

## Functional Summary

The CLS-EXP-DIMU enables the expansion of Crestron® iLux® Integrated Lighting System (CLS-C6 Series) and other Crestron lighting dimmers to allow dimming of both forward and reverse phase type loads. Supported loads include LED,<sup>1</sup> electronic low-voltage, magnetic low-voltage, neon/cold cathode, incandescent, or 2-wire dimmable fluorescent. A single model supports 120, 230, or 277 volt loads up to 16 amps.

The CLS-EXP-DIMU simplifies installation by autodetecting the dimmable load type connected to it and selecting the appropriate operating mode to control that load. Reverse Phase (trailing edge) mode supports incandescent and electronic low-voltage load types, while Forward Phase (leading edge) mode handles magnetic low-voltage, neon, and other inductive load types.

Any output channel of the iLux system can be used to control the CLS-EXP-DIMU to dim a fully loaded circuit. It is also compatible with CLW-Series<sup>2</sup> in-wall dimmers and select CLX-Series lighting control modules.<sup>3</sup> The metal enclosure is designed for mounting to a vertical surface<sup>4</sup> and can be installed in an environmental air-handling space above a suspended ceiling. Conduit knockouts are provided on the bottom and lower sides. All connections are made via screw terminals behind the front cover.

- Works with Crestron iLux, CLW-,<sup>2</sup> DIN-, and CLX-Series dimmers
- Emulates the characteristics of the dimmer that is controlling it
- Up to five expansion modules can be connected to a single iLux dimmer channel
- Supports 120, 230, and 277 volt LED,<sup>1</sup> ELV, MLV, NCC, incandescent, and 2-wire dimmable fluorescent loads
- Auto-selects for forward or reverse phase
- Includes threshold adjustment for setting minimum fluorescent dimming level
- Built-in air gap relay at the output
- Mounts to a wall or above a suspended ceiling

1. For a list of compatible ballasts, visit [www.crestron.com/lightingcompatibility](http://www.crestron.com/lightingcompatibility).
2. CLW-Series device must have a dedicated neutral.
3. Compatible only with forward-phase dimming modules.
4. Must be oriented upright, mounted to a vertical surface, with 6 in (153 mm) minimum spacing above and below for proper ventilation and heat dissipation.

CLS-EXP-DIMU Physical View



## Specifications

CLS-EXP-DIMU Specifications

SPECIFICATION	DETAILS
Load Ratings	
Dimmer Channels	1
Load Rating	16 A
Minimum Load	25 W
Load Types	LED, <sup>1</sup> electronic low voltage, incandescent, neon/cold cathode, magnetic low voltage, 2-wire dimmable fluorescent (Advance Mark 10 Powerline® or equivalent)
Maximum Modules per Dimmer Output	5
Input Voltages	
Line Power	120-277 Vac, 50/60 Hz
Control Input	120-230 Vac, 50/60 Hz, phase independent of line power and load, presents 25 W load to the controlling device
Electrical Terminals	Captive screw type; Accommodates two 22-12 AWG (0.34-4.0 mm <sup>2</sup> ) wires

(Continued on following page)



*CLS-EXP-DIMU Specifications (Continued)*

SPECIFICATION	DETAILS
Enclosure <sup>2</sup>	Surface mount module with (2) integral mounting flanges, galvanized steel with gray matte powder coat front panel, extruded aluminum heat sink, (4) 1/2 in (13 mm) and 3/4 in (19 mm) conduit knockouts provided on bottom and lower left and right sides
Environmental	
Temperature	32° to 104°F (0° to 40°C)
Humidity	10% to 90% RH (non-condensing)
Heat Dissipation	200 Btu/h at maximum load, 16 A
Dimensions	
Height	8.82 in (224 mm)
Width	6.39 in (163 mm)
Depth	3.18 in (81 mm)
Weight	3.3 lbs (1.5 kg)
Compatible Control Devices	
CLS(I)-C6 Series	iLux Integrated Lighting System
CLW-DIM Series	Wall Dimmers
CLW-DIMXRF Series	infiNet™ Wall Dimmers
CLX(I)-1DIM4	Four Channel Dimmer Module, Single Feed
CLX-1DIM8	Eight Channel Dimmer Module, Single Feed
CLX(I)-2DIM2	Two Channel Dimmer Module, Two Feeds
CLX(I)-2DIM8	Eight Channel Dimmer Module, Two Feeds
DIN-Series Dimmers	DIN Rail Universal Dimmer

- For a list of compatible ballasts, visit [www.crestron.com/lightingcompatibility](http://www.crestron.com/lightingcompatibility).
- Must be oriented upright, mounted to a vertical surface, with 6 in (150 mm) minimum spacing above and below for proper ventilation and heat dissipation.

