

Crestron **CNECI-4A**  
Electrical Control Interface with AC  

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Operations Guide



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# Electrical Control Interface with AC: CNECI-4A

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## Description

### Functional Description

The Electrical Control Interface with AC, CNECI-4A, is a wall-mounted interface for AC powered devices such as drapes, screens, and lifts. It is nearly identical to the CNECI-4 but the exception is that it draws operating power from an AC line that is independent of Cresnet<sup>®</sup> system power. This allows for stand-alone operation prior to (and regardless of) connection to a Cresnet system.

The CNECI-4A contains four single-pole, double-throw relays for Cresnet system power control. Using the SIMPL Windows program of the Cresnet system, the relays are programmed for basic operation or in any combination or sequence. Each of the relays has two common (COM) terminals (that are electrically connected), one normally-open (NO) contact, and one normally-closed (NC) contact. A signal from the Cresnet system (digital high) energizes the relay and a corresponding LED illuminates.

The LOCAL INPUTS connector is a nine-pin connector, eight input pins and one ground. A closure from any input pin to ground provides an input to the Cresnet system. These input closures are programmed to control the relays and/or other control system function.

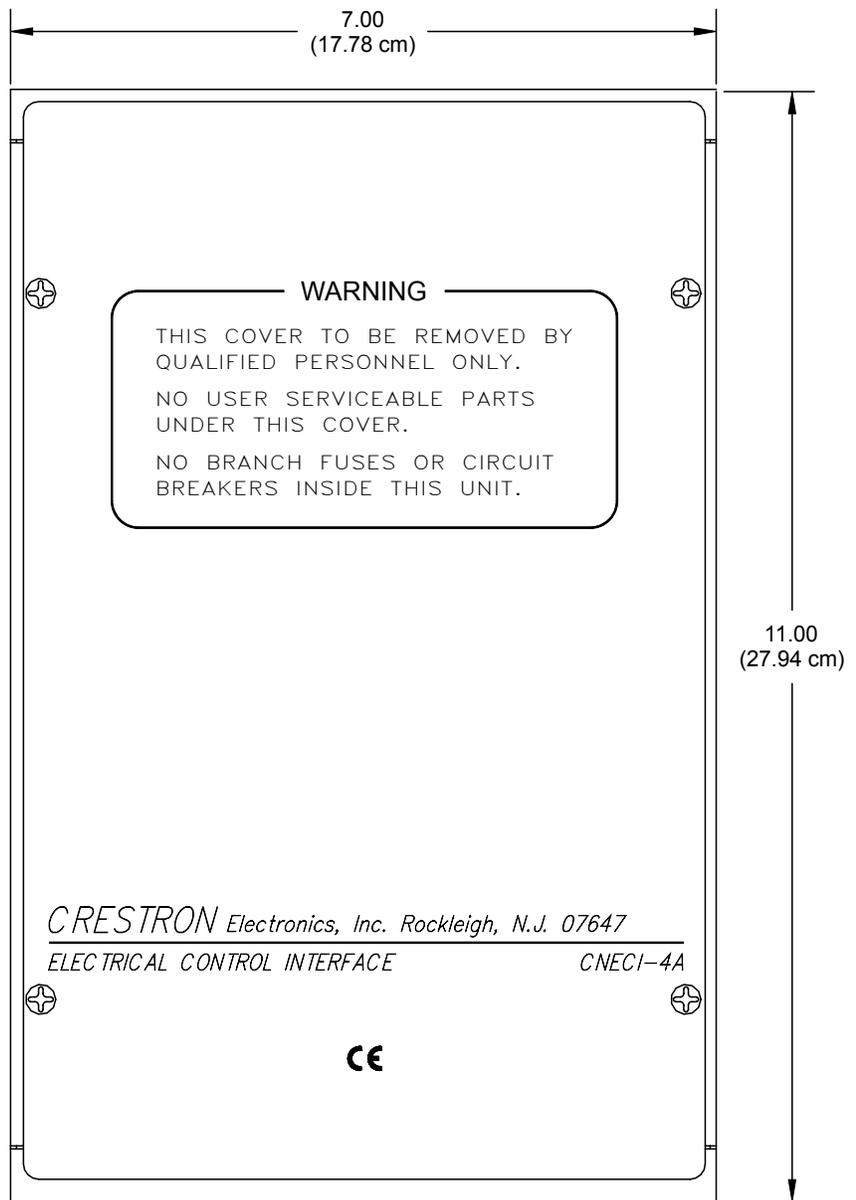
The CNECI-4A operates from an AC power feed. The voltage is selectable from 100-125VAC or 220-250VAC. The CNECI-4A may be installed and operated in this mode via the LOCAL INPUTS by applying a momentary closure to ground to alternately latch and unlatch the corresponding relays. Upon establishing communication with the Cresnet system, the LOCAL INPUTS act as control inputs to the system. Through the NET connector, the +24V Cresnet system power serves as back-up power to energize the relays if the AC power is not available.

