

## LVPC-DIM Low Voltage Controller (3 Load with Dimming)



### SAFETY INFORMATION

In these directions, the word **WARNING** indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

The word **CAUTION** means a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. **CAUTION** also may be used to alert against unsafe practices.

#### ⚠ WARNING

Shock Hazard. Failure to follow all user instructions may result in serious injury or death. Disconnect power before servicing or installing.

1. ALWAYS make sure that the LVPC-DIM is installed by a qualified electrician.
2. Make sure that the LVPC-DIM part number corresponds to your input voltage and Load requirements. Refer to the "Installation and Setup" section.
3. NEVER use the LVPC-DIM for personal, consumer or residential use.

If the LVPC-DIM fails to work contact Oldenburg Electronics at **414-410-3307**.

### PRODUCT FEATURES

The LVPC-DIM enables users to turn high-voltage lights on and off safely when used with a pillow speaker, bed communication side rail device, or momentary dry contact switch. The LVPC-DIM also enables users to operate other high voltage circuits, such as electric doors or drapes.

When used to operate lights, the LVPC-DIM can control two loads independently with 0-10V dimming capability and:

- A third load that when on, activates all three loads at full output (3 loads on, none off)
- A third load that when on, activates the second load at full output (2 loads on, one off)
- A third load that when on, deactivates the other two loads (one on, two off)
- A third load completely independent of the other two loads

The LVPC-DIM may be mounted in a lighting fixture or other suitable fixture.

The LVPC-DIM is designed to be installed by a qualified electrician ONLY. The installer must follow all applicable National Electrical Code requirements. Refer to the installation instructions in the "Installation and Setup" section.

### SPECIFICATIONS

<b>Input Voltage Ratings</b>	120-277 VAC, 50/60 Hz
<b>Load Type</b>	277 VAC, 5 A, General Use per Load 277 VAC, 5 A, Ballast per Load Maximum total device current: 10 A
<b>Output Voltage</b>	120-277 VAC, 50/60 Hz
<b>Output Devices</b>	Three 30 amp relays driven by low voltage microcontroller. ESD protected.
<b>Dimming Control</b>	0-10V (current sourcing)
<b>Low Voltage Momentary Switch Requirements</b>	Dry contacts, momentary, normally open, capable of switching 5 VDC @ 0.5 mA
<b>Power Supply Classification</b>	UL listed switch mode power supply
<b>Regulatory Listings and Compliance</b>	   <ul style="list-style-type: none"> <li>• UL/C-UL Listed to UL 508</li> <li>• Compliant with FCC, Title 47 CFR 15 – Class B</li> <li>• RoHS compliant</li> </ul>
<b>Ambient Operating Temperature Range</b>	10° to 80° C
<b>External Hookup Specifications</b>	<ul style="list-style-type: none"> <li>• White/Black: 12-16 AWG, solid or stranded (coarse stranded)</li> <li>• Pink, Yellow, Orange, Green: 12-18 AWG, solid or stranded (coarse stranded)</li> <li>• All other wires: 12-24 AWG, solid or stranded (coarse stranded)</li> <li>• For use with 75° C Copper Wire ONLY, insulation stripped back 5/16"</li> <li>• For insertion of Coarse stranded wires AND removal of all wires, a small regular screwdriver should be used to disengage the terminal block.</li> <li>• Ensure that wire used exceeds corresponding voltage ratings.</li> </ul>
<b>Mounting</b>	Designed to mount next to a lighting ballast in lighting applications or in another suitable enclosure
<b>Housing</b>	.032" Galvanized Zinc-Plated Steel (white)
<b>Dimensions</b>	9" with tabs (L) x 1.90" (W) x 1.10" (H)

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received including interference that may cause undesired operation.

Device complies with CAN ICES-3 (N/NMB-3(B))

## INSTALLATION AND SETUP

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### ⚠ CAUTION

Do not use if your input voltage exceeds the corresponding voltage rating of the device.

Do not use if the RMS Load current for your application exceeds 5 Amps.  
Contact Oldenburg Electronics for a more suitable application.

