GRAFIK Eye®

GP

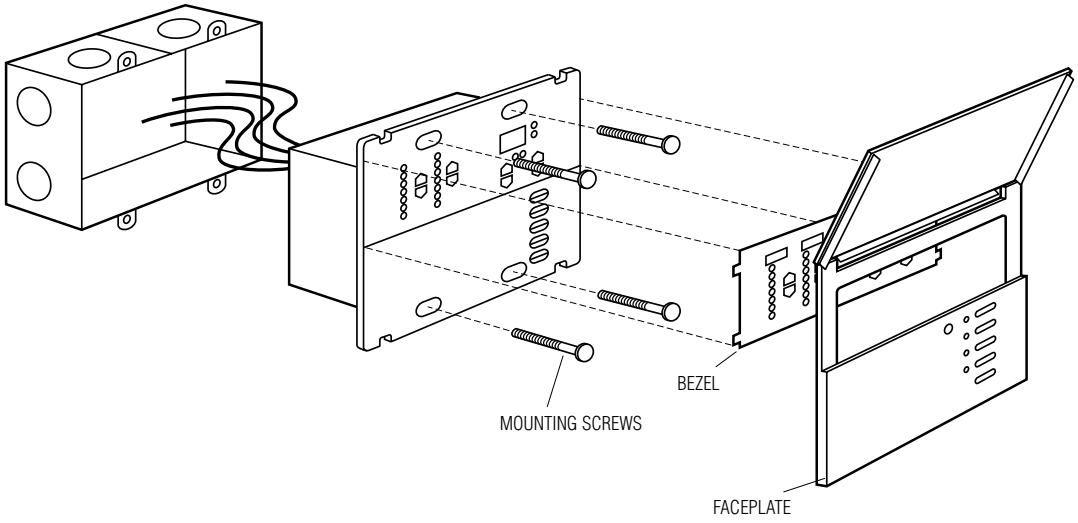
DIMMING PANEL & 4000 SERIES CONTROLS

LUTRON®

Installation, Operation, and Maintenance Manual

Overview

GRX-4000 Series Control Unit



GRAFIK Eye GP Lighting Control Panel

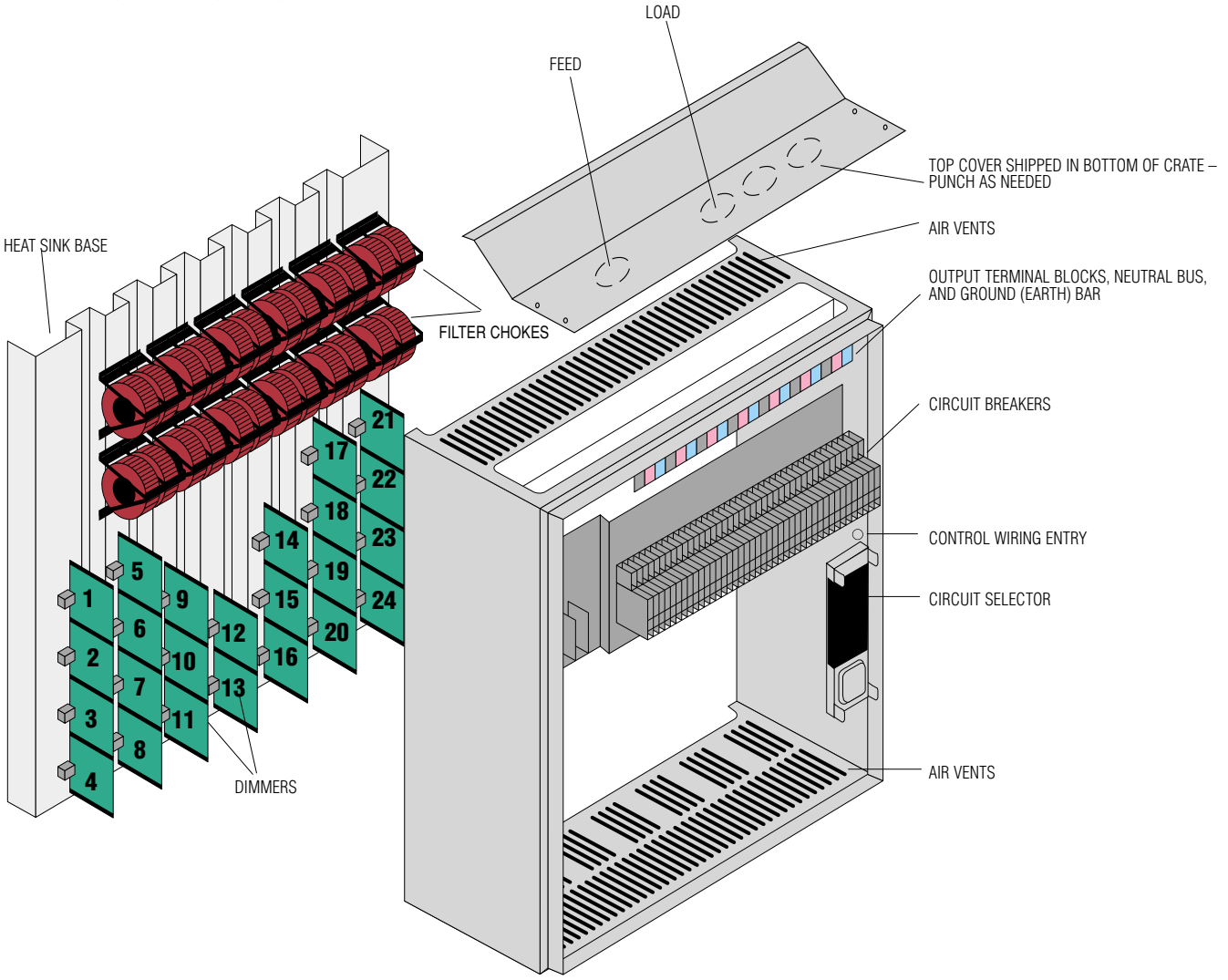


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Table of Contents

Step-by-Step Instructions

Reference Sheets

Mount Wallboxes and Panels

STEP 1: Mount Wallboxes

Use wallboxes with a minimum depth of 2-3/4" (70 mm) for Wallstations and 3-1/2" (89 mm) for GRX-4000 Series Control Units.

Multigang installations may require spacers between wallboxes.

Mount wallboxes flush to 1/8" (3 mm) below finished wall surface.

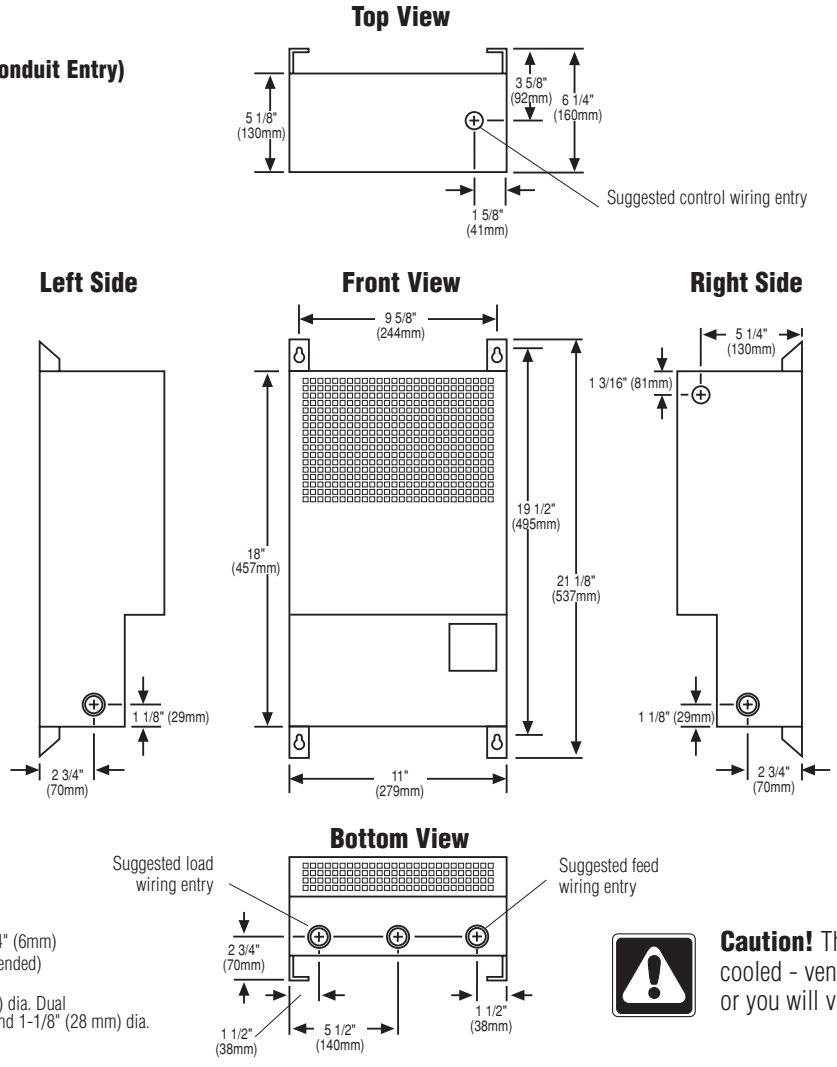
Finished wall should not have gaps around the wallbox of greater than 1/8" (3 mm).

For More Information . . .
See instructions packaged with each control.

Control		Wallbox
GRX-CIR		none – use mounting ring (provided)
GRX-4S-DW		Lutron # 241-399 (provided)
Control Interface		1900 Box (4"x4" box) or Lutron #241-496
EGRX Controls		UK Wallbox or Lutron #241-683 (1gang)
Control Units	**GRXSLD** 3,4 zone (3 gang) 6,8 zone (4 gang)	Lutron # 241-519 3-1/2" (89 mm) deep (1 gang each, gangable) or 2-3/4" (70 mm), 3-1/2" (89mm) deep US Wallbox or Lutron #241-400 2-3/4" (70 mm) deep (4 gang) or Lutron #245-254 3-1/2" (89 mm) deep (4 gang, old work box)
	GRX-4100/4500 2 zone (2 gang) 3 zone (3 gang) 4-24 zone (4 gang)	
	All Others (1 gang)	

STEP 2: Mount Panels

GP3, 4
(Dimensions and Conduit Entry)



Keyhole accepts a maximum of 1/4" (6mm) mounting bolt. (#10 (m6) recommended)

Single knockouts are 7/8" (22 mm) dia. Dual knockouts are 7/8" (22 mm) dia. and 1-1/8" (28 mm) dia.

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

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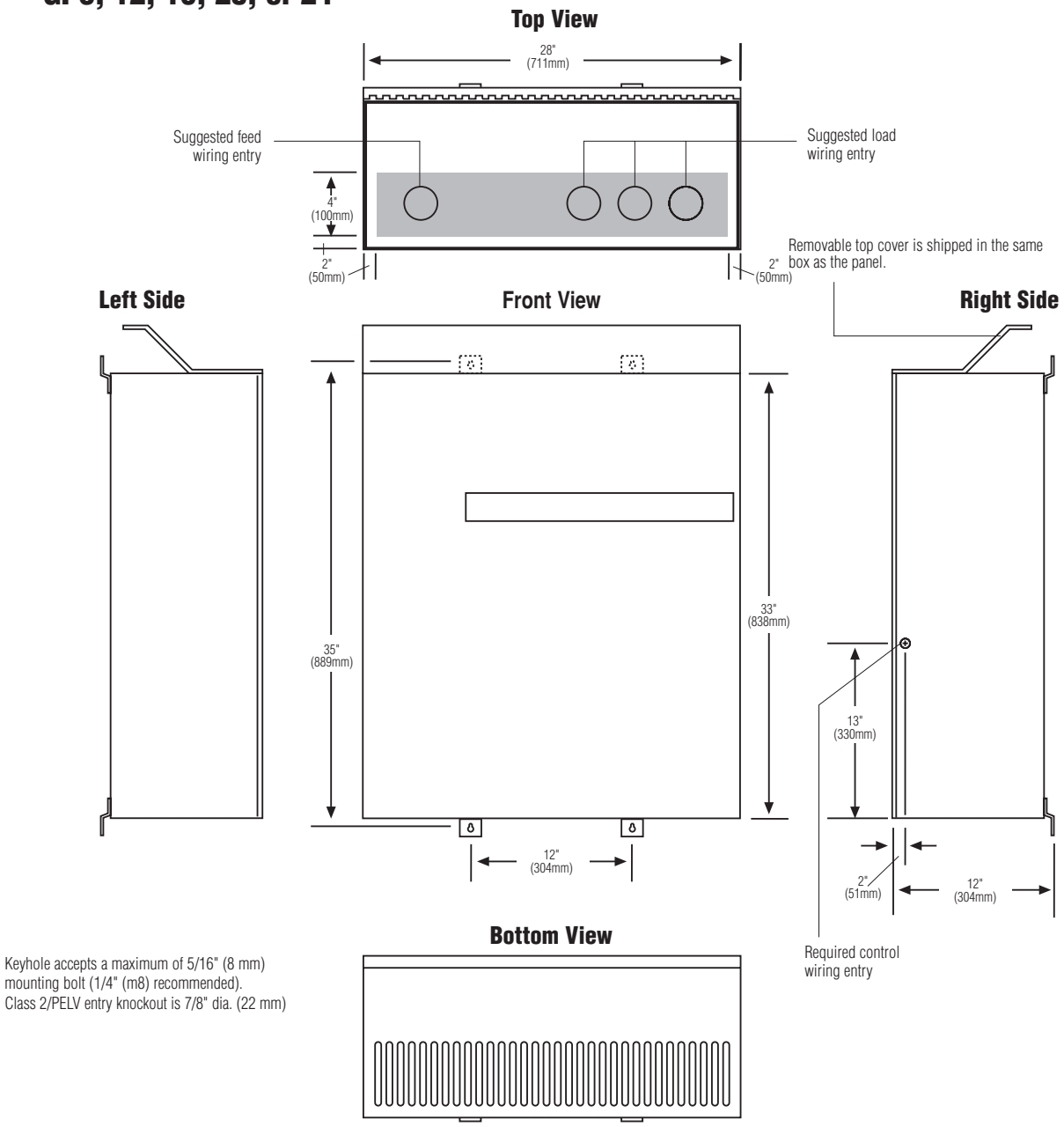
Mount Panels

STEP 2: Mount Panels (continued)

GP8, 12, 16, 20, or 24



For More Information . . .

GP3,4 *Look inside a GP3 and 4 .....32*

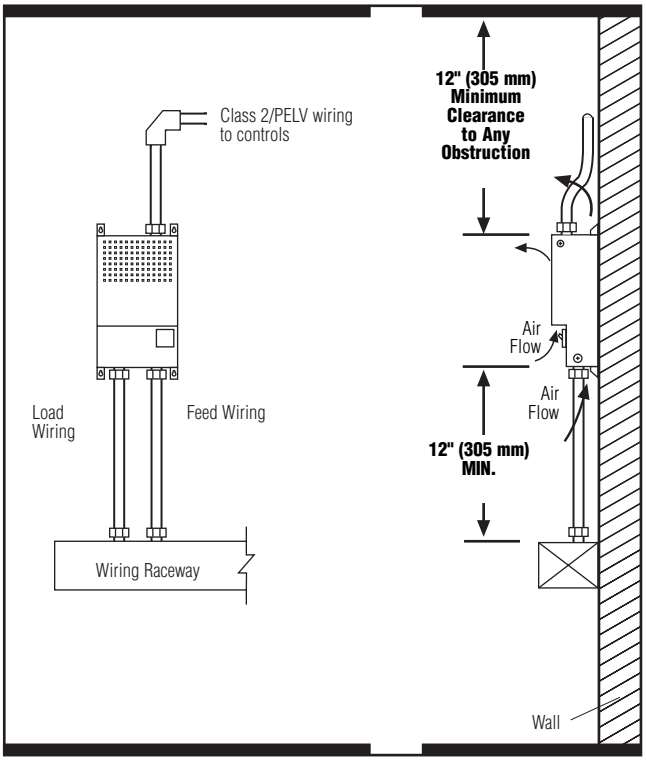
GP8→24 *Look inside a GP8 through 24.....33*

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

Note: GP8 through 24 must have its top cover punched for Feed and Load Circuit wiring.

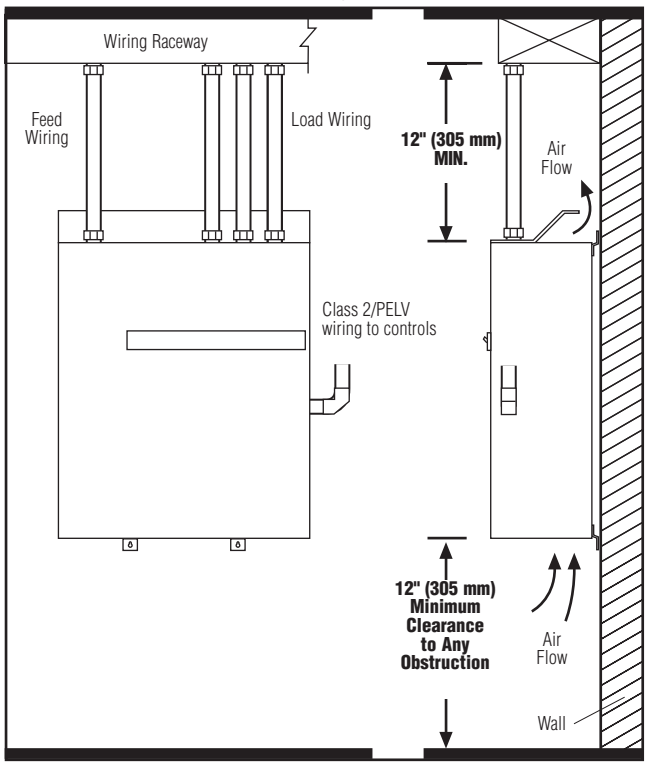
STEP 2: Mount Panels (continued)

GP3, 4
(Suggested Mounting)



Front View **Side View**

GP8 through 24
(Suggested Mounting)



Front View **Side View**

Notes:

- Panel generates heat. Mount only where ambient temperature will be 0 °C-40 °C (32 °F-104 °F).
- Reinforce wall structure as required for weight and local codes.
- Panel clearances are 12" (305 mm) above and below and 0" to each side. (allow room for Class 2/PELV clearance).
- Indoor Use Only. NEMA, Type 1 enclosure, IP20.
- Relative Humidity < 90% non-condensing.
- GP Panels must be mounted within 7° of true vertical.

Panel	Max BTUs/Hr.	Weight w/o Packaging
GP3,4	685	30 lbs (14kg)
GP8	1365	115 lbs (52kg)
GP12	2045	130 lbs (59kg)
GP16	2725	145 lbs (66kg)
GP20	3405	160 lbs (73kg)
GP24	4085	175 lbs (80kg)

Warning! CE marked panels with 10A circuit breakers are intended for industrial or commercial installations.

Caution! Dimming Panels will hum slightly and internal relays will click while in operation. Mount where audible noise is acceptable.

