

# Contact Closure Interfaces

4/8 Series
Contact Closure Interface
Keypad Link
N/A

Contact closure interfaces allow simple integration of the HomeWorks® system with other equipment throughout the house. Equipment such as driveway sensors, occupancy sensors, photocells, and security systems are able to activate lighting scenes and other HomeWorks system events through the use of contact closure input interfaces (HWI-CCI-8 and HR-CCI-6-SW). Equipment such as shades, screens, gates, spas, and thermostats can be controlled by the HomeWorks system through the use of contact closure output interfaces (HWI-CCO-8). In addition, both the HWI-CCI-8 and the HWI-CCO-8 provide an infrared (IR) input that can be used to initiate HomeWorks system events using IR remote controls.

The HWI-CCI-8 and HWI-CCO-8 interfaces can be mounted in any of three different enclosures: HWI-LV32-120, HWI-LV17-120, and HWI-ENC-CC.

**Note:** Wired seeTouch® keypads (pgs. 24, 34) and wired 2-button keypads (pg. 28) also include contact closure inputs.

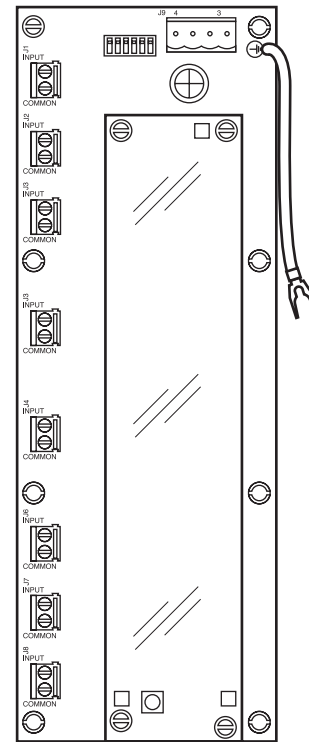
## CONNECTION TO WIRED PROCESSOR

Each interface uses one keypad address. Up to 32 can be directly connected to a configurable link on a HomeWorks wired processor using two pair – one pair #18 AWG (1.0 mm<sup>2</sup>), one pair #18-22 AWG (1.0-0.5 mm<sup>2</sup>) twisted shielded – Class 2 cable. Contact closure interfaces must reside on a link that has been configured for keypads, and may be wired in a daisy-chain, home run, or T-tap configuration. The maximum total cable length of any wire run is 1000 feet (305 m) with up to 10 keypads or interfaces. The maximum total cable length is 4000 feet (1220 m).

## CONTACT CLOSURE INPUT INTERFACES

Many electronic systems and devices have the capability to provide status or control in the form of dry contact closure (relay/switch) outputs. Each individual device output can be connected to one of the contact closure inputs (CCIs) on a contact closure input interface. These contact closure inputs are programmed in the same fashion as the buttons on a HomeWorks keypad. For example, a driveway sensor can be connected to a CCI interface and programmed to activate a “Welcome Home” scene.

Each of the contact closure inputs can be individually programmed as normally-open or normally-closed.



**Wired Contact Closure Input Interface (HWI-CCI-8)**

## WIRED CONTACT CLOSURE INPUT INTERFACE (MODEL # HWI-CCI-8)

Each dry contact closure input has an LED indicator that shows the state of the connected device. The contact closure input interface has an IR receiver that is programmed independently of the contact closure inputs. This receiver allows Lutron® hand-held IR transmitters (SP-HT-WH, SPS-FSIT-RP, SPS-4IT-RP, GRX-IT-WH and GRX-8IT-WH) to function as “wireless keypads” when used in conjunction with standard IR repeater systems.

The Lutron IR codes can be learned by most learning remotes, allowing audio/video remotes to control the HomeWorks system.

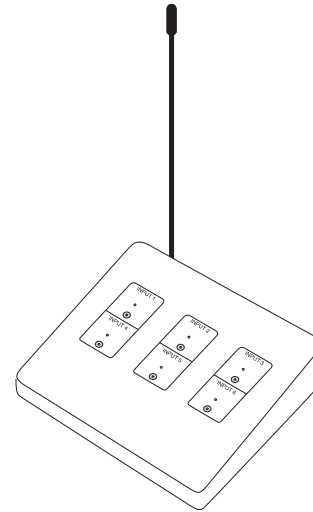
# Contact Closure Interfaces (cont.)

