

Please Read

# LCP128™

## Dimming and Switching System





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## Step-by-Step Instructions

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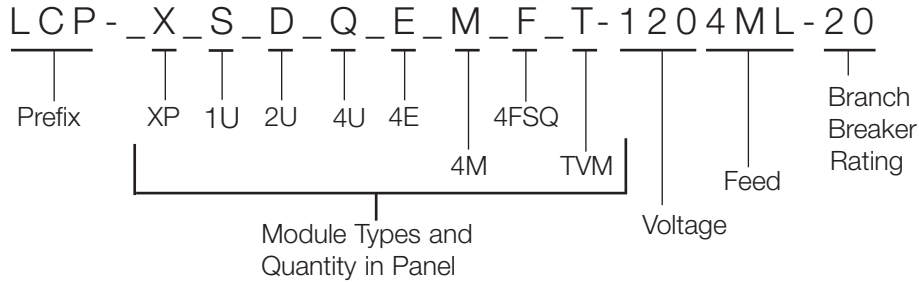
## Overview

Use this guide to successfully install an *LCP128* system. This guide describes panel installation, control station wiring, and load activation.



# Step 1 Panel Model Number Guide

## Panel Model Numbers



Example:  
2S4D = two 1U modules and  
four 2U modules

### Module Types

- XP** = Four-Circuit Switching (Relay) Module
- 1U** = One-Output Dimming Module
- 2U** = Two-Output Dimming Module
- 4U** = Four-Output Dimming Module
- 4E** = Four-Output Electronic Low Voltage Dimming Module
- 4M** = Four-Output Motor Module
- 4FSQ** = Four-Output Quiet Fan Speed Module
- TVM** = 0-10V Ballast Control Module

### Voltage:

**120** for 100 – 127 V ~

### Feed:

- FT** = Feed-Through Panel (circuit breakers not included)
- 4ML** = 3 Phase 4 Wire Feed
- 3ML** = 1 Phase 3 Wire Feed (Split Phase)

### Branch Breaker Rating:

Omit for feed through panels.  
**20** for 20 A Branch Circuit Breakers with 16 A Continuous Load Rating

### Frequency - All Model Numbers and Voltages

50/60 Hz

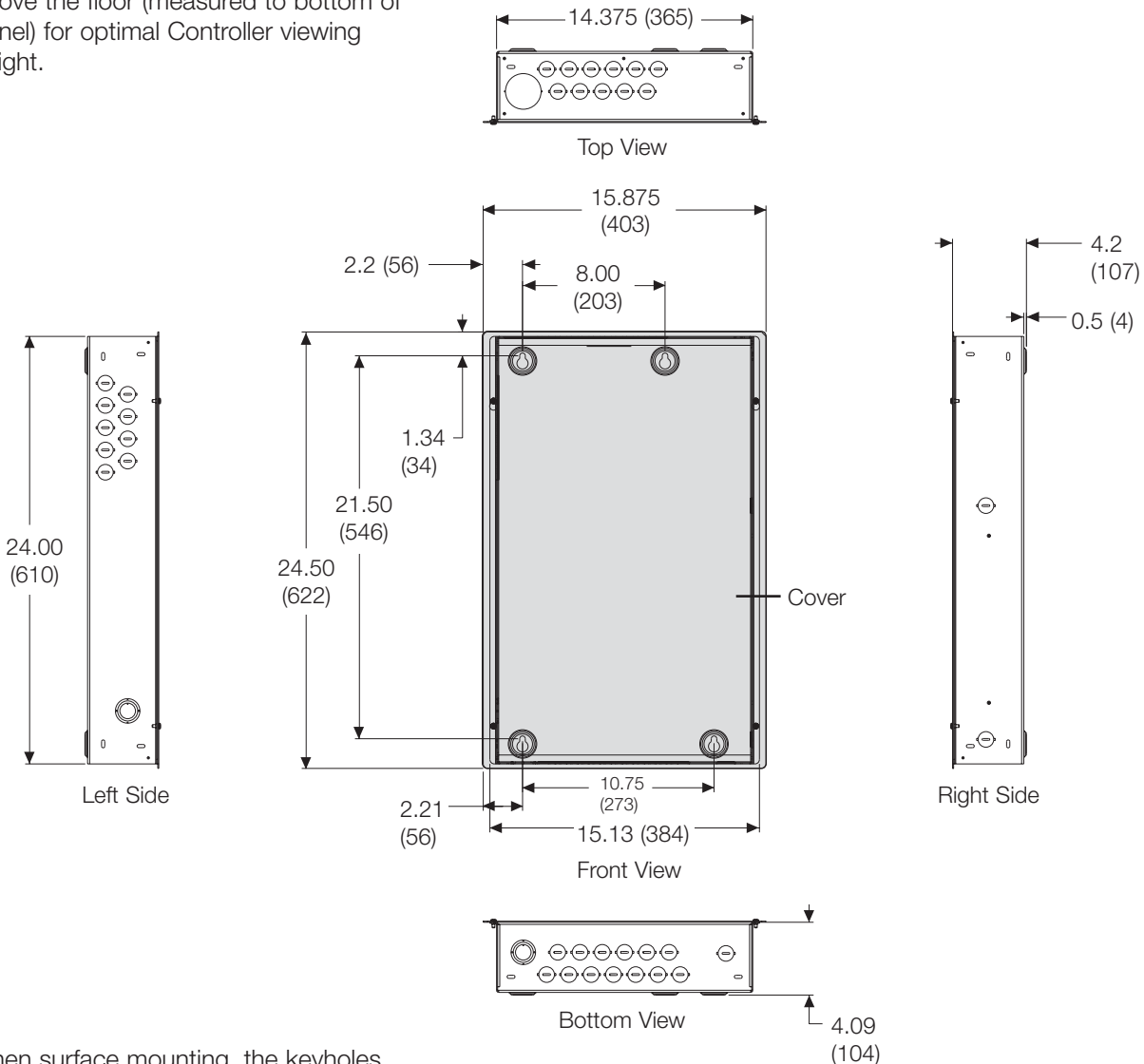


## Step 2 Panel Dimensions

### 24" Mini Panel Dimensions

#### Suggested Mounting Height:

Mount Mini panels 45 in. (1143 mm) above the floor (measured to bottom of panel) for optimal Controller viewing height.



When surface mounting, the keyholes accept a maximum of 1/4 in. (6 mm) mounting bolt. This size is recommended. When flush mounting, mount the panel between flush and 1/8 in. (3 mm) below finished wall surface.

The dimensions are shown in inches and (mm).

