

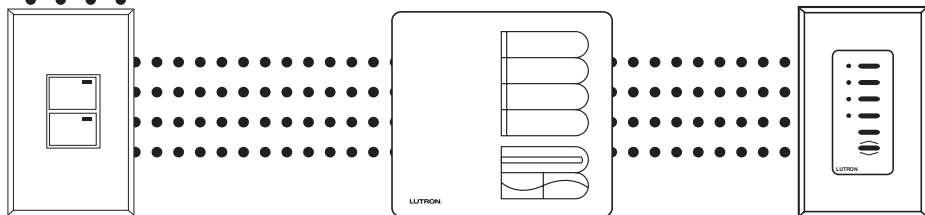
GRAFIK : : : :
integrale™

GXI-3000 Installer's Guide

PLEASE LEAVE FOR OCCUPANT



GRAFIK Integrale™ Control Units supply power to, and control the brightness of four zones of lighting. *GRAFIK Integrale* 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!



IMPORTANT! *GRAFIK Integrale* lighting controls must be installed by a qualified electrician in accordance with all applicable regulations. Improper wiring can result in personal injury or damage to *GRAFIK Integrale* lighting controls or other equipment. Always turn off circuit breaker/MCB (Main Circuit Breaker) or remove main fuse from power line before doing any work. To avoid overheating and possible damage to equipment, do not install dimming devices to dim receptacles, motor-operated appliances, or fluorescent lighting not equipped with 0-10V, DSI, or DALI dimming ballasts. In dimmed magnetic low-voltage circuits, you can prevent transformer overheating and failure by avoiding excessively high current flow: Do not operate *GRAFIK Integrale* lighting controls with any lamps removed or burned out; Replace any burned out lamps immediately; When using magnetic transformers, choose models that incorporate thermal protection or fused primary windings. This lighting control is designed for residential and commercial use. GRAFIK Systems Controls are designed for in-door use only.

LUTRON.
LIGHTING CONTROL

Do you have:	Then read this on page:
Control Unit only? Follow Step 1 and Step 3	STEP 1: Installing GXI-3000 Control Units How to wire and mount <i>GRAFIK Integrale</i> Control Units.	3
Accessory Controls too?	STEP 2: Installing Accessory Controls DIP switch address settings, wiring, and mounting.	4
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Questions? Need technical assistance? Phone Assistance . . . Worldwide!

- **In Europe:** 44-207-702-0657
- **In France:** 33-1-44-70-71-86
- **In Germany:** 49-309-710-4590
- **Website address:** www.lutron.com
- **E-mail:** product@lutron.com
- **In the U.S., Canada and the Caribbean:** 1-800-523-9466, 1-610-282-3800
- **In Mexico, Central and South America:** 1-610-282-3800
- **In Japan:** 03-5405-7333
- **In Hong Kong:** 2104-7733

LIMITED WARRANTY

Lutron will, at its option, repair or replace any unit that is defective in materials or manufacture within one year after purchase. For warranty service, return unit to place of purchase or mail to Lutron at 7200 Suter Rd., Coopersburg, PA 18036-1299, postage pre-paid.

This warranty is in lieu of all other express warranties, and the implied warranty of merchantability is limited to one year from purchase. This warranty does not cover the cost of installation, removal or reinstallation, or damage resulting from misuse, abuse, or improper or incorrect repair, or damage from improper wiring or installation. This warranty does not cover incidental or consequential damages. Lutron's liability on any claim for damages arising out of or in connection with the manufacture, sale, installation, delivery, or use of the unit shall never exceed the purchase price of the unit.

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state. Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

This product may be covered under one or more of the following U.S. patents: 4,797,599; 4,803,380; 4,835,343; 4,893,062; 4,924,151; 5,038,081; 5,187,655; 5,191,265; 5,309,081; 5,430,356; 5,463,286; 5,530,322; 5,633,540; 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 317,593; DES 325,728; DES 335,867; DES 344,264; DES 370,663; DES 378,814 and corresponding patents of other countries.

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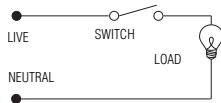
STEP 1: Installing Control Units

This section shows how to install Control Units and make sure they are properly operating all connected loads.

CAUTION!

First test loads for short circuits.

1. Turn power OFF at the breaker/MCB panel or fuse box.
2. Connect standard light switch between live lead and the load wire to test circuit.
3. Turn power on and check for short or open circuits: If load does not operate, circuit is open. If the breaker/MCB trips (fuse blows or opens), circuit is shorted. Correct short or open circuits and test again.



Load Types

The Control Units can control incandescent, electronic low-voltage, magnetic low-voltage, 0-10V, DSI, and DALI (intensity broadcast only) ballasts, and neon/cold cathode load types.

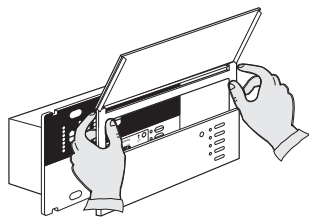
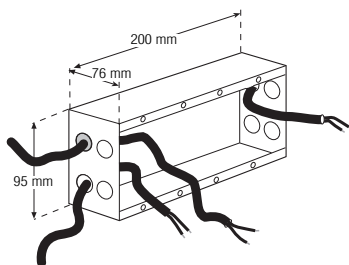
- Not all zones need to be connected; however, connected zones must have a load of at least 40W .
- No one zone may be loaded with more than 800W on the power side*.
- Any one ballast zone output of the *GRAFIK Integrale* Control Unit can handle a maximum of 20 ballasts.
- Unit must not carry more than 10A (2300W/VA) of total lighting load.
- For all low-voltage dimming, check with the transformer's manufacturer that the product is capable of dimming.

* In-rush current must NOT exceed the circuit breaker's maximum rating.

Installation instructions. First, turn power off.

Preparation

1. **Mount Wallbox.** Use the Lutron wallbox, P/N 241-400 or 241-691 (old work metal wallbox). See diagram to the right for dimensions) Always allow at least 110 mm clearance above and below the faceplate to ensure proper heat dissipation.
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.



Line Voltage/Mains Wiring

IMPORTANT WIRING NOTES!

