Crestron **CNXIO-16**
CNX Analog/Digital Input/Output Expansion Card

Operations Guide

CRESTRON
REMOTE CONTROL SYSTEMS

Contents

CNX Analog/Digital Input/Output Expansion Card: CNXIO-16

Description

Functional Description

The CNXIO-16 Analog/Digital Input/Output Expansion Card provides 16 analog inputs or digital input/output connections. All pins pull up to +5V. The digital output is rated for 250 mA sync from maximum 24 VDC with catch diodes for use with 'real world' loads. The digital input is rated for 0 to 24 VDC. There is a 20K Ohm input impedance; programmable 2K Ohm pullup resistor (per pin, software reference to ground or closure to ground). To enable a 0K pull-up resistor, assign a logic "1" to the corresponding "pu#" pin in the software. The input logic threshold is 1.25 VDC. Analog input is rated for 0 to 10 VDC, protected to 24 VDC, maximum.

Physical Description

The CNXIO-16, shown below, is a circuit board fastened to an aluminum faceplate. The card is manufactured to easily fit into an unoccupied slot in a Crestron CNX Generation Control System.

CNXIO-16 Faceplate
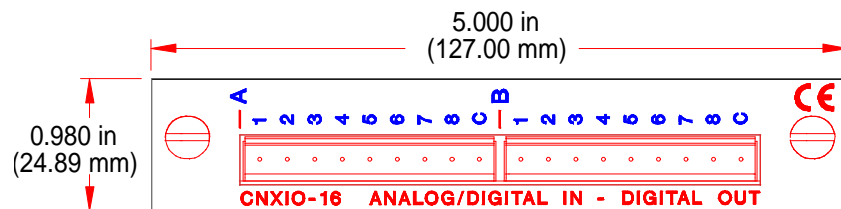
The faceplate contains two identical male, 9-pin connectors. There are eight analog/digital input/output pins and one common ground pin per connector. Silk screening is applied to the faceplate; pins are labeled A1 through A8 and B1 through B8. Common ground pins are labeled with a C. Two supplied 9-position connectors can be wired and attached to connectors A and/or B.

Leading Specifications

The table below provides a summary of leading specifications for the CNXIO-16. Dimensions and weight are approximations rounded to the nearest hundredth unit.

Leading Specifications of the CNXIO-16

SPECIFICATIONS	DETAILS
Connectors	(2) 9-pin terminal block
Power Requirements	24VDC, network power; 2 Watts
Ratings:	
Digital Output	250mA sync from maximum 24VDC
Digital Input	0-24VDC
Input Impedance	20K Ohm
Input Logic Threshold	1.25VDC
Analog Input	0-10VDC, protected to 24VDC maximum
SIMPL™ Windows®	Version 1.20.04 or later
CNX Operating System	Version 5.01.21X or later
CNX Monitor	Version 2.05X or later
Dimensions:	
Height	0.98 in (2.49 cm)
Width	5.00 in (12.70 cm)

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

CE

Installation

Items required to install the CNXIO-16 are already attached to the unit. The only tools required are a Phillips tip screwdriver and a grounding strap. Follow the assembly procedure below.

CAUTION: The CNXIO-16 contains electrostatic sensitive devices (ESD); observe precautions for handling ESDs to avoid damaging the card.

NOTE: If installing the CNXIO-16 into a CNMSX-AV, it is assumed that the CNXCAGE has been installed.

1. Disconnect power from the CNMSX.

2. Use the Phillips tip screwdriver and remove two screws and blank faceplate from the control system.

3. Align the CNXIO-16 with the card guides in the open slot and slide the expansion card into position.

4. Firmly press both ends of the CNXIO-16 faceplate to seat the expansion card into the control system connector.

5. Tighten the thumb screws to secure the CNXIO-16 to the control system.

6. Reapply power to the CNMSX.

Programming with SIMPL™ Windows®

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 the CNXIO-16. 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 is familiar with 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 copy of this program is available from Crestron's ControlCD (Version 5.1 or later). Search for the CNXIO-16.SMW project in the SIMPL Windows Example Base.

How the Program Works

A basic CNXMIDI SIMPL program is shown in block diagram form below. For this example, the CNXIO-16 occupies slot#1 of a CNMSX-PRO. Assume that the touchpanel is used to control the state of lights1 and lights2 in a typical application. Input/outputs on the CNXIO-16 (inA1,outA1 through inA8,outA8) in SIMPL Windows correspond to the CNXIO-16 physical pins A1 through A8. Similarly, inB1,outB1 through inB8,outB8 corresponds to pins B1 through B8.