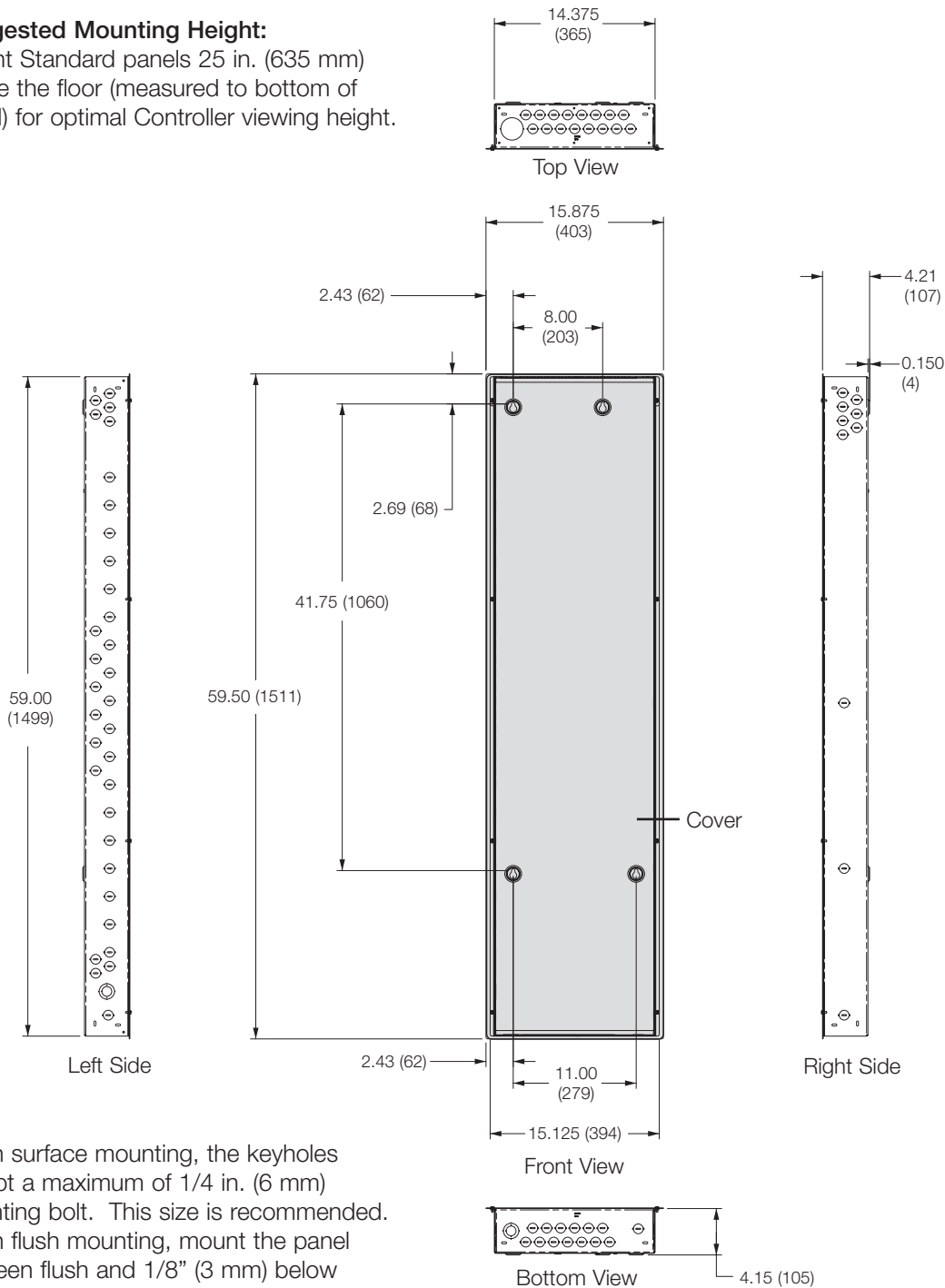


## Step 2 (continued) Panel Dimensions

### 59" Standard Panel Dimensions

#### Suggested Mounting Height:

Mount Standard panels 25 in. (635 mm) above the floor (measured to bottom of panel) for optimal Controller viewing height.



When surface mounting, the keyholes accept a maximum of 1/4 in. (6 mm) mounting bolt. This size is recommended. When flush mounting, mount the panel between flush and 1/8" (3 mm) below finished wall surface.

The dimensions are shown in inches and (mm).



# Step 3 Panel Mounting

- Panel generates heat. Mount only where ambient temperature will be 32°F-104°F (0°C - 40°C).
- Allow 12 in. (305 mm) clearance above and below panel.
- Indoor use only. NEMA®, Type 1 enclosure, IP20.
- Relative humidity must be < 90% non-condensing.
- Mount panels within 7° of true vertical.
- Dimming modules will hum slightly and internal relays will click while in operation. Mount where audible noise is acceptable.
- Mount panel so line (mains) voltage wiring will be at least 6 ft. (1.8 m) from sound or electronic equipment and its wiring.

Dimming Modules	Max BTUs/Hr.	Weight w/o Packaging
2	170	35 lbs (16 Kg)
3	250	37 lbs (17 Kg)
4	330	55 lbs (25 Kg)
5	410	57 lbs (26 Kg)
6	490	59 lbs (27 Kg)
7	570	61 lbs (28 Kg)
8	650	63 lbs (29 Kg)
9	730	65 lbs (30 Kg)



**Caution!** This equipment is air-cooled. Vents must not be blocked or the warranty will be void.

### Surface Mounting:

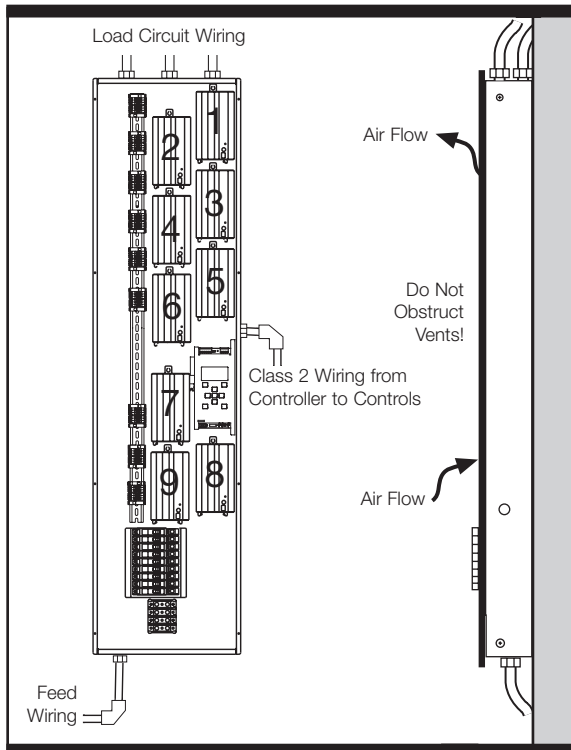
- Mounting keyholes accept a maximum of 1/4 in. (6 mm) diameter mounting bolt. This size is recommended.
- Reinforce wall structure as required for weight and local codes.
- Do not mount panel directly to wall board/drywall.

