

Catalog Numbers • Les Numéros de Catalogue • Números de Catálogo: LIC8/LIC24/LIC48/LICA8/LICA24/LICA48

Country of Origin: Made in China • Pays d'origine: Fabriqué en Chine • País de origen: Hecho en China

INTERIORS

ENCLOSURES

SPECIFICATIONS



Figure 1: Panel interiors and enclosures

Supply Voltages.....	per selected power supply
P115/277 Power Supply.....	120 or 277VAC
P240 Power Supply.....	240VAC
P115/347 Power Supply.....	120 or 347VAC
Accessory Power Output.....	800mA@24VDC/VAC/ACR
Relay Load Ratings.....	@120VAC @277VAC @347VAC
Ballast	N/A 20 Amp 20 Amp
Tungsten	20 Amp N/A N/A
Resistive.....	N/A 20 Amp 20 Amp
Motor	1 1/2 HP N/A N/A
Duplex Receptacle	20 Amp N/A N/A
Environmental	
Maximum Ambient Temperature	60°C
Maximum Humidity	5% to 90% RH, non-condensing
UL & CUL Listed for receptacle rated circuit control	

INTRODUCTION

The Lighting Integrator (LIC) is a relay-based automatic lighting control panel. The LIC controls lighting through scenarios, time schedules, occupancy sensors, daylighting sensors, photocells, and occupant controlled switches. A network of LI panels can also be controlled from a clock, or a building management system, or by a central computer.

As a minimum, each panel requires an interior assembly and an enclosure. These components may have shipped separately.

The panel interior assembly provides isolation between the line- and low-voltage sections of the panel, as well as the mounting frame for relays, the power supply and the circuit board assemblies.

Inside the low voltage area are LEDs for visual indication of relay status, plus manual push-buttons to turn individual relays on or off, and to perform smartwiring.

Smartwiring is a Wattstopper innovation that enables easy push-button relay grouping for convenient group control. Smartwiring offers flexible grouping of lighting loads for control of individual relays, groups of relays, or channels.

After installation and setup, a secure outer cover, when closed, offers protection from the high voltage area.

The following page shows a photograph of a fully assembled 24-relay Lighting Integrator panel that shows installed components for reference. The illustrations show component locations for 8-relay and 48-relay LI panels. Note that not all of the components shown may be fitted in every Lighting Integrator panel, depending on the application.

Before installing the LIC, read the instructions completely. If you have any questions, call our Technical Support team at: 800.879.8585.

Important Installation Notices

- All power must be turned off prior to wiring, installation, or service.
- More than one disconnect may be required to de-energize power to the LIC.
- External circuit protection to the LIC is required (for example, the circuit breaker).
- Installation shall be in accordance with all applicable regulations, wiring practices, and codes.
- Care should be taken to separate high voltage power from low voltage (Class 2) control wiring.
- Do not energize wiring until the unit is fully assembled and connected circuits have been tested and found to be free of electrical shorts.



WARNING:
RISK OF ELECTRIC SHOCK.



WARNING: IMPROPER INSTALLATION OR CONNECTION OF THIS PANEL MAY RESULT IN SERIOUS PERSONAL INJURY AND/OR DAMAGE TO THE PANEL AND OTHER DEVICES.



COMPONENT LOCATIONS

The illustration below shows a Lighting Integrator panel installed inside an enclosure with the cover removed. Note the location of components when the panel is fully assembled.