Block Diagram of CNXIO-16
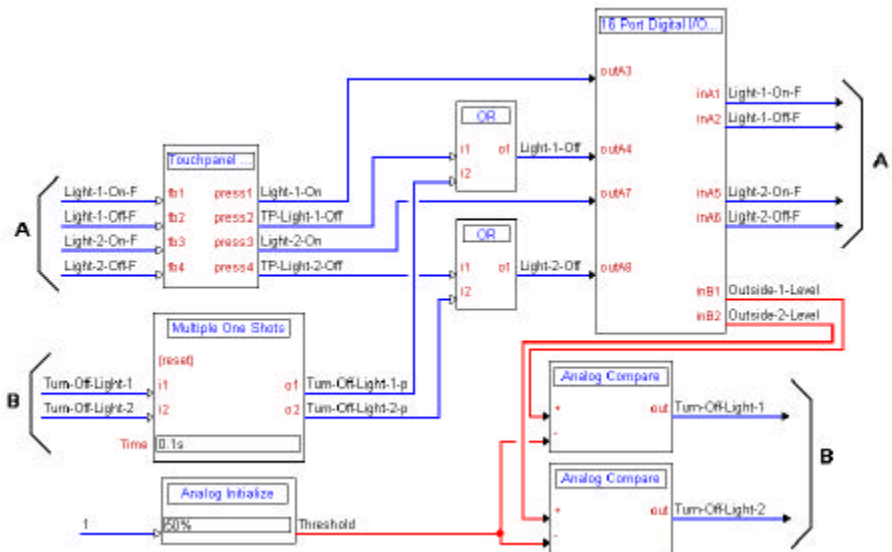
How to Create the Program

Configuration Manager

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 CNXIO-16 to slot #**1** of the control system, shown below.

NOTE: SIMPL Windows v1.20.04 or later is required to program the CNMSX-PRO with a CNXIO-16 card. 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). New users are required to register in order to obtain access to the FTP site.
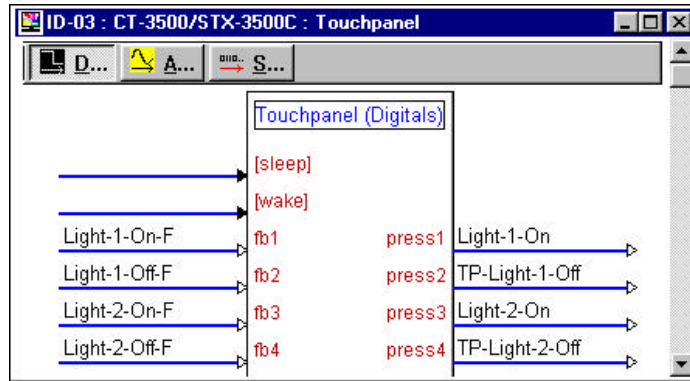
Graphical System View of CNXIO-16 in SIMPL Windows' Configuration Manager
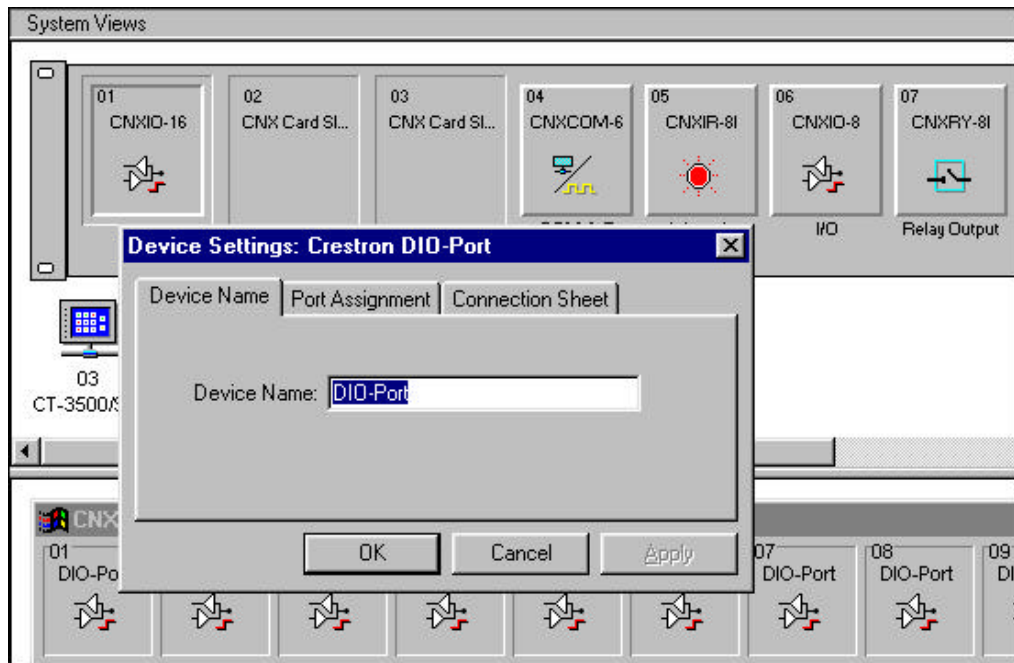