### Recess/Flush Mounting:

- Mount to wall stud by screwing through slots in corners of panel.
- When flush mounting, mount the panel flush to 1/8 in. (3 mm) below finished wall surface.

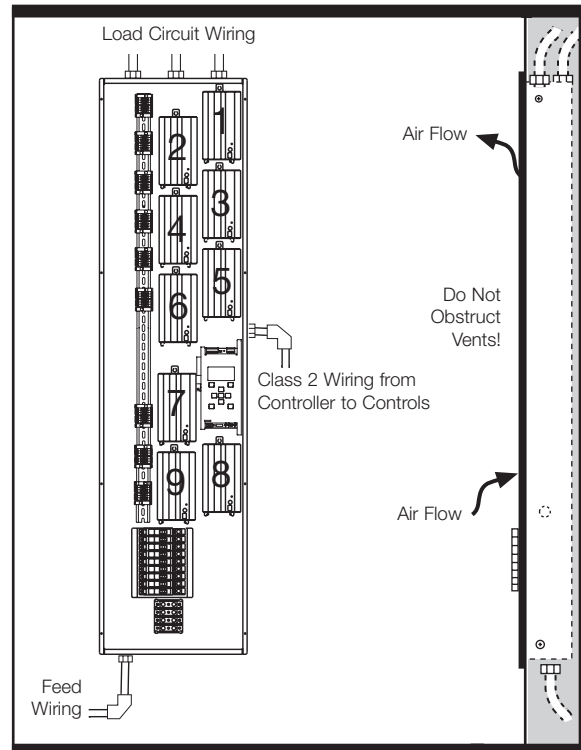
Front View

Surface Mount



Front View

Recess/Flush Mount





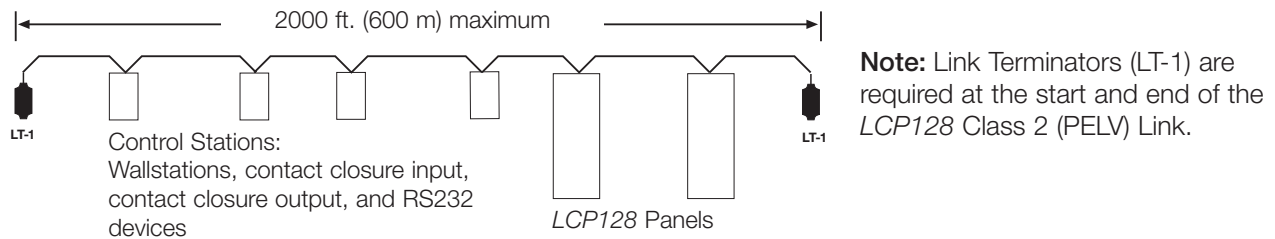
## Step 4 Control Station Wiring

### Control Station Wiring Overview

The *LCP128* system communicates to control stations using a Class 2 (PELV) low voltage link. Control stations include wallstations, contact closure input and output devices, and RS232 interfaces. Wire the Class 2 (PELV) link according to the following guidelines:

- Link must be daisy chained.
- Must run low-voltage in separate trough from line (mains) voltage.
- Link must be less than 2000 ft. (600 m) long.
- Make wire connections inside the wallbox and the *LCP128* panel.
- Install Link Terminators (LT-1) at the start and end of the Class 2 (PELV) daisy-chained link.
- Use Lutron GRX-CBL-46L cable or equivalent.

### Control Station Wiring Specifications



Maximum total length of the control link is 2,000 ft. This distance is based on proper shielding of the twisted/shielded pair, proper wire size, and the use of link terminators (LT-1) at each end of the link. If unapproved cable or smaller wire is used, control link length must be de-rated according to the following chart:

Terminal 1 & 2 Wires Sizes	Max. Control Link Length
#12 AWG	2000 ft. (600 m)
#14 AWG	1400 ft. (425 m)
#16 AWG	900 ft. (275 m)
#18 AWG	600 ft. (180 m)
2.5 mm <sup>2</sup>	450 m (1500 ft.)
1.0 mm <sup>2</sup>	200 m (650 ft.)



**Notice!** If Link Terminators (LT-1) are not used or improper wiring topology is employed, the system will not communicate properly.



