



Warranty & Start-Up Information

Job Name:

Toll-Free 24/7 Technical Support Line: 1.800.523.9466

Job Number:

Field Service Scheduling 1.800.523.9466 ext.4439

Lutron Standard Limited Warranty

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

Limited Warranty

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

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

THIS WARRANTY IS IN LIEU OF ALL OTHER EXPRESS WARRANTIES, AND THE IMPLIED WARRANTY OF MERCHANTABILITY IS LIMITED TO ONE YEAR FROM PURCHASE. THIS WARRANTY APPLIES ONLY TO LUTRON HARDWARE AND DOES NOT INCLUDE LUTRON SOFTWARE, LUTRON PROVIDED SYSTEM SERVERS, LAPTOPS, PDAS, OR COMPUTERS PURCHASED WITH LUTRON CONTROL SYSTEMS. THIS WARRANTY DOES NOT COVER THE COST OF INSTALLATION, REMOVAL, OR REINSTALLATION, OR DAMAGE RESULTING FROM MISUSE, ABUSE, OR IMPROPER OR INCORRECT REPAIR, OR DAMAGE FROM IMPROPER WIRING OR INSTALLATION. THIS WARRANTY DOES NOT COVER INCIDENTAL, OR SPECIAL DAMAGES. THE PURCHASER ASSUMES AND WILL HOLD HARMLESS LUTRON IN RESPECT OF ALL SUCH LOSS. LUTRON'S LIABILITY ON ANY CLAIM FOR DAMAGES ARISING OUT OF OR IN CONNECTION WITH THE MANUFACTURE, SALE, INSTALLATION, DELIVERY, OR USE OF THE UNIT SHALL NEVER EXCEED THE PURCHASE PRICE OF THE UNIT.

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

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

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

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

Note - Although every attempt is made to ensure that catalog information is accurate and up-to-date, please check with Lutron before specifying or purchasing this equipment to confirm availability, exact specifications, and suitability for your application.

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Lutron Electronics Co., Inc. Commercial Systems Limited Warranty

SCOPE

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

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

LIMITED WARRANTY

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

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

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

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

CUSTOMER OBLIGATIONS TO MAINTAIN LIMITED WARRANTY

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

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

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

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

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

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

EXCLUSIONS AND RESTRICTIONS

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

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

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

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

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

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

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

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

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

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

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

TO MAKE A WARRANTY CLAIM

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

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

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

REMOTE ACCESS

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

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

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

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1-Visit Start-up

Description

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

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

Visit Summary:

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

Additional Information

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

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

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

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

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

Description

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

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

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

1. The Silver Plan COVERS:

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

2. Additionally, the Gold & Platinum Plans COVER:

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

3. Service Procedures

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

4. This plan DOES NOT COVER:

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

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

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

5. Warranties

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

6. Limitation of Remedy

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

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

7. Taxes

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

8. Term; Termination

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

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9. Miscellaneous

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

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

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Lutron Contacts for all Warranties and Support and Maintenance Plans

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

WORLD HEADQUARTERS **USA**

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

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

EUROPEAN HEADQUARTERS **United Kingdom**

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

ASIAN HEADQUARTERS

Singapore

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

Asia Technical Hotlines

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

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LCP/XPS System On-Site System Start-up

What Standard GRAFIK LCP/XPS Start-up includes:

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

System start up includes:

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

Programming the wall controls/interfaces to include:

- Control addressing
- Verify proper wiring and operation of control link
- Set up controls to function as per approved submittal drawings. If no control functionality is included, controls will be programmed according to written instructions from end user or end users representative, contractor, or will be set up based on the field engineers past experience in that order of priority.
- Test all buttons to assure proper operation
- Occupancy sensor
 - Verification of proper installation and operation.

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- 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 in writing via the proper channels.
- Field wiring changes or corrections that delay the startup process such that additional time is required for Lutron to complete the startup will result in additional charges.
- Replacement of controls damaged due to miss-wires or incorrect installation or any other related issue not covered under the Lutron warranty is the responsibility of the installer.
- Reprogramming of any functions after initial programming and sign-off.

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

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

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

- LSC-AF-VISIT. Aim and focus visit with design team or end user. This visit is typically coordinated by the construction team, that includes designers, Lutron, and end user to set up light levels and adjust fixtures.
- LSC-SYSOPT. System optimization visit with end user. This visit is coordinated by the EC or end user to optimize the system performance to specific project details.

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- 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.

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

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

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

XPS/LCP system description

XPS is a Lutron Switching System that is designed to provide exceptional value and reliability to our customers. It utilizes Lutron's patented arcless Softswitch circuit that dramatically increases the lifetime of the system over conventional switching relay systems. Even when fully loaded, the arc elimination extends a relay's average rated life to more than 1,000,000 on/off cycles. Digital wall controls may be purchased for simple control in the space. The product also features an integrated time clock for automated system control.

LCP is a Lutron Dimming/Switching System that is designed to provide exceptional value and reliability to our customers. It allows the end user to use dimming and switching in the same panel for all of the space requirements. Digital wall controls may be purchased for simple control in the space. The product also features an integrated time clock for automated system control.

Both systems are similar in appearance, programming, and maintenance, however the XPS is solely a switching system and LCP can have dimming and switching capability in the same panel.

XPS/LCP Training Visit – Typical Agenda (duration – approximately 1 hour):

- Review of XPS/LCP 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 all system components
- Panel(s) and XPS/LCP Controller
 - o Bypassing outputs
 - o Spare dimmer cards/modules, switching modules
 - o Load schedule
 - o Programming of timeclock
- Wall controls
 - o Addressing
 - o Reprogramming
- Troubleshooting system. Panels, processor, controls, interfaces
- System integration (if applicable)
- Warranty information
- Tech support
- Preventive maintenance

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

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Thank you for purchasing a Lutron lighting control system.

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

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



who to call if you have problems: 1.800.523.9466

24-hour Technical Support at No Charge

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

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

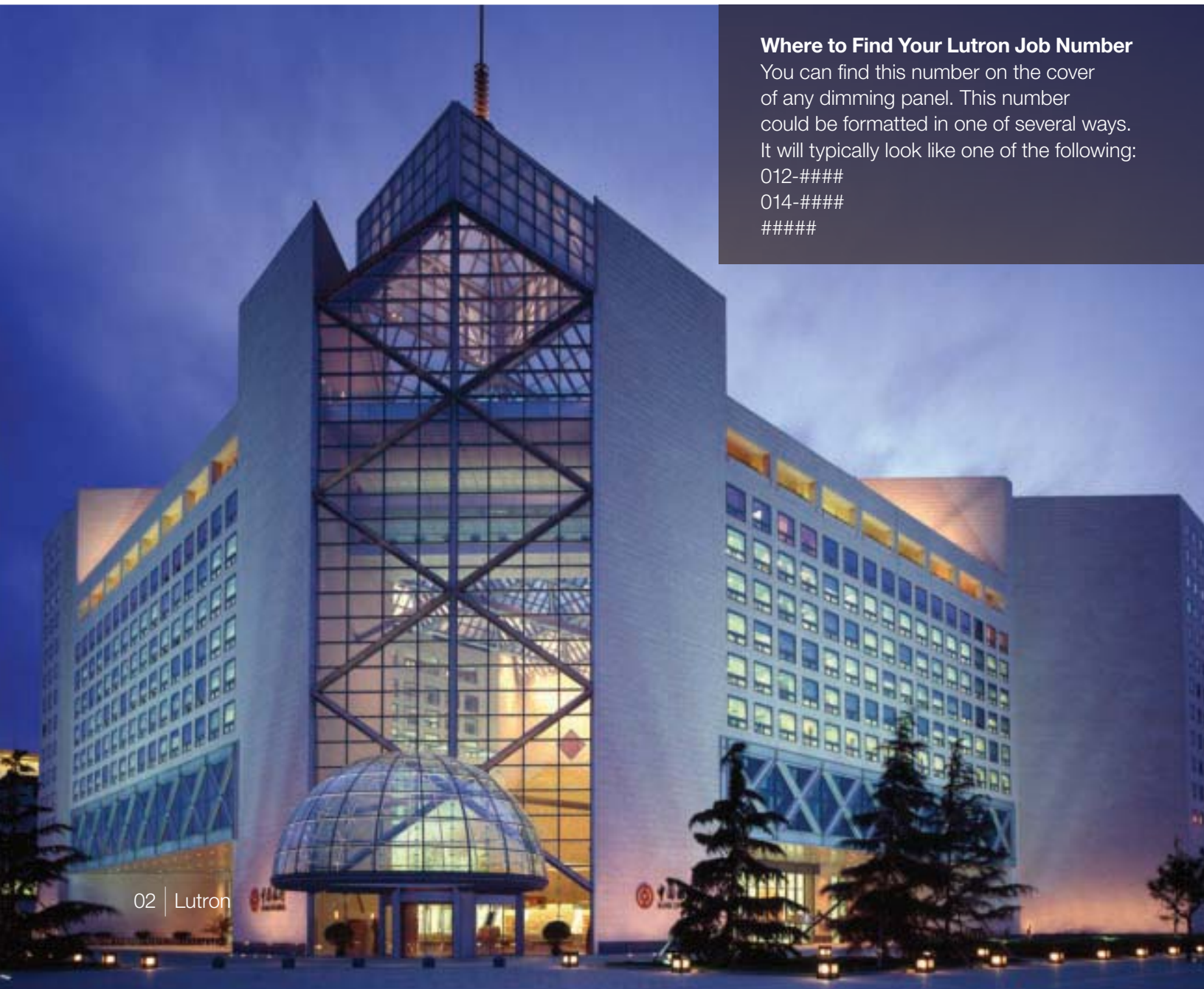
Where to Find Your Lutron Job Number

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

012-####

014-####

#####



what to do if your system needs service

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

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

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

How to Determine Your System Coverage

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

With Lutron Start-up

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

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

Without Lutron Start-up

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

replacement parts

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

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

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



spare parts packages

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

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

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

training sessions

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

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

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

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



optimize energy usage

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




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

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

support & maintenance plans

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

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

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

annual scheduled maintenance visits

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

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



new and improved Lutron products

Add Engraving to Existing Controls

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

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



Upgrade to seeTouch®

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

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



seeTouch®

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

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

Upgrade to GRAFIK Eye® QS

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

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



GRAFIK Eye® QS

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

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



modernize your lighting control system

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

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

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

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



system expansions

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

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

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

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



Lutron in your home

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

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

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

Save energy beautifully

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

* incandescent and halogen

www.lutron.com

save
energy
with
Lutron™



 **LUTRON**® SERVICES CO., INC.

www.lutron.com/service

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

World Headquarters 1.610.282.3800
Technical Support Center 1.800.523.9466

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Install & Setup Guides

Job Name:

Toll-Free 24/7 Technical Support Line: 1.800.523.9466

Job Number:

Field Service Scheduling 1.800.523.9466 ext.4439

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

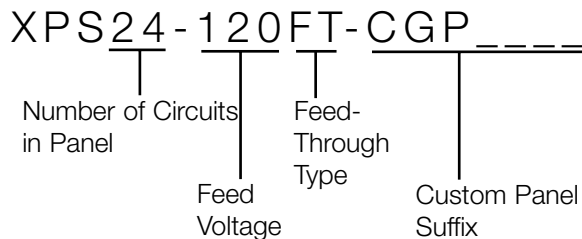
Use this guide to successfully install a switching panel. This guide describes panel installation, wiring, and load activation. For systems using rough-in panels, special instructions are included for keepout areas, panel mounting, and installing the panel interior.

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^{1,2}

Omit for dual voltage

120 for 120 V \sim

230 for 230 V \sim (CE)

240 for 220-240 V \sim (non-CE)

277 for 277 V \sim

Load Circuit Rating

16 A per circuit

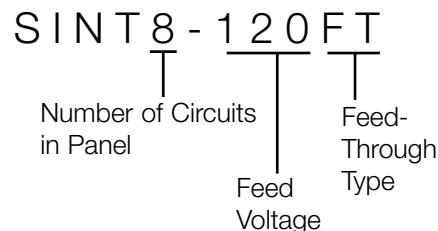
Custom Panel Suffix

Contact Lutron for options

Rough-In Model Numbers

120/277 V \sim 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^{1,2}

Omit for dual voltage

120 for 120 V \sim

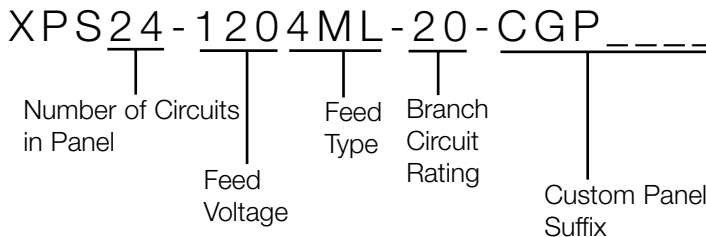
277 for 277 V \sim

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 \sim only)

Feed Voltage

120 for 120 V \sim

230 for 230 V \sim (CE)

240 for 220-240 V \sim (non-CE)

277 for 277 V \sim

347 for 347 V \sim

Feed Type

4ML for 3 phase 4 wire main lugs

Input Ratings

120/208 V \sim

or 277/480 V \sim

or 230/400 V \sim

or 220/380-240/415 V \sim

3ML for 1 phase 3 wire main lugs

120/240 V \sim

4IS for 3 phase 4 wire isolation switch

Branch Circuit Rating

20 for 20 A branch circuit breakers (120/277/347 V \sim ; 16 A continuous load rating)

16 for 16 A branch circuit breakers (230/220-240 V \sim)

Custom Panel Suffix

Contact Lutron for options

Frequency - All Model Numbers and Voltages

50/60 Hz

Output Voltages

120 V \sim , 230 V \sim , 240 V \sim , 277 V \sim , or 347 V \sim

¹Multiple voltages (120 V \sim and 277 V \sim) 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.

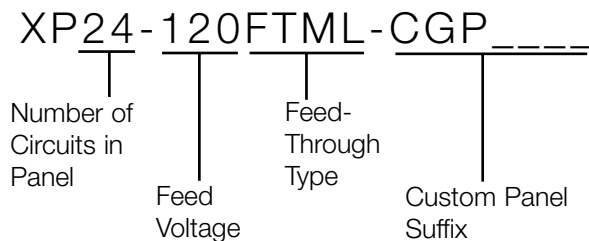
²If voltage is not specified in the model number (e.g., XPS24-FT) product is rated 120 V \sim or 277 V \sim . Refer to Wiring section.

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^{1,2}

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

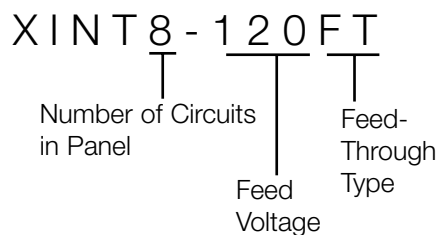
Custom Panel Suffix

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^{1,2}

Omit for dual voltage

120 for 120 V~

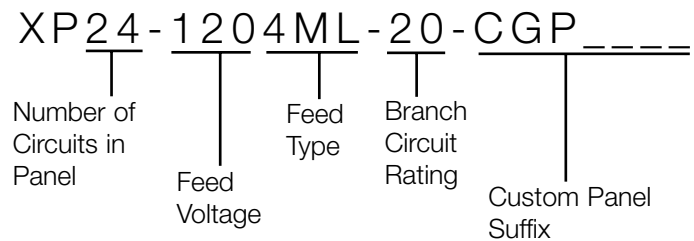
277 for 277 V~

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

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~

IS 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~

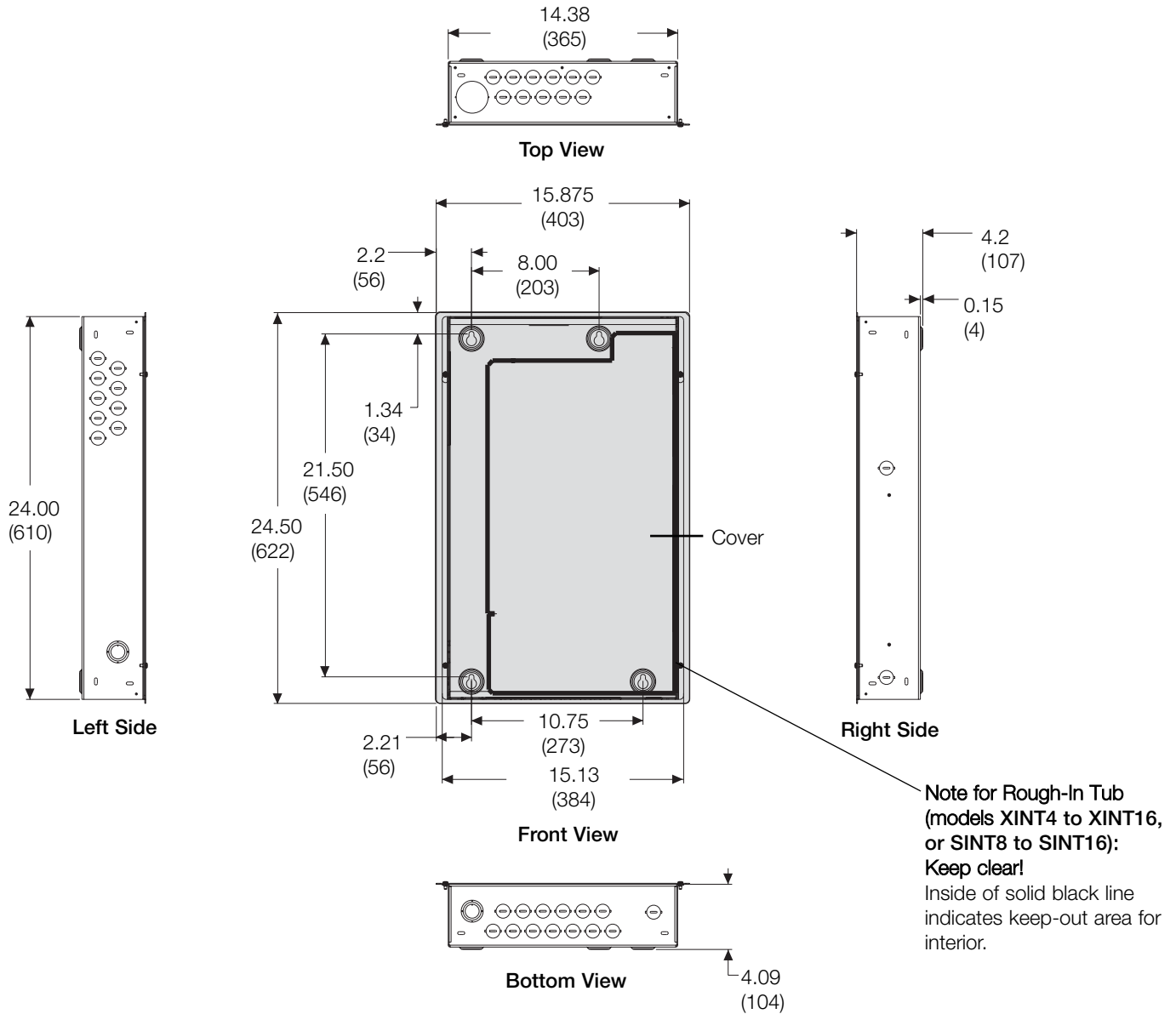
¹Multiple voltages (120 V~ and 277 V~) may be switched in the same panel. At least one feed of the specified voltage is required for the low voltage control transformer in the panel.

²If 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

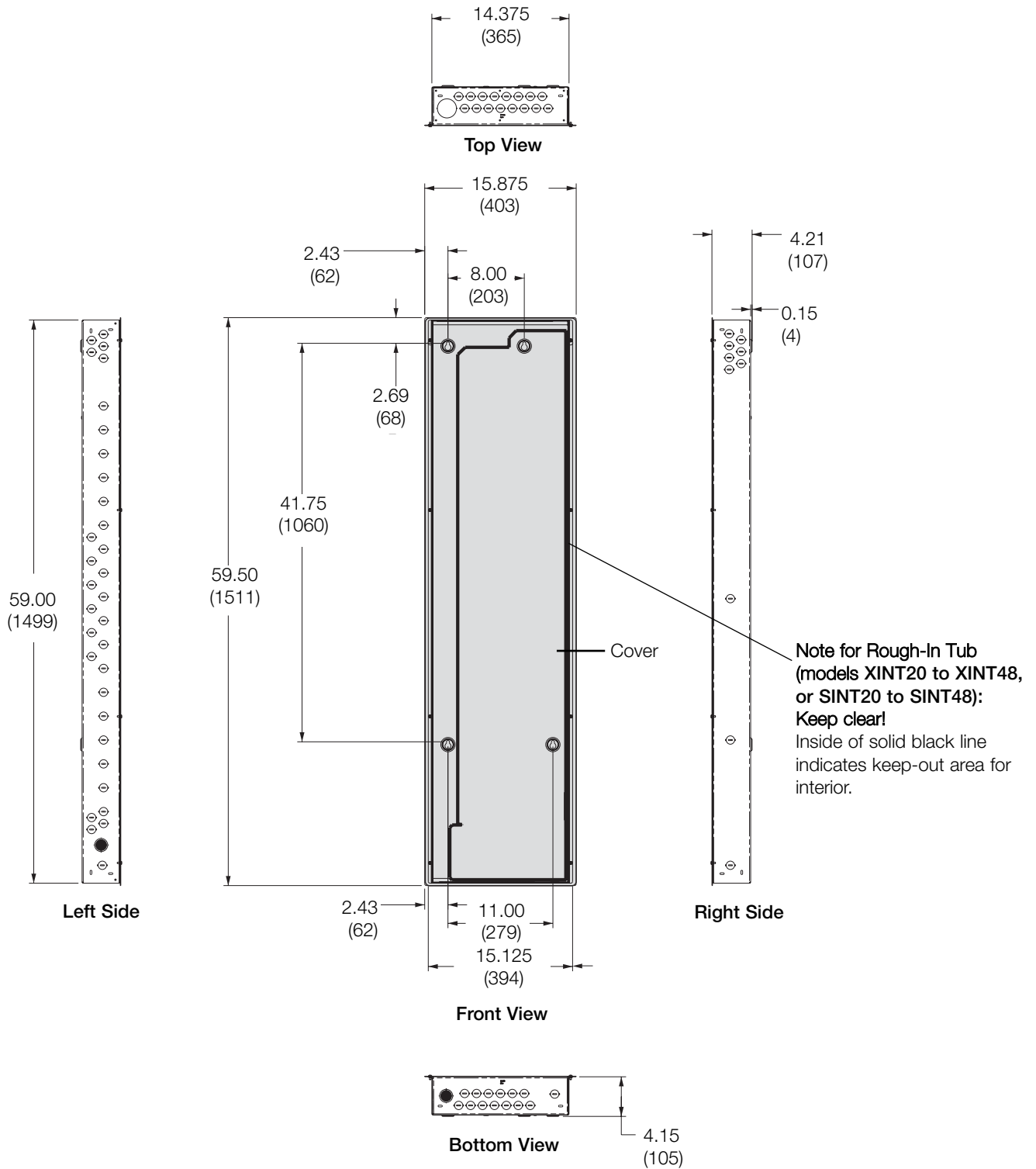
Dimensions are in inches (mm).



Panel Dimensions (continued)

Standard Panel

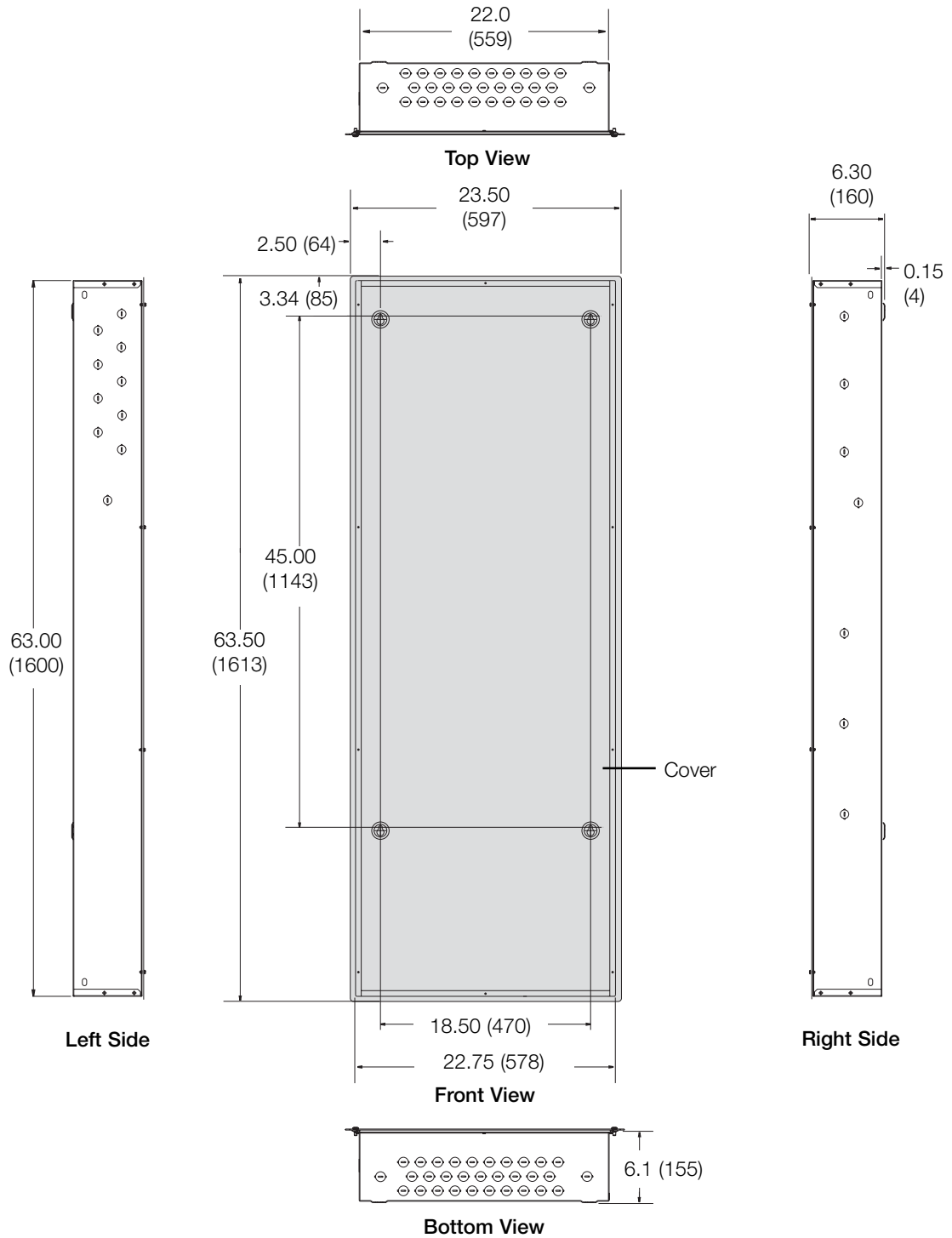
Dimensions are in inches (mm).



Panel Dimensions (continued)

Large Panel (120/277/347 V~ only)

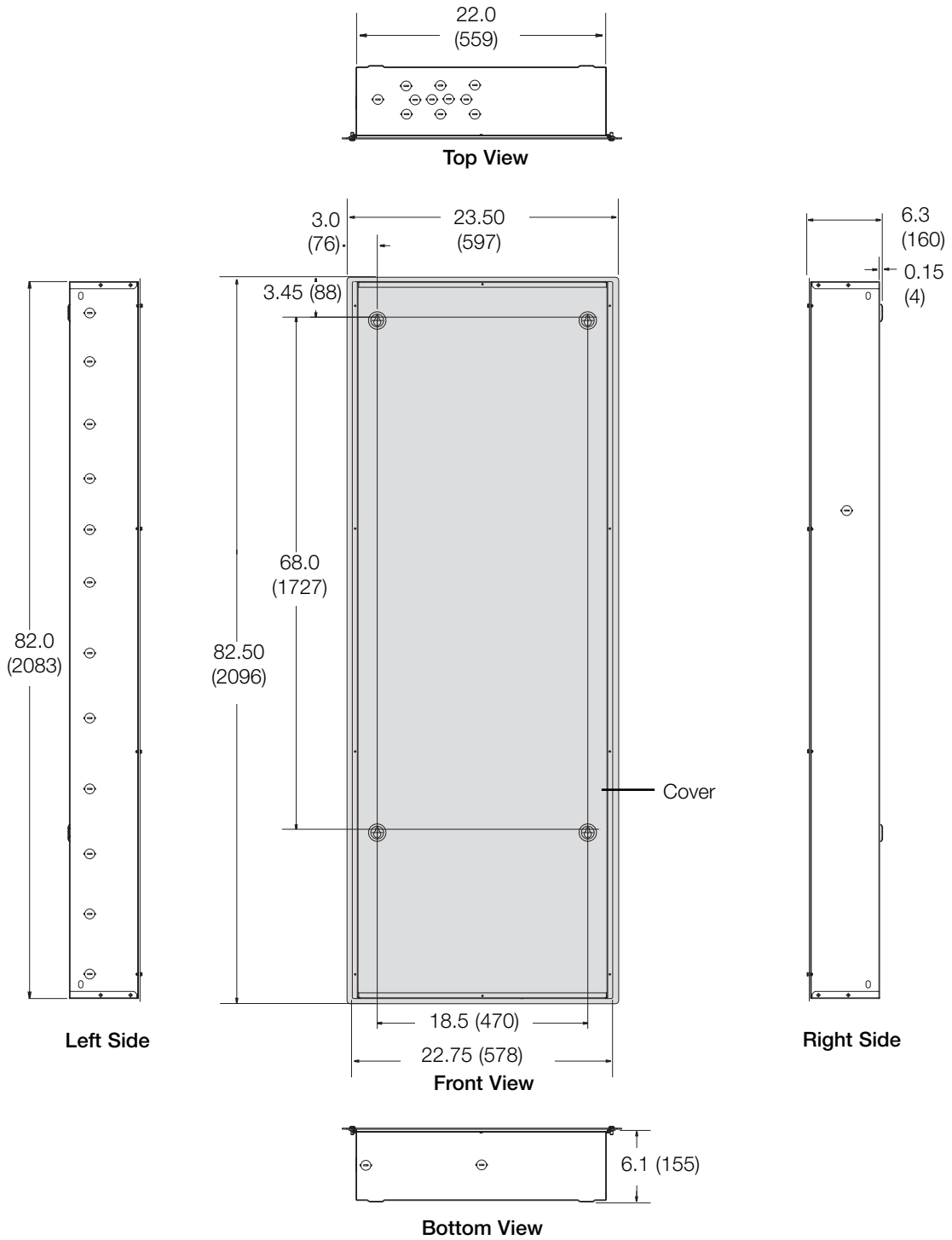
Dimensions are in inches (mm).



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

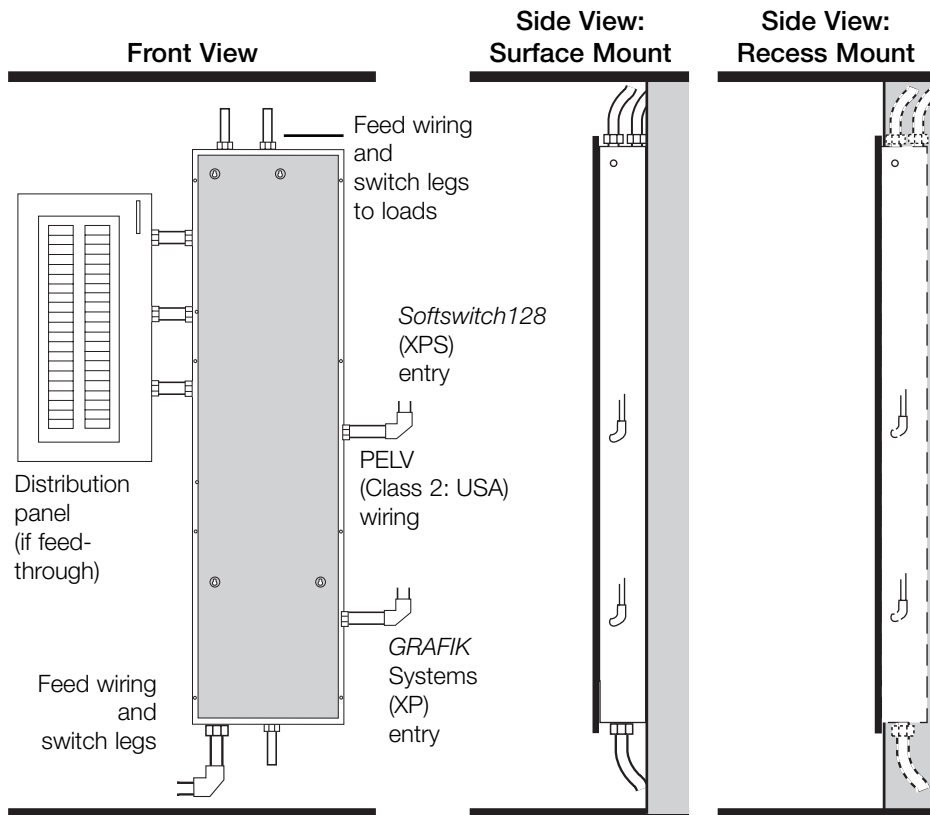
Mini	30 pounds (13.9 kg)
Standard	80 pounds (37 kg)
Large	135 pounds (61.3 kg)
Extra-Large	200 pounds (90.7 kg)

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.