When using the LVPC-DIM in fluorescent lighting applications, make sure the ballast has a power factor of 0.9 or greater.

### ⚠ WARNING

ALWAYS make sure that the LVPC-DIM is installed by a qualified electrician.

1. Mount the LVPC-DIM inside a luminaire or suitable enclosure.
2. Be sure to securely fasten the LVPC-DIM using both mounting slots on the ends of the LVPC-DIM.
3. Wire as per the WIRING: DEFINITION AND MODES section and be sure to follow the SPECIFICATIONS section with regards to ratings and wire gauges.
4. When mounting, ensure that the chassis mounting hardware makes electrical contact with LVPC-DIM mounting tabs to ensure a chassis ground connection.

## TESTING THE LVPC-DIM

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1. Follow your facility's protocol for testing new electrical installations.
2. Plug a pillow speaker into the receptacle or patient station, or wire appropriate switches as necessary.
3. Press the light button(s) and make sure the proper light or device turns on.
4. For additional information, see the Wiring section.

## WIRING: DEFINITION AND MODES

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### The low voltage side of the LVPC-DIM has connections for up to 8 wires (Violet – Light Grey – Violet – Light Grey – Brown – Dark Grey – Blue – Red)

- The Violet (dimming output) and Light Grey (dimming common) connections are outputs compatible with any 0-10V dimming compatible dimming driver (fluorescent, LED...other).
- The Red (switch 1), Blue (switch 2), Dark Grey (switch 3) and Brown (common) connections are for the dry contact, normally open, momentary switches such as a pillow speaker. The LVPC-DIM is capable of interfacing with 3 switch inputs (Red, Blue and Dark Grey respectively). The Brown input is the common for these switches. If the three switch inputs do not share a common, the separate commons need to be wired together and then connected to the Brown input.

### The high voltage side of the LVPC-DIM has connections for up to 6 wires (Black – White – Green – Pink – Yellow – Orange)

- The Black (AC hot) connection should be tied to the AC power source.
- The White (AC common) connection should be tied to the AC common line.
- The Green (earth ground) connection should be tied to earth ground or the luminaire or enclosure chassis. This wire is already electrically connected to the chassis of the LVPC-DIM.
- The Pink (Load 1), Yellow (Load 2) and Orange (Load 3) connections are outputs for AC out to the actual Loads to be driven. The AC voltage out will be the same as the input. See SPECIFICATIONS for details.
- Pillow Speaker and/or wall switch controls:
  - Switch 1 controls Load 1 and the dimming control outputs for Load 1 (DIM1 0-10V)
  - Switch 2 controls Load 2 and the dimming control outputs for Load 2 (DIM2 0-10V)
  - Switch 3 controls Load 3, Loads 2 and 3, or Loads 1, 2, and 3 depending on mode

### Dimming:

- The LVPC-DIM has the capability to provide a 0-10VDC Dimming Control Signal (current sourcing). This means that based on the requested dimming level settings, the LVPC-DIM will output a 0-10VDC signal capable of driving a luminaire dimming driver/ballast to a specific dim level. For example, if the user requests a 50% dim level, the LVPC-DIM will output a 5 VDC (50% of 10VDC) level to the dimming inputs of the luminaire dimming driver/ballast. Dim levels vary significantly between dimming driver/ballast manufacturers, so the perceived dim level may vary between luminaires and is approximate. This is NOT a potentiometer style dimming controller, and as such, device compatibility should be verified prior to use.
- Excessive wire length can affect the voltage level of the dimming control. Ensure that the wire length between the LVPC-DIM Dimming Outputs and the luminaire dimming driver/ballast's inputs does not exceed 100 feet.
- The LVPC-DIM is capable of sourcing up to 5 mA at the respective dimming voltage outputs. Therefore, multiple dimming driver/ballast(s) can be wired in parallel off of a single dimming driver, so long as this 5 mA current level is NOT exceeded. Ensure that additional luminaires that may be wired in parallel do NOT cumulatively exceed the AC Current specification advised in the SPECIFICATIONS section.

