-Screen Keyboard



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

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

Exit the on-screen keyboard by selecting by touching the “X” close button in the upper right corner of the keyboard window. If the **Keyboard** button on the start menu is still visible, it can also be touched to exit the keyboard.

Hard Button Feedback Details

The *Hard Button Feedback* section of the setup menu provides visual feedback for a hard button press. Pressing a the hard button results in the icon on the screen illuminating in bright green.

Ethernet Status Details

The *Ethernet Status* section of the setup menu provides a *Link Status* light to indicate an Ethernet connection and displays the current IP and MAC addresses.

Save & Reboot and Shutdown Details

To save any changes and reboot the touch screen, touch **Save & Reboot**, located in the lower right section of the setup menu.

To turn off the touch screen, touch **Shut Down**, located in lower right section of the setup menu. This is the recommended method for shutting down the touch screen. After the touch screen has shut down, the power supply can be safely removed from the touch screen.

Exit Details

Touch **Exit** to leave the setup menu and return to the project. If no project has been loaded, the touch screen displays an error message and returns to the setup menu.

Hardware Hookup

Ventilation

The TPMC-V12/15 should be used in a well-ventilated area.

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

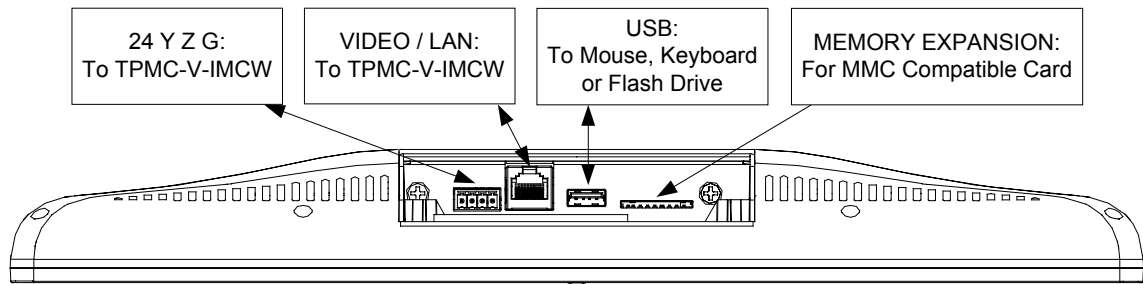
Connect the Device

The TPMC-V12/15 can be connected using the included TPMC-V-IMCW interface module or (if the video inputs provided by the TPMC-V-IMCW are not needed) it can be connected directly to a Crestron control system (sold separately).

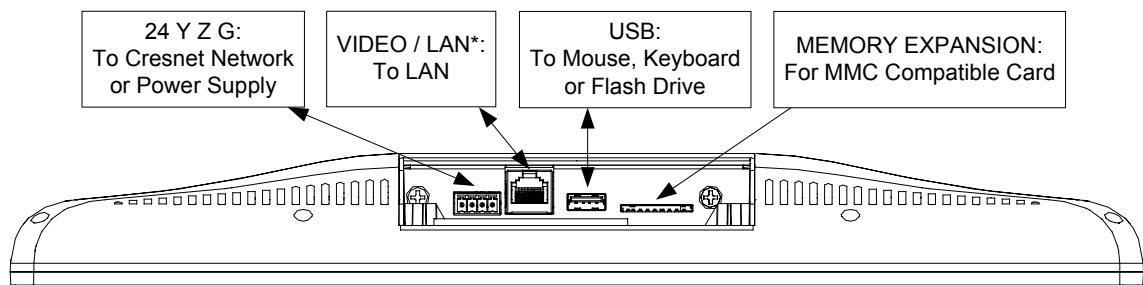
Make the necessary connections as called out in the illustration that follows this paragraph. Apply power after all connections have been made.

When making connections to the TPMC-V12/15, use Crestron power supplies for Crestron equipment.

Hardware Connections for the TPMC-V12/15 Using TPMC-V-IMCW (TPMC-V15 Shown)



Hardware Connections for the TPMC-V12/15 Without Using TPMC-V-IMCW (TPMC-V15 Shown)



* Negates video connectivity

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

NOTE: Direct connection of the TPMC-V12/15 to a Cresnet power source and Ethernet LAN, without the use of the TPMC-V-IMCW, negates video connectivity.