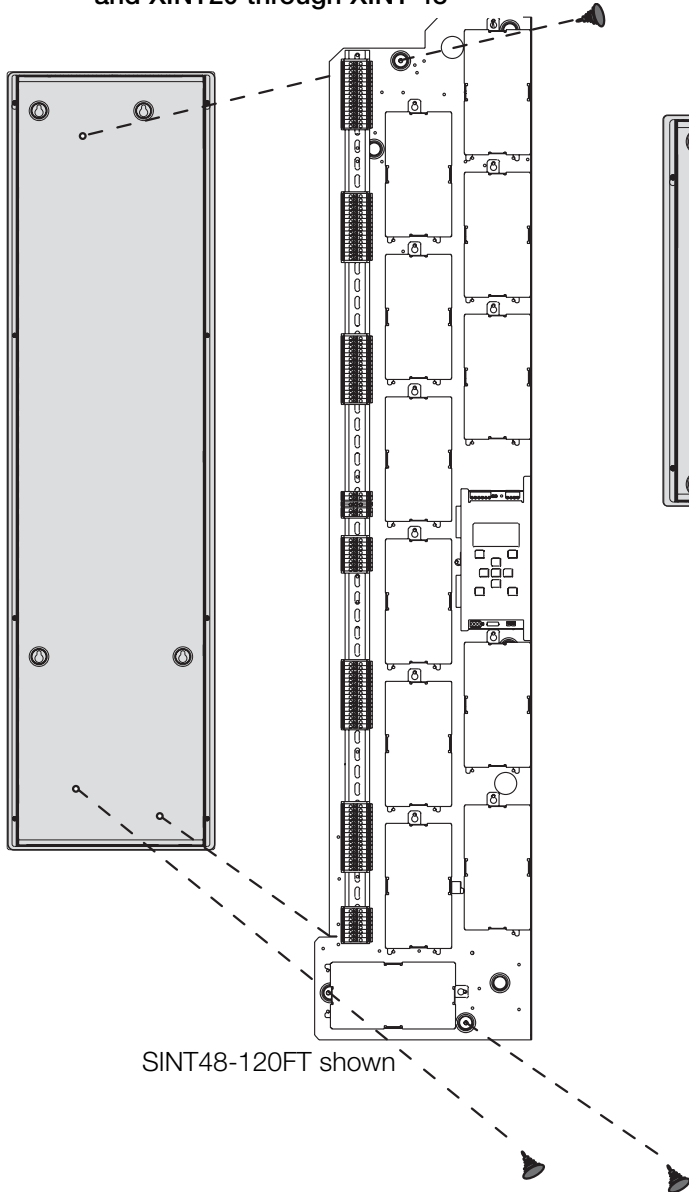
Panel Mounting (continued)

Rough-In Panel Interior Mounting (Rough-in Panels ONLY) (120/277/347 V_~ only)

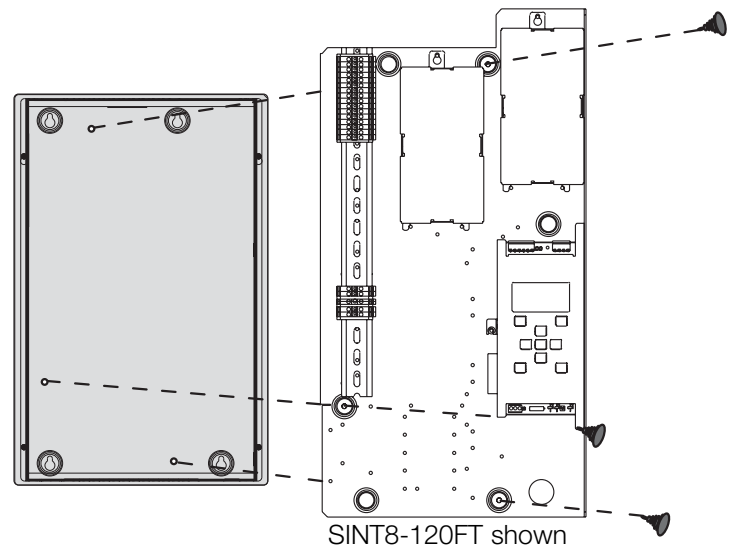
Mounting for SINT or XINT Plate:

- 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

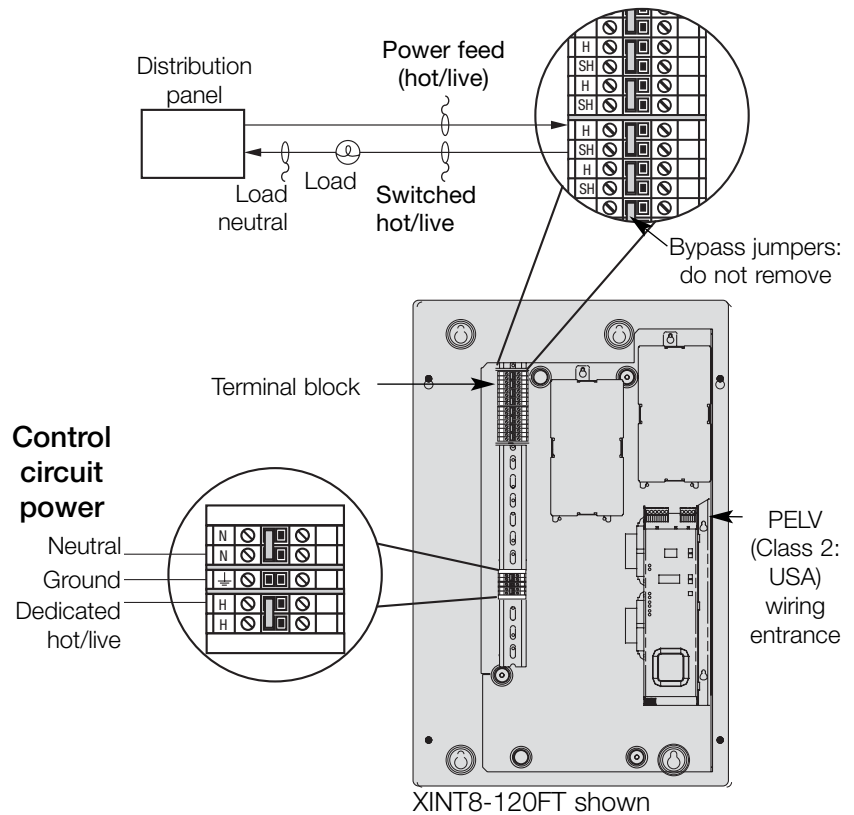


Wiring

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 mm²)
- Switched Hot/Live:
#14-#10 AWG (2.5-4.0 mm²)

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.

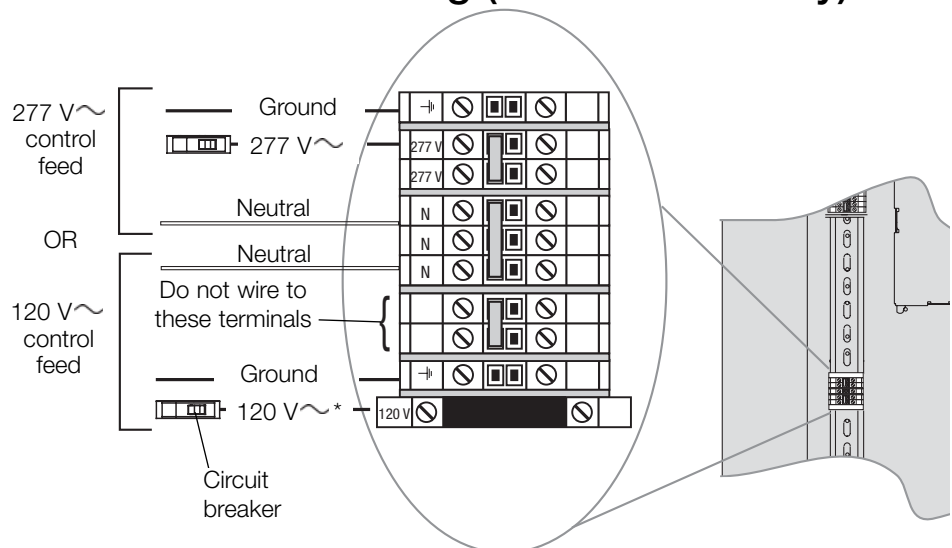
Dual-Voltage Panel: Feed and Load Wiring (120/277 V \sim only)



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.

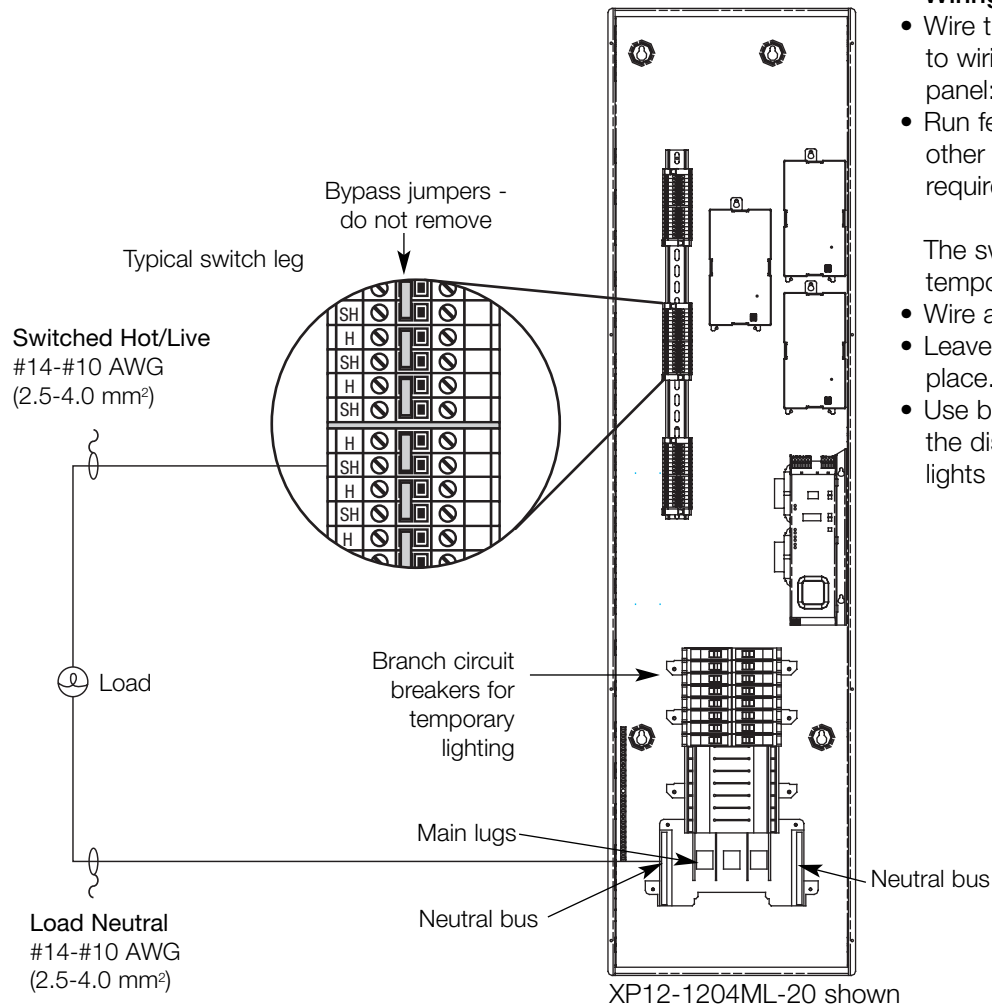
*Note:

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.

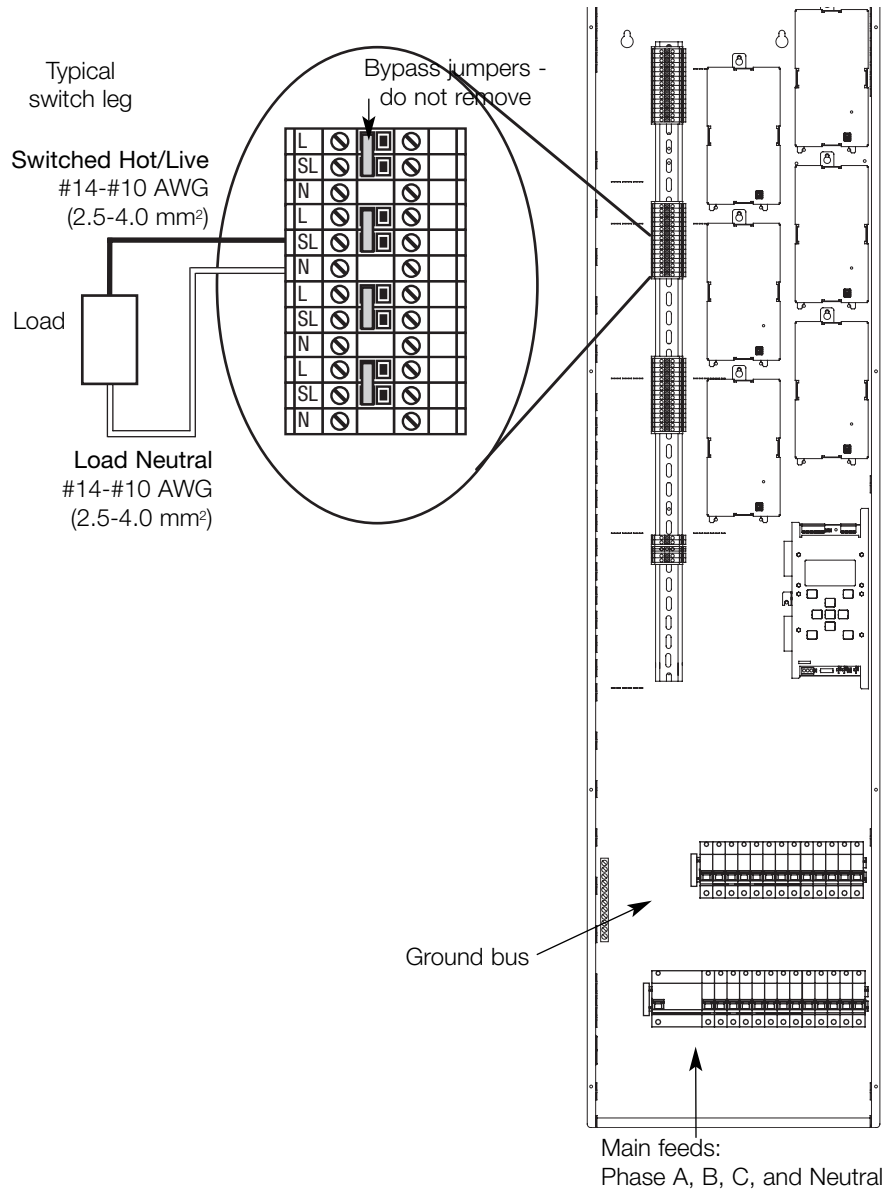
Feed Wiring

Wire Sizes

120 V~	#4 AWG to 250 KCMIL (MCM) (25-185 mm ²)
277 V~	#4 AWG to 250/350 KCMIL (MCM) (25-120/185 mm ²)
347 V~	#4 AWG to 250/350 KCMIL (MCM) (25-120/185 mm ²)

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.

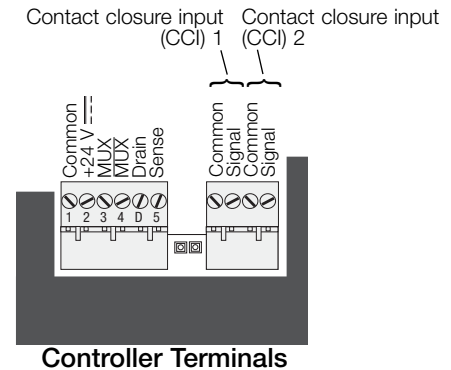
Wire Sizes

- 230 V~ #14-#2 AWG (2.0-35 mm²)
- 220-240 V~ #14-#10 AWG (2.0-4.0 mm²)

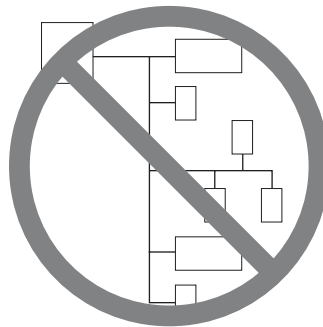
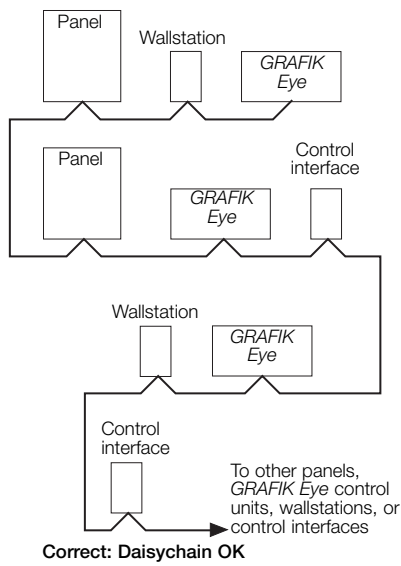
System Wiring Overview

Review the options below for information on wiring your panel correctly into your specific system.

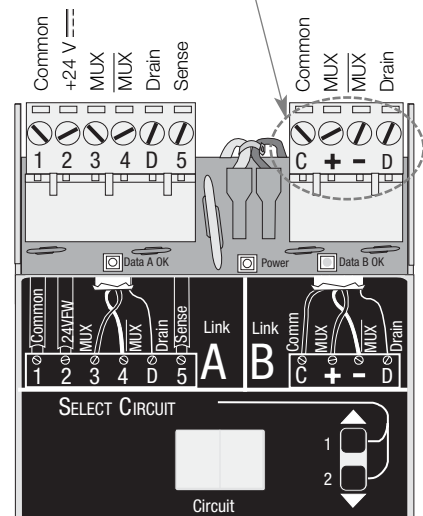
A. Softswitch128™ (XPS) panel: Refer to the *Softswitch128 Setup and Operation Manual* for detailed wiring information.



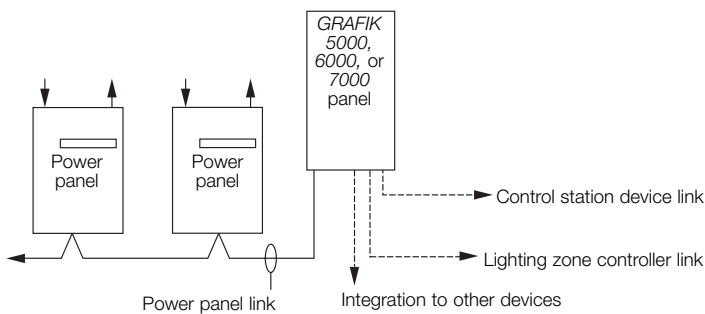
B. GRAFIK Systems™ (XP) panel as a part of a GRAFIK Eye 4000 lighting system: Refer to the *GRAFIK Eye 4000 Installation, Setup, and Operation Manual* and the system overview pictured here for detailed wiring information.



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 ²)	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 ²)	
XPS28	28		
XPS32	32	Main Lug Accepts:	
XPS36	36	#4 AWG to 350	300 A
XPS40	40	KCMIL (MCM)	
XPS42	42	(25-185 mm ²)	

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 ²)	

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 ²)	20 A
XPS28	SINT28	28	mm ²)	
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 mm²) 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 ²)	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 ²)	
XP28	28		
XP32	32	Main Lug Accepts:	
XP36	36	#4 AWG to 350	300 A
XP40	40	KCMIL (MCM)	
XP42	42	(25-185 mm ²)	

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 ²)	

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 ²)	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

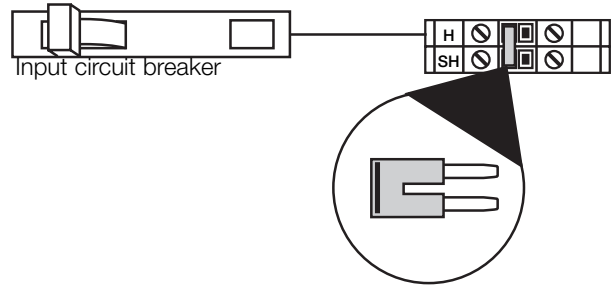
Terminal blocks accept one #14-#10 AWG (2.5-4.0 mm²) wire. Preferred entry is from the top of the panel.

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.

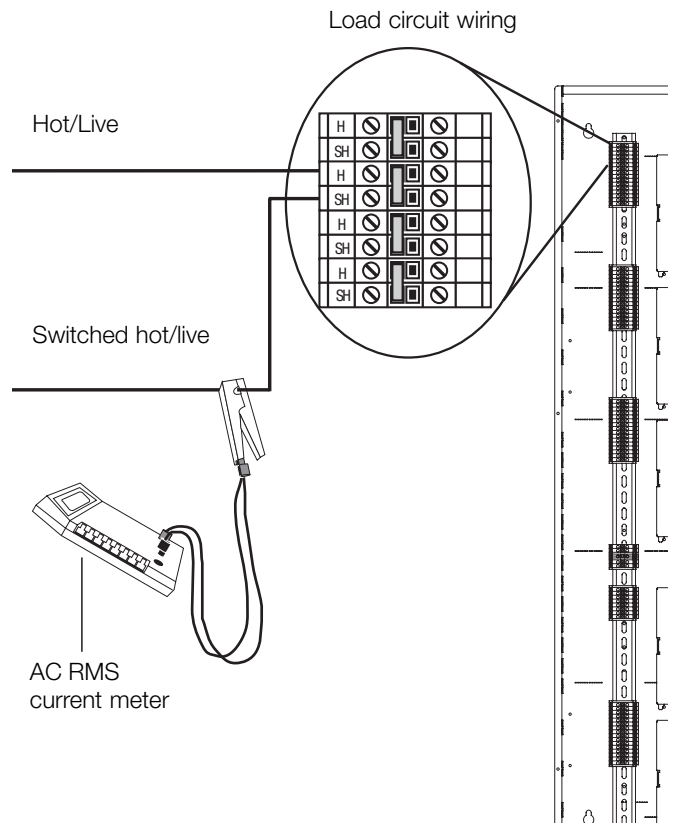


Warning! Verify that the panel is fed from the correct voltage. A feed miswire or loss of a feed neutral can cause damage to the equipment.

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

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In Europe: +44.207.702.0657

In Asia: +65.6220.4666

In Japan: +81.355.758.411

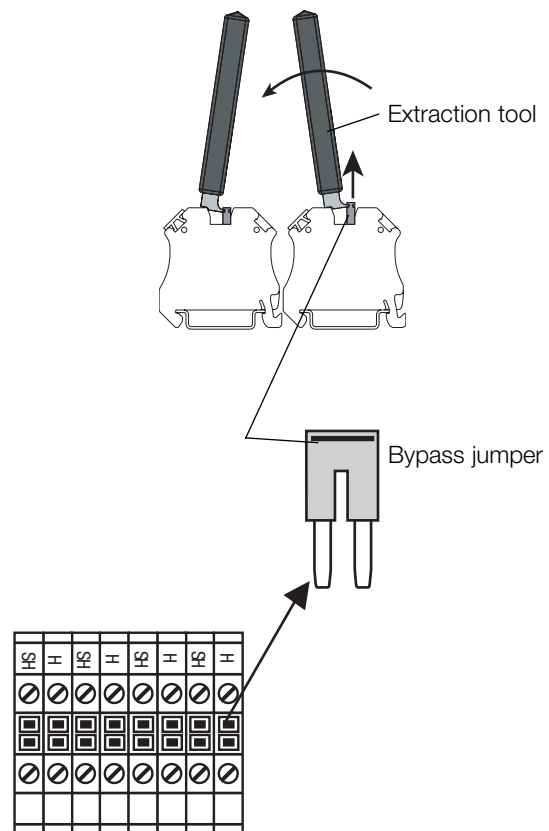
In all other countries: +1.610.282.6701

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

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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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.

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Singapore: 800.120.4491
Taiwan: 00.801.137.737
Thailand: 001.800.120.665853
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Softswitch128™ Switching System



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Introduction

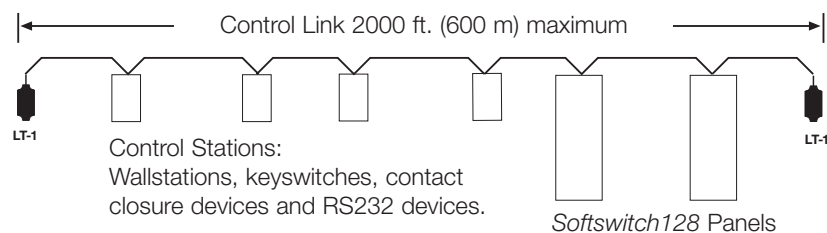
Thank you for purchasing a Softswitch128™ system. This guide will walk you through the steps necessary to program your system. Please read the guide completely before attempting to program the system. **For mounting and wiring information, please refer to the Installation Guide provided, Lutron P/N 032-130.**

When programming the *Softswitch128* system, it is important to know some key information:

- How many panels are in this system and how many circuits are in each panel?
- What is the load schedule?
- Where is each control station located and what should each button do?
- What should each Contact Closure Input do?
- What should the Time Clock do?

Tables are provided at the back of this guide to record the above information. Photocopy these as necessary, and leave them for the occupant after they are completed.

System Overview Diagram



Introduction

System Specifications

The *Softswitch128* system consists of up to 8 switching panels and up to 32 control stations. The *Softswitch128* system has a 128 circuit limit to be divided between eight panels. Control stations can be wallstations, keyswitch, contact closure input/output devices (OMX-AV, OMX-CCO-8) or a RS232 interface (OMX-RS232). All panels and control stations are connected by a digital communications link. Refer to the *Softswitch128* Installation Guide for wiring details. Other system specifications are shown below.

Time Clock

- 7 weekly schedules.
- Up to 40 holiday schedules.
- Each holiday schedule can be 1-90 days.
- Up to 500 time clock events.
- Maximum of 25 time clock events per day or holiday.
- For each time clock event, you can select which circuits turn on and which turn off.
- Time clock events can occur at a fixed time of day or at a time relative to sunrise or sunset (astronomical).
- Events can be placed on a weekly schedule (e.g. occurring every Monday) or a holiday schedule (e.g. occurring only on January 1).
- Holiday events override weekly events.
- Time clock events can begin and end afterhours mode. Afterhours is an energy saving mode, where lights that are set to be off will automatically, after a period of time, turn themselves off. Afterhours allows for a temporary override from any control station action. See STEP 4 for more information.

Control Station - Wallstation

- Wallstation buttons can be individually programmed to:
 - Toggle circuits on and off. Each press of the button will alternate between turning the circuits on and off. If the circuits are in a mixed state (some on and some off), the lights will turn on.
 - Select a pattern. A pattern can be used to turn a circuit or a group of circuits all on, all off, or to a mixed state. Each time the button is pressed, the circuits will go to the programmed pattern.
 - Turn off with a time delay. After the set amount of time, the assigned circuits will turn off.
- The keyswitch (NTOMX-KS) can be programmed for clockwise and counterclockwise turns to perform the same functions as a Wallstation button.

Control Station - Contact Closure Inputs

Two contact closure inputs are available on each *Softswitch128* controller and more are available by purchasing a Lutron OMX-AV control station (five inputs per OMX-AV that can be added anywhere on the digital control station link).

- The contact closure inputs can be programmed on the open and/or closure of the contact to:
 - Toggle circuits on and off. Each press of the button will alternate between turning the circuits on and off. If the circuits are in a mixed state (some on and some off), the lights will turn on.
 - Select a pattern. A pattern can be used to turn a circuit or a group of circuits all on, all off, or to a mixed state. Each time the button is pressed, the circuits will go to the programmed pattern.
 - Turn off with a time delay. After the set amount of time, the assigned circuits will turn off.

Introduction

Control Station - Contact Closure Outputs

Contact closure outputs can be added with either a Lutron OMX-AV control station (five outputs per OMX-AV) or with a Lutron OMX-CCO-8 (eight outputs per OMX-CCO-8). Either control can be added anywhere on the digital Control Station link.

- Each contact closure may be momentary or maintained.
- Each contact closure output can be assigned to a pattern that is programmed to a Wallstation button, contact closure input, timeclock event, or emergency state.

Integration through RS232

The *Softswitch128* system can be integrated with a building management system through the Lutron RS232 interface (OMX-RS232).

Emergency Power Mode

- When a panel is placed into emergency power mode (loss of normal power), circuits are set to an emergency pattern and remain at that setting until the controller exits emergency power mode (return of normal power). All control station inputs and time clock events are ignored while in emergency power mode.
- For more information on Emergency lighting applications, refer to Application Note #106 at www.lutron.com.
- Emergency power mode may be activated using:
 - Panel to panel emergency sense line. This method requires at least two panels to be in the system – a normal (non-essential) feed panel and an emergency (essential) feed panel. When power to the normal panel is interrupted, the emergency panel(s) will go into emergency mode. Note that the normal/emergency switches at the bottom of the controllers need to be set correctly.
 - The Lutron Emergency Lighting Interface (LUT-ELI-3PH), a UL 924 listed device, senses the normal (non-essential) line voltage on all three phases (3PH) of normal power. When one or more phases of power are lost, the LUT-ELI-3PH will send a signal to the *Softswitch128* controller. If the *Softswitch128* controller's normal/emergency switch is set to emergency, the emergency lighting pattern will be activated.

Introduction

Overview of System Programming

Programming your *Softswitch128* system is done in six steps. Depending upon your system, you may not need to perform all of these steps.

1. Panel Configuration

Required for systems with more than one panel. This step will assign each panel an address and configure the number of circuits in each panel.

2. Time, Date, and Location

Required if the time clock will be used. This step shows how to set the clock.

3. Control Station

Required if there is a remote Wallstation, contact closure, or RS232 device. This step is to configure their function.

4. Time Clock Events

Required if the time clock will be used. This step shows how to setup automatic control of lighting using the time clock.

5. Panel Contact Closure Inputs

Required if the panel contact closure inputs are used. This step will define what each input will do.

6. Emergency Power Mode

Required if an emergency pattern is needed when normal power is lost. Control station inputs and time clock events are ignored while in emergency power mode. This step will define if the panel has emergency circuits and how to configure the emergency pattern.

Notes:



Start-Up Notice

Softswitch128 System Start-Up Notice for Electrical Contractor

Important Note:

A Lutron Technical Support Specialist will assist by phone with the startup of the system. To ensure that the *Softswitch128* System is ready for Telephone Start-Up, please complete the following checklist. If excessive time or a visit to the job site is required due to incomplete installation, additional charges may be incurred.

- The *Softswitch128* panel(s) and Wallstation(s) have been mounted in accordance with the installation instructions.
- Wallstation(s) has been wired to the panel in accordance with installation instructions.
- Feed and load wiring to panel have been installed in accordance with the installation instructions.
- All load circuits have been activated in bypass mode (bypass jumpers installed) and are correctly and permanently lamped.
- Bypass jumpers have been removed.
- The charts in the back of this manual have been completed: Control Location Table, Panel Tables, Control Station Table, and the Time Clock Event Table.