### Regulatory Compliance

This product is Listed to applicable UL Standards and requirements by Underwriters Laboratories Inc.



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### Federal Communications Commission (FCC) Compliance Statement

This device complies with part 15 of the FCC Rules. Operation is subject to the following 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.

**CAUTION:** Changes or modifications not expressly approved by the manufacturer responsible for compliance could void the user's authority to operate the equipment.

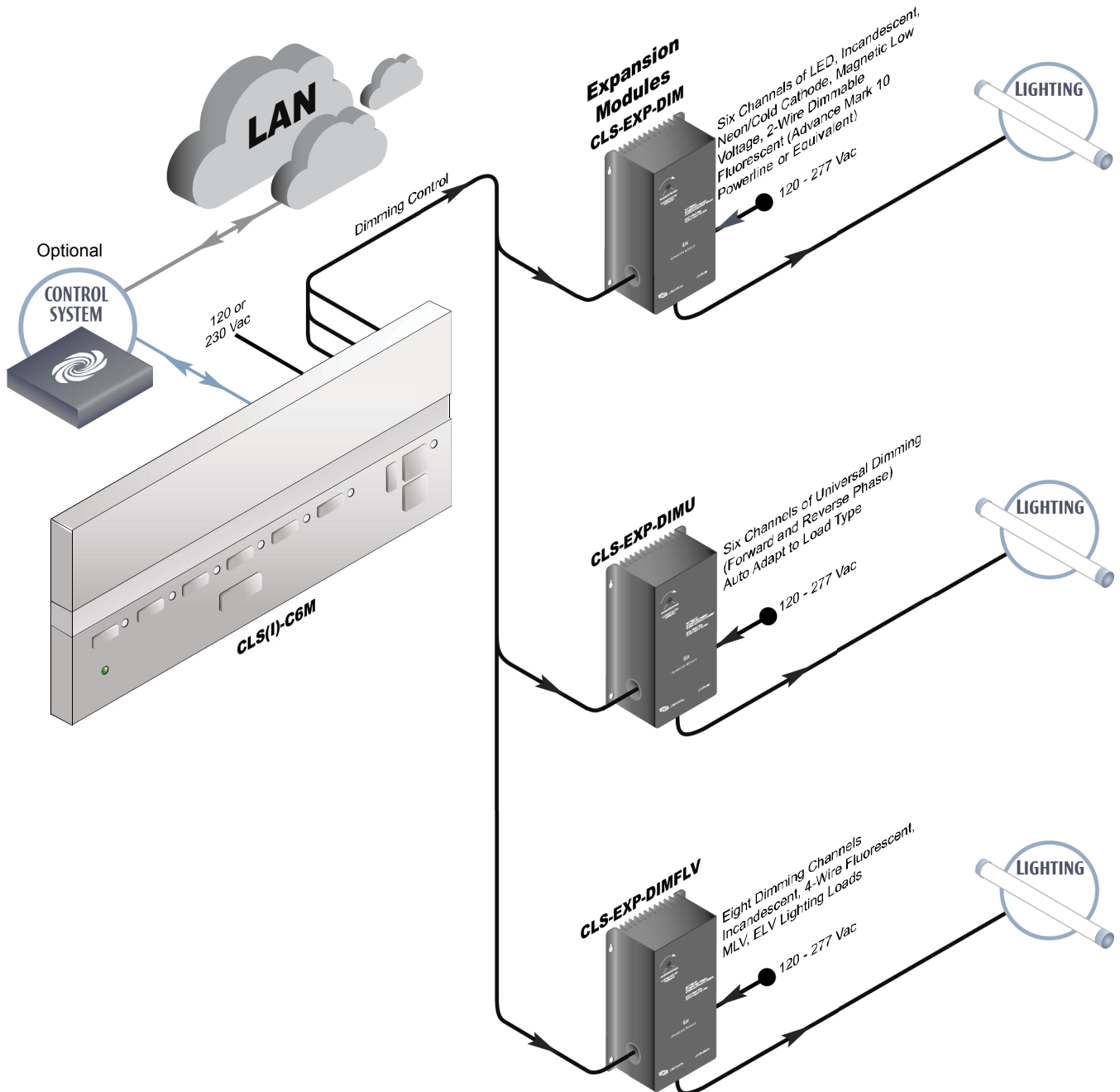
**NOTE:** This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment and receiver
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected
- Consult the dealer or an experienced radio/TV technician for help

## Application

The following diagram shows a CLS-EXP-DIMU module in a typical application.