- Use properly certified cable for all line voltage/mains cables and PELV cables.
- In Europe, acceptable types of cable include HAR certified cable with insulated cores enclosed in a sheath. This cable must bear the appropriate certification mark pertaining to national wiring rules for fixed installations. If certified cable with insulated cores enclosed in a sheath is used for the power cables, the PELV wiring can be any of the specified cables in **Appendix A: More about PELV Wiring**.
- Proper short-circuit and overload protection must be provided at the distribution panel. You can use up to a 10A maximum circuit breaker/MCB or equivalent (tripping curve C according to IEC60898/EN60898 is recommended) with adequate short-circuit breaking capacity for your installation.
- Install in accordance with all local and national electrical codes.
- **CAUTION!** Do not connect line voltage/mains cable to PELV terminals.
- Earth/Ground terminal connection must be made as shown in wiring diagrams.

- Do not mix different load types on the same zone!
- Total unit loads that exceed the unit capacity require power boosters. Refer to Appendix C.

Wire the Control Unit (see Page 15)

1. Strip 8 mm insulation from all wires (ballast control outputs - strip 6 mm) in wallbox and connect them to appropriate terminals on the back of the Control Units. The recommended maximum installation torque is 0.5 N•m for all connections. Each power terminal can accept up to two 2.5 mm² wires (Does not apply to PELV terminal block.)

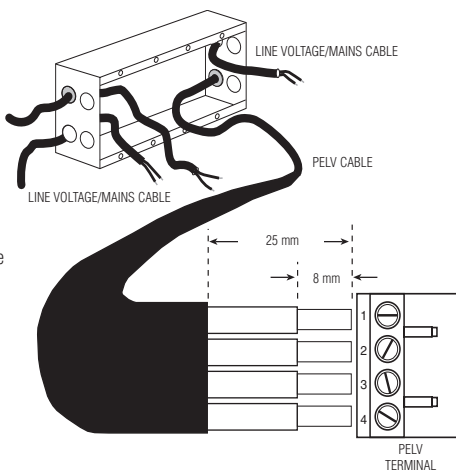
PELV Wiring

Connect PELV wiring *only* if your project has Accessory Controls and/or more than one Control Unit.

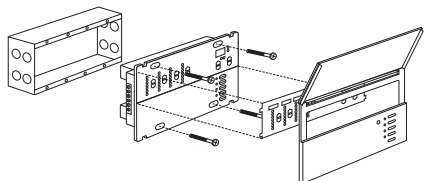
Use recommended cable as specified in **Appendix A: More About PELV Wiring**.

Wiring Note

- Use the rearmost knockouts when pulling wires into the wallbox. This will provide the most clearance when mounting the Control Unit.
1. Strip 25 mm of insulation from the PELV cable.
 2. Strip 8 mm of insulation from each wire.
 3. **Connect the PELV wires to the PELV terminal block.** Make sure no bare wire is exposed after making connections. The recommended installation torque is 0.5 N•m for PELV connections.
 4. The PELV cable and terminal block should be separated from line voltage/mains cables by at least 7 mm.



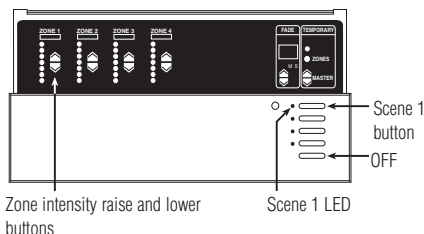
Mounting



1. Mount as shown using the four screws provided. (When mounted in the wallbox, the PELV cable and terminal block should remain separated from the line voltage/mains cables.)
2. Reattach the faceplate to the Control Unit by pushing inward at each corner.

Testing: Do the lights work?

1. **Restore Power.**
2. **Press Scene 1 button** on front of the *GRAFIK Integrale* Control Unit. The Scene 1 LED will light.
3. **Press zone ▲ or ▼** to turn the lights on and off. The zones will not dim until the zone's load types have been set (see pg. 6). Make sure connected loads respond. If not, Refer to **Appendix E: Troubleshooting**, or call Lutron.



STEP 2: Installing Accessory Controls

IMPORTANT WIRING NOTES!

Review Appendix A **BEFORE** wiring!

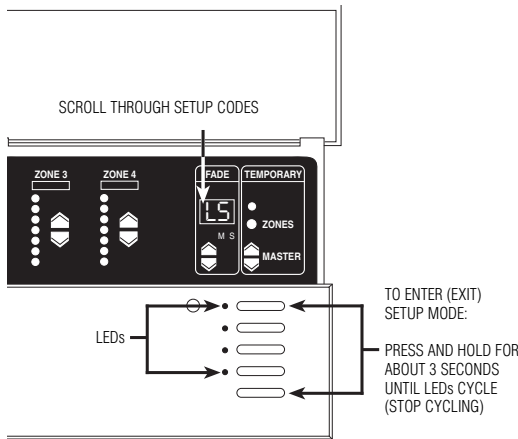
- Accessory Controls must be installed by a qualified electrician.
- Accessory Controls use PELV wiring methods as applicable in your locale.
 - **Using PELV wiring methods:** Accessory Controls that are connected to terminals 1—4 must always meet the requirements of DIN VDE 0100 Part 410 and IEC 60364-4-41 for PELV circuits. See "What is PELV?" in Appendix A.
- Accessory Controls must be mounted in a wallbox. Please refer to instruction sheet included with each Accessory Control to determine wallbox requirements.

Examples of Accessory Controls

EGRX-4S*	European Style 4S Control
EGRX-4S-IR*	European Style 4S Control/Infrared Receiver
seeTouch™ Controls	
SG-2B	Entrance/Special Function Control
SG-4S	Scene Selection Control with Raise/Lower
SG-4SIR	Scene Selection Control/Infrared Receiver
SG-4B	Scene Selection Control
SG-4M	Master Control
SG-4PS	Partition Control
GRX-CIR*	Infrared Ceiling Receiver
GRX-4S-DW*	Architrave™ Door Jamb Control
GRX-AV*	Interface Control
GRX-RS232*	RS-232 Interface Control
GRX-PRG*	Personal Computer Interface
GRX-IT/GRX-8IT	Infrared Handheld Transmitter (see Appendix D)

...and more!

STEP 3: Setting Up *GRAFIK Integrale* Control Units



This section shows how to set up a *GRAFIK Integrale* 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 Integrale* 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.

How to enter and exit setup mode

To enter setup mode: Press and hold the Scene 1 and OFF button for about three seconds, until the scene LEDs start cycling.

