Crestron **TPMC-4SM**
Isys i/O® 4.3” Wall Mount Touchpanel Media Center
Operations & Installation Guide

CRESTRON®

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

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

Regulatory Compliance

As of the date of manufacture, the TMC-4SM has 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

Operation is subject to the following two conditions:

1. This device may not cause interferecne, and
2. This device must accept any interference, including interference that may cause undesired operation of the device.

Contents

Isys i/O® 4.3” Wall Mount Touchpanel Media Center: TPMC-4SM

Introduction

With its clean, contoured appearance, the Isys i/O® TPMC-4SM Wall Mount Touchpanel Media Center makes an elegant statement in any environment. Perfectly at home in the most modern office building, hotel or residence, its high tech good looks underline its power for simplifying everyday tasks and functions throughout any facility, all in a very affordable device that is versatile and easy to install.

An incredibly thin profile and small footprint allow the TPMC-4SM to be installed in places other touchpanels just cannot go, providing the choice of mounting to a standard electrical box or to virtually any flat surface, even glass, granite or marble. A table top enclosure is also available, affording a very stylish, space saving solution for placement on a desktop or bedside table. Complete connectivity is provided through a single high-speed Ethernet connection, containing all control, video, intercom and power signals within a single wire.

The TPMC-4SM packs the latest Crestron® digital touchpanel technology, delivering amazing new graphics capabilities, plus streaming video and 2-way IP intercom. Other new features include dual-color backlit buttons, built-in proximity sensor, PoE (Power over Ethernet) network power, occupancy sensor inputs and out-of-the-box room scheduling capability for use with Crestron RoomView® Server Edition room management software.

Features and Functions

- Modern, contoured appearance
- Thin profile and small footprint
- Affordable and easy to install
- 4.3” widescreen color touchscreen
- 16-bit Isys i/O® graphics
- 800 x 480 resolution
- DNav dynamic menu objects

(Continued on following page)

Features and Functions (Continued)

- Streaming video
- Crestron® IP intercom
- WAV file audio feedback
- Built-in microphone and speaker
- Built-in proximity sensor
- 10 optional "hard key" pushbuttons
- Dual color button backlighting and feedback
- Engravable button text
- RoomView® *Room Scheduling* mode
- Room occupancy sensor option
- Single wire Ethernet connectivity
- PoE network powered
- Available in gloss black or white
- Fits in a horizontal 1-gang or Euro electrical box
- Available tabletop and multi-surface mount kits

Widescreen Touchpanel

Fully custom touchpanel versatility is afforded through a brilliant 4.3" widescreen format touchscreen, displaying stunning 16-bit color graphics and video. Dynamic graphics and text capability enable the display of all kinds of useful data and alluring eye candy, from AV controls and icons to room temperature and lighting levels, to photos and video, to digital media playlists complete with metadata and cover art.

Crestron exclusive DNav technology enables system programmers to produce amazing graphics faster and easier using advanced dynamic control menus and 3D effects. Full-motion animations, multimode objects, PNG translucency, transition effects and streaming video enhance the palette for creating GUIs that are both eye catching and easy to use.

Dual Color Backlit Buttons

The TPMC-4SM comes standard with 10 programmable "hard key" pushbuttons for quick access to commonly used functions. Discrete red and green LEDs behind each translucent button afford enhanced multi-state feedback capability for clear status indication of each button function. The LEDs may also be set to provide dimmable backlighting of the buttons, with independent control over the left and right columns, for a custom appearance and enhanced visibility.

Customized labeling of the covers surrounding the pushbuttons can be attained simply using Crestron Engraver software. For a clean appearance, either column of buttons may be removed and covered using the no-button covers provided.

Room Scheduling Mode

The TPMC-4SM works directly with our RoomView® Server Edition room management software to provide a powerful enterprise-wide room scheduling solution. Installed outside the entrance to every meeting room, the TPMC-4SM provides an immediate view of each room's availability, with the ability to look up the calendar for any room on the network and even book the room right on the spot. The dual color buttons give a clear indication of a room's status at a glance, lighting green when the room is available and red when it is in use. The touchpanel's contoured shape assures that even when mounted in a narrow hallway, the buttons remain clearly visible at a distance to either side.

For more information, refer to the latest version of the Crestron RoomView Server Edition Installation Guide (Doc.6543), which is available from the Crestron website at www.crestron.com/manuals.

Occupancy Sensing

Crestron GLS-series room occupancy sensors can be connected directly to the TPMC-4SM to allow automation of the room's lighting, climate control and other devices. In *Room Scheduling* mode, the sensors allow RoomView to detect when no one has shown up for a scheduled meeting, so even if the meeting is not cancelled or rescheduled by its host, the calendar can be updated automatically to make the room available to other users.

Proximity Sensor

The TPMC-4SM senses as you approach it, waking its display automatically without having to touch the screen so it is always ready for use.

Streaming Video

An onboard streaming video player makes it possible to monitor a security camera or preview a DVD or television channel, right on the touchscreen display. Native support for the motion JPEG streaming format allows the TPMC-4SM to display live video from a variety of Web cameras and servers including the Crestron CEN-NVS100 Network Video Streamer (sold separately).

IP Intercom

Built-in IP intercom capability facilitates direct panel to panel intercom and monitoring right over the LAN without requiring any additional AV wiring. The TPMC-4SM features an integrated microphone and speaker for clear speech communication.

Audio Feedback

Customized WAV files can be loaded on the TPMC-4SM to add dimension to its touchscreen graphics using personalized sounds, button feedback and voice prompts.

Single Wire Connectivity

A simple Ethernet LAN connection is all that is required to wire the TPMC-4SM, enabling seamless communication with Crestron control systems, computers, video servers and other touchpanels.

Power over Ethernet

The TPMC-4SM gets its power right through the LAN wiring using 802.3af PoE (Power over Ethernet) technology. PoE eliminates the need for a local power supply or any dedicated power wiring. A PoE Injector (PWE-4803RU, sold separately) simply connects inline with the LAN cable, allowing for installation at any convenient location. For applications with multiple TPMC-4SMs or other PoE-powered devices, a Crestron 5-port PoE switch (CEN-SW-POE-5, sold separately) may be used, allowing up to four devices to be powered from a single location.

Simple, Versatile Mounting

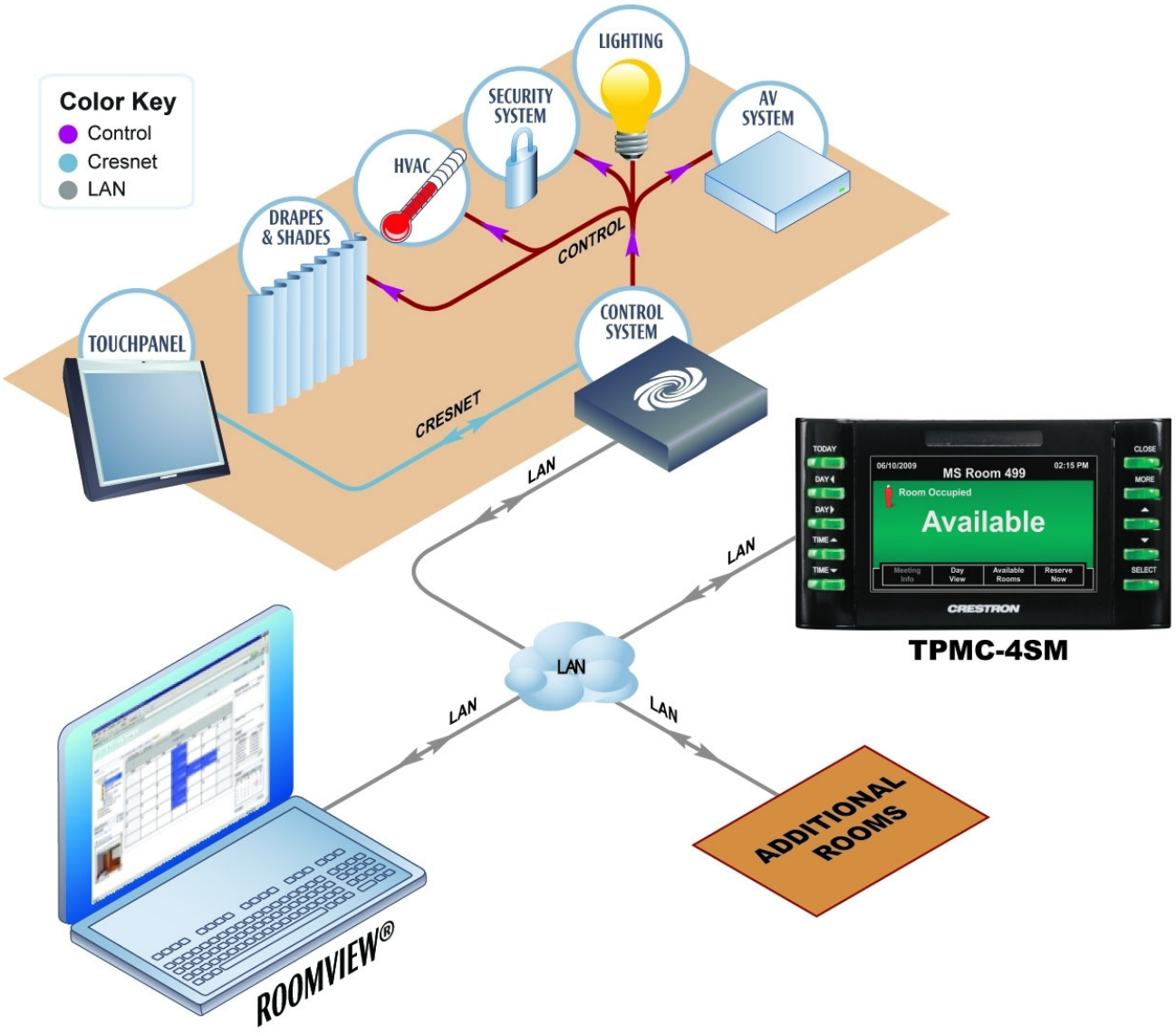
The TPMC-4SM installs easily on virtually any mounting surface. As standard, it mounts directly to a single-gang electrical box (horizontally oriented) or European electrical box, requiring just 1/2 inch mounting depth while protruding less than 3/4

inch from the wall surface. For impenetrable surfaces, such as decorative glass, granite, marble, plaster, smooth stone and masonry, Crestron offers the MSMK-4SM Multi-Surface Mount Kit (sold separately), providing a very versatile mounting solution complete with a low-profile rear shell enclosure, adhesive mounting plate, optional angle bracket and wire raceway. The TTK-4SM Table Top Kit (sold separately) converts the TPMC-4SM into a stylish, compact tabletop touchpanel, perfect for free standing use or permanently-mounted on a tabletop or counter surface.