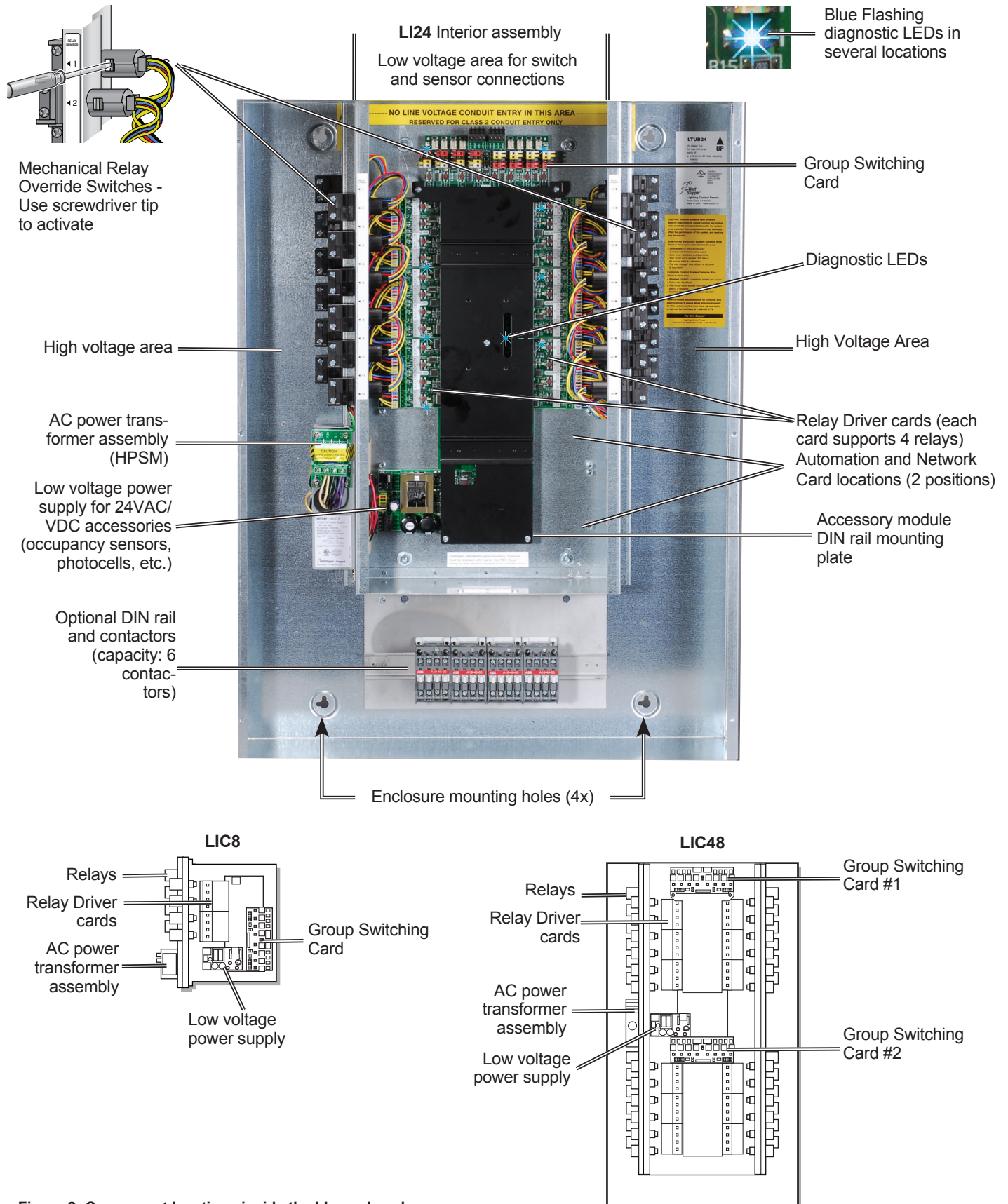


Figure 2: Component locations inside the LI panel enclosure

INSTALLATION AND SETUP

A. Mount the LIC Enclosure

1. Attach the enclosure to the wall.
The enclosure should be level, plumb and rigidly installed. Refer to the instructions provided with the enclosure for flush or surface mounting procedures.
2. Determine the appropriate wire entry locations.
Make sure that all line and low voltage wiring entry locations are confined to the appropriate compartments as shown in the figure below.

Do not run low voltage wiring with line voltage or power wiring.

3. Drill or knock out openings to bring wiring conduit into the enclosure.



**WARNING: OBSERVE LINE AND
LOW VOLTAGE SEPARATION WHEN
ROUTING CONDUIT AND WIRE.**



B. Install the LIC Interior

Do not install the interior assembly until after the LI enclosure has been securely mounted to the wall and the conduit/wiring holes have been drilled or knocked out.

NOTE: If this enclosure includes the optional DMP-1 Din Rail Mounting Plate, place DMP Plate over lower studs before installing the interior.

1. Place the interior in the enclosure and align the interior with the studs provided in the enclosure.
2. Attach the interior assembly to the back of the enclosure using the four sets of nuts and washers provided.
3. After all wiring is completed, attach the cover according to the instructions provided with the enclosure.