To exit setup mode: Exit setup mode the same way you entered it. Press and hold the Scene 1 and OFF button for about 3 seconds, until scene LEDs stop cycling. The Control Unit is out of setup mode; back in normal operating mode.

In setup mode, the FADE window displays the setup codes. To scroll through the menu of setup codes, press the FADE ▲ or ▼ buttons.

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

Code	Stands for	Description
Sd	Save Options	Select from several save options (p. 9)
Sc	Scene	Set unaffected zones and set any of the 16 scenes (p. 9)
R-	Address	Identify Control Units when setting up system communications (p. 10)
LS*	Load Select	Identify load type (p. 7)
LE	Low End	Set low end trim (p. 8)
HE	High End	Set high end trim (p. 8)

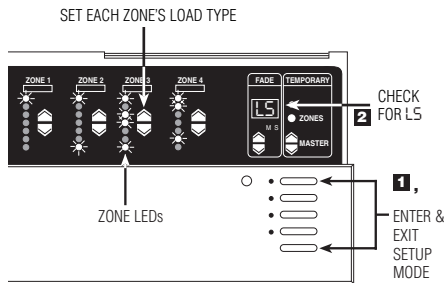
*When you enter setup mode, this code appears first.

- If you press FADE ▲, you will see R-, Sc, then Sd.
- If you press FADE ▼, you will see LE, then HE.

Identifying and setting the load type for each zone



CAUTION! Lutron ships *GRAFIK Integrale* Control Units with all zones set for non-dim. To set load types, follow these steps:

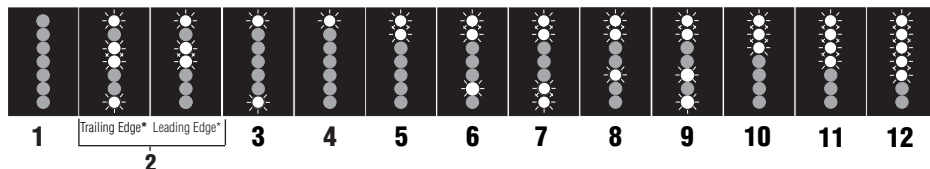


- 1. Enter setup mode.** Press and hold Scene 1 and OFF buttons for about 3 seconds, until scene LEDs cycle.
- 2. Check for LS in FADE window.** (LS is the first code to appear when you enter setup mode)
- 3. Set each zone's load type.** Press ZONE ▲ and ▼ until ZONE LEDs match the load type connected to each zone. Refer to chart on next page.
- 4. Exit setup mode.** Press and hold Scene 1 and OFF buttons for about 3 seconds, until scene LEDs stop cycling.

In the 4-Zone Control Unit shown here:

- Zone 1 is set for Magnetic Low-Voltage.
- Zone 2 is set for ELV/Incandescent/GRX-ELVI.
- Zone 3 is set for Auto Phase (trailing edge).
- Zone 4 is set for 0-10V.

Zone LED Settings for Each Load Type

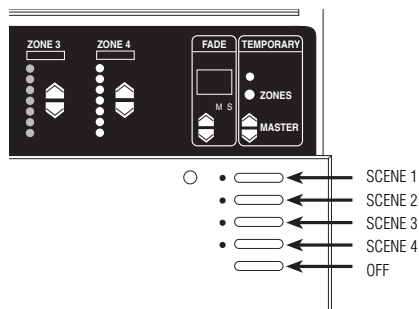


* **Note:** LEDs 1, 3 and 4 will light when initially setting the Auto Phase Load Type. The *GRAFIK Integrale* Control Unit will determine whether Leading/Trailing Edge dimming is used. If it is Trailing Edge, the bottom LED will light as well.

Load Type Settings:

- 1. Unassigned/Non-Dim** - This setting is the default for GXI Control Units (must be changed once installed for dimmable loads).
- 2. Auto Phase** - This setting uses Reverse/Trailing Edge dimming by default. If a magnetic or inductive load is connected, the zone will automatically switch to Forward/Leading Edge dimming. **Do not mix electronic and magnetic transformers on the same zone.**
- 3. Electronic Low Voltage(ELV)/Incandescent/GRX-ELVI** - This setting is used when controlling dimmable ELV transformers, incandescent lamps, and GRX-ELVI booster interfaces. **Do not use on magnetic or inductive loads.**
- 4. Magnetic Low Voltage(MLV)** - This setting is used when controlling dimmable MLV transformers and GRX-PB power booster interfaces. **Do not use on incandescent or ELV loads.**
- 5. GRX-TVI** - This setting is used with a GRX-TVI interface for a large number of 0-10V ballasts.
- 6. 0-10V** - This setting is used when dimming 0-10V ballasts (max 20 ballasts/zone).
- 7. DSI** - This setting is used when dimming DSI compatible ballasts (max 20 ballasts per zone output).
- 8. DALI** - This setting is used when dimming DALI (intensity broadcast only) ballasts (max 20 ballasts per zone output).
- 9. PWM** - This setting is used when dimming PWM ballasts (max 20 ballasts/zone).
- 10. Neon** - This setting should be used when dimming *magnetic neon* transformers. Use the ELV load type for *electronic neon* transformers.
- 11. LOFO Non-Dim** - This setting should be used for any lights to be switched On and Off only. This load type will be the **Last** to switch **On** and the **First** to switch **Off**.
- 12. FOFO Non-Dim** - This setting should be used for any lights to be switched On and Off only. This load type will be the **First** to switch **On** and the **First** to switch **Off**.

What is a scene?



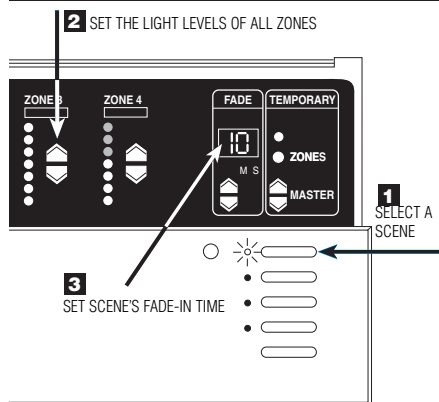
Scenes are the preset light levels and fade times stored in the Control Unit. To create a scene, set the appropriate intensity for each ZONE. To recall a scene, simply press one of the buttons. The first button calls up Scene 1; the second, Scene 2; and so on. The last button turns lights Off.

