

Crestron **CNX-B2/B4/B6/B8/B12**
Single Gang Keypads

Operations & Installation Guide



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



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

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Single Gang Keypads: CNX-B2/B4/B6/B8/B12

Introduction

Features and Functions

The CNX-B2/B4/B6/B8/B12-series Single Gang Keypads are wall-mounted user interfaces that can be part of a Creston[®] solution total control system. The keypads are standard Cresnet[®] devices, and provide fingertip control when the control system is properly programmed using SIMPL Windows. The number in the product's name corresponds to the number of buttons on the panel. Each of these panels is available in three colors: almond, black, and white. A letter at the end of the product name, 'A', 'B', or 'W', denotes the color; i.e., CNX-B12B is a black 12-button unit. For simplicity within this guide, the letter designating color is omitted. Furthermore, even though the CNX-B12 is featured in descriptions and illustrations throughout this guide, the information herein applies to the other keypads as well. Exceptions are noted.

NOTE: Keypads can also be mounted in groups. For more information, refer to the latest version of the B-G2-FP and B-G3-FP, Double and Triple Gang Keypads (Doc. 8182).

Functional Summary

- Ergonomic buttons are easy to read from any angle
- Backlit buttons are easy to locate
- LED indicators provide visual feedback of commands
- A speaker provides audio feedback of WAV files
- A temperature sensor reports to Cresnet for environment monitoring

The keypads feature backlit-capable ergonomic buttons and are designed for wall mounting in a standard single-gang electrical box. The keypad's colors and finishes can be used to accent a home's colors, wall coverings, or décor.

NOTE: The CNX-B12 keypad is supplied with 12 blank pushbuttons. As an option, custom-engraved keys can be designed and obtained by using the Crestron Engraver software. Version 2.0.1.5 or later is available from the Downloads | Software Updates section of the Crestron website (www.crestron.com).

NOTE: Designer series faceplates are also available for customized single-, double-, and triple-gang configurations. Contact a Crestron customer service representative for details.

NOTE: Temperature reading accuracy is affected by unit indicators and backlight state.

All buttons on the keypad are functionally identical and have associated light emitting diodes (LEDs) that serve as user feedback indicators. Each LED's illumination is independently addressable, and is programmable using SIMPL Windows. The keypad also contains a temperature sensor that reports to the Cresnet control system, and an audio speaker that can provide audio feedback via WAV sound files.

In the program, the backlight and button LED intensity levels can be set from 0 to 100%. Similarly, the speaker volume level can be set from 0 to 100%. Refer to “CNX-B12 Symbol in Programming Manager” on page 18 for details. Refer also to the note concerning temperature sensor accuracy and LED settings on page 13.

Specifications

The following table provides specifications for the keypads.

Specifications for the Keypads

SPECIFICATION	DETAILS
Power Requirements	3 Watts (0.125 Amp @ 24 VDC)
Default Network ID	60
Temperature Sensor	
Type	Linear, digital
Precision	0.18°F (0.1°C)
Accuracy	1.8°F (1.0°C) ¹
Range	32°F - 113°F (0°C - 45°C) ²
LED Type	Red, dimmable via program
Backlight Type	White, dimmable via program
Wave File Format/Size Limit	8-bit, 8Khz, PCM/512K total capacity, max. of 101 WAV files ³
Source File Format	<i>projectname. vtp</i>
Compiled File Format	<i>projectname. hex</i>
Control System Update Files ^{4, 5, 6}	
2-Series Control System Update	Version C2-1001.CUZ or later
CEN/CN-TVAV Update File	Version 5.10.13V.UPZ or later
CNMSX-AV/Pro Update File	Version 5.10.11X.UPZ or later
CNRACKX/-DP Update File	Version 5.10.11W.UPZ or later
ST-CP Update File	Version 4.02.04S.UPZ or later
Dimensions and Weight	Height: 4.76 in (12.1 cm) Width: 2.91 in (5.57 cm) Depth: 1.54 in (3.90 cm) ⁷ Weight: 2.60 oz (75 g)
Environmental Temperature	32°F - 113°F (0°C - 45°C)

1. Temperature accuracy with backlight and indicator LEDs off.
2. Sensor reads temperature in degrees Centigrade; keypad firmware converts reading to Fahrenheit.
3. The button panel can store up to 101 wav files that produce a total maximum of approximately 60 seconds playback.

4. The latest software versions can be obtained from the Downloads | Software Updates section of the Crestron website (www.crestron.com). Refer to the NOTE following these footnotes.
5. Crestron 2-Series control systems include the AV2, CP2/CP2E, MP2/MP2E, PAC2, PRO2 and RACK2.
6. 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 sure you are using the update file with the correct suffix letter (e.g., S, V, W, X).
7. The depth of the Keypad is listed without the Cresnet connector (approximately 0.45 in) **plus** clearance for the wiring.

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

Physical Description

Refer to the figures on pages 5 and 6. The number of buttons on a keypad can be 2, 4, 6, 8, or 12. They are arranged numerically from left to right, top to bottom and each has an associated LED window.

NOTE: The *Keypad Physical Views* illustrations show examples of 12-button and 8-button keypads; other models have different configurations. Refer to the button arrangement illustration on page 19.

The removable faceplate and divider attach to the button unit once it is mounted.

Each keypad has a button unit with a membrane switch, a rear speaker, and a male Cresnet network port labeled 24 Y Z G. The port provides for operating power and for communications to/from the keypad.

Keypad Physical Views

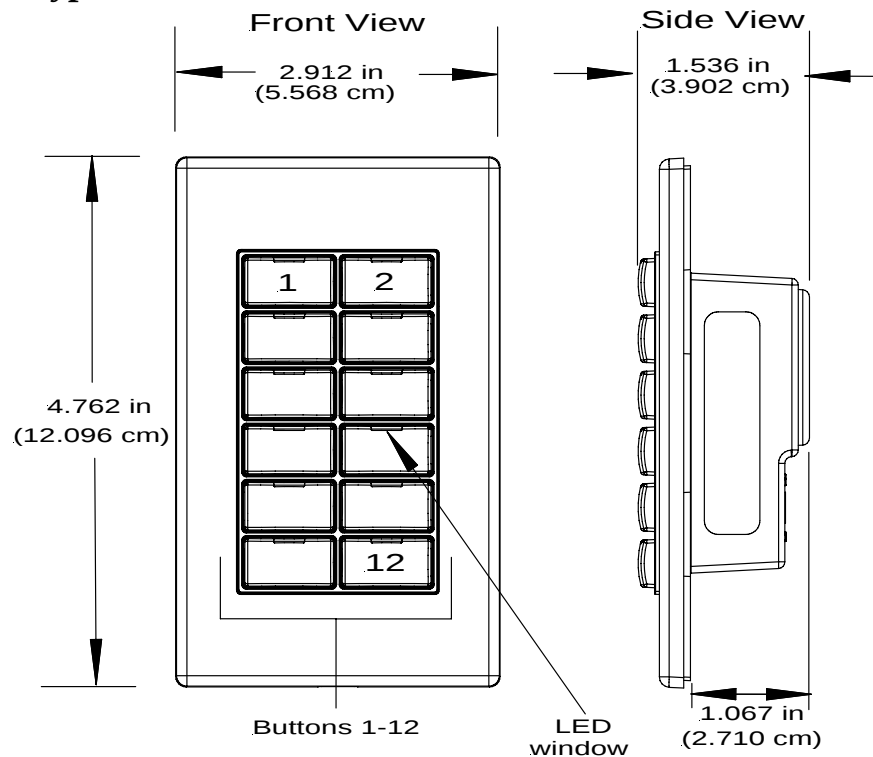


12-button Model
(White Color)