If Cresnet system communications are not available while the +24V or the AC voltage is maintained, the relays may still be operated from LOCAL INPUTS pins 1 through 4. The closure to ground may be supplied from mechanical switches or Cresnet system I/O cards to operate the relays.

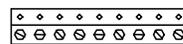
### Physical Description

The CNECI-4A is housed in a gray, metal enclosure with silk-screened labels on the front cover. All connections are made to the internal PCB through enclosure conduit knock-outs that are located on the top, left-side, and bottom of the enclosure. Also supplied is one 4-position terminal block and one 9-position terminal block. Refer to the physical view and the PCB components diagrams after this paragraph:

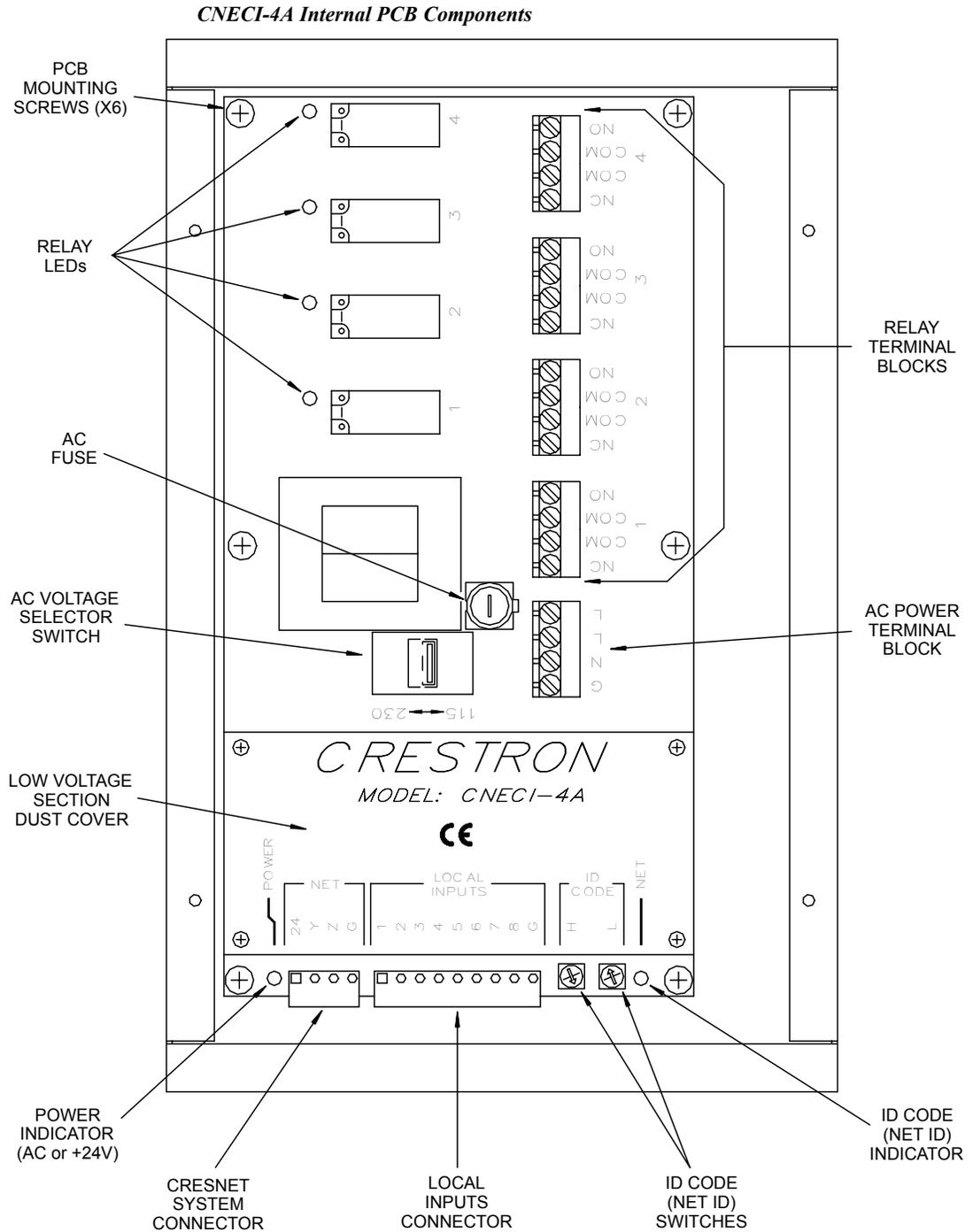
*CNECI-4A Physical View*



4-POSITION  
TERMINAL  
BLOCK



9-POSITION  
TERMINAL  
BLOCK



## Leading Specifications

The table on the next page provides a summary of leading specifications for the CNECI-4A. Dimensions and weight are rounded to the nearest hundredth unit.

*Leading Specifications of the CNECI-4A*

SPECIFICATION	DETAILS
Power Requirements	24VDC, load factor of 5.0 watts, 100 -125VAC or 220 - 250VAC, 50 - 60Hz
AC Fuse Type & Rating	Slo-Blo, 5 x 20mm, glass; 250V, 160mA
Relay Closure Rating	5A, 1/3HP @ 125 or 250VAC, 10A @ 30VDC
Default Network ID	7F
SIMPL Windows	Version 1.30.01 or later <sup>1</sup> with the addition of smwlib45.exe and smwlib45.txt
CNX Operating System	Version 5.01.09x or later
CNX Monitor	Version 2.00 or later
CNMS, CNRACK, CNLCOMP Operating System	Version 3.16.08 or later
ST-CP Operating System	Version 4.00.29 or later
ST-CP Monitor	Version 1.29 or later
VisionTools Pro (VT Pro)	Version 1.2.0 or later <sup>1, 2</sup>
Enclosure	Metal, gray semi-gloss
Enclosure Conduit Knock-outs	3/4 in (1.91 cm) dia., five on three sides
Dimensions & Weight	Height: 11.00 in (27.94 cm) Width: 7.00 in (17.78 cm) Depth: 2.50 in (6.35 cm) Weight: 5.40 lb (2.40 kg)