For example, typical scene settings for a lounge might be:

SCENE	ACTIVITY OR EVENT	LIGHT LEVELS FOR ZONES			
		Cove Lights	Hanging Lights	Down Lights	Scenes
1	General use	70%	10%	20%	20%
2	Entertaining	80%	25%	90%	40%
3	Reading	10%	60%	40%	0%
4	TV	20%	0%	30%	20%

Scenes 1—4 can be selected on the Control Unit. However, all 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: Control Unit must be in *Sc* mode. See page 9 for more information regarding Save Options.

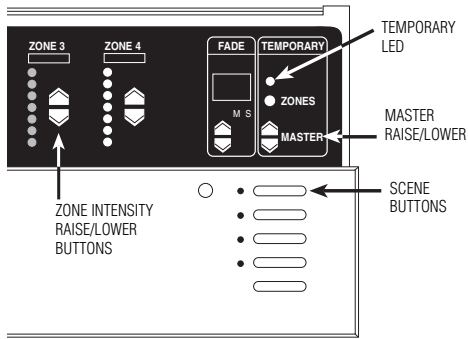
To set up scenes 1 through 4:

- 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 4 is set to 60%.) To program scenes 5 through 16, refer to page 8.
- 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.)

* 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.

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



Control Unit must be in either **5c** or **5b** 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.

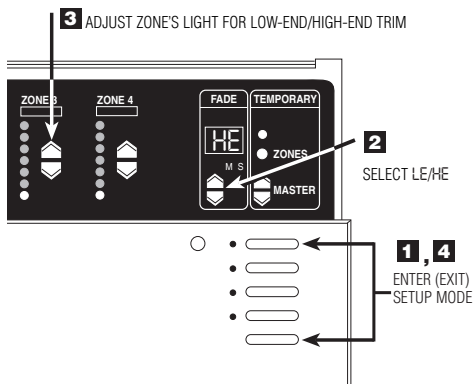
To adjust a zone:

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 Integrale* Control Unit does not store them as permanent scene settings.

How to set low-end / high-end trim—OPTIONAL



HIGH-END TRIM ADJUSTMENT SHOWN IN THIS EXAMPLE

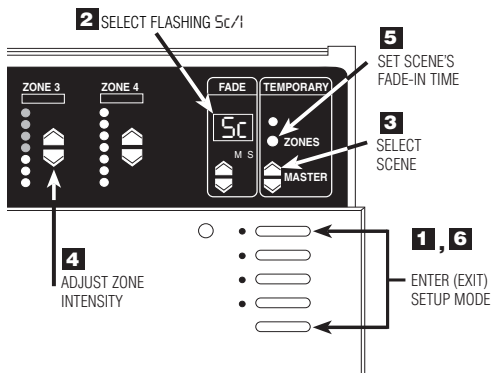
* Except zones set for non-dim. For these, all zone LEDs are off, and you cannot adjust the low-end/high-end trim.

If necessary, adjust the low-end/high-end trim to achieve uniform low-intensity/high intensity dimming and to eliminate flicker for low-end trimming (especially neon/cold-cathode and fluorescent loads).

- 1. Enter setup mode.** Press and hold Scene 1 and OFF buttons for about 3 seconds, until scene LEDs start cycling.
- 2. Select LE** (for low-end) by pressing **FADE ▼** once. Press **FADE ▼** twice to select **HE** (for high-end). For low-end trim, all zones go to their lowest possible dim levels and only their bottom LED is lit*. For high-end trim, all zones go to their highest possible dim levels and all LEDs are lit.
- 3. Adjust zone's lights for low-end/high-end trim.** Use **ZONE ▼** and **▲** for low-end trim to dim the zone's lights as much as possible without causing flicker. This setting becomes the "optimum lowest level" to which the zone will dim before going off. Repeat this process for high-end trim to adjust the maximum dim level as required.
- 4. Exit setup mode.** Press and hold Scene 1 and OFF buttons until scene LEDs stop cycling.

Note: The ZONE LED bargraph does not change while you make low-end/high-end trim adjustments.

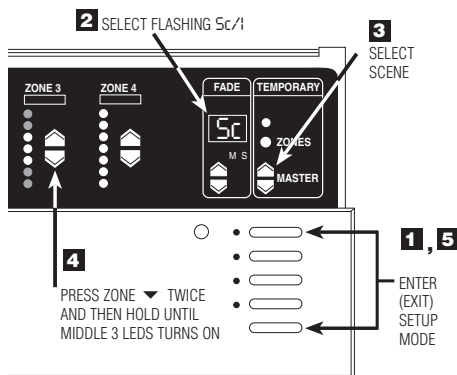
Advanced Scene Programming Options—OPTIONAL



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 **.!** (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.** - Press **ZONE ▲** or **▼** to adjust zone's intensity.
- 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.

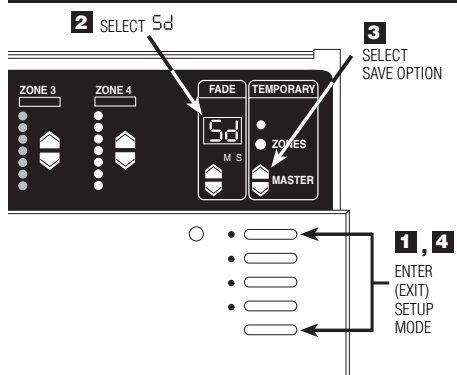
How to set an “unaffected zone” — OPTIONAL



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 3 middle LEDs light (it may take up to 10 seconds after the last LED goes out until the middle LEDs light). 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 Integrale* Control Unit allows 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.
 - Sr 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.

STEP 4: Setting Up System Communications

This section shows how to set up communications between Wallstations and the Control Units they should operate.

Do not set up communications . . .

- If you have only one Control Unit and . . .
 - you have up to three of the following Wallstations: NTGRX-4S, -4B, -4S-IR, -4S-DW, or EGRX-4S, -4S-IR, in any combination.

Close this manual and relax — your project will work as specified without any further wiring or setup!

Do set up communications . . .

- If you have more than one Control Unit or . . .
- You have Wallstations other than the NTGRX-4S, -4B, -4S-IR, -4S-DW, or EGRX-4S, -4S-IR.

IMPORTANT!

First check PELV wiring.