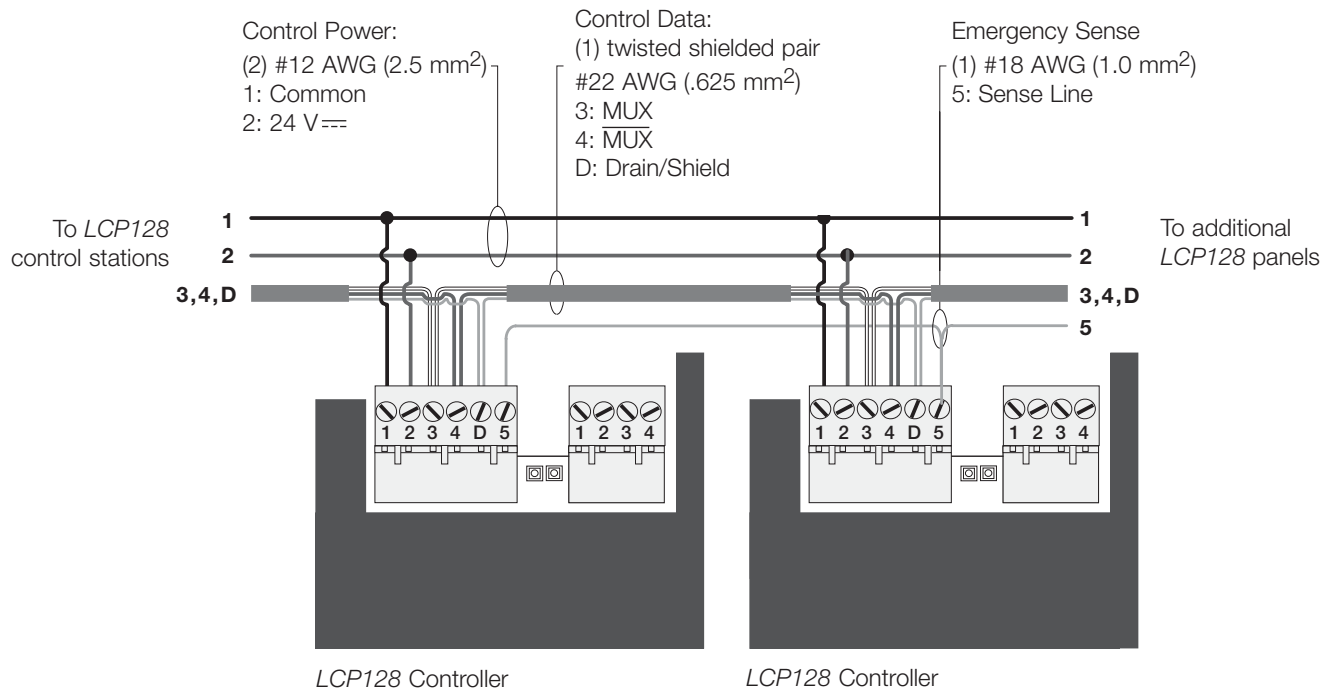


# Step 4 (continued) Control Station Wiring

## Panel and Control Station Wiring

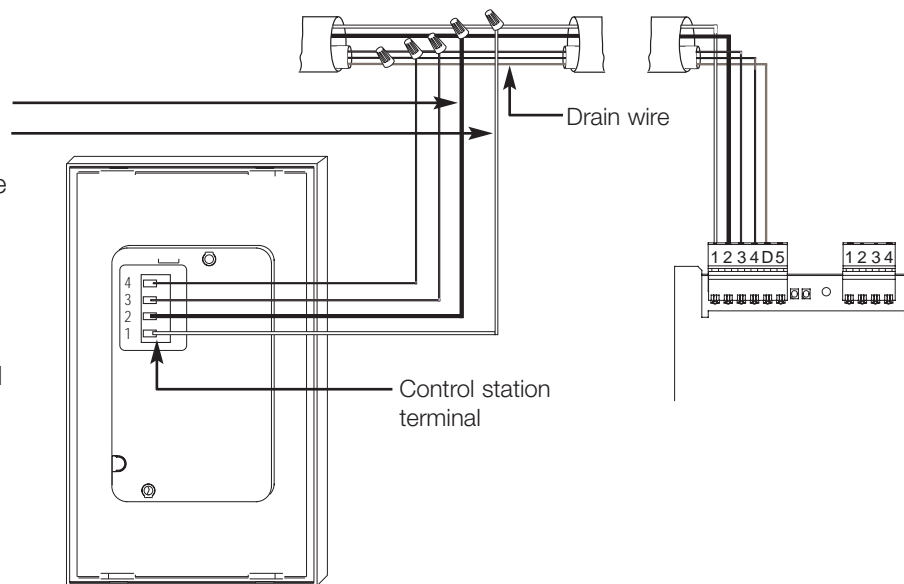
### Control Station Wiring Details:

The Class 2 (PELV) link that connects *LCP128* panels and control stations must contain four wires: two for power and two for data. The illustration below shows wire sizes and wire type required. Use of Lutron cable GRX-CBL-46L is recommended. A fifth wire may be used for emergency sense, if required.



### Wiring Notes:

- Use a wire connector to attach one #18 AWG wire for Common (terminal 1) and one #18 AWG wire for 24 V<sub>DC</sub> (terminal 2) from the Class 2 (PELV) link to the control. Two #12 AWG wires cannot both be terminated on the control station. Maximum wire length from link to control is 8 ft. (2.5 m).
- Only connect the Drain/Shield wire (bare copper) to terminal 'D' in *LCP128* panels. Maintain the shield throughout the link but do not allow it to touch ground (earth) or wallstation circuitry.





# Step 5 Address Control Stations

Wallstations and other controls on the Class 2 (PELV) control link must be uniquely addressed. Devices on the link may not share an address. The Address Switches on each device must be properly set. Please refer to the Installation Guide for each device to locate the Address Switches on that device. Use the space provided to record the name or location of the control. The order of the addresses on the link does not matter.

**This page will be helpful when programming the LCP128 system. See the *LCP128 Setup and Maintenance Guide* for programming details.**

Address	Settings	Address	Settings	Address	Settings
1 _____		12 _____		23 _____	
2 _____		13 _____		24 _____	
3 _____		14 _____		25 _____	
4 _____		15 _____		26 _____	
5 _____		16 _____		27 _____	
6 _____		17 _____		28 _____	
7 _____		18 _____		29 _____	
8 _____		19 _____		30 _____	
9 _____		20 _____		31 _____	
10 _____		21 _____		32 _____	
11 _____		22 _____			



# Step 6 Feed and Load Wiring

## Feed and Load Wiring Overview

### Feed Wiring (Mains Voltage Wiring)

- Preferred feed wiring entry for *LCP128* Panels with main lugs is from the bottom left of the panel.
- Preferred feed wiring entry for feed-through *LCP128* Panels is from the top or bottom left of the panel, wired directly to module terminal blocks.
- Run wiring so that line (mains) voltage wiring will be at least 6 ft. (1.83m) from sound or electronic equipment and its wiring.
- Refer to Wiring Details pages for more information.

### Load Circuit Wiring

- Connect load wiring to the appropriate terminal block set for each module.
- The Dimmed Hot (DH) or Switched Hot (SH) terminal block is grouped with a numbered Hot (H) (H1, H2, etc.). The number represents both the module and circuit breaker number.
- Output terminal blocks accept one #14 AWG (1.5 mm<sup>2</sup>) through #10 AWG (4.0mm<sup>2</sup>) or two #18 AWG (1.0 mm<sup>2</sup>) through #16 AWG wires. Preferred entry is from the top left of the panel.
- Refer to Wiring Details pages for more information.



**Notice!** Common Neutrals are not permitted.  
Run separate Neutrals for each load circuit.

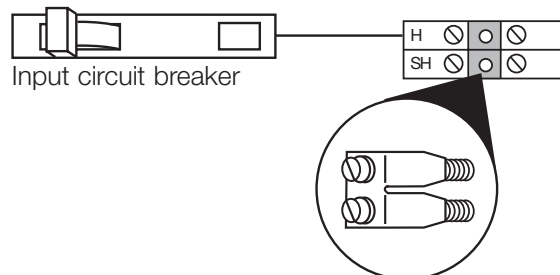


**Caution!** *LCP128* panels require entry of wires as specified. Improper entry will block serviceable parts, and impede air flow through the panel.