Caution! Mount panel so line (mains) voltage wiring will be at least 6 feet (1.8 m) from sound or electronic equipment and its wiring.

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

For More Information . . .

GP3,4 *Look inside a GP3 and 4.* 32

GP8→24 *Look inside a GP8 through 24.* 33

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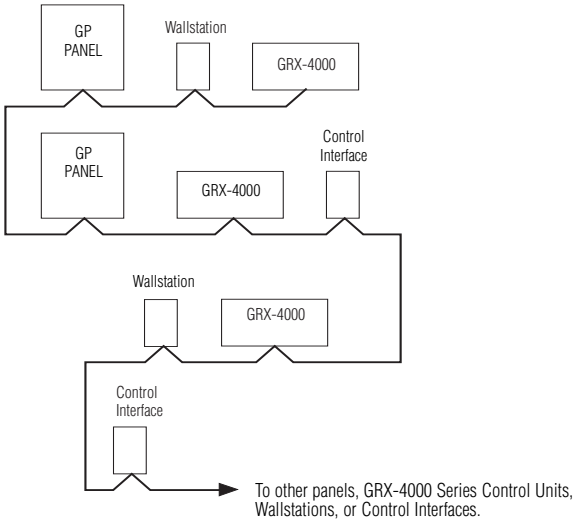
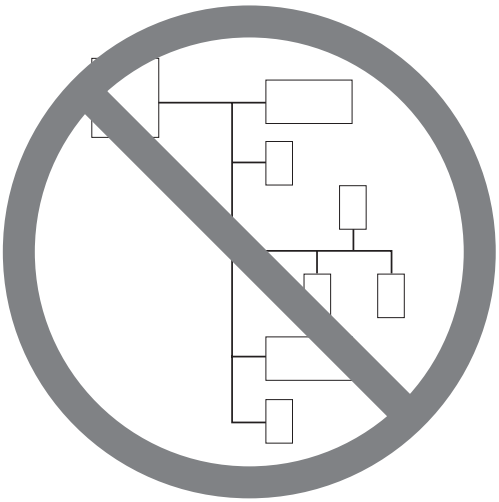
Wire System

STEP 3: Control Wiring

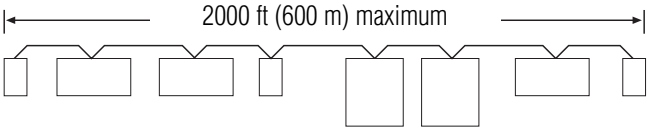


Correct: Daisychain OK



Incorrect: Branch or Home Run not acceptable

Control Link Specifications



Total length of Control Link may be no more than 2,000 feet. This distance is based on proper shielding on the twisted shielded pair, and on #12 AWG wire on the wires to terminal 1 and terminal 2 of the Control Link. If unapproved cable or smaller wire is used, this limit is affected:

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)

Terminal 1 & 2 Wires Sizes	Max. Control Link Length
#12 AWG	600 m (2000 ft.)
2.5 mm^2	450 m (1500 ft.)
1.0 mm^2	200 m (650 ft.)

Questions on wiring?
Lutron may be able to help with charts of Wallstations versus distance.

Total number of Wallstations, Control Units, Control Interfaces or Circuit Selectors = 33 maximum.

Total number of Control Unit addresses = 8 maximum

Note: GRX-4116/4516 has 2 addresses
GRX-4124/4524 has 3 addresses
Total number of Wallstation or Control Interface addresses = 16 maximum.

Notes:

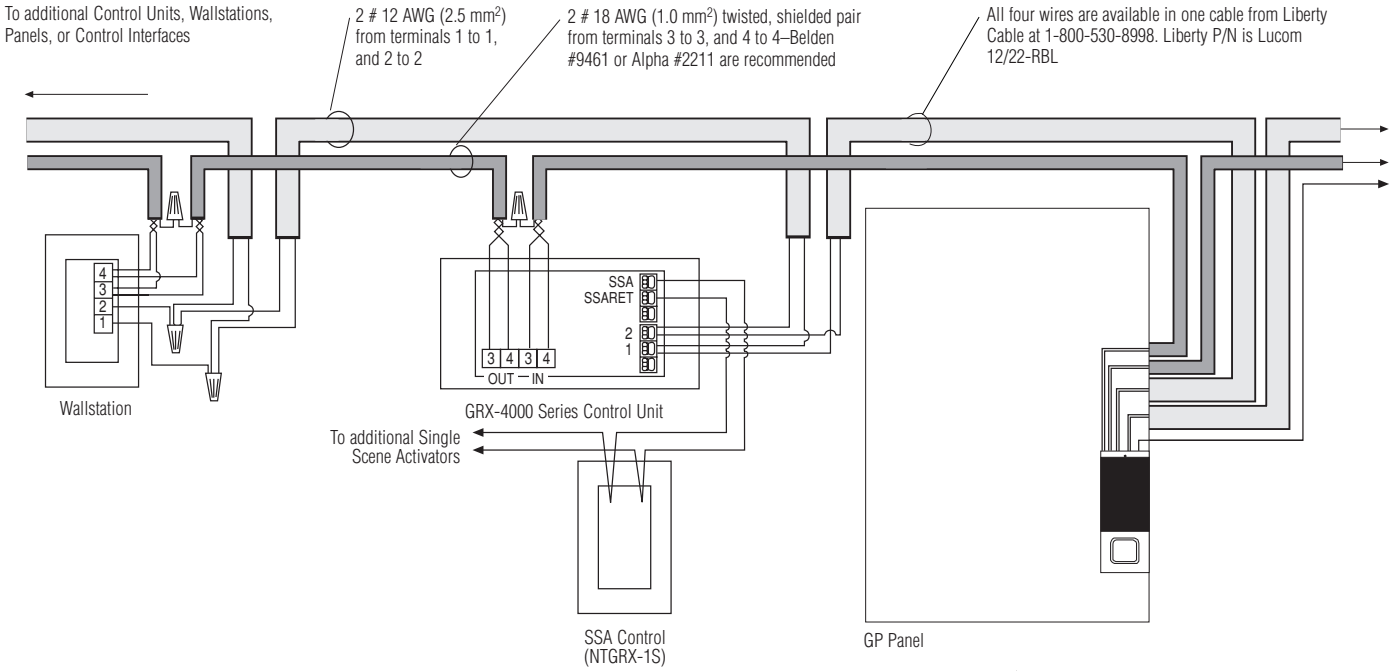
- Make wire connections inside the wallbox and GP panel or in a junction box (by others) within 8 ft. (2.4 m) of the terminal.
- All control wiring is Class 2/PELV. Do not place any of these wires in with line voltage (mains voltage) wiring.
- The order of controls within the control wiring is not important.

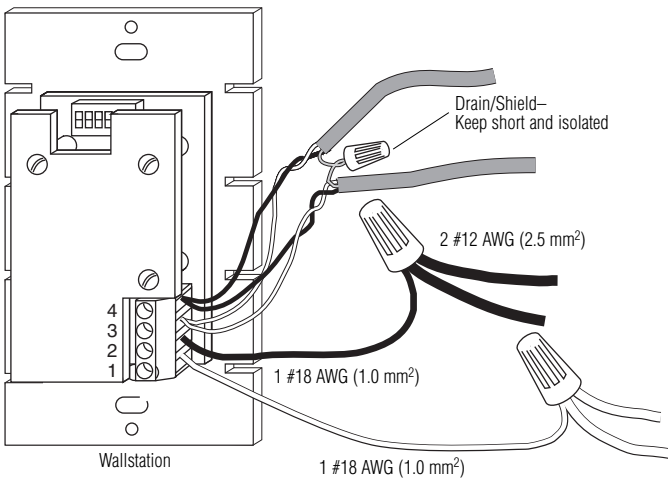
Class 2/PELV Notice:

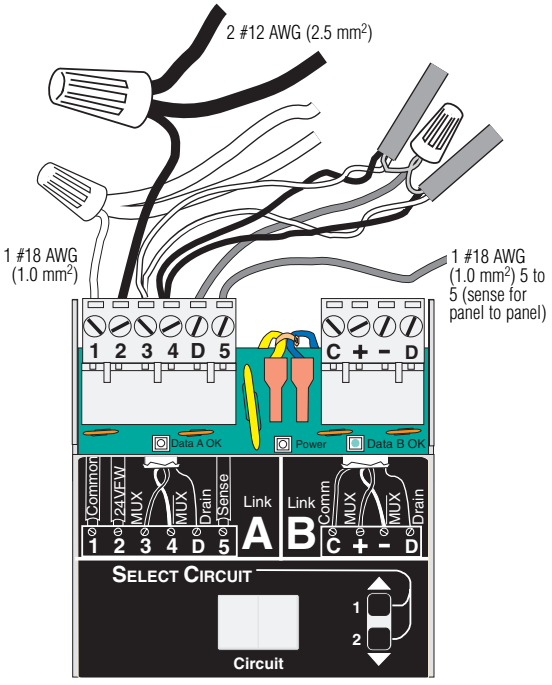
Wallstation circuits are classified as Class 2 circuits (U.S.A.) and PELV circuits (IEC). Unless otherwise specified, the voltages do not exceed 24 VAC or 15 VDC. As Class 2 circuits, they comply with the requirements of NFPA 70. National Electrical Code (NEC). As PELV circuits, they comply with the requirements of IEC 60364-4-41, VDE 0100 Part 410, BS7671:1992 and other equivalent standards. When installing and wiring to these Wallstations, follow all applicable national and/or local wiring regulations. External circuits connected to input, output, RS232, DMX512, and other communication terminals of Wallstations, must be supplied from a Listed Class 2 source or comply with the requirements for PELV circuits as applicable in your country.

STEP 3: Control Wiring (continued)

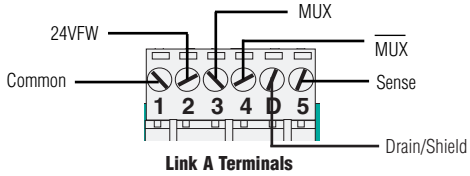
Link A 1-to-1 Wiring (1 to 1, 2 to 2, 3 to 3, . . .)







Circuit Selector in the GP Panel



Link A Terminals

Notes:

- Use the wire connector required by local code (those shown are common in the USA).
- Connect the Drain/Shield to terminal 'D', if this terminal is available. The Drain is a bare wire – care must be taken so that it does not touch ground (earth) or wallstation circuitry.

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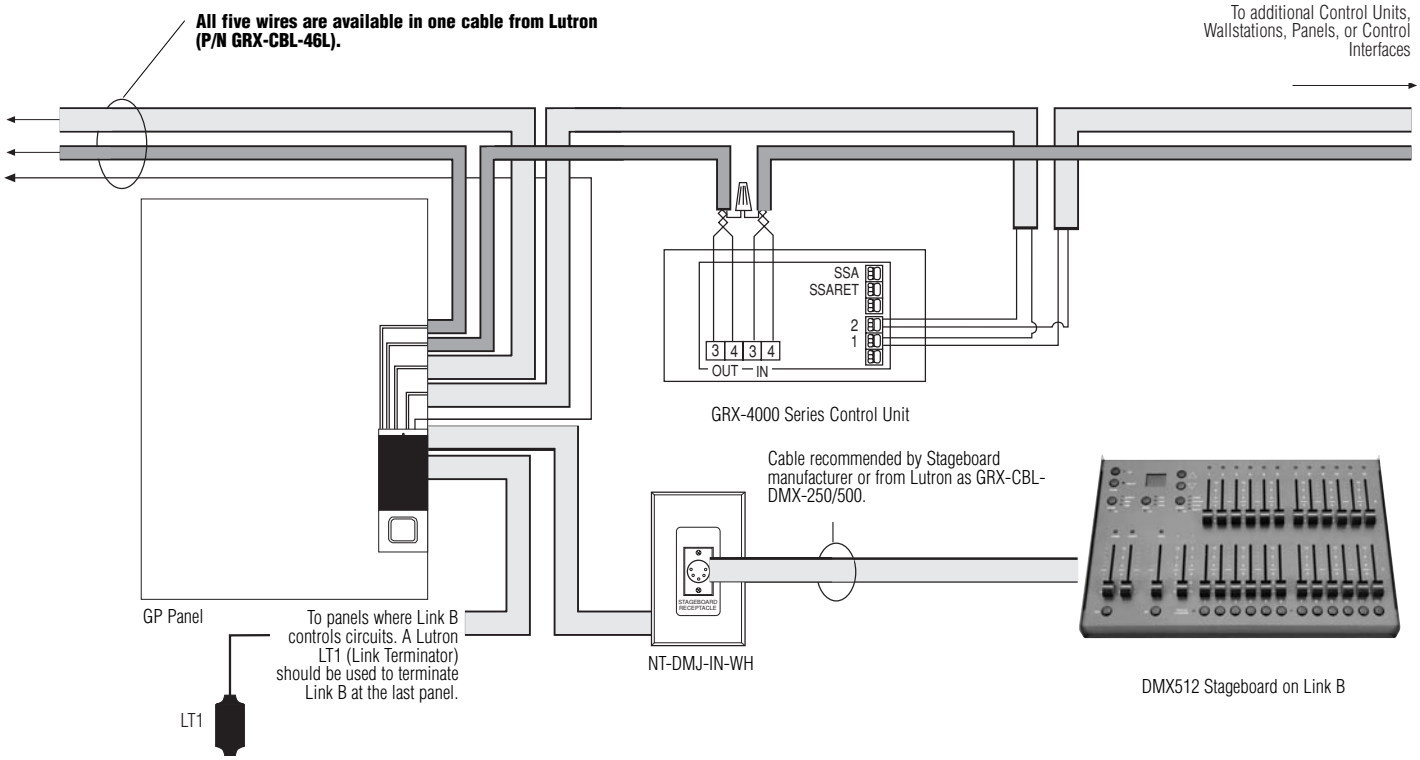
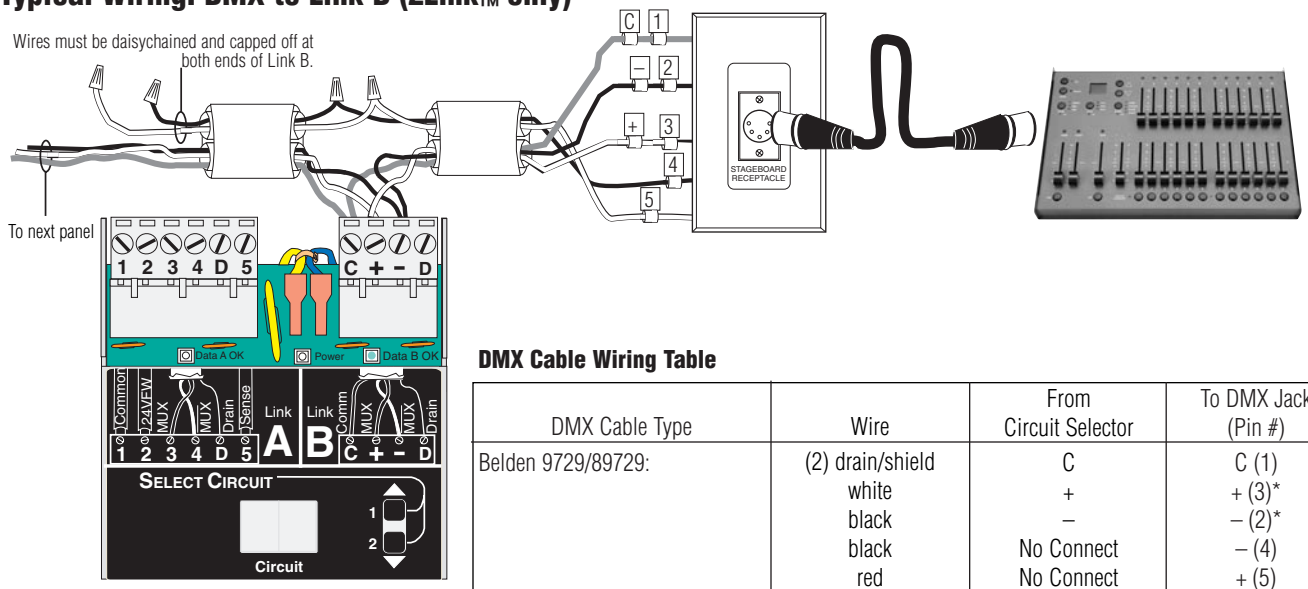
Control Wiring for DMX

STEP 3: **Control Wiring** (continued)

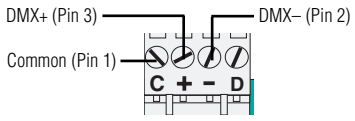
Link B Wiring (C to C, + to +, – to –)



Typical Wiring: DMX to Link B (2Link™ only)



Circuit Selector in the GP Panel



Link B as DMX-512

DMX Cable Wiring Table

DMX Cable Type	Wire	From Circuit Selector	To DMX Jack (Pin #)
Belden 9729/89729:	(2) drain/shield	C	C (1)
	white	+	+ (3)*
	black	–	– (2)*
	black	No Connect	– (4)
	red	No Connect	+ (5)
Lutron GRX-CBL-DMX-250/500:	drain/shield	C	C (1)
	white	+	+ (3)*
	black	–	– (2)*
	green	No Connect	– (4)
	red	No Connect	+ (5)

* Wire in daisy-chain configuration as follows: **C** to **C**, **+** to **+**, and **–** to **–**.

STEP 4: Feed and Load Wiring (continued)

Feed Wiring (Mains Voltage Wiring)

Panel	Wire Size	Where to Enter Panel
GP3 (277 V)	1 or 2 #10 AWG - #14 AWG	Bottom Right of Panel (Bottom or Side Entry)
GP3 (120 V, 230 V)	#6 AWG (10 mm^2) - #14 AWG (1.0 mm^2)	Bottom Right of Panel (Bottom or Side Entry
GP4	#10 AWG (4 mm^2) - #14 AWG (1.0 mm^2)	Bottom Right of Panel (Bottom or Side Entry
GP8 through 24 Main Lugs	#2/0 AWG (50 mm^2) - #14 AWG (1.0 mm^2)	Top left of Panel (Top entry only)
GP 8 through 24 Main Breaker	see rating on breaker	Top left of Panel (Top entry only)

Load Circuit Wiring

Panel	Wire Size	Where to Enter Panel
GP3, 4	#10 AWG ($4mm^2$) - #14 AWG ($1.0mm^2$)	Bottom Left of Panel (Bottom or Side Entry)
GP8 through 24	#10 AWG ($4mm^2$) - #14 AWG ($1.0mm^2$)	Top Right of Panel (Top Entry Only)

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

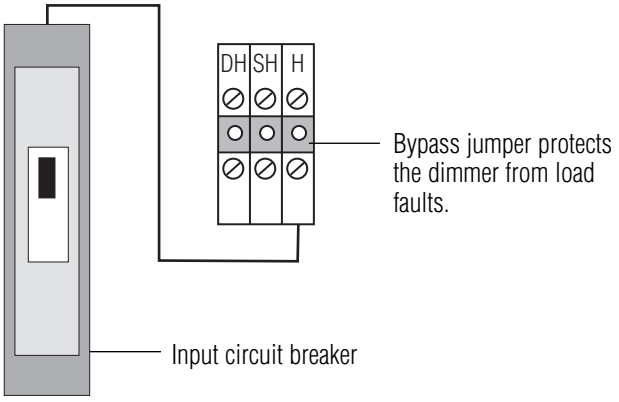
Caution! Common Neutrals are not permitted. Run separate Neutrals for each load circuit.