Applications

The following diagram shows a TPMC-4SM in a typical application.

TPMC-4SM in a Typical Application



Specifications

Specifications for the TPMC-4SM are listed in the following table.

TPMC-4SM Specifications

SPECIFICATION	DETAILS
Touchscreen Display	
Display Type	TFT active matrix color LCD
Size	4.3 inch (109 mm) diagonal
Aspect Ratio	16:9 WVGA
Resolution	800 x 480 pixels
Brightness	270 nits
Contrast	300:1
Color Depth	16-bit, 64k colors
Illumination	Backlit LED
Viewing Angle	±80º horizontal, ±80º vertical
Touchscreen	Resistive membrane
Proximity Sensor	
Type	Active infrared beam and receiver
Range	3-4 feet (0.9-1.2 meters)
Memory	
SDRAM	256 MB
Flash	2 GB
Maximum Project Size	80 MB
Graphic Engine	Isys i/O engine, 16-bit non-palette graphics; 65,536 colors; multi-mode objects; DNav dynamic menu objects' dynamic graphics; PNG translucency; full-motion (60 fps) animation; transition effects
Embedded Software Applications[1]	Crestron MJPEG Viewer, Crestron IP Intercom
Ethernet	10BASE-T/100BASE-TX, auto-switching, auto-negotiating, auto-discover, full/half duplex, TCP/IP, UDP,IP, CIP, DHCP, IEE 802.3U & 802.3af compliant
Video	
Streaming Formats	MPEG via Crestron MJPEG Viewer[1]
Audio	
Hardware Features	Built-in microphone and speaker
Amplification	Mono, 0.5 Watts
Audio Feedback (WAV)	8 & 16-bit PCM, 8 – 44.1 kHz sampling rates, mono & stereo
Power Requirements	
Power over Ethernet	IEEE 802.3af Class 3 PoE powered device
Default IP ID[2]	03
Minimum 2-Series Control System Update File[3, 4]	Version 4.001.1012 or later

(Continued on following page)

TPMC-4SM Specifications (Continued)

SPECIFICATION	DETAILS
Environmental	
Temperature	32º to 104º F (0º to 40º C)
Humidity	10% to 90% RH (non-condensing)
Heat Dissipation	14 BTU/Hr
Enclosure	
Construction	Plastic
Front Bezel	Plastic, includes button and no-button covers, button covers include default engraving, custom engraving sold separately
Mounting	Requires a horizontally oriented 1-gang electrical box or plaster ring or a 1-gang European (DIN 49073) electrical box; choice of standard or security screws provided; optional multi-surface and table top mounting kits sold separately
Dimensions	
Height	3.47 in (89 mm)
Width	6.20 in (158 mm)
Depth	1.21 in (31 mm)
Weight	9 oz (249 g)
Available Models	
TPMC-4SM-B-S	Isys i/O® 4.3" Wall Mount Touchpanel Media Center, Gloss Black
TPMC-4SM-W-S	Isys i/O® 4.3" Wall Mount Touchpanel Media Center, Gloss White
Available Accessories	
CEN-NVS100	Network Video Server
CEN-SW-POE-5	5-Port PoE Switch
GLS Series	Green Light Occupancy Sensors
MSMK-4SM-[B W]-S	Multi-Surface Mount Kit (specify color)
PWE-4803RU	PoE Injector
SMK-4SM	Swivel Mount Kit for TTK-4SM
4SM-BTNO-[B, W]-S	Engravable Button Covers, Set of two (specify color)
TTK-4SM-[B, W]-S	Table Top Kit (specify color)

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 "Identity Code" on page 10 for details.
3. The latest software versions can be obtained from the Crestron website. Refer to the NOTE following these footnotes.
4. Crestron 2-Series control systems include the AV2 and PRO2. Consult the latest Crestron Product Catalog for a complete list of 2-Series control systems.

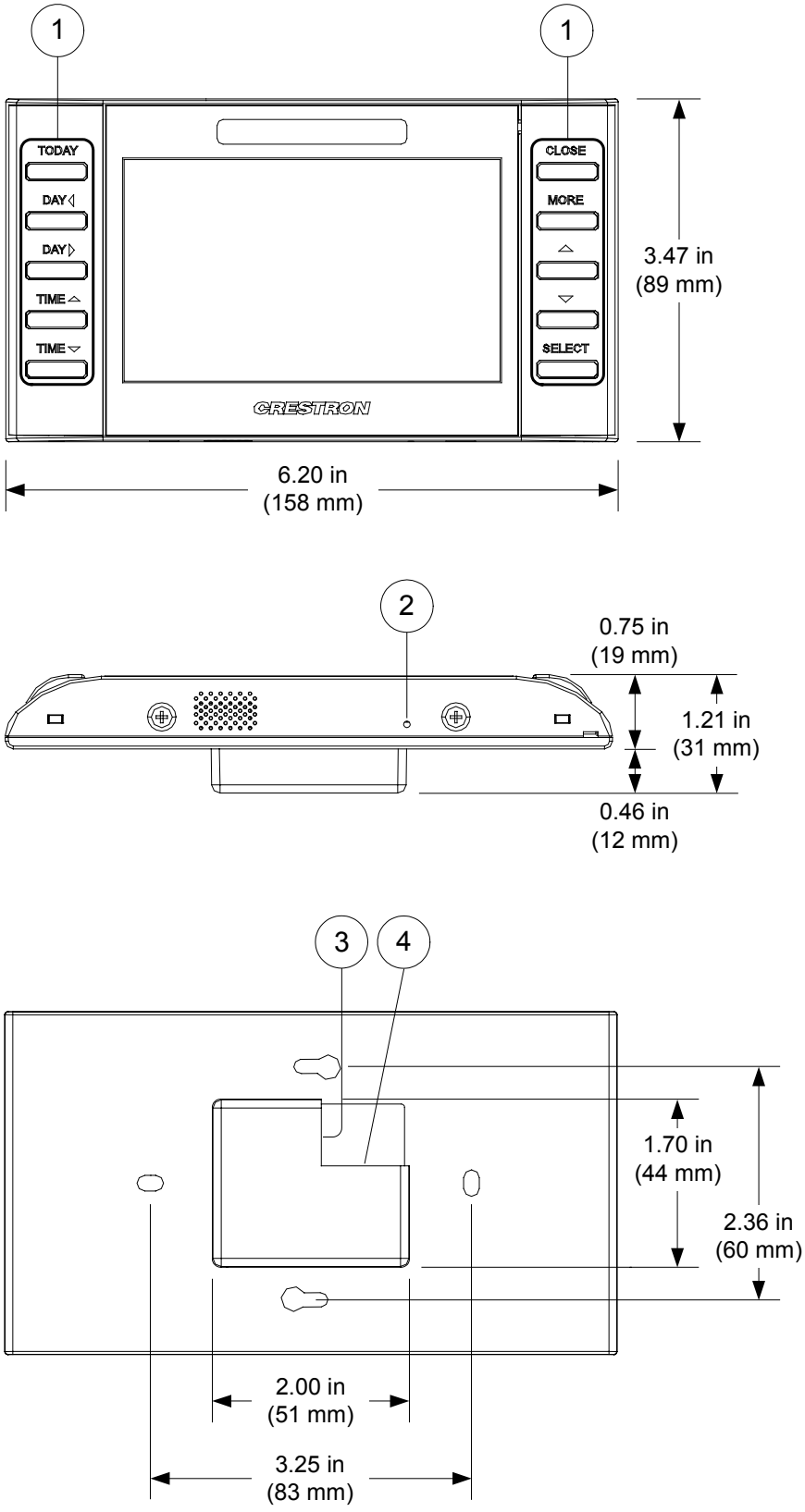
NOTE: Crestron software and any files on the website are for authorized Crestron dealers and Crestron Authorized Independent Programmers (CAIP) only. New users may be required to register to obtain access to certain areas of the site (including the FTP site).

Physical Description

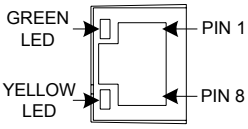
This section provides information on the connections, controls and indicators available on your TPMC-4SM.

