

Crestron TPMC-9L
9" Wall Mount Touch Screen

Operations & Installation Guide



Regulatory Compliance

As of the date of manufacture, the TPMC-9L has been tested and found to comply with specifications for CE marking.



Federal Communications Commission (FCC) Compliance Statement

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

Industry Canada (IC) Compliance Statement

CAN ICES-3(B)/NMB-3(B)

Crestron product development software is licensed to Crestron dealers and Crestron Service Providers (CSPs) under a limited non-exclusive, non-transferable Software Development Tools License Agreement. Crestron product operating system software is licensed to Crestron dealers, CSPs, and end-users under a separate End-User License Agreement. Both of these Agreements can be found on the Crestron website at www.crestron.com/legal/software_license_agreement.

Product warranty can be found at www.crestron.com/warranty.

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

Crestron, the Crestron logo, Capture HD, CresCAT, Cresnet, Crestron e-Control, Crestron Home, Crestron Studio, Crestron Toolbox, DigitalMedia, Rava, Smart Graphics, SmartObjects, TouchPoint, and VT Pro-e are either trademarks or registered trademarks of Crestron Electronics, Inc. in the United States and/or other countries. Microsoft and Windows are either trademarks or registered trademarks of Microsoft Corporation 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. *Crestron is not responsible for errors in typography or photography.*

This document was written by the Technical Publications department at Crestron.
©2014 Crestron Electronics, Inc.

Contents

9" Wall Mount Touch Screen: TPMC-9L	1
Introduction	1
Features and Functions	1
Applications.....	4
Specifications	5
Physical Description.....	8
Setup	12
Network Wiring.....	12
Identity Code	12
Configuring the Touch Screen.....	13
Mounting Options.....	27
Touch Screen Mounting	28
Touch Screen Removal.....	31
Hardware Hookup	31
Recommended Cleaning.....	32
Uploading and Upgrading.....	33
Establishing Communication.....	33
Programs, Projects, and Firmware.....	34
Program Checks	35
Problem Solving	36
Troubleshooting.....	36
Check Network Wiring.....	37
Reference Documents.....	38
Further Inquiries	38
Future Updates	38

9" Wall Mount Touch Screen: TPMC-9L

Introduction

The TPMC-9L Wall Mount Touch Screen from Crestron® delivers high end style and performance in a compact, cost effective flush mount design. Featuring a generous 9" (~229 mm) widescreen display, advanced touch screen graphics, H.264 video, audio feedback and Rava® SIP Intercom, the TPMC-9L delivers a world of control capability, yet leaves a very small footprint. The addition of 12 optional push buttons provides quick access to commonly used functions.

Features and Functions

- Stylish flush mount design for in-wall and lectern installation
- Generous 9" (~229 mm) widescreen color touch screen
- 800 x 480 WVGA display resolution
- Automatic brightness control
- Smart Graphics™ support
- H.264 streaming video
- Wired composite video input
- Rava SIP Intercom and phone technology
- Customizable audio feedback
- Crestron Home® CAT5 video connectivity
- High speed Ethernet and Cresnet® communications
- Built-in USB port for direct program upload
- Includes faceplate with 12 "hard key" push buttons
- Custom button engraving available as solid or backlit text
- No-button blank faceplate also provided
- Wall, lectern and rack mounting options
- Available with almond, black or white textured finish

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 audio, video, lighting, shades, HVAC, security 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.

Smart Graphics

Crestron touch screens use Smart Graphics to deliver the ultimate user experience and the ultimate value, by enabling the creation of dynamically rich user interfaces with incredible efficiency and unparalleled functionality. Using Smart Graphics, 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.

Crestron Smart Graphics include the following 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 switch sources.
- Dashboard widgets personalize the touch screen with clocks, 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.
- GUI development, even across different sized touch screens.

Integrated Video

Streaming video capability makes it possible to view security cameras and other video sources right on the touch screen. Native support for H.264 and MJPEG formats allows the TPMC-9L to display live from an IP camera, a streaming server (Crestron CEN-NVS200* or similar), a DigitalMedia™ switcher, or a Capture HD® system. Streaming video is delivered to the touch screen over Ethernet, eliminating the need for any extra video wiring. 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.

* Item(s) sold separately.

Rava SIP Intercom

Rava SIP Intercom technology enables hands free VoIP communication between any two Rava-enabled Crestron touch screens. Rava works over Ethernet, supporting 2-way intercom, video intercom*, and paging, without any special wiring. VoIP phone capability is also possible through integration with a SIP-compatible IP phone system or SIP server, allowing hands free telephone functionality complete with speed dialing, caller ID, custom ringers and other enhancements. Built-in echo cancellation affords true duplex performance for clear, seamless voice communication using the TPMC-9L's integrated microphone and speakers.

Audio Feedback

Customized audio files can be loaded on the TPMC-9L to add another dimension to the touch screen graphics using personalized sounds, button feedback and voice prompts.

Push Button Options

The TPMC-9L features a faceplate containing 12 programmable "hard key" push buttons, elegantly trimmed by illuminated button dividers. Integral to the faceplate, the push buttons are positioned along the left and right edges of the touch screen, making it possible to align them with text and graphics onscreen. Custom engraving of the buttons is available, with a choice of solid or backlit text. A plain, no-button faceplate is also included, allowing a very clean appearance with no push buttons.

Auto-Brightness Control

The TPMC-9L maintains optimal visibility under varying lighting conditions, adjusting its button backlighting and display brightness smoothly and automatically according to changes in the ambient light level in the room.

High Speed Connectivity

Both Cresnet and high speed Ethernet are standard on the TPMC-9L, providing for easy network integration and seamless communications with Crestron control systems and other network devices.

Versatile Flush Mount Design

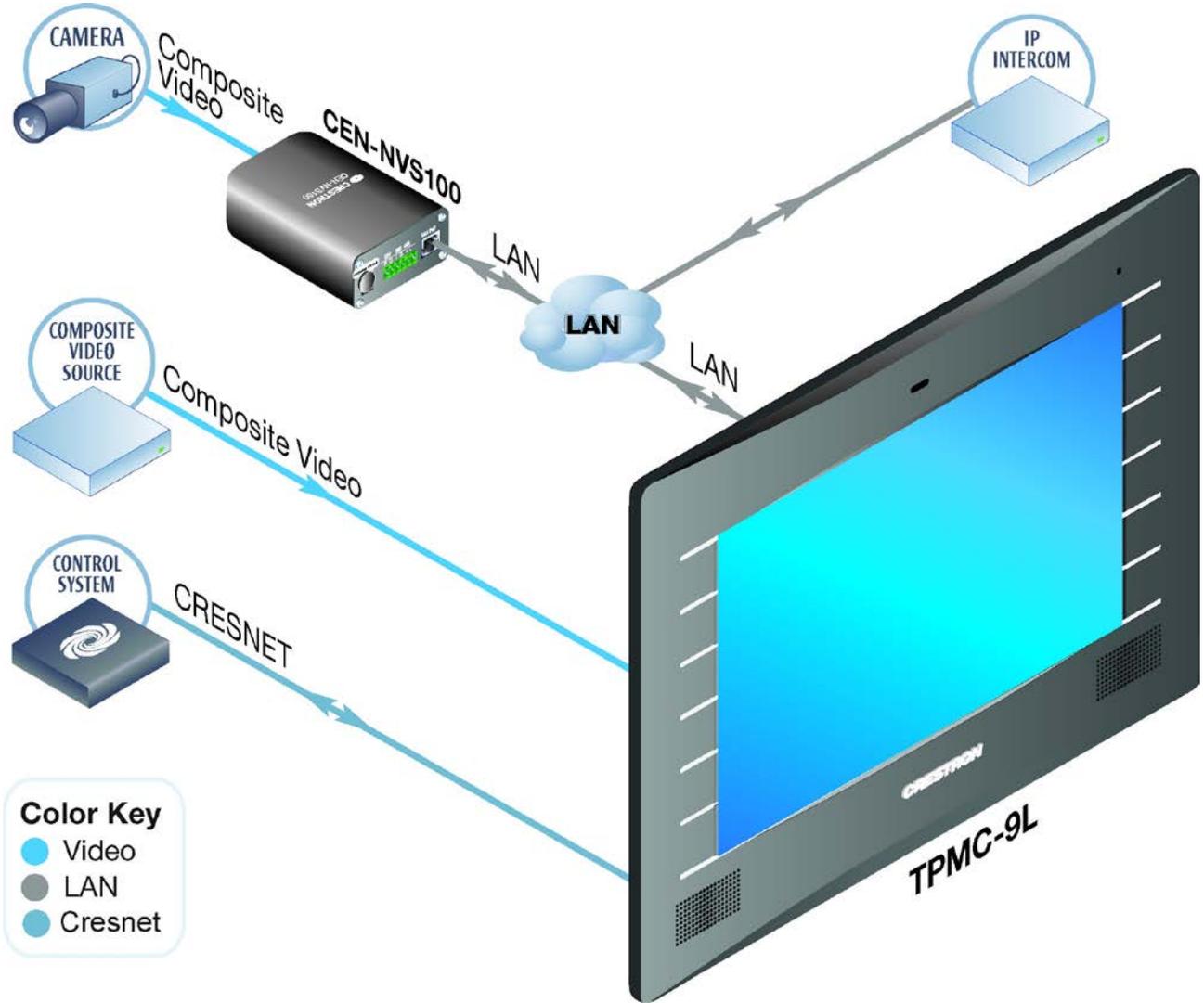
The TPMC-9L is designed for easy flush mount installation in a wall, lectern or similar flat surface. Mounting clips furnished with the TPMC-9L facilitate a clean installation in drywall and many furniture applications. Additional mounting options are available separately.

* H.264-compatible IP camera required.

Applications

The following diagram shows a TPMC-9L in a typical application.

TPMC-9L in a Typical Application



Specifications

Specifications for the TPMC-9L are listed in the following table.