IMPORTANT!

Temporary Lighting

You do not need to install a temporary distribution panel. Place load wires into the appropriate terminal blocks.

Each Input Breaker can supply power to a load while the bypass jumper protects the dimmer from load faults.



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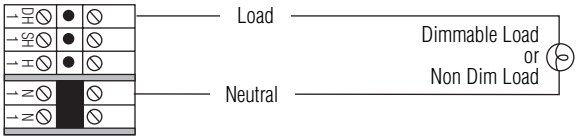
STEP 4: Feed and Load Wiring (continued)

Load Wiring:

For all load types except Hi-lume® FDB or Eco-10™ fluorescent dimming ballasts.

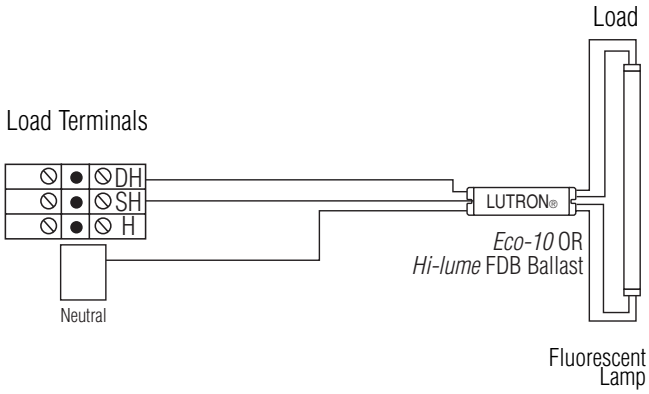
Dimmed Hot (DH) must be used for Non-Dim loads.

Load Terminals



Load Wiring:

For *Hi-lume* FDB or *Eco-10* Fluorescent Dimming Ballast



Notes:

- GP3 Main Breakers can be removed to ease installation of feed wiring.
- For 230V and 240V panels, 'Hot' is referred to as 'Live'. Therefore, terminals will be labeled DL, SL, and L.
- Run wiring so that line (mains) voltage wiring will be at least 6 ft. (1.8 m) from sound or electronic equipment and its wiring.
- Hot (H) is used for bypass on all panels. It can also be used as a protected Hot output on GP3, 8, 12, 16, 20, and 24 (added Hot current plus Load current must not exceed breaker limits).

Caution! Verify with electronic low voltage transformer or ballast manufacturer that product can be controlled with a phase control dimmer before bypass jumpers are removed.

Caution! Switched Hot (SH) must only be used for *Hi-lume* FDB or *Eco-10* loads. Use the Dimmed Hot (DH) for all Non-Dim Load Types.

Danger! Feed-through panels, such as GP4, may be fed by multiple circuits. Locate and lock each supply breaker in the off position before wiring feed or loads.

Warning! CE marked panels are appliances. A distribution panel must provide a main circuit breaker that does not exceed the rating of the panel.

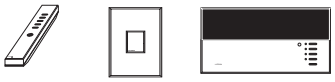
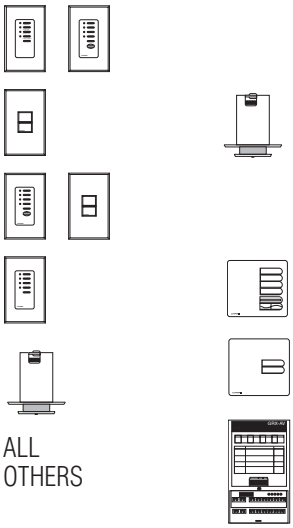
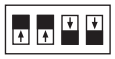
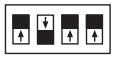
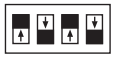
For More Information . . .

Fluorescent Wiring Information 34,35

Neon Application Information.....36,37

Set Address DIP Switches

STEP 5: Set Address Switches

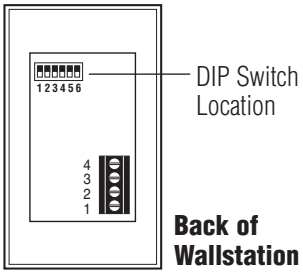
Control	Action	Address (1 2 3 4 | 5 6 7 8) Function	
 GRX-IT NTGRX-1S GRX-4000	No DIP switches for addressing.	The address of a Control Unit is set later in this guide.	N/A
GRX-PRG	Automatically assigned.	Control 16	Setting DIP switches 1-8 requires knowledge of intended function.
 ALL OTHERS	Must set DIP switches BEFORE installing these controls. Set DIP switches 1-4 on each Wallstation and Interface Control to a unique address.	1 2 3 4 Control 1  Control 2  Control 3  Control 4  Control 5  Control 6  Control 7  Control 8  Control 9  Control 10  Control 11  Control 12  Control 13  Control 14  Control 15  Control 16 	Setting DIP switches 5,6,7, or 8 requires knowledge of intended function.

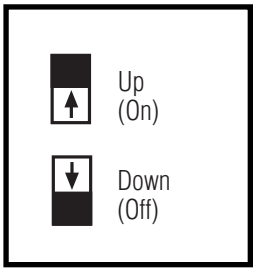
Caution! Do not install controls in wallbox without setting the Address and Function DIP switches.

For More Information . . .

See One-Line Diagram from submittals.

See Installer's Video GRX-V-INST available from Lutron.





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Set Function DIP Switches

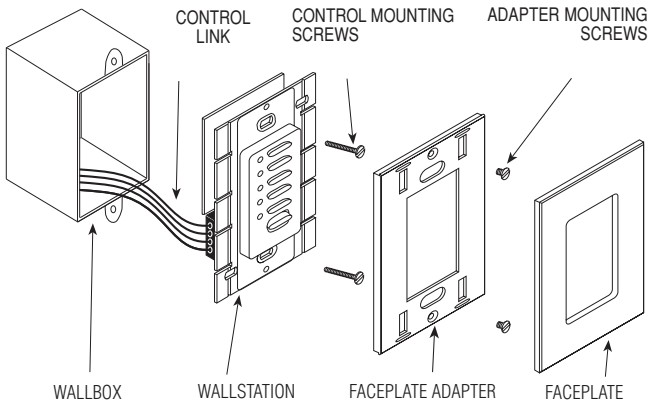
STEP 6: Set Function Switches

Wallstation or Control Interface	Function Set by DIP Switches on Wallstation/Interface (1 2 3 4 | 5 6 7 8)							
	5 6 Factory Set		5 6		5 6		5 6	
NTGRX-4S, NTGRX-4S-IR, NTGRX-4B GRX-4S-DW, EGRX-4S, EGRX-4S-IR GRX-CIR w/GRX-IT	Select Scenes 1-4		Select Scenes 5-8		Select Scenes 9-12		Select Scenes 13-16	
EGRX-8S, EGRX-8S-IR GRX-CIR w/GRX-8IT	Select Scenes 1-8		Select Scenes 5-12		Select Scenes 9-16		Select Scenes 13-4	
NTGRX-4PS	Not Applicable		Not Applicable		Not Applicable		Not Applicable	
NTGRX-4M	Fifth button turns Control Units On only.		Not Applicable		Not Applicable		Fifth button turns Control Units Off only.	
	5 6 7	5 6 7	5 6 7	5 6 7	5 6 7	5 6 7	5 6 7	5 6 7
NTGRX-2B-SL	Select Scenes 1 and Off	Select Scenes 9 and 10	Select Scenes 13 and 14	Panic Control	Fine Tuning Control	Partition Status Control	Zone Lockout	Sequence Scenes 5—16
EGRX-2B-SL								
	5 6 7 8	5 6 7 8	5 6 7 8	5 6 7 8	5 6 7 8	5 6 7 8	5 6 7 8	5 6 7 8
GRX-AV Input 1	Scene 1	Scene 5	Scene 9	Scene 13	Scene 1	Scene 5	Scene 9	Scene 13
Input 2	Scene 2	Scene 6	Scene 10	Scene 14	Scene 2	Scene 6	Scene 10	Scene 14
Input 3	Scene 3	Scene 7	Scene 11	Scene 15	Scene 3	Scene 7	Scene 11	Scene 15
Input 4	Scene 4	Scene 8	Scene 12	Scene 16	Scene 4	Scene 8	Scene 12	Scene 16
Input 5	Off	Off	Off	Off	Off	Off	Off	Off
Output Type	Maintained Outputs				Maintained Outputs			
Input Type	Maintained or Momentary Inputs				Maintained or Momentary Inputs			
	5 6 7 8	5 6 7 8	5 6 7 8	5 6 7 8	5 6 7 8	5 6 7 8	5 6 7 8	5 6 7 8
Input 1	Sequence 1-4	Sequence 5-16	Sequence 1-4	Sequence 5-16	Partition 1	Partition 1	on/off 1	off 1
Input 2	Zone Lockout	Zone Lockout	Zone Lockout	Zone Lockout	Partition 2	Partition 2	on/off 2	off 2
Input 3	Scene Lockout	Scene Lockout	Scene Lockout	Scene Lockout	Partition 3	Partition 3	on/off 3	off 3
Input 4	Panic	Panic	Panic	Panic	Partition 4	Partition 4	on/off 4	off 4
Input 5					Partition 5	Partition 5	on/off 5	off 5
Output Type	Maintained Outputs				Maintained Output			
Input Type	Maintained or Momentary Inputs				Momentary	Maintained	Maintained	
GRX-RS232 Switch Function	1 Zone Lock	2 Scene Lock	3 Sequence	4 Sequence Type	5 (RS232) Fixed Address	6 Raw Feedback	7 Scene Status	8 Time Clock
GRX-PRG On	Retain	Retain	Retain	5-16	1-4 Address	Report	Report	On
Off	Off	Off	Off	1-4	Address 16	No Report	No Report	Off

Install Wallstations and Activate Loads

STEP 7: Install Wallstations

After wiring, setting address switches, and setting function switches, mount the Wallstations. Refer to detailed mounting instructions packaged with each control.



STEP 8: Activate Loads in Bypass

A. Complete load wiring.

B. Check that the bypass jumpers are in place.
These jumpers protect the dimmers from faults and must be used to check load wiring when it is installed or modified.

Warning! For GP3 or GP4, the input breaker of Circuit 1 powers the control wiring as well as Circuit 1's dimmer and load. Steps 8 and 9 should be performed concurrently for these panels.

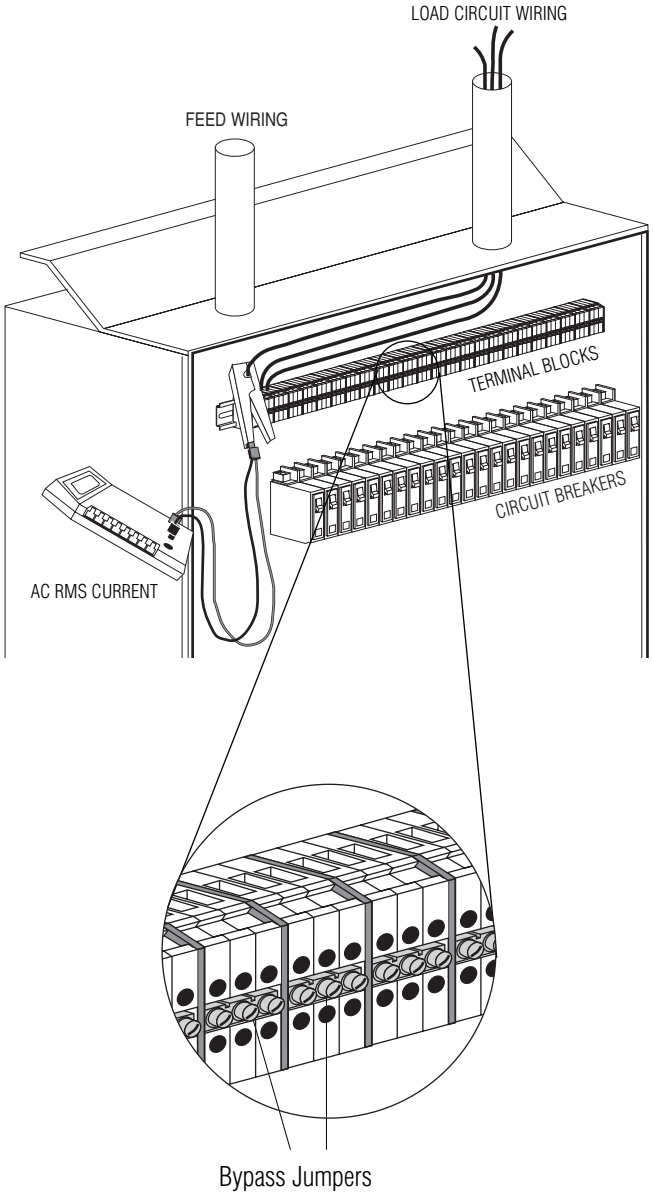
C. Turn circuit breaker 1 ON.
The load should energize, the breaker should not trip, and total load current must be within the Circuit Breaker's limit and less than 16A.

D. Repeat 'C.' for each circuit with completed load wiring.

Warning! DO NOT remove bypass jumpers at this time.

Caution! For proper dimming performance fluorescent lamps must be operated at full intensity for 100 hours prior to dimming.
See Maintenance Reference sheet in the Reference Section of this guide.

Note: For those who purchased Start Up with their Lutron Dimming System — you may want to stop here and have the Lutron Field Engineer set-up the system. Please call for a Start Up visit at least 10 working days before your requested date.



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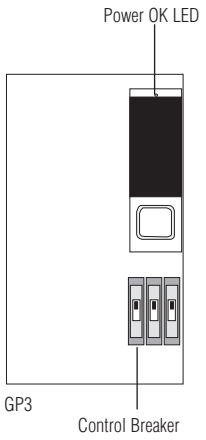
Activate Control Units

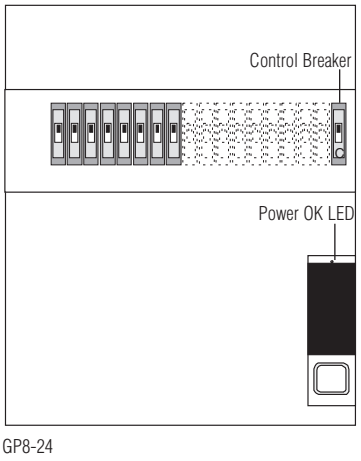
STEP 9: Activate Control Units

Once all controls are installed and wiring verified, turn control breaker 'C' ON.

Warning! For GP3 or GP4, the input breaker of Circuit 1 powers the control wiring as well as Circuit 1's dimmer and load.

Check that the **Power OK** LED at the top of the Circuit Selector is ON. If the **Power OK** LED is OFF, turn OFF the control circuit breaker, check for a short between wires 1 and 2, or 2 and ground. Turn control circuit breakers ON for all panels.

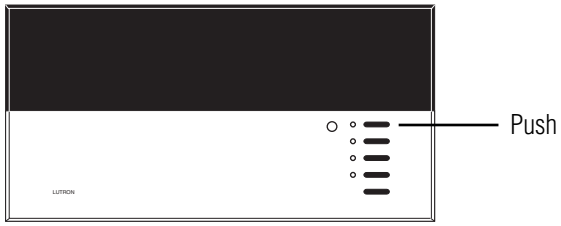




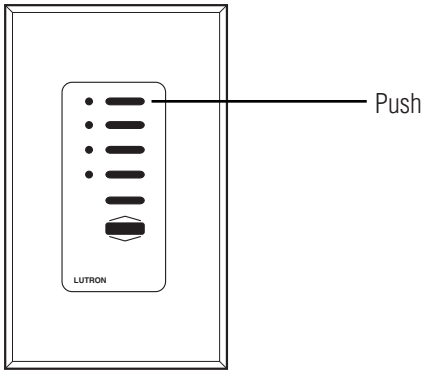
Push scene buttons on Wallstations. All GRX-4000 Series Control Units and Wallstations should act in parallel (e.g,. pressing scene 1 on a Wallstation will select scene 1 on all Control Units, pressing a master raise button will raise all zones).

Notes:

- Lights will not dim at this point.
- NTGRX-4PS, and NTGRX-4M will be inactive until Control Setup steps are completed.
- GRX-AV will be active only if set to affect scenes 1-4 and OFF (switches 5, 6, 7, and 8 all UP).
- NTGRX-2B-SL will be active only if set to affect scene 1 and OFF (switches 5, 6, and 7 all UP).
- Check for miswires if the controls do not act as described.



GRX-4000 Series Control Unit (6 zone unit shown)



Wallstation (NTGRX-4S shown)

For More Information...

Troubleshooting Guide.....38,39

Assign Load Types

STEP 10: Assign Load Types

Assigning Load Types is done using the Circuit Selector located in each GP panel.

To view present load types:

Press button 5 to step through the **Value** displays until **Load Type** LED lights. Use buttons 1 and 2 to view present load type of each circuit. Note that ' - - - ' in the **Value** display means a Load Type is not assigned to the circuit.
If load types are already assigned, compare them to the Circuit Directory (if provided). If there are no changes to be made, go to Step 11.

To change load types:

A. Press and hold buttons 1 and 5 until **SELECT VALUE** LED blinks once per second.
B. Press button 5 to step through the **Value** displays until the **Load Type** LED lights.
C. Choose circuit number with buttons 1 and 2.
D. Use buttons 3 or 4 to choose the appropriate Load Type (see below for Load Type Display).
E. Repeat Steps C and D for each circuit.
F. Press and hold buttons 1 and 5 until the **VIEW VALUE** LED lights.

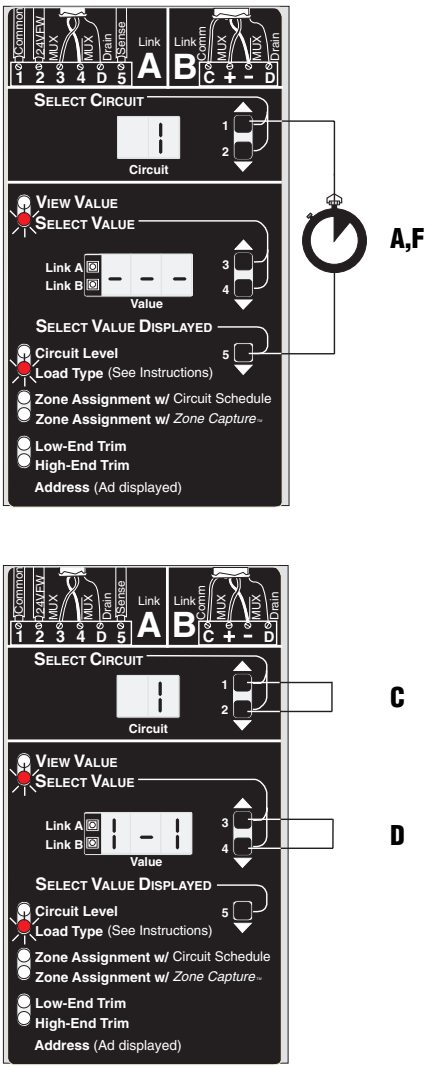
Notes:

- The **Value** window will display the software revision level of the Circuit Selector 20 minutes after the last button press.
- Mark all changes to the Circuit Selector's values on a Circuit Directory for future reference.