Before you set up communications, make sure your PELV system interconnections are working.

- Select Scene 1 (press the top button) on one of the Control Units.
- Is Scene 1 selected on all other Control Units and EGRX-4S-IR controls?

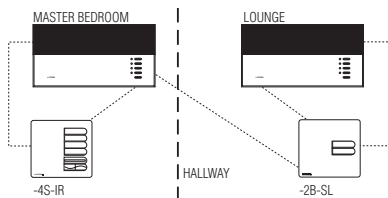
YES: PELV wiring is OK. Proceed.

NO: PELV wiring has a miswire. Check for loose connections, shorted or crossed links. Refer to Appendix A for details on PELV wiring.

OR

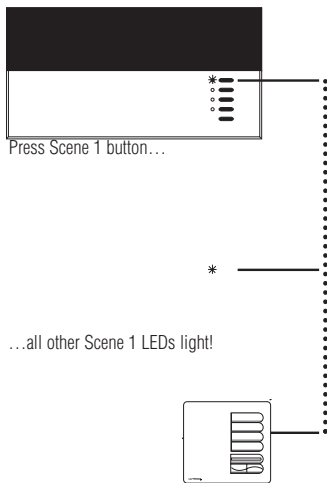
GRAFIK *Integrale* Control Unit has been addressed to other than R- (factory default). See below for more information on addressing Control Units.

Why do you set up communications?

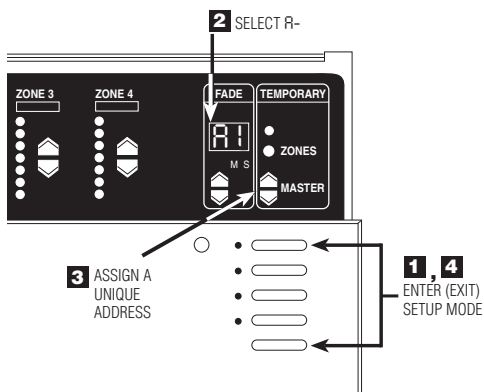


This diagram shows how Wallstations “talk” to Control Units in a typical residential project:

- The EGRX-2B-SL in the hallway turns lights on and off in the master bedroom and lounge. To do this, the -2B-SL “talks” to the Control Units in both of these rooms.
- The EGRX-4S-IR Scene Selection Control in the master bedroom allows you to choose four different lighting scenes. To do this, the -4S-IR “talks” to the master bedroom’s Control Unit (but **not** to the Lounge’s Control Unit).



Assign addresses to GRAFIK *Integrale* Control Units



Assign each GRAFIK *Integrale* Control Unit in your project a unique system address (R1 through R8).

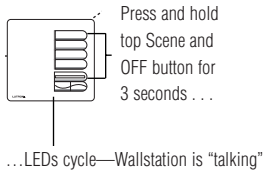
To assign an address:

- 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 *Integrale* Control Unit.

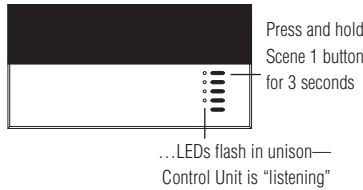
Set up a Wallstation to “talk” to a “listening” Control Unit

In order for Wallstation to communicate with a Control Unit, each Wallstation must be individually configured to “talk.”

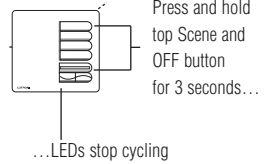
1. Enter setup mode.



2. Make the Control Unit “listen.”



3. Take the Wallstation out of setup mode.



The communication link is now established. The Control Unit will “listen” when the user presses a button on the Wallstation. You can proceed to the next Wallstation and set up its communications.

For more specific, step-by-step instructions about setting up communications for each type of GRAFIK Systems Wallstation, please refer to the instructions included with each Wallstation.

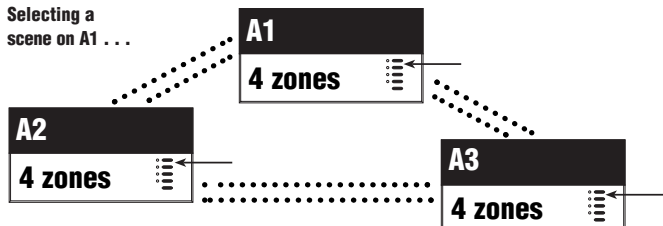
Set up 2-way communication between 2 Control Units

This page explains how to use 2-way communications to set up lighting effects for more than four zones (the maximum number of zones any one GRAFIK Integrale Control Unit can operate).

When you set up two-way communications between Control Units, selecting a scene at any one of these Units automatically activates the same scene in the others. By linking eight 4-Zone Control Units, you can create scenes that control the intensity of up to 32 zones. This “large-zone” capability is ideal for large spaces with dramatic lighting that changes frequently (e.g., churches).

For example: 12-Zone Control

Selecting a scene on A1 ...



... Activates the same scene on A2 and A3.

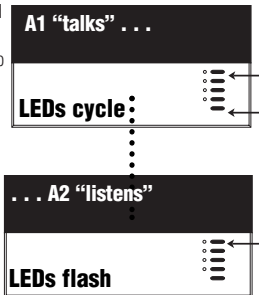
Linked by two-way communications, these Control Units act like a 12-Zone Control Unit. Note that you must set up communications *both* ways among *all* Control Units:

- A1 “talks” to A2 and A3 — and “listens” to them as well.
- A2 “talks” and “listens” to A1 and A3.
- A3 “talks” and “listens” to A1 and A2.

Make sure you have addressed the Control Units (as described on page 10) before setting up two-way communications.

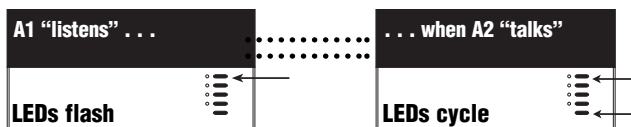
Set up communications in one direction...

1. **Put A1 in setup mode.** Press and hold Scene 1 and OFF buttons for about 3 seconds, until LEDs cycle.
2. **Identify the Control Units to “listen”** (A2 and up to 6 others). Press and hold the Scene 1 button for about 3 seconds until LEDs flash in unison, showing that these Control Unit(s) are “listening” to A1. (To make a “listening” Control Unit not listen to A1: Put A1 in setup mode, then press the “listening” Control Unit’s OFF button until the LEDs stop flashing.)
3. **Take A1 out of setup mode.** Press and hold Scene 1 and OFF buttons for about 3 seconds, until LEDs on A1, and all other linked Control Unit(s), stop cycling. You have set up communications in one direction between A1 and all “listening” Control Units.



