CERV2 I/O Expansion Board Manual

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MANUFACTURED WITH SOLAR ENERGY

Specifications

The CERV2 I/O Expansion Board increases the number of available wired auxiliary connections on a CERV2 system by 3 input channels and 6 output channels. This provides a total of 4 input channels (I0, I1, I2, and I3) and 7 output channels (X0, X1, X2, X3, X4, X5, and X6) for connecting wired external auxiliary devices to a CERV2.

Expansion Board (General Specifications)

Input Voltage	24VAC
Maximum Current	3.0 Amps
Fuses	(2) 5mm x 20mm, 3.0A Fast Blow, 250VAC
Dimensions	7.0" x 4.0" x 1.5" (178mm x 102mm x 38mm)

Auxiliary Outputs (X1-X6)

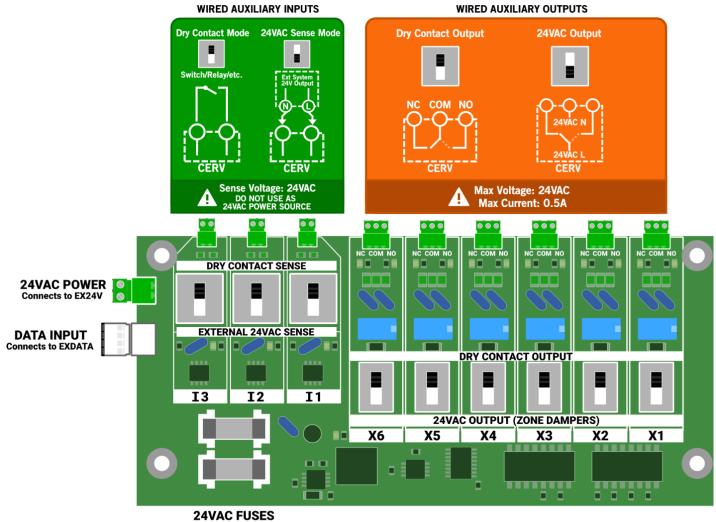|	
Connection Type	3 position pluggable screw terminal block (flathead)
Output Types	Select between Dry Contact Output and 24VAC Output
Maximum Voltage	24VAC
Maximum Current	0.5A per output channel

Auxiliary Inputs (I1-I3)

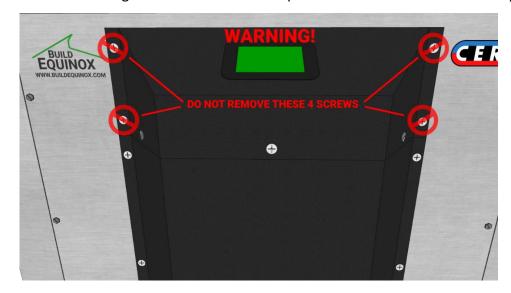|	
Connection Type	2 position pluggable screw terminal block (flathead)
Input Types	Select between Dry Contact Sense and 24VAC Input Sense
Input Voltage	24VAC
Maximum Current	0.05A per input channel

I/O Expansion Board Access/Installation

Before removing any access covers, **power to the CERV2 should be turned off** and the unit either unplugged or the electric breaker switched off. Remove the lower front plastic cover by removing the 13 phillips head screws shown below.

Do not remove the four screws holding the screen enclosure in place. The touchscreen should stay intact.

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Once the lower front cover is off, the expansion board will be visible if factory installed as shown on bottom of page. If installing the I/O board, this can be done now.

- o Orient the I/O board as shown and align the four standoffs circled in yellow with the appropriate holes in the lower metal access panel. Press the standoffs into the holes to secure the board into place.
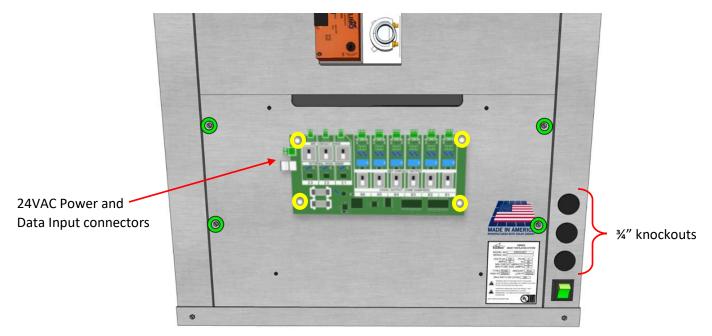- o Connect the two cables between the I/O board and the CERV2's main control board, which is located directly above the two orange damper motors.

