Crestron **Series 1000** Wall-Mounted Touchpanel Operations Guide

CRESTRON®

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

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

Contents

Series 1000 Wall-Mounted Touchpanels

Introduction

The Series 1000 compact wall-mounted touchpanels are 3.8-inch (9.7 cm) passive matrix touchscreen control panels. There are two Series 1000 models available: either grayscale or color. Model selection is based on application requirements. Refer to "Model Differences" on page 2 for a more detailed description of each.

The purpose of a Series 1000 unit is to provide a single, compact touchpanel that ends the age of walls cluttered with switches, control panels, thermostats, etc. These wall-mounted panels can be fully customized for any control environment – graphic icons and programmable "quick" pushbuttons let users easily select and control any function.

Exclusive Crestron® technology delivers added features: a crisp, clear, display that automatically adjusts itself to changing lighting condition, dimming and brightening as needed; storage and playback of WAV sound files adds a whole new dimension to control; 10 "quick" pushbuttons flank the LCD display for frequently used commands.

Functional Summary

- Compact, stylish and affordable
- Touch sensitive 3.8-inch diagonal color or grayscale display
- 10 "quick" pushbuttons are ideal for frequently used commands
- Decorator-style faceplate is available with designer finishes and custom-engraved keys*
- Exclusive Crestron "light-sensing" display adapts to any lighting condition
- Supports color bitmap files and Windows® fonts
- Stores and plays back WAV sound files
- Easy drywall or back box mounting system
- Twisted pair, Cresnet® or CAT5 wiring scheme allows daisy-chaining of panels; never needs termination

* Custom-engraved keys can be obtained by using the Crestron Engraver software. Version 2.0.0.6 or later is available from the Downloads | Software Updates section of the Crestron website (www.crestron.com).

Model Differences

There are two Series 1000 models available and selection depends whether grayscale or color touchscreen is required. Grayscale panels are referred to as the LC-1000 and color panels are known as CT-1000. Other differences between the two models are listed in the table after this paragraph.

Series 1000 Touchpanel Model Differences

FEATURE	LC-1000	CT-1000
Display Type	Four Shades of Grayscale	4,096 Colors
Screen Illumination	White LED Backlight	Fluorescent Backlight
Power Requirements	3 W, 24 VDC, 125 mA	6 W, 24 VDC, 250 mA
Light Sensor	Inversion and/or Backlight Dimming	Backlight Dimming

Specifications

The table below and on the next page provides a summary of specifications for the Series 1000 touchpanel.

Specifications for Series 1000 Touchpanel

SPECIFICATION	DETAILS
Power Requirements	3 Watts (24 VDC @ 125 mA) - LC-1000 only 6 Watts (24 VDC @ 250 mA) - CT-1000 only
Default NET ID	3
Default Timeout	10 minutes
Signal Join Maximums	999 digital, 255 analog, 127 serial
Control System Update Files[1,2,3]	
2-Series Control System	Version C2-2004.CUZ or later
CEN/CN-TVAV	Version 5.10.13V.UPZ or later
CNMSX-AV/PRO	Version 5.07.05X.UPZ or later
CNRACKX/-DP	Version 5.07.06W.UPZ or later
ST-CP	Version 4.00.49S.UPZ or later
Acceptable File Extensions[4]	
SIMPL Windows	
.smw	*projectname* .smw (source file)
.spz	*projectname* .spz (compiled file for 2-Series)
.bin	*projectname* .bin (compiled file for CNX generation)
.csz	*projectname* .csz (compiled file for CNX generation with SIMPL+)
VT Pro-e	
.vtp	*projectname* .vtp (source file)
.hex	*projectname* .hex (compiled file)
Firmware	
.csf	FWxxxxxx.csf (panel firmware)
Audio Capacity	Approximately 90 seconds of total time[5]
Audio Output	0.5 Watts
Memory	768 Kbyte flash memory available for user project and WAV files[6]
Visible Touchscreen Dimensions	3.8" (9.6 cm) diagonal

Leading Specifications for Series 1000 Touchpanel (Continued)

SPECIFICATION	DETAILS
Screen Viewing Angles:	
LC-1000	Y Dir. (X=0°): +50° (from top), -30° (from bottom) X Dir. (Y=10°): +40° (from right), -40° (from left)
CT-1000	Y Dir. (X=0°): +50° (from top), -50° (from bottom) X Dir. (Y=0°): +50° (from right), -50° (from left)
Touchscreen Resolution	240 x 320 pixels
Touchscreen Display	Passive Matrix Grayscale LCD (LC-1000 only) Passive Matrix Color LCD (CT-1000 only)
Touchscreen Illumination	White LED Backlit (LC-1000 only) Backlit Fluorescent (CT-1000 only)
Touchscreen Composition	Analog Resistive Membrane
Operating Temperature	50° to 113°F (10° to 45°C)
Humidity	10% to 90% RH (non-condensing)
Dimensions & Weight	Height: 4.77 in (12.10 cm) Width: 4.86 in (12.34 cm) Depth: 1.59 in (4.04 cm) - with faceplate Weight: 0.54 lb (0.25 kg)

1 The latest versions can be obtained from the Downloads | Software Updates section of the Crestron website (www.crestron.com). Refer to NOTE after last footnote.

2 Crestron 2-Series control systems include the AV2, CP2, CP2E, MP2, MP2E, PAC2, PRO2, and RACK2.

3 CNX update files are required for either CNMSX-AV/Pro or CNRACKX/-DP. Filenames for CNX update files have a UPZ extension and ST-CP files are in one EXE or zipped UPZ file. To avoid program problems, make certain you are using the update file with the correct suffix letter (e.g., S, V, W, X).

4 Extension requires a prefix specific to the touchpanel type. In DETAILS, *projectname* represents the assigned project name, and xxxxxx represents a version number.

5 The exact audio capacity is influenced by the complexity of the control screens and the sampling of the WAV files. A specific WAV file format is required: PCM, 8KHz, mono, 8 bit.

6 Use VT Pro-e to check program size prior to upload to avoid storage capacity problems.

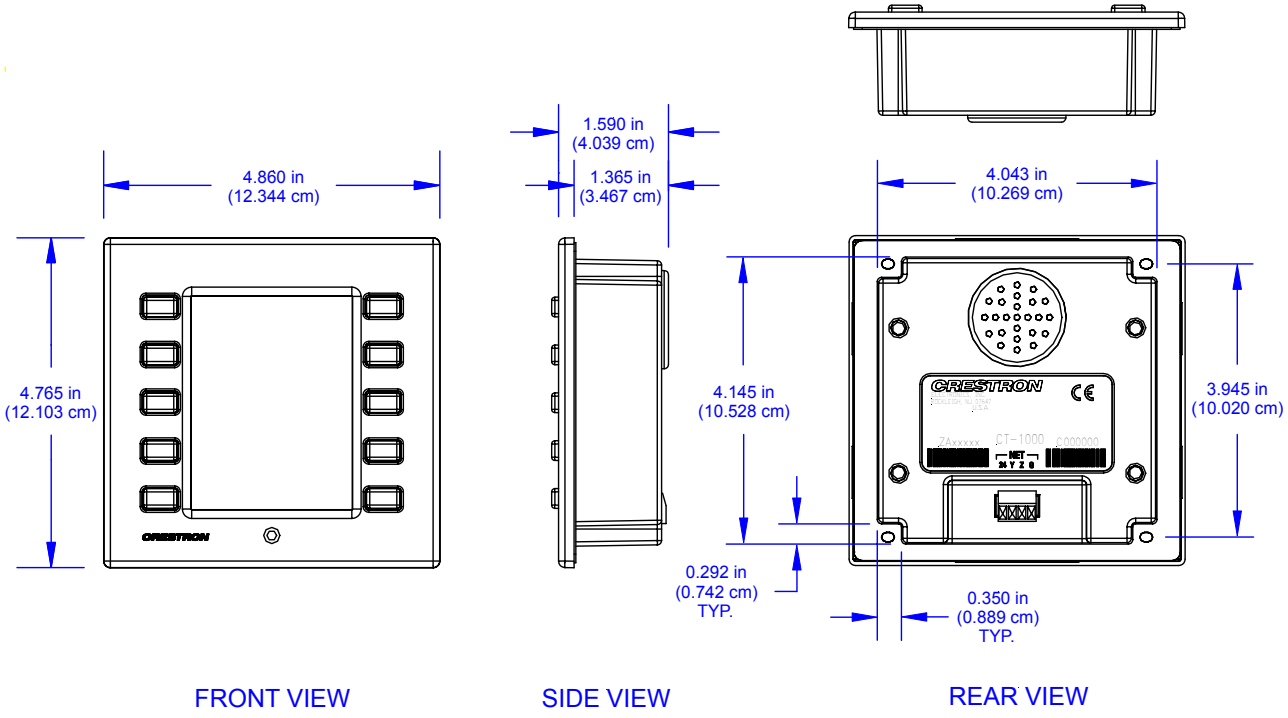
NOTE: Crestron software and any files on the website are for Authorized Crestron dealers only. New users may be required to register to obtain access to certain areas of the site (including the FTP site).

Physical Description

The 3.8-inch (9.7 cm) touch sensitive viewing screen is located on the front of the Series 1000 touchpanel. The electronic hardware is housed in a high impact, molded plastic enclosure, shown after this paragraph. A 4-pin network port is located at the rear of the unit. A speaker is also located on the back of the unit to project sound from the stored WAV audio files.

Series 1000 Touchpanel

Physical Views and Dimensions of a Series 1000 Touchpanel (CT-1000 Shown)



The Series 1000 touchpanel has 10 engravable hard buttons (real buttons, not simulated hard buttons that press on the touchpanel membrane), that allow easy access to the most common functions such as lights, volume, drapes, and screen controls with the added benefits of touchpanel flexibility incorporated right into one panel. Refer to the Engraving Software package, version 2.0.0.6 (available from the Downloads | Software Updates section of the Crestron website (www.crestron.com). A photosensor on the front panel permits the exclusive light-sensing display to switch from daytime super bright to evening soft glow.

Industry Compliance

As of the date of manufacture, this unit has been tested and found to comply with specifications for CE marking and standards per EMC and Radio Communications Compliance Labeling (N11785).

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

Setup

Network Wiring

NOTE: When installing network wiring, refer to the latest revision of the wiring diagram(s) appropriate for your specific system configuration, available from the Downloads | Product Manuals | Software and Wiring Diagrams section of the Crestron website (www. crestron.com).

When calculating the wire gauge for a particular Cresnet run, the length of the run and the power factor of each network unit to be connected must be taken into consideration. If Cresnet units are to be daisy-chained on the run, the power factor of each unit to be daisy-chained must be added together to determine the power factor of the entire chain. The length of the run in feet and the power factor of the run should be used in the following resistance equation to calculate the value on the right side of the equation.

Resistance Equation

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

Where: R = Resistance (refer to table below).
L = Length of run (or chain) in feet.
PF = Power factor of entire run (or chain).

The required wire gauge should be chosen such that the resistance value is less than the value calculated in the resistance equation. Refer to the table after this paragraph.

Wire Gauge Values

RESISTANCE (R)	WIRE GAUGE
4	16
6	18
10	20
15	22
13	Doubled CAT5
8.7	Tripled CAT5

NOTE: All 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 be 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 desirable to add a hub/repeater after only 20 network devices.

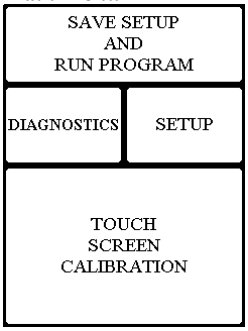
Identity Code

Every equipment and user interface within the Cresnet system requires a unique Cresnet identity code (NET ID). These codes are a two-digit hexadecimal number from 03 to FE. Refer to "Interface Menu" on page 9 for instructions on setting the unit's NET ID. The NET ID of the unit must match the NET ID specified in the SIMPL Windows program. Refer to "Setting the Net ID in Device Settings" on page 17 for details of the SIMPL Windows procedure.