TPMC-9L Specifications

SPECIFICATION	DETAILS
Touch Screen Display	
Display Type	TFT active matrix color LCD
Size	9 inch (229 mm) diagonal
Aspect Ratio	15:9 WVGA
Resolution	800 x 480 pixels
Brightness	350 nits
Contrast	700:1
Color Depth	24-bit, 16.7 M colors
Illumination	Edge lit fluorescent with auto-brightness control
Viewing Angle	± 88° horizontal, ± 88° vertical
Touch Screen	Resistive membrane
Memory	
DDR SDRAM	256 MB
Flash	2 GB
Maximum Project Size	60 MB
Graphics Engine	Supports Smart Graphics or "traditional" GUI projects
Communications	
Ethernet	10/100, auto-switching, auto-negotiating, auto-discovery, full/half duplex, DHCP, for control and console
Cresnet	Cresnet slave mode for control and console
USB	USB client for console
Video	
Analog Input Signal Types	Composite
Analog Formats	NTSC 480i, PAL 576i
Analog Color Depth	24-bit, 16.7 M colors
Streaming Formats	H.264 (MPEG-4 part 10 AVC) (320 x 240 / 15 fps @ 192 kbps recommended), MJPEG (320 x 240 / 10 fps recommended)
Audio	
Features	Built-in microphone and speakers, Rava SIP Intercom, Crestron IP Intercom
Audio Feedback Formats	MP3 using Smart Graphics, WAV using "traditional" graphics
Power Requirements	
Cresnet Power Usage	23 watts (0.96 amps @ 24 Vdc)
Default IP ID*	03

(Continued on following page)

TPMC-9L Specifications (Continued)

SPECIFICATION	DETAILS
Environmental	
Temperature	32° to 112°F (0° to 45°C)
Humidity	10% to 90% RH (non-condensing)
Heat Dissipation	78 Btu/h
Enclosure	
Construction	Plastic, flush mountable using (4) clips provided (additional mounting kits sold separately)
Faceplate	Plastic, button and no-button faceplates included (optional solid or backlit button engraving sold separately)
Dimensions	
Height	7.52 in (191 mm)
Width	10.83 in (275 mm)
Depth	1.86 in (48 mm)
Weight	2.6 lbs (1.2 kg)
Available Models	
TPMC-9LA-T	9" Wall Mount Touch Screen, Almond Textured
TPMC-9LB-T	9" Wall Mount Touch Screen, Black Textured
TPMC-9LW-T	9" Wall Mount Touch Screen, White Textured
Included Accessories	
TPMC-9L-FP[A,B,W]-T_BLANK	Button Faceplate without Engraving, (specify color)
TPMC-9L-FP[A,B,W]-T-NB	No-button Faceplate, (specify color)
Available Accessories	
BB-9L	Pre-Construction Wall Mount Back Box
BBI-9L	Back Box – International Version
CEN-NVS200	Network Video Streamer
CRESCAT®	Crestron Home CAT5 AV Cable
CRESNET	Cresnet Control Cable
MMK-9L	Mud Ring
PMK-9L	Pre-Construction Wall Mount Kit
RMK-9L	Rack Mount Kit
TMK-9L	Trim Ring
TPMC-9L-FP[A,B,W]-T_ENGRAVED	Button Faceplate with Custom Engraving (specify color)
TPMC-9L-FP-BKLT-[A,B,W]-T_ENGRAVED	Backlit Button Faceplate with Custom Engraving (specify color)
VMK-WIN	Touchpoint® Virtual Mouse & Keyboard Software for Windows®
WMKB-6L	Replacement Wall Mount Clips

(Continued on following page)

TPMC-9L Specifications (Continued)

SPECIFICATION	DETAILS
Available Accessories (Continued) WMKM-9L WMKT-9L	Post-Construction Wall Mount Kit with Mud Ring Lectern or Post-Construction Wall Mount Kit with Trim Ring

* Refer to "Identity Code" which starts on page 12 for details.

Physical Description

This section provides information on the connections, controls and indicators available on the TPMC-9L.

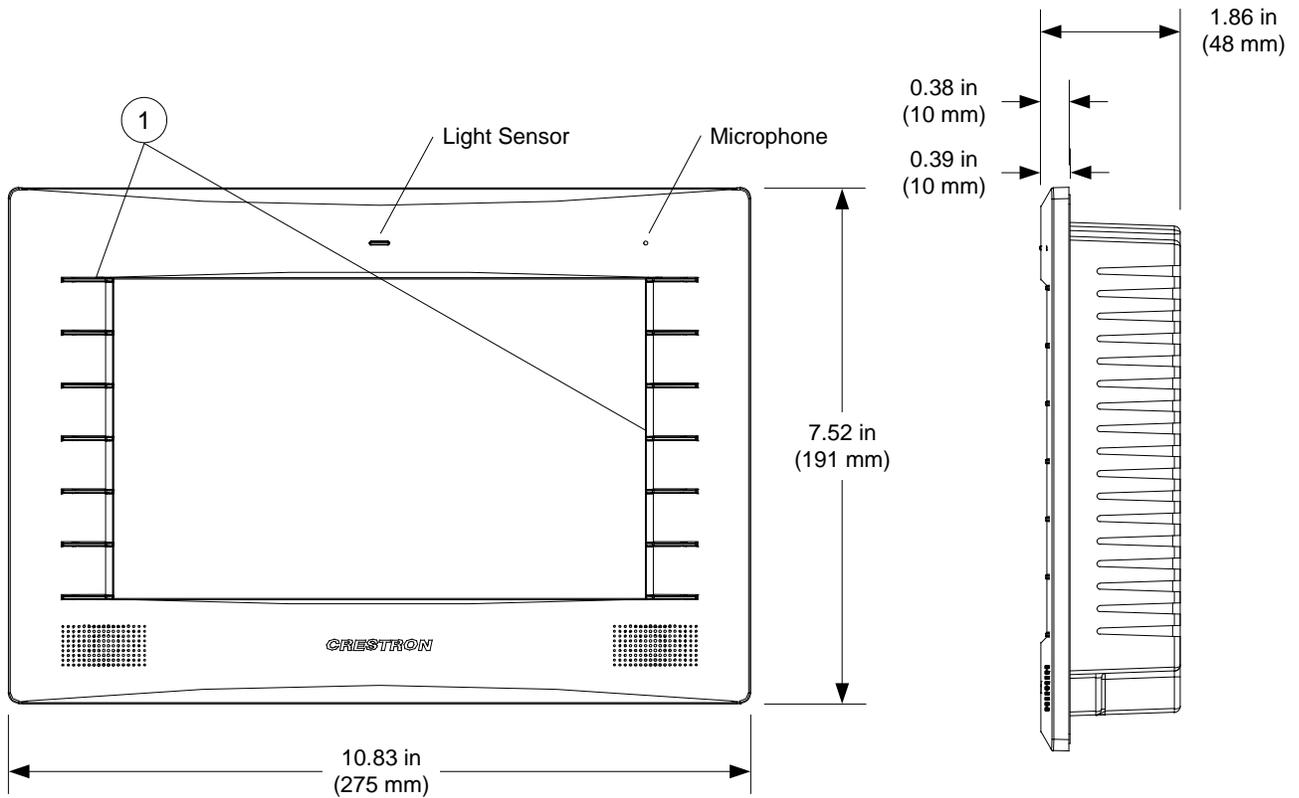
TPMC-9L Physical View



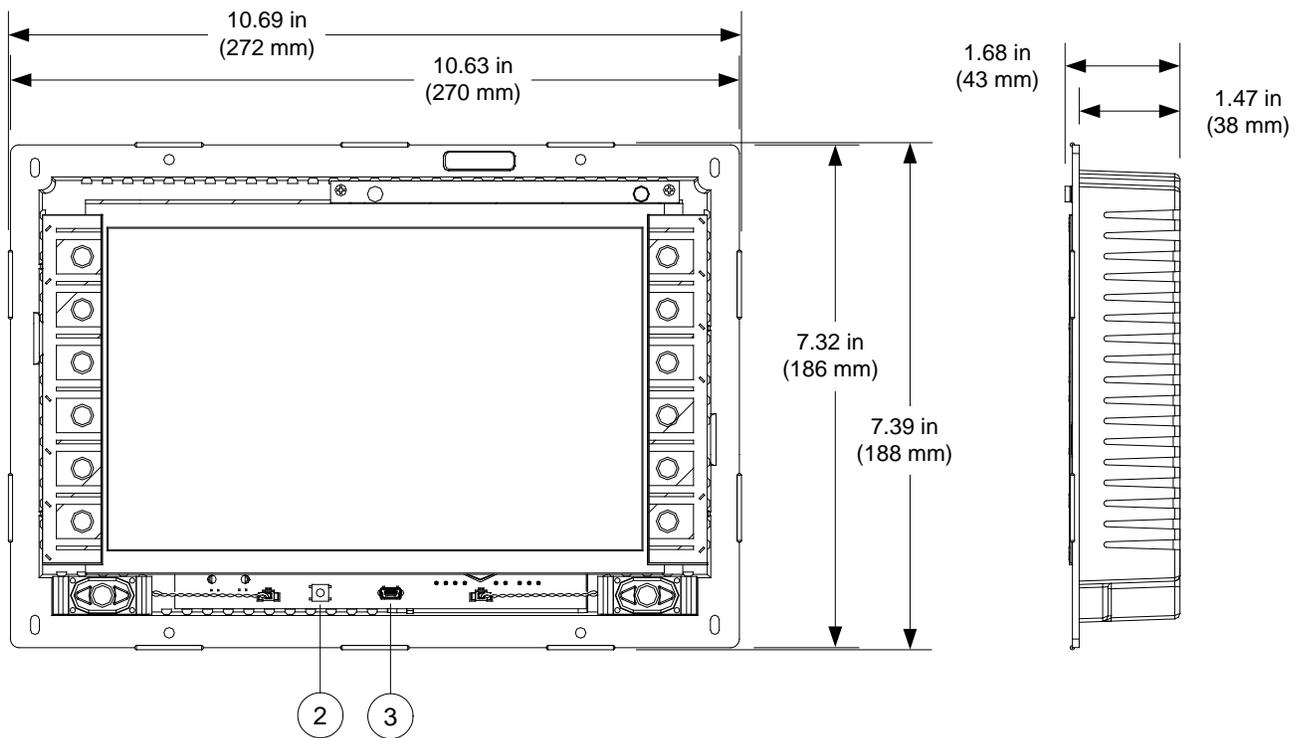
TPMC-9L Physical View (With No-Button Faceplate)