## **RF CONTACT CLOSURE INPUT INTERFACE** **(MODEL # HR-CCI-6-SW)**

Devices that provide contact closure outputs are not always located near the processor. RF CCI interfaces can be distributed throughout the home, locating them near the devices to which they are interfacing. The RF CCI interface has six contact closure inputs which are programmed in the same fashion as the buttons on a HomeWorks® keypad. Six buttons allow you to test each contact closure input's programming from the front of the control. Each dry contact closure input has an LED indicator that shows the state of the connected device.

### **COMMUNICATION TO PROCESSOR**

All RF CCI interfaces must be located within 30 feet (9 m) of an RF processor or a hybrid repeater. Each HomeWorks RF-capable processor can control up to 32 RF keypads. The RF CCI interfaces counts as one of the 32 RF keypads on RF Link 8.2.

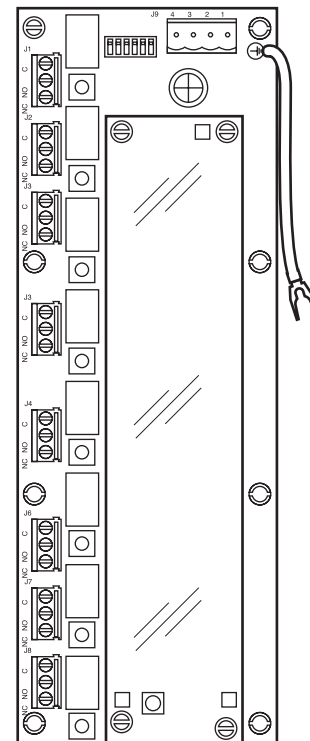


**RF Contact Closure Input Interface  
(HR-CCI-6-SW)**

## **WIRED CONTACT CLOSURE OUTPUT INTERFACE** **(MODEL # HWI-CCO-8)**

Many electronic devices have dry contact closure inputs, allowing them to be controlled by an external system. The HomeWorks® system uses the contact closure output board to control pumps, thermostats, audio/video, and other equipment supplied with dry contact closure inputs. Each contact closure output (CCO) interface has eight individually-controlled contact closure outputs and eight corresponding push buttons with LED indicators. When placed in "manual control mode," the push buttons on the board are used to change the state of each relay, allowing functional testing of the devices that are being controlled. Both normally-open and normally-closed relay contacts are provided for each CCO, and each output can be programmed to provide either momentary (pulsed) or maintained (latching) functionality.

These CCOs can be assigned to any keypad button or time-clock event in the same manner as any lighting load. The CCO Interface has an IR receiver that is programmed independently of the contact closure outputs. This receiver allows Lutron® hand-held IR transmitters (SP-HT-WH, SPS-FSIT-RP, SPS-4IT-RP, GRX-IT-WH and GRX-8IT-WH) to function as "wireless keypads" when used in conjunction with standard IR repeater systems. The Lutron IR codes can be learned by most learning remotes, allowing audio/video remotes to control the lighting control system.