Note: If any of the above conditions are not met when Telephone Start-Up begins, Start-Up may be rescheduled. For this reason any questions on the above checklist or the system can be directed to the Lutron Technical Support Center at (800) 523-9466 (ask for a *Softswitch128* System specialist). **When the above checklist is completed, please fax this sheet along with the completed tables to Lutron Field Service Scheduling at (610) 282-0298. To schedule a Telephone Startup, please call 800-523-9466. Please note that 24 hours advance notice is required for Startup.**

Signature: _____

Job Name: _____

Today's Date: _____

Lutron Job Number: _____

Printed Name: _____

Scheduled Startup Date: _____

Phone Number: _____

Scheduled Startup Time: _____

Fax Number: _____

Job Site Phone Number: _____

Bill of Material (Panels, Wallstations, etc.):

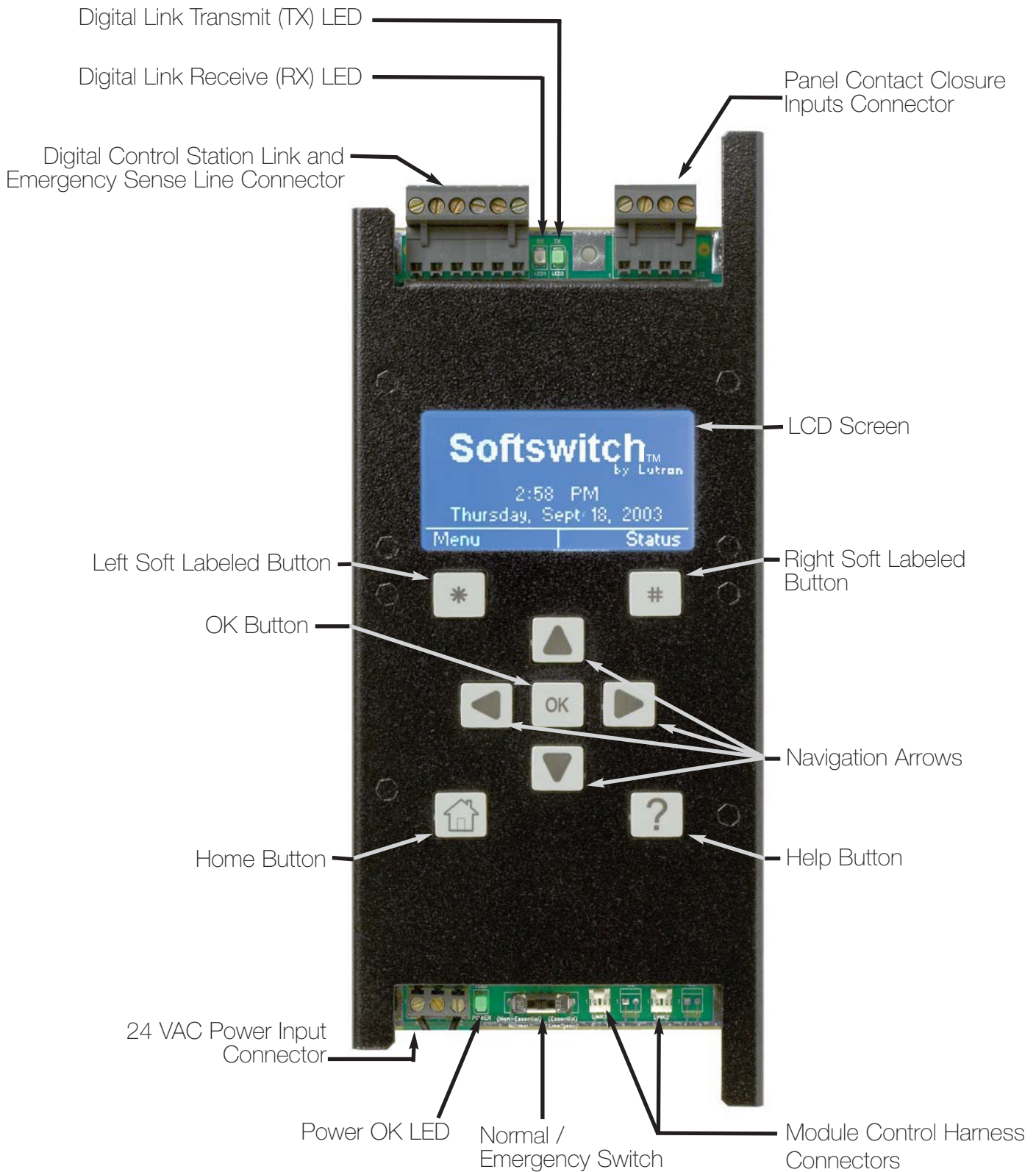
_____ Qty. _____	_____ Qty. _____
_____ Qty. _____	_____ Qty. _____
_____ Qty. _____	_____ Qty. _____

Lutron Electronics Company, Inc.
7200 Suter Road
Coopersburg, PA 18036-1299
Telephone: 800-523-9466 (Listen to menu for scheduling)



Controller Overview

Softswitch128 Controller Layout





Controller Overview

Navigation

The *Softswitch128* controller uses certain methods for navigating, selecting, setting values, etc. Please read this section carefully before using the controller to configure your system.

The *Softswitch128* controller has nine buttons below the display. The table below explains their functions.

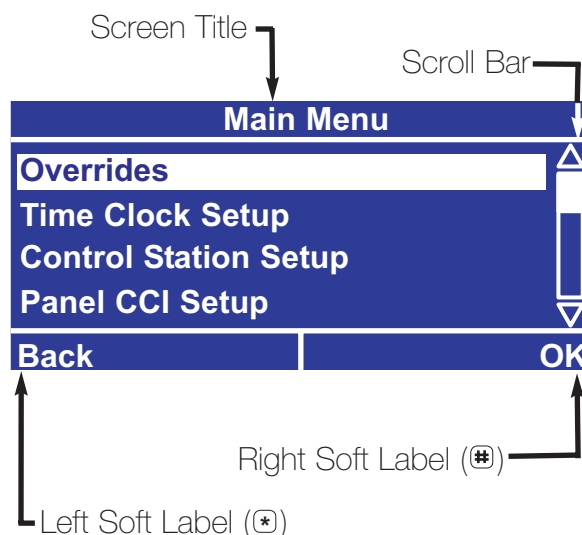
Button	Function
	Navigate the screen and change highlighted values
	Select an item
	Left Soft Labeled - Function defined on screen
	Right Soft Labeled - Function defined on screen
	Go to the Home Screen
	On Screen Help

The Screen

All screens on the *Softswitch128* controller have a similar look with some common elements. These are:

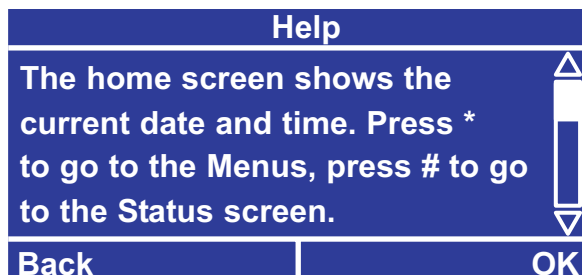
- A screen title
- Left and right soft button labels
- A scroll bar (only present if more information is available than will fit on the screen.)

The example shows the Main Menu. The scroll bar indicates that there is more information in the menu than will fit on the screen. Pressing repeatedly will scroll through the menu and show the other choices. The shaded slider on the scroll bar indicates what portion of the menu is being displayed.



Help

Help on the current screen is always available by pressing the button. If more information is available than will fit on the screen, use the up and down buttons to scroll through the text. Pressing either , , or will return you to the screen you were on.





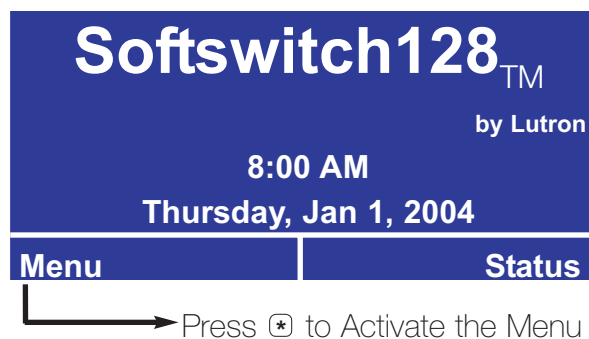
Controller Overview

Getting to the Home Screen

Pressing will always take you back to the home screen.

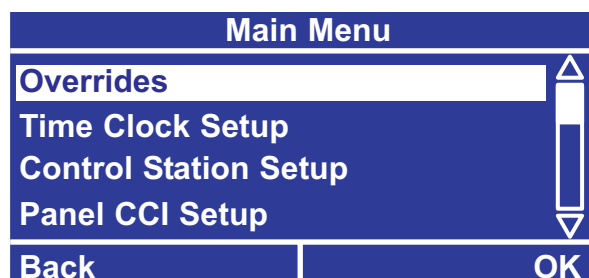
Main Menu Access

From the home screen, pressing will take you to the menu. If a password has been set, you will need to enter it before continuing (see locking / unlocking the controller in the referenced function section).



Navigating the Menus

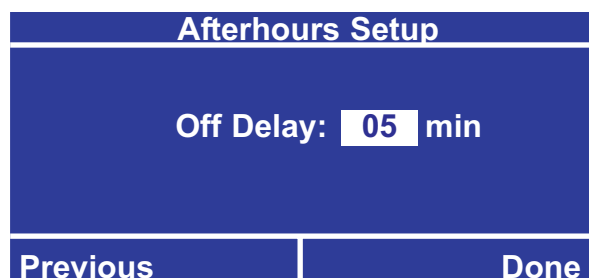
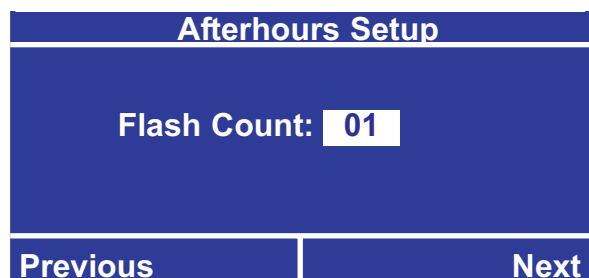
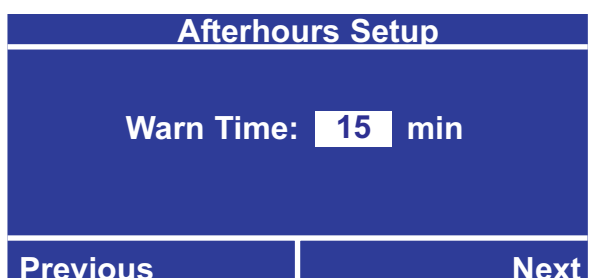
When in a menu, use and to change the highlighted item and press or (OK) to select that item. Pressing will provide help on that item. To go back to the previous screen, press (Back).



Entering Data

One or more screens will be used to program the information required for each feature. If only one screen is required, the screen will have the soft labeled buttons "Cancel" and "Done". If multiple screens are required, the first screen will have the soft-labeled buttons "Cancel" and "Next". The intermediate screens will have the soft-labeled buttons "Previous" and "Next", and the last screen will have the soft-labeled buttons "Previous" and "Done".

Note: The information is not stored until "Done" is selected.

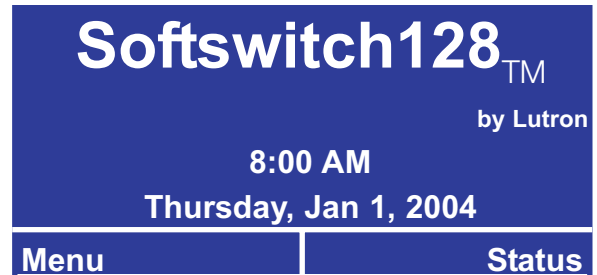




Controller Overview

Getting Started - The Home Screen

- When the controller is first powered or is not used for 20 minutes, the display will show the home screen. Pressing the home button will always take you back to this screen. On the home screen, pressing **⏪** will take you to the main menu and pressing **⏩** will bring up the status screen.
- The home screen shows the current day, date and time set on the controller. If either of these are incorrect, refer to Step 2 - set the date, time, and location.
- The backlight on the LCD will turn off after 25 minutes of no activity. Pressing any button on the control will turn the backlight on and display the home screen.



→ Press **⏪** to Activate the Menu

Unlocking the Controller

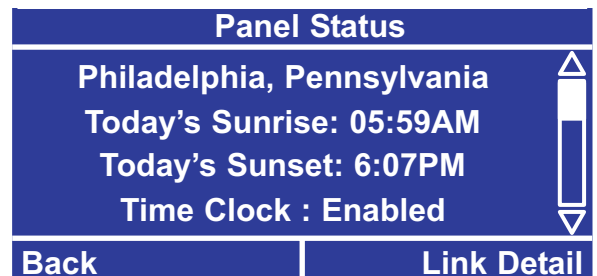
If the controller has been locked (see locking the controller), you will be prompted to enter the password before the main menu is activated. Use **⏪** and **⏩** to select the digit to change, **⏴** and **⏵** to change each digit. When you have entered the password, press **⏩**. If you have forgotten the password, contact Lutron technical support at 1 (800) 523-9466 to unlock the controller.



The Status Screen

The status screen contains several useful pieces of information. Pressing **⏩** from the home screen will bring up the status screen showing:

- Location.
- Whether control stations are enabled or disabled.
- Whether time clock events are enabled or disabled.
- Sunrise and sunset times for the current system date (note that the time, date, and location must be configured correctly).





Controller Overview

The Wallstation Status Screen

The status screen contains several useful pieces of information. Pressing **⊕** from the Panel Status screen will bring up the Wallstation Status screen:

- If the station is present and is recognized, the control is labeled by its type, e.g. “seeTouch”.
- If a station is not present, it is labeled as “No Station”. This could also indicate an address conflict.
- If the unit is present and is not a control that is known to the system, the control is labeled as “???”. This could also indicate an address conflict.

Wall Station Status	
A01	- No Station
A02	- seeTouch
A03	- NT/KS/FOMX
A03	- ???
Back	OK



STEP 1

Panel Configuration - Multi-Panel Systems Only

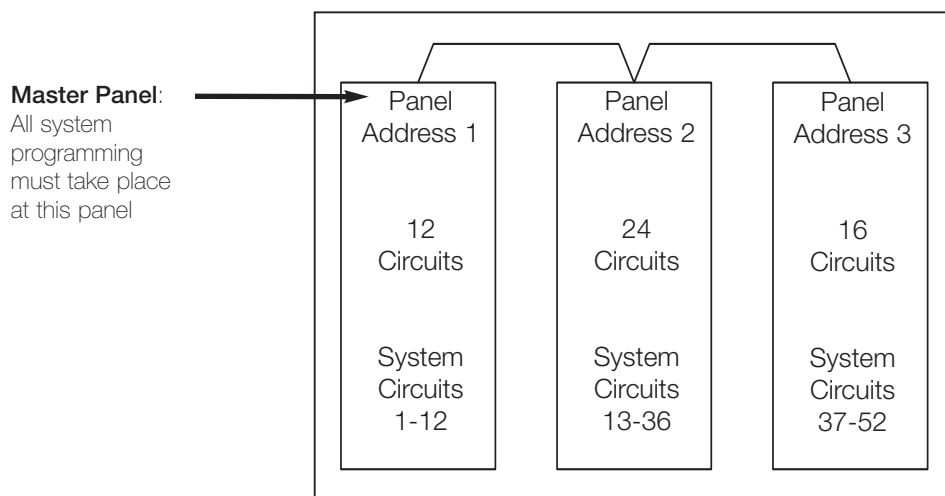
If there is more than one panel in the system, each panel in the system must have the following information programmed (If the system only has one panel, this step is not necessary and can be skipped):

- Panel address
- First system circuit number
- Number of circuits contained in the panel

Each circuit in the system is identified by a system circuit number. This number will be used to identify the circuit for programming purposes. For example, if Panel 1 has 12 circuits, the first circuit in Panel 2 will be circuit 13 on the *Softswitch128* controller. The figure below shows a sample system.

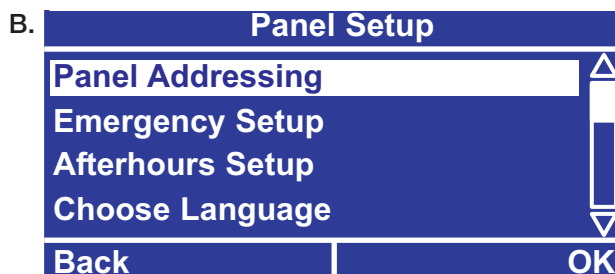
Before proceeding with this step, it may be helpful to complete the panel tables located in the back of this manual.

- All system programming (covered in Programming STEPS 2-6) must be completed at **panel address 1**. In a **multi-panel system, panel address 1 becomes the master programming panel and all other panels are remote panels.**



Set Panel Configuration

- From the **Main Menu** use and to highlight **Panel Setup** and press or (OK).
- Use and to highlight **Panel Addressing** and press or (OK).
- Use and to change the **Panel Address** and press or (Next). The panel address must be different for each panel.
- Use and to change the **Circuit Offset**, the first system circuit number in this panel, and press or (Next).
- Use and to change the number of circuits in this panel and press or (Done) to update the database.

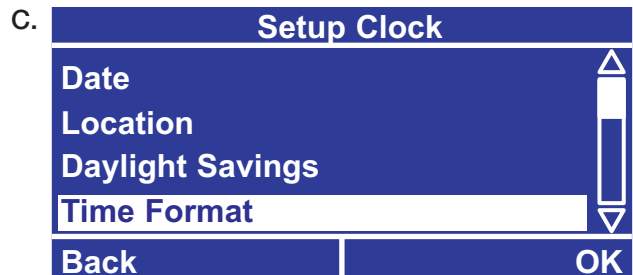




STEP 2

Time Format

- From the **Main Menu** use ▲ and ▼ to highlight **Time Clock Setup** and press ⏎ or ⌘ (OK).
- Use ▲ and ▼ to highlight **Setup Clock** and press ⏎ or ⌘ (OK).
- At the bottom of the Setup Clock menu, **Time Format** allows switching between 24hr. and 12hr. (AM / PM). Press ⏎ or ⌘ (Done) to save changes.



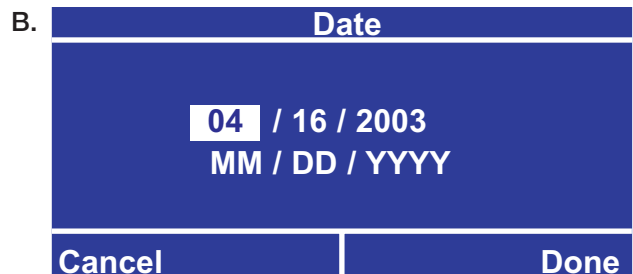
Time

- From the **Setup Clock** menu, use ▲ and ▼ to highlight Time and press ⏎ or ⌘ (OK).
- Use ▲ and ▼ to change the current time. Use ⏏ and ▶ to alternate between hours and minutes.
- Press ⏎ or ⌘ (Done) when done to save changes.
- You are returned to the **Setup Clock** menu.



Date

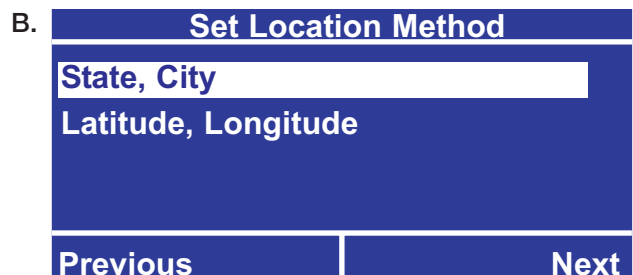
- From the **Setup Clock** menu, use ▲ and ▼ to highlight Date and press ⏎ or ⌘ (OK).
- Use ▲ and ▼ to change the current date. Use ⏏ and ▶ to change between month, day, and year. The first 2 digits are the month, the middle 2 are the day, and the last 4 are the year.
- Press ⏎ or ⌘ (Done) when done to save changes.
- You are returned to the **Setup Clock** menu.



Location

Note: Location must be set if using time clock events relative to sunrise or sunset.

- From the **Setup Clock** menu use ▲ and ▼ to highlight **Location** and press ⏎ or ⌘ (OK).
- Use ▲ and ▼ to select whether you will be setting the location by city and state (recommended) or by latitude and longitude (if there are no nearby cities listed). Press ⏎ or ⌘ (Next) when done.





STEP 2 (continued)

Location (continued)

If setting by City and State

- C. Use and to select the **State** then press or (Next).
- D. Use and to select the **City** then press or (Next).

C. **Set State**

Pennsylvania	
Rhode Island	
South Carolina	
South Dakota	
Previous	Next

If setting by Latitude and Longitude

- C. Use and to select the digit and use and to enter the latitude and longitude of your location in degrees, then press or (Next).
- D. Use and to select the time zone for this location, then press or (Next). Values are listed as on offset from Greenwich Mean Time.

Example: If your location is 39 degrees 36 minutes north, enter 39.6N degrees. The minutes are converted to a decimal of a degree by dividing by 60.

C. **Specify Latitude Longitude**

Latitude	Longitude
39 . 6 N	075 . 1 W
(DEGREES)	(DEGREES)
Previous	Next

D. **Set Time Zone**

GMT -5:00 Eastern Time	
GMT -4:00 Atlantic Time	
GMT -3:30 Newfoundland	
GMT -3:00 Brasilia	
Previous	Next

Adjust Sunrise and Sunset

- E. Use this feature to shift all sunrise and sunset times by a fixed amount. This can be useful if there is a geographic feature (such as a mountain) that offsets the sunrise or sunset time for your location by a fixed amount. This can also be used to shift all time clock events that are relative to sunrise and sunset after they have been programmed. If no offset is required, leave the offsets at 0:00 (default). Press or (Done) to save changes.

Note: Do not use this function to compensate for Daylight Savings Time (see next page).

E. **Adjust Sunrise / Sunset**

Sunrise	Sunset
+ 00 : 00	+ 00 : 00
Previous	Done



STEP 2 (continued)

Daylight Savings Time

Use this feature to set whether or not your location uses Daylight Savings Time. If it does, you will be able to configure when it starts and ends. When Daylight Savings Time is used, the time will change automatically.

- A. From the **Setup Clock Menu** use and to highlight **Daylight Savings** and press or (Next).
- B. Use and to select whether or not your location uses daylight savings time, then press or (Next).
- C. If your location follows the **United States** rules for Daylight Savings Time (starts on the 1st Sunday in April, ends on the last Sunday in October at 2 AM, offset by 1 hour), then select United States. Otherwise select **Other**. Press or (Done) to save changes.
- D. If you select other, you will be prompted to enter the rules. The default rules will be set based on your location. You will need to know:
 - The start month, week, and day.
 - The end month, week, and day.
 - The time change, between 0 and 120 min.

B. **Daylight Savings**

Does this location use daylight savings?

Yes

Cancel **Next**

C. **Daylight Savings**

Current Setting

United States

Previous **Done**



STEP 3

Control Stations Overview

Before proceeding with this step, complete the control station table at the back of this guide. Record what each input (button, keyswitch, or contact closure) on each control station should do.

Control Stations

Control stations are connected to the *Softswitch128* panel via the digital control link. They can be Wallstations (with various numbers of buttons), keyswitches (NTOMX-KS), contact closure input and output devices (OMX-AV), contact closure output devices (OMX-CCO-8), or OMX-RS232 interfaces. Each one must be assigned a unique address. Addressing may be found in either the *Softswitch128* Installation Guide or individual device installation guides. Refer to the instructions for each device on how to set the address. Every Wallstation button or contact closure input may be assigned one of the listed functions:

- **Toggle** - Each press of the button, turn of the keyswitch, or contact closure input toggles the assigned circuits between on and off. If the assigned circuits are in a mixed state (some on and some off), the circuits will turn on.
- **Pattern** - Turns a circuit or a group of circuits on only, off only, or to a mixed state. Each time the button is pressed, the circuits will go to the programmed setting. If they are already at the desired setting, they will not change. A pattern can also be used to control contact closure outputs.
- **Timeclock** - Enables or disables the time clock. When the time clock is disabled, no time clock events occur. When enabled, scheduled time clock events occur. By default, time clock events are enabled.
- **Delay To Off** - The button press will turn the circuit(s) off, after the set amount of time (1 - 90 minutes).



STEP 3 (continued)

Configure the Wallstations

- From the **Main Menu** use \blacktriangle and \blacktriangledown to highlight **Control Station Setup** and press \square or \otimes (OK).
- Use \blacktriangle and \blacktriangledown to choose the **Address** of the Wallstation you would like to configure and press \square or \otimes (Next).
- Use \blacktriangle and \blacktriangledown to set the **Type** to **Wallstation** and press \square or \otimes (Next).
- Use \blacktriangle and \blacktriangledown to select the **Number** of buttons and press \square or \otimes (Next).
- Use \blacktriangle and \blacktriangledown to select which **Button** to program and press \square or \otimes (Next).
- Use \blacktriangle and \blacktriangledown to select the desired **Action: Toggle, Pattern or Delay To Off** and press \square or \otimes (Next). See the beginning of STEP 3 for a description of the different programmable actions.

If Programming a Toggle or Delay to Off Action

- The screen will show all of the circuits. Unassigned circuits are presented as numbers with hash lines going through them. Move the cursor to a circuit number and press \square to toggle between **Assigned** and **Unassigned** (dashed). All circuits can be toggled by pressing \square on the All option. When the circuits are programmed press \otimes (Done) to update the database.

Note: The circuits displayed can be configured only to show the circuits in your system by changing the system size. **System size** is found in **Panel Setup** from the **Main Menu**. System size is 128 by default.

B. **Control Station Setup**

Address 01	
Address 02	
Address 03	
Address 04	
Previous	Next

D. **Address 03 Setup**

Number of Buttons: 03	
Previous	Next

E. **Address 01 Setup**

Button 01	
Button 02	
Button 03	
Previous	Next

F. **Address 03 Button 01**

Action: Toggle	
Previous	Next

G. **Assign Circuits**

PRESS OK TO SELECT CIRCUIT			
ALL Circuits			
001	002	003	004
005	006	007	008
Previous	Done		



STEP 3 (continued)

If Programming a Pattern:

- H. The circuits will appear in a list. Use and to scroll through the list and and to change the setting for that circuit. The options are **On**, **Off**, and **---** (Unaffected). If a circuit is set to Unaffected, this Button will not change its state. To change the setting for all circuits, highlight All Circuits and use and to change the setting.

Note: The circuits displayed can be configured only to show the circuits in your system by changing the system size. **System size** is found in **Panel Setup** from the **Main Menu**. System size is 128 by default.

- I. This screen will only appear if control station devices with contact closure outputs (OMX-AV or OMX-CCO-8, covered later in STEP 3) have been entered into the system.

Use and to scroll through the list to select the output to be associated with the button being programmed. The letter "A" followed by a two digit number at the beginning of each line refers to the the address of the device. Use and to change the setting for that output between: **maintained open**, **momentary open**, **momentary close**, **maintained close** or **---** (unaffected). When the outputs are programmed press or (Done) to update the database.

Example:

A01 CCO3: is address1 contact closure output 3

H.

Select Circuit	
All Circuits	- ---
01	- OFF
02	- ON
03	- ---
Cancel	Next

I.

Select CCO Address	
A01 CCO1	-Maintained Open
A01 CCO2	- ---
A01 CCO3	- ---
A01 CCO4	- ---
Previous	Done

If Programming a Timclock Enable or Disable

- J. Enable or disable will appear in the highlighted box. Use and to select **Enable** or **Disable**. Press or (Done) to update the database.

J.

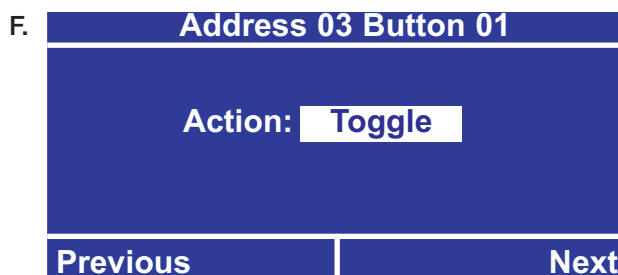
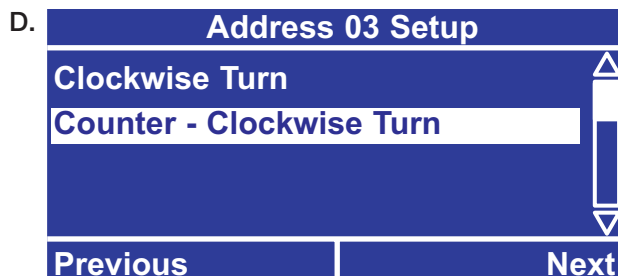
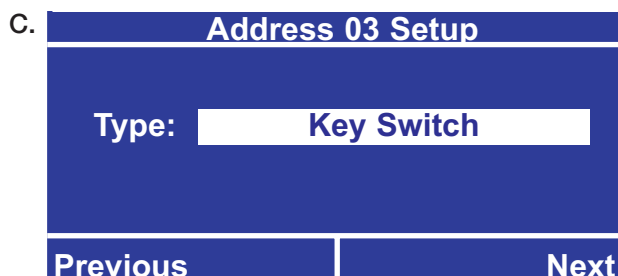
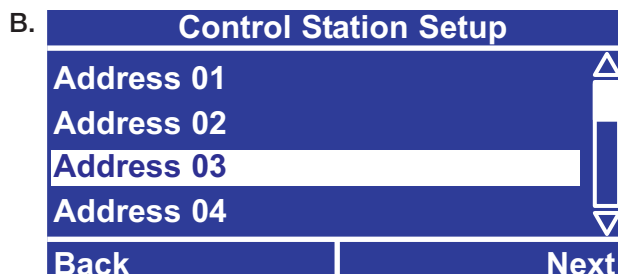
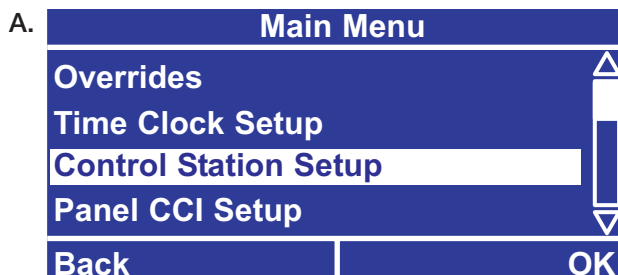
Address 03 Button 01	
Timeclock:	Enable
Previous	Done



STEP 3 (continued)

Key Switch Wall Control (NTOMX-KS)

- From the **Main Menu** use and to highlight **Control Station Setup** and press or (OK).
- Use and to highlight the address of the **NTOMX-KS** you would like to configure and press or (Next).
- Use and to change control type to **NTOMX-KS** and press or (Next).
- Use and to highlight which turn direction to program and press or (Next). Each key switch can be programmed for a clockwise and/or counter-clockwise turn.
- Use and to select the type of action. The choices are **Pattern**, **Toggle**, **Delay To Off**, and **No Action**. Press or (Next). See the beginning of STEP 3 for an explanation of the various types.
- Program **Pattern**, **Toggle**, and **Delay to Off** using the same screen methods as configuring a button on a Wallstation. This is shown in more detail previously in STEP 3.





STEP 3 (continued)

Configure Contact Closure Inputs on OMX-AV

- From the **Main Menu** use and to highlight **Control Station Setup** and press or (OK).
- Use and to highlight the address of the **OMX-AV** you would like to configure and press or (Next).
- Use and to change control **Type** to **OMX-AV** and press or (Next).
- Use and to highlight which **Contact Closure Input (CCI)** to program and press or (Next). Each OMX-AV provides 5 inputs. Select no CCI's if only the CCO's are being used.
- Use and to select whether you will define an action for when the contact opens or when it closes and press or (Next).

Note: If there should be an action for both, first Setup the open action, then follow this procedure again but choose close action.
- Use and to select the type of action. The choices are **Pattern**, **Toggle**, **Delay To Off**, and **No Action** and press or (Next). See the beginning of STEP 3 for an explanation of the various types.
- Program **Pattern**, **Toggle**, and **Delay to Off** using the same screen methods as configuring a button on a Wallstation. This is shown in more detail previously in STEP 3.

