Crestron Isys® **TPS-12/15/17** Tilt Touchpanels

Operations Guide

CRESTRON®

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

Contents

Crestron Isys® Tilt Touchpanels: TPS-12/15/17

Introduction

Features and Functions

The Crestron Isys® TPS-12, TPS-15 and TPS-17 family of tilt touchpanels offer high brightness and contrast combined with a super wide viewing angle to deliver crisp, detailed images under all conditions. For simplicity within this guide, these touchpanels are referred to as TPS-12/15/17, except where noted. These touchpanels are QuickMedia™ compatible. The features and specifications for all three touchpanels are identical (except those relating to the screen). The touchpanels are available with a variety of color bezels (ex. black with silver accent, white with gray accent), and are designated with a -B or -W respectively.

Functional Summary

- 12, 15, and 17 inch (widescreen) active matrix color displays
- Screen resolutions: TPS-12 800 x 600, TPS-15 1024 x 768, TPS-17 1280 x 768
- 16.7 million colors, 24-bit graphics with 8-bit alpha channel
- 128 MB of DDR RAM, 32 MB of internal flash (expandable to 160 MB)
- Built-in time-based correction for stable video and graphics
- Supports composite, S-video, and component inputs in both NTSC and PAL formats
- Supports QuickMedia™ transport technology, which affords expanded AV connectivity through a streamlined wiring solution
- Supports Crestron Home® CAT5 balanced AV connectivity
- Full screen video capability
- Up to 4,000 digital and analog signals; up to 999 serial signals
- Built-in microphone and biamplified speaker system
- Built-in audio amplifier, 5 W per channel
- Stores and plays back WAV sound files
- Stereo headphone jack
- Stereo audio input and microphone output
- 10BaseT/100BaseTX high-speed Ethernet, 802.3U compliant, full duplex, auto switching
- Five backlit hard buttons (one reset and four programmable buttons)
- Includes a TPMC-CH-IMC to facilitate A/V connections

TPS-12/15/17 Block Diagram
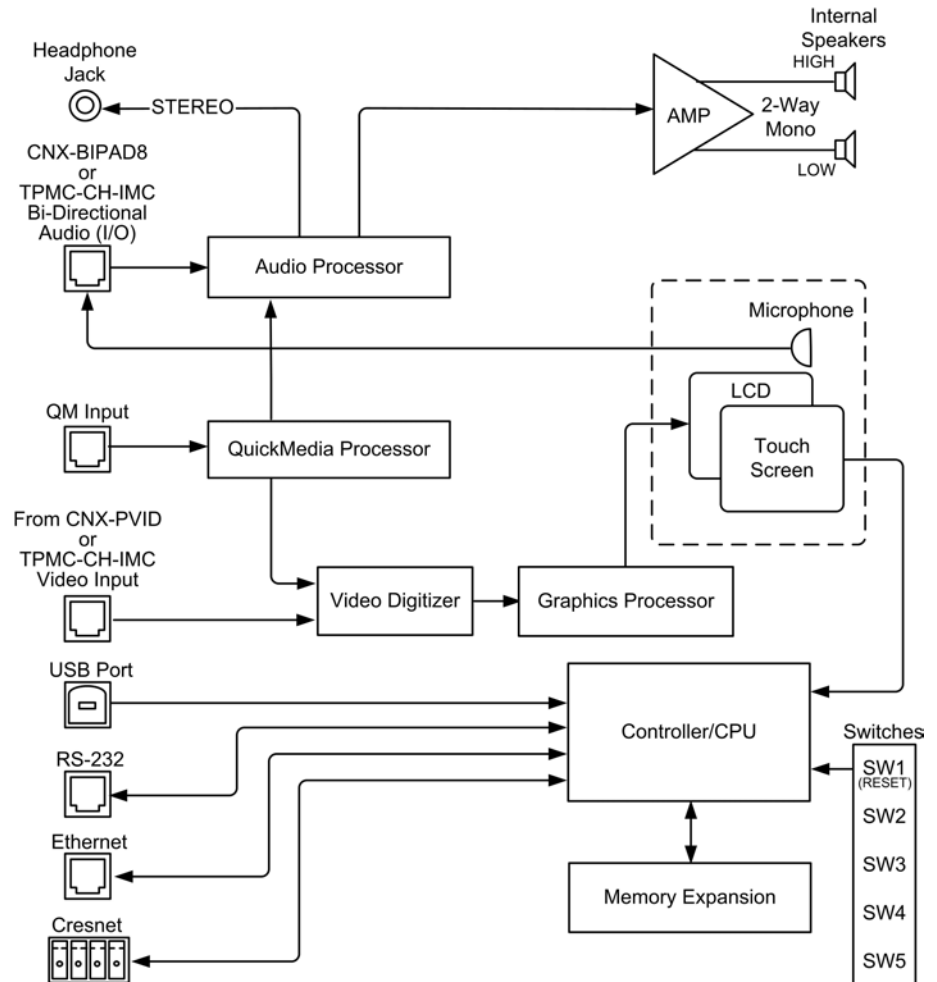
Memory

The TPS-12/15/17 touchpanels feature 128 MB DDR RAM and 32 MB Flash, with a built-in compact flash slot that allows flash memory expansion up to 160 MB.

Sound

Audio capabilities include 5 Watts per channel biamplified audio speakers that offer built-in volume control, a built-in microphone and built-in WAV sound file capability. Sound can be generated by the panel by using downloaded wave files (.WAV) or can be mixed in from an external line level audio source or a QuickMedia input. The TPS-12/15/17 touchpanels are also equipped with balanced output for microphone audio that can be connected to a Crestron CNX-BIPAD8 or similar Crestron CAT5 audio receiver.

Video

The TPS-12/15/17 touchpanels can display a single video window per page, and use auto-detect for composite, S-video, component, NTSC and PAL formats. These touchpanels support SDTV formats (does not support HD). Two video inputs provide for connectivity to QuickMedia and PVID video distribution switches (CNX-PVID8X3 or CNX-PVID8X4).

QuickMedia™

While acting as a QuickMedia (QM) receiver, the TPS-12/15/17 touchpanels can be connected as an endpoint to a QM switching device or QM transmitter.

NOTE: The TPS-12/15/17 does not support RGB.

Connectivity

The TPS-12/15/17 touchpanels feature a Cresnet and a high-speed Ethernet port for seamless communication with Crestron control systems, and computers. In addition, a USB port is provided for future applications. The "RS-232 Port for Touch Output" operation transmits touch coordinates to external devices via RS-232 for "Touch-The-PC" and other functions.

Specifications

The following table provides a summary of specifications for the TPS-12/15/17.

TPS-12/15/17 Specifications

SPECIFICATION	DETAILS
Cresnet® Power Usage Not including TPMC-CH-IMC (1.0 W)	
TPS-12	43 W (1.8 A @ 24 V) Supplied via NET port
TPS-15	65 W (2.7 A @ 24 V) Supplied via NET port
TPS-17	74 W (3.08 A @ 24 V) Supplied via NET port
Default Net ID	03
Timeout	Adjustable from 0 to 120 minutes (Default = 10 min.)
Signal Join Maximums	4000 Digital, 4000 Analog, 999 Serial
Control System Update Files [1, 2, 3] 2-Series Control System	Version 3.137.CUZ or later
Touchpanel Firmware	tps-12_tps-15_tps-17_1.xxx.xxxx.csf
Memory	32 MB Flash, 128 MB DDR RAM
Memory Expansion	Up to 160 MB via Compact Flash
Video	Full screen capable, standard definition formats Auto detect of composite, S-video, component, NTSC, and PAL 16.7M colors Time base correction & gamma correction Supports 480i component video and 576i formats
Audio	Built-in microphone Two built-in biamplified speakers (5 W per channel) Stereo headphone output Internal volume control and audio mixer WAV file capability (8-bit PCM)

Continued on the following page

TPS-12/15/17 Specifications (continued)

SPECIFICATION	DETAILS
Connectors	
NET	One 4-pin 5 mm detachable terminal block for connection to Cresnet
USB	One USB port (reserved for future applications)
RS-232	One 6-pin RJ-11 female connector, bi-directional RS-232 serial connection, touchscreen output to PC or telestrator, or serial mouse connection
Headphones	One 3.5 mm stereo TRS mini phone jack, output power 12 mW, impedance 32 Ohms (nominal)
QM IN	One RJ-45 QuickMedia input connector
VIDEO IN	One RJ-45 CNX-PVID differential video input connector
AUDIO I/O	One RJ-45 CNX-BIPAD balanced stereo audio input and microphone output connector
LAN	One 8-wire RJ-45 Ethernet port with link/activity LED indicators, 10BaseT/100BaseTX high-speed Ethernet, TCP/IP, UDP/IP, CIP, DHCP, 802.3U compliant, full duplex, auto switching
Buttons	Five illuminated pushbuttons, the leftmost button (SW1) is recessed and is a hardware reset used to reboot the touchpanel, the four other buttons are user programmable
Display	
Type	Active Matrix Color LCD
Aspect Ratio	TPS-12 4:3 TPS-15 4:3 TPS-17 15:9
Resolution	TPS-12 800 x 600 TPS-15 1024 x 768 TPS-17 1280 x 768
Brightness	TPS-12 400 nits TPS-15 400 nits TPS-17 450 nits
Contrast	TPS-12 300:1 TPS-15 300:1 TPS-17 400:1
Illumination	Backlit fluorescent
Viewing Angle	TPS-12 +/- 70 degrees horizontal, +45/-55 degrees vertical TPS-15 +/- 85 degrees horizontal and vertical TPS-17 +/- 88 degrees horizontal and vertical
Tilt Angle	45 to 90 degrees
Enclosure	Metal enclosure with a molded plastic bezel and integral rear cover and cable strain relief
CPU	32-bit Motorola Coldfire
Processing Speed	410 MIPS
Operating Environment	Temperature: 41° to 113°F (5° to 45°C) Humidity: 10% to 90% RH (non-condensing)

Continued on the following page

TPS-12/15/17 Specifications (continued)

SPECIFICATION	DETAILS
TPS-12 Dimensions	Height: 12.45 in (31.63 cm) Width: 12.85 in (32.64cm) Depth: 13.75 in (34.93 cm) Weight: 12.95 lbs (5.88 kg)
TPS-15 Dimensions	Height: 14.17 in (36.00 cm) Width: 14.94 in (37.95 cm) Depth: 13.75 in (34.93 cm) Weight: 14.55 lbs (6.60 kg)
TPS-17 Dimensions	Height: 14.17 in (36.00 cm) Width: 17.63 in (44.79 cm) Depth: 13.75 in (34.93) Weight: 18.10 lbs (8.21 kg)
Accessories	TPMC-CH-IMC interface unit

1   The latest software versions can be obtained from the Crestron website. Refer to the NOTE following these footnotes.

2   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.

3   When loading VT Pro-e files or firmware through the RS-232 port of the control system, be sure that the baud rate is at 38400 (Cresnet speed) or lower. Otherwise, Toolbox may post the "Transfer Failed" message.

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 electronic hardware is housed in a metal enclosure with a molded plastic bezel, which is available in a variety of colors such as black with silver accent or white with gray accent. This touchpanel is designed for placement on a tabletop or other flat surface. All audio, RS-232, video, and network connections are made at the rear panel on the base of the unit. A grille located on the front base of the unit conceals a high frequency speaker; the low frequency speaker is in the base. The microphone is located at the top center above the touchscreen. Five buttons (one reset and four programmable) are located on the base.

TPS-12 Angled View

TPS-15 Front View

TPS-17 Angled View

TPS-12 Physical View – Front
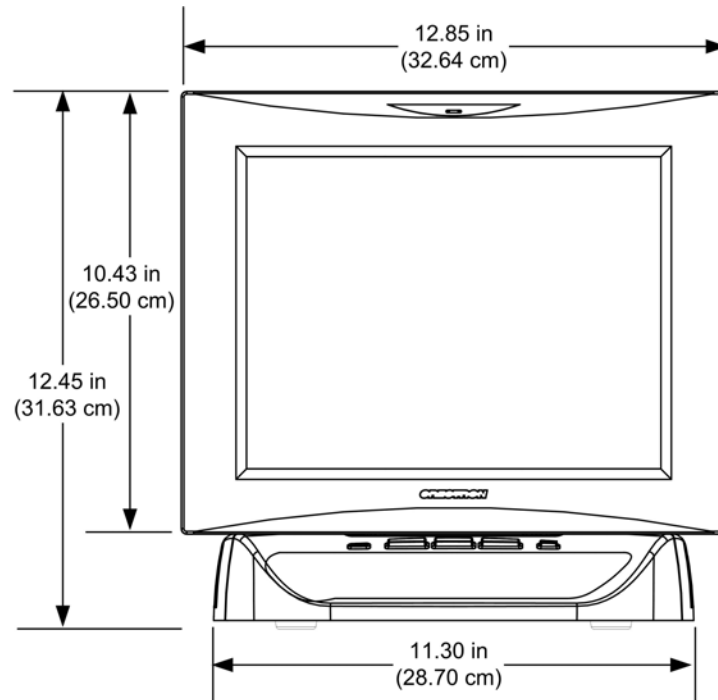
TPS-12 Physical Views – Side View at Maximum and Minimum Elevation
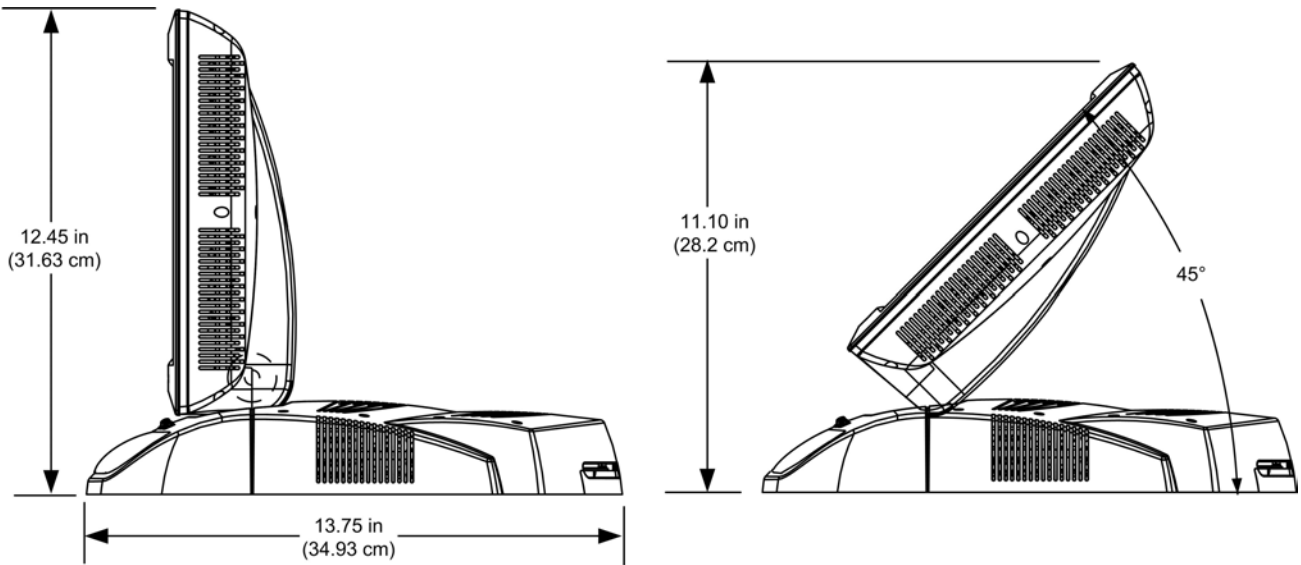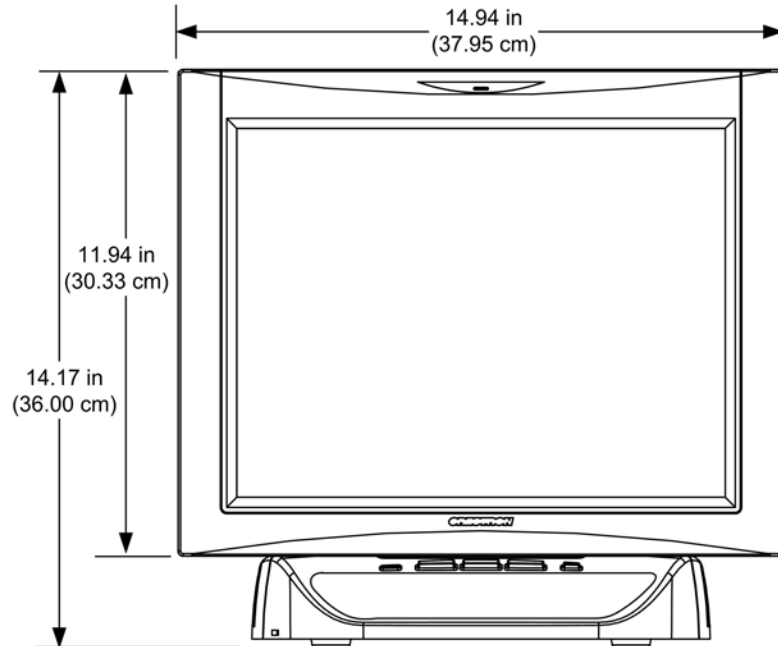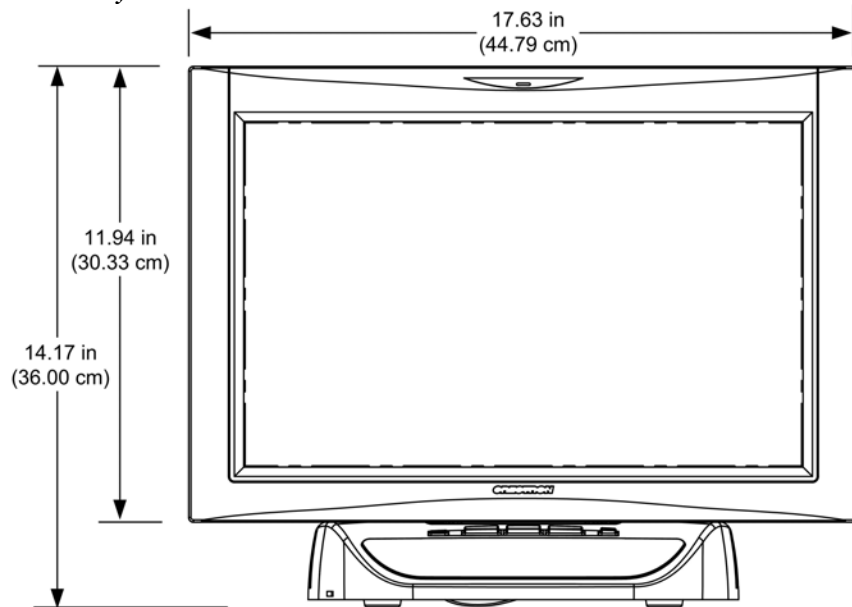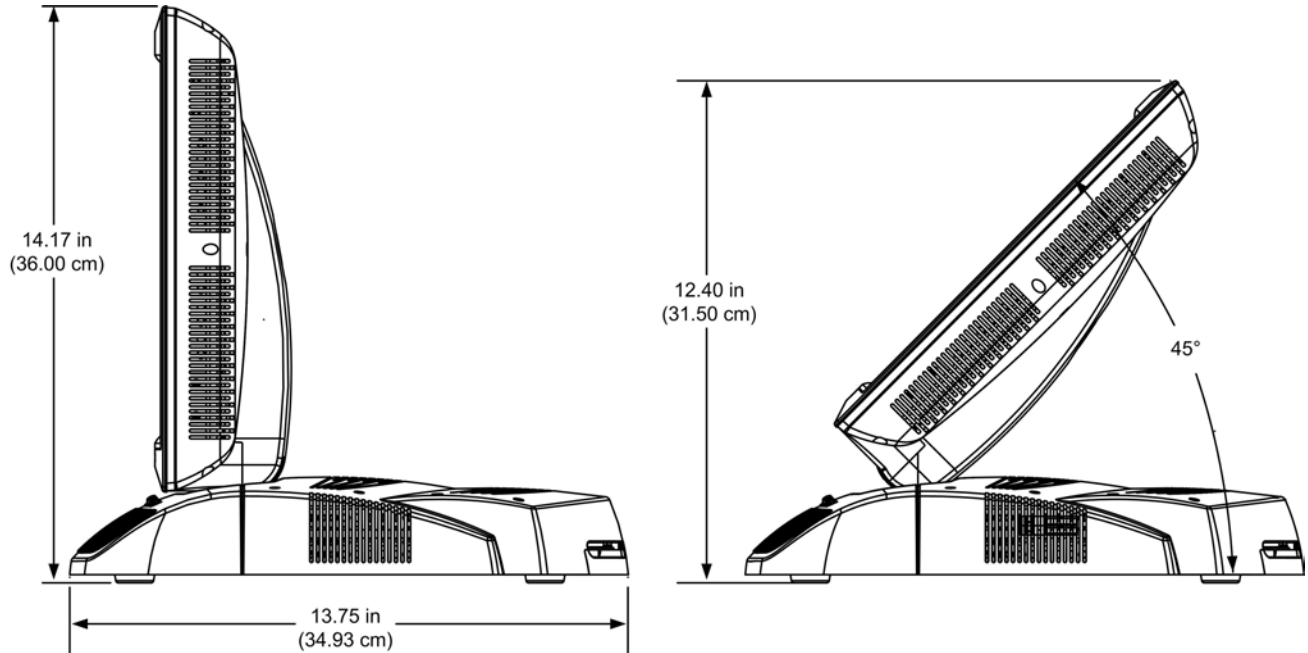
TPS-15 Physical View – Front