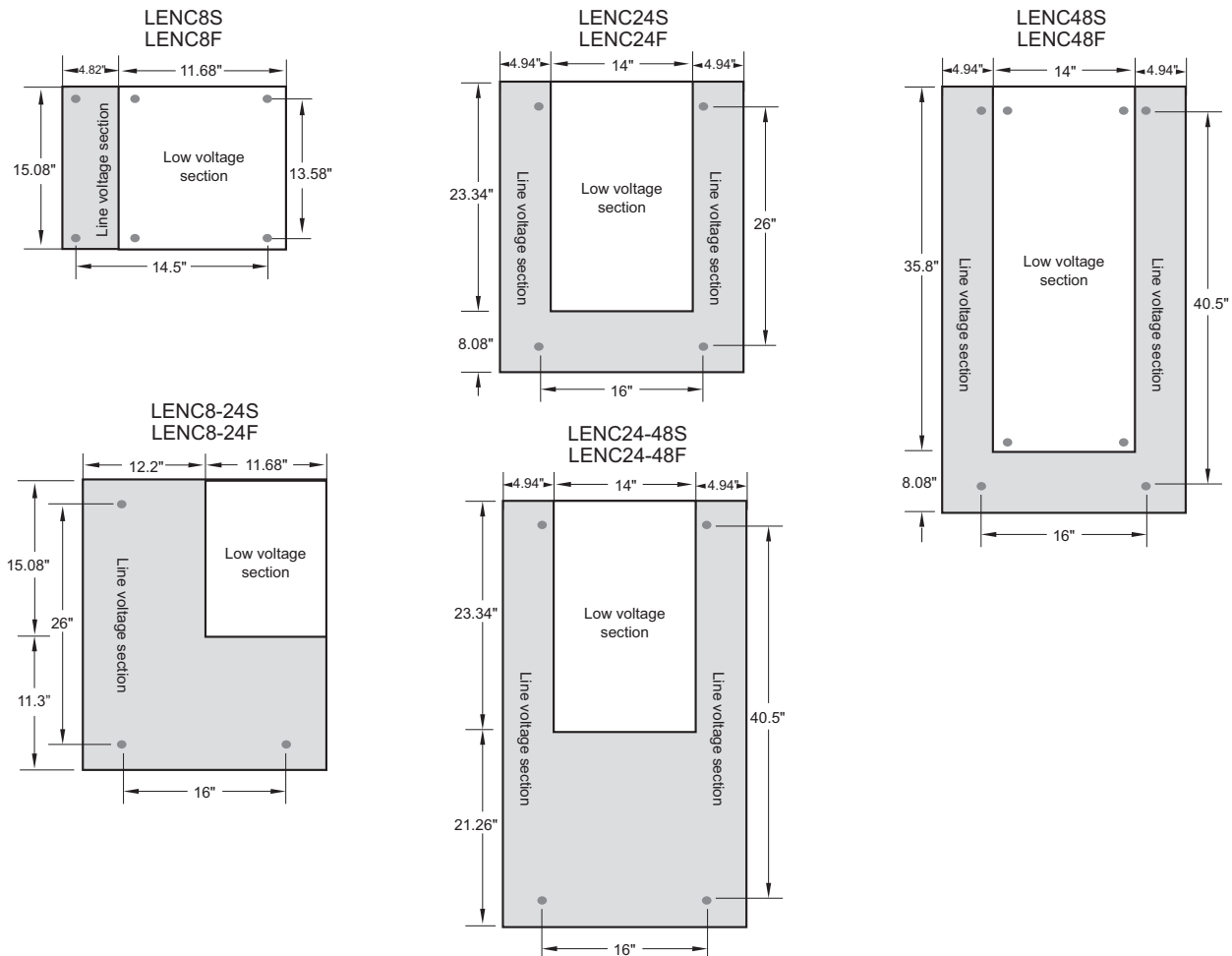
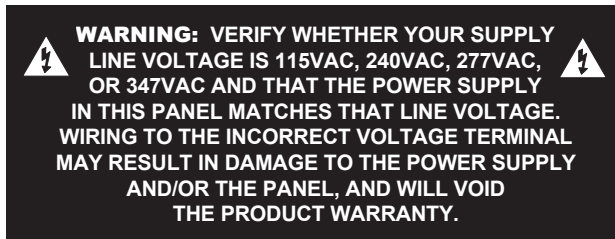


Figure 3: Enclosure dimensions

C. Connect the AC Power Supply to Power Source

The LIC has several power supply options that allow it to operate with 115VAC, 240VAC, 277VAC or 347VAC line voltage. These power supplies function with either 50 or 60 Hz. They have internal overcurrent protection. The transformer automatically turns off when overloaded and resets when the fault is removed. The power supply contains MOVs to protect all downstream electronics from transient power line voltage surges.

1. Read and remove the **WARNING** label covering the terminals.



2. Note that there are different terminals for supply voltage input. Wire to **ONLY ONE** of these terminals. Match your input voltage to the correct terminal.

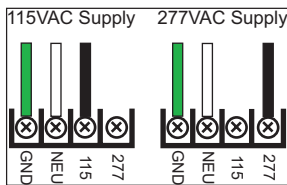


Figure 4: P115/277 wiring

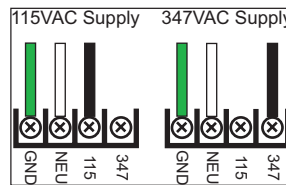


Figure 5: P115/347 wiring



Figure 6: P240 wiring

D. Connect Load and Line Voltage to Relays

Before making any connections to the relays, make sure that none of the load circuits are shorted. Route conductors from the circuit breaker through each relay's SPST output terminals, and from there to the loads. Confirm that each circuit is wired to the relay specified in the electrical construction drawings and relay schedule forms provided with the panel.

Lighting Integrator
Panel Wiring Documentation - 24 relay

Panel ID	Name	Location	Type	Interior Enclosure Size	Circuit
			LI	24/24	

Relay	Circuit	Description	LV Switch	Relay	Circuit	Description	LV Switch
1				13			
2				14			
3				15			
4				16			
5				17			
6				18			
7				19			
8				20			
9				21			
10				22			
11				23			
12				24			

Group Switch Card 1

Channel	Function* (Circle One)	Description	Leads Controlled
A	ON/OFF, Pattern, Group		
B	ON/OFF, Pattern, Group		
C	ON/OFF, Pattern, Group		
D	ON/OFF, Pattern, Group		
E	ON/OFF, Pattern, Group		
F	ON/OFF, Pattern, Group		
G	ON/OFF, Pattern, Group		
H	ON/OFF, Pattern, Group		

* Functions: ON/OFF and Pattern are for relays within the same panel. Group Codes are only available with the Communication Card and are available system wide (see Group Code Form).

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Figure 7: Relay Schedule Form

Power Up and Test Relays

1. Apply power to the LIC power supply **ONLY**. Do NOT apply power to the controlled circuit loads.
2. As shown in the illustration, locate the relay control buttons on the Relay Driver card next to each relay's 5-wire plug-in termination.
3. Press the relay control button to toggle it ON/OFF. The relay clicks, the relay's mechanical override switch moves, and the LED status indicator changes.
4. Confirm the operation by measuring the continuity at the line voltage terminations of each relay.
5. Apply power to the relays.
6. Being careful not to touch any line voltage wiring, toggle each relay ON/OFF again and confirm that each relay controls the appropriate load.

