Crestron **Series 1600**
Wired Touchpanels

Operations & Installation Guide

CRESTRON

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

CRESTRON

Contents

Series 1600 Wired Touchpanels

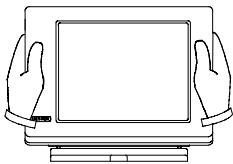## Description

Functional Description

The Series 1600 Touchpanels are 5.7-inch (14.4-cm) touchscreen control panels for any Crestron remote control system (herein referred to as the control system). There are six Series 1600 models available. Options are color versus grayscale, adjustable tiltcase versus lectern/wall mount, and "Designer Series" color cover. Model selection is based on application requirements. Refer to "Model Differences" on page 3 for a more detailed description of each.

The purpose of the Series 1600 Touchpanel is to replace large, complicated panels with a series of simpler screens, each specific to the control problem at hand. Thus, very large numbers of functions can be made available to the user without the confusion associated with hardware panels of that complexity. Series 1600's icons, graphics, and text can dramatically increase any user's comprehension of the control environment. Devices, functions, and control zones are quickly organized and more easily accessed. The Series 1600 Touchpanels offer:

- 256 color passive matrix display (color models only)

- 4 shades of grayscale FSTN transmissive mode display (grayscale models only)

- pop-up sub panels to reduce memory requirements, providing optimal speed and performance

- multiple button, slider control, and icon configurations

- up to 999 functions and 96 screens

- fast graphics performance: imported photographs, drawings, and icons

- support for downloadable fonts - proportional and non-proportional

- foreign language text

- Position Lock feature provides durable support of panel at any angle of inclination between 0 and 70 degrees (tiltcase model only).

Software

VisionTools™ Pro-e (VT Pro-e), a design and programming Windows®-based software, permits the creation of control screen variations incorporating two and three-dimensional graphics and text. A set of pages, which make up a project, can be designed for each Series 1600 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. The project is uploaded to the touchpanel and programmed into the flash PROM. The touchpanel uses the programmed project until another set is uploaded from the PC. The PC may be disconnected from the rack 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, consult the VT Pro-e help file.

Position Lock Button

Hand Position for Tilting Touchpanel to Vertical

The position lock button is centrally located at the front of the base on the Series 1600 adjustable tiltcase model. These touchpanels permit incremental angle positions indicated by audible clicks. Range of motion is adjustable for user comfort and can vary from zero inclination to 70 degrees from horizontal. Thus the user can position the touchscreen to a comfortable angle, just as a microphone can be repositioned for each speaker. The comfortable angle is herein referred to as user position. The position lock guarantees that once a user position is established or locked, the angle will not degrade from repeated presses on the touchscreen.

The touchscreen is free to move up from the horizontal to an incremental angle. Grasp the touchscreen with a hand at each side and gently tilt up to a comfortable position. To activate position lock, slightly reverse the motion until the touchpanel stops moving. Correct hand placement is shown to the left. The touchscreen is now set into user position.

Hand Position for Tilting Touchpanel to Horizontal

Once in user position, the position lock button is activated which means the touchscreen can not be forced to the horizontal position without first depressing the button. The touchscreen is still free to tilt up; a new user position is established at each increment or audible click.

The position lock button needs to be depressed before the touchscreen can be returned to the horizontal position. To depress the button, slightly position the touchscreen in the vertical direction with two hands, avoiding any tilting. The position lock button can be depressed with one hand; the touchscreen can be tilted down to the horizontal position with the other, shown to the left.

Physical Description

Tiltcase Model

The 5.7-inch (14.4-cm) touch sensitive viewing screen is located on the front of each Series 1600 Touchpanel. The electronic hardware is housed in a high impact, black molded plastic enclosure for the adjustable tiltcase configurations, shown after this paragraph. These tiltcase touchpanels are designed to be placed on a counter and possess a hinged base, which can tilt from 0 to 70 degrees. Depress the button located at the front of the base when pivoting the touchpanel to the horizontal position. A cable with a four-pin network connector at its end is attached to the base of the CT-1600 or LC-1600. Connect the cable directly to the control system.

Physical Views of Tiltcase Models

FRONT VIEW   SIDE VIEW
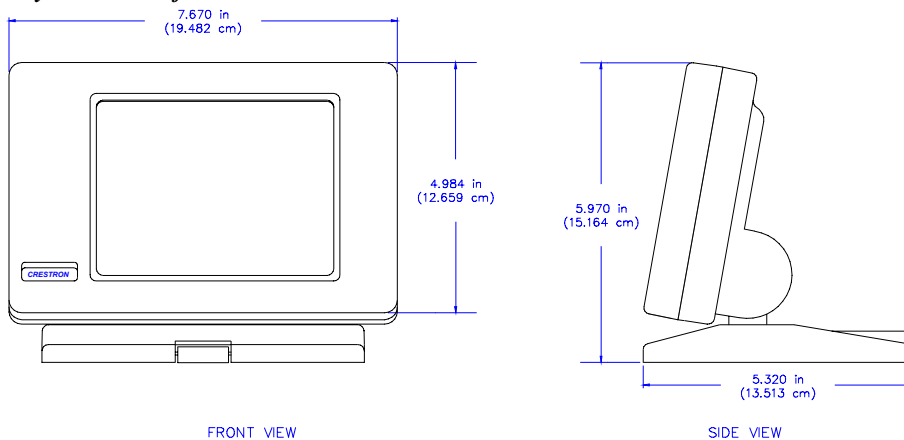
Lectern/Wall Mount Model

The lectern/wall mount models, shown after this paragraph, are housed in a black metal box topped with a plastic "Designer Series" cover. Mounting hardware is included. The four-pin network port is located on the rear of the panel.

