Crestron TPMC-10
Isys i/O™ WiFi Touchpanel
Operations Guide

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Contents

Isys i/O™ WiFi Touchpanel: TPMC-10

Introduction

Functions and Features

The Crestron® Isys i/O™ WiFi Touchpanel, TPMC-10, is a two-way wireless Ethernet touchpanel that delivers rock solid performance with native onboard capabilities for accessing e-mail, streaming multimedia, and browsing the Internet. This stylish and ergonomic 10-inch wireless touchpanel currently supports 64- and 128-bit WEP encryption, and is ready for future WPA (Wi-Fi Protected Access) support. It features integrated 802.11g Wi-Fi technology for reliable, two-way high-speed communications across any wireless LAN. With the Microsoft® Windows® CE .NET 4.2 operating system running behind the scenes, the TPMC-10 has an embedded, true real-time Web browser and built-in document viewers for MS PowerPoint, Word, Excel, and Adobe Acrobat file formats.

Functional Summary

- 10.4 in (26.4 cm) TFT active matrix color LCD
- 800 x 600 screen resolution
- 16-bit color depth for incredible 3D graphics
- Microsoft® Windows® CE .NET 4.2 operating system
- Integrated 802.11g Wi-Fi technology for reliable two-way high-speed communications via Ethernet
- Embedded applications include Internet Explorer, Windows Media® Player, Microsoft Inbox, Remote Desktop, and viewers for Word, Excel, PowerPoint®, and Adobe® Acrobat®
- Optional docking station provides a convenient charging solution with connectivity for a wired USB mouse and keyboard
- Ten-watt biamplified speakers, headphone output, WAV file and MP3 capability

Far more than a mere tablet PC, the TPMC-10 touchpanel is designed to provide a powerful IP-based mobile control solution in a compact package that is easy to hold and intuitive to use. The ergonomic shape shifts effortlessly from tabletop to laptop

use, featuring a sleek contoured base that rests comfortably across one leg. Its smart design achieves an optimal viewing angle under any use, with four programmable hard pushbuttons and an integrated thumb pad to provide tactile control of audio volume, channel selection, OSM navigation, or even pan/tilt cameras.

Boasting 16-bit color depth, the TPMC-10 display produces incredible 3D graphics, dynamic text, and full-motion animations, all with astonishing speed. Through programmatic control, the GUI effectively merges conventional touchpanel control with PC functionality.

To complement its incredible graphics and computing capabilities, the TPMC-10 delivers great sounding audio from its built-in 10-watt biamplified speaker system, and stereo headphone output.

The TPMC-10 communicates only with an Ethernet-enabled Crestron® 2-Series control system (Cresnet® system) through a third-party Wi-Fi access point (not supplied). The two-way communications provide control of third-party and Cresnet devices, with dynamic on-screen feedback for real-time confirmation of commands. (Refer to "Typical System Configurations" on page 17 for more details.)

Part Number Compatibility

Due to production changes, certain information in this manual applies only to recently manufactured TPMC-10 units. The following table lists the differences based on the unit part numbers.

Feature/Part Number Compatibility

Feature Differences	TPMC-10 Part Numbers		
	6002572	6002822	6002881
Touchscreen Display Brightness Contrast Viewing Angle	 150 nits 250:1 ±45° horizontal, +15/-35° vertical	 230 nits 500:1 ±60° horizontal, +35/-65° vertical	 230 nits 500:1 ±60° horizontal, +35/-35° vertical
Embedded WiFi Radio	802.11b	802.11b	802.11g

NOTE: Part numbers can be found on the silver label affixed to each device.

Embedded PC Applications

With a host of embedded applications, the TPMC-10 provides a truly integrated digital media asset management solution. Applications include:

- MS Internet Explorer®
- MS Inbox (supports e-mail client)
- Windows Media Player®
- WordPad
- Adobe Acrobat 6.0 (limited feature set)
- Viewers: MS Word/PowerPoint/Excel/Adobe® Acrobat®
- Remote Desktop (control remote PCs on LAN)

Future PC applications and features may be added, as they become available, through Crestron updates.

Wi-Fi Technology

The TPMC-10 features integrated 802.11g Wi-Fi technology for reliable two-way high-speed communication across wireless LANs.

Wireless Access Point Compatibility

Several devices are compatible with the TPMC-10 for communication with a Cresnet System. Refer to the Crestron website (www.crestron.com), online help answer ID 2488, for recommended access points and configuration files.

Memory Expansion & Program Uploading

The TPMC-10's built-in PCMCIA port permits memory expansion to 4 GB or more, and the two built-in USB A ports can be used to connect to mass storage devices. Firmware updates can be performed via 802.11g wireless communication. Program loading can be accomplished via any mass storage device or through Compact Flash.

Touch Screen Actuation

The TPMC-10 touch screen responds to finger and stylus commands. The stylus provided is designed for use with the TPMC-10. The use of other pointing devices may damage the screen. (Refer to "Using the Stylus" on page 8.)

Optional Docking Station (TPMC-10-DS)

Placing the TPMC-10 into the optional docking station provides a convenient charging solution with connectivity provided for a wired USB mouse and keyboard. The docking station also enables viewing and operating the TPMC-10 in an upright position. Refer to the data sheet supplied with the docking station (Doc. 6285) for specific details.

Optional Mouse (TPMC-10-MS)

The TPMC-10 includes a USB Type A port for an optional wired USB optical mouse. With the mouse connected, the touchpanel continues to respond to stylus or finger actuation as well as all standard mouse functions. Refer to the data sheet supplied with the mouse (Doc. 6309) for specific details.

Optional Keyboard (TPMC-10-KB)

The TPMC-10 includes a USB Type A port for an optional wired keyboard. With the wired keyboard connected, the touchpanel continues to respond to stylus actuation of the on-screen keyboard as well as all available functions of the wired keyboard. Refer to the data sheet supplied with the keyboard (Doc. 6308) for specific details.

NOTE: The optional mouse and keyboard described above have been evaluated by Crestron and are known to be compatible with the TPMC-10. Other USB keyboards and mice may also be compatible, but have not been evaluated by Crestron.

NOTE: To obtain the above optional devices, please contact a Crestron customer service representative.

Specifications

The following table provides a summary of specifications for the TPMC-10.

Specifications of the TPMC-10 Isys i/O™ WiFi Touchpanel

SPECIFICATION	DETAILS
Power Requirement	
Battery[1]	Lithium Polymer 4S1P, 14.8 Volt, 2000 mAh (included)
Power Supply	60 Watts (3.16 Amps @ 19 Volts DC) universal 100~240VAC 50/60Hz (included)
Touchscreen Display	
Display Type:	TFT Active matrix color LCD
Size:	10.4 inch (26.4 cm) diagonal
Aspect Ratio:	4:3 SVGA
Resolution:	800 x 600 pixels
Brightness:	230 nits
Contrast:	500:1
Illumination:	Edge lit fluorescent
Viewing Angle:	±60° horizontal, +35/-65° vertical
Touchscreen Composition:	Resistive membrane
Graphic Engine	Isys i/O engine, 16-bit graphics, 65,536 colors. Synapse image rendering algorithm
Operating System	Microsoft® Windows® CE .NET 4.2
Audio	
Features	10 watt biamplified speakers, headphone output, WAV file and MP3 capability
WAV file	8- & 16-bit PCM, mono & stereo, 8 to 44 kHz sampling rates
Wireless Communication[2]	
RF Transceiver	IEEE 802.11g Wi-Fi 2.4 GHz 2-way RF 11/13 channels (2400 to 2483 MHz); requires third-party 802.11g wireless access point and Ethernet-enabled Crestron 2-Series control system.
Operating Range	Up to 328 feet (100m) @54Mbps (Transmission speed varies based on environmental conditions.)
Addressing Options	64- & 128-bit WEP encryption[3]; 802.1x (EAP pass through); Static IP, DNS/DHCP[4]
Default IP ID[5]	03
Signal Join Maximums	4000 digital, analog, and serial
Control System Update Files[6, 7]	
2-Series Control System	Version C2-3.131.CUZ or later
Acceptable file extensions[8]	
.vtz	*projectname*.vtz (compiled file)
.csz	TPMC-10.*vx.xxx.x*.csz (panel firmware)
Buttons	
Function Buttons	(4) Hard pushbuttons, programmable
Thumb pad	(1) 4-way thumb pad, programmable
Power	(1) Toggles power on and off
Reset	(1) Hard reset button, resets the touchpanel system
Memory	64 MB Flash, 128 MB SDRAM Expandable via PCMCIA Card Slot[9]
Operating Temperature	50° to 113°F (10° to 45°C)
Humidity	10% to 90% RH (non-condensing)

(continued on next page)

Specifications of the TPMC-10 Isys i/O™ WiFi Touchpanel (continued)

SPECIFICATION	DETAILS
Overall Dimensions	Width: 11.48 in (29.16 cm) Depth: 8.38 in (21.29 cm) Height: 2.71 in (6.88 cm)
Weight TPMC-10 Power Supply	 3 lb (1.36 kg) 0.8 lb (0.36 kg)

1. Typical battery life is four hours continuous usage with display at full brightness. Actual operating time depends on usage and settings for display brightness and timeouts.
2. Requires a compatible 802.11b or g Wi-Fi access point. The RF signal range is dependent on construction of the building, obstructions, and RF interference from other devices. The location of the access point and the orientation of its antenna are also important factors in the RF performance. If you use an 802.11g access point with both 802.11b and 802.11g devices connected to it, it is possible that the effective speed will be reduced to 802.11b speed (11Mbps).
3. Wired Equivalent Privacy (WEP) is a security protocol for wireless networks that encrypts transmitted data, and protects the integrity of the data.
4. DHCP is not supported on the TPMC-10.
5. Refer to "WiFi SETUP" on page 13 for details.
6. The latest versions can be obtained from the Crestron website. Refer to NOTE after last footnote.
7. Crestron 2-Series control systems include the AV2 and PRO2. Consult the latest Crestron Product Catalog for a complete list of 2-Series control systems that are Ethernet-enabled directly or via a C2ENET-1 or -2 Ethernet card.
8. In DETAILS, *projectname* represents assigned project name, and *vx.xxx.x* represents a version number.
9. Compact flash expandable to 4GB or more, based on third-party technology.

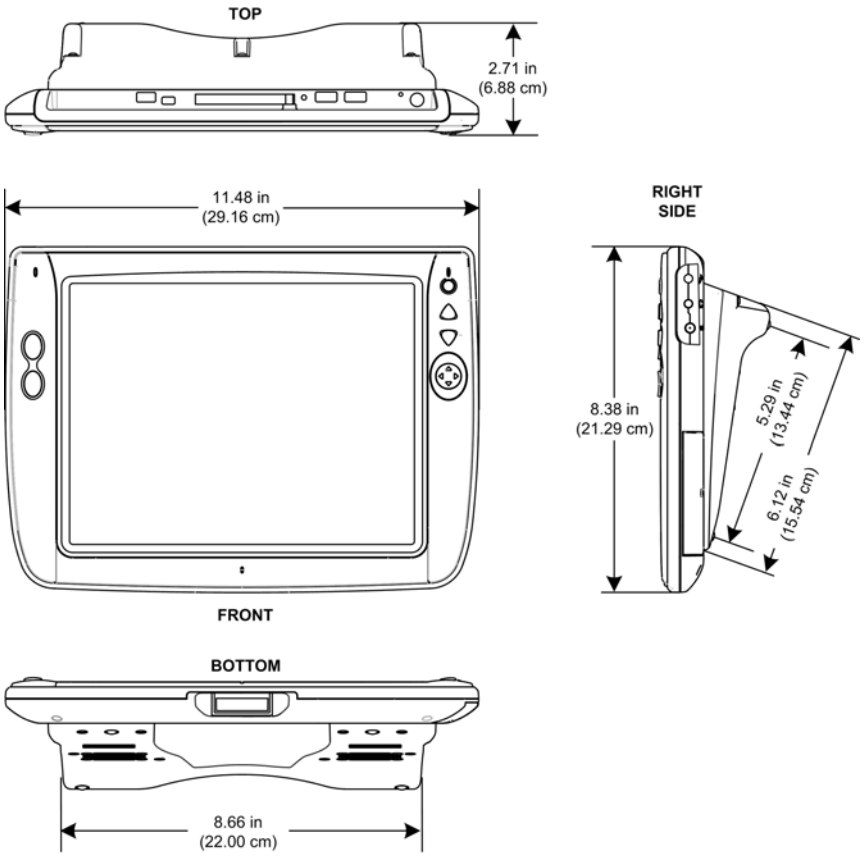
NOTE: Crestron software and any files on the website are for Authorized Crestron dealers and Crestron Authorized Independent Programmers (CAIP) only. New users may be required to register to obtain access to certain areas of the site (including the FTP site).

Physical Description

The TPMC-10 electronic hardware is housed in a black and silver molded plastic enclosure, shown in the following illustrations. Boasting 16-bit color depth, the touch-sensitive TPMC-10 viewing screen produces incredible 3D graphics, dynamic text, full-motion animations, all with astonishing speed.

Physical View of TPMC-10

Physical Views (continued)



TPMC-10 Ports, Controls, and Indicators

The unit's ports, controls, and indicators are described beginning below, and shown in the illustration on page 8.

Headphone

This 3.5 mm TRS mini phone jack provides stereo output to optional headphones (not supplied). Plugging in headphones cuts the audio to the speakers.

DC Power

The included power supply plugs into this jack to supply power to the unit and recharge the battery. (Refer to "Applying Power" on page 9.)

Mouse & Keyboard

These two USB Type A ports are for the optional keyboard and mouse (purchased separately). The mouse and keyboard can be plugged into either port. These ports are only used for the USB keyboard, mouse, or USB mass storage devices.

Reset Pushbutton

This pushbutton reboots the TPMC-10 system software.

PCMCIA Card

A Type II PCMCIA Card slot used for memory expansion up to 4GB or more, plus VT Pro-e project uploads.

USB Mini-B Port

This port is for future use. An interface cable is included.

Mini-VGA Port

One mini-VGA port (DB15HD cable included) RGBHV (VGA) output; aspect ratio: 4:3 SVGA; output resolution: 800 x 600.

