

GRAFIK Eye[®] 4000 Series Installer's Guide

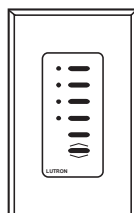
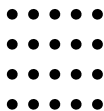
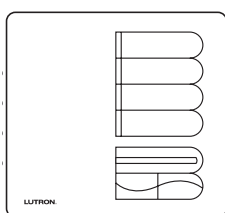
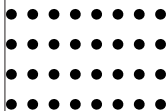
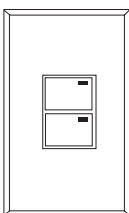
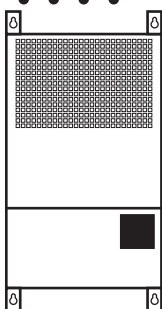
Models 4100 and 4500

PLEASE LEAVE FOR OCCUPANT

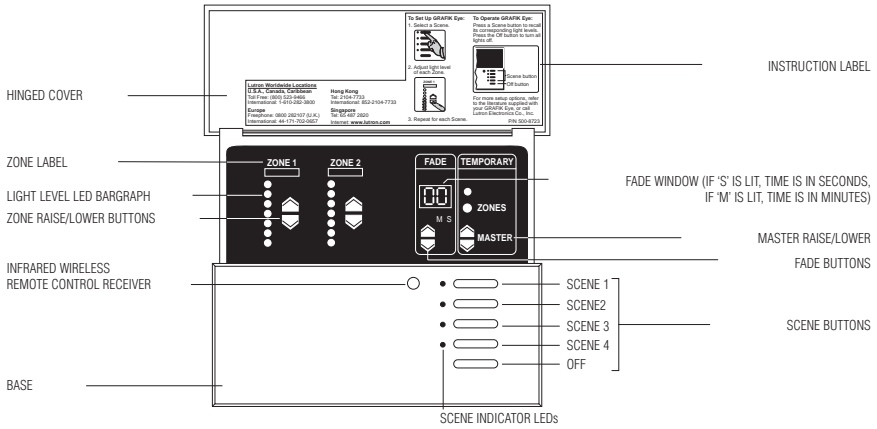


GRAFIK Eye 4000 Series

Control Units, in conjunction with a Lighting Control Panel, control the brightness of two, three, four, six, eight, sixteen, or twenty-four zones of lighting. GRAFIK Eye Control Units control the intensity of all the light sources in a room. You can adjust the lights for a special event or activity with the press of a button!