Load Type Display

- - -	Unassigned (All intensities except 0 = On)
1 - 1	Incandescent, Tungsten
2 - 1	Fluorescent: Lutron *Hi-Lume* FDB or *Eco-10*
2 - 2	Fluorescent: Lutron Tu-Wire®
2 - 3	Fluorescent: 0-10V, with TVM module
2 - 4	Fluorescent: PWM, with TVM module
2 - 5	Fluorescent: Tridonic® DSI, with TVM module
3 - 1	Neon/Cold Cathode
4 - 1	Non-Dim: All intensities except 0 = On
4 - 2	Non-Dim: Intensities above 60% = On, below 40% = Off
5 - 1	Electronic Low Voltage
6 - 1	Magnetic Low Voltage

Circuit Selector



Warning! Failure to correctly assign Load Type may damage loads–especially certain Electronic Transformers, Electronic Ballasts, and Motors. Verify with transformer or ballast manufacturer that product can be dimmed with phase control dimming before setting to any Load Type other than Non-Dim.

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Address GRX-4000 Control Units

STEP 11: Address GRX-4000 Control Units

Note: If using a 16 or 24 zone Control Unit, address these first.

Address Control Unit as follows:

A. Push and hold top and bottom scene buttons until scene LEDs begin to cycle.

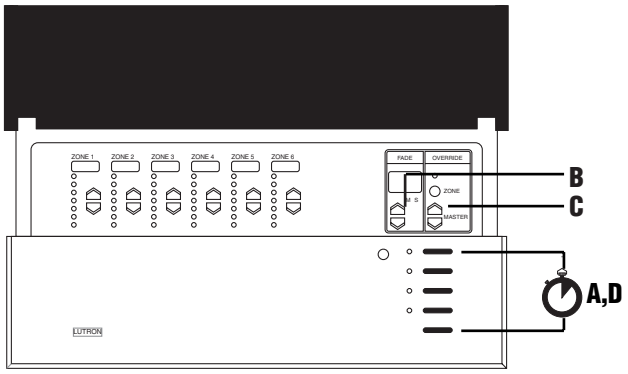
B. Push **FADE** 5 button until 'A-' is displayed in the **FADE** window. If A(1-8) appears, then go to D since the Control Unit is already addressed.

C. Push **MASTER** 5 button once. The control will automatically choose the next available address. Note the address of each (A1-A8) on the Control Directory on Page 27.

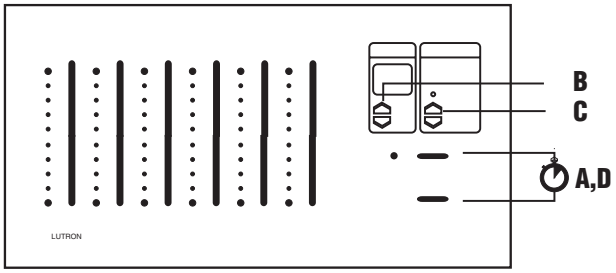
If a Control or Circuit Directory already exists, push **MASTER** 5 and 6 buttons to have the address match these directories.

D. Press and hold the top and bottom scene buttons until the scene LEDs stop cycling.

Repeat Steps A-D on all GRX-4000 Series Control Units.



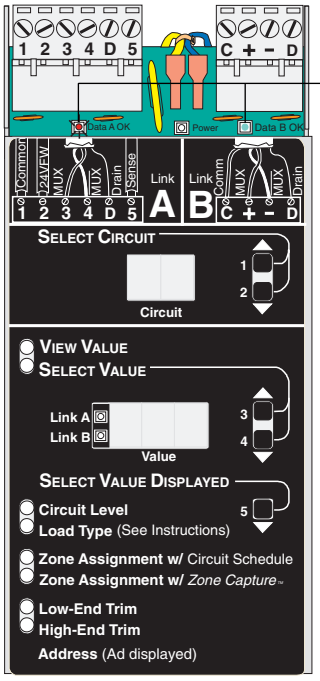
GRX-4000 Series Control Unit



GRXSLD Control Unit (before installing faceplate and knobs)

As soon as a GRX-4000 Series Control Unit is addressed, check that the **Data OK** LED begins to flash on the Circuit Selector. Flashing indicates that the panel recognizes the communication from a GRX-4000 Series Control Unit.

Note: As soon as a GRX-4000 Series Control Unit is addressed, Wallstations will no longer have any affect on the GRX-4000 Series Control Units. The Wallstation communication will be reestablished later.



Data OK LED will be Off before addressing, then flash after addressing (approximately once per second)

LED Status	Meaning
1. Flashes once per second.	Control link data OK.
2. Blank.	No data present on link or Control Breaker 'C' is Off.
3. Flashes rapidly*.	Incorrect data detected. Possible causes: terminal 3 or 4 is not properly connected, or terminals 3 and 4 are miswired.

* The Circuit Selector may take up to 1 minute to properly identify a device on the link. During this time, a rapid flashing pattern may be observed.

For More Information . . .

16,24 *16 and 24 zone GRX Control Units.* 28

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Remove Bypass Jumpers, Check System

STEP 12: Remove Bypass Jumpers

After all load wiring has been checked, turn circuit breakers OFF.

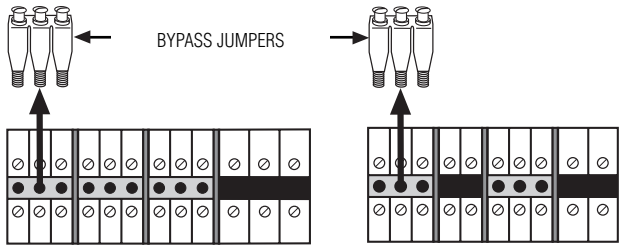
Danger! Feed-through panels, such as GP4, may be fed by multiple circuits. Locate and lock each supply breaker in the off position before removing bypass jumper.

Warning! Confirm that Load Types were correctly assigned. Some loads may be damaged if dimmed - especially certain electronic transformers and electronic ballasts and motors.

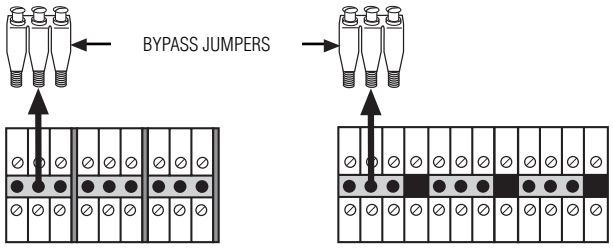
Caution! For proper dimming performance fluorescent lamps must be operated at full intensity for 100 hours prior to dimming. See Maintenance Reference sheet in the Reference Section of this guide. Loosen all 3 screws of each bypass jumper. Remove and store the bypass jumpers for possible later use.

Caution! Reuse the bypass jumper whenever work has been done on a load. Damage caused by short circuits and miswiring is not covered in the product warranty.

Turn Circuit Breakers ON.



GP3 **GP4**



GP8 through 24
(120V and 277V)

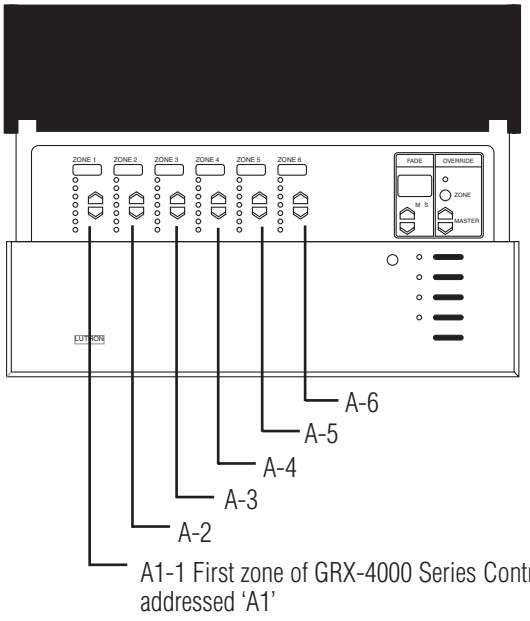
GP8 through 24
(230V and 240V)

STEP 13: Check System

Until zones are assigned, all circuits will be controlled by the first zone of the GRX-4000 Series Control Unit addressed to 'A1'. Locate zone 1 of this 'A1' control (referred to as **A1 1** in the Circuit Selector) and use it to check that all circuits dim smoothly and perform as expected. (This address was set in Step 11.)

Notes:

If the system has already been set up, scenes will work and **A1 1** will not control all circuits.
Circuits with Unassigned or Non-Dim 4 Load Types will not dim, but will only turn on and off.



For More Information . . .

Control Directory.....29

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Assign Primary Zones

STOP!

STOP

Before proceeding, you must have one or more of the following:

- Preassigned set-up
- Knowledge of how the system is to operate.
- Plans and specifications from owner's representative on how the system is to be set-up.
- Owner or owner's representative present.

- ***What should each scene be used for?***
  Examples include - Breakfast, Lunch, Meeting, Accenting, etc...
- ***How long should it take for the lights to fade from scene to scene and to off?***
  Examples include - 1 second fade to "Meeting" scene, 10 minute fade to "Lunch" scene so customers do not notice, 20 second fade to "Off" scene to leave room before the lights go out, etc.
- ***Do I have a 2Link™ option?***
  If so . . . see Link Hierarchy options in the Reference Section.

STEP 14: Assign Primary Zones

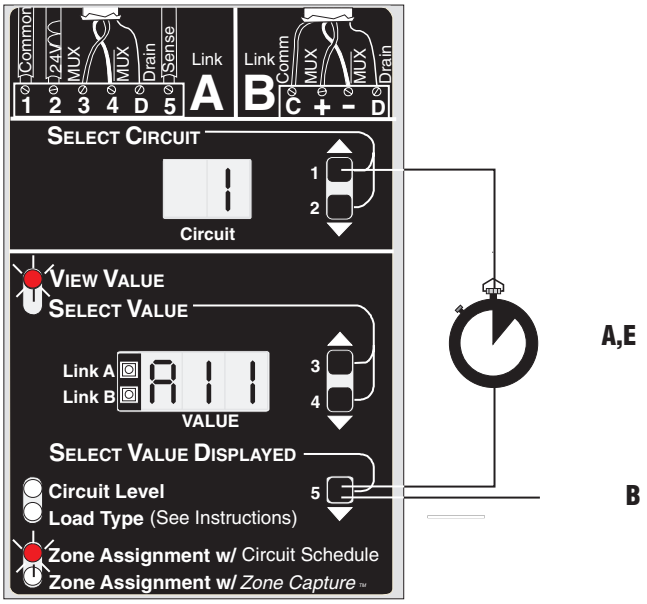
A. Press and hold buttons 1 and 5 until the **SELECT VALUE** LED flashes once per second.

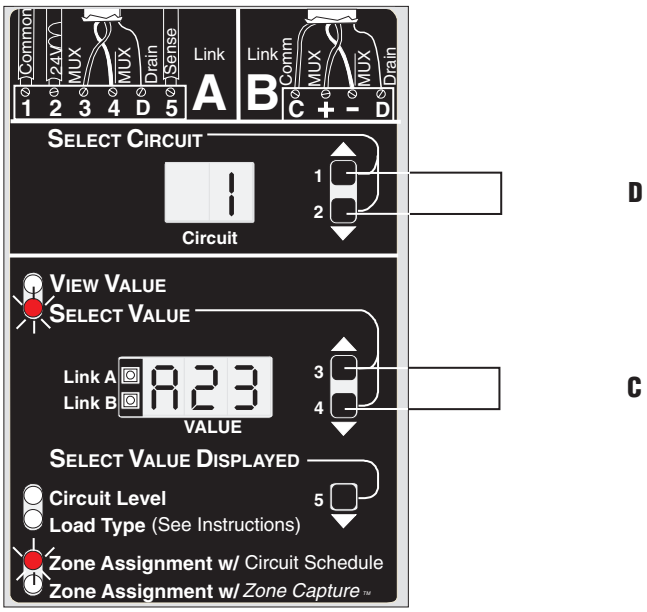
B. Press button 5 repeatedly until the **Zone Assignment w/Circuit Schedule** LED lights.

C. Select the primary zone assignment.
GRX 4000 Series: Press button 3 or 4 to select both Control Unit and zone assignment.
Example - If the control desired is addressed to 'A2' and the zone desired is the 3rd from the left, use buttons 3 and 4 to get 'A23' as a value for the appropriate circuit.
6000 Series or DMX512: Press button 3 or 4 to select zone assignment (1—512).

D. Use buttons 1 and 2 to change to the next circuit and then repeat Step C. Do this for all affected circuits. Record each circuit's control and zone on a Circuit Directory.

E. Press and hold buttons 1 and 5 until the **VIEW VALUE** LED lights.





Notes:

- The Circuit Selector's display will go out automatically 20 minutes after the last button press.
- More than one circuit can be assigned to the same zone.
- Zone Capture™ is an alternate method for assigning zones. It is described in the Circuit Selector Functions Reference Sheet.
- *2Link* only- The Link A and Link B LEDs located next to the **Value** window indicate which Link is being assigned as per the Hierarchy. To set the Hierarchy, see the reference sheet on 2Link options in this guide.

For More Information . . .

16,24 *16 and 24 zone GRX Control Units*.....26

Set Up Non Dim Zones

STEP 15: Set Up Non Dim Zones (GRX-4000 Series only)

For each zone assigned to a circuit with a Non-Dim Load Type, the LEDs on a Control Unit can be made to match the load intensity as shown:

A. Press and hold the top and bottom scene buttons until scene LEDs begin to sequence.

B. With 'LS' in the FADE window, press the zone button of the Non-Dim zone until the top 4 or 5 LEDs are on.

Notes:

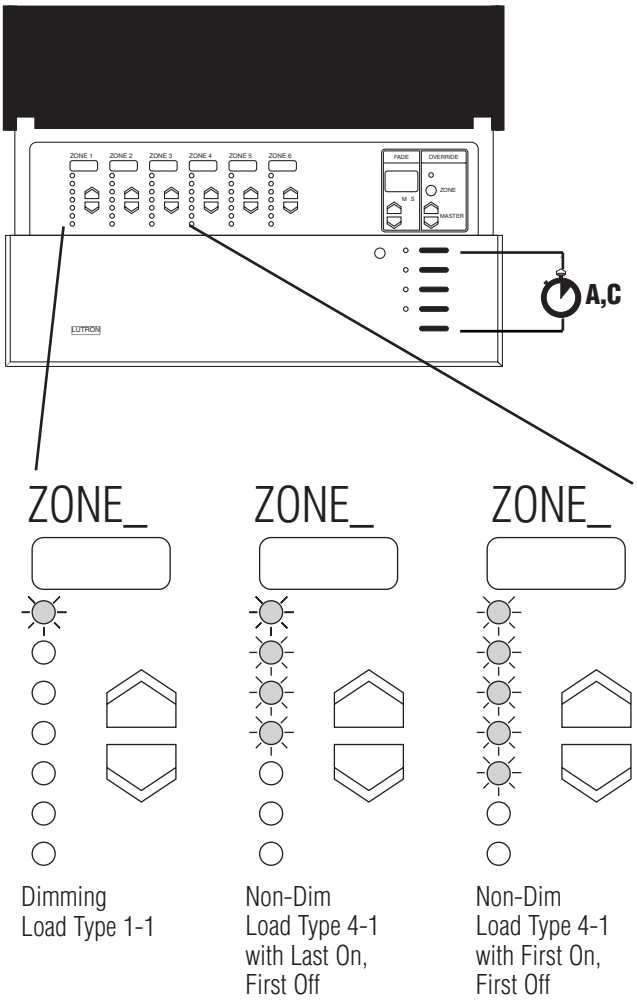
- The Circuit Selector Load Type must be set for Non-Dim on each circuit assigned to this zone.
- With 4 LEDs, the load will operate on a Last On, First Off basis. Load turns ON at the end of a fade to full and OFF at the beginning of a fade from full.
- With 5 LEDs, the load will operate on a First On, First Off basis. Load turns ON at the beginning of a fade to full and OFF at the beginning of a fade from full.

Repeat Step B for all zones controlling a Non-Dim Load Type.

C. Press and hold top and bottom scene buttons until scene LEDs stop sequencing.

D. Repeat Steps A - C for all other GRX-4000 Series Control Units with Non-Dim zones.

Lutron ships GRAFIK Eye Control Units with all zones set for dimming. For each zone that controls a circuit with a dimmable load type, the LEDs should match the load intensity as shipped.



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Set Low or High End

STEP 16: Set Low or High End (optional)

Note: Low End and High End light levels are set automatically when load type is assigned. This step is to be done if the default settings need to be changed.

Warning! Do not reduce the Low End or increase the High End on a Fluorescent Load Type. This will decrease lamp life and may damage the ballasts.

Warning! Do not increase the High End, of Neon/Cold Cathode. This may overdrive the lamps and cause decreased tube life.

To change the setting:

A. Press and hold buttons 1 and 5 until the **SELECT VALUE** LED lights.

B. Press button 5 repeatedly until the **Low End Trim** LED or the **High End Trim** LED lights.

C. Use buttons 1 and 2 to go to the circuit that needs to be changed.

D. Use buttons 3 and 4 to reset the trim as desired. The load will go to the new setting while in this mode despite the GRX control's intensity.

Notes:

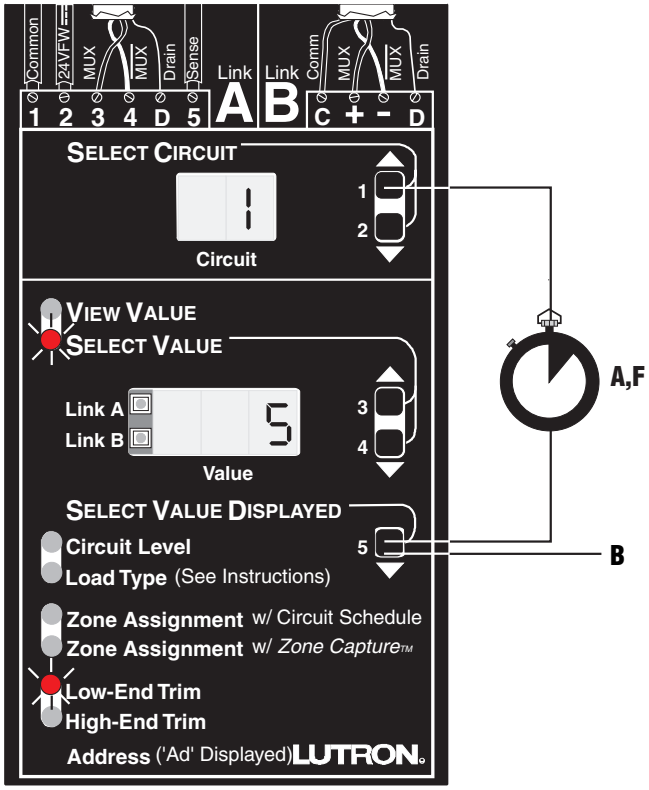
- Low End and High End ranges are limited to avoid overlapping.
- '1' is the minimum Low End and '99' is the maximum High End.
- 'Value' is a relative number. It is **not** a % intensity, but rather a reference point to help set other circuits, if desired.

