Softswitch128™ technical guide

Lutron World Headquarters,
Coopersburg, Pennsylvania

AREA 1
AREA 2
AREA 3
AREA 4

Innovation and quality from the world leader in lighting controls.

In 1961, Lutron introduced the world's first electronic (solid-state) dimmer. From that point forward, Lutron innovations transformed the world of lighting controls. Today, with more than 75 utility and 180 design patents, and more than 10,000 products shipped to 80 countries worldwide, Lutron continues to lead the way with innovation and quality.

seeTouch™ wallstations from Lutron – the new standard for ease of use and intuitive control.

Lutron's first principle is to take care of our customer.

Worldwide sales and service

The Lutron team is here to support you whenever you need us.

Technical support: 24 Hours/7 Days
1·800·523·9466

Customer service: 8am-8pm ET
1·888·LUTRON1

Internet support:
www.lutron.com/switchingsystems

Commitment to innovation

Lutron has been dedicated to producing innovative lighting controls for commercial buildings of every type and style since 1961. A dedication matched only by our commitment to quality, performance, value and service for our customers.

World-class quality

Lutron quality is fueled by a relentless pursuit of the highest standards. Constant improvement activities include an integrated quality system, strict engineering guidelines, and world-class quality and manufacturing processes.

Comprehensive lighting control solutions for electric and natural light

Lutron is your comprehensive resource for lighting control solutions for any commercial or institutional application.

- Architectural dimming systems
- Low-voltage switching systems
- Integrated lighting automation systems
- Theatrical dimming capabilities
- Floor plan based control software
- Factory service plans

Please contact us for information on Lutron's other lighting control products.

For the lighting control professional:

The Softswitch Technical Guide is part of the Lighting Switching Solutions binder (P/N 367-903).

The complete binder includes:

- Softswitch128 Technical Guide
- Softswitch128 specification features
- Cost-effective energy code solutions

Note: Detailed CSI specifications can be found on the internet at www.lutron.com/bpspecs or please contact your Lutron representative to learn more about our online CSI specification software tool - SpecEditor™.

Lutron® switching systems - designed and manufactured to provide exceptional value

Ease of use – Lutron switching panels are easy to program and operate. Wallstations are easily reprogrammed in the field.

Reliability – Lutron's patented Softswitch™ relays have an average rated life of more than one million cycles for ultimate quality and durability, significantly reducing maintenance and service costs.

Lower installed cost – Switching panels can be purchased with or without circuit breakers to achieve the most economical installation. Low-voltage, daisy-chain wiring between both panels and wallstations minimizes home-run wiring. Additionally, all panels are preassembled and pretested for easy shipment and timely delivery.

Contractor friendly, rough-in solution – Panel can be ordered and delivered in two parts: the empty "tub" for rough-in and the pre-wired panel interior.

Outstanding service – Lutron representatives and project management teams are available to help design and specify the right switching system for your project and commission the installation.

Lutron automated switching strategies for any application

- Turn lights on and off based on astronimical and time-of-day time clock.
- Switch electric lighting intelligently based on the availability of natural light.
- Automatically control room lighting based on room occupancy.
- Override automatic control manually to meet occupant's needs.
- Integrate with Building Management Systems (BMS).
- Centralize building control through customizable graphical control software.
- Provide normal or emergency capability.
- Meet or exceed demanding energy codes, including CEC Title 24 (California Energy Commission). Enhanced strategies include afterhours mode with flash-warn and manual override.
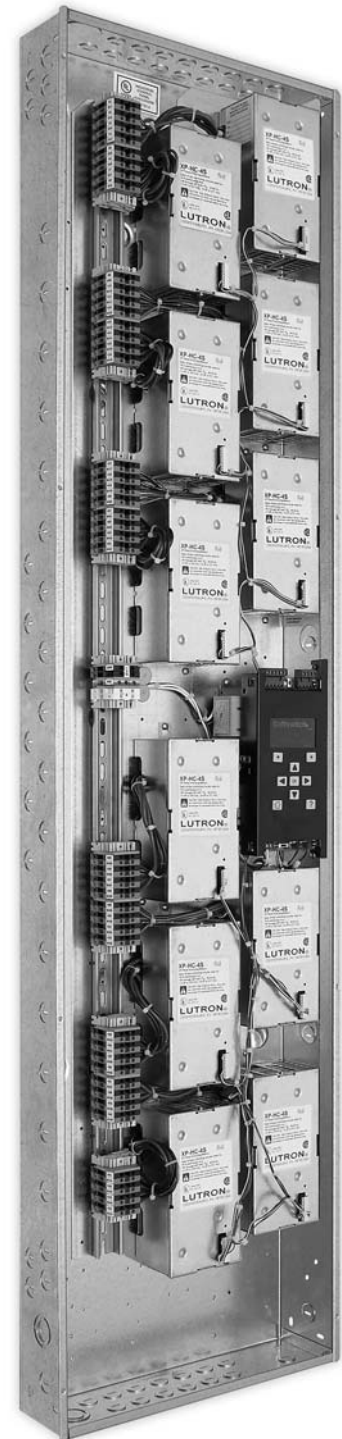
Softswitch128
Standard Switching Panel