TPS-17 Physical View – Front

NOTE: The TPS-15 and TPS-17 are the same height.

TPS-15 and TPS-17 Physical Views – Side View at Maximum and Minimum Elevation

NOTE: All three touchpanels share an identical base unit.

Bottom View
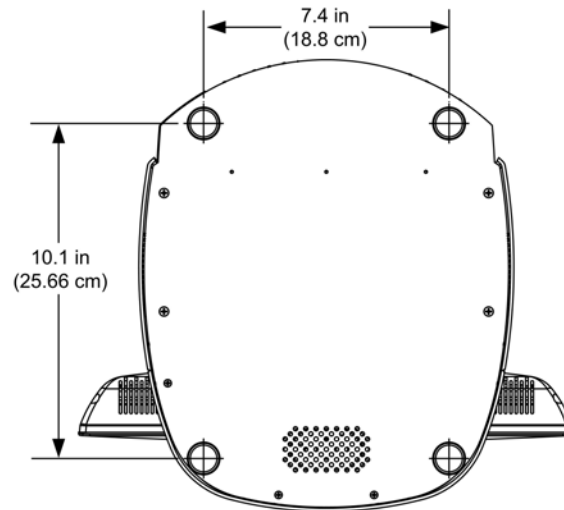
View of Rear Connectors – Cover Removed
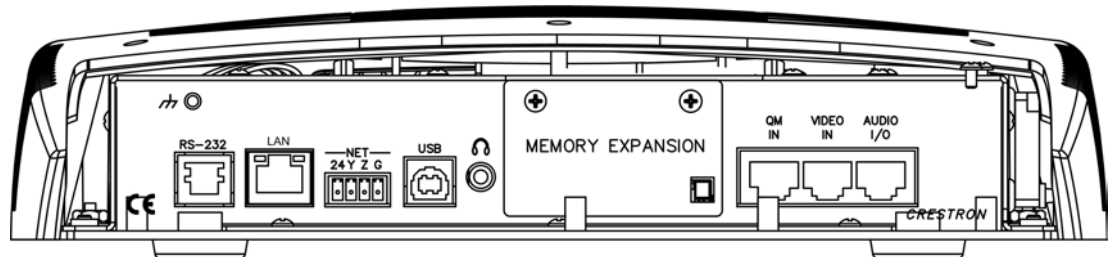
Ports and Pushbuttons

All connections to the TPS-12/15/17 are made through the ports on the rear panel. Refer to the illustrations and descriptions that follow.

NOTE: Rear ports are not accessible after the cover is replaced.

RS-232
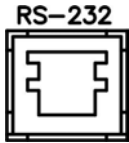
This 6-pin RJ-11 connector mates with a 9-pin serial port of a PC. The connecting cable is not supplied. Use this port to establish a direct connection between the touchpanel and a PC without a control system or network connection. Once the direct connection is established, touchpanel files and firmware updates can be uploaded to the touchpanel. Additionally, the touchpanel's diagnostic tools can be accessed over the direct connection. In the event that modular cables or an RJ-11 to DB9F adapter is not available, the following table and diagram provide information so that the cable can be fabricated on site. Refer to "RS-232 Menu" on page 20 for RS-232 port configuration settings.

RS-232 Pinouts

PIN #	DESCRIPTION
1	CTS
2	GND
3	RXD
4	TXD
5	RTS
6	N/C (Not connected)

PC to TPS-12/15/17 Cable Specifications (Crestron Cable Number STCP-502PC)

LAN

LAN

Green LED   Yellow LED

AMP

Pin 8   Pin 1
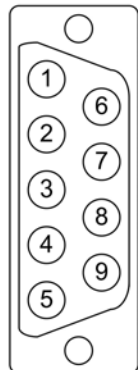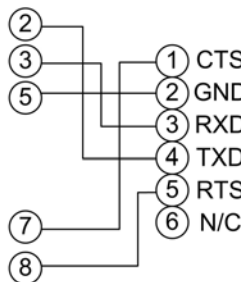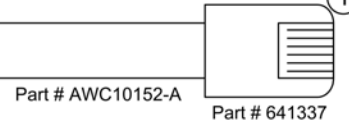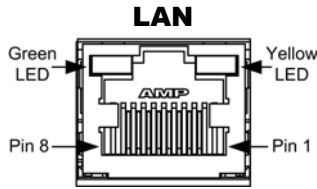
One 8-wire RJ-45 connector with two LED indicators (green LED indicates link status, yellow LED indicates Ethernet activity). This connector provides an Ethernet 10baseT /100baseTX, full duplex, TCP/IP, UDP/IP, CIP, DHCP, IEEE 802.3U compliant network connection.

Network Connector Pinout

PIN	SIGNALS
1	TX +
2	TX -
3	RC+
4	N/C
5	N/C
6	RC -
7	N/C
8	N/C

NET

—NET—
24 Y Z G
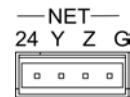
The four-pin 5 mm detachable terminal block provides communication with and power from a Cresnet control network. For additional details, refer to "Network Wiring" on page 14. A cable for this connection is provided with the touchpanel.

Pins 24 and G provide 24 VDC and ground.

Pins Y and Z provide communications (data).

USB

Pin 2   USB   Pin 1

Pin 3   Pin 4
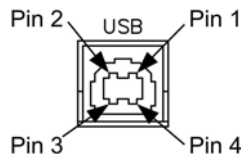
One Universal Serial Bus (USB) "B" connector provides a communications link. USB is a connectivity specification developed by the USB Implementers Forum that provides a single, simple, standardized way to connect devices to a computer. USB shielded cables contain two wires for power +5 volts (red) and ground (brown) and a twisted pair of wires (yellow and blue) that carry data.

USB Type B Connector Pinout

PIN	DESCRIPTION
1	+5 VDC
2	Data -
3	Data +
4	Ground

NOTE: This connector is reserved for future applications.

PHONE

Connect this standard mini phone jack (12 mW, 32 ohm load) to the plug of a 3.5 mm external headphone set plug (not supplied). Plugging in the headphone cuts off the speakers.

MEMORY EXPANSION

⊕   ⊕

MEMORY EXPANSION
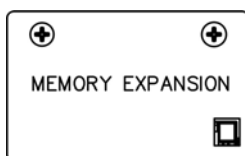
The onboard memory may be enhanced with the addition of a Type II compact flash memory (up to 160 MB).

The flash memory slot is accessible on the rear panel of the unit.

QM
IN

1   8
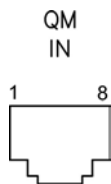
QM IN (QuickMedia Input)

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

NOTE: The QM port is not connected through any "IMC" interface.

NOTE: Only one video source may be displayed at a time.

NOTE: These touchpanels do not support RGB.

RJ-45 QuickMedia Connector Pin Assignments

RJ-45 PIN NUMBER	WIRE COLORS (EIA 568B)	QM ASSIGNMENT COMPOSITE, S-VIDEO, COMPONENT AND AUDIO
1	WHITE/ORANGE	- CHROMINANCE (- P_R)
2	ORANGE	+ CHROMINANCE (+ P_R)
3	WHITE/GREEN	- LUMINANCE (- Y)
4	BLUE	+ AUDIO
5	WHITE/BLUE	- AUDIO
6	GREEN	+ LUMINANCE (+ Y)
7	WHITE/BROWN	- COMPOSITE (- P_B)
8	BROWN	+ COMPOSITE (+ P_B)

RJ-45 MALE CONNECTOR

Pin 1   Pin 8

VIDEO
IN

1   8

VIDEO IN
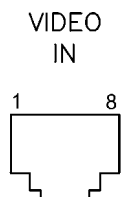
This eight-pin RJ-45 connection provides connectivity to the CNX-PVID or the TPMC-CH-IMC interface module. This port provides component, composite or S-video balanced input to the touchpanel over Crestron Certified Wiring. Description of the pinouts is shown in the following table. A cable for this connection is provided with the touchpanel.

CAUTION: Only use the TPMC-CH-IMC Interface Module when connecting this port. Use of other "IMC" products could damage the panel.

NOTE: Only one video source may be displayed at a time.

Video In Pin Assignments

PIN	WIRE COLORS (568B)	COMPOSITE	S-VIDEO	COMPONENT
1	WHITE/ORANGE	+ Composite	+ Luminance	+ Y
2	ORANGE	- Composite	- Luminance	- Y
3	WHITE/GREEN	N/A	+ Chrominance	+ P_B
4	BLUE	N/A	N/A	+ P_R
5	WHITE/BLUE	N/A	N/A	- P_R
6	GREEN	N/A	- Chrominance	- P_B
7	WHITE/BROWN	N/A	N/A	N/A
8	BROWN	N/A	N/A	N/A

```
AUDIO
 I/O

1        8
```
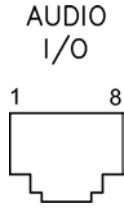
AUDIO I/O

This 8-pin RJ-45 connector provides connectivity to the CNX-BIPAD or with the TPMC-CH-IMC interface module. This port uses Crestron Certified Wiring and provides audio input to the touchpanel and microphone output from the touchpanel. A description of the pinouts is shown in the following table.

CAUTION: Only use the TPMC-CH-IMC Interface Module when connecting this port. Use of other "IMC" products could damage the panel.

Audio In/Out Pin Assignments

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

Pushbuttons

Five pushbuttons are located on the top of the base as shown in the following diagram. The leftmost button is recessed and is a hard reset used to reboot the touchpanel. The other four buttons are programmable. Refer to page 34 for hard button programming information.

TPS-12/15/17 Pushbuttons
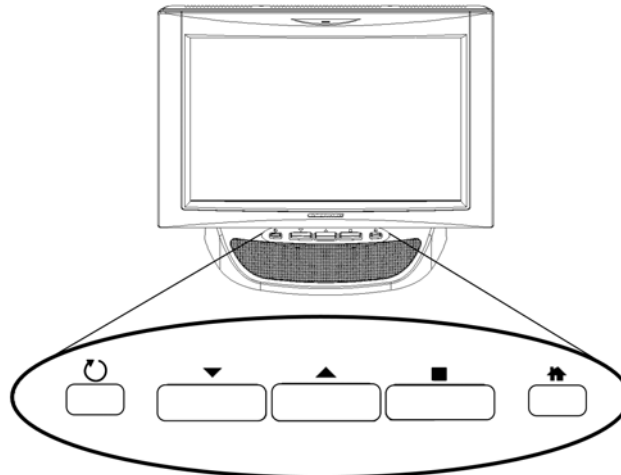
TPMC-CH-IMC Interface Module

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

NOTE: The TPMC-CH-IMC is not for use with QuickMedia.

Tilt Angle Tension Adjustment

Use a 5/32 inch socket (supplied by other) with a hex drive key (Allen wrench) to increase or decrease pivot tension at the base of the touchscreen. Turning the key clockwise increases tension, counterclockwise decreases tension.

Tension Adjustment Screw

Tilt Tension Adjustment
Use a 5/32" Hex (Allen) Wrench
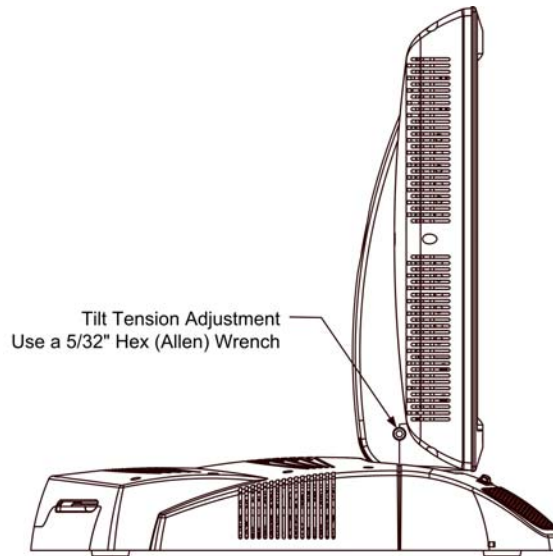
Industry Compliance

As of the date of manufacture, the TPS-12, TPS-15, and TPS-17 have 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.

Setup

Network Wiring

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

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

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

When calculating the length of wire for a particular Cresnet run, the wire gauge and the Cresnet power usage of each network unit to be connected must be taken into consideration. Use Crestron Certified Wire only. If Cresnet units are to be daisy-chained on the run, the Cresnet power usage of each network unit to be daisy-chained must be added together to determine the Cresnet power usage of the entire chain. If the unit is a home-run from a Crestron system power supply network port, the Cresnet power usage of that unit is the Cresnet power usage of the entire run. The wire gauge and the Cresnet power usage of the run should be used in the following equation to calculate the cable length value on the equation's left side.

Cable Length Equation

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

> Where: L = Length of run (or chain) in feet.
>   R = 6 Ohms (Crestron Certified Wire: 18 AWG (0.75 MM^2))
>   P = Cresnet power usage of entire run (or chain).

Make sure the cable length value is less than the value calculated on the right side of the equation. For example, a Cresnet run drawing 20 watts should not have a length of run more than 333 feet.

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

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

NOTE: For larger networks (i.e., greater than 28 network devices), it may become necessary to add a Cresnet Hub/Repeater (CNXHUB) to maintain signal quality throughout the network. Also, for networks with lengthy cable runs, it may be necessary to add a Hub/Repeater after only 20 devices.

QuickMedia Network Wiring

For the QuickMedia (QM) transport, use CresCAT-QM cable. The Crestron QuickMedia cable "CresCAT-QM" contains one CAT5E cable and one Cresnet cable in siamese jackets.

CresCAT-QM Cable

NOTE: Do not untwist the two wires in a single pair for more than 1/3-1/2" (0.84 – 1.27 cm) when making a connection. The twists are critical to canceling out interference between the wires.

The aggregate cable length of a signal path originating at a QM transmitter and terminating at the TPS-12/15/17 must not exceed 328 feet (100 meters). Video signals may experience a loss of quality over very long lengths of cable. This phenomenon is due to the added resistance and capacitance of longer cable lengths, and is not particular to either Crestron and/or QuickMedia systems. To ensure sufficient bandwidth, the maximum aggregate cable length should not exceed 328 feet. The use of lower-resolution signals may allow increased cable length but must be tested by the installer with the sources to be used. The QM pin assignment is based on the EIA/TIA 568B RJ-45 Jack standard.

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

QM Network Topology
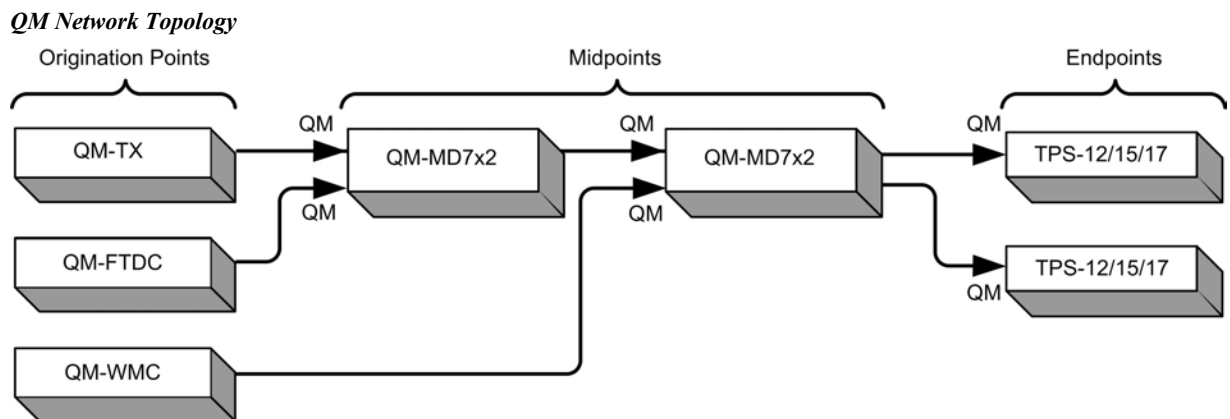
Identity Code

All equipment and user interfaces within the network require a unique identity code (Net ID). These codes are two-digit hexadecimal numbers ranging from 03 to FE (Net ID 02 is reserved for control processors). The Net ID of each unit must match an ID code specified in the SIMPL Windows program. The Net ID is set using the internal setup menu (refer to "Interface Menu" on page 18). The Net ID may also be changed using Crestron Toolbox (refer to "Establishing Communications" on page 43).