Programming Manager

Use the Programming Manager workspace in SIMPL Windows to select symbols and assign their respective signals. For this example, a touchpanel and CNXIO-16 symbols were added automatically when the devices were added to the system in the Configuration Manager workspace. Expand the Network Module folder and double click on the touchpanel for a detail view (alternatively CTRL+D or drag and drop into Detail View). Assign the signals as shown on the next page.

Graphical Detail View of Touchpanel in SIMPL Windows' Programming Manager

Expand the Central Control Modules folder. Double click on Port 1 to display the CNXIO-16 in Detail View (alternatively CTRL+D or drag and drop into Detail View). Assign the signals as shown below.
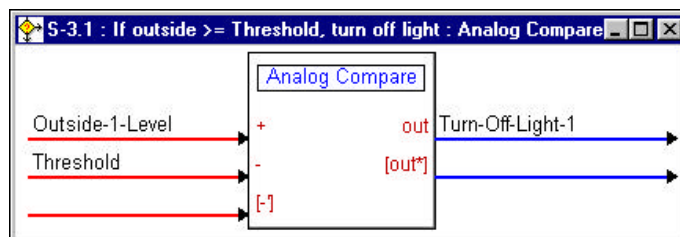
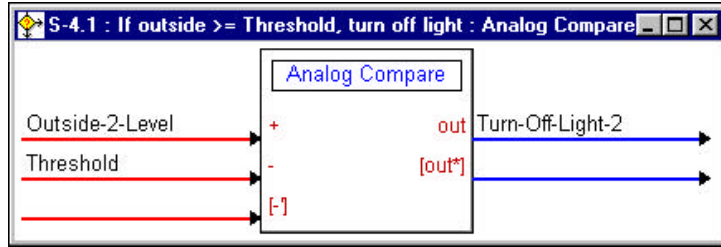*Graphical Detail View of CNXIO-16 in SIMPL Windows' Programming Manager*
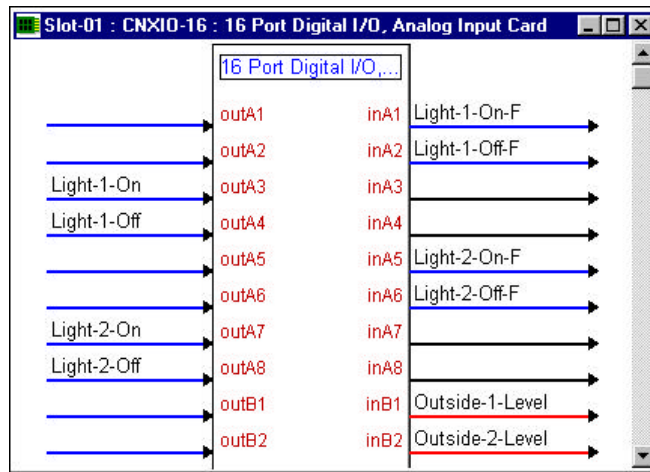
NOTE: Each port on the CNXIO-16 can be assigned as either an input or output, but not both. For example, although the software permits the user to assign two independent signals to i1 and o1, it is improper.