**Wired Contact Closure Output Interface  
(HWI-CCO-8)**

# Contact Closure Interfaces (cont.)

Model Number	HWI-CCI-8: Wired Contact Closure Input Interface.
Input voltage	15 V <sub>DC</sub> (from HomeWorks® Processor Keypad Link).
Input Types	Inputs can be used with ground-referenced, solid-state outputs if the outputs have an on-state saturation voltage of less than 2 V <sub>DC</sub> at 10 milliamperes and an off-state leakage of less than 50 microamperes. Dry contact or solid-state outputs must be capable of switching 15 V <sub>DC</sub> at 10 milliamperes. If there is any question as to whether a device is compatible with these specifications, contact the manufacturer of the device.
Environment	Ambient operating temperature: 0 °C to 40 °C, 32 °F to 104 °F Ambient operating humidity: 0-90% humidity, non-condensing. Indoor use only.
Contact Closure Input Connections	Eight 2-terminal removable connectors, one per input. Each terminal will accept up to four #18 AWG (1.0 mm <sup>2</sup> ) wires.
Low-Voltage Wire Type	Two pair – one pair #18 AWG (1.0 mm <sup>2</sup> ), one pair #18-22 AWG (1.0-0.5 mm <sup>2</sup> ) twisted shielded – Class 2 wire. Lutron® wire model # GRX-CBL-346S-500 may be used.
Low-Voltage Wiring Configuration	Daisy-chain, star, T-tap. Termination not required. Total length of wire on any link cannot exceed 1000 feet (305 m) per wire run. Total length of wire on that link cannot exceed 4000 feet (1220 m). Maximum of 32 devices per processor link that has been configured for keypads.
Low-Voltage Connection	One 4-pin removable terminal block. Terminal block will accept up to two #18 AWG (1.0 mm <sup>2</sup> ) wires.
Addressing	Via DIP switch. Units should be addressed before mounting. Counts as 1 of 32 addresses on the keypad link.
Diagnostics	Link LED for troubleshooting communications with <i>HomeWorks</i> Processor. IR receiver has a talk back LED that flashes when IR is received. IR receiver also has an LED that flashes when a valid Lutron IR command has been received. Each input has a feedback LED that turns on when the input is shorted.
ESD Protection	Meets or exceeds the IEC 61000-4-2 standard.
Surge Protection	Meets or exceeds ANSI/IEEE standard c62.41.
Dimensions	3 in (76 mm) x 8½ in (216 mm)
Keypad Link LED Count	10
Mounting	Mounts in the following enclosures: HWI-LV32-120, HWI-LV24-120, HWI-LV17-120 and HWI-ENC-CC.
IR Receiver	Are compatible with these Lutron IR transmitters only: SP-HT-WH, SPS-FSIT-RP, SPS-4IT-RP, GRX-IT-WH and GRX-8IT-WH. An IR flasher can be mounted directly to the clear plastic shield over the IR receiver. See Fig. 2, pg. 144. Also see Appendix C: Infrared (IR) Integration.
Shipping Weight	0.5 lb. (0.3 kg)