TPMC-4SM Physical View

TPMC-4SM Overall Dimensions (Front, Bottom and Rear Views)



Connectors, Controls & Indicators

#	CONNECTORS, CONTROLS & INDICATORS	DESCRIPTION
1	HARD KEYS[1] with FEEDBACK/ BACKLIGHT	(10) Optional programmable pushbuttons, translucent backlit with (1) red and (1) green LED per hard key.
2	RESET	(1) Recessed pushbutton behind pinhole for hardware reset
3	LAN PoE[2, 3] 	(1) 8-wire RJ-45 with two LED indicators; 10BASE-T/100BASE-TX Ethernet port, 802.3af Power over Ethernet compliant; Green LED indicates link status; Yellow LED indicates Ethernet activity
4	OCCUPANCY SENSOR INPUT	(4) Captive screw terminals comprising (2) voltage sensing inputs (referenced to ground) with 24 Volt DC power output; Input voltage range: 0-30 Volts DC; Sensing threshold: ≥ 4.5 Volts DC active, ≤ 1 Volt DC inactive; Maximum DC load: 4 Watts @ 24 Volts DC, provides operating power for up to (4) Crestron GLS Series occupancy sensors

PIN	SIGNAL	PIN	SIGNAL
1	TX +	5	N/C
2	TX -	6	RX -
3	RX +	7	N/C
4	N/C	8	N/C

1. Refer to "Pushbutton Programming" on page 31 for details.
2. To determine which is pin 1 on the cable, hold the cable so the end of the eight pin modular plug is facing away from you, with the clip down and copper side up. Pin 1 is on the far left.
3. The pin out table indicates signal connections. DC power applied by Ethernet power sourcing equipment (PSE) can connect to either signal pins or N/C pins.

Setup

Network Wiring

When wiring the Ethernet network, consider the following:

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

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

Unlike other Crestron network devices, the TPMC-4SM does not use Cresnet® for communications between the device and the control system. The TPMC-4SM requires the use of a high-speed Ethernet connection for control system communications.

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

The IP ID is set within the TPMC-4SM's table using Crestron Toolbox™. For information on setting an IP table, refer to the Crestron Toolbox help file. The IP IDs of multiple TPMC-4SM 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.

NOTE: In *RoomView OOTBF* mode, the TPMC-4SM will be automatically set to IP ID 02.

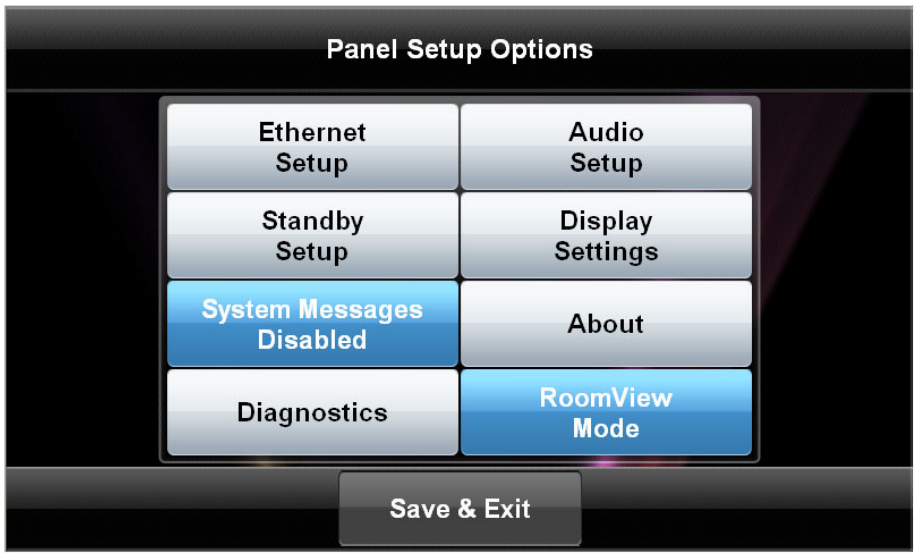
Configuring the Touchpanel

NOTE: The only connection required to configure the touchpanel is power. Refer to "Hardware Hookup" on page 25 for details.

The setup screens allow basic configuration procedures prior to regular operation of the touchpanel. To enter the setup screens, touch the panel while applying power to the unit. The setup screens can also be entered by pressing the top four pushbuttons on the left side of the panel twice in sequence, i.e. 1, 2, 3, 4, 1, 2, 3, 4. (Refer to "Pushbutton Programming" on page 31 for a diagram showing pushbutton numbering.)

The "Panel Setup Options" screen will appear. The functions provided by each button are detailed in subsequent paragraphs.

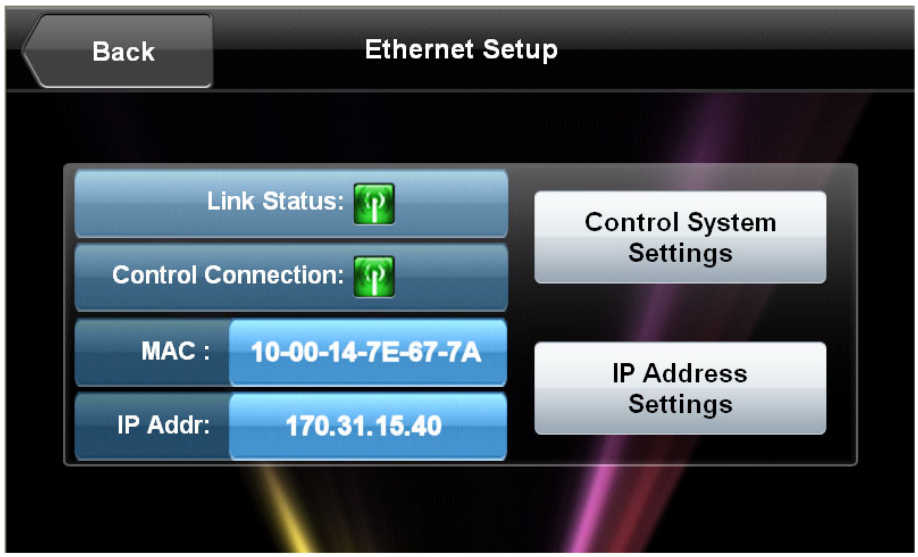
"Panel Setup Options" Screen



Ethernet Setup

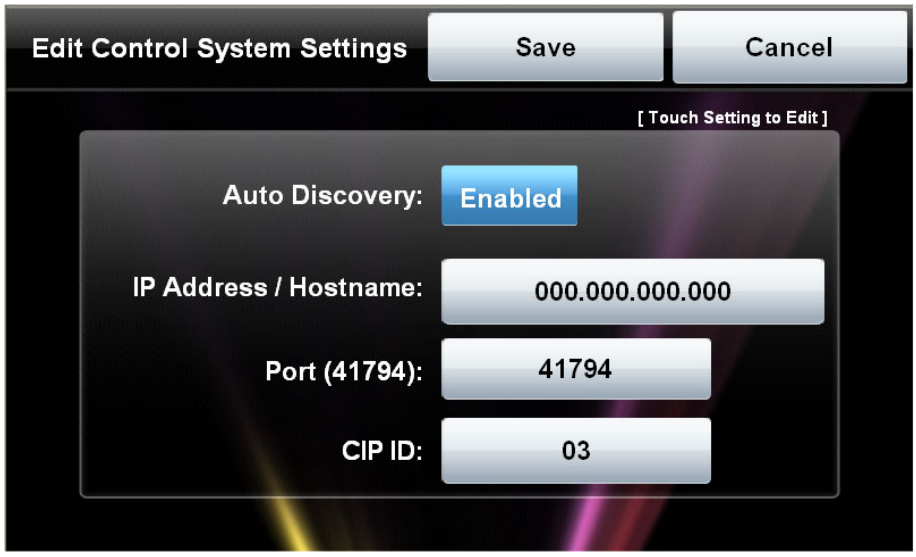
Touch **Ethernet Setup** to display information about your *Link Status*, *Control Connection*, MAC and IP addresses and to access **the Control System Settings** and **IP Address Settings** buttons and their respective submenus. Touch **Back** to return to the "Panel Setup Options" screen.

"Ethernet Setup" Screen



Touch **Control System Settings** to access the "Edit Control System Settings" screen where *Auto Discovery* can be enabled or disabled, *IP Address / Hostname*, *Port* and *CIP ID* can be entered.

"Edit Control System Settings" Screen



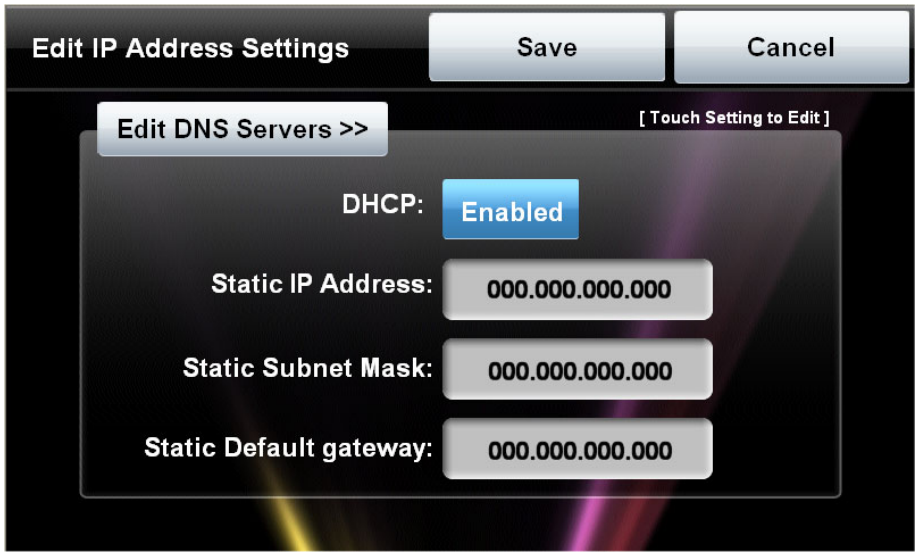
Touch the *IP Address / Hostname*, *Port* or *CIP ID* fields to make an entry. Each will open an on-screen keyboard appropriate for the field. For example, touching the IP Address / Hostname field will open the keyboard illustrated on the following page.