<sup>1</sup> The latest software versions can be obtained from the Software Downloads page (Simplwin and Touchpnl Libraries) of Crestron's website ([www.crestron.com](http://www.crestron.com)). New users are required to register in order to obtain access to the FTP site.

<sup>2</sup> VisionTools Pro is required only for SmarTouch programming. Otherwise, it is not needed.

As of the date of manufacture, the CNECI-4A has been tested and found to comply with specifications for CE marking.



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

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## Setup

### Network Wiring

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. If the network unit is a home-run from a Crestron® system power supply network port, the power factor of that network unit is the power factor of the entire run. The length of the run in feet and the power factor of the run

should be used in the following resistance equation to calculate the value on the right side of the equation.

*Resistance Equation*

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

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

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

*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 ground (G) conductor and the other twisted pair is the Y conductor and the Z conductor.

**NOTE:** When daisy chaining network units, always twist the ends of the incoming wire and outgoing wire which share a pin on the network connector. After twisting the ends, tin the twisted connection with solder. Apply solder only to the ends of the twisted wires. Avoid tinning too far up or the tinned end becomes brittle and breaks. After tinning the twisted ends, insert the tinned connection into the network connector and tighten the retaining screw. Repeat the procedure for the other three network conductors.

## Hookup

**WARNING:** Use extra caution when working with 100-125VAC or 220-250VAC. These voltages present an extreme hazard if inadvertent contact is made. Isolate and turn-off all applicable electrical circuits before routing wiring.