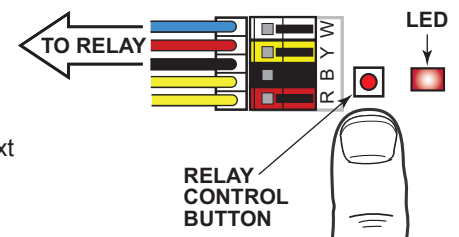


Figure 8: Relay Control Button

E. Low Voltage (Class 2) Wiring

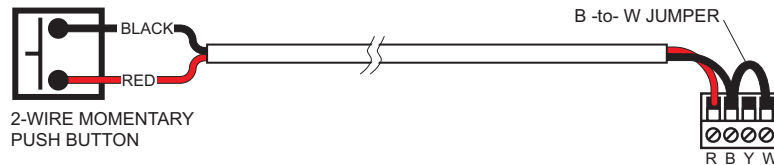
The low voltage (Class 2) section of the panel provides terminal connections for a variety of optional switches and other devices. See Figure 3 for location of the low voltage section. All wire entering this section must be Class 2 only. Do not allow line voltage conductors to pass through the Class 2 section for any reason.

An individual relay can be controlled from a switch or sensor by hardwiring it to the corresponding connector on the Relay Driver card (see Figure 2 for locations). Alternatively, several relays can be grouped together so that they can be controlled from a single switch or sensor that is hardwired to the Group Switching card (see **Optional Group Switching Card** and **Smartwire Procedure** sectionS). A group of relays is assigned to a group channel via smartwiring. Up to 8 groups labeled A through H are available with a single Group Switching card (refer to Figure 10). A 48-relay panel can support two Group Switching cards, for up to 16 group channels.

Hardwire Low Voltage Switch Wiring

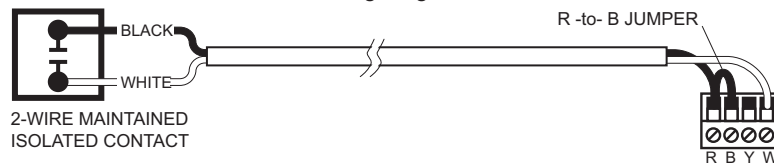
Two-wire momentary

Operates as push ON/push OFF in an alternate action. This type of control is recommended for applications where the user can clearly see the lighting being controlled. This switch cannot be hardwired to multiple inputs. If multiple relays need to be controlled by this type of switch, use a Group Switch card input.



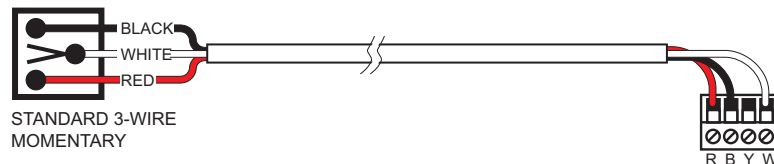
Two-wire maintained

Operates as a standard ON/OFF toggle switch. This type of control should not be used where the lighting is being controlled by scheduled or other automatic means. If the lighting is turned off by automatic means, the switch must be moved through the OFF position before it once again synchronizes with the status of the lighting.



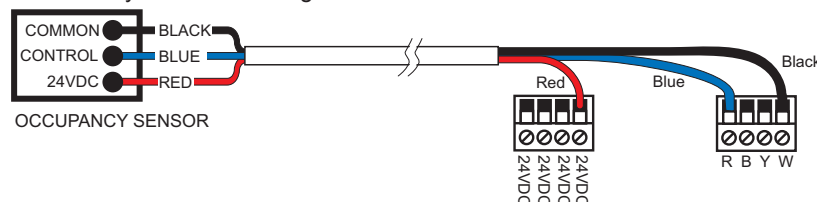
Three-wire momentary

Operates in a dual momentary action mode with an independent contact for the ON and OFF signals. This operation can be provided by a SPDT momentary toggle switch or a variety of Wattstopper low voltage switch options. This is the most common type of direct wired switch option used with LI relay panels.



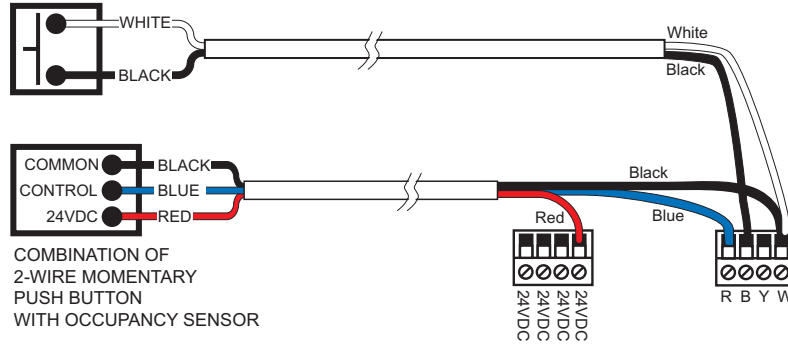
Occupancy Sensor

LIC switch inputs are designed to automatically sense the connection of a Wattstopper occupancy sensor. The operation of the input configures for proper operation as soon as the sensor activates the input for the first time. Operation of the relay is determined by motion detection in the space and the scheduled occupancy state of the relay or channel it is controlling. During scheduled occupied periods, the sensor turns lighting ON when motion is detected but does not turn the lighting OFF. During unoccupied periods, the sensor turns the lighting ON and OFF based only on motion being detected.