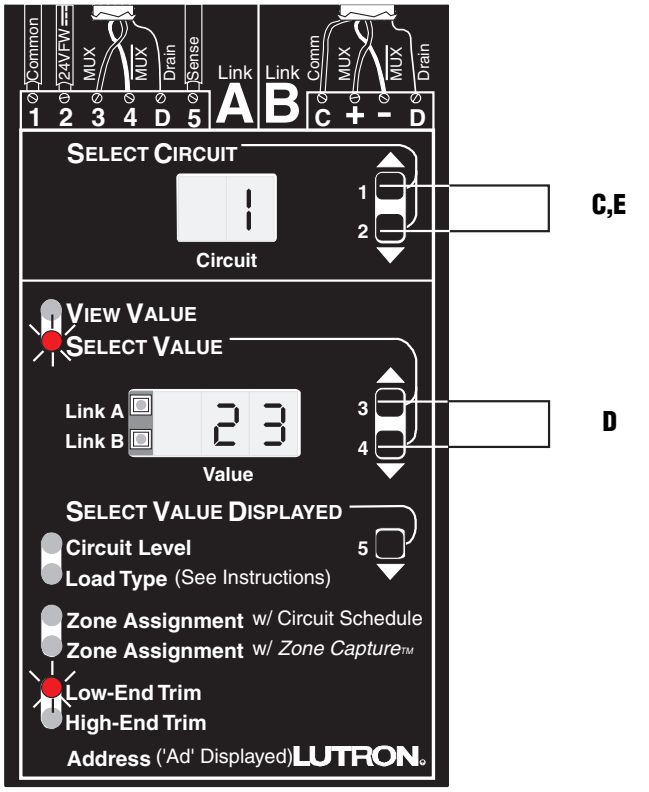
Record the new trim setting on a Circuit Directory so that it is documented.

E. Use buttons 1 and 2 to go to another circuit that needs to be changed and repeat Step D.

F. Press and hold buttons 1 and 5 until the **VIEW VALUE** LED lights.

Note: The Circuit Selector's display will go out automatically 20 minutes after the last button press.





Set Normal/ Emergency Switch

STEP 17: Set Normal/Emergency Switch (Non-Essential/Essential)

Note: This step is only performed if there are any panels with Emergency (Essential) Lighting Circuits on the job.

Panels are shipped with Switch 6 (located at the base of each Circuit Selector) in the center position for operation without any Emergency (Essential) Lighting Circuits.

Identify a panel supplied with Normal (Non-Essential) power. Move its Switch 6 to the left position.

For all the Emergency (Essential) Lighting Panels, move Switch 6 to the right position.

In this arrangement, the Emergency (Essential) Lighting Panel will "sense" the Normal (Non-Essential) Panel's power. When Normal (Non-Essential) power is removed, the Emergency (Essential) Lighting will go to 'ord' override levels (factory set to 100%).

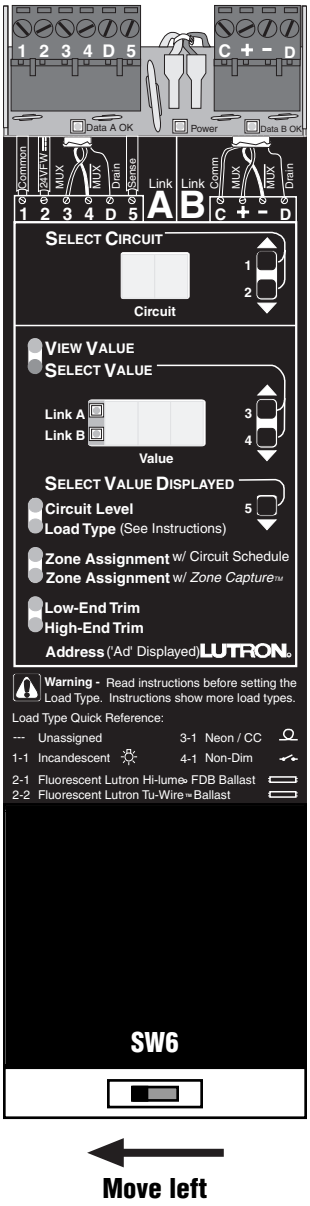
Loss of Normal (Non-Essential) power can be simulated by turning off all connected Normal (Non-Essential) Panel's Control Breakers.

When Switch 6 is in its center position (as shipped), terminal 5 has no affect on the Circuit Selector operation.

Notes:

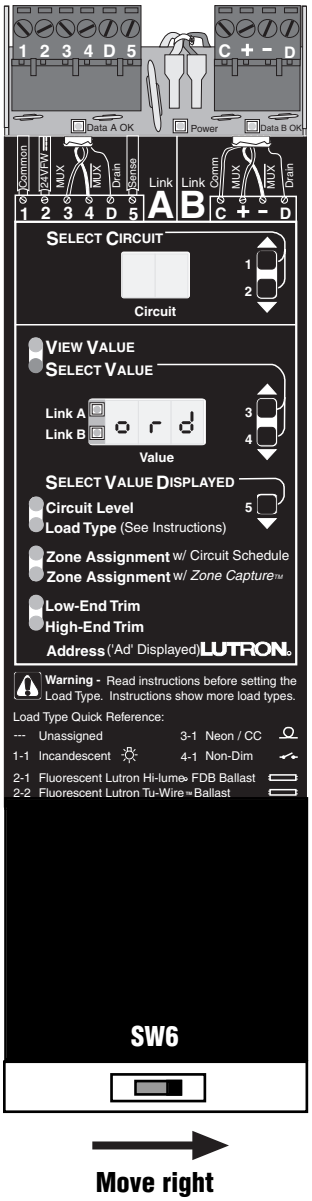
- If there is no Normal Panel, a PS-CIP can be used to create an external 'sense' line. See Lutron.
- Override ('ord') Level is factory set to full output (100). If less than full output is needed, contact Lutron.

Circuit Selector in Normal (Non-Essential) Panel



Move left

Circuit Selector in Emergency (Essential) Lighting Panel



Move right

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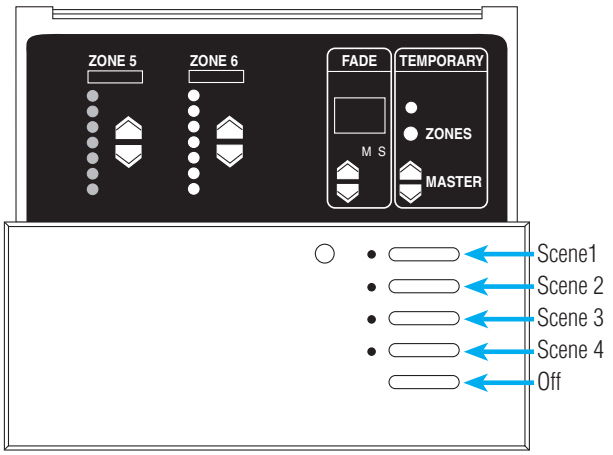
Set Up Scenes on the GRX-4000

STEP 18: Set up scenes on GRX-4000

Scenes are the preset light levels and fade times stored in the Control Unit. To create a scene, set the appropriate intensity for each ZONE. To recall a scene, simply press one of the scene buttons. The first button recalls scene 1; the second, scene 2; and so on. The last button turns lights off.

For example, typical scene settings for a living room might be:

Scene	Activity or Event	Light Levels for Zones			
		Cove Lights	Hanging Lights	Down Lights	Sconces
1	Family Gathering	70%	10%	20%	20%
2	Entertaining	80%	25%	90%	90%
3	Reading	10%	60%	40%	40%
4	TV	20%	0%	30%	30%



Although scenes 1 through 4 can be selected at the *GRAFIK Eye* Control Unit, all *GRAFIK Eye* Control Units are capable of storing up to 16 scenes. Scenes 5 through 16 can be selected using Wallstations.

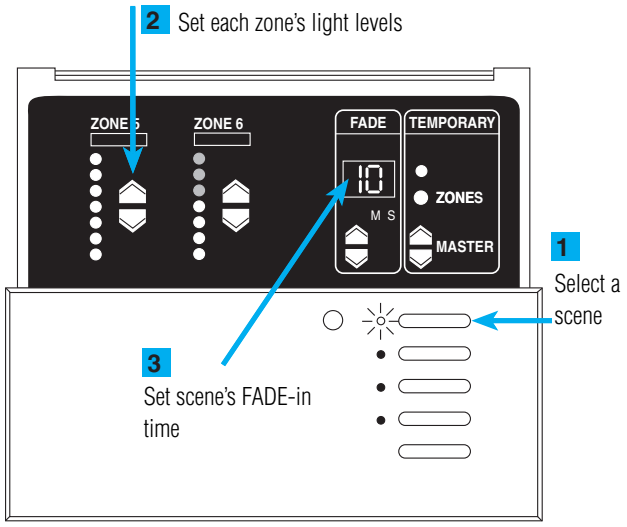
How to set up lighting scenes

NOTE: The Control Unit must be in normal operating mode.

To set up scenes 1 through 4:

1. **Select a scene**. Press the Scene button for the scene you want to adjust. (First button for scene 1, second button for Scene 2, and so on.) Note that the last button is the "Off" Scene. You do not set intensities for this button.
2. **Set each zone's light levels**. Press ZONE 5 and 6 to adjust each ZONE visually to the correct intensity for this scene. (ZONE LEDs show intensity. Each LED represents ~15% intensity change. In this example, ZONE 6 is set to 60%.)
3. **Set scene's FADE-in time**. Press FADE 5 and 6 to make FADE-in time anything from 0-59 seconds or 1-60 minutes*. (A scene's FADE-in time is how long it takes light intensities to adjust to their new levels when the scene is selected. FADE-in from the OFF scene can be up to 5 seconds maximum.)

Repeat this process for each scene specified for the Control Unit. Note that you can also set up a "FADE-to-off" time. Press the OFF button and adjust FADE as desired.



*The S and M indicators under the FADE window show whether FADE is "M"inutes or "S"econds. To set FADE in minutes, you press FADE 5 to scroll through 1-59 seconds until the 'M' lights. FADE is now expressed in minutes. To get back to seconds, press FADE 6 until the window shows "S"econds.

STEP 19: Set Up Wallstations

All Wallstations (except NTGRX-1S) must be set up to make a Control Unit(s) "listen" to button presses on the Wallstation.

- Only one Wallstation can be set up at one time.
- A Control Unit can also be made to "listen" to another Control Unit and is therefore listed with the Wallstations to the right.

Follow the following chart for each Wallstation.

Notes:

- Wallstations **cannot** be made to "listen" to each other, but a GRX-4000 Series Control Unit can be made to "listen" to more than one Wallstation.
- When it is desired for two GRX-4000 Series Control Units to always respond to each other's button presses, the first Control Unit must be set-up to respond to the second Control Unit's buttons, and then the second Control Unit must be set up to respond to the first Control Unit's buttons.
- An NTGRX-1S is wired directly to the GRX-4000 (GRX-3000) Series Control Unit that is to "listen" to it. No setup is required. Certain GRX-3000 2-Zone Series Control Units do not have the SSA capabilities. See pg. 39, "SSA," for more details.
- GRX-PRG and GRX-RS232 do not require this setup.

Control (only 1 at a time)	**Place Control to 'Talk' in Set-Up Mode**
GRX-4000 Series Control Unit 	Press and hold first and the fifth buttons of the GRX-4000 Series Control Unit.
NTGRX-4S  NTGRX-4S-IR GRX-4S-DW  EGRX-4S  EGRX-4S-IR EGRX-8S  EGRX-8S-IR GRX-CIR  w/GRX-IT/81T	Press and hold first and fifth buttons on Wallstation until its LEDs cycle sequentially. **Note:** GRX-CIR only has 1 LED. Use the GRX-IT to press the first and fifth buttons.
NTGRX-4B 	Press and hold first and fourth buttons on Wallstation until its LEDs cycle sequentially.
NTGRX-4PS 	Press and hold first and fifth buttons until LED 1 blinks.
NTGRX-4M 	Press and hold first and fifth buttons until LED 1 blinks.
NTGRX-2B-SL  EGRX-2B-SL Partition Status Control 	Press and hold both buttons of the NTGRX-2B-SL or EGRX-2B-SL until its LEDs blink.
NTGRX-2B-SL  EGRX-2B-SL all other functions 	Press and hold both buttons of the NTGRX-2B-SL or EGRX-2B-SL until its LEDs blink.
GRX-AV 	Press and hold the Program Switch until its LEDs react like the Wallstation whose function is being simulated.

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	Make Control Unit "Listen"	Take Control Out of Set-Up Mode
	Press and hold another Control Unit's Scene 1 button until its LEDs flash. To make it stop "listening", hold OFF button until LEDs go dark.	Press and hold first and fifth buttons of the original GRX-4000 Series Control Unit until LEDs stop sequencing.
	Press and hold Scene 1 on a Control Unit until its LEDs blink in unison. Repeat Scene 1 hold procedure for the other Control Units to be affected. (To remove, hold OFF button until LEDs go dark	Press and hold first and fifth buttons on Wallstation until all LEDs stop cycling.
	Press and hold Scene 1 on a Control Unit until its LEDs flash. To make it stop "listening", hold OFF button until LEDs go dark.	Press and hold first and fourth buttons on Wallstation until all LEDs stop blinking
	Choose two Control Units on either side of a Partition. Press and hold Scene 1 on a Control Unit until its LEDs flash. Repeat Scene 1 hold on the other Control Unit. Press the next button on the NTGRX-4PS. Choose another pair of Control Units. Repeat Scene 1 hold procedure for each of the NTGRX-4PS buttons. To remove, hold OFF button on each Control Unit until LEDs go dark.	Press and hold first and fifth buttons of the NTGRX-4PS until all LEDs stop blinking.
	Choose a Control Unit to be toggled by the NTGRX-4M. Press and hold Scene 1 on the Control Unit until its LEDs flash. Repeat Scene 1 hold on other Control Units to be toggled. Press the next button on the NTGRX-4M. Choose a Control Unit to be toggled. Repeat Scene 1 hold procedure for all 5 of the NTGRX-4M buttons. Button 5 only turns ON or OFF (it does not toggle). To remove, hold OFF button on the Control Unit until its LEDs go dark.	Press and hold first and fifth buttons of the NTGRX-4M until all LEDs stop blinking.
	Press and hold Scene 1 on a Control Unit until its LEDs blink in unison. Repeat Scene 1 hold procedure for the other Control Units to be affected. (To remove, hold OFF button until LEDs go dark.	Press and hold both buttons of the NTGRX-2B-SL or EGRX-2B-SL until all LEDs stop blinking.
	Press and hold Scene 1 on a Control Unit until its LEDs blink in unison. Repeat Scene 1 hold procedure for the other Control Units to be affected. To remove, hold OFF button until LEDs go dark.	Press and hold both buttons of the NTGRX-2B-SL or EGRX-2B-SL until all LEDs stop blinking.
	See above instructions for the simulated Wallstation.	If the GRX-AV's LEDs are sequencing, press and hold the Program Switch until the LEDs stop sequencing. If the GRX-AV has 1 LED blinking, press the program switch repeatedly until there are no blinking LEDs.

Repeat for all Wallstations

Congratulations!

Your state of the art dimming system is complete!

Now:

- Place a copy of the Control Directory with each GP Panel.
- Replace the covers.
- Give the customer a copy of this guide.

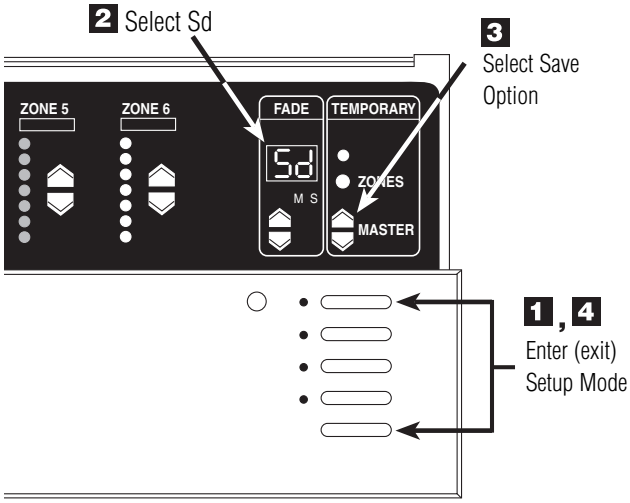
The rest of this guide is
REFERENCE MATERIAL.

Lutron is very interested in your comments on this Installer's Guide and on its products.
Please call (800) 523-9466 with any comments or suggestions. Thank you for your help.

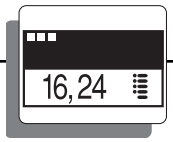
Save Options

The *GRAFIK Eye* 4000 Series Control Units allow selection of several different Save Options. Follow these steps to access the Save Options.

1. **Enter setup mode**. Press and hold Scene 1 and OFF buttons for about 3 seconds until scene LEDs start cycling.
2. **Select** Sd**.** Press FADE 5 until Sd is displayed in the FADE window.
3. **Select Save Options**. Press MASTER 5 and 6 to select between the Save Options:
   - Sd **Save by Default.** Changing a zone's intensity level or fade time permanently changes the preset scene. To temporarily change a light level, see "How to adjust light levels temporarily" on page 8.
   - Sb **Save by Button.** TEMPORARY ZONES LED is normally ON and all intensity and fade changes are temporary unless the TEMPORARY ZONES LED is turned OFF with the TEMPORARY ZONES button.
   - Sn **Save Never.** TEMPORARY ZONES LED is permanently ON and cannot be turned OFF. In this mode, all intensity changes are temporary.
   - 4S **Four Scenes.** This only allows the four Scene buttons, OFF button, IR receiver and the MASTER 5 or 6 to operate. All other buttons on the Control Unit are disabled.
   - bd **Button Disable.** All buttons on the Control Unit are disabled. IR Receiver, and Wallstations are still functional. (Setup mode is still accessible by repeating Step 1.)
4. **Exit setup mode**. Press and hold Scene 1 and OFF buttons until scene LEDs stop cycling.