**WARNING:** Disconnect power before working on this unit. While power is connected, there are live components inside.

**WARNING:** Relay terminals 1, 2, 3, and 4 may still contain voltage even after AC power is disconnected.

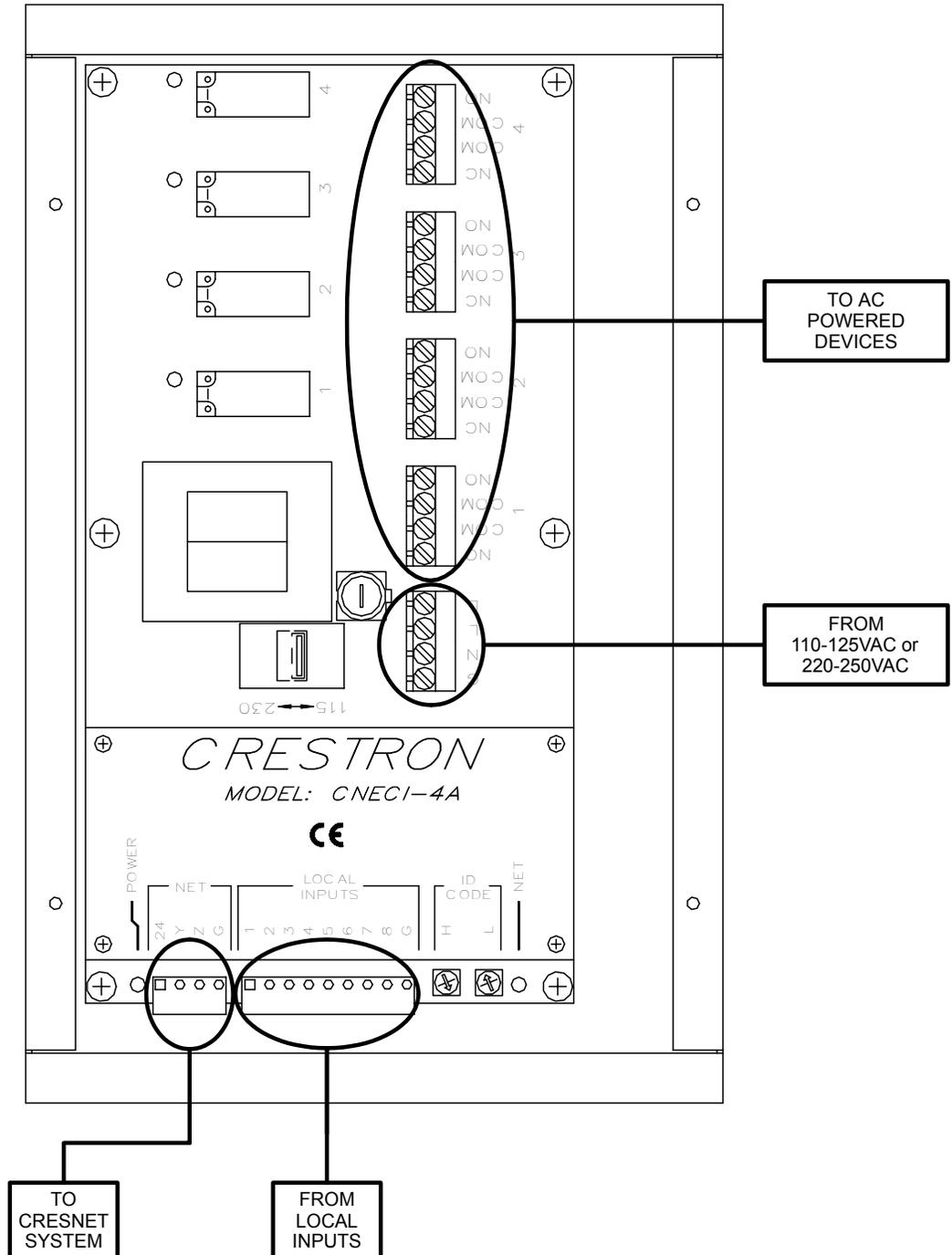
**CAUTION:** When connecting 100-125VAC or 220-250VAC to the AC power terminal block, terminal G must be ground, N is neutral, and the L terminals (either or both terminals, they are electrically connected) are for line voltage.

**NOTE:** Instead of installing discrete AC wiring for each relay, the AC line voltage may be daisy-chained from the L terminal of the AC power terminal block to the relay COM terminals.

**NOTE:** Review the Network Interconnection Diagram (latest revision of Doc. 5411) when making 4-wire connections.

Refer to the diagram below and complete the steps on the next page to hookup the CNECI-4A:

**CNECI-4A Hookup Diagram**



1. Make sure that the Cresnet system and AC power circuits to be installed are turned off.
2. Remove the four CNECI-4A enclosure front cover screws.
3. Remove the six PCB mounting screws (do not remove the low voltage section dust cover) and remove the PCB.
4. Mount the CNECI-4A to the desired wall location.
5. Re-install the PCB with the six mounting screws.
6. Remove appropriate conduit knock-out(s) from the side(s) of the CNECI-4A enclosure.
7. Route the NET and LOCAL INPUTS wiring through the enclosure knock-out(s).
8. Attach the NET and LOCAL INPUTS wiring to the 4-position and 9-position terminal blocks, respectively, but do not connect the terminal blocks to the CNECI-4A.
9. Route the AC powered device wiring and AC power wiring through the enclosure knock-out(s) but do not connect.

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**CAUTION:** To prevent damage to the unit, do not connect the NET terminal block and AC power wiring until the other wiring has been connected or attached.