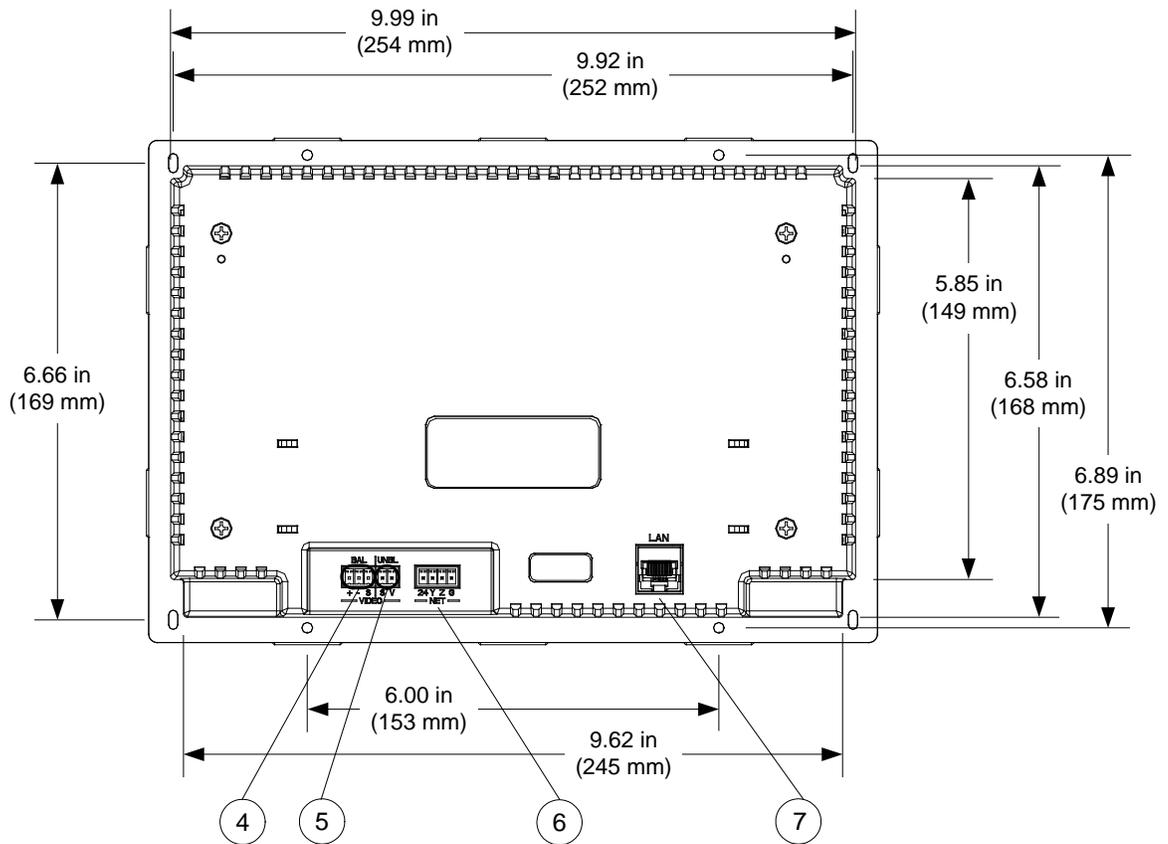
TPMC-9L Overall Dimensions (Front and Side Views, with Faceplate)



TPMC-9L Overall Dimensions (Front and Side Views)



TPMC-9L Overall Dimensions (Rear View)

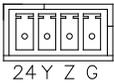
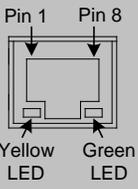


Connectors, Controls, and Indicators

#	CONNECTORS, CONTROLS, AND INDICATORS ¹	DESCRIPTION
1	Hard Keys	(12) Optional engravable push buttons, optional auto-dimmable backlighting
2	Reset Button	(1) Miniature push button for hardware reset (behind faceplate)
3	 USB	(1) Mini-B USB console port (behind faceplate); Mini-B to A USB cable included
4	VIDEO (BAL) ² BAL  + - S	(1) 3-pin 3.5 mm detachable terminal block; Balanced composite video input; Input impedance: 100 Ω nominal; Input level: 1 Vp-p nominal, 1.5 Vp-p maximum; Maximum dc offset: ± 2 volts; Connects to any Crestron CAT5 Video Out port via CresCAT or CAT5 cable
5	VIDEO (UNBL) ² UNBL  S V	(1) 2-pin 3.5 mm detachable terminal block; Unbalanced composite video input; Input impedance: 75 Ω nominal; Input level: 1 Vp-p nominal, 1.5 Vp-p maximum; Maximum dc offset: ± 2 volts; Connects to any conventional coax video source

(Continued on following page)

Connectors, Controls, and Indicators (Continued)

#	CONNECTORS, CONTROLS, AND INDICATORS ¹	DESCRIPTION																				
6	<p style="text-align: center;">NET</p>  <p style="text-align: center;">24 Y Z G</p>	<p>(1) 4-pin 3.5 mm detachable terminal block; Cresnet slave port, connects to Cresnet control network</p> <p>24: Power (24 Vdc) Y: Data Z: Data G: Ground</p>																				
7	<p style="text-align: center;">LAN</p>  <p style="text-align: center;">Yellow LED Green LED</p>	<p>(1) 8-wire RJ-45 with two LED indicators; 10/100BASE-T Ethernet port; Green LED indicates link status; Yellow LED indicates Ethernet activity</p> <table border="1" data-bbox="933 674 1398 827"> <thead> <tr> <th>PIN</th> <th>SIGNAL</th> <th>PIN</th> <th>SIGNAL</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>TX +</td> <td>5</td> <td>N/C</td> </tr> <tr> <td>2</td> <td>TX -</td> <td>6</td> <td>RX -</td> </tr> <tr> <td>3</td> <td>RX +</td> <td>7</td> <td>N/C</td> </tr> <tr> <td>4</td> <td>N/C</td> <td>8</td> <td>N/C</td> </tr> </tbody> </table>	PIN	SIGNAL	PIN	SIGNAL	1	TX +	5	N/C	2	TX -	6	RX -	3	RX +	7	N/C	4	N/C	8	N/C
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. Interface connectors for **VIDEO** and **NET** ports are provided with the unit.
2. Balanced and unbalanced video inputs are mutually exclusive.

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

For more details, refer to “Check Network Wiring” on page 37.

The TPMC-9L can also use high-speed Ethernet for communications between the device and a control system, computer, media server and other IP-based devices.

For general information on connecting Ethernet devices in a Crestron system, refer to the Crestron e-Control® Reference Guide (Doc. 6052) at www.crestron.com/manuals.

Identity Code

NOTE: The latest software can be downloaded at www.crestron.com/software.

Net ID

The Net ID of the TPMC-9L has been factory set to **03**. The Net IDs of multiple TPMC-9L devices in the same system must be unique. The Net ID is set using the internal setup menu (refer to “Cresnet” which starts on page 20). Net ID may also be set from a personal computer (PC) via Crestron Toolbox™ (refer to “Establishing Communication” which starts on page 33).

When setting the Net ID, consider the following:

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

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

IP ID

The IP ID is set within the TPMC-9L’s IP table using the internal setup menu (refer to “IP Table” which starts on page 16). IP ID may also be set from a PC via Crestron Toolbox. For information on setting an IP table, refer to the Crestron Toolbox help file. The IP IDs of multiple TPMC-9L 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 Crestron Studio or SIMPL Windows program.
- Each device using IP to communicate with a control system must have a unique IP ID.

Configuring the Touch Screen

The TPMC-9L is configured from the setup menu.

NOTE: The only connection required to configure the touch screen is power. Refer to "Hardware Hookup" which starts on page 31 for details.

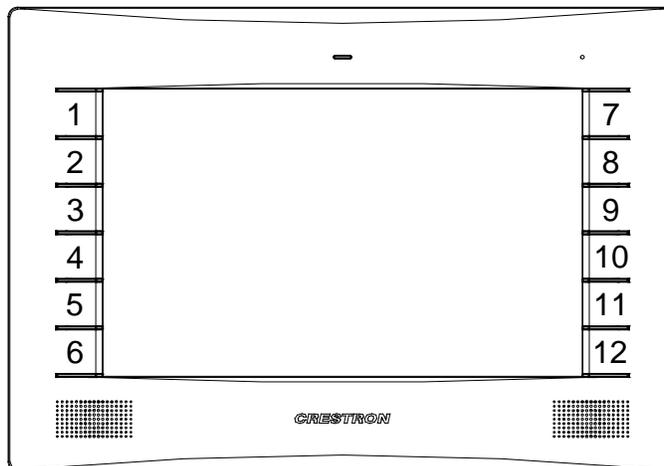
NOTE: The TPMC-9L can take up to 45 seconds to boot to a display after initial power up.

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.

The setup screens allow basic configuration procedures prior to regular operation of the touch screen. To enter the setup screens, touch the panel while applying power to the unit. The setup screens can also be entered by touching the upper left corner, lower left corner, upper right corner and lower right corner of the panel twice in sequence (upper left, lower left, upper right, lower right, upper left, lower left, upper right, lower right). This sequence must be performed within five seconds and touches must be all the way in the corners.

An third way to enter the setup screens, for TPMC-9L touch screens using the button bezel, is to press the first four buttons from the top on the left side of the screen, twice in sequence (1, 2, 3, 4, 1, 2, 3, 4). Refer to the following illustration for push button numbering.

Push Button Layout and Join Number Assignment



The main **Setup** menu opens, as shown in the illustration that follows. The functions provided by each button are detailed in subsequent paragraphs.