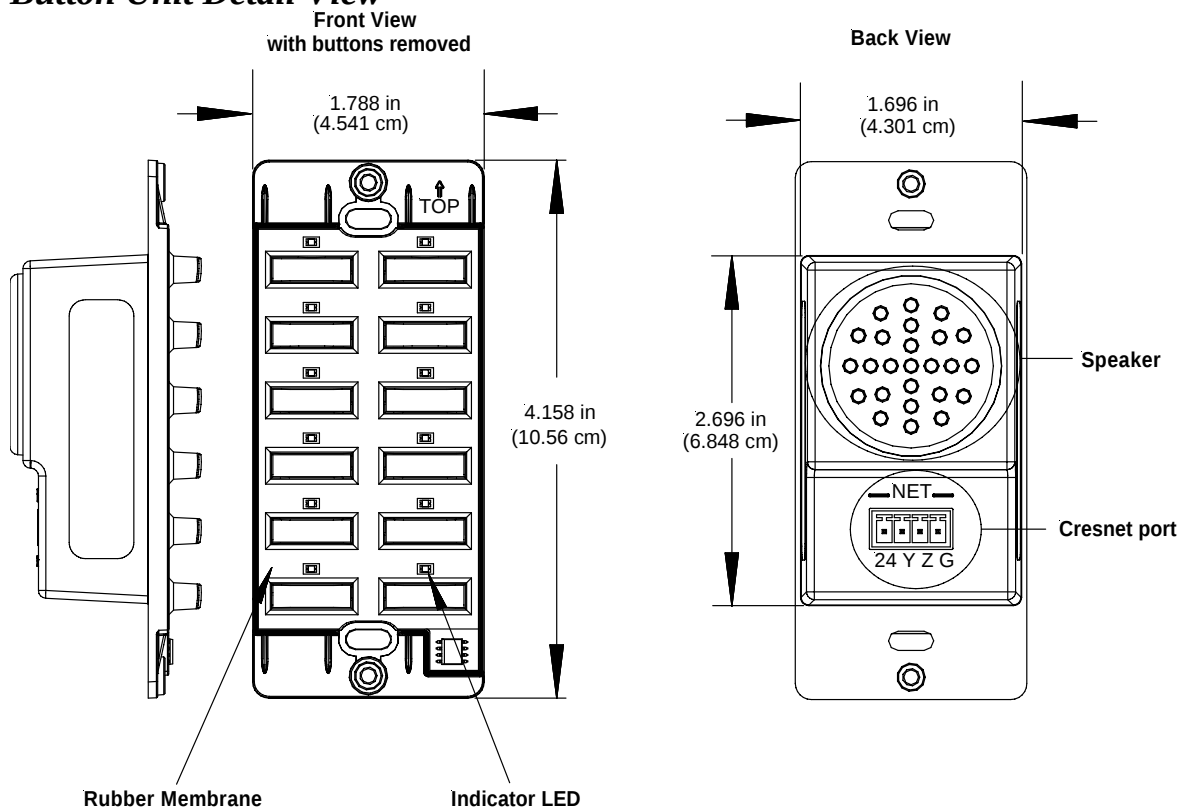
8-button Model
(Black Color)

Keypad Overall Dimensions

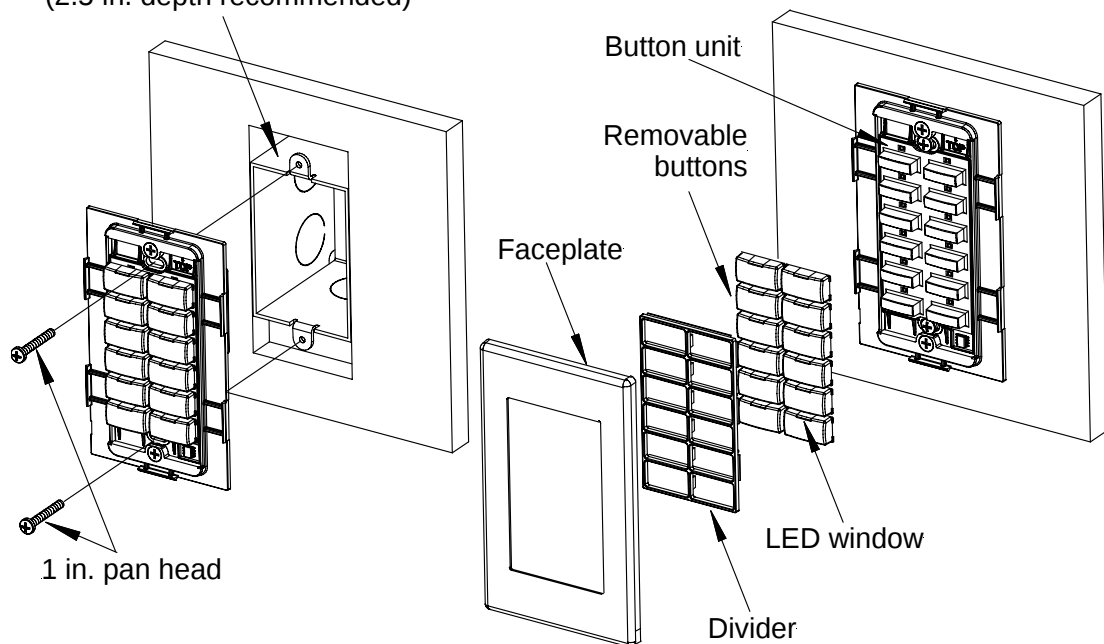


NOTE: Illustration is for 12-button keypad,
other models have fewer buttons.
Button numbers are for programming purposes only.

Refer to the illustrations on page 19 for more button arrangement details.

Button Unit Detail View**Installation View**

Single gang electrical box
(2.5 in. depth recommended)



Industry Compliance

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



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

Setup

Network Wiring

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

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

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

When calculating the length of wire for a particular Cresnet run, the wire gauge and the Cresnet power usage of each network unit to be connected must be taken into consideration. Use Crestron Certified Wire only. If Cresnet units are to be daisy-chained on the run, the Cresnet power usage of each network unit to be daisy-chained must be added together to determine the Cresnet power usage of the entire chain. If the unit is

home-run from a Crestron system power supply network port, the Cresnet power usage of that unit is the Cresnet power usage of the entire run. The wire gauge and the Cresnet power usage of the run should be used in the following equation to calculate the cable length value on the equation's left side.

Cable Length Equation

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

Where: L = Length of run (or chain) in feet
R = 6 Ohms (Crestron Certified Wire: 18 AWG (0.75 MM²))
or 1.6 Ohms (Cresnet HP: 12 AWG (4 MM²))
P = Cresnet power usage of entire run (or chain)

Make sure the cable length value is less than the value calculated on the right side of the equation. For example, a Cresnet run using 18 AWG Crestron Certified Wire and drawing 20 watts should not have a length of run more than 333 feet. If Cresnet HP is used for the same run, its length could extend to 1250 feet.