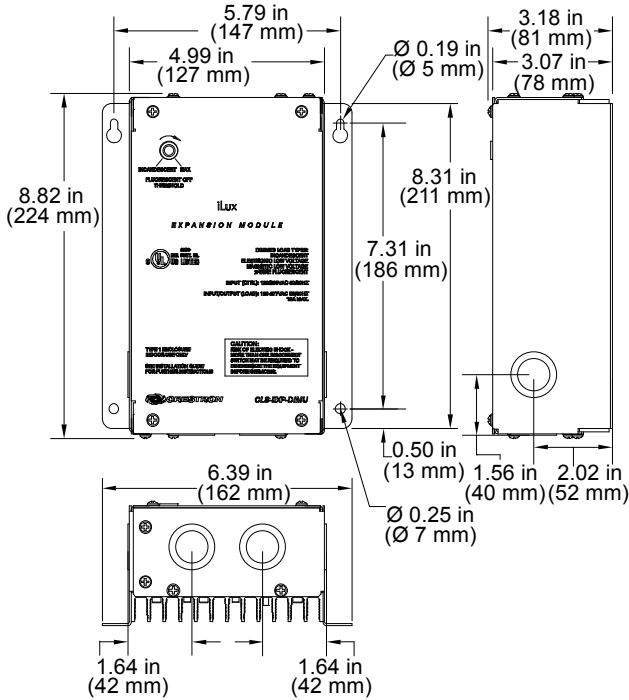
### *CLS-EXP-DIMU Module in a Lighting Application*



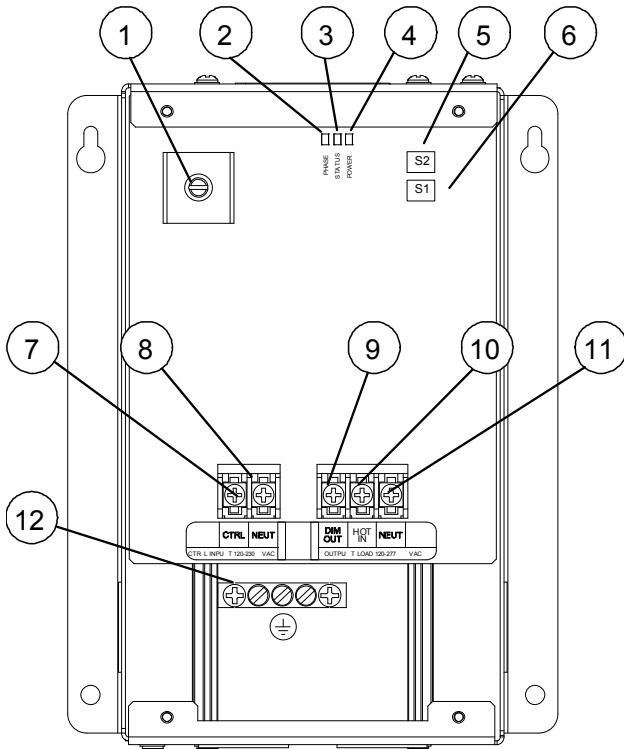
## Physical Description

This section provides information on the connections, controls, and indicators available on the CLS-EXP-DIMU.