GRAFIK Eye Control Unit



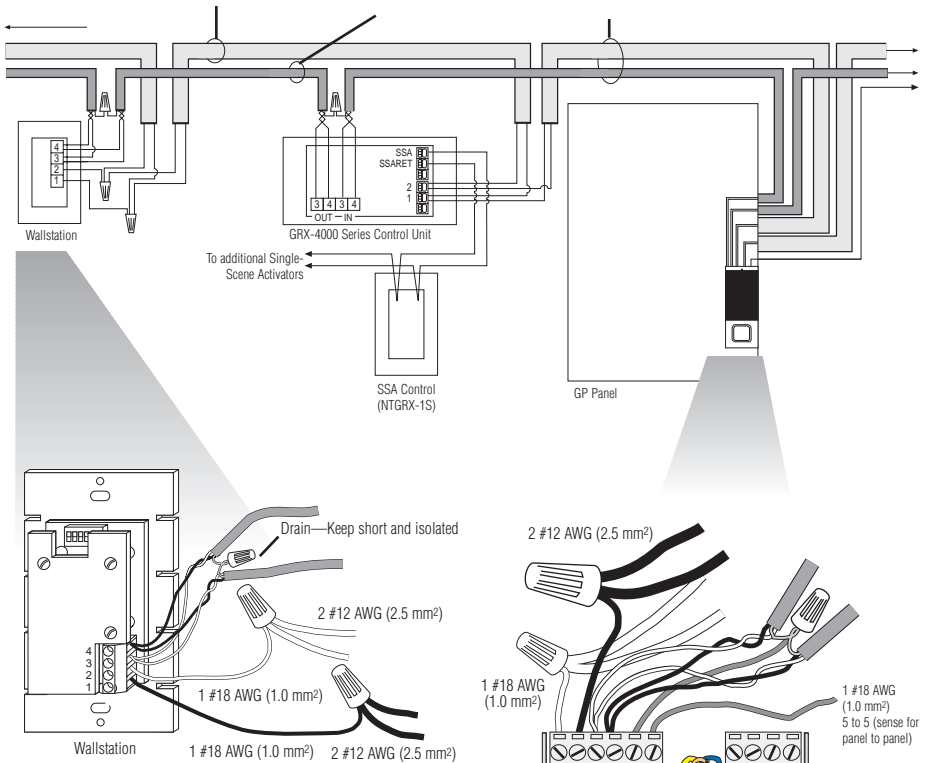
GRAFIK Eye Control Wiring Overview

To additional Control Units, Wallstations, Panels, or Control Interfaces

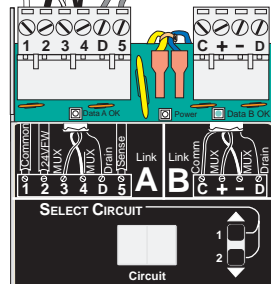
2 #12 AWG (2.5 mm²) from Terminals 1 to 1, and 2 to 2

2 #18 AWG (1.0 mm²) twisted, shielded pair from Terminals 3 to 3, and 4 to 4 (Belden #9461 or Alpha #Z211 are recommended)

Lutron offers a one-cable (non-plenum), low-voltage, color-coded solution for proper daisy-chaining of Control Units, Wallstations, and Circuit Selectors (Lutron P/N GRX-CBL-46L) or all four wires are available from Liberty Cable (P/N Lucom 12/22-RBL) at 1-800-530-8998.



- Connections are made inside the Wallstation's backbox or in a junction box located no more than 8 ft. (2.4 m) from the Wallstation.
- Total Control Wiring length is not to exceed 2000 ft. (450 m for 2.5 mm²) and must not be run in the same raceway as line/mains voltage wiring.
- Use the wire connector required by local code (those shown are common in the U.S.).
- Some of the products shown have removable terminal blocks.
- 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 earth/ground or wallstation circuitry.



Circuit Selector in the GP Panel

Class 2/PELV Wiring

Class 2/PELV wiring is used to carry communications between GRAFIK Eye Control Units, Wallstations, Control Interfaces, and the Circuit Selector.

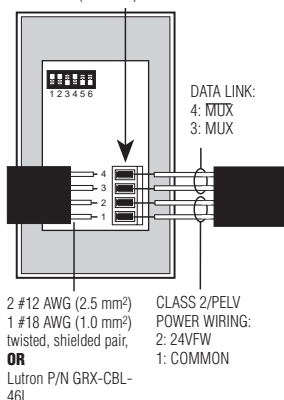
Lutron requires that you connect (daisy-chain) all GRAFIK Eye Control Units and Wallstations for proper operation. The drain wires must be connected to each other or to Terminal D, if present. Drain wires should not be connected to Earth/Ground.

- The 2 #12 AWG (2.5 mm²) wires are used to supply low-voltage power to the Control Unit and Wallstations. These wires are connected to terminals 1 (COMMON) and 2 (24VFW).
- The twisted pair is for a data link (up to 2000 ft. or 450 m long) that enables Wallstations to communicate with GRAFIK Eye Control Units. Connect this twisted pair to Terminals 3 (MUX) and 4 (MUX) of every Control Unit and Wallstation.

Wallstation circuits are classified as Class 2 circuits (U.S.A) and PELV circuits (IEC). Unless otherwise specified, the voltages do not exceed 24VAC or 15VDC. 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.

The GRAFIK Eye 4000 Series Control Unit Class 2/PELV circuit is 24VDC.

