



# Lighting Control & Design

# APPLICATION GUIDE & PRODUCT CATALOG

2012



# LC&D

## TECHNOLOGY TIMELINE

- 1987 First Relay Solution
- 1993 GR 2400 Digital System
- 1997 Blue Box Classic
- 2000 Unity & Unity GX
- 2002 MicroPanel
- 2003 RF Fully Wireless Controls
- 2004 SmartBreaker Panels
- 2006 Quintessence & SilverBullet
- 2007 SnapLink Latching Relay
- 2008 XPoint Backbone Bus
- 2009 Fiber Direct Long Distance Bus
- 2011 First Single Room Packages
- 2012 RF Room Controller

**Easy to use lighting controls  
for any application™**

[www.lightingcontrols.com](http://www.lightingcontrols.com)

# LC&D Lighting Control & Design

Lighting Control & Design provides practical control systems that are easy to program and meet the needs of the specifying engineer, contractor and facility manager. Regardless of the lighting environment, we can tailor our offering to meet your specific needs. When other companies say “no”, we prefer to say “yes, we can do that”, with fast innovation and tailored functionality that works reliably every time.



**AcuityBrands.**

*Expanding the boundaries of lighting™*

Acuity Brands is an industry leader of lighting controls and energy management systems. Through its portfolio of brands, Acuity provides solutions that substantially reduce energy consumption and increase the comfort of occupants.

### OUR BRANDS:

- Lithonia Lighting · Acculamp · American Electric Lighting · Antique Street Lamps
- Carandini · Dark To Light · Gotham · Healthcare Lighting · Holophane · Hydrel
- Lighting Control & Design · Mark Architectural Lighting · Peerless
- Pathway Connectivity · RELOC · ROAM · Sensor Switch · Sunoptics · Tersen
- Synergy · Winona Lighting



LEFT: LC&D Headquarters in Chatsworth, CA

COVER PHOTO: Acuity Brands lighting controls headquarters in Conyers, GA

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## BENEFITS OF LIGHTING CONTROL

Our expertise is delivering reduced operational cost and enhanced occupant comfort within the bounds of building codes and sustainability initiatives.

### Optimize Building Performance

Combine various control strategies to maximize energy savings while ensuring occupant comfort.

### Reduce Operational Costs

In addition to lowering energy costs, LC&D solutions can reduce maintenance costs and increase the service life of lamps, ballasts, and LED drivers.

### Comprehensive Code Compliance

LC&D has a practical working knowledge of various building and electrical codes, including:

- ASHRAE 90.1
- IECC
- CA Title 24 (CEC Certified)
- UL 924 Compliant
- Seismic Certification ICC-ES AC 156

### Environmental Stewardship

LC&D's multi-faceted approach to energy reduction helps you meet sustainability initiatives, including:

- LEED Building Certification
- Net Zero Building
- Green Schools Initiative

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## WHY CHOOSE LC&D

### 1 Scalable Switching & Dimming Systems

Our networkable devices can be combined into a single configurable system to address any size project, thus eliminating complex choices about which “level” of system to use.

### 2 Distributed Intelligence

Each component contains local programming so if one portion of the network is compromised, the rest of the system will continue to operate as designed.

### 3 Factory Pre-Programming Available

Systems are fully tested and programmed during manufacturing to provide out-of-the-box operation.

### 4 Basic Programming Changes Included

Our technical support staff can access your system remotely via modem or Ethernet to modify wall station programming and time schedules.

### 5 Proudly Engineered & Assembled in USA for 25 Years

Designed, built, stocked, and serviced in California – we can rapidly respond to any customer request.



*LC&D LEED™ Gold  
project: Santa Monica  
Public Library, Southern  
California*

## DESIGN WITH CONFIDENCE

LC&D has built a reputation of helping engineers develop elegant solutions to complex problems. Our goal is to enable the design and construction community to apply lighting control best practices to any given project.



### DESIGN TEAM ASSISTANCE

LC&D combines extensive market experience and a diverse product portfolio to develop tailored lighting solutions.

Our design team is available through online chat, email, telephone, or in-person (at the factory) to support your project needs.



### SPECIFICATION TOOLS

Unity design software provides an intuitive interface to create panel and switch schedules, single line drawings, and capture program settings.

Our website offers various resources including CSI specifications, Revit/BIM files, wiring diagrams, data sheets, application guides, and online training.



### DETAILED SUBMITTAL & FACTORY DRAWINGS

Factory engineers review electrical drawings and specification documents to ensure compliance with design intent.

Detailed shop drawings include programming information, wiring diagrams, and product data sheets for engineer and contractor review.

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## INSTALL WITH EASE

LC&D understands the importance of turning over a project on time, in budget, and with no call backs. To that end, we provide specialized programming and packaging services that simplify your site logistics, installation and commissioning.

### PRE-ASSEMBLED

Factory wired and tested relay and breaker panels can reduce on site labor costs, shorten project time lines, and help eliminate costly installation errors.

Quick install guides provide a handy reference for mounting and wiring procedures.



### PRE-STAGED

Ready for rapid site deployment, we consolidate items and mark shipping containers in a manner that allows for easy identification.

Packaged Room Components contain all required parts and low voltage wiring, therefore eliminating the need to combine products onsite.



### PRE-PROGRAMMED

Site specific, out-of-the box functionality significantly reduces onsite configuration and programming time, therefore reducing labor and project management costs while positively impacting timelines.



## A SOLUTION FOR EVERY NEED



### PACKAGED ROOM COMPONENTS

- Versatile input and output devices which combine to form tailored room solutions that come pre-programmed and packaged by specific room or area (complete with applicable low voltage cabling).
- Design templates allow you to quickly choose from prescribed products and programming, or select custom settings to suit unique project needs.



### QUICK CONFIGURED SYSTEMS

- Cost-effective and rapid-ready modular solutions.
- Minimal design and specification required.
- Flexible programming and product configuration satisfy a wide range of project requirements.






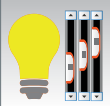
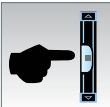




### FACTORY ENGINEERED SOLUTIONS

- Built-to-order relay and breaker assemblies combined with control devices and building integration gateways for a customized whole building solution.
- Fully engraved custom wall controls and switch banks available to solve demanding control scenarios.
- Engineers and contractors are supported by detailed design, submittal, and installation assistance.



# STRATEGIES THAT WORK

LC&D offers practical control solutions for new construction and retrofit projects. Our innovative products utilize various strategies to improve performance including:

STRATEGY	DESCRIPTION	SAVINGS
 <p>Scheduling</p>	<p>Automated control based on time of day, or relative to sunrise and sunset. Temporary timers and blink warnings ensure easy occupant override.</p>	<p>10-40%</p>
 <p>Occupancy Sensing</p>	<p>Turn off lights and set-back HVAC in unoccupied areas. Share occupancy information with BMS or security systems.</p>	<p>10-30%</p>
 <p>Daylight Harvesting</p>	<p>Seamlessly dim or switch artificial lighting in response to available daylight.</p>	<p>5-15%</p>
 <p>Task Tuning</p>	<p>Reduce eye strain and save additional energy by presetting light levels below 100% (full output).</p>	<p>5-15%</p>
 <p>Occupant Controls</p>	<p>Intuitive controls allow adjustment of lighting or temperature to maximize occupant comfort and productivity.</p>	<p>5-25%</p>
 <p>Load Shedding</p>	<p>Minimize peak demand charges and reduce real time energy usages through automated curtailment of various building electrical loads.</p>	<p>5-15%</p>
 <p>HVAC</p>	<p>Leverage lighting system scheduling, sensors, and wall stations to integrate HVAC control.</p>	<p>Situational</p>
 <p>Plug Load Control</p>	<p>Turn off plug loads based on time, occupancy or for load shedding.</p>	<p>Situational</p>
 <p>PC-Based Control</p>	<p>Remote control and monitoring of lighting and sensors simplifies building operations for facility managers and security staff.</p>	<p>Situational</p>

Potential cumulative savings from above strategies

40-65%

# 2 | Packaged Room Components

## RF PACK / RF NODE

The versatile RF Pack and distributed RF Node provides intelligent load control centers for many stand-alone room or mini systems. Featuring an integrated RF transceiver, they seamlessly connect to wireless switches, sensors, and other relays. Utilizing configurable priority mapping for system inputs will allow any device input to hold priority over another, therefore solving most retrofit and new construction switching applications.

### FEATURES

- Application specific control of local and distributed relays based on prioritized switch and sensor inputs, preset timers, and presence of mastering devices (ex. room keycard)
- Accepts up to 16 switch/sensor inputs (wireless or dry contact) and controls up to 16 main/low voltage relay outputs (up to 8 relays can be housed locally within panel)
- Provides multiple button programming schemes including toggle, single action, momentary, and timer override

### WIRELESS ACCESSORIES

- Rocker Switch: Self-powered (piezoelectric), single or dual pad
- Solar Occupancy Sensor\*: Passive infrared, available in ceiling and corner mount
- Solar Photocell\*: Can be oriented for open or closed loop operation
- Solar Window/Door Switch\*: Magnetic contact, differentiated output for open vs. close
- Keycard Switch: Wireless mechanical style, or wired IR beam with nightlight
- Gateway: Link to GR 2400 system for basic control & monitoring
- RF Node: Single 30A relay for control of a single fixture or an entire circuit

\*Optional battery back-up



For additional technical information, please see spec sheet on page 69.

### TYPICAL APPLICATIONS

OFFICE



DORM ROOM



HOTEL ROOM



# Office Pack

- Panel and RF Node quickly install wherever main circuits are feeding the space, and has option for integrated emergency relays for cost-effective code compliance.
- Fully wireless sensors can be quickly and easily moved for best cubicle/desk coverage.
- Wireless switches or remote controls can be used to change current light levels or activate lights when sensors are set to vacancy mode.



## OPEN OFFICE APPLICATION



LEGEND	
1	Office Pack
2	RF Node
3	Rocker Switch
4	Occupancy Sensor
5	Wireless Photocell
6	Occupancy Sensor




# Dorm Pack


- The combination of door/window contact switches and a wireless occupancy sensor enforce responsible energy usage by resident - when unoccupied the room de-powers (Turn off/Set back HVAC, lighting, and select plug loads)
- Intelligent Occupancy Verification: Room occupancy is verified only during the 10 minutes following a door closure, and is updated on subsequent door closures, thus avoiding false-off scenarios during studying or sleeping.


## DORM ROOM APPLICATION


**LEGEND**


- 1** RF Node

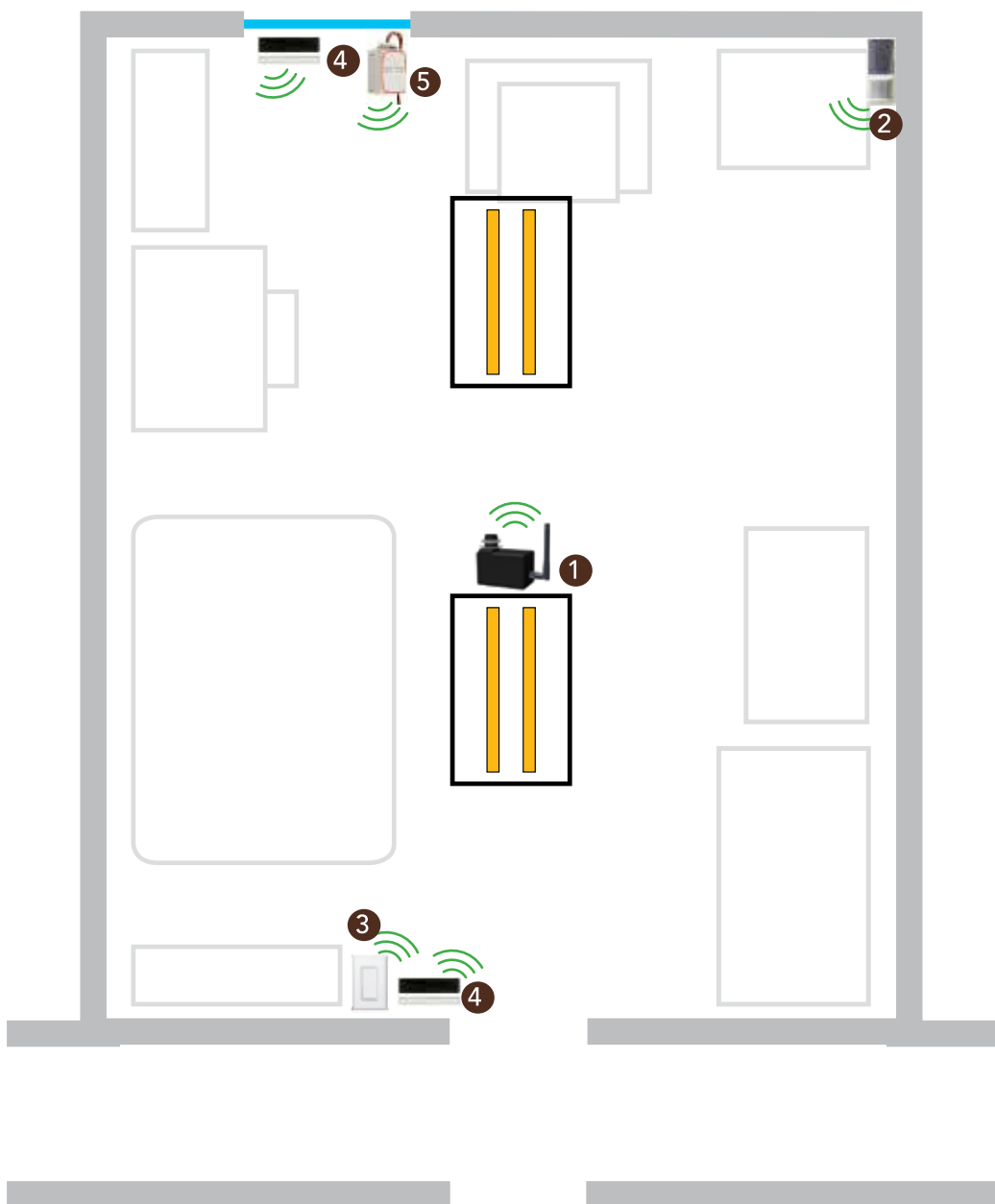

- 2** Occupancy Sensor


- 3** Rocker Switch


- 4** RF Contact Switch


- 5** HVAC Setback Module



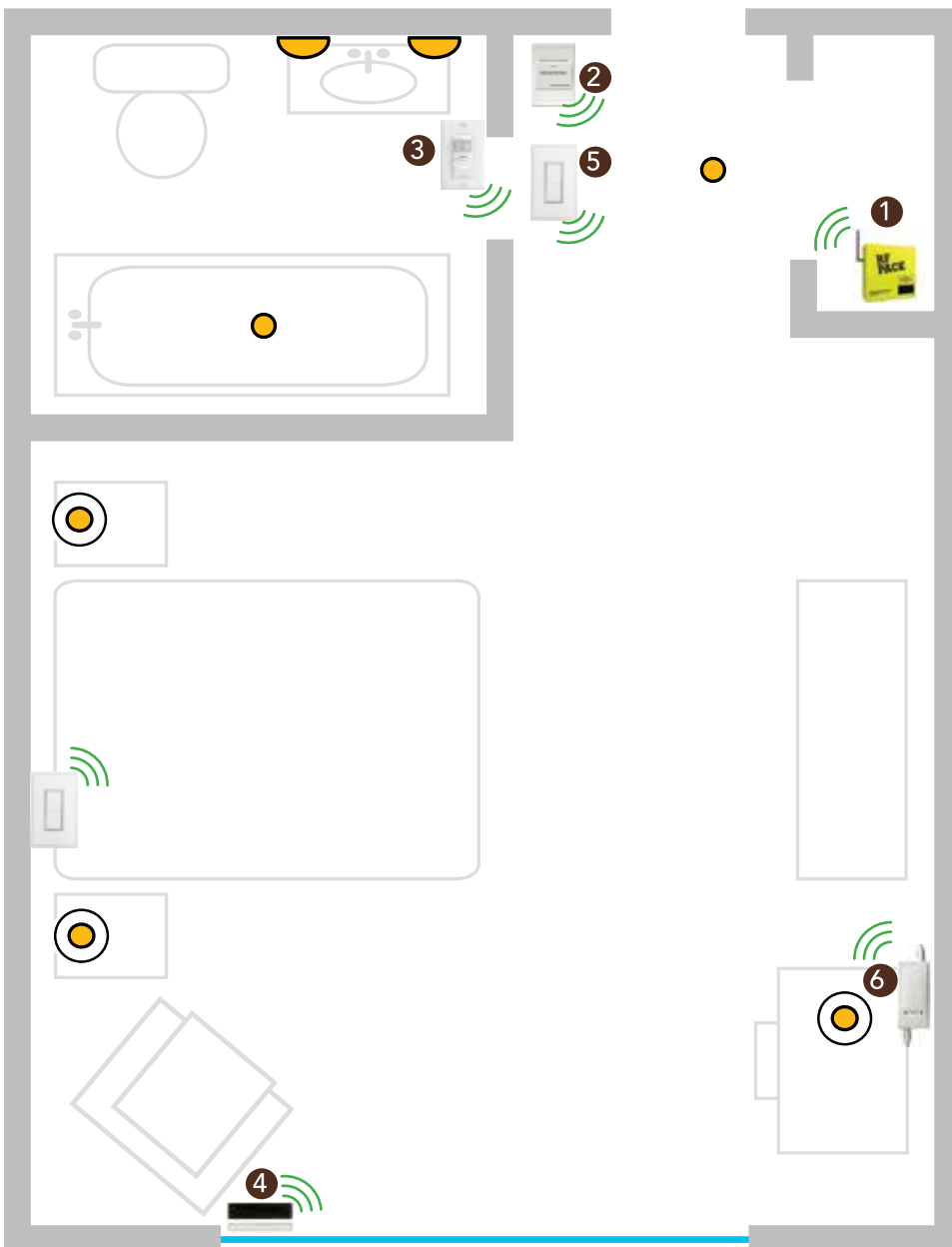


# Hotel Pack

- Master keycard allows occupant to reduce energy usage while room is unoccupied - removal of card can turn off TV and de-power select plug load, lighting, and HVAC.
- Sensor on the sliding door or window can set back or turn off HVAC when door/window is left open too long.
- Room occupancy status can be monitored and graphically displayed for front desk and housekeeping staff.



## HOTEL ROOM APPLICATION



### LEGEND

1 Hotel Pack



2 RF Key Card Switch



3 Occupancy Sensor



4 RF Contact Switch



5 Rocker Switch



6 Plug-In Switch



# Packaged Room Components

## FEATURES

- Versatile daylight management panel with plug ports for quick wiring and installation
- Intelligent daylight harvesting provides multiple levels of light from a single sensor, and can be configured for constant, temporary, or no override of lights
- Variable timers allow for delays, blink warns, and temporary sensor disable
- Space for up to 8 switched outputs and 4 0-10V dimming outputs; Optional barrier for integrated emergency circuits
- Includes 8 contact closure inputs (2 side ports, 6 internal); 4 photocell inputs (1 side port, 3 internal)
- Teams up with a variety of wired and wireless accessories to create versatile stand alone systems
- Shipped pre-programmed or on-site adjustable programming with the HandHeld Programmer (HHP)

## ACCESSORIES

- Wireless Gateway: Link to wireless devices for retrofit installations or for easy future movement of sensors and wallstations
- Switch: Digital and contact closure versions available
- Occupancy Sensor: Passive infrared (PIR) or PIR/Microphonics available. Available in ceiling and corner mount
- Photocell: One photosensor can be used for open or closed loop and be ceiling or fixture mountable
- HandHeld Programmer: Customize advanced features or reprogram system

## MICRO PACK

The Micro Pack provides a powerful switching and dimming platform ideal for daylight management and maximizing energy savings. Feature multiple sensor and photocell inputs, convenient plug-in low voltage wiring ports, and a broad selection of programmable features, this quick install panel can be configured to suit virtually any room control strategy.



For additional technical information, please see spec sheet on page 67.

## TYPICAL APPLICATIONS

### CLASSROOM



### MODULAR ROOM



### PATIENT ROOM



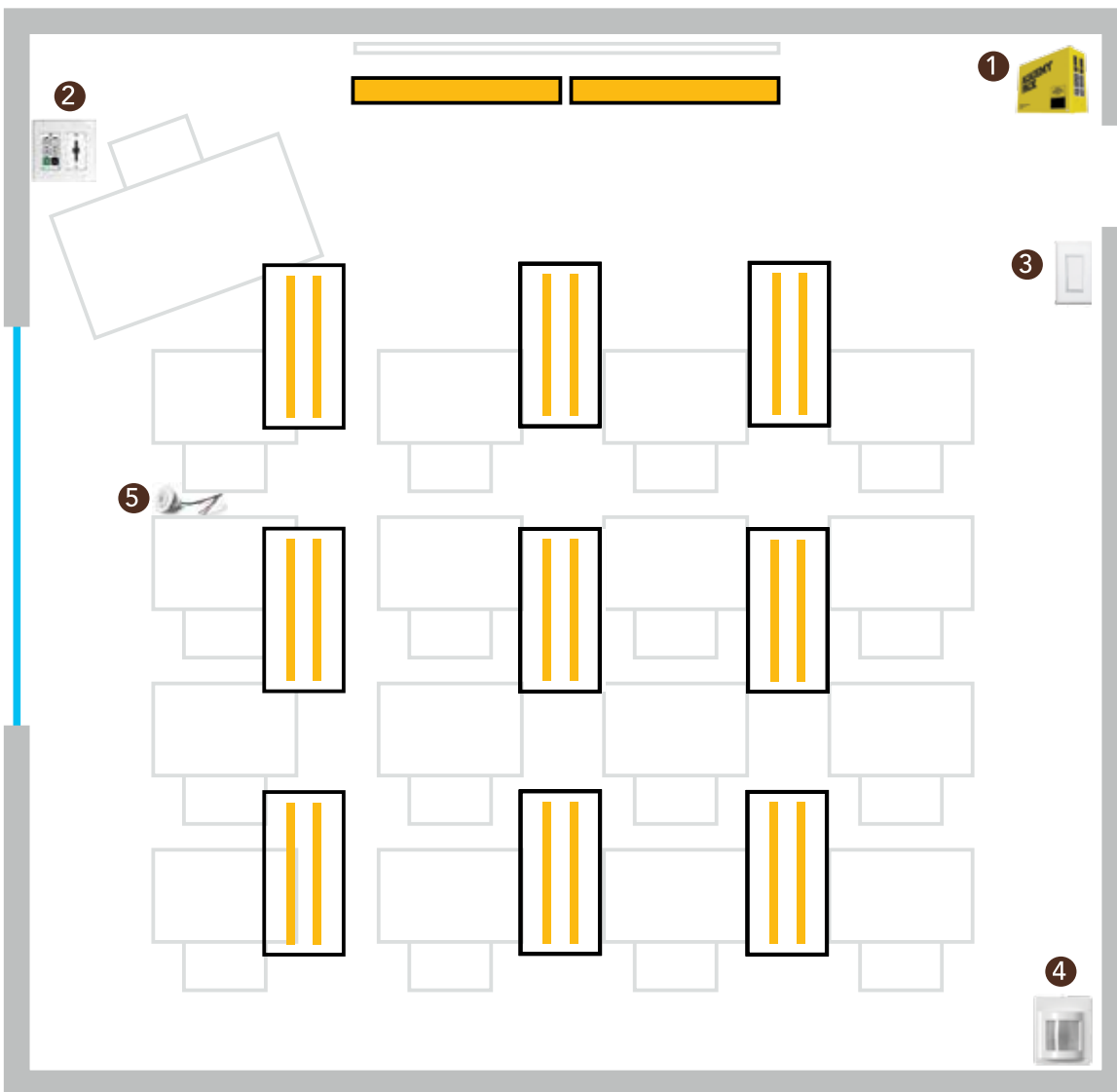
Daylight integration with Sunoptics LightFlex

# Academy Pack






- Enhances the learning environment by providing optimum lighting for board work, desk work and audio-visual presentations.
- Intuitive teacher control station allows selection of automated scenes or user defined light levels.



## CLASSROOM APPLICATION



**LEGEND**

- 1** Academy Pack  

- 2** Teacher Control Station  

- 3** Rocker Switch  

- 4** Occupancy Sensor  

- 5** Photocell  




# Mod Pack

- The flexible panel architecture and wide variety of wall stations and sensors allows a solution for any application.
- Integrated daylight harvesting can adjust artificial lighting to account for both side and overhead natural lighting.


## MODULAR BUILDING APPLICATION

**LEGEND**

1 Micro Pack



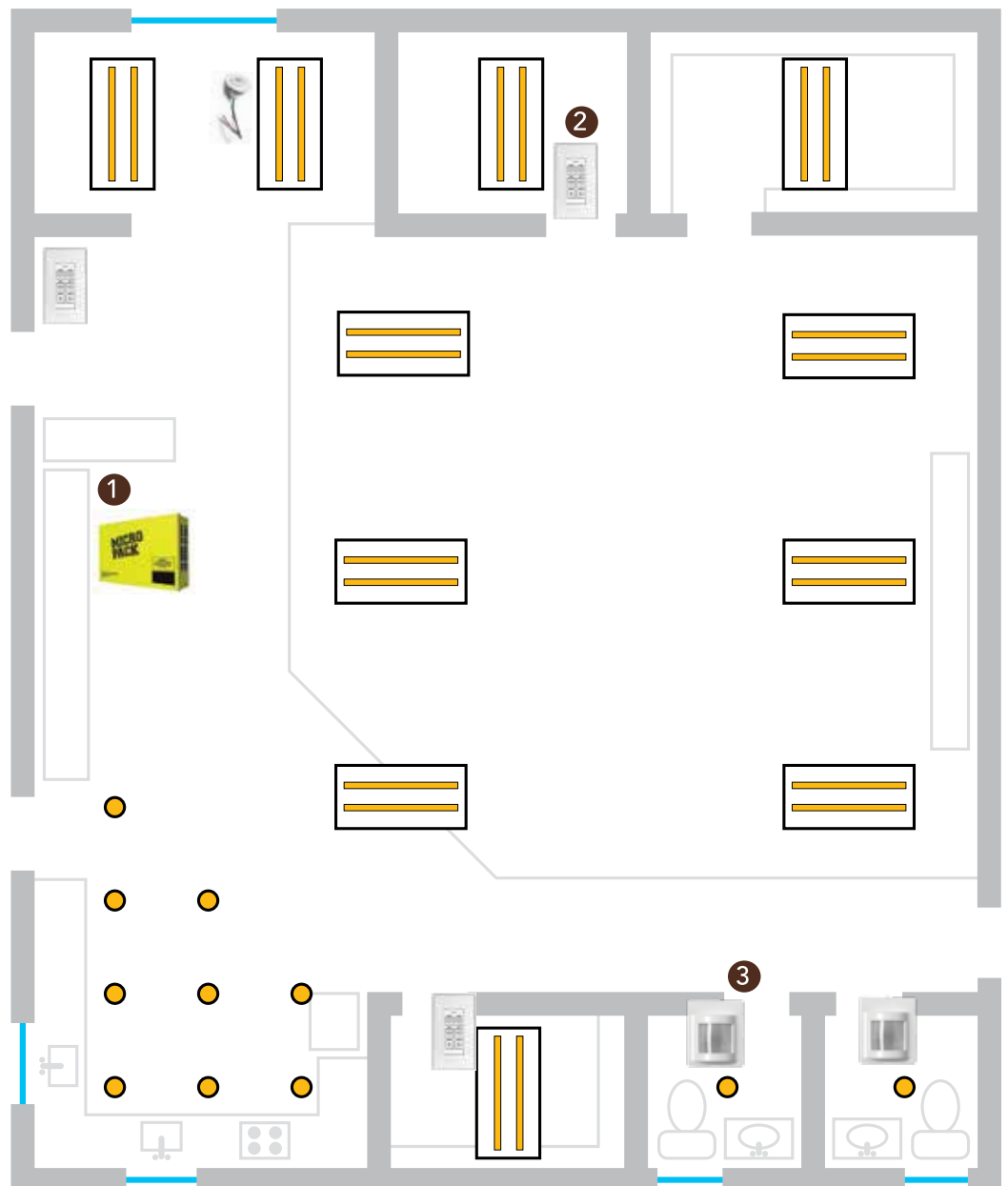
2 Chelsea Switch



3 Occupancy Sensor



4 Photocell



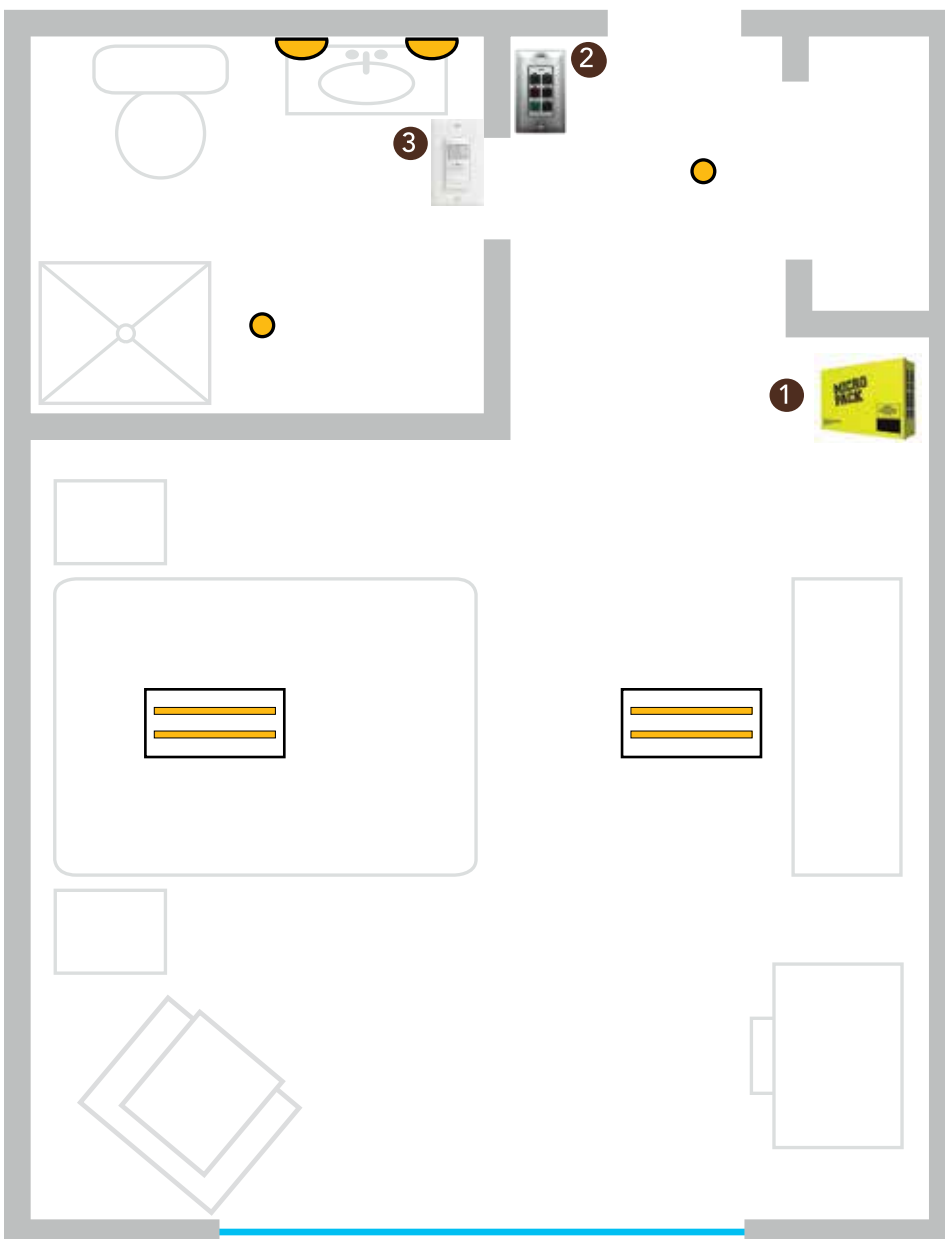


# Patient Pack

- Rugged stainless steel wall stations provide easy-to-use and easy-to-clean granular control of lighting.
- Directly integrate bed side control into overhead lighting control.
- Use of the flexible barrier system allows for normal, emergency, and critical power from the same panel.



## PATIENT ROOM APPLICATION



**LEGEND**

**1** Micro Pack



**2** Stainless Steel Chelsea Switch



**3** Occupancy Sensor



# Packaged Room Components

## DTC PACK

The DTC Pack adds Time Clock functionality to your single room or small area solution. Add the wireless gateway to incorporate wireless switches, sensors, and relays.

### FEATURES

- Time based control of lighting and HVAC, combined with supplemental occupancy and photocell control
- Incorporates wired GR 2400 wall stations, including the versatile switchbolt and digital keyswitch, as well as wireless relays, switches, and sensors
- Provides multiple button programming schemes including toggle, single action, momentary and timer override

### ACCESSORIES

- Switch: Digital and contact closure versions available
- Occupancy Sensor: Passive infrared (PIR) or PIR/Microphonics available; available in ceiling and corner mount
- Photocell: One photosensor can be used for open or closed loop and be ceiling or fixture mountable
- Wireless Gateway: Link to wireless devices for retrofit installations or for easy future movement of sensors and wallstations



For additional technical information, please see spec sheet on page 69.

### TYPICAL APPLICATIONS

#### GYMNASIUM



#### MANUFACTURING



#### OFFICE



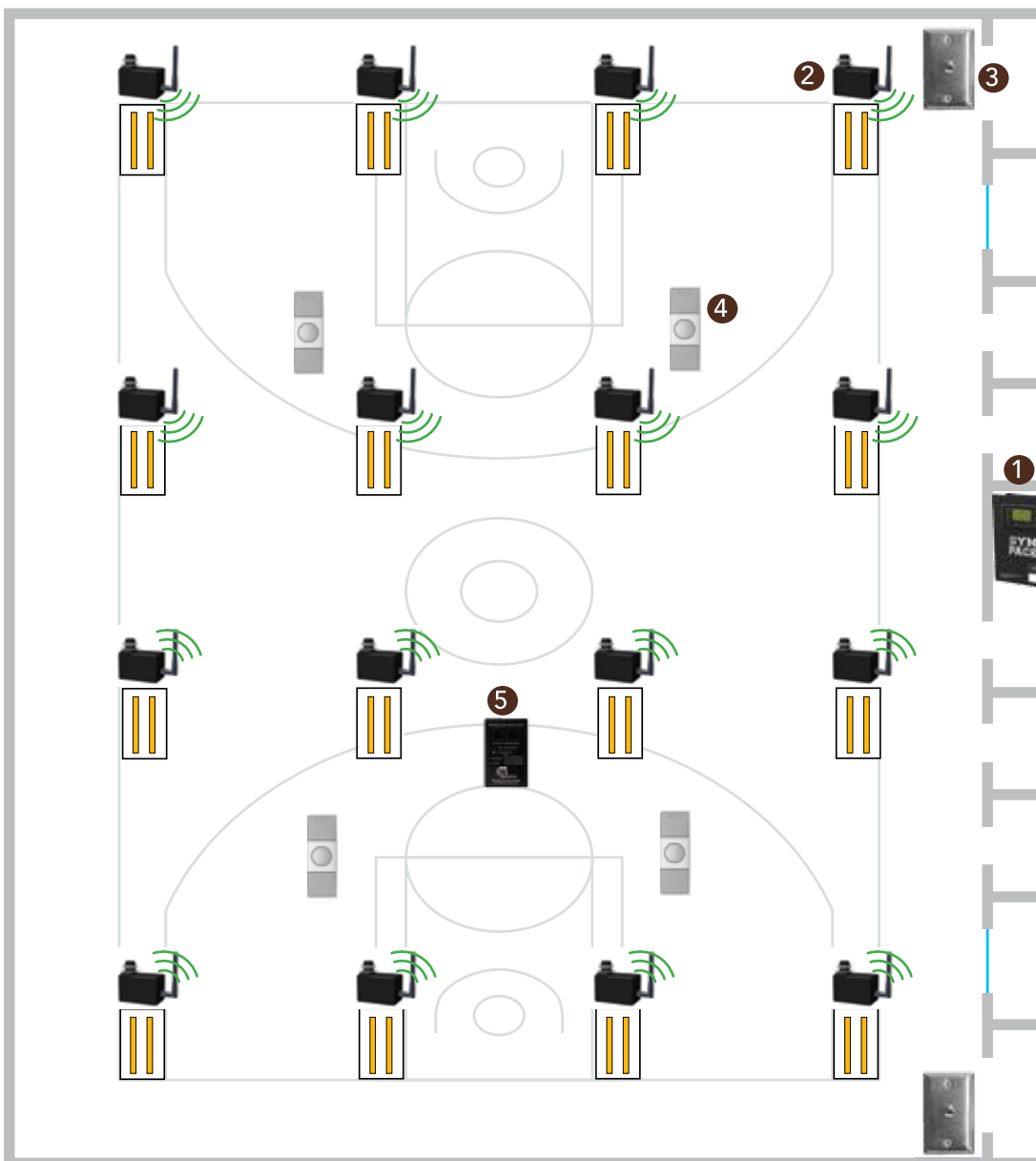
Daylighting integration with Sunoptics Prismatic skylights

# Gym Pack

- Selectively light active sections of the gym based on a time schedule, override switch, or sensors.
- Leave only a few fixtures lit in vacant sections for occupants who briefly pass through.
- Unlike a typical switch, the rugged metal switchbolt or key switch will survive impacts from balls and other hurtling objects, without triggering a change in the lighting system.



## GYMNASIUM APPLICATION



**LEGEND**

- 1** DTC Pack  

- 2** RF Node  

- 3** SwitchBolt Switch  

- 4** RF Occupancy Sensor  

- 5** Wireless Receiver  


# 3 | Quick Configured Systems

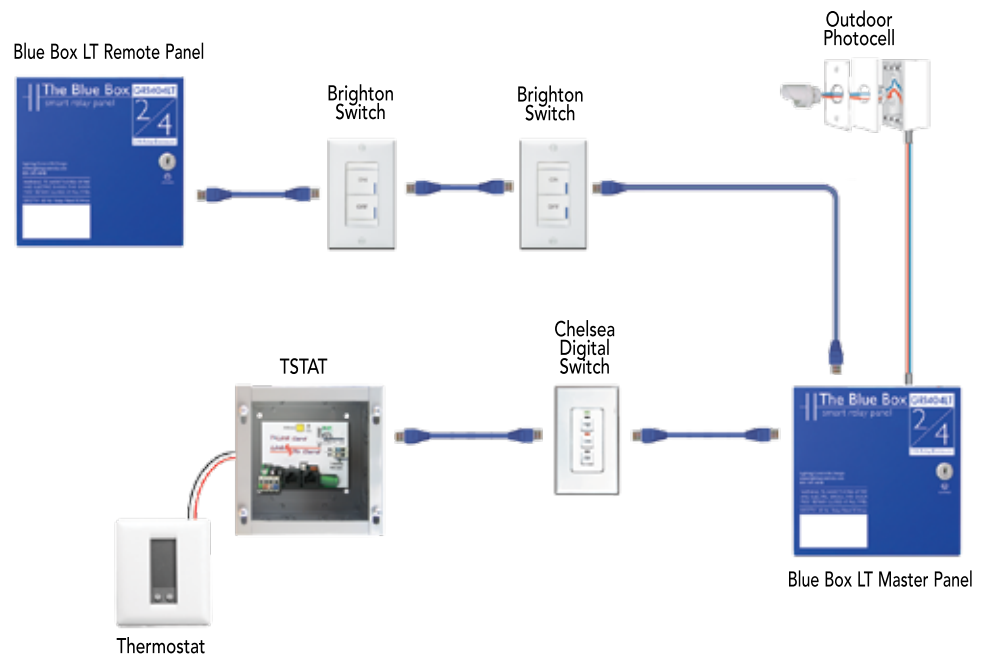
## BLUE BOX LT

The Blue Box LT Series is a cost-effective, simple alternative to traditional time clocks, twist timers and contactor packages. The master panel, which houses an astronomic timeclock and photocell input, can be networked with up to 16 digital devices, including remote panels, switches, integrated HVAC thermostats, and BACnet. Any relay can be controlled via the time clock and photocell, or from any input device or wall station on the bus. The Blue Box LT family, available in 3 very compact enclosure sizes, is a simple solution to small to medium switching projects.

### FEATURES

- UL Listed 30A @ 277V ballast/HID, 20A tungsten, 18,000A SCCR Normally Closed Latching (NCL) relays
- May control normal or emergency power
- Simple networking with CAT. 5 cable with RJ45 connectors
- Hinged locking door
- Replace expensive line-voltage cabling for digital override switches & photocell
- Integrates with all other GR 2400 system components
- Master panel includes an input for outdoor photocell
- Available in 3 sizes: 4, 8 and 16
- Available with internal barrier for mixed voltages

### SYSTEM CONFIGURATION WITH MULTIPLE PANELS



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# Blue Box LT Applications

## Parking Lot / Site Lighting

- Astronomic timeclock allows automated lighting control relative to sunrise/sunset and time of day.
- Independent photocell triggers allow staggered switching of any circuits to incrementally adapt to changing lighting levels.
- Water proof switches and enclosures can be ordered for outdoor installation.



## Retail

- Automated lighting and HVAC ensures a properly lit and conditioned space without distracting store associates.
- Small equipment footprint saves valuable wall space in back office or stock room.
- LC&D can update holiday schedules via modem or network interface as needed.



## Common Area / Hallways

- Time schedules and occupancy sensors turn off lighting in unused areas.
- Photocell minimizes electric lighting when ample daylight is present.
- Dry contact inputs provide simple integration to fire and alarm systems so lights can be activated during emergency.



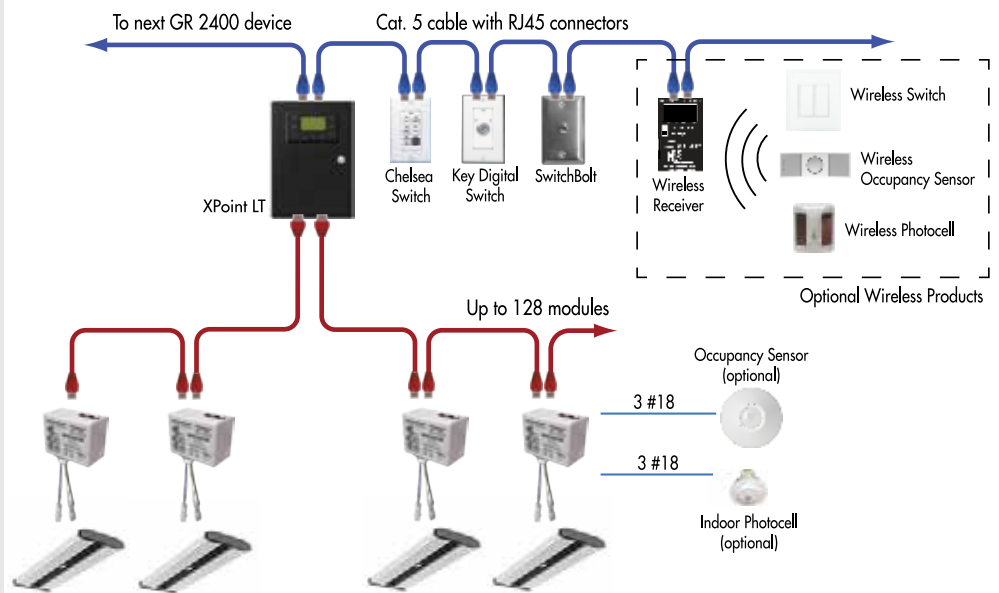
# Quick Configured Systems

## XPOINT LT

XPoint LT is a distributed relay system that provides localized control of full circuits or individual fixtures regardless of building wiring. Designed for flexibility and to meet the most stringent energy codes, the XPoint family of products offers multiple module types to handle any specified load.

### FEATURES

- Reconfiguration of zones without rewiring
- Single enclosures for DTC and router cards
- Enclosure includes space for one additional interfaces card (i.e., Link-To-Ethernet card, Link-To-BAS card) or a Link-To PC serial card to avoid mounting an extra enclosure
- Control of up to 128 modules
- Modules available with 50 degree C ratings for high bay and high temperature environments
- Unity GX2 software can be used to control and reconfigure modules
- Relays are software changeable from normally closed to normally open
- UL listed to control emergency loads



### AVAILABLE MODULE TYPES:

- Single and Dual 30A switching relay
- Single 30A with 0-10V dimming, and photocell/occupancy sensor inputs
- 0-10V dimming with sensor inputs (no relay - for retrofit with existing relay systems)
- 6 Amp 2-pole 480V
- 5 Amp 2- or 3-wire phase control

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# XPoint LT Applications

## Big Box Retail

- Tailored lighting zones allow for optimum daylight harvesting and minimal lighting during “off-hours” servicing of stock.
- Create a single control scheme and interface for both interior and exterior lighting utilizing ROAM modules through GX2 control software.



## Small Warehouse

- Adjust lighting to fit seasonal shifts in inventory levels by reconfiguring aisle zones and turning off lighting in unused bays.
- Unique daylight switching algorithms allow for even exercise of lamps and seamless 0, 2, 4, 6 lamp multi-level switching.



## Supermarket

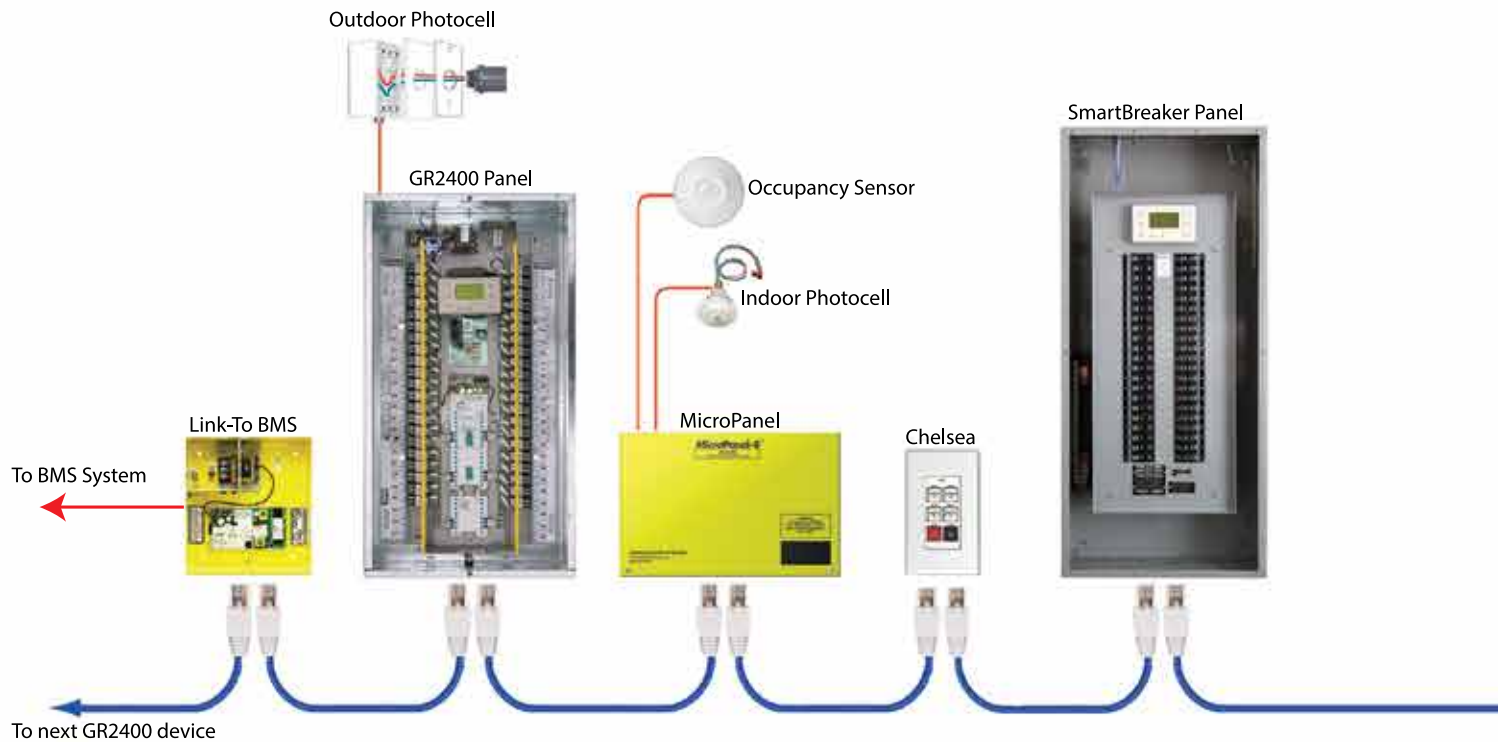
- Save energy by quickly dimming unoccupied aisle lighting (without turning off).
- Minimize lighting during after-hour restocking activities.



# 4 | Factory Engineered Solutions

## THE GR 2400 FAMILY

The GR 2400 lighting control system is the flagship panel and system architecture of LC&D. The highly scalable GR 2400 architecture allows a wide variety of components and subsystems to be networked into large building and campus control solutions.



