



Warranty & Start-Up Information

Job Name:

Toll-Free 24/7 Technical Support Line: 1.800.523.9466

Job Number:

Field Service Scheduling 1.800.523.9466 ext.4439

Lutron Standard Limited Warranty

Applies to all Lutron Products that are not purchased with Lutron Services Co., Inc. start-up.

Limited Warranty

Lutron warrants each new unit to be free from defects in materials and workmanship and to perform under normal use and service.

Lutron will, at its option, repair or replace any unit that is defective in materials or manufacture within one year after purchase. For Lutron ballasts, Lutron will repair or replace any unit that is defective in materials or manufacture within three years after purchase.

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 APPLIES ONLY TO LUTRON HARDWARE AND DOES NOT INCLUDE LUTRON SOFTWARE, LUTRON PROVIDED SYSTEM SERVERS, LAPTOPS, PDAS, OR COMPUTERS PURCHASED WITH LUTRON CONTROL SYSTEMS. 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 SPECIAL DAMAGES. THE PURCHASER ASSUMES AND WILL HOLD HARMLESS LUTRON IN RESPECT OF ALL SUCH LOSS. 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.

For warranty service on returnable products (including Lutron ballasts), take the unit to the place of purchase or mail to:

Lutron
7200 Suter Rd.
Coopersburg, PA 18036-1299
(send postage pre-paid for proper handling)

For warranty service on non-returnable products, contact Lutron Technical Support Center at **1-800-523-9466**

Note - Although every attempt is made to ensure that catalog 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.

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Lutron Electronics Co., Inc. Commercial Systems Limited Warranty

SCOPE

This limited warranty ("Warranty") covers Lutron (a) commercial lighting control system panels, controls, processor panels, wall box products, and other Lutron components (collectively, "Hardware"), (b) ballasts supplied directly by Lutron ("Ballasts"), (c) provided computer ("Supplied Computer"), and (d) commercial systems eLumen software ("Software" and, with the Hardware, Ballasts and Supplied Computer, the "System"). Customer acknowledges and agrees that use of (i) the System, or any part thereof, constitutes acceptance of all terms and conditions of this Warranty and (ii) the Software is subject to the terms and conditions of Lutron's Software License. Any subsequent addition to the System provided by Lutron will be governed by a separate warranty issued at the time of the purchase of the additional equipment.

The provisions of this Warranty applicable to the Supplied Computer and Software will not apply to Systems that do not include these components.

LIMITED WARRANTY

Subject to the exclusions and restrictions and for the periods of time described in this Warranty, Lutron warrants that the System will be free from manufacturing defects. If any manufacturing defect exists in any Hardware or Ballast during the period of time identified below from the date of start-up completion by Lutron or a Lutron approved third party, or the date of shipment by Lutron if such component was not purchased with Lutron start-up, so long as Customer promptly notifies Lutron of the defect and, if requested by Lutron, upon the return of the defective part(s), Lutron will, at its option, either repair the defective part(s) or issue a credit to the Customer against the purchase price of comparable replacement part(s) purchased from Lutron as follows:

Number of Years from Date of Start-up or Shipment, as applicable	Percentage of Part Price Credited by Lutron			
	Hardware		Ballasts	
	With Start-up	No Start-up	With Start-up	No Start-up
Up to 1	100%	100%	100%	100%
More than 1 but not more than 2	100%	0%	100%	100%
More than 2 but not more than 3	50%	0%	100%	100%
More than 3 but not more than 5	50%	0%	100%	0%
More than 5 but not more than 8	25%	0%	0%	0%
More than 8	0%	0%	0%	0%

If any manufacturing defect exists in the Supplied Computer or Software during the one year period from the date of start-up by Lutron or a Lutron approved third party, or the date of shipment by Lutron if component was not purchased with Lutron start-up, so long as Customer promptly notifies Lutron of the defect, upon the return of the defective part(s) as to the Supplied Computer, if requested by Lutron, or Lutron determining that a defect exists as to the Software, Lutron will, at its option, either repair the defective part(s) or provide comparable replacement part(s).

Replacement parts for the System provided by Lutron or, at its sole discretion, an approved vendor may be new, used, repaired, reconditioned, and/or made by a different manufacturer.

CUSTOMER OBLIGATIONS TO MAINTAIN LIMITED WARRANTY

This Warranty will be void, and Lutron will have no obligations under it unless Customer complies with all of the following:

1. The Supplied Computer must be installed and maintained in a secure location, within the

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temperature and relative humidity ranges specified in the documentation accompanying the Supplied Computer, and away from where it may be bumped, abused, or subjected to large amounts of dust or dirt.

- 2. The Supplied Computer must be connected to a reliable (and preferably generator or battery backed-up) power supply.
- 3. The Supplied Computer must be properly shutdown in the event of power loss to prevent damage to it or its data, either of which could prevent it from operating properly. Customer has sole responsibility to take all reasonable measures to prevent this from occurring.
- 4. No modification, alteration, adjustment or repair can be made to the Software except by, or at the express instruction of, Lutron.
- 5. The Software may not be used on any hardware except the Supplied Computer.
- 6. No third party software may be installed on the Supplied Computer.

Lutron does not warrant that the Software will operate in combination with any other software except as specified in the applicable Lutron documentation. Customer acknowledges that its use of the Software may not be uninterrupted or error-free.

To ensure optimal operating conditions for the System, Lutron recommends that the Supplied Computer (1) not be connected to a power source that is also supplying power to a motor or other load that causes significant conducted emissions; (2) be located to permit easy access to it; and (3) be placed on a dedicated circuit.

EXCLUSIONS AND RESTRICTIONS

This Warranty does not cover, and Lutron and its suppliers are not responsible for:

- 1. Damage, malfunction or inoperability diagnosed by Lutron or a Lutron approved third party as caused by normal wear and tear, abuse, misuse, incorrect installation, neglect, accident, interference or environmental factors, such as (a) use of incorrect

line voltages, fuses or circuit breakers; (b) failure to install, maintain and operate the System pursuant to the operating instructions provided by Lutron and the applicable provisions of the National Electrical Code and of the Safety Standards of Underwriter's Laboratories; (c) use of incompatible devices or accessories; (d) improper or insufficient ventilation; (e) unauthorized repairs or adjustments; (f) vandalism; (g) failure to comply with the Customer Obligations listed above; (h) an act of God, such as fire, lightning, flooding, tornado, earthquake, hurricane or other problems beyond Lutron's control; (i) moving the Supplied Computer to another geographic location; (j) a virus or computer hacker; or (k) failure to maintain equipment under specified ambient temperature.

- 2. On-site labor costs to diagnose issues with, and to remove, repair, replace, adjust, reinstall and/or reprogram the System or any of its components.
- 3. Components and equipment external to the System, such as, lamps; non-Lutron ballasts; OEM supplied Lutron ballasts, sockets, and fixtures; fixture wiring between ballasts and lamps; building wiring between the dimmer panels and lamps and between the controls and the control or dimmer panels; audio-visual equipment; and non-Lutron time clocks and motion detectors.
- 4. The cost of repairing or replacing other property that is damaged when the System does not work properly, even if the damage was caused by the System.
- 5. Any loss of software, including the Software, or data. Customer has sole responsibility to properly back up all data on the Supplied Computer's hard disk drive and on any other storage device(s) in the System.
- 6. Repairs required due to malfunctions caused by non-Lutron supplied software.

EXCEPT AS EXPRESSLY PROVIDED IN THIS WARRANTY, THERE ARE NO EXPRESS OR IMPLIED WARRANTIES OF ANY TYPE, INCLUDING ANY IMPLIED WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE OR MERCHANTABILITY.

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LUTRON DOES NOT WARRANT THAT THE SYSTEM WILL OPERATE WITHOUT INTERRUPTION OR BE ERROR FREE.

NO LUTRON AGENT, EMPLOYEE OR REPRESENTATIVE HAS ANY AUTHORITY TO BIND LUTRON TO ANY AFFIRMATION, REPRESENTATION OR WARRANTY CONCERNING THE SYSTEM.

UNLESS AN AFFIRMATION, REPRESENTATION OR WARRANTY MADE BY AN AGENT, EMPLOYEE OR REPRESENTATIVE IS SPECIFICALLY INCLUDED HEREIN, OR IN STANDARD PRINTED MATERIALS PROVIDED BY LUTRON, IT DOES NOT FORM A PART OF THE BASIS OF ANY BARGAIN BETWEEN LUTRON AND CUSTOMER AND WILL NOT IN ANY WAY BE ENFORCEABLE BY CUSTOMER.

IN NO EVENT WILL LUTRON OR ANY OTHER PARTY BE LIABLE FOR EXEMPLARY, CONSEQUENTIAL, INCIDENTAL OR SPECIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, DAMAGES FOR LOSS OF PROFITS, CONFIDENTIAL OR OTHER INFORMATION, OR PRIVACY; BUSINESS INTERRUPTION; PERSONAL INJURY; FAILURE TO MEET ANY DUTY, INCLUDING OF GOOD FAITH OR OF REASONABLE CARE; NEGLIGENCE, OR ANY OTHER PECUNIARY OR OTHER LOSS WHATSOEVER), NOR FOR ANY REPAIR WORK UNDERTAKEN WITHOUT LUTRON'S WRITTEN CONSENT ARISING OUT OF OR IN ANY WAY RELATED TO THE INSTALLATION, DEINSTALLATION, USE OF OR INABILITY TO USE THE SYSTEM OR OTHERWISE UNDER OR IN CONNECTION WITH ANY PROVISION OF THIS WARRANTY, OR ANY AGREEMENT INCORPORATING THIS WARRANTY, EVEN IN THE EVENT OF THE FAULT, TORT (INCLUDING NEGLIGENCE), STRICT LIABILITY, BREACH OF CONTRACT OR BREACH OF WARRANTY OF LUTRON OR ANY SUPPLIER, AND EVEN IF LUTRON OR ANY OTHER PARTY WAS ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

NOTWITHSTANDING ANY DAMAGES THAT CUSTOMER MIGHT INCUR FOR ANY REASON WHATSOEVER (INCLUDING, WITHOUT LIMITATION, ALL DIRECT DAMAGES AND ALL DAMAGES LISTED

ABOVE), THE ENTIRE LIABILITY OF LUTRON AND OF ALL OTHER PARTIES UNDER THIS WARRANTY ON ANY CLAIM FOR DAMAGES ARISING OUT OF OR IN CONNECTION WITH THE MANUFACTURE, SALE, INSTALLATION, DELIVERY, USE, REPAIR, OR REPLACEMENT OF THE SYSTEM, OR ANY AGREEMENT INCORPORATING THIS WARRANTY, AND CUSTOMER'S SOLE REMEDY FOR THE FOREGOING, WILL BE LIMITED TO THE AMOUNT PAID TO LUTRON BY CUSTOMER FOR THE SYSTEM. THE FOREGOING LIMITATIONS, EXCLUSIONS AND DISCLAIMERS WILL APPLY TO THE MAXIMUM EXTENT ALLOWED BY APPLICABLE LAW, EVEN IF ANY REMEDY FAILS ITS ESSENTIAL PURPOSE.

TO MAKE A WARRANTY CLAIM

To make a warranty claim, promptly notify Lutron within the warranty periods described above by calling the Lutron Technical Support Center at 1-800-523-9466. Lutron, in its sole discretion, will determine what action, if any, is required under this Warranty. Most System problems can be corrected over the phone through close cooperation between Customer and a technician. To better enable Lutron to address a warranty claim, have the System's serial and model numbers, its current operating system version, and the brand names and models of any peripheral devices (such as a modem) used with the System available when making the call. Let the technician know what error message you get; when it occurs; what you were doing when the error occurred; and what steps you have already taken to solve the problem. Listen carefully to the technician and follow the technician's directions.

If Lutron, in its sole discretion, determines that an on-site visit or other remedial action is necessary, Lutron may send a Lutron Services Co. representative or coordinate the dispatch of a representative from a Lutron approved vendor, to Customer's site, and/or coordinate a warranty service call between Customer and a Lutron approved vendor. All on-site labor costs incurred to diagnose any problems with

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the System and to repair, replace or adjust (at Lutron's option) the System to restore it to normal operation will be paid by customer at the then current service price unless covered by a Lutron Services Co. Support and Maintenance Plan.

REMOTE ACCESS

A dedicated analog phone line should be installed for the Supplied Computer to allow Lutron to remotely administer, troubleshoot, and support the System. Lutron does not recommended plugging the Supplied Computer into the analog phone line until

asked to do so by Lutron support personnel. During such support calls, Customer should disconnect the Supplied Computer from Customer's local LAN. Lutron expressly disclaims all liability due to local LAN problems or if the phone line is connected to the Supplied Computer at any other time. Customer retains all responsibility for ensuring the security of the Supplied Computer from unauthorized access.

For more information, including preventative maintenance steps, see the Users Guide provided by the Lutron approved vendor of, and included with, the Supplied Computer.

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1-Visit Start-up

Description

The 1-Visit Start-up package includes one on-site start-up visit and extends the limited warranty for your integrated lighting system.

Field Start-up – A Lutron Services Company Engineer will perform an on-site system inspection, start-up the system, and train facilities personnel on system operation and maintenance. This includes the cost of travel.

Visit Summary:

- Installation verification
- Wiring verification – power and low voltage
- Energizing the low voltage and enabling dimming for the system
- Verification of lighting loads
- System programming
- Training

Additional Information

Replaces the Standard Limited Warranty with the Lutron Electronics Co., Inc. Commercial Systems Limited Warranty. Also includes two consecutive 1-year Support and Maintenance Plans. Up to eight additional years of coverage can be purchased.

Extends limited warranty for Lutron ballasts from 3 years to 5 years, if start-up is purchased for the ballasts.

24-hour/7-days a week toll-free telephone support (1-800-523-9466).

Refer to the Lutron Electronics Co., Inc. Commercial Systems Limited Warranty pages for limitations, exclusions, and any other details pertaining to what is covered by this warranty.

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Support and Maintenance Plan - Silver Level (INIT) (LSC-SILV-CS-IN-1, LSC-SILV-CS-IN-2)

Description

- Includes 1-year Support and Maintenance Plan with system purchase and start-up, and commences on date of start-up completion.
- Covers on-site parts and labor, telephone technical support, and remote diagnostics
- Remote Access Support - Diagnostics and programming for systems with that capability (analog telephone line connection required, must be provided by system owner).
- 24-hour/7-days a week toll-free telephone support (1-800-523-9466).

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Terms and Conditions of Lutron Services Co., Inc. Support and Maintenance Plans

This Agreement between Lutron Services Co., Inc. ("LSC") and Customer provides parts and labor coverage for the Lutron Electronics Co., Inc. ("Lutron") Integrated Lighting Control System ("ILCS") purchased on this Bill of Material. Parts and labor are covered at 100%, as further specified below.

1. The Silver Plan COVERS:

- The diagnosis of problems with the Lutron ILCS and the repairs and adjustments necessary to restore the ILCS to normal operation are subject to the limitations described below. Visits will occur during normal business hours Monday through Friday.
- Replacement parts, new or rebuilt, at LSC's option.
- Four (4) hours of remote programming annually, for systems with that capability.
- Remote diagnostics, for systems with that capability.
- Unlimited Lutron Technical Support (1-800-523-9466).

2. Additionally, the Gold & Platinum Plans COVER:

- An annual ILCS Checkup which can include:
 - a) an evaluation to verify that the ILCS is working properly
 - b) verification that panels have not been overloaded in the course of building relamping or renovation
 - c) training of users on operation and maintenance of the ILCS
- For Trouble Calls, LSC will use commercially reasonable efforts to be at the Customer's site within 24 hours (for Platinum customers) or 72 hours (for Gold customers) of receipt of the request.

3. Service Procedures

- To schedule a visit, call 610-282-3800 and request to be connected to Field Service Scheduling.
- LSC representatives will perform service in compliance with security and other instructions provided by the Customer.
- LSC will respect the Customer's need for confidentiality and will utilize job-specific information only as needed to complete the service visit.
- ILCS Checkups (for Gold and Platinum customers) will occur during normal business hours Monday through Friday. They must be scheduled at least two weeks in advance.
- Customer agrees to allow LSC prompt and sufficient access to Customer's facility and to provide reasonable information and assistance to the LSC representatives to expedite the performance of service.
- Customer agrees that all LSC service must be done in compliance with LSC's safety procedures, which may include temporarily disabling or de-energizing the ILCS and other equipment connected to the ILCS.
- LSC will provide a certificate of insurance upon request of Customer.

4. This plan DOES NOT COVER:

- Damage or malfunctions diagnosed by LSC as due to abuse, misuse, or accident, such as: use of incorrect line voltage, fuses or protection devices; failure to follow operating and maintenance instructions provided by Lutron or LSC; failure to comply with national or local electrical codes; unauthorized repairs/adjustments; vandalism or theft; fire, flood, "Acts of God", or other problems beyond LSC's control.
- Non-Lutron components and equipment such as: lamps; non-Lutron ballasts, sockets, and fixtures; fixture wiring between ballasts and lamps; building wiring between ILCS elements; audio-visual

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equipment; non-Lutron timeclocks and motion detectors; and Local Area Networks.

- Labor costs to remove and reinstall fixtures and/ or ballasts.
- Desktop, Laptop, or Server hardware and software.
- Repairs or adjustments to Lutron ILCS required as a result of (i) malfunctions caused by non-Lutron supplied equipment, (ii) software that is connected to or used with the ILCS, or (iii) programming changes made by anyone other than LSC.

5. Warranties

- LSC makes no warranty, either express or implied, including, but not limited to, any implied warranties of merchantability and fitness for a particular purpose
- For ILCS components that may be covered by product-specific warranties, LSC will coordinate the processing of any warranty claims.

6. Limitation of Remedy

- CUSTOMER'S EXCLUSIVE REMEDY AND LSC'S ENTIRE, COLLECTIVE LIABILITY IN CONTRACT, TORT OR OTHERWISE, UNDER THIS AGREEMENT IS THE REPAIR OF THE DEFECTIVE ILCS IN ACCORDANCE WITH THIS AGREEMENT. IF LSC IS UNABLE TO MAKE SUCH REPAIR, CUSTOMER'S EXCLUSIVE REMEDY AND LSC'S ENTIRE LIABILITY WILL BE THE PAYMENT OF ACTUAL DAMAGES NOT TO EXCEED THE CHARGE PAID BY CUSTOMER FOR ONE YEAR OF SERVICE UNDER THIS AGREEMENT. UNDER NO CIRCUMSTANCES WILL LSC BE LIABLE TO CUSTOMER OR ANY OTHER PERSON FOR ANY DAMAGES, INCLUDING, WITHOUT LIMITATION, ANY INDIRECT, INCIDENTAL, SPECIAL, OR CONSEQUENTIAL DAMAGES, EXPENSES, COSTS, PROFITS, LOST SAVINGS OR EARNINGS, LOST OR CORRUPTED DATA, OR OTHER LIABILITY ARISING OUT OF OR RELATED TO THIS AGREEMENT, OR OUT OF THE INSTALLATION, DEINSTALLATION, USE OF OR INABILITY TO USE THE SYSTEM.

- THIS AGREEMENT GIVES CUSTOMER SPECIFIC LEGAL RIGHTS AND CUSTOMER MAY HAVE OTHER RIGHTS THAT VARY FROM STATE TO STATE. SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF (i) INCIDENTAL OR CONSEQUENTIAL DAMAGES OR (ii) IMPLIED WARRANTIES, SO THE ABOVE MAY NOT APPLY.
- Customer shall not bring legal action related to the services being provided hereunder more than two years after the cause of action arose unless otherwise provided by local law without the possibility of contractual waiver or limitation.
- LSC shall not be responsible for any delay or failure to perform its responsibilities under this Agreement that results from problems outside the control of LSC such as: permit or visa requirements; strikes or work stoppage; fires, floods, "Acts of God", wars, or force majeure; and transportation disruptions.
- With regard to any services that are not within the coverage of this Agreement, please contact LSC for service pricing and availability.

7. Taxes

- Customer agrees to pay all taxes (or reimburse LSC for all amounts paid or payable by LSC in discharge of these taxes) arising from this Agreement including state and local sales and use taxes, regardless of designation.

8. Term; Termination

- The term of this Agreement shall commence on the date of start-up completion and shall continue for the number of one-year terms purchased on the Bill of Material.
- Default: LSC may terminate this Agreement if Customer remains in default of any material term or condition of this Agreement ten days after LSC gives Customer written notice of the default.
- Unnecessary Service Calls: If Customer requests service on more than two (2) occasions in any one year for problems that are diagnosed by LSC as non-covered problems, LSC may terminate this Agreement by providing Customer with 30 days notice of termination.

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9. Miscellaneous

- **Entire Agreement:** This Agreement is the complete agreement between Customer and LSC regarding the services provided hereunder, and replaces any prior oral or written communications between Customer and LSC regarding such services. None of LSC’s employees or agents may orally vary the terms and conditions of this Agreement. Any modification of this Agreement must be signed in writing by authorized representatives of Customer and LSC.
- **Additional Remedies:** This Agreement affords Customer specific legal rights. Customer may have additional legal rights that vary from state to state. This Agreement is not a warranty. The ILCS may come with a limited warranty from Lutron or third party manufacturers of products distributed by Lutron. Please consult those warranties for specific rights and remedies.

- **Severability:** If any part of this Agreement is held to be invalid or unenforceable, it will not affect the validity or enforceability of the rest of the Agreement. Without further action of the parties, that part will be reformed to the minimum extent necessary to make it valid and enforceable.
- **Waiver of Rights:** LSC’s failure to exercise, delay in exercising, or single or partial exercise of any right, power, or privilege under this Agreement shall not operate to waive or preclude LSC’s right to exercise such rights, power, or privileges.
- **Send Notices to:** Lutron Services Co., Inc., Attn: Director of Field Service, 7200 Suter Road, Coopersburg, PA 18036, cc: Legal Dept.

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Lutron Contacts for all Warranties and Support and Maintenance Plans

Internet: www.lutron.com
E-mail: lscwarranty@lutron.com

WORLD HEADQUARTERS

USA

Lutron Electronics Co., Inc.
7200 Suter Road, Coopersburg, PA 18036-1299
TEL +1.610.282.3800
FAX +1.610.282.1243
Toll-Free 1.888.LUTRON1
Technical Support 1.800.523.9466

North and South America Technical Hotlines
USA, Canada, Caribbean: 1.800.523.9466
Mexico: +1.888.235.2910
Central/South America: +1.610.282.6701

EUROPEAN HEADQUARTERS

United Kingdom

Lutron EA Ltd.
6 Sovereign Close, London,
E1W 3JF United Kingdom
TEL +44.(0)20.7702.0657
FAX +44.(0)20.7480.6899
FREEPHONE (UK) 0800.282.107
Technical support +44.(0)20.7680.4481

ASIAN HEADQUARTERS

Singapore

Lutron GL Ltd.
15 Hoe Chiang Road,
#07-03 Euro Asia Centre,
Singapore 089316
TEL +65.6220.4666
FAX +65.6220.4333

Asia Technical Hotlines

Northern China: 10.800.712.1536
Southern China: 10.800.120.1536
Hong Kong: 800.901.849
Indonesia: 001.803.011.3994
Japan: +81.3.5575.8411
Macau: 0800.401
Singapore: 800.120.4491
Taiwan: 00.801.137.737
Thailand: 001.800.120.665853
Other countries: +65.6220.4666

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GRAFIK 3000/4000/QSG System On-Site System Start-up

What Standard GRAFIK 3000/4000 Start-up includes:

- One visit to the job site during normal business hours. This is one visit between the hours of 7 AM and 5 PM on a Monday through Friday that is not a Lutron Holiday.
- This visit may require multiple days depending on the size of the system.
- Phased construction projects (requiring multiple visits) should verify this was included with the system provider.
- Visits can be made outside these hours for an additional charge.
- Lutron requires Ten (10) business days notice to schedule a start-up date. Shorter notices may incur expedite fees.
- All terminations will be done by the installing agency. A person from the installing agency needs to be present for the startup. This person should be familiar with the installation of the system.
- A Lutron factory certified technician performs all system start-up items.

System start up includes:

- Verification that the system is installed according to Lutron specifications.
- Panels should be energized in by-pass fully lamped and tested prior to our arrival.
- Load circuits are checked for shorts and overloads and bypass jumpers are removed.
- Programming the dimming/switching panels to include:
 - Panel addressing
 - Proper load types as installed in field or as per approved submittal drawings. As installed conditions take precedence. This system may have modular components and if loads differ from design additional/different equipment may be required.
 - Circuit to zone assignment as per approved submittal drawings. If no zoning information exists prior to start-up, programming will be done according to written instructions from end user or end users representative, contractor, or will be set up based on the field engineers past experience in that order of priority.
 - Set light levels and fade times on controls as per approved submittal drawings. If no information is provided, test scenes will be set to 100%, 75%, 50% and 25% and default fade times will be set to 3 seconds.
 - Program emergency function per the installation guide for the system. This may not be applicable for every system.

Programming the wall controls/interfaces to include:

- Control addressing
- Verify proper wiring and operation of control link
- Set up controls to function as per approved submittal drawings. If no control functionality is included, controls will be programmed according to written instructions from end user or end users representative, contractor, or will be set up based on the field engineers past experience in that order of priority.
- Test all buttons to assure proper operation
- Occupancy sensor
 - Verification of proper installation and operation.
 - Unless otherwise noted, a rough calibration will be performed at system start-up. Final calibration is the responsibility of the end user since it is very dependent on furniture placement, HVAC operation, and space usage.

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- Photocell
 - Verification of proper installation and operation.
 - Unless otherwise noted a rough calibration will be performed at system start-up. Final calibration is the responsibility of the end user since it is very dependent on furniture placement, window treatments, outside weather conditions and space usage.
- Time clock set up
 - Lutron will set up the system location, daylight savings, and time of day preparation for event programming.
 - Lutron will set up time clock events as per the approved submittal drawings or written instructions from end user or end users representative, contractor in that order of priority.
 - In lieu of instructions, the time clock will not be programmed.

Items not included in standard on-site startup:

- Lutron service technicians will not perform work on non-Lutron equipment. Lutron will work with other manufacturers on integration of equipment by others.
- Programming or any other changes that are requested to be performed counter to the approved submittal drawings must be approved in writing via the proper channels.
- Field wiring changes or corrections that delay the startup process such that additional time is required for Lutron to complete the startup in the allotted time will result in additional charges.
- Replacement of controls damaged due to miss-wires or incorrect installation or any other related issue not covered under the Lutron warranty is the responsibility of the installer.
- Reprogramming of any functions after initial programming and sign-off.

End user training on overall system operation. Typical training agenda listed below:

- This system is not typically sold with a separate visit for the training of the end user. Check with purchasing agent if this is required.
- It is the responsibility of the person scheduling the startup to ensure the appropriate end users are present for system training. Lutron typically does not have these contacts.
- Additional charges will apply if a separate visit is required for training the end user.
- Video media is not provided by Lutron for training sessions. This may be provided by “others” for turnover to the end user or job site documentation.
- System demonstration and sign-off by the end user.

Additional items that are not included with standard startup, but may be purchased – check your quote to verify an item has been included with your quote. The quantity of the items listed below on the BOM will determine how many days are included with this item.

- LSC-AF-VISIT. Aim and focus visit with design team or end user. This visit is typically coordinated by the construction team, that includes designers, Lutron, and end user to set up light levels and adjust fixtures.
- LSC-SYSOPT. System optimization visit with end user. This visit is coordinated by the EC or end user to optimize the system performance to specific project details.
- LSC-WALK. Start-up agent or design team walk-through visit. The construction team and the agent requiring the walk-through coordinate this visit. This visit is for any type of additional walk-through that is required for job completion.

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- LSC-SILV/GOLD/PLAT-IW. These are extended warranty part numbers for the system per the specification. Warranty information is supplied within the submittal documentation.
- LSC-TRAINING. This visit is for additional time on the job for training the end user. The EC or the end user typically coordinates this visit.
- LSC-AH-SU. After hours start-up. If normal business hours are not acceptable for start-up, after hours start-up can be purchased.

Additional items listed below may be charged for jobsites that are scheduled for start-up, but not ready when field service engineer arrives.

- LSC-NS-TRAVEL. Non standard travel arrangements
- LSC-SITE-RDY-CHG. Site ready charge. Jobsite not ready.

Job Name: <input type="text"/>	Toll Free 24/7 Tech Support Line 1.800.523.9466
Job Number: <input type="text"/>	Field Service Scheduling 1.800.523.9466 ext. 4439

GRAFIK Eye Family 3000/4000/QSG Series

GRAFIK Eye 4000 Family Series is an architectural preset lighting control product that creates functional spaces through various lighting combinations. It utilizes low voltage digital controls that communicate with high voltage dimming and switching panels. The digital nature of the product allows the user to quickly and easily select lighting scenes to align with the use of the space. These scenes can be reprogrammed as the needs of the space change.

GRAFIK Eye 3000 Family Series is an architectural preset lighting control product that creates functional spaces through various lighting combinations. It utilizes low voltage digital controls that communicate with high voltage digital controls. The digital nature of the product allows the user to quickly and easily select lighting scenes to align with the use of the space. These scenes can be reprogrammed as the needs of the space change.

4000 Training Visit – Typical Agenda (duration – approximately 1 hour):

- Review system with end-user (control location and function).
- Discuss system model numbers
- Discuss Lutron lexicon – what is a zone, scene, fade rate
- Review GRAFIK EYE main controller functions
 - o How to set a scene
 - o How to adjust fade rate
 - o How to make a temporary scene
 - o How to set light loads
 - o How to change light levels
- Special save modes and when to use each
- Review all accessory controls functions
 - o How to address accessory controls
 - o Programming scenes from accessory controls
- Review dimmer panel(s) (for G4000 system, N/A for G3000 systems)
 - o Bypassing a G4000
 - o Spare dimmer cards
- Load schedule
- Troubleshooting the system
- Preventive maintenance
- Liaison software (if applicable)
- Timeclock options
 - o Real Time
 - o Astronomic

NOTE: All topics may not be relevant to every system

Job Name:

Toll Free 24/7 Tech Support Line 1.800.523.9466

Job Number:

Field Service Scheduling 1.800.523.9466 ext. 4439



service and support guide | lighting control system

service record

This information will help us assist you when you contact Lutron:

Job Number (typically on the front cover of the panels)

Approximate date of initial installation

Job Name at time of installation

This pocket is provided for storage of service visit sign-off sheets and other important system documentation.

Lutron controls the light at the following locations featured in this brochure:

- Cover:** Lutron Electronics Headquarters, Coopersburg, Pennsylvania, U.S.A.
Page 1: New York Times Building, New York, New York, U.S.A.
Page 2: Bank of China Headquarters, Beijing, China
Pages 4–5: Getty Museum, Los Angeles, California, U.S.A.
JW Marriott Hotel Shanghai at Tomorrow Square, Shanghai, China
Mandarin Oriental, Tokyo, Japan
Louis Vuitton, Cannes, France
Orange County Convention Center, Orlando, Florida, U.S.A.
Page 7: Mandarin Oriental, New York, New York, U.S.A.
Page 8: TAQA, Ann Arbor, Michigan, U.S.A.
Page 10: The Westbury Mayfair Hotel, London, UK
Page 11: Wynn Las Vegas, Las Vegas, Nevada, U.S.A.
Mandarin Oriental, New York, New York, U.S.A.
Georgian College, Ontario, Canada

Lutron, the sunburst logo, EcoSystem, GRAFIK Eye, GRAFIK 6000, and seeTouch are registered trademarks of Lutron Electronics Co., Inc. GRAFIK Eye 3000, GRAFIK Eye 4000, GRAFIK 5000, GRAFIK 7000, Quantum, and GRAFIK Eye QS are trademarks of Lutron Electronics Co., Inc.

Thank you for purchasing a Lutron lighting control system.

This guide contains the information you will need to ensure your ownership experience is a good one. Please retain it for future reference. It contains important information on warranties, service, upgrades and more.

- 02** | who to call if you have problems
- 03** | what to do if your system needs service
- 04** | replacement parts
- 04** | spare parts packages
- 05** | training sessions
- 05** | optimize energy usage
- 06** | support & maintenance plans
- 07** | annual scheduled maintenance visits
- 08** | new and improved Lutron products
- 11** | modernize your lighting control system
- 11** | system expansions
- 12** | Lutron in your home



who to call if you have problems: 1.800.523.9466

24-hour Technical Support at No Charge

If you have questions about the operation of your system, or if you are not sure it is functioning properly, Lutron provides around-the-clock technical support. A knowledgeable support staff is ready to answer questions about the operation, programming, and maintenance of your system. They can also direct you to the technical information on our website that is specific to your Lutron products.

From the U.S., call 1.800.523.9466. International customers can dial 1.610.282.3800 or visit www.lutron.com to get more information on our international offices.

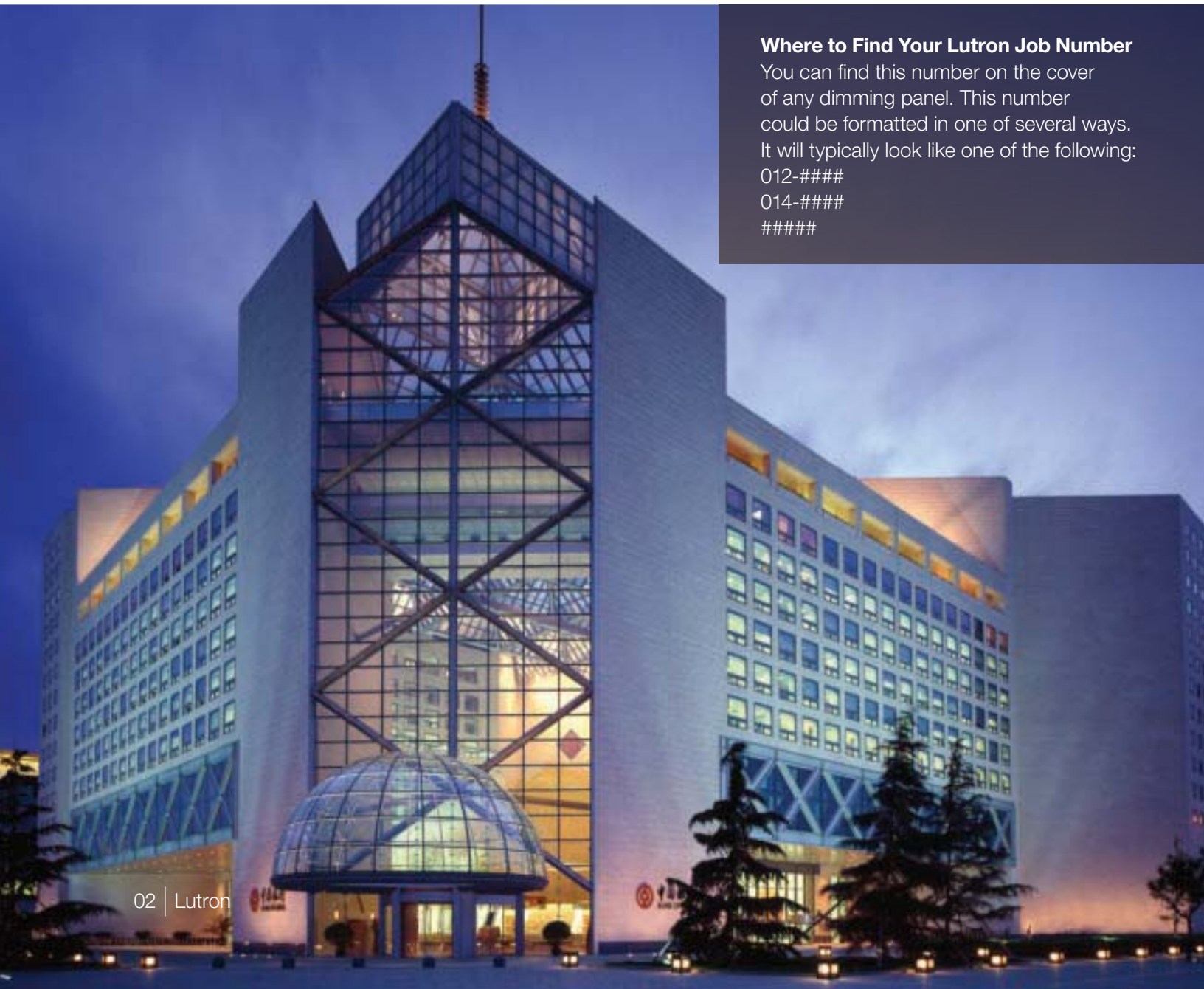
Where to Find Your Lutron Job Number

You can find this number on the cover of any dimming panel. This number could be formatted in one of several ways. It will typically look like one of the following:

012-####

014-####

#####



what to do if your system needs service

If your staff is unable to solve a problem with the help of our Technical Support Representatives, do not worry. There are other ways to get your system up and running. Lutron also provides reprogramming and training services. Please read over the points listed below to ensure you get the best service for your situation.

*Lutron Scheduling Representatives:
1.800.523.9466 and select
option 4, then 1 or email
LSCscheduling@lutron.com.*

- Determine your system coverage (see below).
- If you do not have a Support & Maintenance Plan or labor coverage, we recommend working with a local electrical contractor.
- If the electrical contractor was unable to solve the problem for you, please contact our Scheduling Representatives to set-up a Lutron field service visit.

How to Determine Your System Coverage

Lutron systems that are purchased with start-up have an initial 2-year Support & Maintenance Plan and an 8-year Limited Parts Warranty. That initial plan provides full labor and parts coverage for two years for the majority of equipment. Details on labor and parts coverage can be found in the below charts. The documents from the installing contractor will indicate what coverage you have for your particular system. *If you are unable to find that information, call 1.800.523.9466 and select option 4, then 4 or email LSCwarranty@lutron.com.*

With Lutron Start-up

System Component	Part Coverage	Labor Coverage
Lighting Control Equipment (excluding parts listed below)	100%, first 2 years 50%, year 3 through 5 25%, year 6 through 8	100%, 2 years
Ballasts	100%, 5 years	None
Computer/Laptop/PDA	100%, 1 year	100%, 1 year

To supplement or extend the initial coverage that comes with Lutron start-up, we offer Support & Maintenance Plans that provide up to 10 years of full labor and parts coverage (see pages 6 and 7 for more information).

Without Lutron Start-up

System Component	Part Coverage	Labor Coverage
Lighting Control Equipment (excluding parts listed below)	100%, 1 year	None
Ballasts	100%, 3 years	None
Computer/Laptop/PDA	100%, 1 year	None

replacement parts

If you are experiencing a problem with your system and need to order replacement parts, you can call one of our Parts Specialists. If possible, please have the part number of the failed item as well as the Lutron Job Number for your system. In many cases, we will have the parts in stock and will send them to you in as little as two days.

For custom products and older generation systems, it may take longer for us to provide replacement parts. In those cases, the components that we need to make the products may no longer be available from our suppliers. As a result, we may ask you to send the failed part back to us so we can try to repair it rather than replace it.

To request more information, please call 1.800.523.9466 and select option 4, then 2 or email LSCparts@lutron.com.



spare parts packages

Having a stock of parts at your facility can ensure that small problems will be resolved rapidly. Some components can be installed in minutes, and Lutron's 24-hour Technical Support Representatives are available to walk your maintenance team or local contractor through the process.

We can prepare a recommended spare parts list based upon the specific configuration of your system and any unique requirements you have.

To request more information, please call 1.800.523.9466 and select option 4, then 2 or email LSCparts@lutron.com.

training sessions

On Our Site: The software used with our GRAFIK™ 5000/6000/7000 and Quantum™ systems allows a facility manager to reprogram, control, and monitor the lighting control system. To maximize the benefits this software provides, Lutron offers Facility Manager Training at our headquarters in Coopersburg, PA. The cost of these classes is minimal, and the feedback from past attendees has indicated that the training is well worth the time investment.

Go to www.lutron.com/training to see course dates and registration details.

On Your Site: If staff turnover has left you without anyone who knows how to operate and maintain your system, you can purchase a day of personalized training. This could be an ideal time to make any timeclock or wall control programming changes.

System specific training agendas are available on our website at www.lutron.com/service.



optimize energy usage

Although your lights turn on and off, there are many features that go beyond those basic options. Lighting strategies that take advantage of those new features can lead to more productive environments, happier occupants, and reduced lighting electricity bills.




Studies show that office buildings expend 44% of electricity on lighting alone. You can reduce your lighting energy consumption with a Lutron System Optimization Visit. This type of visit will help you implement strategies that will result in better system performance and more efficient energy usage.

To request more information, please call 1.800.523.9466 and select option 4, then 5 or email rus@lutron.com.

support & maintenance plans

The initial 2-year Silver Support & Maintenance Plan included with most systems can be extended for up to 10 years to ensure the lighting system will continue to satisfy the needs of the facility. With a Support & Maintenance Plan in place, a repair visit is just a phone call away. Annual payments are typical, but quarterly or monthly payments can be arranged to accommodate your budgeting needs.

The table below highlights the features of our three standard plans. If these plans do not fit your needs, please contact us and we can create a custom plan just for your facility.

	benefits	typical applications
 platinum	<ul style="list-style-type: none">• 24-hour response time for service visits• Annual Scheduled Maintenance Visit (see page 7 for details)• 100% parts, 100% labor and any travel costs Lutron incurs• Technical Support, toll-free, around the clock, 365 days per year• Remote diagnostics and programming (for systems with that configuration/capability)	<ul style="list-style-type: none">• Casinos• Convention centers• Luxury hotels/Resorts• Research centers/Vivariums• Hospitals
 gold	<ul style="list-style-type: none">• 72-hour response time for service visits• Annual Scheduled Maintenance Visit (see page 7 for details)• 100% parts, 100% labor and any travel costs Lutron incurs• Technical Support, toll-free, around the clock, 365 days per year• Remote diagnostics and programming (for systems with that configuration/capability)	<ul style="list-style-type: none">• Hotels• Stadiums/Arenas• Museums• Office buildings• High-end restaurants• Boutique retail• Large universities• Estates
 silver	<ul style="list-style-type: none">• 100% parts, 100% labor and any travel costs Lutron incurs• Technical Support, toll-free, around the clock, 365 days per year• Remote diagnostics and programming (for systems with that configuration/capability)	<ul style="list-style-type: none">• Places of worship• Residences• Libraries• Small offices• Small schools

annual scheduled maintenance visits

Our Gold and Platinum Support & Maintenance Plan customers automatically receive an Annual Scheduled Maintenance Visit, but any customer can purchase a day of this service. According to each site's requests and needs, the Lutron Field Service Engineer may complete the following tasks during this visit:

- Train facility staff
- Update staff on new features and capabilities
- Make minor programming changes
- Perform a system check and preventative maintenance
- Provide a system status report
- Compile a list of spare parts to consider for site



new and improved Lutron products

Add Engraving to Existing Controls

With proper labeling of the buttons on existing controls, your lighting system will be easier to use for you and anyone that enters the space. Nearly all Lutron wall controls can be engraved with labels for individual buttons or the entire control. Most engravings are custom to the project but standard options are also available. Engravings are available in a variety of colors and we can laser engrave in any language.

Engraving sheets are available at www.lutron.com/seeTouch.



Upgrade to seeTouch®

An engraved control is better than one that is not, but a control with engraving that can be read in the dark is the ultimate solution. Controls in Lutron's GRAFIK™ 3000/4000/5000/6000/7000 lighting control systems can be replaced to feature this intuitive and ergonomic wall control option.

To upgrade your controls, please call 1.800.523.9466 and select option 4, then 5, or email rus@lutron.com.



seeTouch®

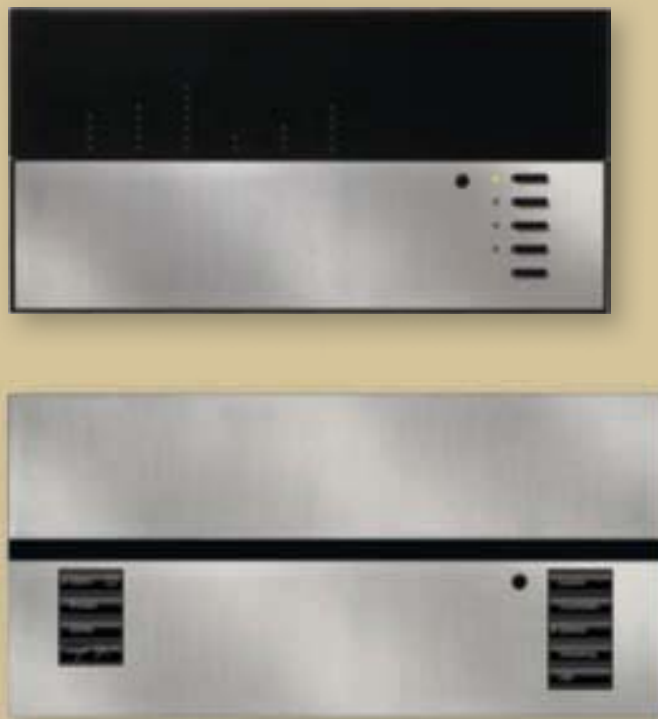
Discover the intuitive simplicity of Lutron's seeTouch controls. As you can see above, our wall controls have continued to evolve into more beautiful and user-friendly additions to your facility. Engraved buttons make them easy to use for newcomers to the space and the backlit buttons remove the need to search for wall controls in the dark.

For more information, please visit www.lutron.com/seeTouch.

Upgrade to GRAFIK Eye® QS

With the positive feedback from the experience our customers had with seeTouch controls, we updated our GRAFIK Eye product to include some of the same engraving and backlit features. An added bonus to the GRAFIK Eye QS is the opportunity to conveniently control shades and lighting from one control station.

To upgrade your controls, please call 1.800.523.9466 and select option 4, then 5, or email rus@lutron.com.



GRAFIK Eye® QS

Set your lights and shades just right for any task or activity in any room of your building. Easily recall these settings with the touch of a button. The new GRAFIK Eye QS provides convenient control and enhancement of the visual environment for the people inside the space.

For more information, please visit www.lutron.com/GRAFIKEyeQS.



modernize your lighting control system

You originally purchased a Lutron lighting control system because you wanted the ultimate in reliability and performance. The pace of innovation in Lutron's products has been rapid—the systems of today have features that were beyond reach just five years ago. These features may be just what you are looking for as you modernize your facilities.

In addition to improved serviceability, a new system brings advanced control features and energy saving capabilities that will take your lighting control experience to the next level.

Regardless of your reasons for wanting to upgrade or replace your system, Lutron will integrate the best products and services to give you a solution that meets your needs.

For more information on upgrading your system, please call 1.800.523.9466 and select option 4, then 5 or email rus@lutron.com.



system expansions

If you are expanding your building, or if existing areas of the building need to be incorporated into the system, we can provide a solution. Our systems are modular and expandable, allowing you to add capabilities or capacity as required.

Adding photo or occupancy sensors can help save energy. Using Lutron occupancy sensors can eliminate 20–30% of lighting energy costs.

Our Replacement Systems Specialists can review the equipment you have, work with you to determine what capabilities and features you want, and propose comprehensive solutions for your lighting needs.

For more information, please call 1.800.523.9466 and select option 4, then 5 or email rus@lutron.com.



Lutron in your home

When it comes to controlling electric and natural light, Lutron has the best products for any application, including your home.

The same world-class quality and engineering in the lighting controls in Buckingham Palace and the White House can be found in the dimmer that you can purchase for your home. After all, we feel that everyone deserves the benefits of dimming such as increased bulb life, improved energy savings, and enhanced room settings.

For assistance in locating Lutron products for your home, go to www.lutron.com.

Save energy beautifully

dimming the lights about	saves electricity	extends bulb life*
10%	10%	2 times longer
25%	20%	4 times longer
50%	40%	20 times longer
75%	60%	20 times longer +

* incandescent and halogen

www.lutron.com

save
energy
with
Lutron™



 **LUTRON**® SERVICES CO., INC.

www.lutron.com/service

Lutron Services Co., Inc.
7200 Suter Road
Coopersburg, PA 18036-1299

World Headquarters 1.610.282.3800
Technical Support Center 1.800.523.9466

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Made and printed in the U.S.A.



Install & Setup Guides

Job Name:

Toll-Free 24/7 Technical Support Line: 1.800.523.9466

Job Number:

Field Service Scheduling 1.800.523.9466 ext.4439

GRAFIK Eye® 3000 Series Installer's Guide

Models 3100 and 3500



PLEASE LEAVE FOR OCCUPANT

English

Español

Deutsch

Français

中文

Português

Nederlands

Italiano



Questions? Need technical assistance?

- In the U.S., Canada and the Caribbean:1-800-523-9466
- In Mexico, Central and South America:1-610-282-3800
- In Europe:44-207-702-0657
- In the U.K.:0800-282-107
- In France:33-1-44-70-71-86
- In Germany:49-309-710-4590
- In Japan:03-5405-7333
- In Hong Kong:2104-7733
- All others:1-610-282-3800
- Website address:www.lutron.com
- E-mail:product@lutron.com

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 by 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; 5,191,265; 5,430,356; 5,463,286; 5,530,322; 5,949,200; 5,990,635; 6,091,205; 6,380,692; 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 335,867; DES 344,264; DES 370,663; DES 378,814; D387,736; D412,315; D412,491; D422,567; D436,930; D453,742; D456,783; D461,782 and corresponding foreign patents. U.S. and foreign patents pending. Lutron, GRAFIK Eye, Tu-Wire, and Hi-Lume are registered trademarks; Hi-Power 2•4•6, Eco-10, LIAISON, and Designer are trademarks of Lutron Electronics Co., Inc. All other trademarks are the property of their respective owners.

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

LUTRON

LUTRON-Quality Systems
Registered to ISO 9001

STEP 1: Installing Control Units

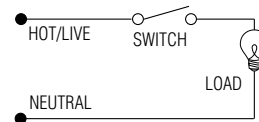
This section shows how to install Control Units and make sure they are properly operating all connected loads.

Please read Appendix B: Special Mounting Considerations before installing!

⚠ DANGER! *GRAFIK Eye* 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 Eye* lighting controls or other equipment. Always turn off circuit breaker/MCB 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 *Lutron Hi-lume*®, *Eco-10*™, or *Tu-Wire*® Electronic 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 Eye* lighting controls with any lamps removed or burned out; Replace any burned out lamps immediately; Use only transformers that incorporate thermal protection or fused primary windings. This lighting control is designed for residential and commercial use. *GRAFIK Eye* Controls are designed for indoor use only.

⚠ 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, halogen (tungsten), magnetic low-voltage, and neon/cold cathode load types. Electronic low-voltage and fluorescent load types can be controlled with an appropriate interface.

- All Electronic Low-Voltage (ELV) lighting used with the Electronic Low-Voltage Interface must be rated for **reverse phase-control dimming**. Before installing an ELV light source, verify with the manufacturer that their transformer can be dimmed. When dimming, an Electronic Low-Voltage Interface **MUST** be used with the Control Unit.
- Not all zones need to be connected; however, connected zones must have a load of at least 25W (40W for AU and CE models).
- No zone may be loaded with more than 800W (1200 for AU models).
- Unit must not carry more than 16A of total lighting load (10A for CE models).

Model

Number

Wallbox Size/Max. Unit Load

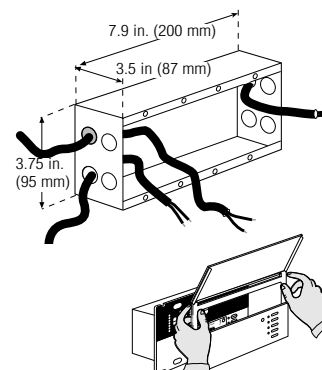
	100-127V	230V	220-240V
3102/3502	2-Gang U.S./1200W/VA	4-Gang U.S.†/10A	2-Gang U.S./1600W/VA
3103/3503	3-Gang U.S./1500W/VA	4-Gang U.S.†/10A	3-Gang U.S./2400W/VA
3104/3504	4-Gang U.S./2000W/VA	4-Gang U.S.†/10A	4-Gang U.S.†/3000W/VA
3106/3506	4-Gang U.S./2000W/VA	4-Gang U.S.†/10A	4-Gang U.S.†/3000W/VA

† Lutron P/N 241-400 or 241-691 (old work metal wallbox).

Installation instructions. First, turn power off.

Preparation

1. **Mount Wallbox.** Use standard U.S. wallbox, 3 1/2 in. (87 mm) deep is strongly recommended, 2 3/4 in. (68 mm) deep minimum. Always allow at least 4 1/2 in. (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

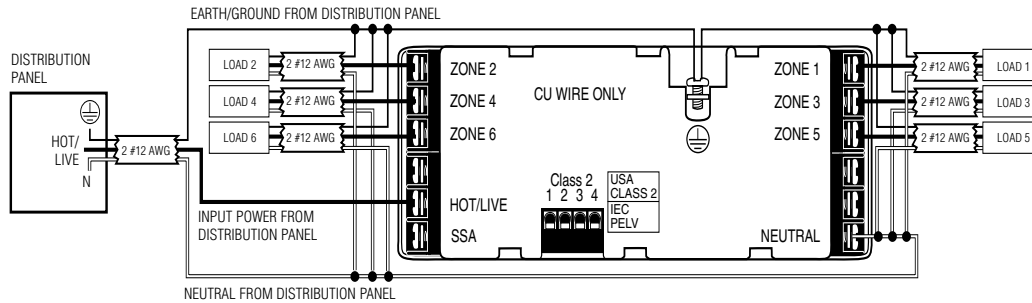
Important Wiring Notes!

- Use properly certified cable for all line voltage/mains cables and Class 2/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 Class 2/PELV wiring can be any of the specified cables in **Appendix A: More about Class 2/PELV Wiring.**
- Proper short-circuit and overload protection must be provided at the distribution panel. You can use up to a 20A (16A for AU, and 10A for CE models) 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 Class 2/PELV terminals.
- Earth/Ground terminal connection must be made as shown in wiring diagrams.
- Do not mix different load types on the same zone!
- Fluorescent and electronic low voltage loads require interfaces. Zone loads that exceed 800W/VA (1200W/VA for AU models) and total unit loads that exceed the unit capacity require power boosters.