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10. Connect the terminal blocks and wiring as shown in the hookup diagram.
11. Make sure that the AC voltage selector switch is positioned for the appropriate (115 for 110-125VAC or 230 for 220-250VAC) voltage.
12. Apply Cresnet system and/or AC power to the CNECI-4A.
13. Confirm that the POWER and NET indicators illuminate. (The relay LEDs illuminate when the corresponding relay energizes.)
14. Re-install the enclosure front cover with the four cover screws.

## Identity Code

Every equipment and user interface within the network requires a unique identity code (NET ID or ID CODE). This code is recognized by a two-digit hexadecimal number from 03 to FE. The ID CODE of the unit must match an NET ID specified in the SIMPL Windows program. The ID CODE of the CNECI-4A is factory set to 7F.

The ID CODE of the CNECI-4A can be changed by using two miniature rotary switches labeled H and L. These 16-position hexadecimal switches can be set to 0 through F. Attach the CNECI-4A to the control system (verify that the software is running) and complete the following steps to change the ID CODE:

1. Using a small flat screwdriver, rotate the arrow in the center of switch H to the first (or most significant) digit or letter of the new ID CODE.
2. Rotate the arrow in the center of switch L to the second (or least significant) digit or letter of the new ID CODE.
3. The NET indicator illuminates to confirm that the NET ID and ID CODE are identical.

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## SIMPL Windows Programming

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 CNECI-4A. 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.

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**NOTE:** The following descriptions assume 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 this sample SIMPL Windows program. The program is available from Crestron's Software Downloads page (Examples Library) of the Crestron website ([www.crestron.com](http://www.crestron.com)). Search for CNECI-4A.ZIP. This file contains the necessary files to recreate the following programming sample.

**NOTE:** The SIMPL Windows program for the CNECI-4A identical to the program of the older Crestron product, the CNECI-4.

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### How the Program Works

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**NOTE:** VisionTools Pro (VT Pro) is a Windows® compatible software package for creating Crestron touchpanel screen designs.

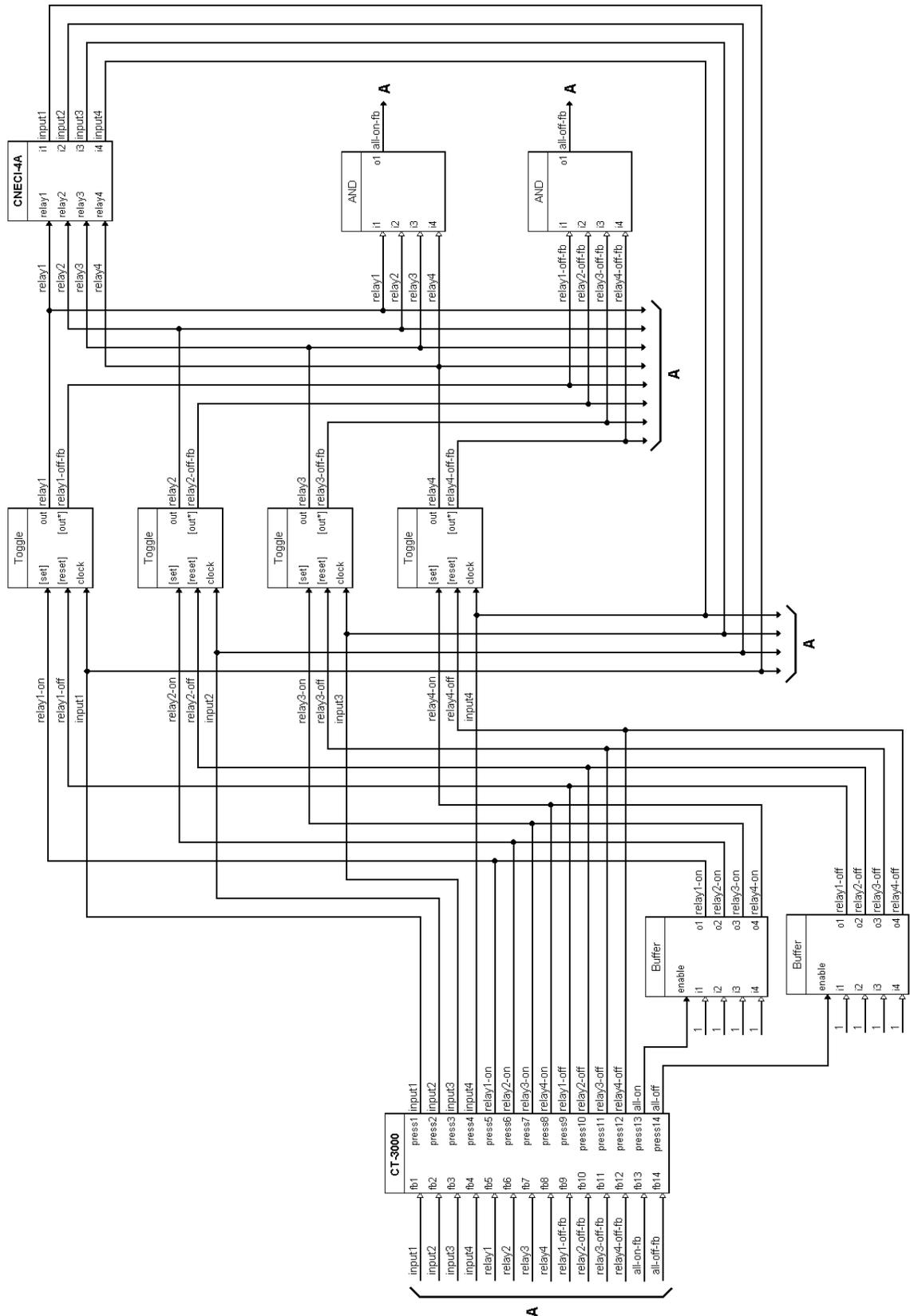
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The basic CNECI-4A SIMPL program is shown as a block diagram on the next page. A CT-3000 touchpanel created with VT Pro, is used to control the relays of the CNECI-4A.