EACH TERMINAL CAN ACCEPT UP TO 2 #18 AWG (1.0 mm²) WIRES



2 #12 AWG (2.5 mm²)
1 #18 AWG (1.0 mm²)
twisted, shielded pair,
OR
Lutron P/N GRX-CBL-46L

CLASS 2/PELV POWER WIRING:
2: 24VFW
1: COMMON

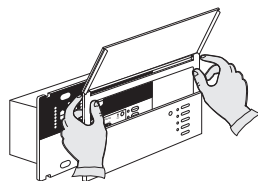
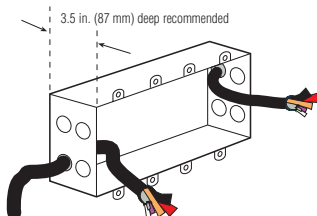
What is PELV?

In countries that abide by the IEC regulations, PELV is commonly referred to as Protective Extra-Low Voltage. A PELV circuit is an earthed circuit in which the voltage cannot exceed 50VAC or 120V ripple-free DC. The power source must be supplied by a safety isolating transformer or equivalent.

Installation instructions.

Preparation

- 1. Mount Wallbox.** Use standard U.S. wallbox, 3 1/2 in. (87 mm) deep is recommended, 2 3/4 in. (68 mm) deep minimum.
- 2. Pull Wires.** Use the rearmost knockouts when pulling wires into the wallbox. This will provide the most clearance when mounting the Control Unit.
- 3. Remove Cover.** Remove the Control Unit's cover and hinged faceplate by pulling outward at each corner.



Model Number	Number of Zones	Wallbox Size
4102/4502	2	2-Gang U.S
4103/4503	3	3-Gang U.S
4104/4504	4	4-Gang U.S*
4106/4506	6	4-Gang U.S*
4108/4508	8	4-Gang U.S*
4116/4516	16	4-Gang U.S*
4124/4524	24	4-Gang U.S*

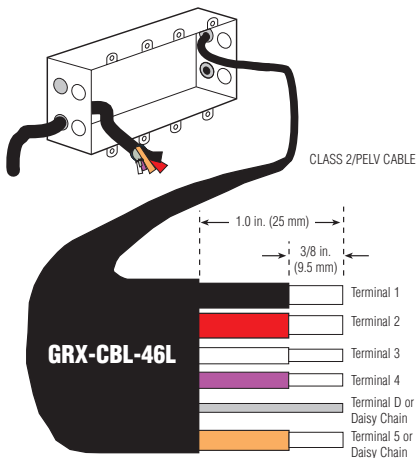
* Lutron P/N 241-400.

IMPORTANT WIRING NOTES!

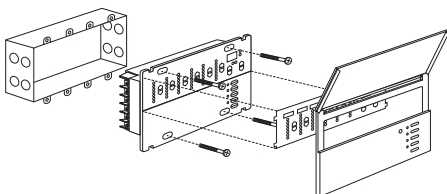
- Use properly certified cable for all Class 2/PELV cables.
- Install in accordance with all local and national electrical codes.
- **CAUTION!** Do not connect line voltage/mains cable to Class 2/PELV terminals.
- It is recommended that the Control Unit be earth grounded.

Wire the Control Unit

- Strip 1 in. (25 mm) of insulation from the Lutron GRX-CBL-46L Class 2/PELV cable.
- Strip 3/8 in. (8 mm) of insulation from each wire and connect them to appropriate terminals on the back of the Control Unit. Terminals 1 and 2 can accept up to two #12 AWG (2.5 mm²) wires. Terminals 3 and 4 can accept one #12 AWG (2.5 mm²) wire. The recommended installation torque is 9.0 in. • lbs. (1.0 N•m) for Terminal 1 and 2 connections, 3.5 in. • lbs. (0.4 N•m) for Terminal 3 and 4 connections, and 10 in. • lbs. (1.3 N•m) for the earth/ground connection.
- Make sure no bare wire is exposed after making connections.



Mounting



- Mount as shown using the four screws provided.
- Reattach the faceplate to the Control Unit by pushing inward at each corner.

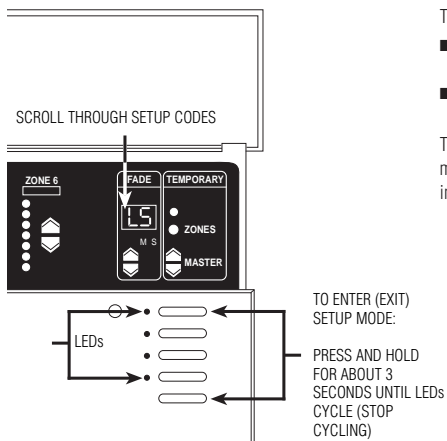
Supplying Power

For step-by-step instructions to properly supply power to the Control Unit, please refer to the instructions included with the Lighting Control Panel.