Physical Views of Lectern/Wall Mount Models
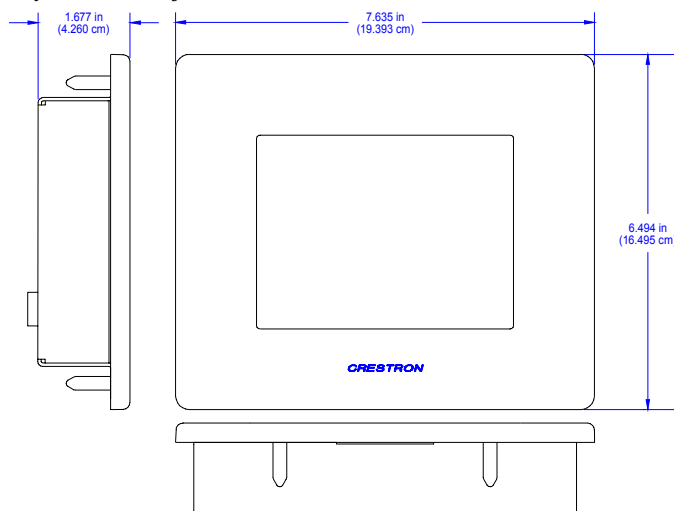
Model Differences

There are six Series 1600 models available and selection depends on type of installation (color versus grayscale, adjustable tiltcase versus lectern/wall mount, and "Designer Series" color cover). The prefix and suffix define a model. Refer to the table after this paragraph for a concise listing of Series 1600 touchpanel models.

Series 1600 Touchpanel Models

MODEL	DISPLAY	INSTALLATION	"DESIGNER SERIES"
CT-1600	256 Colors	Adjustable Tiltcase	Not Applicable
LC-1600	4 Shades of Grayscale	Adjustable Tiltcase	Not Applicable
CT-1600L/W-DB	256 Colors	Lectern/Wall Mount	Black Cover
CT-1600L/W-DW	256 Colors	Lectern/Wall Mount	White Cover
LC-1600L/W-DB	4 Shades of Grayscale	Lectern/Wall Mount	Black Cover
LC-1600L/W-DW	4 Shades of Grayscale	Lectern/Wall Mount	White Cover

Leading Specifications

The table after this paragraph provides a summary of leading specifications for the Series 1600 Touchpanels. Dimensions and weight are rounded to the nearest hundredth unit.

NOTE: Check the Crestron FTP site (www.crestron.com) periodically for the latest firmware versions. Search in the TOUCHPNL Library. New users are required to register in order to obtain access to the FTP site.

Leading Specifications for Series 1600 Touchpanels

SPECIFICATION	DETAILS
Power Requirements	6 Watts, 24 VDC 0.25 Amp
SIMPL[TM] Windows[®]	Version 1.30.01 or later[1] with library update file smwlib62.exe and update document smwlib62.txt or later
CNMSX-AV/PRO Upgrade File (.upz)	Version 50135X or later[2]
CNRACKX/-DP Upgrade File (.upz)	Version 50700W or later[2]
CNMS, CNRACK, CNLCOMP Operating System	Version 3.18.09m, l, c or later[2]
ST-CP Operating System	Version 4.00.49 or later[2]
ST-CP Monitor	Version 1.29 or later[2]
VisionTools[TM] Pro-e (VT Pro-e)	Version 2.1.0 or later[1]
Crestron Database	Version 14.01 or later[1]
Memory	768K Flash for Display
CT-1600 & LC-1600 Dimensions & Weight	Height: 5.97 in (15.16 cm)
	Width: 7.67 in (19.48 cm)
	Depth: 5.32 in (13.51 cm)
	Weight: 2.82 lb (1.28 kg)
CT-, LC-1600L/W-DB & CT-, LC-1600L/W-DW Dimensions & Weight	Height: 6.49 in (16.49 cm)
	Width: 7.64 in (19.39 cm)
	Depth: 1.68 in (4.26 cm)
	Weight: 1.71 lb (0.77 kg)
View Screen Dimensions	Height: 3.52 in (8.94 cm)
	Width: 4.65 in (11.82 cm)
Screen Viewing Angles: CT Models	$+/-50^o$ for X dir and $+40/-50^o$ for Y dir
LC Models	$+/-30^o$ for X dir and $+20/-30^o$ for Y dir
View Screen Resolution	320 x 240 pixels
View Screen LCD: CT Models	STN Transmissive color, dot matrix type
LC Models	FSTN Transmissive mode, dot matrix type
View Screen Illumination	Edgelit Fluorescent
View Screen Touch Screen	Resistive Membrane

1   The latest software versions can be obtained from the Downloads page (SIMPLWIN, TOUCHPNL, VTPRO-E, or CRESDB Libraries) of the Crestron website (www.crestron.com).

2   CNX upgrade files are required for either CNMSX-AV/Pro or CNRACKX/-DP. Filenames for CNX upgrade files have a UPZ extension and SmarTouch files are in one EXE. All can be obtained from the Downloads page (OPSYS Library) of the Crestron website.

As of the date of manufacture, the unit has been tested and found to comply with specifications for CE marking.

$C \epsilon$

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.

Installation/Setup

Identity Code

Every equipment and user interface within the network requires a unique identity code (NET ID). A two-digit hexadecimal number from 03 to FE is representative of these codes. Refer to "Setup 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 "SIMPL™ Windows® Programming" on page 11 for a sample.

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.

Network Wiring

NOTE: When making four-wire network connections, refer to the latest revision of the Cresnet Network Interconnect Drawing (Doc. 5411). The document can be obtained from the Downloads page (CABLES and MANUAL Libraries) of the Crestron website (www. crestron.com). Search for the CRESNET.PDF files.

When calculating the wire gauge for a particular network run, the length of the run and the power factor of each network unit to be connected must be taken into consideration. If network units are to be daisy-chained on the run, the power factor of each network 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

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

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 network 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.

Hardware Hookup

Due to physical differences, the lectern and tiltcase models require different hookup procedures. Furthermore, the lectern model installs simply and cleanly into existing or newly constructed walls (or other suitable mounting surface). Back box and drywall mounting options are available. The stylish, elegant design accommodates painting of its "Designer Series" cover. The necessary mounting hardware (for the drywall option) is provided with each model.

Back Box Mounting

Back box mounting, shown after this paragraph, is typically used at new construction sites. The optional back box, BB-1600, includes the necessary hardware, brackets, and electrical box, which provides a secure enclosure that, can be fastened directly to the mounting surface. This mounting method is optional and requires the BB-1600 (sold separately). Details for installation are provided in the latest revision of the BB-1600 Installation Guide (Doc. 5835).