		Mode #1 (Default)	Mode #2	Mode #3	Mode #4
				<ul style="list-style-type: none"> <li>• Load 1 and Load 2 independent on/off with dimming*</li> <li>• Load 3 also turns on Loads 1 and 2 at full output</li> </ul>	<ul style="list-style-type: none"> <li>• Load 1 and Load 2 independent on/off with dimming*</li> <li>• Load 3 also turns on Load 2 at full output, Load 1 off</li> </ul>
Mode Selector Switch Settings					
		MS1 = OFF (0)	MS1 = OFF (0)	MS1 = ON (1)	MS1 = ON (1)
		MS2 = OFF (0)	MS2 = ON (1)	MS2 = OFF (0)	MS2 = ON (1)
		MS3 = OFF (0)	MS3 = don't care	MS3 = don't care	MS3 = don't care
Toggling or holding switch 1 (Pillow Speakers, wall switch) affects Load 1 as follows:	First toggle <sup>1</sup>	Load 1 ON at full output			
	Sustained press <sup>2</sup>	Smooth dimming <sup>3</sup> (if connected)			
	Second toggle <sup>1</sup>	Load 1 OFF			
Toggling or holding switch 2 (Pillow Speakers, wall switch) affects Load 2 as follows:	First toggle <sup>1</sup>	Load 2 ON at full output			
	Sustained press <sup>2</sup>	Smooth dimming <sup>3</sup> (if connected)			
	Second toggle <sup>1</sup>	Load 2 OFF			
Toggling switch 3 (Pillow Speakers, wall switch) affects Load 3 and Load 1 and/or Load 2 as follows:	First toggle <sup>1</sup>	• Load 3 ON	• Load 3 ON	• Load 3 ON	• Load 3 ON
		• Load 2 ON at full output	• Load 2 ON at full output	• Load 2 OFF	• No change to Load 1 or Load 2
		• Load 1 ON at full output	• Load 1 OFF	• Load 1 OFF	
	Second toggle <sup>1</sup>	• Load 3 OFF	• Load 3 OFF	• Load 3 OFF	• Load 3 OFF
		• Load 2 ON at full output if ON before first toggle, otherwise OFF	• Load 2 ON at full output if ON before first toggle, otherwise OFF	• Load 2 ON at full output if ON before first toggle, otherwise OFF	• No change to Load 1 or Load 2
		• Load 1 ON at full output if ON before first toggle, otherwise OFF	• Load 1 ON at full output if ON before first toggle, otherwise OFF	• Load 1 ON at full output if ON before first toggle, otherwise OFF	

\* Dimming is only possible if wired to a luminaire with dimmable ballasts, drivers, and/or power supplies. If a load is not supplied with a dimmable ballast/driver, loads 1 and 2 are limited to ON/OFF control.