  - o The 24VAC Power cable has green connectors on each end and connects to the green connector on the left side of the I/O board and to the green connector located on the lower left corner of the CERV2 control board labeled "EX24V" shown at right.
  - o Connect the white connector of the Data Input cable to the white connector on the I/O board. The five bare wires of this cable should be inserted into the terminals on the control board labeled "EXDATA" shown at right. To insert a wire, first depress and hold the spring terminal lever with a fingernail or small screwdriver and insert the wire. Release the lever and pull gently on the wire to make sure it is held securely in place. Insert the five wires into the terminals as shown here.
  - o Use cable ties to secure the power and data cables to adjacent wires near the control board.
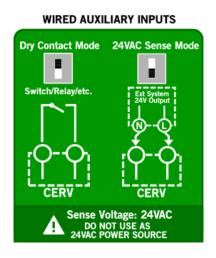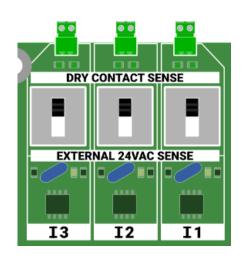
Wiring for input/output external auxiliary devices to the expansion board should be run through the three ¾" knockouts above the power switch, and then out through the upper slot of the bottom front access panel to connect to the Input/Output screw terminal blocks. It is recommended to use cord grips in the knockouts to relieve strain on wires connected to the I/O board. The four screws (circled in green below) for the lower access panel can be removed and the panel will be free to come out to make routing wire easier and to access the I0 and X0 terminals. Before removing the access panel, disconnect the green and white power/data connectors on the left side of the I/O board.
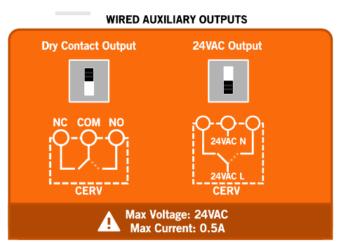

24VAC Power and Data Input connectors

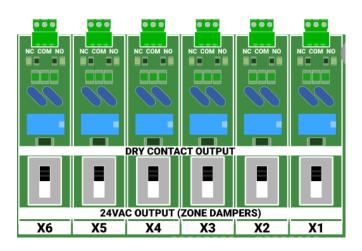¾" knockouts

I/O Channel Wiring and Configuration

Input channels can be set to sense either a dry contact closure or a 24VAC signal from an external source. Move the toggle switch for each input channel to be used into the proper position as shown below for the type of input needed. Connect two conductor thermostat or similar wire to the appropriate input channel screw terminals from the auxiliary system or device.

Output channels can be set to dry contact or 24VAC output. Set the toggle switch to the correct position for the output channels to be used and then make the proper wiring connections to the associated output channel screw terminals from the external auxiliary device.
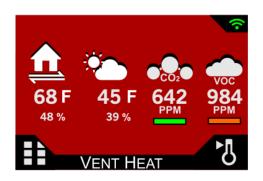

It is recommended to label the wires with the external device names from which they come. Writing down the switch positions and device for each I/O channel also helps for later reference.

Once the toggle switches are set and wiring completed for each I/O channel the function for each channel must be set on the CERV's touchscreen controller. To do this, restore power to the CERV and turn the system on. The lower front plastic cover can remain off during this setup so that indicator LEDs on the expansion board can be seen to check proper operation. Each input channel has an orange LED that will be lit when the channel senses a dry contact or 24VAC. The output channels have two orange LEDs, one of which will be lit to indicate the current position of the relay.

