





## Warranty & Start-Up Information

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Job Name:

Toll-Free 24/7 Technical Support Line: 1.800.523.9466

Job Number:

Field Service Scheduling 1.800.523.9466 ext.4439

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# 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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## 3-Visit Start-up

### Description

The 3-Visit Start-up package includes three on-site start-up visits 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:

**Visit 1** - Pre-Wire inspection:

- Review system wiring requirements
- Define proper locations for devices
- Review general specifications

**Visit 2** - Start-Up of system and installation of system software/database (based on customer supplied information):

- Installation verification
- Wiring verification – power and low voltage
- Energize low voltage and enable dimming for the system
- Verify lighting loads
- System programming

**Visit 3** - Operator/end user training:

- Train facility personnel on operation and maintenance of system
- Fine-tune programming, if necessary

### 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.

Refer to the Lutron Lighting Control System Computer Warranty for details.

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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](http://www.lutron.com)  
E-mail: [lscwarranty@lutron.com](mailto: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 5000/6000/7000 System On-Site System Start-up

### What Standard GRAFIK 5000/6000/7000 start-up includes:

- Three visits to the job site during normal business hours. A pre-wire visit, a startup visit, and a training visit. These are three visits between the hours of 7 AM and 5 PM on a Monday through Friday that is not a Lutron Holiday.
- Visits 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. Additional charges may apply for expedited service inside ten business days

### A Lutron factory certified technician performs all system start-up items.

**All terminations will be done by the installing agency. A person from the installing agency needs to be present for the pre-wire and startup visits, this person should be familiar with the installation of the system.**

### System pre-wire inspection visit including:

- Familiarize the electrical contractor, project manager, owner's representative, with wiring and mounting of system devices.
- Review preliminary ideas for wiring Lutron computer wall jack, local wall controls, ceiling mount controls/sensors, interface devices, centralized processor, and dimming/switching panel locations.
- Review preliminary mounting locations and wiring practices for PC/Server, Lutron computer wall jack, local wall control, ceiling mount controls/sensors, interface devices, centralized processor, and dimming/switching panels.
- Request the name and contact information of the person(s) who will work with Lutron to define the graphical user interface (if applicable).
- Understand the overall project schedule

### System start up includes:

- Verification that the GRAFIK 5000/6000/7000 is installed according to Lutron specifications.
- Verify/set up system PC/Server (if applicable).
  - Verify that an analog phone line is provided for the system PC/Server modem.
  - Verify proper wiring and operation of the user interface link.
  - Verify Lutron processor and transfer system database.
  - Panels should be energized in by-pass fully lamped and tested prior to our arrival.
  - Loads are checked for shorts and overloads and bypass jumpers are removed.

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Field Service Scheduling 1.800.523.9466 ext. 4439

**Programming the dimming/switching panels to include:**

- Panel addressing
- Verify proper wiring and operation of control link
- Proper load types assigned as installed or as per approved submittal drawings. As installed conditions take precedence. This may be a modular system and if loadtypes differ from the original design additional/different equipment may be required.
- Circuit to button assignments as per approved submittal drawings. If no button 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.
- 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
- 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.
- 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.
- 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 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 will result in additional charges.

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- 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 visit on overall system operation (typical training agenda is attached):**

- It is the responsibility of the person scheduling the start-up to ensure the appropriate end users are present for training. Lutron typically does not have these contacts.
- Additional charges will apply if additional visits are required for training the end user.
- Lutron does not provide video media for training sessions. This may be provided by “others” for turnover to the end user or job site documentation.
- Download the graphical user interface (if applicable).
- System demonstration and sign-off by the end user.

**Graphical User Interface (GUI) design visit including (if applicable):**

- Lutron Graphical User Project Specialist to work with the owner’s designated GUI designer to develop the Lutron Graphical User Interface.
- Owner’s GUI designer to provide the customer’s desired graphical images.
- Lutron Graphical User Project Specialist to work with the owner’s designated GUI designer to develop the control strategy and determine how each image will be used.
- Schedule the fine-tuning GUI visit.

**Fine Tuning Graphical User Interface visit including (if applicable):**

- Fine-tune the graphical images/control strategy with owner’s designated GUI designer.

**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.
- 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.

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**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 .

## **GRAFIK 5000/6000/7000 Series**

GRAFIK 5000/6000/7000 Series is a centralized processor based architectural preset lighting control system that creates functional spaces through various lighting combinations. It utilizes low voltage digital controls that communicate with a centralized processor and 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 through software as the needs of the space change.

### **5000/6000/7000 Training Visit – Typical Agenda (duration – approximately 3 hours):**

- Review complete system with end-user (control location and function)
- Discuss system model numbers
- Discuss Lutron lexicon – what is a zone, scene, fade rate, delay rate
- Review eLumen software suite
  - o DesignIT
    - Add, remove, or Re-Label space names, scene names, zone names, control names, panel names, etc.
    - Partitioning, sequencing, conditional logic
    - Program control functions
    - Program circuit to zone assignments
    - Program load types
    - Schedule time clocks – real time, astronomic
    - Change scene intensities
  - o ControllIT
    - Monitor and control your lighting system
    - Change scenes/zone intensities
    - Compile and transfer system changes made with DesignIT
  - o SecureIT
    - Add users to your system
    - Assign passwords for users
    - Assign/change rights and privileges for users
  - o ConfigureIT
    - Real-time configuration changes to scenes. Modify zone intensity, fade time and delay time
    - Flash zone to find in space
    - Save options
  - o Backup, Restore, and Update Tool
    - Backup database
    - Restore database
  - o Update database
  - o System Log

<b>Job Name:</b> <input style="width: 90%; height: 20px;" type="text"/>	<b>Toll Free 24/7 Tech Support Line 1.800.523.9466</b>
<b>Job Number:</b> <input style="width: 100px; height: 20px;" type="text"/>	<b>Field Service Scheduling 1.800.523.9466 ext. 4439</b>



- Review all accessory controls addressing
- Review dimmer/switching panel(s)
  - o Bypassing outputs
  - o Spare dimmer cards/modules, switching modules
  - o Load schedule
- Troubleshooting system. Panels, processor, controls, interfaces
- System integration
- Warranty information
- Tech support
- Lutron Facility Managers Training

*NOTE:* All topics may not be relevant to every system

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





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](http://www.lutron.com) to get more information on our international offices.*

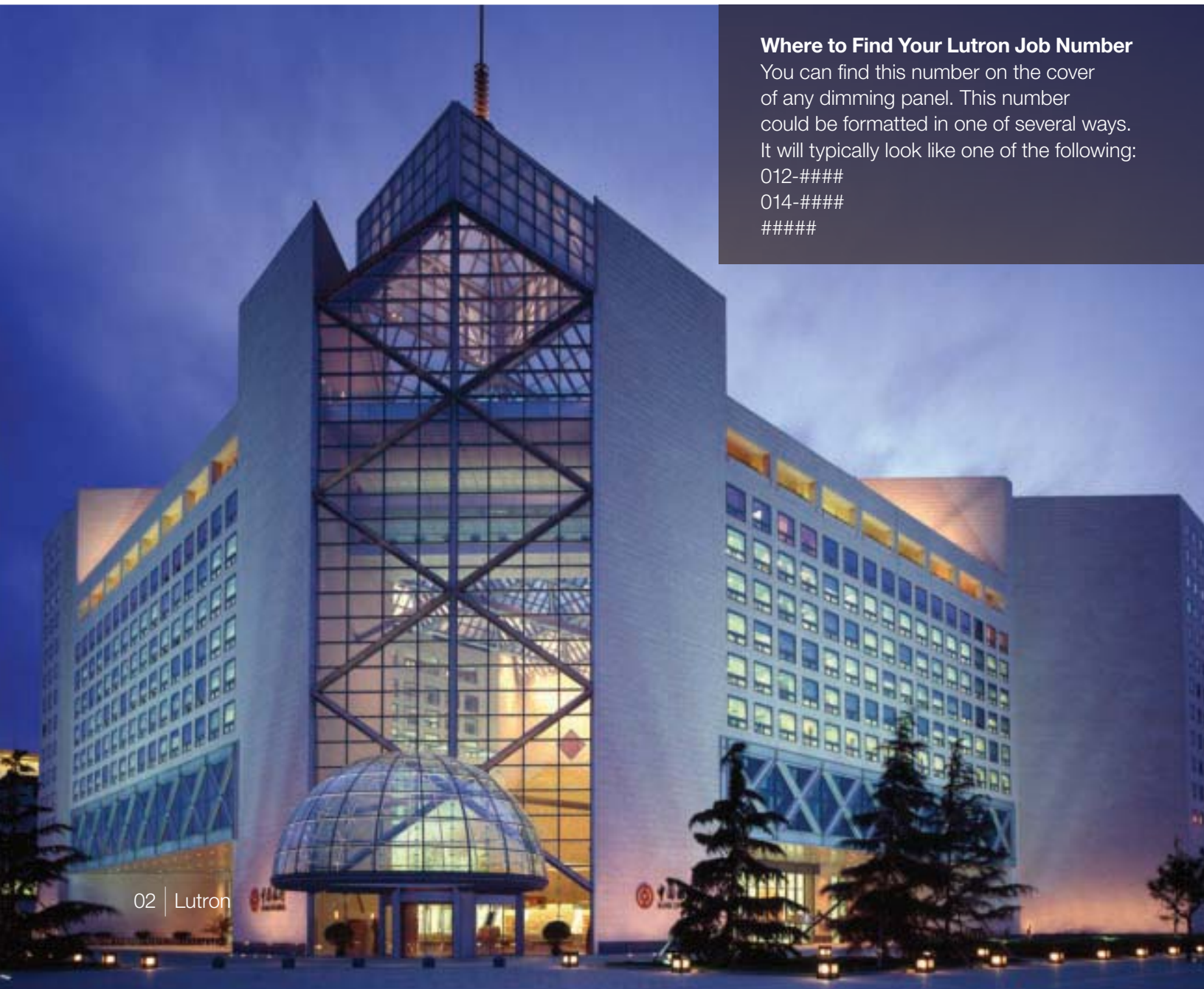
**Where to Find Your Lutron Job Number**

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

## 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.

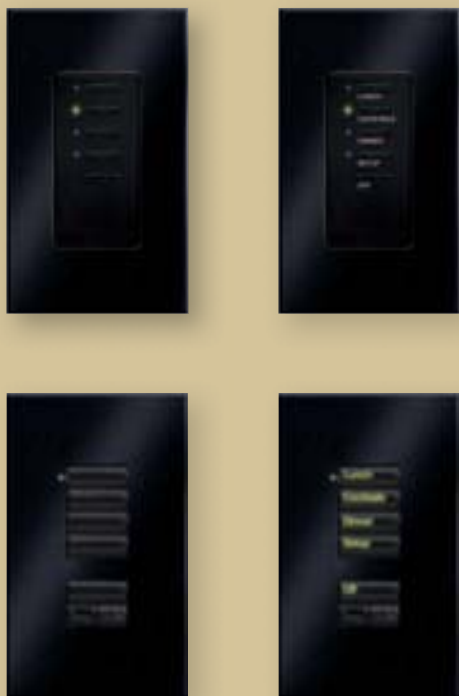
*Engraving sheets are available at [www.lutron.com/seeTouch](http://www.lutron.com/seeTouch).*



### 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](mailto: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](http://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](mailto: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](http://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](mailto: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](mailto: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](http://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](http://www.lutron.com)

save  
energy  
with  
Lutron™



 **LUTRON**® SERVICES CO., INC.

[www.lutron.com/service](http://www.lutron.com/service)

Lutron Services Co., Inc.  
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Coopersburg, PA 18036-1299

World Headquarters 1.610.282.3800  
Technical Support Center 1.800.523.9466

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## Install & Setup Guides

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Job Number:

Field Service Scheduling 1.800.523.9466 ext.4439

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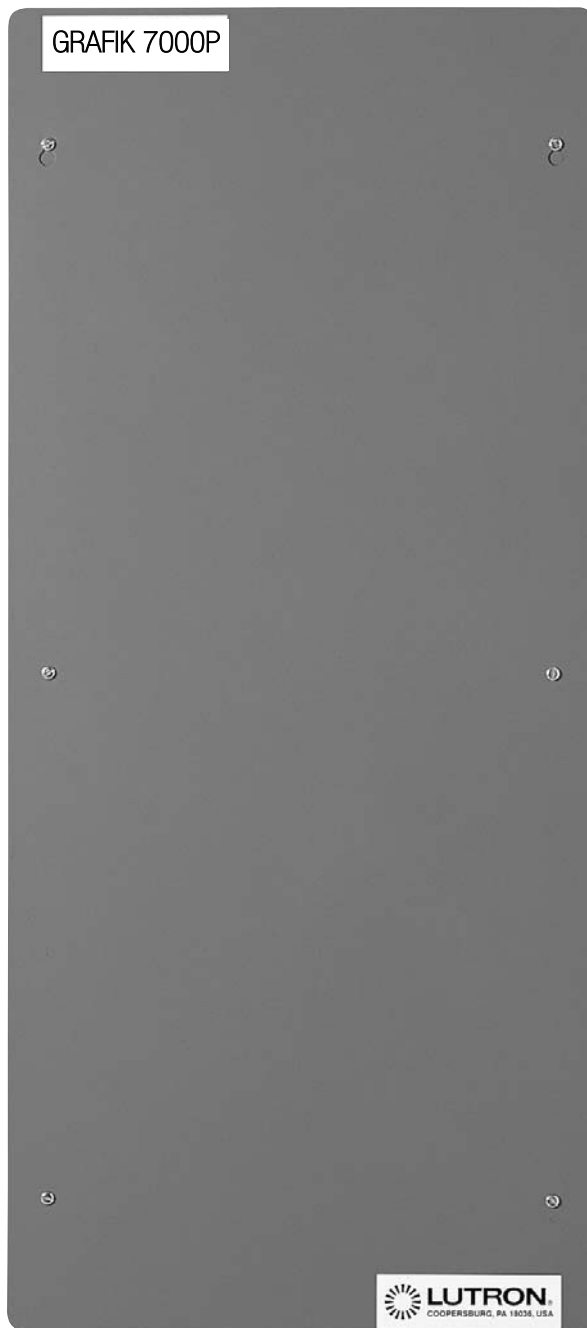
Please Read

# GRAFIK Systems™

## Centralized Lighting Control System

### Installation and Maintenance Guide

**GRAFIK7000™**  
**GRAFIK6000®**  
**GRAFIK5000™**



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### Overview

Use this guide to successfully install and maintain a *GRAFIK5000*, *GRAFIK6000*, or *GRAFIK7000* lighting control system.

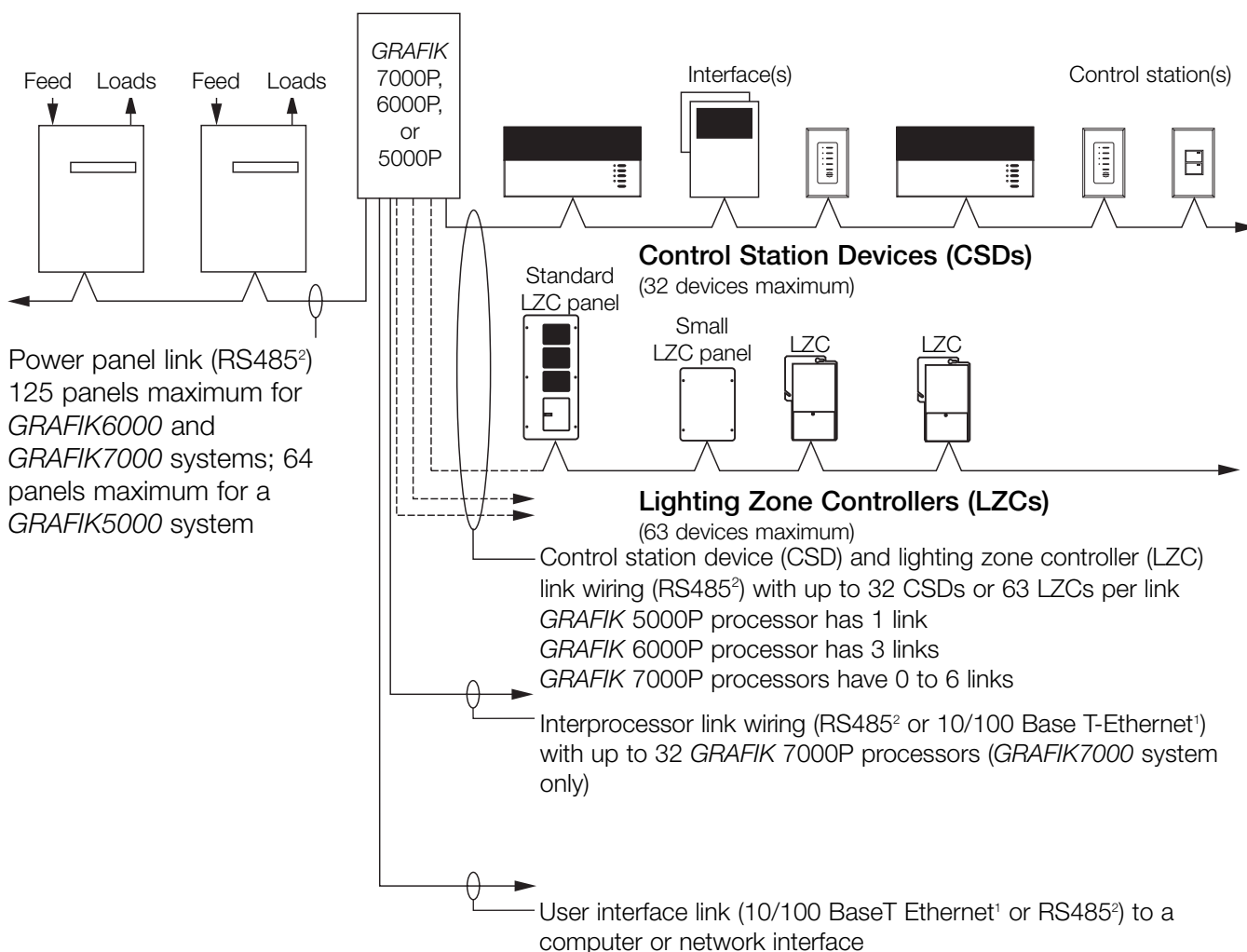
# System Overview

This guide describes installing processor panels and running low-voltage PELV (Class 2: USA) wiring, such as the control station device (CSD), lighting zone controller (LZC), power panel, user interface, and interprocessor links. See instructions included with all power panels and lighting zone controllers for running line (mains) voltage wiring of those devices.

The *GRAFIK7000*, *GRAFIK6000*, and *GRAFIK5000* lighting control systems have one or more central processors that receive commands from control station devices, an *eLumen* manager, internal timeclocks, or third-party systems and provide circuit information and lighting zone intensities to devices connected to the power panel and lighting zone controller links.

## Power Panels (GP, XP, LP, CCP)

## Processor Panel

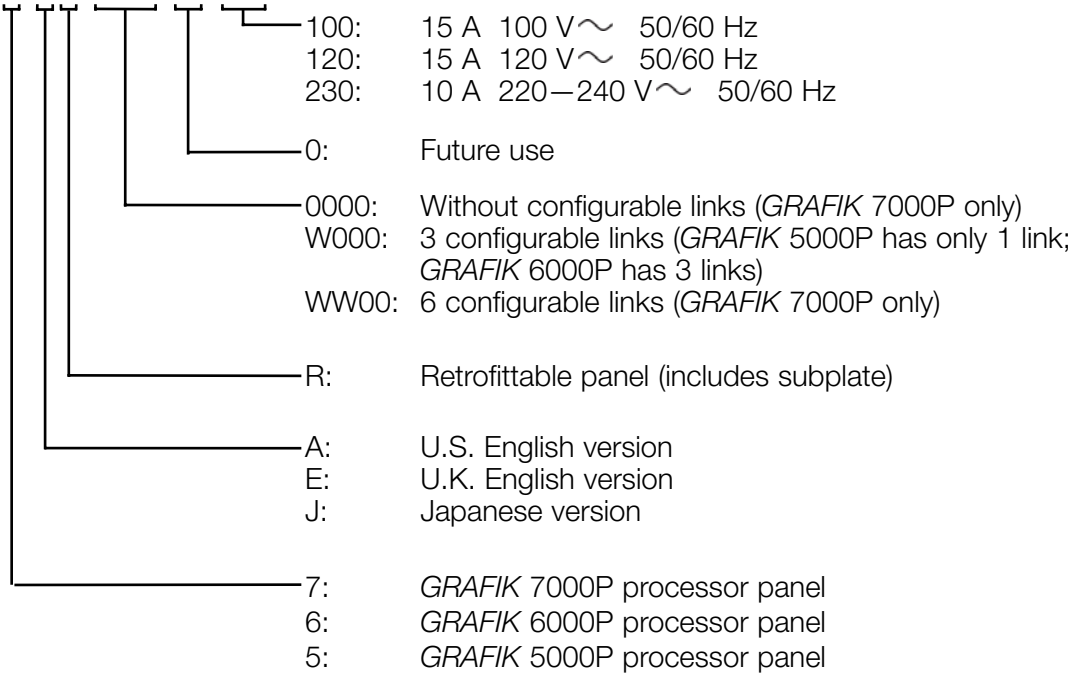


<sup>1</sup>If Ethernet is used to connect both the interprocessor link and user interface link, they must both enter the processor panel on the same Ethernet wiring. There is only one Ethernet connector per processor panel. A single Ethernet segment can be up to 330 ft. (100 m) long. This must be a dedicated network for Lutron lighting control only.

<sup>2</sup>RS485 Links can be up to 2000 ft. (610 m) long when using the correct wire. See the RS485 Wiring Overview for more details. Link boosters can be used to expand link to a maximum of 8000 ft. (2 440 m).

# Model Numbers

## G7-AR-0000-0-120



## System Capabilities

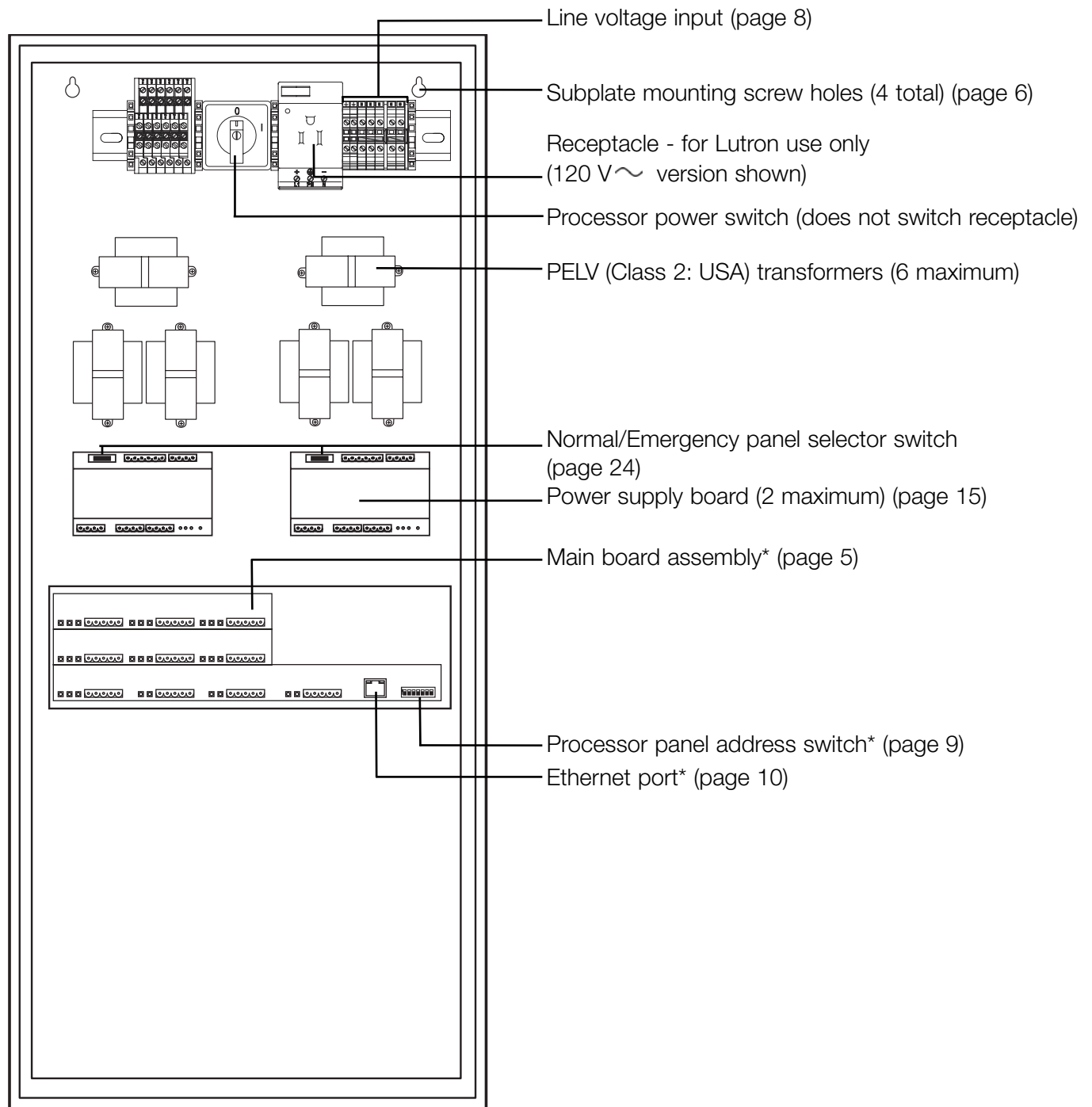
System Maximums	<i>GRAFIK 5000P</i>	<i>GRAFIK 6000P</i>	<i>GRAFIK 7000P</i>
# of Processors	1	1	32
# of Configurable Links	1 link	3 links	6 <sup>1</sup> links per processor
# of Power Panels on the Power Panel Link	64	125	125 per processor
# of Zones <sup>2</sup>	128	512	512 per processor

<sup>1</sup>Each configurable link can have up to 32 CSDs or 63 LZCs.

<sup>2</sup>Zones connected to OMX-3600, OMX-CCO-8, or SO-SVC controls or lighting zone controllers are in addition to the number of zones available in the processor; they are not counted in this number.

# Processor Panels: Overview

## Processor Panel Assembly



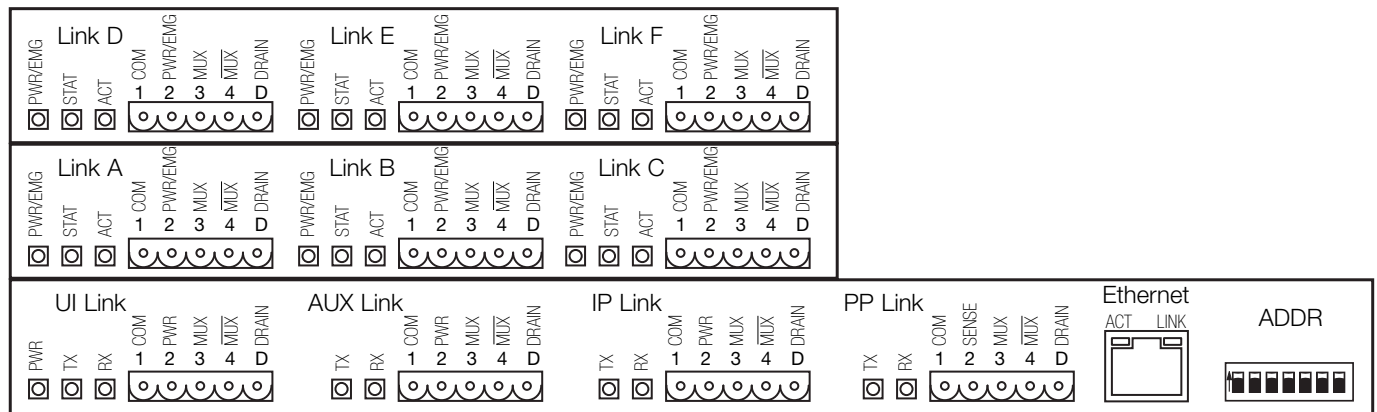
GRAFIK 7000P processor with six links shown

**\*Note:** Label is shown on front surface of unit.  
Connectors and address switch are on bottom surface.



# Processor Panels: Overview (continued)

## Main Board Assembly



### Notes

- Abbreviations are as follows:
  - UI = User Interface
  - AUX = Auxiliary
  - IP = Interprocessor
  - PP = Power Panel
  - EMG = Emergency (LZC links only)
  - PWR = Power
  - COM = Common
  - ADDR = Processor panel address
  - ACT = Ethernet activity
  - LINK = Ethernet link
  - DRAIN= Shield
  - SENSE= Emergency Sense Line
  - MUX/MUX= RS485 Data Connection
- GRAFIK 7000P with six links shown
- The AUX link is used for communicating with Lutron BMS interfaces. Contact Lutron's Technical Support Center for complete integration details.

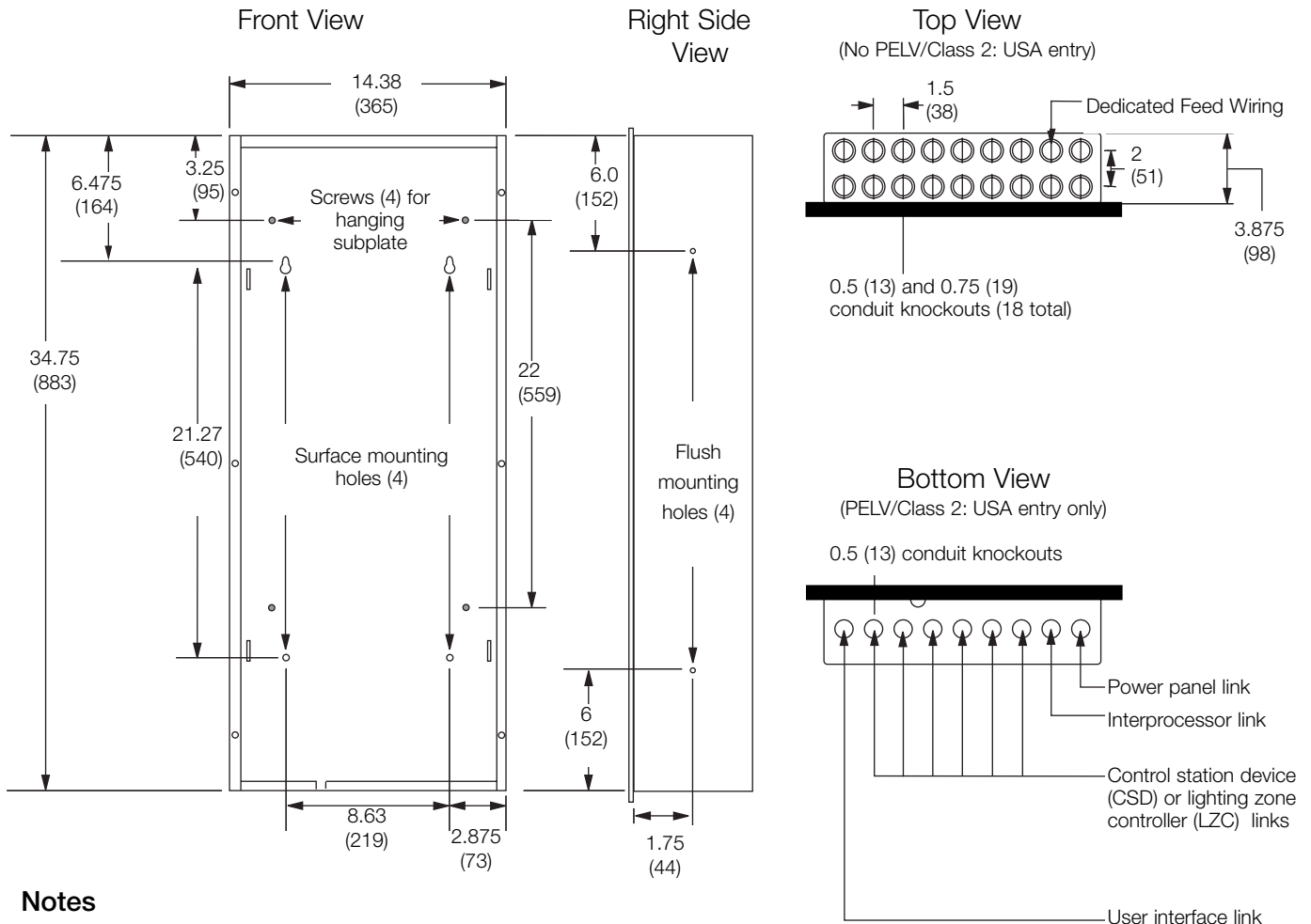


**Warning!** This product has been tested to meet FCC Part 15 Class A requirements. In a domestic environment this product may cause radio interference, in which case the user may be required to take appropriate measures.

# Processor Panels: Mounting

## Dimensions and Recommended Conduit Entry

Dimensions are in inches (mm)



### Notes

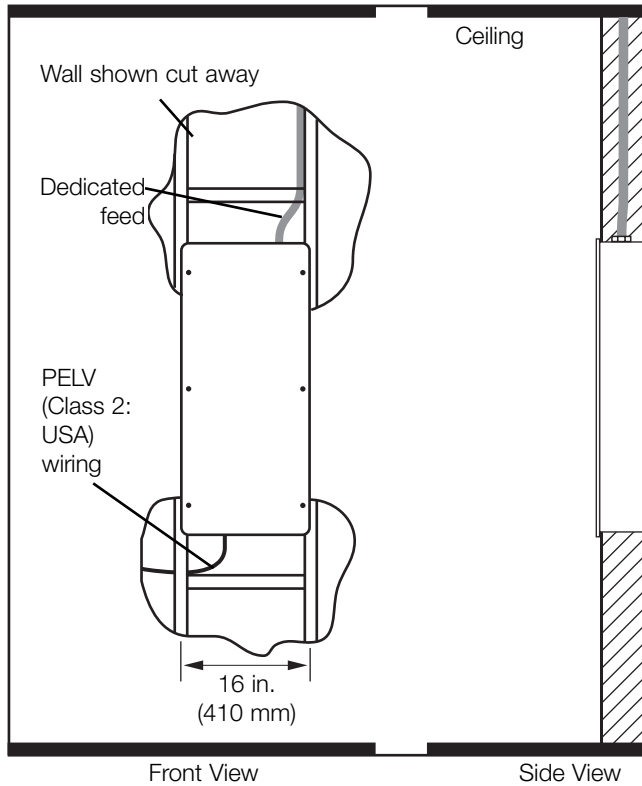
- Reinforce wall structure, if necessary. A processor panel weighs up to 50 lbs. (22 kg)
- Minimum clearance required:  
3 in. (76 mm) minimum above  
3 in. (76 mm) minimum below  
3 in. (76 mm) minimum in front
- Operating environment: 32-104 °F (0-40 °C); relative humidity less than 90% non-condensing
- For indoor use only

## Mount Processor Panel

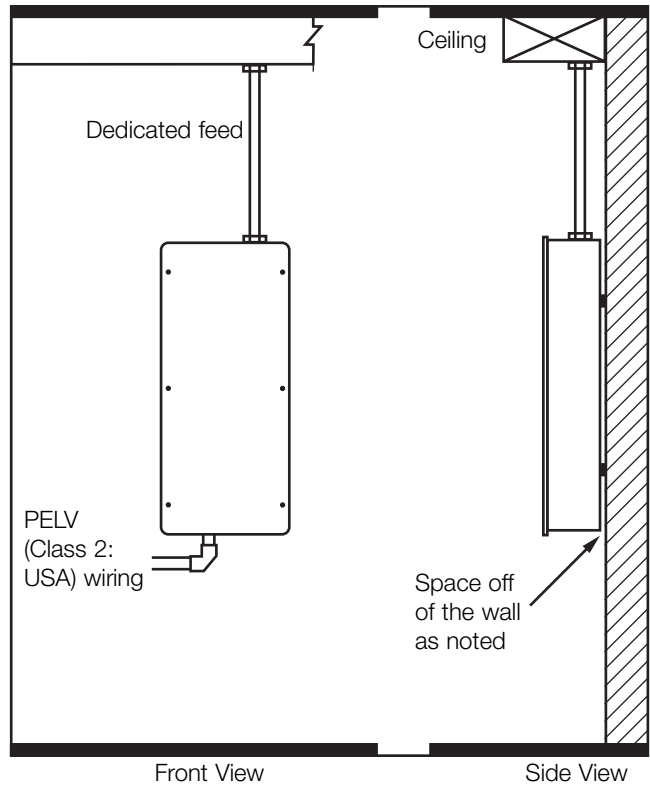
Mount the processor panel to the wall using either the recess (flush) or surface method shown on the following page. Remove the subplate before mounting processor panel enclosure. To do so, remove and save the bottom two subplate mounting screws and loosen the top two subplate mounting screws. Slide the subplate toward the top of the panel and lift out of enclosure.

# Processor Panels: Mounting (continued)

## Recess Mounting



## Surface Mounting



**Caution!** Water damages processors. Install this processor in a location where it will not get wet.

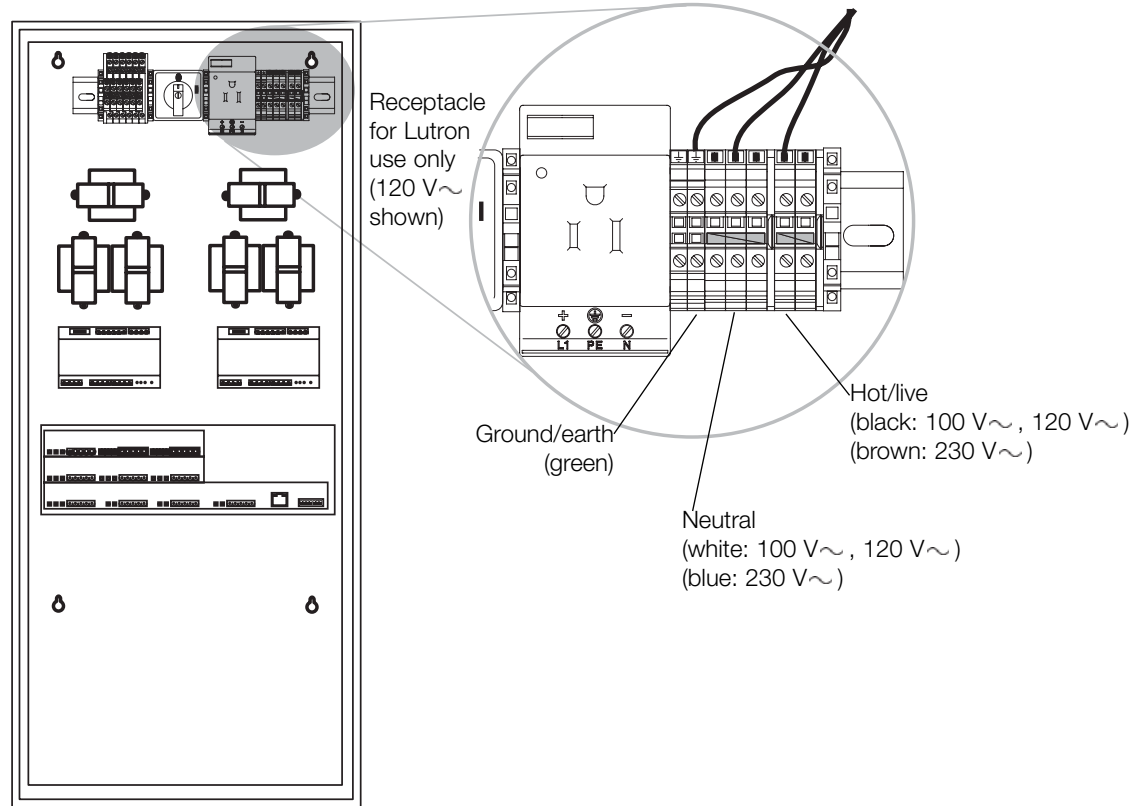
### Surface mounting notes

- Use spacers to ensure that back surface is 1/8 in. (3.2 mm) away from the wall; subplate mounting screws will protrude 1/8 in. (3.2 mm) behind the panel
- Use only the four holes indicated when surface mounting - other holes are for mounting the subplate

## Install Subplate

Reinstall the subplate in the processor panel enclosure using the four (4) screws that were loosened or removed with the subplate.

# Processor Panels: Line Voltage Wiring



## Notes

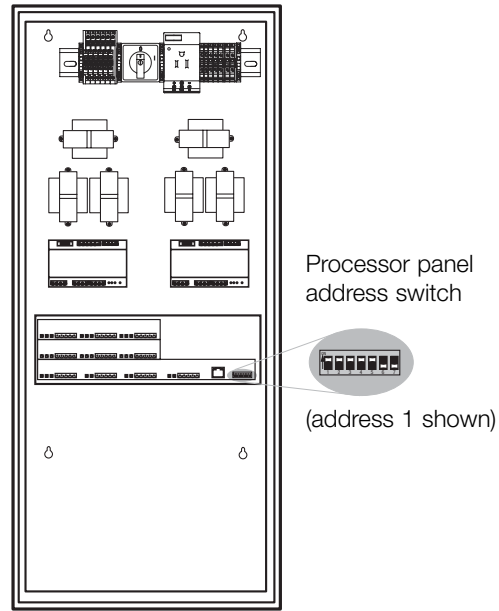
- Make sure line voltage feed wiring enters the processor from the top right
- Run a dedicated feed circuit (see Model Numbers section for feed rating)
- Run wiring so that line (mains) voltage is separate from PELV (Class 2: USA) wiring

# Processor Panels: Addressing

If there is only one processor panel in the system, leave its address as shipped (default is address 1). For proper operation, the address of the processor must match the address set in the *eLumen* software.

If there are two or more processor panels in the system, each must have a unique address between 1 and 32. The address switches may have been pre-set to give the address shown on the job drawings.

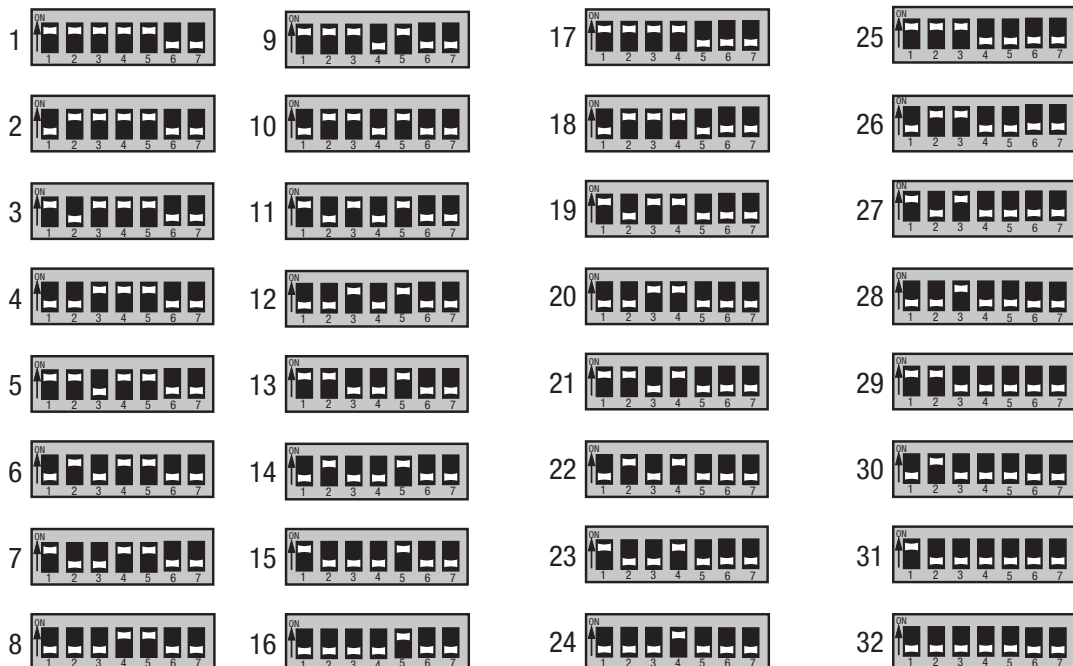
Use the chart below to see how to set the processor address switches to get a specific processor address. Set address switches 6 and 7 to the OFF (down) position.



GRAFIK 7000P processor panel with 6 links shown.

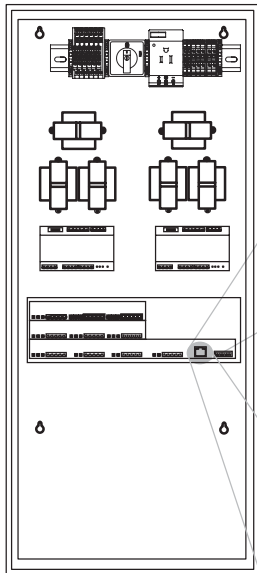
## Notes

- Processor panels may be pre-addressed by the factory; otherwise, they must be addressed during installation by the electrical contractor
- Processor panel address switches 1 through 5 should be set as shown below
- Set processor panel address switches 6 and 7 to the OFF (down) position



# Ethernet Wiring Options

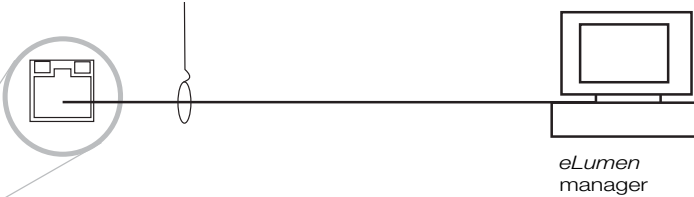
Copper Ethernet cabling can be used to connect a processor panel to the *eLumen* manager and other processor panels. Use proper LAN (local area network) wiring practices when running and terminating Ethernet cable. A single copper RJ45 jack is provided on the processor, which is used for communication from processor to *eLumen* manager and from processor to processor (in a multiprocessor system). The processor supports 10 or 100 BaseT operation. By default, the processor will automatically select the fastest supported Ethernet link speed.



Processor panel (GRAFIK 7000P with 6 links shown)

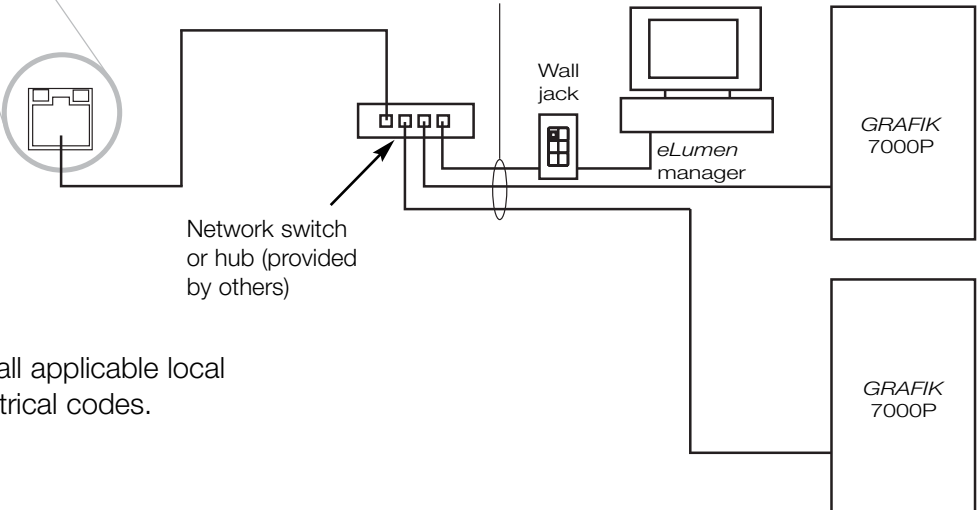
## I. Ethernet User Interface Only Wiring Option (Direct to Computer)

Ethernet data link from one *eLumen* manager to one processor:  
 (1) Category 5 UTP (unshielded, twisted pair) **crossover** cable



## II. Ethernet Wiring Option for User Interface and Interprocessor (with Network Switch or Hub)

Ethernet data link from *eLumen* manager to network interface to processor(s):  
 (1) each Category 5 UTP (unshielded, twisted pair) cable  
 The wall jack shown is an NT-6PS-WH with an RJ45 connector.



**Caution!** Follow all applicable local and national electrical codes.

### Notes

- Ethernet wiring is considered PELV (Class 2: USA); do not run in the same conduit as line (mains) voltage wiring
- Wiring distance for any single Ethernet data link segment is 330 ft. (100 m) max; use switches, hubs, or the RS485 Wiring Option for longer distances
- If all processors are connected to an *eLumen* manager over Ethernet, an RS485 connection is not required on the IP or UI links
- The Ethernet network parameters will be set using the *eLumen* software; the default IP address of each processor is 192.168.250.x, where x is the processor's address (the processor supports only fixed IP addresses)
- Processors communicate over the Ethernet network using TCP/IP and multicast UDP; a dedicated network must be used for the lighting control system

# RS485 Wiring Overview

RS485 wiring is the PELV (Class 2: USA) wiring used for the following links:

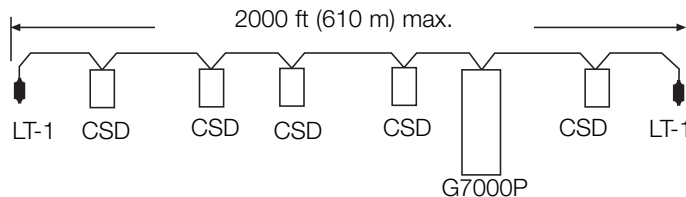
- Control station device (CSD) link(s)
- Local zone controller (LZC) link(s)
- Power panel (PP) link
- Interprocessor (IP) link  
(if not using the Ethernet wiring option)
- User interface (UI) link  
(if not using the Ethernet wiring option)
- Auxiliary (AUX) link

## Specifications and Notes

- Do not run PELV (Class 2: USA) RS485 wiring in same conduit as line (mains) voltage wiring; follow all applicable local and national electrical codes
- Each link must be daisy-chained; do not home-run wiring to individual devices
- The processor panel does not need to be at the end of any RS485 link (see drawing)
- Use a link terminator (LT-1) at each end of each RS485 link, with the exception of the LZC links, which do not require link terminators
- Connections to numbered terminals are wired 1 to 1, 2 to 2, 3 to 3, etc. on each of the CSD, PP, and IP links
- Total length of any RS485 link may not be more than 2000 ft. (610 m). This distance is based on proper shielding of the twisted shielded pair, #12 AWG (4.0 mm<sup>2</sup>) wire to terminal 1 and terminal 2 of the CSD link, and the use of a link terminator (LT-1) at each end of each non-LZC link
- If #12 AWG (4.0 mm<sup>2</sup>) wire is not used on terminals 1 and 2 of the CSD link, the maximum CSD link length must be de-rated; see chart. Length of LZC, PP, IP, and UI links do not need to be de-rated if smaller wire sizes are used on terminals 1 and 2



**Caution!** If link terminators (LT-1) are not used when needed, or improper wiring topology is employed, the system may not communicate reliably.



Example of daisy chain wiring:

Do not home-run individual device wiring.

Processor panel may be located at any point on link.

- A link booster (MX-RPTR) can be used to increase the CSD or PP link length by another 2000 ft. (610 m), to a maximum of 3 link boosters and 8000 ft. (2 440 m); link boosters cannot be used on LZC links
- RS485 communication is a stream of low-voltage data. Suggestions listed on this page help to keep that communication reliable:
  - Proper shielding blocks noise
  - LT-1 termination stops “data reflection” from corrupting data on the link
  - Daisy-chaining eliminates multiple “data reflection” paths
  - #12 AWG (4.0 mm<sup>2</sup>) wire on terminals 1 and 2 of the CSD link minimizes power loss to the CSDs

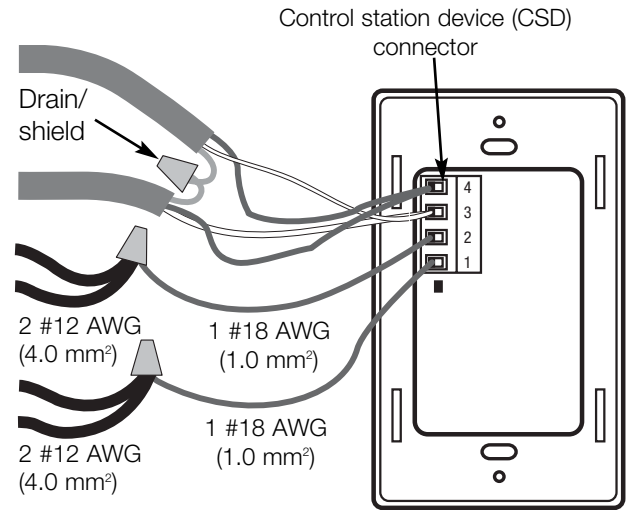
Terminals 1 & 2 Wire Sizes	Maximum CSD Link Length
#12 AWG (4.0 mm <sup>2</sup> )	2000 ft. (610 m)
#14 AWG (2.5 mm <sup>2</sup> )	1400 ft. (425 m)
#16 AWG (1.5 mm <sup>2</sup> )	900 ft. (275 m)
#18 AWG (1.0 mm <sup>2</sup> )	600 ft. (180 m)



# RS485 Wiring Overview (continued)

## Additional RS485 Wiring Notes

- Two #12 AWG (4.0 mm<sup>2</sup>) wires cannot fit into most device connectors on an RS485 link. Use a screw-on connector (or other approved connector) to “T-tap” a #18 AWG (1.0 mm<sup>2</sup>) wire to each connector terminal, as needed. Make this “T-tap” in the wallbox in order to keep the length of the new #18 AWG (1.0 mm<sup>2</sup>) wire(s) as short as possible
- Connect the uninsulated drain or shield wire(s) to terminal D or Shield whenever present. If there is no terminal D or Shield, connect the two drain/shield wires together, making a continuous shield throughout the link. If the device at the end of the link does not have a D or Shield terminal, terminate the wire and leave it disconnected.
- Do not allow any part of the drain/shield wire to touch ground (earth) or any electrical circuitry
- CSDs should be mounted in metal wallboxes that are connected to grounded conduit. Grounding the metal mounting plate via mounting to a grounded metal wallbox keeps electrostatic discharge from affecting the devices on the RS485 link.



### Approved sources of wire include:

Twisted-shielded pair (data wires) only:

- Belden #9461
- Alpha #2211

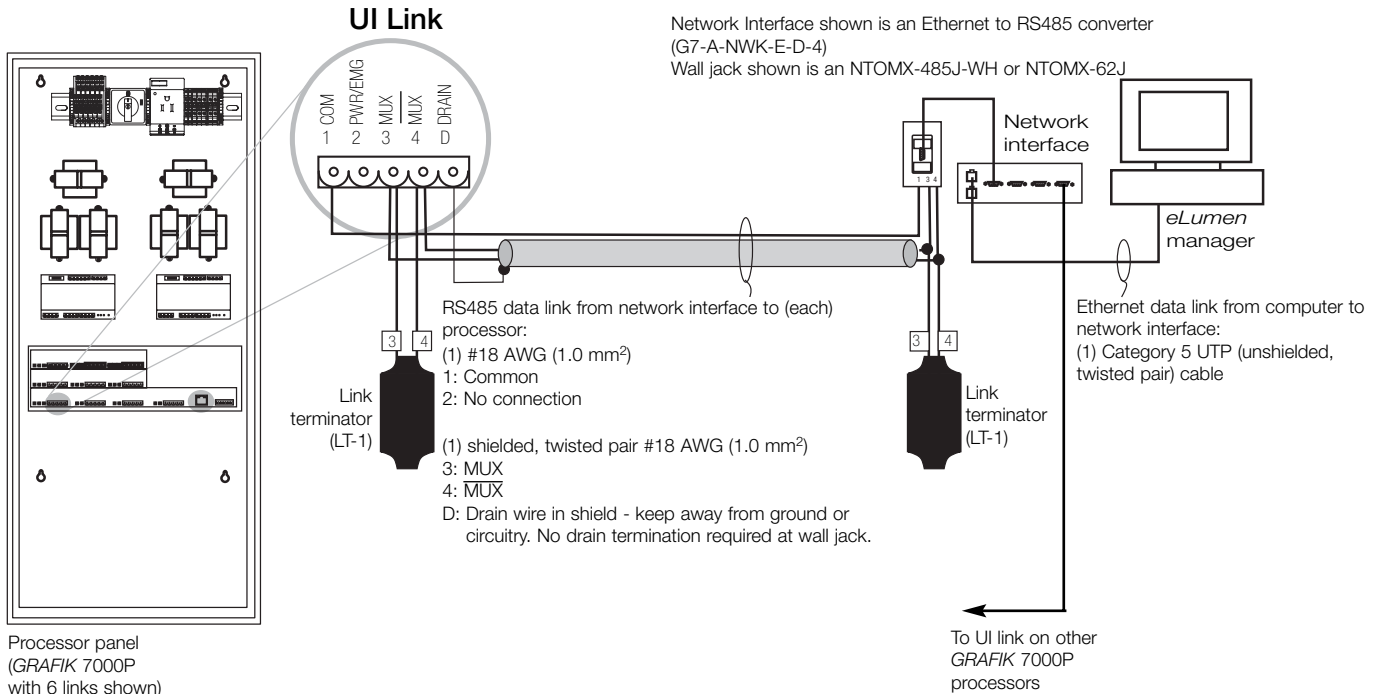
One-cable solutions (data link, control power wiring, and sense line in one cable):

- Lutron GRX-CBL-46L-500 (non-plenum rated)
- Lutron GRX-PCBL-46L-500 (plenum rated)
- Belden, Alpha, Liberty, and Signature have approved cables; ask for *GRAFIK Eye* cable

Note: Sense line is used only on PP link.

# User Interface (UI) RS485 Link Wiring

An RS485 user interface (UI) link connection, wall jack, and network interface box are required if the processor panels are not connected via Ethernet. Follow the diagram below for wiring the UI link. The network interface and *eLumen* manager will be wired and configured at commissioning time by Lutron Services personnel.



**Note:** Label shown is on top of processor assembly. Connectors are located on bottom surface of processor assembly.

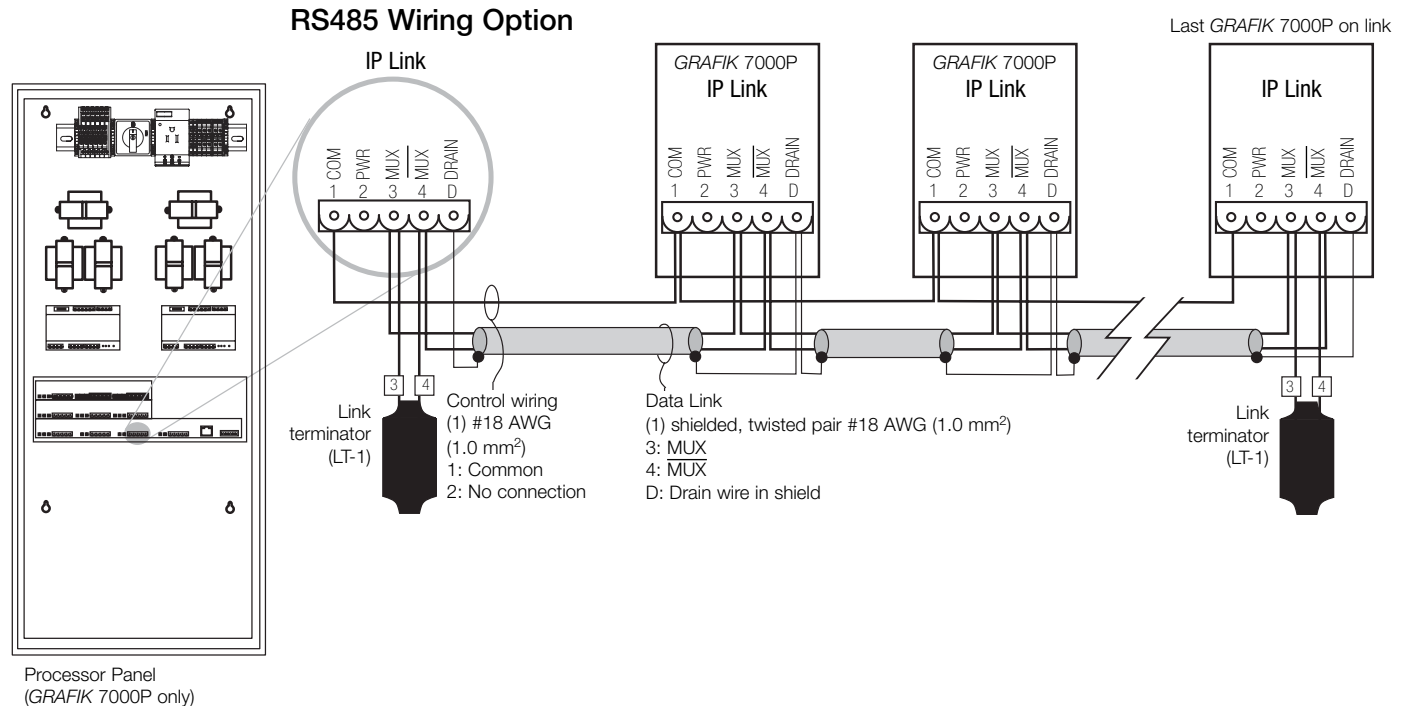
## Notes

- Leave terminal 2 (PWR) of the processor's UI link unconnected
- One UI link connection is required for each processor; multiple processors cannot be connected to the same UI link
- Wiring the UI link via RS485 is not necessary if the processor is connected via Ethernet (See Ethernet Wiring Options for details)
- See RS485 Wiring Overview for approved cable options and additional information when using the RS485 wiring method

# Interprocessor (IP) RS485 Link Wiring

## GRAFIK 7000P processor only

An RS485 interprocessor link connection is required if the processor panels are not connected via Ethernet. Wire the interprocessor link to all GRAFIK 7000P processor panels as shown below.



**Note:** Label shown is on top of processor assembly. Connectors are located on bottom surface of processor assembly.

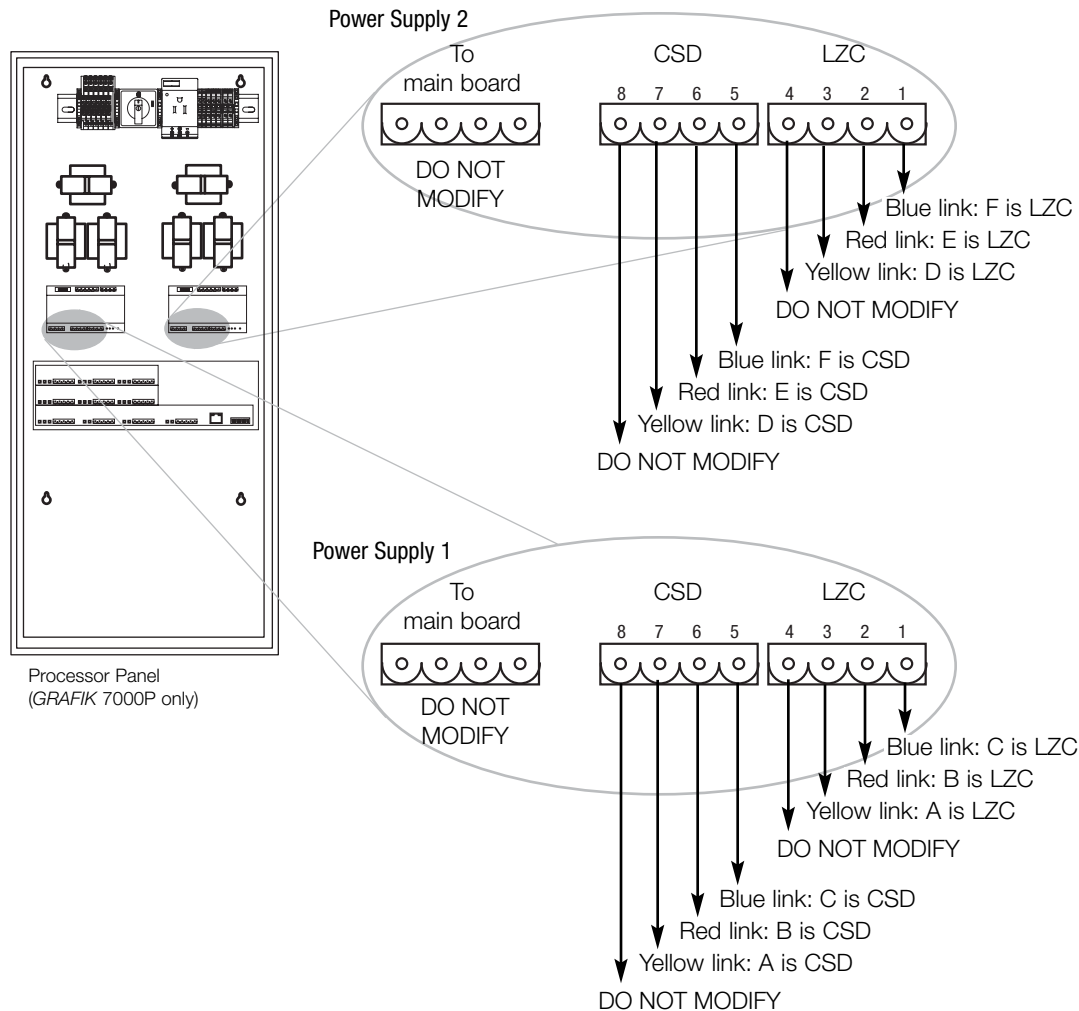
### Notes

- Leave the PWR connection of the processor's IP link unconnected
- Wiring the interprocessor link via RS485 is not necessary if the GRAFIK 7000P processors are connected via Ethernet (see Ethernet Wiring Option for User Interface and Interprocessor)
- Follow the job drawings to determine the proper IP link wiring option
- See RS485 Wiring Overview for approved cable options when using the RS485 wiring option
- See Appendix for details on enabling an emergency/override contact closure on a multi-processor system

# Power Supply Configuration

## GRAFIK 7000P processor only

The power supply modules must be properly configured for communicating with either lighting zone controllers (LZCs) or control station devices (CSDs) on each link. Use the table below to find the row for each link used in your system, and confirm that the proper color wire is connected to the proper terminal on the corresponding power supply for your link type.



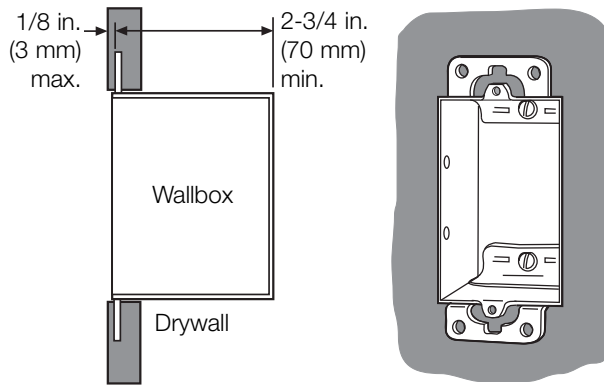
Link	Power Supply #	To Connect CSDs to Link	To Connect LZCs to Link
A (yellow wire)	1	Use terminal 7	Use terminal 3
B (red wire)	1	Use terminal 6	Use terminal 2
C (blue wire)	1	Use terminal 5	Use terminal 1
D (yellow wire)	2	Use terminal 7	Use terminal 3
E (red wire)	2	Use terminal 6	Use terminal 2
F (blue wire)	2	Use terminal 5	Use terminal 1

### Notes

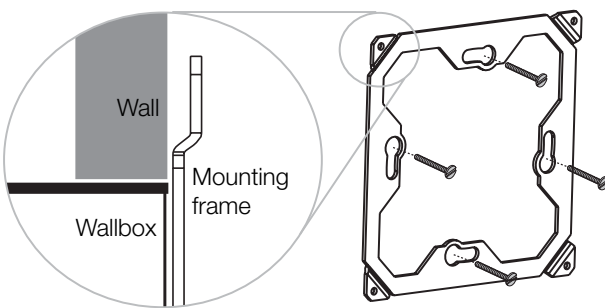
- Processor panels generally come properly wired from the factory for CSD and LZC links; if field adjustment is required, follow the diagram above
- Do not modify the connections to the MB terminals
- Unused or undefined links should be connected to the CSD connector

# Control Station Devices (CSDs): Mounting Wallboxes

- Use wallboxes with a minimum depth of 2-3/4 in. (70 mm) for control station devices (CSDs); wallboxes are required only for CSDs
- Multigang installations may require spacers between wallboxes
- Mount wallboxes between flush and 1/8 in. (3 mm) below finished wall surface
- Finished wall should not have gaps around the wallbox of greater than 1/8 in. (3 mm)
- Ground metal wallboxes whenever possible
- See the instructions sent with each individual CSD for device-specific mounting requirements and instructions.



Mounting of a single-gang US wallbox shown.

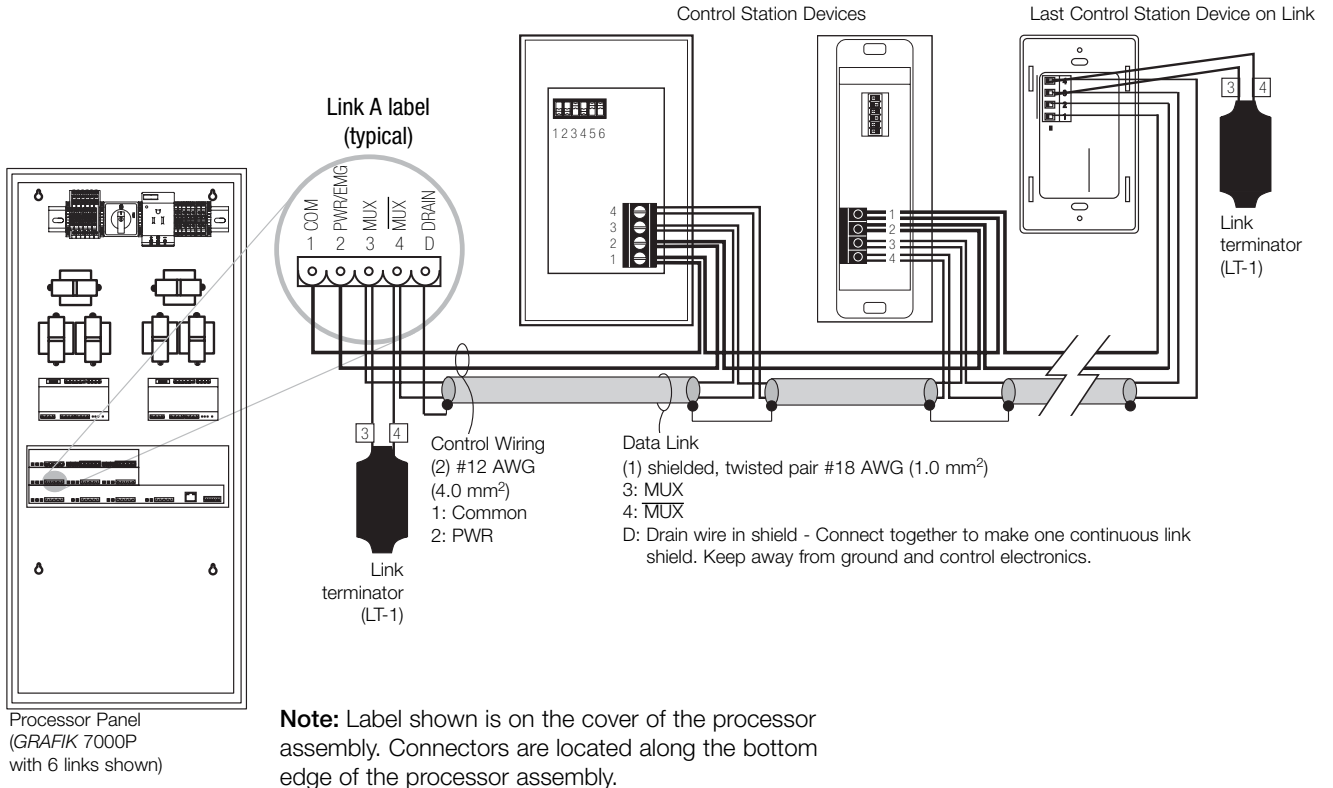


Mounting frame orientation of a single-gang EOMX product shown.

NOTE: European backbox required.

# Control Station Devices (CSDs): Link Wiring

Wire the control station device link to all control station devices as shown below. See instruction sheets provided with each control station device for location of CSD (wallstation) link connector.



## Notes

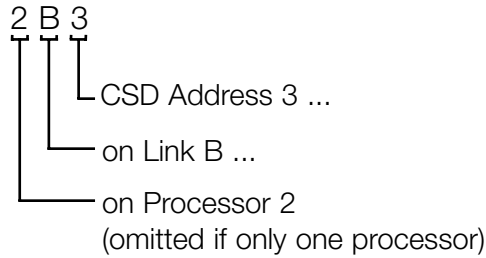
- Follow the job drawings to connect control station devices to the proper link on the processor (link A-F)
- It is not necessary to have the processor panel at the end of the CSD link
- See RS485 Wiring Overview for approved cable options
- Links A through F can be used as either CSD or LZC links in a GRAFIK7000 system; function is defined using *eLumen* software



# Control Station Devices (CSDs): Addressing

Each device on the control station device (CSD) link must have a unique address ranging from 1 to 32. The address switches may have been preset to give the address shown on the job drawings.

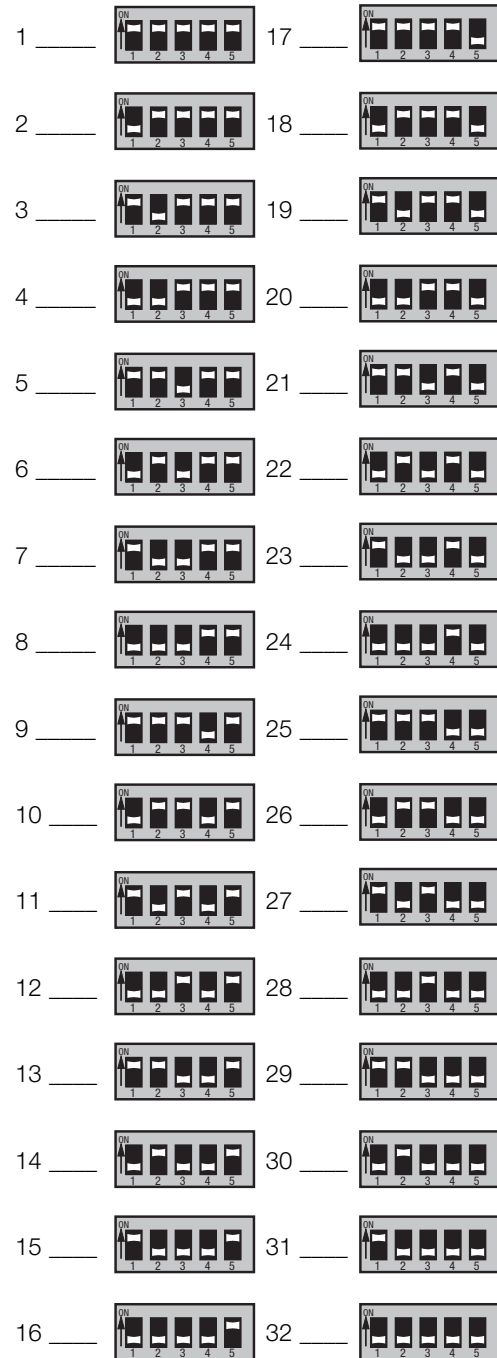
Job drawings may show:



If the address switches were not preset (all set to address 1), assign each CSD a unique address based on the information provided in the job drawings. For proper operation, the address of the CSD must match the address given in the *eLumen* software.

The chart at right shows how to set the address switches for each specific address.

If needed, refer to the instructions provided with each CSD to help locate its address switches, or to set switches other than 1 through 5.



## Notes

- GRAFIK Eye® control units (OMX-46xx and OMX-36xx) and Viseo® control units (OMX-VDC) do not have address switches and must be programmed with a unique address; see separate instructions sent with these devices for complete addressing instructions
- Handheld programmers and handheld programmer jacks do not require an address



**Caution!** Turn power OFF to system before addressing the control station devices.

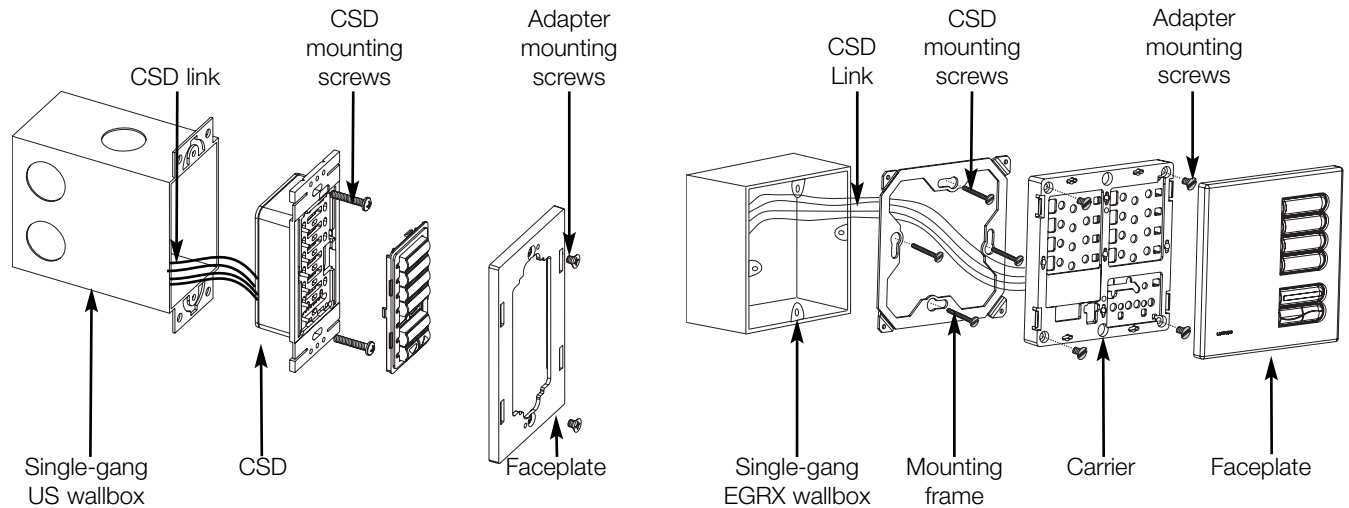


**Caution!** Do not install a CSD without confirming that the address switches have been properly set. Improper addressing will prevent proper system operation.

# Control Station Devices (CSDs): Installation

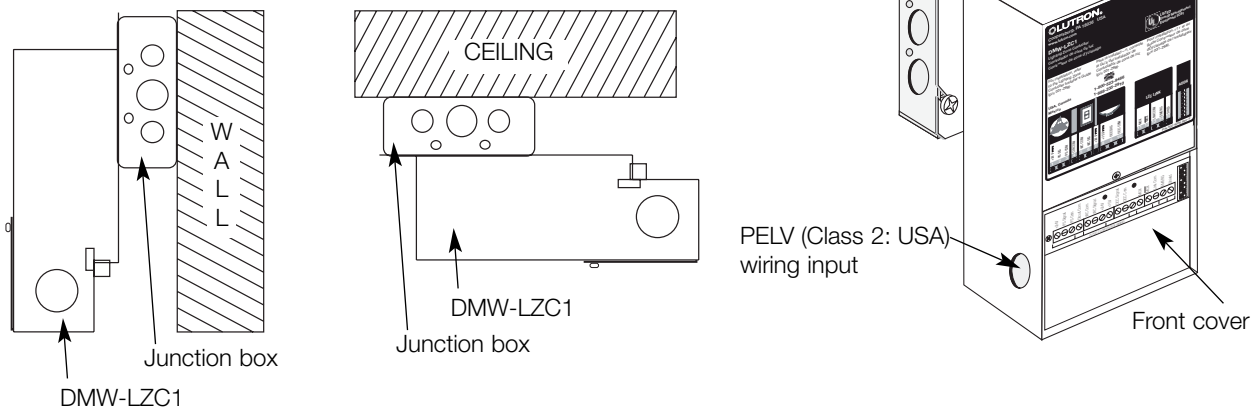
After confirming that each control station device (CSD) is addressed, install them into the wallboxes.

See the instructions sent with each individual CSD for detailed installation instructions.



# Lighting Zone Controllers (LZCs): Installation

Install lighting zone controllers (LZCs) only after confirming they have been properly addressed. See the instructions sent with each individual LZC for detailed installation instructions, as well as panel mounting directions for panel-based LZCs.

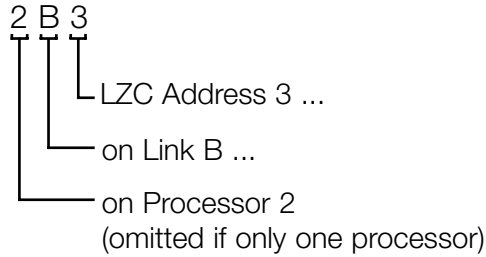


(Lighting zone controller panels not shown.)

# Lighting Zone Controllers (LZCs): Addressing

Each device on the lighting zone controller (LZC) link must have a unique address ranging from 1 to 63. The address switches may have been factory preset to the address shown on the job drawings.

Job drawings may show:



If the address switches were not preset (all set to address 1), assign each LZC a unique address and document its location and description. For proper operation, the address of the LZC must match the address given in the *eLumen* software. If needed, refer to the instructions for each LZC or LZC panel to help locate its address switches, or to set switches other than 1 through 6. The chart shows how to set the address switches to get a specific address.

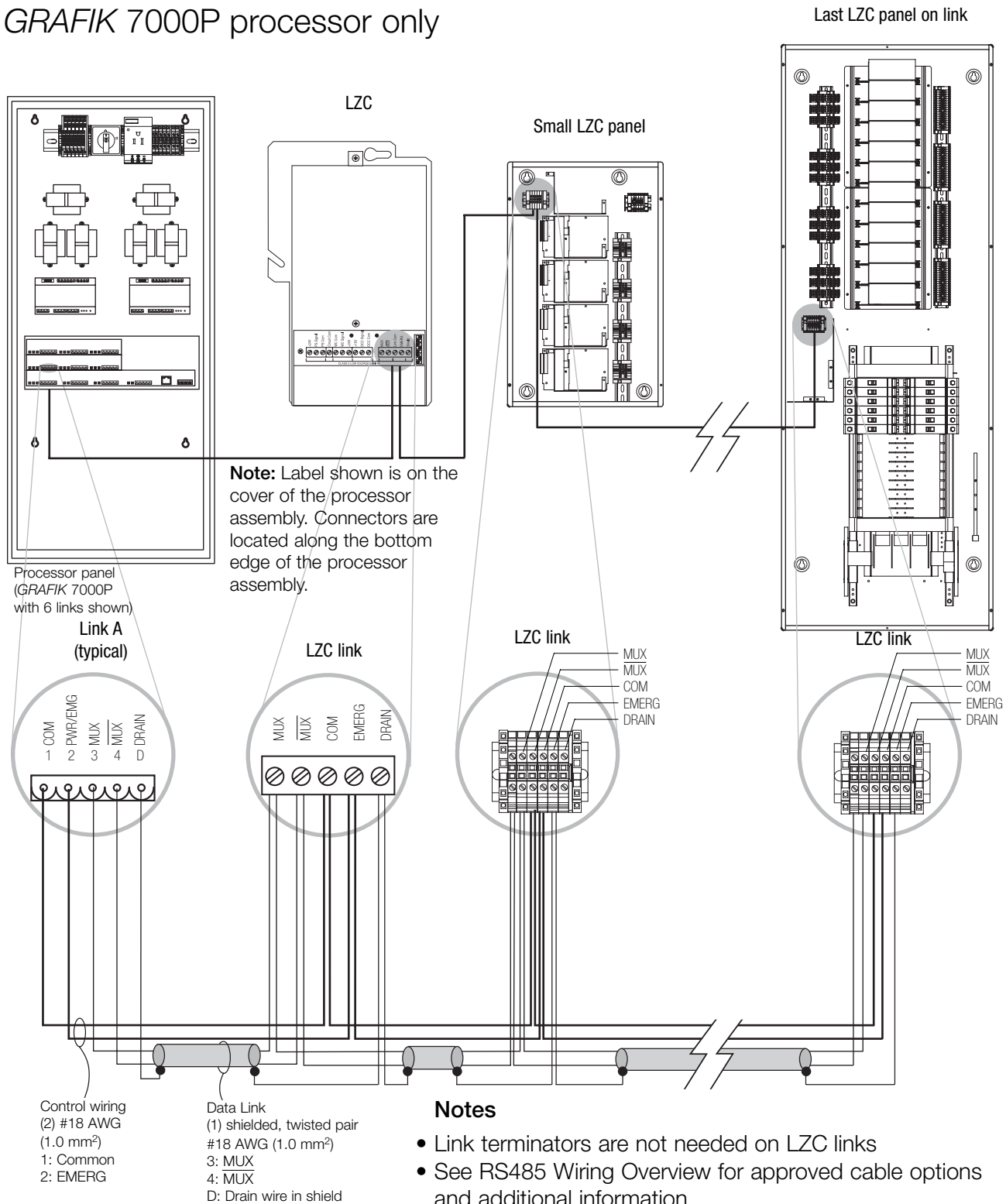


**Caution!** Turn power OFF to system before addressing the control station devices.

1		17		33		49	
2		18		34		50	
3		19		35		51	
4		20		36		52	
5		21		37		53	
6		22		38		54	
7		23		39		55	
8		24		40		56	
9		25		41		57	
10		26		42		58	
11		27		43		59	
12		28		44		60	
13		29		45		61	
14		30		46		62	
15		31		47		63	
16		32		48			

# Lighting Zone Controllers (LZCs): Link Wiring

GRAFIK 7000P processor only



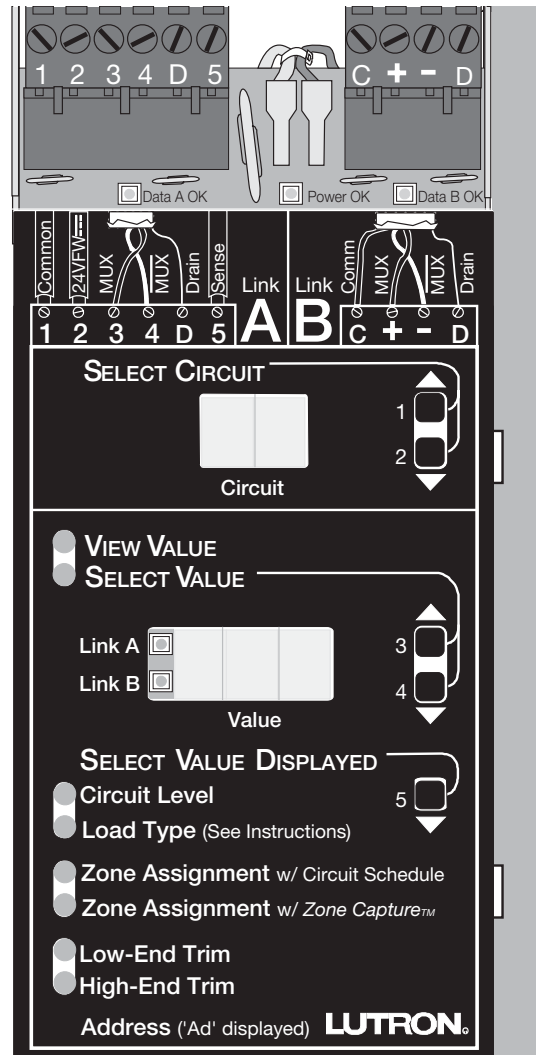
# Power Panels (PPs): Addressing and Installation

Each power panel must have a unique address on the power panel link. Power panels are not pre-addressed by the factory. For proper operation, the address of the circuit selector in the power panel must match the address set in the *eLumen* software. Without the unique address, the processor panel cannot communicate and download system settings to the power panel.

Refer to job drawings to see the intended address of each power panel. Set the address by manually programming the circuit selector within each power panel. See instructions provided with each power panel for the addressing procedure.

If the job drawings do not include an address, document the power panel's location and model number for each address. This information will be needed to set up the system properly.

See the instructions sent with each individual power panel for detailed installation and line voltage wiring instructions.



Circuit selector used to address power panel

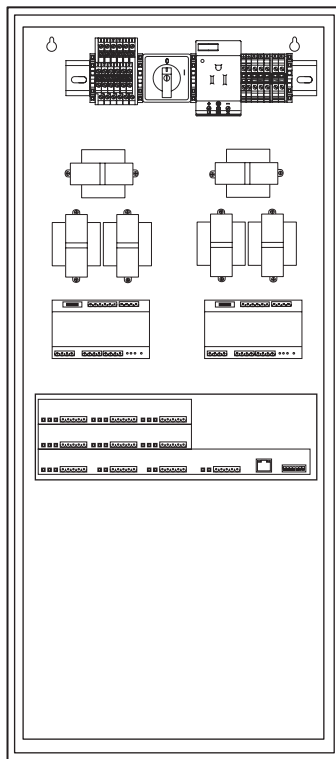


# Power Panels (PPs): Set Normal/Emergency Panel Selector Switch

## GRAFIK 7000P processor only




The normal (non-essential)/emergency (essential) switch located on the power supply board in the processor panel determines the operation of lighting zone controller and power panel zones on the processor in the case of a power loss or emergency condition. (The switch is not needed if no LZCs are being used.) Functionality of power panel zones is determined by the Normal/Emergency panel selector switch located in each power panel. See the installation manual for each power panel for help locating the Normal/Emergency switch.

GRAFIK 7000P processor panel



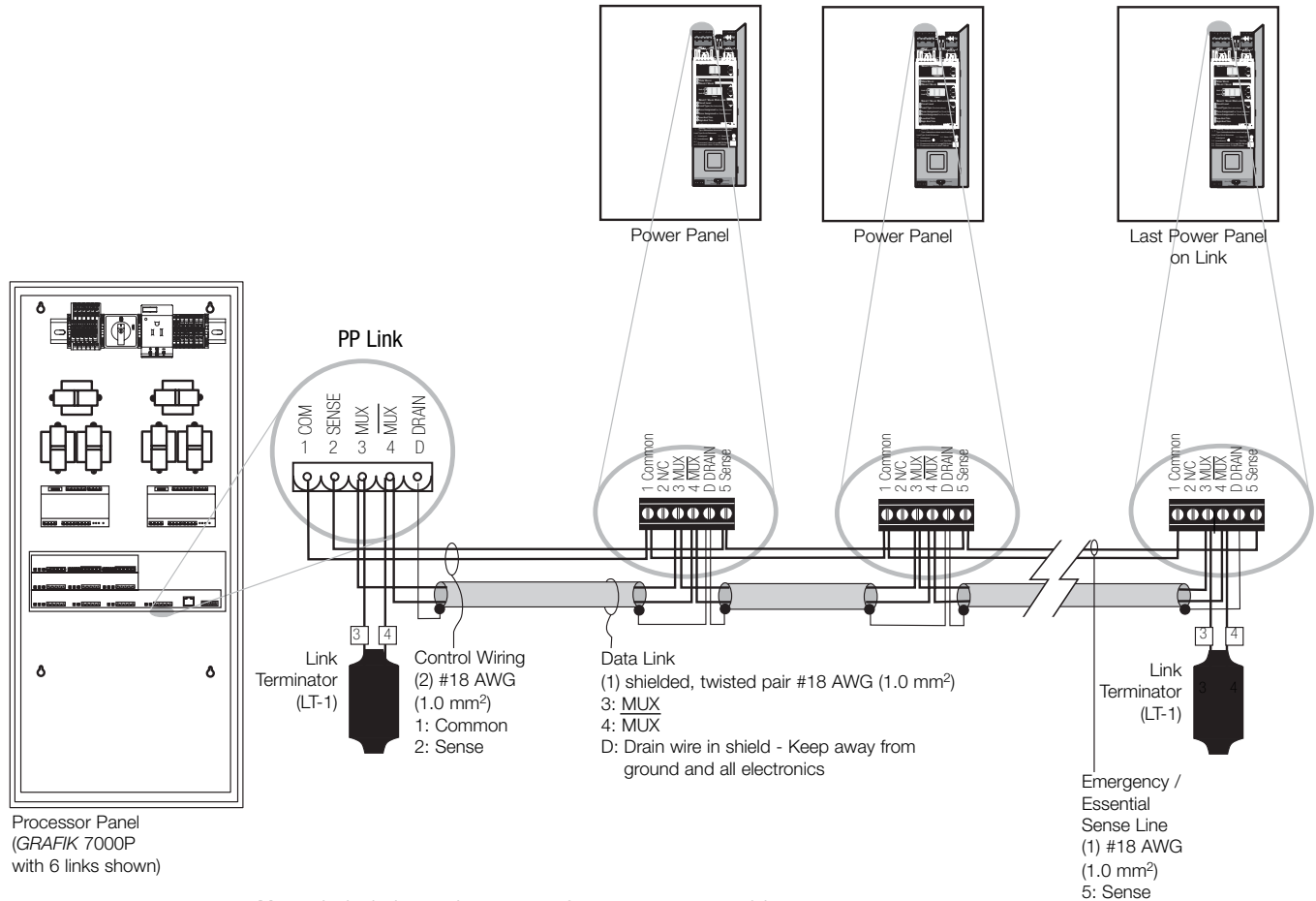
### Notes

- If no power panels are installed, the Normal/Emergency panel selector switch must be set to the “Ignored” position
- LZCs in emergency mode will be forced to their user-configured emergency level. Power panels in override mode will be forced to their user-configured override level. Levels are set using the *eLumen* software.
- Contact Lutron for applications where only a subset of LZCs should enter emergency mode during a power loss or emergency condition
- A LUT-ELI-3PH is needed for each processor panel to make the lighting control system UL-924 compliant. The LUT-ELI-3PH can put the entire lighting system into emergency/override mode due to power loss or external contact closure. See the installation guide provided with the LUT-ELI-3PH for complete details.
- A LUT-ELI-3PH initiating an emergency condition will cause all lighting zone controller zones to enter emergency mode and all power panel zones to go to their override level if their corresponding panel selector switch is set to Emergency (essential) and they are all wired to the same SENSE line. This will occur regardless of the status of all Normal panels.

Switch Position	Description	Operation of LZCs	Operation of Power Panels
Left 	Normal (non-essential)	Lighting zone controllers connected to an LZC link on this processor panel will enter emergency mode when power is lost to this processor panel and all power panels on the power panel link that are set to Normal.	Power panels connected to the power panel link on this processor will enter emergency mode when power is lost to this processor panel and all power panels on the power panel link that are set to Normal.
Center 	Ignored	Lighting zone controllers connected to an LZC link on this processor panel will enter emergency mode when power is lost to this processor panel and all power panels on the power panel link that are set to Normal.	This processor panel has no effect on power panels connected to the power panel link of this processor.
Right 	Emergency (essential)	Lighting zone controllers connected to an LZC link on this processor panel will enter emergency mode when power is lost to all power panels on the power panel link that are set to Normal.	This processor panel has no effect on power panels connected to the power panel link of this processor.

# Power Panels (PPs): Link Wiring

Wire the power panel link to all power panels as shown below. See instruction sheets provided with each power panel for complete wiring and mounting instructions.

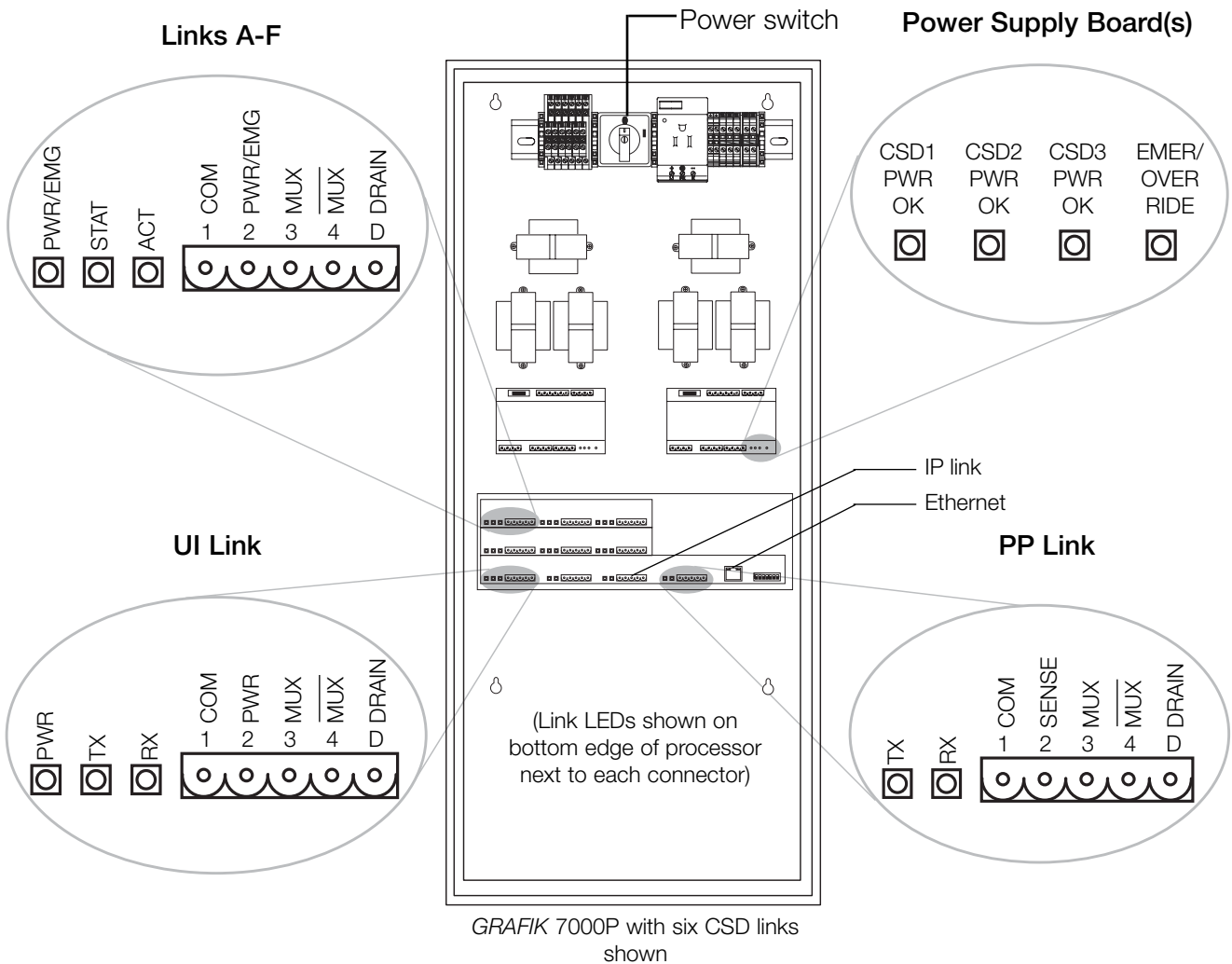


## Notes

- It is not necessary to have the processor panel at the end of the PP link
- The power panel link's sense wire is used whenever there is a panel being supplied by an emergency/essential feed; see power panel instructions for more details
- See RS485 Wiring Overview for approved cable options

# Activate System

Once all links are installed and wiring is verified, turn the Processor Panel power switch ON (rotate clockwise to the position marked 1). After 10 seconds, compare the diagnostic LEDs shown below to those listed in the Troubleshooting Guide.



## Note

Your processor panel may have been pre-programmed at the factory for operation with your system. If all wiring has been successfully completed, control station devices should be able to control loads that are not wired in bypass.

You have completed your *GRAFIK5000, 6000, or 7000* system installation. For Onsite Factory Commissioning, call Lutron Technical Support and select Startup to schedule a field service visit. Allow for 10 working days between day of call and scheduled visit.

In the U.S., Canada, and the Caribbean: 1.800.523.9466

In Mexico: 888.235.2910

In Europe: +44.207.702.0657

In Asia: +65.6220.4666

In Japan: +81.355.758.411

In all other countries: +1.610.282.6701

# Troubleshooting Guide

## LED Diagnostics

Location of LED		Name	Normal Operation	Problem Indicator / Possible Cause	
Processor Panel	Power Supply Board	CSD PWR OK	On	Off	<ul style="list-style-type: none"> <li>No power from transformer - check if power feed and power switch are On</li> <li>Processor panel is in emergency state; check Normal/Emergency panel selector switch or Sense connection on PP link</li> </ul>
		EMER OVER RIDE	Off	On	
	Link A-F	PWR EMG	On (for CSD link) Off (for LZC link)	Off On	<ul style="list-style-type: none"> <li>Short on CSD Link - check wires 1 and 2</li> <li>LZCs are in emergency mode; check Normal/Emergency panel selector switch or Sense connection on PP link</li> <li>Processor in self-test - contact Lutron</li> <li>No database loaded; transfer database using <i>eLumen</i> software</li> <li>Link is not used in database</li> </ul>
		STAT ACT	Flashes Rapidly Flashes Rapidly	Off Off	
	PP Link	TX	Flashes Rapidly	Off	<ul style="list-style-type: none"> <li>No database loaded; transfer database using <i>eLumen</i> software</li> <li>No data received - power panels not addressed or check wires 1, 3, and 4</li> </ul>
		RX	Flashes Dimly	Off	
	IP Link	TX	On Dim	Off	<ul style="list-style-type: none"> <li>No database loaded; transfer database using <i>eLumen</i> software</li> <li>No data received - link not used or check wires 1, 3, and 4</li> </ul>
		RX	On Dim	Off	
	UI Link	PWR TX	On Irregular Flash	Off Off	<ul style="list-style-type: none"> <li>Short on UI Link - check wires 1 and 2</li> <li>No communication to computer - check wires 1, 3, and 4 - or RS485 option not used</li> <li>No communication from computer - check wires 1, 3, and 4 - or RS485 option not used</li> </ul>
		RX	Irregular Flash	Off	
Ethernet	ACT LNK	Irregular Flash On	Off Off	<ul style="list-style-type: none"> <li>No activity on network, if connected</li> <li>No network detected or network not used</li> </ul>	
CSD	Front of CSD	none	On (if button pressed)  Flash	<ul style="list-style-type: none"> <li>No power - wires 1 and 2 miswired</li> <li>If On then Off, CSD not programmed in <i>eLumen</i></li> <li>Those that flash may have the same address</li> <li>Miswire - check wires 1, 3, and 4</li> </ul>	
Power Panel	Circuit Selector	DATA PWR	Flashes 1/sec On	Rapid Off	<ul style="list-style-type: none"> <li>Miswire of wires 3 and 4</li> <li>Control Breaker off</li> </ul>
	Dimmer / Module	None	Flashes 1/sec	Slow Rapid	<ul style="list-style-type: none"> <li>No communication from Circuit Selector</li> <li>Shorted Triac - contact Lutron</li> </ul>

### LED problem indicators:

- “Flash” on CSD is all LEDs turning On for approximately 1 second, then off 3 seconds
- “Rapid” on a Circuit Selector is any rate faster than the “Heartbeat” of once per second
- “Rapid” on a Dimmer/Module is one LED turning On approximately 5 times per second
- “Slow” on a Dimmer/Module is one LED turning On approximately once per 7 seconds

# Maintenance Guide

---

Lutron products are designed to have minimal maintenance requirements. For more information on any product, refer to its specific installation and maintenance documentation.

## Control Station Devices (CSDs)

Clean front surface with a soft towel moistened with a mild soap solution (non-ammonia based). Clean approximately every six months. Do not spray cleaning solution directly at any CSD.

## Power Panels

Visually inspect installation periodically - keep air flow clear of obstructions. Power panels generally need 12 in. (300 mm) of clearance above, below, and in front of the enclosure.

## Lighting Zone Controller Panels

Visually inspect installation periodically - keep air flow clear of obstructions. Lighting zone controller panels generally need 12 in. (300 mm) of clearance above, below, and in front of the enclosure.

## Processor Panels

There are no maintenance requirements for these products. Clean the front cover as needed.

## Other

See instructions supplied with individual products for any other recommendations for maintenance.



**Danger!** Turn power off before working on any load. See instructions supplied with individual power panels.



**Warning!** When working on any load (such as rewiring a load), replace the bypass jumpers to protect the power panels or lighting zone controller panels until the load is proven. See appropriate installation guides for details.



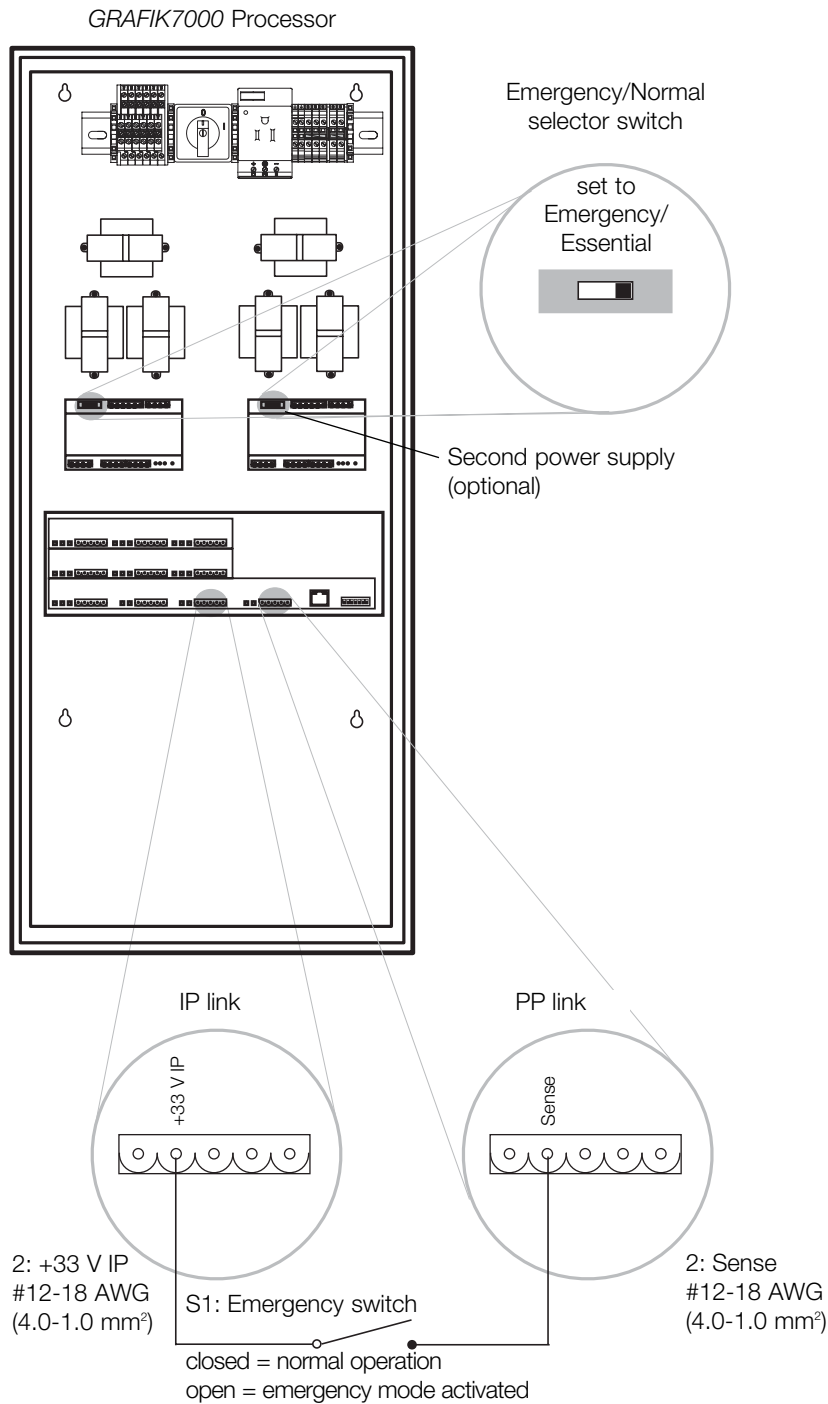
**Danger!** Any liquid that enters products with line (mains) voltage may reach internal components, cause personal injury, damage the equipment, and void the warranty.

# Appendix: Using the *GRAFIK7000* Processor with Emergency Systems

The GRAFIK7000 processor offers several options to integrate with emergency systems. Follow the example scenarios below, or contact the Lutron Technical Support Center.

## Scenario 1: Single-Processor System with Lighting Zone Controller (LZC) Zones Only

1. Set Normal/Emergency switch on power supply (or supplies) to Emergency (Essential) position.
2. Wire terminal 2 (+33 V IP) on IP link to terminal 2 (SENSE) on PP link through a normally closed (NC) switch.
3. All LZC units connected to this processor will go to their programmed emergency light level when switch S1 is opened or power is lost to this processor panel.



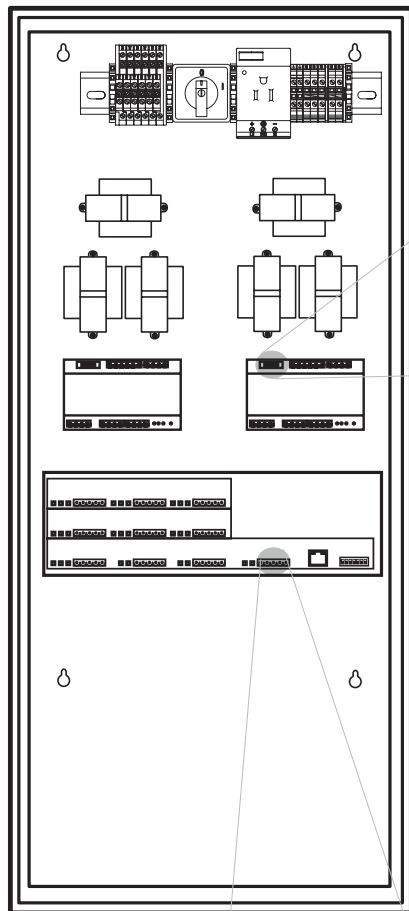


# Appendix: Using the *GRAFIK7000* Processor with Emergency Systems (continued)

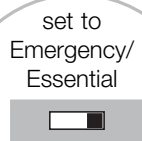
## Scenario 2: Single-Processor System with Lighting Zone Controller (LZC) and Power Panel (PP) Zones

1. Set Normal/Emergency switch on at least one processor or power panel to Normal. Other panels should have their Normal/Emergency switch set to emergency.
2. Wire the PP link connector on the processor to all power panels.
3. Wire an optional normally open (NO) switch between SENSE and COMMON.
4. All LZC and PP zones on panels set to Emergency will go to their emergency or override light levels when switch S1 is closed or power is lost to **all** panels set to Normal.

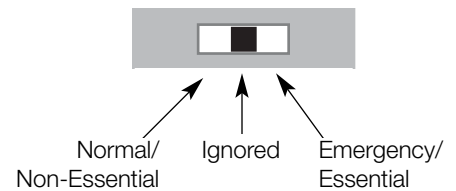
GRAFIK7000 Processor



Emergency/Normal selector switch



Switch Settings

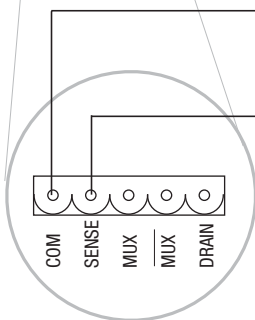


Emergency/Normal selector switch

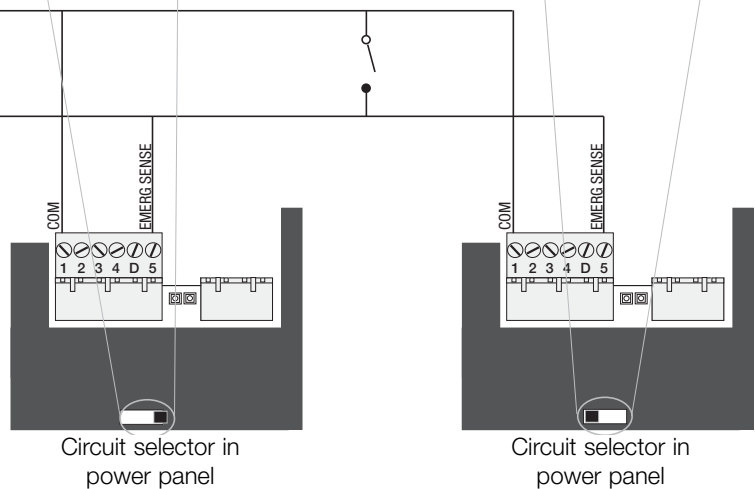


S1: Emergency switch  
open = normal operation  
closed = emergency/override active

- 1: COM
- 2: SENSE
- #12-18 AWG  
(4.0-1.0 mm<sup>2</sup>)



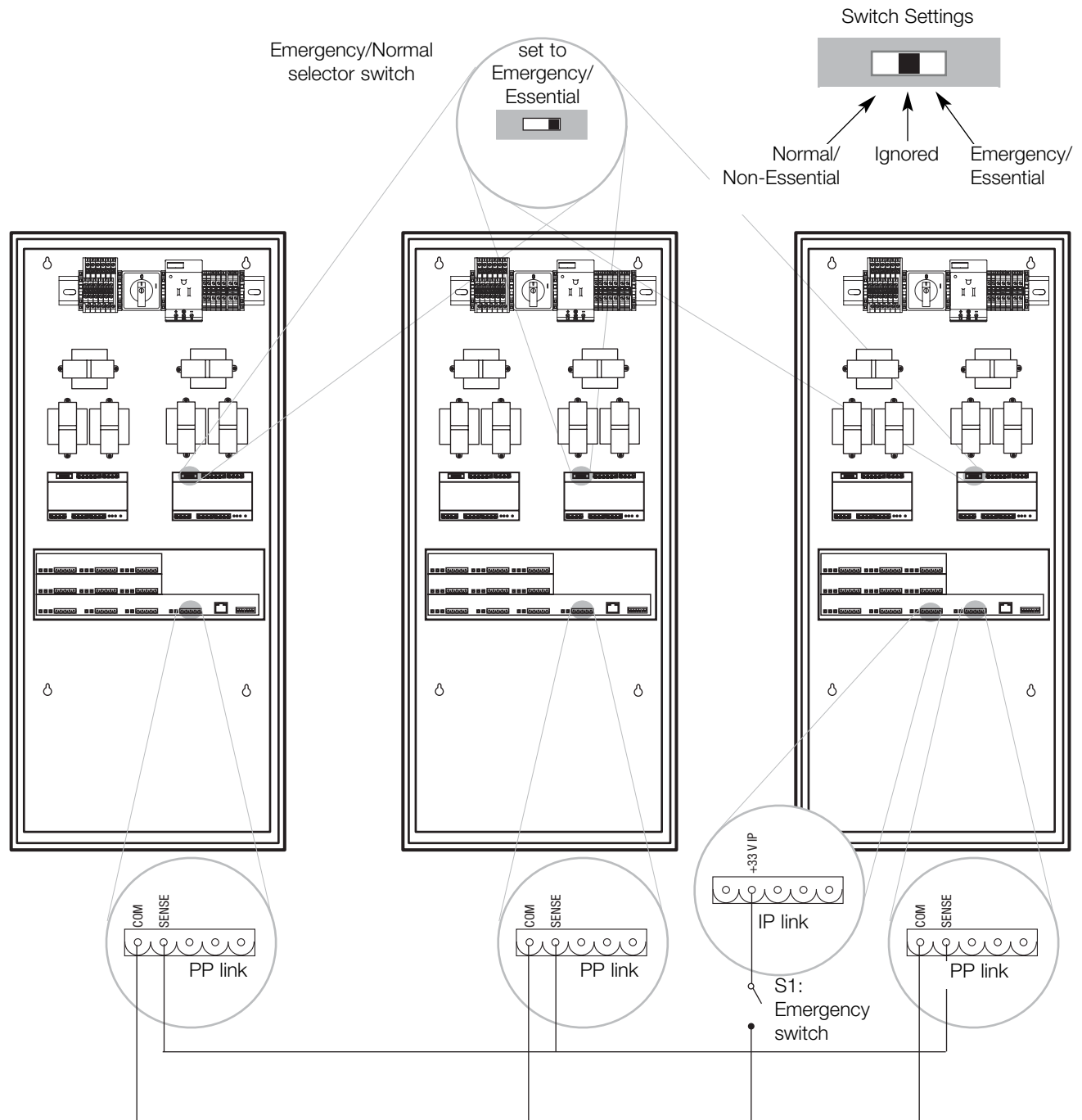
PP link  
Note: Connections to MUX and MUX terminals required, but not shown. Refer to "Power Panels: Link Wiring"



# Appendix: Using the *GRAFIK7000* Processor with Emergency Systems (continued)

## Scenario 3: Multi-Processor System with Lighting Zone Controller (LZC) Zones

1. Set Normal/Emergency switch in all processor panels to the Emergency/Essential position.
2. Wire each processor's PP link terminal 1 (COM) and 2 (Sense) together.
3. In one processor panel, connect a normally closed (NC) switch between IP link terminal 2 (+33 V IP) and PP link terminal 2 (Sense).
4. All LZCs on all panels will go to their emergency light level when switch S1 is opened, or when power is lost to the processor where switch S1 is connected.



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## LIMITED WARRANTY

Lutron Electronics Co., Inc.

### One Year Limited Warranty

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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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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.

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Other countries: +800.120.4491



# eLumen™ Software

SUITE VERSION 2.2  
Software User Guide

DesignIT™  
SecureIT™  
ControlIT™  
ConfigureIT™



 **LUTRON**  
Lutron controls your light.™

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# Chapter 1

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## eLumen™

### Introduction

Welcome to eLumen™ software and to the worldwide Lutron customer family! Your new Lutron lighting control system will enhance the ambiance and elegance of your building, while providing you with an extraordinary suite of tools to design, monitor, and control your project.

Lighting design is an important part of a building project and a key element in managing the building for its users. Your new Lutron system enhances your building when you first open your doors, and your Lutron system can grow and change to provide you and your building users with the utmost in flexibility, convenience, and system management.

### Overview

Lutron's GRAFIK™ 5000, 6000, and 7000 systems control a wide range of projects from residences and restaurants to hotels, convention centers, theme parks, and office buildings. Some projects have modest design requirements - other projects require constant management and monitoring by a staff of dedicated building professionals. Whether the simplest system or the most sophisticated, your Lutron lighting control system is managed by a suite of applications named eLumen. eLumen software was developed with sophisticated technology to:

- Design your system—identifying spaces and zones, specifying scenes, creating schedules, programming events, and much more.
- Monitor your system—reporting zone intensities, current scene selection, system status information, and much more.
- Control your system—selecting scenes, changing light levels, enabling or disabling controls, and much more.

### eLumen™ Applications

The eLumen suite includes four standard applications: DesignIT™, ControllIT™, ConfigureIT™, and SecureIT™. You will use these tools to manage your Lutron lighting control system.

#### DesignIT™

Use the DesignIT application to add, change, or remove different parts of your project. You will use the DesignIT application to add additional spaces or zones, to change intensities in scenes, to program buttons, to schedule events, and much more. As a general rule, if you are changing data in your project, you will use the DesignIT application.

#### ControllIT™

Use the ControllIT application to monitor and control your lighting system. You can view (or change) current zone intensities, specify the scene to show in a space, and otherwise manage your system. You will also use the ControllIT application to compile and transfer any project changes you make with DesignIT to the GRAFIK 5000, 6000, or 7000 processor(s) in your system.

#### SecureIT™

Use the SecureIT application to add users to your system, assign passwords for those users, and assign access rights and privileges to users. If your system is divided into multiple projects you can associate a user with some of those projects, but not necessarily all of them.

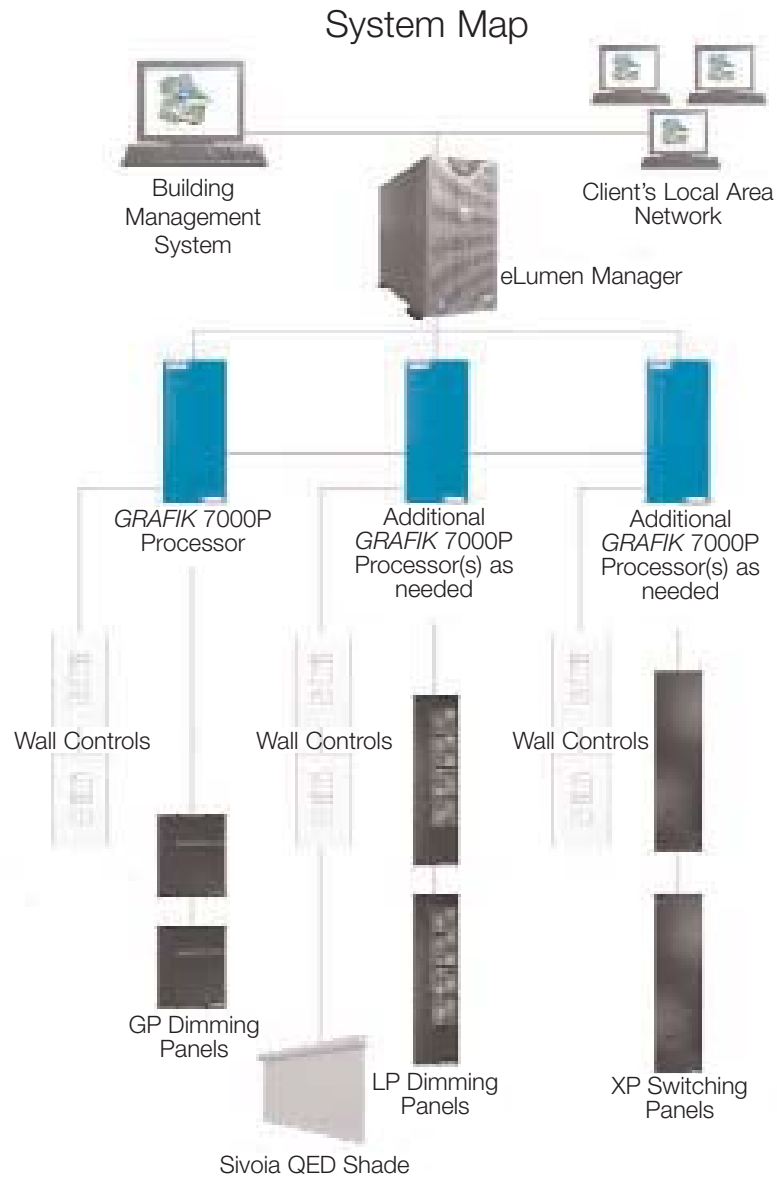
#### ConfigureIT™

Use the ConfigureIT application to make real-time configuration changes to your scenes. You can modify zone intensity, fade time, and delay time. The ConfigureIT application also allows you to flash individual zones if you have trouble locating them in the space.