For relay 1, the **input1** signal on the clock of the TOGGLE causes the relay to change states. **Relay1-on** turns the relay on and **relay1-off** turns the relay off. The status of the toggle is feedback to the touchpanel. All four of the CNECI-4A relays are operated identically with their respective signals.

The **all-on** and **all-off** signals, from the touchpanel through their respective BUFFERS, turn all four of the relays on or off. The AND symbols provide the toggle status feedback to the touchpanel.

*CNECI-4A SIMPL Program*



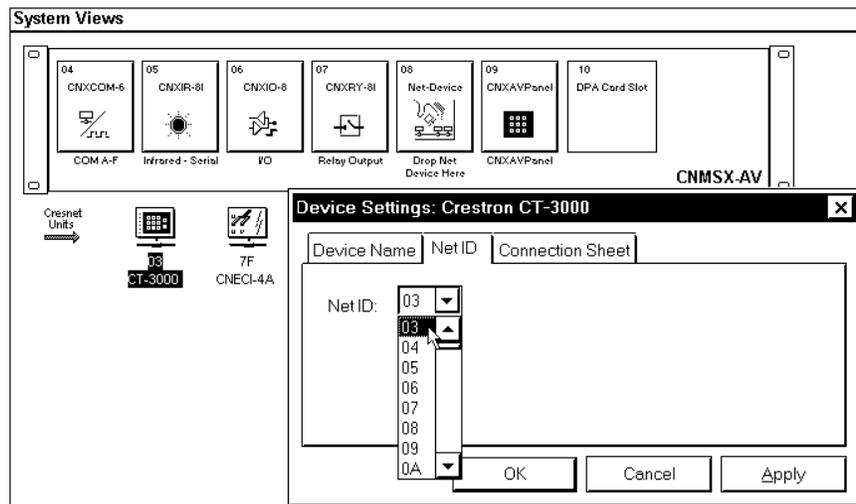
## How to Create the Program

### Configuration Manager

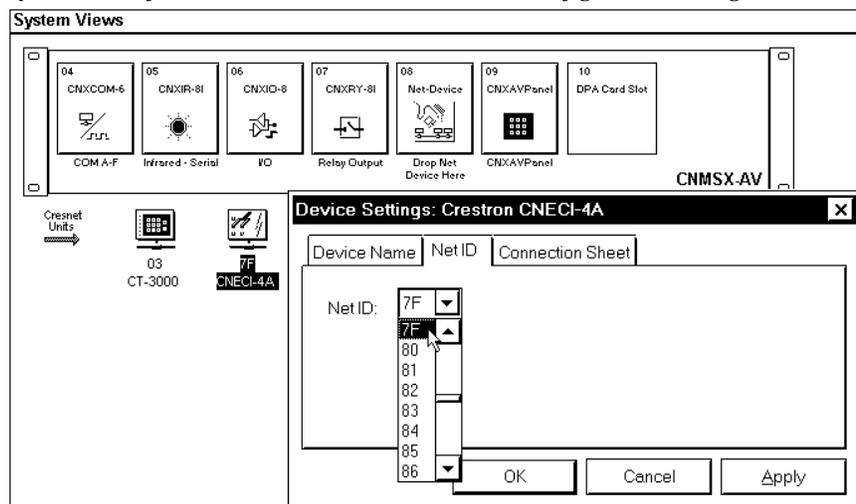
Use the Configuration Manager workspace (**Project | Configure System**) in SIMPL Windows to select and configure all the devices that need to be included into the system. For this example, from the Control Systems folder in the *Device Library*, select CNMSX-AV. From the Touchpanels (Wired) folder, drop and drag the CT-3000 symbol into *System Views* and set the NET ID to 03. Drag and drop the CNECI-4A (from Network Control Modules folder in the *Device Library*) into *System Views*. The NET ID of the CNECI-4A is set to 7F.