Back Box Mounting
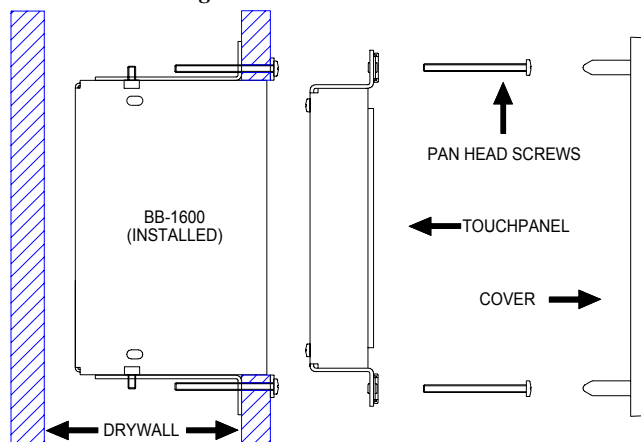
Drywall Mounting

Each Series 1600 Touchpanel is provided with four metal mounting plates (two small and two large) and eight mounting screws to fasten the panel to a mounting surface without an electrical box. Complete the following installation procedure in the order provided. The only tools required are a pencil (or equivalent), drywall saw (or equivalent), a Phillips tip screwdriver, a drill with a 5/16" bit, and a drill with a #20 bit. Refer to the illustration after this paragraph as needed.

Drywall Mounting
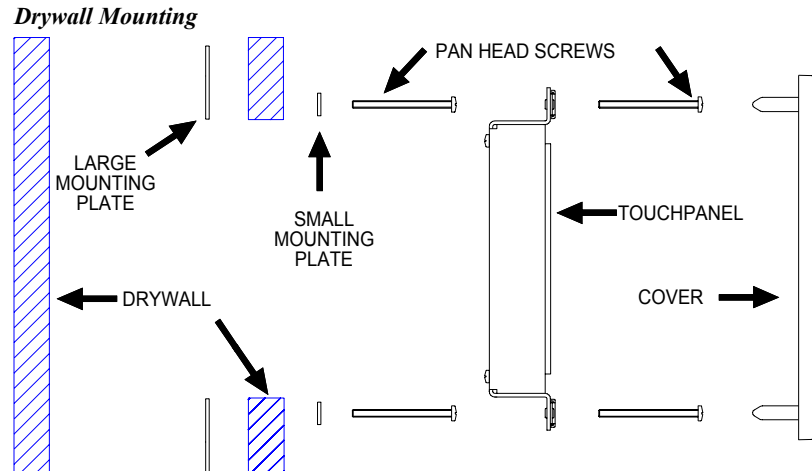
1. Locate an area on the wall clear of studs, wires, and other obstructions.

2. Make a small hole near the middle of the designated site; verify location is suitable.

3. Fasten cutout template (40048, supplied) to mounting surface; verify that the template is level.

4. Cut out and remove the traced shape of mounting surface.

5. Drill four 5/16" through holes as marked on template. Refer to "Appendix B: Cutout Detail of Supplied Template" on page 20 for an illustrative reference.

6. Drill eight holes marked "A" with #20 drill. Refer to "Appendix B: Cutout Detail of Supplied Template" on page 20 for an illustrative reference.

7. Slide one large metal mounting plate through the opening and position it inside along the top horizontal edge.

8. Position one small metal mounting plate along the outside top horizontal edge so that it covers the two center holes marked "A".

9. Use two mounting screws to secure the large and small metal mounting plates to the mounting surface.

10. Repeat steps 7 through 9 for the bottom horizontal edge of the opening.

11. Attach the network cable in the wall to the connector on the back of the touchpanel. Refer to "Network Wiring" on page 5 for wiring details.

12. Position the touchpanel (less the "Designer Series" cover) into the opening and secure with the four remaining mounting screws. Be sure the touchpanel is positioned right side up.

13. Firmly press the "Designer Series" cover evenly onto the touchpanel.

Mounting the Tiltcase Model

The CT-1600 or LC-1600 can be placed on or mounted to a flat surface. There are mounting holes on the "foot" of the touchpanel to secure the panel in a fixed position. Refer to the mounting information shown in the illustration after this paragraph for this model. Mount the touchpanel with #6-32 hardware (not supplied).

Tiltcase Model - Mounting Details
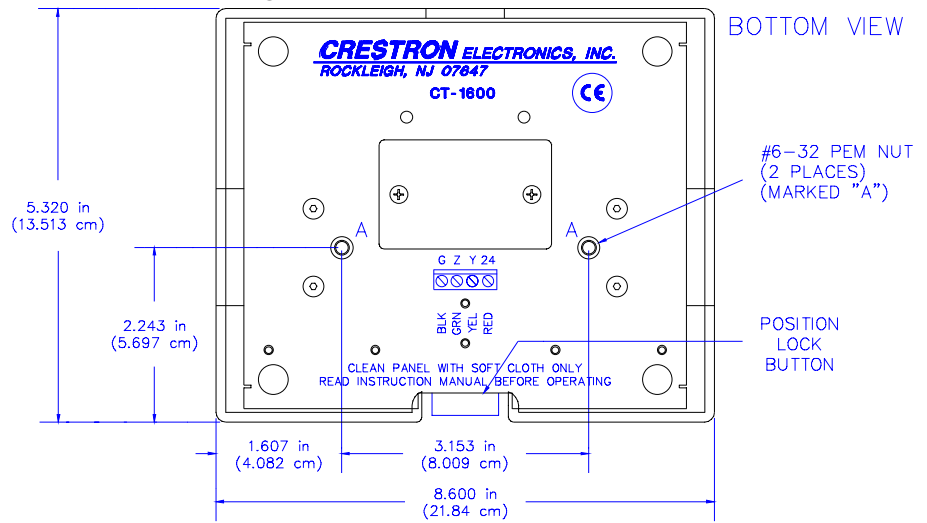
Configuring the Touchpanel

Main Menu

	SAVE SETUP AND RUN PROGRAM
TOUCH SCREEN CALIBRATION	SETUP
	DIAGNOSTICS

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. 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.

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

The **SAVE SETUP AND RUN PROGRAM** button, located at the upper right corner of the Main Menu, saves all of the setup information to EEPROM and displays the main page that has been programmed into the system.

The remaining buttons on the Main Menu open additional menus and their functionality is described in the following paragraphs.

Calibration Menu

Calibration Menu

Perform Calibration	Return to Main Menu

NOTE: When touching the screen during calibration, be as accurate as possible.

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. When touching the screen, be as accurate as possible.