Configuring the Touchpanel

NOTE: The only connection required to configure the touchpanel is power. Refer to "Hardware Hookup" on page 10 for details.

Main Menu



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 (approx. 5 seconds) to the touchscreen as power is applied. Remove your finger when the message "SETUP MODE" appears on the touchscreen. Holding a finger to the touchscreen for five seconds after the "SETUP MODE" message is displayed sets the brightness to high and the contrast to a default level.

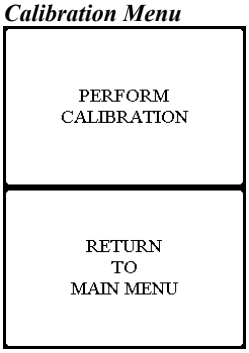
NOTE: "SETUP MODE" may also be entered by sending the respective command from the **Functions** pull-down of the Crestron Viewport.

Upon entering SETUP MODE, the Main Menu, shown to the left, displays four buttons: **SAVE SETUP AND RUN PROGRAM**, **DIAGNOSTICS**, **TOUCH SCREEN CALIBRATION**, and **SETUP**.

The **SAVE SETUP AND RUN PROGRAM** button verifies that all of the setup information has been saved to 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.

Calibration Menu

Calibration Menu



Calibration of the touchscreen is required if the active touch area of a button does not coincide with the button's image. Select the **TOUCH SCREEN CALIBRATION** button to display the Calibration Menu, shown to the left. The Calibration Menu offers the choice to initiate calibration with the **PERFORM CALIBRATION** button or return to the previous screen with the **RETURN TO MAIN MENU** button. Choose an option by touching the correct button.

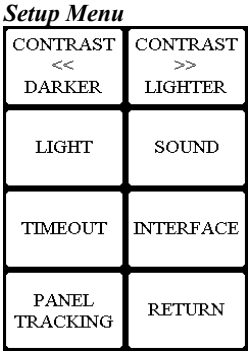
If you proceed to calibrate the touchpanel, the screen prompts you with the message "Touch Screen Calibration Menu Touch Lower Right Corner" centered on the display. A hand with a pointing finger indicates the correct corner. Touch the corner of the screen to initiate calibration. Another message, "Touch Screen Calibration Menu Touch Upper Left Corner", appears and a hand with a pointing finger indicates the correct corner. Touch the corner of the screen to conclude calibration and return to the Main 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 an area that is opposite from the instructed area.

NOTE: Calibration can also be performed by sending the respective command from the **Functions** pull-down of the Crestron Viewport.

Setup Menu

Setup Menu



To obtain the Setup Menu, shown to the left, press the **SETUP** button from the Main Menu. Many touchpanel options (i.e., contrast and panel tracking) are available directly from the Setup Menu and are explained in the following paragraphs. Other setup parameters (i.e., light, timeout, interface, and sound) use additional menus and are detailed in subsequent paragraphs as well. After setup parameters have been set, select the **RETURN** button to return to the Main Menu.

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

Contrast

Screen contrast may need to be altered because of ambient light conditions, panel temperature, or personal preference. Two contrast buttons, **CONTRAST << DARKER** and **CONTRAST >> LIGHTER** on the Setup Menu, may be held down for continuous and smooth adjustment of the screen.

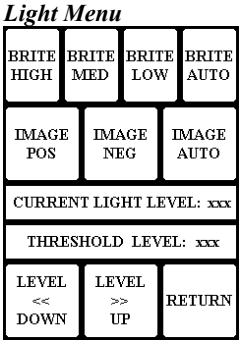
Panel Tracking

Panel tracking is a useful communication feature between touchpanels when more than one touchpanel exists on the network. Panel tracking is enabled when the **PANEL TRACKING** button on the Setup Menu is selected. Selection is indicated with white text on a dark gray background (for the LC-1000) and red text (for the CT-1000). When enabled, a given touchpanel maintains communication in such a way that a page change to any touchpanel on the network forces the same page change to all enabled touchpanels. Panel tracking is disabled when the **PANEL TRACKING** button is deselected. When disabled a given touchpanel does not respond to page changes made to other touchpanels on the network. Panel tracking is factory set with the **PANEL TRACKING** button deselected.

NOTE: The single button, **PANEL TRACKING**, provides alternate action for both panel tracking settings.

Light Menu

Light Menu



NOTE: *The menu shown above appears on the LC-1000. There are no **IMAGE** (POS, NEG, or AUTO) buttons available on the CT-1000.*

Screen brightness and image may need to be altered because of ambient light conditions or personal preference. These lighting attributes may be manually set or programmed to be adjusted automatically from the Light Menu, shown to the left. Press the **LIGHT** button from the Setup Menu to access this screen. To return to the Setup Menu, select the **RETURN** button on the Light Menu. Brightness and image settings are factory set to **BRITE HIGH** and **IMAGE AUTO**, respectively.

MANUAL SETTINGS

Three brightness buttons, **BRITE HIGH**, **BRITE MED**, and **BRITE LOW** on the Light Menu may be selected to manually assign brightness setting. Current brightness setting is shown in white text on dark gray background (for the LC-1000) or red text (for the CT-1000).

Two image buttons, **IMAGE POS** and **IMAGE NEG**, located on the Light Menu of the LC-1000 only may be selected to manually assign the screen image. Selecting **IMAGE POS** results in an image that looks similar to the one designed with VT Pro-e. Selecting **IMAGE NEG** results in the photographic negative of the image designed with VT Pro-e.

AUTOMATIC SETTINGS

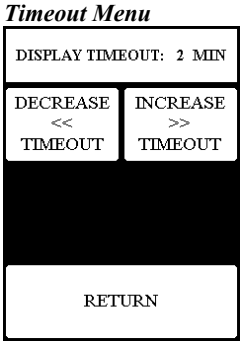
A photosensor on the front panel permits the exclusive light-sensing display to automatically switch from daytime super bright to evening soft glow. The third row of the Light Menu displays the current light level as detected by the photosensor. The **CURRENT LIGHT LEVEL** numerical value, represented by xxx in the illustration, can range from 0 (dark) to 255 (very bright).

The **THRESHOLD LEVEL** located on the Light Menu is a key element to automatically adjusting brightness and image. The **THRESHOLD LEVEL** numerical value, represented by xxx in the illustration, can range from 0 (dark) to 255 (very bright). The **LEVEL << DOWN** and **LEVEL >> UP** buttons decrease and increase the **THRESHOLD LEVEL** by increments of 10, respectively.

Once the **THRESHOLD LEVEL** has been set, the **BRITE AUTO** and/or **IMAGE AUTO** buttons on the Light Menu of the LC-1000 only can be selected to automatically adjust brightness and image. If both buttons have been selected and the **CURRENT LIGHT LEVEL** has exceeded the **THRESHOLD LEVEL**, the screen switches to high brightness and positive image. When the **CURRENT LIGHT LEVEL** is less than the **THRESHOLD LEVEL**, the screen switches to low brightness and negative image.

Timeout Menu

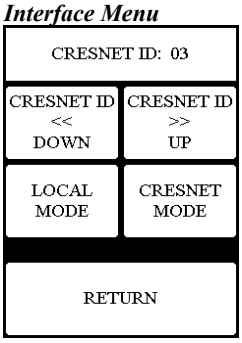
Timeout Menu



The touchpanel display can be turned off (standby mode) when not in active use. Select the **TIMEOUT** button on the Setup Menu to reveal the Timeout Menu, shown to the left. This setting turns the display off when the touchpanel is inactive for a specified time (shown in minutes). When the touchpanel is pressed, the last screen to be displayed reappears. A two minute **DISPLAY TIMEOUT** is shown in the illustration. Minutes can vary from 0 to 120, where 0 disables the timeout. **DECREASE << TIMEOUT** and **INCREASE >> TIMEOUT** buttons decrease and increase the timeout, respectively. Select the **RETURN** button located on the Timeout Menu to save the timeout setting and return to the Setup Menu.

Interface Menu

Interface Menu



The touchpanel communicates with a control system to activate other controls 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, shown to the left.

The Cresnet network identity number (CRESNET ID) is displayed on the Interface Menu. CRESNET ID is the two-digit hexadecimal number shown as 03 in the figure. NET ID is factory set to 03 (default). 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.

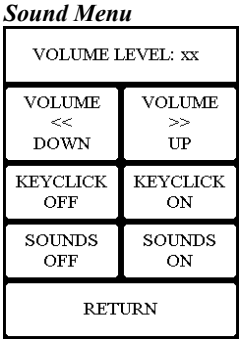
Two side-by-side buttons beneath the hexadecimal display, **CRESNET ID << DOWN** and **CRESNET ID >> UP**, decrease and increase the CRESNET ID by one, respectively.

The touchpanel usually communicates with a Cresnet system. Occasionally the touchpanel can be used in a local demo mode where it merely displays various menus, but does not communicate with Cresnet system. In local mode, the directory buttons change pages, but buttons requiring feedback do not work. Two centrally located buttons on the Interface Menu, **LOCAL MODE** and **CRESNET MODE**, determine communication mode. Select **LOCAL MODE** to set the touchpanel into demo mode and **CRESNET MODE** for normal Cresnet communication mode. Selected buttons have white text on dark gray background (for the LC-1000) or red text (for the CT-1000). Communication mode is factory set to **CRESNET MODE**.

Select the **RETURN** button located on the Interface Menu to return to the Setup Menu.

Sound Menu

Sound Menu



The **SOUND** button on the Setup Menu is used to display the Sound Menu, shown to the left. Use this screen to activate audible key clicks and sounds (recorded as WAV files) on each individual touchpanel. This feature is a useful feedback tool or can be used to capture that custom interface.

Confirmation of a button press on a touchpanel is acknowledged by an audible click assuming this feature is enabled. To enable this feature, verify that the **KEYCLICK ON** button is active (white text on dark gray background (for LC-1000) or red text (for CT-1000)). An active **KEYCLICK OFF** button disables the feature.

NOTE: If keyclick is enabled on a touchpanel, each press of the touchpanel results in an audible click. It may be desirable to conceal the keyclick sound for certain buttons (eg., if the button triggers playing of a WAV file). Using VT Pro-e, the panel designer has the option to suppress the keyclick on a button-by-button basis from the "Button Properties" window.

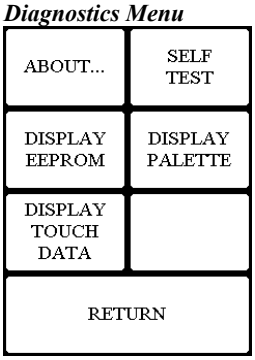
WAV file audio messages can provide that custom interface with a touchpanel, assuming this feature is enabled. To enable this feature, verify that the **SOUNDS ON** button is active (white text on dark gray background (for LC-1000) or red text (for CT-1000)). An active **SOUNDS OFF** button disables the feature.

Volume of the audible clicks and sounds is controlled with the **VOLUME UP** and **VOLUME DOWN** buttons. The **VOLUME LEVEL** numerical value, represented by xx in the illustration, can range from 0 (no volume) to 11 (loud volume). The unit is factory set with the keyclicks and sounds on.

Select the **RETURN** button located on the Sound Menu to return to the Setup Menu.

Diagnostics Menu

Diagnostics Menu



The **DIAGNOSTICS** button from the Main Menu should only be used under supervision from a Crestron technical support representative during telephone support. The options available from the Diagnostics Menu, shown to the left, are numeric in nature and their interpretation is beyond the scope of this manual.

NOTE: Pressing the **ABOUT** button reveals the touchpanel firmware version.