...then the other.

4. To complete the two-way communication, reverse the process described above: Put A2 in setup mode; then make A1 (and any other Control Units) “listen”; then take A2 out of setup mode.



Appendix A: More about PELV Wiring

This appendix explains the PELV wiring used to carry communications between *GRAFIK Integrale* Control Units and Wallstations.

Lutron requires that you connect (daisy-chain) all *GRAFIK Integrale* 3000 Series Control Units and Wallstations with two twisted pair for operation. If shielded wire is used, the drain wires must be connected to each other or to Terminal D, if present. Drain wires should not be connected to Earth/Ground.

- One pair is for the low-voltage power wiring that enables each *GRAFIK Integrale* Control Unit to supply power to up to three Wallstations. Connect this twisted pair to terminals 1 (COMMON) and 2 (12VDC). Terminate the 12VDC power to ensure that each Control Unit powers **no more than three Wallstations**.
- The second pair is for a data link (up to 610 m long) that enables Wallstations to communicate with *GRAFIK Integrale* Control Units. Connect this twisted pair to terminals 3 (MUX) and 4 (MUX) of every Control Unit and Wallstation.

Each twisted pair in the PELV wiring link should consist of two 1.0 mm² stranded conductors.

- Lutron offers a one-cable (non-plenum), low-voltage solution. Please ask for P/N GRX-CBL-346S.**

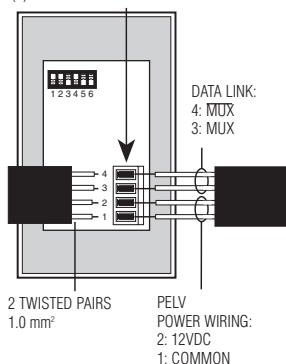
Recommended unshielded cables:

- For non-plenum installations, use (2) Belden 9470, (1) Belden 9156, or (2) Liberty 181P/2C-EX-GRN, or equivalent.
- For plenum installations, use (2) Belden 82740, or equivalent.

Wallstation circuits are classified as PELV circuits (IEC). Unless otherwise specified, the voltages do not exceed 24VAC or 15VDC. 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 comply with the requirements for PELV circuits as applicable in your country.

The *GRAFIK Integrale* 3000 Series Control Unit PELV circuit is 12VDC.

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



What is PELV?

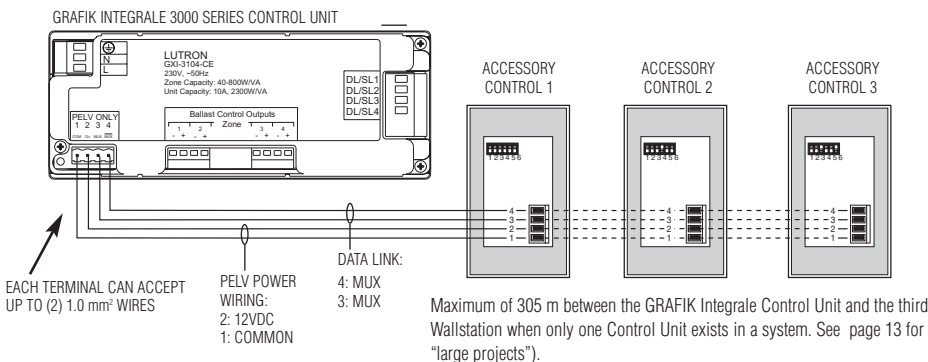
In countries that abide by the IEC regulations, PELV is commonly referred to as Protective Extra-Low Voltage. A PELV circuit is an earthed circuit in which the voltage cannot exceed 50VAC or 120V ripple-free DC. The power source must be supplied by a safety isolating transformer or equivalent.

IMPORTANT WIRING NOTE!

Proper separation is required between the Line Voltage/Mains cables and PELV cables. Use certified cable for all Line Voltage/Mains cables and PELV cables. Cable bearing HAR or national certification marks are acceptable, provided it covers all applicable wiring regulations for fixed installations. See Important Wiring Note on page 3.

Small project: A Control Unit with up to three Wallstations

Each Control Unit can power up to three Wallstations.

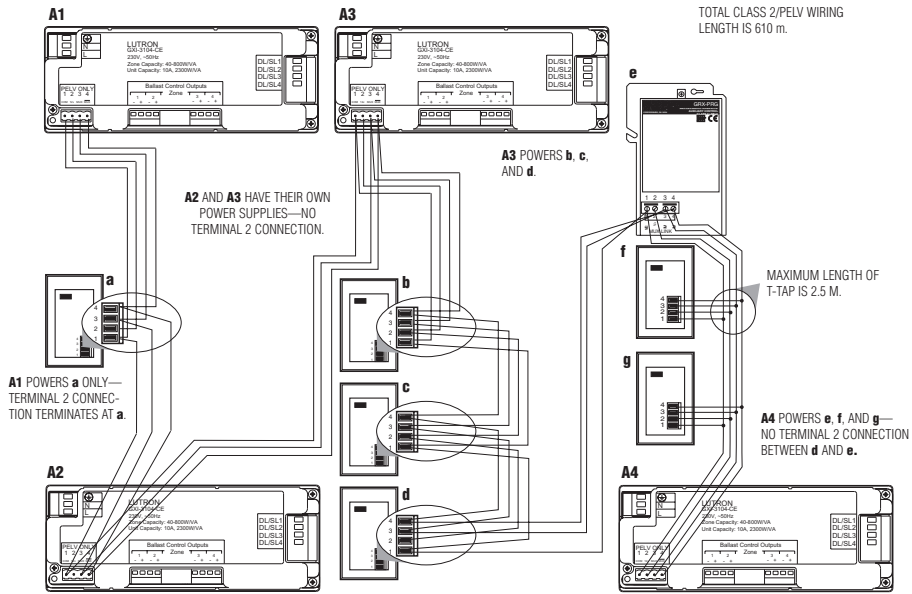


IMPORTANT WIRING NOTES!