The eLumen suite offers additional software tools that are sold as system options to provide graphical floorplan control, to permit ad hoc scheduling of events, and other features. If you would like to explore adding options to your system, contact your Lutron sales representative for assistance, or call Lutron customer service at one of the phone numbers listed on page 5.

## Sample System

The following illustration shows a sample configuration for a GRAFIK™ 7000 lighting control system.



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## System Maximums

### GRAFIK™ 5000

- 1 *GRAFIK* 5000P processor
- 128 zones
- 2,048 circuits
- 64 dimming and/or switching panels
- 32 wallstations and/or interfaces

### GRAFIK 6000®

- 1 *GRAFIK* 6000P processor
- 512 zones
- 4,000 circuits
- 125 dimming and/or switching panels
- 96 wallstations and/or interfaces

### GRAFIK™ 7000

- 32 *GRAFIK* 7000 processors
- 16,384 zones
- 128,000 circuits
- 4,000 Lutron dimming and/or switching panels
- 6,144 wallstations and/or interfaces
- 1 eLumen™ Manager with RAID (Redundant Array Independent Disks)

## Using Your Manual

This manual was designed to help you use eLumen™ to manage your Lutron lighting control system. The manual is divided into chapters. Each chapter contains several major topics and each major topic may have one or more specific tasks. Screen shots and pictures of icons are frequently used to show you how each task can be performed.

Please take note of the following special features:

Major Topic

Words defined in the Lexicon are italicized

Specific Task

Procedures include screen shots parallel to the corresponding text showing the current task with helpful arrows guiding the way

### Creating a New Zone

A *zone* is a collection of switch legs controlled simultaneously as one unit (also called a channel by some lighting designers).

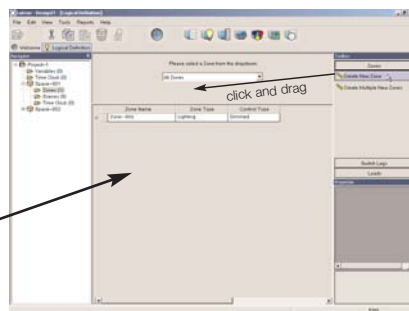
#### To create a new zone:

1. From the Navigator in the Logical Definition screen, select the space to which the zone is to be added. The Zones dropdown list in the top portion of the main pane displays existing zones for that space. The table in the lower portion of the main pane displays settings for the currently selected zone.
2. Select the Zones panel in the Toolbox. Then click and drag the Create New Zone option into the top portion of the main pane.

The zone is added to the space. You can now associate switch legs with the zone. You can also add zones to scenes.

#### NOTES:

- To rename the zone, refer to "Viewing and Editing Object Properties" on page 11.
- To create more than one zone, click and drag the Create Multiple New Zones option into the main pane. Type the number you wish to add and click the OK button.



### Creating Switch Leg to Zone

#### Associations

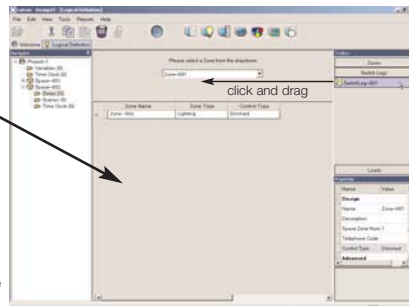
Switch legs are associated with zones so that they (and the loads they connect to) can be controlled simultaneously through the zone.

#### To create a switch leg to zone association:

1. From the Navigator in the Logical Definition screen, select the Zones folder below the space that is to have the switch leg to zone association.

The Zones dropdown list in the top portion of the main pane displays existing zones for that space. The table in the lower portion of the main pane displays settings for the currently selected zone.

2. From the Zone dropdown list, select the zone.
3. Select the Switch Legs panel in the Toolbox. Then click and drag the appropriate switch leg into the top portion of the main pane or directly onto the zone row in the table (the row will highlight when the cursor is over it).





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## Additional Help

This manual includes several additional features to help you get the most advantage from your Lutron lighting control system.

- Lexicon: defines many of the terms used throughout the manual. See page 80
- Frequently Asked Questions (FAQ): lists questions that the user community has asked, with references to appropriate tasks in this manual. See page 6
- Index: used to find specific information on a wide range of topics. See page 84
- Online help: Each application provides useful, practical information at your fingertips as you work with the software.

## Lutron Technical Support

Every Lutron lighting control system shipped includes an invaluable feature: the men and women of Lutron Technical Support, who are available 24 hours per day, 7 days per week, to help you with any issue. Our Technical Support staff can help you with any problem you might encounter - and they can provide helpful suggestions about how to best take advantage of your system.

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Coopersburg, PA 18036-1299

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Customer Support 1.888.LUTRON1

### Technical Support Centers

United States, Canada and the Caribbean: 1.800.523.9466

United Kingdom and Europe: +44.(0)20.7680.4481

Northern China: 10.800.712.1536

Southern China: 10.800.120.1536

Hong Kong: 800.901.849

Japan: +81.3.5575.8411

Singapore: 800.120.4491

Taiwan: 00.801.137.737

Thailand: 001.800.120.665853

Other countries: +800.120.4491

# Frequently Asked Questions

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New to the current version of eLumen™ software is a Welcome Screen that addresses some of the most commonly performed tasks and a quick guide to performing each task.

*The documentation uses a word or phrase I have never seen before.*  
See "Lexicon" on page 80.

*How do I change my preset lighting scenes?*  
See "Changing a Preset Lighting Scene" on page 23.

*How do I change when my time clock event happens?*  
See "Changing When a Time Clock Event Happens" on page 46.

*How do I change what my time clock does?*  
See "Changing What the Time Clock Event Does" on page 46.

*How do I create a new time clock?*  
See "Creating a New Time Clock" on page 25.

*How do I change the function of my wall controls?*  
See "Programming a Button for a Single Action" on page 35.  
See "Programming a Button for a Dual Action" on page 37.  
See "Programming a Button for a Conditional Action" on page 38.

*How do I add a new circuit or switch leg?*  
See "Adding a Switch Leg" on page 19.

*How do I transfer settings to the system (processor)?*  
See Chapter 7 "Compile and Transfer" on page 71.

*How do I change my username and password?*  
See "Resetting a User's Password" on page 51.

*How do I control my lighting zones?*  
See "Viewing and Setting Zone Intensities" on page 57.

*How do I disable a control station device?*  
See "Viewing and Setting the State of Programmable Devices" on page 59.

*How do I save scene changes?*  
See "To Run the Scene Capture Macro" on page 62.

*How do I rename my zones/scenes/spaces?*  
See "Viewing and Editing Object Properties" on page 10.

*How do I backup my database?*  
See Chapter 6 "Backup, Restore, and Update Tool" on page 69.

*Why can't I see my project in any of my applications?*  
See "Associating Users with Projects" on page 50.

# Chapter 2

## DesignIT™

### Overview

The DesignIT application enables you to create and maintain a database that models the lighting control system in a facility. To set up the database, you:

- Create a model of the facility, including defining *spaces* and *partitionable spaces*
- Create *zones* and associate *switch legs*
- Add hardware, including *control station devices*, *lighting panels*, and *sensors*
- Program control functions, including assigning *scenes* and defining button functionality
- Create schedules
- Create flexible *programming* strategies with controls, *groups*, *modes*, partitions, *time clock* scheduling (*astronomic* and *real-time*), and reference scheduling

The database you create within the DesignIT application is used to automate the facility's lighting control system.


**NOTE:** The DesignIT application is not intended for real-time control. For real-time control, refer to Chapter 4: ControllIT™.

### Performing Basic DesignIT™ Operations

The following topics contain procedures used to perform basic DesignIT application operations.

#### Starting and Exiting DesignIT™

##### ▶ To start DesignIT™:

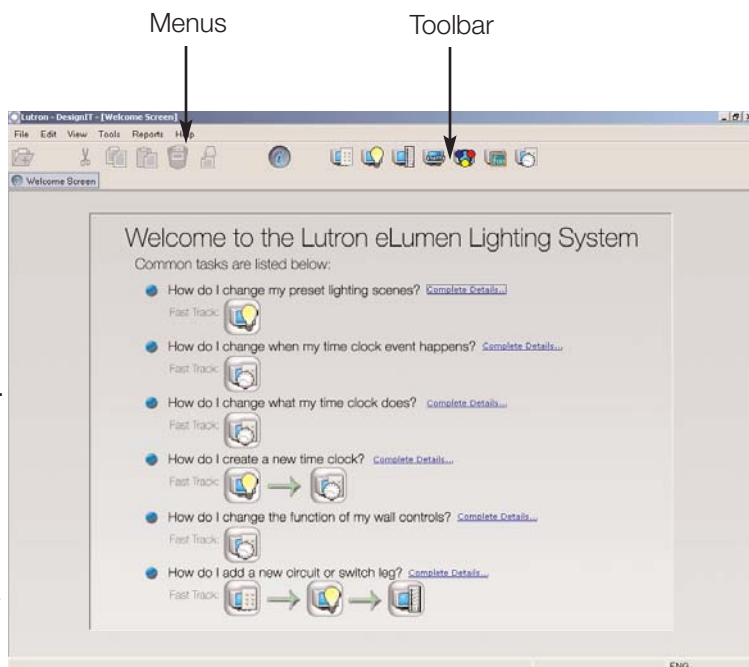
1. Double-click the DesignIT icon  on the desktop. Or from the Start menu, choose Lutron Electronics>DesignIT.

You are prompted to login.

2. Enter your user name and password. Then click OK.

The DesignIT application framework is displayed. It contains menus, a toolbar, and a status bar. When a DesignIT application screen is open, additional components are added to the framework.

- ##### ▶ To exit DesignIT™:
- Choose Exit from the File menu.



Menus

Toolbar

Status bar

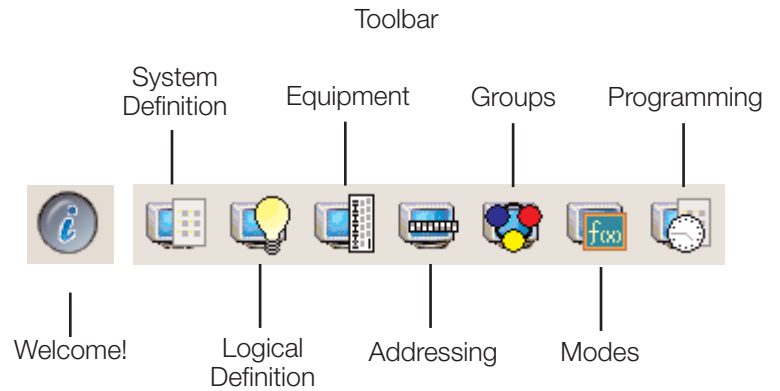
The Design IT Framework

## Opening DesignIT™ Screens

Eight main screens are available from the DesignIT application framework.

- ▶ **To open a DesignIT screen:** Click its icon in the toolbar.

Optionally, choose a screen from the View menu.



## DesignIT™ Screen Components

Each DesignIT application screen has the following common components.

### NAVIGATOR

Shows existing *projects* you can access and enables you to *navigate* to *spaces* and other folders within a project.

### TOOLBOX

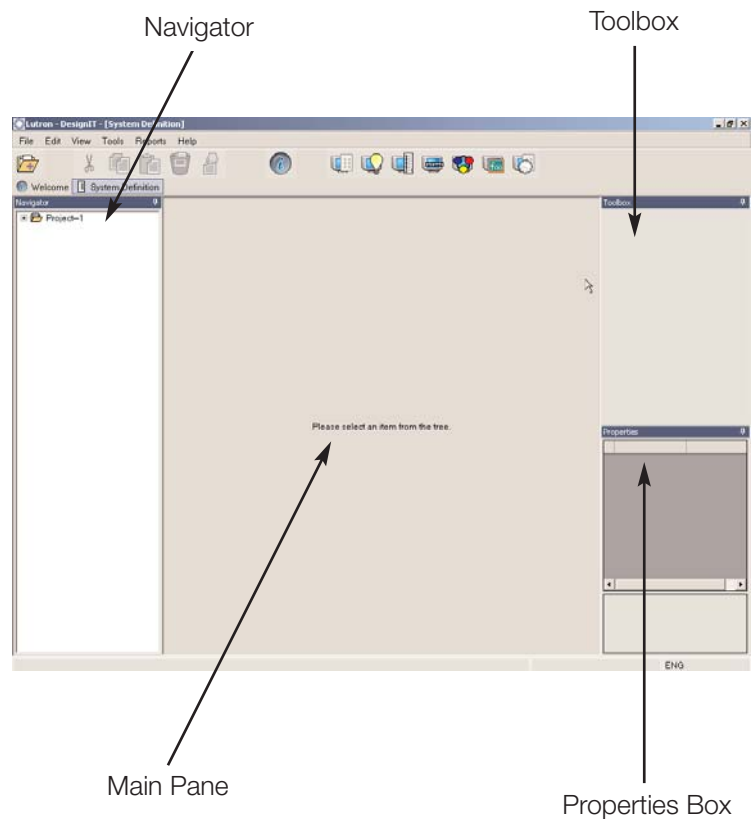
Used to add objects to the project.

### MAIN PANE

Used to add *objects* by dragging them here from the Toolbox. Can show lists of objects and interactive images of Lutron hardware.

### PROPERTIES BOX

Used to view and modify properties of the currently selected item.



## Using the Navigator

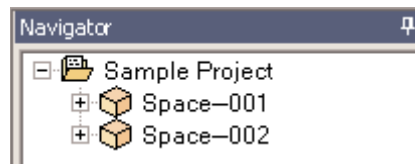
The Navigator component in the DesignIT™ application framework displays levels of database information through which you can navigate. The project folder is positioned on top, with object folders arranged hierarchically below it.

*NOTE:* The projects available to you in the Navigator depend on the system privileges associated with your user name. For details about user names, refer to Chapter 3: SecureIT™.

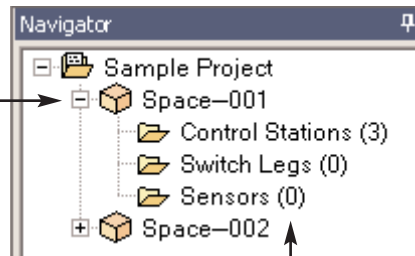
- ▶ **To open a folder and display its contents:** Click the folder's + sign or simply double-click the folder.



The folder opens and displays the first sublevel within the navigational tree. Continue to open folders until you reach the desired level of the selected project. The number in parentheses following the folder name indicates the number of objects contained in the folder.



- ▶ **To close a folder and hide its contents:** Click the folder's - sign or double-click the folder.



Number in parentheses shows the total number of objects contained in the folder

## Viewing and Editing Object Properties

The Properties box in the DesignIT application framework shows property values for the *object* that is currently selected (for example, the object's name).

Editable property fields are white; non-editable fields are gray and their values cannot be modified from this screen.

- ▶ **To edit a property value for a selected object:** Click in the property field and then enter the new value.

Name	Value
<b>Design</b>	
Name	Space-001
Description	
Telephone Code	
Off Scene Number	17
Sort Order	0
<b>Advanced</b>	


**Description**  
The description of the space.

Click in an editable field and then enter a new property value

## Deleting Objects

You can delete an *object* if it is no longer needed.


- ▶ **To delete an object:**

1. Select the object.  
Some objects are selected in the navigator (for example, *projects* or *spaces*). Others are selected from dropdown lists displayed in the top portion of the main pane (for example, *control stations* or *groups*).
2. Click  in the toolbar, or choose Delete from the Edit menu.
3. Click OK to confirm the deletion. (Or click Cancel to cancel the deletion.)

## Removing Objects

You can remove an *object* that is associated with another object (for example, a *switch leg* associated with a *panel*).

- ▶ **To remove an object:**

1. Select the object.  
Associated objects are typically selected by clicking on the *object* when displayed in the lower portion of the main pane.
2. Click  in the toolbar, or choose Remove from the Edit menu.
3. Click OK to confirm the removal. (Or click Cancel to cancel the removal.)


**NOTE:** Removing an object only removes the association to another object. It does not delete the object.



## Using the System Definition Screen

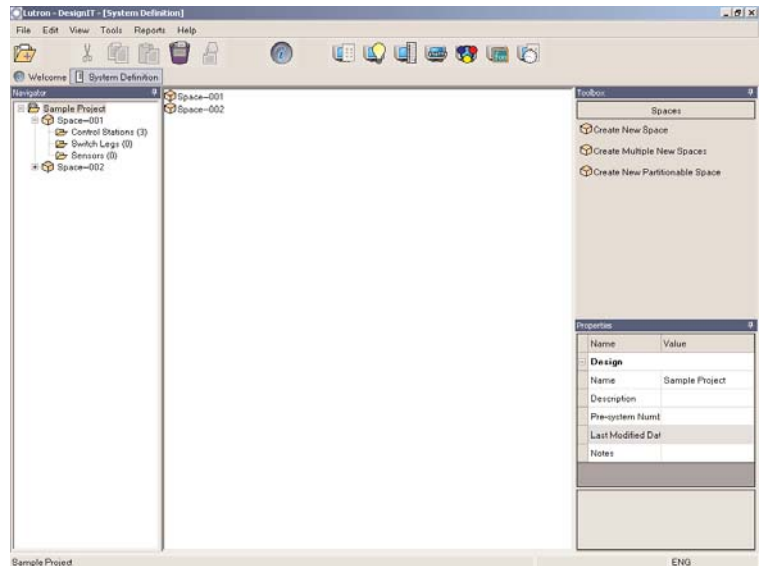
The *System Definition* screen is used to create a *project* and add *spaces* that represent the physical characteristics of a facility or building. This screen is also used to add *control stations*, *control station devices*, *switch legs*, and *sensors*.

### Opening the System Definition Screen

- ▶ **To open the System Definition screen:** Click  in the toolbar or choose System Definition from the View menu.

From the *System Definition* screen, you can:

- Create *projects*
- Create *spaces* and *partitionable spaces*
- Add *control stations* and *control station devices*
- Add *switch legs*
- Add *sensors*

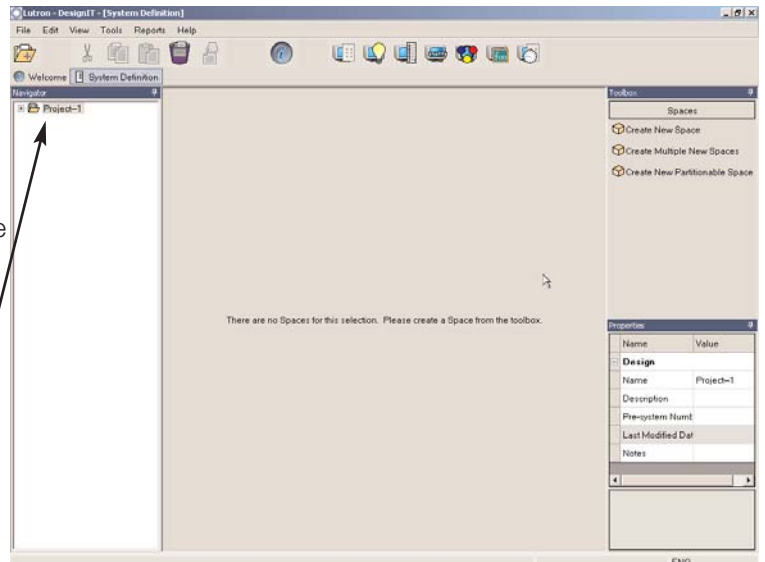


The System Definition Screen

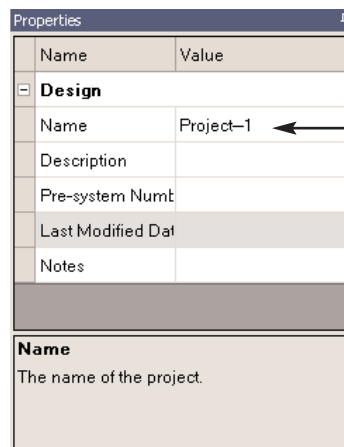
### Creating a New Project

A *project* is a container that includes all the database modeling information for a lighting control system.

- ▶ **To create a new project:** From the *System Definition* screen, click  in the toolbar, or choose New from the File menu. A folder for the new project is displayed in the Navigator and assigned a default project name.



- ▶ **To rename the project:** Select the project folder in the Navigator. In the Properties box, click in the Name value field and then enter the name you would like to use. Once a project is created, you can add *spaces* and other *objects* to it.



Click here and then enter a new project name

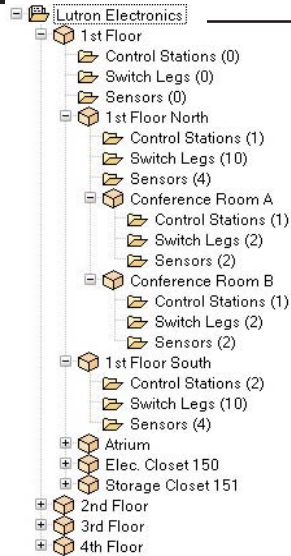
## Creating Spaces

A *space* refers to the physical representation of a building or any of its parts. Spaces can contain other spaces (subspaces). Spaces can also contain other *objects* (for example, *control stations*, *sensors*, and so on).

Adding spaces to a *project* or other spaces enables you to create an accurate representation of the building or facility to be modeled. For example, a typical office building could be modeled as shown on the right.

Spaces can be *fixed* (their walls do not move) or *partitioned* (have one or more movable walls that can be positioned to divide the space into subspaces).

Once spaces are created in the database, you can add objects to them.



Sample office building space hierarchy

## Creating a New Fixed Space

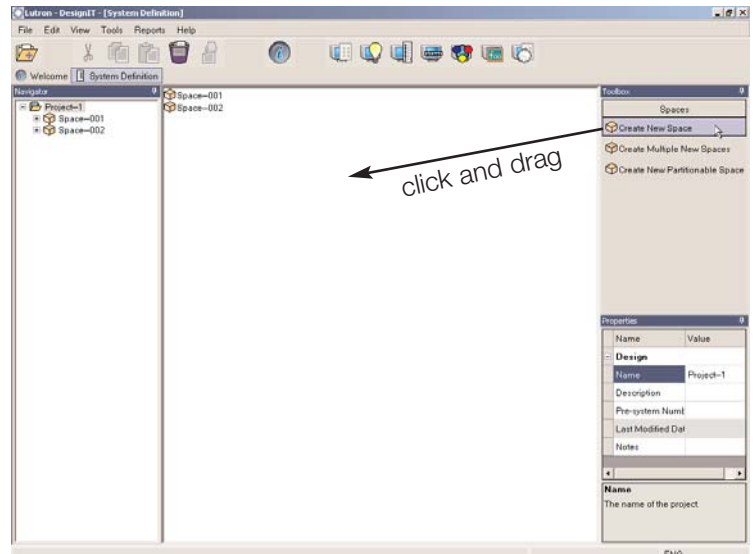
Fixed *spaces* have fixed walls and cannot be partitioned.

### ► To create a new fixed space:

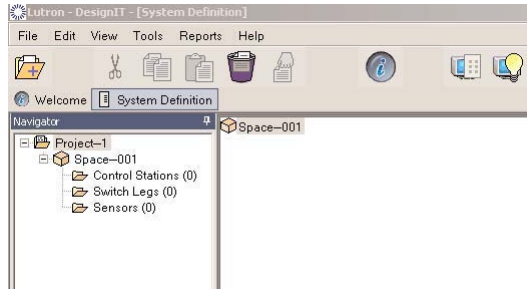
1. From the *System Definition* screen, select the *project* in the Navigator. Or, to create a space within a space, select an existing space within the project. Existing spaces, if any, for the selected project or space are listed in the main pane.
2. Select the Spaces panel in the Toolbox. Then click and drag the Create New Space option into the main pane.

**NOTE:** To create more than one space, click and drag the Create Multiple New Spaces option into the main pane. Type the number you wish to add and click the OK button.

The new space is displayed in the Navigator and assigned a default name. Folders for *control stations*, *switch legs*, and *sensors* are also automatically displayed for the space.

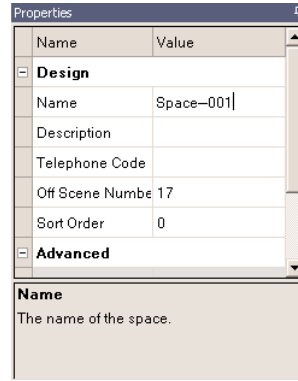


**NOTE:** Other folders exist within the project and space. These folders for other *object* types are visible only on the screens in which they can be modified.

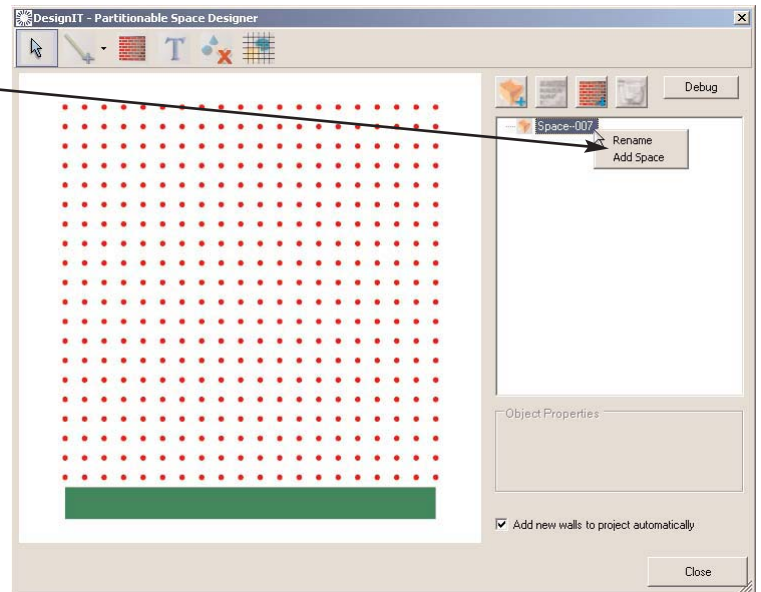


► **To rename the space:**

1. Select the space in the Navigator.
2. In the Properties box, click the Name value field and then enter the name you would like to use.



**NOTE:** For *partitionable spaces* you must open the Partitionable Space Edit field to rename spaces. Right-click on the name of the space.



## Creating a New Partitionable Space

Partitionable spaces can have movable walls used to partition the space (create subspaces). Lights in partitionable spaces can be controlled differently depending on the state of the movable walls.

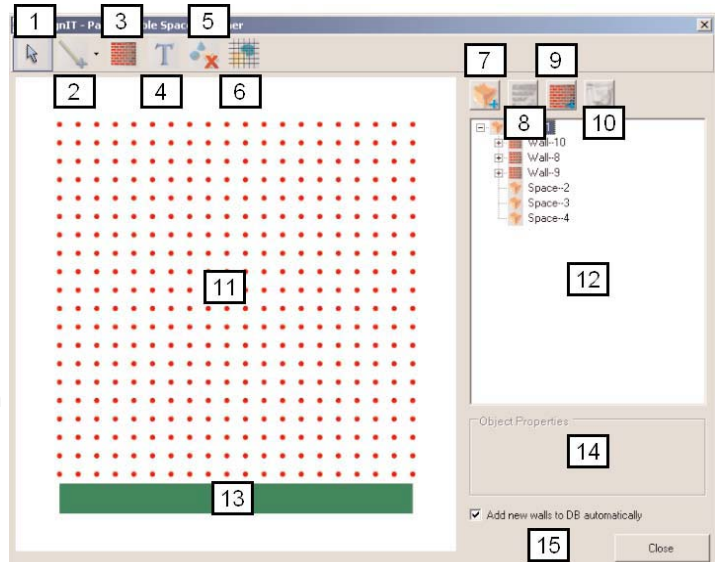
### ► To create a new partitionable space:

1. From the *System Definition* screen, select the *project* in the Navigator. Or, to create a space within a space, select an existing space within the project.  
Existing spaces, if any, for the selected project or space are listed in the main pane.
2. Select the Spaces panel in the Toolbox. Then click and drag the Create New Partitionable Space option into the main pane.

The *Partitionable Space Designer* opens and enables you to model the space, including fixed and movable walls.

### NOTES:

- To create more than one partitionable space, click and drag the Create Multiple New Partitionable Spaces option into the main pane. Type the number you wish to add and click the OK button.
- The Partitionable Space Designer can also be used later to modify the space as needed.



### Legend

1. **Normal Tool.** Used to select, move, and highlight objects.
2. **Fixed Wall Tool.** Used to draw fixed walls in the partitionable space; this can be used to draw straight lines or rectangles.
3. **Moveable Wall Tool.** Used to draw moveable walls in the space.
4. **Text Tool.** Used to add descriptive text to the diagram.
5. **Delete Symbol Tool.** Used to delete objects in the graphic.
6. **Show / Hide Grid.** Shows or hides the grid (the red dots); the grid is visible only in the DesignIT editor.
7. **Add Space.** Adds a new subspace to the partitionable space.
8. **Add Wall State.** Adds a new wall state to an existing wall.
9. **Add Wall.** Adds a new wall to the partitionable space.
10. **Delete.** Deletes objects from the project (walls, spaces, wall states).
11. **Draw Region.** The area in which the user draws the partitionable space layout.
12. **Explorer Tree.** Used to show the spaces and walls in the partitionable space. Right-click on any object and rename it from the tree.
13. **Feedback Bar.** Displays the properties of an object when you place the cursor over the object in the graphic.
14. **Template Object Properties.** Used to change properties related to wall templates.
15. **Add Wall to DB.** Inserts a movable wall in the graphic into the database. There may be cases when you do not want to do this (associating a wall with an existing wall). By un-checking this option, you can draw a wall in the graphic without having to add it to the database.

► **To use the Partitionable Space Designer:**

1. To create a fixed *wall*, select the Fixed Wall tool. Then click the grid points to draw the shape of the *space*.

Click the start and end points to create a line. Double-click the final point to complete the shape.

2. To create a partition, select the Moveable Wall tool. Then click the grid points to draw the shape of the *space*.

Click the start and end points to create a line. Double-click the final point to complete the shape.

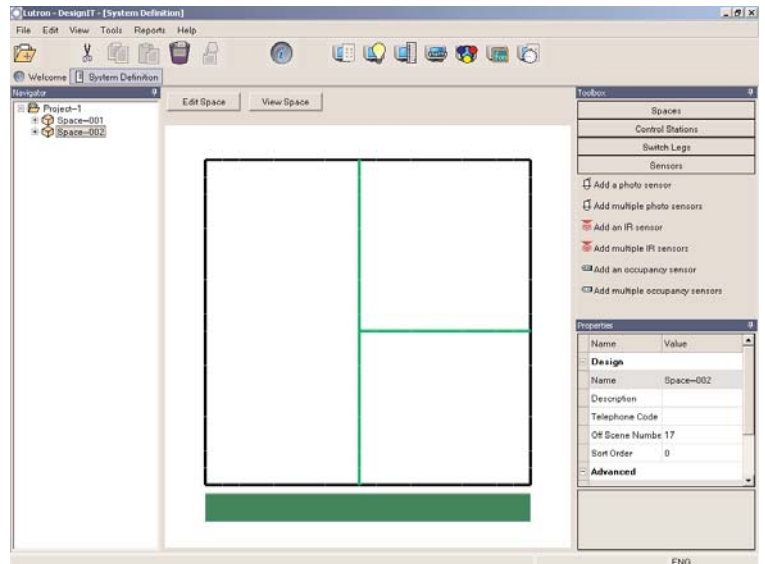
3. When you are finished modeling the space, click the Close button.

The new partitioned space is displayed in the Navigator and an image of the space is shown in the main pane. Edit Space and View Space buttons are also added to the main pane.

Folders for *control stations*, *switch legs*, and *sensors* are also automatically created for the space.

- To continue modeling the space, click the Edit Space button.
- To view the space in a separate window and view more details, click the View Space button.
- To rename the space, click the Edit Space button. From the navigation tree in the *Partitionable Space Designer*, right-click on the space name. Select Rename from the popup menu and then enter a new name.

*NOTE:* Partitioned spaces cannot be renamed using the Properties box.

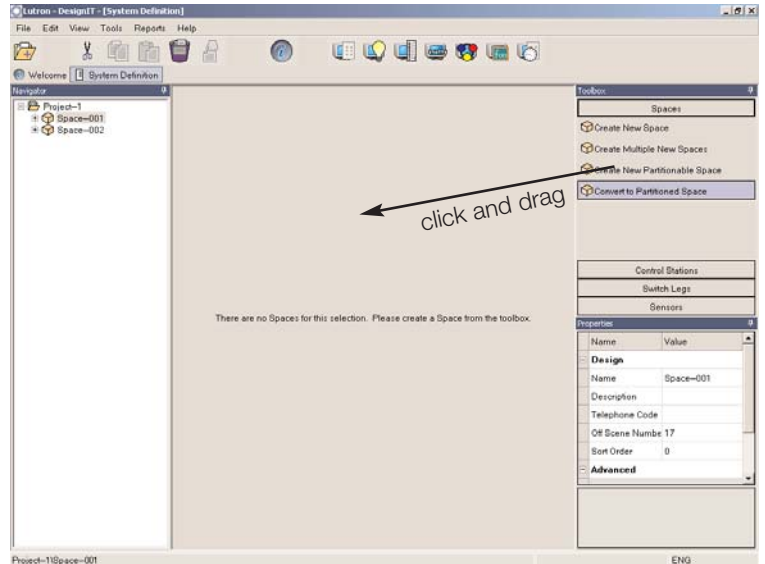


## Converting a Fixed Space to a Partitionable Space

An existing fixed *space* can be converted automatically to a *partitionable space*.

### ► To convert a fixed space to a partitionable space:

1. From the *System Definition* screen, select the fixed space in the Navigator.
2. Select the Spaces panel in the Toolbox. Then click and drag the Convert to Partitioned Space option into the main pane.



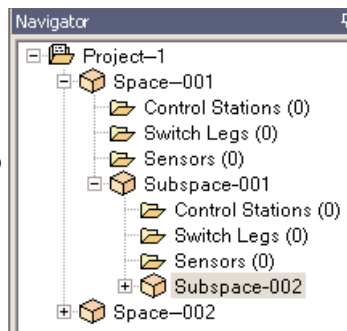
The space is converted and Edit Space and View Space buttons are displayed at the top of the main pane.

- To model the partitionable space, click the Edit Space button. Then use the *Partitionable Space Designer* to draw the model.
- To view the partitionable space in a separate window showing additional details, click the View Space button.



Note that there are two instances in which you cannot convert a fixed space to a partitionable space:

- The space to be converted cannot have more than one level of subspaces. For example, in the sample project shown below, Space A cannot be converted because it has a subspace called Space B, which in turn has a subspace called Space C. You could convert either Space B or Space C because they do not have more than 1 level of subspaces.
- A fixed space cannot be converted to a partitionable space if one of its subspaces is already partitioned. For example, in the sample project, if Space C was partitioned you could not convert Space B to a partitionable space.



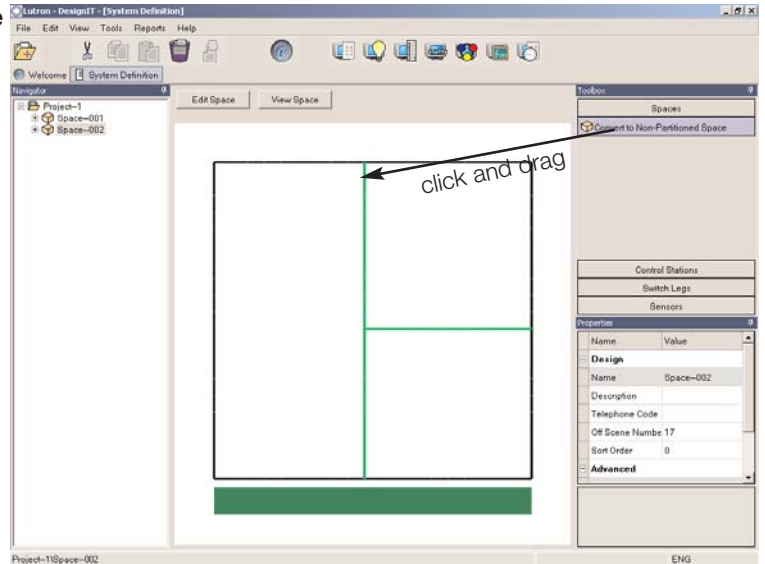


## Converting a Partitioned Space to a Fixed Space

An existing *partitioned space* can be converted automatically to a fixed *space*. Movable *walls* are automatically deleted.

### ► To convert a partitioned space to a fixed space:

1. From the *System Definition* screen, select the partitioned *space* in the Navigator.  
The image of the partitioned space is displayed in the main pane.
2. Select the Spaces panel in the Toolbox. Then click and drag the Convert to Non-Partitioned Space option into the main pane.  
The space is converted and the space image is removed from the screen. Since the space is no longer partitionable, the Edit Space and View Space buttons are also removed.



## Adding a New Control Station

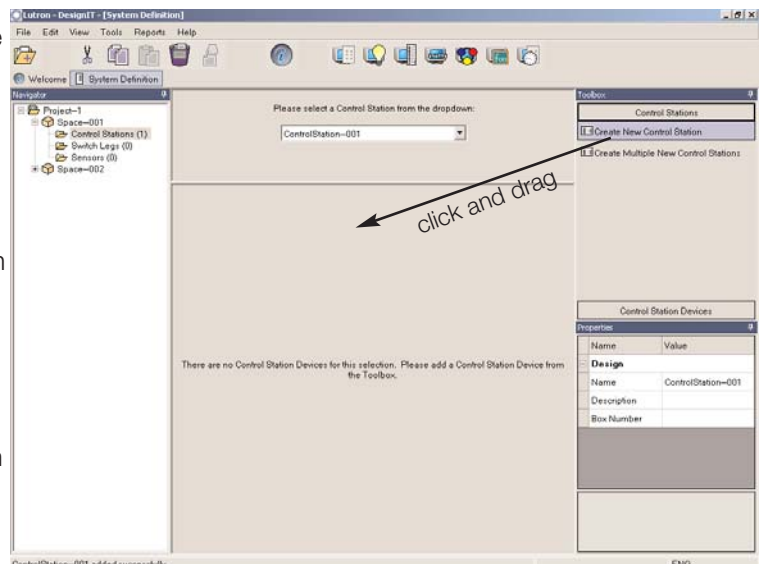
A *control station* refers to the wallbox used to house the *control station device*. Control stations are added to *spaces* as needed to model the lighting system.

### ► To add a control station to a space:

1. From the *System Definition* screen, select the space in the Navigator.  
The Control Stations dropdown list in the top portion of the main pane displays the existing control stations for that space.
2. Select the Control Stations panel in the Toolbox. Then click and drag the Create New Control Stations option into the main pane.  
A control station is added to the space. Devices can now be added to the control station.

#### NOTES:

- To rename the control station, refer to "Viewing and Editing Object Properties" on page 10.
- To create more than one control station, click and drag the Create Multiple New Control Stations option into the main pane. Type the number you wish to add and click the OK button.





## Adding a Control Station Device

A *control station device* is housed in a *control station* and provides a point of input or output (for example, the buttons in a wall-mounted control). Devices are added to control stations as needed to model the lighting system.

### ► To add a device to a control station:

1. From the Navigator in the *System Definition* screen, select the Control Stations folder for the *space* in which the control station is located.

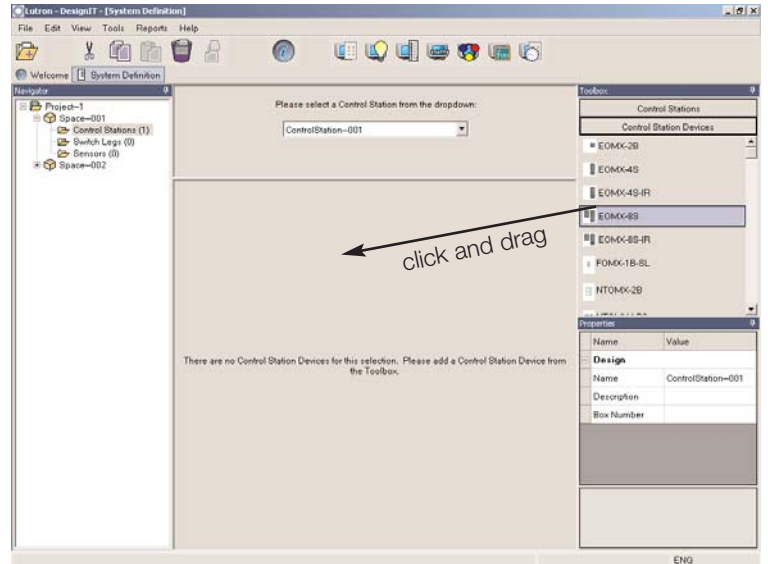
The Control Stations dropdown list in the top portion of the main pane displays the existing control stations for that space.

2. Select the control station from the dropdown list.
3. Select the Control Station Devices panel in the Toolbox. Then click and drag the *base model number* of the device to be added into the main pane.

The device will be added to the control station and an interactive image of the hardware will be displayed.

### NOTES:

- To remove a control station device from the control station, select the device image in the main pane. Then select Remove from the Edit menu.
- Control station devices are programmed using the *Programming* screen.



## Adding a Sensor

*Sensors* are devices that control lighting by detecting *infrared (IR)* signals, the current light level in the *space*, or whether the space is occupied. Sensors are added to spaces as needed to model the lighting system.

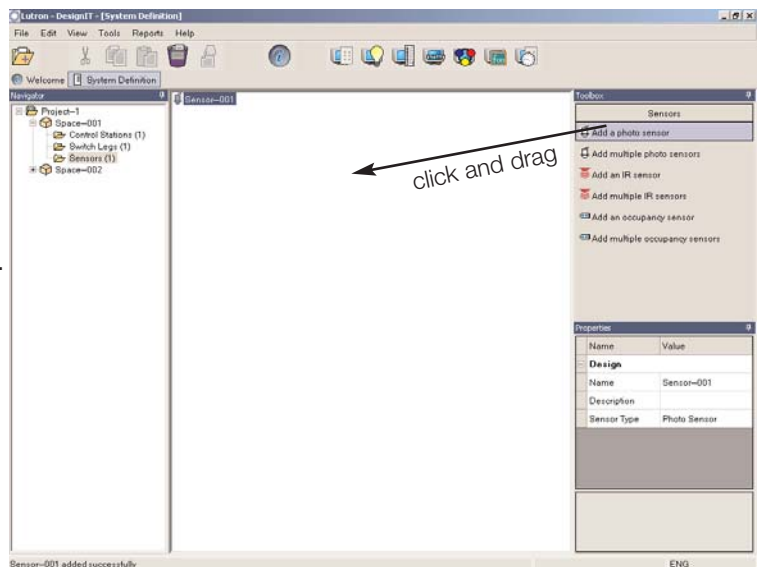
### ► To add a sensor:

1. From the Navigator in the *System Definition* screen, select the space to which the sensor is to be added.
2. Select the Sensors panel in the Toolbox. Then click and drag an *infrared (IR)*, *photo*, or *occupancy sensor* into the main pane.

The sensor is added to the space.

### NOTES:

- To rename the sensor, refer to "Viewing and Editing Object Properties" on page 10.
- To create more than one sensor, click and drag the Add Multiple Sensors option into the main pane. Type the number you wish to add and click the OK button.
- Sensors are associated with Lighting Zone Controller units using the *addressing* screen.



## Adding a Switch Leg

A *switch leg* is the connection between a *group of loads* and a *switch leg control*. Switch legs are added to *spaces* as needed to model the lighting system.

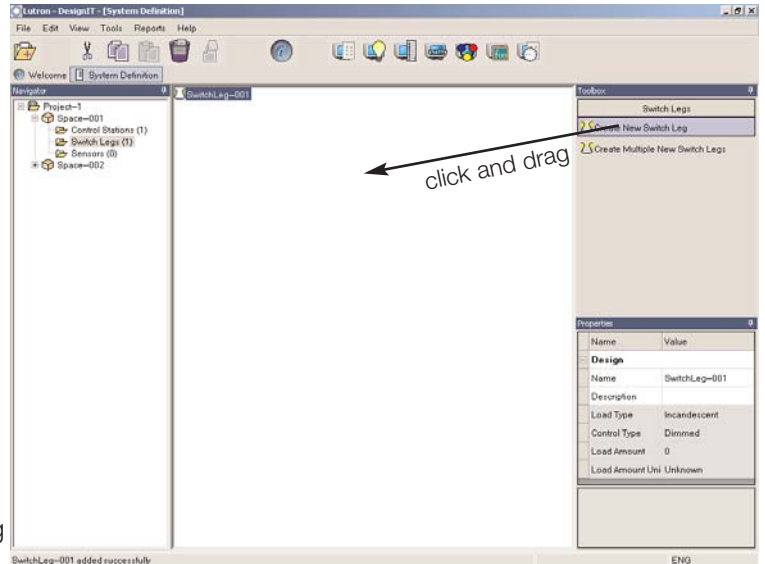
### ▶ To add a switch leg to a space:

1. From the Navigator in the *System Definition* screen, select the space to which the switch leg is to be added.
2. Select the Switch Legs panel in the Toolbox. Then click and drag the Create New Switch Leg option into the main pane.

The switch leg is added to the space.

### NOTES:


- To rename the switch leg, refer to "Viewing and Editing Object Properties" on page 10.
- To create more than one switch leg, click and drag the Create Multiple New Switch Legs option into the main pane. Type the number you wish to add and click the OK button.
- Switch legs are associated with zones using the Logical Definition screen. If this switch leg is to be controlled individually, create a new zone and associate this switch leg to it. If the switch leg is to be controlled with others, associate the switch legs together on one zone.
- Switch legs are associated with lighting panels and high voltage control units, known as switch leg controls, using the Equipment screen. Each switch leg will be associated with the output number of one of the switch leg controls.



## Using the Logical Definition Screen

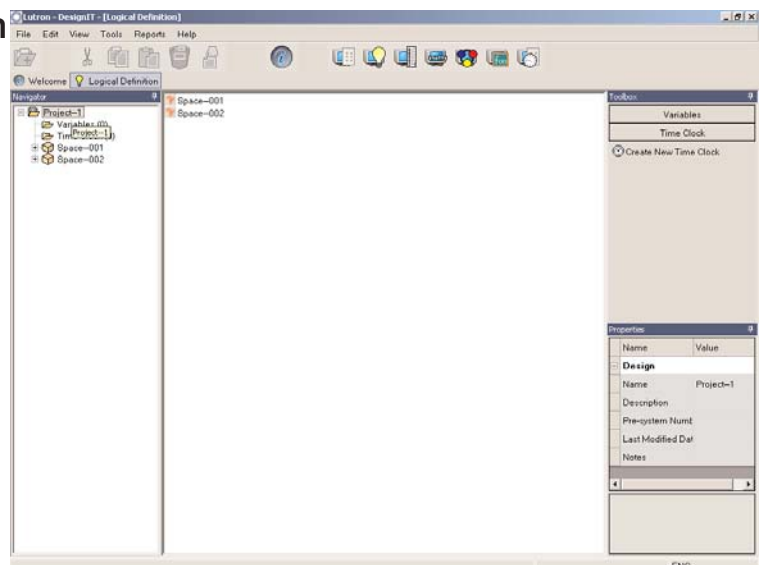
The *Logical Definition* screen is used to add zones, scenes, time clocks, and variables to a space or project.

### Opening the Logical Definition Screen

- ▶ To open the Logical Definition screen: Click  in the toolbar or choose Logical Definition from the View Menu.

From the *Logical Definition* screen, you can:

- Create zones
- Create *switch leg* to zone associations
- Create scenes
- Create variables
- Create time clocks



## Creating a New Zone

A *zone* is a collection of *switch legs* controlled simultaneously as one unit (also called a channel by some lighting designers).

### ► To create a new zone:

1. From the Navigator in the *Logical Definition* screen, select the *space* to which the zone is to be added.

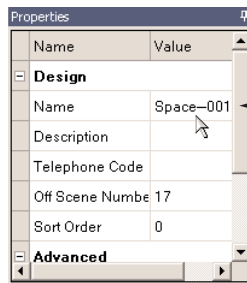
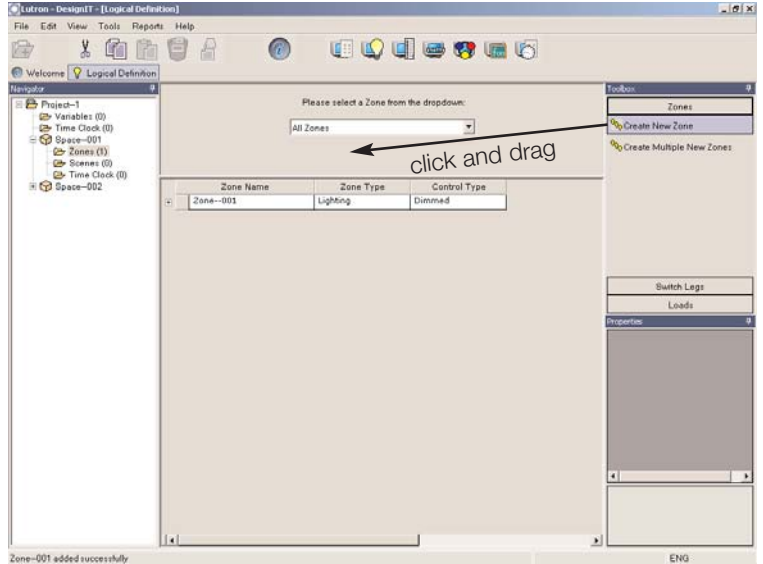
The Zones dropdown list in the top portion of the main pane displays existing zones for that space. The table in the lower portion of the main pane displays settings for the currently selected zone.

2. Select the Zones panel in the Toolbox. Then click and drag the Create New Zone option into the top portion of the main pane.

The zone is added to the space. You can now associate switch legs with the zone. You can also add zones to *scenes*.

- ### ► To rename the zone:
- Select the *zone* in the Navigator. In the Properties box, click in the Name value field and then enter the name you would like to use.

**NOTE:** To create more than one zone, click and drag the Create Multiple New Zones option into the main pane. Type the number you wish to add and click the OK button.



## Creating Switch Leg to Zone Associations

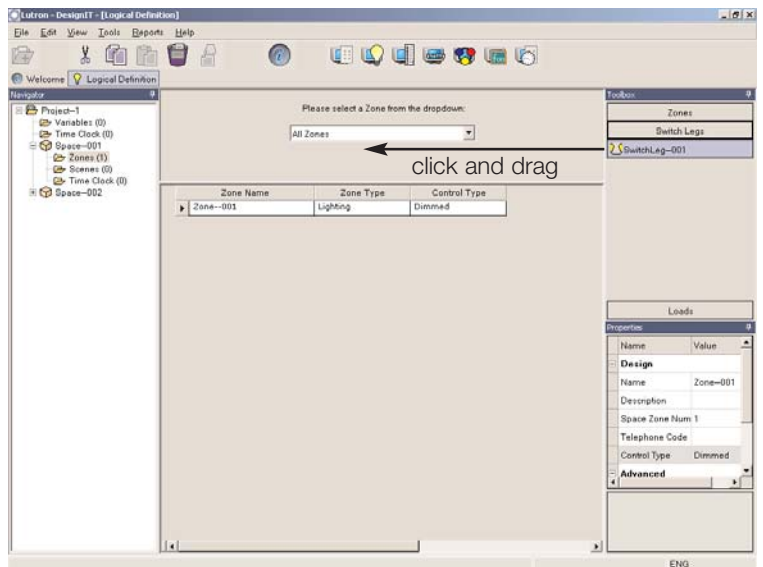
*Switch legs* are associated with *zones* so that they (and the *loads* they connect to) can be controlled simultaneously through the zone.

### ► To create a switch leg to zone association:

1. From the Navigator in the *Logical Definition* screen, select the Zones folder below the *space* that is to have the switch leg to zone association.

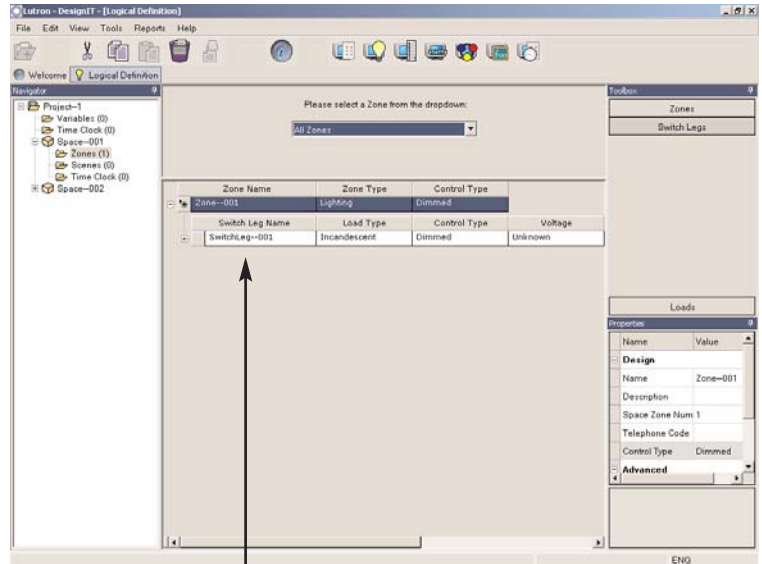
The Zones dropdown list in the top portion of the main pane displays existing zones for that space. The table in the lower portion of the main pane displays settings for the currently selected zone.

2. From the Zone dropdown list, select the zone.
3. Select the Switch Legs panel in the Toolbox. Then click and drag the appropriate switch leg into the top portion of the main pane or directly onto the zone row in the table (the row will highlight when the cursor is over it).



**NOTE:** If All Zones is selected in the Zones dropdown list, the switch leg is associated with the zone that is currently selected in the table. To make the association with a different zone, click and drag the switch leg directly onto the row for the desired zone in the table.

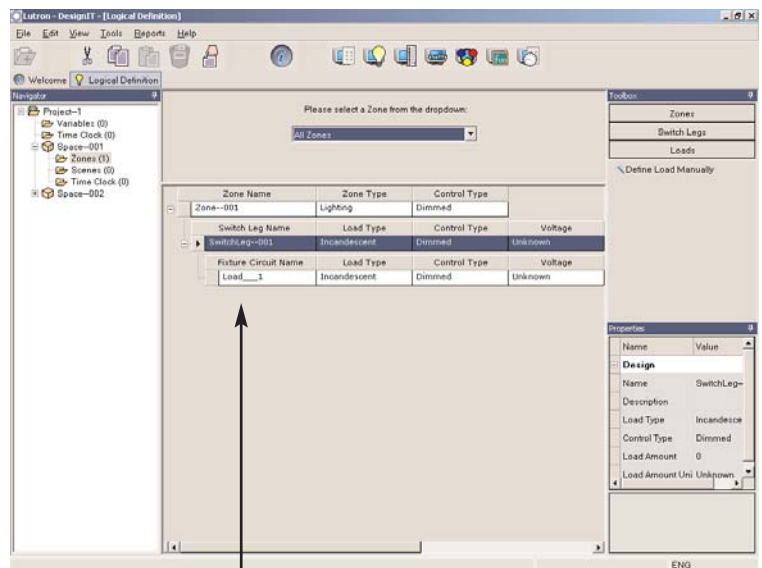
The switch leg to zone association is created and default switch leg settings are displayed. You can now manually define the load for the switch legs in the zone.



Switch leg associated with zone

► **To manually define the load for a switch leg:**

1. From the table in the main pane, select the *switch leg* whose *load* you want to define.
2. Select the Loads panel in the Toolbox. Then click and drag the Define Load Manually option into the main pane and directly onto the row for the switch leg in the table. (The row will highlight when the cursor is positioned over it.)  
An editable row showing default *load* settings is added beneath the switch leg in the table. You can modify the settings, as needed.
3. To rename the load, click in the Fixture Circuit Name field and enter a new name.
4. To change the load type, click in the Load Type field and then select the option you want from the dropdown list.
5. To modify the other load settings, click in each of the fields and enter a new value. Move from left to right across the fields in the table row.



Load associated with switch leg

Fixture Circuit Name	Load Type	Control Type
Load__1	Incandescent	Dimmed
	High Voltage 3-Wire Motor	
	High Voltage Output Closure	
	High-Intensity Discharge	
	Incandescent	
	Low Voltage Output Closure	
	Magnetic Low Voltage	

## Creating a New Scene

A *scene* is a lighting effect achieved by adjusting one or more *zones* to *preset* levels.

### ► To create a new scene:

1. From the Navigator in the *Logical Definition* screen, select the Scenes folder below the *space* that is to have the scene.

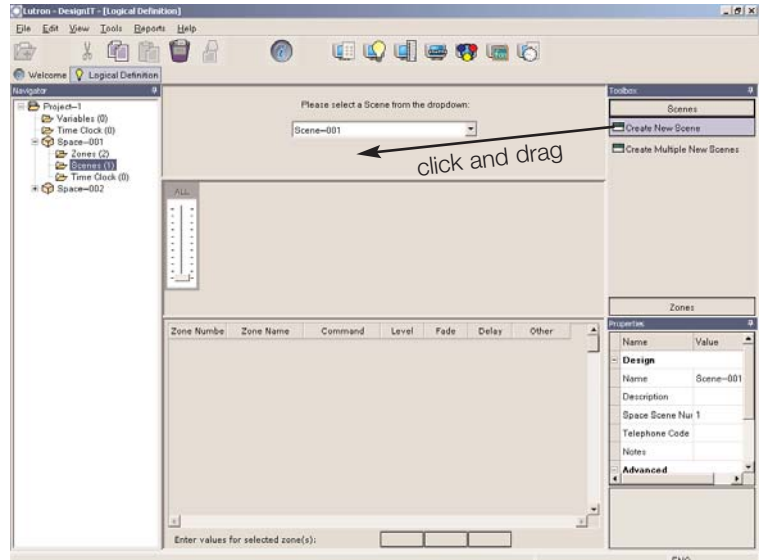
The Scene dropdown list in the top portion of the main pane displays existing scenes for that space. The table in the lower portion of the main pane displays settings for the currently selected scene.

2. Select the Scenes panel in the Toolbox. Then click and drag the Create New Scene option into the top portion of the main pane.

The scene is added and displayed in the Scenes dropdown list in the top portion of the main pane. Empty fields for scene values are also displayed.

### NOTES:

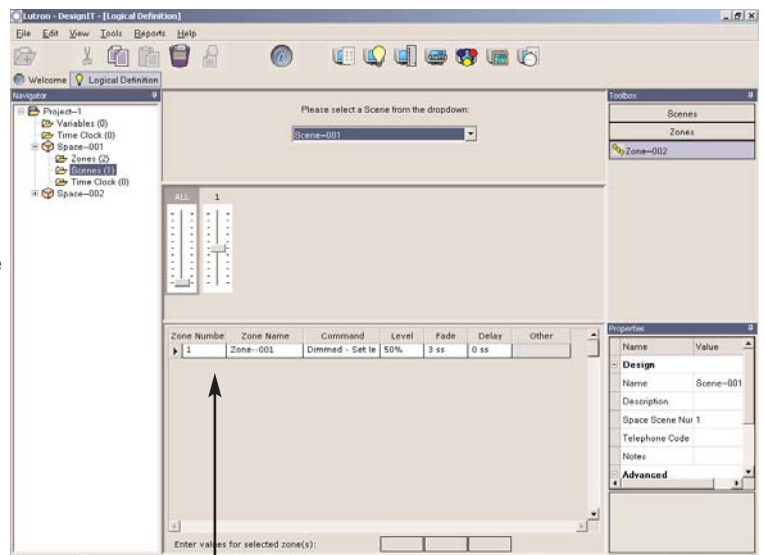
- To rename the scene, refer to "Viewing and Editing Object Properties" on page 10.
- To create more than one scene, click and drag the Create Multiple New Scenes option into the main pane. Type the number you wish to add and click the OK button.



### ► To add a zone to the scene:


1. From the Scene dropdown list in the main pane, select the *scene* to which you want to add a *zone*.
2. Select the Zones panel in the Toolbox. Then click and drag the zone to be added into the top portion of the main pane.

The zone is associated with the scene and default settings for the zone are displayed in the table in the main pane.



Zone added to scene

### ► To remove a zone from the scene:

1. From the Scene dropdown list in the main pane, select the scene from which you want to remove a zone.
2. Select the zone that you would like to remove from the table in the lower center of the main pane.
3. Click on the remove icon  in the menu bar to remove the zone from the scene.



## Changing a Preset Lighting Scene

A *scene* is a lighting effect achieved by adjusting one or more *zones* to *preset* levels.

### ► To select a scene to edit:

From the Navigator in the Logical Definition screen, select the Scenes folder below the appropriate *space*.

The Scene dropdown list in the top portion of the main pane displays existing scenes for that space. The table in the lower portion of the main pane displays zone settings for the currently selected scene.

*NOTE:* To rename the scene, refer to “Viewing and Editing Object Properties” on page 10.

### ► To change scene settings for an individual zone:

To modify the scene settings, enter the Level, Fade and/or Delay moving from left to right, in the appropriate field for each zone.

*NOTE:* Alternatively, to set the level, use the slider to set the value in the Level field.



Zone Number	Zone Name	Command	Level	Fade	Delay	Other
1	Zone--001	Dimmed - Set l	50%	3 ss	0 ss	

Dimmed - Set level  
Follow slider (Zone)

### ► To change scene settings for multiple zones:

1. Select multiple zones by holding the CTRL key and clicking on each zone or by clicking on the first zone and then hold the Shift key while clicking on the last zone.
2. To modify the scene settings for the selected zones, enter the Level, Fade and/or Delay in the fields at the bottom of the table.

*NOTE:* Alternatively, to set the level for all zones, use the ALL slider to set the value in the Level fields.



Zone Number	Zone Name	Command	Level	Fade	Delay	Other
1	Zone--001	Dimmed - Set level	100%	3 ss	0 ss	
2	Zone--002	Dimmed - Set level	100%	3 ss	0 ss	
3	Zone--003	Dimmed - Set level	100%	3 ss	0 ss	
4	Zone--004	Dimmed - Set level	100%	3 ss	0 ss	
5	Zone--005	Dimmed - Set level	50%	3 ss	0 ss	
6	Zone--006	Dimmed - Set level	100%	3 ss	0 ss	
7	Zone--007	Dimmed - Set level	100%	3 ss	0 ss	
8	Zone--008	Dimmed - Set level	50%	3 ss	0 ss	
9	Zone--009	Dimmed - Set level	50%	3 ss	0 ss	

Enter values for selected zone(s):    100%    3 ss    0 ss

## Creating New Variables

A *variable* is a user-created *object* used for *programming* purposes. A variable can be one of three types: True/False, Multi-state, or Integer. Variables are added at the *project* level. Example: A variable named "[spacename] occupied" could be created and the *variable states* could be True and False. This variable could then be used to program a button to either turn the lights OFF or dim them to a very low level.

### ► To create a new variable:

1. From the Navigator in the *Logical Definition* screen, select the Variables folder below the *project* folder.  
The Variables dropdown list in the top portion of the main pane displays existing *variables* for that *space*. The table in the lower portion of the main pane displays settings for the currently selected variable.
2. Select the Variables panel in the Toolbox. Then click and drag the Create New Variable option into the main pane.

The variable is added to the project and displayed in the dropdown list in the main pane.

#### NOTES:

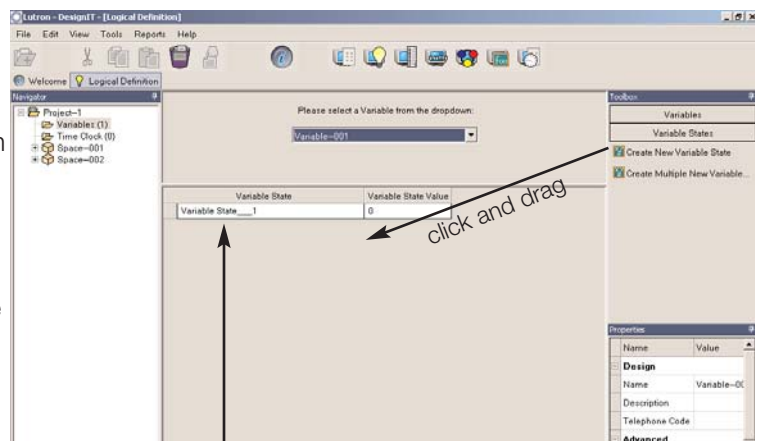
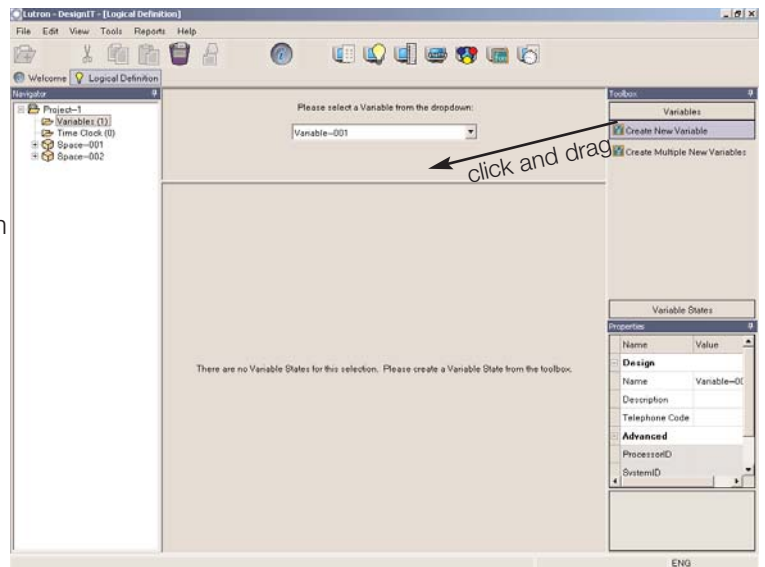
- To create more than one variable, click and drag the Create Multiple New Variables option into the main pane. Type the number you wish to add and click the OK button.
- To rename the variable, refer to "Viewing and Editing Object Properties" on page 10.

### ► To create a state for the variable:

1. Select the *variable* from the Variable dropdown list.
2. Select the *Variable States* panel in the Toolbox. Then click and drag the Create New Variable State option into the main pane.  
The variable state is created and its default settings are displayed in the table.
3. To modify the variable state settings, enter the name and value in the fields provided.

#### NOTES:

- To create more than one variable state, click and drag the Create Multiple New Variables States option into the main pane. Type the number you wish to add and click the OK button.
- Variables are used later in the *Programming* screen.



Variable state added



## Creating a New Time Clock

A *time clock* is a collection of *schedules*. Time clocks can be added to the *project* or a *space*.

### ► To create a new time clock:

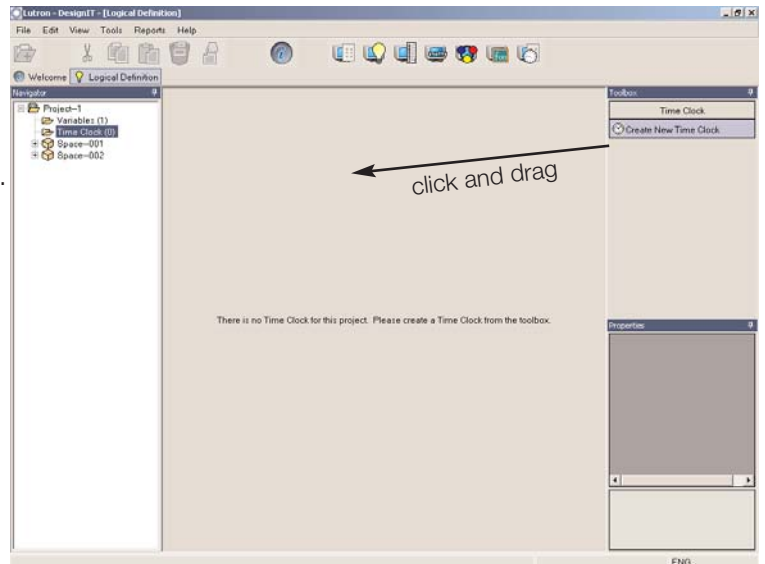
1. From the Navigator in the *Logical Definition* screen, select the Time Clock folder for the project or space.
2. Select the Time Clock panel in the Toolbox. Then click and drag the Create New Time Clock option into the main pane.

The time clock is added to the project or space.

3. Events can now be created for your time clock. These programming functions can be accomplished on the Programming Screen. Please see “Working with Schedules and Time Clocks” on page 40 for more information.

### NOTES:

- To rename the time clock, refer to “Viewing and Editing Object Properties” on page 10.
- Time clocks are programmed from the *Programming* screen.



## Using the Equipment Screen

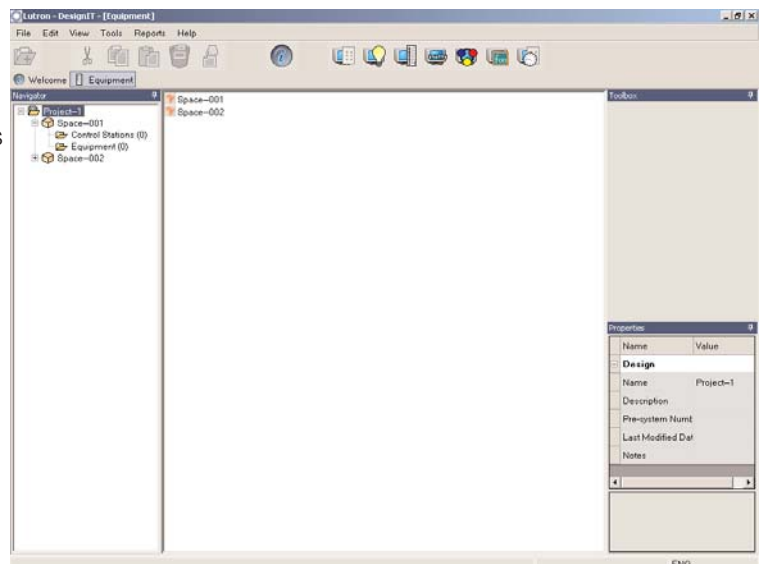
The Equipment screen is used to add *processors* and *panels* to *spaces* in a *project*. This screen is also used to associate all the *switch legs* in the lighting system with the *switch leg controls* in panels and high voltage *control station devices* (such as a *GRAFIK Eye 3602*).

### Opening the Equipment Screen

- To open the Equipment screen: Click  in the toolbar or choose Equipment from the View Menu.

From the Equipment screen, you can:

- Add processors
- Add panels
- Create switch leg to switch leg control associations



## Adding a Processor

A *processor* is a Lutron hardware device that communicates with other hardware via a series of *links*. A processor runs programs and maintains the state of all *objects* in the lighting system. Processors are housed in *enclosures*.

### ► To add a processor:

1. From the Navigator in the Equipment screen, select the Equipment folder for the *space* in which the processor is located.

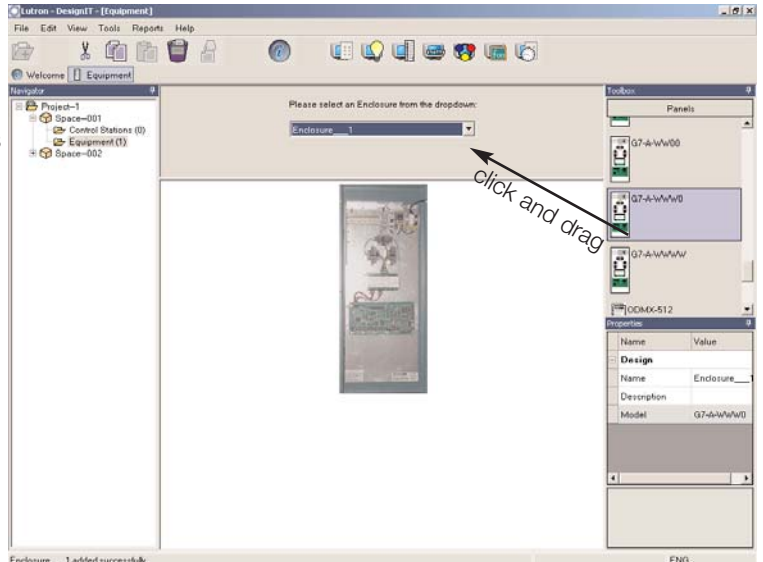
The *Enclosure* dropdown list in the main pane displays the existing enclosures, if any, for the *space*.

2. Select the *Panels* panel in the Toolbox. Then click and drag the *base model number* of the processor to be added into the main pane.

The processor is added to the space. The default name for the enclosure that houses the processor is displayed in the Enclosure dropdown list in the main pane. An image of the processor is also shown.

### NOTES:

- To rename the enclosure, select the enclosure from the dropdown list and then enter a new name in the Properties box. You can rename the processor on the *Addressing* screen.
- *Objects* are added to *links* on the processor using the *Addressing* screen.



## Adding a Panel

A *panel* is a factory built pre-wired assembly of hardware. Panels are housed in *enclosures*.

### ► To add a panel:

1. From the Navigator in the Equipment screen, select the Equipment folder for the *space* in which the panel is located.

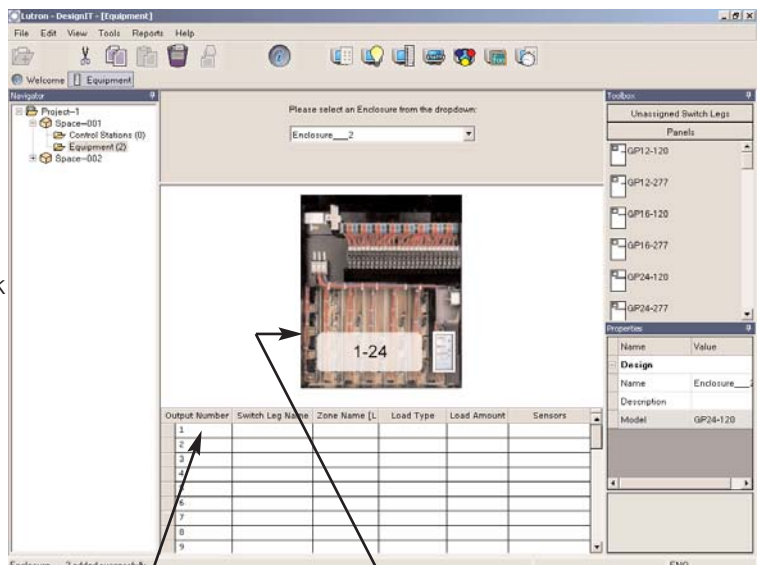
The Enclosure dropdown list in the main pane displays the existing enclosures, if any, for the *space*.

2. Select the *Panels* panel in the Toolbox and then click and drag the *base model number* of the panel into the main pane.

The panel is added to the space. The default name for the enclosure that houses the panel is displayed in the Enclosure dropdown list in the main pane. An image of the panel and a table for creating *switch leg control* associations is also displayed.

**NOTE:** To rename the enclosure, select the enclosure from the dropdown list and then enter a new name in the Properties box. To rename the panel, select the image and then enter a new name in the Properties box.

You can now associate a *switch leg* with each switch leg control on the panel.



Settings for switch leg to switch leg control associations

Switch leg controls inside the panel

## Creating a Switch Leg to Switch Leg Control Association

A *switch leg control* is any electronic device that controls a *switch leg* by varying the signal delivered to the *load(s)*, including wallbox and *panel*-based switch leg controls. In most cases, a switch leg is located between the circuit breaker and the load(s) being controlled.

### ► To associate a switch leg with a switch leg control:

1. From the Navigator in the Equipment screen, select the Equipment folder for the *space* in which the panel/switch leg control is located.

The *Enclosure* dropdown list in the main pane displays the existing enclosures for the *space*.


2. From the Enclosures dropdown list, select the panel that contains the switch leg control(s) to be associated.


A table showing the panel's switch leg control associations is displayed in the main pane. If there are no existing associations, the table is empty.

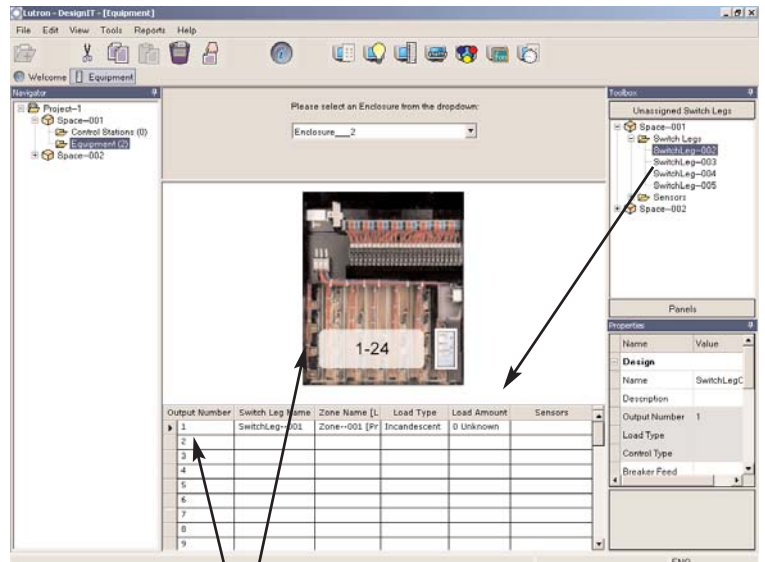
3. Select the Unassigned Switch Legs panel in the Toolbox and then select the Switch Legs folder that contains the switch leg to be assigned. Click and drag a switch leg directly onto the correct row in the table.

The association is made and switch leg settings are displayed in the table row.

### ► To remove a switch leg association:

1. Select the switch leg in the table.
2. Click  in the toolbar, or choose Remove from the Edit menu.

**NOTE:** Clicking  in the toolbar or choosing Delete from the Edit menu will delete the entire panel.



Rows in table correspond to switch leg controls in the panel

## Using the Addressing Screen

The *Addressing screen* is used to inform the system of the location of all addressable hardware in the lighting system. Addresses enable a *processor* to communicate with the hardware connected to it.

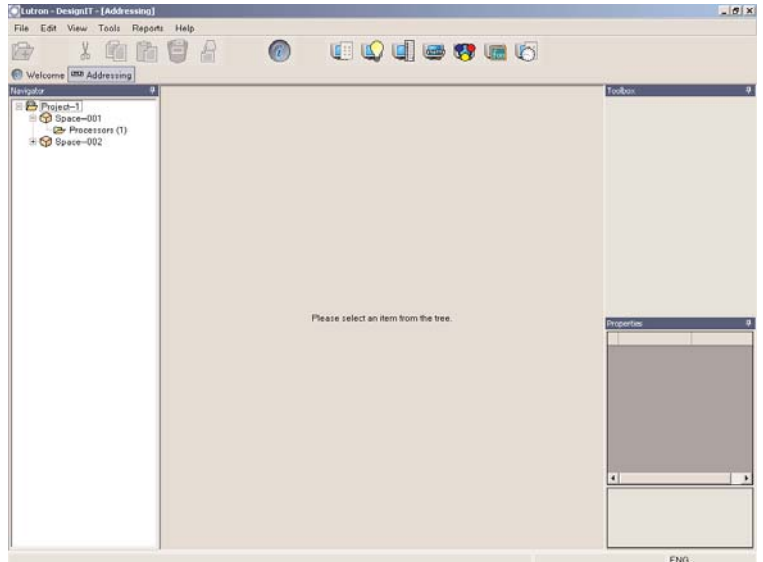
### Opening the Addressing Screen

- ▶ **To open the Addressing screen:** Click  in the toolbar or choose Addressing from the View Menu.

From the *Addressing screen*, you can:

- Add an *object* to a *link* on a processor
- Configure the network settings of the processor
- Create a *sensor* to Lighting Zone Controller association

**NOTE:** Lighting Zone Controller units are only available for North and South America.



### Adding an Object to a Link on a Processor

A *link* refers to a low-voltage wire that connects to the *processor* and enables it to communicate with other hardware in the lighting system.

- ▶ **To add an object to a link on a processor:**

1. From the Navigator in the *Addressing screen*, select the Processor folder for the *space* in which the processor is located.

The Processor dropdown list in the main pane displays the existing processors for the *space*. The Link dropdown list displays available links.

2. From the Processor dropdown list, select the processor. From the Links dropdown list, select the link on the processor to which the *object* is to be assigned.

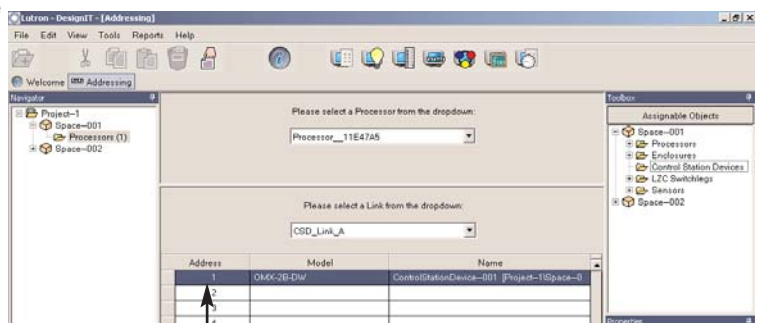
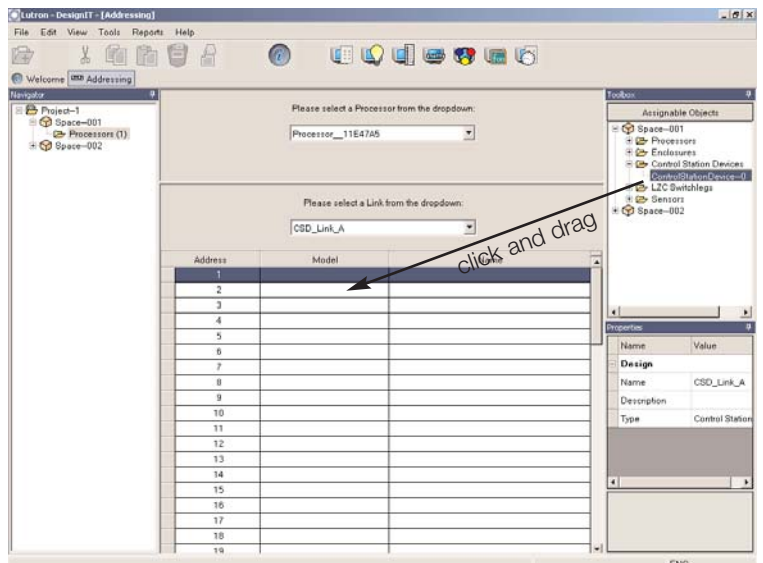
Depending on the selected processor and link, the appropriate number of *address* rows are listed in the table.

**NOTES:**

- AUX and UI links are not addressable from the *Addressing screen*.
- To rename the processor, select the processor from the dropdown list and then enter a new name in the Properties box.


3. Select the *assignable objects* panel in the Toolbox and then navigate to the space that contains the object to be assigned. Open the appropriate object folder and then click and drag the object directly onto the correct address row in the table.

The association is made and the properties of the object are displayed in the table row.



Object added to address on link

► **To remove an addressed object from the processor:**

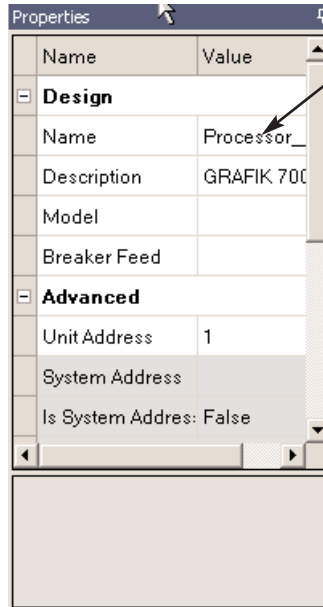
1. Select the object in the table.
2. Click  in the toolbar, or choose Remove from the Edit menu.

**Configuring the Network Settings of the Processor**

The eLumen™ software communicates to the *processor(s)* across a TCP/IP network. The network settings for each processor are configured using the properties window on the *Addressing screen*.

► **To configure the network settings of the processor:**

1. From the Navigator in the *Addressing screen*, select the Processor folder for the *space* in which the *object* is to be assigned.
2. Select the processor from the Processor dropdown list in the main pane.
3. In the Properties box, click each property field to be configured and then enter the appropriate network setting.



Click in an editable field and then enter the new value

Use the scroll bars to display fields that are hidden from view

The following table describes the network settings.

Setting	Description
Unit Address	DIP switch address of the processor.
IP Address	Network address of the processor (factory default is 192.168.250.1).
Subnet Mask	Subnetwork mask (factory default is 255.255.255.0).
UI Port	User interface port used to communicate from the software to the processor (factory default is 8000).

**NOTE:** You cannot change the current address fields. Instead, change the future *address* fields. The fields will be updated during the next data *transfer* from the ControllIT application. (For procedures on how to transfer data, refer to Chapter 4.)



## Creating a Sensor to Lighting Zone Controller (LZC) Association

Occupancy sensors and photo sensors can be wired to Lighting Zone Controller (LZC) units to enhance their functionality in the *space*. These sensors are associated with the unit from the *Addressing* screen.

### ► To associate a sensor with a Lighting Zone Controller unit:

1. From the Navigator in the Addressing screen, select the Processor folder for the space in which the processor is located.

The Processor dropdown list in the main pane displays the existing processors for the space. The Link dropdown list displays available *links*.

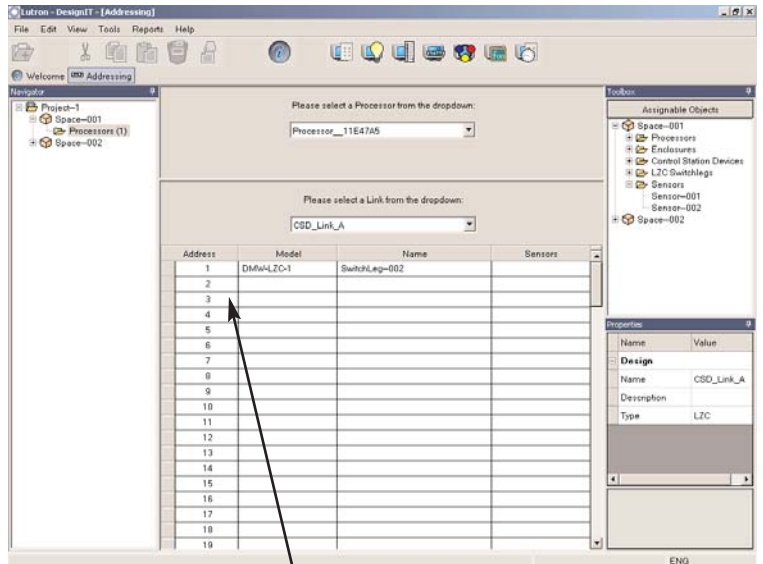
2. From the Processor dropdown list, select the processor. From the Links dropdown list, select the LZC link on the processor to which the *object* is to be assigned.

Depending on the selected processor and link, the appropriate number of *address* rows are listed in the table.

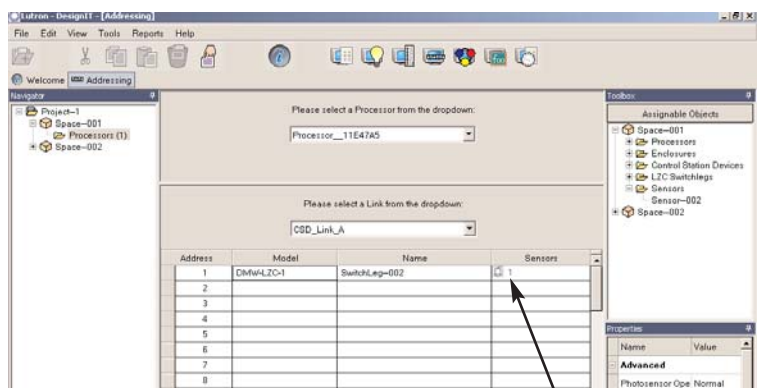
**NOTE:** The Sensors field will display only for Lighting Zone Controller links. The link type can be changed from the link Properties box.

3. Select the *assignable objects* panel in the Toolbox and then navigate to the space that contains the sensor to be assigned. Open the sensor folder and then click and drag the object directly onto the correct address row in the table.

The association is made and the number of sensors associated with the LZC unit is displayed in the Sensors field.



Rows in table correspond to LZC units in the processor



Sensor added

### ► To remove a sensor association:

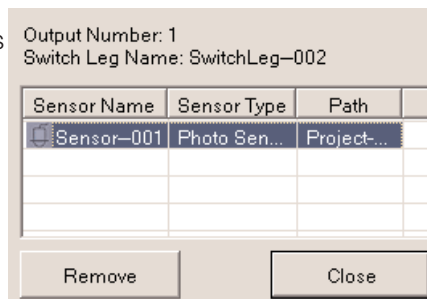
1. From the table in the main pane, click in the Sensors field that contains the *sensor* whose association is to be removed.

A browse button is displayed.

2. Click  .

A popup window lists the sensors currently associated with that *switch leg*.


3. Select the sensor to be removed and then click the Remove button.



## Using the Group Definition Screen

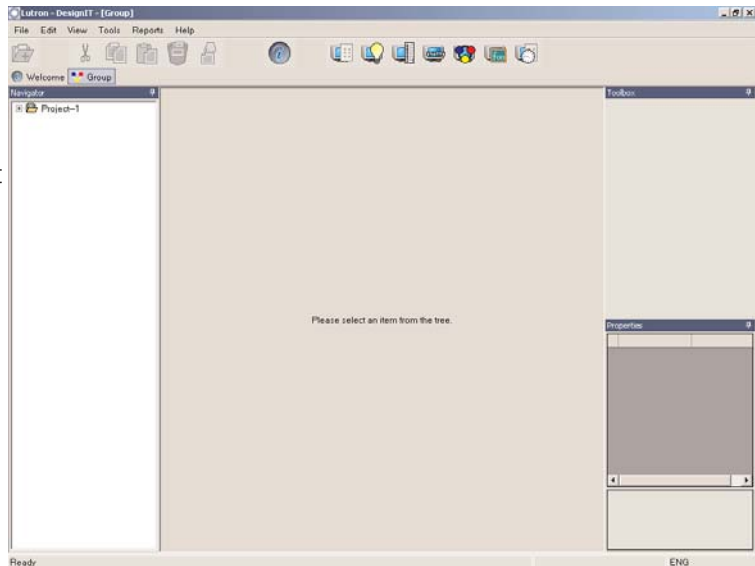
The *Group Definition* screen is used to create *groups* and add *objects* to them. Groups can be used to quickly affect a large number of lighting system objects simultaneously. *Groups* are a *programming* convenience and are not required for a lighting system to operate.

### Opening the Group Definition Screen

- **To open the Group Definition screen:** Click  in the toolbar or choose Group Definition from the View Menu.

From the *Group Definition* screen, you can:

- Create new groups
- Add objects to groups



## Creating a Group

A *group* is a named collection of one or more *objects* (or one or more groups) that share a common functional purpose. Groups can be added to a *space* or to the *project*.

Example: A group called "public spaces" could be created that contains all public places and their *control station devices*.

► **To create a new group:**

1. From the Navigator in the *Group Definition* screen, select the Groups folder for the space in which the processor is located.

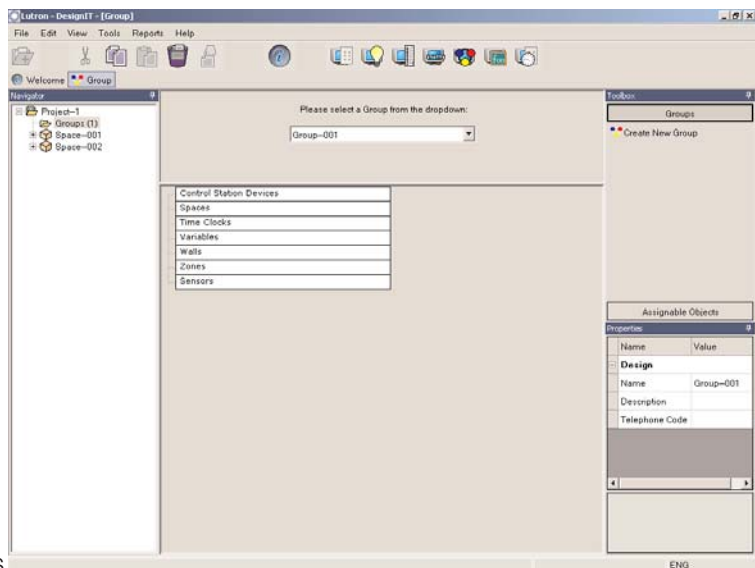
The Group dropdown list in the main pane displays the existing groups, if any, for the space.

2. Select the Groups panel in the Toolbox. Then click and drag the Create New Group option into the main pane.

The group is added and you can now assign objects to it.

**NOTES:**

- To rename the group, refer to "Viewing and Editing Object Properties" on page 10.
- Groups are controlled by applying a *mode* to them from the *Mode Definition* screen.



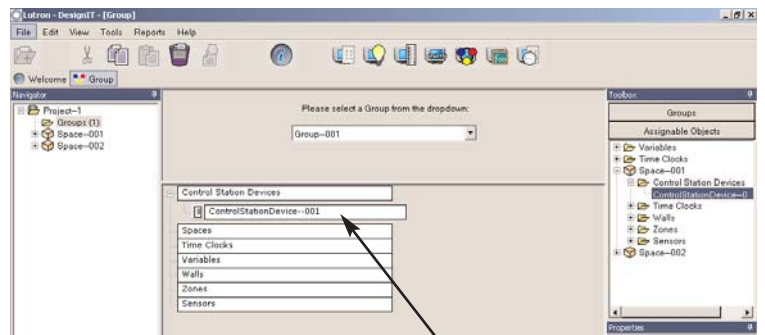
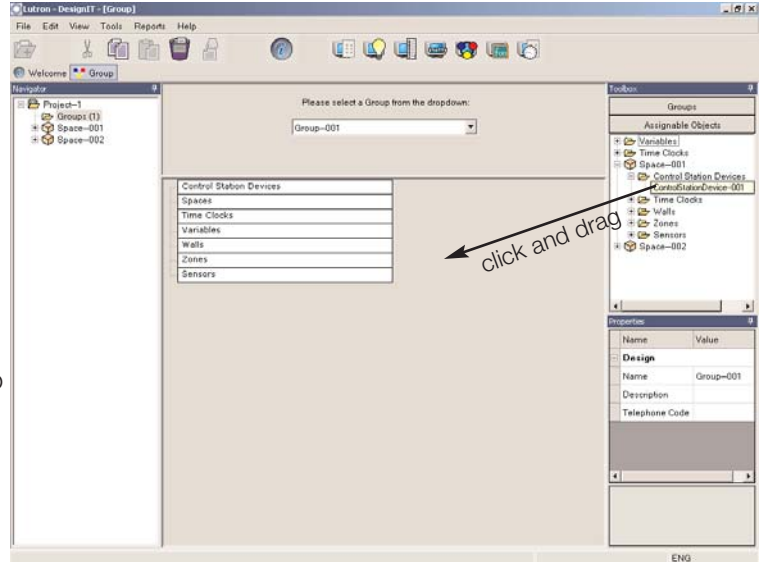


## Assigning Objects to a Group

After a *group* is added to a *project* or *space*, you assign the *objects* to be included in it.

### ► To assign objects to a group:

1. From the Navigator in the *Group Definition* screen, select the Groups folder for the project or space.  
The Group dropdown list in the main pane displays the existing groups for the space.
2. From the Group dropdown list, select the group to which you want to assign objects.
3. Select the *Assignable Objects* panel in the Toolbox and then select the folder that contains the object to be assigned. Click and drag the object into the lower portion of the main pane.  
The object is added under the corresponding row type in the table.




## Using the Mode Definition Screen

The *Mode Definition* screen is used to create *modes* (programming functions and values) that can be applied to *groups* and other *objects* during programming.

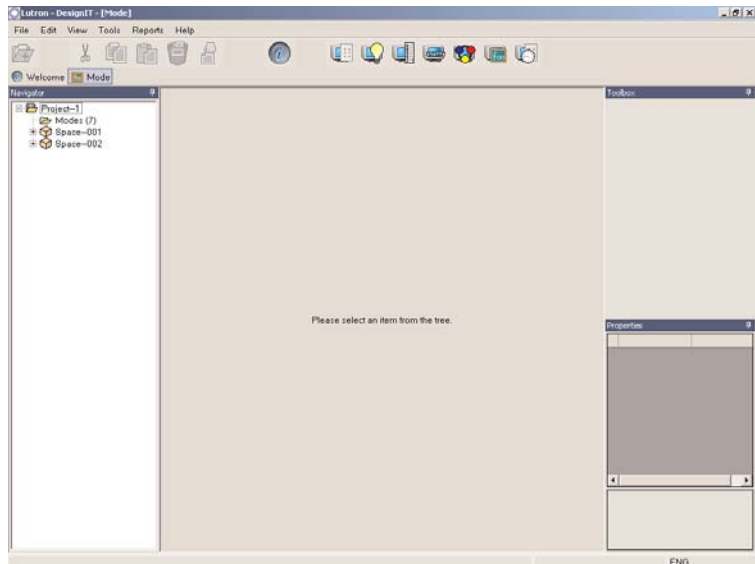
*Modes* are a programming convenience and are not required for the operation of the lighting system.

### Opening the Mode Definition Screen

- ▶ **To open the Mode Definition screen:** Click  in the toolbar or choose Mode Definition from the View Menu.

From the Mode Definition screen, you can:

- Create new modes
- Add object types to modes



## Creating a Mode

A *mode* is a function and set of associated values that determine the behavior of a *group* or other *object* to which it is applied. Modes are added at the *project* level.

Example: A mode called "Daytime" could be created to turn on all lights and disable the *control station devices* in a group that contains *spaces* and *control station devices*.

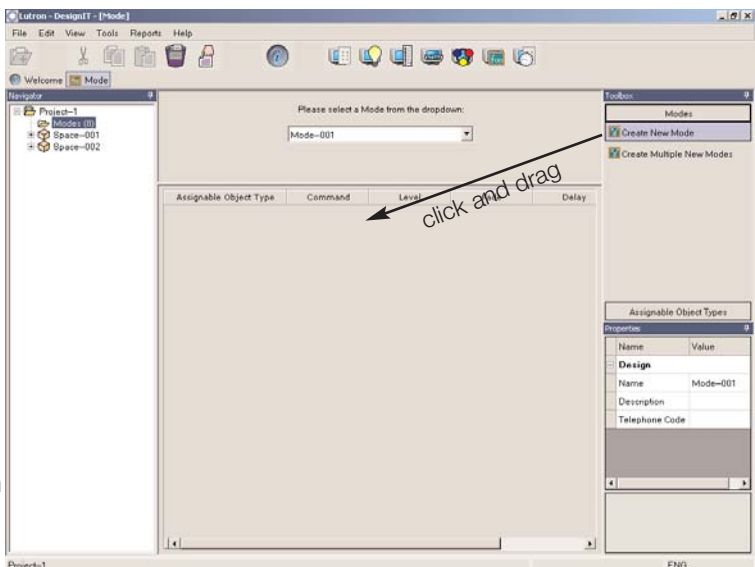
- ▶ **To create a new mode:**

1. From the Navigator in the *Mode Definition* screen, select the Mode folder for the *project*.  
Existing modes, if any, are displayed in the Mode dropdown list in the main pane.
2. Select the Modes panel in the Toolbox. Then click and drag the Create New Mode option into the main pane.

The mode is added to the project and displayed in the Mode dropdown list in the main pane. You can now assign objects to the mode.

#### NOTES:

- To rename the mode, refer to "Viewing and Editing Object Properties" on page 10.
- To create more than one mode, click and drag the Create Multiple New Modes option into the main pane. Type the number you wish to add and click the OK button.

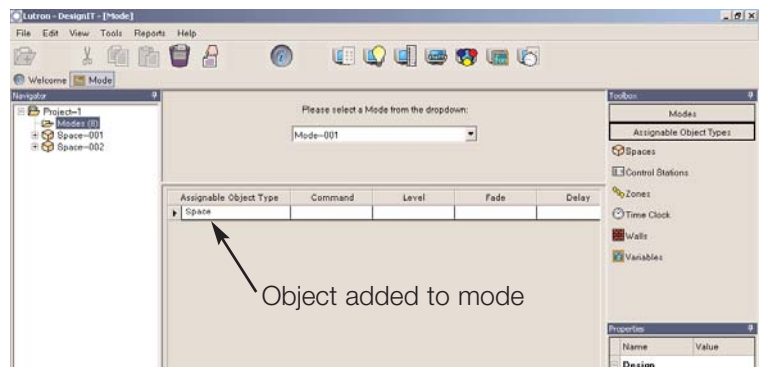
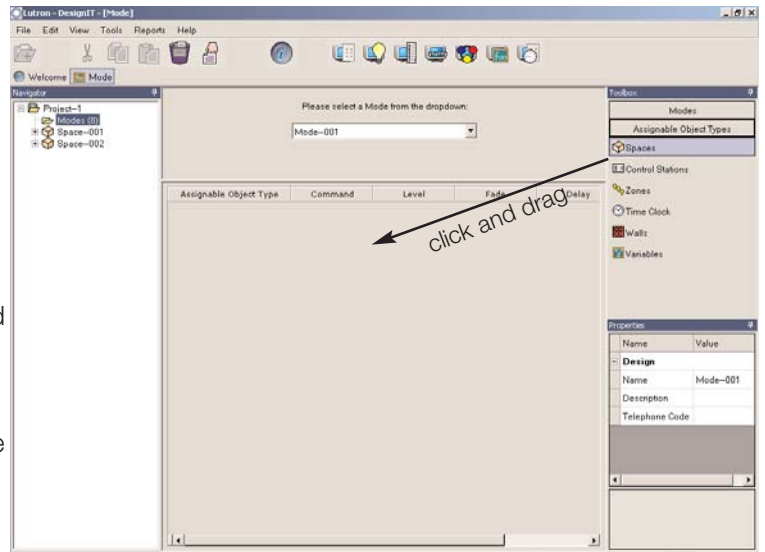


## Assigning Objects to a Mode

After a *mode* is added to a *project*, you assign the *objects* you want it to control.

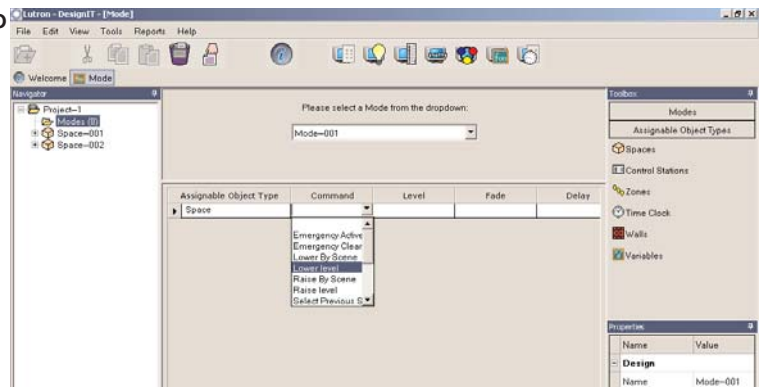
### ► To assign objects to a mode:

1. From the Navigator in the *Mode Definition* screen, select the Mode folder for the project.  
The Modes dropdown list in the main pane displays the existing modes for the *space*.
2. Select the mode from the dropdown list. Select the *Assignable Object Types* panel from the Toolbox and then click and drag the type of object to be assigned into the main pane.  
The *object* type is assigned to the *mode* and fields for entering object setting values are displayed in the table.



### ► To enter setting values for the object assigned to the mode:

1. Double-click in the Command field in the row for the assigned object.  
A dropdown list is displayed.
2. Select the Command value from the dropdown list.  
Depending on the value you select, default values are displayed in the other fields in the table row.
3. To modify the other settings for the object, click in each of the fields and enter a new value. Move from left to right across the table row.




Assignable Object Type	Command	Level	Fade	Delay
* Space	Set level	100%	0 ss	0 ss

## Using the Programming Screen

The *Programming screen* is used to program *control station* buttons, create *programming* and *schedules*, and apply schedules to *time clocks*.

### Opening the Programming Screen

- ▶ **To open the Programming screen:** Click  in the toolbar or choose Programming from the View Menu.

From the Programming screen, you can:

- Program the buttons for control station devices.
- Program schedules for time clocks.

## Working with Control Station Devices

A *control station device* is housed in a control station and provides a point of input or output. In most cases, control stations devices are wall-mounted controls with buttons.

Control station devices can be programmed to react to a button press (Single Action), a button press and release (Dual Action), a different action based on the status of a part of the building (Conditional), or to run a sequence of events (Auto Sequence).

*NOTE:* For information on *programming an autosequence*, refer to the Online Help in the DesignIT application.

## Programming a Button for a Single Action

*Control station* buttons can be programmed to execute a *single action* when pressed (for example, pressing the button selects a *scene*).

- ▶ **To program a button for a single action:**

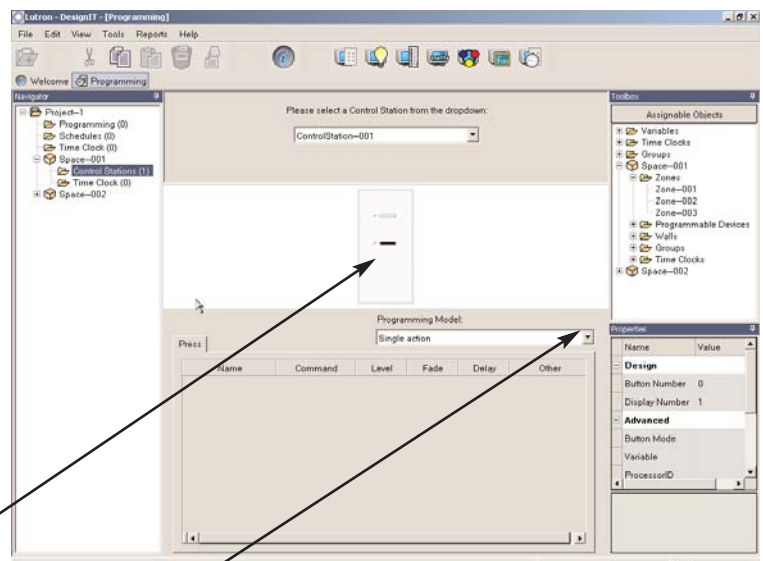
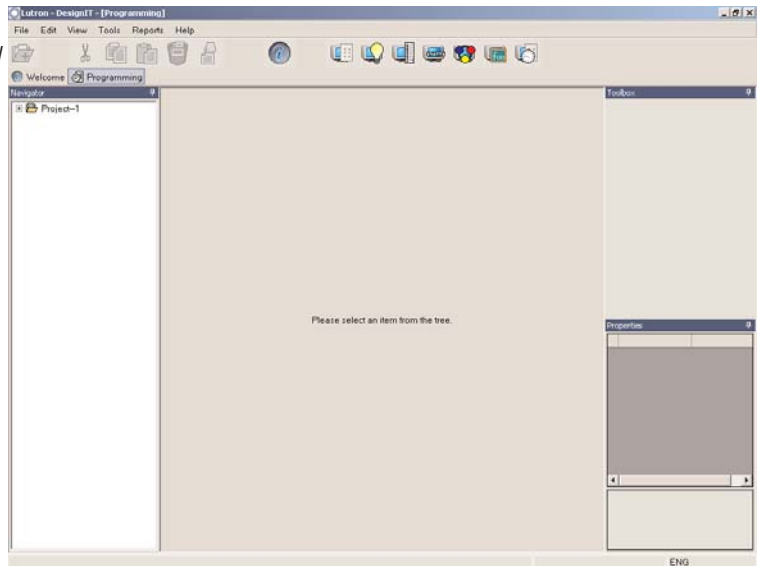
1. From the Navigator in the *Programming screen*, select the *space* and then the *Control Stations* folder that contains the *control station* to be programmed.

The Control station dropdown list in the main pane displays the existing control stations for the space. An image of the currently selected control station is also displayed.

2. From the dropdown list, select the control station to be programmed.
3. From the image of the control station device, click the button to be programmed.

The Programming Model dropdown list displays available models for the selected button. A model specifies how the *system* responds to user interaction.

4. From the Programming Model dropdown list, select Single action.

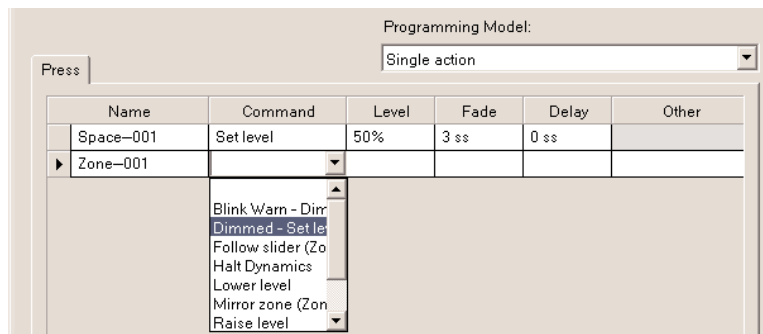
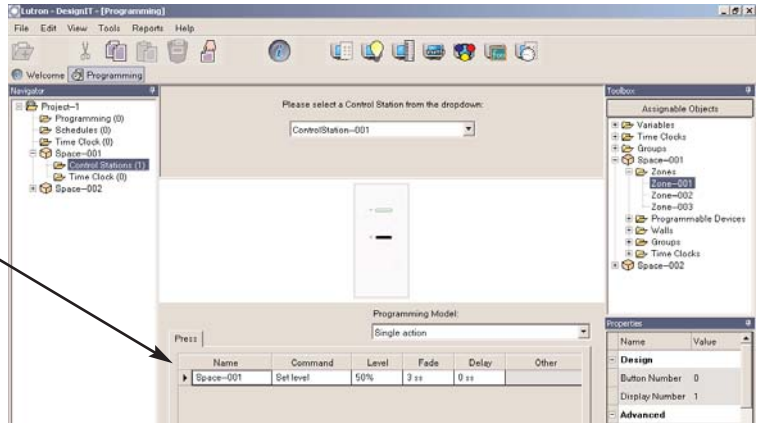


- Select the *Assignable Objects* panel in the Toolbox. Navigate to the space that contains the object to be controlled by the selected button. Select that object folder and then click and drag the object into the lower portion of the main pane.

The object is assigned to the button and default program settings are displayed in the table.

- To modify the default settings, double-click the Command field. Then select the value you want from the dropdown list.
- To modify other program settings for the object, click in each field and enter the new value. Move from left to right across the table row.

*NOTE:* Use the scroll bars to view table fields that are hidden from view.



## Programming a Button for a Dual Action

*Control station* buttons can be programmed to execute a *single action* when pressed (for example, pressing the button starts raising the *zone* intensity) and then execute another action when released (for example, releasing the button stops raising the zone intensity).

### ► To program a button for a dual action:

1. From the Navigator in the *Programming* screen, select the *space* and then the *Control Stations* folder that contains the control station to be programmed.

The Control Station dropdown list in the main pane displays the existing control stations for the space. An image of the currently selected control station is also displayed.

2. From the dropdown list, select the control station to be programmed.
3. From the image of the *control station device*, click the button to be programmed.

The Programming Model dropdown list displays available models for the selected button. A model specifies how the *system* responds to user interaction.

4. From the Programming Model dropdown list, select *Dual action*.

The Press tab in the main pane is automatically selected.

5. Select the *Assignable Objects* panel in the Toolbox. Navigate to the space that contains the object to be controlled by the selected button. Select that object folder and then click and drag the object into the lower portion of the main pane.

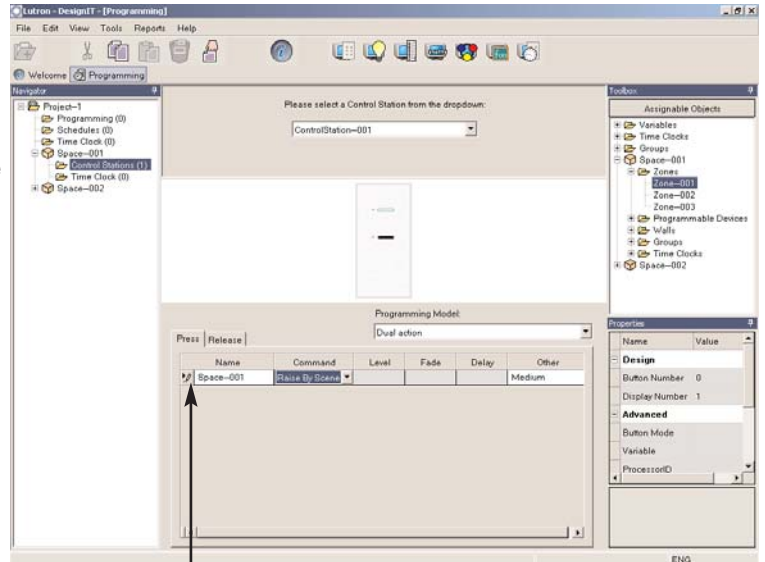
The object is assigned to the button and default program settings are displayed in the table.

6. To modify the default settings, double-click the Command field. Then select the value you want from the dropdown list.

7. To modify other program settings for the object, click in each field and enter the new value. Move from left to right across the table row.

*NOTE:* Use the scroll bars to view table fields that are hidden from view.

8. Select the Release tab in the main pane. Then repeat steps 5 through 7 to specify the button *release* action.



Object is assigned to the button



## Programming a Button for a Conditional Action

Control station buttons can be programmed to execute an action based on one or more conditions. For example, when a button is pressed, you may want to select Scene 2 if Scene 1 was previously selected. Otherwise, you would like to have the Off Scene selected. In this example, you would need to create the following program settings:

```

If
    The Scene in Space A = Scene 1
Then
    Select Scene 2
Else
    Select Scene Off
End If
  
```

### ► To program a button for a conditional action:

1. From the Navigator in the *Programming* screen, select the *space* and then the *Control Stations* folder that contains the control station to be programmed.

The Control Station dropdown list in the main pane displays the control stations for the space. An image of the currently selected control station is also displayed.

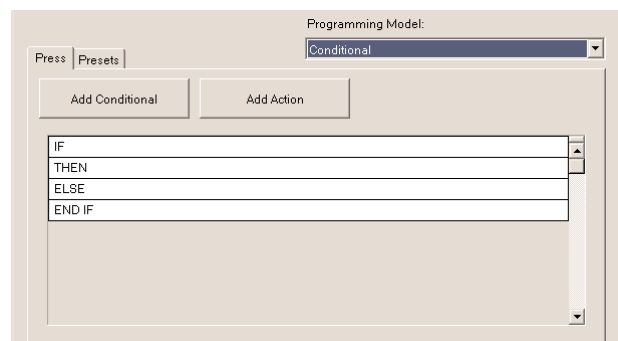
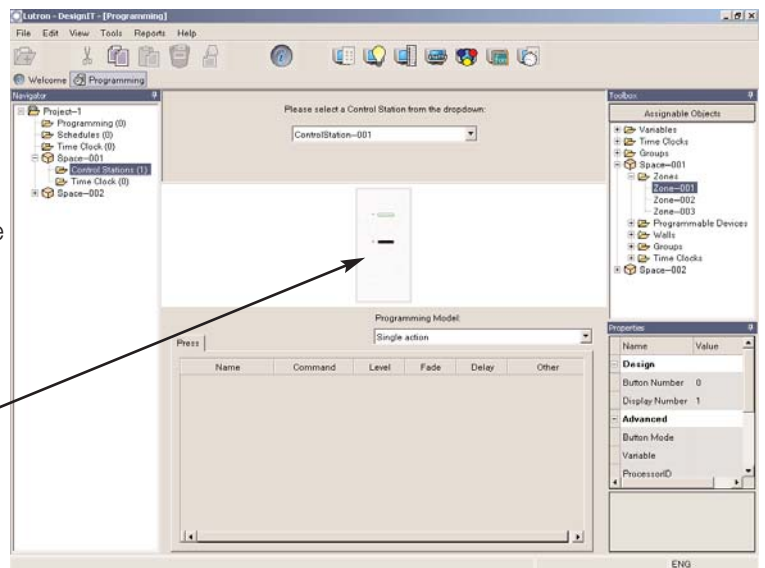
2. From the dropdown list, select the control station to be programmed.
3. From the image of the control station, click the button to be programmed.

The Programming Model dropdown list displays available models for the selected button. A model specifies how the *system* responds to user interaction.

4. From the Programming Model dropdown list, select *Conditional*.

A table used to create the *conditional programming* is displayed in the main pane.

At this point, you can create a *preset* to be used in the conditional programming. A preset specifies the object(s) that are controlled by the button and the action to be performed.





► **To create a preset to use for conditional programming:**

1. Select the Presets tab in the main pane.
2. Click the New button.
3. Select the *Assignable Objects* panel in the Toolbox. Navigate to the *space* that contains the *object* to be controlled by the *conditional* button. Select the object folder and then click and drag the object into the lower portion of the main pane.

The object is assigned to the *preset* and default program settings are displayed in the table.

4. To rename the preset, click in the Name field and enter a new name.

If needed, enter a text description of the preset in the Description field.

5. To modify the program settings, double-click the Command field. Then select the value you want from the dropdown list.

6. To modify other program settings for the object, click in each field and enter the new value. Move from left to right across the table row.

*NOTE:* Use the scroll bars to view table fields that are hidden from view.

7. Repeat the procedure to create all presets needed to create the *conditional* programming.


► **To apply a preset to the conditional programming:**

1. Select the Press tab in the main pane.
2. Click the IF cell in the table. From the Toolbox, drag the *object* that the condition is evaluating into the IF cell.

A row for the object is added in the table.

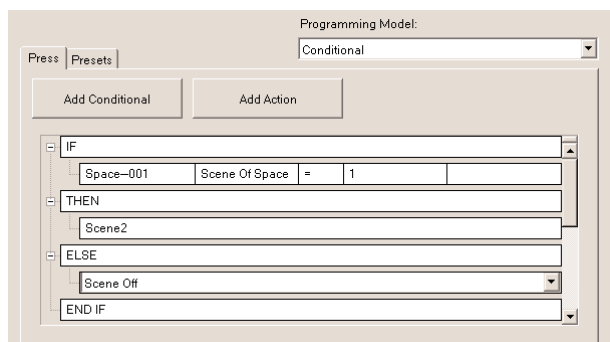
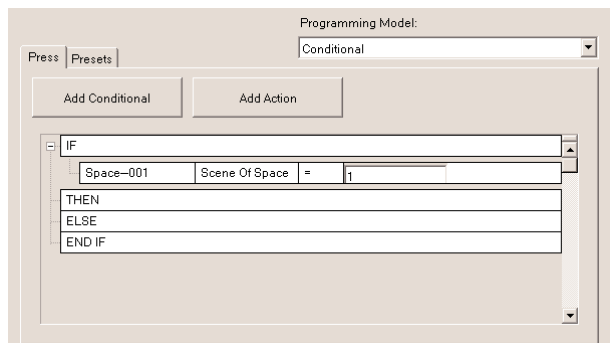
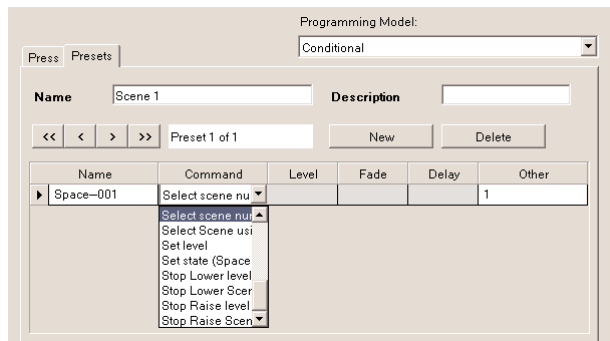
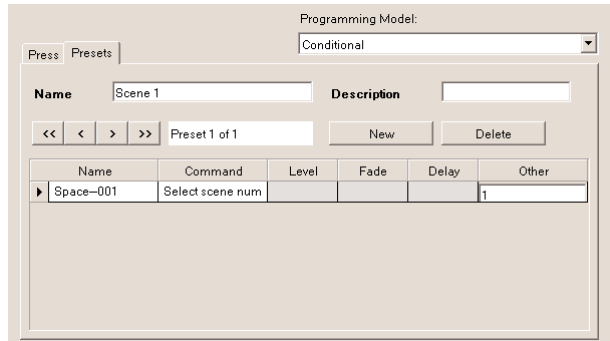
3. Click in the row for the object and specify the settings and values to be used.
4. Click in the THEN cell on the grid. Click the Add Action button in the main pane.
5. Double-click the cell created below the THEN cell. Select the *preset* you created from the dropdown list.
6. If needed, click in the ELSE and/or END IF cells. Click the Add Action button and then select the appropriate preset for those actions.