Battery

The removable, lithium-polymer 14.8 Volt, 2000 mAh, battery supplies power to the TPMC-10.

Battery Compartment Lock

Releases or secures the removable lithium-polymer battery in the TPMC-10.

Docking Station Interface

When the TPMC-10 is docked in the optional TPMC-10-DS docking station, this port provides connectivity to the power supply and the optional mouse and keyboard plugged into the docking station.

Communication LED

The LED is solid green when the communication signal level is good, blinks yellow if the signal level is poor, and is off when communication is lost.

Power Pushbutton and LED

The pushbutton is used to cycle the TPMC-10 between on and standby modes. The LED indicates the battery's current status and charge level:

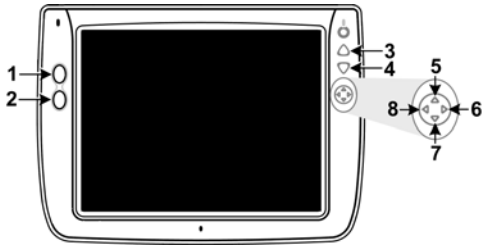
- Off – the TPMC-10 is powered off
- Solid green – the battery power level is OK
- Solid yellow – the battery power level is low
- Blinking yellow – the battery power level is critically low

When using the external power supply directly or via the docking station, the LED indicates the following:

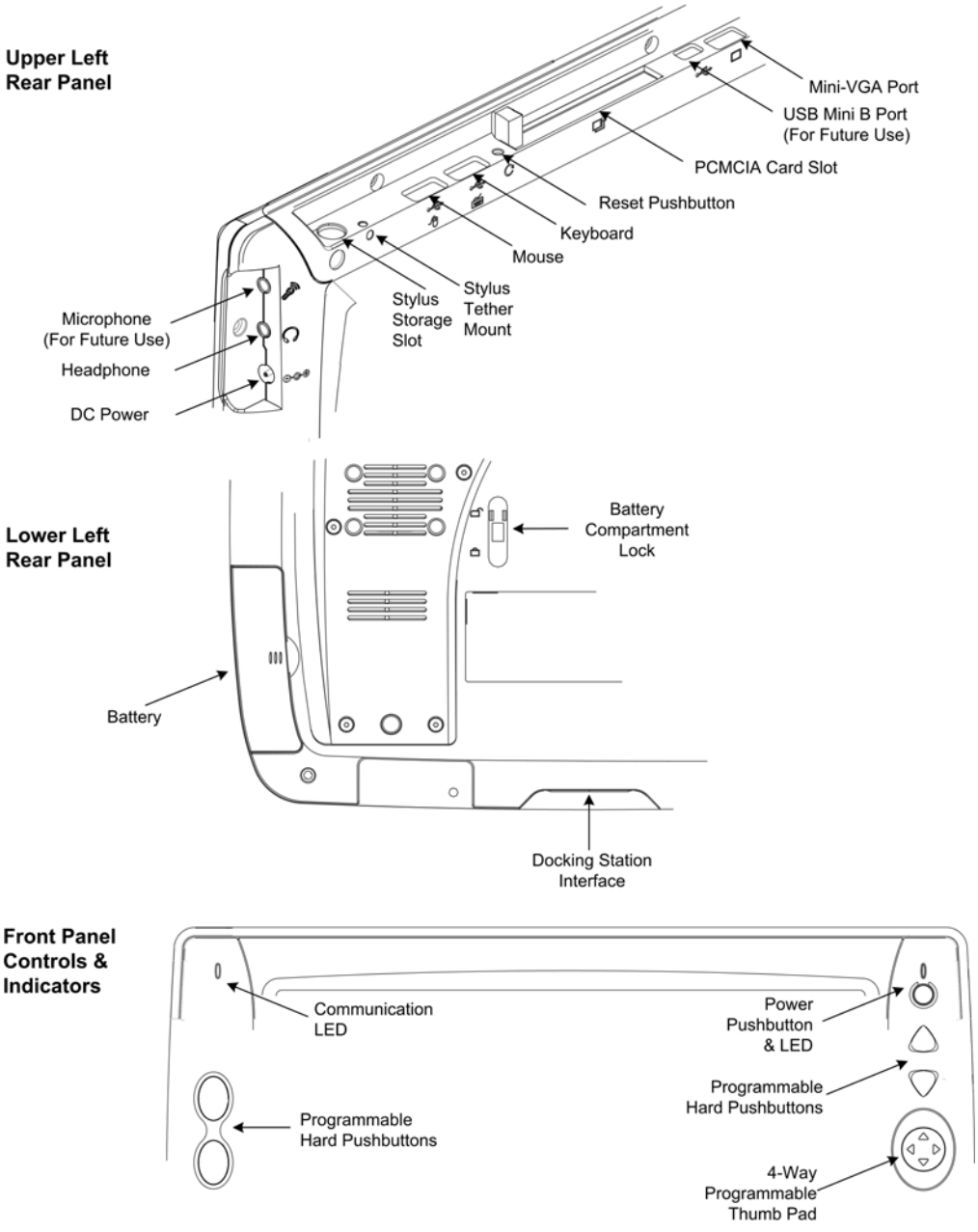
- Solid green – the unit is being powered by the power supply, and the battery is fully charged
- Blinking green – the unit is being powered by the power supply, and the battery is charging

Programmable Hard Pushbuttons and Thumb Pad

These hard pushbuttons and the four-way thumb pad are programmable and can provide tactile control of many functions such as audio volume, channel selection, OSM navigation, or even pan/tilt cameras. Fixed join numbers are assigned to these buttons as shown below. (Refer to "TPMC-10 Input/Output Signals" on page 23.)



TPMC-10 Ports, Controls, and Indicators



Using the Stylus

Use the stylus to "tap" or "double-tap" or to do "select and drag" functions just as you would using a mouse. The stylus is also used to "type" on the input panel "keyboard" when entering text or commands. When running embedded applications, pressing and holding the stylus on the screen brings up the application context menu, like a "right-click" mouse function. The stylus supplied with your TPMC-10 is designed for your screen. The use of other pointers could damage the screen. Use the tether to attach the stylus to the touchpanel to prevent the stylus from being misplaced. To obtain an additional stylus and/or tether, contact a Crestron customer service representative.

Industry Compliance

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

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

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. The 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 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 transceiver.
- Connect the equipment into an outlet on a circuit different from that to which the transceiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Setup

Applying Power

The TPMC-10 can be powered via its internal battery, or via the supplied external power supply. The power supply can be connected directly to the TPMC-10 or, if the touchpanel is docked in the optional TPMC-10-DS docking station (sold separately), it can be connected to the docking station.

NOTE: Before using the TPMC-10 for the first time, charge the internal battery for at least five hours, using the power supply provided.

It takes the TPMC-10 about two hours to recharge while not in use, and about four hours while in use. A fully charged battery can provide up to four hours of use depending upon screen brightness setting and the use of optional PCMCIA card accessories.

CAUTION: Removing the battery can cause the loss of any unsaved file changes. To prevent loss of data, connect the power supply before removing the battery.

Replacing the Battery

To replace the battery, slide the battery compartment latch up to the unlocked position, and slide the battery out. Slide the replacement battery into the TPMC-10 until it snaps into position, and slide the latch into the locked position.

CAUTION: Replace only with a TPMC-10 battery. To obtain a replacement battery, please contact a Crestron customer service representative.

CAUTION: Failure to fully charge the battery for five hours before turning on the TPMC-10 for the first time may reduce the overall service life of the battery.

NOTE: The TPMC-10's battery "trickle" charges when the external power supply is used to power the touchpanel.

NOTE: If you are not using the TPMC-10 on a daily basis, store the unit by connecting the power supply. For extended storage, remove the battery completely.

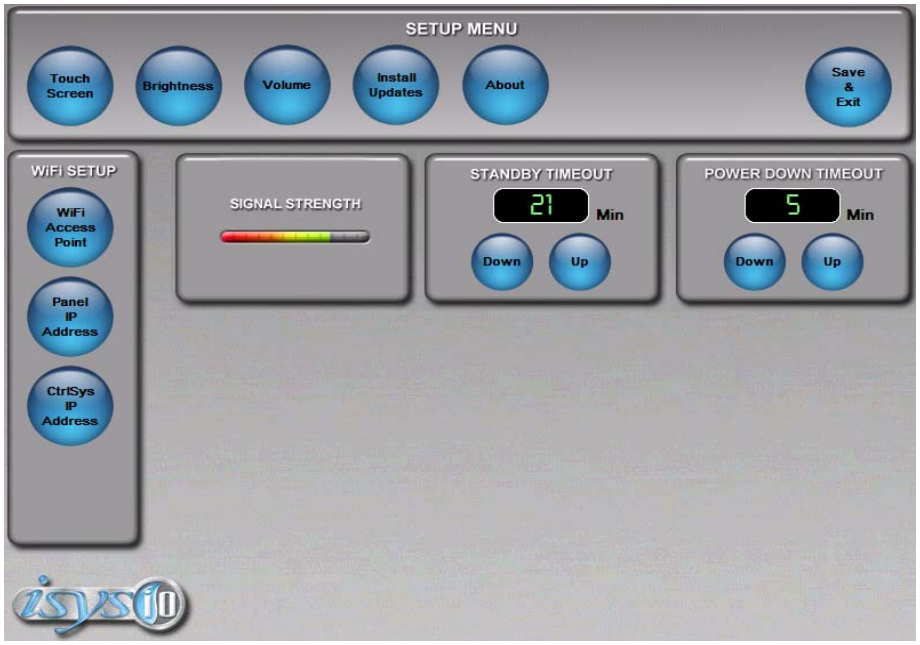
Configuring the Touchpanel

When power is applied to the unit for the first time, the following screen appears.

Initial Opening Window

Touching the **Setup** button with the stylus or your finger will display the TPMC-10 setup screen shown on the next page.

Setup Screen



The setup screen is used to perform basic configuration procedures prior to regular operation of the touchpanel.

NOTE: During regular operation of the touchpanel, there are three ways to activate the setup functions: either place a button on the project main page and assign the reserved join number (17242) that activates Setup (refer to "Programming Embedded Windows Applications" on page 41); hold your finger on the screen, use the stylus to press the Reset button, and continue to keep your finger on the screen until the setup screen appears (about 90 seconds); or press the hard pushbuttons in the sequence 1, 2, 3, 4, 1, 2, 3, 4 (refer to "Programmable Hard Pushbuttons" on page 7).

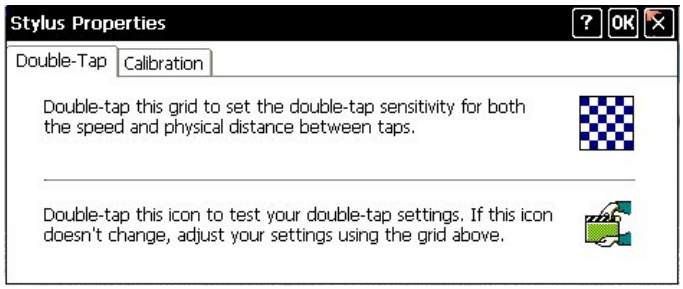
SETUP MENU

The SETUP MENU functions control the basic operation of the TPMC-10, such as setting stylus properties, screen calibration, screen brightness, and audio volume.

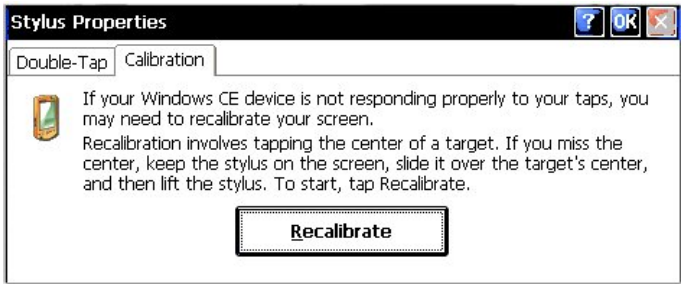
Touch Screen

Selecting the **Touch Screen** button displays the following "Stylus Properties" window that allows you to set stylus properties and perform a screen calibration. Use the stylus and follow the on-screen instructions to calibrate the display.

Use the supplied stylus and follow the *Double-Tap* tab instructions to customize the unit's sensitivity to your use of the stylus.

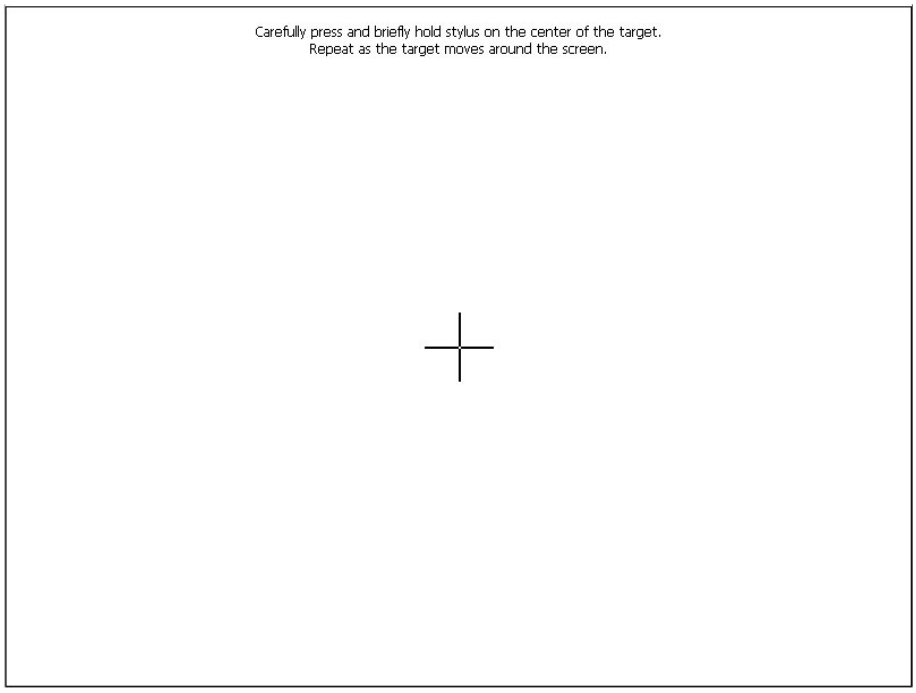


Selecting the *Calibration* tab displays the following window.