HOSPITAL/MEDICAL OFFICES

- Distributed panels provide discrete control of patient rooms and hallways, allowing easy service with minimal patient room downtime
- Occupancy sensors and wall stations can operate differently based on time of day
- Automated or manual control of hallway lighting from Nurses station



K-12/EDUCATION

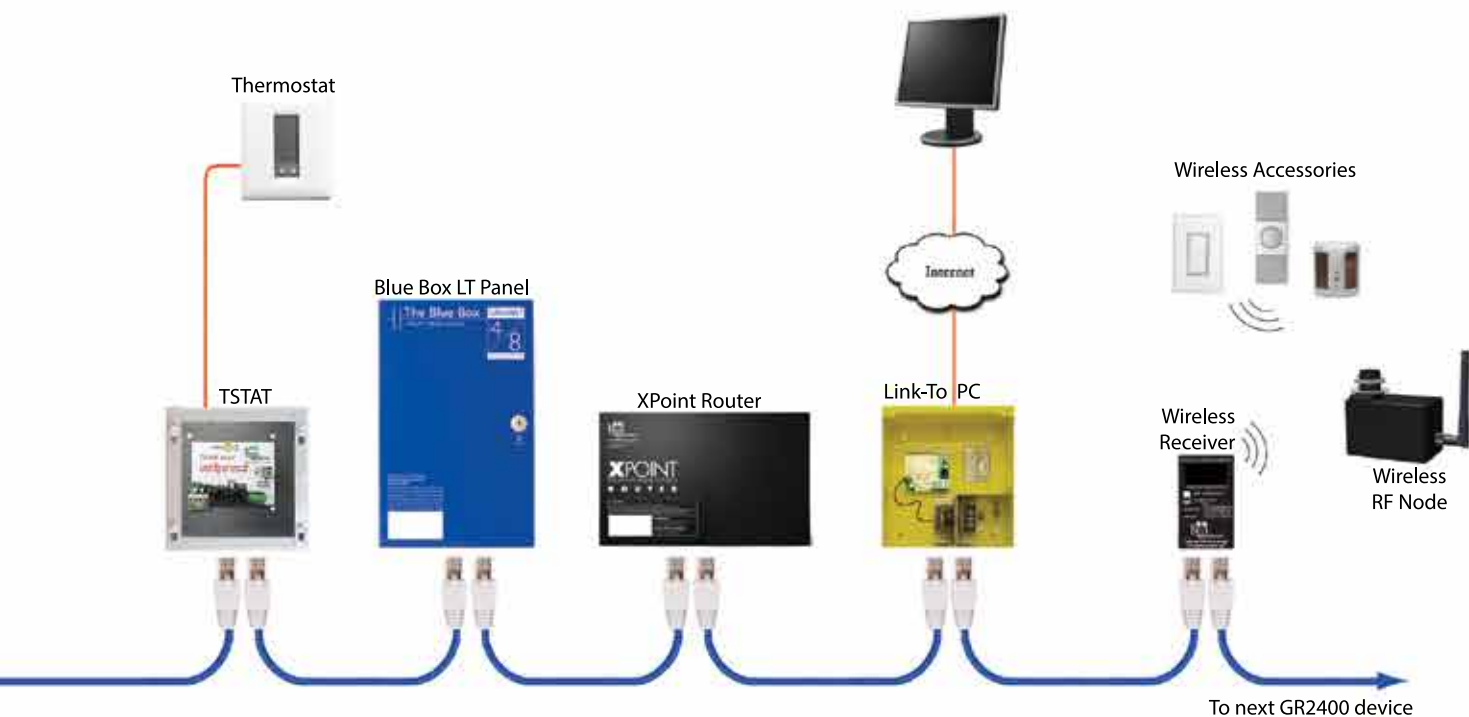
- Enable/disable various wall stations based on time of day or using a key switch
- Vandal-resistant controls prevent costly repairs and inoperability of lights
- School- or district-wide control and monitoring of all facilities via GX2 software



CORRECTIONAL FACILITY

- Custom switch bank wall stations provide a single intuitive interface for managing large groups of lighting
- Tamper-resistant, metal wall stations allow basic control of lights while maintaining safe conditions for security personnel





### INDUSTRIAL/MANUFACTURING

- High temperature relay modules, specialized enclosures and custom wall stations are available for harsh environments
- Site-wide control and monitoring software allows efficient adjustment of lighting zones, schedules, and sensor programming as production needs vary



### TRANSIT TERMINAL/HANGER

- Schedule spaces on and off based on specific travel intervals
- One-button, system-wide control for rapid response to emergency situations



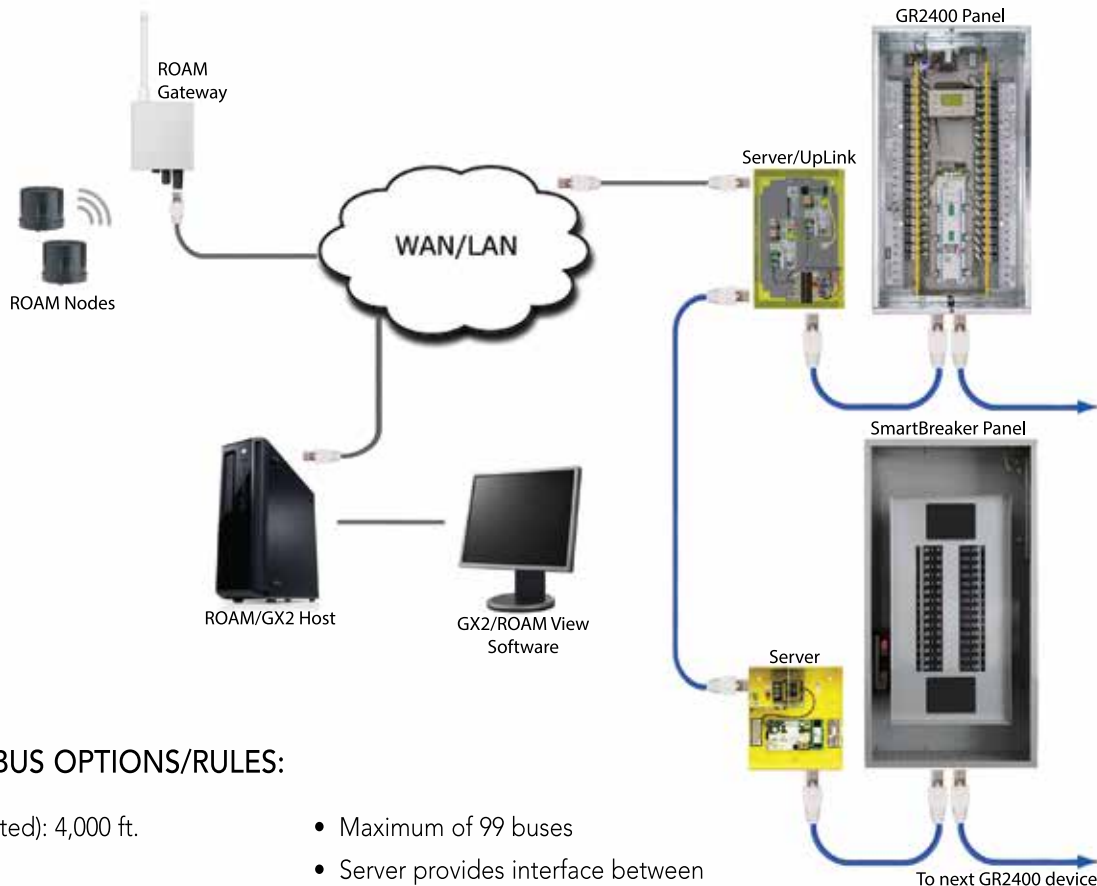
### SPORTS COMPLEX

- Robust relays handle rigorous switching requirements from full circuits of concourse and site lighting
- Monitor all lighting, occupancy sensors, and IP-based security cameras from a single user interface

# Factory Engineered Solutions

## MULTIBUS AND ROAM INTEGRATION

Multibus systems are used when you exceed address limits on a single GR 2400 network, when the length of GR 2400 bus greatly exceeds 4,000 feet, or to facilitate hub and spoke wiring on large buildings. In addition, integration with ROAM wireless outdoor lighting can be accomplished using a server/uplink and Unity GX2 software.



### BACKBONE BUS OPTIONS/RULES:

- RS485 (dedicated): 4,000 ft. maximum bus
- Single/multimode fiber optic bus: multiple miles (maximum distance varies-contact factory for assistance)
- TCP/IP (dedicated or shared building infrastructure)
- Maximum of 99 buses
- Server provides interface between Backbone bus and WAN/LAN

### UNIVERSITY CAMPUS



### MILITARY BASE

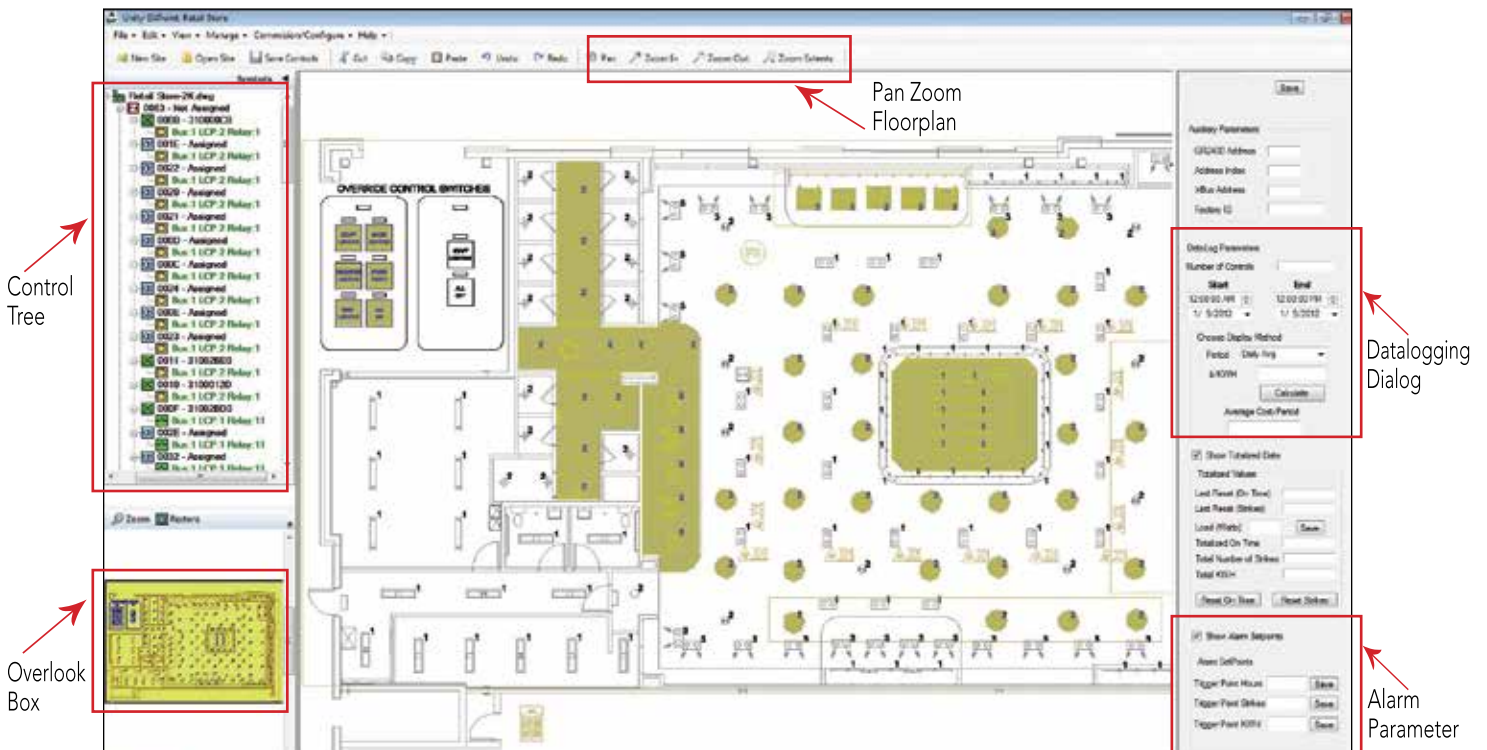


### SITE LIGHTING



# UNITY GX2

**Advanced Graphical Control** Pan and zoom floor-plan based energy management software for control and real-time monitoring of wired/wireless lights, sensors and basic HVAC solutions.



## FEATURES

- **Data logging** - Analyze energy usage (kWh) total on time and number of strikes and cycles relative to a daily, weekly, monthly or user-defined time interval
- **Alarms** - Notification via software, email, or a signal to a third-party system when control point exceeds a specified number of daily/total run hours, number of strikes or if occupancy is detected during user-defined "Unoccupied Time"
- **Load shedding** - Quick activation of predefined load shedding scenarios
- **Regroup & Rezone lighting** - Customize zones, groups and time schedule for area specific
- **Personalized interface** - Available with customer-specific graphics and page
- **Enhanced security** - Real-time occupancy information and access to IP cameras

# Factory Engineered Solutions

## GR 2400 COMPONENTS

### GR 2400 Panel

The GR 2400 Panel is a centralized relay panel which houses the Digital Timeclock (the time keeper and primary system programming interface) and up to 48 relays. Providing a flexible voltage barrier system and space for single and double pole relays, the GR 2400 panel is a highly configurable switching solution.

#### FEATURES

- May control mixed voltages (i.e., 120V, 277V)
- May control normal or emergency power
- Ideal for all applications
- Manual override of individual relays, zones or entire panel
- Link up to 127 addresses of digital devices via CAT. 5 patch cable with RJ45 connectors

### Quintessence Combination Panels

Quintessence Panels offer a complete pre-assembled and pre-wired solution, where we combine relays with breakers or surge suppression equipment. These panels offer substantial labor savings and reduce wiring errors relative to independent panels wired on site.

#### GR 2400 WITH BREAKER

- Available in top-feed or bottom-feed panels
- MLO or Main breaker
- Saves on-site labor time

#### GR 2400 WITH SILVERBULLET

- UL listed current limiting for up to 21 circuit per 10" extension box
- AIC rating 10,000A @ 120V
- Pre-wired and pre-assembled components

#### GR 2400 WITH SURGE SUPPRESSION

- Protection elements status LED indicator light – one per circuit
- Compact enclosure (UL 94V-0 rated ABS)
- High density/high energy individual circuit protection



For additional technical information, please see spec sheet on page 35.



For additional technical information, please see spec sheets on pages 59-63.



For additional technical information, please see spec sheet on page 49.

## SmartBreaker Panels

SmartBreakers are the combination of a controllable relay and a circuit breaker within a single device. SmartBreaker Panels (available in 42 circuits of control) require less space, and eliminate the need to wire between breakers and relays. For many projects, this savings in onsite labor and material leads to a much lower installed cost and reduced installation errors. Furthermore, the SmartBreaker panel interiors can be quickly retrofit into existing breaker panel enclosures allowing for digital lighting control in any space.

### FEATURES

- AIC up to 65K available
- Voltage up to 480V
- 1,2 and 3 pole breakers
- Mix controlled and conventional breakers in the same panel
- Main breaker or MLO



For additional technical information, please see spec sheets on pages 123-127.

## Link-To Integration Devices

LC&D's family of Link-To devices provide easy integration between the GR 2400 network and third party equipment and sensors.

### LINK-TO BUILDING AUTOMATION

- BACnet IP/MSTP
- ModBus RS232/RS485
- N2 Metasys

### LINK-TO PC

- Ethernet
- RS232/USB
- RS232/Ethernet (low-voltage)
- RS232/Ethernet/T-Link (low-voltage)

### ADDITIONAL LINK-TO DEVICES

- DigiLink
- T-Link
- DMX
- Grafik Eye

# Factory Engineered Solutions

## GR 2400 COMPONENTS

### MicroPanel

The compact MicroPanel offers distributed switching and dimming, perfect for daylight harvesting and load shedding applications. With onboard photocell and occupancy sensor inputs, and available plenum and emergency barrier options, this is a highly versatile local area controller.

#### FEATURES

- Up to 8 dimming and switching outputs
- Connect/power up to 4 photocells and 8 occupancy sensor or dry contact inputs
- Configure wall stations to recall various scenes or override timers, and provide end user either zero, temporary, or permanent override of daylight and occupancy settings
- Lumen Depreciation Management: gradually drives light levels higher over time as lamps/LEDs age or fixture becomes dirty and produces less light
- Intelligent integration of skylight louvers and window shades allows one touch control of natural and electric lights, while also maximizing natural light contribution prior to raising artificial lights



For additional technical information, please see spec sheet on page 45.

### XPoint

XPoint is a fully distributed switching and dimming solution allowing remote mounting of 30A relay modules for individual fixture or single circuit control of lighting, plug load, or select mechanical equipment. Modules can be organized into various size groups, and quickly recalled for user specific light settings. Graphical software allows instant rezoning of lights as space changes.

#### FEATURES

- Variety of module options:
  - Single and Dual 30A switching relay
  - Single 30A with 0-10V dimming, and photocell/occupancy sensor inputs
  - 0-10V dimming with sensor inputs (no relay - for retrofit with existing relay systems)
  - 6 Amp 2-pole 480V
  - 5 Amp 2- or 3-wire phase control
- Dual relay module and seamless 0, 2, 4, 6 lamp switching provide cost effective daylight management solution
- Modules can be field mounted or factory installed into most Acuity LED/Fluorescent/HID fixtures
- Optional 5 Amp quick connect model provides easy code compliance



For additional technical information, please see spec sheets on pages 39-42.



For additional technical information, please see spec sheet on page 37.

## Blue Box LT

The Blue Box LT Series is a cost-effective, compact relay panel, available in three enclosure sizes. The remote panels can be networked to the GR 2400 system. Low voltage inputs are available to interface with dry contact switches, low voltage occupancy sensor and signals from third party devices.

### FEATURES

- May control mixed voltages (i.e., 120V, 277V)
- May control normal or emergency power
- Simple networking with CAT. 5 cable with RJ45 connectors



For additional technical information, please see spec sheet on page 121.

## T-Link

The T-Link card allows a basic connection between your HVAC and lighting control system. Each T-Link card allows both monitoring and programming of up to 32 intelligent thermostats, for full control of conventional and heat pump units.

### FEATURES

- Built-in, short-cycle protection
- No battery required for power outage
- Built-in LED indicators
- Automatic changeover from heat-to-cool and cool-to-heat
- Adjust local keypad range control
- Program heating/cooling levels

# Factory Engineered Solutions

## ACCESSORIES

### Wired Digital Keypads

#### CHELSEA DIGITAL SWITCH



- 1 to 6 engraved buttons (various button colors available)
- Waterproof option available
- Rugged stainless steel construction
- LED blink and audible beep available

#### KNIGHTSBRIDGE DIGITAL SWITCH



- 1 to 6 buttons or 1 to 6 rockers
- Available faceplate engraving
- Rugged stainless steel construction
- Button and night light LEDs

#### BRIGHTON DIGITAL SWITCH



- 2, 4, 5, 6, 7, or 8 buttons
- Pre-engraved button kits
- LED blink options

#### SWITCHBOLT DIGITAL SWITCH



- 1 or 2 buttons per gang
- Waterproof option available
- Rugged stainless steel construction
- Status LED and audible beep available

#### KEY DIGITAL SWITCH



- Programmable 2 position switch
- Single engraved key input
- Rugged stainless steel construction
- LED night light

#### ROCKER DIGITAL SWITCH



- Programmable 2 position switch
- Traditional decorator look

### Wired Sensors

#### OUTDOOR PHOTOCELL



- 14 trigger points
- Global control for multiple zones

#### 3-WIRE LOCAL SLIMLINE PHOTOSENSOR



- 0.310 diameter footprint
- Available factory mounted in select Peerless fixtures

#### OCCUPANCY SENSOR



- Passive Infrared (PIR)
- Dual Tech: PIR/ Microphonics
- Adjustable time delay
- Global load control

### Relays

#### SNAPLINK LATCHING RELAY



- 18,000 Amps SCCR @ 277V
- No energy is used to hold contacts, creating less heat
- UL 924 listed

#### SNAPLINK 2-POLE RELAY



- Ideal for 208/480 2-pole loads
- Normally closed relay

#### EMERGENCY SHUNT RELAY



- ETL listed to UL 924
- Normally open or normally closed



## SPECIALTY PANELS



For additional technical information, please see spec sheets on page 55.

### SilverBullet Current Limiting Panel

The SilverBullet panel houses non-system current limiting breakers, which restrict the total power available to a branch circuit. These are typically used to allow track lighting fixtures to comply with stricter energy codes and W/ft<sup>2</sup> allowances.

#### FEATURES

- Current limiting for up to 21 circuit
- Current limiting available from 1-8, 10, 13, and 15A
- AIC Rating of 10,000A @ 120V
- Factory pre-assembled
- Each load factory-labeled on the door sheet
- No programming required



For additional technical information, please see spec sheets on pages 49-53.

### DMX Input Panels

These panels are typically used to control theatrical lighting and plug load. They are mapped to a continuous block of DMX addresses and take commands from a third party DMX512 console.

#### GR 2400/BLUE BOX DMX FEATURES

- AIC up to 65K available
- Voltage up to 480V
- 1, 2 and 3 pole breakers
- Mix controlled and conventional breakers in the same panel
- Main breaker or MLO

#### SMARTBREAKER DMX FEATURES

- Seamless integration to any DMX512A-based control system
- 16/32/48 size relay panel
- 42 size circuit breaker panel
- UL listed

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# GR 2400™

## Control Panel



## GR 2400™ Relay Panel

**Description:** The GR 2400 system is a 100% digital solution to lighting control. Panels and switches daisy-chain together, using Cat. 5 patch cable with RJ45 connectors in any sequence.

- Features:**
- 32-channel, 365-day/astromical time clock. Large display (21 x 8 characters) acts as the programming interface for the entire system. Non-volatile memory holds all programming indefinitely. Ten-year battery back-up for time-of-day
  - Modem includes free lifetime factory programming
  - May control mixed voltages (i.e., 120VAC, 277VAC)
  - May control normal or emergency power
  - Ideal for all applications
  - Manual override of individual relays, zones or entire panel
  - Link up to 127 addresses of digital devices via Cat. 5 patch cable with RJ45 connectors

## Specifications:

Enclosure dimensions:	32 Relays NEMA 1 - 20" w x 25.5" h x 6" d NEMA 4/4X/12 - 24"w x 36"h x 8"d	Optional relays:	Normally Open (NOL), Normally Closed (NCL), Two Pole — NO or NC (480VAC); Double Throw 20A 277VAC
	48 Relays NEMA 1 - 20" w x 37.5" h x 6" d NEMA 4/12 - 24"w x 48"h x 10"d NEMA 4X - 36"w x 48"h x 10"d	Listings:	UL and cUL 916 listed, ETL listed to UL 924 (for emergency circuit use)
Enclosure type:	Surface mount, hinged locking door, NEMA 1	Programming:	Via DTC, via PC with <b>Unity 2™ Software</b>
Relay:	Normally Closed (NCL) 30A @ 277VAC Ballast 20A @ 120VAC Tungsten 20A @ 347VAC Ballast SCCR 18kA @ 277VAC Rated 250,000 Cycles	Max. humidity:	10–90% non-condensing
Addresses used:	GR 2432 (4), GR 2448 (6)	Ambient temperature:	32–104° F (0–40° C)
		Power supply voltage:	120/277VAC or 120/347VAC
		Bus physical layer:	RS 485 (GR 2400 bus)
		Bus connector:	RJ45 connectors

# Overview

## Power Supply:

120/277VAC or 120/347VAC

## DTC:

32-channel, 365-day astro clock  
Access and program the entire system

## Modem:

Remote programming and control, includes free lifetime dial-up programming

## Bus connectors

RJ45 connectors

## Lighting Relays:

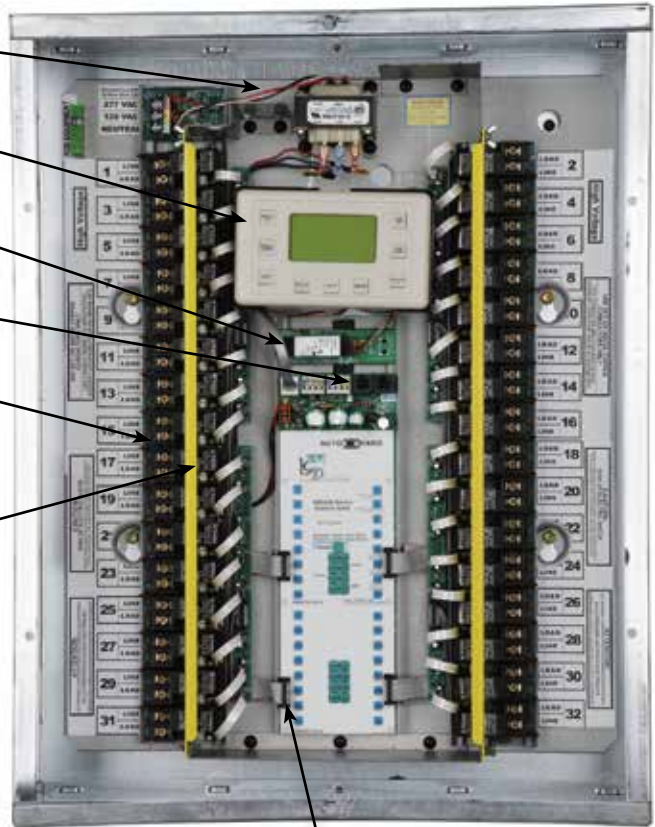
Normally Closed (NCL), 30A @ 277V Ballast,  
20A @ 120V Tungsten, 20A @ 347V Ballast,  
SCCR 18kA @ 277V, Rated 250,000 Cycles

## Optional Relays:

Normally Open, (NOL) Spec same as NCL,  
Two Pole — NO or NC (480VAC); Double Throw 20A  
277VAC

## High/Low Voltage Barrier:

(16 gauge steel)



Relay Control Card  
(manual control of zones  
or individual relays)

## Seismic Certification:

- Preapproved for use in Category IV structures with an Importance Factor of 1.5
- California Office of Statewide Health Planning and Development (OSHPD) Special Seismic Certification Preapproval (# OSP-0091-10)

Evaluated per the requirements of:

- 2007/ 2010 California Building Code
- Section 13.2.5 of (American Society of Civil Engineers / Structural Engineering Institute) ASCE/SEI 7-05
- Tested to: ICC-ES AC156

## ORDERING INFORMATION

### Enclosure

#### Relay Panel Enclosure

GR2448 ENC = 48 Relay Enclosure  
GR2432 ENC = 32 Relay Enclosure

#### Enclosure Mounting, NEMA Rating, Knockouts

SM NE1 = Surface Mount, NEMA 1 with knockouts  
FM NE1 = Flush Mount, NEMA 1 with knockouts  
SM NE1 NKO = Surface Mount, NEMA 1 no knockouts  
FM NE1 NKO = Flush Mount, NEMA 1 no knockouts  
SM NE4 = Surface Mount, NEMA 4  
SM NE12 = Surface Mount, NEMA 12  
SM NE4X = Surface Mount, NEMA 4X

#### Examples:

GR2448 ENC SM NE1

GR2448 INT 12NCL 12DPNC DTCMOD DV

48 relay, surface mount NEMA 1 enclosure with knockouts, with 12 normally closed relays, 12 double pole normally closed relays, with a digital time clock and modem (master panel), and a 120/277V dual voltage transformer (also, no voltage barriers).

### Interior

#### Relay Panel Interior

GR2448 INT = 48 Relay Interior  
GR2432 INT = 32 Relay Interior

#### Relays

[qty]NCL = Normally Closed Latching  
[qty]NOL = Normally Open Latching  
[qty]DPNC = Double Pole Normally Closed  
[qty]DPNO = Double Pole Normally Open  
[qty]RRNO = Reed Relay Normally Open (pair)  
[qty]SPDT = Single Pole Double Throw  
[qty]SPDTC = Single Pole Double Throw Contactor

#### Clock Option

DTCMOD = Digital time clock with modem  
DTC = Digital time clock without modem  
REMOTE = Remote panel, no clock

#### Transformer

DV = Dual voltage 120/277V  
CNDV = 120/347V

#### Voltage Barrier<sup>1</sup>

[blank] = No barrier  
1VB = 1 barrier  
2VB = 2 barriers  
3VB = 3 barriers  
4VB = 4 barriers

<sup>1</sup> = Check with NEC or CEC, State or Province, and local regulations as well as your electrical inspector about allowances for voltage barriers within panels.

# The Blue Box

## Control Panel



An Acuity Brands Company



## The Blue Box LT Series

**Description:** The Blue Box LT Series is a cost-effective, simple alternative to traditional time clocks, twist timers and contactor packages. It comes in three enclosure sizes, each with a compact footprint. The Blue Box LT Series is ideal for small-to-medium projects, and arrives pre-assembled and ready for installation. The Master Panel may be networked with up to 16 digital devices including remote relay panels, switches and photocell. The Master Panel has an input for an outdoor photosensor which may be programmed to control any relay(s) on the bus. The Blue Box LT Series is compatible with LC&D's GR 2400 system accessories. Blue Box LT remote panels may be used on GR 2400 systems.

- Features:**
- 100% digital
  - UL Listed 30A @ 277V ballast/HID, 20A tungsten, 18,000A SCCR normally closed latching lighting relays (NCL)
  - Simple networking with Cat. 5 cable with RJ45 connectors
  - Hinged locking door
  - Replace expensive line-voltage cabling for override switches and photocells
  - Integrates with all other GR 2400 system components

## Specifications:

Enclosure dimensions:	<b>GR1404LT</b> (2 or 4 relays) NEMA 1 - 8.4" w x 8.4" h x 3.125" d NEMA 4/4X/12 - 12" w x 16" h x 6" d	SCCR 18kA @ 277VAC Rated 250,000 Cycles
	<b>GR1408LT</b> (4 or 8 relays) NEMA 1 - 8.4" w x 13.4" h x 3.125" d NEMA 4/4X/12 - 16" w x 20" h x 6" d	Optional relays: Normally Open (NOL) 2-Pole Relay in remote panels only
	<b>GR1416LT</b> (8 or 16 relays) NEMA 1 - 10.6" w x 17.1" h x 3.125" d NEMA 4X - 16" w x 24" h x 8" d NEMA 4/12 - 16" w x 24" h x 6" d	Max. devices per bus: 16 digital devices w/ Blue Box LT Master Panel
Enclosure type:	Surface Mount, Hinged Locking Door, NE 1 Flush Mount optional	# of Addresses: GR 1404 (1), GR 1408 (1), GR 1416 (2)
Optional enclosures:	NEMA 4, NEMA 12	Programming: Via DTC
Relay:	Normally Closed (NCL) 30A @ 277VAC Ballast and HID 20A @ 120VAC Tungsten 20A @ 347VAC Ballast	Max. humidity: 10-90% non-condensing Ambient temperature: 32-104° F (0-40° C)
		Power supply voltage: 120/277VAC (for all) 120/347VAC (for 1408 & 1416) 347VAC (for 1404 only)
		Bus physical layer: RS485 (GR 2400 bus)
		Bus connector: RJ45 connectors
		Listings: UL and cUL 916 listed, ETL listed to UL 924 (for emergency circuit use)

# One Product...Three Solutions

**1400 DTC:**  
32-channel, 365-day astro clock to access and program the entire system.

**Dead Front**

**UL Listed 30A @ 277VAC 18,000A SCCR Relays**

**Optional Modem:**  
For remote programming and control, includes free lifetime dial-up programming.

**Removable Interior**

**GR 1404 LT**

- With 2 or 4 relays
- Master or remote
- 8.4" w x 8.4" h x 3.125" d

**GR 1408 LT**

- With 4 or 8 relays
- Master or remote
- 8.4" w x 13.4" h x 3.125" d

**GR 1416 LT**

- With 8 or 16 relays
- Master or remote
- 10.6" w x 17.1" h x 3.125" d

Master Relay Panel

Photosensor

Chelsea DigitalSwitch™

Remote Relay Panel

Chelsea DigitalSwitch™

Cat. 5 patch cable with RJ45 connectors

Up to 16 digital devices with a **Blue Box LT Series** Master Panel  
Up to 127 digital devices with a **GR 2400** Master Panel  
Up to 4,000 ft. bus length

## Seismic Certification:

- Preapproved for use in Category IV structures with an Importance Factor of 1.5
- California Office of Statewide Health Planning and Development (OSHPD) Special Seismic Certification Preapproval (# OSP-0091-10)

Evaluated per the requirements of:

- 2007/ 2010 California Building Code
- Section 13.2.5 of (American Society of Civil Engineers / Structural Engineering Institute) ASCE/SEI 7-05

- Tested to: ICC-ES AC156

## ORDERING INFORMATION

### Enclosure

#### Relay Panel Enclosure

GR1416 LT ENC = 16 Relay Enclosure  
GR1408 LT ENC = 8 Relay Enclosure  
GR1404 LT ENC = 4 Relay Enclosure

#### Enclosure Mounting, NEMA Rating

SM NE1 = Surface Mount, NEMA 1  
FM NE1 = Flush Mount, NEMA 1  
SM NE4 = Surface Mount, NEMA 4  
SM NE12 = Surface Mount, NEMA 12

### Interior

#### Relay Panel Interior

GR1416 LT INT = 16 Relay Interior  
GR1408 LT INT = 8 Relay Interior  
GR1404 LT INT = 4 Relay Interior

#### Relays

[qty]NCL = Normally Closed Latching  
[qty]NOL = Normally Open Latching  
[qty]DPNC = Double Pole Normally Closed  
[qty]DPNO = Double Pole Normally Open  
[qty]RRNO = Reed Relay Normally Open (pair)  
[qty]SPDT = Single Pole Double Throw  
[qty]SPDTC = Single Pole Double Throw Contactor

#### Clock Option

DTCMOD = Digital time clock with modem  
DTC = Digital time clock without modem  
REMOTE = Remote panel, no clock

#### Transformer

DV = Dual voltage 120/277V  
CNDV = Canadian dual voltage 120/347V (GR1408 & GR1416 only)  
347 = 347 volt (GR1404 only)

#### Voltage Barrier

1VB = 1 Voltage Barrier

#### Dry Contacts (optional)

D6 = 6 inputs (with enable/disable)  
D14 = 14 inputs (no enable/disable)

Total quantity of relay spaces specified must either equal to, or half of, the total allowed in any given enclosure. The GR1416 may only have 16 or 8 relays, the GR1408 may only have 8 or 4, and the GR1404 may only have 4 or 2 (example: GR1416 LT INT 8NCL = a quantity of 8 normally closed, latching relays for the GR1416 LT interior).

2-pole relays, reed relay pairs, and contactor relays all count as two relay spaces (example: a GR1416 LT INT may not have more than 8 2-pole relays).

**2-pole and contactor relays may not be combined into the DTC or DTCMOD option panel.**

#### Examples:

GR1416 LT ENC SM NE1  
R1416 LT INT 16NCL DTCMOD DV D14  
GR 1416 Blue Box LT master panel with a modem, in a surface mounted, NEMA 1 enclosure, with 16 normally closed relays, 120/277V dual voltage transformer and 14 dry contact inputs.

GR1408 LT ENC SM NE1  
GR1408 LT INT 4NCL 2DPNC REMOTE DV  
GR 1408 Blue Box LT remote panel, in a surface mounted, NEMA 1 enclosure, with 4 normally closed relays and 2 2-pole normally closed relays, and a 120/277V dual voltage transformer.



# GR 2400™

## XPoint Router



## XPoint™ Router *Fixture-Level Digital Control*

**Information:** An XPoint Router consists of two types of control card:

- a) The XPoint Router Board
- b) The XPoint Driver Board

Driver boards are available as:

- a) Relay Drivers
- b) Dim Drivers

### XPoint Router Board:

The router board has a pair of yellow RJ45s for the GR 2400 bus and a pair of white RJ45s for the XPoint bus. The white RJ45s are considered the XPoint Port and each RJ45 may drive a "String" of up to 2,000 ft. of Cat. 5 wire with up to 64 modules on it. Thus, one could consider the XPoint bus to be 4,000 ft. long with up to 128 modules only driven from the center of the bus.

### Relay Driver Cards:

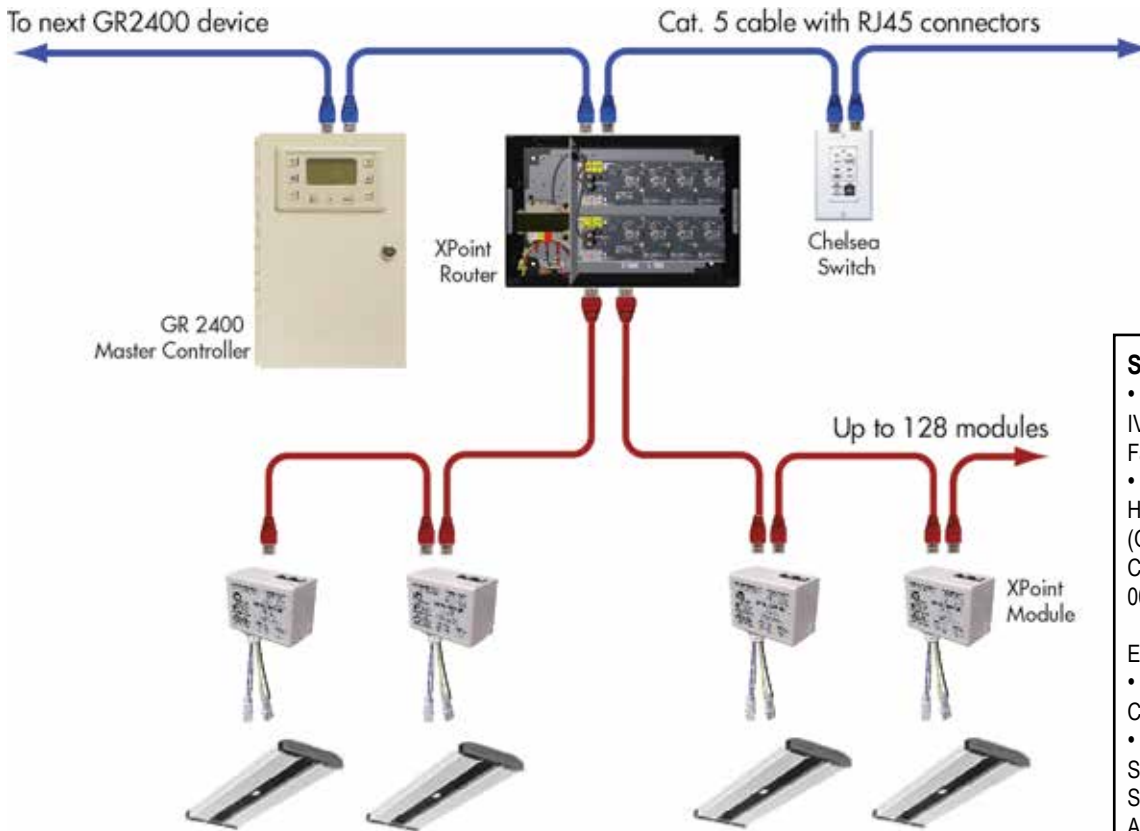
Relay drivers plug into the XPoint Router board and emulate a single GR 2448 relay panel. Up to two driver boards may drive a single XPoint port giving a maximum of 96 relays/zones emulated. The relays in the XPoint Modules are software assigned to operate as one of the emulated relays, now called a Zone. One or as more relays from the XPoint Modules on the bus may be assigned to a zone. Thus, if one wishes to have individual control, one may have up to 96 zones/relays on the bus. It is far more usual to have about 12 zones of control with all the relays assigned to these zones.

### Dim Driver Cards:

Dim drivers also plug into the XPoint Router Board and similarly emulate a GR 2408 iDim or iDH panel. These are only available with 4 (0–10 volt) dimmers (in a DH card these are relays), 4 scene accessible relays, 4 photosensor inputs and 8 dry contact scene inputs. Each dimmer or relay can be considered as a zone. Dimmers on the bus can be assigned to dimming zones, relays to relay zones. Up to 4 driver cards can drive a single XPoint port. These can be a mix of both dimmer and relay drivers. (No more than two relay drivers.) If all four boards are dimmers, there will be 16 available zones of dimming on a single bus. XPoint Dim and DH modules additionally have a photosensor and a contact closure input on each module. These may be assigned to any available "soft input" on each of the driver cards through software. Each driver card has 4 "soft" photosensor inputs and 8 "soft" scene inputs. A single photosensor may be used to control Dim/DHs in all 4 cards. In the same way the contact closure input can be assigned and can have an occupancy sensor connected that operates scenes in one (or all four) of the emulated Dim/DH cards. Occupant sensor inputs can be "soft" programmable to be used with pull high or pull low style sensors. Only one style may be used on a bus. Note: The photosensor and contact closure inputs only operate on relays or dimmers assigned to Dim/DH cards. They do not work with relays assigned to relay drivers on the same port.

**Listing:** ETL Listed to UL 916, UL 924, CSA C22.2#205

# Overview



**Seismic Certification:**

- Preapproved for use in Category IV structures with an Importance Factor of 1.5
- California Office of Statewide Health Planning and Development (OSHPD) Special Seismic Certification Preapproval (# OSP-0091-10)

Evaluated per the requirements of:

- 2007/ 2010 California Building Code
- Section 13.2.5 of (American Society of Civil Engineers / Structural Engineering Institute) ASCE/SEI 7-05
- Tested to: ICC-ES AC156

## Ordering Information:

Note: Routers are ordered separately from XPoint Modules. A single router card has two ports. Each port may drive up to 64 modules and shall not exceed 2000 feet.

### ORDERING INFORMATION

XPoint™ Router				
GR2400XP				
<b>XPoint Router</b>	<b>XPoint Router Card 1</b> <b>Relay Switching Only</b> 48RZX1 = 48 relay zones 96RZX1 = 96 relay zones  <b>Dimming Only</b> 4DZX1 = 4 dimming zones 8DZX1 = 8 dimming zones 12DZX1 = 12 dimming zones 16DZX1 = 16 dimming zones  <b>Relay Switching and Dimming Mixed</b> 48RZX1 4DZX1 = 48 relay & 4 dimming zones 48RZX1 8DZX1 = 48 relay & 8 dimming zones 48RZX1 12DZX1 = 48 relay & 12 dimming zones 96RZX1 4DZX1 = 96 relay & 4 dimming zones 96RZX1 8DZX1 = 96 relay & 8 dimming zones	<b>XPoint Router Card 2 (optional)</b> <b>Relay Switching Only</b> 48RZX2 = 48 relay zones 96RZX2 = 96 relay zones  <b>Dimming Only</b> 4DZX2 = 4 dimming zones 8DZX2 = 8 dimming zones 12DZX2 = 12 dimming zones 16DZX2 = 16 dimming zones  <b>Relay Switching and Dimming Mixed</b> 48RZX2 4DZX2 = 48 relay & 4 dimming zones 48RZX2 8DZX2 = 48 relay & 8 dimming zones 48RZX2 12DZX2 = 48 relay & 12 dimming zones 96RZX2 4DZX2 = 96 relay & 4 dimming zones 96RZX2 8DZX2 = 96 relay & 8 dimming zones	<b>Transformer</b> DV = Dual voltage 120/277V CNDV = Canadian dual voltage 120/347V	<b>Mount &amp; NEMA Type</b> SM NE1 = Surface mount, NEMA 1 FM NE1 = Flush mount, NEMA 1
<b>Examples:</b> <b>GR2400XP 96RZX1 DV SM NE1</b> XPoint Router with one XPoint Router Card configured for 96 relay zones, 120/277V dual voltage transformer, in a surface mount NEMA 1 enclosure  <b>GR2400XP 96RZX1 8DZX1 48RZX2 12DZX2 CNDV SM NE1</b> XPoint Router with two XPoint Router Cards, one configured for 96 relay zones and 8 dimming zones, the other configured for 48 relay zones and 12 dimming zones, 120/347V dual voltage transformer for Canadian voltage, in a surface mount NEMA 1 enclosure				

# GR 2400™

## XPoint Module



An AcuityBrands Company



## XPoint™ Module *Fixture-Level Digital Control*

### Description:

The **XPoint** Modules provide all the features of a networked Relay or (0–10V) Dimmer without the panel. Use the **XPoint** Module to control an individual fixture, a string of fixtures, a 30A circuit or anything in between. Precise control exactly where you need it.

Daisy chain up to 128 **XPoint** Modules from a single port on an **XPoint** Router. Modules are placed on a string of Cat. 5 cable with RJ45 connectors. Routers come with driver boards that emulate either a relay panel or a dimming panel on the GR 2400 system. The **XPoint** Modules may be assigned to any one of up to 96 Relay zones and Dimming Modules to any one of up to 16 dimming zones. Program each zone as required. Reprogramming is as simple as remotely accessing the LC&D GR 2400 system.

Relays are software selectable normally closed (N/C), normally open (N/O), or “Latching” (no change on power failure).

Note: **XPoint** Modules may only be plugged into an XPoint Router bus port.

### Features:

- Control any standard ballast—ideal for both new construction and retrofits
- Fits into a standard 1/2" KO in any fixture or J-box
- Each Port from an XPoint router drives two strings of up to 2000 ft, each string supports up to 64 modules for a total of 128 modules on a router port. (One could think of this as a 4000 ft bus with 128 modules driven from the center of the bus in order to minimize voltage drop since Modules are powered from the router.)
- Up to 128 modules on each port
- Dual relay counts as a single module allowing 256 relays per port
- Field installed or shipped to fixture manufacturer for factory installation
- Dim and DH Modules have inputs for photosensor and occupant sensor (must use specified occupant sensor — each sensor reduces modules on bus by 3)
- Optional 0–10VDC control for dimmers
- Relay defaults to software selectable state at loss of bus power or loss of communication with router box (N/O, N/C or Latched)

## Specifications:

Overall dimensions: 2" w x 2.375" h x 2.625" d  
Ambient temperature: 32–104° F (0–40° C)  
Humidity: 10–90% non-condensing  
Listings: ETL Listed to UL 916, UL 924,  
CSA C22.2#205  
# Operations: 250,000 cycles

Power consumption: Less than 2mA @ 24VDC per XPoint (for XPoint 1 and XPoint 2). XDim has additional universal 120/277VAC power supply to power 0–10VDC drive  
Contact rating: 30A @ 277VAC ballast, 20A @ 120VAC tungsten, 20A @ 347VAC ballast, 1.4hp @ 120VAC, 3hp @ 277VAC

# Overview

Relay Option	Size	Relay Description	Voltage	0-10V Dimming	Photocell Input	Dry Contact Input	Router Card	QK	Special notes
RL1	30A	One single pole relay	120/277/347	No	No	No	RZX or DZX	Optional*	
RL2	30A	Two Single Pole relays	120/277/347	No	No	No	RZX or DZX	Optional*	Two independent relays (Not for 2-pole applications)
RL480V	6A	One Double Pole relay	208/480	No	No	No	RZX or DZX	Required	Only available with quick connect
RL1 DPI	30A	One single pole relay	120/277	Yes	Yes	Yes	DZX	Optional*	Optically isolated 0–10VDC dimming output. 10mA drive for ballasts (can drive multiple 0–10V ballasts). Active drive (source and sink) defaults to +10VDC on loss of bus power or control signal.
RL1 DPI BUSP	30A	One single pole relay	120/277/347	Yes	Yes	Yes	DZX	Optional*	Bus-Powered 0–10VDC. Each Module counts for 3 on the bus. (Only 21 allowed per bus.) May be used for Canadian 347V or other voltages, or when a neutral is not available to power the dim module.
RL1 PI	30A	One single pole relay	120/277/347	No	Yes	Yes	DZX	Optional*	
DPI	N/A	No relay	N/A	Yes	Yes	Yes	DZX	Optional*	

\*QK option reduces Module size to 6A MAX.

NOTE: Xpoint routers may only be used on a bus with a 2400 DTC.

## ORDERING INFORMATION

XP		
<b>XPoint Module</b>	<b>Relay Type, Input/Output Options</b>	<b>Quick Connector</b>
	RL1 = Single relay RL2 = Dual relay RL1 DPI = Single relay, dimming output, sensor inputs RL1 DPI BUSP = Single relay, dimming output, sensor inputs, bus powered dimming RL1 PI = Single relay, sensor inputs DPI = Dimming output, sensor inputs RL480V QK = Double pole, 480VAC with quick connector RL1 PD2 = Single relay, 2-wire dimming ballasts RL1 PD3 = Single relay, 3-wire dimming ballasts	[blank] = Standard wire leads QK = Quick Connector (6 amp max)

# GR 2400™

## XPoint LT



An AcuityBrands Company



## XPoint™ LT

**Description:** XPoint LT is a low cost option specifically designed for small scale XPoint projects where 128 or less XPoint modules are needed. XPoint LT combines the GR2400 DTC, GR2400 Modem and XPoint router card into one enclosure. XPoint LT enclosure has space for one additional accessory card, such as a Link-To Ethernet card. Standard XPoint router cards cannot be connected to this system. If a larger XPoint system is needed, please refer to the standard XPoint system. XPoint LT is available in two configurations:

### Switching

**Configuration:** The switching version of XPoint LT provides control of up to 128 modules in 96 discrete zones. Multiple relays can be put into the same zone. If each relay must be controlled separately, then 96 relays should not be exceeded. Applicable XPoint modules include: XP RL1, XP RL2 and XP RL480 QK. Please refer to the XPoint module techsheet for details.

### Dimming/DLH

**Version:** The dimming version of XPoint LT provides control of up to 128 modules in (8) 0-10V dimming and (8) switching zones. Multiple relays can be put into the same zone. The Dimming/DLH version provides 8 photocell and 16 dry contact groups. These inputs can be accessed through the XPoint Dim (XP RL1 DPI) and XPoint DH (XP RL1 PI) modules which have a photocell and a contact closure input on each module. These modules will only work with the Dimming/DH XPoint router card.