# Contact Closure Interfaces (cont.)

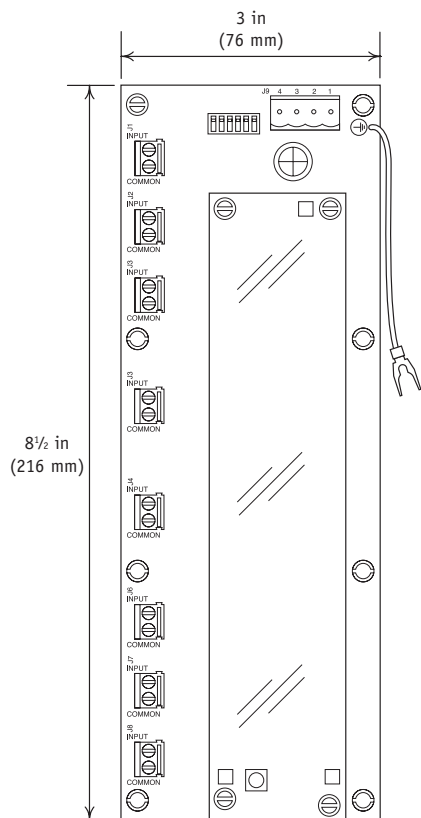


Figure 1 - HWI-CCI-8 Dimensions

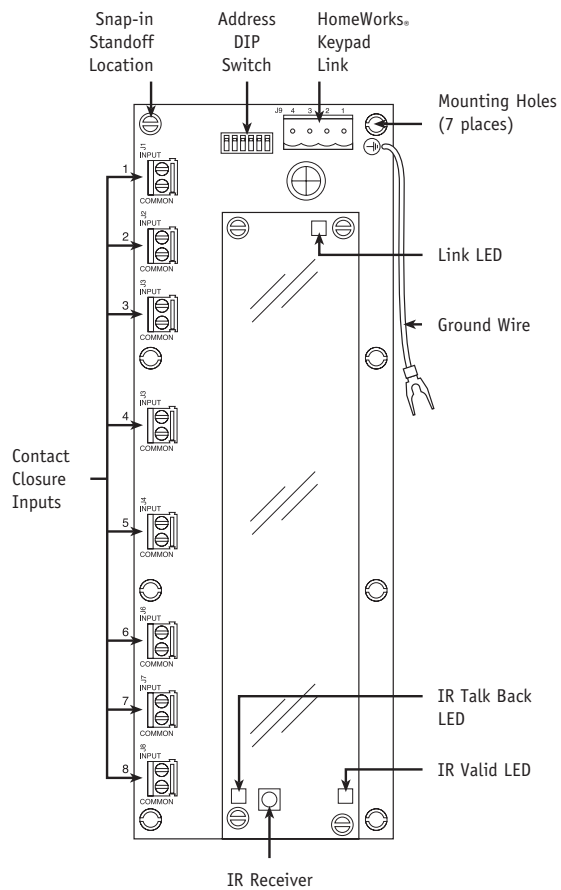


Figure 2 - HWI-CCI-8 Parts Identification

# Contact Closure Interfaces (cont.)

Model Number	HR-CCI-6-SW: RF Contact Closure Input Interface.
Input Voltage	9 V $\overline{=}$ transformer (provided)
Regulatory Approvals	HR-CCI-6-SW: FCC, IC; Transformer: UL, NOM
Environment	Ambient operating temperature: 0 °C to 40 °C, 32 °F to 104 °F Ambient operating humidity: 0-90% humidity, non-condensing. Indoor use only.
Line-Voltage Connections	Lutron provides a plug-in low-voltage transformer.
Input Types	Inputs can be used with ground-referenced, solid-state outputs if the outputs have an on-state saturation voltage of less than 1 V $\overline{=}$ at 2 milliamperes and an off-state leakage of less than 10 microamperes at 12 V $\overline{=}$ . Dry contact or solid-state outputs must be capable of switching 15 V $\overline{=}$ at 10 milliamperes. Outputs must stay in the open or closed state for at least 40 milliseconds to be recognized by the interface, If there is any question as to whether a device is compatible with these specifications, contact the manufacturer of the device.
Contact Closure Input Connections	8 position terminal block, 6 input connections, 2 common connections. Each terminal will accept up to two #18-22 AWG (1.0 -0.5 mm <sup>2</sup> ) wires.
Addressing	Via the HomeWorks® software. Units must be installed prior to addressing.
Diagnostics	Six buttons allow you to test each contact closure input's programming from the front of the control. Each dry contact closure input has an LED indicator that shows the state of the connected device.
ESD Protection	Meets or exceeds the IEC 61000-4-2 standard.
Surge Protection	Meets or exceeds ANSI/IEEE standard c62.41.
Dimensions	See Fig. 1, pg. 146.
Mounting	Unit must be located within 5 feet (1.5 m) of a 120 V $\overline{\sim}$ receptacle. Unit must be placed within 30 feet (9 m) of an hybrid repeater or an RF processor.
Shipping Weight	1.5 lbs. (0.7 kg)