Selecting the **Recalibrate** button displays the following screen. Use the stylus and follow the on-screen instructions to recalibrate the display.

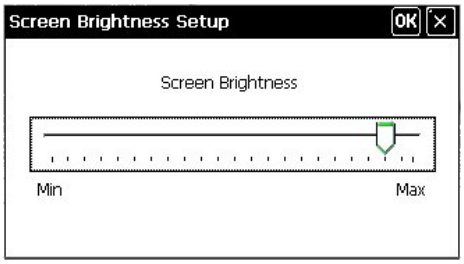
Calibration Window



If the recalibration is successful, the "Stylus Properties" window reappears. Tap the 'X' to close the window and return to the setup screen.

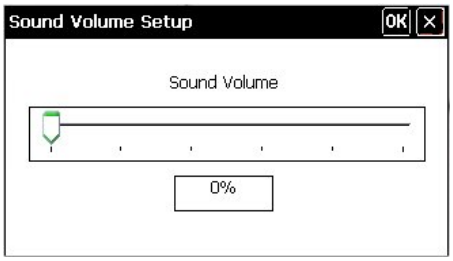
Brightness

Selecting the **Brightness** button displays the following window that allows you to adjust the display brightness. Brightness can be set from Min to Max (full brightness). A lower brightness setting extends battery life.



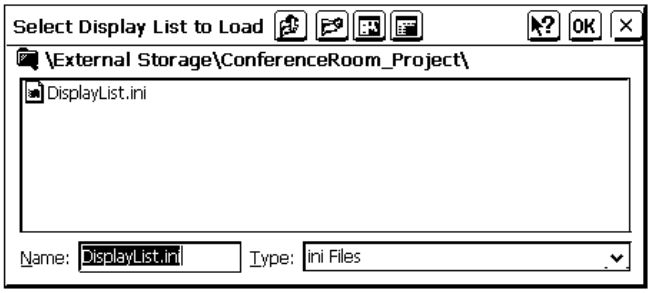
Volume

Selecting the **Volume** button displays the following window that lets you adjust the unit's audio volume from 0% (mute) to 100% (full volume) in 20% increments.



Install Updates

Selecting the **Install Updates** button displays the following *Open* window that allows you to browse through the directory of the installed PCMCIA or USB storage devices and select the program files to be loaded into the unit.



STANDBY TIMEOUT and POWER DOWN TIMEOUT

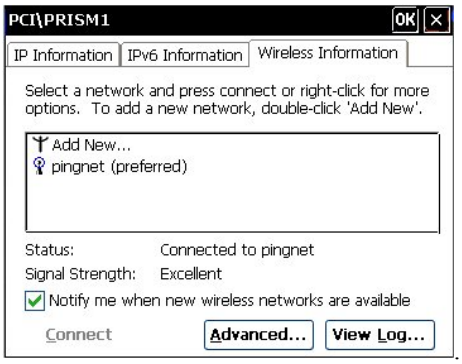
Use these two windows to specify the standby and the power down timeout settings. Standby timeout is the time (up to 120 minutes) from the last use of the touchpanel before going into standby mode (screen display is off but the unit is still on). Power down timeout is the time (up to 120 minutes) **from going into standby mode** before turning off unit power. Both timeouts are adjustable in one-minute increments.

WiFi SETUP

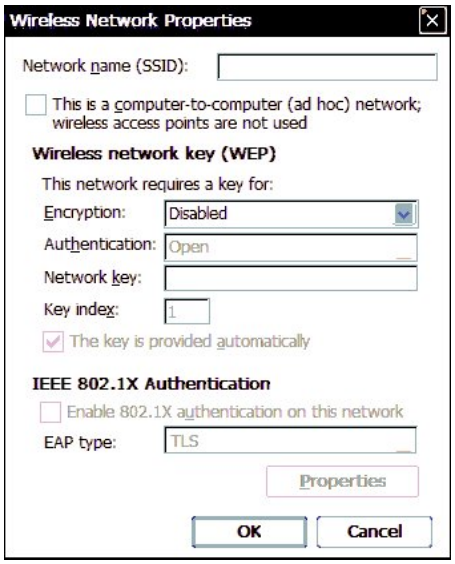
The WiFi SETUP functions control the basic communication address assignment operations of the TPMC-10.

WiFi Access Point

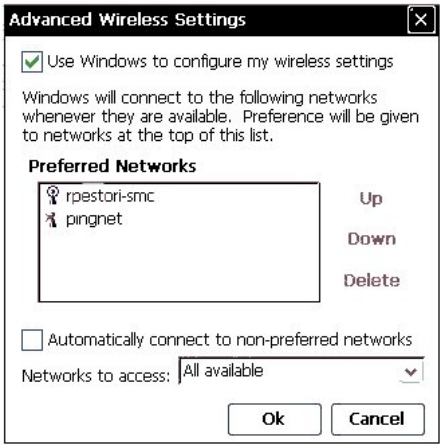
Selecting the **WiFi Access Point** button displays the following window, which allows you to specify a wireless access point.



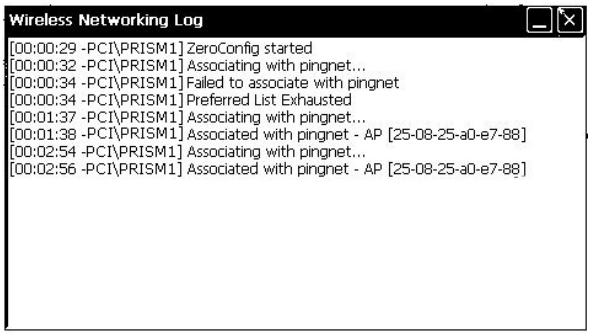
Double-clicking in the *Wireless Information* tab above displays the "Wireless Network Properties" window, which allows you to specify the wireless encryption parameters for your network.



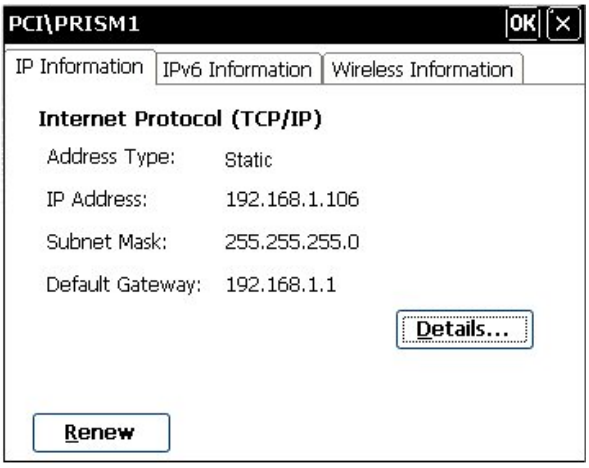
Selecting **Advanced** displays the "Advanced Wireless Settings" window. This window allows you to select the hierarchy of wireless access points.



Clicking the *Automatically connect to non-preferred networks* checkbox allows the system to automatically connect to all wireless access points. Select **View Log** to display the "Wireless Networking Log" window as shown in the following graphic.



The *IP Information* tab displays the IP information of the TPMC-10.

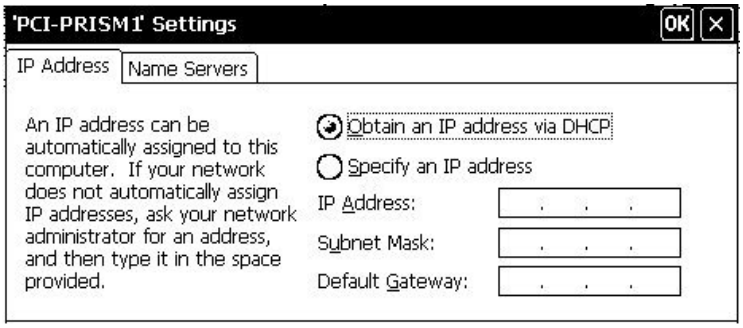


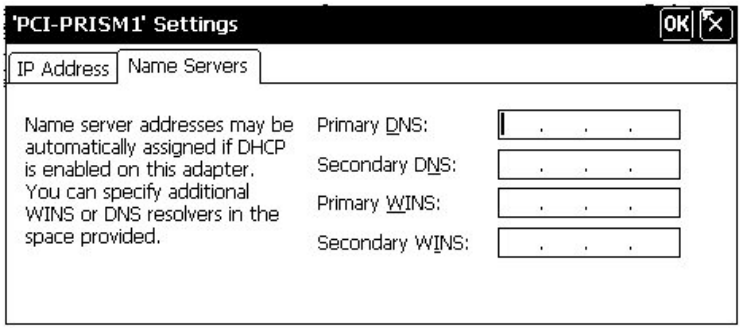
Selecting the **Details** button displays a screen that shows detailed information about the network connections. Selecting the **Renew** button causes the TPMC-10 to obtain a new address from the DHCP server. (DHCP not supported on the TPMC-10.)

The *IPv6 Information* tab displays the IPv6 information of the TPMC-10.

Panel IP Address

Selecting the **Panel IP Address** button displays the "'PCI-PRISM1' Settings" window. Click each tab and follow the on-screen instructions, as appropriate. (Refer to the following graphics.)

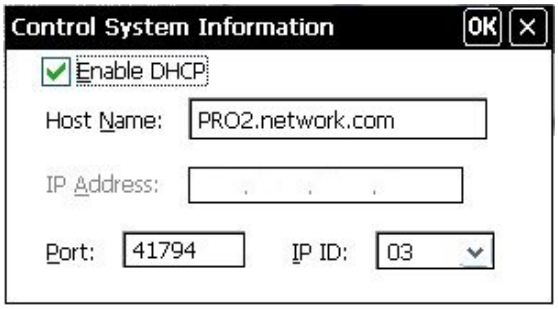




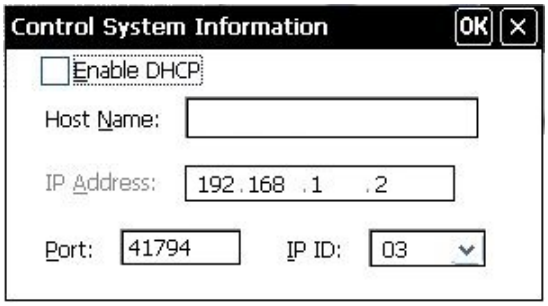
NOTE: IF DHCP is enabled, and name server addresses have been assigned as stated on the tab, entering other addresses here will clear all the DHCP-supplied data. (DHCP not supported on the TPMC-10)

CtrlSys IP Address

Selecting the **CtrlSys IP Address** button displays the "Control System Information" window that allows you to enter the control system's name, its port address, and its IP ID.



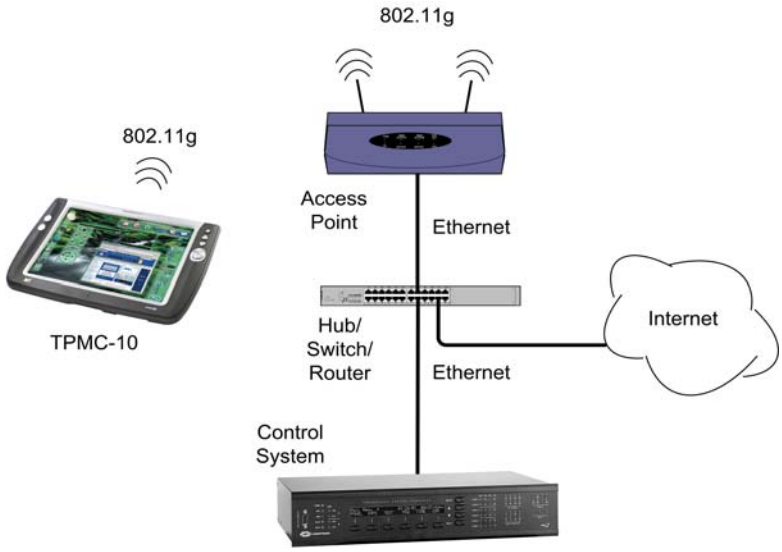
If the *Enable DHCP* checkbox is unchecked, the window allows you to enter the control system's IP address instead of its name. (DHCP not supported on the TPMC-10.)



In either case, make sure the IP ID matches the IP ID specified in the SIMPL program. (Refer to "WiFi SETUP" on page 13 for details.)

Typical System Configurations

The following diagram illustrates a basic configuration that connects a TPMC-10 WiFi touchpanel to a control system via a wireless access point (WAP).

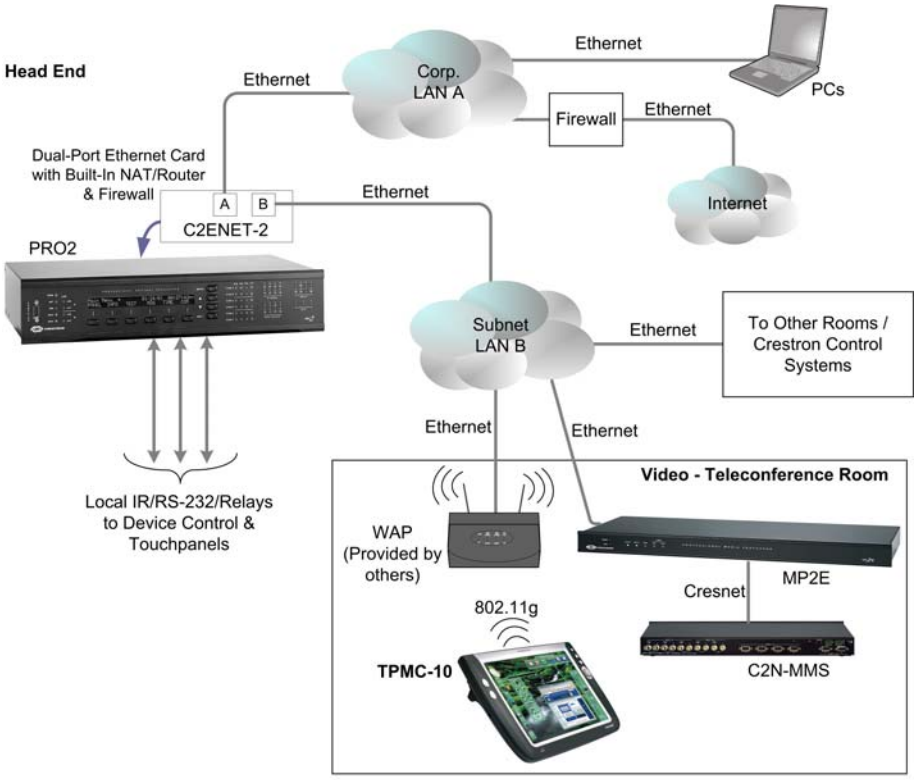


- The distance between the TPMC-10 and the dedicated WAP should not exceed 30 feet. The TPMC-10 is not a roaming device.
- Use a dedicated wireless router/access point for each TPMC-10 device.
- Each TPMC-10 must have only a single dedicated WAP listed in its *Preferred Networks* list. Refer to the "WiFi SETUP" instructions on page 13. Refer to the Crestron website (www.crestron.com), online help answer ID 2488, for recommended access points and configuration files.