**NOTE:** SIMPL Windows v1.30.01 or later is required to program the control system containing a CNECI-4A. 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 Software Downloads page of Crestron's website ([www.crestron.com](http://www.crestron.com)). New users are required to register in order to obtain access to the FTP site.

#### System View of the CT-3000 in SIMPL Windows' Configuration Manager



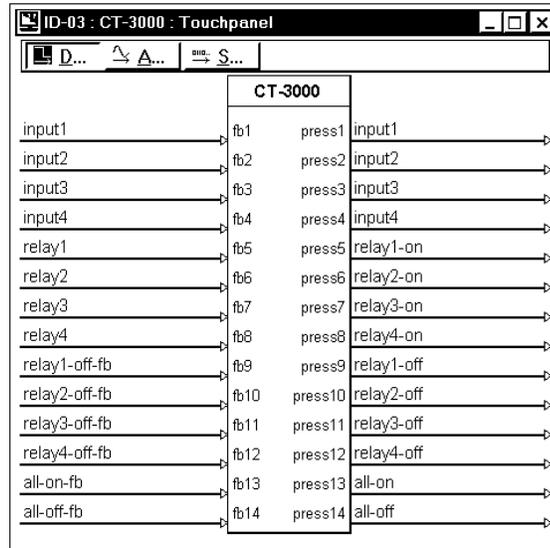
#### System View of the CNECI-4A in SIMPL Windows' Configuration Manager



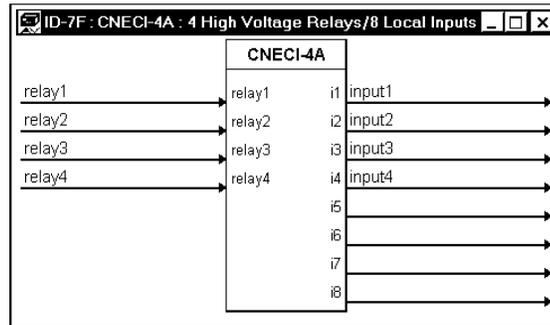
### Programming Manager

Use the Programming Manager workspace (**Project | Program System**) in SIMPL Windows to select symbols and assign their respective signals. For this example, CT-3000 and CNECI-4A 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 CT-3000 and CNECI-4A for detail views (alternatively CTRL+D or drag and drop into *Detail View*). Assign the signals as shown after this paragraph.

*Detail View of the CT-3000 in SIMPL Windows' Programming Manager*



*Detail View of the CNECI-4A in SIMPL Windows' Programming Manager*

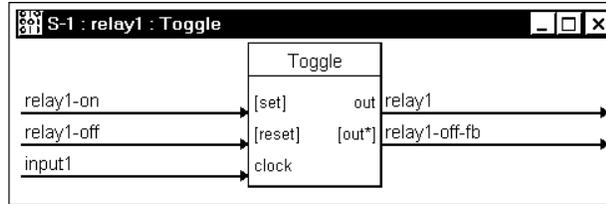


All logic symbols necessary for the SIMPL Windows program must be added from the *Symbol Library* in the Programming Manager workspace. In this example, drag and drop four TOGGLE symbols from the Memory folder, two BUFFER and two AND symbols from Conditional folder into the Logic folder in *Program View*. Expand the Logic folder and double click on symbol icons for a detail view (alternatively CTRL+D or drag and drop into *Detail View*). Assign signals as shown on the next pages.