Manual ON/OFF with Occupancy Sensor

Allows a two-wire momentary switch to have manual ON/OFF control of the lighting in conjunction with occupancy sensor control. Unlike the occupancy sensor, this switch turns the lighting ON or OFF regardless of the status of the sensor or scheduled occupancy status relay or channel it is controlling.



Switches with Pilot Lights

The “Y” (yellow) terminal on the Switch Input Terminal Blocks supplies 24V rectified for use with pilot light switches.

To power a pilot light from the “Y” (yellow) terminal of a Group Switching (GS) card, install a jumper wire from 24VR to Yelcom on the GS card.

Voltage is present when the associated relay is ON.

Contact the Factory for configuring the panel for use with switch pilots requiring other voltages.

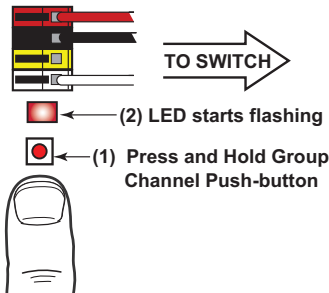
F. Optional group switching and smartwire procedure

The Group Switching card (Figure 10) provides eight channels (A-H), which may be smartwired to relays within the panel. Channels are used to group relays for common control.

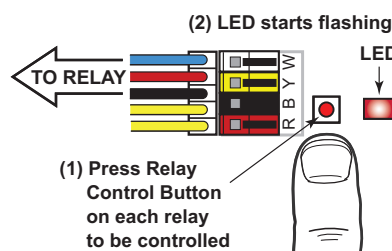
When an LIA panel includes an automation module (HCLK8SS Network Clock or HBMS8SS BMS Interface Module), turn to the installation instructions for that automation module and complete the documentation before smartwiring any relay to channels.

However, if automation is to be provided by an interface to another system, or by using manual switches only, the channels may be used simply for grouping relays. See instructions 1, 2, and 3.

Step 1. GROUP SWITCHING CARD



Step 2. RELAY DRIVER CARD



Step 3. GROUP SWITCHING CARD

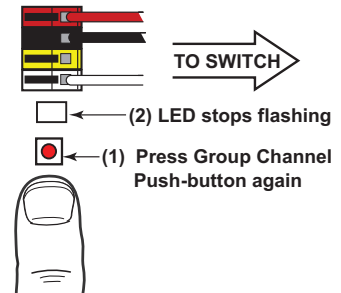


Figure 9: Manual relay channel setup for the Group Switching Card

1. On the Group Switching card, press and hold the Group channel push button for several seconds.
2. Release the button when the red channel LED and the LEDs for relays currently controlled by that input begin to flash.
3. On each Relay card, select the relays to be controlled.
If a relay was previously “smartwired” to the channel input selected, the LED flashes; otherwise the LED is off.
4. Press the associated Relay Control Button to add/delete that relay to/from the group.
The LED for each relay included in the group flashes.
5. On the Group Switching card, press the Group Channel Push-button again for several seconds.
6. Release the button when all LEDs stop flashing.
The input switch now controls the relays selected.

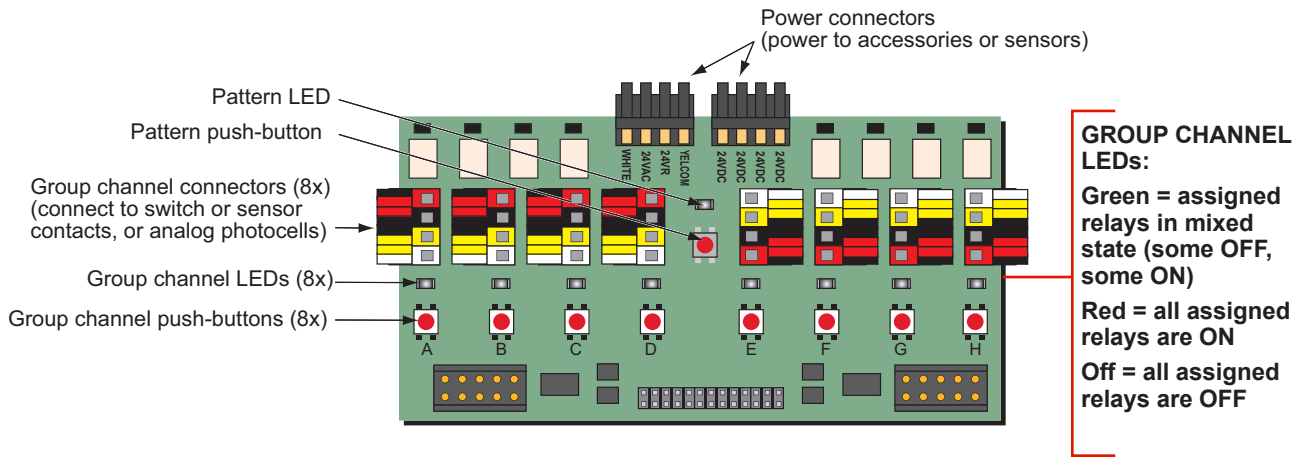


Figure 10: Group Switching card connections and components

Test Smartwired Relay Group Channels

1. Press the Group channel Push-button ON/OFF/ON to toggle the group ON/OFF/ON.
The Group channel LED tracks the last action. With all relays in the group ON, the Group channel LED is Red.
2. Turn OFF each relay in the group using the individual Relay Control Buttons.
The Group channel LED turns Green to indicate that the relays assigned to that channel are in mixed states – some are OFF, some are ON.
When the last relay is turned OFF, the Group Channel LED should also go OFF.