The following diagram presents a more complex configuration. In this scenario, the WAP is connected to an A/V subnet. Port B of the control system's C2ENET-2 card is also connected to the A/V subnet. Port A is connected to the corporate LAN. The card's internal firewall controls data flow thus isolating the two subnets.

NOTE: When using a dual-port Ethernet card, Ports A & B must be different subnets (Port A = 192.168.1.1; Port B = 192.168.2.1).

For additional information on setting up and understanding an Ethernet network, refer to Doc. 6052, Crestron e-Control Reference Guide. It may be downloaded from the Crestron website (www.crestron.com/manuals).



To set up a WAP on the B-side of the C2ENET-2 dual-port Ethernet card, do the following:

1. Configure an IP address on port B (refer to the latest version of the Crestron C2ENET-1/-2 Operations and Installation Guide (Doc. 5962).
2. Configure the WAP to be on the same subnet as port B; use port B's address as the default gateway.
3. Configure the TPMC-10 to connect to the WAP (refer to "WiFi SETUP" on page 13).
4. Configure the IP table in the TPMC-10 to point to the port B address.

General Use and Safety

WARNING: To avoid shock hazard and possible damage to the unit, do not use the touchpanel in the rain or expose it to unnecessary moisture.

Recommended Touchpanel 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. The surrounding plastic enclosure may not provide a watertight seal. Therefore, apply cleaning solution to the cloth rather than the surface of the touchscreen. Wipe the touchscreen clean and avoid leakage of moisture beneath the panel.

Programming Software

Have a question or comment about Crestron software?

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

You can create a program that allows you to set up the TPMC-10 to operate a Crestron control system using the Crestron programming tools: Crestron SystemBuilder™ and SIMPL Windows. These tools are intended for users with different levels of programming knowledge. The flexibility of each tool is proportional to the degree of programming expertise (i.e., the more flexible, the more a programmer needs to know and account for). Of course, one can initiate programming using the easiest method (SystemBuilder) and use advanced techniques that are available from SIMPL Windows to customize the job.

Crestron VisionTools® Pro-e (VT Pro-e) is a Windows® compatible software package for creating Crestron touchpanel screen designs. Refer to "Programming with VT Pro-e" on page 39 for additional details regarding VT Pro-e.

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.

The following are recommended software version requirements for the PC:

- SIMPL Windows version 2.05 or later. Requires SIMPL+ Cross Compiler version 1.1, and Symbol Library version 304.
- Crestron Database version 16.34 or later.
- (Optional) Crestron SystemBuilder version 1.02 or later. Requires SIMPL Windows, and SystemBuilder Templates version 1.0.2 or later.
- VT Pro-e version 3.3.or later, used for graphical touchscreen design.
- (Optional) Viewport version 3.103 or later

Programming with the Crestron SystemBuilder

The easiest method of programming, but does not offer as much flexibility as SIMPL Windows.

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

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

Programming with SIMPL Windows

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

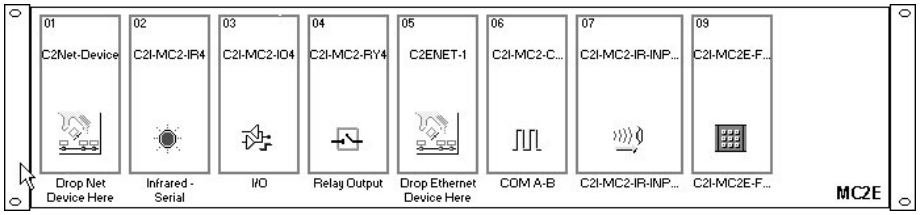
NOTE: In the following description, the MC2E control system is used. However, any 2-Series processor that is e-control enabled can be used.

SIMPL Windows is Crestron's software for programming Crestron control systems. It provides a well-designed graphical environment with a number of workspaces (i.e., windows) in which a programmer can select, configure, program, test, and monitor a Crestron control system. SIMPL Windows offers drag and drop functionality in a familiar Windows® environment.

This section describes a sample SIMPL Windows program that includes a TPMC-10.

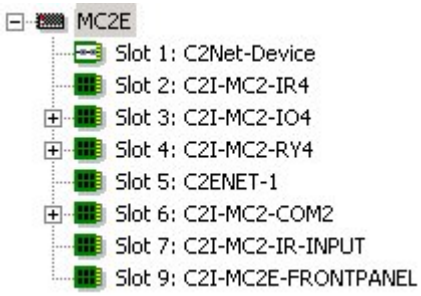
Configuration Manager is where programmers "build" a Crestron control system by selecting hardware from the *Device Library*. In Configuration Manager, drag the MC2E from the Control Systems folder of the *Device Library* and drop it in the upper pane of the *System Views*. The MC2E with its associated communication ports is displayed in the *System Views* upper pane.

MC2E System View



The *System Views* lower pane displays the MC2E system tree (refer to following graphic). This tree can be expanded to display and configure the communications port.

Expanded MC2E System Tree

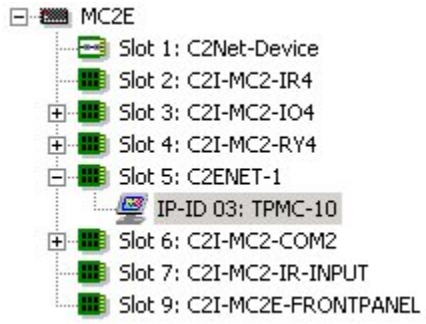


C2ENET-1-Device Slot in Configuration Manager

To incorporate a TPMC-10 into the system, the control system requires either a plug-in Ethernet card, or a built-in Ethernet port. The MC2E control system has a built-in Ethernet port in Slot 5 that can accept the TPMC-10 two-way wireless Ethernet touchpanel. The slot allows Cresnet communication between the touchpanel and the control system.

Drag the TPMC-10 from the Touchpanels | Touchpanels (Ethernet) folder of the *Device Library* and drop it on the C2ENET-1 in Slot 5. The MC2E displays the TPMC-10 at its default IP-ID location, "03," as shown in the following graphic.

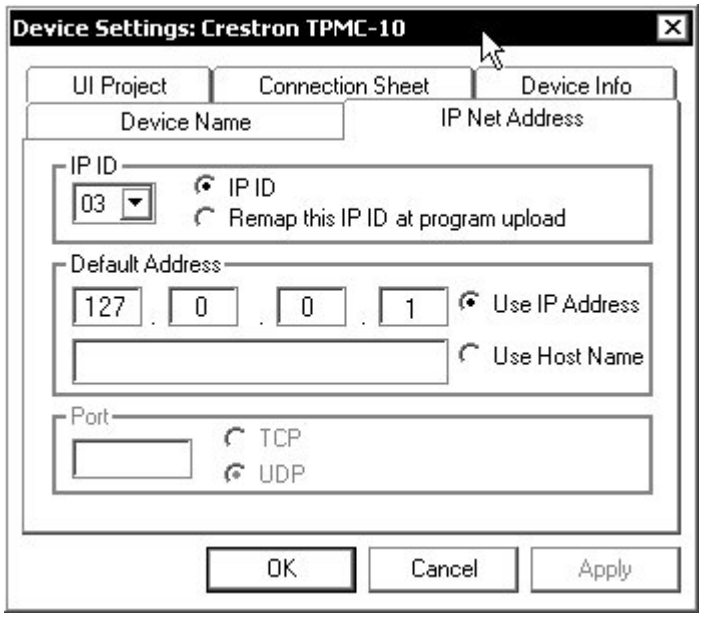
C2Net Device, Slot 9



Expand the system tree in the lower pane and double-click the TPMC-10 icon to open the "Device Settings" window for the touchpanel. Select the *IP Net Address* tab to change the touchpanel, or to set the Default IP Address as shown on the next page. For more information on setting the IP ID of the TPMC-10, refer to "WiFi SETUP" which begins on page 13.

NOTE: The correct address here would be 127.0.0.1, or the control system IP address.

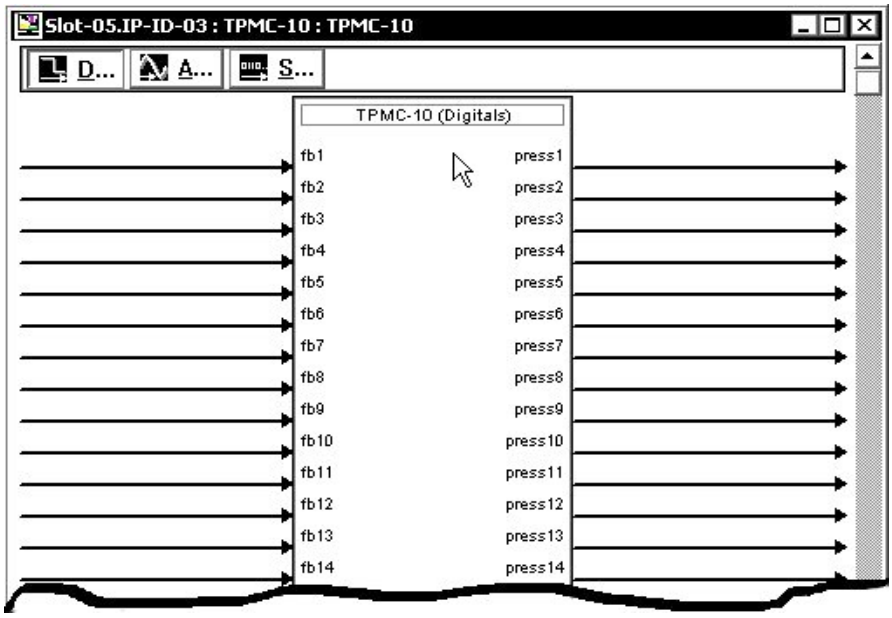
Touchpanel "Device Settings" Window



TPMC-10 Symbol in Programming Manager

Programming Manager is where programmers "program" a Crestron control system by assigning signals to symbols. The graphic after this paragraph shows the TPMC-10 symbol in the SIMPL Windows' Programming Manager.

Detail View of the TPMC-10 in SIMPL Windows' Programming Manager



Signal Types

Signals interconnect the various devices and logic symbols that comprise a SIMPL program. Signals can be one of three types: digital, analog, or serial. For any given signal, the signal type is determined by its driving source. That is, if the symbol that drives the signal has an analog output, then, by definition, the signal connected there will be an analog signal.

In SIMPL Windows, the signal types are color-coded as follows:

Digital = Blue

Analog = Red

Serial = Black

Other = Green

NOTE: "Other" signals are a combination of the three basic types (e.g. many symbols accept either analog or serial signals where the combination is shown as a green signal). The signal type is displayed on the Status Bar when the signal is highlighted.

For additional information, refer to Doc. 6120, Crestron SIMPL Windows Symbol Guide. It may be downloaded from the Crestron website.

Digital Signals

A digital signal contains one bit of information and usually takes on one of two values: 1 or 0. These two digits can represent the logical values true and false, and they can be represented in an electronic device by the states on/off or high/low, recognized as two voltage levels. (Other common descriptors are active/inactive.)

Analog Signals

Unlike digital signals, analog signals can vary continuously in value, in the same manner as a parameter such as volume, temperature, or pressure. Analog signals contain 16 bits of information, which means that this type of signal can have values

ranging from 0 to 65535 (2^{16}-1). This 16-bit property makes analog signals useful for controlling devices that do not have discrete settings, such as volume controllers, pan/tilt head controllers, and lighting dimmers.

Serial Signals

Serial signals are used to facilitate the transmission of serial data (strings of characters). These signals can be generated by incoming data on a COM port or by a symbol that has a serial output.

The TPMC-10 supports up to 4000 serial inputs and outputs. By default, the input strings (<**text-o1**> through <**text-o4000**>) are "permanent," meaning that the serial data will remain in memory for as long as the program is running. The serial data is removed from memory when the program resets or shuts down. This facilitates serial strings being updated automatically to the panel when the panel issues an update request, so that the programmer does not need to add extra logic.

It is important to remember that the strings are NOT stored in NVRAM.

The mandatory <**Permanent String Size**> parameter at the bottom of the symbol sets the default size of the input string in bytes (1d = 1 byte). If this parameter is set to accommodate the longest expected string, too much memory may be allocated for input strings, limiting the amount of memory available for the program. To minimize the amount of memory allocated for input strings, set this parameter to the smallest possible size that will accommodate the majority of strings.

To further manage memory allocation, any given string that is significantly larger or smaller than the <**Permanent String Size**> parameter in the program can also be tied to a Make String Permanent symbol. Here the system will allocate memory for the string according to the parameter set in the MSP symbol.

If the parameter is set to 0d, or is set higher than its maximum value, 255, the processor will issue an error when the program initiates.

TPMC-10 Input/Output Signals

The TPMC-10 symbol provides up to 4000 digital joins, analog joins, and serial joins. The programmer selects the signal types by clicking on the appropriate button at the top of the *Symbol Detail* view when programming the panel.