- Features:**
- Reconfiguration of zones without rewiring
  - Single enclosure for DTC, router cards, and interfaces for quick and easy installation
  - Enclosure includes space for one additional interface card such as: a Link-To Ethernet card, Link-To BAS card or a Link-To PC serial card to avoid mounting an extra enclosure
  - Provides voltage to the GR2400 bus to help power passive devices to avoid extra power boosters
  - Control of up to 128 (standard XPoint) modules

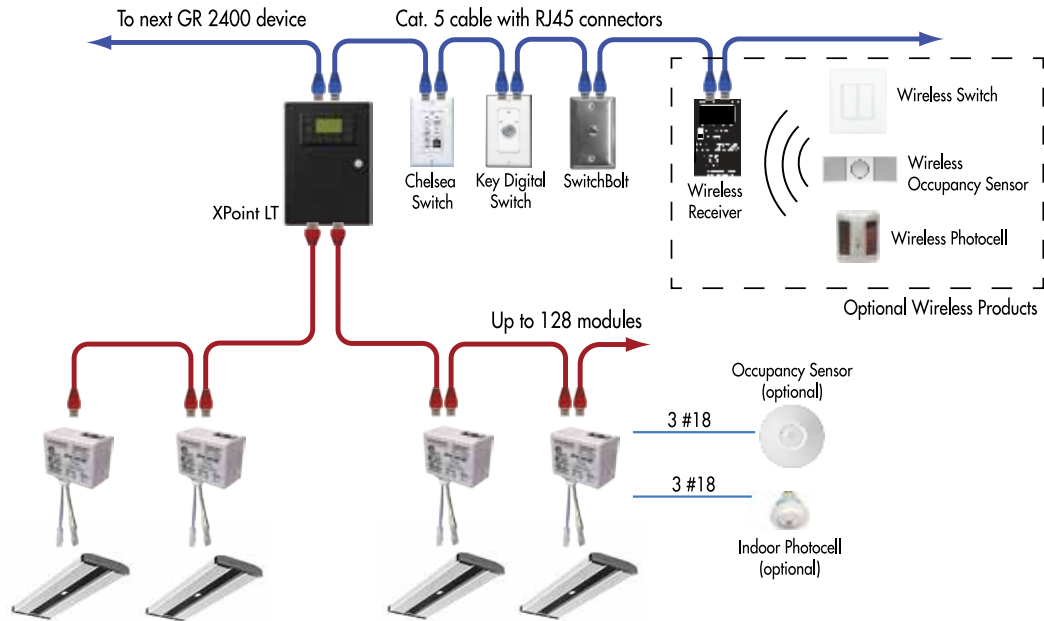
### Graphical

- Option:**
- Unity GX2 software provides a visual floor plan representation of lighting, including fixture and control status
  - With the Link-To PC Ethernet card and Unity GX, configuration becomes simplified
  - Pan and zoom without distortion using AutoCAD vector-based graphics
  - Virtual keypads provide easy local and global control
  - Easy activation of load-shedding
  - Allows for zone/fixture energy management with trending report capabilities

## Specifications:

Enclosure dimensions:	8.25" w x 13.25" h x 4" d	Max. humidity:	10–90% non-condensing
Enclosure type:	Surface Mount or flush mount, NEMA 1	Ambient temperature:	0–90° F
Max. devices per bus:	128 devices	Power consumption:	112VA
Listings:	UL and cUL listed	Operating voltage:	120/277VAC
		Bus physical layer:	RS485

# Overview



## Unity GX2 Software

### ORDERING LOGIC

GR2400XP LT				
<b>System</b> XPoint LT	<b>XPoint Cards</b> 8DZX1 = 8 dimming zones 96RZX1 = 96 relay zones	<b>Additional Cards*</b> PCETHERNET = PC Ethernet	<b>Digital Clock/Modem</b> DTC = Digital Time Clock DTCMOD = Digital Time Clock & Modem	<b>Transformer, Mount and Enclosure Type</b> DV SM NE1 = Surface mount, NEMA 1 DV FM NE1 = Flush mount, NEMA 1
* For additional options, please contact the factory.				

# GR 2400-*i*™

## Control Panel



### MicroPanel™

**Description:** The *MicroPanel*™ comes standard equipped with four relays (*MicroPanel-4*) and provides integration features simply not available anywhere else; particularly the advanced daylight harvesting properties. In its extended version it is a compact lighting controller with up to eight switching (iDH) and four 0–10V dimming (iDim) outputs that links every room into one digital, easy-to-use system.

The *MicroPanel-8* (with eight relays) provides eight switched outputs, four of which can be dimmed outputs using a single control card. It is the ideal solution for applications requiring more than four switch legs per classroom. Example: “a, b, c” lighting with dimming, a leg for presentation lighting over a white board, emergency lighting, and a contact closure for the thermostat. For applications that require more than four (0–10V) dimming outputs, a second control card may be added.

- Features:**
- Digital (global) or local wall switches
  - Digital (global) or local photosensors and occupant sensors
  - Integrates with the entire GR 2400™ system including centralized control panels
  - Time-of-day scheduling
  - Back plate mounting allows enclosure only to be shipped for rough-in
  - Rated for Normal or Emergency Power (mixed sources require an adjacent enclosure)

### Specifications:

Enclosure dimensions: **MicroPanel-4** (2-4 relays)  
NEMA 1 - 8.375" w x 8.375" h x 3.125" d  
NEMA 4/4X/12 - 12" w x 16" h x 6" d  
**MicroPanel-8** (5-8 relays)  
NEMA 1 - 12.875" w x 8.375" h x 3.125" d  
NEMA 4/4X/12 - 16" w x 20" h x 6" d

Enclosure type: Surface mount, screw cover door, NEMA 1, EZ-Find™ yellow powdercoat

Optional Enclosures: NEMA 4, NEMA 4X, NEMA 12

Relays: Normally Closed (NCL) 30A @ 277VAC Ballast, 20A @ 120VAC Tungsten, 20A @ 347VAC Ballast, SCCR 18kA @ 277VAC, Rated 250,000 Cycles

Optional Relays: Normally Open, (NOL) Spec same as NCL, NO or NC; Two Pole — NO or NC (480VAC); Double Throw 20A, 277VAC

Number of Addresses: *MicroPanel 4* (2) addresses  
*MicroPanel 8* (4) addresses

Ambient temp: 32–104° F (0–40° C), non-condensing

Listings: UL and cUL to UL 916, available for mounting in an air plenum (with suitable enclosure) for City of Chicago, ETL listed to UL 924 for emergency circuit use)

Photosensor inputs: 4 (8 with optional 2nd control card)

Local switch inputs: 8 (16 with optional 2nd control card)

0–10VDC outputs: 4 (8 with optional 2nd control card, 15mA per channel)

Power for Occupant Sensor: 24VDC/300mA

Power Supply Voltage: 120/277VAC or 347VAC

Programming: Via DTC, via PC with **Unity™ Lighting Control Software**

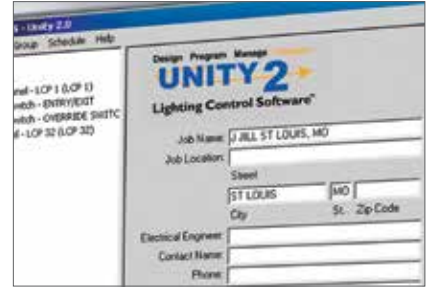
# The Digital Daylight Harvesting Solution

Because our competitor's daylight harvesting controls are not part of a system, commissioning and any later adjustments often require on-site or hardwiring changes.

The **MicroPanel-iDH** and **-iDim** solve this with our 100% digital lighting control system.

With proper installation, expensive on-site commissioning can be eliminated. Commissioning can be accomplished remotely (via dial-up or internet) from the factory.

Any adjustments (e.g., to adapt to interior design changes) can be made with a phone call.



## Adjustments can be made with a phone call

# Unprecedented Daylight Harvesting

**Response Curve.** Individually set three points on the response curve, start dim level, mid-point and turn off or end point. This is a major breakthrough in daylight harvesting, as almost any architectural setting can be compensated for after photosensor placement.

**Fade Rates.** Separate raise and lower fade rates (0 seconds to 100 minutes) in response to the photosensor helps accommodate human eye response.

**Local Override.** Room occupants may temporarily override automatic lighting levels. Even operates with inexpensive (3-way) low voltage wall switches.

**Time Delay.** Prevents nuisance cycling. Adjust from 0 seconds to 99 minutes.

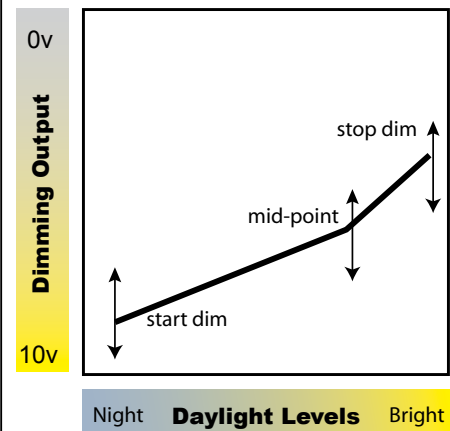
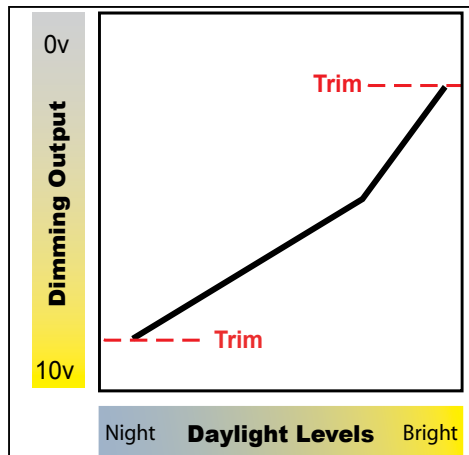
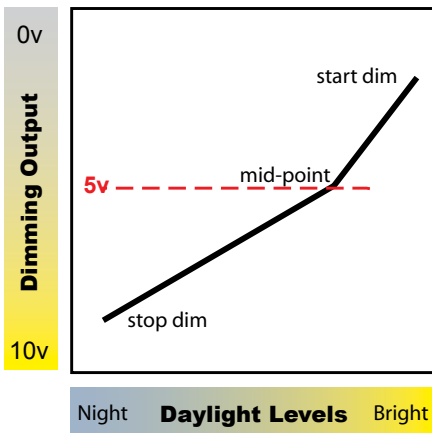
**Trim.** Individual trim levels may be set for each dimmer to compensate for manufacturers' ballast response (for example, 2–8V instead of 0–10V).



**Baseline.** If room occupants feel the automatic settings are too bright or too dim, they can adjust the baseline with an optional slider switch. The adjustment range of the slider can be set remotely.

Occupants offered a degree of control are less likely to disable the system.

**"Must Turn On" Level.** A light level below which electric lighting is switched on with no time delay (but with the proper fade rate). Sometimes required when blinds are closed or dark clouds pass overhead.



**12 Scenes.** Accommodate daylight harvesting presets for seasonal changes or fixed level presets for architectural dimming.

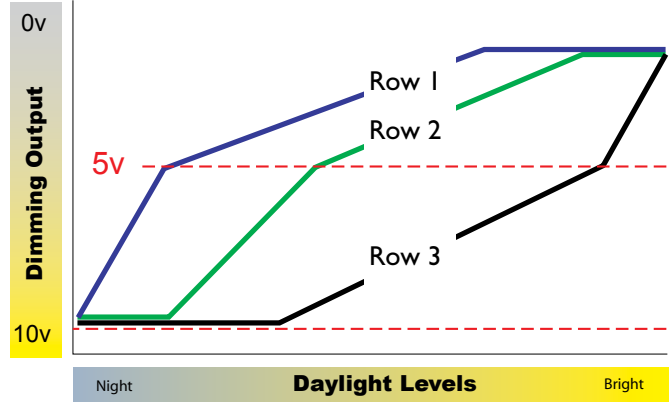
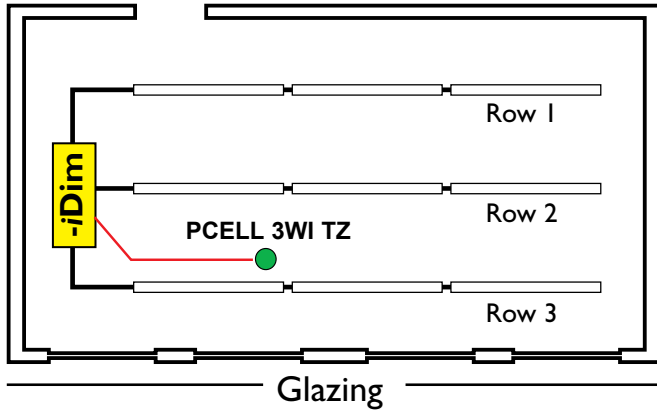


# Multi-Zone Dimming & Switching

The really big news is the ability of the **MicroPanel** to control multiple daylight harvesting zones (dimming or switching) with a single (local or global) photosensor.

Each dimmer (or relay) may have its own dimming curve appropriate to its location in the room. These multiple dimming curves are ideal for open loop or closed loop daylight harvesting.

No matter what the exposure may be (north, south, east or west), the right curve can be precisely set for any architectural setting.



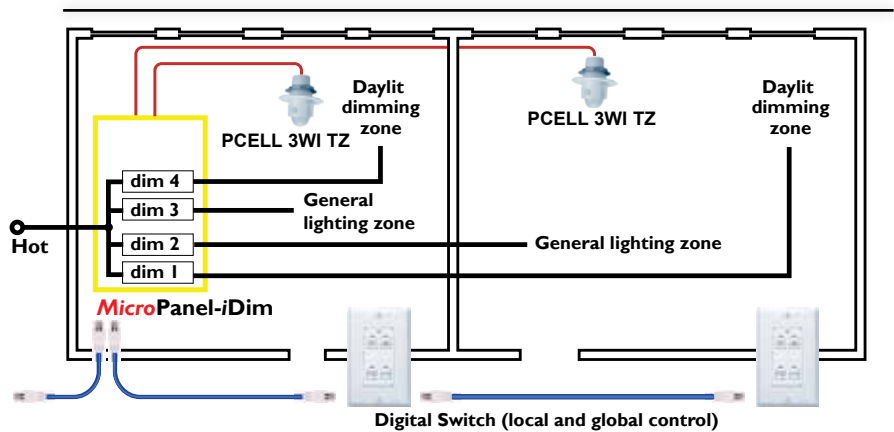
# Local & Global Photosensors

LC&D clients are used to having local and global switches, occupancy sensors and programming. Now we also offer global daylighting photosensors!

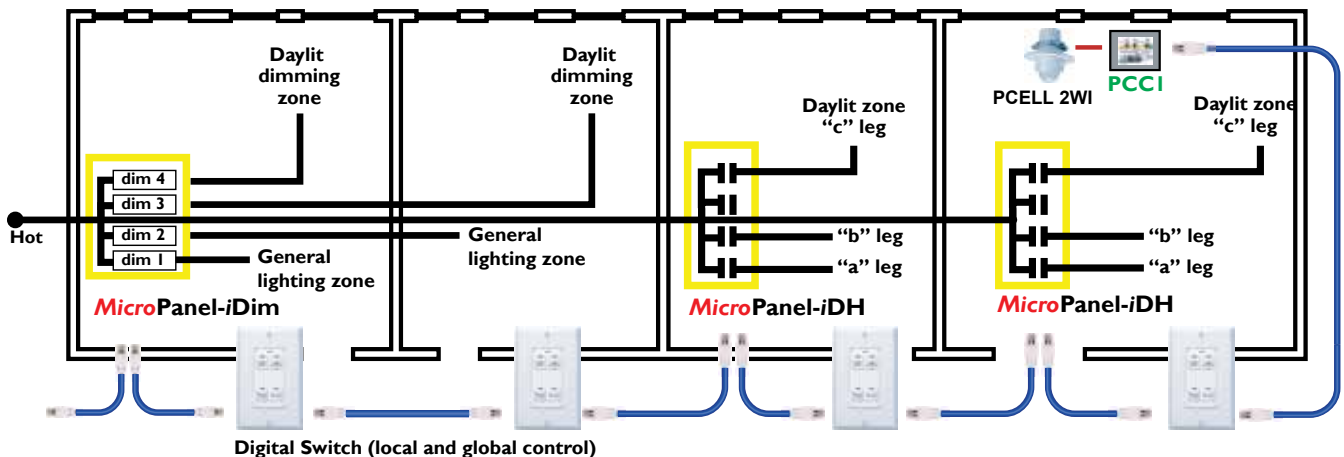
Local photosensors are used when separate responses are required for each room to account for individual blinds or window treatments.

Multiple rooms that share the same exposure and window treatment can share the same photosensor over the network. Global photosensors are also used for top-lit applications such as warehouses.

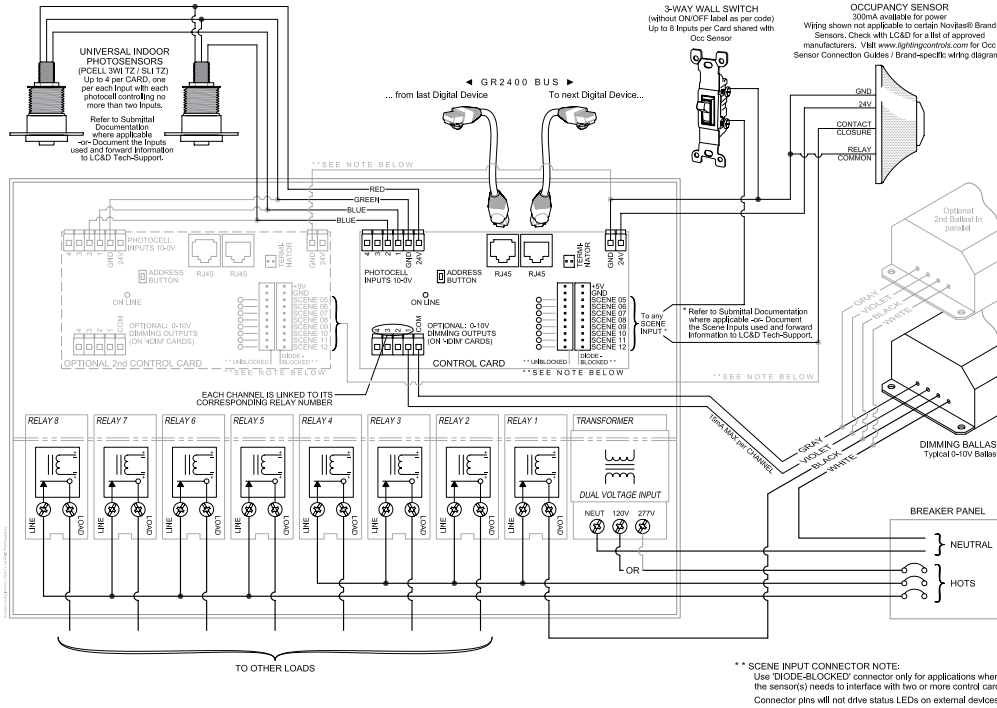
## Local Photosensors



## Global Photosensor



# Single Line Drawings



**Seismic Certification:**

- Preapproved for use in Category IV structures with an Importance Factor of 1.5
- California Office of Statewide Health Planning and Development (OSHPD) Special Seismic Certification Preapproval (# OSP-0091-10)

Evaluated per the requirements of:

- 2007/ 2010 California Building Code
- Section 13.2.5 of (American Society of Civil Engineers / Structural Engineering Institute) ASCE/SEI 7-05

• Tested to: ICC-ES AC156

## ORDERING INFORMATION

Enclosure				
<b>Relay Panel Enclosure</b> GR2404 ENC = 4 Relay Enclosure GR2408 ENC = 8 Relay Enclosure	<b>Enclosure Mounting, NEMA Rating</b> SM NE1 = Surface Mount, NEMA 1 FM NE1 = Flush Mount, NEMA 1 SM NE4 = Surface Mount, NEMA 4 SM NE12 = Surface Mount, NEMA 12 SM NE4X = Surface Mount, NEMA 4X	<b>Emergency Options (optional)</b> EMSMDM EMSMDH 1VB = 1 Voltage Barrier	If this is not being used for separating normal and emergency circuits, then leave this blank. Otherwise put EM for emergency, SM for surface mount (flush mount is not available in this configuration), then depending on your control card choice for the interior, put DM if you chose iDim, or DH if you chose iDH.  Example: EMSMDH would be for a MicroPanel iDH for emergency circuits in a surface mount enclosure.	
Interior				
<b>Relay Panel Interior</b> GR2404 INT = 4 Relay Interior GR2408 INT = 8 Relay Interior	<b>Relays</b> [qty]NCL = Normally Closed Latching [qty]NOL = Normally Open Latching [qty]DPNC = Double Pole Normally Closed [qty]DPNO = Double Pole Normally Open [qty]RRNO = Reed Relay Normally Open (pair) [qty]SPDT = Single Pole Double Throw [qty]SPDTC = Single Pole Double Throw Contactor	<b>Control Card</b> IDH4 = iDH control card for GR 2404 IDH8 = iDH control card for GR 2408 IDIM4 = iDim control card for GR 2404 IDIM8 = iDim control card for GR 2408	<b>Transformer</b> DV = Dual voltage 120/277V 347 = 347 volt	<b>Input Card (optional)*</b> D6 = 6 inputs (enable/disable) D14 = 14 inputs (no enable/disable)
Where [qty] is in the nomenclature, replace with quantity of relays, and leave no space between number and code (example: 8NOL = a quantity of 8 normally open, latching relays).  Total may not exceed 4 for GR2404, or 8 for GR2408 and quantity must be in pairs for single relays (NCL, NOL, and SPDT) or each for any double relays (DPNC, DPNO, RRNO, and SPDTC) as they count as two: example, a GR2408 may only have 2, 4, 6 or 8 NCL relays, or 1,2,3 or 4 DPNC relays).		<b>Example:</b> GR2408 ENC SM NE1 EMSMDM GR2408 INT 8NCL IDIM4 DV D6  8 relay MicroPanel iDim for emergency circuits, surface mount NEMA 1 enclosure, with 8 normally closed relays, iDim control card with 6 dry-contact enable/disable inputs, and a 120/277V dual voltage transformer.		

# GR 2400™

## Control Panel



An AcuityBrands Company

## SmartBreaker™ Panel

**Description:** The GR 2400 **SmartBreaker** Panel uses solenoid-operated thermal magnetic breakers. Combine over-current protection and lighting control in a single package. Mix controlled and conventional breakers in the same panelboard.

The **SmartBreaker** Panel is part of the GR 2400 system and seamlessly integrates with GR 2400 relay panels, digital switches, the **Micro Panel** and all of our digital devices.

Directly control each breaker using **Unity™ Lighting Control Software** or **Unity GX™ Advanced Graphical Software**, or from the DTC located in the master panel.

- Features:**
- Main lugs or main breakers
  - Retrofit chassis
  - RJ45 connectors
  - Modem includes free lifetime factory programming
  - UL listed
  - AIC to 65k
  - Link up to 127 digital addresses via Cat. 5 patch cable with RJ45 connectors
  - Temperature 32–105° F (0–41° C)

## Specifications:

Enclosure dimensions:  
20" w x 45" h x 6" d @ 225A with main lugs (panel height may vary depending on mains)

Type:  
NEMA 1 (other NEMA types optional)  
Standard Panel configurations:

- 100–600A
- Main lugs or main breakers
- 120/208VAC (3 phase, 4 wire)
- 120/240VAC (1 phase, 3 wire)
- 277/480VAC (3 phase, 4 wire)

Solenoid breaker configurations:

- Single pole 15A, 20A, 30A
- Double pole 20A, 30A

AIC Rating:  
65k @ 120/208VAC (MAIN only)  
14k @ 277/480VAC

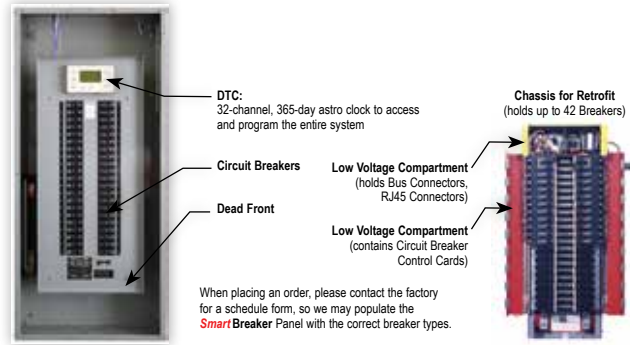
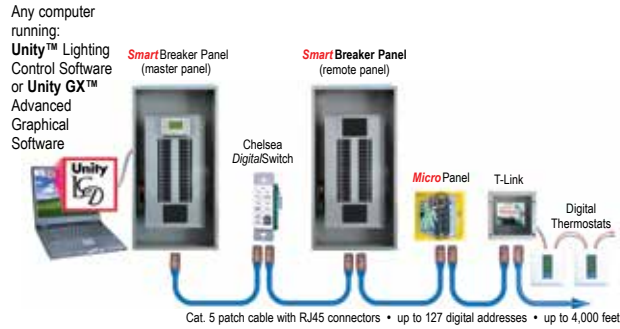
Single Pole



Double Pole



# System Design



## ORDERING INFORMATION

SmartBreaker Panel																																																	
<b>GR2400SBP CHASSIS</b>																																																	
<b>System and Type</b>	<b>Feed Voltage</b>	<b>Feed Current</b>	<b>Feed Type<sup>2</sup></b>	<b>AIC</b>																																													
	120V208V 120V240V 277V480V <sup>1</sup>	100AMP 225AMP 400AMP 600AMP	MAIN <sup>1</sup> = Main Breaker MLO <sup>2</sup> = Main Lug Only MLODL <sup>2</sup> = Main Lug Only with Double Lugs	14K <sup>2</sup> 65K <sup>1</sup>																																													
<p><sup>1</sup> = If feed voltage is specified 277V480V and AIC is specified 65K, then feed type must be MAIN.  <sup>2</sup> = AIC Rating for MLO or MLODL panel(s) is set at 14k AIC.</p>																																																	
<b>Clock Option</b>	<b>Enclosure Mounting &amp; NEMA Rating</b>		<b>Feed Orientation</b>																																														
DTC = Digital Time Clock DTCMOD = Digital Time Clock with Modem REMOTE = Remote Panel	SM NE1 = Surface Mount, NEMA 1 FM NE1 = Flush Mount, NEMA 1 SM NE4 = Surface Mount, NEMA 4 SM NE4X = Surface Mount, NEMA 4X SM NE12 = Surface Mount, NEMA 12		BOTTOM = Bottom Feed TOP = Top Feed																																														
<p>Alternate feed voltages, AIC ratings, feed currents, as well as other non-standard options are available. Please contact the factory for quotation of panels beyond the options outlined here.</p>																																																	
SmartBreaker Panel Breakers																																																	
<b>GR2400SBP BRKR</b>																																																	
<b>System and Type</b>	<b>Breakers and Breaker Accessories</b>																																																
<p>Due to the complexity of this product, breakers must be entered as separate line items following the chassis code. Enter quantities as part of the line entry. Note that one 20A 1P breaker must be reserved to provide power for control electronics.</p> <p>If you have not filled all 42 breaker positions, you must order the difference in breaker spacers (BSPC) (example: if a 225A feed current panel had 32 1-pole breakers were specified, then 10 breaker spacers would be required, or if 20 2-pole breakers were specified, 2 BSPC would be needed, or for 12 3-pole breakers, you would need 6).</p>	<p>1P[amp]ARB = 1-Pole Remote Breaker                  2P[amp]ARB = 2-Pole Remote Breaker                  1P[amp]ABB = 1-Pole Branch Breaker                  2P[amp]ABB = 2-Pole Branch Breaker                  3P[amp]ABB = 3-Pole Branch Breaker                  BSPC = Breaker Spacer                  CLIP = Locking Clips</p> <p>Where [amp] is, replace with ampere rating for that breaker (please refer to the Ampere Rating Table to select the proper rating for a specific breaker type).</p>																																																
	<table border="1"> <caption>Ampere Rating Table</caption> <thead> <tr> <th rowspan="2">Remote Breakers</th> <th colspan="2">Branch Breakers</th> </tr> <tr> <th>1- or 2-Pole</th> <th>1-Pole</th> <th>2- or 3-Pole</th> </tr> </thead> <tbody> <tr><td>15</td><td>15</td><td>15</td></tr> <tr><td>20</td><td>20</td><td>20</td></tr> <tr><td>25</td><td>25</td><td>25</td></tr> <tr><td>30</td><td>30</td><td>30</td></tr> <tr><td></td><td>35</td><td>35</td></tr> <tr><td></td><td>40</td><td>40</td></tr> <tr><td></td><td>45</td><td>45</td></tr> <tr><td></td><td>50</td><td>50</td></tr> <tr><td></td><td>60</td><td>60</td></tr> <tr><td></td><td>80</td><td>70</td></tr> <tr><td></td><td></td><td>90</td></tr> <tr><td></td><td></td><td>95</td></tr> <tr><td></td><td></td><td>100</td></tr> </tbody> </table>				Remote Breakers	Branch Breakers		1- or 2-Pole	1-Pole	2- or 3-Pole	15	15	15	20	20	20	25	25	25	30	30	30		35	35		40	40		45	45		50	50		60	60		80	70			90			95			100
Remote Breakers	Branch Breakers																																																
	1- or 2-Pole	1-Pole	2- or 3-Pole																																														
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	<p><b>Example:</b> GR2400SBP DMXCHASSIS 120V208V 225AMP MAIN 65K DTCMOD SM NE1 BOTTOM                  GR2400SBP BRKR 1P15ARB (quantity is specified on line entry – 14 for this example)                  GR2400SBP BRKR 1P20ARB (quantity is specified on line entry – 10 for this example)                  GR2400SBP BRKR 2P30ABB (quantity is specified on line entry – 5 for this example)                  GR2400SBP BRKR 3P100ABB (quantity is specified on line entry – 2 for this example)                  GR2400SBP BSPC (quantity is specified on line entry – 2 for this example)                  GR2400SBP CLIP (quantity is specified on line entry – 6 for this example)</p> <p>120/208V DMX SmartBreaker panel rated at 65k AIC, with a 225A main breaker, configured as a master panel with digital time clock and modem, containing 14 15A and 10 20A 1-pole remote breakers, 5 30A 2-pole and 2 100A 3-pole branch breakers, 2 breaker spacers and 6 locking clips, surface mount NEMA 1 enclosure with knockouts, designed for bottom line voltage feed.</p>																																																

# DMX Panel

## Control Panel



An Acuity Brands Company



## DMX512A Relay Panels

**Description:** A DMX-only panel which employs a DMX512 command to turn on and off SnapLink™ relays. The DMX relay panel may use any start address. Will not interface to a GR 2400™ system. DMX relay panels are DMX512A compatible.

For applications which require both GR 2400 digital lighting controls and a DMX take-over, refer to the Link-To™ DMX card.

- Features:**
- Manual override of individual relays, zones, or entire panel if no DMX signal or auto-hand switch.
  - Panels may be controlled in “Zone Mode” or “Discrete Mode.” Zone mode allows multiple relays to be controlled by the same DMX address
  - May control mixed voltages (i.e., 120V, 277V)
  - May control normal or emergency power

## Specifications:

Enclosure dimensions:	16 relays NEMA 1 - 12" w x 18" h x 6" d NEMA 4X - 16" w x 24" h x 8" d NEMA 4/12 - 16" w x 24" h x 6" d up to 32 relays: NEMA 1 - 20" w x 25.5" h x 6" d NEMA 4/4X/12 - 24" w x 36" h x 8" d up to 48 relays: NEMA 1 - 20" w x 37.5" h x 6" d NEMA 4/12 - 24" w x 48" h x 10" d NEMA 4X - 36" w x 48" h x 10" d	Relays:	Normally Closed (NCL) 30A @ 277VAC Ballast 20A @ 120VAC Tungsten 20A @ 347VAC Ballast SCCR 18kA @ 277VAC Rated 250,000 Cycles
Enclosure type:	NEMA 1 surface mount, hinged locking door	Optional relays:	Normally Open, (NOL) Spec same as NCL, Two Pole — NO or NC (480VAC); Double Throw 20A 277VAC
Optional enclosure rating:	NEMA 4, NEMA 12, NEMA 4X or flush mount NEMA 1	Listings:	UL and cUL to UL 916, ETL listed to UL 924 (for emergency circuit use)
		Max. humidity:	10–90% non-condensing
		Ambient temperature:	32–104° F (0–40° C)
		Power supply voltage:	120/277VAC or 120/347VAC
		Protocol:	DMX512A

# Details

Digital DMX Connectors:  
Depluggable Screw Connectors

**Lighting Relays:**  
Normally Closed (NCL), 30A @ 277V Ballast,  
20A @ 120V Tungsten, 20A @ 347V Ballast, SCCR 18kA  
@ 277V, Rated 250,000 Cycles

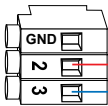
**Optional relays:**  
Normally Open, (NOL) Spec same as NCL,  
Two Pole — NO or NC; Double Throw 20A 277V

Relay Control Card:  
Manual control of zones or individual relays

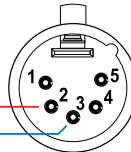
High/Low Voltage Barrier:  
(16 gauge steel)



Digital DMX Connector  
in DMX Panel



Use a proper data cable.  
Twisted pair with foil and twisted braids.  
Balanced audio cable will not do.



Male XLR pin connector  
(front view)

**Notes:**

- Pin #3 of the XLR Connector is routed to Terminal #3 of the Digital DMX Connector
- Pin #2 of the XLR Connector is routed to Terminal #2 of the Digital DMX Connector
- If end of the line is a XLR connector, then terminate the end of the network with 120 ohm end-of-line resistor. In the case of the Digital DMX connector, end-of-line resistors should be across Terminals #2 and #3.
- If there is a 2 pin terminator connector on the panel, use Blue jumper to enable it.

**Seismic Certification:**

- Preapproved for use in Category IV structures with an Importance Factor of 1.5
- California Office of Statewide Health Planning and Development (OSHPD) Special Seismic Certification Preapproval (# OSP-0091-10)

Evaluated per the requirements of:

- 2007/ 2010 California Building Code
- Section 13.2.5 of (American Society of Civil Engineers / Structural Engineering Institute) ASCE/SEI 7-05

- Tested to: ICC-ES AC156

**ORDERING INFORMATION**

**DMX Enclosure**

**DMX Relay Panel Enclosure**

DMX16 ENC = 16 Relay Enclosure  
DMX32 ENC = 32 Relay Enclosure  
DMX48 ENC = 48 Relay Enclosure

**Enclosure Mounting, NEMA Rating, Knockouts<sup>1</sup>**

SM NE1 = Surface Mount, NEMA 1 with knockouts  
FM NE1 = Flush Mount, NEMA 1 with knockouts  
SM NE1 NKO<sup>1</sup> = Surface Mount, NEMA 1 no knockouts  
FM NE1 NKO<sup>1</sup> = Flush Mount, NEMA 1 no knockouts  
SM NE4 = Surface Mount, NEMA 4  
SM NE12 = Surface Mount, NEMA 12  
SM NE4X = Surface Mount, NEMA 4X

1 = "No knockouts" option only available for DMX32 and DMX48 enclosures. DMX16 NEMA 1 enclosures come with knockouts by default. All other NEMA ratings (4, 4X and 12) come without knockouts by default.

**Example:**

DMX48 ENC SM NE1  
DMX48 INT 12NCL 12SPDT 12DPNO DV 1VB

48 relay DMX panel, surface mount NEMA 1 enclosure with knockouts, with 12 normally closed relays, 12 single pole double throw relays, 12 double pole normally open relays, a 120/277V dual voltage transformer, and one voltage barrier.

**DMX Interior**

**DMX Relay Panel Interior**

DMX16 INT = 16 Relay Interior  
DMX32 INT = 32 Relay Interior  
DMX48 INT = 48 Relay Interior

**Relays**

[qty]NCL = Normally Closed Latching  
[qty]NOL = Normally Open Latching  
[qty]DPNC = Double Pole Normally Closed  
[qty]DPNO = Double Pole Normally Open  
[qty]RRNO = Reed Relay Normally Open (pair)  
[qty]SPDT = Single Pole Double Throw  
[qty]SPDTC = Single Pole Double Throw Contactor

Total quantity of relay spaces specified must not exceed the total allowed in any given enclosure. The DMX16 may only have up to 16 relays, the DMX32 may only have up to 32, and the DMX48 may only have up to 48. (example: DMX16 INT 10NCL = a quantity of 10 normally closed, latching relays for the DMX16 interior). 2-pole relays, reed relay pairs, and contactor relays all count as two relay spaces (example: a DMX32 INT may not have more than 16 2-pole relays).

**Transformer**

DV = Dual voltage 120/277V  
CNDV = Canadian dual voltage 120/347V

**Voltage Barrier<sup>2</sup>**

[blank] = No barrier  
1VB = 1 barrier  
2VB = 2 barriers  
3VB = 3 barriers  
4VB = 4 barriers

2 = Voltage barriers are only available in the DMX32 and DMX48 panels. Check with NEC or CEC, State or Province, and local regulations as well as your electrical inspector about allowances for voltage barriers within panels.

# DMX Panel

## Control Panel



## DMX512A *SmartBreaker*™ Panel

**Description:** A DMX-only panel which employs a DMX 512 command to turn on and off *SmartBreakers*.

The **DMX *SmartBreaker* Panel** uses solenoid operated thermal magnetic breakers to combine over-current protection and lighting control into a single package.

The **DMX *SmartBreaker* Panel** may use any start address from 1–512. All breaker addresses consecutively follow the start address.

Integrate a DMX system to a **GR 2400** digital lighting control system with the **Link-To™ DMX card**.

- Features:**
- Seamless integration to any DMX-based control system
  - Mix controlled and conventional breakers in the same panelboard
  - Main lugs or main breakers
  - Retrofit chassis
  - UL listed
  - DMX512A compatible

## Specifications:

Enclosure dimensions:  
20" w x 45" h x 6" d @ 225A with main lugs)

Type:  
NEMA 1 (other NEMA types optional)

Standard Panel configurations:

- 100–600A
- Main lugs or main breakers
- 120/208VAC (3 phase, 4 wire)
- 120/240VAC (1 phase, 3 wire)
- 277/480VAC (3 phase, 4 wire)

Solenoid breaker configurations:

Single pole 15A, 20A  
Double Pole 20A, 30A

AIC Rating:  
65k @ 120/208VAC, 14k @ 277/480VAC

Listings:  
UL listed

Single Pole

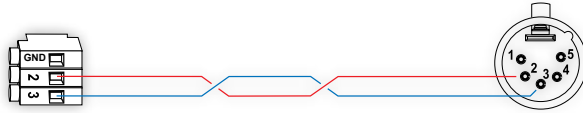


Double Pole

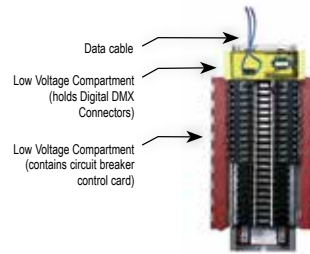


# System Design

DMX SmartBreaker Panel



Chassis for retrofit (holds up to 42 Breakers)



Retrofit an existing breaker panel with a **SmartBreaker** DMX chassis. Contact the factory for assistance.

## ORDERING INFORMATION

DMX SmartBreaker Panel																																																	
<b>DMXSBP CHASSIS</b>																																																	
<b>System and Type</b>	<b>Feed Voltage</b>	<b>Feed Current</b>	<b>Feed Type<sup>2</sup></b>	<b>AIC</b>																																													
	120V208V 120V240V 277V480V <sup>1</sup>	100AMP 225AMP 400AMP 600AMP	MAIN <sup>1</sup> = Main Breaker MLO <sup>2</sup> = Main Lug Only MLODL <sup>2</sup> = Main Lug Only with Double Lugs	14K 65K <sup>1</sup>																																													
<sup>1</sup> = If feed voltage is specified 277V480V and AIC is specified 65K, then feed type must be MAIN. <sup>2</sup> = AIC Rating for MLO or MLODL panel(s) is set at 14k AIC.																																																	
<b>REMOTE</b>																																																	
<b>Clock Option</b>	<b>Enclosure Mounting &amp; NEMA Rating</b>	<b>Feed Orientation</b>																																															
	SM NE1 = Surface Mount, NEMA 1 FM NE1 = Flush Mount, NEMA 1 SM NE4 = Surface Mount, NEMA 4 SM NE4X = Surface Mount, NEMA 4X SM NE12 = Surface Mount, NEMA 12	BOTTOM = Bottom Feed TOP = Top Feed																																															
Alternate feed voltages, AIC ratings, feed currents, as well as other non-standard options are available. Please contact the factory for quotation of panels beyond the options outlined here.																																																	
DMX SmartBreaker Panel Breakers																																																	
<b>GR2400SBP BRKR</b>																																																	
<b>System and Type</b>	<b>Breakers and Breaker Accessories</b>																																																
<p>Due to the complexity of this product, breakers must be entered as separate line items following the chassis code. Enter quantities as part of the line entry. One 20A 1P breaker must be reserved to provide power for control electronics.</p> <p>If you have not filled all 42 breaker positions, you must order the difference in breaker spacers (BSPC) (example: if a 225A feed current panel had 32 1-pole breakers were specified, then 10 breaker spacers would be required, or if 20 2-pole breakers were specified, 2 BSPC would be needed, or for 12 3-pole breakers, you would need 6).</p>	<p>1P[amp]ARB = 1-Pole Remote Breaker                  2P[amp]ARB = 2-Pole Remote Breaker                  1P[amp]ABB = 1-Pole Branch Breaker                  2P[amp]ABB = 2-Pole Branch Breaker                  3P[amp]ABB = 3-Pole Branch Breaker                  BSPC = Breaker Spacer                  CLIP = Locking Clips</p> <p>Where [amp] is, replace with ampere rating for that breaker (please refer to the Ampere Rating Table to select the proper rating for a specific breaker type).</p>																																																
	<table border="1"> <caption>Ampere Rating Table</caption> <thead> <tr> <th rowspan="2">Remote Breakers</th> <th colspan="2">Branch Breakers</th> </tr> <tr> <th>1- or 2-Pole</th> <th>1-Pole</th> <th>2- or 3-Pole</th> </tr> </thead> <tbody> <tr><td>15</td><td>15</td><td>15</td></tr> <tr><td>20</td><td>20</td><td>20</td></tr> <tr><td>25</td><td>25</td><td>25</td></tr> <tr><td>30</td><td>30</td><td>30</td></tr> <tr><td></td><td>35</td><td>35</td></tr> <tr><td></td><td>40</td><td>40</td></tr> <tr><td></td><td>45</td><td>45</td></tr> <tr><td></td><td>50</td><td>50</td></tr> <tr><td></td><td>60</td><td>60</td></tr> <tr><td></td><td>80</td><td>70</td></tr> <tr><td></td><td></td><td>90</td></tr> <tr><td></td><td></td><td>95</td></tr> <tr><td></td><td></td><td>100</td></tr> </tbody> </table>				Remote Breakers	Branch Breakers		1- or 2-Pole	1-Pole	2- or 3-Pole	15	15	15	20	20	20	25	25	25	30	30	30		35	35		40	40		45	45		50	50		60	60		80	70			90			95			100
Remote Breakers	Branch Breakers																																																
	1- or 2-Pole	1-Pole	2- or 3-Pole																																														
15	15	15																																															
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		100																																															
	<p><b>Example:</b></p> <p>GR2400SBP DMXCHASSIS 120V208V 225AMP MAIN 65K DTCMOD SM NE1 BOTTOM                  GR2400SBP BRKR 1P15ARB (quantity is specified on line entry – 14 for this example)                  GR2400SBP BRKR 1P20ARB (quantity is specified on line entry – 10 for this example)                  GR2400SBP BRKR 2P30ABB (quantity is specified on line entry – 5 for this example)                  GR2400SBP BRKR 3P100ABB (quantity is specified on line entry – 2 for this example)                  GR2400SBP BSPC (quantity is specified on line entry – 2 for this example)                  GR2400SBP CLIP (quantity is specified on line entry – 6 for this example)</p>																																																
	<p>120/208V DMX SmartBreaker panel rated at 65k AIC, with a 225A main breaker, configured as a master panel with digital time clock and modem, containing 14 15A and 10 20A 1-pole remote breakers, 5 30A 2-pole and 2 100A 3-pole branch breakers, 2 breaker spacers and 6 locking clips, surface mount NEMA 1 enclosure with knockouts, designed for bottom line voltage feed.</p>																																																



# SilverBullet™

## Current Limiting Panel



An Acuity Brands Company



## The SilverBullet™ Sub-Branch Circuit Current Limiter

**Description:** Lighting calculations for most energy codes include a deduction for each linear foot of track. California's Title 24 "charges" 45 watts/linear foot of track lighting. Seattle "charges" 70 watts/foot. ASHRAE, 30 watts/foot. With today's lighting technology the connected load is far less than the per-foot requirements of these codes.

The SilverBullet, a "Sub-Branch Circuit Current Limiter" solves this requirement by enforcing a definite current limit to lower the VA rating of each track lighting circuit.

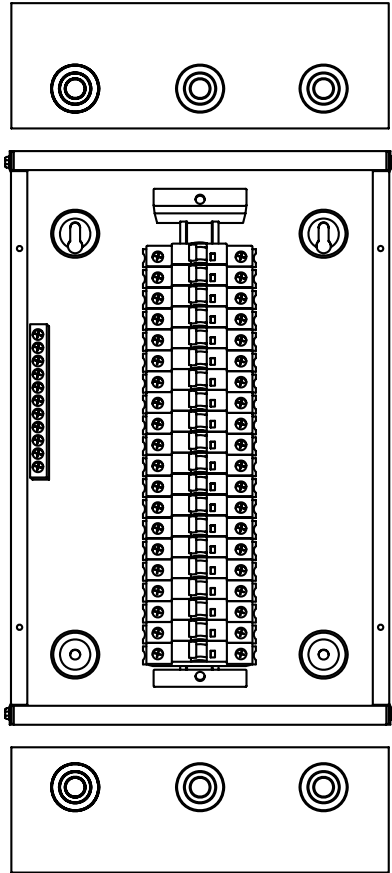
For example, California's Title 24 would require three track circuits with a total length 100 ft to be calculated at a minimum of 4500 watts (45 watts/foot x 100 ft). With the SilverBullet those three tracks could be limited to 8 amps each to reduce the lighting load calculation to 2880 watts (120V x 24 amps).

- Features:**
- Current limiting for up to 21 circuits
  - Current limiting available from 1-8, 10, 13 & 15 amps
  - Compact Sizes 12" w x 18" h x 4" d or 12" w x 12" h x 4" d
  - AIC Rating of 10,000A @ 120VAC
  - Factory pre-assembled
  - Each load factory labeled on the door sheet
  - No programming required

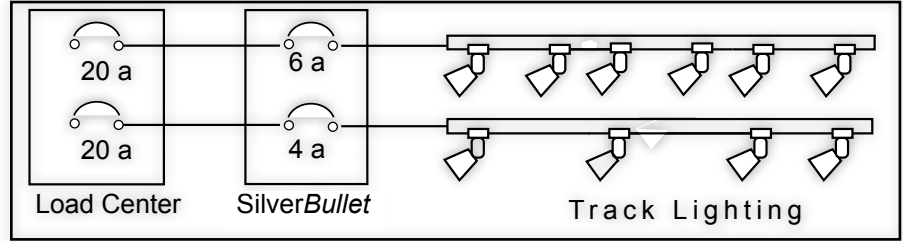
## Specifications:

- Enclosure dimensions: 12" w x 12" h x 4" d, (1-12 supplementary breakers)  
12" w x 18" h x 4" d, (6-21 supplementary breakers)
- Enclosure type: Surface mount, hinged locking door, NEMA 1
- Optional enclosures: Flush mount
- Certifications: Panel complies with UL 508, breakers comply with UL 489
- Max. humidity: 10–90% non-condensing
- Ambient temperature: 32–104° F (0–40° C) (Note: Thermal magnetic breakers. De-rate to 80% of load for temperatures over 70° F)

# How It Works



SUPPLEMENTAL CURRENT LIMITING PANEL  
NEMA 1 ENCLOSURE WITH HINGED LOCKING DOOR  
UP TO 21 CURRENT LIMITERS: 12"W X 18"H X 6"D



## More Track—Less Penalty

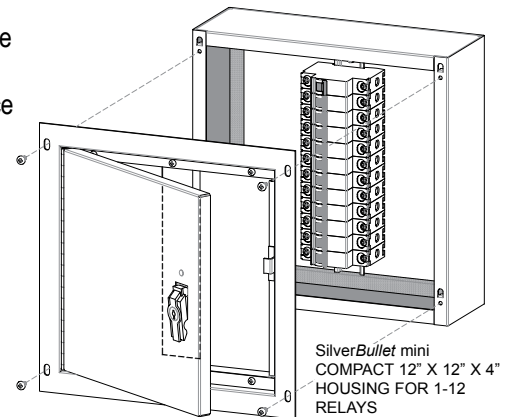
The SilverBullet is UL Listed to be placed in-line between the branch circuit breaker and the track mounted lighting loads.

**California 2005 Title 24, Section 130 C(3) states:**

**(c) Luminaire power.** Luminaire wattage incorporated into the installed lighting power shall be determined in accordance with the following criteria: The wattage of line voltage lighting track and plug-in busway which allows the addition or relocation of luminaires without altering the wiring of the system shall be the volt-ampere rating of the branch circuit feeding the luminaires.

This is what the SilverBullet does.

When doing energy calculations, use the ampere rating of the supplementary breaker in the SilverBullet as opposed to the linear footage of the rack. No magic. Just a SilverBullet.



SilverBullet mini  
COMPACT 12" X 12" X 4"  
HOUSING FOR 1-12  
RELAYS

## ORDERING INFORMATION

### SilverBullet

#### System

T24 = Standard (21 breakers max.)  
T24M = Mini (12 breakers max.)

#### Breaker UL Listing

489UL = Standard  
1077UL = (required for City  
of Los Angeles)

#### Breaker Positions

[qty]BP = # of positions

Where [qty] is, replace with the total number of breakers needed in a panel, within a range depending upon the specified panel: T24 is from 6 and 21 breakers, T24M is from 1 to 12.

#### Breakers

1A[qty] = 1 amp breaker  
2A[qty] = 2 amp breaker  
3A[qty] = 3 amp breaker  
4A[qty] = 4 amp breaker  
5A[qty] = 5 amp breaker  
6A[qty] = 6 amp breaker  
7A[qty] = 7 amp breaker  
8A[qty] = 8 amp breaker  
10A[qty] = 10 amp breaker  
13A[qty] = 13 amp breaker  
15A[qty] = 15 amp breaker

1 = only available with 1077UL option

Where [qty] is, replace with the quantity of breakers of that amperage. Total quantity of breaker spaces specified must fall within the number specified under Panel Size. 3A2 is two 3 amp breakers, 10A10 is ten 10 amp breakers.

#### Enclosure Mountings

SM = Surface Mount  
FM = Flush Mount

# GR 2400™

## Master Controller



An AcuityBrands Company



## GR 2400 Master Controller



### Description:

GR 2400 Systems with distributed control are not always specified with a master panel (which would contain the DTC.) In these situations, the DTC is mounted by itself in its own enclosure with a power supply in the base. Additional interface cards may also be mounted and powered by the enclosure to make for a more compact system.