ADVANCED FEATURES INSTALLATION AND SETUP

The preceding sections covered the general installation procedure for the Lighting Integrator panel. The following sections are specific to the various optional configurations of the panel. Use the guide below to identify the configuration, then proceed to the applicable section or sections to complete the installation.

Dataline Switch Support

LICA panels configured for use with HDLS series digital dataline switches will include the LC Card. These components require installation of the LI Local Dataline. **Proceed to Section A.**

Complete Control Level

These systems use the WinControl software running on a personal computer to download programming and provide sophisticated lighting control functions. LI Complete Control level panels have the Complete Control card installed (see Figure 1). **Proceed to Section B.**

Dataline Link (DL) Card

In some systems, the Dataline Link (DL) card may be supplied in place of the Dataline Power Supply (DP) card. The DL card includes a dataline power supply; therefore, systems with a DL card do not require a separate DP card. **Proceed to Section C.**

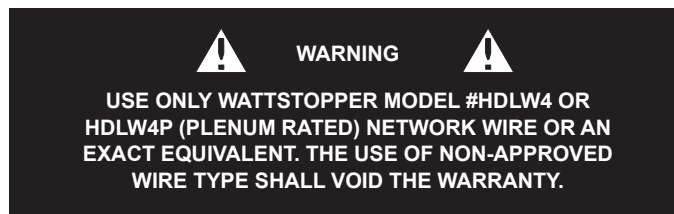
A. Dataline Switch Support — Local Dataline Installation

The Local Dataline is a LonWorks® based digital communications bus that allows the LIC panel to work with HDLS series digital programmable wall switches. The local dataline consists of two unshielded wire pairs (four wires) with the white/blue pair supplying power to the dataline switches, and the red/black pair for communications.

The local dataline can be installed using free topology routing as long as the total length of wire does not exceed 1500 feet.

If the installation requires more than 1500 feet of Local dataline wire, run it in a strict daisy chain (linear) bus topology with no T-taps, Ys, or star configurations. A jumper on the LW card needs to be adjusted and the last switch on the local dataline must be terminated.

Connect the local dataline to the panel at the terminal block labeled “LOCAL DATALINE” in the upper right corner of the LC Card (see Figure 11). The terminal block can be removed from the circuit board to facilitate making the connections. Be sure to observe the color code when connecting the dataline wire.



DO NOT run the DATALINE along with or over any HIGH VOLTAGE CONDUCTORS

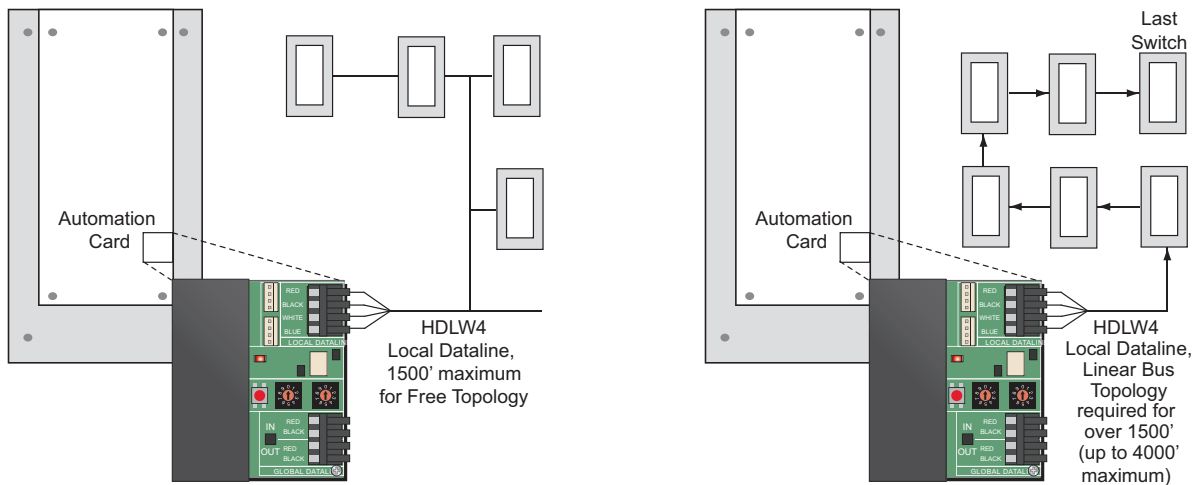


Figure 11: HDLW4 Local Dataline configurations

B. Complete Control Level Panel and CC Dataline Installation

The Complete Control level Lighting Integrator panel is designed to operate in conjunction with WinControl software, which is used to load user programming into the panel. If the installation is to use HDLS series digital dataline switches, the LI panel must also have an LC Card installed.