NOTE: For wiring between the TPMC-V12 and interface module, use a TPMC-V-CBL-S Siamese Cable, CresCAT, CresCAT-D-HP, CresCAT-QM, DM-CBL or quality CAT5e/CAT6. CAT5e/6 requires an additional CRESNET or CRESNET-HP for Cresnet and power or else a single wire pair for power only. The maximum length for CRESCAT-D-HP, CAT5e/6 + CRESNET-HP or CAT5e/6 + 14 AWG power wire is 330 feet (100 meters) minus the length of any Ethernet cable connected to the LAN jack on the rear of the interface module. The maximum length for CresCAT, CresCAT-QM, DM-CBL, CAT5e/6 + CRESNET or CAT5e/6 + 18 AWG power wire is 155 feet (47 meters) minus the length of any additional Ethernet cable beyond 175 feet (53 meters).

NOTE: For wiring between the TPMC-V15 and interface module, use a TPMC-V-CBL-S Siamese Cable, CresCAT, CresCAT-D-HP, CresCAT-QM, DM-CBL or quality CAT5e/CAT6. CAT5e/6 requires an additional CRESNET or CRESNET-HP for Cresnet and power or else a single wire pair for power only. The maximum length for CRESCAT-D-HP, CAT5e/6 + CRESNET-HP or CAT5e/6 + 14 AWG power wire is 330 feet (100 meters) minus the length of any Ethernet cable connected to the LAN jack on the rear of the interface module. The maximum length for CresCAT, CresCAT-QM, DM-CBL, CAT5e/6 + CRESNET or CAT5e/6 + 18 AWG power wire is 148 feet (45 meters) minus the length of any additional Ethernet cable beyond 182 feet (55 meters).

NOTE: Be sure to set Cresnet to *Disable* when using Ethernet. Refer to “Cresnet” on page 31 for details.

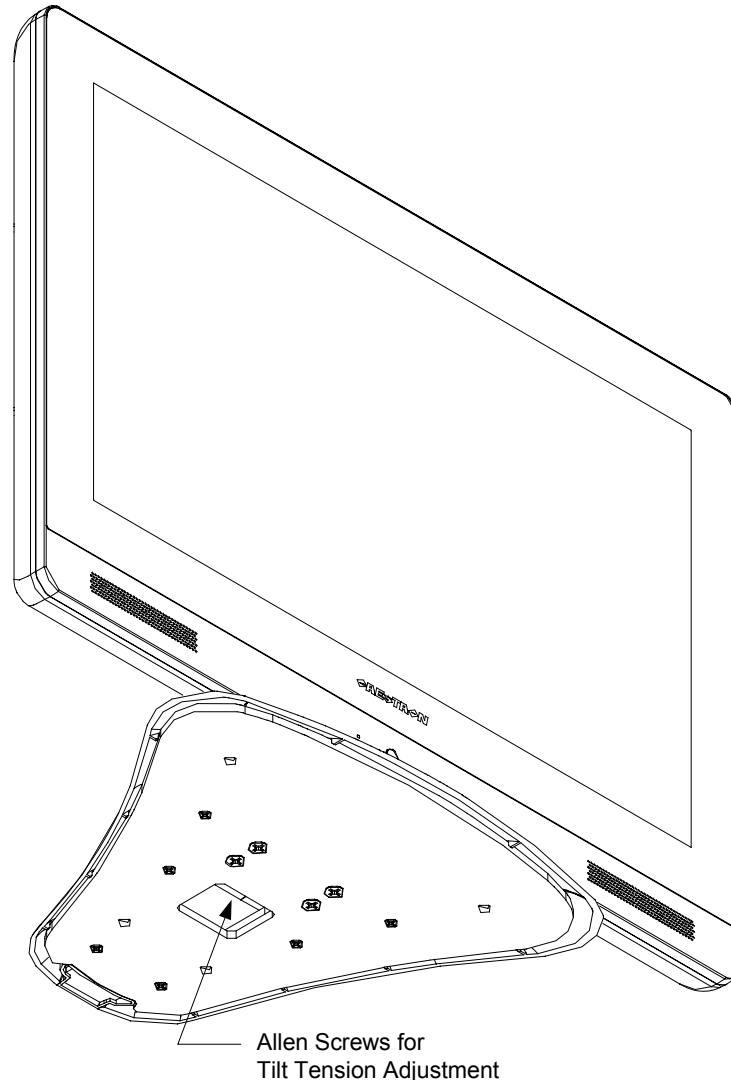
NOTE: When booting the TPMC-V12/15, the only USB devices supported are a keyboard or mouse. Having a USB drive or hub connected interferes with proper booting of the touch screen.

NOTE: After inserting a USB device or MMC card, a “Found New Hardware” window may appear. If this window appears, click “Yes” to close the window.

Tilt Tension Adjustment

Tilt tension on the TPMC-V12 and TPMC-V15 is preset at the factory to allow the screen to be tilted anywhere within its 35 degree tilt range and maintain its position during use. To tighten tilt tension or to fix the screen at a given tilt position, use the three Allen screws accessed through the hole in the touch screen base, as shown in the following illustration.