### Features:

- Self contained DTC may mount at any convenient point on the GR 2400 bus with access to a phone line for use by the modem
- Provides voltage to the GR 2400 bus to help power a run of switches
- May also contain additional interface cards including a Link-To BAS card or a server card
- Painted in ivory. May be mounted in an office if needed to provide convenient access to the system
- Universal enclosure may be surface or flush mounted
- Enclosure dimensions: 8.25" w x 13.25" h x 4" d
- UL and cUL Listed

# Overview



**Note About NEMA 4 Enclosures:** When ordering the NEMA 4 enclosure option, you will receive a flush mount NEMA 1 enclosure mounted inside of a surface mount NEMA 4 enclosure.

**Note About Additional Cards:** When ordering additional items to be mounted in the same box, follow the example below: For instance, a Link-to PC needs to be ordered with this system, usually it would get its own enclosure and be ordered as:

**GR2400 L2 PC232 115K DV SM NE1**  
*(DV SM NE1 means it comes with a dual voltage transformer in a surface mount NEMA 1 enclosure)*

Instead, order GR2400 L2 PC232 115K (with no DV SM NE1) on the lines following the Master Controller entry.

**Note: XPoint Router Cards are excluded from the options available for additional cards.**

### Seismic Certification:

- Preapproved for use in Category IV structures with an Importance Factor of 1.5
- California Office of Statewide Health Planning and Development (OSHPD) Special Seismic Certification Preapproval (# OSP-0091-10)

Evaluated per the requirements of:

- 2007/ 2010 California Building Code
- Section 13.2.5 of (American Society of Civil Engineers / Structural Engineering Institute) ASCE/SEI 7-05

- Tested to: ICC-ES AC156

### ORDERING INFORMATION

#### GR 2400 Master Controller

**GR2400**

#### System

#### Digital Clock/Modem

DTC = Digital Time Clock  
 DTCMOD = Digital Time Clock & Modem

#### Transformer

DV = Dual Voltage 120/277V  
 347V = 347 volt

#### Dry Inputs

D6 = 6 inputs  
 D14 = 14 inputs

#### Mount and Enclosure Type

SM NE1 = Surface Mount, NEMA 1  
 FM NE1 = Flush Mount, NEMA 1  
 SM NE4 = Surface Mount, NEMA 4

# GR 2400™

*Quintessence*



An Acuity Brands Company



## GR 2400 Relay Panel/SilverBullet (Sub-Branch Circuit Current Limiter)

**Description:** Factory pre-wired, pre-assembled components integrate the GR 2400 Relay Panel with the SilverBullet "Sub-Branch Circuit Current Limiter" to solve the requirements of energy code lighting calculations, by enforcing a definite current limit to lower the VA rating of track lighting circuits.

### Features:

- GR 2400 Relay Panel
- 32-channel, 365-day/astronomical time clock interface for the entire system. Non-volatile memory holds all programming indefinitely. Ten-year battery back-up for time-of-day
  - May control mixed voltages (i.e., 120V, 277V), normal or emergency power
  - Manual override of individual relays, zones or entire panel
  - Link up to 127 addresses of digital devices via Cat.5 patch cable with RJ45 connectors
- SilverBullet
- UL listed current limiting for up to 21 circuits per 10" extension box
  - AIC Rating of 10,000A @ 120V
  - Factory pre-wired, pre-assembled components

## Specifications:

Enclosure dimensions:	20" w x 35.5" h x 6" d (32 relays) 21 Breakers 20" w x 45.5" h x 6" d (32 relays) 42 Breakers 20" w x 47.5" h x 6" d (48 relays) 21 Breakers 20" w x 57.5" h x 6" d (48 relays) 42 Breakers SilverBullet mounted in 10" extension enclosure(s)	Max. humidity:	10–90% non-condensing
Enclosure type:	Surface mount, hinged locking door, NEMA 1	Ambient temperature:	32–105° F (0–41° C)
Relay:	Normally Closed (NCL), 30A @ 277VAC Ballast 20A @ 120VAC Tungsten, 20A @ 347VAC Ballast SCCR 18kA @ 277VAC, Rated 250,000 Cycles	Power supply voltage:	120/277VAC
Optional relays:	Normally Open, (NOL) Spec same as NCL, Two Pole — NO or NC (480VAC); Double Throw 20A 277VAC	Bus physical layer:	RS 485 (GR 2400 bus)
Addresses per bus:	127	Bus connector:	RJ45 connectors
# of Addresses used:	GR 2432 (4), GR 2448 (6)	<b>SilverBullet Sub-Branch Circuit Current Limiter</b>	
Relay panel listings:	UL and cUL to UL 916, ETL listed to UL 924 (for emergency circuit use)	Enclosure dimensions:	20" w x 12" h x 4" d (6-12 supplementary breakers)
Programming:	Via DTC, via PC with <b>Unity™ Lighting Control Software</b>	Enclosure type:	Surface mount, hinged locking door, NEMA 1
		Max Humidity:	10–90% non-condensing
		Certifications:	Panel complies with UL 508, Breakers comply with UL 489
		Ambient temperature:	32–104° F (0–40° C)

# Overview

**Power Supply (input):**  
120/277V

**DTC:**  
32-channel, 365-day astro clock. Access and program the entire system

**Modem:**  
Remote programming and control, includes free lifetime dial-up programming

**Bus connectors**  
RJ45 connectors

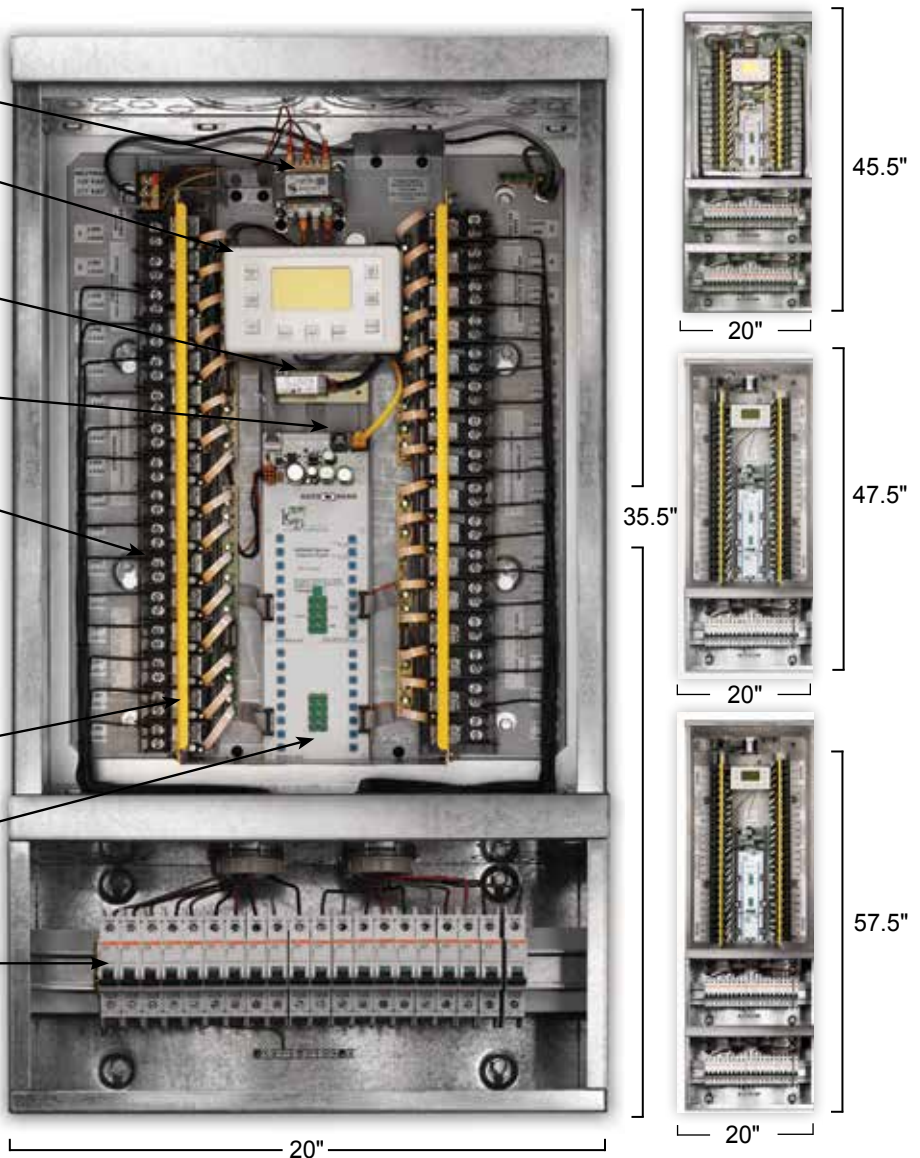
**Lighting Relays:**  
Normally Closed (NCL), 30A @ 277V Ballast, 20A @ 120V Tungsten, 20A @ 347V Ballast, SCCR 18kA @ 277V, Rated 250,000 Cycles

**Optional Relays:**  
Normally Open, (NOL) Spec same as NCL, NO or NC (120V); Two Pole — NO or NC (480V); Double Throw 20A 277V

**High/Low Voltage Barrier:**  
(16 gauge steel)

**Relay Control card:**  
(manual control of zones or individual relays)

**Limiters:**  
UL listed current limiting available from 1-8, 10, 13 & 15 amps.



## ORDERING INFORMATION

### For Nomenclature:

Please see the tech sheet for the GR 2400 Relay Panel and enter as usual with these exceptions:

- Must choose Surface Mount, NEMA 1 with knockouts (SM NE1)

Please see the tech sheet for the SilverBullet and enter as usual with these exceptions:

- Add a "Q" to the beginning of the nomenclature (T24 becomes QT24, T24M is not available for Quintessence)
- You may exceed the maximum number of breakers by 1 (up to 22 breakers total)
- You must choose Surface Mount (SM)

**Examples:** GR2448 ENC SM NE1  
GR2448 INT 22NCL 14SPDT 6DPNC DTCMOD DV  
QT24 1077UL 22BP 4A10 10A8 13A2 15A2 SM

48 relay panel with 22 normally closed relays, 14 single pole double throw relays, 6 double pole normally closed relays, with a digital time clock and modem (master panel), and a 120/277V dual voltage transformer (no voltage barriers) as part of a Quintessence package prewired to a SilverBullet panel configured with 22 breaker positions, and containing 10 4A, 8 10A, 2 13A and 2 15A breakers, all installed in a combined, surface mount NEMA 1 enclosure with knockouts.

# GR 2400™

*Quintessence*



## GR 2400 Relay Panel/Breaker Panel

**Description:** Factory pre-wired assembly of a circuit breaker and **GR 2400** relay panel

- Features:**
- Provides the same features as a controllable breaker panel in the same footprint
  - Available in top feed or bottom feed panels
  - MLO or with a Master breaker
  - Your choice of breaker panel
  - Saves on site labor
  - All the standard features of a GR 2400 panel

## Specifications:

Relay enclosure dimensions: 20" w x 63" h x 6" d (32 relays)  
20" w x 75" h x 6" d (48 relays)

Enclosure type: Surface mount, hinged locking door, NEMA 1

Relay: Normally Closed (NCL)  
30A @ 277VAC Ballast  
20A @ 120VAC Tungsten  
20A @ 347VAC Ballast  
SCCR 18kA @ 277VAC  
Rated 250,000 Cycles

Optional relays: Normally Open, (NOL) Spec same as NCL,  
Two Pole — NO or NC (480VAC); Double  
Throw 20A, 277VAC

Addresses per bus: 127

#Addresses used: GR 2432 (4), GR 2448 (6)

Relay panel listings: UL and cUL to UL 916,  
ETL listed to UL 924 (for  
emergency circuit use)

Programming: Via DTC, via PC with  
**Unity™ Lighting Control  
Software**

Max. humidity: 10–90% non-condensing

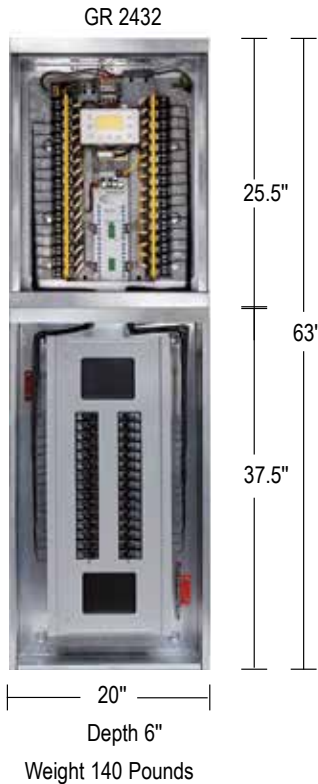
Ambient temperature: 32–104° F (0–40° C)

Power supply voltage: 120/277VAC

Bus physical layer: RS 485 (GR 2400 bus)

Bus connector: RJ45 connectors

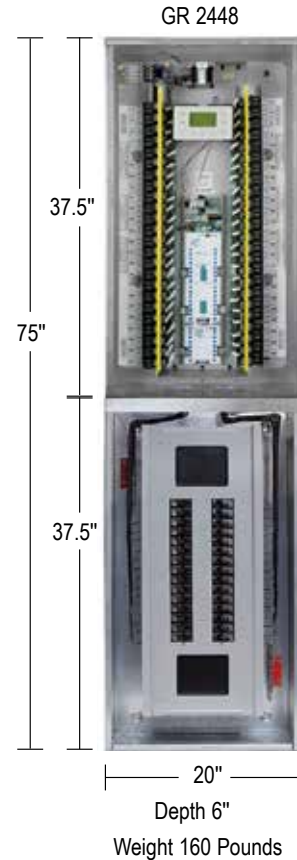
# Overview



GR 2432 or GR 2448 digital relay panel  
Pre-wired to standard circuit breaker panel

- 120V or 277V
- NEMA 1 Enclosures
- Up to 400A
- Hinged locking doors
- Breakers prewired to specific relay per approved submittal

Note: Breaker panel length may change based on amperage and brand of breaker panel specified.



## ORDERING INFORMATION

### For Nomenclature:

Please see the tech sheet for the GR 2400 Relay Panel and enter as usual with these exceptions:

- You must choose Surface Mount, NEMA 1 with knockouts (SM NE1)

Please see the tech sheet for the Smart Breaker Panel and enter as usual with these exceptions:

- Use "QBP" in place of "GR2400SBP" for the panel and breakers
- You must choose Surface Mount, NEMA 1 (SM NE1)
- You must choose bottom feed orientation (BOTTOM)
- You must choose remote for the clock option (REMOTE)
- You may not select remote breakers, all other breaker types are available in identical quantities
- Enter the breakers as separate line items per the tech sheet with no variations in the nomenclature

### Examples:

**GR2448 ENC SM NE1**

**GR2448 INT 12NCL 12SPDT 12DPNC DTCMOD DV**

**QBP CHASSIS 120V208V 225AMP MAIN 65K REMOTE SM NE1 BOTTOM**

**QBP BRKR 1P15ABB** (quantity is specified on line entry – 14 for this example)

**QBP BRKR 1P20ABB** (quantity is specified on line entry – 10 for this example)

**QBP BRKR 2P30ABB** (quantity is specified on line entry – 5 for this example)

**QBP BRKR 3P100ABB** (quantity is specified on line entry – 2 for this example)

**QBP BSPC** (quantity is specified on line entry – 2 for this example)

**QBP CLIP** (quantity is specified on line entry – 6 for this example)

48 relay panel with 12 normally closed relays, 12 single pole double throw relays, 12 double pole normally closed relays, with a digital time clock and modem (master panel), and a 120/277V dual voltage transformer (no voltage barriers) as part of a Quintessence package prewired to a 120/208V breaker panel rated at 65k AIC, with a 225A main breaker, configured as a remote panel, containing 14 15A and 10 20A 1-pole, 5 30A 2-pole, 2 100A 3-pole branch breakers, 2 breaker spacers and 6 locking clips, all installed in a combined, surface mount NEMA 1 enclosure with knockouts, designed for bottom line voltage feed.



# GR 2400™

## Control Panel



An AcuityBrands Company



## GR 2400™ Relay Panel w/Surge Suppression

**Description:** GR 2400 panel prewired to state-of-the-art transient voltage surge suppression (TVSS) type protection. Surge Suppression brand protection has the lowest let-through voltages in the industry and is backed by a 25-year warranty.

- Features:**
- 32-channel, 365-day/astromical time clock. Large display (21 x 8 characters) acts as programming interface for the entire system. Non-volatile memory holds all programming indefinitely. Ten-year battery back-up for time-of-day
  - Modem includes free lifetime factory programming
  - May control mixed voltages (i.e., 120V, 277V)
  - May control normal or emergency power
  - Ideal for all applications
  - Manual override of individual relays, zones or entire panel
  - Link up to 127 digital devices via Cat. 5 patch cable with RJ45 connectors

### Surge Protection

- Protection Element Status LED indicator light—one per circuit
- Compact Enclosure (UL94V-0 Rated ABS)
- High Density/High Energy Individual Circuit Protection

## Specifications:

Enclosure dimensions:	20" w x 35.5" h x 6" d (32 relays) 20" w x 47.5" h x 6" d (48 relays) Surge Suppression mounted in 10" extension enclosure(s). Contact factory for number of extensions required.	Relay panel listings:	UL and cUL to UL 916, ETL listed to UL 924 (for emergency circuit use)
Enclosure type:	Surface mount, hinged locking door, NEMA 1	Programming:	Via DTC, via PC with Unity™ Lighting Control Software
Relay:	Normally Closed (NCL), 30A @ 277VAC Ballast 20A @ 120VAC Tungsten, 20A @ 347VAC Ballast SCCR 18kA @ 277VAC, Rated 250,000 Cycles	Max. humidity:	10–90% non-condensing
Optional relays:	Normally Open, (NOL) Spec same as NCL, Two Pole — NO or NC (480VAC); Double Throw 20A 277VAC	Ambient temperature:	32–104° F (0–40° C)
Addresses per bus:	127	Power supply voltage:	120/277VAC
# Addresses used:	GR 2432 (4), GR 2448 (6)	Bus physical layer:	RS 485 (GR 2400 bus)
		Bus connector:	RJ45 connectors
		Surge Protection:	Discrete All Mode Protection Component Level/Phase Level Fusing 60kA (60,000 amps) per circuit Peak

# Overview

**Power Supply (input) 120/277V**  
(Optional Surge Protection available)

**DTC:**  
32-channel, 365-day astro clock. Access and program the entire system

**Modem:**  
Remote programming and control, includes free lifetime dial-up programming

**Bus connectors**  
RJ45 connectors

**Lighting Relays:**  
Normally Closed (NCL), 30A @ 277VAC Ballast, 20A @ 120VAC Tungsten, 20A @ 347VAC Ballast, SCCR 18kA @ 277VAC, Rated 250,000 Cycles

**Optional Relays:**  
Normally Open, (NOL) Spec same as NCL, NO or NC (120V); Two Pole — NO or NC (480V); Double Throw 20A 277V

**High/Low Voltage Barrier:**  
(16 gauge steel)

**Relay Control card:**  
(manual control of zones or individual relays)

**Output Surge Protection:**  
Protection Element Status LED indicator light—one per circuit.

**Phone Jack:**  
(Prewired if required)



**GR 2400 Bus Surge Protection:** Surge protection is available for the power supply (input), relay panel output and for low voltage wiring such as the modem/ ethernet connections. Contact our Sales Hot Line for ordering information.

Contact factory for exact ordering information.

## ORDERING INFORMATION

### GR 2400 Relay Panel with Surge Suppression

**For Nomenclature:**

**Please see the tech sheet for the GR 2400 Relay Panel and enter as usual with these exceptions:  
Must choose Surface Mount, NEMA 1 with knockouts (SM NE1)**

LCDACC

#### System & Type

#### Type

SSPT21205 = Relay Panel Protection, 120V 5A  
 SSPT22775 = Relay Panel Protection, 277V 5A  
 SFSP2120P1 = Load Protection, 120V  
 SFSP2120P1 DIN = Load Protection, 120V, DIN Rail Mount  
 SFSP2277P1 = Load Protection, 277V  
 SFSP2277P1 DIN = Load Protection, 277V, DIN Rail Mount  
 SRJ14R = Analog Modem Protection  
 SRJ45122M = System Bus Protection, 2Mbps  
 RJ4512100M = System Bus Protection, 100Mbps

# Hotel Pack

## *Stand-Alone Control Panel*



COMPATIBLE WITH  WIRELESS PRODUCTS

## Hotel Pack Energy Conservation System

**Description:** Card Key Switch enables power for hotel rooms. The infrared card detector never wears out. Provides a signal to the cost-effective Hotel Pack Relay Panel.

- Features:**
- Clean lines—Card Key has no visible screws
  - Super simple installation. Perforral devices connect wirelessly to the panel.
  - Up to 8 Relay outputs. Single-or dual-pole relays available.
  - Rotary switch sets delay before OFF to allow occupant time to leave the room before power down.
  - Cost effective

## *Specifications:*

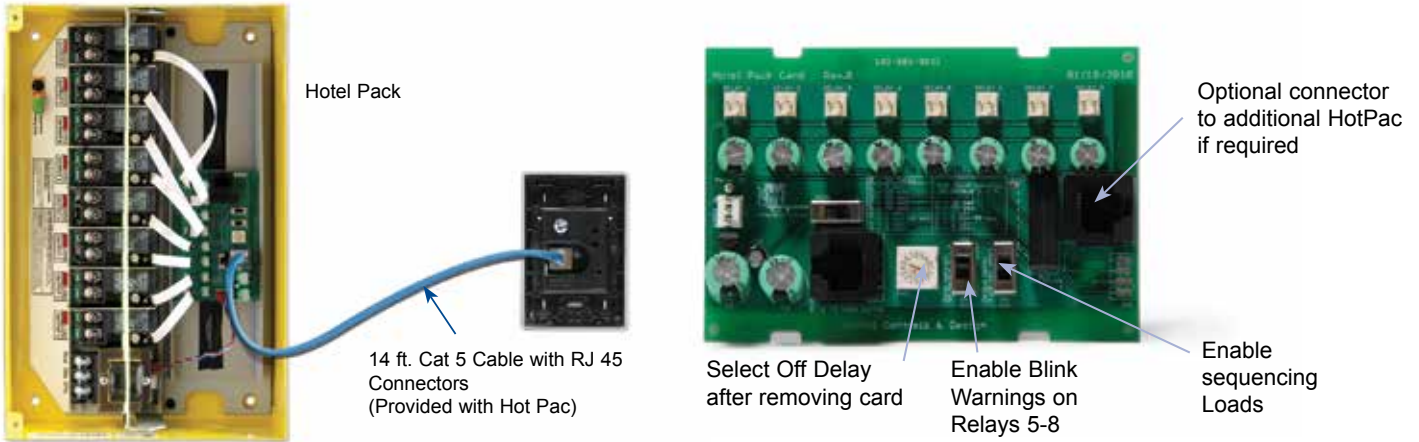
### **Card Key:**

Color: White  
Dimensions: 3.3" w x 4.9" h  
Power: 24VDC from Hotel Pack

### **Hotel Pack:**

Color: Yellow  
Dimensions: 12.5" w x 8.25" h x 3.3" d  
Power: 120/277VAC or 347VAC transformer  
Number of Relays: Up to 8  
optional 2-Pole takes 2 positions  
Relay Spec: 30A 277VAC ballast  
20A 120V incandescent  
1.5hp at 120VAC  
3hp at 277VAC  
Listings: UL and cUL Listed

# Layout



## Seismic Certification:

- Preapproved for use in Category IV structures with an Importance Factor of 1.5
- California Office of Statewide Health Planning and Development (OSHPD) Special Seismic Certification Preapproval (# OSP-0091-10)

Evaluated per the requirements of:

- 2007/ 2010 California Building Code
- Section 13.2.5 of (American Society of Civil Engineers / Structural Engineering Institute) ASCE/SEI 7-05
- Tested to: ICC-ES AC156

## ORDERING INFORMATION

Card Switch

**HOTPACK HCS**

Hotel Pack Card Switch

Hotel Pack

### Hotel Pack Enclosure Size

HOTPACK4 = 4 relay enclosure  
HOTPACK8 = 8 relay enclosure

### Relays

[qty]NCL = Normally Closed Latching  
[qty]NOL = Normally Open Latching  
[qty]DPNC = Double Pole Normally Closed  
[qty]DPNO = Double Pole Normally Open  
[qty]RRNO = Reed Relay Normally Open (pair)  
[qty]SPDT = Single Pole Double Throw  
[qty]SPDTC = Single Pole Double Throw Contactor

Where [qty] is in the nomenclature, replace with quantity of relays, and leave no space between number and code (example: 8NOL = a quantity of 8 normally open, latching relays).

### Transformer, Enclosure Mount, NEMA Rating

DV SM NE1 = Dual voltage 120/277V, Surface Mount, NEMA 1  
DV FM NE1 = Dual voltage 120/277V, Flush Mount, NEMA 1

Total must be from 3 to 8 for single relays (NCL, NOL, and SPDT) or from 1 to 4 each for any 2-pole relays (DPNC, DPNO, RRNO, and SPDTC) as they count as two. One DormPack enclosure may contain mixed relay types.

One HotPac and one HotPac Hotel Card Switch per hotel room is required. If needed a secondary HotPac may be purchased with its own configuration if you require more relays for larger rooms. One HotPac Hotel Card Switch is needed to operate one or two HotPacs.

# Academy Pack

## Stand-Alone Control Panel



COMPATIBLE WITH enocean WIRELESS PRODUCTS

## Academy Pack Classroom Solution

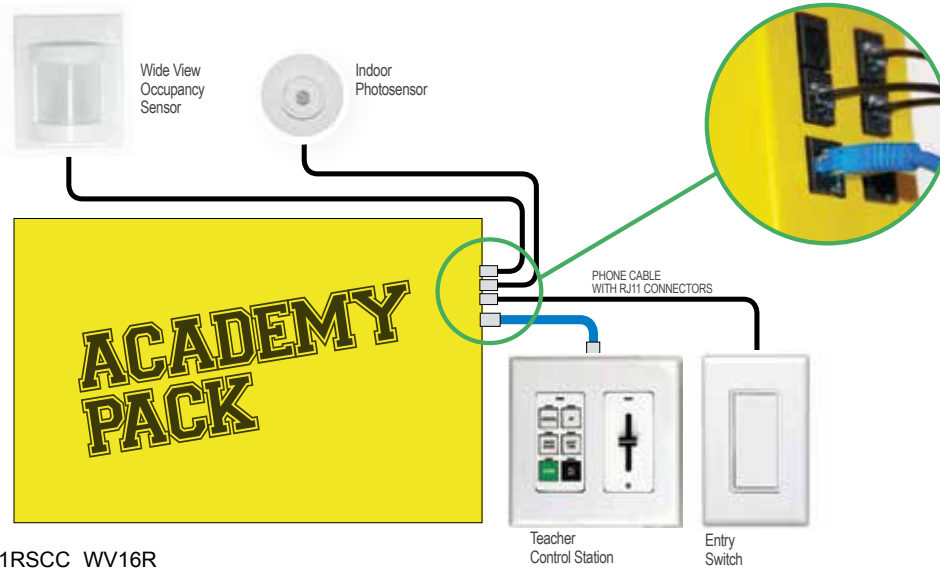
**Description:** The Academy Pack is a complete, stand-alone, dimming/switching control solution. It is designed to enhance the learning environment, reduce energy expenditures, and help support emergency lighting in today's classrooms, lecture halls and universities.

- Features:**
- Program wall stations to provide single button control of lighting scenes, toggle of lights, variable timers, overrides, blink warning, control of shades and skylight louvers.
  - Intelligent occupancy detection, select between vacancy and occupancy sensing.
  - Intelligent daylight harvesting: use a single photocell to independently dim multiple fixtures based on contribution of natural light.
  - Comes pre-programmed or can be field adjusted with the optional Hand Held Programmer.
  - Integral emergency relay section (and barrier) provides UL924 compliance without additional shunt relay equipment.
  - Quick install: hang pre-programmed panel, land loads, install wall stations, plug and play
  - Easy to maintain: operates without networked components, but can be future upgraded to integrate with BMS or AV (additional equipment required).

## Specifications:

Dimensions:	13" w x 8.5" h x 3.125" d	Ambient Temp:	32-105°F (0-40°C), non-condensing
Number of Relays:	Up to 8 relays (optional emergency, dry contact closure)	Listings:	UL/CUL and ETL listed
High Voltage Relay Spec:	30A @ 277VAC ballast 20A @ 120VAC incandescent 1.5hp @ 120VAC 3hp @ 277VAC SCCR 18kA @ 277VAC	Inputs/Outputs:	Photosensor inputs - 1 Occ. sensor inputs - 1 Local switch inputs - 2 Digital switch inputs - 2 0-10V outputs - 4, 15mA per channel
# Operations:	250,000 cycles	Power for Occ. Sensor:	24VDC/450mA
Programming:	Pre-programmed or adjustable on site with optional Hand Held Programmer	Power Supply Voltage:	120/277VAC or 347VAC

# Academy Pack Overview



## TYPICAL PACKAGE:

APAC AP2408 DV 6NCL  
 PCELL1 TCS6CH TCS1SS 1RSCC WV16R

TEACHER CONTROL STATION					
TYPICAL BUTTON OPERATIONS					
LABEL	BUTTON COLOR	FUNCTION	LABEL	BUTTON COLOR	FUNCTION
Teach	White	Front of the room with brighter light levels, white board illuminated, student area dimmed lower, photocell enabled	Enable Slider	White	Override control of dimming zones
A/V	White	Front of the room with lower light levels, white board light turned off, student area with higher light levels, photocell disabled	Sensor Override	White	Disables occupancy sensor for one hour
Energy Saver	Green	Light levels lowered, photocell enabled for daylight harvesting to further reduce energy consumption	White Board	White	Toggle whiteboard lights on and off
General	White	Uniform light levels throughout, photocell enabled	All Off	Black	Turns off all lights

## ORDERING LOGIC

APAC				
<b>System</b> APAC	<b>Panel Type<sup>1</sup></b> AP2408 - Academy Pack panel [blank] - No panel	<b>Relays</b> [qty]NCL - Normally Closed Latching [qty]NOL - Normally Open Latching [qty]DPNC - Double Pole Normally Closed [qty]DPNO - Double Pole Normally Open [qty]RRNO - Reed Relay Normally Open [qty]SPDT - Single Pole Double Throw [qty]SPDTC - Single Pole Double Throw Contactor	<b>Voltage</b> DV - 120V/277V 347V - 347 Volt	<b>Emergency Options</b> EMSM - Emergency enclosure 1VB - 1 Voltage barrier [blank] - no Emergency options
<b>Photocell<sup>2</sup></b> PCELL1 - 1 Photocell [blank] - no Photocell	<b>Teacher Control Station<sup>3</sup></b> <b>Switch</b> TCS6CH - 6 Button switch TCS4CH - 4 Button switch [blank] - no switch TCS1 - Preconfigured 6 button switch with Slider TCS2 - Preconfigured 4 button switch with Slider TCS3 - Preconfigured 4 button switch	<b>Slider (optional)</b> TCS1SS - Single Slider TCS2SS - Dual Slider [blank] - No Slider	<b>Entry Switch</b> 1RSCC - 1 contact closure Rocker 2RSCC - 2 contact closure Rocker [blank] - no entry switch	<b>Occupancy Sensor<sup>4</sup></b> [qty]WVPDT16R - wide view [qty]CMPDT9R - standard range [qty]CMPDT10R - extended range [blank] - no sensor

### Notes:

1. Relay, Voltage and Emergency options are not available if AP2408 is not selected.
2. For multiple photocells please contact factory.

3. Custom button engraving and colors available, please contact factory.
4. Maximum of 2 sensors per room, if more are needed, please contact factory.
5. To update programming onsite, order Hand Held Programmer separately (APAC HHR).

# RF Pack

## *Stand-Alone Control Panel*



## RF Pack Energy Conservation System

**Description:** The RF Pack is a wireless platform specially designed for small to medium spaces, such as living spaces or office environments.

- Features:**
- Quick and easy installation.
  - Up to 8 internal and 8 wireless relay outputs.
  - Intuitive user interface for quick programming and commissioning.
  - Cost effective
  - May contain Normal and/or Emergency relays

## *Specifications:*

Dimensions: 8.375" w x 8.375" h x 3.125" d (4 relay panel)  
12.875" w x 8.375" h x 3.125" d (8 relay panel)

Power: 120/277VAC or 347VAC transformer

Number of Relays: Up to 16 relays (up to 8 relays in the enclosure and 8 wireless relays)  
optional 2-Pole relay takes 2 positions in the panel

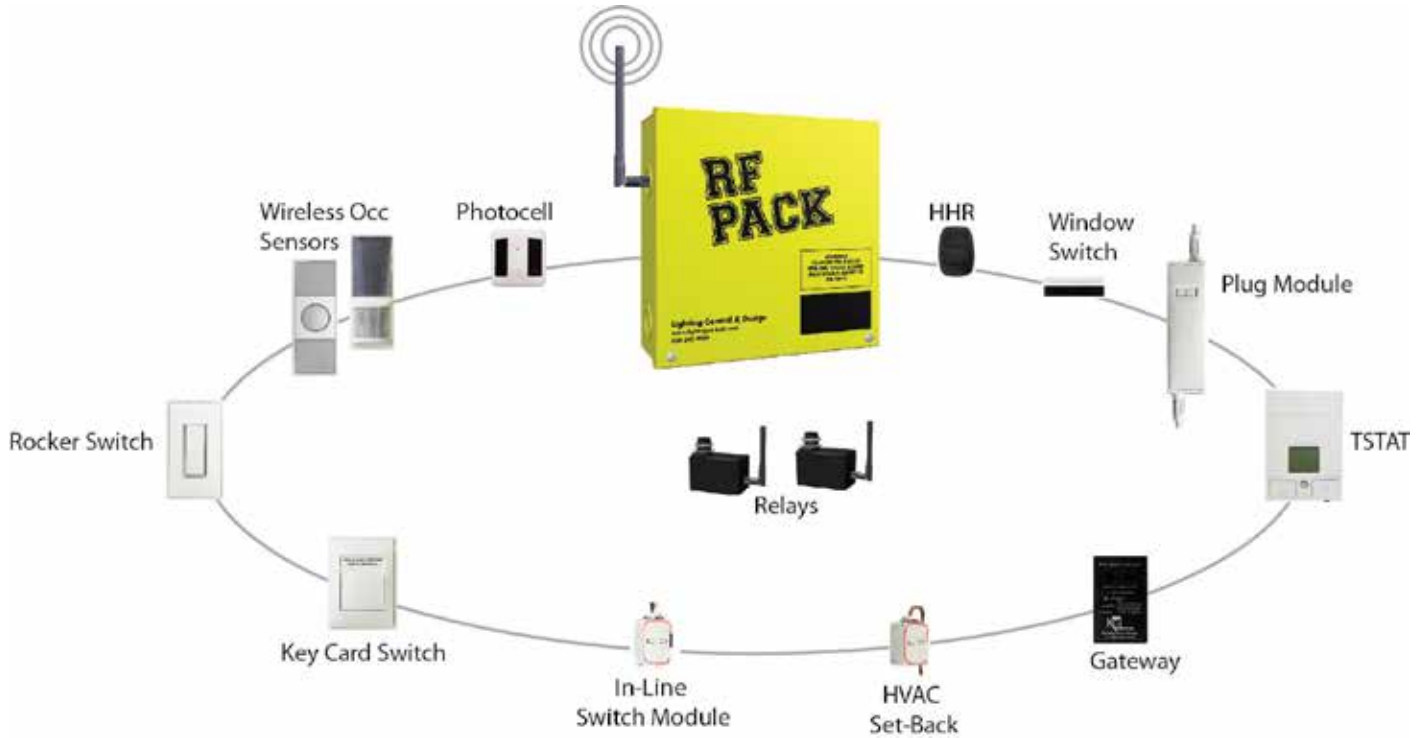
Relay Spec: 30A 277VAC ballast  
20A 120V incandescent  
1.5hp at 120VAC  
3hp at 277VAC

Listings: UL and cUL Listed

Max. humidity: 10–90% non-condensing

Ambient temperature: 32–104° F (0–40° C)

# Layout



## ORDERING INFORMATION

RF Pack		
<p><b>RF Pack Enclosure Size</b>                      RF2404 = 4 relay enclosure                      RF2408 = 8 relay enclosure</p>	<p><b>Relays</b>                      [qty]NCL = Normally Closed Latching                      [qty]NOL = Normally Open Latching                      [qty]DPNC = Double Pole Normally Closed                      [qty]DPNO = Double Pole Normally Open                      [qty]RRNO = Reed Relay Normally Open (pair)                      [qty]SPDT = Single Pole Double Throw                      [qty]SPDTC = Single Pole Double Throw Contactor                      [qty]RFNODE = RF Node</p> <p>Where [qty] is in the nomenclature, replace with quantity of relays, and leave no space between number and code (example: 8NCL = a quantity of 8 normally closed, latching relays).</p>	<p><b>Transformer, Enclosure Mount, NEMA Rating</b>                      DV SM NE1 = Dual voltage 120/277V, Surface Mount, NEMA 1</p>



# GR 2400™

## Relay



## SnapLink™ Latching Relay

**Description:** The SnapLink™ Latching Relay from LC&D is a single-pole, lighting relay designed to meet the demands of today's high-efficiency ballast loads. This latching relay can be specified to default to open (simulated NO) or to default to closed (simulated NC) upon loss of power. The Normally Closed relay is the default relay shipped unless otherwise noted.

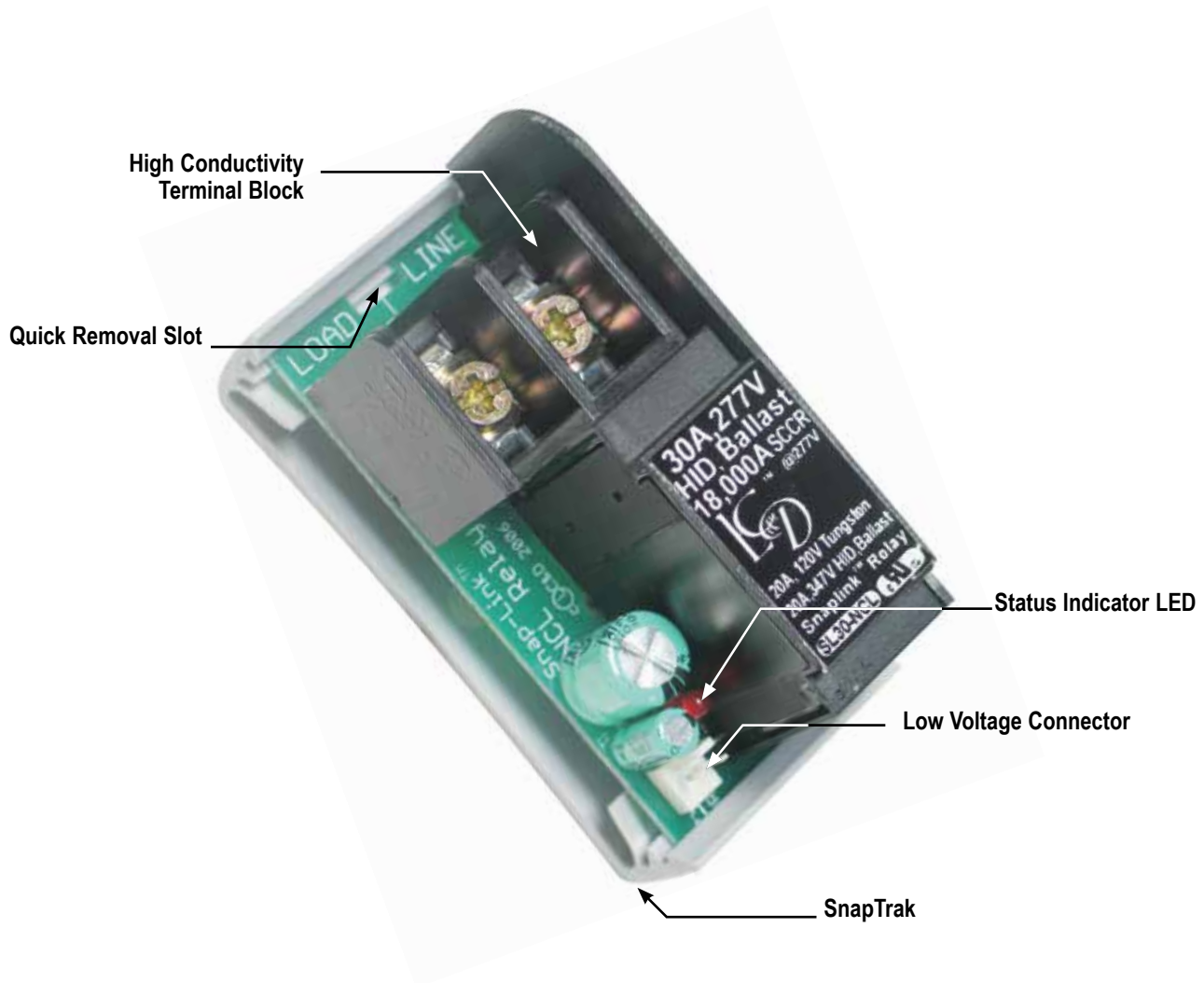
- Features:**
- New larger contacts allow switching up to 30 amps lighting (ballast, HID) at 277V, 20 amps at 347V and 20 amps Tungsten at 120V
  - UL listed for 18,000 amps SCCR (Short Circuit Current Rating) at 277V
  - Eliminates zero-cross circuitry—ideal for many modern types of ballast, particularly HID which can become “core-saturated” when controlled by zero-cross lighting relays
  - New heavy-duty, high-conductivity terminal blocks allow up to 2 #8 AWG wires per lug
  - 3-year warranty
  - Since relays are latching, no energy is used to hold contacts, creating less heat

## Specifications:

Contacts:	Normally Closed (optional Normally Open)	UL rated for:	30A @ 277VAC, 20A @ 347VAC Ballast/HID 20A @ 120VAC Tungsten 1.5hp @ 120VAC 3hp @ 277VAC Not rated for DC current
Type of action:	Latching (Innovative electronics allows default to NC or NO on power failure)	Conductors:	2 ea # 8AWG per lug
Operations at 30 amp load:	250,000 cycles	Listings:	UL and cUL Recognized assembly
		UL tested SCCR rating:	18,000A @ 277VAC

# Overview

## 30A, 277V HID, Ballast Relay



### ORDERING INFORMATION

SnapLink Latching Relay	
LCDACC	
<b>Category</b>	<b>Relay Type</b> SL30NCL = SnapLink 30A Normally Closed Latching Relay SL30NOL = SnapLink 30A Normally Open Latching Relay

# GR 2400™

## Optional Replacement Relays



**Double-Pole**



**ZeroCross™  
(120V, 277V)**

## SnapLink™ Relays

**Description:** **Double-Pole Relay:** The double-pole relay occupies the footprint of two single-pole relays when mounted in the SnapTrak within the relay panel. The relay is ideal for 208V, 240V or 480V two-pole loads.

**ZeroCross™ (120V, 277V):** This electrically-held relay uses special circuitry to switch loads both ON and OFF when the instantaneous AC voltage value is zero. This relay is available as either Normally Closed (default) or or Normally Open. (For replacement parts only)

## Specifications:

### Double-Pole Relay

Contact ratings:

**Voltage:** 480VAC, **Amperage:** 20A

**Rated for:** Ballast/HID

**Horsepower:** 1hp @ 208 or 240VAC,  
2hp @ 480VAC

**AWG Ratings for Lugs:** 2 #12 AWG, 2 #10 AWG, 2 #8 AWG

**SCCR:** 5000A\*

### ZeroCross™ SnapLink Relay (120V, 277V)

Contact ratings:

**Voltage:** 277VAC

**Rated for:** Tungsten/ballast/HID (Not rated for DC current)

**Horsepower:** 1hp @ 120VAC, 2hp @ 277VAC

**AWG Ratings for Lugs:** #12 AWG, 2 #10 AWG, 2 #8 AWG

**SCCR:** 5000A\*

**Operations at Full Load:** 250,000 cycles (NO or NC)

# SnapLink Relays



**Double-Pole**



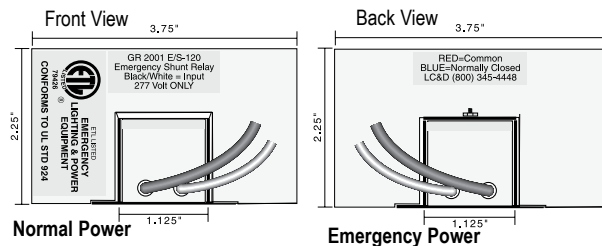
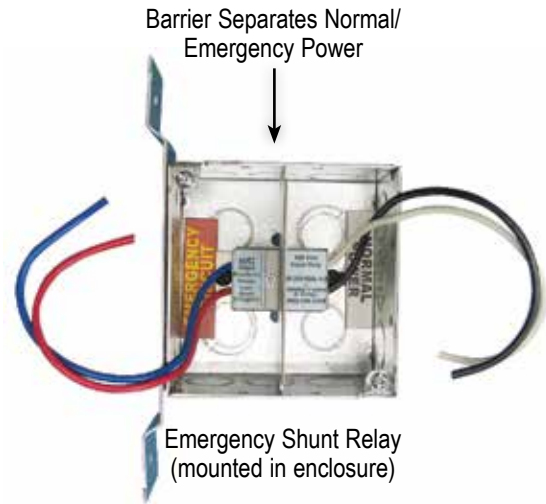
**ZeroCross™  
(120V, 277V)**

## ORDERING INFORMATION

Additional SnapLink Relays	
<b>LCDACC</b>	
<b>Category</b>	<p><b>Relay Type</b></p> <ul style="list-style-type: none"> <li>SL20NCZC = SnapLink 20A Normally Closed ZeroCross Relay</li> <li>SL20NOZC = SnapLink 20A Normally Open ZeroCross Relay</li> <li>SLDPNC = SnapLink 20A Double Pole Normally Closed Relay</li> <li>SLDPNO = SnapLink 20A Double Pole Normally Open Relay</li> </ul>

# GR 2001™

## Relay



## Emergency Shunt Relay

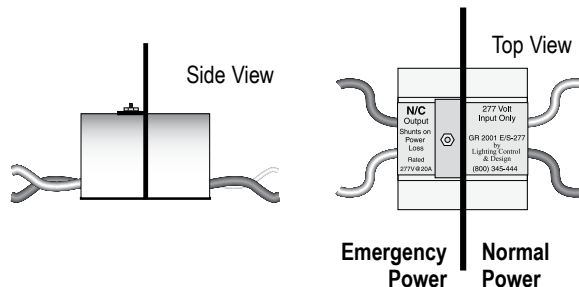
**Description:** Normally-closed, electrically-held relay to be wired in parallel with a wall switch. Manually controlled emergency lighting will be automatically shunted on during a power outage.

The **Emergency Shunt Relay** comes in a two-gang junction box with a voltage-separating barrier and is shipped with a plaster ring separating normal and emergency power. The compact size allows wall switches to be mounted directly on the junction box.

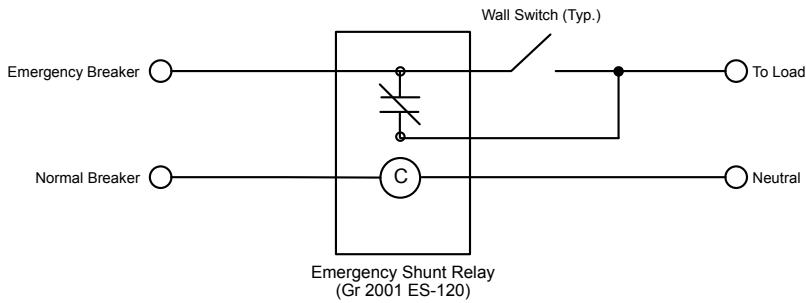
- Features:**
- Manual control of emergency lighting is safely accomplished
  - Not wattage-dependent, ideal for wall dimmers
  - Optional enclosure will hold up to eight shunt relays for feed-through dimming panels
  - ETL listed to UL 924

## Specifications:

Junction box dimensions:	4" w x 4" h x 2.125" d
Plaster ring depth:	0.625" (5/8")
Ambient temperature:	32–105° F (0–41° C)
Humidity:	10–90% non-condensing
Power consumption:	1 watt
Coil rating:	Specify 120VAC or 277VAC
Contact rating:	20A up to 277VAC
# Operations:	40,000 @ 20A 277VAC
Listings:	ETL listed to UL 924 (emergency systems)



# Schematic/Specs



The **GR 2001™ EMSHUNT** isolates the normal and emergency power both electrically and mechanically.

The major advantage of the **GR 2001 EMSHUNT** is its small size — a wall switch may be mounted in the same box as the **GR 2001 EMSHUNT**, simplifying installation.

Emergency Shunt Relay to be factory mounted in a 4" x 4" junction box and two-gang deep plaster ring. Emergency circuit wall switch shall mount in same enclosure.

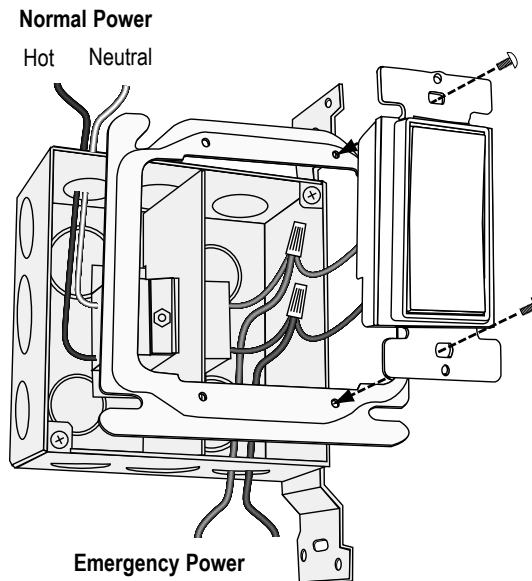
Contractor to supply two-gang wall plate and single wall switch appropriately rated per NEC and any local electrical codes.

Emergency Shunt Relay is ETL Listed to UL STD 924 with a 16-gauge steel barrier to separate normal and emergency power, manufactured by LC&D Lighting Controls (800) 345-4448.

Drawing and specs are available at [www.lightingcontrols.com](http://www.lightingcontrols.com)

# Hook Up

1. Mount **GR 2001** enclosure to stud using mounting brackets.
2. Route normal and emergency conductors to appropriate compartment.
3. Ensure that the coil is fed by the correct voltage (i.e., 120V or 277V).
4. Wire the relay contacts in parallel with the switch.
5. Mount switch to the plaster ring provided by LC&D.
6. Mount a two-gang cover plate (supplied by contractor). Cover plate should have a blank on one side and the switch punch-out on the other.