A. **Main Menu**

Overrides	
Time Clock Setup	
Control Station Setup	
Panel CCI Setup	
Back	OK

B. **Control Station Setup**

Address 01	
Address 02	
Address 03	
Address 04	
Previous	Next

C. **Address 03 Setup**

Type: OMX-AV	
Previous	Next

D. **Address 03 OMX-AV**

No CCI's	
CCI 01	
CCI 02	
CCI 03	
Previous	Next

E. **Address 03 CCI 2 Setup**

Open Action	
Closure Action	
Previous	Next



STEP 3 (continued)

Integration through RS232

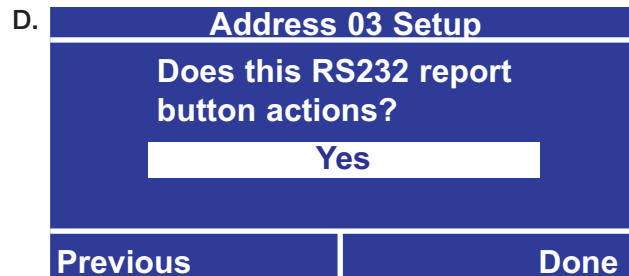
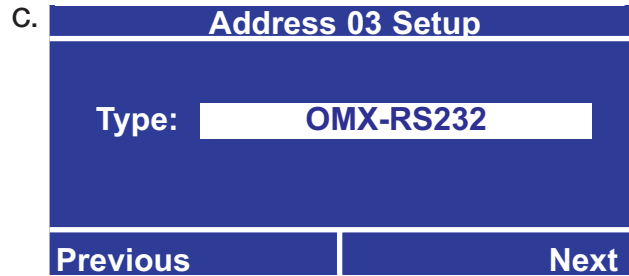
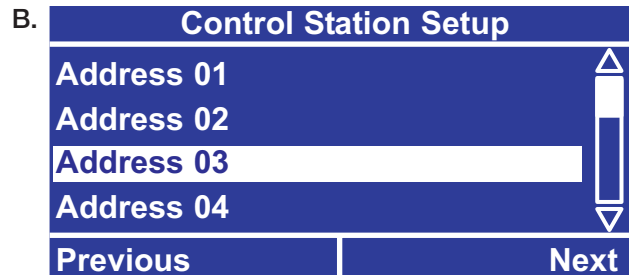
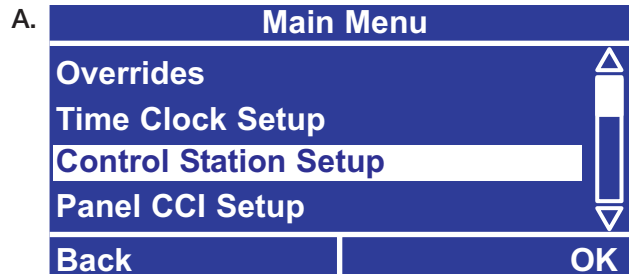
- From the **Main Menu** use and to highlight **Control Station Setup** and press or (OK).
- Use and to highlight the address of the **OMX-RS232** you would like to configure and press or (Next).
- Use and to change control **Type** to **OMX-RS232** and press or (Next).
- Use and to select **Yes** or **No** if this RS232 reports button actions and press or (Done).

Using the GRAFIK 6000 RS232 protocol.

The OMX-RS232 is packaged and shipped with a protocol document that details how to execute each command. Only a subset of the commands in that document work with the *Softswitch128* switching system and they are listed below:

Command Softswitch128 Function

Fade to Level:	Sets a pattern or time delay to off
Multilevel:	Flash circuits
Get Level:	Request level
Simulate Press:	Simulate button press
Simulate Release:	Simulate button release
Enable Control Stations:	Enable control stations
Disable Control Stations:	Disable control stations
Set Clock:	Sets time and date
Time Now:	Request time
Astro Times:	Request sunrise / sunset times
Date:	Request date
Enable Timeclock:	Enable timeclock
Disable Timeclock:	Disable timeclock





STEP 4

Time Clock Events Overview

Time clock events allow the system to turn circuits on or off automatically at either a specific time of day or at a time relative to sunrise or sunset. 47 schedules are available - one for every day of the week plus 40 holiday schedules. There can be a total of up to 500 events and no more than 25 on any day/holiday. Holiday schedules always override the weekly schedule.

Before proceeding with this step, complete the time clock event table located in the back of this manual. Record when each event should occur and what it should do. The options for time clock events are:

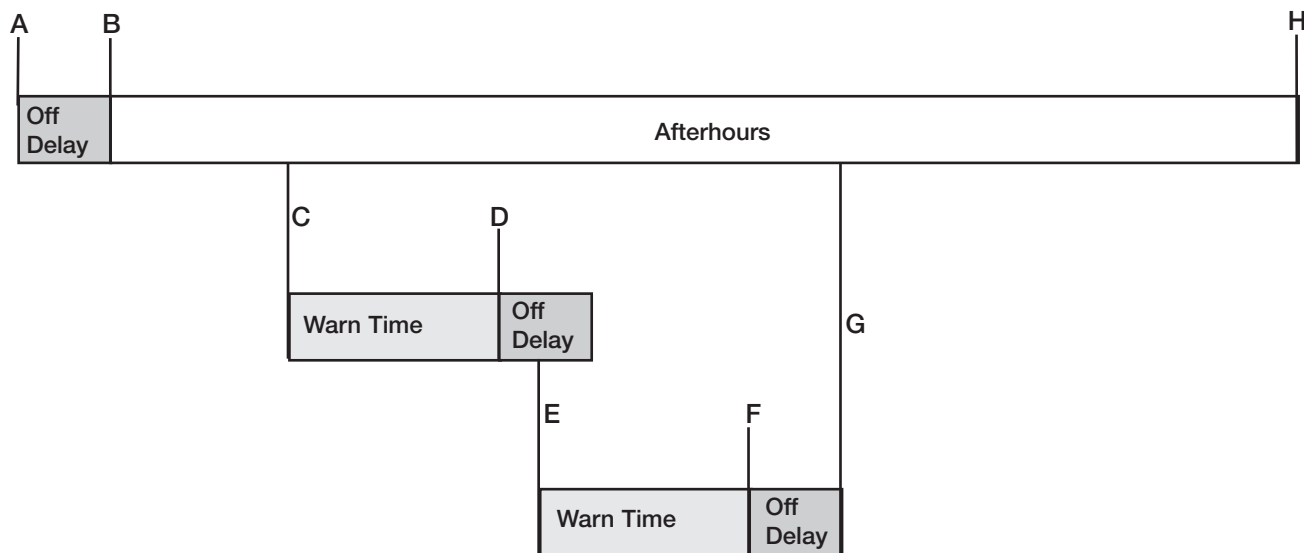
- **Pattern** - Turns a circuit or a group of circuits on, off, or to a mixed state.
- **Enable or Disable Controls**
- **Afterhours Start**- Starts an energy saving mode that is used to turn lights off at the end of normal hours until the beginning of the next day. First, a lighting pattern is recalled for the space (**Afterhours Start**). Lights can be programmed to turn **ON**, **OFF**, **OFF No Flash**, or remain unaffected '---'. Circuits programmed to turn **OFF** will flash to warn any occupants that they are about to turn off (the number of flashes specified by **Flash Count**). Lights remain on to allow the occupant a chance to press a button to keep lights on (length of time is programmed as **Off Delay**). Finally, if a button has not been pressed, lights turn off automatically. Circuits programmed to **OFF No Flash** follow a similar sequence except they will not flash.

If a button is pressed, occupancy sensor is tripped or another timeclock event occurs while the system is in **Afterhours** mode or in **Off Delay**, lights will turn on and remain on for the programmed number of minutes, (**Warn Time**) then flash (number specified by **Flash Count**) and then turn off after the **Off Delay**.

- **Afterhours End** - When afterhours is over the lights are left at their current state.

Example Scenario for Afterhours:

- Afterhours start event - afterhours pattern recalled. If not already off, the circuits that are going to turn off start to flash and Off Delay starts counting down.
- System enters Afterhours.
- Button is pressed to turn lights on.
- Lights flash notifying they will be turning off soon.
- Button is pressed to keep lights on.
- Lights flash notifying they will be turning off soon.
- Lights turn off.
- Afterhours end event.





STEP 4 (continued)

Adding Weekly Events

- A. From the **Main Menu** use and to highlight **Time Clock Setup** and press or (OK).
- B. Use and to highlight **Add Event** and press or (OK).
- C. Use and to highlight **Add Weekly Event** and press or (OK).
- D. Use and to select the **Day** to which you would like to add the event and press or (Next).
- E. Use and to select **Fixed Time** or at a time relative to **Sunset** or **Sunrise**. Press to adjust the time or offset. Adjust the time using and and press or (Next) to save changes.
- F. Use and to select the desired action (**Pattern**, **Enable/Disable Controls**, **Afterhours Start/End**) and press or (Next). See previous page for an explanation of the various types.

Note: For **Afterhours End**, this step is complete.

- G. For **Afterhours Start** or **Pattern**, circuits will appear in a list. Use and to scroll through the list, and to change the setting for that circuit. The options are --- (Unaffected), **On**, **Off**, and **Off No Flash**. Press or (Done) when finished to save changes.

Note: If a circuit is set to unaffected, this event action will not change the circuit's state. To change the setting for all circuits, highlight **All Circuits** and press and .

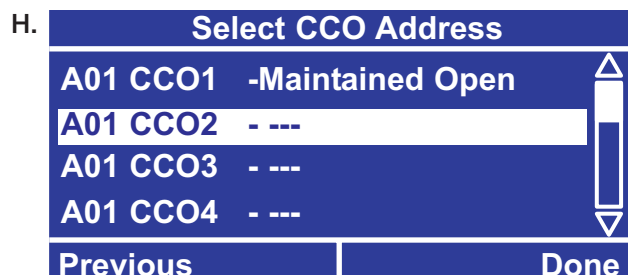
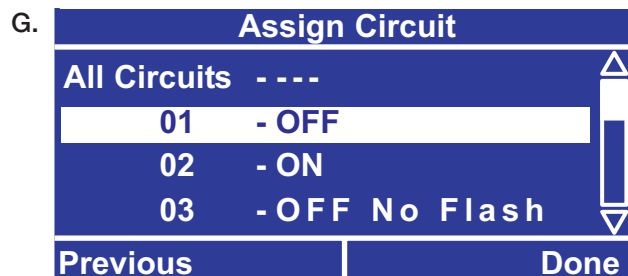
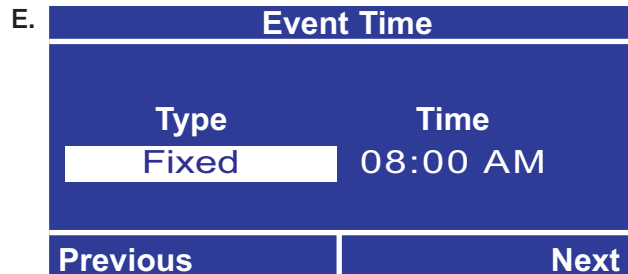
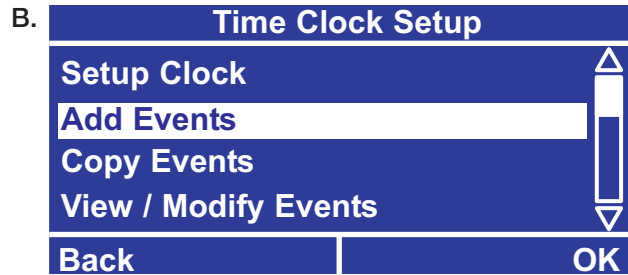
- H. This screen will only appear if this is a pattern event and control station devices with contact closure outputs (OMX-AV or OMX-CCO-8) have been entered into the system.

Use and to scroll through the list to select the output to be associated with the button being programmed. The letter "A" followed by a two digit number at the beginning of each line refers to the address of the device. Use and to change the setting for that output between: **maintained open**, **momentary open**, **momentary close**, **maintained close** or --- (unaffected). When the outputs are programmed press or (Done) to update the database.

Example:

A01 CCO3: is address 1, contact closure output 3.

- I. After pressing **Done**, you will be asked if you want to program another event on that day. Continue programming all Time Clock Events as desired or add/remove/edit time clock events at a future time.





STEP 4 (continued)

Adding Holiday Events

- A. From the **Main Menu** use and to highlight **Time Clock Setup** and press or (OK).
- B. Use and to highlight **Add Event** and press or (OK).
- C. Use and to highlight **Add Holiday Event** and press or (OK).
- D. Use and to select the holiday you would like to add the event to and press or (Next).
 - If you need to define a new holiday, select **New Holiday**.
 - Enter the date for the holiday.
 - Enter the duration of the holiday. For example, New Year's might be defined as starting on December 31st and lasting 2 days (Dec 31 and Jan1).
- E. Continue through steps **E** through **I** for **Adding a Weekly Event** on the previous page.

C.

Add Event	
Add Weekly Event	
Add Holiday Event	
Back	OK

D.

Add Holiday Event	
Select Holiday:	
Add New Holiday	
Cancel	Next

Holiday Start Date

12 / 31	
MM / DD	
Previous	Next

Holiday Duration

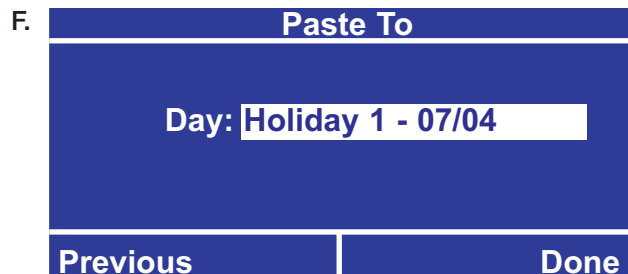
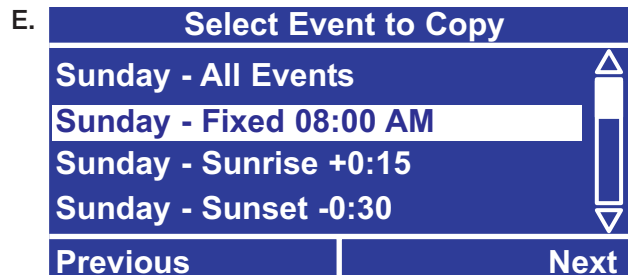
Number of Days: 01	
Previous	Next



STEP 4 (continued)

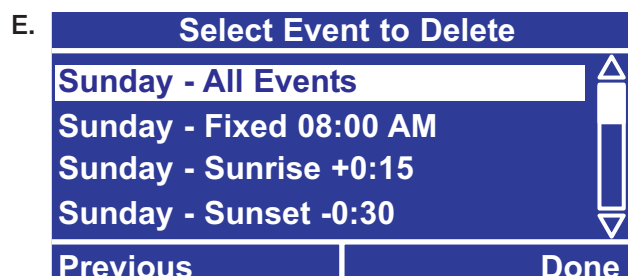
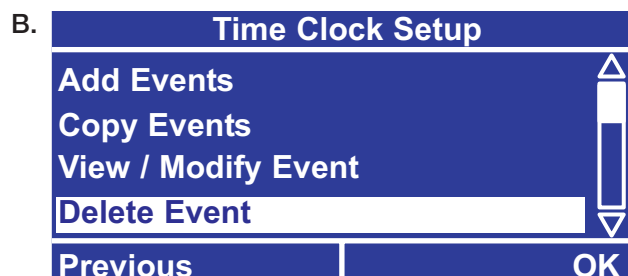
Copying Events

- From the **Main Menu** use and to highlight **Time Clock Setup** and press or (OK).
- Use and to highlight **Copy Event/Schedule** and press or (OK).
- Use and to highlight **Copy Weekly Event** or **Copy Holiday Event** and press or (OK).
- Use and to select the day of the week or the holiday schedule you would like to copy from and press or (Next).
- Use and to select the event you would like to copy and press or (Next). If you would like to copy all events for that schedule, select **All Events**.
- Use and to select the day you would like to paste to and press or (Next). Holidays appear after the weekdays in the list. If you would like to add a new holiday, select **New Holiday** at the end of the list.
- If you would like to paste this event or Schedule to another day, select **Yes** when prompted to "Paste Again?".



Deleting Events

- From the **Main Menu** use and to highlight **Time Clock Setup** and press or (OK).
- Use and to highlight **Delete Event** and press or (OK).
- Use and to highlight **Delete Weekly Event** or **Delete Holiday Event** and press or (OK).
- Use and to select the day of the week or the holiday schedule you would like to delete from and press or (Next).
- Use and to select the event you would like to delete and press or (Next). If you would like to delete all events for that schedule, select **All Events**.
- You will be asked to confirm deleting the event(s). To confirm press **Yes**, otherwise press **No**.
- If you would like to delete another event from that schedule, select **Yes** when prompted to "Delete Another?".

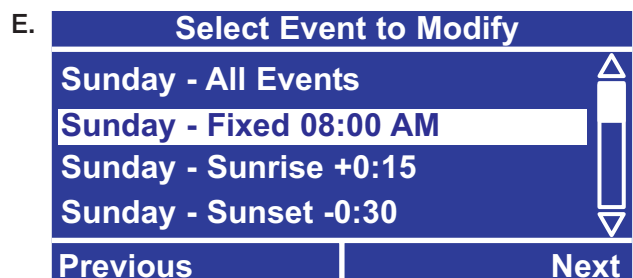
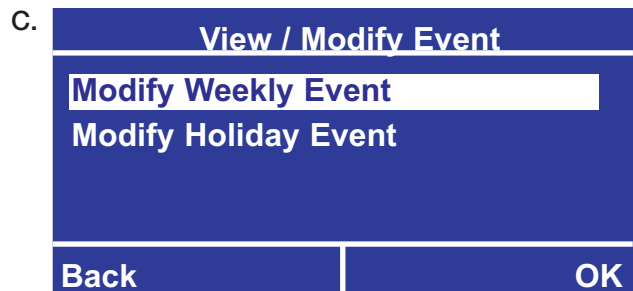
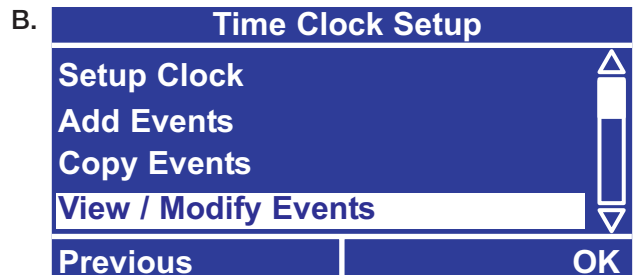




STEP 4 (continued)

Viewing / Modifying Events

- From the **Main Menu** use and to highlight **Time Clock Setup** and press or (OK).
- Use and to highlight **View/Modify Event** and press or (OK).
- Use and to highlight **Modify Weekly Event** or **Modify Holiday Event** and press or (OK).
- Use and to select the day of the week or the holiday schedule you would like to view or modify and press or (Next).
- Use and to select the day you would like to view or modify to and press or (Next).
- You will now have the opportunity to modify this event. Refer to **Adding Weekly Events** or **Adding Holiday Events** for more details on how to do this.

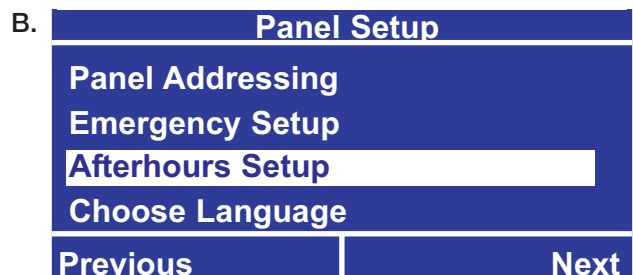
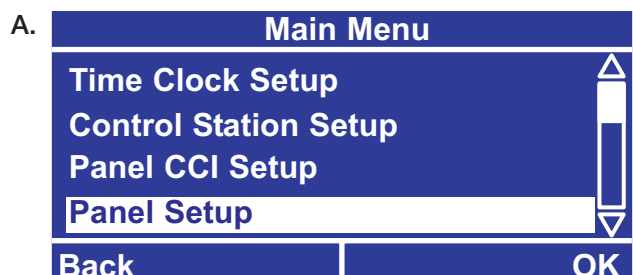


Afterhours Setup

Note: See page 26 for an explanation of Afterhours.

- From the **Main Menu** use and to highlight **Panel Setup** and press or (OK).
- Use and to choose **Afterhours Setup** and press or (OK).
- Use and to enter **Warn Time**, from 1 to 180 minutes and press or (Next).
- Use and to enter **Flash Count**, from 1 to 15 flashes and press or (Next).
- Use and to enter **Off Delay**, from 1 to 180 minutes and press or (Done).

Note: 120 minutes is the maximum allowable off delay in California Title 24.





STEP 5

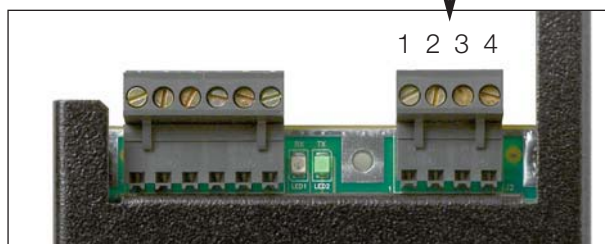
Panel Contact Closure Inputs

Before proceeding with this Step, complete the control station table located in the back of this manual. Record how each local contact closure should function. Designate them: Panel 1 CCI 1 Opening, Panel 1 CCI 1 Closing, Panel 1 CCI 2 Opening, Panel 1 CCI 2 Closing, and continue for Panel 2 through Panel 8 as required. The *Softswitch128* controller has two contact closure inputs, see picture below. Separate actions can be defined for the opening and closing of the contact. The choices are:

- **Toggle** - Each press of the button (or contact closure) toggles the assigned circuits between on and off. If the assigned circuits are in a mixed state (some on and some off), the circuits will turn on.
- **Pattern** - A Pattern can be used to turn a circuit or a group of circuits on only, off only, or to a mixed state. Each time the button is pressed, the circuits will go to the programmed setting. If they are already at the desired setting, they will not change. A pattern can also be used to control contact closure outputs.
- **Delay To Off** - The button press will turn the circuit(s) off after the set amount of time (1 - 90 minutes). If the button is pressed again before the delay has expired, the circuit(s) will turn off.

Panel CCI Terminal Markings

- 1: 15VDC or 24VDC CCI 1
- 2: Common CCI 1
- 3: 15VDC or 24VDC CCI 2
- 4: Common CCI 2



Softswitch128 Controller Top



STEP 5 (continued)

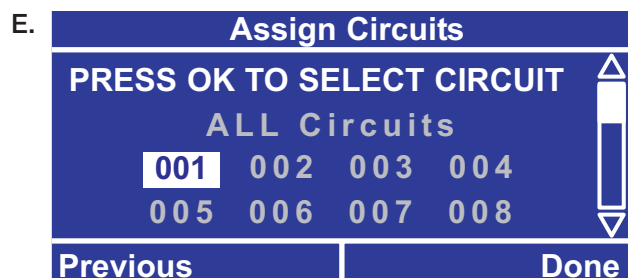
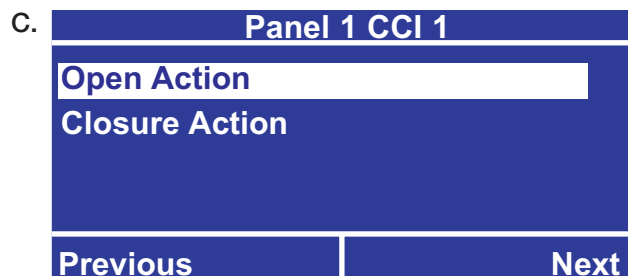
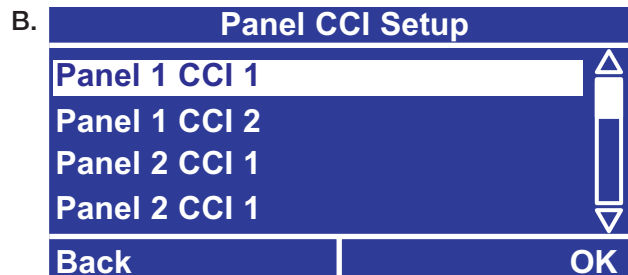
Configure Contact Closure Inputs

- From the **Main Menu** use and to highlight **Panel CCI Setup** and press or (OK).
- Use and to choose which Contact Closure Input you would like to configure and press or (OK).
- Use and to select whether you will define an action for when the **Contact Opens** or for when it **Closes** and press or (Next).
- Use and to choose the type of Action. The choices are **Pattern**, **Toggle**, **Delay To Off**, and **No Action**. See beginning of STEP 5 for description of the different types.
- When programming a toggle or delay to off action, the screen will show all of the circuits. Unassigned circuits will appear with lines through the numbers. Use , , , and to move the cursor over the circuit to be selected. When the circuit number is highlighted, press to toggle between **Assigned** and **Unassigned**. All circuits can be toggled by pressing on the all option. When the circuits are programmed, press (Done) to update the database.
- When programming a pattern, the circuits will appear in a list. Use and to scroll through the list, and to change the setting for that circuit. The options are **On**, **Off**, and **---** (Unaffected). If a circuit is set to unaffected, this button will not change its state. To change the setting for all circuits, highlight all circuits and change the setting. When the circuits are programmed, press or (Done) to update the database.
- This screen will only appear if programming a pattern and control station devices with contact closure outputs (OMX-AV or OMX-CCO-8) have been entered into the system.

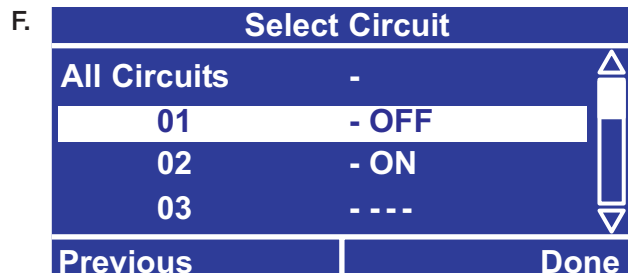
Use and to scroll through the list to select the output to be associated with the button being programmed. The letter "A" followed by a two digit number at the beginning of each line refers to the address of the device. Use and to change the setting for that output between: **maintained open**, **momentary open**, **momentary close**, **maintained close** or **---** (unaffected). When the outputs are programmed press or (Done) to update the database.

Example:

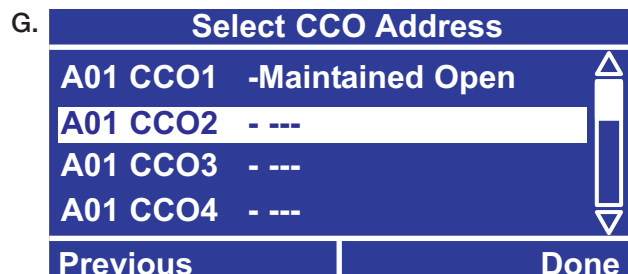
A01 CCO3: is address 1 contact closure output 3.



Toggle and Delay to Off Assign Circuits Screen



Pattern Programming Screen



CCO Programming Screen - for Patterns Only



STEP 6

Setup Emergency Power Mode

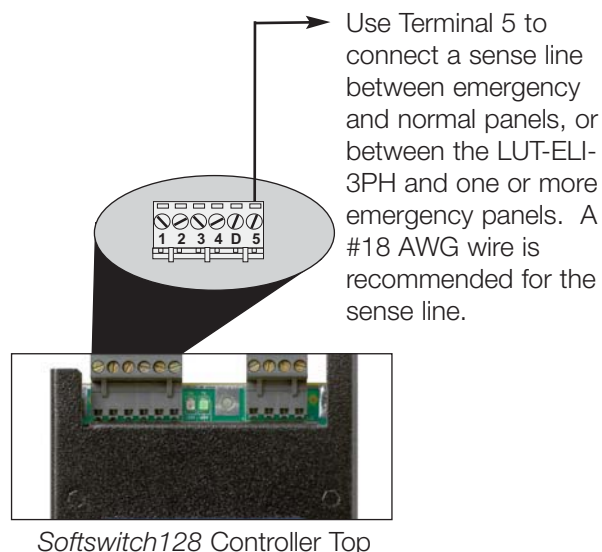
This step is only performed if an emergency pattern is needed when normal power is lost. All control station inputs and time clock events are ignored while in emergency power mode. This step will define if the panel has emergency circuits and how to configure the emergency pattern.

- Identify panels fed by normal (non-essential) power. Move their **emergency switches** to the left position (see illustration below).
- For all the emergency (essential) lighting panels, move the **emergency switches** to the right position (see illustration below).
- The essential and non-essential panels must be connected by a sense line wired to **terminal 5** on the link connector on the *Softswitch128* controller (see illustration below). For wiring details, see the Installation Guide.

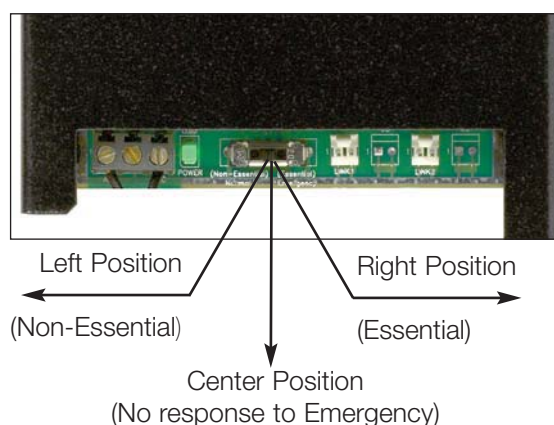
In this configuration, the emergency (essential) lighting panel will “sense” the normal panels’ power. When normal power is lost, the emergency panel will go to the emergency pattern (factory set to all circuits On). When normal power is restored, lighting circuits and contact closure outputs return to their previous state.

Notes:

- If UL 924 certification is required, the Lutron Emergency Lighting Interface (LUT-ELI-3PH) may be used to meet code. The LUT-ELI-3PH senses the normal (non-essential) line voltage on all three phases (3PH) of normal power. When one or more phases of power are lost, the LUT-ELI-3PH will send a signal to **terminal 5** on the *Softswitch128* controller(s). When the **emergency switch** is set to the right position (essential) the emergency pattern will be recalled. The LUT-ELI-3PH can be used with one or multiple panel systems.
- Loss of normal power can be simulated by turning off all connected normal (non-essential) panels’ control breaker.
- When the emergency switch is in its center position (as shipped), terminal 5 the panel does not respond to emergency.



Three position **Emergency Switch** is located at the bottom of the *Softswitch128* controller.





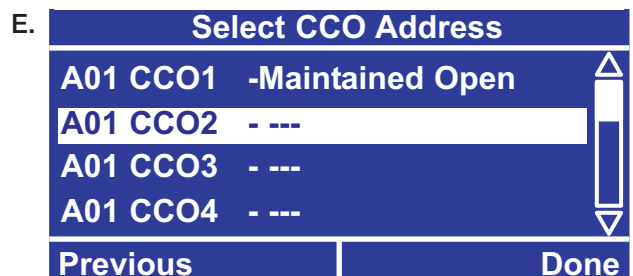
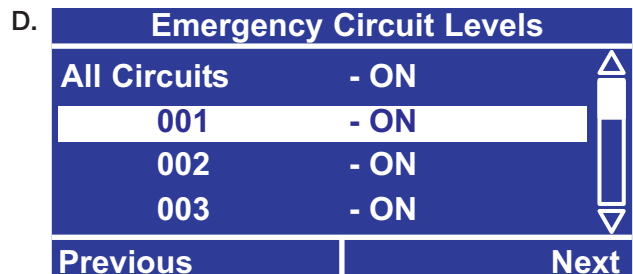
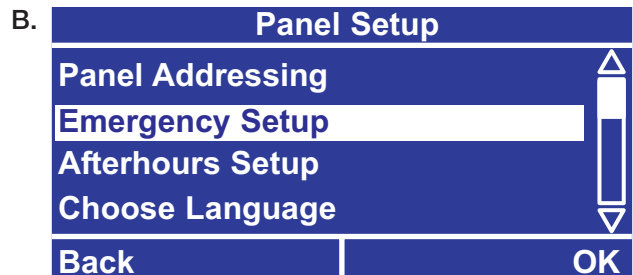
STEP 6 (continued)

Changing the Emergency Override Levels

- From the **Main Menu** use and to highlight **Panel Setup** and press or (OK).
- Use and to choose **Emergency Setup** and press or (OK).
- Use and to select **Yes** when asked if the panel has Emergency Functionality press or (Next).
- Use and to scroll through the list, and use and to change the setting for that circuit. The options are **On**, **Off**, and **---** (Unaffected). To change the setting for all circuits, highlight All Circuits.
- This screen will only appear if control station devices with contact closure outputs (OMX-AV or OMX-CCO-8) have been entered into the system.
Use and to scroll through the list to select the output to be associated with the button being programmed. The letter "A" followed by a two digit number at the beginning of each line refers to the address of the device. Use and to change the setting for that output between: **maintained open**, **momentary open**, **momentary close**, **maintained close** or **---** (unaffected). When the outputs are programmed press or (Done) to update the database.

Example:

A01 CCO3: is address 1 contact closure output 3.



Congratulations!

Your switching system
is ready to use!

Now:

Keep the Control Location Table Directory
with each *Softswitch128* Panel.

Give the customer a copy of this Manual.

The rest of this guide is
REFERENCE MATERIAL.