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

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

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

Identity Code

Every equipment and user interface within the network requires a unique identity code (NET ID). These codes are recognized by a two-digit

hexadecimal number from 03 to FE. The NET ID of each unit must match an ID code 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.

Refer to the note on page 22 for a definition of Viewport.

The NET ID of the keypad has been factory set to **60**. The NET IDs of multiple keypads in the same system must be unique. NET IDs are changed from a personal computer (PC) via the Crestron Viewport.

NOTE: For detailed information on establishing communication between the PC and control system, refer to “Communication Settings” on page 23. If communication cannot be established, refer to the “Troubleshooting Communications” section in the respective Operations Guide for the control system.

There are two different methods—Method A or Method B—for setting the keypad NET IDs:

Method A (Cresnet address-settable ID), described below, must be used for keypads with firmware prior to version 1.06, but can be used with later versions of firmware and requires that a single keypad be the only network device connected to the control system.

Method B (Touch Settable IDs), which begins on page 10, applies to keypads with firmware version 1.06 or later, in a Cresnet system with 2-Series control system upgrade file (CUZ) version 3.008 or later. These upgrades enable Touch Settable ID (TSID) functionality, which makes it possible for the control system to recognize a network device via its serial number, which is stored in the device’s memory. This method does not require that any devices be disconnected from the network; NET IDs may be set with the entire Cresnet system intact. *However, the serial number must have been entered when the firmware was upgraded to version 1.06, either at the factory or in the field.*

Use the appropriate method to set the keypad NET ID.

Method A (Cresnet address-settable ID)

1. Ensure that the keypad is the only device connected to the control system.
2. Open the Crestron Viewport.

3. From the Viewport menu, select **Functions | Set Network ID**. The software checks the baud rate and then opens the "Set Network ID" window.
4. In the "Set Network ID" window, select the CNX-B12 from the *Current Network Devices* text window.
5. Select the new NET ID for the keypad from the *Choose the new network ID for the selected device (Hex):* text box.
6. Click **Set ID** to initiate the change. This will display the "ID command has been sent" window.
7. In the "Command Complete" window, click **OK**.
8. In the *Current Network Devices* text window, verify the new NET ID code.
9. In the "Set Network ID" window, click **Close**.

NOTE: The new NET ID code may also be verified by selecting **Diagnostic | Report Network Devices** in the Viewport (alternately, select **F4**).

10. Repeat this procedure for each keypad to be added to the system.

Method B (Touch Settable IDs)

Before using this method, you should have a list of all current network devices and their Net IDs, to avoid assigning duplicate IDs.

Set Net ID via D3 Pro

Version 1.0 of this program includes procedures that enable setting the Net ID by touching any button of a set of keypads. Refer to the extensive help information provided with the software file for instructions.

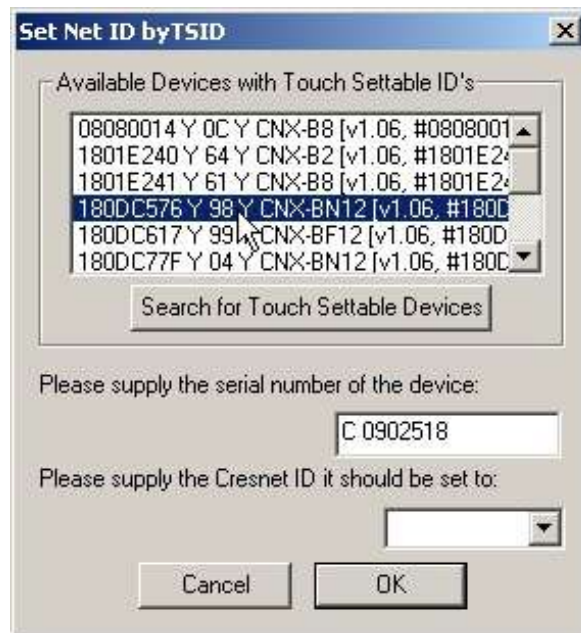
Set Net ID by TSID

These procedures are for TSID-enabled network devices during the initial configuration of a Cresnet system or when such devices are being added/replaced.

1. Ensure that all keypads are connected to the control system.
2. Open the Crestron Viewport version 3.35 or later.

3. From the Viewport menu, select **Functions | Assign Cresnet ID by Serial Number**. The “Set Net ID by TSID” window appears. The window is first displayed with the data fields empty.
 - When you click on the **Search for Touch Settable Devices** button, the system searches the network and lists all TSID-enabled devices found, as shown in the figure below.
 - This information is similar to the report produced by pressing **F4** (Report Network Devices); the first eight digits of each line constitute the TSID number (hexadecimal form of the serial number).

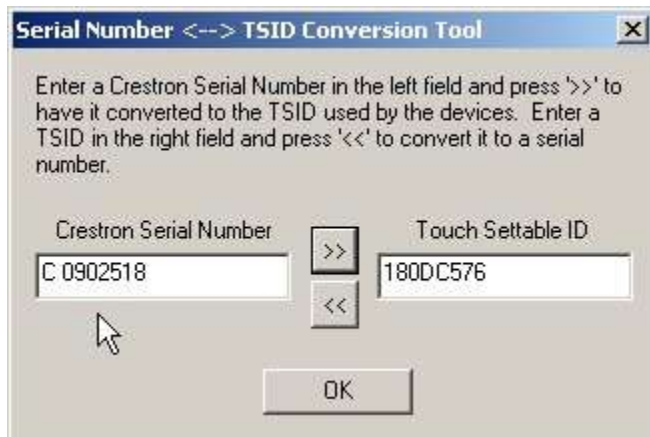
Set Net ID by TSID Window



Serial Number to TSID Conversion

If you know the device serial number, but not its TSID number, or you know the TSID but not the serial number, do the following:

1. Open the Crestron Viewport.
2. From the Viewport menu, select **Functions | Serial Number ↔ TSID Conversion Tool**. The “Serial Number ↔ TSID Conversion Tool” window is displayed.

Serial Number to TSID Conversion Tool Window

3. Enter the serial number or TSID number as instructed; press the appropriate button to obtain the corresponding number.

Installation

The following tools/hardware are required for installation:

- Cresnet network cable (not supplied)
- Phillips screwdriver (not supplied)
- Two 1 in. pan head Phillips screws (supplied)
- Insulation (not supplied)

NOTE: The insulation will protect the sensor from any in-wall conditions (such as drafts, etc.). Use type in compliance with local codes.

After the Cresnet network wiring has been installed and verified, use the following procedure to install the keypad in a standard, single-gang electrical box (refer to illustrations on pages 5 and 6).

1. Turn Cresnet system power **OFF**.
2. Connect the Cresnet cable with supplied mate to the keypad's Cresnet port and the other end to the control system.
3. Insert insulation in electrical box (make sure it fills void of box not occupied by keypad).

CAUTION: Excess wire pinched between the keypad and electrical box could short out. Make sure that all excess wire is completely inside the electrical box and not between the box and the keypad.

4. Make sure button unit is oriented as marked with arrow at top, and place it in the electrical box.
5. Attach button unit using the supplied 1 in. pan head screws.
6. Attach buttons with LED window oriented upward to match each LED indicator.
7. Attach divider and faceplate (orient with arrow up). Make sure faceplate snaps in position.
8. Turn Cresnet system power **ON**.