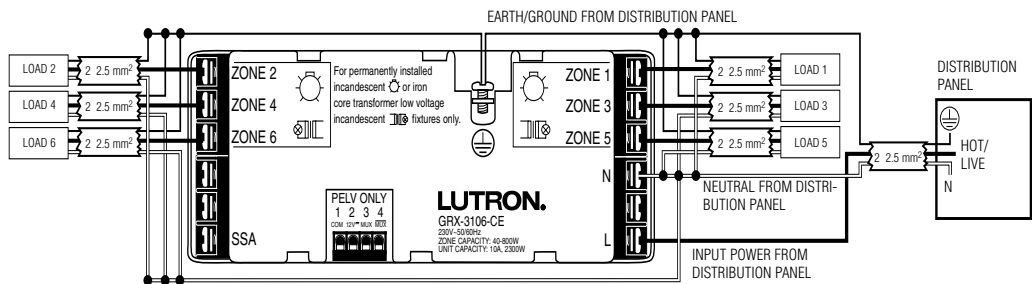
Wire the Control Unit

1. Strip 1/2 in. (12 mm) insulation from all wires in wallbox and connect them to appropriate terminals on the back of the Control Units. The recommended installation torque is 9.0 in.-lbs. (1.0 N•m) for line voltage connections and 10 in.-lbs. (1.3 N•m) for the earth/ground connection. Each power terminal can accept up to two #12 AWG (2.5 mm²) wires (does not apply to Class 2/PELV terminal block).

GRX-3106/3506*, GRX-3106-AU/3506-AU*



GRX-CE Models*



* For phase-to-phase and delta-feed wiring, please contact Lutron.

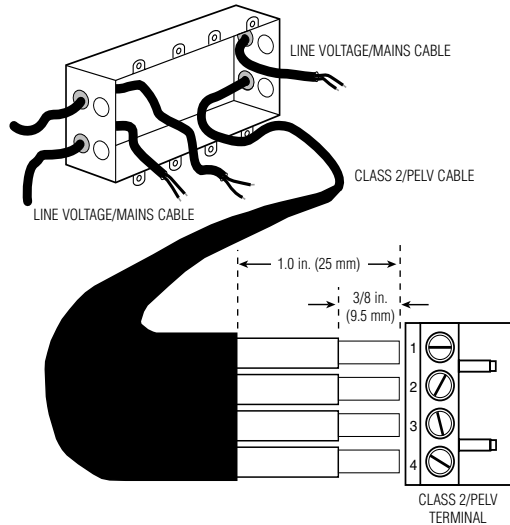
Class 2/PELV Wiring

Connect Class 2/PELV wiring *only* if your project has WallStations and/or more than one Control Unit.

Use recommended cable as specified in **Appendix A: More About Class 2/PELV Wiring**.

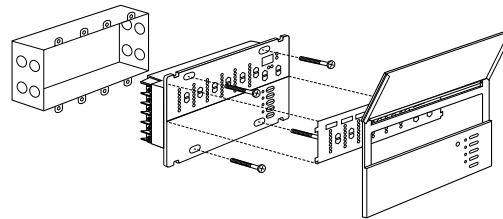
Use the rearmost knockouts when pulling wires into the wallbox. This will provide the most clearance when mounting the Control Unit.

- Strip 1 in. (25 mm) of insulation from the Class 2/PELV cable.
- Strip 3/8 in. (8 mm) of insulation from each wire.
- Connect the Class 2/PELV wires to the Class 2/PELV terminal block. Make sure no bare wire is exposed after making connections. The recommended installation torque is 3.5 in.-lbs. (0.4 N•m) for Class 2/PELV connections.
- The Class 2/PELV cable and terminal block should be separated from line voltage/mains cables by at least 1/4 in. (7 mm).



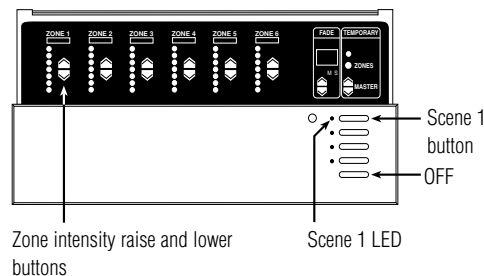
Mounting

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



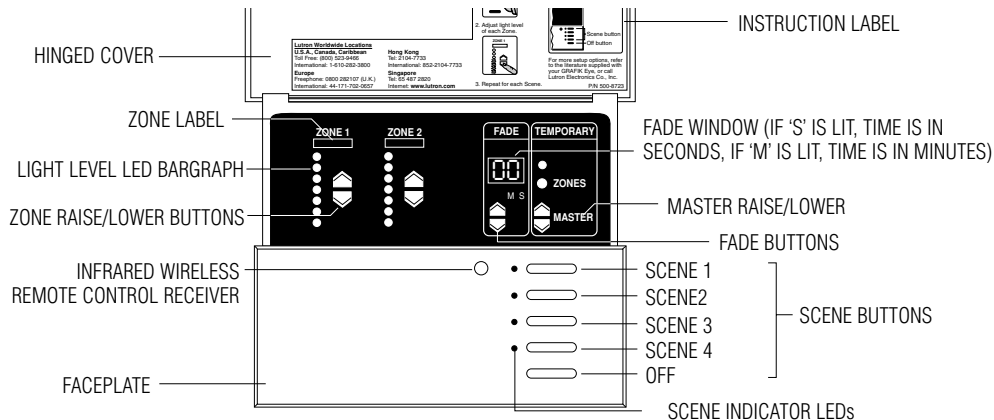
Testing: Do the lights work?

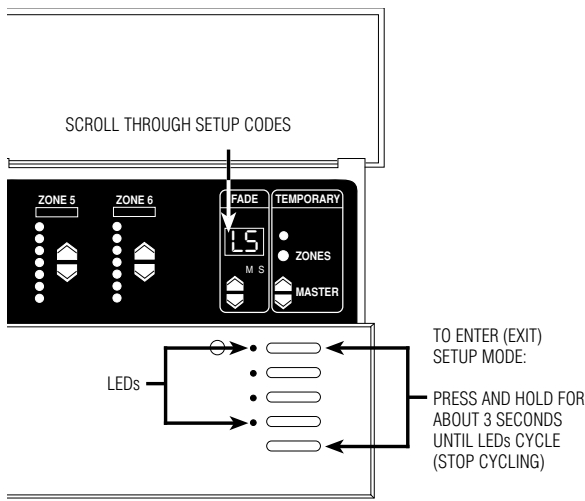
- Restore Power.
- Press **Scene 1** button on front of the *GRAFIK Eye* Control Unit. The Scene 1 LED will light.
- Press **zone ▲ or ▼** to raise or lower the light levels. Make sure that the Control Unit is dimming all connected loads. Refer to **Appendix C: Troubleshooting**, or call *Lutron*.



STEP 2: Setting Up *GRAFIK Eye* Control Units

GRAFIK Eye Control Unit





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.

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:

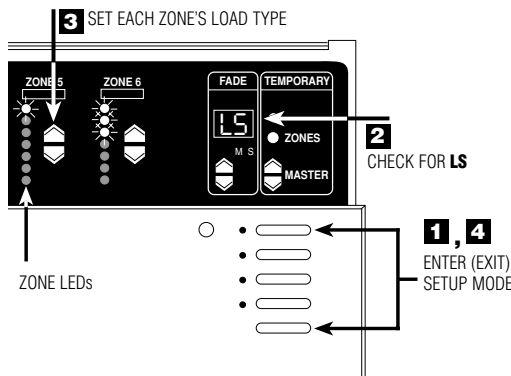
Code	Stands for	Description
Sd	Save Options	Select from several save options (Pg. 8)
Sc	Scene	Set unaffected zones and set any of the 16 scenes (Pg. 8)
A-	Address	Identify Control Units when setting up system communications (Pg. 9)
LS*	Load Select	Identify load type (Pg. 5)
LE	Low End	Set low end trim (Pg. 7)

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

- If you press FADE ▲, you will see **A-**, **Sc**, then **Sd**.
- If you press FADE ▼, you will see **LE**.

Identifying the Load Type for each Zone

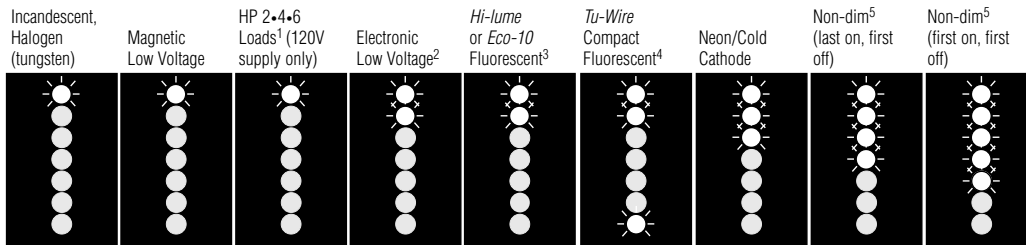
Lutron ships *GRAFIK Eye* Control Units with all zones set for incandescent/halogen (tungsten) lighting. If your project has non-incandescent loads, change all non-incandescent zones to the correct load type.



- 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.** 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.

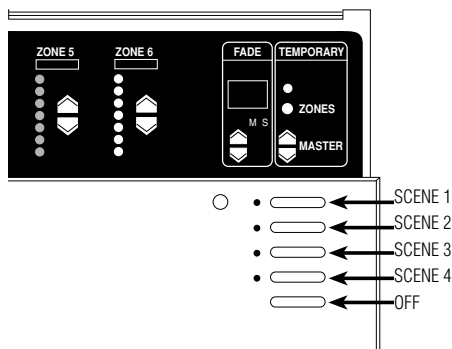
In the 6-Zone Control Unit shown here:

- Zone 5 is set for incandescent or magnetic low-voltage.
- Zone 6 is set for neon/cold cathode.



1. Set all zones connected to HP Dimming Modules as shown—no matter what load type they are (including non-dim or switching). The HP can be used to switch non-capacitive ballasts. To fine-tune the dimming of these “HP-powered” zones, you must adjust high- and low-end trim on the HPs as described in the Instruction Sheet supplied with the unit. Do **NOT** use HPs with generator-supplied line/mains voltage.
2. All electronic low-voltage (ELV) lighting used with the Electronic Low-Voltage Interface (ELVI) must be rated for reverse phase control dimming. Before installing an ELV light source, verify with the manufacturer that their transformer can be dimmed. When dimming, an ELVI **MUST** be used with the 3000 Series Control Unit.
3. Any zones set for Lutron *Hi-lume* or *Eco-10* fluorescent lighting **must** have GRX-FDBI or GRX-TVI Fluorescent Interfaces. Consult Lutron for more information.
4. Please note that the *Tu-Wire* Compact Fluorescent, unlike other fluorescent load types, **does not** require an FDBI interface. This load type is not available in GRX-CE models.
5. Use non-dim for any lights to be switched on and off only—not dimmed (unless using HP Dimming Module).
 - Fluorescent non-dim loads with electronic or magnetic ballasts must: use a GRX-TVI Interface *and* be set for non-dim mode, or use an *HP 2•4•6_w* Dimming Module *and* be set for *HP 2•4•6* Dimming Module loads.

What is a Scene?

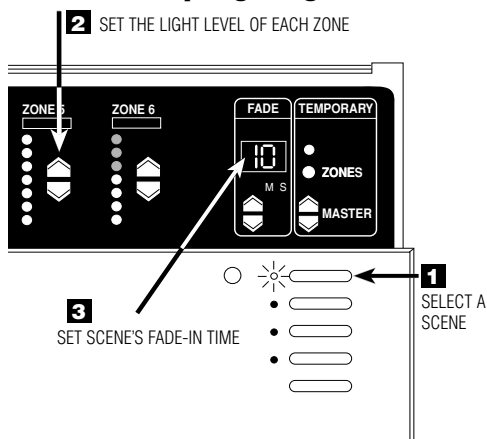


Scenes are the preset light levels and fade times stored in the Control Unit. To create a scene, set the appropriate intensity for each ZONE. To recall a scene, simply press one of the buttons. The first button calls up Scene 1; the second, Scene 2; and so on. The last button turns lights Off.

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

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 **Sd** mode. See Page 8 for more information regarding Save Options.

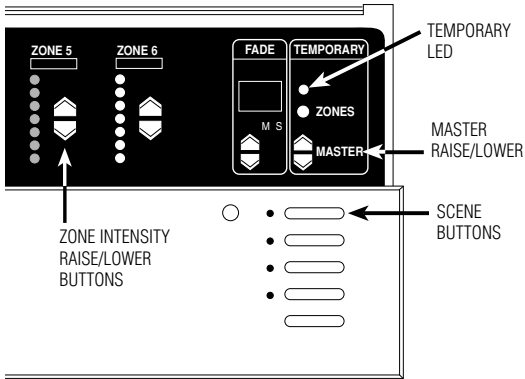
To set up scenes 1 through 4:

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. To program scenes 5 through 16, or for more precise zone intensity adjustment with a *GRAFIK Eye 3500* Control Unit, refer to page 7.
3. **Set scene’s FADE-in time.** Press FADE ▲ and ▼ to make FADE-in time anything from 0—59 seconds or 1—60 minutes*. (FADE-in time is how long it takes the lights to adjust to the 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. The FADE-in time from OFF to any Scene is factory-set at 3 seconds.

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 **Sd** or **Sb** mode. See Page 8 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.

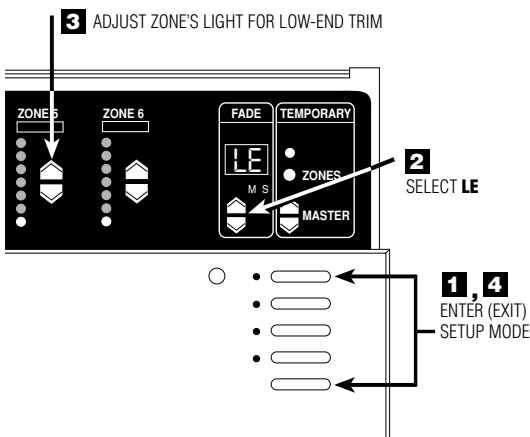
To adjust a zone:

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.

How to Set Low-end Trim—OPTIONAL



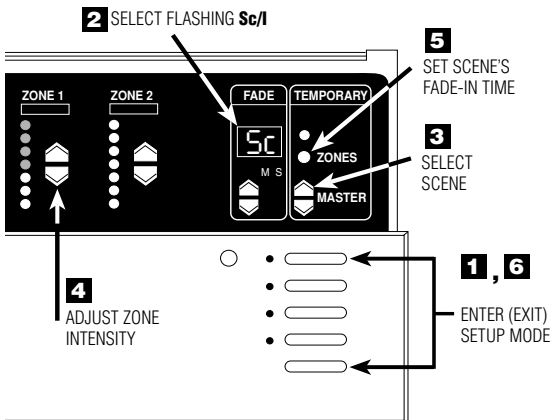
If necessary, adjust the low-end trim to achieve uniform low-intensity dimming and to eliminate flicker (especially with neon/cold-cathode and fluorescent loads).

- 1. Enter setup mode.** Press and hold Scene 1 and OFF buttons for about 3 seconds, until scene LEDs start cycling.
- 2. Select LE (low end)** by pressing FADE ▼ once. All zones go to their lowest possible dim levels and only their bottom LED is lit*.
- 3. Adjust zone's lights for low-end trim.** Use ZONE ▼ and ▲ to dim the zone's lights as much as possible without causing flicker. Repeat this process for any other zones that require low-end trim.
- 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 trim adjustments. The bargraph remains set to its lowest level in this mode.

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

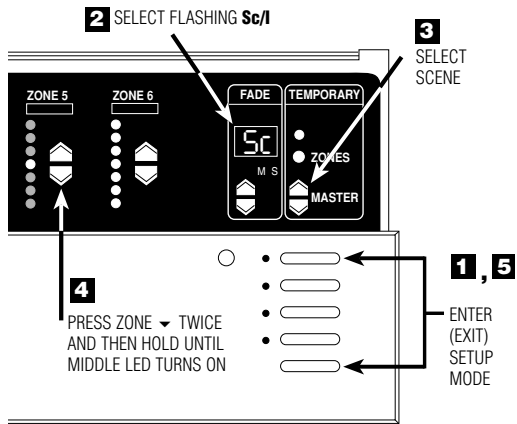
Advanced Scene Programming Options—OPTIONAL



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** (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 (GRX-3500 units will 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.

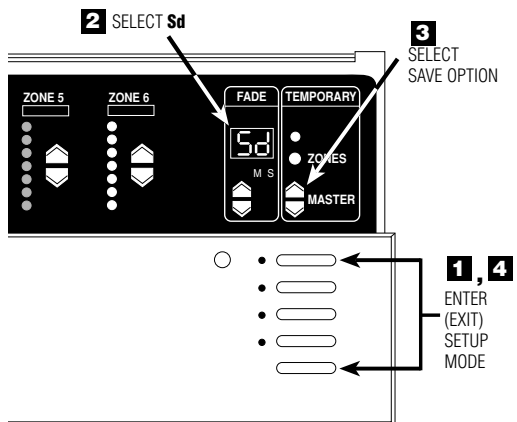
How to Set an “unaffected zone” — OPTIONAL



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 \uparrow twice. Sc and I (for scene 1) will alternately flash in the FADE window.
- 3. Select scene.** Press MASTER \uparrow and \downarrow to select the scene that will have the unaffected zone.
- 4. Program any ZONE as unaffected.** Press ZONE \downarrow twice and then hold until all the bargraph LEDs go out and the middle LED light. (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 3000 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 \uparrow until Sd is displayed in the FADE window.
 - 3. Select Save Options.** Press MASTER \uparrow and \downarrow 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 7.
 - 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 \uparrow or \downarrow 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 3: Installing Wallstations/Controls

IMPORTANT WIRING NOTES!

Review Appendix A BEFORE wiring!

- Please refer to the Installation Instructions included with each Wallstation/Control before installing.
- Wallstations/Controls must be installed by a qualified electrician.
- Wallstations/Controls use Class 2 or PELV wiring methods as applicable in your locale.
 - **Using Class 2 wiring methods:** Wallstations/Controls must be connected in accordance with the 1996 National Electrical Code, Article 725-54(a), (1) Exception No. 3 or the Canadian 1994 CE Code Handbook, Rule 16-212, Subrule (4). Check with your local electrical inspector to comply with local codes and wiring practices.
 - **Using PELV wiring methods:** Wallstations/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.
- Wallstations/Controls must be mounted in a wallbox. Please refer to instruction sheet included with each Wallstation/Control to determine wallbox requirements.

STEP 4: Setting Up System Communications

This section shows how to set up communications between Control Units. For specific, step-by-step instructions about setting up communications for each type of *GRAFIK Eye* Wallstation, please refer to the instructions included with each Wallstation.

IMPORTANT!

First check Class 2/PELV wiring.

Before you set up communications, make sure your Class 2/PELV system interconnections are working.

1. Select Scene 1 (press the top button) on one of the Control Units.

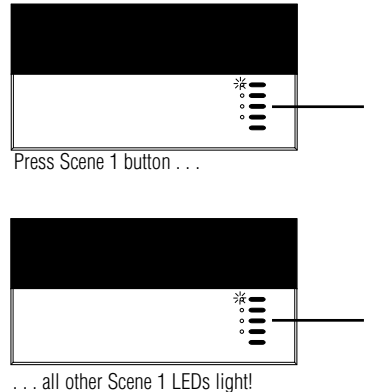
2. Is Scene 1 selected on all other Control Units?

YES: Class 2/PELV wiring is OK. Proceed.

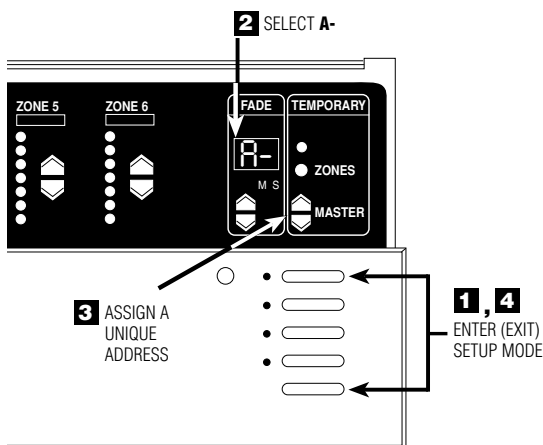
NO: Class 2/PELV wiring has a miswire. Check for loose connections, shorted or crossed links. Refer to Appendix A for details on Class 2/PELV wiring.

OR

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



Assign Addresses to GRAFIK Eye Control Units



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 A-** (the address display). Press FADE ▲ once, **A-** 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, **A1** 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.

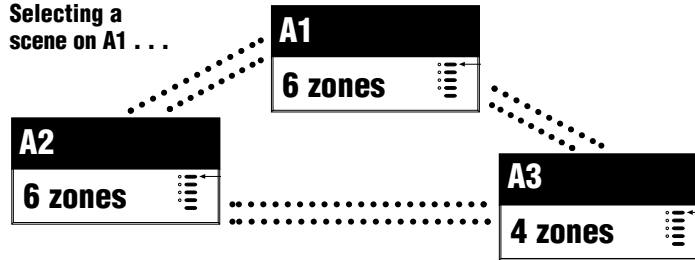
Set up Communication between 2 or more Control Units

This page explains how to use 2-way communications to set up lighting effects for more than six zones (the maximum number of zones any *one* 3000 Series 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 6-Zone Control Units, you can create scenes that control the intensity of up to 48 zones. This “large-zone” capability is ideal for large spaces with dramatic lighting that changes frequently (e.g., churches).

For example: 16-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 16-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 9) 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.

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.



. . . then the other.



Appendix A: More about Class 2/PELV Wiring

This appendix explains the Class 2/PELV wiring used to carry communications between *GRAFIK Eye* Control Units and Wallstations.

Lutron requires that you connect (daisy-chain) all *GRAFIK Eye* 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 Eye* 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 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.

Each twisted pair in the Class 2/PELV wiring link should consist of two #18 AWG (1.0 mm²) stranded conductors.

- **Lutron offers a one-cable, low-voltage solution: P/N GRX-CBL-346S (non-plenum), or GRX-PCBL-346S (plenum).**

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 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.

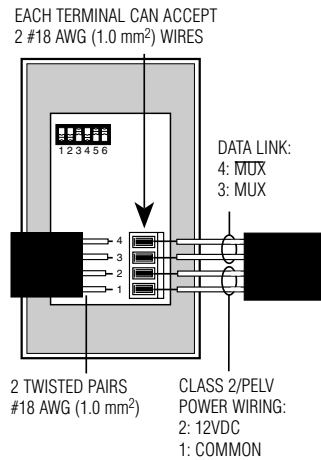
The *GRAFIK Eye* 3000 Series Control Unit Class 2/PELV circuit is 12VDC.

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.

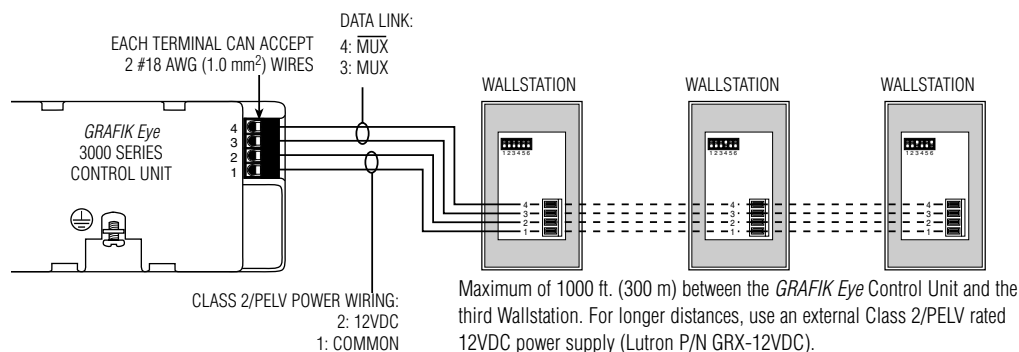
IMPORTANT WIRING NOTE!

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.



A Control Unit with up to three Wallstations

See Important Wiring Notes on Page 12. 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 P/N GRX-12VDC).

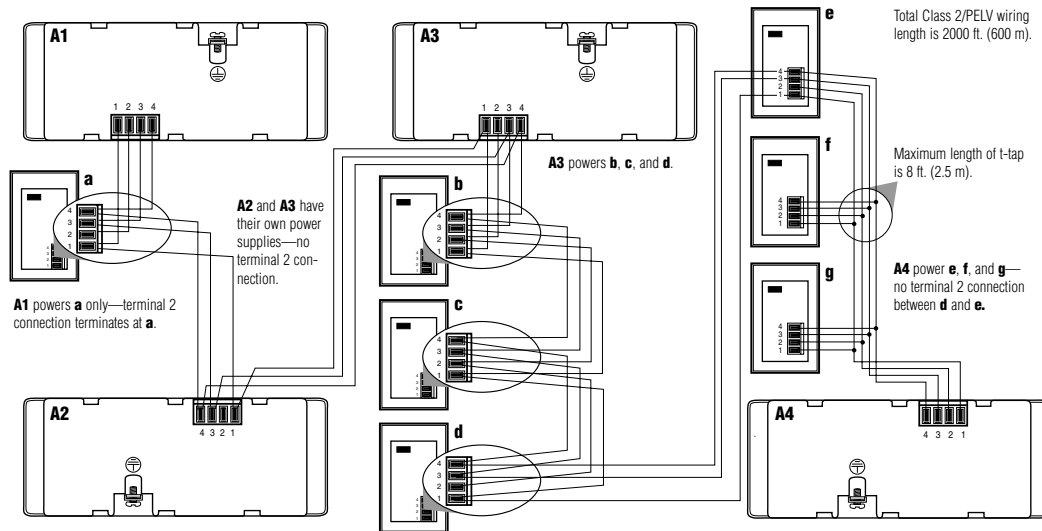


IMPORTANT WIRING NOTES!

1. 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.
2. 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 as described later in this section.
3. 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 8 ft. (2.5m) from the link to the connected unit.

Note: Do not allow Class 2/PELV wires to contact line/mains wires. Refer to Class 2/PELV wiring on Page 4.

Up to 8 Control Units and 16 Wallstations



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 8 ft. (2.5 m) from the link to the connected unit.

Note: Do not allow Class 2/PELV wires to contact line/mains wires. Refer to Class 2/PELV wiring on Page 4.

Installing an External Power Supply

Install an external Class 2/PELV rated 12VDC power supply as shown on Page 13. This power must be Class 2/PELV rated and be a regulated supply rated for at least 50 mA per Wallstation on the link. It can supply power to up to 16 Wallstations, enabling you to use up to 16 Wallstations with one Control Unit.

Use an external power supply if you need to power more than 3 Wallstations from a single Control Unit or if your wire lengths exceed maximums. Power supplies do not boost data line signals. The distance limitation for the data line is 2000 ft. (450 m).

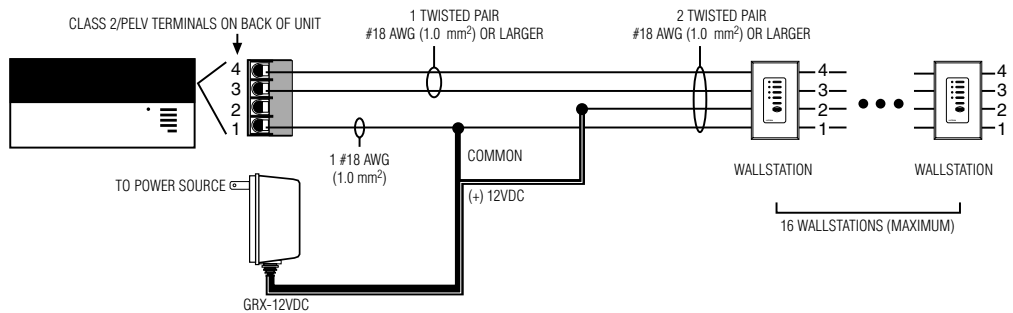
Make sure you review the manufacturer's instructions before installing.

Lutron offers a 12VDC transformer for 120V applications. Please ask for P/N GRX-12VDC.

IMPORTANT WIRING NOTES!

1. Connect the +12VDC wire from the power supply to the terminal 2 connection on all Wallstations. Do not connect this wire to any Control Units on the link. Be sure that the terminal 1 connection is made to all Wallstations and Control Units.
2. Lutron recommends these maximum distances from the external 12VDC power supply to the sixteenth Wallstation:
 - #18 AWG (1.0 mm²) wire: 300 ft. (90 m).
 - #12 AWG (2.5 mm²) wire: 1000 ft. (300 m).

Note that the allowable maximum distance depends on the number of Wallstations in the system. Please see Application Note W14 or consult Lutron Technical Support for more detailed information.



Appendix B: Special Mounting Considerations

Wallbox Mounting

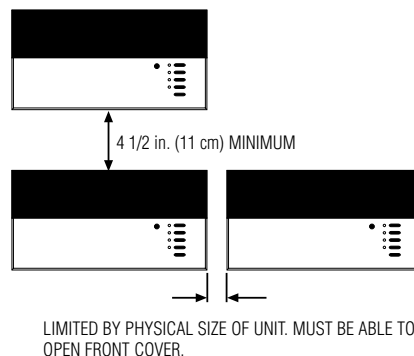
Spacing of the *GRAFIK Eye 3000 Series Control Unit*

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

- All *GRAFIK Eye 3000 Series Control Units* **MUST** be mounted in a standard U.S. Wallbox. These are available from Lutron.
 - For two-zone Control Units, Power Boosters, Fluorescent Interfaces, and Electronic Low-Voltage Interfaces, use two P/N 241-519 single-gang wallboxes.
 - For three-zone Control Units, use three P/N 241-519 single-gang wallboxes.
 - For four-zone (or larger) Control Units, use one P/N 241-400 four-gang wallbox.

Note: All GRX-CE Control Units mount in one P/N 241-400 four-gang wallbox.

- All *GRAFIK Eye 3000 Series Control Units*, Power Boosters, Fluorescent Interfaces, and Electronic Low-Voltage Interfaces **MUST** have 4 1/2 in. (11 cm) of space above and below the faceplate to dissipate the heat caused by normal operation.



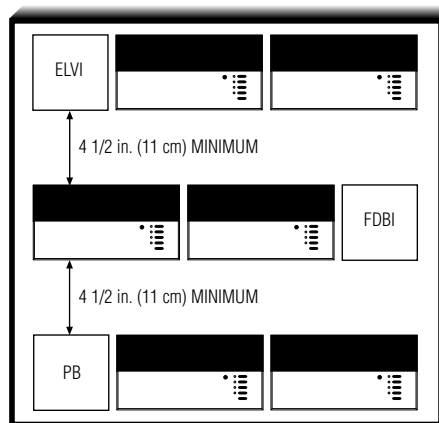
Panel Mounting

- 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 Eye 3000 Series Control Units* and Interface Devices.
- If mounting multiple *GRAFIK Eye 3000 Series Control Units* or Interface Devices in an enclosure:
 - Ambient temperature within an enclosure **MUST remain between 32°—104° F (0°—40° C)**.
 - 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 Interface Units, (i.e., NGRX-PB, GRX-ELVI, etc.), remove the faceplate from the unit.

IMPORTANT NOTE:

GRAFIK Eye 3000 Series Control Units and Interface Devices, such as NGRX-PB, dissipate heat when operating.

Obstructing these units can cause malfunction to both the Control Unit and the Interface Device if ambient temperature does not remain between 32°—104° F (0°—40° C).



Appendix C: 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 — especially the project's One-Line Diagram, which gives an overview of the wiring and shows how all *GRAFIK Eye* equipment connects. The *GRAFIK Eye Designer*™ software, which produces such one-line diagrams, is available from Lutron.
- 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 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 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 8 for Save Options.

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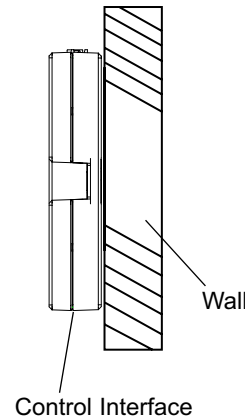
Please refer to the enclosed CD for the product Specification Sheets and Operation Manuals, Ethernet Device IP program, and RS232 Protocol information.

PELV (Class 2: USA) Devices 12 - 24 V_{DC} 200 mA

Mounting

1. Mount the Control Interface directly on a wall, as shown in the Mounting Diagram, using screws (not included). When mounting, provide sufficient space for connecting cables. The unit can also be placed in the LUT-19AV-1U AV rack using the screws provided with the unit. The LUT-19AV-1U will hold up to four units. If conduit is desired for wiring, the LUT-5x10-ENC can be used to mount one unit.
2. Strip 3/8 in. (10 mm) of insulation from wires. Each Data Link terminal will accept up to two #18 AWG (1.0 mm²) wires.
3. Connect wiring as shown in the Wiring Diagram (next page). LED 1 lights continuously (Power) and LED 7 blinks rapidly (Data Link RX) when the Class 2 (PELV) Data Link is installed correctly.

Mounting Diagram

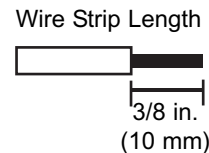
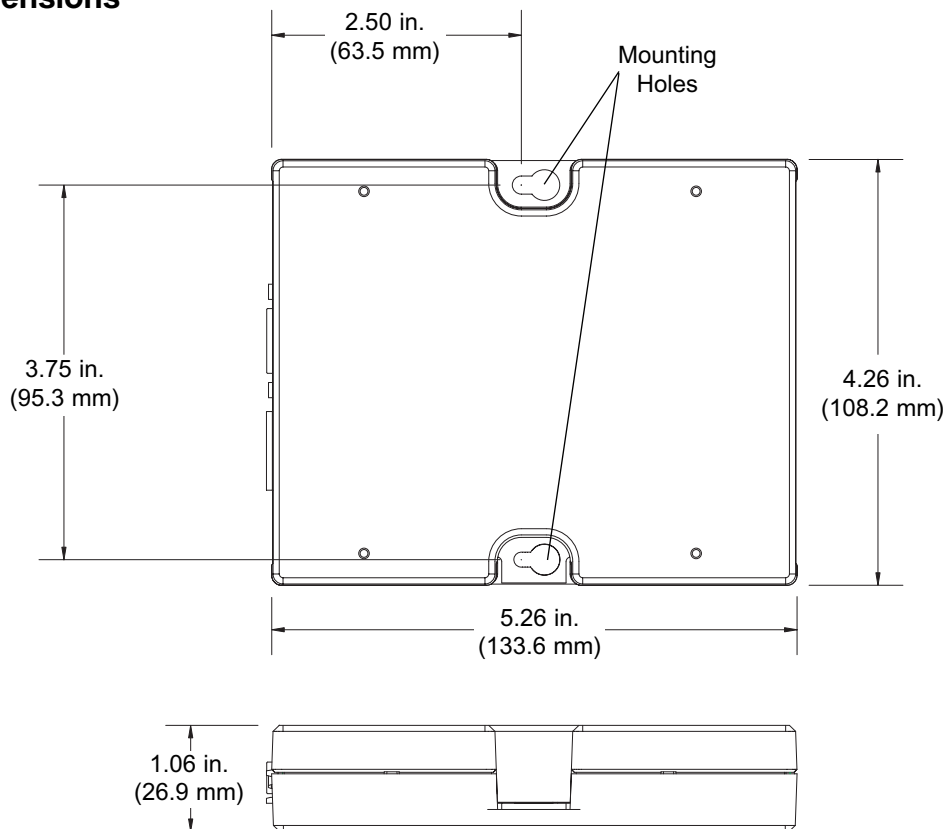


LUT-19AV-1U



LUT-5x10-ENC

Dimensions

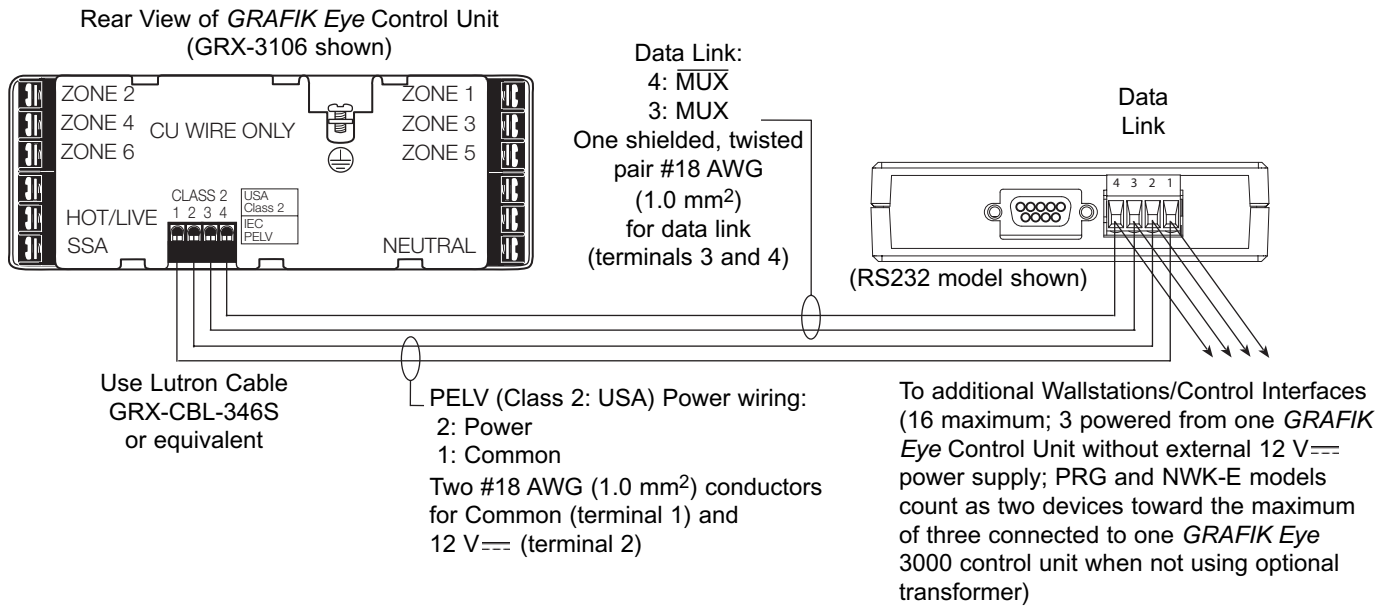


Low-Voltage PELV (Class 2: USA) Wiring

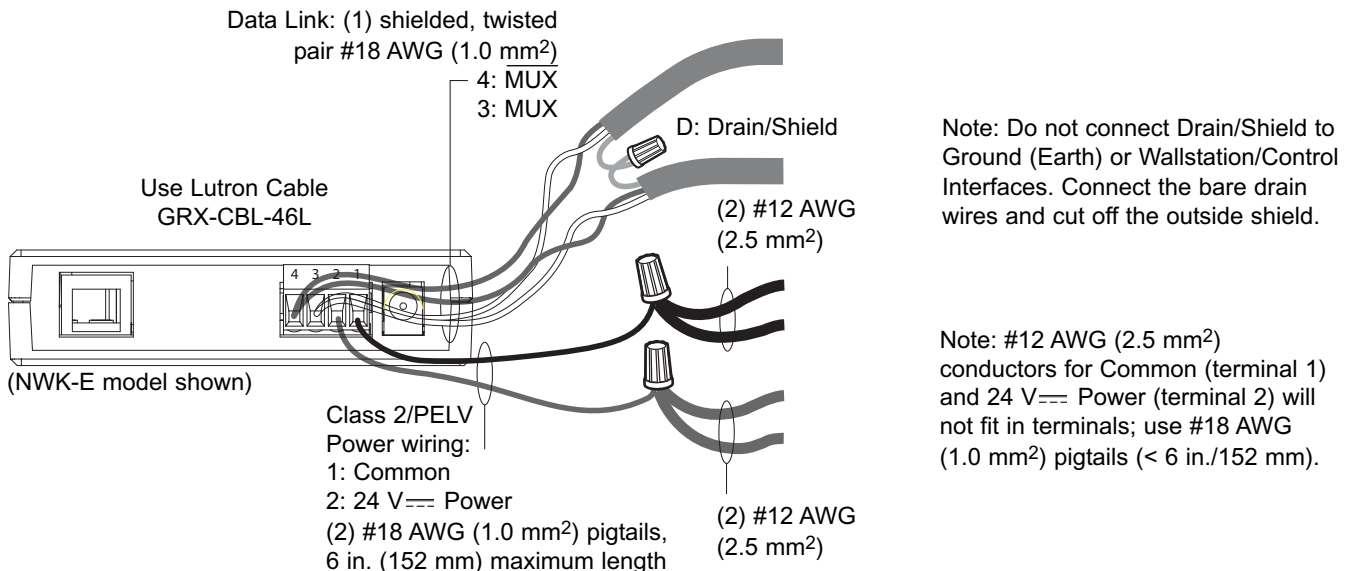
Important Notes

- Install in accordance with all applicable regulations.
- **CAUTION:** Do **not** connect line voltage/mains power to device. Improper wiring can result in personal injury or damage to the device or to other equipment.
- This control can use PELV (Class 2: USA) wiring methods. Check with your local electrical inspector for compliance with national and local codes and wiring practices.
- Make daisy-chain connections to the low-voltage PELV (Class 2: USA) Data Link terminals on the end of the Control Interface.
- Do not use T-taps. Run all wires in and out of the terminal block.
- Each terminal accepts up to two #18 AWG (1.0 mm²) wires.

Control Interface Wiring: GRX-3000 Control Unit

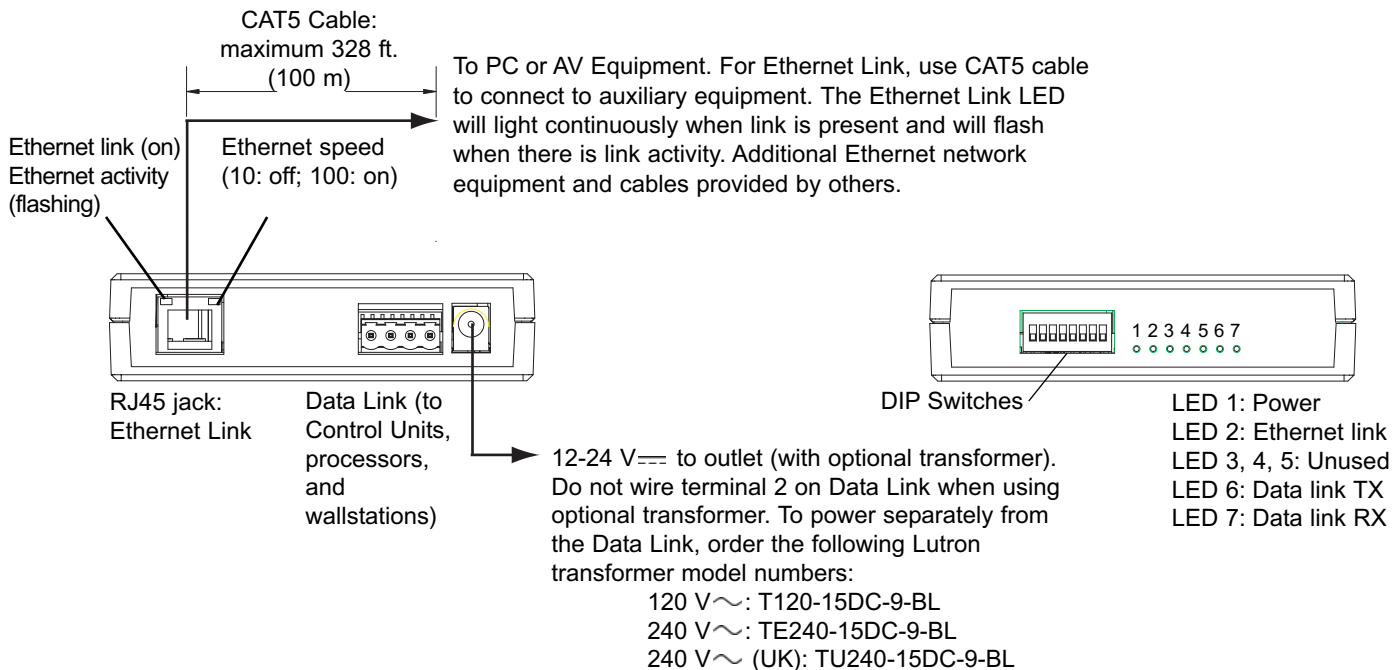


Control Interface Wiring: GRX-4000 Control Unit or OMX Control Station Device Link (Data Link connection shown)

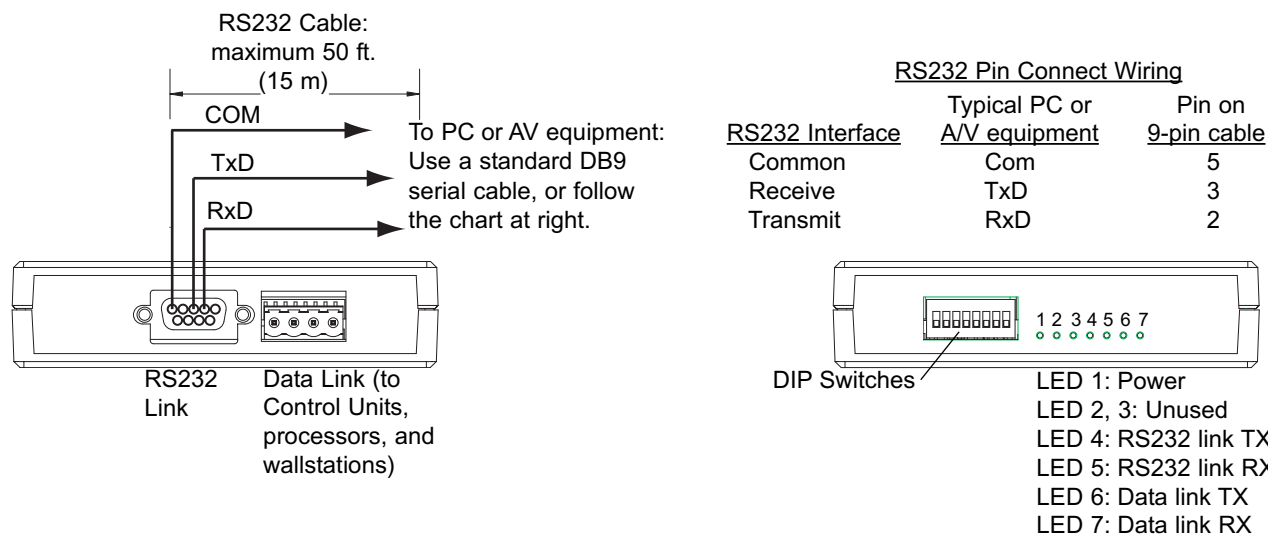


A/V Connections and Signal/Link Information

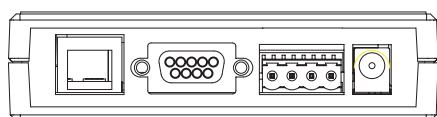
GRX-CI-NWK-E, GRX-IA-CI-NWK-E, OMX-CI-NWK-E



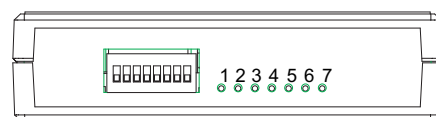
GRX-CI-RS232, GRX-IA-CI-RS232, OMX-CI-RS232



GRX-CI-PRG, GRX-IA-CI-PRG



Links and connections are same as shown for above units.



LED 1: Power
LED 2: Ethernet link
LED 3: Unused
LED 4: RS232 link TX
LED 5: RS232 link RX
LED 6: Data link TX
LED 7: Data link RX

Please refer to the enclosed CD for the product Specification Sheets and Operation Manuals, Ethernet Device IP program, and RS232 Protocol information.

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For a period of one year from the date of purchase, and subject to the exclusions and restrictions described below, Lutron warrants each new unit to be free from manufacturing defects. Lutron will, at its option, either repair the defective unit or issue a credit equal to the purchase price of the defective unit to the Customer against the purchase price of comparable replacement part purchased from Lutron. Replacements for the unit provided by Lutron or, at its sole discretion, an approved vendor may be new, used, repaired, reconditioned, and/or made by a different manufacturer.

If the unit is commissioned by Lutron or a Lutron approved third party as part of a Lutron commissioned lighting control system, the term of this warranty will be extended, and any credits against the cost of replacement parts will be prorated, in accordance with the warranty issued with the commissioned system, except that the term of the unit's warranty term will be measured from the date of its commissioning.

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This Warranty does not cover, and Lutron and its suppliers are not responsible for:

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3. Equipment and parts external to the unit, including those sold or supplied by Lutron (which may be covered by a separate warranty).
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P/N 040-228 Rev. B





GRX-CI-NWK-E

GRX-CI-RS232

Description

Up to eight *GRAFIK Eye* Control Units can be interfaced with your personal computer or auxiliary audio/visual equipment via TCP/IP communication over Ethernet (GRX-CI-NWK-E) or RS232 (GRX-CI-RS232). The interface can be used to execute Control Commands and allow for Status Monitoring.

Control Commands

The Control Interface can send commands from a PC or A/V equipment to a maximum of eight *GRAFIK Eye* Control Units. The following commands are available:

Select Scene. Select any scene on any *GRAFIK Eye* Control Unit.

Scene Lock. Prevent changes to *GRAFIK Eye* Control Unit(s) from any remote location.

Request Scene Status. Request the current scene of every *GRAFIK Eye* Control Unit in the system.

Read Zone Intensity. Read the zone intensities on a specified *GRAFIK Eye* Control Unit.

Set Zone Intensity (requires 3500/4500 Series Control Unit). Change the intensities of the given zones on a specified *GRAFIK Eye* 3500 or 4500 Series Control Unit in the given fade time.

Sequence. Begin sequencing scenes 1 to 4 or 5 to 16 (DIP-switch selectable) on selected *GRAFIK Eye* Control Unit(s).

Zone Lock. Prevent permanent changes to preset levels of *GRAFIK Eye* Control Unit(s).

Zone Raise/Lower. Raise or lower any zone on any *GRAFIK Eye* Control Unit.

Refer to the *GRAFIK Eye* RS232 Protocol and Command Set on the enclosed CD for detailed command descriptions and information on configuring your PC or auxiliary A/V equipment for use with Lutron's RS232 interfaces.

Status Monitoring

The Control Interface will allow a PC or auxiliary A/V equipment to monitor a *GRAFIK Eye* system. The following commands are available:

Raw Feedback (DIP switch 6 ON). Report all button presses and releases on all *GRAFIK Eye* Control Units and Accessory Controls.

Scene Status (DIP switch 7 ON). Report scene status changes on all *GRAFIK Eye* Control Units. Scene status may be changed by Control Units, Accessory Controls, or sequences.

Communication Settings: NWK-E

To configure your device to talk to the *GRAFIK Eye* Ethernet Interface, open a Telnet session with the following default IP address, port, and login information.

Default IP Address: 192.168.250.1

Default Port: 23 (Telnet Port)

Default Login for Connection 1: 'nwk'

Default Login for Connection 2: 'nwk2'

If you wish to send these commands from a PC, run the Microsoft® Windows® Telnet program or an equivalent program.

Communication Settings: RS232

To configure your device to talk to the *GRAFIK Eye* RS232 Interface, use the data conventions listed below.

9600 BAUD

8 DATA BITS

1 STOP BIT

NO PARITY

If you wish to send these commands from a PC, run the Microsoft® Windows® Hyper Terminal program or an equivalent program. Then, select Local Echo, Line Feed, and Carriage Return inbound and outbound. This allows you to see the characters that you are typing as well as keep the responses from overwriting typed characters.

DIP Switch Operation

The settings of the DIP switches affect the interface operation between *GRAFIK Eye* Control Units and your PC or auxiliary A/V equipment. Control Units and Accessory Controls must be uniquely addressed for use with the Control Interface. For addressing, see the *GRAFIK Eye* Installation Guide included with the Control Units. The Control Interface will default to address 16, unless addressed in fixed address mode (see below). DIP switch options:

DIP Switch 1: ZONE LOCK RETAIN;

DIP Switch 2: SCENE LOCK RETAIN; and

DIP Switch 3: SEQUENCE RETAIN:

In the event of a power outage, the Control Interface will retain which *GRAFIK Eye* Control Units were in Zone Lock, Scene Lock, and Sequence modes (set using the Control Interface), respectively. Upon returning power, Control Units that had been in Zone Lock, Scene Lock, or Sequence mode (set using the Control Interface) will stay locked or sequencing if the DIP switches are in the ON position. When these DIP switches are in the OFF position, this information will **not** be restored upon power up. These DIP switches do not affect Zone Lock, Scene Lock, or Sequence mode set by a GRX-AV in 4Q mode.

DIP Switch 4: SEQUENCE TYPE: Set the scene range that *GRAFIK Eye* Control Units will sequence using the SEQUENCE command. In the OFF position, *GRAFIK Eye* Control Units will sequence scenes 1 to 4. In the ON position, they will sequence scenes 5 to 16.

DIP Switch 5: FIXED ADDRESS: If you want to add an Control Interface to a Data Link that already has a GRX-CI-NWK-E, GRX-CI-RS232 or GRX-CI-PRG, the fixed address option must be used by setting DIP Switch 5 ON. DIP Switches 1 to 4 are then used to address the Interface. Refer to the addressing table.

The Sequence Type (DIP switch 4) that will run when using the SEQUENCE command of the Control Interface is determined by the address of the Control Interface. Even addresses (2, 4, etc.) will sequence scenes 1 to 4, and odd addresses (1, 3, etc.) will sequence scenes 5 to 16.

A fixed address Control Interface can only do one of the following modes at any time: Zone Lock (ZL), Scene Lock (SL), or Sequence (SQ).

Note: Use the fixed address option only if there is a GRX-CI-PRG, GRX-CI-RS232, or GRX-CI-NWK-E already on the Data Link.

DIP Switch 6: RAW FEEDBACK

Setting DIP switch 6 of the Control Interface in the ON position will report when a button has been pushed or released on a *GRAFIK Eye* Control Unit or Accessory Control. The response will be formatted as follows:

[address][button data]

address - address of *GRAFIK Eye* Control Unit or Accessory Control where button was pressed or released

button data - what action was taken as a result of the button press or release

The first parameter is the address of the *GRAFIK Eye* Control Unit or Accessory Control where a button was pushed or released. A capital letter indicates a button was pushed, and a lowercase letter indicates a button was released. The table opposite lists how addresses will be reported by raw feedback.