On-Screen Keyboard for IP Address / Hostname

Touch **OK** to add the entry or **CANCEL** to cancel it. When you are returned to the "Edit Control System Settings" screen, touch **Save** to keep the new setting or **Cancel** to cancel it.

On the TPMC-4SM, DHCP is enabled by default. To switch to a static IP address, touch **IP Address Settings** on the "Ethernet Setup" screen, to access the "Edit IP Address Settings" screen.

"Edit IP Address Settings" Screen

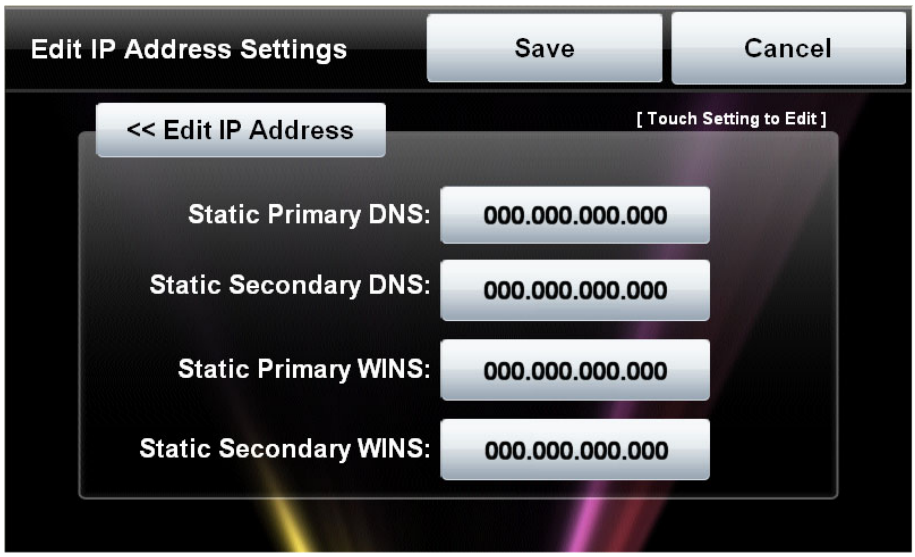


Touch the **Enabled/Disabled** button to toggle between DHCP enabled and disabled. Then touch the field for the *Static IP Address*, *Static Subnet Mask* or *Static Default gateway* you wish to enter. The on-screen keyboard will appear. After entering the addresses, touch **OK** to add the entries or **CANCEL** to cancel them.

On the "Edit IP Address Settings" screen, touch **Edit DNS Servers** to enter the screen for editing these addresses.

Touch **Save** to keep the new setting or **Cancel** to cancel it.

"Edit IP Address Settings" Screen (for DNS and WINS Servers)



Audio Setup

On the "Panel Setup Options" screen, touch **Audio Setup** to display the "Audio Setting" screen. This screen provides controls for *Master Volume*, *KeyClick Volume*, *Wave Volume*, *Mute* controls for all three and a **Play Test Wave** button. Touch **Back** to return to the "Panel Setup Options" screen.

"Audio Settings" Screen

Standby Setup

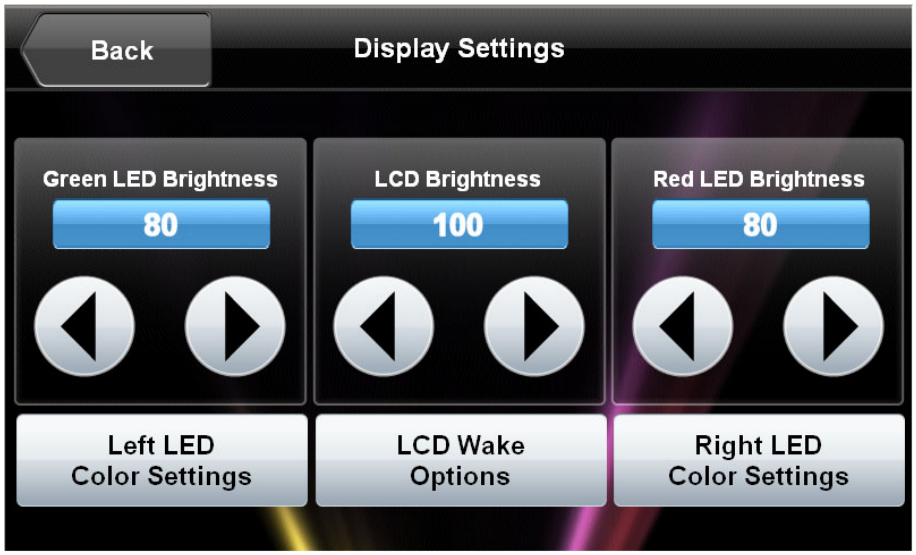
On the "Panel Setup Options" screen, touch **Standby Setup** to display the "Standby Timeouts" screen. This screen provides controls to adjust *Standby Timeout* from 0 to 120 seconds. Touch **Back** to return to the "Panel Setup Options" screen.

"Standby Timeouts" Screen

Display Settings

On the "Panel Setup Options" screen, touch **Display Settings** to enter the "Display Settings" screen. This screen provides controls to adjust *Green LED Brightness*, *LCD Brightness* and *Red LED Brightness* in addition to providing buttons to enter the **Left LED Color Settings**, **LCD Wake Options** and **Right LED Color Settings** submenus. Touch **Back** to return to the "Panel Setup Options" screen.

"Display Settings" Screen



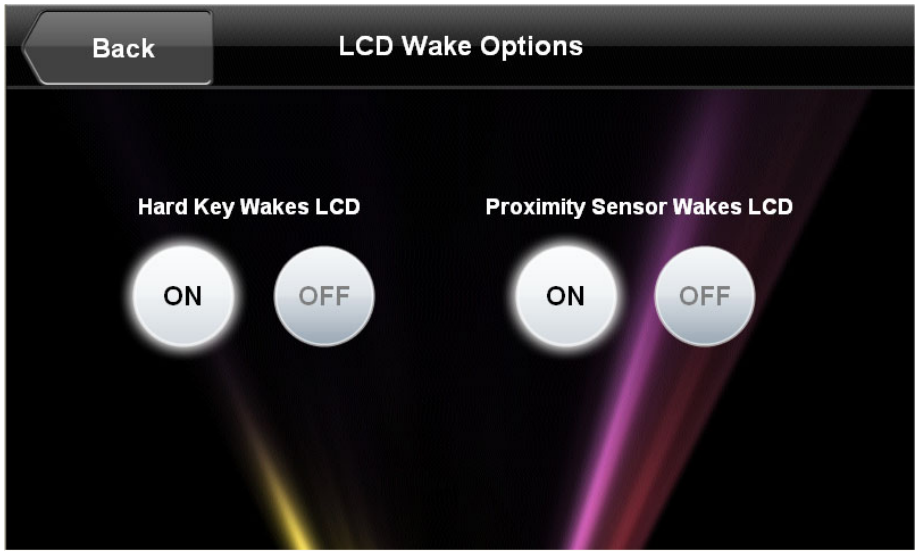
Touch **Left LED Color Settings** to enter the "Display Settings" screen for *Left Bank LED Color*. Options are **Green**, **Red** and **Off**. Touch **Back** to return to the main "Display Settings" screen.

"Display Settings" Screen (for Left Bank LED Color)

NOTE: The **Right LED Color Settings** button takes you to a similar screen, where the *Right Bank LED Color* can be selected.

On the main "Display Settings" screen, touch **LCD Wake Options** to display the "LCD Wake Options" screen. This screen provides controls for turning the *Hard Key Wakes LCD* and *Proximity Sensor Wakes LCD* functions **ON** or **OFF**. Touch **Back** to return to the main "Display Settings" screen.

"LCD Wake Options" Screen



System Messages Enabled/Disabled

On the "Panel Setup Options" screen, the **System Messages Disabled** (the default setting) button toggles between this state and **System Message Enabled**, allowing you to turn system message on or off.

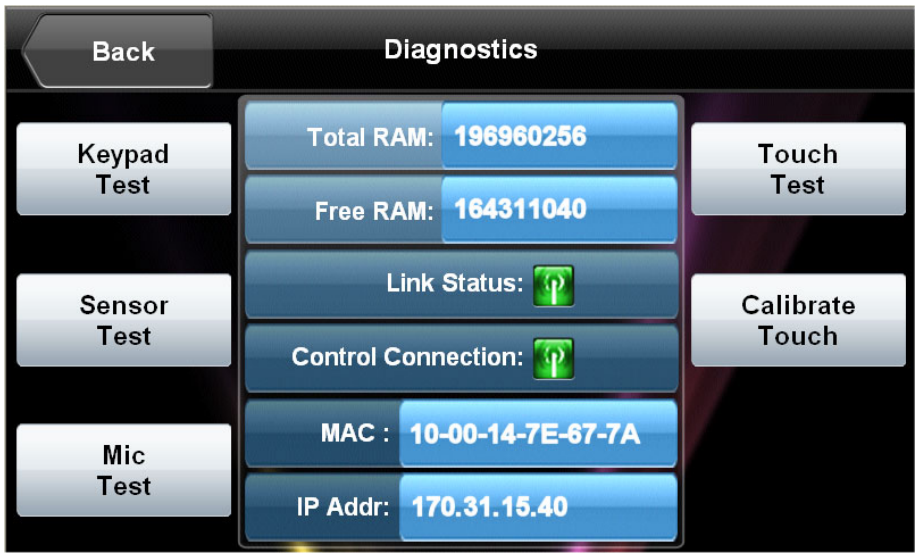
About

On the "Panel Setup Options" screen, the **About** button opens a small window displaying the *Firmware Version* and the *OS Image Version*. Click **OK** to close the window.