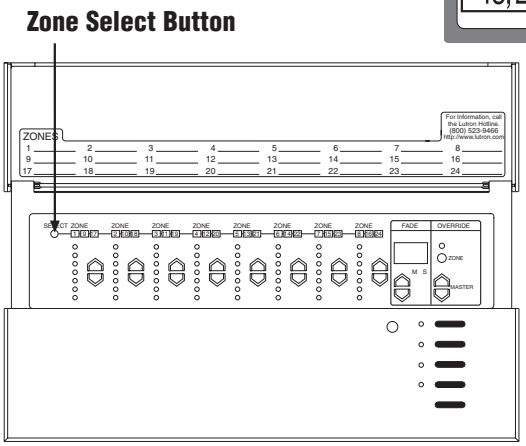


16 and 24 Zone GRX Control Units



GRX-4116/4516 and GRX-4124/4524 Control Units

The 16 and 24 zone *GRAFIK Eye* Control Units offer an expanded number of zones that can be controlled from a single wall station. The zone intensity LEDs on the GRX-4x16 or GRX-4x24 will display the light level of eight zones at a time. Other sets of zones may be displayed and controlled by pressing the Zone Select Button.



GRX-4124 Control Unit

Addressing

The GRX-4x16 and the GRX-4x24 Control Units take multiple, consecutive addresses. The GRX-4x16 Control Unit takes up two consecutive addresses, and the GRX-4x24 Control Unit requires three. To ensure there are sufficient addresses available, any GRX-4x16 and/or GRX-4x24 Control Units in the system should be addressed first.

Assigning Zones

When assigning zones use the chart on the right as a guide to see how zones are displayed on the Circuit Selector.

Note: The chart at right is for a GRX-4x24, which uses three addresses. A GRX-4x16 will have two addresses.

If Control Unit's Addresses are . . .	Zones on the Control Unit . . .	Will appear on the Circuit Selector . . .
A1, A2, A3	1—8 9—16 17—24	A11—A18 A21—A28 A31—A38
A2, A3, A4	1—8 9—16 17—24	A21—A28 A31—A38 A41—A48
.	.	.
.	.	.
.	.	.
A6, A7, A8	1—8 9—16 17—24	A61—A68 A71—A78 A81—A88

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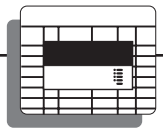
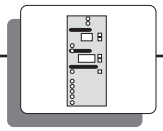


Control Directory - GRX-4000 Series Control Unit

Area: A1			Area: A2			Area: A3			Area: A4		
Zone		Zone Description	Zone		Zone Description	Zone		Zone Description	Zone		Zone Description
A1	1		A2	1		A3	1		A4	1	
A1	2		A2	2		A3	2		A4	2	
A1	3		A2	3		A3	3		A4	3	
A1	4		A2	4		A3	4		A4	4	
A1	5		A2	5		A3	5		A4	5	
A1	6		A2	6		A3	6		A4	6	
A1	7		A2	7		A3	7		A4	7	
A1	8		A2	8		A3	8		A4	8	

Area:: A5			Area:: A6			Area: A7			Area: A8		
Zone		Zone Description	Zone		Zone Description	Zone		Zone Description	Zone		Zone Description
A5	1		A6	1		A7	1		A8	1	
A5	2		A6	2		A7	2		A8	2	
A5	3		A6	3		A7	3		A8	3	
A5	4		A6	4		A7	4		A8	4	
A5	5		A6	5		A7	5		A8	5	
A5	6		A6	6		A7	6		A8	6	
A5	7		A6	7		A7	7		A8	7	
A5	8		A6	8		A7	8		A8	8	

Use this Directory as GRX-4000 Series Control Units are addressed and zones are assigned. Keep this Directory for job records and maintenance information.



Circuit Selector Functions

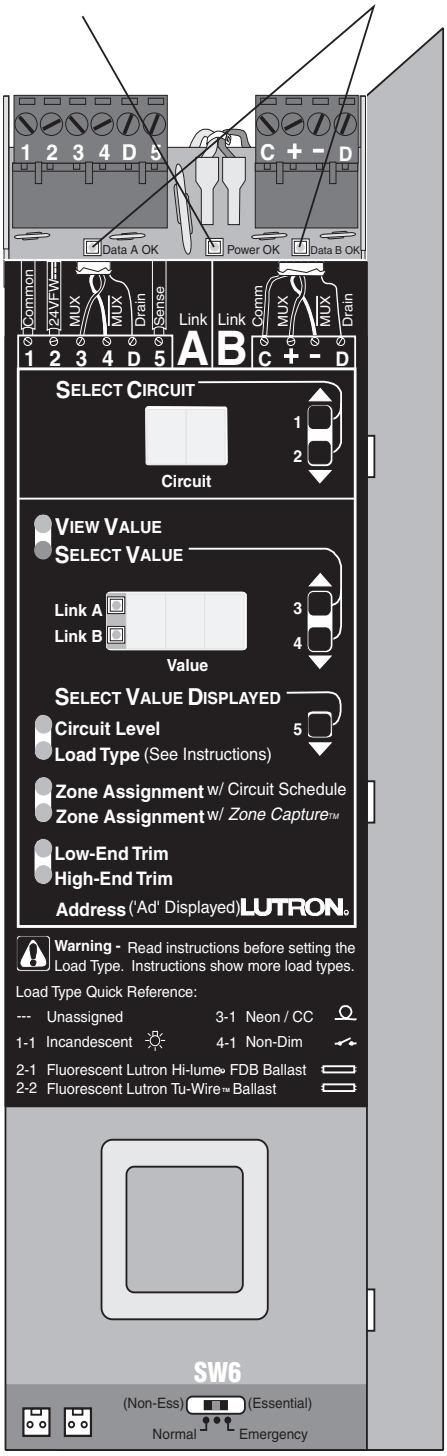
There is a Circuit Selector in every Lighting Control Panel. It is used to communicate with GRX-4000 Series Control Unit(s), G6000 controller, or DMX512 stageboards – and then to tell the dimmers their intensity levels.

It is also used to select Values for each Circuit:

- **Circuit Level** - allows a way to view the intensity being sent to the dimmer or manually take over control of the dimmer's output. See description in the Troubleshooting Reference section.
- **Load Type** - to be changed to match the load to the Load Type value. Non-Dim 4 must be used if the Load is not dimmable.
- **Control and Zone Assigned** - allows two ways of assigning a control and zone to a specific circuit.
  1. 'w/ Circuit Schedule' allows a Control and Zone (such as 'A2','3') to be directly entered into the Circuit Selector.
  2. 'w/ *Zone Capture*' allows a Control and Zone to be 'captured' by the Circuit Selector by doing the following:
     - **A.** Press and hold buttons 1 and 5 until the **SELECT VALUE** LED lights.
     - **B.** Press button 5 repeatedly until the ***Zone Capture*** LED lights. The circuit will now flash.
     - **C.** Use buttons 1 and 2 to choose the correct circuit to be assigned.
     - **D.** Go to the GRX-4000 Series Control Unit to be assigned to this circuit.
     - **E.** Select Scene 1.
     - **F.** Identify the zone to be assigned to this circuit.
     - **G.** Press the zone 6 button until all zone LEDs are off.
     - **H.** Press the zone 5 button until the load starts tracking the zone intensity LEDs.
     - **I.** Press the zone 6 button until all zone LEDs are off. (Steps H. and I. must take less than 15 seconds or the Circuit Selector will not lock on the captured zone.)
     - **J.** Go back to the Circuit Selector and the proper Control and Zone should be displayed. Repeat this process for any other Circuits.
     - **K.** Press and hold buttons 1 and 5 until the **VIEW VALUE** LED lights.
- **Low and High End Trims** - allows the Circuit's range limits to be adjusted.

'Power OK' indicates whether 24VAC is present from the Class 2 transformer.

'Data OK' LED(s) blink when the Circuit Selector is properly receiving data.



The Circuit Selector can also provide or receive a 'sense' line depending on the location of Switch 6 (SW6).

Circuit Selector Address

Assign Address to Circuit Selector

Address the Circuit Selector whenever it is to talk to a G6000 Controller or GRX-4500 Series Control Unit.

Caution! Assigning an improper address to the Circuit Selector can result in damage to the load.

A. To set or change the address, press and hold buttons 1 and 5 until the **SELECT VALUE** LED flashes once per second.

B. Press button 5 on circuit selector until “Ad” is displayed in the **Circuit** window.

   If the **Value** window displays an address other than ‘–’, the address has already been set (proceed to Step D).

C. Use button 3 or 4 to assign an address (1—512) to the Circuit Selector. This address should match the address in the job drawing.

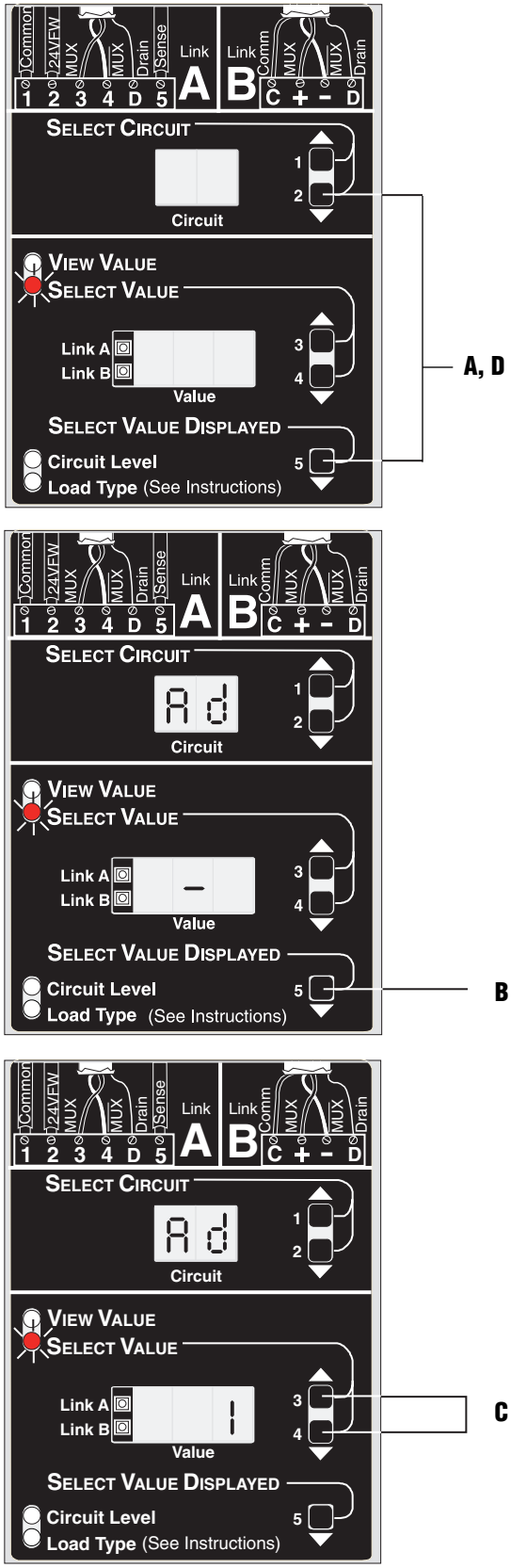
D. Press and hold buttons 1 and 5 on the Circuit Selector until the **VIEW VALUE** LED lights.

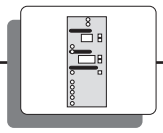
Notes:

- The **Value** window will display the software revision level of the Circuit Selector 20 minutes after the last button press.
- Panel addressing must be completed prior to transferring data from LIAISON™ or the GRAFIK 6000® controller.
- Mark addresses on a Circuit Directory for future reference.
- If **'LC'** is displayed in the Circuit window, the circuit selection is locked out. Contact the Lutron Field Service Department.

Warning:! Each GP Panel must have a unique, specific address. See Lutron's Load Schedule, Cabinet Detail Report, or user setup software.

Circuit Selector





Assign Link Hierarchy (*2Link* only)

Link Hierarchy is only used when there are two control links. Each circuit can be assigned to a hierarchy listed below (see job prints if predetermined)

If you are not sure if you have a *2Link* Circuit Selector, please call the Lutron Technical Assistance Hotline at 1-800-523-9466.

Code	Definition	Primary Link	Secondary Link	Application Example
A	Link A only.	A	None	Circuit to follow Link A (standard operation).
b	Link B only.	b	None	Panel is shared by two links to save on Panel costs.
A1	Link A unless Link B is present.	A	b	When the DMX-512 Stageboard is plugged in on Link B, listen to Link B. Return to Link A when the DMX-512 Stageboard is unplugged. Redundant system. If Link B fails, circuits follow Link A.
A2	Link A unless Link B is present and Zone X intensity on Link B is >50%.	A	b	DMX-512 Stageboard is plugged in on Link B, but does not take control until the light intensity of Zone X on Link B is above 50%.
b1	Link B unless Link A is present.	b	A	Redundant system. If Link A fails, circuits follow Link B.
b2	Link B unless Link A is present and Zone X intensity on Link A is >50%.	b	A	DMX-512 Stageboard plugged in on Link B, but is not given control until the light intensity of Zone X on Link A is below 50%.
Ab1	Highest intensity of the zone assignments of Link A and Link B.	A	b	Redundant system. If either Link A or Link B fails, the other will have higher intensities.
Ab2	Lowest intensity of the zone assignments of Link A and Link B.	A	b	Energy management.

Assign Link Hierarchy (continued)

A. To view or assign the Link Hierarchy, press and hold buttons 2 and 5 until **SELECT VALUE** LED flashes twice repeatedly.

B. Press button 5 until the **Circuit Level** LED lights.

C. Use buttons 1 and 2 to choose circuit number.

D. Use buttons 3 and 4 to assign the Link Hierarchy (see Table for options).

- If Link Hierarchy A or b is selected, go to Step I.
- If Link Hierarchy A2 or b2 is selected, go to Step E.
- If Link Hierarchy A1, b1, Ab1, or Ab2 is selected, go to Step G.

E. Press button 5 until **Load Type** LED lights.

F. Select Zone X

4000 Series on Secondary Link: Press button 3 or 4 to select both Control Unit and zone assignment. Example - If the control desired is addressed to 'A2' and the zone desired is the 3rd from the left, use buttons 3 and 4 to get 'A23' as a value for the appropriate circuit.

6000 Series or DMX512: Press button 3 or 4 to select zone assignment (1—512).

G. Press button 5 until the **Zone Assignment w/Circuit Schedule** LED lights.

H. Select the Secondary zone assignment.

4000 Series on Secondary Link: Press button 3 or 4 to select both Control Unit and zone assignment. Example - If the control desired is addressed to 'A2' and the zone desired is the 3rd from the left, use buttons 3 and 4 to get 'A23' as a value for the appropriate circuit.

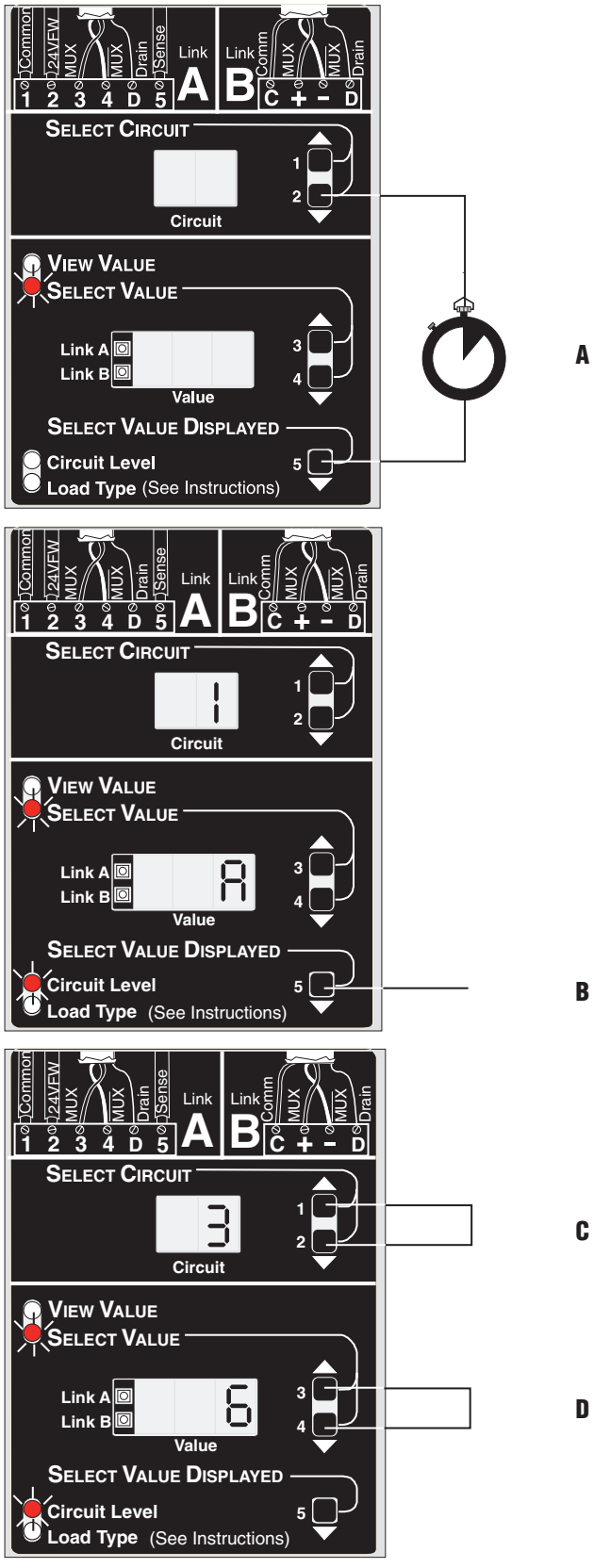
6000 Series or DMX512: Press button 3 or 4 to select zone assignment (1—512).

Note - Primary Zone assignment is done in Step 14 of this guide.

I. Repeat steps C and D for **each and every** circuit to be changed.

J. Press and hold buttons 1 and 5 until **VIEW VALUE** LED lights.

Circuit Selector



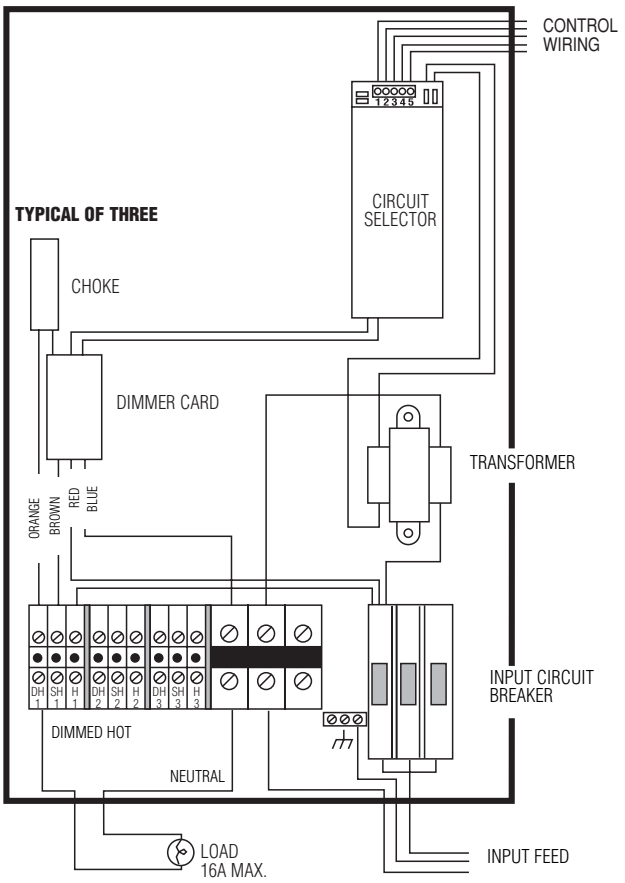
GP3 and GP4

GP3 and GP4 panels are very similar. GP3 panels have three dimming circuits, with input circuit breakers provided, while a GP4 panel has four dimming circuits and no circuit breakers. One difference is the way of wiring Neutrals in the GP3 and GP4 panels. A GP3 panel has three terminals for all Neutrals bussed together. A GP4 panel has two Neutral terminal blocks (electrically tied to each other) provided for each circuit (one for input and one for load).

