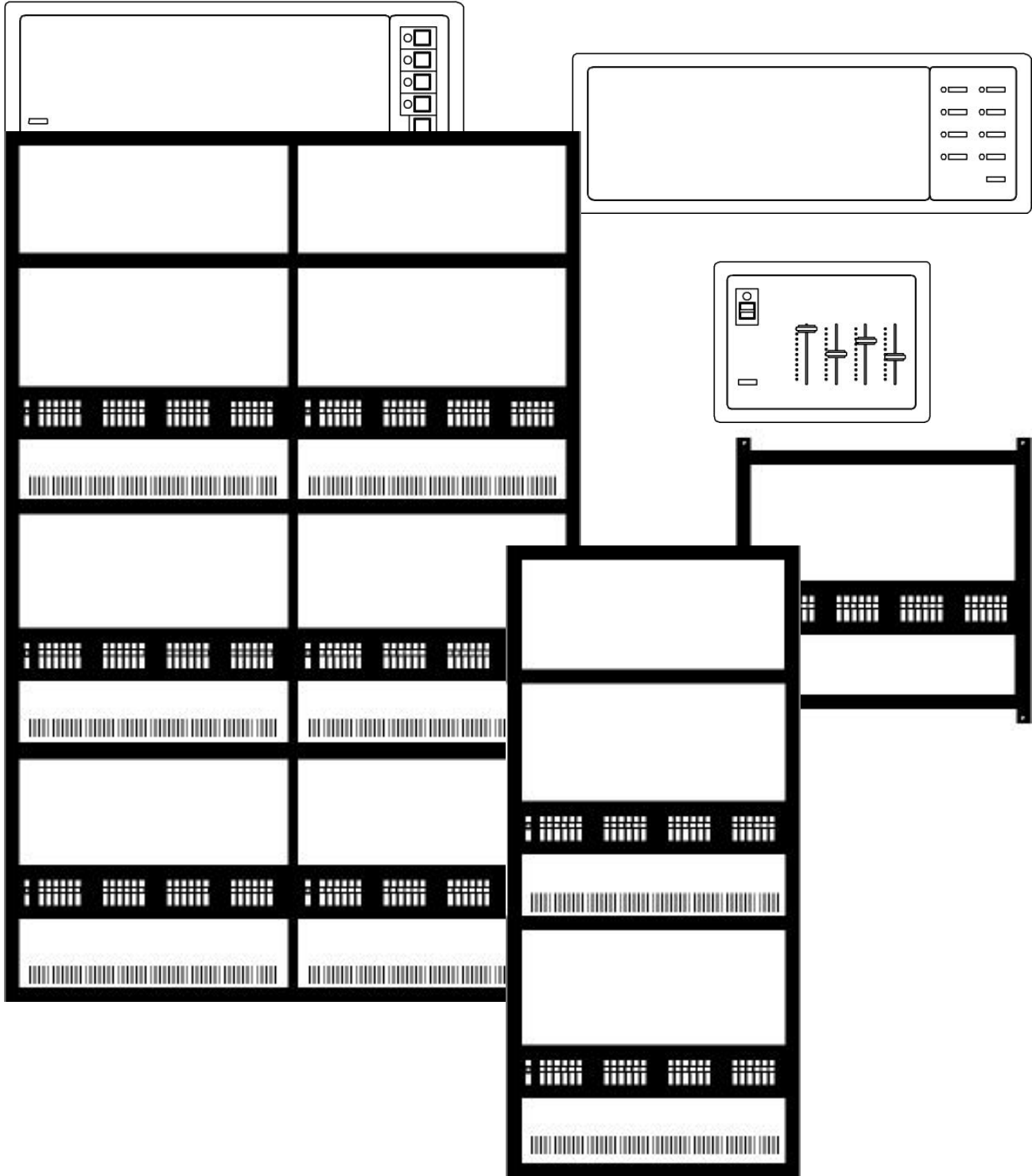


Pre Systems

Lighting Control Systems



DP Panel
Replacement Product
Installation Guide

Warnings and Options

Read Warnings Before Continuing

Use this guide to successfully install a replacement dimmer within a Lutron Pre Systems DP Panel. The guide is intended for use by qualified Electricians only. DP Panels can have multiple Line Voltage (Mains) feeds and typically use 3-Phase power that is distributed and exposed throughout the DP Panel.

Consider this option -

Lutron has trained Field Application Specialists who can come to your location and do this replacement for you. Beyond the cost of the replacement dimmer itself, you will be charged a fee for the travel and daily wage of the Specialist. To schedule a visit, please call 1-800-523-9466 (see back page for more contact numbers outside the United States).



Danger

Turn power OFF before working on any DP Panel.

Note that there can be multiple feeds per panel.

Note that some feeds may have Emergency (Essential) backup feeds.

Note that when the control breaker is off, then the affected lights will be off, but power to the modules may still be ON.



Warning

Placing the wrong dimmer on an existing load could result in damage to the load or dimmer. See DP Panel Model Numbers chart in this guide.



Warning

Before powering a replacement dimmer, replace the bypass bar to protect the dimmer until the load is proven.

Damage due to a short circuit or miswiring will result in the need to purchase another replacement dimmer.



Warning

When working on any load (such as rewiring a load), replace the bypass bar to protect the dimmer until the load is proven.



Warning

If any screw or other metallic object falls into the DP Panel, do not turn ON power until it is found and removed. It is recommended to use a magnetic screwdriver whenever removing any screw as described in this guide.



Note

Lutron Electronics, Co., Inc., reserves the right to make changes to its products without prior notice. Although every attempt is made to ensure that this information is accurate and up to date, please check with Lutron to confirm product availability, latest specifications and suitability for your application.