Diagnostics

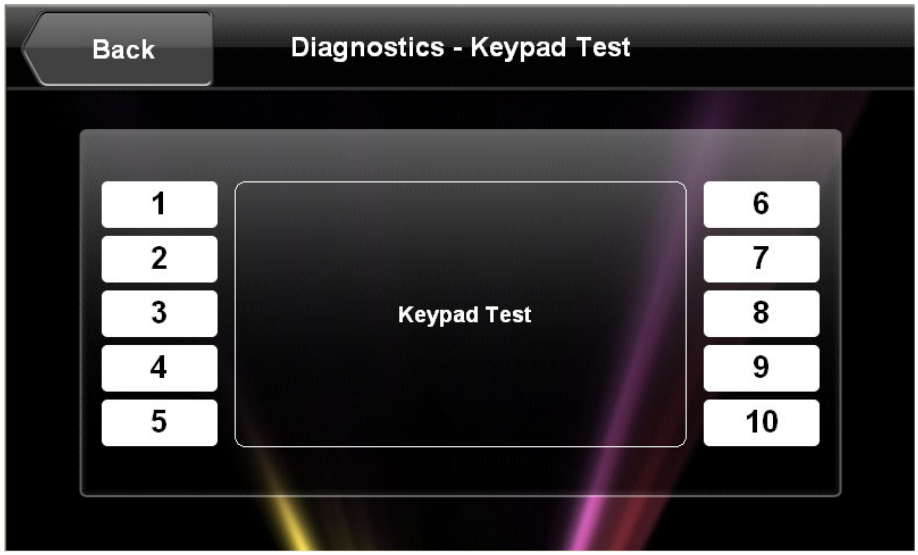
On the "Panel Setup Options" screen, touch **Diagnostics** to display the "Diagnostics" screen to display information about *Total RAM*, *Free RAM*, *Link Status*, *Control Connection*, MAC and IP addresses and to access the **Keypad Test**, **Touch Test**, **Sensor Test**, **Calibrate Touch** and **Mic Test** buttons. Touch **Back** to return to the "Panel Setup Options" screen.

"Diagnostics" Screen



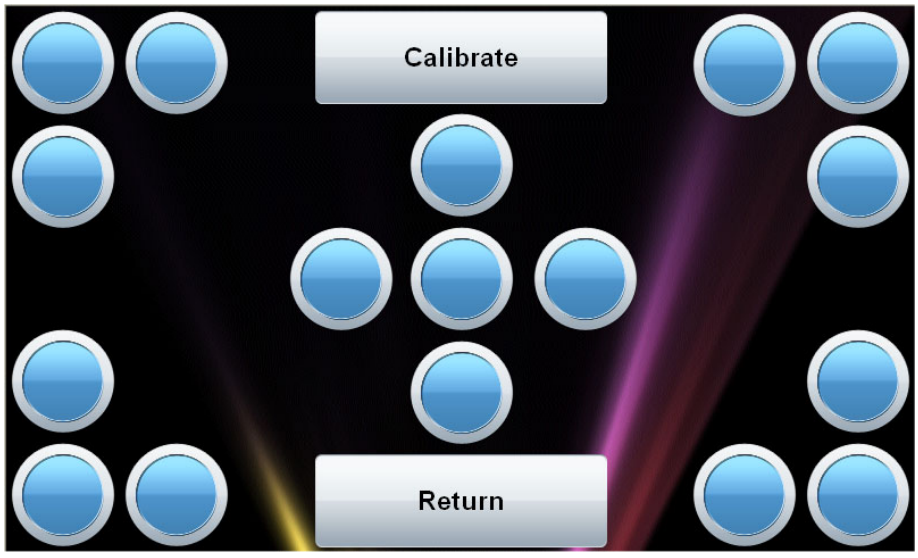
Touch **Keypad Test** to display the "Diagnostics – Keypad Test" screen. Use this screen to test the function of the hard key pushbuttons on either side of the screen. When a button is pressed, its corresponding button will light on the screen. Touch **Back** to return to the main "Diagnostics" screen.

"Diagnostics – Keypad Test" Screen



On the main "Diagnostics" screen, the **Touch Test** button displays the following screen, with a **Calibrate** button to initiate touchscreen calibration. The **Calibrate Touch** button on the "Diagnostics" screen will also initiate touchscreen calibration.

Touch Test Screen

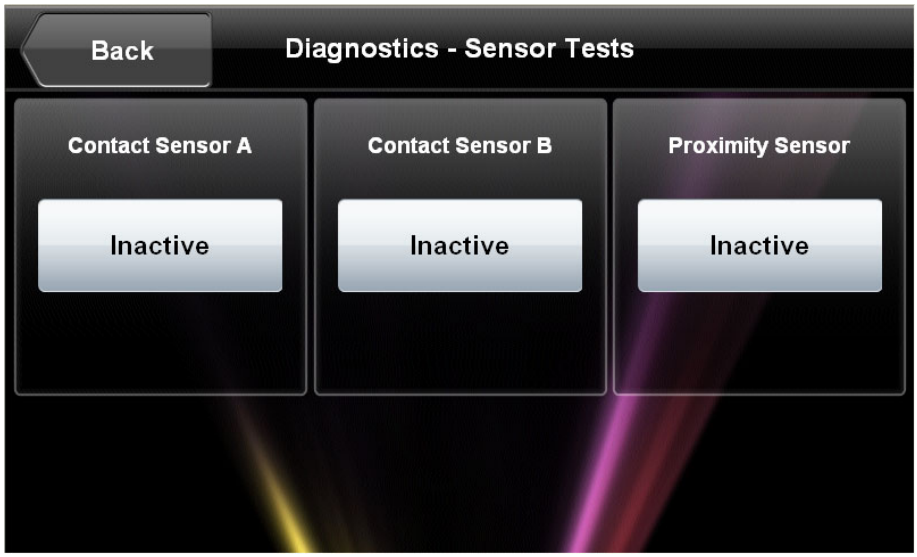


During touchscreen calibration, a crosshair will appear at the center of the screen. Touch the center of the crosshair, which will then move to the upper left part of the screen. Touch the center of the crosshair and it will move to another part of the screen. Continue touching the center of the crosshair until calibration is complete.

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.

On the main "Diagnostics" screen, touch **Sensor Test** to display the "Diagnostics – Sensor Tests" screen. If contact sensors are connected to the TPMC-4SM, the respective indicator will change from Inactive to Active as appropriate for each sensor's activity. Similarly, the TPMC-4SM's own proximity sensor's indicator will change from Inactive to Active when the TPMC-4SM senses motion in front of the unit. Touch **Back** to return to the main "Diagnostics" screen.

"Diagnostics – Sensor Tests" Screen



On the main "Diagnostics" screen, to perform a test of the TPMC-4SM's built-in microphone, touch **Mic Test**. The button label will change to **RECORDING/PLAYBACK**. Speak into the microphone on the front of the TPMC-4SM and your voice will be played back to confirm the microphone is functioning. After playback, the button will revert to its original **Mic Test** label. Touch **Back** to return to the "Panel Setup Options" screen.

RoomView Mode / User Project Mode

On the "Panel Setup Options" screen, **RoomView Mode** button toggles between this mode and **User Project Mode**. **RoomView Mode** is the default state for using the TPMC-4SM with the RoomView Interface. For more information, refer to the latest version of the TPMC-4SM RoomView Interface Operations Guide (Doc. 6846).

Save & Exit

On the "Panel Setup Options" screen, touch **Save & Exi**t to save all settings, exit the setup screens and return to the main project.

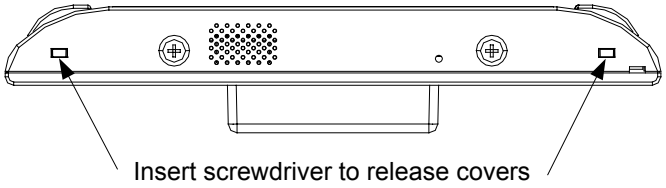
Changing the Button Inserts

The TPMC-4SM ships with 10 "hard key" pushbuttons for quick access to commonly used functions. For a clean appearance, either column of buttons may be removed and covered using the no-button covers provided.

To change the inserts, use the following procedure:

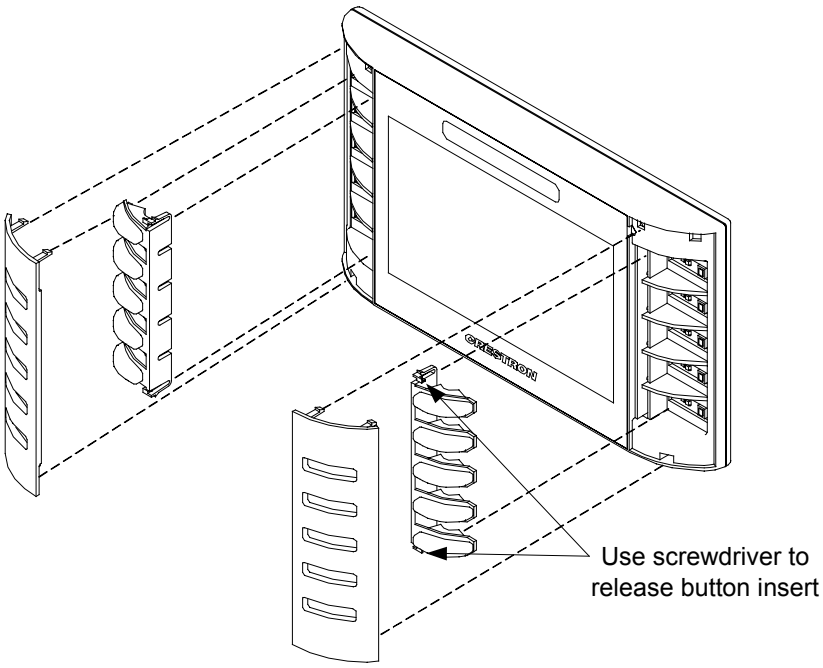
1. Insert a small, slot head screwdriver into the appropriate hole on the bottom of the TPMC-4SM to release its cover. Refer to the following illustration.