### Temporary Lighting

Each input breaker can supply power to a load while the bypass jumper protects the dimmer from load faults. Jumpers tie the hot input directly to dimmed/switched hot outputs, thereby bypassing the dimming/switching modules.

You do not need to install a temporary distribution panel. Simply place load wires into the appropriate terminal blocks while keeping the bypass jumpers installed. See the “Activate Loads in Bypass” step for more information.



**Caution!** Do not remove bypass jumpers at this point! Bypass jumpers protect the modules from load faults.



## Step 6 (continued) Feed and Load Wiring

### Ratings for Model Numbers – 120V

#### **LCP128 Panels with Circuit Breakers, No XP Switching Modules (Standard panels, main lugs only)**

Number of Modules	Feed Type	Feed Size (A)	Breaker Ratings	Panel Size
2	1Ø, 3W	20 A	20 A	Mini
3	3Ø, 4W	20 A	20 A	Mini
4	3Ø, 4W or 1Ø, 3W	175 A	20 A	Standard
5	3Ø, 4W or 1Ø, 3W	175 A	20 A	Standard
6	3Ø, 4W or 1Ø, 3W	175 A	20 A	Standard
7	3Ø, 4W or 1Ø, 3W	175 A	20 A	Standard
8	3Ø, 4W or 1Ø, 3W	175 A	20 A	Standard
9	3Ø, 4W or 1Ø, 3W	175 A	20 A	Standard

#### **LCP128 Panels with Circuit Breakers, With XP Switching Modules (Standard panels, main lugs only)**

Number of Modules	Feed Type	Feed Size (A)	Breaker Ratings	Panel Size
2	3Ø, 4W or 1Ø, 3W	200 A	20 A	Standard
3	3Ø, 4W or 1Ø, 3W	200 A	20 A	Standard
4	3Ø, 4W or 1Ø, 3W	200 A	20 A	Standard
5	3Ø, 4W or 1Ø, 3W	200 A	20 A	Standard
6	3Ø, 4W or 1Ø, 3W	200 A	20 A	Standard
7	3Ø, 4W or 1Ø, 3W	200 A	20 A	Standard

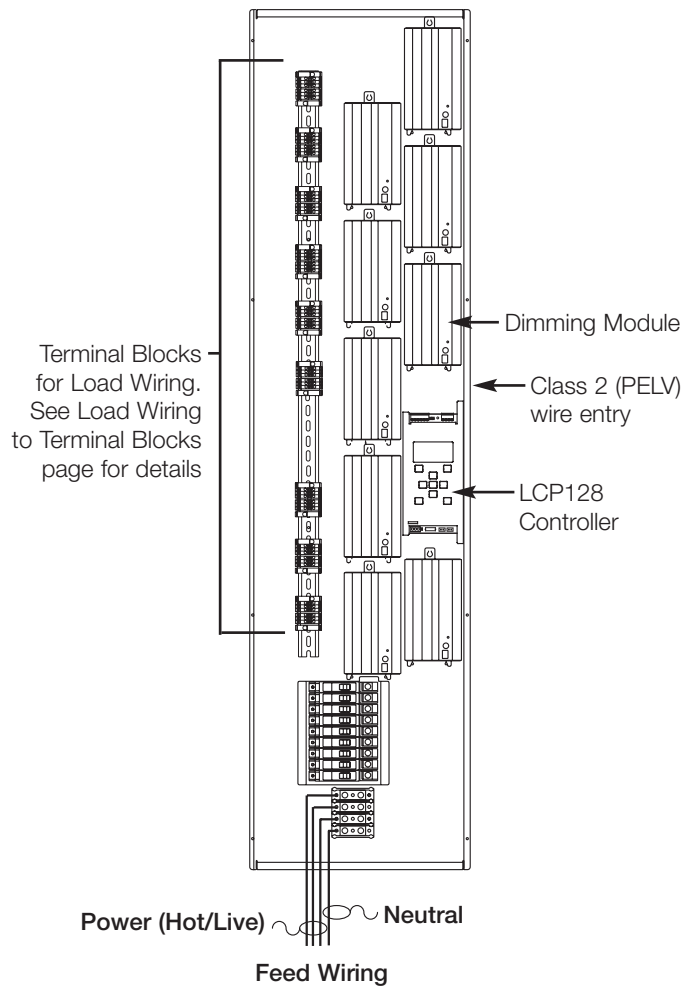
#### **Feed-Through LCP128 Panels (Without branch circuit breakers)**

Number of Modules	Feed Type	Feed Size (A)	Panel Size
2	1Ø, 2W	20 A	Mini
3	1Ø, 2W	20 A	Mini
4	1Ø, 2W	20 A	Standard
5	1Ø, 2W	20 A	Standard
6	1Ø, 2W	20 A	Standard
7	1Ø, 2W	20 A	Standard
8	1Ø, 2W	20 A	Standard
9	1Ø, 2W	20 A	Standard



# Step 6 (continued) Feed and Load Wiring

## Wiring Details – Main Lug with Breaker Panel – 120V



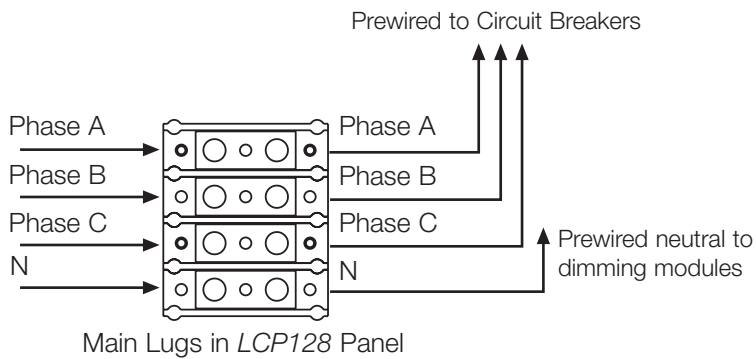
### Wire Sizes for Power Feed, Panels without XP Switching Modules

- **Power Feed:**  
#14 AWG (2.0mm<sup>2</sup>) to #2/0 AWG (70.0mm<sup>2</sup>)
- **Neutral Feed:**  
#14 AWG (2.0mm<sup>2</sup>) to #2/0 AWG (70.0mm<sup>2</sup>)

### Wire Sizes for Load Wiring, All Models

- **Dimmed/Switched Hot (Live):**  
#14 AWG (2.0mm<sup>2</sup>) to #10 AWG (4.0mm<sup>2</sup>)
- **Load Neutral:**  
#14 AWG (2.0mm<sup>2</sup>) to #10 AWG (4.0mm<sup>2</sup>)