Position of Allen Screws for Tilt Tension Adjustment



Recommended Cleaning

Keep the surface of the touch screen free of dirt, dust or other materials that could degrade optical properties. Long-term contact with abrasive materials can scratch the surface, which may detrimentally affect 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 touch screen. Wipe touch screen 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 Web site. To post a question or view questions submitted to Crestron’s True Blue Support, log in at www.crestron.com/onlinehelp. First-time users must establish a user account to fully benefit from all available features.

Software Requirements for the PC

NOTE: The latest software can be downloaded from the Crestron Web site (www.crestron.com/software).

Crestron provides an assortment of Windows®-based software tools to develop a customized system. Use SystemBuilder™ or SIMPL Windows to create a program to control the TPMC-V12/15.

Programming with Crestron SystemBuilder

SystemBuilder is a comprehensive programming environment. Appropriate for most systems, it can quickly and easily generate a complete working program including both control processor logic and touch screen graphics.

Programming with SIMPL Windows

NOTE: While SIMPL Windows can be used to program the TPMC-V12/15, it is recommended to use SystemBuilder for configuring a system.

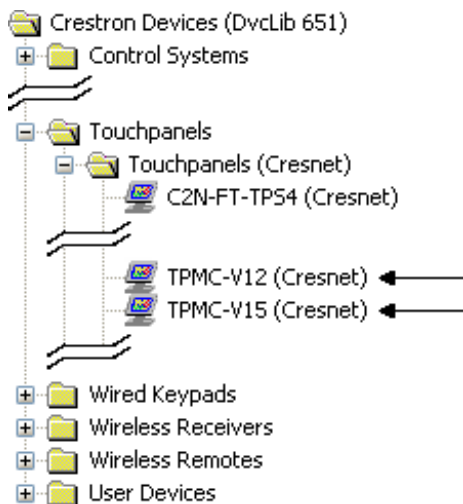
SIMPL Windows is Crestron’s premier software for programming Crestron control systems. It is organized into two separate but equally important “Managers”: Configuration and Program.

Configuration Manager

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

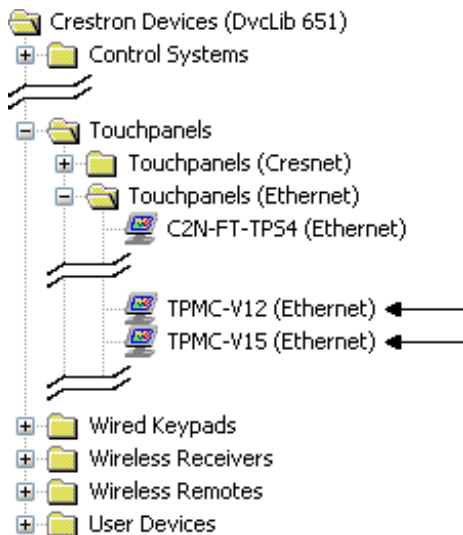
1. The TPMC-V12/15 must first be incorporated into the system.
 - a. To incorporate the TPMC-V12/15 (Cresnet) into the system, drag the TPMC-V12/15 from the Touchpanels | Touchpanels (Cresnet) folder of the *Device Library* and drop it in the *System Views*.

Locating the TPMC-V12/15 (Cresnet) in the Device Library



- b. To incorporate the TPMC-V12/15 (Ethernet) into the system, drag the TPMC-V12/15 from the Touchpanels | Touchpanels (Ethernet) folder of the *Device Library* and drop it in the *System Views*.

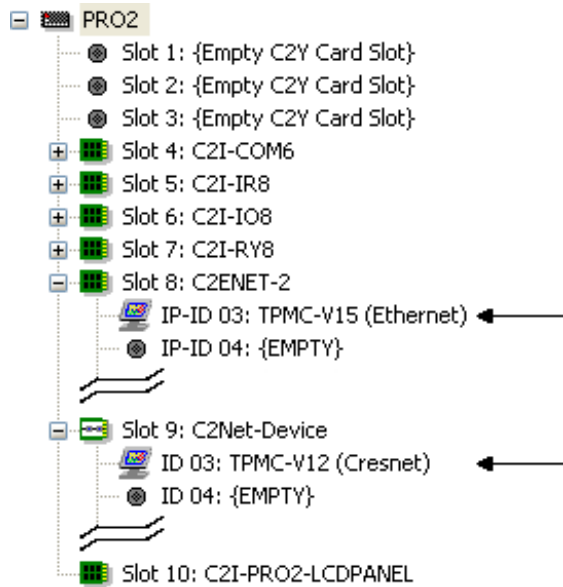
Locating the TPMC-V12/15 (Ethernet) in the Device Library