### CLS-EXP-DIMU Overall Dimensions



### CLS-EXP-DIMU (Cover Removed)



### Connectors, Controls, and Indicators

#	CONNECTORS, CONTROLS, AND INDICATORS	DESCRIPTION
1	FLUORESCENT OFF THRESHOLD	(1) Recessed screwdriver-adjustable trim pot behind removable cap, adjusts minimum brightness level
2	PHASE LED	(1) Yellow LED behind front panel, illuminates when operating in Reverse Phase mode
3	STATUS LED	(1) Red LED behind front panel, illuminates when load output is on
4	POWER LED	(1) Green LED behind front panel, indicates power is applied to the HOT terminal
5	S2 	(1) Two-position DIP switch behind front panel, enables or disables zero cross detection filter For more information, refer to "Zero Cross Detection Filter" on page 7.
6	S1 	(1) Two-position DIP switch behind front panel; Selects Forward, Reverse, or Autodetect mode For more information, refer to "Dimming Mode" on page 7.
7	CTRL INPUT 120-230VAC – CTRL	(1) Captive screw terminal, <sup>1</sup> control input from CLS(I)-C6 Series, <sup>2</sup> CLW-DIM Series, <sup>2</sup> CLX(I)-DIM Series, GLX-DIM6, GLXX-2DIM8, or DIN-Series dimmers <b>NOTE:</b> Presents a 25 W load to the controlling dimmer; A maximum of five CLS-EXP-DIMU modules may be connected to the controlling dimmer, which cannot be wired to control any other loads besides the CLS-EXP-DIMU modules.
8	CTRL INPUT 120-230VAC – NEUT	(1) Captive screw terminal, <sup>1</sup> neutral connection for control input
9	OUTPUT LOAD 120-277VAC – DIM OUT	(1) Captive screw terminal, <sup>1</sup> dimmed load output
10	OUTPUT LOAD 120-277VAC – HOT IN	(1) Captive screw terminal, <sup>1</sup> line power input
11	OUTPUT LOAD 120-277VAC – NEUT	(1) Captive screw terminal, <sup>1</sup> neutral connection for line power input and load
12	Ground	(1) 3-terminal chassis ground bus bar

1. Captive screw terminals accept up to two 22 to 12 AWG (0.34 to 4.0 mm<sup>2</sup>) wires per terminal.

2. CLW-Series device must have a dedicated neutral.

## Setup

### Important Notes

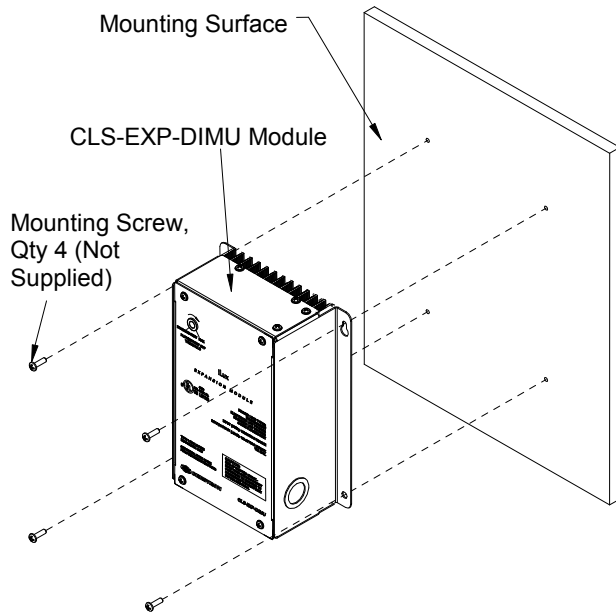
#### Read before installation.

Use copper conductors only – rated 75°C or greater.

### Installation

The CLS-EXP-DIMU can be installed vertically on a wall and it can also be installed in a space used for environmental air as defined in NEC® Article 300.22(C). Refer to the following diagram when installing a CLS-EXP-DIMU module.

#### Module Installation



Adhere to the following instructions to ensure proper ventilation:

- Install the device vertically on a vertical surface.

**NOTE:** To prevent potential heat damage to drywall, do not mount the CLS-EXP-DIMU directly onto drywall. Mount a 1/2 in (13 mm) piece thick (minimum) plywood between the CLS-EXP-DIMU and the drywall.

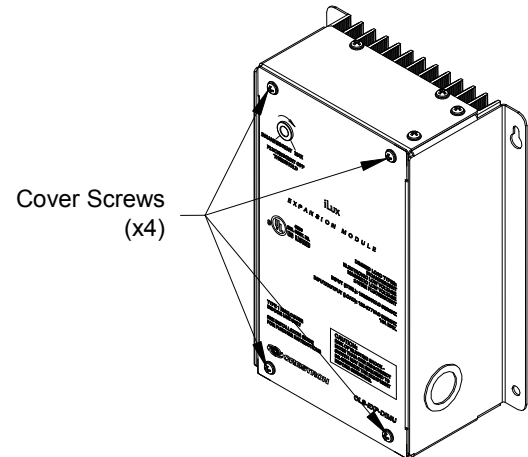
- Install the device with 6 in (152 mm) of clearance from the top and bottom of the device.

## Hardware Hookup

**WARNING: RISK OF SERIOUS PERSONAL INJURY.** Turn off power at the circuit breaker(s) prior to installation. Installing with the power on can result in serious personal injury and damage to the device.