If you proceed to calibrate the touchpanel, the screen prompts you with the message "Touch Screen Calibration Menu Touch Upper Left 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 Lower Right 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. A fine tipped, but not sharp, object (i.e., pen cap) should be used to get the finest possible resolution.

Diagnostics Menu

Diagnostics Menu

DISPLAY EEPROM	DISPLAY PALETTE
DISPLAY TOUCH DATA	SELF TEST
ABOUT...	RETURN

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 beyond the scope of this manual.

Setup Menu

Setup Menu

MANAGE POWER	INTERFACE	SOUND
CONT <<	CONT >>	PANEL TRACKING
BRT LOW / BRT MED / BRT HI		RETURN

To obtain the Setup Menu, shown to the left, select the **SETUP** button from the Main Menu. Many options for setting brightness, contrast, and panel tracking are directly available from the Setup Menu. This menu also provides buttons (**MANAGE POWER**, **INTERFACE**, and **SOUND**) that open submenus for specific features. After setup parameters have been set, select the **RETURN** button, located at the lower right corner of the Setup Menu.

Brightness

Screen brightness may need to be altered because of ambient light conditions or personal preference. Three brightness buttons, **BRT LOW**, **BRT MED**, and **BRT HI**, located in the bottom row of the Setup Menu may be selected to assign brightness setting. Current brightness setting is shown in red rather than black text (for CT models) or gray rather than black text (for LC models).

Contrast

Screen contrast may need to be altered because of ambient light conditions, panel temperature, or personal preference. Two contrast buttons, **CONT <<** and **CONT >>**, 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, located on the right side of the center row of the Setup Menu, is selected. Selection is indicated with red text (for CT models) or gray (for LC models). 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.

Power Management Submenu

NOTE: Display backlight requires warm-up time. A display reaches 80% of its final level in five minutes and full brightness in 20 minutes.

BACKLIGHT TIMEOUT 2 MIN.	
DOWN	UP
SAVE TIMEOUT	RETURN

The touchpanel display hardware life can be lengthened by turning off the backlight when the touchpanel is inactive. The **MANAGE POWER** button is located in the top left corner of the Setup Menu. Selection of this button changes the touchpanel display to reveal the Power Management Submenu, shown to the left.

BACKLIGHT TIMEOUT is displayed on the Timeout Submenu. This setting turns the backlight off when the touchpanel is inactive for a specified time frame (shown in minutes). When the touchpanel is activated, the last screen to be displayed reappears. A two-minute **BACKLIGHT TIMEOUT** is shown in the illustration. Minutes can vary from 0 to 120, where 0 disables the timeout. **DOWN** and **UP** buttons decrease and increase the timeout, respectively.

After the timeout parameter has been set, touch the **SAVE TIMEOUT** button in the lower left corner of the screen to save the new settings. Touch the **RETURN** button, located in the lower right corner of the screen, to display the Setup Menu.

Interface Submenu

##	< CRESNET ID	CRESNET > ID
	CRESNET II	LOCAL
	RS-232 ON	RS-232 OFF
		RS232 SETTINGS
RETURN		

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 centrally in the top row of the Setup Menu and display the Interface Submenu, shown to the left.

The Cresnet network identity number (NET ID) is displayed in the top left corner of the Interface Submenu. NET ID is the two-digit hexadecimal number represented by ## in the figure for illustrative purposes. The hexadecimal number can range from 03 to FE and must correspond to the NET ID set in the SIMPL Windows program. Matching NET IDs between touchpanel and program are required if data is to be successfully transferred or new touchpanel screens are to be loaded. NET ID is factory set to 03.

Two side-by-side buttons adjacent to the hexadecimal display, **< CRESNET ID** and **CRESNET ID >,** decrease and increase the NET 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 Submenu, **CRESNET II** and **LOCAL**, determine communication mode. Select **LOCAL** to set the touchpanel into demo mode and **CRESNET II** for normal Cresnet communication mode. Text within the selected button changes color from black to red (for CT models) or black to gray (for LC models). Communication mode is factory set to **CRESNET II**.

NOTE: RS-232 communication requires installation of a custom hardware option.

Two side-by-side buttons, **RS-232 ON** and **RS-232 OFF**, are centrally located on the Interface Submenu. RS-232 is just for external control applications. Panel loading is always available; RS-232 does not have to be on.

If the touchpanel is utilized in a system with optional RS-232 communication, ensure that the **RS-232 ON** button is selected. Additional RS-232 parameters must be set with the RS-232 Screen since alternative parameters may be required for successful
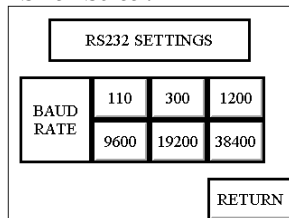
transfers to a PC. Text within the selected button changes color from black to red (for CT models) or black to gray (for LC models). **RS-232 ON** is the default setting.

RS-232 Screen

RS232 SETTINGS

BAUD RATE	110	300	1200
	9600	19200	38400

RETURN

Select the **RS-232 SETTINGS** button, located near the bottom just above the **RETURN** button of the Interface Submenu, to change the touchpanel display to the RS-232 Screen, shown to the left. The RS-232 Screen displays six baud rate buttons, labeled **110**, **300**, **1200**, **9600**, **19200**, and **38400**. The enabled baud rate is indicated with red text (for CT models) or gray text (for LC models). The unit is factory set to 38.4 Kbd.

To bring back the Interface Submenu select the **RETURN** button, located at the bottom of the RS-232 Screen, after the baud rate has been set.

To bring back the Setup Menu select the **RETURN** button, located at the bottom of the Interface Submenu, after interface parameters have been set.

Sound Submenu

Sound Submenu

KEYCLICK ON	VOLUME UP
KEYCLICK OFF	VOLUME DOWN
RETURN	
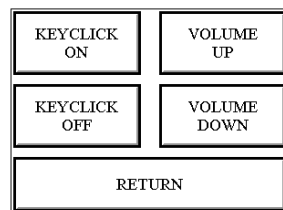
The **SOUND** button, located at the top right corner of the Setup Menu, is used to display the Sound Submenu, shown to the left. Use this screen to activate audible key clicks. This feature is a useful feedback tool. Confirmation of a button press on a touchpanel is acknowledged by an audible click assuming this feature is enabled. To enable this feature, verify that the **KEYCLICK ON** button is active (red for CT models or gray for LC models). An active **KEYCLICK OFF** button disables the feature. Volume of the audible click is controlled with the **VOLUME UP** and **VOLUME DOWN** buttons. The unit is factory set with the sound on.