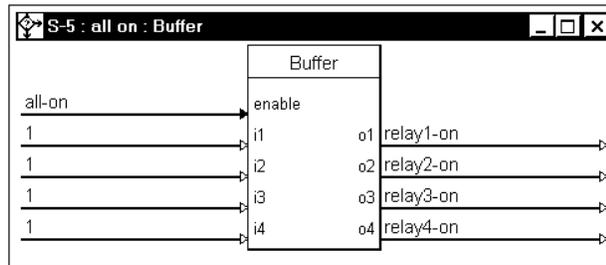
**NOTE:** For more descriptive symbol names, as shown in the illustrations above, right mouse click on the symbol icons in the Logic folder in *Program View* and select **Edit Symbol Comment** (alternatively, highlight the icon and depress Ctrl+R or Tab). Enter new descriptive names in the “Enter Symbol Comment” dialog boxes and click OK.

To assign signals to the four toggle symbols, follow the example shown below. The signals shown below are toggle symbol S-1 signals for relay 1. Toggle symbols S-2 through S-4 are assigned similar signal names using relay2, 3, 4 and input2, 3, 4, respectively.

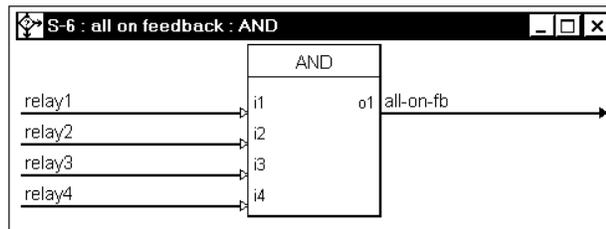
*Detail View of a TOGGLE (S-1 - S4) in SIMPL Windows' Programming Manager*



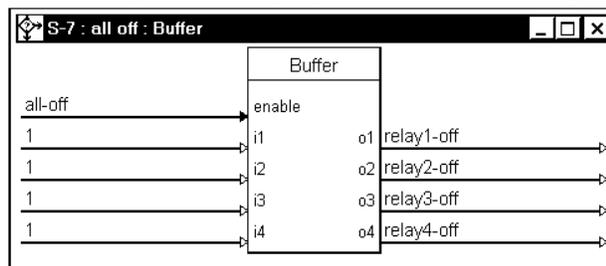
*Detail View of a BUFFER (S-5) in SIMPL Windows' Programming Manager*



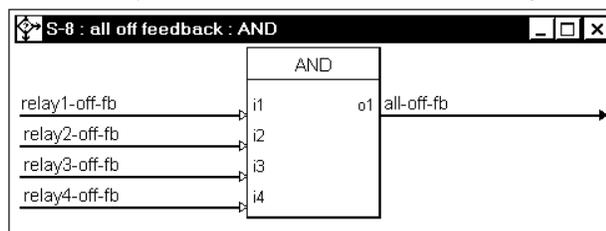
*Detail View of a AND (S-6) in SIMPL Windows' Programming Manager*



*Detail View of a BUFFER (S-7) in SIMPL Windows' Programming Manager*



*Detail View of a AND (S-8) in SIMPL Windows' Programming Manager*



## Problem Solving

### Troubleshooting

The table below provides corrective action for possible trouble situations of the CNECI-4A. If further assistance is required, please contact a Crestron customer service representative.

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**WARNING:** Disconnect power before working on this unit. While power is connected, there are live components inside.

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**WARNING:** Relay terminals 1, 2, 3, and 4 may still contain voltage even after AC power is disconnected.

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#### *CNECI-4A Troubleshooting*

TROUBLE	POSSIBLE CAUSE(S)	CORRECTIVE ACTION
Green POWER indicator does not illuminate.	CNECI-4A is not receiving AC power.	Check AC fuse. If necessary, replace only with the same fuse type and rating. USE CAUTION. Verify that AC wires into terminal block(s) are secure.
	CNECI-4A is not receiving +24V power.	Verify that cable plugged into NET connector is secure.
Yellow NET indicator does not illuminate.	Loose network connection.	Verify that cable plugged into NET connector is secure.
	Improper NET ID.	Verify that the ID CODE of the CNECI-4A matches the Cresnet NET ID. Refer to "Identity Code".
AC powered devices will not operate properly.	AC voltage selector switch in wrong position.	Confirm that AC selector switch is positioned to 115 or 230 as appropriate.

### Further Inquiries

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

You can also log onto the online help section of the Crestron website ([www.crestron.com](http://www.crestron.com)) to ask questions about Crestron products. First-time users will need to establish a user account to fully benefit from all available features.

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## Return and Warranty Policies

### Merchandise Returns / Repair Service

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

### CRESTRON Limited Warranty

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

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

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

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

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

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

#### Trademark Information

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Specifications subject to  
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