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

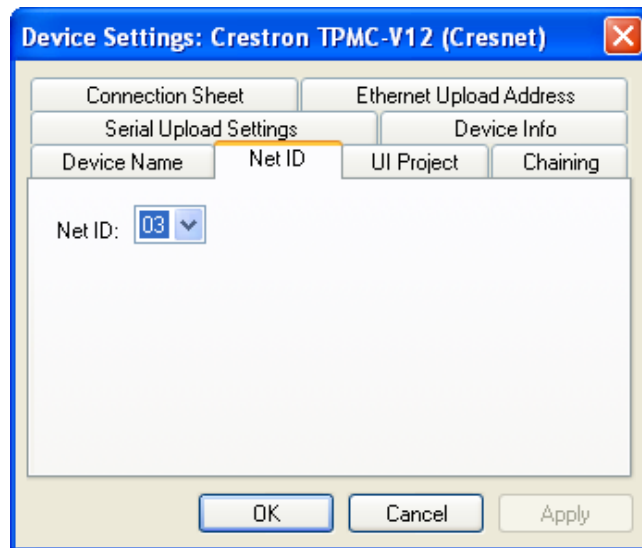
NOTE: In the following illustration, there is both an Ethernet device in Slot 8 and a Cresnet device in Slot 9. It is possible to have both types of device attached to a control system as long as the control system has either a built-in or expansion Ethernet interface. If Cresnet operation is desired, the IP table for the TPMC-V12/15 must be empty.

C2ENET-2 and C2Net Devices, Slot 8 and 9

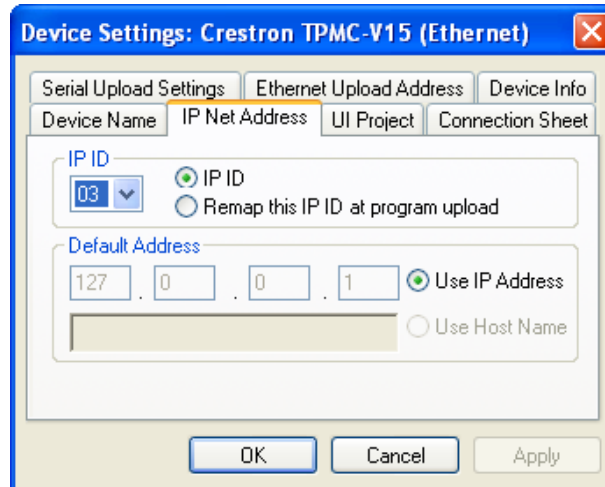


2. If additional TPMC-V12/15 devices are to be added, repeat step 1 for each device. Each TPMC-V12/15 is assigned a different Net ID or IP ID number as it is added.
3. If necessary, double click a device to open the “Device Settings” window and change the Net ID or IP ID, as shown in the following figure(s).

“Device Settings: Crestron TPMC-V12/15 (Cresnet)” Window (TPMC-V12 Shown)



*“Device Settings: Crestron TPMC-V12/15 (Ethernet)” Window
(TPMC-V15 Shown)*



NOTE: The ID code specified in the SIMPL Windows program must match the Net ID or IP ID of each unit. Refer to “Identity Code” on page 26.

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

Touch screen pages should be created in Crestron VisionTools® (VT 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-V12/15 in a room control system.

Multi-Mode Objects

Multi-mode objects offer high-performance programming!

The single most advanced VT Pro-e high performance programming technique involving the TPMC-V12/15 is the concept of multi-mode objects. A multi-mode object (i.e., button, legend, etc.) is an object drawn on a VT 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 VT Pro-e touch screen files and SIMPL Windows files that illustrate the high-performance capabilities of multi-mode objects.

WAV File Audio Messages

The TPMC-V12/15 touch screens 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. 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-V12/15 touch screens only accept the following WAV file formats: **PCM, 8 and 16 bit, 8 – 44.1kHz, mono and stereo**. 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 VT Pro-e to learn how to use its audio tool, Sound Manager, to attach WAV files to a touch screen 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 touch screen directly or may be edited with the Sound Recorder. For example, the individual files can be combined to create custom messages.

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

Bit Depth and File Size

A balance of performance and quality can be achieved by using VT Pro-e to configure the size of graphics in a project. Read this section to learn about bit depth and how to maximize the quality and performance of a TPMC-V12/15 project.

Bit depth refers to the number of memory bits used to store color data for each pixel in a raster image. A touch screen 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. The 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 touch screens, 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.), a sophisticated project can be created

that fits in the memory space provided while the touch screen remains very responsive.