TPMC-9L Setup Menu

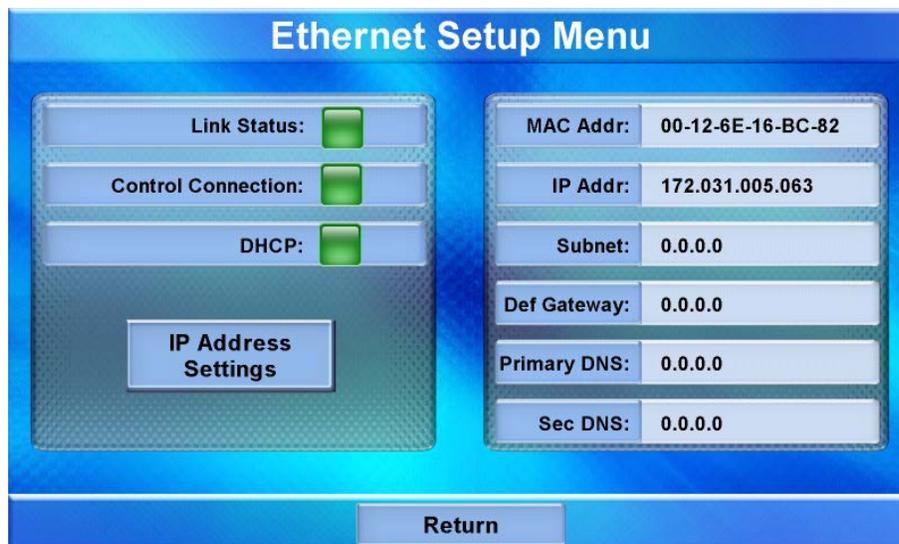


The **Setup** menu provides access to all basic functions and parameters. There are buttons for **Ethernet**, **IP Table**, **Video**, **Audio**, **Cresnet**, **Diagnostics**, **About**, **Display** and **Keypad**. There are also buttons to increase and decrease **Standby Timeout**, buttons to turn the **Hard Key Wakes LCD** function on or off, as well as a button to enable/disable system messages. A **Save & Reboot** button is provided to save settings and reboot the touch screen.

Ethernet

Touch **Ethernet** to enter the **Ethernet Setup Menu**, shown in the illustration below.

Ethernet Setup Menu



The **Ethernet Setup Menu** displays information about the **Link Status**, **Control Connection**, **DHCP**, MAC address, IP address, subnet, default gateway, primary

DNS and secondary DNS. It also has an **IP Address Settings** button used to access the submenus for setting up IP address and DNS servers.

Touch **IP Address Settings** to enter the **IP Address** screen, shown in the illustration below. Touch **Return** to go back to the main **Setup** menu.

"P Address Screen



DHCP is enabled by default. To enter a **Static IP Address**, **Static Subnet Mask** or **Static Default gateway**, first touch the **DHCP Enabled** button. The button text changes to **Disabled**. Then touch the appropriate button for the address to be entered (or changed). A numeric keypad opens, as shown in the illustration that follows.

Numeric Keypad



Touch **CLEAR** to remove any previous entry. Then enter the address required. Touch **OK** to accept the entry or **CANCEL** to cancel the entry. This hides the numeric keypad and returns the display to the **IP Address** screen.

On the **IP Address** screen, touch **Save** to keep the change or **Cancel** to cancel the change and return to the **Ethernet Setup Menu**.

To enter (or change) the **Static Primary DNS**, **Static Secondary DNS**, **Static Primary WINS** or **Static Secondary WINS**, touch **Edit DNS Servers** on the **IP Address** screen. The **IP Address** screen changes to show these addresses, as shown in the illustration below.

IP Address Screen (Showing DNS and WINS Servers)

Touch the appropriate button for the address to be entered (or changed). The numeric keypad opens.

Touch **CLEAR** to remove any previous entry. Then enter the address required. Touch **OK** to accept the entry or **CANCEL** to cancel the entry. This hides the numeric keypad and returns the display to the **IP Address** screen.

On the **IP Address** screen, touch **Save** to keep the change or **Cancel** to cancel the change and return to the **Ethernet Setup Menu**. Touch **Edit IP Address** to return to the previous **IP Address** screen.

IP Table

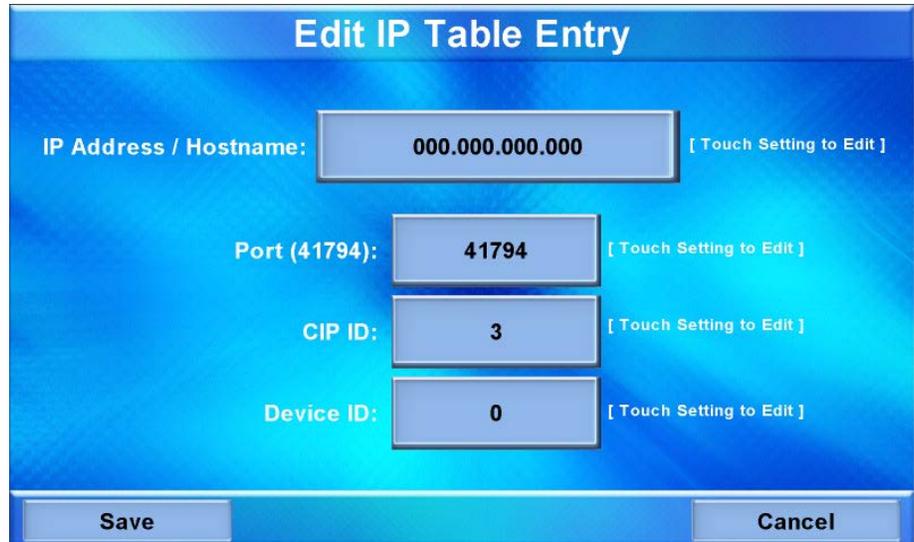
From the main **Setup** menu, touch **IP Table** to enter the **Control System Interface** menu, shown in the illustration below.

Control System Interface Menu

The **Control System Interface** menu contains buttons for eight IP Table slots as well as **Add IP**, **Edit IP** and **Remove IP** buttons to facilitate editing entries. Touch the **Auto Discovery Enabled** button to toggle to **Auto Discover Disabled**. A **Control Connection** indicator lights in green to show a control system connection. Touch **Cresnet** to enter a **Cresnet ID** and to enable or disable Cresnet. (Refer to "Cresnet" which starts on page 20 for details.)

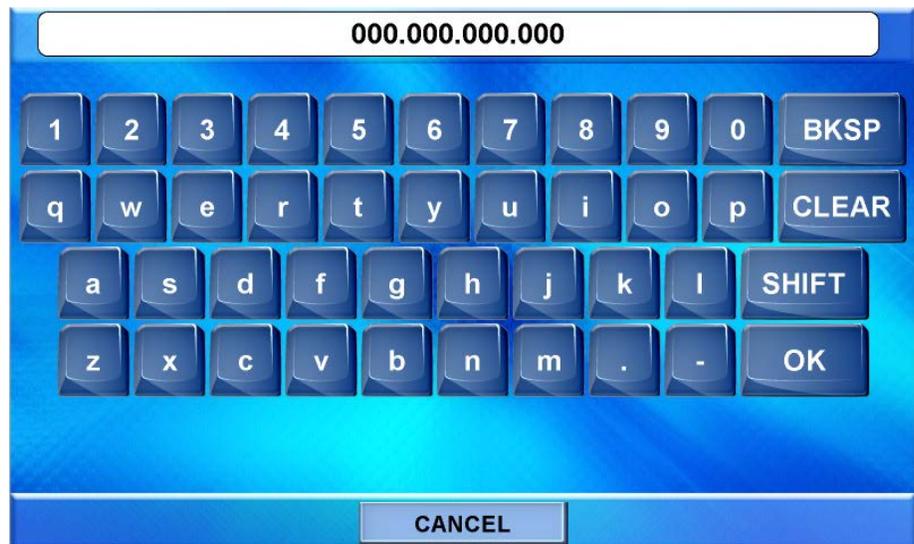
To add an IP entry to a blank slot, first touch one of the **Empty IP Table Slot** buttons, then touch **Add IP**. The **Edit IP Table Entry** screen is displayed, as shown below.

Edit IP Table Entry Screen



Touch the **IP Address / Hostname** button. The on-screen keyboard opens, as shown in the illustration below.

On-Screen Keyboard



Touch **CLEAR** to remove any previous entry. Then enter the address required. Touch **OK** to accept the entry or **CANCEL** to cancel the entry. This hides the on-screen keyboard and returns the display to the **Edit IP Table Entry** screen.

On the **Edit IP Table Entry** screen, touch **Save** to keep the change or **Cancel** to cancel the change and return to the **Control System Interface** menu.

To edit the port, **CIP ID** or **Device ID**, touch the appropriate button. Touching the **Port (41794)** button opens the numeric keypad. Touching the **CIP ID** or **Device ID** buttons opens a hex keypad, shown in the illustration below.

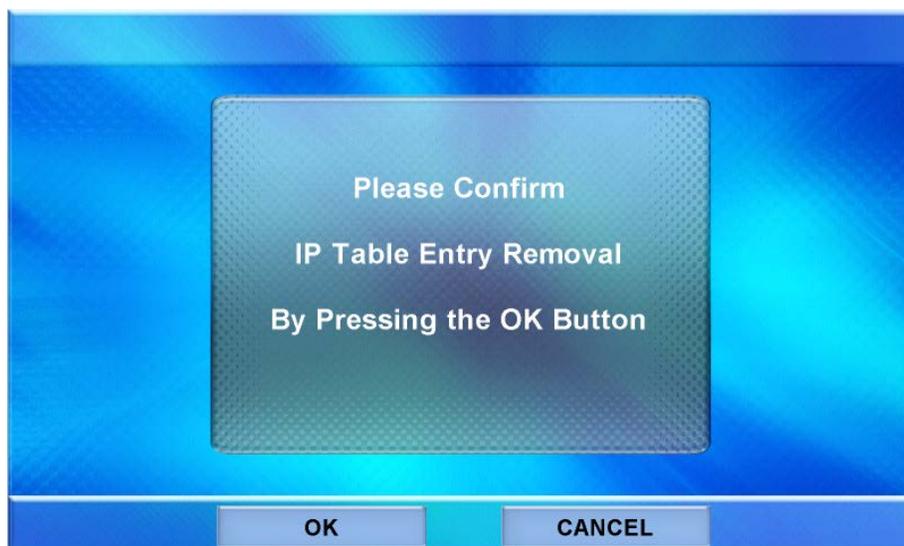
Hex Keypad



Touch **CLEAR** to remove any previous entry. Then enter the ID required. Touch **OK** to accept the entry or **CANCEL** to cancel the entry. This hides the hex keypad and returns the display to the “**Edit IP Table Entry**” screen.

From the **Control System Interface** menu, to edit or remove an IP entry, first touch the appropriate button containing the entry. Then touch **Edit IP** or **Remove IP** as appropriate. Editing an entry displays the **Edit IP Table Entry** screen (refer to the first illustration on page 17). Removing an entry displays a message saying **Please Confirm IP Table Entry Removal By Pressing the OK Button**, as shown in the illustration below.