► **To remove existing programming:**

1. Navigate to the button.
2. Click on the row you wish to remove.
3. Click the remove button  .

*NOTES:*

- Be sure to choose an LED preset for your button in the Properties Box.



---

## Working with Schedules and Time

### Clocks

A *schedule* is a collection of *event/programming* pairs. A schedule identifies the programmed commands to be executed within the lighting *system* at a certain time. You can create weekly schedules (for ongoing *events* that occur weekly) or date-specific schedules (for holidays or other special events).

Schedules are applied to *time clocks*, which are *calendars* that identify when scheduled events are to occur.

It is important to understand the workflow needed to set up the schedules and time clocks for a system:

1. Identify the purpose of the schedule (events to be included, *objects* to be affected, and commands to be executed).
2. Create the programming to be used in a time clock.
3. Create the schedule and apply a time to the programming.
4. Apply the schedule to a time clock within the system.

### Planning Schedules and Time Clock Configurations

Before you create the *programming* for a *schedule*, it is helpful to map out the schedule on paper. This will make it easier to understand how a program, schedule, and *time clock* work together to control the lighting *system*.

For example, suppose you want to turn off Zone 1 and Zone 2 at 2PM on August 6:

- The programming portion is zone 1 = 0% and zone 2 = 0%.
- The schedule portion is the *real-time event* of 2PM.
- The time clock portion is August 6.

Programming and schedules are created at the project level. Time clocks can be configured at both the project and space level.

## Creating New Programming for a Schedule

*Programming* is predetermined behavior that is defined to occur as the result of an *event* (*astronomic* or *real-time*).

### ► To create new programming for a schedule:

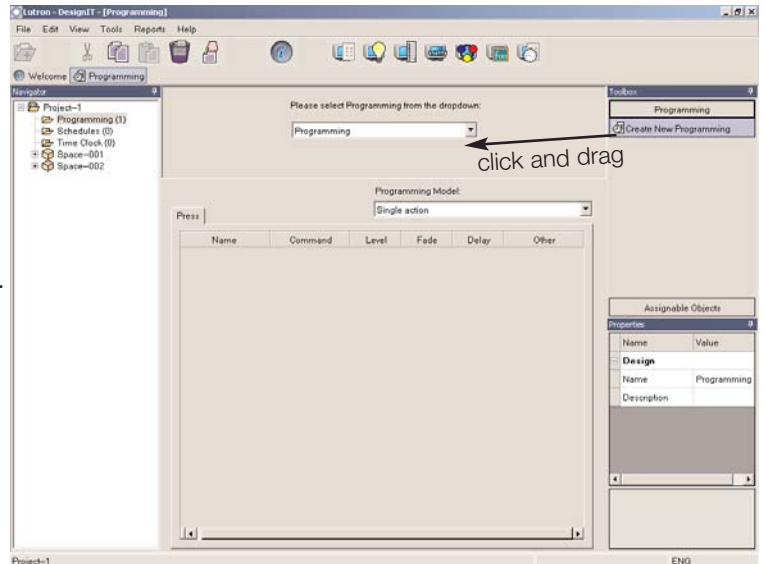
1. From the Navigator in the *Programming* screen, select the *Programming* folder for the *project*.

The *Programming* dropdown list in the main pane displays existing programming, if any, for the *project*.

2. Select the *Programming* panel in the *Toolbox*. Then click and drag the *Create New Programming* option into the top portion of the main pane.

The programming is added. You can now assign *objects* and programming actions to it.

*NOTE:* To rename the programming, refer to "Viewing and Editing Object Properties" on page 10.



### ► To assign objects and actions to the programming:

1. If it is not already selected, select the *programming* from the *Programming* dropdown list.
2. From the *Programming Model* dropdown list, select *Single action* or *Conditional*.
3. Select the *Assignable Objects* panel in the *Toolbox*. Navigate to the *space* that contains the *object* to be controlled by the programming. Select that object folder and then click and drag the object into the lower portion of the main pane.

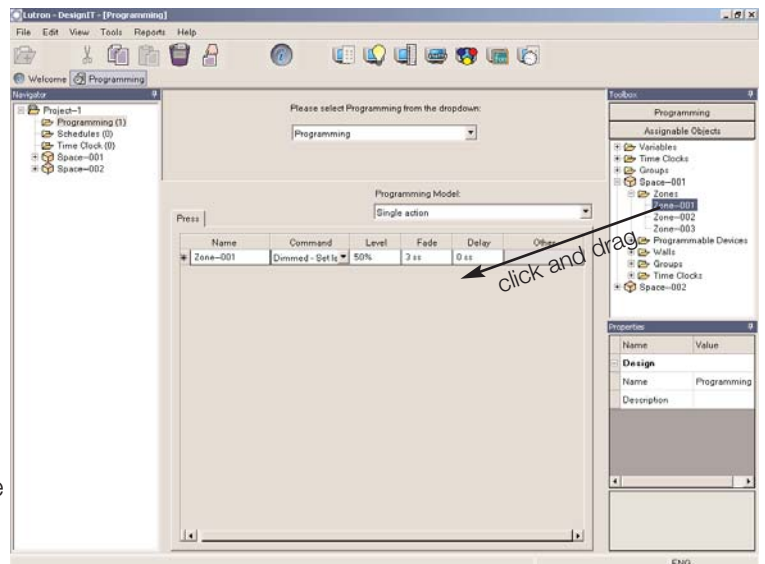
The object is added to the program and default program settings are displayed in the table.

4. Modify the program settings, as needed.

For procedures on how to modify *single action* settings, refer to "Programming a Button for a Single Action" on page 35.

For procedures on how to modify conditional action settings, refer to "Programming a Button for a Conditional Action" on page 38.

After the schedule programming is created, you can create the schedule.



## Creating a New Schedule

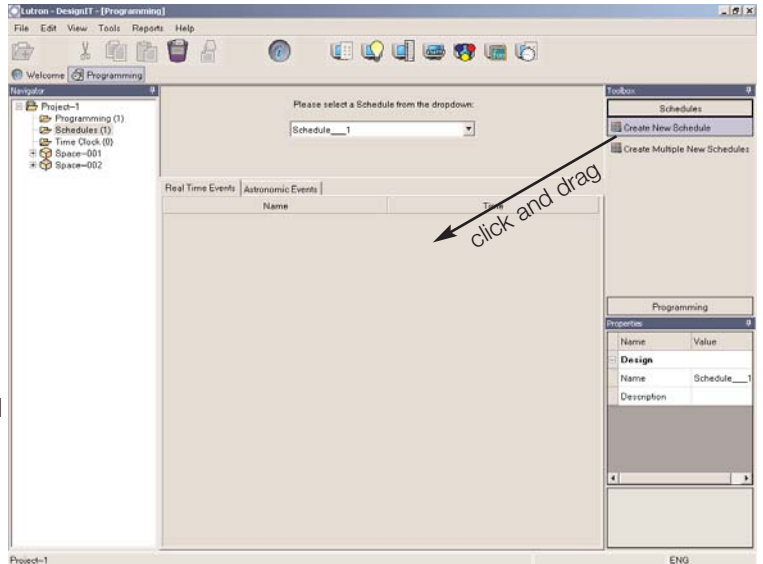
A *schedule* is a collection of *event/programming* pairs. A schedule identifies the programmed commands to be executed within the lighting system at a certain time. Schedules are created at the *project* level.

### ► To create a new schedule:

1. From the Navigator in the *Programming* screen, select the Schedules folder for the project.  
The Schedule dropdown list in the main pane displays the existing schedules, if any, for the project.
2. Select the Schedules panel in the Toolbox. Click and drag the Create New Schedule option into the main pane.

The schedule is added and displayed in the Schedule dropdown list. You can now add *astronomic* and/or *real-time* events to it.

**NOTE:** To rename the schedule, refer to "Viewing and Editing Object Properties" on page 10.

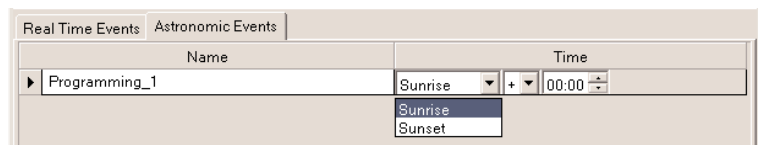
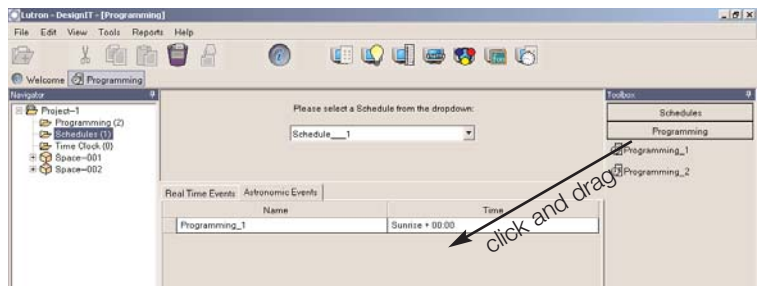


## Adding an Astronomic Event to a Schedule

An *astronomic event* is an *event* defined to occur at a certain time period before or after sunrise or sunset.

### ► To add an astronomic event to a schedule:

1. From the Navigator in the *Programming* screen, select the Schedules folder for the *project*.  
The Schedule dropdown list in the main pane displays the existing *schedules* for the project.
2. From the dropdown list, select the schedule to which the astronomic event is to be added. Then select the Astronomic Events tab in the main pane.
3. Select the Programming panel in the Toolbox. Click and drag the predefined *programming* for the schedule into the lower portion of the main pane.  
This should be programming you created specifically for this schedule. (For procedures, refer to "Creating New Programming for a Schedule" on page 41.)  
The programming is added to the schedule and default event settings are displayed in the table.
4. To modify the setting values, double-click the Sunrise/Sunset field. Then select the value you want from the dropdown list.
5. Click in the +/- field. Select + to start the event after sunrise or sunset. Select - to start the event before sunrise or sunset.
6. Click the Time field. Enter the number of hours and minutes to wait before starting the event.



## Adding a Real-Time Event to a Schedule

A *real-time event* is an *event* defined to occur at a specific time of day.

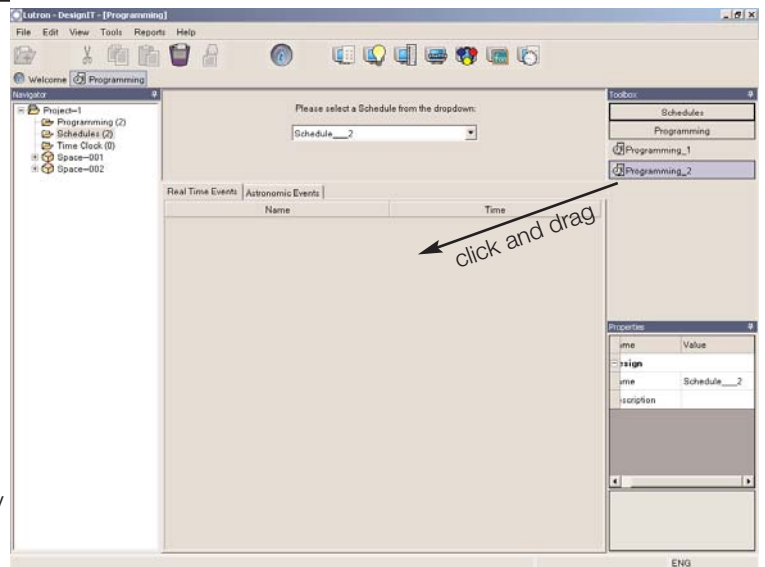
### ► To add a real-time event a schedule:

1. From the Navigator in the *Programming* screen, select the Schedules folder for the *project*.  
The Schedule dropdown list in the main pane displays the existing *schedules* for the project.
2. From the dropdown list, select the schedule to which the real-time event is to be added. Select the Real-Time Events tab in the main pane.
3. Select the Programming panel in the Toolbox. Click and drag the predefined *programming* for the schedule into the lower portion of the main pane.

This should be programming you created specifically for this schedule. (For procedures, refer to "Creating New Programming for a Schedule" on page 41.)

The programming is added to the schedule and a default event time is displayed in the table.

**NOTE:** To change the event time, double-click in the Time field and enter a different time.



Name	Time
Programming_2	12:00 PM

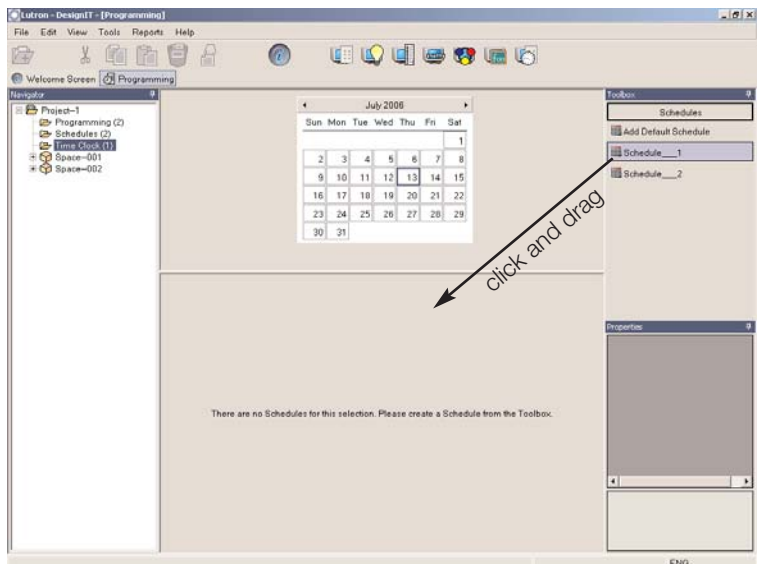
## Adding a Date-Specific Schedule to a Time Clock

If a *schedule* is designed for *events* that occur on one or more specific dates (for example, a holiday or special time period), it is added to the *time clock* for those dates only.

**NOTE:** Default weekly schedules can also be added to a *time clock*. Refer to "Adding a Default Weekly Schedule to a Time Clock" on page 44.

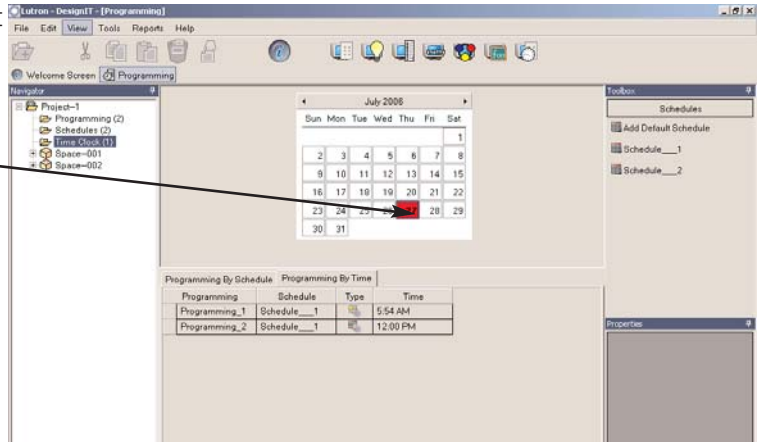
### ► To add a date-specific schedule to a time clock:

1. From the Navigator in the *Programming* screen, select the Time Clock folder for the *project*. Or to add a *schedule* to a *space*, select the Time Clock folder for the *space*.  
A *calendar* for the *time clock* is displayed in the main pane. Today's date is automatically selected.
2. Select the date to which you want to add the schedule.  
**NOTE:** Use the scroll arrows to scroll through the calendar months.
3. Select the Schedules panel in the Toolbox. Click and drag the schedule to be assigned into the main pane.  
The schedule is assigned and the calendar date is highlighted in red.



4. If the schedule applies to more than one date, select the next date and repeat the procedure.

► **To view the schedule for a date:** Click the date in the calendar.



### Adding a Default Weekly Schedule to a Time Clock

If a *schedule* is designed for *events* that occur weekly, it is added to the *system* as a *default schedule*.

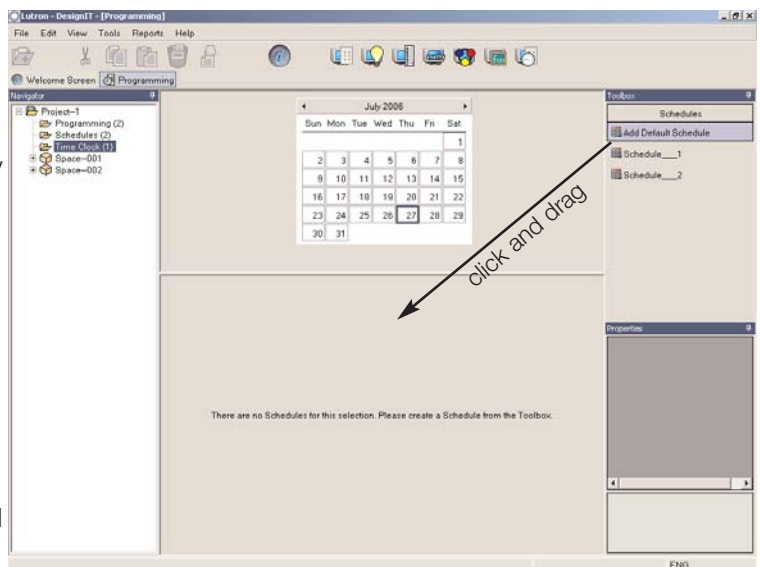
**NOTE:** Default schedules will occur on the same day every week. To add a date-specific schedule to a *time clock*, refer to page 43.

► **To add a default weekly schedule to a time clock:**

1. From the Navigator in the *Programming* screen, select the Time Clock folder for the *project*. Or to add a default schedule to a *space*, select the Time Clock folder for the *space*.

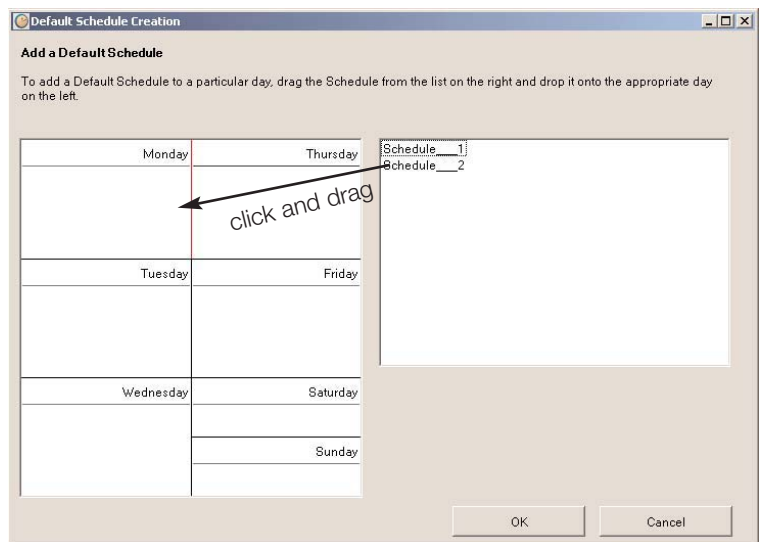
The time clock *calendar* is displayed in the main pane. Today's date is automatically selected.

2. Select the Schedules panel in the Toolbox. Click and drag the Add Default Schedule option into the main pane.



The Default Schedule Creation window displays. It contains a placeholder for each day in the week. It also lists the existing schedules for the project or space.

3. From the Default Schedule Creation window, click and drag a *schedule* onto each day that it should occur.

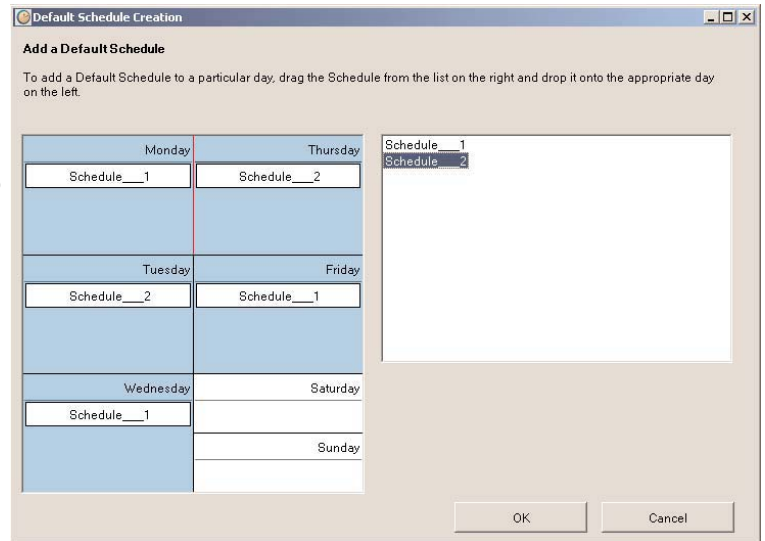




4. When you are finished setting default schedules, click the OK button.

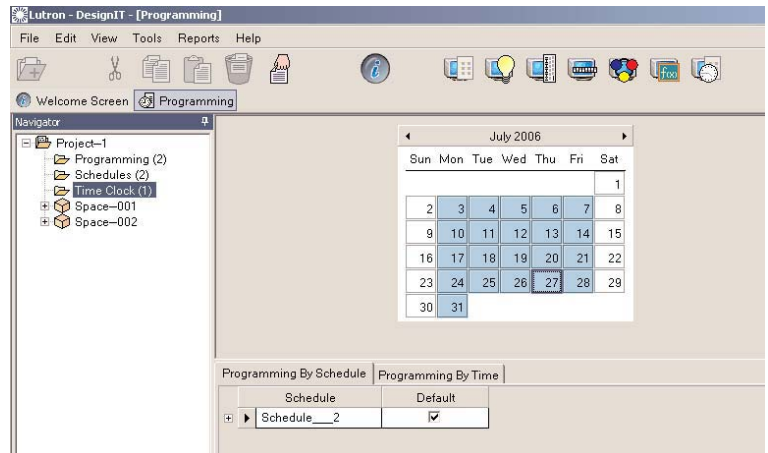
Days in the calendar that have been assigned a default schedule are highlighted in blue in the main pane.

*NOTE:* To remove a default schedule, please refer to the Online Help.



► **To view the schedule for a date:** Click the day in the calendar.

*NOTE:* Only one *schedule* can run on each *time clock* for a given day.





## Changing When a Time Clock Event Happens

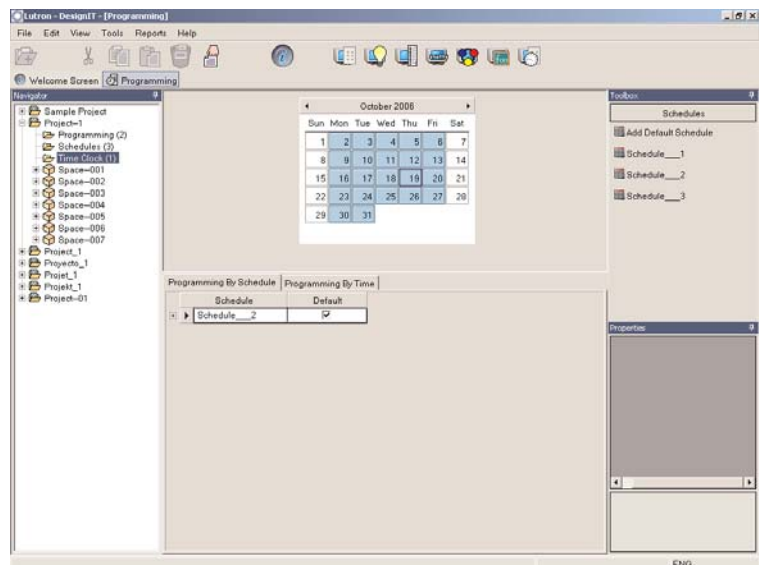
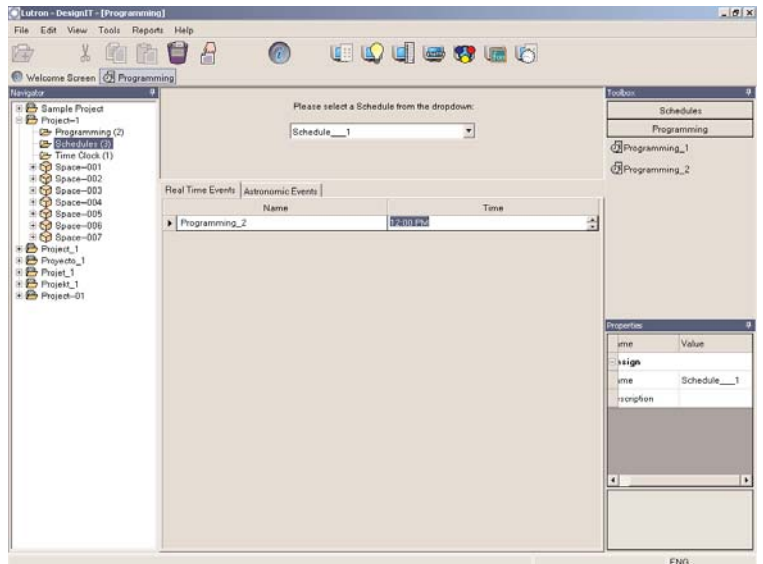
A *schedule* is a collection of *event/programming* pairs. A schedule identifies the programmed commands to be executed within the lighting system at a certain time. Schedules are created at the *project* level.

### ► To change the time an event occurs:

1. From the Navigator in the Programming screen, select the Schedules folder for the project.  
The Schedule dropdown list in the main pane displays the existing schedules for the project.
2. Select the tab for Real-Time or Astronomic events.  
Real-Time events occur at a specific time, while Astronomic events occur relative to sunrise or sunset.
3. Using the table in the center of the main pane, enter a new time for the event.

### ► To change the day an event occurs:

1. Select the day that the event occurs from the calendar at the top of the main pane.
2. Click on the remove icon from the menu bar.
3. You can now add a date-specific schedule (see page 43) or add a default weekly schedule (see page 44).



## Viewing and Changing What the Time Clock Event Does

*Programming* is predetermined behavior that is defined to occur as the result of an *event* (*astronomic* or *real-time*).

### ► To locate programming on a specific time clock:

1. From the Report menu, select Time Clock Programming.
2. Next, select a date or date range for the report.
3. The report will display the *time clock*, event name, event time, programming name, and *schedule* name.

*NOTE:* For more information on running reports in the DesignIT or ControlIT applications, refer to Generating Reports on page 64.

► **To change existing time clock programming:**

From the Navigator in the Programming screen, select the Programming folder for the project.

The Programming dropdown list in the main pane displays existing programming for the project.

*NOTE:* To rename the programming, refer to “Viewing and Editing Object Properties” on page 10.

► **Add commands to the programming:**

1. Select the Assignable Objects panel in the Toolbox.
2. Navigate to the space that contains the object to be controlled by the programming.
3. Select that object folder and then click and drag the object into the lower portion of the main pane.

► **Edit commands to the programming:**

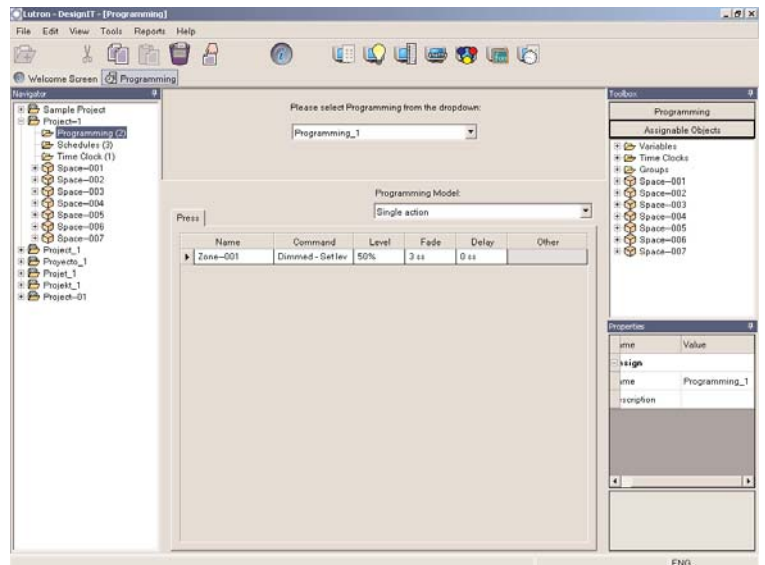
1. From the table in the main pane, select the command, level, fade time, or delay time.
2. Add or remove commands as necessary.

► **Remove commands from the programming:**

1. Select the command within the table on the main pane.
2. Click on the Remove icon from the menu bar.

► **Change the programming model from Single Action to Conditional:**

1. Using the Programming Model dropdown list select Conditional.
2. A dialog box will appear asking you to choose to modify the existing programming or to create new programming. If you choose to edit the existing program, any scheduled events will be affected.



# Chapter 3

## SecureIT™

### Overview


The SecureIT™ application enables an eLumen™ administrator to manage eLumen™ Lighting Control user accounts.

From the SecureIT™ application, an administrator can:

- Add and delete users
- Enable and disable users
- Associate users with *projects*
- Change a user's password
- Change a user's basic information
- Set application level access
- Set application feature privileges
- Set *space* level access

### Starting and Exiting SecureIT™

#### ▶ To start SecureIT™:

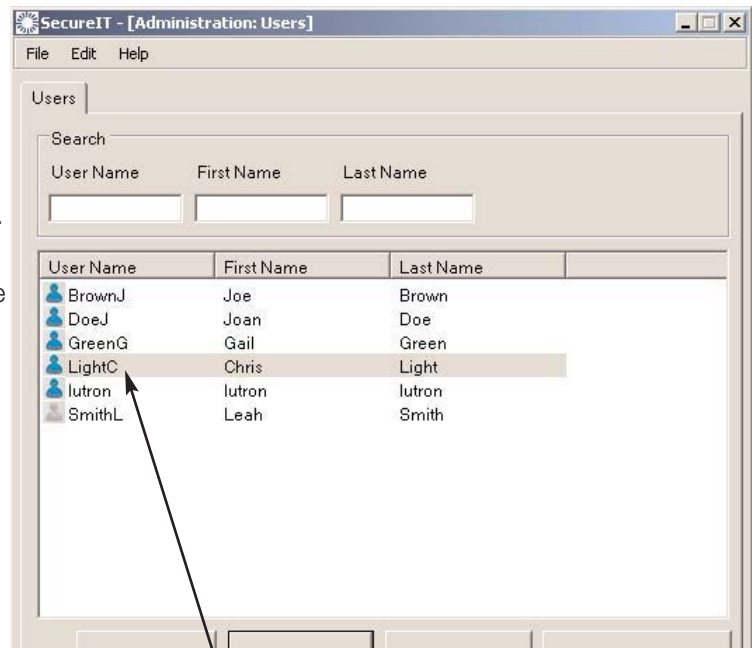
1. Double-click the SecureIT™ icon  on the desktop. Or from the Start menu, choose Lutron Electronics>SecureIT.

You are prompted to login.

2. Enter your user name and password. Then click OK.

The SecureIT™ window displays all eLumen™ users.

#### ▶ To exit SecureIT™: Open the File menu and choose Exit.



eLumen™ users  
(disabled users are dimmed)

## Adding Users

**NOTE:** Only available to eLumen™ administrators.

Users must be added to SecureIT™ to use the eLumen™ software tools.

### ► To add a user:

1. From the SecureIT™ application window, open the File menu and choose Add>User. Alternatively, you can click on the Add button at the bottom of the screen.

The Add a User window displays.

2. Enter the user settings.
3. Click the OK button.

The user is added to the list in the SecureIT™ window.

**NOTE:** The new user that was created must be enabled and associated with a *project* before the user will be active (see page 50).

The following table describes the user settings.

Setting	Description
User Name	1-30 character user name used to login to eLumen software tools.
First Name	The user's first name.
Last Name	The user's last name.
User Locale	Language to be displayed within eLumen software suite for the user.
Password	0-30 character password used to login to eLumen software tools
Confirm Password	Re-type the password in this field to confirm that it is entered correctly.

## Deleting Users

**NOTE:** Only available to eLumen™ administrators

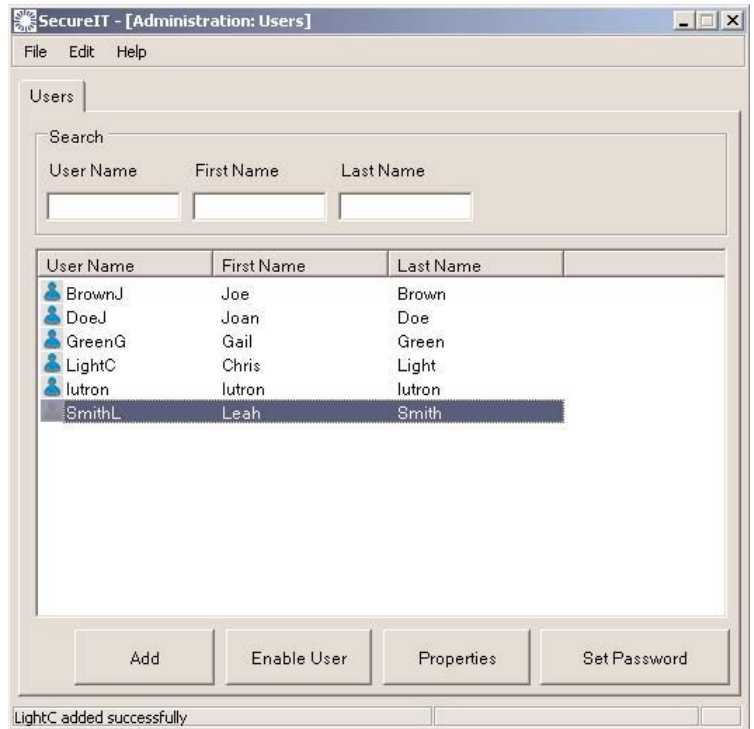
### ► To delete a user:

1. From the SecureIT™ application window, select the user.
2. Open the File menu and choose Delete>User.
3. Click the OK button to confirm the deletion, or click the Cancel button to cancel the deletion.

## Enabling and Disabling Users


An administrator must enable users in order for them to login to the eLumen™ software tools.

- ▶ **To enable a user:** Select the user name. Then, open the File menu and choose Enable>User. Alternatively, you can click on the Enable User button at the bottom of the screen.
- ▶ **To disable a user:** Select the user name. Then, open the File menu and choose Disable>User. Alternatively, you can click on the Disable User button at the bottom of the screen.




## Associating Users with Projects

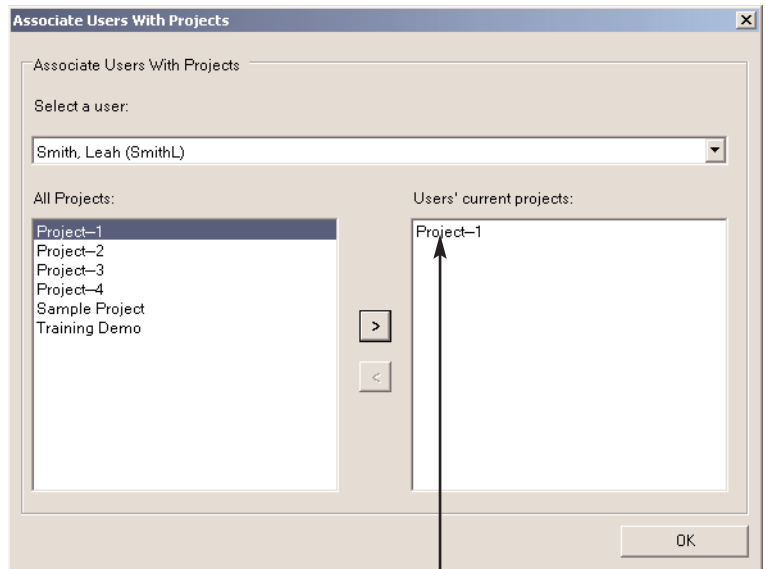
An eLumen™ administrator must associate users with the *projects* they can access within the eLumen™ software tools.

- ▶ **To associate a project with a user:**
  1. From the SecureIT™ window, open the File menu and choose Add>User Project.  
The Associate Users with Projects window is displayed.
  2. From the dropdown list, select the user.
  3. From the All Projects box, select the project to be associated with this user.
  4. Click the  button.

The association is made and the project name is displayed in the User's current projects box.

The next time the user logs in to an eLumen™ software tool, the associated project(s) will be displayed in the navigation tree.

- ▶ **To remove a project association:**
  1. From the Associate Users with Projects window, select the user from the dropdown list.
  2. From the User's current projects box, select the project to be removed from the user.
  3. Click the  button.



Projects associated with this user

## Resetting a User's Password

### ▶ To reset a user's password:

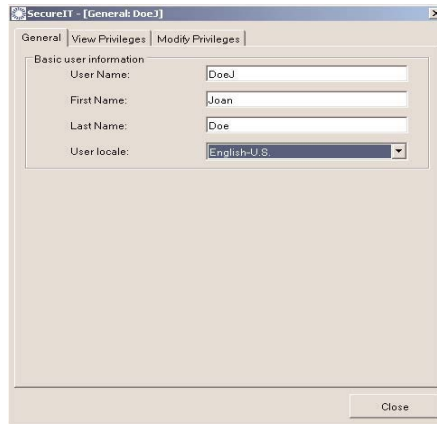
1. From the SecureIT™ application window, select the user. Then click the Set Password button.  
The Set Password dialog box displays.
2. Enter the new password in each field. Then click the OK button.



## Changing a User's Basic Information

### ▶ To change a user's basic information:

1. From the SecureIT™ application window, select the user. Then click the Properties button.
2. Change the properties for the user, as needed. Then click the Close button.



## Viewing User Privileges

### ▶ To view a user's privileges:

1. From the SecureIT™ application window, select the user.
2. Open the Edit menu and choose Properties.
3. You can now view the applications, features, and spaces that the selected user has access to use.
4. Click on the Close button to return to the SecureIT™ application window.



## Modifying User Privileges Setting Space Level Access

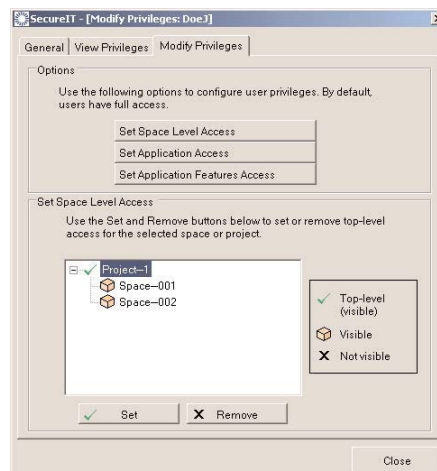
*NOTE:* Only available to eLumen™ administrators

### ▶ To set application access for a user:

1. From the SecureIT™ application window, select the user.
2. Open the Edit menu and choose Properties.
3. Click on the Modify Privileges tab.

Top-level *spaces* appear at the top of the software tree list within the eLumen™ Suite of tools. A user has access to all spaces underneath a top-level space.

A top-level space that can be accessed will be marked with a check ✓. A top-level space that cannot be accessed will be marked with an ✗.





### ► To set access to spaces:

1. Select the top-level *space* for a particular *project* and click on the Set button.
2. Repeat this process for all spaces that should be visible at the top-level.

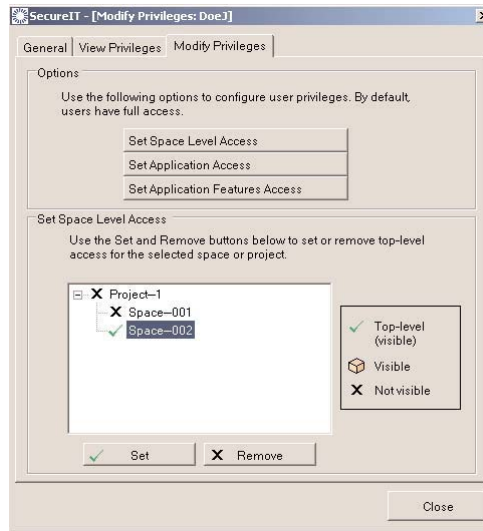
#### NOTES:

- Access will be granted to all spaces and subspaces that are marked as top-level.
- It is possible to have more than one top-level space. A space can only be a top-level space if none of the spaces above it within the same branch are also top-level spaces.

### ► To remove access to spaces:

1. Select a top-level *space* for a particular *project* and click on the Remove button.
2. Repeat this process for all spaces that should not be visible to the user.

*NOTE:* To restore a space to the list of visible spaces, select the space and click on the Set button.

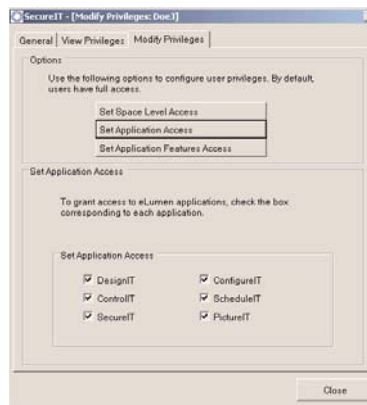


## Setting Application Level Access

*NOTE:* Only available to eLumen™ administrators.

### ► To set application access for a user:

1. From the SecureIT™ application window, select the user.
2. Open the Edit menu and choose Properties.
3. Click on the Modify Privileges tab.
4. Deselect check boxes to remove access to those programs.

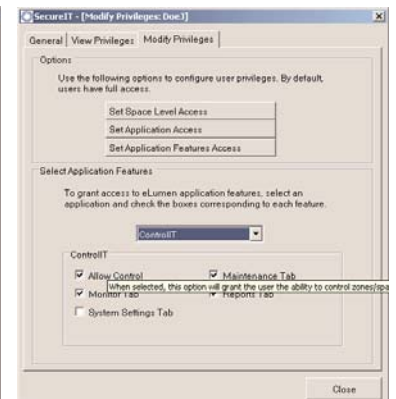


## Setting Application Features Access

*NOTE:* Only available to eLumen™ administrators.

### ► To set application features access for a user:

1. From the SecureIT™ application window, select the user.
2. Open the Edit menu and choose Properties.
3. Click on the Modify Privileges tab.
4. Click on the Set Application Features Access button.
5. Use the dropdown box and select an application.
6. Remove the check boxes from the features that you wish to have removed from the user's access rights.



# Chapter 4

## ControllIT™

### Overview

ControllIT™ is a web-based interface used to monitor and control a facility's lighting system in *real-time*. The ControllIT™ application enables you to view the status of the lighting system at any time and temporarily change the settings specified in DesignIT™.

From the ControllIT™ application, you can:

- View current status and details on *spaces* (including subspaces), *zones*, *control station devices*, *calendar events*, and *variables*
- Select *scenes* and modes in any space
- Set zone intensities, including raise/lower, on/off, and full on/off
- Enable/disable control station devices
- Enable/disable *time clocks*
- Set *variable states*
- Set the state of movable *walls*
- Apply *modes* to *groups*
- Run reports, including time clock and event log
- Perform maintenance or troubleshooting by checking communication channels and software error logs
- Process system settings, including compiling a *project* and transferring it to the processor(s)

When you change *real-time* settings using the ControllIT™ application, the system stays in that temporary state until a time clock event, button press, or other user interaction occurs. Real-time changes made in the ControllIT™ application do not modify the system settings specified in DesignIT™.

### NOTES:

- The ControllIT™ application is not intended for system modeling or programming. For modeling and programming procedures, refer to Chapter 2: DesignIT™.
- Actions initiated from the ControllIT™ application will be sent to the system immediately, but the status may not be displayed for up to one minute.

## Performing Basic ControllIT™ Operations

The following topics contain procedures used to perform basic ControllIT™ operations.

### Starting and Exiting ControllIT™

#### ▶ To start ControllIT™:

1. Double-click the ControllIT™ application icon  on the desktop.

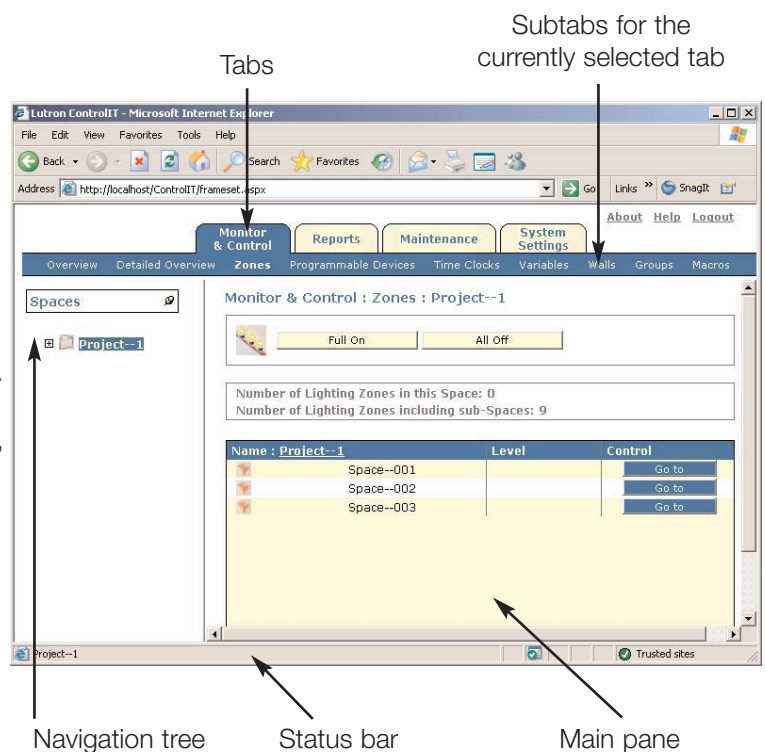
You are prompted to login.

2. Enter your user name and password. Then click OK.

The ControllIT™ Zones page is displayed. The page contains tabs and related subtabs, a navigation tree, a main pane, and a status bar.

#### ▶ To logout of ControllIT™: Click Logout.

#### ▶ To exit ControllIT™: Choose Close from the File menu or click the **X** in the upper right-hand corner of the screen.



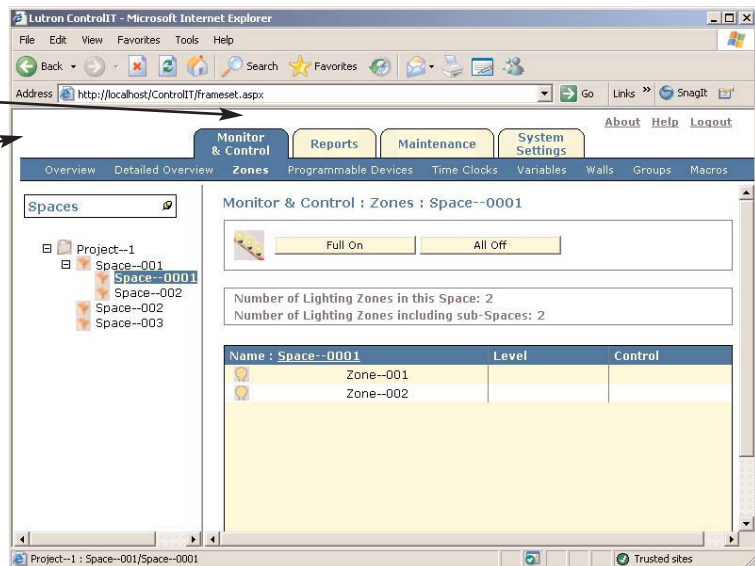
## Selecting ControllIT™ Tabs and Subtabs

To work within the ControllIT™ application, select a function tab.

Related subtabs for that function are displayed.

Click a subtab to select a specific operation.

**NOTE:** Function tabs can be visible or hidden depending on the level of access that has been granted to that user by the eLumen™ administrator.



## Using the Navigation Tree

The navigation tree on ControllIT™ pages displays levels of *system* information through which you can navigate. The *project* folder is positioned on top, with system spaces arranged hierarchically below it.

**NOTE:** The projects available to you in the navigation tree depend on the system privileges associated with your user name. For details about user names, refer to Chapter 3: SecureIT™.

### ▶ To open the project folder and display its contents:

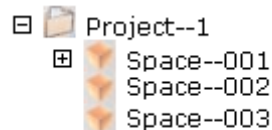
Click the folder's + sign or simply double-click the folder.



The project folder opens and displays the first level of *spaces* in the project.

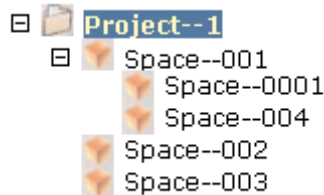
Click a space's + sign to display the next level of spaces (subspaces). Continue to open folders until you reach the desired level of the selected project.

If a space does not have a + sign, it does not have subspaces.



### ▶ To close a project or space and hide its contents:

Click its - sign or double-click its name.

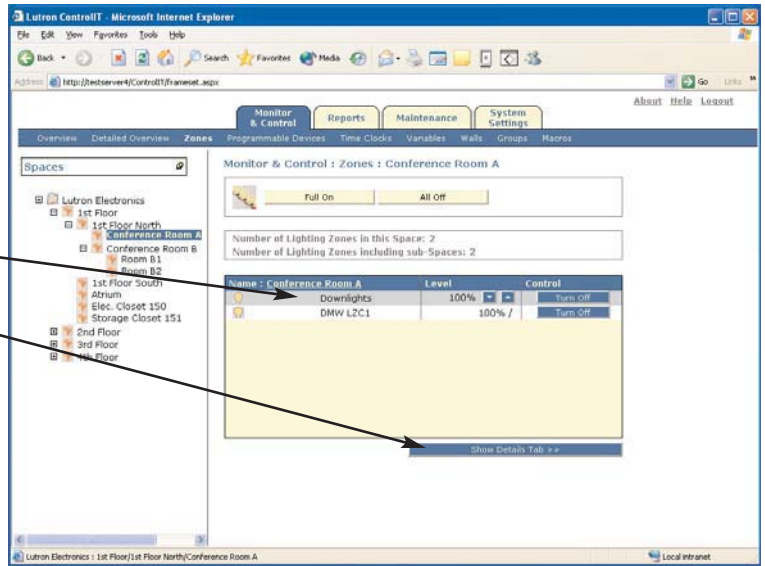


## Showing and Hiding the Details Tab

If the ControllIT™ page you are viewing has a Show Details Tab button, you can view details about a *space* or other *object* shown in the table on the main pane.

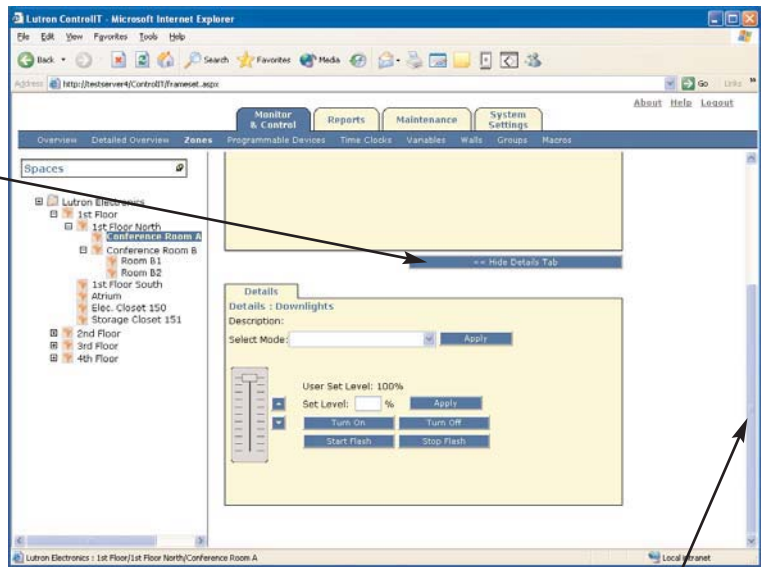
- ▶ **To show the details tab for an object:** Select the object in the table.

Then click the Show Details tab button.



The Details tab is shown at the bottom of the page.

- ▶ **To hide the Details tab:** Click the Hide Details Tab button.



Use the scroll bar to move up and down on the page

## Monitoring and Controlling the System

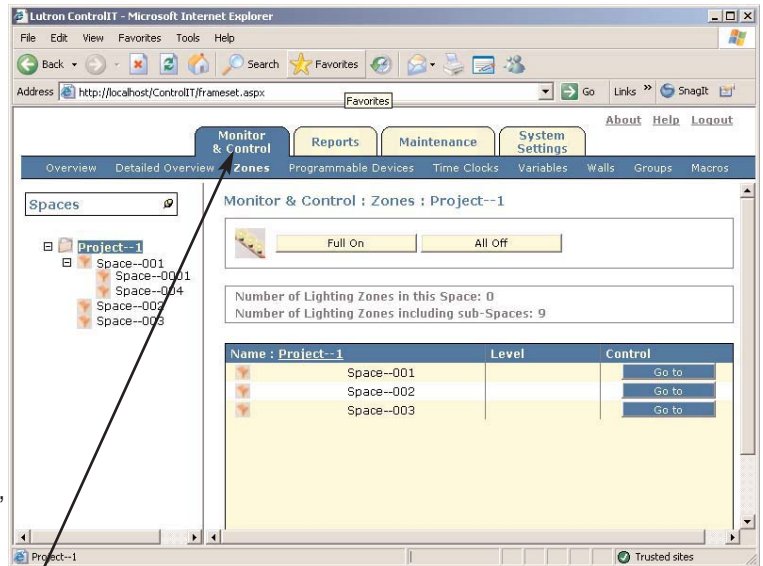
From the Monitor and Control page in the ControllIT™ application, you can view a list of all the *spaces* in the *system* and select a *scene* and/or *mode* for any space.

You can also view and set the state of:

- *Zone* intensities
- Programmable devices
- *Time clocks*
- *Variables*
- *Movable walls*
- *Groups*

**NOTE:** When you change the *real-time* state of an object using the ControllIT™ application, the system stays in that temporary state until a time clock event, button *press*, or other user interaction occurs. Real-time changes made in the ControllIT™ application do not modify the system settings specified in DesignIT™.

- ▶ **To display the Monitor and Control page:** Select the Monitor & Control tab.



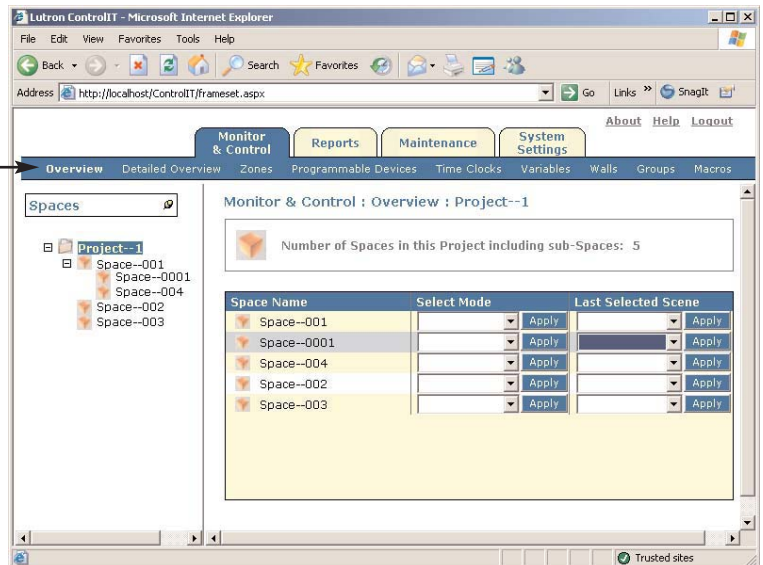
## Viewing System Spaces and Selecting Scenes and Modes

The Overview and Detailed Overview pages are used to view system *spaces* and select *scenes* and *modes*.

### Viewing and Selecting Space Scenes and Modes Using the Overview Page

The Overview page lists all the spaces in the *system* and enables you to apply a different scene or mode to any space.

- ▶ **To view all system spaces using the Overview page:** From the Monitor & Control page, click the Overview subtab.
- Once the Overview page is displayed, the table in the main pane lists all the spaces in the *project* and the last selected scene for each space.
- ▶ **To select a scene for a space:** Click in the Last Selected Scene field for the space. From the dropdown list, select the scene to be applied. Then click the Apply button.
- ▶ **To apply a mode to a space:** Click in the Select Mode field for the space. From the dropdown list, select the mode to be applied. Then click the Apply button.





## Viewing and Selecting Space Scenes and Modes using the Detailed Overview Page

The Detailed Overview page displays the *scene* and *mode* for a specific *space* and enables you to apply a different scene or mode. Light level and power graphs are also displayed.

### ▶ To view a specific space using the Detailed Overview page:

1. From the navigation tree in the Monitor & Control page, select the space you want to monitor.
2. Click the Detailed Overview subtab.

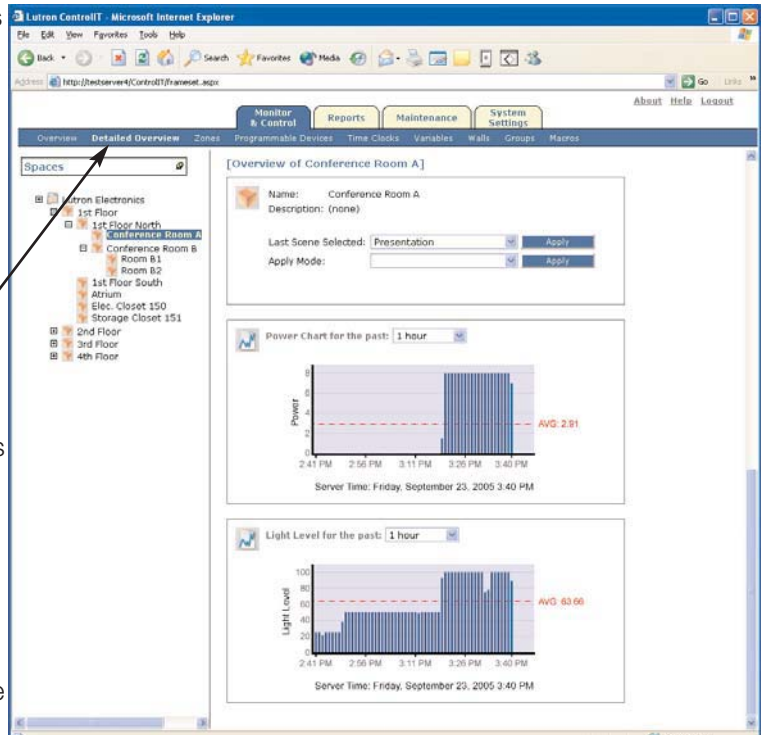
The Detailed Overview page displays detailed information about the space.

**NOTE:** The power graph is displayed only for spaces that contain Lighting Zone Controller (LZC) units. LZC units are only available for North and South America.

- ▶ **To select a scene for the space:** From the Last Scene Selected dropdown list, select the scene to be applied. Then click the Apply button.
- ▶ **To apply a mode to the space:** From the Apply Mode dropdown list, select the mode. Then click the Apply button.

If the selected space contains LZC units, the Detailed Overview page contains additional information.

- ▶ **To change the timeframe of the data displayed in the power and light level graphs:** Select a time interval from the dropdown list.



## Viewing and Setting Zone Intensities

A *zone* is a collection of *switch legs* controlled simultaneously as one unit (also called a channel by some lighting designers).

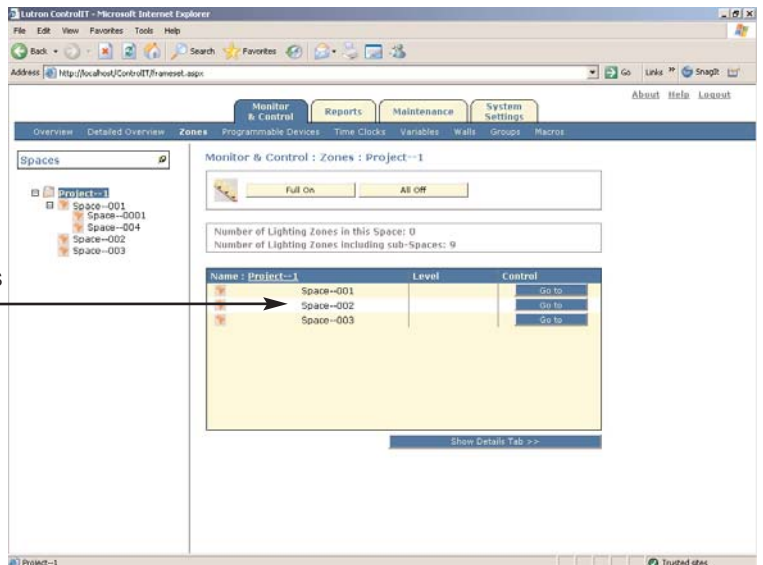
### ▶ To view the intensity setting for a zone:

1. From the navigation tree on the Monitor and Control page, select the space that contains the zone whose intensity you want to view.
2. Click the Zones subtab.



The zones for that space and their current intensities (lighting levels) are displayed in the table.

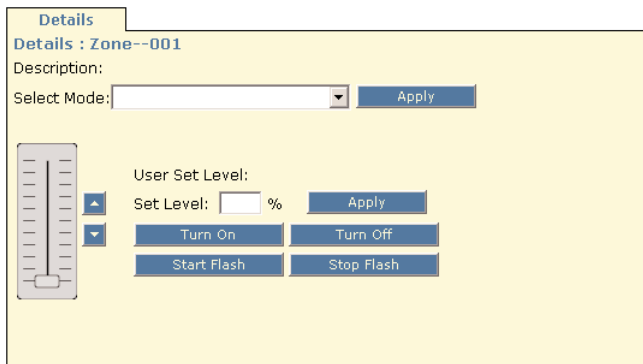
### ▶ To set the intensity of a zone:

1. Select the *zone* in the table.
2. Click to lower or raise the intensity.
  - To turn the zone ON or OFF, click the Turn On or Turn Off button.
  - To turn all zones for the space ON or OFF, click the Full On or All Off button. This turns ON or OFF all zones in that space and any subspaces.



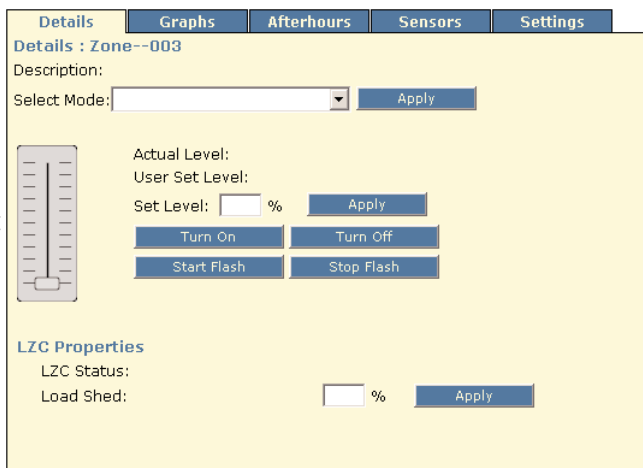
► **To modify settings of a zone:**

- To view details about a zone, select the zone in the table. Then click the Show Details Tab button. The zone Details tab is displayed and you can view or apply additional zone settings.
- To apply a mode to the zone, select the mode from the Select Mode dropdown list. Then click the Apply button.
- To lower or raise the zone intensity, use the slider or click   or enter a value in the Set Level field and then click the Apply button.
- To start or stop zone flashing, click the Start Flash or Stop Flash button.



► **To modify additional settings of a Lighting Zone Controller (LZC) Unit:**

- To set the *load shed*, enter a value in the Load Shed % field and then click the Apply button.
- To view the power and light levels for the zone, select the Graphs subtab. Use the dropdown list to select the time interval to be displayed.
- To view and adjust the settings for when a LZC unit goes into *Afterhours* mode, select the Afterhours subtab. This mode is used to turn the lights OFF after a set time in which the space is unoccupied.
- To view and adjust the settings for *sensors* attached to a LZC unit, select the Sensors subtab.
- To view and adjust the LZC unit settings, select the Settings subtab.



The following table describes the LZC unit settings.

Setting	Description
High-end Trim	Maximum actual light level that is allowed to be set (for example, Actual=90 when user sets it to 100)
Low-end Trim	Lowest the light level can go before the OFF command is sent.
Emergency Level	Light level the unit will go to during Emergency mode.
Status	Indicates if a wall control is connected.
Wall Control State	Indicates if the wall control is enabled or disabled.



## Viewing and Setting the State of Programmable Devices

Programmable devices include wall controls, AV equipment, and RS232 equipment.

### ▶ To view the state of a programmable device:

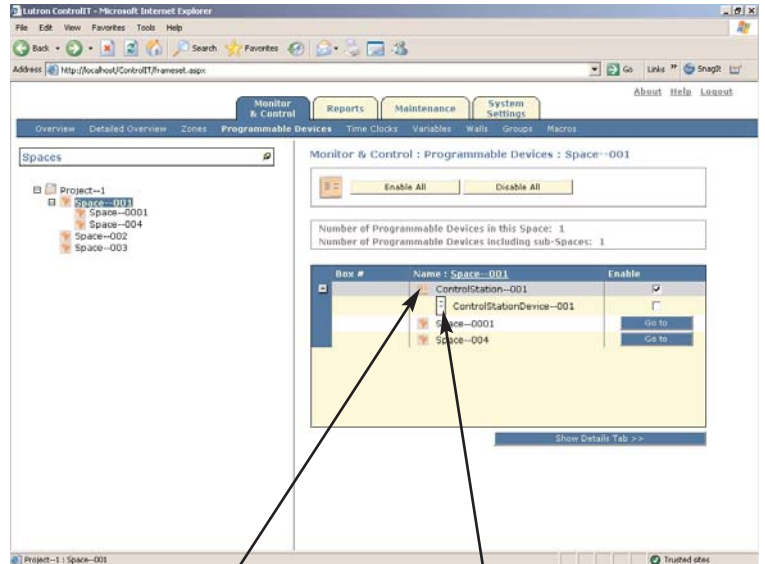
1. From the navigation tree on the Monitor and Control page, select the *space* that contains the programmable device.
2. Select the Programmable Devices subtab.

The programmable devices for the space are listed in the table.

**NOTE:** If there are subspaces below the selected space, the subspaces are also listed in the table. Click the Go to button for a subspace to view its programmable devices.

### ▶ To enable or disable a programmable device:

Check or uncheck its Enable checkbox.



Control station

Control station device

### ▶ To enable or disable all programmable devices in the space and its subspaces:

Click the Enable All or Disable All button.

### ▶ To view more details about a programmable device:

Select the device in the table. Then click the Show Details Tab button.

The Details tab is displayed and you can view or apply additional device settings.

### ▶ To virtually "press" a button on the device:

Click the button in the image.

**NOTE:** Since a *release* event cannot be simulated in the ControlIT™ application, pressing the button may not have the same effect as a real button *press* on the actual device.

### ▶ To apply a mode to the device:

Select the *mode* from the Select Mode dropdown list. Then click the Apply button.



## Viewing and Setting the State of Time Clocks

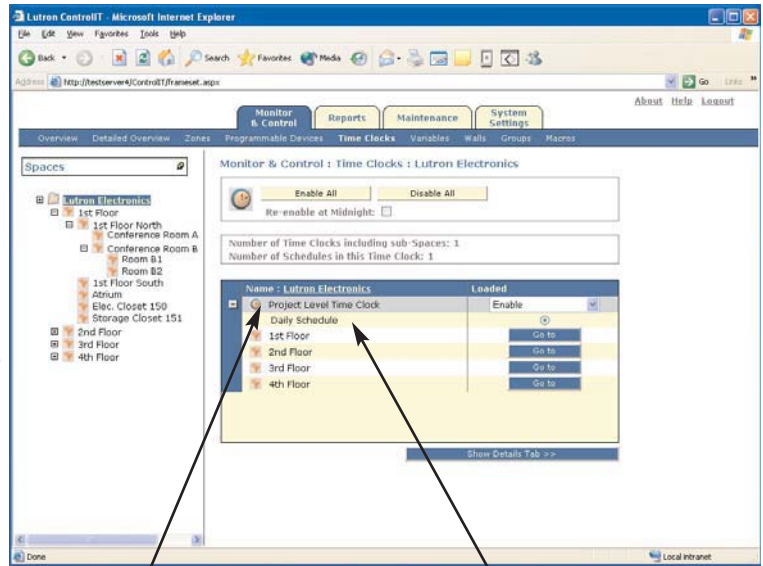
A *time clock* is a collection of *schedules*. Time clocks are used to trigger lighting *system* events.

### ► To view the state of a time clock:

1. From the navigation tree on the Monitor and Control page, select the *space* that contains the time clock. Or to view the time clock for the *project*, select the project.
2. Select the Time Clocks subtab.

The time clock is listed in the table in the main pane.

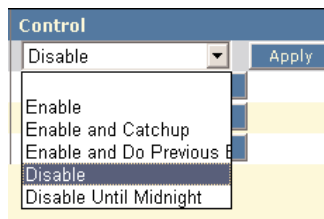
**NOTE:** If there are subspaces below the selected space, the subspaces are also listed in the table. Click the Go to button for a subspace to view its time clock.



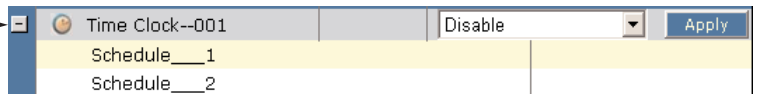
Time clock

Schedule

- ### ► To enable or disable the time clock:
- Select the state from the dropdown list.



- ### ► To view the time clock schedules:
- Select the time clock's + sign.



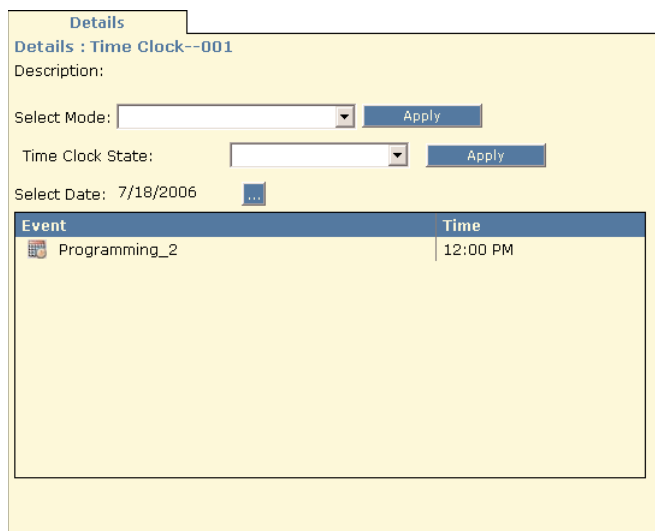
- ### ► To enable or disable all time clocks in the selected space and its subspaces:
- Click the Enable All or Disable All button.

To re-enable all time clocks at midnight, check the Re-enable at Midnight checkbox.

- ### ► To view details about a time clock schedule:
- Select the *schedule* in the table. Then click the Show Details Tab button.

The Details tab is displayed and you can view *schedule* events.

- ### ► To apply a mode to the schedule:
- Select the *mode* from the Select Mode dropdown list. Then click the Apply button.



## Viewing and Setting the State of Variables

A *variable* is a programming *object* that is referenced by other objects for programming purposes. A variable can be one of three types: True/False, Multi-state, or Integer.

### ▶ To view the state of a variable:

1. From the navigation tree on the Monitor and Control page, select the *project*.
2. Select the Variables subtab.

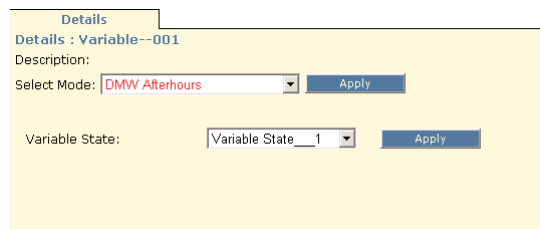
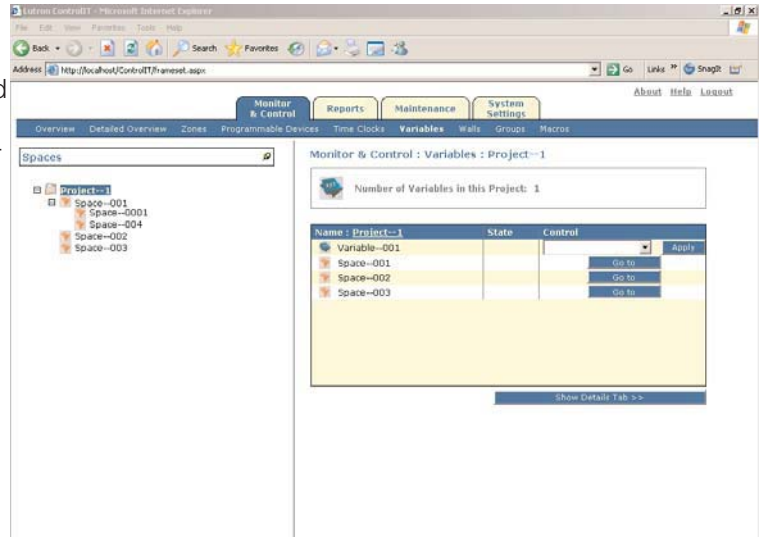
The variables for the project are listed in the table.

### ▶ To set the variable state:

- Select the state from the dropdown list.
- ### ▶ To view details about a variable:
- Select the variable in the table, and then click the Show Details Tab button.

The variable Details tab is displayed.

- ### ▶ To apply a mode to the variable:
- Select the *mode* from the Select Mode dropdown list. Then click the Apply button.



## Viewing and Setting the State of Movable Walls

*Movable walls* can be opened or closed to create partitions (subspaces) within a *space*.

### ▶ To view the state of a movable wall:

1. From the navigation tree on the Monitor and Control page, select the *partitioned space* that contains the wall.
2. Select the Walls subtab.

The movable walls for the space are listed in the table.

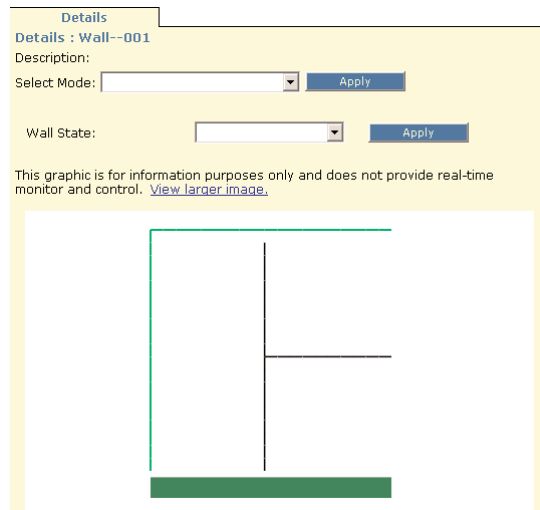
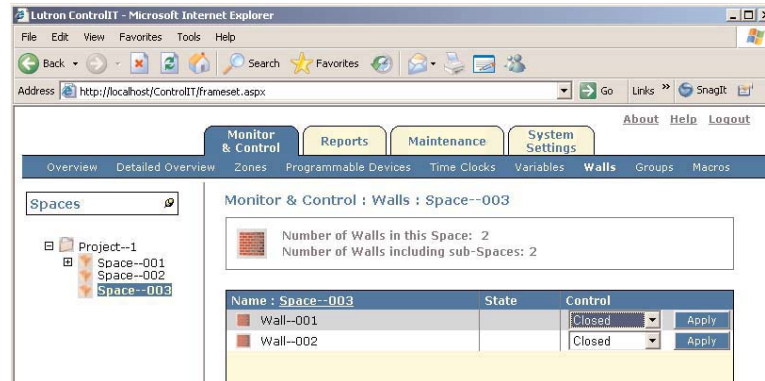
**NOTE:** If there are subspaces below the selected space, the subspaces are also listed in the table. Click the Go to button for a subspace to view its movable walls.

- ### ▶ To open or close the wall:
- Select that option from the Wall State dropdown list.

- ### ▶ To view details about a wall:
- Select the wall in the table, and then click the Show Details Tab button.

The wall Details tab is displayed.

- ### ▶ To apply a mode to the wall:
- Select the *mode* from the Select Mode dropdown list. Then click the Apply button.



## Viewing and Setting the State of Groups

A *group* is a named collection of one or more *objects* (or one or more groups) that share a common functional purpose.

### ► To view the state of a group:

1. From the navigation tree on the Monitor and Control page, select the *project* or *space* that contains the group.
2. Click the Groups subtab.

The groups in the space are listed in the table.

**NOTE:** If there are subspaces below the selected space, the subspaces are also listed in the table. Click the Go to button for a subspace to view its groups.

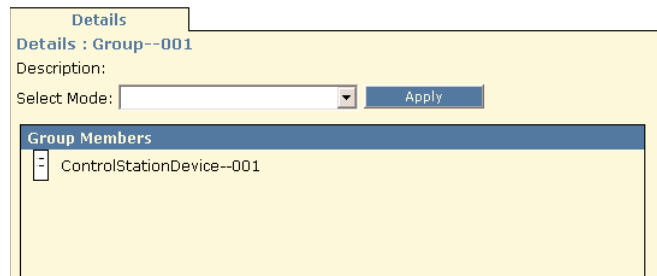
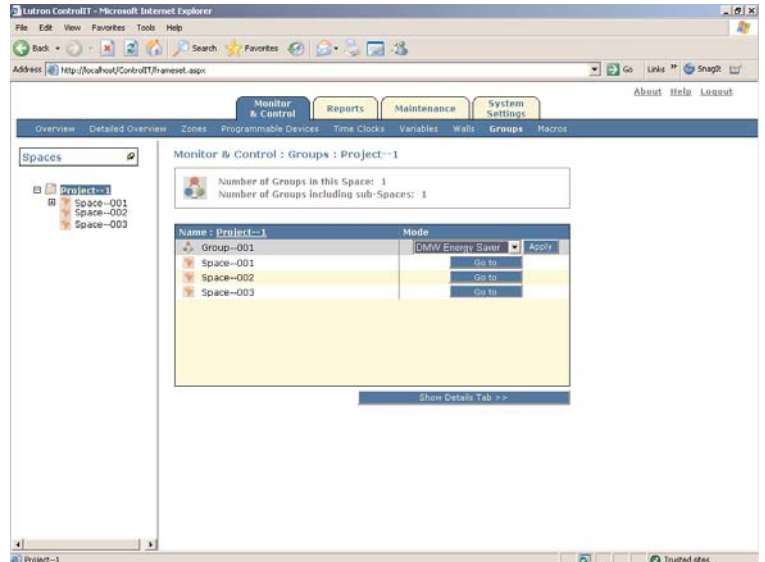
### ► To apply a mode to a group:

Select the *mode* from the Select Mode dropdown list. Then click the Apply button.

### ► To view details about a group:

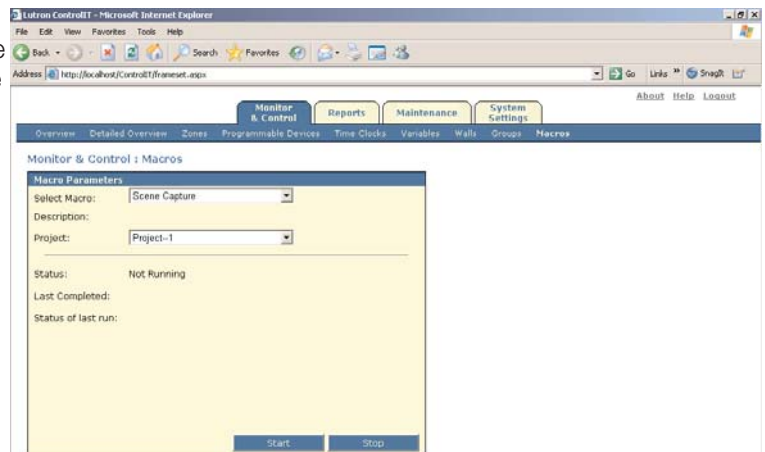
Select the group in the table, and then click the Show Details Tab button.

The group Details tab is displayed. Members of the group are listed in the table.



### ► To run the scene capture macro:

Your *system* may be equipped with certain hardware devices that can modify the values of *scenes*. These devices are called hand-held programmers and Viseo™ *control station devices*. When scene changes are made from the devices, the changes are stored in the processors only. If you *transfer* to your system without saving these changes to the database, the changes will be lost. If you choose to save the changes, you will do so by clicking on the *macro* option under Monitor & Control. Choose the scene capture macro and press the run button. The macro may take several minutes to execute. The screen will update to inform you that the operation was completed successfully.

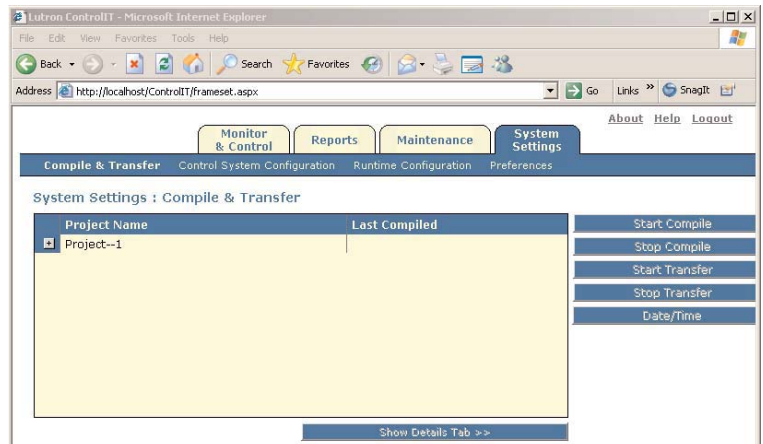


## System Settings

From the System Settings page, you can:

- *Compile* the *project* database and then *transfer* it to the lighting system hardware
  - View and set preferences
- ▶ **To display the System Settings page:** Select the Systems Settings tab.

*NOTE:* Function tabs can be visible or hidden depending on the level of access that has been granted to that user by the eLumen™ administrator.



## Compiling and Transferring Project Data

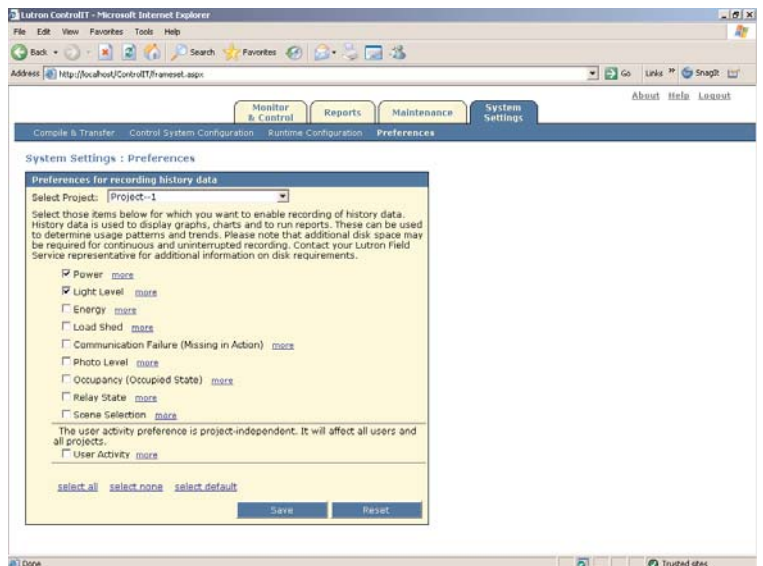
Please refer to Chapter 7: Compile and Transfer.

## Viewing and Setting Preferences

Preference settings specify the items to be recorded about the *system* (for example, when graphs are displayed and reports are generated.)

- ▶ **To enable/disable DataLogging:**

1. From the System Settings page, select the Preferences subtab.
2. Check or uncheck the setting checkboxes. Then click the Save button.

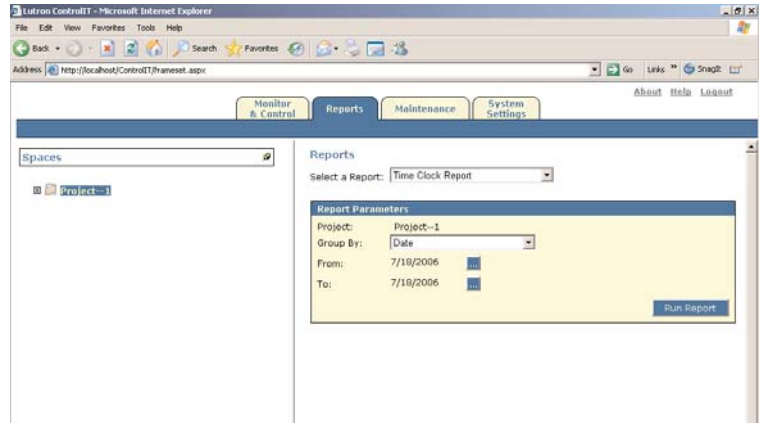


## Generating Reports

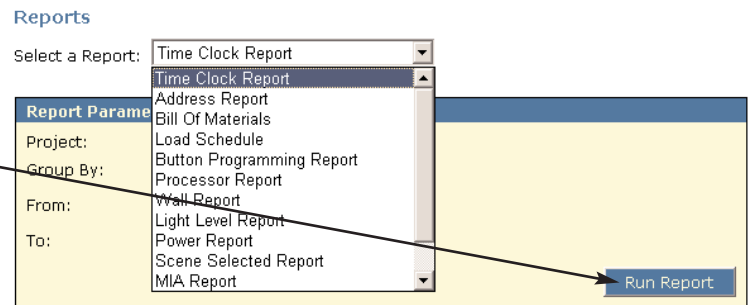
The ControllIT™ application enables you to generate a variety of reports. Reports are helpful for monitoring *system* usage and performance.

### ► To generate a report:

1. Select the Reports tab.  
The Reports page is displayed.
2. From the Select a Report dropdown list, select the type of report to be generated.  
Depending on the report type you select, related report *parameters* are displayed in the Report Parameters box.
3. Select the parameters to be included in the report.

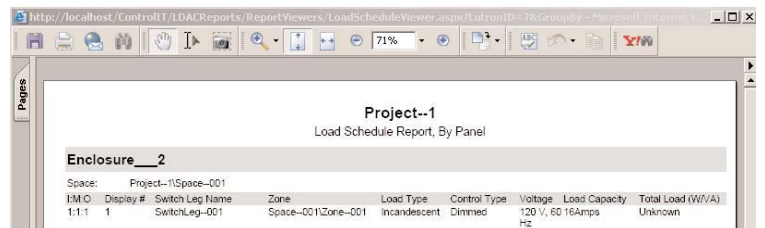


4. Click the Run Report button.



The report is generated and displayed in PDF format. Use the Adobe window controls to save or print the report.

NOTE: Some reports will not contain data until relevant preferences are set. See “Viewing and Setting Preferences” on page 63.





## Performing Maintenance

From time to time, you may need to perform *system* maintenance or troubleshoot problems by checking communication channels, *switch legs*, and software error logs. You can also display lamp information for Lighting Zone Controller units.

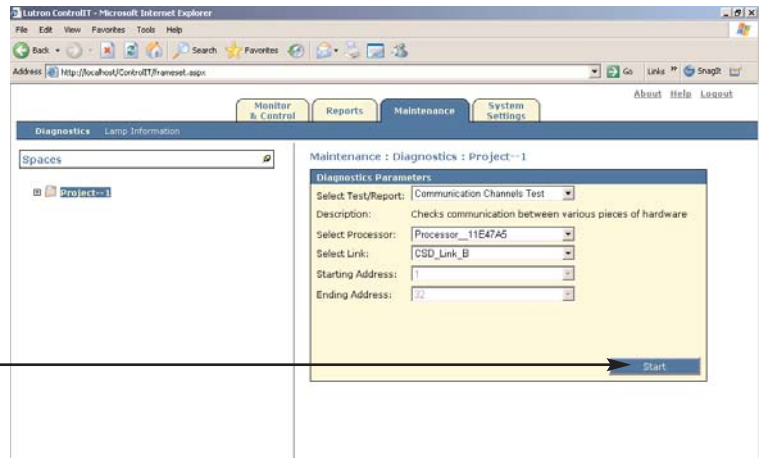
System maintenance is performed from the Maintenance page.

- ▶ **To display the Maintenance page:** Select the Maintenance tab.

## Running Diagnostic Tests

- ▶ **To run a diagnostic test:**

1. From the Maintenance page, select the Diagnostics subtab.
2. From the Select Test/Report dropdown list, select the test to be run.
3. Select the *parameters* to be included in the test.
4. Click the Start button.



## Displaying Lamp Information for Lighting Zone Controller Units

- ▶ **To display lamp information for Lighting Zone Controller units:** From the Maintenance page, select the Lamp Information subtab.

# Chapter 5

## ConfigureIT™

### Overview

The ConfigureIT™ application enables you to make *real-time* configuration changes to your *scenes*.

From Configure IT™, you can:

- Modify scene values and save changes to the hardware and/or the database
- Modify *zone* intensity
- Modify zone *fade time*
- Modify zone *delay* time
- View scene values from the *processor* or the database

**NOTE:** The ConfigureIT™ application is designed to only work with panel-based zones or LZC units.

### Starting and Exiting ConfigureIT™

#### ▶ To start ConfigureIT™:

1. Double-click the ConfigureIT™ application icon on the desktop. Or from the Start menu, choose Lutron Electronics>ConfigureIT™.

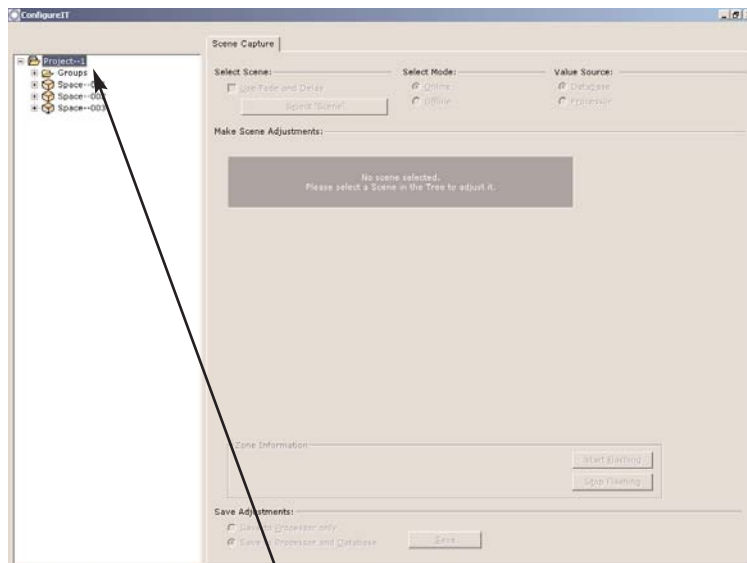


You are prompted to login.

2. Enter your user name and password. Then click OK.

The ConfigureIT™ application window displays the list of *spaces* and *scenes* in the navigator.

#### ▶ To exit ConfigureIT™: Choose Exit from the File menu.



Navigator

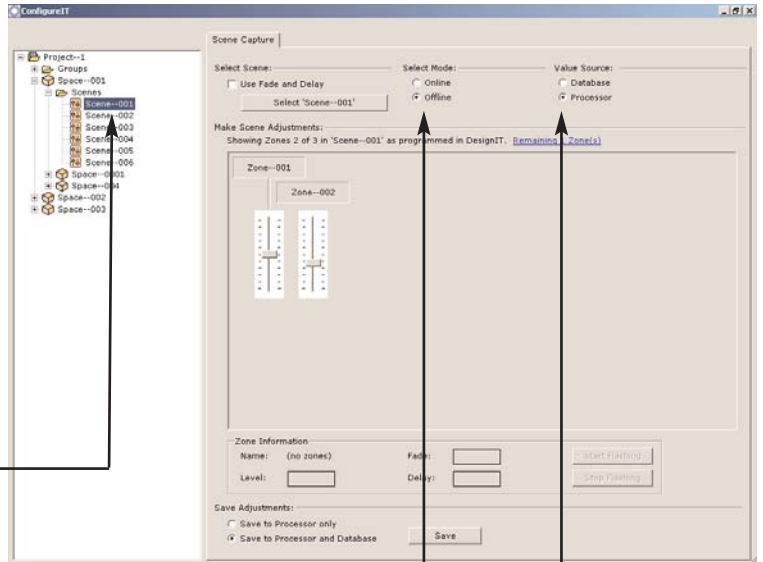
## Viewing or Modifying Scene Values in a Space

A *scene* is a lighting effect achieved by adjusting one or more *zones* to *preset* levels. While scenes are programmed in DesignIT™, from the ConfigureIT™ window, you can:

- View scene lighting levels for each zone in a *space*
- Make a scene active in a *space*
- Adjust the scene values for one or more zones

### ► To select a scene and view its values:

1. From the navigation tree in the ConfigureIT™ window, select the *space* that contains the scene you want to view or modify.
2. Within that space, select the Scenes folder and then a specific scene.
3. Select Mode “Online” to modify scene values and lighting levels in real-time or select “Offline” to only change the scene values.
4. Select Value Source from where you would like to read the scene values. You can view values that were stored in the “Processor” or were saved in the “Database”.

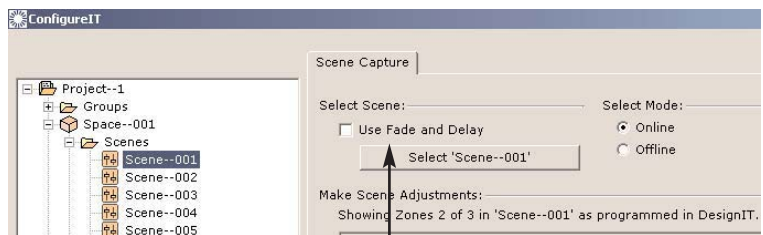


The Scene Capture tab displays the programmed scene lighting levels for each zone in the space.

- ### ► To make the selected scene active in the space:
- Click the Select '[scene name]' button.

### NOTES:

- This function is not available in offline mode.
- If the Use Fade and Delay checkbox is checked, selecting the scene will apply it to the zones using the programmed fade and delay values. Otherwise, the scene will be applied instantly in the space.



Click here to make the selected scene active in the space

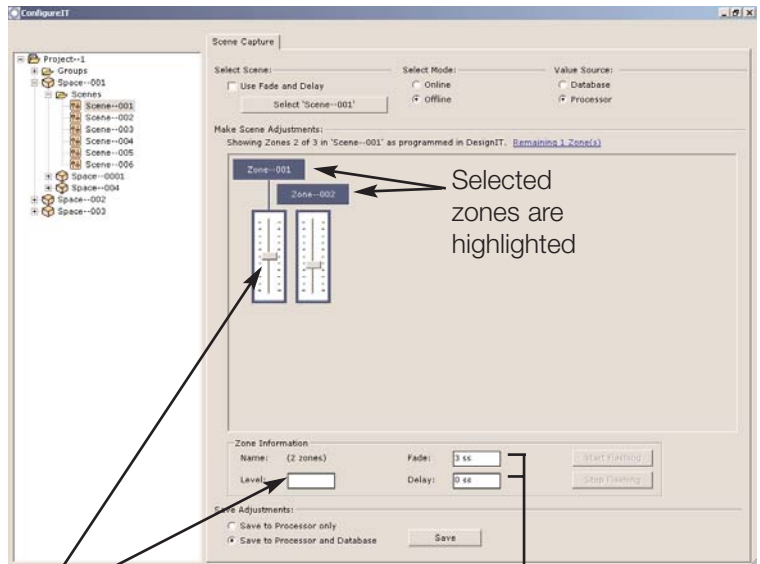
► **To adjust the zone values in a scene:**

1. In the Make Scene Adjustments portion of the window, select the *zone* to be modified.

The zone is highlighted to show that it is selected.

*NOTE:* SHIFT-click and/or CTRL-click to select multiple zones. Press CTRL-A to select all zones in the *space*.

2. To adjust the programmed lighting level for the zone, use the slider control or enter the intensity value in the Level field.
3. If needed, enter the number of seconds in the Fade and Delay fields.



Use sliders or the zone level field to set the intensity

Set the fade and delay times by typing in the number of seconds in the appropriate field

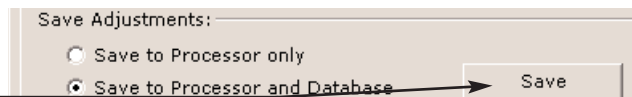
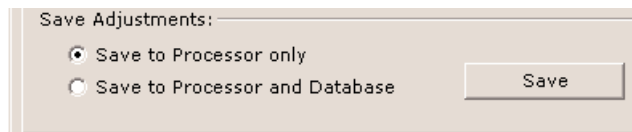
► **To save the modified scene values:**

1. Select the Save to Processor only option. *The adjustments will be saved to the processor, but not permanently saved in the database.*

or

Select the Save to Processor and Database option. *The adjustments will be saved to the processor and also permanently saved in the database.*

2. Click the Save button.



*NOTES:*

- Scene changes saved only to the processor will be overwritten the next time a database transfer is done.
- For more information on transferring data to the processor, refer to Chapter 4: ControlIT™.

# Chapter 6

## Backup, Restore, and Update Tool

### Overview

The Backup, Restore, and Update tool (BRU tool) is a utility that enables you to manage the MS SQL database. With the BRU tool you can:

- Backup an existing database
- Restore a database from an external file
- Update a database to the latest software version

*NOTE:* The BRU tool is not intended to create a database. For information on creating a database, refer to Chapter 2: DesignIT™.

### Performing Basic BRU Operations

The following topics contain procedures used to perform basic BRU operations.

#### Starting and Exiting the BRU Tool

##### ► To start the BRU tool:

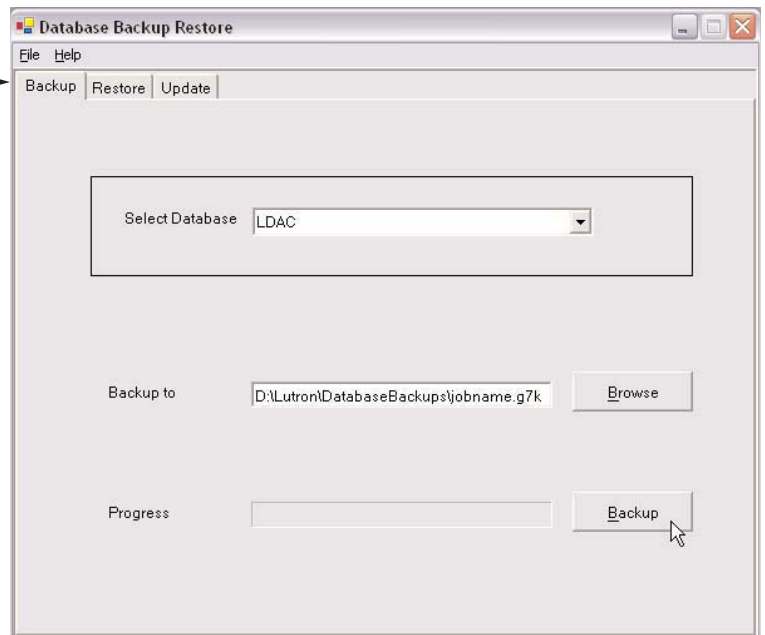
1. The default location of the BRU tool application in the file system is “\Lutron\DB Backup Restore\Lutron\_Monitor\_DBBBackupRestore.exe”. You are prompted to login.
2. Once the application is started, you will need to login with the username database and the password restore. Then click OK.



### Database Backup

##### ► To backup the database to an external file:

1. Select the Backup tab on the form. The "LDAC" database is already selected for you on the "Select Database" drop down list.
2. Click the Browse button to specify a backup file, or, type backup file name and path in the "Backup" to text box.
3. Click the Backup button to backup the database.
4. When the "Database Backup Completed" message box pops up, the database has been successfully backed up to the file you specified.



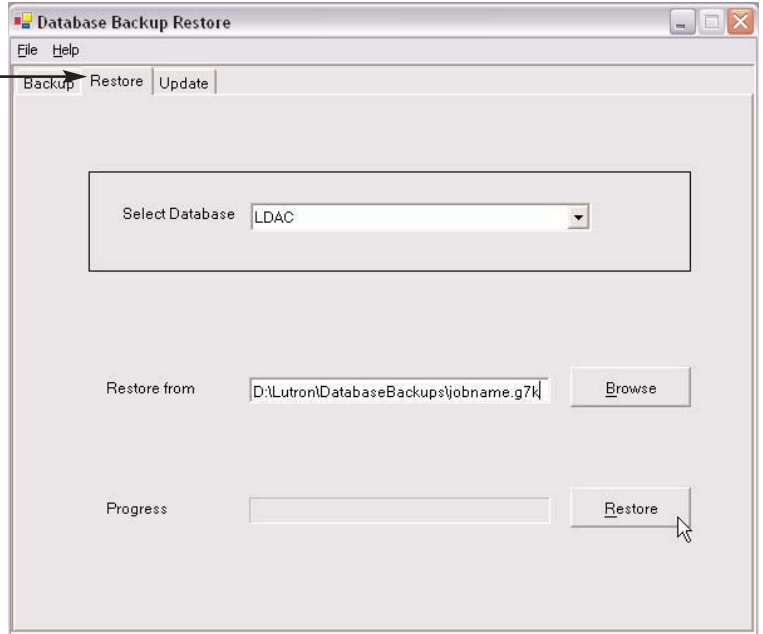
## Database Restore

### ► To restore the database from an external file:

1. Select the Restore tab on the form.  
The "LDAC" Database is already selected for you on the "Select Database" drop down list.
2. Click the Browse button to select a backup file or type the full path and name of a backup file in the Restore from text box.
3. Click the Restore button to restore the database.
4. When the "Database Restore Completed" message box pops up, the database has been successfully restored.

*NOTE:* You cannot restore a database if there are active connections to the database. To close these connections, you will need to stop the "Lutron\_LDAC\_ControlSystem" and "Lutron\_LDAC\_RuntimeLogic" services.

For more information, please see Chapter 8: System Services.



## Database Update

### ► To update the database to the current version:

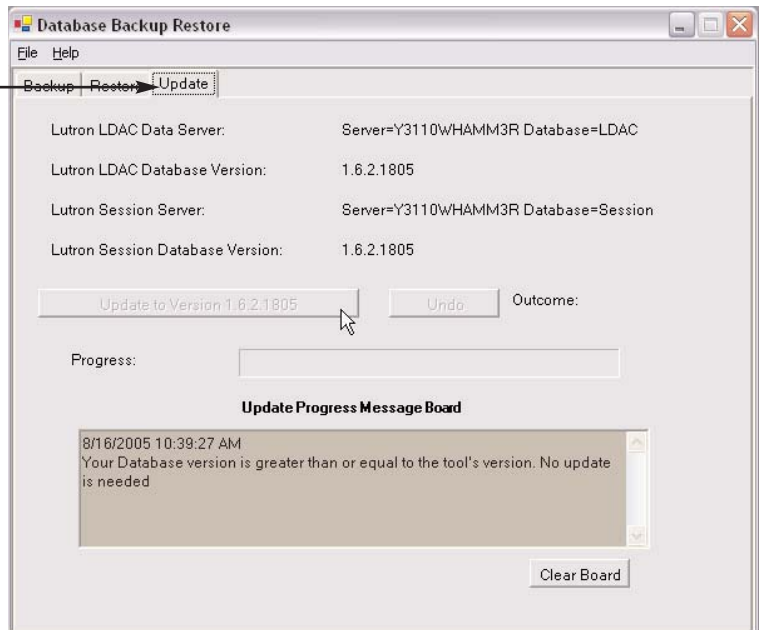
1. Select the Update tab on the form.  
The server name, database name, and database version will be displayed on the form.
2. If at least one database version is older than the tool version and no database version is newer than the tool version, the Update button will be enabled and you can use the tool to update your databases.
3. Click the Update button to update the databases.  
(The target database version number will be displayed on the button.)

The tool will automatically back up the databases before updating them.

If there is any error during the updating, the tool will stop the update process and restore the databases to their original state prior to continuing.

4. When the "Outcome:" field shows "Success", the databases have been successfully updated.
5. After a successful update, you can click on the Undo button to undo the upgrade and revert the databases to their previous state.

*NOTE:* This function can only be used to update the Session and LDAC databases after a software update has been performed. This process can take several minutes to an hour, depending upon the size of the database.





# Chapter 7

## Compile and Transfer

### Overview

The Compiler is a subsystem of the eLumen™ Suite that converts the database into the individual files that will be transferred into the G7000 processor. When you are finished creating or modifying a *project*, you must *compile* the project before *transferring* the database to the lighting system hardware. The output files of each compile are stored locally on the database host computer.

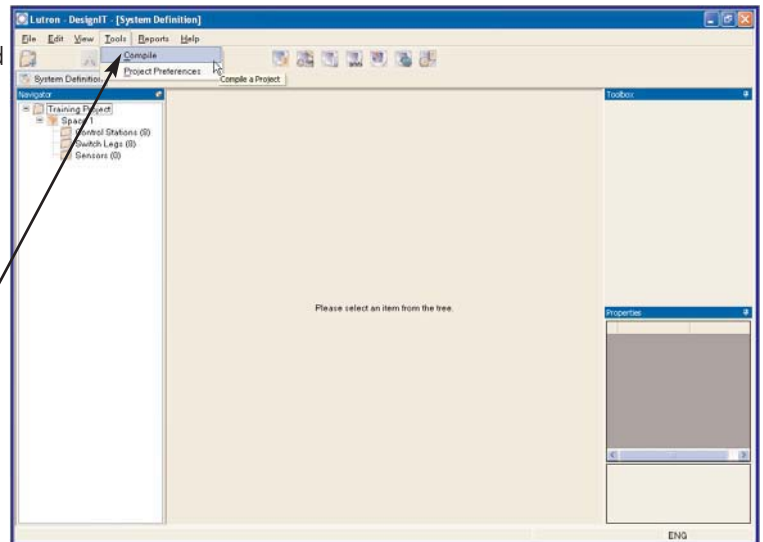
#### NOTES:

- The system can be compiled from either the DesignIT™ or ControllIT™ application, but the system can only be transferred from ControllIT™.
- Scene changes will be lost if not saved to the database (refer to “Run the Scene Capture Macro” on page 62).

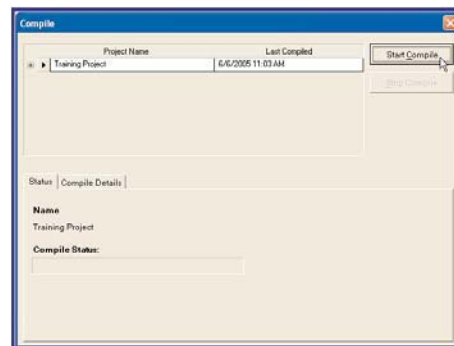
### Compiling a Project

#### ► To compile from DesignIT™:

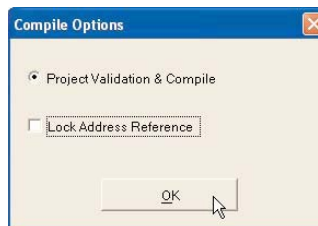
1. Click on “Tools” and then click on “Compile.”



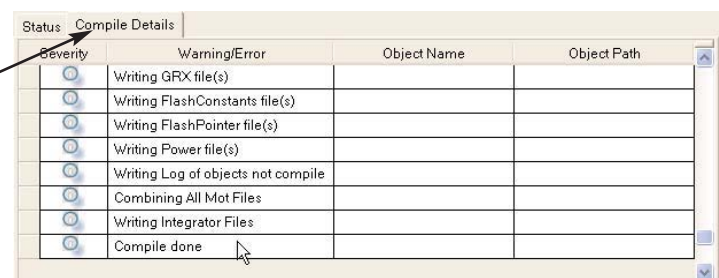
2. Next, click on the name of the Project that you wish to compile and click the Start Compile button.



3. A popup window will appear asking if you wish to lock the database. Locking the database will lock the location of objects (spaces, zones, etc.) in the database. Make your selection and then click on “OK.”



4. Finally, click on the Compile Details tab to see if the compile has completed and if there are any warnings or errors.



► To compile from ControllIT™:

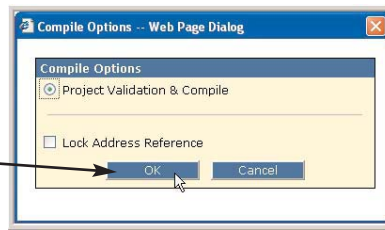
1. Click on the System Settings Tab.



2. Click on the Project Name and then click on “Start Compile.”

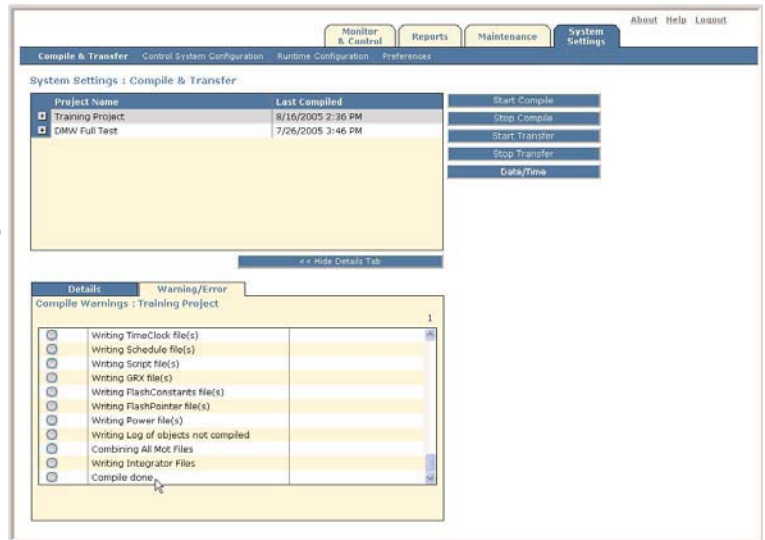


3. A popup window will appear asking if you wish to lock the database. Locking the database will lock the location of objects (spaces, zones, etc.) in the database. Make your selection and then click on “OK.”



**NOTE:** Selecting the Lock the Address Reference option will lock all *space* and *zone* identifiers. This is needed only for BMS, RS232, and DMX integration jobs.

4. Click on the Show Details tab to see if the compile has completed and if there are any warnings or errors. When compiling is complete, you can *transfer* the data to the *system* hardware.



**NOTE:** Resolve all compile warnings and errors before transferring. Click on the Warning/Error tab to view this information.

## System Transfer

The system transfer function of ControllIT™ allows the user to transfer the compiled database files to the processor.

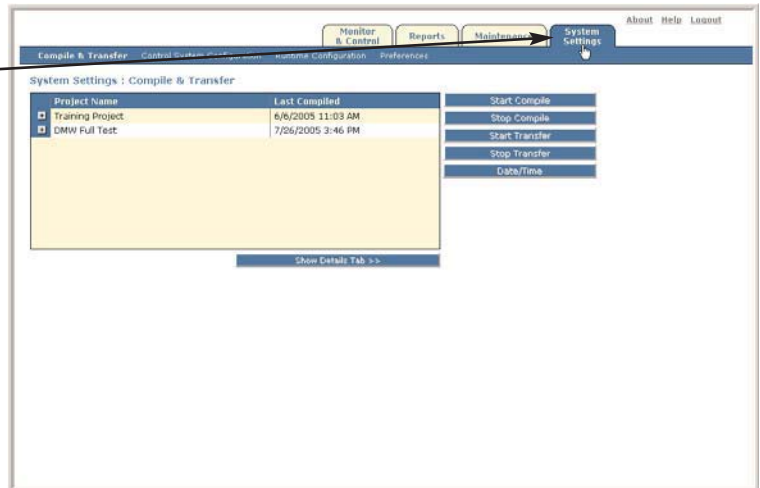
### Transferring from ControllIT™

#### ► To transfer the database from ControllIT™:

1. Click on the System Settings Tab.
2. Select the Project name that you would like to access. If you would like to transfer to a specific processor to group of processors, you would need to click on the + sign next to the Project name. If you would like to transfer to all processors in the project, you would simply keep the Project name selected.

*NOTE:* Transferring to individual processors after you have made significant changes may cause Timeclocks and other Inter-Processor functionality to behave incorrectly. Improper scripts or events could be run and as such individual processor transfers should only be conducted if you are aware of the system configuration.

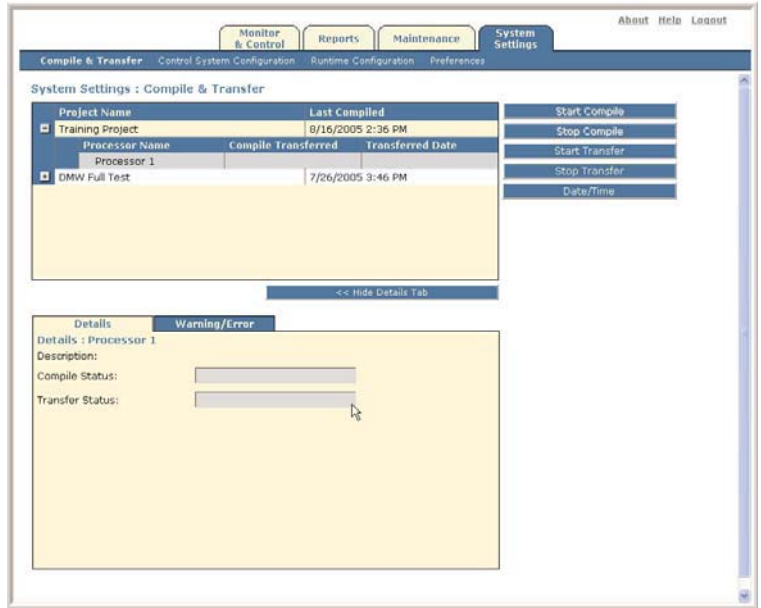
3. Click on the “Start Transfer” button to begin transferring to the project or processor(s) that you have selected.



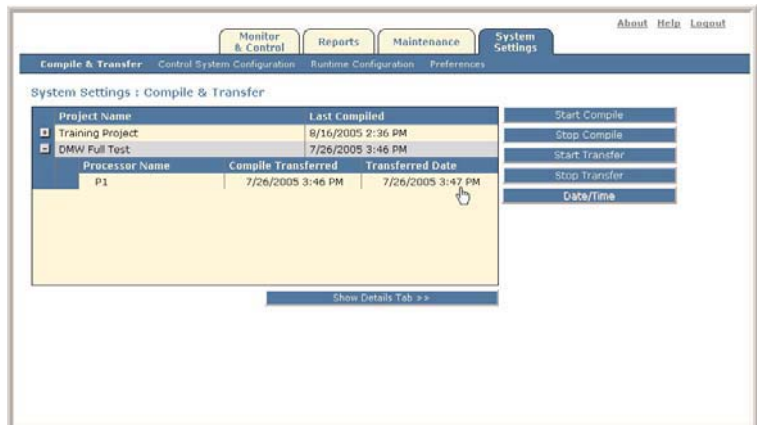
4. Choose to transfer the System Data, or System Data and Power Panel Data. You only need to transfer Power Panel Data if you need to transfer information to the Circuit Selectors in the field.



5. Click on the "Show Details Tab" button to see the progress of the transfer.



6. When the transfer has completed, the transferred date field will be populated.



## Transfer Troubleshooting

If you have an error transferring, the following error will appear. Please note that this error will also appear the first time that you try to transfer after you have changed any of the network settings within the DesignIT™ application.

► **To fix this error, complete the following steps:**

1. Ensure that the UI Link is connected properly.
2. Ensure that the Ethernet cable is connected from the computer to the Control Box or to the Processor's Ethernet port.
3. Verify the proper network configuration settings are in DesignIT™ under the Address Screen. The IP Address, Subnet Mask, and UI Port must all be set. The default settings are 192.168.250.1, 255.255.255.0, and 8000, respectively.
4. Verify communication with the processor by pinging the processor's IP address.

**To ping a processor:**

- Open Start menu in Windows toolbar.
- Select Run.
- Type in CMD and press return/enter button.
- In the command window, enter the ping command. For example, "ping 192.168.250.1".

If there is an error communicating with the processor, please contact Lutron Technical Support.

5. Ensure that all IP Addresses are unique on the network.
6. Ensure that the Runtime and Control services are started.



# Chapter 8

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## System Services

### Overview

The eLumen™ Software Suite utilizes services that run at the system level. This means that these services are running in the background while the client tools are being used at the user level. The real benefit to service-level applications is that a user does not need to be logged in for the application to be active. The eLumen™ System Services contains four components. They consist of the following:

- Environment – Provides the configuration settings for the eLumen™ software.
- Control System – Responsible for all communication and message parsing between the hardware and the software.
- RunTime Logic – Translates low-level commands to plain text.
- DataLogging – Records user commands and historical system settings.

*NOTE:* DataLogging is initially disabled. To enable datalogging, refer to “Viewing and Setting Preferences” on page 63.

### Control System

The Control System is a Windows service and is responsible for taking messages from the Runtime Logic System, creating hardware commands, and sending the commands to the appropriate piece of hardware.

The Control System is responsible for the following features:

- Building messages that hardware can understand from a common low-level language. This allows the GRAFIK 7000 to easily interface with many different types of hardware using various protocols.
- Scheduling and Dispatching of commands based on priority and scheduling class.
- Maintaining simultaneous communication with all processors.
- Polling the processors for information to fill monitors with data.
- Ethernet communications.

### Starting the Control System

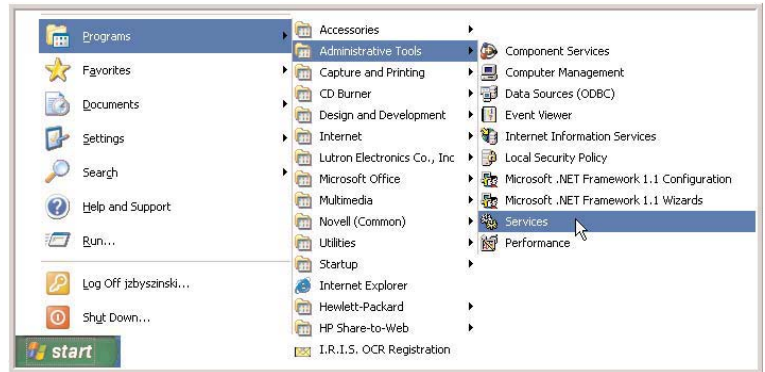
The Control System is a Windows Service. This means that it starts when the Operating System is loaded. A user does not need to log into Windows for it to start. To view the status of the Control System, you will need to look at the Services Console.



► **To view the status of the Control System services:**

1. Click on Start > Program Files > Administrative Tools, and then click on Services.

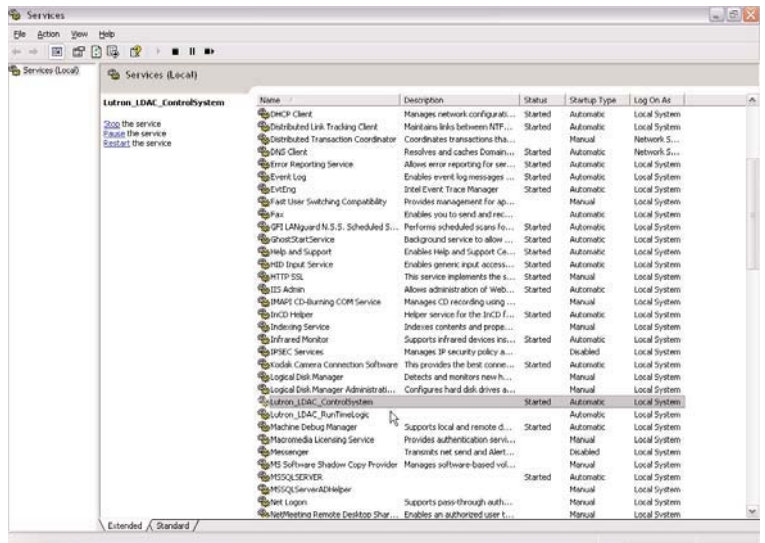
This will bring up the Services Console. You will need to scroll down until you see “Lutron\_LDAC\_ControlSystem.” When a service is running it will show as “Started” within the status column.



► **To start or stop a service:**

1. If it has not been started, simply click on the name of the service and then click on start button ►.
2. To stop a service, simply click on the stop button ■.

*NOTE:* The only time a service should be stopped is if you are restoring a database. The ControlSystem and RuntimeLogic services must be running to communicate with the hardware.



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## Runtime Logic System

The Runtime Logic System is a Windows service that is responsible for translating low-level commands to something that the user can understand. This interface primarily holds data values and interprets user requests into a messaging scheme that lower-level components can understand.

Runtime Logic is responsible for the following features:

- Database connectivity for ControllIT™.
- Exposing a web service to allow ControllIT™ clients to connect through HTML pages.
- Accepting messages from the messaging server for processing.
- Providing data to the compiler in formatting low-level hardware commands.
- Storing data that has been collected from hardware.
- Broadcasting changes in requested data to clients
- Creation of controls for quick access.
- Decoding and Encoding of messages from the hardware.
- Normalizing values from hardware to something that the user can understand.
- Transferring databases to GRAFIK 7000 processors.

## Starting the Runtime Logic System

The Runtime Logic System is a Windows Service. This means that it starts when the Operating System is loaded. A user does not need to log into Windows for it to start. To view the status of the Control System, you will need to look at the Services Console.

*NOTE:* For more information on viewing the status of a service, refer to page 77.

For more information on starting or stopping a service, refer to page 77.