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System Overview

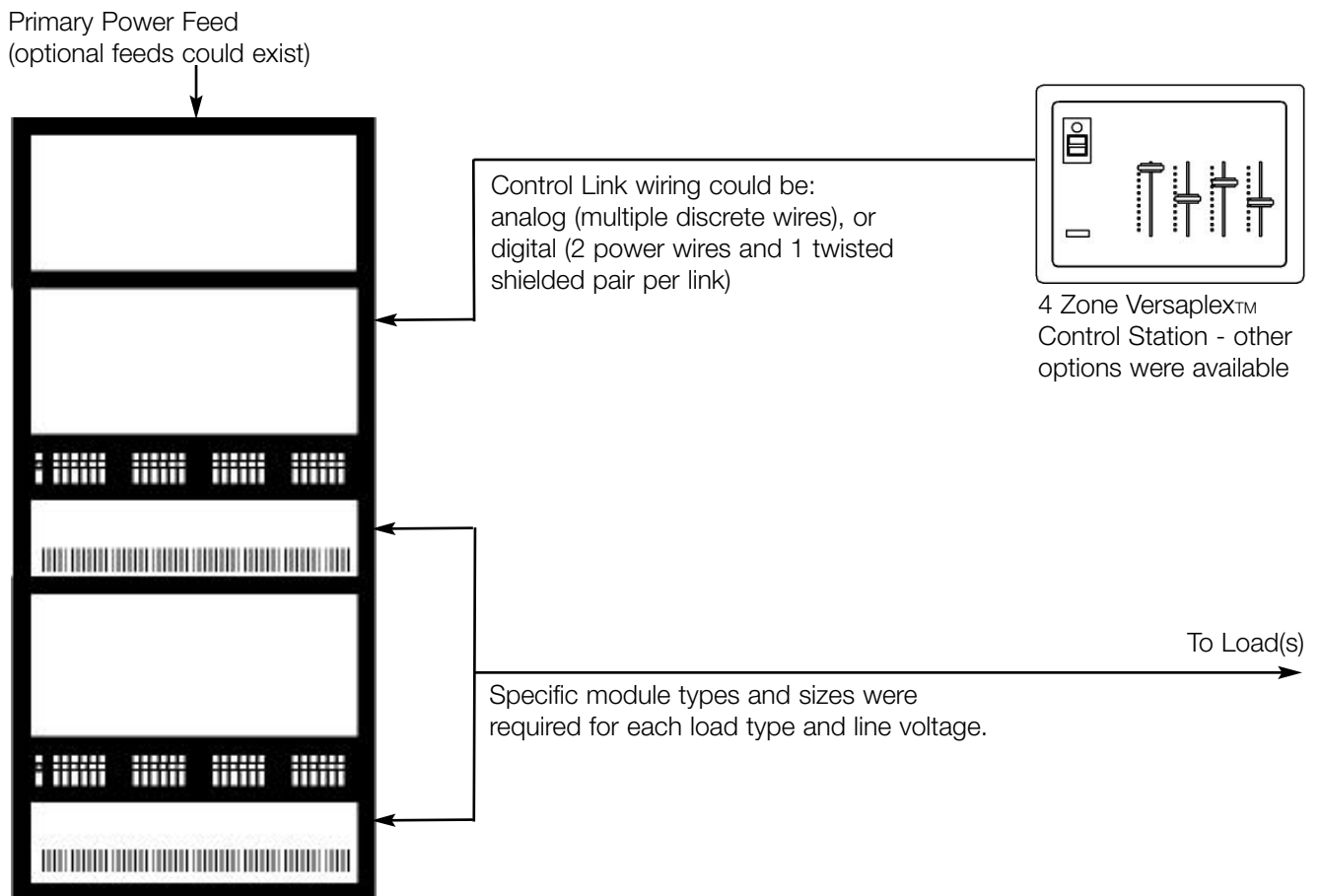
DP Panels were shipped new from 1982 through 1995. They came in many sizes, based on the number of dimming modules they could contain. A DP1 had space for one dimming module while a DP24 had space for 24. There were DP1, DP2, DP4, DP8, DP12, DP16, DP20, and DP24 Panels. The cover of this guide shows a DP24, a DP8, and a DP4 (from left to right).

PDP Panels contained wider modules (3 in the space of the 4 in a DP). There were PDP1, PDP3, PDP6, PDP9, PDP12, PDP15, and PDP18 Panels. This guide only refers to DP Panels but the information is useful for PDP Panels as well.

Dimming module technology evolved a great deal while DP Panels were being sold new. The older varieties must be sent to Lutron for repair (with proper RGA # - contact Lutron) while the newer varieties can still be supported with replacement dimmers as described in this guide. The model number of the panel and the module name can help determine how each module can be supported.

The control stations wired to the DP Panels also changed greatly while DP Panels were being sold new. Lutron still attempts to repair these, as needed. Analog controls (one discrete wire per zone and scene) were shipped new from 1982 through 1995. Digital controls (multiplexed data stream on a twisted shielded pair of wires) were shipped new from 1987 through 1995. For digital controls, DP Panels contained a 'Demux' board to translate the digital information from the digital controls to the same analog dimming modules.

Grafik Eye® Control Units and GP panels were introduced in 1994 and took over the DP Panel business as of 1995. These newer designs have proven to be more reliable and flexible.

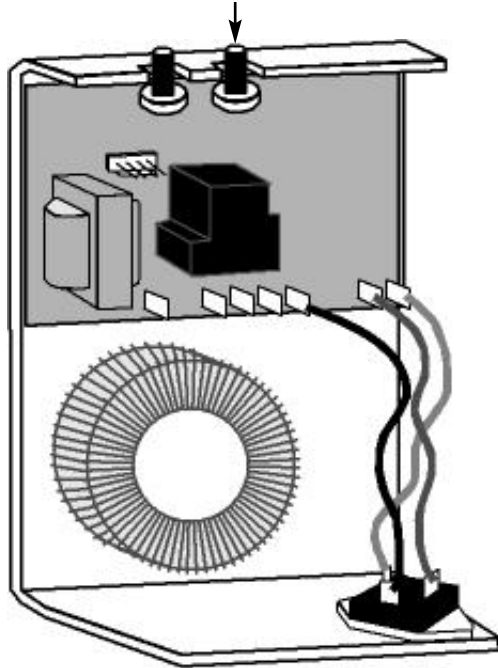


DP8 shown

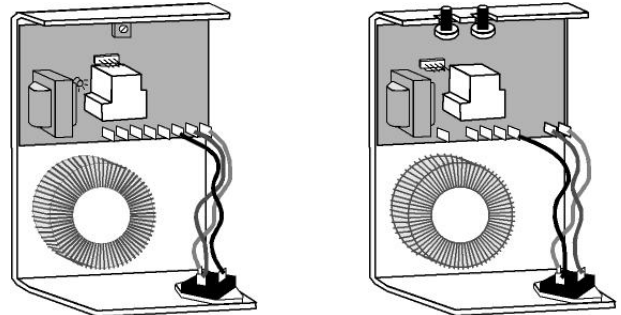
System Overview

The replacement dimmer may not look exactly like the original version. It will have two trim pots - one for Low End trim and one for High End trim.