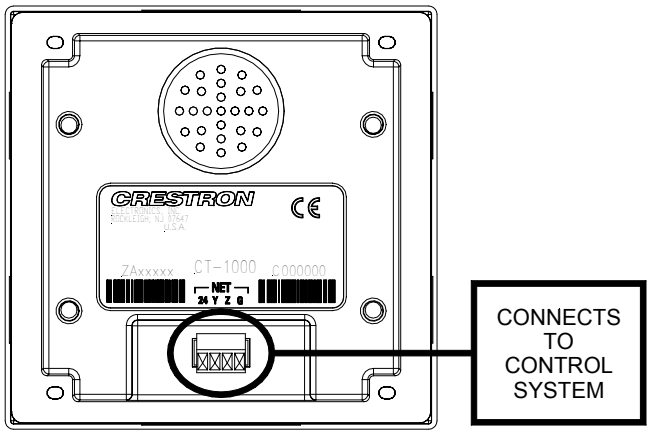
Hardware Hookup

CAUTION: Do not remove the tape that covers the photosensor. Doing so can short the board and damage the touchpanel.

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

Make the necessary connection called out in the illustration that follows this paragraph. Refer to "Network Wiring" on page 5 before attaching the 4-pin connector.

Hardware Connection for the Series 1000 (Back of the Unit is Shown)



Mounting Options

The Series 1000 touchpanel installs simply and cleanly into existing or newly constructed walls, with an assortment of pre- and post-construction mounting options. All mounting options are provided separately from the actual touchpanel. Refer to the table after this paragraph for a complete list of mounting options and respective Installation Guides for the Series 1000 touchpanels.

Mounting Options for the Series 1000 Touchpanels

PRE-CONSTRUCTION* OPTION	POST-CONSTRUCTION** OPTION	MODEL NUMBER	DOCUMENT NUMBER
Back Box Kit	-	BB-1000L	6060
Pre-Construction Mount Kit	-	PMK-1000L	6061
Mud Mount Kit (accessory)	-	MMK-1000L	6062
Trim Mount Kit (accessory)	-	TMK-1000L	6063
-	Wall Mount Kit - Mud	WMKM-1000L	6062
-	Wall Mount Kit - Trim	WMKT-1000L	6063
-	Water Resistant Cover***	CT/LC-WPK	5932

* Pre-construction refers to framed walls prior to hanging drywall.

** Post-construction refers to framed walls with drywall hung.

*** Cover can be placed over installed touchpanel.

NOTE: Early production units ship with two mounting brackets (and other parts) that allowed the low-voltage touchpanel to be installed directly into a mounting surface. If these parts are supplied with the touchpanel and a direct mounting option is preferred, refer to "Appendix: Early Production Units" on page 34.

If the BB-1000L or PMK-1000L are to be used and a touchpanel is not available, the installer can either leave the hole in the mounting surface open (if permitted by local building codes) or attach the cover plate supplied with these two mounting options.

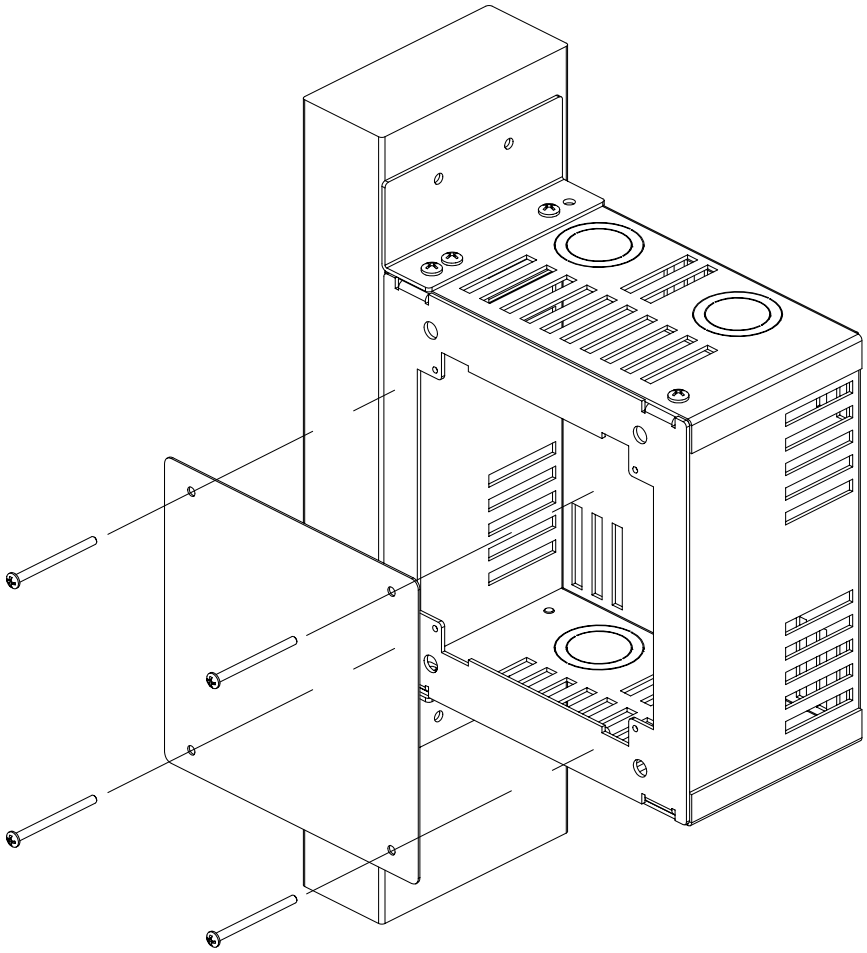
Touchpanel Mounting

Required Tools

- #1 Phillips tip screwdriver

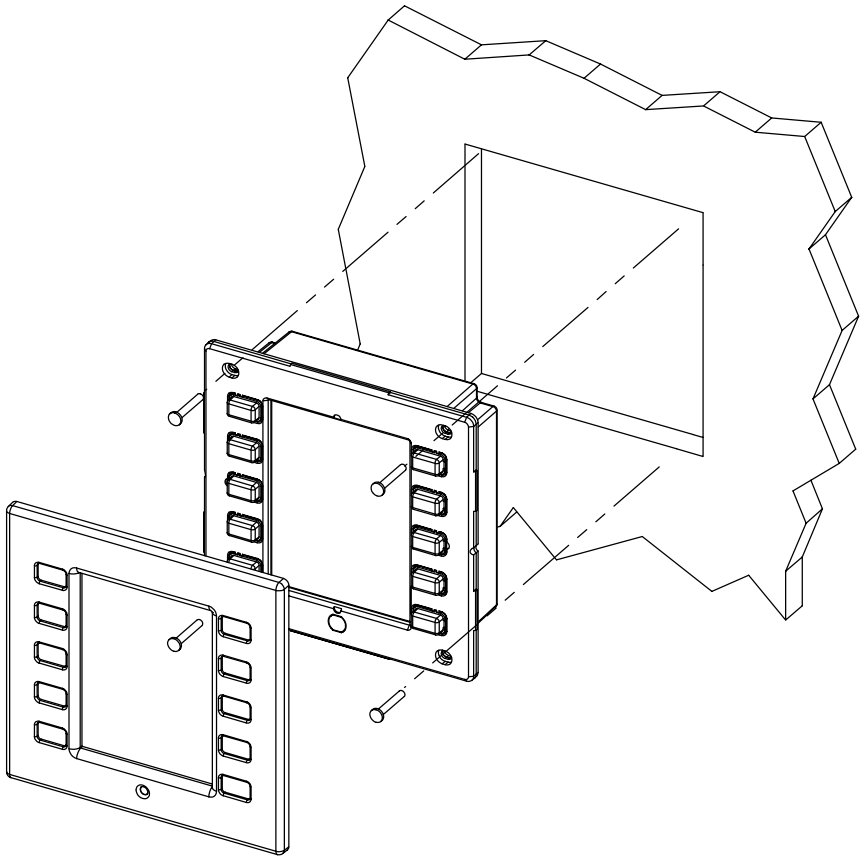
1. If the cover is attached, use a #1 Phillips screwdriver to loosen and remove the four screws and cover plate.

Remove Cover Plate (BB-1000L Shown as Mounting Example - Drywall Not Shown)



2. Make the connection as described in "Hardware Hookup" on page 10.
3. Insert the touchpanel (without its faceplate) into the mounting option and align the four screw holes.
4. Insert and tighten the four screws (finger tight and then using a #1 Phillips screwdriver, tighten an additional 1/8-turn).
5. Insert ten buttons. If the buttons are engraved, verify that the placement of each button matches the programming.
6. Cover the mounted unit with the faceplate. Refer to the illustration after this paragraph for guidance.

Insert Series 1000 into Opening (Buttons Shown as Attached)



Custom engraved faceplate and/or keys can be ordered separately by using the Crestron Engraver Software. Version 2.0.0.6 or later is available from the Downloads | Software Updates section of the Crestron website (www.crestron.com). There are even plastic faceplates that accept metal and non-metal inlays for that custom contemporary appearance. Call a Crestron customer support representative for the specific details.

NOTE: If it is necessary to remove the touchpanel, secure and label the attached cables before disconnecting them from the back of the touchpanel.

Touchpanel Removal

If it is necessary to remove the touchpanel after it has been installed into a mounting surface, complete the following steps in the order provided to remove the touchpanel. The only tool required is a #1 Phillips tip screwdriver.

1. Lift the plastic faceplate off the touchpanel.
2. Remove the plastic buttons from the touchpanel. If the buttons are engraved, be sure to record the button engraving with the button location so that the buttons can be properly returned.
3. Loosen and remove the four screws that secure touchpanel to the mounting option in use.

4. Using equal pressure, carefully remove the touchpanel from the opening.
5. If necessary, secure the attached cables before disconnecting them from the back of the touchpanel.

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 ingress of moisture beneath panels.

Programming Software

Have a comment about Crestron's software?

Direct software related suggestions and/or complaints to Crestron via email (software@crestron.com). Do not forward any queries to this address. Instead refer to "Further Inquiries" on page 33 for assistance.

Setup is easy thanks to Crestron's Windows®-based programming software. The Crestron Application Builder™ (AppBuilder) creates a complete project, with no special programming required. The AppBuilder completes all necessary programming for a base system including all touchpanel screens and the control system program. Once Crestron AppBuilder creates the project, the system interfaces and program logic can be customized. It can easily be modified with Crestron development tools (i.e., SIMPL Windows and VisionTools® Pro-e (VT Pro-e) software packages).

The program output of Crestron AppBuilder is a SIMPL Windows program with much of the functionality encapsulated in macros. Therefore, extending the capabilities of the system is very easy. Crestron AppBuilder and SIMPL Windows are intended for users with different levels of programming knowledge. Crestron AppBuilder is easier to use for the beginning programmer, and much faster for all programmers. However, it does not allow the degree of control and flexibility that SIMPL Windows does. Of course, one can initiate programming using the easiest method (Crestron AppBuilder) and use advanced techniques that are available from SIMPL Windows to customize the job.

Crestron AppBuilder 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 Crestron AppBuilder 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 Crestron AppBuilder or develop original touchpanel screen designs.

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 Downloads | Software Updates section of the Crestron website (www.crestron.com).

The following are the earliest useable software version requirements for the PC:

- Application Builder version 1.16 or later. Requires SIMPL Windows.
- SIMPL Windows version 1.61.13 or later
  Requires SIMPL+ Cross Compiler version 1.1.
- Crestron Database version 15.6.8 or later. Required by SIMPL Windows.

- VisionTools Pro-e version 2.3.3.6 or later. Used for graphical touchscreen design.

NOTE: The Series 1000 touchpanel is supplied with 10 blank pushbuttons. Custom-engraved keys can be obtained by using the Crestron Engraver software. Version 2.0.0.6 or later is available from the Downloads | Software Updates section of the Crestron website (www.crestron.com).

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 functions.

NOTE: Unjoined buttons can initiate local page flips.

Programming with the Crestron AppBuilder

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

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

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

Programming with SIMPL Windows

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

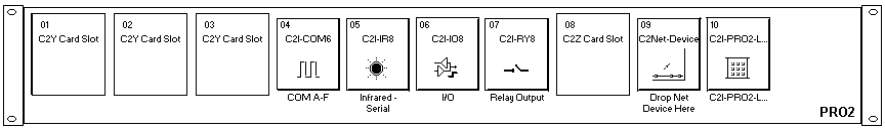
NOTE: In the following description, the PRO2 control system is used.