## Troubleshooting the Control and Runtime System

When using the Runtime and Control Systems, the following is important to keep in mind:

The Control System service must start before the Runtime Logic System. Since the Control System is not dependent on any other components and has a short startup sequence, this is always the case when the system starts automatically. If you restart the Control System, you will also need to restart Runtime Logic afterwards.

The Control System uses an addressing scheme to communicate with each piece of hardware. If you have not properly set up the addressing and connectivity using DesignIT™, you will not be able to communicate with hardware.

Runtime and Control System are configured using the Environment Utility. Changing the environment settings will allow you to customize how the systems operate without the need to change software code. If you make an environment change, you will need to restart each of the services.

If the services fail to start, it is usually attributed to settings in the Environment.

The Runtime Logic System is also dependent on the Data Server to start. The Data Server is a combination of MS SQL (the database) and Internet Information Services (IIS web server).



# Lexicon

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**Address:** A unique alphanumeric identifier that is applied to each component in a system communication link.

**Addressing Screen:** A screen in DesignIT™ that allows the user to assign control station devices to processors and assign addresses to all equipment and control station devices.

**Assignable Object:** An object whose value can be modified via an event. Examples would include a particular zone or a particular control station device.

**Assignable Object Type:** A classification of an assignable object. Examples of Assignable Object Types include, but are not limited to: zones, walls, variables, time clocks, and control station devices.

**Astronomic Event:** An event defined as a number of hours and minutes before or after sunrise or sunset time.

**Autosequence:** A programming model that will automatically loop through a series of presets, with a user defined dwell time between presets, until it is terminated.

**Base Model Number:** The portion of the model number that is required to identify the functionality of the device.

**Button-by-button programming:** A programming technique where each button on a control station device is programmed individually. This programming technique does not limit the user to those objects contained by the same space in which the control station device is located.

**Button Mode:** A means by which the programming to be executed changes based on the value of a variable or moveable wall.

**Calendar:** Identifies the dates to which a particular schedule refers.

**Circuit:** A connection between the circuit breaker and one or more switch leg controls. (This is not a connection between a group of loads and a switch leg control. In the 7000 Lexicon, this is referred to as a switch leg.)

**Client:** A software application that provides an interface to server-based components.

**Client-Server:** A network system that utilizes one or more servers and one or more clients.

**Compile:** The act of translating user-defined project data into the machine level language that Lutron hardware understands.

**Conditional:** A programming model that may execute different presets based on logical statements that utilize the values of variables or moveable walls.

**Control:** An object that allows the user of ControllIT™ to change the present value of a parameter for an object or collection of objects. This will generate an event in the system.

**Control Station:** One or more ganged control station devices under a common faceplate.

**Control Station Device:** A device that provides a point of input or output. In most cases, these are wall-mounted controls with buttons.

**Control Type:** The manner in which a given load type can be controlled. Not all control types are valid for all load types. Examples of control types include, but are not limited to: dimmed and switched.

**ControllIT™:** A user-interface that allows the user to monitor and control the system via a standard, non-graphical, Web-based control.

**Default Schedule:** A collection of event/programming pairs that has been added to a Time Clock on a particular day of the week. Once added, it will always run on that day of the week.

**Delay:** A user defined time interval between an event and a response (for example, the time between the button press and the light turning on).

**DesignIT™:** A user-interface used to create a database model of a lighting system and implement the desired control strategies.

**Dual Action:** A programming model that will execute a preset while the control is pressed and held and then execute a second preset once released.

**Dwell Time:** A user-defined period of time between successive presets in an automatic sequence.

**Enclosure:** The housing in which the equipment is installed.

**Engraving:** User-defined numbers or letters that are inscribed on control stations, control station devices, or control station device buttons.

**Equipment:** The hardware of the system that is installed in an enclosure or is found in a panel. Examples include processors, interfaces, and switch leg controls.

**Equipment Definition Screen:** A screen in DesignIT™ that allows the user to define the equipment for a project. Additionally, switch legs are assigned to switch leg controls on this screen.

**Event:** An occurrence that can trigger programming to be executed.

**Exception Schedule:** A collection of event/programming pairs that has been added to a Time Clock on a particular date or dates.

**Faceplate:** A separate, decorative component that covers a control station. Also referred to as a wallplate or frontplate.

**Fade:** A change in intensity (bright to dim) of a light or lighting environment.

**Fade Rate:** The rate at which a particular zone changes intensity.

**Fade Time:** The total time it takes a dimmable zone to change intensity from one level to another.

**Fixture:** A complete electrical device that may consist of lamps, relays, motors, ballasts, or receptacles.

**Fixture Power Feeds:** Refers to one or more electrical connections as required by a fixture. Multiple fixture power feeds are required for those fixtures that have a total current draw that is larger than the capacity of one switch leg control and those fixtures that have differing load types.

**Fixture Type:** A reusable template that defines or specifies the characteristics of one or more loads that are contained within the same housing or apparatus.

**Group:** A named collection of one or more objects or other groups that share a common functional purpose. This is consistent with the building automation industry standard term.

**Group Definition Screen:** A screen in DesignIT™ that allows the user to create new groups or to modify existing groups.

**Hold:** The period of time between a press and release.

**Infrared (IR) Sensor:** A device that controls the lighting system by detecting infrared (IR) signals from a handheld remote.

**LED Logic:** Defines the condition for which an LED will light.

**Link:** The means by which the individual parts of a lighting control system communicate with each other.

**Load:** A device to which power is delivered via a switch leg.

**Load Schedule:** A list of switch leg to switch leg control assignments and the switch leg properties, including load type, voltage, etc. Typically, this list is delivered on a panel-by-panel basis.

**Load Shed:** The term load shed, in the broadest sense, means reducing power consumption by "shedding" or reducing some of the load. In a modern building this load is primarily electrical, and is due to the many computers, lights, HVAC components, coffee machines, microwave ovens, etc., operating in the building at any given time.

**Load Type:** A classification of a load determined by the load's electrical characteristics. The load type determines the manner in which the load can be controlled based on the switch leg control's capability.

**Logical Definition Screen:** A screen in DesignIT™ that allows the user to create scenes, time clocks, variables, and zones.

**Macro:** Programming that executes on the server.

**Mode:** A function and a set of associated values that determine the behavior of a group or other object to which it is applied. This is consistent with the building automation industry standard term.

**Mode Definition Screen:** A screen in DesignIT™ that allows the user to create new modes or modify existing modes.

**Model Number:** A unique alphanumeric string assigned to a Lutron component.

**Object:** A generic term that refers to any Lutron product or abstract entity that is added to the project (for example, Lutron product-GP48; abstract entity-scene).

**Occupancy Sensor:** A device that controls the lighting system by detecting whether the space is occupied or unoccupied.

**Panel:** A factory built pre-wired assembly of hardware.

**Parameter:** A property whose value determines the characteristics or behavior of an object.

**Partitioned/Partitionable Space:** A term that refers to a specific type of space. A partitionable space allows the user to include fixed and moveable walls. These walls can be used later in the Programming Screen to achieve various lighting effects. A partitionable space contains child spaces as defined by the Partitionable Space Designer.

**Partitionable Space Designer:** A feature that leads the user through all the steps required to define a partitionable space.

**Photo Sensor:** A device that controls the lighting system by the current light level in the space.

**Preset:** A user-defined set of one or more objects and their associated commands/levels.

**Press:** A type of button event. In the case of a mechanical button, this occurs when the button is depressed.

**Processor:** A factory-built assembly that contains the system information and executes time clock events. Each processor contains a unique address and all equipment is wired to and communicates with a processor.

**Programming:** Predetermined behavior that is defined to occur as the result of an event. Programming does not include the event itself.

**Programming Model:** Specifies how the system responds to user interaction (for example, single action, automatic sequence).

**Programming Screen:** A screen in DesignIT™ used to program control station buttons, create programming and schedules, and apply schedules to time clocks.

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**Project:** A named container that includes all information about the system.

**Project Hardware Type:** The lighting control product family or families that the user is planning to use in a project (for example, HWI, G6000, LZC, etc).

**Real-Time Event:** An event defined in terms of the time of day.

**Release:** A type of button event. In the case of a mechanical button, this occurs when the button is no longer depressed.

**Scene:** A lighting effect achieved by adjusting one or more zones to various levels.

**Schedule:** A collection of event/programming pairs.

**Script:** A reusable set of one or more commands that resides and is executed in the processor.

**SecureIT™:** A user-interface that allows an administrator to define user accessibility to various aspects of the system.

**Sensor:** A device that controls the lighting system by detecting infrared (IR) signals, the current light level in the space, or whether the space is occupied.

**Sequence:** A series of presets that occur successively to achieve a desired lighting effect.

**Server:** A computer in a network that is used to provide services to clients in the network.

**Single Action:** A programming model that executes the same preset for each event.

**Space:** A generic term that refers to a physical representation of a building, or any of its parts. Spaces can contain other spaces. Additionally, each space can contain other objects. Each object in a space can only be assigned to one space.

**Switch Leg:** A connection between a group of loads and a switch leg control.

**Switch Leg Control:** Any electronic device that controls a switch leg by varying the signal delivered to the load(s). In most cases, it is situated between the circuit breaker and the load(s) being controlled. This includes wall box and panel-based switch leg controls.

**System:** The interconnected components that are referenced in an eLumen™ project.

**System Definition Screen:** A screen in DesignIT™ that allows the user to create spaces, add control stations, add control station devices, and add switch legs.

**Time Clock:** A collection of schedules.

**Transfer:** The act of transmitting the compiled data from the user-interface to Lutron Hardware or vice-versa. This cannot be done in the absence of hardware.

**Variable:** A user created object that can be of three types: True/False, Multi-state, or Integer. Variables can be used in the Programming Screen.

**Variable State:** One of the 255 available values of a

variable, which is used for conditional logic programming.

**Wall:** A structure that is used to define a partitionable space.

**Wall State:** A state of a moveable wall (for example, fully open, fully closed, half open).

**Zone:** A group of switch legs controlled simultaneously as one unit (also called a channel by some lighting designers).



# Notes

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Please Read

**LUTRON®**

## Switching Panels

### Installation Guide Softswitch128™ (XPS) and GRAFIK Systems™ (XP)



XPS48-1204ML-20 shown

### Contents

#### Panel Model Number Guide

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### Overview

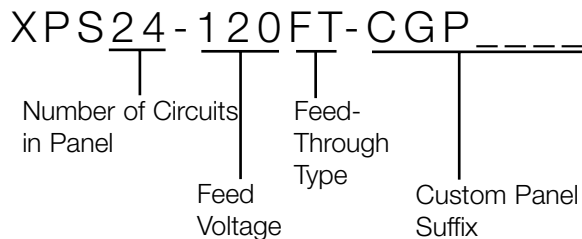
Use this guide to successfully install a switching panel. This guide describes panel installation, wiring, and load activation. For systems using rough-in panels, special instructions are included for keepout areas, panel mounting, and installing the panel interior.

# Panel Model Number Guide

## Softswitch128™ (XPS)

### Feed-Through Model Numbers

Example



#### Number of Circuits in Panel

Indicates number of switching circuits in the panel:  
8, 12, 16, 20, 24, 28, 32, 36, 40, 44, or 48

#### Feed Voltage<sup>1,2</sup>

Omit for dual voltage

120 for 120 V~

230 for 230 V~ (CE)

240 for 220-240 V~ (non-CE)

277 for 277 V~

#### Load Circuit Rating

16 A per circuit

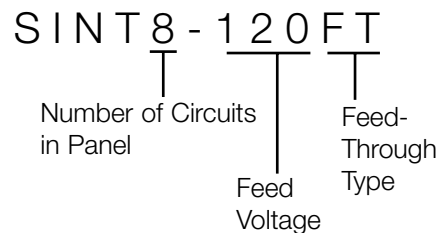
#### Custom Panel Suffix

Contact Lutron for options

### Rough-In Model Numbers

120/277 V~ only

Example



#### Number of Circuits in Panel

Indicates number of switching circuits in the panel:  
8, 12, 16, 20, 24, 28, 32, 36, 40, 44, or 48

#### Feed Voltage<sup>1,2</sup>

Omit for dual voltage

120 for 120 V~

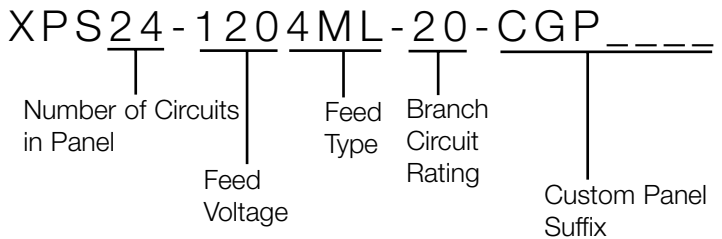
277 for 277 V~

#### Load Circuit Rating

16 A per circuit

### Branch Circuit Breaker Model Numbers

Example



#### Number of Circuits in Panel

Indicates number of switching circuits in the panel:  
8, 12, 16, 20, 24 (all voltages)  
28, 32, 36, 40, or 42 (120/277/347 V~ only)

#### Feed Voltage

120 for 120 V~

230 for 230 V~ (CE)

240 for 220-240 V~ (non-CE)

277 for 277 V~

347 for 347 V~

#### Feed Type

4ML for 3 phase 4 wire main lugs

#### Input Ratings

120/208 V~

or 277/480 V~

or 230/400 V~

or 220/380-240/415 V~

3ML for 1 phase 3 wire main lugs

120/240 V~

4IS for 3 phase 4 wire isolation switch

#### Branch Circuit Rating

20 for 20 A branch circuit breakers (120/277/347 V~; 16 A continuous load rating)

16 for 16 A branch circuit breakers (230/220-240 V~)

#### Custom Panel Suffix

Contact Lutron for options

### Frequency - All Model Numbers and Voltages

50/60 Hz

#### Output Voltages

120 V~, 230 V~, 240 V~, 277 V~, or 347 V~

<sup>1</sup>Multiple voltages (120 V~ and 277 V~) may be switched in the same panel. At least one feed of the specified voltage is required for the low voltage control transformer in the panel.

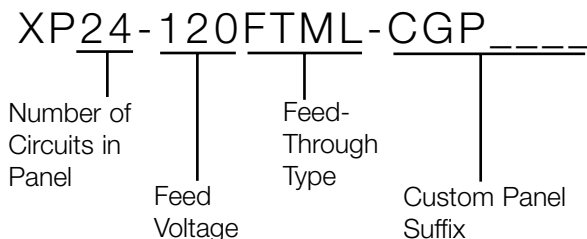
<sup>2</sup>If voltage is not specified in the model number (e.g., XPS24-FT) product is rated 120 V~ or 277 V~. Refer to Wiring section.

# Panel Model Number Guide (continued)

## GRAFIK Systems™ (XP)

### Feed-Through Model Numbers

Example



#### Number of Circuits in Panel

Indicates number of switching circuits in the panel:  
4, 8, 12, 16, 20, 24, 28, 32, 36, 40, 44, or 48

#### Feed Voltage<sup>1,2</sup>

Omit for dual voltage

- 120 for 120 V~
- 230 for 230 V~ (CE)
- 240 for 220-240 V~ (non-CE)
- 277 for 277 V~
- 347 for 347 V~

#### Load Circuit Rating

16 A per circuit

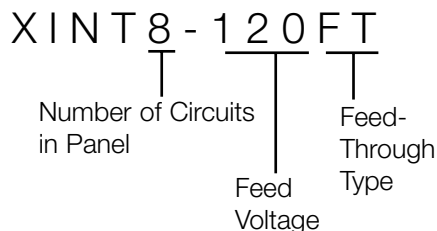
#### Custom Panel Suffix

Contact Lutron for options

### Rough-In Model Numbers

120/277 V~ only

Example



#### Number of Circuits in Panel

Indicates number of switching circuits in the panel:  
4, 8, 12, 16, 20, 24, 28, 32, 36, 40, 44, or 48

#### Feed Voltage<sup>1,2</sup>

Omit for dual voltage

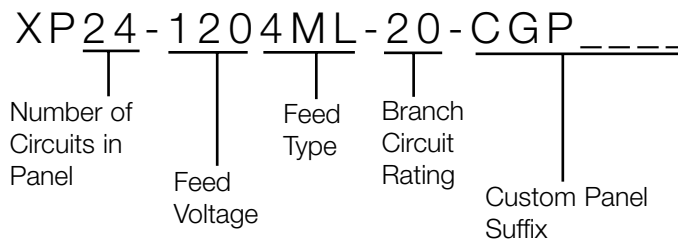
- 120 for 120 V~
- 277 for 277 V~

#### Load Circuit Rating

16 A per circuit

### Branch Circuit Breaker Model Numbers

Example



#### Number of Circuits in Panel

Indicates number of switching circuits in the panel:  
4, 8, 12, 16, 20, 24 (all voltages)  
28, 32, 36, 40, or 42 (120/277/347 V~ only)

#### Feed Voltage

- 120 for 120 V~
- 230 for 230 V~ (CE)
- 240 for 220-240 V~ (non-CE)
- 277 for 277 V~
- 347 for 347 V~

#### Feed Type

- 4ML for 3 phase 4 wire main lugs
- 3ML for 1 phase 3 wire main lugs
- IS for 3 phase 4 wire isolation switch

#### Input Ratings

- 120/208 V~
- or 277/480 V~
- or 230/400 V~
- or 220/380-240/415 V~

#### Branch Circuit Rating

- 20 for 20 A branch circuit breakers (120/277/347 V~; 16 A continuous load rating)
- 16 for 16 A branch circuit breakers (230/220-240 V~)

#### Custom Panel Suffix

Contact Lutron for options

### Frequency - All Model Numbers and Voltages

50/60 Hz

#### Output Voltages

120 V~, 230 V~, 240 V~, 277 V~, or 347 V~

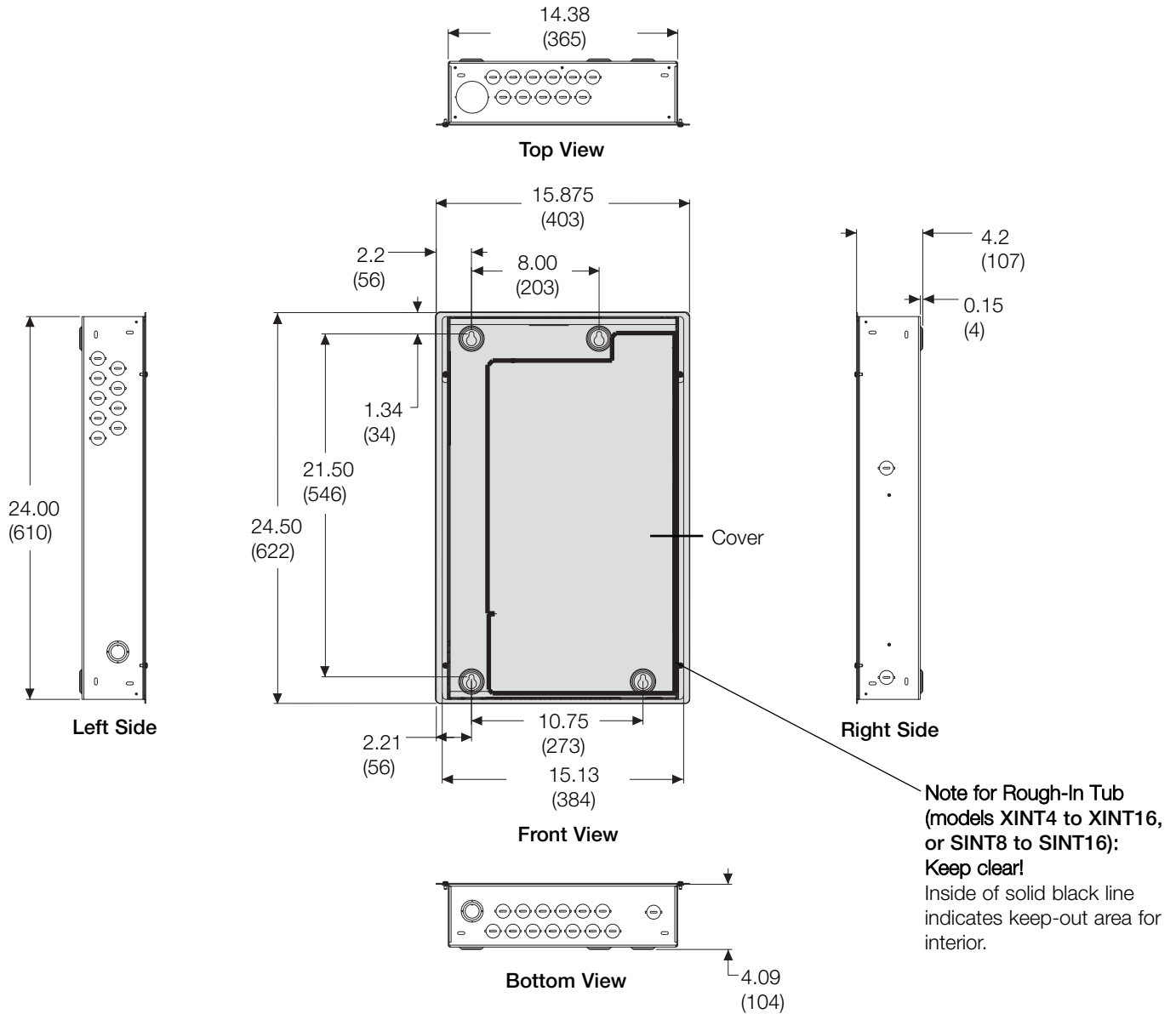
<sup>1</sup>Multiple voltages (120 V~ and 277 V~) may be switched in the same panel. At least one feed of the specified voltage is required for the low voltage control transformer in the panel.

<sup>2</sup>If voltage is not specified in the model number (e.g., XPS24-FT) product is rated 120 V~ or 277 V~. Refer to Wiring section.

# Panel Dimensions

## Mini Panel

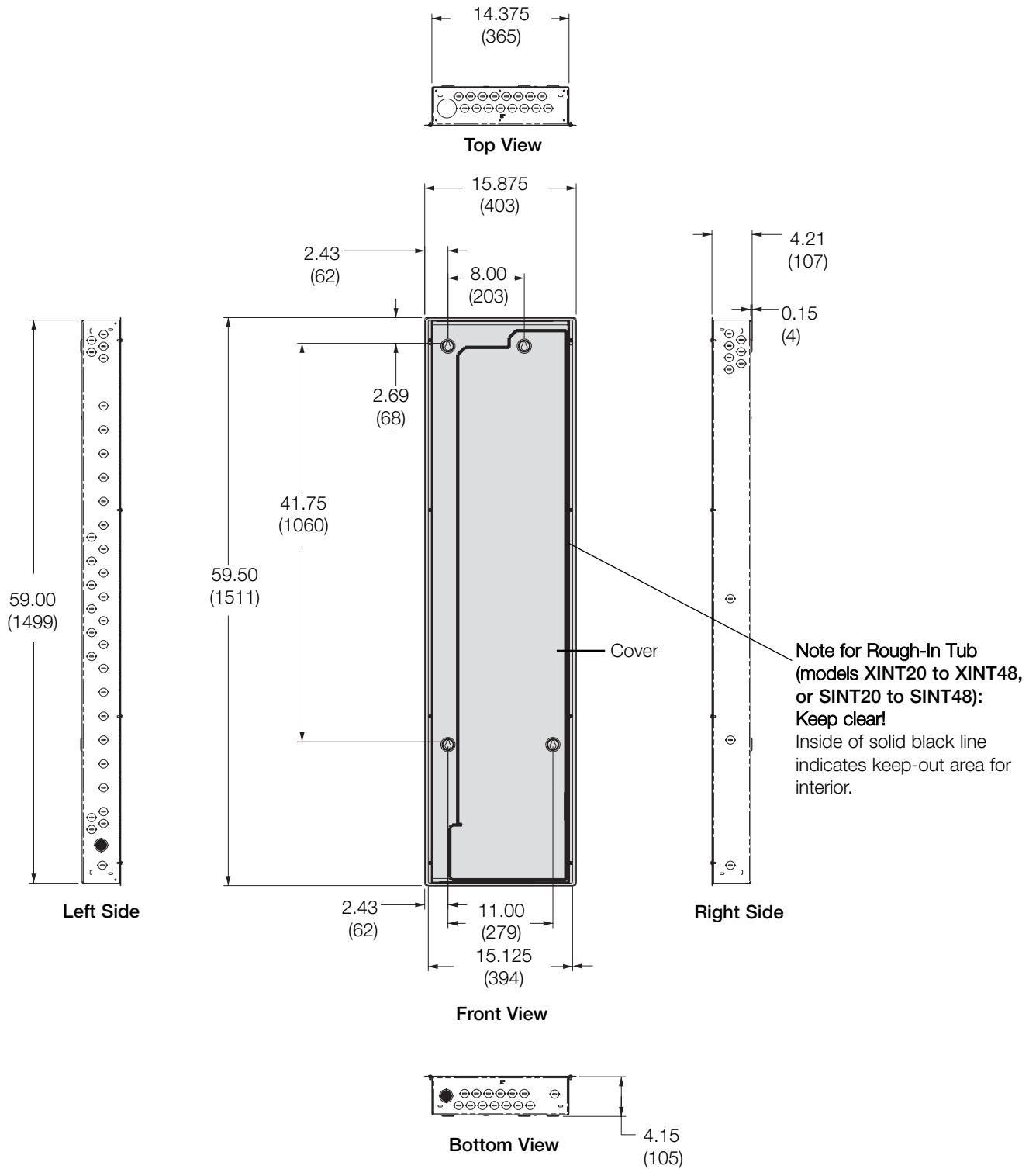
Dimensions are in inches (mm).



# Panel Dimensions (continued)

## Standard Panel

Dimensions are in inches (mm).

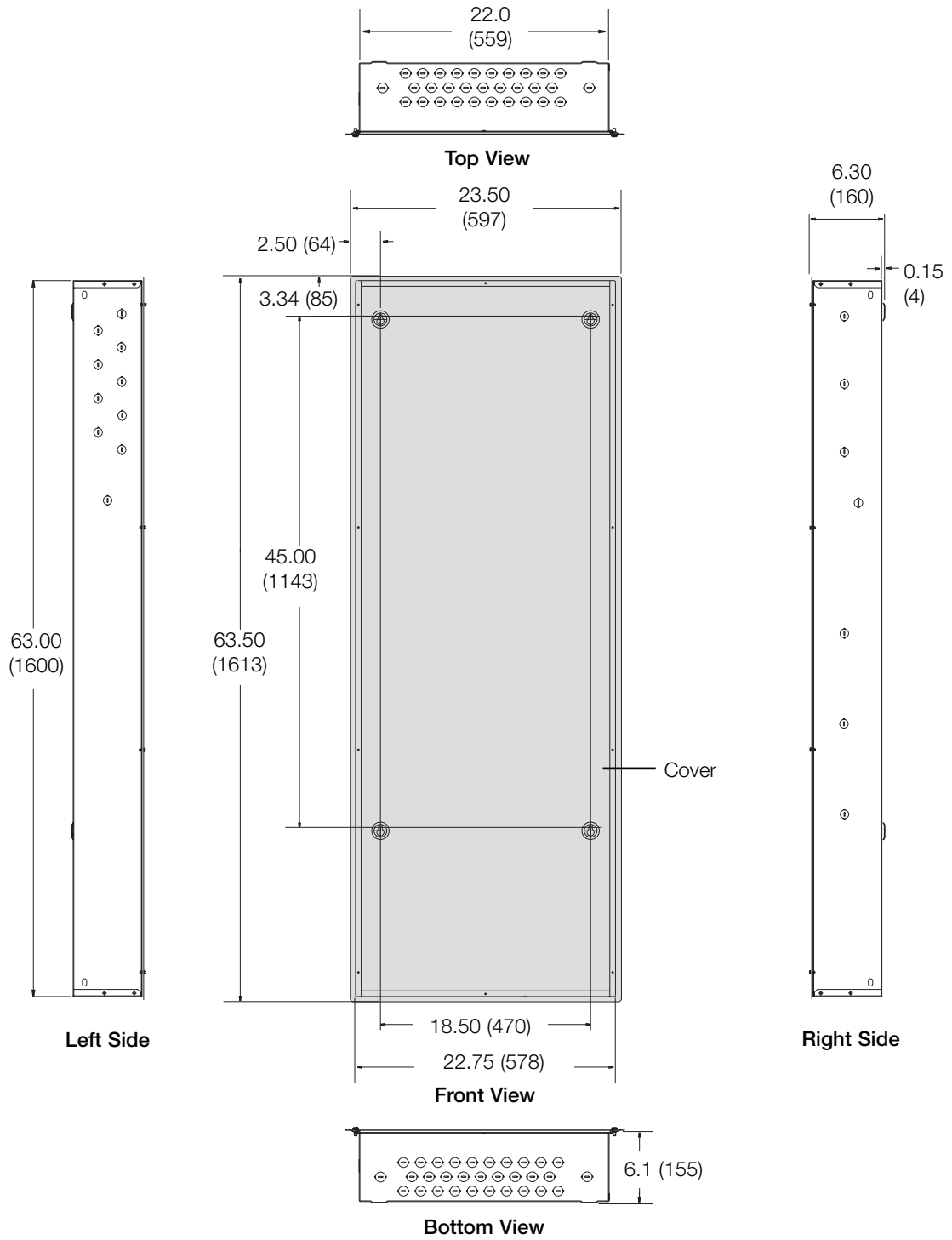




# Panel Dimensions (continued)

## Large Panel (120/277/347 V~ only)

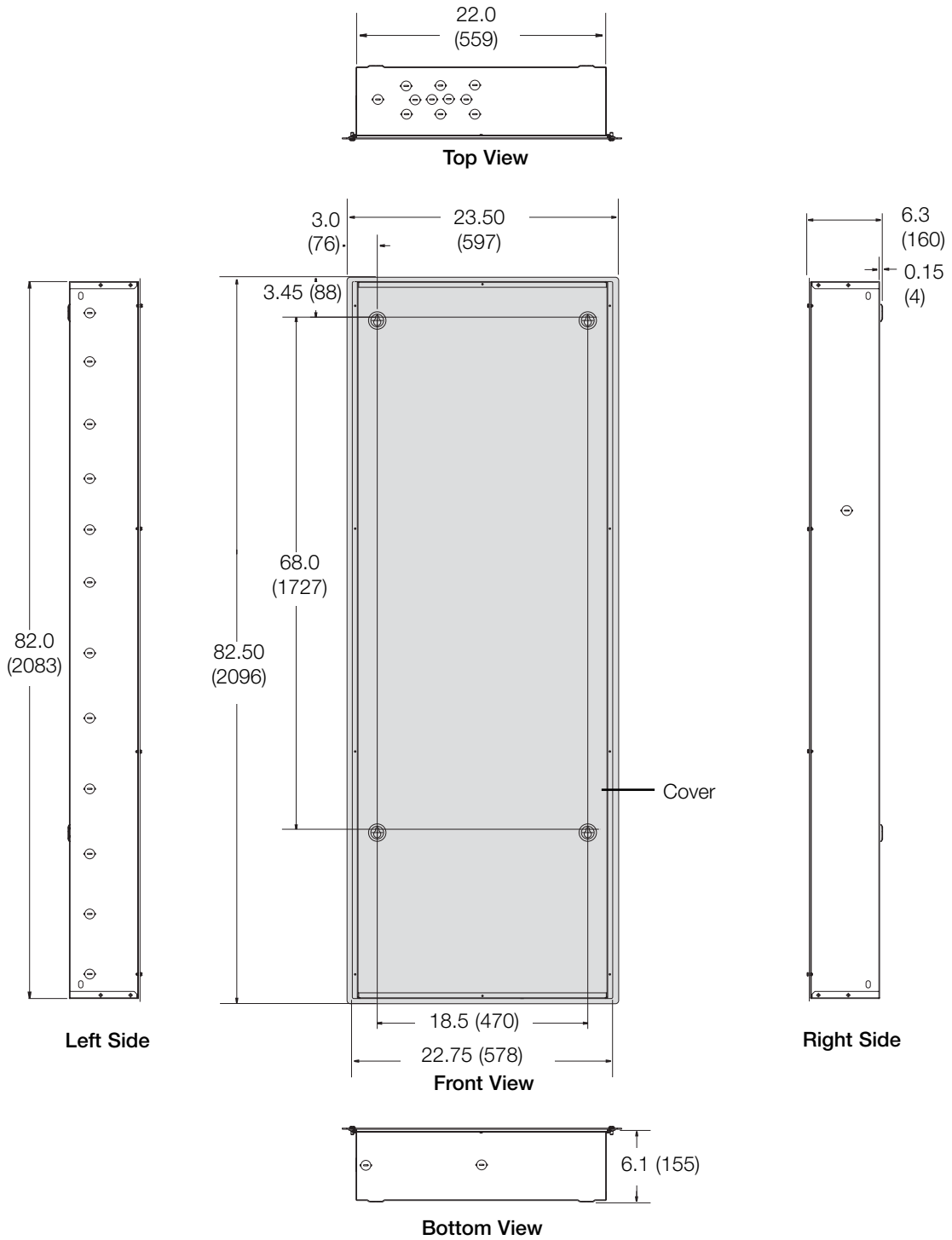
Dimensions are in inches (mm).



# Panel Dimensions (continued)

## Extra-Large Panel (277/347 V~ only)

Dimensions are in inches (mm).



# Panel Mounting

## Panel and TUB Mounting

### Mounting Guidelines

- For Indoor Use Only! NEMA, Type 1 enclosure, IP20.
- Large and extra-large panels for surface mount only.
- Panel generates heat. Mount where ambient temperature is 32-104 °F (0-40 °C).
- Relative humidity must be <90% non-condensing.
- Reinforce wall structure for panel weight and local codes; see table.
- Mount panel where audible noise is acceptable. (Internal relays click.)
- Mount panel so line (mains) voltage wiring is at least 6 feet (1.8 m) from audio or electronic equipment and associated wiring.
- Mount within 7° of true vertical.
- Consult Dimensions page for dimensions, conduit knockouts, and mounting holes and hardware.
- Install in accordance with all national and local electrical codes.

### Maximum Panel Weights

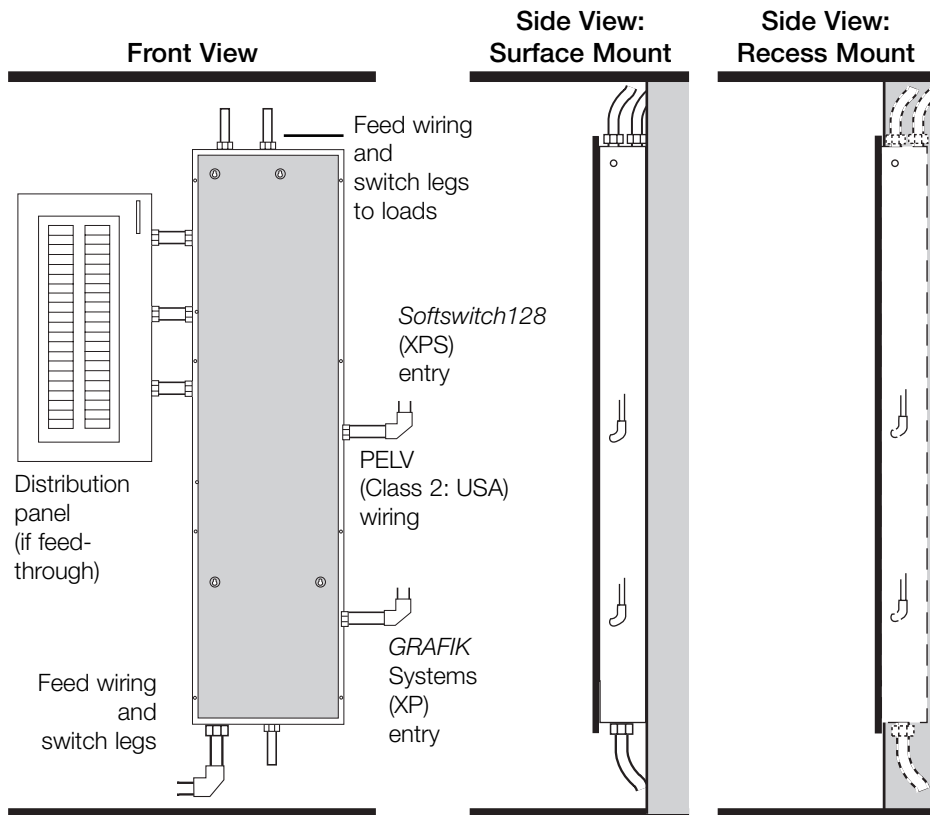
Mini	30 pounds (13.9 kg)
Standard	80 pounds (37 kg)
Large	135 pounds (61.3 kg)
Extra-Large	200 pounds (90.7 kg)

### Recommended Mounting Heights\*

**(120/277/347 V~ Softswitch128 systems)**

Mini	45 in. (1143 mm)
Standard	25 in. (635 mm)
Large	10 in. (254 mm)
Extra-Large	7 in. (178 mm)

\*Measure from floor to bottom of panel.  
Provides optimal viewing height for controller.



### Surface Mounting

- Lutron recommends using 1/4 in. (6 mm) mounting bolts (maximum size accepted by keyholes).
- Allow room for cover. Leave 1 1/2 in. (38 mm) clearance to each side of panel.

### Recess Mounting

- Mount panel between flush and 1/8 in. (3 mm) below finished wall surface.
- Allow room for cover. Leave 1 1/2 in. (38 mm) clearance to each side of panel.

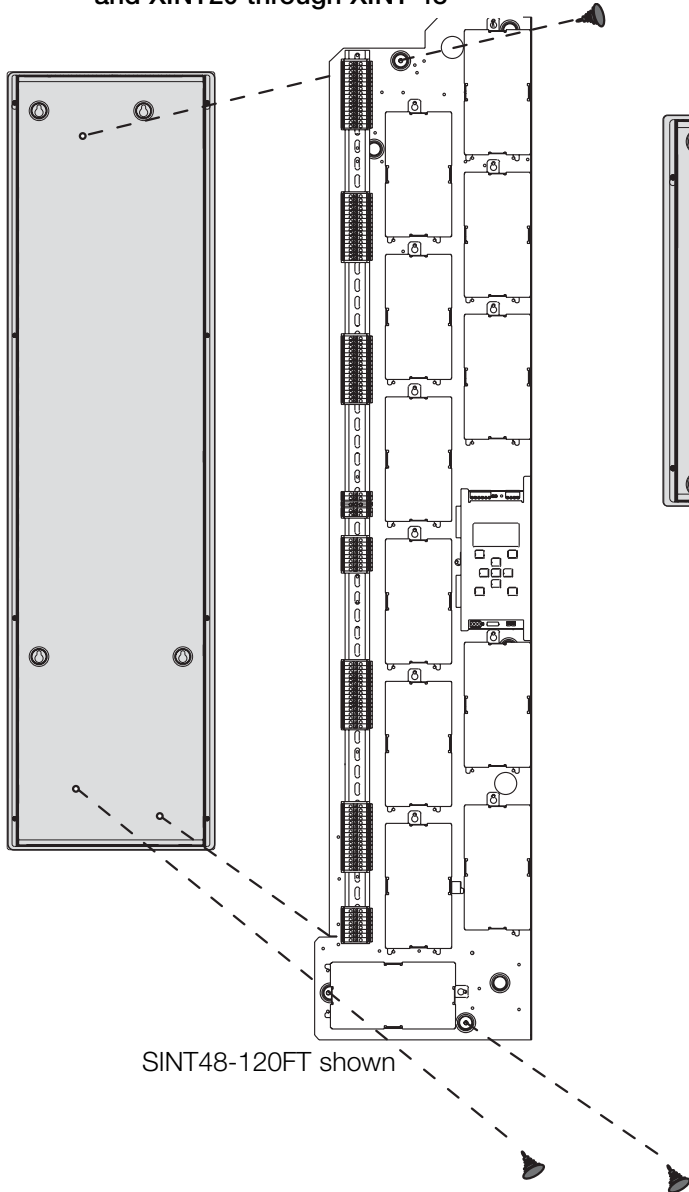
# Panel Mounting (continued)

## Rough-In Panel Interior Mounting (Rough-in Panels ONLY) (120/277/347 V<sub>~</sub> only)

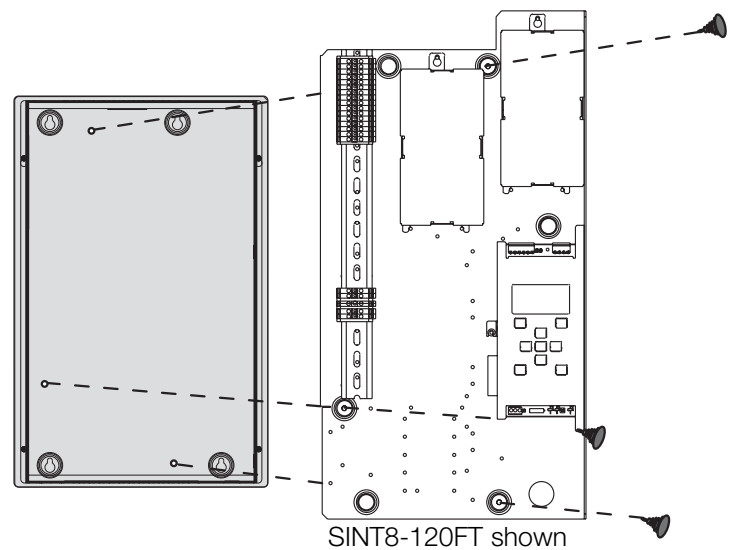
### Mounting for SINT or XINT Plate:

- Insert interior into TUB.
- Rest interior on bottom of TUB.
- Press interior flat into back of TUB.
- Insert 3 screws (provided) as shown into interior to secure to TUB.
- All mounting guidelines apply (see previous page).

**TUB 48 Mounting for  
SINT20 through SINT48  
and XINT20 through XINT 48**



**TUB 16 Mounting for  
SINT8 through SINT16  
and XINT4 through XINT16**

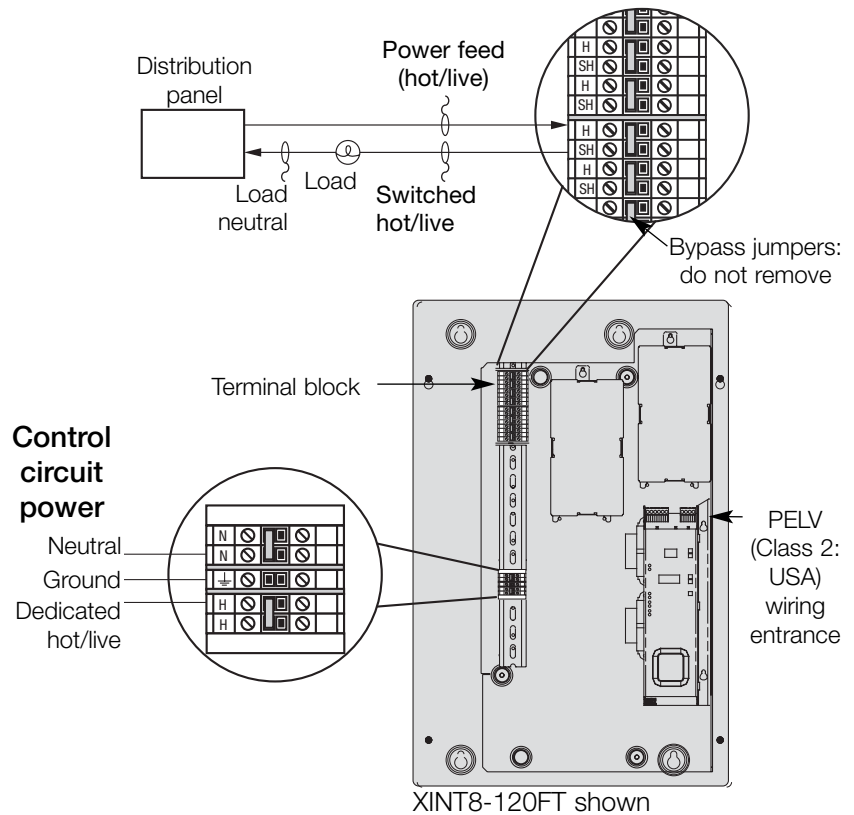


# Wiring

## Feed-Through Panel: Feed and Load Wiring

- Use a trough when the switching panel is far away from the distribution panel. Splice neutrals in trough.
- Wire the switching panel similar to a lighting distribution panel. Run feed and load wiring.
- Use the switching panel to provide temporary lighting by leaving the bypass jumpers in place. (See page 16 for more details.)

### Typical load circuit



### Wire Sizes

- Power Feed (Hot/Live): #14-#10 AWG (2.5-4.0 mm<sup>2</sup>)
- Switched Hot/Live: #14-#10 AWG (2.5-4.0 mm<sup>2</sup>)

### Control Circuit Power:

- Supplies power for internal operation.
- Requires dedicated feed with same voltage and phase as panel.
- Must be 1/4" (6 mm) away from PELV (Class 2: USA) control wiring harness.
- Panel voltage (see pages 2-3) indicates feed voltage.
- For 230 V $\sim$  and 240 V $\sim$  panels, "Hot" is referred to as "Live". Therefore, terminals will be labeled L and SL.

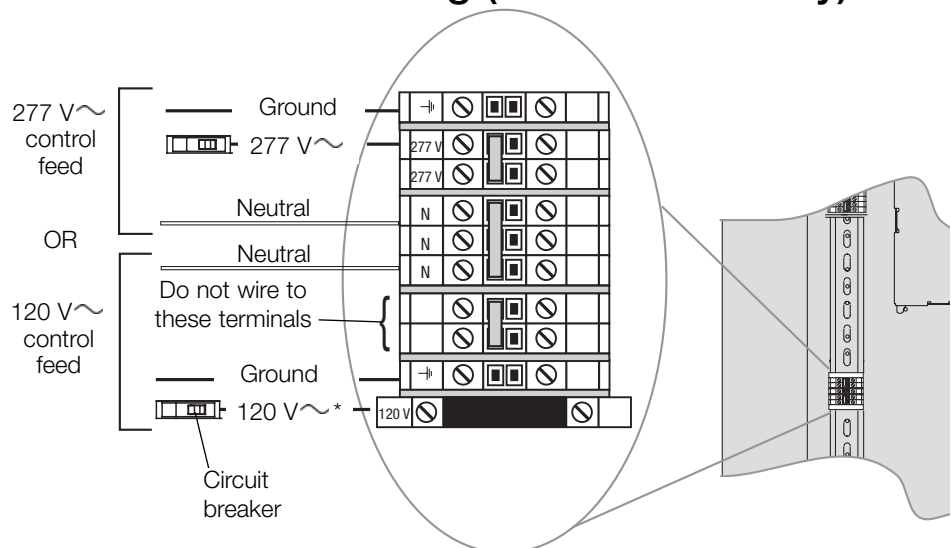
## Dual-Voltage Panel: Feed and Load Wiring (120/277 V $\sim$ only)



Wire to either the 120 V $\sim$  or the 277 V $\sim$  control feed terminals, not both. The terminals for the unused voltage will remain empty.

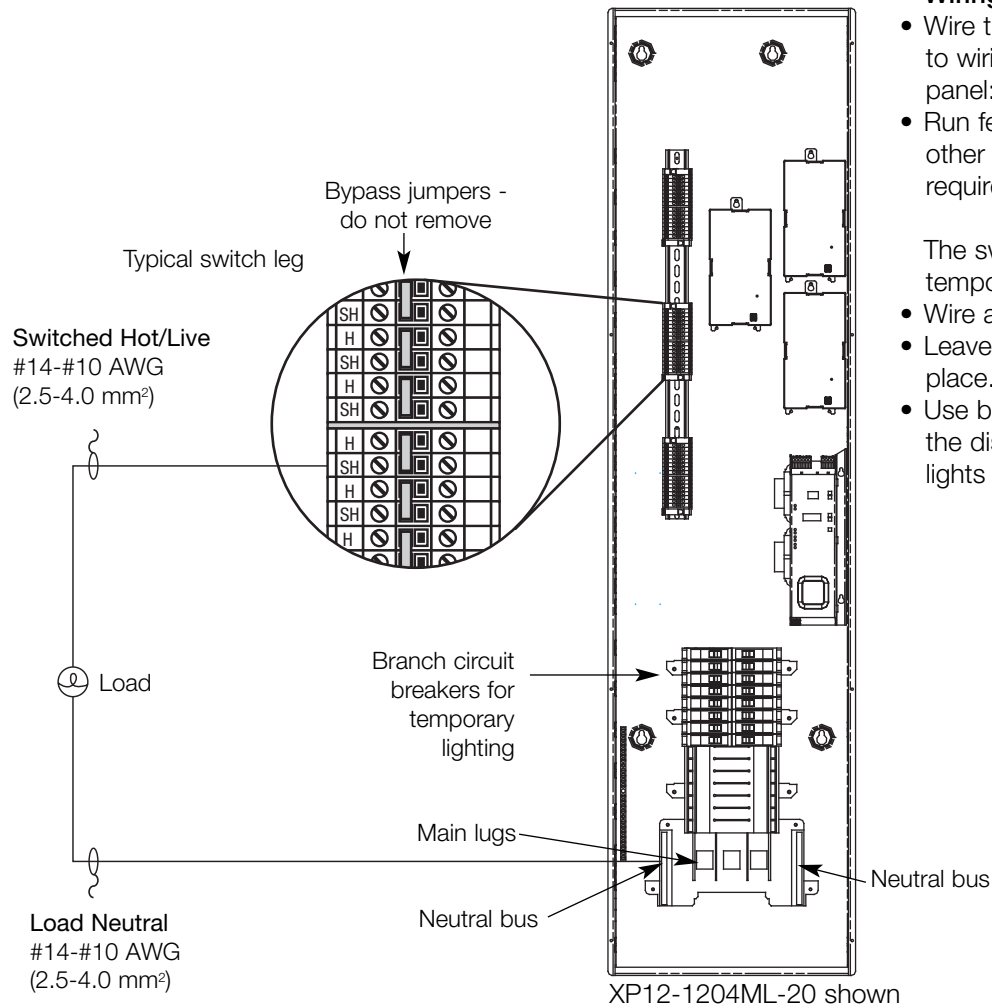
### \*Note:

120 V $\sim$  Hot/Live terminal is protected by an internal fuse in case 277 V $\sim$  is mistakenly applied. A spare fuse is also supplied in the panel terminal block.



# Wiring (continued)

## Panel with Branch Circuit Breakers: Feed and Load Wiring (120/277/347 V~ only)



### Wiring Tips

- Wire the switching panel similar to wiring a lighting distribution panel:
- Run feed and load wiring. No other wiring or assembly required.

The switching panel can provide temporary lighting:

- Wire all loads.
- Leave the bypass jumpers in place.
- Use branch circuit breakers at the distribution panel to switch lights on and off.

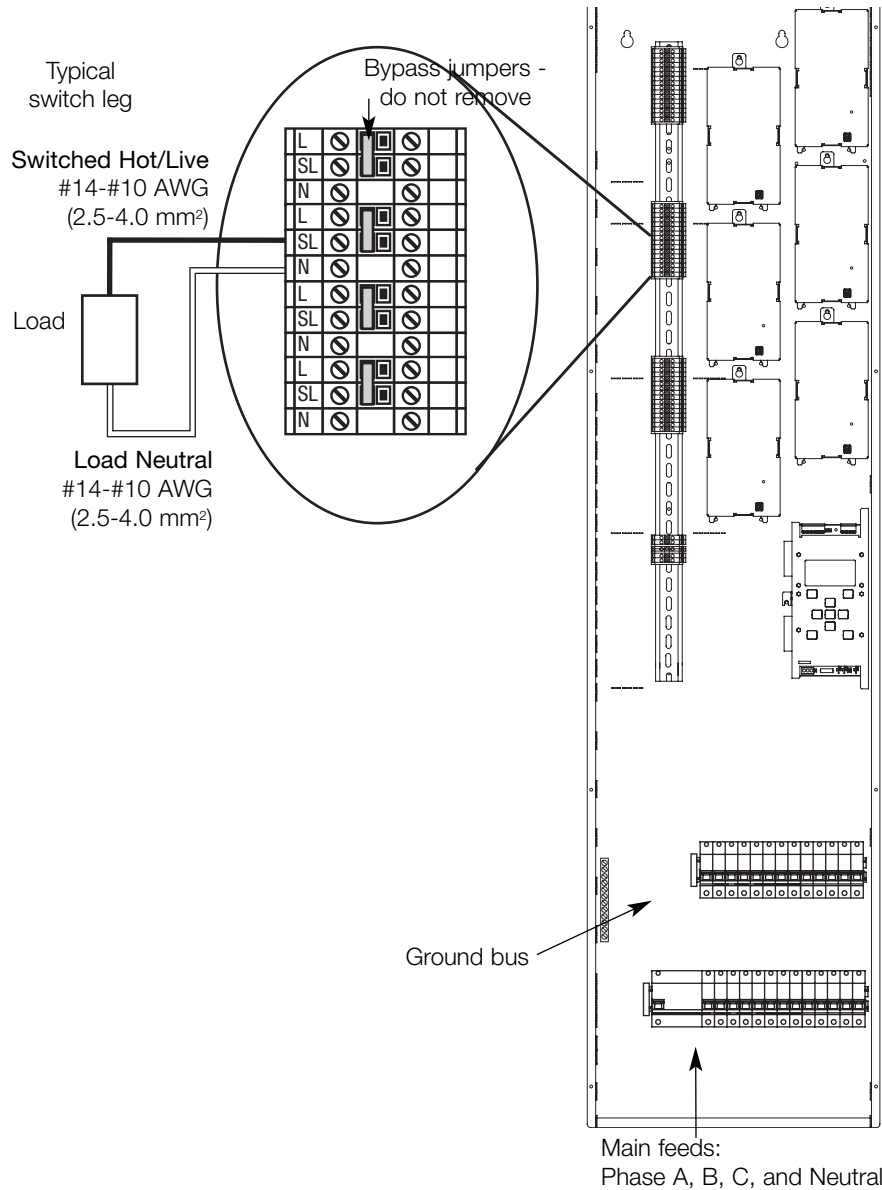
### Feed Wiring

#### Wire Sizes

120 V~	#4 AWG to 250 KCMIL (MCM) (25-185 mm <sup>2</sup> )
277 V~	#4 AWG to 250/350 KCMIL (MCM) (25-120/185 mm <sup>2</sup> )
347 V~	#4 AWG to 250/350 KCMIL (MCM) (25-120/185 mm <sup>2</sup> )

# Wiring (continued)

## Panel with Isolation Switch: Feed and Load Wiring (230/220-240 V~ only)



### Wiring Tips

- Wire the switching panel similar to wiring a lighting distribution panel.
- Run feed and load wiring. No other wiring or assembly required.

The switching panel can provide temporary lighting:

- Wire all loads.
- Leave the bypass jumpers in place.
- Use branch circuit breakers at the distribution panel to switch lights on and off.

### Wire Sizes

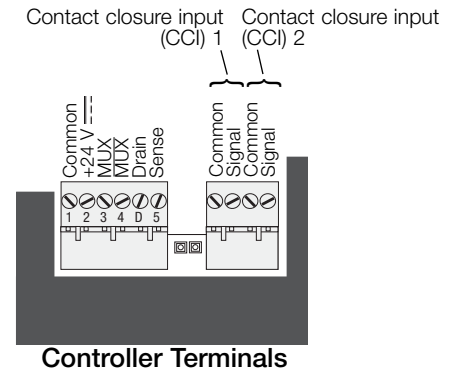
- 230 V~ #14-#2 AWG (2.0-35 mm<sup>2</sup>)
- 220-240 V~ #14-#10 AWG (2.0-4.0 mm<sup>2</sup>)



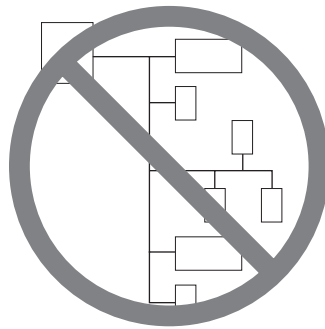
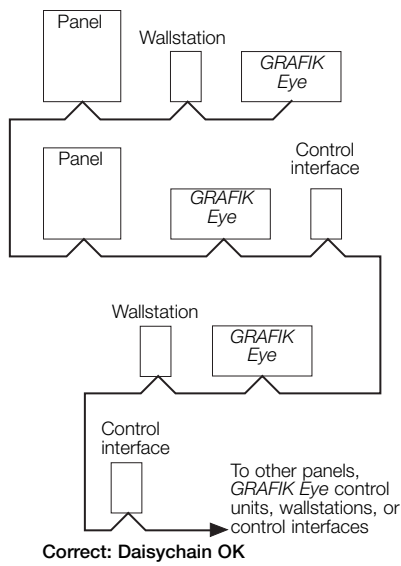
# System Wiring Overview

Review the options below for information on wiring your panel correctly into your specific system.

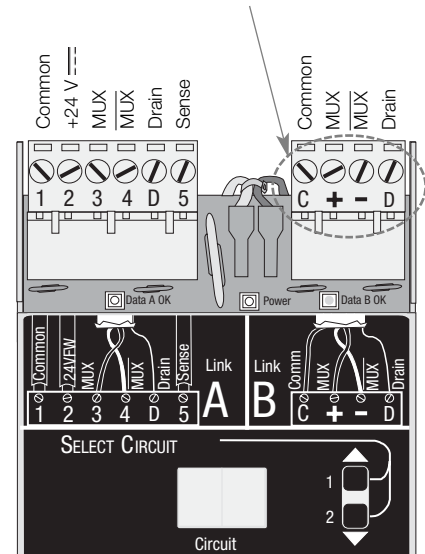
**A. Softswitch128™ (XPS) panel:** Refer to the *Softswitch128 Setup and Operation Manual* for detailed wiring information.



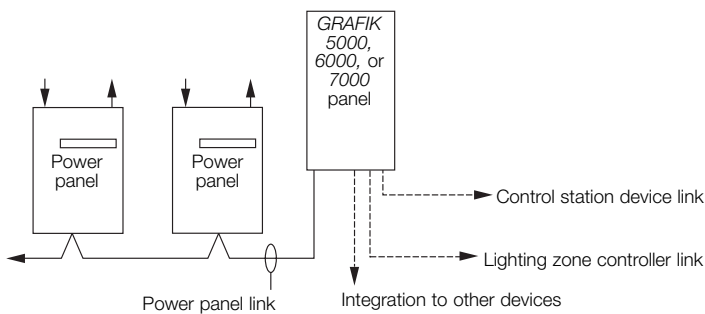
**B. GRAFIK Systems™ (XP) panel as a part of a GRAFIK Eye 4000 lighting system:** Refer to the *GRAFIK Eye 4000 Installation, Setup, and Operation Manual* and the system overview pictured here for detailed wiring information.



Note: Single-link circuit selectors will not have Link B connector.



**C. GRAFIK Systems™ (XP) panel as a part of a GRAFIK 7000 lighting system:** Refer to the *GRAFIK7000 Installation, and Maintenance Guide* and the system overview pictured here for detailed wiring information.



# Ratings

## Softswitch128™ (XPS)

Use the charts below to determine feed and load wiring sizes for *Softswitch128* panels. Note that load circuit wiring sizes are shown bottom right.

### 120 V~ Panels with Branch Circuit Breakers

XPS Model	Switch Legs	Feed Type	Max Feed
XPS8	8		
XPS12	12	3Ø 4W or	
XPS16	16	1Ø 3W	200 A
XPS20	20		
XPS24	24	Main Lug Accepts:	
XPS28	28	#4 AWG to 250	
XPS32	32	KCMIL (MCM)	
XPS36	36	(25-120 mm <sup>2</sup> )	225 A
XPS40	40		
XPS42	42		

### 277 V~ Panels with Branch Circuit Breakers

XPS Model	Switch Legs	Feed Type	Max Feed
XPS8	8	3Ø 4W or 1Ø 3W	
XPS12	12	Main Lug Accepts:	
XPS16	16	#4 AWG to 250	250 A
XPS20	20	KCMIL (MCM)	
XPS24	24	(25-120 mm <sup>2</sup> )	
XPS28	28		
XPS32	32	Main Lug Accepts:	
XPS36	36	#4 AWG to 350	300 A
XPS40	40	KCMIL (MCM)	
XPS42	42	(25-185 mm <sup>2</sup> )	

### 220-240 V~ and 230 V~ Panels with Branch Circuit Breakers

XPS Model	Switch Legs	Feed Type	Max Feed
XPS8	8	3Ø 4W	
XPS12	12	Isolation Switch	
XPS16	16	Accepts:	125 A
XPS20	20	#14-#2 AWG	
XPS24	24	(2.0-35 mm <sup>2</sup> )	

### Feed-Through (FT) and Rough-In (RI) Panels (120 V~, 277 V~, 120/277 V~)

FT Model	RI Model	Switch Legs	Feed Type	Max Feed
XPS8	SINT8	8		
XPS12	SINT12	12	1Ø 2W	
XPS16	SINT16	16		
XPS20	SINT20	20	#14-#10 AWG	
XPS24	SINT24	24	(2.5-4.0 mm <sup>2</sup> )	20 A
XPS28	SINT28	28	mm <sup>2</sup> )	
XPS32	SINT32	32		
XPS36	SINT36	36		
XPS40	SINT40	40		
XPS44	SINT44	44		
XPS48	SINT48	48		

### Load Circuit Wiring

Terminal blocks accept one #14-#10 AWG (2.5-4.0 mm<sup>2</sup>) wire. Preferred entry is from the top of the panel.

## Ratings (continued)

### GRAFIK Systems™ (XP)

Use the charts below to determine feed and load wiring sizes for *GRAFIK* Systems panels. Note that load circuit wiring sizes are shown bottom right.

#### 120 V~ Panels with Branch Circuit Breakers

XP Model	Switch Legs	Feed Type	Max Feed
XP4	4		
XP8	8		
XP12	12	3Ø 4W or	
XP16	16	1Ø 3W	200 A
XP20	20		
XP24	24	Main Lug Accepts:	
XP28	28	#4 AWG to 250	
XP32	32	KCMIL (MCM)	
XP36	36	(25-120 mm <sup>2</sup> )	225 A
XP40	40		
XP42	42		

#### 277 V~ Panels with Branch Circuit Breakers

XP Model	Switch Legs	Feed Type	Max Feed
XP4	4		
XP8	8	3Ø 4W or 1Ø 3W	
XP12	12	Main Lug Accepts:	
XP16	16	#4 AWG to 250	250 A
XP20	20	KCMIL (MCM)	
XP24	24	(25-120 mm <sup>2</sup> )	
XP28	28		
XP32	32	Main Lug Accepts:	
XP36	36	#4 AWG to 350	300 A
XP40	40	KCMIL (MCM)	
XP42	42	(25-185 mm <sup>2</sup> )	

#### 220-240 V~ and 230 V~ Panels with Branch Circuit Breakers

XPS Model	Switch Legs	Feed Type	Max Feed
XPS8	8	3Ø 4W	
XPS12	12	Isolation Switch	
XPS16	16	Accepts:	125 A
XPS20	20	#14-#2 AWG	
XPS24	24	(2.0-35 mm <sup>2</sup> )	

#### Feed-Through (FT) and Rough-In (RI) Panels (120 V~, 277 V~, 120/277 V~)

FT Model	RI Model	Switch Legs	Feed Type	Max Feed
XP4	XINT4	4		
XP8	XINT8	8	1Ø 2W	
XP12	XINT12	12		
XP16	XINT16	16	#14-#10 AWG	
XP20	XINT20	20	(2.5-4.0 mm <sup>2</sup> )	20 A
XP24	XINT24	24		
XP28	XINT28	28		
XP32	XINT32	32		
XP36	XINT36	36		
XP40	XINT40	40		
XP44	XINT44	44		
XP48	XINT48	48		

#### Load Circuit Wiring

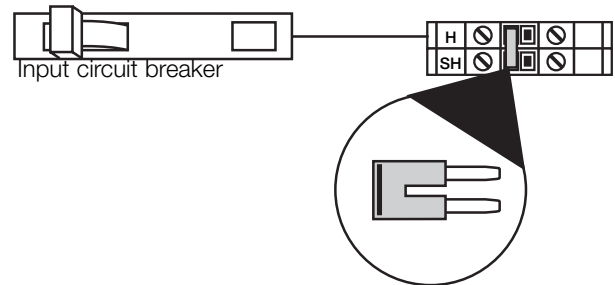
Terminal blocks accept one #14-#10 AWG (2.5-4.0 mm<sup>2</sup>) wire. Preferred entry is from the top of the panel.

# Temporary Lighting

You do not need to install a temporary distribution panel. Connect load wires into the appropriate terminal blocks. Each input breaker can supply power to a load while the bypass jumper protects the module from load faults.



**Warning!** Verify that the panel is fed from the correct voltage. A feed miswire or loss of a feed neutral can cause over-voltage damage to the equipment. Do NOT remove bypass jumpers at this point--they protect the modules from load faults.



Bypass jumper protects the switch module from load faults.

# Activate Loads in Bypass

## A. Complete load wiring.

## B. Check that the bypass jumpers are in place.

These jumpers protect from load faults and must be used to check load wiring when it is installed or modified.

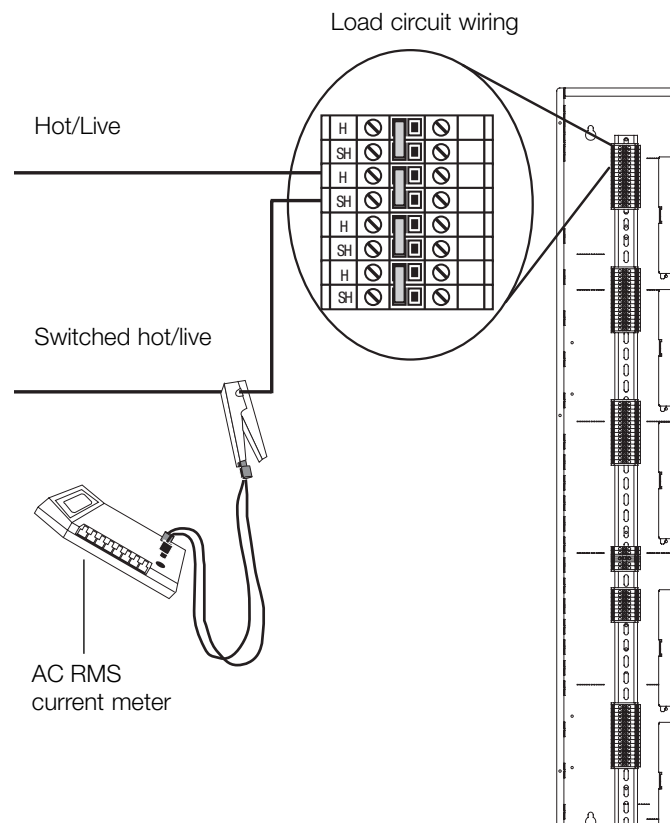


**Warning!** Verify that the panel is fed from the correct voltage. A feed miswire or loss of a feed neutral can cause damage to the equipment.

## C. Turn a load's input circuit breaker ON.

The load should energize, the breaker should not trip, and total load current must be within the circuit breaker's limit and less than or equivalent to 16 A.

## D. Repeat step C for each circuit with completed load wiring.



# Complete Installation

You have completed your panel installation.

**For Onsite Factory Commissioning**, call Lutron Technical Support and select Startup to schedule a field service visit. Allow for 10 working days between day of call and scheduled visit.

**If you purchased Telephone Startup** (*Softswitch128/XPS* only), stop here and complete the Control Location, Panel, and Control Station Tables that are located in the back of the *Setup and Operation Manual*. Once the tables are complete, call Lutron Technical Support and select Startup. Please call 24 hours prior to desired system startup.

**In the U.S., Canada, and the Caribbean: 1.800.523.9466**

**In Mexico: +1.888.235.2910**

**In Europe: +44.207.702.0657**

**In Asia: +65.6220.4666**

**In Japan: +81.355.758.411**

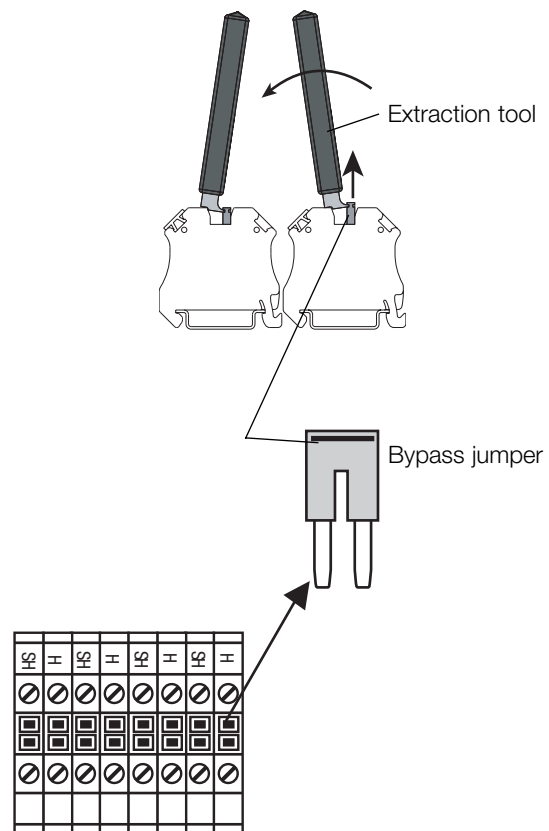
**In all other countries: +1.610.282.6701**

## Remove Bypass Jumpers

- A. After all load wiring has been checked, turn circuit breakers OFF.
- B. Remove and store the bypass jumpers for possible future use.
- C. Turn circuit breakers ON.



**Caution!** Reuse the bypass jumpers whenever work is being done on a load. Damage caused by short-circuits and miswiring is not covered by the product warranty.



Panel installation, control station wiring, and load activation are now complete.

Next Step: Refer to the *Setup and Operation Manual* to set up the functions and operation of the panel.

# Notes

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# Warranty

## 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.

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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: 5,309,068; 5,633,540; and corresponding foreign patents.

National Electric Code (NEC) is a registered trademark of the National Fire Protection Association, Quincy, Massachusetts.

Lutron and the sunburst logo are registered trademarks of Lutron Electronics Co., Inc.; Softswitch128 and GRAFIK Systems are trademarks of Lutron Electronics Co., Inc. © 2005 Lutron Electronics Co., Inc.



# Contact Information

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Toll-Free 1.888.LUTRON1  
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Other countries: +800.120.4491



Please Read

# Dimming and Switching **Panels**

# LUTRON®

## Installation Guide LCP128™ (LCP) and GRAFIK Systems™ (LP and CCP)

English

Español

Deutsch

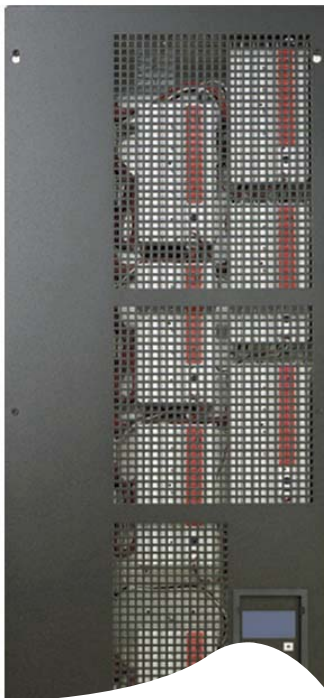
Français

中文

Português

Nederlands

Italiano



LCP Panel shown

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## Overview

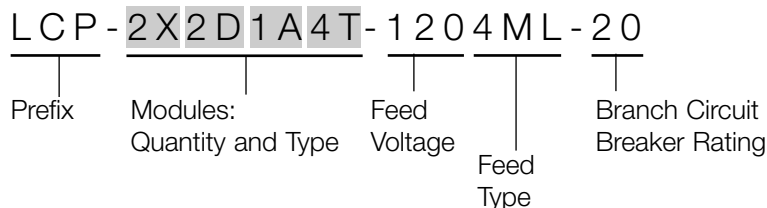
Use this guide to successfully install a dimming and switching panel. This guide describes panel installation, wiring, and load activation.

# Panel Model Number Guide

## LCP128™ (LCP) (120 V~ only)

See page 5 for 230/220-240 V~

Example



### Prefix

**LCP** = LCP dimming panel

### Module Types

**X S D Q A M F T**

List modules in the order shown above. Insert the quantity before each module code. Omit codes for modules not used in panel. See table below for limits on numbers of modules per panel.

- X** = Four-Circuit Switching (Relay) (XP)
- S** = One-Circuit Dimming (1U)
- D** = Two-Circuit Dimming (2U)
- Q** = Four-Circuit Dimming (4U)
- A** = Four-Circuit Adaptive Dimming (4A)
- M** = Four-Circuit Motor (4M)
- F** = Four-Circuit Quiet Fan Speed (4FSQ)
- T** = 0-10 V, DALI (broadcast), DSI, and PWM Ballast Control (TVM)

### Feed Voltage

**120** for 120 V~

### Feed Type/Input Ratings

**FT** = Feed-through panel (circuit breakers not included) / 120 V~

**3M or 3ML** = 1 phase 3 wire feed (split phase) / 120/240 V~

**4M or 4ML** = 3 phase 4 wire feed / 120/208 V~

### Branch Circuit Breaker Rating

Omit for feed-through panels

**20** for 20 A branch circuit breakers

### Frequency - All Model Numbers and Voltages

50/60 Hz

### Output (Load) Ratings

Module Type	Rating
XP	16 A per circuit
1U, 2U, 4U	16 A per module
4A	16 A per module, 10 A per output
4M	16 A per module, 5 A per output (1/4 HP motor), 1 motor per output
4FSQ	2 A per output (single ceiling fan)
TVM	50 mA per channel, 750 mA per system

### Module Quantity Limits

Panel Size	Feed type	TVM	4A	4U	4M	XP
Mini	Feed-through	NA	Any combination up to 3 modules			
Mini	Feed-through	0-4	Any combination up to 2 modules; must have 1 4U or XP module minimum; each 4U or XP module can control only 2 TVM modules			
Mini	Breakers	NA	Any combination up to 3 modules			0
Mini	Breakers	0-4	Any combination up to 2 modules; must have 1 4U module minimum; each 4U module can control only 2 TVM modules			0
Standard	Feed-through	NA	Any combination up to 9 modules			
Standard	Feed-through	0-12	Any combination up to 8 modules; must have 1 4U or XP module minimum; each 4U or XP module can control only 2 TVM modules			
Standard	Breakers (main lugs)	NA	Any combination up to 9 modules			0
Standard	Breakers (main lugs)	NA	Any combination up to 7 modules			
Standard	Breakers (main lugs)	0-12	Any combination up to 7 modules; must have 1 4U module minimum; each 4U module can control only 2 TVM modules			0
Standard	Breakers (main lugs)	0-12	Any combination up to 5 modules; must have 1 4U or XP module minimum; each 4U or XP module can control only 2 TVM modules			

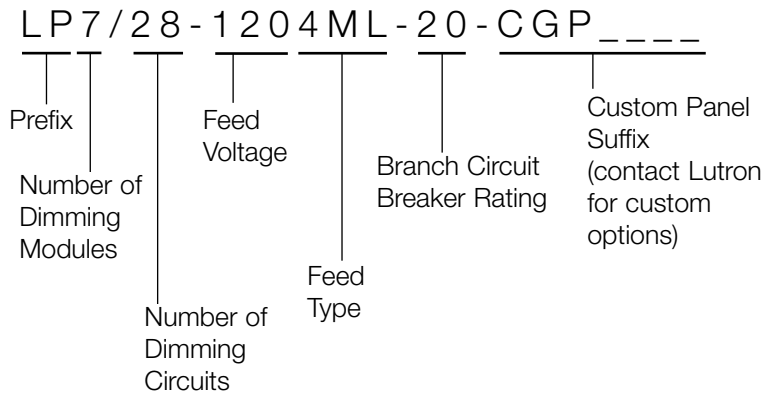
### Notes

- Consult Lutron for panels with custom breaker needs.
- TVM = 0 is a TVM-ready panel; TVM modules can easily be installed in the future.
- TVM = NA is not TVM-ready

# Panel Model Number Guide (continued)

## GRAFIK Systems™ (LP) (all voltages)

Example



### Prefix

LP = LP dimming panel

### Number of Dimming Modules

Indicates number of 4-circuit (4U) dimming modules in the panel: 1 through 8; also indicates number of full load circuits

### Number of Dimming Circuits

Indicates number of dimming circuits in the panel: 4, 8, 12, 16, 20, 24, 28, or 32; each module has four dimming circuits

### Feed Voltage

120 = 120 V~

230 = 230 V~ (CE)

240 = 220-240 V~ (non-CE)

### Feed Type

2M or 2ML = 1 phase 2 wire feed

3M or 3ML = 1 phase 3 wire feed (split phase)

4M or 4ML = 3 phase 4 wire feed

Mxx = Main Breaker;

xx = breaker size in amps (custom panel option)

IS = 3 phase 4 wire isolation switch (230/220-240 V~ only)

### Input Ratings

120 V~

120/240 V~

120/208 V~

### Branch Circuit Breaker Rating

20 for 20 A branch circuit breakers (120 V~ only)

20 A branch circuit breakers have a 16 A continuous load rating

15 for 15 A branch circuit breakers (120 V~ only)

15 A branch circuit breakers have a 12 A continuous load rating

13 for 13 A branch circuit breakers (230 V~ CE only)

16 for 16 A branch circuit breakers (220-240 V~ non-CE only)

### Custom Panel Suffix (optional)

Indicates panel with special options

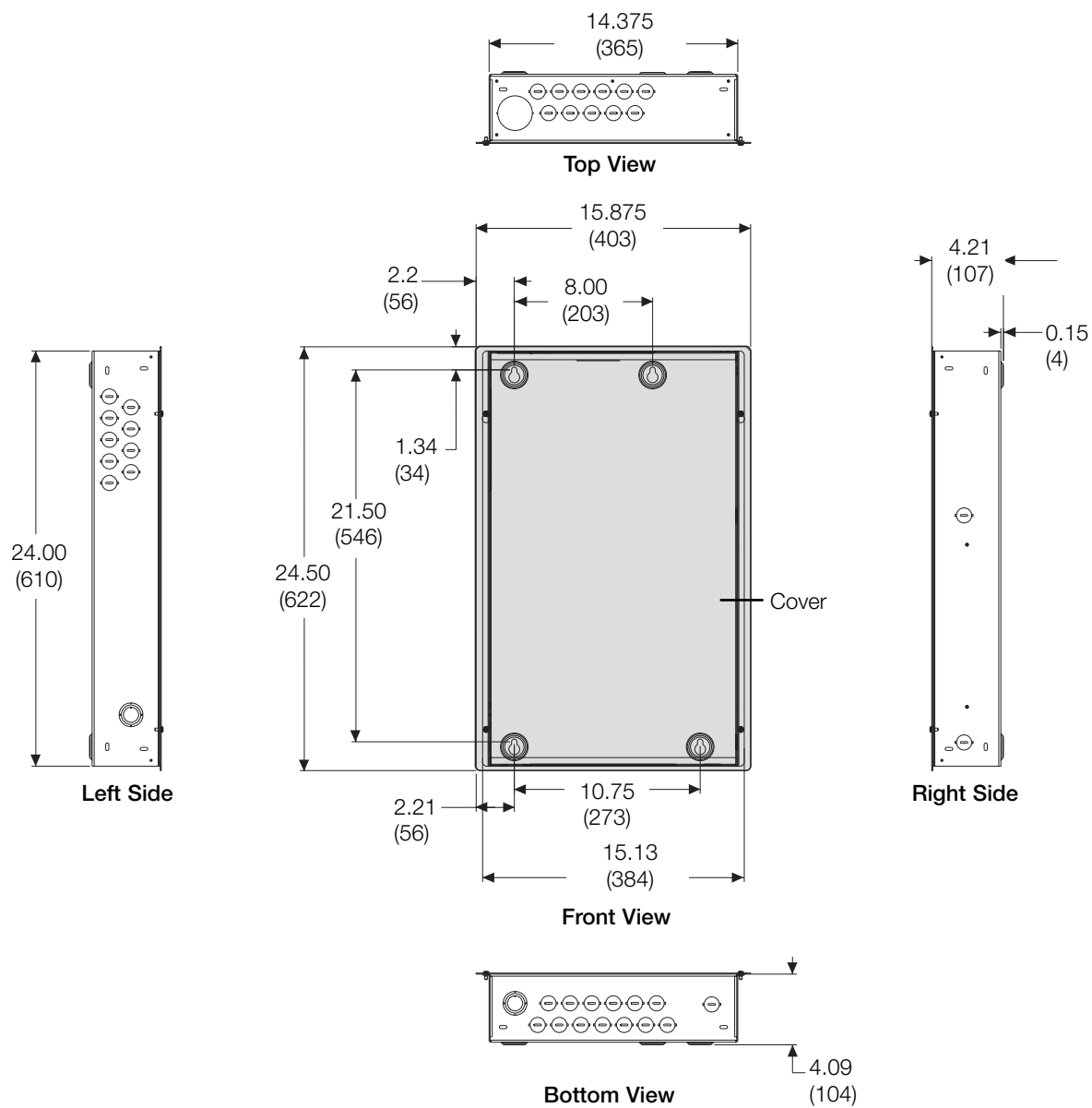




# Panel Dimensions

## Mini Panel

Dimensions are in inches (mm).

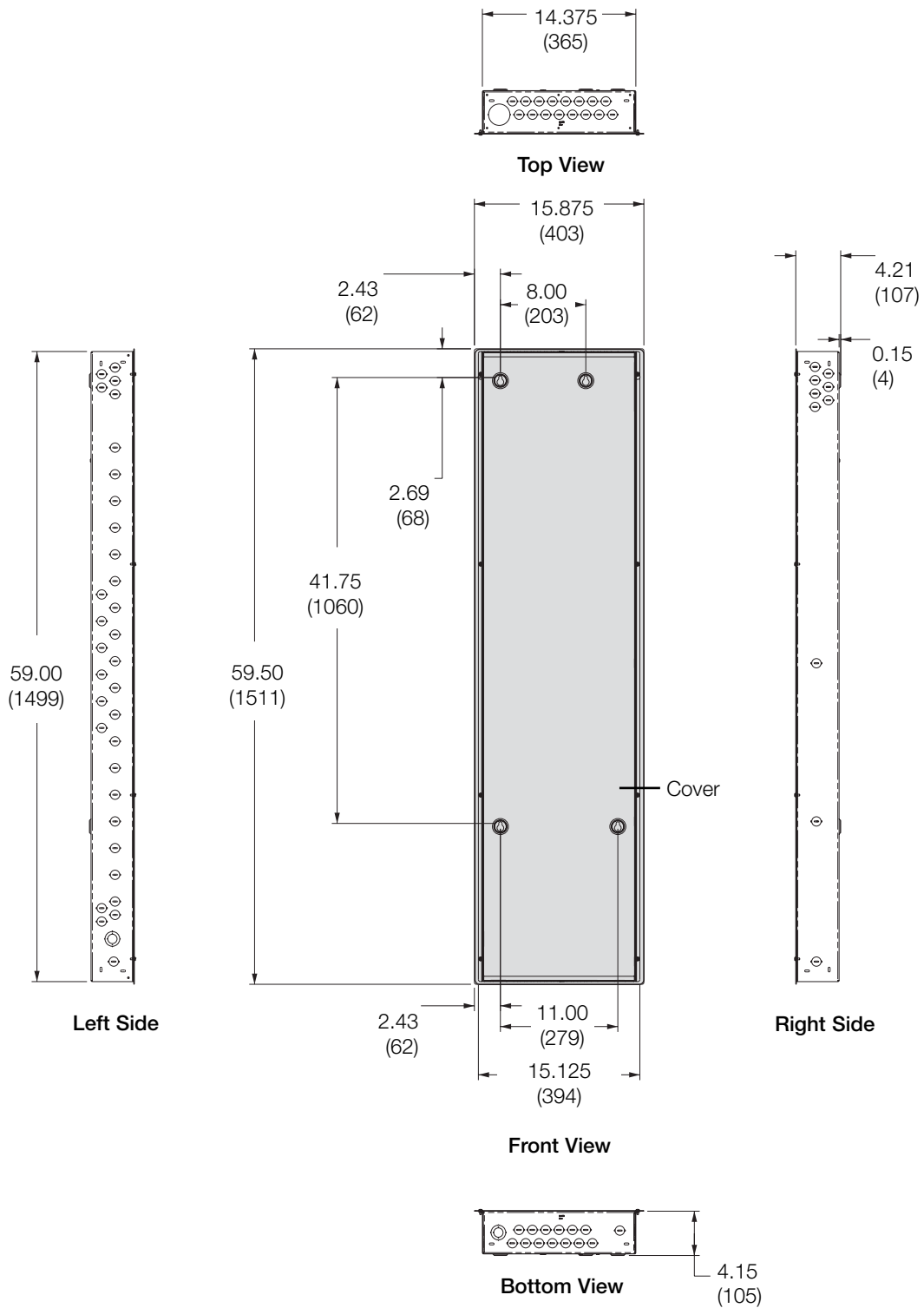




# Panel Dimensions (continued)

## Standard Panel

Dimensions are in inches (mm).



# Panel Mounting

## Mounting Guidelines

- For Indoor Use Only! NEMA, Type 1 enclosure, IP20.
- Panel generates heat. Mount only where ambient temperature is 32-104 °F (0-40 °C).
- Relative humidity must be < 90% non-condensing.
- Reinforce wall structure for panel weight and local codes; see table.
- Allow 12 in. (305 mm) clearance above and below panel.
- Mount within 7° of true vertical.
- Mount panel where audible noise is acceptable. (Internal relays click.)
- Mount panel so line (mains) voltage wiring is at least 6 ft. (1.8 m) from audio or electronic equipment and associated wiring.
- Install in accordance with all national and local electrical codes.

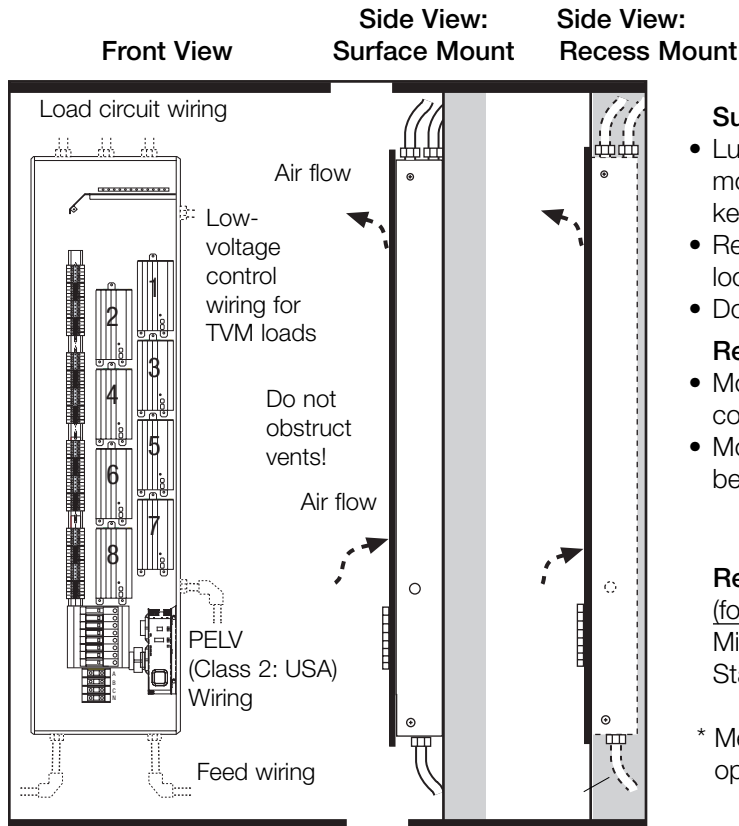
No. Modules	Max. Heat BTUs (Kcal)/Hr.	Max. Weight w/o Packaging Pounds (kg)
1	90 (22.68)	24 (11)
2	170 (42.84)	35 (16)
3	250 (63.00)	37 (17)
4	330 (83.16)	68 (25)
5	410 (103.32)	71 (26)
6	490 (123.48)	74 (27)
7	570 (143.64)	77 (28)
8	650 (163.80)	80 (29)
9	730 (183.96)	83 (30)



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



**Caution!** 230 V $\sim$  panels with 13 A circuit breakers are intended for industrial or commercial use only.



LP8/32-1204ML-20 shown

## Surface Mounting

- Lutron recommends using 1/4 in. (6 mm) mounting bolts (maximum size accepted by keyholes).
- Reinforce wall structure as required for weight and local codes.
- Do not mount panel directly to wall board/drywall.

## Recess Mounting

- Mount to wall stud by screwing through slots in corners of panel.
- Mount panel between flush and 1/8 in. (3 mm) below finished wall surface.

## Recommended Mounting Heights\*

(for LCP128 systems)

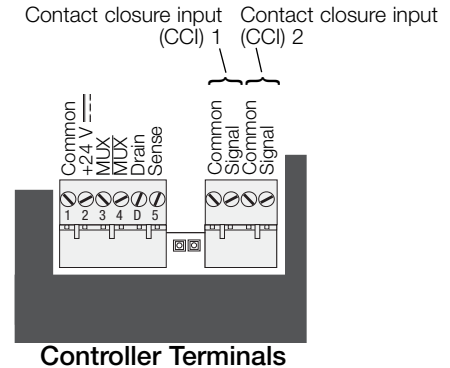
Mini	45 in. (1143 mm)
Standard	25 in. (635 mm)

\* Measure from floor to bottom of panel; optimal viewing height for controller.

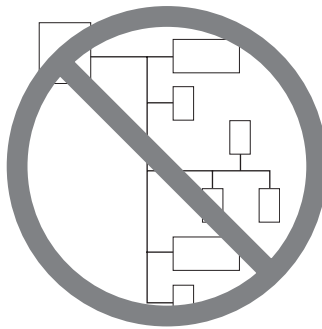
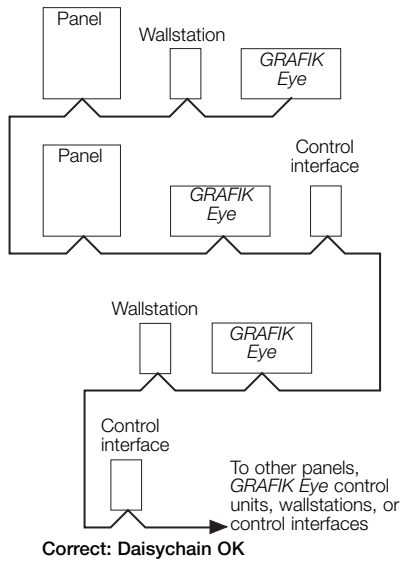
# System Wiring Overview

Review the options below for information on wiring your panel correctly into your specific system.

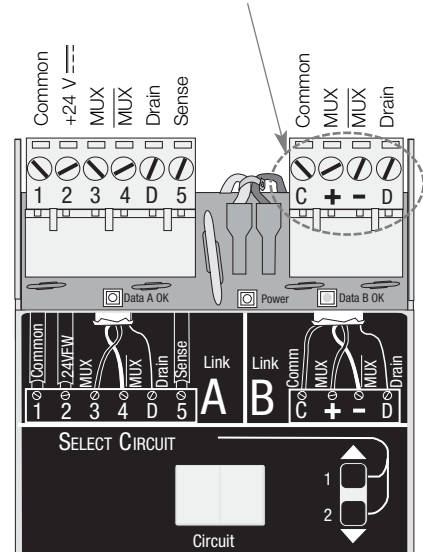
**A. LCP128 panel:** Refer to the *LCP128 Setup and Operation Manual* for detailed wiring information.



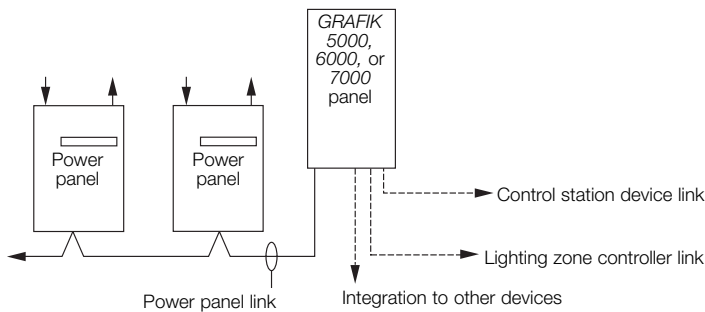
**B. LP or CCP panel as a part of a GRAFIK Eye 4000 lighting system:** Refer to the *GRAFIK Eye 4000 Installation, Setup, and Operation Manual* and the system overview pictured here for detailed wiring information.



Note: Single-link circuit selectors will not have Link B connector.



**C. LP or CCP panel as a part of a GRAFIK 7000 lighting system:** Refer to the *GRAFIK 7000 Installation, and Maintenance Guide* and the system overview pictured here for detailed wiring information.



# Wiring (continued)

## Feed and Load Wiring Overview

### Feed Wiring (Mains Voltage Wiring)

- Preferred feed wiring entry for panels with main lugs/isolation switch is from the bottom left of the panel.
- Preferred feed wiring entry for feed-through panels is from the top or bottom left of the panel, wired directly to module terminal blocks.
- Run wiring so that line (mains) voltage wiring will be at least 6 ft. (1.83 m) from sound or electronic equipment and its wiring.
- Refer to Feed Wiring pages for more information.

### Load Circuit Wiring

- Connect load wiring to the appropriate terminal block set for each module.
- For 230 V $\sim$  and 240 V $\sim$  panels, “Hot” is referred to as “Live”. Therefore, terminals will be labeled DL and L.
- The Dimmed Hot/Live (DH/DL) terminal block is grouped with a numbered Hot/Live (H/L) (H1, H2, etc./L1, L2, etc.). The number represents both the module and circuit breaker number.
- Output terminal blocks accept one #14-#10 AWG (2.5-4.0 mm<sup>2</sup>) wires. Preferred entry is from the top left of the panel.
- Refer to Load Wiring pages for more information.



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



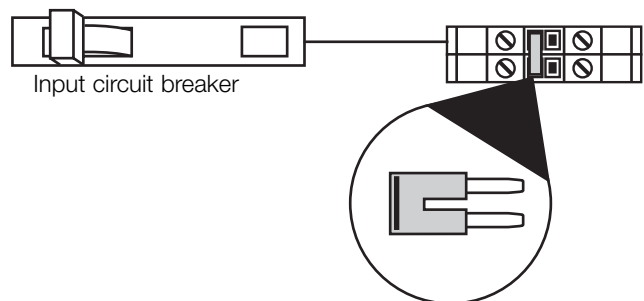
**Caution!** Panels require entry of wires as specified. Improper entry will block serviceable parts and impede air flow through the panel.

## Temporary Lighting

You do not need to install a temporary distribution panel. Connect load wires into the appropriate terminal blocks. Each input breaker can supply power to a load while the bypass jumper protects the module from load faults.



**Caution!** Verify that the panel is fed from the correct voltage. A feed miswire or loss of a feed neutral can cause over-voltage damage to the equipment. Do NOT remove bypass jumpers at this point--they protect the modules from load faults.



Bypass jumper protects the module from load faults.

# Ratings

## LP/LCP/CCP Panels

### Feed-Through Panels (all voltages)

Number of Modules	Feed Type	Max. Feed
1 2 3 4 5 6 7 8 9	1Ø, 2W  #14-#10 AWG (1.5-4.0 mm <sup>2</sup> )	120 V~: 20 A 230 V~: 13 A or 16 A 220-240 V~: 16 A

### Panels with Breaker (120 V~ only)

Number of Modules	Feed Type
1 2 3	1Ø, 2W 1Ø, 3W 3Ø, 4W #14-#10 AWG (1.5-4.0 mm <sup>2</sup> )

### Panels with Main Lugs (120 V~ only)

Number of Modules	Feed Type	Maximum Feed
4 5 6 7 8 9	1Ø, 3W or 3Ø, 4W #14-#2/0 AWG (25-70 mm <sup>2</sup> )	175 A

### Panels with Breaker (220-240 V~ and 230 V~ only)

Number of Modules	Feed Type
1 2 3	1Ø, 2W 1Ø, 2W 3Ø, 4W #14-#12 AWG (1.5-4.0 mm <sup>2</sup> )

### Panels with Isolation Switch (220-240 V~ and 230 V~ only)

Number of Modules	Feed Type	Maximum Feed	
		230 V~	220-240 V~
4 5 6 7 8	3Ø, 4W #14-#2/0 AWG (25-70 mm <sup>2</sup> )	125 A	125 A

# Feed-Through Panel: Feed and Load Wiring (all voltages)

## General Notes

- Typical dimming/switching legs shown.
- Do not remove bypass jumpers until after load wiring has been verified.

### Wire sizes for power feed, to each input

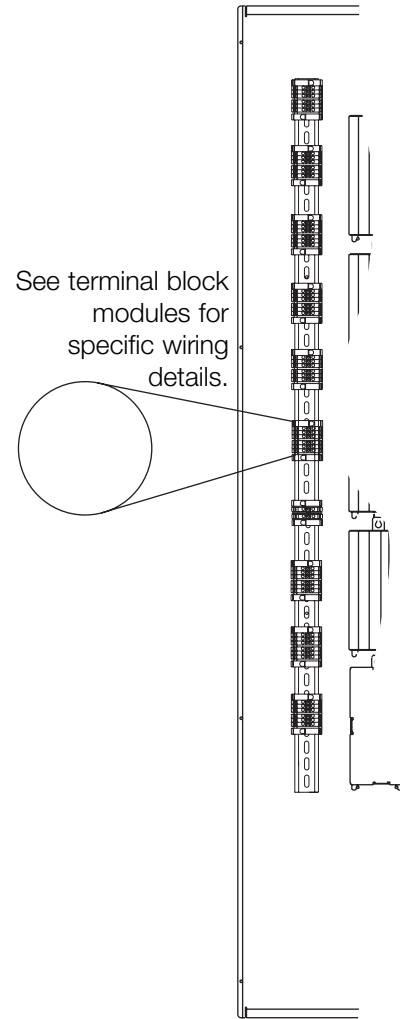
- Power feed: #14 AWG (2.5 mm<sup>2</sup>) to #10 AWG (4.0 mm<sup>2</sup>)
- Neutral feed: #14 AWG (2.5 mm<sup>2</sup>) to #10 AWG (4.0 mm<sup>2</sup>)

### Wire sizes for load wiring, from each output

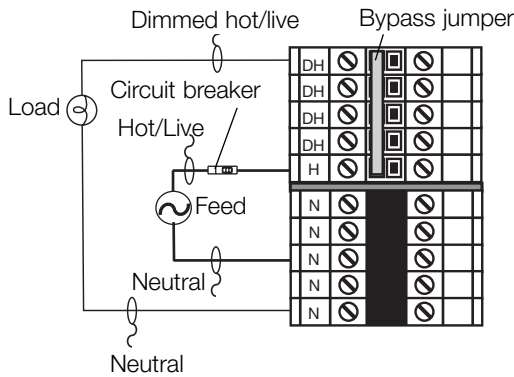
- Dimmed hot (live): #14 AWG (2.5 mm<sup>2</sup>) to #10 AWG (4.0 mm<sup>2</sup>)
- Load neutral: #14 AWG (2.5 mm<sup>2</sup>) to #10 AWG (4.0 mm<sup>2</sup>)

### Control Circuit Power

- Supplies power for internal operation.
- Requires dedicated feed with same voltage and phase as panel.
- Must be 1/4 in. (6 mm) away from PELV (Class 2: USA) control wiring harness.
- Panel voltage (see pages 2-3) indicates feed voltage.
- For 230 V $\sim$  and 240 V $\sim$  panels, "Hot" is referred to as "Live". Therefore, terminals will be labeled L and DL.

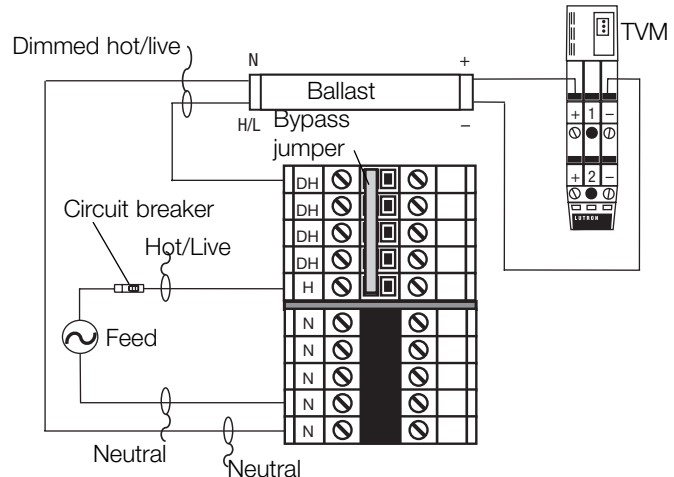


- 4-Circuit Dimming Module (4U)
- 4-Circuit Adaptive Dimming Module (4A)
- 4-Circuit ELV Dimming Module (4E: 230 V $\sim$  and 220-240 V $\sim$  only)
- 4-Circuit Quiet Fan Speed Module (4FSQ)

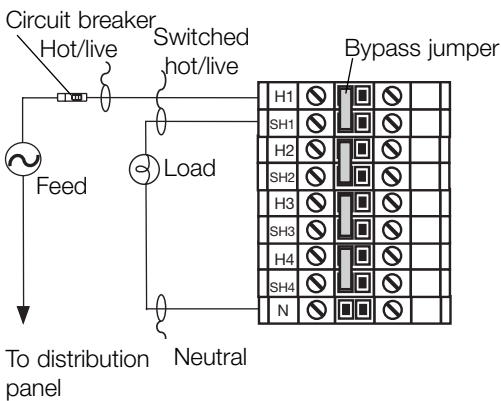


### TVM Module

For 0-10 V, PWM, Tridonic® DSI, and DALI loads. Each TVM controls two consecutive circuits of lighting and are the first circuits in the panel. Maximum low-voltage ballast control current: 50 mA per zone, 750 mA per panel. Dimming or switching module is used to switch power to the ballast.

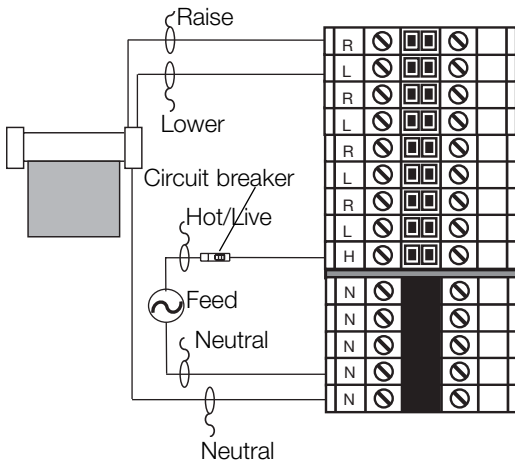


### 4-Circuit Switching (Relay) Module (XP)

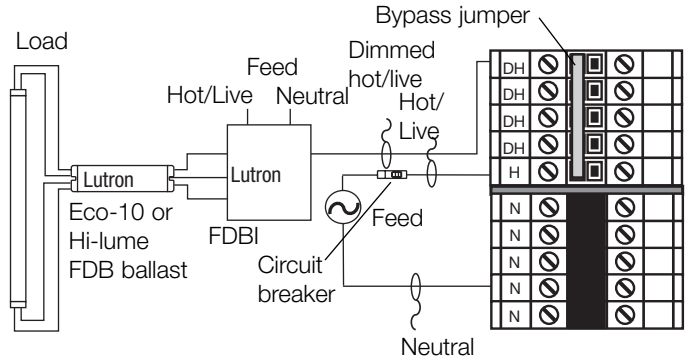


# Feed-Through Panel: Feed and Load Wiring (continued)

## 4-Circuit Motor Module (4M)



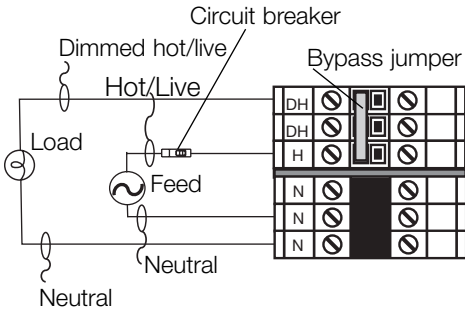
## Connecting an NGRX-FDBI to a Panel



Refer to FDBI Installation Sheet for detailed wiring.

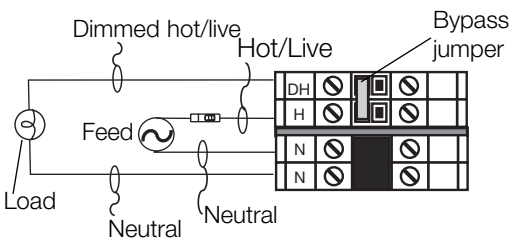
## 2-Circuit Dimming Module (2U)

(LCP and CCP only)



## 1-Circuit Dimming Module (1U)

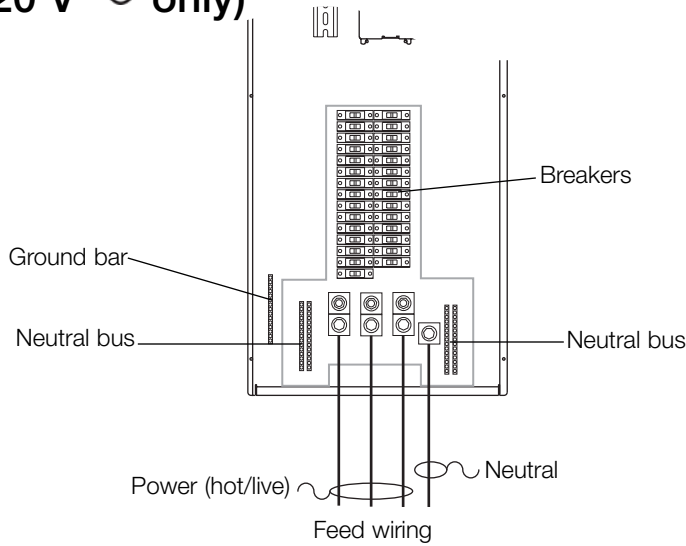
(LCP only)





# Panel with Main Lugs: Feed Wiring

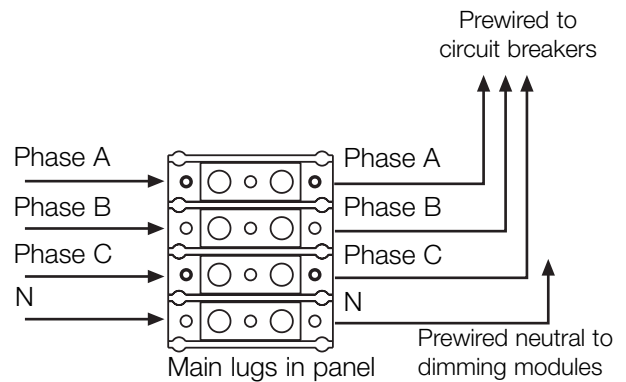
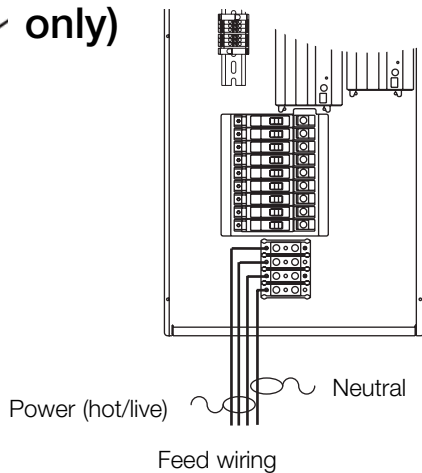
## Dimming and Switching Panels (120 V ~ only)



### Notes

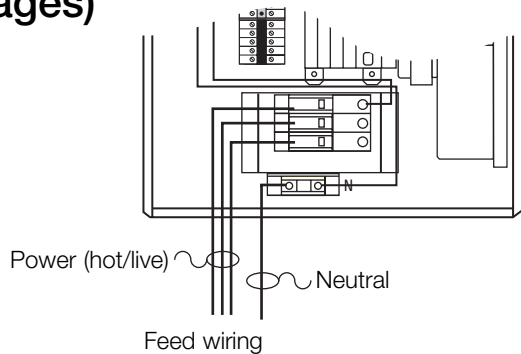
- See page 15 for load wiring details.
- On **dimming panels** only, the input breaker of Circuit 1 supplies current to Load Circuit 1 and to the Control Wiring (2 A draw max.). Panels with switching modules have a dedicated circuit breaker for the control circuit.

## Dimming Panels (120 V ~ only)

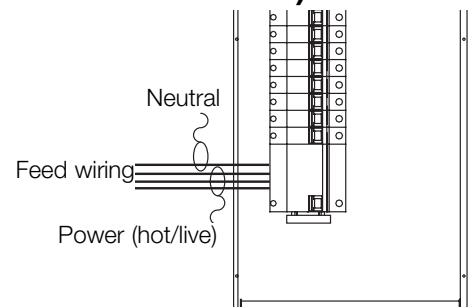


Main Lugs feed wiring gauge:  
#2/0 AWG (70 mm<sup>2</sup>)

## Mini Panel Breaker Wiring (all voltages)



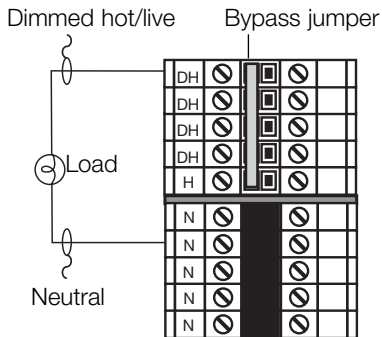
## Dimming Panels Isolation Switch (230/220-240 V ~)



# Panel with Main Lugs: Load Wiring

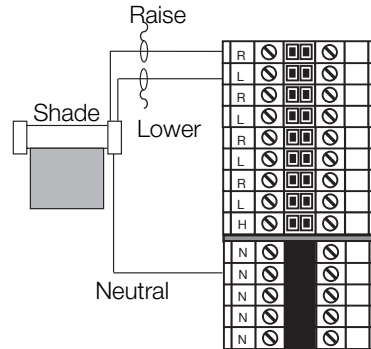
## Typical Dimming/Switching Leg Shown

- 4-Circuit Dimming Module (4U)
- 4-Circuit Adaptive Dimming Module (4A)
- 4-Circuit ELV Dimming Module (4E: 230 V~ and 220-240 V~ only)
- 4-Circuit Fan Speed Control Module (4FSQ)

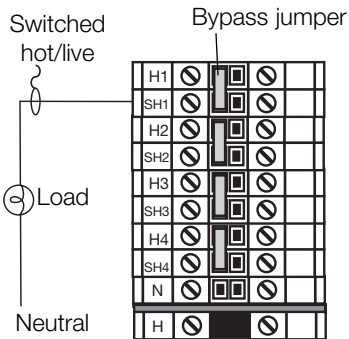


**Caution!** Do not remove bypass jumpers until after load wiring has been verified.

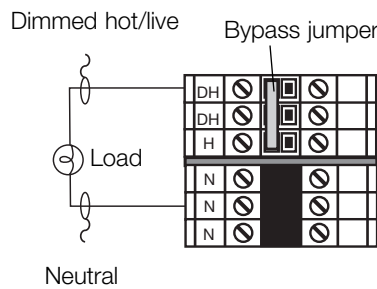
## 4-Circuit Motor Module (4M)



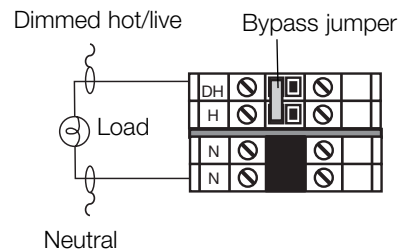
## 4-Circuit Switching Module (XP)



## 2-Circuit Dimming Module (2U) (LCP only)

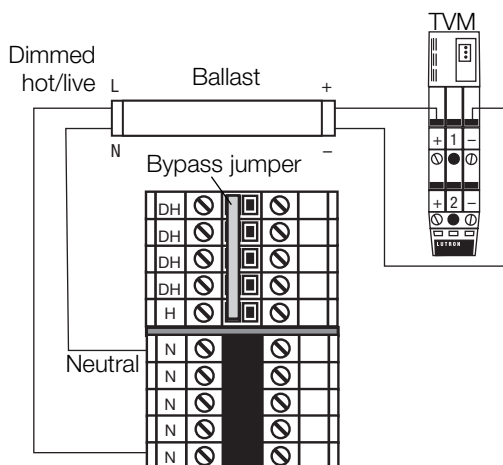


## 1-Circuit Dimming Module (1U) (LCP only)



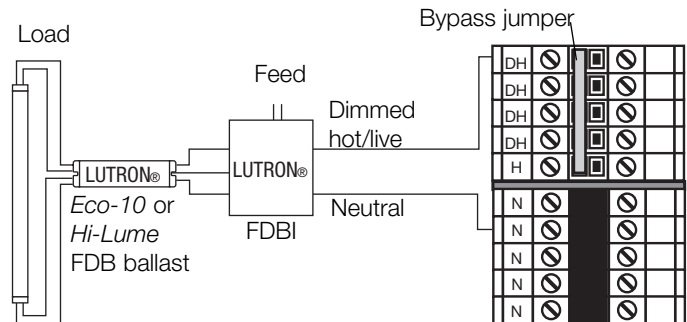
## Load Wiring for TVM Module

For 0-10 V, PWM, and Tridonic® DSI loads. Each TVM controls two consecutive circuits of lighting and are the first circuits in the panel. Maximum low-voltage ballast control current: 50 mA per zone, 750 mA per panel.



## Connecting an NGRX-FDBI to a Panel

For Hi-Lume® FDB or Eco-10™ Fluorescent Dimming Ballast



# Activate Loads in Bypass

## Activate Loads in Bypass

### A. Complete load wiring.

### B. Check that the bypass jumpers are in place.

These jumpers protect from load faults and must be used to check load wiring when it is installed or modified.



**Caution!** Verify that the panel is fed from the correct voltage. A feed miswire or loss of a feed neutral can cause damage to the equipment.

### C. Turn circuit breaker 1 ON.

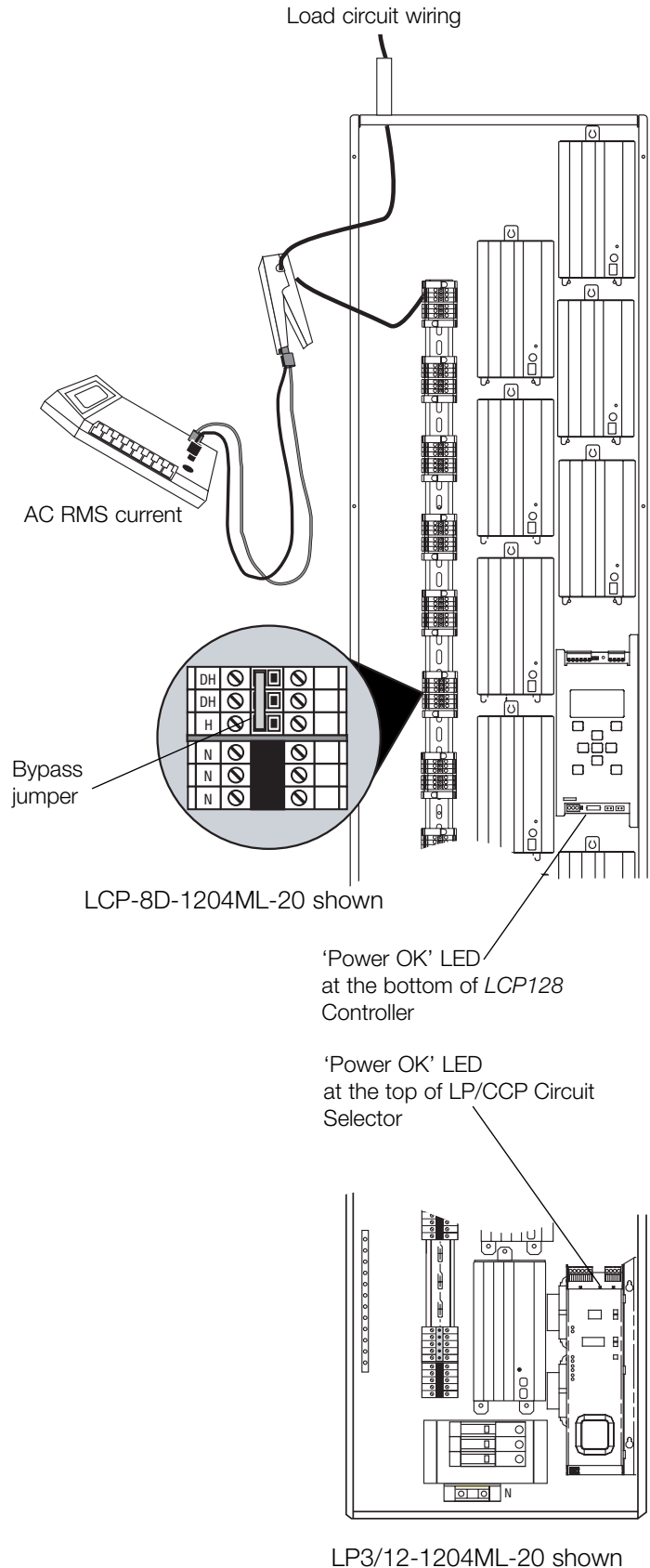
The load(s) should energize, the breaker should not trip, and total load current must be within the circuit breaker's limit and less than or equivalent to 16 A.

Circuit breaker 1 powers the control wiring as well as Circuit 1's dimmer and load(s). Check that the Power OK LED on the Controller (*LCP128*) or circuit selector (LP or CCP) is ON. If the Power OK LED is OFF, turn OFF the control circuit breaker (breaker 1) and check for a miswire on the low voltage link.

### D. Turn next circuit breaker ON.

The load should energize, the breaker should not trip, and total load current must be within the circuit breaker's limit and less than or equal to 16 A.

### E. Repeat step D for each circuit with completed load wiring.



# Complete Installation

You have completed your panel installation.

**For Onsite Factory Commissioning**, call Lutron Technical Support and select Startup to schedule a field service visit. Allow for 10 working days between day of call and scheduled visit.

**If you purchased Telephone Startup** (LCP128 only), stop here and complete the Control Location, Panel, and Control Station Tables that are located in the back of the *Setup and Operation*. Once the tables are complete, call Lutron Technical Support and select Startup. Please call 24 hours prior to desired system startup.

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**In Asia: +65.6220.4666**


**In Japan: +81.355.758.411**

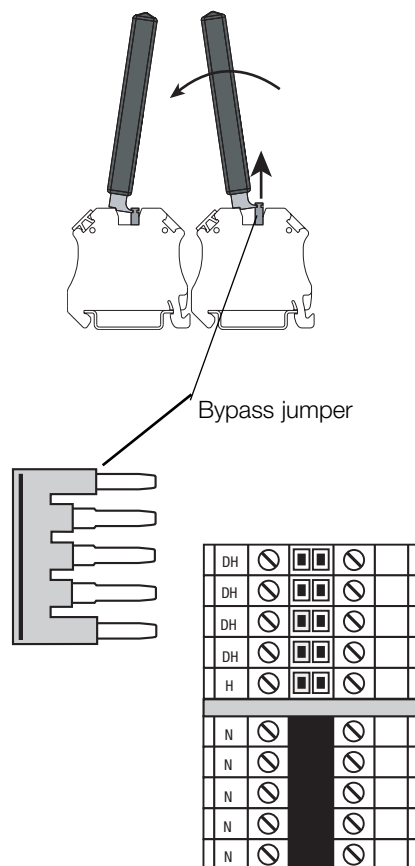
**In all other countries: +1.610.282.6701**

## Remove Bypass Jumpers

- After all load wiring has been checked, turn circuit breakers OFF.
- Remove and store the bypass jumpers for possible future use.
- Turn circuit breakers ON.

 **Note.** All circuits are now set to the default Non-Dim load type. Non-Dim load types will respond by immediately going to full ON in any lighting scene (except the OFF scene).

 **Caution!** Reuse the bypass jumpers whenever work is being done on a load. Damage caused by short-circuits and miswiring is not covered by the product warranty.



Module with 4 outputs shown

Panel installation, control station wiring, and load activation are now complete.

Next Step: Refer to the *Setup and Operation Manual* to set up the functions and operation of the panel.

# Notes

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# Warranty

## 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.

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Taiwan: 00.801.137.737  
Thailand: 001.800.120.665853  
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Please Read

# LUTRON® Dimming Panels

Installation Guide  
GRAFIK Systems™ (DCI)

English

Español

Français



DCI3-1202M-20 shown

## Contents

Panel Model Number Guide	2
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Panel Mounting	4
Panel Feed Wiring	6
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## Overview

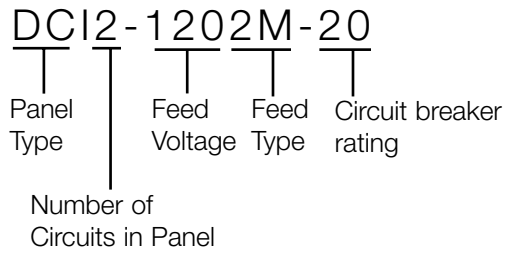
Use this guide to successfully install a dimming panel. This guide describes panel installation, wiring, and load activation.