Confirm IP Table Entry Removal Screen



Touch **OK** to confirm the removal or touch **CANCEL** to cancel the removal. The display returns to the **Control System Interface** menu (refer to the second illustration on page 16).

On the **Control System Interface** menu, touch **Return** to go back to the main **Setup** menu.

Video

From the main **Setup** menu, touch **Video** to enter the **Video Setup** screen, shown in the illustration below.

Video Setup Screen

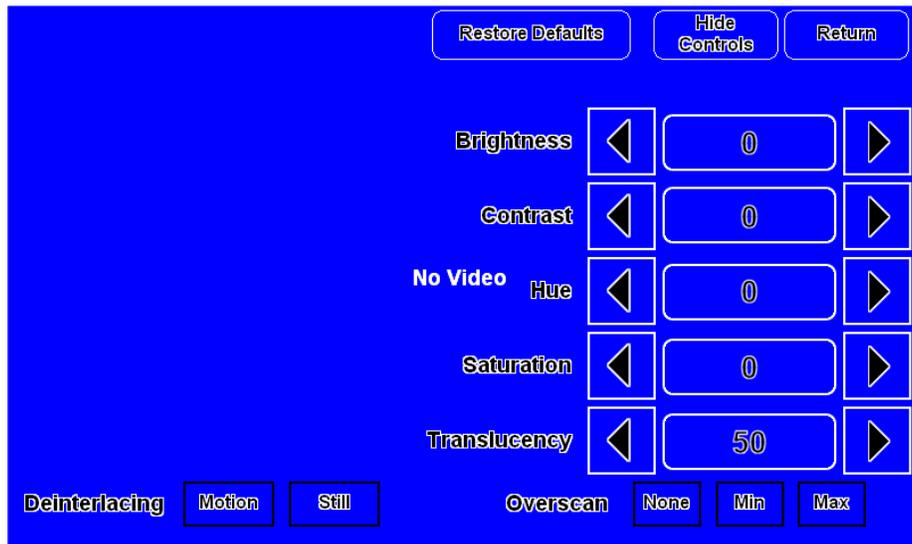


The **Video Setup** screen contains buttons for adjustment of **Brightness**, **Contrast**, **Hue**, **Saturation**, **Translucency**, type of **Deinterlacing** and amount of **Overscan**.

There is also a **Restore Defaults** button to return to factory settings and a window to display video.

Touch the video window for a full screen video display, as shown in the illustration below.

Full Screen Video Display

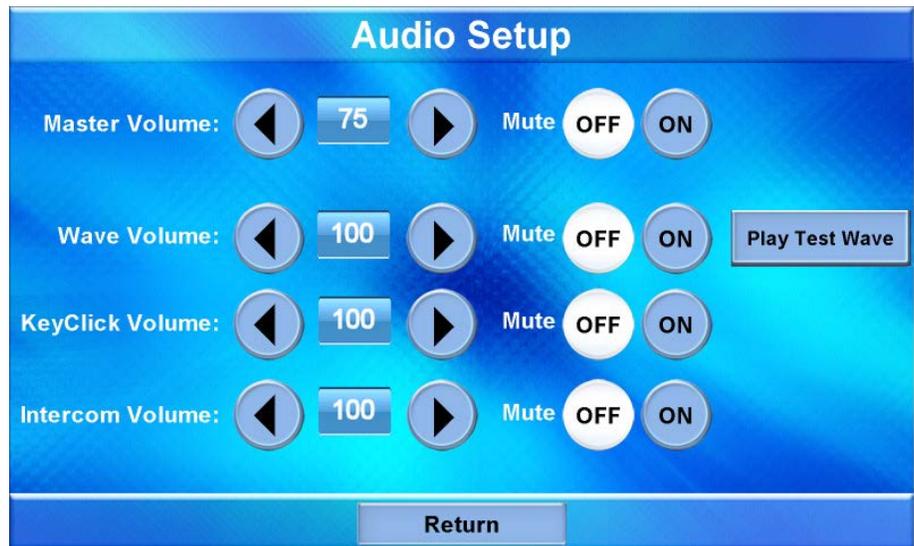


Touch **Hide Controls** to remove the controls. The button text changes to **Show Controls**. Touch **Return** to go back to the **Video Setup** screen. From the **Video Setup** screen, touch **Return** to go back to the main **Setup** menu.

Audio

From the main **Setup** menu, touch **Audio** to enter the **Audio Setup** screen, shown in the illustration below.

Audio Setup Screen

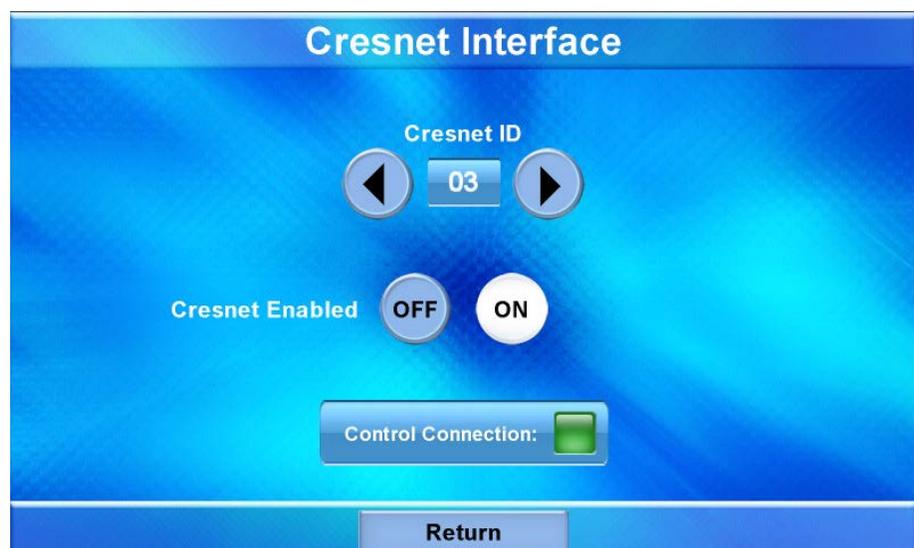


The **Audio Setup** screen contains buttons for adjustment or muting of **Master Volume**, **Wave Volume**, **KeyClick Volume** and **Intercom Volume**. There is also a **Play Test Wave** button. Touch **Return** to go back to the main **Setup** menu.

Cresnet

From the main **Setup** menu, touch **Cresnet** to enter the **Cresnet Interface** screen, shown in the illustration below.

Cresnet Interface Screen



The **Cresnet Interface** screen contains buttons for setting the **Cresnet ID** and for enabling or disabling Cresnet. A **Control Connection** indicator lights in green to show a control system connection. Touch **Return** to go back to the main **Setup** menu.

Diagnostics

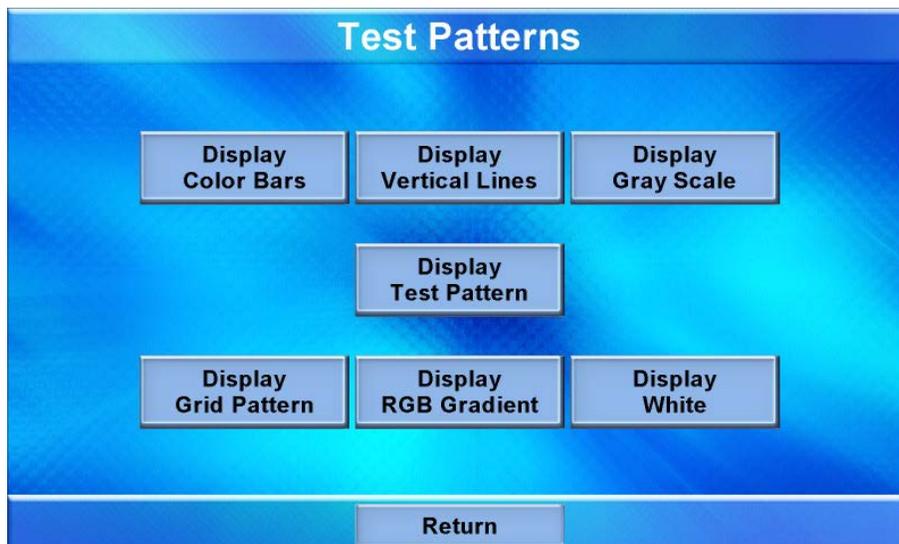
From the main **Setup** menu, touch **Diagnostics** to enter the **Diagnostics** menu, shown in the illustration below.

Diagnostics Menu



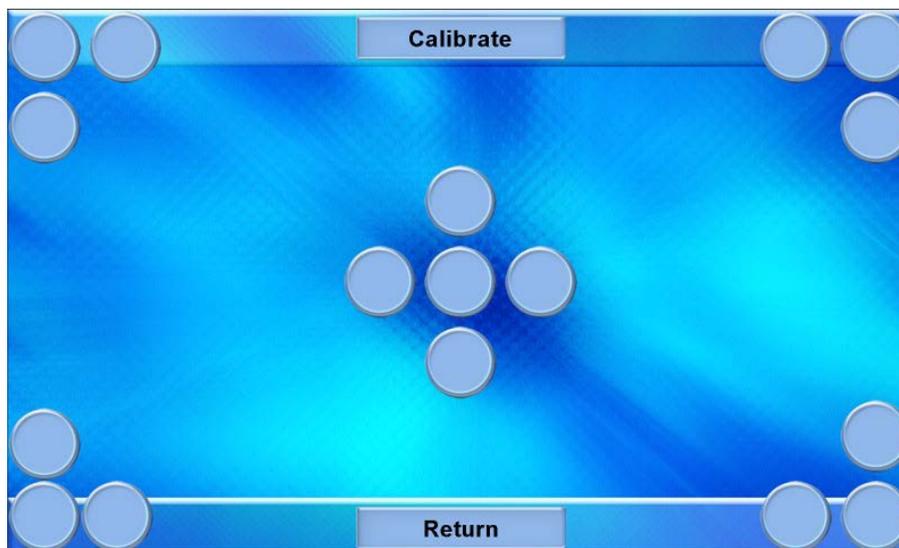
The **Diagnostics** menu contains buttons for **Test Patterns**, **Touch Test**, **Keypad Test**, **Swipe Test**, **Mic Test** and **Calibrate Touch**. This screen also displays **Total RAM**, **Free RAM**, as well as the current **MAC** and **IP** addresses. A **Link Status** indicator lights in green to show Ethernet activity and a **Control Connection** indicator lights in green to show a control system connection. The **Light Sensor** meter at the bottom of the screen provides indication of ambient light level.