- Daisy-chain the terminal 1, terminal 2, terminal 3, and terminal 4 connections to all Control Units and Wallstations. The Control Unit has *its own* power supply.
- Each Control Unit can power up to three Wallstations. If you need to power more than three Wallstations from one Control Unit, install an external 12VDC power supply.
- Lutron recommends that all connections be made in the unit wallbox. Remote connection must be in a switchbox or junction box with a maximum wire length of 2.4 m from the link to the connected unit.

Note: Do not allow PELV wires to contact line/mains wires. Refer to PELV wiring on page 4.

Large project: Up to 8 Control Units and 16 Accessory Controls



IMPORTANT WIRING NOTES!

1. Daisy-chain the terminal 1, terminal 3, and terminal 4 connections to all Control Units and Wallstations. Each Control Unit has *its own* power supply. Terminate the terminal 2 connection (12VDC power) so that:
 - Each Control Unit supplies power to a *maximum* of three Wallstations.
 - Each Wallstation receives power from only *one* Control Unit.
2. Lutron recommends that all connections be made in the Control Unit's wallbox. Remote connection must be in a switchbox or junction box with a maximum wire length of 2.5 m from the link to the connected unit.

Note: Do not allow PELV wires to contact line/mains wires. Refer to PELV wiring on page 2.

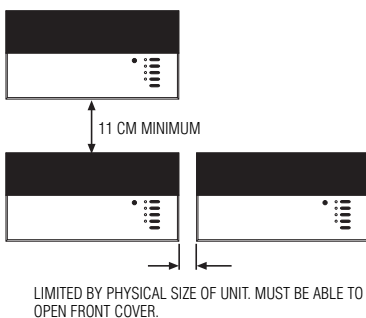
Appendix B: Special Mounting Considerations

Wallbox Mounting

Spacing of the GRAFIK Integrale 3000 Series Control Unit

When mounting multiple GRAFIK Integrale 3000 Series Control Units near each other, the following spacing and ventilation guidelines are required for proper operation.

1. All GRAFIK Integrale 3000 Series Control Units **MUST** be mounted in a Lutron Wallbox., P/N 241-400.
 - For Power Boosters, Fluorescent Boosters, and Electronic Low-Voltage boosters, use two P/N 241-519 single-gang wallboxes.
2. All GRAFIK Integrale 3000 Series Control Units, Power Boosters, Fluorescent Boosters, and Electronic Low-Voltage Boosters **MUST** have 11 cm of space above and below the faceplate to dissipate the heat caused by normal operation.



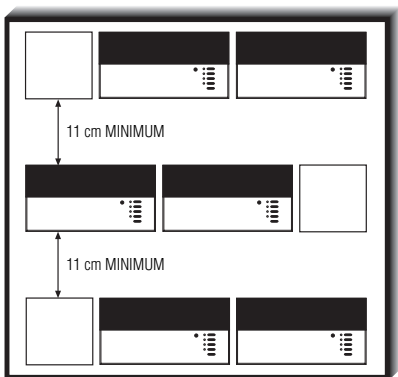
Panel Mounting

- The enclosure must be in accordance with all local and national electrical codes.
- Lutron does not recommend using a door to enclose the front of a panel, since this restricts airflow to the GRAFIK Integrale 3000 Series Control Units and Booster Devices.
- If mounting multiple GRAFIK Integrale 3000 Series Control Units or Booster Units in an enclosure:
 1. Ambient temperature within an enclosure **MUST remain between 0°—40° C.**
 2. If not mounting in a metal enclosure, all units **MUST** be mounted in a wallbox. Refer to Wallbox Mounting above.
- To improve heat dissipation of Booster Units, (i.e., NGRX-PB, GRX-ELVI, etc.), remove the faceplate from the unit.

IMPORTANT NOTE:

GRAFIK Integrale 3000 Series Control Units and Booster Units, such as NGRX-PB, dissipate heat when operating.

Obstructing these units can cause malfunction to both the Control Unit and the Booster Unit if ambient temperature does not remain between 0°—40° C.



Appendix C: Power Boosters

This "load-side" equipment installs on the zone wiring between the Control Unit and the lighting load.

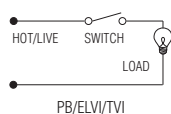
The **PB** increases a Control Unit's zone load capacity for Incandescent/Halogen (Tungsten), Magnetic Low Voltage, and Neon/Cold Cathode load types.

The **ELVI** enables a zone of the Control Unit to increase zone capacity for electronic low-voltage loads.

The **TVI** increases the number of 0-10V ballasts that a Integrale Control Unit can control.

CAUTION! Test load for short circuits.

- Turn power off.
- PB/ELVI/TVI: Connect standard switch between hot/live lead and the load wire to test circuit.
- Turn power on and check for short or open circuits.



Wiring instructions (see pg. 15)

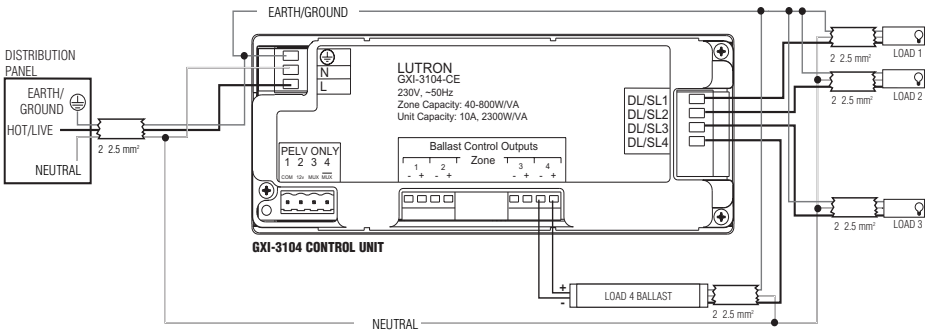
1. Turn off power to the Control Unit and the feed to the PB or ELVI!
2. Mount 2-gang wallbox: 87.5 mm deep recommended, 68.75 mm deep minimum. When mounting several units in a vertical layout (one underneath the other), allow at least 11 cm between units.
3. Strip 13 mm insulation from 2.5 mm² 75 °C copper (CU) wires and connect as shown. **Please see the Instruction Sheet supplied with the unit for more detailed wiring diagrams.**