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 Series 1000 touchpanel.

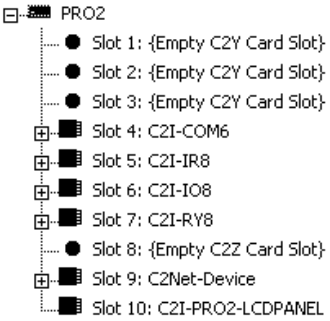
Configuration Manager is where programmers “build” a Crestron control system by selecting hardware from the *Device Library*. In Configuration Manager, drag the PRO2 from the Control Systems folder of the *Device Library* and drop it in the upper pane of the *System Views*. The PRO2 with its associated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

PRO2 System View



The *System Views* lower pane displays the PRO2 system tree (refer to graphic below). This tree can be expanded to display and configure the communications ports.

Expanded PRO2 System Tree



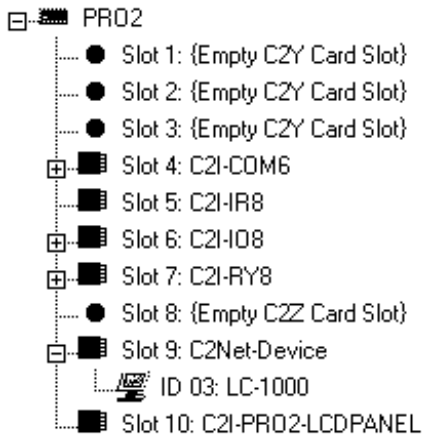
C2Net-Device Slot in Configuration Manager

To incorporate the Series 1000 touchpanel into the system, drag the CT-1000 or LC-1000 from the Touchpanels | Touchpanels (Cresnet) folder of the *Device Library* and drop it in *System Views*. The PRO2 system tree displays the touchpanel in Slot 9, with a default NET ID of "03" as shown in the following illustration.

NOTE: For the purposes of this manual, an LC-1000 is selected from the *Device Library*.

NOTE: The first touchpanel in a system is preset with a NET ID of 03, when its symbol is dragged into the upper pane of *System Views*. Additional touchpanels are assigned different NET ID numbers as they are added.

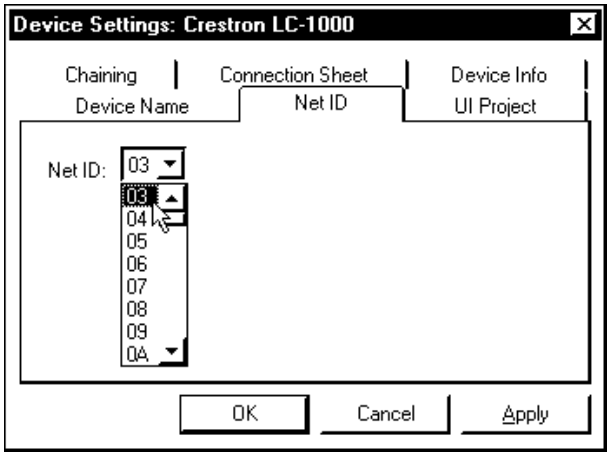
C2Net Device, Slot 9



Setting the Net ID in Device Settings

Double-click the LC-1000 icon to open the "Device Settings" window. This window displays the LC-1000 device information. Select the *Net ID* tab to change the touchpanel Net ID, as shown in the following figure.

"Device Settings" Window for the LC-1000



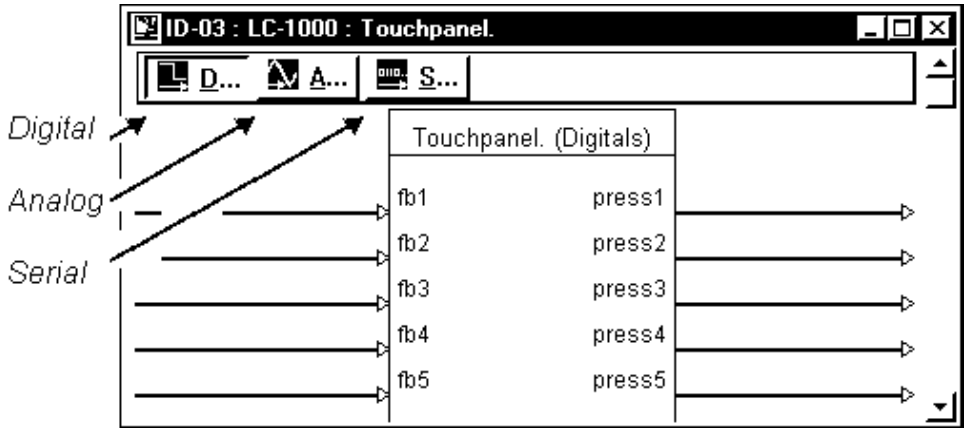
NOTE: SIMPL Windows automatically changes NET ID values of a device added to a program if a duplicate device or a device with the same default NET ID already exists in the program. Always ensure that the hardware and software settings of the NET ID match. For NET ID hardware setting details, refer to "Identity Code" on page 6.

LC-1000 Symbol in Programming Manager

Programming Manager is where programmers "program" a Creston control system by assigning signals to symbols. The following diagram shows the LC-1000 symbol in the SIMPL Windows' Programming Manager.

NOTE: With respect to programming in SIMPL Windows, the CT-1000 symbol is identical, except for the nomenclature.

Detail View of the LC-1000 in SIMPL Windows' Programming Manager



NOTE: Pin numbers are expandable to 999 Digital, 255 Analog, and 127 Serial.

Signal Types

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

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

Digital = Blue

Analog = Red

Serial = Black

Undefined/Other = Green

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

For additional information, refer to Doc. 6120, Crestron SIMPL Windows Symbol Guide. It may be downloaded from the Downloads | Product Manuals | Software section of the Crestron website (www.crestron.com).

Digital Signals

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

Analog Signals

Unlike digital signals, analog signals can vary continuously in value, in the same manner as a parameter such as volume, temperature, or pressure. Analog signals contain 16 bits of information, which means that this type of signal can have values ranging from 0 to 65535 (2^{16}-1). This 16-bit property makes analog signals useful for controlling devices that do not have discrete settings, such as volume controllers, pan/tilt head controllers, and lighting dimmers.

Serial Signals

Serial signals are much like analog signals, in that they, too, contain 16 bits of information. However, whereas the value of an analog signal is used directly–to control volume or temperature, for instance–the value of the serial signal is used as a pointer to a location in memory that contains a string of characters. When a serial signal is routed to a symbol, that symbol can identify the signal as serial rather than analog and it will automatically look at the data to which it points.

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

CT/LC-1000 Input/Output Signals

The CT-1000 and LC-1000 symbol provides up to 999 digital and 255 analog input and output joins, and up to 127 serial input joins. The programmer selects the signal types by clicking on the appropriate button at the top of the S*ymbol Detail* view when programming the panel.

The tables below list and give functional descriptions for the touchpanel outputs and inputs.

Digital Output Signal Descriptions

OUTPUT	DESCRIPTION
press 1 through press 999	Notifies control system of button press (1 – 999). High/1 = Button being pressed Low/0 = Button not being pressed

Digital Input Signal Descriptions

INPUT	DESCRIPTION
fb 1 through fb 999	Notifies panel to display feedback (1 – 999). This can represent that the button was pressed, or can be actual device feedback, e.g., that power was turned on.

Analog Output Signal Descriptions

OUTPUT	DESCRIPTION
an_act 1 through an_act 255	Notifies control system of an analog action (1-255). Any value from 0 through 65535

Analog Input Signal Descriptions

INPUT	DESCRIPTION
an_fb 1 through an_fb 255	Notifies panel of analog feedback (1 – 255).

Serial Input Signal Descriptions

INPUT	DESCRIPTION
text-01 through text-127	Notifies panel of text string (1 – 127). Also called indirect text.

Device Extenders

Device extenders provide additional logic and functionality to a device. The Poll Manager and Sleep/Wake Manager symbols are device extenders for touchpanels. Poll Manager takes the touchpanel on and off line during polling by the control system. Sleep/Wake Manager suspends and restores operation of the touchpanel. 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.

CT/LC-1000 Example Program

An example program for the Series 1000 touchpanel is available from the Crestron FTP site (ftp://ftp.crestron.com/Examples/). Search for CT_or_LC-1000_SIMPL_Windows_example_file.SMW.

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 sounds (recorded as WAV files). A set of

pages, which make up a project, can be designed for each Series 1000 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 Downloads | Software Updates section of the Crestron website (www.crestron.com).

WAV File Audio Messages

The Series 1000 touchpanel is 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 touchpanel only accepts the following WAV file format: **PCM, 8KHz, mono, 8 bit**.

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.

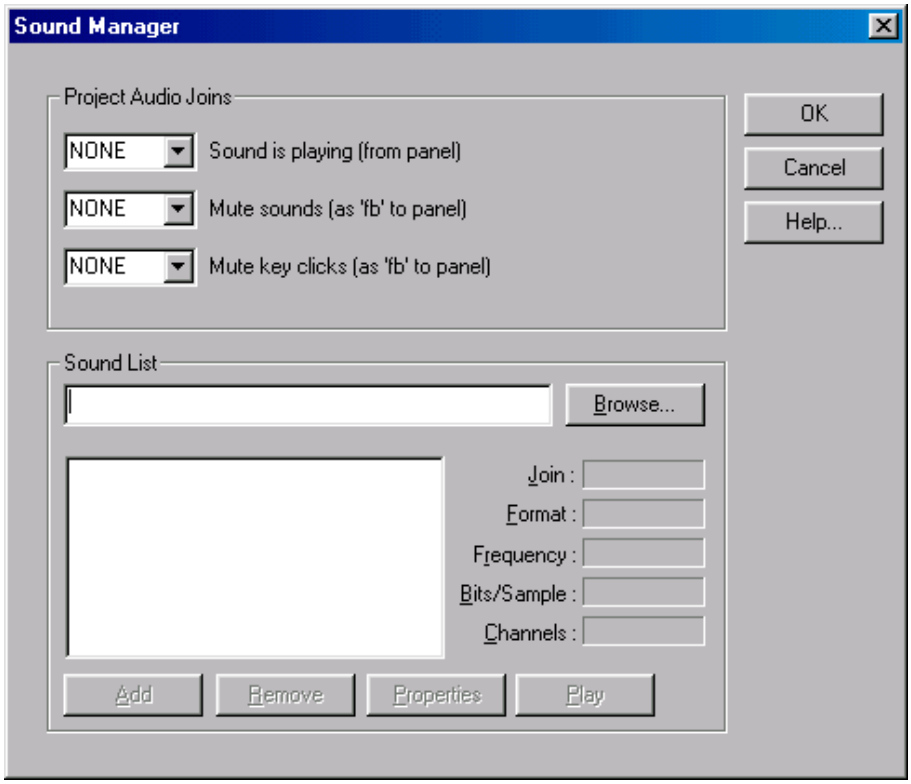
NOTE: WAV files for the touchpanel are available from the Wave LC Library of the Crestron FTP site (ftp://ftp.crestron.com).
Only use those WAV files designated for the CT/LC-1000 touchpanels. These WAV files are different than those made available for the CNXTA and Crestron CNX Telephone Audio Interface Card.

Sound Manager

NOTE: If keyclick is enabled on a touchpanel, each press of the touchpanel results in an audible click. It may be desirable to conceal the keyclick sound for certain buttons (eg., if the button triggers playing of a WAV file). Using VT Pro-e, the panel designer has the option to suppress the keyclick on a button-by-button basis from the "Button Properties" window.

Crestron VT Pro-e (version 2.1.0 and later) contains an audio tool, Sound Manager, which permits the panel designer to attach WAV files to a touchpanel project. Sound Manager is available from the Tools pull-down menu and opens the "Sound Manager" window, shown after this paragraph.

"Sound Manager" Window



Sound Manager Guidelines

There are three things to keep in mind when using Sound Manager.