# Panel Model Number Guide

---

## Feed-Through Model Numbers

Example



### **Panel Type**

**DCI** for DCI panel

### **Number of Circuits in Panel**

Indicates number of dimming modules in the panel:

1, 2, or 3

### **Feed Voltage**

**120** for 120 V~

### **Feed Type**

**2M** for 1 phase 2 wire main breaker

One breaker per module; input feed terminates at terminal blocks

### **Branch Circuit Breaker Rating**

**20** for 20 A circuit breakers

---

## **Frequency - All Model Numbers and Voltages**

50/60 Hz

### **Output Voltages**

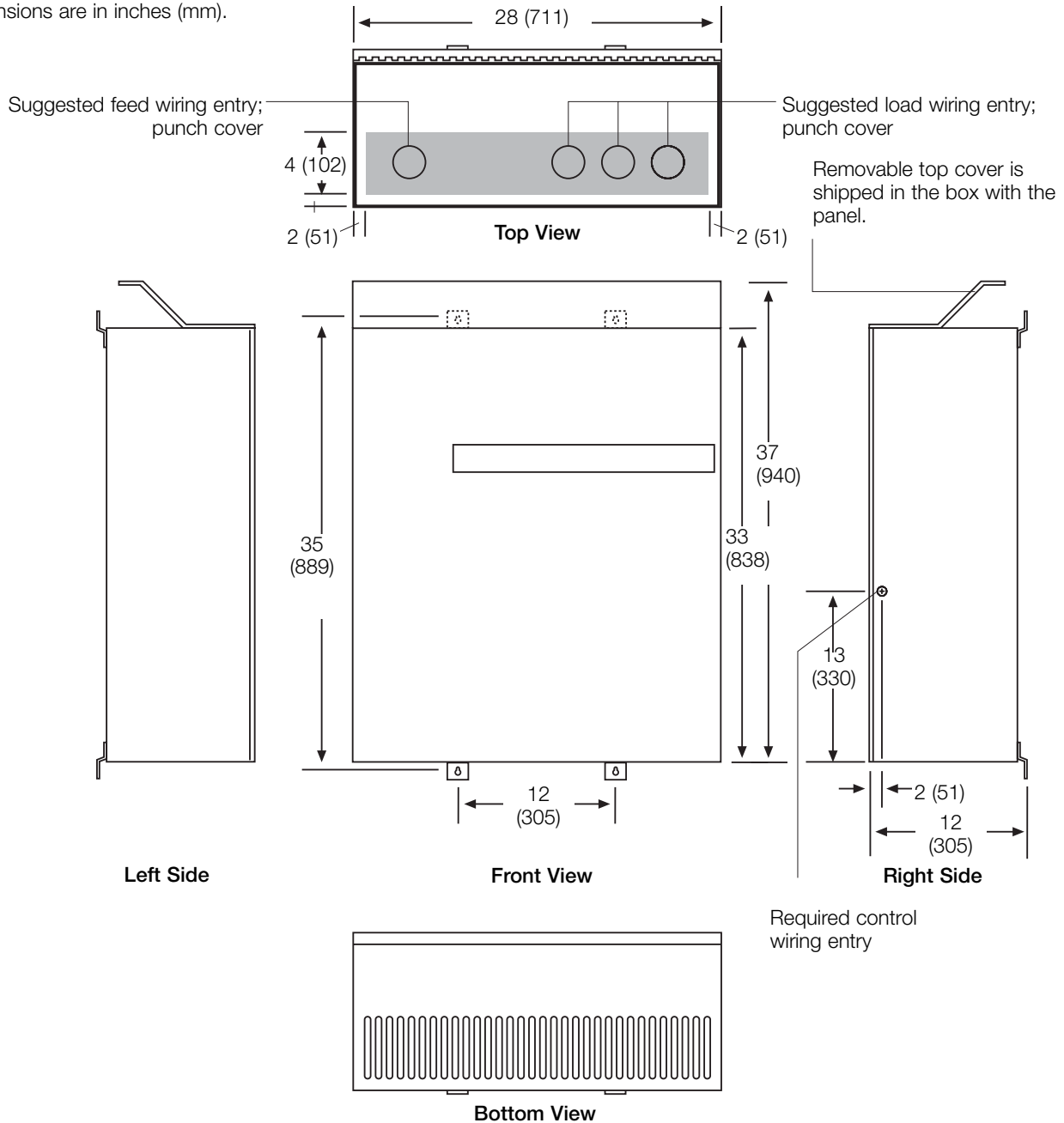
120 V~ or 277 V~

0-110 V==

# Panel Dimensions

## Standard Panel: DCI1-3

Dimensions are in inches (mm).



### Notes

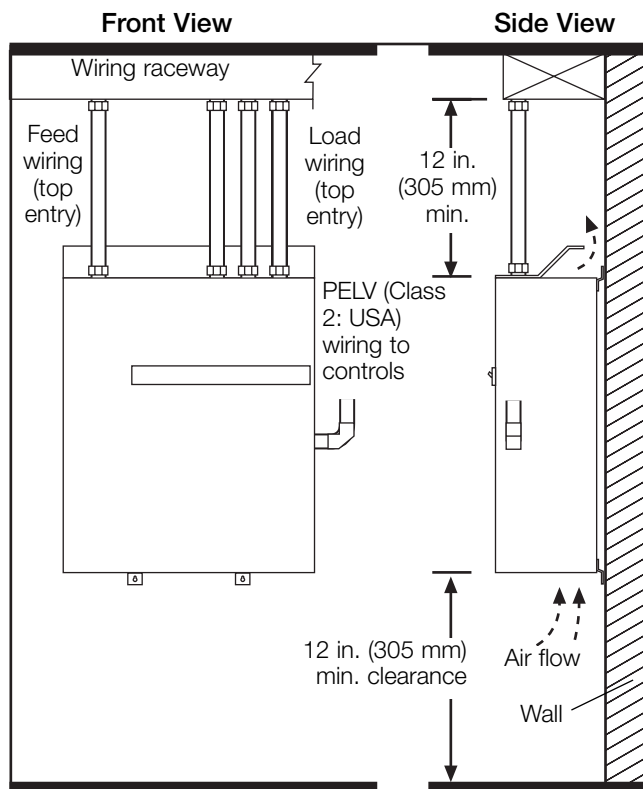
- Keyhole accepts a maximum 5/16 in. (8 mm) mounting bolt (1/4 in./m8 recommended).
- PELV (Class 2: USA) entry knockout is 7/8 in. dia. (22 mm).



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

# Panel Mounting

## Standard Panel



### Mounting Guidelines

- For Indoor Use Only! NEMA, Type 1 enclosure, IP20.
- Panel generates heat. Mount where ambient temperature is 32-104 °F (0-40 °C).
- Relative humidity must be <90% non-condensing.
- Reinforce wall structure for panel weight and local codes; see table.
- Mount panel where audible noise is acceptable (internal relays click).
- Mount panel so line (mains) voltage wiring is at least 6 ft. (1.8 m) from audio or electronic equipment and associated wiring.
- Mount within 7° of true vertical.
- Panel clearances are 12 in. (305 mm) above and below and 0 in. to each side. Allow room for PELV (Class 2: USA) clearance.

Panel	Max. Heat BTUs (Kcal) per Hour	Max. Weight w/o Packaging* pounds (kg)
DCI1	260 (65.56)	130 (59)
DCI2	515 (129.86)	170 (77)
DCI3	770 (194.17)	210 (95)

\*Packaging weight adds 50 lbs (23 kg).

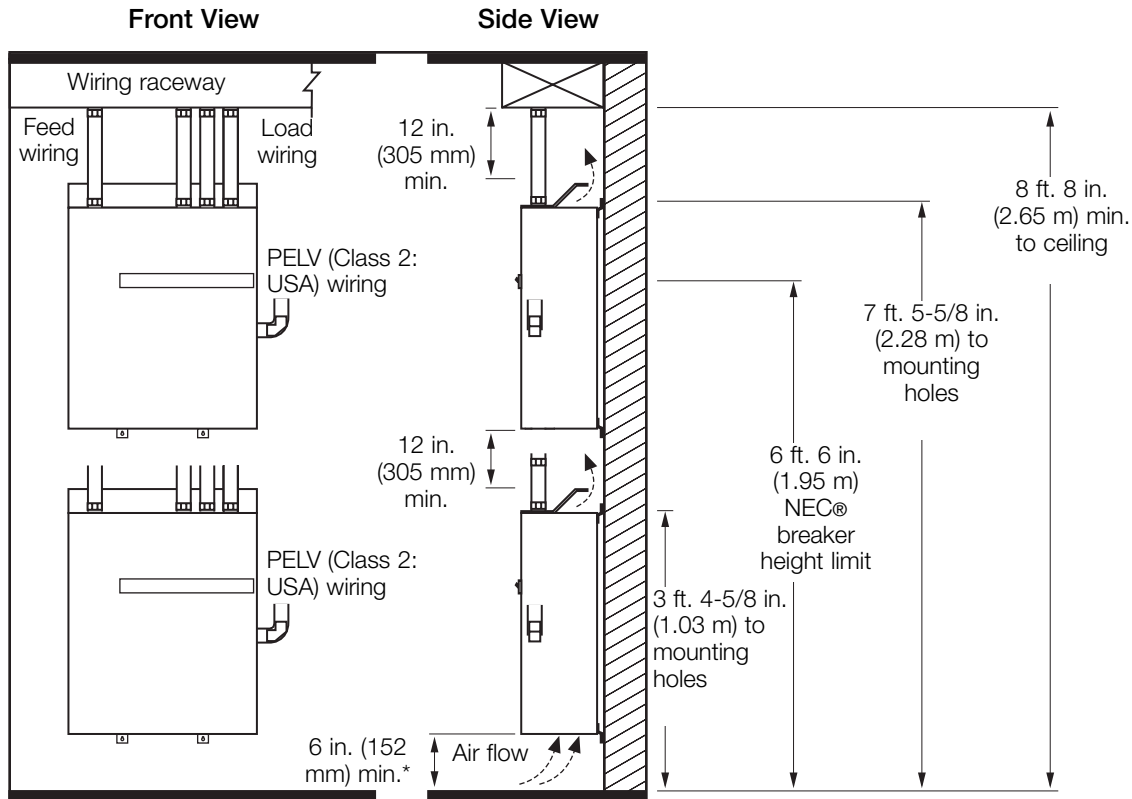


**Caution!** This equipment is air-cooled. Vents must not be blocked or you will void the warranty.

# Panel Mounting (continued)

## Mounting One Panel above Another

At least 8 ft. 8 in. (2.74 m) between floor and suspended ceiling is required for this layout.



\*6 in. (152 mm) approved for this layout only.



**Warning!** Water damages panels. Install where they will not get wet.

# Panel Wiring Overview

## DCI1-DCI3

### Feed Wiring

Connect to terminal blocks.  
#14-10 AWG (2.0-4.0 mm<sup>2</sup>)

Two Feed Options:

A) If standard (not dimming-specific) facility filters are used on the load side then isolation transformers must be used to feed the DCI Panel

B) If custom dimming-specific facility filters are used (see page 8) then isolation transformers are not needed.

### Load Circuit Wiring

Connect to fuse blocks.  
#16-4 AWG (1.5-25 mm<sup>2</sup>)

### Control Wiring

Connect to circuit selector.  
See PELV (Class 2: USA) wiring section.

Power and control wires must be run in separate raceways to ensure proper operation of controls.

### Notes

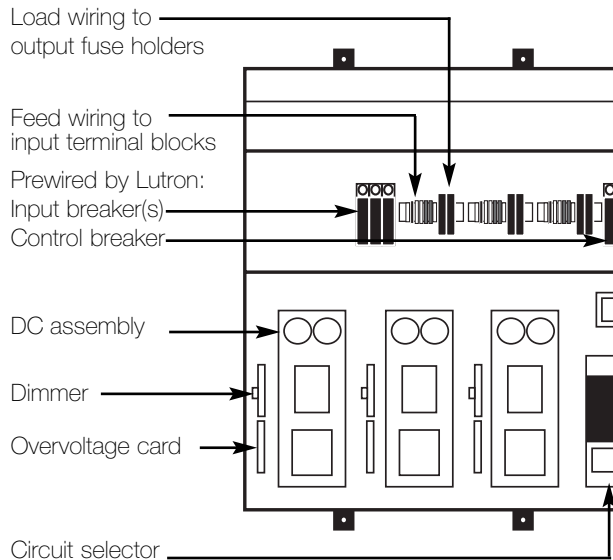
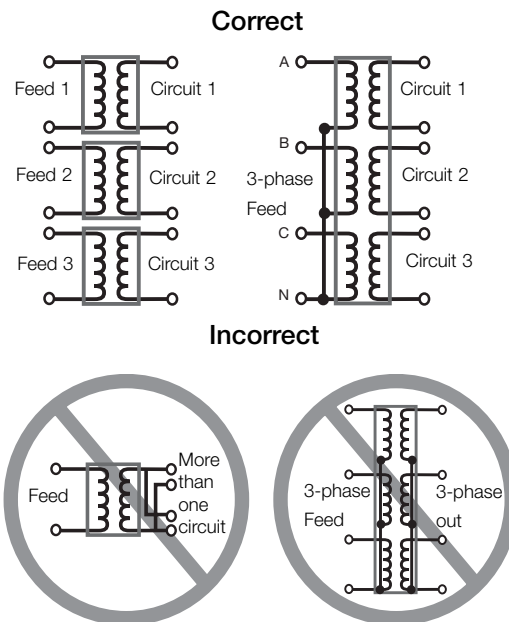
- Run feed and load wiring; no other wiring or assembly required.
- Common neutrals are not permitted; run separate neutrals for each load circuit.

To provide temporary lighting:

- Wire all loads.
- Use circuit breakers to switch lights on and off. Leave control breaker off.

### Note on Isolation Transformers

Keep each DCI Circuit Feed separate from each other.



Note: Panels are not designed for side or bottom entry of feed or load wires.

## Wire Sizes

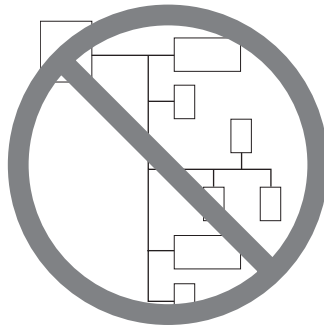
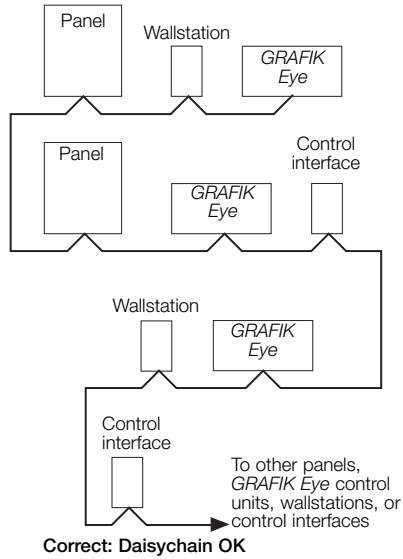
Panel/ Voltage	Power Feed	Neutral Feed	DC+/ DC-
DCI1-DCI3 120 V~	#14-#10 AWG (2.5-4.0 mm <sup>2</sup> )	#14-#10 AWG (2.5-4.0 mm <sup>2</sup> )	#16-#4 AWG (1.5-25 mm <sup>2</sup> )

# System Wiring Overview

Review the options below for information on wiring your panel correctly into your specific system.

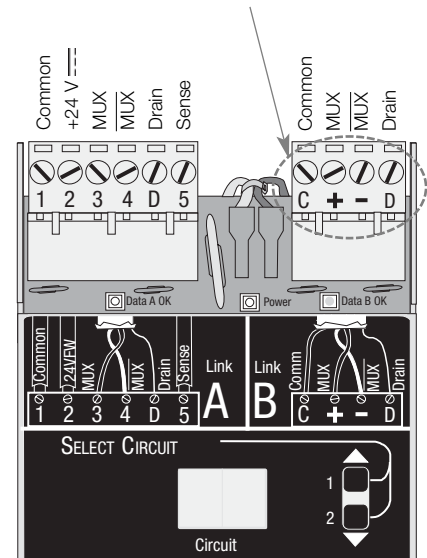
## A. DCI panel as a part of a GRAFIK Eye® 4000 lighting system:

Refer to the *GRAFIK Eye® 4000 Series Installers Guide* and the system overview pictured here for detailed wiring information.



Incorrect: Branch, T-tap, or home run not acceptable

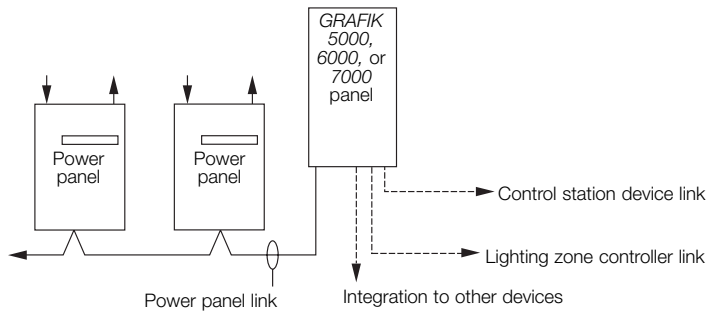
Note: Single-link circuit selectors will not have Link B connector.



Circuit Selector Terminals

## B. DCI panel as a part of a GRAFIK7000™ lighting system:

Refer to the *GRAFIK7000 Installation, and Maintenance Guide* and the system overview pictured here for detailed wiring information.





# Load Wiring

## MRI Facility Filters



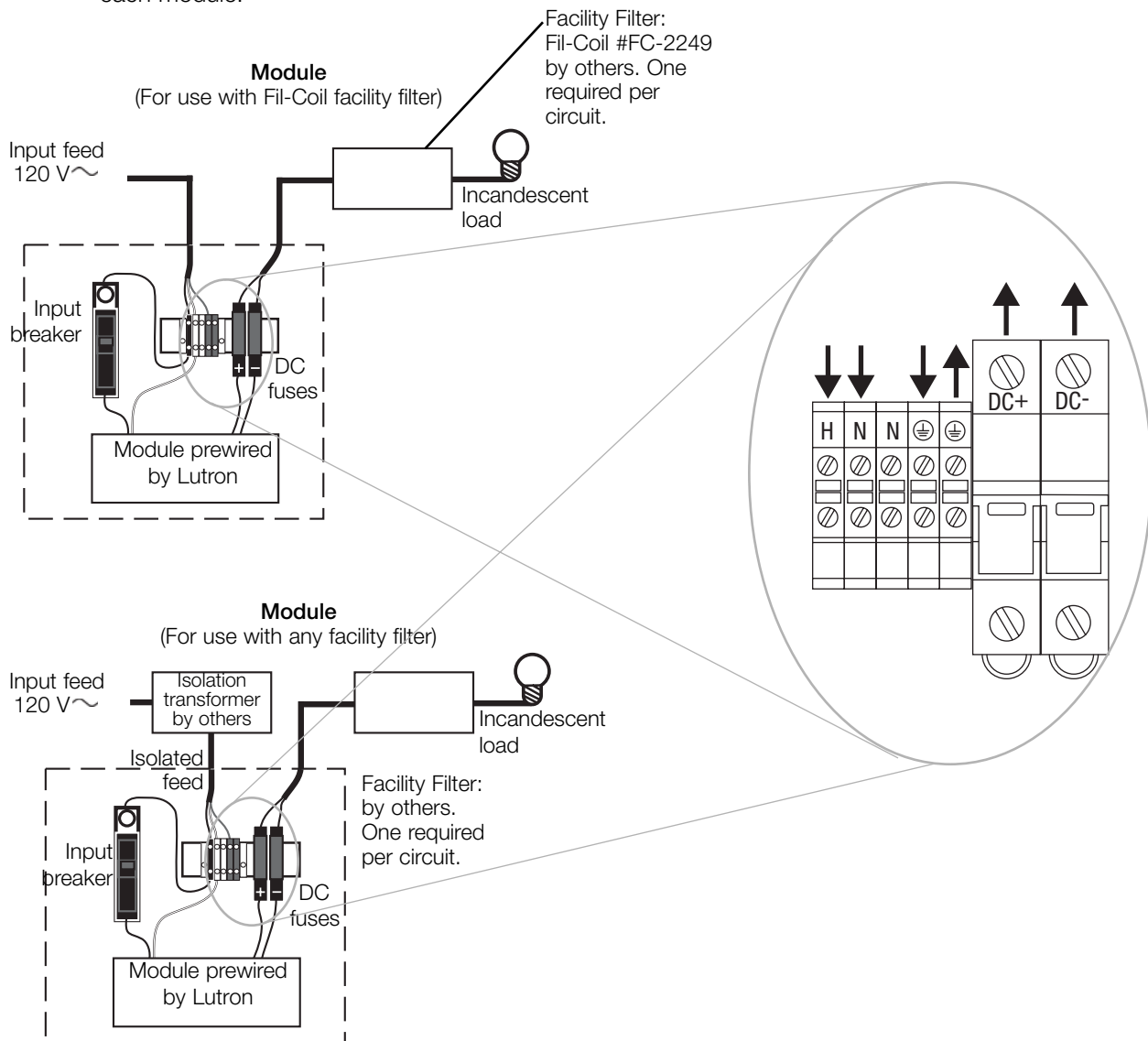
All voltage supplies into MRI room must be fed through facility filters. Lutron recommends the following UL listed filter: FIL-COIL CORP., P/N FC-2249



All controls and dimming panels must be mounted outside the MRI room away from the influence of large magnetic fields.

Please contact the above manufacturer to ensure a proper installation. Standard filters are not permitted unless each dimming module is supplied by an isolation transformer.

Isolation transformer must be 120:120, 3.0 KVA. One unique transformer required for each module.

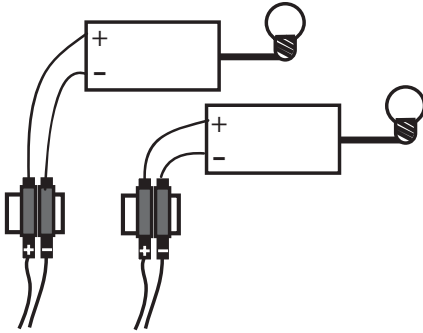


# Load Wiring (continued)

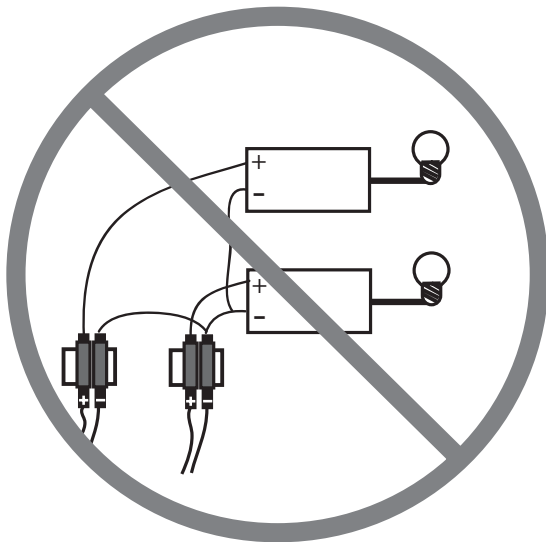
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Each circuit must wire to a unique +/- set of terminals in the panel. The “-” return must not be shared between circuits.

**Correct**



**Incorrect**



## Complete Installation

---

You have completed your panel installation.

**For Onsite Factory Commissioning**, call Lutron Technical Support and select Startup to schedule a field service visit. Allow for 10 working days between day of call and scheduled visit.

**In the U.S., Canada, and the Caribbean: 1.800.523.9466**

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# Notes

---

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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.
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Singapore: 800.120.4491  
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Please Read

# LUTRON® Dimming Panels

## Installation Guide GRAFIK Systems™ (GP) and LCP128™ (LCP SpecGrade)

### Contents

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230 V~ and 220-240 V~	3
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GP24-1204ML-20 shown

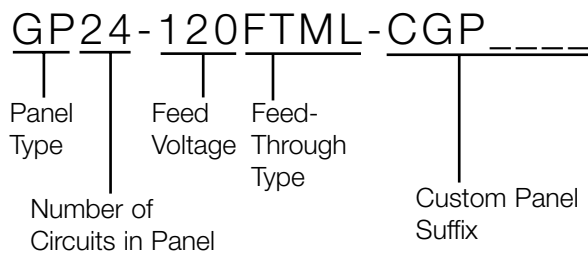
### Overview

Use this guide to successfully install a dimming panel. This guide describes panel installation, wiring, and load activation.

# Panel Model Number Guide: 120/277 V $\sim$

## Feed-Through Model Numbers

Example



### Panel Type

**GP** for GP panels

**LCP** for LCP128 SpecGrade panels

### Number of Circuits in Panel

Indicates number of circuits in the panel:

GP models: 3, 4, 8, 12, 16, 20, 24, 28, 32, 36, 40, 44, 48, 60, 72, or 144

LCP (SpecGrade) models: 8, 12, 16, 20, or 24

### Feed Voltage

**120** for 120 V $\sim$

**277** for 277 V $\sim$

### Load Circuit Rating

16 A per circuit

### Custom Panel Suffix

Contact Lutron for options

## Frequency - All Model Numbers and Voltages

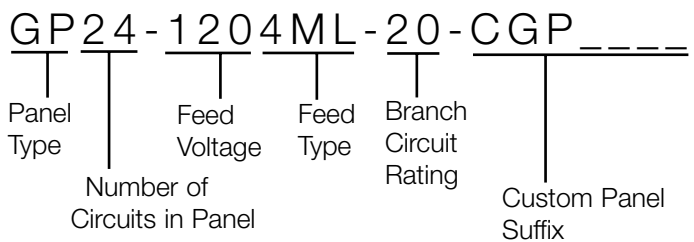
50/60 Hz

### Output Voltages

120 V $\sim$  or 277 V $\sim$

## Branch Circuit Breaker Model Numbers

Example



### Panel Type

**GP** for GP panels

**LCP** for LCP128 SpecGrade panels

### Number of Circuits in Panel

Indicates number of circuits in the panel:

GP models: 3, 8, 12, 16, 20, 24, 28, 32, 36, 40, 44, 48, 60, 72, or 144

LCP (SpecGrade) models: 8, 12, 16, 20, or 24

### Feed Voltage

**120** for 120 V $\sim$

**277** for 277 V $\sim$

### Load Circuit Rating

16 A per circuit

### Feed Type and Input Ratings

**4M or 4ML** for 3 phase 4 wire main lugs:  
120/208 V $\sim$  or 277/480 V $\sim$

**3M or 3ML** for 1 phase 3 wire main lugs:  
120/240 V $\sim$

**2M or 2ML** for 1 phase 2 wire main lugs:  
120 V $\sim$  or 277 V $\sim$

**DTML** for dual tap main lugs

**Mxxx** for main breaker (xxx = breaker size in amps)

### Branch Circuit Rating

**15** for 15 A branch circuit breakers (GP only)  
15 A branch circuit breakers have a 12 A continuous load rating

**20** for 20 A branch circuit breakers  
20 A branch circuit breakers have a 16 A continuous load rating

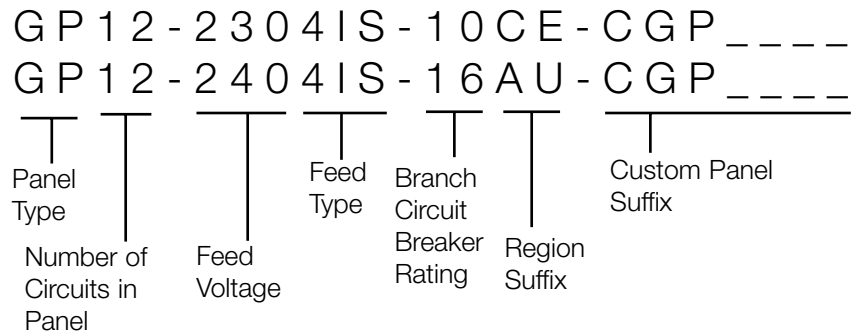
### Custom Panel Suffix

Contact Lutron for options



# Panel Model Number Guide: 230 V $\sim$ and 220-240 V $\sim$

Examples



## **Panel Type**

**GP** for GP panels

## **Number of Circuits in Panel**

Indicates number of circuits in the panel:  
3, 4, 8, 12, 16, 20, 24

## **Feed Voltage**

**230** for 230 V $\sim$  (CE)

**240** for 220-240 V $\sim$  (non-CE)

## **Feed Type**

**2IS** for 1 phase 2 wire isolation switch

**4IS** for 3 phase 4 wire isolation switch

## **Input Ratings**

230 V $\sim$  or 240 V $\sim$

220-240/380-415 V $\sim$

## **Branch Circuit Breaker Rating**

**10** for 10 A branch circuit breakers

10 A branch circuit breakers have a 10 A continuous load rating

**16** for 16 A branch circuit breakers (240 V $\sim$  only)

16 A branch circuit breakers have a 16 A continuous load rating

## **Region Suffix**

**CE** for 230 V $\sim$

**AU** for 220-240 V $\sim$

## **Custom Panel Suffix (optional)**

Indicates panel with special options

## **Frequency - All Model Numbers and Voltages**

50/60 Hz

## **Load Circuit Rating**

16 A per circuit (non-CE)

10 A per circuit (CE)

## **Output Voltages**

230 V $\sim$  or 220-240 V $\sim$

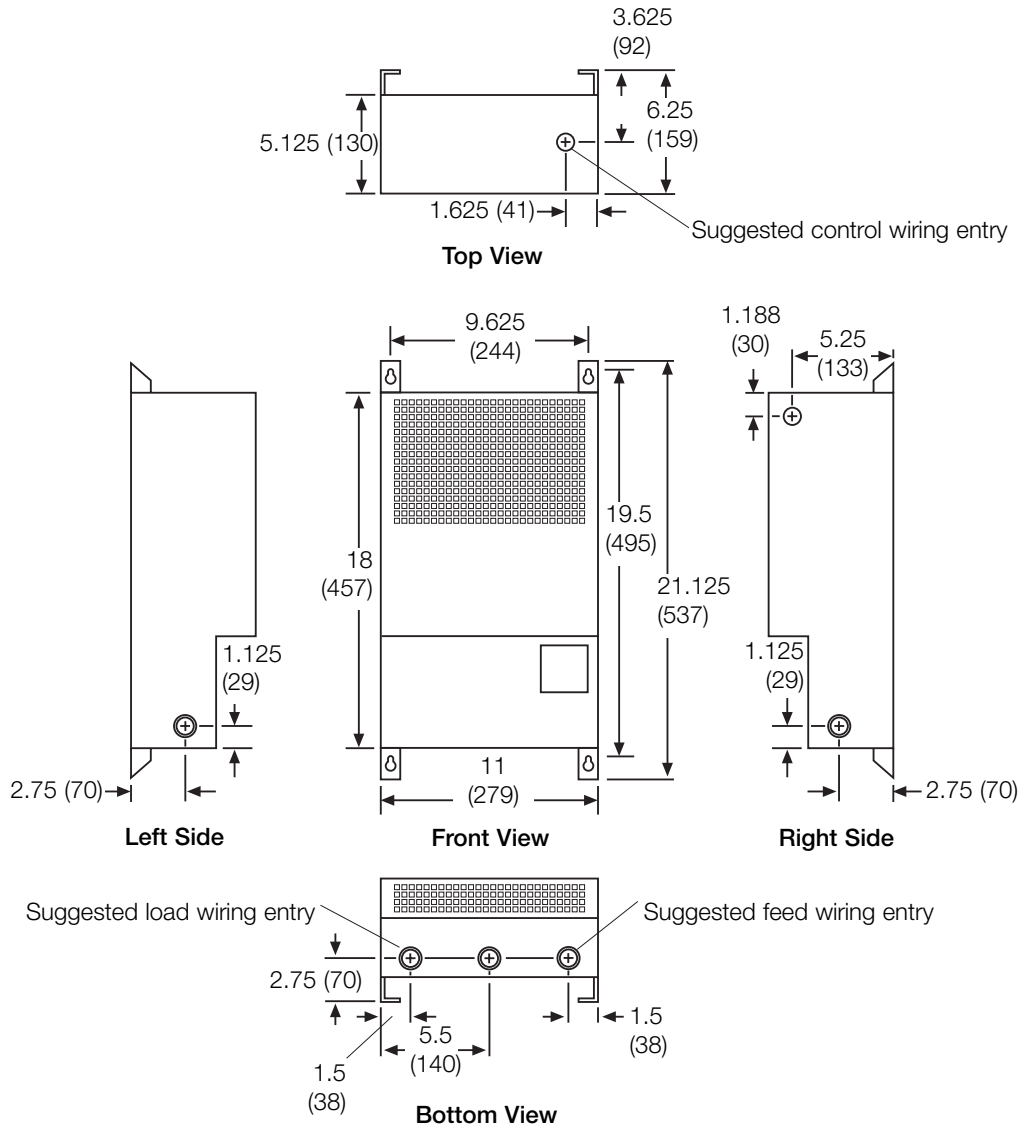
## **Custom Panel Suffix**

Contact Lutron for options

# Panel Dimensions

## Mini Panel: GP3 and GP4

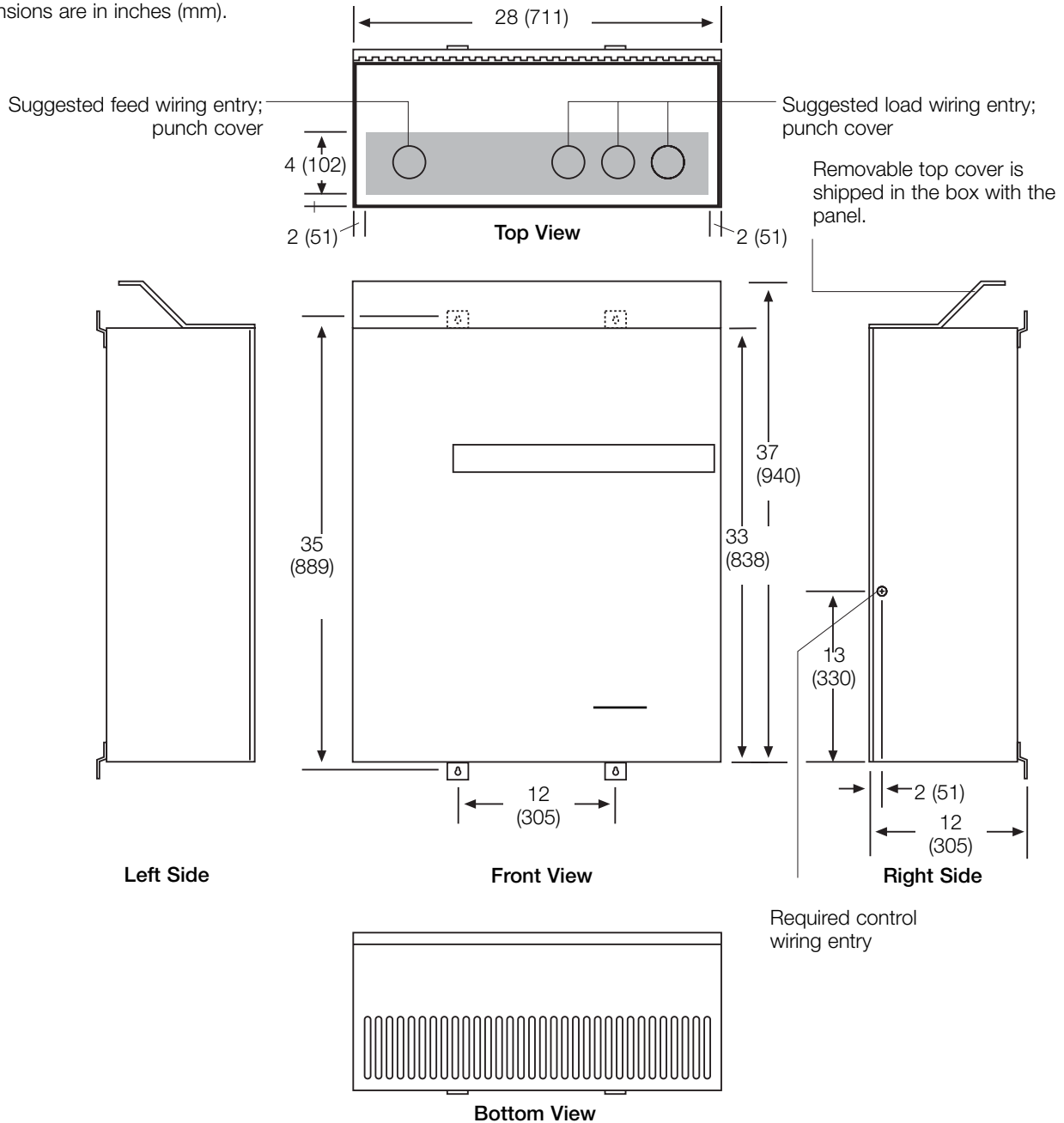
Dimensions are in inches (mm).



# Panel Dimensions (continued)

## Standard Panel: GP8-GP24, LCP8-LCP24

Dimensions are in inches (mm).



### Notes

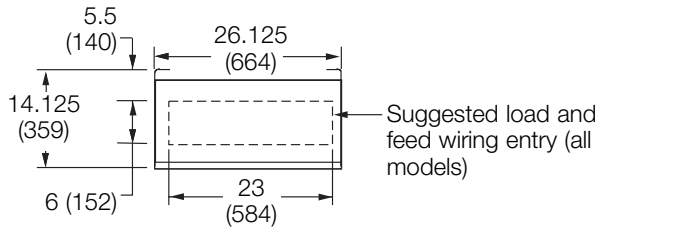
- Keyhole accepts a maximum 5/16 in. (8 mm) mounting bolt (1/4 in./m8 recommended).
- PELV (Class 2: USA) entry knockout is 7/8 in. dia. (22 mm).



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

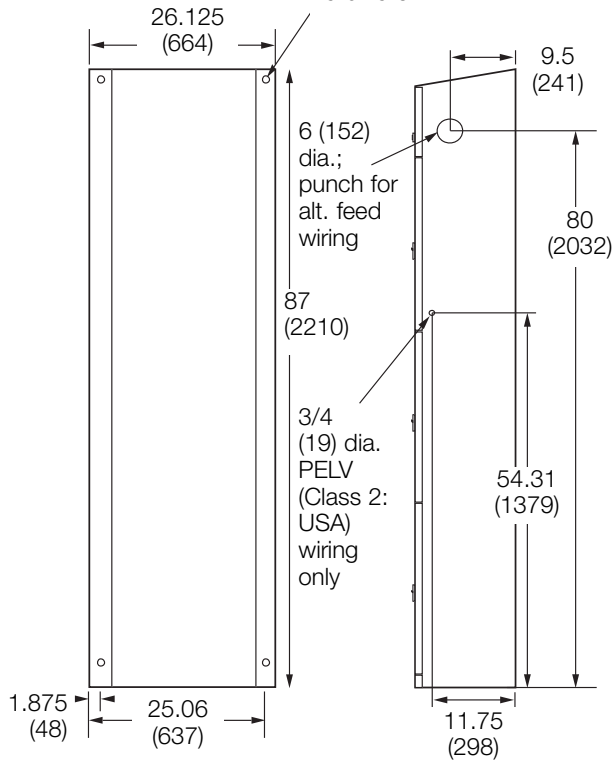
# Panel Dimensions (continued)

## Large Panel: GP36 (120/277 V $\sim$ only)



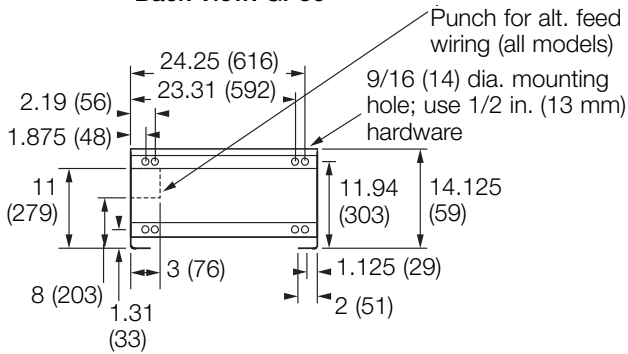
Top View: GP36

9/16 (14) dia. mounting hole; use 1/2 in. (13 mm) hardware



Back View: GP36

Right Side

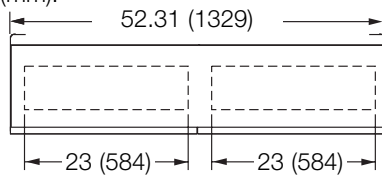


Bottom View: GP36

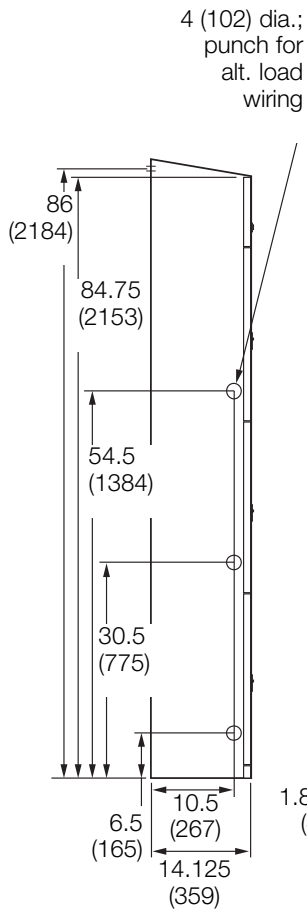
# Panel Dimensions

## Large Panel: GP48-GP72 (120/277 V $\sim$ only)

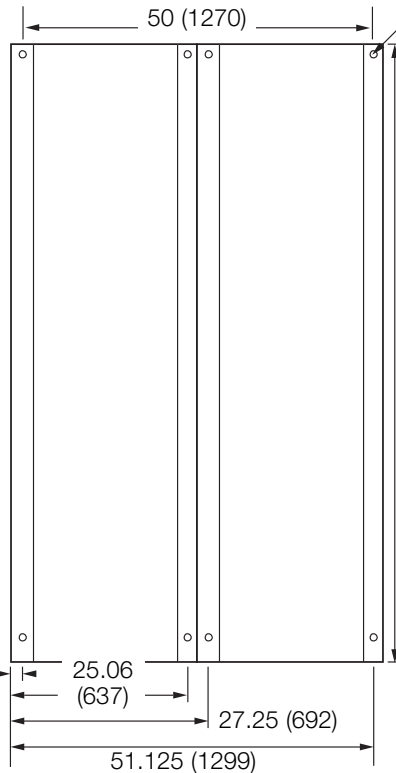
Dimensions are in inches (mm).



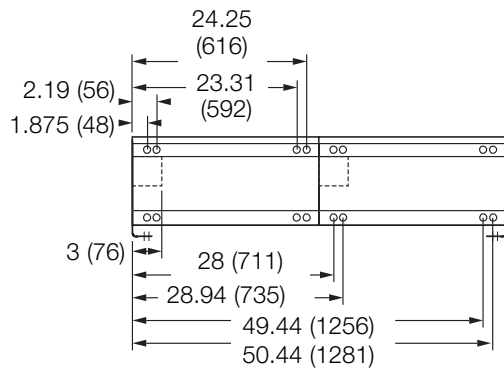
**Top View: GP48 - GP72**



**Left Side**



**Back View: GP48 - GP72**

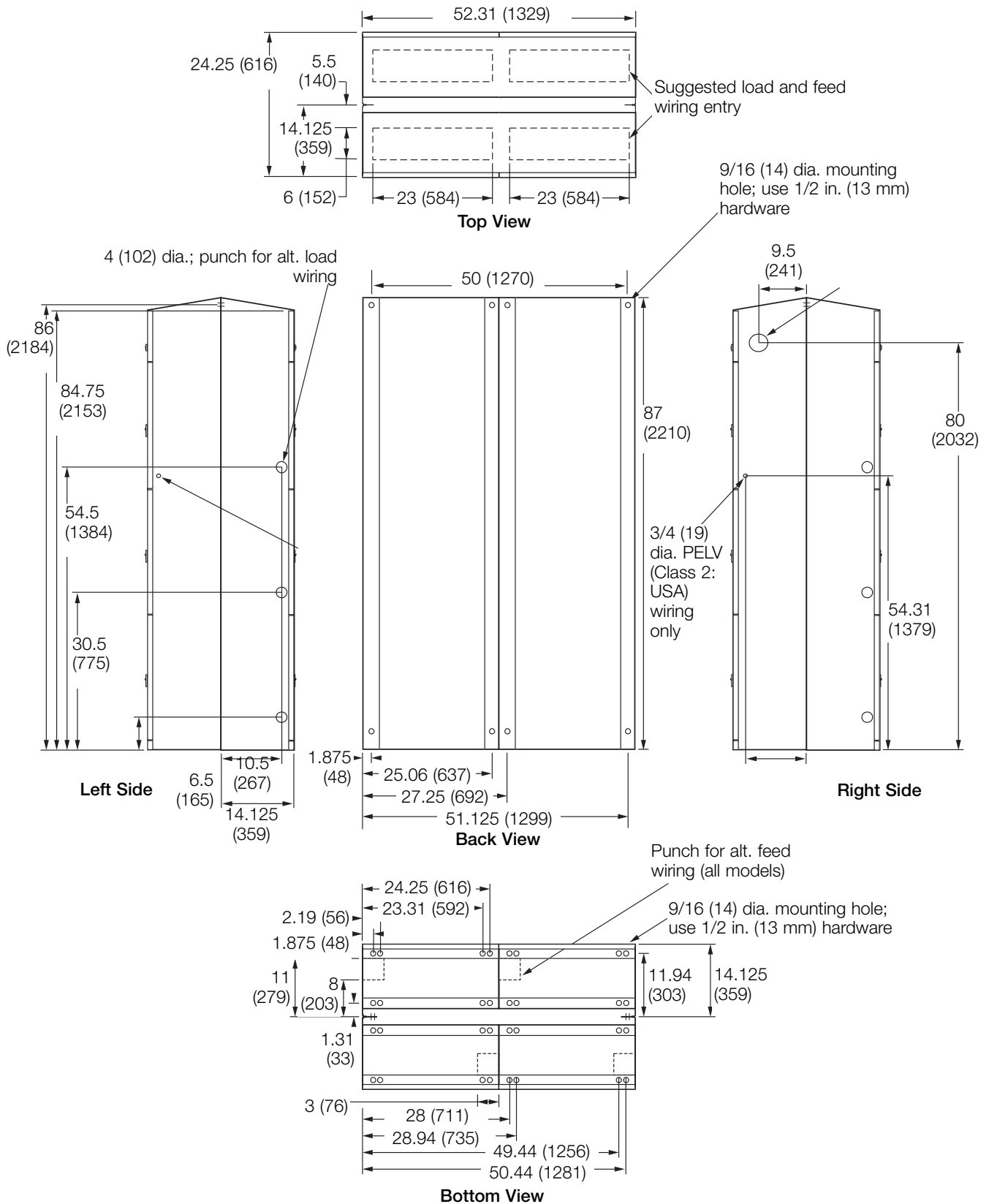


**Bottom View: GP48 - GP72**

# Panel Dimensions (continued)

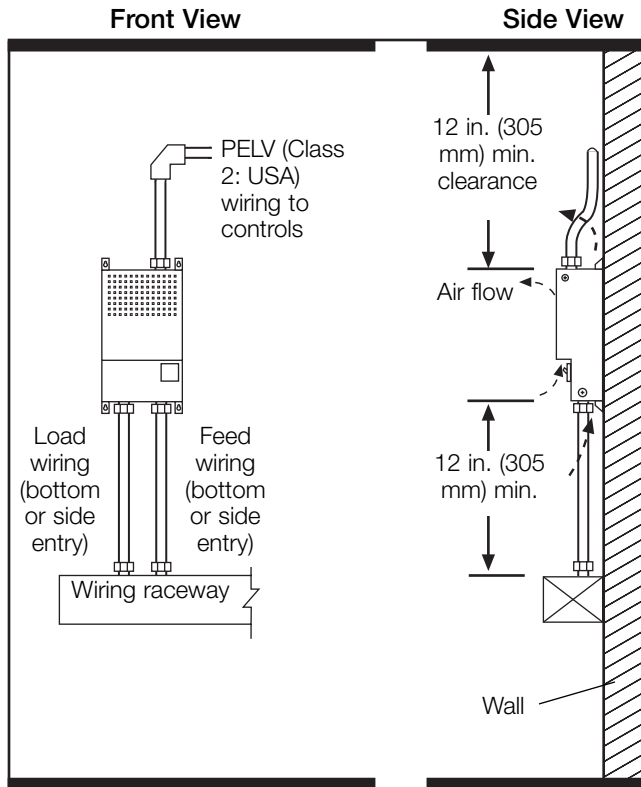
## Large Panel: GP96-GP144 (120/277 V $\sim$ only)

Dimensions are in inches (cm).

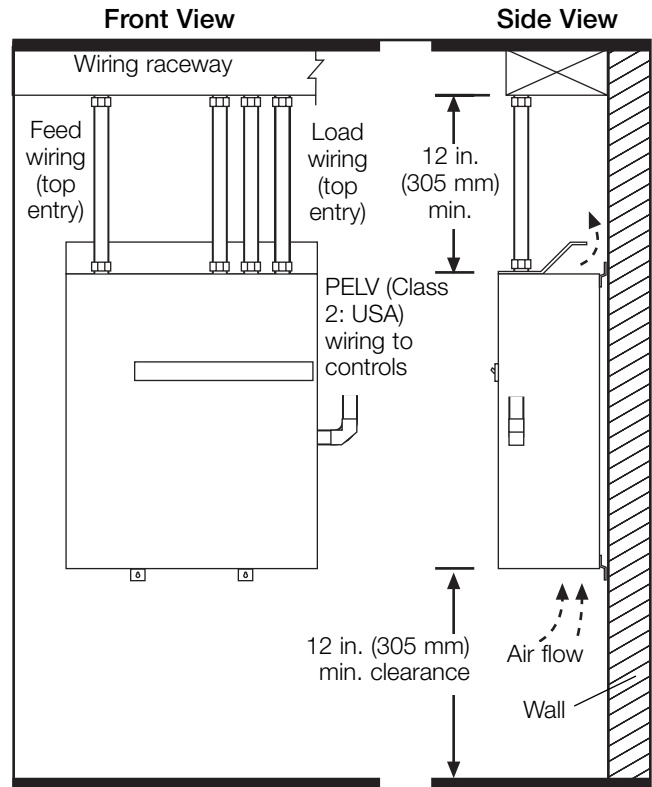


# Panel Mounting

## Mini Panel



## Standard Panel



### Mounting Guidelines

- For Indoor Use Only! NEMA, Type 1 enclosure, IP20.
- Panel generates heat. Mount where ambient temperature is 32-104 °F (0-40 °C).
- Relative humidity must be <90% non-condensing.
- Reinforce wall structure for panel weight and local codes; see table.
- Mount panel where audible noise is acceptable (internal relays click).
- Mount panel so line (mains) voltage wiring is at least 6 ft. (1.8 m) from audio or electronic equipment and associated wiring.
- Mount within 7° of true vertical.
- Panel clearances are 12 in. (305 mm) above and below and 0 in. to each side. Allow room for PELV (Class 2: USA) clearance.



**Warning!** CE-marked panels with 10 A circuit breakers are intended for industrial or commercial use only.



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

Panel	Max. Heat BTUs (Kcal)/Hour	Max. Weight w/o Packaging* pounds (kg)
<b>Mini</b>		
GP3, GP4	685 (172.62)	30 (14)
<b>Standard</b>		
GP8, LCP8	1365 (343.98)	115 (52)
GP12, LCP12	2045 (515.34)	120 (54)
GP16, LCP16	2725 (686.70)	145 (66)
GP20, LCP20	3405 (858.06)	160 (73)
GP24, LCP24	4085 (1029.42)	175 (80)
<b>Large</b>		
GP36	4350 (1096.20)	325 (147)
GP48	5806 (1463.11)	550 (250)
GP60	7258 (1829.02)	600 (274)
GP72	8709 (2194.67)	650 (295)
GP144	17400 (4384.80)	1300 (590)

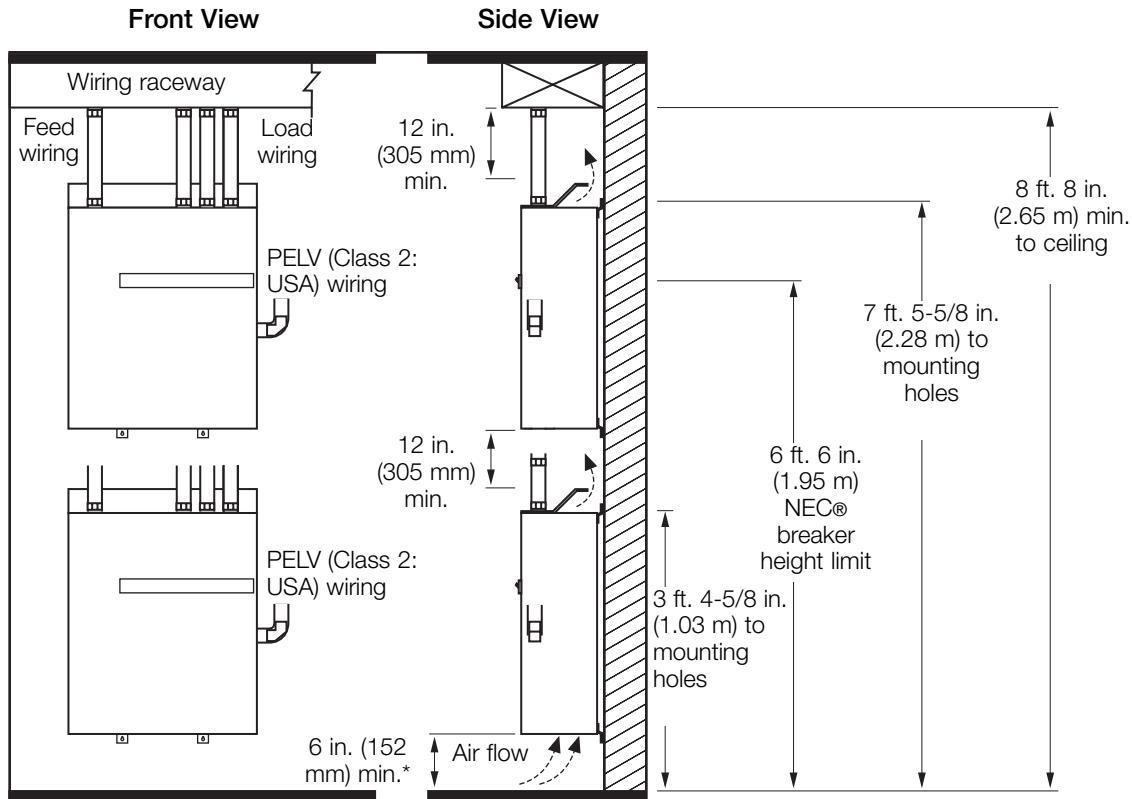
\*Packaging weight adds 150 lbs (69 kg) for large panels, 50 lbs (23 kg) for medium panels, and 10 lbs (4.5 kg) for mini panels.



# Panel Mounting (continued)

## Mounting One Panel above Another: GP8-GP24, LCP8-LCP24 only

At least 8 ft. 8 in. (2.74 m) between floor and suspended ceiling is required for this layout.



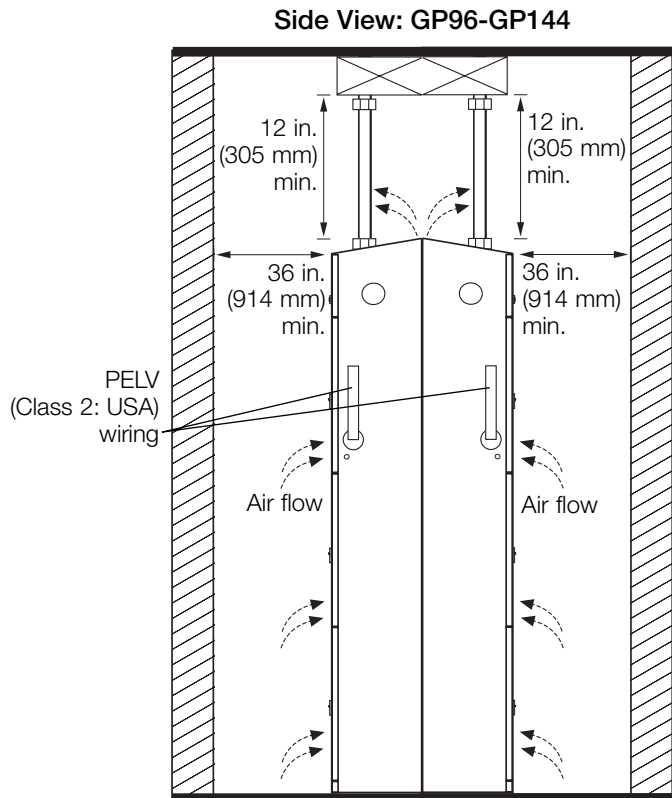
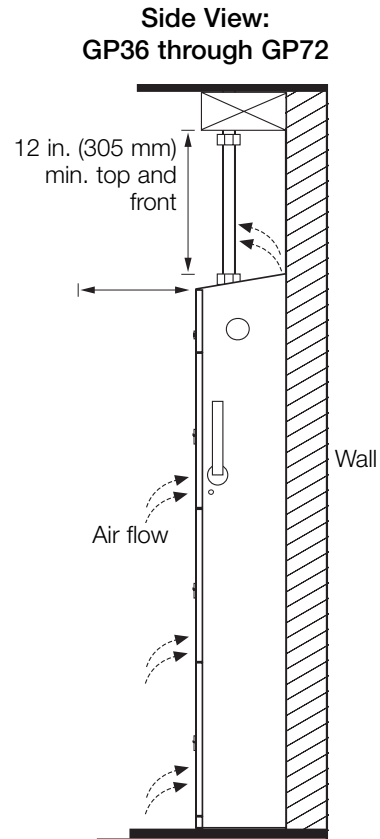
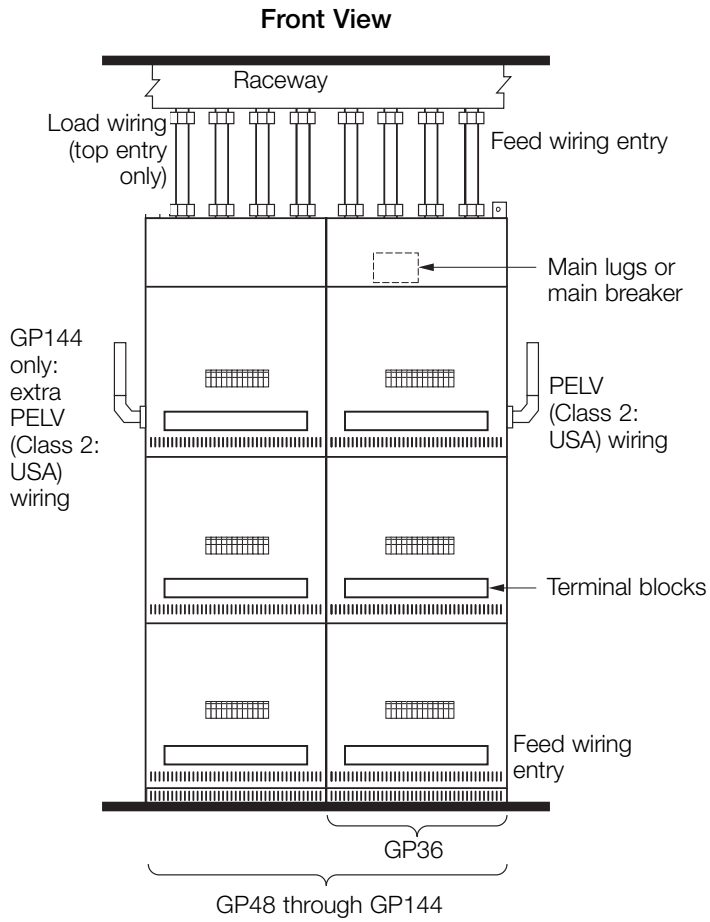
\*6 in. (152 mm) approved for this layout only.



**Warning!** Water damages panels. Install where they will not get wet.

# Panel Mounting

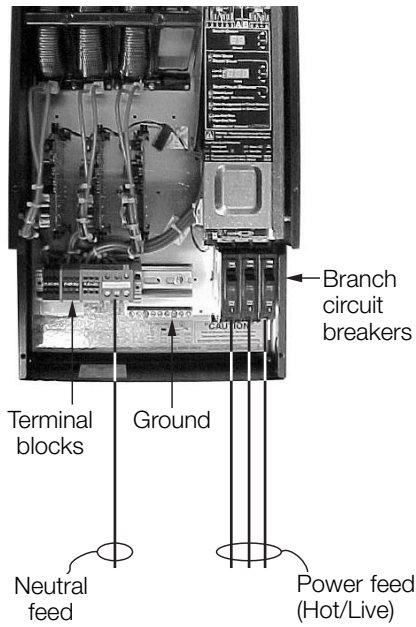
## Large Panel (120/277 V~ only)



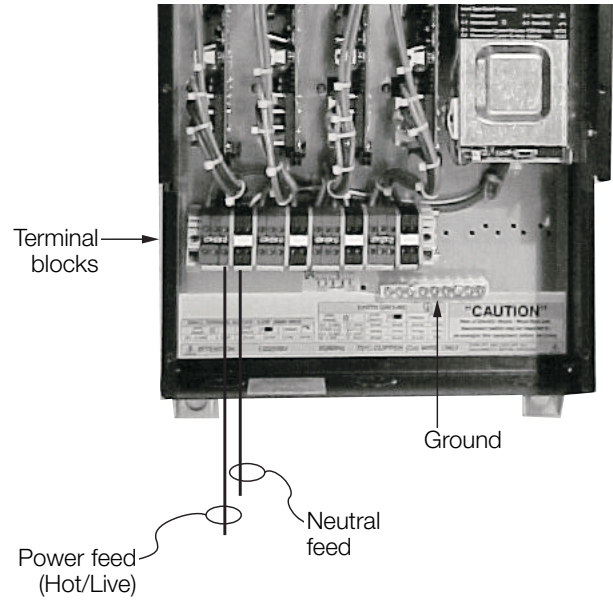
**Note:** Mount on the floor and against a wall. Reinforce wall structure as required for weight and local codes. See page 8.

# Panel Feed: Wiring Overview

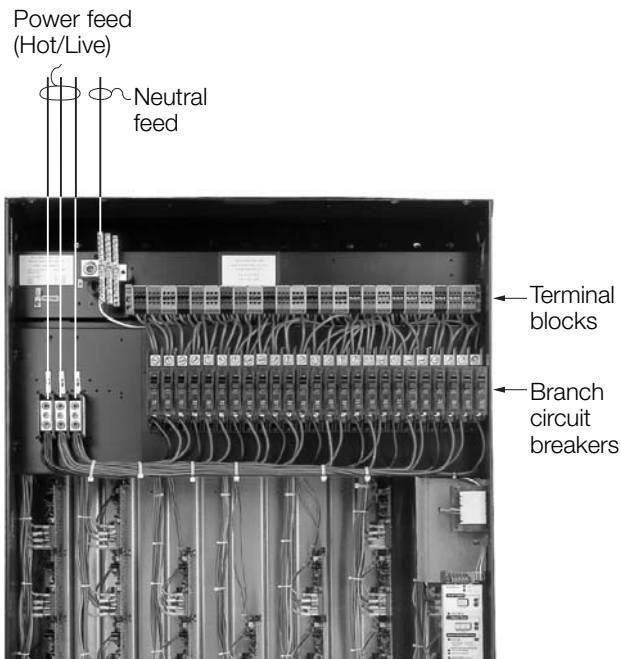
## GP3



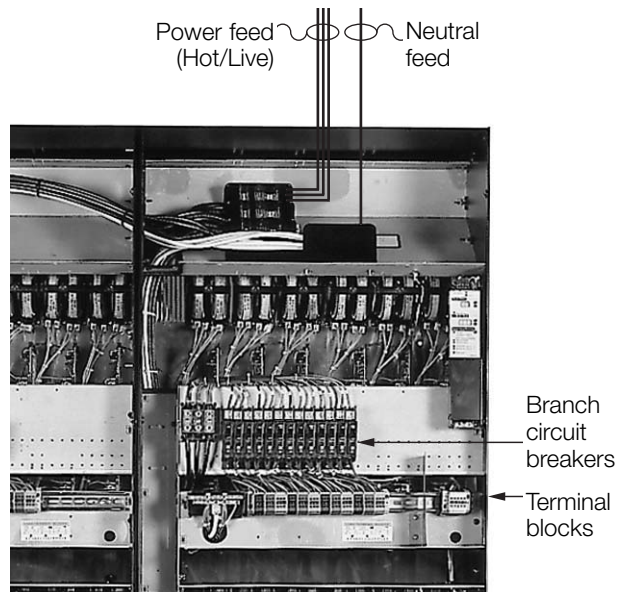
## GP4



## GP8-GP24



## GP36-GP144



# Panel Feed: Wiring Details

## Notes

- Wire similar to a lighting distribution panel.
- Run feed and load wiring; no other wiring or assembly required.
- Common neutrals are not permitted; run separate neutrals for each load circuit.  
To provide temporary lighting:
- Wire all loads.
- Do NOT remove the bypass jumpers that protect the dimming modules.
- Use branch circuit breakers to switch lights on and off.

## Wire Sizes

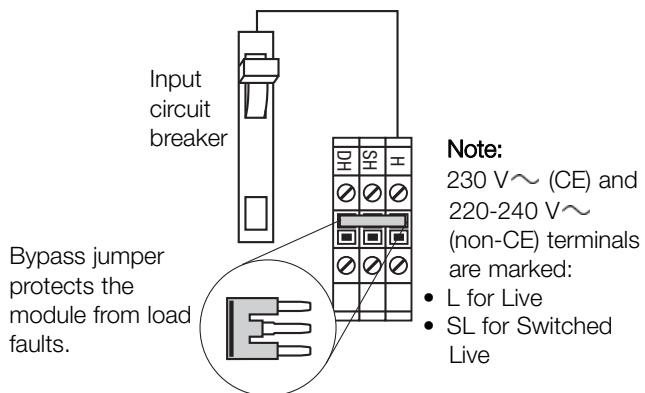
Panel/ Voltage	Power Feed	Neutral Feed	Dimmed Hot/ Dimmed Live	Load Neutral
<b>GP3</b>				
120 V~	#14-#8 AWG (2.5-10 mm <sup>2</sup> )	#14-#6 AWG (2.5-10 mm <sup>2</sup> )	#14-#10 AWG (2.5-4.0 mm <sup>2</sup> )	#14-#6 AWG (2.5-10 mm <sup>2</sup> )
230/240 V~	#18-#4 AWG (1.0-25 mm <sup>2</sup> )	#14-#6 AWG (2.5-10 mm <sup>2</sup> )	#14-#10 AWG (2.5-4.0 mm <sup>2</sup> )	#14-#6 AWG (2.5-10 mm <sup>2</sup> )
277 V~	#14-#10 AWG (2.5-4.0 mm <sup>2</sup> )	#14-#6 AWG (2.5-10 mm <sup>2</sup> )	#14-#10 AWG (2.5-4.0 mm <sup>2</sup> )	#14-#6 AWG (2.5-10 mm <sup>2</sup> )
<b>GP4</b>				
120 V~	#14-#10 AWG (2.5-4.0 mm <sup>2</sup> )	#14-#10 AWG (2.5-4.0 mm <sup>2</sup> )	#14-#10 AWG (2.5-4.0 mm <sup>2</sup> )	#14-#10 AWG (2.5-4.0 mm <sup>2</sup> )
230/240 V~	#14-#10 AWG (2.5-4.0 mm <sup>2</sup> )	#14-#10 AWG (2.5-4.0 mm <sup>2</sup> )	#14-#10 AWG (2.5-4.0 mm <sup>2</sup> )	#14-#10 AWG (2.5-4.0 mm <sup>2</sup> )
277 V~	#14-#10 AWG (2.5-4.0 mm <sup>2</sup> )	#14-#10 AWG (2.5-4.0 mm <sup>2</sup> )	#14-#10 AWG (2.5-4.0 mm <sup>2</sup> )	#14-#10 AWG (2.5-4.0 mm <sup>2</sup> )
<b>GP8-GP24, LCP8-LCP24</b>				
120 V~	#14-#2/0 AWG (2.5-70 mm <sup>2</sup> )	#6 AWG-350 MCM (10-185 mm <sup>2</sup> )	#14-#10 AWG (2.5-4.0 mm <sup>2</sup> )	#14-#6 AWG (2.5-10 mm <sup>2</sup> )
230/240 V~ (GP only)	#14-#2 AWG (2.5-35 mm <sup>2</sup> )	#14-#2 AWG (2.5-35 mm <sup>2</sup> )	#14-#10 AWG (2.5-4.0 mm <sup>2</sup> )	#14-#6 AWG (2.5-10 mm <sup>2</sup> )
277 V~	#14-#2/0 AWG (2.5-70 mm <sup>2</sup> )	#6 AWG-350 MCM (10-185 mm <sup>2</sup> )	#14-#10 AWG (2.5-4.0 mm <sup>2</sup> )	#14-#6 AWG (2.5-10 mm <sup>2</sup> )
<b>GP36-GP144</b>				
120 V~	(2) #4 AWG - 500 MCM ((2) 25-240 mm <sup>2</sup> )		#14-#10 AWG (2.5-4.0 mm <sup>2</sup> )	#14-#6 AWG (2.5-10 mm <sup>2</sup> )
277 V~	(2) #4 AWG - 500 MCM ((2) 25-240 mm <sup>2</sup> )		#14-#10 AWG (2.5-4.0 mm <sup>2</sup> )	#14-#6 AWG (2.5-10 mm <sup>2</sup> )

# Temporary Lighting

You do not need to install a temporary distribution panel. Connect load wires into the appropriate terminal blocks. Each input breaker can supply power to a load while the bypass jumper protects the module from load faults.



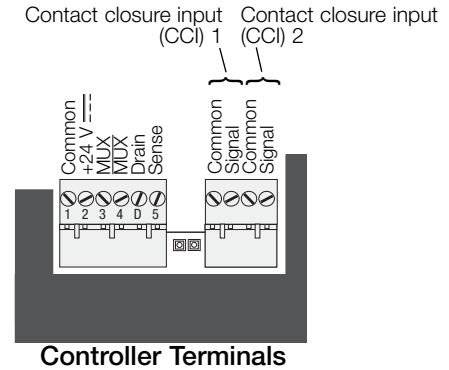
**Warning!** Verify that the panel is fed from the correct voltage. A feed miswire or loss of a feed neutral can cause over-voltage damage to the equipment. Do NOT remove bypass jumpers at this point--they protect the modules from load faults.



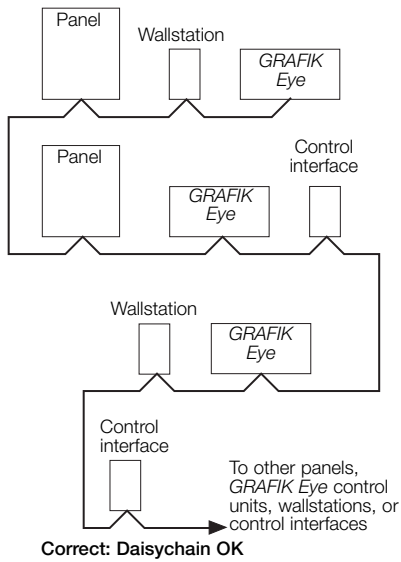
# System Wiring Overview

Review the options below for information on wiring your panel correctly into your specific system.

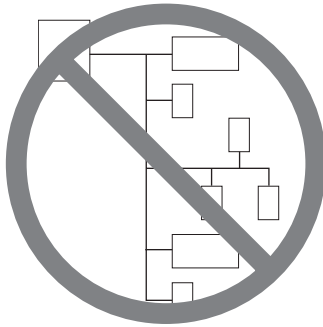
**A. LCP128 SpecGrade panel:** Refer to the *LCP128 Setup and Operation Manual* for detailed wiring information.



**B. GP panel as a part of a GRAFIK Eye 4000 lighting system:** Refer to the *GRAFIK Eye 4000 Installation, Setup, and Operation Manual* and the system overview pictured here for detailed wiring information.

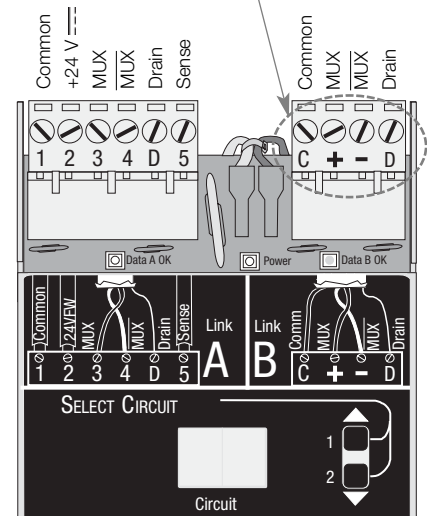


Correct: Daisychain OK



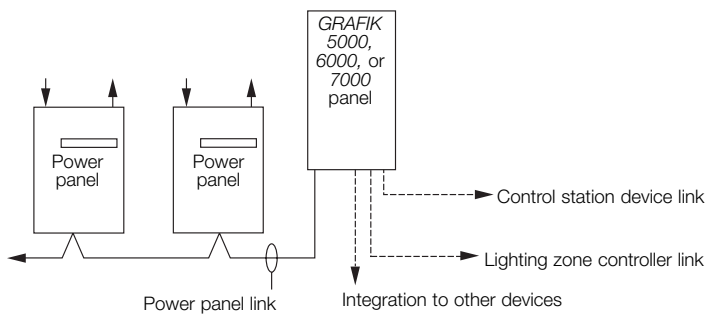
Incorrect: Branch, T-tap, or home run not acceptable

Note: Single-link circuit selectors will not have Link B connector.



Circuit Selector Terminals

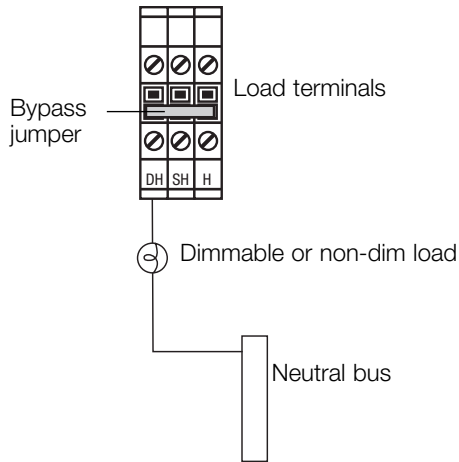
**C. GP panel as a part of a GRAFIK7000 lighting system:** Refer to the *GRAFIK7000 Installation, and Maintenance Guide* and the system overview pictured here for detailed wiring information.



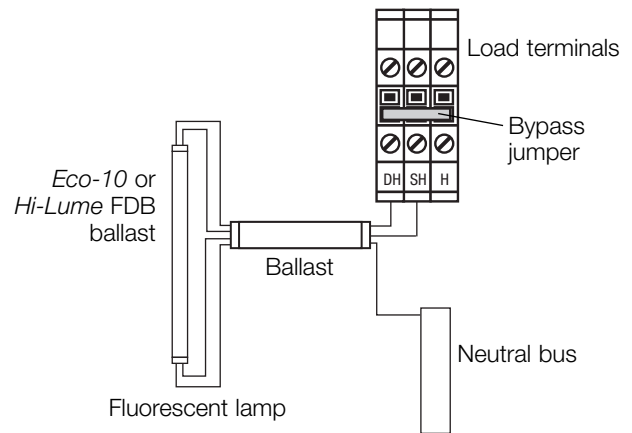
# Load Wiring

## Incandescent Load Types

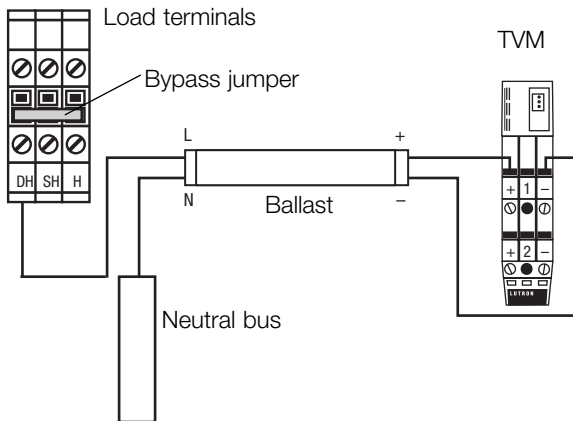
Dimmed Hot/Live (DH/DL) must be used for non-dim loads whether they will be dimmed or switched



## Hi-Lume® FDB or Eco-10™ fluorescent dimming ballasts

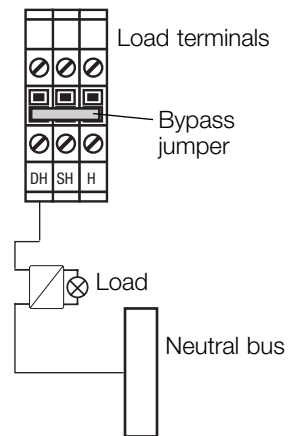


## TVM Load Types



## ELV Load Types

Dimmed Hot/Live (DH/DL) must be used for non-dim loads whether they will be dimmed or switched



### Notes

- For 230 V $\sim$  and 240 V $\sim$  panels, “Hot” is referred to as “Live”. Therefore, terminals will be labeled DL, SL, and L.
- Run wiring so that line (mains) voltage wiring will be at least 6 feet (1.8 m) from sound or electronic equipment and its wiring.
- Hot/Live (H/L) is used for bypass on all panels. It can also be used as a protected Hot/Live output on GP3, GP8, GP12, GP16, GP20, and GP24. (Added hot/live current plus load current must not exceed breaker limits.)



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



**Caution!** Switched Hot/Live (SH/SL) must be used for only *Hi-lume* FDB or *Eco-10* loads. Use Dimmed Hot/Live (DH/DL) for all non-dim loads.



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



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



# Activate Loads in Bypass

## A. Complete load wiring.

## B. Check that the bypass jumpers are in place.

These jumpers protect from load faults and must be used to check load wiring when it is installed or modified.



**Warning!** For GP3 and GP4, the input breaker of Circuit 1 powers the control wiring as well as Circuit 1's dimmer and load. Activate loads and remove loads from bypass concurrently for these models.

## C. Turn circuit breaker 1 ON.

The load(s) should energize, the breaker should not trip, and total load current must be within the circuit breaker's limit and less than or equivalent to 16 A.

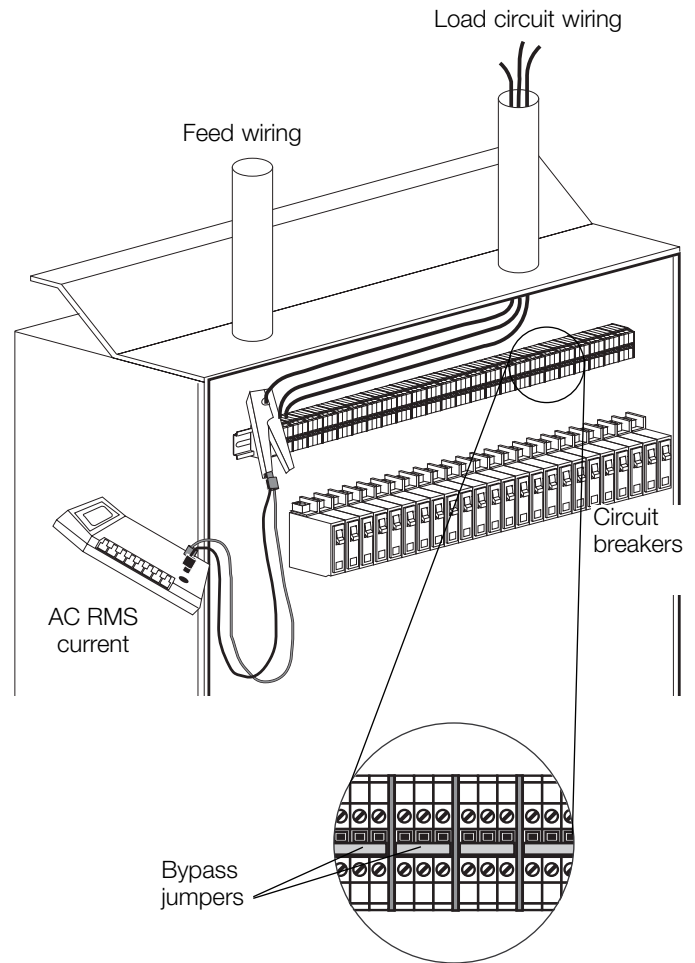
## D. Repeat step C for each circuit with completed load wiring.



**Warning!** Do not remove bypass jumpers at this time.



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



# Complete Installation

You have completed your panel installation.

**For Onsite Factory Commissioning**, call Lutron Technical Support and select Startup to schedule a field service visit. Allow for 10 working days between day of call and scheduled visit.

**If you purchased Telephone Startup** (LCP128 only), stop here and complete the Control Location, Panel, and Control Station Tables that are located in the back of the *Setup and Operation Manual*. Once the tables are complete, call Lutron Technical Support and select Startup. Please call 24 hours prior to desired system startup.

**In the U.S., Canada, and the Caribbean: 1.800.523.9466**

**In Mexico: +1.888.235.2910**

**In Europe: +44.207.702.0657**

**In Asia: +65.6220.4666**

**In Japan: +81.355.758.411**

**In all other countries: +1.610.282.6701**

## Remove Bypass Jumpers

- A. After all load wiring has been checked, turn circuit breakers OFF.
- B. Remove and store the bypass jumpers for possible future use.
- C. Turn circuit breakers ON.



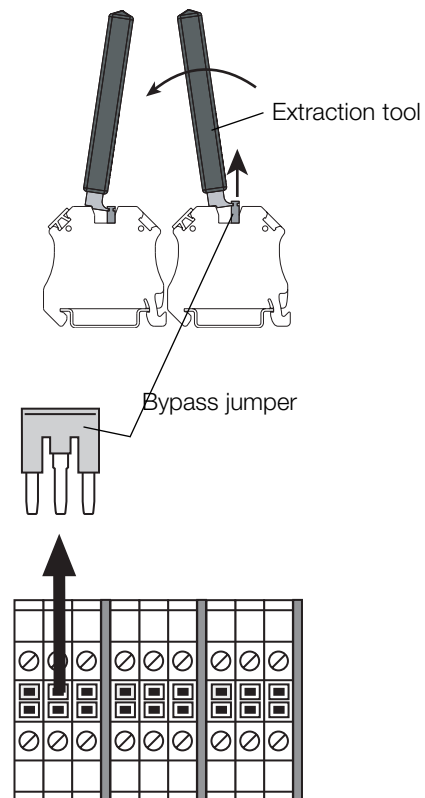
**Caution!** Reuse the bypass jumpers whenever work is being done on a load. Damage caused by short-circuits and miswiring is not covered by the product warranty.



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



**Warning!** Confirm that load types were correctly assigned. Some loads may be damaged if dimmed, especially certain electronic transformers and electronic ballasts and motors.



Panel installation, control station wiring, and load activation are now complete.

Next Step: Refer to the *Setup and Operation Manual* to set up the functions and operation of the panel.

# Warranty

## 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: 5,808,417; 6,046,550; 6,091,205; 6,188,181; 6,380,692; and corresponding foreign patents.

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Thailand: 001.800.120.665853  
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Please Read

**LUTRON®**

Dimming and Switching Panels

# Setup and Maintenance Guide for Panels with Circuit Selectors

Load Type	Symbol	Code	Label	Icon
---	---	3-1	Neon / CC	
1-1		4-1	Non-Dim	
2-1			Fluorescent Lutron Hi-lume® FDB Ballast	
2-2			Fluorescent Lutron Tu-Wire™ Ballast	

## Contents

**Link Wiring Detail**

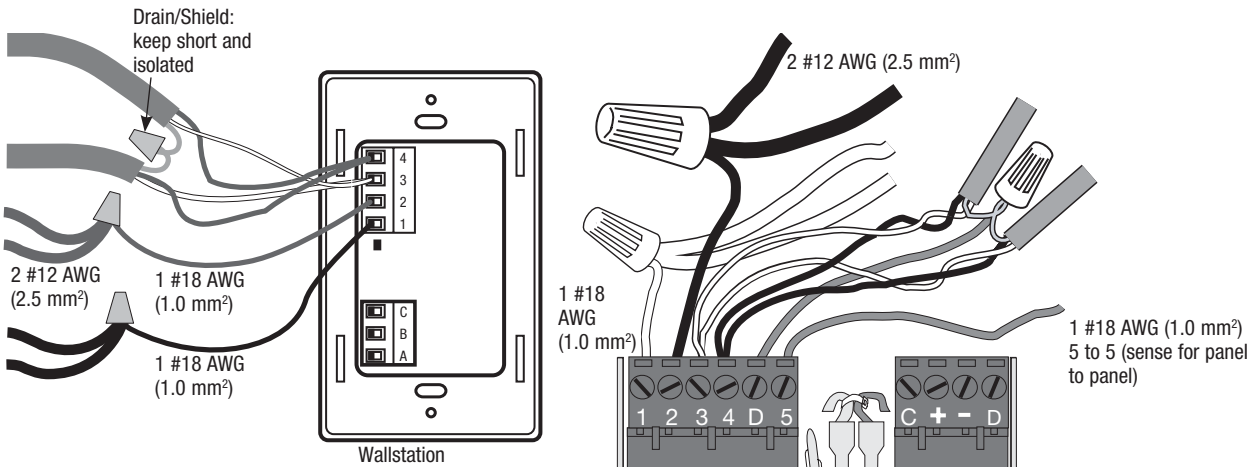
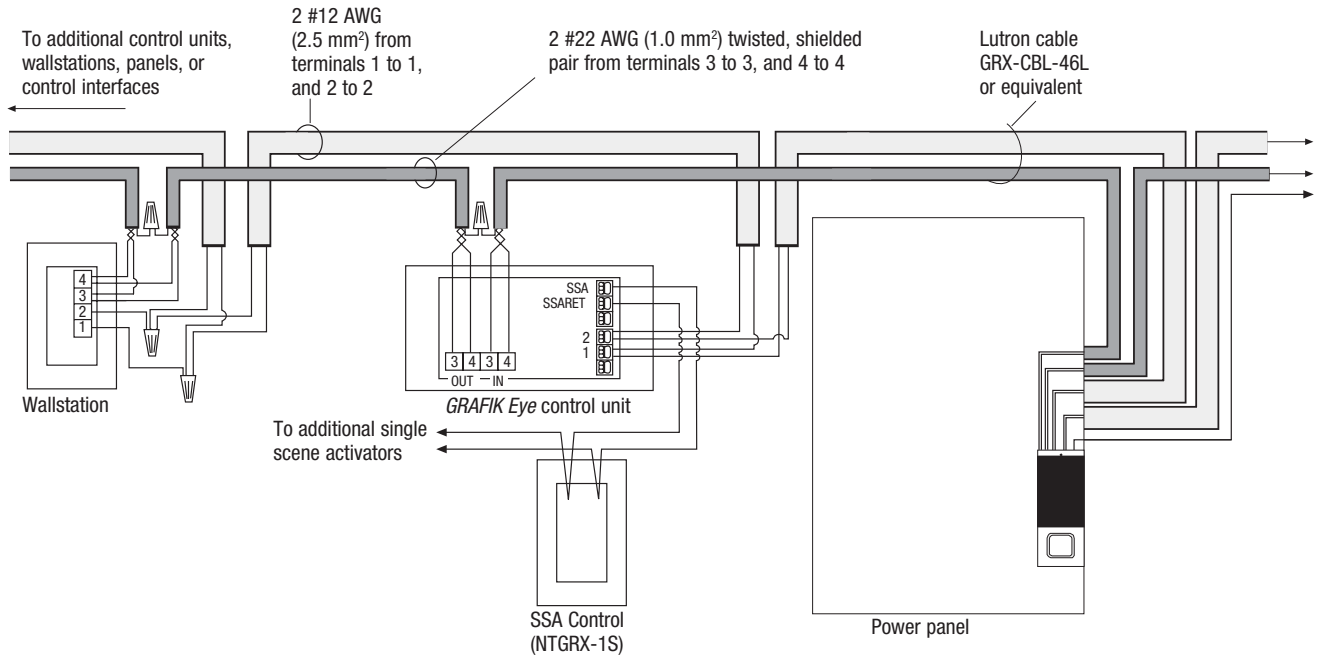
- Link A .....2
- Link B .....3

**Programming the Circuit Selector**

- Circuit Selector Functions .....4
- Set Normal/Emergency Switch .....4
- Assign Load Types .....5
- Address the Circuit Selector .....5
- Assign Primary Zones .....6
- Set Low or High End .....6
- Assign Link Hierarchy (2Link™ only) .....7
- Maintenance .....7

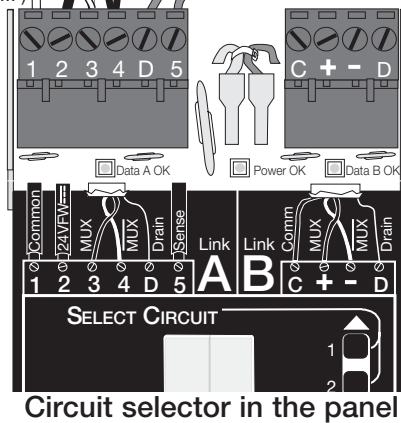
Contact Information .....8

# Link Wiring Detail: Link A (1 to 1, 2 to 2, 3 to 3, etc.)

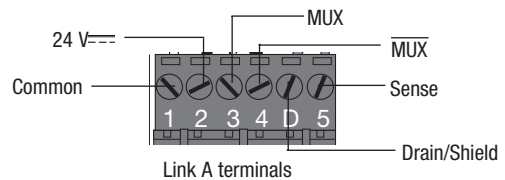


## Notes:

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

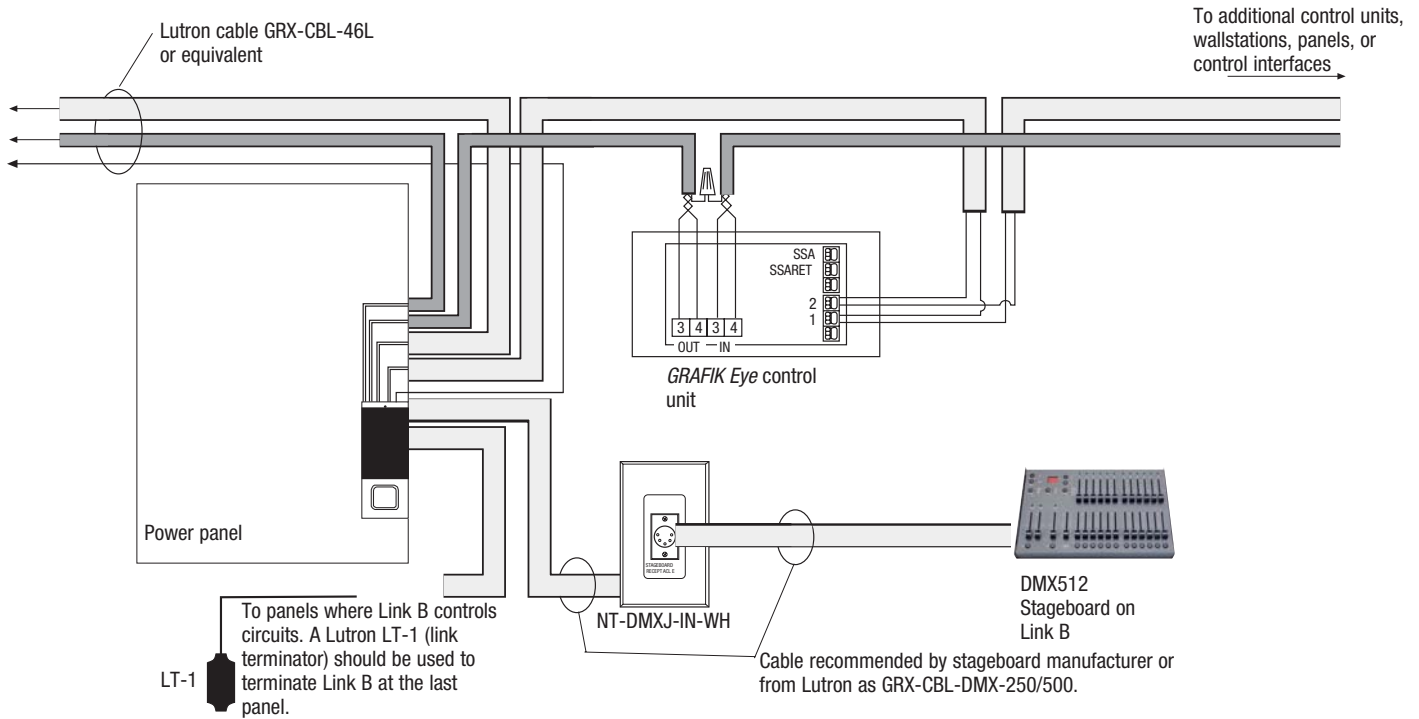


Circuit selector in the panel

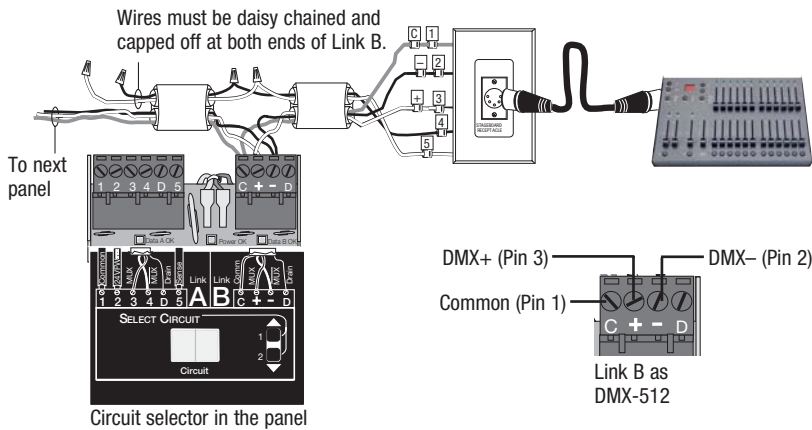


Link A terminals

# Link Wiring Detail: Link B (C to C, + to +, - to -)



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



### DMX Cable Wiring Table

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

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



# Programming the Circuit Selector

Before proceeding, you must have one or more of the following: preassigned setup, knowledge of how the system is to operate, plans and specifications from owner's representative on how the system is to be set up, or owner or owner's representative present.

## Circuit Selector Functions

There is a circuit selector in every lighting control panel. It is used to communicate with GRX-4000 Series control unit(s) or DMX512 stageboards – and then to tell the dimmers their intensity levels. It is also used to select Values for each circuit:

- Circuit Level - allows a way to view the intensity being sent to the dimmer or manually take over control of the dimmer's output. See description in the Troubleshooting section.
- Load Type - to be changed to match the load to the Load Type value. Non-Dim 4 must be used if the Load is not dimmable.
- Control and Zone Assigned - allows two ways of assigning a control and zone to a specific circuit.
  1. 'w/ Circuit Schedule' allows a Control and Zone (such as 'A2', '3') to be directly entered into the Circuit Selector.
  2. 'w/ Zone Capture' allows a Control and Zone to be 'captured' by the Circuit Selector by doing the following:
    - A. Press and hold buttons 1 and 5 until the Select Value LED lights.
    - B. Press button 5 repeatedly until the Zone Capture LED lights. The circuit will now flash.
    - C. Use buttons 1 and 2 to choose the correct circuit to be assigned.
    - D. Go to the GRX-4000 Series control unit to be assigned to this circuit.
    - E. Select Scene 1.
    - F. Identify the zone to be assigned to this circuit.
    - G. Press the zone 6 button until all zone LEDs are off.
    - H. Press the zone 5 button until the load starts tracking the zone intensity LEDs.
    - I. Press the zone 6 button until all zone LEDs are off. (Steps H. and I. must take less than 15 seconds or the circuit selector will not lock on the captured zone.)
    - J. Go back to the Circuit Selector and the proper control and zone should be displayed. Repeat this process for any other circuits.
    - K. Press and hold buttons 1 and 5 until the VIEW VALUE LED lights.
- Low and High End trims - allows the circuit's range limits to be adjusted.
- The Value window will display the software revision level of the circuit selector 20 minutes after the last button press.

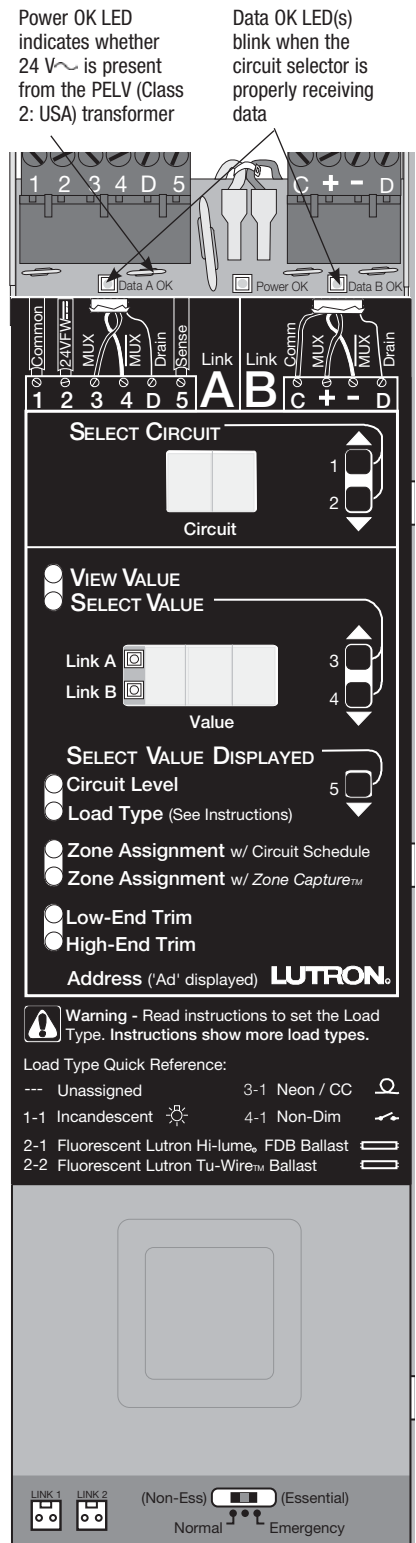
## Set Normal/Emergency Switch

**Note:** This step is only performed if there are any panels with Emergency (Essential) lighting circuits on the job. Panels are shipped with switch 6 (located at the base of each circuit selector) in the center position for normal operation (without any Emergency/Essential lighting circuits). When switch 6 is in its center position (as shipped), terminal 5 has no affect on the circuit selector operation.

1. Identify a panel supplied with Normal (Non-Essential) power. Move its switch 6 to the left position.
2. For all the Emergency (Essential) lighting panels, move switch 6 to the right position. In this arrangement, the Emergency (Essential) Lighting panel will "sense" the Normal (Non-Essential) panel's power. When Normal (Non-Essential) power is removed, the Emergency (Essential) lighting will go to 'ord' override levels (factory set to 100%).

## Notes

- If there is no Normal panel, contact Lutron Technical Support.
- Override ('ord') Level is factory set to full output (100). If less than full output is needed, contact Lutron.
- Loss of Normal (Non-Essential) power can be simulated by turning off all connected Normal (Non-Essential) panel's control breaker.



The circuit selector can also provide or receive a sense line depending on the location of switch 6 (SW6).

### SW6 Switch Settings

- Normal (non-essential)
- Normal (as shipped)
- Emergency (essential)

# Assign Load Types

Assigning load types is done using the circuit selector located in each panel.

## To view present load types:

Press button 5 to step through the Value displays until Load Type LED lights. Use buttons 1 and 2 to view present load type of each circuit. Note that ' - - - ' in the Value display means a load type is not assigned to the circuit. If load types are already assigned, compare them to the circuit directory (if provided). If there are no changes to be made, go to page 13, Assign Primary Zones.

## To change load types:

- Press and hold buttons 1 and 5 until SELECT VALUE LED blinks once per second.
- Press button 5 until the Load Type LED lights.
- Choose circuit number with buttons 1 and 2.
- Use buttons 3 or 4 to display the load type (see below) in Value window.
- Repeat steps C and D for each circuit.
- Press and hold buttons 1 and 5 until the VIEW VALUE LED lights.

## Load Type Display

The load type is shown in the Value window. Use buttons 3 and 4 on the circuit selector to scroll through the choices and find the appropriate type.

-- -	Unassigned (All intensities except 0 = On)		
1 - 1	Incandescent, Tungsten	<b>Hi-2 Baud Rate</b>	
2 - 1	Fluorescent: Lutron Hi-Lume FDB or Eco-10	4 - 1	Non-Dim: All intensities except 0% = On (first on, last off)
2 - 2	Fluorescent: Lutron Tu-Wire®	4 - 2	Non-Dim: Intensities above 60% = On, below 40% = Off (non-dim slider)
2 - 3	Fluorescent: 0-10 V, with TVM module	4 - 3	Non-Dim: All intensities except 0% = On (first on, last off)
2 - 4	Fluorescent: PWM, with TVM module	4 - 4	Non-Dim: All intensities except 0% = On (first on, last off)
2 - 5	Fluorescent: Tridonic® DSI, with TVM module		
2 - 6	Fluorescent: Tridonic® DSI (electronic off), with TVM module	<b>Hi-1 and Lo Baud Rates</b>	
2 - 7	DALI <sup>1</sup> , with TVM module	4 - 1	Non-Dim: 0-99% = Off; 100% = On (last on, first off)
2 - 8	Fluorescent: Tridonic® DSI (logarithmic dimming curve), with TVM module	4 - 2	Non-Dim: Intensities above 60% = On, below 40% = Off (non-dim slider)
2 - 9	DALI1 (logarithmic dimming curve), with TVM module	4 - 3	Non-dim: 0-99% = Off; 100% = On (last on, first off)
2 - A	Fluorescent: 10-0 V (10 V = 1%; 0 V = 100%), with TVM module	4 - 4	Non-Dim: 0% = Off, 0-1% = turn On, 100-99% = turn Off (first on, first off)
3 - 1	Neon/Cold Cathode		
5 - 1	Electronic Low-Voltage		
6 - 1	Magnetic Low-Voltage		
7 - 1	Fan		
8 - 1	Motor		
-- A	Auto phase		

<sup>1</sup>Intensity broadcasts only; individual ballast addressing not possible

**Warning!** Failure to correctly assign load type may damage loads—especially certain electronic transformers, electronic ballasts, and motors. Verify with transformer or ballast manufacturer that product can be dimmed with phase control dimming before setting to any load type other than non-dim.

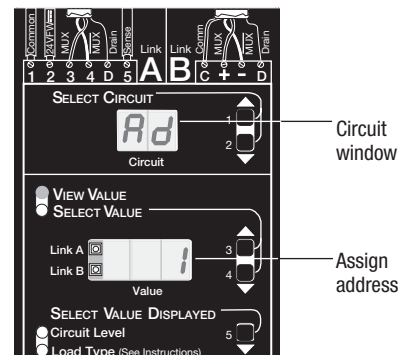
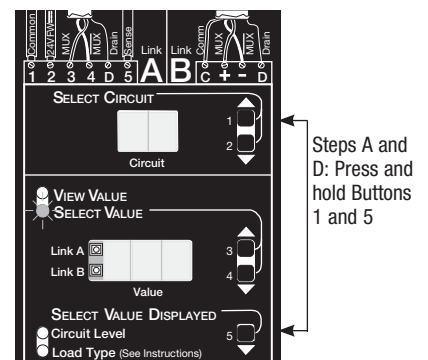
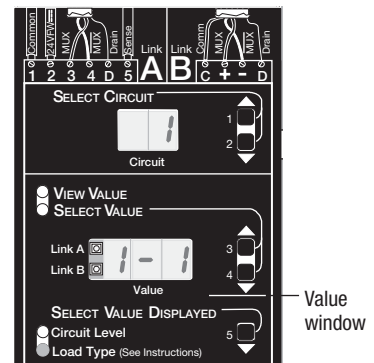
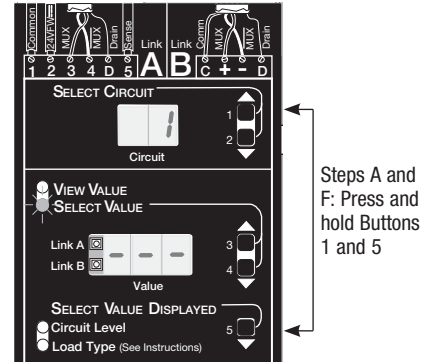
## Address the Circuit Selector

If you are using *GRAFIK Liaison* software, the circuit selector must be addressed to download information.

- To set or change the address, press and hold buttons 1 and 5 until the Select Value LED flashes once per second.
- Press button 5 on the circuit selector until "Ad" is displayed in the Circuit window. If the Value window displays an address other than '-', the address has already been set (proceed to Step D).
- Use button 3 or 4 to assign an address (1-512) to the circuit selector. This address should match the address in the job drawing.
- Press and hold buttons 1 and 5 until the View Value LED lights.

## Notes

- Mark addresses on a circuit directory for future reference.
- If 'LC' is displayed in the circuit window, the circuit selector is locked out. Contact Lutron for assistance.



## Assign Primary Zones

See page 25 for the Control Directory worksheets for recording zone assignments.

- Press and hold buttons 1 and 5 until the Select Value LED flashes once per second.
- Press button 5 repeatedly until the Zone Assignment w/Circuit Schedule LED lights.
- Select the primary zone assignment.

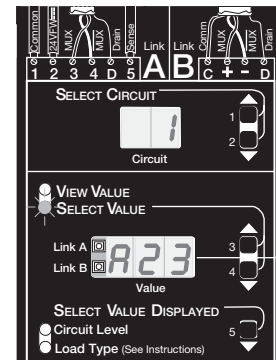
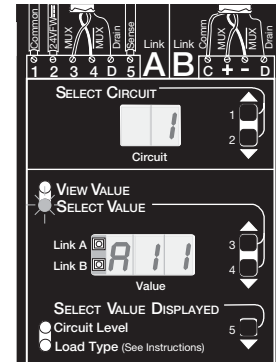
For GRX 4000 Series: Press button 3 or 4 to select both control unit and zone assignment. Example: If the control desired is addressed to 'A2' and the zone desired is the 3rd from the left, use buttons 3 and 4 to get 'A23' as a value for the appropriate circuit.

For DMX512: (2Link only) Press button 3 or 4 to select zone assignment (1-512).

- Use buttons 1 and 2 to change to the next circuit, then repeat Step C. Do this for all affected circuits. Record each circuit's control and zone on a Circuit Directory.
- Press and hold buttons 1 and 5 until the View Value LED lights.

### Notes

- The circuit selector's display will go out automatically 20 minutes after the last button press.
- More than one circuit can be assigned to the same zone.
- Zone Capture™ is an alternate method for assigning zones. It is described on the opposite page.
- 2Link only- The Link A and Link B LEDs located next to the Value window indicate which link is being assigned as per the hierarchy. To set the hierarchy, see page 15.



## Set Low or High End

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



**Warning!** Do not reduce the low end or increase the high end on a fluorescent load type. This will decrease lamp life and may damage the ballasts. Do not increase the high end of neon/cold cathode. This may overdrive the lamps and cause decreased tube life.

### To change the setting:

- Press and hold buttons 1 and 5 until the Select Value LED lights.
- Press button 5 repeatedly until the Low End Trim LED or the High End Trim LED lights.
- Use buttons 1 and 2 to go to the circuit that needs to be changed.
- Use buttons 3 and 4 to reset the trim as desired. The load will go to the new setting while in this mode despite the GRX control's intensity.

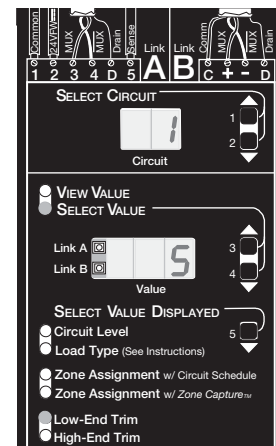
### Notes

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

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

- Use buttons 1 and 2 to go to another circuit that needs to be changed and repeat Step D.
- Press and hold buttons 1 and 5 until the VIEW VALUE LED lights.

**Note:** The circuit selector's display will go out automatically 20 minutes after the last button press.



## Assign Link Hierarchy (2Link™ only)

Link hierarchy is used only when there are two control links. Each circuit can be assigned to a hierarchy listed below (see job prints if predetermined). If you are not sure if you have a 2Link circuit selector, please call Lutron Technical Support.

- A. To view or assign the Link Hierarchy, press and hold buttons 2 and 5 until Select Value LED flashes twice repeatedly.
- B. Press button 5 until the Circuit Level LED lights.
- C. Use buttons 1 and 2 to choose circuit number.
- D. Use buttons 3 and 4 to assign the Link Hierarchy (see Table for options).
  - If Link Hierarchy A or b is selected, go to Step I.
  - If Link Hierarchy A2 or b2 is selected, go to Step E.
  - If Link Hierarchy A1, b1, Ab1, or Ab2 is selected, go to Step G.
- E. Press button 5 until Load Type LED lights.
- F. Select Zone X.

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

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

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

- H. Select the Secondary zone assignment.

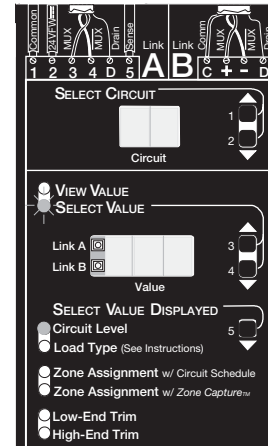
4000 Series on Secondary Link: Press button 3 or 4 to select both control unit and zone assignment. Example: If the control desired is addressed to 'A2' and the zone desired is the 3rd from the left, use buttons 3 and 4 to get 'A23' as a value for the appropriate circuit.

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

**Note:** Primary Zone assignment is covered on page 13 of this guide; if primary link is changed to B, repeat those steps to update your system.

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

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



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

## Maintenance

### Wallstations and Key Switches

Clean front surfaces of wallstations and key switches with a soft towel moistened with a mild soap solution (non-ammonia based). Clean approximately every six months.



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

### Panels

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

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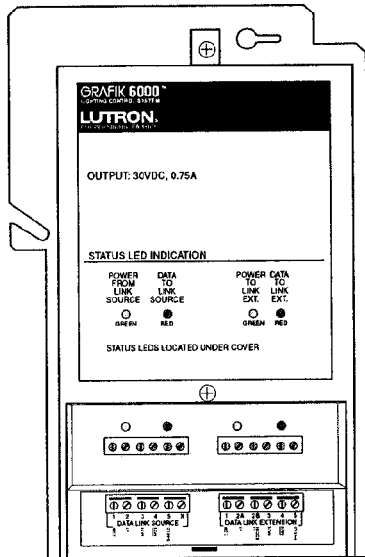
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## Description

The Link Booster allows Wallstation or Dimmer Panel Links to be extended beyond their normal maximum distances. Included are:

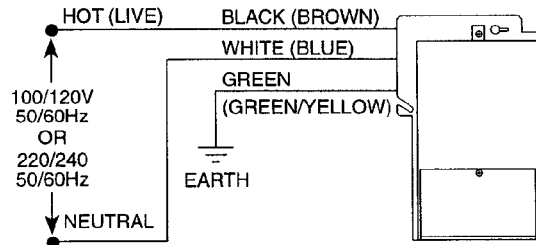
- (1) MX-RPTR-100/120 or MX-RPTR-220/240
- (2) LT-1 Link Termination Assembly

## Important Notes

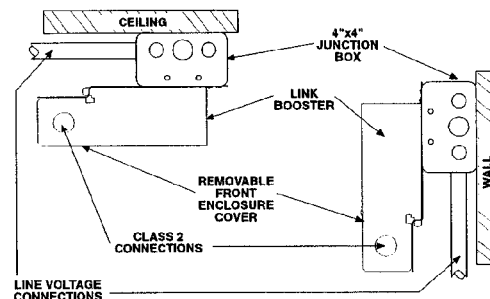
1. READ ALL INSTRUCTIONS CAREFULLY BEFORE STARTING INSTALLATION.
2. The Link Booster must be installed by a qualified electrician.
3. Install in accordance with all local and national electrical codes.
4. Power must be OFF at the breaker or fuse supplying power to the Link Booster and the GRAFIK 6000 Processor Panel before installing. Do not connect high-voltage power to low-voltage terminals. Improper wiring can result in personal injury or damage to the control and to other equipment.
5. Link Booster may be installed up to 2000 ft. (600 m) maximum from the lighting control panel to provide an additional 2000 feet (600 m) of capacity. Up to three Link Boosters can be installed on a link to increase the link wiring length. Each Link Booster can power only 24 of the 32 maximum wallstation controls; or 0.75A.
6. The wire connectors provided are suitable for copper wire only. They can be used to join one #18, #16, #14, #12, or #10 AWG (1.0—3.0 mm<sup>2</sup>) with one or two #14 or #12 AWG.

## Installation on a Wallstation Link

1. **Prewiring:** The Wallstation Link requires special wiring considerations. Refer to the GRAFIK 6000 Installation Guide and Lutron job drawings for wiring restrictions and limitations that apply to your specific project. Pull a power feed to the junction box where the Link Booster will be mounted. Power feed is only required when used on a Wallstation Link. Junction box may be wall-mounted or ceiling-mounted. Refer to local codes for additional mounting restrictions.
2. Turn power OFF.  
**WARNING: Always turn the Link Booster power and the power to the GRAFIK 6000 Processor Panel off before doing any work. Failure to do so can result in serious personal injury and damage to equipment.**
3. Strip wires so  $\frac{3}{8}$  in. (9.5 mm) of bare wire is exposed. Connect the line voltage wiring to the wires exiting from the rear of the Link Booster as shown.



4. Mount the Link Booster to the junction box as shown in either Mounting Diagram. Unscrew and remove the front enclosure cover to expose the Class 2/PELV terminals and Status LEDs.



Mounting Diagrams

5. Strip insulation from Wallstation Link wires so  $\frac{3}{8}$  in. (9.5 mm) bare wire is exposed. The terminals will accept up to two #18 AWG (1.0 mm<sup>2</sup>) wires. If wires are larger, splice a #18 wire to the wires to make the connection.

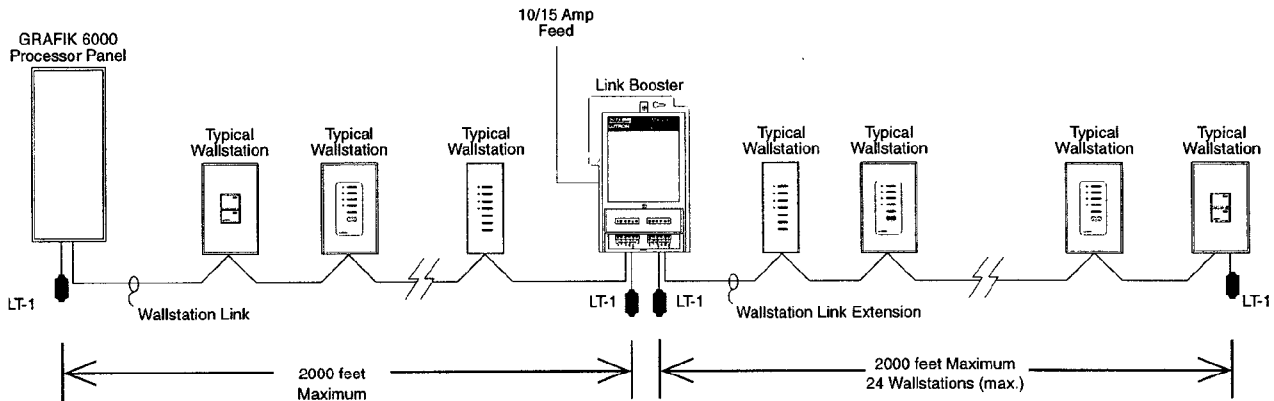


- Review Wallstation Link Application No. 1 and No. 2 and wire the Link Booster into the Wallstation Link as shown in the appropriate drawings. LT-1s, Link Termination Assemblies, are required at each end of the Wallstation Link as shown. Confirm all connections.

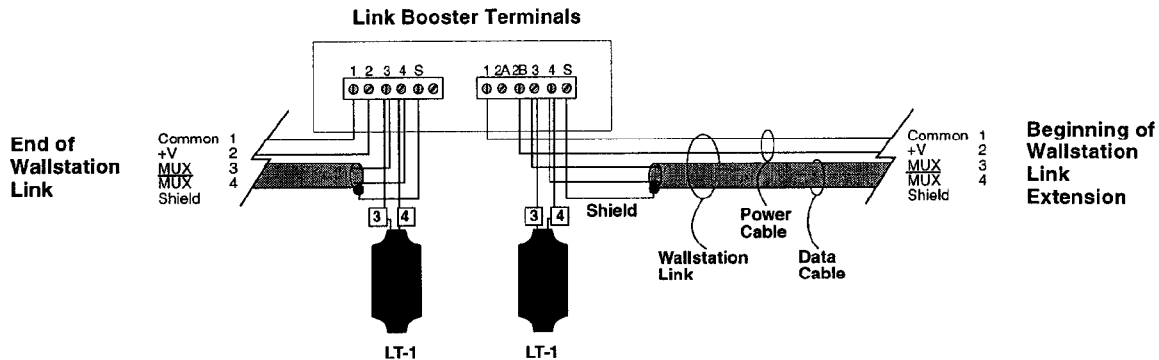
- Replace front enclosure cover. Restore power to the Link Booster and the GRAFIK 6000 Processor Panel **after** installation of the system is complete.

## Wallstation Link Application No. 1: Extension Wiring (Used to extend Wallstation Link length)

### Wiring Overview



### Link Booster Wiring Detail



#### Wiring Notes:

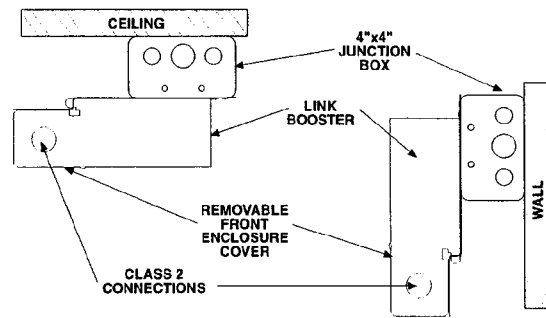
- Lutron recommends that the connection of the Link Booster to the Wallstation Link be made inside the Link Booster. If a junction box (provided by others) is used instead, locate the box no more than 8 ft. (2.4 m) from the Link Booster.
- Wallstation Link wiring must not be run in the same raceway as line voltage (main voltage) wiring.
- Neither the Wallstation Link nor the Wallstation Link Extension can exceed 2000 ft. (600 m) in length.
- Data cable shield must be maintained throughout the Wallstation Link. **DO NOT** connect the shield to earth ground.
- Refer to the GRAFIK 6000 Installation Guide and Lutron job drawings for power cable and data cable (Wallstation Link) wiring restrictions and limitations.
- Wallstation Link requires an LT-1, Link Termination Assembly, at each end of the Wallstation Link and each end of the Wallstation Link Extension.





## Installation on a Dimmer Panel Link

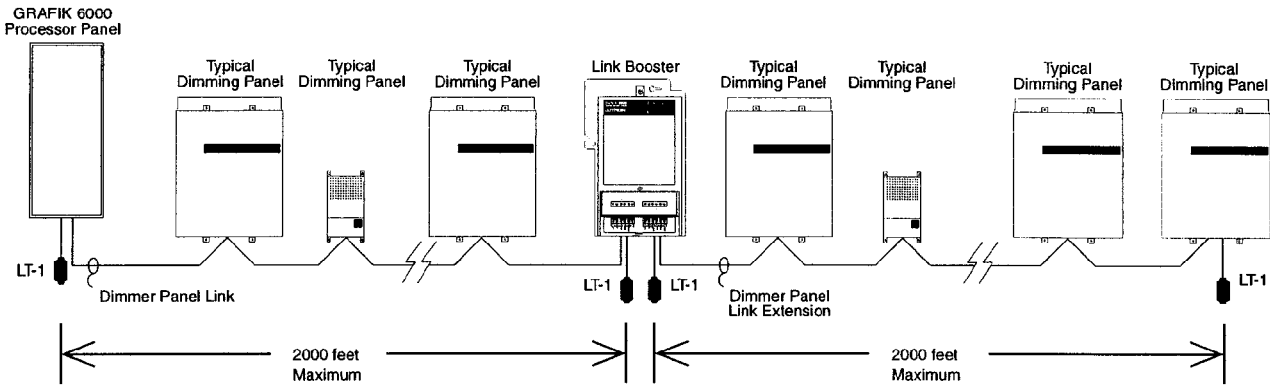
- 1. Prewiring:** The Dimmer Panel Link requires special wiring considerations. Refer to the GRAFIK 6000 Installation Guide and Lutron job drawings for wiring restrictions and limitations that apply to your specific project.
- 2. Turn power OFF.**  
**WARNING:** Always turn off power to the GRAFIK 6000 Processor Panel before doing any work. Failure to do so can result in serious personal injury and damage to equipment.
- 3.** Using the wire connectors provided, cap off the three wires on the Link Booster. These wires are only used when installing the Link Booster to boost a Wallstation Link.
- 4.** Mount the Link Booster to the junction box in one of two ways as shown in the Mounting Diagram at right. The Link Booster may be wall-mounted or ceiling-mounted. Refer to local electrical codes for additional restrictions. Unscrew and remove the front enclosure cover to expose the Class 2 terminals.
- 5.** Strip insulation from Dimmer Panel Link wires so  $\frac{3}{8}$  in. (9.5 mm) bare wire is exposed. The terminals will accept up to two #18 AWG (1.0 mm<sup>2</sup>) wires. If wires are larger, splice a #18 AWG (1.0 mm<sup>2</sup>) wire to the wires to make the connection.
- 6.** Review Dimmer Panel Link Application No. 1 and No. 2 on the pages that follow and wire the Link Booster into the Dimmer Panel Link as shown in the appropriate drawing. LT-1s, Link Termination Assemblies, are required at each end of the Panel Link as shown. Confirm all connections.  
**Note:** When an installation uses a "sense line," the "sense line" (wire 5) must be maintained throughout the link; but, it does not connect to the Link Booster. For additional information about the "sense line," consult the panel to panel wiring section of the GRAFIK 6000 Installer's Guide.
- 7.** Replace front enclosure cover. Restore power to the GRAFIK 6000 Processor Panel **after** the installation of the system is complete.