1. Use a #2 Phillips screwdriver to remove the cover screws, as shown in the following diagram, and remove the cover.

#### Remove Cover Screws



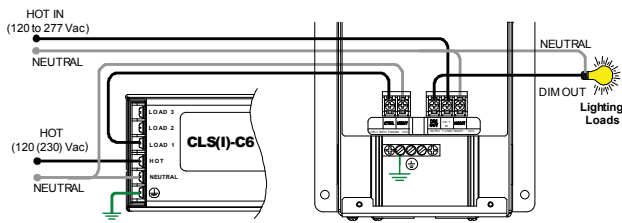
2. Depending on the module's application, select the appropriate configuration from one of the wiring diagrams on the next page and connect the CLS-C6 and load(s) as shown.
  - Do not connect wires of differing gauge to a single terminal.
  - Strip wires to 7/16 in (11 mm).
  - Tighten terminal screws to 7 in-lbs (0.79 Nm).

**NOTE:** Dimmers controlling one or more CLS-EXP-DIMU modules must not be wired to control any other type of load.

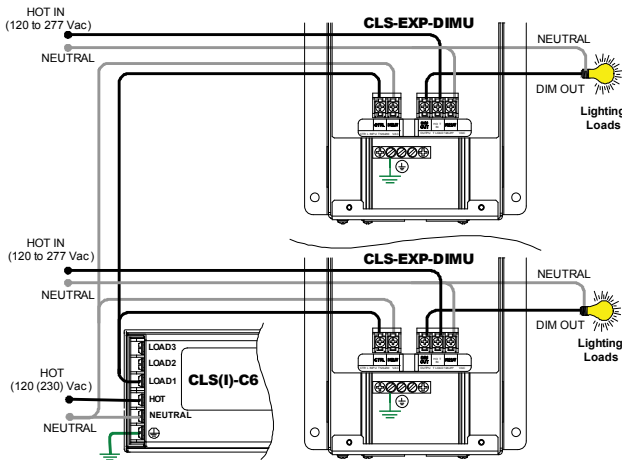
**NOTE:** While these diagrams show a CLS-C6 as the controlling source, other Crestron products such as CLW-Series wall dimmers (Cresnet® and infiNET™), DIN-Series, and CLX-Series dimming modules can be used as well. Refer to the specific dimmer's installation guide for detailed information.

**NOTE:** When using a CLW-Series wall dimmer, the wall dimmer must be wired with a dedicated neutral wire.

## CLS-EXP-DIMU Wiring with Dual Feeds



## Multiple CLS-EXP-DIMU Modules



3. Apply power to the line or load and turn on the controlling device. The power indicator LED lights, indicating that power is being supplied to the module.
4. Replace the cover and cover screws.

## Dimming Mode

The CLS-EXP-DIMU is capable of automatically detecting the attached load type and setting itself for Forward Phase (leading edge) or Reverse Phase (trailing edge) dimming mode accordingly. In addition, the unit can be forced to perform forward or reverse phase dimming by overriding the automatic detection.

**Disabling the Autodetect mode should not be necessary and is not recommended unless suggested by a Crestron technical support representative.**

**WARNING: RISK OF SERIOUS PERSONAL INJURY.** Turn off power at the circuit breaker(s) prior to changing any switch settings. Changing settings with the power on can result in serious personal injury and damage to the device.

The dimming mode can be changed by adjusting the S1 DIP switches as detailed in the table in the following column.

## Switch Settings for the S1 DIP Switch

SW. 1	SW. 2	DIMMING MODE	LOAD TYPES
Off	Off	Autodetect (Default, Recommended)	All
On	Off	Reverse Phase	Incandescent, electronic low voltage
On	On	Forward Phase	Magnetic low voltage, NCC, 2-wire dimmable fluorescent

## Zero Cross Detection Filter

The CLS-EXP-DIMU filters to compensate for noise on the incoming ac line. This filtering is useful for eliminating flickering of the load caused by line noise. If necessary, this filtering can be disabled.

**Disabling the zero cross detection filter should not be necessary and is not recommended unless suggested by a Crestron technical support representative.**

**WARNING: RISK OF SERIOUS PERSONAL INJURY.** Turn off power at the circuit breaker(s) prior to changing any switch settings. Changing settings with the power on can result in serious personal injury and damage to the device.

The function of the zero cross detection filter is set using the S2 DIP switch. Refer to the following table when setting the zero cross detection filter.