# Contact Closure Interfaces (cont.)

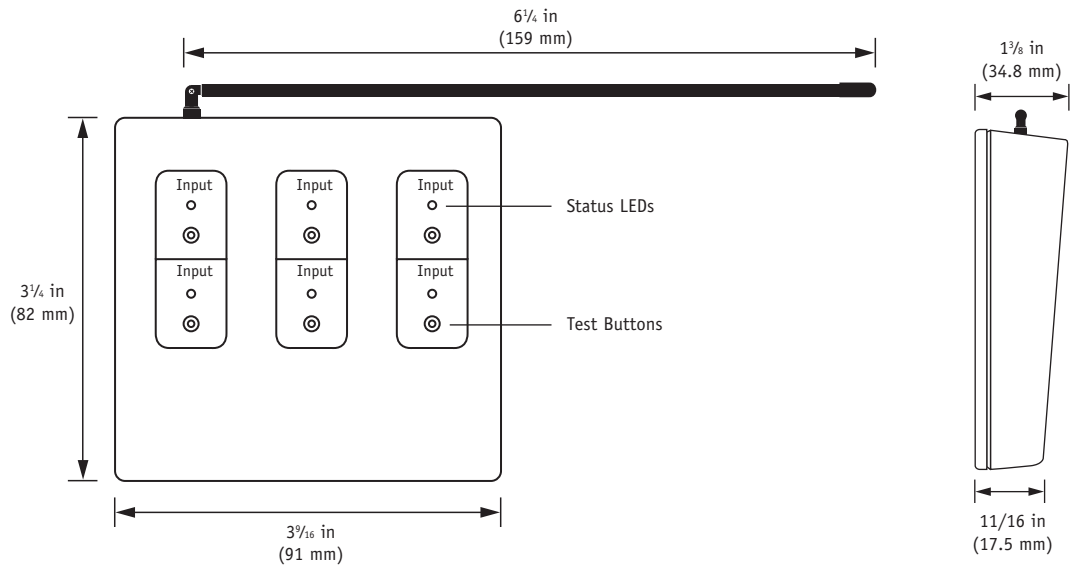


Figure 1 – HR-CCI-6-SW Dimensions

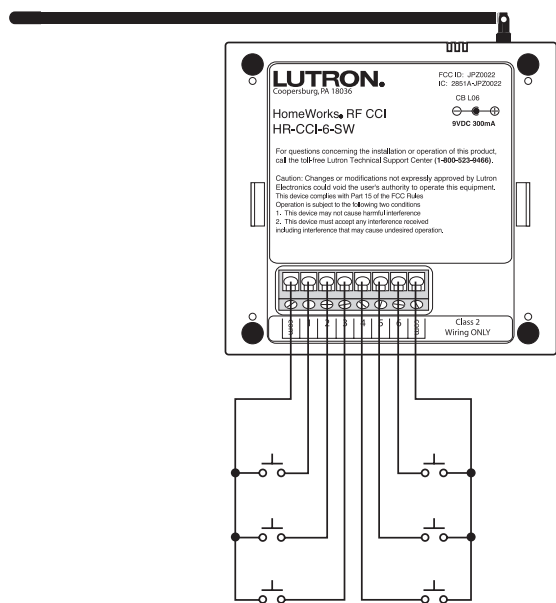


Figure 2 – HR-CCI-6-SW Wiring

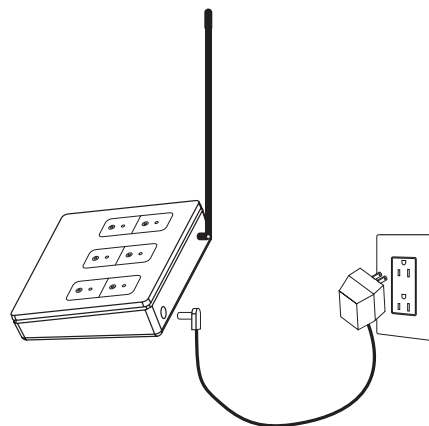


Figure 3 – HR-CCI-6-SW Installation

BACK ROOM

# Contact Closure Interfaces (cont.)

Model Number	HWI-CCO-8: Wired Contact Closure Output Interface.
Input Voltage	15 V $\overline{=}$ (from HomeWorks <sup>®</sup> processor keypad link).
Relay Contact Ratings	See Table 1, pg. 148.
Relay Outputs	Each output can be normally-open (NO) and normally-closed (NC). Outputs can be programmed to provide either momentary (pulsed) or maintained (latching) functionality.
Environment	Ambient operating temperature: 0 °C to 40 °C, 32 °F to 104 °F Ambient operating humidity: 0-90% humidity, non-condensing. Indoor use only.
Contact Closure Output Connections	Eight 3-terminal (normally-open, normally-closed, common) non-removable connectors, one per output. Each terminal will accept up to four #18 AWG (1.0 mm <sup>2</sup> ) wires.
Low-Voltage Wire Type	Two pair—one pair #18 AWG (1.0 mm <sup>2</sup> ), one pair #18-22 AWG (1.0-0.5 mm <sup>2</sup> ) twisted shielded—Class 2 wire. Lutron <sup>®</sup> wire model # GRX-CBL-346S-500 may be used.
Low-Voltage Wiring Configuration	Daisy-chain, star, T-tap. Termination not required. Total length of wire on any link cannot exceed 1000 feet (305 m) per wire run. Total length of wire on that link cannot exceed 4000 feet (1220 m). Maximum of 32 devices per processor link that has been configured for keypads.
Low-Voltage Connections	One 4-pin removable terminal block. Terminal block will accept up to two #18 AWG (1.0 mm <sup>2</sup> ) wires.
Addressing	Via DIP switch. Units should be addressed before mounting. Counts as 1 of 32 addresses on the keypad link.
Diagnostics	Link LED for troubleshooting communications with processor IR receiver has a talk back LED that flashes when IR is received and a valid IR LED that flashes when a valid Lutron IR command has been received. Each output has a feedback LED that turns on when the normally-open contact is connected to common. Using one of the DIP switches, the HWI-CCO-8 can be placed into manual control mode. While in manual control mode, the state of each relay can only be toggled by pressing the corresponding button.
ESD Protection	Meets or exceeds the IEC 61000-4-2 standard.
Surge Protection	Meets or exceeds ANSI/IEEE standard c62.41.
Dimensions	3 in (76 mm) x 8½ in (216 mm)
Keypad Link LED Count	10
Mounting	Mounts in the following enclosures: HWI-LV32-120, HWI-LV24-120, HWI-LV17-120, and HWI-ENC-CC.
IR Receiver	Are compatible with these Lutron IR transmitters only: SP-HT-WH, SPS-FSIT-RP, SPS-4IT-RP, GRX-IT-WH and GRX-8IT-WH. An IR flasher can be mounted directly to the clear plastic shield over the IR receiver. See Fig. 2, pg. 148. Also see Appendix C: Infrared (IR) Integration.
Shipping Weight	0.5 lb. (0.3 kg)