Select the **RETURN** button, located at the bottom of the Sound Submenu, after sound parameters have been set.

SIMPL™ Windows® Programming

NOTE: VisionTools Pro-e (VT Pro-e) is a Windows compatible software package for creating Crestron touchpanel screen designs. Refer to "Software" on page 2 for additional details regarding VT Pro-e.

SIMPL (Symbol Intensive Master Programming Language) is an easy-to-use programming language that is completely integrated and compatible with all Crestron system hardware. The objects that are used in SIMPL are called symbols. SIMPL Windows offers drag and drop functionality in a familiar Windows® environment.

SIMPL Windows is Crestron Electronics' 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.

The next two subsections describe a sample SIMPL Windows program that utilizes a Series 1600 Touchpanel. The first subsection details how the sample program works with a textual description and block diagram. The second subsection provides a broad description of how to actually create the SIMPL Windows program.

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

NOTE: There is no need to recreate the sample SIMPL Windows program. A similar copy of this program is available from the Crestron ControlCD (version 6.2

and later) or the Crestron FTP site (www.crestron.com). Search for the CT-1600.SMW project in the SIMPL Windows Example Base (on the CD) or the EXAMPLES Library (Downloads page of the FTP site).

How the Program Works

A basic Series 1600 Touchpanel SIMPL program is shown after this paragraph in block diagram form. For this example, the CT-1600 is the user interface in a control system containing a CNMSX-PRO. Assume that the CT-1600 is used to control the state of Zone 1 in a lighting system. Zone 1 can either be turned ON or OFF or can be ramped UP or DOWN. This example program is designed expecting that the only serial strings input for Zone 1 are those in the COM port definition.

NOTE: If an earlier SIMPL Windows version is being used to program a system with the LC-1600 as the user interface, the 'LC-1600' target type may not be available. Instead, use a 'CT-1600' model or any other wired touchpanel.

Block Diagram of a SIMPL Windows Program Implementing a CT-1600
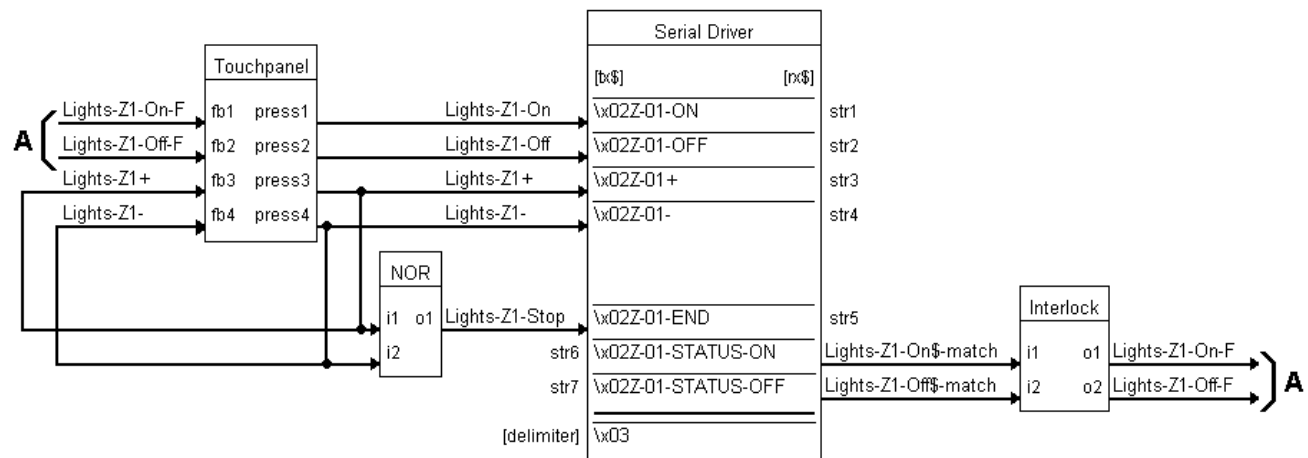
To turn the lights on, 9 bytes are sent (\x02Z-01-ON\x03). When join #1 on the touchpanel is pressed, the signal "Lights-Z1-On" goes high. When this signal goes high, the data is sent out the port to the lighting system. A similar approach is taken for "Lights-Z1-Off". These buttons have true feedback from the lighting system (i.e., when the 16 bytes (\x02Z-01-STATUS-ON\x03) enter the port, the digital signal "Lights-Z1-On-F" goes high and drives the feedback of join #1 high). In turn, this lights the feedback for the OFF button on the panel.

In order to ramp the zone, the appropriate command is sent to start the ramping operation when the UP or DOWN button is pressed. When either button is released, the output of the NOR gate goes high. This, in turn, sends the STOP command to the lighting system, telling it to halt the ramping operation in progress.

As shown in the block diagram above, it is important to note that the user does not have to define the [TX$] or [RX$] for the port. If strings are being triggered and matched only in the port, the string assignment is taken care of by the compiler. If the TX$ is defined, it can be driven by other string creation symbols (i.e., an Analog to Serial or speed key: TXA). If RX$ is defined, it can be routed to other string processing symbols (i.e. Serial Gather or speed key: GATHER). Another typical usage would be if a macro were to drive the port, then the TX$ and RX$ would come from/go to the macro definition. Refer to the help file in SIMPL Windows. From the

Contents, search on Symbol Card File or from the Index search on the names of the symbols for details.

How to Create the Program

Use the Configuration Manager workspace in SIMPL Windows to select and configure all the devices that need to be included into the system. For this example, add a CNXCOM-2 to slot #1 of the CNMSX-PRO. Also add a CT-1600 to the system; its NET ID must be set to 03, shown after this paragraph.

NOTE: SIMPL Windows v1.30.01 or later is required to program the control system containing a CT-1600 touchpanel. If using an earlier version of SIMPL Windows, Crestron recommends a SIMPL Windows and operating system upgrade. The latest version can be obtained from the Downloads page of the Crestron website (www.crestron.com). New users are required to register in order to obtain access to the FTP site.