Insertion Points for Button Cover Release



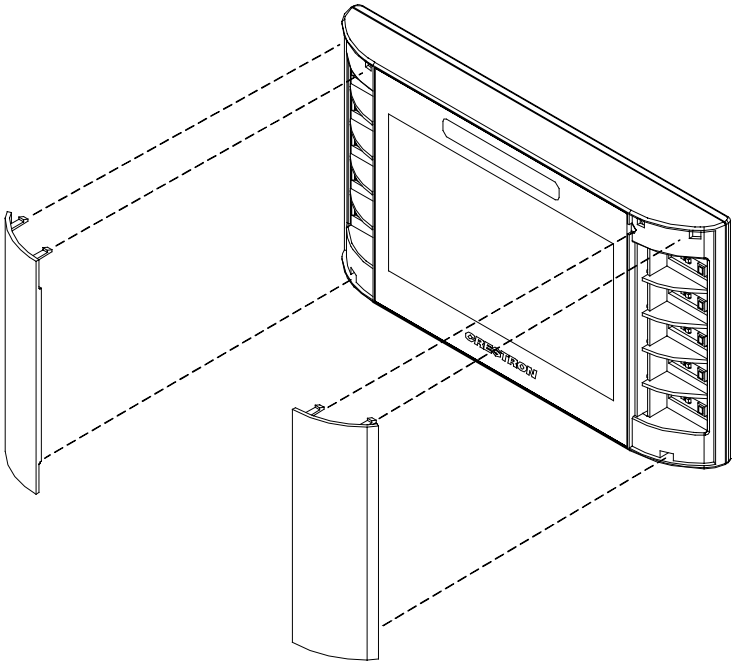
2. With the bottom of the cover released, gently remove it from the TPMC-4SM.
3. If removing the button insert, after releasing and removing the button cover, use a small slot head screwdriver to press and gently lift the button insert from the TPMC-4SM. Refer to the following illustration for the press and lift points on the button insert.

TPMC-4SM with Button Inserts



4. Gently place the new cover in position and press it into place.

TPMC-4SM with No-Button Covers



Installation

The TPMC-4SM touchpanel installs simply and cleanly into a standard electrical box or on to virtually any flat surface.

A table top enclosure, the TTK-4SM and swivel mount, SMK-4SM are also available (both sold separately). For mounting onto a flat surface, use the MSMK-4SM Multi-Surface Mounting Kit (sold separately).

The TPMC-4SM is supplied with screws for installation into an electrical box.

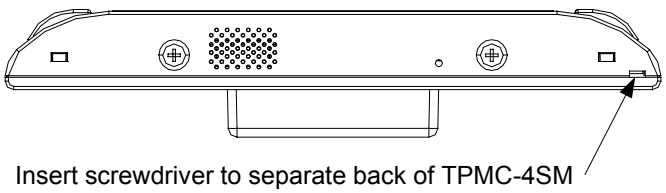
Mounting in a US Electrical Box

NOTE: When mounting the TPMC-4SM into an electrical box, the box must be installed horizontally.

To mount the TPMC-4SM into an electrical box, use the following procedure:

1. Insert a small slot head screwdriver into the hole shown in the following illustration and gently separate the back of the TPMC-4SM.

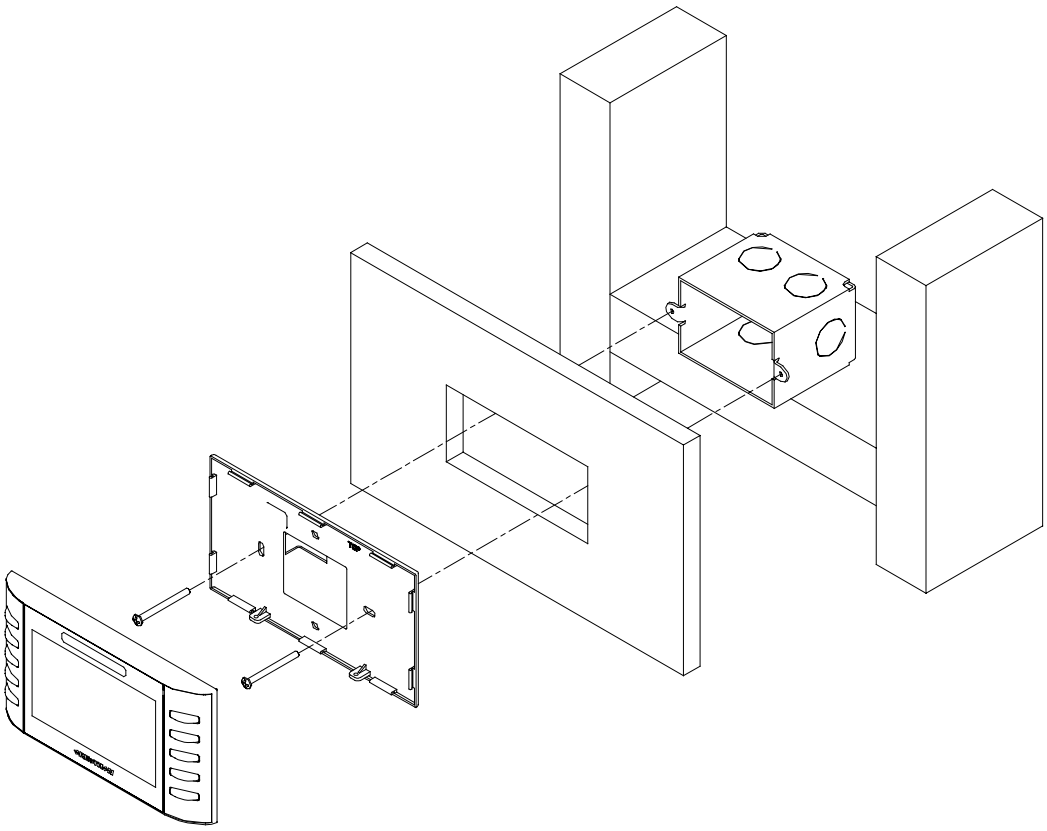
Insertion Point for Separation of Back Panel



2. Use the two included #06-32 x 1/2” screws (2007254) to attach the back panel to a horizontally mounted electrical box, as shown in the following illustration.

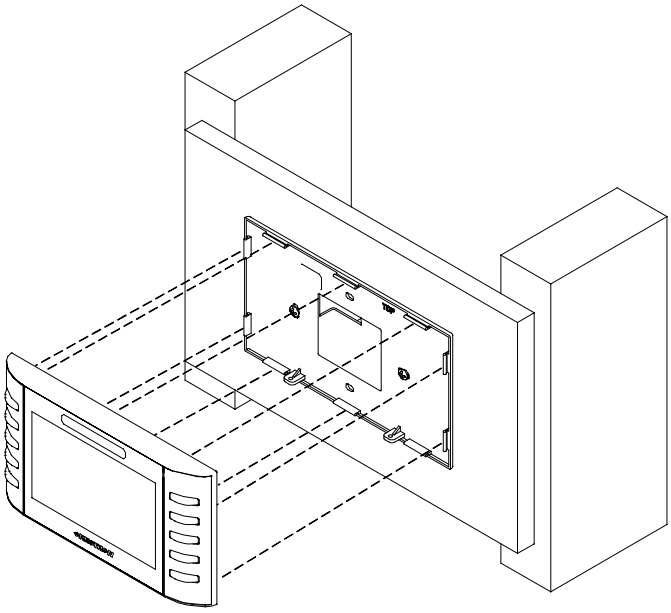
NOTE: Use the left and right screw holes for attachment to the electrical box.

Mounting the TPMC-4SM into an Electrical Box



3. Carefully position the front of the TPMC-4SM over the back panel and gently snap it into place, as shown in the following illustration.

Snap the TPMC-4SM into Place



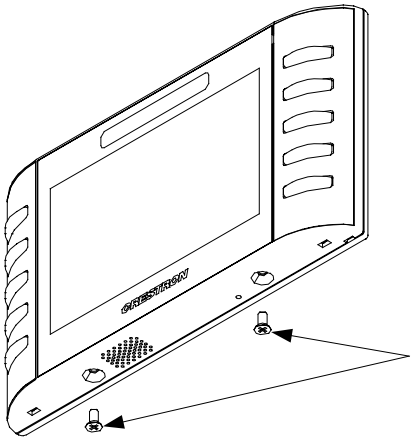
4. Use two of the included #04-40 x 1/4" screws to secure the TPMC-4SM, as shown in the following illustration:

   a. For standard applications, use the Phillips screws (2007152 or 2007160).

   b. For secure applications, use the security type Torx screws (2025311 or 2025312) along with the included Torx screwdriver bit (2025915).