The second parameter, **button data**, varies based on the function of the *GRAFIK Eye* Control Unit or Accessory Control. Functions can be separated into four major categories: scene selection/fine tuning, special functions, partitioning, and mastering.

Addressing Table

 ADDRESS 1	 ADDRESS 9
 ADDRESS 2	 ADDRESS 10
 ADDRESS 3	 ADDRESS 11
 ADDRESS 4	 ADDRESS 12
 ADDRESS 5	 ADDRESS 13
 ADDRESS 6	 ADDRESS 14
 ADDRESS 7	 ADDRESS 15
 ADDRESS 8	 ADDRESS 16*

*Reserved for GRX-CI-PRG, if present in the system.

DIP Switch Operation (continued)

<u>Unit Type</u>	<u>Addressed as</u>	<u>Address Reported</u>
Control Unit	A1	A or a
	A2	B or b
	A3	C or c
	A4	D or d
	A5	E or e
	A6	F or f
	A7	G or g
	A8	H or h
Accessory Control	1	I or i
	2	J or j
	3	K or k
	4	L or l
	5	M or m
	6	N or n
	7	O or o
	8	P or p
	9	Q or q
	10	R or r
	11	S or s
	12	T or t
	13	U or u
	14	V or v
	15	W or w
	16	X or x

Scene Selection/Fine Tuning (e.g., GRX-3100, 3500, 4100, and 4500; NTGRX-4S, 4S-IR, and 2B-SL; GRX-4S-DW; and GRX-CIR)

The second parameter, **button data**, represents the scene that was selected by the pressed or released button. Characters 1 to 16 represent scenes 1 to 16, and 0 represents the OFF scene. For a Control Unit, a Master Raise is indicated by a 17, while a Master Lower is indicated by an 18. For a fine tuning control, such as NTGRX-2B-SL, a 1 indicates that the Raise or top button has been pushed, and a 0 indicates that the Lower or bottom button has been pushed.

Example of raw feedback:

D3: button press selecting scene 3 on *GRAFIK Eye* Control Unit addressed as A4

d3: button release after selecting scene 3 on *GRAFIK Eye* Control Unit addressed as A4

Special Functions (e.g., NTGRX-4Q and GRX-AV)

The second parameter, **button data**, will be a value representing which functions are active. If the address parameter is a lowercase letter, no functions are active. Available functions and their values are: Sequence = 1, Zone Lock = 2, Scene Lock = 4, Fade Override (NTGRX-4Q) = 8, Panic (GRX-AV) = 16. Values are added if more than one function is active.

Example of raw feedback:

J6: zone lock and scene lock are active on the Accessory Control addressed as 2

j1: no functions are active on the Accessory Control addressed as 2

Partitioning and Mastering (e.g., NTGRX-4M, NTGRX-4PS, and GRX-AV)

The status of these functions cannot be decoded by the Control Interface.

DIP Switch 7: SCENE STATUS: In the ON position, the Control Interface will return the current scene of all eight *GRAFIK Eye* Control Units on the Data Link when a new scene is selected. The response will be a ":ss", followed by a string of eight ASCII characters, one for each *GRAFIK Eye* Control Unit. Each character represents the scene of each *GRAFIK Eye* Control Unit.

<u>Character</u>	<u>Control Unit Status</u>
0	off
1	scene 1
2	scene 2
3	scene 3
4	scene 4
5	scene 5
6	scene 6
7	scene 7
8	scene 8
9	scene 9
A	scene 10
B	scene 11
C	scene 12
D	scene 13
E	scene 14
F	scene 15
G	scene 16
H	temporary scene
M	missing/not responding
R	sending Master Raise
L	sending Master Lower

The current scene can also be obtained by using the Request Scene Status command; see the *GRAFIK Eye* RS232 Protocol and Command Set on the enclosed CD.

Example of Scene Status response:

:ssM180R2D2<CR><LF>

Control Unit A1 is missing
 Control Unit A2 is in scene 1
 Control Unit A3 is in scene 8
 Control Unit A4 is off
 Control Unit A5 is sending a Master Raise
 Control Unit A6 is in scene 2
 Control Unit A7 is in scene 13
 Control Unit A8 is in scene 2

DIP Switch 8: Unused.

Device Communication Information (GRX-CI-NWK-E Only)

Server Description

The GRX-CI-NWK-E is running a Telnet server that allows up to two connections at a time. The server defaults to run at IP Address 192.168.250.1 and Port 23 (default Telnet Port).

A PC, touch screen, or any device that can initiate a Telnet client connection and send ASCII strings makes a connection to the server at the above address and port. After connecting, the device waits for a login name. After logging in, the device waits for ASCII strings to perform commands. These strings can be found in the *GRAFIK Eye RS232 Protocol and Command Set* on the enclosed CD.

Example sequence of events

```
login: nwk<cr>
connection established<cr><lf>
:A21<cr>
~1 OK<cr><lf>
```

Description of the sequence of events

- A connection is made by a Telnet client to the GRX-CI-NWK-E at IP address 192.168.250.1 Port 23.
- Once connected, the GRX-CI-NWK-E sends 'login: ' back to the Telnet client. Note: The last character in 'login: ' is a space.
- The Telnet client sends 'nwk' followed by a Carriage Return (CR; adding a Line Feed after the CR is OK).
- GRX-CI-NWK-E responds with 'connection established' followed by a Carriage Return and Line Feed.
- GRX-CI-NWK-E then waits for the ASCII strings that can be found in the *GRAFIK Eye RS232 Protocol and Command Set* on the enclosed CD.
- Telnet client Sends ':A21' followed by a Carriage Return (adding a Line Feed after the CR is OK) to select scene 2 on *GRAFIK Eye Control Unit* at address 1.
- GRX-CI-NWK-E responds with '~1 OK' followed by a Carriage Return and Line Feed to indicate that one command was executed properly.

Connection 1 and Connection 2

- Connection 1 and Connection 2 can both be running at the same time. The two connections act exactly the same except for one characteristic: Connection 1 will allow another connection with the correct login name to disconnect an existing connection to Connection 1.
- Connection 2 will reject any other attempts to connect to Connection 2 if there is already a device connected to Connection 2.

Changing Default Communication Settings

Default IP Address: 192.168.250.1
Default Subnet Mask: 255.255.255.0
Default Gateway: 0.0.0.0
Default Connection 1 Login: 'nwk'
Default Connection 2 Login: 'nwk2'

To configure your device from the default network settings, use the Lutron Device IP program included on the CD provided.

Install on Windows® XP, 2000, or 98SE, and run the program. Click Discover Devices, and the program will search for Lutron devices and report back the settings. Enter your network setting changes and click Update Device to change the settings. The device is now updated and does not need to be rebooted.

The following RS232 commands have also been added to the *GRAFIK Eye RS232 Protocol and Command Set* on the enclosed CD for reading and changing network settings.

Note: Before using the commands below to change the GRX-CI-NWK-E default network settings, you must first change your computer's IP address to 192.168.250.xxx (where xxx is not 1) in order to connect to the device. (IP address change is not required when using using Lutron Device IP program.)

Set IP Address: 'sip xxx.xxx.xxx.xxx<cr>'

Example: 'sip 192.168.250.1<cr>'

Response: '~1 OK'

Read IP Address: 'rip<cr>'

Response: '~ip: 192.168.250.1 1 OK'

Set Subnet Mask 'ssm xxx.xxx.xxx.xxx<cr>'

Example: 'ssm 255.255.255.0<cr>'

Response: '~1 OK'

Read Subnet Mask: 'rsm<cr>'

Response: '~sm: 255.255.255.0 1 OK'

Set Gateway 'sgw xxx.xxx.xxx.xxx<cr>'

Example: 'sgw 192.168.250.100<cr>'

Response: '~1 OK'

Read Gateway: 'rgw<cr>'

Response: '~gw: 192.168.255.100 1 OK'

Set Login Name 'sln [connection #] [existing login] [new login]<cr>'

Example: 'sln 2 nwk2 lutron<cr>'

Response: '~1 OK'

Read Login Name: 'rln [connection #]<cr>'

Example: 'rln 2<cr>'

Response: '~ln: lutron 1 OK'

Note: Login names can be a maximum of 8 characters and cannot include spaces.

The settings above will not take effect until after a reset or power cycle. The 'rst<cr>' command will close all connections and reset the device.

LED Information (NWK-E models)

LED 1: Power: Lights continuously when Data Link Pins 1 and 2 (common and power) are wired correctly or optional transformer is plugged in.

LED 2: Ethernet Link: Lights continuously when a connection is established, and flashes when there is activity on the Ethernet link.

LED 3, 4, and 5: Unused.

LED 6: Data Link TX: Flashes when the interface is transmitting information on the *GRAFIK Eye* Link.

LED 7: Data Link RX: Flashes when the interface is receiving information on the *GRAFIK Eye* Link. When properly wired and *GRAFIK Eye* Control Unit(s) addressed, flashes continuously.

RJ45 Jack LEDs: Left LED lights continuously when the Ethernet link is established, and flashes when there is activity on the Ethernet link. Right LED lights continuously when a 100BaseT connection is established, and is off when a 10BaseT connection is established.

LED Information (RS232 models)

LED 1: Power: Lights continuously when Data Link Pins 1 and 2 (common and power) are wired correctly.

LED 2 and 3: Unused.

LED 4: RS232 Link TX: Flashes when the Control Interface is transmitting information on the RS232 Link.

LED 5: RS232 Link RX: Flashes when the Control Interface is receiving information on the RS232 Link.

LED 6: Data Link TX: Flashes when the Control Interface is transmitting information on the *GRAFIK Eye* Link.

LED 7: Data Link RX: Flashes when the interface is receiving information on the *GRAFIK Eye* Link. When properly wired and *GRAFIK Eye* Control Unit(s) addressed, flashes continuously.

Please refer to the enclosed CD for the product Specification Sheets and Operation Manuals, Ethernet Device IP program, and RS232 Protocol information.

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LIMITED WARRANTY

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

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Description

Up to eight *GRAFIK Eye* Control Units can be interfaced with your personal computer or auxiliary audio/visual equipment via TCP/IP communication over Ethernet or RS232. The interface can be used to execute Control Commands and allow for Status Monitoring.

The GRX-CI-PRG also allows for complete programming of your *GRAFIK Eye* 3500 and 4500 control units from a PC or other RS232 device. In addition, the GRX-CI-PRG provides an internal astronomic timeclock. Included with the GRX-CI-PRG is Lutron's *GRAFIK Eye Liaison* lighting control software that can be used to schedule events or make Super Sequences.

Note: Control over Ethernet requires *Liaison* software version 4.0 or later.

Note: Only one GRX-CI-PRG can be installed on the same MUX link. If additional RS232 interfaces are required, the GRX-RS232 should be used in your system. For additional information on this application, refer to the GRX-RS232 installation and operation instructions.

Control Commands

The Control Interface can send commands from a PC or A/V equipment to a maximum of eight *GRAFIK Eye* Control Units. The following commands are available:

Select Scene. Select any scene on any *GRAFIK Eye* Control Unit.

Scene Lock. Prevent changes to *GRAFIK Eye* Control Unit(s) from any remote location.

Request Scene Status. Request the current scene of every *GRAFIK Eye* Control Unit in the system.

Read Zone Intensity. Read the zone intensities on a specified *GRAFIK Eye* Control Unit.

Set Zone Intensity (requires 3500/4500 Series Control Unit). Change the intensities of the given zones on a specified *GRAFIK Eye* 3500 or 4500 Series Control Unit in the given fade time.

Sequence. Begin sequencing scenes 1 to 4 or 5 to 16 (DIP-switch selectable) on selected *GRAFIK Eye* Control Unit(s). **Zone Lock.** Prevent permanent changes to preset levels of *GRAFIK Eye* Control Unit(s).

Zone Raise/Lower. Raise or lower any zone on any *GRAFIK Eye* Control Unit.

Refer to the *GRAFIK Eye* RS232 Protocol and Command Set on the enclosed CD for detailed command descriptions and information on configuring your PC or auxiliary A/V equipment for use with Lutron's RS232 interfaces.

In addition, the GRX-CI-PRG allows the user to program the following on the 3500/4500 control units:

- Scenes: intensities and fade times
- Load types: non-dim options also available
- Temporary mode: scene programmability options
- Communications: units "talk to" additional units
- Zone intensities: temporary light level changes

Timeclock Commands

Set time: Set the time, date, and day for the internal timeclock.

Report time: Report the time, date, and day set in the internal timeclock in the GRX-CI-PRG.

Select schedule: Select the timeclock schedule setup using the Liaison software to be run for the current day.

Report schedule: Report which schedule is being run for the current day.

Report sunrise/sunset times: Report sunrise and sunset times for the current day.

Super Sequence: Start, pause, or resume a scene sequence programmed in the GRX-CI-PRG.

Note: Refer to the *GRAFIK Eye* 3500/4500 Command Set for detailed descriptions of available commands. In addition, refer to the Command Set for information on configuring your PC or auxiliary A/V equipment for use with Lutron's RS232 Interfaces.

Status Monitoring

The Control Interface will allow a PC or auxiliary A/V equipment to monitor a *GRAFIK Eye* system. The following commands are available:

Raw Feedback (DIP switch 6 ON). Report all button presses and releases on all *GRAFIK Eye* Control Units and Accessory Controls.

Scene Status (DIP switch 7 ON). Report scene status changes on all *GRAFIK Eye* Control Units. Scene status may be changed by Control Units, Accessory Controls, or sequences.

Communication Settings: Ethernet

To configure your device to talk to the *GRAFIK Eye* Ethernet Interface, open a Telnet session with the following default IP address, port, and login information.

Default IP Address: 192.168.250.1

Default Port: 23 (Telnet Port)

Default Login for Connection 1: 'nwk'

Default Login for Connection 2: 'nwk2'

If you wish to send these commands from a PC, run the Microsoft® Windows® Telnet program or an equivalent program.

Communication Settings: RS232

To configure your device to talk to the *GRAFIK Eye* RS232 Interface, use the data conventions listed below.

9600 BAUD

8 DATA BITS

1 STOP BIT

NO PARITY

If you wish to send these commands from a PC, run the Microsoft® Windows® Hyper Terminal program or an equivalent program. Then, select Local Echo, Line Feed, and Carriage Return inbound and outbound. This allows you to see the characters that you are typing as well as keep the responses from overwriting typed characters.

DIP Switch Operation

The settings of the DIP switches affect the interface operation between *GRAFIK Eye* Control Units and your PC or auxiliary A/V equipment. Control Units and Accessory Controls must be uniquely addressed for use with the Control Interface. For addressing, see the *GRAFIK Eye* Installation Guide included with the Control Units. The Control Interface will default to address 16, unless addressed in fixed address mode (see below). DIP switch options:

DIP Switch 1: ZONE LOCK RETAIN;

DIP Switch 2: SCENE LOCK RETAIN; and

DIP Switch 3: SEQUENCE RETAIN:

In the event of a power outage, the Control Interface will retain which *GRAFIK Eye* Control Units were in Zone Lock, Scene Lock, and Sequence modes (set using the Control Interface), respectively. Upon returning power, Control Units that had been in Zone Lock, Scene Lock, or Sequence mode (set using the Control Interface) will stay locked or sequencing if the DIP switches are in the ON position. When these DIP switches are in the OFF position, this information will **not** be restored upon power up. These DIP switches do not affect Zone Lock, Scene Lock, or Sequence mode set by a GRX-AV in 4Q mode.

DIP Switch 4: SEQUENCE TYPE: Set the scene range that *GRAFIK Eye* Control Units will sequence using the SEQUENCE command. In the OFF position, *GRAFIK Eye* Control Units will sequence scenes 1 to 4. In the ON position, they will sequence scenes 5 to 16.

DIP Switch 5: Unused.

DIP Switch 6: RAW FEEDBACK

Setting DIP switch 6 of the Control Interface in the ON position will report when a button has been pushed or released on a *GRAFIK Eye* Control Unit or Accessory Control. The response will be formatted as follows:

[address][button data]

address - address of *GRAFIK Eye* Control Unit or Accessory Control where button was pressed or released

button data - what action was taken as a result of the button press or release

The first parameter is the address of the *GRAFIK Eye* Control Unit or Accessory Control where a button was pushed or released. A capital letter indicates a button was pushed, and a lowercase letter indicates a button was released. The table opposite lists how addresses will be reported by raw feedback.

The second parameter, **button data**, varies based on the function of the *GRAFIK Eye* Control Unit or Accessory Control. Functions can be separated into four major categories: scene selection/fine tuning, special functions, partitioning, and mastering.

<u>Unit Type</u>	<u>Addressed as</u>	<u>Address Reported</u>
Control Unit	A1	A or a
	A2	B or b
	A3	C or c
	A4	D or d
	A5	E or e
	A6	F or f
	A7	G or g
	A8	H or h
Accessory Control	1	I or i
	2	J or j
	3	K or k
	4	L or l
	5	M or m
	6	N or n
	7	O or o
	8	P or p
	9	Q or q
	10	R or r
	11	S or s
	12	T or t
	13	U or u
	14	V or v
	15	W or w
	16	X or x

Scene Selection/Fine Tuning (e.g., GRX-3100, 3500, 4100, and 4500; NTGRX-4S, 4S-IR, and 2B-SL; GRX-4S-DW; and GRX-CIR)

The second parameter, **button data**, represents the scene that was selected by the pressed or released button. Characters 1 to 16 represent scenes 1 to 16, and 0 represents the OFF scene. For a Control Unit, a Master Raise is indicated by a 17, while a Master Lower is indicated by an 18. For a fine tuning control, such as NTGRX-2B-SL, a 1 indicates that the Raise or top button has been pushed, and a 0 indicates that the Lower or bottom button has been pushed.

Example of raw feedback:

D3: button press selecting scene 3 on *GRAFIK Eye* Control Unit addressed as A4

d3: button release after selecting scene 3 on *GRAFIK Eye* Control Unit addressed as A4

Special Functions (e.g., NTGRX-4Q and GRX-AV)

The second parameter, **button data**, will be a value representing which functions are active. If the address parameter is a lowercase letter, no functions are active. Available functions and their values are: Sequence = 1, Zone Lock = 2, Scene Lock = 4, Fade Override (NTGRX-4Q) = 8, Panic (GRX-AV) = 16. Values are added if more than one function is active.

Example of raw feedback:

J6: zone lock and scene lock are active on the Accessory Control addressed as 2

j1: no functions are active on the Accessory Control addressed as 2

Partitioning and Mastering (e.g., NTGRX-4M, NTGRX-4PS, and GRX-AV)

The status of these functions cannot be decoded by the Control Interface.

DIP Switch 7: SCENE STATUS: In the ON position, the Control Interface will return the current scene of all eight *GRAFIK Eye* Control Units on the Data Link when a new scene is selected. The response will be a ":ss", followed by a string of eight ASCII characters, one for each *GRAFIK Eye* Control Unit. Each character represents the scene of each *GRAFIK Eye* Control Unit.

<u>Character</u>	<u>Control Unit Status</u>
0	off
1	scene 1
2	scene 2
3	scene 3
4	scene 4
5	scene 5
6	scene 6
7	scene 7
8	scene 8
9	scene 9
A	scene 10
B	scene 11
C	scene 12
D	scene 13
E	scene 14
F	scene 15
G	scene 16
H	temporary scene
M	missing/not responding
R	sending Master Raise
L	sending Master Lower

The current scene can also be obtained by using the Request Scene Status command; see the *GRAFIK Eye* RS232 Protocol and Command Set on the enclosed CD.

Example of Scene Status response:

:ssM180R2D2<CR><LF>

Control Unit A1 is missing
Control Unit A2 is in scene 1
Control Unit A3 is in scene 8
Control Unit A4 is off
Control Unit A5 is sending a Master Raise
Control Unit A6 is in scene 2
Control Unit A7 is in scene 13
Control Unit A8 is in scene 2

DIP Switch 8: TIMECLOCK ON/OFF: In the ON position, the internal timeclock of the GRX-CI-PRG can control the operation of the *GRAFIK Eye* control units. Timeclock scheduled and Super Sequence are configured and programmed using Lutron's *GRAFIK Eye Liaison* software.

LED Information

LED 1: Power: Lights continuously when Data Link Pins 1 and 2 (common and power) are wired correctly or optional transformer is plugged in.

LED 2: Ethernet Link: Lights continuously when a connection is established, and flashes when there is activity on the Ethernet link.

LED 3: Unused.

LED 4: RS232 Link TX: Flashes when the Control Interface is transmitting information on the RS232 Link.

LED 5: RS232 Link RX: Flashes when the Control Interface is receiving information on the RS232 Link.

LED 6: Data Link TX: Flashes when the interface is transmitting information on the *GRAFIK Eye* Link.

LED 7: Data Link RX: Flashes when the interface is receiving information on the *GRAFIK Eye* Link. When properly wired and *GRAFIK Eye* Control Unit(s) addressed, flashes continuously.

RJ45 Jack LEDs: Left LED lights continuously when the Ethernet link is established, and flashes when there is activity on the Ethernet link. Right LED lights continuously when a 100BaseT connection is established, and is off when a 10BaseT connection is established.

Device Communication Information (Ethernet Only)

Server Description

The GRX-CI-PRG is running a Telnet server that allows up to two connections at a time. The server defaults to run at IP Address 192.168.250.1 and Port 23 (default Telnet Port).

A PC, touch screen, or any device that can initiate a Telnet client connection and send ASCII strings makes a connection to the server at the above address and port. After connecting, the device waits for a login name. After logging in, the device waits for ASCII strings to perform commands. These strings can be found in the *GRAFIK Eye RS232 Protocol and Command Set* on the enclosed CD.

Example sequence of events

```
login: nwk<cr>
connection established<cr><lf>
:A21<cr>
~1 OK<cr><lf>
```

Description of the sequence of events

- A connection is made by a Telnet client to the GRX-CI-PRG at IP address 192.168.250.1 Port 23.
- Once connected, the GRX-CI-PRG sends 'login: ' back to the Telnet client. Note: The last character in 'login: ' is a space.
- The Telnet client sends 'nwk' followed by a Carriage Return (CR; adding a Line Feed after the CR is OK).
- GRX-CI-PRG responds with 'connection established' followed by a Carriage Return and Line Feed.
- GRX-CI-PRG then waits for the ASCII strings that can be found in the *GRAFIK Eye RS232 Protocol and Command Set* on the enclosed CD.
- Telnet client Sends ':A21' followed by a Carriage Return (adding a Line Feed after the CR is OK) to select scene 2 on *GRAFIK Eye Control Unit* at address 1.
- GRX-CI-PRG responds with '~1 OK' followed by a Carriage Return and Line Feed to indicate that one command was executed properly.

Connection 1 and Connection 2

- Connection 1 and Connection 2 can both be running at the same time. The two connections act exactly the same except for one characteristic: Connection 1 will allow another connection with the correct login name to disconnect an existing connection to Connection 1.
- Connection 2 will reject any other attempts to connect to Connection 2 if there is already a device connected to Connection 2.

Changing Default Communication Settings

Default IP Address: 192.168.250.1
Default Subnet Mask: 255.255.255.0
Default Gateway: 0.0.0.0
Default Connection 1 Login: 'nwk'
Default Connection 2 Login: 'nwk2'

To configure your device from the default network settings, use the Lutron Device IP program included on the CD provided.

Install on Windows® XP, 2000, or 98SE, and run the program. Click Discover Devices, and the program will search for Lutron devices and report back the settings. Enter your network setting changes and click Update Device to change the settings. The device is now updated and does not need to be rebooted.

The following RS232 commands have also been added to the *GRAFIK Eye RS232 Protocol and Command Set* on the enclosed CD for reading and changing network settings.

Note: Before using the commands below to change the GRX-CI-PRG default network settings, you must first change your computer's IP address to 192.168.250.xxx (where xxx is not 1) in order to connect to the device. (IP address change is not required when using using Lutron Device IP program.)

Set IP Address: 'sip xxx.xxx.xxx.xxx<cr>'

Example: 'sip 192.168.250.1<cr>'

Response: '~1 OK'

Read IP Address: 'rip<cr>'

Response: '~ip: 192.168.250.1 1 OK'

Set Subnet Mask 'ssm xxx.xxx.xxx.xxx<cr>'

Example: 'ssm 255.255.255.0<cr>'

Response: '~1 OK'

Read Subnet Mask: 'rsm<cr>'

Response: '~sm: 255.255.255.0 1 OK'

Set Gateway 'sgw xxx.xxx.xxx.xxx<cr>'

Example: 'sgw 192.168.250.100<cr>'

Response: '~1 OK'

Read Gateway: 'rgw<cr>'

Response: '~gw: 192.168.255.100 1 OK'

Set Login Name 'sln [connection #] [existing login] [new login]<cr>'

Example: 'sln 2 nwk2 lutron<cr>'

Response: '~1 OK'

Read Login Name: 'rln [connection #]<cr>'

Example: 'rln 2<cr>'

Response: '~ln: lutron 1 OK'

Note: Login names can be a maximum of 8 characters and cannot include spaces.

The settings above will not take effect until after a reset or power cycle. The 'rst<cr>' command will close all connections and reset the device.

Please refer to the enclosed CD for the product Specification Sheets and Operation Manuals, Ethernet Device IP program, and RS232 Protocol information.

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General Information

This document describes the commands available to monitor and operate the GRAFIK Eye system through various GRAFIK Eye RS232 Interfaces: GRX-RS232 or GRX-PRG. The following general information applies to all RS232 Interfaces.

Communication Settings

To configure your device to talk to the GRAFIK Eye RS232 Interface, use the data conventions listed below.

9600 BAUD
8 DATA
1 STOP
NO PARITY

If you wish to send these commands from a PC, run the Microsoft Windows® Hyper Terminal program or an equivalent program. Then, select Local Echo, Line Feed, and Carriage Return inbound and outbound. This allows you to see the characters that you are typing as well as keep the responses from overwriting typed characters.

Typical Interface Wiring

For connection to any GRAFIK Eye RS232 Interface, use a cable with a DB9 connector and 5-position terminal block (Lutron P/N 234-123). If you do not have this cable, the following Table lists the connections you need to make one.

	RS232 I/O Link on Lutron equipment	Typical PC or A/V equipment signal	Pin on standard 9 pin connector	Pin on standard 25 pin connector
1	Common	COM	5	7
2	Data In	TxD	3	2
3	Data Out	RxD	2	3
4	NC			
5	NC			

GRAFIK EYE Control Units

There are eight addresses (1 to 8) available for Control Units in a GRAFIK Eye System. The following terms are applicable for GRAFIK Eye 3000 and 4000 Series Control Units.

Scenes

Each Control Unit has 16 scenes plus OFF. For commands that include a scene parameter, the scene is represented by a single character 0 (zero) to G. Characters 1 to 9 represent scenes 1 to 9, characters A to G represent scenes 10 to 16, and 0 represents the OFF scene.

Intensity (int)

Intensity information can range from 0h to 7Fh (**h** indicates a hexadecimal value). For presets, an intensity of D0h assigns a zone to "unaffected." For all load types, a 0h turns it OFF and opens the air-gap relay. A value of 1h closes the relay and sets a minimum light level. A value of 7Fh turns it to maximum light level. If the zone is a non-dim, then 7Fh is required to turn it ON; 0h is required to turn the zone OFF.

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General Information (continued)

Temporary Mode

The temporary mode (*override* in early models) determines whether temporary light level changes are normally saved or not. There are five temporary mode settings: Sd, Sb, Sn, 4S, and bd.

- 0 = Sd - Save by default
- 1 = Sb - Save by button
- 2 = Sn - Save never
- 3 = 4S - Scene selects and master raise/lower only
- 4 = bd - buttons disabled

Sd - Save by default. Any changes to the intensities or fade time at the Control Unit are saved automatically. TEMPORARY LED is normally OFF, but can be manually overridden to ON. See GRAFIK Eye Installation Guide for more details.

Sb - Save by button. Any changes to the intensities or fade time will not normally be saved; TEMPORARY LED is normally ON, but can be manually overridden to OFF. See GRAFIK Eye Installation Guide for more details.

Sn - Save never. All changes to the intensities are temporary. TEMPORARY LED is always ON and cannot be overridden.

4S - Scene selects and master raise/lower only. All buttons on the Control Unit are disabled, except the scene select buttons and the master raise/lower buttons.

bd - Buttons disabled. All buttons on the Control Unit are disabled. IR and Accessory Control commands will not be disabled.

Accessory Controls

There are 16 addresses (1 to 16) available for Accessory Controls and 8 addresses (1 to 8) available for Motorized Window Treatment Controllers in a GRAFIK Eye System. The following terms are applicable for GRAFIK Eye 3000 and 4000 series Accessory Controls. Systems that include a GRX-PRG are limited to 15 addresses (1 to 15) for Accessory Controls; Address 16 is reserved for the GRX-PRG.

DIP switch

Most GRAFIK Eye Accessory Controls are addressed using a set of DIP switches on the Accessory Control. The exceptions are the GRX-DACPI, GRX-PRG, and GRX-RS232 (not using fixed address). Addressing information is included with all GRAFIK Eye Accessory Control Installation and Operation Instructions. DIP switches are also used to assign functionality for each Accessory Control. This information can be reported by *Programming Mode: Accessory Control Commands* available through the GRX-PRG. For commands that include an Accessory Control parameter, the Accessory Control address is represented by a single character 1 to G. Characters 1 to 9 represent addresses 1 to 9, characters A to G represent addresses 10 to 16. For commands that include a Motorized Window Treatment parameter, the Motorized Window Treatment Control address is represented by a 2-character absolute address, 11-18. When a Motorized Window Treatment Control responds, it will respond with its relative address, 1-8.

LEDs

The status of LEDs on GRAFIK Eye Accessory Controls can be set (ON) and cleared (OFF) using Accessory Control Command **srl** available through the GRX-PRG. However, the LED status cannot be read.

General Information (continued)

Format for Commands

All data is in ASCII

COMMAND FORMAT [:][**command**][**parameters**] <cr>

:	- Clears input buffer
command	- command as shown
parameters	- GRAFIK Eye Units, Zones, or other parameters specific to each command
<cr>	- carriage return executes command

Example: To select Scene 1 on GRAFIK Eye Control Units 2 and 3, the following would be sent:
:A123 <cr>

Note: All commands in this document are presented as ASCII strings. If your equipment does not support transmission of ASCII text, you will need to convert command strings per the requirements of your equipment.

For example, if you are using a touchscreen to interface with a GRX-RS232 that can only send hex values, you will need to convert the ASCII command string to a hexadecimal equivalent. To do this, you must determine the hexadecimal representation of the ASCII character you want to send (refer to the ASCII Character Lookup Chart in Appendix A). To make the scene select in the previous example (:A123 in ASCII), the hexadecimal equivalent would be:

ASCII	:	A	1	2	3	<cr>
hexadecimal		3A	41	31	32	33 0D

Note: THE COMMAND STRING MAY CONTAIN A MAXIMUM OF 30 CHARACTERS.

System Responses to Commands

After each command line is entered, the GRX-RS232 or GRX-PRG transmits a response to the command. This response always begins as follows:

ASCII	unprintable character	~
hexadecimal	FFh	7Eh

Response Strings

The response string will always take one of the following forms:

~(response if applicable) N OK	no errors occurred, N is the number of commands executed
<i>Example:</i>	~1 OK
~ERROR #X N OK	an error occurred and N number of commands were executed
<i>Example:</i>	~ERROR #6 0 OK

Refer to the Error Codes in Appendix A for explanations of error codes.

End of Response

The response string will always end as follows:

ASCII	<cr>	<lf>
hexadecimal	0Dh	0Ah

RS232 Commands

These commands are for use with the GRX-RS232 or the GRX-PRG Interface Accessory Controls.

SELECT SCENE

Select any scene on the specified GRAFIK Eye Control Units.

A[scene][Control Units]

scene - scene to select (0 to G)
Control Units - Control Units to select scene on

Examples: :A21 select scene 2 on Control Unit A1
 :AG78 select scene 16 on Control Units A7 & A8

SCENE LOCK

Place the specified GRAFIK Eye Control Units in or out of Scene Lock. **Setting Scene Lock from an RS232 Interface can only be cleared by the same RS232 Interface.**

SL[+ or -][Control Units]

+ or - - add or remove Control Units from scene lock
Control Units - Control Units to scene lock

Examples: :SL release all Control Units from scene lock
 :SL-1 release only Control Unit 1 from scene lock
 :SL+36 additionally lockout Control Units 3 & 6

REQUEST SCENE

Report the scene status of all Control Units on the link.

G

Example: :G get scene status

Response: ~:ss [S1][S2][S3][S4][S5][S6][S7][S8]

[Sx] - scene currently selected on Control Unit at address x

Response: ~:ss 1AMMMMMM Control Unit at address 1 is in scene 1, Control Unit at address 2 is in scene 10, Control Units at addresses 3 to 8 are missing (M)

SEQUENCE

Sequence scenes on the specified GRAFIK Eye Control Units. Range of scenes sequenced (1 to 4, or 5 to 16) is set by DIP switch 4 on the RS232 Interface. **Setting Sequence from an RS232 Interface can only be cleared by the same RS232 Interface.**

SQ[+ or -][Control Units]

+ or - - add or remove Control Units from sequencing
Control Units - Control Units to sequence

Examples: :SQ release all Control Units from sequence mode
 :SQ-3 release only Control Unit 3 from sequencing
 :SQ+68 add Control Units 6 & 8 to sequencing

RS232 Commands (continued)

ZONE LOCK

Zone lockout the specified GRAFIK Eye Control Units. **Setting Zone Lock from an RS232 Interface can only be cleared by the same RS232 Interface.**

ZL[+ or -][Control Units]

+ or - - add or remove Control Units from zone lock
Control Units - Control Units to zone lock

Examples: :ZL release all Control Units from zone lock
 :ZL-1 release only Control Unit 1 from lock
 :ZL+36 additionally lockout Control Units 3 & 6

ZONE LOWER (This command will not affect shade zones)

Zone lower ramps down specific zones on a single GRAFIK Eye Control Unit.

D[Control Unit][zones]

Control Unit - Control Unit where zones are to ramp down
zones - zones to ramp down

Examples: :D5 stop ramping down all zones on Control Unit 5
 :D3124 ramp down zones 1, 2, & 4 on Control Unit 3

ZONE LOWER STOP (This command will not affect shade zones)

This command is a shortcut means of stopping all ramping down on all Control Units.

E

Example: :E stop ramping down all zones on all Control Units

ZONE RAISE (This command will not affect shade zones)

Zone raise ramps up specific zones on a single GRAFIK Eye Control Unit.

B[Control Unit][zones]

Control Unit - Control Unit where zones are to ramp up
zones - zones to ramp up

Examples: :B5 stop ramping up all zones on Control Unit 5
 :B3124 ramp up zones 1, 2, & 4 on Control Unit 3

ZONE RAISE STOP (This command will not affect shade zones)

This command is a shortcut means of stopping all ramping up on all Control Units.

C

Example: :C stop ramping up all zones on all Control Units

PRG Commands

These commands are for use with the GRX-PRG Interface Accessory Controls. In addition, all GRX-RS232 commands can be used with the GRX-PRG.

Note: Timeclock and Super Sequence commands can be used with GRAFIK Eye 3100, 3500, 4100, 4500, or Integrale Series Control Units. All other PRG commands require 3500, 4500, or Integrale Series Control Units.

SET TIME

Set the time in the internal timeclock. Parameters must be separated by a space (20h).

ST [hr] [min] [mth] [day] [yr] [dayofweek]

hr - hour of time to set (0 to 23)
min - min of time to set (0 to 59)
mth - month of date to set (1 to 12)
day - day of date to set (1 to 31)
yr - year of date to set
day of week - day of week of date (1 to 7, 1 = Sunday)

Examples: :ST 1 35 10 26 95 5 set time and date to 1:35am, Thurs, Oct 26, 1995
 :ST 13 45 10 27 95 6 set time and date to 1:45pm, Fri, Oct 27, 1995

REPORT TIME

Report the current time and date in the internal timeclock. Parameters will be separated by a space (20h).

RT

Example: :RT report current time and date of control

Response: ~:rt [hr] [min] [month] [day] [yr] [dayofweek]

hr - hour of time set (0 to 23)
min - min of time set (0 to 59)
mth - month of date set (1 to 12)
day - day of date set (1 to 31)
yr - year of date set, > 50 will be 1900, < 50 will be 2000
day of week - day of week date (1 to 7, 1 = Sunday)

Response: ~:rt 13 45 10 27 95 6 the time and date are 1:45pm, Fri, Oct 27, 1995

SELECT SCHEDULE

Select the schedule to be run for the current day. This will override the default schedule to run as configured by a download from LIAISON software.

SS[schedule]

schedule - schedule to run, 0 = suspend schedule
 1 = weekday schedule
 2 = weekend schedule

Example: :SS1 start the weekday schedule

PRG Commands (continued)

REPORT SCHEDULE

Report the schedule to be run for the current day. Parameters will be separated by a space (20h).

RS

Example: :RS report which schedule is currently running

Response: ~:rs [schedule] report which schedule is currently running

schedule - schedule to run, 0 = suspend schedule
1 = weekday schedule
2 = weekend schedule

Response: ~:rs 1 weekday schedule is currently running

REPORT SUNRISE/SUNSET

Report the sunrise and sunset times for today's date. This time is based on system location as configured by a download from LIAISON software. Parameters will be separated by a space (20h).

RA

Example: :RA report sunrise time and sunset time

Response: ~:ra [rise_hr] [rise_min] [set_hr] [set_min]

rise_hr - hour of sunrise (0 to 24)
rise_min - min of sunrise (0 to 59)
set_hr - hour of sunset (0 to 24)
set_min - min of sunset (0 to 59)

Response: ~:ra 6 13 18 26 sunrise will be 6:13am, sunset will be 6:26pm

SUPER SEQUENCE START

A super sequence created and downloaded from GRAFIK Eye LIAISON software can be started from either RS232 Interface. The super sequence will begin at the first event.

QS

Example: :QS start the super sequence at the first step

SUPER SEQUENCE PAUSE

A super sequence created and downloaded from LIAISON software can be paused from either RS232 Interface.

QP

Example: :QP stop the super sequence at the current step

SUPER SEQUENCE RESUME

A super sequence created and downloaded from LIAISON software that has been paused can be resumed from either RS232 Interface.

QC

Example: :QC resume the super sequence at the next step

If the super sequence has not been started, **QC** will start the super sequence at the first step.

PRG Commands (continued)

REPORT SUPER SEQUENCE STATUS

The status of the super sequence created and downloaded from GRAFIK Eye LIAISON can be reported from the GRX-PRG. Parameters will be separated by a space (20h).

Q?

Example: :Q? report the status of the super sequence

Response: ~:s? [status] [next] [min] [sec]

status - R = running, S = stopped
next - next step in super sequence
min - minutes until next step
sec - seconds until next step

Response: ~:s? R 5 0 20 the super sequence is running, Step 5 will occur in 20 seconds

SET TIMECLOCK STATUS

Timeclock events can be enabled and disabled on an individual Control Unit basis. Control Units that have timeclock events disabled will not respond to timeclock events as long as they are disabled. Parameters will be separated by a space (20h).

ate [bitmap]

bitmap - hex bitmap of what Control Units to enable and disable timeclock events at (bit 0 = Unit 1, bit 7 = Unit 8)

Bitmap Examples: 27h = 00100111 = enable timeclock at Control Units 6, 3, 2, 1
 = disable timeclock at Control Units 8, 7, 4
 0Ch = 00001100 = enable timeclock at Control Units 4, 3
 = disable timeclock at Control Units 8, 7, 6, 5, 2, 1

Example: :ate FF enable timeclock events on all Control Units

REPORT TIMECLOCK STATUS

Control Units that have timeclock events disabled will not respond to timeclock events as long as they are disabled. Parameters will be separated by a space (20h).

at?

Example: :at? report the timeclock enabled status

Response: ~:at [bitmap]

bitmap - hex bitmap of what Control Units are timeclock enabled (bit 0 = Unit 1, bit 7 = Unit 8)

Bitmap Examples: 27h = 00100111 = timeclock enabled at Control Units 6, 3, 2, 1
 = timeclock disabled at Control Units 8, 7, 4
 0Ch = 00001100 = timeclock enabled at Control Units 4, 3
 = timeclock disabled at Control Units 8, 7, 6, 5, 2, 1

Response: ~:at 27 timeclock events at Control Units 1, 2, 3, and 6 are enabled

PRG Commands (continued)

The following commands require GRAFIK Eye 3500, 4500, or Integrale Series Control Units.

Programming Mode: Control Unit Commands

All Programming Mode Commands require that the GRX-PRG Interface Accessory Control be in programming mode.

START PROGRAMMING MODE

This command places the GRX-PRG unit into programming mode. It removes any other Control Units or Accessory Controls from programming mode. It is necessary to place the GRX-PRG unit into programming mode to access the Read and Program commands below. The GRX-PRG unit will remain in programming mode until removed using the “epm” command or until no commands are sent to the GRX-PRG unit for 10 minutes.

spm

Example: :spm start programming mode

END PROGRAMMING MODE

This command will remove the GRX-PRG unit from programming mode thus allowing normal system operation.

epm

Example: :epm end programming mode

READ CONTROL UNIT INFO

This command will return the type of Control Unit and its code revision. Parameters will be separated by a space (20h).

rmu [Control Unit]

Control Unit - Control Unit to get details from (1 to 8)

Example: :rmu 1 get details of unit at address 1

Response: ~:mu [main_unit] [type] [zones] [code_rev] [units_inv] [temp_mode] [pll] [4q] [ir_addr]

Control Unit - Control Unit for which details are returned

type - 35 or 45 (3500 series or 4500 series)

zones - number of zones on the unit, 2h to 18h (2 to 24 zones)

code_rev - revision level 00h to 7Fh

units_inv - bitmap of what Control Units are "talked to" (bit 0 = Unit 1, bit 7 = Unit 8)

temp_mode - 0 to 4, temporary mode of Control Unit (Sd, Sb, Sn, 4S, bd)

pll - For 3500 series - 0 = generator mode, 1 = PLL mode,
2 = automatic power mode selection

- For 4500 series - 0

- For 4516, 4524 - 11 = 1st address of multi-address unit
- 12 = 2nd address of multi-address unit
- 13 = 3rd address of multi-address unit

This value is undefined in all units after GRX units 6-0 and all Integrale units.

PRG Commands (continued)

- 4q** - bitmap of 4Q functions now active on this control
 bit 4 = unit in fade override
 bit 3 = unit in scene lock
 bit 2 = unit in zone lock
 bit 1 = unit in sequence mode
 bit 0 - set = seq type 5—16, clr = seq type 1—4
- ir_addr** - IR address variable 0h—FFh

Response: ~:mu 1 35 4 51 6 1 1 0 0 address 1 is a GRX-3504, code rev = 5.1, talks to Control Units at address 2 and 3, the temporary mode is Sb, PLL option is on

READ LOAD TYPES

This command will return the load types assigned to each zone of the Control Unit. Parameters will be separated by a space (20h).

rlt [Control Unit]

- Control Unit** - Control Unit to get load type data from (1 to 8)

Example: :rlt 7 get load types of zones on unit at address 7

Response: ~:lt [main_unit] [lt1] [lt2] [lt3] [lt4] [lt5] [lt6] [lt7] [lt8]

- Control Unit** - Control Unit for which load types are returned
- ltx** - load type returned where **x** is the zone number

- 1 = INC, MLV - incandescent, magnetic low voltage
- 2 = FDB, ELV - fluorescent, electronic low voltage
- 3 = Neon/Cold Cathode
- 4 = ND - Non-dim, Last on, first off
- 5 = ND - Non-dim, First on, first off

Response: ~:lt 7 1 1 2 2 1 1 1 1 the load types for the Control Unit at address 7 are:
 INC,MLV Zones 1, 2, 5, 6, 7, 8
 FDB,ELV Zones 3, 4

Note: The response will always include load types for 8 zones. For Control Units with less than 8 zones, load type 1 will be returned for zones exceeding the number of zones on the Control Unit.

Load Type	GRX3xxx	Integrale	GRX4xxx*
1 = Incandescent, MLV	X	X	X
2 = FDB	X	X	ext
3 = Neon	X	X	ext
4 = Non-dim last on, first off	X	X	X
5 = Non-dim First ON, First OFF	X	X	X
6 = Tu-Wire	5-5		ext
7 = ELV Reverse Phase		X	ext
8 = Auto select (For/REV)		X	
9 = 0-10 Fluorescent		X	ext
10 = DSI Fluorescent		X	ext
11 = DALI Fluorescent		X	ext
12 = PWM Fluorescent		X	ext
13 = Unused			
14 = Unused			
15 = Unused			
16 = AC Shade	7-1		7-1
17 = Sivoia Shade	7-1		7-1

* GRX4xxx unit should be set to load type 1 for these.

Key: X = all versions; X-X = all versions of that code rev or higher; ext = set by external module and circuit selector.

PRG Commands (continued)

READ LOW ENDS

This command will return the low end values assigned to each zone of the Control Unit. Parameters will be separated by a space (20h).

rl [*Control Unit*]

Control Unit - Control Unit to get low end data from (1 to 8)

Example: :rl 7 get low ends of zones on unit at address 7

Response: ~:le [*main_unit*] [*le1*] [*le2*] [*le3*] [*le4*] [*le5*] [*le6*] [*le7*] [*le8*]

Control Unit - Control Unit for which load types are returned

lex - low end returned where **x** is the zone number

7Fh = Non-dim (has no low end setting)

Response: ~:le 7 4 4 3C 3C 4 4 4 4 the low ends for the Control Unit at address 7 are:

4h Zones 1, 2, 5, 6, 7, 8

3Ch Zones 3, 4

Note: The response will always include low ends for 8 zones. For Control Units with less than 8 zones, low end for incandescent will be returned for zones exceeding the number of zones on the unit.

Other values represent the low-end setting that depends on the load type. (1 = lowest light level possible; numbers greater than 1 represent higher low-end light settings). Each load type has a different maximum low-end value (highest low-end light level). Also, each load type has a default low-end value that is set automatically whenever a load type is changed. The lowest low end level (least light) for each load type has a value of 1. Each load type has a different max low end trim value (highest light). There is also a default low end for each type that is set automatically each time a load type is changed. This value is 0.

<u>GRX3xxx</u>	<u>LE Range</u> (higher number = brighter light)	<u>Default Value</u>
Incandescent	1 to 50h	3h or 0
FDB	1 to 50h	39h or 0
Tu-Wire	1 to 50h	6h or 0
Neon/CC	1 to 50h	2Ah or 0
<u>Integrale</u>	<u>LE Range</u> (higher number = brighter light)	<u>Default Value</u>
Auto	1 to 5Fh	Ah or 0
ELV	1 to 5Fh	Ah or 0
MLV	1 to 5Ah	7h or 0
FDB	1 to 5Ah	38h or 0
0-10	1 to 38h	Ah or 0
DSI	1 to 38h	Ah or 0
DALI	1 to 38h	Ah or 0
PWM	1 to 38h	Ah or 0
Neon/CC	1 to 6Eh	28h or 0

Note: Values for shade and non-dim zones are undefined.
Command not available on GRX4xxx type units.

PRG Commands (continued)

READ HIGH ENDS

This command will return the highend values assigned to each zone of the Control Unit. Parameters will be separated by a space (20h). This command is valid only on units with software 7.0 or higher and Integrale.

rhe [*Control Unit*]

Control Unit - Control Unit to get high end data from (1 to 8)

Example: :rhe 7 get high ends of zones on unit at address 7

Response: ~:he [*main_unit*] [*he1*] [*he2*] [*he3*] [*he4*] [*he5*] [*he6*] [*he7*] [*he8*]

Control Unit - Control Unit for which load types are returned

hex - high end returned where *x* is the zone number

7Fh = Non-dim (has no high end setting)

Response: ~:he 7 4 4 3C 3C 4 4 4 4 the high ends for the Control Unit at address 7 are:

4h Zones 1, 2, 5, 6, 7, 8

3Ch Zones 3, 4

Note: The response will always include high ends for 8 zones. For Control Units with less than 8 zones, high end for incandescent will be returned for zones exceeding the number of zones on the unit.

The highest high end level (most light) for each load type has a value of 1. Each load type has a different max high end trim value (lowest light). There is also a default high end for each type that is set automatically each time a load type is changed. This value is 0.

<u>GRX3xxx</u>	<u>HE Range</u> (higher number = brighter light)	<u>Default Value</u>
Incandescent	1 to 50h	3h or 0
FDB	1 to 50h	39h or 0
Tu-Wire	1 to 50h	6h or 0
Neon/CC	1 to 50h	2Ah or 0
<u>Integrale</u>	<u>HE Range</u> (higher number = brighter light)	<u>Default Value</u>
Auto	1 to 55h	2Dh or 0
ELV	1 to 55h	1Eh or 0
MLV	1 to 5Ch	9h or 0
FDB	1 to 5Ch	38h or 0
0-10	1 to 38h	Ah or 0
DSI	1 to 38h	Ah or 0
DALI	1 to 38h	Ah or 0
PWM	1 to 38h	Ah or 0
Neon/CC	1 to 55h	45h or 0

Note: Values for shade and non-dim zones are undefined.
Command not available on GRX4xxx type units.

PRG Commands (continued)

READ PRESET SCENE

This command will return the preset scene data for each zone of the Control Unit. Parameters will be separated by a space (20h).

rps [*Control Unit*] [*scene*]

Control Unit - Control Unit to read preset
scene - scene number 0h (Off) to 10h (Scene 16)

Example: :rps 1 2 return preset for scene 2 on Control Unit at address 1

Response: ~:ps [*Control Unit*] [*scene*] [*ft*] [*Int1*] [*Int2*] [*Int3*] [*Int4*] [*Int5*] [*Int6*] [*Int7*] [*Int8*]

Control Unit - Control Unit address
scene - scene number 0h (Off) to 10h (Scene 16)
ft - fade time

0h—3Bh = seconds (0—59 seconds)

3Ch—78h = subtract 3Bh for minutes (1—60 minutes)

Intx - intensity for zone *x* 0h -> 7Fh, D0h is unaffected

Refer to Control Units, Intensity in the General Information section for details on converting decimal values to hexadecimal values.

Response: ~:ps 1 2 5 20 40 60 7F D0 D0 40 40 sene 2 at address 1 is programmed for:

5 second fade	
25%	Zone 1
50%	Zone 2
75%	Zones 3, 7, 8
99%	Zone 4
Unaffected	Zones 5, 6

Note: The response will always return 8 intensities. For Control Units with less than 8 zones, disregard intensities exceeding the number of zones on the unit.

For AC shade zones valid values for intensity are

D0h = unaffected

1 = OPEN

2 = CLOSE

For Sivoia shade zones, valid values are:

D0h = unaffected

1 = OPEN

2 = CLOSED

3 = preset 1

4 = preset 2

5 = preset 3

STOP COMMUNICATION LINK

This command will stop all link polling and allow the RS-232 unit to communicate with and program the INTEGRATOR boxes in each dimmer panel. This communication is documented in the GRAFIK 6000® product documentation. If valid dimmer panel commands are not present on the link for 5 seconds, the link will resume polling.

scl

Example: :scl stop the communication link to the dimmer panels

PRG Commands (continued)

RESTART COMMUNICATION LINK

This command will allow link polling to resume.

rcl

Example: :rcl restart link polling with the dimmer panels

PROGRAM WHO I TALK TO

This command will set the Control Units talked to by the scene select buttons of the Control Unit. Parameters must be separated by a space (20h).

ptt [Control Unit] [bitmap]

Control Unit - Control Unit to program
bitmap - hex bitmap of which Control Units to talk to (bit 0 = Unit 1, bit 7 = Unit 8)

Bitmap Examples: 27h = 00100111 = Control Units 6, 3, 2, 1
 0Ch = 00001100 = Control Units 4, 3

Example: :ptt 2 C program Control Unit at address 2 to talk to addresses 3 and 4

PROGRAM LOAD TYPES

This command will program the load types assigned to each zone of the Control Unit. Parameters must be separated by a space (20h).

plt [Control Unit] [lt1] [lt2] [lt3] [lt4] [lt5] [lt6] [lt7] [lt8]

Control Unit - Control Unit to program load types
ltx - load type for each zone where **x** is the zone number

Load Type	GRX3xxx	Integrale	GRX4xxx*
1 = Incandescent, MLV	X	X	X
2 = FDB	X	X	ext
3 = Neon	X	X	ext
4 = Non-dim last on, first off	X	X	X
5 = Non-dim First ON, First OFF	X	X	X
6 = Tu-Wire	5-5 +		ext
7 = ELV Reverse Phase		X	ext
8 = Auto select (For/REV)		X	
9 = 0-10 Fluorescent		X	ext
10 = DSI Fluorescent		X	ext
11 = DALI Fluorescent		X	ext
12 = PWM Fluorescent		X	ext
13 = Unused			
14 = Unused			
15 = Unused			
16 = AC Shade	7-1 +		7-1 +
17 = Sivoia Shade	7-1 +		7-1 +

* Set Load Type to 1.

+Key:X = all versions; X-X = all versions of that code rev or higher; ext = set by external module and circuit selector.

Example: :plt 2 1 1 * 1 program zones 1, 2, 4 of address 2 to be incandescent

Note: It is not necessary to send all 8 values, but placement and order is important. Use * for zones that are to remain the same. In the example above, zone 3 does not change, but an * is required as a placeholder to

PRG Commands (continued)

PROGRAM LOW ENDS

This command will program the low-end values assigned to each zone of the Control Unit. Parameters must be separated by a space (20h).

ple [*Control Unit*] [*le1*] [*le2*] [*le3*] [*le4*] [*le5*] [*le6*] [*le7*] [*le8*]

Control Unit - Control Unit to get low end data from (1 to 8)

lex - low end hex value for zone **x**

7Fh = Non-dim (has no low-end setting)

Example: :ple 2 10 10 * 10 program low ends of zones 1, 2, and 4 at address 2 to 10h (16 decimal)

Note: It is not necessary to send all 8 values, but placement and order is important. Use * for zones that are to remain the same. In the example above, zone 3 does not change, but an * is required as a placeholder to send values for zone 4.

Other values represent the low-end setting that depends on the load type. (1 = lowest light level possible; numbers greater than 1 represent higher low-end light settings). Each load type has a different maximum low-end value (highest low-end light level). Also, each load type has a default low-end value that is set automatically whenever a load type is changed. The lowest low end level (least light) for each load type has a value of 1. Each load type has a different max low end trim value (highest light). There is also a default lowend for each type that is set automatically each time a load type is changed. This value is 0.