Configuring the Touchpanel

NOTE: The only connection required to configure the touchpanel is power (supplied via Cresnet). Refer to "Hardware Hookup" on page 24 for details.

To configure the unit, it may be necessary to access a series of setup screens prior to viewing run-time screens that are loaded into the touchpanel for normal operation. The MAIN MENU for configuring the touchpanel appears when a finger is held to the touchscreen as power is applied, or after the hardware reset button is pressed and released. Remove your finger when the message "SETUP MODE" briefly appears on the touchscreen.

Upon entering SETUP MODE, the MAIN MENU, as shown in the following illustration, displays four buttons: **Touch Screen Calibration**, **Exit and Run Program**, **Setup**, and **Diagnostics**.

The **Exit and Run Program** button verifies that all of the setup information has been saved to the EEPROM and displays the main page that has been programmed

into your system. The remaining buttons on the MAIN MENU open other menus, which are discussed in subsequent paragraphs.

MAIN MENU

MAIN MENU

Touch Screen
Calibration

Exit and
Run Program

Setup

Diagnostics

Calibration Menu

CALIBRATION MENU

CALIBRATION MENU

Perform

Calibration

Return
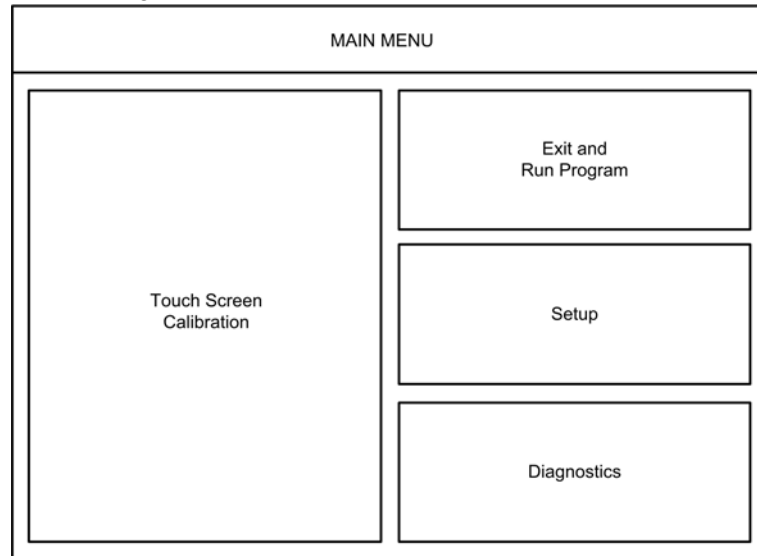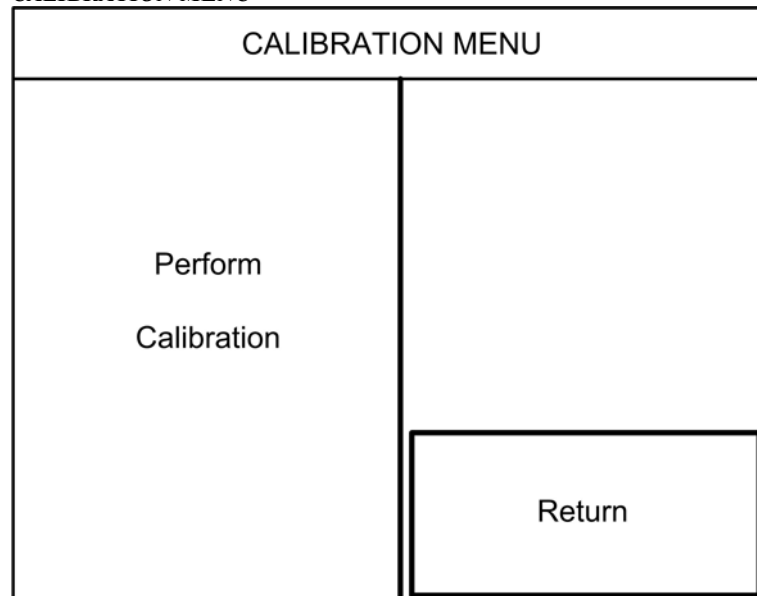
Touch **Perform Calibration**. The message "Touch Upper Left" appears centered on the panel with a cross hair in the upper left corner. Touch the center of the cross hair in the corner of the screen to initiate calibration. Another message, "Touch Upper Right", appears with a cross hair in the correct corner. Touch the center of the cross hair in the corner of the screen. A final message, "Touch Lower Right", appears with a cross hair in the correct corner. Touch the center of the cross hair in the corner of the screen to conclude calibration and return to the CALIBRATION MENU.

NOTE: When touching the screen during calibration, be as accurate as possible. Use the tip of a capped pen or the eraser end of a pencil. To cancel calibration and return to the CALIBRATION MENU without saving calibration data, create a calibration error by touching the screen in the same spot three times.

Setup Menu

To obtain the SETUP MENU, press the **Setup** button from the MAIN MENU. The SETUP MENU offers a series of buttons, which open additional menus and displays, and are detailed in subsequent paragraphs. The SETUP MENU also provides the screen brightness control, key backlight control, and the standby timeout setting. After setup parameters have been selected, select the **Return** button to return to the MAIN MENU.

NOTE: For convenience, the current CRESNET ID setting is displayed in the upper left corner.

NOTE: All touchpanel settings are automatically saved in non-volatile memory.

SETUP MENU

```
┌─────────────────────────────────────────────────────────────────────────┐
│  ┌─────────────┐           SETUP MENU                                     │
│  │ CRESNET ID  │                                                          │
│  │    03       │                                                          │
│  ├─────────────┤  ┌─────────┐  ┌─────────┐  ┌─────────┐  ┌─────────┐     │
│  │             │  │         │  │         │  │         │  │         │     │
│  │  Interface  │  │ RS-232  │  │  Audio  │  │Ethernet │  │  Video  │     │
│  └─────────────┘  └─────────┘  └─────────┘  └─────────┘  └─────────┘     │
│                                                                           │
│  ┌─────────────────────────┐        ┌─────────────────────────┐         │
│  │   SCREEN BRIGHTNESS      │        │    KEY BACKLIGHT         │         │
│  │        99%              │        │        99%              │         │
│  ├────────────┬────────────┤        ├────────────┬────────────┤         │
│  │   DOWN     │    UP       │        │   DOWN     │    UP       │         │
│  └────────────┴────────────┘        └────────────┴────────────┘         │
│                                                                           │
│  ┌─────────────────────────┐                      ┌─────────────┐        │
│  │   STANDBY TIMEOUT        │                      │             │        │
│  │        120              │                      │   Return    │        │
│  ├────────────┬────────────┤                      │             │        │
│  │   DOWN     │    UP       │                      └─────────────┘        │
│  └────────────┴────────────┘                                              │
└─────────────────────────────────────────────────────────────────────────┘
```
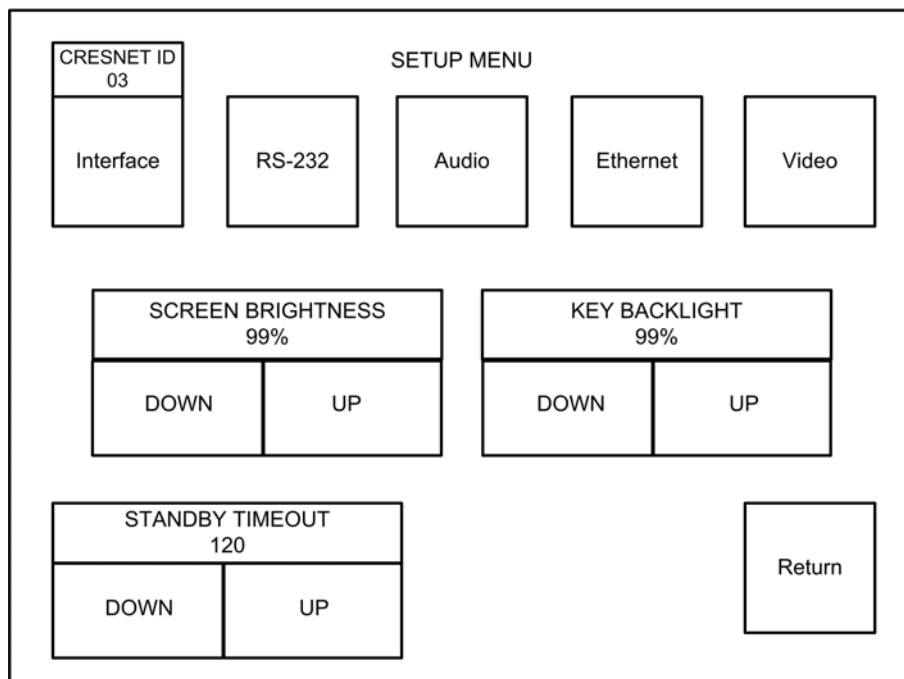
Interface Menu

The touchpanel communicates with a control system to activate commands or to display feedback from components within the system. The communication interface must be correctly specified or communication will not occur. To set communication parameters select the **Interface** button located on the SETUP MENU and display the INTERFACE MENU, as shown on the next page.

The Cresnet network identity number (CRESNET ID also known as the Net ID) is displayed on the INTERFACE MENU. Net ID is the two-digit hexadecimal number. The hexadecimal number can range from 03 to FE and must correspond to the Net ID set in the SIMPL Windows program of the Cresnet system. Matching IDs between touchpanel and SIMPL Windows program is required if data is to be successfully transferred. Net ID for the TPS-12/15/17 is factory set to 03. No two devices in the same system can have the same Net ID.

INTERFACE MENU

```
INTERFACE MENU

CRESNET ID          Enable      Disable        RS-232 Port for
    03            CRESNET II  CRESNET II          Console

DOWN    UP          Enable      Disable        RS-232 Port for
                  Touch Screen Touch Screen      Touch Output

                    Enable      Disable        RS-232 Port for
                     CIP         CIP            Mouse Input

                    Enable      Disable
                    Ethernet    Ethernet

                                                  Save
                                                  and
                                                  Return
```
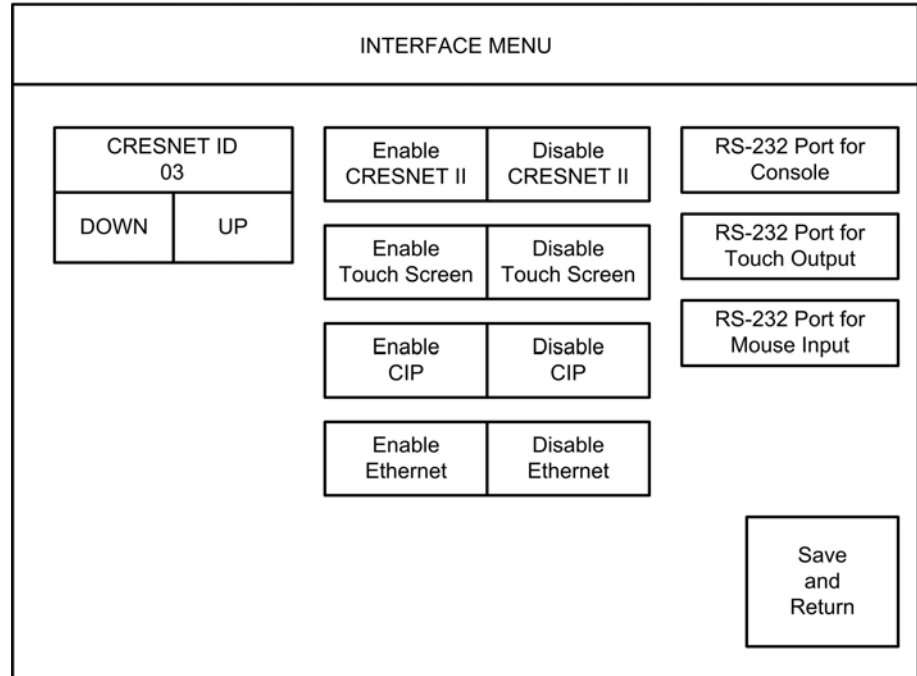
Two buttons adjacent to the hexadecimal display, **UP** and **DOWN**, increase and decrease the Net ID by one, respectively.

The three buttons on the right define how the RS-232 port can be used; as a console port (i.e., loading touchpanel projects and firmware), a touch output port (communication of touch coordinates to an external device), and as a mouse input port (allows a mouse to control the touchpanel).

The touchpanel usually communicates with a Cresnet system. Occasionally the touchpanel can be used in a demo mode where it merely displays various menus, but does not communicate with a Cresnet system. In demo mode, the directory buttons change pages, but buttons requiring feedback do not work. Two side-by-side buttons, **Enable CRESNET II** and **Disable CRESNET II**, determine communication mode. Select **Enable CRESNET II** for normal Cresnet communication mode and **Disable CRESNET II** to set the touchpanel into demo mode. Communication mode is factory set to **Enable CRESNET II**.

There may be Ethernet devices (i.e., a control system) on the network that communicates with the touchpanel via CIP (Cresnet Internet Protocol). Two buttons located on the INTERFACE MENU determine if the touchpanel is capable of this type of communication. Select **Enable CIP** to permit this protocol recognition and **Disable CIP** to prohibit any CIP connection. CIP must be enabled for the touchpanel to communicate with other Crestron Ethernet devices.

NOTE: The TPS-12/15/17 do not support a wireless Ethernet connection.

Select the **Return** button located on the INTERFACE MENU to return to the SETUP MENU.

RS-232 Menu

The touchpanel allows for one of three RS-232 communication modes:

- Console (i.e., loading touchpanel projects and firmware)
- Touch Output (communication of touch coordinates to an external device)
- Mouse Input (allows a mouse to control the touchpanel)

For convenience, the RS-232 MENU also permits the selection of the RS-232 communication options, RTS-CTS On/Off, XON-XOFF On/Off, Baud Rate, Data Bits, Parity, and Stop Bits.

Touch the communication option to select communication parameters and then select **Save and Return** to save the RS-232 settings and return to the SETUP MENU.

Default settings: Console mode, Baud rate: 115200, data bits: 8 bit, parity: none, stop bit: 1, XON/XOFF on, RTS/CTS off.

RS-232 MENU

```
┌──────────────────────────────────────────────────────────────────┐
│                          RS-232 MENU                               │
│                                                                    │
│  ┌───────────────────────────┐    ┌────────────────────────┐      │
│  │         BAUDRATE           │    │  RS-232 Port for       │      │
│  ├─────────┬─────────┬────────┤    │  Console               │      │
│  │   110   │   150   │  300   │    └────────────────────────┘      │
│  ├─────────┼─────────┼────────┤    ┌────────────────────────┐      │
│  │   600   │  1200   │ 2400   │    │  RS-232 Port for       │      │
│  ├─────────┼─────────┼────────┤    │  Touch Output          │      │
│  │  4800   │  9600   │ 19200  │    └────────────────────────┘      │
│  ├─────────┼─────────┼────────┤    ┌────────────────────────┐      │
│  │  38400  │  57600  │ 115200 │    │  RS-232 Port for       │      │
│  └─────────┴─────────┴────────┘    │  Mouse Input           │      │
│  ┌───────────────────────────┐    └────────────────────────┘      │
│  │         DATA BITS          │    ┌───────────┬────────────┐      │
│  ├─────────────┬─────────────┤     │ RTS-CTS On│ RTS-CTS Off│      │
│  │      7      │      8      │     └───────────┴────────────┘      │
│  └─────────────┴─────────────┘    ┌───────────┬────────────┐      │
│  ┌───────────────────────────┐    │XON-XOFF On│ XON-XOFF Off│     │
│  │          PARITY            │    └───────────┴────────────┘      │
│  ├────────┬────────┬─────────┤                                     │
│  │  None  │  Odd   │  Even   │            ┌──────────┐             │
│  └────────┴────────┴─────────┘            │  Save    │             │
│  ┌───────────────────────────┐            │  and     │             │
│  │         STOP BITS          │            │  Return  │             │
│  ├─────────────┬─────────────┤            └──────────┘             │
│  │      1      │      2      │                                     │
│  └─────────────┴─────────────┘                                     │
└──────────────────────────────────────────────────────────────────┘
```

Audio Menu

To open the AUDIO MENU, press the **Audio** button from the SETUP MENU. The AUDIO MENU offers a series of buttons that adjust the decibel level as indicated by the gauges. The MIXER INPUTS are independently adjustable, allowing you to precisely control the amount of signal for each component of the audio mix. The MASTER OUTPUT provides an overall control of the total volume, bass and treble.

The **Restore Default Audio Settings** button returns all audio parameters to their default settings when the button is selected. The **Play Test WAV File** button plays a short audio file. The QM Link Status also indicates if the touchpanel is receiving a QM signal. After audio parameters have been set, select the **Return** button to return to the SETUP MENU.

AUDIO MENU
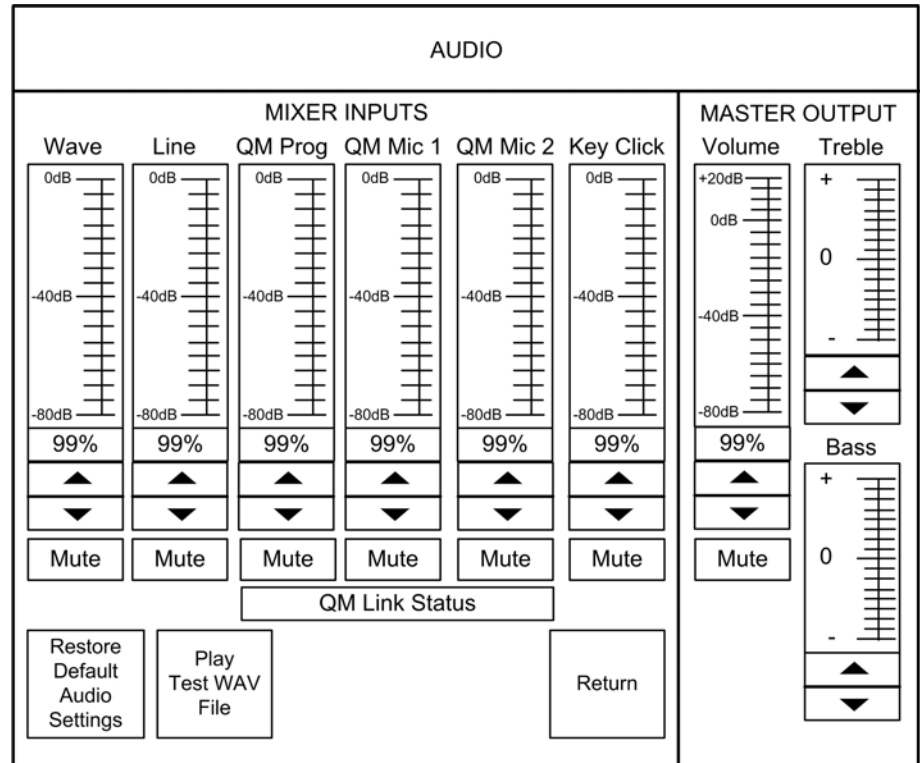
Refer to the following table for additional AUDIO MENU setup details.