NOTE: Parts 2007152 and 2025311 come with black models. Parts 2007160 and 2025312 come with white models.

Secure TPMC-4SM



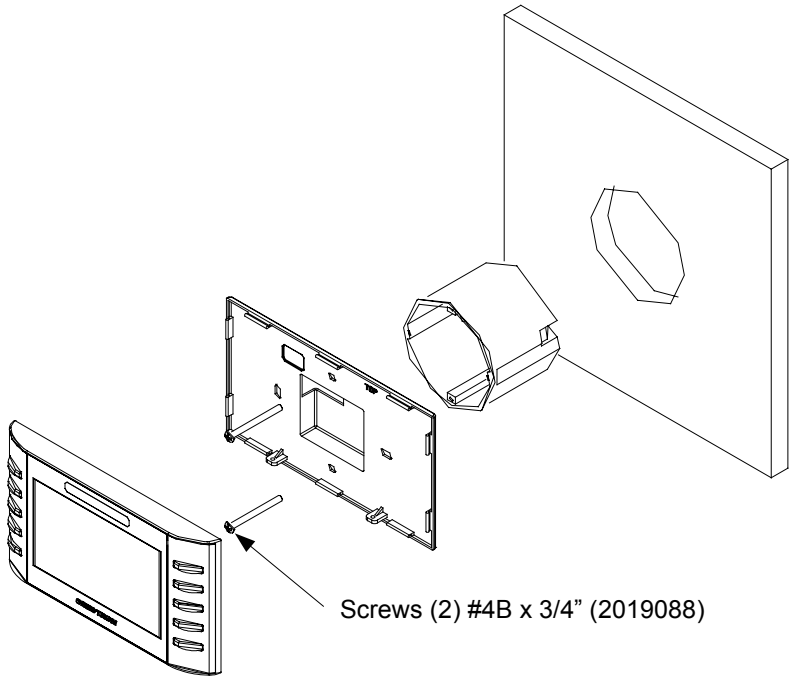
Mounting in a European Electrical Box

To mount the TPMC-4SM into a European electrical box, use the following procedure:

1. Insert a small slot head screwdriver into the hole shown in the illustration at the top of page 21 and gently separate the back of the TPMC-4SM.
2. Use the two included #4B x 3/4" screws (2019088) to attach the back panel to the electrical box, as shown in the following illustration.

NOTE: For European electrical boxes, use the top and bottom screw holes for attachment to the electrical box.

Mounting the TPMC-4SM into a European Electrical Box



3. Carefully position the front of the TPMC-4SM over the back panel and gently snap it into place, as shown in the illustration at the bottom of page 22.
4. Use either the two included #04-40 x 1/4" Phillips screws (2007152 or 2007160) or the two included #04-40 x 1/4" security type Torx screws (2025311 or 2025312) along with the included Torx screwdriver bit (2025915) to secure the TPMC-4SM, as shown in the illustration on page 23.

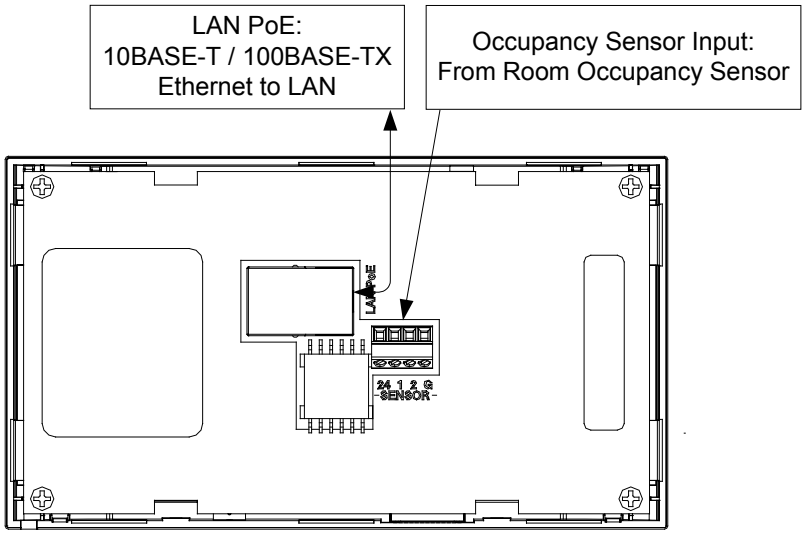
NOTE: Parts 2007152 and 2025311 come with black models.
Parts 2007160 and 2025312 come with black models.

Hardware Hookup

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-4SM, use Crestron power supplies for Crestron equipment.

Hardware Connections for the TPMC-4SM



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

Recommended Cleaning

Keep the surface of the touchscreen free of dirt, dust or other materials that could degrade optical properties. Long-term contact with abrasive materials can scratch the surface, which may 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 touchscreen. Wipe touchscreen clean and avoid getting moisture beneath the bezels.

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

Programming Software

Have a question or comment about Crestron software?

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

Earliest Version Software Requirements for the PC

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

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

Programming with Crestron SystemBuilder

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

Programming with SIMPL Windows

NOTE: While SIMPL Windows can be used to program the TPMC-4SM, it is recommended to use SystemBuilder for configuring a system.

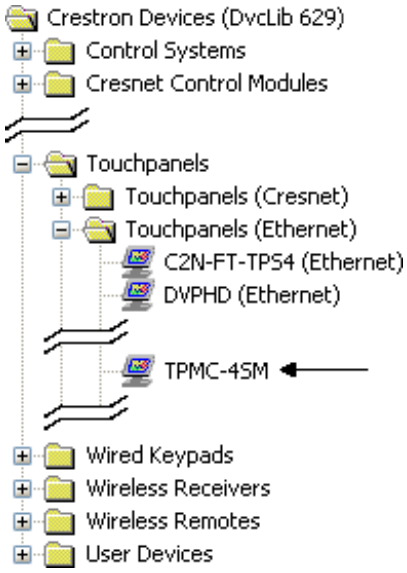
SIMPL Windows is Crestron's premier software for programming Crestron control systems. It is organized into two separate but equally important "Managers".

Configuration Manager

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

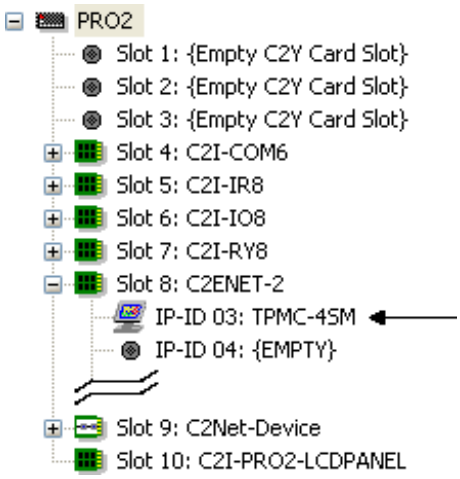
1. To incorporate the TPMC-4SM into the system, drag the TPMC-4SM from the Touchpanels | Touchpanels (Ethernet) folder of the *Device Library* and drop it in the *System Views*.

Locating the TPMC-4SM in the Device Library



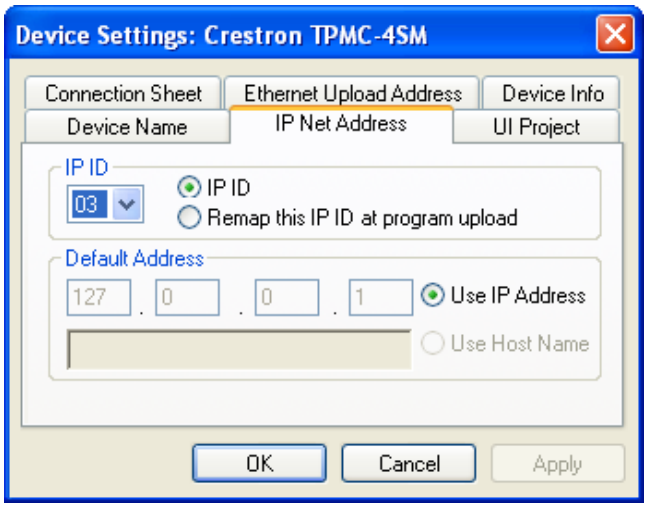
2. The system tree of the control system displays the device in the appropriate slot with a default IP ID as shown in the following illustration.

C2Net Device, Slot 8



3. Additional TPMC-4SM devices are assigned different IP ID numbers as they are added.
4. If necessary, double click a device to open the "Device Settings" window and change the IP ID, as shown in the following figure.

"Device Settings: Crestron TPMC-4SM" Window



5. The ID code specified in the SIMPL Windows program must match the IP ID of each unit. Refer to "Identity Code" on page 10.

Program Manager

Program Manager is the view where programmers "program" a Crestron control system by assigning signals to symbols.

The symbol can be viewed by double clicking on the icon or dragging it into *Detail View*. Each signal in the symbol is described in the SIMPL Windows help file (**F1**).

Programming with VisionTools Pro-e

Touchpanel screens should be created in VisionTools® Pro-e (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-4SM in a room control system. "Accessing the embedded applications," should be included only for i/O devices.

Multi-Mode Objects

Multi-mode objects offer high-performance programming!

The single most advanced VT Pro-e high performance programming technique involving the TPMC-4SM 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 touchpanel files and SIMPL Windows files that illustrate the high-performance capabilities of multi-mode objects.

WAV File Audio Messages

The TPMC-4SM touchpanels are capable of playing audio messages as system prompts and responses. These files are recorded as WAV files on a PC using an audio utility such as Sound Recorder that is packaged with Microsoft Windows 95/98/Me/XP/NT/2000/Vista/7™. 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-4SM touchpanels 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 touchpanel project.