1. A toggle is a switch press that is released within 0.5 seconds.

2. A sustained press is a switch press that is held for more than 0.5 seconds before it is released.

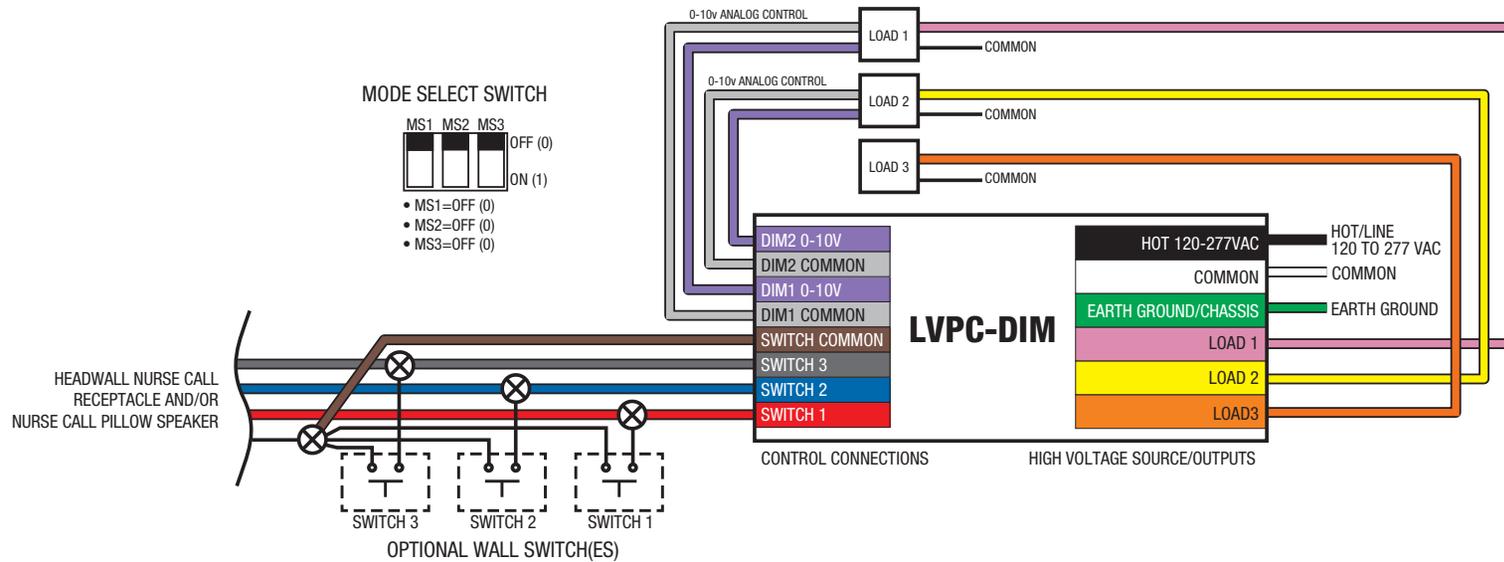
3. Smooth dimming means that a sustained press will slowly cycle through the dimming levels throughout the luminaire's full range in 16 equal steps. The dimming steps cycle at a rate of approximately 0.5 seconds per step, allowing sufficient time for the user to identify the desired level and release the button to latch to that level. This corresponds to approximately 8 seconds to decrease the output level from maximum to minimum or vice-versa. Each successive sustained press will reverse the dimming direction. If a sustained press is held down continuously, the dimming output will stop at the maximum or minimum value, depending on the dimming direction. The sustained press must be released, and the switch toggled with a short press, to turn the load OFF. The dimming level will always start at maximum output when the load is turned ON. Sustained presses do not have any effect when the load is OFF.

**Note:** Smooth Dimming is not functionally compatible with all current patient stations. To verify whether or not smooth dimming is compatible with the patient station employed, connect the LVPC-DIM in any mode and TOGGLE switch 1 to turn on Load 1 at full output. Next, make a SUSTAINED PRESS on switch 1. If the load begins to dim and reaches its minimum output within 10 seconds, then the patient station is compatible with Smooth Dimming. If the state of the light does not visibly change, then the patient station is not compatible with this feature and only ON/OFF control will be possible.