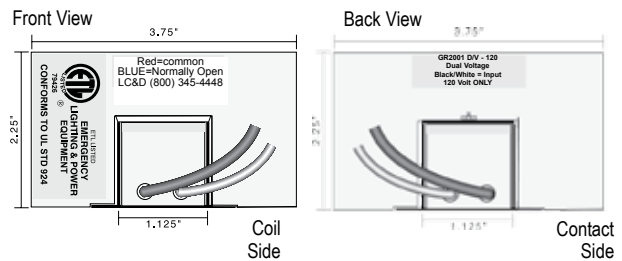
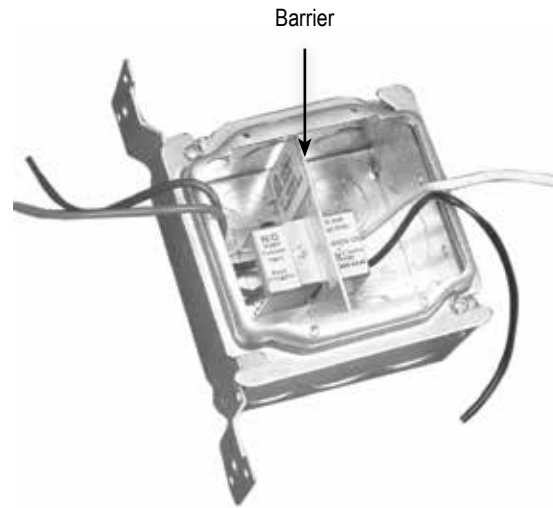


## ORDERING INFORMATION

Emergency Shunt Relay			
GR2001 EMSHUNT			
<b>System and Type</b>	<b>Voltage</b> 120 277	<b>Number of Relays per Enclosure</b> 1SR = 1 Emergency Shunt Relay 2SR = 2 Emergency Shunt Relays 4SR = 4 Emergency Shunt Relays 6SR = 6 Emergency Shunt Relays 8SR = 8 Emergency Shunt Relays DUAL = 2 Emergency Shunt Relays to control normal and emergency lighting from single-pole wall switch	<b>Enclosure Type</b> NE1 = NEMA 1

# GR 2001™

## Relay



## Dual Voltage Switch

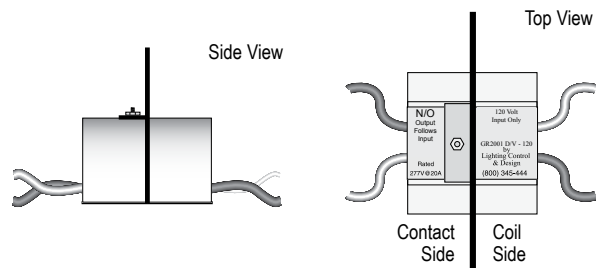
**Description:** Normally Open, electrically held relay which allows a single-pole switch to control loads operating at two different voltages (i.e., 120V and 277V).

The **Dual Voltage Switch** is shipped in a two-gang junction box with a voltage-separating barrier and is shipped with a plaster ring. Its compact size allows a wall switch to be mounted directly onto the **GR 2001** box and plaster ring package.

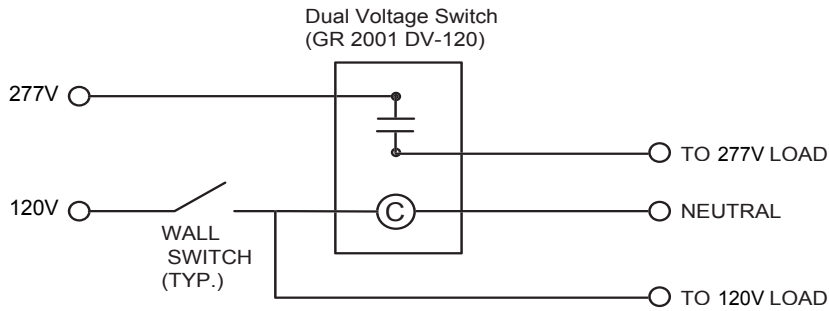
- Features:**
- Built-in voltage barrier
  - Shipped from factory in two-gang box and plaster ring. No other parts to purchase.
  - ETL Listed to UL 924

## Specifications:

- Junction box dimensions: 4" w x 4" h x 2.125" d
- Plaster ring depth: 0.625" (5/8")
- Ambient temperature: 32–104° F (0–40° C)
- Humidity: 10–90% non-condensin
- Power consumption: 1 watt
- Coil rating: Specify 120VAC or 277VAC
- Contact rating: 20A up to 277VAC
- # Operations: 40,000 @ 20A 277VAC
- Listings: ETL Listed to UL 924



# Schematic / Specs



The **GR 2001™ DUALV** isolates the two voltages both electrically and mechanically.

The major advantage of the **GR 2001 DUALV** is its small size — a wall switch may be mounted in the same box as the **GR 2001 DUALV**, simplifying installation.

Dual voltage switch to be factory mounted in a 4" x 4" junction box and two-gang, deep plaster ring. Emergency circuit-wall switch shall mount in same enclosure.

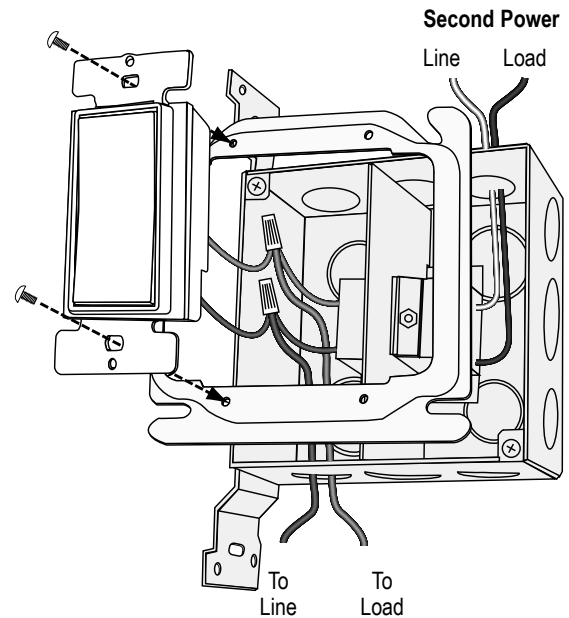
Drawing and specs are available at [www.lightingcontrols.com](http://www.lightingcontrols.com)

Contractor to supply two-gang wall plate and single-wall switch appropriately rated per NEC or CEC and any local electrical codes.

Dual voltage switch is ETL Listed to UL 924 with a 16-gauge steel barrier to separate high and low voltage. To be manufactured by Lighting Control & Design (800) 345-4448.

# Hook Up

1. Mount the dual voltage switch enclosure to stud using mounting brackets.
2. Route conductors to appropriate voltage compartment.
3. Ensure that the coil is fed by the correct voltage (i.e., 120VAC or 277VAC).
4. Wire the relay coil in parallel with the load.
5. Mount switch to the plaster ring provided by LC&D.
6. Mount a two-gang cover plate (supplied by contractor). Cover plate should have a blank on one side and the switch punch-out on the other.



## ORDERING INFORMATION

Dual Voltage Switch		
GR2001 DUALV		
<b>System and Type</b>	<b>Voltage</b>	<b>Enclosure Type</b>
	120 277	NE1 = NEMA 1



# GR 2400™

## Switch



Cover plate provided by contractor



## Chelsea DigitalSwitch™

**Description:** The **Chelsea DigitalSwitch** is a 100% digital switch which connects directly to the **GR 2400** bus via Cat. 5 patch cable with RJ45 connectors. **Chelsea DigitalSwitches** can be ordered with 1, 2, 3, 4 or 6 buttons per gang and can be mounted in any standard 2.25" deep switch box with a decorator style switch plate. All **Chelsea DigitalSwitches** are 100% backwards compatible with all LC&D systems.

- Features:**
- May be programmed to control any relay, **SmartBreaker™** or dimmer in any panel
  - Custom button engraving at no cost (2 lines 8 character/line)
  - All push buttons are annunciated with a pilot light
  - Available as a Waterproof option
  - Factory preprogrammed. May be reprogrammed in the field using the DTC (Digital Time Clock)
  - Link up to 127 digital addresses via Cat. 5 patch cable with RJ45 connectors
  - Can be enabled/disabled by optional **KeyEnable™** switch

- Advanced Programming Features:**
- A programmable green "Locator Light" at the top of each unit is always on, can be programmed to blink to show Horn Driver Mode or help locate a switch
  - Programmable Status LED logic
  - Adjustable debounce time to avoid accidental trigger
  - Audible beep alert for warning or switch locating
  - Alternate button programming to allow more flexibility of use, for example the same button can perform a different task at different times of the day
  - Capable of being digitally enabled/disabled over the bus on a per button or per switch basis

## Specifications:

Dimensions:	1.3" w x 4" h x 1.3" d	Programming:	Via DTC
Switch plate:	Decorator style	Humidity:	10–90% non-condensing (100% rain proof - Waterproof option only)
Mounting:	2.25" deep-switch box (Waterproof bell box - Waterproof option only)	Ambient temperature:	32–104° F (0–40° C)
Addresses available:	1–119	Power supply:	Powered from GR 2400 bus
Address per switch:	1	Bus connector:	Two RJ45 connectors
Function:	ON, OFF, Mixed, Group Control, Toggle, Scene Control	Bus termination:	Manual end-of-line termination with jumper

# Ordering Information

**Chelsea DigitalSwitches™** are available in 1, 2, 3, 4 or 6 buttons. Center plates are available in white, ivory and brushed stainless steel. Indicator light is red and locator light is green.



## Waterproof Chelsea DigitalSwitch™



**Note:** Sealed Switch is provided with a 10ft standard Cat. 5 connection cable and may be cut to a more convenient length.

## ORDERING INFORMATION

Chelsea Digital Switch™			
Number of Buttons	Single/Multicolor	Multicolor Button Colors	Plate Colors
CH1 = 1 button Chelsea CH2 = 2 button Chelsea CH3 = 3 button Chelsea CH4 = 4 button Chelsea CH6 = 6 button Chelsea  When ordering Waterproof Chelsea, add WP to the ordering nomenclature. Example: CH1 WP, CH2 WP, CH3 WP, CH4 WP, CH6 WP	BWH = All buttons white BIV = All buttons ivory BGY = All buttons gray BBK = All buttons black BRD = All buttons red BGR = All buttons green BBU = All buttons blue BYL = All buttons yellow BOR = All buttons orange MC = Multicolored buttons (please select quantities from the multicolor button section)	<b>Button Quantity</b> 1B = 1 button 2B = 2 buttons 3B = 3 buttons 4B = 4 buttons 6B = 6 buttons  <b>Color</b> WH = White IV = Ivory GY = Gray BK = Black RD = Red GR = Green BU = Blue YL = Yellow OR = Orange	<b>Multicolor Examples:</b> <b>CH6 MC 2BWH 4BBK PST</b> 6 button Chelsea with 2 white and 4 black buttons and a stainless steel faceplate  <b>CH4 MC 2BBU 1BGR 1BYL PWH</b> 4 button Chelsea with 2 blue, 1 green, and 1 yellow button and a white faceplate  <b>Button Quantity</b> represents the number of buttons on a switch that will be in the selected color—number may not exceed total number of buttons on switch - total of all button color quantities must equal total number of buttons on switch (refer to examples).
<b>Examples:</b> CH6 BWH PWH = 6 button Chelsea with all white buttons and a white faceplate CH3 WP MC 1BRD 2BBK PIV = 3 button waterproof Chelsea with 1 red button, 2 black buttons, and an ivory plate			

# GR 2400™

## Switch



An Acuity Brands Company

## Brighton DigitalSwitch™

**Description:** The Brighton **DigitalSwitch** is a 100% digital switch which connects directly to the **GR 1400** bus via Cat. 5 patch cable with RJ45 connectors. **Brighton DigitalSwitches** can be ordered with 2, 4, 5, 6, 7 or 8 buttons per gang, and can be mounted in any standard 2.25" deep switch box with a decorator style switch plate.

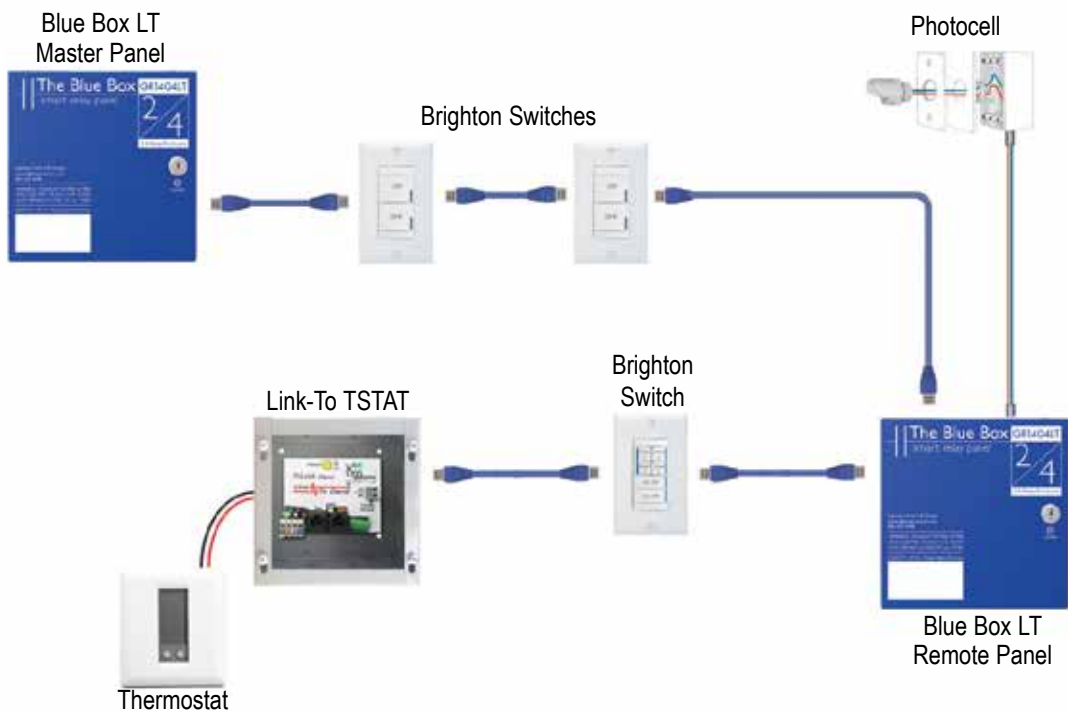
- Features:**
- May be programmed to control any relay in a GR 2400 system.
  - All push buttons are annunciated with a pilot light
  - Factory preprogrammed or can be programmed in the field using the DTC (Digital Time Clock)
  - Standard engraving included with all switch configurations. Custom engraved buttons are available to be ordered separately from the factory.

## Specifications:

Dimensions:	1.7" w x 4.17" h x 1.82" d	Ambient temperature:	32–104° F (0–40° C)
Switch plate:	Decorator style	Power supply:	Powered from GR 2400 bus
Mounting:	2.25" deep-switch box	Bus connector:	Two RJ45 connectors
Addresses available:	1–119	Bus termination:	Manual end-of-line termination with jumper
Address per switch:	1		
Function:	ON, OFF, Mixed, Group Control, Toggle, Scene Control		
Programming:	Via DTC		
Humidity:	10–90% non-condensing		

# Overview

Brighton *DigitalSwitches* are available in 2, 4, 5, 6, 7 and 8 buttons.



## ORDERING INFORMATION

Brighton <i>DigitalSwitch</i> ™		
Number of Buttons	Button Color	Plate Colors
BR2 = 2 button Brighton BR4 = 4 button Brighton BR5 = 5 button Brighton BR6 = 6 button Brighton BR7 = 7 button Brighton BR8 = 8 button Brighton	BWH = All buttons white	PWH = White plate

# GR 2400™

## Switch



## Key DigitalSwitch™

**Description:** The **Key DigitalSwitch™** is a 100% digital switch which connects directly to the **GR 2400** bus via Cat. 5 patch cable with RJ45 connectors. **Key DigitalSwitches** can be mounted in any 2.25" switch box with a decorator style switch plate. This makes the **Key DigitalSwitch** ideal for schools, gymnasiums, site-lighting and high-security applications.

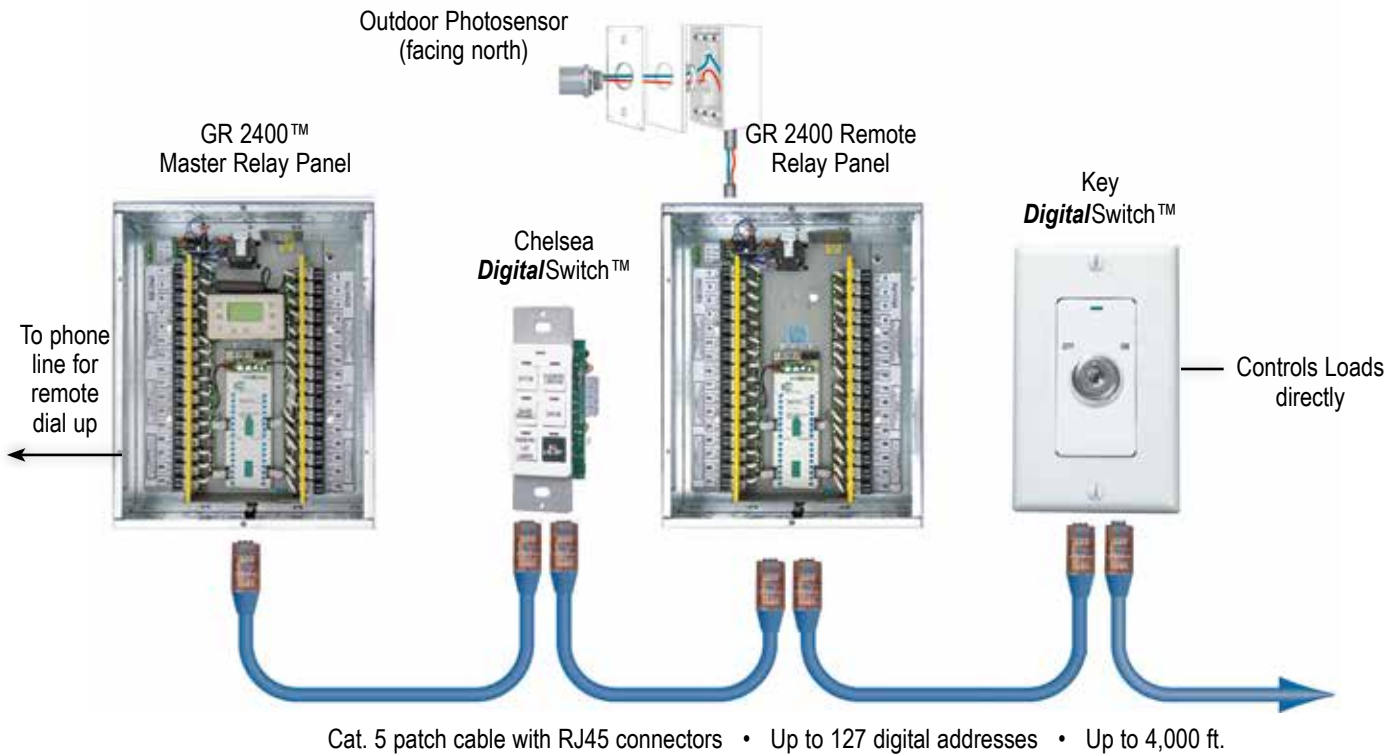
- Features:**
- Factory pre-programmed. May be reprogrammed in the field or remotely
  - **Key DigitalSwitch** is available as momentary on/off or as "captive" (CT24 required captive key)
  - Pilot LED indicates status of controlled loads (on or off)
  - May be programmed to control any relay, **SmartBreaker** or dimmer in any panel
  - Link up to 127 digital addresses via Cat. 5 patch cable with RJ45 connectors
  - Use to enable/disable multiple Chelsea DE or Chelsea AP switches

## Specifications:

Dimensions:	1.3" w x 4" h x 1.625" d
Switch plate:	Decorator style
Mounting:	3" deep-switch box
Switch addresses available:	1-119
Addresses per switch:	1
Function:	Positive ON, Positive OFF, Group Control, Toggle, Bypass or Scene Control
Action:	Center-off momentary (positive-on/positive-off)
Programming:	Via DTC, via PC with <b>Unity™ Lighting Control Software</b>
Humidity:	10-90% non-condensing
Ambient temperature:	32-104° F (0-40° C)
Power supply:	12VDC from bus
Bus physical layer:	RS 485 (GR 2400 bus)
Bus connector:	RJ45 connectors



# Hook Up



## ORDERING INFORMATION

Key DigitalSwitch		
KS		
<b>Switch</b>	<b>Plate Color</b> PWH = White plate PIV = Ivory plate PST = Stainless steel plate	<b>Captive Key</b> [blank] = No captive key CK = Captive key
<b>Examples:</b> KS PWH = Key DigitalSwitch with white plate KS PST = Key DigitalSwitch with stainless steel plate		

# GR 2400™

## Switch



Decora plate provided by contractor



## KeyEnable™ Switch

**Description:** The **KeyEnable Switch** replaces multiple-gang key switches. The **KeyEnable** may be mounted with up to three **Chelsea DigitalSwitches**, with up to six buttons each. The buttons of the **Chelsea DigitalSwitch** are enabled and disabled by the **KeyEnable Switch**. This eliminates the requirement for unwieldy multiple-gang key switches.

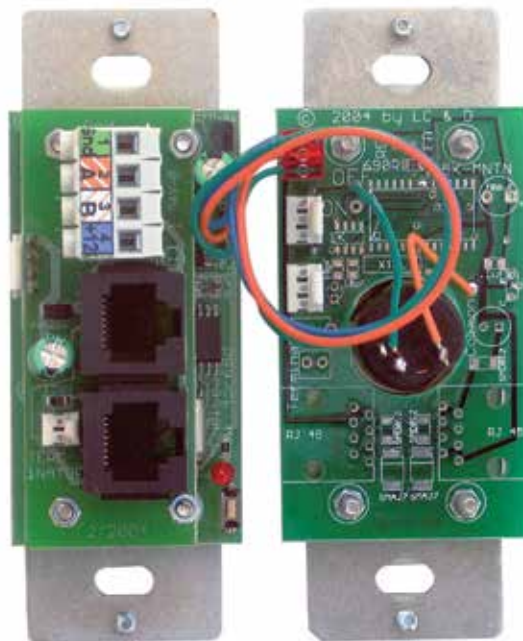
- Features:**
- No programming required
  - Ideal for site lighting, schools, theatres, gymnasiums, prisons and other high-security applications
  - Pilot LED indicates status of controlled **Chelsea DigitalSwitches** (enabled or disabled)
  - Captive key option available, so that the key can only be removed in the “disabled” position
  - Push button switch LEDs function whether or not buttons are enabled

## Specifications:

Dimensions:	1.3" w x 2.6" h x 1.625" d
Switch plate:	Decorator style
Mounting:	2.25" deep-switch box
Action:	Maintained
Function:	Positive ON, Positive OFF, Group Control, Toggle, Bypass or Scene Control
Humidity:	10–90% non-condensing
Ambient temperature:	32–104° F (0–40° C)
Power supply:	Powered from adjacent 12VDC <b>Chelsea DigitalSwitch</b>



# Hook Up



1. Starting with the topmost, connect a jumper from the KeyEnable™ Switch to the disable pins on the custom Chelsea DigitalSwitch™.
2. Using the second and third connectors, connect jumpers to Chelsea DigitalSwitches 2 & 3 (if needed).
3. Connect all switches to the bus. Program Chelsea DigitalSwitches if not already done (see manual).
4. Mount switches in Decora plate (not supplied).



**Note:**  
**Factory pre-wired Key Enabled Chelsea Digital Switches are available—please specify prior to purchase.**

## ORDERING INFORMATION

KeyEnable Switch			
KE			
<b>Switch</b>	<b>Plate Color</b> PWH = White plate PIV = Ivory plate PST = Stainless steel plate	<b>Captive Key</b> [blank] = No captive key CK = Captive key	<b>Examples:</b> KE PWH = KeyEnable Switch with white plate KE PST = KeyEnable Switch with stainless steel plate



# GR 2400™

## Switch



Decora plate provided by contractor

## KnightsBridge DigitalSwitch™

**Description:** The **KnightsBridge DigitalSwitch** is a 100% digital momentary switch which connects directly to the **GR 2400** bus via Cat. 5 patch cable with RJ45 connectors. **KnightsBridge DigitalSwitches** can be ordered with one to six buttons per gang and can be mounted in any standard switch box with a decorator style switch plate.

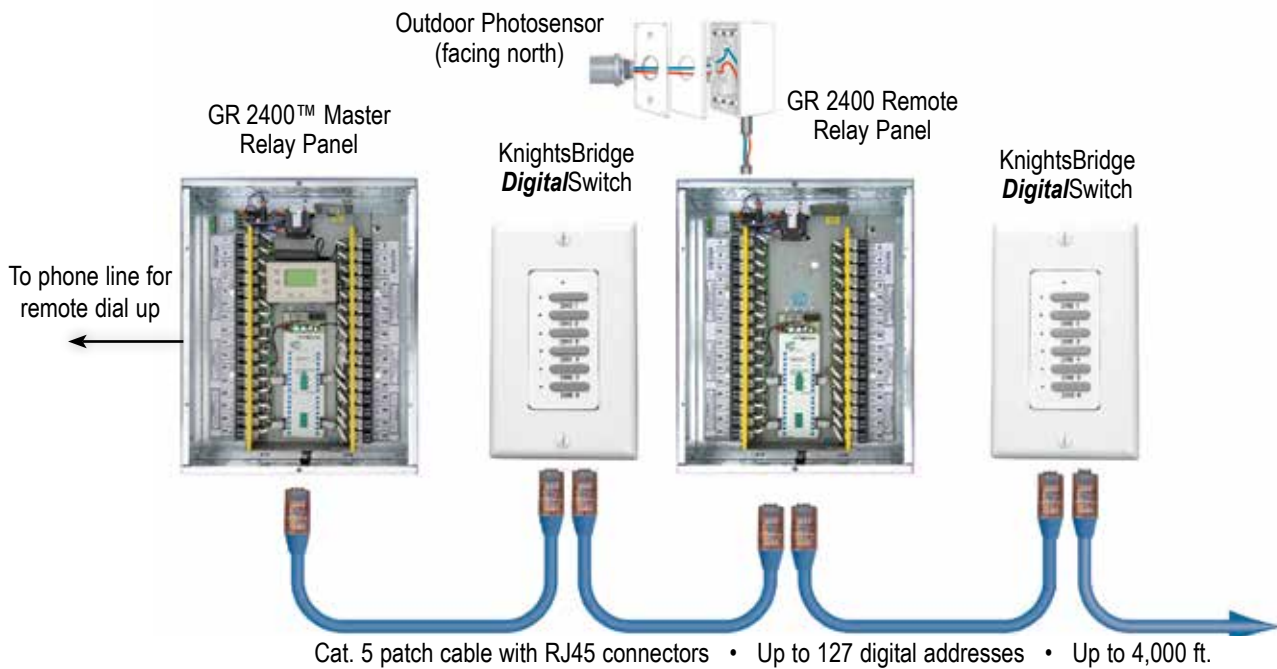
- Features:**
- Factory preprogrammed
  - Available in painted white, ivory and brushed stainless steel plates
  - Button positions one through six are also available as rocker buttons for on/off control
  - May be programmed to control any relays, **SmartBreakers** or dimmers in any panels
  - Custom engraving (one line)
  - Link up to 127 digital addresses via Cat. 5 patch cable with RJ45 connectors

## Specifications:

Dimensions:	1.6" w x 4" h x 1.625" d
Switch plate:	Decorator style
Mounting:	2.25" deep-switch box
Switch Addresses available:	1–119
Addresses per switch:	1
Function:	Positive on, Positive off, Group Control, Toggle, Bypass or Scene Control
Programming:	Via DTC, via PC with <b>Unity™ Lighting Control Software</b>
Humidity:	10–90% non-condensing
Ambient temperature:	32–104° F (0–40° C)
Power supply:	12VDC from bus
Bus physical layer:	RS 485 ( <b>GR 2400</b> bus)
Bus connector:	RJ45 connectors

# Ordering Information

KnightsBridge **DigitalSwitches™** are available in 1, 2, 3, 4, 5 or 6 buttons. Center plates are available in white, ivory, and brushed metal. Indicator light is red and locator light is green.



## ORDERING INFORMATION

### KnightsBridge DigitalSwitch

#### Total Number of Buttons

KB1 = 1 button KnightsBridge  
 KB2 = 2 button KnightsBridge  
 KB3 = 3 button KnightsBridge  
 KB4 = 4 button KnightsBridge  
 KB5 = 5 button KnightsBridge  
 KB6 = 6 button KnightsBridge

#### Button Color/Type

BGY = Gray standard button  
 BBK = Black standard button  
 BIV = Ivory standard button  
 RKRGY [qty]RKR = Gray rocker button  
 RKRBK [qty]RKR = Black rocker button  
 RKRIV [qty]RKR = Ivory rocker button

[qty] represents the number of buttons on the switch that are rocker buttons. Note a space belong just before the quantity number and no space after (between the number and RKR). The quantity may be any number from 1 up to the maximum of that switch.

#### Plate Type

PWH = White plate  
 PIV = Ivory plate  
 PST = Stainless steel plate

**Examples:** KB4 BGY PWH = 4 button KnightsBridge DigitalSwitch with gray standard buttons, and a white faceplate

KB6 RKRBK 3RKR PST = 6 button KnightsBridge DigitalSwitch with 3 standard buttons, and 3 rocker buttons, all in black, and a stainless steel faceplate

# GR 2400™

## Switch



Decora plate provided by contractor



## Rocker DigitalSwitch™

**Description:** The **Rocker DigitalSwitch** provides a familiar interface to a modern lighting control system as it looks like an ordinary wall switch. The **Rocker DigitalSwitch** is a center-off momentary switch, is 100% digital and sits directly on the **GR 2400** bus.

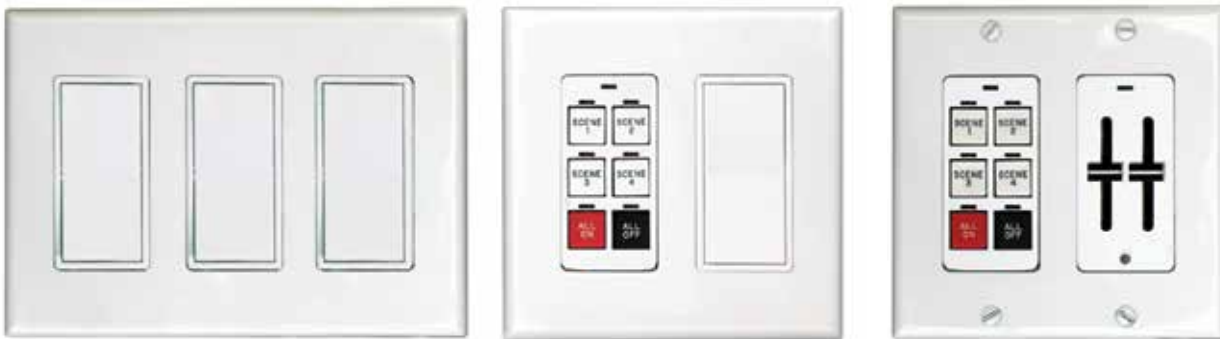
It is also available in a contact closure version which is home-run either to the contact closure inputs of a **DigiLink™** or **MicroPanel™**. If connected to a **DigiLink™** card, the **Rocker Contact Closure** can be programmed to control any relay(s) in any panel(s) on the **GR 2400** bus.

## Specifications:

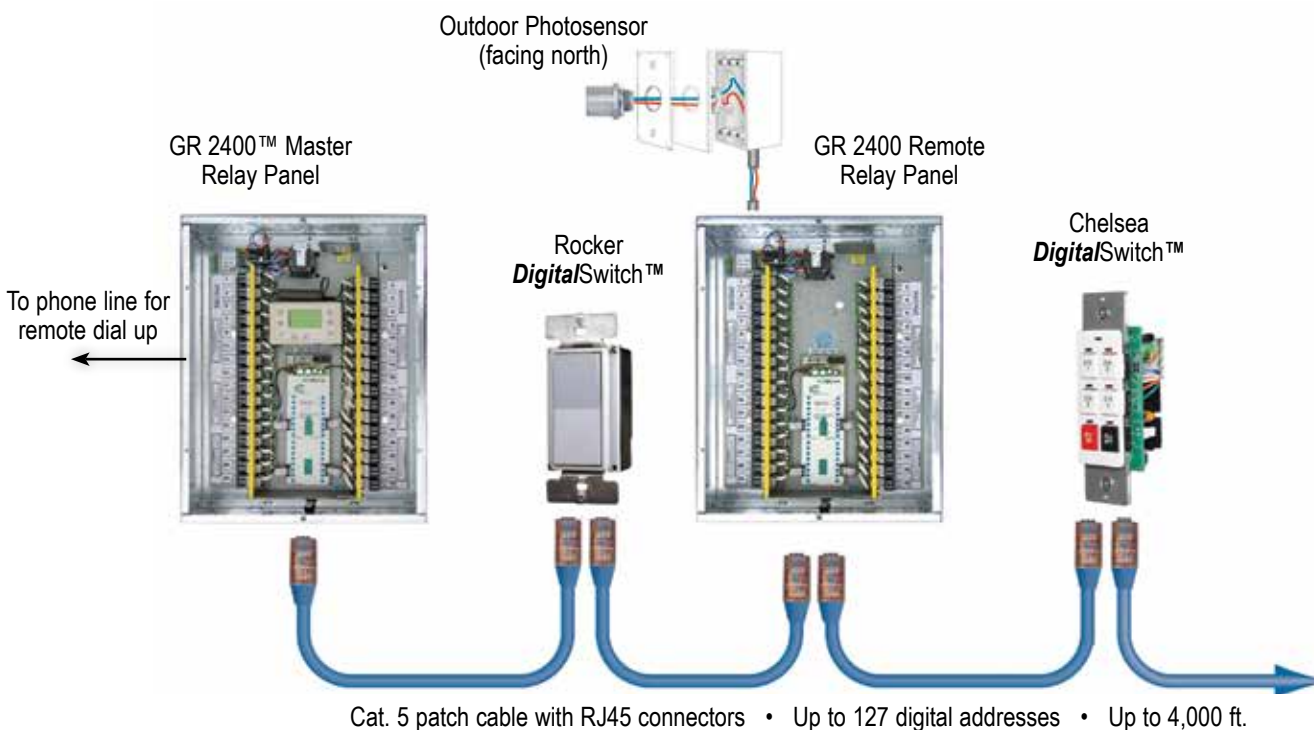
Dimensions:	1.6" w x 4" h x 2.5" d
Switch plate:	Decorator style
Mounting:	3.5" deep switch box
Action:	Momentary - Off - Momentary
Humidity:	10–90% non-condensing
Ambient temperature:	32–104° F (0–40° C)



# Overview



Rocker *DigitalSwitch* can be utilized in combination with other switches to achieve a variety of control possibilities.



## ORDERING INFORMATION

Rocker DigitalSwitch		
RS		
<b>Switch</b>	<b>Digital Switch / Contact Closure</b> DGS = Digital Switch CCS = Contact Closure Switch	<b>Button Color</b> BWH = White buttons BIV = Ivory buttons
<b>Examples:</b> RS DGS BWH = Rocker DigitalSwitch with white button RS CCS BIV = Rocker DigitalSwitch with ivory button		

# GR 2400™

## Switch



Decora plate provided by contractor



## Slider DigitalSwitch™

**Description:** An accessory for the **MicroPanel-iDim**, the **Slider Switch** is used for manual raise/lower of lighting levels. Simply raise sliders for more light and lower them for less.

- Features:**
- Elegant design is ideal in any architectural setting
  - 1 or 2 sliders per gang for compact placement on wall
  - Will operate with any (0–10V) dimmed load through the **MicroPanel-iDim™** analog inputs
  - Digital slider operates over the bus

- Applications:**
- Daylight Dimming in Daylit Offices, Classrooms, Labs
  - Restaurants (for manual control of dining area)
  - Presentation/Meeting Rooms

## Specifications:

Dimensions:	1.6" w x 4" h x 1.625" d
Switch plate:	Decorator style
Mounting:	2.25" deep-switch box
Switch Addresses available:	1–119 (max. slider switches in a bus is 16)
Addresses per switch:	1
Function:	Manual Raise Lower
Programming:	At <b>MicroPanel-iDim</b> , DTC, or via PC with <b>Unity™ Lighting Control Software</b>
Humidity:	10–90% non-condensing
Ambient temperature:	32–104° F (0–40° C)
Power supply:	Accepts 12VDC for Digital Slider and 24VDC for analog slider
Bus physical layer:	Contact closure and analog voltage or <b>GR 2400</b> bus
Connector:	5 conductor depluggable connectors or RJ45

# Overview

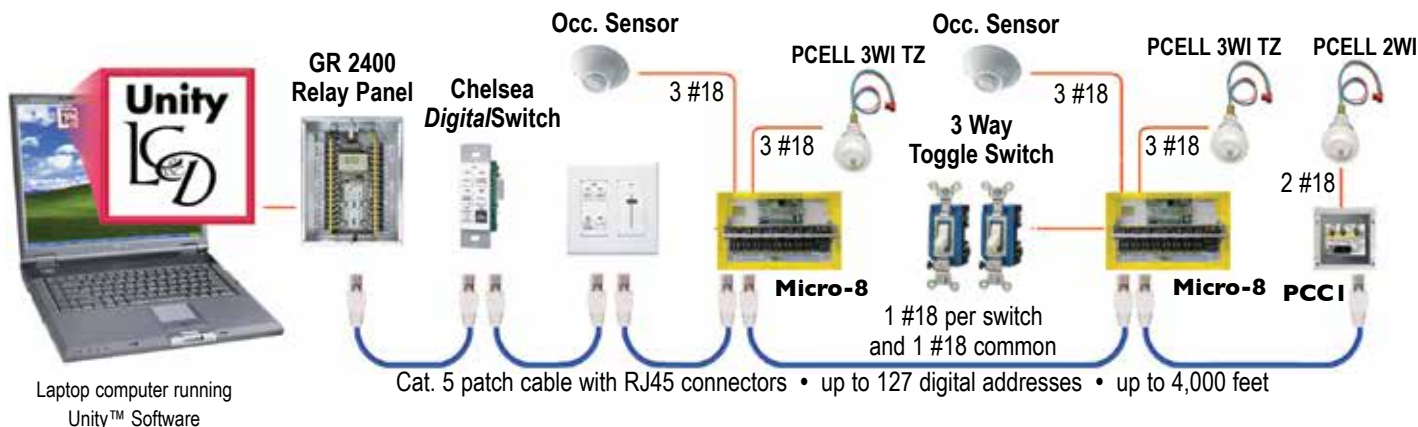


Slider switches may be mounted beside a **Chelsea DigitalSwitch** to combine manual raise/lower and scene control (up to 4 scenes).



**Slider Switches** are available with 1 or 2 sliders. Center decorator-style plates are available in white, ivory, or brushed steel.

The Slider Switch is one component of a comprehensive daylight dimming package with the **MicroPanel-iDIM™**. The **MicroPanel-iDIM** is part of the 100% digital **GR 2400™** Lighting Control System, that links all lighting controls in a building into a unified lighting control solution.



## ORDERING INFORMATION

Slider <i>DigitalSwitch</i>		
SLIDER		
<b>Switch</b>	<b># of Sliders and Digital / Analog</b> 1DGS = 1 slider and digital 2DGS = 2 sliders and digital 1ANS = 1 slider and analog 2ANS = 2 sliders and analog	<b>Plate Color</b> PWH = White plate PIV = Ivory plate PST = Stainless steel plate
<b>Examples:</b>		Slider 1DGS PWH = Digital single slider switch with white plate Slider 2DGS PIV = Digital dual slider switch with ivory plate

# GR 2400™

## Switch



## SwitchBolt™ DigitalSwitch

**Description:** The **SwitchBolt DigitalSwitch** replaces conventional toggle or push-button switches in installations where they may be subject to abuse or severe conditions. The **SwitchBolt** is a virtually indestructible stainless-steel bolt that mounts on a face plate or in a panel so that only the head of the switch is exposed. With a touch of your finger, the **SwitchBolt** can control any relay, dimmer, group or zone in any **GR 2400** panel.

- Features:**
- Ideal for security, high abuse and food preparation areas. Faceplate may be hosed down if properly used with gasket. Suitable for indoor or outdoor use
  - **SwitchBolt DigitalSwitch** sits directly on the digital bus
  - **SwitchBolt DigitalSwitch** mounts in any plate up to 1/4" thick. Requires 2" minimum deep box. Specify standard single gang plate or contractor may supply own plate
  - Hose down version available
  - Multi-gang version available

- Optional:**
- Capable of being digitally enabled/disabled over the bus

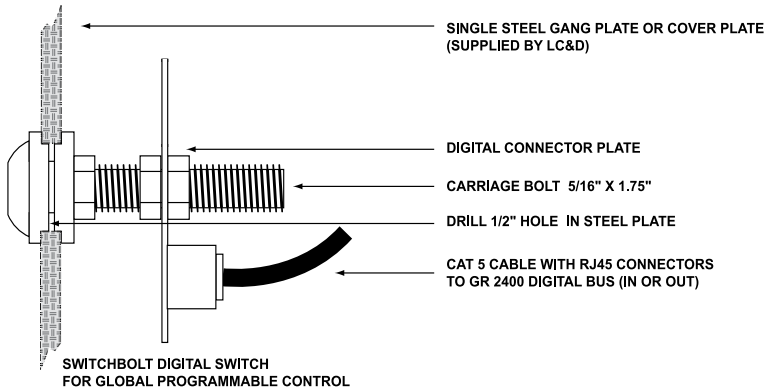
## Specifications:

Bolt dimensions:	5/16" (#20 thread) x 1.75" long	Function:	Positive ON, Positive OFF, Group Control, Toggle, Bypass, Raise, Lower or Scene Control
Mounting hole diameter:	0.5"	Programming:	Via DTC, via PC with <b>Unity™ Lighting Control Software</b>
Bolt material:	Stainless steel	Ambient temperature:	32–104° F (0–40° C)
Switch plate:	Stainless steel 1 gang plate	Power supply:	Accepts 12VDC from bus
Max. <b>SwitchBolt</b>			
Switch addresses available:	1–119		
Addresses per switch:	1		

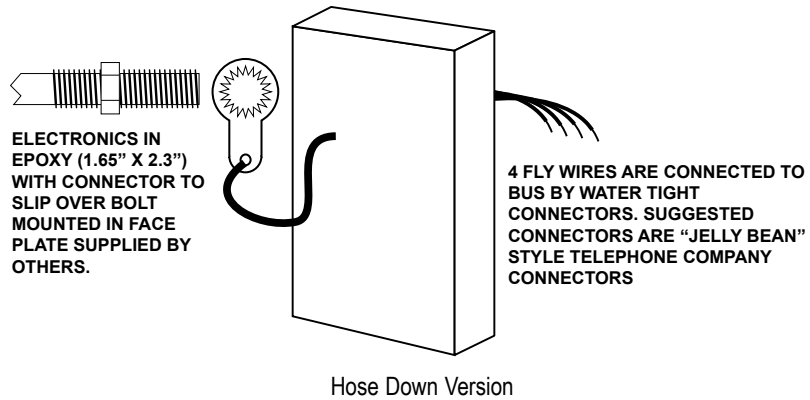
# Hook Up - Details



Circuit Board Front View



Back View  
(In this example faceplate and back box supplied by others)



## ORDERING INFORMATION

SwitchBolt DigitalSwitch			
SBOLT			
<b>Switch</b>	<b>Hose Down</b> [blank] = No hose down option HD = Hose down option	<b># of SwitchBolts and Digital</b> 1DGS = 1 bolt per 1-gang digital switch 2DGS = 2 bolts per 1-gang digital switch 4DGS = 4 bolts per 2-gang digital switch 6DGS = 6 bolts per 3-gang digital switch	<b>Plate Type</b> PSS = Stainless steel plate PBO = Plate by others
<b>Examples:</b> SBOLT 1DGS PSS = Digital SwitchBolt with 1 bolt and stainless steel plate SBOLT 2DGS PSS = Digital SwitchBolt with 2 bolts and stainless steel plate			



# GR 2400™

## Wireless Photosensor



## Wireless Photosensor

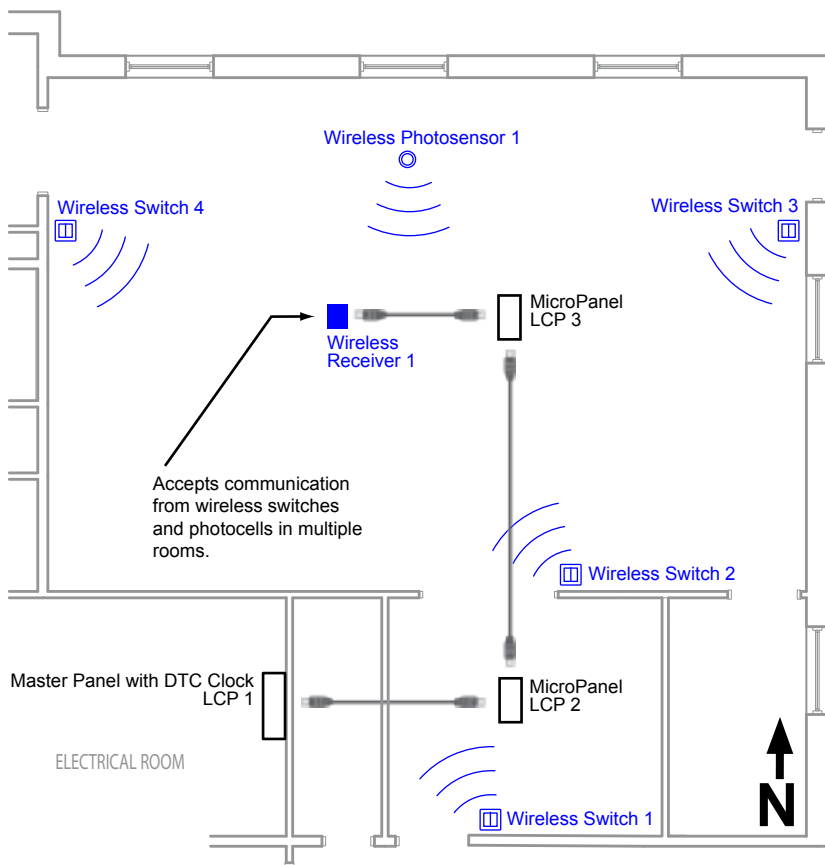
**Description:** The Wireless Photosensor (PCELL WRI) is designed to be ceiling mounted where one of the photovoltaic collectors is facing a window or source of light. The photosensor can transmit a signal to a receiver up to 90 ft away. The photovoltaic cell must receive at least 20 foot candles of light for several hours a day to charge the storage capacitor. A Wireless Receiver (GR2400 WREC) must be on the GR 2400 Bus within the transmitting distance.

- Features:**
- Extended sensitivity range
  - Transmits data every 10 seconds if light level change is detected
  - Uses STM 110C EnOcean Transmitter Module
  - Easy Installation
  - Can be used in both open loop and closed loop applications
  - 315 MHz frequency
  - Optional coin battery if required for more frequent updates or low light levels

## Specifications:

Colors:	White
Sensitivity:	1–1000 fc
Dimensions:	3.125" w x 2.5" h x .75" d
Mounting:	Surface mounting subplate may be taped or screwed to surface May also be suspended on the end of a 3/8" thread
Power:	Photovoltaic
Humidity:	10–90% non-condensing
Ambient temperature:	32–140° F (0–60° C)
	EnOcean Wireless Technology
	Transmission Power Max. 10mW
	Data rate/Modulation 125kbs/ASK
	Conforms with FCC 15.231 and RSS-210 for USA and Canada







# Drawings



## Notes:

1. Wireless receiver is powered by the digital bus.
2. Wireless receiver can communicate with up to 14 single switches or 7 double switches and 3 wireless photosensors.
3. Wireless switches and photosensors must not be more than 90 ft. from wireless receiver.
4. Switches and receivers must have a minimum clearance of 12" from reflective surfaces (metal surfaces, or grids of "rebar") to avoid signal cancellation.