The remainder of this installer's guide is reference material that includes how to set up the 4000 Series Control Units and Troubleshooting procedures.

REFERENCE MATERIAL

Setting Up GRAFIK Eye Control Units



This section shows how to set up a GRAFIK Eye Control Unit, including:

- Identifying the load type for each zone of lighting connected to the Control Unit.
- Setting up the scenes to create the desired lighting effects, and make sure the Control Unit is working correctly.

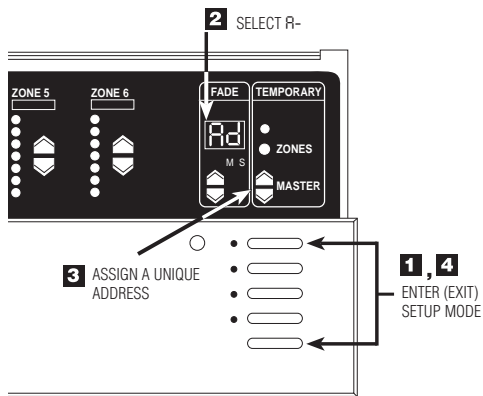
To set up the GRAFIK Eye Control Unit, enter the "setup mode" and use the menu of setup codes that appear in the FADE window. Step-by-step instructions for using the setup codes are on the following pages.

The following is a list of the setup codes and their descriptions:

Code	Stands for:
C	Save Options (Page 9)
Sc	Scene (Page 7)
R-	Address (Page 6)
LS	Load Select (Page 7)

Assign addresses to GRAFIK Eye Control Units

The following instructions on Addressing and Assigning Zones are critical for the correct setup of a GRAFIK Eye system.



For 16- and 24-zone Control Units, please see instructions on Page 9!

Assign each GRAFIK Eye Control Unit in your project a unique system address (A1 through A8).

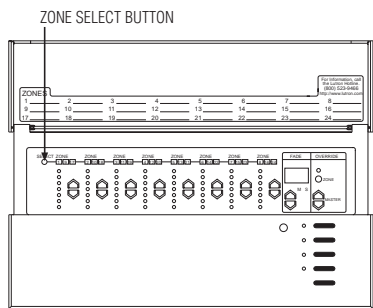
To assign an address:

- 1. Enter setup mode.** Press and hold Scene 1 and OFF buttons about 3 seconds, until scene LEDs cycle.
- 2. Select R-** (the address display). Press FADE ▲ once, R- appears in the FADE window.
- 3. Assign a unique address.** Press MASTER ▲ once, the next "free" (unassigned) address automatically appears in the FADE window. This will be the Control Unit's address. (If you are working on the first Control Unit in the project, R1 will appear.)
- 4. Exit setup mode.** Press and hold Scene 1 and OFF buttons about 3 seconds, until the LEDs stop cycling.
- 5. Repeat** steps 1 through 4 for each GRAFIK Eye Control Unit.

Assign addresses to GRAFIK Eye Control Units

16- and 24-zone Control Units

The 16- and 24-zone Control Units offer an expanded number of zones that can be controlled from a single wallstation. The zone intensity LEDs 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.



Addressing

These Control Units take multiple, consecutive addresses: the 16-zone takes two and the 24-zone takes three. To ensure that there are sufficient addresses available, these Control Units should be addressed first (see Page 8).

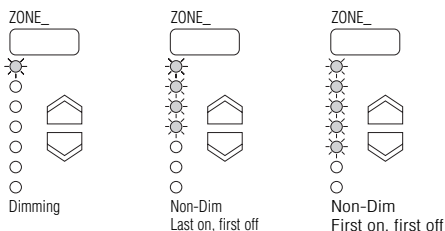
Assigning Zones

When assigning zones with the dimming panel's Circuit Selector (see the instructions shipped with the panel), the chart below shows how zones are displayed on the Circuit Selector. (The chart is for a 24-zone Control Unit, a 16-zone Control Unit will have only two addresses.)