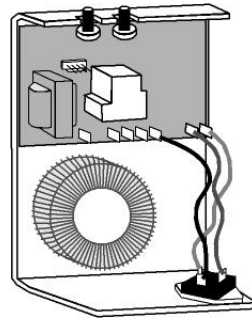
Note that the Low End trim is always toward the center of the control card on the dimmer.



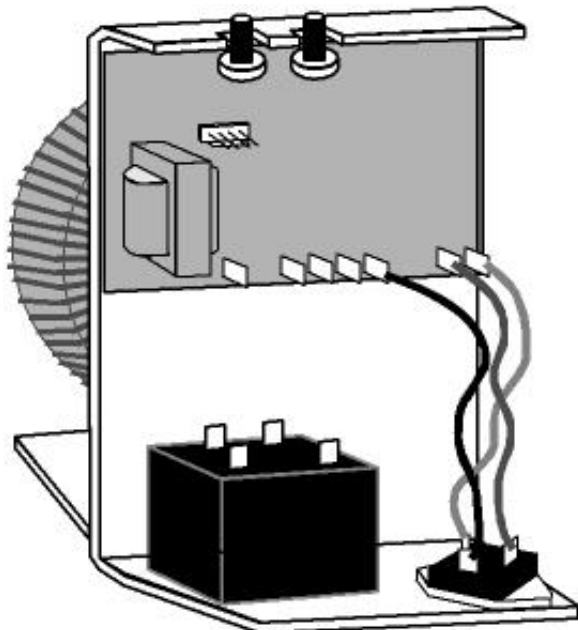
All 10A 'N Module Sections' look similar, but different load types are clearly labeled.



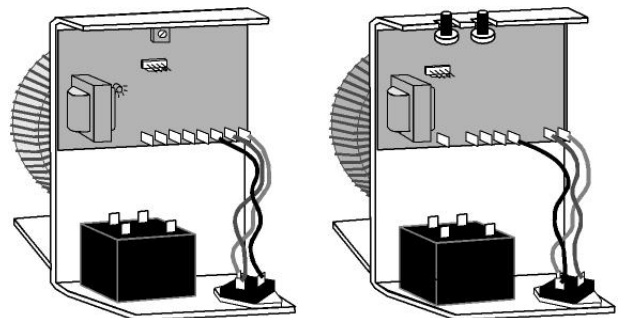
Original 'looks' of Incandescent or Magnetic Low Voltage 'N Module Sections'.



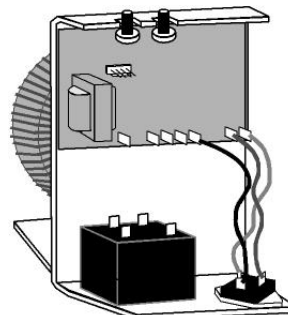
Original 'look' of Neon 'N Module Sections'.



All 16A 'Triple Module Sections' look similar but different load types are clearly labeled. 16A dimmer sections take up twice as much module space as 10A dimmer sections due to the larger choke and relay.



Original 'looks' of Incandescent or Magnetic Low Voltage 'Triple Module Sections'



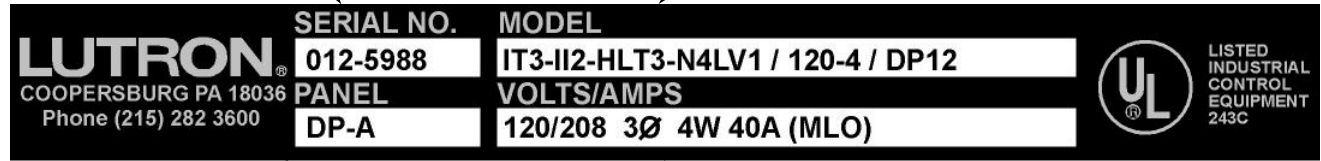
Original 'look' of Neon 'Triple Module Sections'

DP Panel Model Numbers

Typical DP Panel label:

Job Serial Number - Always reference this number whenever calling Lutron. Job drawings may be on file.

DP Panel Model Number - Describes custom built panel - see below for explanation.

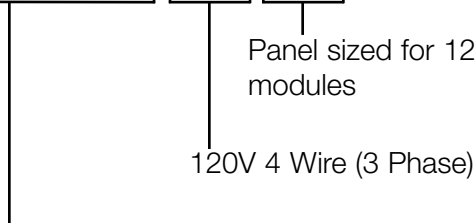


DP Panel Identification as per customer's job prints - default = DP-A, DP-B, etc....

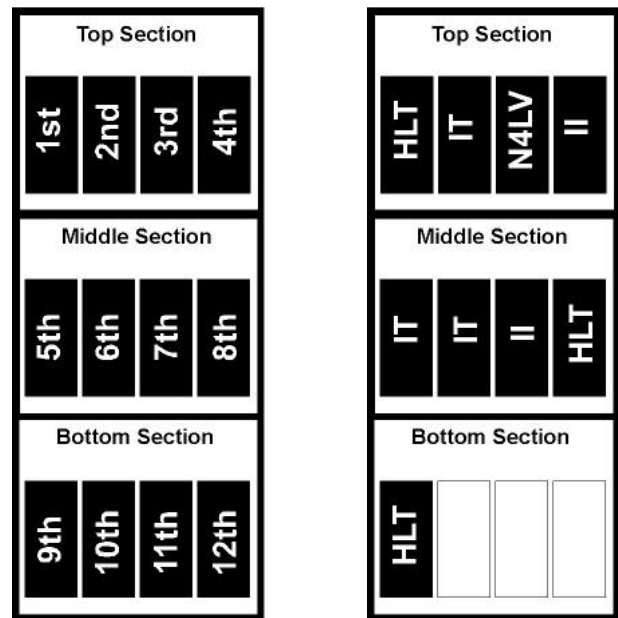
DP Panel Power Feed information - MLO = Main Lugs Only (no Main Breaker).