Graphical System View of CT-1600 in SIMPL Windows' Configuration Manager
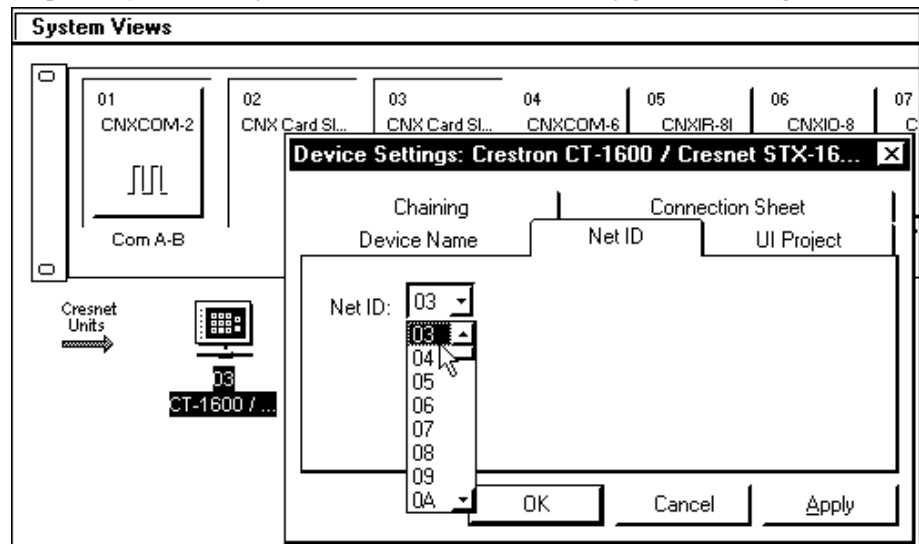
The lighting system communicates with port A of the CNXCOM-2 over RS-422 with 38400 N81 settings. These preferences for the port are set up in the Configuration Manager. Click on the CNXCOM-2 in slot #1 of the CNMSX-PRO to display the ports of the card in the *Detail System View* area of the Configuration Manager. To assign the aforementioned settings, double click on the white field in port A. The "Device Settings" dialog box opens. Confirm the parameters, shown after this paragraph.

"Device Settings" Dialog Box
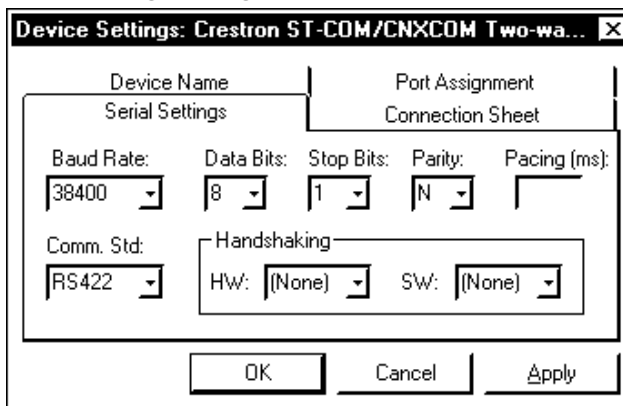
Use the Programming Manager workspace in SIMPL Windows to select symbols and assign their respective signals. For this example, a touchpanel and CNXCOM-2 symbols were added automatically when the devices were added to the system in the Configuration Manager workspace. Expand the Network Modules folder and double click on the touchpanel for a detail view (alternatively CTRL+D or drag and drop into Detail View). Assign signals as shown after this paragraph.

NOTE:
The illustration to the right was captured using an early version of SIMPL Windows.

*In SIMPL Windows v1.52.01 (and later) the touchpanel symbol has all extended functionality hidden. Right click on the touchpanel in Program Manager. One of the available options is **Insert Device Extender**. These extenders (i.e., sleep and wake) enhance the functionality of the touchpanel. Extenders are not available for older control systems (CNMS/ CNRACK/CNLCOMP/ST-CP).*

Graphical Detail View of the CT-1600 in SIMPL Windows' Programming Manager
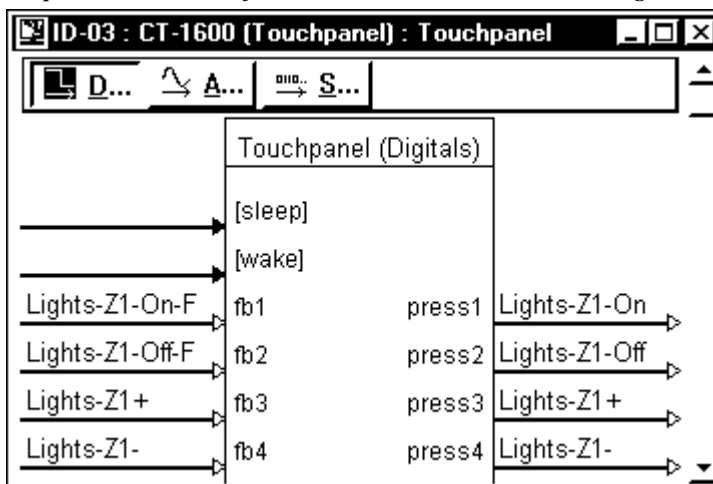
Expand the Central Control Modules and Slot-01 folders. Double click on the Port A icon for a detail view (alternatively CTRL+D or drag and drop into Detail View). Assign signals as shown after this paragraph.