The following pages shows how to navigate the touchscreen menus to set the function for each I/O channel. This is the final step in the setup for the wired I/O to work properly. Some example input and output configurations are shown as well. For more information on the settings and functionality of each I/O function type, see the manual for that particular device, the CERV2 Installation Manual, or the Touchscreen Controller Guide. When configuration is complete the lower front plastic cover should be reinstalled.
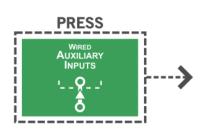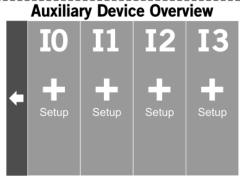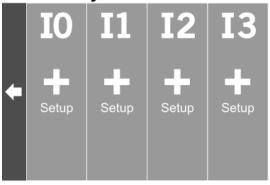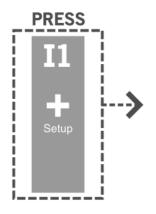
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Wired Auxiliary Input Setup

PRESS

HOME — COMFORT — EXTERNAL I/O — SYSTEM CERV — SETTINGS

PRESS — EXTERNAL I/O

WIRED AUXILIARY OUTPUTS — WIRED AUXILIARY INPUTS — ZONE CONFIGURATION — WIRELESS DEVICES

PRESS — WIRED AUXILIARY INPUTS

Auxiliary Device Overview

I0	I1	I2	I3
+ Setup	+ Setup	+ Setup	+ Setup

Configure Auxiliary Input

Auxiliary Device Overview

I0	I1	I2	I3
+ Setup	+ Setup	+ Setup	+ Setup

PRESS — I1 + Setup

Auxiliary Input Function

X N/A

ⓘ Input Disabled

Available Auxiliary Input Functions

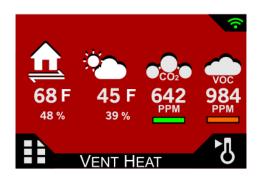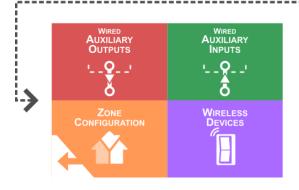| X N/A	Heat	Cool	Vent	Recirc	STOP Halt Operation	STOP Halt Operation

Wired Auxiliary Output Setup

PRESS

HOME

PRESS — EXTERNAL I/O

WIRED AUXILIARY OUTPUTS · WIRED AUXILIARY INPUTS · ZONE CONFIGURATION · WIRELESS DEVICES

PRESS — WIRED AUXILIARY OUTPUTS

Auxiliary Device Overview

X0	X1 Setup	X2 Setup
+ Setup	X3 Setup	X4 Setup
	X5 Setup	X6 Setup

Configure Auxiliary Output

Auxiliary Device Overview

X0	X1 Setup	X2 Setup
+ Setup	X3 Setup	X4 Setup
	X5 Setup	X6 Setup

PRESS — X1 Setup

Auxiliary Output Function
X
N/A

Available Auxiliary Output Functions

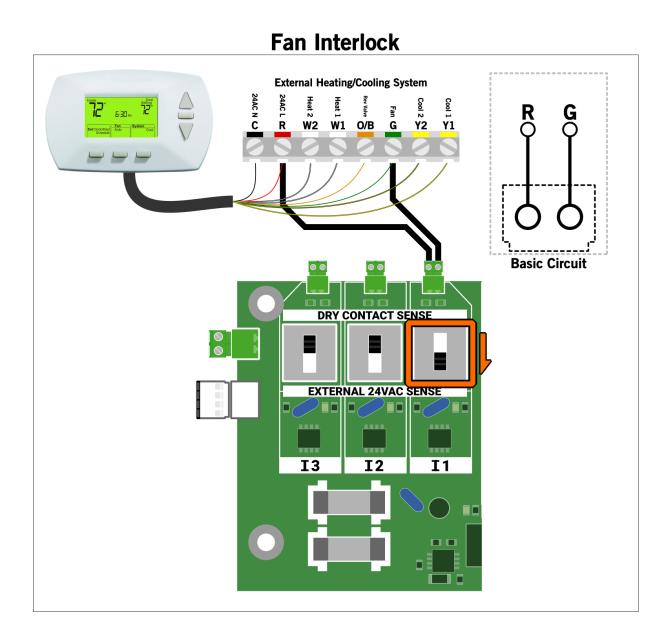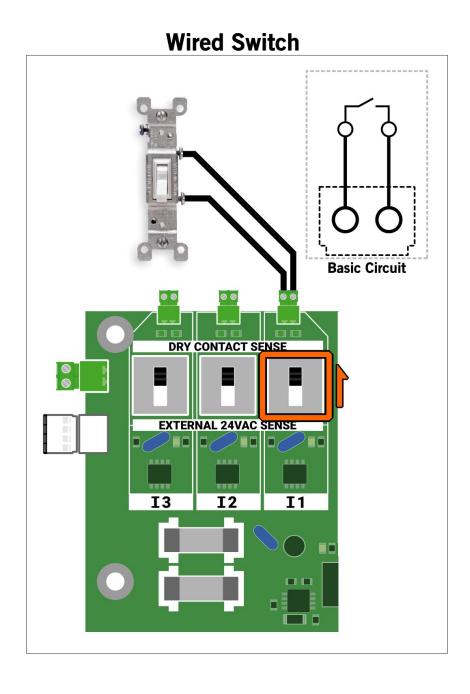| N/A	Heat	Cool	Vent	Humidity Removal	Humidity Addition	GEO BOOST	Zone Damper	Fan Interlock