Touch **Test Patterns** to display a selection of test pattern options, as shown in the illustration below.

Test Patterns Screen

Test pattern options include **Display Color Bars**, **Display Vertical Lines**, **Display Gray Scale**, **Display Test Pattern**, **Display Grid Pattern**, **Display RGB Gradient** and **Display White**. From any of these, touch the screen to return to the **Touch Patterns** screen. From the **Touch Patterns** screen, touch **Return** to go back to the **Diagnostics** menu.

From the **Diagnostics** menu, touch **Touch Test** to access touch screen calibration controls, as shown in the illustration below.

Touch Test Screen

Touch **Calibrate** to initiate touch screen calibration. During touch screen calibration, a crosshair appears at the center of the screen. Touch the center of the crosshair, which then moves to the upper left part of the screen. Touch the center of the crosshair and it moves to another part of the screen. Continue touching the center of the crosshair at each new location until calibration is complete. After calibration, the display returns to the screen shown above. Touch **Return** to go back to the **Diagnostics** menu.

From the **Diagnostics** menu, touch **Keypad Test** to display the **Diagnostics – Keypad Test** screen, shown in the illustration below.

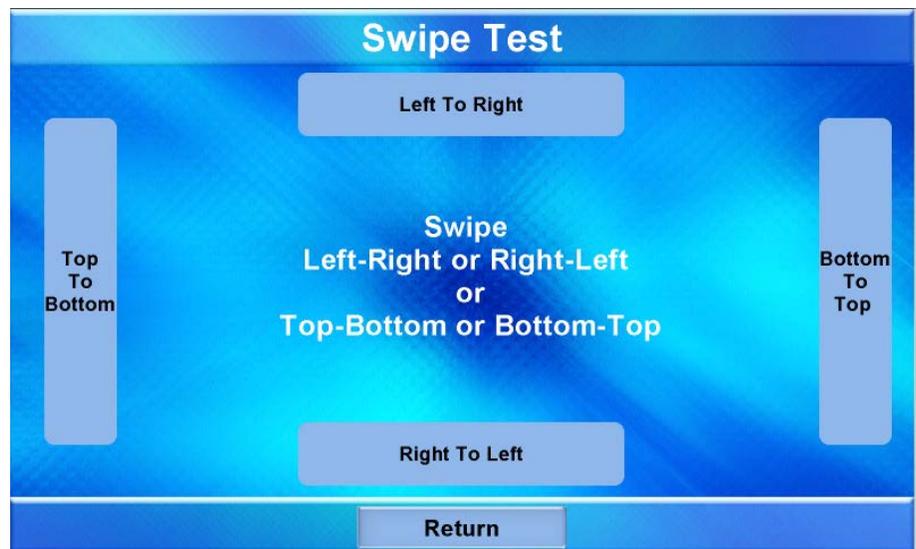
Diagnostics – Keypad Test Screen



The **Diagnostics – Keypad Test** screen allows testing of the hard keys on the touch screen faceplate (assuming the button faceplate and not the no-button faceplate is installed). Pressing any of the hard keys results in its corresponding section of the screen changing (from a black number on a white background to a white number on a dark background) in recognition of the key press. Touch **Return** to go back to the **Diagnostics** menu.

From the **Diagnostics** menu, touch **Swipe Test** to display the **Swipe Test** screen, as shown in the illustration below.

Swipe Test Screen



Swiping a finger on screen, left to right, right to left, top to bottom or bottom to top lights the appropriate indicator, showing the swipe was recognized. Touch **Return** to go back to the **Diagnostics** menu.

From the **Diagnostics** menu, touch **Mic Test** to display the **Diagnostics - Mic Test** screen, as shown in the illustration below.

Diagnostics – Mic Test Screen



This screen performs a test of the TPMC-9L's built-in microphone. The touch screen records audio for five seconds and then plays back the recorded sound. Speak into the microphone on the front of the TPMC-9L and the recording is played back to confirm the microphone is functioning. When playback is finished, the display goes back to the **Diagnostics** menu.

The **Calibrate Touch** button on the **Diagnostics** menu initiates touch screen calibration, as does the **Calibrate** button on the Touch Test screen (refer to the "Touch Test Screen" illustration on page 22).

From the **Diagnostics** menu, touch **Return** to go back to the main **Setup** menu.

About

From the main **Setup** menu, touch **About** to display the firmware version and operating system image version currently loaded on the TPMC-9L. Touch **Return** to go back to the main **Setup** menu.

Display

From the main **Setup** menu, touch **Display** to enter the **Display Settings** screen, shown in the illustration below.

Display Settings Screen



The **Display Settings** screen contains buttons for turning the TPMC-9L's **Auto Brightness Control** on or off, controls for pre-setting the **Screen Brightness Level – HIGH** and **Screen Brightness Level – LOW**, as well as **HIGH** and **LOW** buttons for instantly activating these presets. In addition, there are controls to set the **Sensor Threshold** and a **Current Light Sensor Level** meter, like the one on the main **Diagnostics** menu (refer to “Diagnostics” which starts on page 21), to indicate ambient light level.

With the **Auto Brightness Control** set to **OFF**, the screen brightness is at the level set by the **Screen Brightness** controls (which appear in place of the **Sensor Threshold** and **Current Light Sensor Level** meters, as shown in the illustration that follows).

Screen Brightness Controls



Use the **Screen Brightness** controls to adjust the relative level (0% to 100%) of current brightness. Use the **Screen Brightness Level – HIGH** and **Screen Brightness Level – LOW** controls to set the high and low preset brightness levels. Press the **HIGH** and **LOW** buttons to check each level.

With the **Auto Brightness Control** set to **ON** (the default), the **Current Light Sensor Level** meter changes to show the amount of ambient light reaching the sensor. The internal light sensor adjusts the brightness level to accommodate for the current room ambience. If the light level is above the threshold, the brightness changes to the high setting; if the level is below the threshold, brightness changes to the low setting.

Use the **Sensor Threshold** controls to set the level at which the **Auto Brightness Control**, when set to **ON**, adjusts screen brightness. The **Sensor Level** meter is provided as a guide to setting the threshold.

Touch **Return** to go back to the main **Setup** menu.

Keypad

From the main **Setup** menu, touch **Keypad** to enter the **Keypad Backlight Settings** screen, shown in the illustration below.

Keypad Backlight Settings Screen



The **Keypad Backlight Settings** screen contains buttons for setting the TPMC-9L's **Auto Key Backlight Control** for optimal performance to match the color bezel (white, almond or black), setting the control manually or turning off the key backlighting. There are also controls for pre-setting the **Key Brightness Level – HIGH** and **Key Brightness Level – LOW**, as well as **HIGH** and **LOW** buttons for instantly activating these presets. In addition, there are controls to set the **Sensor Threshold** and a **Current Light Sensor Level** meter, like the one on the main **Diagnostics** menu (refer to “Diagnostics” which starts on page 21) and on the **Display Settings** screen (refer to “Display” which starts on page 25), to indicate ambient light level.

With the **Auto Key Backlight Control** set to **Manual**, the key backlighting is at the level set by the **Keypad Backlight Brightness** controls (which appear in place of the **Sensor Threshold** and **Current Light Sensor Level** meters, as shown in the illustration that follows).

Keypad Backlight Brightness Controls



Use the **Keypad Backlight Brightness** controls to adjust the relative level (0% to 100%) of current key backlighting. Use the **Key Brightness Level – HIGH** and **Key**

Brightness Level – LOW controls to set the high and low preset brightness levels. Press the **HIGH** and **LOW** buttons to check each level.

With the **Auto Key Backlight Control** set to **White Bezel**, **Almond Bezel** or **Black Bezel**, the **Current Light Sensor Level** meter changes to show the amount of ambient light reaching the sensor. The internal light sensor adjusts the key backlighting to accommodate for the current room ambience.

The threshold value is constant for all bezel colors. What the panel does when the sensor reading crosses the threshold differs for white, almond and black bezels.

- For white or almond bezels:
 - ⇒ When the sensor level is below the threshold, the key backlight brightness is set to the high level.
 - ⇒ When the sensor is above the threshold, the key backlight brightness is set to the low level.
- For black bezels:
 - ⇒ When the sensor level is below the threshold, the key backlight brightness is set to the low level.
 - ⇒ When the sensor is above the threshold, the key backlight brightness is set to the high level.

With the **Auto Key Backlight Control** set to **No Key Backlight**, the key backlight is turned off, regardless of the sensor reading or other settings.

Touch **Return** to go back to the main **Setup** menu.

Save & Reboot

From the main **Setup** menu, touch **Save & Reboot** to save all settings, exit the setup screens and return to the main project.

Mounting Options

The TPMC-9L installs simply and cleanly into existing or newly constructed walls, with an assortment of pre- and post-construction mounting options. The TPMC-9L is supplied with four screws and clips for post-construction installation. All available mounting options are listed in the following table. The options listed are sold separately from the touch screen.

Mounting Options for the TPMC-9L

PRE-CONSTRUCTION OPTION	POST-CONSTRUCTION OPTION	MODEL NUMBER	DOCUMENT NUMBER
Back Box Kit	-	BB-9L	7031
Wall Mount Kit	-	PMK-9L	7032
Mud Ring Mount Kit	-	MMK-9L	7033
Trim Ring Mount Kit	-	TMK-9L	7034
-	Wall Mount Kit with Mud Ring	WMKM-9L	7033
-	Wall Mount Kit with Trim Ring	WMKT-9L	7034

NOTE: Pre-construction refers to framed walls prior to hanging drywall. Post-construction refers to framed walls with drywall hung.

NOTE: There is also a rack mount kit (RMK-9L) available for the TPMC-9L. Refer to the RMK-9L Installation Guide (Doc. 7035).

If the BB-9L or PMK-9L are to be used and a touch screen is not available, the installer can either leave the hole in the mounting surface open (if permitted by local building codes) or attach the cover plate supplied with the mounting kit.

Touch Screen Mounting

Physical installation of the TPMC-9L without a mounting option includes mounting the unit to the wall and installing a faceplate. The only tools required for the procedures presented here are masking tape (or equivalent), a level, a gypsum board saw (or equivalent), and a #2 Phillips tip screwdriver. The following procedures are based on the use of the supplied screws and clips for post-construction installation.