## Symbol Legend:

-  Cat. 5 with RJ45's
-  Wireless Receiver
-  Wireless Switch
-  Wireless Photosensor
-  GR 2404/8 MicroPanel (Slave)
-  GR 2400 Panel (Master)

## ORDERING INFORMATION

Wireless Photosensor

PCELL WRI

Wireless Photosensor

# GR 2400™

## Wireless Switch



## Wireless Switch

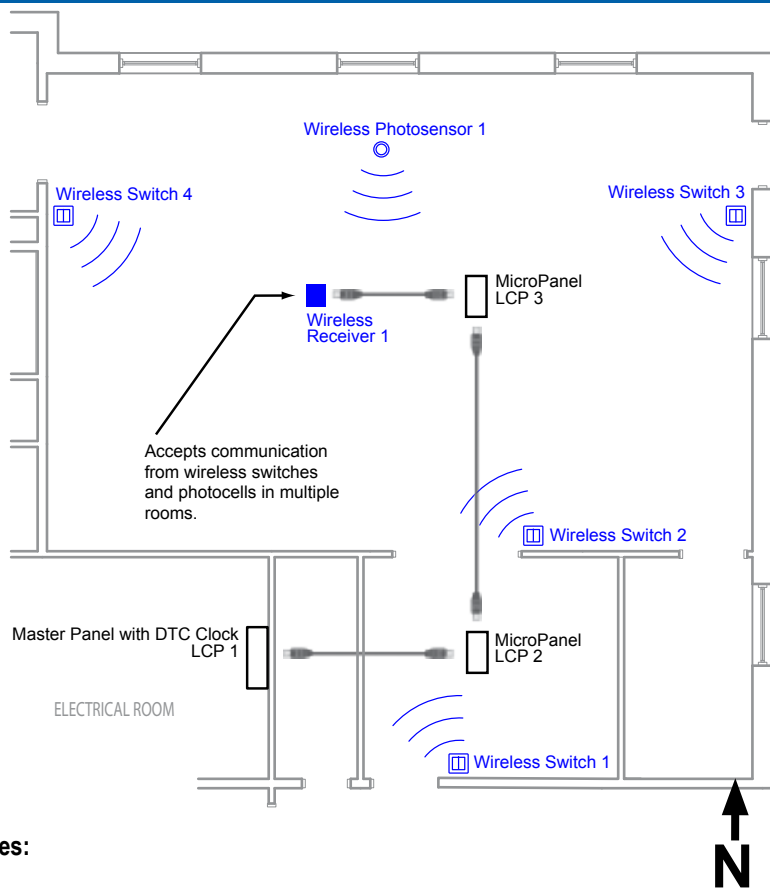
**Description:** The LC&D wireless switch can be stuck or screw-mounted onto any flat surface, providing instant control of any of LC&D's lighting control systems. Every transmitter is manufactured with a unique 32-bit address allowing multiple wireless switches. The Wireless Receiver sits on the GR 2400 bus and is mounted within a reasonable distance from the transmitting Wireless Switches. The Wireless Switch is fully digital, maintenance free and does not require batteries. (Required: Wireless Receiver GR2400 WREC)

- Features:**
- 90 ft max. indoor range
  - 1 rocker or 2 rockers per switch
  - Each rocker position can be programmed:
    - On
    - Off
    - Raise } i.e. for dimmer
    - Lower }
  - Easy setup
  - 315 MHz (Unlicensed Frequency Band)





## Specifications:

Colors:	White	Format:	EnOcean Wireless Technology
Mounting:	Surface, sticker or screwed	TX Power Max.:	10mW
Power:	Not required (no batteries, no wires)	Data rate/Modulation:	125kbs/ASK
Humidity:	10–90% non-condensing	Certifications:	Conforms with FCC 15.231 and RSS-210 for USA and Canada
Ambient temperature:	32–140° F (0–60° C)		

# Drawings



Hand Held Remote

-  Wireless Switch
-  Wireless Photosensor
-  GR 2404/8 MicroPanel (Slave)
-  GR 2400 Panel (Master)

## Notes:

1. Wireless receiver is powered by the digital bus.
2. Wireless receiver can communicate with up to 14 single switches or 7 double switches and 3 wireless photosensors.
3. Wireless switches and photosensors must not be more than 90 ft. from wireless receiver.
4. Switches and receivers must have a minimum clearance of 12" from reflective surfaces (metal surfaces, or grids of "rebar") to avoid signal cancellation.

## ORDERING INFORMATION

Wireless Digital Switch	
<b>WRSWT</b>	
<b>Switch</b>	<b>Button Type/Color</b> 1BWH = 1 button rocker, single gang, classic style, white faceplate 2BWH = 2 button rocker, single gang, classic style, white faceplate 1BBK = 1 button rocker, single gang, classic style, black faceplate 2BBK = 2 button rocker, single gang, classic style, black faceplate 1PWH = 1 button switch, single gang, pad style, white faceplate 2PWH = 2 button switch, double gang, pad style, white faceplate
Hand Held Remote	
<b>WRSWT</b>	
	<b>Remote</b> HHR BBK = Black hand held remote HHR BWH = White hand held remote

# GR 2400™

## Wireless Occupancy Sensor



## Wireless Occupancy Sensor

**Description:** The Wireless Occupancy Sensors communicate to the lighting control system to automatically turn off lighting when the space is not in use. The occupancy sensors are powered by built-in solar cells and use passive infrared (PIR) motion detectors

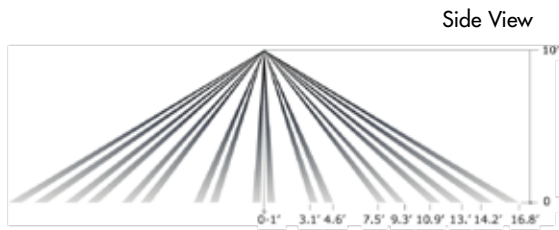
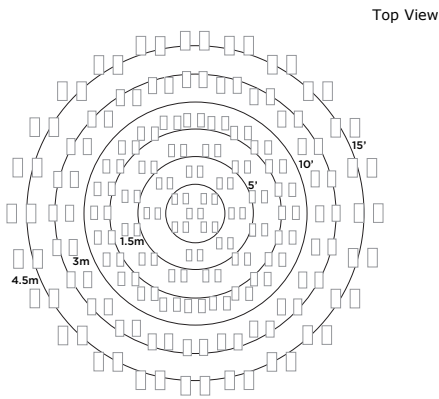
- Features:**
- Easy Installation
  - Transmits data every 10 seconds if light level change is detected
  - Optional coin battery if required for more frequent updates or low light levels

## Specifications:

- Colors: White
- Dimensions: 5.83" w x 2.52" h x 1.8" d Wall mount sensor  
6.5" w x 2.36" h x 1.47" d Ceiling mount sensor
- Mounting: Surface mounting subplate may be taped or screwed to surface
- Power: Photovoltaic
- Humidity: 10–90% non-condensing
- Ambient temperature: 32–140° F (0–60° C)
- EnOcean Wireless Technology
- Conforms with FCC 15.231 and RSS-210 for USA and Canada

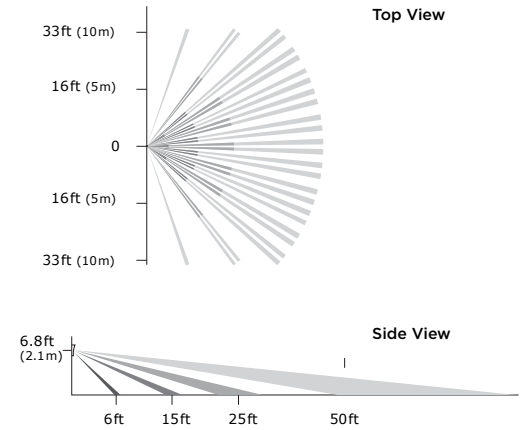
# Sensor Coverage Patterns

## Ceiling Mount Occupancy Sensor

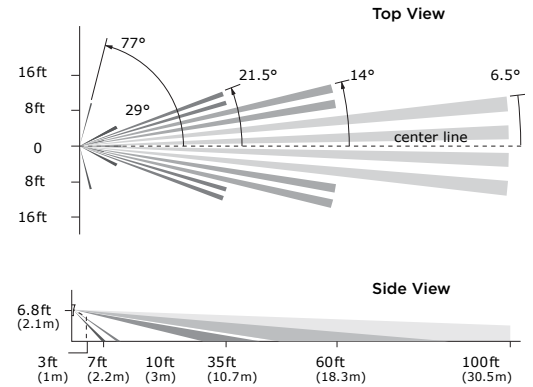


## Wall Mount Occupancy Sensor

### Wide Angle Coverage



### Long Range Coverage



## ORDERING INFORMATION

### Wireless Occupancy Sensor



#### Type

WRCM = Wireless ceiling mount occupancy sensor  
WRWM = Wireless wall mount occupancy sensor

# GR 2400™

## Wireless Door/Window Sensor



## Wireless Door/Window Sensor

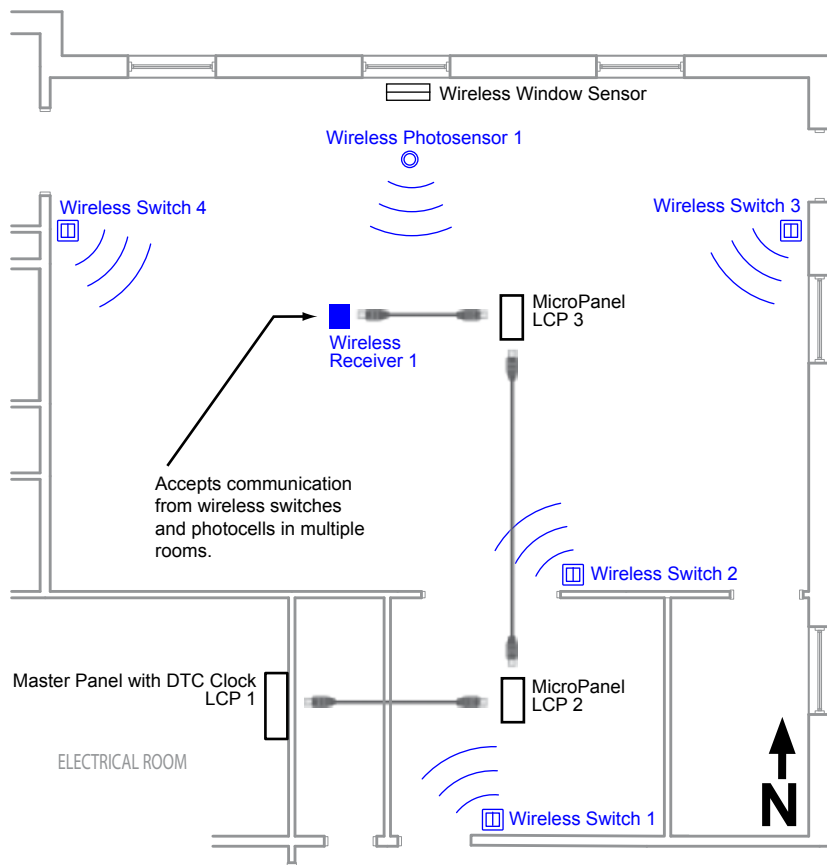
**Description:** The Window/Door Sensor communicates wirelessly to the LC&D system whenever it detects that a door or window has been opened or closed. The Wireless Door/Window Sensor can be easily mounted on any standard door or window frame to disable HVAC or other electric loads. The sensor is completely self-powered by harvesting ambient solar energy so there are no wires to run or batteries to replace, reducing installation time and eliminating the need for on-going maintenance.

- Features:**
- Extended sensitivity range
  - Integrated solar cell powers the sensor with no batteries or wires
  - Removable mounting plate allows for easy installation
  - Optional battery for low light level installations

## Specifications:

Colors:	White
Dimensions:	3.15" w x 0.83" h x 0.59" d sensor 3.15" w x 0.47" h x 0.5" d magnet
Mounting:	Surface mounting subplate may be taped or screwed to surface
Power:	Photovoltaic
Humidity:	10–90% non-condensing
Ambient temperature:	32–140° F (0–60° C)
	EnOcean Wireless Technology
	Transmission Power Max. 10mW
	Data rate/Modulation 125kbs/ASK
	Conforms with FCC 15.231 and RSS-210 for USA and Canada








# Drawings



### Notes:

1. Wireless receiver is powered by the digital bus.
2. Wireless receiver can communicate with up to 14 single switches or 7 double switches and 3 wireless photosensors.
3. Wireless switches and sensors must not be more than 90 ft. from wireless receiver.
4. Switches and receivers must have a minimum clearance of 12" from reflective surfaces (metal surfaces, or grids of "rebar") to avoid signal cancellation.

### Symbol Legend:

-  Cat. 5 with RJ45's
-  Wireless Receiver
-  Wireless Switch
-  Wireless Photosensor
-  GR 2404/8 MicroPanel (Slave)
-  GR 2400 Panel (Master)
-  Wireless Window Sensor

### ORDERING INFORMATION

Wireless Contact/Window/Door Sensor	
WRCS	
Wireless Contact Sensor	



# GR 2400™

## Wireless Receiver



## Wireless Receiver

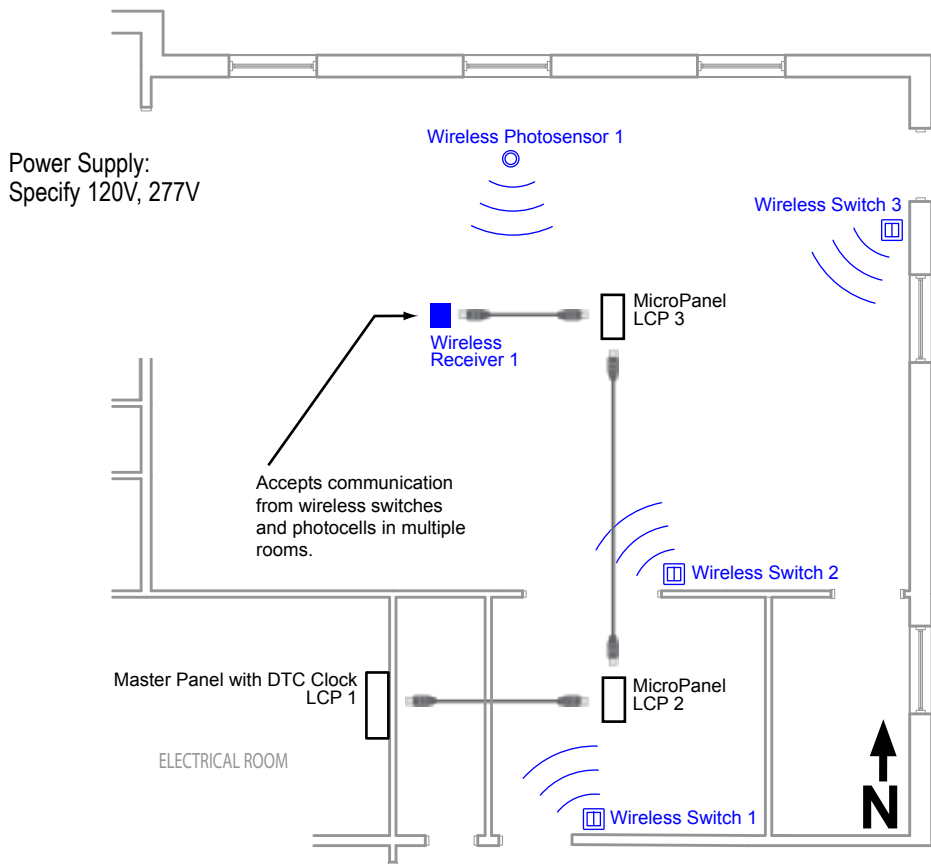
**Description:** The Wireless Receiver works together with the Wireless Switch, the Wireless Occupancy Sensor, the Wireless Door/Window Sensor, the Wireless Handheld Remote and/or the Wireless Photosensor. The GR 2400 Wireless Receiver is powered by the GR 2400 bus (12VDC). The unit itself is wired with Cat. 5 cables and RJ-45 connectors. Each receiver is programmable to allow up to 14 Wireless Switches when no Wireless Photosensors are used, or up to 7 Wireless Switches and up to 3 Wireless Photosensors when photosensors are used. As with any wireless system, care must be taken to ensure that the signal is received from each of the wireless devices. The receiver location may be moved to optimize the system.

- Features:**
- 120 Ohms termination resistance (Uses slide switch to activate the terminator)
  - RCM 130C EnOcean Receiver Module
  - Takes 2 consecutive bus addresses
  - Easy to program
  - 14 Wireless Rocker Switches (Single) (WRSWT 1BWH)
  - 7 Wireless Rocker Switches (Double) (WRSWT 2BWH)
  - 3 Wireless Photosensors (PCELL WRI)
  - Powered by the GR 2400 System Bus
  - 315 MHz Frequency
  - 15cm antenna

## Specifications:

Dimensions:	2.25" w x 3.625" h x 1" d (casing)	Format:	EnOcean Wireless Technology
Mounting:	Surface	Bus physical layer:	RS 485 (GR 2400 bus)
Wireless RX Power:	+12VDC bus power	Bus Connector:	RJ45 Connectors
Humidity:	10–90% non-condensing	Programming:	Via DTC
Ambient temperature:	32–150° F (0–66° C)		







# Drawings



## Notes:

1. Wireless receiver is powered by the digital bus.
2. Wireless receiver can communicate with up to 14 single switches or 7 double switches and 3 wireless photosensors.
3. Wireless switches and photosensors must not be more than 90 ft. from wireless receiver.
4. Switches and receivers must have a minimum clearance of 12" from reflective surfaces (metal surfaces, or grids of "rebar") to avoid signal cancellation.

## Symbol Legend:

-  Cat. 5 with RJ45's
-  Wireless Receiver
-  Wireless Switch
-  Wireless Photosensor
-  GR 2404/8 MicroPanel (Slave)
-  GR 2400 Panel (Master)

## ORDERING INFORMATION

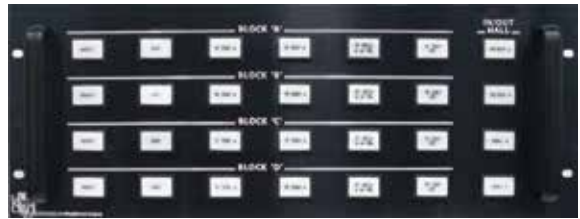
### Wireless Receiver

GR2400 WREC

Wireless Receiver

# GR 2400™

## Custom Switch



## Custom Switches and Controls

**Description:** As part of its 100% digital lighting controls, LC&D offers custom manufactured switch-banks and touch-screen based control. We can match existing equipment or assist in designing a completely custom product to meet almost any requirement. Custom fabrication is available in a variety of materials including stainless steel, aluminum, lexan, or various laminates.

Hundreds of different switch types are available, with and without pilot lights, or with external LED pilot lights. Also available are bolt switches, mushroom switches, bi-color pilot-lit switches and more.

Touch-screen controls are interactive and available with multiple virtual pages and include real-time status (ON or OFF) of any area. Add new custom graphics at any time to meet changing conditions or use.

- Features:**
- Available for indoor, outdoor or harsh environments
  - Match new controls to existing controls
  - Link each switch-bank or console via Cat. 5 patch cable with RJ45 connectors
  - Manufactured to any specification
  - Mix touch-screens and push button switches in a single console
  - Centrally control all lighting in a facility — even over the internet
  - Digital or key-based enable or disable

**Applications:**

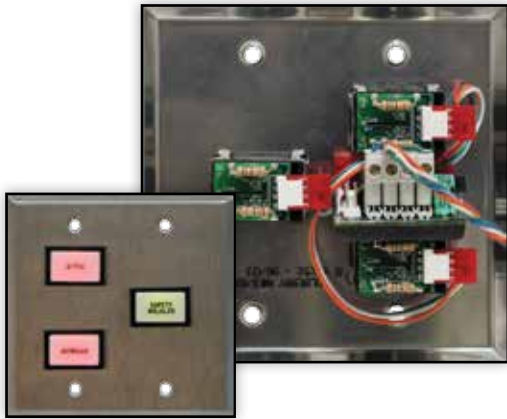
- Prisons
- Nurse Call Stations
- Secure area controls
- Stage Work Lights
- Building-Wide Controls

## Specifications:

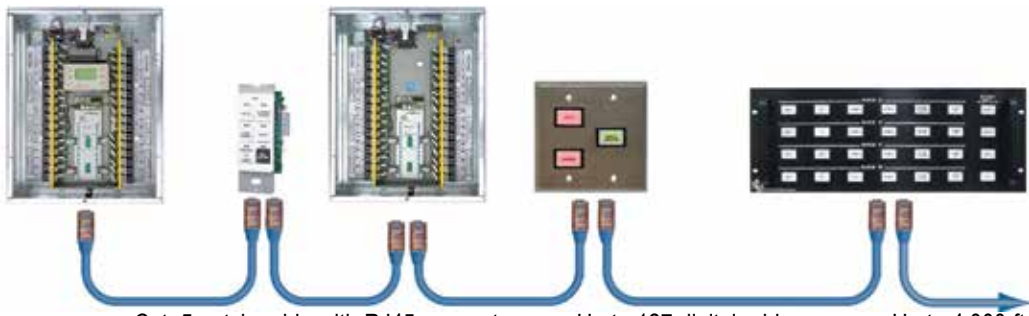
Dimensions, mounting, other ratings including NEMA ratings all per owner specs.

Function:	On, Off, Toggle, Mixed mode, Dim up, Dim down, Raise, Lower, Interaction with other equipment including thermostats, security, alarms, motor controls and more	Power supply:	Accepts 12VDC from bus Onboard power supply available for large consoles (120VAC, 277VAC or 347VAC)
Programming:	At DTC, or via PC with <b>Unity™ Lighting Control Software</b>	Bus physical layer:	RS 485 ( <b>GR 2400</b> bus)
		Connector:	Cat. 5 patch cable with RJ45 connectors

# Overview



Theatrical-grade work-light switch.  
Custom manufactured for each project. Rack mounting, console mounting, and wall mounting in single, or multi-gang boxes are the mounting options available. Positive annunciation to indicate status of loads (green= ON, red= OFF). Link hundreds of buttons to the GR 2400 system with Cat 5. cable.



Cat. 5 patch cable with RJ45 connectors • Up to 127 digital addresses • Up to 4,000 ft.

## ORDERING INFORMATION

### Custom Switches and Controls

Contact factory for specs, ordering codes and pricing

# GR 2400™

## Photosensor



## Outdoor Digital Photosensor

**Description:** The **Outdoor Digital Photosensor** is designed for single-zone or multi-zone outdoor lighting control applications. Its global control ability makes it ideal for both simple and complex site-lighting controls. The **GR2400 PCC1 2WO** is the 2-wire outdoor photosensor shipped with a photocell control card which may be located anywhere on the GR 2400 Bus. The **PCELL 2WO** is shipped without a control card to be plugged directly into a Blue Box Master control card.

- Features:**
- Readout of the photosensor is digitally displayed at the DTC and remotely at a PC operating **Unity™ Lighting Control Software**
  - The **GR2400 PCC1 2WO** may be programmed with up to 14 different trigger points, each controlling a unique relay group at different ON and OFF light levels in as many as 64 relay panels.
  - The **PCELL 2WO** operates with a single schedule with a single trigger point to provide photocell ON, timeclock OFF control to a GR 1400 system. This will operate on any relay on the bus.
  - Totally sealed and suitable for wet locations

## Specifications:

Operating range: 0–1000 fc  
Programming at: DTC  
PC (with **Unity™ Lighting Control Software**)

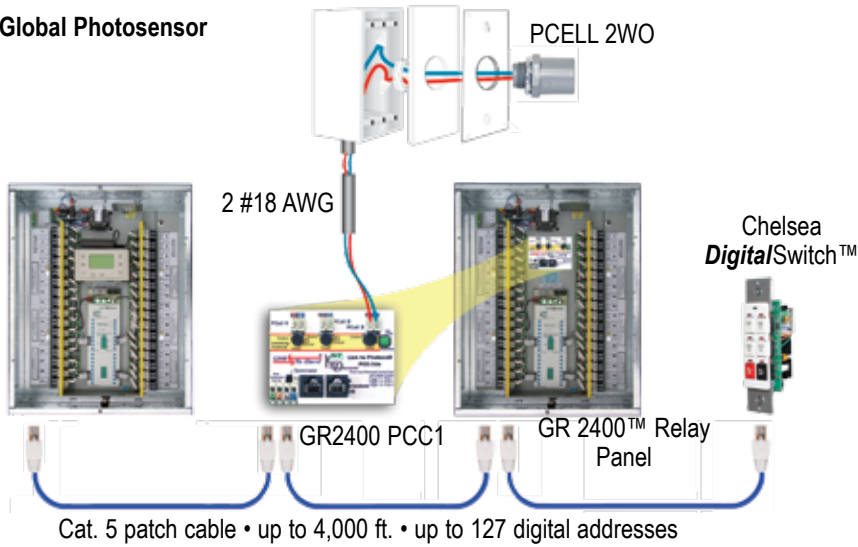
### Outdoor Photosensors

The hood protects the photosensor from direct exposure to the sun. The **Outdoor Digital Photosensor** is usually roof-mounted and aimed North.

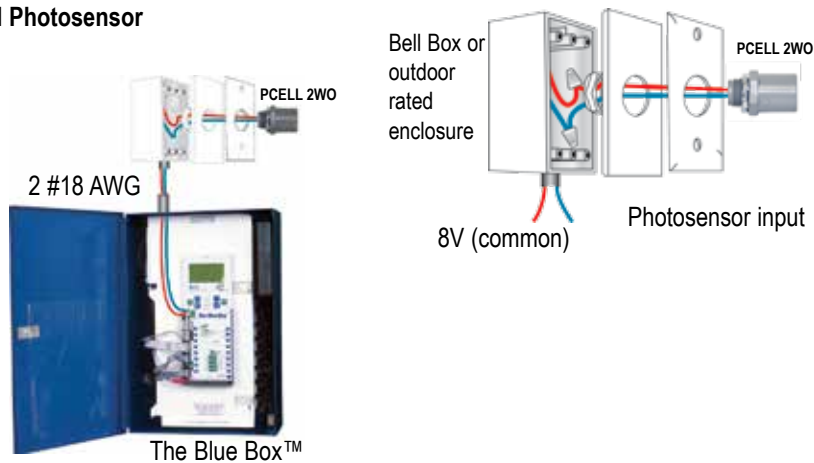
For daylight harvesting applications, refer to the **Indoor Digital Photosensor**.

# Single Line

## Global Photosensor



## Global Photosensor



Lighting can be staggered on as outdoor light levels decrease with a single photosensor.

### ORDERING INFORMATION

#### Outdoor Digital Photosensor

PCELL 2WO

Two-Wire Outdoor Photosensor for GR 1400 system

GR2400 PCC1 2WO

Two-Wire Outdoor Photosensor with PCC-1 control card for GR 2400 system

# GR 2400™

## Photosensor



An Acuity Brands Company



2-Wire Global



3-Wire Local



3-Wire Local Slimline

## Indoor Digital Photosensors

**Description:** The Indoor Digital Photosensors have an extended sensitivity range that allows it to be used in almost any location without needing adjustment for the reflectivity of the environment. Additionally, its dual housing construction allows it to be used as a full-sized sensor or the center section may be separated for a diminutive ceiling footprint. The Indoor Digital Photosensor comes in four styles:

**2-Wire Global Photosensor:** Photosensors when combined with a photocell card, have up to 14 different trigger points, each controlling a unique relay group in as many as 64 relay panels. Moreover, each dimmer (0-10V or 120V “phase”) may be separately controlled to maintain a unique light level.

**3-Wire Local Photosensor:** Ten to zero used with the *MicroPanel* or other integrated distributed control panels which have on-board photosensor inputs. Zero to ten used with XPoint devices.

**3-Wire Local Slimline Photosensor:** Same as 3-Wire Local Photosensor but with smaller footprint, makes it ideal for mounting directly to luminaires.

**2-Wire Global Slimline Photosensor:** Same as 2-Wire Local Photosensor but with smaller footprint, makes it ideal for mounting directly to luminaires.

- Features:**
- Small and discrete ceiling mount or fixture mount
  - Extended sensitivity range; no adjustment needed
  - Can be used in both open loop and closed loop applications
  - Low voltage power

## Specifications:

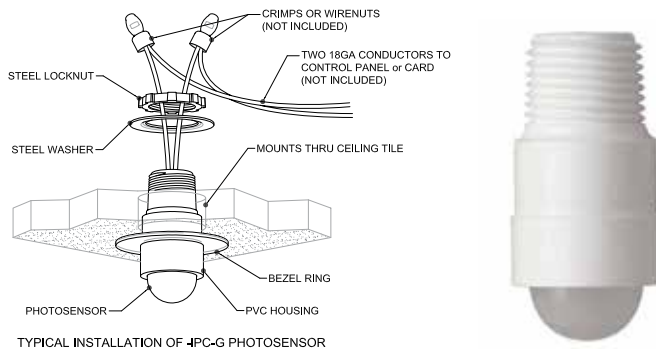
Spectral sensitivity: Similar to human eye  
Operating range: 0–1000 fc for 2-wire  
0–100 fc for 3-wire  
Programming at: DTC w/PC (with Unity™  
**Lighting Control  
Software**)

Max. humidity: 10–90% non-condensing  
Ambient temperature: 32–104° F (0–40° C)  
Voltage: 3-wire operates on 12–30VDC  
2-wire powered by  
Photosensor Input Card

## Global Indoor Photosensor

2-Wire Indoor

- Global Photosensor
- Requires PCC3 control card

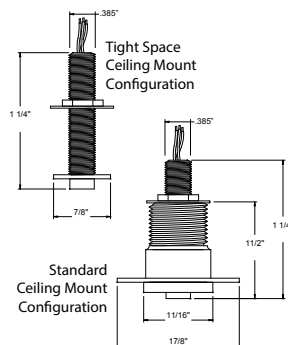


TYPICAL INSTALLATION OF 4PC-G PHOTOSENSOR

## Local Indoor Photosensor

3-Wire Indoor

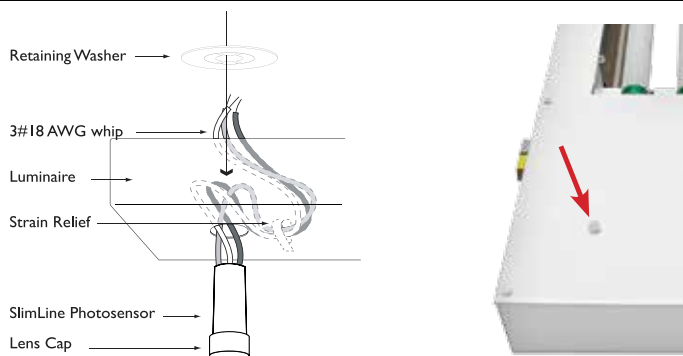
- Local Photosensor for *Micro*Panels
- Full Daylight Harvesting Features



## Local & Global Indoor Photosensor

SlimLine 2 & 3-Wire Indoor

- Local Photosensor for *Micro*Panels
- Global Photosensor for PCC3
- Miniature Profile .276" dia. (7mm) hole in Luminaire



### ORDERING INFORMATION

#### Indoor Digital Photosensor

PCELL

#### Photosensors

#### Type and Subtype

2WI = Two Wire Indoor  
 3WI TZ = Three Wire Indoor, Ten to Zero  
 3WI ZT = Three Wire Indoor, Zero to Ten  
 3WI SLI TZ = Three Wire, Slimline Indoor, Ten to Zero  
 3WI SLI ZT = Three Wire, Slimline Indoor, Zero to Ten  
 2WI SLI = Slimline Indoor, Two Wire Indoor

**Note: 2WI Requires PCC3 control card: GR2400 PCC3**



# GR 2400™

## Photosensor Input Cards



## Photosensor Input Cards

**Description:** Photosensor input card which a) converts the signal of a photosensor into a digital stream, and b) stores “global” switching triggers. Triggers are global “On” and “Off” commands programmed at a unique light level, each with a unique group of relays, smart breakers or dimmers.

The PCC1 is used for outdoor photosensors (PCELL 2WO) and has a single photosensor input.

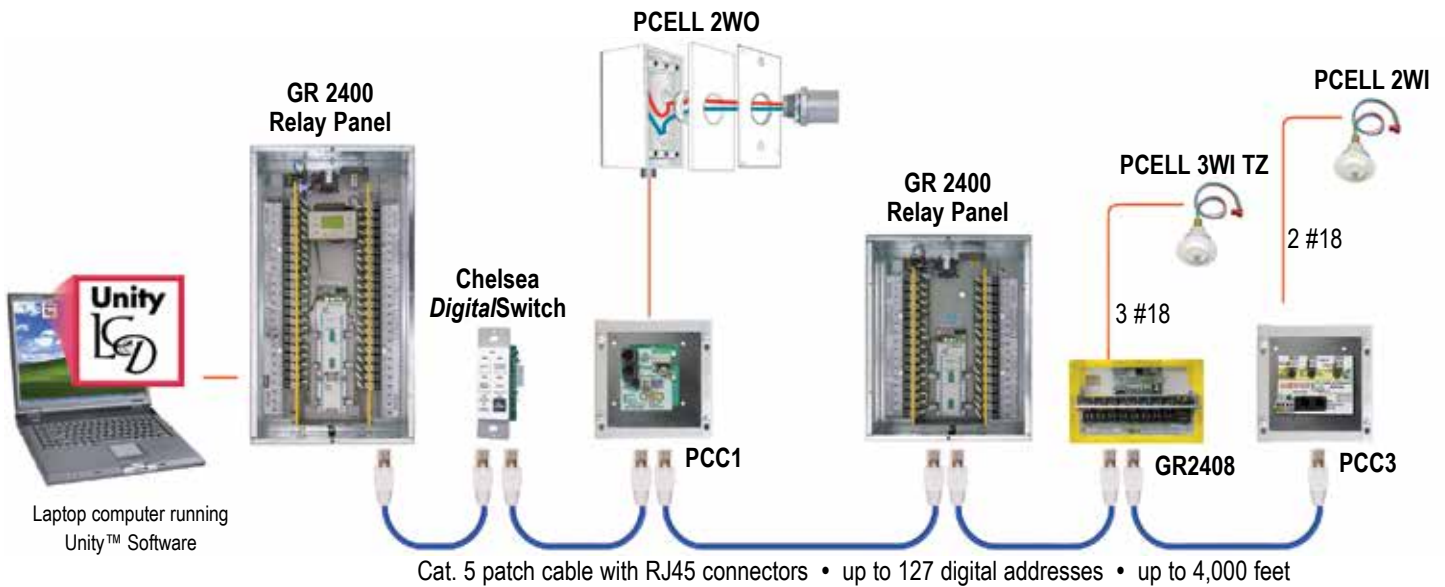
The PCC3 is used for indoor photosensors (PCELL 2WI) and has inputs for up to 3 separate photosensors.

- Features:**
- Light levels from each photosensor may be displayed or read at the DTC
  - Light levels may also be displayed via **Unity™ Lighting Control Software** or **Unity GX™ Advanced Graphical Software**
  - Up to 14 switch-trigger points
  - May be polled by GR2400 Dimmers over the bus
  - Programming locally at the DTC, or remotely via **Unity™ Lighting Control Software** or **Unity GX™ Advanced Graphical Software**
  - The inputs of a PCC-3 may be digitally enabled or disabled via time clock, or other controllers such as digital switch, building automation, occupant sensors, etc.
  - Advanced daylight harvesting features—please refer to Indoor Photosensor tech sheet for more details

## Specifications:

Enclosure:	6" w x 6" h x 4" d NEMA 1 Screw Cover	Power supply:	From GR 2400 bus
# of Addresses:	1 (PCC1 and PCC3)	Humidity:	10–90% non-condensing
		Ambient temperature:	32–104° F (0–40° C)
		Max wiring distance:	300 ft. to each photosensor

# Hook up / Programming



Photosensors do not always require a photosensor card. The Blue Box Master Panel (not shown) has an onboard input for one outdoor photosensor with 8 global triggers. The MicroPanel has onboard inputs for up to 4 local indoor photosensors.

## ORDERING INFORMATION

Photosensor Control Cards		
GR2400		
<b>System Type</b>	<b>Photosensor Card (with or without Photosensor)<sup>1</sup></b> PCC1 = Outdoor card, 1 input, no sensor PCC1 2WO = Outdoor card, 1 input, one 2WO PCC3 = Indoor card, 3 inputs, no sensor PCC3 2WI = Indoor card, 3 inputs, one 2WI PCC3 2WO = Indoor card, 3 inputs, one 2WO  1 = Indoor Photosensor card PCC3 includes digital enable/disable feature	<b>Enclosure</b> [blank] = card only, no enclosure SM NE1 = Surface Mount, NEMA 1 FM NE1 = Flush Mount, NEMA 1 SM NE4 = Surface Mount, NEMA 4

# GR 2400™

## Software

Design Program Manage Integrate

# UNITY2

## Lighting Control Software™

Download Unity2 at: [www.lightingcontrols.com](http://www.lightingcontrols.com)



## Unity2 Lighting Control Software

**Unity2 Lighting Control Software** bundles *design* (specification), *programming* and *management* of a lighting control system into a single software package. It's **free**. And it requires no formal training.

Specifiers use our **Unity2 Lighting Control Software** to rapidly design a new lighting control system. **Unity** files may be saved and output to AUTOCAD in a few seconds. LC&D will preprogram (upload the specifier's **Unity** file) prior to shipment—at no cost.

Building engineers may use **Unity2** to monitor and control the lighting controls in real time from the display of our clock or from a desktop PC.

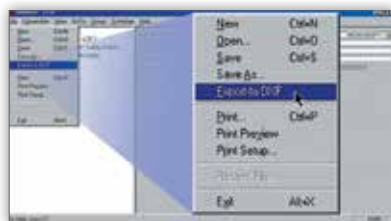
## Design

One of the best features of **Unity2 Lighting Control Software** is its ease of use and easy point and click features. Quickly design a complete lighting control system from the ground up in minutes.

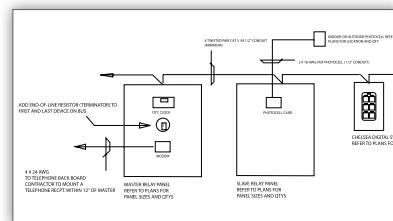
- Set up relay panels, switches, photosensors, time schedules — any aspect of a system
- Output a design to AUTOCAD in a few seconds, including job-specific single-line drawings, panel schedules, switch schedules and specs
- When ready, the **Unity** file can be emailed to Lighting Control & Design and will be built and programmed exactly as laid out



**Add** relay panels, switches or any of our many accessories. Simply point your mouse to the left window pane and right-click. You will see a pulldown box which allows you to select whatever device you require. You can do this as many times as needed.



**Submit** your lighting control system in AUTOCAD format or output your design to a **Unity** file (.bus2) and email it to us. LC&D can build your system according to your specifications.



**Export** your lighting control system design to CAD (.DXF format) in seconds. **Unity2** will generate a single-line drawing, panel schedules, switch schedules and specifications.

# Program

**Lighting Control & Design** uses our carefully prepared **Unity** submittal to preprogram panels, switches and time schedules—the entire lighting control system prior to shipment. New settings may be programmed in real time.

All the tools needed to program your lighting control system are incorporated in **Unity**. Programming or adjusting switches, photosensors, relay panels, etc., is fast and simple. Easily connect to your lighting system to modify your system.



# Manage

Remotely access the **GR 2400** bus with **Unity Software**. Connection options include:

- Dial-up connection (built in modem in the master LCP)
- Direct serial connection (**Link-To PC**)

Control relays and groups, modify schedules and much more.

The Digital Time Clock (DTC) mounted in the master relay panel uses **Unity** to:

- Manually control all relays in real time
- Program switches and photosensor trip points
- Program time schedules
- Program all aspects of the system



## ORDERING INFORMATION

Software
<b>UNITY</b>
Unity Software

# GR 2400™

## Software



## Unity GX2™ Graphical Management Software

### Description:

Unity GX2 is an application specific “Pan & Zoom” floor-plan based energy management software that provides control and real time monitoring of wired/wireless lights, sensors, and basic HVAC solutions. This software is designed for use with both indoor and outdoor facilities to provide centralized and remote access to lighting and sensors. Additional uses include enhanced security, load shedding management, data logging and everyday/basic usage alarms. This software was specifically designed with the end user in mind to perform quick rezoning and scheduling by the facilities, security, building occupant, or the system administrator.

### Features:

- A unified indoor and outdoor control that integrates the GR2400 system and ROAM nodes onto a single platform
- Configurable data logging for period specific or ongoing energy usage statistic. Alarms can be set for number of lamp strikes, kWh or run hours eclipses a pre-determined amount.
- Effective management of load-shedding scenarios
- Embedded zones allow for control and reorganization of multiple group of lights
- Green Screen provides a visual display of system savings and usage
- Personalized interface for improved look and feel of icons and controls
- Virtual switches provide easy local and global control
- Access multiple floors/areas and use pan/zoom feature to quickly navigate the floor plan
- The symbol library allows for faster creation and editing of control points on the floor plan
- Overview window to indicate where you are zoomed in on the graphic
- Tree structure for quick select and viewing of control zones and system hardware
- Properties box provides information on selected control zone or hardware device
- Export the controls layer to DWG for inclusion in building designs

## Infinite Pan & Zoom

Pan and zoom without the distortion or pixelation associated with DWG/CAD based graphics.



25% or less magnification



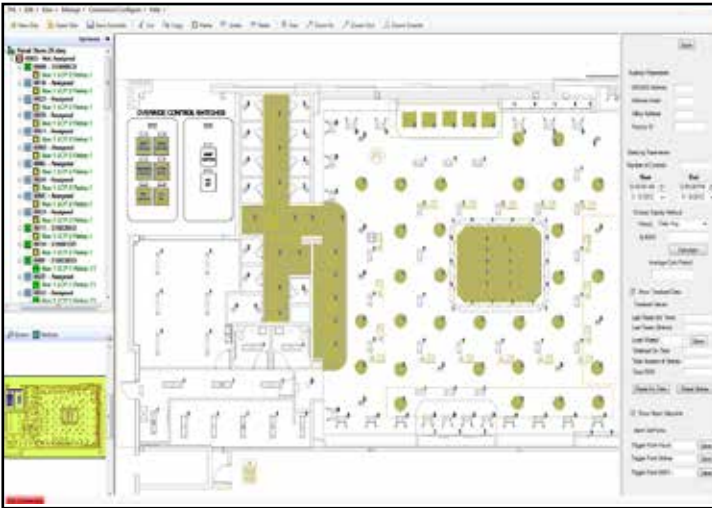
300% magnification



1000% or more magnification

# Professional Tool Set

Unity GX2™ uses intuitive graphical controls and an easy-to-understand interface to make managing your lighting controls as straightforward as pointing and clicking on an object.



## Control Tree

Allows the user to see all control zones and system hardware.

## Data Logging & Alarms

The user is able to configure the data logging for a specified period of time or ongoing energy usage statistics. The alarm can be set for the number of lamp strikes, kWh or run hours exlapses for a predetermined amount of time.

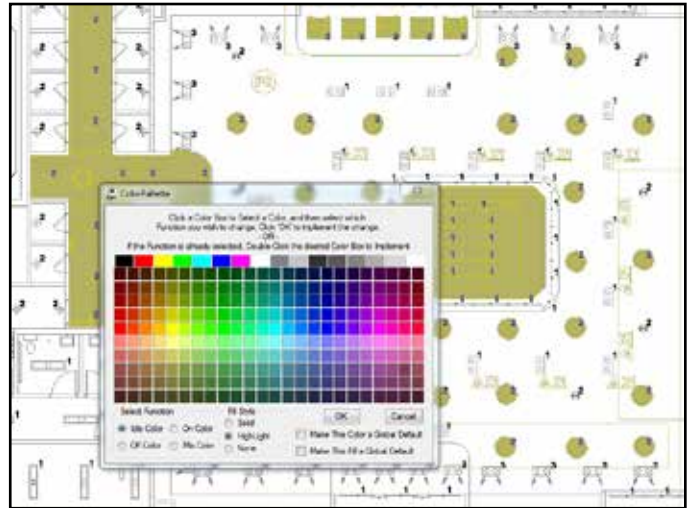


## Shapes-Draw/Edit Controls

Map areas using the box, elliptical or polygon tool.

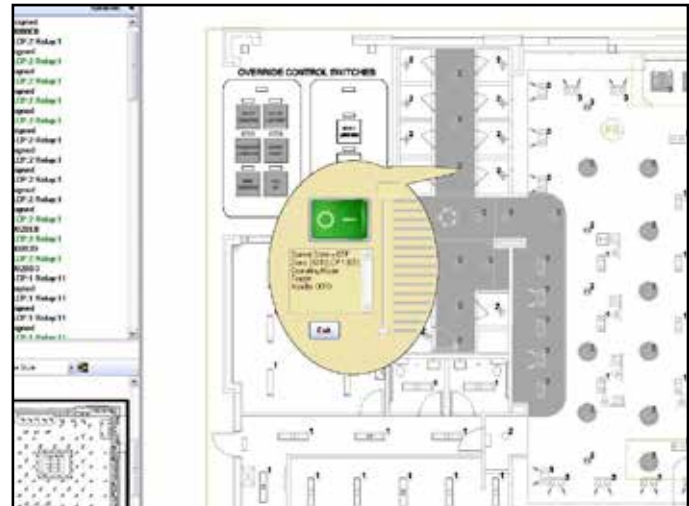
## ORDERING INFORMATION

Software
<b>UNITY GX2</b>
<p><b>Unity GX2 Software</b></p> <p>Version 2, compatible with XPoint, NOT compatible with Version 1 (GX Vector) sites. License is for one seat.</p>



## Color Palette

User is able to choose color for idle and run modes (see-through, opaque or outline modes).

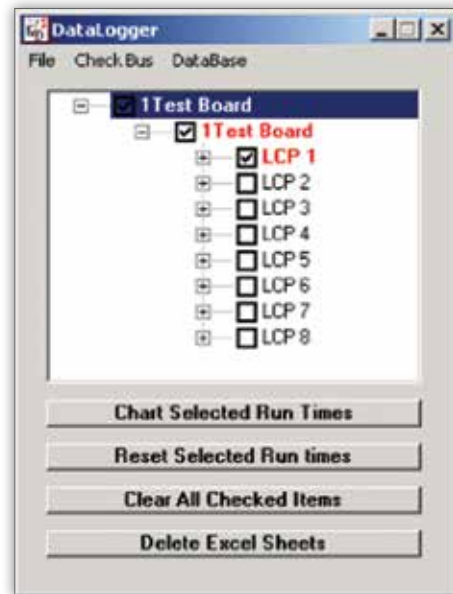


## Switch Properties

By hovering over the switch, the user is able to see the properties of the switch, including: the zone location of the switch and its current state.

# GR 2400™

*Accessory*



## DataLogger™

**Description:** DataLogger™ lighting management software reads and then logs information about the lighting controls which can be used to better manage a facility. DataLogger offers three different software modules:

Runtime Module keeps a log of the total run time of lighting loads. This can be used to schedule lamp changes and to keep track of lamp life (in hours).

The ON event total counts the number of ON events for each relay. This is useful for lamp life calculations.

Event Logging Module keeps a log of all events which affect the status of relays, dimmers, **SmartBreakers**, and other digital devices. For example: the actual on and off times of relays, which device or schedule turned a relay or group of relays on/off or how often lighting is extended after hours.

The GR 2400 Digital Bus writes the logs directly to the UpLink™ *network multiplex card* for each GR 2400 Digital Bus. Logs can be downloaded and managed from a workstation which has installed DataLogger. A MetaServer™ *digital web server* acts as the portal to the UpLink Cards and can be accessed over the local area network or the internet.

Refer to the UpLink and MetaServer Tech Sheets for more information about these products.

- Features:**
- Manage lamp change scheduling for multiple sites
  - Isolate the cause of high (or low) energy bills

## Specifications:

Log storages:	UpLink Card	Workstation
Max storage on		(not provided):
Uplink card:	8MB	Mid level current technology
Access via:	MetaServer	Windows XP or emulation
Hard drive space		Chart output format:
for DataLogger:	20MB	MS-Excel® Spreadsheets

# Hook up / Programming

LC&D Run Time Log Report										
Site: 1Test Board / 1Test Board @ 17:32:48 / 10-15-2005										
1Test Board			LCP # 1			LCP @ Address 1				
Relay Number	Line Feed	Breaker Number	Load Name	From Date	Start Cycles	Hours	Days	Hrs/Day	Volts	
<Bus File>	<Bus File>	<Bus File>	<Bus File>	<Upl. link>	<Upl. link>	<Upl. link>	<System>	<System>	<Bus File>	
1			1Relay Pnl 48	10/12/05	3	6.27	2	24	120	
2			2Relay Pnl 48	10/12/05	3	6.27	2	24	120	
3			3Relay Pnl 48	10/12/05	3	6.27	2	24	120	
4			4Relay Pnl 48	10/12/05	3	6.26	2	24	120	
5			5Relay Pnl 48	10/12/05	3	6.27	2	24	120	
6			6Relay Pnl 48	10/12/05	3	6.26	2	24	120	

Logs are output as MS-Excel® Spreadsheets, allowing true management of lighting data:

- Create charts
- Manipulate and manage data
- Combine or compare logs from multiple sites or over time
- Predict and schedule lamp changes
- Compare lamp life predictions against actual lamp life

## ORDERING INFORMATION

Datalogger™

UNITY DLOG

Datalogger Software



# GR 2400™

*Accessory*



## DigiLink™ Contact Closure Interface

**Description:** The DigiLink is a gateway for contact closure devices to the GR 2400 system. The DL 2400 is typically mounted in an external enclosure.

**Features:** Contact closure devices may be programmed to control any relays, **SmartBreakers™** or dimmers in any panel. Control relays through time schedules of any Building Automation System.

Up to 14 contact closure inputs. Optional 6 input card allows for digital enable/disable over the bus. Can take a dry contact from BMS system to initiate control of relays through time schedules or do load shedding.