# WIRING (CONTINUED)

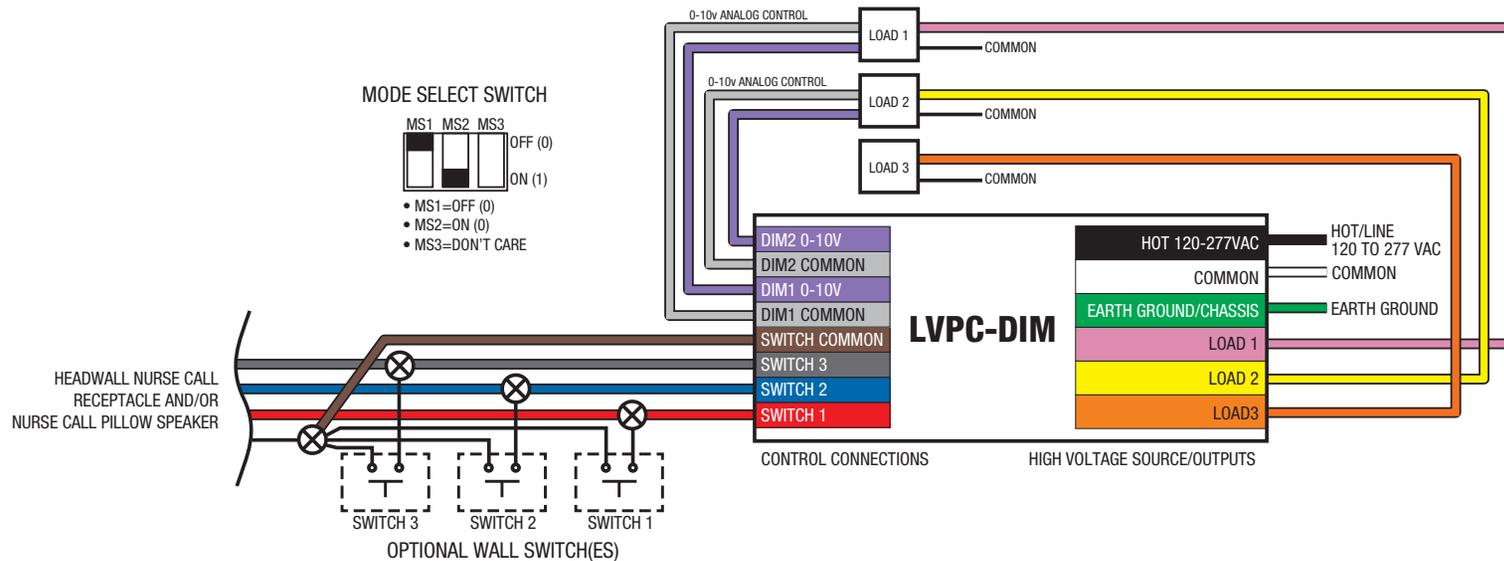
## MODE 1 (DEFAULT):

LOADS 1 AND 2 INDEPENDENT (WITH DIMMING), LOAD 3 WITH LOADS 1 AND 2 AT MAX OUTPUT



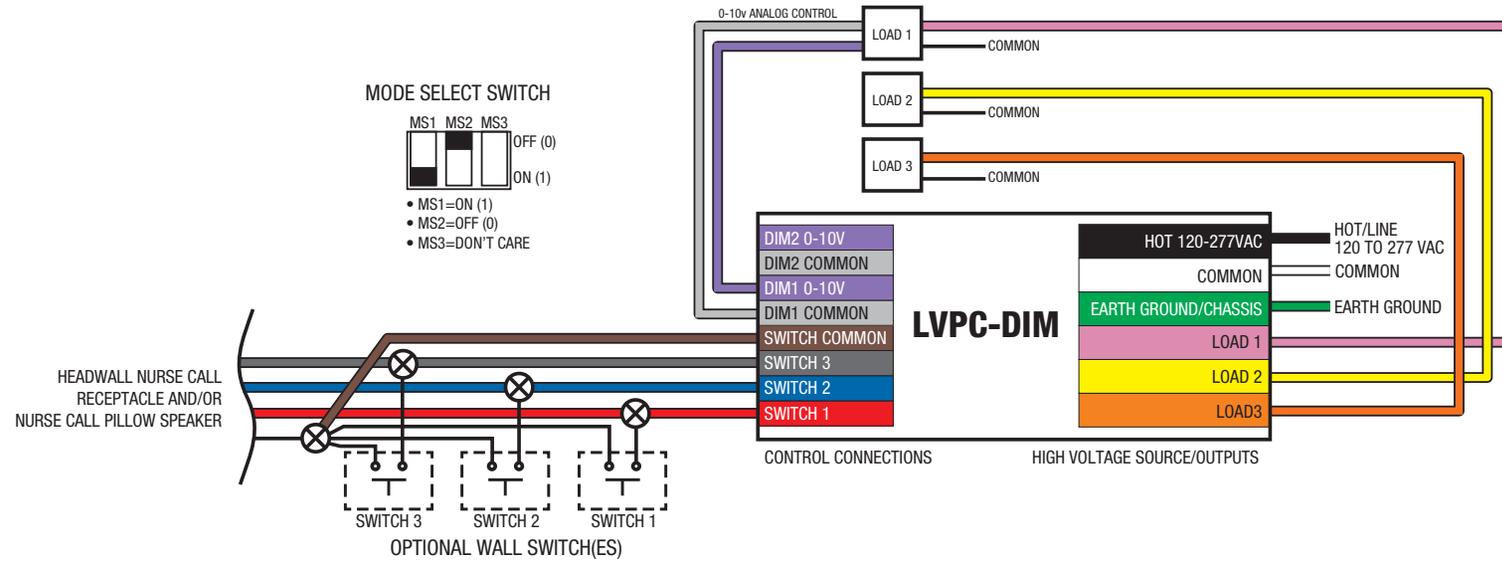
## MODE 2:

LOADS 1 AND 2 INDEPENDENT (WITH DIMMING), LOAD 3 ON/OFF WITH LOADS 2 AT MAX OUTPUT (LOAD 1 OFF)



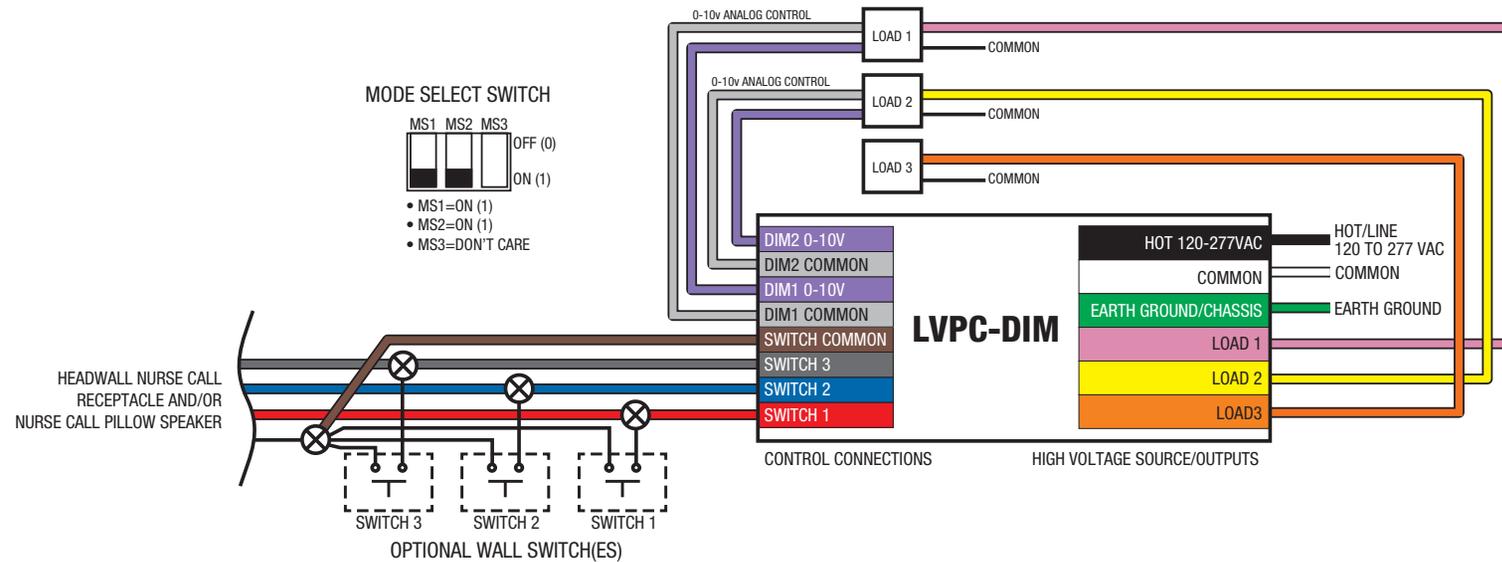
### MODE 3:

LOADS 1 AND 2 INDEPENDENT (WITH DIMMING), LOAD 3 ON/OFF (LOADS 1 AND 2 OFF)



### MODE 4:

LOADS 1 AND 2 INDEPENDENT (WITH DIMMING), LOAD 3 INDEPENDENT ON/OFF (NO DIMMING)



## TROUBLESHOOTING

Problem	Corrective Action
Switch Input does not activate the corresponding Load	Check the LVPC-DIM Wiring corresponds to the desired MODE under the WIRING Section
	Ensure the Input switch is a dry contact, momentary switch.
	Ensure the applied voltage is as per the SPECIFICATIONS section
	Ensure the Driver/Ballast/Load is compatible with the applied voltage
Desired Load is not dimming in SMOOTH DIMMING Mode	The patient station being employed may not be compatible with SMOOTH dimming. Refer to the WIRING: DEFINITION AND MODES Section
	Ensure the luminaire ballast or driver is compatible with 0-10VDC Dimming
Load 3 is NOT Dimming	Load 3 is a designated ON/OFF Load. No DIMMING capability is present for Load 3
Dimming/load control sporadic or not as expected	Ensure mode select switches are set to one of the settings shown in "Wiring"
	Ensure that the station does NOT short ANY Switch Input wires together, prior to wiring to the LVPC-DIM. Some patient stations may be wired in this fashion to achieve sequential load control with legacy low voltage controller models. The LVPC-DIM does NOT employ this method. If the patient station cannot be changed to remove any shorts between switch input wires, contact Oldenburg Electronics for recommendations for alternate controllers.
Cannot insert /remove stripped wire ends into the LVPC-DIM terminal blocks	Refer to the SPECIFICATIONS section for recommended wire types and styles. For insertion of Coarse stranded wires AND removal of all wires, a small regular screwdriver should be used to disengage the corresponding position of the terminal blocks prior to insertion/removal of wires.
After insertion, the wires do not appear to be making contact or contact is intermittent within the terminal block.	Refer to the SPECIFICATIONS section for recommended wire types and styles.
	Verify that the wire strip length is as per the SPECIFICATIONS section.
Loads do NOT Turn ON when in Smooth Dimming Mode.	Some Dimming Driver/Ballasts do not respond quickly. This means they take a second or two to Turn ON. Ensure that the user MOMENTARILY presses the light switch to allow the light to become fully energized PRIOR to a sustained press for desired DIM Level. This is especially prevalent in fluorescent dimming ballasts.

## REPAIR AND WARRANTY

### ⚠ WARNING

NEVER attempt to repair a light controller. Call Oldenburg Electronics at **414-410-3307** if the light controller fails to operate properly.

Please visit [www.oldenburgelectronics.com](http://www.oldenburgelectronics.com) for the full terms and conditions of sale, including complete warranty information.

- Oldenburg Electronics warrants to the original purchaser or end user that this product will be free from material defects in workmanship and materials under normal use and service for a period of three years from the date of purchase from Oldenburg Electronics.
- There is NO WARRANTY in case of damage in transit, negligence, abuse, abnormal usage, misuse, accidents, normal wear and tear, damage due to environmental or natural elements, failure to follow instructions or improper installation, modifications, storage or maintenance.
- Oldenburg Electronics will only cover replacement or repair of defective products, and does not include the cost of service travel, labor, inspection, removal or installation of products, or normal maintenance.
- To return a unit for service:
  - Contact Oldenburg Electronics to obtain a Return Goods Authorization (RGA) Number
  - Pack the products to avoid shipping damage
  - Include the RGA number on all shipping paperwork and on the outside of the shipping box(es)
  - Include the original shipping date and a description of the problem to avoid delays.
  - Send the package freight pre-paid to:
 

Oldenburg Electronics  
1717 W. Civic Dr  
Milwaukee, WI 53209



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