<u>GRX3xxx</u>	<u>LE Range</u> (higher number = brighter light)	<u>Default Value</u>
Incandescent	1 to 50h	3h or 0
FDB	1 to 50h	39h or 0
Tu-Wire	1 to 50h	6h or 0
Neon/CC	1 to 50h	2Ah or 0
<u>Integrale</u>	<u>LE Range</u> (higher number = brighter light)	<u>Default Value</u>
Auto	1 to 5Fh	Ah or 0
ELV	1 to 5Fh	Ah or 0
MLV	1 to 5Ah	7h or 0
FDB	1 to 5Ah	38h or 0
0-10	1 to 38h	Ah or 0
DSI	1 to 38h	Ah or 0
DALI	1 to 38h	Ah or 0
PWM	1 to 38h	Ah or 0
Neon/CC	1 to 6Eh	28h or 0

Note: Values for shade and non-dim zones are undefined.
Command not available on GRX4xxx type units.

PRG Commands (continued)

PROGRAM HIGH ENDS

This command will program the high-end values assigned to each zone of the Control Unit. Parameters must be separated by a space (20h). This command is valid only on units with software version 7.0 or higher and Integrale.

phe [*Control Unit*] [*he1*] [*he2*] [*he3*] [*he4*] [*he5*] [*he6*] [*he7*] [*he8*]

Control Unit - Control Unit to get low end data from (1 to 8)

hex - high end hex value for zone *x*

7Fh = Non-dim (has no low-end setting)

Example: :phe 2 10 10 * 10 program high ends of zones 1, 2, and 4 at address 2 to 10h (16 decimal)

Note: It is not necessary to send all 8 values, but placement and order is important. Use * for zones that are to remain the same. In the example above, zone 3 does not change, but an * is required as a placeholder to send values for zone 4.

Other values represent the high-end setting that depends on the load type. (1 = highest light level possible; numbers greater than 1 represent lower high-end light settings). Each load type has a different maximum high-end value (lowest high-end light level). Also, each load type has a default high-end value that is set automatically whenever a load type is changed. The highest high end level (most light) for each load type has a value of 1. Each load type has a different max highend trim value (lowest light). There is also a default high end for each type that is set automatically each time a load type is changed. This value is 0.

Note: Values for Window Treatment and Non-Dim Zones are undefined. Command is not available on GRX-4XXX units.

<u>GRX3xxx</u>	<u>HE Range</u> (higher number = brighter light)	<u>Default Value</u>
Incandescent	1 to 50h	3h or 0
FDB	1 to 50h	39h or 0
Tu-Wire	1 to 50h	6h or 0
Neon/CC	1 to 50h	2Ah or 0
<u>Integrale</u>	<u>HE Range</u> (higher number = brighter light)	<u>Default Value</u>
Auto	1 to 55h	2Dh or 0
ELV	1 to 55h	1Eh or 0
MLV	1 to 5Ch	9h or 0
FDB	1 to 5Ch	38h or 0
0-10	1 to 38h	Ah or 0
DSI	1 to 38h	Ah or 0
DALI	1 to 38h	Ah or 0
PWM	1 to 38h	Ah or 0
Neon/CC	1 to 55h	45h or 0

Note: Values for shade and non-dim zones are undefined. Command not available on GRX4xxx type units.

PRG Commands (continued)

PROGRAM PRESET SCENE

This command will program the fade time and preset scene data for each zone of the Control Unit. Parameters must be separated by a space (20h).

pps [*Control Unit*] [*scene*] [*ft*] [*Int1*] [*Int2*] [*Int3*] [*Int4*] [*Int5*] [*Int6*] [*Int7*] [*Int8*]

Control Unit - Control Unit to program preset at
scene - scene number 0h (Off) to 10h (Scene 16)
ft - fade time
 0h—3Bh = seconds (0—59 seconds)
 3Ch—78h = subtract 3Bh for minutes (1—60 minutes)
Intx - intensity for zone x 0h -> 7Fh, D0h is unaffected, * is don't change
Refer to Control Units, Intensity in the General Information section for details on converting decimal values to hexadecimal values.

Example: :pps 1 2 5 40 40 * 20 60 60 program scene 2 at address 1 to:
 5 second fade
 don't change Zone 3
 25% Zone 4
 50% Zones 1, 2
 75% Zones 5, 6

Note: It is not necessary to send all 8 values, but placement and order is important. Use * for zones that are to remain the same. In the example above, zone 3 does not change, but an * is required as a placeholder to send values for zones 4 and above.

PROGRAM TEMPORARY MODE

This command will program the value of the Temporary Mode on a Control Unit. Parameters must be separated by a space (20h).

ptm [*Control Unit*] [*temp mode*]

Control Unit - Control Unit to program temporary mode
temp mode - temporary mode
 0 = Sd - Save by default
 1 = Sb - Save by button
 2 = Sn - Save never
 3 = 4S - scene selects and master raise/lower only
 4 = bd - buttons on this control are disabled

Example: :ptm 2 1 program Control Unit 2 to "save by button" mode

PROGRAM PLL MODE

This command will program the PLL Filter Mode of GRAFIK Eye 3500 Series Control Units. This function is not used in Integrale and GRX versions 6-0 and above. Parameters must be separated by a space (20h).

ppl [*Control Unit*] [*pll mode*]

Control Unit - Control Unit to program temporary mode
pll mode - power mode
 0 = generator mode, PLL off
 1 = power line mode, PLL on

Example: :ppl 2 1 program Control Unit 2 to use PLL mode

PRG Commands (continued)

Programming Mode: Accessory Control Commands

All Programming Mode Commands require that the GRX-PRG RS232 Interface be in programming mode. To start programming mode, see the **START PROGRAMMING MODE (spm)** command.

READ ACCESSORY CONTROL INFO

This command will return the type of Accessory Control, code revision level, function, and other information about the Accessory Control. Parameters will be separated by a space (20h).

rru [Acc Control]

Acc Control - address of Accessory Control 1h to Fh (1 to 15)

Example: :rru A get details of Accessory Control at address 10

Response: ~:ru [Acc Control] [type] [code_rev] [(...other Acc Control data...)]

Acc Control - address for which details are returned

type - see chart below

code_rev - revision level 00h -> 7Fh

other data - see below

Response: ~:ru A 0 20 3 2 Accessory Control at address 10 is an NTGRX-4S with code revision level 2-0, programmed to "talk to" Control Units 1 and 2 and select scenes 5—8

The Accessory Control data returned will be different for each Accessory Control, depending on its type. Refer to the following table:

READ ACCESSORY CONTROL Response Table

<u>Type</u>	<u>Type Description</u>	<u>Other Accessory Control Data</u>
0	4S	a) Bitmap Control Units talked to (bit 0 = addr 1) b) setting of DIP switches 5 and 6 (3 = scenes 1—4) (2 = scenes 5—8) (1 = scenes 9—12) (0 = scenes 13—16)
1	4Q	a) Bitmap Control Units talked to (bit 0 = addr 1) b) Bitmap of DIP switches 5 and 6 (3, 2 = seq 1—4) (1, 0 = seq 5—16)
2	4PS	a) Bitmap Control Units button 1 (bit 0 = addr 1) b) Bitmap Control Units button 2 (bit 0 = addr 1) c) Bitmap Control Units button 3 (bit 0 = addr 1) d) Bitmap Control Units button 4 (bit 0 = addr 1)
3	4M	a) Bitmap Control Units button 1 (bit 0 = addr 1) b) Bitmap Control Units button 2 (bit 0 = addr 1) c) Bitmap Control Units button 3 (bit 0 = addr 1) d) Bitmap Control Units button 4 (bit 0 = addr 1) e) Bitmap Control Units button 5 (bit 0 = addr 1) f) setting of DIP switches 5 and 6 (3, 2 = button 5 turns ON) (1, 0 = button 5 turns OFF)

PRG Commands (continued)

<u>Type</u>	<u>Type Description</u>	<u>Other Accessory Control Data</u>
5	CIR	a) Bitmap Control Units talked to (bit 0 = addr 1) b) variable IR address value c) setting of DIP switches 5 and 6 - starting scene of unit (3 = scene 1) (2 = scene 5) (1 = scene 9) (0 = scene 13)
7	4S IR	a) Bitmap Control Units talked to (bit 0 = addr 1) b) variable IR address value c) setting of DIP switches 5 and 6 - starting scene of unit (3 = scene 1) (2 = scene 5) (1 = scene 9) (0 = scene 13)
8	FINETUNE	a) Control Unit number (1—8) b) Bitmap of zones on unit above that i talk to c) . . . up to 7 more Control Units and zone bitmaps can follow . . .
9	2B Scene	a) Bitmap Control Units talked to (bit 0 = addr 1) b) setting of DIP switches 5 and 6 (3 = scenes 9—10) (2 = scenes 13—14)
A	2B Panic	a) Bitmap Control Units talked to (bit 0 = addr 1)
B	2B Part	a) Bitmap Control Units talked to (bit 0 = addr 1)
C	2B 4Q	a) Bitmap Control Units talked to (bit 0 = addr 1) b) setting of DIP switch 7 (1 = sequence scenes 5—16) (0 = zone lockout)
D	2B 1S	a) Bitmap Control Units talked to (bit 0 = addr 1)
F	DACPI	a) Bitmap Control Units talked to (bit 0 = addr 1) b) photocell calibration value high byte c) photocell calibration value low byte
20	A/V 4S Maintained Output	a) Bitmap Control Units talked to (bit 0 = addr 1) b) setting of DIP switches 5 and 6 (3 = scenes 1—4) (2 = scenes 5—8) (1 = scenes 9—12) (0 = scenes 13—16) c) Bitmap of current states of inputs 1—5 (bit 0 = input 1, set (1) = closed)

PRG Commands (continued)

<u>Type</u>	<u>Type Description</u>	<u>Other Accessory Control Data</u>
21	A/V 4Q	a) Bitmap Control Units talked to (bit 0 = addr 1) b) setting of DIP switches 5 and 6 (bit 1 on = momentary inputs) (bit 1 off = maintained inputs) (bit 2 on = seq 1—4) (bit 2 off = seq 5—16) c) Bitmap of current states of inputs 1—5 (bit 0 = input 1, set (1) = closed)
22	A/V 4PS	a) Bitmap Control Units button 1 (bit 0 = addr 1) b) Bitmap Control Units button 2 (bit 0 = addr 1) c) Bitmap Control Units button 3 (bit 0 = addr 1) d) Bitmap Control Units button 4 (bit 0 = addr 1) e) Bitmap Control Units button 5 (bit 0 = addr 1) f) setting of DIP switches 5 and 6 (3 = momentary inputs) (2 = maintained inputs) g) Bitmap of current states of inputs 1—5 (bit 0 = input 1, set(1) = closed)
24	A/V OCC	a) Bitmap Control Units button 1 (bit 0 = addr 1) b) Bitmap Control Units button 2 (bit 0 = addr 1) c) Bitmap Control Units button 3 (bit 0 = addr 1) d) Bitmap Control Units button 4 (bit 0 = addr 1) e) Bitmap Control Units button 5 (bit 0 = addr 1) f) setting of DIP switch 5 (0 = 0 off scene only) (1 = 1 on and off function) g) Bitmap of current states of inputs 1-5 (bit 0 = input 1, set(1) = closed)
25	A/V 4S Momentary Output	a) Bitmap Control Units talked to (bit 0 = addr 1) b) setting of DIP switches 5 and 6 (3 = scenes 1—4) (2 = scenes 5—8) (1 = scenes 9—12) (0 = scenes 13—16) c) Bitmap of current states of inputs 1—5 (bit 0 = input 1, set (1) = closed)
28	RS232 Fixed Address	a) Bitmap of DIP switches 6,7and 8 (bit 1 on = momentary inputs) (bit 1 off = maintained inputs) (bit 2 on = seq 1—4) (bit 2 off = seq 5—16)
42	Shade Control 3W or 3WRL	a) Control Unit Number 1—8 b) Bitmap of zones on unit above that I talk to c) . . . up to 7 more Control Units and zone bitmaps can follow . . .

PRG Commands (continued)

43	Shade Control 2W	<ul style="list-style-type: none"> a) Control Unit Number 1—8 b) Bitmap of zones on unit above that I talk to c) . . . up to 7 more Control Units and zone bitmaps can follow . . .
60	CCO in Scene Control	<ul style="list-style-type: none"> a) Bitmap of Control Units I listen to b) Bitmap of Switch Settings <ul style="list-style-type: none"> bits 0-2 indicate scene selections bit 3 indicates scene match status bit 4 indicates momentary or maintained outputs 0 → ON 1 → OFF <p>Refer to GRX-CCO installer's guide for more information.</p>
61	Shade Control 3WD	<p>Top half of control</p> <ul style="list-style-type: none"> a) Control Unit Number 1—8 b) bitmap of zones on unit above that I talk to c) . . . up to 7 more Control Units and zone bitmaps can follow . . . <p>Bottom half of control</p> <p>Read with :rrs command format</p> <p>rrs [Acc Control] [bank to read]</p> <p>Response</p> <p>rrs [Acc Control] [type][code rev][data packet]</p> <p>data packet</p> <ul style="list-style-type: none"> a)Control Unit Number 1—8 b)bitmap of zones on unit above that I talk to c) . . . up to 7 more Control Units and zone bitmaps can follow . . .
70	Group Controller	<ul style="list-style-type: none"> a) Control Unit for channel 1 b) bitmap of zones that I listen to c) 3 more Control Units and zone bitmaps can follow
71	CCO in Zone Control	<ul style="list-style-type: none"> a) Control Unit for channel 1 b) bitmap of zones that I listen to c) Up to 7 more Control Units and zone bitmaps can follow
72	Sivoia Interface	<ul style="list-style-type: none"> a) Control Unit Number 1—8 b) bitmap of zones that I listen to

PRG Commands (continued)

- 80 Preset Shade Control 5WRL
 - a) Control Unit Number 1—8
 - b) Bitmap of zones on unit above that I talk to
 - c) . . . up to 7 more Control Units and zone bitmaps can follow . . .

- 31-36, 41, 51, 52, 62 Custom Shade Control
 - a) Control Unit Number 1—8
 - b) Bitmap of zones on unit above that I talk to
 - c) . . . up to 7 more Control Units and zone bitmaps can follow . . .

READ ACCESSORY CONTROL SPECIFIC DATA

This command is used to get data from the Accessory Control that is not contained in the **rru** response. Parameters will be separated by a space (20h).

rrs [Acc Control] [packet]

- Acc Control** - address of Accessory Control
- packet** - data packet number to return data from

The Accessory Control data returned will be different for each Accessory Control, depending on its type.

DACPI

Example: :rrs A 1

Response: ~:rs [Acc Control] [packet] [(...Acc Control specific packet data...)]

- Acc Control** - address for which details are returned
- packet** - see chart below
- specific data** - see chart below

<u>Accessory Control</u>	<u>Packet#</u>	<u>Accessory Control Specific Packet Data</u>
1h – Fh (1 to 15)	1 – 4 (Bank #)	a) Threshold 1 (0h – 63h) (1 to 99) b) Threshold 2 (0h – 63h) (1 to 99) c) Threshold 3 (0h – 63h) (1 to 99) d) Enforce Option 0h = Not Enforced 1h – 7Fh = Enforced

Response: ~:rs A 1 19 32 4B the thresholds for Bank 1 of DACPI Accessory Control at address 10 are:
 25%- Threshold 1
 50%- Threshold 2
 75%- Threshold 3

CCO in Zone Control

Example: :rrs 11 1

Response: ~:rs [Acc Control] [packet] [(...Acc Control specific packet data...)]

- Acc Control** - address for which details are returned
- packet** - see chart below
- specific data** - see chart below

<u>Accessory Control</u>	<u>Packet#</u>	<u>Accessory Control Specific Packet Data</u>
11h – 18h	1	Bitmap of OPTIONS switch settings Switches 1 – 5 correspond to bits 0 – 4, respectively. 0 = ON, 1 = OFF

PRG Commands (continued)

Response: ~:rs 1 1 1 the OPTIONS switch is set as follows:
 Switch 1- ON
 Switch 2- ON
 Switch 3- ON
 Switch 4- ON
 Switch 5- OFF

3WD

Example: :rrs 1 1

Response: ~:rs [Acc Control] [type] [code rev] [packet] [(...Acc Control specific packet data...)]

Acc Control - address for which details are returned
type - 61 (indicates accessory control type)
code rev - software revision
packet - see chart below
specific data - see chart below

<u>Accessory Control</u>	<u>Packet#</u>	<u>Accessory Control Specific Packet Data</u>
1h – Fh	0 – Top	a) Control Unit
	1 – Bottom	b) bitmap of zones that I talk to
		c) ...up to 7 more Control Units and zone bitmaps can follow.

Response: ~:rs 1 1 7 3 8 1 the 3WD talks to zones 1 and 2 on Control Unit 7 and zone 1 on Control Unit 8

PROGRAM ACCESSORY CONTROL

This command will program the Accessory Control. The data format will be different, depending on the type of Accessory Control. Parameters must be separated by a space (20h).

pru [Acc Control] [type] [specific data]

Acc Control - address of Accessory Control 1h to Fh (1 to 15)
type - see chart below
specific data - see below

Example: :pru A 0 3 program NTGRX-4S Accessory Control at address 10 to "talk to" Control Units at address 1 and 2

PRG Commands (continued)

The Accessory Control data sent will be different for each Accessory Control, depending on its type. Refer to the following table:

PROGRAM ACCESSORY CONTROL Data Table

<u>Type</u>	<u>Type Description</u>	<u>Other Accessory Control Data</u>
0	4S	a) Bitmap Control Units talked to (bit 0 = addr 1)
1	4Q	a) Bitmap Control Units talked to (bit 0 = addr 1)
2	4PS	a) Bitmap Control Units button 1 (bit 0 = addr 1) b) Bitmap Control Units button 2 (bit 0 = addr 1) c) Bitmap Control Units button 3 (bit 0 = addr 1) d) Bitmap Control Units button 4 (bit 0 = addr 1)
3	4M	a) Bitmap Control Units button 1 (bit 0 = addr 1) b) Bitmap Control Units button 2 (bit 0 = addr 1) c) Bitmap Control Units button 3 (bit 0 = addr 1) d) Bitmap Control Units button 4 (bit 0 = addr 1) e) Bitmap Control Units button 5 (bit 0 = addr 1)
5	CIR	a) Bitmap Control Units talked to (bit 0 = addr 1) b) variable IR address value
7	4S IR	a) Bitmap Control Units talked to (bit 0 = addr 1) b) variable IR address value
8	FINETUNE	a) Control Unit number (1—8) b) Bitmap of zones on unit above that i talk to c) . . . up to 7 more Control Units and zone bitmaps can follow . . .
	9	2B Scene a) Bitmap Control Units talked to (bit 0 = addr 1)
A	2B Panic	a) Bitmap Control Units talked to (bit 0 = addr 1)
B	2B Part	a) Bitmap Control Units talked to (bit 0 = addr 1)
C	2B 4Q	a) Bitmap Control Units talked to (bit 0 = addr 1)
D	2B 1S	a) Bitmap Control Units talked to (bit 0 = addr 1)
F	DACPI	a) Bitmap Control Units talked to (bit 0 = addr 1) b) photocell calibration value high byte c) photocell calibration value low byte
20	A/V 4S Maintained Output	a) Bitmap Control Units talked to (bit 0 = addr 1)
21	A/V 4Q	a) Bitmap Control Units talked to (bit 0 = addr 1)

PRG Commands (continued)

22	A/V 4PS	<ul style="list-style-type: none"> a) Bitmap Control Units button 1 (bit 0 = addr 1) b) Bitmap Control Units button 2 (bit 0 = addr 1) c) Bitmap Control Units button 3 (bit 0 = addr 1) d) Bitmap Control Units button 4 (bit 0 = addr 1)
24	A/V OCC	<ul style="list-style-type: none"> a) Bitmap Control Units button 1 (bit 0 = addr 1) b) Bitmap Control Units button 2 (bit 0 = addr 1) c) Bitmap Control Units button 3 (bit 0 = addr 1) d) Bitmap Control Units button 4 (bit 0 = addr 1) e) Bitmap Control Units button 5 (bit 0 = addr 1)
25	A/V 4S Momentary Output	<ul style="list-style-type: none"> a) Bitmap Control Units talked to (bit 0 = addr 1)
42	Shade Control 3W or 3WJ	<ul style="list-style-type: none"> a) Control Unit Number 1—8 b) Bitmap of zones on unit above that I talk to c) . . . up to 7 more Control Units and zone bitmaps can follow. .
43	Shade Control 2W	<ul style="list-style-type: none"> a) Control Unit Number 1—8 b) Bitmap of zones on unit above that I talk to c) . . . up to 7 more Control Units and zone bitmaps can follow. .
60	CCO in Scene Mode	<ul style="list-style-type: none"> a) bitmap of Control Units I listen to
61	Shade Control 3WD	<p>Top half of control</p> <ul style="list-style-type: none"> a) Control Unit Number 1—8 b) Bitmap of zones on unit above that I talk to c) . . . up to 7 more Control Units and zone bitmaps can follow . . . <p>Bottom half of control</p> <p>Read with :rrs command format</p> <p>rrs [Acc Control] [bank to read]</p> <p>Response</p> <p>rrs [Acc Control] [type][code rev][data packet]</p> <p>data packet</p> <ul style="list-style-type: none"> a)Control Unit Number 1—8 b)Bitmap of zones on unit above that I talk to c) . . . up to 7 more Control Units and zone bitmaps can follow . . .
70	Group Controller	<ul style="list-style-type: none"> a) Control Unit for channel 1 b) bitmap of zones for channel 1 Only one bit may be set except: 0 indicates no Control Unit Controls Channel, 55h will leave programming unaffected c) Repeat for Channels 2-4

PRG Commands (continued)

71	CCO in Zone Control	<ul style="list-style-type: none"> a) Control Unit for channel 1 b) Bitmap of zones for channel Only one bit may be set except; 0 indicates no Control Unit controls Channel, 55h will leave programming unaffected c) . . . up to 7 more Control Units and zone bitmaps can follow...
72	Sivoia Interface	<ul style="list-style-type: none"> a) Control Unit b) bitmap of zones listened to. Bitmap must have only 1 bit set
80	Preset Shade Control 5WRL	<ul style="list-style-type: none"> a) Control Unit Number 1—8 b) bitmap of zones on unit above that I talk to c) . . . up to 7 more Control Units and zone bitmaps can follow...
31-36, 41, 51, 52, 62	Custom Shade Control	<ul style="list-style-type: none"> a) Control Unit Number 1—8 b) bitmap of zones on unit above that I talk to c) . . . up to 7 more Control Units and zone bitmaps can follow . . .

PROGRAM ACCESSORY CONTROL SPECIFIC DATA

This command is used to program Accessory Controls with data values that are not contained in the **pru** command. Parameters must be separated by a space (20h). The command will have a format that is dependent on the type of Accessory Control.

DACPI

prs [Acc Control] [packet] [type] [specific data]

- Acc Control** - address of Accessory Control
- packet** - data packet number to return data from
- specific data** - see chart below

Accessory Control

1h—Fh (1 to 15)

Packet#

1—4 (Bank#)

Accessory Control Specific

Data packet Details

- a) Threshold 1 (0h—63h) (1 to 99)
- b) Threshold 2 (0h—63h) (1 to 99)
- c) Threshold 3 (0h—63h) (1 to 99)
- d) Enforce Option 0h = Not Enforced
1h—7Fh = Enforced

3WD

prs [Acc Control] [packet] [type][specific data]

- Acc Control** - address of Accessory Control
- packet** - data packet number to return data from
- type** - 61 (type of Accessory Control)
- specific data** - see chart below

Accessory Control

1h – Fh

Packet#

0 – Top
1 – Bottom

Accessory Control Specific

Data packet Details

- a) Control Unit
- b) bitmap of zones that I talk to
- c) ...up to 7 more Control Units and zone bitmaps

PRG Commands (continued)

Non-Programming Mode Commands

SET CONTROL UNIT ZONE INTENSITIES

This command changes the intensity of the given zones to the new values in the given fade time. The scene number selected will change to 17 (H from an :A command), but preset data will not be changed. Parameters must be separated by a space (20h).

szi [*Control Unit*] [*ft*] [*Int1*] [*Int2*] [*Int3*] [*Int4*] [*Int5*] [*Int6*] [*Int7*] [*Int8*]

Control Unit - Control Unit to set zone intensities

ft - fade time

0h—3Bh = seconds (0—59 seconds)

3Ch—78h = subtract 3Bh for minutes (1—60 minutes)

Intx - intensity for zone *x* 0h -> 7Fh, * is don't change

Refer to Control Units, Intensity in the General Information section for details on converting decimal values to hexadecimal values.

Example: :szi 5 A 20 20 * 20 20 20 set zones 1, 2, 4, 5, and 6 on unit at address 5 to 25%
with a 10 second fade, don't change zone 3

Note: It is not necessary to send all 8 values, but placement and order is important. Use * for zones that are to remain the same. In the example above, zone 3 does not change, but an * is required as a placeholder to send values for zones 4 and above.

Note: For non-Dim zones, 0 = zone off, 1 to 7F = zone on.

For shade zones 0 = STOP

1 = OPEN

2 = Close

3 = Preset 1 (Sivoia only)

4 = Preset 2 (Sivoia only)

5 = Preset 3 (Sivoia only)

PRG Commands (continued)

READ CONTROL UNIT ZONE INTENSITIES

This command returns the zone intensities on a specified Control Unit. Parameters will be separated by a space (20h).

rzi [*Control Unit*]

Control Unit - Control Unit to return zone intensities
Intx - intensity for zone *x* 0h -> 7Fh

Refer to Control Units, Intensity in the General Information section for details on converting decimal values to hexadecimal values.

Example: :rzi 5 return zone intensities for Control Unit at address 5

Response: ~:zi [*Control Unit*] [*Int1*] [*Int2*] [*Int3*] [*Int4*] [*Int5*] [*Int6*] [*Int7*] [*Int8*]

Control Unit - Control Unit address
Intx - intensity for zone *x* 0h -> 7Fh

Refer to Control Units, Intensity in the General Information section for details on converting decimal values to hexadecimal values.

Response: ~:zi 1 20 40 60 7F 4 5 6 7 current intensities for zones at address 1 are:

25%	Zone 1
50%	Zone 2
75%	Zone 3
99%	Zone 4
not present	Zones 5—8

Note: Eight zone intensities will always be returned. **Intx** will equal *x* – 1 for *x* greater than the number of zones on the Control Unit.

Note: For non-Dim zones, 0 = zone off, 1 to 7F = zone on.

If Motorized Window Treatments are moving, the following zone intensities are valid.

5Eh = STOP
 15h = OPEN
 2Dh = Close
 71h = Preset 1 (*Sivoia* Shades only)
 72h = Preset 2 (*Sivoia* Shades only)
 73h = Preset 3 (*Sivoia* Shades only)

If Motorized Window Treatments are stopped, the following zone intensities are valid.

5Eh = STOP
 5Fh = OPEN
 60h = Close
 61h = Preset 1 (*Sivoia* Shades only)
 62h = Preset 2 (*Sivoia* Shades only)
 63h = Preset 3 (*Sivoia* Shades only)

Note: The system assumes that the Motorized Window Treatments are moving for 2 minutes. These values are valid 2 minutes after the last command.

Note: There are other zone intensities that exist for internal use. These values are transient and should be ignored.

PRG Commands (continued)

SET REMOTE LEDs

This command will turn on the given LEDs in the Accessory Control. The LEDs will override the normal LED functionality of the control. Parameters must be separated by a space (20h).

srl [Acc Control] [bitmap]

Acc Control - address of Accessory Control 1h -> Fh (1 to 15)

bitmap - hex bitmap 0h to 7Fh (lsb = LED 1 of control)

bitmap value of FFh will result in the

Accessory Control reverting back to it's normal

LED functionality (7 LEDs maximum per Accessory Control)

Bitmap Examples: 7h = 00000111 = turn on LEDs 3, 2, 1

= turn off LEDs 7, 6, 5, 4

1Ch = 00011100 = turn on LEDs 5, 4, 3

= turn off LEDs 7, 6, 2, 1

Example: :srl 2 8 turn on LED 4 of Accessory Control at address 2
turn off LEDs 1, 2, 3, 5, 6, 7

Prior to receiving any **srl** command, Accessory Control LEDs will reflect the status defined by DIP switch settings. Any **srl** command will override the status LEDs. An **srl** command with a bitmap value of FFh will cause the Accessory Control's LEDs to revert back to reflecting the status defined by the DIP switch settings.

DACPI Accessory Control Commands

DACPI ON

This command will turn ON the DACPI photocell control at the address specified. The control will become active and transmit scene selections based upon its programmed thresholds and the available natural lighting (normal DACPI function).

P+ [Acc Control]

Acc Control - address of DACPI Accessory Control 1h to Fh (1 to 15)

Example: :P+ A turn on DACPI Accessory Control at address 10

DACPI OFF

This command will turn OFF the DACPI photocell control at the address specified. Only the Bank switch and the four Manual Scene Select Switches will be active. No automatic Scene Selections will occur. Manually selected Scenes will be within the currently active Bank.

P- [Acc Control]

Acc Control - address of DACPI Accessory Control 1h to Fh (1 to 15)

Example: :P-B turn off DACPI Accessory Control at address 11

PRG Commands (continued)

Miscellaneous Commands

These commands are for use on all GRAFIK Eye RS232 Interfaces: GRX-RS232, GRX-ATC, and GRX-PRG.

CODE REV LEVEL

This command requests the revision level of the embedded system's software. It is used for diagnostic purposes and may be needed if you ever contact the Lutron Technical Assistance Hotline for assistance. Parameters will be separated by a space (20h).

V

Example: :V report the software revision level of the RS232 Interface

Response: ~:v hi_rev lo_rev model

Appendix A

ASCII Character Lookup Chart

ASCII	Hex Value	Decimal Value	ASCII	Hex Value	Decimal Value
:	3A	58	S	53	83
space	20	32	T	54	84
+	2B	43	U	55	85
-	2D	45	V	56	86
~	7E	126	W	57	87
<cr>	0D	13	X	58	88
<lf>	0A	10	Y	59	89
0	30	48	Z	5A	90
1	31	49	a	61	97
2	32	50	b	62	98
3	33	51	c	63	99
4	34	52	d	64	100
5	35	53	e	65	101
6	36	54	f	66	102
7	37	55	g	67	103
8	38	56	h	68	104
9	39	57	i	69	105
A	41	65	j	6A	106
B	42	66	k	6B	107
C	43	67	l	6C	108
D	44	68	m	6D	109
E	45	69	n	6E	110
F	46	70	o	6F	111
G	47	71	p	70	112
H	48	72	q	71	113
I	49	73	r	72	114
J	4A	74	s	73	115
K	4B	75	t	74	116
L	4C	76	u	75	117
M	4D	77	v	76	118
N	4E	78	w	77	119
O	4F	79	x	78	120
P	50	80	y	79	121
Q	51	81	z	7A	122
R	52	82			

Error Codes

Error	Description
1	Control Unit Raise/Lower error
2	Invalid scene selected
6	Bad command was sent
13	Not a timeclock unit (GRX-ATC or GRX-PRG)
14	Illegal time was entered
15	Invalid schedule
16	No Super Sequence has been loaded
20	Command was missing Control Units
21	Command was missing data
24	Invalid Control Unit
25	Invalid value, outside range of acceptable values
26	Invalid Accessory Control
80	Time-out error, no response received
255	GRX-PRG must be in programming mode for specific commands

Appendix A (continued)

Control Unit and Accessory Raw Feedback

Setting DIP switch 6 of any RS232 Interface in the ON position will report when a button has been pushed or released on a GRAFIK Eye Control Unit or Accessory Control. The response will be formatted as follows:

[address][button data]

address - address of Control Unit or Accessory Control where button was pressed or released

button data - what action was taken as a result of the button press or release

The first parameter is the address of the Control Unit or Accessory Control where a button was pushed or released. A capital letter indicates a button was pushed, and a lowercase letter indicates a button was released. The Table that follows is a list of how addresses will be reported by raw feedback.

Unit Type:	Addressed as:	Address reported:	Unit Type:	Addressed as:	Address reported:
Control Unit	A1	A or a	Accessory Control	5	M or m
	A2	B or b		6	N or n
	A3	C or c		7	O or o
	A4	D or d		8	P or p
	A5	E or e		9	Q or q
	A6	F or f		10	R or r
	A7	G or g		11	S or s
	A8	H or h		12	T or t
Accessory Control	1	I or i	13	U or u	
	2	J or j	14	V or v	
	3	K or k	15	W or w	
	4	L or l	16	X or x	

The second parameter, **button data**, varies based on the function of the Control Unit or Accessory Control. Functions can be separated into four major categories: scene selection/fine tuning, Special Functions (4Q), partitioning, and mastering.

Scene Selection/Fine Tuning (GRX-3100, 3500, 4100, and 4500, NTGRX-4S, 4S-IR, and 2B-SL, GRX-4S-DW, & GRX-CIR)

button data represents the scene that was selected by the pressed or released button. Characters 1 to 9 represent scenes 1 to 9; characters A to G represent scenes 10 to 16, and 0 represents the OFF scene. For a Control Unit, a Master Raise is indicated by a 17, while a Master Lower is indicated by an 18. For a fine tuning control, such as NTGRX-2B-SL, a 1 indicates that the Raise or top button has been pushed, and a 0 indicates that the Lower or bottom button has been pushed.

Example of raw feedback:

D3	button press selecting scene 3 on GRAFIK Eye Control Unit addressed as A4
d3	button release after selecting scene 3 on GRAFIK Eye Control Unit addressed as A4

Special Functions (NTGRX-4Q, & GRX-AV)

The second parameter will be a value representing which functions are active. If the address parameter is a lowercase letter, no functions are active. The functions available and their values are: Sequence = 1, Zone Lock = 2, Scene Lock = 4, Fade Override (NTGRX-4Q) = 8, Panic (GRX-AV) = 16. Values are added if more than one function is active.

Example of raw feedback:

J6	zone lock and scene lock are active on the Accessory Control addressed as 12
j1	no functions are active on the Accessory Control addressed as 12

Partitioning and Mastering (NTGRX-4M, NTGRX-4PS, & GRX-AV)

The status of these functions cannot be decoded by the RS232 Interface.

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LIMITED WARRANTY

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

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.

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These products are covered by one or more of the following United States patents: 4,797,500; 4,835,343; 4,924,349; 5,038,081; 5,309,068; 5,430,356; 5,633,540; 5,990,635; 6,046,550; 6,091,205; 6,188,181; 6,380,692; D422,567; D436,930; D453,742; D456,783; D461,782; D465,460; D465,770; D466,090; D466,091; D466,484; and corresponding foreign patents. U.S. and foreign patents pending.

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LIAISON Software lets you . . .

PROGRAM the following:

GRAFIK Eye Control Units*

- Scenes—intensities and fade times
- Load types—includes non-dim options
- Temporary Mode switch setting
- Control Unit communication assignments
- Temporary, on-line scenes

Accessory Controls*

- Control Unit communication assignments

Power Panels*

- Control Unit and Zone assignment for each circuit
- Load types for each circuit

Timeclock Events

- Real-time and astronomic event scheduling

Super Sequence

- Automated, synchronized dynamic scene selection throughout the system

INTERROGATE the system for:

- The above information
- Number of Control Units and Accessory Controls present in system
- Control Unit type*
- Number of Control Units zones (2–24)
- Accessory Control type

BACK UP an entire programmed system, including Timeclock events, for archival purposes.

* Requires the use of 3500 and/or 4500 series Control Units and GRX-PRG or GRX-CI-PRG.

For use with 3100, 3500, 4100, and/or 4500 series Control Units. Requires GRX-PRG or GRX-CI-PRG.



Installing GRAFIK Eye LIAISON System Requirements:

In order to use *GRAFIK Eye LIAISON*, you will need the following:

HARDWARE

- IBM® compatible PC, Pentium® 266 MHz or higher recommended
- 32 MB RAM
- 15 MB of free space on your hard drive
- VGA Graphics

SOFTWARE

- Microsoft® Windows® 95 or later operating system, or Microsoft® Windows® NT version 4.0 or later
- **LIAISON** does not support Microsoft® Windows® Vista

CD INSTALLATION

- Quit all other applications, including any anti-virus programs by:
 1. Right-clicking on its icon in the System Tray and quitting the program, or
 2. Pressing **Ctrl-Alt-Delete**, selecting the process, and clicking on the button labeled "End Process."
- Insert the *GRAFIK Eye LIAISON* CD into the CD-ROM.
- From Windows START menu, select RUN.
- In the RUN box, type the letter for your computer's CD-ROM drive (usually D: or E:), and SETUP. Click OK.
- After installation is complete, click on the *LIAISON* icon to run *LIAISON*.

To download the latest version of **LIAISON**, visit our website at www.lutron.com.

START-UP SCREEN

GRAFIK Eye LIAISON Lighting Control Software can be used to Create, Edit, Go Online with, or Back up a *GRAFIK Eye* system. Select the mode you wish to use:

Create or Edit a Project from File

This mode can be used without being connected to a GRX-PRG or GRX-CI-PRG. Select this mode if: you are in the design stage of a project or wish to edit an existing project; you have created a project and need to download the data for the first time; or, you want create a project in your office for future downloading to a *GRAFIK Eye* system.

Go Online with System

Select this mode after you have transferred data using **Create or Edit a Project from File** to monitor and operate your *GRAFIK Eye* system. This mode requires interfacing with the GRX-PRG or GRX-CI-PRG (refer to instruction sheet P/N 040-135 or 040-228). See Page 18.

CREATE OR EDIT A PROJECT FROM FILE

FILE MENU



Open

- If you have already created a job file, open that file using **Open**. *LIAISON* files have the extension “.lia” and, by default, are saved in the same directory as *LIAISON*.



New

- From the **File** menu, select **New**. Select the type of system that you will be designing. There are three options when creating a new file:

1. Timeclock Only

Schedule real-time and/or astronomic events for the entire system. Use the super sequence for dynamic, synchronized scene selections throughout the system. Requires a GRX-PRG or GRX-CI-PRG and 3100 and/or 4100 series Control Units.

2. Programmable System

Includes all the Timeclock Only features, plus the ability to program all aspects of the system operation using *LIAISON*.
Program all Control Unit information:

- scenes (intensities and fade times), load types, communication assignments, and temporary mode options.
- Program Control Unit and zone assignments to the circuits in the system.
- Program the Control Unit communication assignments for Accessory Controls.
- Also, program all the Timeclock events and super sequence events; available with **Timeclock Only**.

Note: Programming Requires a GRX-PRG or GRX-CI-PRG. To program directly from a Control Unit, a 3500 and/or 4500 series Control Unit is necessary.

3. Lutron Lighting Wizard

If you are still in the process of designing your system, let the Lutron Lighting Wizard assist you in creating a New file. After answering the questions presented by the Wizard and

clicking **Finish**, those screens that apply to your project will be shown. If you want to add to or edit your system at a later time, simply use the menus to reopen the needed screen. The equipment required is based upon choices selected using the Wizard.



Save

- From the **File** menu, select **Save** to save the file.

Import - GRAFIK Eye Timeclock (.GTC)

- GRAFIK Eye LIAISON* can also be used to create Timeclock Only systems. Timeclock systems that have been created by *GRAFIK Eye Timeclock (P/N GRXTC-WIN)* can be imported to *LIAISON*. From the **File** menu, select **Import -> GRAFIK Eye Timeclock (.GTC)**. After selecting the file to import, click on **OK**. The file extension will be changed from .gtc to .lia and the imported file will be opened for editing. The original file created by *GRAFIK Eye Timeclock* will not be changed.



Print

- From the **File** menu, select **Print** to print information about the currently opened file. All system information or selected information can be printed. Select the information to be printed and then click **OK**.



Exit

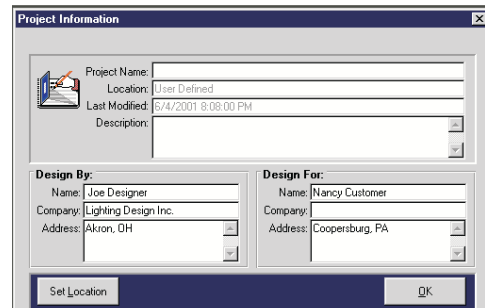
- To exit *LIAISON*, select **Exit** from the **File** menu. If changes have been made to the currently opened file, or a new file was created that has not been saved, a prompt to save will be issued before exiting.

VIEW MENU

Enter Project Information

By default, the Project Information screen is shown every time a new file is created. This information can be viewed or edited at any time. From the **View** menu, select **Project Information**.

- For future reference, enter the job name, location, and description in the corresponding boxes.
- Enter the name of individuals and companies for whom the system was designed. Include addresses for future reference.
- Click **Done** to exit the screen.



Set Preferences

Customize *LIAISON* by setting preferences for the user and hardware interface. Preferences for toolbar views, desktop color, and communication settings are set by selecting **Preferences** from the **View** menu.

- Toolbar.** The toolbar below can be displayed by selecting “Buttons Without Text” from the Preferences screen. Also, “Large Buttons With Text” and “No Buttons” are options in the Preferences screen. The toolbar provides a shortcut means of selecting menu items.



- **Desktop Color.** Change the default color of the *LIAISON* desktop by selecting a color from the palette. The selection will be saved to an initialization file and used every time *LIAISON* is run.
- **Communications Type** - Specify how *LIAISON* will communicate with a PRG box. GRX-CI-PRG supports RS232 and Ethernet communication. *LIAISON* versions 4.0 and later support both RS232 and Ethernet communication. The “DeviceIP” button launches Lutron’s Ethernet device discovery program, installed from CD separately. This program enables you to set and get the IP information from GRX-CI-PRG units that are connected over Ethernet and connected on the same Ethernet switch (or hub), or connected directly to the PC.
- **Communications Port** - If serial communication is present, transferring data to the *GRAFIK Eye* system requires the use of a PC serial COM port. From the **Preferences** screen, you may select the COM port through which data will be transferred. The selection will be saved in an initialization file and will only need to be set the first time you use *LIAISON* to program your system or if you change the hardware configuration of your PC. The COM port can also be selected from the **Set COM Port** of the **Online Options** menu.
- **Device IP Information** - If Ethernet communication is selected, you must specify the IP address, Port number, and login of the GRX-CI-PRG box from the **Preferences** screen. The following is the default setting of a GRX-CI-PRG:
 - IP Address: 192.168.250.1
 - Port Number: 23
 - login: nwk

Advanced

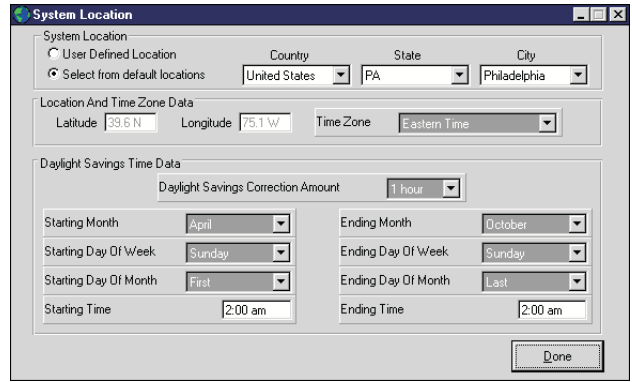
- **Set redirection connecting time** - By default port redirection connecting time is 0. If a longer connecting time is needed (i.e the user tries to use *LIAISON* to control a *GRAFIK Eye* system via a network by network-enabling the serial device or via telnet to a remote location), the user can click **Advanced** button and specify the connecting time via the **Connection** and **Communication Time** screen. This time is used when establishing communication.
- **Set response timeout** - By default the response timeout is set to 0.5 second. During communication, *LIAISON* will wait for a response from the PRG after sending out a command. *LIAISON* will stop waiting if it receives a response or times out.
- **Log communications** - If this option is checked, the communication between *LIAISON* software and the PRG will be logged to a file. Note that this option may slow down the communication process and should be used for troubleshooting only.
By default the communication will not be logged. If you want to log communication, reselect this option each time you start *LIAISON*.
The log file is named “LiaCommunication.log” and is located in the *LIAISON* application directory. New records are appended to the log file. If you need a clean log file, you can delete or rename the existing log file and the software will create a new log file for you.

NOTE: *LIAISON* is designed to communicate with the GRX-PRG, GRX-CI-PRG or GRX-RS232 via serial communication or Ethernet. If the user decides to network-enable the serial device, the communication quality and port redirection connecting time may vary depending on the system setup (i.e. the network adapter, device server, redirector software, operating system, etc.). Not all port redirector software and device servers will work with *LIAISON*. It is the user’s responsibility to test the communication.



Enter Geographical Location

The geographical location of a job must be defined if any astronomic events are to be scheduled.



1. Select the **Location** item found in the **View** menu.
2. Select the city where the job is located using the pull-down lists for Country, State (if applicable), and City. The location value, time zone, and daylight savings information associated with the chosen city will appear on the screen.
3. If the desired city is not present in the list, select “User Defined Location” and enter the latitude and longitude in the appropriate locations on the screen. Latitude and longitude are in units of degrees. **For example**, 12.5 = 12 degrees, 30 minutes. Now enter the correct time zone and Daylight Savings information.
4. Click on **Done** to return to the start-up screen. Select **Save** from the **File** menu to save the changes.

SETUP MENU

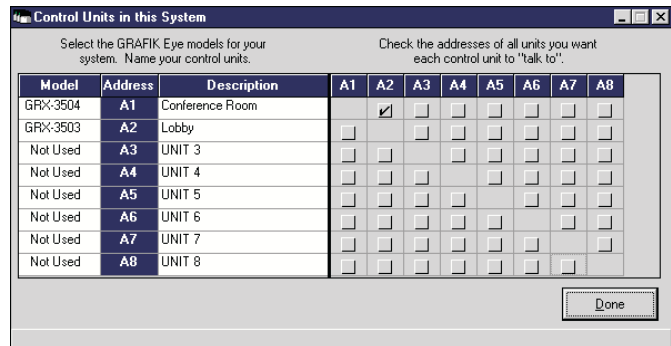


Specify Control Units

NOTE: Programming directly from a Control Unit requires 3500 and 4500 series Control Units.

Control Units are specified based upon the type of system that you are designing. If Timeclock Only was specified when the file was created OR the Wizard decisions did not require programmable Control Units, models will be limited to 3100 and 4100 series Control Units. If Programmable System was specified OR the Wizard decisions included creating scenes for **GRAFIK Eye** Control Units, the model list will include 3500 and 4500 series Control Units.

1. From the **Set Up** menu, select **Specify Control Units**. Click on the menu under the **Model** column to select or change the **GRAFIK Eye** model numbers for your system.
2. Use your pointer to highlight the Description section and name your Control Units by entering a description, such as “Conference Room” or “Lobby”, on the line corresponding to each Control Unit.



3. If the Control Units are 3500 and 4500 series, check off the addresses of all the Control Units you want each Control Unit to “talk to” by clicking each corresponding box. **For example**, click A2 on the first line if you want Control Unit A1 to “talk to” Control Unit A2.
4. Once you have specified each Control Unit, click **Done** to exit the screen.



If **Timeclock Only** was specified when the file was created OR the Wizard decisions did not require programmable Control Units, skip the rest of this Section and proceed to **Timeclock Menu** on Page 13.



Specify Accessories (For Programmable Systems using GRX-PRG or GRX-CI-PRG Only)

Many GRAFIK Eye systems include Accessory Controls that allow for remote control of Control Unit(s). These accessories must be told which Control Unit(s) to “talk to.” Some accessories are programmed such that all buttons “talk to” the same Control Unit(s). Others, such as partition controls, are programmed on a button by button basis. These differences are based upon Accessory model and functionality. For this reason, Accessory Controls must be specified and then programmed.

NOTE: Model information and functionality will not be programmed. This information is used to determine whether programming will be for all buttons or each individual button.

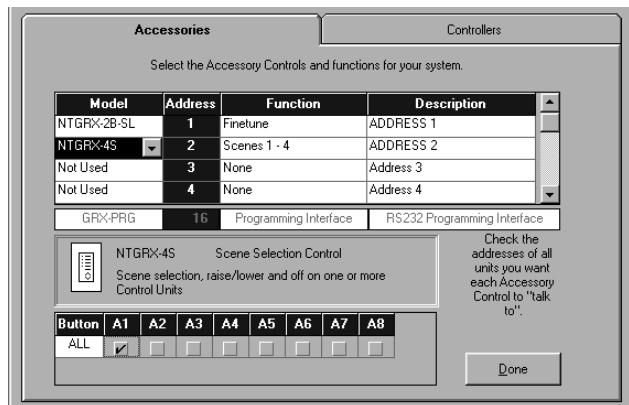
IMPORTANT! Accessory Control details are only available from accessory controls with a minimum code revision. To determine the code revision level, inspect the back of the accessory control. If you have questions, please contact the Lutron Hotline for assistance.

Minimum Code Revision of Accessory Controls For Getting Details

Type	Minimum Code Revision
Standard Accessory Control	2-0
Shade Accessory Control	1-1

Accessories. Click the **Accessories** tab on the “Accessory Controls in this System” form. Click on the drop down menu under the **Model** column, and select the Accessory Control model numbers for your system.

- The functions listed for each address are dependent on the model selected in the first column. Click on the drop down menu under the **Function** column, and select the function for the Accessory Control. The button table at the bottom of the screen may change from “ALL” to individual buttons based on the selected function.



NOTE: The bottom of this screen may have a different appearance for certain Accessory Controls.

- Name your Accessory Control by highlighting the Description section and entering a description, such as “Conf Rm Entrance” or “Conf Rm Podium”, on the line corresponding to each Accessory Control. Descriptions are for reference only and will not be downloaded to the Programmer Interface (GRX-PRG or GRX-CI-PRG).
- Indicate which Control Units you want each Accessory Control to “talk to” by checking each corresponding box. **For example**, click A1 on the first line of the Button table if you want the NTGRX-4S Accessory Control at Address 2 to “talk to” A1.
- For Fine Tuning Accessory Controls and Shade Accessory Controls, individual zone control is available. To program which zones of a Control Unit you want the Accessory to control, click on the corresponding box. This action will bring up a list box of zones for the selected Control Unit. Select or de-select zones by clicking on the zones of the list box, or select / de-select all zones of the Control Unit by clicking the Select All / Clear All button, and then click Done to exit the screen. (SG-3WD is a dual 3-button shade control, the top 3 buttons and the bottom 3 buttons can be programmed separately on a zone by zone basis).
- Once you have specified each Accessory Control and Controllers, click **Done** to exit the screen.

Specify Controllers (For Programmable Systems using GRX-PRG or GRX-CI-PRG Only)

1. From the **Set Up** menu, select **Specify Accessories**. Click the **Controllers** tab on the “Accessory Controls in this System” form. Click on the drop down menu under the **Model** column, and select the Controller model numbers for your system.
2. The functions listed for each address are dependent on the model selected in the first column. Click on the drop down menu under the **Function** column, and select the function for the Accessory Control.
3. Name your Controller by highlighting the Description section and entering a description, such as “Conf Rm Entrance” or “Conf Rm Podium”, on the line corresponding to each Controller. Descriptions are for reference only and will not be downloaded to the Programmer Interface (GRX-PRG or GRX-CI-PRG).

NOTE: The bottom of this screen may have a different appearance for certain Accessory Controls.

4. Using the table at the bottom of the screen to program the selected controller.

GRX-SVC: Specify a zone to control.

GRX-GC: For each channel of the unit, specify a zone to control.

GRX-CCO (Zone mode): For each relay group of the unit, specify a zone to control.

- Click on the drop down menu under the **Control Unit** column of the bottom table, select the Control Unit that you want the selected unit/channel/relay group to “talk to” from the list.
- Click on the drop down menu under the “Zone” column of the bottom table, select the zone that you want the selected unit/channel/relay group to “talk to” from the list.

GRX-CCO (Scene mode):

- Indicate which Control Units you want the controller to “talk to” by checking each corresponding box. **For example**, click the box under A1 if you want the controller to “talk to” A1.

5. Once you have specified each Controller and Accessories, click **Done** to exit the screen.

NOTES:

- Each Controller in a system must be assigned a unique Controller address by setting the DIP switches on the unit. There are a maximum of 8 Controllers per system. (These Controllers do not occupy the 16 standard Accessory Control addresses).
- GRX-SVC, GRX-GC and GRX-CCO (Zone mode) can only control zones on GRAFIK Eye Control Units with software revision 7-0 or higher, these controllers will not function correctly with Control Units with lower software revisions.
- Each GRX-SVC unit, each channel of a GRX-GC, each relay group of a GRX-CCO (Zone mode) can “talk to” one zone **in a system**.



Program Control Units (For Programmable Systems using GRX-PRG or GRX-CI-PRG Only)

In addition to specifying Control Unit model numbers and communications, scene names, zone names, scenes, and load types are all programmable using *LIAISON*.

1. Scenes are made up of zone intensities and fade times. There are 16 scenes plus an Off scene for each Control Unit.
2. Light intensities for all scenes except Off can be adjusted from 0 to 99 or unaffected (UA).
AC shade positions for all scenes can be set to Open, Close or unaffected (UA).


Sivoia shade positions for all scenes can be set to Open, Preset 1, Preset 2, Preset 3, Close or unaffected (UA).

The light level or shade position of an unaffected zone will not change when that scene is selected.

3. Fade times are adjustable for all scenes and can range from 0 to 59 seconds or 1 to 60 minutes. The fade time is the time it will take for the zone intensities to raise or lower to the scene’s preset level from their current intensities.
4. Load types are the type of fixture(s) that will be controlled on a zone-by-zone basis. It is important to specify the correct load type for each zone to achieve the best dimming performance.

- From the **Set Up** menu, select **Program Control Units**. Click on the list box in the upper left-hand corner of the window and choose from the units specified previously. **For example**, click on Conference Room to program the Conference Room Control Unit.