## Switch Settings for the S2 DIP Switch

SW. 1	SW. 2	DESCRIPTION
Off	Off	Enables zero cross detection filter (default, recommended), which provides maximum filtering under various line noise conditions
On	Off	Disables zero cross detection filter; Allows rapid tracking of the ac line; Suitable when using generators for ac line power

## Minimum Dimming Level

Certain types of loads can flicker when dimmed too low. Adjust the FLUORESCENT OFF THRESHOLD to prevent the CLS-EXP-DIMU from attempting to dim the load below a certain level.

**NOTE:** Some fluorescent ballasts may require that voltage levels be maintained above a specified minimum level to prevent premature lamp failure. Be sure to set the minimum dim level so that the minimum voltage is met at all times when the load is on. Consult the ballast manufacturer's documentation for details.

Do the following to adjust the minimum dimming level:

1. Remove the cap from the FLUORESCENT OFF THRESHOLD adjustment from the inside of the cover (requires removing the cover as shown on page 6).
2. Using a flat-head screwdriver, turn the FLUORESCENT OFF THRESHOLD adjustment counter-clockwise until it stops.
3. Set the CLS-C6 so that the light output is on but is below the desired minimum level.
4. Turn the FLUORESCENT OFF THRESHOLD adjustment clockwise until the light output is at the desired minimum level.
5. Replace the cap.

## Troubleshooting

The following table provides corrective action for possible trouble situations. If further assistance is required, please contact a Crestron customer service representative.

### CLS-EXP-DIMU Troubleshooting

TROUBLE	POSSIBLE CAUSE(S)	CORRECTIVE ACTION
The load does not turn on.	The controller is not working.	Make sure the controller is powered on and is one of the compatible dimmers listed in "Specifications" on page 1.
	No power is applied to the HOT terminal.	Check the circuit breaker. Check that the green POWER LED on the inside of the unit is lit.

*(Continued in following column)*

### CLS-EXP-DIMU Troubleshooting (Continued)

TROUBLE	POSSIBLE CAUSE(S)	CORRECTIVE ACTION
The load turns on and off but does not dim.	The controlling unit is either not a dimmer or has been set to non-dim.	Verify that the dimmer is compatible with the CLS-EXP-DIMU (refer to "Specifications" on page 1). Verify that the controlling channel has not been programmed as non-dim.
	The FLUORESCENT OFF THRESHOLD has been set too high.	Refer to "Set the Minimum Dimming Level" on page 7.
The lights flicker at certain dimming levels.	Some types of loads cannot be dimmed below a certain level.	Refer to "Set the Minimum Dimming Level" on page 7.
The lights do not dim properly.	An incompatible dimmer is being used.	Make sure that the dimmer is one of those listed in "Specifications" on page 1.
There is audible noise while dimming.	The load is being dimmed in the wrong mode.	Refer to the list of load types in the table at the top of page 7. Check the PHASE LED to ensure that the load is being dimmed in the proper way for the attached load type. If the unit is set to Autodetect, and the improper mode is being used, follow the instructions on page 7 to override the Autodetect setting and force the unit to the proper mode.
	There is a large incandescent load.	Some incandescent loads can make noise when dimmed due to the size of the filament. Try a different lamp manufacturer.
The lights cannot be dimmed below a certain level.	The FLUORESCENT OFF THRESHOLD has been set too high.	Refer to "Set the Minimum Dimming Level" on page 7.



## Further Inquiries

To locate specific information or resolve questions after reviewing this guide, contact Crestron's True Blue Support at 1-888-CRESTRON [1-888-273-7876] or, for assistance within a particular geographic region, refer to the listing of Crestron worldwide offices at [www.crestron.com/offices](http://www.crestron.com/offices).

To post a question about Crestron products, log onto Crestron's Online Help at [www.crestron.com/onlinehelp](http://www.crestron.com/onlinehelp). First-time users must establish a user account to fully benefit from all available features.

## Future Updates

As Crestron improves functions, adds new features, and extends the capabilities of the CLS-EXP-DIMU, additional information may be made available as manual updates. These updates are solely electronic and serve as intermediary supplements prior to the release of a complete technical documentation revision.

Check the Crestron website periodically for manual update availability and its relevance. Updates are identified as an "Addendum" in the Download column.

Product warranty can be found at [www.crestron.com/warranty](http://www.crestron.com/warranty).

The specific patents that cover Crestron products are listed at [patents.crestron.com](http://patents.crestron.com).

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