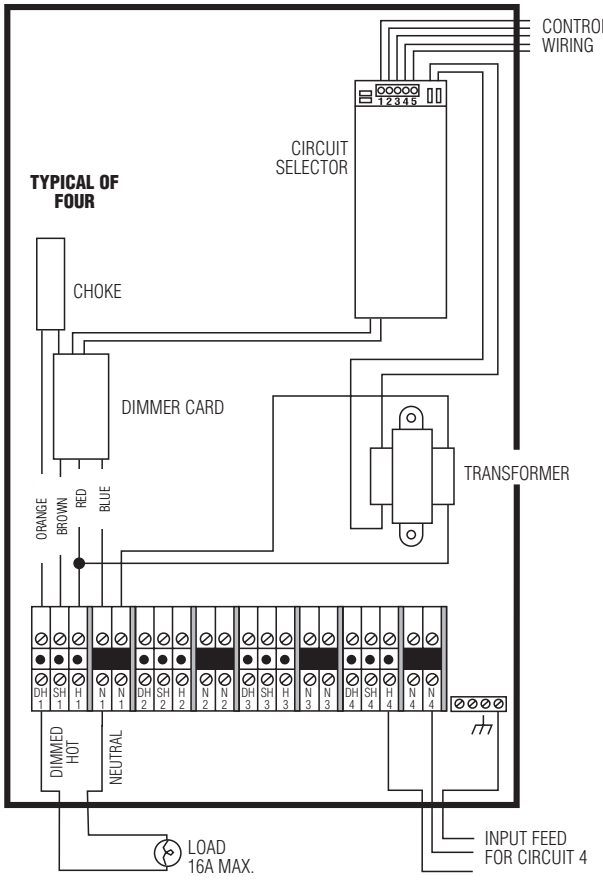
Notes:

- GP3 can be wired as 3-phase, 4 wire or 1-phase, 2 wire. If wiring is 1-phase, 2 wire, 3 #12 AWG (2.5mm^2) must be spliced to the Hot/Live feed wire.
- All are in a NEMA Type 1 enclosure and provide protection of IP-20.
- 120V and 277V panels are UL listed under UL file E42071 and are CSA certified.
- 230V CE panels have been tested to IEC439-1. Rated isolation voltage is 264Vac, rated short-time withstand current is 2000A RMS for 1 second, and classification of short circuit protection is 100A gL fuse.
- The input breaker of Circuit 1 supplies current to Load Circuit 1 and to the Control Wiring (2A draw max.)

GP3



GP4



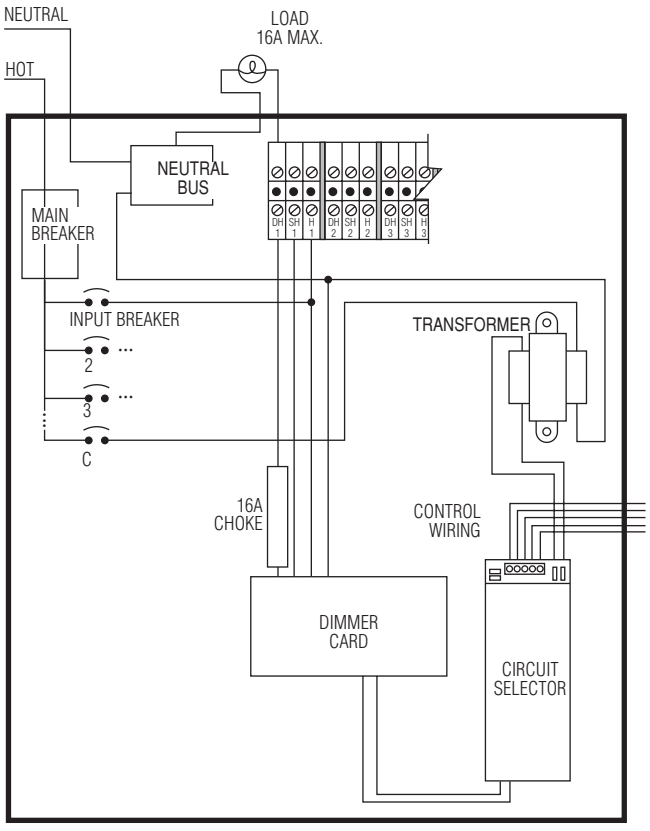
GP8 through 24

The only difference among GP8, 12, 16, 20, and 24 panels is the number of 16A dimmers (and associated components) in each.

Notes:

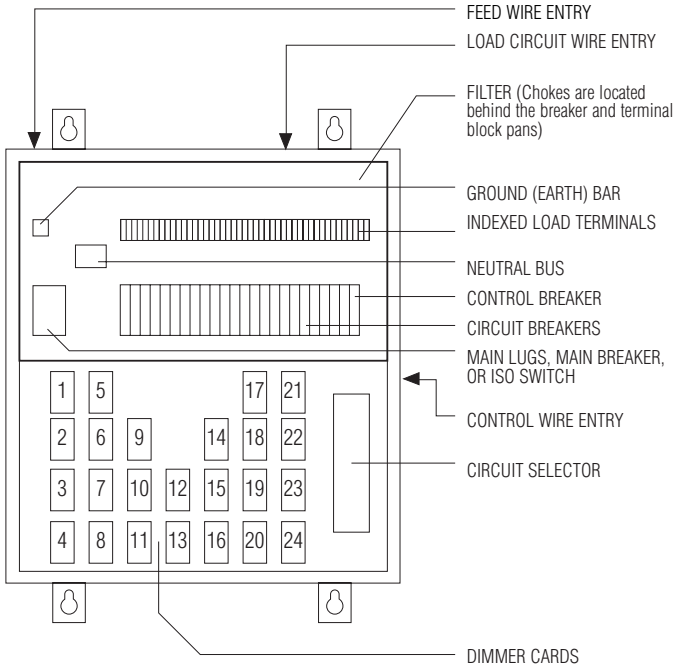
- GP3 can be wired as 3Ø, 4 wire or 1Ø, 2 wire. If wiring is 1Ø, 2 wire, 3 #12 AWG (2.5mm²) must be spliced to the Hot/Live feed wire.
- All are in a NEMA Type 1 enclosure and provide protection of IP-20.
- 120V and 277V panels are UL listed under UL file E42071 and are CSA certified.
- 230V CE panels have been tested to IEC439-1. Rated isolation voltage is 264Vac, rated short-time withstand current is 2000A RMS for 1 second, and classification of short circuit protection is 100A gL fuse.

GP8 through 24



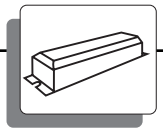
Note: There is no Neutral bus on 230V or 240V panels. Neutral terminals are included with the indexed load terminals.

GP8 through 24 Components



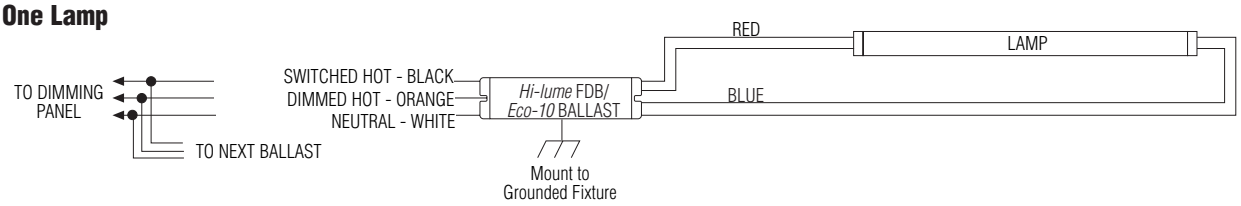
Fluorescent Wiring Information

Reference Sheet

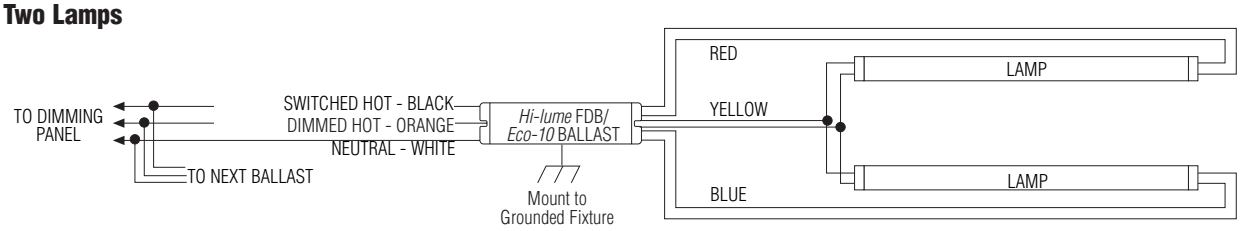


Ballast and Fixture Wiring

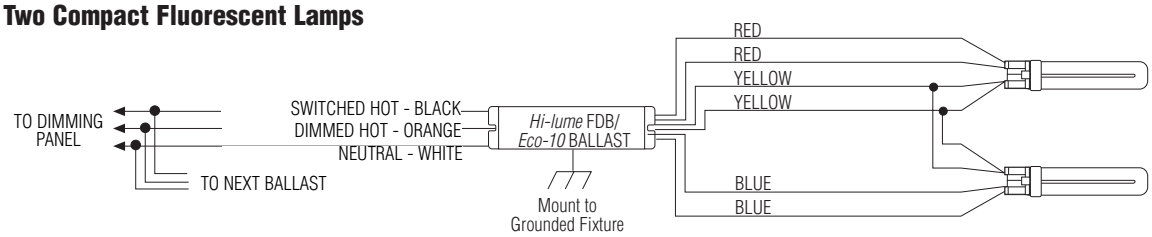
One Lamp



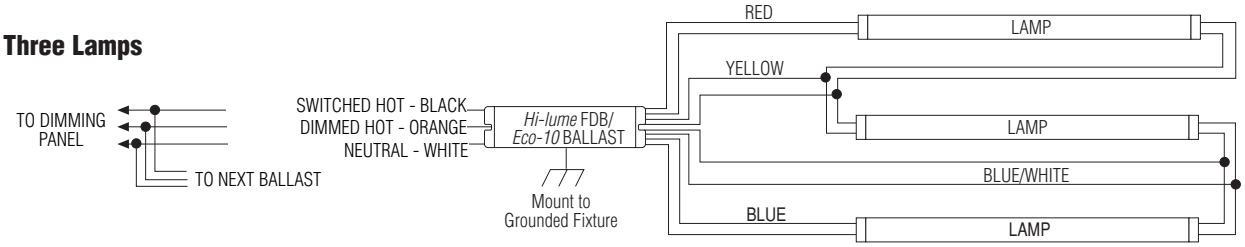
Two Lamps



Two Compact Fluorescent Lamps



Three Lamps



Notes:

- Ballasts must be located so that the maximum case temperature is less than 75 °C (167 °F) and the relative humidity is less than 90%, non-condensing.
- Avoid situations where strong air drafts blow directly on bare bulbs (minimum start temperature is 10 °C).
- Good metal-to-metal contact between lamp pins and lamp holder contacts is necessary for proper dimming performance. Knife-edge sockets are recommended.
- For those who purchased Start Up with their *Lutron* Dimming System - you may want to stop here and have the Lutron Field Engineer set-up the system. Please call for a Start Up visit at least 10 working days before your requested date.
- Compact Fluorescent lamps must be 4 pin.
- Ballast cases and fixtures must be earth grounded.
- Yellow and blue w/white trace leads, from the ballast should be kept as short as possible.
- Ballasts are not designed for remote mounting. Total length of wire from the ballast to the lamp socket is not to exceed 7 ft. (2.1 m) for T8, T12, and not to exceed 3 ft. (0.9 m) for T4, T5.
- 240V Ballasts have different wire colors-follow the label on each individual ballast.

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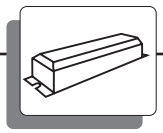
Fluorescent Wiring Information

Reference Sheet



Check Installation

Use the following table to determine if the lamp sockets in the fixture need to be replaced. (Linear and 4-Tube lamps)

Existing Ballast(s) Information		How to prepare the existing fixture for *Lutron* Dimming Ballasts.
Number of Lamps per ballast	**Total** number of wires coming out of the ballast	
1	5 or FEWER	Replace the lamp sockets with Rapid Start sockets.
	6 or 7	Using the existing sockets, and the existing wires.
2	7 or FEWER	Replace the lamp sockets with Rapid Start sockets.
	8 or 9	Using the existing sockets, and the existing wires.
3	9 or FEWER	Replace the lamp sockets with Rapid Start sockets.
	10 or 11	Using the existing sockets, and the existing wires.
4	11 or FEWER	Replace the lamp sockets with Rapid Start sockets. Note that 2 two-lamp *Lutron* ballasts will replace this ballast.
	12 or 13	Using the existing sockets, and the existing wires. Note that 2 two-lamp *Lutron* ballasts will replace this ballast.

Note: When replacing sockets, use Rapid Start sockets. (A knife-edge variety, such as model #13053-UN by Leviton Mfg. Co., or a #660 Series by Triboro Mfg. Co., is recommended.)

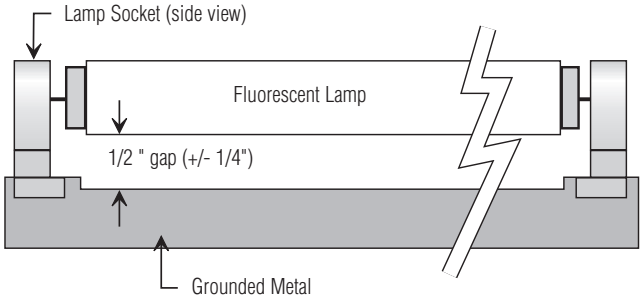
Many fluorescent lamp sockets are available with mounting slots to vary the height of the lamp away from the grounded metal surface. Use these slots to get the outside edge of the lamp to be 1/2" (12 7 mm) ±1/4" (6 mm) away from the grounded metal surface.

Having a fluorescent lamp too close to the grounded metal will make the minimum intensity too low and will reduce lamp life.

Having a fluorescent lamp too far away from the grounded metal will make the lamp flicker or not turn ON at all.

A Rapid Start, one-lamp ballast will normally have 6 wires – (1) Hot, (1) Neutral, (4) lamp wires. A 7th wire, the Ground, may be present depending upon the manufacturer. New sockets are not required when this type of ballast is replaced with a *Lutron* ballast.

Warning! Operating *Lutron* Dimming Ballast(s) with the wrong sockets in place will damage the ballast(s) and void the warranty.



For More Information . . .

Refer to Lutron publication P/N 366-606

Neon Tube Application Information

Notes on Neon/Cold-Cathode Dimming

Overview

Successful dimming of neon and cold-cathode sources can be achieved through proper equipment selection and installation. The following installation suggestions and Luminous Tube Length Chart for Dimming Applications must be used for optimum performance.

1. If equipment is selected and installed as specified here, a dimming range of 95%-10% light should be possible.
2. The electrical properties of argon fill gas make it easier to dim than red neon fill gas; therefore, installations using argon fill gas will see a greater degree of success compared to neon installations.
3. In addition to the following guidelines, all installations must meet the NEC and local codes.

Lamps

1. Neon/cold-cathode lamps must be manufactured to proper lamp pressurization (standard lamp pressure) without impurities. If pressurization is not standard or impurities are present, poor performance will result.
2. Neon/cold-cathode tubing should be well supported to avoid rattling when dimmed.
3. Lutron recommends using only the transformer/tube combinations spelled out in the Luminous Tube Length Chart for Dimming Applications. Other combinations will result in poor performance and flicker. Note that there are few successful combinations for red neon tubes smaller than 11 mm.
4. Ends of tubes must be insulated to avoid arcing and subsequent lamp instability.

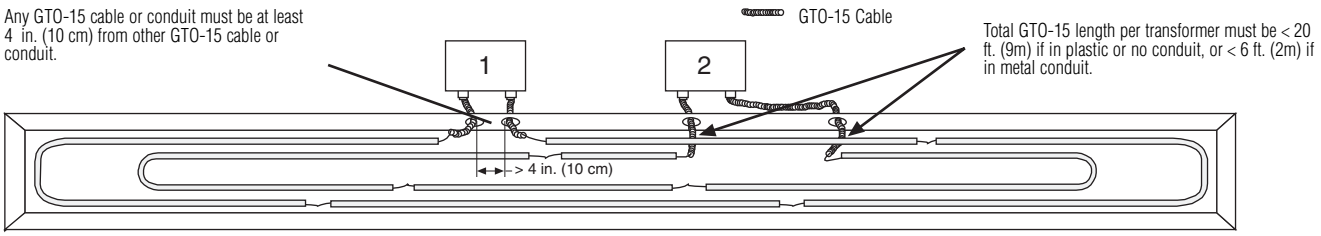
Transformers

1. Normal power factor transformers must be used; electronic transformers are not dimmable.
2. When choosing transformer secondary currents, it is important to note that the higher the transformer current rating, the brighter the light from the tube.
3. Transformers must be sized according to the chart. These modified charts must be used by neon/cold-cathode transformer suppliers to size the transformer for dimming applications. Standard luminous tube length charts must not be used to size transformers in dimming applications as poor performance will result.
4. Transformers must be thermally-protected or fused.
5. Power factor correction capacitors, if present must be disconnected. If power correction is required, contact the toll-free ***Lutron Hotline*** for details on power factor correction at the lighting controller.
6. Transformers should be sized to run as close as possible to full load footage as shown in the chart.

Wiring

1. Optimal dimming performance is achieved when the high voltage (GTO-15) cable connecting a transformer output terminal to a cold-cathode tube is enclosed in plastic conduit or run without conduit. If code requires metal conduit, aluminum is preferred.
2. The total length of all GTO-15 cable connecting a transformer to the cold-cathode tubes must be:

   Twenty feet or Less if enclosed in plastic or no conduit; 6 ft. or Less if enclosed in Metal Conduit
3. Braided or shielded GTO-15 cable must not be used for dimming applications.
4. Lutron recommends that only one GTO-15 cable be run per conduit.
5. All GTO-15 cables should be spaced a minimum of 4" from any other GTO-15 cable.
6. Make sure spacing from tube ends to ground (earth) and other tube ends is adequate to prevent arcing and subsequent lamp instability.