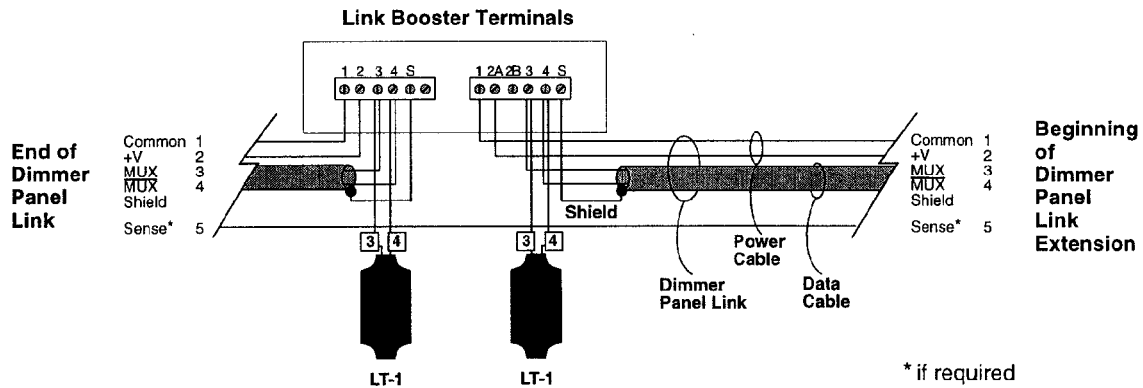
Mounting Diagrams

# Dimmer Panel Link Application No. 1: Extension Wiring (Used to extend Dimmer Panel Link length.)

## Wiring Overview



## Link Booster Wiring Detail



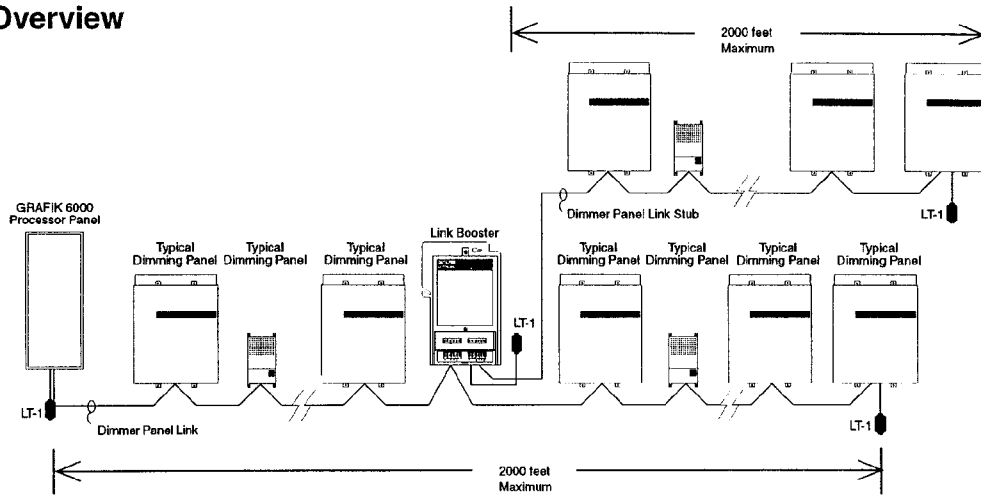
\* if required

### Wiring Notes:

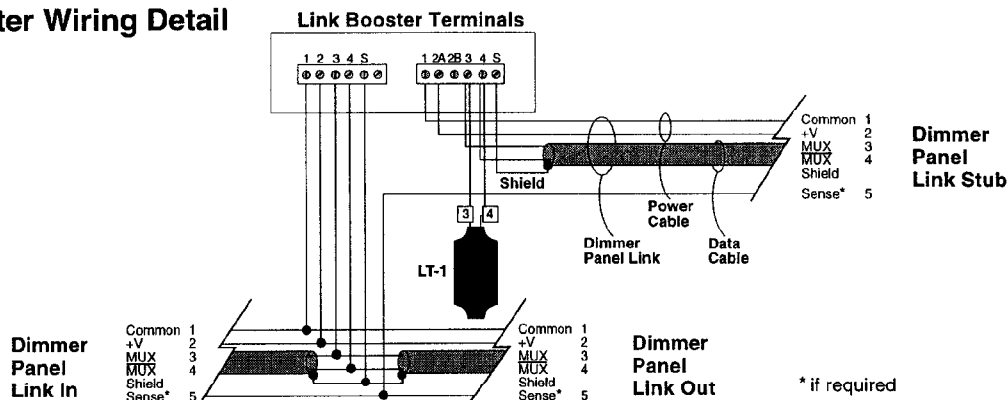
1. Lutron recommends that the connection of the Link Booster to the Dimmer Panel Link be made inside the Link Booster. If a junction box (provided by others) is used instead, locate the box no more than 8 ft. (2.4 m) from the Link Booster.
2. Dimmer Panel Link wiring must not be run in the same raceway as line voltage (main voltage) wiring.
3. Neither the Dimmer Panel Link nor the Dimmer Panel Link Extension can exceed 2000 ft. (600 m) in length.
4. Data cable shield must be maintained throughout the Dimmer Panel Link. **DO NOT** connect the shield to earth ground.
5. Refer to the GRAFIK 6000 Installation Guide and Lutron job drawings for power cable and data cable (Dimmer Panel Link) wiring restrictions and limitations.
6. Dimmer Panel Link requires an LT-1, Link Termination Assembly, at each end of the Dimmer Panel Link and each end of the Dimmer Panel Link Extension.

# Dimmer Panel Link Application No. 2: Stub Wiring (Used to correct a branched or "T-tapped" section of Dimmer Panel Link)

## Wiring Overview



## Link Booster Wiring Detail



### Wiring Notes:

- Lutron recommends that the connection of the Link Booster to the Dimmer Panel Link be made inside the Link Booster. If a junction box (provided by others) is used instead, locate the box no more than 8 ft. (2.4 m) from the Link Booster.
- Dimmer Panel Link wiring must not be run in the same raceway as line voltage (main voltage) wiring.
- Neither the Dimmer Panel Link nor the Dimmer Panel Link Stub can exceed 2000 ft. (600 m) in length.
- Data cable shield must be maintained throughout the Dimmer Panel Link. **DO NOT** connect the shield to earth ground.
- Refer to the GRAFIK 6000 Installation Guide and Lutron job drawings for power cable and data cable (Dimmer Panel Link) wiring restrictions and limitations.
- Dimmer Panel Link requires an LT-1, Link Termination Assembly, at each end of the Dimmer Panel Link and each end of the Dimmer Panel Link Stub.

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### WARRANTY

Lutron warrants each new unit to be free from defects in materials and workmanship and to perform under normal use and service. This warranty shall run only for a period of one year from the date of purchase and Lutron's obligations under this warranty are limited to remedying any defect or replacing any defective part and shall be effective only if the defective unit is shipped to Lutron postage prepaid within 12 months after purchase. Damage due to abuse, misuse, inadequate wiring or installation is not covered by this warranty.

In no event shall Lutron or any other seller be liable for any other loss or damage, including consequential or special damages that may arise through the use by a purchaser or others of this device and the purchaser assumes and will hold harmless Lutron in respect of all such loss.

Although every attempt is made to ensure that catalogue information is accurate and up-to-date, please check with Lutron before specifying or purchasing this equipment to confirm availability, exact specifications and suitability for your application.

This product may be covered by one or more of the following U.S. patents: 4,797,599; 4,803,380; 4,825,075; 4,893,062; 5,030,893; 5,191,265; 5,430,356; 5,463,286; 5,530,322; DES 308,647; DES 310,349; DES 311,170; DES 311,371; DES 311,382; DES 311,485; DES 311,678; DES 313,738; DES 335,867; DES 344,264 and corresponding foreign patents. U.S. and foreign patents pending.

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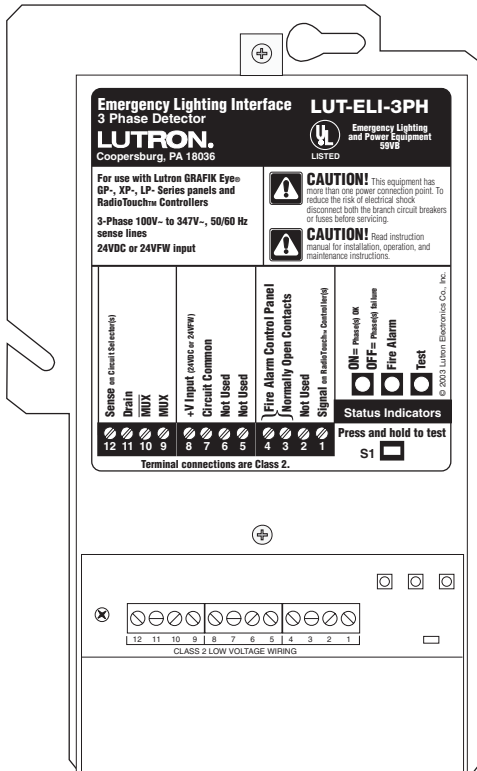
# LUTRON®


Lutron Electronics Co., Inc.  
Made and printed in U.S.A. 8/98  
P/N 040-096 Rev B

# Emergency Lighting Interface LUT-ELI-3PH and LUT-ELI-1PH

For use with Lutron GRAFIK Eye® GP, XP, LP panels and RadioTouch™ lighting controls

## Installation and Operating Instructions



 **Caution:** This device does not provide emergency power. An emergency (Essential) power source must be provided.

### Listing

The Emergency Lighting Interface – LUT-ELI is **UL924 Listed** as “Emergency Lighting and Power Equipment.” The interface shall be used with Lutron *GRAFIK Eye* GP, LP dimming panels, XP switching panels, and *RadioTouch* Controllers only.

### Description

The LUT-ELI senses the line voltage on all three phases (3PH) or a single phase (1PH) and controls the emergency signal to the *RadioTouch* Controller or Circuit Selector for GP, XP, and LP panels. When one or more phases of power are lost, the LUT-ELI sends a signal to the *RadioTouch* Controller or Circuit Selector activating the emergency lighting mode. Any lights controlled by these devices will go to the emergency light level setting (factory set to 100% intensity). When normal power is restored, the lights will return to their previous intensities.

### System Ratings

Voltage – 100 VAC–347 VAC 50/60 Hz, 1 and 3 phase versions  
Current – 20 Amp maximum circuit breaker

### Features

- Can be added to an existing system.
- Status indicator, indicates the phase status. Indicator ‘ON’ is normal mode, ‘OFF’ is emergency mode.
- A test switch is provided to perform a functional test of the system by simulating an emergency situation.
- The interface has inputs for a Fire Alarm Control Panel (FACP). A maintained dry contact closure received between the FACP inputs will actuate the emergency mode.

### Note:

One LUT-ELI can be used with up to 32 Circuit Selectors or 100 *RadioTouch* Controllers.

## Important Safeguards

- Read and follow all safety instructions.
- Do not use outdoors.
- Do not let power supply cords touch hot surfaces.
- Do not mount near gas or electric heaters.
- Equipment should be mounted in locations and at heights where it will not readily be subjected to tampering by unauthorized personnel.
- The use of accessory equipment not recommended by the manufacturer may cause an unsafe condition.
- Do not use this equipment for other than intended use.
- All servicing should be performed by qualified service personnel.

## Save these instructions.

### Important Notes

1. Observe all national and local electrical codes and safety standards.
2. Follow these instructions.
3. Turn off power before installation.



**Danger** – Locate and lock the supply breaker(s) in the OFF position, or remove the supply fuse(s) before continuing. This equipment may have more than one power connection point.



**Important** – Line voltage input to the LUT-ELI MUST be from the NORMAL (Non Essential) power source.

## Table of Contents

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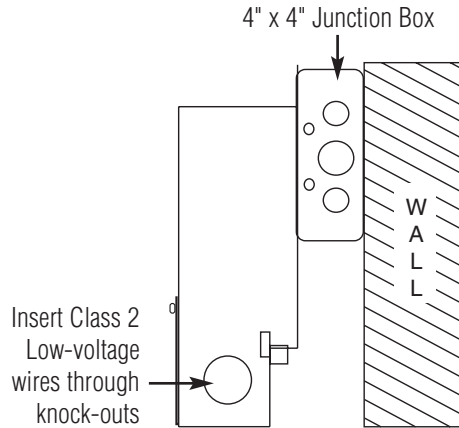
# Hardware Installation

## LUT-ELI and *RadioTouch* Line Voltage Connections

### Mounting the Interface

Mount the LUT-ELI onto a 4" x 4" junction box (not included, but available – Lutron part number 241-496).

Insert the Class 2 wires – through knock-outs as shown in the diagram. Remove front enclosure cover to expose the terminal blocks, test switch, and the status LEDs.



Connect the Class 2 wires to the Circuit Selector or *RadioTouch* Controller. Wiring to these devices will be described in the following steps.



**Caution** – Be sure all the power wires are completely inside the junction box before tightening the mounting screws.

**Note:** For emergency fixtures (fixtures that never turn off or have a battery back-up ballast in the fixture), call the Lutron Technical Support Center, (800) 523-9466 for restrictions and wiring requirements.

### Installation of LUT-ELI with Line Voltage Connections in a *RadioTouch* System

#### Step 1: Wiring from Mains

##### Turn power off

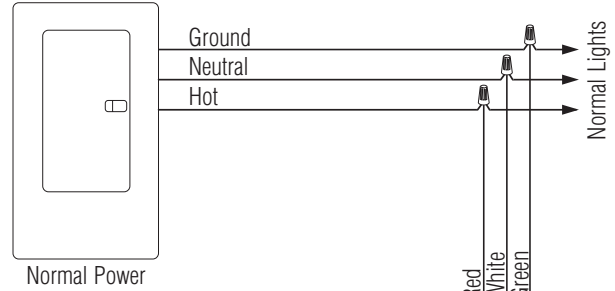


**Danger** – Locate and lock the supply breaker(s) in the OFF position, or remove the supply fuse(s) before continuing. This equipment may have more than one power connection point.



**Important** – Line voltage input to the LUT-ELI MUST be from the NORMAL power source. The LUT-ELI accepts 100 VAC-347 VAC 50/60 Hz input.

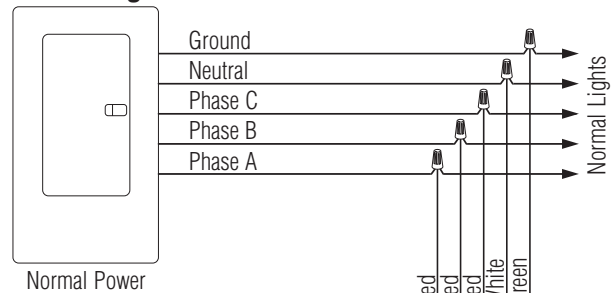
#### Single Phase Diagram



#### Guide to Power Source Wiring

Wire:	Connects to:
Red Wire	Hot
White Wire	Neutral
Green Wire	Ground

#### 3 Phase Diagram



#### Guide to Power Source Wiring

Wire:	Connects to:
Red Wire	Phase A
Red Wire	Phase B
Red Wire	Phase C
White Wire	Neutral
Green Wire	Ground



**Danger** – Proper short circuit and overcurrent protection must be provided at the distribution panel. You can use up to a **20A maximum** circuit breaker for your installation.



**Note:** If your *RadioTouch* Controller, model number RTA-RX-F, RTA-RX-F-SC, or RTA-RX-SW was shipped before August 1, 2002 please contact Lutron Technical Support at (800) 523-9466 before connecting your LUT-ELI.





# Hardware Installation

## LUT-ELI and *RadioTouch* Low-voltage (Class 2) Connections

**Note:** When wiring for a backup/emergency source of power the *RadioTouch* Controller (models RTA-RX-F, RTA-RX-F-SC, RTA-RX-SW), being used for the backup/emergency lights (Unit A & B) **cannot** be controlled by an occupant sensor. Units A and B DIP switch #2 must be in the down position.

### Step 2: Class 2 wiring to *RadioTouch* Controllers

One LUT-ELI can be connected in parallel with up to 100 *RadioTouch* Controllers.

**Step A** - Flip DIP switch #2 on the *RadioTouch* Controller to the down position.

**Step B** - Disconnect any occupant sensors wired to the *RadioTouch* Controller.

**Step C** - Make the following connections.

LUT-ELI	<i>RadioTouch</i> Controller
Terminal 8 (+24V)	Terminal 4 (+24V), Unit A only
Terminal 7 (Common)	Terminal 6 (Circuit Common)
Terminal 1 (Signal)	Terminal 2 (Occ. Signal)



**Important Note:** When wiring multiple *RadioTouch* Controllers to the same emergency closure circuit, **only one Controller can be connected to the +24 (number 4) terminal.** Wiring +24 to multiple Controllers can damage your *RadioTouch* Controller and/or the LUT-ELI. See diagram below.

### Step 3: Test the System

Please perform the following tests to ensure proper installation.

Loss of Normal (Non-Essential) power can be simulated by turning off one of the Normal (Non-Essential) phase(s) breaker(s) that the LUT-ELI is monitoring.

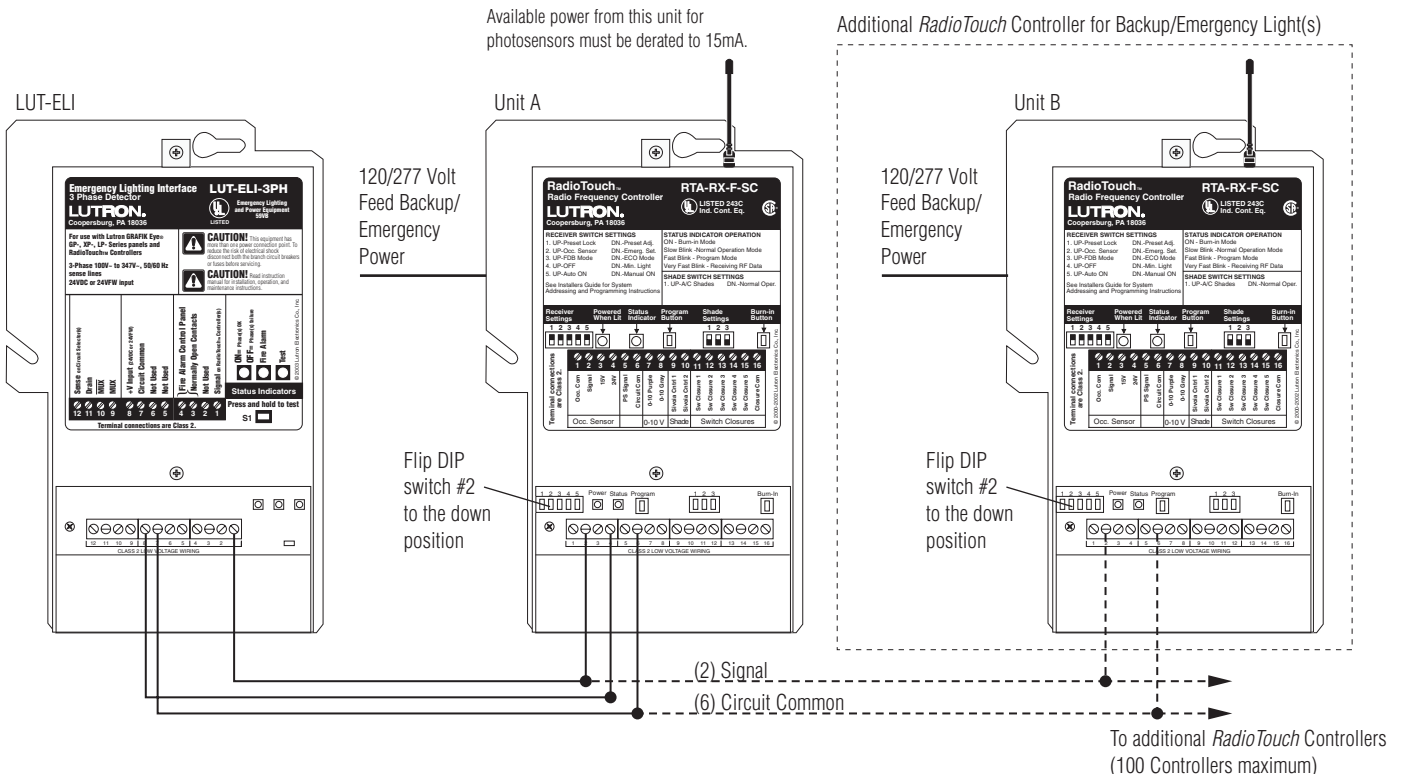
You should expect the following,

- All lights controlled by Emergency (Essential) Panel will go to FULL INTENSITY (factory set).
- PHASE ON/OFF Status Indicator (Green) will turn OFF as the above test creates a phase failure.

Or, press and hold Switch SW1 on the LUT-ELI

You should expect the following,

- TEST LED (Orange) will turn ON.
- All lights controlled by Emergency *RadioTouch* Controller will go to FULL INTENSITY (factory set).
- Note:** PHASE ON/OFF Status Indicator (Green) will not turn OFF as the above test does not create a phase failure.
- Upon releasing the switch SW1 all lights will return back to their original intensities.





# Hardware Installation

## LUT-ELI and *GRAFIK Eye* GP, XP, and LP Panel Line Voltage Connections

### Installation of LUT-ELI with Line Voltage Connections with *GRAFIK Eye* GP, LP, and XP Panels

#### Step 1: Wiring from GP panel or Wiring from Mains (XP, LP)

Turn OFF power.



**Danger** – Locate and lock the supply breaker(s) in the OFF position, or remove the supply fuse(s) before continuing. This equipment may have more than one power connection point.



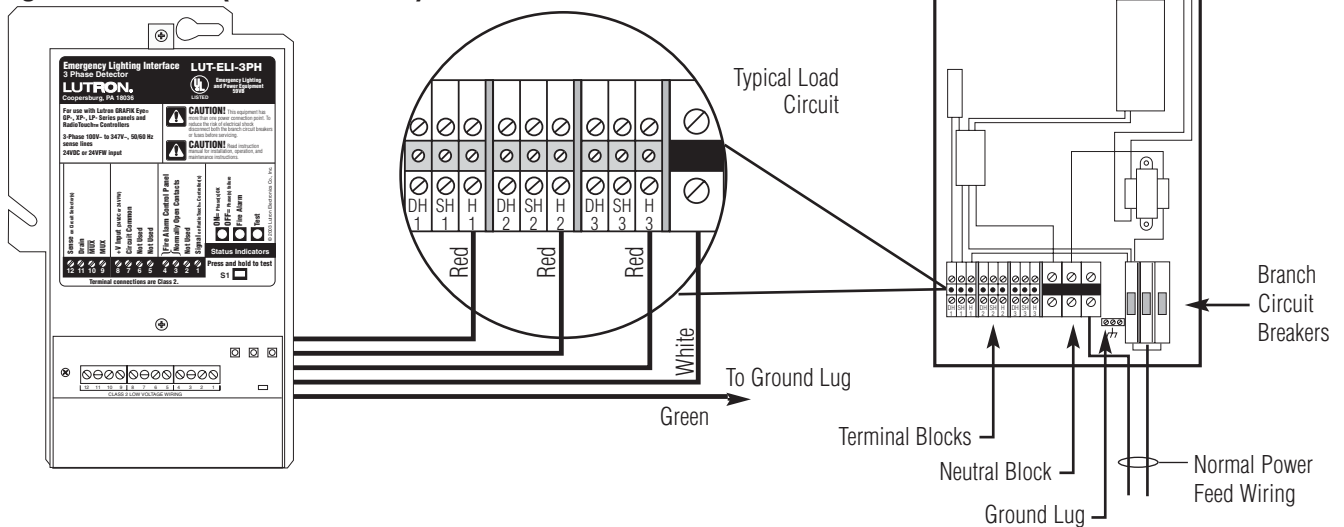
**Important** – Line voltage input to the LUT-ELI MUST be from the NORMAL power source – the same as to NORMAL (Non-Essential) panels.

For installation directly to XP and LP panels consult the Lutron Technical Support Center at (800) 523-9466.

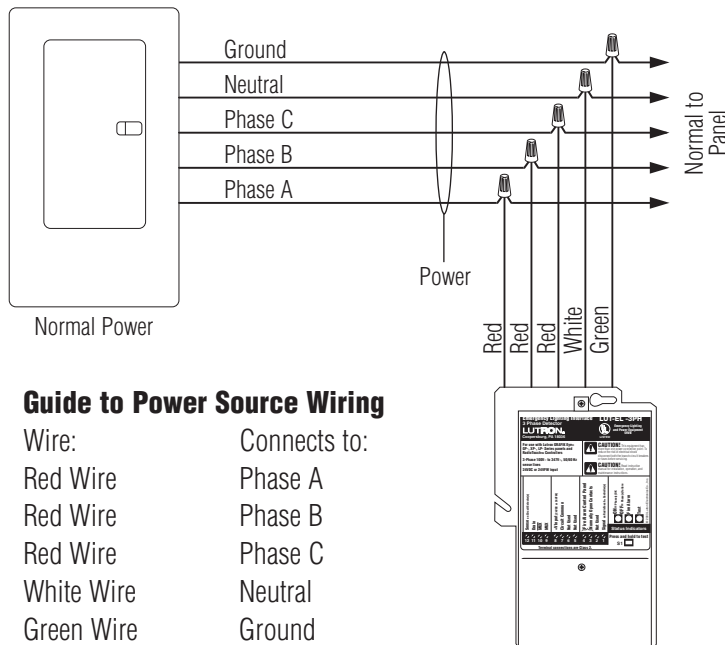


**Danger** – Proper short circuit and overcurrent protection must be provided at the distribution panel. You can use up to a **20A maximum** circuit breaker for your installation.

#### Option 1 Wiring from Normal (Non-Essential) GP Panel



#### Option 2 Wiring From Mains with GP, XP, and LP Panels



#### Guide to Power Source Wiring

Wire:	Connects to:
Red Wire	Phase A
Red Wire	Phase B
Red Wire	Phase C
White Wire	Neutral
Green Wire	Ground

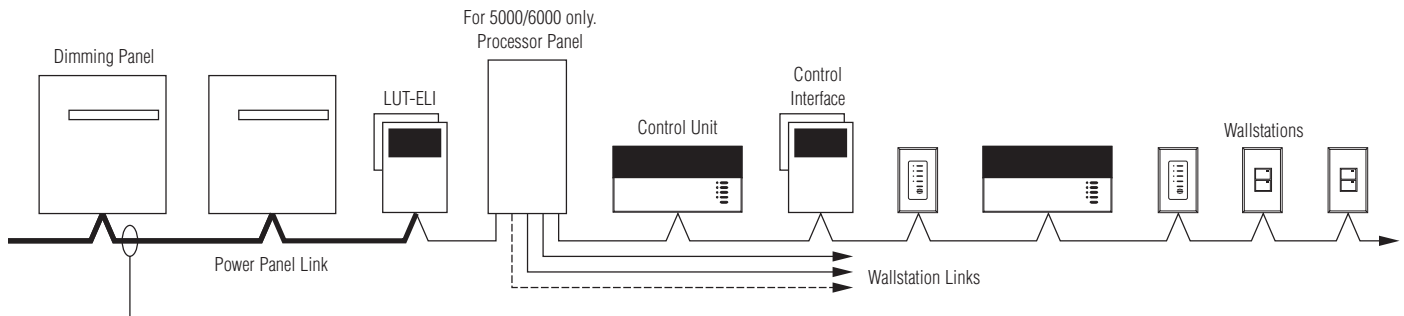


### Step 2: GP, XP, and LP Low-voltage Class 2 (PELV) Wiring

Pull low-voltage type Class 2 wiring for system communications.

- Must be daisy-chained!
- Must run separately from line (mains) voltage.

**Note:** LUT-ELI can be placed anywhere in the power panel link.



#### Panel-to-Panel wiring<sup>†</sup>

Include one extra #18 AWG (1.0 mm<sup>2</sup>). Used as a "sense line" for emergency (essential) lighting.

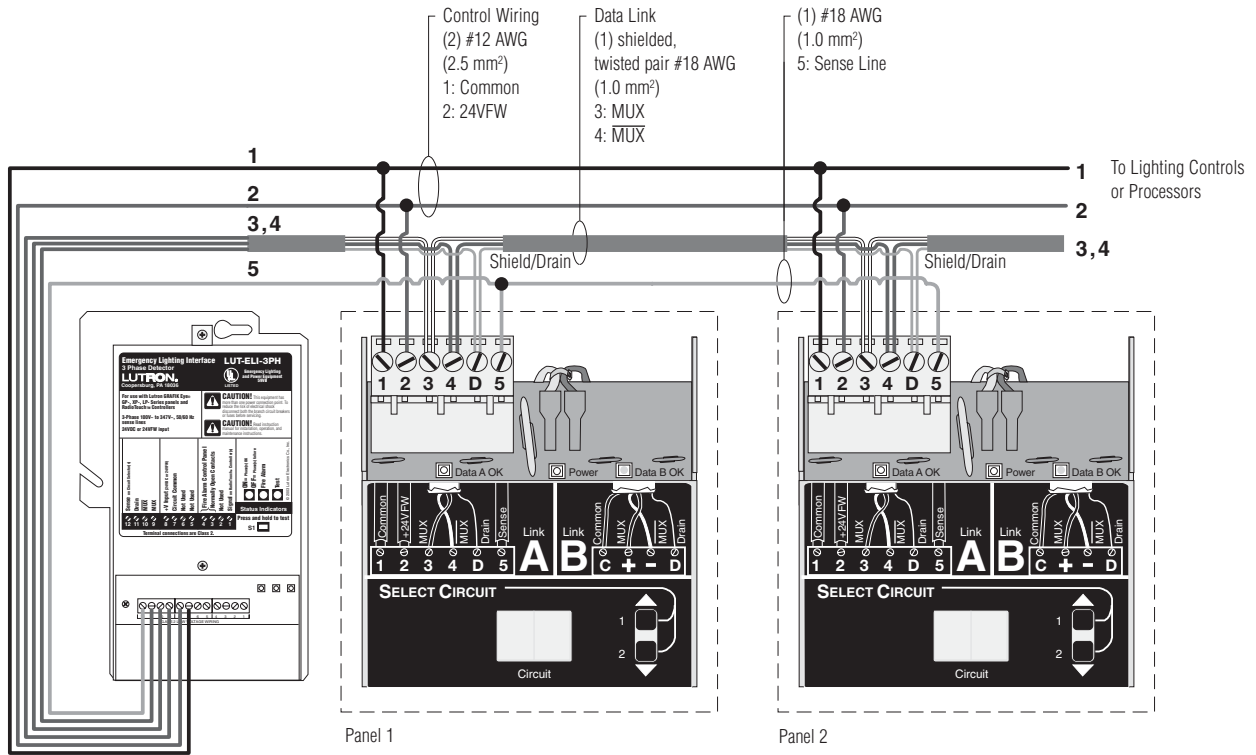
<sup>†</sup> If you use Lutron cable, you can use smaller-gauge wires.

- If a Class 2 (PELV) wiring link is less than 500 feet (152 m), you can use GRX-CBL-346S:
  - Two #18AWG (1.0 mm<sup>2</sup>) for control wiring.
  - One twisted, shielded pair #22 AWG (.625 mm<sup>2</sup>) for data link.
  - No "sense line" included - add your own #18 AWG (1.0 mm<sup>2</sup>).
- If a Class 2 (PELV) wiring link is 500 to 2000 feet (152 to 610 m), you can use GRX-CBL-46L:
  - Two #12 AWG (2.5 mm<sup>2</sup>) for control wiring.
  - One twisted, shielded pair #22 AWG (.625 mm<sup>2</sup>) for data link.
  - One #18 AWG (1.0 mm<sup>2</sup>) for sense line between Panels.
- Lutron has also approved smaller-gauge cable from Belden, Liberty, Alpha, and Signature. Ask for Lutron *GRAFIK Eye* Cable.



### Step 2: (Continued)

#### Class 2 (PELV) Panel-to-panel wiring (all models)



### Make the following connections.

#### LUT-ELI

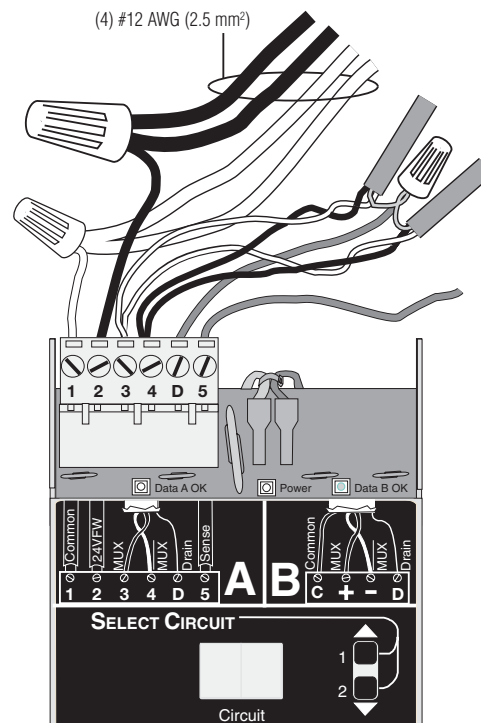
- Terminal 12 (Sense)
- Terminal 11 (Drain)
- Terminal 10 (MUX)
- Terminal 9 (MUX)
- Terminal 8 (+24V)
- Terminal 7 (Common)

#### Circuit Selector

- Terminal 5 (Sense)
- Terminal D (Drain)
- Terminal 4 (MUX)
- Terminal 3 (MUX)
- Terminal 2 (+24V)
- Terminal 1 (Circuit Common)

#### Notes:

1. Emergency Power: The additional #18 AWG (1.0 mm<sup>2</sup>) wire is a "sense" line from terminal 12 on the LUT-ELI. This sense line allows an Emergency (Essential) Lighting Panel to "sense" when Normal (Non-Essential) power is lost. If more than one Emergency Lighting Panel needs to sense off a specific LUT-ELI, you may have to run a dedicated wire between each LUT-ELI and Emergency (Essential) panel(s).
2. Shield/Drain: Connect shielding as shown.
  - Do not connect to Ground (Earth) or Circuit Selector.
  - Connect the bare drain wires and cut off the outside shield.



#### Class 2 (PELV) Terminal Connections

Each low-voltage Class 2 (PELV) terminal can accept only two #18 AWG (1.0 mm<sup>2</sup>) wires. Two #12 AWG (2.5 mm<sup>2</sup>) conductors won't fit. Connect as shown.



### Step 3: Set Circuit Selector Switch Position

#### Circuit Selector Switch (SW6) position (Normal/Emergency Switch)

Panels are shipped with SW6 (located at the base of each Circuit Selector) in the middle position.

#### All Emergency Panels

- Move SW6 to the right Emergency (Essential) position.

In this arrangement, the LUT-ELI will be the only unit controlling the sense line. If one or more phases go down, LUT-ELI sends a signal through the sense line to Emergency (Essential) panel(s). The lights controlled by these panels will go to 'ord' override levels (factory set to full intensity) When normal power is restored, lights will return to their previous intensities.

When SW6 is in its center position (as shipped), terminal 5 (sense) has no affect on the Circuit Selector operation.

 **Switch position SW6 on the Circuit Selector MUST be in the Right position on ALL EMERGENCY Panels.**

### Step 4: Test the System

Please perform the following tests to ensure proper installation.

Loss of Normal (Non-Essential) power can be simulated by turning off one of the Normal (Non-Essential) phase(s) breaker(s) that the LUT-ELI is monitoring.

You should expect the following,

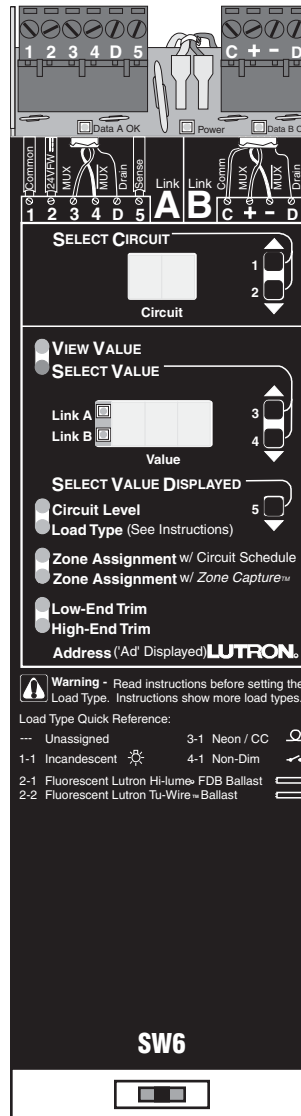
- PHASE ON/OFF Status Indicator (Green) will turn OFF as the above test creates a phase failure.
- Circuit Selector on Emergency (Essential) Panel will go to 'ord' override mode.
- All lights controlled by Emergency (Essential) Panel will go to FULL INTENSITY (factory set).
- All lights controlled by Normal (Non-essential) Panel will freeze at their respective intensities.

OR, Press and hold Switch SW1

You should expect the following,

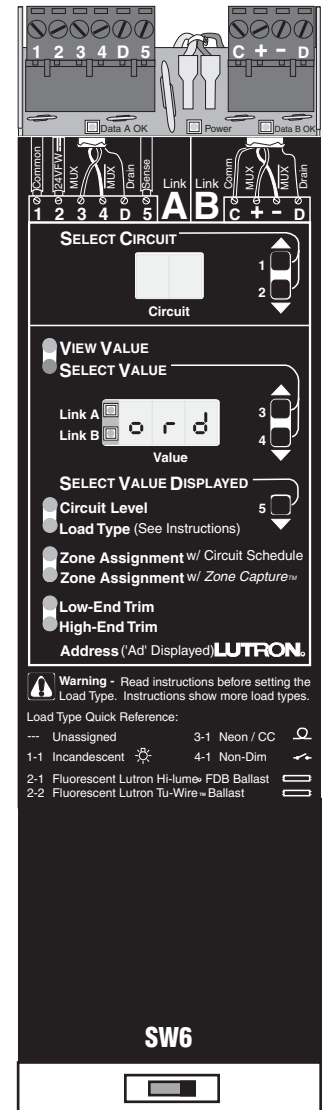
- TEST LED (Orange) will turn ON.
- NOTE:** PHASE ON/OFF Status Indicator (Green) will not turn OFF as the above test doesn't create a phase failure.
- Circuit Selector on Emergency (Essential) Panel will go to 'ord' override mode.
- All lights controlled by Emergency (Essential) Panel will go to FULL INTENSITY (factory set).

#### Circuit Selector in (Non-Emergency) Panel



**Keep in Middle Position**

#### Circuit Selector in Emergency (Essential) Lighting Panel

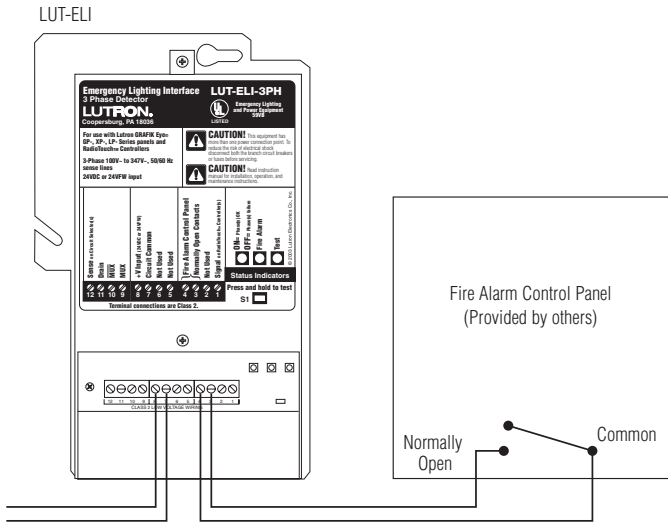


**Move Right**

- All lights controlled by Normal (Non-essential) Panel will freeze at their current intensities.
- Upon releasing switch SW1, all lights will return back to their previous intensities.



### Connections to Fire Alarm Control Panel (FACP) Low-voltage Class 2 Connections



To *RadioTouch* Controller or  
*GRAFIK Eye* Control Unit for +24V Power

**Note:** Wiring diagram does not show connections to Lutron lighting controls.



**Important** – Only use with normally open dry contact closure. When the contact closure is triggered it must be maintained for the LUT-ELI to go into Emergency Mode. Once the contact is released (open) the LUT-ELI will return the *GRAFIK Eye* GP, XP, LP panel(s) or *RadioTouch* Controller(s) back to normal operation mode.

Consult your Fire Alarm Control Panel's Instruction manual before connecting the LUT-ELI.



**Danger** – Do not connect any voltage source to the FACP inputs on the LUT-ELI. If voltage is provided by the FACP and connected to the LUT-ELI, it can damage the LUT-ELI.



## Troubleshooting

### LUT-ELI and *RadioTouch* Controllers

#### LUT-ELI Troubleshooting Guide

*RadioTouch* Controller

Symptom	Possible Cause	Solution
Lights are at full intensity and can not be controlled by an addressed transmitter	<ul style="list-style-type: none"> <li>LUT-ELI is not connected to Signal on the <i>RadioTouch</i> Controller</li> <li>One or more of the phases feeding the LUT-ELI are off (phase LED on the LUT-ELI will be off)</li> <li>Neutral is not connected on the LUT-ELI (phase LED on the LUT-ELI will be OFF)</li> <li>24VDC is not connected on the LUT-ELI (phase LED on the LUT-ELI will be OFF)</li> <li>There is a short across FACP and normally open contact (FACP LED will be ON)</li> </ul>	<p>Connect terminal 2 "signal" from the <i>RadioTouch</i> Controller to "signal on <i>RadioTouch</i> Controller" on the LUT-ELI</p> <p>Turn ON all normal power phases to LUT-ELI</p> <p>Connect neutral</p> <p>Connect terminal 4 "+24VDC" from <i>RadioTouch</i> Controller to "+24" on the LUT-ELI</p> <p>Remove short</p>



## LUT-ELI Troubleshooting Guide

*RadioTouch* Controller (continued)

Symptom	Possible Cause	Solution
Lights do not turn ON and do not go to high end when the test switch is pressed	<ul style="list-style-type: none"> <li>• DIP switch 2 on the <i>RadioTouch</i> Controller is in the UP position</li> <li>• 24VDC and signal are swapped</li> <li>• 24VDC and common wires are swapped</li> <li>• Common and signal are swapped</li> </ul>	<p>Move DIP switch 2 on the <i>RadioTouch</i> Controller to the DOWN position</p> <p>Connect terminal 4 “+24VDC” from the <i>RadioTouch</i> Controller to “+24” on the LUT-ELI and connect terminal 2 “signal” from the <i>RadioTouch</i> Controller to “signal on <i>RadioTouch</i> Controller” on the LUT-ELI</p> <p>Connect terminal 4 “+24VDC” from the <i>RadioTouch</i> Controller to “+24” on the LUT-ELI and connect terminal 6 “COM” from the <i>RadioTouch</i> Controller to “Common” on the LUT-ELI</p> <p>Connect terminal 6 “COM” from the <i>RadioTouch</i> Controller to “Common” on the LUT-ELI and connect terminal 2 “signal” from the <i>RadioTouch</i> Controller to “signal on <i>RadioTouch</i> Controller” on the LUT-ELI</p>
Lights do not turn ON and do not go to high end when one or more of the normal power phases are turned OFF	<ul style="list-style-type: none"> <li>• DIP switch 2 on the <i>RadioTouch</i> Controller is in the UP position</li> <li>• 24VDC and signal are swapped</li> <li>• That <i>RadioTouch</i> Controller is not powered by the emergency circuit power</li> <li>• The emergency transfer switch is not switching over</li> <li>• LUT-ELI is connected to the emergency circuit</li> <li>• 24VDC and common wires are swapped</li> <li>• Common and signal are swapped</li> </ul>	<p>Move DIP switch 2 on the <i>RadioTouch</i> Controller to the DOWN position</p> <p>Connect terminal 4 “+24VDC” from the <i>RadioTouch</i> Controller to “+24” on the LUT-ELI and connect terminal 2 “signal” from the <i>RadioTouch</i> Controller to “signal on <i>RadioTouch</i> Controller” on the LUT-ELI</p> <p>Power the <i>RadioTouch</i> Controller from the emergency circuit and not from normal</p> <p>Consult transfer switch manufacture for troubleshooting</p> <p>Connect the LUT-ELI to normal power</p> <p>Connect terminal 4 “+24VDC” from the <i>RadioTouch</i> Controller to “+24” on the LUT-ELI and connect terminal 6 “COM” from the <i>RadioTouch</i> Controller to “Common” on the LUT-ELI</p> <p>Connect terminal 6 “COM” from the <i>RadioTouch</i> Controller to “Common” on the LUT-ELI and connect terminal 2 “signal” from the <i>RadioTouch</i> Controller to “signal on <i>RadioTouch</i> Controller” on the LUT-ELI</p>





# Troubleshooting LUT-ELI and *GRAFIK Eye* GP, XP, and LP Panels

## LUT-ELI Troubleshooting Guide

Circuit Selector (*GRAFIK Eye* GP-, XP-, LP Series Panels)

Symptom	Possible Cause	Solution
Lights are at full intensity and can not be controlled by the wallstation (Circuit Selector reads "ord")	<ul style="list-style-type: none"> <li>• Sense wire is not connected from the Circuit Selector to the LUT-ELI</li> <li>• One or more of the phases feeding the LUT-ELI are off (phase LED on the LUT-ELI will be OFF)</li> <li>• Neutral is not connected on the LUT-ELI (phase LED on the LUT-ELI will be OFF)</li> <li>• 24VFW is not connected on the LUT-ELI (phase LED on the LUT-ELI will be OFF)</li> <li>• There is a short across FACP and normally open contact (FACP LED will be ON)</li> <li>• 24VFW and sense are swapped</li> <li>• Common and sense are swapped</li> </ul>	<p>Connect terminal 5 "sense" from the Circuit Selector to "sense" on the LUT-ELI</p> <p>Turn ON all normal power phases to LUT-ELI</p> <p>Connect neutral</p> <p>Connect terminal 2 "24VFW" from the Circuit Selector to "+24" on the LUT-ELI</p> <p>Remove short</p> <p>Connect terminal 2 "24VFW" from the Circuit Selector to "+24" on the LUT-ELI and connect terminal 5 "sense" from the Circuit Selector to "sense" on the LUT-ELI</p> <p>Connect terminal 1 "Common" from the Circuit Selector to "Common" on the LUT-ELI and connect terminal 5 "sense" from the Circuit Selector to "sense" on the LUT-ELI</p>
Lights do not turn ON and do not go to high end when the test switch is pressed	<ul style="list-style-type: none"> <li>• SW6 on the Circuit Selector is in the middle position or far left position</li> <li>• 24VDC and common wires are swapped</li> </ul>	<p>Move SW6 on the Circuit Selector to the far right position</p> <p>Connect terminal 2 "24VFW" from the Circuit Selector to "+24" on the LUT-ELI and connect terminal 1 "Common" from the Circuit Selector to "Common" on the LUT-ELI</p>
Lights do not turn ON and do not go to high end when one or more of the normal power phases are turned OFF	<ul style="list-style-type: none"> <li>• SW6 on the Circuit Selector is in the middle position or far left position</li> <li>• 24VDC and common wires are swapped</li> <li>• That Emergency Panel is not powered by the emergency circuit</li> <li>• The emergency transfer switch is not switching over</li> <li>• LUT-ELI is connected to the emergency circuit</li> </ul>	<p>Move SW6 on the Circuit Selector to the far right position</p> <p>Connect terminal 2 "24VFW" from the Circuit Selector to "+24" on the LUT-ELI and connect terminal 1 "Common" from the Circuit Selector to "Common" on the LUT-ELI</p> <p>Power the Emergency Panel from the emergency circuit and not from normal power</p> <p>Consult transfer switch manufacture for troubleshooting</p> <p>Connect the LUT-ELI to normal power</p>

## 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 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 have other rights which vary from state to state. Some states do not allow the exclusion or limitation of incidental or consequential damages, or limitation on how long an implied warranty may last, so the above limitations may not apply to you.

Lutron and GRAFIK Eye are registered trademarks and RadioTouch is a trademark of Lutron Electronics Co., Inc.

## Technical and Sales Assistance

If you have questions concerning the installation or operation of this product, call the toll-free **Lutron Technical Support Center**. Please provide exact model number when calling.

U.S.A., Canada, and the Caribbean  
(800) 523-9466 27 hrs/7 days

other countries  
(610) 282-3800 8:00a.m. – 8:00p.m. ET

Our address on the web is <http://www.lutron.com>

## WORLD HEADQUARTERS

Lutron Electronics Co., Inc.  
7200 Suter Road  
Coopersburg, PA 18036-1299 U.S.A.

**TOLL FREE:** (800) 523-9466 (U.S.A., Canada, and the Caribbean)

Tel: (610) 282-3800; International 1610 282-3800

Fax: (610) 282-3090; International 1610 282-3090

## EUROPEAN HEADQUARTERS

Lutron EA Ltd.  
Lutron House  
6 Sovereign Close  
Wapping  
London, E1W 3JF, England

**FREEPHONE:** 0800 282107 (U.K.)

Tel: (0171) 702-0657; International 44-207-702-0657

Fax: (0171) 480-6899; International 44-207-480-6899

## ASIAN HEADQUARTERS

Lutron Asuka Co., Ltd.  
No. 16 Kowa Bldg. 4F  
1-9-20 Akasaka, Minato-ku  
Tokyo 107-0052 Japan

**TOLL FREE:** (0120) 083417 (Japan)

Tel: (03) 5574-8411; International 81-3-5575-8411

Fax: (03) 5575-8420; International 81-3-5575-8420

## HONG KONG SALES OFFICE

Tel: 2104-7733; International 852-2104-7733

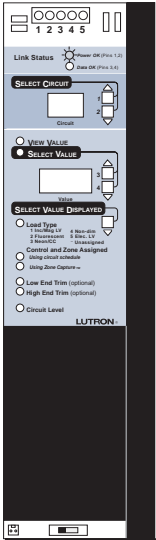
Fax: 2104-7633; International 852-2104-7633

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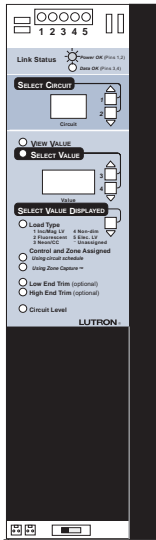
# RK-CS

Replacement Kit Instructions for These Circuit Selectors:

**24-Circuit Original Circuit Selector**



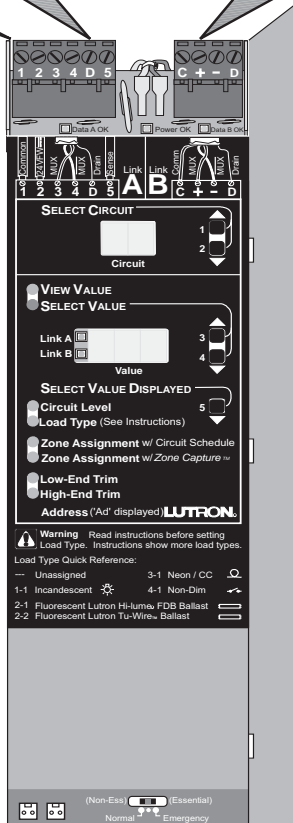
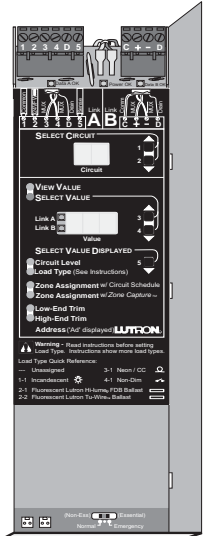
**48-Circuit Original Circuit Selector (2nd Dimmer Link Present)**



**Circuit Selector II Single Link**



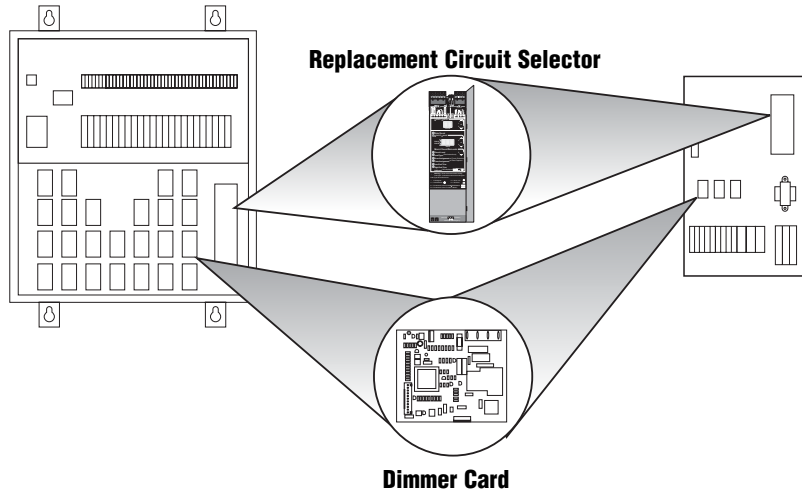
**Circuit Selector II with 2Link™ (Link B Present)**



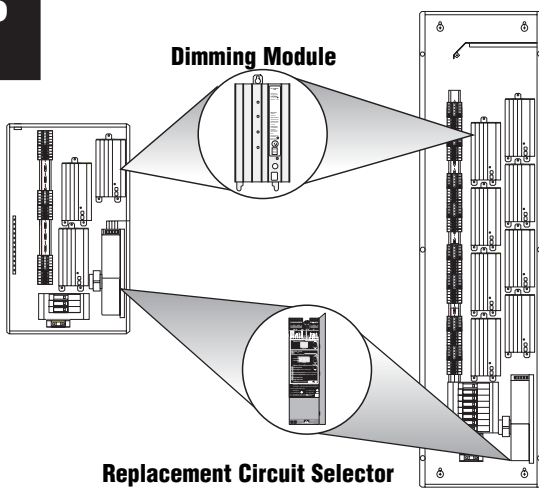
# Overview

## Lighting Control Panels with Circuit Selectors

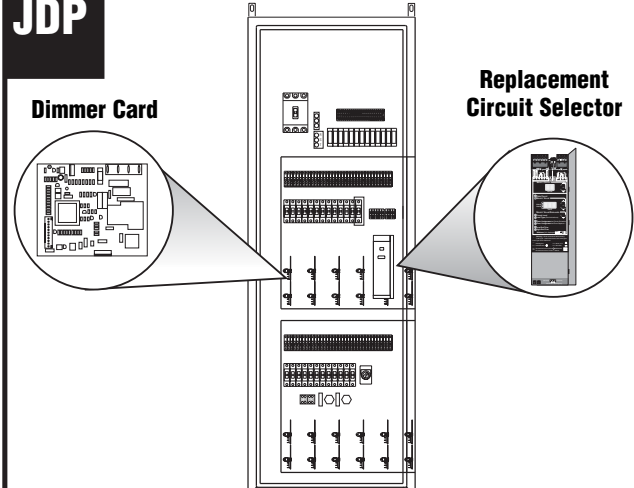
**GP**



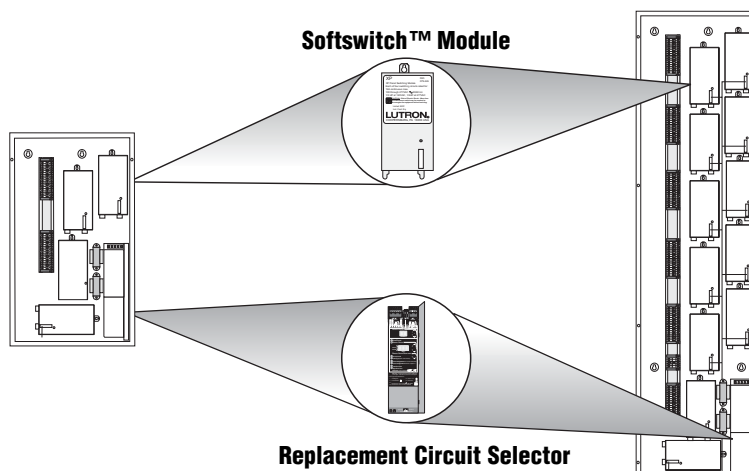
**LP**



**JDP**



**XP**



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## Special Notes



Text following this icon indicates instructions for an Original Circuit Selector (24 or 48-circuit).



Text following this icon indicates instructions for a Circuit Selector II (Single or *2Link*).



# Confirm Status of Existing Circuit Selector

It may be possible to retrieve settings from the existing Circuit Selector and reenter them into the Replacement Circuit Selector. To determine this, proceed with the following steps.

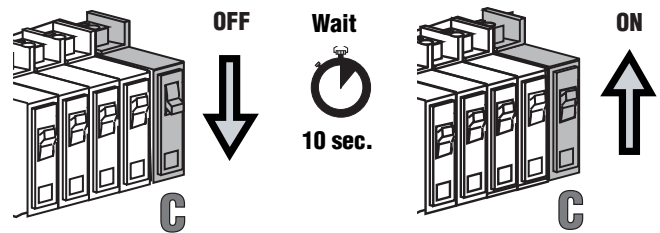


- If you are performing an **upgrade** and the existing Circuit Selector is working properly, skip Step 1 and proceed to Step 2.
- If one of the following products are used, it may be possible to **download** the setup data to the Replacement Circuit Selector: *Liaison™*, *Grafik 5000™*, *Grafik 6000®*, or *HomeWorks Interactive™*. Call Lutron for details.

## STEP 1: Confirm Status of Existing Circuit Selector

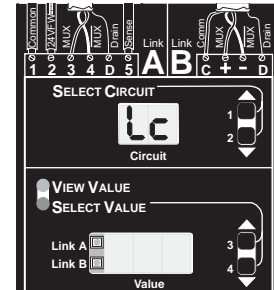
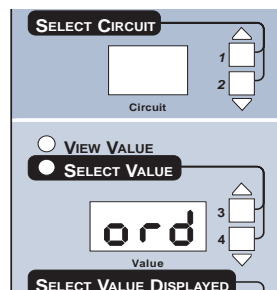
**A.** Cycle power to ensure consistency with the following steps.

1. Turn control breaker 'C' **OFF**.
2. Wait 10 seconds.
3. Turn control breaker 'C' back **ON**.



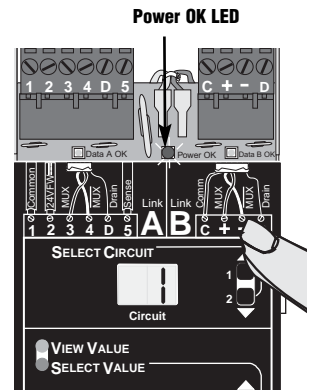
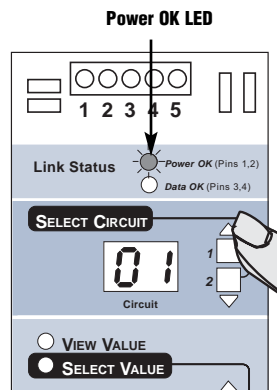
**Warning!** For GP3, GP4 (breakers provided by customer), or LP Panel, the input breaker of Circuit 1 powers the control wiring as well as Circuit 1's dimmer and load.

4. If the displays read **"ord"** or **"Lc,"** the unit may be working properly. Please call the Lutron Technical Assistance Hotline at **1-800-523-9466**.



**B.** Activate Circuit display to check status.

1. Press and release button 1.
  - If the **Circuit** display reads **"1"**, proceed to **Step 2**.
  - If the displays are **empty** and the **Power OK** LED is ON, the data cannot be retrieved. Proceed to **Step 3**.





# Record Present Data

## STEP 2: Record Present Data

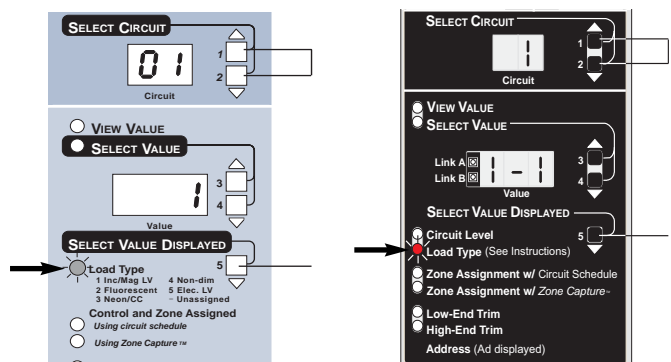
- Use the **Circuit Directory** in the **Reference Section** while following the steps below to record the present data.



The **Link A or B Hierarchy and Zone X** columns are necessary only if the Circuit Selector you are replacing uses the *2Link* option. **To find instructions on how to view this information, refer to the *2Link Options* section of the GP Installation Guide included with this kit.**

### A. View and record load types.

1. Press button 5 repeatedly until the **Load Type** LED lights.
  - Use buttons 1 and 2 to view the present Load Type of each circuit in the **Value** display and record the data in the Circuit Directory.
  - Note that ' - ' or ' - - - ' in the **Value** display means that the circuit's load type is unassigned.



**Example below:** Circuit "1" has a load type of 1 (Circuit Selector II has a load type equivalent of 1-1. See conversion chart on page 6.)

## Circuit Directory (See Reference Section)

Circuit <sup>1</sup>	Load Type <sup>2</sup>	Low End Trim	High End Trim
1	1		
2			
3			
4			



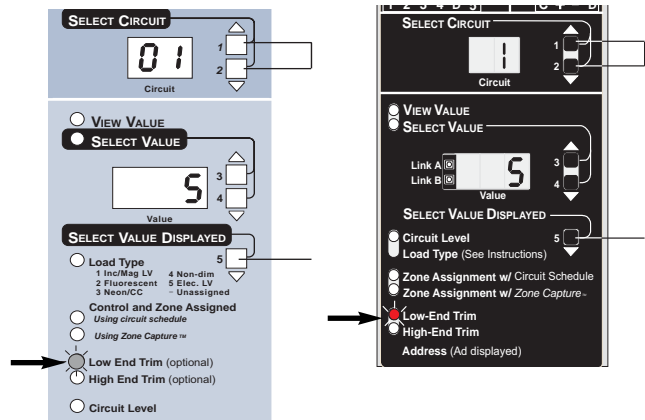


# Record Present Data

## STEP 2: Record Present Data (cont'd)

### B. View and record low end and high end trim.

- Press button 5 repeatedly until the **Low End / High End Trim** LED lights.
  - Use buttons 1 and 2 to view present settings for one or both of these options in the **Value** display and record the data into the Circuit Directory.
  - Low end/high end trim have default settings for each load type. If the settings were not changed and match the defaults, it is unnecessary to record them into the Circuit Directory.
  - Use this chart to compare values and to **translate** load type settings (Original Circuit Selector to Replacement Circuit Selector II settings are different).



Load Type		Default Settings	
		Low End Trim	High End Trim
<b>1</b> Incandescent	<b>1-1</b> Incandescent	<b>5</b>	<b>90</b>
<b>2</b> Fluorescent	<b>2-1</b> FDB	<b>28</b>	<b>81</b>
Not Available	<b>2-2</b> Tu-Wire®	<b>27</b>	<b>95</b>
	<b>2-3</b> 0-10 w/ TVM	<b>10</b>	<b>90</b>
	<b>2-4</b> PWM w/ TVM	<b>10</b>	<b>90</b>
	<b>2-5</b> Tridonic® DSI w/ TVM	<b>10</b>	<b>90</b>
	<b>2-7</b> DALI <sup>1</sup> w/ TVM	<b>10</b>	<b>90</b>
<b>3</b> Neon	<b>3-1</b> Neon	<b>24</b>	<b>68</b>
Not Available	<b>4-1</b> Non-Dim >0 On	<b>1</b>	<b>99</b>
<b>8</b> Non-Dim Slider	<b>4-2</b> Non-Dim Slider	<b>1</b>	<b>99</b>
<b>4</b> Non-Dim	<b>4-3</b> Last On, First Off	<b>1</b>	<b>99</b>
<b>6</b> Screen Non-Dim	<b>4-4</b> First On, First Off	<b>1</b>	<b>99</b>
<b>5</b> Elect. LV	<b>5-1</b> Elect. LV	<b>5</b>	<b>90</b>
Included w/ Incandescent	<b>6-1</b> Magnetic LV	<b>5</b>	<b>90</b>
<b>7</b> Fan	<b>7-1</b> Fan	<b>Custom Code*</b>	

<sup>1</sup> Intensity broadcast only

\* Please call Lutron Technical Assistance Hotline at **1-800-523-9466**.

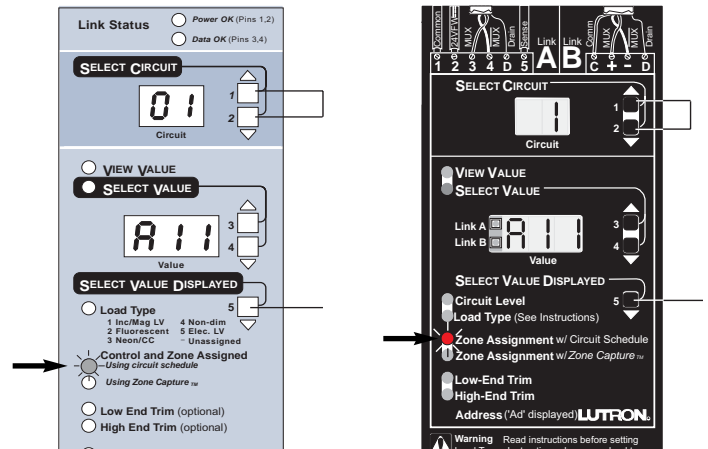


# Record Present Data

## STEP 2: Record Present Data (cont'd)

### C. View and record zone assignments.

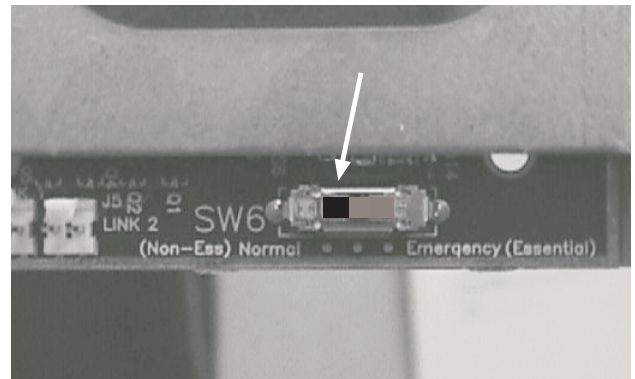
1. Press button 5 repeatedly until the **Zone Assignment w/ Circuit Schedule** LED lights.
  - Use buttons 1 and 2 to view the present zone assignments in the **Value** display and record the data into the Circuit Directory under the appropriate column.



### D. Record normal/emergency switch 6 (SW6) position.

- View the position of SW6 (located at the base of each Circuit Selector) and record its setting in the space provided at the bottom of the Circuit Directory.

**Example:** The unit's setting in this drawing is in the **left** position. See the *Set Up System* section of the GP Installation Guide included with this kit for details about this switch setting.

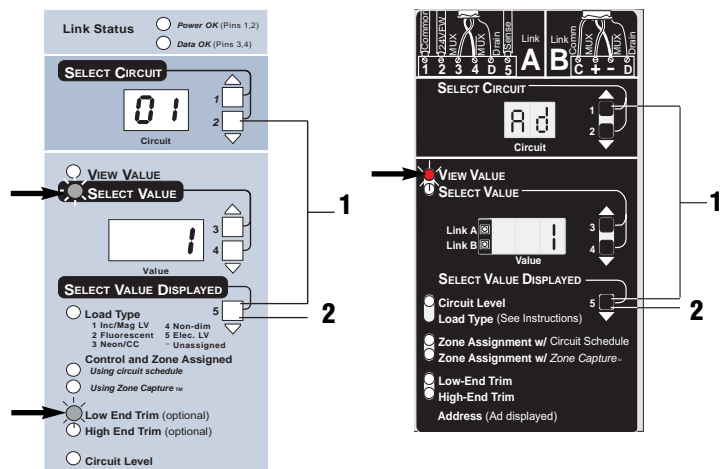


### E. View and record the address assigned to the Circuit Selector.

1. Press and hold buttons 2 and 5 until the **Select Value** LED flashes once per second (must hold for about 9 seconds).
2. Press button 5 until the **Low End Trim** LED lights. The address number (1-511 range) will appear in the **Value** display.

To **exit**, press and hold buttons 1 and 5 on the Circuit Selector until the **View Value** LED lights.

- Press button 5 until "Ad" is displayed in the **Circuit** display. The address number (1-512 range) will appear in the **Value** display.





# Record Present Data

The **PLL** (Phase Lock Loop) is a software setting that helps prevent the lights from flickering. If the existing dimmers/modules do not have *RTISS™*, the PLL setting on the Replacement Circuit Selector must be made to match the PLL setting of the existing Circuit Selector.



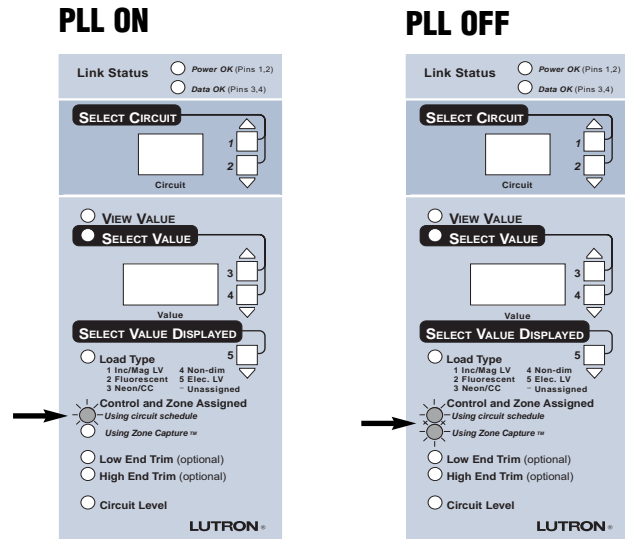
If this is a GP Panel that was shipped after July 2000, or all dimmers are being upgraded, this portion of Step 2 is unnecessary. These newer dimmers/modules have been equipped with the Real Time Illumination Stability System (*RTISS™*).

## STEP 2: Record Present Data (cont'd)

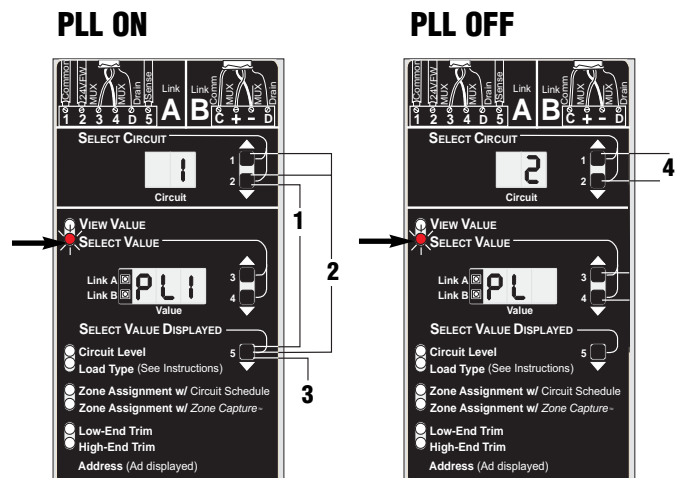
### F. View and record the **PLL** setting.

- Turn the system power **OFF**, then back **ON**.
  - If only the **first** zone assignment LED is **ON**, the PLL setting is **ON**.
  - If **both** zone assignment LEDs are **ON**, the PLL setting is **OFF**.

Record this setting in the space provided at the bottom of the Circuit Directory.



- Press and hold buttons 2 and 5 until the **Select Value** LED flashes in intervals of two.
  - Press and hold buttons 1, 2, and 5 (for about 9 seconds) until the **Select Value** LED flashes in intervals of three.
  - Press button 5 repeatedly until "**PL**" appears in the **Value** display with either the number 1, 2, or 3 (PLL ON) or blank space (PLL OFF) next to it. Record this value in the PLL column of the Circuit Directory.
  - Use buttons 1 and 2 to view and record the PLL setting for each circuit.
- Note:** Circuit Selector II may have multiple PLL settings, so it is necessary to record the value for each circuit.
- To **exit**, press and hold buttons 1 and 5 until the **View Value** LED lights.





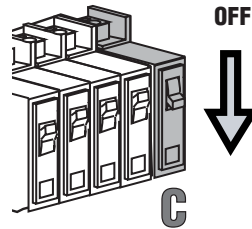
## Remove Wiring from Existing Circuit Selector

### STEP 3: Remove Wiring from Existing Circuit Selector

**A.** Turn control breaker 'C' **OFF**.



**Warning!** For GP3, GP4 (breakers provided by customer), or LP Panel, the input breaker of Circuit 1 powers the control wiring as well as Circuit 1's dimmer and load.



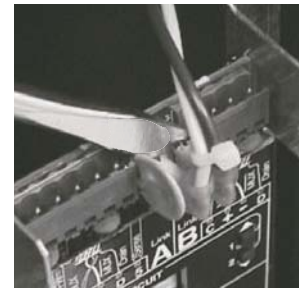
**B.** Remove wiring from the existing Circuit Selector.

- 1. Carefully** unplug the Class 2/PELV 24VAC Lutron Wiring with a screwdriver.

Original Circuit Selector

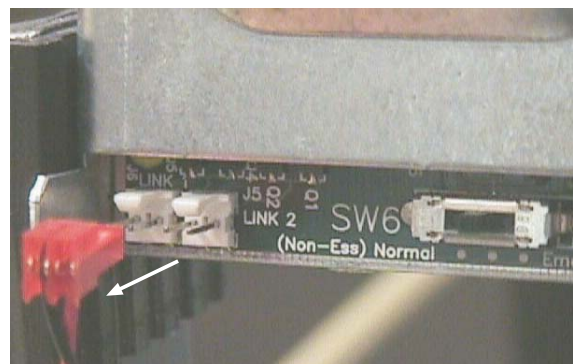
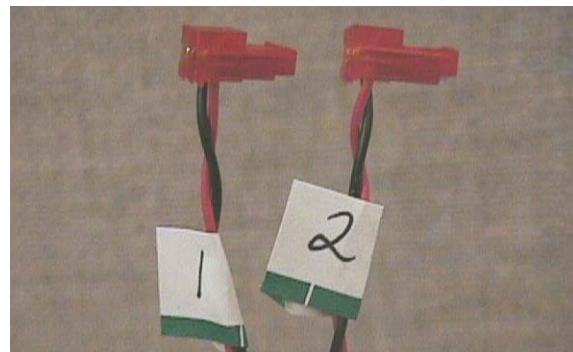


Circuit Selector II



**Caution!** If the Circuit Selector has two (2) dimmer links, it is necessary to tag each link to ensure that they are reattached to the same outlets at the bottom of the Replacement Circuit Selector.

- 2.** Remove dimmer link(s) from the bottom of the Circuit Selector.

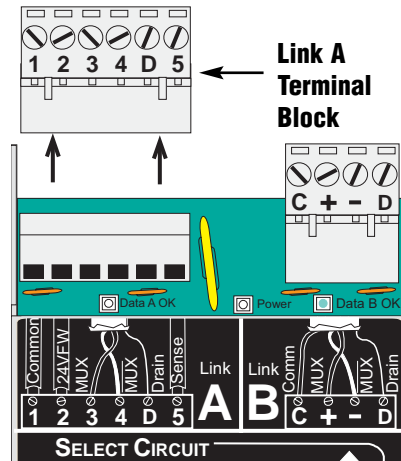






# Remove Wiring from Existing Circuit Selector

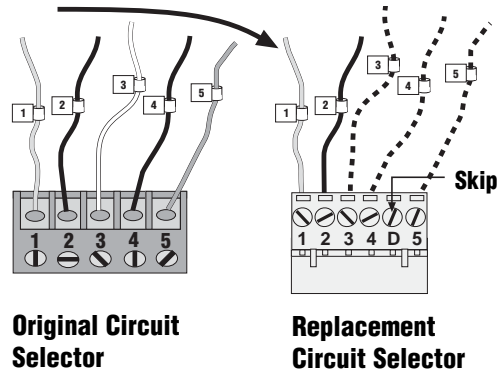
## STEP 3: Remove Wiring from Existing Circuit Selector (cont'd)

- Unplug the Link A Terminal Block from the Replacement Circuit Selector.



-  Move one Control Link wire at a time and insert each into the corresponding openings of the Link A Terminal Block of the Replacement Circuit Selector. Make sure to tighten each terminal's screw

-  Unplug the existing Circuit Selector II's Terminal Block(s). They will be reattached after the Replacement Circuit Selector is mounted.





## Remove Existing Circuit Selector: Original Circuit Selector

### STEP 4: Remove Existing Circuit Selector: Original Circuit Selector

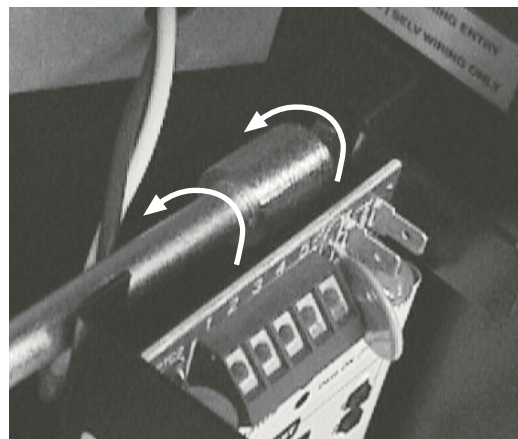


**For replacing an Original Circuit Selector:  
(See next page for Circuit Selector II)**

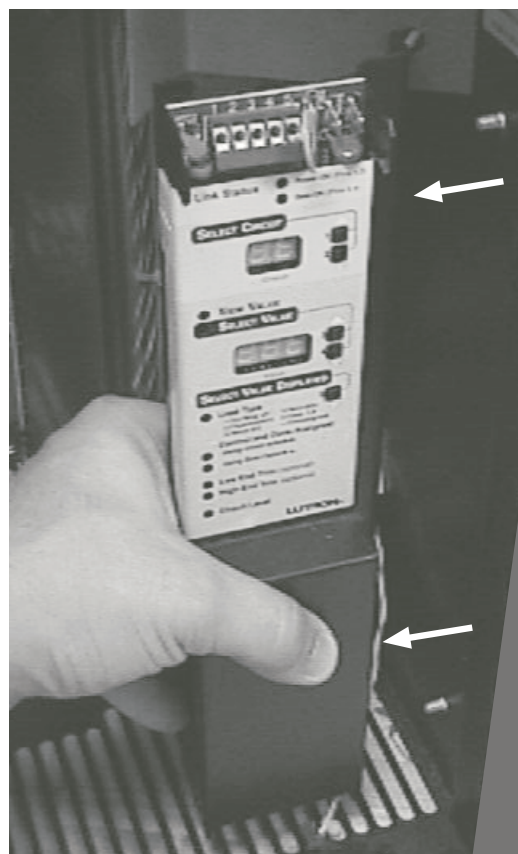
- A.** Loosen and remove the two nuts and star washers from behind the Circuit Selector by turning each counterclockwise using a 11/32" (9 mm) nut driver. Save these fasteners to use when mounting the Replacement Circuit Selector.



**Caution!** When removing these nuts and star washers, do not allow them to fall into the panel. Contact with exposed wiring may cause damage.



- B.** Remove the Circuit Selector by pulling the unit away from the side of the panel.





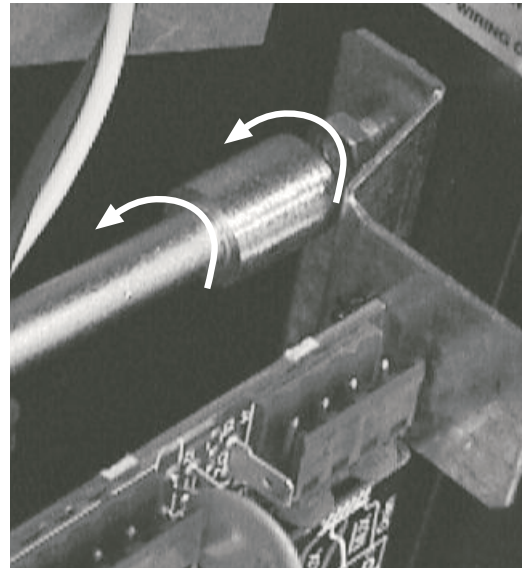


## Remove Existing Circuit Selector: Circuit Selector II

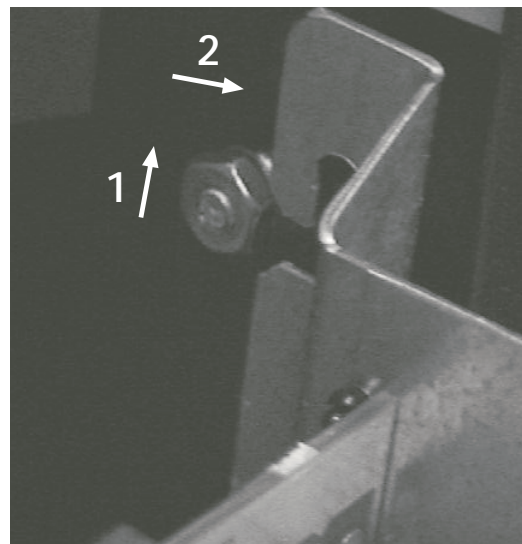
### STEP 4: Remove Existing Circuit Selector: Circuit Selector II

**For replacing a Circuit Selector II: (See previous page for Original Circuit Selector)**

- A.** Loosen (but do not remove) the two nuts behind the Circuit Selector II by turning each counterclockwise using a 11/32" (9 mm) nut driver.



- B.** To remove the Circuit Selector II:
1. Lift up,
  2. Pull towards the front of the panel.



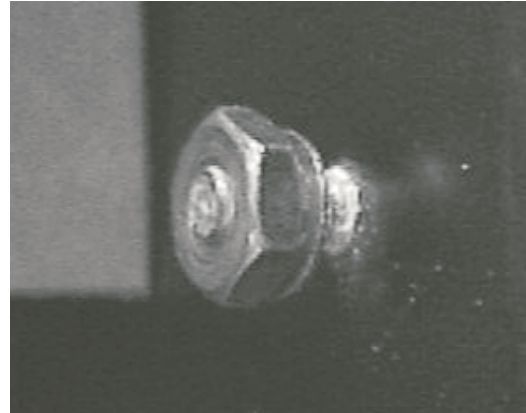




## Mount Replacement Circuit Selector

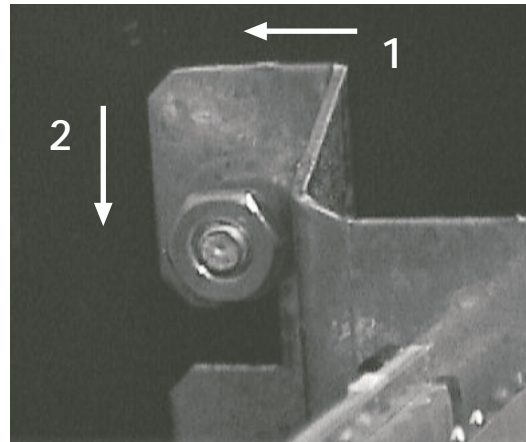
### STEP 5: Mount Replacement Circuit Selector

- A.** If the star washers and nuts were removed in Step 4, replace them, but do not tighten completely.

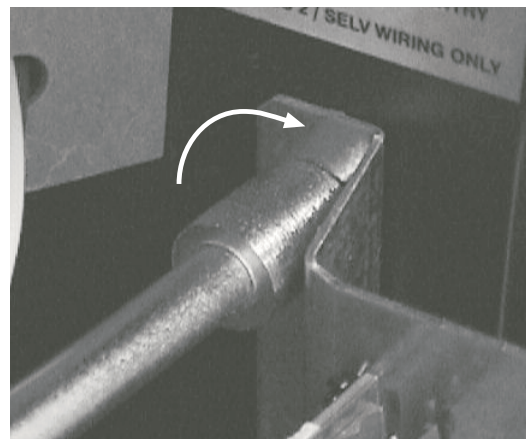


- B.** Mount Replacement Circuit Selector:

1. Slide the Replacement Circuit Selector over the screw/stud
2. Pull down.



2. Firmly tighten both nuts and star washers.

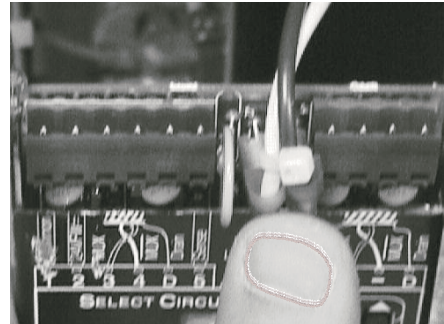




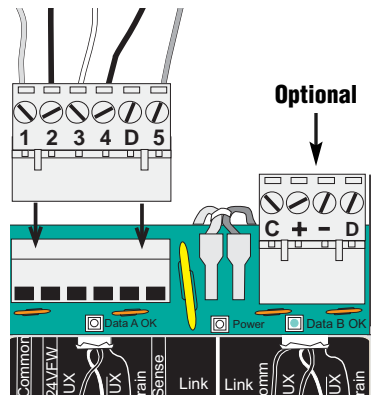
# Rewire Replacement Circuit Selector

## STEP 6: Rewire Replacement Circuit Selector

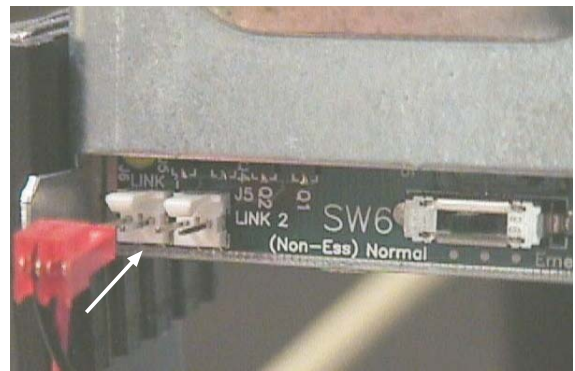
**A.** Plug Class 2/PELV 24VAC Lutron Wiring into the Replacement Circuit Selector.



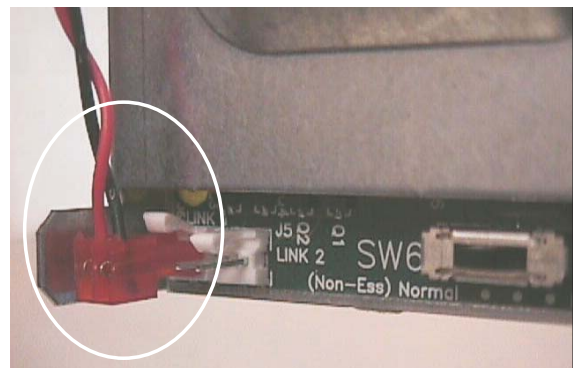
**B.** Plug Terminal Block(s) into the Replacement Circuit Selector.



**C.** Plug in dimmer link(s) to the corresponding outlet(s) at the bottom of the Replacement Circuit Selector.



**Caution!** When replacing an **Original Circuit Selector for an XP Panel**, it is necessary to put the dimmer link(s) in **upside down** (wires should run towards the top of the Circuit Selector instead of towards the bottom).



**XP Panel Only!**



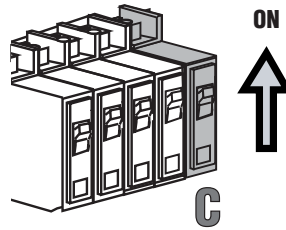
# Activate Replacement Circuit Selector

## STEP 7: Activate Replacement Circuit Selector

A. Turn control breaker 'C' **ON**.

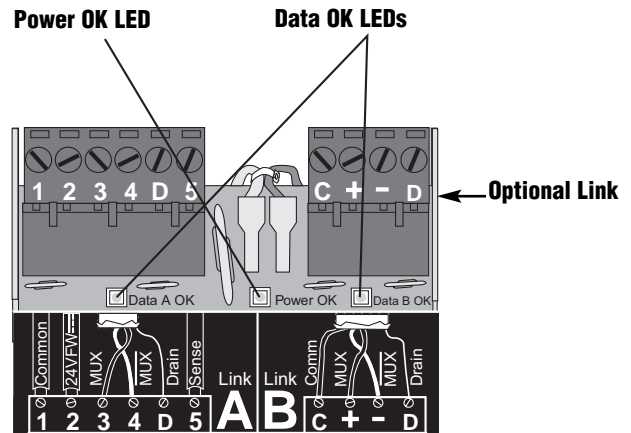


**Warning!** For GP3, GP4 (breakers provided by customer), or LP Panel, the input breaker of Circuit 1 powers the control wiring as well as Circuit 1's dimmer and load.



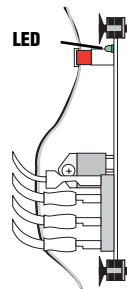
- **Power OK LED** should remain ON, and the **Data OK LED(s)** should flash once per second (as long as that link is active).

**Note:** If the Power OK LED is **not** ON, turn OFF the control breaker, clear the short between wire #2 and #1 (or ground), then reactivate the panel.

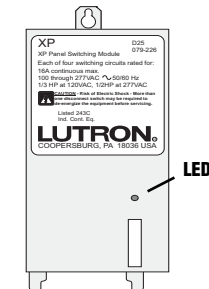


- If the dimmer card/ module diagnostic LEDs are all flashing once per second, skip Step 8 and proceed to Step 9.
- If these LEDs are always ON (GP panels) or in "Light House" (flashing once every 7 seconds for XP, LP panels), proceed with Step 8.

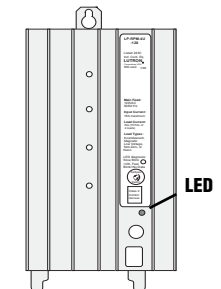
Front View of Dimmer Card in GP(JDP) Panel



Front View of Softswitch™ Module in XP Panel



Front View of Dimming Module in LP Panel



For more information, refer to the Troubleshooting Guide .....pg. 23



# Change Baud Rate

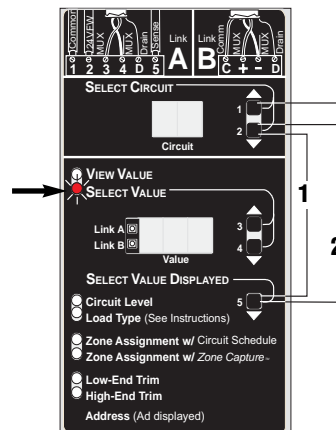
The Replacement Circuit Selector is capable of “talking” to the dimmer/module at various link speeds (**baud rates**). The dimmer/module baud rate must match the slowest “listening” dimmer/module on the link for all circuits to function.



If this is a GP Panel that was shipped after July 2000 or all dimmers are being upgraded, this portion of Step 8 is unnecessary.

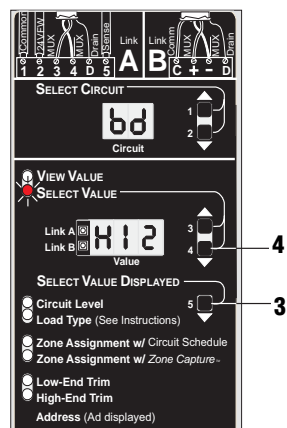
## STEP 8: Change Baud Rate

1. Press and hold buttons 2 and 5 until the **Select Value** LED flashes in intervals of two.
2. Press and hold buttons 1, 2, and 5 (for about 9 seconds) until the **Select Value** LED flashes in intervals of three.



3. Press button 5 until 'bd' appears in the **Circuit** display. The **Value** display will show the current baud rate.
4. Press button 4 once to lower the baud rate.
5. To **exit**, press and hold buttons 1 and 5 until the **View Value** LED lights.

**Note:** If the status of the diagnostic LED does not change (as specified in Step 7), repeat Step 8. If this does not work, please call Lutron Technical Assistance Hotline at **1-800-523-9466**.

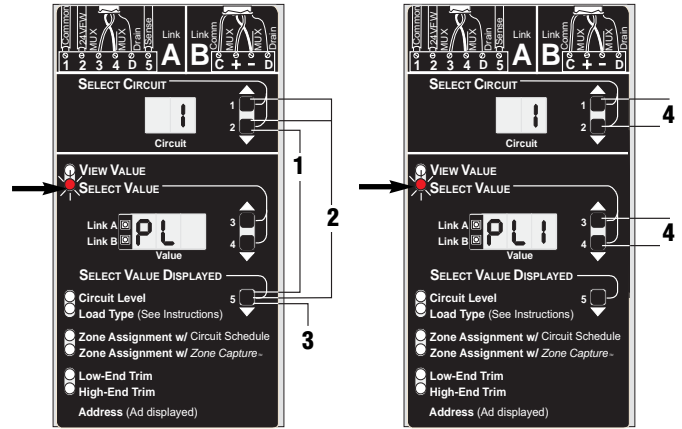




## STEP 9: Reenter Settings

### A. Reenter PLL settings.

1. Press and hold buttons 2 and 5 until the **Select Value** LED flashes in intervals of two.
2. Press and hold buttons 1, 2, and 5 (for about 9 seconds) until the **Select Value** LED flashes in intervals of three.
3. Press button 5 repeatedly until “PL” appears in the **Value** display (PLL OFF).
4. Use buttons 3 and 4 to change the PLL settings for each circuit (use buttons 1 and 2 to move to different circuits).



- If the PLL setting recorded in the Circuit Directory was ON, it is necessary to reenter the PLL setting as “PL 1” for **each circuit** (if the PLL was OFF, it is unnecessary to change the PLL setting in the Replacement Circuit Selector).

- Enter the PLL settings as recorded in the Circuit Directory for each circuit (if the PLL setting for each circuit was “PL”, it is unnecessary to change the PLL setting in the Replacement Circuit Selector).

5. To **exit**, press and hold buttons 1 and 5 until the **View Value** LED lights.

**To reenter all other settings recorded in the Circuit Directory, please refer to the “Start Up System” section of the GP Installation Guide included with this kit for complete instructions.**



# Change Circuit Range

The circuit range is factory set from 1 to 24 (as appears in the **Circuit** display of the Circuit Selector). It can be set to accommodate individual panel specifications with settings ranging from 1 to 48 circuits.



If the Replacement Circuit Selector is installed in a panel with 24 or fewer circuits, changing the circuit range is **not** necessary.

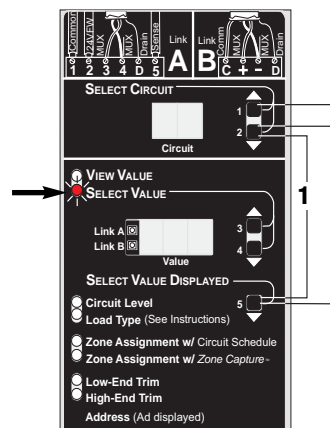
**Example:** If a panel has 7 modules with 4 circuits each (total of 28 circuits), it is necessary to change the circuit range upper limit to 28.

■ For personal preference, it is possible to change the circuit range to eliminate unused circuits.

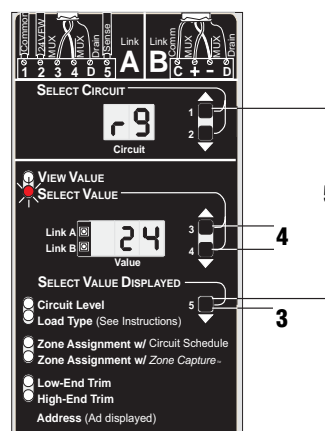
**Example:** Change the circuit range of a GP 8 to 1-8 and eliminate 9-24 (not used).

## STEP 10: Change Circuit Range

1. Press and hold buttons 2 and 5 until the **Select Value** LED flashes in intervals of two.
2. Press and hold buttons 1, 2, and 5 (for about 9 seconds) until the **Select Value** LED flashes in intervals of three.



3. Press button 5 repeatedly until 'rg' appears in the **Circuit** display. The **Value** display will show the current upper limit for the circuit range (factory set at 24).
4. Press button 3 to raise the circuit range upper limit or button 4 to lower the circuit range limit.
5. To **exit**, press and hold buttons 1 and 5 until the **View Value** LED lights.





# Change Circuit Offset

The circuit offset is factory set to 0 (as appears in the **Circuit** display of the Circuit Selector). It can be set to offset the 1st circuit by a count of 24 or 48.

**STOP** The circuit offset is changed generally for GP-36 or GP-72 panels only.

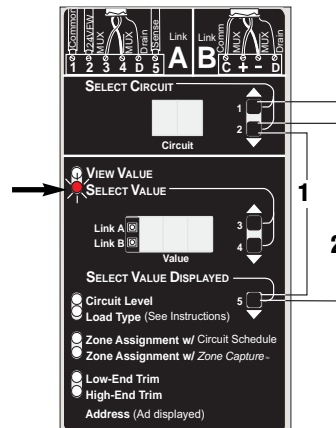
**Example:** The **Circuit** display would scroll from 25 to 48 (with a circuit range of 24 - see previous page) when the circuit offset is switched from 0 to 24.

- For personal preference, it is possible to change the circuit offset to designate two different panels' circuit numbers as unique.

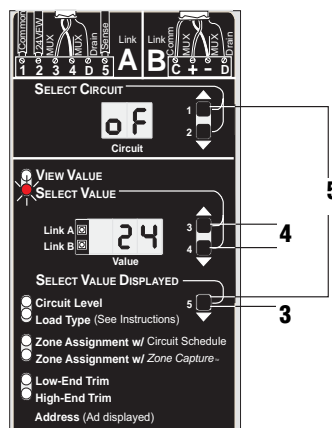
**Example:** Change the circuit offset of one GP 24 panel to 24 so it displays circuit 25-48, while leaving a previous GP 24 panel's circuit offset unchanged to read 1-24.

## STEP 11: Change Circuit Offset

1. Press and hold buttons 2 and 5 until the **Select Value** LED flashes in intervals of two.
2. Press and hold buttons 1, 2, and 5 (for about 9 seconds) until the **Select Value** LED flashes in intervals of three.



3. Press button 5 repeatedly until 'of' appears in the **Circuit** display. The **Value** display will show the current setting for the circuit offset (factory set at 0).
4. Press button 3 to raise the circuit offset or button 4 to lower the circuit offset.
5. To **exit**, press and hold buttons 1 and 5 until the **View Value** LED lights.







# Circuit Directory

Circuit <sup>1</sup>	Load Type <sup>2</sup>	Low End Trim	High End Trim	Primary Zone		Secondary Zone (only with 2Link™)		Hierarchy	Zone X (A2 or b2 only)	PLL
				Zone Assignment	Link A or B	Zone Assignment	Link A or B			
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										
24										

<sup>1</sup> If replacing a 48-Zone Circuit Selector, make a copy of this chart and re-number the Circuit column 25-48.

<sup>2</sup> Load Type settings are different for the Original Circuit Selector and the Circuit Selector II. See the chart on page 6 for the updated settings when reentering information.

**Switch 6** \_\_\_\_\_ **Address** \_\_\_\_\_ **PLL** \_\_\_\_\_  
(LEFT, CENTER, or RIGHT)




## Other Functions

The following functions have all been set to factory default for standard operation; any changes are **optional**.




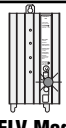


Need more information? Call *Lutron* to find out more about these and other Circuit Selector functions.

<b>Chicago Setting-</b>	Sets a “floor” which the dimmer will not go below. This function is used for emergency circuits in situations where the lights are not allowed to turn off, such as in Chicago.
<b>Override Setting-</b>	Allows circuit(s) connected to an emergency panel to enter an intensity other than full (100%).
<b>Programmed OFF Level-</b>	Allows a dimmer to enter a specific intensity other than zero (0) when a dimmer’s intensity command is 0%.  <b>Warning!</b> Defeating Lutron’s “Airgap OFF” feature must be carefully considered for safety reasons.
<b>“SL” Slushing-</b>	Allows for modification of a dimmer’s intensity change response time. An intensity change can have a “jump to” response or one of three “smooth out the transition” responses.
<b>“SF” Soft Start-</b>	Allows the standard transition from OFF to ON to be defeated. <b>It is recommended that the default settings for each load type remain unchanged.</b>
<b>“UC” Voltage Compensation-</b>	Allows the standard compensation for voltage changes to be defeated. <b>It is recommended that the default settings for each load type remain unchanged.</b>
<b>“AU” Autodetect-</b>	Allows the protocol of each control link to be autodetected (default) or manually assigned (OFF). This function is changed to OFF primarily if the control has not been installed but needs to be programmed beforehand to autodetect, or if the Circuit Selector has trouble detecting DMX 512 protocol.



# Troubleshooting Guide

## Troubleshooting Guide

Symptom	 <b>Dimmer Card LED</b>	 <b>LP/ELV Module LED</b>	 <b>XP/XP2 Module LED</b>	RK-CS Diagnostics			 <b>GRX LEDs</b>	Possible Cause/Solutions
				'Power OK' LED	'Data OK' LED	Circuit # Display		
None - Normal operation (as reference)	"Heartbeat" (~1 per sec)	"Heartbeat" (~1 per sec)	"Heartbeat" (~1 per sec)	On	"Heartbeat" (~1 per sec)	OK	OK	All LEDs show OK, see below for other suggestions.
						Out	OK	Push any button on Circuit Selector (display turns off in 20 minutes).
						"LC"	OK	RK-CS locked out - contact Lutron.
All dimmers controlled by 1st zone	"Heartbeat" (~1 per sec)	"Heartbeat" (~1 per sec)	"Heartbeat" (~1 per sec)	On	"Heartbeat" (~1 per sec)	OK	OK	RK-CS not set up - see instructions for Zone Assignment.
All outputs On FULL or Off only	"Heartbeat" (~1 per sec)	"Heartbeat" (~1 per sec)	"Heartbeat" (~1 per sec)	On	"Heartbeat" (~1 per sec)	OK	OK	XP panels only switch On or Off (no dimming). RK-CS not set up - see instructions for Load Types.
No dimming - always FULL	"Flutter"* (~5 per sec)	"Flutter"* (~5 per sec)	"Flutter"* (~5 per sec)	On	"Heartbeat" (~1 per sec)	OK	OK	Dimmer in Bypass - see instructions on load wiring. Dimmer defective - contact Lutron.
No dimming - Lights stuck at present light level/"frozen"	"Light House" (~1 per 7 sec)	"Light House" (~1 per 7 sec)	"Light House" (~1 per 7 sec)	On	"Heartbeat" (~1 per sec)	OK	OK	2-pin plug(s) for dimmer communication link not connected at the bottom of the RK-CS.
	"Light House" (~1 per 7 sec)	"Light House" (~1 per 7 sec)	"Light House" (~1 per 7 sec)	Off	Off	Out	Off	Control breaker "C" Off. 2 power plugs at top of RK-CS not connected. Control transformer may be damaged.
	"Light House" (~1 per 7 sec)	"Light House" (~1 per 7 sec)	"Light House" (~1 per 7 sec)	On	"Flutter" (~5 per sec)	OK	OK	Miswire of control link wiring - wires 3 and 4 may be swapped, shorted to ground, or open.
	All ON continuously	"Light House" (~1 per 7 sec)	"Light House" (~1 per 7 sec)	On	N/A	OK	OK	Wrong Baud Rate - see section on Baud Rate.
Controls not working/"Dead"	"Light House" (~1 per 7 sec)	"Light House" (~1 per 7 sec)	"Light House" (~1 per 7 sec)	On	Off	OK	Off	Miswire of control link wiring - unplugged terminal block or open wire 1 or 2.
	"Light House" (~1 per 7 sec)	"Light House" (~1 per 7 sec)	"Light House" (~1 per 7 sec)	On	Off	OK	OK	Miswire of control link wiring - open wire 3 and/or 4.
	"Light House" (~1 per 7 sec)	"Light House" (~1 per 7 sec)	"Light House" (~1 per 7 sec)	Off	Off	Out	Off	Miswire of control link wiring - wires 1 and 2 shorted together or wire 2 shorted to ground. Turn control breaker "C" Off a minimum of 30 sec., clear the short, then turn breaker back On.
RK-CS does not function the same as previous Circuit Selector	"Heartbeat" (~1 per sec)	"Heartbeat" (~1 per sec)	"Heartbeat" (~1 per sec)	On	"Heartbeat" (~1 per sec)	OK	OK	Contact Lutron with job # (ex. 21022-01) and description of function desired.

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



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# GRAFIK 5000™/6000®

## Hand-Held Lighting Programmer Operating Instructions

### Overview

Your *GRAFIK 5000/6000* Hand-Held Lighting Programmer (Figure A) gives you in-the-space, on-line preset programming for your *GRAFIK 5000/6000* system. Use the Programmer within a lighting area to make adjustments to the preset lighting levels.

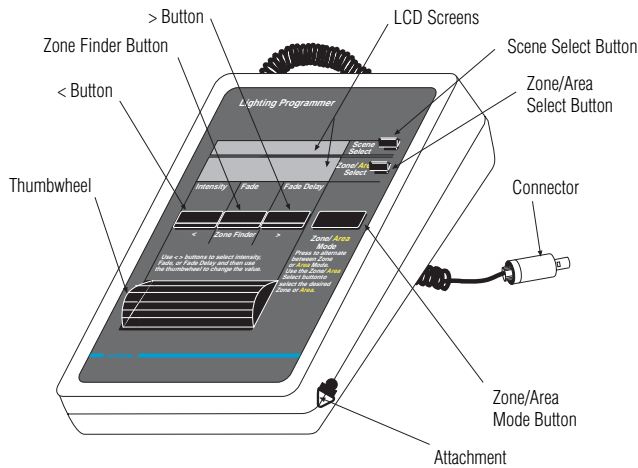


Figure A. Hand-Held Lighting Programmer

### To attach or detach carrying straps (Figure B):

- Slide down strap collar and open attachment clip.
- Slip clip on or off programmer's attachment loop.
- Slide up strap collar.

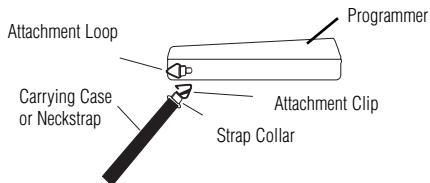


Figure B. Carrying Strap Connection

### Plugging In Your Programmer

Noting placement of alignment guide, plug your Programmer's connector into the wall jack (Figure C). The connector is self-locking and should click into place.

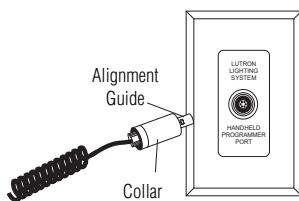


Figure C. Plugging Programmer into Wall Jack

When successfully connected, a message appears on the Programmer's screen for two seconds (Figure D), then the Programmer enters Area Select Mode (Figure E).



Figure D. Opening Message

### Unplugging Your Programmer

When you are finished making adjustments, you can unplug your Programmer's connector from the wall jack by pulling on the connector's collar (Figure C).

### Glossary

<i>Area</i>	A group of zones collectively controlled by a system scene.
<i>Fade</i>	The time it takes a zone to transition from one Intensity to another.
<i>Fade Delay</i>	The time your systems waits <b>before</b> it begins to fade a zone from one Intensity to another .
<i>Intensity</i>	Light level of a zone.
<i>Scene</i>	A lighting preset determined by Intensity, Fade time, and Fade Delay time settings for each of the zones within an area.
<i>Zone</i>	A light or group of lights controlled by a single intensity setting.

### Selecting An Area

A system area name appears on the bottom line of the screen (Figure E).

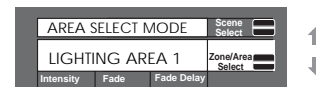


Figure E. Area Select Mode

Use the Zone/Area Select Switch to choose the area you want to program.

**Note:** Area, scene, and zone names over 20 characters will be shortened on the Programmer's screen.

### Selecting A Scene

Once the desired area is selected, enter Scene Select Mode by pressing the Scene Select Switch up. The current scene name appears on the top line of the screen (Figure F). Choose a scene to program by pressing the Scene Select Switch up/down. The lights in the area will change immediately to this scene's preset level.

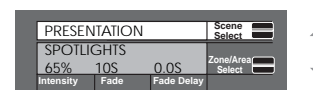


Figure F. Scene Information and Scene Select Switch

Pressing the Zone/Area Mode button will return the Programmer to Area Select Mode (Figure G).

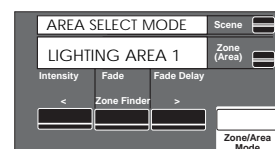


Figure G. Return to Area Select Mode

**Note:** Pressing the Zone/Area Mode button again returns the Programmer to the previously selected scene in the current area.

### Selecting A Zone Within the Selected Scene

The current zone name appears on the middle line of the screen while in the Scene Select mode (Figure H). Press the Zone/Area Select Switch up/down to select the next/previous zone.

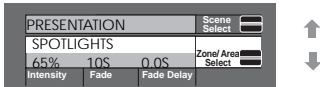


Figure H. Zone Information and Zone Selector Switch

### Viewing A Zone

Use the Zone Finder Button to see all lights associated with the selected zone. Press and hold the button; lights in the selected zone will flash until the button is released (Figure I).

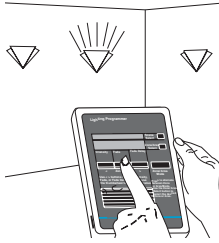


Figure I. Using Zone Finder

### Changing A Zone's Intensity

Press the < or > Button to move the on-screen cursor to the Intensity value (Figure J).

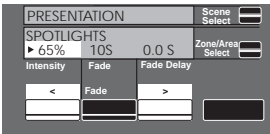


Figure J. Selecting Intensity Value for Adjustment

Roll the thumbwheel upward to increase Intensity, downward to decrease Intensity. Intensity may be adjusted from OFF to MAX in 1% increments.

### Changing A Zone's Fade Value

Press the < or > Button to move the on-screen cursor to the Fade value (Figure K).

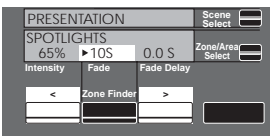


Figure K. Selecting Fade Value for Adjustment

Roll the thumbwheel upward to increase Fade time, downward to decrease Fade time.

### Changing A Zone's Fade Delay Value

Press the < or > Button to move the on-screen cursor to the Fade Delay value (Figure L).

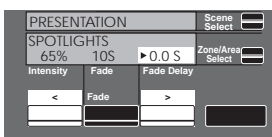


Figure L. Selecting Fade Delay Value for Adjustment

Roll the thumbwheel upward to increase Fade Delay time, downward to decrease Fade Delay time.

**Note:** All new settings for Intensity, Fade, and Fade Delay are written immediately into preset memory.

### Fade and Fade Delay

Time Ranges			Increments
0.0 sec	-	9.9 sec	0.1 sec
10 sec	-	99 sec	1.0 sec
1.7 min	-	9.9 min	0.1 min
10 min	-	99 min	1 min

### General Notes:

1. Area and Zone names can only be changed using *GRAFIK 5000/6000* User Interface Software.
2. Zones that are assigned to follow sliders may not be changed from the hand-held programmer.

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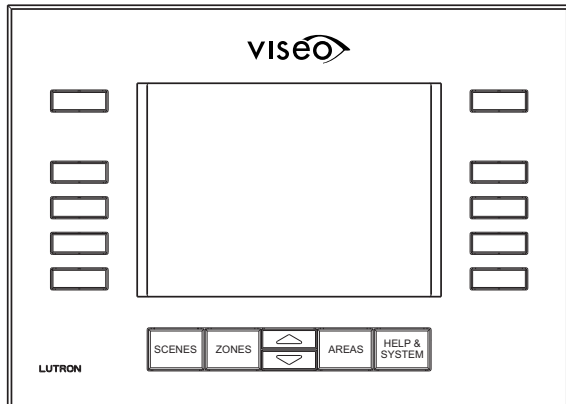
## Installation Instructions

*Please Leave for Occupant*

## Viseo Wallstation Control

### OMX-VDC-LB / OMX-VDC-LF

(Class 2/PELV Device)



**OMX-VDC-LB**

### Description

The OMX-VDC-LB / OMX-VDC-LF Wallstation provides local access to the Lighting Control System.

- Program, monitor, and operate every scene and lighting zone of a space/entire building from multiple locations.
- Simplify day-to-day operation by minimizing the need for PCs, laptops, or other plug-in devices.
- Works with GRAFIK 5000™ and GRAFIK 6000® Systems.
- Automatically downloads data from your system without reprogramming.

### Important Notes

1. READ ALL INSTRUCTIONS CAREFULLY BEFORE STARTING INSTALLATION.
2. This control must be installed by a qualified electrician.
3. Install in accordance with the National Electric Code and all applicable local regulations.
4. Turn power OFF at the control panel before installing controls. **Do not** connect high-voltage power to low voltage terminals. Improper wiring can result in personal injury or damage to the control or to other equipment.
5. Use only a cloth with warm water and mild soap to clean faceplates (no chemical cleaners).

### Installation

1. Prewiring: The Control Links require special wiring considerations. Refer to the *GRAFIK 5000/GRAFIK 6000* Installation Guide and Lutron job drawings for wiring restrictions and limitations that apply to your specific project.

2. **Turn power OFF.**

**⚠ Warning!** Always turn off the power to the control panel before doing any work. Failure to do so can result in serious personal injury and damage to equipment.

3. Strip insulation from wires so 3/8" bare wire is exposed.

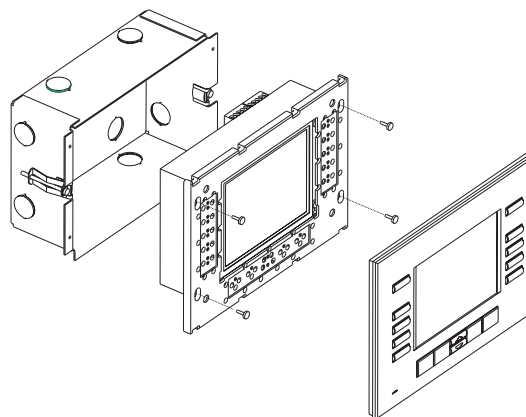


The terminals will accept up to two #18 AWG wires. If wires are larger than #18 AWG, splice one #18 AWG wire to the larger wires to make the connection.

4. Remove the faceplate by pulling outward at each corner, one corner at a time.

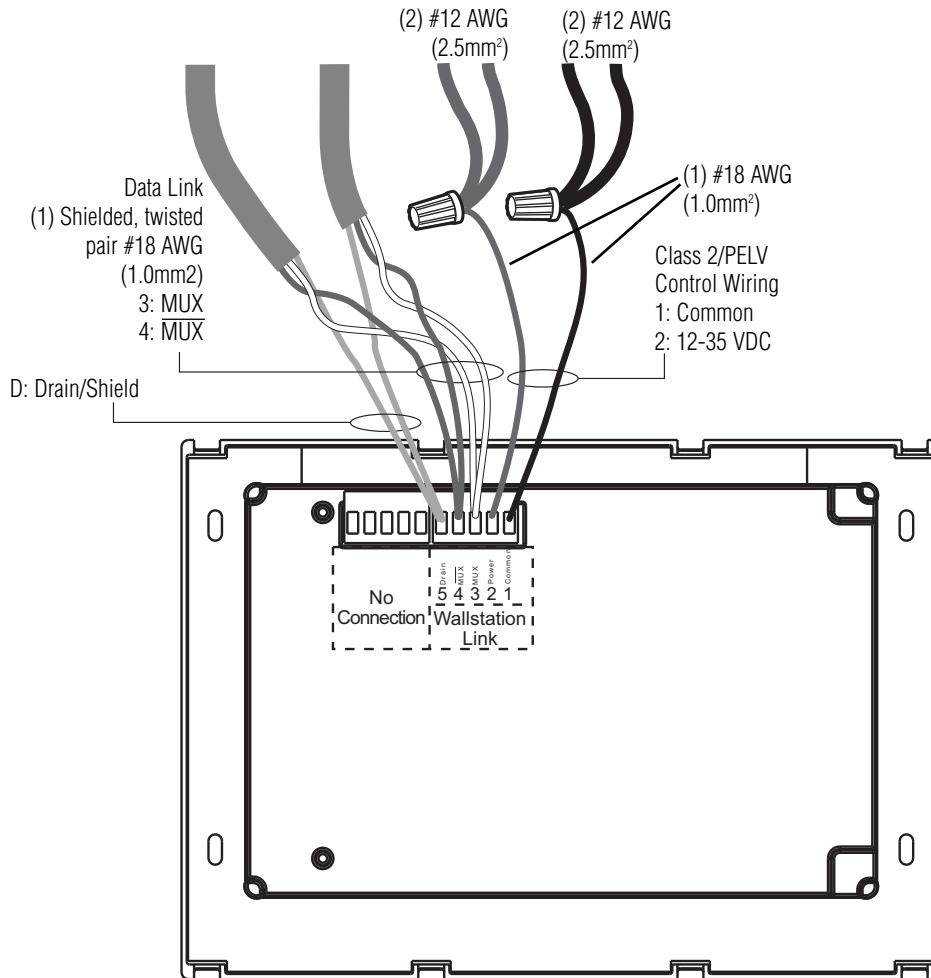


5. Connect wiring as shown in Typical Control Link Wiring Diagram on the next page. Confirm all connections.
6. Mount Control as shown in the Mounting Diagram below. *Viseo* requires a special Lutron backbox, P/N 241-806.



7. Restore power to the control panel **after** the installation of the system is complete.

# Control Link Wiring Diagram



## Wiring Notes:

1. Connection of the control to the Control Link should be made inside the control's wallbox or in a junction box (provided by others) located no more than 8 ft. (2.4 m) from the control.
2. Control Link wiring must not be run in the same raceway as 120 VAC or 277 VAC.
3. Total Control Link length is not to exceed 2000 ft. (610 m) unless the signal is boosted using a link booster (MX-RPTR).
4. Shielded data cable must be used throughout the Control Link. DO NOT connect the shield to earth/ground.
5. Refer to the *GRAFIK 5000/GRAFIK 6000* Installation Guide and Lutron job drawings for power cable and data cable (Control Link) wiring restrictions and limitations.
6. Control Link requires a LT-1, Link Termination Assembly, at each end of the Control Link. Refer to the LT-1 instruction sheet for location and installation information.

# Getting *Viseo* Started

## Setting the Address and Loading the Database Information into the *Viseo*

If the *Viseo* is addressed correctly, the unit will begin downloading the database information when it is powered up and connected to the Wallstation link. If the unit displays "Please Wait... For G6000 Communication to Begin" but does not begin to download the data, please complete the following steps.

1. Press **Help & System**.
2. Select **Viseo Setup Menu** (lowest button on right side).
3. If needed, enter the passcode "1000" by selecting **+** (right side buttons) or **-** (left side buttons).
4. Select **Unit Options**.
5. Select **Link Address**.
6. Press the Raise and Lower buttons to select the address of the *Viseo* Wallstation in the database as shown in the Lutron job drawings.
7. Select **Viseo Setup Menu**.
8. Select **Read G6000 Data**. The unit will display "Please Wait... Reading Data". Do not press any buttons until the data is done loading.

## Setting the Contrast

1. Press **Help & System**.
2. Select **Viseo Setup Menu**.
3. If needed, enter the passcode by selecting **+** or **-**.
4. Select **LCD Setup**.
5. Select **LCD Contrast**.
6. Use the Raise and Lower buttons to set the contrast of the screen at the optimum level.