Relationship of Bits to Colors

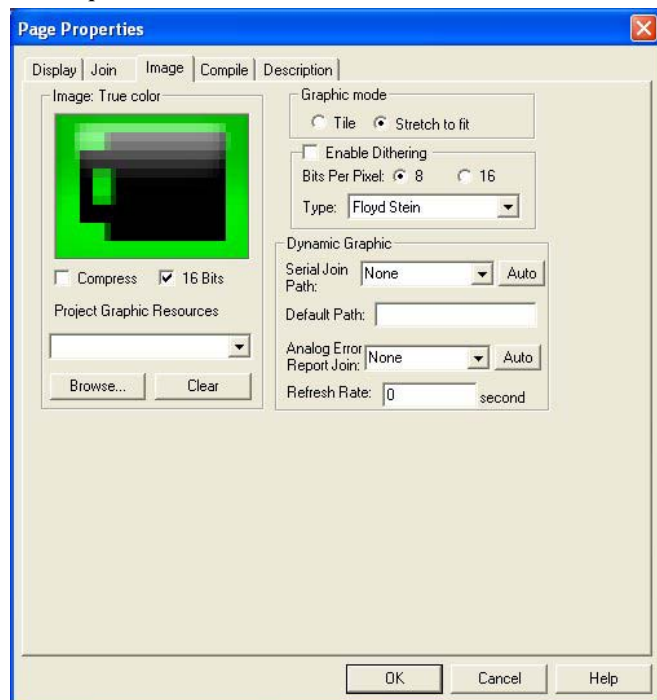
NUMBER OF BITS	NUMBER OF COLORS
1 bit	Black and White
2 bits	4 Colors
4 bits	16 Colors
8 bits	256 Colors
16 bits	65,536 Colors (Highcolor)
24 bits	16.7 million Colors (Truecolor)
32 bits	16.7 million Colors plus Transparency

When creating a VT Pro-e project, the image size can be compressed and reduced in the “Page Properties” dialog box for the entire page. The image size can also be compressed and reduced using the “Image Properties” dialog box. A reduction in image size saves a considerable amount of memory space for the project.

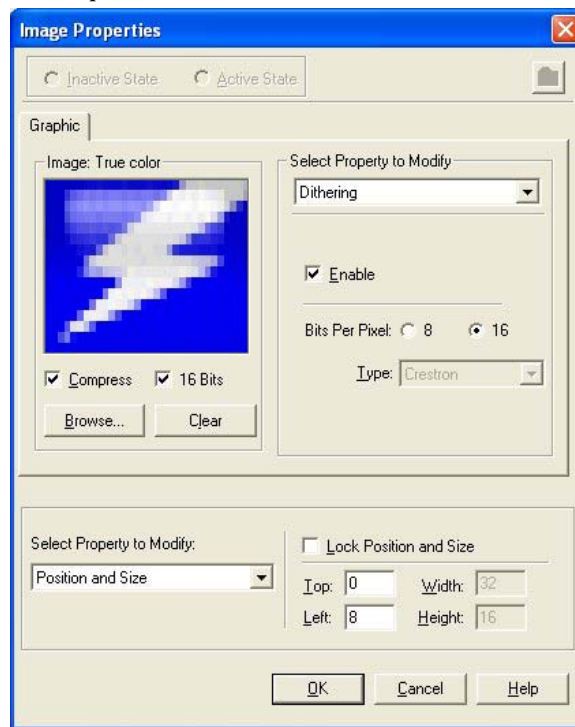
In VT Pro-e, the **Compress** checkbox permits the image to be compressed when compiling. The **16 Bits** checkbox converts a 24-bit or 32-bit image to 16 bits. This conversion to a 16-bit image may cause the loss of some subtle shading. To compensate for this, use the dithering to simulate the original shading. Check the image with each of the available dithering types to determine which delivers the best quality image.

Dithering type selection can be accessed from the “Page Properties” or “Image Properties” dialog boxes in VT-Pro-e. Refer to the following illustrations.

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



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



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 touch screen firmware changes are required in either case.

Indirect text on a button is entered in VT 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 can not be compiled correctly in SIMPL Windows. In other words, Chinese characters cannot be interspersed with numbers. Enter Chinese characters or numbers in separate strings or pad each number with “\x00” to make it multibyte and then combine it with Chinese characters in the same string.

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

Additional Language Fonts

The TPMC-V12/15 has fonts in several languages built into the touch screen. These fonts do not use extra project memory and they are rendered at the highest fidelity. Other languages may be used as well but they use project memory.

The fonts for the following languages are built into the touch screen.