Typical DP Panel Model Number:

IT3-II2-HLT3-N4LV1/120-4/DP12



List of module types with their quantity in the panel. Each module type is separated by a '-' or a space. The order of the module types listed does not indicate their location within the DP panel. To identify a module, see its label or refer to the Job Drawings.



A DP12 has room for 12 modules. In the example on the right, the panel was customized to hold 9 specific modules.

DP Panel Modules vary depending on load type, current capacity of each dimmer, number of dimmers per module, and line voltage. A listing of each module that has a replacement dimmer section is shown on the next page. Complete modules may be stocked at Lutron. Most modules can be repaired by Lutron.



Note

Job Drawings help to make any Pre Systems job more understandable. Lutron sells copies of the latest version on file. Contact Lutron at 1-800-523-9466.

DP Panel Model Numbers

Module Information				Replacement Dimmer Section Information		
Panel Model # Abbreviation	Name on Module Label	Dimmers / Module	Load Type	Name	Current Capacity	Voltage Rating
DCI	DCI-1200	1	Incandescent	E022301	10A	120V
FDBD	FDBD-4400/2-277	2	FDB Fluor.	E050402	16A	277V
FDBS	FDBS-2000	1	FDB Fluor.	E050401	16A	120V
	FDBS-4400-277	1	FDB Fluor.	E050402	16A	277V
FDBT	FDBT-2000/3	3	FDB Fluor.	E050401	16A	120V
GD	GD-2000/2	2	Inc / Mag LV	REP-DP-G16-120	16A	120V
GS	GS-2000	1	Inc / Mag LV	REP-DP-G16-120	16A	120V
	GS-4000-225	1	Inc / Mag LV	EE040401	16A	220V
	GS-4000-245	1	Inc / Mag LV	EE040401	16A	240V
GT	GT-2000/3	3	Inc / Mag LV	REP-DP-G16-120	16A	120V
	GT-3600/3-225	3	Inc / Mag LV	EE040406	16A	220V
	GT-4000/3-245	3	Inc / Mag LV	EE040406	16A	240V
ID	ID-2000/2	2	Incandescent	REP-DP-G16-120	16A	120V
IS	IS-2000	1	Incandescent	REP-DP-G16-120	16A	120V
IT	IT-2000/3	3	Incandescent	REP-DP-G16-120	16A	120V
LVD	LVD-2000/2	2	Magnetic LV	REP-DP-G16-120	16A	120V
LVS	LVS-2000	1	Magnetic LV	REP-DP-G16-120	16A	120V
LVT	LVT-2000/3	3	Magnetic LV	REP-DP-G16-120	16A	120V
NnELV	NnELV-1200/n	n = 1-6	Electronic LV	E051704	10A	120V
NnG	NnG-1200/n	n = 1-6	Inc / Mag LV	REP-DP-G10-120	10A	220V
	NnG-2200/n-225	n = 1-6	Inc / Mag LV	REP-DP-G10-240	10A	240V
	NnG-2400/n-245	n = 1-6	Inc / Mag LV	REP-DP-G10-240	10A	120V
NnI	NnI-1200/n	n = 1-6	Incandescent	REP-DP-G10-120	10A	120V
NnLV	NnLV-1200/n	n = 1-6	Magnetic LV	REP-DP-G10-120	10A	120V
NnNC	NnNC-1200/n	n = 1-6	Neon CC	E052501	10A	120V
	NnNC-2200/n-225	n = 1-6	Neon CC	EE040502	10A	220V
	NnNC-2400/n-245	n = 1-6	Neon CC	EE040502	10A	240V
NnNDA	NnNDA-1200/n	n = 1-6	Non Dim	E051702	10A	120V
	NnNDA-2200/n-225	n = 1-6	Non Dim	E051702	10A	220V
	NnNDA-2400/n-245	n = 1-6	Non Dim	E051702	10A	240V
	NnNDA-2770/n-277	n = 1-6	Non Dim	E051702	10A	277V

Notes:

- Modules listed above that start with an 'Nn' were known as 'N Modules'. They had from 1 to 6 10A dimmers per module. Later versions mixed the types of 10A dimmers within one module. An example of such a module is: N2LV-N2NCC-N1ELV-1200/5
This is a 120V module with a total of five 'N Sections' on one 'N Module'. Each type of 'N Section' had a different load type (and therefore may have a different replacement section, as listed above).
- Dimmer section Names that begin with an 'E' are no longer manufactured, but a limited amount of stock is available.



Be aware that N Modules could have more than one load type - 'N2LV-N2NCC-N1ELV-1200/5' is shown.



Step 1

Turn OFF Power to the DP Panel

Refer to the DP Panel label and the Job Drawings to identify the feed type(s) within the DP Panel. If the DP Panel has main breakers (or Isolation Switches), turn each of these OFF. If the DP Panel does not have an internal method of turning all power OFF, turn OFF and lock all feeds to the DP Panel.

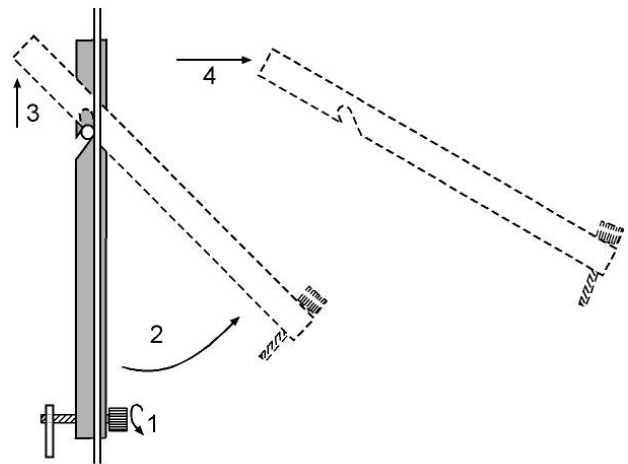


Danger

Turn power OFF before working on any DP Panel. Note that there can be multiple feeds per panel. Note that some feeds may have Emergency (Essential) backup feeds.