NOTE: The heat from the button LEDs can affect the reading of the temperature sensor. Thus, the accuracy of the sensor depends on the installation, and the number and intensity of LEDs that are on at a given time. If the unit is operated for about an hour with the typical number of LEDs lit and the backlight feature off, a constant offset can be determined and added to the SIMPL program to compensate for this effect, allowing you to calibrate the accuracy of the sensor to within about 3.6°F (2° C). You can also compensate for heat from the backlight, but this may result in a larger inaccuracy after a change in backlight state until the unit reaches a steady-state temperature.

Programming Software

*Have a
comment about
Crestron
software?*

*Direct
software
related
suggestions
and/or
complaints to
Crestron via
email*

*([software@
crestron.com](mailto:software@crestron.com)).*

*Do not forward
any queries to
this address.*

*Instead refer to
“Further
Inquiries” on
page 34 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. Crestron 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 Crestron Vision Tools[®] 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 and templates. 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).

NOTE: You can also use VT Pro-e to create WAV file programs (for sound) in the keypads.

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

- (Optional) Application Builder version 1.0.17 or later. Requires SIMPL Windows.
- (Optional) D3 Pro version 1.0 or later.
- SIMPL Windows version 2.01.05 or later. Requires SIMPL+[®] Cross Compiler version 1.1.
- VT Pro-e version 2.4 or later.
- Crestron Database version 15.7.2 or later.
- (Optional) Crestron Engraver version 2.0.1.5 or later.

Programming with Crestron AppBuilder or D3 Pro

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

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

Crestron D3 Pro similarly offers automatic programming for lighting, HVAC, and security.

Both Crestron AppBuilder and D3 Pro are fully integrated with Crestron's suite of software development tools, including SIMPL Windows, VT Pro-e, and the Crestron Database. Both access 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.

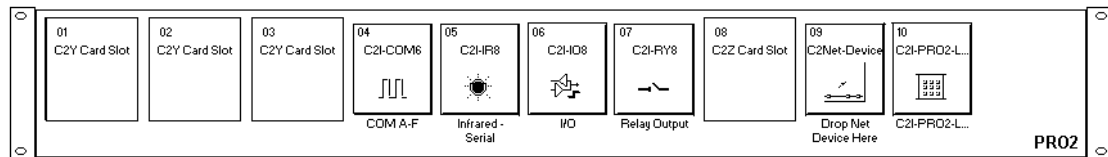
SIMPL Windows is Crestron's software for programming Crestron control systems. It provides a well-designed graphical environment with

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 explains how to create a SIMPL Windows program that includes a single gang keypad.

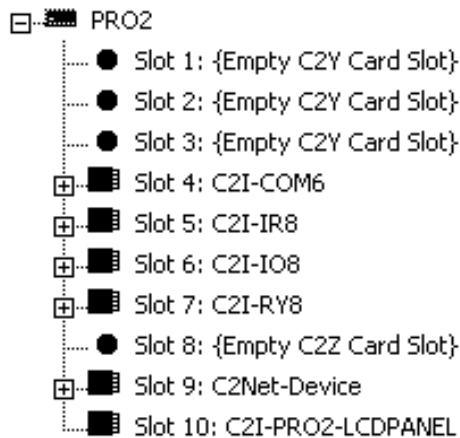
Configuration Manager is where programmers “build” a Crestron control system by selecting hardware from the *Device Library*. In Configuration Manager, drag the PRO2 from the Control Systems folder of the *Device Library* and drop it in the upper pane of the *System Views*. The PRO2 with its associated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

PRO2 System View



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

Expanded PRO2 System Tree

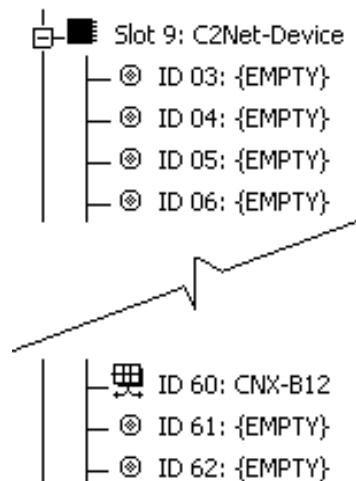


C2Net-Device Slot in Configuration Manager

To incorporate a CNX-B12 into the system, drag the CNX-B12 from the Wired Keypad folder of the *Device Library* and drop it in *System Views*. The PRO2 system tree displays the CNX-B12 in Slot 9, with a default NET ID of 60 as shown in the illustration on the next page.

NOTE: The first CNX-B12 in a system is preset with a NET ID of 60 when its symbol is dragged into the upper pane of *System Views*. Additional units are assigned different NET ID numbers as they are added.

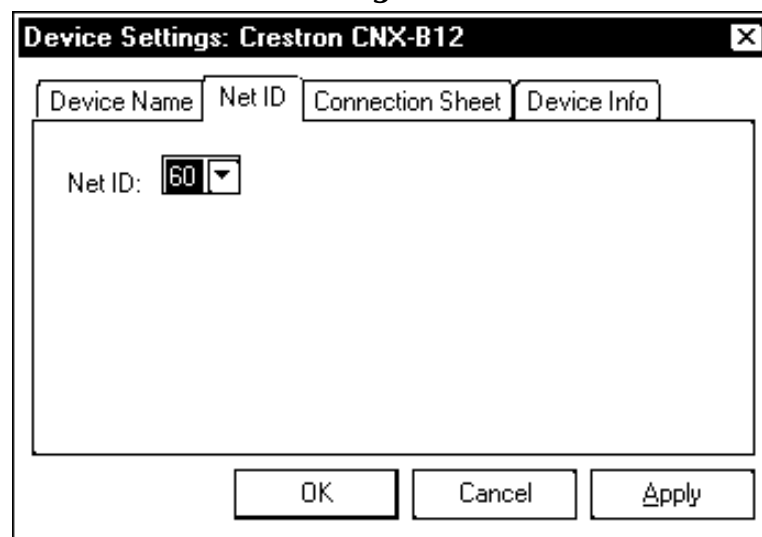
C2Net Device, Slot 9



Setting the Net ID in Device Settings

Double-click the CNX-B12 icon in the upper pane to open the “Device Settings” window. This window displays CNX-B12 device information. The NET ID can be changed in this window using the *NET ID* tab, as shown in the following figure.