Note: Make sure spacing between any tubing, tubing ends, high voltage secondary cable, or conduit to any grounded (earthed) surface is adequate to prevent arcing and subsequent lamp instability.

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Neon Tube Application Information

Luminous Tube Length Chart for Neon/Cold-Cathode Dimming Applications

Transformer Ratings			Approximate Number of Feet of Tubing and Pairs of electrodes*																				
			Neon Fill (clear or fluorescent red)											Argon/Mercury Fill (colors other than neon red)									
			Tube Size (millimeters)											Tube Size (millimeters)									
Secondary Voltage (V)	Secondary Short Circuit Current (mA)	Input Volt-Amperes with Secondary Short Circuit (VA)	25	22	20	18	15	14	13	12	11	10	9	25	22	20	18	15	14	13	12	11	10	9
15000	60	900	77	64	58	54	45	X	X	X	X	X	X	96	80	72	64	58	51	48	44	38	35	X
	30	450	77	64	58	54	45	X	X	X	X	X	X	96	80	72	64	58	51	48	44	38	35	X
	20	270					X	X	X	X	X	X	X					X	X	X	X	X	X	X
12000	60	720	59	50	46	41	34	32	29	26	X	X	X	76	63	56	50	44	40	37	35	30	28	X
	30	360	59	50	46	41	34	32	29	26	X	X	X	76	63	56	50	44	40	37	35	30	28	X
	20	225					X	X	X	X	X	X	X					X	X	X	X	X	X	X
9000	120	1080	58	49	41	35	28	25	25	23	20	17	X	74	62	50	42	37	33	30	28	26	22	X
	60	540	50	43	36	30	25	23	22	20	18	16	X	64	54	44	36	32	29	26	26	22	20	X
	30	270	50	43	36	30	25	23	22	20	X	X	X	64	54	44	36	32	29	26	26	22	20	X
	20	180					21	20	18	16	X	X	X					27	25	23	22	18	16	X
7500	120	900	44	35	29	24	22	20	20	17	16	14	X	56	44	36	31	28	26	25	22	20	18	X
	60	450	38	31	25	21	20	18	16	16	14	13	X	49	38	31	28	25	22	22	20	18	16	X
	30	225	38	31	25	21	20	18	16	16	X	X	X	49	38	31	28	25	22	22	20	18	16	X
	20	150					16	16	15	14	X	X	X					22	20	18	17	15	14	X
6000	120	720	35	29	24	20	18	16	16	14	13	11	X	44	37	30	26	22	21	20	18	16	14	X
	60	360	30	25	21	17	16	14	14	12	11	10	X	38	32	26	22	19	18	17	15	14	13	X
	30	180	30	25	21	17	16	14	14	12	X	X	X	38	32	26	22	19	18	17	15	14	13	X
	20	130					14	13	12	10	X	X	X					18	16	14	14	12	10	X
5000	120	600	28	24	20	16	15	14	13	10	9	8	X	37	30	25	21	18	18	15	14	12	10	X
	60	300	25	21	17	14	13	12	11	9	8	8	X	32	26	22	18	16	15	13	13	10	10	X
	30	160	25	21	17	14	13	12	11	9	X	X	X	32	26	22	18	16	15	13	13	10	10	X
	20	100					11	10	10	8	X	X	X					14	13	12	11	9	8	X
4000	60	240	20	17	14	12	10	9	8	8	7	6	X	26	22	18	15	14	13	12	11	9	8	X
	30	140	20	17	14	12	10	9	8	8	X	X	X	26	22	18	15	14	13	12	11	9	8	X
	20	90					8	8	8	7	X	X	X					11	10	10	10	7	6	X
3000	60	180	13	10	9	8	8	7	7	6	5	5	X	18	14	13	11	10	9	8	7	6	6	X
	30	100	13	10	9	8	8	7	7	6	5	5	X	18	14	13	11	10	9	8	7	6	6	X
	20	75					6	6	5	5	4	3	X					8	7	6	6	5	4	X
2000	30	75					5	5	5	5	X	X	X					7	6	6	6	5	4	X
	20	50					5	4	4	4	X	X	X					6	6	6	5	4	3	X
Recommended gas pressure, mm/Hg			6	7	7.5	8	9	10	10	11	12	13		6	7	7.5	8	9	10	10	11	12	13	

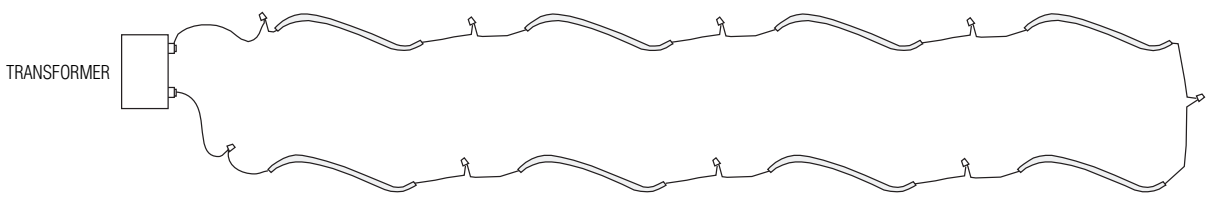
Notes:

- X denotes this combination cannot be successfully dimmed.
- Tube length is shown in feet. To convert to meters, 1ft. = 0.305 m.
- If using a center-tap on a center-tapped transformer, the secondary voltage will be reduced by half.

Warning! This chart has been calculated for dimming purposes and must not be used for non-dimming installations.

Danger! Potentially hazardous high voltage can be present. Testing, handling, and servicing should be done only by qualified personnel.

* Each pair of electrodes equals one foot of tube. Example application = 8 red neon, 4 foot long, 18 mm dia., 60 mA lamps



Total Lamp Length = (8 Lamps X 4 ft) + (8 Lamps X 1 ft for each pair of electrodes) = 40 ft.
A 12000V, 60mA, 720VA transformer should be used (Capable of dimming 41 ft.)

Troubleshooting Guide

Symptom	Dimmer Card LED	'Power OK' LED	Circuit Selector 'Data OK' LEDs	Circuit # Display	GRX LEDs	Possible Cause/Solutions
Normal Operation as Reference	"Heartbeat" (~1 per sec)	On	"Heartbeat" (~1 per sec)	OK	OK	All LEDs show OK, see below for other suggestions
				OUT	OK	Push any button on Circuit Selector (display turns off in 20 minutes)
				"LC"	OK	Circuit Selector Locked out
All dimmers controlled by 1st zone	"Heartbeat" (~1 per sec)	On	"Heartbeat" (~1 per sec)	OK	OK	Circuit Selector not set up - see instructions for zone assignment.
All Dimmers on FULL or OFF only	"Heartbeat" (~1 per sec)	On	"Heartbeat" (~1 per sec)	OK	OK	Circuit Selector not set up - see instructions for Load Types.
No Dimming - Always Full	"Flutter"* (~5 per sec)	On	"Heartbeat" (~1 per sec)	OK	OK	Dimmer in Bypass - remove Bypass Jumper after loads have been proven Dimmer defective - contact Lutron
No dimming - Level Frozen	"Light House" (~1 per 7 sec)	On	"Heartbeat" (~1 per sec)	OK	OK	2-wire Panel Control Harness disconnected at the bottom of the Circuit Selector
		On	"Flutter"* (~5 per sec)	OK	OK	Wiring of Terminals 3 and 4 flipped. GRX connector unplugged at Control Unit.
	ON continuously	N/A	N/A	N/A	N/A	Dimmer circuitry locked up. Turn off circuit breaker to reset the dimmer. Notify Lutron. Wrong Baud Rate—Notify Lutron.
Controls Dead	"Light House" (~1 per 7 sec)	On	Off	OK	Off	GRAFIK Eye Control Units not addressed. Miswire to control link wires 1, 2, 3, and 4
		On	Off	OK	OK	No data on Control Link open wires 3 or 4
		Off	Off	OK	Off	Miswire shorting 24VFW (Terminal 2) to Common (Terminal 1) or ground
		Off	Off	Out	Off	Control Breaker Off

* An accurate "Flutter" rate requires that the circuit be cycled OFF, then ON to high end from the appropriate Control Unit.

Troubleshooting Guide (continued)

After checking LED diagnostics, use this chart:

Symptom	Possible Cause/Solutions
Wallstations will not go into Set Up Mode	GRX-4000 Series Control Units are not addressed. Terminals 3 and 4 miswired.
Fluorescent Load Flickers	DIM HOT and SW HOT wires crossed. Low End set too low.
Panel is Warm	This is probably normal. Solid-state controls dissipate about 2% of the connected load as heat. Make sure panel has adequate venting. Areas above and below the panel allow air lto flow behind the panel to cool it.
Two Control Units have the same Address (usually A1)	One of the units has wires 3 and 4 crossed or open. Wire terminal 3 to terminal 3, 4 to 4.

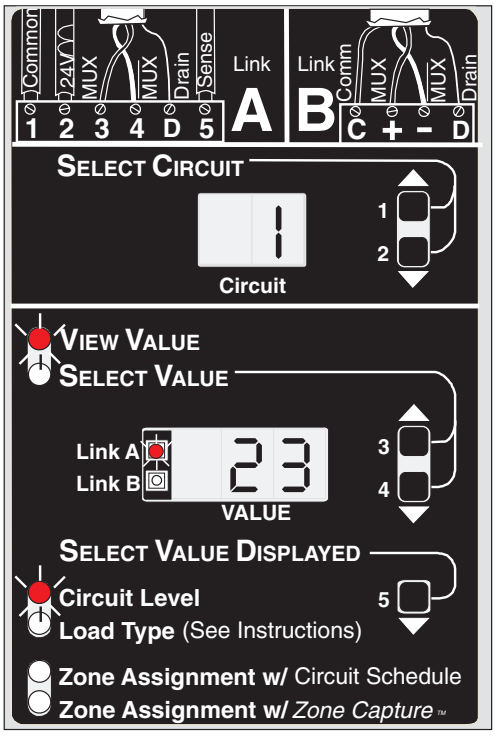
Note: The following voltages should be present on the GRX wiring:
Terminals 2 to 1 ≈ 22VDC
Terminals 3 to 4 ≈ 3VDC
Terminals 5 to 1 if Switch 6 set for Normal ≈ 22VDC

Other Troubleshooting tools:

The Circuit Selector can be used to view the intensity information being sent to the dimmer. Use buttons 1 and 2 on the Circuit Selector to access the circuit Number desired. Press button 5 repeatedly until the **Circuit Level** LED lights. Value displayed is now the present intensity sent from either Link A or Link B (as indicated) that is controlling that circuit.Value = 0 is OFF, Value = 100 is ON full.

The Circuit Selector can also be used to manually change the intensity of the desired circuit. Press and hold buttons 1 and 5 until the **SELECT VALUE** LED lights. Use buttons 1 and 2 to access the circuit desired. Press button 5 repeatedly until the **Circuit Level** LED lights. Buttons 3 and 4 will now control the desired circuit.

Value = 0 is OFF, Value = 100 is ON full, Value = CF is Circuit Finder - load will blink for easy location.



Maintenance

GRX-4000 Series Control Units and Wallstations

Clean front surface of control with a soft towel moistened with a mild soap solution (non-ammonia- based). Clean approximately every six months.

Caution! Do not spray cleaning solution onto control as it may reach internal components.

GP Panels

1. Clean any dirt from air vent openings with a vacuum and check for any obstructions which may block air flow. Keep 12" (30.5 cm) above and below panels unobstructed.
2. If any extra wiring is brought into the power panel, thoroughly remove all metal chips, wire strands, insulation and other debris before reapplying power.
3. In the unlikely event of damage to dimming equipment, turn off breakers, replace bypass jumpers and turn on breakers. This will apply full power to fixtures.

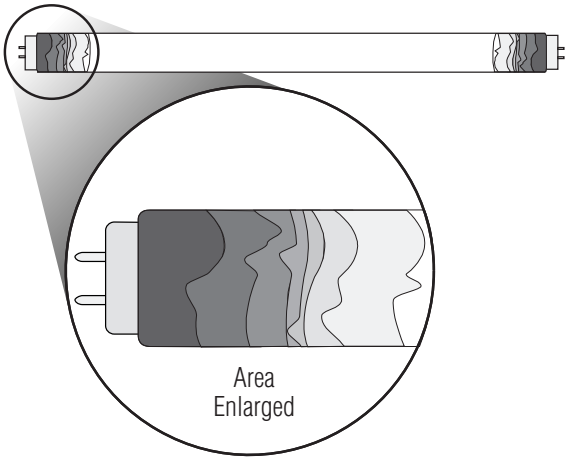
Fluorescent Fixtures

1. It is important that lamps are maintained properly to prevent what may appear as dimming equipment malfunctions. When lamps begin to fail on a circuit, Lutron recommends group relamping of the entire circuit.
2. **New fluorescent lamps must be "seasoned" for dimming applications by operating at full intensity for their first 100 hours.**

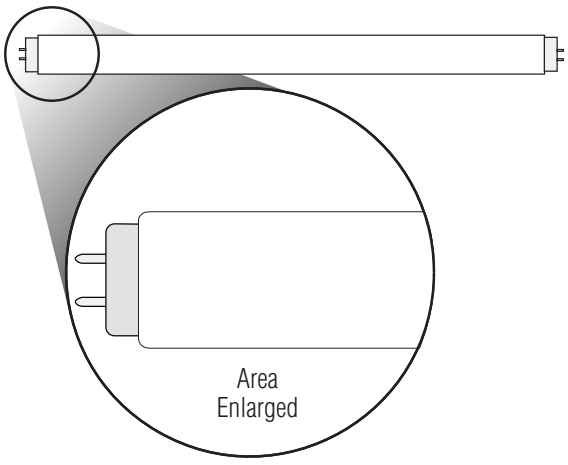
   Leave the lamps at full intensity for 100 hours. Although this may be inconvenient, it is necessary for good dimming performance, and achieving normal lamp life.

Warning! For proper dimming performance fluorescent lamps must be operated at full intensity for 100 hours prior to dimming.

Why keep the lamps at full intensity for 100 hours?



Lamp that was **NOT** seasoned for 100 hours.



Lamp that **WAS** seasoned for 100 hours.

New fluorescent lamps have impurities in them which lamp manufacturers cannot eliminate completely. Lamps must be operated at full intensity for 100 hours **before dimming** to neutralize the harmful effects of these impurities. Without the 100 hours at full intensity, the impurities may cause the lamp to fail within a week (or failure may take months depending on usage and the amount of impurities).

2Link- an option feature on a Circuit Selector that allows a circuit within a Lighting Control Panel, to be assigned to any zone on either Control Link A or Control Link B. The choice of Link Hierarchy determines which Link's intensity level is sent to a specific circuit.

Accessory Control - former term for both a Wallstation and Control Interface. This term was separated to more clearly distinguish between the two types of controls.

Addressing - a way for the controls on a link to identify each other. Wallstations are addressed, using switches 1 through 4 on the back of each control. Each control needs a unique address. GRX-4000 Series Control Units are addressed while in Set-Up Mode from the front panel's buttons.

Circuit Selector - the interface between the Control Link(s) and the digital dimmers that reside in a GP panel. The Circuit Selector houses all Circuit Values including Load Type, Control and Zone assigned, and Low End and High End light levels. *2Link* is available as an option or upgrade.

Control Interface - *GRAFIK EYE* control wired to a GRX-4000 (or GRX-3000) Series Control Unit to select scenes, raise and lower specific zones or other functions on an attached Control Unit. An external closure or a computer typically activates these functions.

Control Link - the daisy-chained link of controls wired to the Circuit selector. A Control Link can be a) GRX-3000/4000, b) G6000, or c) DMX-512.

Dimmed Hot (DH) - a variable output from each circuit. This output must be used for all Non-Dim Load Types to ensure full lifetime of the dimmer's relay closure. The output limits and characteristics are set by the Load Type.

Fade - a gradual change in light intensity in a room or space.

Fade Time - selected time interval to change from one scene to another. A GRX-4000 (and GRX-3000) Series Control Unit has a customer-adjustable fade time that ranges from 0-59 seconds and 1 to 60 minutes.

GP Panel - *GRAFIK Eye* Lighting Control Panel - a panel (rack) of digital dimmers (circuits) which can be assigned to Dim or Non-Dim multiple load sources.

High End - the light level when a circuit output is at its highest intensity. The High End can be trimmed to a brighter or dimmer level. High End is usually set for lamp life and energy savings.

Link Hierarchy - a value that must be set when using the *2Link* option on the Circuit Selector. This value determines when either Link A or Link B controls the output of any circuit within the Control Panel.

LED (Light Emitting Diode) - an illuminated indicator to help in setting up and diagnosing GP Panel and GRX-4000 Series Control Unit's functions.

Load Type - a value in the Circuit Selector that defines the performance of the circuit to optimally control loads such as: Incandescent, *Hi-lume* FDB or *Eco-10* Dimmable Fluorescent, Neon, Non-Dim, Electronic Low Voltage.

Low End - the light level when a circuit output is at its lowest intensity (just above OFF). The Low End can be trimmed to a brighter or dimmer level. Low End is usually set for aesthetics.

Non-Dim Load - a source that is not to be dimmed. Load Circuit wiring is to be connected to the Dimmed Hot (DH) terminal and Load Type for that circuit is to be set to a Non-Dim Load Type only.

RTISS™ - Real Time Illumination Stability System used to filter noise out of the power feed to each digital dimmer, resulting in a more stable output.

Scene - (or Preset) - Predetermined light intensity for one or more lights, creating a lighting effect that can be recalled by pressing a single button. The GRX-4000 Series Control Unit has Scene 1-4 and OFF accessible on the front of the control. Some Wallstations and Interface Controls can be Set-Up to access Scenes 5-16.

SSA - Single Scene Activator (model # NTGRX-1S) alternately toggles the GRX-4000 (GRX 3000)Series Control Unit, to which it is wired, between Scene 1 and OFF. The SSA is not counted as a Wallstation. Multiple SSA Wallstations can be wired in parallel controlling the same GRX-4000 Series Control Unit. SSA Wallstations do not work with GRX-3000 Series 2-Zone Control Units for the U.S. and Australia (*CE* 2-Zone version **does** have SSA).

Switched Hot (SH) - an unprotected relay closure from each dimmer. This output is used for *Hi-lume* FDB or *Eco-10* Fluorescent only.

Wallstation - *GRAFIK EYE* control wired to a GRX-4000 (or GRX-3000) Series Control Unit to select scenes, raise and lower specific zones or other functions on an attached Control Unit. Buttons typically activate these functions.

Zone - a fixture or a group of fixtures controlled simultaneously. The GRX-4000 Series Control Unit controls multiple zones (e.g., a GRX-4008 can control 8 zones). Each zone can be assigned to one or more Circuits in a GP Panel. Each zone should only control one Load Type.

Zone Capture - a method of Assigning a Control and Zone to a circuit without knowing Control Addresses. See 'Circuit Selector Functions' in the Reference Section.

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