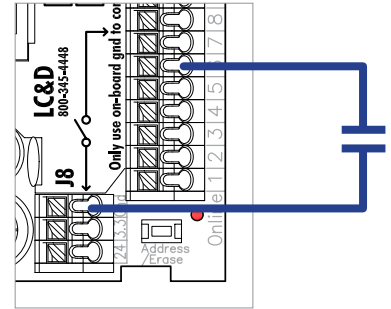
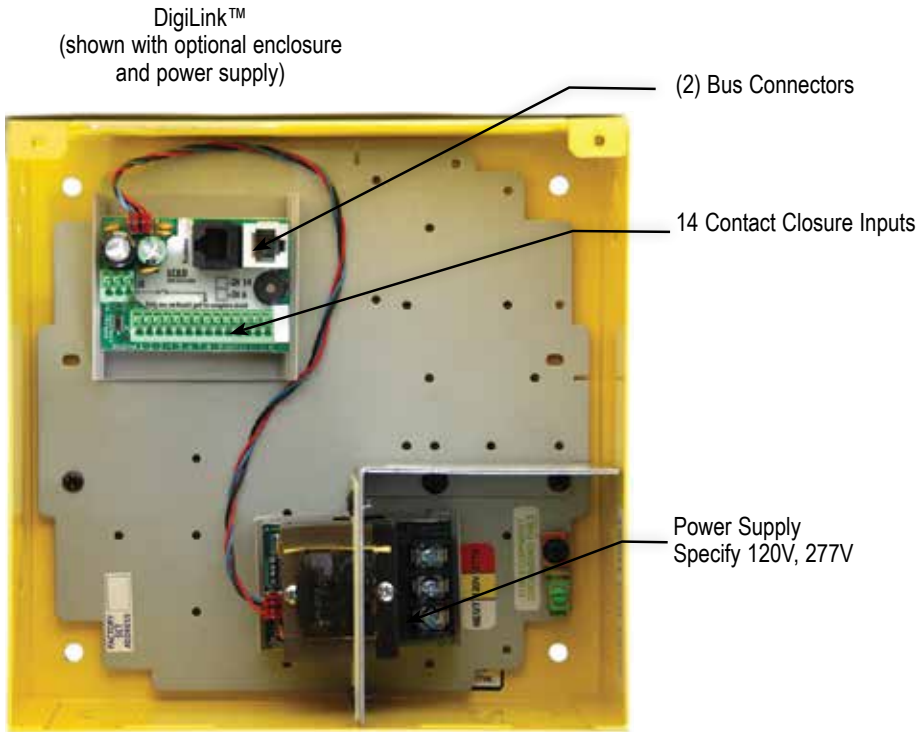
Interface to:

- Building automation
- Occupancy sensors
- Security systems — life safety
- Contact closure low voltage switches
- Link up to 127 digital addresses via Cat. 5 patch cable with RJ45 connectors

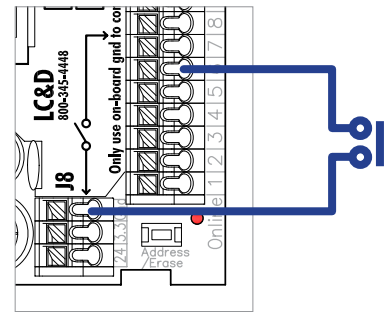
## Specifications:

Enclosure type:	NEMA 1, Flush mount optional 8.375" w x 8.375" h x 3.125" d	Bus physical layer:	RS 485 (GR 2400 bus)
Optional enclosure:	NEMA 4, NEMA 12	# of Addresses:	1
Card dimensions:	1.90" x 2.75"	Programming:	via DTC
Input power:	Bus powered or 120/277VAC or 347VAC	Bus connectors:	RJ45 connectors
Contact closure inputs:	14	Digilink with	Supplies up to 350mA @ 24VDC for occupancy sensor power
Ambient temperature:	32–104° F (0–40° C)		

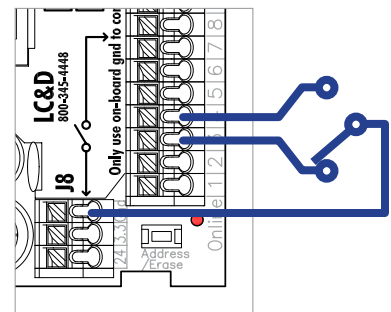
# Hook Up / Wiring Details



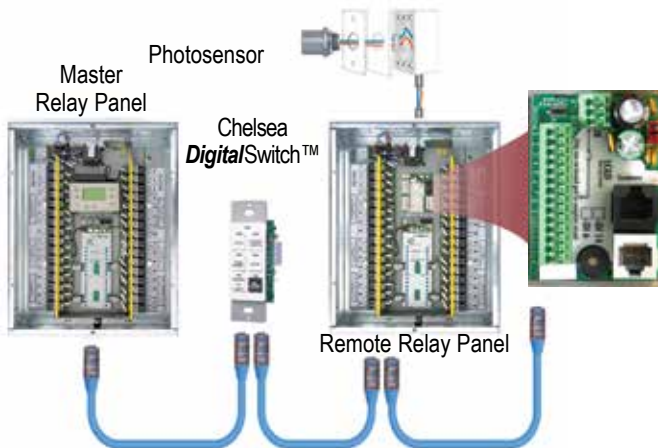
**Maintained Contact Closure**



**Momentary Contact Closure**



**Positive On/Off Contact Closure**



Cat. 5 patch cable with RJ45 connectors • Up to 127 digital addresses • Up to 4,000 ft.

## ORDERING INFORMATION

DigiLink Dry Contact Closure Gateway			
<b>GR2400 DIGILINK</b>			
<b>System and Accessory Type</b>	<b>Transformer</b> [blank] = Bus powered DV = Dual voltage 120/277V 347 = 347V	<b>Dry Contact Inputs</b> D6 = 6 inputs (with enable/disable) D14 = 14 inputs (no enable/disable)	<b>Enclosure Mounting, NEMA Rating</b> SM NE1 = Surface Mount, NEMA 1 FM NE1 = Flush Mount, NEMA 1 SM NE4 = Surface Mount, NEMA 4 SM NE12 = Surface Mount, NEMA 12

# GR 2400™

## Accessory



### T-Link™ (Link-To™ T-Stat)

**Description:** Each T-Link card allows both monitoring and programming of up to 32 intelligent thermostats, for full control of conventional and heat pump units. Thermostat manufactured by XCI Corp\*.

- Features:**
- Complete remote control and status of up to 32 thermostats via the T-Link control card
  - Adjust and monitor all settings locally at the master relay panel or remotely from a PC via dial-up, internet or intranet
  - Thermostats are emulated on the bus by a relay panel at LCP32. When the relay is ON the program is in the Day/Occupied mode. When off the thermostat is in set level Night/Unoccupied mode
  - Program heating/cooling levels
  - Program day/night, occupied/unoccupied setback set-points
  - Use the **Chelsea DigitalSwitch™** to temporarily override lighting and HVAC thermostat features
  - Fan selector for continuous fan operation
  - Built-in, short-cycle protection
  - No battery required for power outage
  - Built-in LED indicators
  - Automatic changeover from heat-to-cool and cool-to-heat
  - Optional remote indoor and outdoor sensors
  - Adjust local keypad range control

### Specifications:

Card dimensions: 3.65" w x 2.75" h  
Enclosure: 6" w x 6" h x 4" d NEMA 1  
Power supply: Accepts 12VDC from **GR 2400** bus  
Ambient temperature: 32–104° F (0–40° C)  
Humidity: 10–90% non-condensing  
Max # thermostats per T-Link: 32  
Programming: Via DTC programmer, via PC with **Unity™ Lighting Control Software**

Thermostat dimensions: 4" w x 4.5" h x .875" d  
Addresses: 1 per 8 T-Stat controlled  
Control range: Heating: 38–88° F (3–31° C)  
Cooling: 60–108° F (16–42° C)  
Measurement range: 28–124° F (–2–51° C)  
Control accuracy: +/- 1° F (.55° C) @ 68° F (20° C)  
Minimum deadband: 2° F (1.11° C) between heating/cooling

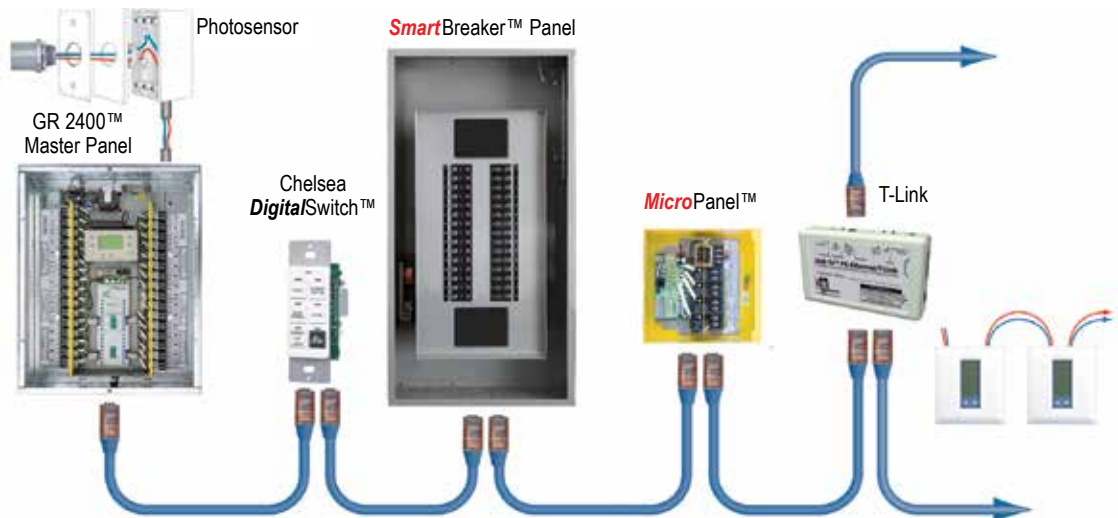
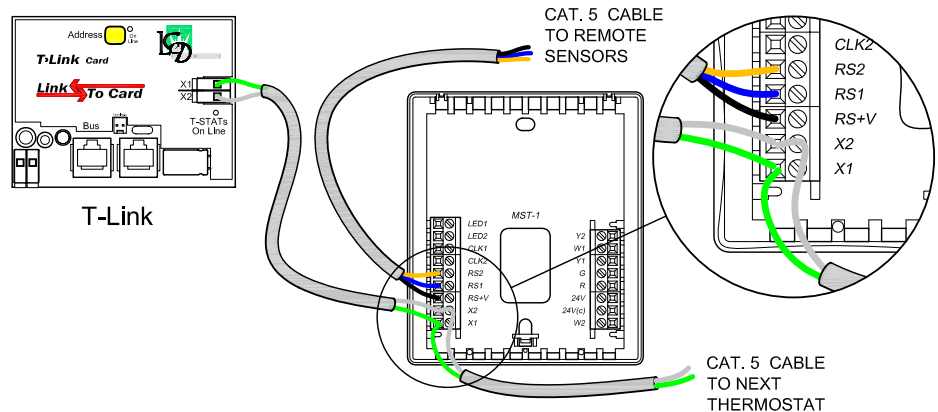
To download specs, drawings and instructions go to <http://www.lightingcontrols.com>

\*For more specs go to: <http://www.xcicorp.com>

# Overview

The **T-Link** card is the interface from the **GR 2400** system to the XCI Digital Thermostats. One **T-Link** will interface with up to 32 digital thermostats. Connect X1 and X2 inputs/outputs in parallel in all thermostats and to the **T-Link** card.

Each thermostat has outputs for auxiliary external sensors, ideal for measuring outside temp, duct temp or for mounting the Digital Thermostat in a secure location with remote sensors.



Cat. 5 patch cable with RJ45 connectors • Up to 127 digital addresses • Up to 4,000 ft.

## ORDERING INFORMATION

T-Link™		
GR2400 L2	TSTAT	
<b>System and Type</b>	<b>Link-to Type</b> TSTAT = TSTAT (Thermostat)	<b>Mounting and Enclosure Type</b> SM NE1 = Surface mount, NEMA 1 FM NE1 = Flush mount, NEMA 1 SM NE4 = Surface mount, NEMA 4 RETRO = Retrofit enclosure
T-STAT™		
TSTAT		
<b>Thermostat</b>	<b>Link-to Type</b> MST = Multi-Stage Thermostat HPT = Heat Pump Thermostat RIS = Remote Indoor Sensor RDS = Remote Duct Sensor	

# GR 2400™

**Link**  **To Card**



## Link-To™ PC/Ethernet and Link-To™ PC/RS232-USB

**Description:** Two different interface cards which allow multiple computers to connect to the **GR 2400** system. Connection is from any serial/comm port (RS 232), USB port or ethernet network connection. USB version comes with RS232 to USB adapters.

- Features:**
- Ethernet Version:
    - Links to **GR 2400** LAN and via a gateway to the internet
    - **Unity™ Remote Clock**
    - **Unity GX™ Vector Advanced Graphical Software**
  - RS232/USB Version: Works with:
    - **Unity Lighting Control Software**
    - **Unity Remote Clock**
    - **Unity GX Vector Advanced Graphical Software**

## Specifications:

Card dimensions:	3.65" w x 2.75" h	Ambient temperature:	32–104° F (0–40° C)
Power consumption:	80mA @ 12VDC	Power supply:	Accepts 12VDC from bus or in-box supply (specify 120/277VAC or 347VAC)
Optional enclosure rating:	NEMA 4	Bus physical layer:	RS 485 ( <b>GR 2400</b> bus)
Enclosure dimensions:	8.375" w x 8.375" h x 3.125" d	Serial cabling:	To DB9 serial port supplied by LC&D
Optional mounting:	In relay panel	USB cabling:	In-line adaptor supplied by LC&D
Max L2-PC cards:	6 per <b>GR 2400</b> bus	Ethernet cabling option:	Cat. 5 cable with RJ45 connectors RJ45 connectors supplied by others
Programming:	None required		
Max. humidity:	10–90% non-condensing		

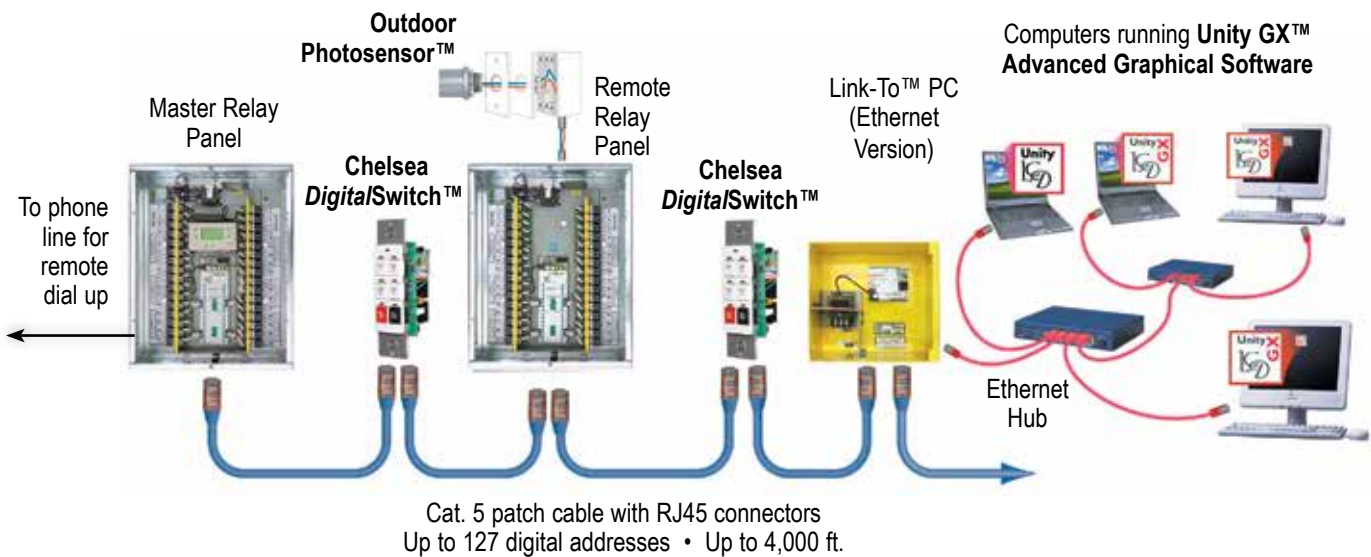
# Hook Up Programming

Power Supply:  
Specify 120V, 277V



GR 2400 Bus Connectors  
(2) RJ45 Connectors

Link-To PC/Ethernet



## ORDERING INFORMATION

Link-To™ PC		
GR2400 L2		
<b>System and Type</b>	<b>Link-to Type</b>	<b>Transformer, Mount and Enclosure Type</b>
	PCETH = PC Ethernet <sup>1</sup> PC232 115K = PC RS232 <sup>2</sup> , 115k baud (standard) PC232 9600 = PC RS232 <sup>2</sup> , 9600 baud PCUSB 115K = PC USB <sup>2</sup> , 115k baud (standard) PCUSB 9600 = PC USB <sup>2</sup> , 9600 baud	DV SM NE1 = Dual voltage 120/277V, surface mount, NEMA 1 DV FM NE1 = Dual voltage 120/277V, flush mount, NEMA 1 DV SM NE4 = Dual voltage 120/277V, surface mount, NEMA 4 347 SM NE1 = 347 volt, surface mount, NEMA 1 347 FM NE1 = 347 volt, flush mount, NEMA 1 347 SM NE4 = 347 volt, surface mount, NEMA 4 RETRO = Retrofit enclosure
	<sup>1</sup> = Required to choose a transformer, mount and enclosure type <sup>2</sup> = Transformer, mount and enclosure optional (device may be ordered as card only)	

# GR 2400™

**Link**  **To Card**



## Link-To™ DMX

**Description:** Links a DMX-based system to a **GR 2400** lighting control system. Ideal for applications which require the powerful features of the **GR 2400** system and a DMX “take-over”

- Features:**
- Single point of interface from a DMX-based control system allows 14 global commands to all relay panels in the **GR 2400** bus
  - DMX start address may be manually set to any address at the **Link-To DMX card** via the multifunction push buttons. Controls automatically respond to the next 13 addresses for a total of 14 programmable inputs
  - Link up to 127 digital devices via Cat. 5 patch cable with RJ45 connectors

## Specifications:

Power consumption:	80mA @ 12VDC
Power supply voltage:	120/277VAC or 347VAC
Card size:	4" w x 6.25" h
Enclosure size:	8.375" w x 8.375" h x 3.125" d
Enclosure rating:	NEMA 1, flush mount optional
Optional enclosures:	NEMA 4
Addresses:	1 per card
Max. humidity:	10–90% non-condensing
Ambient temperature:	32–104° F (0–40° C)
Bus physical layer:	RS 485
Interface protocol:	DMX512 & DMX512A compatible
Approvals:	UL and cUL listed

### Line-Voltage Compartment

Power supply 120/277VAC or 347VAC

### Low-Voltage Compartment Link-To DMX card

- DMX input (screw terminal)
- **GR 2400** bus (RJ45)
- Manual (test) push buttons for each DMX channel (if no DMX signal)
- DMX address buttons (see manual)
- **GR 2400** address button

# Hook Up

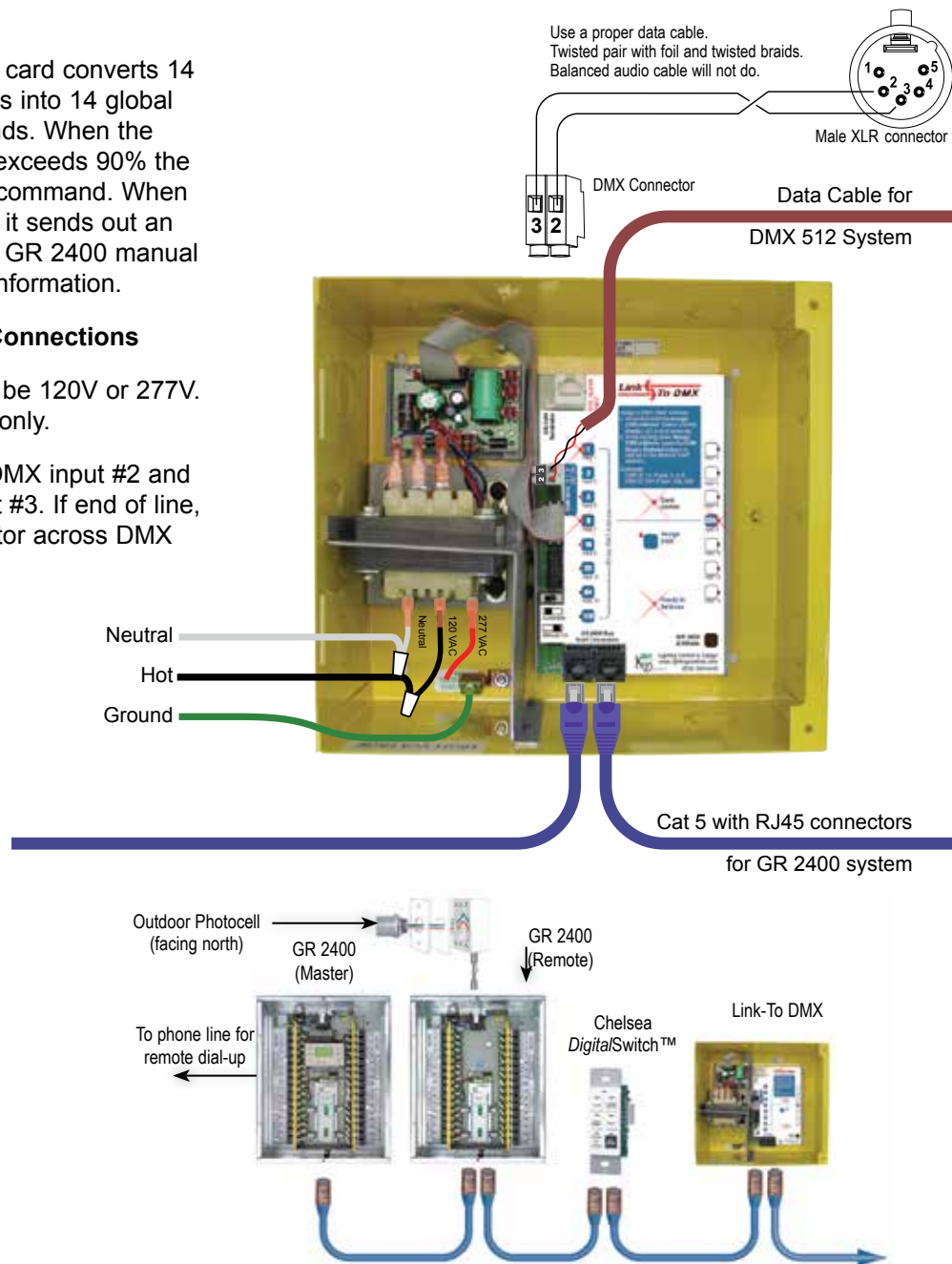
## Overview

The Link-To DMX control card converts 14 contiguous DMX channels into 14 global GR 2400 switch commands. When the level set to that channel exceeds 90% the switch sends out an ON command. When it drops to less than 10% it sends out an OFF command. See the GR 2400 manual for switch programming information.

## Line and Low Voltage Connections

Panel power supply may be 120V or 277V. Ground is for equipment only.

Connect XLR Pin #2 to DMX input #2 and XLR Pin #3 to DMX input #3. If end of line, connect a 120 ohm resistor across DMX inputs #2 and #3.



## ORDERING INFORMATION

Link-To™ DMX		
GR2400 L2	512A	
<b>System and Type</b>	<b>Link-to Type</b> 512A = DMX <sup>1</sup>  <sup>1</sup> = Required to choose a transformer, mount and enclosure type	<b>Transformer, Mount and Enclosure Type</b> DV SM NE1 = Dual voltage 120/277V, surface mount, NEMA 1 DV FM NE1 = Dual voltage 120/277V, flush mount, NEMA 1 DV SM NE4 = Dual voltage 120/277V, surface mount, NEMA 4 347 SM NE1 = 347 volt, surface mount, NEMA 1 347 FM NE1 = 347 volt, flush mount, NEMA 1 347 SM NE4 = 347 volt, surface mount, NEMA 4



# GR 2400™

**Link** ← → **To Card**



An Acuity Brands Company

## Link-To™ Building Automation

**Description:** LC&D offers two methods of building automation interfaces:

- 1) Gateway cards using DDC protocols such as BACnet™ and Metasys™ (N2) accept on/off commands, time schedules and report status of all relays in all panels in real time.
- 2) The second method greatly simplifies interface to building automation through dry contact closure.

- Features:**
- Certified Connectivity Partner with Johnson Controls®, N2 protocol
  - A number of building automation protocols are available as well as contact closure
  - Program schedules from building automation package
  - Expand any building automation package to include:
    - a) Communication-based **Chelsea DigitalSwitches™**
    - b) “Flick Warn” option for notifying room occupants of an impending lighting shut-off
    - c) Remotely adjustable multi-trip-point photosensor(s)
    - d) Gateway cards accept control and report real-time status of all relays
  - Link up to 127 digital addresses via Cat. 5 patch cable with RJ45 connectors

## Specifications:

Enclosure rating:	NEMA 1
Enclosure dimensions:	8.375" w x 8.375" h x 3.125" d
Optional mounting:	In relay panel
Max. humidity:	10–90% non-condensing
Ambient temperature:	32–104° F (0–40° C)
Power supply:	120/277VAC or 347VAC
Bus physical layer:	RS 485 ( <b>GR 2400</b> bus)
Interface protocol:	Specific to building automation system
Approvals:	UL and cUL listed

# Details

## Link-To Building Automation (DigiLink™)



Low-Voltage Compartment Access Door

Power Supply:  
Specify transformer  
120/277VAC or 347VAC

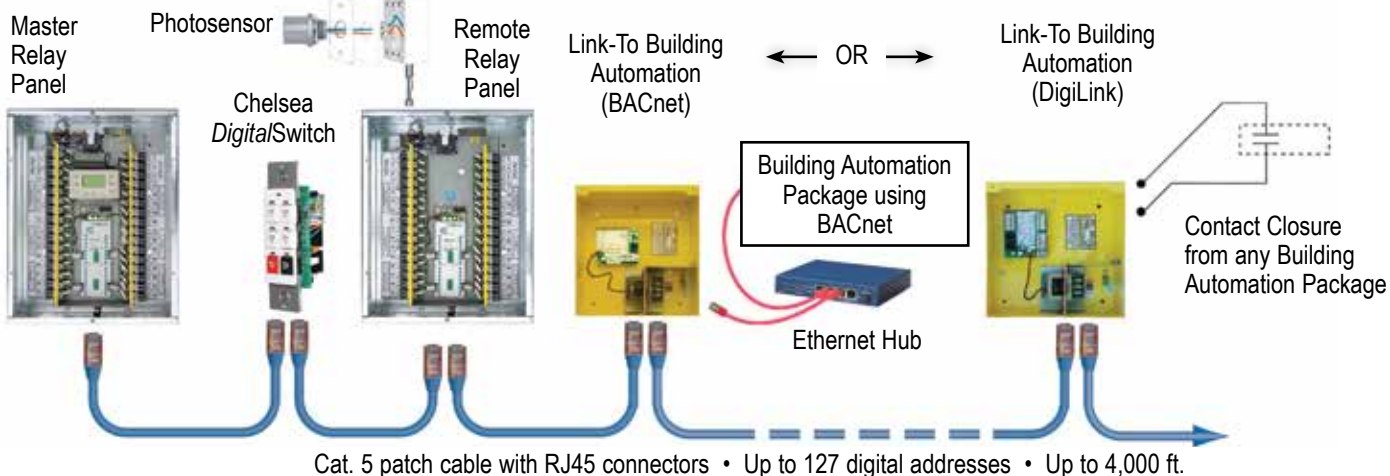
14 contact closure inputs

GR 2400 Bus Connectors  
(2) RJ45 Connectors  
(1) Spring-cage terminal block  
direct plug-in

## Link-To Building Automation (BACnet® Gateway)



Ethernet Output to BACnet



### ORDERING INFORMATION

Link-To™ Building Automation		
GR2400 L2		
<b>System and Type</b>	<b>Link-to Type</b> MODB232 = ModBus RS232 <sup>1</sup> MODB485 = ModBus RS485 <sup>1</sup> BACNETIP = BacNet IP <sup>1</sup> BACNETMSTP = BacNet MSTP <sup>1</sup> METN2 = N2 Metasys <sup>2</sup>  1 = Required to choose a transformer, mount and enclosure type 2 = Transformer, mount and enclosure optional (device may be ordered as card only)	<b>Transformer, Mount and Enclosure Type</b> DV SM NE1 = Dual voltage 120/277V, surface mount, NEMA 1 DV FM NE1 = Dual voltage 120/277V, flush mount, NEMA 1 DV SM NE4 = Dual voltage 120/277V, surface mount, NEMA 4 347 SM NE1 = 347 volt, surface mount, NEMA 1 347 FM NE1 = 347 volt, flush mount, NEMA 1 347 SM NE4 = 347 volt, surface mount, NEMA 4

**FOR DRY CONTACT INPUTS, SEE DIGILINK TECH SHEET**

# GR 2400™

## Accessory



## MetaServer™ and UpLink™

**Description:** The UpLink™ network multiplex card links up to 99 digital buses together to create a system with over 12 thousand digital lighting control devices.

The MetaServer™ digital web server is a gateway that provides Internet or computer access to these devices.

Here's how they work: Up to 127 digital addresses (relay panels, digital switches, etc) may be linked together within a GR 2400 digital bus. Except for the largest projects, this proves to be more than enough capacity. For larger installations where multiple buses are needed to accommodate the large number of digital devices, LC&D has developed a BackBone Bus using the UpLink™ card and MetaServer™ to link up to 99 GR 2400 buses together.

At the head of the BackBone Bus is a MetaServer that does the duty of connecting the whole system via Ethernet or Modem to a computer or the internet. Connecting each digital bus to the BackBone Bus is an UpLink card. It captures packets meant for that particular bus and routes the data correctly. The UpLink card has a large memory capacity which acts as a mirror of the status of the GR 2400 bus for more rapid communication. It also keeps logs of the number of times a relay has been operated, the time it has been ON since last reset and a log of each event (see DataLogger™ tech sheet for more information).

- Features:**
- An almost unlimited number of commands may move from one digital bus to another. Switches from one GR 2400 bus may control all relays, dimmers, scenes, groups, or SmartBreakers in other downstream busses with full feedback.
  - Run-time and event-logging are stored in Flash memory until downloaded by an administrator (see tech sheet for DataLogger software)
  - Connect as many as 99 UpLink cards to the internet
  - Access multiple buses using Unity GX Advanced Graphical Software
  - The MetaServer requires only a single IP and provides complete access to one or multiple buildings

## Specifications:

Enclosure dimensions: 8.375" w x 8.375" h x 3.125" d

Enclosure type: Surface mount NEMA 1,  
flush mount optional

Optional enclosure: NEMA 4

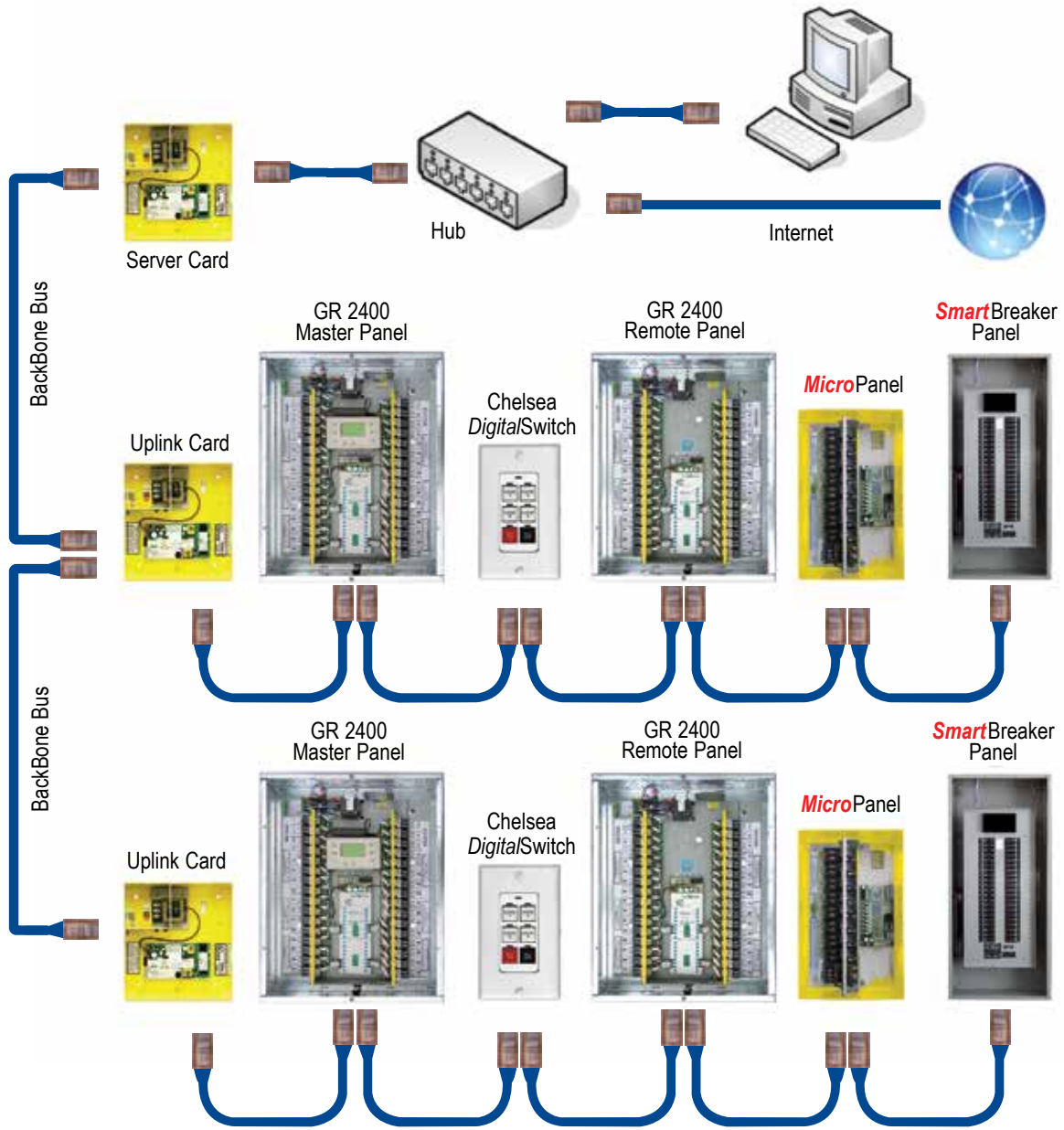
Power supply: 120/277VAC (DV) or 347VAC

Ambient temperature: 32–104° F (0–40° C)

Programming: via PC  
(with administrator access)

Approvals: UL and cUL listed

# Hook up / Programming



Note: MetaServer • 1 per system, UpLink • 1 per bus

## ORDERING INFORMATION

MetaServer™ and UpLink™		
<b>System and Type</b> GR2400 UH4 = UpLink GR2400 SH4MOD = MetaServer with modem GR2400 SH4MUH4 = Server-Uplink with modem	<b>Transformer</b> DV = Dual voltage 120/277V 347 = 347 volt	<b>Mount and Enclosure Type</b> SM NE1 = Surface mount, NEMA 1 FM NE1 = Flush mount, NEMA 1 SM NE4 = Surface mount, NEMA 4

# GR 2400™

## *Accessory*



## Bus Booster

**Description:** The Bus Booster is used on the GR 2400 System when the distance between switches and a relay panel cause voltage drop.

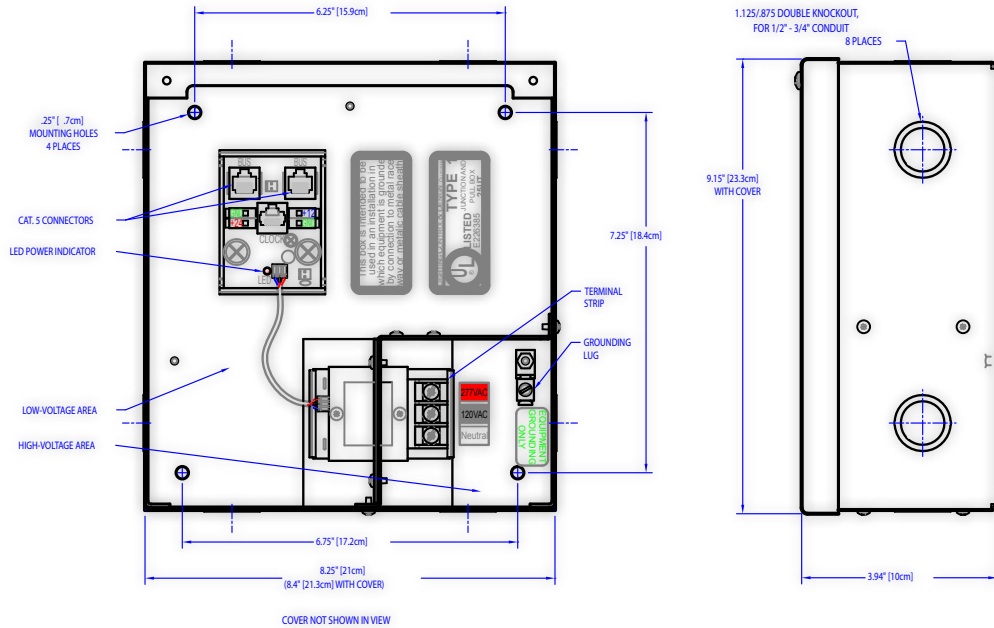
Switches are supplied with power over the GR 2400 bus. While the data can travel 4,000 ft., the power to a switch needs to be fed with a relay panel or a bus booster every few hundred feet.

- Features:**
- Provides up to 0.8 amp at 12 volts DC to the system bus
  - Simply power up and plug in the bus
  - Current limited

## *Specifications:*

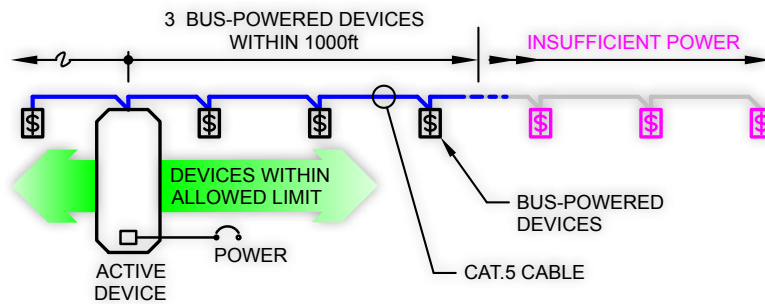
Enclosure rating:	NEMA 1
Enclosure dimensions:	8.375" w x 8.375" h x 3.125" d
RJ45 Connectors:	Sockets for Bus In & Out and Clock
Input:	120/277VAC, 347VAC
Output:	12VDC up to 800mA
Approvals:	UL and cUL listed to UL 916

# Layout

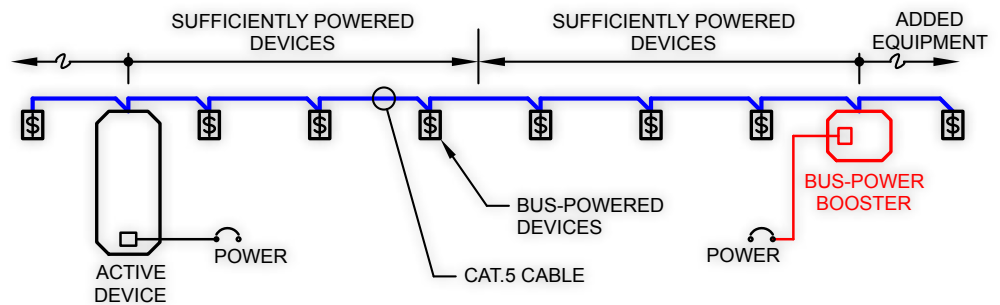


## Insufficient Power

Normally, up to 3 bus-powered devices may be powered across 1000 feet of Cat. 5 cable. This ensures that the power supplied by the Master LCP is sufficient for each device.



Specifying a Bus Booster allows you to add more devices without dropping voltage, because it provides additional power to the bus.



## ORDERING INFORMATION

Bus Booster		
GR2400 BOOSTER		
<b>System and Type</b>	<b>Transformer</b> DV = Dual voltage 120/277V 347 = 347 volt	<b>Mount and Enclosure Type</b> SM NE1 = Surface mount, NEMA 1 FM NE1 = Flush mount, NEMA 1

# GR 2400™

*Accessory*



## Modem Switch

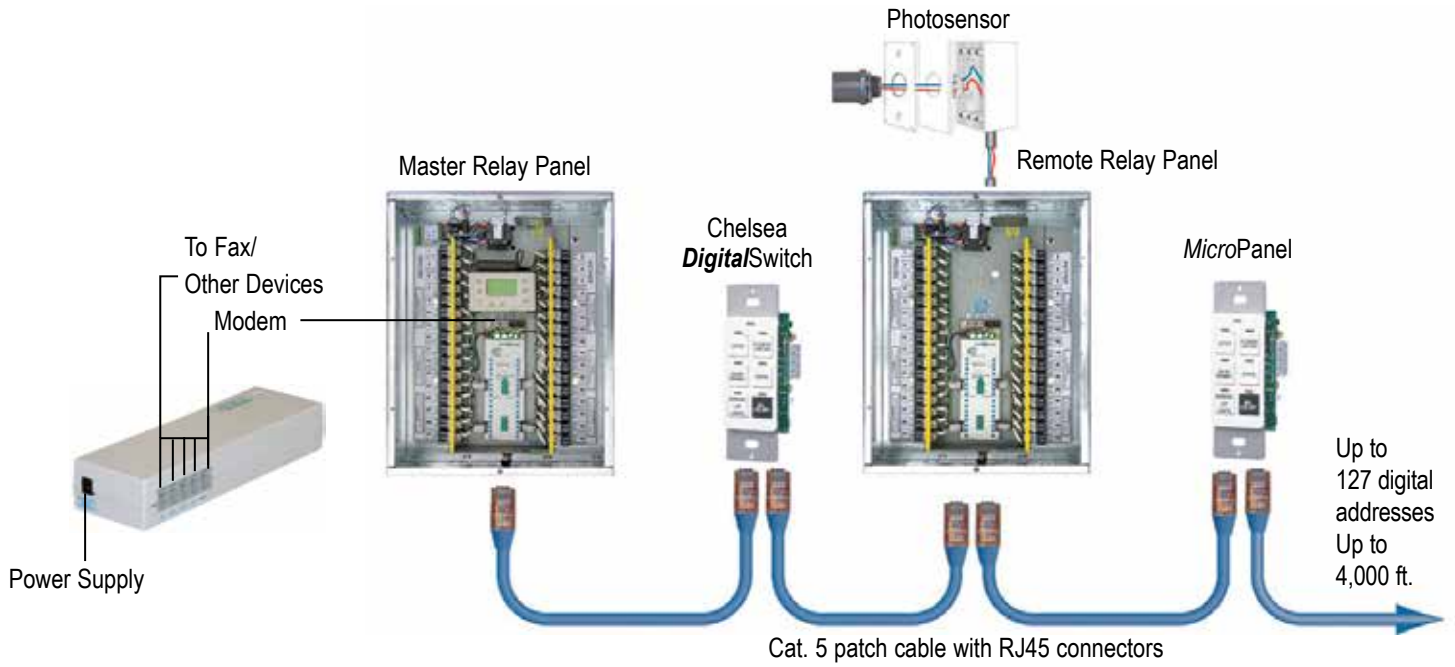
**Description:** The Modem Switch makes the most of a single phone line by making it available to the phone, a fax and/or a modem. The Modem Switch acts as a digital call processor to automatically screen and route incoming analog signals to the right equipment.

- Features:**
- Easy to install
  - Eliminates the need for dedicated phone lines
  - Plug-and-Play™ device
  - No PC interface or drivers needed
  - Non-volatile memory holds all programming indefinitely
  - Barge-in protection prevents interruption of ongoing calls to connected devices

## *Specifications:*

Enclosure dimensions:	8.15" w x 1.4" h x 2.4" d
Function:	ON/OFF (status LED can be found on the front of the device)
Power supply:	12VDC
Bus connector:	RJ-11
Ambient temperature:	32–104° F (0–40° C)

# Hook Up Diagram



## ORDERING INFORMATION

Modem Switch

LCDACC MODSW

Modem Switch

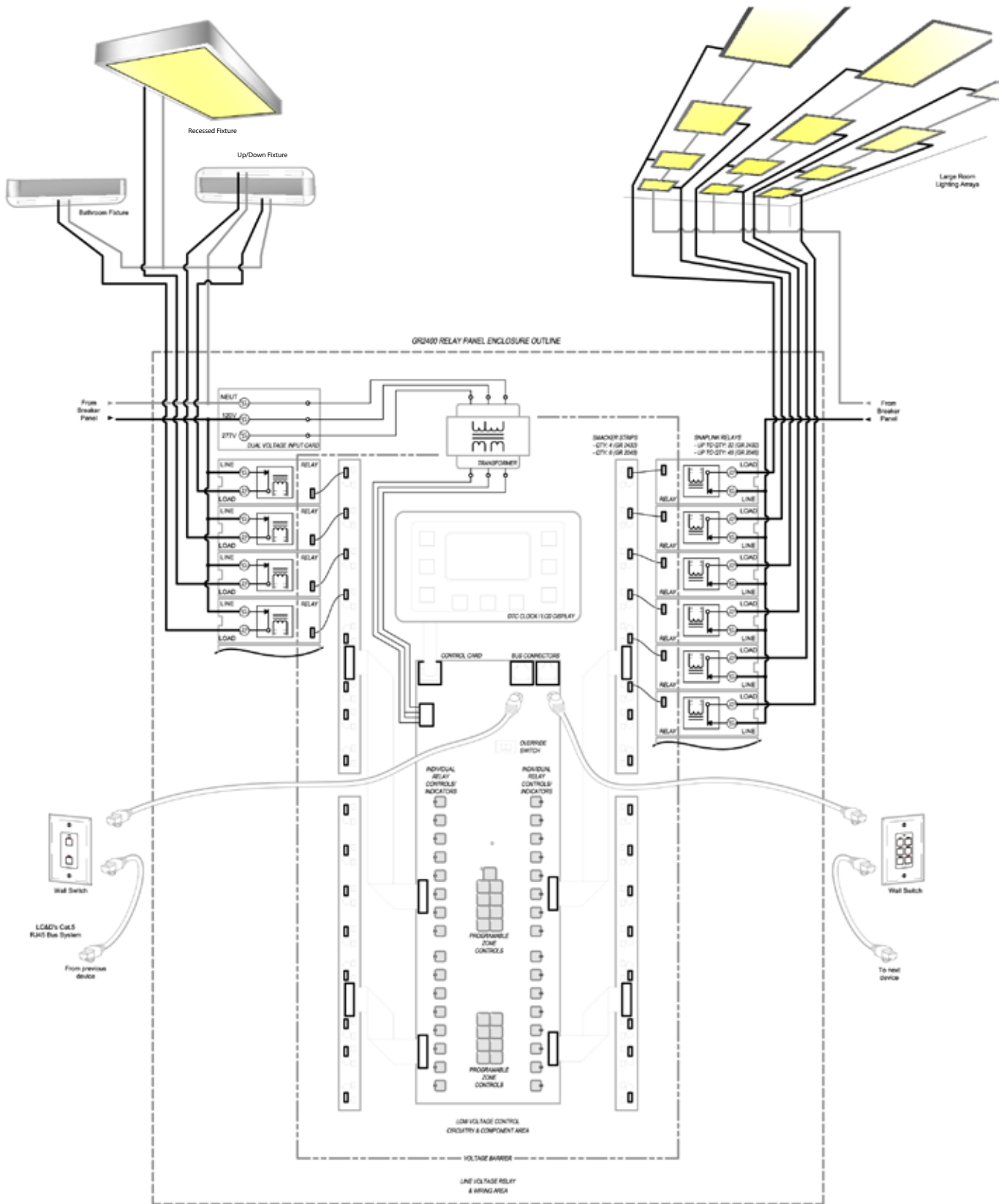


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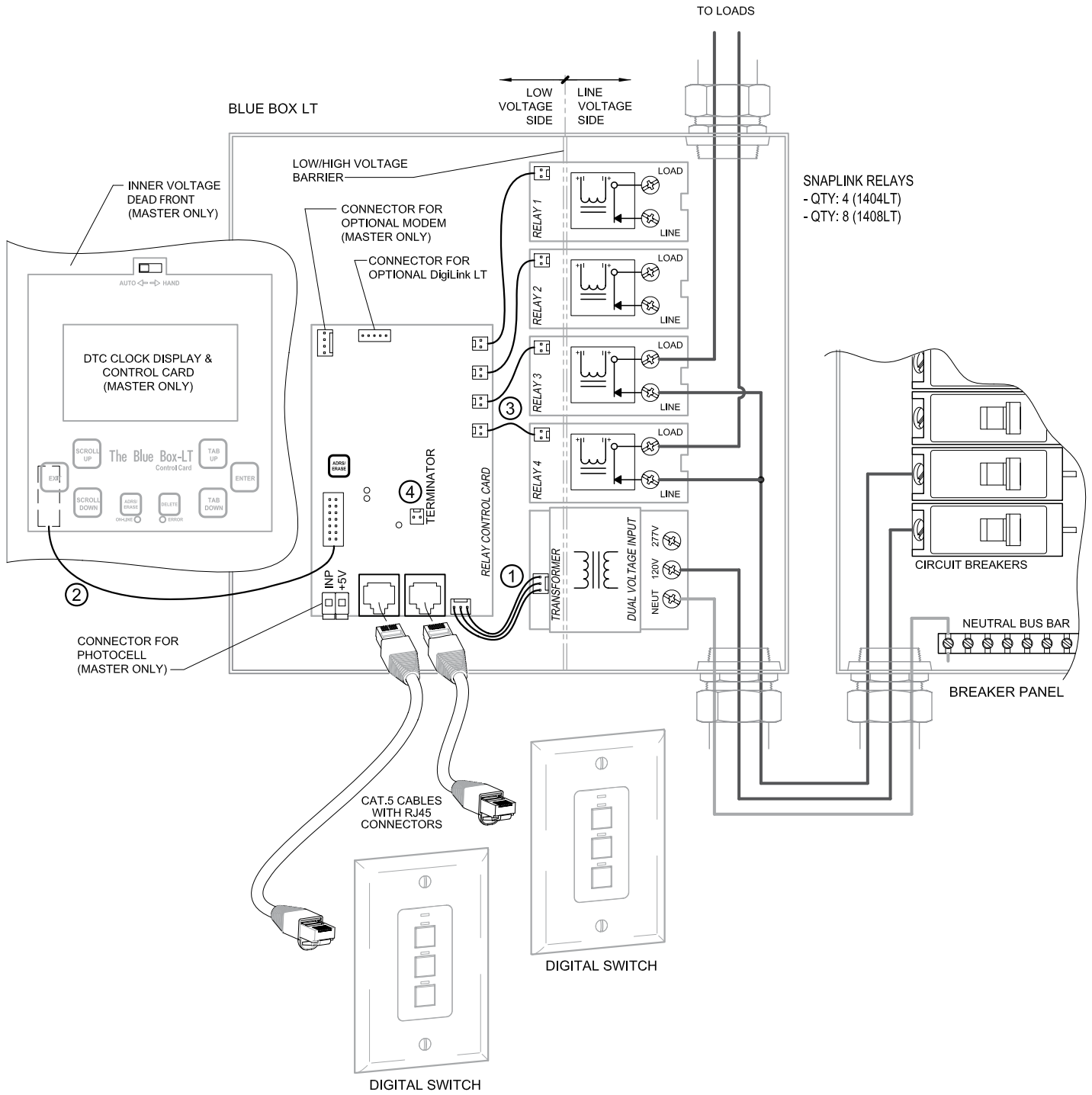
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# 6 | Wiring Diagrams