The following tables list functional descriptions for touchpanel outputs and inputs, organized by touchpanel signal name and type. For convenience, a second set of tables describes the touchpanel outputs and inputs, organized by VT Pro-e object type, beginning on page 32.

Digital Input & Output Signal Descriptions

TOUCHPANEL SIGNAL NAME AND TYPE	VT Pro-e JOIN TYPE	VT Pro-e OBJECT	DESCRIPTION
Digital outputs*: <**press1**> through <**press8**>	Digital Press Join	None (Hard push buttons)	Indicates that the corresponding hard pushbutton is being pressed, as follows: Top left button = <**press1**> Lower left button = <**press2**> Top right button = <**press3**> Lower right button = <**press4**> Top thumb pad position = <**press5**> Right thumb pad position = <**press6**> Bottom thumb pad position = <**press7**> Left thumb pad position = <**press8**> The signal remains high for the duration of the button press. High/1 = Hard pushbutton pressed; Low/0 = Button released
Digital outputs: <**press9**> through <**press4000**>	Digital Press Join	Button	Indicates that the corresponding button on the touchscreen (not a hard pushbutton) is being pressed. The signal remains high for the duration of the button press. High/1 = Button pressed; Low/0 = Button released
	Digital Press Join	Slider	Indicates that the slider is being pressed. The signal remains high for as long as the slider is being adjusted. High/1 = Slider pressed; Low/0 = Slider released
	Open/Close	Embedded Application	Indicates that the embedded application is open. The signal remains high for as long as the application is open. The signal will go low if the application is closed or minimized. High/1 = Application is open; Low/0 = Application is closed/minimized
	Open File Window	Embedded Application	Indicates that the "Open File" window is being displayed (on the rising edge of the corresponding digital input). The Open File window allows the end user to locate the file manually. The signal remains high for as long as the window is open. The Open File window closes when the end user presses or clicks the Open (or Cancel) button. High/1 = Open File window open; Low/0 = Open File window closed
	Audio project join ("Sound is Playing")	Sound Manager	Indicates that a WAV file is playing. The signal remains high for as long as the WAV file is playing. High/1 = WAV file playing; Low/0 = WAV file not playing

** Refer to Programmable Hard Pushbuttons and Thumb pad on page 7*

(continued on next page)

Digital Input & Output Signal Descriptions (continued)

TOUCHPANEL SIGNAL NAME AND TYPE	VT Pro-e JOIN TYPE	VT Pro-e OBJECT	DESCRIPTION
Digital inputs: <**fb1**> through <**fb4000**>	Digital Press Join	Button	Causes the button to display in the active state for as long as the signal is high. When connected to the corresponding <**press**> output, this means the button will display active feedback for the duration of the button press. Note that this behavior applies to the touchscreen buttons only. Since <**fb1**> through <**fb8**> correspond to hard pushbuttons with no visible feedback, connecting them as just described will have no effect. High/1 (level sensitive) = Active feedback; Low/0 = Inactive feedback
	Open/Close	Embedded Application	Opens the embedded application when the input goes high. When the input goes low, this closes the application. High/1 (level sensitive) = Open application; Low/0 = Close application
	Open File Window	Embedded Application	Displays the "Open File" window on the rising edge of the signal. This window allows the user to locate a file manually. The Open File window closes when the end user presses or clicks the Open (or Cancel) button. High/1 (rising edge) = Display "Open File" window; Low/0 = No effect
	Show/Hide	Popup Window (System Bar)	Shows the window for as long as the signal is high, and hides the window when the signal is low. High/1 (level sensitive) = Show window; Low/0 = Hide window
	Page Join	Page	Displays the page on the rising edge of the input. If the signal is latched high, then on power-up or any re-established communication, the panel will return to the page. Typically, all page inputs should be interlocked to ensure that the panel will return to the most recently viewed page after communication is re-established. High/1 (rising edge) = Display page; Low/0 = No effect

(continued on next page)

Digital Input & Output Signal Descriptions (continued)

TOUCHPANEL SIGNAL NAME AND TYPE	VT Pro-e JOIN TYPE	VT Pro-e OBJECT	DESCRIPTION
Digital inputs: <**fb1**> through <**fb4000**> (continued)	Return Page Join	Page	Displays the previous (most recently viewed) page on the rising edge of the input. High/1 (rising edge) = Return page; Low/0 = No effect
	Subpage Reference Join	Subpage Reference	Displays the subpage for as long as the input is high. When the input goes low, this closes the subpage. High/1 (level sensitive) = Show subpage; Low/0 = Close subpage
	Digital Feedback Join	Legend	Causes the legend to display in the active state for as long as the input is high. High/1 (level sensitive) = Active feedback; Low/0 = Inactive feedback
	Mute Sounds (Audio project join)	Sound Manager	Mutes all audio, including WAV file playback and key clicks, for as long as the input is high. When the input goes low, audio is enabled. High/1 (level sensitive) = Mute all audio; Low/0 = Enable audio
	Mute Key Clicks (Audio project join)	Sound Manager	Mutes the sound of the key click for as long as the input is high. When the input goes low, key clicks are enabled. High/1 (level sensitive) = Mute key clicks; Low/0 = Enable key clicks
	Play WAV file (Audio project join)	Sound Manager	Plays the audio WAV file on the rising edge of the input. High/1 (rising edge) = Play WAV file; Low/0 = No effect
Analog outputs: <**an_act1**> through <**an_act4000**>	Analog Touch/ Feedback Join	Slider	Reports the current value being sent by the slider and updates the value as it changes during run time.
	Analog Feedback Join: Left Top Width Height	Embedded Application	Reports the position and size of the window in pixels (1d = one pixel) when the user opens the embedded application. (The outputs do not report the position or size when sent by the control system.) If a Left join is defined, the output reports the number of pixels from the left side of the window to the left edge of the screen. If a Top join is defined, the output reports the number of pixels from the top of the window to the top edge of the screen. If a Height join is defined, the output reports the height of the window. If a Width join is defined, the output reports the width of the window.

Analog Input & Output Signal Descriptions

TOUCHPANEL SIGNAL NAME AND TYPE	VT Pro-e JOIN TYPE	VT Pro-e OBJECT	DESCRIPTION
Analog inputs: <**an_fb1**> through <**an_fb4000**>	Analog State Join and Mode - Active and Inactive	Button Legend	Selects the mode (appearance) of the button or legend, in both the active and inactive states. Valid values can range from 0d to 99d for the active state; and 0d to 99d for the inactive state. The actual range of values depends on the number of modes defined in the VT Pro-e project. For example, if five modes are defined for the active state, there will be five valid values for that join.
	Analog State Join and Mode	Border, Clock, Gauge, Digital Gauge, Hex Gauge, % Gauge, Slider, Timer	Selects the mode (appearance) of the object. Valid values can range from 0d to 99d. The actual range of values depends on the number of modes defined in the VT Pro-e project. For example, if five modes are defined, there will be five valid values for that join.
	Analog Feedback Join: Left Top Width Height	Embedded Application Popup Window (System Bar)	Controls the position and size of the window as follows: The Left join sets the number of pixels from the left side of the window to the left edge of the screen. The Top join sets the number of pixels from the top of the window to the top edge of the screen. Valid analog values for Left and Top range from 0d to 65535d, adjustable in increments of one pixel (1d = one pixel). Use values larger than the display size to move the application off the screen, thus hiding the window without closing it. Usable values depend on the screen resolution. For example, for 1024x768 resolution, usable values would range between 0d and 1024d for Left; and 0d and 768d for Top. The Width and Height joins set the width and height in pixels. Valid analog values for Width and Height range from 0d to 65535d, adjustable in increments of one pixel (1d = one pixel). Usable values will depend on the screen resolution. For example, for 1024x768 resolution, usable values would range between 0d and 1024d for Width; and 0d and 768d for Height. Setting both the Width and Height to 0d would hide the window.

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Analog Input & Output Signal Descriptions (continued)

TOUCHPANEL SIGNAL NAME AND TYPE	VT Pro-e JOIN TYPE	VT Pro-e OBJECT	DESCRIPTION
Analog inputs: <**an_fb1**> through <**an_fb4000**> (continued)	Analog Feedback Join: Open/Close	Embedded Application	Selects the display mode for the embedded application. Valid values are as follows: 2d = Show 4d = Hide 8d = Close 16d = Maximize
	Analog Touch/ Feedback Join	Slider	Sets the slider to the specified level. Valid analog values can be signed or unsigned, depending on the selection made in VT Pro-e.
	Analog Scrolling Text Join	Border, Button, Legend, Text, Gauge, Slider	Selects the top line of text to be displayed. Valid analog values depend on the Scrolling Offset selected in VT Pro-e, beginning at 0d. The Scrolling Offset determines the top-most entry (first line) to be displayed and scrolled. For instance, if there are 10 lines of text and Scrolling Offset is at 3, then the fourth line will be seen when the signal is initialized to 0d, and the first three lines will never be visible. Separate from the above, VT Pro-e also provides a "Scrolling Limit Enabled" selection. For Scrolling Limit Enabled, regardless of the analog value sent, it will only function between valid ranges. If there are nine items in the list, and the object shows two items at a time, setting the analog value to 7d will display the 8th and 9th lines. Sending any other value higher then 7d will yield no change in the display. If Scrolling Limit Enabled is not selected, then higher values for the analog will change the display. Here, if there are nine items in the list, and the object shows two items at a time, setting the analog value to 7d will display the 8th and 9th lines. Sending higher values will show additional lines, even if there is no text. Thus, a value of 8d would display the 9th line and a blank line under it; 9d would display two blank lines.

(continued on next page)

Analog Input & Output Signal Descriptions (continued)

TOUCHPANEL SIGNAL NAME AND TYPE	VT Pro-e JOIN TYPE	VT Pro-e OBJECT	DESCRIPTION
Analog inputs: <**an_fb1**> through <**an_fb4000**> (continued)	Analog Feedback Join	Gauge	Sets the value of the indicator on the Gauge object. The indicator direction (top/bottom, left/right) and style (shaded or line) depends on the format selected in VT Pro-e. The indicator can represent signed or unsigned values, depending on the format selected in VT Pro-e.
	Analog Feedback Join	Digital Gauge	Sets the values to be displayed on the Digital Gauge object. The displayed values depend on the width, decimal position, and format selected in VT Pro-e. The display can consist of one to five digits and be unsigned or signed. Thus, the program should send values based on what the display can show. For example, for a signed 1-digit decimal value, valid values can be 65527d to 65535d, and 0d to 9d, resulting in a display range of -9 to 9. If the displayed value would exceed the selected width, the gauge will truncate the display to the rightmost digits.
	Analog Feedback Join	Hex Gauge	Sets the values to be displayed in hexadecimal notation on the Hex Gauge object. The displayed values depend on the width, decimal position, and format selected in VT Pro-e. The display can consist of one to four hexadecimal digits. If the displayed value would exceed the selected width, the gauge will truncate the display to the rightmost digits.
	Analog Feedback Join	% Gauge	Sets the values to be displayed as a percentage on the Percent Gauge object. The displayed values depend on the width, decimal position, and format selected in VT Pro-e. The display can consist of one to five digits and be unsigned or signed. Thus, the program should send values based on what the display can show. For example, for a signed 1-digit decimal value, valid values can be 65527d to 65535d, and 0d to 9d, resulting in a display range of -9 to 9. If the displayed value would exceed the selected width, the percent gauge will display the most significant digits.

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Analog Input & Output Signal Descriptions (continued)

TOUCHPANEL SIGNAL NAME AND TYPE	VT Pro-e JOIN TYPE	VT Pro-e OBJECT	DESCRIPTION
Analog inputs: <**an_fb1**> through <**an_fb4000**> (continued)	Analog Feedback Join	Timer	Sends time values for display on the Timer object. Valid analog values can be signed or unsigned, depending on the selection made in VT Pro-e. Unsigned values range from 0s to 65535s (18H:12M:15S). Signed values for the HH:MM:SS format can range from -32767s (-09:06:07) to +32767s (+09:06:07). Unsigned values for the MM:SS format can range from 0s to 5999s (99:59). Signed values for the MM:SS format can range from -5999s (-99:59) to +5999s (+99:59).
	Analog Feedback Join	Clock	Sets the time offset. Decimal values alter the time being displayed by one minute. The analog value is a signed number; if no offset is selected in VT Pro-e, 0d will show the current control system time. A value of 60d will show one hour ahead. A value of -60d will show one hour behind. If a clock offset is selected in VT Pro-e too, the object uses both values to determine the offset. That is, if the offset is set to one hour forward in VT Pro-e and the Analog Feedback Join value is 120d, then the clock object will display three hours ahead.
	Analog Feedback Join	Animation	Selects the frame to be displayed on the Animation object. The range of valid values equals the number of frames in the animation, starting at 0d. (Animation can be controlled by Numeric Keypad and Oscillator symbols. Refer also to the Crestron module, *Animator.cmc*.)

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Serial Input & Output Signal Descriptions

TOUCHPANEL SIGNAL NAME AND TYPE	VT Pro-e JOIN TYPE	VT Pro-e OBJECT	DESCRIPTION
	Indirect Text Join	Border Button Legend Text Gauge Slider	Sends text to the object's text field for display during run time.
Serial inputs: <**text-o1**> through <**text-o4000**> All serial inputs are permanent. To set the maximum size of the string (recommended), use the optional <**Permanent String Size**> parameter.	Target Join	Embedded Application	Sends a new file path and/or filename to the TPMC-10. If the application is not open, the TPMC-10 will open the file when the Open/Close join for the application goes high. If the embedded application is already open, the new path and file name will not take effect until the application is closed and reopened. If the string is not valid (i.e., the target does not exist), the TPMC-10 will send an error code to the control system via the Errors/Warnings analog join for the Project Properties. Logic should then be programmed to handle the error or trigger the "Open File" window. The Target string will persist in the panel's memory until a new string overwrites it, i.e., the control system sends a new string on the Target join, or the end user selects a new target locally.

The following tables provide functional descriptions of touchpanel outputs and inputs, organized by VT Pro-e object types.