1. Each WAV file must be assigned a unique digital join number. The join number options include none, keyclick, or a number (1 through 999). The default is none. If the keyclick option is selected, this WAV file becomes the default keyclick sound for all buttons. The other WAV files can be played by having the SIMPL Windows program assert the assigned join number.
2. Each WAV file must have the correct audio format and attributes for the CT-1000 or LC-1000 target type selected in VT Pro-e.
   The correct audio format is PCM, 8 or 16 KHz, 8 bit, mono.
3. There are three system-wide join numbers that the designer can define. The first, sound playing from panel, differs from the other two in that it is triggered from the panel.

a. Sound Playing from Panel – The signal for this join number goes high when the WAV file plays.

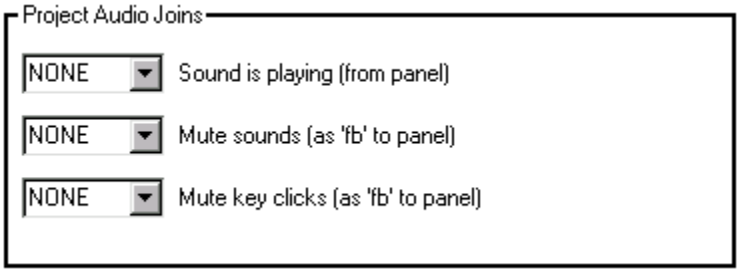
b. Mute Sounds – All WAV files (except the keyclick) in the project are muted when this join number goes high.

c. Mute Key Click – The keyclick sound is muted when this join number goes high.

Using Sound Manager

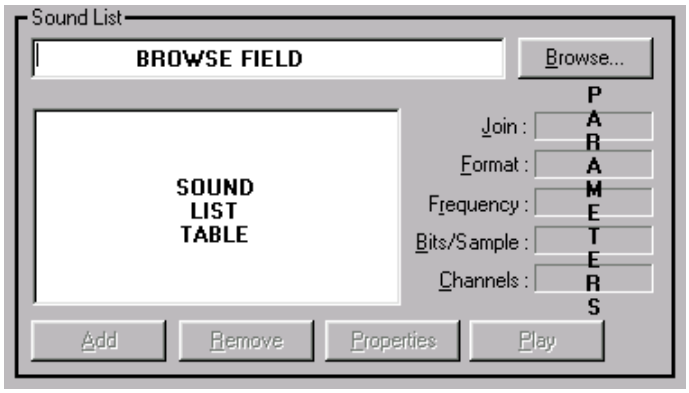
Sound Manager is broken into two distinct components. The *Project Audio Joins* component, shown below, permits the designer to assign the three system-wide join numbers described in the previous section. The three system joins can be assigned automatically with the **Auto** button or by scrolling down to the desired number.

Project Audio Joins Component



The *Sound List* component, shown after this paragraph, permits the designer to attach WAV files to the touchpanel project. Complete the following steps to attach (add) a WAV file.

Sound List Component



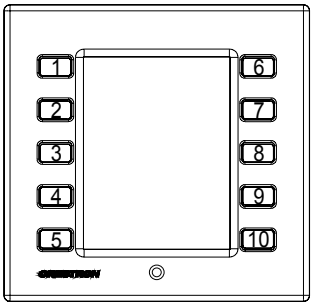
1. Use the **Browse** button to locate the desired WAV files. It should appear in the field adjacent to the **Browse** button.
2. If necessary, select the **Play** button to verify that the file in the browse field is the desired file.
3. Select the **Add** button to transfer the WAV file to the *Sound List* table located below the browse field. The audio parameters of the file also appear to the right of the table.
4. Repeat steps 1 through 3 for each desired WAV file.

NOTE: To remove a WAV file from the *Sound List* table, highlight the file and click on the **Remove** button.

The **Properties** button opens the "Sound Properties" window for a highlighted WAV file in the *Sound List* table. The designer can assign a join number either automatically with the **Auto** button or by scrolling down to the desired number. Select **Description** to enter comments about the WAV file.

"Quick" Pushbuttons

Pushbutton Layout and Join Number Assignment



There are 10 "quick" pushbuttons that flank the LCD display. These buttons are used to access any frequently used commands. Each button has a permanently fixed digital join number, refer to the illustration shown to the left. The sequence of digital join numbers is (top to bottom) 1 through 5 on the left side and 6 through 10 on the right side.

NOTE: A VT Pro-e sample project, LC-1000.VTP, is available from the VT Pro-e section of the Crestron FTP site (ftp://ftp.crestron.com/VTPro-E/). This project provides guides for panel designers so that they can line up objects with the 10 "quick" pushbuttons that flank the LCD display. New users are required to register in order to obtain access to the FTP site.

NOTE: To generate page flips from the "quick" pushbuttons, define a page in VT Pro-e with 10 buttons and assign join numbers 1 through 10 to each of the buttons. For each object, open the "Button Properties" window. Select **Page Flip** from the *Select Properties* pulldown and from the *Page Flip* pulldown, select a destination page for the action. Save the properties settings. Also, select **Edit | Page** Properties and choose the Compile tab from the "Page Properties" window. Uncheck *Compile this page* so that this page does not get uploaded to the touchpanel.

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 shown after this paragraph provide lists 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 Setup Menu, ramps contrast, etc., via reserved join numbers.

Analog Reserved Join Numbers for Series 1000 Touchpanels

JOIN NUMBER	FUNCTION
513	Display Timeout
519	Volume Level
537	Current Light Level
538	Light Threshold Level

* Defaults: Display Timeout – 10 minutes, Volume Level – 6, Light Threshold level – 0

Digital Reserved Join Numbers for Series 1000 Touchpanels

JOIN NUMBER	FUNCTION	VALUE
1016	Standby	Not Applicable
1017	Brightness	Low
1018	Brightness	Medium
1019	Brightness	High
1020	Brightness	Auto
1023	Contrast	Lighten
1024	Contrast	Darken
1035	Call up Setup Menu	Not Applicable
1051	Cresnet ID	Down
1052	Cresnet ID	Up
1053	Local Mode	Not Applicable
1054	Cresnet Mode	Not Applicable
1084	Light Threshold Level	Up
1085	Light Threshold Level	Down
1086*	Image	Positive
1087*	Image	Negative
1088*	Image	Auto
1107	Timeout	Increase
1108	Timeout	Decrease
1160	Sound/Keyclick Volume	Up
1161	Sound/Keyclick Volume	Down
1172	Keyclick	On
1173	Keyclick	Off
1176	Sounds	On
1177	Sounds	Off
1822	Panel Tracking	Enabled

* Only applies to the LC-1000.

Uploading and Upgrading

Assuming a PC is properly connected to the entire system, Crestron programming software allows the programmer to upload programs and projects to the system and touchpanel 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 Viewport.

NOTE: Currently, the Crestron Viewport is only available as a pull-down command from SIMPL Windows and VT Pro-e (**Tools | Viewport**). The Viewport utility accomplishes multiple system tasks, primarily via an RS-232 or TCP/IP connection between the control system and a PC. It is used to observe system processes, upload new operating systems and firmware, change system and network parameters, and communicate with network device consoles and touchpanels, among many other tasks. Viewport can also function as a terminal emulator for generic file transfer. All of these functions are accessed through the commands and options in the Viewport menus. Therefore, for its effectiveness as a support and diagnostic tool, the Crestron

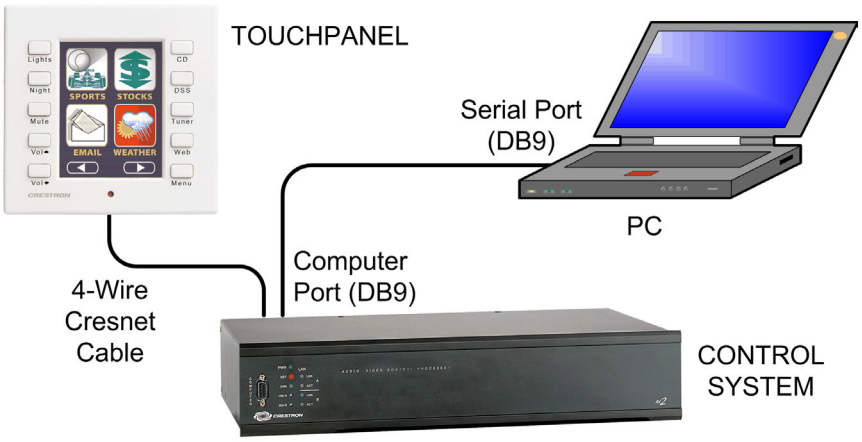
Viewport may be preferred over development tools when uploading programs and projects.

The following sections define how one would upload a SIMPL Windows program, VT Pro-e project or upgrade the firmware of the Series 1000 touchpanel. However, before attempting to upload or upgrade, it is necessary to establish communications.

Communication Settings

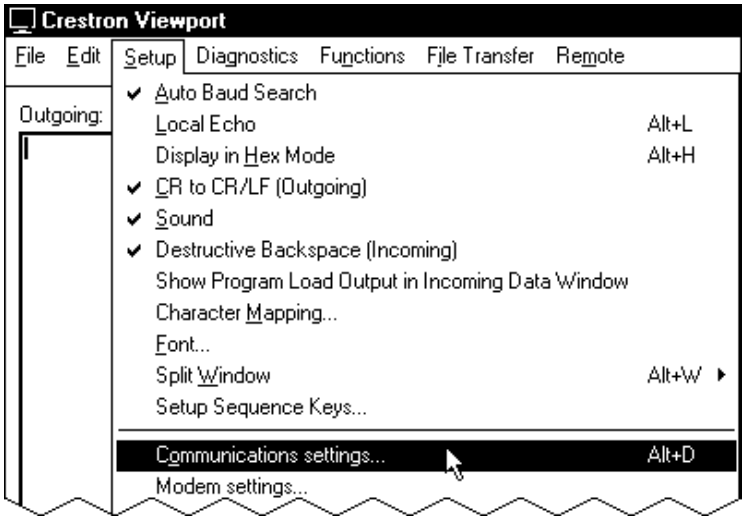
There is only a single Cresnet connector on the back of the Series 1000 touchpanel. Therefore, uploading or upgrading must be accomplished through a control system. The procedure in this section provides details for RS-232 communication between the PC and the control system. If TCP/IP communication is preferred, consult the latest version of the Crestron e-Control Reference Guide (Doc. 6052) or the respective Operations Guide for the control system. These documents are available from the Downloads | Product Manuals section of the Crestron website (www.crestron.com). Refer to the figures below for a typical connection diagram when uploading files.

Typical Connection Diagram when Uploading Files



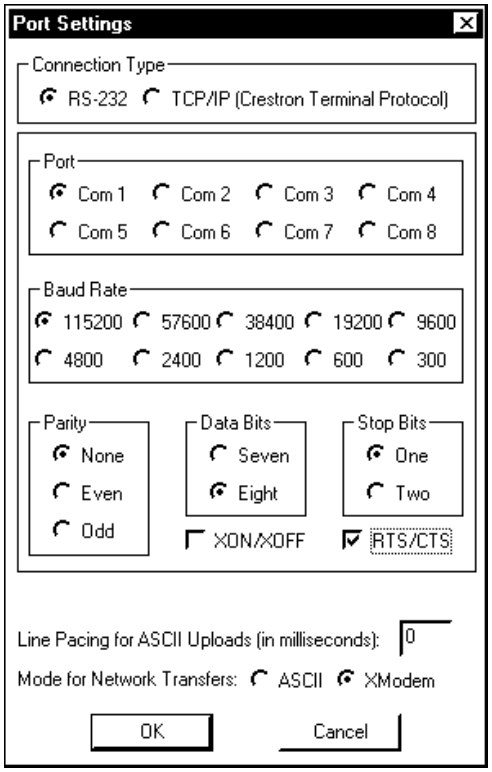
1. Start SIMPL Windows or VT Pro-e.
2. From the menu bar, select **Tools | Viewport** to open the Crestron Viewport.
3. Refer to the figure after this step. From the Viewport menu, select **Setup | Communications settings** (alternatively, press **Alt+D**) to open the "Port Settings" window.