Audio Setup Details

AUDIO MENU CONTROLS	DESCRIPTION
Master	The volume of all audio types (WAV, line, and key click) is affected by the Master Volume control. If the Master Volume control is set to 100%, the volume for any type of audio is at maximum. If the Master Volume is set to 0%, the value of all audio types is overridden and the touchpanel is silent. If Master Volume is a percentage (say 50%), then all audio types can only achieve half their value.
Treble	Adjusts the overall treble output with the UP▲ and DOWN ▼buttons.
Bass	Adjusts the overall bass output with the UP▲ and DOWN ▼buttons.
Mute	A separate mute button is provided for each of the six mixer inputs and one for the master control.
Wave	Adjusts the volume of the Wav file with the UP▲ and DOWN ▼buttons. Click **Play Test WAV File** button to sample and adjust the volume as a pre-loaded WAV file plays.
Line	Adjusts line level audio with the UP▲ and DOWN ▼buttons.
QM (Prog)	Adjusts the QM program audio level with the UP▲ and DOWN ▼buttons.
QM Mic 1	Adjusts the level of microphone 1 with the UP▲ and DOWN ▼buttons.
QM Mic 2	Adjusts the level of microphone 2 with the UP▲ and DOWN ▼buttons.
Key Click	Adjusts the level of the key click sound with the UP▲ and DOWN ▼buttons.
QM Link Status	Indicates QM connectivity

Ethernet

Selection of the **Ethernet** button from the SETUP MENU displays details such as the IP Address, Subnet Mask, Default Router, IP Table, etc. The settings can only be viewed from this screen. The enable/disable Ethernet feature is provided on the INTERFACE MENU. Ethernet settings are made through Crestron Toolbox. Refer to page 48 for additional details.

Video Menu

The touchpanel can display composite, S-video, and component video input from one of the selected sources, from the TPMC-CH-IMC interface unit, a CNX-PVID, or from the QM input connector in both NTSC and PAL formats. Select the **Video** button from the SETUP MENU to display the video screen, shown in the following illustration. You can select **Video Auto Detect**, **QM Auto Detect**, or choose one particular input source.

Controls for **BRIGHTNESS**, **CONTRAST**, **SATURATION**, and **HUE** are provided independently for each video source. Controls for **PEAK**, **BOOST**, **QM Preset** and auto compensation (**AC**) are provided for QM video input.

The **Restore Default Values** button resets the controls to the factory settings. After video parameters have been set, select the **Return** button to return to the SETUP MENU.

Refer to the following graphic and table for additional information.

VIDEO MENU
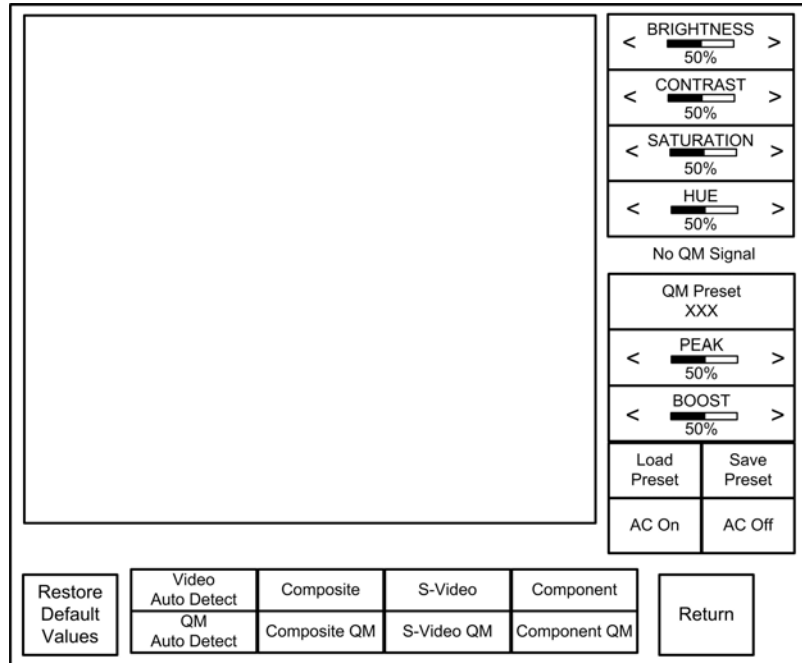
Video Setup Details

VIDEO SCREEN CONTROLS	DESCRIPTION
Brightness[1, 2]	Adjust video image brightness with the left and right arrow buttons.
Contrast[1, 2]	Adjust video image contrast with the left and right arrow buttons.
Saturation[1, 2]	Adjust video image saturation with the left and right arrow buttons.
Hue[1, 2]	Adjust video image hue with the left and right arrow buttons.
OM Preset	Displays the current QM Preset number.
Peak	Peaking adjusts for high frequency attenuation that can occur over long cable lengths.
Boost	Boost compensates for overall signal loss that can occur over long cable lengths.
AC ON	When auto compensation is on, the QM receiving device uses the auto compensation data received from the QM transmitter.
AC OFF	Turns off auto compensation.
Restore Default Values	Returns all settings to the default factory settings.
Video Auto Detect	Enable the auto-detect mode, automatically selects video source connected to the VIDEO IN input.
Composite	Selects composite video source at VIDEO IN.
S-Video	Selects S-video at VIDEO IN.
Component	Selects component video at VIDEO IN.
QM Auto Detect[3]	Enable the auto-detect mode, automatically selects video source connected to the QM IN input.
Composite QM	Selects QM composite video source at the QM IN input.
S-Video QM	Selects QM S-video source at the QM IN input.
Component QM	Selects QM component video source at the QM IN input.
Return	Reverts to the SETUP MENU.

1. Video default is 50% for each of the video parameters (brightness, contrast, saturation, and hue).
2. Adjustment applies to the currently selected video source only.
3. QM IN and Video IN are mutually exclusive (i.e., auto-detect for QM IN de-selects auto-detect for Video IN).

Diagnostics Menu

The **Diagnostics** button from the MAIN MENU contains controls for diagnostic tools. The diagnostic tools should only be used under supervision from a Crestron customer service representative during telephone support. The options available from the DIAGNOSTICS MENU are numeric in nature and their interpretation is beyond the scope of this manual.

DIAGNOSTICS MENU
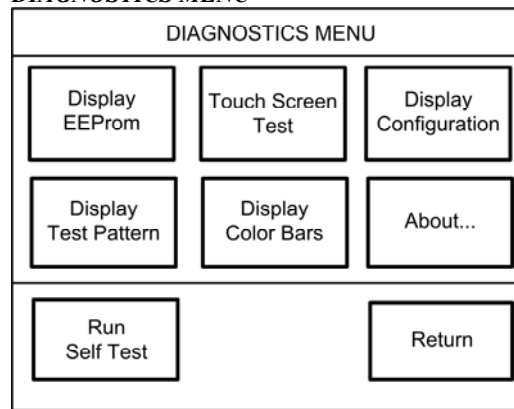
Hardware Hookup

Refer to the following diagram and complete the video and communications connections as needed in any order. Connect the power last.

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

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

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

NOTE: The headphone output is for WAV and Line audio only. It does not carry the microphone signal. Use the AUDIO OUT on the TPMC-CH-IMC for the microphone signal.

NOTE: TPS-12/15/17 touchpanels include a TPMC-CH-IMC Interface Module for system connection. The TPMC-CH-IMC serves as an interface between the touchpanel, external A/V system, microphone output, and the Cresnet system. Refer to the TPMC-CH-IMC Operations Guide (Doc. 6345) for hardware hookup using this interface.

NOTE: The supplied cable is only for use with the video and Cresnet connections. It is not designed for the "QM" connection. QM connections should use Crestron

Certified Wire (CresCAT, CresCAT-D, or CresCAT-Q). If the supplied cable is used for "QM" connections, signal degradation and reduced image quality may result.

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

Refer to the following diagram for access to the connectors and cable routing.

Access to I/O Panel and Cable Routing
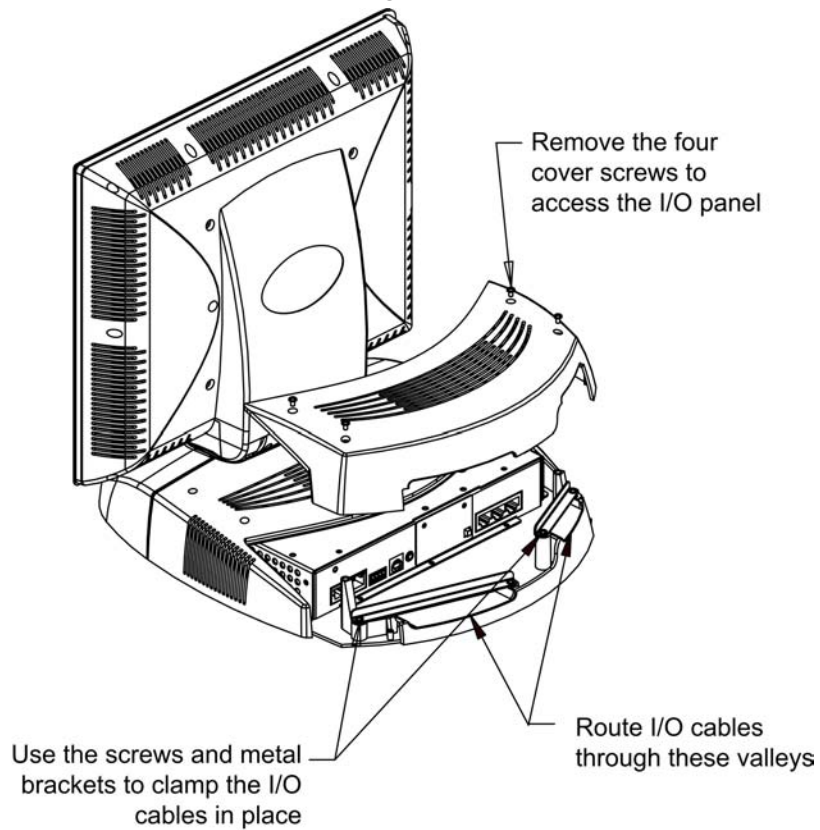
The TPS-12/15/17 touchpanels have rubber pads on the underside of its base so that it can rest on a horizontal surface. Make the required connections as shown and described in the following sections. Refer to the following illustration for proper connections; apply power last.

TPS-12/15/17 Hookup
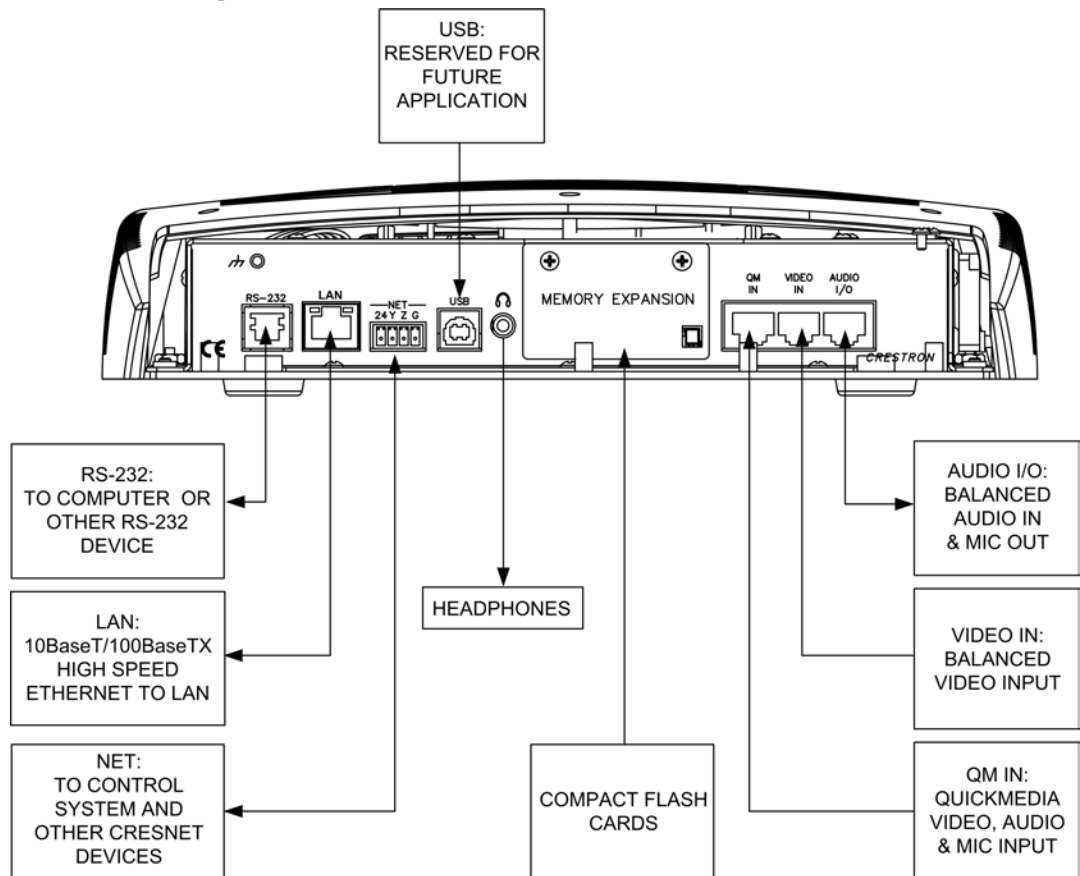
CAUTION: Only use the TPMC-CH-IMC Interface Module when connecting the VIDEO IN and AUDIO I/O ports. The use of other "IMC" products could damage the panel.

NOTE: The QM port is not connected through any "IMC" interface.

NOTE: The connectors are not accessible after the rear cover is reinstalled.

Recommended Cleaning

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

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

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.

Configuration is easy thanks to Crestron's Windows®-based programming software. Crestron SystemBuilder™ software creates a complete project, with no special programming required. SystemBuilder completes all necessary programming for a base system including all touchpanel screens and the control system program. The program output of SystemBuilder is a SIMPL Windows program with much of the functionality encapsulated in macros and templates. Once SystemBuilder creates the project, the system interfaces and program logic can be customized in SystemBuilder. Modifications are easily accomplished with Crestron development tools (i.e., SIMPL Windows and Crestron VisionTools® Pro-e (VT Pro-e) software packages).

NOTE: Modifications to the program that are made outside of SystemBuilder (for example, in VT Pro-e or SIMPL windows) are not preserved when you reenter SystemBuilder.

SystemBuilder comes with templates for all supported interfaces. If a user wishes to create a touchpanel project using templates with a different look-and-feel, this can be accomplished by making a custom template. This custom template can then be used by SystemBuilder to create the final project files to be loaded into the panels. Alternatively, VT Pro-e can be used to tweak projects created with the SystemBuilder or develop original touchpanel screen designs.

Digital, analog and serial join numbers are a common thread between VT Pro-e and SIMPL Windows. These numbers define how the objects on a touchpanel page of a VT Pro-e project interface to the outside world, specifically the Cresnet system as defined in the SIMPL Windows program. There are digital join numbers that carry out some predetermined function (a logical high or low); analog join numbers for displaying incremental values, sliders, gauges and bar graphs; and serial join numbers that allow for the display of variable text and transmission/reception of serial commands from other manufacturers. Unjoined objects are not interfaced with the system and thus cannot initiate any logic functions (although they can perform page flips).

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:

- (Optional but highly recommended) SystemBuilder version 2.0 or later (Requires SIMPL Windows, VT Pro-e, Crestron Database and Crestron Engraver).

- SIMPL Windows version 2.06.16 or later. Requires SIMPL+® Cross Compiler version 1.1 and Device Library update 342.

- Crestron Database version 17.2.0 or later. Required by SIMPL Windows and VT Pro-e.

- VisionTools Pro-e version 3.4.0.7 or later. Used for graphical touchscreen design.

- Crestron Toolbox version 1.0 or later. Used for communication, file transfer, and many other functions (replaces Viewport).

Programming with Crestron System Builder

Crestron System Builder 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. Crestron System Builder then programs the system, including all touchpanel projects and control system logic.

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

SystemBuilder
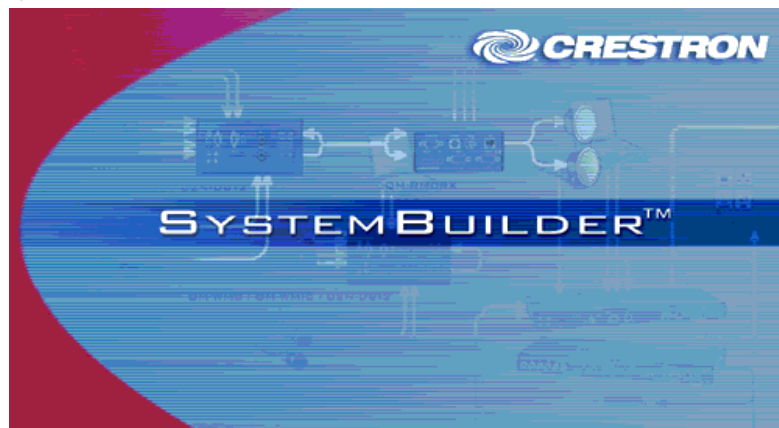
For additional details, download SystemBuilder from the Crestron website and examine the extensive help file.

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: The following are acceptable file extensions for programs that include a TPS-12/15/17, developed for specific control system types:

.smw   *projectname*.smw (source file)
.spz   *projectname*.spz   (compiled file for 2-Series)
.usp   *projectname*.usp   (source code module for SIMPL+)
.ir   *projectname*.ir   (user IR)
.umc   *projectname*.umc   (user macro)
.ush   *projectname*.ush   (completed SIMPL+)

NOTE: In the following description, the PRO2 control system is 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 TPS-12 touchpanel. Procedures are identical for the TPS-15 and TPS-17.

Join Number Remapping (JNR) is a programming concept that allows a TPS Series panel to use join numbers with values over 4000 (Join Numbers 4001 to 15999 and Reserved Join Numbers) by bringing them within the range of the TPS touchpanel symbol, thereby increasing a touchpanel's functionality. Through JNR, a TPS Series panel's internal functions become accessible to a control system and can activate the local functions of other touchpanels, route its internal feedback back to the control system, and receive feedback from remote locations. JNR provides the additional capability of managing IP IDs in Ethernet applications where a touchpanel communicates with multiple control systems that have been uploaded with the same program. Refer to the latest version of the 2-Series Control System Reference Guide (Doc. 6256) and the SIMPL Windows help file for more details.