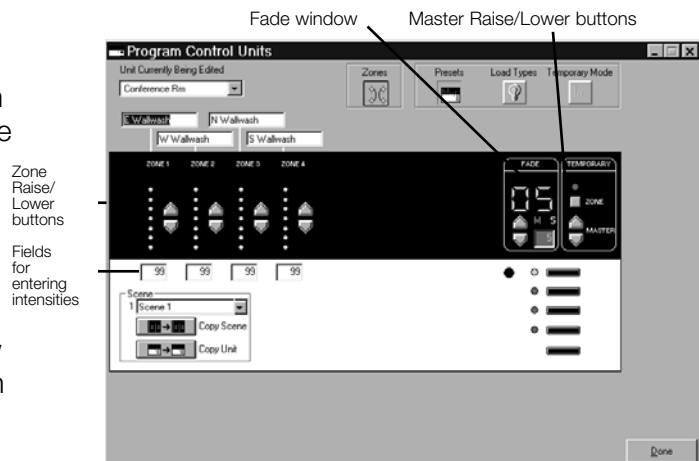
Zone Names

- Click on the **Zones** button  to label your zones. Enter the names of your zones, e.g., “Downlights” or “Sconces”, in the Zones text boxes.

Presets

- Click on the **Presets** button to set up your scenes. Select the scene you want to create in the Scenes list box. To change the name of the scene, highlight the Scenes list box and enter the new scene name.

To create a scene, set the intensities of the zones in that scene by clicking on the Zone Raise and Lower buttons of each zone OR by typing in the value of intensity in the box below each zone. **For example**, for Scene 1, click on the Zone 1 Raise button to increase the light intensity of that zone or type in 90 in the box if you want the intensity at exactly 90%. Repeat the procedure for each zone in the scene.



Lighting Zones:

Clicking on Raise/Lower button or typing in intensity value to set lights intensity.

AC Shade Zones:

Clicking on Raise/Lower button or typing in the following key to set shade position (Open and Close),

- Or: Typing in “O” or “o” for Open
- Typing in “C” or “c” for Close

Sivoia Shade Zones:

Clicking on Raise/Lower button or typing in the following key to set shade position (Open, Preset 1, Preset 2, Preset 3 and Close),

Or: Typing in “O” or “o” for Open; Typing in “C” or “c” for Close

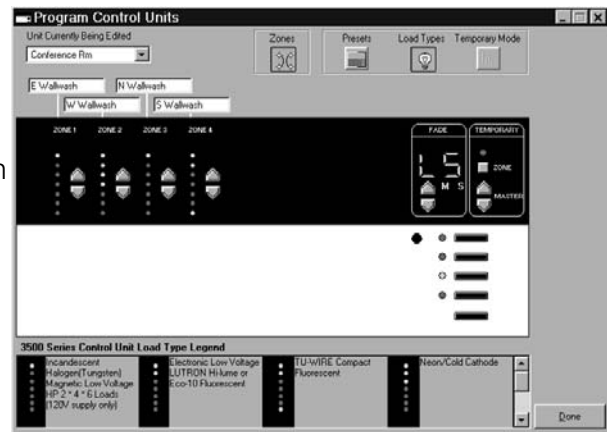
Typing in “1” for Preset 1; Typing in “2” for Preset 2; Typing in “3” for Preset 3

Fade Time

- Modify the Fade Time for the scene by clicking on the Raise/Lower buttons in the Fade box OR by typing in the exact value in the Fade window.
- Follow the same procedure for each scene.
- Fade time will not be applied to non-lighting zones.








Select Load Types






- To select Load Types, click on the **Load Types** button in the Program Control Units window.
- Click on the Raise/Lower buttons of each zone until the correct number of LEDs corresponding to the appropriate load type (as defined in the chart at the bottom of the screen) are lit. For example, for electronic low-voltage loads, use the Raise/Lower buttons to light two LEDs. Repeat for each zone.



Load Type Legend

LED Display	Load Type Description	GRX -3xxx	GRX-4xxx	Integrale GXI-3xxx
	GRX units: Incandescent Magnetic low voltage HP 2, 4, 6 loads (120v supply only) Integrale: Magnetic Low Voltage (MLV)	Yes	Yes	Yes
	GRX units: Electronic low voltage Lutron Hi-lume or Eco-10 fluorescent Integrale: GRX-TVI	Yes	N/A *	Yes
	Tu-wire compact fluorescent	rev 5-5 or higher	N/A *	N/A

	Neon/Cold cathode	Yes	N/A *	Yes
	Non-dim (last on, first off)	Yes	Yes	Yes
	Non-dim (first on, first off)	Yes	Yes	Yes
	AC shade	rev 7-0 or higher	rev 7-0 or higher	N/A
	Sivoia shade	rev 7-0 or higher	rev 7-0 or higher	N/A
	Unassigned/Non Dim This setting is the default for GXI Control units.	N/A	N/A	Yes
	Auto Phase Last LED ON: Reverse/ Trailing edge Last LED OFF: Forward/ Leading edge Note: LIAISON will always display Reverse/Trailing edge	N/A	N/A	Yes

	Electronic Low Voltage (ELV) Incandescent GRX-ELVI	N/A	N/A	Yes
	0-10v ballasts	N/A	N/A	Yes
	DSI compatible ballasts	N/A	N/A	Yes
	DALI (intensity broadcast only) ballasts	N/A	N/A	Yes
	PWM ballasts	N/A	N/A	Yes


Key:

Yes: All versions support the LoadType

Rev #: All versions of that code rev or higher

* : GRX-4000 units should be set to Load Type 1 for those Load Types

Temporary Mode

- To set the Temporary Mode, click on the **Temporary Mode** button. 
- Use the Master Raise/Lower buttons to select a Temporary Mode: **Sd** to Save by default; **Sb** to Save by button; **Sn** to Save never; **4S** for Scene selection and Master Raise/Lower only; and **bd** for Buttons disabled. The Temporary Mode selected appears in the Fade window. Press F1 for descriptions.



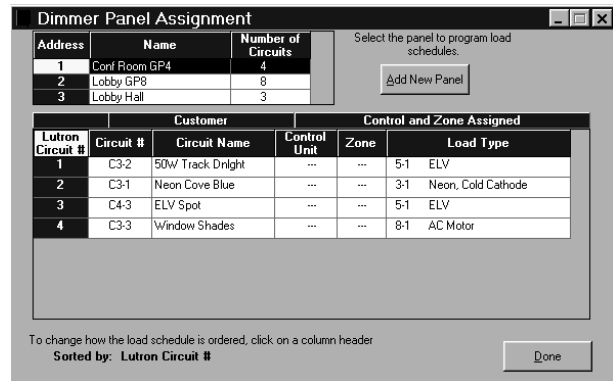
Program Power Panels (For Programmable Systems using GRX-PRG or GRX-CI-PRG Only)

If your system requires the use of *GRAFIK Eye* dimming or switching panels, use *LIAISON* to program Control Unit and Zone assignments plus the load type for each circuit. It will be necessary to Program Power Panels if 4100 or 4500 series Control Units have been included in the system. Each circuit of a dimming panel receives its light level from a Control Unit and Zone in the system. Each circuit will have an individual Zone assigned; however, multiple circuits may have the same Zone assignment. Load types are the type of fixture(s) that will be controlled on a zone-by-zone basis. It is important to specify the correct load type for each zone to achieve the best dimming performance.

NOTE: Power Panels must be uniquely addressed to allow for programming. If you have any questions regarding panel addressing, circuit capacities, or load types, please contact the Lutron Hotline for assistance.

IMPORTANT! Power Panel details are only available from circuit selectors with a code revision level of 2-50 or newer. The code revision is available on the circuit selector of the panel. If you have questions, please contact the Lutron Hotline for assistance.

- From the **Set Up** menu, select **Program Power Panels**. Choose the Panel to program by specifying the address in the table at the top of the screen. **For example**, click on Address 1 to program the Conference Room GP4.



- To modify the name of the panel, select the **Name** cell of the panel address you are modifying. Enter in the new panel name. This name is for reference only and will not be downloaded to the system.
- To modify the number of circuits in a panel, select the **Number of Circuits** cell of the panel address you are modifying. Use the pull-down list box to select the number of circuits for the panel being programmed. If the new number of circuits is greater than the original number, the circuits will be added to the current load schedule. If the new number is less than the original number, the circuits will be deleted. If any circuits to be deleted have already been programmed, you will have to confirm the deletion when prompted.
- The load schedule table at the bottom of the screen lists the circuits in the panel and allows the user to program the Control Unit, zone assignments, and the load type for each circuit. In addition, customer circuit information can be provided for reference. Select **Customer Circuit #** or **Customer Circuit Name** to enter customer-specific information.
- Click on the **Control Unit** cell and select from the pull-down list the Control Unit of the Zone that will be dimmed by this circuit. Only those Control Units that have been included in the system (see **Specify Control Units**) will be listed. After selecting the Control Unit, click on the **Zone** cell and select a zone from the list. This is the zone that will control the light level of the loads attached to the circuit.
- Finally, click on the **Load Type** cell and select from the pull-down list the load type of the fixtures of the circuit. The load type must be specified at the power panel in addition to specifying load type on the Control Unit (see **Program Control Units**).
- Program the remaining circuits of the panel in the same manner. To add additional panels to the system, click **Add New Panel**. A new panel will be added to the bottom of the panel table.
- Once you have programmed all the Power Panels, click **Done** to exit the screen. Remember to save your changes while working by selecting **Save** from the **File** menu.

TIMECLOCK MENU



Create a Timeclock Schedule



NOTE! For each schedule, there is a maximum of 60 events allowed.

Select **Schedules** from the **Timeclock** menu to open the *Schedule Events* screen. Follow the steps below to define a schedule.

1. **Select a Schedule.** There are four schedule options: Weekday, Weekend, Special 1 and Special 2. The Weekday and Weekend options allow schedules to be defined that will run every weekday or every weekend day by default. The Special 1 and Special 2 schedules are used to define schedules of events for a unique day (e.g., Holiday, Party, etc.). Select a schedule to program by clicking on an item from the “Schedule” list.

2. **Select Event type: Time of Day or Astronomic** - Select the **Time of Day** or **Astronomic** tab of the schedule. If the **Time of Day** tab is selected, events can be scheduled to occur at a particular time of day or night. Astronomic events can be defined by selecting the **Astronomic** tab. Events can be set to occur up to 2 hours before or up to 2 hours after sunrise OR sunset. The time scale corresponding to the event type will be listed in the schedule.

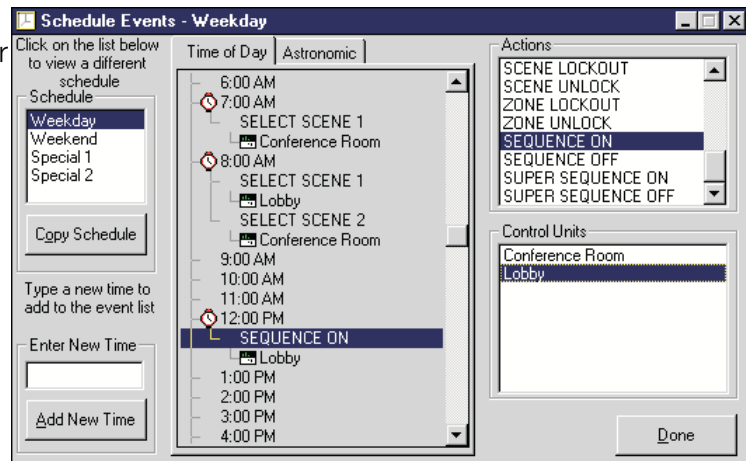


Figure 1. Time of Day Events

NOTE: For both event types, the time resolution is to the nearest minute. Figure 1 displays **Time of Day** events. All four schedules can include both real-time and astronomic events (though they cannot be viewed simultaneously on the *Schedule Events* screen).

3. **Add an event.** The *Schedule Events* screen utilizes the “drag and drop” method of adding items to a list. To add an event, begin by adding an action to the list of events. Select an action in the “Actions” list. Click on this item by pressing and holding the left button of your mouse. Continue to hold the left button down and drag the action to a time in the **Time of Day** or **Astronomic** event list. To drop the action, release the mouse button when the time for the event is highlighted. Actions can be dropped on times or other actions. For example, to change the action of a previously defined event, you would drag and drop the new action onto the original action.

After adding an action, you must specify at which **GRAFIK Eye** Control Units the action will occur. The only actions that do not require a Control Unit are “SUPER SEQUENCE ON” or “OFF.” To add a Control Unit or Units to an action, click on the Control Unit in the “Control Units” list. Press and hold the left button of your mouse and drop the Control Unit to an action in the list. Control Units can be dropped on actions or other Control Units. If the Control Unit is already included in the action, it will not be added a second time. Multiple Control Units can be listed under an action by dragging additional items from the “Control Units” list to an action in the event list.

NOTE: Only those Control Units that have been included in **Specify Control Units** will be available for selection.

NOTE: To schedule a “START AFTER HOURS MODE” or “CANCEL AFTER HOURS MODE” event, After Hours Mode must be enabled.

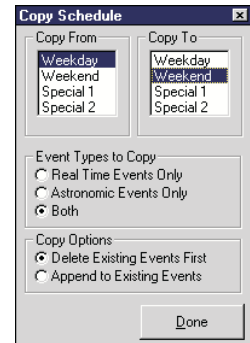
4. **Change an event time.** To change the time that an event will occur, again use the “drag and drop” method. Click on the action in the event list. Press and hold the left button of your mouse.



Create a Timeclock Schedule (continuation)

Drag this action to the new time in the event list. If the time is not listed, follow the procedures below to add the new time and then relocate the action.

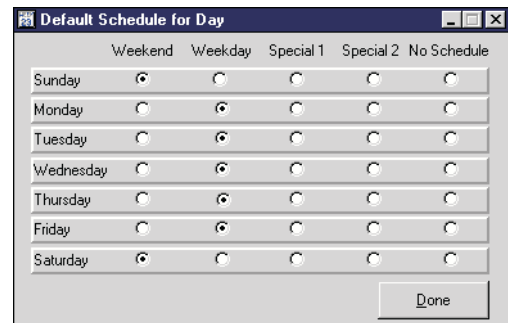
5. **Add New Time.** If you wish to schedule an event for a time not included on the list, you will need to add the time. In the “Enter New Time” text box, type the time of the event. For Time of Day events, type in the time, formatted based on the computer’s international settings. For Astronomic events, type in the desired amount of time Before or After sunRise or sunSet (up to 2 hours) followed by the appropriate code: BS, AS, BR, AR. After entering the time, click on **Add New Time**. The new time will be added to the list. For Time of Day, if AM or PM was omitted (but included in the computer’s international setting), the AM or PM extension will automatically be added based on the current event selected in the list.
6. To remove any events, highlight the event and then select **Delete** from the **Edit** menu.
7. To copy one schedule to another, click on the **Copy Schedule** button. The *Copy Schedule* screen gives the user the option to copy real-time events, astronomic events, or both, to another schedule. There is also the option to overwrite the events or to append the events to the end of the “Copy To” schedule.
8. The “Copy From” list is the schedule of events that will be copied. The “Copy To” list is the schedule to which the events will be copied. Use the options to set which events will be copied. Click and drag a schedule from the “Copy From” list to a schedule in the “Copy To” list. When the copy is complete, click on **Done**.
9. To change schedules, select a new item from the “Schedule” list. When the Weekday, Weekend and any Special schedules have been defined, click on the **Done** button to exit the *Schedule Events* screen.
10. Select **Save** from the **File** menu to save your system changes.



Default Schedule for Day

By default, weekday schedules will run Monday through Friday and weekend schedules will run Saturday and Sunday. If your system requires modifications to this default week definition, proceed as follows.

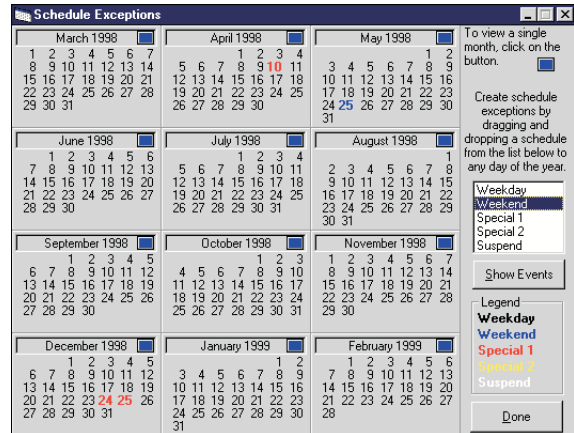
- To change the week definition, select **Default Schedules** from the **Timeclock** menu. The days that constitute weekdays and weekend days can be modified in the *Default Schedule for Day* screen. **For example**, to run the weekend schedule every Monday select the “Weekend” button.
- When modifications have been completed, click on **Done** to return to the main screen.
- Select **Save** from the **File** menu to save the changes.



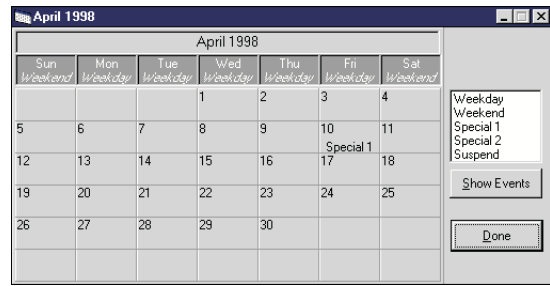


View and Modify Calendar Exceptions

After creating and transferring a schedule of events, the weekday and weekend schedules will run, by default, every weekday and weekend, as defined in the *Default Schedule for Day* screen (see **Default Schedule for Day**). Special 1 and Special 2 schedules can be used for special events or exceptions to the default. In addition, schedules can be suspended or overridden using **Calendar**. Suspending scheduled events on a specific day will only suspend the schedule for that day. Any scheduled events will resume the following day. Exceptions are saved by date in memory indefinitely, therefore, annual maintenance may be needed for holidays that do not fall on the same day every year (e.g., Thanksgiving, Labor Day, etc...). Fixed-date holidays, such as New Year's Day, do not require maintenance.



1. Select **Calendar** from the **Timeclock** menu.
2. The *Schedule Exceptions* screen displays a one year calendar. To add an exception, drag a schedule from the list and drop it on any day of the year.
3. To view the events in a schedule, select the schedule in the list and click **Show Events**.
4. To view an individual month, the button in the top right corner of each month can be selected. Using the month view, you can add exceptions to every day or every weekday in a single “drag and drop” action. **For example**, to create exceptions for every Sunday, select the schedule, drag and then drop on “Sunday.” To create exceptions for the entire month, select the schedule, drag and then drop on “April.”
5. To delete an exception, highlight the day and select **Delete** from the **Edit** menu.
6. When the calendar modifications are complete, click on **Done** to return to the main screen.



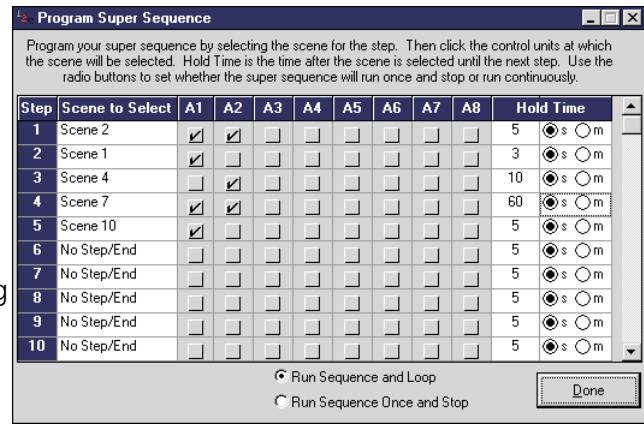
Create a Super Sequence

A Super Sequence is a collection of up to 60 system scene selects, called steps, and their corresponding hold times. The elements involved with a Super Sequence event are the scene, the selected *GRAFIK Eye* units, and the Hold Time.

- To define a Super Sequence, select **Super Sequence** from the **Timeclock** menu.
- **Set a Step.** Steps that have not yet been defined will have “No Step/End” in the **Scene to Select** column. From the first unused step, select the desired scene number from the pull-down list. Select the Units at which the scene will be selected by checking the appropriate Control Units.

NOTE: The selected scene will be activated on each of the Control Units selected for that step. For example, if Scene 2 and Control Units 1 and 2 (A1 and A2) are chosen for a step, Control Units 1 and 2 will go to their respective Scene 2 levels, using their respective Scene 2 fade times, when the step occurs.

- **Set a Hold Time.** The Hold Time defines the amount of time the system will wait before executing the next Super Sequence step. The range of hold times are 0 to 60 seconds and 0 to 99 minutes. If a Hold Time of 0 seconds is used, that step and the next step will occur simultaneously.



NOTE: The hold time begins as soon as the scene is selected, not after the scene has completed its fade. If your application requires that a scene remains for a given time after it has completed its fade, you must add the scene’s fade time to the hold time. **For example,** you require that Scene 1 remains for 20 seconds after it has completed its fade. Scene 1 has a fade of 5 seconds, therefore, a Hold Time of 25 seconds should be set.

- **Editing Steps.** From the **Edit** menu, use the **Cut**, **Copy**, **Delete**, and **Paste** options to edit steps of the Super Sequence. To edit a step, select from the **Step** column and choose the appropriate edit function. In addition, an edit menu will appear by clicking the right mouse button when an event is highlighted. This pop-up menu also includes **Insert**. Inserting a step will shift the highlighted step and all steps following down one step and paste the copied step to the current step. If a step 60 has been defined, it will be shifted off the list.
- Click on **Done** to leave the *Program Super Sequence* screen.
- Select **Save** in the **File** menu to save the defined Super Sequence.

After Hours Mode

After Hours Mode of the GRX-PRG or GRX-CI-PRG and *LIAISON* software allows the user to create timeclock schedules that minimize energy usage during off-peak periods or periods of non-occupancy. After a user-defined delay, following the start of After Hours mode, a user-defined scene will be selected. Any scene selection during this delay period will reset the delay period and “lease” the lighting for the space.

The user-defined delay can range from two minutes to two hours. After Hours mode can be cancelled via a scheduled event. After Hours mode can be initiated and cancelled on any combination of Control Units. The delay time is the same for all Control Units. The scene to be selected is the same for all Control Units.

After Hours Scene

A user designated scene that is automatically selected after a user-defined delay following a scene selection during After Hours Mode. While in After Hours mode, the system can automatically return to the desired energy efficiency level during periods of non-occupancy or off-peak usage.

After Hours Timeout

A user-defined time period, between two minutes and two hours, that the system will stay in a selected scene during After Hours Mode. When the time expires, the system will automatically select the After Hours Scene.

- Configure After Hours Mode:
 1. In Edit Mode, from the **Timeclock** menu, select **After Hours Mode**.
 2. On the After Hours Mode screen, check **Enable After Hours** Mode to enable the After Hours Mode; or uncheck the box to disabled it.
 3. Specify the After Hours Timeout. The valid timeout range is 2 minutes to 2 hours. Default timeout is 2 hours.
 4. Select an After Hours Scene. After Hours Mode Scene can be any Scene from Scene 1 to16 or Scene Off, the default is Scene 15.
 5. Click **Done** to exit the After Hours Mode screen
- After Hours Mode events:
 - Start After Hours Mode
 - Cancel After Hours Mode

These events can be scheduled as timeclock events.
- View System After Hours Mode Configuration:

In online mode, from Online Options menu, select After Hours Mode.

NOTE: After Hours Mode requires a GRX-PRG (with minimum code revision of 4.2) or GRX-CI-PRG.

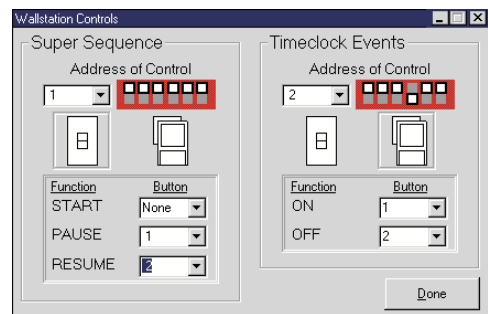


Assign Controls for Super Sequence and Timeclock Events

GRAFIK Eye Accessory Controls, NTGRX-2B-SL and GRX-AV, can be assigned to manually control the Timeclock interface by providing the following functions: start, pause and resume a Super Sequence, and turn on or off Timeclock events.

- To assign an Accessory Control, select **Wallstation Control** from the **Timeclock menu**. Choose the appropriate system address for the Accessory Control and the Wallstation type, NTGRX-2B-SL or GRX-AV.

NOTE: The Accessory Controls **must** have the function DIP Switches set for Scene 1 selection.
- Assign a button for the function required.
- Select **Save** from the **File** menu to save the changes.



ONLINE OPTIONS MENU

Communicating with the GRX-PRG or GRX-CI-PRG Interface Control

- **Establish communication with the Interface Control.** Review the GRX-PRG or GRX-CI-PRG instruction sheet before attempting to communicate with the Interface Control. For serial connection, verify that the provided cable is connected on the Interface Control to a COM port on your computer.

For Ethernet connection, verify that the PC and the GRX-CI-PRG are connected via an Ethernet network.

NOTE: At this time, it is assumed that all system wiring has been completed correctly.

- For Serial connection, select **Set COM Port** from the **Online Options** menu or **Preference** form. Select the COM port that corresponds to the port on your computer to which the GRX-PRG or GRX-CI-PRG is connected.

For Ethernet connection, specify IP address, Port number, and login of the GRX-CI-PRG from the **Preference** form.

- Click the **Advance** button on the **Preference** form to open the **Connection or Communication Time** form. Specify Connection Timeout and Response Timeout from this form.
- Select **Establish Communication** from the **Online Options** menu. **LIAISON** will attempt to locate a GRX-PRG or GRX-CI-PRG Interface Control. If one exists, and is connected properly, you will be notified that the unit was found. If an error message is displayed, check the wiring to the Interface Control and the PC.

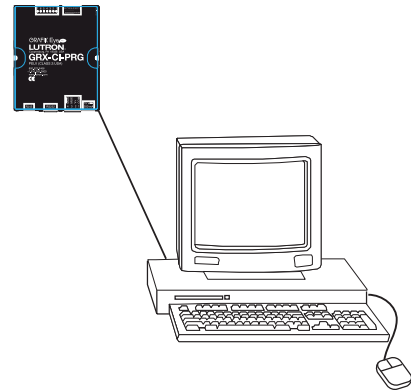
Transfer Data to the GRX-PRG or GRX-CI-PRG Interface Control

- Once communication has been established between the PC and the Interface Control, select **Transfer Data** from the **Online Options** menu. The **Transfer Options** screen allows the user to selectively transfer portions of data to the system. This feature is useful when only a portion (e.g., Timeclock events) of the system information has been modified. An initial transfer of any system requires that all system information be programmed and will take longer than selectively transferring data. After selecting **OK**, the **GRAFIK Eye LIAISON Compiler** screen will contain messages pertaining to the current status of the transfer. The messages shown during compilation will be dependent on the options chosen in the **Transfer Options** screen. After the data has been compiled and transferred, the message will read "System Compiled Successfully." After transferring data, you will be prompted to switch to Online Mode. If you would like to monitor the currently installed system, switch to **Online Mode**; otherwise, if additional editing to the system file is required, remain in the Edit Mode.

Congratulations! You have completed programming using **LIAISON** Lighting Control Software for **GRAFIK Eye**. To monitor the status of your system, continue to the next section, **Go Online with System**.

GO ONLINE WITH SYSTEM

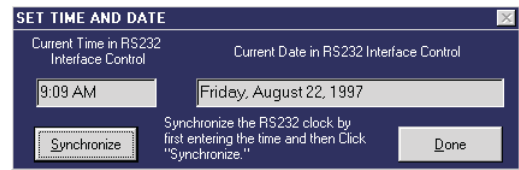
After you have transferred data using the first mode (**Create or Edit a Project from File**), select this mode to monitor and operate your **GRAFIK Eye** system. System status is available for each Control Unit in the system. System status includes current scene selected, Timeclock status, Super Sequence status, and scheduled events. Monitoring an installed project does not require a database file (files with extension .lia). The only system information that will not be available will be panel names. All other information can be monitored and/or retrieved from any installed system.





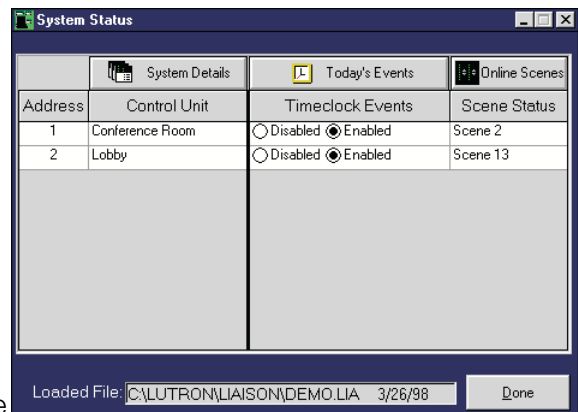
Set the Time and Date in the GRX-PRG or GRX-CI-PRG

1. Select **Set Time and Date** from the **Online Options** menu.
2. The current time and date in the Interface Control will be displayed. If the time or date needs to be modified, type in the correct information and click the **Synchronize** button. Do not include the day of the week when entering the date.
3. Click on **Done** after the time and date have been set.



Check the Status of your System

1. The current status of your system can be viewed by selecting **System Status** from the **Online Options** menu. The **System Status** screen will display current information, such as the currently selected scene at each Control Unit. With **LIAISON**, Timeclock events can be enabled and disabled on a Control Unit-by-Control Unit basis. By disabling the timeclock for a specific Control Unit, timeclock events will still occur, but will not affect the specified Control Unit.
2. If a wallstation control has been configured to turn Timeclock Events on and off (**Create or Edit a Project from File**), the Timeclock Status shown in the **System Status** screen will be affected. The Timeclock ON and OFF functions will enable and disable, respectively, the timeclock events of all Control Units in the system. **In addition, DIP Switch 8 (Timeclock ON/OFF) on the GRX-PRG or GRX-CI-PRG will also affect timeclock status. However, timeclock status cannot be enabled on any Control Unit if the timeclock has been turned off using DIP Switch 8.**
3. Click on **Done** to close the **System Status** screen.



View the Details of your System

The details of your system can be viewed in the **System Details** screen. System details include Control Unit model number, software revision (ideal for troubleshooting), communications information, and temporary mode settings.

1. Select **System Details** from the **Online Options** menu.
2. If any changes are made to the system, click **Update Details** to refresh the list of Control Units. This feature can be useful during installation or troubleshooting.
3. Click on **Done** to close the **System Details** screen.



View the Accessory Control Details of your System

The details of the Accessory Controls in your system can be viewed in the *Accessory Control Details* screen (include Accessory Control model number, function, and communications information).

IMPORTANT! Accessory Control details are only available from accessory controls with a minimum code revision. To determine the code revision level, inspect the back of the accessory control. If you have questions, please contact the Lutron Hotline for assistance.

Minimum Code Revision of Accessory Controls for Getting Details

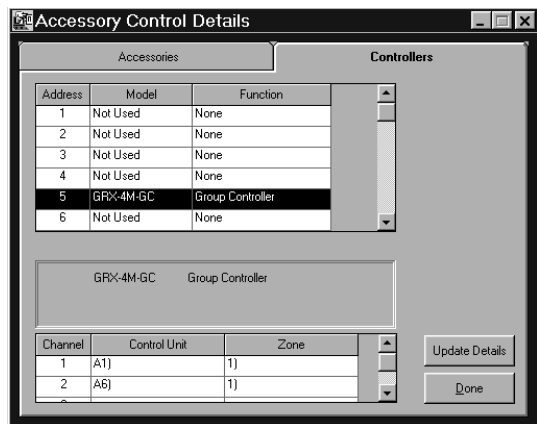
Type	Minimum Code Revision
Standard Accessory Control	2-0
Shade Accessory Control	1-1

1. Select **Accessory Controls Details** from the **Online Options** menu.

- Click the **Accessories** tab on the Accessory Control Details screen to view Accessory details.
- Click the **Controllers** tab on the Accessory Control Details screen to view Controller details.

2. The function is derived from the DIP switch settings of the Accessory Control. Refer to the installation and instruction sheets of the Accessory Controls for more information.

3. If any changes are made to the system, click **Update Details** to refresh the list of Accessory Controls. This feature can be useful during installation or troubleshooting.



4. Click on **Done** to close the *Accessory Control Details* screen.

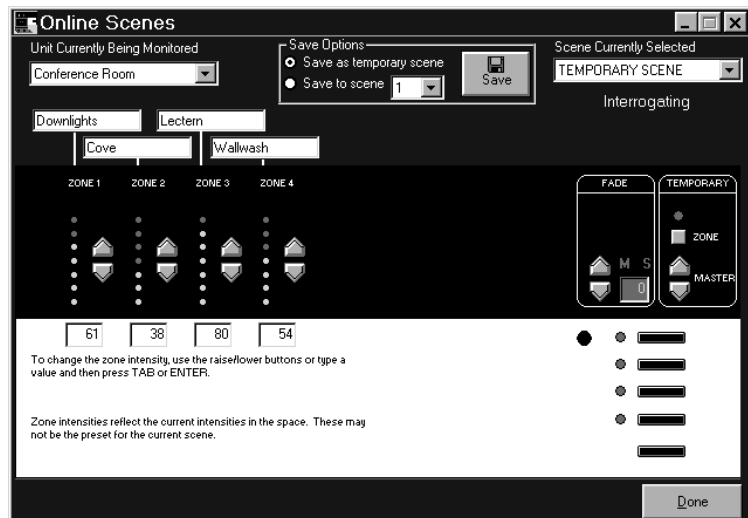


Modify Scenes Online

Online Scenes, located in the **Online Options** menu, enables you to modify preset data from your PC. Using your PC, temporarily adjust your lights through the familiar *GRAFIK Eye* Interface to create new scenes by adjusting fade times and zone intensities. Use this screen to “tweak” the light levels in the space, just as you would use the physical Control Unit.

■ To adjust the current light levels or make modifications to presets, select **Online Scenes** from the **Online Options** menu.

■ Any modifications to the light levels using **Online Scenes** will make “TEMPORARY SCENE” the currently selected scene on the Control Unit. This protects you from inadvertently changing presets unless you are sure of the modifications. To save a temporary preset, use the Save Options to select the scene and then press **Save**.



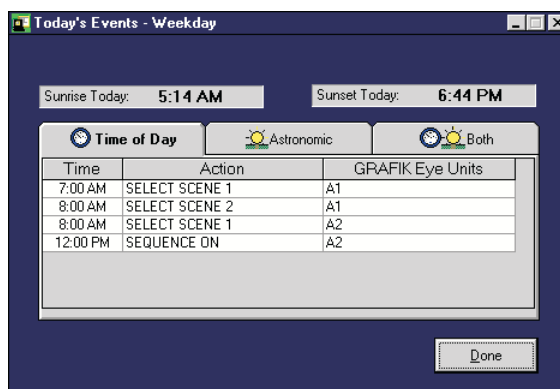
NOTE: All preset and system information in online mode is real time and does not require a file to be opened. Saving a preset in this screen saves the data to the Control Unit in the system. To retrieve and save this information to a file, refer to **Decompile**.

- To change the Control Unit being viewed, select from the “Unit Currently Being Monitored” list. The list of Control Units are the names last programmed using *LIAISON*.
- To change the current scene of the Control Unit being viewed, select from the “Scene Currently Selected” list. Remember, the zone intensities shown reflect the current intensities in the space. They may not be the preset for the current scene if someone has adjusted light levels from an Accessory Control or directly at the Control Unit.
- Click on **Done** to close the *Online Scenes* screen.



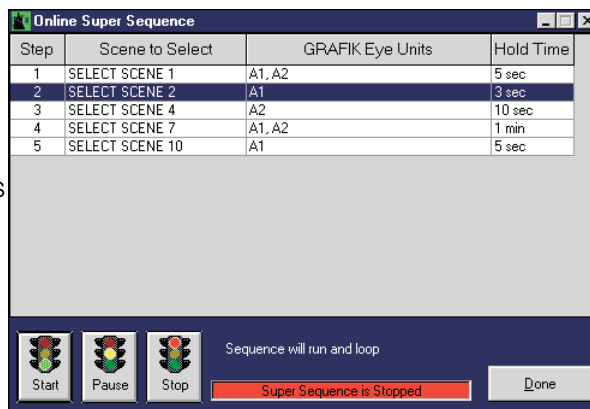
View the Events for Today

- To view the events scheduled for the current day, select **Today's Events** from the **Online Options** menu. The screen will display the current day, what schedule is to run, and the events in the specified schedule. If any events are astronomic, the time the event will occur will be shown followed by an * indicating that the time has been calculated based on sunrise or sunset.
- Click on **Done** to close *Today's Events*.



Monitor the Super Sequence

- If a super sequence (**Creating or Editing a Project from File**) has been created and transferred, the current status of your system can be viewed by selecting **Online Super Sequence** from the **Online Options** menu. The *Online Super Sequence* screen will display the status of the super sequence. Additionally, all steps of the sequence will be shown, but cannot be edited. From this screen, the user can start, resume, and stop the loaded super sequence.
 - Selecting **Start** will begin the super sequence at the first step. If **Start** is selected while a super sequence is running, the super sequence will immediately go to Step 1 and continue. Selecting **Start**, for a super sequence that is **Paused** (see next page), will continue the super sequence at the next step following the event when the super sequence was **Paused**.
 - Selecting **Pause** will halt the super sequence at the current step. This function may be ideal in a showroom application where specific areas are illuminated in a sequential manner and then stepped through to highlight specific areas.
 - Selecting **Stop** will halt the super sequence. Any **Start** command or **Resume** from a Wallstation Control (**Creating or Editing a Project from File**) will begin the super sequence at the first step.
- Any status change to the super sequence made by a Wallstation Control, will affect the status viewed in *Online Super Sequence*.



- Click on **Done** to close *Online Super Sequence*.

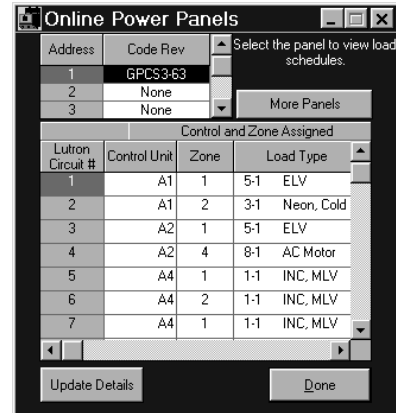


View the Power Panels of your System

The details of the power panels in your system can be viewed in the *Online Power Panels* screen. Panel details include Control Unit and zone assignment, and load type for each circuit of a panel.

IMPORTANT! Power Panel details are only available from circuit selectors with a code revision level of 2-50 or newer. The code revision is available on the circuit selector of the panel. If you have questions, please contact the Lutron Hotline for assistance.

- Select **Online Power Panels** from the **Online Options** menu.
- LIAISON will search for the first four addresses of power panels. For each panel located, circuit information will be received.
- To check for more panel addresses, click **More Panels**. LIAISON will search for the next four addresses.
- If any changes are made to the system, click **Update Details** to refresh the Control Unit and Zone and load type assignments. This feature can be useful during installation or troubleshooting.
- Click on **Done** to close *Online Power Panels*.



Communicate with the GRX-PRG or GRX-CI-PRG in Real Time

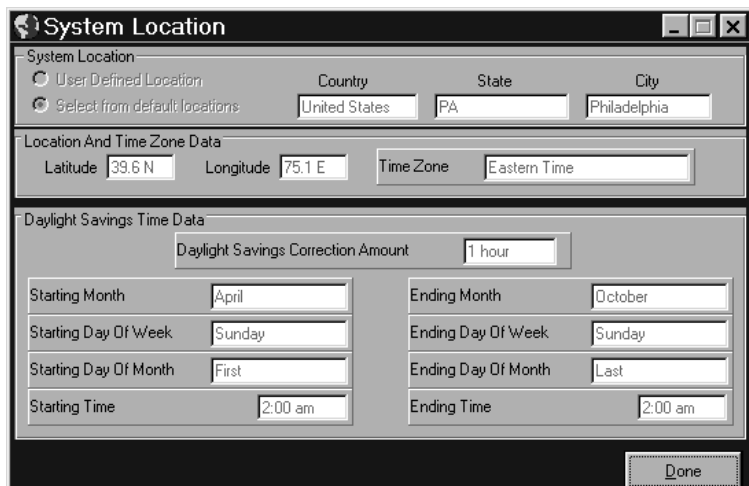
All commands available through the user interface can also be sent using a terminal or equivalent device. To use the terminal interface available with LIAISON:

- Select **Terminal** from the **Online Options** menu.
- Refer to the *GRAFIK Eye* RS232 Protocol help file installed in the LIAISON program group for commands that can be entered and data that can be received from this screen. For a complete set of printed commands, refer to the *GRAFIK Eye* RS232 Protocol (Lutron P/N 040-138).



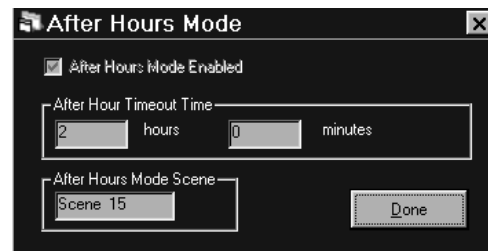
Get System Location Information from the PRG

- Select **Location** from the **Online Options** menu.
- LIAISON will display the project location information that was stored in the GRX-PRG or GRX-CI-PRG.
- Click on **Done** to close online *System Location* form.



Get After Hours Mode Information from the PRG

- Select **After Hours Mode** from the **Online Options** menu.
- **LIAISON** will display the after hours mode information that was stored in the GRX-PRG or GRX-CI-PRG.
- Click on **Done** to close online *After Hours Mode* form.



Retrieve the Current System Configuration from the GRX-PRG or GRX-CI-PRG

In many instances, the programming of the *GRAFIK Eye* system may be done using conventional programming methods instead of *LIAISON*. Or perhaps, *LIAISON* may be used for the initial programming and final adjustments to the lighting are done in the space. In these instances, it would be desirable to recover the system configuration in a format that could be reviewed or reused at a later time. Most system information can be recovered; including presets, communication information, Timeclock events, Super Sequence data, calendar exceptions, and default schedules configuration. The only data that cannot be retrieved are Accessory Control names, system location, and customer circuit information. To retrieve the current system configuration:

- Once communication has been established between the PC and the Interface Control, select **Decompile** from the **Online Options** menu. The *LIAISON Decompiler* screen will contain messages pertaining to the current status of the retrieval. The first step of decompiling is to select a file name for saving the configuration. A warning will appear if the file already exists. After retrieving the data, you will be prompted to switch to Edit Mode. If you would like to view or edit the currently installed system, switch to Edit Mode where the decompiled file will be open; otherwise, if additional monitoring to the system file is desired, remain in the Online Mode.

Finally . . .

Switching between Edit Mode and Online Mode

After starting *LIAISON*, it is still possible to switch between **Create or Edit a Project from File** and **Go Online with System** modes. From either mode, select the **File** menu. Depending on the current mode of operation, select either **Go to Online Mode** or **Go to Edit Mode**.

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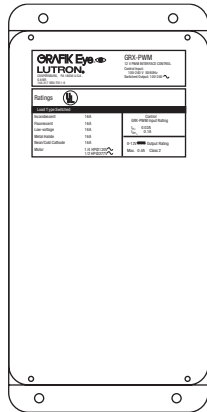
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Made and printed in U.S.A. 03/07
P/N 040-139 Rev. E





Description

The GRX-PWM provides 12 VDC Pulse Width Modulated (PWM) control and ballast switching capabilities in one enclosure. With the GRX-PWM, a GRAFIK Eye 3000 Series Control Unit* can control PWM ballasts powered by 100-277 VAC and provide switching relays that can handle the in-rush current for a full circuit of ballasts. The GRX-PWM can also be used to switch any of the load types listed below.

*GRX-PWM will also work with Lutron GP or LP panel outputs.

Product Specifications

FEATURES.....Provides a PELV (Class 2: USA) isolated 12 VDC 1 kHz PWM output signal that conforms to IEC60929 and JIS C8120-2. Accepts a constant-gate drive fluorescent signal

INPUT VOLTAGE RATING	100/120 V ~, 50/60 Hz
SWITCHED VOLTAGE RATING	100-277 V ~, 50/60 Hz
H2 TERMINAL INPUT RATING	200 mA max
DH2 TERMINAL INPUT RATING	100 mA
12 VDC PWM OUTPUT RATING	400 mA - sources current only

Source/Load Type	Switched Hot Current 100-277 V ~
Fluorescent: Lutron Eco-10™ (TVE Series)	16 A
Electronic Capacitive Non-Dim Other Manufacturer's 12 VDC PWM Ballasts (12 VDC PWM source only)	16 A
Incandescent	16 A
Low-Voltage	16 A
Metal Halide	16 A
Neon/Cold Cathode	16 A
Motors	1/4 HP @ 100-120 V ~ 1/2 HP @ 200-277 V ~

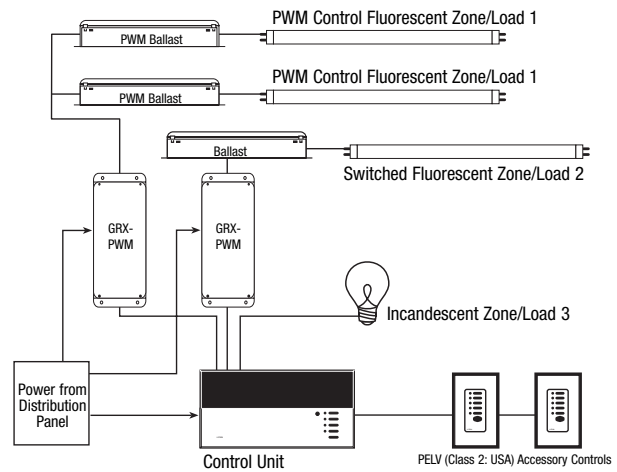
TERMINALS Two #12-20 AWG (0.5-2.5 mm²) conductors per terminal.
MOUNTING NEMA Type 1 enclosure, indoor use only.
ENVIRONMENTAL 32-104°F (0-40°C).
WEIGHT 4.25 lb. (2 kg)

Mounting

Find a suitable location for mounting.

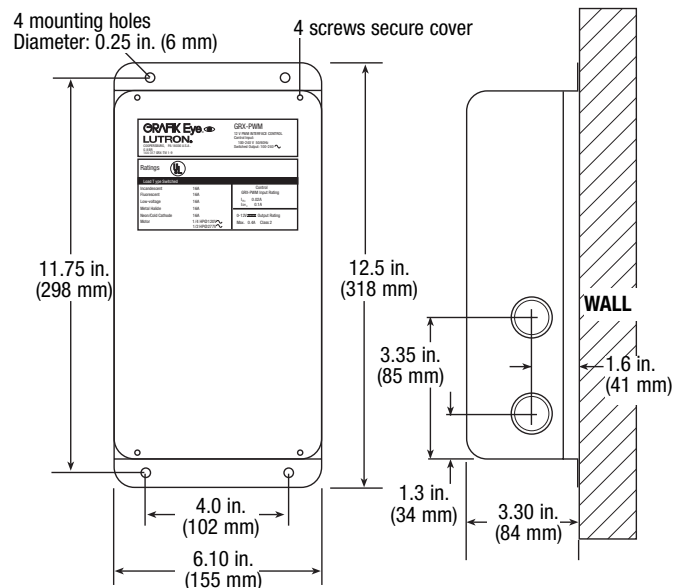
- Decide on the proper location for the GRX-PWM (NEMA Type 1 enclosure, indoor use only). See System Wiring Layout below.
- The environment where the GRX-PWM is placed must have an ambient temperature range of 32-104°F (0-40°C).
- Mount the enclosure vertically on a wall (screws not provided). See Mounting Diagram below.
- Mounting method must be able to support weight and forces applied during installation.
- Internal relays will click while in operation; mount where audible noise is acceptable.

System Wiring Layout



Note: When using a Control Unit, a GRX-PWM is required for each 12 VDC PWM fluorescent zone. (A 3-zone Control Unit with two fluorescent zones and one incandescent zone is shown as an example.)

Mounting Diagram



100-277 V \sim Control Interface

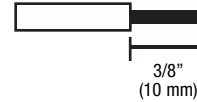
Important Installation Information

- Install in accordance with all national and local electrical codes.
- Check for short-circuited loads during new installations before wiring the GRX-PWM.



Caution: Multiple feeds may enter this enclosure. Locate and lock each feed circuit breaker/MCB in the OFF position before wiring the Interface.

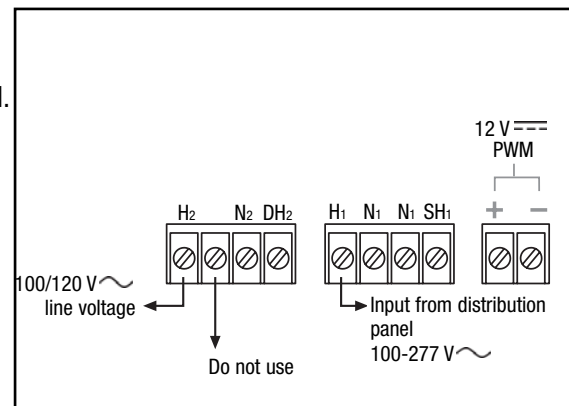
- Proper short-circuit and overload protection must be provided at the distribution panel. You can use up to a 20 A maximum circuit breaker/MCB or equivalent (tripping curve C according to IEC 898/EN60898 is recommended) with adequate short-circuit breaking capacity for your installation.
- Terminal blocks are rated for two #12-20 AWG (0.5-2.5 mm²) wires per terminal.
- Strip 3/8 in. (10 mm) of insulation from wires.
- Wiring Diagram A shows a GRX-PWM wired from one distribution panel. If the power requirement of the complete system is less than an MCB/circuit breaker rating, one feed can be jumpered inside the enclosure (as shown).
- Wiring Diagram B shows a GRX-PWM wired from two separate distribution panels that may be different phases or voltages.
- Use the internal terminal block label to see where to land wires.



- The label shows two separate Hot terminals (H1 & H2).
H1 is the Hot feed to power the lighting load.
H2 is the Hot feed that powers internal circuitry of the GRX-PWM.
H2 has a 100/120 V \sim connection. Do **not** use the unlabeled terminal.

Note 1: Not all terminal blocks receive a connection.

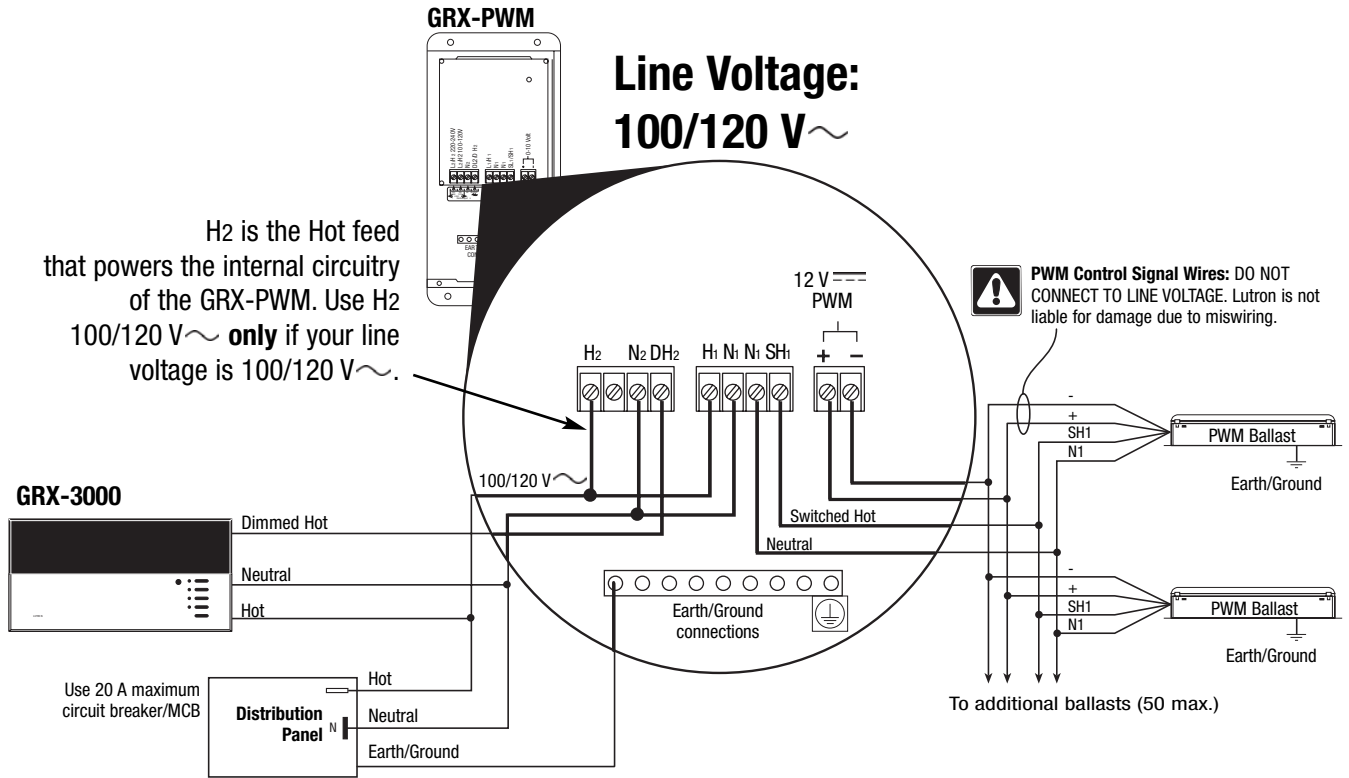
Note 2: The power feed to the Control Unit and H2 of the GRX-PWM must be the same phase!
PELV (Class 2: USA), 12 V \equiv PWM wiring from a ballast to the GRX-PWM must be separated from the power wiring. Enter the PELV (Class 2: USA) wires through the knockout adjacent to the 12 V \equiv PWM terminal blocks. The Nomex[®] barrier ensures separation and is flexible to allow access to the terminals. The barrier must be in place when installation is complete.