Setup | Communications Settings Command



4. Select **RS-232** as the connection type. Verify that an available COM port (COM 1 is shown after this step) is selected, and that all communication parameters and necessary options from the "Port Settings" window are selected as shown after this step. Click the **OK** button to save the settings and close the window.

"Port Settings" Window



NOTE: The parameters shown in the illustration above are the port settings for a PRO2 control system. Consult the Operations Guide for the control system being used for exact parameter selection.

5. To verify communication, select **Diagnostics | Establish Communications (Find Rack)**. This should display a window that gives the COM port and baud rate. If communication cannot be established, refer to the "Troubleshooting Communications" section in the respective Operations Guide for the control system.

Uploading a SIMPL Windows Program

A control system source file has the extension .smw. A compiled SIMPL Windows file has the extension .spz for a 2-Series control system, .bin for CNX generation, and .csz for CNX generation with SIMPL+.

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

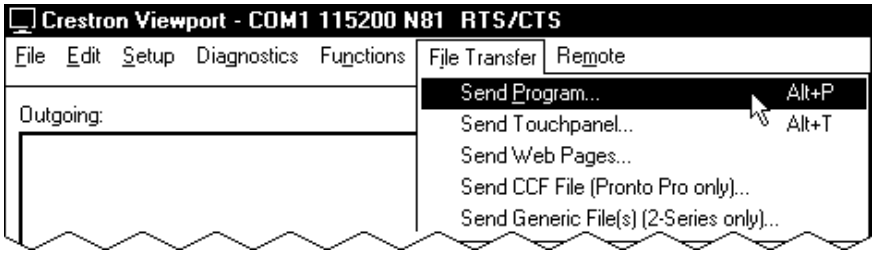
Upload via SIMPL Windows

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 Viewport

1. Verify that the procedure for "Communication Settings" that begins on page 25 has been performed.
2. As shown after this step, select **File Transfer | Send Program** (alternatively, press **Alt+P**) from the Viewport menu.

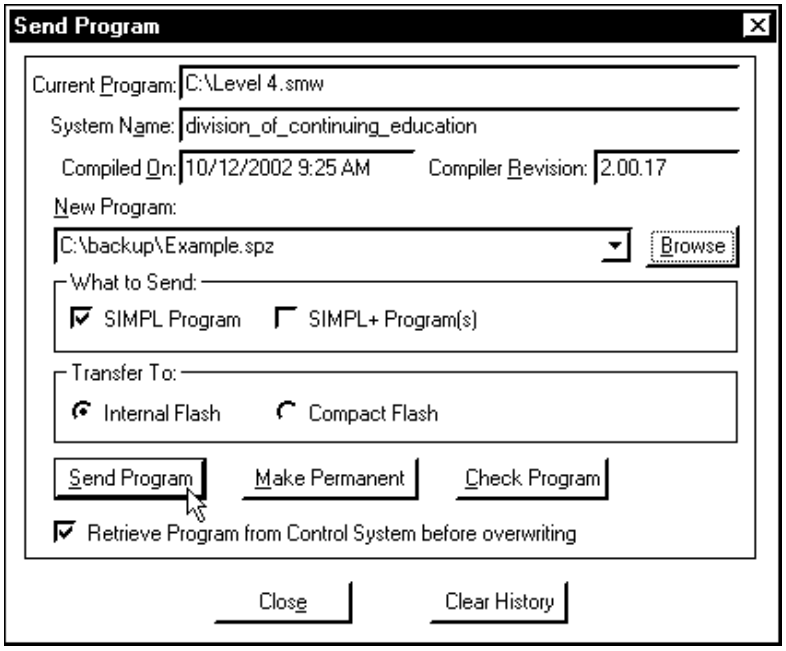
File Transfer | Send Program Command



3. The "Send Program" window appears, as shown after this step. Click **Browse**, locate the compiled file (.spz for PRO2) and click **Open**. This will display the program's header information and enable one or both of the *What to Send* check boxes. If the program does not contain any SIMPL+ modules, only the **SIMPL Program** check box will be enabled. If it does contain SIMPL+ modules, then the **SIMPL+** check box will also be enabled. Select one or both check boxes and then click **Send Program** to begin the transfer.

NOTE: Refer to the respective Operations Guide for the control system for details about the other fields shown on the "Send Program" window.

"Send Program" Window



4. To verify that the program has been transferred successfully, select **Diagnostics** | **Report Program Information**. This should display a window that provides details about the current program loaded into the control system.

Uploading a VT Pro-e Project

The Series 1000 touchpanel source file has the extension .vtp. A compiled VT Pro-e file has the extension .hex.

The VT Pro-e file can be uploaded to the touchpanel using VT Pro-e or via the Crestron Viewport. Verify the NET ID before sending the program.

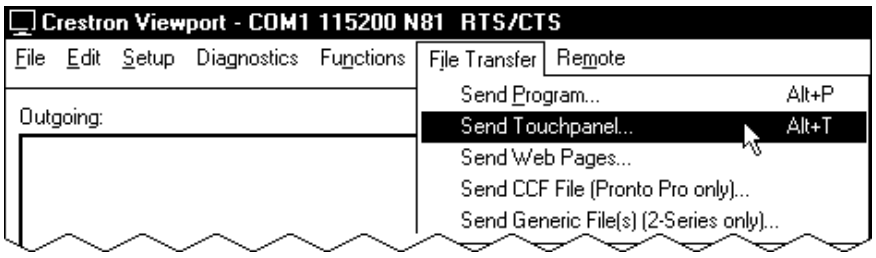
Upload via VT Pro-e

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**.

Upload via Crestron Viewport

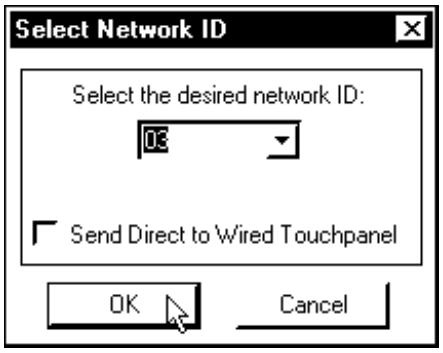
1. Verify that the procedure for "Communication Settings" that begins on page 25 has been performed.
2. As shown after this step, select **File Transfer | Send Touchpanel** (alternatively, press **Alt+T**) from the Viewport menu.

File Transfer | Send Touchpanel Command



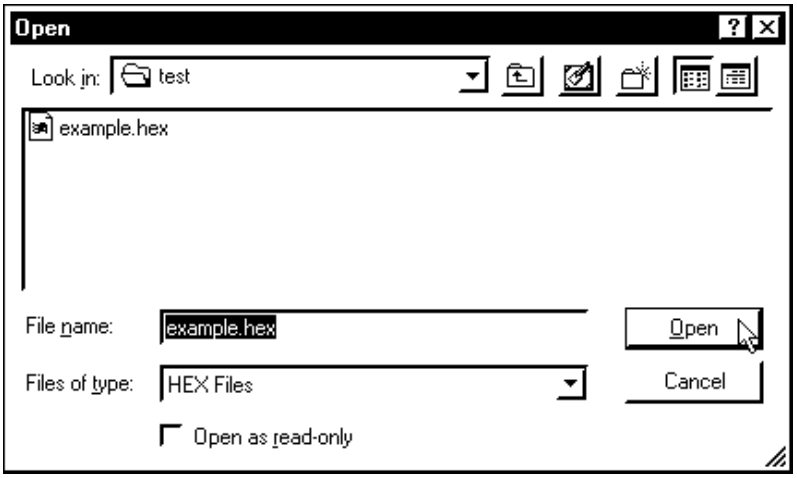
3. As shown after this step, select the NET ID of the Series 1000 touchpanel and then click **OK**. The "Open" window appears (refer to the subsequent graphic).

"Select Network ID" Window



NOTE: When transferring any Cresnet file (touchpanel project/firmware), lower the port speed baud rate to 38400 to match the Cresnet bus speed.

"Open" Window



4. Browse to the .hex file and click **Open** to begin the transfer.

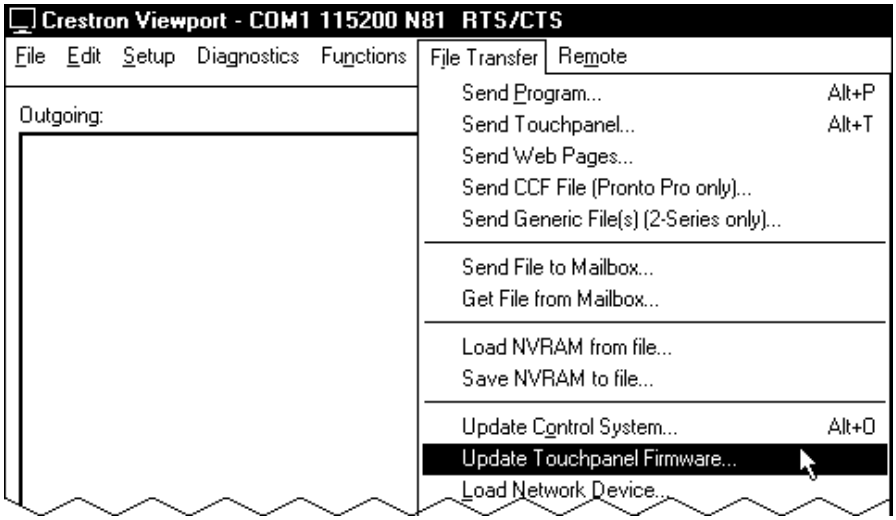
Firmware Upgrade

A firmware upgrade file has the extension .csf.

To take advantage of all the Series 1000 touchpanel features, it is important that the unit contains the latest firmware available. Therefore, please check the Crestron website (http://www.crestron.com/downloads/software_updates.asp) 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.

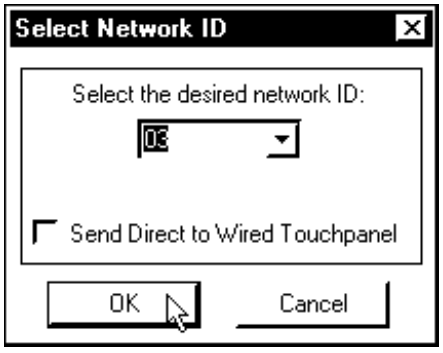
1. Make sure that "Communication Settings" that begins on page 25 has been performed.
2. As shown after this step, select **File Transfer | Update Touchpanel Firmware** from the Viewport menu.

File transfer | Update Touchpanel Firmware Command



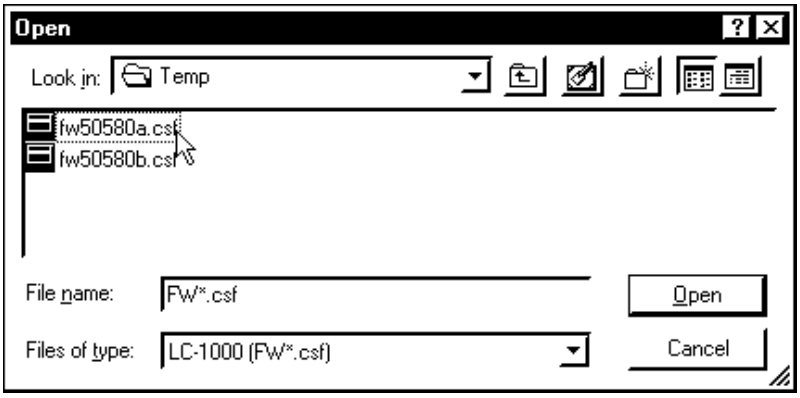
3. As shown after this step, select the NET ID of the Series 1000 touchpanel and then click **OK**. The "Open" window appears (refer to the subsequent graphic).

"Select Network ID" Window



NOTE: When transferring any Cresnet file (touchpanel project/firmware), lower the port speed baud rate to 38400 to match the Cresnet bus speed.