- Arabic
- Chinese Simplified
- Chinese Traditional
- Croatian
- Czech
- Danish
- Dutch
- English
- Estonian
- Finnish
- French
- German
- Greek
- Hebrew
- Hungarian
- Icelandic

- Indonesian
- Italian
- Japanese
- Korean
- Latvian
- Lithuanian
- Norwegian
- Polish
- Portuguese
- Romanian
- Russian
- Serbian
- Slovak
- Slovenian
- Spanish
- Swedish
- Turkish

Embedded Applications

NOTE: Installations and downloads from within embedded applications are not supported by the TPMC-V12/15.

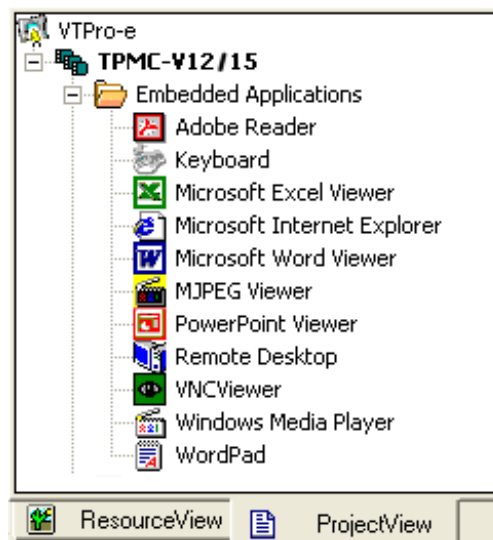
A number of third-party or in-house applications are embedded in a VT Pro-e TPMC-V12/15 project. (Refer to illustration on the following page.)

- Adobe Reader
- Keyboard
- Microsoft Excel Viewer
- Microsoft Internet Explorer
- Microsoft Word Viewer
- MJPEG Viewer
- PowerPoint Viewer
- Remote Desktop
- 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-V12/15 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



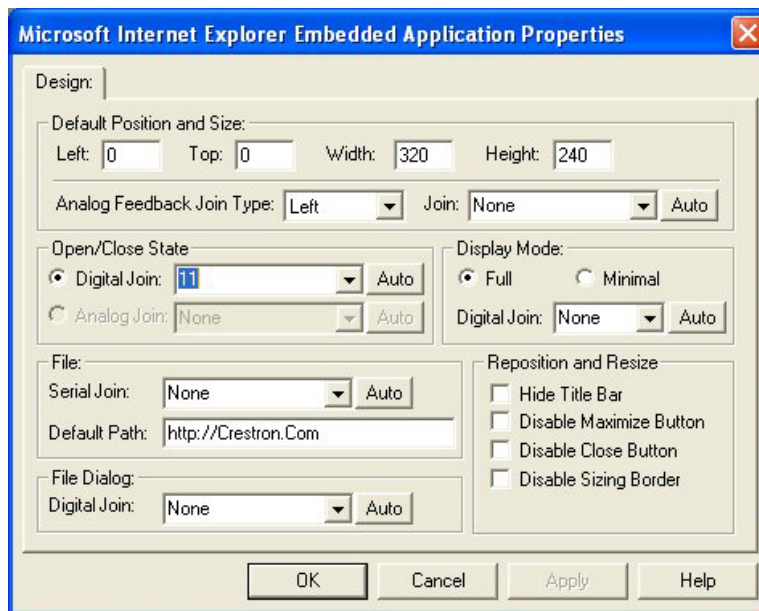
Right-click on any of the applications in the *Project View* and select **Properties** to open the “Embedded Application Property” window (refer to the illustration on the following page). This window permits a choice of positions on the screen, assignment of an analog touch join type and number and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