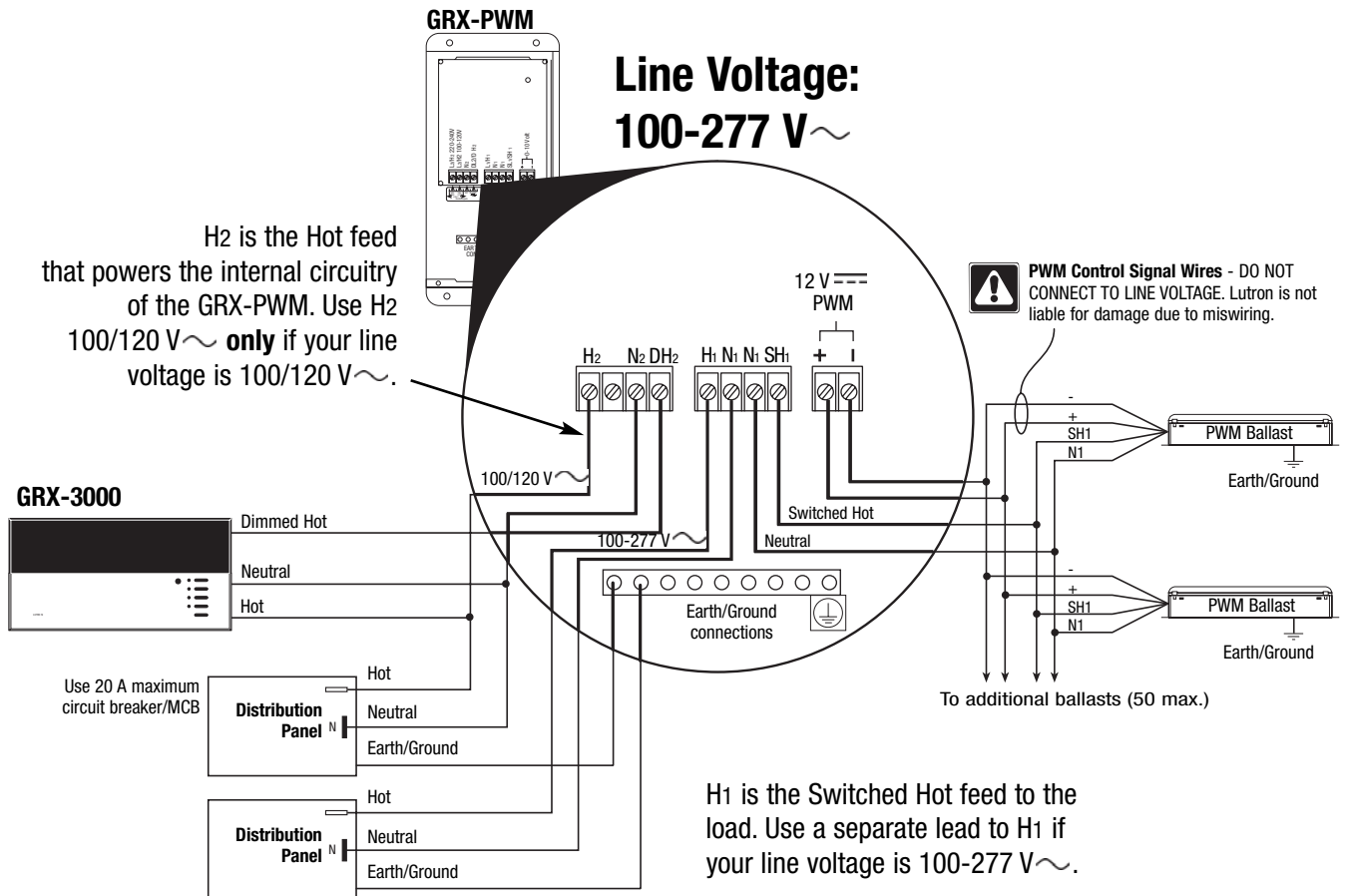
GRX-PWM Internal Terminal Block Label Definitions

H2 100/120 V \sim	Power input for GRX-PWM control (line voltage must be 100/120 V \sim only)
N2	Neutral for GRX-PWM control
DH2	GRAFIK Eye 3000 Series Control Unit Lighting Zone connection (Phase Control Input to GRX-PWM)
H1	Power input for lighting load (switched voltage can be 100-277 V \sim)
N1	Neutral for lighting load (2 terminals provided and internally tied together — one for input neutral, and one for load neutral)
SH1	Switched output to power lighting load
+ -	PWM control signal terminals

Wiring Diagram A: 100/120 V ~ GRX-PWM: 1 Distribution Panel



Wiring Diagram B: 100-277 V ~ GRX-PWM: 2 Distribution Panels



Operation

After wiring is complete, supply power to the GRX-PWM to check for proper operation.

- With the cover removed, an LED will provide visual feedback about the operation of the system.
- When power is first applied, the LED will turn on for 8 seconds to indicate start-up mode and then start to flash in one of two ways to indicate the status of the system:

1. Standard Operation

- The LED will flash at a rate of twice per second to signify proper communication between the Control Unit and the Interface.

2. Incorrect Operation - No Active Input

- The LED will repeatedly turn on for 1 second, then off for 1 second, to indicate that there is not an active phase control input to the GRX-PWM. Make sure that the phase control dimmer is ON and connected to the GRX-PWM at the terminal block marked DH2. Check that the corresponding zone for the DH2 terminal is ON and the light level is not set at the minimum output.
- When the LED indicates proper input of a phase control signal, then the output can be checked by looking at the load and checking operation from the Control Unit.
- For non-dimming ballasts, select non-dim load type on the *GRAFIK Eye* Control Unit and do not connect ballasts to PWM's + and - terminals.



Make sure that the Control Unit is set for **Fluorescent Load Type**. (Refer to *GRAFIK Eye* 3000 Series Installer's Guide.) If the load type is not set correctly, proper dimming will not occur.

Troubleshooting

Symptom	Possible Cause	Solution
PWM Ballast does not dim or control unit to the Interface.	Miswire	Verify that LED pulses twice per second. If not, check wiring from phase control unit to the Interface.
	Power is OFF	Make sure that the <i>GRAFIK Eye</i> 3000 Series Control Unit is ON.
	Miswire	Check for proper polarity of PWM signals at terminal blocks. Does it match what is at every ballast? A miswire at any ballast will cause all ballasts to go to the low end.
	Incorrect control setup	<i>GRAFIK Eye</i> 3000 Series Control Unit is not configured for fluorescent load type.
Light does not switch on	Miswire	Check that the SH1 connection goes to the ballasts.
	Miswire	Check that the DH2 connection is actually wired to a phase control input.
Light does not switch off	Miswire	Check that load is connected to SH terminal.
	Miswire	Check that the DH2 connection is actually wired to a phase control input.
LED is not illuminated	No power input	Check that power is applied to the Interface.

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LIMITED WARRANTY

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

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.

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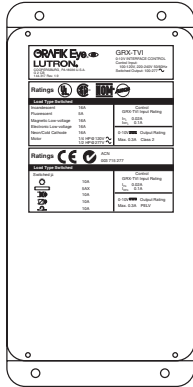
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Lutron Electronics Co., Inc.
Made and printed in U.S.A. 2/06
P/N 031-267 Rev. A





Description

The GRX-TVI provides 0-10V control and ballast switching capabilities in one enclosure. The GRX-TVI gives *GRAFIK Eye* 3000 Series Control Units the ability to control any 0-10V ballasts powered by 100V-277V (**ballast must provide 0-10V sourcing of current**) and provides switching relays that can handle the in-rush current for a circuit of ballasts. The GRX-TVI gives a *GRAFIK Eye* 3000 Series Control Unit the ability to both dim and switch electronic ballasts, such as *Lutron's Eco-10™* (TVE models). The GRX-TVI can also be used to switch any of the load types listed below.

Product Specifications

FEATURES.....Provides a Class 2/PELV isolated 0-10V output signal that conforms to EN60929 and IEC60929
Accepts a constant-gate drive fluorescent signal (100-127V, 220-240V, 50/60Hz)

INPUT POWER RATING.....100-127/220-240V, 50/60Hz

H2/L2 TERMINAL.....20mA

INPUT RATING

DH2/DL2 TERMINAL.....100mA

INPUT RATING

0-10V OUTPUT RATING.....10µA-300mA - Sinks current only (maximum 150 ballasts)

Source/Load Type	230V (CE)	100-127V/ 200-277V
Fluorescent: <i>Lutron Eco-10™</i> (TVE Series)	—	16A
Electronic Capacitive Non-Dim	10A	16A
Other Manufacturer's 0-10V Ballasts (0-10V source only)	10A	16A
Incandescent	10A	16A
Low-Voltage	10A	16A
Metal Halide	10A	16A
Neon/Cold Cathode	10A	16A
Motors	1/4HP @ 100-120V 1/2HP @ 200-277V 1/2HP @ 230V CE	

TERMINALS Two #12-20AWG (0.5-2.5 mm²) conductors per terminal.

MOUNTING NEMA Type 1 enclosure, indoor use only.

ENVIRONMENTAL 32–104 °F (0–40 °C).

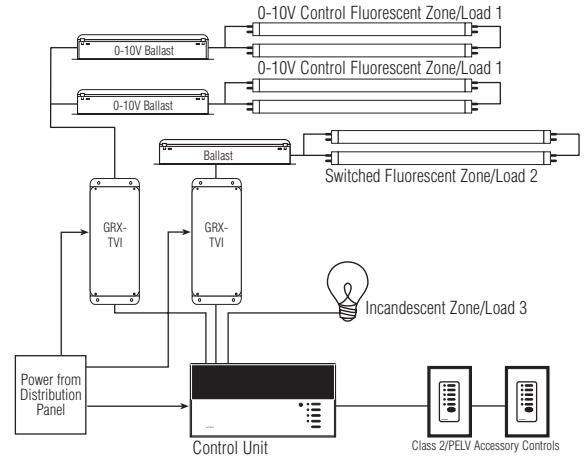
WEIGHT 4.25 lb. (2kg)

Mounting

Find a suitable location for mounting.

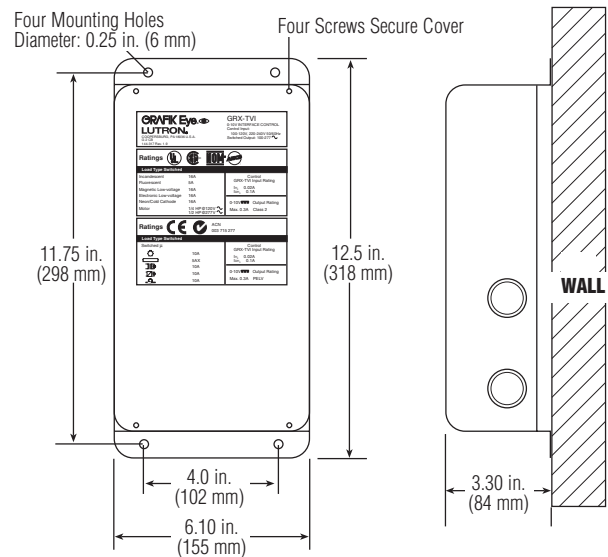
- Decide on the proper location for the GRX-TVI (NEMA Type 1 enclosure, indoor use only). See System Wiring Layout below.
- The environment where the GRX-TVI is placed must have an ambient temperature range of 32–104 °F (0–40 °C).
- Mount the enclosure vertically on a wall (screws not provided). See Mounting Diagram below.
- Mounting method must be able to support weight and forces applied during installation.
- Internal relays will click while in operation — mount where audible noise is acceptable.

System Wiring Layout



Note: When using a Control Unit, a GRX-TVI is required for each 0-10V fluorescent zone. (A 3-zone Control Unit with two fluorescent zones and one incandescent zone is shown as an example.)

Mounting Diagram



220-240V/CE Control Interface

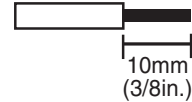
Important Installation Information

- Install in accordance with all national and local electrical codes.
- Check for short circuited loads during new installations before wiring the GRX-TVI.



Caution: Multiple feeds may enter this enclosure. Locate and lock each feed circuit breaker/MCB in the OFF position before wiring the Interface.

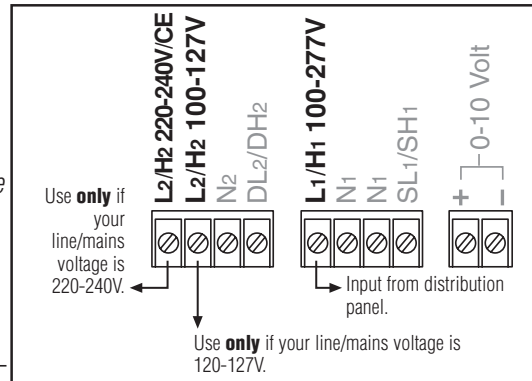
- Proper short circuit and overload protection must be provided at the distribution panel. You can use up to a 20A (16A for CE) maximum circuit breaker/MCB or equivalent (tripping curve C according to IEC 898/EN60898 is recommended) with adequate short circuit breaking capacity for your installation.
- Terminal blocks are rated for two #12-22 AWG (0.5-2.5 mm²) wires per terminal.
- Strip 3/8 in. (10 mm) of insulation from wires.
- Wiring Diagram A shows a GRX-TVI wired from one distribution panel. If the power requirement of the complete system is less than an MCB/circuit breaker rating, one feed can be jumpered inside the enclosure (as shown).
- Wiring Diagram B shows a GRX-TVI wired from two separate distribution panels that may be different phases or voltages.
- Use the internal terminal block label to see where to land wires.



- The label shows two separate Hot/Live terminals (L1/H1 & L2/H2).
L1/H1 is the Hot/Live feed to power the lighting load.
L2/H2 is the Hot/Live feed that powers internal circuitry of the GRX-TVI.
*L2/H2 has a 100-127V connection **and** a 220-240V connection - use **only** the one corresponding to line voltage for your application.*

Note 1: Not all terminal blocks receive a connection.

Note 2: The power feed to the Control Unit and L2/H2 of the GRX-TVI must be the same phase!
Class 2/PELV, 0-10V wiring from a ballast to the GRX-TVI-CE must be separated from the power wiring. Enter the Class 2/PELV wires through the knockout adjacent to the 0-10V terminal blocks. The Nomex[®] barrier ensures separation and is flexible to allow access to the terminals. The barrier must be in place when installation is complete.

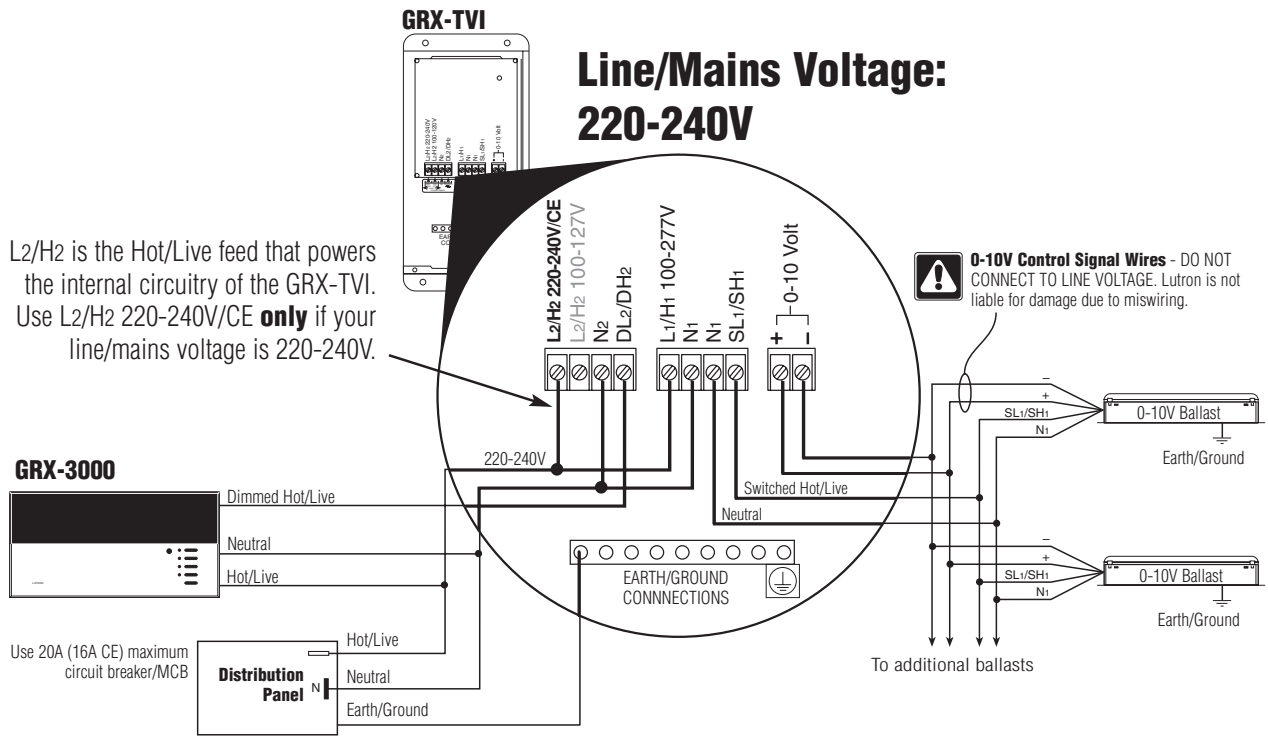


GRX-TVI Internal Terminal Block Label Definitions

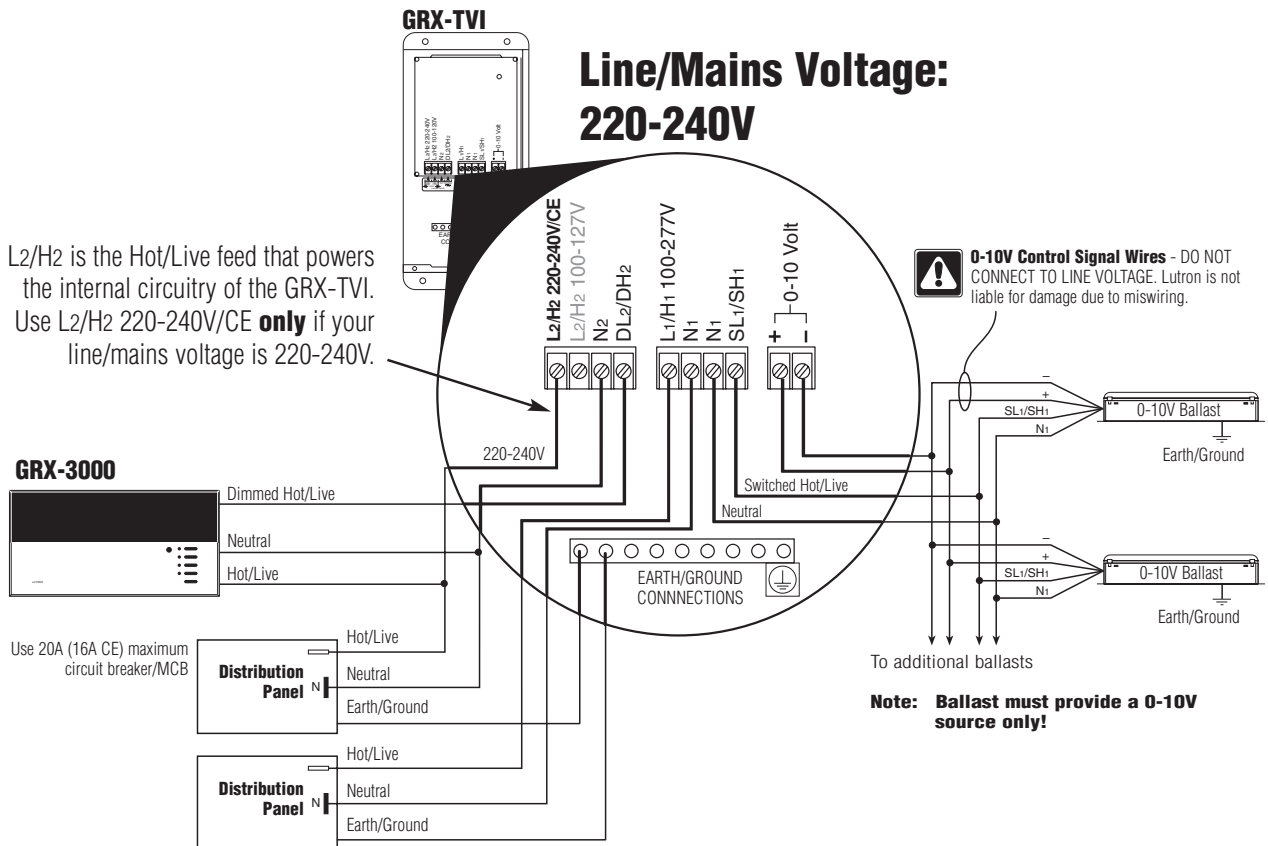
Use **only one** input according to Input Voltage:

L2/H2 240V	Power input for GRX-TVI control (line/mains voltage must be 220-240V)
L2/H2 127V	Power input for GRX-TVI control (line/mains voltage must be 100-127V)
N2	Neutral for GRX-TVI control
DL2/DH	GRAFIK Eye 3000 Series Control Unit Lighting Zone connection (Phase Control Input to GRX-TVI)
L1/H1	Power input for lighting load
N1	Neutral for lighting load (2 terminals provided and internally tied together — one for input neutral and one for load neutral)
SL1/SH1	Switched output to power lighting load
+ -	0-10V control signal wires (ballast must provide a 0-10V source only)

Wiring Diagram A: 220-240V/CE GRX-TVI — 1 Distribution Panel



Wiring Diagram B: 220-240V/CE GRX-TVI — 2 Distribution Panels



100-127V Control Interface

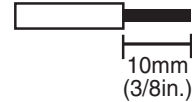
Important Installation Information

- Install in accordance with all national and local electrical codes.
- Check for short circuited loads during new installations before wiring the GRX-TVI.



Caution: Multiple feeds may enter this enclosure. Locate and lock each feed circuit breaker/MCB in the OFF position before wiring the Interface.

- Proper short circuit and overload protection must be provided at the distribution panel. You can use up to a 20A (16A for CE) maximum circuit breaker/MCB or equivalent (tripping curve C according to IEC 898/EN60898 is recommended) with adequate short circuit breaking capacity for your installation.
- Terminal blocks are rated for two #12-22 AWG (0.5-2.5 mm²) wires per terminal.
- Strip 3/8 in. (10 mm) of insulation from wires.
- Wiring Diagram C shows a GRX-TVI wired from one distribution panel. If the power requirement of the complete system is less than an MCB/circuit breaker rating, one feed can be jumpered inside the enclosure (as shown).
- Wiring Diagram D shows a GRX-TVI wired from two separate distribution panels that may be different phases or voltages.
- Use the internal terminal block label to see where to land wires.

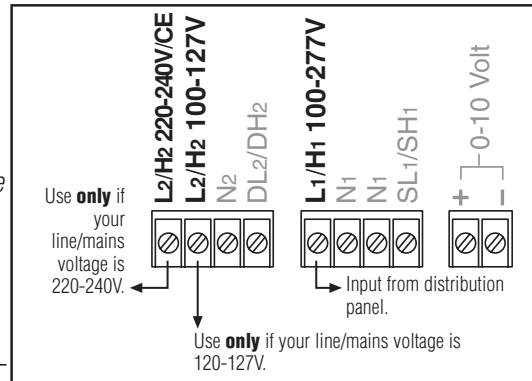


- The label shows two separate Hot/Live terminals (L1/H1 & L2/H2).
L1/H1 is the Hot/Live feed to power the lighting load.
L2/H2 is the Hot/Live feed that powers internal circuitry of the GRX-TVI.

*L2/H2 has a 100-127V connection **and** a 220-240V connection - use **only** the one corresponding to line voltage for your application.*

Note 1: Not all terminal blocks receive a connection.

Note 2: The power feed to the Control Unit and L2/H2 of the GRX-TVI must be the same phase!
Class 2/PELV, 0-10V wiring from a ballast to the GRX-TVI-CE must be separated from the power wiring. Enter the Class 2/PELV wires through the knockout adjacent to the 0-10V terminal blocks. The *Nomex*® barrier ensures separation and is flexible to allow access to the terminals. The barrier must be in place when installation is complete.

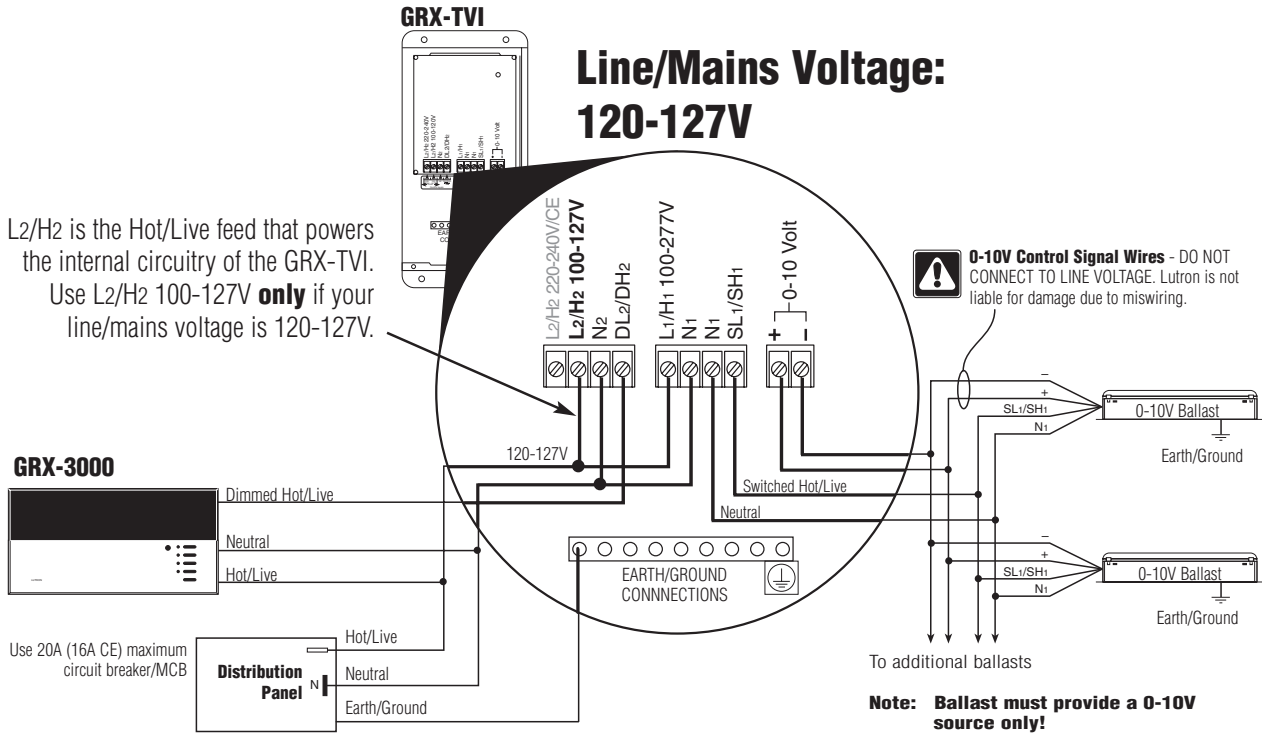


GRX-TVI Internal Terminal Block Label Definitions

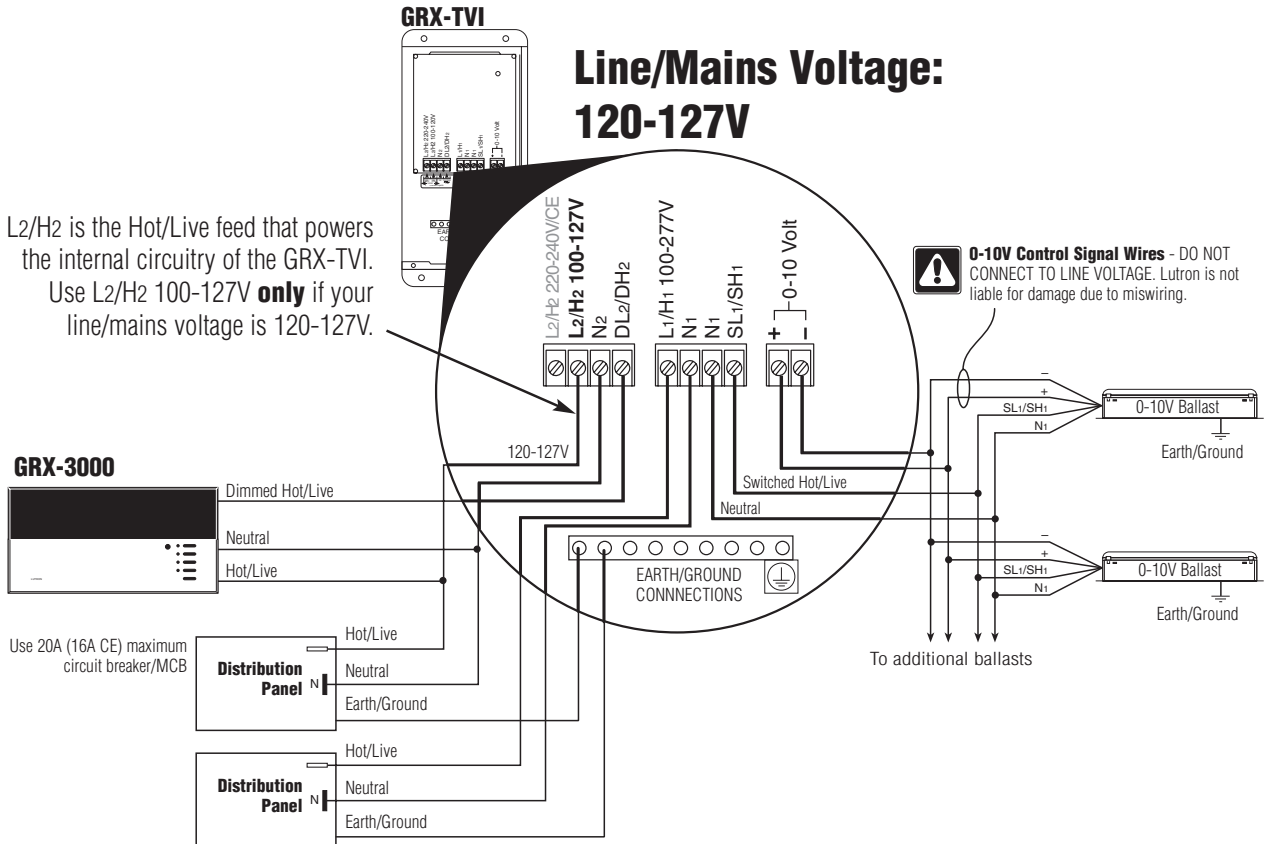
Use **only one** input according to Input Voltage:

L2/H2 240V	Power input for GRX-TVI control (line/mains voltage must be 220-240V)
L2/H2 127V	Power input for GRX-TVI control (line/mains voltage must be 100-127V)
N2	Neutral for GRX-TVI control
DL2/DH	GRAFIK Eye 3000 Series Control Unit Lighting Zone connection (Phase Control Input to GRX-TVI)
L1/H1	Power input for lighting load
N1	Neutral for lighting load (2 terminals provided and internally tied together — one for input neutral and one for load neutral)
SL1/SH1	Switched output to power lighting load
+ -	0-10V control signal wires (ballast must provide a 0-10V source only)

Wiring Diagram C: 100-127V GRX-TVI — 1 Distribution Panel



Wiring Diagram D: 100-127V GRX-TVI — 2 Distribution Panels



Operation

After wiring is complete, supply power to the GRX-TVI to check for proper operation.

- With the cover removed, an LED will provide visual feedback about the operation of the system.
- When power is first applied, the LED will turn on for 8 seconds to indicate start-up mode and then start to flash in one of two ways to indicate the status of the system:
 1. **Standard Operation**
 - The LED will flash at a rate of twice per second to signify proper communication between the Control Unit and the Interface.
 2. **Incorrect Operation - No Active Input**
 - The LED will repeatedly turn on for 1 second then off for 1 second to indicate that there is not an active phase control input to the GRX-TVI. Make sure that the phase control dimmer is ON and connected to the GRX-TVI at the terminal block marked DL2/DH2. Check that the corresponding zone for the DL2/DH2 terminal is ON and the light level is not set at the minimum output.
- When the LED indicates proper input of a phase control signal, then the output can be checked by looking at the load and checking operation from the Control Unit.
- For non-dimming ballasts, select non-dim load type on the GRAFIK Eye Control Unit and do not connect ballasts to 0-10V terminals.



Make sure that the Control Unit is set for **Fluorescent Load Type**. (Refer to *GRAFIK Eye 3000 Series Installer's Guide*.) If the load type is not set correctly, proper dimming will not occur.

Troubleshooting

Symptom	Possible Cause	Solution
0-10V Ballast does not dim or control unit to the Interface.	Miswire	Verify that LED pulses twice per second. If not, check wiring from phase control unit to the Interface.
	Power is OFF	Make sure that the <i>GRAFIK Eye 3000 Series Control Unit</i> is ON.
	Miswire	Check for proper polarity of 0-10V signals at terminal blocks. Does it match what is at every ballast? A miswire at any ballast will cause all ballasts to go to the low end.
	Incorrect Control Setup	<i>GRAFIK Eye 3000 Series Control Unit</i> is not configured for fluorescent load type.
Light does not switch on	Miswire	Check that the SL ₁ /SH ₁ connection goes to the ballasts.
	Miswire	Check that the DL ₂ /DH ₂ connection is actually wired to a phase control input.
Light does not switch off	Miswire	Load is not connected to SH (SL) terminal.
	Miswire	Check that the DL ₂ /DH ₂ connection is actually wired to a phase control input.
LED is not illuminated	No Power Input	Check that power is applied to the Interface.

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LIMITED WARRANTY

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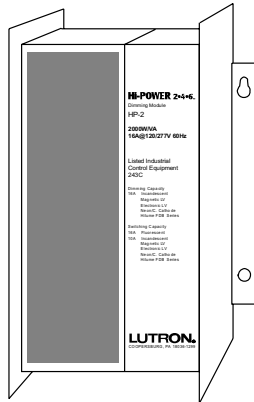
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Lutron Electronics Co., Inc.
Made and printed in U.S.A. 8/03
P/N 032-119 Rev. B

Hi-POWER 2•4•6™

Installation Instructions
Please Leave for Occupant

HP-2, HP-4, & HP-6
Dimming Module
120/277VAC, 60Hz



Description

The Hi-POWER 2•4•6 Dimming Module provides the capability to control a large zone of lighting from either a Lutron incandescent wallbox dimmer or from Class 2 controls. Multiple modules can be used together in a system to control a total load of up to 30,000W/VA. The Hi-POWER 2•4•6 Dimming Module can dim 120V incandescent, magnetic low-voltage, electronic low-voltage, neon/cold-cathode loads, 277V magnetic low-voltage, and Lutron's Hi-lume® FDB-series and Eco-10™, 120V and 277V fluorescent dimming ballasts. It can also switch these loads (except Hi-lume FDB and Eco-10 ballasts) as well as metal halide and non-capacitive fluorescent loads.

Important Notes

Please Read Before Installation

1. Install in accordance with all local and national electrical codes.
2. **CAUTION:** Only a qualified electrician should install this system. Turn power OFF at circuit breakers or remove fuses before wiring. Do not wire with power on. Improper wiring can result in personal injury or damage to equipment. Damage to product caused by wiring with power on voids warranty.
3. Do not remove factory-installed bypass jumpers on load circuit terminals until load circuits are tested (see Start-up Procedure on page 5).
4. The Hi-POWER dimming modules are designed to operate in ambient temperatures between 0°C-40°C (32°F-104°F).
5. To reduce the risk of overheating and possible damage to other equipment, the module must be mounted as shown on page 2. Failure to provide adequate space for cooling may result in overheating and void the warranty.

6. Module hums slightly during operation and the internal relay clicks when the circuit is turned on and off. Choose an installation location where these sounds are acceptable.
7. Operation of dimmed low-voltage circuit with all lamps inoperative or removed may result in current flow in excess of normal levels. To avoid transformer overheating and possible failure, Lutron strongly recommends the following:
 - a. Do not operate dimmed low-voltage circuits without lamps in place.
 - b. Replace burned-out lamps immediately.
 - c. Use transformers incorporating thermal protection or fused transformer primary windings to prevent transformer failure due to overcurrent.
8. Dimmed electronic low-voltage transformers may produce an audible noise when dimmed. For more information, call the toll-free **Lutron Hotline** at 1-800-523-9466.
9. See "Neon/Cold-Cathode Dimming" (pages 14-15) before attempting to dim neon/cold-cathode lamps.
10. For proper dimming performance fluorescent lamps must be operated at full intensity for 100 hours prior to dimming.

Electrical Ratings

Module		HP-2	HP-4	HP-6
Inputs Required	Control Circuit 120VAC, 60Hz	1 (20VA)	1 (20VA)	1 (20VA)
	Load Circuit 120/277 ^{1,4} VAC, 60Hz	1	2	3
Outputs Available	Dimmed Hot	1	2	3
	Switched Hot	1	2	3
Minimum load per Module	Hi-lume FDB or Eco-10 ballasts	1	2	3
	All other loads	50W/VA	100W/VA	150W/VA
Heat Dissipation	BTU/Hr Maximum	200	400	600

Capacity of each Output^{2,3}

Load Type	Dimmed	Switched ⁴
Incandescent	16A (1920W)	10A
Magnetic Low-Voltage, Electronic Low-Voltage, or Neon/Cold-Cathode	16A (1920VA)	10A
Hi-lume FDB or Eco-10 Fluorescent	16A	—
Fluorescent (non-capacitive)	—	16A
Metal Halide	—	10A

¹ 277V Hi-lume FDB or Eco-10 fluorescent, or 277V magnetic low-voltage only.

² Any load circuit can be connected to any phase.

³ Each load circuit may be connected to a different load type; however, load types cannot be mixed on the same circuit.

⁴ Switched loads may be either 120 or 277VAC.

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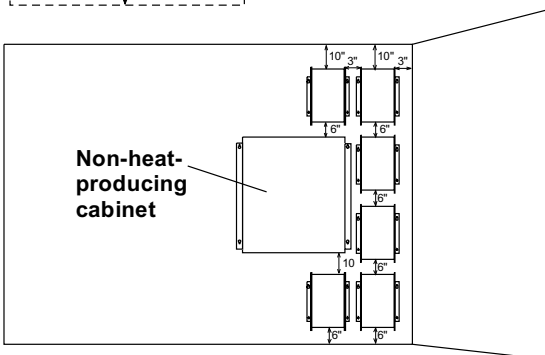
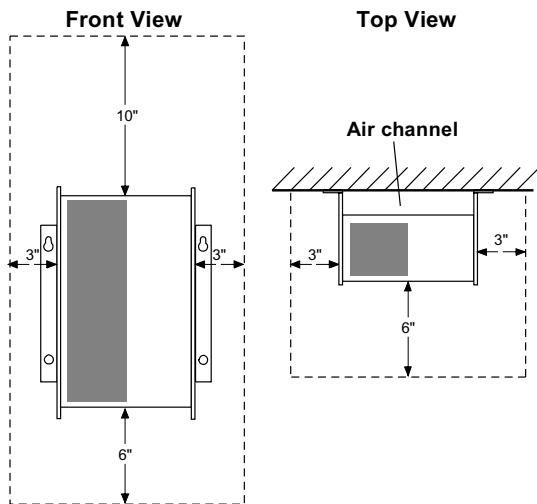
These products may be covered by one or more of the following U.S. patents: 4,797,599; 4,803,380; 4,893,062; 4,947,054; 5,030,893; 5,191,265; 5,248,919; 5,399,940; 5,430,356; 5,463,286; DES 311,170; DES 313,738; DES 337,755; DES 399,326; DES 344,264; DES 353,798 and corresponding foreign patents. U.S. and foreign patents pending. Lutron, GRAFIK Eye, Hi-lume, Maestro, Nova T™, and Vareo are registered trademarks and Hi-POWER 2•4•6, ECO-10, and Omnislide are trademarks of Lutron Electronics Co., Inc. © 1996 Lutron Electronics Co., Inc.

Mounting and Dimensions

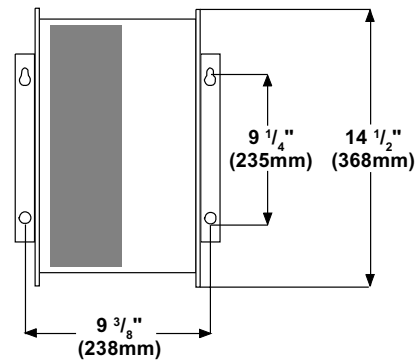
- 1. Choose an appropriate location.**
Select a convenient location such as an electrical closet or basement. Make sure location is at least 6' from sensitive equipment (and its wiring). Also, make sure to locate module where its sounds (relays clicking and slight humming) are acceptable. Ensure ambient temperatures are between 0°C-40°C (32°F-104°F). Module must be mounted away from steam pipes, direct sunlight, or other heat sources.
- 2. Plan placement of modules (see below).**
Modules must be mounted vertically. Make sure nothing blocks the air channel between the back of the module and the wall.
 - Leave 6" (152mm) of space above and below modules and 3" (76mm) of space on either side of modules.
 - Leave 10" (204mm) between the top of the module and the ceiling, and 6" (152mm) between the bottom of the module and the floor.
 - Leave 6" (152mm) of clearance in front of each module.

- 3. Mount modules (see below).**
Using the mounting dimensions shown below, mark (while keeping the module vertical), then drill mounting holes. Securely fasten the module to the wall. Mounting holes are keyed to facilitate mounting.

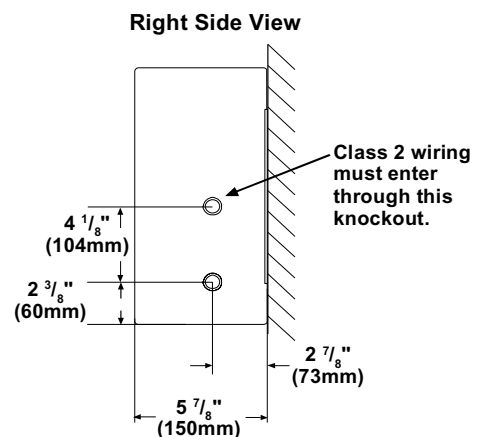
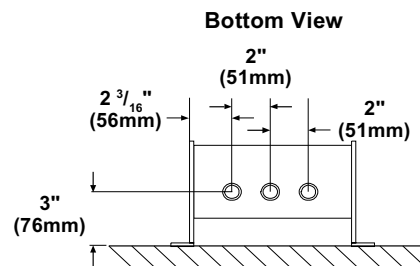
Airspace Required



Mounting Dimensions



Knockout Locations



Wiring



WARNING: Turn power OFF to all circuits before installing any part of the Dimming System. Wiring with the power on can result in serious personal injury or damage to equipment.

1. Pull dedicated feeds.

For each circuit in the Hi-POWER module, pull a 20A dedicated feed: one circuit for the HP-2, two circuits for the HP-4, and three circuits for the HP-6 (see Typical System Wiring Diagram).

2. Provide control circuit power to first module.

The Hi-POWER module requires power to operate its circuitry. This control circuit can be wired from any of the dedicated feeds coming into the Hi-POWER module as long as they have an additional 20VA of capacity available for each Hi-Power module connected to the same control (refer to Power Feed Wiring Diagram on page 4 for terminal locations). Do not wire control circuit power to any additional modules.

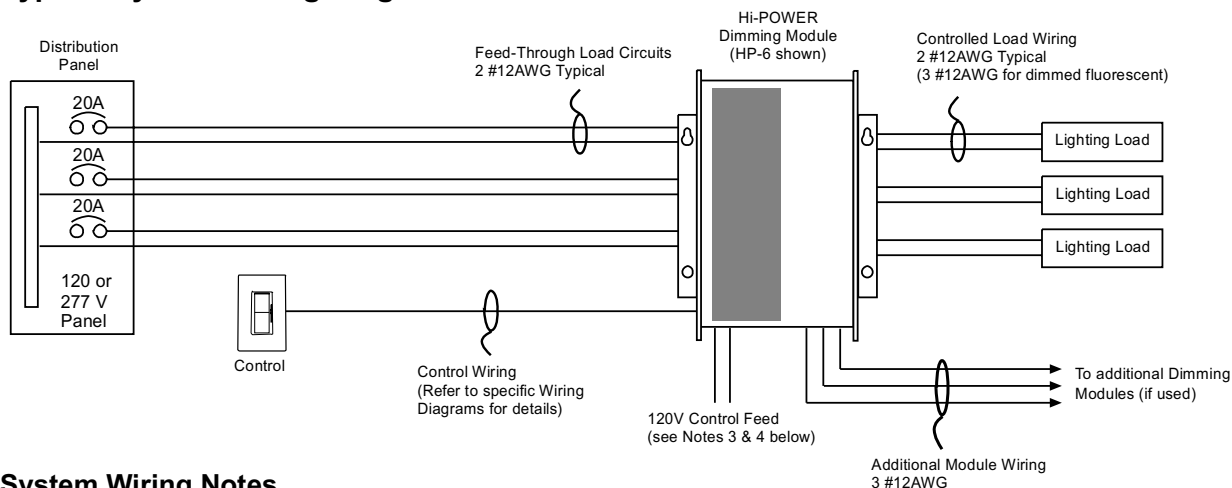


IMPORTANT: If more than one module is used, only connect power to the control circuit of the first module.

3. Wire between Hi-POWER modules.

If more than one Dimming Module is being operated from the same control, run 3 #12 wires from the Additional Module Terminals on the first module to the Additional Module Terminals on the next. No connection is made to the Control Circuit Terminals on the additional modules. Wire additional modules until all are connected in a line. See Power Feed Wiring Diagram on page 4 for location of the Additional Module Terminals. Wiring is 1 to 1, 2 to 2, 3 to 3. Do not cross wires.

Typical System Wiring Diagram



System Wiring Notes

1. Load circuit input feeds can be connected to any phase.
2. Power and control wires must be run in separate raceways. Run individual neutrals for each input and load circuit.
3. Module requires a 120V control circuit input feed. It can be provided from any source, such as one of the load circuits, with 20VA of spare capacity for each Hi-POWER module in the system (For GRAFIK Eye 3000, the control circuit feed must be on same phase as the power for the GRAFIK Eye Control Unit.) If necessary, a 277:120V, 100VA transformer may be used to obtain proper input. (Examples are Acme #TA-2-81303, Hammond Mfg. #MH100GP, or equivalents.)
4. In systems with more than one dimming module per lighting zone, connect feed to control circuit of first module only. **Control circuits must be 120V only.**
5. The diagram represents a three load circuit model (HP-6). For one circuit (HP-2) or two circuit (HP-4) applications, the number of circuits controlled differs, but the wiring will be the same. A different load type may be used on each circuit if desired. However, do not mix load types on the same load circuit.
6. 15A circuit breakers may be used in place of 20A circuit breakers. Do not exceed 1440W per 15A circuit.

4. Wire to Controlled Loads.

Load wiring differs depending on the load type and whether the load is dimmed or switched (see below). Refer to Load Wiring Diagrams on page 7 for load wiring specifics.

Load Type	Load Wiring Diagram	
	Dimmed	Switched
Incandescent	1	3
Magnetic Low-Voltage	1	3
Electronic Low-Voltage	1	3
Neon/Cold-Cathode	1	3
Hi-lume FDB	2	—
Eco-10	2	—
Fluorescent (non-capacitive)	—	3
Metal Halide	—	3



NOTE: Electronic and magnetic low-voltage transformers may create an audible noise when connected to a dimmer.

5. Wire to Controls.

Control wiring will vary depending on the type of control being used. Refer to the appropriate page for the necessary control wiring:

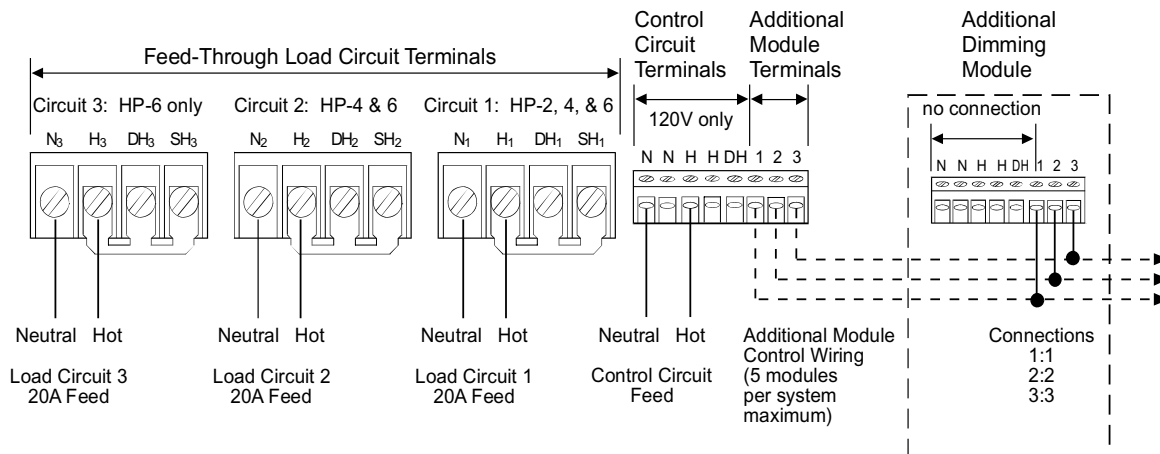
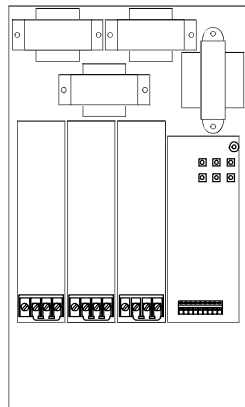
Control Type	Control Wiring Diagram	Page
Single-pole dimmer*	1	8
Mechanical 3-way dimmer*	2-4	8
Maestro	5-7	9
Vareo	8-10	10
Nova T* Infrared	11	11
Nova T* Omnislide	12	11
GRAFIK Eye 3000	13	11
Class 2 Control (raise/lower)	14	12-13

* Rotary, Glyder, Ariadni, Skylark, Diva, Luméa, Nova T* Slide-to-Off, Nova T* Preset, Nova Slide-to-Off, Nova Preset, Centurion, and Athena.

6. Start-up system.

Go to Start-up Procedure on page 5 to put the dimming system in operation.

Power Feed Wiring Diagram



Start-up Procedure

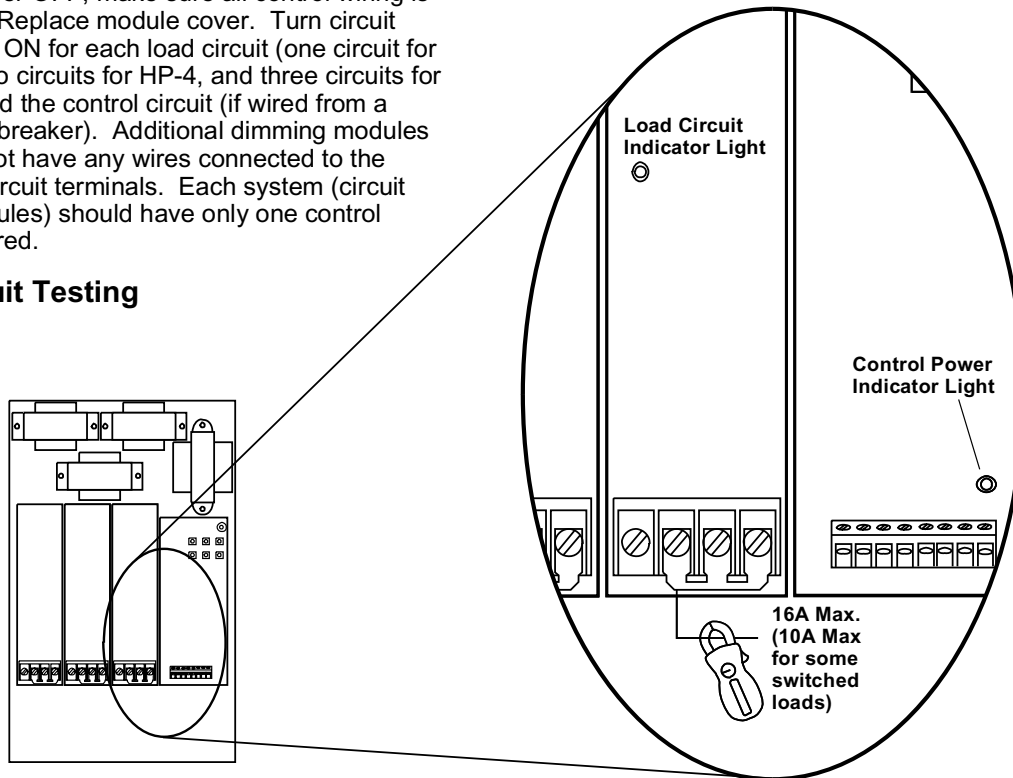
Check Load Circuits.

1. Make sure the factory-installed bypass jumper(s) are still in place between the H (Hot), SH (Switched Hot), and DH (Dimmed Hot) terminals of each load circuit. Replace module cover. Turn circuit breakers on for each load circuit (1 circuit for HP-2, 2 circuits for HP-4, and 3 circuits for HP-6). Each Load Circuit Indicator Light inside the dimming module should light to full intensity.
2. Check the input current to the Hot terminal of each load circuit with a "clamp-on" type current probe. The current should be no more than 16A for dimmed loads or 10A for switched loads (16A for non-capacitive fluorescent). See diagram.
3. Turn loads ON for at least 10 minutes. If any circuit breaker trips, turn power OFF, then locate and correct miswire or overload.
4. Repeat the above steps until the circuit breaker does not trip. If the Hi-POWER module is controlled by a line voltage dimmer, proceed to Check Control Circuit section (next column). If the module is controlled by Class 2 controls, proceed to "Remove Bypass Jumpers" (next column).

Check Control Circuit (line-voltage dimmer only).

1. With power OFF, make sure all control wiring is correct. Replace module cover. Turn circuit breakers ON for each load circuit (one circuit for HP-2, two circuits for HP-4, and three circuits for HP-6) and the control circuit (if wired from a different breaker). Additional dimming modules should not have any wires connected to the control circuit terminals. Each system (circuit and modules) should have only one control circuit wired.

Load Circuit Testing



2. Adjust slider/knob/rocker on control, then switch control on and off. The lighting should remain on full, but the control power indicator light should dim up and down and/or switch on or off as the control is adjusted. Make sure the Load Circuit Indicator Lights are not dimming or switching on or off with the control. If they are, control and load wiring are incorrect. Correct wiring errors and repeat Start-up Procedure.

Remove Bypass Jumpers.