Maximum Rating

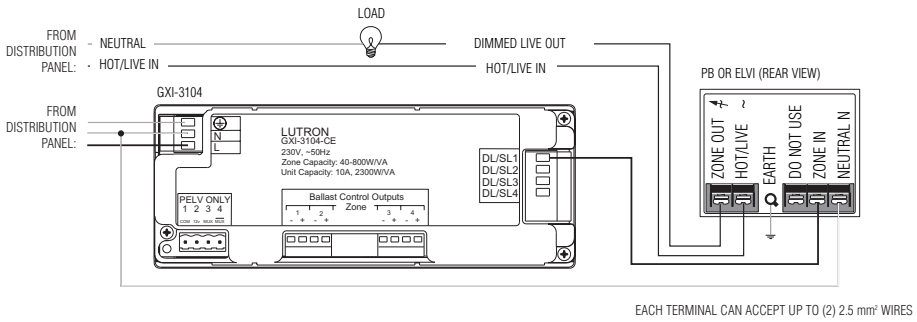
Unit	230V (CE)
PB	1840W/VA*, 8A
ELVI	1200W/VA, 5.2 A
TVI	1150W/VA, 5A

*1200W/VA and 5.2A for flush-mount.

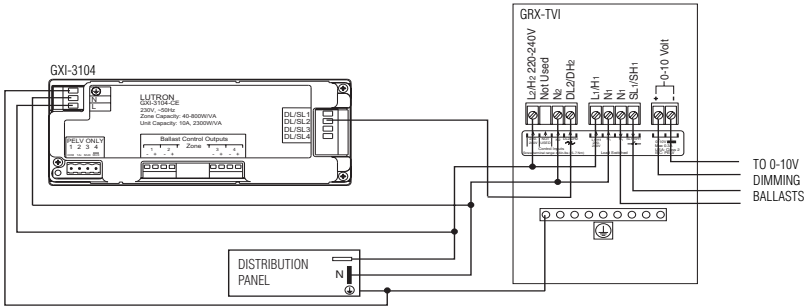
Control Unit Wiring Details



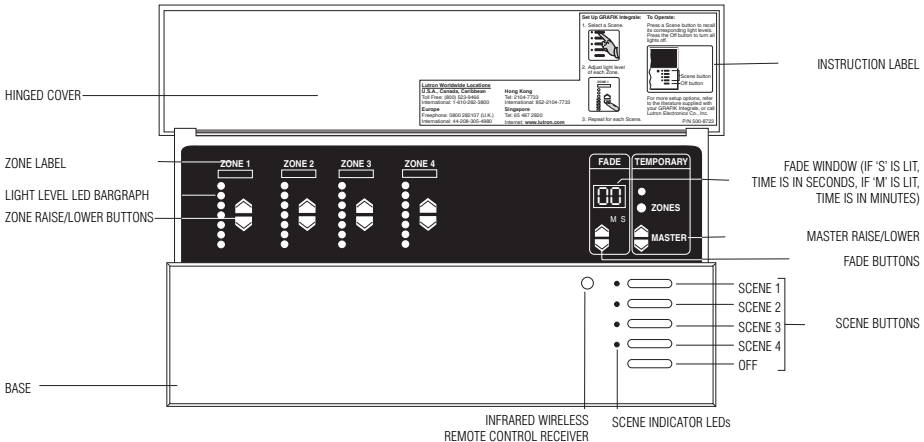
PB/ELVI Booster Wiring Detail



GRX-TVI Booster Wiring Detail



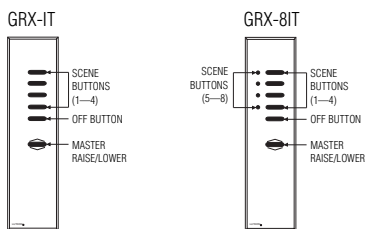
GRAFIK Integrale Control Unit



Appendix D: Infrared Transmitters

Infrared Transmitters

GRAFIK Integrale Control Units are equipped with an Infrared Receiver. This allows control of the Control Unit with the optional Handheld Infrared Wireless Remote Control Transmitters. The Infrared Transmitters control 4 (or 8) scenes plus master raise/lower and Off. With this you can recall scenes or fine-tune light levels.



Infrared Interference

GRAFIK Integrale 3000 Series Control Units are equipped with an IR Receiver for use with Lutron GRX-IT and GRX-8IT handheld remote controls. The IR frequency for all Control Units is 40.000 KHz. Any other device continuously operating in the frequency range from 30 KHz to 50 KHz may cause either no response or unwanted scene changes on the Control Unit.

Appendix E: Troubleshooting

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

- Review carefully the GRAFIK Systems submittal documentation prepared for your project
- Consult the chart below to identify and correct the problem.
- If necessary, call Lutron.

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	Check wiring (refer to wiring details). Connect zone wires to loads (refer to wiring details). Replace bad lamps.
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 FET	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 Class 2/PELV terminals on Unit and Wallstations (refer to Appendix A). Confirm programming.
Faceplate is warm	Normal	Solid-state controls dissipate about 2% of the connected load as heat.
Unit does not allow scene changes or zone adjustments	Unit may be set to an optional Save Option.	Refer to page 9 for Save Options.
Zone does not dim	Load type not set correctly	Set or reset load type - see pg. 6-7

GRAFIK Integrale Control Unit Error Messages

If the Control Unit detects certain wiring problems/unit failure, it will display an error code for the affected zone(s).



- All LEDs in a zone are flashing and the zone is not lit:
1. The zone is overloaded - it must be reduced to $\leq 3.5A$ per zone.
 2. The load may have a short-circuit - check the wiring on that zone.



- Bottom LED is flashing and the zone's load is not lit:
1. Incorrect Load Type is assigned - change Load Type to match the load connected (see pg. 6).



- Bottom three LEDs in a zone are flashing...
1. And the zone does not dim (stays full On), an internal component has failed - contact Lutron.
 2. And the zone does not switch On, the load may be miswired - make sure the load is connected between the DL/DH and the Neutral.

If the bottom three LEDs are flashing for multiple zones, check to make sure the DL/DH wires at the Control Unit are not touching.



- All LEDs in **all** zones are flashing and the zones are not lit:
1. The unit has overheated because of an overload- current **MUST** be reduced to $\leq 3.5A$ per zone, 10A per unit.
 2. The ambient temperature is too high - ensure adequate airflow to the unit. Normal operation will resume once the unit has cooled.