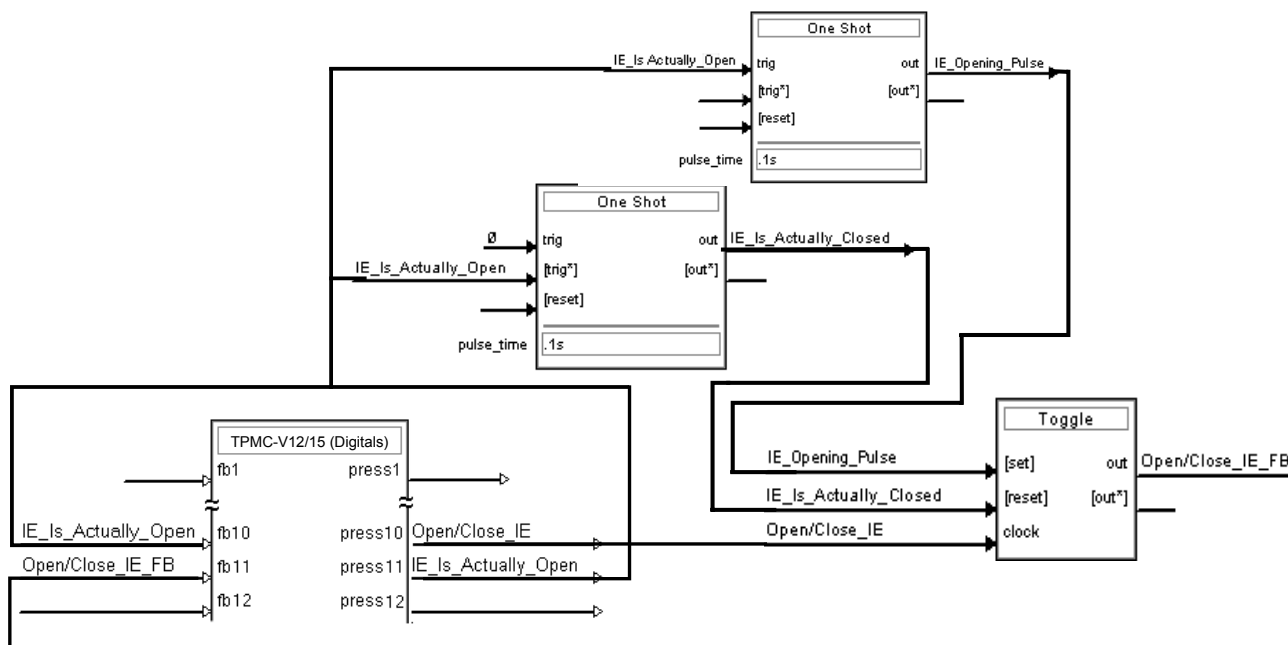
Edit the *Default Position and Size* in the “Embedded Application Properties” window to point to the new location.

Sample of an “Embedded Application Properties” Window



Programming Embedded Windows Applications

The following diagram is an example of a basic SIMPL program that enables opening/closing 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. Press10 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 gets 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**> goes 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 Press11 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 touch screen itself.

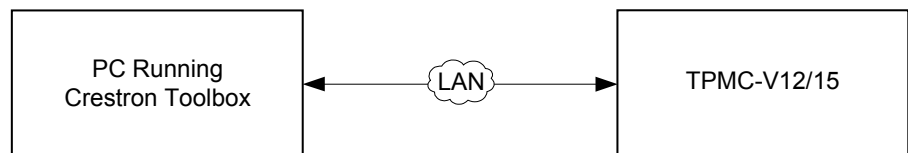
Uploading and Upgrading

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-V12/15; refer to the Crestron Toolbox help file for details. There is a single method of communication: TCP/IP communication.

Ethernet Communication



The TPMC-V12/15 connects to PC via Ethernet:

1. Confirm Ethernet connection between TPMC-V12/15 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.
2. Use the Device Discovery Tool in Crestron Toolbox to detect all Ethernet devices on the network and their IP configuration. The tool is available in Toolbox version 1.15.143 or later.
3. Use the Address Book in Crestron Toolbox to create an entry for the TPMC-V12/15 with the TPMC-V12/15's TCP/IP communication parameters.
4. Display the "System Info" window (click the **i** icon) and select the TPMC-V12/15 entry from the Address Book or the Address Book drop-down menu.

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 Web site 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, VT 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.

VT Pro-e

Upload the VT Pro-e file to the touch screen using VT Pro-e or Crestron Toolbox.

Firmware

Check the Crestron Web site 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-V12/15 firmware via Crestron Toolbox.

1. Establish communication with the TPMC-V12/15 and display the “System Info” window.
2. Select **Functions | Firmware...** to upgrade the TPMC-V12/15 firmware.

NOTE: Projects and firmware can also be loaded via a USB flash drive or MMC drive.


Program Checks

Actions that can be performed on the TPMC-V12/15 vary depending on whether it is connected via Cresnet or Ethernet.

Cresnet Connections

For Cresnet connections, using Crestron Toolbox, display the network device tree (**Tools | Network Device Tree View**) to show all network devices connected to the control system. Right-click on the TPMC-V12/15 to display actions that can be performed on the TPMC-V12/15.

Ethernet Connections

For Ethernet connections, using Crestron Toolbox, display the “System Info window (click the  icon) and select the **Functions** menu to display actions that can be performed on the TPMC-V12/15.

Be sure to use Crestron Toolbox to create the TPMC-V12/15 IP table.

1. Select **Functions | IP Table Setup**.
2. Add, modify or delete entries in the IP table. The TPMC-V12/15 can have only one IP table entry.
3. 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-V12/15. The entry should list the TPMC-V12/15’s IP ID (specified on the TPMC-V12/15’s IP table) and the internal gateway IP address 127.0.0.1.

Restore

The `restore` console command restores the TPMC-V12/15 to its original factory default settings and also restores the original version of the firmware.

NOTE: Use of the `restore` console command requires all service packs to be re-installed as well.