CNX-B12 Device Settings Window



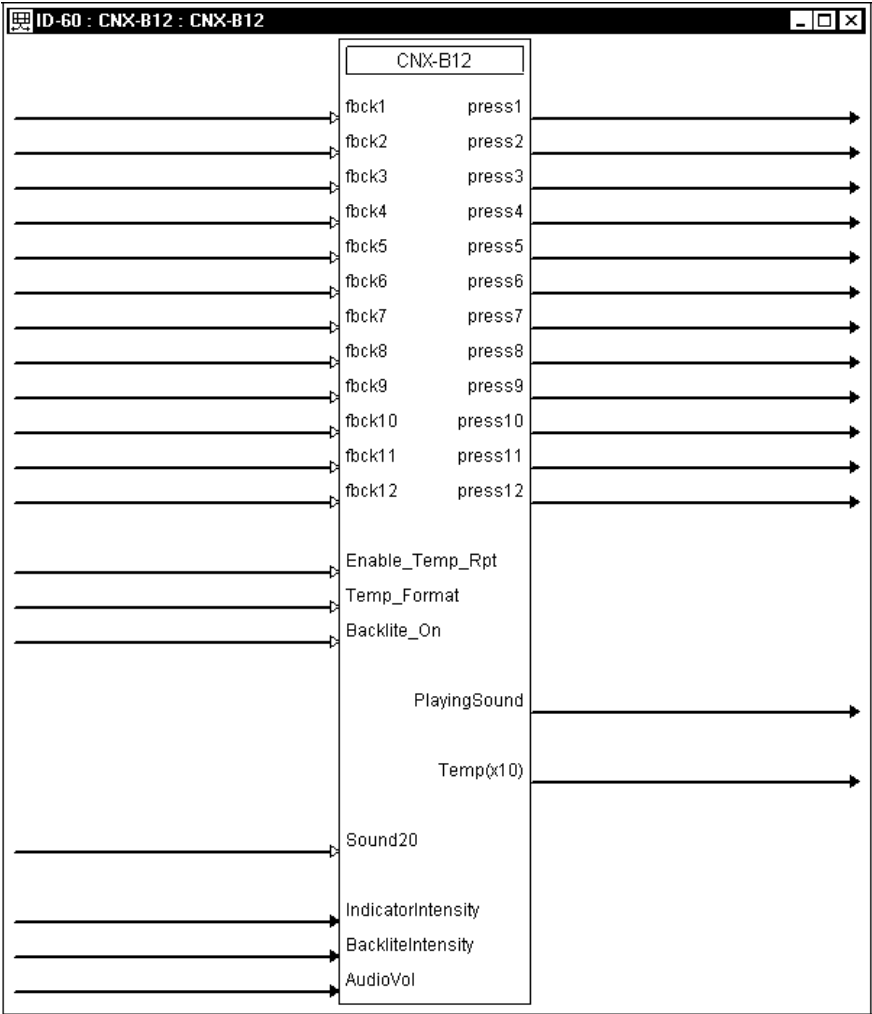
NOTE: This procedure sets the NET ID for the CNX-B12 in the program only. It does not automatically set the NET ID for the keypad itself.

SIMPL Windows automatically changes NET ID values of a device added to a program if a duplicate device or a device with the same NET ID already exists in the program. Always ensure that the hardware and software settings of the NET ID match. For NET ID hardware setting details, refer to “Identity Code” on page 8.

CNX-B12 Symbol in Programming Manager

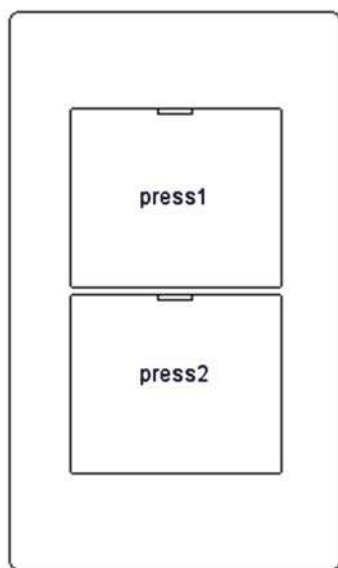
Programming Manager is where programmers “program” a Creston control system by assigning signals to symbols. The following graphic shows the CNX-B12 symbol in the SIMPL Windows Programming Manager.

CNX-B12 symbol in SIMPL Windows Programming Manager

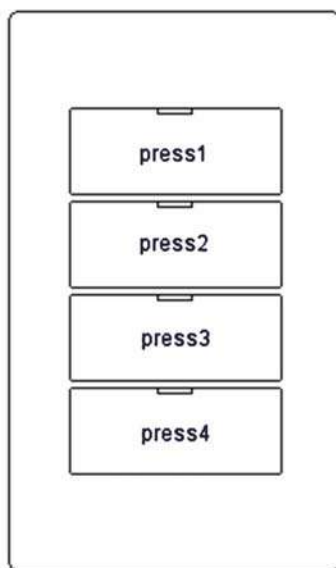


NOTE: In the symbol, the number of press and fbck (feedback)—outputs and inputs, respectively—correspond to the number of buttons in a given keypad. For example, a CNX-B8 has press1-8 and fbck1-8 only in its symbol. The illustration below shows the button arrangement for the keypads

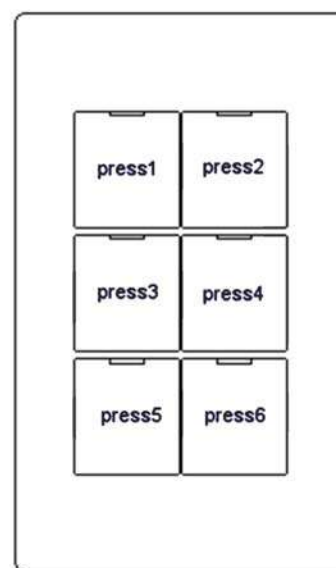
Button Arrangement of CNX-B Series Keypads (Front Views)



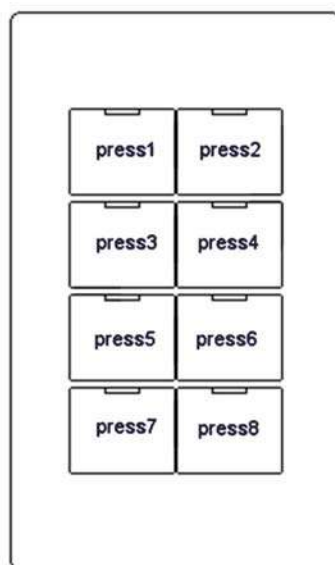
CNX-B2



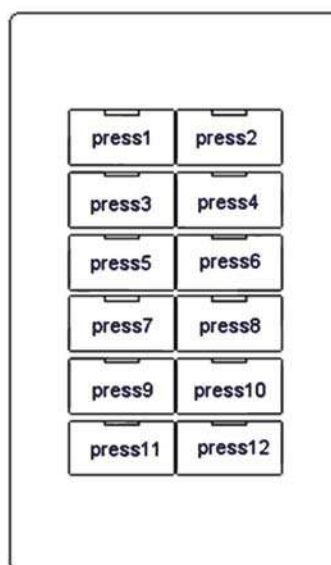
CNX-B4



CNX-B6



CNX-B8



CNX-B12

The following two tables list the symbol inputs and outputs, respectively, and their functional descriptions.

NOTE: All signals listed in the tables are DIGITAL unless noted. A digital signal can be high (logic level of 1) or low (logic level of 0), and have rising edge (low to high) transitions, and falling edge (high to low) transitions.

CNX-B12 Symbol Input Signal Descriptions

INPUT	DESCRIPTION
fbck1 thru fbck12	Activates feedback LEDs 1-12. High/1=function feedback On Low/0=function feedback Off
Enable_Temp_Rpt	Enables temperature reporting to control system. High/1=reporting enable Low/0=reporting disable
Temp_Format	Controls temperature format. High/1=Celsius Low/0=Fahrenheit
BackliteON	Activates backlight. High/1=On Low/0=Off
Sound20-120*	Activates sound file specified by the corresponding join number in VT Pro-e. Rising edge starts sound file.
IndicatorIntensity (analog)	Controls LED indicator intensity. Ramp Level=0-100% (If no signal is connected, default is 100%.)
BackliteIntensity (analog)	Controls backlight intensity. Ramp Level=0-100% (If no signal is connected, default is 100%.)
AudioVol (analog)	Controls audio volume thru speaker. Ramp Level=0-100% (If no signal is connected, default is 0%.)