Configuration Manager is where programmers "build" a Crestron control system by selecting hardware from the *Device Library*. In Configuration Manager, drag the PRO2 from the Control Systems folder of the *Device Library* and drop it in the upper pane of the *System Views*. The PRO2 with its associated communication ports is displayed in the *System Views* upper pane.

PRO2 System View
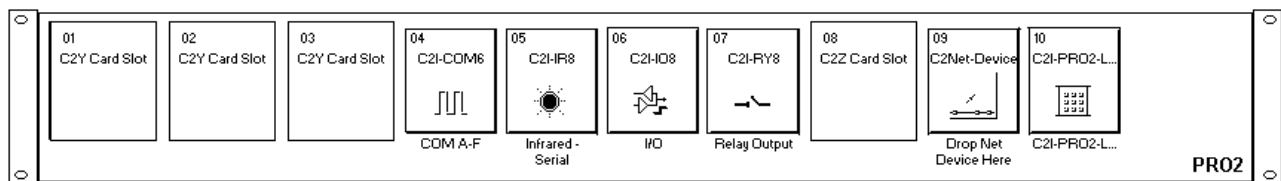
The *System Views* lower pane displays the PRO2 system tree. This tree can be expanded to display and configure the communications ports.

Expanded PRO2 System Tree
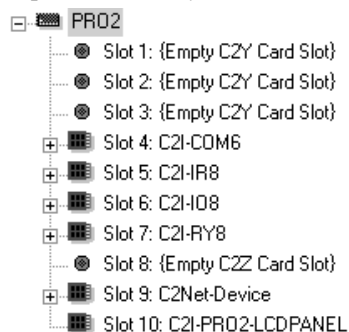
C2Net-Device Slot in Configuration Manager

To incorporate the TPS-12/15/17 touchpanel into the system, drag the touchpanel from the Touchpanels folder (Cresnet or Ethernet) of the *Device Library* and drop it on the C2Net-Device Slot. The PRO2 system tree displays the touchpanel in Slot 9, with a default Net ID of 03, as shown in the following illustration. Additional touchpanels will be added with the next available Net ID number.

C2Net Device, Slot 9
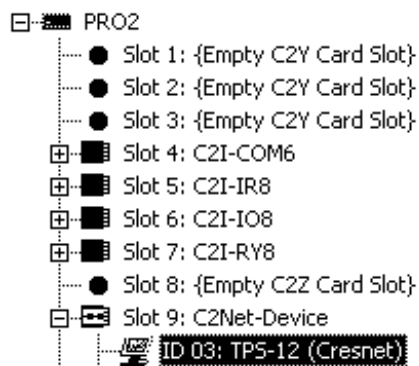
Setting the Net ID in Device Settings

Double-click the TPS-12 icon in the upper pane to open the "Device Settings" window. This window displays TPS-12 device information. If necessary, select the *Net ID* tab to change the Net ID, as shown in the following figure.

"Device Settings" Window for the TPS-12

22

no2ll.
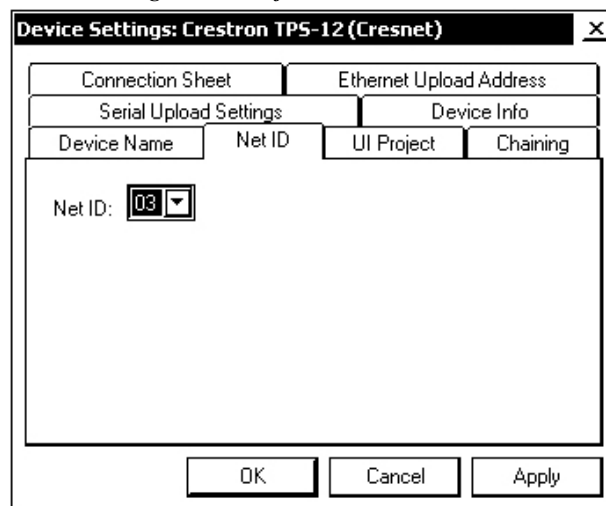
NOTE: This procedure sets the Net ID for the touchpanel in the program only. It does not automatically set the Net ID for the touchpanel itself. SIMPL Windows automatically changes Net ID values of a device added to a program if a duplicate device or a device with the same Net ID already exists in the program. Always ensure that the hardware and software settings of the Net ID match. For Net ID hardware settings details, refer to "Interface Menu" which begins on page 18.

TPS-12/15/17 Symbol in Programming Manager

Programming Manager is where programmers "program" a Crestron control system by assigning signals to symbols. The symbol can be viewed by double clicking on the icon or dragging it into *Detail View*. A description for each signal in the symbol is described in the SIMPL Windows help file (**F1**).

Device Extenders

Device extenders provide additional logic and functionality to a device. Three device extenders are currently available for the TPS-12/15/17 touchpanels.

- The Poll Manager takes the touchpanel on and off line during polling by the control system

- The Sleep/Wake Manager suspends and restores operation of the touchpanel

- Activity Detection symbol indicates that the control system has received analog, digital or serial data (below join 17000) from the device

For additional information about Device Extenders, refer to the latest version of the Crestron SIMPL Windows Symbol Guide (Doc. 6120), or the on-line help included with SIMPL Windows.

Example Program

An example program for the TPS-12/15/17 is available from the "Example Program" section of the Crestron website (http://www.crestron.com/exampleprograms). Search for TPS-12/15/17.zip.

Programming with VisionTools Pro-e

VT Pro-e, a design and programming Windows®-based software, permits the creation of unlimited control screen variations incorporating two and three-dimensional graphics and text as well as video and sounds (recorded as WAV files). A set of pages, which make up a project, can be designed for each touchpanel application. Each page contains objects such as custom control graphics, two and three-dimensional buttons, sliders, and digital readouts which allow the user to interface with the control system via join numbers. Unjoined objects are not interfaced with the system and thus cannot initiate any functions. The completed and compiled project is uploaded to the touchpanel and programmed into the flash PROM via the **File | Upload Project** command. The touchpanel uses the programmed project until another set is uploaded from the PC. The PC may be disconnected from the control system or panel except during reprogramming. VT Pro-e also allows users the option to generate projects destined for web browsers rather than for physical touchpanels.

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.

Multi-Mode Objects

The single most-advanced VT Pro-e high-performance programming technique involving the TPS-12/15/17 is the concept of multi-mode objects. A multi-mode object (i.e., button, legend, etc.) is an object drawn on a VT Pro-e page that can have one or more active and inactive visible settings (*modes*).

For examples, refer to http://www.crestron.com/downloads/example_programs.asp and search for Multi-mode object examples. This file contains the VT Pro-e touchpanel files and SIMPL Windows files that illustrate the high-performance capabilities of multi-mode objects.

WAV File Audio Messages

The TPS-12/15/17 touchpanels are capable of playing audio messages as system prompts and responses. These files are recorded as WAV files on a PC using an audio utility such as Sound Recorder that is packaged with Microsoft Windows 95/98/Me/XP/NT/ 2000™. Files from other sources may also be converted to an acceptable format by using this or a similar utility. Many other audio utilities are available commercially or as shareware. The TPS-12/15/17 touchpanels only accept the following WAV file format: **PCM, 8KHz, mono, 8-bit**. For more information about how to use Sound Recorder, refer to its User's Guide and extensive help information provided with the software. Also refer to the help file in VT Pro-e to learn how to use its audio tool, Sound Manager, to attach WAV files to a touchpanel project.

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

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

Bit Depth and File Size

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

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

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

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

In a 24-bit graphics display, the video memory allocates 24 bits for each pixel on the screen, enabling each pixel to take on any one of a possible 16.7 million colors. Each 24-bit value is composed of 8-bits for red, 8-bits for green, and 8-bits for blue. These triplets of 8-bit values are also referred to as the red, green, and blue color planes. A 24-bit image is actually composed of three component images, which combine to

create the truecolor picture. The reason this is called truecolor is that this is around the maximum number of colors the human eye is able to detect.

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

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

Relationship of Bits to Colors

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

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

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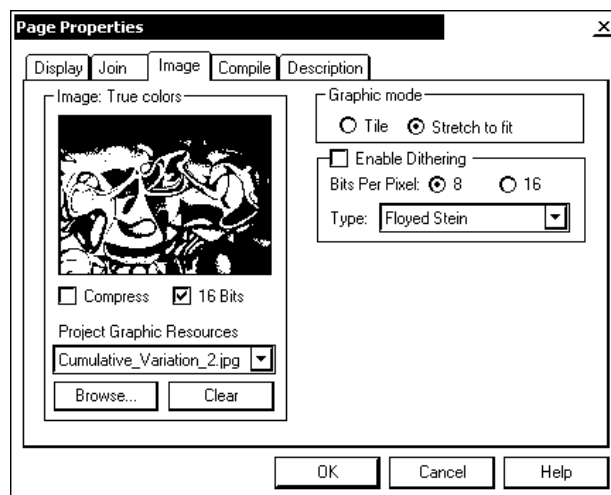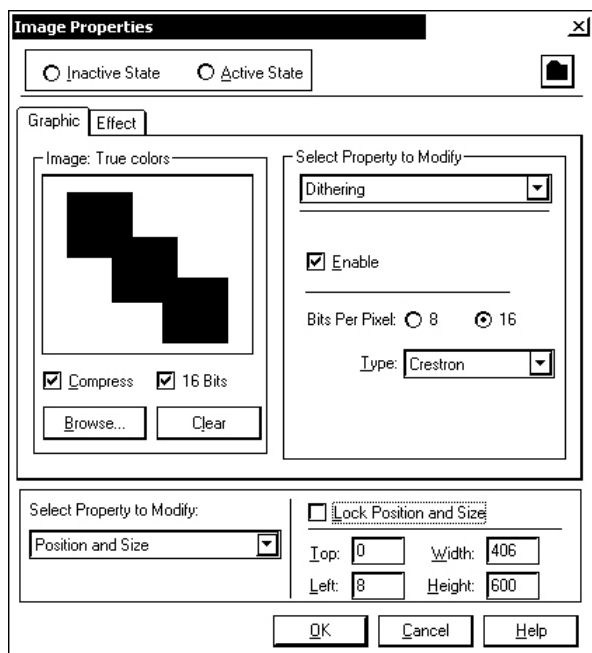
Hard Button Programming

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

Pushbutton Layout and Join Number Assignment
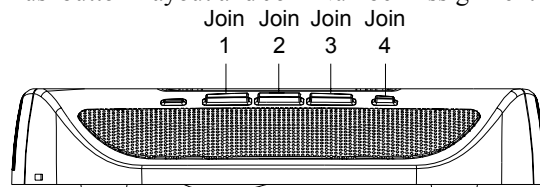
Reserved Join Numbers

A reserved join number is a feature of the software that enables a designer to create a button that completes a predetermined function. The tables that follow provide a list of reserved join numbers available within the software.

NOTE: Many touchpanel configuration "shortcuts" are available via the software. A button can be created on a page that either calls up the Preferences Menu, adjusts brightness, etc., via reserved join numbers.

Video Properties Reserved Joins

NUMBER	FUNCTION	INPUT	OUTPUT	TYPE
17101	Comp Tp	YES	YES	DIGITAL
17102	Svideo Tp	YES	YES	DIGITAL
17103	Auto Det Tp	YES	YES	DIGITAL
17119	No Input Flag	NO	YES	DIGITAL
17122	Defaults	YES	NO	DIGITAL

System Reserved Joins

NUMBER	FUNCTION	INPUT	OUTPUT	TYPE
17153	Auto Det Tp	YES	YES	DIGITAL
17201	Factory Defaults	YES	NO	DIGITAL
17202	Show Config	YES	NO	DIGITAL
17203	Selftest	YES	NO	DIGITAL
17204	Input Ts	YES	YES	DIGITAL
17205	Input Mouse	YES	YES	DIGITAL
17208	Mode Console	YES	YES	DIGITAL
17210	Cresnet Enable	YES	YES	DIGITAL
17211	Cresnet Disable	YES	YES	DIGITAL
17212	Cip On	YES	YES	DIGITAL
17213	Cip Off	YES	YES	DIGITAL
17214	Cresnet ID Down	YES	YES	DIGITAL
17215	Cresnet ID Up	YES	YES	DIGITAL
17216	Lcd Brt Up	YES	NO	DIGITAL
17217	Lcd Brt Dn	YES	NO	DIGITAL
17218	Lcd Brt High	YES	NO	DIGITAL
17219	Lcd Brt Med	YES	NO	DIGITAL
17220	Lcd Brt Lo	YES	NO	DIGITAL
17222	Perform Calibration	YES	NO	DIGITAL
17223	Touch Values	YES	NO	DIGITAL
17229	Backlight On	YES	YES	DIGITAL
17230	Backlight Off	YES	YES	DIGITAL
17231	Standby Timeout Up	YES	NO	DIGITAL
17232	Standby Timeout Down	YES	NO	DIGITAL
17235	Exit and Run Program	NO	NO	DIGITAL
17236	Save	NO	NO	DIGITAL
17239	Test Pattern	YES	NO	DIGITAL
17240	Display Eeprom	YES	NO	DIGITAL
17261	Not Tpi Flag	NO	YES	DIGITAL
17262	Display Ethernet	YES	NO	DIGITAL
17263	Mode Touchout	YES	NO	DIGITAL
17265	Touchout Action 0	YES	YES	DIGITAL
17266	Touchout Action 1	YES	YES	DIGITAL
17267	Touchout Action 2	YES	YES	DIGITAL

Continued on the following page

System Reserved Joins (continued)

NUMBER	FUNCTION	INPUT	OUTPUT	TYPE
17268	Touchout Action 3	YES	YES	DIGITAL
17269	Touchout Action 4	YES	YES	DIGITAL
17270	Touchout Action 5	YES	YES	DIGITAL
17271	Touchout Action 6	YES	YES	DIGITAL
17272	Touchout Action 7	YES	YES	DIGITAL
17273	Touchout Action 8	YES	YES	DIGITAL
17274	Touchout Action 9	YES	YES	DIGITAL
17275	Touchout Action A	YES	YES	DIGITAL
17276	Touchout Action B	YES	YES	DIGITAL
17277	Touchout Action C	YES	YES	DIGITAL
17278	Touchout Action D	YES	YES	DIGITAL
17279	Touchout Action E	YES	YES	DIGITAL
17280	Touchout Action F	YES	YES	DIGITAL
17281	Touchout State Up	YES	NO	DIGITAL
17282	Touchout State Dn	YES	NO	DIGITAL
17283	Input Ts Off	YES	YES	DIGITAL
17285	Selftest Running	NO	YES	DIGITAL
17286	Setup Blank Page Press	NO	YES	DIGITAL
17287	Setup Active	NO	YES	DIGITAL
17200	Cresnet ID	YES	YES	ANALOG
17201	Lcd Brt	YES	YES	ANALOG
17203	Standby Timeout	YES	YES	ANALOG
17204	Touchout State A	YES	YES	ANALOG
17205	Touchout Destination A	YES	YES	ANALOG
17206	Touchout Channel A	YES	YES	ANALOG
17207	Touchout Analog Join A	YES	YES	ANALOG
17208	Touchout Analog Join Plus One A	YES	YES	ANALOG
17209	Touchout Format A	YES	YES	ANALOG
17210	Touchout State B	YES	YES	ANALOG
17211	Touchout Destination B	YES	YES	ANALOG
17212	Touchout Channel B	YES	YES	ANALOG
17213	Touchout Analog Join B	YES	YES	ANALOG
17214	Touchout Analog Join Plus One B	YES	YES	ANALOG
17215	Touchout Format B	YES	YES	ANALOG
32768	Product Name Text Join	NO	YES	SERIAL
32769	Product Version Text Join	NO	YES	SERIAL
32770	Everything Else Text Join	NO	YES	SERIAL

Audio Reserved Joins

NUMBER	FUNCTION	INPUT	OUTPUT	TYPE
17300	All Audio On	YES	YES	DIGITAL
17301	All Audio Off	YES	YES	DIGITAL
17302	Key Click On	YES	YES	DIGITAL
17303	Key Click Off	YES	YES	DIGITAL
17304	Key Click Volume Up	YES	NO	DIGITAL
17305	Key Click Volume Down	YES	NO	DIGITAL
17306	Line On	YES	YES	DIGITAL
17307	Line Off	YES	YES	DIGITAL
17308	Line Volume Up	YES	NO	DIGITAL
17309	Line Volume Down	YES	NO	DIGITAL
17312	WAV On	YES	YES	DIGITAL
17313	WAV Off	YES	YES	DIGITAL
17314	WAV Volume Up	YES	NO	DIGITAL
17315	WAV Volume Down	YES	NO	DIGITAL
17320	Play Test WAV File	YES	NO	DIGITAL
17321	Defaults	YES	NO	DIGITAL
17322	Beep Short	YES	NO	DIGITAL
17323	Beep Medium	YES	NO	DIGITAL
17324	Beep Long	YES	NO	DIGITAL
17325	Bass Up	YES	NO	DIGITAL
17326	Bass Dn	YES	NO	DIGITAL
17327	Treble Up	YES	NO	DIGITAL
17328	Treble Dn	YES	NO	DIGITAL
17329	All Audio Volume Up	YES	NO	DIGITAL
17330	All Audio Volume Down	YES	NO	DIGITAL
17349	Master Mute Button	YES	NO	DIGITAL
17350	Keyclick Mute Button	YES	NO	DIGITAL
17351	Line Mute Button	YES	NO	DIGITAL
17352	Wave Mute Button	YES	NO	DIGITAL
17300	Key Click Volume	YES	YES	ANALOG
17301	Line Volume	YES	YES	ANALOG
17302	WAV Volume	YES	YES	ANALOG
17305	Bass	YES	YES	ANALOG
17306	Treble	YES	YES	ANALOG
17307	All Audio Volume	YES	YES	ANALOG

Ethernet Reserved Joins

NUMBER	FUNCTION	INPUT	OUTPUT	TYPE
17401	Board On	YES	YES	DIGITAL
17402	Board Off	YES	YES	DIGITAL

RS-232 Control Reserved Joins

NUMBER	FUNCTION	INPUT	OUTPUT	TYPE
17600	Baud 115200	YES	YES	DIGITAL
17601	Baud 57600	YES	YES	DIGITAL
17602	Baud 38400	YES	YES	DIGITAL
17603	Baud 19200	YES	YES	DIGITAL
17604	Baud 9600	YES	YES	DIGITAL
17605	Baud 4800	YES	YES	DIGITAL
17606	Baud 2400	YES	YES	DIGITAL
17607	Baud 1200	YES	YES	DIGITAL
17608	Baud 600	YES	YES	DIGITAL
17609	Baud 300	YES	YES	DIGITAL
17610	Baud 150	YES	YES	DIGITAL
17611	Baud 110	YES	YES	DIGITAL
17612	Data 8	YES	YES	DIGITAL
17613	Data 7	YES	YES	DIGITAL
17614	Par None	YES	YES	DIGITAL
17615	Par Odd	YES	YES	DIGITAL
17616	Par Even	YES	YES	DIGITAL
17617	Stop 1	YES	YES	DIGITAL
17618	Stop 2	YES	YES	DIGITAL
17619	Rts Cts On	YES	YES	DIGITAL
17620	Rts Cts Off	YES	YES	DIGITAL
17621	Xon Xoff On	YES	YES	DIGITAL
17622	Xon Xoff Off	YES	YES	DIGITAL
17623	Load Params	YES	NO	DIGITAL