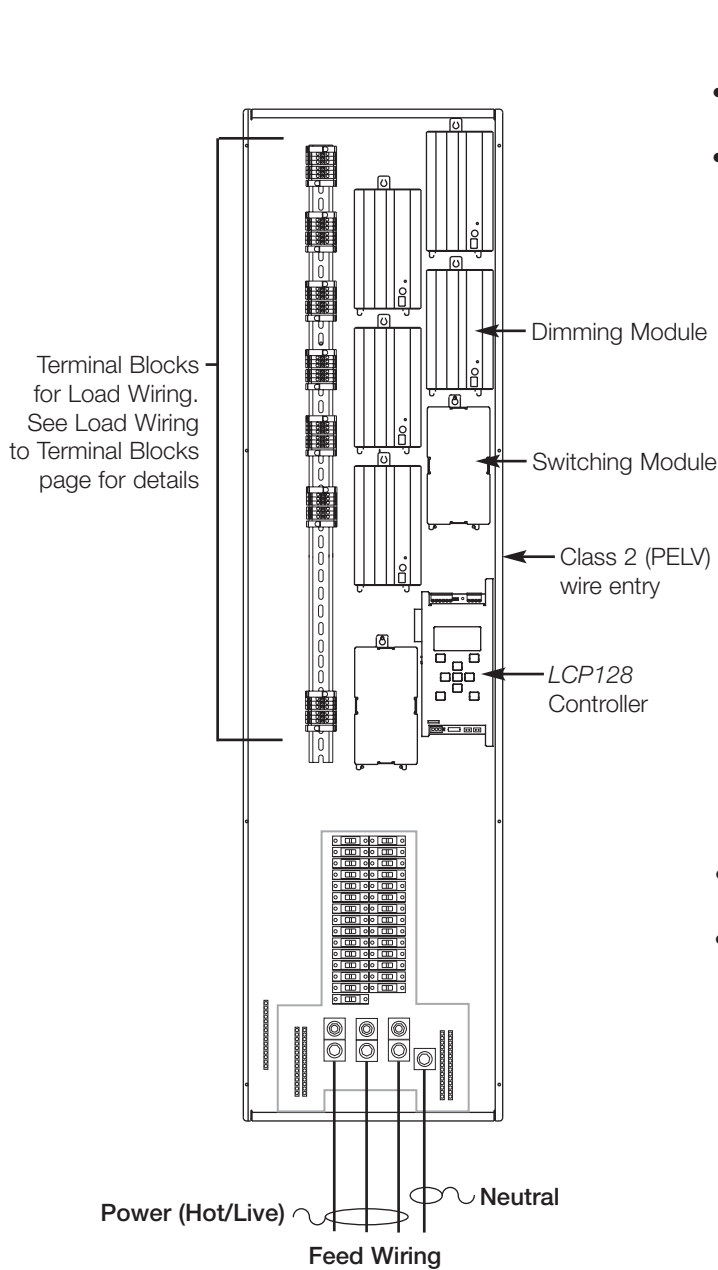
**Note:** See Load Wiring to Terminal Blocks page for load wiring details.





## Step 6 (continued) Feed and Load Wiring

### Wiring Details – Panel with XP Switching Modules – 120V



#### Wire Sizes for Power Feed, Panels with XP Switching Modules

- **Power (Hot/Live):**  
#4 AWG (25mm<sup>2</sup>) to 250 KCMIL (120mm<sup>2</sup>)
- **Neutral:**  
#4 AWG (25mm<sup>2</sup>) to 250 KCMIL (120mm<sup>2</sup>)

#### Wire Sizes for Load Wiring, All Models

- **Dimmed/Switched Hot (Live):**  
#14 AWG (2.0mm<sup>2</sup>) to #10 AWG (4.0mm<sup>2</sup>)
- **Load Neutral:**  
#14 AWG (2.0mm<sup>2</sup>) to #10 AWG (4.0mm<sup>2</sup>)

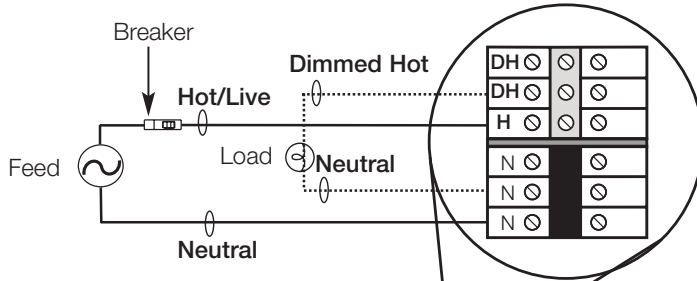
**Note:** See Load Wiring to Terminal Blocks page for load wiring details.



# Step 6 (continued) Feed and Load Wiring

## Wiring Details – Feed-Through Panel – 120V

### Typical Dimming/Switching Leg



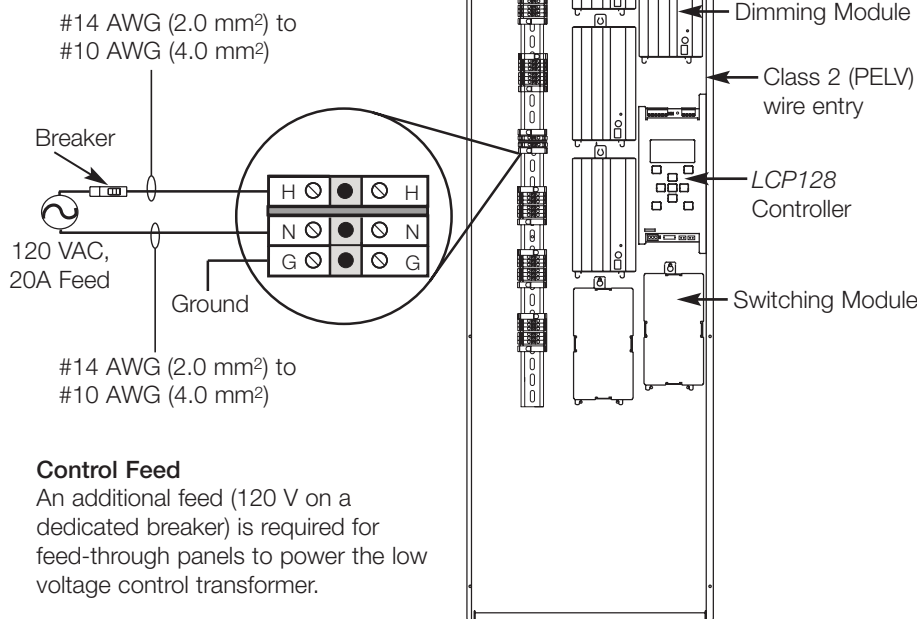
### Wire Sizes for Power Feed, To Each Circuit