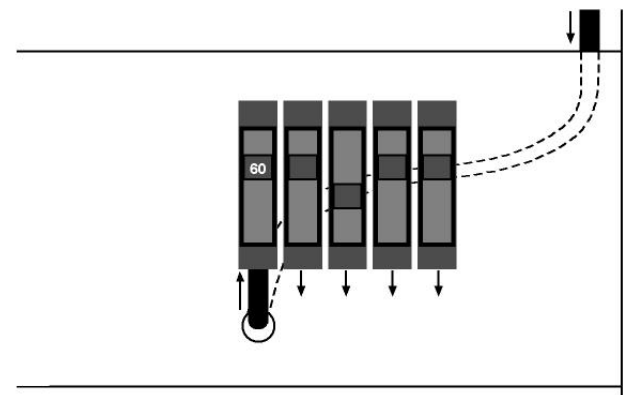
Open the cover of the affected DP Panel section:

1. Loosen the two front screws,
2. Pull on the loosened screw heads,
3. Swing the lower edge of the cover out, then
4. Lift the entire cover off of its guide pins.



Once the power is OFF, open the front cover of the DP Panel section.

Visually confirm that all input feed wires are wired to the same feed. Each DP Panel section could have a separate feed. Feed wires generally run along the right side of each DP Panel section. The input breaker is the leftmost, and highest amperage breaker per group of breakers. There is an input breaker per module.



Wires into the bottom of each input breaker should be visually checked to confirm that their source is OFF.



Step 2

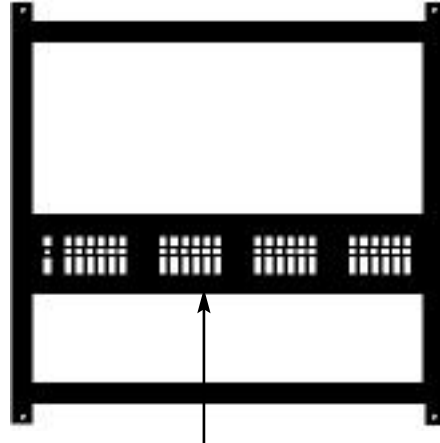
Identify the Section of the Module to be Replaced

This procedure assumes that there is an issue (load does not dim, or flickers, etc...) with one of the outputs of a DP Panel. Locate the output breaker that controls the load with the issue.



Note

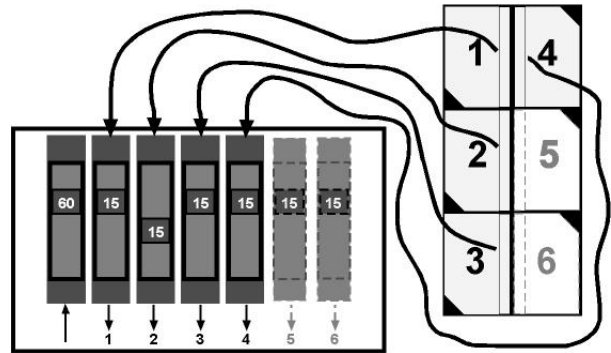
Check for the symptoms of the issue in the Troubleshooting Chart in this guide. The issue could be caused by a change in the load, etc... This may save you the time to complete this procedure.



Locate the output breaker to the load with the issue.

For 120V and 277V DP Panels -

If the output breaker has a rating of 15A or less, this dimming module has 10A dimmers (from 1 to 6 outputs per module).



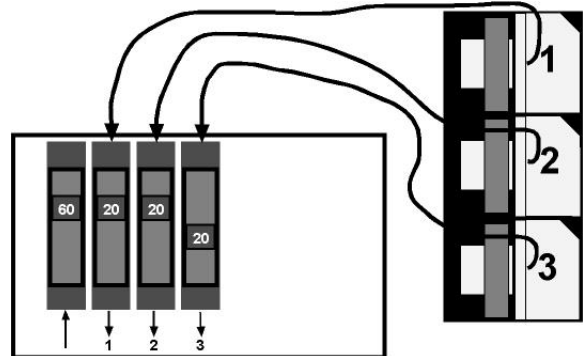
Output breaker indicates a specific dimming section on the 'N' module.

For 220V, 230V, and 240V DP Panels -

If the output breaker has a rating of 10A or less, this dimming module has 10A dimmers (from 1 to 6 outputs per module).

For 120V and 277V DP Panels -

If the output breaker has a rating of 16A or more, this dimming module has 16A dimmers (from 1 to 3 outputs per module).



Output breaker indicates a specific dimming section on the 'Triple' module.

For 220V, 230V, and 240V DP Panels -

If the output breaker has a rating of 11A or more, this dimming module has 16A dimmers (from 1 to 3 outputs per module).

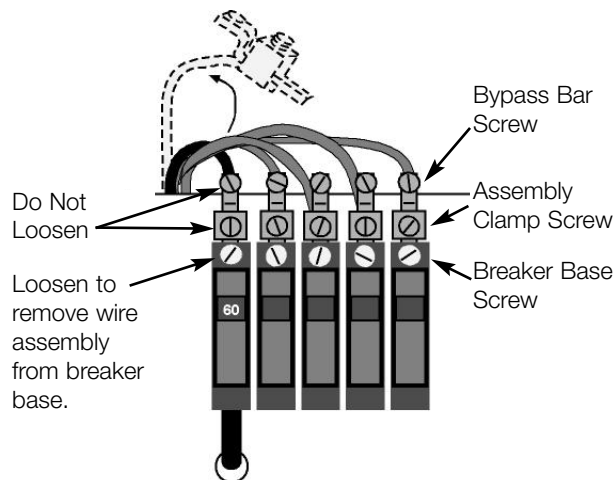


STEP 3

Prepare the Affected Module for Removal

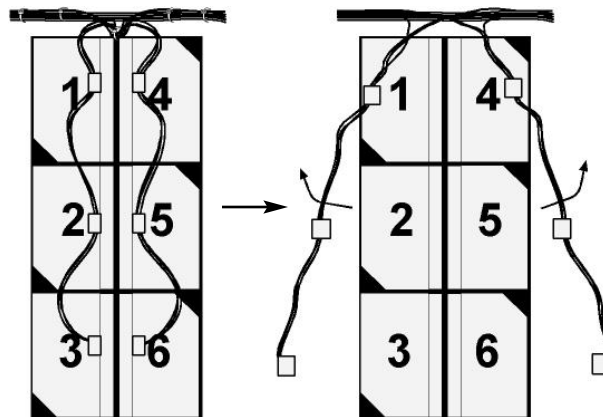
Note the order of the red wires to the output breakers. The wires will be identified by either a numbered label or a colored stripe on the wire. These wires will have to return to the proper breaker after the dimmer section is replaced.