Screen Information Reserved Joins

NUMBER	FUNCTION	INPUT	OUTPUT	TYPE
17700	Size 800x600	NO	YES	DIGITAL
17701	Size 1024x768	NO	YES	DIGITAL
17705	Size 1280x768	NO	YES	DIGITAL

System 2 Reserved Joins

NUMBER	FUNCTION	INPUT	OUTPUT	TYPE
19219	Src Ctrl All Gain Up	YES	NO	DIGITAL
19220	Src Ctrl All Gain Dn	YES	NO	DIGITAL
19221	Src Ctrl Contrast Up	YES	NO	DIGITAL
19222	Src Ctrl Contrast Dn	YES	NO	DIGITAL
19237	Src Ctrl Saturation Up	YES	NO	DIGITAL
19238	Src Ctrl Saturation Down	YES	NO	DIGITAL
19239	Src Ctrl Hue Up	YES	NO	DIGITAL
19240	Src Ctrl Hue Down	YES	NO	DIGITAL
19119	Src Ctrl All Gain	NO	NO	ANALOG
19121	Src Ctrl Contrast	NO	NO	ANALOG
19123	Src Ctrl Saturation	NO	NO	ANALOG
19125	Src Ctrl Hue	NO	NO	ANALOG

SVID-1 Control Reserved Joins

NUMBER	FUNCTION	INPUT	OUTPUT	TYPE
19619	SVID-1 Brightness Up	YES	YES	DIGITAL
19620	SVID-1 Brightness Down	YES	YES	DIGITAL
19621	SVID-1 Contrast Up	YES	YES	DIGITAL
19622	SVID-1 Contrast Down	YES	YES	DIGITAL
19637	SVID-1 Saturation Up	YES	YES	DIGITAL
19638	SVID-1 Saturation Down	YES	YES	DIGITAL
19639	SVID-1 Hue Up	YES	YES	DIGITAL
19640	SVID-1 Hue Down	YES	YES	DIGITAL
19519	SVID-1 Brightness	YES	YES	ANALOG
19521	SVID-1 Contrast	YES	YES	ANALOG
19523	SVID-1 Saturation	YES	YES	ANALOG
19525	SVID-1 Hue	YES	YES	ANALOG

SVID-2 Control Reserved Joins

NUMBER	FUNCTION	INPUT	OUTPUT	TYPE
19719	SVID-2 Brightness Up	YES	YES	DIGITAL
19720	SVID-2 Brightness Down	YES	YES	DIGITAL
19721	SVID-2 Contrast Up	YES	YES	DIGITAL
19722	SVID-2 Contrast Down	YES	YES	DIGITAL
19737	SVID-2 Saturation Up	YES	YES	DIGITAL
19738	SVID-2 Saturation Down	YES	YES	DIGITAL
19739	SVID-2 Hue Up	YES	YES	DIGITAL
19740	SVID-2 Hue Down	YES	YES	DIGITAL
19619	SVID-2 Brightness	YES	YES	ANALOG
19621	SVID-2 Contrast	YES	YES	ANALOG
19623	SVID-2 Saturation	YES	YES	ANALOG
19625	SVID-2 Hue	YES	YES	ANALOG

Composite-1A Control Reserved Joins

NUMBER	FUNCTION	INPUT	OUTPUT	TYPE
19819	Composite-1A Brightness Up	YES	YES	DIGITAL
19820	Composite-1A Brightness Down	YES	YES	DIGITAL
19821	Composite-1A Contrast Up	YES	YES	DIGITAL
19822	Composite-1A Contrast Down	YES	YES	DIGITAL
19837	Composite-1A Saturation Up	YES	YES	DIGITAL
19838	Composite-1A Saturation Down	YES	YES	DIGITAL
19839	Composite-1A Hue Up	YES	YES	DIGITAL
19840	Composite-1A Hue Down	YES	YES	DIGITAL
19719	Composite-1A Brightness	YES	YES	ANALOG
19721	Composite-1A Contrast	YES	YES	ANALOG
19723	Composite-1A Saturation	YES	YES	ANALOG
19725	Composite-1A Hue	YES	YES	ANALOG

Composite-2A Control Reserved Joins

NUMBER	FUNCTION	INPUT	OUTPUT	TYPE
20119	Composite-2A Brightness Up	YES	YES	DIGITAL
20120	Composite-2A Brightness Down	YES	YES	DIGITAL
20121	Composite-2A Contrast Up	YES	YES	DIGITAL
20122	Composite-2A Contrast Down	YES	YES	DIGITAL
20137	Composite-2A Saturation Up	YES	YES	DIGITAL
20138	Composite-2A Saturation Down	YES	YES	DIGITAL
20139	Composite-2A Hue Up	YES	YES	DIGITAL
20140	Composite-2A Hue Down	YES	YES	DIGITAL
20019	Composite-2A Brightness	YES	YES	ANALOG
20021	Composite-2A Contrast	YES	YES	ANALOG
20023	Composite-2A Saturation	YES	YES	ANALOG
20025	Composite-2A Hue	YES	YES	ANALOG

YPbPr-1 Control Reserved Joins

NUMBER	FUNCTION	INPUT	OUTPUT	TYPE
20419	YPbPr-1 Brightness Up	YES	YES	DIGITAL
20420	YPbPr-1 Brightness Down	YES	YES	DIGITAL
20421	YPbPr-1 Contrast Up	YES	YES	DIGITAL
20422	YPbPr-1 Contrast Down	YES	YES	DIGITAL
20437	YPbPr-1 Saturation Up	YES	YES	DIGITAL
20438	YPbPr-1 Saturation Down	YES	YES	DIGITAL
20439	YPbPr-1 Hue Up	YES	YES	DIGITAL
20440	YPbPr-1 Hue Down	YES	YES	DIGITAL
20319	YPbPr-1 Brightness	YES	YES	ANALOG
20321	YPbPr-1 Contrast	YES	YES	ANALOG
20323	YPbPr-1 Saturation	YES	YES	ANALOG
20325	YPbPr-1 Hue	YES	YES	ANALOG
20519	YPbPr-2 Brightness Up	YES	YES	DIGITAL
20520	YPbPr-2 Brightness Down	YES	YES	DIGITAL
20521	YPbPr-2 Contrast Up	YES	YES	DIGITAL
20522	YPbPr-2 Contrast Down	YES	YES	DIGITAL
20537	YPbPr-2 Saturation Up	YES	YES	DIGITAL
20538	YPbPr-2 Saturation Down	YES	YES	DIGITAL
20539	YPbPr-2 Hue Up	YES	YES	DIGITAL
20540	YPbPr-2 Hue Down	YES	YES	DIGITAL

QM Audio Reserved Joins

NUMBER	FUNCTION	INPUT	OUTPUT	TYPE
22202	Audio Src-1 Program On	YES	YES	DIGITAL
22203	Audio Src-1 Program Off	YES	YES	DIGITAL
22204	Audio Src-1 Program Volume Up	YES	NO	DIGITAL
22205	Audio Src-1 Program volume Down	YES	NO	DIGITAL
22208	Audio Src-1 Mic-1 On	YES	YES	DIGITAL
22209	Audio Src-1 Mic-1 Off	YES	YES	DIGITAL
22210	Audio Src-1 Mic-1 Volume Up	YES	NO	DIGITAL
22211	Audio Src-1 Mic-1 Volume Down	YES	NO	DIGITAL
22212	Audio Src-1 Mic-2 On	YES	YES	DIGITAL
22213	Audio Src-1 Mic-2 Off	YES	YES	DIGITAL
22214	Audio Src-1 Mic-2 Volume Up	YES	NO	DIGITAL
22215	Audio Src-1 Mic-2 Volume Down	YES	NO	DIGITAL
22246	Audio Src-1 Linked	YES	NO	DIGITAL
22248	Audio Src-1 Program Mute Button	YES	NO	DIGITAL
22249	Audio Src-1 Mic-1 Mute Button	YES	NO	DIGITAL
22250	Audio Src-1 Mic-2 Mute Button	YES	NO	DIGITAL

Continued on the following page

QM Audio Reserved Joins (continued)

NUMBER	FUNCTION	INPUT	OUTPUT	TYPE
22251	Audio Src-2 Program Mute Button	YES	NO	DIGITAL
22252	Audio Src-2 Mic-1 Mute Button	YES	NO	DIGITAL
22253	Audio Src-2 Mic-2 Mute Button	YES	NO	DIGITAL
22200	Audio Src-1 Program Volume	YES	YES	ANALOG
22203	Audio Src-1 Mic-1 Volume	YES	YES	ANALOG
22208	Audio Src-1 Mic-2 Volume	YES	YES	ANALOG

Video Compensation Reserved Joins

NUMBER	FUNCTION	INPUT	OUTPUT	TYPE
22300	Video Input-1 Peak Up	YES	YES	DIGITAL
22301	Video Input-1 Peak Down	YES	YES	DIGITAL
22302	Video Input-1 Boost Up	YES	YES	DIGITAL
22303	Video Input-1 Boost Down	YES	YES	DIGITAL
22310	Video Input-1 Auto Compensation On	YES	YES	DIGITAL
22311	Video Input-1 Auto Compensation Off	YES	YES	DIGITAL
22320	Video Compensation Preset Up	YES	YES	DIGITAL
22321	Video Compensation Preset Down	YES	YES	DIGITAL
22322	Video Compensation Preset Load	YES	YES	DIGITAL
22323	Video Compensation Preset Store	YES	YES	DIGITAL
22300	Video Input-1 Peak	YES	YES	ANALOG
22301	Video Input-1 Boost	YES	YES	ANALOG
22305	QM Link 1 Preset/#	YES	YES	ANALOG

MultiByte International Characters

Most languages use a single byte of 8 bits to represent a character, e.g. English, French, German, Hebrew, Russian, Thai, etc.

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

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

Static text on a button, entered in the standard way in VT Pro-e, always works under Windows 98. Under Windows XP, you must use VT Pro-e 3.0 or later.

Indirect text on a button is entered in VT Pro-e and the actual string to be displayed is entered in SIMPL Windows. You must use VT Pro-e 3.0 or later to guarantee that the full set of characters in the font is stored on the touchpanel. You must use SIMPL Windows 2.03.11 or later to enter Chinese characters directly. As of this publication date, only completely single byte or completely multibyte strings may be entered or they will not be compiled correctly in SIMPL Windows. In other words, you cannot enter Chinese character interspersed with numbers. You can enter Chinese characters

or numbers in separate strings. Crestron is scheduling time to fix this in the near future and the release notes for SIMPL Windows will mention it.

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

Uploading and Upgrading

NOTE: Crestron recommends using the latest programming 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, projects and firmware to the system and touchpanels after their development. 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 Toolbox.

NOTE: The Crestron Toolbox (replacement for Crestron Viewport, you may continue to use Viewport if desired) is a broad-based software package that accomplishes multiple system tasks, primarily using an RS-232 or TCP/IP connection between a PC and one or more Crestron control systems.

The following sections define how to upload a SIMPL Windows program, VT Pro-e project, or upgrade touchpanel firmware. However, before attempting to upload or upgrade, it is necessary to establish communications between the PC and the touchpanel.

Establishing Communications

When communicating with a touchpanel from a PC, one of three communication methods can be used.

- Indirect RS-232 serial communication via control system
- Direct RS-232 serial communication
- TCP/IP communication

Indirect Serial Communication via Control System

The procedure in this section provides details for RS-232 communication between the PC and the touchpanel via the control system. This method can be used to communicate with the control system directly and with a touchpanel via the control system's Cresnet connection.

Refer to the following figure for a typical connection diagram connecting to a touchpanel via a control system.

Indirect Serial Communications Setup Connections
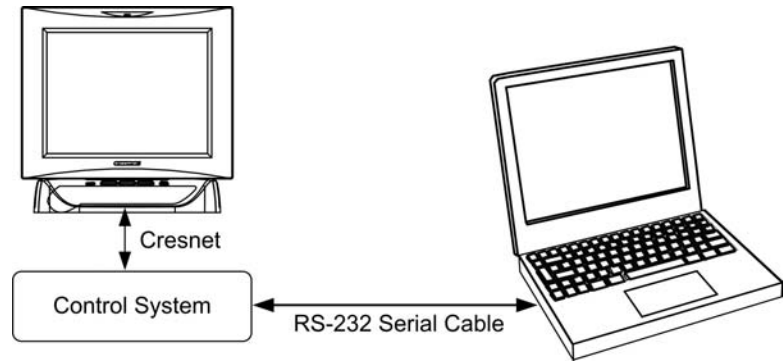
1. Ensure that all devices are connected to the control processor and the control processor is connected via serial cable to the PC.

2. Open Crestron Toolbox and click **Tools | Manage Address Book** to display a list of available devices. Select **Serial on COM1** as the connection type. **Serial on COM1** is an entry in the DefaultAddressBook that is included with Crestron Toolbox.

    The PC communication settings specified here should match the protocol that the control processor expects. The usual settings are as follows:

    - Port = COM 1 through COM 8. Select the correct COM port on the PC.

    - Baud rate = Auto-Detect.

    - Parity = None.

    - Number of data bits = 8.

    - Number of stop bits = 1.

    - Hardware handshaking (RTS/CTS) enabled.

    - Software handshaking (XON/XOFF) not enabled.

"Address Book" Window – Serial Setup
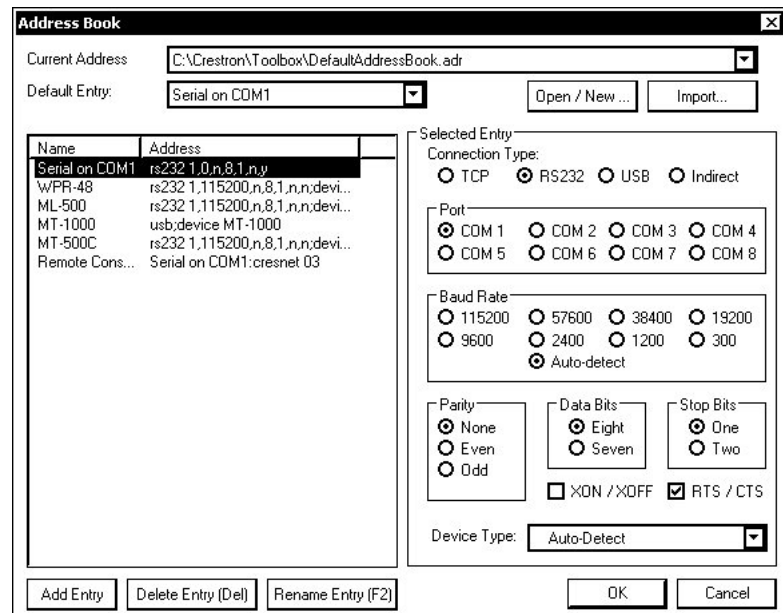
3. After setting the correct parameters, click **OK** to return to the Crestron Toolbox main window.

4. Click **Tools | Network Device Tree**, or click the network device tree icon ![icon] to display the devices in the system. Communications are confirmed when the network devices are displayed.

Network Device Tree
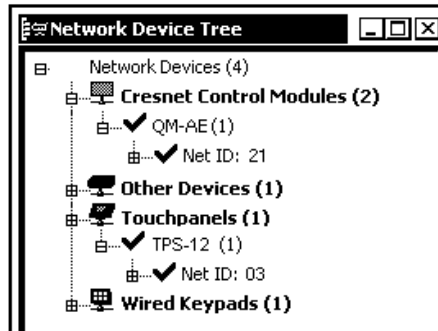
To view a specific device, expand the network device tree by clicking +. Expand the network device tree till the device to be managed is selected. Right-click the desired Net ID to open the sub-menu. This menu provides a wide range of functions, including; change the Net ID, open text console, upload project, update firmware, etc.

Network Device Tree Sub-Menu -Functions
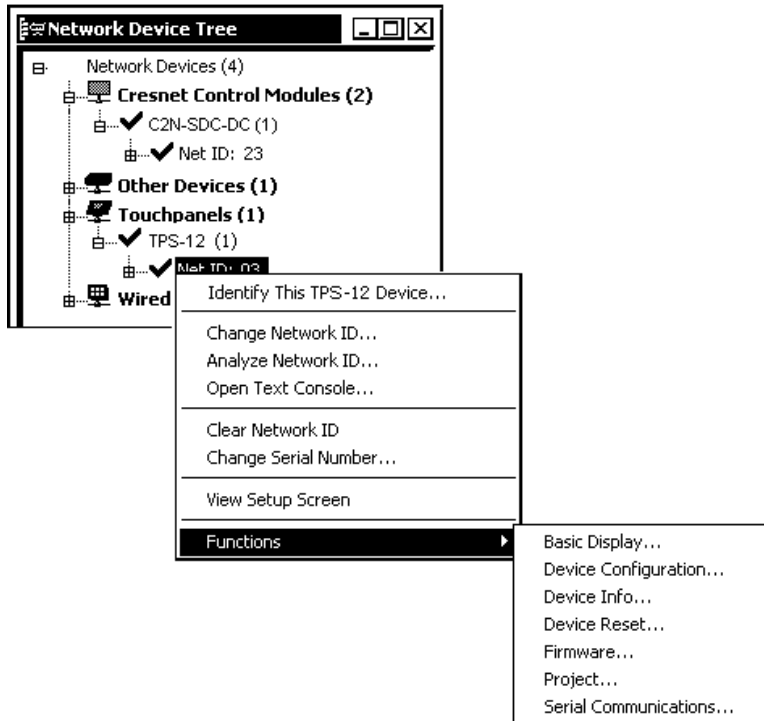
NOTE: Toolbox displays a customized list of functions depending on the type of device with which it is communicating.

Direct Serial Communication

Crestron devices that have an RS-232 port can be connected directly to a PC.

To prepare the touchpanel for direct communication from a PC, refer to the following figure. Connect the RS-232 port of the computer directly to the RS-232 port of the touchpanel using Crestron Cable Number STCP-502PC. Refer to page 10 for pin assignments.

NOTE: Direct serial communication is a faster method for transferring programming and projects than indirect serial communication, which uses the control system's Cresnet connection.