- **Power Feed:**  
#14 AWG (2.0mm<sup>2</sup>) to #10 AWG (4.0mm<sup>2</sup>)
- **Neutral Feed:**  
#14 AWG (2.0mm<sup>2</sup>) to #10 AWG (4.0mm<sup>2</sup>)

### Wire Sizes for Load Wiring, From Each Output

- **Dimmed/Switched Hot (Live):**  
#14 AWG (2.0mm<sup>2</sup>) to #10 AWG (4.0mm<sup>2</sup>)
- **Load Neutral:**  
#14 AWG (2.0mm<sup>2</sup>) to #10 AWG (4.0mm<sup>2</sup>)

**Note:** See Load Wiring to Terminal Blocks page for load wiring details.



### Control Feed

An additional feed (120 V on a dedicated breaker) is required for feed-through panels to power the low voltage control transformer.



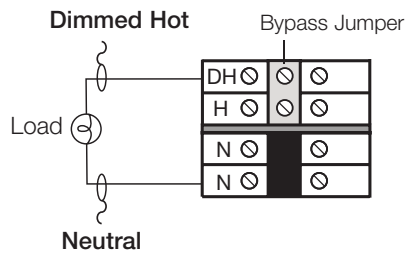
# Step 6 (continued) Feed and Load Wiring

## Load Wiring to Terminal Blocks – 120V

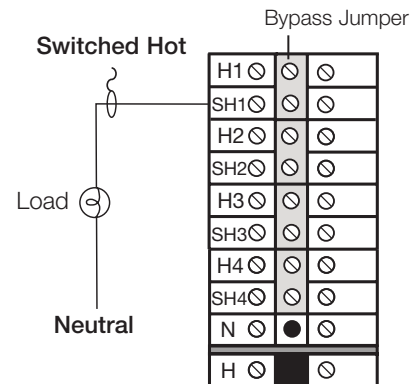
Typical Dimming/Switching Leg Shown

**Note:** Do not remove bypass jumpers until after load wiring has been verified.

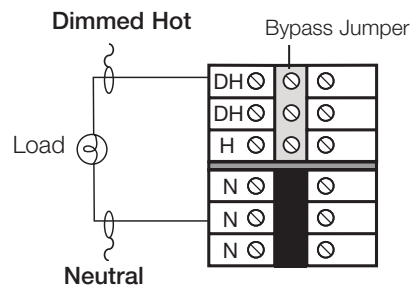
### 1-Output Dimming Module (1U)



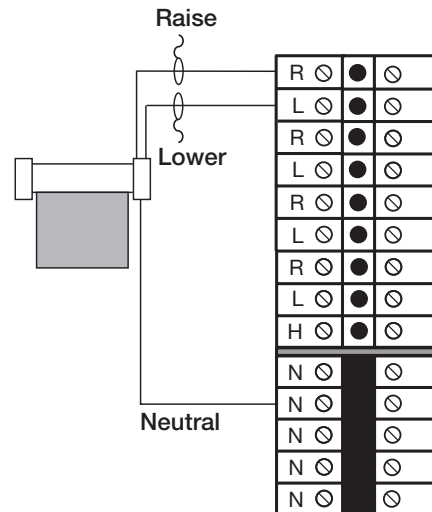
### 4-Circuit Switching Module (XP)



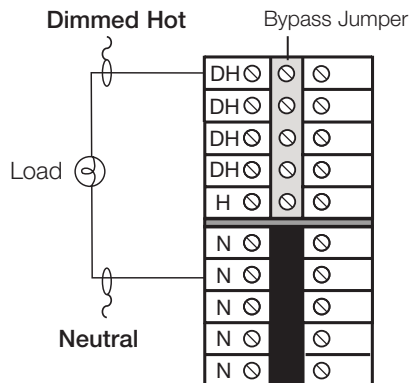
### 2-Output Dimming Module (2U)



### 4-Output Motor Module (4M)



- 4-Output Dimming Module (4U)
- 4-Output ELV Dimming Module (4E)
- 4-Output Fan Speed Control Module (4FSQ)







# Step 7 Activate Loads in Bypass

## Activate Loads in Bypass

**A. Complete load wiring.**

**B. Check that the bypass jumpers are in place.**

These jumpers protect the dimmers from load faults and must be in place when load wiring is installed or modified.



**Caution!** Verify that the panel is fed the correct voltage. A feed miswire or loss of a feed neutral can cause damage to the equipment.

**C. Turn circuit breaker 1 ON.**

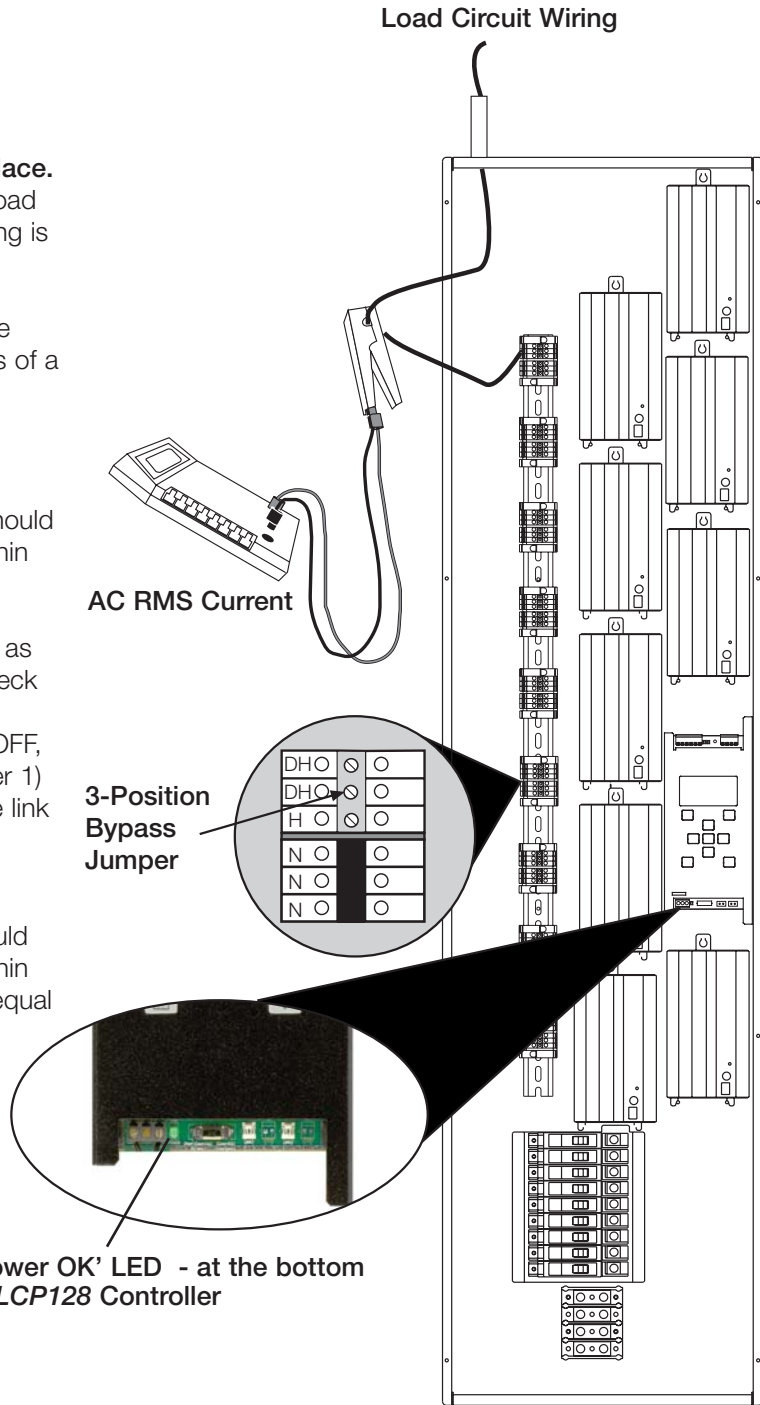
The load(s) should energize, the breaker should not trip, and total load current must be within the circuit breaker's limit and less than or equivalent to 16A.