Mounting in a Wall

The TPMC-9L is designed to be mounted in a wall or lectern. Two overlay cutout templates (4511860) are supplied. One is in the shape of the required opening; the other is similar to a frame, with the inner area of the frame the shape of the required opening. (Refer to the illustrations on page 29.) Use the template that is most convenient.

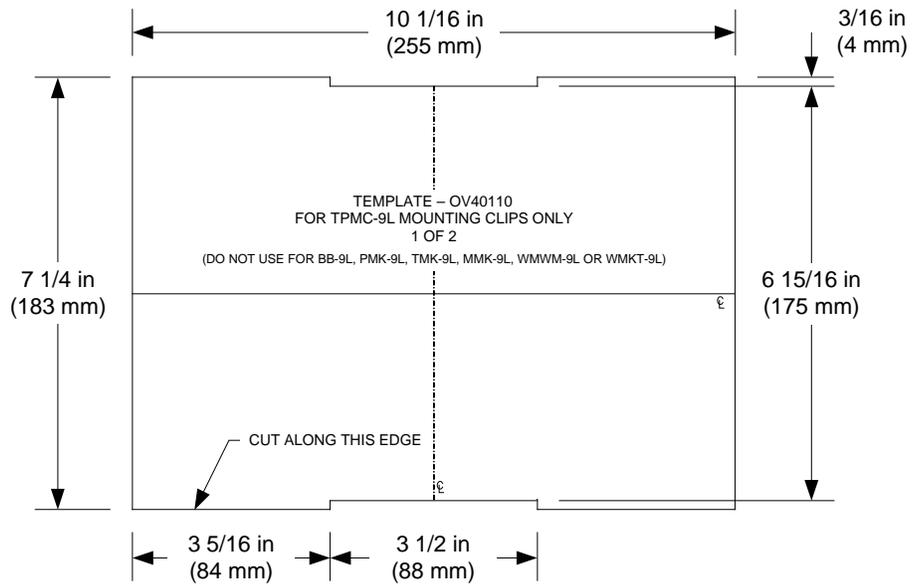
Mounting Parts Supplied with the TPMC-9L

PART DESCRIPTION	PART NUMBER	QUANTITY
Metal Mounting Clip	2014237	4
Overlay Template Cutout	4511860	1
Connector Plug, 2-pin	2003574	1
Connector Plug, 3-pin	2003575	1
Connector Plug, 4-pin	2003576	1
Screw, #6-AB x 2-1/2", Pan Head	2014276	4
Screw, #04-40 x 2", Pan Head*	2018793	4

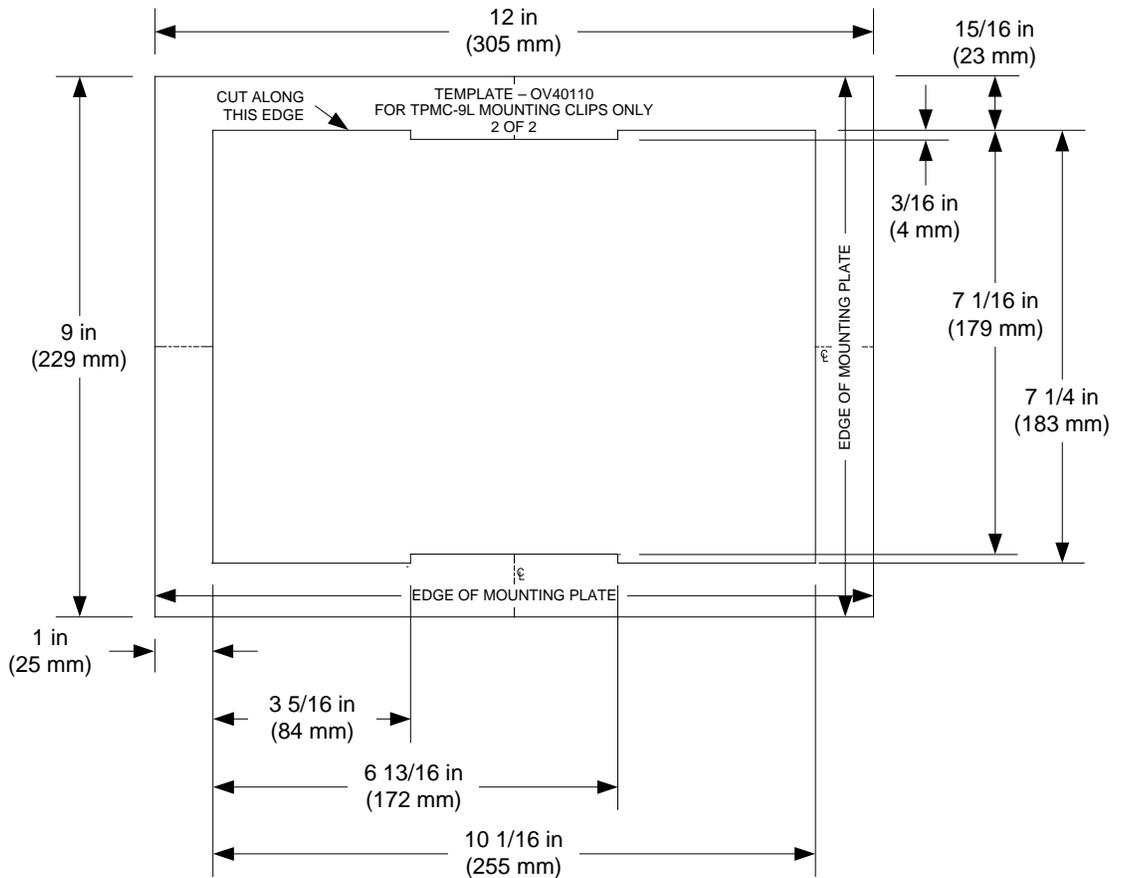
* The #04-40 x 2" screws are for use with TPMC-9L mounting kits such as the BB-9L (sold separately).

NOTE: The following drawings are not to scale. Do not attempt to use them to prepare the hole in the mounting surface.

TPMC-9L Cutout Dimensions (4511860, 1 of 2)



TPMC-9L Cutout Dimensions (4511860, 2 of 2)

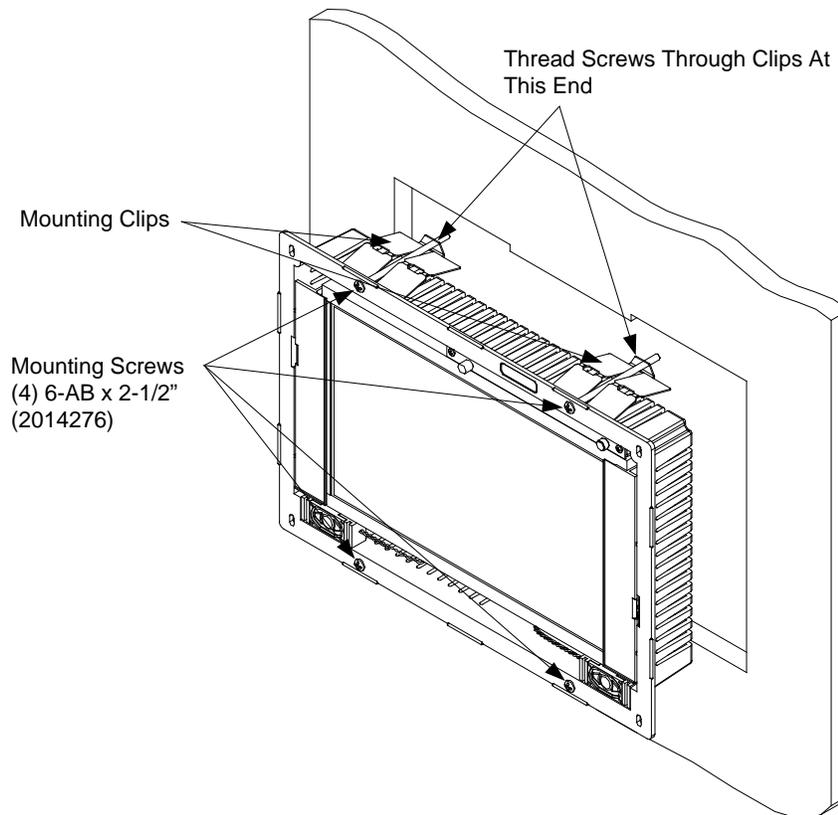


1. Locate an area on the wall that is free of miscellaneous wiring and studs.
2. Make a small hole near the middle of the designated site, and verify that the location is suitable.
3. Using masking tape (or equivalent), fasten the template to the wall; verify that the template is level, and trace the opening shape on the wall.
4. Remove the template, and then cut out and remove the traced shape to produce the required opening.

NOTE: Before inserting the TPMC-9L in the mounting hole, ensure that all required cables have been installed in the wall.

5. Install the four supplied #6-AB x 2-1/2" screws and mounting clips as shown in the following diagram (two on the top and two on the bottom).
 - a. Insert the screws through the touch screen flange and then through the larger hole in the mounting clip.
 - b. Thread the screws through the smaller hole in the mounting clips and tighten the screws only enough that the mounting clips are brought flush with the rear of the touch screen flange. Do not compress the mounting clips at this time.

Attaching the Screws and Mounting Clips



6. Connect the Cresnet cable, using the supplied mating connector, to the Cresnet port; attach the Ethernet cable, if required. Attach video cables, using the supplied mating connectors and position the TPMC-9L in the mounting hole. Refer to "Hardware Hookup" which starts on page 31.

7. Tighten the mounting screws evenly and only enough to compress the mounting clips and secure the TPMC-9L squarely in the mounting surface. Do not over-tighten the screws.

Installing the Faceplate

Use the Crestron Engraver software package to obtain a custom-engraved faceplate for the TPMC-9L. Install the faceplate as follows.

1. Carefully position the faceplate over the face of the touch screen.
2. Ensure that the faceplate is oriented properly and press against the TPMC-9L until the faceplate snaps into place.

Touch Screen Removal

If it is necessary to remove the touch screen after it has been installed into a mounting surface, complete the following steps in the order provided to remove the touch screen. The only tool required is a #2 Phillips tip screwdriver.