*Sound20 is the sound assignment to join20. Sounds must be assigned in VT Pro-e and the resulting project loaded. The compiled file incorporating all relevant WAV files is xxx.hex. Refer to the VT Pro-e help file for more information. To create additional sound symbols in SIMPL Windows, right click on the CNX-B12 symbol and select *Insert Symbol/Parameter Field* (alternatively, select **Alt +**).

CNX-B12 Symbol Output Signal Descriptions

OUTPUT	DESCRIPTION
press1 thru press12	Notifies control system of button press (1-12). High/1=press On Low/0=press Off
PlayingSound	Notifies control system that sound file is playing. High/1=playing Low/0=not playing
Temp(x10) (analog)	Reports ambient temperature every 2 seconds (Enable_Temp_Rpt must be High/1). Units are tenths of a degree, e.g. 685 is 68.5 degrees.

NOTE: The join assignments for panels with fewer than 12 buttons and feedback LEDs do not change.

Example Program

An example program for the keypad is available from the Crestron FTP site (<ftp://ftp.crestron.com/Examples>). Search for CNX-B12.SMW.

Programming with VT Pro-e

The CNX-B12 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 CNX-B12 keypad accepts only the following WAV file format: **PCM, 8KHz, mono, 8 bit**. For more information about how to use Sound Recorder, refer to its User's Guide and extensive help information provided with the software. Also, refer to the help file in VT Pro-e to learn how to use its audio tool, Sound Manager, to attach WAV files to a keypad project.

Pre-recorded WAV files for voice prompts and responses can be obtained from the Wave Library of the Crestron FTP site (<ftp://ftp.crestron.com>).

These files can be stored into and programmed for use in the keypad directly or may be edited with the Sound Recorder. For example, the individual files can be combined to create custom messages.

To play WAV files, a CNX-B12 project must be created in VT Pro-e (with the WAV files and correct join numbers as part of the project).

NOTE: If you need to create WAV files, refer to Windows Help (Using Sound Recorder).

NOTE: The following are acceptable file extensions for WAV file programs developed for the keypads:

.vtp *projectname.vtp* (source file)
.hex *projectname.hex* (compiled file)

NOTE: Join numbers assigned to a WAV file in VT Pro-e begin at 20 because join numbers below 20 are already assigned to other keypad buttons or functions.

NOTE: When you begin to create a new keypad program, note that you cannot assign pages or sub pages (because keypads have no screen). Instead, use **Tools | Sound Manager** from the VT Pro-e menu bar to create the program and assign joins to the WAV files, etc.

Once the project is created, use **File | Upload Project** from the VT Pro-e main menu to load it in the CNX-B12. For more information, refer to the VT Pro-e help file.

NOTE: This can be done after an identity code (NET ID) is assigned to the keypad (page 8) or after installation (page 12).

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 and/or keypads 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: The Crestron Viewport is available as a pull-down command from SIMPL Windows and VT Pro-e (**Tools | Viewport**), or as a standalone utility. 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 or a VT Pro-e project, or upgrade the firmware of the CNX-B12. However, before attempting to upload or upgrade, it is necessary to establish communications.

Communication Settings

NOTE: For laptops and other PCs without a built-in RS-232 port, Crestron recommends the use of PCMCIA cards, rather than USB-to-serial adapters. If a USB-to-serial adapter must be used, Crestron has tested the following devices with good results:

Belkin (large model) F5U103
I/O Gear GUC232A
Keyspan USA-19QW

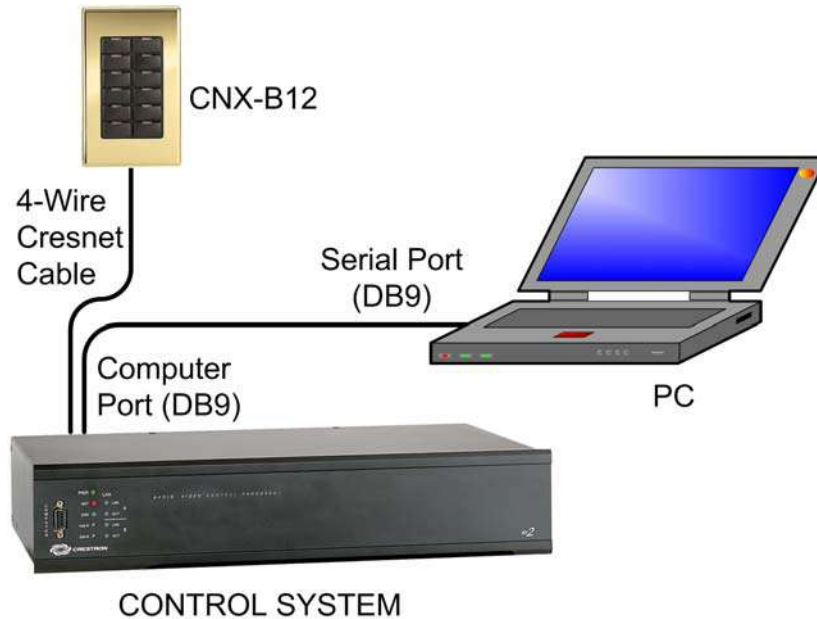
Other models, even from the same manufacturer, may not yield the same results.

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

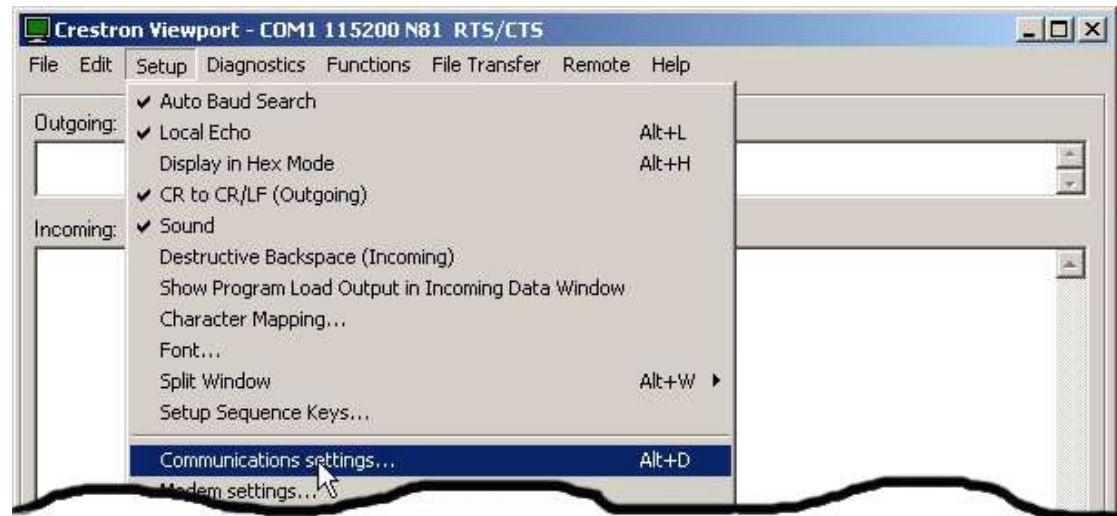
Guide (Doc. 6052) or the respective Operations Guide for the control system. These documents are available from the Downloads | Product Manuals section of the Crestron website (www.crestron.com). Refer to the figure below for a typical connection diagram when uploading files.