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

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

Bit Depth and File Size

A 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-4SM project.

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

Greater bit depths are required to represent finer gradations of color. Increasing bit depth necessarily increases file size. A black and white drawing requires only one bit per pixel to store all the available color information. Using a 32-bit per pixel bit depth for a black and white image increases the file size 32 times without adding anything to the black and white image quality.

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

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

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

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

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

Relationship of Bits to Colors

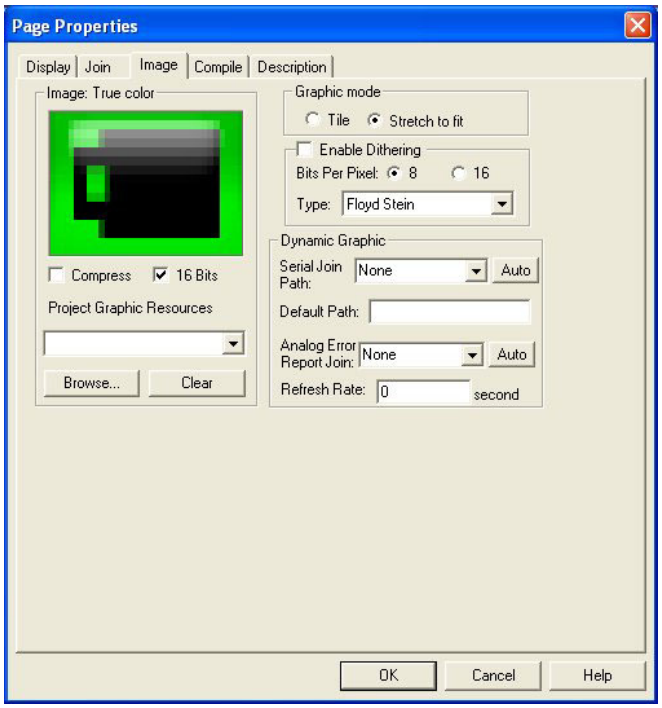
NUMBER OF BITS	NUMBER OF COLORS
1 bit	Black and White
2 bits	4 Colors
4 bits	16 Colors
8 bits	256 Colors
16 bits	65,536 Colors (Highcolor)
24 bits	16.7 million Colors (Truecolor)
32 bits	16.7 million Colors plus Transparency

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

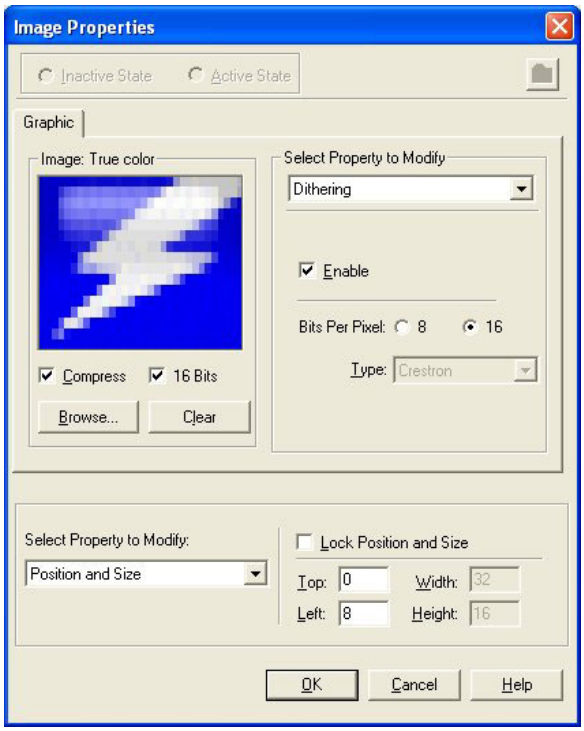
In VT Pro-e, the **Compress** checkbox permits the image to be compressed when compiling. The **16 Bits** checkbox converts a 24-bit or 32-bit image to 16 bits. This conversion to a 16-bit image may cause the loss of some subtle shading. To compensate for this, use the dithering to simulate the original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

Dithering type selection can be accessed from the "Page Properties" or "Image Properties" windows in VT-Pro-e. Refer to the following illustrations.

VT Pro-e "Page Properties" Window – Bit Depth Selection



VT Pro-e "Image Properties" Window – Bit Depth Selection



Pushbutton Programming

The buttons can be programmed to access any frequently used command. Each button has a default digital join number. Refer to the following illustration for their assigned join numbers. These can be modified using the VT Pro-e Hard Button Manager.

Pushbutton Layout and Join Number Assignment

MultiByte International Characters

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

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

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

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

Of course you can always use the workaround of showing a graphic that displays the string but it is not dynamic. To compile and use multibyte characters it is essential that the operating system understand the language. Windows XP, Vista and 7 are available in many international languages and add-on software is available for other versions of Windows.

Out of the Box Programming

For out-of-the-box programming information, refer to the TPMC-4SM RoomView Interface Operations Guide (Doc. 6846).

Example Program

An example program for the TPMC-4SM is available from the Crestron website (www.crestron.com/exampleprograms).

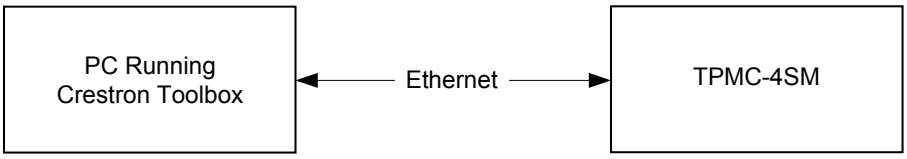
Uploading and Upgrading

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

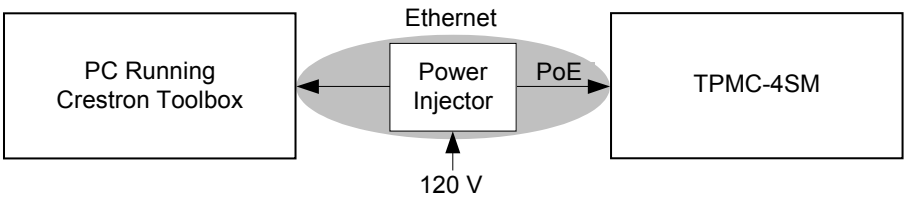
Establishing Communication

Use Crestron Toolbox for communicating with the TPMC-4SM; refer to the Crestron Toolbox help file for details. There is a single method of communication: TCP/IP communication.

Ethernet Communication



Ethernet Communications (Without Hub or Router)



The TPMC-4SM connects to PC via Ethernet:

1. Enter the IP address, IP mask and default router of the TPMC-4SM via Crestron Toolbox (**Functions | Ethernet Addressing**); otherwise enable DHCP.

NOTE: 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.

2. Confirm Ethernet connection between TPMC-4SM 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 (via static IP and a power injector, if no other power is supplied).

   NOTE: Some PCs may not require a crossover cable. Check with PC manufacturer.

3. Use the Address Book in Crestron Toolbox to create an entry for the TPMC-4SM with the TPMC-4SM's TCP/IP communication parameters.

4. Display the "System Info" window (click the  icon) and select the TPMC-4SM entry.

Programs, Projects and Firmware

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

VisionTools Pro-e

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

Firmware

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

Upgrade TPMC-4SM firmware via Crestron Toolbox.

1. Establish communication with the TPMC-4SM and display the "System Info" window.
2. Select **Functions | Firmware…** to upgrade the TPMC-4SM firmware.

Program Checks

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-4SM.

Be sure to use Crestron Toolbox to create the TPMC-4SM IP table.

1. Select **Functions | IP Table Setup**.
2. Add, modify or delete entries in the IP table. The TPMC-4SM 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-4SM. The entry should list the TPMC-4SM's IP ID (specified on the TPMC-4SM's IP table) and the internal gateway IP address 127.0.0.1.

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-4SM Troubleshooting

TROUBLE	POSSIBLE CAUSE(S)	CORRECTIVE ACTION
Device does not function.	Device is not communicating with the network.	Use Crestron Toolbox to poll the network. Verify network connection to the device.
	Device is not receiving power from a Crestron power source.	Use the provided Crestron power source. Verify connections.
	Device is not receiving sufficient power.	Use the Crestron Power Calculator to help calculate how much power is needed for the system.
TPMC-4SM is not responding.	No IP address configured/obtained.	Use the internal setup menu (refer to "Ethernet Setup" which starts on page 12) or Crestron Toolbox to create/verify Ethernet settings.
	Invalid control system IP address / IP ID set up on the TPMC-4SM	The IP address (or host name) for the control system is invalid or the IP ID does not match the one defined in the SIMPL program. Refer to "Ethernet Setup" which starts on page 12 to define IP addresses.
TPMC-4SM boots up in setup screens every time.	Invalid VT Pro-e project or no VT Pro-e project is loaded.	Load/reload VT Pro-e project using the Toolbox.

Reference Documents

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

List of Related Reference Documents

DOCUMENT TITLE
Crestron e-Control Reference Guide
Crestron RoomView Server Edition Installation Guide
TPMC-4SM RoomView Interface Operations Guide

Further Inquiries

If you cannot locate specific information or have questions after reviewing this guide, please take advantage of Crestron's award winning customer service team by calling Crestron at 1-888-CRESTRON [1-888-273-7876].

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

Future Updates

As Crestron improves functions, adds new features and extends the capabilities of the TPMC-4SM, additional information may be made available as manual updates. These updates are solely electronic and serve as intermediary supplements prior to the release of a complete technical documentation revision.

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

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

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