**For additional instructions on setting up the *Viseo* control, please see the *Viseo User's Guide* (P/N 030-726).**

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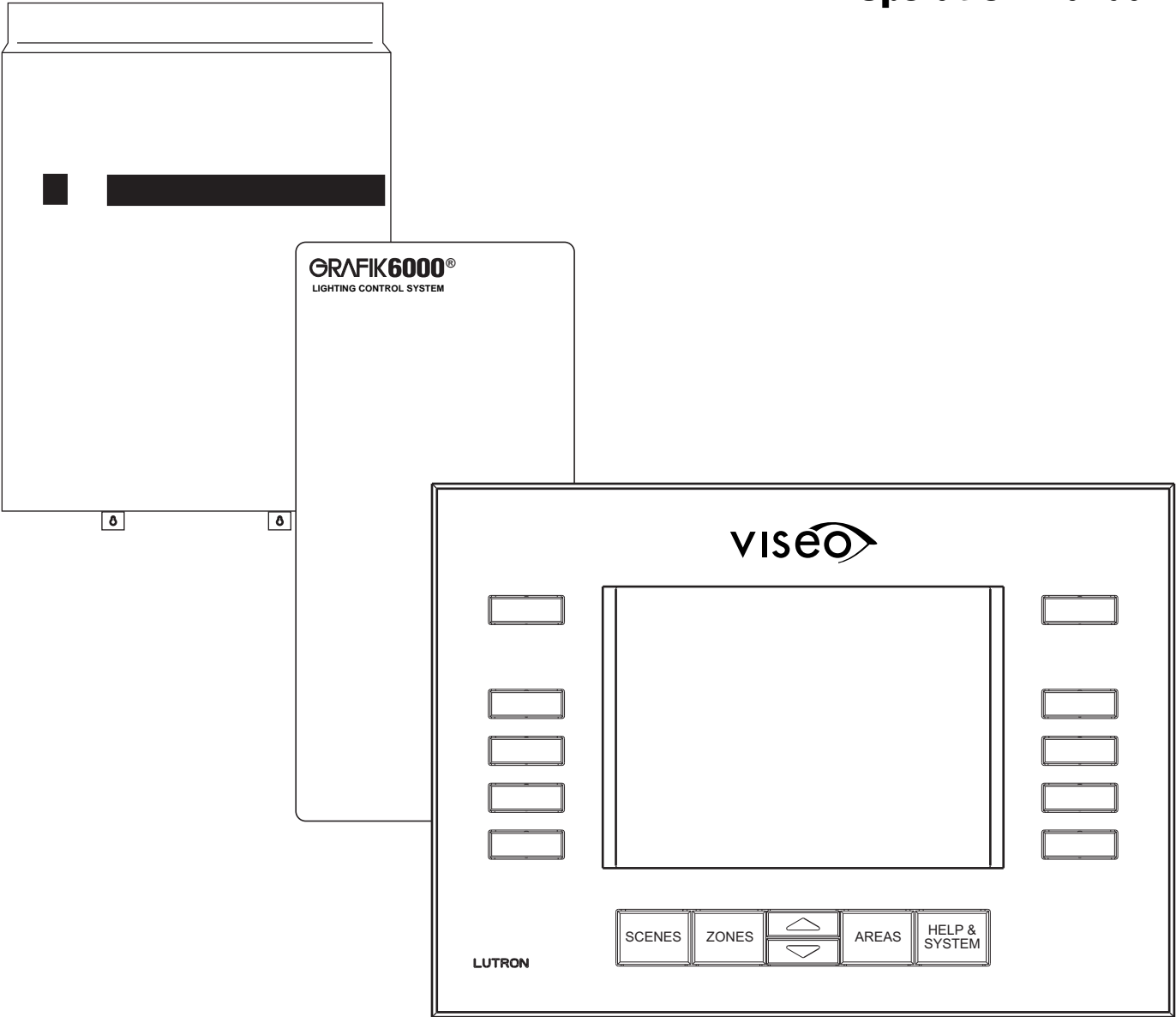
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**GRAFIK5000™/**  
**GRAFIK6000®**



**Viseo Display Control (VDC)**  
**Operation Manual**



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**OMX-VDC-LB**  
**OMX-VDC-LF**



# Notes

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## Step-by-Step Instructions

**Note:** The letters **VDC** stand for **V**iseo **D**isplay **C**ontrol.

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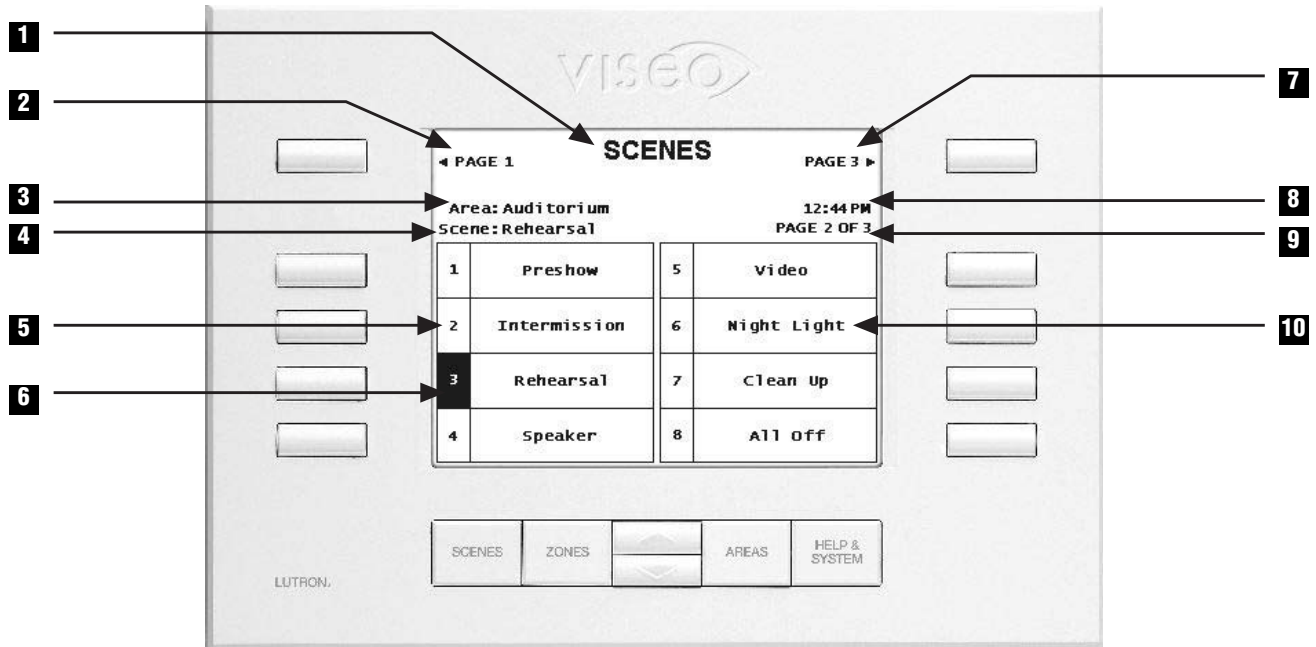
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## Basic Screen Layout

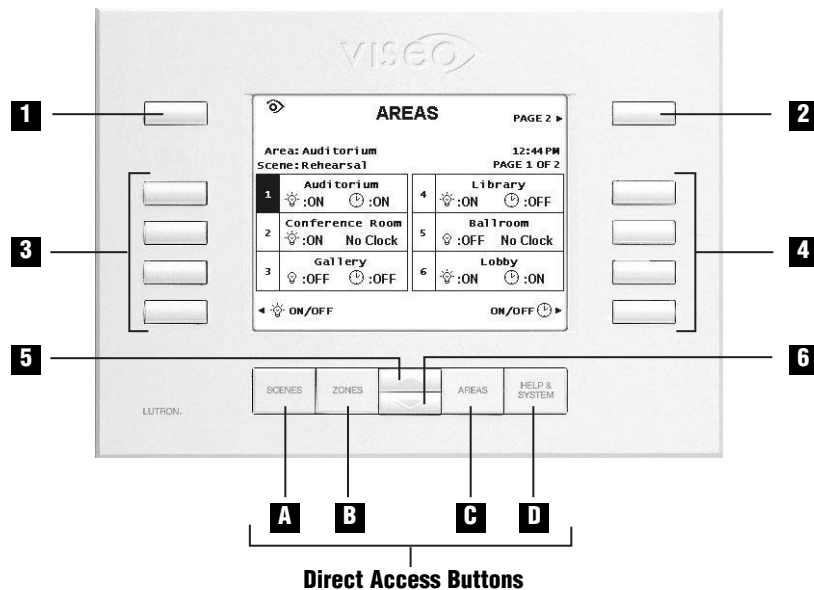


**Figure 1: Basic Screen Layout**

- 1 Page title
2. Return to previous page (when active)
3. Current area being monitored, controlled, or programmed
4. Current scene of the current area
5. Scene number
6. Selected scene (current scene - highlighted number box in screen above)
7. Scroll up to additional pages (when active)
- 8 System time
9. Current page
10. Scene name



## Location and Function of Buttons



**Figure 2: VDC Button Layout**

- 1. Previous Page (when available)** - Displays the previous page of scenes, zones, or areas (i.e. lower numbered scenes, zones or areas). Note that this button also serves other purposes on some of the options pages.
- 2. Next Page (when available)** - Displays the next page of scenes, zones, or areas (i.e. higher numbered scenes, zones or areas). Note that this button also serves other purposes on some of the setup menu pages.
- 3. Left Buttons** - These buttons select the scene, zone, area, or option that is listed on the screen directly to the right of the button.
- 4. Right Buttons** - These buttons select the scene, zone, area, or option that is listed on the screen directly to the left of the button.
- 5. Raise Button** - Increases the intensity of the selected zone(s) or all zones in the selected scene or area. Also, scrolls up through available options of the selected field. On some pages, this button performs no function.
- 6. Lower Button** - Decreases the intensity of the selected zone(s) or all zones in the selected scene or area. Also, scrolls down through available options of the selected field. On some pages, this button performs no function.

### Direct Access Buttons

Pressing a Direct Access Button sends the user to the appropriate page.

- A. SCENES Button** - Displays the Scenes page for the current area selected. Enables the user to select the scene to program when in programming mode.
- B. ZONES Button** - Displays the Zones page for the current area selected.
- C. AREAS Button** - Displays the Areas page.
- D. HELP & SYSTEM Button** - Displays the Help page for the current page.



**Before proceeding to the next section,**

**Please read !**

### **Fundamentals for Operating the VDC**

- The letters **VDC** stand for **V**iseo **D**isplay **C**ontrol.
- When viewing the *Scenes*, *Zones*, or *Areas* pages, the screen may not be able to display all of the scenes, zones, or areas that are in the system on a single page. The screen can show eight (8) scenes at one time on one page, six (6) zones at one time, or six (6) areas at one time. If the desired scene, zone, or area is not on the screen, use the PREVIOUS PAGE (top left) and NEXT PAGE (top right) buttons to navigate to the other pages.
- If the space on the screen beside a button is blank, that button performs no function.
- If the backlight has timed out and turned Off, any button press on the unit will activate the backlight. The next button press will perform its normal function.
- If the screen displays "Please Wait. Reading ...", the unit is downloading the area, scene, and zone name data from the G5000/G6000 processor. This may take a few minutes, depending on the size of the lighting control system database. The only button that will perform a function during this time period is the HELP & SYSTEM button. Pressing this button will stop the download and display the *Viseo Setup Menu* page.

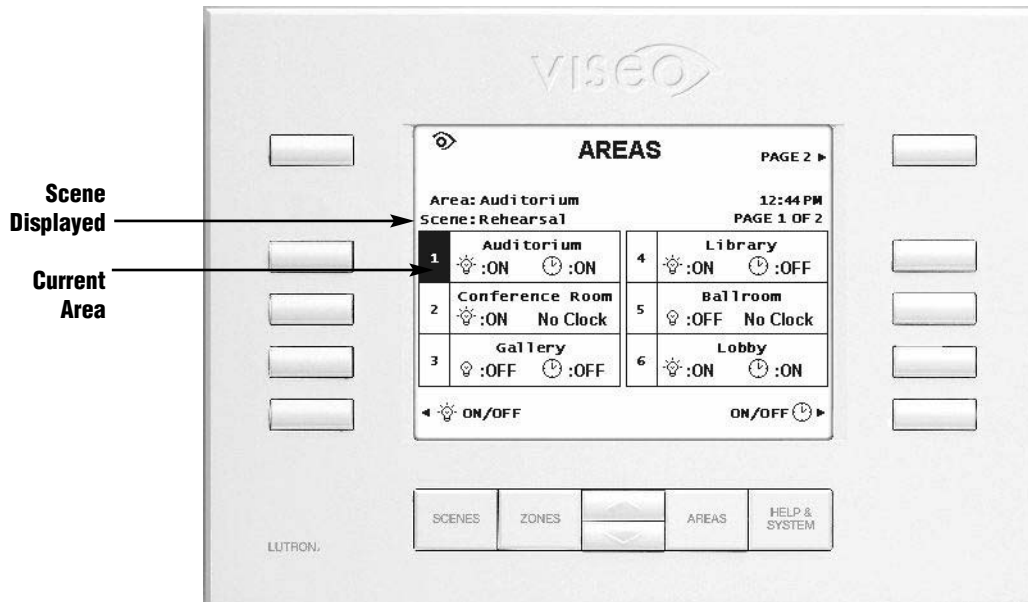


## Normal Operation

**Note:** If the area/scene/zone that you want to monitor is not on the current page, use the PREVIOUS PAGE (top left - see page 3) and NEXT PAGE (top right - see page 3) buttons to navigate to other pages of areas/scenes/zones.

### A. Monitoring the Scene Status in All Areas

1. Press the AREAS button.
2. Select an area to monitor by pressing the button next to the appropriate area name. Use the buttons on the left and right sides of the VDC.
3. Finally, note the scene of the current area being displayed in the Scene field on the screen.



**Figure 3: Areas Page**

### B. Turning Lights On and Off in an Area

1. Press the AREAS button to display the *Areas* page.
2. Select an area by pressing the button next to the appropriate area name.
3. Note the status of the lights in the area [(next to the light bulb symbol) = On = Off].
4. Select ON/OFF (bottom left) to switch the lights On (first scene of the area) and Off (last scene of the area). If the area is set to MONITOR ONLY (see pg. 20), the user will not be able to turn the lights On and Off.

### C. Turning the Timeclock On and Off in an Area

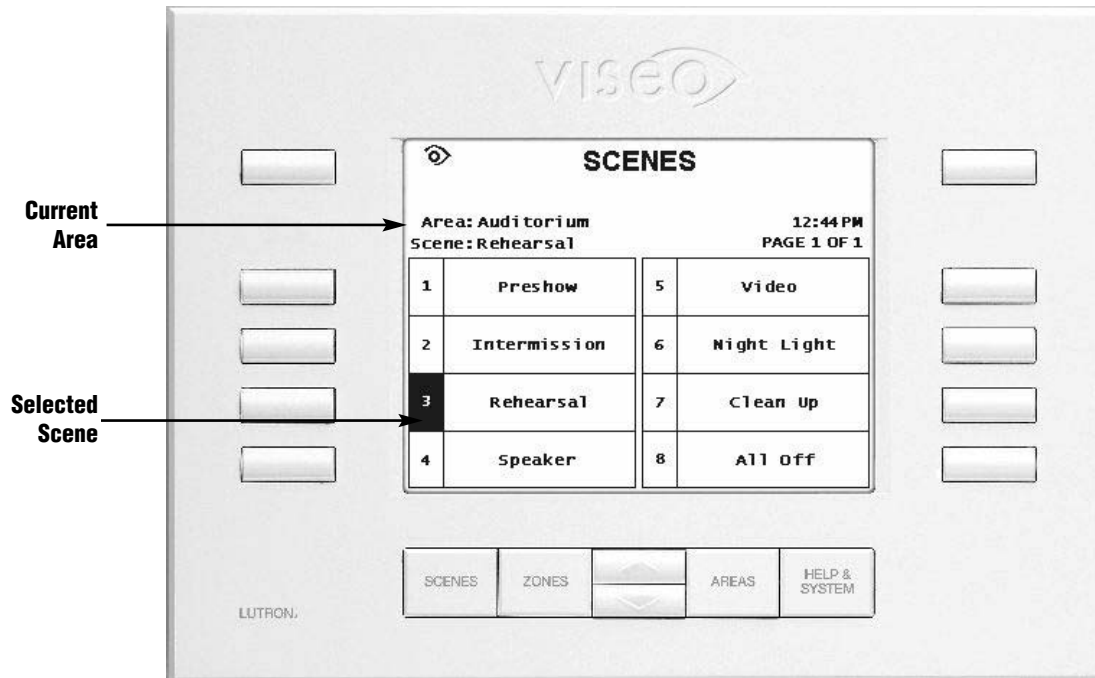
1. Press the AREAS button to display the *Areas* page.
2. Select an area by pressing the button next to the appropriate area name.
3. Note the status of the timeclock in the area (next to the clock symbol ). If no events are scheduled in that area, "No Clock" will appear in the box.
4. Select ON/OFF (bottom right) to switch the timeclock On and Off. The timeclock can only be changed if that area is set to PROGRAMMABLE (see page 19).



## Normal Operation

### D. Selecting a Scene in an Area

1. Press the AREAS button.
2. Select an area by pressing the button next to the appropriate area name.
3. Press the SCENES button.
4. Select a scene to activate by pressing the button next to the appropriate scene name.



**Figure 4: Scenes Page**

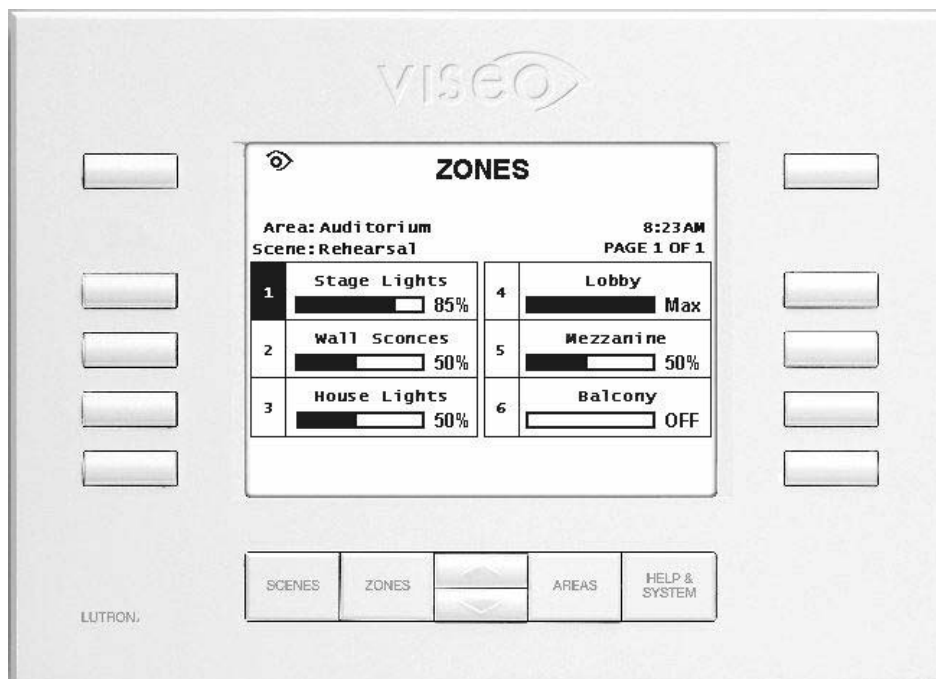


## Normal Operation

### E. Changing a Zone Level Manually

**Note:** All zone level changes discussed on this page are **TEMPORARY** and do not change the G5000/G6000 processor panel database settings.

1. Press the AREAS button.
2. Select an area by pressing the button next to the appropriate area name.
3. Press the ZONES button.
4. Select a zone by pressing the button next to the appropriate zone name.
  - a. To deselect a zone, the button beside it **MUST** be pressed again. Simply pressing a different zone button will not deselect the previously selected zone.
  - b. Multiple zones from the same page **CAN** be selected and changed. Once the PREVIOUS PAGE or NEXT PAGE button is pressed, all zones are deselected.
5. Use the Raise and Lower buttons to change the levels of the selected zones. The zone levels on the screen will change.



**Figure 5: Zones Page**

### F. Raising and Lowering all Zones in a Scene

1. Press the SCENES button to display the *Scenes* page.
2. Select a scene by pressing the button next to the appropriate scene name.
3. Press the Raise and Lower buttons to change the levels of all zones in the selected scene.

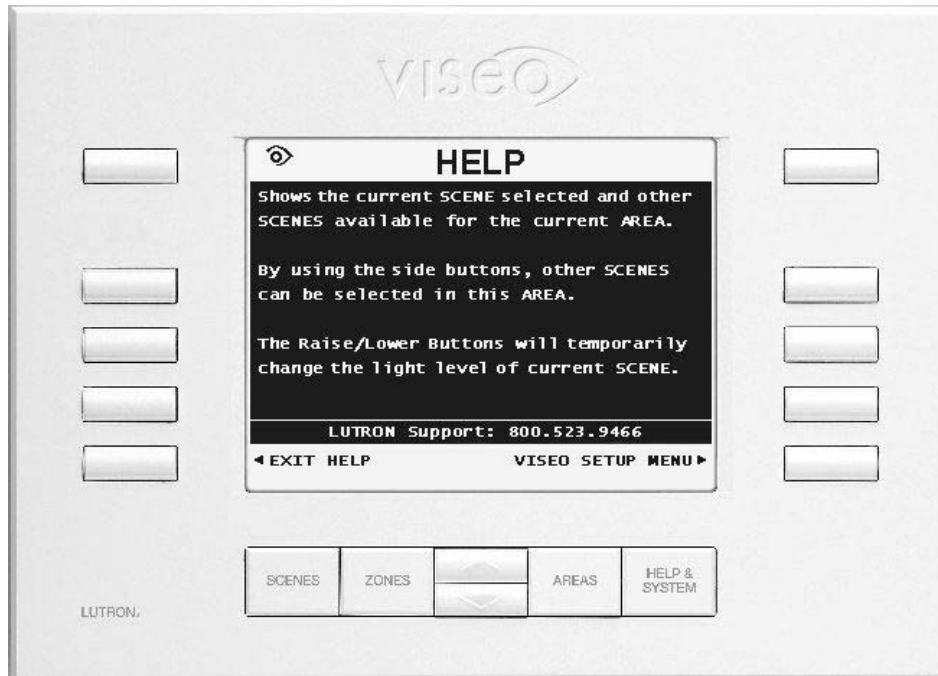




## Normal Operation

### G. Accessing the Help Screen

1. If help with a page is necessary, press the HELP & SYSTEM button.
2. To exit help, press any of the direct access buttons or select EXIT HELP (bottom left button) to return to the previous page.



**Figure 6: Help Screen for the Scenes Page**



## Programming Mode

- Note:** 1. The letters **VDC** stand for **V**iseo **D**isplay **C**ontrol.  
2. If the scene to be programmed is not on the current page, use the PREVIOUS PAGE (top left - see page 3) and NEXT PAGE (top right - see page 3) buttons to navigate to other pages of areas/scenes/zones.

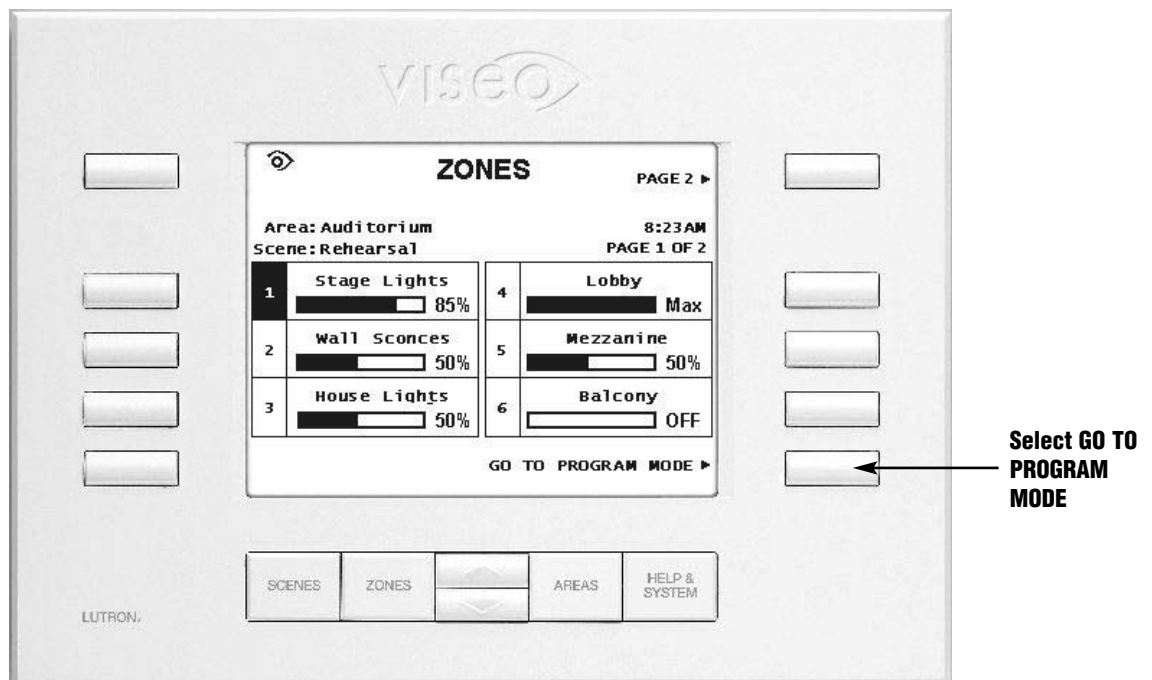
Programming mode allows the user to change the scenes saved in the G5000/G6000 database. For all of the zones in each scene of every area, the user can set:

- **Intensity** - the light level of the zone.
- **Fade Rate** - the time it takes a zone to raise or lower its intensity from the current level to the new level of the scene that was just selected.
- **Delay Rate** - the time it takes for a zone to begin changing after the scene has been selected.

### A. Entering Programming Mode

1. Press the AREAS button and select an area to program.
2. Press the ZONES button.
3. Select GO TO PROGRAM MODE (bottom right button).

**Note:** If the area is **NOT** set to PROGRAMMABLE (see pg. 20), this option will not be visible on the screen. When the user unlocks access to the VDC from the *Viseo Setup Menu* (see page 16 & 26 for details), all non-hidden areas in the system become programmable. The user then has access to program all of the non-hidden areas until the access timeout has expired or LOCK AREAS (SEE PG. 26) on the *Viseo Setup Menu* page is pressed. At this time, the areas return to their normal settings.



**Figure 7: Zones Page with Programming Option Visible**



## A. Entering Programming Mode (continued)

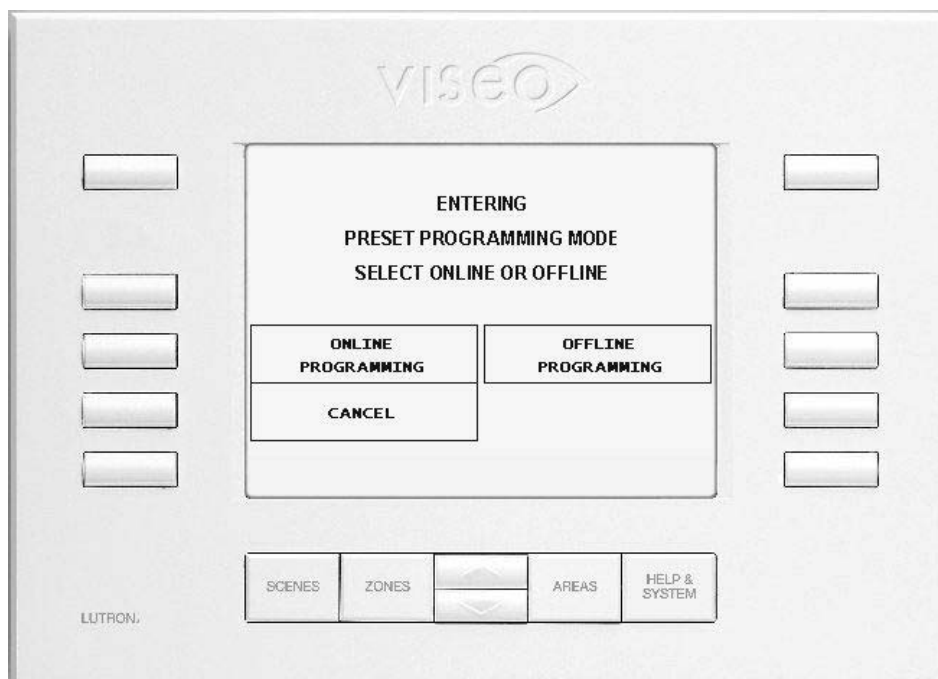
### **Online Programming vs. Offline Programming**

There are two different programming modes in the *GRAFIK 5000/GRAFIK 6000* system. In *Online Programming*, the light intensities in the selected scene of an area will change while programming the zone levels. During *Offline Programming*, the light intensities in the selected scene of an area will not change while programming the zone levels. This mode can be used when there are people occupying an area. Changes made during Offline Programming take effect the next time the scene is selected from the VDC, or any other control.

1. Select ONLINE PROGRAMMING or OFFLINE PROGRAMMING.

After selecting Online or Offline Programming, the *Zones: Setting Intensities* page (for the current scene) is automatically displayed.

**Note:** All programming steps on the following pages are identical for Online or Offline Programming.



**Figure 8: Online or Offline Programming Selection Screen**

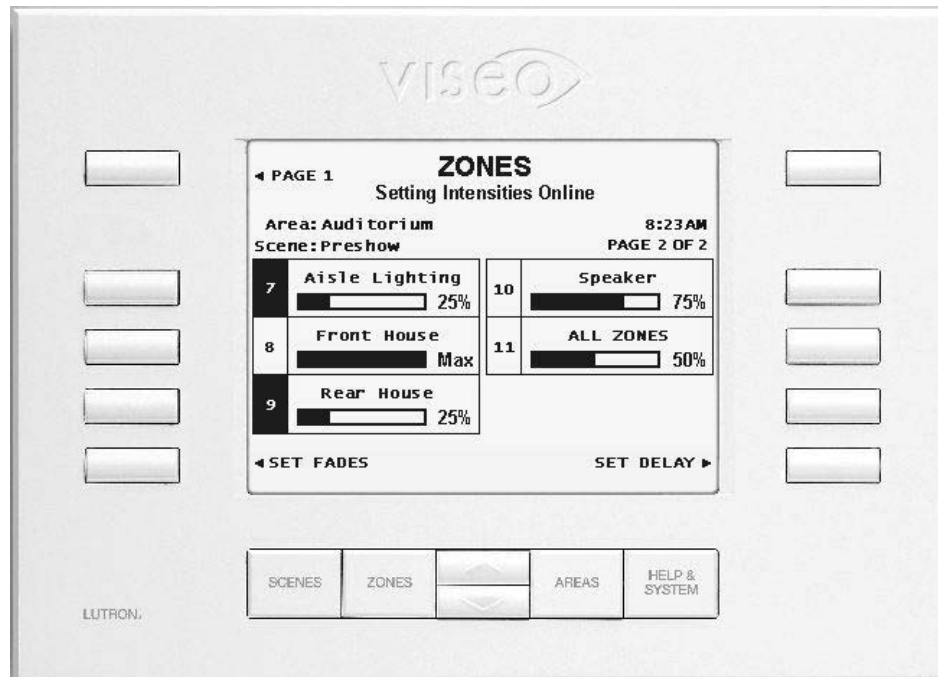


## B. How to Program a Scene

### Programming Zone Intensities of the Scene

**Note:** If the current page is not the *Zones: Setting Intensities* page, select SET INTENSITY.

1. Select the zone(s) that needs to be changed.
  - a. To deselect a zone, the button beside it **MUST** be pressed again. Simply pressing a different zone button will not deselect the previously selected zone.
  - b. Multiple zones from the same page **CAN** be selected and changed. Once the PREVIOUS PAGE or NEXT PAGE button is pressed, all zones are deselected.
  - c. To select all zones, scroll to the last page of zones and select the zone that reads ALL ZONES.
2. Use the Raise and Lower buttons to set the zone(s) to the desired level.
3. To program another zone in this scene, deselect the current zone and repeat steps 1 and 2.



**Figure 9: Setting Intensities Screen**



## Programming Mode

### B. How to Program a Scene (continued)

#### Programming the Fade Rate of the Scene

1. Select SET FADES, and the *Zones: Setting Fades* page will be displayed.
2. Select the zone(s) that that requires a fade rate change.
  - a. To deselect a zone, the button beside it **MUST** be pressed again. Simply pressing a different zone button will not deselect the previously selected zone.
  - b. Multiple zones from the same page **CAN** be selected and changed. Once the PREVIOUS PAGE or NEXT PAGE button is pressed, all zones are deselected.
  - c. To select all zones, scroll to the last page of zones and select the zone that reads ALL ZONES.
3. Use the Raise and Lower buttons to set the zone(s) to the desired fade rate. The fade rate ranges from 0-99 seconds or 2-60 minutes.

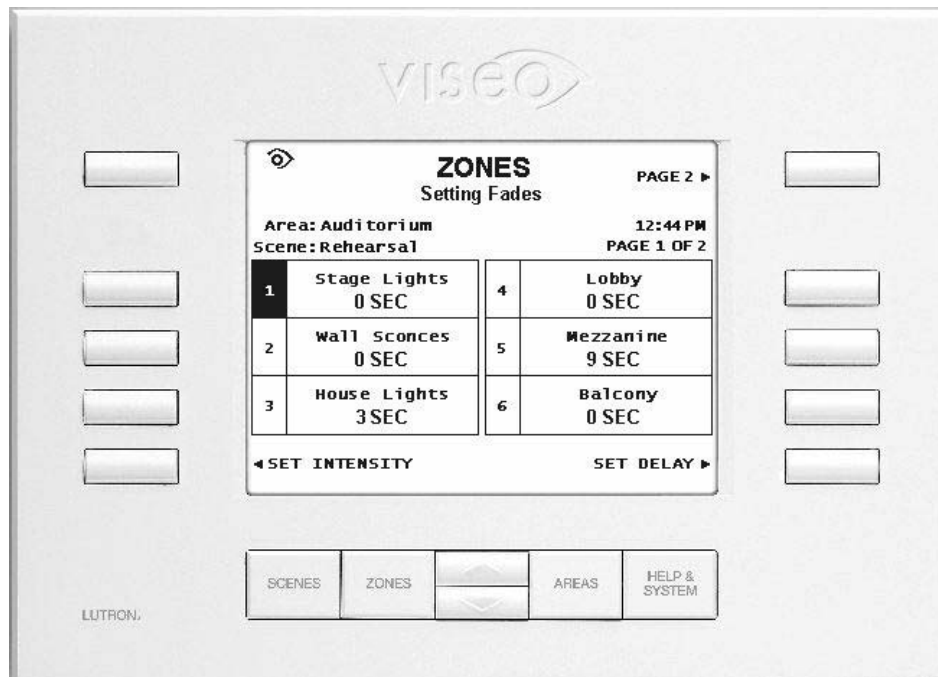


Figure 10: Setting Fades Screen

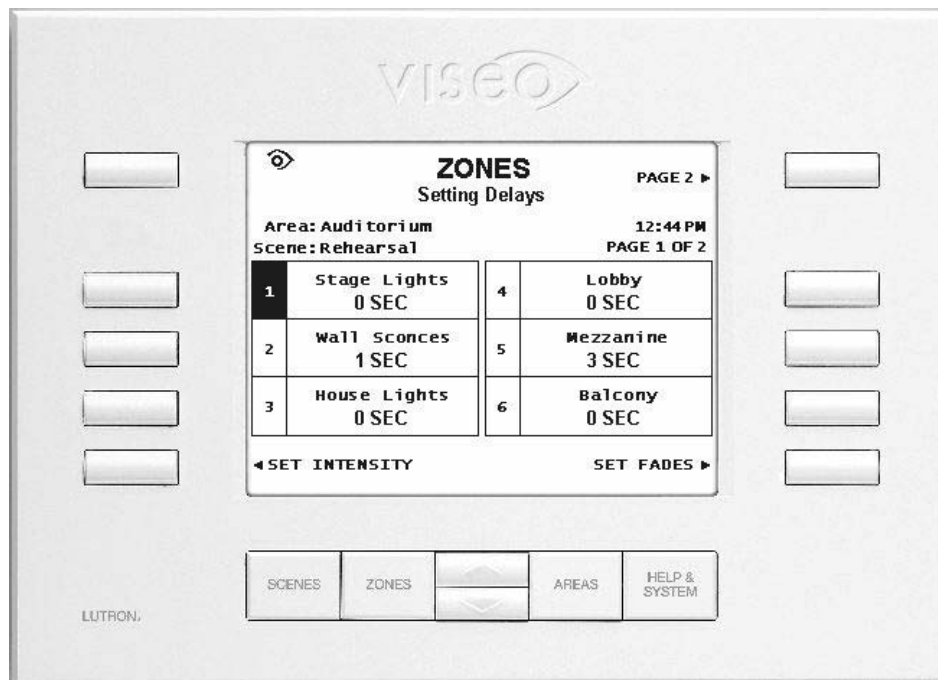


## Programming Mode

### B. How to Program a Scene (continued)

#### Programming the Delay Rate of the Scene

1. Select SET DELAY and the *Zones: Setting Delays* page will be displayed.
2. Select the zone(s) that requires a delay rate change.
  - a. To deselect a zone, the button beside it **MUST** be pressed again. Simply pressing a different zone button will not deselect the previously selected zone.
  - b. Multiple zones from the same page **CAN** be selected and changed. Once the PREVIOUS PAGE or NEXT PAGE button is pressed, all zones are deselected.
  - c. To select all zones, scroll to the last page of zones and select the zone that reads ALL ZONES.
3. Use the Raise and Lower buttons to set the zone(s) to the desired delay rate. The delay rate ranges from 0-99 seconds or 2-60 minutes.



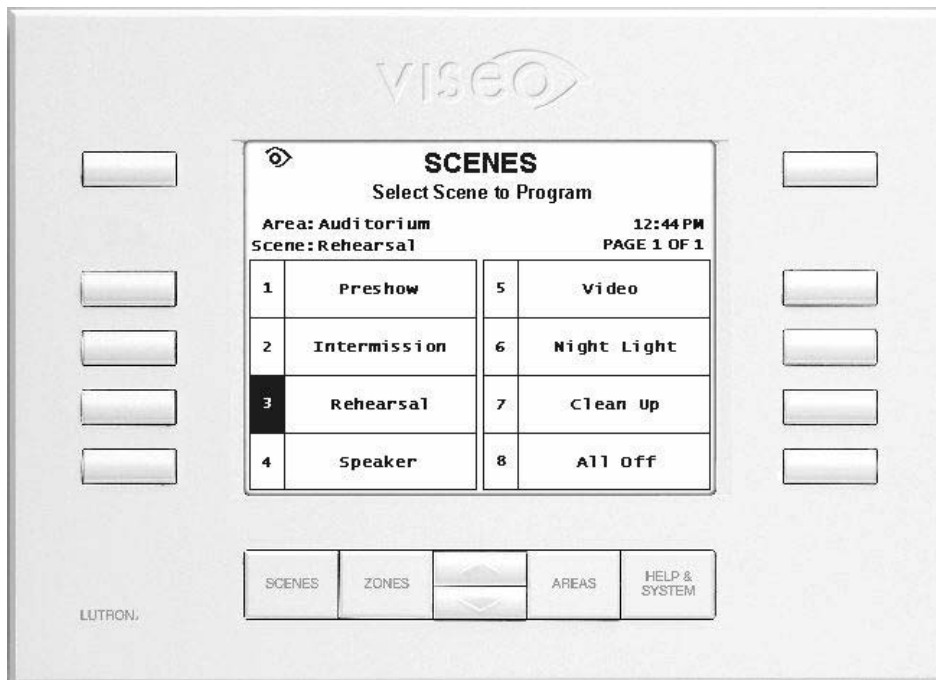
**Figure 11: Setting Delays Screen**



## B. How to Program a Scene (continued)

### Selecting a Scene to Program

1. Press the SCENES button, and the *Scenes: Select Scene to Program* page will appear.
2. Select a scene to program, and the programming page for that scene will appear.



**Figure 12: Select Scene To Program Screen**

## C. Exiting Programming Mode

To exit programming mode, press the AREAS button.

**Note:** The programming changes made on a VDC are only saved in the G5000/G6000 processor. No changes are saved to the database in the PC that is connected to the G5000/G6000 processor. To save changes to the database in the PC, see Appendix C (pg. 30-31).



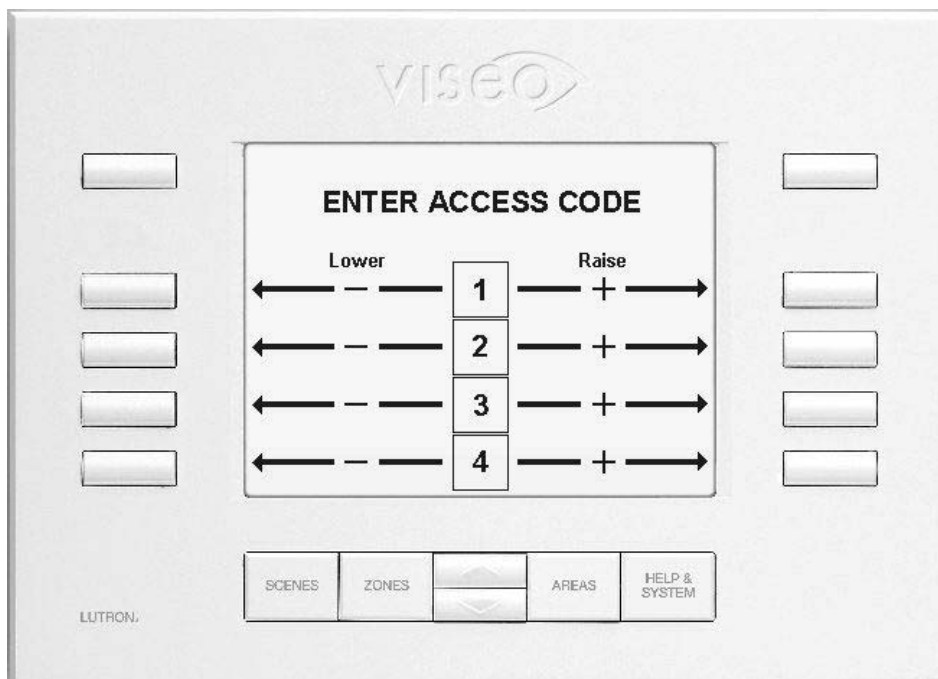
**Note:** The letters **VDC** stand for **V**iseo **D**isplay **C**ontrol.

## A. Accessing the Viseo Setup Menu

1. Press HELP & SYSTEM.
2. Select VISEO SETUP MENU (bottom right button).
3. If required, enter the appropriate access code by selecting + (right side buttons) and - (left side buttons).

**Note:** The **default** access code set at the factory is **1000**.

4. When the correct access code has been entered in the squares, the screen will automatically display the *Viseo Setup Menu*.



**Figure 13: Enter Access Code Screen**



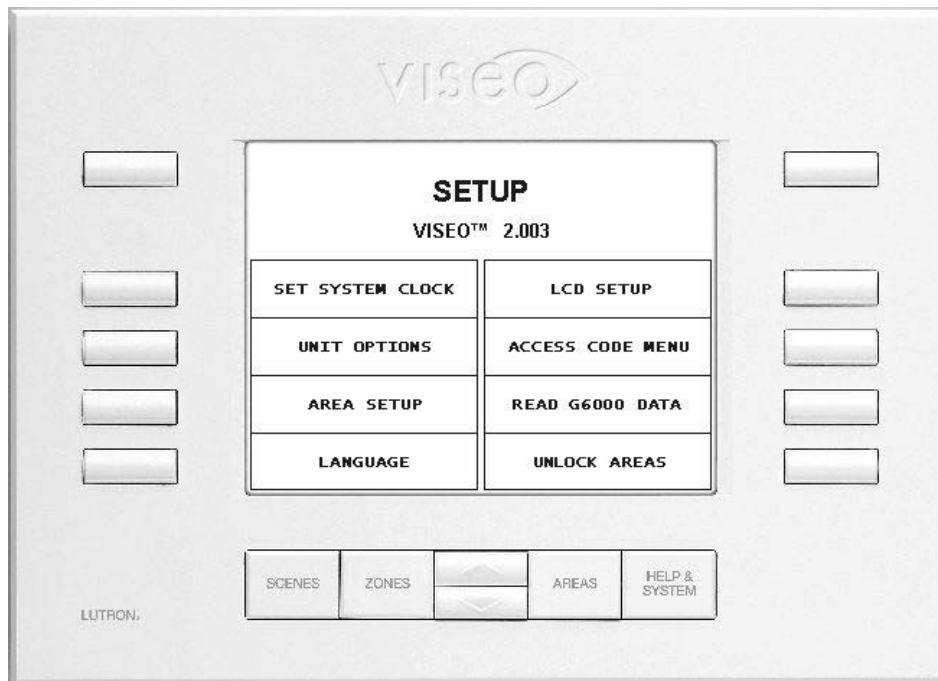


## B. Setup Menu Choices

The *Viseo Setup Menu* allows the user to customize the VDC's preferences. Use the side buttons to select these choices.

### **Viseo Setup Menu Choices:**

1. SET SYSTEM CLOCK - allows the user to set the date and time for the *GRAFIK 5000/GRAFIK 6000* System.
2. UNIT OPTIONS - allows the user to adjust the Link Address, Default Area, and Area & Scene Numbers.
3. AREA SETUP - allows the user to change the settings for each of the areas.
4. LANGUAGE - allows the user to change the display language.
5. LCD (Liquid Crystal Display) SETUP - allows the user to change the LCD settings.
6. ACCESS CODE MENU - allows the user to make changes to the access requirement settings.
7. READ G6000 DATA - download the area, scene, and zone names from the G5000/G6000 processor database into the VDC.
8. UNLOCK/LOCK AREAS - switches the unit between "Areas Unlocked" mode and "Areas Locked" mode.



**Figure 14: Viseo Setup Menu Screen**

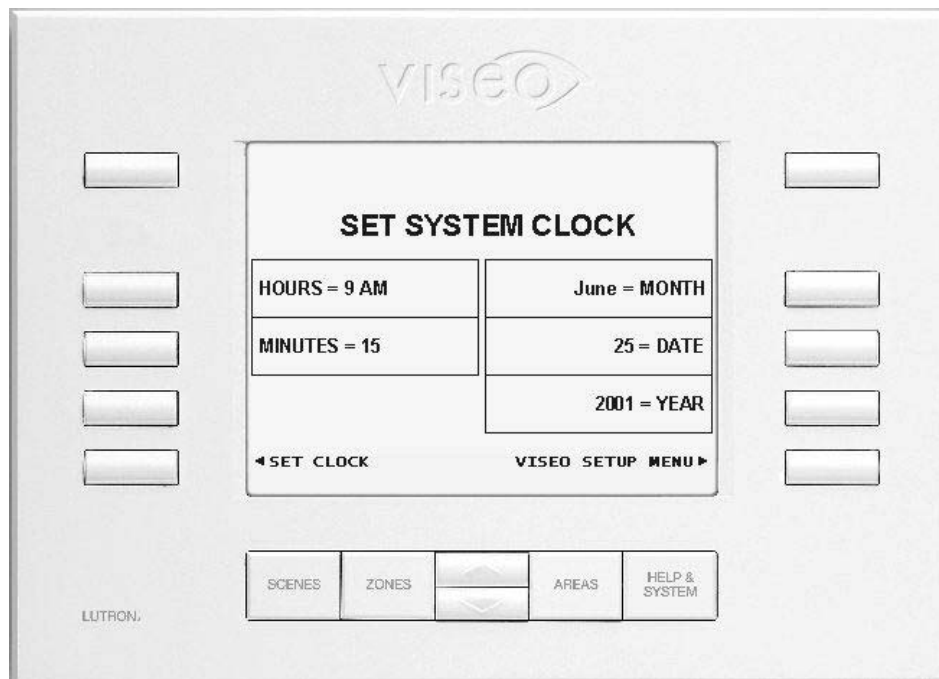


## 1. Set System Clock

This page allows the user to set the date and time for the *GRAFIK 5000/GRAFIK 6000* System.

### How to Set System Clock:

- Select each of the clock options (Hours, Minutes, Month, Date, and Year) and use the Raise and Lower buttons to change the entry to the desired value.
- Select SET CLOCK to save the clock values currently on the screen.
- To exit the *Set System Clock* page without saving the time, select VISEO SETUP MENU.



**Figure 15: Set System Clock Screen**



## 2. Unit Options

This page allows the user to adjust the following options:

- **Link Address** – sets the address of the VDC. This number is the same as the Wallstation link address number of the VDC in the database (see Appendix B: Including VDC in the G5000/G6000 Database). The address can be 1 through 32. Any two VDCs/Wallstations on the same link cannot have the same address.

**Note:** Lutron does **NOT** recommend changing the address of the VDC, as it is already addressed at the factory.

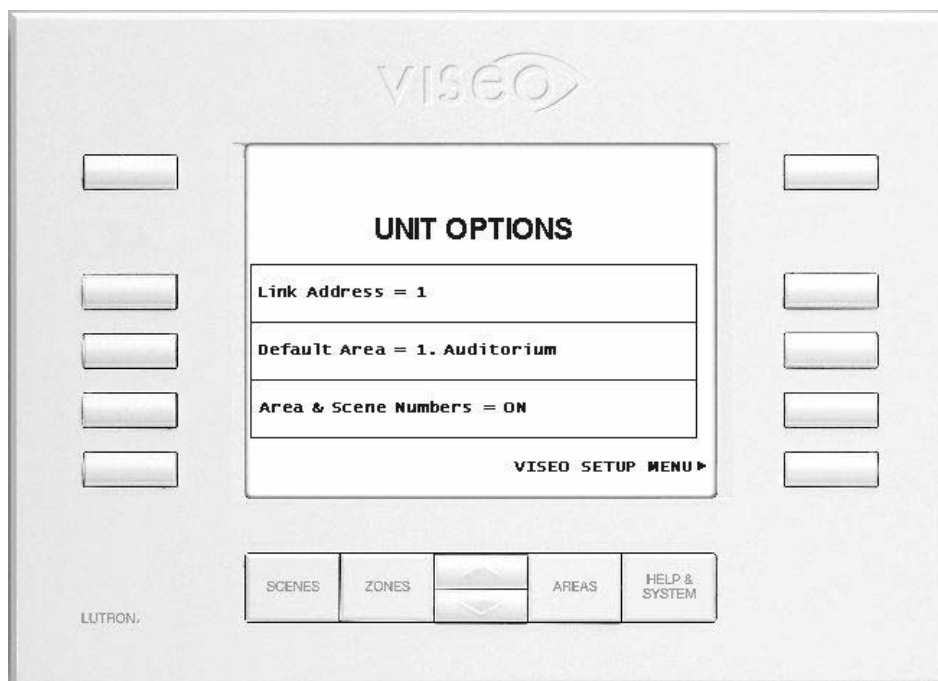
- **Default Area** – sets the default area of the system. When the access or backlight timeout is reached, the *Scenes* page of the default area is displayed on the screen. The default area cannot be hidden.

**Note:** If the default area is set to ALL AREAS, the *Areas* page will be displayed when the backlight timeout is reached.

- **Area & Scene Numbers** – turns the area and scene numbers On and Off. When this option is On, numbers are displayed in front of the area and scene names on the *Areas* page and *Scenes* page. When the option is Off, no numbers are displayed.

### How to Adjust Unit Options:

- Press the buttons on the left of the screen to select an option.
- Use the Raise and Lower buttons to change the value of the entry.



**Figure 16: Unit Options Screen**



## 3. Area Setup

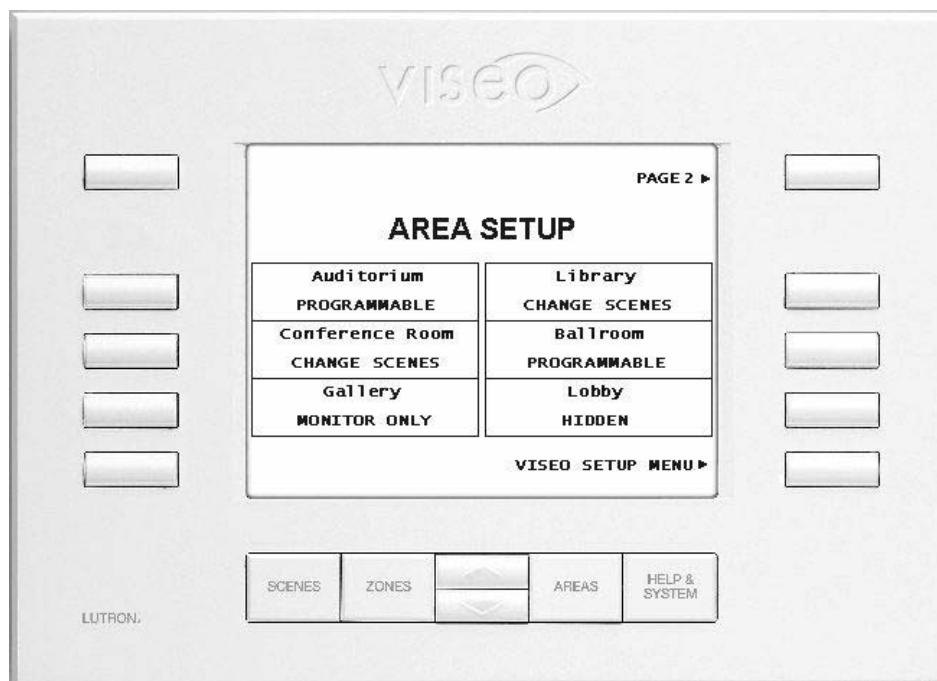
This page allows the user to change the settings for each of the areas. The possible settings are:

- **Programmable** – all users have access to program and select the scenes and switch the timeclock On and Off in this area.
- **Change Scenes** – users are able to select scenes in this area, but not reprogram the scenes or turn On and Off the timeclock.
- **Monitor Only** – users are not able to program or select scenes in this area, but they can check the current scene and light levels.
- **Hidden** – this area is hidden from the user's view on the *Areas* page. The default area (page 18) **cannot** be hidden.

### How to Adjust Area Settings:

- Select the area.
- Use the Raise and Lower buttons to display the desired option.

**Note:** When the user unlocks access to the VDC from the *Viseo Setup Menu* (by pressing UNLOCK AREAS on the *Viseo Setup Menu*, page 25), all non-hidden areas in the system become programmable. The user then has access to program all of the non-hidden areas until the access timeout has expired or LOCK AREAS on the *Viseo Setup Menu* page is pressed. At this time, the areas return to their original settings.



**Figure 17: Area Setup Screen**

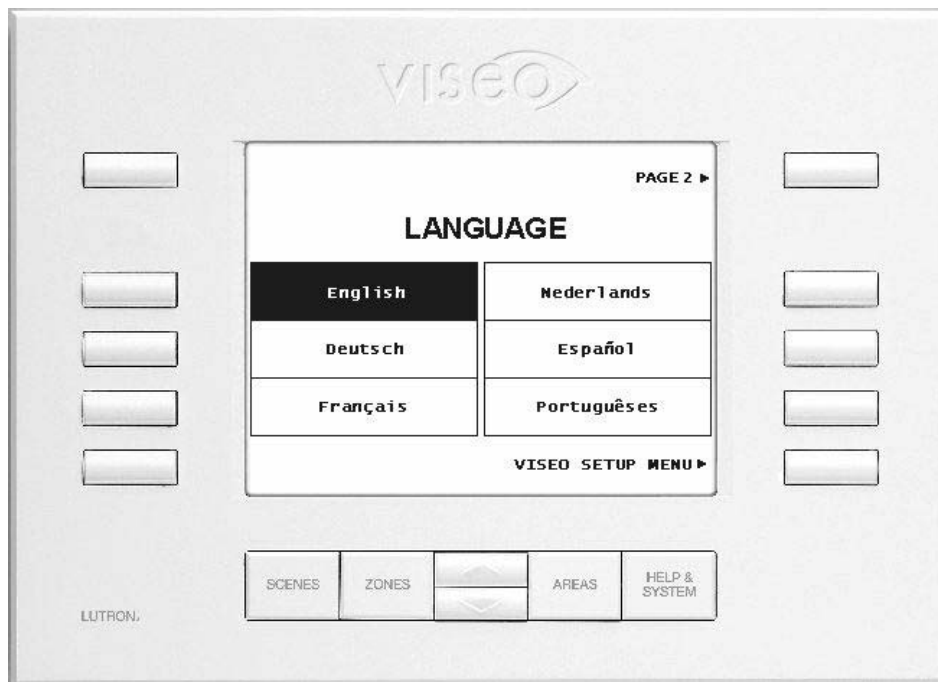


## 4. Language

These pages allow the user to change the display language for page titles, menu options, messages, etc. on the screen. The following languages are available:

- English
- Deutsche (German)
- Français (French)
- Nederlands (Dutch)
- Español (Spanish)
- Portuguêses (Portuguese)
- Italiano (Italian - on page 2)

**Note:** This language option does not translate the area, scene, or zone names that are held in the database on the laptop. These names need to be entered using G5000/G6000 Setup software in the desired language. The PC being used must have the appropriate language capabilities to display all characters on the screen.



**Figure 18: Language Selection Screen**



## 5. LCD (Liquid Crystal Display) Setup

This page allows the user to change the LCD settings:

- **LCD Contrast** – change the contrast of the LCD. This value ranges from 0% (black) to 100% (white).
- **LCD Backlight** – change the intensity of the backlight of the LCD. This value ranges from 0% (off) to 100% (on full).
- **Backlight Timeout** – change the timeout for the backlight. This timeout is reached when no one presses a button on the *Viseo* control for the length of the timeout. At this time, the backlight shuts off and the screen changes to the *Scenes* page of the default area (or the *Areas* page depending on the default area setting - see pg. 18).

### How to Change the LCD Display Settings:

- Press the buttons on the left of the screen to select an option.
- Use the Raise and Lower buttons to change the value of the entry.



Figure 19: LCD Setup Screen



## 6. Access Code Menu

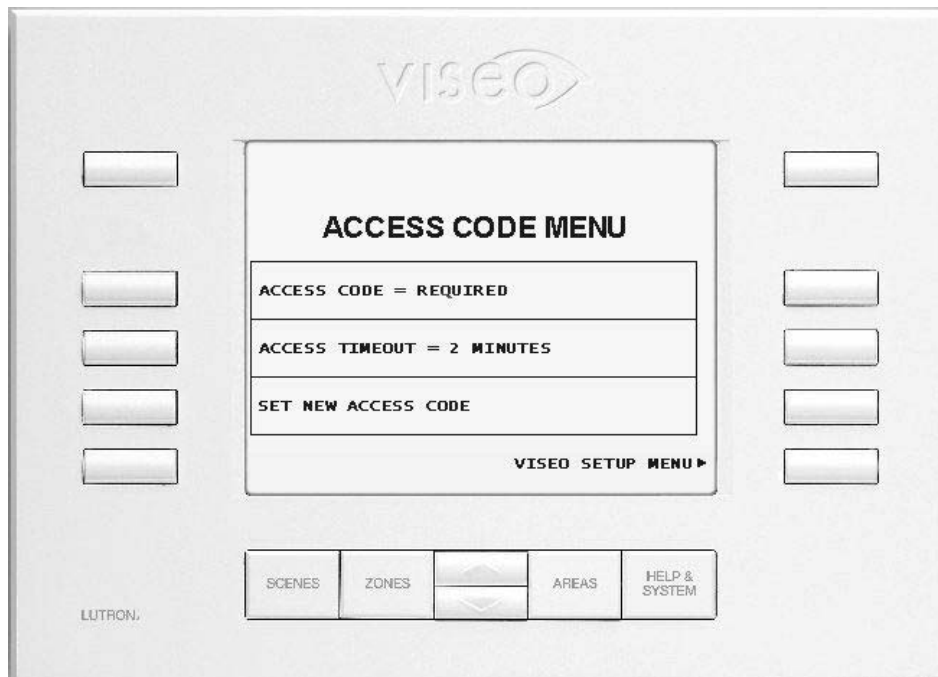
This page allows the user to make changes to the following access requirement settings:

- **Access Code** – enables (REQUIRED) and disables (NOT REQUIRED) the access code requirement. If the access code is required and a user tries to enter the *Viseo Setup Menu*, the user must enter an access code to continue. If the access code is not required, the user will not be prompted for an access code. Note that **ANY** user will be able to enter the *Viseo Setup Menu* and change the settings of the unit if the access code is set to NOT REQUIRED mode.
- **Access Timeout** – changes the timeout setting for “Areas Unlocked” mode (see page 25). This timeout is reached when no one presses a button on the *Viseo* control for the length of the timeout during setup. When the timeout expires, the *Viseo* control changes from “Areas Unlocked” mode to “Areas Locked” mode.
- **Set New Access Code** – displays the *New Access Code* page.

### How to Change the Access Requirements:

- Press the buttons on the left of the screen to select an option.
- Use the Raise and Lower buttons to change the value of the entry.

**Note:** Selecting SET NEW ACCESS CODE will take the user directly to the *New Access Code* page.



**Figure 20: Access Code Menu Screen**



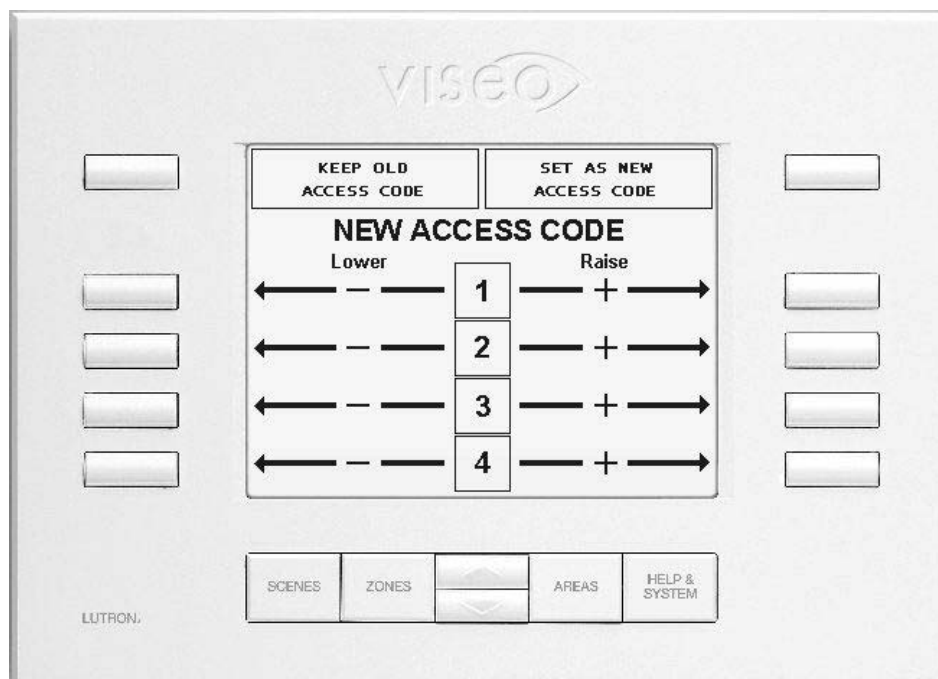
## 6. Access Code Menu (continued)

### How to Set a New Access Code:

- On the *Access Code Menu* page, select SET NEW ACCESS CODE.
- Enter the new access code by selecting + (right side buttons) and - (left side buttons).
- When the desired code is in the squares, select SET AS NEW ACCESS CODE to save the new code. Make sure to record the new access code in a safe place for future reference, possibly in the space provided at the bottom of this page.

**Note:** To exit the *New Access Code* page at any time without changing the access code, select KEEP OLD ACCESS CODE.

**Note:** When the user unlocks access to the VDC from the *Viseo Setup Menu* (by pressing Unlock Areas on the *Viseo Setup Menu*), all non-hidden areas in the system become programmable. The user then has access to program all of the non-hidden areas until the access timeout has expired or LOCK AREAS on the *Viseo Setup Menu* page is pressed. At this time, the areas return to their normal settings.



**Figure 21: New Access Code Screen**

### New Access Code:

\_\_\_\_\_





### 7. Read G5000/G6000 Data

Selecting this option will download the area, scene, and zone names from the G5000/G6000 processor database into the VDC. This may take a few minutes, depending on the size of the database. This function also occurs automatically when the system is powered up.

**Note:** Pressing the HELP & SYSTEM button will stop the download and display the *Viseo Setup Menu* page. Lutron does **NOT** recommend stopping the download since the VDC will not have all the database information necessary to operate properly. To restart the download, select READ G6000 DATA on the *Viseo Setup Menu* page.



**Figure 22: Download Screen**



## 8. Unlock/Lock Areas

Pressing the bottom right button on the *Viseo Setup Menu* switches the unit between "Areas Unlocked" mode and "Areas Locked" mode. When this button displays UNLOCK AREAS, the VDC is in "Areas Locked" mode.

### "Areas Locked" Mode:


- a. Each area behaves as it is configured in the AREA SETUP mode from the *Viseo Setup Menu* (page 19).
- b. An access code is required to reenter the *Viseo Setup Menu*.

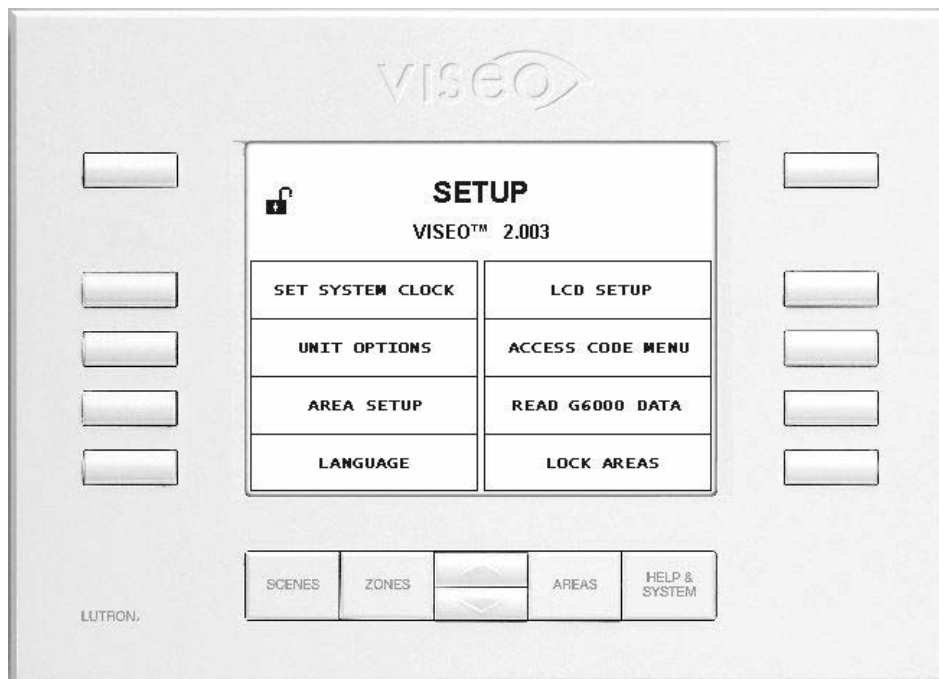
After selecting UNLOCK AREAS, the button will display LOCK AREAS, and the VDC will be in the "Areas Unlocked" mode.

### "Areas Unlocked" Mode:

- a. All non-hidden areas are **temporarily** set to programmable.
- b. No access code is required to reenter the *Viseo Setup Menu*.
- c. Able to turn On and Off the timeclocks in all non-hidden areas.

**Note:** Hidden areas cannot be programmed unless the user first enters the *Area Setup* page and changes the area's setting from HIDDEN (see pg. 20).

An "unlocked" symbol (  ) will appear on the screen while the unit is in the "Areas Unlocked" mode. Access to the VDC will remain "unlocked" until the user selects LOCK AREAS from the *Viseo Setup Menu* or until the access code timeout expires (see pg. 23-24). Then, all areas resume their original settings, and the access code will once again need to be entered to access the *Viseo Setup Menu*.



**Figure 23: Viseo Setup Menu in "Areas Unlocked" Mode**



# Troubleshooting Guide

**Note:** The letters **VDC** stand for **V**iseo **D**isplay **C**ontrol.

## Troubleshooting Guide

Symptoms	Possible Causes and Remedies
Screen is blank and the backlight is not On.	<ul style="list-style-type: none"> <li>■ Is the VDC powered? Check for 12-35V<sub>DC</sub> from terminals 2 to 1 on the Wallstation link.</li> <li>■ Reset power to the VDC (or G5000/G6000 processor) and immediately press the top left button. This will restore the unit to the default contrast and backlight intensity.</li> <li>■ There may be too many Controls (Wallstations/VDCs) on the Wallstation Link. It may be necessary to add a MUX-Repeater (MUX-RPTR). See <b>Appendix E</b> for more information.</li> </ul>
Backlight is On, but the LCD screen is blank.	<ul style="list-style-type: none"> <li>■ Contrast is too low or too high. Reset power to the VDC (or G5000/G6000 processor) and immediately press the top left button. This will restore the unit to the default contrast and backlight intensity.</li> <li>■ Check the voltage between terminals 2 &amp; 1 on the Wallstation Link. If the voltage is below 12V<sub>DC</sub>, there may be too many Controls (Wallstations/VDCs) on the Wallstation Link. It may be necessary to add a MUX-Repeater (MUX-RPTR). See <b>Appendix E</b> for more information.</li> </ul>
Screen is not blank, but the backlight is very dim or not On.	<ul style="list-style-type: none"> <li>■ The VDC backlight may have timed-out. Press any button to restore the backlight.</li> <li>■ Backlight intensity is too low. Go to the <i>Viseo Setup Menu</i> and select LCD SETUP. Select BACKLIGHT INTENSITY and press the Raise button until the backlight is bright.</li> <li>■ Reset power to the VDC (or G5000/G6000 processor) and immediately press the top left button. This will restore the unit to the default contrast and backlight intensity.</li> </ul>
The VDC is waiting for download, but there is no response. Screen is displaying "Please Wait... For G6000 Communication to Begin," and unit is not downloading the data from the processor.	<ul style="list-style-type: none"> <li>■ Has the VDC been included in the database? See <b>Appendix B</b>.</li> <li>■ Is the VDC addressed correctly?</li> <li>■ Is there another control addressed the same as the VDC?</li> <li>■ Check wiring - are MUX and MUX connected to the correct terminals on the back of the VDC? Check that the wires to terminals 3 (white) and 4 (purple) at the back are connected to terminals 3 and 4 (3 to 3, 4 to 4) at the G5000/G6000 processor.</li> <li>■ Does this system have an older G5000/G6000 processor? (Is this job a retrofit?) If so, the processor needs new operating code and the I/O card must be the current revision. See <b>Appendix D</b>.</li> </ul>



## Troubleshooting Guide (continued)

<b>Symptoms</b>	<b>Possible Causes and Remedies</b>
The VDC keeps resetting without anyone touching the control.	<ul style="list-style-type: none"><li>■ Check the wiring - are there any bad connections?</li><li>■ Is there another Control addressed the same as the VDC?</li><li>■ Make sure that there is a link termination at both ends of the Wallstation Link.</li><li>■ Is the appropriate operating code loaded into the G5000/G6000 processor?</li></ul>
The screen has locked up.	<ul style="list-style-type: none"><li>■ Make sure that there is a link termination at both ends of the Wallstation Link.</li><li>■ Is the appropriate operating code loaded into the G5000/G6000 processor?</li><li>■ Reset power to the G5000/G6000 processor.</li><li>■ Check to see if the VDC is disabled in the G5000/G6000 Operate software. The VDC should be enabled at all times.</li></ul>
The end of an area, scene, or zone name is cut off on the VDC's screen.	<ul style="list-style-type: none"><li>■ The name is too long. Open <i>G5000/G6000 Setup</i> (on the PC) and change the name so that it is shorter. Try entering the name in lower case rather than all capitals because this takes up less space. Download the database into the G5000/G6000 processor.</li></ul>



---

# Appendix A: Setting Up the *Viseo* Display Control (VDC)

## Setting the Address and Loading the Database Information into the VDC

If the VDC is addressed correctly when it is powered up and connected to the Wallstation link, the unit will begin downloading the database information. If the VDC is displaying "Please Wait... For G6000 Communication to Begin" and does not begin to download the data, please complete the following steps.

1. Press HELP & SYSTEM.
2. Select VISEO SETUP MENU (lowest button on right side).
3. If needed, enter the access code "1000" (factory preset) by selecting + (right side buttons) and - (left side buttons).
4. Select UNIT OPTIONS.
5. Select LINK ADDRESS.
6. Press the Raise and Lower buttons to select the address of the VDC in the database (see Appendix B: Including the VDC in the G5000/G6000 Database).
7. Select VISEO SETUP MENU.
8. Select READ G6000 DATA (same selection for *GRAFIK 5000* systems). The VDC will display "Please Wait... Reading Data". Do not press any buttons until the data is done loading.

## Setting a New Access Code for the VDC

1. Press HELP & SYSTEM.
2. Select VISEO SETUP MENU.
3. If needed, enter the access code "1000" (factory preset) by selecting + and -.
4. Select ACCESS CODE MENU.
5. Select SET NEW ACCESS CODE .
6. Enter the new access code by selecting + and -.
7. Select SET AS NEW ACCESS CODE (this will cancel "1000" as the access code).

## Setting the Default Area and Hidden Areas

1. Press HELP & SYSTEM.
2. Select VISEO SETUP MENU.
3. If needed, enter the access code (from step 6 above) by selecting + and -.
4. Select UNIT OPTIONS.
5. Select DEFAULT AREA.
6. Press the Raise and Lower buttons to select an area as the default area (the screen displays to this area's *Scenes* page after the security access timeout has expired). For more information, please see pg. 18.
7. Select VISEO SETUP MENU.
8. Select AREA SETUP.
9. Select an area to change the settings on. Use the Previous Page (top left) and Next Page (top right) buttons to navigate to other pages of areas.
10. Press the Raise and Lower buttons to change the entry to Programmable, Change Scenes, Monitor Only, or Hidden. See *Area Setup* (see pg. 20). Note that the default area **cannot** be hidden.
11. Repeat steps 9 and 10 for all areas.



---

### Appendix A: Setting Up the *Viseo* Display Control (VDC) (continued)

#### Setting the Contrast

1. Press HELP & SYSTEM.
2. Select VISEO SETUP MENU.
3. If needed, enter the access code by selecting + and -.
4. Select LCD SETUP.
5. Select LCD CONTRAST.
6. Use the Raise and Lower buttons to set the contrast of the screen at the optimum level.

### Appendix B: Including the VDC in the G5000/G6000 Database

The VDC is included in the *GRAFIK 5000/GRAFIK 6000* database as an OMX-RS232 control. When the VDC is connected to the Wallstation link, the processor automatically detects it as a VDC. Follow this procedure using the *GRAFIK 5000/GRAFIK 6000* Operate Software on a PC to add a VDC to the database.

1. Start G5000/G6000 Operate Software and open your database.
2. Press CTRL + ALT + HOME at the same time to bring up the *System Wallstations* Menu.
3. Select the next available Wallstation from the column on the right.
4. Click on the single arrow button pointing to the left (<).
5. Click on DONE.
6. Click on the STANDARD AREAS icon to open the Standard Areas Overview.
7. Click on DEFINE WALLSTATION CONTROL.
8. Under *Wallstation Being Displayed*, scroll until the new Wallstation is being displayed.
9. Click on the text box under *Enter New Wallstation Name*.
10. Type in the new name and press ENTER.
11. Click on DONE.
12. Save the database.

### Appendix C: Saving Programming Changes Made at the VDC to the PC Database

1. Make the appropriate scene programming changes at the VDC using either Online or Offline programming (see pg. 11). Exit programming mode.
2. Make sure that the PC is plugged into the G5000/G6000 processor using the PJ62-ADPT-1 adapter.
3. Open the G5000/G6000 Operate Software.
4. Select *Monitor/Operate > Scene Values > Online Programming* (selecting Offline Programming will also work).
5. A warning message will appear that reads, "Scene Values In The *GRAFIK 5000/GRAFIK 6000* Have Been Modified Since The Last Data File Transfer. The Values Which Will Be Displayed On Screen Are Those Stored In the *GRAFIK 5000/GRAFIK 6000*."
6. Click on OK.
7. If changes were made at the VDC to the first area in the system, another warning message will appear that reads, "This Area Contains Scenes Which Have Been Modified Since The Last Data File Transfer. Modified Scenes Are Indicated By A '#' In The Name Prefix." (continued on next page)



### Appendix C (continued)

8. Click on OK, if necessary.
9. Click on DONE.
10. Another message will appear that reads, "WARNING! There Are Scenes In The System Which Have Been Modified In The *GRAFIK 5000/GRAFIK 6000*. This Means The Current Data File May Not Match The Date In The *GRAFIK 5000/GRAFIK 6000*. You Should Save Or Discard The Modified *GRAFIK 5000/GRAFIK 6000* Scene Data Before Proceeding."
11. Click on SAVE ALL MODIFIED SCENE DATA. The scene programming changes made at the VDC have now been saved in the database on the PC.

### Appendix D: Installing a VDC with Existing *GRAFIK 5000/GRAFIK 6000* Systems

For any *GRAFIK 5000/GRAFIK 6000* retro-fit jobs that include VDCs, two issues need to be addressed for the controls to operate correctly:

1. The operating code needs to be o2\_210.mot or a later rev.
2. The I/O cards on the processor need to be rev. 6 or later.

#### Downloading the New G6000 Operating Code

1. Make sure that the laptop is connected to the G5000/G6000 processor with the PJ62-ADPT-1.
2. Using Windows Explorer, copy the new operating code (o2\_210.mot) into the G5000/G6000 directory.
3. Click on START > RUN...
4. For *GRAFIK 5000* Systems type: c:\g5000\download o2\_210.mot  
For *GRAFIK 6000* Systems type: c:\g6000\download o2\_210.mot
5. Reset power to the G5000/G6000 processor. File should begin downloading from the laptop to the processor.

#### Checking the I/O Card

1. Make sure that the laptop is connected to the G5000/G6000 processor with the PJ62-ADPT-1.
2. Open the *GRAFIK 5000/GRAFIK 6000* Operate software.
3. Press CTRL + ALT + HOME at the same time to add the Diagnostics menu to the menu bar at the top of the screen.
4. Select DIAGNOSTICS > LINK DETAILS.
5. Click on the **A** button (in the top left corner of the form).
6. Check the line that reads "I/O Card Code Rev: O2\_I02-6". The last digits of this line should be 2-6 or higher. If the code rev is O2\_I02-5, a new I/O card will need to be installed in the G5000/G6000 processor. If the G5000/G6000 processor has more than 3 Wallstation links, more than one I/O card is necessary.

#### Replacing the I/O Card

1. Turn Off all power to the G5000/G6000 processor panel.
2. Once you have the new I/O cards, remove the front of the G5000/G6000 processor panel and the enclosure around the actual processor board. Use appropriate safety and anti-static precautions when installing the new I/O card.
3. The I/O card is the only removable card on the processor board. Remove this card and insert the new card into the slot. Repeat this for all I/O cards.
4. Switch the power to the G5000/G6000 panel back **On**.



## Appendix E

### Appendix E: VDC Wallstation Link Requirements

**Note:** The VDC draws more current than a standard Wallstation.

G5000/G6000 Wallstation Link Controls:

	# Wallstations/VDCs	# Power Units
<b>Wallstation Link Max</b>	32	32 - 128*
<b>Standard Wallstation</b>	1	1
<b>Viseo Wallstation</b>	1	4

**Note:** Adding a MUX-Repeater (MUX-RPTR) increases the # of power units by 32.

\* Each VDC requires 4 power units with a maximum of 32 Wallstations (4 x 32 = 128).

Use the following equations to determine the number of controls that can be on one Wallstation Link. The numbers must satisfy both equations.

**Controls (Wallstations/VDCs):**

$$(\# \text{ of VDCs}) + (\# \text{ of other Wallstations}) \leq 32$$

**Power Units:**

$$(4 \times \{\# \text{ of VDCs}\}) + (\# \text{ of other Wallstations}) \leq (32 \times \{\# \text{ of MUX-RPTRs}\} + 1)$$

For example, on a Wallstation Link with no MUX-RPTR, the possible number of controls is:

# of VDCs	# of other Wallstations
0	32
1	28
2	24
3	20
4	16
5	12
6	8
7	4
8	0



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## LIMITED WARRANTY

Lutron will, at its option, repair or replace any Viseo Display Control that is defective in materials or manufacture within one year after original 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: DES 421,399 and DES 43,199 and corresponding foreign patents. Other U.S. and foreign patents pending.

Lutron, GRAFIK Eye, GRAFIK 6000, and the Sunburst design are registered trademarks; GRAFIK 5000 is a trademark of Lutron Electronics Co., Inc.

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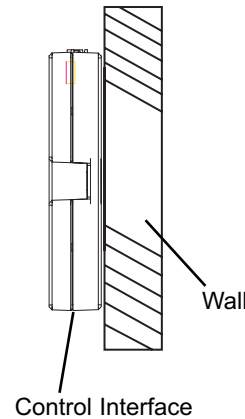
Lutron Electronics Co., Inc.  
Made and printed in U.S.A.  
P/N 030-726 Rev. A 1/02

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

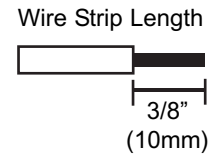
## Mounting

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.
2. Strip 3/8 in. (10mm) of insulation from wires. Each Data Link terminal will accept up to two #18 AWG (1.0mm<sup>2</sup>) 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.

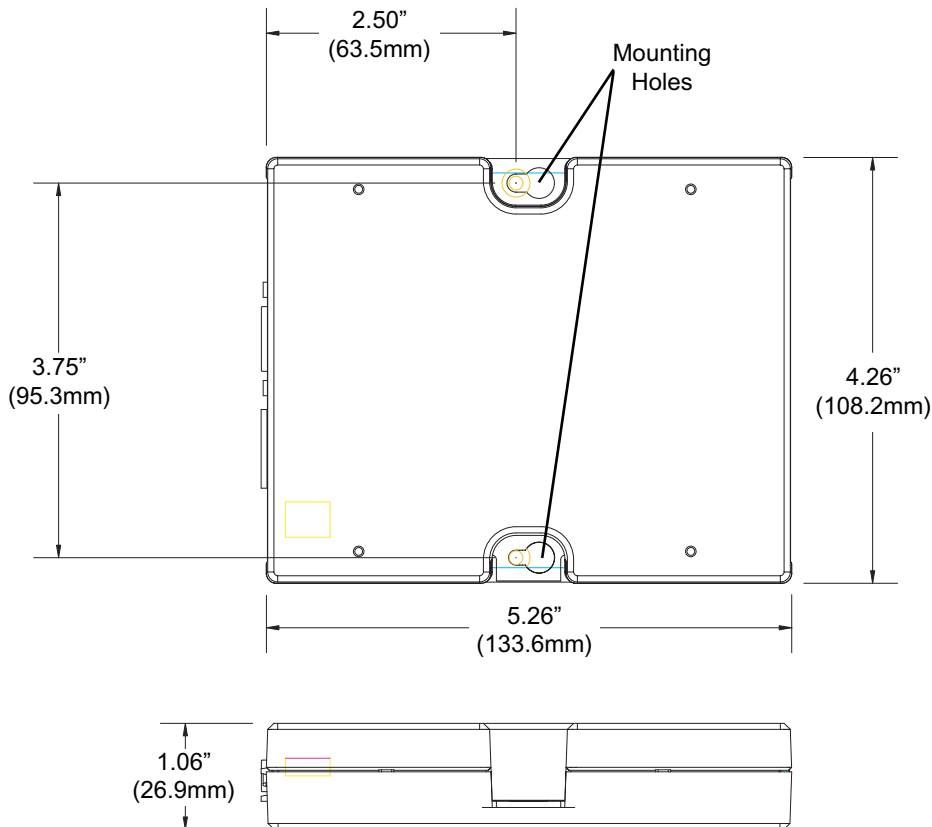
**Mounting Diagram**



LUT-19AV-1U



## Dimensions

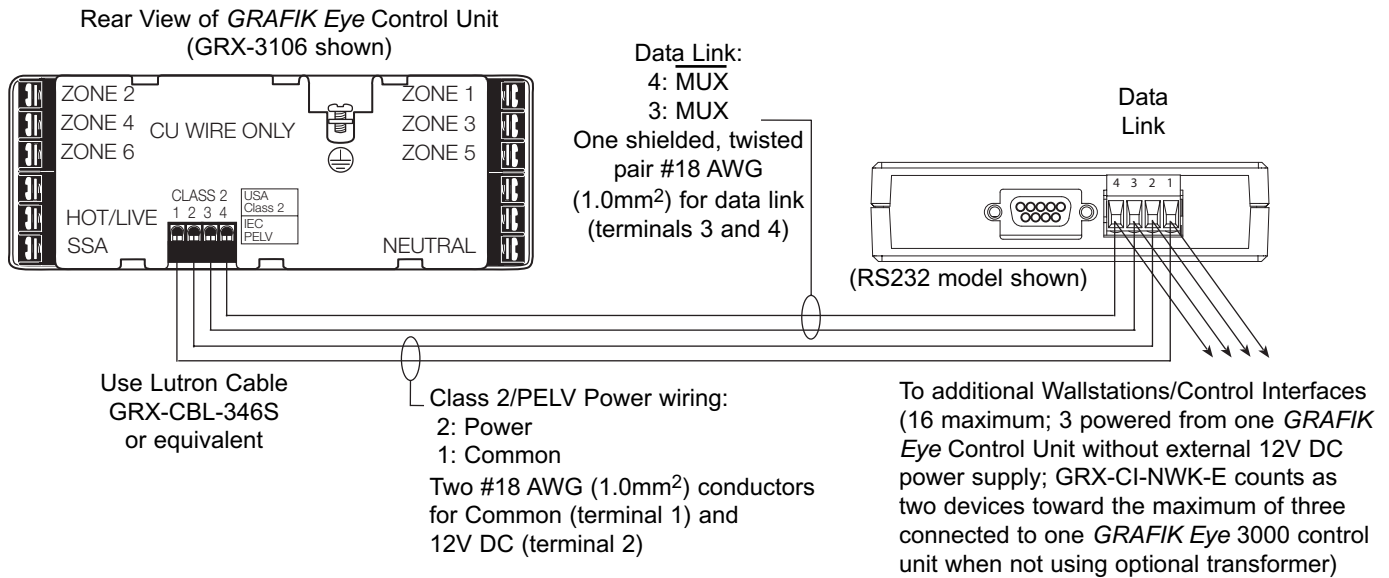


# Low-Voltage Class 2 (PELV) Wiring

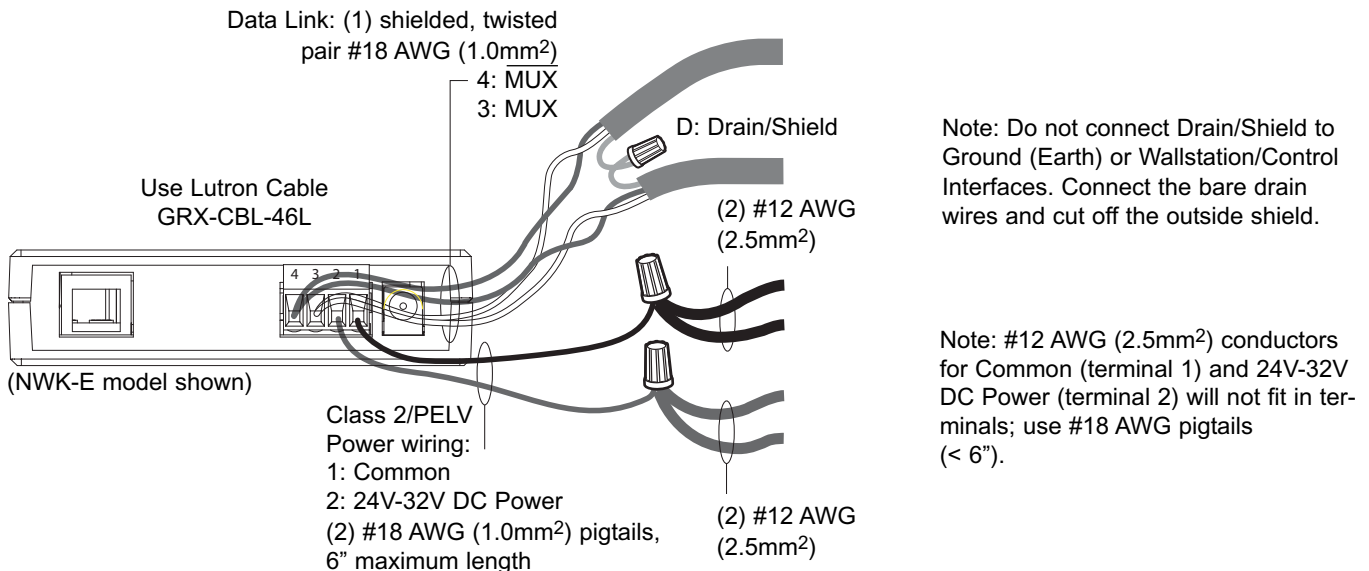
## Important Notes

- 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 Class 2/PELV 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 Class 2 (PELV) 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 (1.0mm<sup>2</sup>) wires.

## Control Interface Wiring: GRX-3000 Control Unit

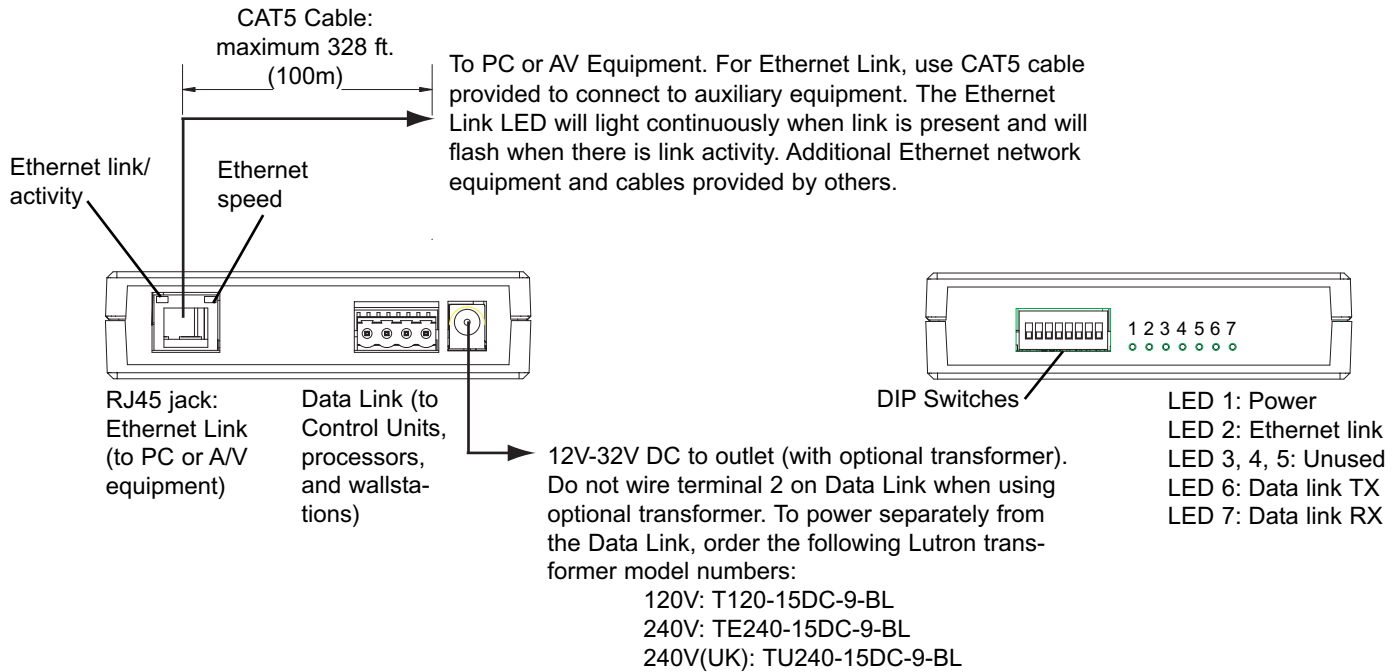


## Control Interface Wiring: GRX-4000 Control Unit or OMX Control Station Device Link (Data Link connection shown)

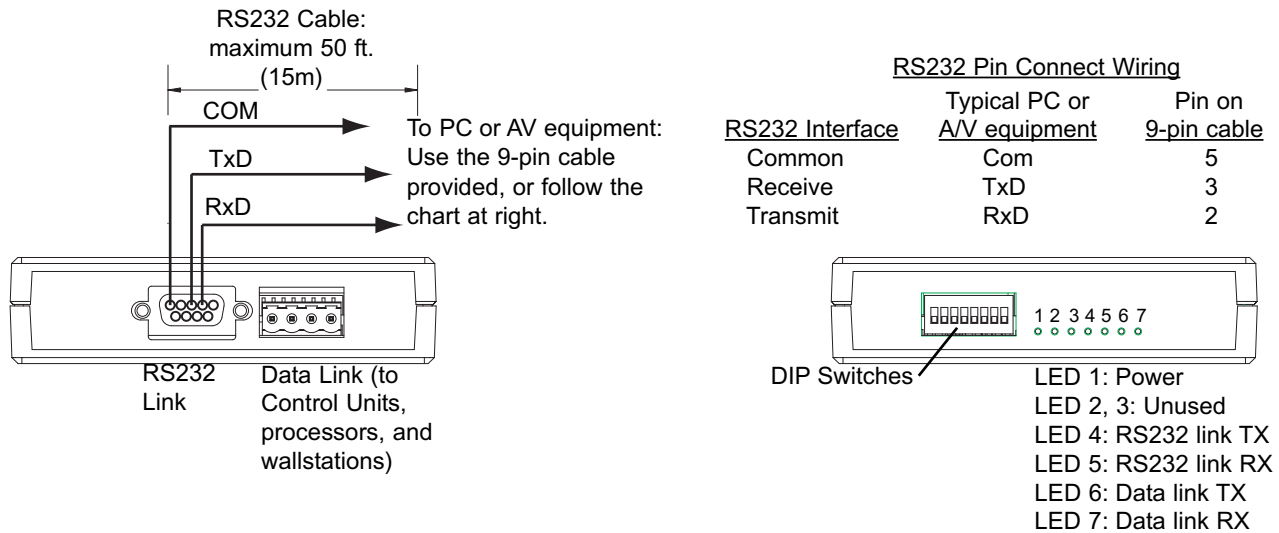


# A/V Connections and Signal/Link Information

## GRX-CI-NWK-E, OMX-CI-NWK-E



## GRX-CI-RS232, OMX-CI-RS232



## GRX-CI-PRG



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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P/N 040-228 Rev. A



OMX-CI-NWK-E

OMX-CI-RS232

### Description

GRAFIK 5000, 6000, and 7000; LCP128; and Softswitch128 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. Commands can be found in the GRAFIK Systems RS232 Protocol and command set on the enclosed CD and on the Lutron website. Not all systems support all commands.

### Communication Settings: OMX-CI-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: OMX-CI-RS232

To configure your device to talk to the OMX-CI-RS232 Interface, use the data conventions listed below.

**BAUD** (based on DIP switches)

**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.

### Command

All commands below are preceded with the five-character command string prefix '~11h '

The HEX equivalent of the '~11h ' string is:

0x7E (~)

0x31(1)

0x31(1)

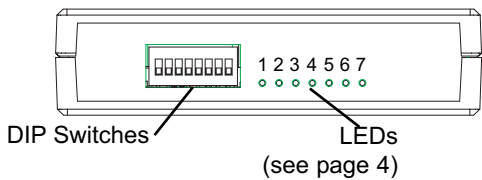
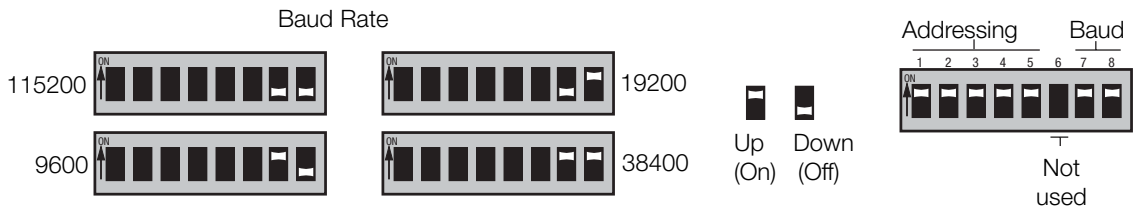
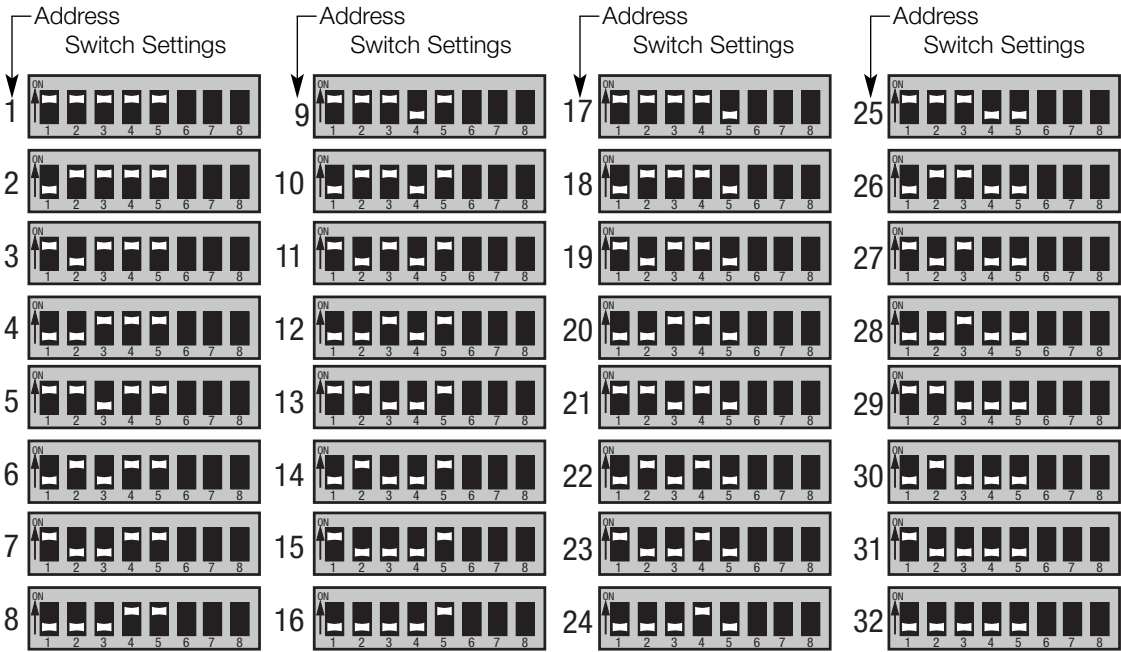
0x68(h)

0x20(space)

The '~' clears the buffer in the device and prepares it to receive commands. The '11' is a constant. The 'h' indicates that all commands and data following this command string will be in the hexadecimal format. Optionally, a 'd' could be used for the commands and data to be entered in the decimal format. The decimal option is available only for communication via the GRAFIK 6000 or 7000 panel's local RS232 port.

## DIP Switch Settings

In order to properly communicate on the CSD link, the control interface must have its address set. Use the Lutron-supplied drawings to determine the required address, and find it in the table below. Switches 1-5 set the address of the control interface. Switches 7 and 8 set the baud rate.





## Device Communication Information (OMX-CI-NWK-E Only)

### Server Description

The OMX-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 provides a login prompt and waits for a login name. (No password is necessary.) After logging in, the device waits for ASCII strings to perform commands. These strings can be found in the *GRAFIK* Systems RS232 Protocol and Command Set on the enclosed CD and the Lutron website.

### Example sequence of events

```
login: nwk<cr>
connection established<cr><lf>
~11h 12 2<cr>
#1 OK<cr><lf>
```

### Description of the sequence of events

- A connection is made by a Telnet client to the OMX-CI-NWK-E at IP address 192.168.250.1 Port 23.
- Once connected, the OMX-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).
- OMX-CI-NWK-E responds with 'connection established' followed by a Carriage Return and Line Feed.
- OMX-CI-NWK-E then waits for the ASCII strings that can be found in the *GRAFIK* Systems RS232 Protocol and Command Set.
- The Telnet client sends '~11h 12 2' followed by a Carriage Return (adding a Line Feed after the CR is OK) to select scene 2 on the *GRAFIK* System.
- OMX-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.
- Connection 1 and Connection 2 are differentiated using different login names.

## 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.

After installing Device IP on Windows® XP, 2000, or 98SE, click on the icon to run the program. Click Discover Devices, and the program will search for Lutron devices and report back the settings of all devices found. 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* Systems RS232 Protocol and Command Set for reading and changing network settings.

Note: Before using the commands below to change the OMX-CI-NWK-E default network settings, you must first make sure your computer's IP address is 192.168.250.xxx (where xxx is not 1) in order to connect to the device. This is not necessary when using using Lutron Device IP program. (Note that these commands are not prefixed by ~11h.)

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 2 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 (OMX-CI-NWK-E models only)

See page 2 for location.

**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 OMX Link.

**LED 7:** Data Link RX: Flashes when the interface is receiving information on the OMX Link. When properly wired, 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 (OMX-CI-RS232 models only)

See page 2 for location.

**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 OMX Link.

**LED 7:** Data Link RX: Flashes when the interface is receiving information on the OMX Link. When properly wired, 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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## General Information

In this document, values that are specified as hexadecimal are followed by a lowercase “h”. In those cases, the “h” is not actually typed in a command string to indicate a hexadecimal number (see individual command string examples). If not followed by “h”, numbers are assumed to be decimal values, except hexadecimal command numbers and hexadecimal numbers shown in examples.

Note that “~11h”, which precedes commands to clear the buffer, is not a hexadecimal value, and that lowercase “h” must be included in the command string (see Command String Formats, and individual command string examples).

### System Maximums

System	System Scene	System Zone/Circuit	System Space
LCP128	32 total + Off 0 - 20h	128 total 0 - 7Fh	N/A
Softswitch	32 total + Off 0 - 20h	512 total 0 - 1FFh	N/A
GRAFIK 5000, 6000, 7000	16000 maximum 0 - 3E80h	512 maximum 0 - 1FFh	500 maximum 0 - 1F4h

Note: Some system zones may remain unused. Check your job drawings for details.

Unused scenes and zones must be accounted for when assigning system scene and zone numbers.

### Intensity Level

<b>Range</b>	0 - 7Fh	0 - 99%
<b>Set to Off</b>	0h (0%)	Opens air gap relay
<b>Set to Minimum</b>	1h	Only for non-dim zones
<b>Set to Maximum (full On)</b>	7Fh (99%)	On for non-dim zones

### Cycles

Cycles are important when working with fade times and delays. One cycle is 0.1 second. Ten (10) seconds = 100 (64h) cycles.

## General Information (continued)

### COMMUNICATION SETTINGS

#### RS232 Settings

To configure your device to talk to the OMX-CI-RS232 Interface, use the data conventions listed below.

9600/19200/38400/115200 BAUD  
8 DATA  
1 STOP  
NO PARITY  
NO FLOW CONTROL

If you wish to send these commands from a PC, run Microsoft Windows® Hyper Terminal 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. Refer to the table below for dipswitch settings to select baud rates.

BAUD	DIP SWITCH 7	DIP SWITCH 8
9600	ON	OFF
19200	OFF	ON
38400	ON	ON
115200	OFF	OFF

#### Ethernet Settings

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

ATTRIBUTE	DEFAULT VALUE
Default IP Address	192.168.250.1
Default Subnet Mask	255.255.255.0
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. In most situations, the IP address should have the first three sets (192.168.250) equal to the first three sets on the machine to which it is connected (with the last different), and the subnet mask equal to 255.255.255.0. The device information may also be managed using Lutron's DeviceIP software program, which can be found on the enclosed CD.

## General Information (continued)

### Command Structure

All data values are 16 bits (0 - FFFFh) or (0 - 65,535) and are separated by spaces (20h). Leading zeros do not have to be entered.

<b>COMMAND STRING FORMATS</b>	
Syntax	[~11h] [command # in hexadecimal] [parameters in hexadecimal]<CR>
Allowed Values	~11h        clears input buffer ("h" must be lowercase) command    the command ID number, in hexadecimal parameters optional; a list of one or more items; either circuits/ zones or scenes that are to receive this command <CR>        carriage return executes command
Example	~11h (command) (parameters in hexadecimal) FFFFh (command) (parameters in hexadecimal)<CR>
Additional Information	The execution of the command is stopped when an item encountered is higher than the maximum item defined in the system. More than one command can be specified in an input string by using a separator (FFFFh) For the OMX-RS232, the command string has a maximum length of 30 characters; other devices have a maximum string length of 128 characters.

## General Information (continued)

### System Responses to Commands

After each command line is entered, the interface transmits a response to the command. This response always begins as follows:

ASCII	~
hexadecimal	7Eh

### Response Strings

Event	LCP/XPS Response	GRAFIK 5000/6000/7000 Response
Command executed properly	#N OK N = number of commands executed properly	#N OK N = number of commands executed properly
Error generated on the interface (error in command format)	ERROR #N N = error number	ERROR #N N = error number
Error generated on the processor	~UI ERROR N N = error number	#0 OK UI ERROR N N = error number
Command has requested information from the processor (e.g., Time command)	~:<response string>	:<response string>#1 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

### System Responses to Status Requests

The system responds to a status request string with a response string that contains status information in the same order it was requested. The response takes the following form:

SYSTEM RESPONSES													
Syntax	~:xx [response] [response] ... N OK												
Allowed Values	<table> <tr> <td>~:</td> <td>precedes most responses</td> </tr> <tr> <td>xx</td> <td>last 2 digits of the hex command that was sent</td> </tr> <tr> <td>response</td> <td>the status information requested; number of response substrings mirrors number of commands sent</td> </tr> <tr> <td>N OK</td> <td>N is the number of commands executed</td> </tr> <tr> <td>0Dh</td> <td>sends a carriage return</td> </tr> <tr> <td>0Ah</td> <td>sends a line feed</td> </tr> </table>	~:	precedes most responses	xx	last 2 digits of the hex command that was sent	response	the status information requested; number of response substrings mirrors number of commands sent	N OK	N is the number of commands executed	0Dh	sends a carriage return	0Ah	sends a line feed
~:	precedes most responses												
xx	last 2 digits of the hex command that was sent												
response	the status information requested; number of response substrings mirrors number of commands sent												
N OK	N is the number of commands executed												
0Dh	sends a carriage return												
0Ah	sends a line feed												
Example	<pre>~11h 805 101&lt;CR&gt; Request current intensity level of zone 257 :05 5F The intensity level of system zone 257 is 95 (out of 128 levels) (75%)</pre>												
Additional Information	Spaces separate response substrings. Note: Not all commands generate a response.												

## Ethernet Setup Commands (OMX-CI-NWK-E only)

Note: Before using the commands below to change the OMX-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. Ethernet setup commands will not take effect until after the device resets or completes a power cycle. The 'rst<CR>' command will close all connections and reset the device. If you use the Device IP program provided on the CD, you will not need to use the manual commands or change your computer's IP address.

**Note: These commands begin with "~", not "~11h" as all other commands do.**

<b>SET IP ADDRESS</b>	
Command Name	<b>sip</b>
Description	Sets the IP address of the device.
Syntax	~sip xxx.xxx.xxx.xxx<CR>
Allowed Values	xxx is a value from 0 - 255; each group is separated by a period (2Fh)
Example	~sip 192.168.250.1<CR> Sets IP device to address 192.168.250.1
Additional Information	The new value will not take effect until a power cycle or a reset occurs.

<b>READ IP ADDRESS</b>	
Command Name	<b>rip</b>
Description	Returns the IP address of the device.
Syntax	~rip<CR>
Response	:ip xxx.xxx.xxx.xxx

<b>SET SUBNET MASK</b>	
Command Name	<b>ssm</b>
Description	Sets the Subnet Mask of the device.
Syntax	~ssm xxx.xxx.xxx.xxx<CR>
Allowed Values	xxx is a value from 0 - 255; each group is separated by a period (2Fh)
Example	~ssm 255.255.255.0<CR> Sets Subnet Mask to 255.255.255.0
Additional Information	The new value will not take effect until a power cycle or a reset occurs.

<b>READ SUBNET MASK</b>	
Command Name	<b>rsm</b>
Description	Returns the Subnet mask of the device.
Syntax	~rsm<CR>
Response	:sm xxx.xxx.xxx.xxx

## Ethernet Setup Commands (continued)

<b>SET GATEWAY</b>	
Command Name	<b>sgw</b>
Description	Sets the gateway address of the device.
Syntax	~sgw xxx.xxx.xxx.xxx<CR>
Allowed Values	xxx is a value from 0 - 255; each group is separated by a period (2Fh)
Example	~sgw 192.168.250.100<CR> Sets gateway address to 192.168.250.100
Additional Information	The new value will not take effect until a power cycle or a reset occurs.

<b>READ GATEWAY</b>	
Command Name	<b>rgw</b>
Description	Returns the gateway address of the device.
Syntax	~rgw<CR>
Response	:gw xxx.xxx.xxx.xxx

<b>SET LOGIN NAME</b>	
Command Name	<b>sln</b>
Description	Sets the login name of the device.
Syntax	~sln [connection #] [existing login] [new login]<CR>
Allowed Values	Connection # can be 1 or 2 Login names can be a maximum of 8 characters and cannot include spaces
Example	~sln 2 nwk2 lutron<CR> Changes the password for connection 2 to lutron from nwk2.
Additional Information	The new value will not take effect until a power cycle or a reset occurs.

<b>READ LOGIN NAME</b>	
Command Name	<b>rln</b>
Description	Reads the login name of the device and returns it.
Syntax	~rgw [connection #]<CR>
Allowed Values	Connection # can be 1 or 2
Example	~rln 2<CR>
Response	:ln 2 lutron

<b>DEVICE RESET</b>	
Command Name	<b>rst</b>
Description	Resets the device. All connections are immediately closed and the device resets.
Syntax	~rst<CR>



## Circuit/Zone/Scene Commands

<b>FADE TO LEVEL</b>	
Applicable Systems	<b>LCP128<sub>m</sub></b> <b>XPS Softswitch128<sub>s</sub></b> <b>GRAFIK 5000<sub>m</sub>/6000<sub>s</sub>/7000<sub>m</sub></b>
Command Number (hex)	<b>7</b>
Description	All circuits/zones specified in the command will fade from their current intensity level to the new intensity level using the specified delay and fade times.
Syntax	~11h 7 [level] [fade] [delay] [zone(s)]<CR>
Allowed Values	Level 0 - 7Fh; 128 intensity levels available Fade number of cycles; 10 cycles = 1 second maximum 6300 seconds (63000 or F618h cycles) Delay number of cycles; 10 cycles = 1 second maximum 6300 seconds (63000 or F618h cycles) Zones LCP128: 0 - 7Fh (128 circuits) XPS/Softswitch128: 0 - 1FFh (512 circuits) GRAFIK 5000/6000/7000: 0 - 1FFh (512 zones)
Example	~11h 7 7F 32 0 A B<CR> Immediately sends zones 10 and 11 to 7Fh intensity level (full On), with a fade time of 0 seconds and a delay of 0 seconds.
Additional Information	The fade transition starts after the delay.

<b>FADE TO LEVELS AND REPEAT</b>	
Applicable Systems	<b>LCP128<sub>m</sub></b> <b>XPS Softswitch128<sub>s</sub></b> <b>GRAFIK 5000<sub>m</sub>/6000<sub>s</sub>/7000<sub>m</sub></b>
Command Number (hex)	<b>D</b>
Description	After an initial delay time, the circuits/zones will go first to one setting, then to a second setting. Each setting allows the user to specify the delay time (which dictates how long the circuits/zones stay at that level), fade time, and intensity level. Then, the circuits/zones will repeat both intensity levels a specified number of times. If zero repeats are specified, circuits/zones fade to the original intensity level over the first fade time. If 255 (FFh) repeats are specified, only a new circuit/zone command will stop the progression.
Syntax	~11h D [delay] [level1] [fade1] [delay1] [level2] [fade2] [delay2] [repeat] [zone(s)]<CR>
Allowed Values	Delay number of cycles; 10 cycles = 1 second Level 0 - 7Fh; 128 intensity levels available Fade number of cycles; 10 cycles = 1 second maximum 6300 seconds (63000 or F618h cycles) Repeat 0 - FFh (number of times to repeat after first cycle) Zones LCP128: 0 - 7Fh (128 circuits) XPS/Softswitch128: 0 - 1FFh (512 circuits) GRAFIK 5000/6000/7000: 0 - 1FFh (512 zones)
Example	~11h D 0 7F 0 5 0 0 5 4 10 11<CR> Immediately flash zones 16 and 17 5 times between Off and 100% at a 1-second frequency, and then return to their initial settings.
Additional Information	For <i>Softswitch128</i> , values greater than 0 are full On and 0 is Off.

## Circuit/Zone/Scene Commands (continued)

<b>SELECT SYSTEM SCENE</b>	
Applicable Systems	LCP128™ XPS Softswitch128™ GRAFIK 5000™/6000™/7000™
Command Number (hex)	<b>12</b>
Description	This command selects a system scene using the previously stored set of intensity levels, fade times, and delay times. A scene selection will cancel any previous commands for the space and circuits/zones involved in the preset.
Syntax	~11h 12 [scene(s)] <CR>
Allowed Values	Scenes LCP128, XPS/Softswitch128: 0 - 20h (32 scenes + Off) GRAFIK 5000/6000/7000: 0 - 3E80h (16000 scenes)
Example	~11h 12 1 11 40<CR> Select system scenes 1, 17, and 64.
Additional Information	Scene selections in locked zones or zones being programmed are ignored. This command does not apply to GRAFIK 5000, 6000, or 7000 scene numbers within spaces.

<b>HALT ZONE</b>	
Applicable Systems	GRAFIK 5000™/6000™/7000™
Command Number (hex)	<b>1</b>
Description	Permanently stops all zone dynamics and freezes the zone's level until another command affects the zone.
Syntax	~11h 1 [zone(s)] <CR>
Allowed Values	Zones GRAFIK 5000/6000/7000: 0 - 200h (512 zones)
Example	~11h 1 7 8 B<CR> Freeze system zones 7, 8, and 11 at their current intensity levels.


<b>TOGGLE ZONE</b>	
Applicable Systems	GRAFIK 5000™/6000™/7000™
Command Number (hex)	<b>6</b>
Description	If the zone intensity level is at any intensity level between 1 - 7Fh, this command turns the zone Off (0). If the zone intensity level is Off, it turns the zone On to max (7Fh). The transition will take place over a period of fade cycles. After a toggle fade is complete, the zone is in steady state.
Syntax	~11h 6 [fade] [zone(s)] <CR>
Allowed Values	Fade number of cycles; 10 cycles = 1 second maximum 6300 seconds (63000 or F618h cycles) Zones GRAFIK 5000/6000/7000: 0 - 200h (512 zones)
Example	~11h 6 14 7 8 A<CR> Toggle system zones 7, 8, and 10 with a 2-second (20-cycle) fade time.


## Circuit/Zone/Scene Commands (continued)

<b>RAMP CIRCUITS UP</b>	
Applicable Systems	<b>LCP128™</b> <b>XPS Softswitch128®</b>
Command Number (hex)	<b>500 (switch press; start raise)</b> <b>600 (switch release; stop raise)</b>
Description	Ramps programmed circuits up. The wallstation (or virtual wallstation) button must be programmed as raise in the system. Only circuits programmed to the raise button are affected. Note: Wallstations need not be physically present in the system, but they must be programmed in the system.
Syntax	~11h [command number] [address] [button]<CR>
Allowed Values	Command 500 for switch press; 600 for switch release Address 0 - 5Fh 0 - 1Fh for LCP128/XPS with no XPS-E Link Expander 0 - 5Fh for XPS with XPS-E Link Expander Button Programmed button number on that wallstation
Example	~11h 500 010C<CR> Raise programmed circuits using the raise button on wallstation address 2 on link 0. Raise button is button 12. ~11h 600 010C<CR> Stop raising programmed circuits using the raise button on wallstation address 2 on link 0.
Additional Information	Convert button numbers and addresses to zero-based hexadecimal (e.g., button 1 = 0h).

<b>RAMP CIRCUITS DOWN</b>	
Applicable Systems	<b>LCP128™</b> <b>XPS Softswitch128®</b>
Command Number (hex)	<b>500 (switch press; start lower)</b> <b>600 (switch release; stop lower)</b>
Description	Ramps programmed circuits down. The wallstation (or virtual wallstation) button must be programmed as lower in the system. Only circuits programmed to the lower button are affected. Note: Wallstations need not be physically present in the system, but they must be programmed in the system.
Syntax	~11h [command number] [address] [button]<CR>
Allowed Values	Command 500 for switch press; 600 for switch release Address 0 - 5Fh 0 - 1Fh for LCP128/XPS with no XPS-E Link Expander 0 - 5Fh for XPS with XPS-E Link Expander Button Programmed button number on that wallstation
Example	~11h 500 010B<CR> Lower programmed circuits using the raise button on wallstation address 2 on link 0. Lower button is button 11. 11h 600 010B<CR> Stop lowering programmed circuits using the raise button on wallstation address 2 on link 0.
Additional Information	Convert button numbers and addresses to zero-based hexadecimal (e.g., button 1 = 0h).

## Circuit/Zone/Scene Commands (continued)

<b>RAMP UP SYSTEM ZONE</b>	
Applicable Systems	
Command Number (hex)	<b>B</b>
Description	Increase the intensity level of the specified zone(s) at a specified rate, and repeat as specified. The actual step sizes are divided by 256 (100h), then added to the zone's intensity level (from 0 - 7Fh) every 0.1 second. For example, a step size of 200h causes an intensity change of about 15% a second.
Syntax	~11h B [initial rate] [repeat rate] [zone(s)] <CR>
Allowed Values	Initial rate      step size ÷ 256 Repeat rate      step size ÷ 256 Zones              0 - 200h (512 zones)
Example	~11h B 200 200 0 1<CR> 200h ÷ 100h = increment intensity by 2 every 0.1 second, or 20 per second. Zone intensity levels range from 0 - 7Fh; 20h ÷ 7Fh = 15%. Ramp up system zones 0 and 1 at a rate of about 15% per second.

<b>RAMP DOWN SYSTEM ZONE</b>	
Applicable Systems	
Command Number (hex)	<b>C</b>
Description	Decrease the intensity level of the specified zone(s) at a specified rate, and repeat as specified. The actual step sizes are divided by 256 (100h), then subtracted from the zone's intensity level (from 0 - 7Fh) every 0.1 second. For example, a step size of 500h causes an intensity change of about 40% a second.
Syntax	~11h C [initial rate] [repeat rate] [zone(s)] <CR>
Allowed Values	Initial rate      step size ÷ 256 Repeat rate      step size ÷ 256 Zones              0 - 200h (512 zones)
Example	~11h C 500 500 FF 100 101<CR> 500h ÷ 100h = increment intensity by 5 every 0.1 second, or 50 per second. Zone intensity levels range from 0 - 7Fh; 50h ÷ 7Fh = 40%. Ramp down system zones 255, 256, and 257 at a rate of about 40% per second.

## Circuit/Zone/Scene Commands (continued)

<b>RAMP UP ALL ZONES IN LAST SCENE SELECTED</b>	
Applicable Systems	<b>GRAFIK</b> 5000.m/6000.s/7000.m
Command Number (hex)	<b>20</b>
Description	This command looks at the zones within the specified space. If any zones are at the specified unaffected intensity level, those zones do not change. All other zones increase at the specified rate. If the specified unaffected intensity level is 80h, all zones will ramp up. To stop this ramp up, use the Stop Scene Ramp Up command (22). See Ramp Up System Zone command (B) above for details on the step size values.
Syntax	~11h 20 [unaffected level] [initial rate] [repeat rate] [space(s)]<CR>
Allowed Values	Unaffected level      0 - 80h; 80h = all zones in space will ramp up Initial rate            step size ÷ 256 Repeat rate            step size ÷ 256 Zones                    0 - 200h (512 zones)
Example	~11h 20 0 200 200 7 A<CR> Ramp up all zones in the current space than are On (at any intensity level other than 0) in system spaces 7 and 10
Additional Information	The preset profile will <i>not</i> be preserved. Zone intensity levels will become equal (full) after a full ramp up.

<b>RAMP DOWN ALL ZONES IN LAST SCENE SELECTED</b>	
Applicable Systems	<b>GRAFIK</b> 5000.m/6000.s/7000.m
Command Number (hex)	<b>21</b>
Description	This command looks at the zones within the specified space. If any zones are at the specified unaffected intensity level, those zones do not change. All other zones decrease at the specified rate. If the specified unaffected intensity level is 80h, all zones will ramp down. To stop this ramp down, use the Stop Scene Ramp Down command (23). See Ramp Down System Zone command (C) above for details on the step size values.
Syntax	~11h 21 [unaffected level] [initial rate] [repeat rate] [space(s)]<CR>
Allowed Values	Unaffected level      0 - 80h; 80h = all zones in space will ramp down Initial rate            step size ÷ 256 Repeat rate            step size ÷ 256 Zones                    0 - 200h (512 zones)
Example	~11h 21 80 200 200 0<CR> Ramp down all zones in the current space in system space 0
Additional Information	The preset profile will <i>not</i> be preserved. Zone intensity levels will be 0 (Off) after a full ramp down.