Expand the Logic folder to display the logic symbols used in this program. They include Analog Compare, Analog Initialize, Multiple One Shots, and OR symbols. View the symbol in detail view (alternatively CTRL+D or drag and drop into Detail View). Some logic symbols are shown in optional sub system folders. Assign the signals as shown below.
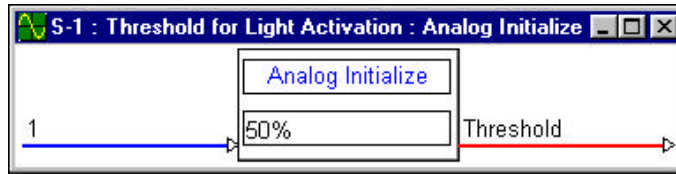
Graphical Detail View of Analog Compare Symbols in SIMPL Windows' Programming Manager
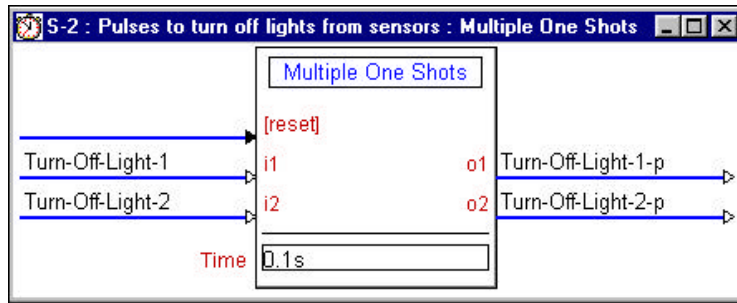
Graphical Detail View of Analog Compare Symbols in SIMPL Windows' Programming Manager (Continued)
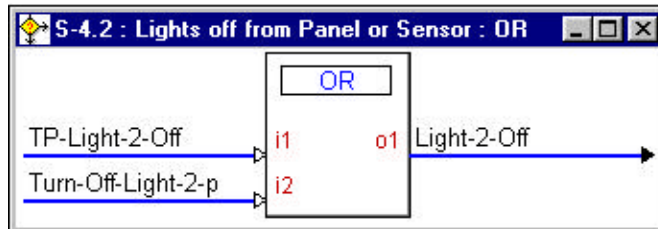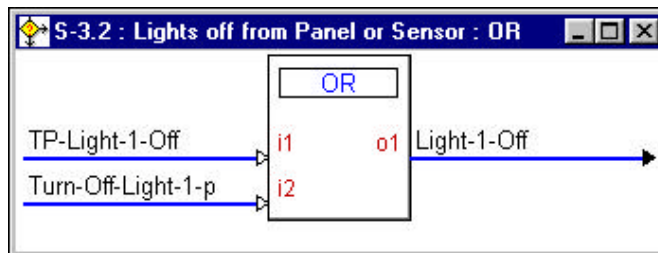

Graphical Detail View of Analog Initialize in SIMPL Windows' Programming Manager

Graphical Detail View of Multiple One Shots symbol in SIMPL Windows' Programming Manager

Graphical Detail View of Multiple OR symbols in SIMPL Windows' Programming Manager

Problem Solving

Troubleshooting

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

CNXIO-16 Troubleshooting

TROUBLE	POSSIBLE CAUSE(S)	CORRECTIVE ACTION
CNXIO-16 does not function.	CNX Control System is not receiving power.	Verify power to CNX Control System.
	Circuit card is not properly seated in slot.	Verify CNXIO-16 is properly inserted into CNX Control System slot per procedures in this Operations Guide.
	Cable from CNXIO-16 to controlled equipment is incorrect.	Verify wiring. Connect only the required pins for each communication type.
	Programming error.	Check SIMPL Windows program.

Further Inquiries

If after reviewing this Operations Guide, you cannot locate specific information or have questions, please take advantage of Crestron's award winning technical support 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 +525-574-15-90.

For local support from exclusive Crestron factory-trained personnel call:

- In Australia, call Soundcorp at +613-941-61066.

- In New Zealand, call Amber Technologies at +649-410-8382.

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, 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.

CRESTRON Limited Warranty

CRESTRON ELECTRONICS, Inc. warrants its Cresnet products, denoted by a "CN" prefix model number, to be free from manufacturing defects in materials and workmanship for a period of three (3) years from the date of shipment to purchaser. Disk drives and any other moving or rotating mechanical parts are covered for a period of one (1) year. CRESTRON warrants all its other products for a period of one year from the defects mentioned above, excluding touchscreen display components which are covered for 90 days. Incandescent lamps are completely excluded from Crestron's Limited Warranty. 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.

CRESTRON shall not be liable to honor warranty terms if the product has been used in any application other than that for which it was intended, or if it 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 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 makes no other warranties nor authorizes any other party to offer any warranty, expressed or implied, including warranties of merchantability for this product. This warranty statement supersedes all previous warranties.

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