Connect the CC dataline to the Complete Control card. See Figure 2 for the location of the card in the panel.

Note that separate "IN" out "OUT" terminals are provided purely as a convenience in making the wire connections. These are connected in parallel on the circuit board. The terminal blocks are removable to aid in making the wire connections. In most installations, the GROUND terminal is not used. However, in some cases, problematic networks can be improved by connecting the shield to ground. See Figure 12.

The CC dataline consists of a single twisted wire pair (two wires) with a shield. It can be installed using free topology wire routing. The total length of wire should not exceed 4000 feet. If the installation requires more than 4000 feet of wire, network repeaters can be used (consult factory). In either case, DO NOT run the DATALINE along with or over any HIGH VOLTAGE CONDUCTORS.

Dataline Power Supply

Every LI Complete Control Networked System requires a DATALINE Power Supply to be installed in one panel. In systems with Factory supplied submittal documents, this is typically LCPI.

C. Dataline Link (DL) Card

In some systems, the Dataline Link (DL) card may be supplied in place of the Dataline Power Supply (DP) card. The DL card includes a dataline power supply; therefore, systems with a DL card do not require a separate DP card.

The DL card adds functionality to the LIC panel system. In some cases, a system is specified with more than one panel containing a DL card, or the system uses the HLINK. In these cases, the HLINK is typically set as the master, and the DL card(s) should be set as slaves. A DIP Switch is provided on the DL card for this setting. See Figure 12.

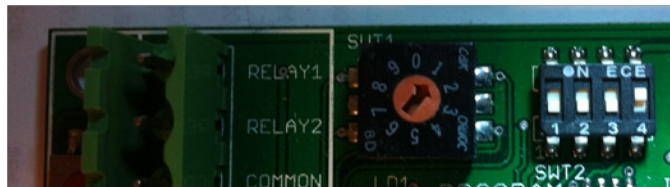


Figure 12: DIP Switch

Where a system has more than one DL card installed, each DL card must be set to a different device number, 1 - 9. This is set using the rotary dial labeled SWT1 on the DL card. Most systems have a single DL card, and this should be set to #1.

DL Card DIP Switch Settings:

DIP Switch #1 - OFF = Slave mode, ON = Master mode (only one DL per system may be ON)

DIP Switch #2 - Leave ON

DIP Switch #3 - Leave ON

DIP Switch #4 - ON = this card is powering the dataline, OFF = dataline is powered elsewhere

Refer to the submittal documents provided with the system for additional information concerning the DL card(s).

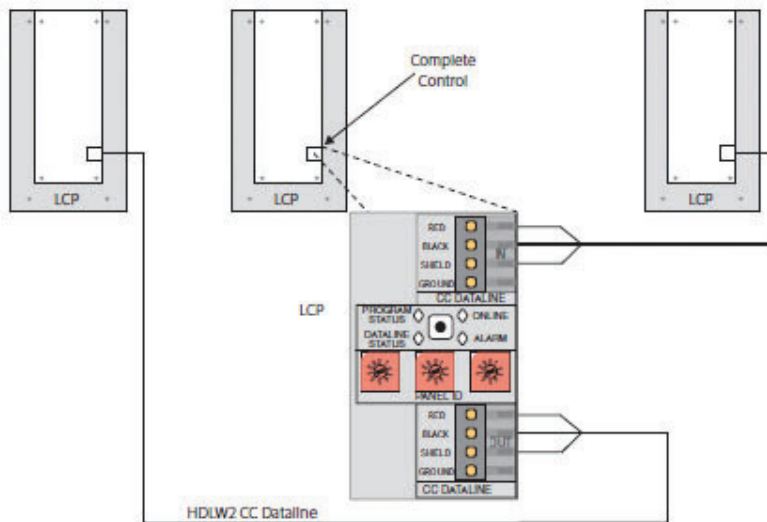


Figure 13: HDLW2 CC Dataline Installation

⚡ CAUTION ⚡

USE ONLY WATTSTOPPER MODEL #HDLW4 OR HDLW4P (PLENUM RATED) NETWORK WIRE OR AN EXACT EQUIVALENT. THE USE OF NON-APPROVED WIRE TYPE SHALL VOID THE WARRANTY.

The CC dataline should be tested for continuity and isolation from ground.

To test for continuity:

1. Disconnect the DATALINE from the DATALINE Power Supply (DP CARD).
In most installations, the DP Card will be located in LCP #1.
2. Remove the red and black dataline wires at the first panel and temporarily wire nut them together.
3. Go to the last panel in the series and measure the resistance between the red and black wires.
It should be less than 60 ohms.
4. Return to the first panel and restore the red and black wires to their associated terminals.

To test for a short circuit to ground:

1. Test from the red and black terminals in turn to the metal chassis of the panel enclosure.
The test should show an open circuit. If the test shows a short circuit, trace the wiring back, segment by segment until the short is located.
2. Use the three rotary switches labeled PANEL ID in the right center of the CC card to set a unique address for each panel.
It is likely that the Complete Control system was supplied with factory-prepared submittal documents. It is important that the panel ID settings be made in accordance with the ID settings indicated on the submittal documents. These settings are used by the WinControl software to provide correct programming for each lighting control panel.

NOTE: If the Automation Card is installed with the complete control card, the GLOBAL DATALINE rotary switches must be set to "01".