Addresses are:	Zones are:	Circuit Selector shows:
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

Identifying the load type for each zone

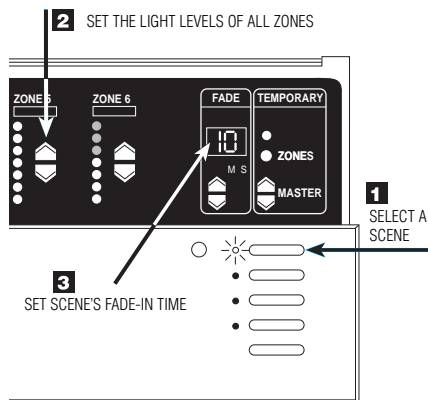
Assigning specific load types is done by using the Circuit Selector located in each dimming panel, however, it is important to setup the zones at the Control Unit to control either dimmable or non-dimmable load types. Please refer to the instructions shipped with each dimming panel.



For each zone, the LEDs can be made to match the load type as shown:

- 1. Enter setup mode.** Press and hold Scene 1 and OFF buttons for about 3 seconds, until scene LEDs cycle.
- 2. Check for LS in FADE window.** (LS is the first code to appear when you enter setup mode. For the LS mode, ZONE LEDs turn on from top to bottom.)
- 3. Set each zone's load type.** Using the diagram shown, press ZONE ▲ and ▼ until ZONE LEDs match the load type for each zone.
- 4. Exit setup mode.** Press and hold Scene 1 and OFF buttons for about 3 seconds, until scene LEDs stop cycling.

How to set up lighting scenes



* 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 ▲ to scroll through 1—59 seconds . . . the M lights. FADE is now expressed in minutes. To get back to seconds, press FADE ▼ until the window shows "S"econds.

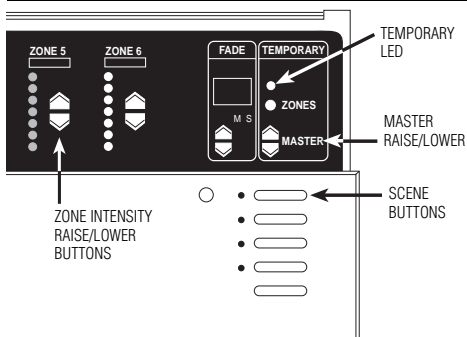
Note: Control Unit must be in **C** mode. See page 9 for more information regarding Save Options.

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 ▲ and ▼ to adjust each ZONE to the right visual intensity for this scene. (ZONE LEDs show intensity bargraph-style. Each LED represents ~ 15% intensity change. In this example, ZONE 6 is set to 60%.) To program scenes 5 through 16, or for more precise zone intensity adjustment with a GRAFIK Eye 3500 Control Unit, refer to "Advanced Scene Programming Options" below.
- 3. Set scene's FADE-in time.** Press FADE ▲ and ▼ 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.)

Repeat this process to set up each of the remaining scenes. Note that you can also set up a "FADE-to-off" time. Press the OFF button and adjust FADE as desired.

How to adjust light levels temporarily



Note: Control Unit must be in either **C** or **Sb** mode. See page 9 for more information regarding Save Options.

To adjust an entire scene:

Press the appropriate scene button.

Press MASTER ▲ or ▼ to raise or lower the intensity of all zones.

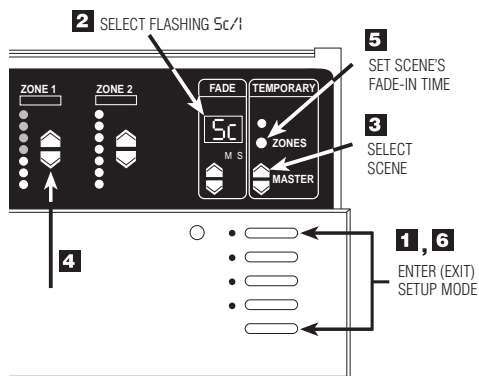
To adjust a zone:

If the TEMPORARY LED is not already lit, press the TEMPORARY ZONES button. The TEMPORARY LED above the TEMPORARY ZONES button will light.