Loosen the breaker base screws as shown (NOT the copper clamp screws). Remove the assembly from the input breaker, then the assemblies from all of the output breakers.



Each dimmer section has a red 4-pin connector with a white cap on it. This connector is part of the control harness. Gently remove each connector from the dimmer section.

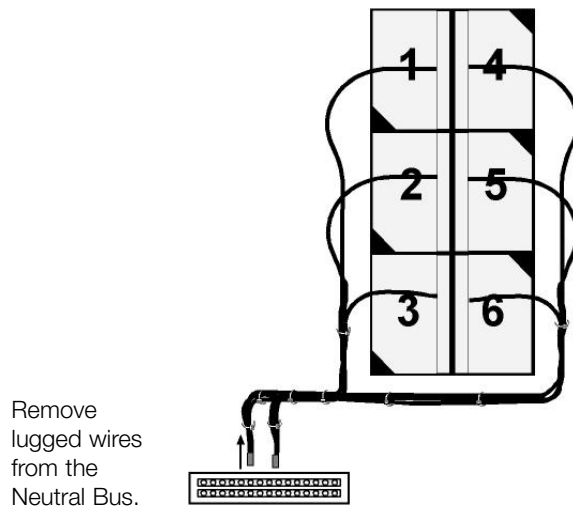
Create some slack on the control harness wires by cutting enough cable ties to allow the module to be removed from the panel, and to be replaced onto the PCB assemblies as the module is sliding back into the panel. Be careful not to cut into any wire insulation when cutting the cable ties.



Locate and remove the module's neutral lug(s) from the neutral bus. Up to three neutral wires fit into a neutral lug. An 'N Module' with 4 to 6 dimmer sections will have two neutral lugs.

Module neutral lugs are usually in the back row of the neutral bus (to make room for load neutrals).

Free the entire power harness (wires that went to the breakers and the neutral bus) by carefully cutting all of the cable ties that dressed it to the breaker pan and to other power harnesses. Cable ties that held the power harness together do not need to be cut.





STEP 4

Remove the Module and Replace the Appropriate Dimmer Section

Using a screwdriver with a magnetic tip, unscrew the two mounting screws that hold the dimming module into the DP Panel.

Lean the top of the module forward against the back of the breaker pan, pull up on the module and lift it out of the panel.



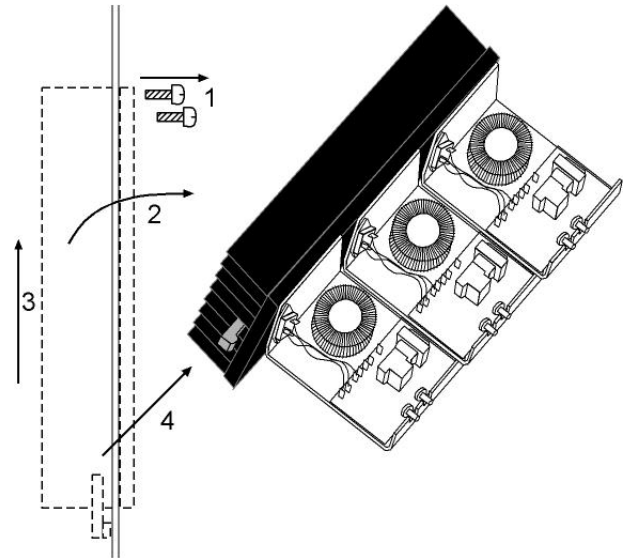
Warning

Be careful not to damage the trimpots during module handling.



Warning

Module corners and edges may be sharp. Do not slide fingers along any metal edge.



Place the removed module on a bench or other work surface.

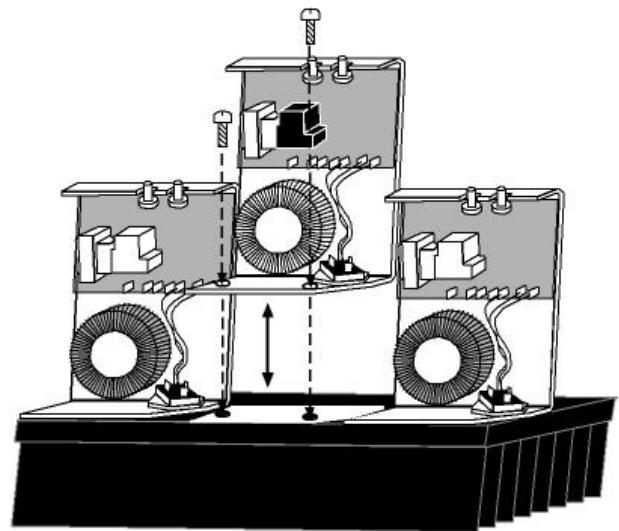
Record the color and order of the three power harness connections to the 'faulty' dimmer section. Remove them by gently rocking each connector off of the PC Board tab.

Note that some of the mounting screws have a washer under the screw head. They are needed to keep specific screw locations from protruding out the back of the black heat fin.

Remove the 'faulty' dimmer section. DO NOT wipe off the white thermal grease from the black heat sink.

Wipe off the white thermal grease from the bottom of the 'faulty' dimmer section (optional).

Place the new dimmer on top of the original white thermal grease. Replace the mounting screws (and washers) that held the original dimmer section.



Remove the 'faulty' dimmer section. DO NOT wipe off the white thermal grease. Any mounting screw with a washer must be returned to the same location when installing the new dimmer section.