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



Overrides

Overrides

The *Softswitch128* controller allows three types of overrides:

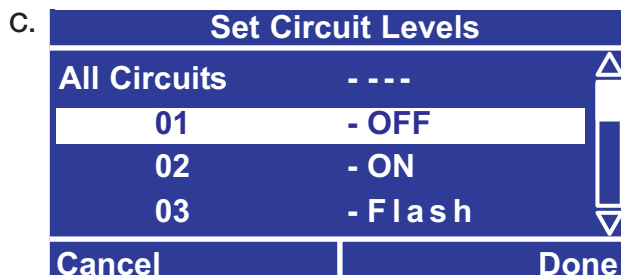
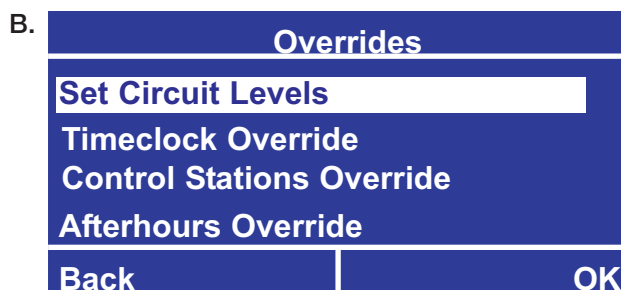
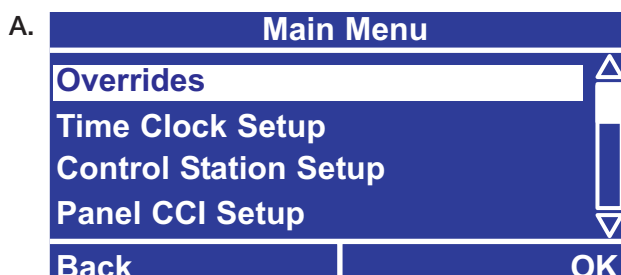
- **Circuit Level Override** - Directly set whether a circuit is on or off. Override occurs immediately and remains in effect as long as the **Set Circuit Levels** screen is displayed on the controller. Pressing **DONE** to exit the **Set Circuit Levels** screen will keep the circuits at the override setting until they are changed by a control station input or time clock event. Press **CANCEL** to exit the **Set Circuit Levels** screen and the lights will return to the previous state.
- **Time Clock Override** - Enable or disable all time clock events. When the time clock is re-enabled, missed events do not occur; control starts with the next scheduled event.
- **Control Station Override** - Enable or disable all control stations. When control stations are re-enabled, button presses or contact closures will be processed again.

To Override the Circuits

- From the **Main Menu** use and to highlight **Overrides** and press or (OK).
- Use and to choose **Set Circuit Levels** and press or (OK)
- The circuits are listed with their current state displayed (On or Off). Use and to scroll through the list, and to change the setting for that circuit. The options are **On**, **Off**, and **Flash**. Flash cycles the circuit between On and Off once every few seconds - useful for locating a circuit in the space. To change the setting for all circuits, highlight All Circuits and change the setting. When the circuits are programmed press or (Done) to update the database.

Note: Changes take effect immediately. As long as this screen is visible, the circuits will stay at the set state. This setting overrides all other inputs (Time Clock Events, Button Presses, Contact Closure Inputs, etc.). Pressing **DONE** to exit the **Set Circuit Levels** screen will keep the circuits at the override setting until they are changed by a control station input or time clock event. Press **CANCEL** to exit the **Set Circuit Levels** screen and the lights will return to the previous state.

- To exit the **Set Circuit Levels** screen and keep the changed settings, press or (Done). If you would like the circuits to go back to what they were before using the **Set Circuit Levels** screen, press (Cancel).

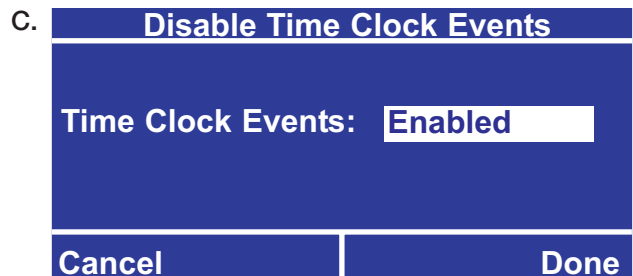
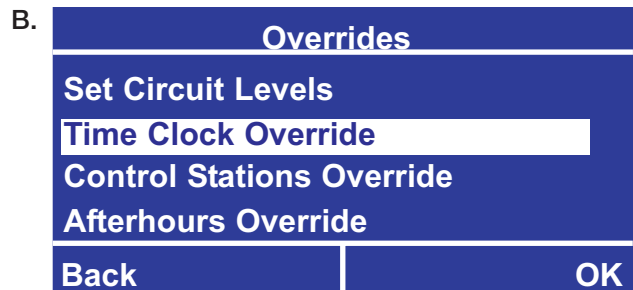




Overrides (continued)

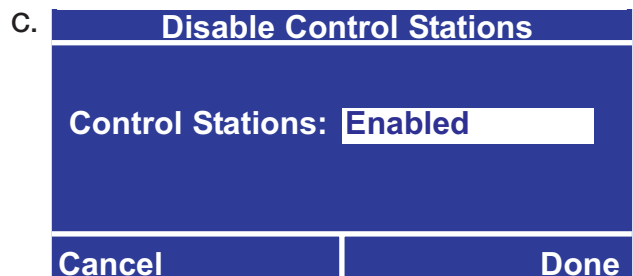
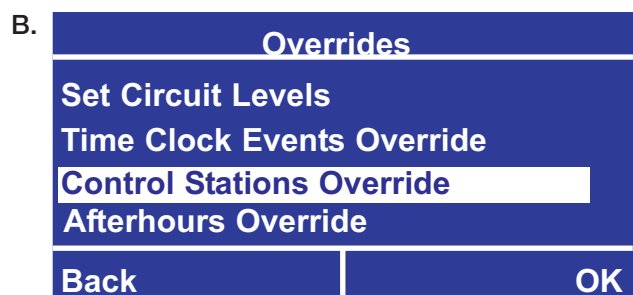
To Disable or Enable all Time Clock Events

- From the **Main Menu** use and to highlight **Overrides** and press or (OK).
- Use and to choose **Time Clock Override** and press or (OK).
- Use and to change the setting to **Disabled** or **Enable** and press or (Done).



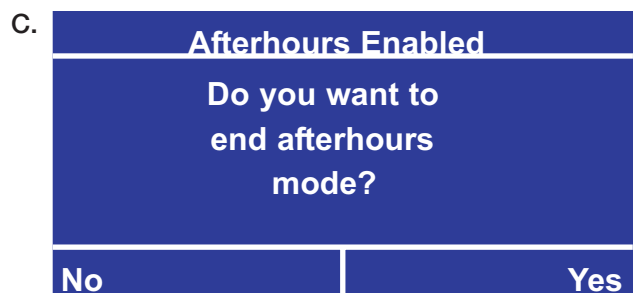
To Disable or Enable all Control Stations

- From the **Main Menu** use and to highlight **Overrides** and press or (OK).
- Use and to choose **Control Stations Override** and press or (OK).
- Use and to change the setting to **Disabled** or **Enable** and press or (Done).



To End Afterhours Mode

- From the **Main Menu** use and to highlight **Overrides** and press or (OK).
- Use and to choose **Afterhours Override** and press or (OK).
- The title says Afterhours Enabled or Afterhours Disabled. To end afterhours mode press or (Yes).





Locking the Controller

Locking The Controller

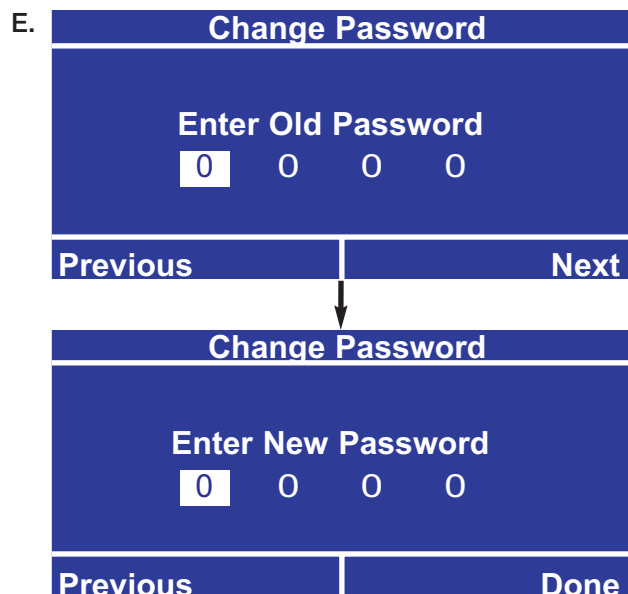
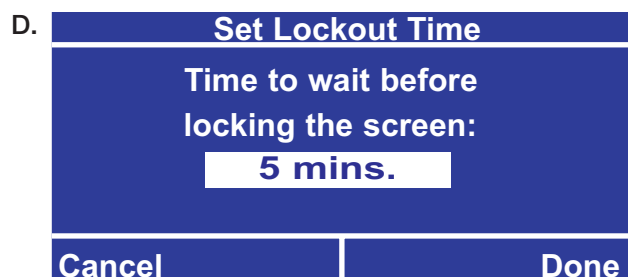
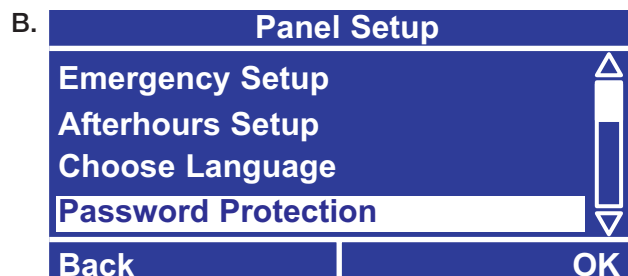
The *Softswitch128* controller can be password protected to prevent unauthorized changes to settings such as time clock events, control station assignments, etc. After no button presses for the lockout time, the controller will automatically lock. A 4-digit password must be set when locking is configured. This password must be entered before any of the menus can be accessed when the controller is locked. This password must also be entered to change the password.

To Set the Controller to Lock

- From the **Main Menu** use and to highlight **Panel Setup** and press or (OK).
- Use and to choose **Password Protection** and press or (OK).
- Use and to select either **Change Password** or **Set Lockout Time** and press or (OK).
- If **Set Lockout Time** is selected, use and to set the time of inactivity (no button presses on the controller) to wait before locking and press or (Next). If you do not want the controller to lock, select **Do Not Lock**.
- If **Change Passwords** is selected, enter the current password (default is 0 0 0 0). Use and to select the digit to change, and to change each value. When you have entered the password press or (Next). Enter the new password, then press or (Next). Then re-enter the new password for confirmation and press or (Done).

The controller will now lock after the set amount of time.

Note: If you have forgotten the Password, contact Lutron Technical Support to unlock the controller.



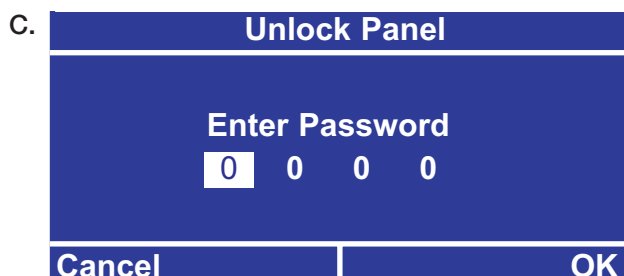
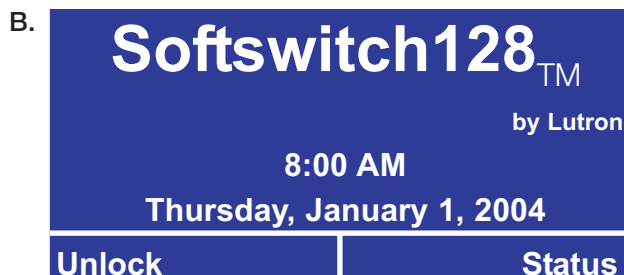


Locking the Controller (continued)

Unlocking the Controller

If the controller has been locked (see Locking the Controller), you will be prompted to enter the Password before the Main Menu is Activated.


- A. Press **⓪** (Unlock)
- B. Use **⏪** and **⏩** to select the digit to change, **▲** and **▼** to change each value. When you have entered the Password, press **⓪** or **Ⓜ** (OK). If you have forgotten the Password, contact Lutron Technical Support at 1(800) 523-9466 to unlock the controller.





Troubleshooting



Symptom	Likely Cause	Action(s) for Remedy
Circuits always ON or always OFF.	(a) Bypass jumpers have not been removed.	(a) Visually inspect the terminal blocks. If the metal bypass jumpers are installed, see the Softswitch128 Installation Guide for proper circuit test and jumper removal procedure.
	(b) Controller is not powered.	(b) The 'POWER' LED at the bottom of the controller should be lit (see the Controller Overview section of this guide for location). If it is not, there is no power, and the feed should be checked.
	(c) Controller is in the override screen.	(c) Press the  home button to exit the override screen.
	(d) Emergency is active.	(d) Disable the emergency function by sliding the emergency switch at the bottom of the controller to the center position on all panels.
	(e) Circuit breaker is OFF.	(e) Turn the breaker on to verify proper power supply to each circuit. The breaker could be inside the <i>Softswitch128</i> panel or in a separate distribution panel if the <i>Softswitch128</i> panel is a feed-through type.
	(f) Duplicate panel addresses.	(f) Check that all panel addresses are unique. The panel address is listed on the home screen. To change addresses, see STEP 1 in this guide for more information.
Circuit breakers are tripping.	(a) Circuits are overloaded.	(a) Check load continuity (between SH and N) with a meter, and verify that there is not a short. If shorted, repair the miswire or load failure. If not shorted, reset the breaker and measure the current on the circuit. If greater than 16A, the circuit is overloaded and should be remedied by re-lamping to smaller loads or by "splitting" the circuit.



Troubleshooting




Symptom	Likely Cause	Action(s) for Remedy
Control station buttons do not work.	(a) Link has a panel or control address conflict.	(a) Check all control station addresses, and ensure that there are no duplicate settings. See the Softswitch128 Installation Guide for more information.
(and / or) Control station LED's are flashing.	(b) Control station is addressed incorrectly.	(b) Check the address of the non-working control station for correctness and uniqueness. See the Softswitch128 Installation Guide for more information.
(and / or) Control station buttons or CCI's work sporadically.	(c) Button is not programmed.	(c) Program the button's function at the controller. See STEP 3 in this guide for more information.
(and / or) Control station LED's do not turn on.	(d) Control stations are disabled.	(d) Enable the control stations using the LCD. See the Overrides section in this guide for more information.
	(e) Control station link is mis-wired.	(e) See the Softswitch128 Installation Guide for proper wiring. If a T-tap was created to wire a control to the control station link, it should be no longer than 8 ft. (2.44m).
	(f) Emergency is active.	(f) Disable the emergency function by sliding the emergency switch at the bottom of the controller to the center position on all panels.
Panel contact closure inputs do not work.	(a) Input closure/opening is not occurring.	(a) Check that the device controlling the input is opening or closing properly.
	(b) Input is programmed incorrectly.	(b) Program the contact closure input function on the controller. See STEP 3 in this guide for more information. Note that open and closure actions can be programmed to conflict with each other, and this may cause undesirable results.
	(c) Input is mis-wired.	(c) See the Softswitch128 Installation Guide for proper wiring. If a T-tap was created to wire a control to the control station link, it should be no longer than 8 ft. (2.44m).



Troubleshooting




Symptom	Likely Cause	Action(s) for Remedy
Time clock events do not occur.	(a) Controller is in the override screen.	(a) Press the  home button to exit the override screen.
(and / or) Sunrise or sunset events do not occur at the correct time.	(b) Timeclock is disabled.	(b) Enable the timeclock. See STEP 4 in this guide for more information.
	(c) Time is not set.	(c) Set the time. See STEP 4 in this guide for more information.
	(d) Date is not set correctly.	(d) Set the date. See STEP 4 in this guide for more information.
	(e) Location is not set correctly.	(e) Set the location. See STEP 4 in this guide for more information.
	(f) Holiday schedule is in effect.	(f) Check if there is a holiday on the date the event is not occurring. See STEP 4 in this guide for more information.
Circuits are flashing erratically.	(a) Duplicate panel addresses.	(a) Check that all panel addresses are unique. The panel address is listed on the home screen. To change addresses, see STEP 1 in the this guide for more information.
	(b) Duplicate control station addresses.	(b) Check that the address of the non-working control station is correct and unique. See the Softswitch128 Installation Guide for more information.
	(c) Contact closure input is controlling the circuits.	(c) Confirm that the contact closure input into the system is in a steady state. Verify this at every panel contact closure input and at every OMX-AV.
	(d) Control station link is mis-wired.	(d) See the Softswitch128 Installation Guide for proper wiring. If a T-tap was created to wire a control to the control station link, it should be no longer that 8 ft. (2.44m).
	(e) Time clock events are occurring.	(e) Check the time clock events for the day or holiday that coincide with the time of the erratic behavior. Holiday schedules override the 7 daily schedules. See STEP 4 of this guide for more information.
	(f) Afterhours mode is active.	(f) Afterhours mode may cause the lights to flash. See STEP 4 of this guide for more information.



Troubleshooting



Symptom	Likely Cause	Action(s) for Remedy
Contact closure outputs do not work.	(a) Controller is in the override screen.	(a) Press the  home button to exit the override screen
	(b) Control Stations are disabled.	(b) Enable the controls. See STEP 3 in this guide for more information.
	(c) Link has an address conflict.	(c) Check all control station address switches, and ensure that there are no duplicate settings.
	(d) Link is mis-wired.	(d) See the Softswitch128 Installation Guide for proper wiring. If a T-tap was created to wire a control to the control station link, it should be no longer than 8 ft. (2.44m).
	(e) System is programmed incorrectly.	(e) Check the action that is to cause the output, and ensure that it is programmed correctly. See STEP 3 in this guide for more information.
Emergency does not work.	(a) Sense lines are not connected.	(a) For emergency to work, the right most pin on the 6-pin connector at the top of the controller must be wired between panels. See the Softswitch128 Installation Guide for more emergency sense wiring information.
	(b) Emergency switch is not set correctly.	(b) Essential Emergency panels must have their emergency switch set to the rightmost position. Non-Essential Normal panels must have their emergency switch set to the leftmost position.
	(c) There must be at least one non-essential panel and at least one essential panel.	(c) Essential Emergency panels sense the presence of non-essential panels. Therefore, there must be at least one of each for emergency to work.
	(d) Emergency levels are not programmed.	(d) Emergency levels must be programmed using the LCD screen. To program the emergency levels, see STEP 6 in this guide for more information..
LCD backlight is OFF.	(a) Screen saver is on.	(a) Press any button on the controller.
	(b) Controller is not powered.	(b) The 'POWER' LED at the bottom of the controller should be lit. If it is not, there is no power, and the circuit should be checked for power.



Troubleshooting



Symptom	Likely Cause	Action(s) for Remedy
RS232 commands do not work.	<p>(a) Baud rate is wrong.</p> <p>(b) See 'Control station buttons do not work' symptom of this troubleshooting section.</p>	<p>(a) Check that the baud rate switches on the OMX-RS232 are correct. The baud rate on the OMX-RS232 must match the baud rate of the sending device.</p>
OMX-CCO8 is not working.	<p>(a) Option switch on the OMX-CCO-8 is not set correctly.</p> <p>(b) See 'Control station buttons do not work' symptom of this troubleshooting section.</p>	<p>(a) All Option switches should be in the ON position.</p>
OMX-AV outputs are not working.	<p>(a) DIP switch 8 is not set correctly.</p> <p>(b) No external power supply on the outputs.</p> <p>(c) See 'Control station buttons do not work' symptom of this troubleshooting section.</p>	<p>(a) Set DIP switch 8 to ON. This sets the unit to handle maintained or momentary closures.</p> <p>(b) The OMX-AV requires the outputs to be powered by an external power supply (30VDC max).</p>
Password is unknown.	<p>(a) Contact Lutron Technical Support to unlock the controller.</p>	<p>(a) Contact information for technical support may be found at the end of this guide.</p>



Maintenance



Wallstations

Clean front surface 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 Wallstation as it may reach internal components.

Softswitch128 Panels

1. Clean any dirt from air vent openings with a vacuum and check for any obstructions which 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 switching equipment, turn off breakers, replace bypass jumpers, and turn on breakers. This will apply full power to fixtures and bypass the switching modules.



Glossary of Terms



- **Addressing** - how the controls on a link identify each other. Control stations are assigned an address between 1 and 32, using addressing switches 1 through 5 on the unit. Refer to the *Softswitch128* Installation Guide or control station instructions for further information.
- **Afterhours Mode** - a time clock mode typically used for turning selected lights off at the end of a building's normal business hours. The system first warns occupants that the lights are going to turn off by flashing the lights (flash count), then waits for a period of time (off delay) before automatically turning the lights off. If an occupant wants the lights to remain on (or turn back on), they can press a Wallstation button that controls those lights. The lights then remain on for a set amount of time (warn time) and the process repeats. This process continues until an afterhours end time clock event occurs.
- **Contact Closure Input (CCI)** - an input provided to the system in the form of two contacts completing a circuit (dry contact closure). This input could be from a button or a relay controlled by another system (fire alarm, building management system, etc.)
- **Open Action vs. Closed Action** - a CCI into the *Softswitch128* can be programmed to respond to the opening or closing of the contact.
- **Contact Closure Output (CCO)** - an output provided from the system in the form of two contacts completing a circuit (dry contact closure). This output could be from a OMX-AV, OMX-CCO-8, button, or time clock event.
- **Maintained vs. Momentary** - a CCO from the *Softswitch128* can be programmed to be a pulse (momentary) or constant (maintained) output.
- **Control Link** - the daisy-chained link of control stations wired to the *Softswitch128* panel(s).
- **Control Station** - a device located on the control link that provides low-voltage inputs and/or outputs, typically a Wallstation, keyswitch, OMX-CCO-8, OMX-RS232, or OMX-AV.
- **Emergency Mode** - a mode where all inputs to the system are disabled and circuits are turned on or off as set in the emergency mode setup. Activated via the emergency sense line.
- **Flash Count** - the number of times the lights will flash to warn an occupant that the lights are going to turn off automatically.
- **Holiday** - a special time clock schedule that is set to start on a specific date and last a set number of days. Overrides the normal weekly schedule.
- **Holiday Event** - a time clock event that is set to occur on a holiday.
- **LCD (Liquid Crystal Display)** - the graphical display built into the *Softswitch128* controller that is used to configure the system.
- **LED (Light Emitting Diode)** - an illuminated indicator to help in diagnosing the controller and control station operation.
- **OMX-AV** - a control station that is connected to the control link and accepts up to 5 contact closure inputs and 5 contact closure outputs.
- **OMX-CCO-8** - a control station that is connected to the control link and accepts up to 8 contact closure inputs.
- **NTOMX-KS** - a control station that requires a key. The key switch can be programmed for clockwise and counter-clockwise turns.
- **OMX-RS232** - a control interface device that facilitates building management integration through RS232 commands.
- **Toggle** - Each press of the button switches the assigned circuits between on and off. If the assigned circuits are in a mixed state (some on and some off), the circuits will turn on.
- **Pattern** - predetermined state for one or more circuits, creating an effect that can be recalled by pressing a single button.
- **Delay to Off** - up to a 90 minute delay can be programmed for a group of circuits before turning the light off, recalled by pressing a single button.
- **Time Clock Event** - an action that is set to occur at a particular time of day or at a time relative to sunrise or sunset (astronomical).
- **Wallstation** - a control that mounts on the wall, contains one or more buttons, and wires to the control link. The buttons can be used to activate patterns, toggle circuits, etc.
- **Warn Time** - the amount of time a light can be turned on by a Wallstation or CCI before automatically being turned off in afterhours mode.
- **Weekly Event** - a time clock event that is set to occur on a specific day of the week (Sunday - Saturday).



Notes:



Control Location Table

- **How to Use this Table:**
For each control station, fill in the number of buttons and brief description / location

Address	Number of Buttons	Location / Description
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
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22		
23		
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29		
30		
31		
32		



Panel Table

How to Use these Tables:

- For each panel, fill in a description for each circuit. Label all spares.
- Cross out the circuits that do not exist.
- Fill in the system circuit numbers.

Panel 1		
Panel Circuit	System Circuit	Description
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
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42		
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44		
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47		
48		

Panel 2		
Panel Circuit	System Circuit	Description
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
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38		
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41		
42		
43		
44		
45		
46		
47		
48		



Panel Table

How to Use these Tables (continued):

- Circuit 1 in panel 1 is system circuit 1. The circuit number is continuous from panel to panel. Continue numbering panels 2 through 4 (if present).

Panel 3		
Panel Circuit	System Circuit	Description
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
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36		
37		
38		
39		
40		
41		
42		
43		
44		
45		
46		
47		
48		

Panel 4		
Panel Circuit	System Circuit	Description
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
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Contact Information and Warranty

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

WORLD HEADQUARTERS

Lutron Electronics Co. Inc.,
TOLL FREE: 1.800.523.9466
(U.S.A., Canada, portions of Caribbean)
Tel: 1.610.282.3800
Fax: 1.610.282.3090

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Fax: +852.2104.7633

SINGAPORE

Lutron GL (Singapore)
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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: 5,309,068; 5,633,540 and corresponding foreign patents.

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Description

The *Softswitch128* Expansion Module allows an increased number of control stations (wallstations or control interfaces) to be connected to a *Softswitch128* system.

Features

The Expansion Module provides three PELV (Class 2: USA) link connections. Up to 32 wallstations and/or control interfaces may be wired to each link connection.

Mounting

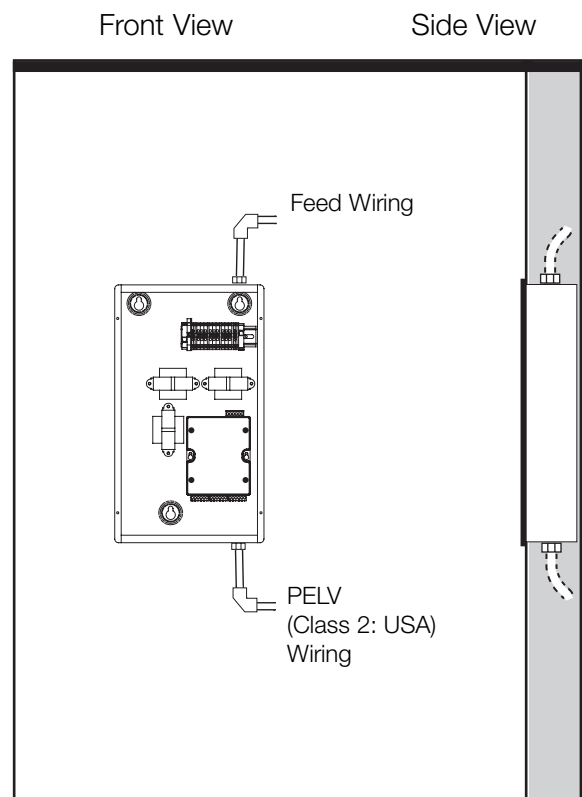
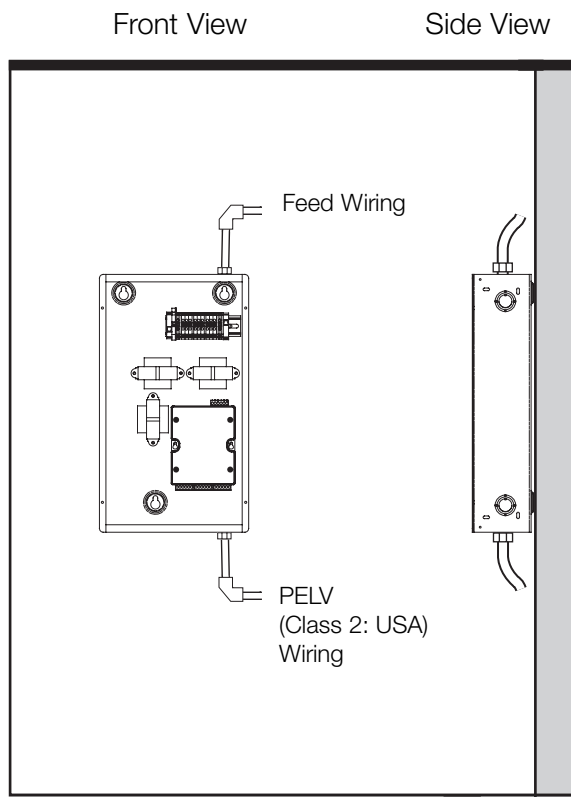
- For indoor use only.
- Consult dimensions page for panel size, conduit knockouts, and mounting holes.
- Mount where ambient temperature is 32-104°F (0-40°C).
- Reinforce wall structure for weight and local codes as necessary.
- Mount panel so line (mains) voltage wiring is at least 6 ft. (1.8 m) from sound or electronic equipment and wiring.
- Mount within 7° of true vertical.

Surface Mounting

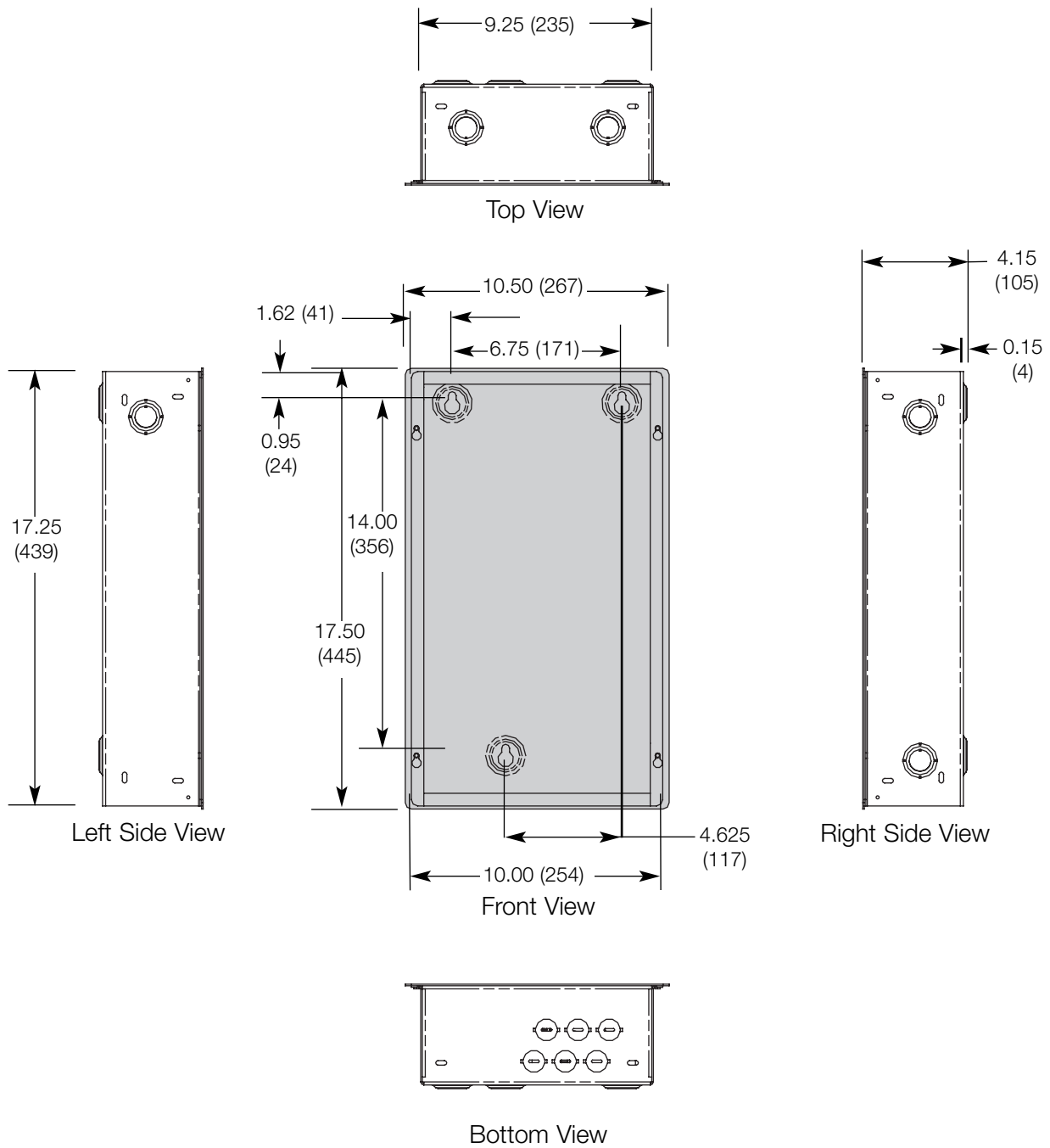
- Lutron recommends using 0.25 in. (6 mm) mounting bolts.
- Leave 1.25 in. (32 mm) clearance on each side of panel for cover.