1. Lift one edge of the faceplate to free it from the touch screen and lift it off. Do not apply excessive pressure to the touch screen.
2. Loosen and remove the screws that secure touch screen to the mounting option in use.
3. Using equal pressure, carefully remove the touch screen from the opening.

If necessary, secure and label the attached cables before disconnecting them from the back of the touch screen.

Hardware Hookup

Ventilation

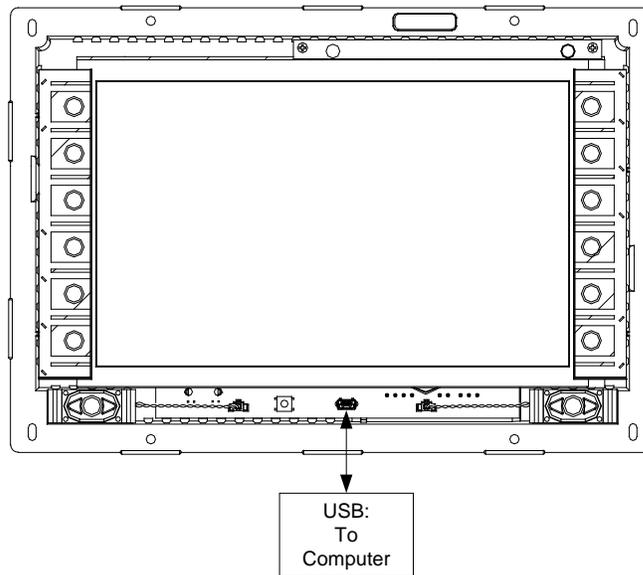
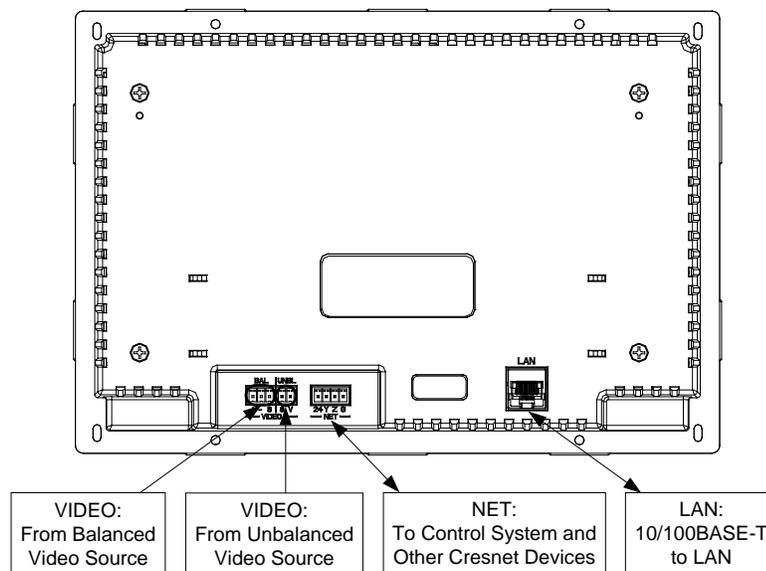
The TPMC-9L should be used in a well-ventilated area. The venting holes should not be obstructed under any circumstances. If the TPMC-9L is hot to the touch, consider using forced air ventilation.

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

Connect the Device

Make the necessary connections as called out in the illustration on the following page. Refer to "Network Wiring" on page 12 before attaching the 4-position terminal block connector. Apply power after all connections have been made.

When making connections to the TPMC-9L, use Crestron power supplies for Crestron equipment.

Hardware Connections for the TPMC-9L (Front View)*Hardware Connections for the TPMC-9L (Rear View)*

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. Faceplates 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 faceplate.

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

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 (or device). Finally, program checks can be performed (such as changing the device ID or creating an IP table) to ensure proper functioning.

NOTE: Crestron software and any files on the website are for authorized Crestron dealers and Crestron Service Providers (CSPs) only. New users must register to obtain access to certain areas of the site (including the FTP site).

Establishing Communication

NOTE: For PCs running Windows 2000 or XP, ActiveSync 4.5 or later is required for Toolbox to communicate with the TPMC-9L via USB to upload firmware and display lists. Download and install ActiveSync from the Microsoft® website (www.microsoft.com/windowsmobile/en-us/help/synchronize/device-synch.mspx).

PCs running Windows Vista or 7 require Windows Mobile Device Center for communication with Toolbox. Download and install Windows Mobile Device Center (WMDC) from the Microsoft website (www.microsoft.com/windowsmobile/devicecenter.mspx).

Use Crestron Toolbox for communicating with the TPMC-9L; refer to the Crestron Toolbox help file for details. There are three methods of communication: indirect, TCP/IP and USB.

Indirect

Indirect Communication



TPMC-9L connects to control system via Cresnet:

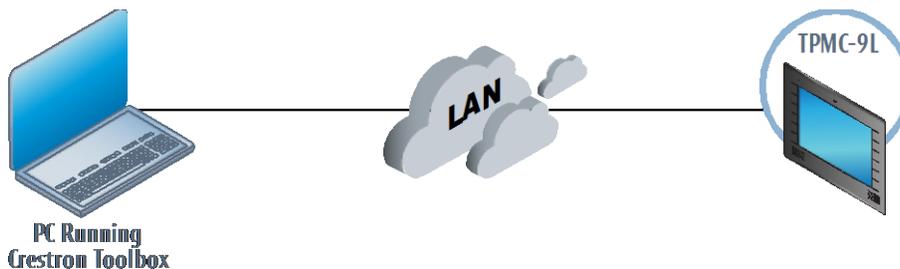
1. Select **Tools > System Info**.
2. Click the  icon.
3. For *Connection Type*, select *Cresnet ID*. In the *Through* drop-down menu, select the control system.
4. For *Device is at*, select *Cresnet ID* and select the ID number from the drop-down menu.
5. In the *Through* drop-down menu, select the control system.

NOTE: If no address book entry is listed for the control system, click **Address Book...** to create an entry. For details, refer to the Crestron Toolbox help file.

- Click **OK**. Communications are confirmed when the device information is displayed.

TCP/IP

Ethernet Communication

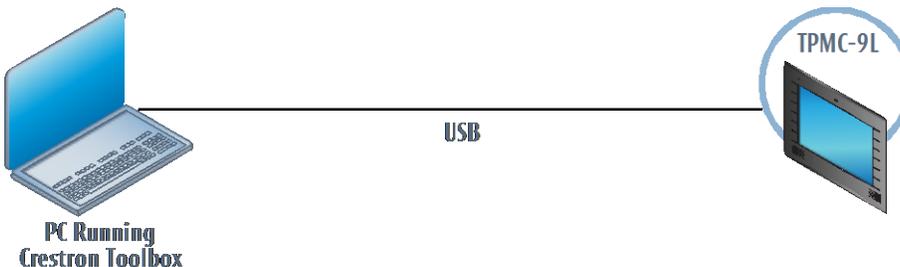


The TPMC-9L connects to PC via Ethernet:

- Use the Device Discovery Tool (click the  icon) 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.
- Click on the TPMC-9-L to display information about the device.

USB

USB Communication



The **USB** port on the TPMC-9L connects to the USB port on the PC:

- Select **Tools > System Info**.
- Click the  icon.
- For *Connection Type*, select **USB**. When multiple USB devices are connected, identify the TPMC-9L by entering "TPMC-9L" in the *Model* text box, the unit's serial number in the *Serial* text box or the unit's hostname (if known) in the *Hostname* text box.
- Click **OK**. Communications are confirmed when the device information is displayed.

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 Crestron Studio help file, SIMPL Windows help file, VT Pro-e[®] help file or the Crestron Toolbox help file.

Crestron Studio or SIMPL Windows

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

Crestron Studio or VT Pro-e

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

Firmware

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

Upgrade TPMC-9L firmware via Crestron Toolbox.

1. Establish communication with the TPMC-9L and display the “System Info” window.
2. Select **Functions > Firmware...** to upgrade the TPMC-9L firmware.

Program Checks

Actions that can be performed on the TPMC-9L 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-9L to display actions that can be performed on the TPMC-9L.

Ethernet Connections

For Ethernet connections, display the “System Info” window (**Tools > System Info**) and select the **Functions** menu to display actions that can be performed on the TPMC-9L.

Be sure to use the internal setup menu (refer to “IP Table” which starts on page 16) or Crestron Toolbox to create the TPMC-9L IP table. In Toolbox:

1. Select **Functions > IP Table Setup**.
2. Add, modify or delete entries in the IP table.
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-9L. The entry should list the TPMC-9L’s IP ID (specified on the TPMC-9L’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-9L 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.
Touch screen is not responding.	Touch screen Net ID is not set to match the Net ID in the SIMPL program.	Use Crestron Toolbox to poll the network. Verify the Net ID for the touch screen is properly set to match the Net ID in the SIMPL program.
	Touch screen Net 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.
	No IP address configured/obtained on the TPMC-9L.	Use the internal setup menu (refer to "IP Table" which starts on page 16) or Crestron Toolbox to create/verify Ethernet settings.
	Invalid control system IP address / IP ID set up on the TPMC-9L.	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" which starts on page 14 and to "IP Table" which starts on page 16 to define IP addresses.
Touch screen display is dark.	Standby timeout has elapsed.	Touch the screen to reactivate.
Unexpected response from touch screen.	Touch screen is incorrectly calibrated.	Recalibrate the touch screen (refer to "Diagnostics" which starts on page 21).
TPMC-9L 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.

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: 18AWG (0.75 mm²))
 or 1.6 ohms (Cresnet HP: 12AWG (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 **24** and **G** pair and the other twisted pair is the **Y** and **Z** pair.

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

All documents mentioned in the guide are available at www.crestron.com/manuals.

List of Related Reference Documents

DOCUMENT TITLE
BB-9L Pre-Construction Wall Mount Back Box
Crestron e-Control Reference Guide
MMK-9L & WMKM-9L Mud Mount Kits
PMK-9L Pre-Construction Wall Mount Kit
RMK-9L Rack Mount Kit
TMK-9L & WMKT-9L Trim Ring 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, for assistance within a particular geographic region, refer to the listing of Crestron worldwide offices at www.crestron.com/offices.

To post a question about Crestron products, log onto Crestron's Online Help at 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-9L, 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.

This page is intentionally left blank.



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



Operations & Installation Guide – DOC. 7030F
(2028354)

12.14

Specifications subject to
change without notice.