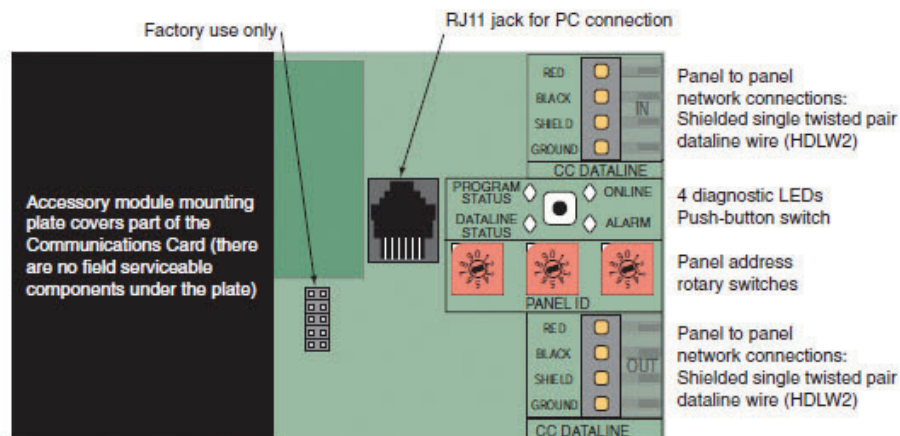


Figure 14: HDLW2 CC

TESTING

Basic Power-up Testing

Test	Response	What next? If the panel continues to fail a test, call Technical Support
Observe Blue LEDS on the C8 or C24 board.	Blue LED blinks at a regular tempo.	Go to next Test.
	Blue LED off or continuously lit.	Reset panel power. Check LED again.
Observe Blue LEDS (at DS6) on RD boards (and on GS card if installed).	Blue LED flashes at regular intervals on both boards.	Go to next Test.
	Blue LED off or continuously lit.	Reset panel power. Check LED again.
Observe the Green Status LEDS on the C8 or C24 board.	All 6 Green Status LEDS are continuously lit.	Go to next Test.
	Any Green Status LED is off.	Reset panel power. Check LEDs again.
Observe the two green Power LEDS at DS1 & DS2 on the PS board.	Both green Power LEDS are continuously lit.	Go to next Test.
	Either Green Power LED is off.	Turn off power to panel and check red and black wire connections to the J2 terminal block on the PS board. Reset panel power. Check LEDs again.
Look for any lit Amber LEDS on the RD (and GS if installed).	No Amber LEDS observed.	Go to next Test.
	An Amber LED is lit or blinking.	Reset panel power. Check for Amber LEDS again.
Relay Operation: Press each Relay control push-button.	Red LED for each relay lights and relay clicks. Press button again, relay clicks and Red LED goes off.	Ok to wire low voltage devices to relay card terminals.
	Red LED doesn't light and/or relay doesn't click.	Make sure a jumper is installed on PS board between YELCOM and 24VR terminals.

TROUBLESHOOTING

#	Problem	Test Steps	Next
1	The LV switch does not control the relay or group.	Are the wires routed and terminated correctly in the panel? See pages 5 & 7.	No – Correct terminations.
			Yes – Go to next step.
		Is the 12VDC indicating LED on the C8 or C24 motherboard solid Green?	No – Cycle power to panel; recheck.
			Yes – Go to next step.
		Does the board mounted override pushbutton control the relay or group?	No – Call tech support.
			Yes – Go to next step.
		Disconnect input terminals. Does jumping the Red to White input terminals turn the relay on and does Black to White turn it off?	No – Call tech support.
			Yes - Verify the LV wiring is not shorted and that the switch is operating correctly.
2	When I try to turn the relay off it goes off for a second then comes back on.	If using a Group switch, have the relays been assigned to the particular group using the GS card?	No – Make the necessary assignments (refer to page 8).
			Yes – Go to next step.
		Remove any LV switching that is landed at the relay input and attempt to turn relay ON using the board override buttons.	No change in status - Go to next step.
			Relay functions normally - Verify the LV wiring is not shorted and that the switch is operating correctly.
		Move LV relay connection to a different point on the RD board and attempt to override the relay on.	No change in status - relay needs to be replaced - call tech support.
			Relay functions properly – circuit board needs to be replaced - call tech support.

#	Problem	Test Steps	Next
3	When I try to turn the relay on it comes on for a second then goes off again.	Remove any LV switching that is landed at the relay input and attempt to turn relay ON using the board override buttons.	No change in status - Go to next step.
			Relay functions normally – Verify the LV wiring is not shorted and that the switch is operating correctly.
		Move LV relay connection to a different point on the RD board and attempt to override the relay on.	No change in status - relay needs to be replaced - call tech support.
			Relay functions properly – circuit board needs to be replaced - call tech support.
4	I need to remove a sensor from the system.	Once a sensor has been connected to a relay driver or group switch card low voltage input, the input will remain in the sensor mode even if the sensor is removed. To restore normal operation: <ol style="list-style-type: none"> 1. Remove the sensor wiring from the panel input. 2. Turn the associated relay or group off using the red override button corresponding to the input where the sensor had been connected. 3. Momentarily jumper the white and red terminals. 4. Does the relay/group turn on? 	No – Call tech support.
			Yes – Normal operation is restored. The input is configured for standard low voltage switches.

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