Recess Mounting

- Mount panel from flush to 0.125 in. (3 mm) below finished wall surface.
- Leave 1.25 in. (32 mm) clearance on each side of panel for cover.



Dimensions



Dimensions are in inches (mm).

Wiring Overview - 120/277 V~

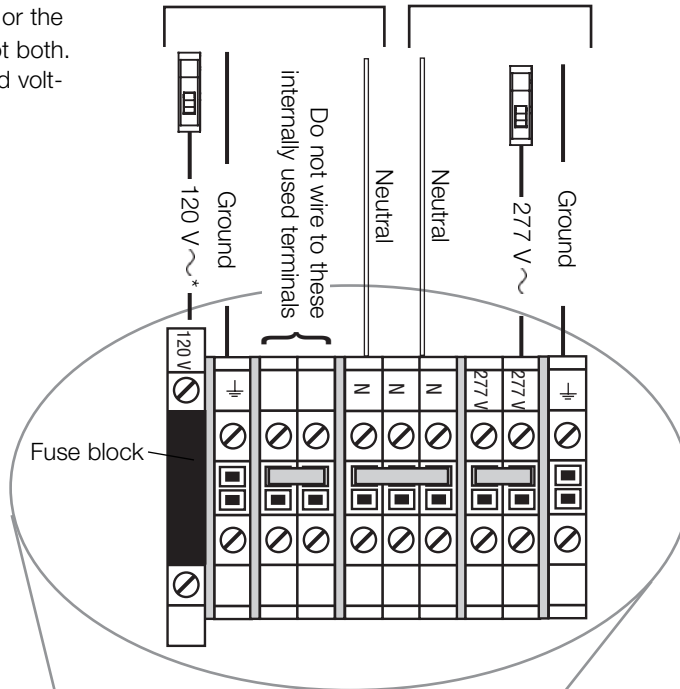
XPS-E-120/277-FT model number may be wired with either 120 or 277 V~ (not both).



Wire to either the 120 V~ or the 277 V~ feed terminals, not both. The terminals for the unused voltage will remain empty.

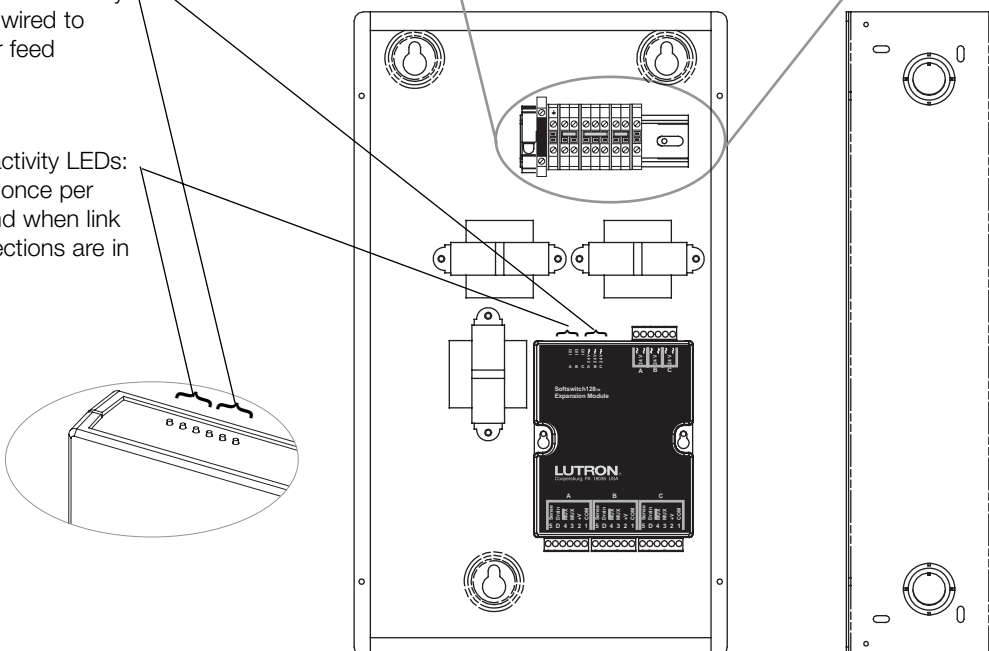
***Note:** 120 V~ Hot terminal is protected by an internal fuse in case 277 V~ is mistakenly applied. A spare fuse is also supplied in the panel terminal block: fuse #GSL8/10 by Ferraz Shawmut.

120 V~ Feed OR 277 V~ Feed



Link power LEDs:
Light continuously
when wired to
power feed

Link activity LEDs:
Flash once per
second when link
connections are in
use



Low-Voltage PELV (Class 2: USA) Wiring

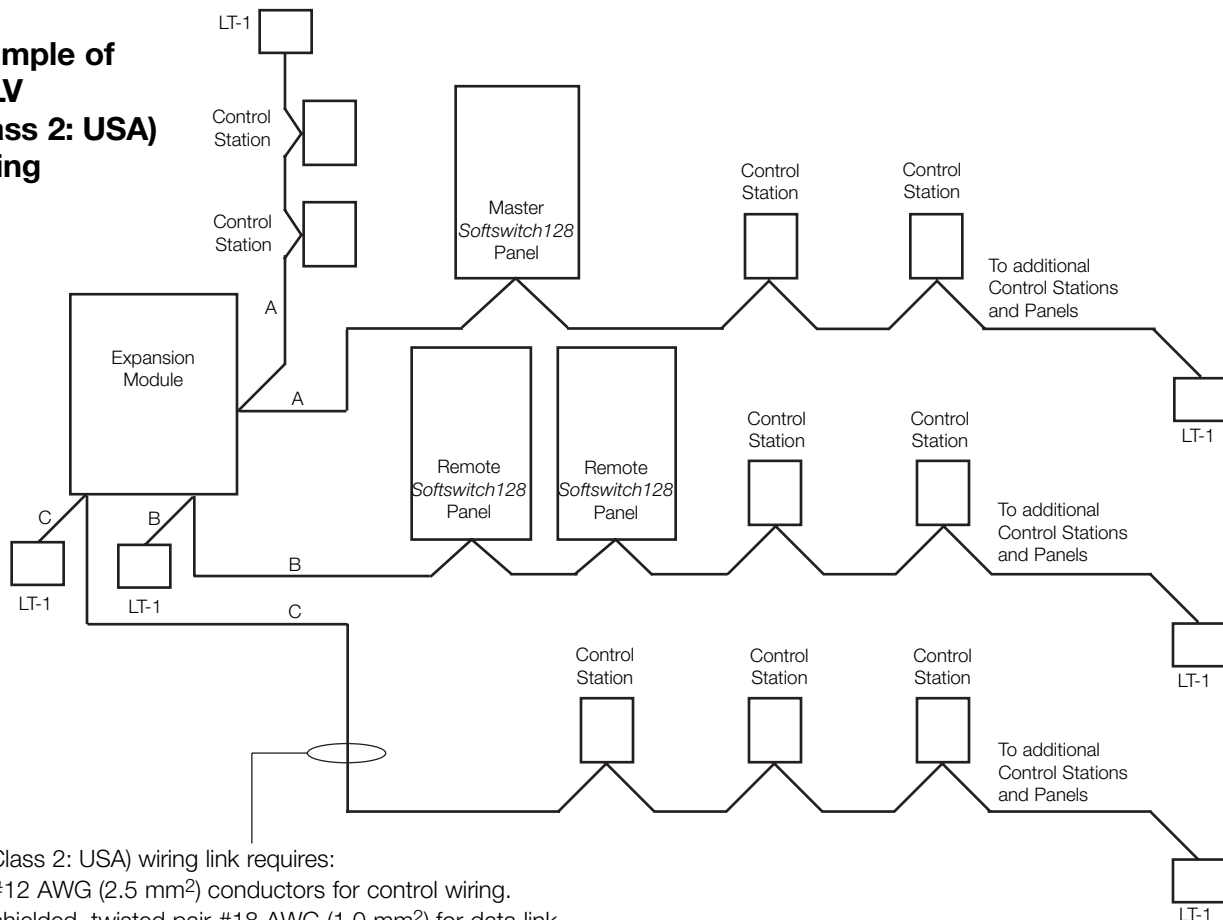
Daisy-Chain Topology

- Refer to wiring on next page.
- Daisy-chain the Expansion Module to the PELV (Class 2: USA) link that connects switching panels to control stations.
- There are three link connections (A, B, and C) on the Expansion Module.
- Make daisy-chain connections to the low-voltage PELV (Class 2: USA) link terminals inside the Expansion Module.
- Do not use T-taps. Run all wires in and out of the terminal block.
- Each terminal accepts up to two #18 AWG (1.0 mm²) wires.
- I/O LEDs A, B, and C flash when each of the PELV (Class 2: USA) Links are correctly installed and power is applied.
- Install link terminators (LT-1) at the start and end of each PELV (Class 2: USA) Link.

Important Notes

- The Master *Softswitch128* panel may be any one panel on the three links. All *Softswitch128* panels have the capability to be the master panel.
- Up to 16 panels (system maximum) may be wired to the system.
- Each of the 16 panels may be wired to any one of the three link connections.
- 32 control stations may be wired to each link connection.
- It is permissible for a link to consist of only control stations or only panels.
- The Expansion Module may or may not be at the end of any control link. It may be connected anywhere on the link, including the ends or middle.

Example of PELV (Class 2: USA) Wiring

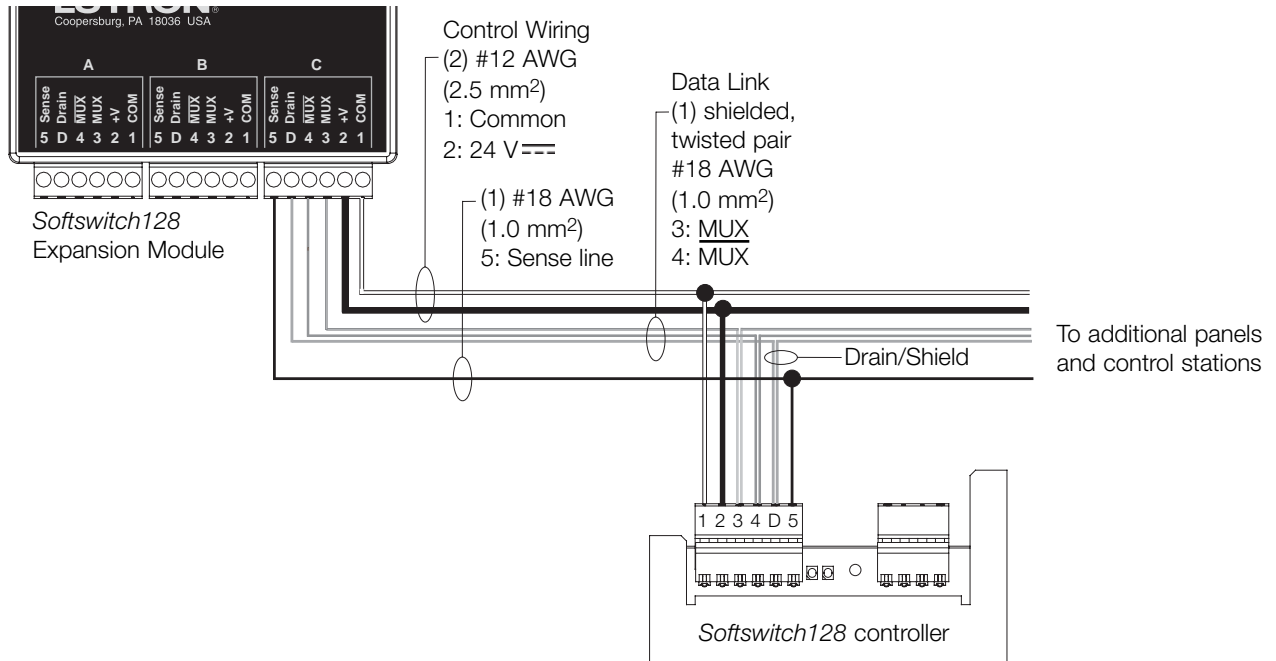


PELV (Class 2: USA) wiring link requires:

- Two #12 AWG (2.5 mm²) conductors for control wiring.
- One shielded, twisted pair #18 AWG (1.0 mm²) for data link.

PELV (Class 2: USA) Wiring

Expansion Module to Switching Panel

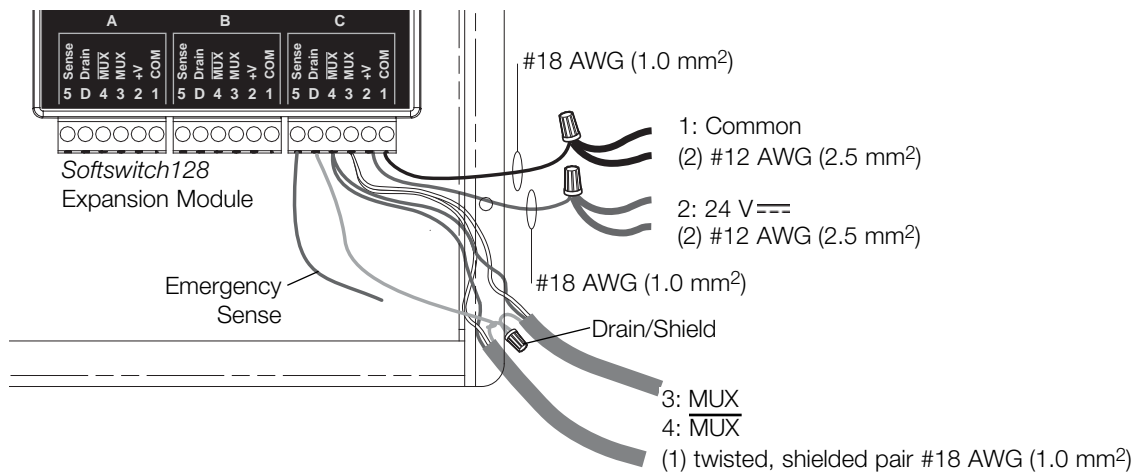


Terminal Connections

- Two #12 AWG (2.5 mm²) conductors for common (terminal 1) and 24 V_{DC} (terminal 2). These will not fit in terminals. Connect as shown below.
- One twisted, shielded pair #18 AWG (1.0 mm²) for data link (terminals 3 and 4).
- Connect Drain/Shield as shown. Do not connect to Ground (Earth) or Wallstation/Control Interfaces. Connect the bare drain wires and cut off the outside shield.
- If Emergency panels are present in the system, connect Emergency Sense line to terminal 5 on Expansion Module link terminal(s).

For the PELV (Class 2: USA) link, use GRX-CBL-46L or equivalent. The cable consists of:

- Two #12 AWG (2.5 mm²) wires.
- One #18 AWG (1.0 mm²) shielded, twisted pair.
- One #18 AWG (1.0 mm²) wire for Emergency Sense.



Troubleshooting Guide

Symptom	Likely Cause	Action(s) for Remedy
<ul style="list-style-type: none"> → Control station buttons do not work on one link → Control station LEDs are flashing → Master XPS controller can not control circuits or control stations on other links → Link activity LEDs are flashing slowly (once every 11 seconds) 	<ul style="list-style-type: none"> ♦ Link has a panel or control address conflict. ♦ Control station is addressed incorrectly. ♦ There is no panel address 1. ♦ Expansion Module is not powered. ♦ Link is miswired. 	<ul style="list-style-type: none"> ✓ Check that control station addresses on the link are unique. ✓ Ensure that panels are uniquely addressed. See the <i>Softswitch128</i> Installation Guide for more information. ✓ Check the address of the non-working control station for correctness and uniqueness. See the <i>Softswitch128</i> Installation Guide for more information. ✓ Address one of the panels as address 1. See the <i>Softswitch128</i> Installation Guide for more information. ✓ Check the 3 link power LEDs on top of the Expansion Module, check wiring for correctness, and ensure power is provided. Refer to this manual for more information. ✓ Check Link wiring; refer to this manual for more information.
<ul style="list-style-type: none"> → All three power LEDs on Expansion Module not lit 	<ul style="list-style-type: none"> ♦ Expansion Module is not powered. ♦ 120 V\sim fuse is blown. ♦ 24 V\equiv on low-voltage link is miswired. 	<ul style="list-style-type: none"> ✓ Check that panel feed is on. ✓ Check fuse for continuity and make sure of proper feed voltage. ✓ Check link wiring for shorts between 1 and 2; refer to PELV (Class 2: USA) wiring in this manual for more information.
<ul style="list-style-type: none"> → One or two power LEDs on Expansion Module not lit 	<ul style="list-style-type: none"> ♦ 24 V\equiv on low-voltage link is miswired. ♦ Link is overloaded. 	<ul style="list-style-type: none"> ✓ Check link wiring; refer to PELV (Class 2: USA) wiring in this manual for more information. ✓ Make sure no more than 32 control stations and 16 panels are on each link.
<ul style="list-style-type: none"> → <i>Softswitch</i> controller will not communicate with system 	<ul style="list-style-type: none"> ♦ Controller is addressed incorrectly. ♦ Controller is wired incorrectly. 	<ul style="list-style-type: none"> ✓ Check that all panel addresses are unique. The panel address is listed on the home screen. To change addresses, see Step 1 in the <i>Softswitch128</i> Switching System Setup and Maintenance Guide. ✓ Refer to <i>Softswitch128</i> Switching System Setup and Maintenance Guide troubleshooting section for more information.
<ul style="list-style-type: none"> → Link activity LEDs are blinking once per second 	<ul style="list-style-type: none"> ♦ Normal operation. 	

Refer to *Softswitch128* Switching System Setup and Maintenance Guide for more Troubleshooting.

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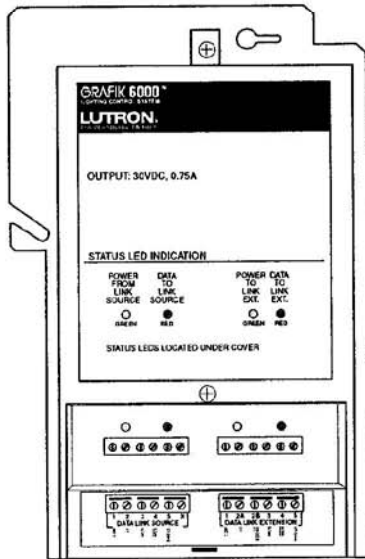
LIMITED WARRANTY

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

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

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

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Description

The Link Booster allows Wallstation or Dimmer Panel Links to be extended beyond their normal maximum distances. Included are:

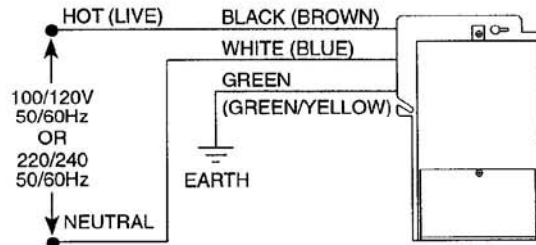
- (1) MX-RPTR-100/120 or MX-RPTR-220/240
- (2) LT-1 Link Termination Assembly

Important Notes

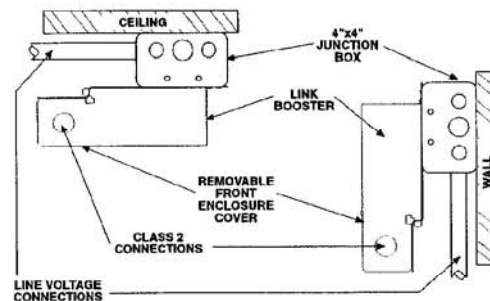
1. READ ALL INSTRUCTIONS CAREFULLY BEFORE STARTING INSTALLATION.
2. The Link Booster must be installed by a qualified electrician.
3. Install in accordance with all local and national electrical codes.
4. Power must be OFF at the breaker or fuse supplying power to the Link Booster and the GRAFIK 6000 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 mm²) 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

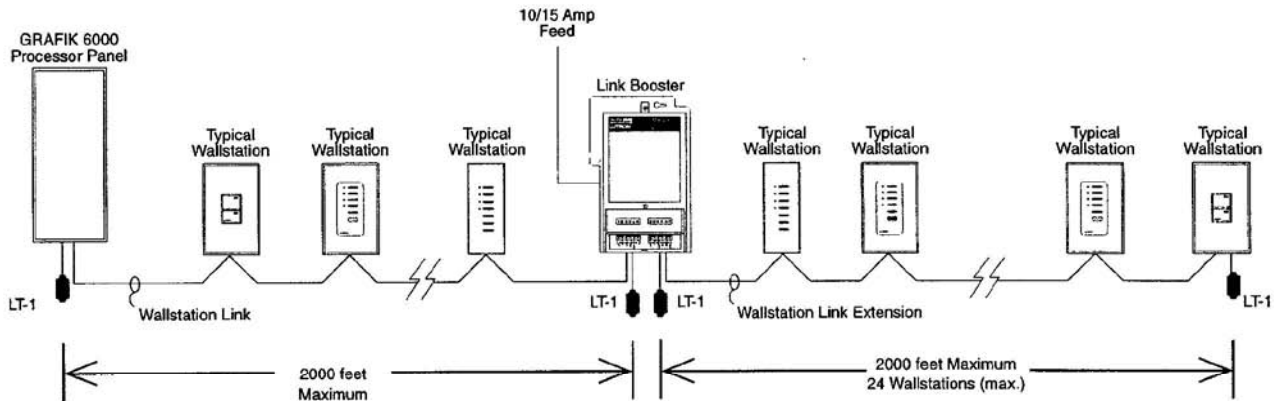
5. Strip insulation from Wallstation Link wires so $\frac{3}{8}$ in. (9.5 mm) bare wire is exposed. The terminals will accept up to two #18 AWG (1.0 mm²) wires. If wires are larger, splice a #18 wire to the wires to make the connection.

- 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.

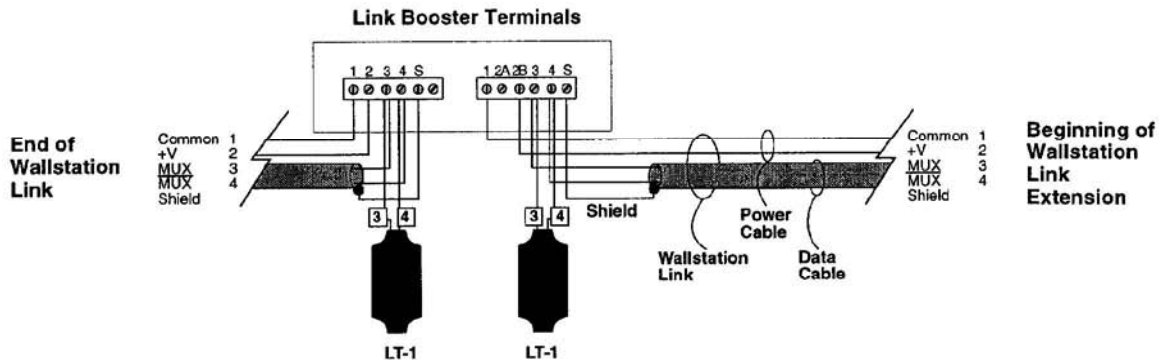
- Replace front enclosure cover. Restore power to the Link Booster and the GRAFIK 6000 Processor Panel **after** installation of the system is complete.

Wallstation Link Application No. 1: Extension Wiring (Used to extend Wallstation Link length)

Wiring Overview



Link Booster Wiring Detail

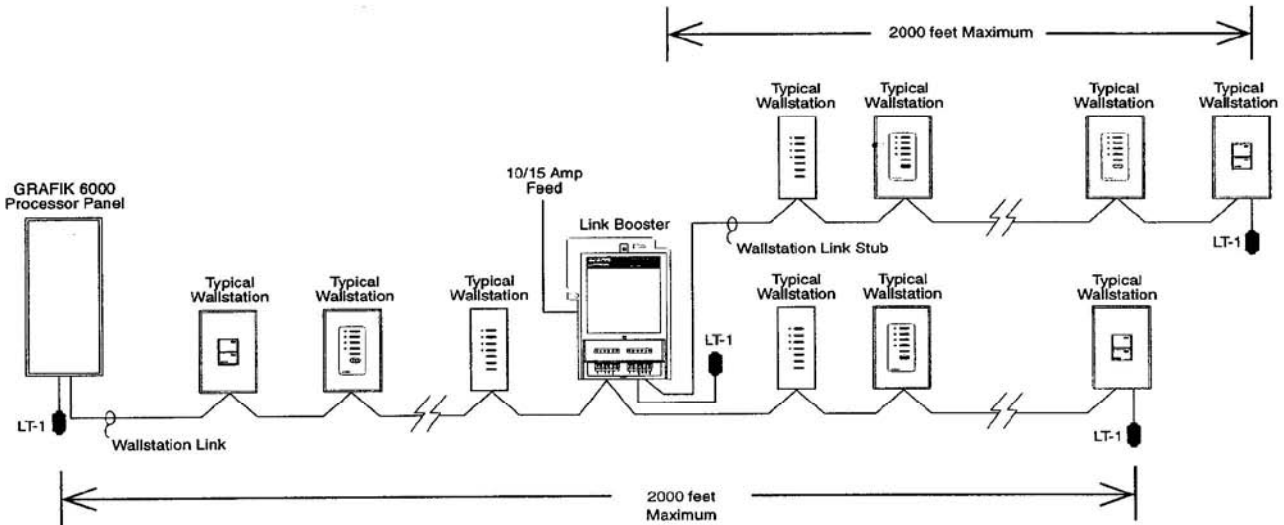


Wiring Notes:

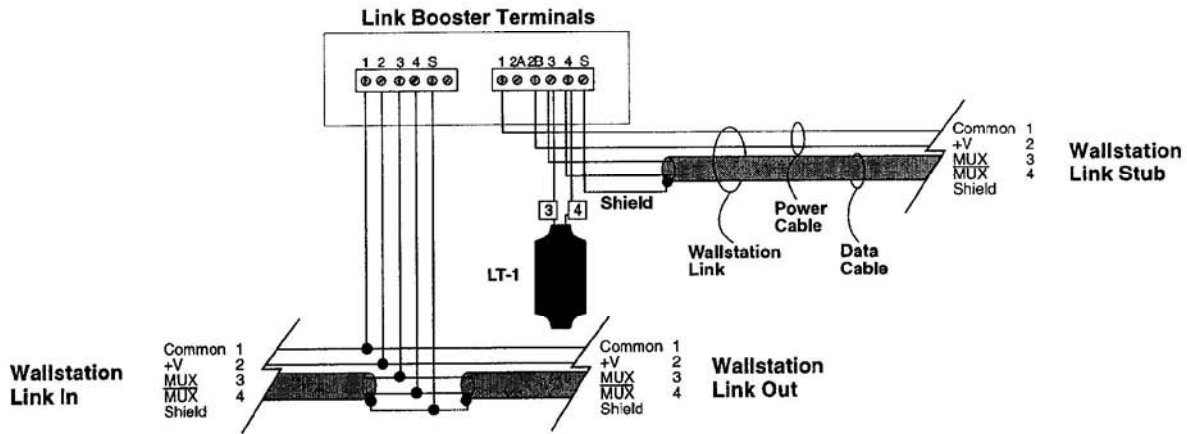
- Lutron recommends that the connection of the Link Booster to the Wallstation Link be made inside the Link Booster. If a junction box (provided by others) is used instead, locate the box no more than 8 ft. (2.4 m) from the Link Booster.
- Wallstation Link wiring must not be run in the same raceway as 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.

Wallstation Link Application No. 2: Stub Wiring (Used to correct a branched or "T-tapped" section of Wallstation Link)

Wiring Overview



Link Booster Wiring Detail

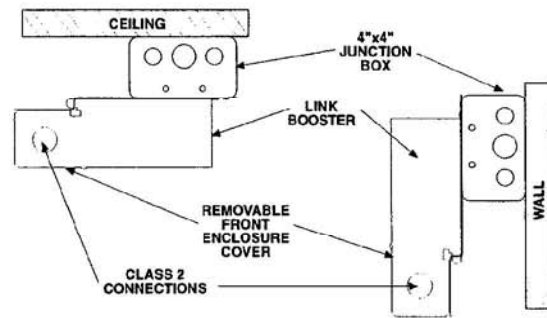


Wiring Notes:

1. 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.
2. Wallstation Link wiring must not be run in the same raceway as line voltage (main voltage) wiring.
3. Neither the Wallstation Link nor the Wallstation Link Stub can exceed 2000 ft. (600 m) in length.
4. Data cable shield must be maintained throughout the Wallstation 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 (Wallstation Link) wiring restrictions and limitations.
6. Wallstation Link requires an LT-1, Link Termination Assembly, at each end of the Wallstation Link and each end of the Wallstation Link Stub.

Installation on a Dimmer Panel Link

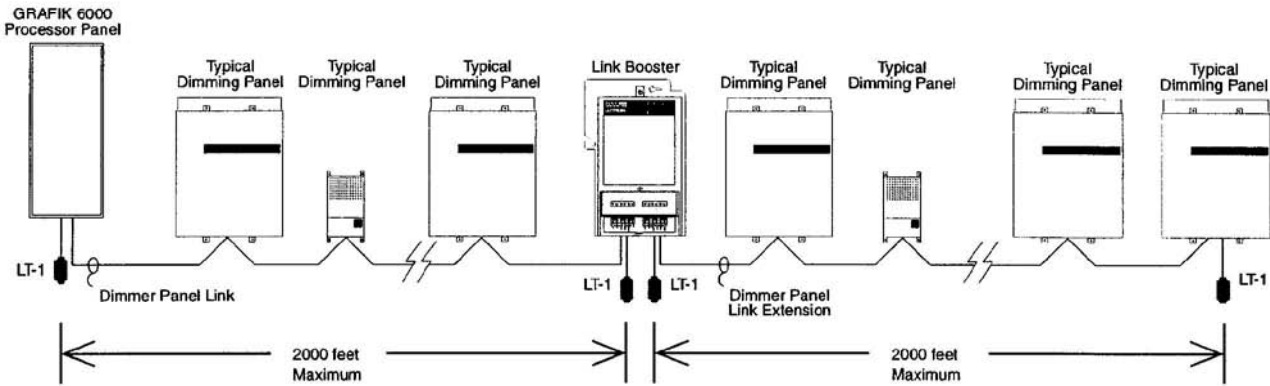
- 1. Prewiring:** The Dimmer Panel Link requires special wiring considerations. Refer to the GRAFIK 6000 Installation Guide and Lutron job drawings for wiring restrictions and limitations that apply to your specific project.
- 2. Turn power OFF.**
WARNING: Always turn off power to the GRAFIK 6000 Processor 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 mm²) wires. If wires are larger, splice a #18 AWG (1.0 mm²) 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.



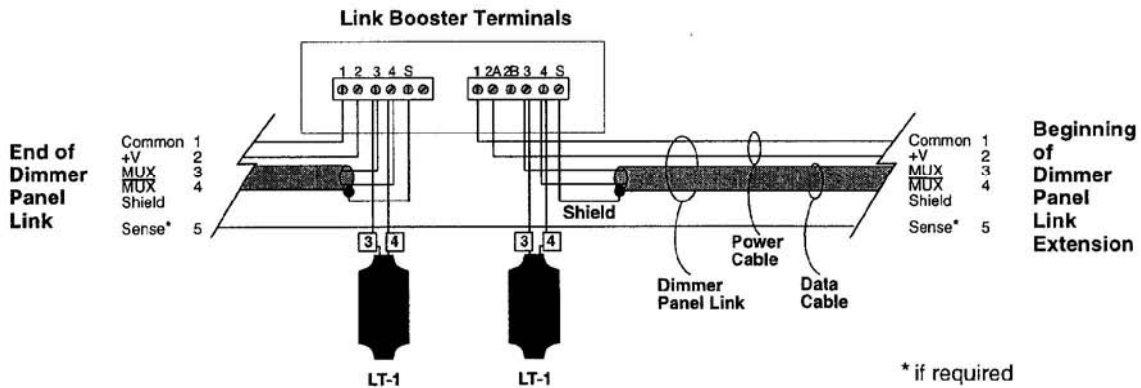
Mounting Diagrams

Dimmer Panel Link Application No. 1: Extension Wiring (Used to extend Dimmer Panel Link length.)