Note: Use a standard DB9 male to female “straight-through” cable.

Typical Connection Diagram when Uploading



1. Start SIMPL Windows.
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

The "Port Settings" window is a dialog box with a title bar containing a close button. It contains several sections of settings:

- Connection Type:** Two radio buttons: ☒ RS-232 and ☐ TCP/IP (Crestron Terminal Protocol).
- Port:** Eight radio buttons arranged in two rows: Com 1, Com 2, Com 3, Com 4 (top row); Com 5, Com 6, Com 7, Com 8 (bottom row). Com 1 is selected.
- Baud Rate:** Two rows of radio buttons: 115200, 57600, 38400, 19200, 9600 (top row); 4800, 2400, 1200, 600, 300 (bottom row). 115200 is selected.
- Parity:** Three radio buttons: None, Even, Odd. None is selected.
- Data Bits:** Two radio buttons: Seven, Eight. Eight is selected.
- Stop Bits:** Two radio buttons: One, Two. One is selected.
- Flow Control:** Two checkboxes: ☐ XON/XOFF and ☒ RTS/CTS.
- Line Pacing for ASCII Uploads (in milliseconds):** A text input field containing the value 0.
- Mode for Network Transfers:** Two radio buttons: ASCII and XModem. XModem is selected.
- Buttons:** OK and Cancel buttons at the bottom.

NOTE: The parameters shown in the illustration above are the port settings for a 2-Series 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

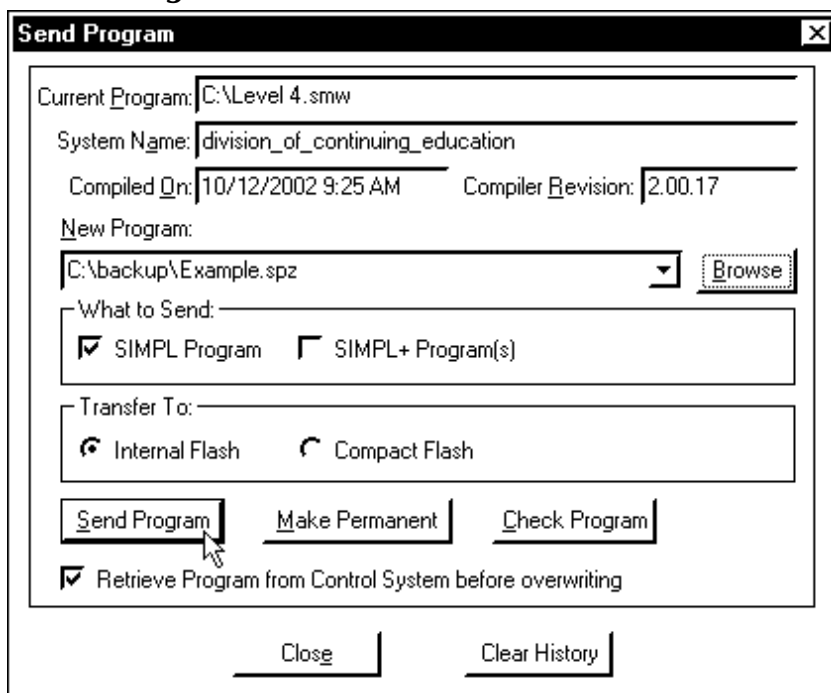
1. Verify that the procedure for “Communication Settings” that begins on page 23 has been performed.
2. As shown after this step, select **File Transfer | Send Program** (alternatively, press **Alt+P**) from the Viewport menu bar.

File Transfer | Send Program Command



3. The “Send Program” window appears, as shown on the next page. 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+ Program(s)* 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 WAV File Project

The VT Pro-e project file can be uploaded to the keypad using VT Pro-e or via the Crestron Viewport.

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 (.hex), and click **Open**.
3. Select **File | Upload Project**.

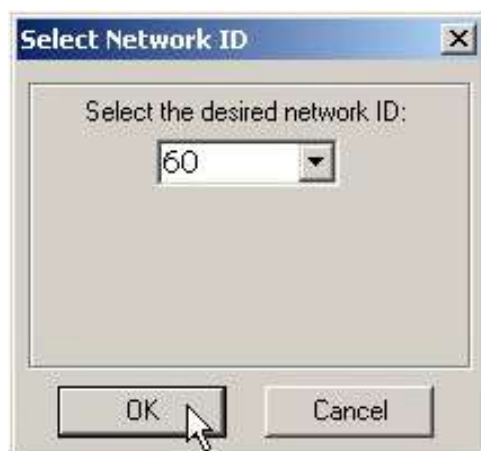
Upload via Crestron Viewport

1. Verify that the procedure for “Communication Settings” that begins on page 23 has been performed.
2. As shown after this step, select **File Transfer | Send Touchpanel** from the Viewport menu.

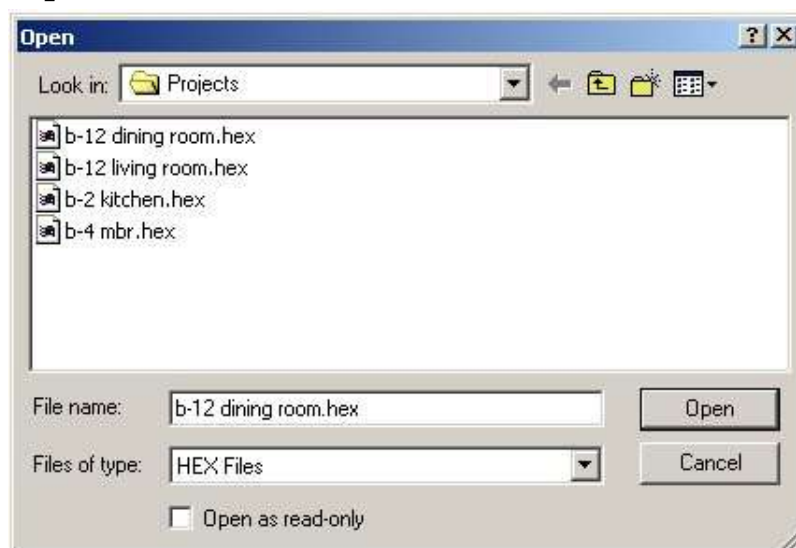
The CNX-B12 keypad source file has the extension .vtp. A compiled VT Pro-e file has the extension hex.

File Transfer | Send Touchpanel Command

3. As shown after this step, select the NET ID of the CNX-B12 keypad and then click **OK**. The “Open” window appears (refer to graphic below).