Operation – Security Infrastructure

Since the TPMC-V12/15 does not use a traditional hard drive but rather an image that is restored every time the touch screen 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-V12/15 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 window 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 Web site.
4. Email Viruses
There is no e-mail client installed on the TPMC-V12/15, so email-based viruses cannot be executed.
5. Viruses that attack web/FTP servers
The TPMC-V12/15 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-V12/15 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-V12/15.
7. ActiveX and Java
The TPMC-V12/15 has ActiveX disabled and has no Java Virtual Machine installed. These applets cannot run on the TPMC-V12/15.

NOTE: While browsing the Internet with the TPMC-V12/15, 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 the system administrator.” If this message appears, checking *Enable Pop-ups* in the “Embedded Apps” window (refer to “Embed Apps (Embedded Applications)” which starts 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-V12/15 Troubleshooting

TROUBLE	POSSIBLE CAUSE(S)	CORRECTIVE ACTION
Touch screen does not function.	Touch screen is not communicating with the network.	Use Crestron Toolbox (via SIMPL Windows or VT Pro-e) to poll the network. Verify network connection to the touch screen.
	Touch screen is incorrectly calibrated.	Enter the setup menu or use Crestron Toolbox to initiate the calibration sequence and recalibrate. (Refer to "Touch Screen" which starts on page 32.)
Touch screen is not responding.	Incorrect network wiring.	Touch the screen to remove any message and verify correct wiring to all connectors.
	Touch screen 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 touch screen is properly set to match the Net ID in the SIMPL program.
	Touch screen 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.
Touch screen display is dark.	Standby timeout has elapsed.	Touch the screen to reactivate.
	Screen brightness is improperly set.	Adjust screen brightness from the "Video Setup" menu. (Refer to "Video Setup" which starts on page 35.)
Unexpected response from the touch screen.	Touch screen is incorrectly calibrated.	Enter the setup menu or use Crestron Toolbox to initiate the calibration sequence and recalibrate. (Refer to "Touch Screen" which starts on page 32.)
Video window on touch screen has no display.	Improper video connection.	Verify proper connections on the touch screen.
	Incorrect video cable used.	Verify that the correct video cable is being used.

(Continued on following page)

TPMC-V12/15 Troubleshooting (Continued)

TROUBLE	POSSIBLE CAUSE(S)	CORRECTIVE ACTION
Video window on touch screen has no display. (Continued)	Incorrect VT Pro-e project file loaded.	Make sure that video window object resides in project, re-compile and reload.
Communications via the LAN port is not functioning.	Improper Ethernet connection (IEC).	Verify proper connection at touch screen LAN port.
	Incorrect touch screen selected in SIMPL Windows.	Select “Touchpanel (Ethernet)” instead of “Touchpanel (Cresnet)”.
	Another device set to the same IP address.	Obtain new touch screen 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 touch screen to confirm communication. If it is good, confirm hub port by testing with another Ethernet device.

Check Network Wiring

Use the Right Wire

To ensure optimum performance over the full range of the installation topology, use Crestron Certified Wire only. 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. 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 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 (101 meters). If Cresnet HP is used for the same run, its length could extend to 1250 feet (381 meters).

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

Strip and Tin Wire

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

Add Hubs

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

Reference Documents

The latest version of all documents mentioned within the guide can be obtained from the Crestron Web site (www.crestron.com/manuals).

List of Related Reference Documents

DOCUMENT TITLE
2-Series Control Systems Reference Guide
Crestron e-Control Reference Guide
TPMC-V12-WALL, V12-WALL & WMKC-V12 Wall Mount Kits
TPMC-V15-WALL, V15-WALL & WMKC-V15 Wall Mount Kits

Further Inquiries

To locate specific information or resolve questions after reviewing this guide, contact Crestron's True Blue Support at 1-888-CRESTRON [1-888-273-7876] or refer to the listing of Crestron worldwide offices on the Crestron Web site (www.crestron.com/offices) for assistance within a particular geographic region.

To post a question about Crestron products, log onto the Online Help section of the Crestron Web site (www.crestron.com/onlinehelp). First-time users must 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-V12/15, additional information may be made available as manual updates. These updates are solely electronic and serve as intermediary supplements prior to the release of a complete technical documentation revision.

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

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; touch screen 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.

Crestron software, including without limitation, product development software and product operating system software is licensed to Crestron dealers and Crestron Authorized Independent Programmers (CAIPs) under a limited non-exclusive, non-transferable license pursuant to a separate end-user license agreement. The terms of this end user license agreement can be found on the Crestron Web site at www.crestron.com/legal/software_license_agreement.

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.



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

Operations Guide – DOC. 6940C
(2027403)
08.12
Specifications subject to
change without notice.