Press ZONE ▲ or ▼ to adjust any zone's intensity.

Note: These adjustments are temporary and remain only until a new scene selection occurs—the GRAFIK Eye Control Unit does not store them as permanent scene settings.

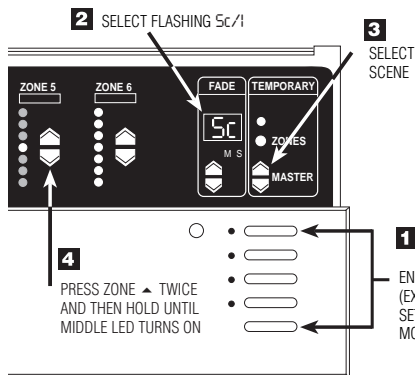
Advanced Scene Programming Options—OPTIONAL



Programming Scenes 5 through 16.

- 1. Enter setup mode.** Press and hold Scene 1 and OFF buttons about 3 seconds until scene LEDs start cycling.
- 2. Select Sc** (the code for scene setup) by pressing FADE ▲ twice. Sc and 1 (for Scene 1) will alternately flash in the FADE window.
- 3. Select scene.** Press MASTER ▲ or ▼ to select the scene to be programmed.
- 4. Adjust ZONE-intensity.**
 - 4100** - Press ZONE ▲ or ▼ to adjust zone's intensity.
 - 4500** - Press ZONE ▲ or ▼ to display exact percentage light output. Press again to adjust light levels in 1% increments.
- 5. Set scene's FADE-in time.** Press and hold the TEMPORARY ZONES button. The current FADE-in time is displayed. Adjust using the FADE ▲ and ▼ while still holding the TEMPORARY ZONES button.
- 6. Exit setup mode.** Press and hold Scene 1 and OFF buttons until LEDs stop cycling.

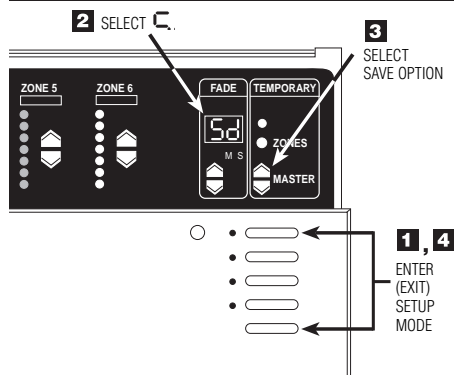
How to set an “unaffected zone” — OPTIONAL



You can set up a zone to be “unaffected” when a certain scene is selected. (The unaffected zone’s light levels remain unchanged when the new specified scene is selected.)

- 1. Enter setup mode.** Press and hold Scene 1 and OFF buttons about 3 seconds until scene LEDs start cycling.
- 2. Select Sc** (the code for scene setup) by pressing FADE ▲ twice. Sc and 1 (for scene 1) will alternately flash in the FADE window.
- 3. Select scene.** Press MASTER ▲ and ▼ to select the scene that will have the unaffected zone.
- 4. Program any ZONE as unaffected.** Press ZONE ▼ twice and then hold until all the bargraph LEDs go out and the middle LED lights. (It may take up to 10 seconds after the last LED goes out until the middle LED lights.) This zone’s light levels will no longer be affected when this scene is selected. Note that you can set up several zones to be unaffected in a scene.
- 5. Exit setup mode.** Press and hold Scene 1 and OFF buttons until LEDs stop cycling.

How to set Save Options — OPTIONAL



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 ▲ until Sd is displayed in the FADE window.
- 3. Select Save Options.** Press MASTER ▲ and ▼ 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.
 - Sc **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 ▲ or ▼ 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.

Troubleshooting

If the GRAFIK Eye lighting controls in your project aren't working as specified . . .

- Review carefully the GRAFIK Eye submittal documentation prepared for your project.
- Consult the chart below to identify and correct the problem.