STEP 5

Return the Module to the DP Panel

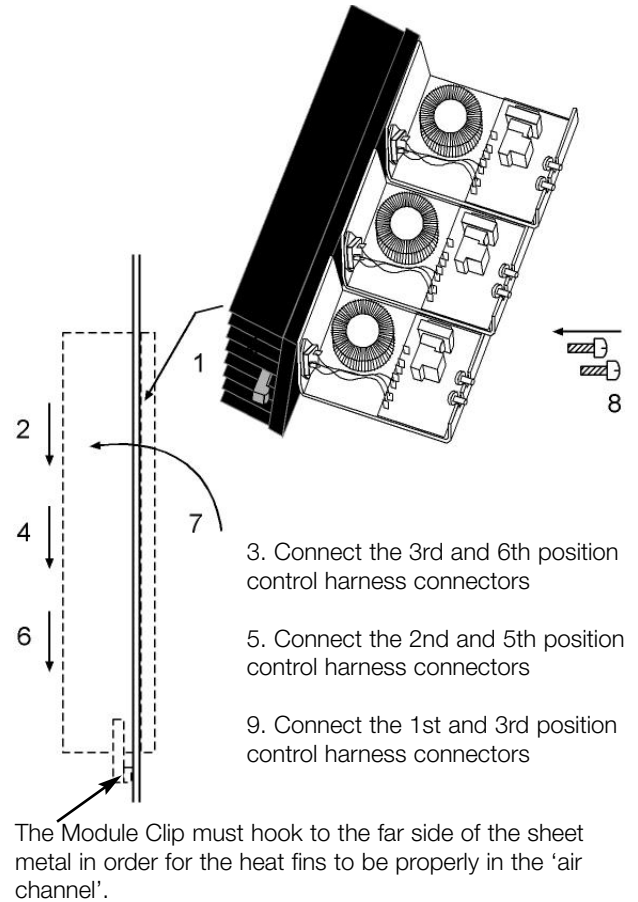
Lift the repaired module over and behind the breaker pan, place the black heat fins into the module opening and slide the module downward a short distance. Push the 3rd and 6th position red 4-pin connector onto the 3rd and 6th position dimmer sections (if applicable). Visually confirm that all 4 pins entered all 4 openings in the connectors.

Slide the module down the sheet metal opening until the 2nd and 5th dimmer sections reach their respective red 4-pin connectors. Repeat the procedure of pushing on and verifying alignment of the connectors.

While keeping the bottom edge of the module back against the sheet metal, slide the module all the way to the bottom of the opening. Confirm that the module clip is holding the bottom edge of the module against the sheetmetal opening. Push the module downward, then tilt the top of the module back against the sheet metal.

While holding the module against the sheet metal, use a screwdriver with a magnetic tip to insert the two mounting screws.

Repeat the procedure of pushing on and verifying alignment of the 1st and 4th connectors.



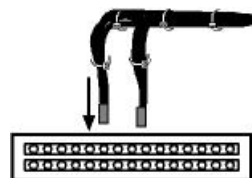
3. Connect the 3rd and 6th position control harness connectors

5. Connect the 2nd and 5th position control harness connectors

9. Connect the 1st and 3rd position control harness connectors

The Module Clip must hook to the far side of the sheet metal in order for the heat fins to be properly in the 'air channel'.

Connect the neutral wires to the neutral bus.
Torque the neutral bus screw(s) to 20 in-lbs.



Return the neutral lug(s) to the neutral bus.



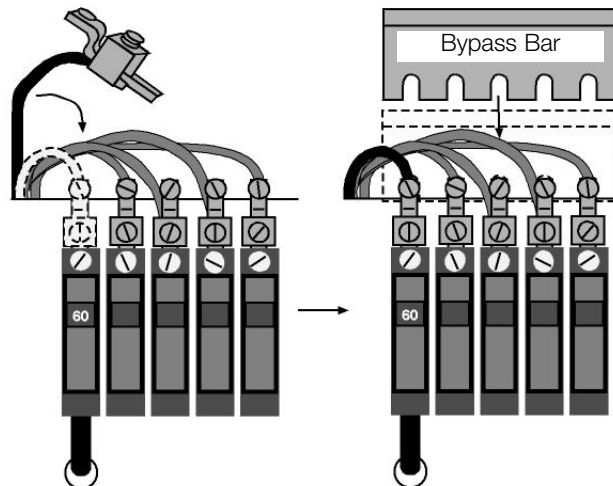
STEP 6

Return the power harness assemblies into the breaker bases and tighten the breaker base screws to approximately 4 in-lbs. (enough to prevent the power harness assembly from pulling itself out, but not tightened down).

Place the bypass bar onto all of the power harness assemblies. The bypass bar locates the power harness assemblies and should not be removed until after power is reactivated (to protect the dimmer from a possible short circuit).

Tighten the power harness assembly screws onto the bypass bar to 10 in-lbs.

Tighten the breaker base screws to 35 in-lbs.



Activate System

Once the repaired module is successfully returned to the DP Panel, confirm that all of its breakers are OFF, the bypass bar is in place, and that no one is working on the loads controlled by this panel.

Turn ON the feed to the DP Panel. All loads other than the affected module's loads should go to their appropriate light level.

Turn ON the input breaker to the repaired module.

Turn ON one output breaker at a time, ending with the one to the replaced dimmer section.

If any breaker trips, fix any shorts (or overload) at the load. Retest until the cause of the breaker tripping is resolved.

Turn each output breaker OFF, then the input breaker OFF. Remove the bypass bar - be careful not to touch the module on either side of the repaired module. Save the bypass bar for any future work on the loads.

Turn ON the input breaker, then turn ON all output breakers.

The system should now dim properly. Confirm this by dimming at the appropriate control.



STEP 7

Set Low and High End Trims

The Low and High End Trims are factory set to what Lutron considers 'normal' (a low Low End and a high High End for a given Load Type). Most installations leave them at the factory settings.