VT Pro-e Objects and Signal Type Descriptions

VT Pro-e OBJECT	VT Pro-e JOIN DESCRIPTION (SIGNAL TYPE)	DESCRIPTION
None (Hard pushbuttons)	Digital Press Join (Digital output)	Indicates that the corresponding hard pushbutton is being pressed, as follows: Top left button = <**press1**> Lower left button = <**press2**> Top right button = <**press3**> Lower right button = <**press4**> Top thumb pad position = <**press5**> Right thumb pad position = <**press6**> Bottom thumb pad position = <**press7**> Left thumb pad position = <**press8**> The signal remains high for the duration of the button press. High/1 = Hard pushbutton pressed; Low/0 = Button released
Button	Digital Press Join (Digital output)	Indicates that the corresponding button on the touchscreen is being pressed. The signal remains high for the duration of the button press. High/1 = Button pressed; Low/0 = Button released
	Digital Press Join (Digital input)	Causes the button to display in the active state for as long as the signal is high. When connected to the corresponding <**press**> output, this means the button will display active feedback for the duration of the button press. Note that this behavior applies to the touchscreen buttons only. Since <**fb1**> through <**fb8**> correspond to hard pushbuttons with no visible feedback, connecting them as just described will have no effect. However, these signals can be defined to trigger page flips (if configured that way in VT Pro-e) or for other purposes. High/1 (level sensitive) = Active feedback; Low/0 = Inactive feedback
	Analog State Join and Mode (Active and Inactive) - (Analog input)	Selects the mode (appearance) of the button, in both the active and inactive states. Valid values can range from 0d to 99d for the active state; and 0d to 99d for the inactive state. The actual range of values depends on the number of modes defined in the VT Pro-e project. For example, if five modes are defined for the active state, there will be five valid values for that join.

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VT Pro-e Objects and Signal Type Descriptions (continued)

VT Pro-e OBJECT	VT Pro-e JOIN DESCRIPTION (SIGNAL TYPE)	DESCRIPTION
Button (continued)	Analog Scrolling Text Join (Analog input)	Selects the top line of text to be displayed. Valid analog values depend on the Scrolling Offset selected in VT Pro-e, beginning at 0d. The Scrolling Offset determines the top-most entry (first line) to be displayed and scrolled. For instance, if there are ten lines of text and Scrolling Offset is at three, then the fourth line will be seen when the signal is initialized to 0d, and the first three lines will never be visible. Separate from the above, VT Pro-e also provides a "Scrolling Limit Enabled" selection. For Scrolling Limit Enabled, regardless of the analog value sent, it will only function between valid ranges. If there are nine items in the list, and the object shows two items at a time, setting the analog value to 7d will display the 8th and 9th lines. Sending any other value higher then 7d will yield no change in the display. If Scrolling Limit Enabled is not selected, then higher values for the analog will change the display. Here, if there are nine items in the list, and the object shows two items at a time, setting the analog value to 7d will display the 8th and 9th lines. Sending higher values will show additional lines, even if there is no text. Thus, a value of 8d would display the 9th line and a blank line under it. A value of 9d would display two blank lines.
	Indirect Text Join (Serial input)	Sends text to the button's text field for display during run time.
Legend	Digital Feedback Join (Digital input)	Causes the legend to display in the active state for as long as the input is high. High/1 (level sensitive) = Active feedback; Low/0 = Inactive feedback
	Analog State Join and Mode (Active and Inactive) - (Analog input)	Selects the mode (appearance) of the legend, in both the active and inactive states—refer to description for Button.
	Analog Scrolling Text Join (Analog input)	Selects the top line of text to be displayed—refer to description for Button.
	Indirect Text Join (Serial input)	Sends text to the object's text field for display during run time.
Text	Analog Scrolling Text Join (Analog input)	Selects the top line of text to be displayed—refer to description for Button.
	Indirect Text Join (Serial input)	Sends text to the object's text field for display during run time

(continued on next page)

VT Pro-e Objects and Signal Type Descriptions (continued)

VT Pro-e OBJECT	VT Pro-e JOIN DESCRIPTION (SIGNAL TYPE)	DESCRIPTION
Border	Analog State Join and Mode (Analog input)	Selects the mode (appearance) of the border. Valid values can range from 0d to 99d. The actual range of values depends on the number of modes defined in the VT Pro-e project. For example, if five modes are defined, there will be five valid values for that join.
	Analog Scrolling Text Join (Analog input)	Selects the top line of text to be displayed—refer to description for Button.
	Indirect Text Join (Serial input)	Sends text to the object's text field for display during run time.
Slider	Analog State Join and Mode (Analog input)	Selects the mode (appearance) of the slider—refer to description for Border.
	Digital Press Join (Digital output)	Indicates that the slider is being pressed. The signal remains high for as long as the slider is being pressed. High/1 = Slider pressed; Low/0 = Slider released
	Analog Touch/Feedback Join (Analog output)	Reports the current value being sent by the slider and updates the value as it changes during run time.
	Analog Touch/Feedback Join (Analog input)	Sets the slider to the specified level. Valid analog values can be signed or unsigned, depending on the selection made in VT Pro-e.
	Analog Scrolling Text Join (Analog input)	Selects the top line of text to be displayed—refer to description for Button.
	Indirect Text Join (Serial input)	Sends text to the object's text field for display during run time.
Gauge	Analog State Join and Mode (Analog input)	Selects the mode (appearance) of the Gauge—refer to description for Border.
	Analog Feedback Join (Analog input)	Sets the value of the indicator on the Gauge object. The indicator direction (top/bottom, left/right) and style (shaded or line) depends on the format selected in VT Pro-e. The indicator can represent signed or unsigned values, depending on the format selected in VT Pro-e.
	Analog Scrolling Text Join (Analog input)	Selects the top line of text to be displayed—refer to description for Button.
	Indirect Text Join (Serial input)	Sends text to the object's text field for display during run time.
Digital Gauge	Analog State Join and Mode (Analog input)	Selects the mode (appearance) of the object—refer to description for Border.

(continued on next page)

VT Pro-e Objects and Signal Type Descriptions (continued)

VT Pro-e OBJECT	VT Pro-e JOIN DESCRIPTION (SIGNAL TYPE)	DESCRIPTION
Digital Gauge (continued)	Analog Feedback Join (Analog input)	Sets the values to be displayed on the Digital Gauge object. The displayed values depend on the width, decimal position, and format selected in VT Pro-e. The display can consist of one to five digits and be unsigned or signed. Thus, the program should send values based on what the display can show. For example, for a signed 1-digit decimal value, valid values can be 65527d to 65535d, and 0d to 9d, resulting in a display range of -9 to 9. If the displayed value would exceed the selected width, the gauge will truncate the display to the rightmost digits.
Hex Gauge	Analog State Join and Mode (Analog input)	Selects the mode (appearance) of the object—refer to description for Border.
	Analog Feedback Join (Analog input)	Sets the values to be displayed in hexadecimal notation on the Hex Gauge object. The displayed values depend on the width, decimal position, and format selected in VT Pro-e. The display can consist of one to four hexadecimal digits. If the displayed value would exceed the selected width, the gauge will truncate the display to the rightmost digits.
% Gauge	Analog State Join and Mode (Analog input)	Selects the mode (appearance) of the object—refer to description for Border.
	Analog Feedback Join (Analog input)	Sets the values to be displayed as a percentage on the Percent Gauge object. The displayed values depend on the width, decimal position, and format selected in VT Pro-e. The display can consist of one to five digits and be unsigned or signed. Thus, the program should send values based on what the display can show. For example, for a signed 1-digit decimal value, valid values can be 65527d to 65535d, and 0d to 9d, resulting in a display range of -9 to 9. If the displayed value would exceed the selected width, the percent gauge will display the most significant digits.
Timer	Analog State Join and Mode (Analog input)	Selects the mode (appearance) of the object—refer to description for Border.

(continued on next page)

VT Pro-e Objects and Signal Type Descriptions (continued)

VT Pro-e OBJECT	VT Pro-e JOIN DESCRIPTION (SIGNAL TYPE)	DESCRIPTION
Timer (continued)	Analog Feedback Join (Analog input)	Sends time values for display on the Timer object. The displayed values depend on the format selected in VT Pro-e: HH:MM:SS or MM:SS. Thus, the program should send values based on what the display can show. For example, unsigned values for the HH:MM:SS format can range from 0s to 65535s (18:12:15). Signed values for the HH:MM:SS format can range from -32767s (-09:06:07) to +32767s (+09:06:07). Unsigned values for the MM:SS format can range from 0s to 5999s (99:59). Signed values for the MM:SS format can range from -5999s (-99:59) to +5999s (+99:59).
Clock	Analog State Join and Mode (Analog input)	Selects the mode (appearance) of the object—refer to description for Border
	Analog Feedback Join (Analog input)	Sets the time offset. Each decimal value will alter the time being displayed by one minute. The analog value is a signed number; if no offset is selected in VT Pro-e, 0d will show the current control system time. A value of 60d will show one hour ahead. A value of 65476d (-60d) will show one hour behind. If a clock offset is also selected within VT Pro-e, the object will use both values to determine the offset. That is, if the offset is set to one hour forward in VT Pro-e and the Analog Feedback Join value is 120d, then the clock object will display three hours ahead.
Animation	Analog Feedback Join (Analog input)	Selects the frame to be displayed on the Animation object. The range of valid values equals the number of frames in the animation, starting at 0d. (Animation can be controlled by Numeric Keypad and Oscillator symbols. Refer to the Crestron module, *Animator.cmc*.)
Embedded Application	Open/Close Join (Digital output)	Indicates that the embedded application is open. The signal remains high for as long as the application is open. The signal will go low if the application is closed or minimized. High/1 = Application is open; Low/0 = Application is closed/minimized
	Open File Window Join (Digital output)	Indicates that the "Open File" window is being displayed (on the rising edge of the corresponding digital input). The Open File window allows the end user to locate a file manually. The signal remains high for as long as the window is open. The Open File window closes when the end user presses or clicks the Open (or Cancel) button. High/1 = Open File window open; Low/0 = Open File window closed

(continued on next page)

VT Pro-e Objects and Signal Type Descriptions (continued)

VT Pro-e OBJECT	VT Pro-e JOIN DESCRIPTION (SIGNAL TYPE)	DESCRIPTION
Embedded Application (continued)	Open/Close Join (Digital input)	Opens the embedded application when the input goes high. When the input goes low, this closes the application. High/1 (level sensitive) = Open application; Low/0 = Close application
	Analog Feedback Join (Analog outputs): Left Top Width Height	Reports the position and size of the window in pixels (1d = one pixel) when the user opens the embedded application. (The outputs do not report the position or size when sent by the control system.) If a Left join is defined, the output will report the number of pixels from the left side of the window to the left edge of the screen. If a Top join is defined, the output will report the number of pixels from the top of the window to the top edge of the screen. If a Height join is defined, the output will report the height of the window. If a Width join is defined, the output will report the width of the window.
	Analog Feedback Join (Analog input): Open/Close	Selects the display mode for the embedded application. Valid values are as follows: 2d = Show 4d = Hide 8d = Close 16d = Maximize
	Analog Feedback Join (Analog inputs): Left Top Width Height	Controls the position and size of the window as follows: The Left join sets the number of pixels from the left side of the window to the left edge of the screen. The Top join sets the number of pixels from the top of the window to the top edge of the screen. Valid analog values for Left and Top range from 0d to 65535d, adjustable in increments of one pixel (1d =one pixel). Values larger than the display size can be used to move the application off the screen, thus hiding the application without closing it. Usable values will depend on the resolution of the touchscreen. For example, for a touchscreen with 1024x768 resolution, usable values would range between 0d and 1024d for Left; and 0d and 768d for Top. The Width and Height joins set the width and height in pixels. Valid analog values for Width and Height range from 0d to 65535d, adjustable in increments of one pixel (1d = one pixel). Usable values will depend on the resolution of the touchscreen. For example, for a touchscreen with 1024x768 resolution, usable values would range between 0d and 1024d for Width; and 0d and 768d for Height. Setting both the Width and Height to 0d would hide the window.

(continued on next page)

VT Pro-e Objects and Signal Type Descriptions (continued)

VT Pro-e OBJECT	VT Pro-e JOIN DESCRIPTION (SIGNAL TYPE)	DESCRIPTION
Embedded Application (continued)	Target Join (Serial input)	Sends a new file path and/or filename to the TPMC-10. If the application is not open, the TPMC-10 will open the file when the Open/Close join for the application goes high. If the embedded application is already open, the new path and file name will not take effect until the application is closed and reopened. If the application is not open, the TPMC-10 will open the file when the Open/Close join for the application goes high. If the string is not valid (i.e., the target does not exist), the TPMC-10 will send an error code to the control system via the Errors/Warnings analog join for the Project Properties. Logic should then be programmed to handle the error or trigger the "Open File" window. The Target string will persist in the panel's memory until a new string overwrites it, i.e., the control system sends a new string on the Target join, or the end user selects a new target locally.
Popup Windows (System Bar)	Show/Hide (Digital input)	Shows the window for as long as the signal is high, and hides the window when the signal is low. High/1 (level sensitive) = Show window; Low/0 = Hide window
	Analog Feedback Join (Analog inputs): Left Top Width Height	Controls the position and size of the window—refer to the description for Embedded Application.
Sound Manager	Sound is Playing Join (Digital output)	Indicates that a WAV file is playing. The signal remains high for as long as the WAV file is playing. High/1 = WAV file playing; Low/0 = WAV file not playing
	Mute Sounds Join (Digital input)	Mutes all audio, including WAV file playback and key clicks, for as long as the input is high. When the input goes low, audio is enabled. High/1 (level sensitive) = Mute all audio; Low/0 = Enable audio
	Mute Key Clicks Join (Digital input)	Mutes the sound of the key click for as long as the input is high. When the input goes low, key clicks are enabled. High/1 (level sensitive) = Mute key clicks; Low/0 = Enable key clicks
	Play WAV File Join (Digital input)	Plays the audio WAV file on the rising edge of the input. High/1 (rising edge) = Play WAV file; Low/0 = No effect

(continued on next page)

VT Pro-e Objects and Signal Type Descriptions (continued)

VT Pro-e OBJECT	VT Pro-e JOIN DESCRIPTION (SIGNAL TYPE)	DESCRIPTION
Page	Page Join (Digital input)	Displays the page on the rising edge of the input. If the signal is latched high, then on power-up or any re-established communication the panel will return to the page. Typically, all page inputs should be interlocked to ensure that the panel will return to the most recently viewed page after communication is re-established. High/1 (rising edge) = Display page; Low/0 = No effect
	Return Page Join (Digital input)	Displays the previous (most recently viewed) page on the rising edge of the input. High/1 (rising edge) = Return page; Low/0 = No effect
Subpage Reference	Subpage Reference Join (Digital input)	Displays the subpage for as long as the input is high. When the input goes low, this closes the subpage. High/1 (level sensitive) = Show subpage; Low/0 = Close subpage

Programming with VT Pro-e

Control screen variations incorporating two- and three-dimensional graphics and text are possible and can be created with VT Pro-e, a design/programming Windows® -based software program. A set of pages that make up a project can be designed for each application. Each touchpanel can be organized with the ideal, color-oriented control environment with custom control graphics: icons, two and three-dimensional buttons, and floor plans. The project is uploaded to the touchpanel's flash PROM. The touchpanel uses the project until another is uploaded from the PC. The PC only needs to be actively connected to the touchpanel when uploading a project.