Wiring Overview



Link Booster Wiring Detail



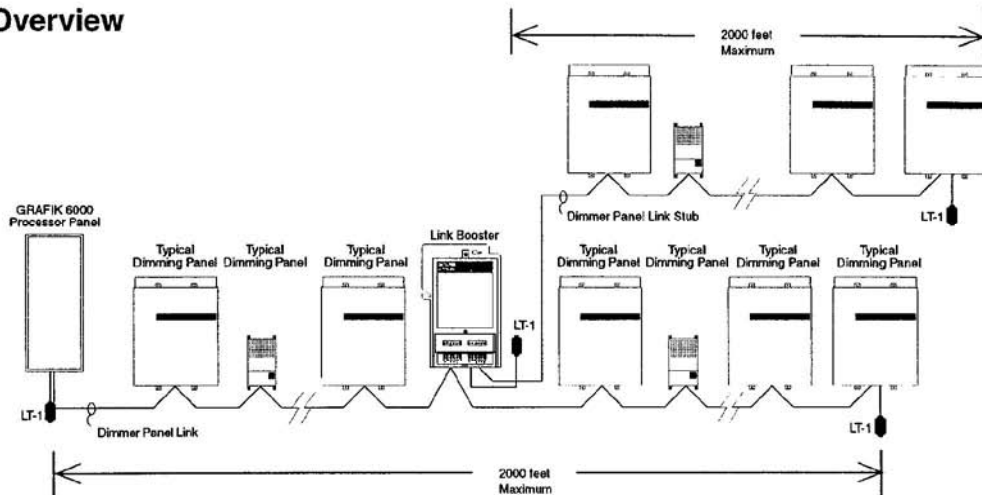
* if required

Wiring Notes:

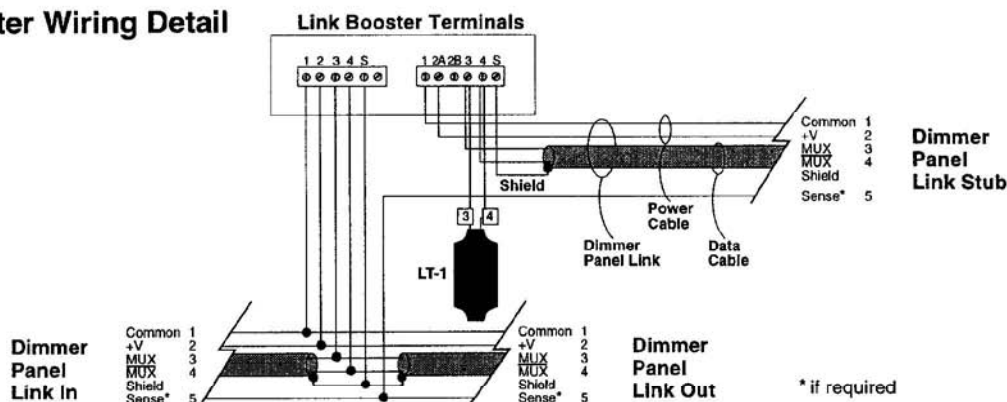
1. Lutron recommends that the connection of the Link Booster to the Dimmer Panel Link be made inside the Link Booster. If a junction box (provided by others) is used instead, locate the box no more than 8 ft. (2.4 m) from the Link Booster.
2. Dimmer Panel Link wiring must not be run in the same raceway 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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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; 5,483,286; 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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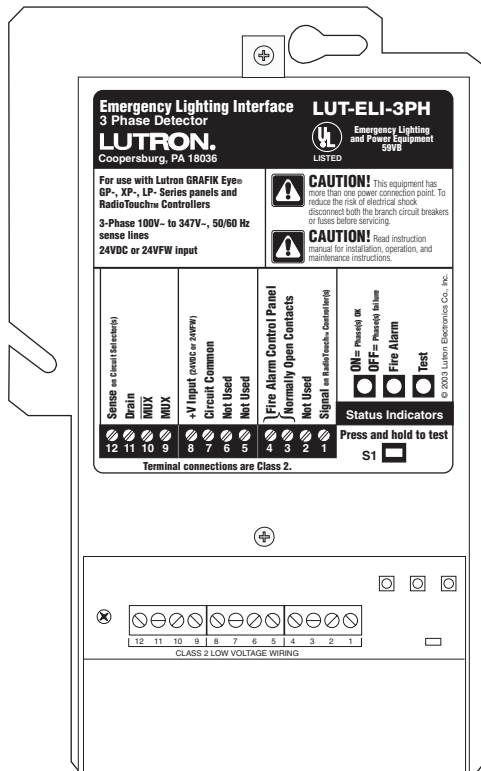
LUTRON®

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.

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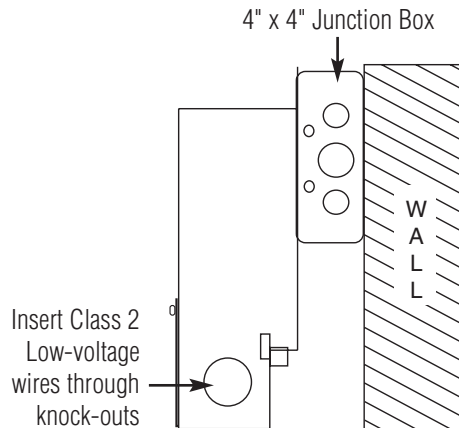
Hardware Installation

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

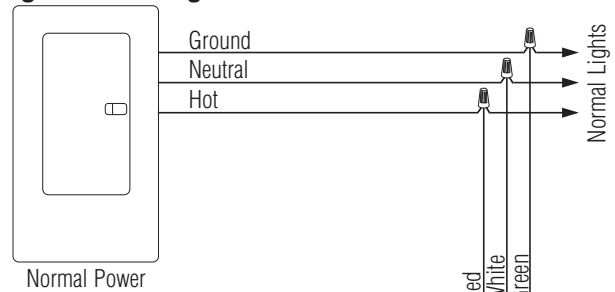


Danger – Locate and lock the supply breaker(s) in the OFF position, or remove the supply fuse(s) before continuing. This equipment may have more than one power connection point.



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.

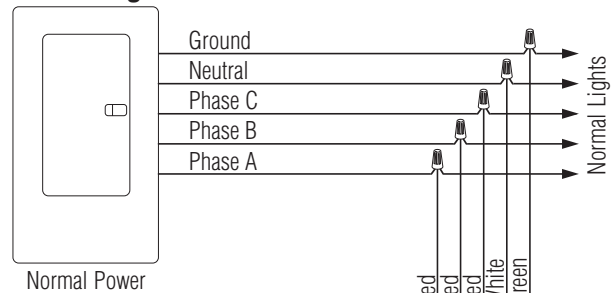
Single Phase Diagram



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.

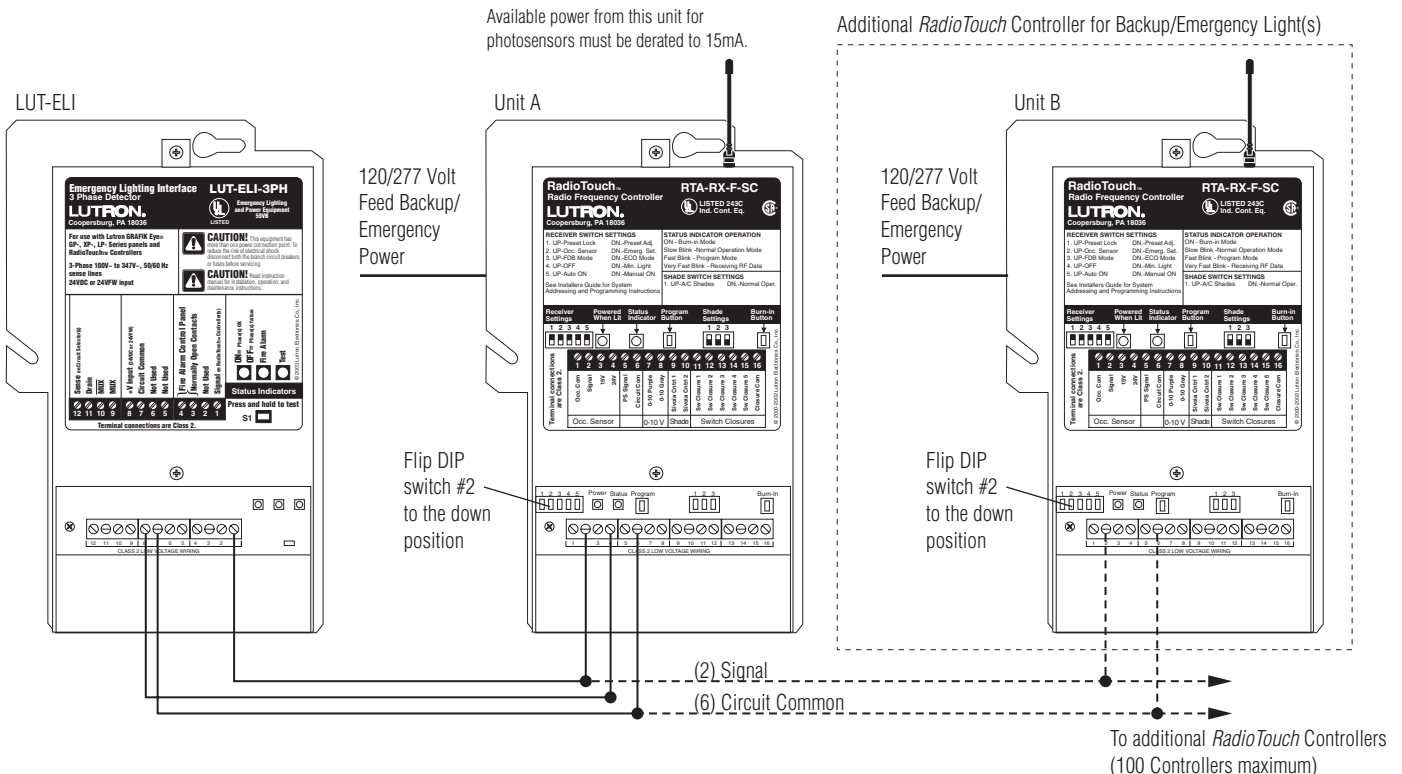
Or, press and hold Switch SW1 on the LUT-ELI

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.



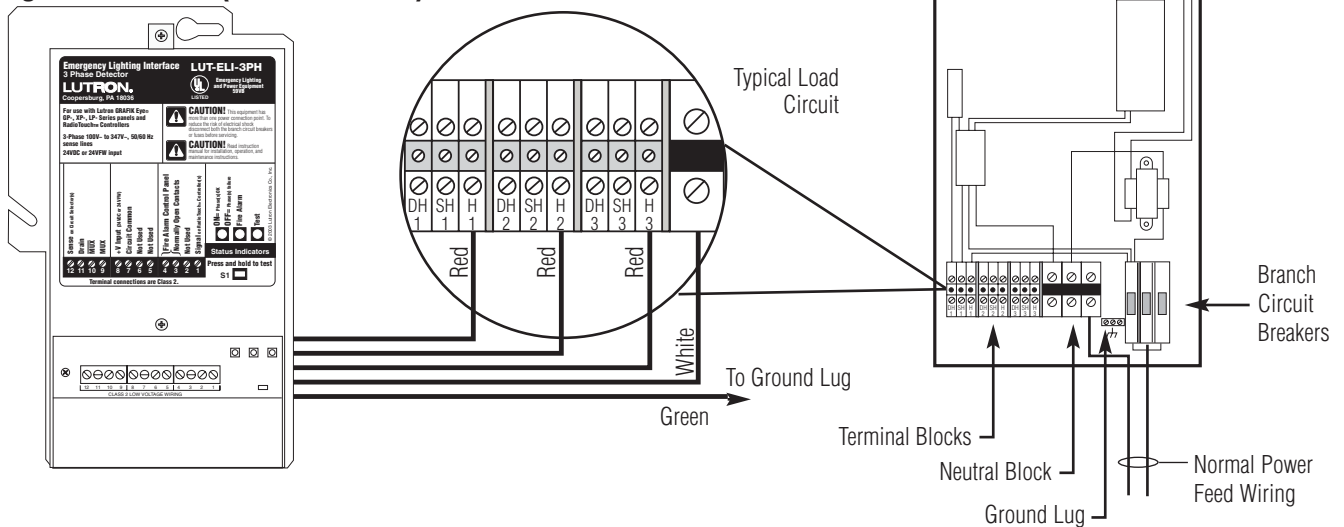
Important – Line voltage input to the LUT-ELI MUST be from the NORMAL power source – the same as to NORMAL (Non-Essential) panels.

For installation directly to XP and LP panels consult the Lutron Technical Support Center at (800) 523-9466.

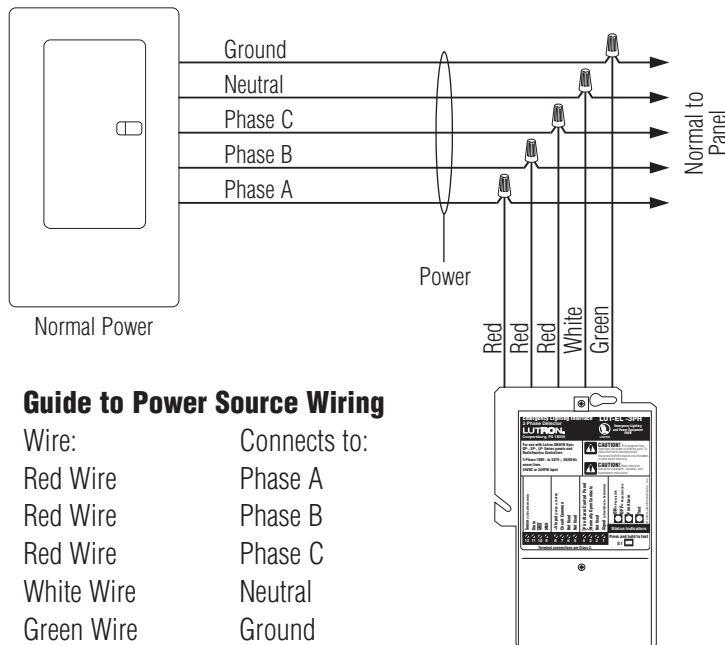


Danger – Proper short circuit and overcurrent protection must be provided at the distribution panel. You can use up to a **20A maximum** circuit breaker for your installation.

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

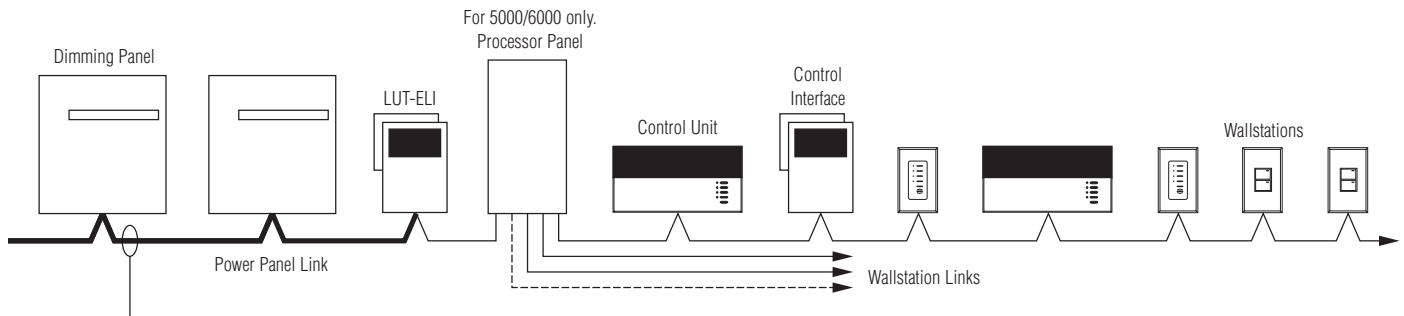


Step 2: GP, XP, and LP Low-voltage Class 2 (PELV) Wiring

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[†]

Include one extra #18 AWG (1.0 mm²). Used as a "sense line" for emergency (essential) lighting.

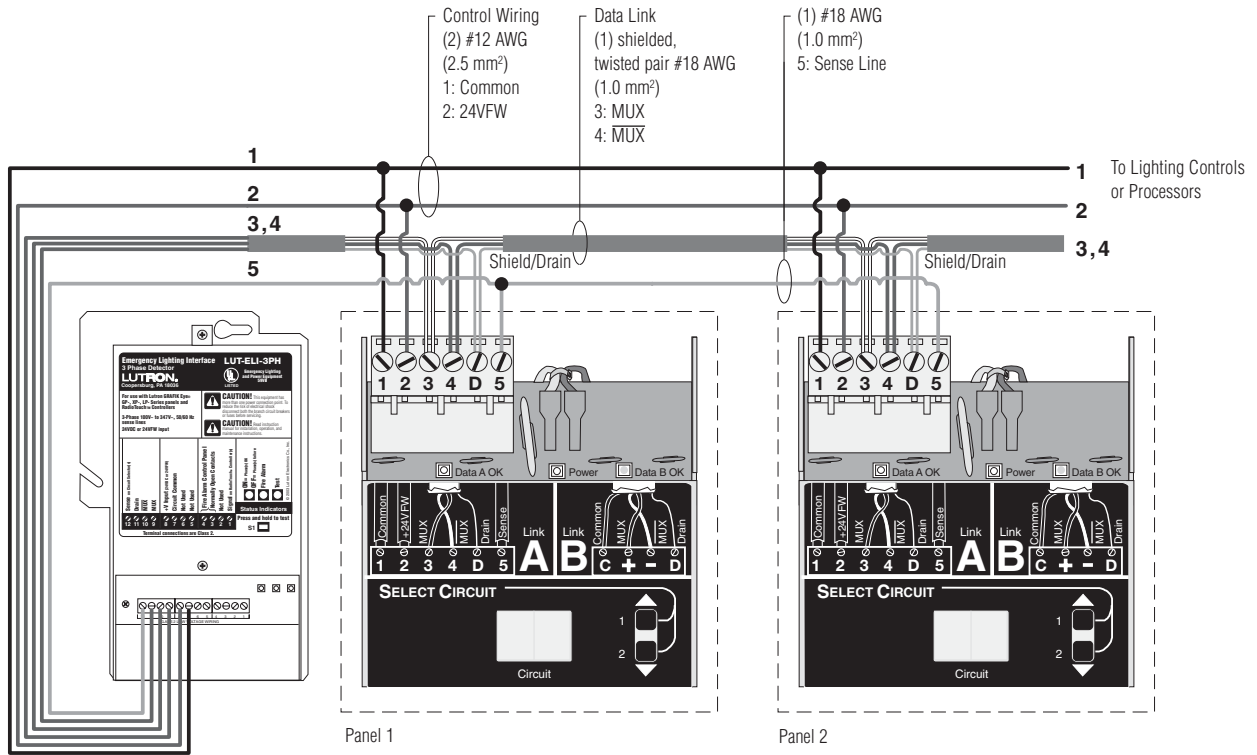
[†] If you use Lutron cable, you can use smaller-gauge wires.

- If a Class 2 (PELV) wiring link is less than 500 feet (152 m), you can use GRX-CBL-346S:
 - Two #18AWG (1.0 mm²) for control wiring.
 - One twisted, shielded pair #22 AWG (.625 mm²) for data link.
 - No "sense line" included - add your own #18 AWG (1.0 mm²).
- 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 mm²) for control wiring.
 - One twisted, shielded pair #22 AWG (.625 mm²) for data link.
 - One #18 AWG (1.0 mm²) 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

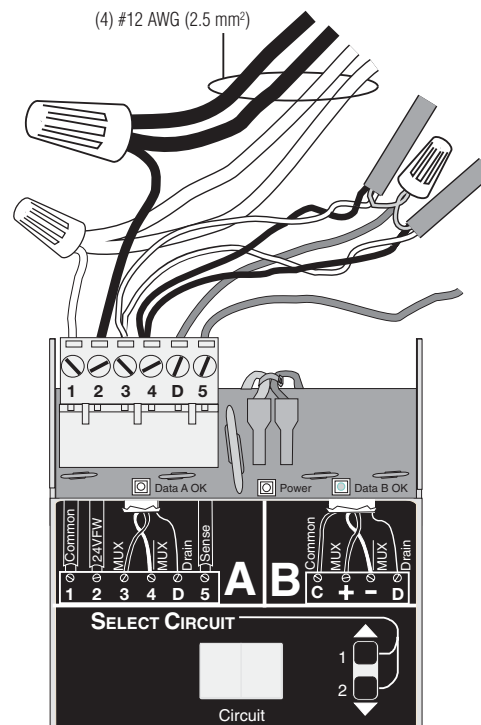
- Terminal 12 (Sense)
- Terminal 11 (Drain)
- Terminal 10 (MUX)
- Terminal 9 (MUX)
- Terminal 8 (+24V)
- Terminal 7 (Common)

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 mm²) 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 mm²) wires. Two #12 AWG (2.5 mm²) 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,

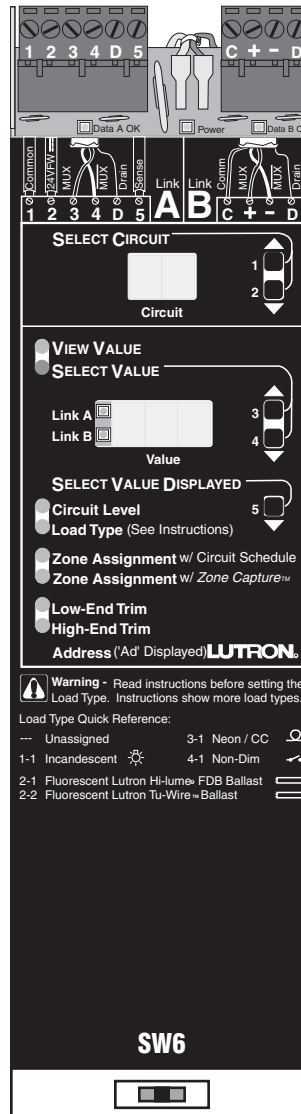
- PHASE ON/OFF Status Indicator (Green) will turn OFF as the above test creates a phase failure.
- Circuit Selector on Emergency (Essential) Panel will go to 'ord' override mode.
- All lights controlled by Emergency (Essential) Panel will go to FULL INTENSITY (factory set).
- All lights controlled by Normal (Non-essential) Panel will freeze at their respective intensities.

OR, Press and hold Switch SW1

You should expect the following,

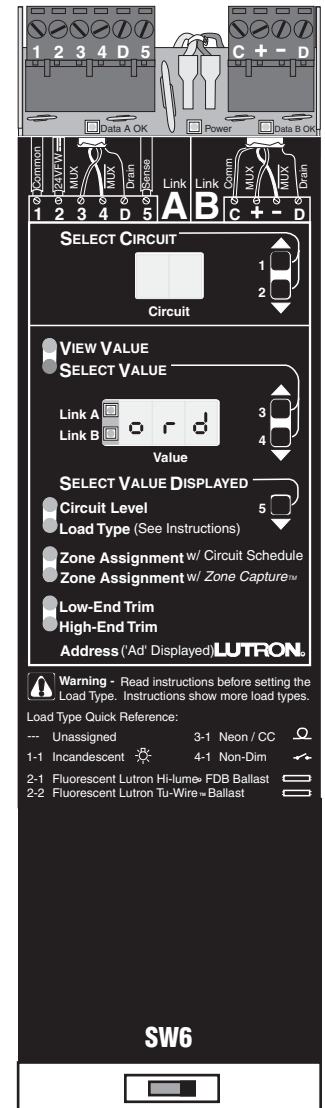
- TEST LED (Orange) will turn ON.
- NOTE:** PHASE ON/OFF Status Indicator (Green) will not turn OFF as the above test doesn't create a phase failure.
- Circuit Selector on Emergency (Essential) Panel will go to 'ord' override mode.
- All lights controlled by Emergency (Essential) Panel will go to FULL INTENSITY (factory set).

Circuit Selector in (Non-Emergency) Panel



Keep in Middle Position

Circuit Selector in Emergency (Essential) Lighting Panel

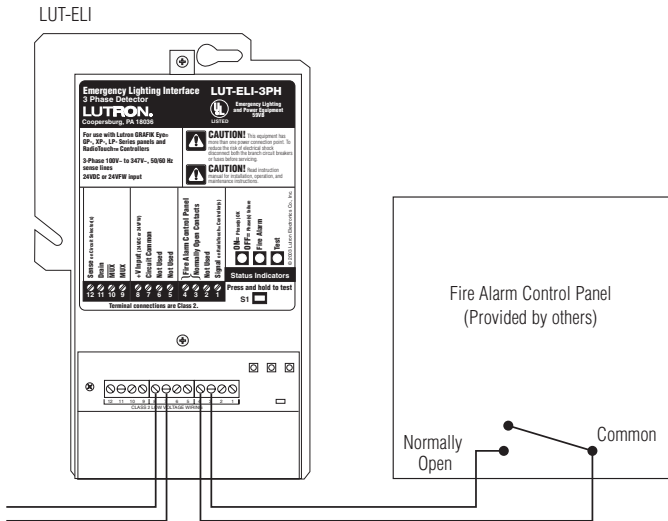


Move Right

- 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"> LUT-ELI is not connected to Signal on the <i>RadioTouch</i> Controller One or more of the phases feeding the LUT-ELI are off (phase LED on the LUT-ELI will be off) Neutral is not connected on the LUT-ELI (phase LED on the LUT-ELI will be OFF) 24VDC is not connected on the LUT-ELI (phase LED on the LUT-ELI will be OFF) There is a short across FACP and normally open contact (FACP LED will be ON) 	<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"> • DIP switch 2 on the <i>RadioTouch</i> Controller is in the UP position • 24VDC and signal are swapped • 24VDC and common wires are swapped • Common and signal are swapped 	<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"> • DIP switch 2 on the <i>RadioTouch</i> Controller is in the UP position • 24VDC and signal are swapped • That <i>RadioTouch</i> Controller is not powered by the emergency circuit power • The emergency transfer switch is not switching over • LUT-ELI is connected to the emergency circuit • 24VDC and common wires are swapped • Common and signal are swapped 	<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)

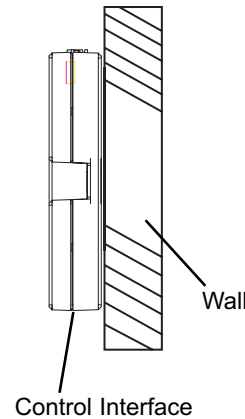
Symptom	Possible Cause	Solution
Lights are at full intensity and can not be controlled by the wallstation (Circuit Selector reads "ord")	<ul style="list-style-type: none"> • Sense wire is not connected from the Circuit Selector to the LUT-ELI • One or more of the phases feeding the LUT-ELI are off (phase LED on the LUT-ELI will be OFF) • Neutral is not connected on the LUT-ELI (phase LED on the LUT-ELI will be OFF) • 24VFW is not connected on the LUT-ELI (phase LED on the LUT-ELI will be OFF) • There is a short across FACP and normally open contact (FACP LED will be ON) • 24VFW and sense are swapped • Common and sense are swapped 	<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"> • SW6 on the Circuit Selector is in the middle position or far left position • 24VDC and common wires are swapped 	<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"> • SW6 on the Circuit Selector is in the middle position or far left position • 24VDC and common wires are swapped • That Emergency Panel is not powered by the emergency circuit • The emergency transfer switch is not switching over • LUT-ELI is connected to the emergency circuit 	<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>

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

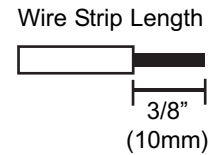
Mounting

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 (1.0mm²) 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.

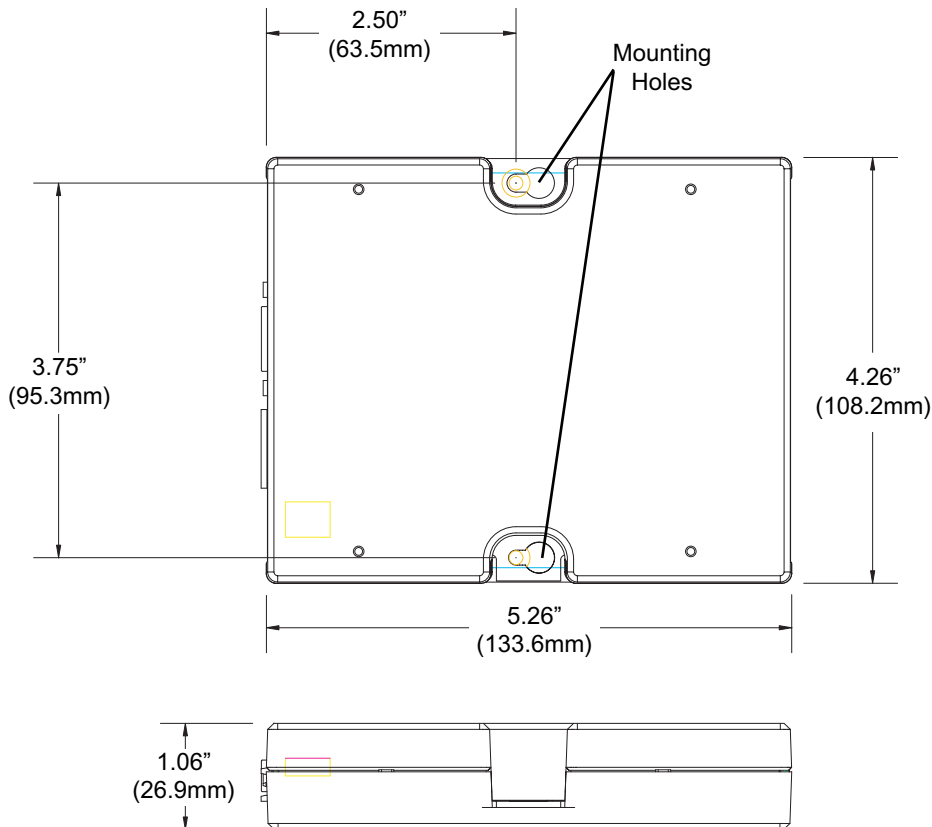
Mounting Diagram



LUT-19AV-1U



Dimensions

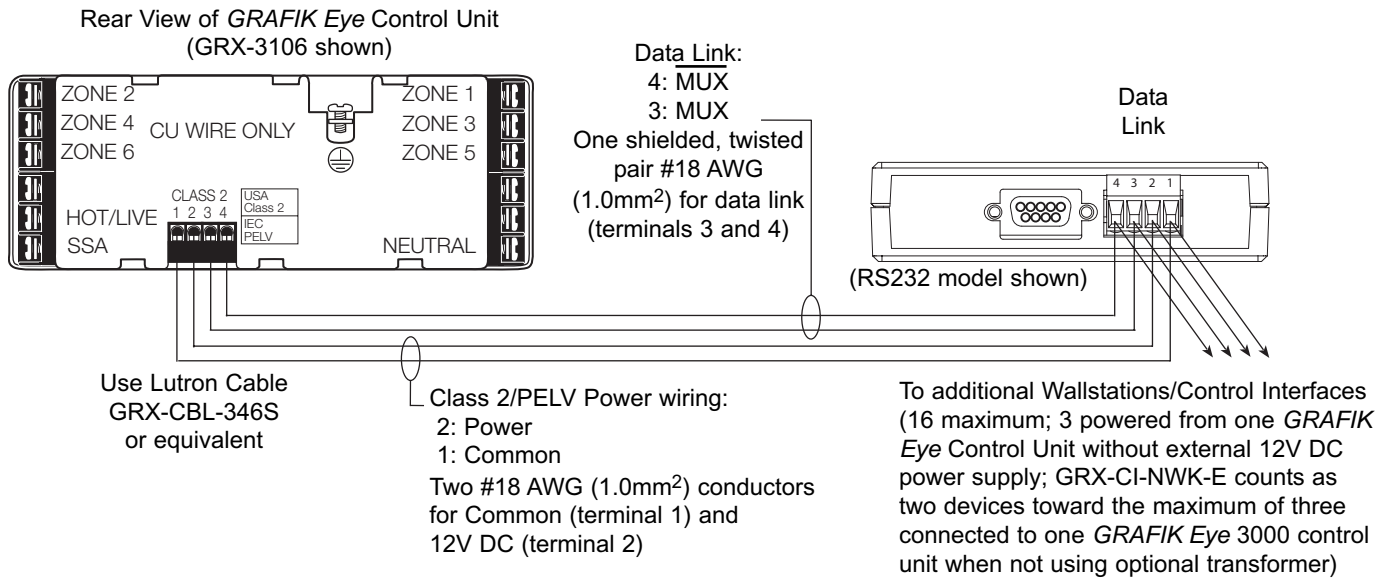


Low-Voltage Class 2 (PELV) Wiring

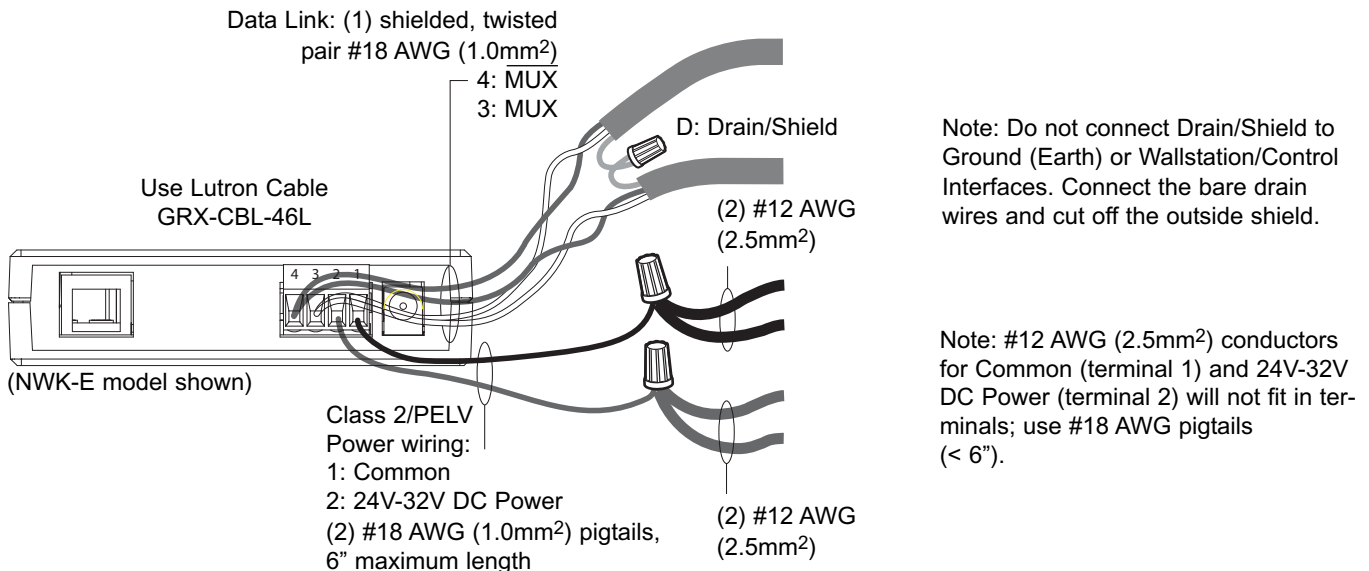
Important Notes

- 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 (1.0mm²) wires.