Direct Serial Communications Setup Connections

RS-232 Serial Cable
Crestron STCP-502PC
or Equivalent
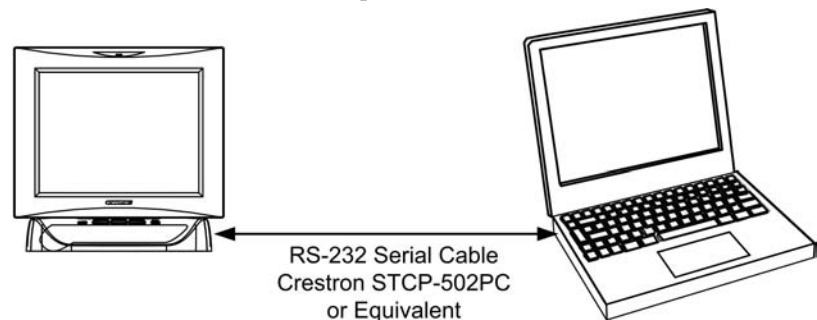
1. Apply power to the touchpanel.
2. Open Crestron Toolbox.
3. Click the **Address Book** icon 📖 , or select **Tools | Manage Address Book** to open the Address Book. The Address Book allows you to maintain a list of accessible control systems and network devices. You can establish a session with any or all of the devices in the address book (provided the PC has a valid connection to each Cresnet or Ethernet network).
4. Select the device from the Address Book or click **Add Entry** and type a name for the new device, such as **Touchpanel Direct**.
5. Select **RS232** as the *Connection Type* and select the serial settings of the device. This sets the PC to the same serial settings. Enter the settings and click **OK**.

   For touchpanels, the default settings are:
   - Port = COM 1
   - Baud Rate = 152000 (or select Auto-Detect)
   - Parity = None
   - Data Bits = 8
   - Stop Bits = 1
   - Hardware Handshaking (RTS/CTS) = On
   - Software Handshaking (XON/XOFF) = Off

Crestron Toolbox Address Book Setup
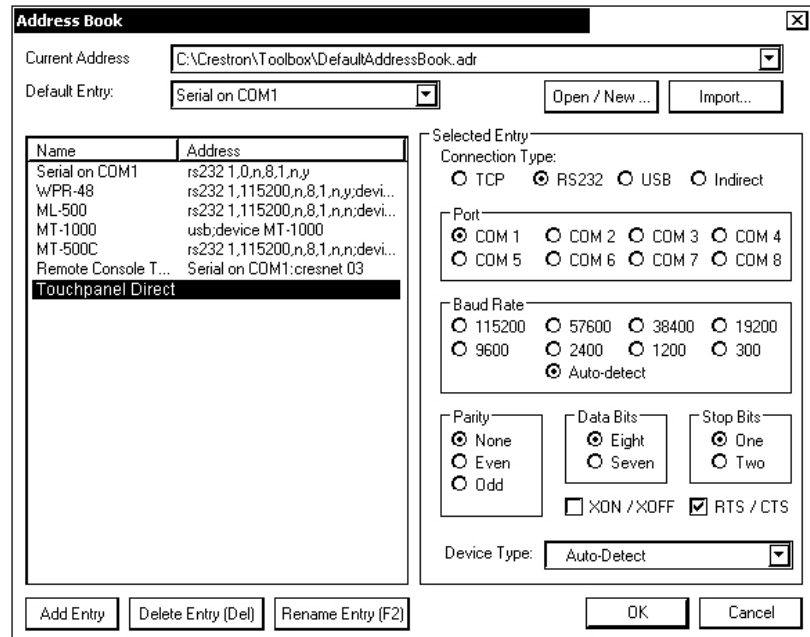
6. Select **Tools | System Info** or click the System Info icon . Select **Touchpanel Direct** from the drop down list if it is not already selected. If communication is successful, the "System Info" window displays the operating system, Cresnet ID, connection parameters, memory usage, and hardware information.

Toolbox – System Info
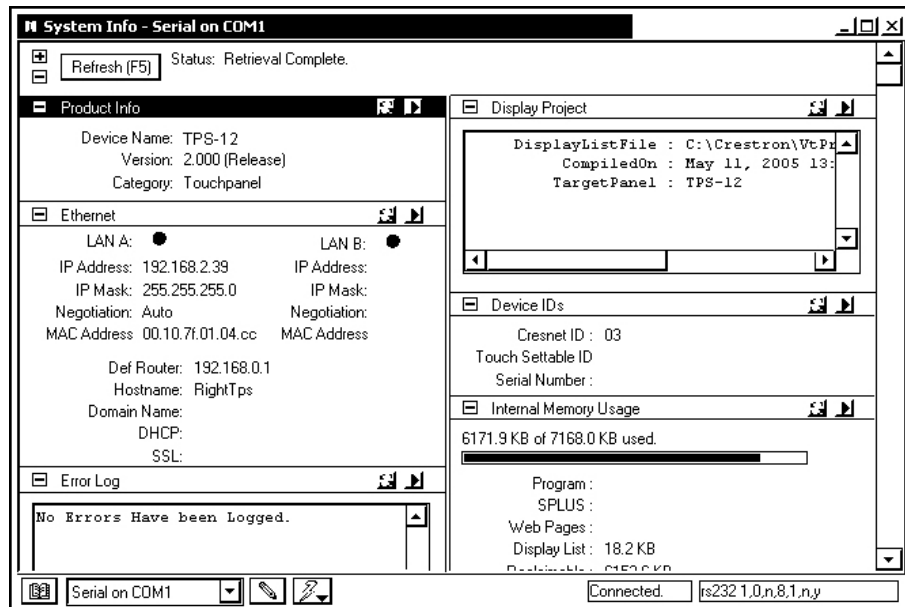
The *Functions* menu may now be used to upload a project, update firmware, and reset the network ID.

Toolbox Functions Menu – Specific to TPS-12/15/17

```
Functions
    Cresnet ID...
    Device Info...
    Device Reset...
    Display Message...
    Error Log...
    Ethernet Addressing...
    File System...
    Firmware...
    IP Table Setup...
    Project...
    Serial Communications...
    Setup Mode...
```

NOTE: The list of functions depends on the type of device.

TCP/IP Communication

This section explains how to configure a TPS-12/15/17 to communicate over Ethernet using TCP/IP. These procedures assume that the touchpanel has been powered up and connected properly.

PC-to-touchpanel communications can be implemented over TCP/IP as shown in the following diagram. TCP/IP is the fastest method of communicating between the PC and the touchpanel.

Typical Connection Diagram when Uploading a Touchpanel Project or Firmware to the Touchpanel via TCP/IP
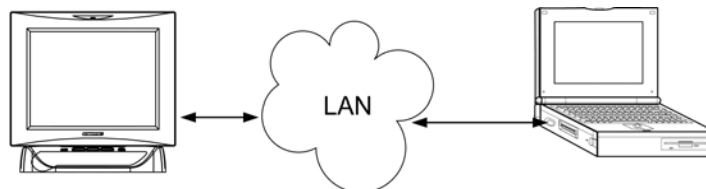
1. To establish TCP/IP communications with the touchpanel, a serial connection must be established between the PC and touchpanel. Refer to "Indirect Serial Communication" on page 43 or "Direct Serial Connection" on page 46 for instructions.

2. While connected to the touchpanel, select **Functions** | **Ethernet Addressing**. The current IP address, IP mask and default router are displayed.

"Ethernet Address" Window
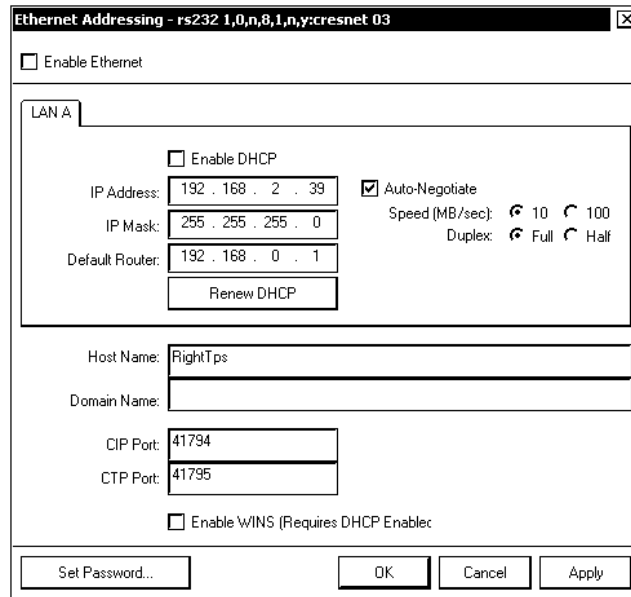
3. Enter a new IP address, IP Mask, Default Router, or select **Enable DHCP** and click **OK**.

NOTE: The touchpanel is capable of communicating via DHCP (Dynamic Host Configuration Protocol). A network server uses this protocol to dynamically assign IP addresses to networked devices. The DHCP client is not guaranteed to have a particular TCP/IP address at any given time. If the DHCP is disabled, the network administrator must assign the IP address. The Interface menu provides an enable/disable feature for Ethernet and CIP (Crestron Internet Protocol).

---

4. Ensure that all devices are connected to the control processor. For TCP/IP, use CAT5 straight through cables with 8-pin RJ-45 connectors to connect the LAN port on the touchpanel and the LAN port on the PC to the Ethernet hub. Alternatively, you can use a CAT5 crossover cable to connect the two LAN ports directly, without using a hub. The following figure illustrates pinouts for straight through and crossover RJ-45 cables. Pins 4, 5, 7, and 8 are not used.

RJ-45 Straight Through Cable – For Connection Through Hub

FROM PIN	COLOR	SIGNAL	TO PIN	SIGNAL
1	White/Orange	Tx+	1	Tx+
2	Orange	Tx-	2	Tx-
3	White/Green	Rc+	3	Rc+
6	Green	Rc-	6	Rc-
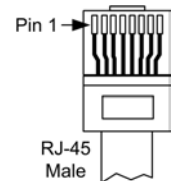
RJ-45 Crossover Cable – For Direct PC Connection

FROM PIN	COLOR	SIGNAL	TO PIN	SIGNAL
1	White/Orange	Rc+	3	Tx+
2	Orange	Rc-	6	Tx-
3	White/Green	Tx+	1	Rc+
6	Green	Tx-	2	Rc-

5. Once the cable connections are made, open Crestron Toolbox and click **Tools | Manage Address book** to display the "Address Book" window.

6. Select the touchpanel from the address book or click **Add Entry** and type a new name for the new device, such as **TPS**.

7. Click **TCP** as the connection type. Enter the IP address or hostname of the touchpanel and click **OK**.

"Address Book" Window – TCP/IP Setup
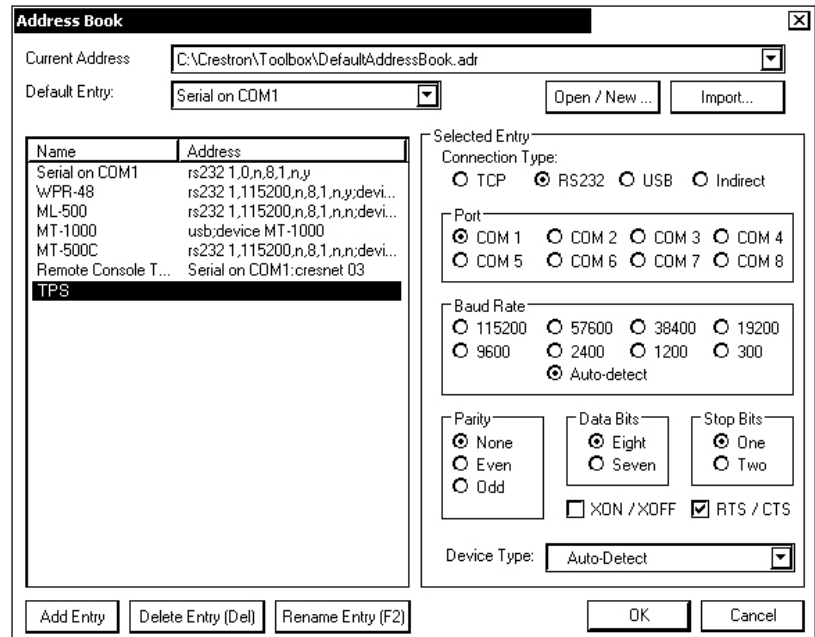
8. Click **Tools | System Info** to display the "System Info" window. From the pull-down menu, select the entry created in step 7.

If the touchpanel is to communicate with a control system over TCP/IP, an IP table must be created on the touchpanel to identify the control system(s) it will communicate with over TCP/IP.

Use the following instructions to create the IP table.

1. Select **Functions | IP Table Setup** from the Toolbox menu bar.
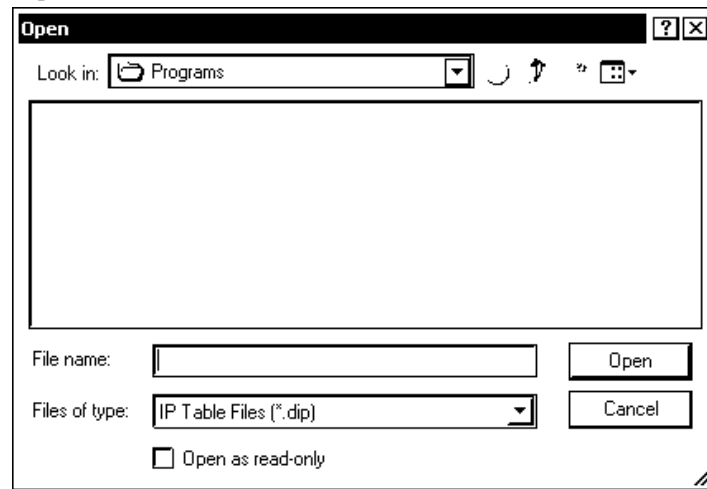
"IP Table" Window
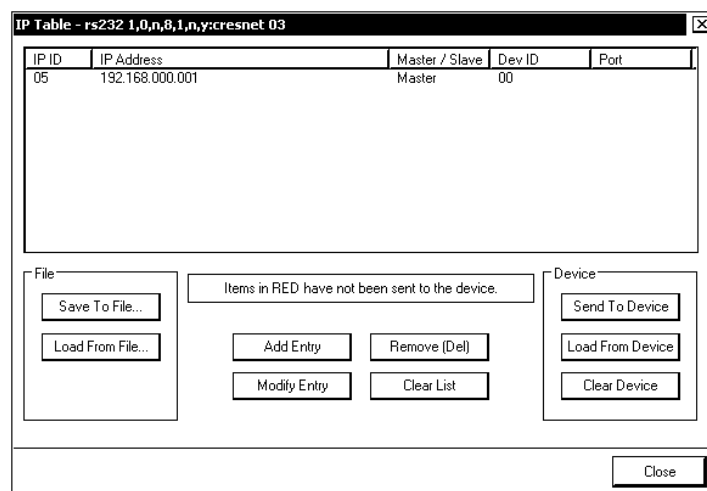
2. If the touchpanel already has an IP table, it is displayed at the top of the window.

3. Click **Add Entry t**o add a new IP table entry or select an existing IP entry from the list and click **Modify Entry**. Up to 252 entries can be listed on a touchpanels IP table. Click **Remove [Del]** to remove a selected IP entry or click **Clear List** to remove all of the entries from the IP table.

**NOTE:** IP table entries that have not yet been sent to the device are listed in red.

4. Click **Load From File…** to browse for a saved IP table.

"Open" Window

5. To enter a new IP ID, select the hexadecimal IP ID of the control system from the *IP ID* list. The IP ID of the control system must match the IP ID that is specified for the control system in the SIMPL Windows program.
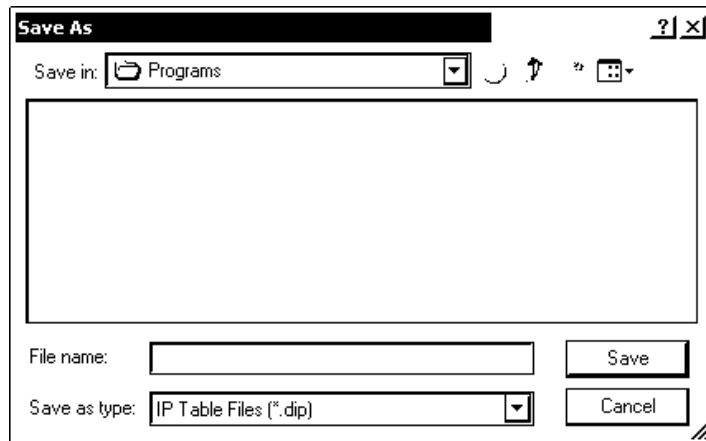
"IP Table Entry" Window
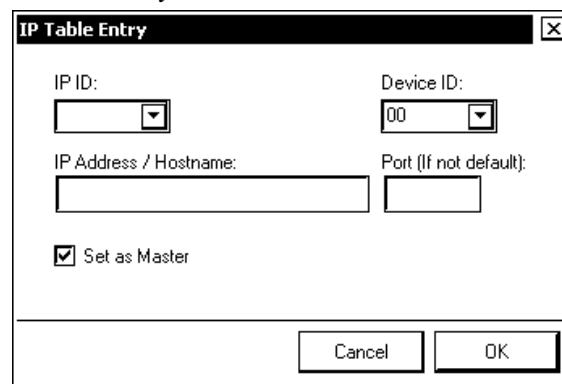
NOTE: All IP table entries are set as Master and cannot be changed.

6. In the *IP Address/Hostname* field, enter the static IP address of the control system, or if the control system is DHCP-enabled, its fully qualified domain name. After entering all of the information, click **OK** to add the device to the IP table.

7. Repeat this procedure for all the control systems that will control the touchpanel.

8. Click **Save To File…** on the "IP Table" window to save this IP table to the PC.

"Save As" Window

```
Save As                                                          ? X
 Save in:  🗁 Programs                   ▼  ⟳  ⇡   "  ▦▾

 ┌─────────────────────────────────────────────────────┐
 │                                                       │
 │                                                       │
 │                                                       │
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 │                                                       │
 └─────────────────────────────────────────────────────┘

 File name:      [                              ]      [  Save  ]

 Save as type:  [ IP Table Files (*.dip)          ▼]   [ Cancel ]
```

9. Once all of the control systems have been listed, click **Send to Device** on the "IP Table" window to upload the IP table to the touchpanel. The touchpanel will reboot and all of the table entries will be listed in black.

NOTE: When an IP table is sent to the touchpanel, the previously loaded IP table is overwritten.

Troubleshooting Communications

Use the following checklist if communication cannot be established with the control processor.

1. Verify that you are using the correct cables. As described previously, an RS-232 connection requires a straight-through serial cable. TCP/IP connection requires a CAT5 cable with 8-pin RJ-45 connectors.

2. With a serial connection, verify that the correct COM port on the PC has been selected. Some computers have more than one COM port; some may be internal (e.g., for a modem). Consult the manufacturer's documentation for further information about the COM ports on your PC.