Fan Interlock Wiring (Input)

If the CERV is ducted along with another system, it may be desired for both system's fans to operate simultaneously. This section indicates how to ensure that the CERV's fans operate along with the connected system. Toggle switch for the channel should be moved to the EXTERNAL 24VAC SENSE setting.

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Wired Switch (Input)

A wired switch may be used to trigger ventilation (or any other input function) on the CERV. Toggle switch for the channel should be moved to the DRY CONTACT SENSE setting. Any number of switches maybe connected in parallel to a single input terminal. These switches would all share the same settings for the input channel. Separate input channels should be used if different settings are needed or when using zone dampers.

WARNING: THE SWITCH SHOULD DRY CONTACT ONLY, DO NOT CONNECT LINE VOLTAGE TO THE INPUT TERMINALS!
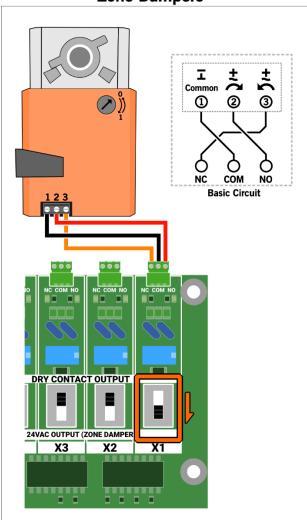
Wired Switch

Basic Circuit

Zone Damper Wiring (Output)

Zone damper wiring requires 3 conductor wire capable of carrying 24VAC at 0.5A (thermostat wire is acceptable).

The standard damper motor terminal block is three positions, with the first as a common, while the second and third activate the damper motor to turn clockwise or counterclockwise when voltage is applied. This may vary if other damper motors, such as spring return, are used. Rotation of the damper motor can sometimes be confusing when wiring the terminals, so the damper motor has an integrated switch to reverse the rotation direction. If you apply system power and find that the damper motor is rotating the wrong way, you can simply toggle the switch with a small flathead screwdriver.

IO Expansion Board is capable of directly outputting 24VAC through its terminals without requiring connection to an external 24VAC source. NOTE: for this configuration, you must move the slide-switch above the terminal block towards the 24VAC OUTPUT label. LED indicators on the IO Expansion Board will light up above either the NO or NC terminals, to indicate which is active. Up to six zone dampers may be connected to the IO Expansion Board.
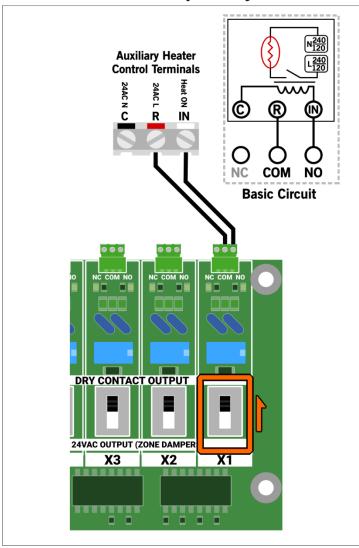
For more information on Zone Damper Setup and Configuration, please see the Zone Damper Guide