“Select Network ID” Window

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

“Open” Window

5. Select the VT Pro-e (hex) file and click **Open**. The transfer will complete automatically.

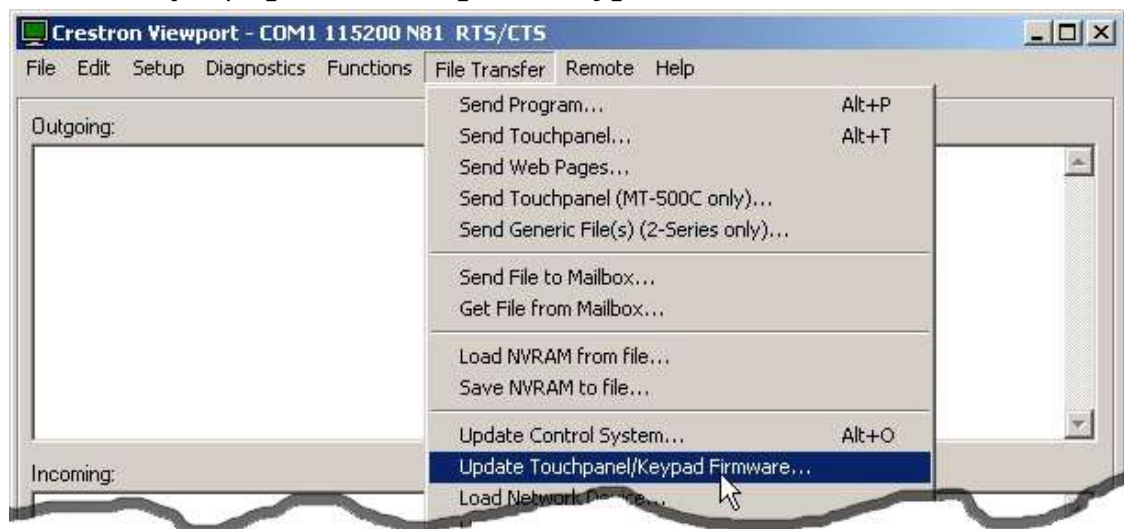
Firmware Upgrade

A firmware upgrade file has the extension .csf.

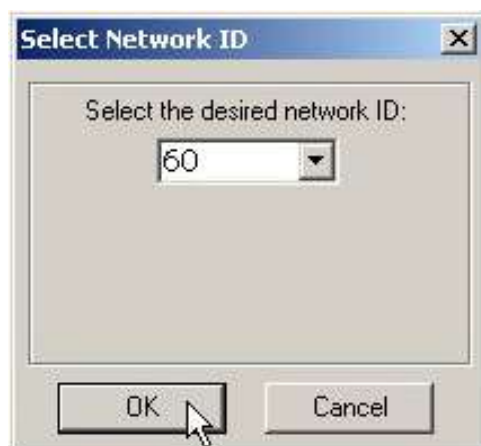
To take advantage of all the CNX-B12 features, it is important that the unit contains the latest firmware available. Please check the Crestron website (http://www.crestron.com/downloads/software_updates.asp) for the latest version of firmware. Not every product has a firmware upgrade, but as Crestron 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 23 has been performed.
2. As shown after this step, select **File Transfer | Update Touchpanel/Keypad Firmware** from the Viewport menu bar.

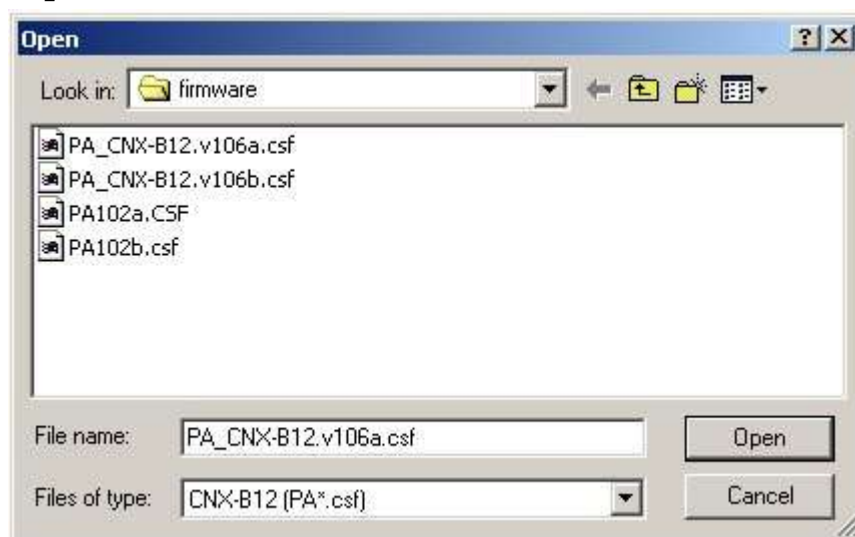
File Transfer | Update Touchpanel/Keypad Firmware Command



3. As shown in the “Select Network ID” window, select the NET ID of the CNX-B12, and then click **OK**. The “Open” window appears (refer to the graphics on the next page).

“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

NOTE: Firmware upgrades to the button panel include two files, [filename]**a**.csf and [filename]**b**.csf. Select the ‘**a**’ file to begin the upload; the ‘**b**’ file is loaded automatically.

4. Browse to the desired [filename]a.csf file and click **Open** to begin the transfer. The program automatically sends the ‘a’ file and then the ‘b’ file.

Serial Number Assignment

These procedures are to be used for keypads that just received a firmware upgrade enabling TSID support where it was not previously available.

1. Open the Crestron Viewport.
2. From the Viewport menu, select **Functions | Assign Serial Number**. The “Serial Number Assignment” window appears.

Serial Number Assignment Window



3. Enter the device serial number exactly as it appears on the device label.
4. Use the drop-down list to change the current Cresnet ID.

NOTE: Do not select the *Broadcast* check box unless your device is the only device of its type on the network.

5. Click **Send** to store the serial number and NET ID information into the keypad’s memory.

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.

Keypad Troubleshooting

TROUBLE	POSSIBLE CAUSE(S)	CORRECTIVE ACTION
Keypad does not function when a button is pressed.	Incorrect power supply.	Use a Crestron power supply.
	Keypad is not receiving power.	Check wiring connection to unit.
	Keypad Net ID is not correct.	In Viewport, poll the network (F4) to verify Net ID.
	Keypad Net ID is not set to match the Net ID set in the SIMPL Windows program.	Verify SIMPL Windows program for setting Net ID.
	Keypad Net ID is the same as another device's Net ID.	Assign a different Net ID in SIMPL Windows and reset unit using Viewport.
Pressing button yields wrong result.	Keypad is mounted upside down.	Check keypad orientation.
	Keypad programmed incorrectly.	Check programming in SIMPL Windows.
Keypad functions but LED indicator does not illuminate.	Feedback signal names incorrect in SIMPL Windows program.	Verify SIMPL Windows program for feedback signal names.
	LED intensity set to 0 (zero).	Set intensity to desired level.
No sound from speaker.	Feedback audio signal not present.	Verify VT Pro-e program for feedback audio signals.
	Volume set to 0 (zero).	Set volume to desired level.

Further Inquiries

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

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

Future Updates

As Crestron improves functions, adds new features, and extends the capabilities of the single gang keypads, additional information and programming examples may be made available as manual updates. These updates are solely electronic and serve as intermediary supplements prior to the release of a complete technical documentation revision.

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

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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.

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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.

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

**Operations & Installation Guide - DOC. 8173A
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