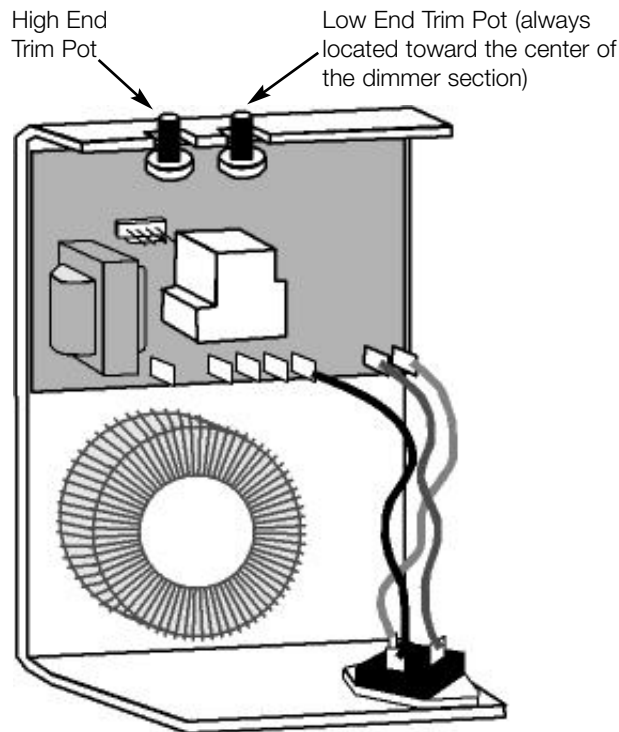
Ease of access to trim pots depends on the location on the module. Sections 1 and 4 are easy, while sections 3 and 6 are not. Use an insulated, right-angle screwdriver to access the top of the less accessible trim pots.

Setting High End (typically to lower the High End in order to increase lamp life or to conserve energy) -

1. Move the signal (slider) to full
2. Wait for any fading to be complete
3. Turn the High End trim pot counter-clockwise to lower the maximum output to the desired level.

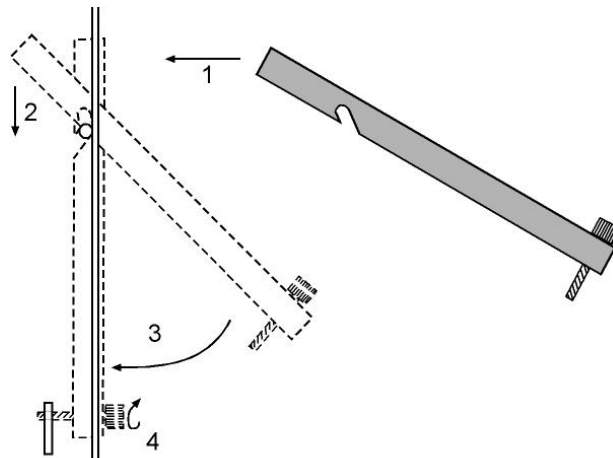
Setting Low End (typically to tweak a lamp glow for a wattage other than the one used in the factory) -

1. Move signal (slider) to Low End
2. Wait for any fading to be complete
3. Turn the Low End trim pot to the desired level. Note that this trim pot is very sensitive (a little turn changes the output a lot).



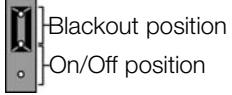
Once the customer is happy with the system's performance, return a cover to each DP Panel section by:

1. Lift the cover onto the guide pins
2. Swing the lower edge of the cover down
3. Move any misaligned breakers so that they fit through the cover's opening
4. Pull the loosened screw heads out, then back into the cover
5. Locate the mounting hole with the tip of the mounting screw, and
6. Tighten the two front screws.



Troubleshooting Guide

Basic System Symptoms and Possible Causes

Dimmer Section Load	Same Module Loads	Other Modules Loads	Dimmer Section Control	Possible Causes
On Only	OK	OK	OK	<ul style="list-style-type: none"> Low End trim too high or Low End and High End trims crossed Triac shorted - due to load short without Bypass Bar? - need another section
On Only	On Only	OK	OK	<ul style="list-style-type: none"> Bypass Bar still installed
Flicker	OK	OK	OK	<ul style="list-style-type: none"> Signal from Control unstable - due to damaged slider? - contact Lutron Input line feed varies too much - due to elevator or other motor? - see if still does it with Bypass Bar in place Dimmer Section or wiring failing - due to drying capacitor? poor solder connection? intermittent mechanical connection? - contact Lutron
Off Only	OK	OK	OK	<ul style="list-style-type: none"> Output breaker OFF Control harness connector not plugged onto section Control harness connector plugged but shifted one pin Power harness connectors rewired incorrectly - see other sections order Demux board damaged - digital systems only - contact Lutron DCI only - Reset switch in panel needs to be pressed after fixing load
Off at Wrong Time	OK	OK	OK	<p>On/Off Jumper in the wrong position: </p> <ul style="list-style-type: none"> Blackout turns off at bottom of slider travel On/Off turns off at switch only
Off	Off	OK	OK	<ul style="list-style-type: none"> Input breaker or all output breakers OFF Neutral wires not reconnected to Neutral Bus Control harness wires open - cut during cable tie removal?
Off	Off	Off	Off	<ul style="list-style-type: none"> Power OFF to Panel Control breaker OFF (leftmost breaker in each DP Panel section) 40VA Transformer damaged - due to Control Link wiring short? - contact Lutron

Glossary of Terms in Chart:

- 'Blackout' = Dimmer turns off at low end of the slider travel. Usually used with Neon and Fluorescent loads
- 'Bypass Bar' = Copper bar connecting the input breakers to the output breakers
- 'Dimmer Section Load' = Lights controlled by any portion of any module
- 'Flicker' = Light flashes, dips, or strobos when control is unchanged
- 'Off' = No voltage present at any time
- 'Off at Wrong Time' = Dimmer does not turn off when the customer expects it to
- 'OK' = Works normally
- 'On/Off' = Dimmer stays on at low end of the slider travel. Usually used with Incandescent loads
- 'On Only' = Lights go on but will not dim
- 'Other Modules Loads' = Lights controlled by other modules near the module with the dimmer section in the first column of the chart
- 'Same Module Loads' = Lights controlled by other dimmer sections on the same module as the one in the first column of the chart

Contact Information

Warranty

Lutron can help to maintain, service, or upgrade your lighting control system. Lutron has manufactured wall dimmers since 1968, and assembled custom dimming systems since 1975.

When you are ready to discuss an upgrade, please call the contact information below. The look of the controls, the function of each button, the wiring in the wall, and the minimized down time matter when changing to a new system. Lutron understands this and has the experience to help make any transition a smooth one.

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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.

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