1. Turn power OFF. Make sure to remove power from all circuits providing power to the Hi-POWER dimming module.
2. Remove the load circuit bypass jumper(s) from all modules. Do not remove factory-installed jumper from Class 2 terminal block when using Lutron NTRCS-1, NRCS-1, and RCS-1 controls. See wiring diagram on pages 12-13 for details.
3. Turn power ON to all circuits. Test the control(s) to make sure they adjust the light level. The system should now function properly. If not, refer to the Troubleshooting section on page 16.
4. Proceed to Calibration on page 6.

Calibration

High-End and Low-End Trim Adjustment

The high-end and low-end light levels are adjustable to get the best dimming range for the particular application and load type.

- **For Lutron Hi-lume or ECO-10 fluorescent loads:** This unit is factory-calibrated and does not require low-end light adjustment. If lamps flicker or drop out at minimum dimming level there may be an installation error. Continued use of the system in this mode will cause premature lamp failure. If this is occurring, call the **Lutron Hotline** at 1-800-523-9466. For proper dimming performance fluorescent lamps must be operated at full intensity for 100 hours.
- **For incandescent, magnetic low-voltage, and electronic low-voltage loads:** Some adjustment will be necessary to achieve full-range dimming.
- **For neon/cold-cathode loads:** Depending on the installation, you may be able to achieve a lower dimming range. The low-end should be adjusted so that no flickering occurs or the transformer may fail prematurely.

Control Adjustment: Line-voltage incandescent dimmer

CAUTION: For all adjustments, use the supplied non-conductive probe. Failure to do so can result in personal injury or damage to equipment. Do not use screwdriver or finger.

High-End Trim

1. Adjust the wall control to its full intensity position.
2. Using the non-conductive probe, push the small buttons labeled “RAISE” or “LOWER” (see diagram at right) to make the high-end light level brighter or dimmer.
3. Repeat for each load circuit as necessary.

Low-End Trim

1. Adjust the wall control to its minimum position.
2. Using the non-conductive probe, push the small buttons labeled “RAISE” or “LOWER” (see diagram at right) to make the low-end light level brighter or dimmer.
3. Repeat for each load circuit as necessary.

Control Adjustment: Class 2 Raise/Lower

CAUTION: For all adjustments, use the supplied non-conductive probe. Failure to do so can result in personal injury or damage to equipment. Do not use screwdriver or finger.

High-End Trim

1. Using the non-conductive probe, turn the Fade Rate Adjust (see figure below) fully counterclockwise.
2. Activate the raise function on the control for 10 seconds to bring the lights to their maximum intensity.
3. Using the non-conductive probe, push the small buttons labeled “RAISE” or “LOWER” (see figure below) to make the high end light level brighter or dimmer.
4. Repeat for each load circuit as necessary.

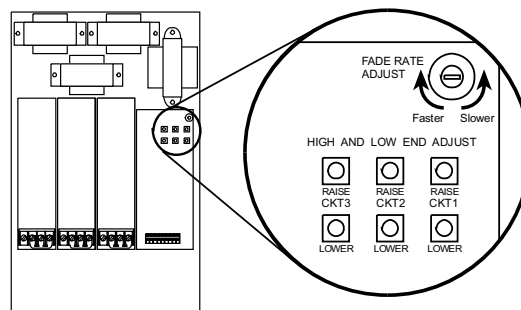
Low-End Trim

1. Using the non-conductive probe, turn the Fade Rate Adjust (see figure below) fully counterclockwise.
2. Activate the lower function on the control for 10 seconds to bring the lights to their minimum intensity.
3. Using the non-conductive probe, push the small buttons labeled “RAISE” or “LOWER” to make the low-end light level brighter or dimmer.
4. Repeat for each load circuit as necessary.

Fade Rate Adjustment (Class 2 controls only)

The fade rate is the time it takes for the lights to go from the lowest to highest intensity (or vice-versa) when activating a Class 2 wired raise/lower control. If you are using Class 2 wired NTRCS-1, NRCS-1, or RCS-1 multi-location wall controls, the Hi-POWER module is factory preset to the fastest fade rate. The fade rate can be changed in increments of approximately 2, 4, 8, 15, 30, and 60 seconds. Use the non-conductive probe to turn the Fade Rate Adjust (see figure below) clockwise to fade faster or counterclockwise to fade slower.

Intensity and Fade Adjust Location



Load Wiring

Diagram 1

Dimmed loads:

Incandescent, Magnetic Low-Voltage, Electronic Low-Voltage, Neon/Cold-Cathode

Wiring notes:

1. For Neon/Cold-Cathode loads, refer to pages 14 and 15 for proper installation.
2. Terminal blocks are rated for 2 #12 AWG max.
3. Load wiring must be 120VAC.
4. The diagrams represent a single load circuit model (HP-2). For two circuit (HP-4) or three circuit (HP-6) applications, repeat the same wiring method for each circuit. A different load type may be used on each circuit if desired. However, do not mix load types on the same load circuit.

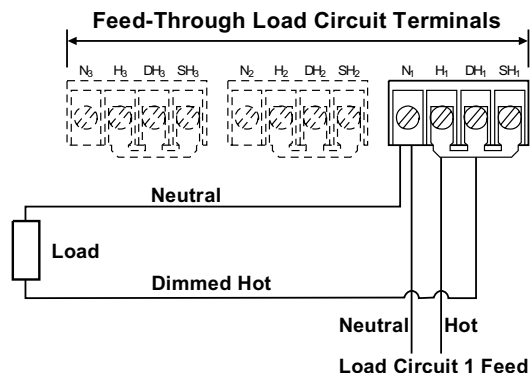


Diagram 2

Dimmed Loads:

Hi-lume FDB and Eco-10 Fluorescent Dimming Ballasts

Wiring notes:

1. Use only Lutron Hi-lume or Eco-10 Fluorescent Dimming Ballasts.
2. Terminal blocks are rated for 2 #12 AWG max.
3. Load wiring may be 120VAC or 277VAC. Control circuit must be 120VAC.
4. The diagrams represent a single load circuit model (HP-2). For two circuit (HP-4) or three circuit (HP-6) applications, repeat the same wiring method for each circuit. A different load type may be used on each circuit if desired. However, do not mix load types on the same load circuit.

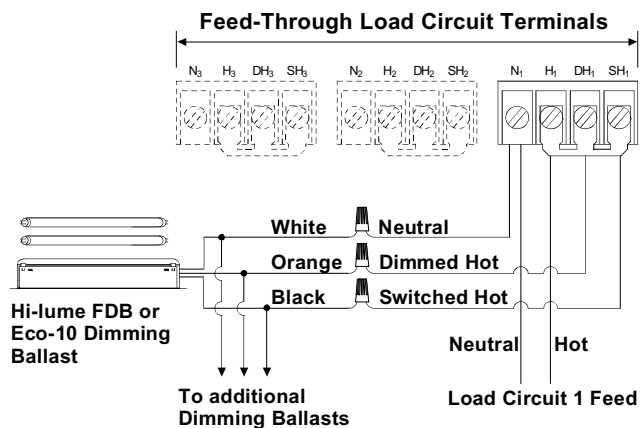


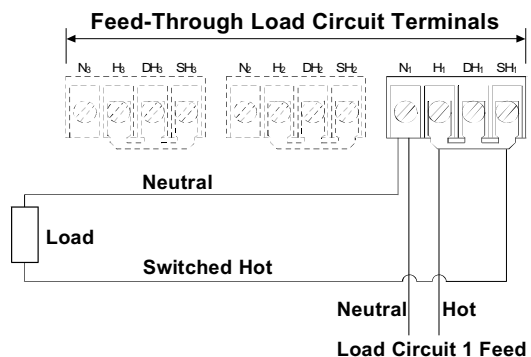
Diagram 3

Switched loads:

Incandescent, Magnetic Low-Voltage, Electronic Low-Voltage, Neon/Cold-Cathode, Non-Capacitive Fluorescent, and Metal Halide

Wiring notes:

1. Terminal blocks are rated for 2 #12 AWG max.
2. Load wiring may be 120VAC or 277VAC. Control circuit must be 120VAC.
3. The diagram represented a single load circuit model (HP-2). For two circuit (HP-4) or three circuit (HP-6) applications, repeat the same wiring method for each circuit. A different load type may be used on each circuit if desired. However, do not mix load types on the same load circuit.



Control Wiring

Diagram 1: Single-pole Dimmer

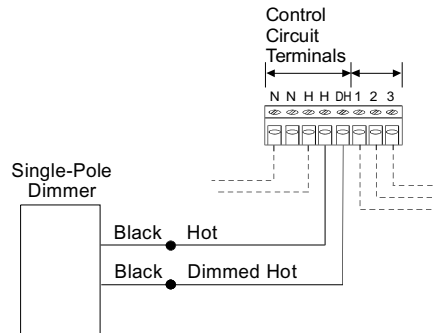


Diagram 2: Mechanical 3-way Dimmer (Single location)

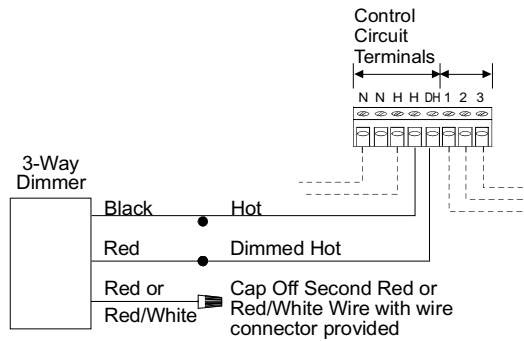


Diagram 3: Mechanical 3-way Dimmer (Two location)

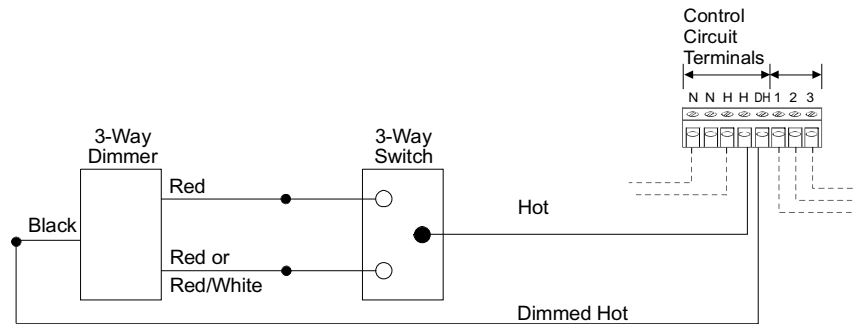
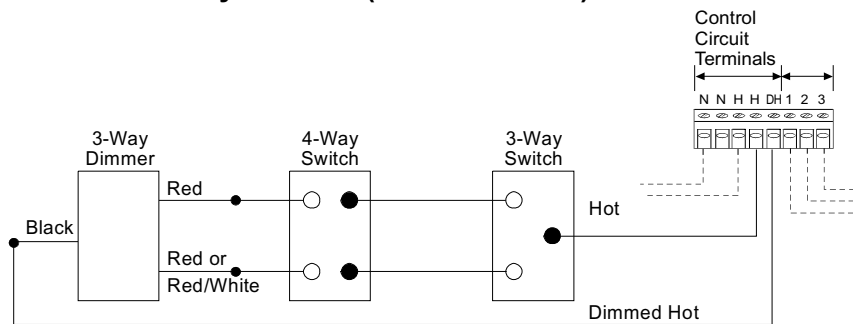


Diagram 4: Mechanical 3-way Dimmer (Three location)



Control Wiring

Diagram 5: Maestro Incandescent Dimmer (Single location)

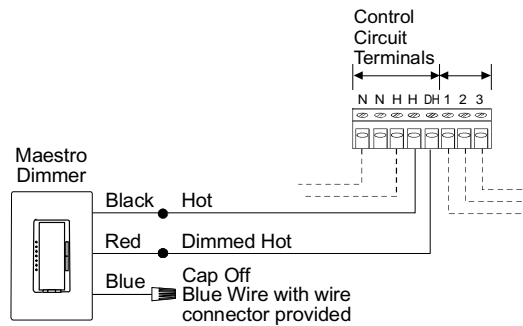


Diagram 6: Maestro Incandescent Dimmer (Two location)

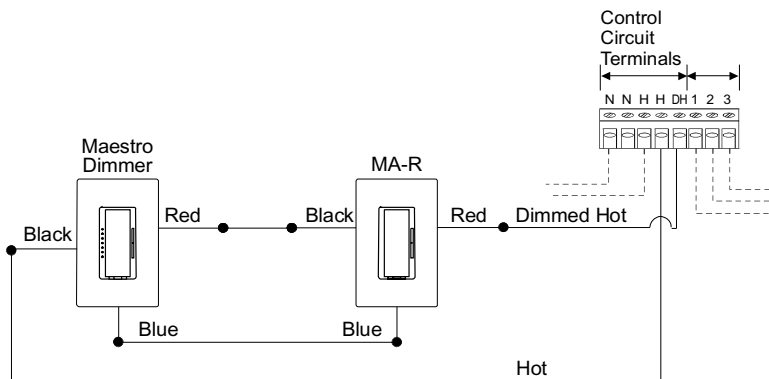
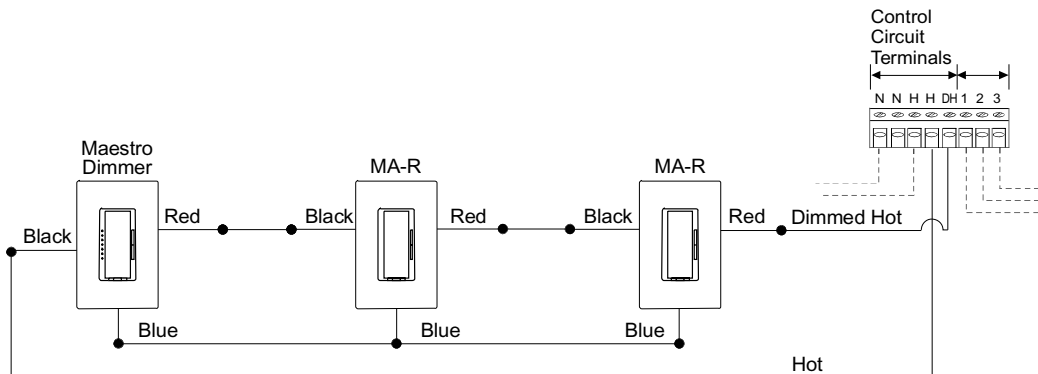


Diagram 7: Maestro Incandescent Dimmer (Three location)



Control Wiring

Diagram 8: Vareo Dimmer (Single location)

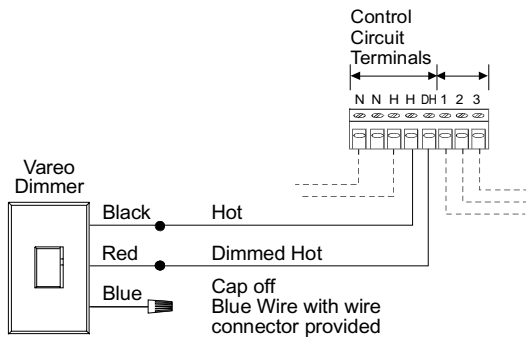


Diagram 9: Vareo Dimmer (Two location)

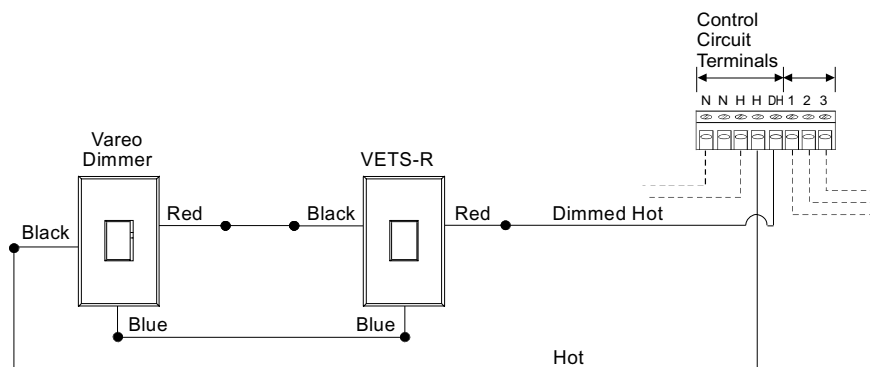
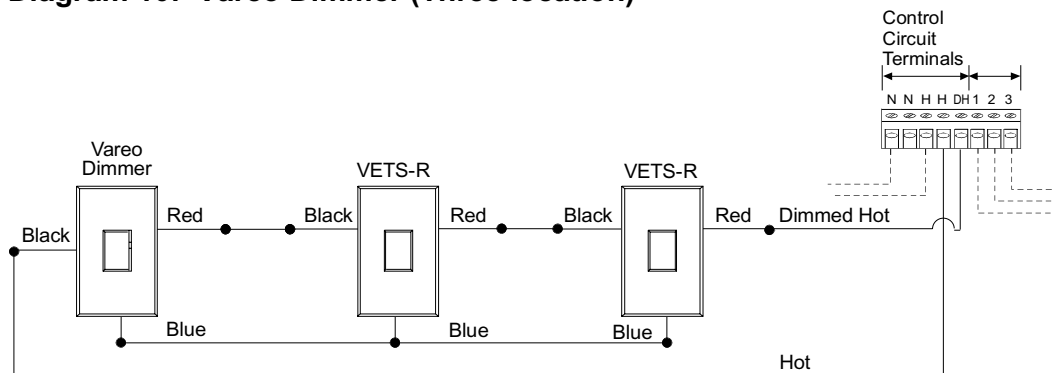


Diagram 10: Vareo Dimmer (Three location)



Control Wiring

Diagram 11: Nova T* Infrared Dimmer

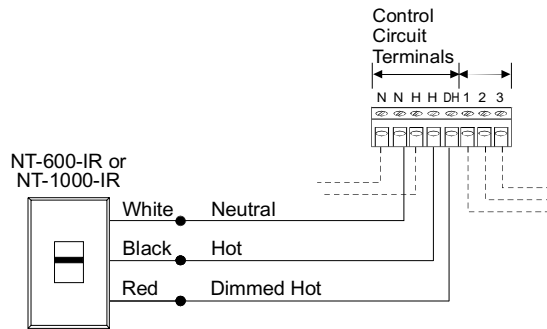


Diagram 12: Nova T* Omnislide Dimmers (Two location)

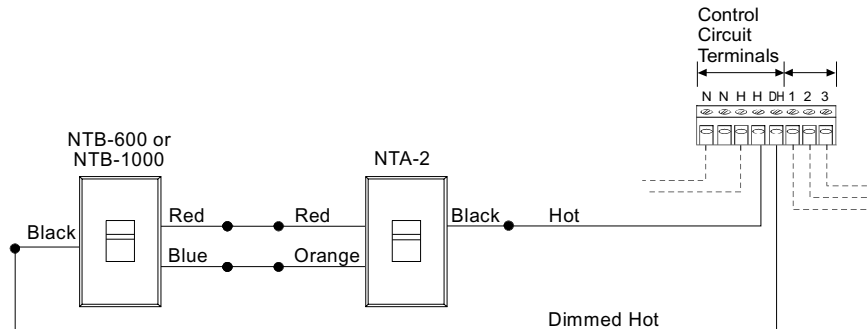
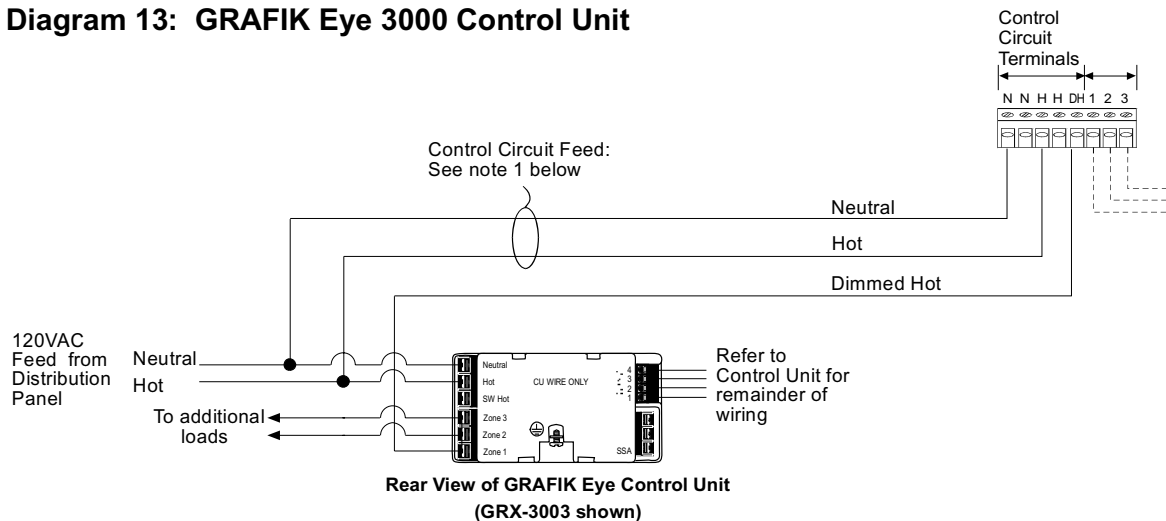


Diagram 13: GRAFIK Eye 3000 Control Unit



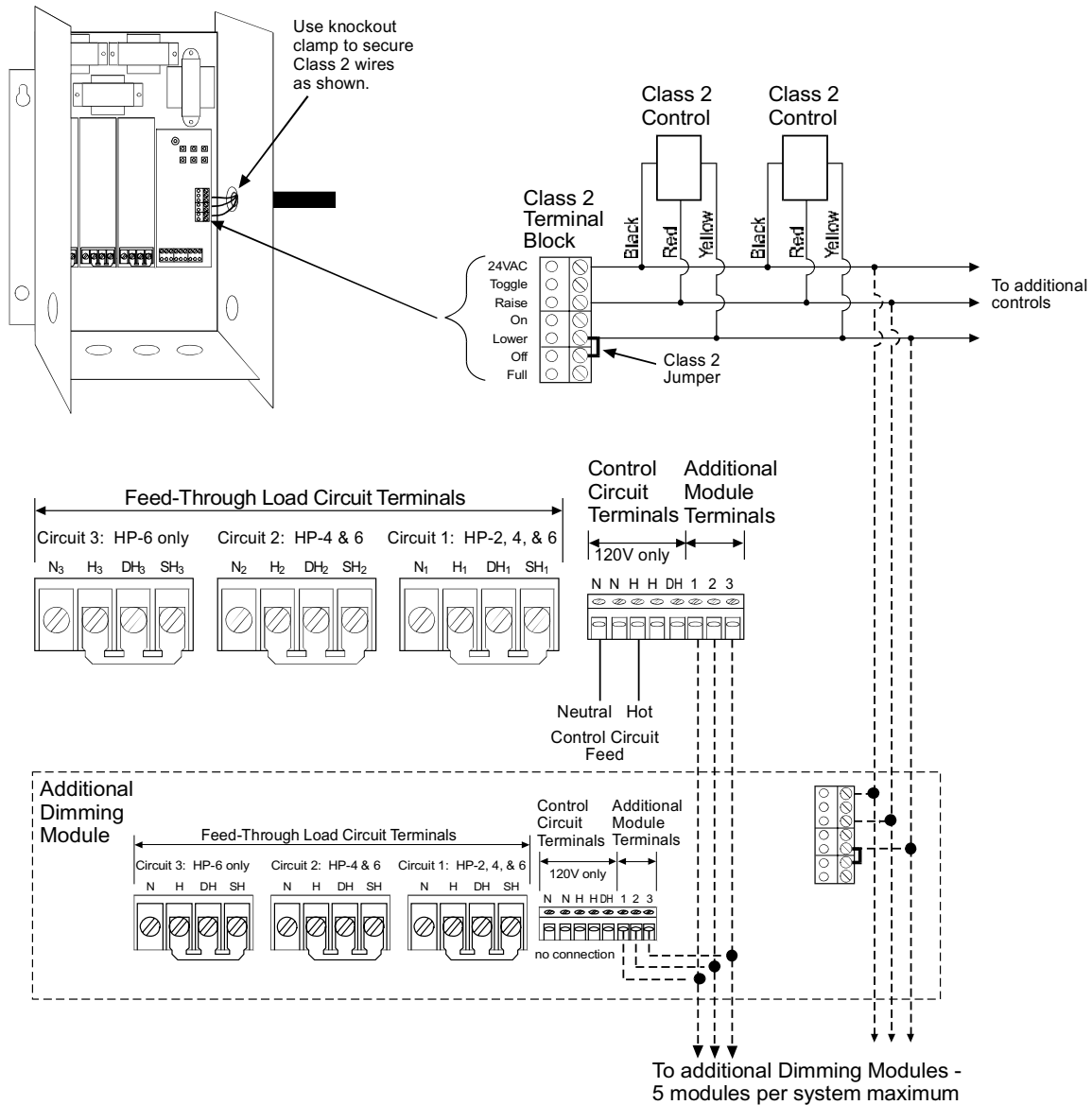
GRAFIK Eye 3000 Wiring Notes:

1. Control Circuit feed is shown coming from the GRAFIK Eye Control Unit's feed. The load for each Hi-POWER module connected to the circuit is 20VA. If the circuit does not have sufficient capacity to support the load of the module(s), the Control Circuit feed can be supplied from any circuit with sufficient capacity as long as it is on the **same phase** as the GRAFIK Eye Control Unit.
2. Load type should be set as incandescent on the GRAFIK Eye Control Unit.
3. Dimmed Hot is shown as Zone 1 in the diagram, but can be provided from any zone on the Control Unit.
4. Refer to GRAFIK Eye Installation Sheet for remainder of Control Unit wiring.

Control Wiring

Diagram 14: Class 2 Controls: NTRCS-1, NRCS-1, RCS-1

These controls provide single-location or multi-location raise/lower dimming with "off" at low-end. For other Class 2 control options refer to page 13.



Class 2 Wiring Notes:

1. Class 2 terminal block is removable. It is packaged loose with the dimming module.
2. Position terminal block so wires exit as shown through the knockout indicated. Class 2 wiring must exit through this knockout.
3. To avoid contact between Class 2 wires and branch circuit wiring below, maintain 1-1/2" or less of Class 2 wiring within the enclosure. Do not leave any extra wire within the enclosure. Secure wiring using a knockout clamp.
4. **DO NOT** remove Class 2 factory bypass jumper between the Lower and Off terminals when using NTRCS-1, NRCS-1, or RCS-1 controls.

Class 2 Control Options

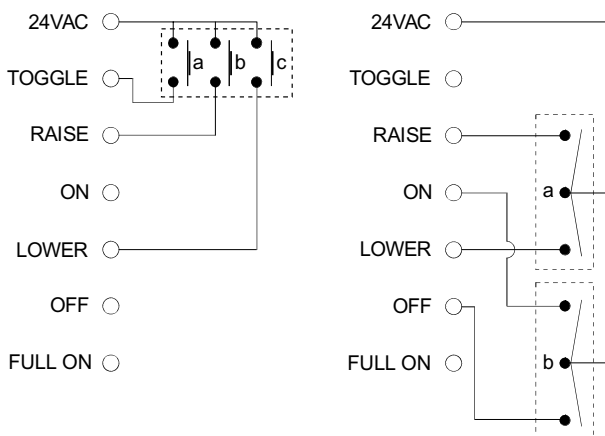
Definitions of Control Options

RAISE	Increases the light level while the switch is activated.
LOWER	Decreases light level while the switch is activated. Does not turn lights off.
LOWER/OFF	Decreases light level while the switch is activated. Turns lights off after the low-end is reached.
ON	Fades lights on to preset level.
OFF	Fades lights off.
TOGGLE	Fades lights on to preset level if they are off, fades lights off if they are on.
FULL ON	Turns lights on instantly to full when the switch is activated. No other control options are available while this switch is activated. Must be a maintained switch closure.
FADE RATE	Rate at which the light level changes while you activate a control option (for example, the rate at which the light level changes as you hold the RAISE button and the rate at which the lights fade on or off when you press the on or off). For all of the above options except "full on", the FADE RATE is adjustable inside the dimming module. See page 6 for location and adjustment instructions.

How to Access Control Options:

The desired Control Option is accessed with a 24VAC switch closure. Switch closures must be rated for switching 5mA at 24VAC RMS. See the chart below for the specific terminations of the switch closure on the Class 2 terminal block and type of switch closure permissible. See page 12 for the Class 2 terminal block location and terminal designations.

Typical Class 2 Control Wiring Examples:



Example 1: Three SPST momentary pushbuttons. Switch "a" controls the TOGGLE on/off function. Switch "b" controls the RAISE function. Switch "c" controls the LOWER function.

Example 2: Two momentary, center off SPDT switches. Switch "a" performs the RAISE and LOWER functions. Switch "b" performs the ON/OFF functions.

Control Option	Switch Closure Between:	Switch Closure Type
RAISE	RAISE and 24VAC terminals	Either momentary or maintained
LOWER	LOWER and 24VAC terminals Remove factory installed jumper between LOWER & OFF terminals	Either momentary or maintained
LOWER/OFF	LOWER and 24VAC terminals DO NOT remove factory installed jumper between LOWER & OFF terminals	Either momentary or maintained
ON	24VAC and ON	Either momentary or maintained
OFF	24VAC and OFF	Either momentary or maintained
TOGGLE	24VAC and TOGGLE	Must be momentary
FULL ON	24VAC and FULL ON	Must be maintained

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 Derated 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 be more successful than 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 in the Derated Luminous Tube Length Chart for Dimming Applications. Other combinations will flicker and perform poorly. Note that there are few successful combinations for red neon tubes smaller than 11 mm.

Transformers

1. Normal power factor transformers must be used; electronic transformers cannot be dimmed.
2. When choosing transformer secondary currents, 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. Do not use standard luminous tube length charts to size transformers in dimming applications. 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, call 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. High voltage (GTO-15) cable connecting a transformer output terminal to a cold-cathode tube must not be longer than twenty feet.
2. All GTO-15 cables should be spaced a minimum of four inches from any other GTO-15 cable.
3. It is recommended that only one GTO-15 cable be run per conduit.
4. Optimal dimming performance is achieved when GTO-15 cable is enclosed in plastic conduit or run without conduit. If codes require metal conduit, aluminum is preferred and lengths must be kept to less than six feet per transformer.
5. Braided or shielded GTO-15 cable must not be used for dimming applications.

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

Transformer Ratings			Approximate number of feet of tubing																					
Secondary Voltage (V)	Secondary Short Circuit Current (mA)	Input Volt-Amperes with Secondary Short Circuit (VA)	Neon Fill (clear or fluorescent red)									Argon /Mercury Fill (colors other than neon red)												
			Tube Size (millimeters)									Tube Size (millimeters)												
			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
12000	20	270					X	X	X	X	X	X	X					X	X	X	X	X	X	X
	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
9000	20	225					X	X	X	X	X	X	X					X	X	X	X	X	X	X
	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
7500	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
	120	900	44	35	29	24	22	20	20	17	16	14	X	56	44	36	31	28	26	25	22	20	18	X
6000	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
5000	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
4000	20	130					14	13	12	10	X	X	X					18	16	14	14	12	10	X
	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
3000	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
	60	240	20	17	14	12	10	9	8	8	7	6	X	26	22	18	15	14	13	12	11	9	8	X
2000	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
	60	180	13	10	9	8	8	7	7	6	5	5	X	18	14	13	11	10	9	8	7	6	6	X
2000	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
	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:

- This table has been modified for dimming applications. When calculating total length of tube, add approximately 1 foot for each section of tubing (each pair of electrodes).
- **Do not** use this table for non-dimming installations.
- X denotes a combination which cannot be successfully dimmed.
- Tube length is shown in feet. To convert to meters: 1 foot = 0.305 meters.

WARNING: Potentially hazardous high voltage can be present. Testing, handling, and servicing should be performed only by a qualified electrician.

Troubleshooting Guide

Symptom	Causes	Solution
Lights do not come on.	Load input feed power not present	Check load power indicator light(s) and verify that all input breakers are on and wiring is connected properly.
	Control input feed power is not present.	Check control power indicator light and verify that the control wiring is connected properly.
Lights cannot be dimmed.	Bypass jumpers are not removed.	Remove bypass jumpers on load circuit terminal blocks.
	Dimmed load is miswired to switched hot output load terminal.	Compare load wiring to wiring diagrams on page 7.
	Low-end trim is set too high.	Refer to page 6 and adjust low-end trim.
	Control dimmer is not operating properly.	Check that Control Power Indicator Light dims when control is adjusted; check wiring.
	Shorted triac - usually caused by a load short or overload.	Try to adjust high-end or low-end trim. If lights remain at full, triac is shorted. Contact Lutron for a Replacement Triac Kit . Verify proper load size and load wiring before replacing triac.
Portion of slider travel does not affect light level.	High- and/or low-end trim need adjustment.	Refer to page 6 and adjust high- and/or low-end trim settings.
Hi-lume FDB or Eco-10 lamps flicker at low-end.	Lamps not operated at full intensity before dimming.	Operate lamps at full intensity for 100 hours prior to dimming.
	Hi-lume FDB or ECO 10 ballasts improperly wired to Dimming Module.	Refer to wiring diagram on page 7 and correct wiring.
Neon lamps flicker at low-end.	Low-end trim is set too low.	Refer to page 6 and adjust low-end trim.
	There is a problem with the neon installation.	Refer to pages 14 and 15 for approved neon dimming installation specifications.
Switched load does not turn off.	Bypass jumper not removed.	Remove bypass jumpers on load circuit terminal blocks.
Lights do not dim low enough.	Low-end trim needs adjustment.	Refer to page 6 and adjust low-end trim.
Lights do not brighten to full or remain at low-end.	High-end trim is set too low.	Refer to page 6 and adjust high-end trim.
Lights on different dimming modules dim at different rates when using Class 2 raise/ lower controls.	Fade rate adjustment set differently on each module.	Refer to page 6 and adjust fade rates so that they are the same.
Circuit breaker trips on power up.	Additional dimming module slaves wired incorrectly.	Compare additional module wiring to diagrams on page 4.

Worldwide Technical and Sales Assistance

If you need assistance, call the toll-free **Lutron Technical Assistance Hotline:**
 (800) 523-9466 (U.S.A., Canada and the Caribbean)
 Other countries call (610) 282-3800
 FAX (610) 282-3090

Warranty

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

This warranty is in lieu of all other warranties, express or implied, 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 wiring or installation.

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 the exclusion or limitation of incidental or consequential damages or limitations on how long an implied warranty may last, so the above limitations and exclusions may not apply to you.

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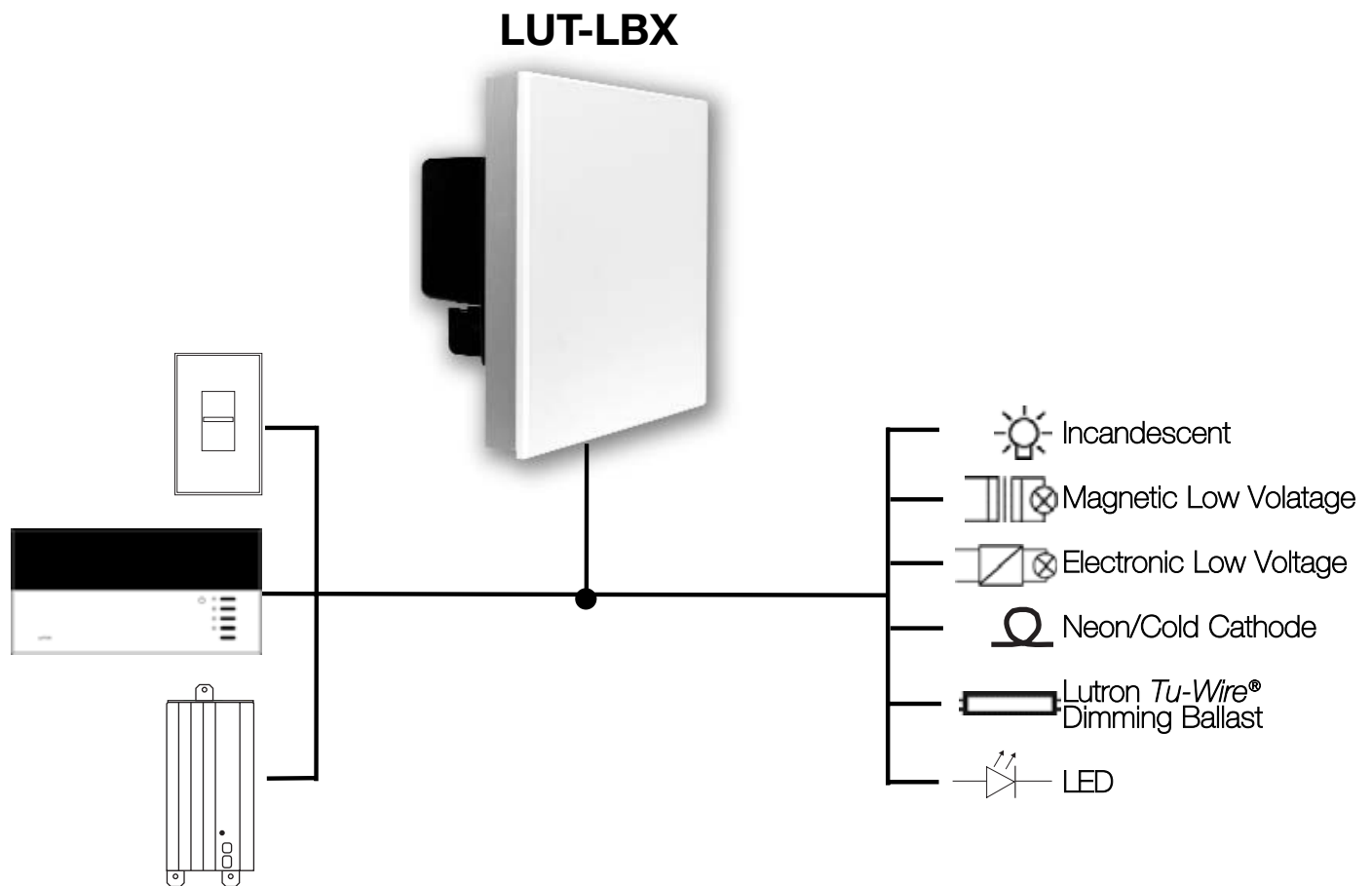
Lutron Electronics Co., Inc.
 7200 Suter Road
 Coopersburg, PA 18036-1299 USA
 Made and Printed in U.S.A. 6/96 P/N 030-452 Rev. B

LUT-LBX Synthetic Minimum Load

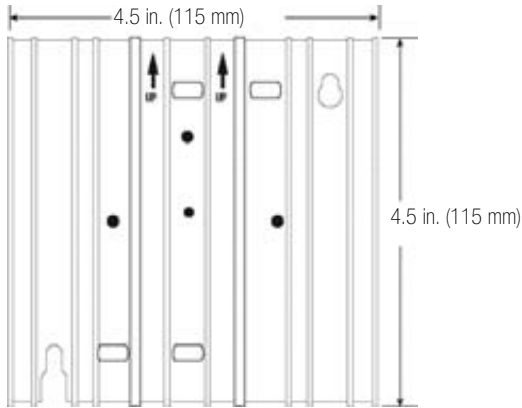
For use with Reverse and Forward Phase Dimmers

Installation Instructions

Please Read



- This device provides capability for certain Lutron dimmers to control low-wattage loads from 0 watts up to the dimmer's minimum rating.
- It presents a simulated load to the dimmer to meet the minimum load requirements even when the actual load is smaller.

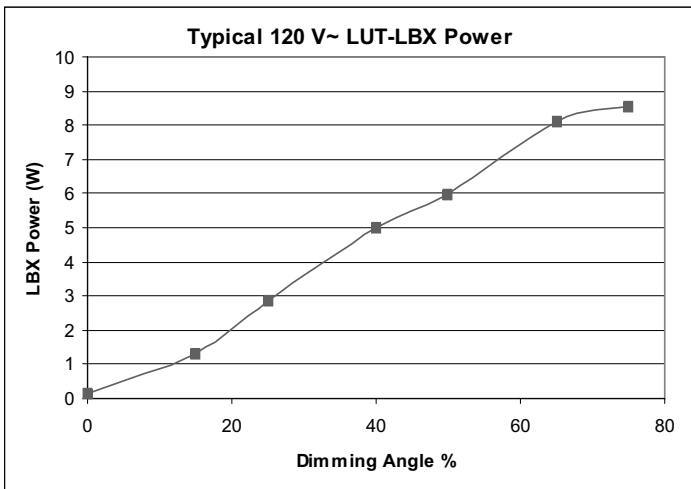


Interface shown with faceplate removed

This “load-side” equipment installs on the zone wiring in parallel with the lighting load. It provides an equivalent minimum load for Lutron dimmers when the actual load is too low for proper control unit operation.

Input:

- 120 V \sim 100 mA 50/60 Hz (LUT-LBX)
- Power dissipation less than 10 watts

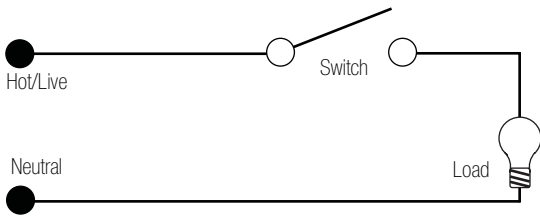


Danger! Always turn OFF the circuit breakers/MCB or remove the main fuses from the power line before doing any work. Failure to do so can result in serious personal injury. **Disconnect all power sources before servicing unit.**

1. This Interface must be installed by a qualified electrician in accordance with all applicable regulations.
2. Improper wiring can result in personal injury, damage to the Interface, or damage to other equipment.
3. One LUT-LBX per circuit below minimum load.
4. The LUT-LBX must be mounted with arrows on yoke facing upward to ensure adequate cooling.
5. **CAUTION!** Dimmed magnetic low-voltage transformers: To avoid excessively high current flow that can cause transformer overheating and failure, observe the following:
 - (a) Do not operate the MLV dimmers with all of the lamps removed or with any lamps inoperative.
 - (b) Replace any burned out lamps immediately.
 - (c) Use only transformers that incorporate thermal protection or fused primary windings.
6. The LUT-LBX does not change the approved load types of the dimmer. Use the required dimmer for the given load type.
7. For LED lighting dimming operation, refer to Application Note #138.

Test load for short circuits

- Turn power Off.
- Connect standard switch between Hot/Live lead and the load wire to test circuit.
- Turn power On and check for short or open circuits.

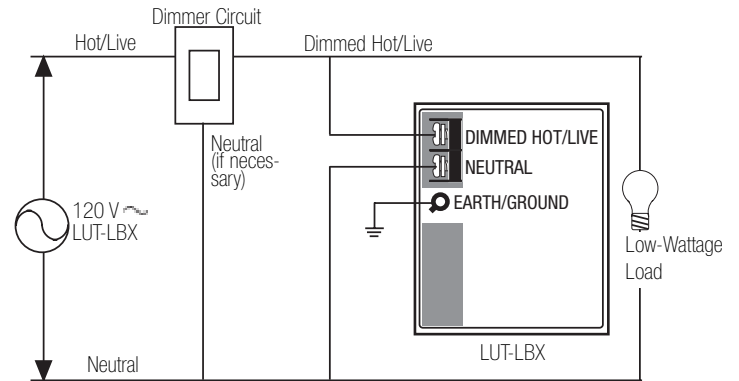


Installation Instructions

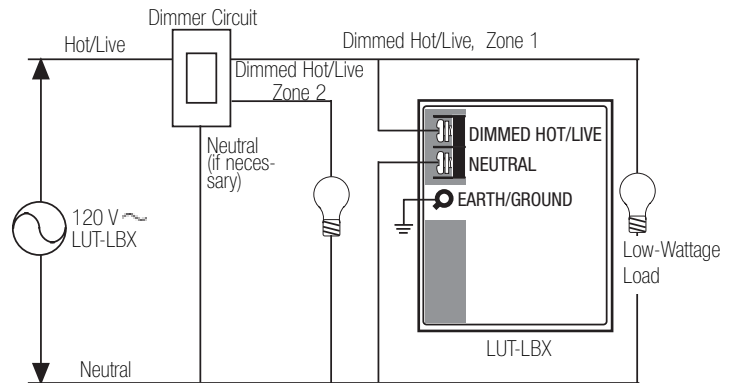
1. Turn power Off to the Control Unit.
2. Mount standard U.S. 2-gang wallbox (available from Lutron, P/N 241-496); 3 1/2 in. (89 mm) deep is strongly recommended, 2 3/4 in. (68 mm) minimum. Allow at least 4 1/2 in. (110 mm) clearance above/below Interfaces to ensure proper heat dissipation.
3. Strip 1/2 in. (12 mm) insulation from all wires in wallbox and wire as shown. All connections are made using #12 AWG to #16 AWG (2.5 - 1 mm²) wire. Power terminals can accept up to two #12 AWG (2.5 mm²) wires. The recommended installation torque is 9.0 in.●lbs. (1.0 N●m) for line voltage connections.



Single-Zone Wiring



Dual-Zone Wiring

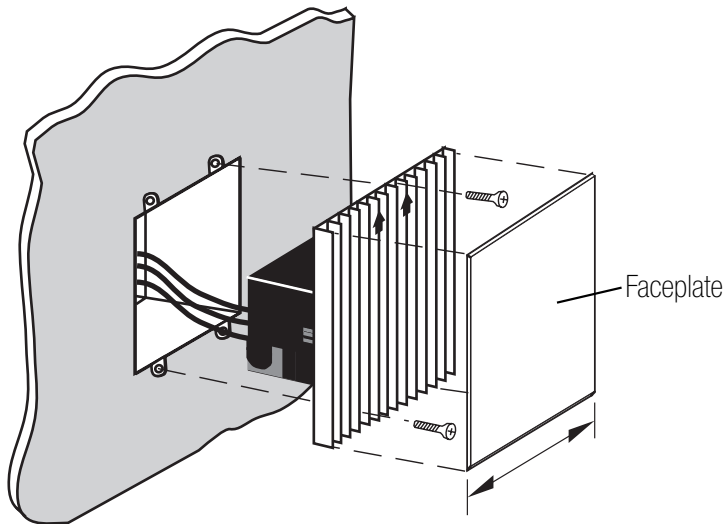


* Wallbox may be recess mounted or surface mounted. If mounting Interface in a panel, please refer to Panel Mounting section for important information.

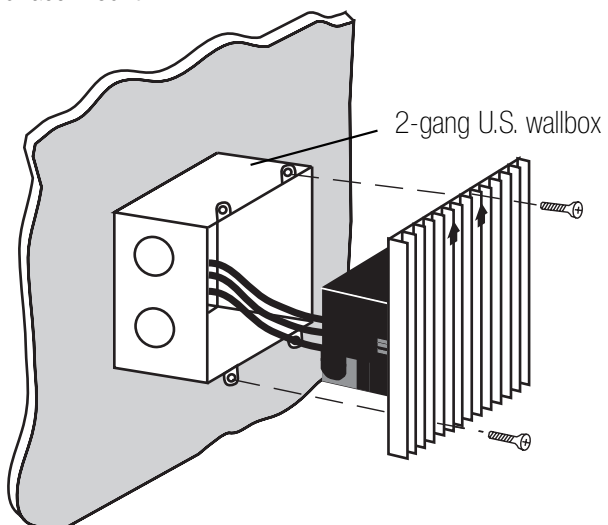
Mounting: Interface must be mounted *vertically!*

1. Confirm all connections and mount the Interface using the screws provided.
2. Restore power to the system.

Recess Mount



Surface Mount

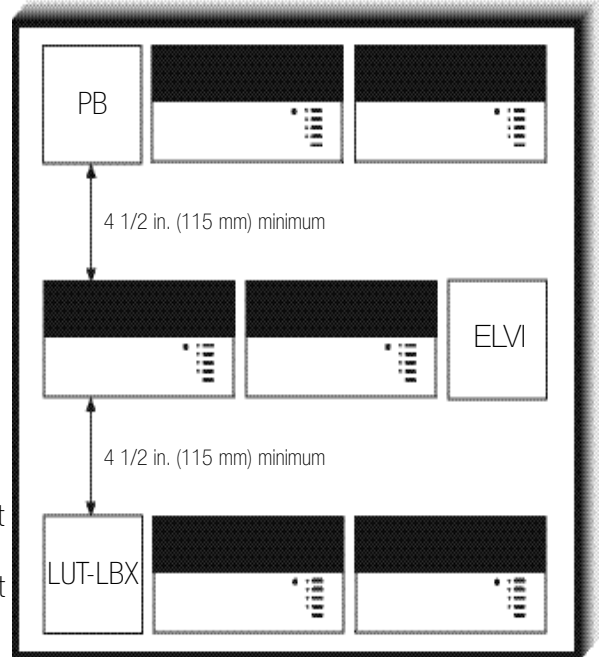


Panel Mounting

- 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 Eye* Control Units and Interfaces.
- If mounting multiple Control Units or Interfaces in an enclosure:
 1. Ambient temperature within an enclosure must remain between 32 - 104 °F (0 - 40 °C).
 2. If not mounting in a metal enclosure, all units **must** be mounted in a wallbox.
- To improve heat dissipation of the Interface, remove the faceplate from the unit.



GRAFIK Eye Control Units and Interface Units dissipate heat when operating. Obstructing these units can cause malfunction to both the Control Unit and the Interface if ambient temperature does not remain between 32 - 104 °F (0 - 40 °C).



Troubleshooting Guide

Symptom	Causes	Solution
Lights do not come on.	Power is off	Restore power to the control unit.
	Miswire	Confirm wiring per wiring diagrams.
	Bulb(s)/lamp(s) burned out	Replace bulb(s)/lamp(s).
	Control Unit	Refer to troubleshooting section of Control Unit Installation Guide.
Lights turn on/off unexpectedly.	Load Type	Confirm that the load type being switched/dimmed is compatible with the control unit or dimmer being used. Line/Mains voltage phase control dimming only.
	Miswire	Confirm wiring per wiring diagrams.
	Control Unit	Refer to the troubleshooting section of Control Unit Installation Guide.
	Damaged/disconnected LUT-LBX	Lighting load does not meet minimum requirements of dimmer; check for damage or disconnection.

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Macau: 0800.401
Singapore: 800-120-4491
Taiwan: 00-801-137-737
Thailand: 001-800-120-665853
Other Areas: +65-6220-4666

Lutron Electronics Co., Inc. One Year Limited Warranty

For a period of one year from the date of purchase, and subject to the exclusions and restrictions described below, Lutron warrants each new unit to be free from manufacturing defects. Lutron will, at its option, either repair the defective unit or issue a credit equal to the purchase price of the defective unit to the Customer against the purchase price of comparable replacement part purchased from Lutron. Replacements for the unit provided by Lutron or, at its sole discretion, an approved vendor may be new, used, repaired, reconditioned, and/or made by a different manufacturer.

If the unit is commissioned by Lutron or a Lutron approved third party as part of a Lutron commissioned lighting control system, the term of this warranty will be extended, and any credits against the cost of replacement parts will be prorated, in accordance with the warranty issued with the commissioned system, except that the term of the unit's warranty term will be measured from the date of its commissioning.

EXCLUSIONS AND RESTRICTIONS

This Warranty does not cover, and Lutron and its suppliers are not responsible for:

1. Damage, malfunction or inoperability diagnosed by Lutron or a Lutron approved third party as caused by normal wear and tear, abuse, misuse, incorrect installation, neglect, accident, interference or environmental factors, such as (a) use of incorrect line voltages, fuses or circuit breakers; (b) failure to install, maintain and operate the unit pursuant to the operating instructions provided by Lutron and the applicable provisions of the National Electrical Code and of the Safety Standards of Underwriter's Laboratories; (c) use of incompatible devices or accessories; (d) improper or insufficient ventilation; (e) unauthorized repairs or adjustments; (f) vandalism; or (g) an act of God, such as fire, lightning, flooding, tornado, earthquake, hurricane or other problems beyond Lutron's control.
 2. On-site labor costs to diagnose issues with, and to remove, repair, replace, adjust, reinstall and/or reprogram the unit or any of its components.
 3. Equipment and parts external to the unit, including those sold or supplied by Lutron (which may be covered by a separate warranty).
 4. The cost of repairing or replacing other property that is damaged when the unit does not work properly, even if the damage was caused by the unit.
- EXCEPT AS EXPRESSLY PROVIDED IN THIS WARRANTY, THERE ARE NO EXPRESS OR IMPLIED WARRANTIES OF ANY TYPE, INCLUDING ANY IMPLIED WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE OR MERCHANTABILITY. LUTRON DOES NOT WARRANT THAT THE UNIT WILL OPERATE WITHOUT INTERRUPTION OR BE ERROR FREE.

NO LUTRON AGENT, EMPLOYEE OR REPRESENTATIVE HAS ANY AUTHORITY TO BIND LUTRON TO ANY AFFIRMATION, REPRESENTATION OR WARRANTY CONCERNING THE UNIT. UNLESS AN AFFIRMATION, REPRESENTATION OR WARRANTY MADE BY AN AGENT, EMPLOYEE OR REPRESENTATIVE IS SPECIFICALLY INCLUDED HEREIN, OR IN STANDARD PRINTED MATERIALS PROVIDED BY LUTRON, IT DOES NOT FORM A PART OF THE BASIS OF ANY BARGAIN BETWEEN LUTRON AND CUSTOMER AND WILL NOT IN ANY WAY BE ENFORCEABLE BY CUSTOMER.