# Contact Closure Interfaces (cont.)

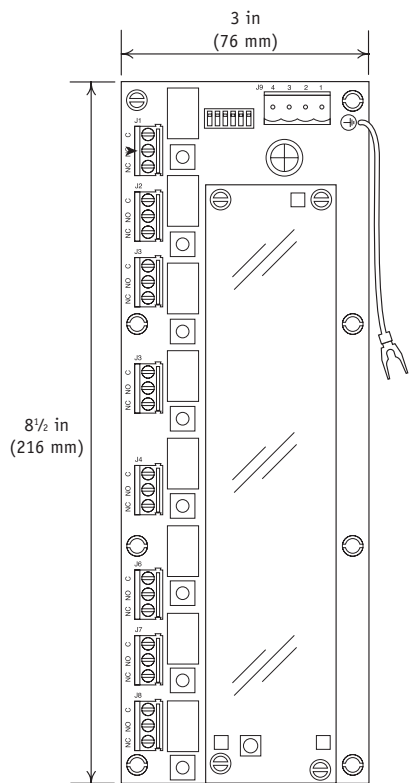


Figure 1 – HWI-CCO-8 Dimensions

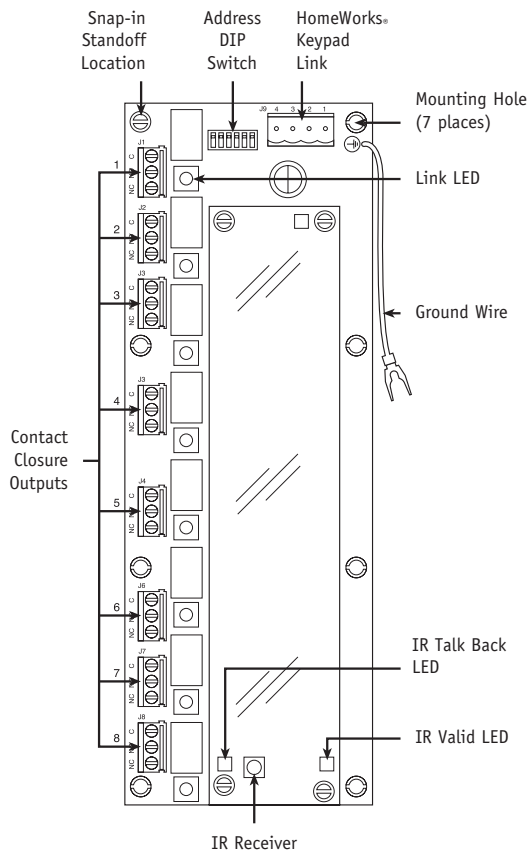


Figure 2 – HWI-CCO-8 Parts Identification

Voltage	Resistive Load	Inductive Load
Up to 30 V	1 A	0.2 A
Up to 30 V	0.5 A	0.1 A
Up to 60 V	1 A	Do not use HWI-CCO-8
Up to 42.4 V	0.5 A	Do not use HWI-CCO-8

Table 1 – HWI-CCO-8 Relay Contact Ratings