Control Interface Wiring: GRX-3000 Control Unit

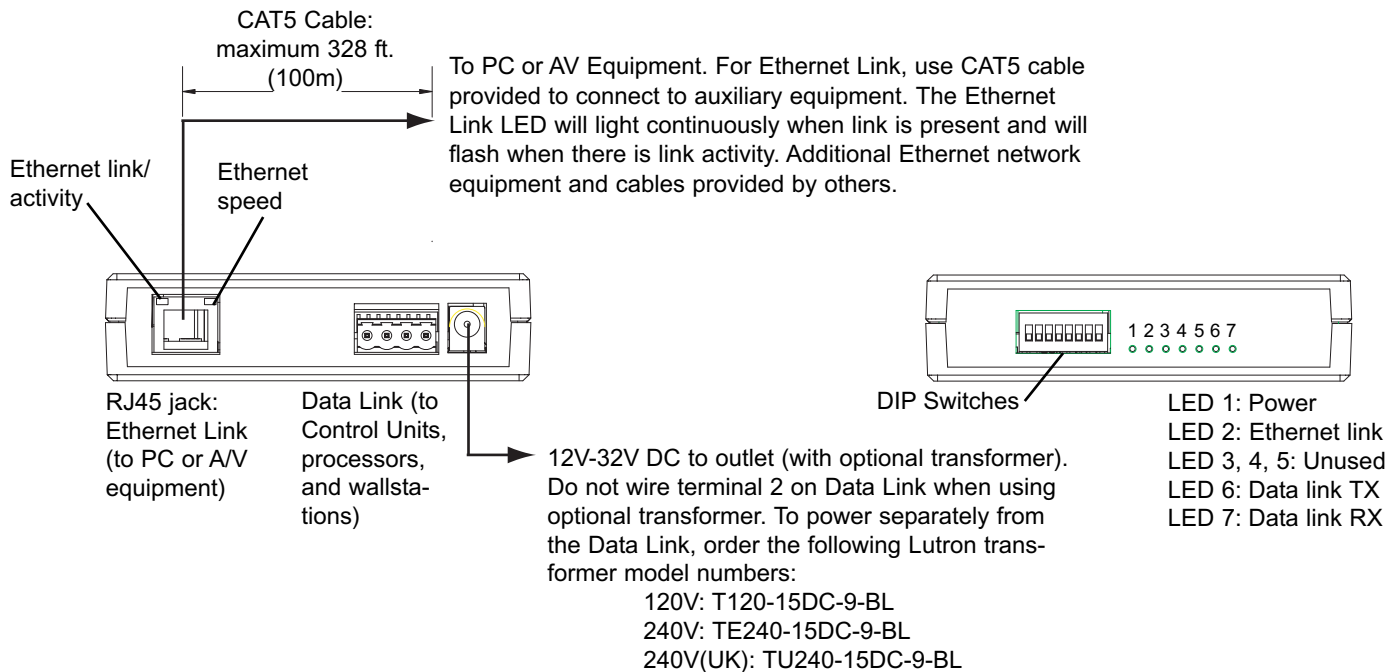


Control Interface Wiring: GRX-4000 Control Unit or OMX Control Station Device Link (Data Link connection shown)

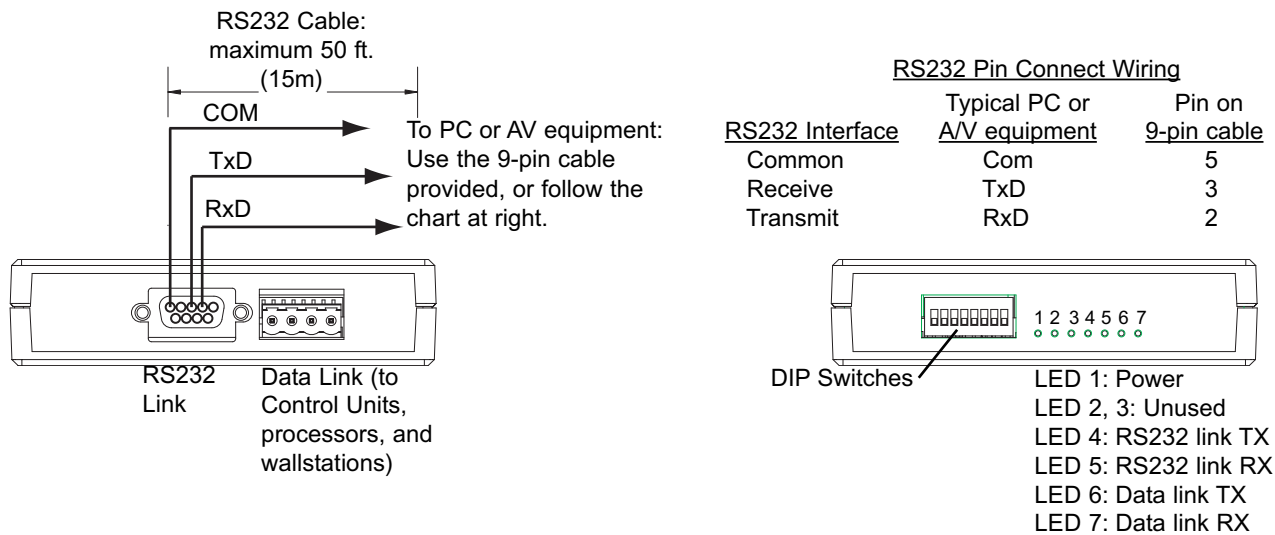


A/V Connections and Signal/Link Information

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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FAX +86-21-62881751

LIMITED WARRANTY

Lutron will, at its option, repair or replace any unit that is defective in materials or manufacture within one year after purchase. For warranty service, return unit to place of purchase or mail to Lutron at 7200 Suter Rd., Coopersburg, PA 18036-1299, postage pre-paid. *This warranty is in lieu of all other express warranties, and the implied warranty of merchantability is limited to one year from purchase. This warranty does not cover the cost of installation, removal or reinstallation, or damage resulting from misuse, abuse, or improper or incorrect repair, or damage from improper wiring or installation. This warranty does not cover incidental or consequential damages. Lutron's liability on any claim for damages arising out of or in connection with the manufacture, sale, installation, delivery, or use of the unit shall never exceed the purchase price of the unit.* This warranty gives you specific legal rights, and you may also have other rights which vary from state to state. Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

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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)

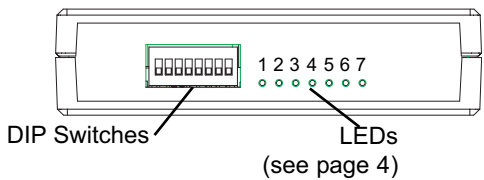
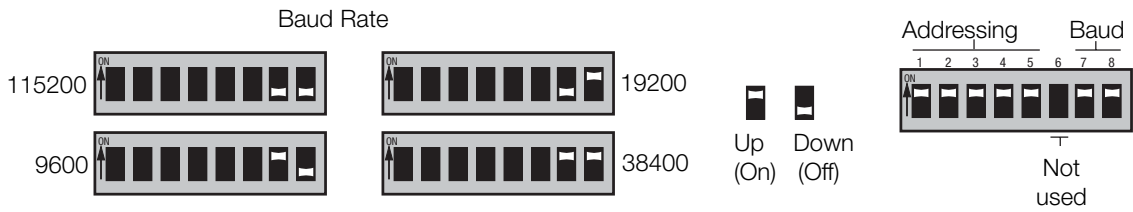
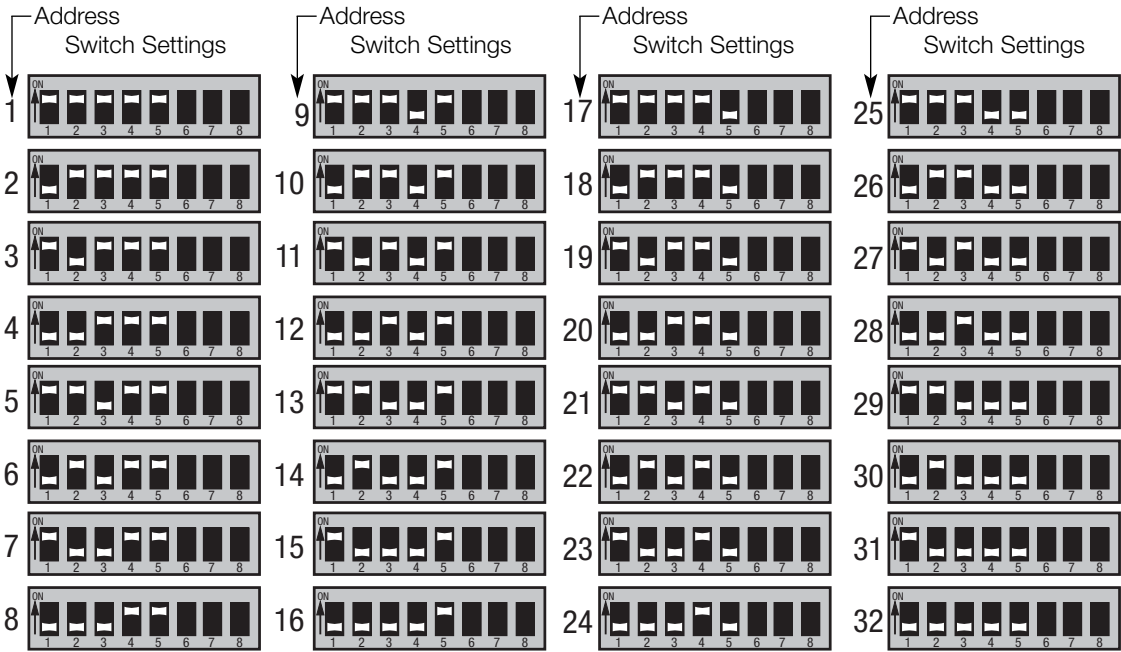
0x68(h)

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

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

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

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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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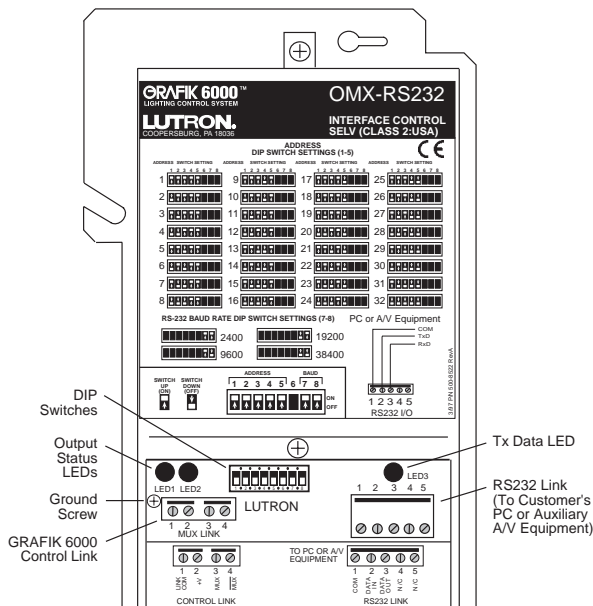
To make a warranty claim, promptly notify Lutron within the warranty period described above by calling the Lutron Technical Support Center at (800) 523-9466. Lutron, in its sole discretion, will determine what action, if any, is required under this warranty. To better enable Lutron to address a warranty 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.

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U.S. and foreign patents pending.

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Description

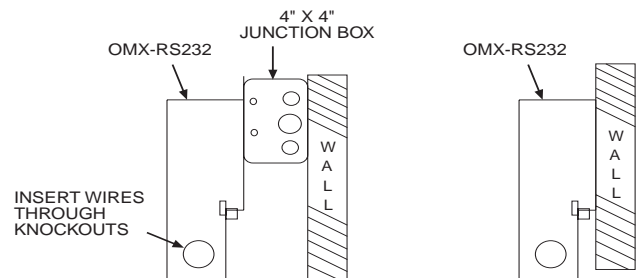
The OMX-RS232 Interface Control allows customer-supplied equipment with a RS232 port to communicate with a GRAFIK 6000 System. Multiple units can be used to provide for multi-point RS232 interface to the system. The customer's equipment can execute all user interface commands and receive system status details on request. RS232 communication baud rate is selectable via a DIP Switch. For complete details on the RS232 command structure, refer to Lutron document 040-134 "GRAFIK 6000 RS232 Commands".

Important Notes

1. Install in accordance with all national and local electrical codes.
2. Turn power OFF at the control panel before installing controls. Do not connect line/mains voltage to Class 2/PELV terminals. Improper wiring can result in personal injury or damage to the control and to other equipment.
3. This control can use Class 2/PELV wiring methods. Check with your local electrical inspector for compliance with local codes and wiring practices.

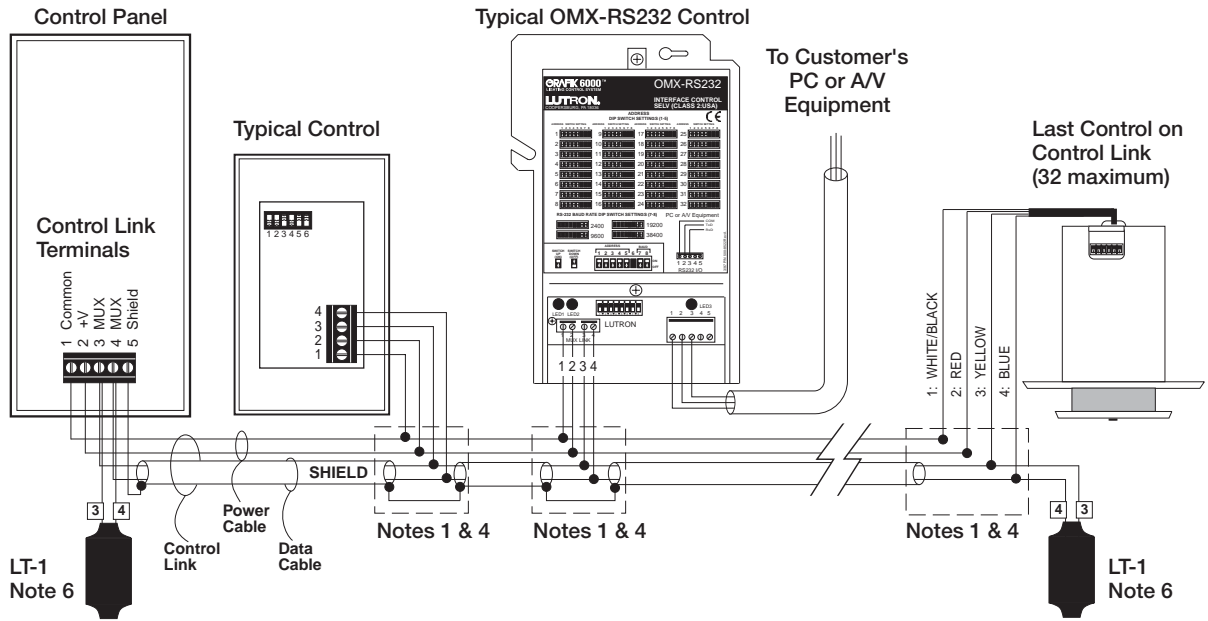
Installation

1. **Prewiring:** The Control Links require 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 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. Mount the OMX-RS232 Control to a junction box or to a wall as shown. If the unit is not mounted to a metal junction box, ensure proper grounding of the metal casing by connecting a ground wire to the ground screw. Unscrew and remove the front enclosure cover to expose the terminal blocks, DIP Switches, and Output Status LEDs. Insert wires through side knockouts only.

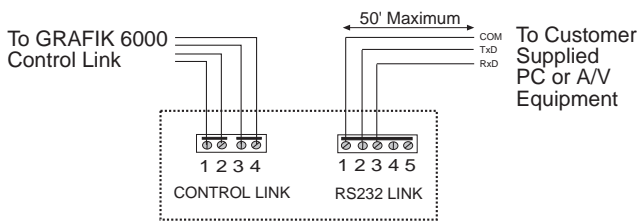


4. **Assign Addresses:**
Address all controls on the Control Link. Refer to Lutron job drawings for any preassigned job-specific address for each control. Each Control Link can support up to 32 controls. For proper system operation, each control on a link must have a unique address. Set DIP Switches 1—5 on each control to the appropriate position. Record assignments for future reference.
5. **Select RS232 baud rate:**
Set DIP Switches 7 and 8 to select the same baud rate as the RS232 equipment. Refer to the unit label for DIP Switch settings.
6. 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, splice a #18 AWG wire to the wires to make the connection.
7. Connect Control Link wiring as shown in Typical Control Link Wiring Diagram. Confirm all connections.
8. Connect customer's equipment to the RS232 link with the 9 pin cable provided (P/N 243-123) or follow the Typical Interface Wiring Diagram.
9. Replace front enclosure cover. Restore power to the control panel after the installation of the system is complete.

Typical Control Link Wiring Diagram



Typical Interface Wiring Diagram



RS232 Link OMX-RS232	Typical PC or A/V equipment	Pin on 9 pin cable
1 Common	Com	5
2 Data In	TxD	3
3 Data Out	RxD	2

Wiring Notes:

1. Connection of the control to the Control Link should be made inside the OMX-RS232 or on a junction box (provided by others) located no more than 8 feet from the control.
2. Control Link wiring must not be run in the same raceway as line/mains voltage.
3. Total Control Link length is not to exceed 2000 feet unless signal is boosted using a link booster (MX-RPTR).
4. Data cable shield must be maintained throughout the Control Link. DO NOT connect the shield to earth/ground.
5. Refer to the GRAFIK 6000 Installation Guide and Lutron job drawings for Control Link wiring restrictions and limitations.
6. Control Link requires an LT-1 (Link Termination Assembly) at each end of the Control Link. Refer to LT-1 instruction sheet for location and installation information.

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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; 4,803,360; 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; DES 5,808,417 and corresponding foreign patents. U.S. and foreign patents pending.

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P/N 040-133 Rev. C

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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

Range	0 - 7Fh	0 - 99%
Set to Off	0h (0%)	Opens air gap relay
Set to Minimum	1h	Only for non-dim zones
Set to Maximum (full On)	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)

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<CR> 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.

SET IP ADDRESS	
Command Name	sip
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.

READ IP ADDRESS	
Command Name	rip
Description	Returns the IP address of the device.
Syntax	~rip<CR>
Response	:ip xxx.xxx.xxx.xxx

SET SUBNET MASK	
Command Name	ssm
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.

READ SUBNET MASK	
Command Name	rsm
Description	Returns the Subnet mask of the device.
Syntax	~rsm<CR>
Response	:sm xxx.xxx.xxx.xxx

Ethernet Setup Commands (continued)

SET GATEWAY	
Command Name	sgw
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.

READ GATEWAY	
Command Name	rgw
Description	Returns the gateway address of the device.
Syntax	~rgw<CR>
Response	:gw xxx.xxx.xxx.xxx

SET LOGIN NAME	
Command Name	sln
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.

READ LOGIN NAME	
Command Name	rln
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

DEVICE RESET	
Command Name	rst
Description	Resets the device. All connections are immediately closed and the device resets.
Syntax	~rst<CR>

Circuit/Zone/Scene Commands

FADE TO LEVEL	
Applicable Systems	LCP128_m XPS Softswitch128_s GRAFIK 5000_m/6000_s/7000_m
Command Number (hex)	7
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.

FADE TO LEVELS AND REPEAT	
Applicable Systems	LCP128_m XPS Softswitch128_s GRAFIK 5000_m/6000_s/7000_m
Command Number (hex)	D
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 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)

SELECT SYSTEM SCENE	
Applicable Systems	LCP128™ XPS Softswitch128™ GRAFIK 5000™/6000™/7000™
Command Number (hex)	12
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.

HALT ZONE	
Applicable Systems	GRAFIK 5000™/6000™/7000™
Command Number (hex)	1
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.

TOGGLE ZONE	
Applicable Systems	GRAFIK 5000™/6000™/7000™
Command Number (hex)	6
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)

RAMP CIRCUITS UP	
Applicable Systems	LCP128™ XPS Softswitch128®
Command Number (hex)	500 (switch press; start raise) 600 (switch release; stop raise)
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 <i>LCP128/XPS</i> 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).

RAMP CIRCUITS DOWN	
Applicable Systems	LCP128™ XPS Softswitch128®
Command Number (hex)	500 (switch press; start lower) 600 (switch release; stop lower)
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 <i>LCP128/XPS</i> 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)

RAMP UP SYSTEM ZONE	
Applicable Systems	GRAFIK 5000 _m /6000 _s /7000 _m
Command Number (hex)	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.

RAMP DOWN SYSTEM ZONE	
Applicable Systems	GRAFIK 5000 _m /6000 _s /7000 _m
Command Number (hex)	C
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)

STOP RAMP UP ALL ZONES IN LAST SCENE SELECTED	
Applicable Systems	GRAFIK 5000 _m /6000 _e /7000 _m
Command Number (hex)	22
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

STOP RAMP DOWN ALL ZONES IN LAST SCENE SELECTED	
Applicable Systems	GRAFIK 5000 _m /6000 _e /7000 _m
Command Number (hex)	23
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

SELECT SYSTEM SCENE USING OVERRIDE TIMES	
Applicable Systems	GRAFIK 5000 _m /6000 _e /7000 _m
Command Number (hex)	13
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)

SELECT TEMP SCENE	
Applicable Systems	GRAFIK 5000.m/6000.e/7000.m
Command Number (hex)	1C
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.


SELECT SCENE OF SPACE	
Applicable Systems	GRAFIK 5000.m/6000.e/7000.m
Command Number (hex)	1E
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)

GET CIRCUIT/ZONE INTENSITY LEVEL	
Applicable Systems	LCP128™ XPS Softswitch128® GRAFIK 5000™/6000®/7000™
Command Number (hex)	805
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%)

GET STATUS OF SPACE	
Applicable Systems	GRAFIK 5000™/6000®/7000™
Command Number (hex)	801
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)

GET STATUS OF SCENES IN SPACE	
Applicable Systems	
Command Number (hex)	830
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

SET SYSTEM TIME AND DATE	
Applicable Systems	LCP128™ XPS Softswitch128® GRAFIK 5000™/6000®/7000™
Command Number (hex)	207
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.

GET SYSTEM TIME	
Applicable Systems	LCP128™ XPS Softswitch128® GRAFIK 5000™/6000®/7000™
Command Number (hex)	808
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.).

GET SYSTEM DATE	
Applicable Systems	LCP128™ XPS Softswitch128® GRAFIK 5000™/6000®/7000™
Command Number (hex)	80A
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)

GET SUNRISE/SUNSET TIMES	
Applicable Systems	LCP128™ XPS Softswitch128® GRAFIK 5000™/6000®/7000™
Command Number (hex)	809
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.).
GET TIMECLOCK STATUS	
Applicable Systems	LCP128™ XPS Softswitch128® GRAFIK 5000™/6000®/7000™
Command Number (hex)	802
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)

DISABLE TIMECLOCK UNTIL AN ENABLE IS ISSUED	
Applicable Systems	LCP128™ XPS Softswitch128® GRAFIK 5000™/6000®/7000™
Command Number (hex)	201
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.

DISABLE TIMECLOCK UNTIL END OF DAY OR UNTIL AN ENABLE IS ISSUED	
Applicable Systems	GRAFIK 5000™/6000®/7000™
Command Number (hex)	202
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)

ENABLE TIMECLOCK	
Applicable Systems	LCP128™ XPS Softswitch128® GRAFIK 5000™/6000®/7000™
Command Number (hex)	205
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.

ENABLE TIMECLOCK AND EXECUTE MISSED COMMANDS	
Applicable Systems	GRAFIK 5000™/6000®/7000™
Command Number (hex)	203
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.

ENABLE TIMECLOCK AND EXECUTE PREVIOUS COMMAND	
Applicable Systems	GRAFIK 5000™/6000®/7000™
Command Number (hex)	204
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

ENABLE WALLSTATION	
Applicable Systems	LCP128™ XPS Softswitch128® GRAFIK 5000™/6000®/7000™
Command Number (hex)	300
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.

DISABLE WALLSTATION	
Applicable Systems	LCP128™ XPS Softswitch128® GRAFIK 5000™/6000®/7000™
Command Number (hex)	301
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)

SIMULATE WALLSTATION SWITCH PRESS	
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)	500 - 50B (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.

SIMULATE WALLSTATION SWITCH RELEASE	
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)	600 - 60B (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)

SET SYSTEM VARIABLE	
Applicable Systems	GRAFIK 5000 _m /6000 _s /7000 _m
Command Number (hex)	40D
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.
GET VARIABLE VALUE	
Applicable Systems	GRAFIK 5000 _m /6000 _s /7000 _m
Command Number (hex)	815
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)

GET WALLSTATION/CONTROL STATION DEVICE STATUS	
Applicable Systems	GRAFIK 5000 _m /6000 _e /7000 _m
Command Number (hex)	803
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).

GET SWITCH/BUTTON STATUS	
Applicable Systems	GRAFIK 5000 _m /6000 _e /7000 _m
Command Number (hex)	804
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

GET OPERATING SYSTEM REV LEVEL	
Applicable Systems	LCP128™ XPS Softswitch128® GRAFIK 5000™/6000®/7000™
Command Number (hex)	811
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.
GET BOOT CODE REV LEVEL	
Applicable Systems	LCP128™ XPS Softswitch128® GRAFIK 5000™/6000®/7000™
Command Number (hex)	812
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- _{ns}	9
6	Toggle Zone	GRAFIK 5000-/6000-/7000- _{ns}	9
7	Fade to Level	LCP128- _{ns} XPS Softswitch128- _o GRAFIK 5000-/6000-/7000- _{ns}	8
B	Ramp Up System Zone	GRAFIK 5000-/6000-/7000- _{ns}	11
C	Ramp Down System Zone	GRAFIK 5000-/6000-/7000- _{ns}	11
D	Fade to Levels and Repeat	LCP128- _{ns} XPS Softswitch128- _o GRAFIK 5000-/6000-/7000- _{ns}	8
12	Select System Scene	LCP128- _{ns} XPS Softswitch128- _o GRAFIK 5000-/6000-/7000- _{ns}	9
13	Select System Scene Using Override Times	GRAFIK 5000-/6000-/7000- _{ns}	13
1C	Select Temp Scene	GRAFIK 5000-/6000-/7000- _{ns}	14
1E	Select Scene of Space	GRAFIK 5000-/6000-/7000- _{ns}	14
20	Ramp Up All Zones in Last Scene Selected	GRAFIK 5000-/6000-/7000- _{ns}	12
21	Ramp Down All Zones in Last Scene Selected	GRAFIK 5000-/6000-/7000- _{ns}	12
22	Stop Ramp Up All Zones in Last Scene Selected	GRAFIK 5000-/6000-/7000- _{ns}	13
23	Stop Ramp Down in Last Scene Selected	GRAFIK 5000-/6000-/7000- _{ns}	13
201	Disable Timeclock Until an Enable is Issued	GRAFIK 5000-/6000-/7000- _{ns}	19
202	Disable Timeclock Until End of Day or Until an Enable is Issued	LCP128- _{ns} XPS Softswitch128- _o GRAFIK 5000-/6000-/7000- _{ns}	19
203	Enable Timeclock and Execute Missed Commands	GRAFIK 5000-/6000-/7000- _{ns}	20
204	Enable Timeclock and Execute Previous Command	GRAFIK 5000-/6000-/7000- _{ns}	20
205	Enable Timeclock	LCP128- _{ns} XPS Softswitch128- _o GRAFIK 5000-/6000-/7000- _{ns}	20
207	Set System Time and Date	LCP128- _{ns} XPS Softswitch128- _o GRAFIK 5000-/6000-/7000- _{ns}	17
300	Enable Wallstation	LCP128- _{ns} XPS Softswitch128- _o GRAFIK 5000-/6000-/7000- _{ns}	21
301	Disable Wallstation	LCP128- _{ns} XPS Softswitch128- _o GRAFIK 5000-/6000-/7000- _{ns}	21
40D	Set System Variable	GRAFIK 5000-/6000-/7000- _{ns}	23
500, 600	Ramp Circuits Up/Down	LCP128- _{ns} XPS Softswitch128- _o	10
500-50B	Simulate Wallstation Switch Press	LCP128- _{ns} XPS Softswitch128- _o GRAFIK 5000-/6000-/7000- _{ns}	22
600-60B	Simulate Wallstation Switch Release	LCP128- _{ns} XPS Softswitch128- _o GRAFIK 5000-/6000-/7000- _{ns}	22

Command Number	Command Name	Applicable Systems	Page #
801	Get Status of Space	GRAFIK 5000 _{rs} /6000 _{rs} /7000 _{rs}	15
802	Get Timeclock Status	LCP128 _{rs} XPS Softswitch128 _{rs} GRAFIK 5000 _{rs} /6000 _{rs} /7000 _{rs}	18
803	Get Wallstation/Control Station Device Status	GRAFIK 5000 _{rs} /6000 _{rs} /7000 _{rs}	24
804	Get Switch/Button Status	GRAFIK 5000 _{rs} /6000 _{rs} /7000 _{rs}	24
805	Get Zone Intensity	LCP128 _{rs} XPS Softswitch128 _{rs} GRAFIK 5000 _{rs} /6000 _{rs} /7000 _{rs}	15
808	Get System Time	LCP128 _{rs} XPS Softswitch128 _{rs} GRAFIK 5000 _{rs} /6000 _{rs} /7000 _{rs}	17
809	Get Sunrise/Sunset Times	LCP128 _{rs} XPS Softswitch128 _{rs} GRAFIK 5000 _{rs} /6000 _{rs} /7000 _{rs}	18
80A	Get System Date	LCP128 _{rs} XPS Softswitch128 _{rs} GRAFIK 5000 _{rs} /6000 _{rs} /7000 _{rs}	17
811	Get Operating System Rev Level	LCP128 _{rs} XPS Softswitch128 _{rs} GRAFIK 5000 _{rs} /6000 _{rs} /7000 _{rs}	25
812	Get Boot Code Rev Level	LCP128 _{rs} XPS Softswitch128 _{rs} GRAFIK 5000 _{rs} /6000 _{rs} /7000 _{rs}	25
815	Get Variable Value	GRAFIK 5000 _{rs} /6000 _{rs} /7000 _{rs}	23
830	Get Status of Scenes in Space	GRAFIK 5000 _{rs} /6000 _{rs} /7000 _{rs}	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 (0 - 127)	Percentage (0 - 100)	Intensity (0 - 127)	Percentage (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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