## Circuit/Zone/Scene Commands (continued)

<b>STOP RAMP UP ALL ZONES IN LAST SCENE SELECTED</b>	
Applicable Systems	<b>GRAFIK</b> 5000 <sub>ms</sub> /6000 <sub>ms</sub> /7000 <sub>ms</sub>
Command Number (hex)	<b>22</b>
Description	This command looks at the zones within the specified space and determines which system scene is currently selected in each space. It then halts those zones in the space that are currently in Ramp Up mode.
Syntax	~11h 22 [space(s)]<CR>
Allowed Values	Zones 0 - 200h (512 zones)
Example	~11h 22 0 10<CR> Stop ramping up zones in spaces 0 and 16

<b>STOP RAMP DOWN ALL ZONES IN LAST SCENE SELECTED</b>	
Applicable Systems	<b>GRAFIK</b> 5000 <sub>ms</sub> /6000 <sub>ms</sub> /7000 <sub>ms</sub>
Command Number (hex)	<b>23</b>
Description	This command looks at the zones within the specified space and determines which system scene is currently selected in each space. It then halts those zones in the space that are currently in Ramp Down mode.
Syntax	~11h 23 [space(s)]<CR>
Allowed Values	Zones 0 - 200h (512 zones)
Example	~11h 23 0 10<CR> Stop ramping down zones in spaces 0 and 16

<b>SELECT SYSTEM SCENE USING OVERRIDE TIMES</b>	
Applicable Systems	<b>GRAFIK</b> 5000 <sub>ms</sub> /6000 <sub>ms</sub> /7000 <sub>ms</sub>
Command Number (hex)	<b>13</b>
Description	This command selects a system scene using the previously stored set of intensity levels. It overrides the stored fade and delay times for each zone involved, and uses the specified fade and delay times.
Syntax	~11h 13 [fade] [delay] [scene(s)]<CR>
Allowed Values	Fade number of cycles; 10 cycles = 1 second Delay number of cycles; 10 cycles = 1 second Scenes 0 - 3E80h (16000 scenes)
Example	~11h 13 A 19 1 11 40<CR> Select system scenes 1, 17, and 64 using a 1-second fade time and a 2.5-second delay time.

## Circuit/Zone/Scene Commands (continued)

<b>SELECT TEMP SCENE</b>	
Applicable Systems	<b>GRAFIK</b> 5000.m/6000.e/7000.m
Command Number (hex)	<b>1C</b>
Description	This command selects the defined temporary preset.
Syntax	~11h 1C [zone] [intensity level] [fade] [delay] [repeat all variables for additional zones]<CR>
Allowed Values	Zones           0 - 200h (512 zones) Intensity level 0 - 7Fh Fade            number of cycles; 10 cycles = 1 second maximum 6300 seconds (63000 or F618h cycles) Delay           number of cycles; 10 cycles = 1 second maximum 6300 seconds (63000 or F618h cycles)
Example	~11h 1C 1 7F 32 0 2 0 A 32<CR> Send system zone 1 immediately to full using a 5-second fade time, while sending zone 2 to Off using a 1-second fade time after a 5-second delay.
Additional Information	The temporary scene remains until another scene is selected. Wallstation LEDs are not affected by this command.

<b>SELECT SCENE OF SPACE</b>	
Applicable Systems	<b>GRAFIK</b> 5000.m/6000.e/7000.m
Command Number (hex)	<b>1E</b>
Description	This command selects the scene number in the given space (not the system scene number). Scene selection in multiple spaces may be accomplished by adding space/scene pairs.
Syntax	~11h 1E [sys space] [space scene] [repeat variables for additional spaces]<CR>
Allowed Values	Spaces         0 - 200h (512 zones) Scene          0 - 3E80h (16000 scenes)
Example	~11h 1E 0 7 1 7<CR> Select the eighth scene of system spaces 0 and 1. (The first scene in each space is scene 0.)




## Circuit/Zone/Scene Commands (continued)

<b>GET CIRCUIT/ZONE INTENSITY LEVEL</b>	
Applicable Systems	LCP128™ XPS Softswitch128® GRAFIK 5000™/6000®/7000™
Command Number (hex)	<b>805</b>
Description	Requests the current intensity level (0 - 7Fh) of the specified circuit/zone
Syntax	~11h [zone]<CR>
Allowed Values	Zones LCP128: 0 - 7Fh (128 circuits) XPS/Softswitch128: 0 - 1FFh (512 circuits) GRAFIK 5000/6000/7000: 0 - 1FFh (512 zones)
Response	:05 [intensity level] Values 0 - 7Fh
Example	~11h 805 101<CR> Request current intensity level of zone 257 :05 5F The intensity level of system zone 257 is 95 (out of 128 levels) (75%)

<b>GET STATUS OF SPACE</b>	
Applicable Systems	GRAFIK 5000™/6000®/7000™
Command Number (hex)	<b>801</b>
Description	This command requests information about a space, such as the last scene selected and if a sequence is currently running.
Syntax	~11h 801 [sys space]<CR>
Allowed Values	System space 0 - 7FFFh
Response	:01 [space] [system scene on] [system sequence running] FFFFh =no sequence running
Example	~11h 801 0<CR> Get status of system space 0. :01 0 7 FFFFh System space 0 is running system scene 7 with no sequence running.
Additional Information	This command returns the system scene number. See Get Status of Scenes in Space (command 830) for the command that returns space scene numbers.



**Circuit/Zone/Scene Commands** (continued)

<b>GET STATUS OF SCENES IN SPACE</b>	
Applicable Systems	
Command Number (hex)	<b>830</b>
Description	This command requests information about a space, such as whether a current scene is On or whether a timed sequence is running.
Syntax	~11h 830 [sys space]<CR>
Allowed Values	System space      0 - 7FFFh
Response	:01 [space] [system scene on] [system sequence running] FFFFh =no sequence running
Example	~11h 830 0<CR> Get scene status of system space 0. :01 0 2 FFFFh System space 0 is running scene 2 with no sequence running.
Additional Information	This command returns the space scene number. See Get Status of Space (Command 801) for the command that returns system scene numbers.

## Time/Date/Timeclock Commands

<b>SET SYSTEM TIME AND DATE</b>	
Applicable Systems	LCP128™ XPS Softswitch128® GRAFIK 5000™/6000®/7000™
Command Number (hex)	<b>207</b>
Description	This command sets the system clock to the specified time and date. The system clock begins running with the specified time (seconds = 0) upon completing the command.
Syntax	~11h 207 [hour] [min] [month] [date] [year] [day]<CR>
Allowed Values	Hour 0 - 17h (24-hour format) Min 0 - 3Bh (0 - 59 minutes after the hour) Month 1 - Ch (1 = January) Date 1 - 1Fh (1 - 31) Year 0 - 63h Day 1 - 7h (1 = Sunday)
Example	~11h 207 11 00 1 19 61 7<CR> Set the system clock to 5:00 p.m. on Saturday, January 25, 1997.

<b>GET SYSTEM TIME</b>	
Applicable Systems	LCP128™ XPS Softswitch128® GRAFIK 5000™/6000®/7000™
Command Number (hex)	<b>808</b>
Description	This command requests the current system time, and returns it formatted as the number of minutes past midnight.
Syntax	~11h 808<CR>
Response	:08 [minutes past midnight, in hexadecimal]
Example	~11h 808<CR> :08 398 The current time is 920 minutes past midnight (3:20 p.m.).

<b>GET SYSTEM DATE</b>	
Applicable Systems	LCP128™ XPS Softswitch128® GRAFIK 5000™/6000®/7000™
Command Number (hex)	<b>80A</b>
Description	This command requests the current system date
Syntax	~11h 80A<CR>
Response	:0A [month] [date] [year] [day]
Example	~11h 80A<CR> :0A 9 11 2 3 The month is 9 (September), the date is 17, the year is 2 (2002), and the day is 3 (Tuesday).
Additional Information	See Set System Time and Date, above, for specific date value information.

## Time/Date/Timeclock Commands (continued)

<b>GET SUNRISE/SUNSET TIMES</b>	
Applicable Systems	LCP128™ XPS Softswitch128® GRAFIK 5000™/6000®/7000™
Command Number (hex)	<b>809</b>
Description	This command requests today's sunrise and sunset times, and returns them formatted as the number of minutes past midnight.
Syntax	~11h 809<CR>
Response	:09 [sunrise, in minutes past midnight, in hexadecimal] [sunset, in minutes past midnight, in hexadecimal]
Example	~11h 809<CR> :09 18B 47D Today's sunrise is 395 minutes past minutes (6:35 a.m.), and today's sunset is 1149 minutes past midnight (7:09 p.m.).
<b>GET TIMECLOCK STATUS</b>	
Applicable Systems	LCP128™ XPS Softswitch128® GRAFIK 5000™/6000®/7000™
Command Number (hex)	<b>802</b>
Description	This command requests the status of the system timeclock, including the current schedule running, the next scheduled event's type and time, and the next event script.
Syntax	~11h 802 [space]<CR>
Response	:02 [space] [schedule] [next event] [next time] [next script]
Allowed Values	Space Where the timeclock is Schedule Current schedule running Next event N = no more event is schedule D = timeclock is disabled A = astronomic event R = real-time event Next time Specified in minutes past midnight Next script
Example	~11h 802 7<CR> Request timeclock status in system space 7 :02 7 48 R 3FC 23B The timeclock in system space 7 is running schedule 73; the next scheduled event is a real-time event that will occur at 1020 minutes past midnight (5:00 p.m.) and will run system script 572.
Additional Information	If bit 15 is set in the next event time (event time is greater than 8000h), the event is a "catch-up" event.

## Time/Date/Timeclock Commands (continued)

<b>DISABLE TIMECLOCK UNTIL AN ENABLE IS ISSUED</b>	
Applicable Systems	<b>LCP128™</b> <b>XPS Softswitch128®</b> <b>GRAFIK 5000™/6000®/7000™</b>
Command Number (hex)	<b>201</b>
Description	This command stops any timeclock events from occurring in the selected spaces until an Enable Timeclock command is issued for those spaces.
Syntax	~11h 201 [space timeclock(s)]<CR>
Allowed Values	Timeclocks 0 - 1F4h
Example	~11h 201 0 1 2 3<CR> Disable the timeclocks in spaces 0, 1, 2, and 3.
<b>DISABLE TIMECLOCK UNTIL END OF DAY OR UNTIL AN ENABLE IS ISSUED</b>	
Applicable Systems	<b>GRAFIK 5000™/6000®/7000™</b>
Command Number (hex)	<b>202</b>
Description	This command stops any timeclock events from occurring in the selected spaces until an Enable Timeclock command is issued for those spaces, or for the duration of the current day (whichever occurs first).
Syntax	~11h 202 [space timeclock(s)]<CR>
Allowed Values	Timeclocks 0 - 1F4h
Example	~11h 202 0 1 2 3<CR> Disable the timeclocks in spaces 0, 1, 2, and 3.

## Time/Date/Timeclock Commands (continued)

<b>ENABLE TIMECLOCK</b>	
Applicable Systems	<b>LCP128™</b> <b>XPS Softswitch128®</b> <b>GRAFIK 5000™/6000®/7000™</b>
Command Number (hex)	<b>205</b>
Description	This command enables the listed timeclocks (if they are currently disabled). The next event to occur will be the next scheduled event in that space.
Syntax	~11h 205 [space timeclock(s)]<CR>
Allowed Values	Timeclocks 0 - 1F4h
Example	~11h 205 0 11<CR> Enable the timeclocks in spaces 0 and 17.

<b>ENABLE TIMECLOCK AND EXECUTE MISSED COMMANDS</b>	
Applicable Systems	<b>GRAFIK 5000™/6000®/7000™</b>
Command Number (hex)	<b>203</b>
Description	This command enables the listed timeclocks (if they are currently disabled). It will then execute all events that were missed since the previous midnight. The next event to then occur will be the next scheduled event in that space.
Syntax	~11h 203 [space timeclock(s)]<CR>
Allowed Values	Timeclocks 0 - h
Example	~11h 203 15 16<CR> Enable the timeclocks in spaces 21 and 22, and execute all timeclock events that were missed after midnight.

<b>ENABLE TIMECLOCK AND EXECUTE PREVIOUS COMMAND</b>	
Applicable Systems	<b>GRAFIK 5000™/6000®/7000™</b>
Command Number (hex)	<b>204</b>
Description	This command enables the listed timeclocks (if they are currently disabled). It will then execute all events that were scheduled to run at the time this command was executed. The next event to then occur will be the next scheduled event in that space.
Syntax	~11h 204 [space timeclock(s)]<CR>
Allowed Values	Timeclocks 0 - h
Example	~11h 204 7<CR> Enable the timeclock in space 7, and execute all timeclock events that were to occur at the time of enabling.

## Wallstation Commands

<b>ENABLE WALLSTATION</b>	
Applicable Systems	<b>LCP128™</b> <b>XPS Softswitch128®</b> <b>GRAFIK 5000™/6000®/7000™</b>
Command Number (hex)	<b>300</b>
Description	This command enables all inputs on the listed wallstations.
Syntax	~11h 300 [wallstation(s)]<CR>
Allowed Values	Link number           0 - Bh (only Link 0 for <i>LCP128/XPS</i> ) Wallstation on link   0 - 1Fh
Example	~11h 300 14<CR> Enable the 21st wallstation on the first link (Link A).
Additional Information	The wallstation value changes to indicate both the link number and the wallstation number on the link. The first digit is the hexadecimal link number; the last two digits are the hexadecimal wallstation number on that link.

<b>DISABLE WALLSTATION</b>	
Applicable Systems	<b>LCP128™</b> <b>XPS Softswitch128®</b> <b>GRAFIK 5000™/6000®/7000™</b>
Command Number (hex)	<b>301</b>
Description	This command disables all inputs on the listed wallstations.
Syntax	~11h 301 [wallstation(s)]<CR>
Allowed Values	Link number           0 - Bh (only Link 0 for <i>LCP128/XPS</i> ) Wallstation on link   0 - 1Fh
Example	~11h 301 207<CR> Disable the 8th wallstation on the third link (Link C).
Additional Information	The wallstation value changes to indicate both the link number and the wallstation number on the link. The first digit is the hexadecimal link number; the last two digits are the hexadecimal wallstation number on that link.

## Wallstation Commands (continued)

<b>SIMULATE WALLSTATION SWITCH PRESS</b>	
Applicable Systems	<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="border: 1px solid black; padding: 2px; font-size: 8px;">LCP128™</div> <div style="border: 1px solid black; padding: 2px; font-size: 8px;">XPS Softswitch128®</div> <div style="border: 1px solid black; padding: 2px; font-size: 8px;">GRAFIK 5000™/6000®/7000™</div> </div>
Command Number (hex)	<b>500 - 50B</b> (note: <i>LCP128/XPS</i> use only 500)
Description	This command simulates a switch press from any system wallstation. The system runs the programmed script response for the “pressed” switch.
Syntax	~11h 50x [switch(es)]<CR> The third digit of the command (the “x” in 50x) is the hexadecimal equivalent of the number of the wallstation link. Link number                      0 - Bh
Allowed Values	Wallstation on link              0 - 1Fh Switch on wallstation          0 - 1Fh
Example	~11h 501 F04<CR> Simulate a switch press of the fifth switch (switch 4) on the 16th wallstation (wallstation 15) on the second link (link 1).
Additional Information	For <i>Softswitch</i> systems that include a link expander, use command 500 for links B and C. Wallstation addresses are 0 - 5Fh. The switch value changes to indicate both the wallstation number and the Switch number on the wallstation. The first two digits are the hexadecimal wallstation number; the last two digits are the hexadecimal switch number on that wallstation.

<b>SIMULATE WALLSTATION SWITCH RELEASE</b>	
Applicable Systems	<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="border: 1px solid black; padding: 2px; font-size: 8px;">LCP128™</div> <div style="border: 1px solid black; padding: 2px; font-size: 8px;">XPS Softswitch128®</div> <div style="border: 1px solid black; padding: 2px; font-size: 8px;">GRAFIK 5000™/6000®/7000™</div> </div>
Command Number (hex)	<b>600 - 60B</b> (note: <i>LCP128/XPS</i> use only 600)
Description	This command simulates a switch release from any system wallstation. The system runs the programmed script response for the “released” switch.
Syntax	~11h 60x [switch(es)]<CR> The third digit of the command (the “x” in 60x) is the hexadecimal equivalent of the number of the wallstation link. Link number                      0 - Bh
Allowed Values	Wallstation on link              0 - 1Fh Switch on wallstation          0 - 1Fh
Example	~11h 602 300<CR> Simulate a switch release of the first switch (switch 0) on the fourth wallstation (wallstation 5) on the third link (link 2).
Additional Information	For <i>Softswitch</i> systems that include a link expander, use command 600 for links B and C. Wallstation addresses are 0 - 5Fh. The switch value changes to indicate both the wallstation number and the Switch number on the wallstation. The first two digits are the hexadecimal wallstation number; the last two digits are the hexadecimal switch number on that wallstation.

## Wallstation Commands (continued)

<b>SET SYSTEM VARIABLE</b>	
Applicable Systems	<b>GRAFIK</b> 5000 <sub>m</sub> /6000 <sub>s</sub> /7000 <sub>m</sub>
Command Number (hex)	<b>40D</b>
Description	This command sets the state of the system variables specified to the specified value.
Syntax	~11h 40D [value] [variable(s)]<CR>
Allowed Values	Value           0 - FFh (256 decimal) Variable        0 - 400h (1024 decimal)
Example	~11h 40D 0 0 6<CR> Set the first and seventh system variables to the value of 0.

<b>GET VARIABLE VALUE</b>	
Applicable Systems	<b>GRAFIK</b> 5000 <sub>m</sub> /6000 <sub>s</sub> /7000 <sub>m</sub>
Command Number (hex)	<b>815</b>
Description	This command requests the value of a system variable.
Syntax	~11h 815 [variable(s)]<CR>
Response	:15 [variable value]
Allowed Values	Variable        0 - 400h (1024 decimal)
Example	~11h 815 0<CR> Get the value of the first system variable. :15 FF The value of the first system variable is 255.



## Wallstation Commands (continued)

<b>GET WALLSTATION/CONTROL STATION DEVICE STATUS</b>	
Applicable Systems	<b>GRAFIK</b> 5000 <sub>m</sub> /6000 <sub>e</sub> /7000 <sub>m</sub>
Command Number (hex)	<b>803</b>
Description	This command requests the priority and the enable/disable status of all switches on the specified wallstation.
Syntax	~11h 803 [wallstation]<CR>
Allowed Values	Wallstation on link    0 - 1Fh
Response	:03 [wallstation] [switches and status] Priority value in lower four bits (0 - F). If disabled, bit 7 is set in priority value (80 - 8F).
Example	~11h 803 207<CR> Check the status of the wallstation at the 8th address on the third link. :03 7 5 5 5 5 5 5 On link 3, wallstation 8, all switches are priority 5 (enabled).

<b>GET SWITCH/BUTTON STATUS</b>	
Applicable Systems	<b>GRAFIK</b> 5000 <sub>m</sub> /6000 <sub>e</sub> /7000 <sub>m</sub>
Command Number (hex)	<b>804</b>
Description	This command requests the priority of the given wallstation button.
Syntax	~11h 804 [wallstation] [switch]<CR>
Allowed Values	Wallstation on link        0 - 1Fh Switch on wallstation      0 - 1Fh
Response	:04 [switch] [priority] Priority value in lower four bits (0 - F). If disabled, bit 7 is set in priority value (80 - 8F).
Example	~11h 804 207 0<CR> Get the status of the first switch on the 8th wallstation on the third link. :04 207 0 On link 3, wallstation 8, switch 1 is priority 0 (enabled).

## Diagnostic Commands

<b>GET OPERATING SYSTEM REV LEVEL</b>	
Applicable Systems	LCP128™ XPS Softswitch128® GRAFIK 5000™/6000®/7000™
Command Number (hex)	<b>811</b>
Description	This command requests the revision level of the embedded operating software. It is used for diagnostic purposes.
Syntax	~11h 811<CR>
Response	:11 [rev level]
Example	~11h 811<CR> :11 300 The current operating software is revision 300h.
<b>GET BOOT CODE REV LEVEL</b>	
Applicable Systems	LCP128™ XPS Softswitch128® GRAFIK 5000™/6000®/7000™
Command Number (hex)	<b>812</b>
Description	This command requests the revision level of the embedded system boot software. It is used for diagnostic purposes.
Syntax	~11h 812<CR>
Response	:12 [boot rev level]
Example	~11h 812<CR> :12 114 The current boot software is revision 114h.

**COMMANDS LISTED BY NUMBER**

Command Number	Command Name	Applicable Systems	Page #
1	Halt Zone	GRAFIK 5000-/6000-/7000- <sub>ns</sub>	9
6	Toggle Zone	GRAFIK 5000-/6000-/7000- <sub>ns</sub>	9
7	Fade to Level	LCP128- <sub>ns</sub> XPS Softswitch128- <sub>o</sub> GRAFIK 5000-/6000-/7000- <sub>ns</sub>	8
B	Ramp Up System Zone	GRAFIK 5000-/6000-/7000- <sub>ns</sub>	11
C	Ramp Down System Zone	GRAFIK 5000-/6000-/7000- <sub>ns</sub>	11
D	Fade to Levels and Repeat	LCP128- <sub>ns</sub> XPS Softswitch128- <sub>o</sub> GRAFIK 5000-/6000-/7000- <sub>ns</sub>	8
12	Select System Scene	LCP128- <sub>ns</sub> XPS Softswitch128- <sub>o</sub> GRAFIK 5000-/6000-/7000- <sub>ns</sub>	9
13	Select System Scene Using Override Times	GRAFIK 5000-/6000-/7000- <sub>ns</sub>	13
1C	Select Temp Scene	GRAFIK 5000-/6000-/7000- <sub>ns</sub>	14
1E	Select Scene of Space	GRAFIK 5000-/6000-/7000- <sub>ns</sub>	14
20	Ramp Up All Zones in Last Scene Selected	GRAFIK 5000-/6000-/7000- <sub>ns</sub>	12
21	Ramp Down All Zones in Last Scene Selected	GRAFIK 5000-/6000-/7000- <sub>ns</sub>	12
22	Stop Ramp Up All Zones in Last Scene Selected	GRAFIK 5000-/6000-/7000- <sub>ns</sub>	13
23	Stop Ramp Down in Last Scene Selected	GRAFIK 5000-/6000-/7000- <sub>ns</sub>	13
201	Disable Timeclock Until an Enable is Issued	GRAFIK 5000-/6000-/7000- <sub>ns</sub>	19
202	Disable Timeclock Until End of Day or Until an Enable is Issued	LCP128- <sub>ns</sub> XPS Softswitch128- <sub>o</sub> GRAFIK 5000-/6000-/7000- <sub>ns</sub>	19
203	Enable Timeclock and Execute Missed Commands	GRAFIK 5000-/6000-/7000- <sub>ns</sub>	20
204	Enable Timeclock and Execute Previous Command	GRAFIK 5000-/6000-/7000- <sub>ns</sub>	20
205	Enable Timeclock	LCP128- <sub>ns</sub> XPS Softswitch128- <sub>o</sub> GRAFIK 5000-/6000-/7000- <sub>ns</sub>	20
207	Set System Time and Date	LCP128- <sub>ns</sub> XPS Softswitch128- <sub>o</sub> GRAFIK 5000-/6000-/7000- <sub>ns</sub>	17
300	Enable Wallstation	LCP128- <sub>ns</sub> XPS Softswitch128- <sub>o</sub> GRAFIK 5000-/6000-/7000- <sub>ns</sub>	21
301	Disable Wallstation	LCP128- <sub>ns</sub> XPS Softswitch128- <sub>o</sub> GRAFIK 5000-/6000-/7000- <sub>ns</sub>	21
40D	Set System Variable	GRAFIK 5000-/6000-/7000- <sub>ns</sub>	23
500, 600	Ramp Circuits Up/Down	LCP128- <sub>ns</sub> XPS Softswitch128- <sub>o</sub>	10
500-50B	Simulate Wallstation Switch Press	LCP128- <sub>ns</sub> XPS Softswitch128- <sub>o</sub> GRAFIK 5000-/6000-/7000- <sub>ns</sub>	22
600-60B	Simulate Wallstation Switch Release	LCP128- <sub>ns</sub> XPS Softswitch128- <sub>o</sub> GRAFIK 5000-/6000-/7000- <sub>ns</sub>	22

Command Number	Command Name	Applicable Systems	Page #
801	Get Status of Space	GRAFIK 5000-/6000-/7000- <sub>rs</sub>	15
802	Get Timeclock Status	LCP128- <sub>rs</sub> XPS Softswitch128- <sub>o</sub> GRAFIK 5000-/6000-/7000- <sub>rs</sub>	18
803	Get Wallstation/Control Station Device Status	GRAFIK 5000-/6000-/7000- <sub>rs</sub>	24
804	Get Switch/Button Status	GRAFIK 5000-/6000-/7000- <sub>rs</sub>	24
805	Get Zone Intensity	LCP128- <sub>rs</sub> XPS Softswitch128- <sub>o</sub> GRAFIK 5000-/6000-/7000- <sub>rs</sub>	15
808	Get System Time	LCP128- <sub>rs</sub> XPS Softswitch128- <sub>o</sub> GRAFIK 5000-/6000-/7000- <sub>rs</sub>	17
809	Get Sunrise/Sunset Times	LCP128- <sub>rs</sub> XPS Softswitch128- <sub>o</sub> GRAFIK 5000-/6000-/7000- <sub>rs</sub>	18
80A	Get System Date	LCP128- <sub>rs</sub> XPS Softswitch128- <sub>o</sub> GRAFIK 5000-/6000-/7000- <sub>rs</sub>	17
811	Get Operating System Rev Level	LCP128- <sub>rs</sub> XPS Softswitch128- <sub>o</sub> GRAFIK 5000-/6000-/7000- <sub>rs</sub>	25
812	Get Boot Code Rev Level	LCP128- <sub>rs</sub> XPS Softswitch128- <sub>o</sub> GRAFIK 5000-/6000-/7000- <sub>rs</sub>	25
815	Get Variable Value	GRAFIK 5000-/6000-/7000- <sub>rs</sub>	23
830	Get Status of Scenes in Space	GRAFIK 5000-/6000-/7000- <sub>rs</sub>	16

## Appendix A: ASCII Character Lookup

### Chart for Allowable Characters

ASCII	Hex Value	Decimal Value	ASCII	Hex Value	Decimal Value
:	3A	58	S	53	83
space	20	32	T	54	84
#	23	35	U	55	85
~	7E	126	V	56	86
<CR>	0D	13	W	57	87
<lf>	0A	10	X	58	88
0	30	48	Y	59	89
1	31	49	Z	5A	90
2	32	50	a	61	97
3	33	51	b	62	98
4	34	52	c	63	99
5	35	53	d	64	100
6	36	54	e	65	101
7	37	55	f	66	102
8	38	56	g	67	103
9	39	57	h	68	104
A	41	65	i	69	105
B	42	66	j	6A	106
C	43	67	k	6B	107
D	44	68	l	6C	108
E	45	69	m	6D	109
F	46	70	n	6E	110
G	47	71	o	6F	111
H	48	72	p	70	112
I	49	73	q	71	113
J	4A	74	r	72	114
K	4B	75	s	73	115
L	4C	76	t	74	116
M	4D	77	u	75	117
N	4E	78	v	76	118
O	4F	79	w	77	119
P	50	80	x	78	120
Q	51	81	y	79	121
R	52	82	z	7A	122

### Error Codes

Error	Description
1	232 string framing or overrun error Wrong baud rate selected by sender or receiver, or sender is sending too fast
2	232 string buffer error Input string was longer than 36 characters total (including ~11h)
4	No response from the processor (occurs if the interface address is disabled)
5	No tilde (~) sent
6	No ~11h sent
8	232 string check is wrong when using ~11h
31	Network address illegally formatted. 4 octets required (xxx.xxx.xxx.xxx)
100	Invalid Telnet login number
101	Invalid Telnet login
102	Login name exceeds 8 characters
103	Invalid number of arguments

## Appendix B: Conversion Chart for Intensities

Intensity Percentage (0 - 127) (0 - 100)		Intensity Percentage (0 - 127) (0 - 100)	
0	0	65	51
1	1	66	52
2	2	67	53
3	3	68	54
4	4	69	55
5	4	70	56
6	5	71	56
7	6	72	57
8	7	73	58
9	8	74	59
10	8	75	60
11	9	76	60
12	10	77	61
13	11	78	62
14	12	79	63
15	12	80	63
16	13	81	64
17	14	82	65
18	15	83	66
19	15	84	67
20	16	85	67
21	17	86	68
22	18	87	69
23	19	88	70
24	19	89	71
25	20	90	71
26	21	91	72
27	22	92	73
28	23	93	74
29	23	94	75
30	24	95	75
31	25	96	76
32	26	97	77
33	26	98	77
34	27	99	78
35	28	100	79
36	29	101	80
37	30	102	81
38	30	103	82
39	31	104	82
40	32	105	83
41	33	106	84
42	34	107	85
43	34	108	85
44	35	109	86
45	36	110	87
46	37	111	88
47	38	112	89
48	38	113	89
49	39	114	90
50	40	115	90
51	41	116	91
52	41	117	92
53	42	118	93
54	43	119	93
55	44	120	94
56	45	121	95
57	45	122	96
58	46	123	97
59	47	124	98
60	48	125	98
61	49	126	99
62	49	127	100
63	50		
64	51		

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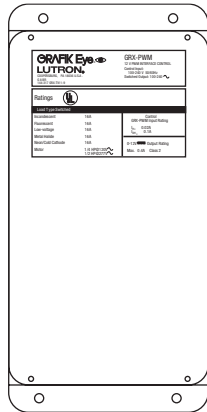
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## Description

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

<b>INPUT VOLTAGE RATING</b>	100/120 V ~, 50/60 Hz
<b>SWITCHED VOLTAGE RATING</b>	100-277 V ~, 50/60 Hz
<b>H2 TERMINAL INPUT RATING</b>	200 mA max
<b>DH2 TERMINAL INPUT RATING</b>	100 mA
<b>12 VDC PWM OUTPUT RATING</b>	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 ~

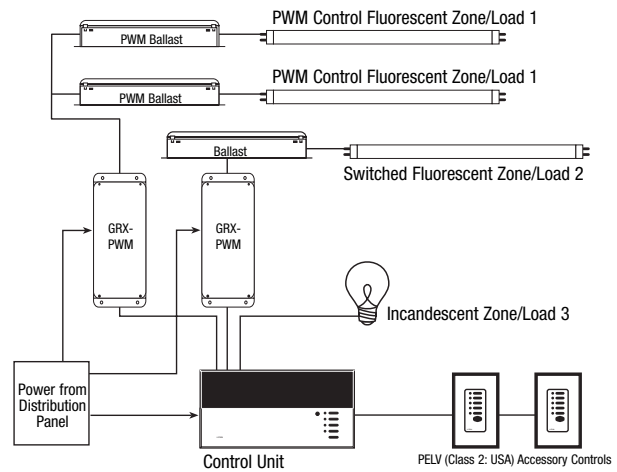
**TERMINALS** Two #12-20 AWG (0.5-2.5 mm<sup>2</sup>) conductors per terminal.  
**MOUNTING** NEMA Type 1 enclosure, indoor use only.  
**ENVIRONMENTAL** 32-104°F (0-40°C).  
**WEIGHT** 4.25 lb. (2 kg)

## Mounting

Find a suitable location for mounting.

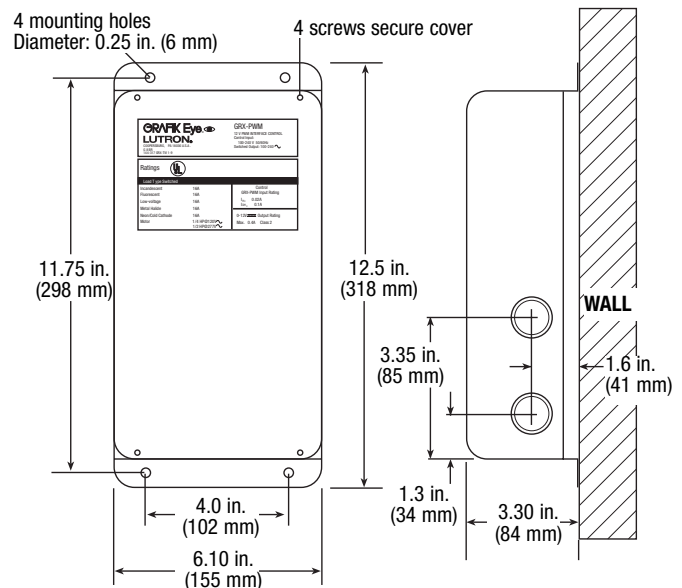
- Decide on the proper location for the GRX-PWM (NEMA Type 1 enclosure, indoor use only). See System Wiring Layout below.
- The environment where the GRX-PWM is placed must have an ambient temperature range of 32-104°F (0-40°C).
- Mount the enclosure vertically on a wall (screws not provided). See Mounting 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

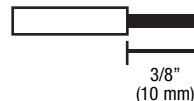
## Important Installation Information

- 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.

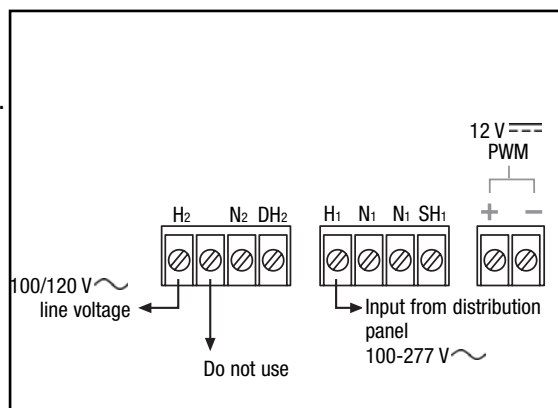
- Proper short-circuit and overload protection must be provided at the distribution panel. You can use up to a 20 A maximum circuit breaker/MCB or equivalent (tripping curve C according to IEC 898/EN60898 is recommended) with adequate short-circuit breaking capacity for your installation.
- Terminal blocks are rated for two #12-20 AWG (0.5-2.5 mm<sup>2</sup>) 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.

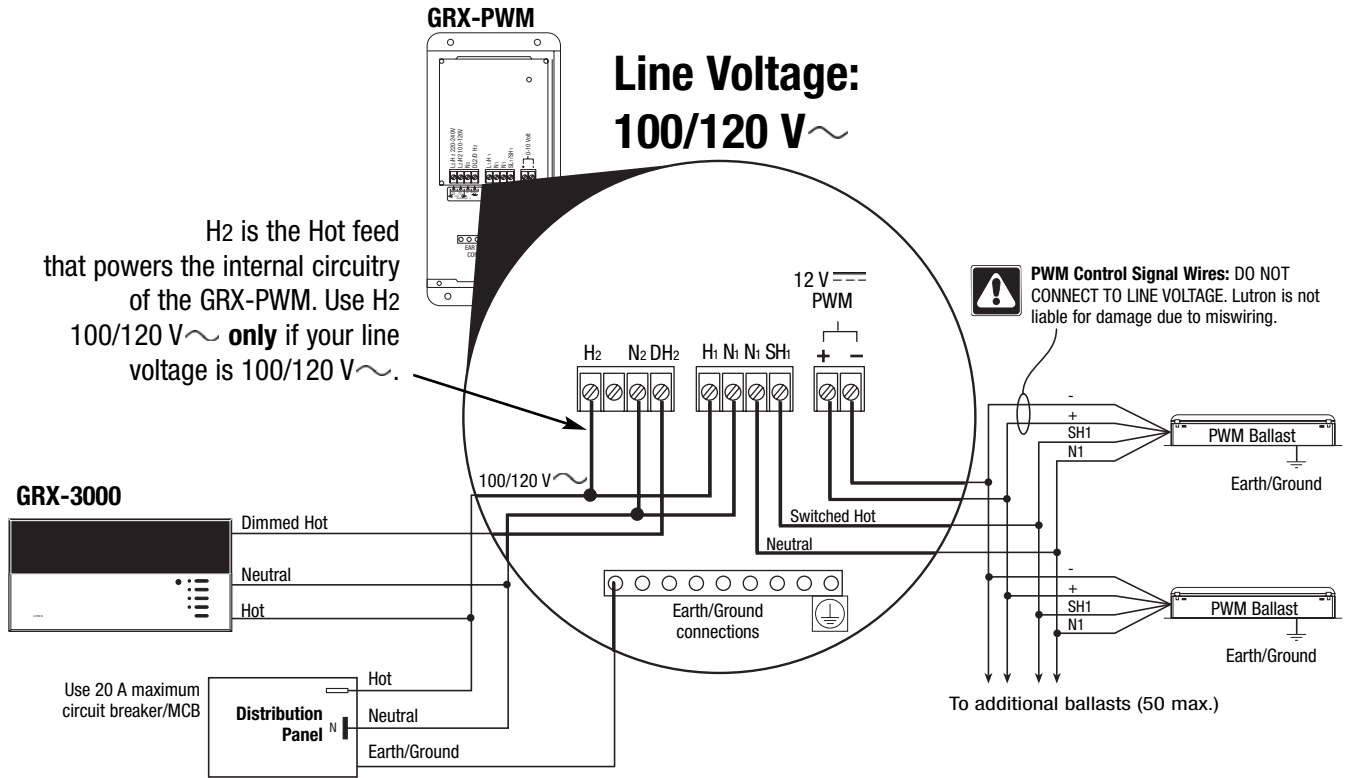
Note 2: The power feed to the Control Unit and H2 of the GRX-PWM must be the same phase! PELV (Class 2: USA), 12 V $\equiv$  PWM wiring from a ballast to the GRX-PWM must be separated from the power wiring. Enter the PELV (Class 2: USA) wires through the knockout adjacent to the 12 V $\equiv$  PWM terminal blocks. The Nomex<sup>®</sup> barrier ensures separation and is flexible to allow access to the terminals. The barrier must be in place when installation is complete.



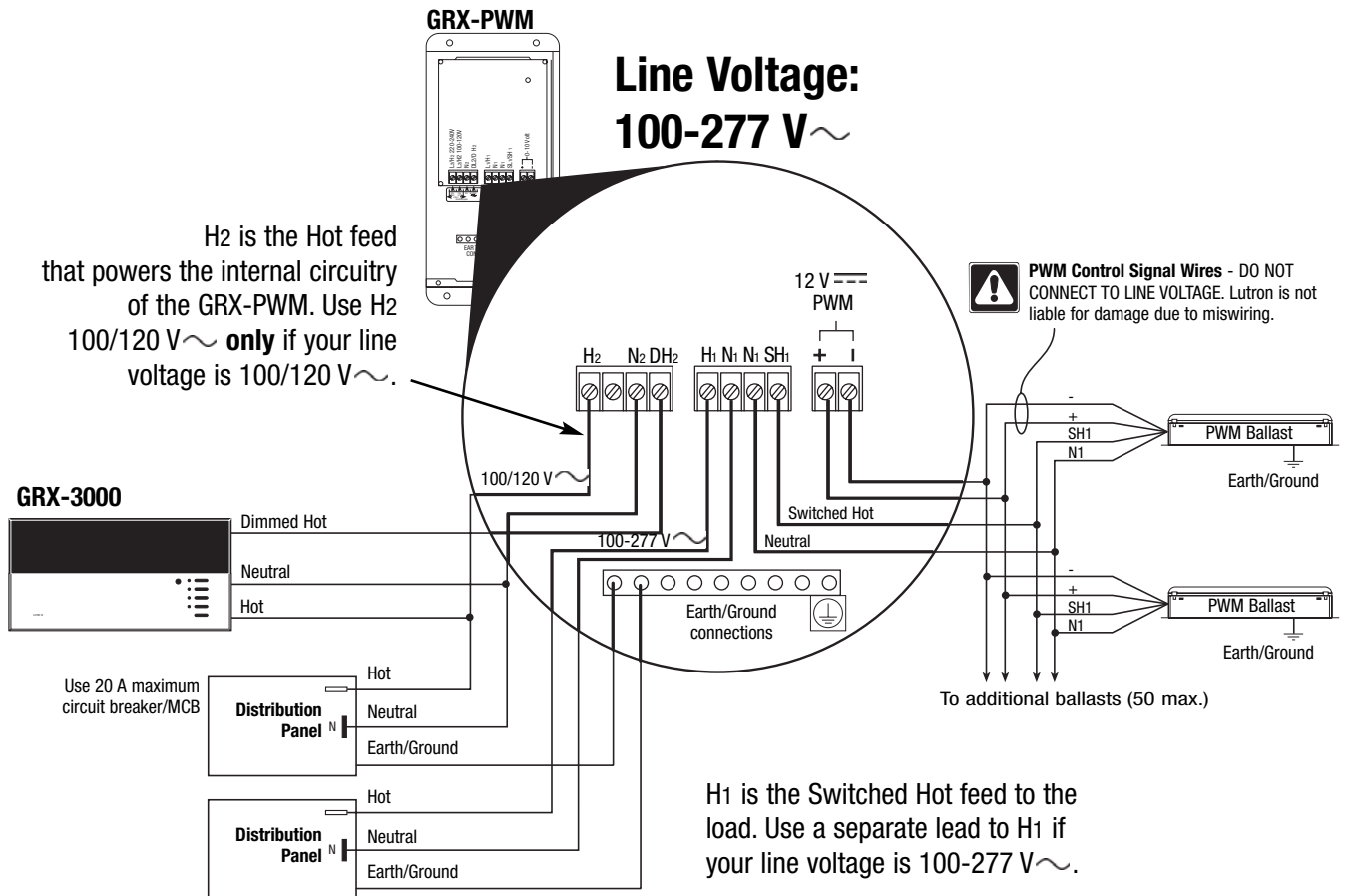
## GRX-PWM Internal Terminal Block Label Definitions

H2 100/120 V $\sim$	Power input for GRX-PWM control (line voltage <b>must be</b> 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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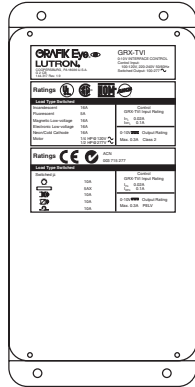
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**LIMITED WARRANTY**  
Lutron will, at its option, repair or replace any unit that is defective in materials or manufacture within one year after purchase. For warranty service, return unit to place of purchase or mail to Lutron at 7200 Suter Rd., 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.  
This product may be covered by one or more of the following U.S. Patents: 4,797,599; 5,309,068; 5,633,540; and corresponding foreign patents.  
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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 mm<sup>2</sup>) conductors per terminal.

**MOUNTING** NEMA Type 1 enclosure, indoor use only.

**ENVIRONMENTAL** 32–104 °F (0–40 °C).

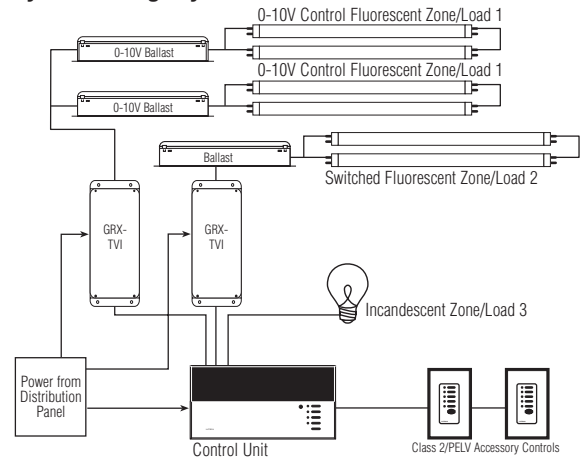
**WEIGHT** 4.25 lb. (2kg)

### Mounting

Find a suitable location for mounting.

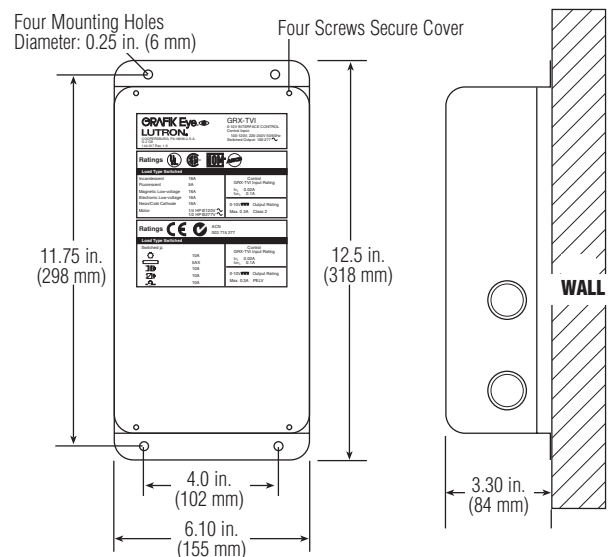
- Decide on the proper location for the GRX-TVI (NEMA Type 1 enclosure, indoor use only). See System Wiring Layout below.
- The environment where the GRX-TVI is placed must have an ambient temperature range of 32–104 °F (0–40 °C).
- Mount the enclosure vertically on a wall (screws not provided). See 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

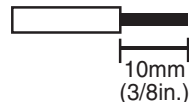
## Important Installation Information

- 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 mm<sup>2</sup>) 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.



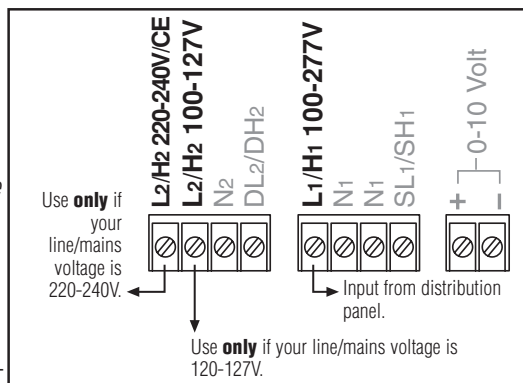
- The label shows two separate Hot/Live terminals (L1/H1 & L2/H2).  
L1/H1 is the Hot/Live feed to power the lighting load.  
L2/H2 is the Hot/Live feed that powers internal circuitry of the GRX-TVI.

*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<sup>®</sup> barrier ensures separation and is flexible to allow access to the terminals. The barrier must be in place when installation is complete.

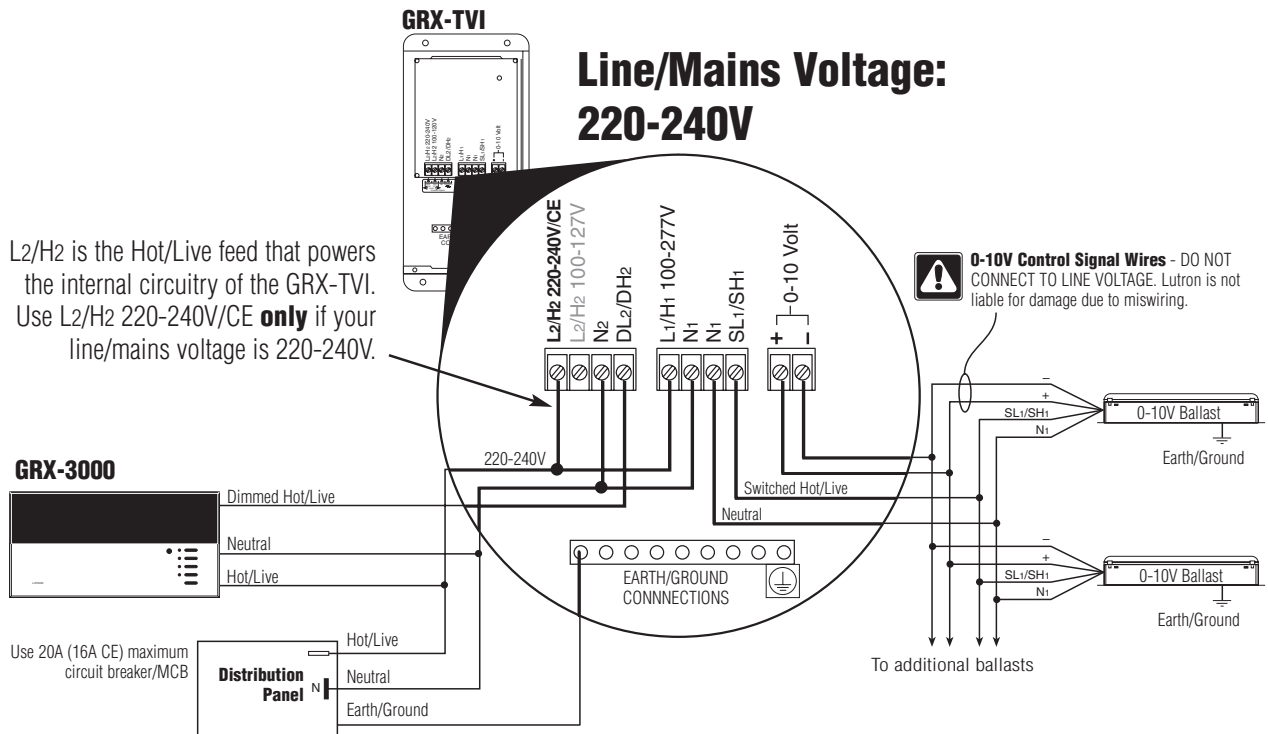


## GRX-TVI Internal Terminal Block Label Definitions

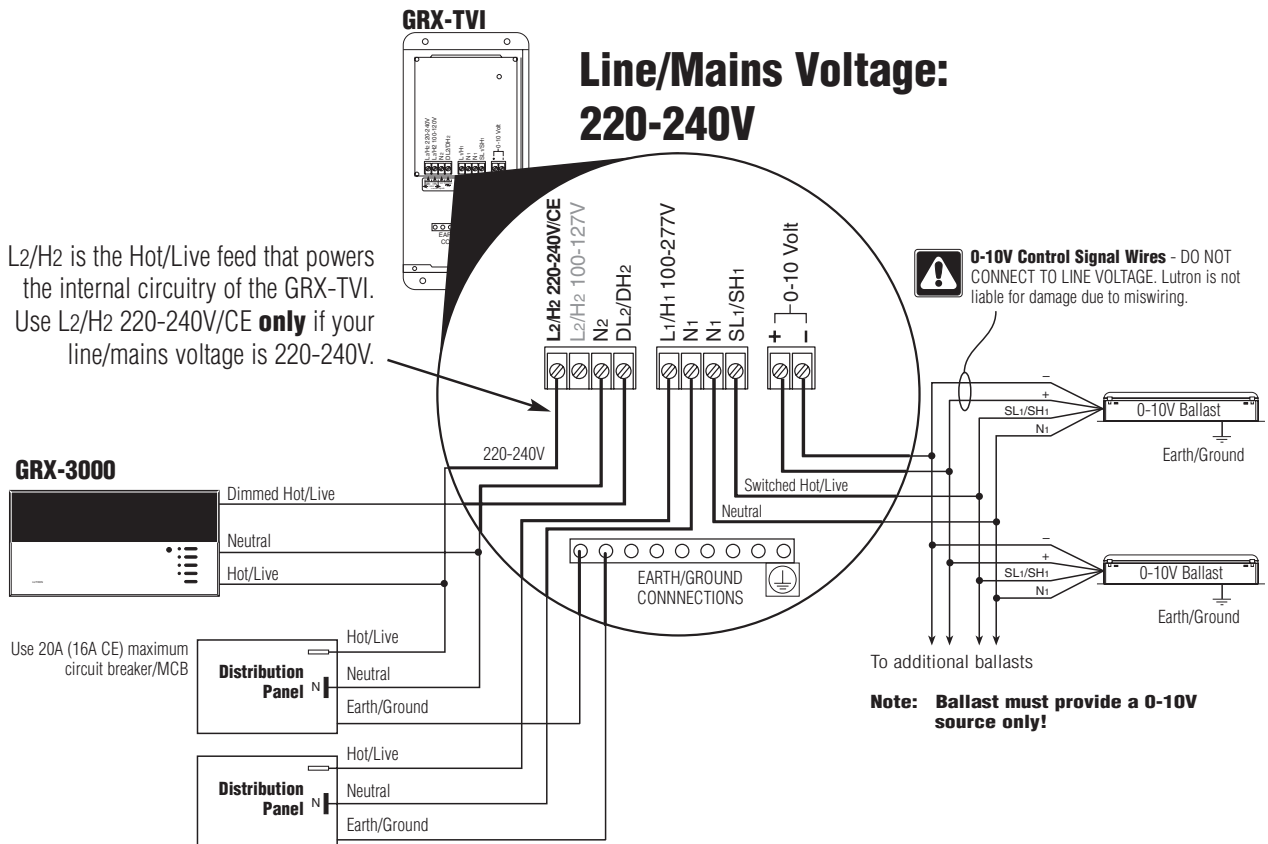
Use **only one** input according to Input Voltage:

L2/H2 240V	Power input for GRX-TVI control (line/mains voltage <b>must be</b> 220-240V)
L2/H2 127V	Power input for GRX-TVI control (line/mains voltage <b>must be</b> 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 ( <b>ballast must provide a 0-10V source only</b> )

## 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

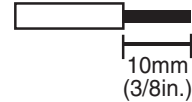
## Important Installation Information

- 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 mm<sup>2</sup>) 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.

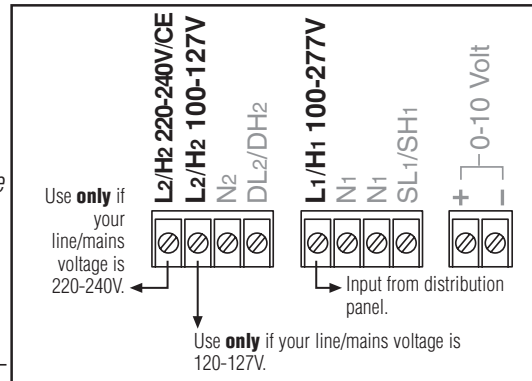


- The label shows two separate Hot/Live terminals (L1/H1 & L2/H2).  
L1/H1 is the Hot/Live feed to power the lighting load.  
L2/H2 is the Hot/Live feed that powers internal circuitry of the GRX-TVI.

*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.



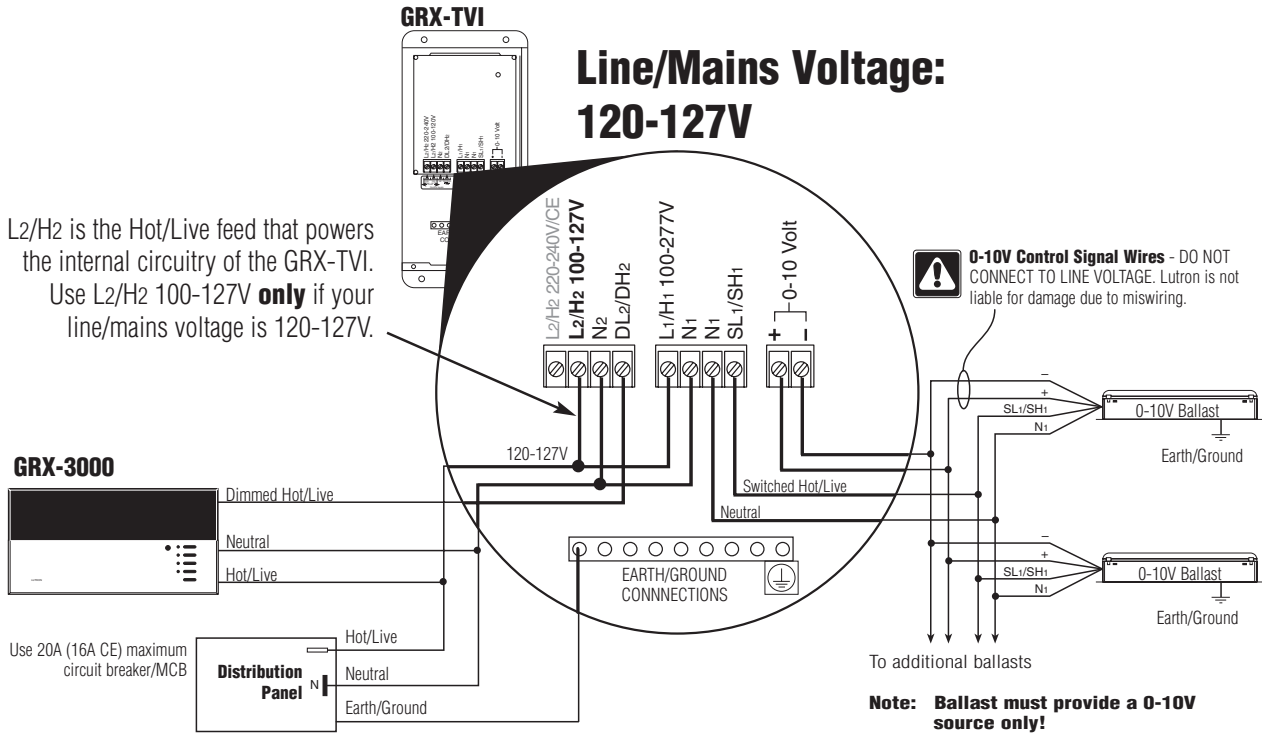
## GRX-TVI Internal Terminal Block Label Definitions

Use **only one** input according to Input Voltage:

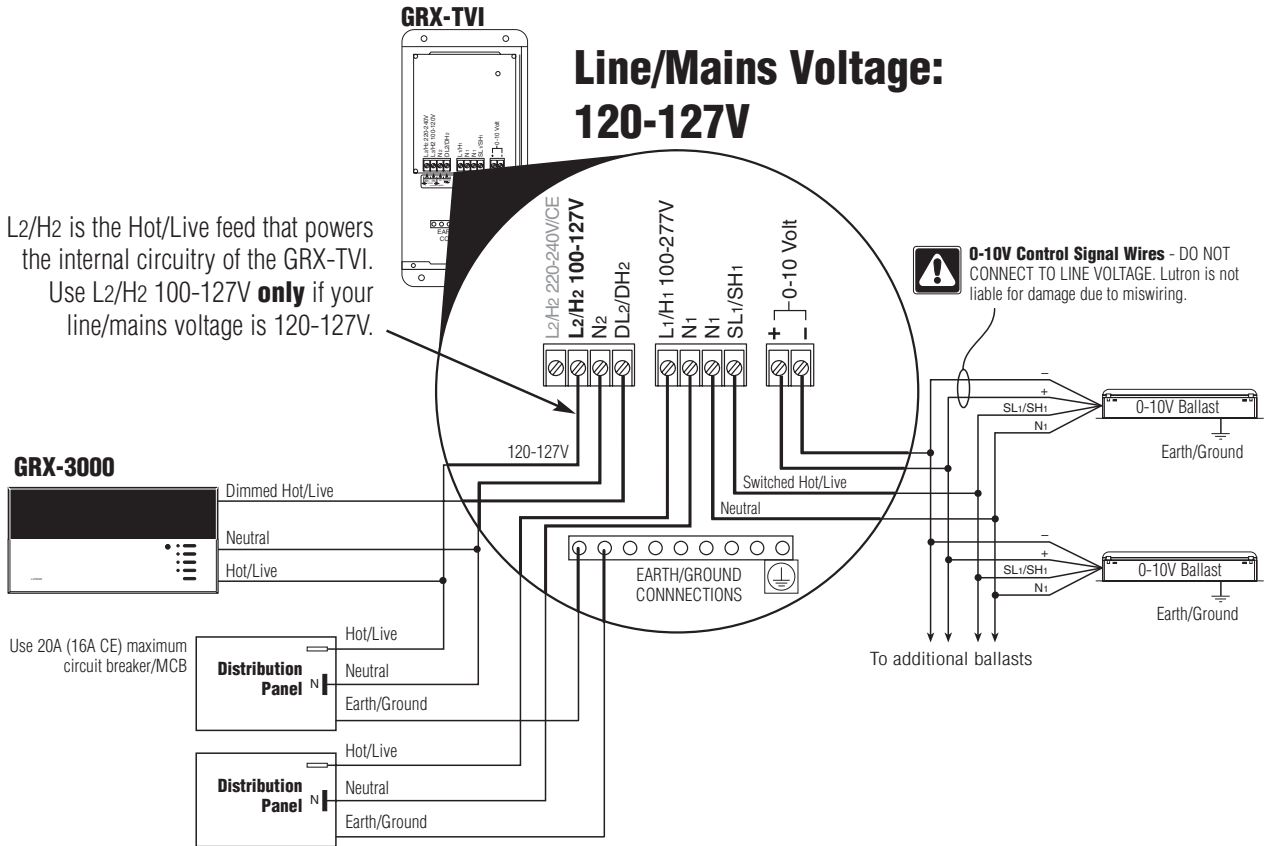
L2/H2 240V	Power input for GRX-TVI control (line/mains voltage <b>must be</b> 220-240V)
L2/H2 127V	Power input for GRX-TVI control (line/mains voltage <b>must be</b> 100-127V)
N2	Neutral for GRX-TVI control
DL2/DH	GRAFIK Eye 3000 Series Control Unit Lighting Zone connection (Phase Control Input to GRX-TVI)
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 ( <b>ballast must provide a 0-10V source only</b> )



### 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 <sub>1</sub> /SH <sub>1</sub> connection goes to the ballasts.
	Miswire	Check that the DL <sub>2</sub> /DH <sub>2</sub> 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 <sub>2</sub> /DH <sub>2</sub> 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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***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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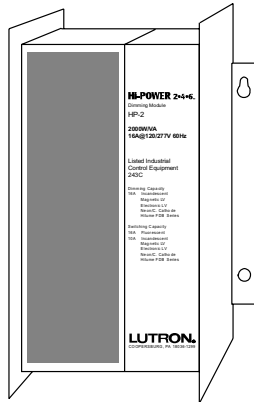
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P/N 032-119 Rev. B

# 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 <sup>1,4</sup> 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 <sup>2,3</sup>

Load Type	Dimmed	Switched <sup>4</sup>
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

<sup>1</sup> 277V Hi-lume FDB or Eco-10 fluorescent, or 277V magnetic low-voltage only.

<sup>2</sup> Any load circuit can be connected to any phase.

<sup>3</sup> Each load circuit may be connected to a different load type; however, load types cannot be mixed on the same circuit.

<sup>4</sup> Switched loads may be either 120 or 277VAC.

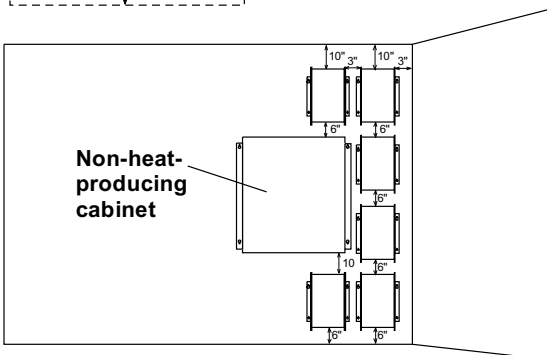
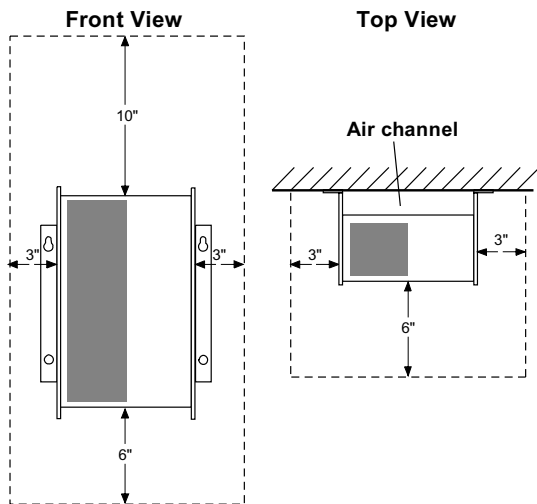
# LUTRON®

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

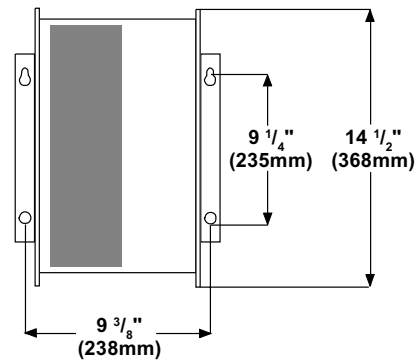
- 1. Choose an appropriate location.**  
Select a convenient location such as an electrical closet or basement. Make sure location is at least 6' from sensitive equipment (and its wiring). Also, make sure to locate module where its sounds (relays clicking and slight humming) are acceptable. Ensure ambient 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.

### Airspace Required

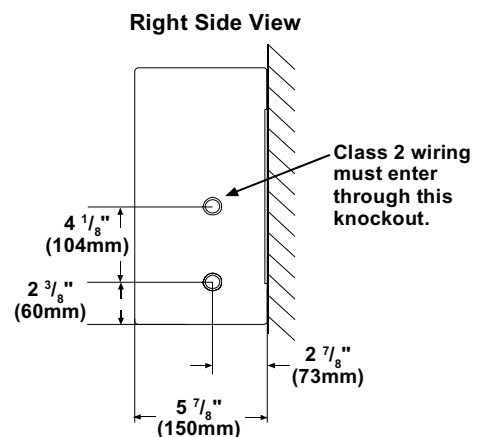
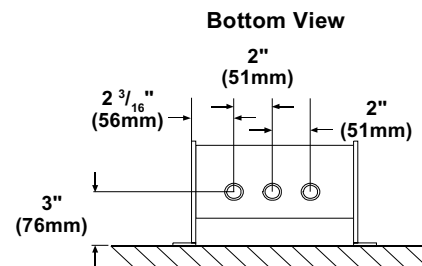


- 3. Mount modules (see below).**  
Using the mounting dimensions shown below, mark (while keeping the module vertical), then drill mounting holes. Securely fasten the module to the wall. Mounting holes are keyed to facilitate mounting.

### 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.

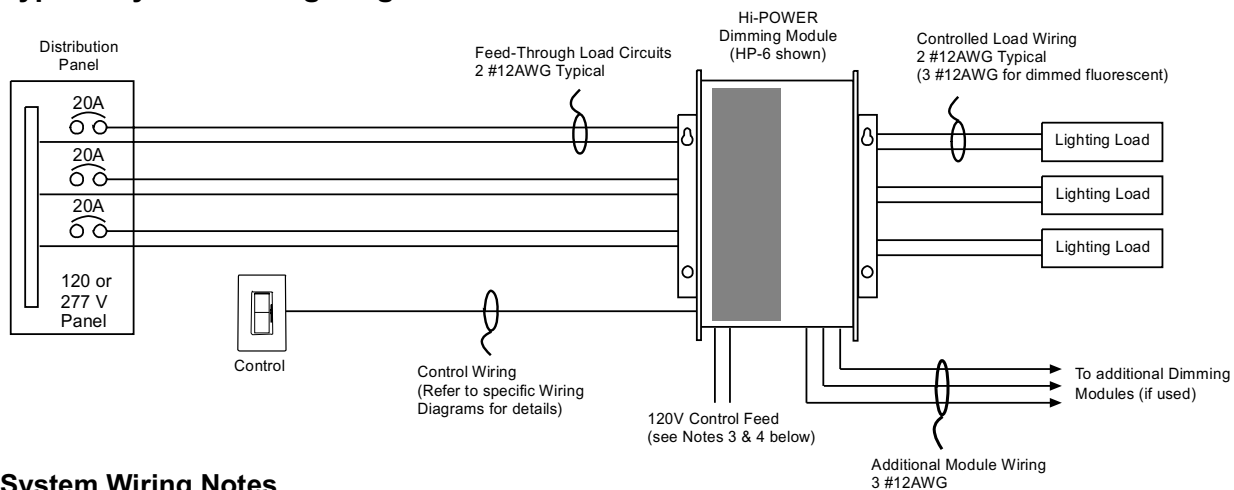


**IMPORTANT:** If more than one module is used, only connect power to the control circuit of the first module.

### 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:

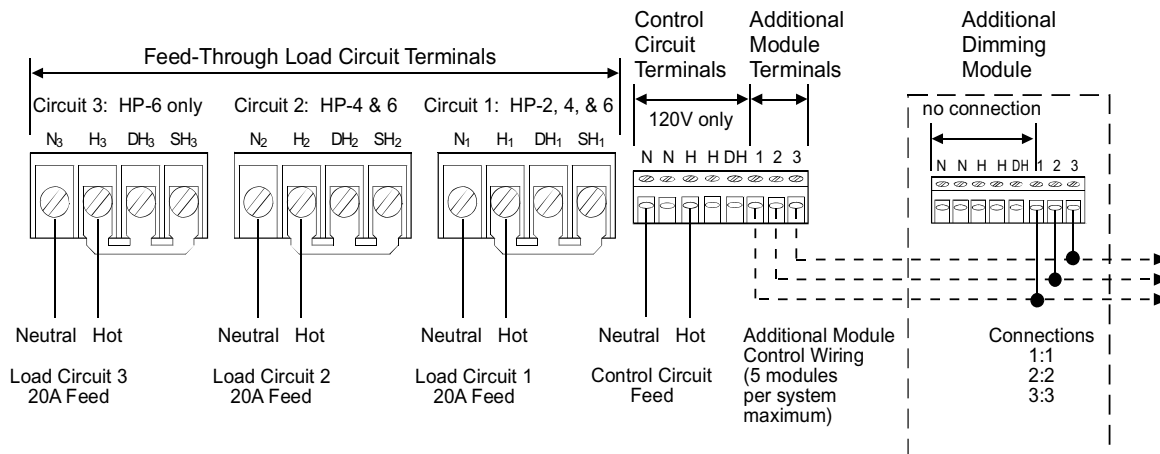
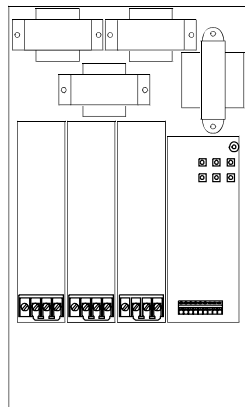
Control Type	Control Wiring Diagram	Page
Single-pole dimmer*	1	8
Mechanical 3-way dimmer*	2-4	8
Maestro	5-7	9
Vareo	8-10	10
Nova T* Infrared	11	11
Nova T* Omnislide	12	11
GRAFIK Eye 3000	13	11
Class 2 Control (raise/lower)	14	12-13

\* 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

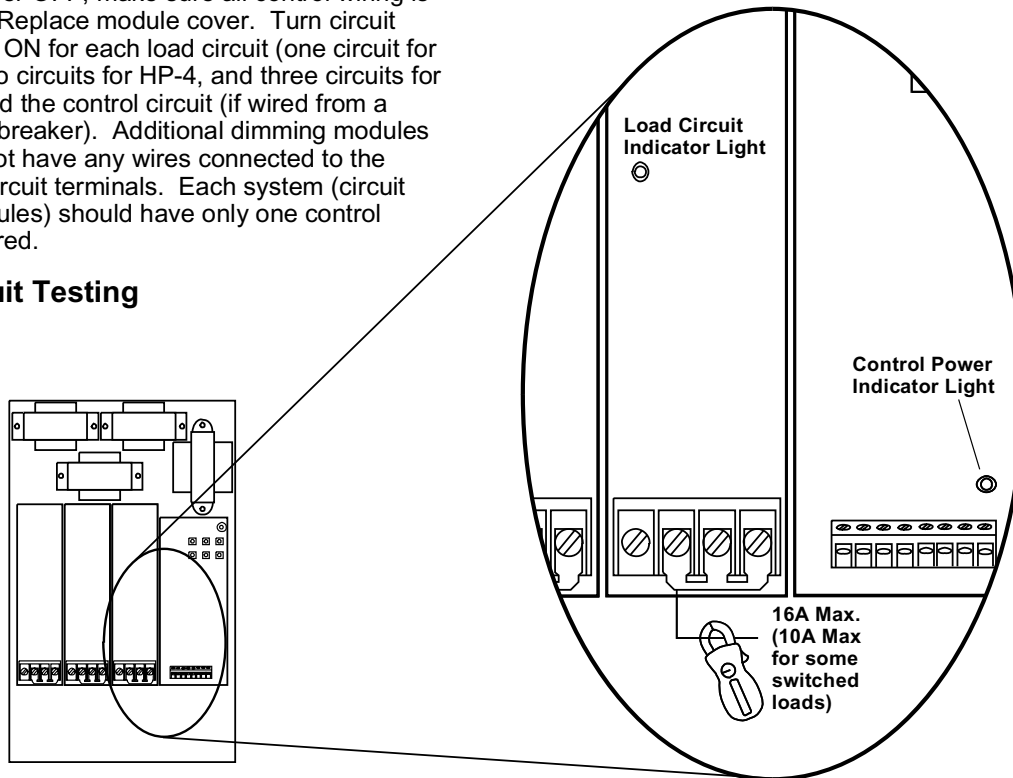
### Check Load Circuits.

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.

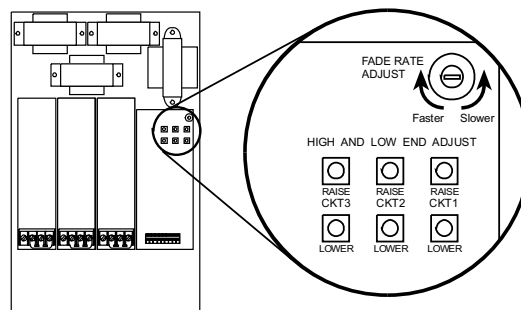
### Low-End Trim

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

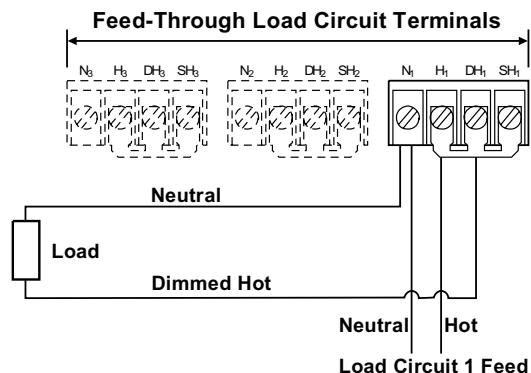
### Diagram 1

#### 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.



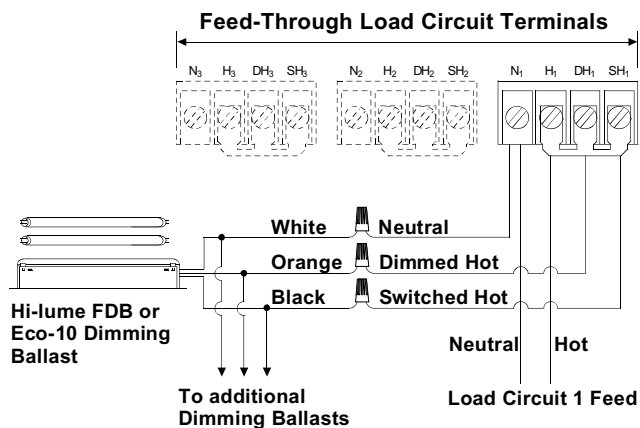
### Diagram 2

#### 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.



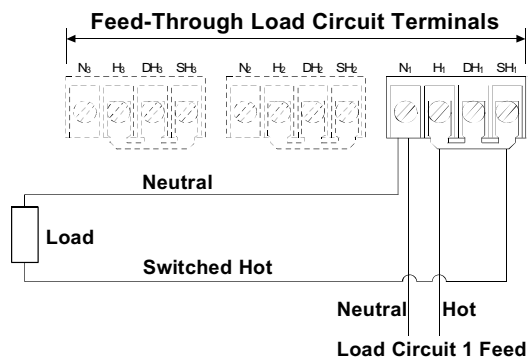
### Diagram 3

#### Switched loads:

**Incandescent, Magnetic Low-Voltage, Electronic Low-Voltage, Neon/Cold-Cathode, Non-Capacitive Fluorescent, and Metal Halide**

#### Wiring notes:

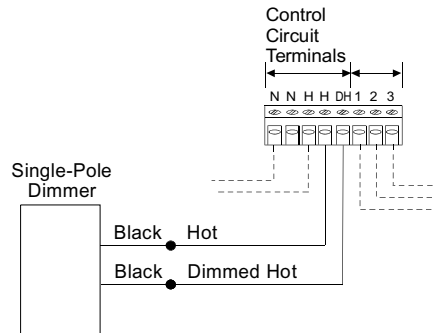
1. Terminal blocks are rated for 2 #12 AWG max.
2. Load wiring may be 120VAC or 277VAC. Control circuit must be 120VAC.
3. The diagram represented a single load circuit model (HP-2). For two circuit (HP-4) or three circuit (HP-6) applications, repeat the same wiring method for each circuit. A different load type may be used on each circuit if desired. However, do not mix load types on the same load circuit.



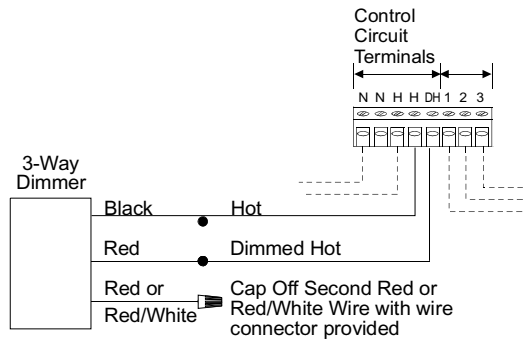


# Control Wiring

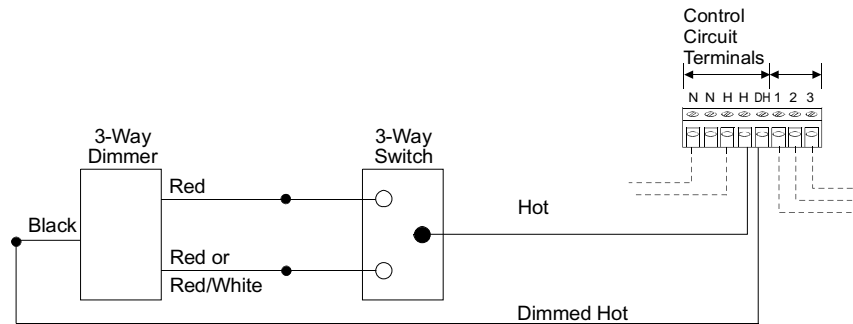
**Diagram 1: Single-pole Dimmer**



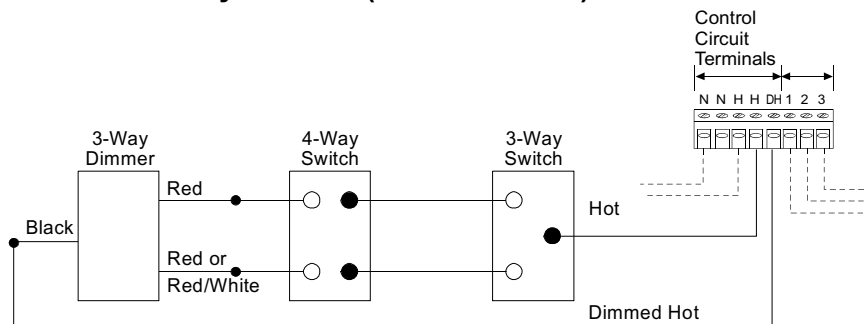
**Diagram 2: Mechanical 3-way Dimmer (Single location)**



**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)

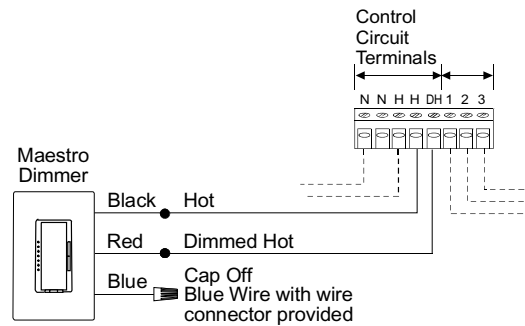


Diagram 6: Maestro Incandescent Dimmer (Two location)

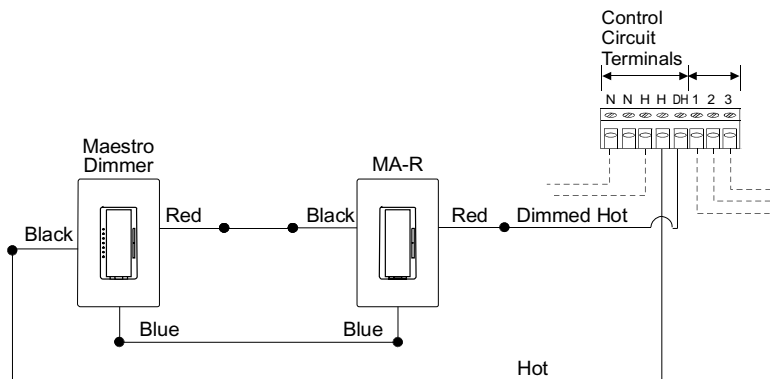
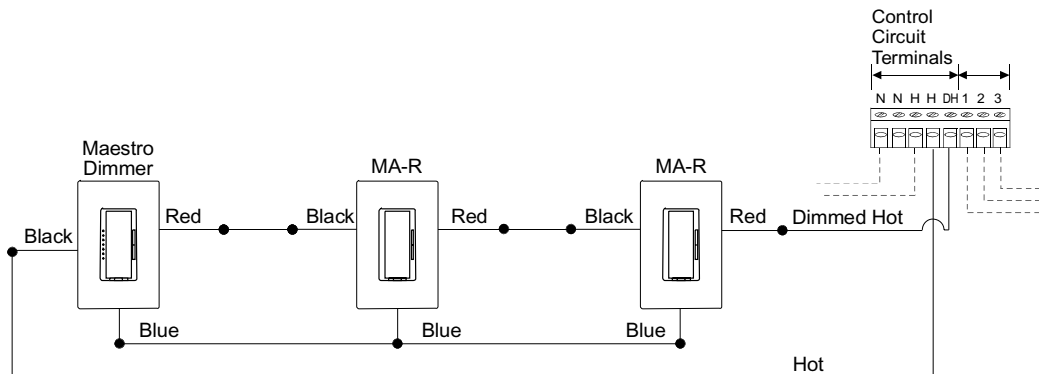
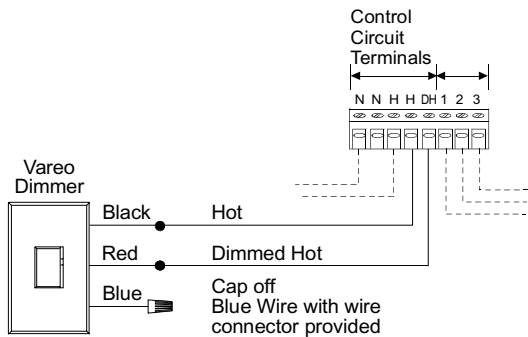


Diagram 7: Maestro Incandescent Dimmer (Three location)

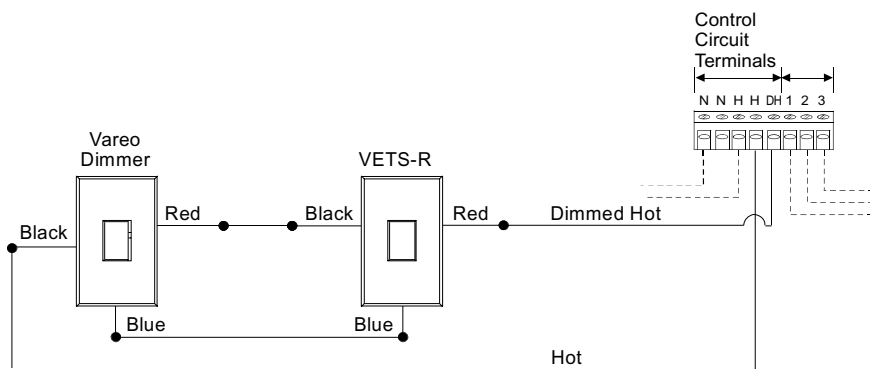


# Control Wiring

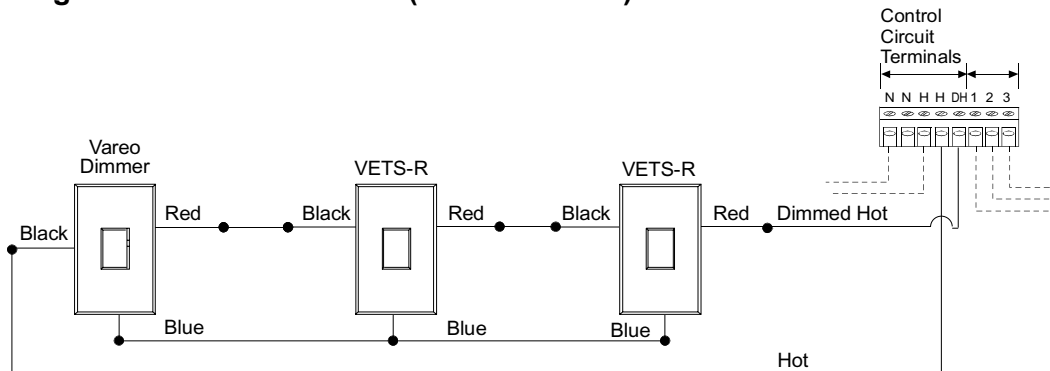
**Diagram 8: Vareo Dimmer (Single location)**



**Diagram 9: Vareo Dimmer (Two location)**



**Diagram 10: Vareo Dimmer (Three location)**



## Control Wiring

Diagram 11: Nova T\* Infrared Dimmer

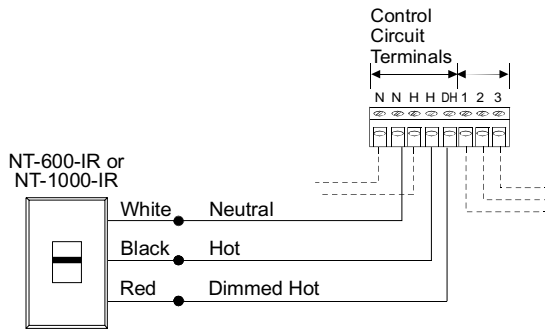


Diagram 12: Nova T\* Omnislide Dimmers (Two location)

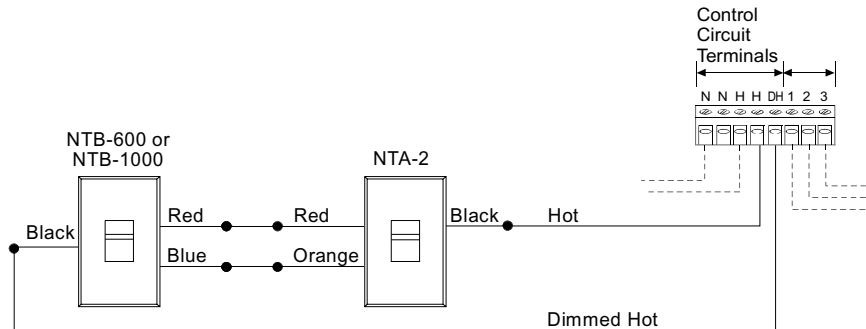
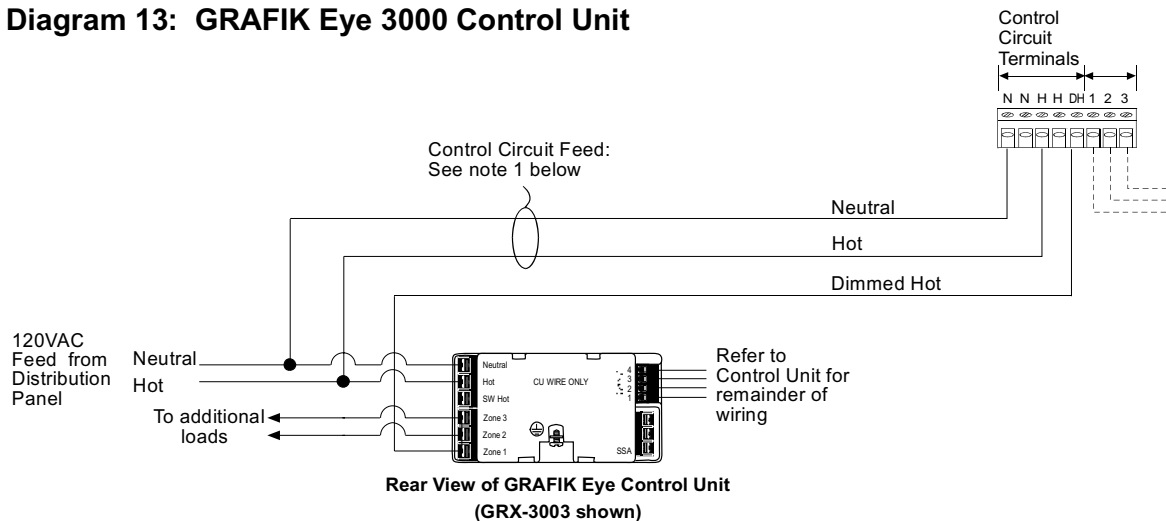


Diagram 13: GRAFIK Eye 3000 Control Unit



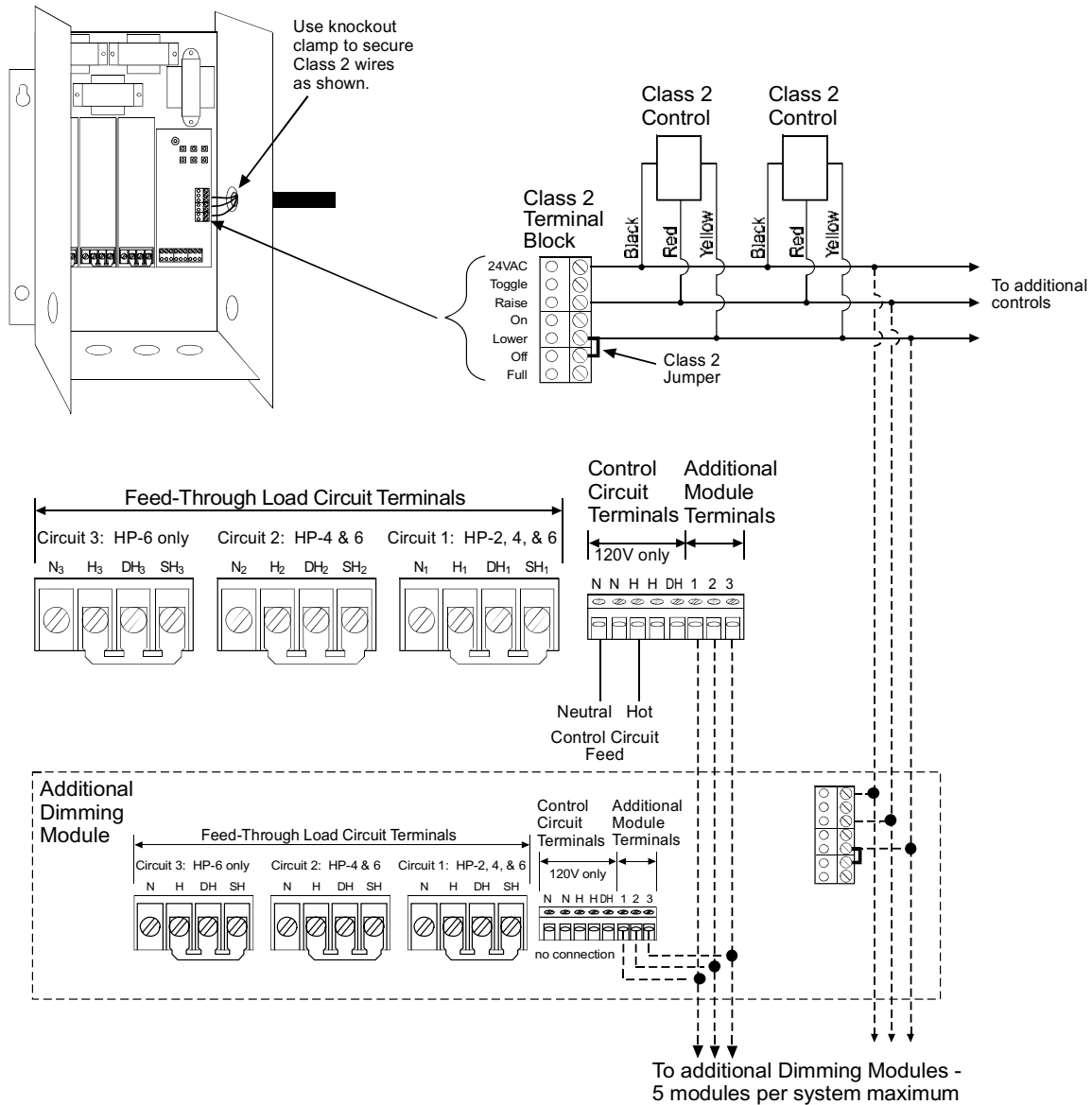
### GRAFIK Eye 3000 Wiring Notes:

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

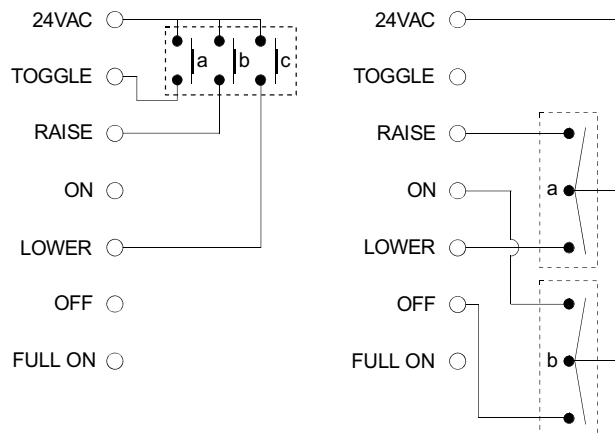
### Definitions of Control Options

<b>RAISE</b>	Increases the light level while the switch is activated.
<b>LOWER</b>	Decreases light level while the switch is activated. Does not turn lights off.
<b>LOWER/OFF</b>	Decreases light level while the switch is activated. Turns lights off after the low-end is reached.
<b>ON</b>	Fades lights on to preset level.
<b>OFF</b>	Fades lights off.
<b>TOGGLE</b>	Fades lights on to preset level if they are off, fades lights off if they are on.
<b>FULL ON</b>	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.
<b>FADE RATE</b>	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.

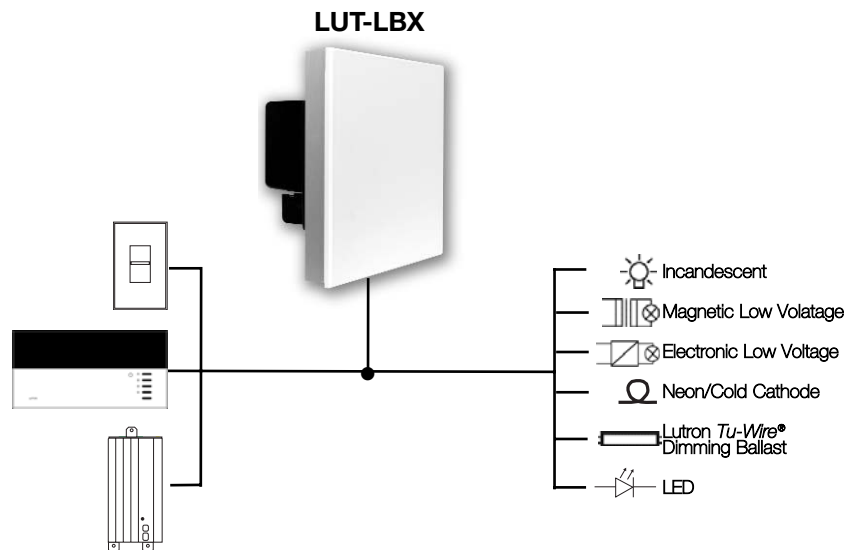
# LUTRON®

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

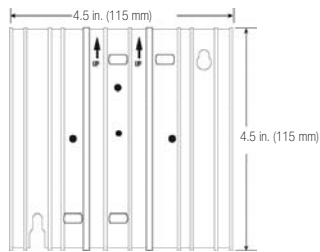
## LUT-LBX Synthetic Minimum Load For use with Reverse and Forward Phase Dimmers

*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.

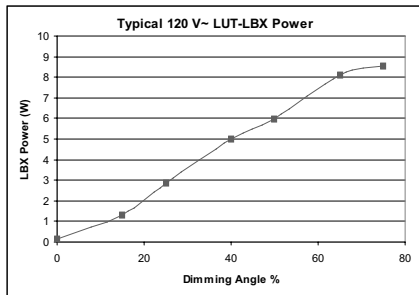


Interface shown with faceplate removed

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

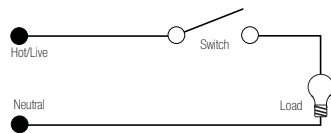


**Danger!** Always turn OFF the circuit breakers/MCB or remove the main fuses from the power line before doing any work. Failure to do so can result in serious personal injury. **Disconnect all power sources before servicing unit.**

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.

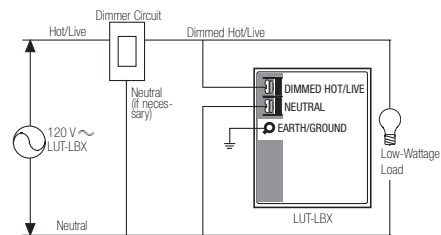


## Installation Instructions

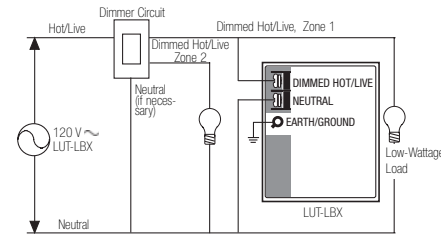
1. Turn power Off to the Control Unit.
2. Mount standard U.S. 2-gang wallbox (available from Lutron, P/N 241-496); 3 1/2 in. (89 mm) deep is strongly recommended, 2 3/4 in. (68 mm) minimum. Allow at least 4 1/2 in. (110 mm) clearance above/below Interfaces to ensure proper heat dissipation.
3. Strip 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 mm<sup>2</sup>) wire. Power terminals can accept up to two #12 AWG (2.5 mm<sup>2</sup>) wires. The recommended installation torque is 9.0 in.●lbs. (1.0 N●m) for line voltage connections.



## Single-Zone Wiring



## Dual-Zone Wiring

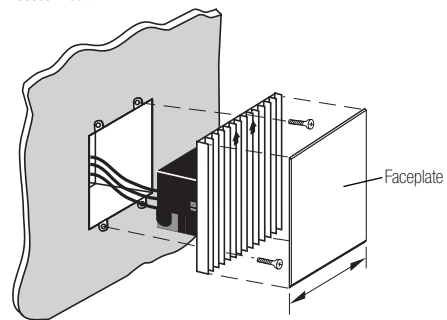


\* Wallbox may be recess mounted or surface mounted. If mounting Interface in a panel, please refer to Panel Mounting section for important information.

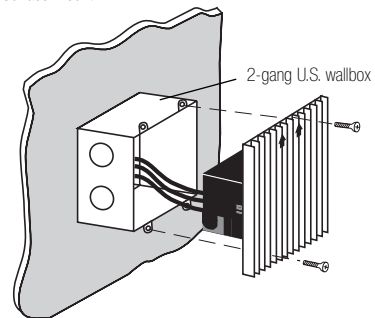
**Mounting: Interface must be mounted *vertically*!**

1. Confirm all connections and mount the Interface using the screws provided.
2. Restore power to the system.

Recess Mount



Surface Mount

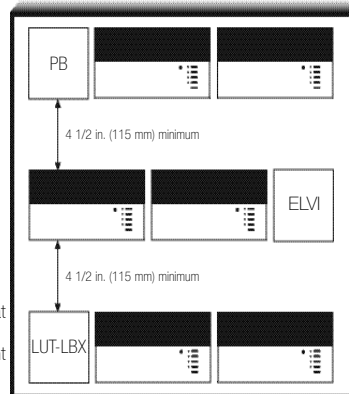


## Panel Mounting

- 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.

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

#### WORLD HEADQUARTERS

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18036

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Technical Support 1-800-523-9466

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#### Asia Technical Hotlines

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Hong Kong: 800-901-849  
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Japan: +81.3.5575.8411  
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, Ti-Wire, and Grafik Eye are registered trademarks of Lutron Electronics Co., Inc. © 2006 Lutron Electronics Co., Inc.



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Made and printed in U.S.A.  
P/N 030-852 Rev. A 01/07

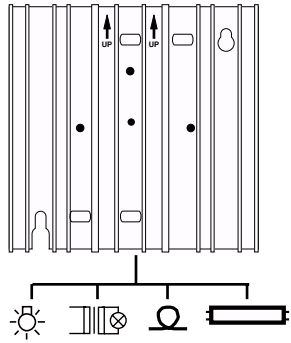


## GRAFIK Eye® Power Interfaces

### Power Booster (PB) Electronic Low Voltage Interface (ELVI) Fluorescent Dimming Ballast Interface (FDBI)

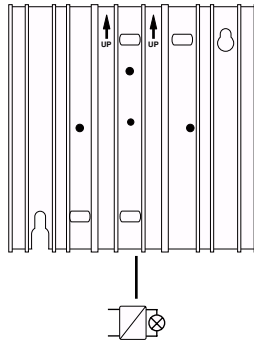
*Installation Instructions — Please Read*

#### PB



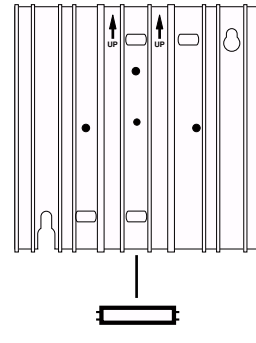
Incandescent  
Magnetic Low Voltage  
Neon/Cold Cathode  
Lutron *Tu-Wire*® Dimming Ballast

#### ELVI



Electronic Low Voltage

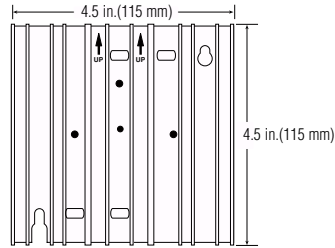
#### FDBI



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.

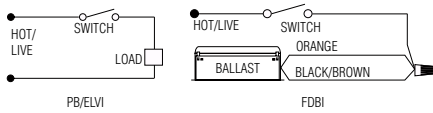
**Disconnect all power sources before servicing unit.**

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

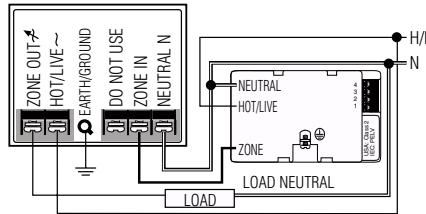
- Turn power Off.
- **PB/ELVI:** Connect standard switch between Hot/Live lead and the load wire to test circuit.
- **FDBI:** Connect standard switch between Hot/Live lead and the Dimmed Hot/Live and switched Hot/Live leads of the ballast.
- Turn power On and check for short or open circuits.



### Single-Feed Wiring for PB/ELVI 120V and 220-240V

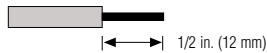


The **PB/ELVI** may be on the same circuit as the Control Unit *only if* the total load does not exceed the rating of the breaker.



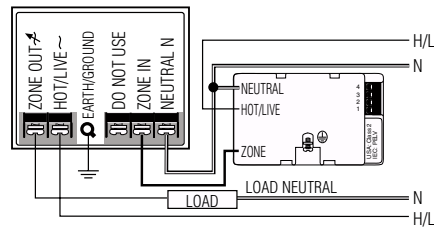
### Wiring Instructions

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 mm<sup>2</sup>) wire. Power terminals can accept up to two #12 AWG (2.5 mm<sup>2</sup>) 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

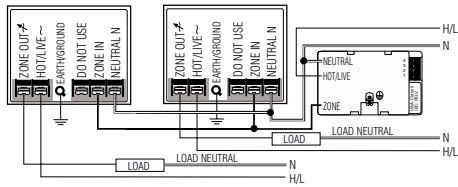
The load breaker/MCB can be on a different phase than the control breaker/MCB.



\* 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.



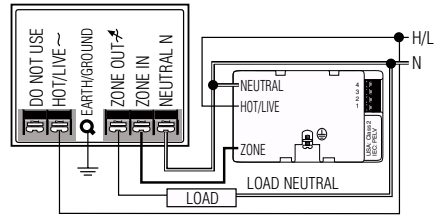
**Tu-Wire Dimming Ballast**

- 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**

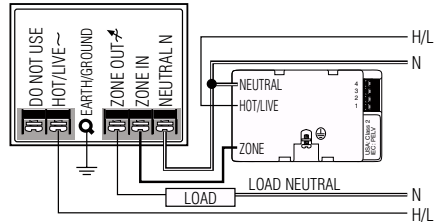


The **PB/ELVI** may be on the same circuit as the Control Unit *only if* the total load does not exceed the rating of the breaker.



**Dual-Feed Wiring for PB/ELVI 230V**

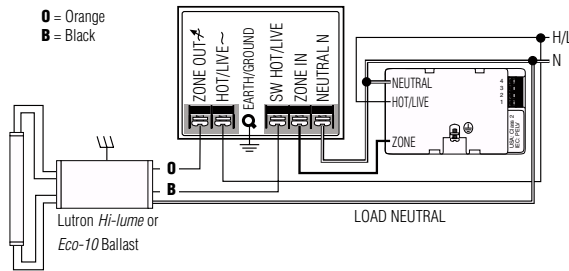
The load breaker/MCB can be on a different phase than the control breaker/MCB.



**Single-Feed Wiring for FDBI  
120V and 220-240V**

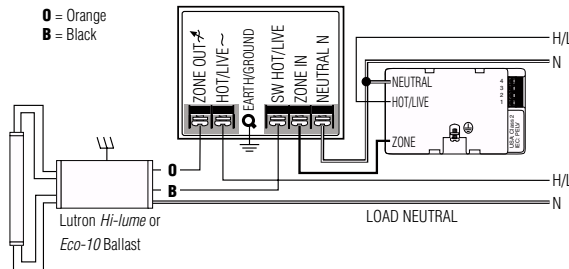


The **FDBI** may be on the same circuit as the Control Unit if, and only if, the total load does not exceed the rating of the breaker. Connect ZONE OUT only to Lutron *Hi-lume* or *Eco-10* Electronic Dimming Ballasts.



**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.



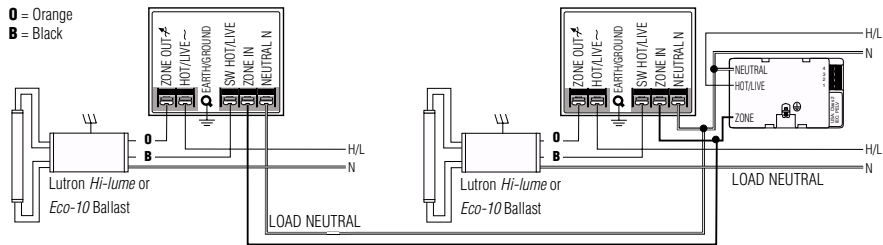
**Lutron Products**

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**

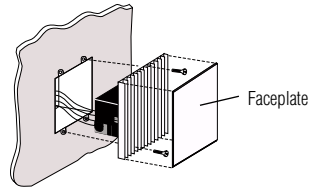
The load breaker/MCB can be on a different phase than the control breaker/MCB. Connect ZONE OUT only to Lutron *Hi-lume* or *Eco-10* Electronic Dimming Ballasts.



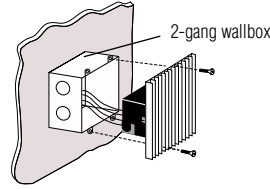
**Mounting: Interface must be mounted *vertically!***

1. Confirm all connections and mount the Interface using the screws provided.
2. Restore power to the system.

**Flush Mount**



**Surface Mount**

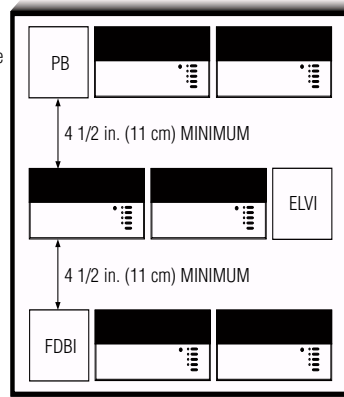


## Panel Mounting

- 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 <b>PB/ELVI/FDBI</b> . 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 <b>PB/ELVI/FDBI</b> .
	<i>GRAFIK Eye</i> 3000 Control Unit	Refer to the troubleshooting section of <i>GRAFIK Eye</i> Control Unit Installation Guide.

Internet: [www.lutron.com](http://www.lutron.com)  
E-mail: [product@lutron.com](mailto:product@lutron.com)

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**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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# Power Modules Installation Instructions

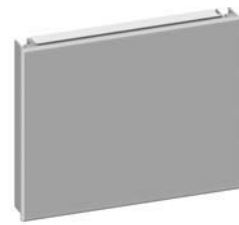
Please Read



Phase-Adaptive  
Power Module



3-Wire Fluorescent  
Power Module



Switching  
Power Module

English

Español

## 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		

Français





### 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

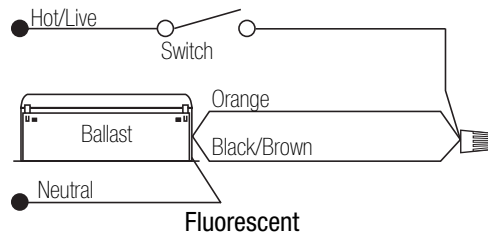
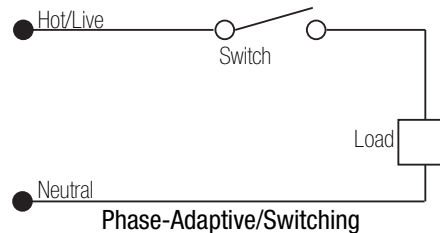
### Product Compatibility

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.

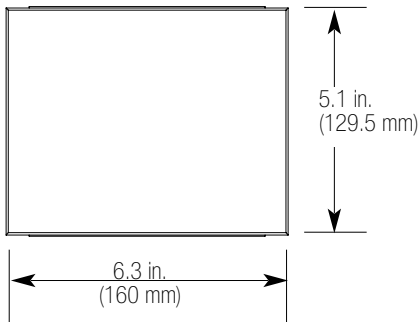
- Provide #12 AWG (2.5 mm<sup>2</sup>) copper (Cu) wires (75 °C minimum) for input power and load circuit.
- Strip 1/2 in. (12 mm) insulation from wires before connecting.
- Run separate neutral for load circuit - no common neutrals.



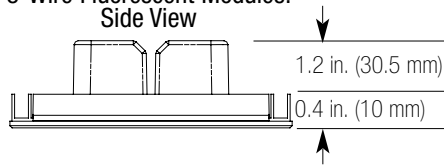
**Note!** Plastic faceplate must be installed on module for normal operation (all models).

### Dimensions

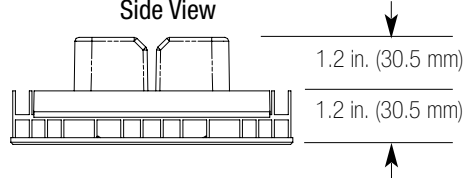
All Modules: Front View



Switching and  
3-Wire Fluorescent Modules:  
Side View

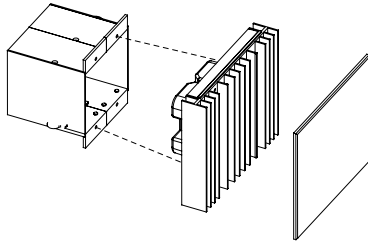


Phase-Adaptive Module:  
Side View

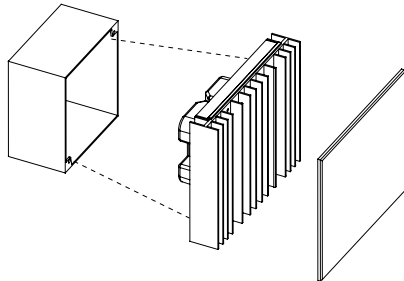


**Mounting Methods**

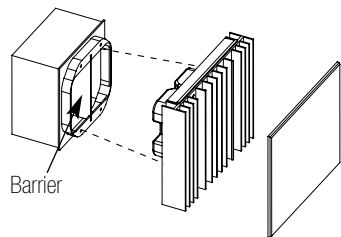
Mount to 2-gang U.S. wallbox



Mount to 4 x 4 in. (102 mm), 2.1 in. (53 mm) deep U.S. junction box



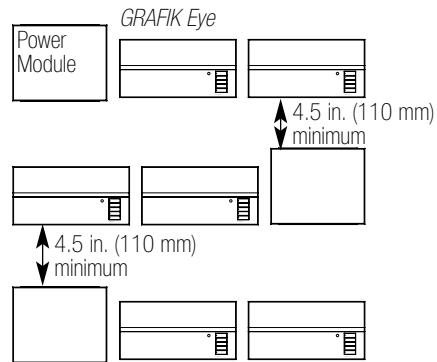
Mount to 4 x 4 in. (102 mm), 2.1 in. (53 mm) deep U.S. junction box with barrier (for 277 V~ loads if required by local electrical code)



**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.

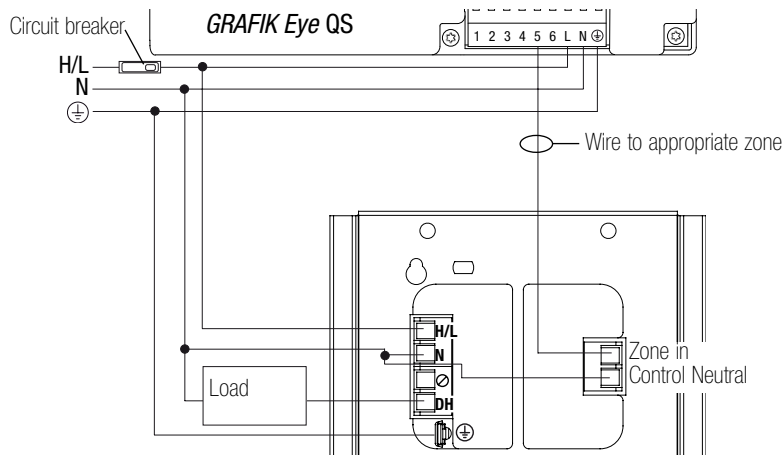
**Note!** Plastic faceplate must be installed on module for normal operation (all models).



### 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.

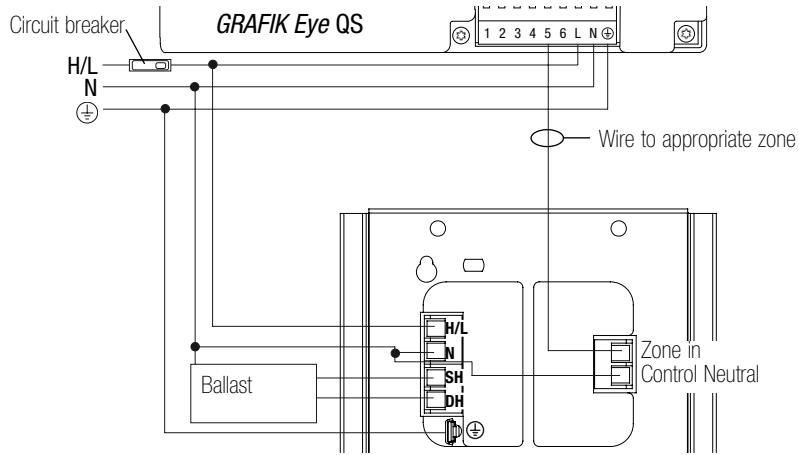
### Phase-Adaptive Module Wiring



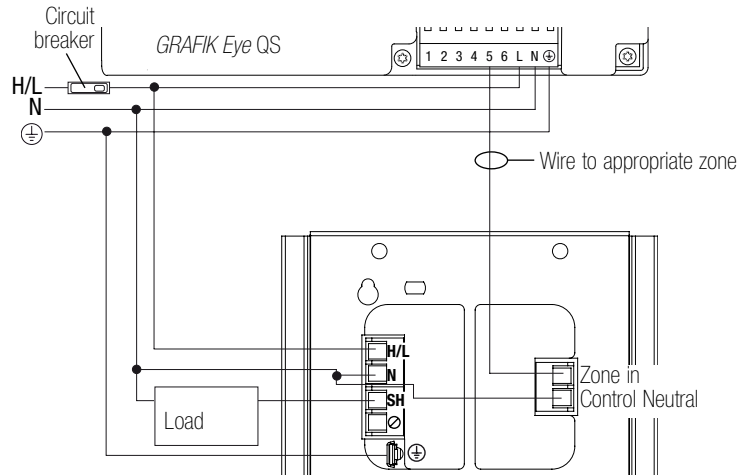
### Legend

- H/L Hot/Live
- N Neutral
- SH Switched Hot
- DH Dimmed Hot
- ⊕ Ground
- ⊘ Not Used

### Fluorescent 3-Wire Module Wiring



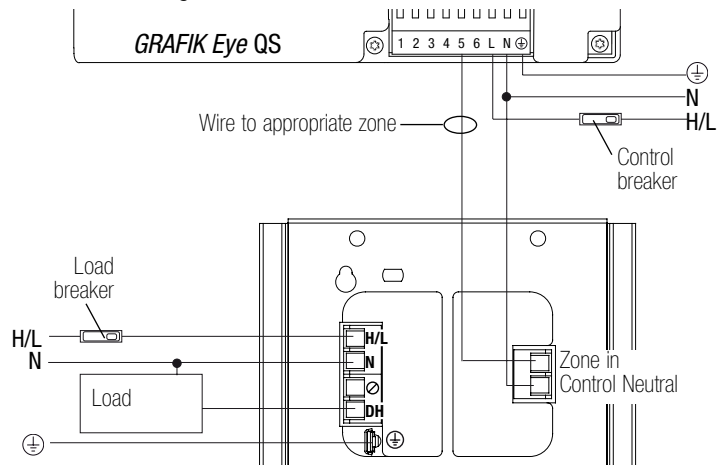
### Switching Module Wiring



### 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.

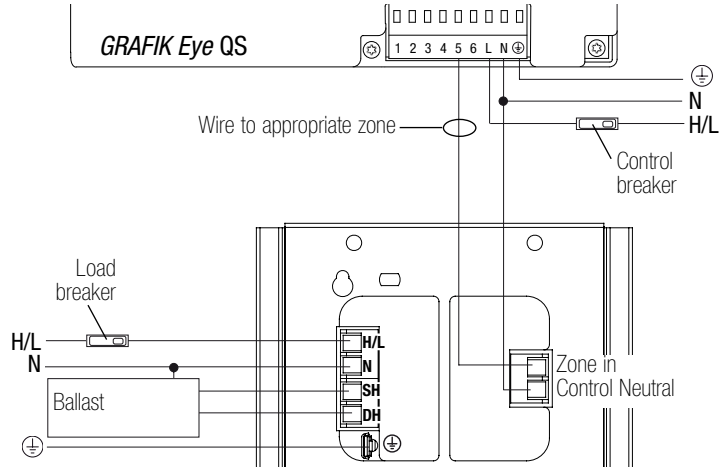
### Phase-Adaptive Module Wiring



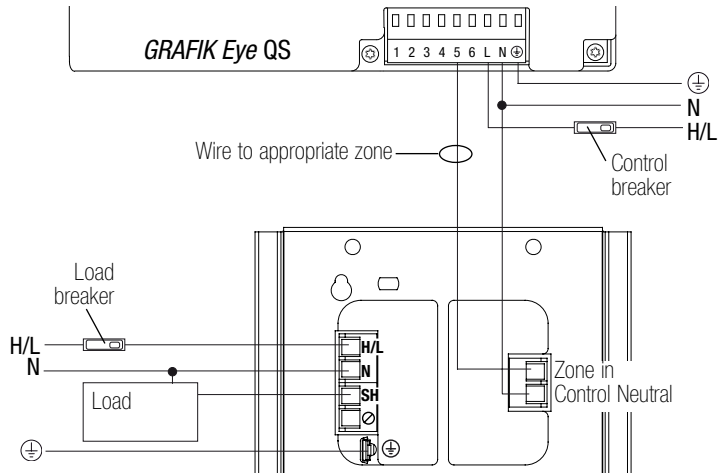
### Legend

- H/L Hot/Live
- N Neutral
- SH Switched Hot
- DH Dimmed Hot
- ⊕ Ground
- ⊘ Not Used

**Fluorescent 3-Wire Module Wiring**

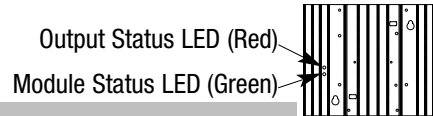


**Switching Module Wiring**





**PHASE-ADAPTIVE POWER MODULE  
DIAGNOSTICS AND TROUBLESHOOTING**



**Module Status LED (green)**

LED Action	Comments
Off	Module not powered. <b>Caution:</b> 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 <sup>1</sup>
2 blinks, pause, repeat	On	Off	Over-voltage error <sup>2</sup>
3 blinks, pause, repeat	On	On full	Shorted component <sup>3</sup>
4 blinks, pause, repeat	On	Off	DC detection <sup>4</sup>

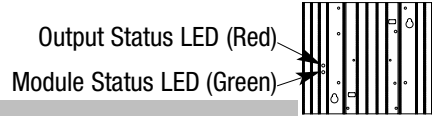
<sup>1</sup>Remove power; repair fault; re-apply power.

<sup>2</sup>Verify proper load on output.

<sup>3</sup>Replace power module; internal device is damaged.

<sup>4</sup>Possible faulty MLV load.

**3-WIRE FLUORESCENT POWER MODULE  
DIAGNOSTICS AND TROUBLESHOOTING**



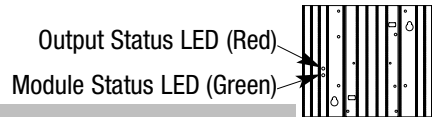
**Module Status LED (green)**

LED Action	Comments
Off	Module not powered. <b>Caution:</b> 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. <b>Note:</b> 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. <b>Caution:</b> 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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Made and printed in U.S.A.  
P/N 032-178 Rev. A 4/07



**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.

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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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