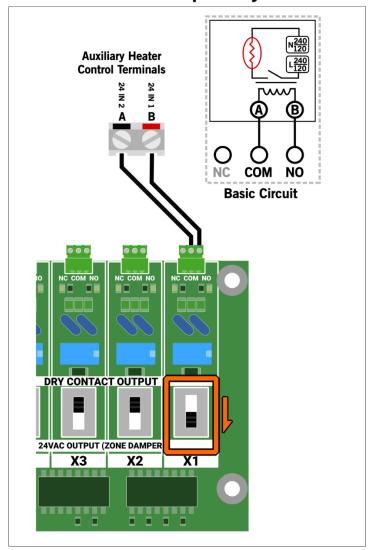Rev 1.2

Auxiliary Heater Wiring (Output)

There are typically two configurations for Auxiliary Heater wiring – dry contact control, and 24VAC signal control. Consult the installation guide for the heater to determine which is applicable. Take note of the slide switch position for each configuration.

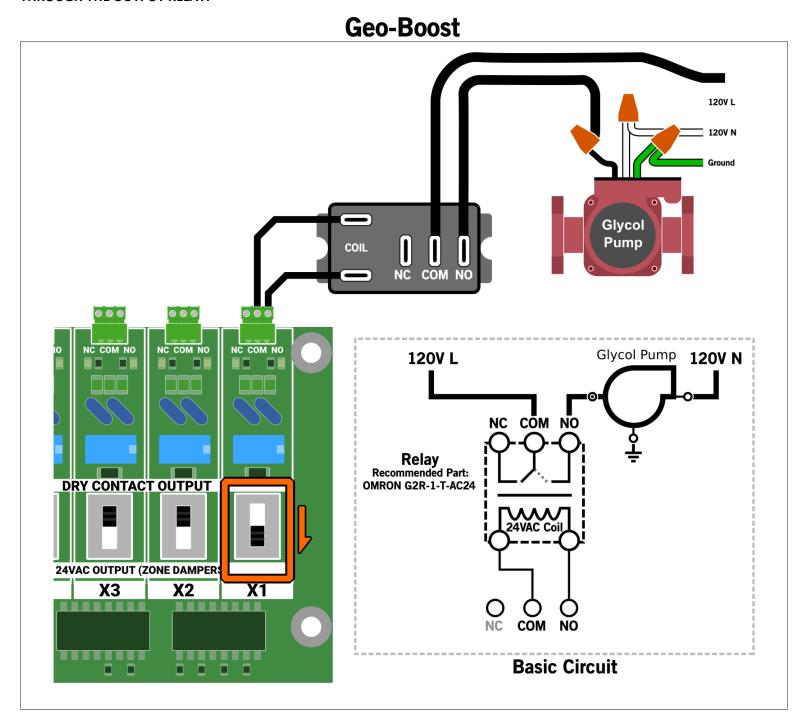**WARNING: OUTPUT CHANNELS ARE RATED MAXIMUM 24VAC 0.5A. DO NOT CONNECT POWER WIRING THROUGH THE OUTPUT RELAY.**

Geo-Boost Wiring (Output)

In order to control the Geo-Boost circulation pump via the I/O board, an external dry contact relay must be used with the pump's power wiring. Recommended relay: OMRON G2R-1-T-AC24. Toggle switch for the channel should be moved to the 24VAC OUTPUT setting. See the Geo-Boost Installation Manual for more information.

WARNING: EXPANSION BOARD OUTPUT CHANNELS ARE RATED MAXIMUM 24VAC 0.5A. DO NOT CONNECT POWER WIRING THROUGH THE OUTPUT RELAY.

Geo-Boost

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Fan Interlock Wiring (Output)

If the CERV is ducted along with another system, it may be desired for both system's fans to operate simultaneously. This section indicates how to ensure that the connected system's fans operate along with the CERV. Toggle switch for the channel should be moved to the DRY CONTACT OUTPUT setting.