Problem	Cause	Remedy
Unit does not turn lights on	Breaker/MCB is off Long fade time Low zone settings Miswire System short circuit System overload	Switch breaker/MCB on. Set FADE time to 0 seconds. Use zone ▲ for each scene. Check wiring (refer to wiring details). Find and correct shorts in fixtures and/or wallbox. Make sure lighting loads don't exceed Unit's maximum rated load.
Unit does not control load ZONE control does not work	Miswire Disconnected wires Burned-out lamps Load in Bypass	Check wiring (refer to wiring details). Connect zone wires to loads (refer to wiring details). Replace bad lamps. Complete Lighting Control Panel set up.
1 or more zones are "full-on" when any scene is on and zone intensity is not adjustable (and zone is not a non-dim)	Miswire Shorted triac	Make sure loads are connected to the right zones (refer to wiring details). Replace Control Unit.
A ZONE control affects more than one zone	Miswire	Check wiring (refer to wiring detail).
Wallstation does not function properly	Miswire or loose connection Wallstation not set up properly	Check and tighten loose connections at terminals on Control Unit and Wallstations. Confirm programming.
Unit does not allow scene changes or zone adjustments	Unit may be set to an optional Save Option.	Refer to page 6 for Save Options.

Warranty

Lutron warrants each new unit to be free from defects in materials and workmanship and to perform under normal use and service. This warranty shall run only for a period of one year from the date of purchase and Lutron's obligations under this warranty are limited to remedying any defect or replacing any defective part and shall be effective only if the defective unit is shipped to Lutron postage prepaid within 12 months after purchase. Damage due to abuse, misuse, inadequate wiring or installation is not covered by this warranty. In no event shall Lutron or any other seller be liable for any other loss or damage, including consequential or special damages that may arise through the use by a purchaser or others of this device and the purchaser assumes and will hold harmless Lutron in respect of all such loss. Although every attempt is made to ensure that catalogue information is accurate and up-to-date, please check with Lutron before specifying or purchasing this equipment to confirm availability, exact specifications and suitability for your application. This product may be covered by one or more of the following U.S. patents: 4,797,599; 4,803,380; 4,825,075; 4,893,062; 5,030,893; 5,191,265; 5,430,356; 5,463,286; 5,530,322; 5,808,417; DES 308,647; DES 310,349; DES 311,170; DES 311,371; DES 311,382; DES 311,485; DES 311,678; DES 313,738; DES 335,867; DES 344,264; DES 370,663; DES 378,814 and corresponding foreign patents. U.S. and foreign patents pending. Lutron and GRAFIK Eye are registered trademarks of Lutron Electronics Co., Inc. © 1999 Lutron Electronics Co., Inc.



Safety standards listed above apply to one or more products in the GRAFIK Eye product line. Consult factory for specific information.

LUTRON-Quality Systems Registered to ISO 9001

WORLD HEADQUARTERS

Lutron Electronics Co. Inc.
7200 Suter Road
Coopersburg, PA 18036-1299 U.S.A.
TOLL FREE: (800) 523-9466 (U.S.A., Canada, Caribbean)
Tel: (610) 282-3800; International 1 610 282-3800
Fax: (610) 282-3090; International 1 610 282-3090

GREAT BRITAIN

Lutron EA Ltd.
Wapping, London
Tel: (171) 702-0657; International 44 171 702-0657
Fax: (171) 480-6899; International 44 171 480-6899

GERMANY

Lutron Electronics GmbH BCA
Berlin, Germany
Tel: (309) 710-4590; International 49 309 710-4590
Fax: (309) 710-4591; International 49 309 710-4591

ASIAN HEADQUARTERS

Lutron Asuka Corporation.
Minato-ku, Tokyo Japan
Tel: (03) 5405-7333; International 81-3-5405-7333
Fax: (03) 5405-7496; International 81-3-5405-7496

HONG KONG SALES OFFICE

Lutron GL Ltd.
Central, Hong Kong
Tel: 2104-7733; International 852-2104-7733
Fax: 2104-7633; International 852-2104-7633

SINGAPORE SALES OFFICE

Lutron GL Ltd.
Singapore 053326
Tel: 220-4666; International 65-220-4666
Fax: 220-4333; International 65-220-4333

Lutron Electronics, Co., Inc., reserves the right to make improvements or changes in 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.