"Open" Window



4. Browse to the .csf file and click **Open** to begin the transfer.

Problem Solving

Troubleshooting

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

Series 1000 Touchpanel Troubleshooting

TROUBLE	POSSIBLE CAUSE(S)	CORRECTIVE ACTION
Touchpanel does not function.	Touchpanel is not communicating to the network.	Use Performance Viewport (via SIMPL Windows or VT Pro-e) to poll the network. Verify network connection to the touchpanel.
		Verify touchpanel is in "CRESNET MODE" as defined in "Interface Menu", page 8.
	Touchpanel is not receiving network power.	Confirm that power is supplied to the network.
	Touchpanel is incorrectly calibrated.	Enter "SETUP MODE" and recalibrate.
Touchpanel is not responding and screen displays "Cresnet Error" message.	Incorrect network wiring.	Touch screen to remove message and verify correct wiring to all connectors.
	Touchpanel Cresnet ID is not set to match the Net ID in the SIMPL program.	Touch screen to remove message and enter Performance Viewport (via SIMPL Windows or VT Pro-e) 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 not unique, two or more units share same ID.	Enter Performance Viewport (via SIMPL Windows or VT Pro-e) to poll the network. Verify that each ID is used once.
Touchpanel display is dark.	Standby timeout has elapsed.	Touch screen to reactivate.
	Screen brightness or contrast is improperly set.	Enter "SETUP MODE" and hold finger to touchscreen for five seconds to set the brightness to high and the contrast to a default level.
Screen is blank (either all white or all black, backlight is on).	Contrast adjustment outside visible range.	Remove power. Restore power while pressing on touchscreen (for approximately 10 seconds) until "SETUP MODE" appears.
Unexpected response from touchpanel.	Touchpanel is incorrectly calibrated.	Enter "SETUP MODE" and recalibrate.

Further Inquiries

If after reviewing this Operations Guide, you cannot locate specific information or have questions, please take advantage of Crestron's award winning customer service team by calling:

- In the US and Canada, call Crestron's corporate headquarters at 1-888-CRESTRON [1-888-273-7876].
- In Europe, call Crestron International at +32-15-50-99-50.
- In Asia, call Crestron Asia at +852-2341-2016.
- In Latin America, call Crestron Latin America at +5255-5093-2160.
- In Australia and New Zealand, call Crestron Control Solutions at +61-2-9737-8203.

Future Updates

As Crestron improves functions, adds new features, and extends the capabilities of the Series 1000 touchpanel, 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 (www.crestron.com) periodically for manual update availability and its relevance. Updates are available from the Downloads | Product Manuals section and are identified as an "Addendum" in the Download column.

Appendix: Early Production Units

Early production units ship with two mounting brackets (and other parts) that allowed the low-voltage touchpanel to be installed directly into a mounting surface. These units are provided with mounting hardware and accessories, as shown in the table after this paragraph.

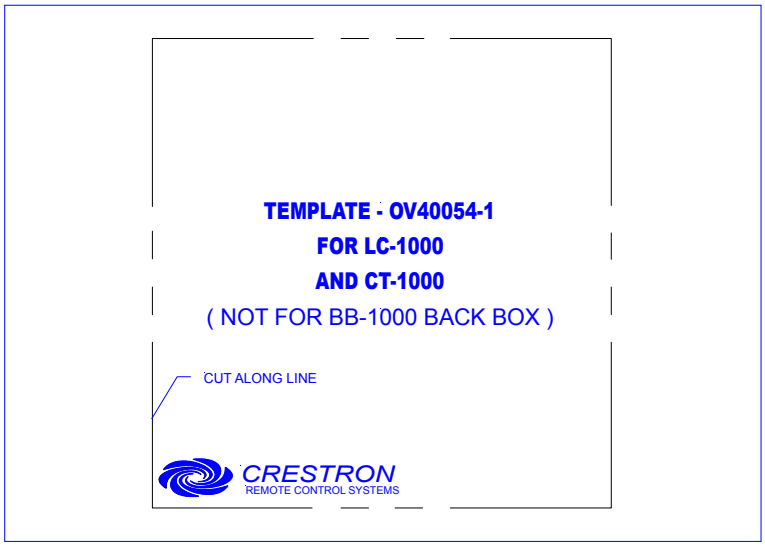
Series 1000 Supplied Mounting Hardware and Accessories (Early Production Units)

ITEM	PART NUMBER	QUANTITY
Mounting Bracket	AY17517-1	2
Template	OV40054-1	1
Screw, Pan Phillips	#4-40 x 1" LG	4
Network Connector	JHPS138SG04SR-1	1
Plastic Buttons	SWCP28292-1	10
Plastic Cover	PLCV28207-1	1

If these parts are supplied with the touchpanel and a direct mounting option is preferred, complete the following mounting procedure in the order provided. The only tools required are masking tape (or equivalent), a gypsum board saw (or equivalent), and a #2 Phillips tip screwdriver.

1. Locate an area on the wall that is free of miscellaneous wiring and studs.
2. Make a small hole near the middle of the designated site; verify that the location is suitable.
3. Using masking tape (or equivalent), fasten cutout template (40054, supplied) to mounting surface; verify that the template is level.

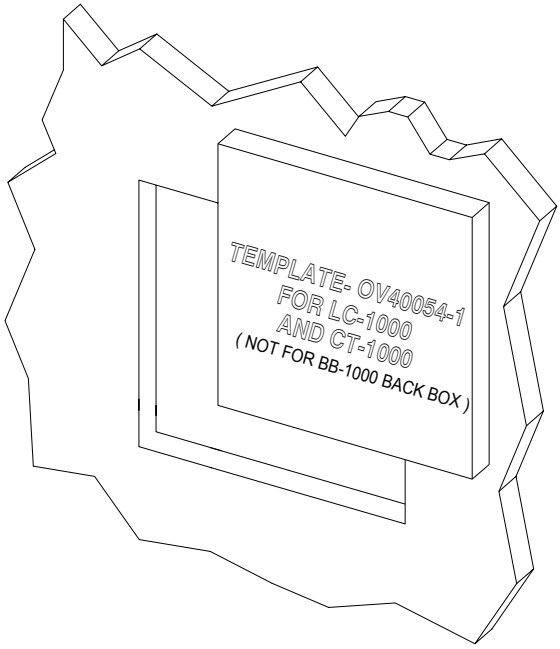
Cutout Detail of Supplied Template



NOTE: The actual cutout dimensions (shown as dashed lines) are 4 $^{3}/_{16}$ inch (106 mm) wide by 4 $^{5}/_{16}$ inch (109 mm) high. However, Crestron recommends that the supplied template be used to avoid error.

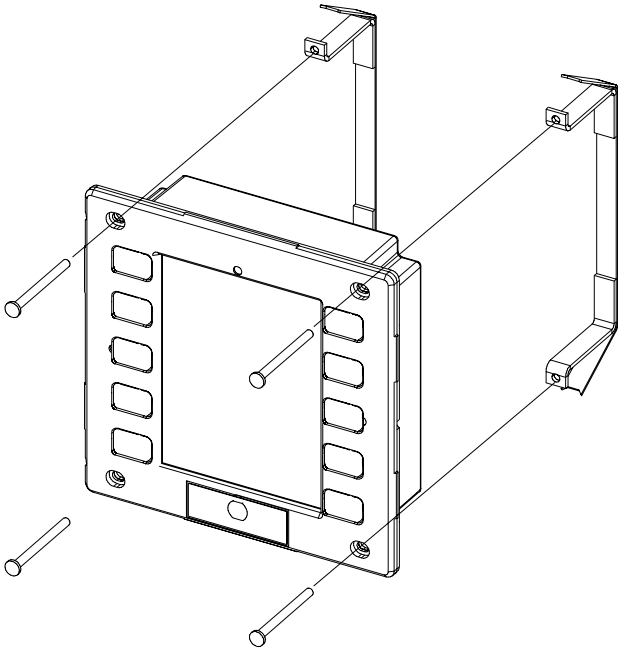
4. Cut out and remove the traced shape of the mounting surface (refer to illustration after this step).

Removing Template Cut Out



5. Use four pan head screws, supplied, to attach two mounting brackets to the touchpanel (refer to illustration after this step). Do not tighten screws. The screw threads should catch the mounting brackets, but not pass more than 1/16" through to the other side of the opening.

Mounting Bracket/Touchpanel Assembly



6. Attach the CAT 5 cable in the wall to the connector on the back of the touchpanel. Refer to “Network Wiring” on page 5 for wiring details.

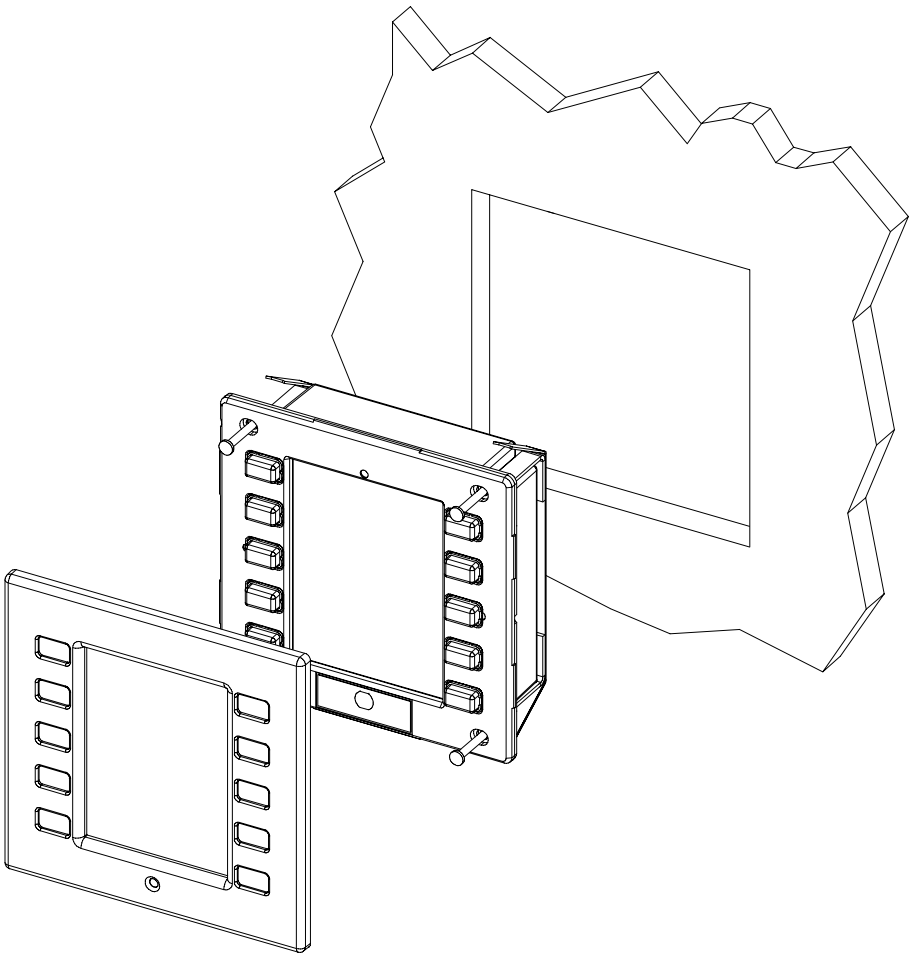
7. Position the mounting bracket/touchpanel assembly (less the plastic buttons and faceplate) over the opening and apply equal pressure on the four screw heads of the touchpanel until the assembly slides into place (refer to illustration after the last step).

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

8. Tighten four screws until mounting bracket/touchpanel assembly is secure within the opening.
9. Install the plastic buttons by firmly pressing them into place (refer to illustration after the last step). If buttons are engraved, be sure to match button engraving with button functionality.
10. Firmly press on the plastic faceplate over the touchpanel (refer to illustration after this step).

NOTE: If necessary, refer to "Touchpanel Removal" on page 13 for removal procedure.