3. Remove and reapply power to the control system.

4. If communication still cannot be established, contact Crestron customer service.

Uploading a SIMPL Windows Program

The SIMPL Windows file can be uploaded to the control system using SIMPL Windows or via the Crestron Toolbox.

Upload via SIMPL Windows

1. Start SIMPL Windows.

2. Select **File | Open** to view the "Open" window, navigate to the SIMPL Window file (.smw), and click **Open**.

3. Select **Project | Transfer Program.**

Upload via Crestron Toolbox

1. Verify that the procedure for "Establishing Communications" that begins on page 43 has been performed to establish a connection between the PC and the control system.

2. Open Crestron Toolbox.

3. Select **Tools | System Info.**

Crestron Toolbox – Tools | System Info
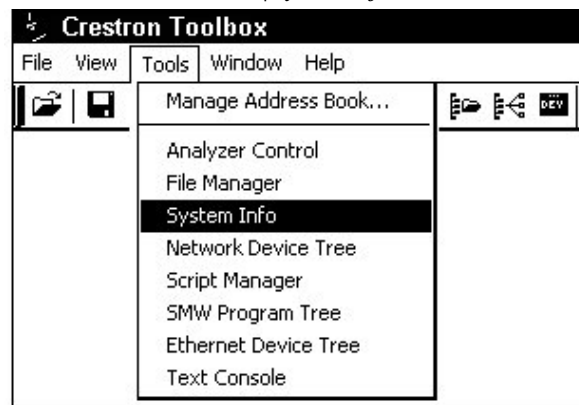
4. When the "System Info" window appears, and you are connected to the control system, the Functions option becomes available from the menu bar.

5. Select **Functions | SIMPL Program**.

   The "SIMPL Program" window contains information about the currently loaded SIMPL program (if any), and permits you to stop, start, erase, retrieve, and upload a SIMPL program. This menu also permits you to upload to compact flash or internal flash.

"SIMPL Program" Window
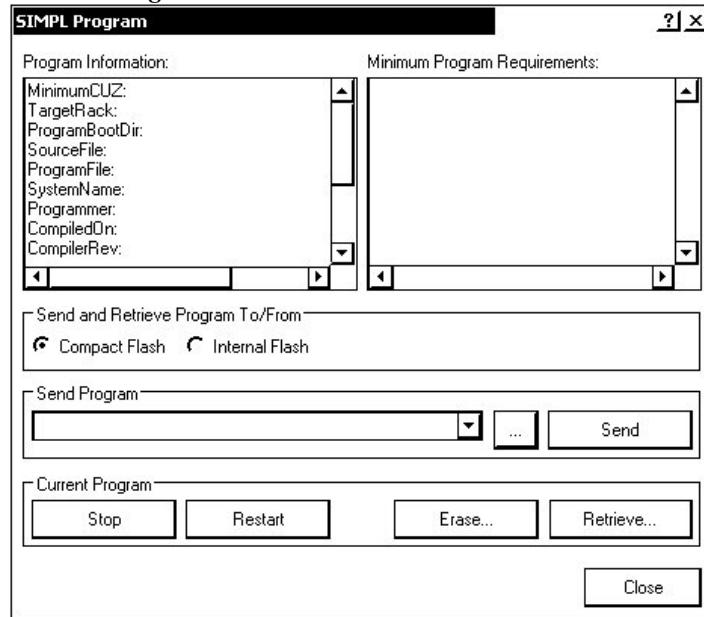
6. Click the **Browse** button to locate a compiled (.spz) program.

"Open" Window
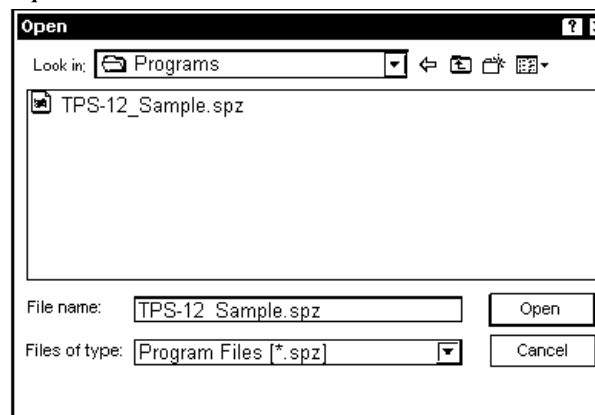
7. Select a file and click **Open.** When the "SIMPL Program" window re-opens click **Send**.

Uploading a VT Pro-e Project

The VT Pro-e file can be uploaded to the touchpanel using VT Pro-e or via the Crestron Toolbox. The TPS-12/15/17 touchpanel source file has the extension .vtp. A compiled VT Pro-e file has the extension .vtz.

Upload via VT Pro-e

1. Start VT Pro-e.

2. Select **File | Open | Project** to view the "Open" window, navigate to the VT Pro-e file (.vtp), and click **Open**.

3. Select **File | Upload Project**. This automatically selects the compiled .vtz file.

Upload via Crestron Toolbox

1. Verify that the procedure for "Establishing Communications" that begins on page 43 has been performed to establish a connection between the PC and the touchpanel.

2. Open Crestron Toolbox.

3. Select **Tools | System Info.**

Crestron Toolbox – Tools | System Info
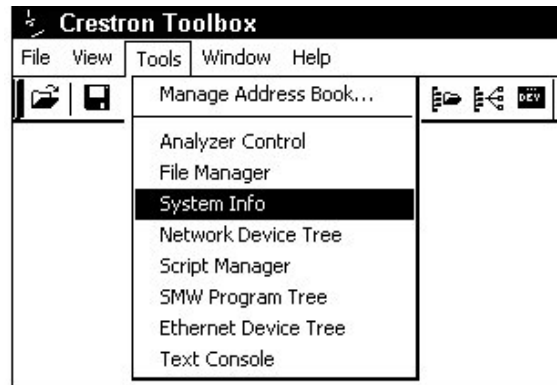
4. When the "System Info" window appears, and you are connected to the touchpanel, the Functions option becomes available from the menu bar. Select the touchpanel where the program will be uploaded.

5. Select **Functions | Project** (alternatively, press **Alt+P**).

6. The "Project" window is used to select the project to be uploaded to the touchpanel.

"Project" Window
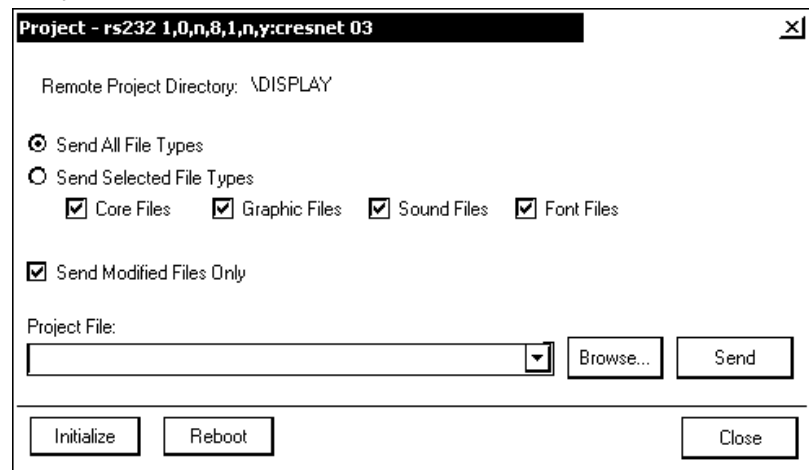
Each time a project is selected using the **Browse** command, that project is added to the *Project File* drop-down list. This makes it convenient to recall projects without the need to browse to a directory.

- **Send All File Types** sends the entire project.

- **Send Selected File Types** sends only the file types that are selected.

- **Core Files** are files that include touchpanel logic, join number remapping, and other files related to touchpanel functionality.

- **Graphic Files** are graphics that are displayed on the touchpanel screen. **Sound Files** are WAV files that are assigned within a touchpanel project.

- **Font Files** are fonts that are part of a touchpanel project.

- **Send Modified Files Only** will only send files that are different from those that are currently stored in the touchpanel. Note that if any pages in the panel are not present in the project, those pages will be deleted from the panel.

NOTE: When loading a compact flash directly from a PC, the VTZ files contain a single timestamp that is assumed to be the local time of the machine on which it is opened. When loading through a panel, Toolbox may see a mismatch of timestamps between some of the project files within the VTZ file and the project files already loaded to the panel, and may re-send these files even if they have not been updated. This will happen once each time Toolbox updates files that were originally loaded by a PC directly to the CF card.

NOTE: With a browser project, there is no .vtz or .hex file; rather, VT Pro-e creates a .web folder with the name of the project. This .web folder contains HTML pages and a JAVA subfolder.

7. Click the **Browse** button to browse for a new compiled (.vtz) program.

"Open" Window
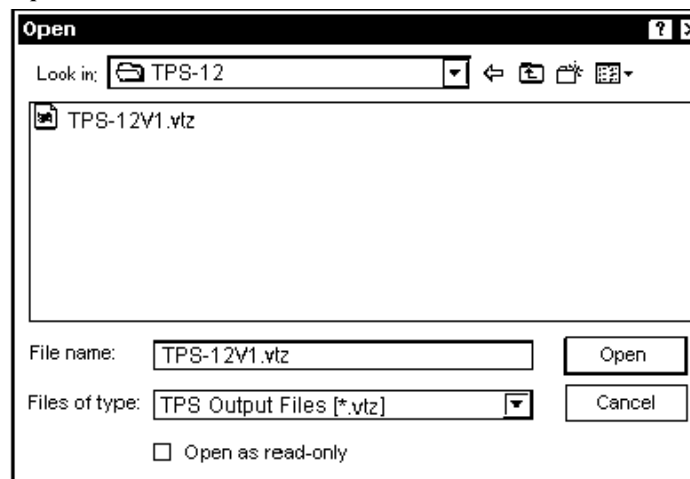
8. Select a file and click **Open.** When the "Project" window re-opens click **Send** to send the project to the touchpanel.

   To verify that the project has been transferred successfully, select **Tools | System Info**. The new project information will appear in the upper left corner of the "System Info" window.

Firmware Upgrade

To take advantage of all the touchpanel 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 firmware, complete the following steps.

**NOTE:** Touchpanel calibration may be required after a firmware upgrade.

1. Make sure that "Establishing Communications" that begins on page 43 has been performed.

2. Open Crestron Toolbox.

3. Open the "Network Device Tree" window (the firmware upgrade function is also available in the SMW Program Tree window).

4. Right-click on the device and select **Functions** | **Firmware**.

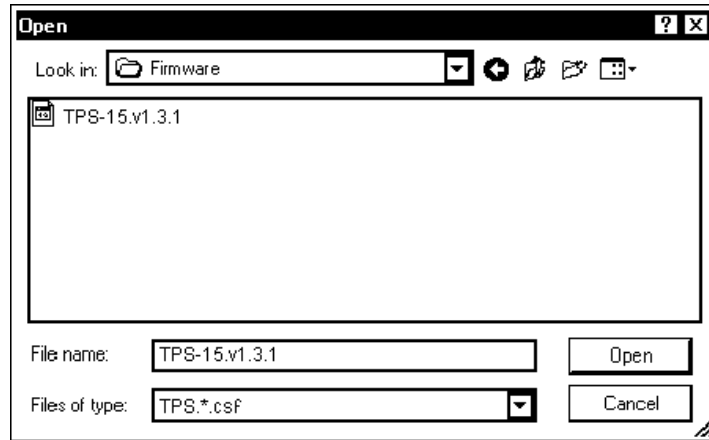*Network Device Tree Window – Right-Click Sub Menu*
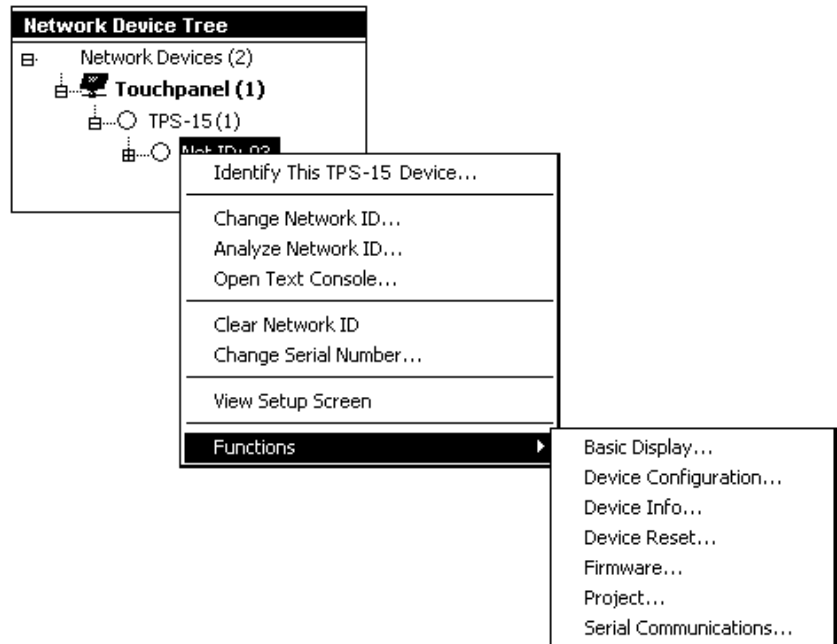
5. The "Firmware" window displays the model and current firmware version. Click **Upload New Firmware**.
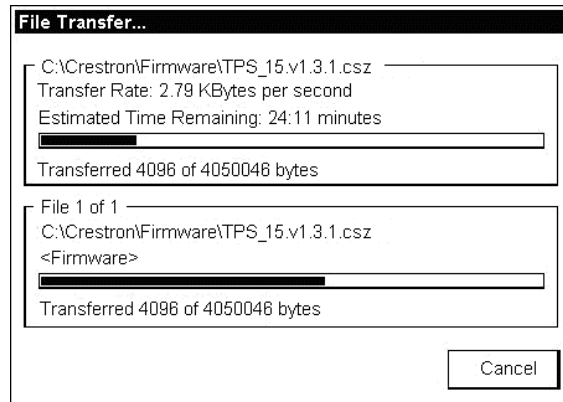
"Firmware" Window
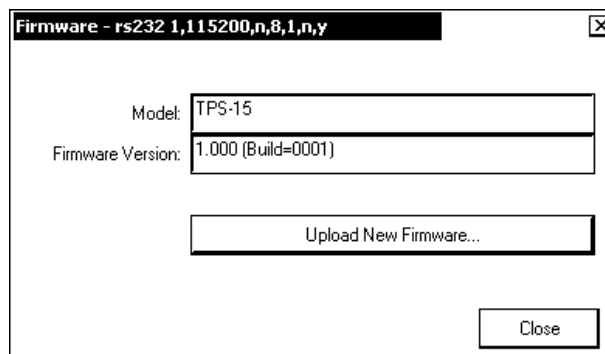
6. When the following screen appears, browse to locate the firmware (.csf) file.

Locate Firmware in the "Open" Window

7.   Click **Open** and the file transfers to the unit.

"File Transfer" Window

8.   The "Firmware" window reopens indicating the new firmware version. Click **Close** after the touchpanel automatically reboots.

Problem Solving

Troubleshooting

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

TPS-12/15/17 Troubleshooting

TROUBLE	POSSIBLE CAUSE(S)	CORRECTIVE ACTION
TPS-12/15/17 does not function.	TPS-12/15/17 is not receiving power.	Verify power to unit. Use only Crestron power supplies for Crestron equipment.
	Incorrect cable connections.	Follow connection procedures in this guide and inspect connector pins.
	Incorrect firmware/software.	Update firmware/software versions as per those listed in the "Specifications" section.
	Touchpanel is incorrectly calibrated.	Enter "SETUP MODE" and recalibrate.
	Touchpanel is not communicating with the network.	Use Toolbox to poll the network. Verify network connection to the touchpanel.
		Verify touchpanel is in "CRESNET MODE" as defined in the "Interface Menu" on page 18.
	Brightness is set too low.	Adjust touchpanel brightness using the setup menu. Refer to page 18.
Touchpanel is not responding.	Incorrect network wiring.	Touch the screen to remove the message and verify correct wiring to all connectors.
	Touchpanel Cresnet ID is not set to match the Net ID in the SIMPL program.	Use Crestron Toolbox or Viewport to poll the network. Verify that the Cresnet ID for the touchpanel is properly set to match the Net ID in the SIMPL program.
	Touchpanel Cresnet ID is not unique, two or more units share the same ID.	Use Crestron Toolbox or Viewport to poll the network and verify that each ID is used only once.
No video displayed.	Wrong VT Pro-e or SIMPL Windows programs.	Verify correct programs. Verify proper video set up.
	Incorrect input connection.	Verify video input and QM connections.
TPS-12/15/17 does not respond to ping command.	IP address not correct (LAN green and amber LEDs are off).	Assign correct IP address to TPS-12/15/17.
	IP mask not correct (LAN green and amber LEDs are on).	Assign correct IP mask.
	PC and TPS-12/15/17 not on same subnet.	Ensure that the PC and the TPS-12/15/17 are on the same subnet.
Mouse or touchpanel does not work.	Incorrect Touch settings.	Check Touch settings on interface menu.
Touchpanel does not communicate with RS-232 devices.	Incorrect RS-232 settings.	Match communication settings of touchpanel to peripheral device.

Continued on the following page

TPS-12/15/17 Troubleshooting (continued)

TROUBLE	POSSIBLE CAUSE(S)	CORRECTIVE ACTION
Touchpanel display is dark.	Standby timeout has elapsed.	Touch the screen to reactivate.
Unexpected response from the touchpanel.	Touchpanel is incorrectly calibrated.	Enter "SETUP MODE" and recalibrate.
Communications via the LAN port is not functioning.	Improper Ethernet connection (IEC).	Verify proper connection at touchpanel LAN port.
	Another device set to the same IP address.	Obtain new touchpanel static IP address.

Further Inquiries

If you cannot locate specific information or have questions after reviewing this guide, please take advantage of Crestron's award winning customer service team by calling the Crestron corporate headquarters at 1-888-CRESTRON [1-888-273-7876]. For assistance in your local time zone, refer to the Crestron website (www.crestron.com) 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 TPS-12/15/17, additional information may be made available as manual updates. These updates are solely electronic and serve as intermediary supplements prior to the release of a complete technical documentation revision.

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

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1. No merchandise may be returned for credit, exchange, or service without prior authorization from CRESTRON. To obtain warranty service for CRESTRON products, contact the factory and request an RMA (Return Merchandise Authorization) number. Enclose a note specifying the nature of the problem, name and phone number of contact person, RMA number, and return address.

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3. Return freight charges following repair of items under warranty shall be paid by CRESTRON, shipping by standard ground carrier. In the event repairs are found to be non-warranty, return freight costs shall be paid by the purchaser.

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