Graphical Detail View of CNXCOM-2 in SIMPL Windows' Programming Manager
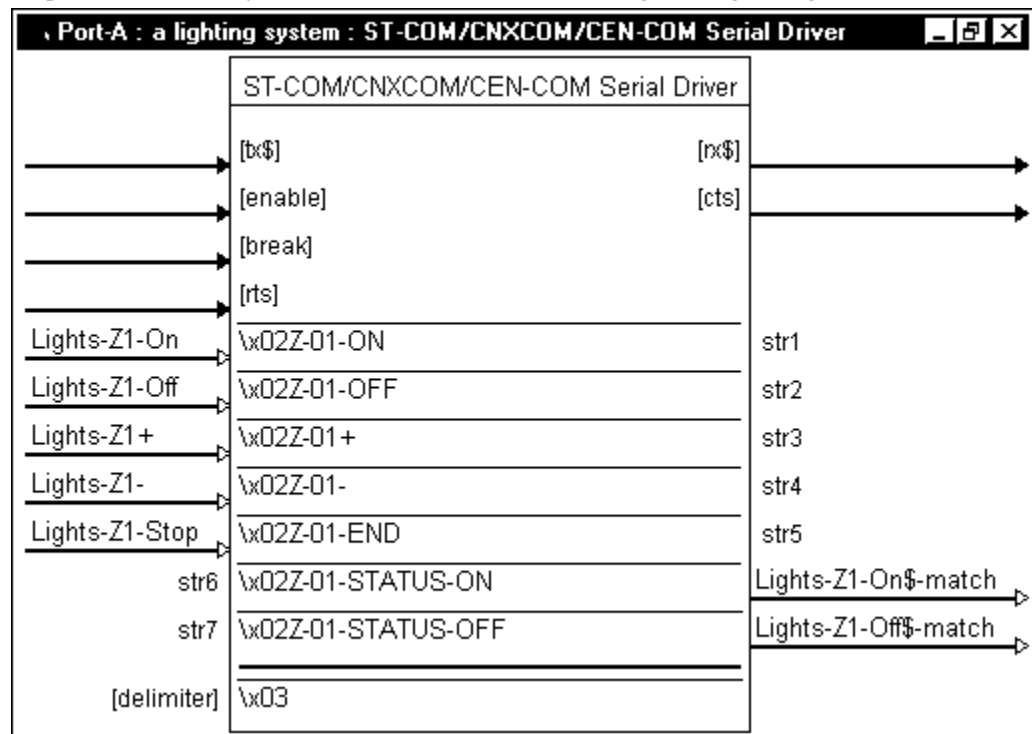
In this example, all commands are suffixed with the hex byte \x03. To save some typing, \x03 can be entered as the delimiter in the CNXCOM-2 Port A symbol. When present, the delimiter is appended to every string of text in the port definition (both transmitted and received strings).

Expand the Logic folder to display the Interlock and NOR symbols integrated into this program. View the symbols in detail view (alternatively CTRL+D or drag and drop into Detail View). Assign signals as shown after this paragraph.

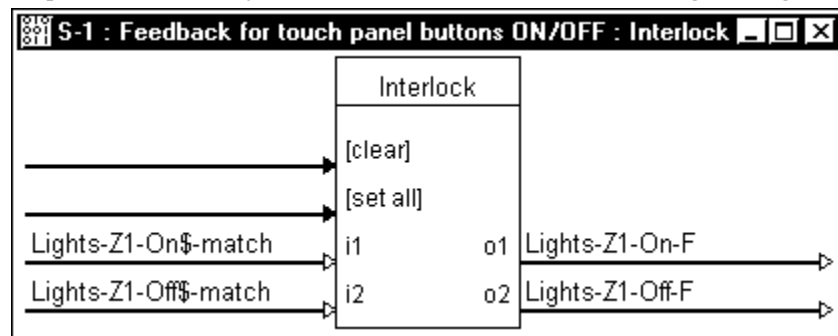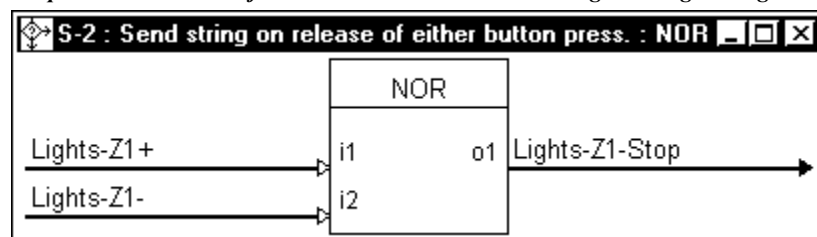*Graphical Detail View of an INTERLOCK in SIMPL Windows' Programming Manager*

Graphical Detail View of a NOR in SIMPL Windows' Programming Manager

Reserved Join Numbers

A reserved join number is a feature of the software that enables a designer to create a button on a touchpanel page that either calls up the Setup Menu, ramps brightness, etc. The table shown after this paragraph provides a list of reserved join numbers available within the software.

Reserved Join Numbers for Series 1600 Touchpanels

JOIN NUMBER	FUNCTION	VALUE
1016	Brightness	Off
1017	Brightness	Low
1018	Brightness	Medium
1019	Brightness	High
1023	Contrast	Up
1024	Contrast	Down
1035	Call up Setup Menu	Not Applicable
1160	Keyclick Volume	Up
1161	Keyclick Volume	Down
1172	Keyclick	On
1173	Keyclick	Off

Problem Solving

Troubleshooting

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

Series 1600 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 II" mode as defined in the Interface Menu of the "Configuring the Touchpanel".
	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 "Network Poll Error" message.	Incorrect network wiring.	Touch screen to remove message and verify correct wiring to all connectors.
	Touchpanel 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 NET ID for the touchpanel is properly set to match the SIMPL program.
	Touchpanel 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.

Series 1600 Touchpanel Troubleshooting (Continued)

TROUBLE	POSSIBLE CAUSE(S)	CORRECTIVE ACTION
Touchpanel display is dark.	Backlight timeout has elapsed.	Touch screen to reactivate.
	Screen brightness is improperly set.	Enter SETUP MODE and alter screen brightness from the Setup Menu.
Screen is blank (either all white or all black, backlight is on).	Contrast adjustment outside visible range.	Remove power. Restore power while pressing on screen (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 for the Series 1600 Touchpanel, 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] or 1-201-767-3400.

- 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, call Crestron Pacific at +613-9480-2999.

For local support from exclusive Crestron factory-trained personnel in New Zealand call Amber Technologies at +649-410-8382.

Future Updates

As Crestron improves functions, adds new features, and extends the capabilities of the Series 1600 Touchpanels, 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.

The Downloads page of the Crestron website (www.crestron.com) directs the reader to the location and description of each update. Check the site periodically for update availability and its subjective value.

Appendix A: RS-232 Protocol

With the addition of a custom hardware option, the Series 1600 Touchpanels support panel operation via a host computer through the RS-232 port. Crestron recommends that the following serial data format is used.

Suggested Serial Data Format

Baud Rate: 38400	Data Bits: 8	Parity: None	Stop Bits: 1

The baud rate may be altered via the RS-232 Menu when configuring the touchpanel, however, doing so may prevent Crestron supplied software from operating with the touchpanel. Low baud rates will cause the panel to appear unresponsive. For example, at 300 baud, a single button press (and release) generates 12 characters and requires more than 0.333 of a second to send. Delays as short as 0.1 of a second are generally considered perceptible and somewhat annoying.