Secure Mounting Bracket/Touchpanel Assembly and Add Plastic Buttons and Faceplate



Software License Agreement

This License Agreement ("Agreement") is a legal contract between you (either an individual or a single business entity) and Crestron Electronics, Inc. ("Crestron") for software referenced in this guide, which includes computer software and, as applicable, associated media, printed materials, and "online" or electronic documentation (the "Software").

BY INSTALLING, COPYING, OR OTHERWISE USING THE SOFTWARE, YOU REPRESENT THAT YOU ARE AN AUTHORIZED DEALER OF CRESTRON PRODUCTS OR A CRESTRON AUTHORIZED INDEPENDENT PROGRAMMER AND YOU AGREE TO BE BOUND BY THE TERMS OF THIS AGREEMENT. IF YOU DO NOT AGREE TO THE TERMS OF THIS AGREEMENT, DO NOT INSTALL OR USE THE SOFTWARE.

IF YOU HAVE PAID A FEE FOR THIS LICENSE AND DO NOT ACCEPT THE TERMS OF THIS AGREEMENT, CRESTRON WILL REFUND THE FEE TO YOU PROVIDED YOU (1) CLICK THE DO NOT ACCEPT BUTTON, (2) DO NOT INSTALL THE SOFTWARE AND (3) RETURN ALL SOFTWARE, MEDIA AND OTHER DOCUMENTATION AND MATERIALS PROVIDED WITH THE SOFTWARE TO CRESTRON AT: CRESTRON ELECTRONICS, INC., 15 VOLVO DRIVE, ROCKLEIGH, NEW JERSEY 07647, WITHIN 30 DAYS OF PAYMENT.

LICENSE TERMS

Crestron hereby grants You and You accept a nonexclusive, nontransferable license to use the Software (a) in machine readable object code together with the related explanatory written materials provided by Creston (b) on a central processing unit ("CPU") owned or leased or otherwise controlled exclusively by You, and (c) only as authorized in this Agreement and the related explanatory files and written materials provided by Crestron.

If this software requires payment for a license, you may make one backup copy of the Software, provided Yo*u*r backup copy is not installed or used on any CPU. You may not transfer the rights of this Agreement to a backup copy unless the installed copy of the Software is destroyed or otherwise inoperable and You transfer all rights in the Software.

You may not transfer the license granted pursuant to this Agreement or assign this Agreement without the express written consent of Crestron.

If this software requires payment for a license, the total number of CPU's on which all versions of the Software are installed may not exceed one per license fee (1) and no concurrent, server or network use of the Software (including any permitted back-up copies) is permitted, including but not limited to using the Software (a) either directly or through commands, data or instructions from or to another computer (b) for local, campus or wide area network, internet or web hosting services; or (c) pursuant to any rental, sharing or "service bureau" arrangement.

The Software is designed as a software development and customization tool. As such Crestron cannot and does not guarantee any results of use of the Software or that the Software will operate error free and You acknowledge that any development that You perform using the Software or Host Application is done entirely at Your own risk.

The Software is licensed and not sold. Crestron retains ownership of the Software and all copies of the Software and reserves all rights not expressly granted in writing.

OTHER LIMITATIONS

You must be an Authorized Dealer of Crestron products or a Crestron Authorized Independent Programmer to install or use the Software. If Your status as a Crestron Authorized Dealer or Crestron Authorized Independent Programmer is terminated, Your license is also terminated.

You may not rent, lease, lend, sublicense, distribute or otherwise transfer or assign any interest in or to the Software.

You may not reverse engineer, decompile, or disassemble the Software.

You agree that the Software will not be shipped, transferred or exported into any country or used in any manner prohibited by the United States Export Administration Act or any other export laws, restrictions or regulations ("Export Laws"). By downloading or installing the Software You (a) are certifying that You are not a national of Cuba, Iran, Iraq, Libya, North Korea, Sudan, or Syria or any country to which the United States embargoes goods (b) are certifying that You are not otherwise prohibited from receiving the Software and (c) You agree to comply with the Export Laws.

If any part of this Agreement is found void and unenforceable, it will not affect the validity of the balance of the Agreement, which shall remain valid and enforceable according to its terms. This Agreement may only be modified by a writing signed by an authorized officer of Crestron. Updates may be licensed to You by Crestron with additional or different terms. This is the entire agreement between Crestron and You relating to the Software and it supersedes any prior representations, discussions, undertakings, communications or advertising relating to the Software. The failure of either party to enforce any right or take any action in the event of a breach hereunder shall constitute a waiver unless expressly acknowledged and set forth in writing by the party alleged to have provided such waiver.

If You are a business or organization, You agree that upon request from Crestron or its authorized agent, You will within thirty (30) days fully document and certify that use of any and all Software at the time of the request is in conformity with Your valid licenses from Crestron of its authorized agent.

Without prejudice to any other rights, Crestron may terminate this Agreement immediately upon notice if you fail to comply with the terms and conditions of this Agreement. In such event, you must destroy all copies of the Software and all of its component parts.

PROPRIETARY RIGHTS

Copyright. All title and copyrights in and to the Software (including, without limitation, any images, photographs, animations, video, audio, music, text, and "applets" incorporated into the Software), the accompanying media and printed materials, and any copies of the Software are owned by Crestron or its suppliers. The Software is protected by copyright laws and international treaty provisions. Therefore, you must treat the Software like any other copyrighted material, subject to the provisions of this Agreement.

Submissions. Should you decide to transmit to Crestron's website by any means or by any media any materials or other information (including, without limitation, ideas, concepts or techniques for new or improved services and products), whether as information, feedback, data, questions, comments, suggestions or the like, you agree such submissions are unrestricted and shall be deemed non-confidential and you automatically grant Crestron and its assigns a non-exclusive, royalty-tree, worldwide, perpetual, irrevocable license, with the right to sublicense, to use, copy, transmit, distribute, create derivative works of, display and perform the same.

Trademarks. CRESTRON and the Swirl Logo are registered trademarks of Crestron Electronics, Inc. You shall not remove or conceal any trademark or proprietary notice of Crestron from the Software including any back-up copy.

GOVERNING LAW

This Agreement shall be governed by the laws of the State of New Jersey, without regard to conflicts of laws principles. Any disputes between the parties to the Agreement shall be brought in the state courts in Bergen County, New Jersey or the federal courts located in the District of New Jersey. The United Nations Convention on Contracts for the International Sale of Goods, shall not apply to this Agreement.

CRESTRON LIMITED WARRANTY

CRESTRON warrants that: (a) the Software will perform substantially in accordance with the published specifications for a period of ninety (90) days from the date of receipt, and (b) that any hardware accompanying the Software will be subject to its own limited warranty as stated in its accompanying written material. Crestron shall, at its option, repair or replace or refund the license fee for any Software found defective by Crestron if notified by you within the warranty period. The foregoing remedy shall be your exclusive remedy for any claim or loss arising from the Software.

CRESTRON shall not be liable to honor warranty terms if the product has been used in any application other than that for which it was intended, or if it as been subjected to misuse, accidental damage, modification, or improper installation procedures. Furthermore, this warranty does not cover any product that has had the serial number or license code altered, defaced, improperly obtained, or removed.

Notwithstanding any agreement to maintain or correct errors or defects Crestron, shall have no obligation to service or correct any error or defect that is not reproducible by Crestron or is deemed in Crestron's reasonable discretion to have resulted from (1) accident; unusual stress; neglect; misuse; failure of electric power, operation of the Software with other media not meeting or not maintained in accordance with the manufacturer's specifications; or causes other than ordinary use; (2) improper installation by anyone other than Crestron or its authorized agents of the Software that deviates from any operating procedures established by Crestron in the material and files provided to You by Crestron or its authorized agent; (3) use of the Software on unauthorized hardware; or (4) modification of, alteration of, or additions to the Software undertaken by persons other than Crestron or Crestron's authorized agents.

ANY LIABILITY OF CRESTRON FOR A DEFECTIVE COPY OF THE SOFTWARE WILL BE LIMITED EXCLUSIVELY TO REPAIR OR REPLACEMENT OF YOUR COPY OF THE SOFTWARE WITH ANOTHER COPY OR REFUND OF THE INITIAL LICENSE FEE CRESTRON RECEIVED FROM YOU FOR THE DEFECTIVE COPY OF THE PRODUCT. THIS WARRANTY SHALL BE THE SOLE AND EXCLUSIVE REMEDY TO YOU. IN NO EVENT SHALL CRESTRON BE LIABLE FOR INCIDENTAL, CONSEQUENTIAL, SPECIAL OR PUNITIVE DAMAGES OF ANY KIND (PROPERTY OR ECONOMIC DAMAGES INCLUSIVE), EVEN IF A CRESTRON REPRESENTATIVE HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES OR OF ANY CLAIM BY ANY THIRD PARTY. CRESTRON MAKES NO WARRANTIES, EXPRESS OR IMPLIED, AS TO TITLE OR INFRINGEMENT OF THIRD-PARTY RIGHTS, MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE, OR ANY OTHER WARRANTIES, NOR AUTHORIZES ANY OTHER PARTY TO OFFER ANY WARRANTIES, INCLUDING WARRANTIES OF MERCHANTABILITY FOR THIS PRODUCT. THIS WARRANTY STATEMENT SUPERSEDES ALL PREVIOUS WARRANTIES.

Return and Warranty Policies

Merchandise Returns / Repair Service

1. No merchandise may be returned for credit, exchange, or service without prior authorization from CRESTRON. To obtain warranty service for CRESTRON products, contact the factory and request an RMA (Return Merchandise Authorization) number. Enclose a note specifying the nature of the problem, name and phone number of contact person, RMA number, and return address.
2. Products may be returned for credit, exchange, or service with a CRESTRON Return Merchandise Authorization (RMA) number. Authorized returns must be shipped freight prepaid to CRESTRON, 6 Volvo Drive, Rockleigh, N.J., or its authorized subsidiaries, with RMA number clearly marked on the outside of all cartons. Shipments arriving freight collect or without an RMA number shall be subject to refusal. CRESTRON reserves the right in its sole and absolute discretion to charge a 15% restocking fee, plus shipping costs, on any products returned with an RMA.
3. Return freight charges following repair of items under warranty shall be paid by CRESTRON, shipping by standard ground carrier. In the event repairs are found to be non-warranty, return freight costs shall be paid by the purchaser.

CRESTRON Limited Warranty

CRESTRON ELECTRONICS, Inc. warrants its products to be free from manufacturing defects in materials and workmanship under normal use for a period of three (3) years from the date of purchase from CRESTRON, with the following exceptions: disk drives and any other moving or rotating mechanical parts, pan/tilt heads and power supplies are covered for a period of one (1) year; touchscreen display and overlay components are covered for 90 days; batteries and incandescent lamps are not covered.

This warranty extends to products purchased directly from CRESTRON or an authorized CRESTRON dealer. Purchasers should inquire of the dealer regarding the nature and extent of the dealer's warranty, if any.

CRESTRON shall not be liable to honor the terms of this warranty if the product has been used in any application other than that for which it was intended, or if it has been subjected to misuse, accidental damage, modification, or improper installation procedures. Furthermore, this warranty does not cover any product that has had the serial number altered, defaced, or removed.

This warranty shall be the sole and exclusive remedy to the original purchaser. In no event shall CRESTRON be liable for incidental or consequential damages of any kind (property or economic damages inclusive) arising from the sale or use of this equipment. CRESTRON is not liable for any claim made by a third party or made by the purchaser for a third party.

CRESTRON shall, at its option, repair or replace any product found defective, without charge for parts or labor. Repaired or replaced equipment and parts supplied under this warranty shall be covered only by the unexpired portion of the warranty.

Except as expressly set forth in this warranty, CRESTRON makes no other warranties, expressed or implied, nor authorizes any other party to offer any warranty, including any implied warranties of merchantability or fitness for a particular purpose. Any implied warranties that may be imposed by law are limited to the terms of this limited warranty. This warranty statement supercedes all previous warranties.

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

Operations Guide – DOC. 5813B
12.02