For additional software information, refer to the help file provided with the software. The latest version of VT Pro-e can be obtained from the Crestron website.

Native Fonts

The TPMC-10 includes a variety of native (built-in) fonts. These fonts are all anti-aliased via the hardware, and produce good results in a VT Pro-e project. (Refer to the following table.)
The TPMC-10 does not support anti-aliasing of non-native fonts.

TPMC-10 NATIVE FONTS		
Arial	ST Bd Ex	TP Black Condensed
BudHand	ST Black	TP Black Extended
Courier New	ST Md Cn	TP GUI Cons 01
Crestron Transport	Symbol	TP GUI Transports
Crestron Transport Outlines	Tahoma	TP LCD
ST Bd Cn	Times New Roman	WingDings

Embedded Applications

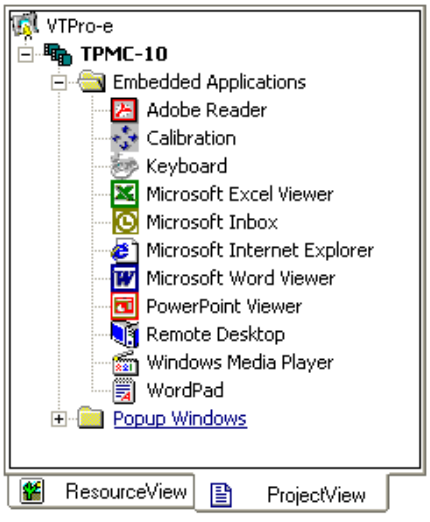
A number of third-party or in-house applications are embedded in a VT Pro-e TPMC-10 project. (Refer to the following illustration.)

- Microsoft Internet Explorer
- Windows Media Player
- Remote Desktop
- Microsoft Word Viewer
- WordPad
- Adobe Acrobat 6.0 (limited feature set)
- PowerPoint Viewer
- Excel Viewer
- Microsoft Inbox

The embedded applications have the following features:

- All embedded applications listed in the VT Pro-e ProjectView workspace are created by default for a new TPMC-10 project.
- All applications are created at project-level – one instance per project.
- The static position and size of each application can be viewed from any page.
- Four analog joins can be assigned to each application to dynamically change position and size.
- One digital feedback join or one analog join can be assigned to dynamically show/hide an application.

Embedded Applications in ProjectView



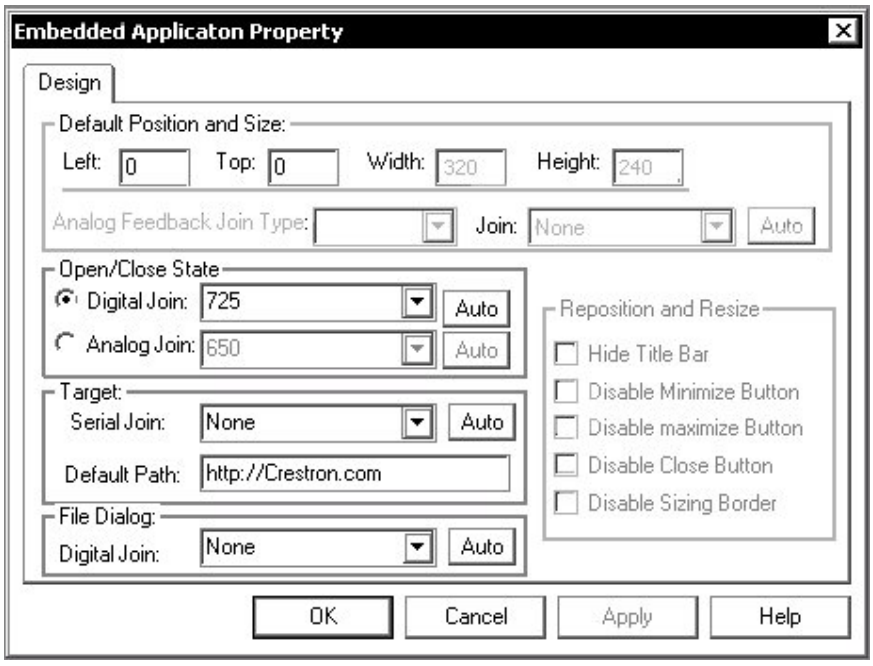
The "Embedded Application Property" window permits a choice of positions on the screen, assignment of an analog touch join type and number, and a show/hide join number.

Defaults for Embedded Windows Applications

Use the *Default Path* text box to enter the default document for the application.

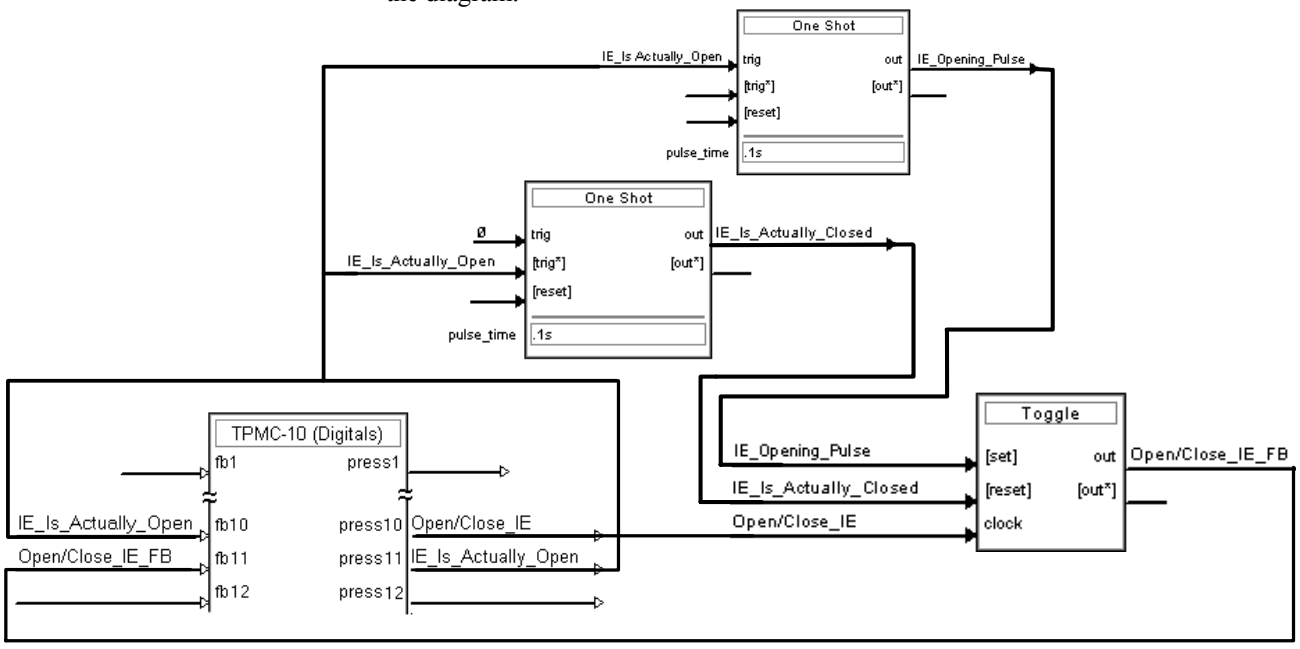
Edit the *Default Position and Size* in the "Embedded Application Property" window to point to your new location.

"Embedded Application Property" Window



Programming Embedded Windows Applications

The following diagram is an example of a basic SIMPL program that enables you to open/close an embedded application. The example program is discussed following the diagram.



The example has Join #10 assigned to a button that is used to toggle the state of Internet Explorer. Press11 is routed to the clock line of a Toggle symbol. The output of the toggle is routed to fb11. Join #11 is referred to as the "Open/Close State Digital Join." The feedback signal of the Open/Close State Digital Join is used to Open/Close the application. In this example, when fb11 goes high, Internet Explorer opens, and when fb11 goes low, Internet Explorer closes. However, since the application can also be closed by pressing the "X" in the upper right hand corner of Internet Explorer, we must keep the logic synchronized. If we do not, the toggle will get out of sync. Similarly, using the reserved join to launch the embedded application would result in the application being open, but the state of the toggle remaining low, so a one-shot is used to set the state of the toggle if the embedded application is opened in this way.

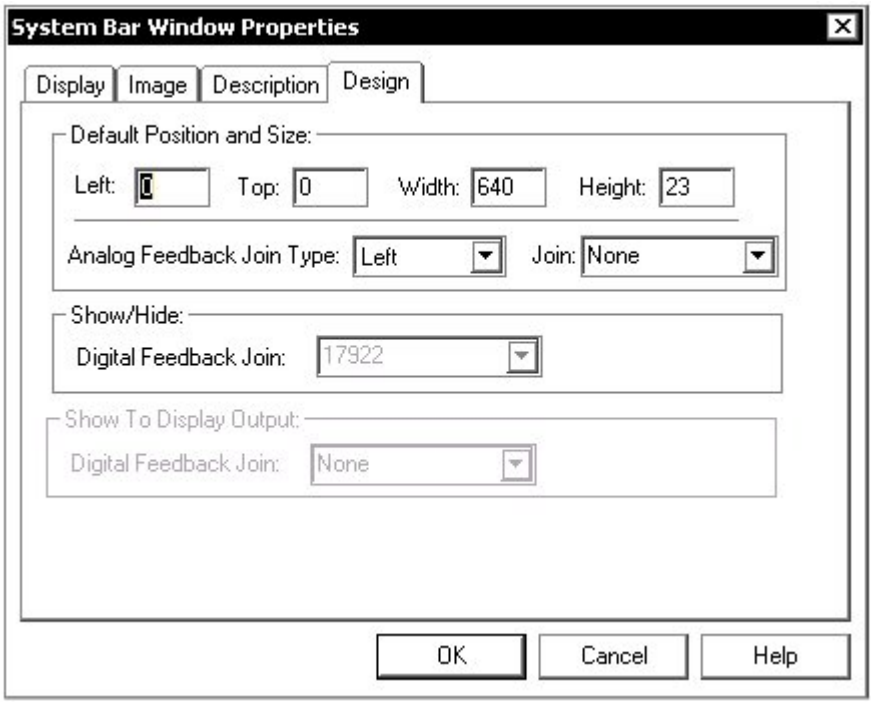
For example, the user presses button #10 and the output of the toggle (<**Open/Close_IE_FB**>) is high. If the user presses the "X" on IE, IE closes. The next time they touch button #10, <**Open/Close_IE_FB**> will go low, which tries to close the application. However, the application is already closed.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

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

System Bar Popup Window

Every VT Pro-e project for a TPMC-10 includes a System Bar popup window. The default System Bar includes a Signal Status gauge, assigned analog join 17517, a Signal Strength gauge, assigned analog join 17516; and a Battery Level gauge, assigned analog join 17507. The System Bar itself is assigned digital reserved join 17922 (show/hide). (Refer to the following figure.)

The System Bar is similar to a Subpage in that it may contain buttons, text, graphics, etc. Like a subpage, the System Bar does not ordinarily take up the entire display area. A primary difference of the System Bar is that when it is shown, it appears as a topmost window, on top of all pages, subpages, and embedded applications except the on-screen keyboard. Also, at run time, the System Bar can be resized by analog join. Refer to the following "System Bar Window Properties" *Design* tab window.



The System Bar is controlled (i.e., shown or hidden) via the digital feedback join. As long as the signal is high, the System Bar will appear; when the signal goes low, the System Bar disappears.

Reserved Join Numbers

A reserved join number is a feature of the software that enables a designer to create a button that completes a predetermined function such as adjusting brightness or volume, or activating a setup window. The following tables provide lists of reserved join numbers for the TPMC-10 available within the VT Pro-e and/or SIMPL Windows software.