IN NO EVENT WILL LUTRON OR ANY OTHER PARTY BE LIABLE FOR EXEMPLARY, CONSEQUENTIAL, INCIDENTAL OR SPECIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, DAMAGES FOR LOSS OF PROFITS, CONFIDENTIAL OR OTHER INFORMATION, OR PRIVACY; BUSINESS INTERRUPTION; PERSONAL INJURY; FAILURE TO MEET ANY DUTY, INCLUDING OF GOOD FAITH OR OF REASONABLE CARE; NEGLIGENCE, OR ANY OTHER PECUNIARY OR OTHER LOSS WHATSOEVER), NOR FOR ANY REPAIR WORK UNDERTAKEN WITHOUT LUTRON'S WRITTEN CONSENT ARISING OUT OF OR IN ANY WAY RELATED TO THE INSTALLATION, DEINSTALLATION, USE OF OR INABILITY TO USE THE UNIT OR OTHERWISE UNDER OR IN CONNECTION WITH ANY PROVISION OF THIS WARRANTY, OR ANY AGREEMENT INCORPORATING THIS WARRANTY, EVEN IN THE EVENT OF THE FAULT, TORT (INCLUDING NEGLIGENCE), STRICT LIABILITY, BREACH OF CONTRACT OR BREACH OF WARRANTY OF LUTRON OR ANY SUPPLIER, AND EVEN IF LUTRON OR ANY OTHER PARTY WAS ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

NOTWITHSTANDING ANY DAMAGES THAT CUSTOMER MIGHT INCUR FOR ANY REASON WHATSOEVER (INCLUDING, WITHOUT LIMITATION, ALL DIRECT DAMAGES AND ALL DAMAGES LISTED ABOVE), THE ENTIRE LIABILITY OF LUTRON AND OF ALL OTHER PARTIES UNDER THIS WARRANTY ON ANY CLAIM FOR DAMAGES ARISING OUT OF OR IN CONNECTION WITH THE MANUFACTURE, SALE, INSTALLATION, DELIVERY, USE, REPAIR, OR REPLACEMENT OF THE UNIT, OR ANY AGREEMENT INCORPORATING THIS WARRANTY, AND CUSTOMER'S SOLE REMEDY FOR THE FOREGOING, WILL BE LIMITED TO THE AMOUNT PAID TO LUTRON BY CUSTOMER FOR THE UNIT. THE FOREGOING LIMITATIONS, EXCLUSIONS AND DISCLAIMERS WILL APPLY TO THE MAXIMUM EXTENT ALLOWED BY APPLICABLE LAW, EVEN IF ANY REMEDY FAILS ITS ESSENTIAL PURPOSE.

TO MAKE A WARRANTY CLAIM

To make a warranty claim, promptly notify Lutron within the warranty period described above by calling the Lutron Technical Support Center at (800) 523-9466. Lutron, in its sole discretion, will determine what action, if any, is required under this warranty. To better enable Lutron to address a warranty claim, have the unit's serial and model numbers available when making the call. If Lutron, in its sole discretion, determines that an on-site visit or other remedial action is necessary, Lutron may send a Lutron Services Co. representative or coordinate the dispatch of a representative from a Lutron approved vendor to Customer's site, and/or coordinate a warranty service call between Customer and a Lutron approved vendor.

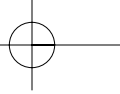
This warranty gives you specific legal rights, and you may also have other rights which vary from state to state. Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you. Some states do not allow the exclusion or limitation of incidental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

These products may be covered under one or more of the following U.S. patents: 4,797,599; 4,803,380; and corresponding foreign patents. Lutron, the sunburst logo, Tu-Wire, and Grafik Eye are registered trademarks of Lutron Electronics Co., Inc. © 2006 Lutron Electronics Co., Inc.



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P/N 030-852 Rev. A 01/07



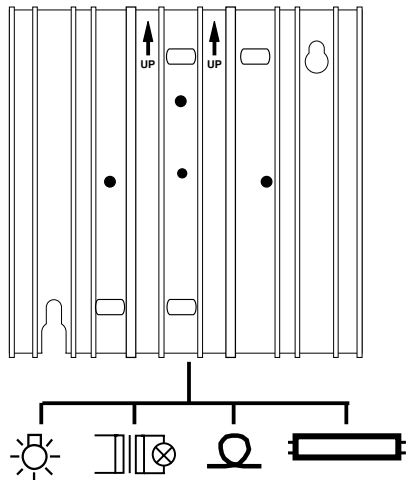


GRAFIK Eye® Power Interfaces

Power Booster (PB) Electronic Low Voltage Interface (ELVI) Fluorescent Dimming Ballast Interface (FDBI)

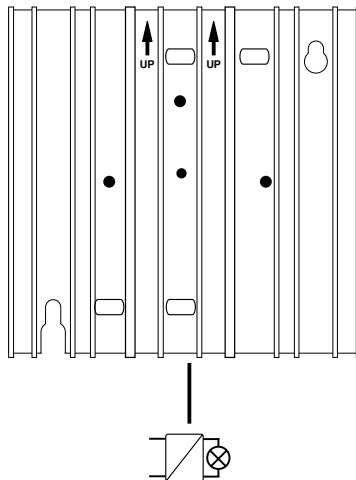
Installation Instructions — Please Read

PB



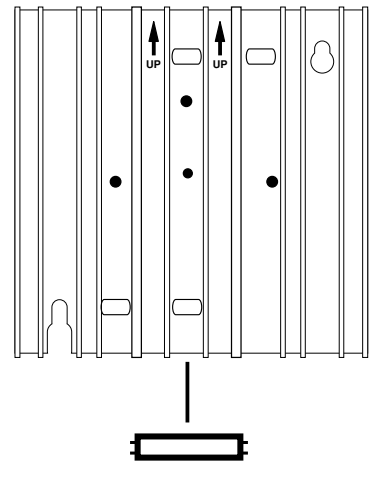
**Incandescent
Magnetic Low Voltage
Neon/Cold Cathode
Lutron *Tu-Wire*® Dimming Ballast**

ELVI



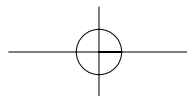
Electronic Low Voltage

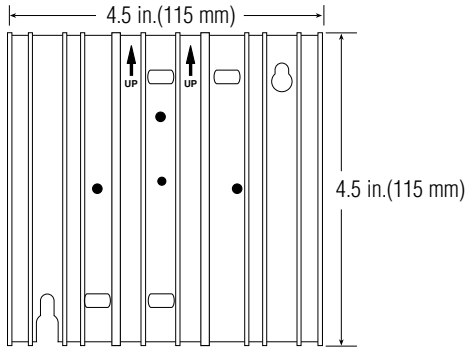
FDBI



**Lutron *Hi-lume*® or *Eco-10*™
Fluorescent Dimming Ballast**

LUTRON®





Interface shown with faceplate removed

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, Neon/Cold Cathode, and Lutron *Tu-Wire* load types.

The **ELVI** enables a zone of the Control Unit to control Electronic Low-Voltage loads.

The **FDBI** enables a zone of the Control Unit to control fluorescent loads with Lutron *Hi-lume* or *Eco-10* phase-controlled dimming ballasts.

The maximum load capacity for each Interface is shown in the table that follows.

Unit	120V	220-240V (AU)	230V (CE)
PB	1920W/VA 16A	2400W/VA 10A	1840W/VA† 8A†
ELVI	1000W/VA 8.3A	1200W/VA 5A	1200W/VA 5.2A
FDBI	1920W/VA 16A	2400W/VA 10A	— —

† 1200W/VA and 5.2A for flush mount (as shown on pg. 6).



Danger! Always turn OFF the circuit breakers/MCB or remove the main fuses from the power line before doing any work. Failure to do so can result in serious personal injury. More than one MCB can power this device.

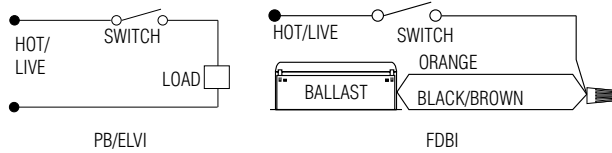
Disconnect all power sources before servicing unit.

1. This Interface must be installed by a qualified electrician in accordance with all applicable regulations.
2. Improper wiring can result in personal injury, damage to the Interface, or damage to other equipment.
3. Up to two **PB/ELVI/FDBIs** per zone.
4. The **PB/ELVI/FDBI** must be mounted with arrows facing upward to ensure adequate cooling.
5. **PB:** If using low-voltage incandescent fixtures, use only with iron core (magnetic) transformers.
6. **ELVI:** Use only with solid-state (electronic) low-voltage transformers that are manufacturer approved to be dimmed by reverse phase control.
7. **CAUTION!** Dimmed magnetic low-voltage transformers: To avoid excessively high current flow that can cause transformer overheating and failure, observe the following:
 - (a) Do not operate the Interface with all of the lamps removed or with any lamps inoperative.
 - (b) Replace any burned out lamps immediately.
 - (c) Use only transformers that incorporate thermal protection or fused primary windings.
8. **ELVI/FDBI:** These Interfaces contain a thermal device that turns Off the Interface if overloaded. The Interface will turn On when it cools.

* See Page 5 for other Lutron products that can be used to control your PB/ELVI/FDBI.

Test load for short circuits

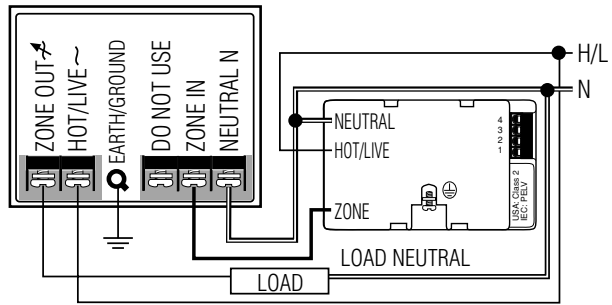
- Turn power Off.
- **PB/ELVI:** Connect standard switch between Hot/Live lead and the load wire to test circuit.
- **FDBI:** Connect standard switch between Hot/Live lead and the Dimmed Hot/Live and switched Hot/Live leads of the ballast.
- Turn power On and check for short or open circuits.



Single-Feed Wiring for PB/ELVI 120V and 220-240V

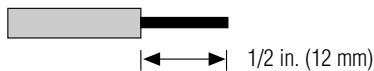


The **PB/ELVI** may be on the same circuit as the Control Unit *only if* the total load does not exceed the rating of the breaker.



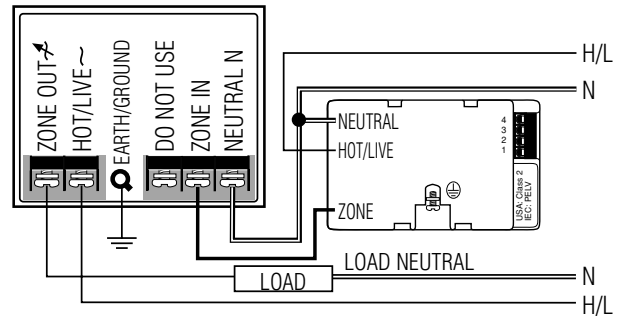
Wiring Instructions

1. Turn power Off to the Control Unit *and* the feed to the **PB, ELVI, or FDBI!**
2. Mount standard U.S. 2-gang wallbox* (available from Lutron, P/N 241-641), 3 1/2 in. (87 mm) deep is strongly recommended, 2 3/4 in. (68 mm) minimum. Allow at least 4 1/2 in. (110 mm) clearance above/below Interfaces to ensure proper heat dissipation.
3. Strip 1/2 in. (12 mm) insulation from all wires in wallbox and wire as shown. All connections are made using #12 AWG (2.5 mm²) wire. Power terminals can accept up to two #12 AWG (2.5 mm²) wires. The NEUTRAL N terminal is for the Control neutral, **not** the load neutral! The recommended installation torque is 9.0 in.•lbs. (1.0 N•m) for line voltage connections.



Dual-Feed Wiring for PB/ELVI 120V and 220-240V

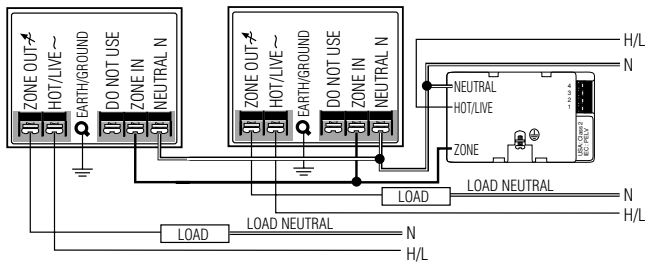
The load breaker/MCB can be on a different phase than the control breaker/MCB.



* Wallbox may be flush mounted or surface mounted. If mounting Interface in a panel, please refer to Panel Mounting section for important information.

Dual-Feed Wiring for Two (2) PB/ELVI Interfaces on One Zone - 120V and 220-240V

The load breaker/MCB can be on a different phase than the control breaker/MCB.



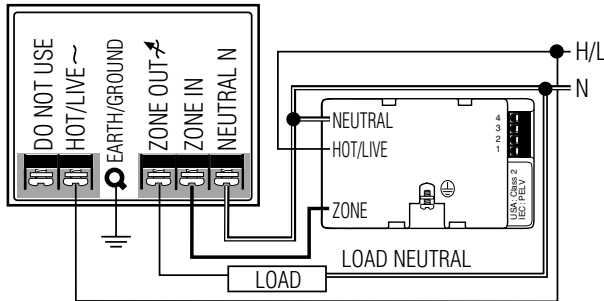
Tu-Wire Dimming Ballast

- When using a **PB** to control a Lutron *Tu-Wire* dimming ballast, the associated zone on the GRAFIK Eye® 3000 Series Control Unit must be set to the *Tu-Wire* load type. Please see the *GRAFIK Eye* 3000 Series Installer's Guide for more details.
- The **PB 230V** must not be used with *Tu-Wire* ballasts because the *Tu-Wire* load type is not available on 230V CE models of the *GRAFIK Eye* Control Unit.

Single-Feed Wiring for PB/ELVI 230V

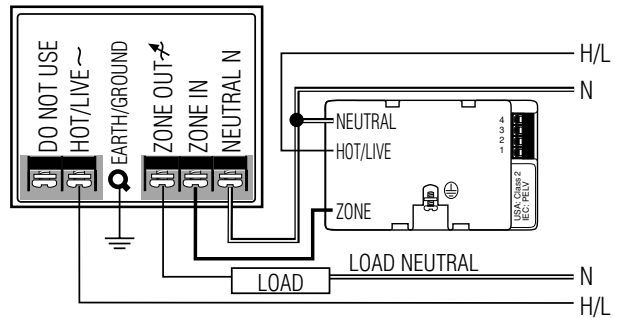


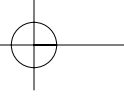
The **PB/ELVI** may be on the same circuit as the Control Unit *only if* the total load does not exceed the rating of the breaker.



Dual-Feed Wiring for PB/ELVI 230V

The load breaker/MCB can be on a different phase than the control breaker/MCB.

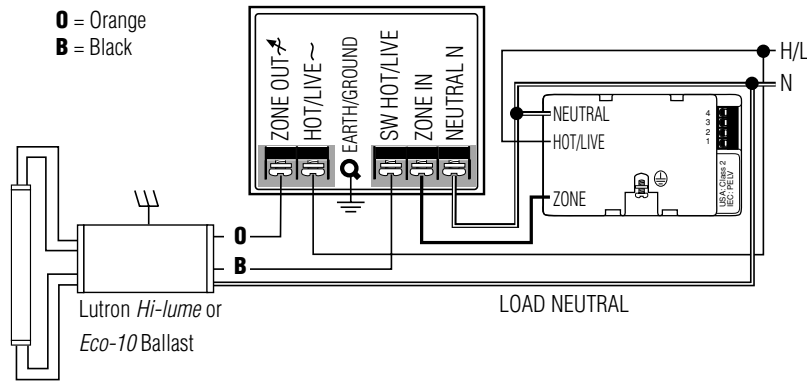




Single-Feed Wiring for FDBI 120V and 220-240V

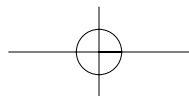
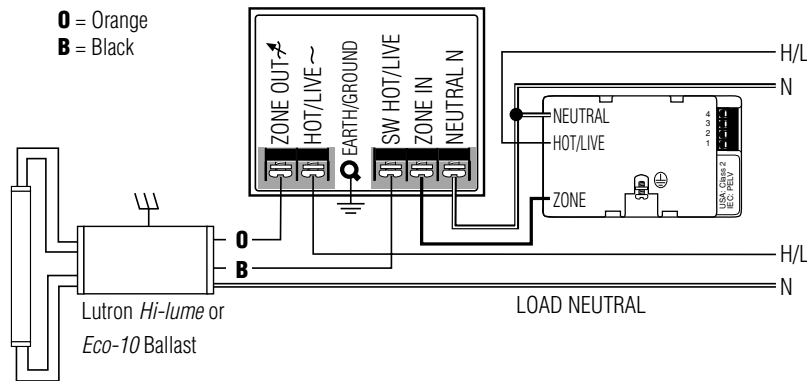


The **FDBI** may be on the same circuit as the Control Unit if, and only if, the total load does not exceed the rating of the breaker. Connect ZONE OUT only to Lutron *Hi-lume* or *Eco-10* Electronic Dimming Ballasts.



Dual-Feed Wiring for FDBI 120V and 220-240V

The load breaker/MCB can be on a different phase than the control breaker/MCB. Connect ZONE OUT only to Lutron *Hi-lume* or *Eco-10* Electronic Dimming Ballasts.



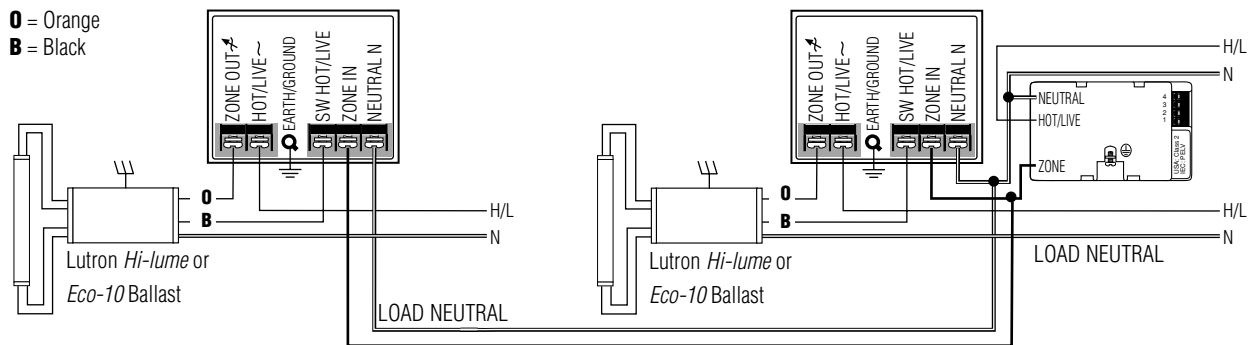
Lutron Products

The following Lutron products can also be used to control your **PB/ELVI/FDBI**:

- *GRAFIK Eye* GP Dimming Panels.
- *GRAFIK Eye* LP Dimming Panels.
- Homeworks Interactive™ Remote Power Panels.
- Lutron fluorescent wallbox dimmers.
- Please contact Lutron for use with other *Homeworks Interactive* or *RadioRA*® dimmers.

Dual-Feed Wiring for Two (2) FDBI Interfaces on One Zone 120V and 220-240V

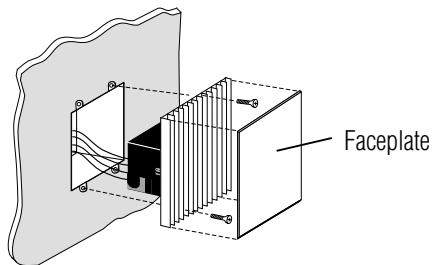
The load breaker/MCB can be on a different phase than the control breaker/MCB. Connect ZONE OUT only to Lutron *Hi-lume* or *Eco-10* Electronic Dimming Ballasts.



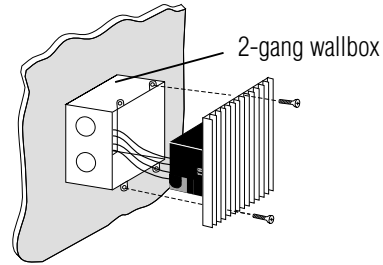
Mounting: Interface must be mounted *vertically*!

1. Confirm all connections and mount the Interface using the screws provided.
2. Restore power to the system.

Flush Mount



Surface Mount



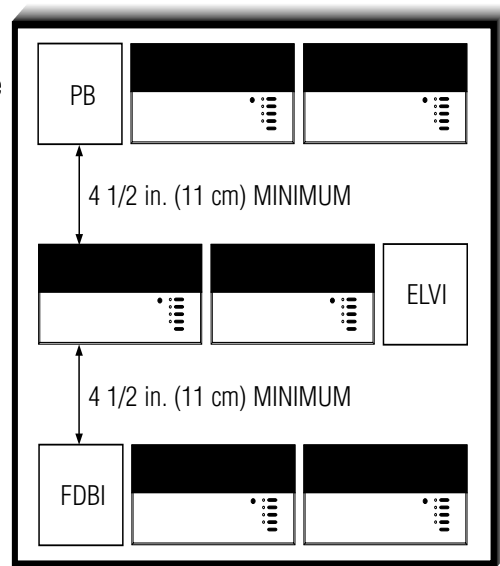


Panel Mounting

- 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 Eye* Control Units and Interfaces.
- If mounting multiple Control Units or Interfaces in an enclosure:
 1. Ambient temperature within an enclosure **must remain between 32°—104° F (0°—40° C)**.
 2. If not mounting in a metal enclosure, all units **must** be mounted in a wallbox.
- To improve heat dissipation of Power Interfaces, remove the faceplate from the unit.



GRAFIK Eye Control Units and Interface Units dissipate heat when operating. Obstructing these units can cause malfunction to both the Control Unit and the Interface if ambient temperature does not remain between 32°—104° F (0°—40° C).



Troubleshooting Guide

Symptom	Causes	Solution
Lights do not come on.	Power is off	Restore power to the PB/ELVI/FDBI . Restore power to the Control Unit.
	Miswire	Confirm wiring per wiring diagrams.
	Bulb(s)/lamp(s) burned out	Replace bulb(s)/lamp(s).
	<i>GRAFIK Eye</i> 3000 Control Unit	Refer to troubleshooting section of <i>GRAFIK Eye</i> Control Unit Installer's Guide.
	Interface is overloaded	Check for excess load, proper mounting, and adequate air convection. Allow unit to cool.
Lights turn on/off unexpectedly.	Load Type	Confirm that the load type being switched/dimmed is compatible with the PB/ELVI/FDBI .
	<i>GRAFIK Eye</i> 3000 Control Unit	Refer to the troubleshooting section of <i>GRAFIK Eye</i> Control Unit Installation Guide.



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International 852-2104-7633

SINGAPORE

Lutron GL (Singapore)
Tel: 65 220 4666
Fax: 65 220 4333

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 by one or more of the following U.S. patents: 4,797,599; 4,803,380; and corresponding foreign patents.

Lutron, GRAFIK Eye, Hi-lume, Homeworks, Radio RA, and Tu-Wire are registered trademarks, and Eco-10, Tu-Wire, and Homeworks Interactive are trademarks of Lutron Electronics Co., Inc.

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P/N 030-739 Rev. A 2/02

Power Modules Installation Instructions

Please Read



Phase-Adaptive
Power Module



3-Wire Fluorescent
Power Module



Switching
Power Module

Models and Capacities

Module Type	Control	Load	Load Capacity	Model Number
Phase-Adaptive	120 V \sim	120 - 277 V \sim	16 A	PHPM-PA-DV-WH
	50 / 60 Hz	50 / 60 Hz		
Phase-Adaptive	120 V \sim	120 V \sim	16 A	PHPM-PA-120-WH
	50 / 60 Hz	50 / 60 Hz		
3-Wire Fluorescent	120 V \sim	120 - 277 V \sim	16 A	PHPM-3F-DV-WH
	50 / 60 Hz	50 / 60 Hz		
3-Wire Fluorescent	120 V \sim	120 V \sim	16 A	PHPM-3F-120-WH
	50 / 60 Hz	50 / 60 Hz		
Switching	120 V \sim	120 - 277 V \sim	16 A	PHPM-SW-DV-WH
	50 / 60 Hz	50 / 60 Hz		

General Notes



Danger! Always turn OFF the circuit breakers or remove the main fuses from the power line before doing any work. Failure to do so can result in serious personal injury. More than one disconnect may be required to de-energize this device. Disconnect all power sources before servicing unit.

- This power module must be installed by a qualified electrician in accordance with all applicable regulations.
- Improper wiring can result in personal injury, damage to the interface, or damage to other equipment.
- Up to three power modules per zone.
- The power module must be mounted with arrow facing upward to ensure adequate cooling.
- CAUTION! Dimmed magnetic low-voltage transformers: To avoid excessively high current flow that can cause transformer overheating and failure, observe the following:
 - (a) Do not operate the power module with all of the lamps removed or with any lamps inoperative.
 - (b) Replace any burned out lamps immediately.
 - (c) Use only transformers that incorporate thermal protection or fused primary windings.

- Phase-Adaptive/Fluorescent: These power modules contain circuitry that will shut down the output if it is overloaded. To correct the problem, turn off power and reduce the load to the specified rating before re-applying power.



Note! Plastic faceplate must be installed on module for normal operation (all models).

Load Type Capability

Switching Power Module:

- Incandescent (tungsten)
- Halogen
- Magnetic low-voltage transformer (iron core)
- Electronic (solid-state) low-voltage transformer.
- Magnetic and electronic fluorescent lamp ballasts
- Neon/cold-cathode
- HID
- Motor
 - 1/2 HP at 277 V \sim
 - 1/3 HP at 120 V \sim

Phase-Adaptive Power Module:

- Incandescent (tungsten)
- Halogen
- Magnetic low-voltage transformer (iron core)
- Electronic (solid-state) low-voltage transformer
- Lutron Tu-Wire™ electronic fluorescent dimming ballast
- Neon/cold-cathode

3-Wire Fluorescent Power Module:

- Lutron *Hi-Lume* and *Eco-10* (Eco Series) line-voltage control electronic dimming ballasts

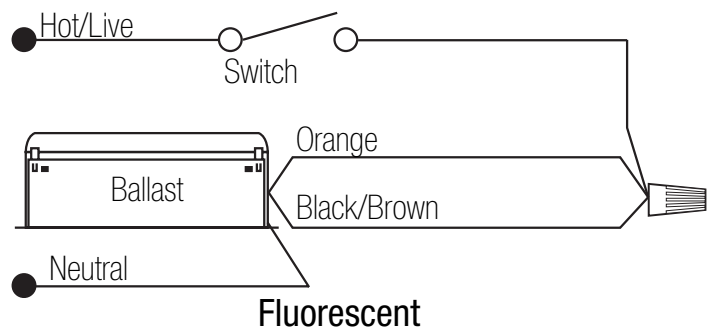
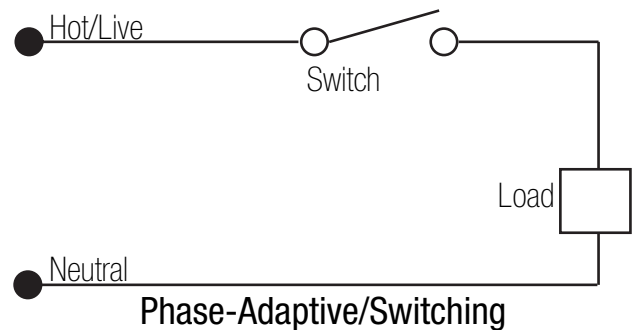
Product Compatibility

The following Lutron products may be used to control these power modules:

- *GRAFIK Eye* QS control units
- *GRAFIK Eye* 3000 Series control units
- LP, LCP, GP dimming panels
- *HomeWorks* remote power panels

Test Load for Short-Circuit

- Turn power Off.
- Phase-Adaptive/Switching: Connect standard switch between Hot/Live lead and the load wire to test circuit.
- Fluorescent: Connect standard switch between Hot/Live lead and the Dimmed Hot/Live and switched Hot/Live leads of the ballast.
- Turn power On and check for short or open circuits.



Wiring

- Mount in 2-gang U.S. wallbox 3.5 in. (89 mm) deep or 4 x 4 in. (102 mm) junction box 2.1 in. deep (53 mm). Indoors only.
- This device generates heat; mount only where ambient temperature is 32 - 104 °F (0 - 40 °C).
- Mount with arrows facing up to ensure adequate cooling.
- Allow 4.5 in. (114 mm) above and below unit and between faceplates when mounting several in a vertical layout.
- Mount so line (mains) voltage wiring is at least 6 ft. (1.8 m) from sound or electronic equipment and wiring.
- Mount within 7° of true vertical.

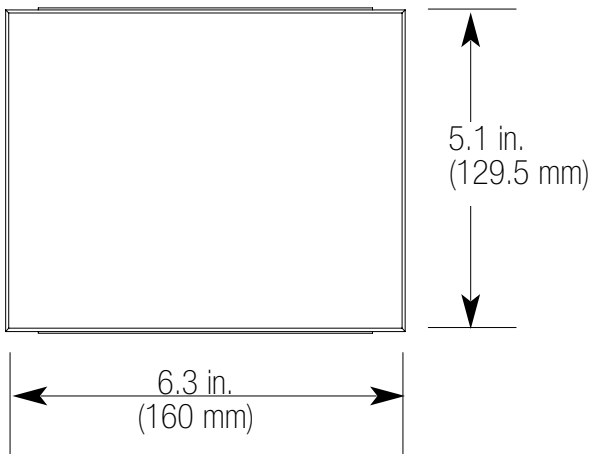
- Provide #12 AWG (2.5 mm²) copper (Cu) wires (75 °C minimum) for input power and load circuit.
- Strip 1/2 in. (12 mm) insulation from wires before connecting.
- Run separate neutral for load circuit - no common neutrals.



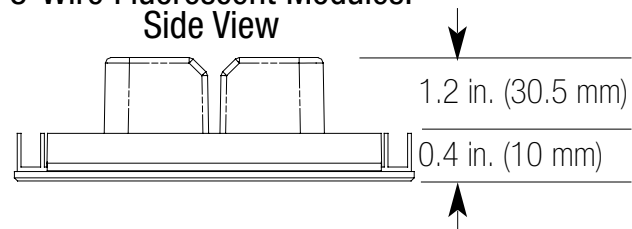
Note! Plastic faceplate must be installed on module for normal operation (all models).

Dimensions

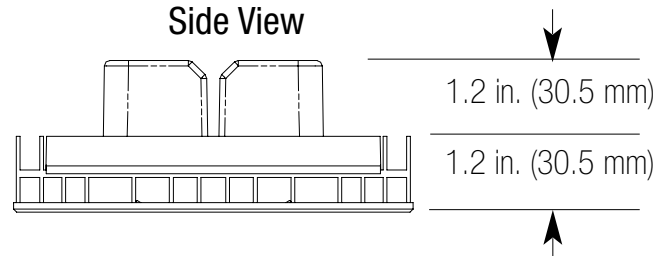
All Modules: Front View



Switching and
3-Wire Fluorescent Modules:
Side View

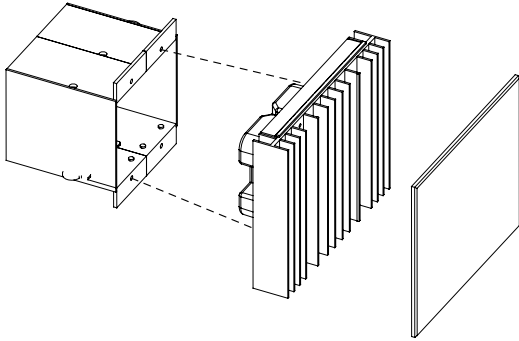


Phase-Adaptive Module:
Side View

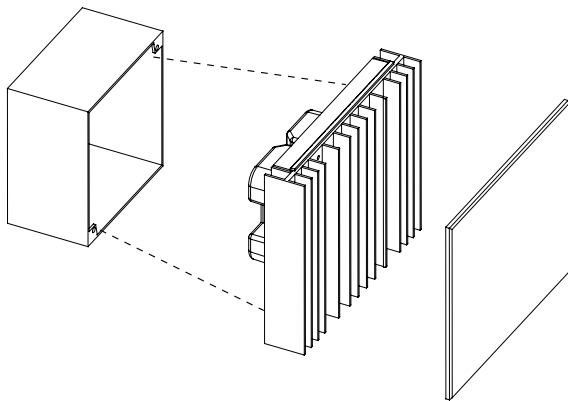


Mounting Methods

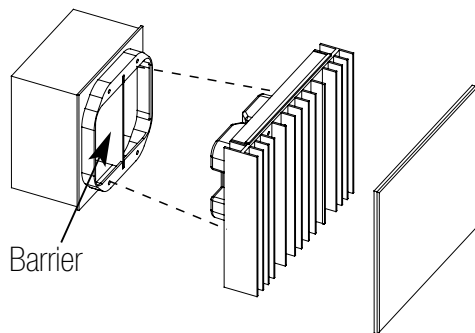
Mount to 2-gang U.S. wallbox



Mount to 4 x 4 in. (102 mm), 2.1 in. (53 mm) deep U.S. junction box



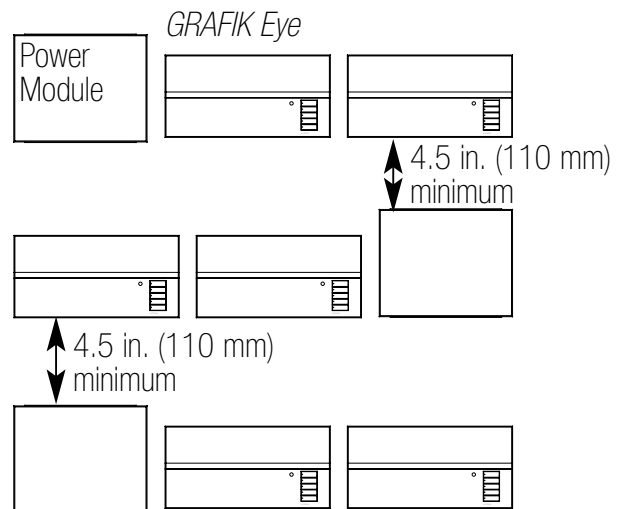
Mount to 4 x 4 in. (102 mm), 2.1 in. (53 mm) deep U.S. junction box with barrier (for 277 V_~ loads if required by local electrical code)



Mounting Inside an Enclosure with GRAFIK Eye Control Units

- Mount in accordance with all local and national electrical codes.
- Proper ventilation is required. Ambient temperature inside enclosure must remain between 32 - 104 °F (0 - 40 °C) when GRAFIK Eye control units and power modules are operating.
- See diagram below for required spacing between units.

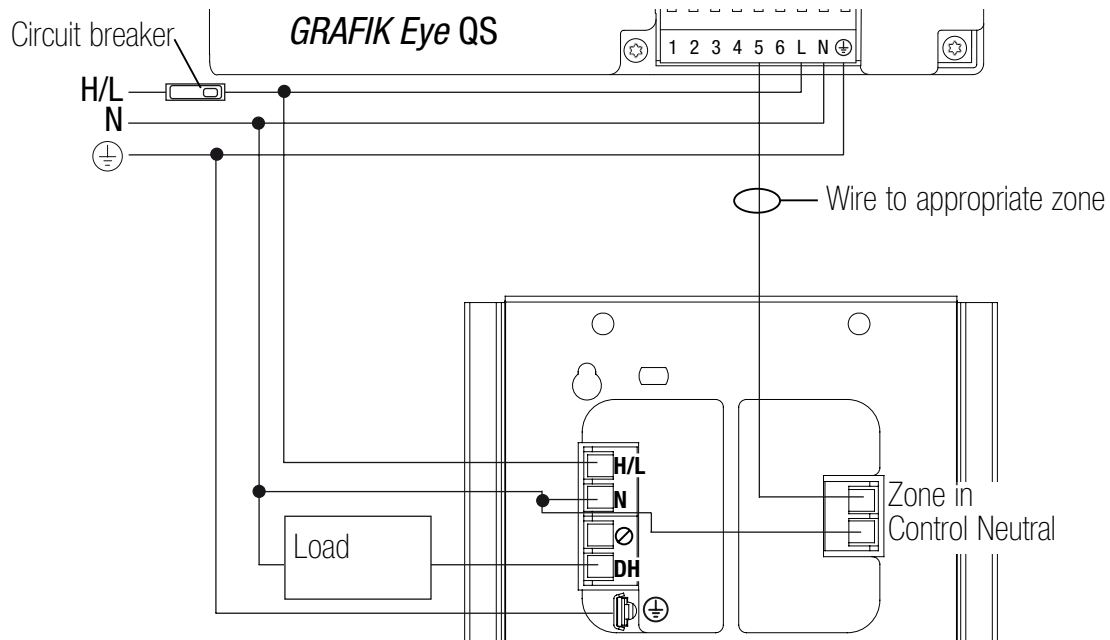
Note! Plastic faceplate must be installed on module for normal operation (all models).



Single-Feed Wiring

The power module may be on the same circuit as the control unit only if the total load does not exceed the rating of the branch circuit breaker in accordance with local and national electrical codes.

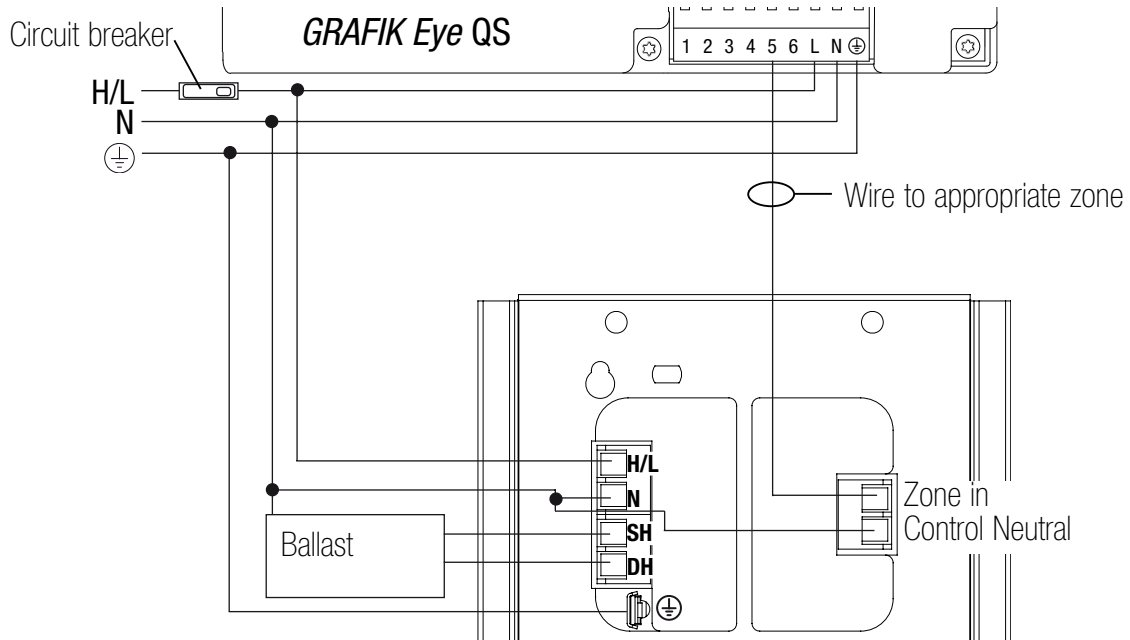
Phase-Adaptive Module Wiring



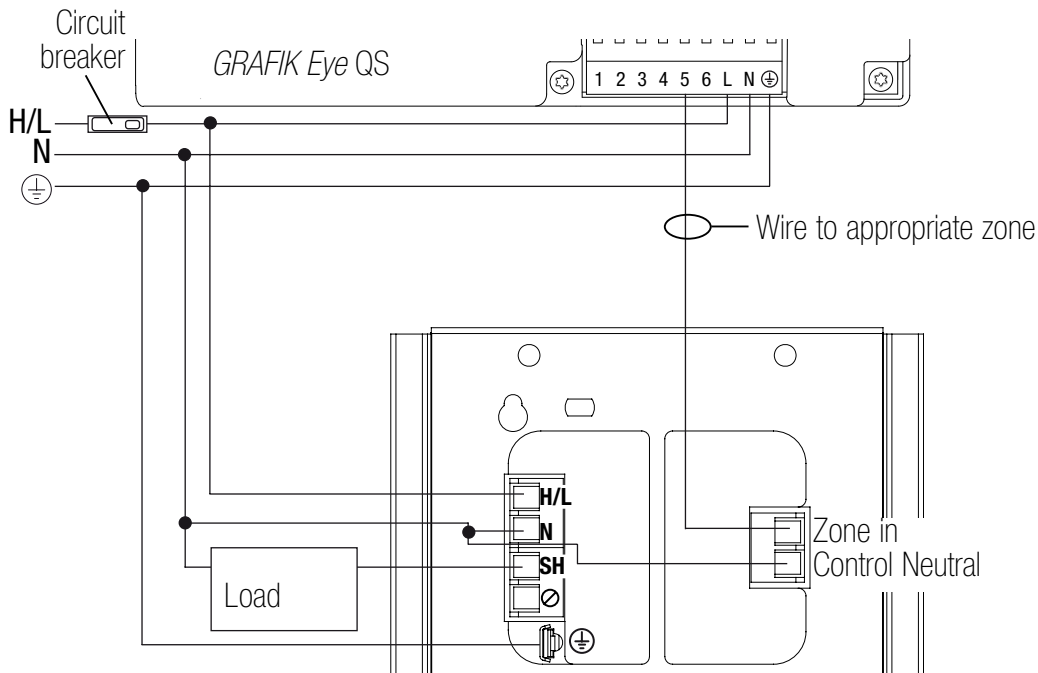
Legend

- H/L Hot/Live
- N Neutral
- SH Switched Hot
- DH Dimmed Hot
- ⊕ Ground
- ⊘ Not Used

Fluorescent 3-Wire Module Wiring



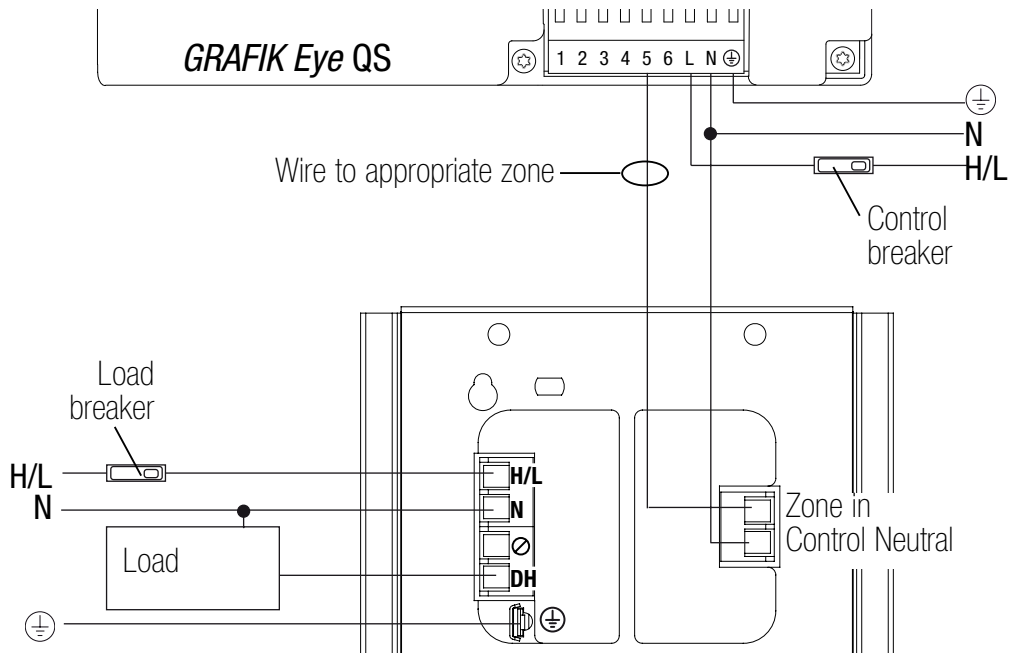
Switching Module Wiring



Dual-Feed Wiring

The load breaker can be on a different phase than the control breaker. Both breakers must be turned off prior to installing or servicing the module.

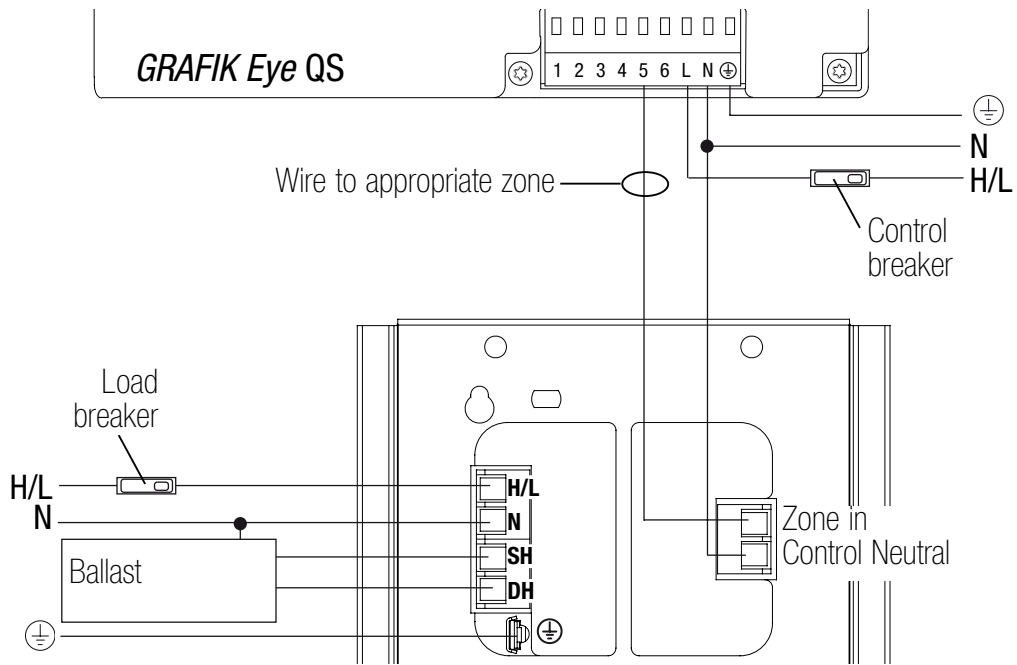
Phase-Adaptive Module Wiring



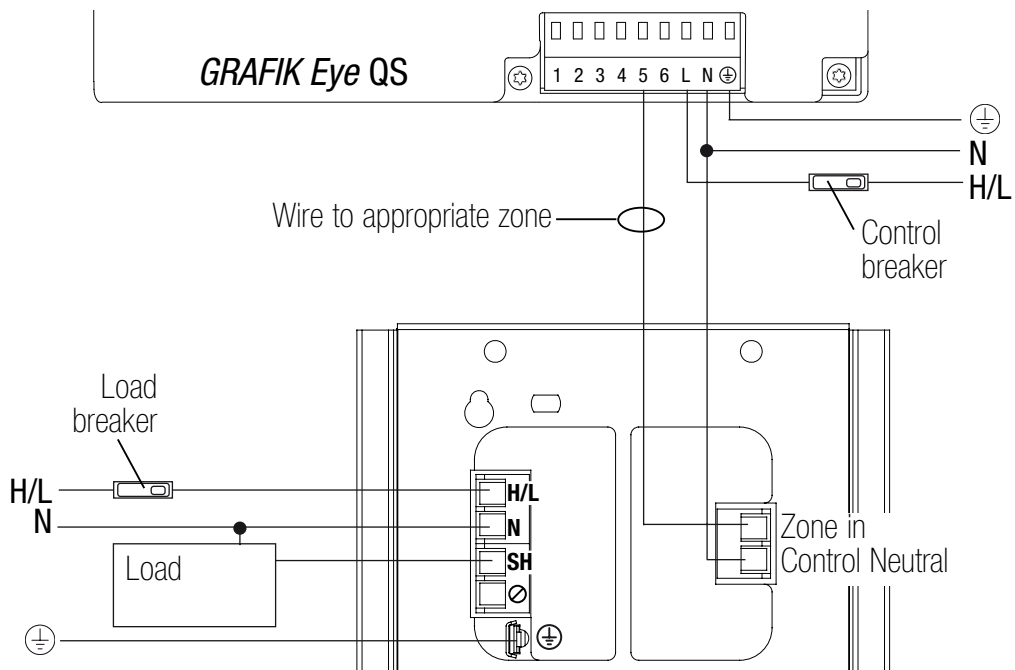
Legend

H/L	Hot/Live
N	Neutral
SH	Switched Hot
DH	Dimmed Hot
⊕	Ground
⊘	Not Used

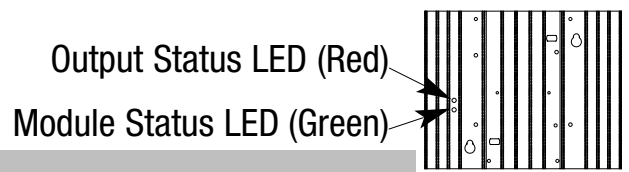
Fluorescent 3-Wire Module Wiring



Switching Module Wiring



PHASE-ADAPTIVE POWER MODULE DIAGNOSTICS AND TROUBLESHOOTING



Module Status LED (green)	
LED Action	Comments
Off	Module not powered. Caution: Control input may still be powered. Turn off all breakers before removing unit.
1 blink/second (“heartbeat”)	Module powered; normal operation

Output Status LED (red)			
LED Action	Control Input Status	Load Status	Comments
Off	Input signal off or disconnected	Off	Load off
Continuously on	On	On	Incandescent/electronic dimming
1 blink/second (“heartbeat”)	On	On	Magnetic dimming
1 blink, pause, repeat	On	Off	Load short-circuit/overload ¹
2 blinks, pause, repeat	On	Off	Over-voltage error ²
3 blinks, pause, repeat	On	On full	Shorted component ³
4 blinks, pause, repeat	On	Off	DC detection ⁴

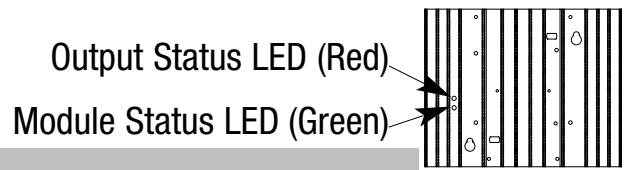
¹Remove power; repair fault; re-apply power.

²Verify proper load on output.

³Replace power module; internal device is damaged.

⁴Possible faulty MLV load.

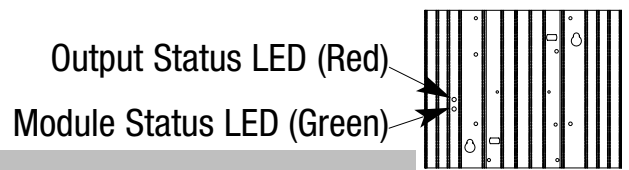
3-WIRE FLUORESCENT POWER MODULE DIAGNOSTICS AND TROUBLESHOOTING



Module Status LED (green)	
LED Action	Comments
Off	Module not powered. Caution: Control input may still be powered. Turn off all breakers before removing unit.
1 blink/second (“heartbeat”)	Module powered; normal operation

Output Status LED (red)			
LED Action	Control Input Status	Load Status	Comments
Off	Input signal off or disconnected	Off	Load off
Continuously on	On	On	Load on. Note: Output may repeatedly turn on and off if DH is overloaded or if DH and SH are miswired.

SWITCHING POWER MODULE DIAGNOSTICS AND TROUBLESHOOTING



Module Status LED (green)	
LED Action	Comments
Off	Module not powered. Caution: Control input may still be powered. Turn off all breakers before removing unit.
1 blink/second (“heartbeat”)	Module powered; normal operation

Output Status LED (red)			
LED Action	Control Input Status	Load Status	Comments
Off	Input signal off or disconnected	Off	Load off
Continuously on	On	On	Load on

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Lutron Electronics Co., Inc. One Year Limited Warranty

For a period of one year from the date of purchase, and subject to the exclusions and restrictions described below, Lutron warrants each new unit to be free from manufacturing defects. Lutron will, at its option, either repair the defective unit or issue a credit equal to the purchase price of the defective unit to the Customer against the purchase price of comparable replacement part purchased from Lutron. Replacements for the unit provided by Lutron or, at its sole discretion, an approved vendor may be new, used, repaired, reconditioned, and/or made by a different manufacturer.

If the unit is commissioned by Lutron or a Lutron approved third party as part of a Lutron commissioned lighting control system, the term of this warranty will be extended, and any credits against the cost of replacement parts will be prorated, in accordance with the warranty issued with the commissioned system, except that the term of the unit's warranty term will be measured from the date of its commissioning.

EXCLUSIONS AND RESTRICTIONS

This Warranty does not cover, and Lutron and its suppliers are not responsible for:

1. Damage, malfunction or inoperability diagnosed by Lutron or a Lutron approved third party as caused by normal wear and tear, abuse, misuse, incorrect installation, neglect, accident, interference or environmental factors, such as (a) use of incorrect line voltages, fuses or circuit breakers; (b) failure to install, maintain and operate the unit pursuant to the operating instructions provided by Lutron and the applicable provisions of the National Electrical Code and of the Safety Standards of Underwriter's Laboratories; (c) use of incompatible devices or accessories; (d) improper or insufficient ventilation; (e) unauthorized repairs or adjustments; (f) vandalism; or (g) an act of God, such as fire, lightning, flooding, tornado, earthquake, hurricane or other problems beyond Lutron's control.
2. On-site labor costs to diagnose issues with, and to remove, repair, replace, adjust, reinstall and/or reprogram the unit or any of its components.
3. Equipment and parts external to the unit, including those sold or supplied by Lutron (which may be covered by a separate warranty).
4. The cost of repairing or replacing other property that is damaged when the unit does not work properly, even if the damage was caused by the unit.

EXCEPT AS EXPRESSLY PROVIDED IN THIS WARRANTY, THERE ARE NO EXPRESS OR IMPLIED WARRANTIES OF ANY TYPE, INCLUDING ANY IMPLIED WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE OR MERCHANTABILITY. LUTRON DOES NOT WARRANT THAT THE UNIT WILL OPERATE WITHOUT INTERRUPTION OR BE ERROR FREE.

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TO MAKE A WARRANTY CLAIM

To make a warranty claim, promptly notify Lutron within the warranty period described above by calling the Lutron Technical Support Center at (800) 523-9466. Lutron, in its sole discretion, will determine what action, if any, is required under this warranty. To better enable Lutron to address a warranty claim, have the unit's serial and model numbers available when making the call. If Lutron, in its sole discretion, determines that an on-site visit or other remedial action is necessary, Lutron may send a Lutron Services Co. representative or coordinate the dispatch of a representative from a Lutron approved vendor to Customer's site, and/or coordinate a warranty service call between Customer and a Lutron approved vendor.

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.

These products may be covered under one or more of the following U.S. patents: 4,797,599; 5,309,068; 5,633,540; 6,091,205; 6,380,692; and corresponding foreign patents. U.S. and foreign patents pending.

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