## GR 2400 CONNECTION

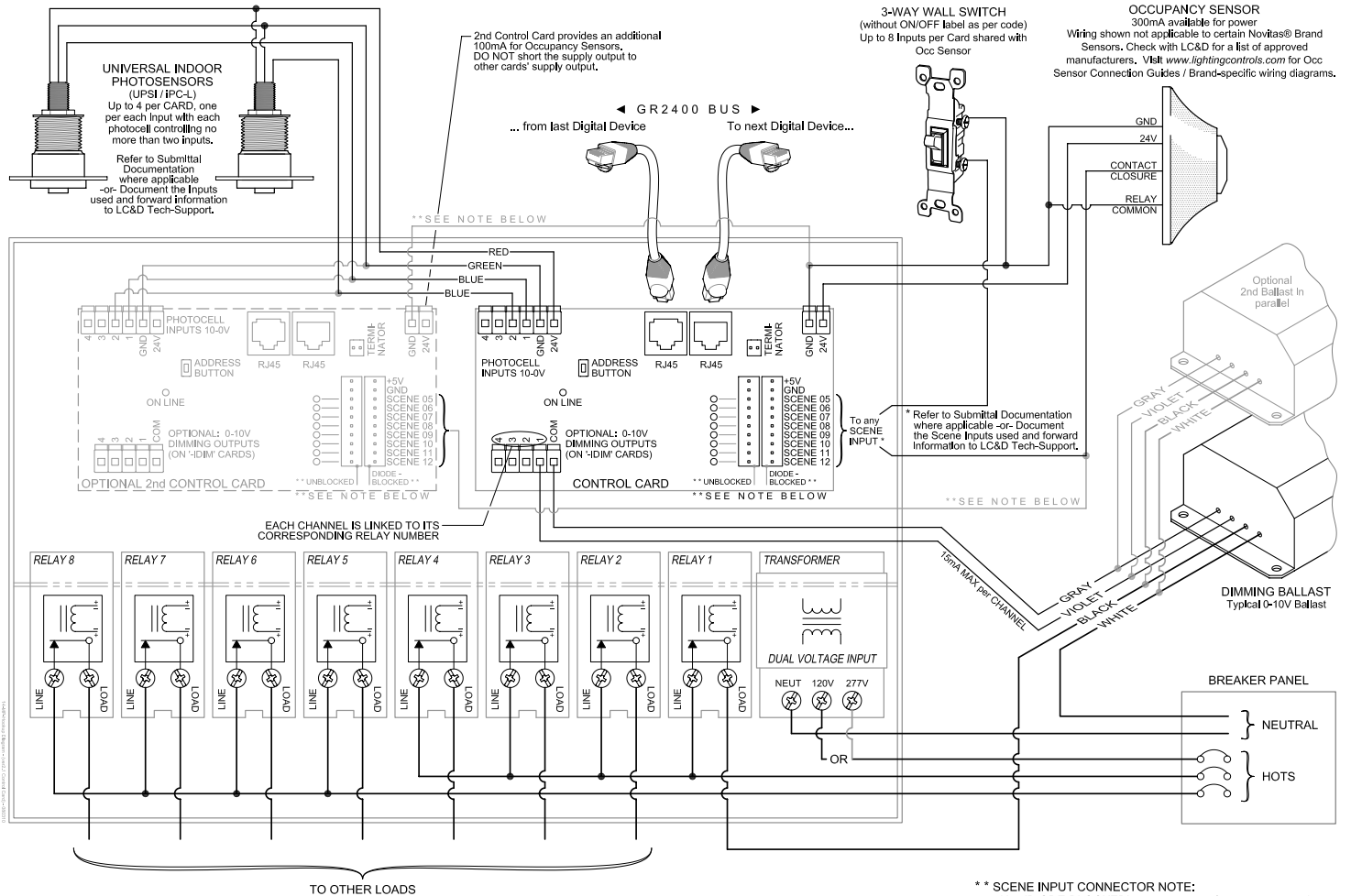


# BLUE BOX LT



# Wiring Diagrams

## MICROPANEL



# SILVERBULLET LINE VOLTAGE

## TYPICAL LINE VOLTAGE HOOK UP

### PANEL BOARD TO SILVERBULLET TO GR 2400 RELAY PANEL

#### BREAKER PANEL

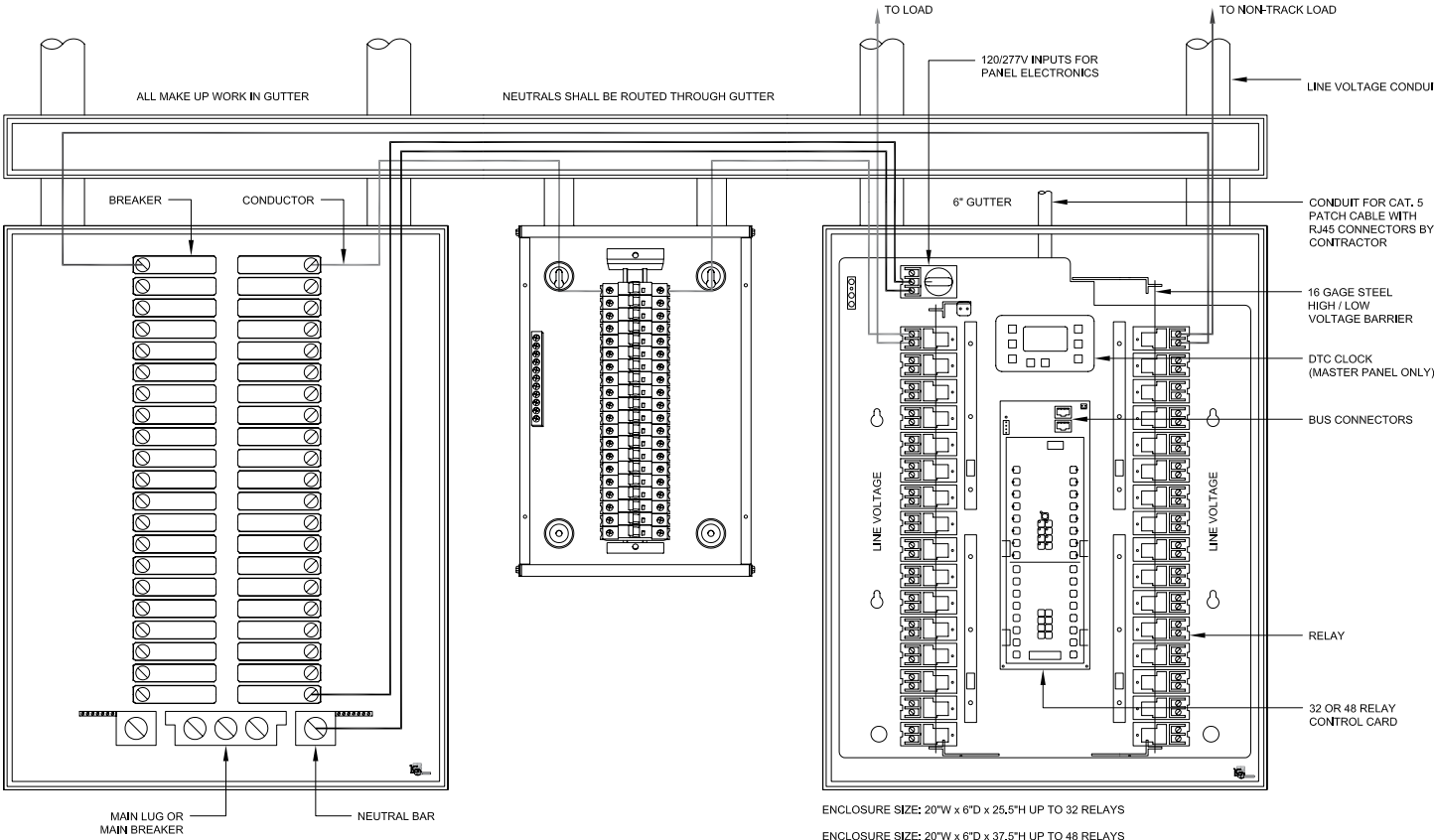
PANEL DETAIL

#### SILVERBULLET

PANEL DETAIL

#### GR 2400 SERIES RELAY PANEL

PANEL DETAIL



# Wiring Diagrams

## XPOINT HOOK UP - XP RL1, RL2, RL480 QK

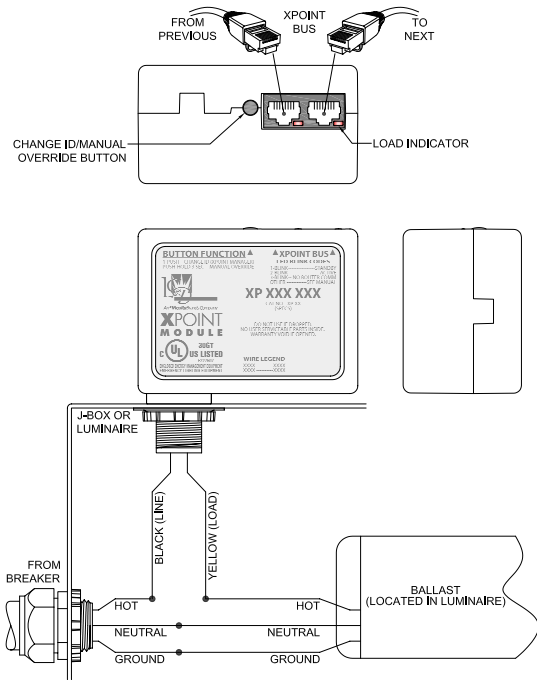
### MODEL TYPES AND FEATURES

TYPE	FEATURES							DIAGRAM
	SINGLE RELAY	DUAL RELAY	SENSOR INPUTS	DIMMING OUTPUT	BUS-PWR DIM-347V	QUICK CONNECT	DUAL POLE 480V	
XP RL1	●							A
XP RL1 QK	●							A (REF)
XP RL2		●						B
XP RL2 QK		●			●			B (REF)
XP RL1 PI	●		●					C
XP RL1 PI QK	●		●		●			C (REF)
XP RL1 DPI	●		●	●				D
XP RL1 DPI QK	●		●	●	●			D (REF)
XP DPI			●	●				E
XP DPI QK			●	●	●			E (REF)
XP RL1 DPI BUSP	●		●	●	●			F
XP RL1 DPI BUSP QK	●		●	●	●			F (REF)
XP RL480 QK						●	●	G (REF)

### XPOINT™ MODULE: XP RL1 (QK\*)

#### SINGLE RELAY

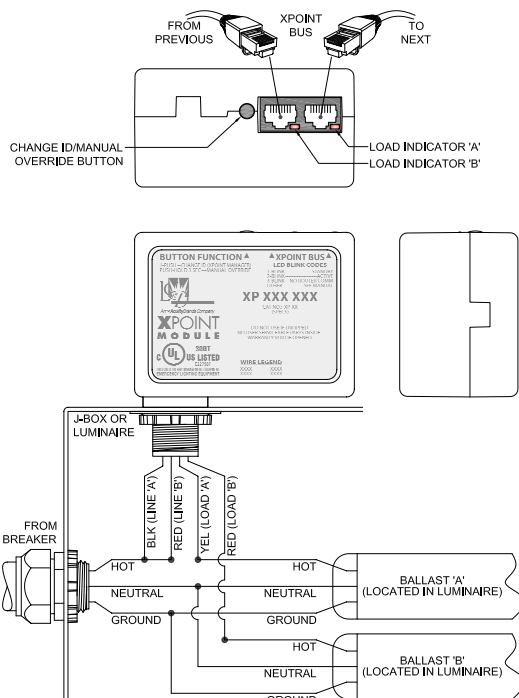
\* NOTE: THE "QUICK CONNECT" MODULES (INDICATED WITH "QK" AT END OF MODEL NUMBER) HAVE POLARIZED CONNECTORS ON ALL LEAD TERMINATIONS FOR MATING WITH "QUICK CONNECT" BALLASTS. THE WIRE-COLOR CONVENTIONS ARE THE SAME AS SHOWN ON THE HOOK-UP DIAGRAM BELOW WHICH MAY BE USED FOR REFERENCE.



### XPOINT™ MODULE: XP RL2 (QK\*)

#### DUAL RELAY

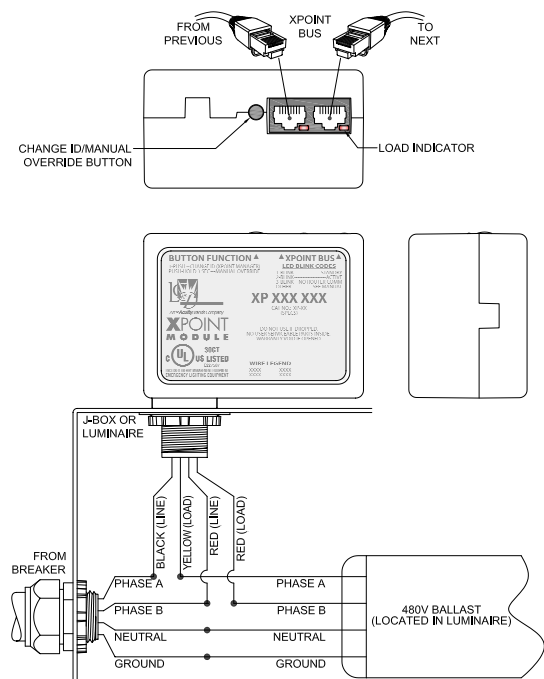
\* NOTE: THE "QUICK CONNECT" MODULES (INDICATED WITH "QK" AT END OF MODEL NUMBER) HAVE POLARIZED CONNECTORS ON ALL LEAD TERMINATIONS FOR MATING WITH "QUICK CONNECT" BALLASTS. THE WIRE-COLOR CONVENTIONS ARE THE SAME AS SHOWN ON THE HOOK-UP DIAGRAM BELOW WHICH MAY BE USED FOR REFERENCE.



### XPOINT™ MODULE: XP RL480 QK

#### SINGLE DUAL-POLE 480V RELAY

\* NOTE: THE "QUICK CONNECT" MODULES (INDICATED WITH "QK" AT END OF MODEL NUMBER) HAVE POLARIZED CONNECTORS ON ALL LEAD TERMINATIONS FOR MATING WITH "QUICK CONNECT" BALLASTS. THE DIAGRAM BELOW IS FOR REFERENCE.

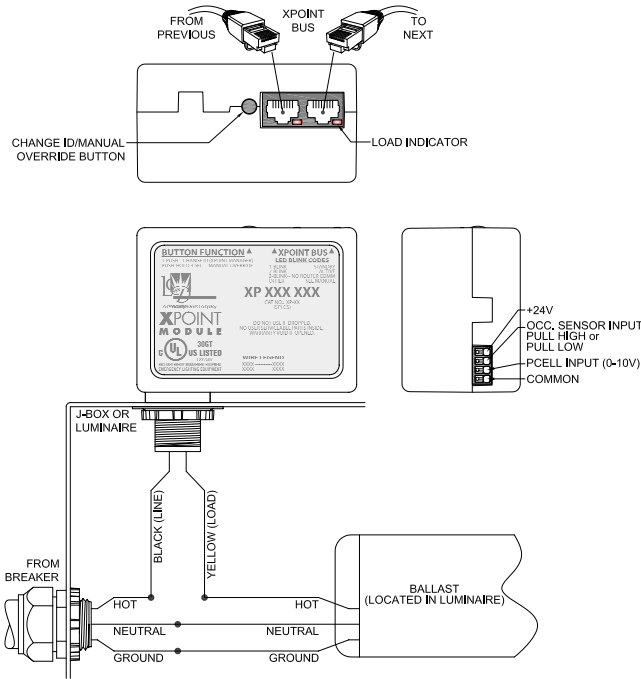


# XPOINT HOOK UP - XP RL1 PI, DPI, RL1 DPI, RL1 DPI BUSP

## XPOINT™ MODULE: XP RL1 PI (QK\*)

### SINGLE RELAY, SENSOR INPUTS

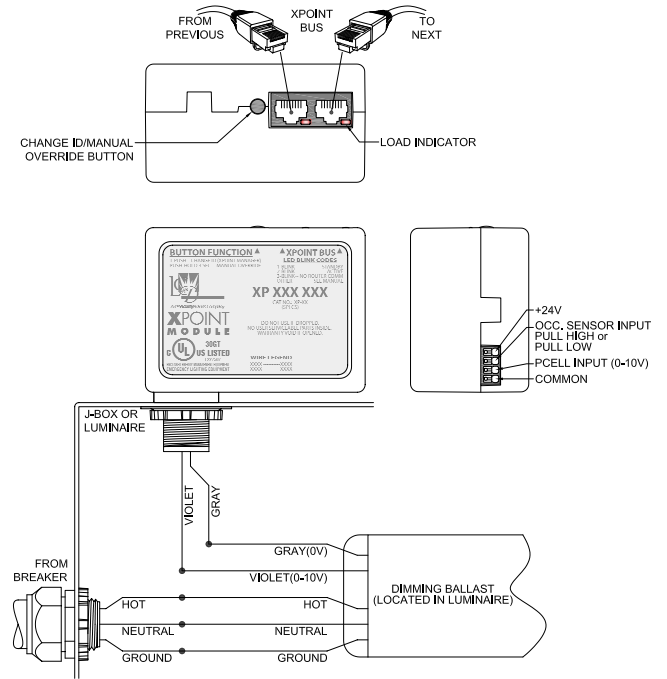
\* NOTE: THE "QUICK CONNECT" MODULES (INDICATED WITH "QK" AT END OF MODEL NUMBER) HAVE POLARIZED CONNECTORS ON ALL LEAD TERMINATIONS FOR MATING WITH "QUICK CONNECT" BALLASTS. THE WIRE-COLOR CONVENTIONS ARE THE SAME AS SHOWN ON THE HOOK-UP DIAGRAM BELOW WHICH MAY BE USED FOR REFERENCE.



## XPOINT™ MODULE: XP DPI (QK\*)

### SENSOR INPUTS, DIMMING OUTPUT

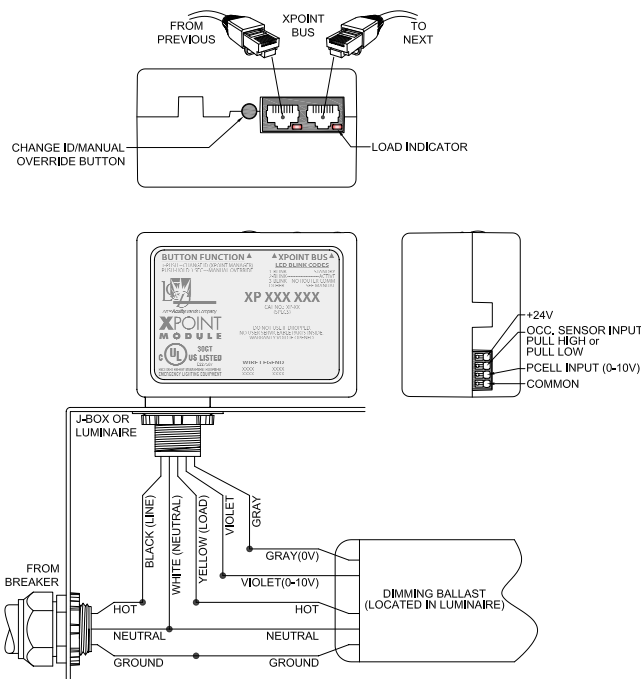
\* NOTE: THE "QUICK CONNECT" MODULES (INDICATED WITH "QK" AT END OF MODEL NUMBER) HAVE POLARIZED CONNECTORS ON ALL LEAD TERMINATIONS FOR MATING WITH "QUICK CONNECT" BALLASTS. THE WIRE-COLOR CONVENTIONS ARE THE SAME AS SHOWN ON THE HOOK-UP DIAGRAM BELOW WHICH MAY BE USED FOR REFERENCE.



## XPOINT™ MODULE: XP RL1 DPI (QK\*)

### SINGLE RELAY, SENSOR INPUTS, DIMMING OUTPUT

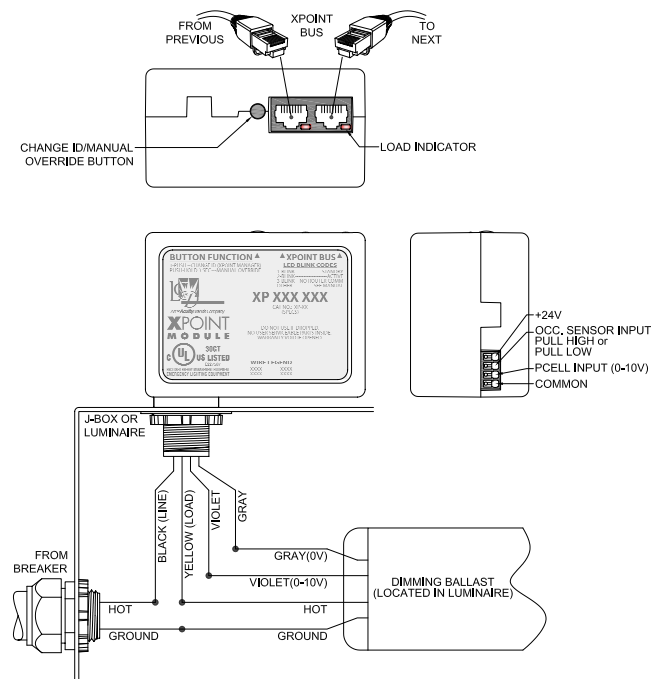
\* NOTE: THE "QUICK CONNECT" MODULES (INDICATED WITH "QK" AT END OF MODEL NUMBER) HAVE POLARIZED CONNECTORS ON ALL LEAD TERMINATIONS FOR MATING WITH "QUICK CONNECT" BALLASTS. THE WIRE-COLOR CONVENTIONS ARE THE SAME AS SHOWN ON THE HOOK-UP DIAGRAM BELOW WHICH MAY BE USED FOR REFERENCE.



## XPOINT™ MODULE: XP RL1 DPI BUSP (QK\*)

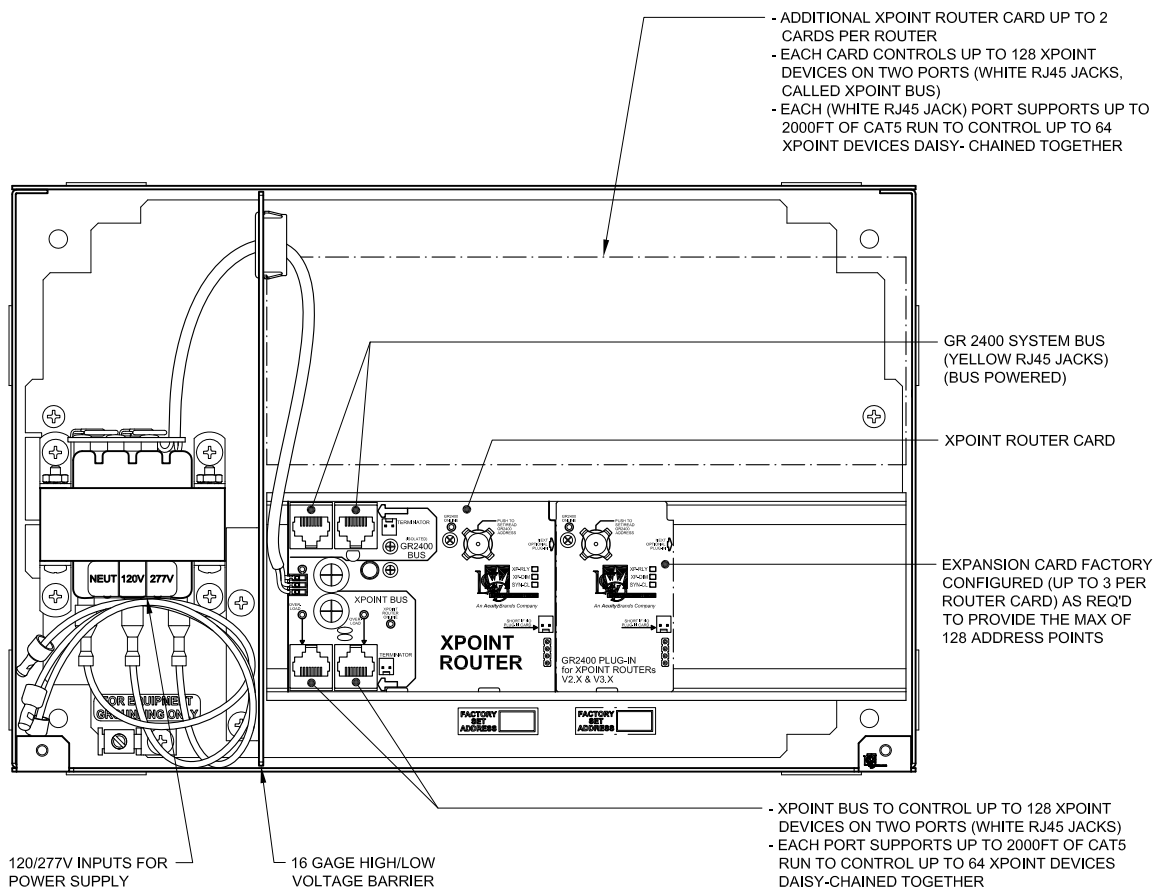
### SINGLE RELAY, SENSOR INPUTS, BUS-POWERED DIMMING OUTPUT

\* NOTE: THE "QUICK CONNECT" MODULES (INDICATED WITH "QK" AT END OF MODEL NUMBER) HAVE POLARIZED CONNECTORS ON ALL LEAD TERMINATIONS FOR MATING WITH "QUICK CONNECT" BALLASTS. THE WIRE-COLOR CONVENTIONS ARE THE SAME AS SHOWN ON THE HOOK-UP DIAGRAM BELOW WHICH MAY BE USED FOR REFERENCE.



# Wiring Diagrams

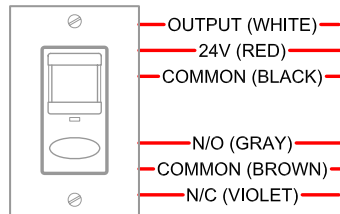
## XPOINT ROUTER





# OCC TO DIGILINK CONNECTION

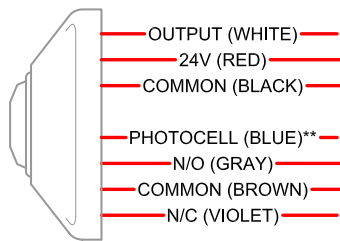
## SENSOR SWITCH SENSORS with LC&D DigiLink CARD



### WALL SWITCH LOW VOLTAGE DECORATOR SENSORS

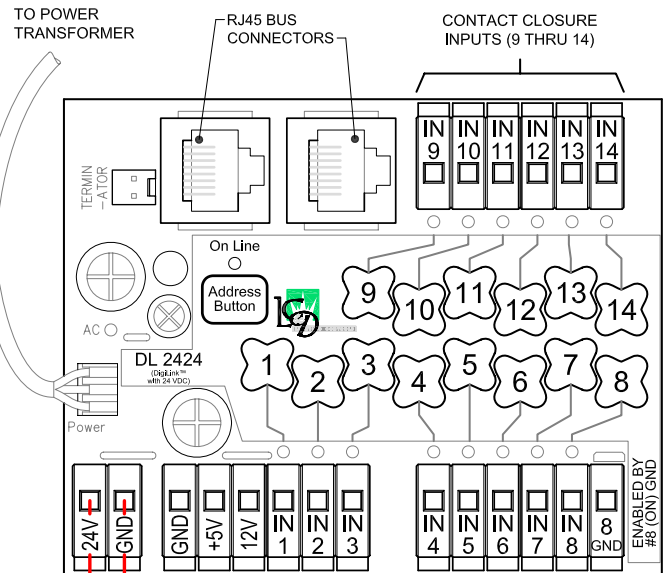
(WITH "R" (RELAY) OPTION)

- WSD-LV-R PASSIVE INFRARED (PIR)
- WSD-PDT-LV-R PIR/MICROPHONICS (PDT)



\*\* ONLY ON "P" (PHOTOCELL) OPTION

### DL 2400 DigiLink CARD



TO ANY CONTACT CLOSURE INPUT \*

\* CONTACT CLOSURE INPUTS: REFER TO SUBMITTAL DOCUMENTATION WHERE APPLICABLE.  
- OR -  
DOCUMENT INPUTS USED AND FORWARD INFORMATION TO LC&D TECH SUPPORT.

### SENSOR SWITCH SENSORS

(WITH "R" (RELAY) OPTION)

#### STANDARD RANGE LOW VOLTAGE 360° SENSORS

- CM-9-R CEILING MOUNT, PASSIVE INFRARED (PIR)
- CM-PDT-R CEILING MOUNT, PIR/MICROPHONICS (PDT)
- RM-9-R RECESSED MOUNT, PASSIVE INFRARED (PIR)
- RM-PDT-R RECESSED MOUNT, PIR/MICROPHONICS (PDT)
- CMB-9-R FIXTURE MOUNT, PASSIVE INFRARED (PIR)
- CMB-PDT-R FIXTURE MOUNT, PIR/MICROPHONICS (PDT)

#### EXTENDED RANGE LOW VOLTAGE 360° SENSORS

- CM-10-R CEILING MOUNT, PASSIVE INFRARED (PIR)
- CM-PDT-10-R CEILING MOUNT, PIR/MICROPHONICS (PDT)
- RM-10-R RECESSED MOUNT, PASSIVE INFRARED (PIR)
- RM-PDT-10-R RECESSED MOUNT, PIR/MICROPHONICS (PDT)
- CMB-10-R FIXTURE MOUNT, PASSIVE INFRARED (PIR)
- CMB-PDT-10-R FIXTURE MOUNT, PIR/MICROPHONICS (PDT)

#### WIDE VIEW & HALLWAY LOW VOLTAGE SENSORS

- WV-16-R WIDE VIEW - CORNER MOUNT, PASSIVE INFRARED (PIR)
- WV-PDT-R WIDE VIEW - CORNER MOUNT, PIR/MICROPHONICS (PDT)
- HW-13-R HALLWAY - WALL MOUNT, PASSIVE INFRARED (PIR)

#### HIGHBAY LOW VOLTAGE 360° SENSORS

- CM-6-R CEILING MOUNT, PASSIVE INFRARED (PIR)
- RM-6-R RECESSED MOUNT, PASSIVE INFRARED (PIR)
- CMB-6-R FIXTURE MOUNT, PASSIVE INFRARED (PIR)

#### HIGHBAY LOW VOLTAGE AISLEWAY SENSORS

- HM-50-R SURFACE MOUNT, PASSIVE INFRARED (PIR)
- RM-50-R RECESSED MOUNT, PASSIVE INFRARED (PIR)
- CMB-50-R FIXTURE MOUNT, PASSIVE INFRARED (PIR)

#### HIGHBAY LOW VOLTAGE END-OF-AISLEWAY SENSORS

- HM-10-R SURFACE MOUNT, PASSIVE INFRARED (PIR)
- HMB-10-R FIXTURE MOUNT, PASSIVE INFRARED (PIR)

NOTES:  
THE DL2400 DigiLink CARD PROVIDES 12VDC OR 24VDC.  
OCCUPANCY SENSORS REQUIRING 24VAC REQUIRE AN ALTERNATE POWER SUPPLY SOURCE.

CONNECTIONS WITH WIRE RUNS BEYOND 200 FEET REQUIRE THE USE OF SHIELDED CABLE TO AVOID SIGNAL INTERFERENCE.

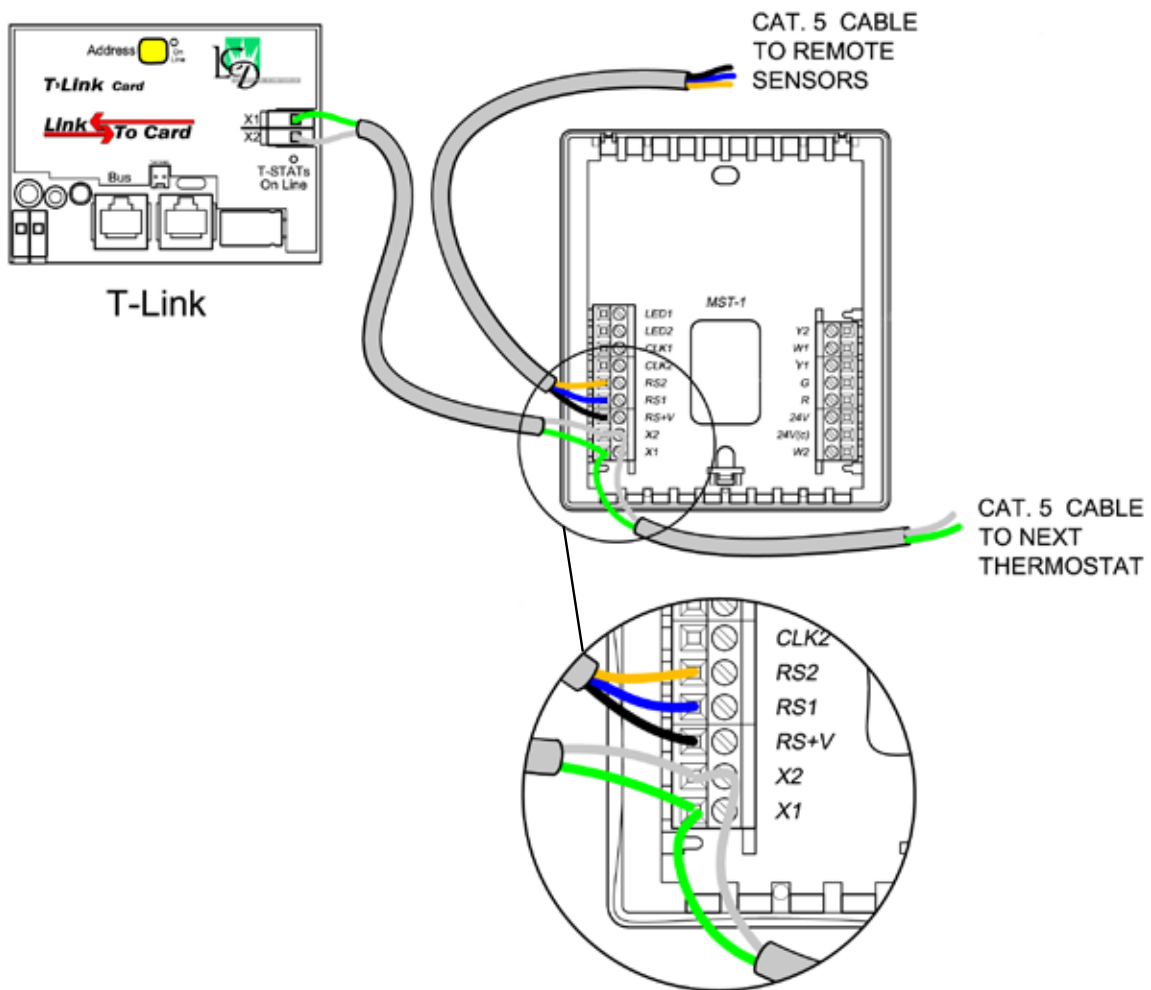
PLEASE REFER TO THE MANUFACTURER'S INSTALLATION GUIDE FOR ANY OTHER PERTINENT INFORMATION THAT MAY BE REQUIRED FOR INSTALLATION OF THEIR PRODUCT. LIGHTING CONTROL & DESIGN CANNOT BE HELD LIABLE FOR CHANGES OR ANY OTHER ISSUES IN RELATION TO ANY PRODUCT MANUFACTURED BY OTHERS.

THE MODEL SHOWN IS THE MOST RECENT VERSION. PREVIOUS VERSIONS ONLY DIFFERED IN REGARD TO ENCLOSURE AND GENERAL ARRANGEMENT OF THEIR COMPONENTS. THEREFORE THIS INSTRUCTION SHEET MAY STILL APPLY.

IF THERE IS ANY CONCERN FOR ANY REASON REGARDING DISCREPANCIES BETWEEN THE DETAILS SHOWN HERE AND THOSE OF THE ACTUAL EQUIPMENT, WE HIGHLY RECOMMEND YOU CONTACT LC&D TECH SUPPORT PRIOR TO PROCEEDING.

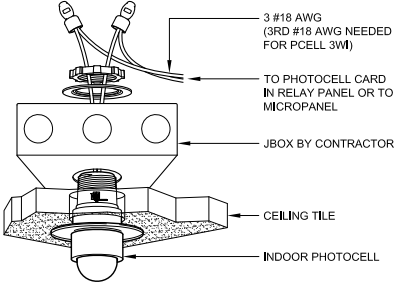
# Wiring Diagrams

## T-LINK CONNECTION



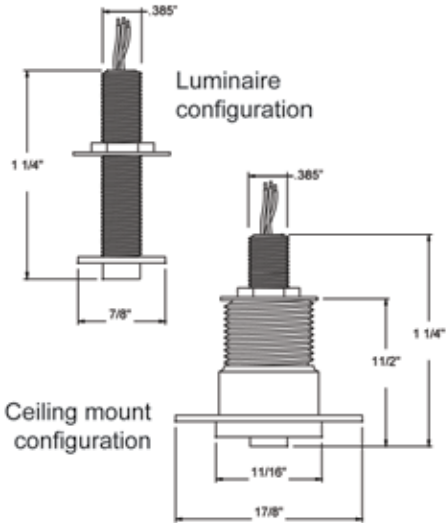
# PHOTOCELL WIRING

## TWO-WIRE INDOOR PHOTOCELL

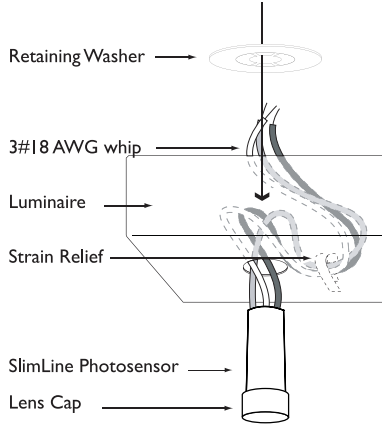


NOTES:  
INSTALLER TO FOLLOW MANUFACTURER'S  
RECOMMENDATIONS FOR PHOTOCELL PLACEMENT.

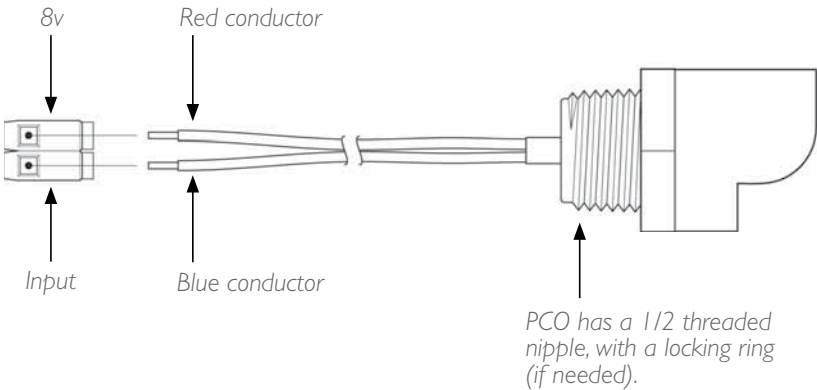
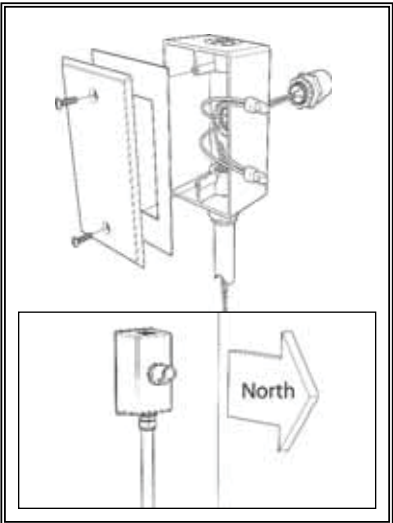
## THREE-WIRE PHOTOCELL



## SLIMLINE PHOTOCELL



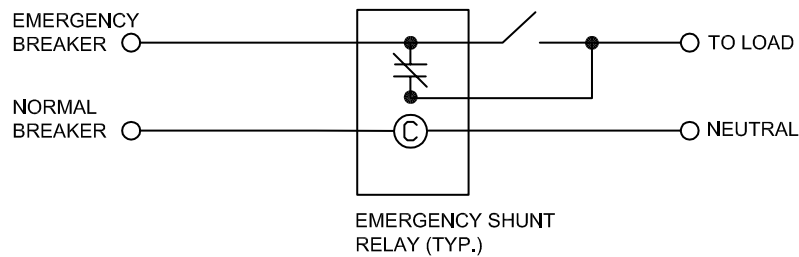
## OUTDOOR PHOTOCELL



# Wiring Diagrams

## EMERGENCY SHUNT RELAY

### EMERGENCY SHUNT RELAY USED WITH SINGLE CIRCUIT WALL SWITCH

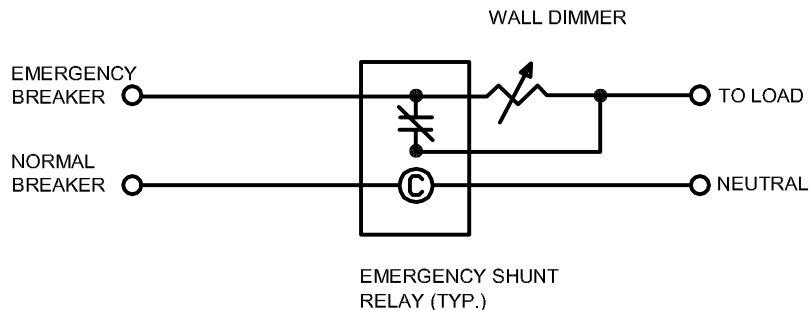


EMERGENCY SHUNT RELAY TO BE FACTORY MOUNTED IN A 4" X 4" JUNCTION BOX, AND 2 GANG DEEP PLASTER RING. EMERGENCY CIRCUIT WALL SWITCH SHALL MOUNT IN SAME ENCLOSURE.

CONTRACTOR TO SUPPLY 2 GANG WALL PLATE AND SINGLE WALL SWITCH APPROPRIATELY RATED PER NEC AND ANY LOCAL ELECTRICAL CODES.

EMERGENCY SHUNT RELAY SHALL BE ETL LISTED TO UL STD 916 AND UL 924, WITH A 16 GAGE STEEL BARRIER TO SEPERATE NORMAL AND EMERGENCY POWER. MANUFACTURED BY LC&D LIGHTING CONTROLS (800) 345-4448

### EMERGENCY SHUNT RELAY USED WITH SINGLE CIRCUIT WALL DIMMER



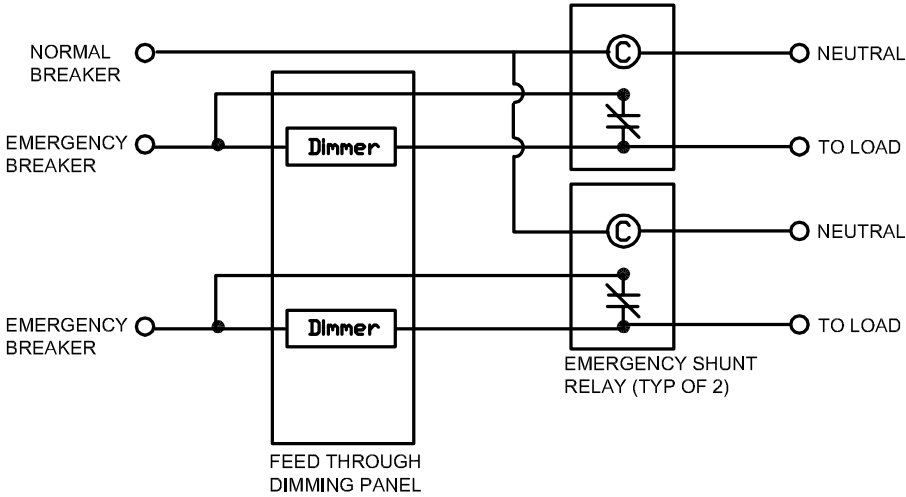
EMERGENCY SHUNT RELAY TO BE FACTORY MOUNTED IN A 4" X 4" JUNCTION BOX, AND 2 GANG DEEP PLASTER RING. EMERGENCY CIRCUIT WALL SWITCH SHALL MOUNT IN SAME ENCLOSURE.

CONTRACTOR TO SUPPLY 2 GANG WALL PLATE AND SINGLE WALL SWITCH APPROPRIATELY RATED PER NEC AND ANY LOCAL ELECTRICAL CODES.

EMERGENCY SHUNT RELAY SHALL BE ETL LISTED TO UL STD 916 AND UL 924, WITH A 16 GAGE STEEL BARRIER TO SEPERATE NORMAL AND EMERGENCY POWER. SHUNT RELAY SHALL NOT BE WATTAGE DEPENDANT. MANUFACTURED BY LC&D LIGHTING CONTROLS (800) 345-4448

# EMERGENCY SHUNT RELAY

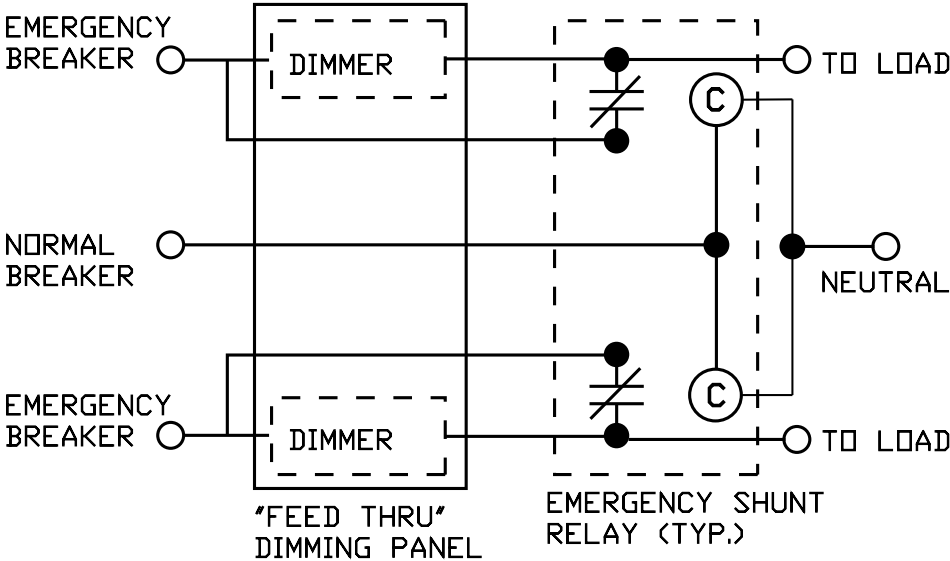
## EMERGENCY SHUNT RELAY USED WITH FEED THROUGH DIMMING PANEL



EMERGENCY SHUNT RELAYS TO BE FACTORY MOUNTED IN NEMA 1 ENCLOSURE. ONE SHUNT RELAY IS REQUIRED FOR EACH DIMMER TO BE SWITCHED ON DURING THE LOSS OF NORMAL POWER.

EMERGENCY SHUNT RELAY SHALL BE ETL LISTED TO UL STD 916 AND UL 924, WITH A 16 GAGE STEEL BARRIER TO SEPARATE NORMAL AND EMERGENCY POWER. SHUNT RELAY SHALL NOT BE WATTAGE DEPENDANT. MANUFACTURED BY LC&D LIGHTING CONTROLS (800) 345-4448

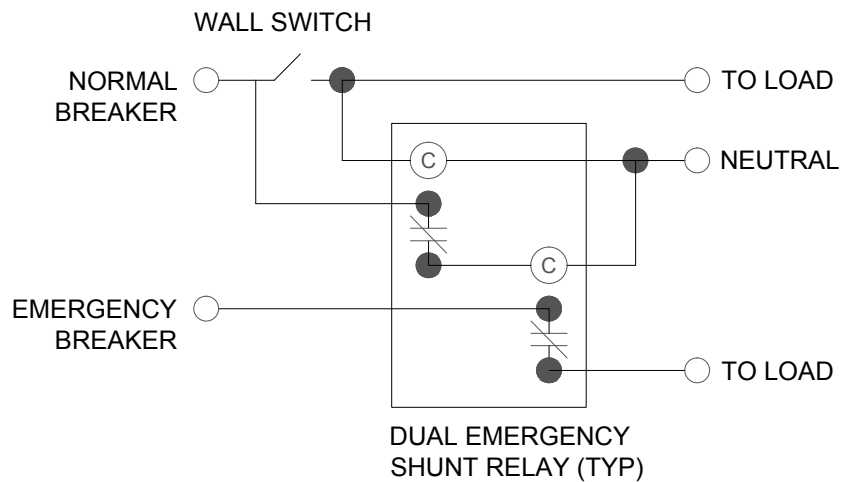
## "FEED THROUGH" DIMMING PANEL - 2SR



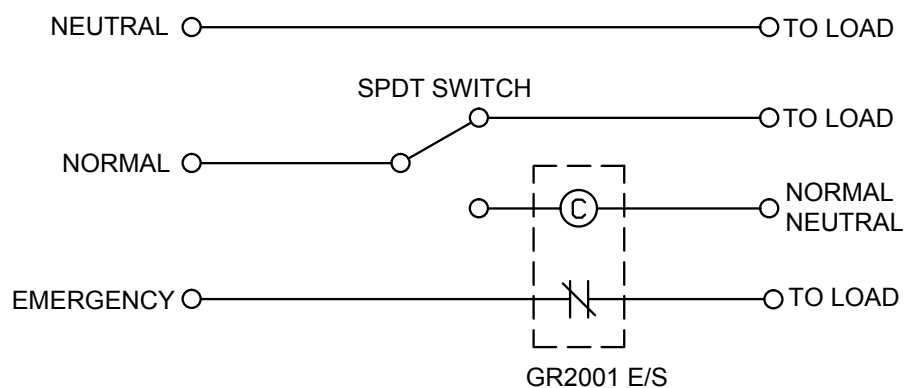
# Wiring Diagrams

## EMERGENCY SHUNT RELAY

SWITCH CONTROLLING NORMAL & EMERGENCY LIGHTING



GR2001 E/S CONNECTION WITH SINGLE POLE DOUBLE THROW SWITCH



***Easy to use lighting controls  
for any application™***

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