Digital Reserved Join Numbers for TPMC-10

JOIN NUMBER	FUNCTION	WHERE EXPOSED	
		VTPro-e	SIMPL
17231	Standby Timeout Up	X	X
17232	Standby Timeout Down	X	X
17233	Power Timeout Up	X	X
17234	Power Timeout Down	X	X
17329	Audio Master Volume Up	X	X
17330	Audio Master Volume Down	X	X
17904	Brightness Up	X	X
17905	Brightness Down	X	X
17941	Puts the TPMC-10 into Standby mode	X	X
17942	Puts the TPMC-10 into Suspend mode	X	X

Analog Reserved Join Numbers for TPMC-10

JOIN NUMBER	FUNCTION	WHERE EXPOSED	
		VTPro-e	SIMPL
17202	Power Timeout - 0-120 minutes. (Default = 30 minutes)	X	X
17203	Standby Timeout - 0-120 minutes (Default = 10 minutes)	X	X
17307	Volume Level – 0 to 100	X	X
17507	Battery Level – 0 to 100	X	X
17516	Wi-Fi Signal Strength – 0 to 100	X	X
17517	Control System Connection Status – 0 to 3*	X	X
17537	Control System Status	X	X
17900	Brightness Level – 0 to 100	X	X

Reserved Join Numbers to Activate Embedded Applications

JOIN NUMBER	FUNCTION	WHERE EXPOSED	
		VTPro-e	SIMPL
17921	System_Display_Keyboard	X	
17944	System_Display_Adobe_Reader	X	
17946	System_Display_Excel_Viewer	X	
17947	System_Display_Outlook	X	
17948	System_Display_IE	X	
17949	System_Display_Word_Viewer	X	
17950	System_Display_Powerpoint_Viewer	X	
17951	System_Display_Media_Player	X	
17952	System_Display_Wordpad	X	
17953	System_Display_Remote_Desktop	X	
21705	System_Display_Calibration	X	

Reserved Join Numbers to Activate TPMC-10 Setup Windows

JOIN NUMBER	FUNCTION	WHERE EXPOSED	
		VTPro-e	SIMPL
17202	Displays a window that indicates the current software version number	X	X
17236	Sends data to the system after being set by any one of the setup windows	X	X
17242	Runs the “Setup” screen from a user’s project	X	X
17925	Activates the “Install Display List” function	X	
17926	Activates the “CtrlSys IP Address” window	X	
17927	Displays the “WiFi Access Point” window	X	
17931	Show system bar		X
17932	Hide system bar		X
21704**	Displays the “Panel IP Address” window. NOTE: When these values are modified, the user is prompted to reboot the touchpanel	X	
21705**	Activates the “Touch Screen” window	X	
21709**	Activates the “Volume” window	X	
21736**	Activates the “Brightness” window	X	

* For this range, 0 = Good connection; 1 = Warning (may encounter network difficulty); 2 = Not supported; 3 = No connection to control system.

**Values entered on these screens can be sent to system memory by activating a button, such as a Save or Store button defined on the touchpanel, that has been assigned join number 17236.

Example Program

An example program for the TPMC-10 is available from the "Example Program" section of the Crestron website (http://www.crestron.com/exampleprograms). Search for TPMC-10.ZIP

Uploading and Upgrading

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

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

NOTE: The Crestron Viewport utility performs multiple system tasks, primarily via a TCP/IP connection between the touchpanel and a PC. It is used to observe system processes, upload new firmware, change system and network parameters, and communicate with network device consoles and touchpanels, among many other tasks. Viewport can also function as a terminal emulator for generic file transfer. All of these functions are accessed through the commands and options in the Viewport menus. Therefore, for its effectiveness as a support and diagnostic tool, the Crestron Viewport may be preferred over development tools when uploading programs and projects.

The following sections define how one would upload a VT Pro-e project or upgrade the firmware of the TPMC-10.

VT Pro-e Project Upload

A compiled VT Pro-e file has the extension .vtz

To upload a compiled VT Pro-e project to the TPMC-10, complete the following steps.

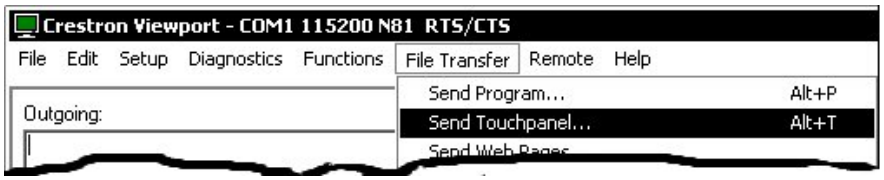
NOTE: To perform a VT Pro-e project upload, power to the TPMC-10 must be from the provided power supply, either directly or via the docking station.

1. Verify that the touchpanel has been configured as described in "Configuring the Touchpanel" on page 10. If necessary, press the **WiFi Access Point** button on the "Setup Screen" and select the *IP Information* tab to determine the IP Address of the touchpanel.
2. The PC should be connected to the Cresnet system via Ethernet (refer to "Typical System Configurations" on page 17), and power to the touchpanel must be supplied via the provided power supply.
3. Connect to the touchpanel through Viewport.

- Open Viewport, version 3.103 or later.
- Select **Remote | TCP/IP | Connect** from the Viewport menu.
- Enter the IP address of the TPMC-10 in the "Crestron Viewport TCP/IP Connect" window, and click **Connect.**

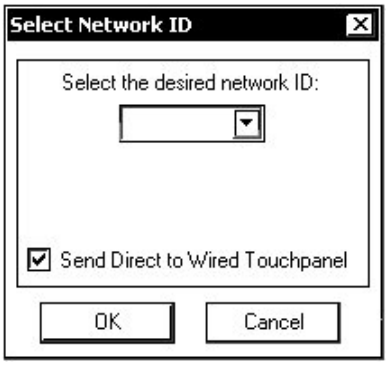
4. As shown in the following graphic, select **File Transfer | Send Touchpanel** (alternatively, depress **Alt+T**) from the Viewport menu.

Select Send Touchpanel

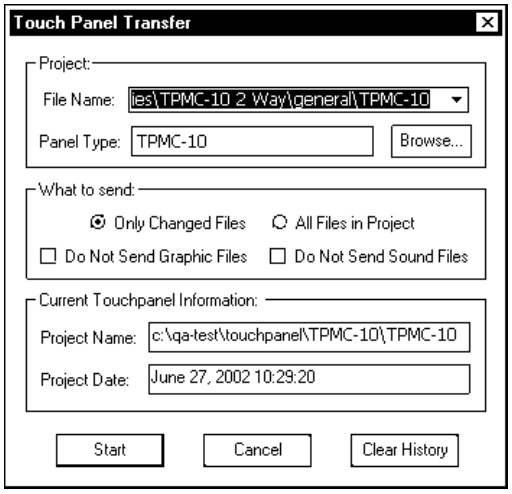


5. As shown in the following figure, select the *Send Direct to Wired Touchpanel* checkbox and click **OK**. The "Touchpanel Transfer" window appears (refer to the subsequent graphic).

"Select Network ID" Window

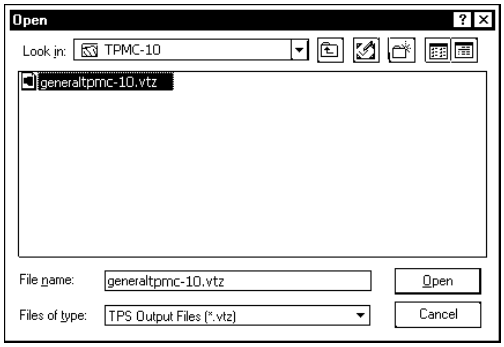


"Touchpanel Transfer" Window



6. Click Browse. The "Open" window appears as shown in the following graphic.
7. Select the VT Pro-e (.vtz) file and click **Open**. The file is transferred automatically when you select **Start**.

Select VTZ File



8. When the transfer is complete, the touchpanel automatically loads the new display.

Firmware Upgrade

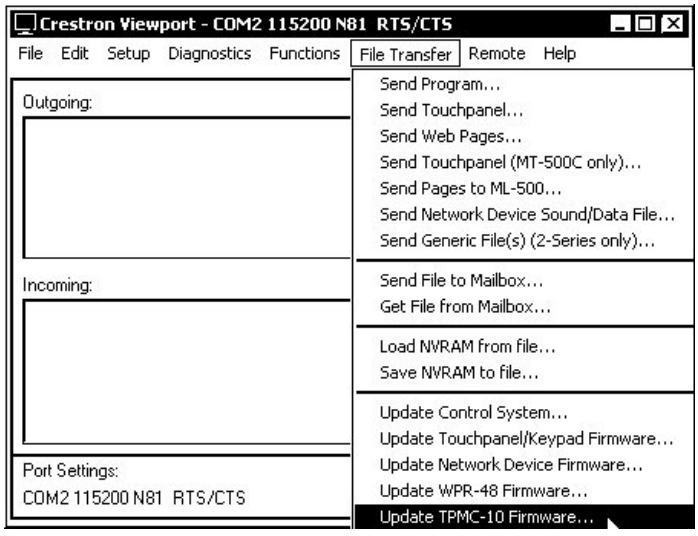
A firmware upgrade file has the extension .csz

To take advantage of all the available features, it is important that the unit contains the latest firmware. Please check the Crestron website for the latest version of firmware. Not every product has a firmware upgrade, but as Crestron improves functions, adds new features, and extends the capabilities of its products, firmware upgrades are posted. To upgrade the TPMC-10 firmware, complete the following steps.

NOTE: To perform a firmware upgrade, power to the TPMC-10 must be from the provided power supply, either directly or via the docking station.

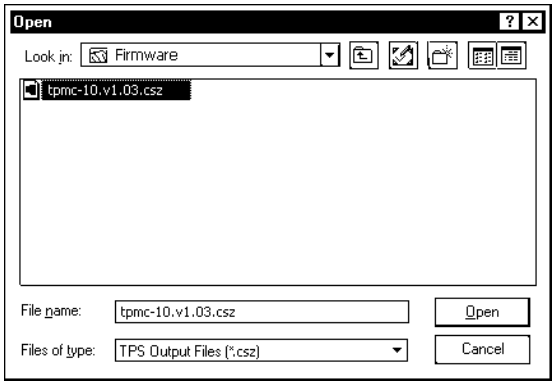
1. As shown below, select **File Transfer** | **Update TPMC-10 Firmware** from the Viewport menu.

Select Update Touchpanel Firmware



2. As shown on the following page, use the *Open* window to browse for and select the firmware (CSZ) file, and click **Open**. The transfer will complete automatically. (This process can take up to three minutes to complete and requires no user intervention.)

Select CSZ File



3. When the upload process is complete, the display shows the prompt:

   Firmware Installed!
   Please Reboot Panel for Installation to Complete

4. Press the reset pushbutton with the stylus to reboot the touchpanel.

Problem Solving

Troubleshooting

The table below and continued on the next page provides corrective action for possible trouble situations. If further assistance is required, please contact a Crestron customer service representative.

TPMC-10 Troubleshooting

TROUBLE	POSSIBLE CAUSE(S)	CORRECTIVE ACTION
Touchpanel does not turn on.	Battery is not installed, or is discharged.	Install the battery or charge the battery using the provided power supply.
	Power supply is not connected to the TPMC-10.	Connect the power supply to the TPMC-10 or, if the unit is docked, to the docking station.
Cannot upload display list from Viewport.	TPMC-10 is off or in suspend mode, or has no power.	Verify that the AC adapter is connected to the TPMC-10 (or docking station) and the unit is on or in standby mode.
	No WAPs defined /selected on the TPMC-10.	Refer to "WiFi SETUP" on page 13 to define/select WAPs.
	No IP address configured/obtained on the TPMC-10.	Refer to "Panel IP Address" on page 15 to define IP addresses. If the TPMC-10 is set up to use DHCP, you can use the WAP window box to verify the IP address provided. If the number is invalid for your subnet, or no number is present, verify that the DHCP server is working properly.*
	TPMC-10 is out of range or has poor access to the WAPs.	The TPMC-10 is out of range of the WAP or is experiencing interference. Refer to the WAP documentation for instructions on setting up a wireless network with minimum interference and no dead spots.

(continued on next page)

TPMC-10 Troubleshooting (continued)

TROUBLE	POSSIBLE CAUSE(S)	CORRECTIVE ACTION
Cannot upgrade TPMC-10 firmware from Viewport.	TPMC-10 is off or in suspend mode, or has no power.	Verify that the AC adapter is connected to the TPMC-10 (or docking station) and the unit is on or in standby mode.
	No WAPs defined /selected on the TPMC-10.	Refer to "WiFi SETUP" on page 13 to define/select WAPs.
	No IP address configured/obtained on the TPMC-10.	Refer to "Panel IP Address" on page 15 to define IP addresses. If the TPMC-10 is set up to use DHCP, you can use the WAP window box to verify the IP address provided. If the number is invalid for your subnet, or no number is present, verify that the DHCP server is working properly. *
	Invalid firmware file used.	Download the latest version from the Crestron website.
	TPMC-10 is out of range or has poor access to the WAPs.	The TPMC-10 is out of range of the WAP or is experiencing interference. Refer to the WAP documentation for instructions on setting up a wireless network with minimum interference and no dead spots.
TPMC-10 does not show feedback and/or does not control any devices.	No WAPs defined /selected on the TPMC-10.	Refer to "WiFi SETUP" on page 13 to define/select WAPs.
	No IP address configured/obtained on the TPMC-10.	Refer to "Panel IP Address" on page 15 to define IP addresses. If the TPMC-10 is set up to use DHCP, you can use the WAP window box to verify the IP address provided. If the number is invalid for your subnet, or no number is present, verify that the DHCP server is working properly. *
	Invalid control system IP address / IP ID set up on TPMC-10.	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 "CtrlSys IP Address" on page 15 to define IP addresses.
	No DNS set up on the TPMC-10.	You are attempting to connect to a control system by name, but there is no DNS server set up on the TPMC-10. Refer to "Panel IP Address" on page 15 to define DNS server.
	TPMC-10 is out of range or has poor access to the WAPs.	The TPMC-10 is out of range of the WAP or is experiencing interference. Refer to the WAP documentation for instructions on setting up a wireless network with minimum interference and no dead spots.
TPMC-10 shows unexpected or intermittent feedback and/or has intermittent device control.	TPMC-10 is out of range or has poor access to the WAPs.	The TPMC-10 is out of range of the WAP or is experiencing interference. Refer to the WAP documentation for instructions on setting up a wireless network with minimum interference and no dead spots.
Cannot install displaylist from setup screens.	No mass storage device or invalid mass storage device is attached.	Attach a valid mass storage device.
TPMC-10 boots up in setup screens every time.	Invalid display list or no display list is loaded.	Load/reload display list using the Viewport or the TPMC-10 setup screen.

* DHCP not supported on the TPMC-10.

Further Inquiries

If you cannot locate specific information or have questions after reviewing this guide, please take advantage of Crestron's award winning customer service team by calling the Crestron corporate headquarters at 1-888-CRESTRON [1-888-273-7876]. For assistance in your local time zone, refer to the Crestron website (http://www.crestron.com/) for a listing of Crestron worldwide offices.

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

Future Updates

As Crestron improves functions, adds new features, and extends the capabilities of the TPMC-10, additional information and programming examples 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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