Command Format - Command format for all items sent to or from the touchpanel is very simple. All items are ASCII strings terminated by a <cr>. Line feed characters are ignored, thus <cr><lf> or <lf><cr> are also acceptable line terminators. When the touchpanel sends a line, it is always terminated with <cr><lf>.

For all strings, the first character determines command type. Numeric arguments, if present, are in decimal and separated by commas. No control characters are embedded in the strings to ease processing the strings with high level languages. Be careful when using commas in BASIC, because BASIC uses commas for field separators when reading strings from a file using the INPUT # statement. Since we are dealing with complete lines, use the LINE INPUT # statement to cure this problem.

P<#> and R<#> Commands - When in RUN mode, pressing a button (assuming that it has been joined) generates a six-character code in the format P###<cr><lf>, where ### is a three-character decimal number in the range of 1 through 999, providing for up to 999 functions. When the button is released, a similar code is generated, with an 'R' in place of the 'P'. Given that only one button may be pressed at a time, an 'R' code always follows a 'P' code. A fixed three-digit format is used to simplify software on the host.

Codes may be sent to the touchpanel in the same form as they are received. The 'P' form activates button feedback and the 'R' form deactivates button feedback; sending back information received from the touchpanel (i.e., jumping pins 2 and 3) makes the buttons momentary. Notice that the touchpanel responds to P and R commands even when configured for other interface modes. Selecting an RS-232 interface mode merely enables P and R commands to be issued by the touchpanel when its screen is pressed. In addition, leading zeros are not required for commands sent to the touchpanel; P1, P01, and P001 are all perfectly valid commands.

Compared to running on Cresnet, an RS-232 interface to a personal computer is slower, provides less features (such as tracking, among others), is less noise immune (Cresnet uses balanced transmission for high common mode rejection, RS-232 does not), and requires the user to supply the control logic program in the PC.

V<chan>,<level> Command - Levels in gauge and slider objects may be set through the RS-232 port. The command contains both the object channel number (1-255) and level (0-65535) in decimal separated by a comma. For example, V6,32768 would set channel 6 to level 32768, or half way up.

One quick note on baud rate and smooth ramping. Ramping is accomplished by sending successive levels to the object. To do this in 64 levels over three seconds, for example, requires about 576 bytes worth of commands to be sent, and could not be

accomplished at any rate less than 2400 baud. Obviously, ramping several objects at once requires a baud rate several times as high.

Indirect Text - Series 1600 Touchpanels support a feature that permits the text field in any user-defined button to be altered on the fly in RUN mode. This is accomplished by substituting a text pointer for the text in the button. The text pointer informs the panel to use the contents of a variable that may be dynamically redefined as the text field for the button. This presents a considerable advantage over other methods in that changing screens does not destroy information and that information may be placed in buttons not currently displayed.

The text pointer is a number in the range of '1' through '127' preceded by the "pound" symbol (#). If [text…] is omitted, the text field is cleared. If [text…] exists, it is added to the text field. For example, consider the following string :

> #3Now is the time<cr>
> #3for all good men<cr>
> #3to come to the<cr>
> #3aid of the party.<cr>

Assuming that a button with an #3 text pointer was being displayed, the contents of the button would be changed to:

> Now is the time
> for all good men
> to come to the
> aid of the party.

NOTE: To clear the text field for this example, type in "#3<cr>".

As each line is entered, the display is updated. Since the text may be placed in several different buttons and borders, no boundary checking is done to see if the text fits in the button. If the text overflows the button/borders, it remains centered in the button/border.

Appendix B: Cutout Detail of Supplied Template

Use the alphanumeric codes in the illustration and table to obtain the cutout dimensions for the lectern/wall mount models when mounting without the BB-1600. However, Crestron recommends that the supplied template be used to avoid error.
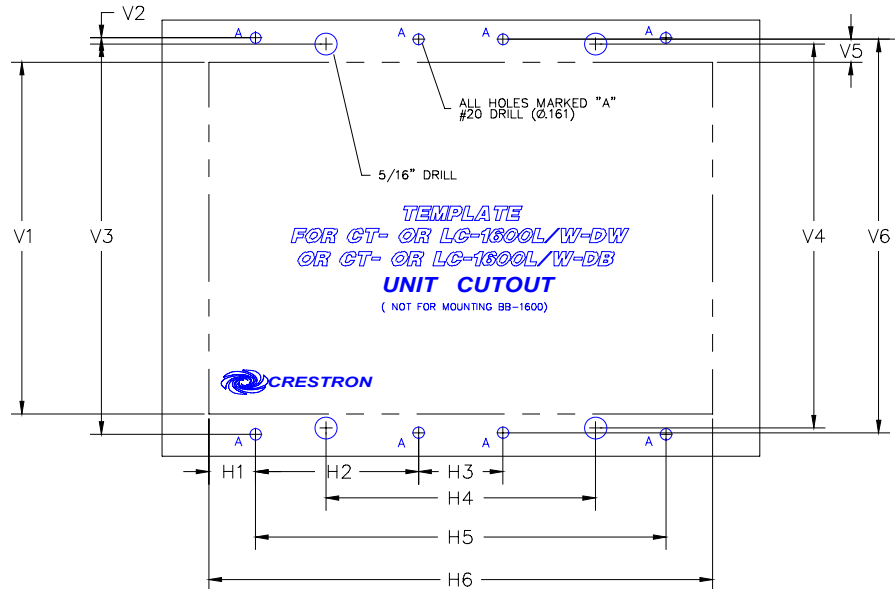
VERTICAL MEASUREMENTS		
V1	=	5.041 in (12.804 cm)
V2	=	0.089 in (0.226 cm)
V3	=	5.681 in (14.430 cm)
V4	=	5.502 in (13.975 cm)
V5	=	0.330 in (0.838 cm)
V6	=	5.638 in (14.321 cm)

HORIZONTAL MEASUREMENTS		
H1	=	0.663 in (1.684 cm)
H2	=	2.318 in (5.888 cm)
H3	=	1.200 in (3.048 cm)
H4	=	3.835 in (9.741 cm)
H5	=	5.835 in (14.821 cm)
H6	=	7.161 in (18.189 cm)

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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, Cresskill, 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.

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