Circuit breaker 1 powers the control wiring as well as Circuit 1's dimmer and load(s). Check that the Power OK LED on the LCP128 Controller is ON. If the Power OK LED is OFF, turn OFF the control circuit breaker (breaker 1) and check for a miswire on the low voltage link (see STEP 4).

**D. Turn next circuit breaker ON.**

The load should energize, the breaker should not trip, and total load current must be within the circuit breaker's limit and less than or equal to 16A.

**E. Repeat step 'D' for each circuit.**





# Step 8 Remove Bypass Jumpers

## Remove Bypass Jumpers

- A. After all load wiring has been checked, turn circuit breakers OFF.
- B. Loosen all the screws of each bypass jumper. Remove and store the bypass jumpers for possible future use.
- C. Turn circuit breakers ON.

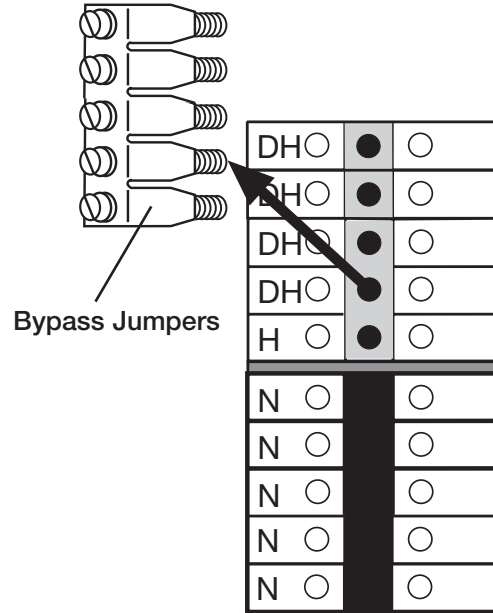


**Note:** All circuits are now set to the default Non-Dim load type. Non-Dim load types will respond by immediately going to full ON in any lighting scene (except the OFF scene).

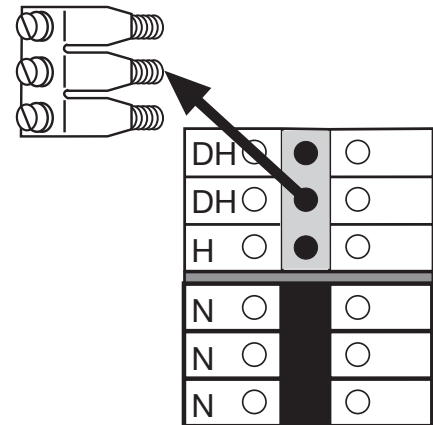


**Note:** Re-use the bypass jumpers whenever work must be done on a load. Damage caused by short circuits and miswiring is not covered by the product warranty.

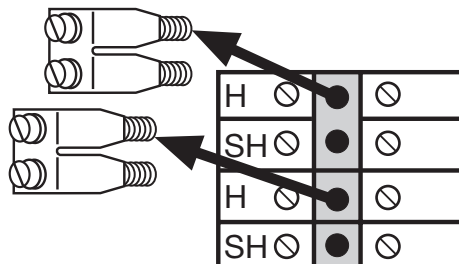
Module With 4 Outputs



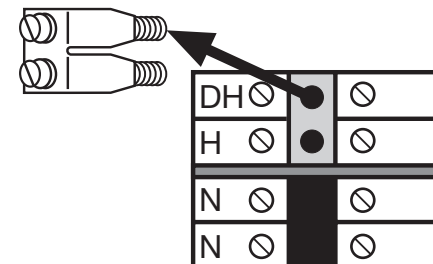
Module With 2 Outputs



Switching Module



Module With 1 Output





## Installation is Complete

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Panel installation, control station wiring, and load activation are now complete.

### Next Step:

Refer to the *LCP128 Setup and Maintenance Guide* to setup the functions and operation of the *LCP128* System. To prepare for setup, please complete the tables and charts that are provided in the *LCP128 Setup and Maintenance Guide*.

# Notes

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# Notes

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# Notes

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# Contact Information and Warranty

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## LIMITED WARRANTY

Lutron will, at its option, repair or replace any unit that is defective in materials or manufacture within one year after purchase. For warranty service, return unit to place of purchase or mail to Lutron at 7200 Suter Rd., Coopersburg, PA 18036-1299, postage pre-paid.

***This warranty is in lieu of all other express warranties, and the implied warranty of merchantability is limited to one year from purchase. This warranty does not cover the cost of installation, removal or reinstallation, or damage resulting from misuse, abuse, or improper or incorrect repair, or damage from improper wiring or installation. This warranty does not cover incidental or consequential damages. Lutron's liability on any claim for damages arising out of or in connection with the manufacture, sale, installation, delivery, or use of the unit shall never exceed the purchase price of the unit.***

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