Patented arcless
Softswitch™ circuit

### Arcing: the cause of relay failure
Each time a relay closes, the contacts "bounce" several times. Under load, the current flowing through the relay creates an arc. This arcing erodes the contacts leading to premature relay failure.

The Lutron solution
Lutron's exclusive Softswitch circuitry opens and closes the relay contacts without arcing. Even when fully loaded, the arc reduction extends a relay's average rated life to more than 1,000,000 on/off cycles.

The diagram to the right shows the Softswitch turn-on sequence which guards against arcing. The reverse operation is used at turn-off.

The Lutron Softswitch technology is not a solid state switch. When off, the load is completely disconnected by a mechanical air-gap. When on, the relays create a closed circuit without triac power loss.
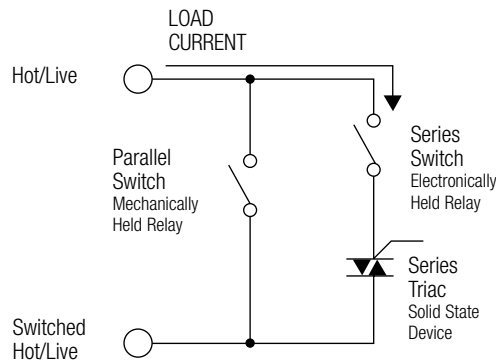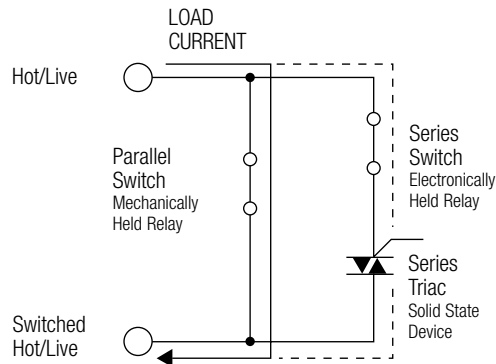
Air-gap Off
Both relays are open providing a true air-gap off, with no leakage current to the load.
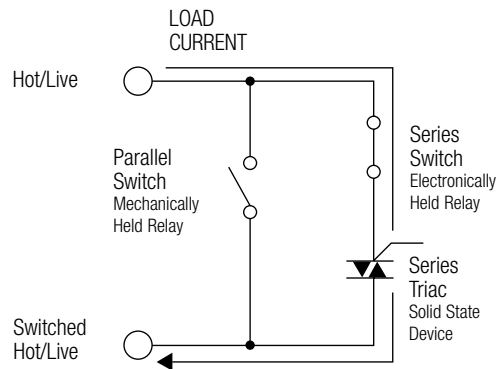
Lights Turning On
The series relay is closed first. While these contacts bounce, there is no arcing because the series triac blocks current flow. After the relay contacts stop bouncing, the triac turns on, providing power to the load.

Eliminate Triac Power Loss
While the load current flows through the triac, power loss is dissipated as heat. The parallel relay is closed to bypass the triac. As the parallel relay contacts bounce, the triac and the series relay offer an alternative current path that prevents arcing.
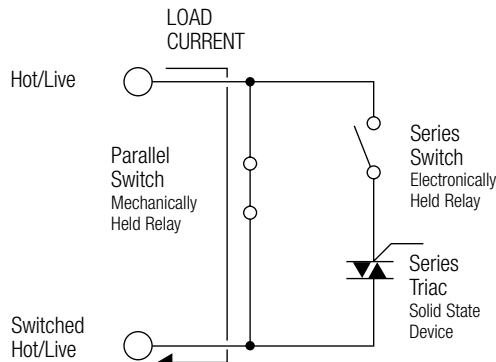
Lights On – Full Conduction
After the parallel relay is fully closed, the series relay opens. Any dissipation loss in the triac is eliminated. Full conduction is delivered to the load, and the relays have not been damaged in the transition.

A full line of switching systems with patented Softswitch technology for projects of any size	**Softswitch128** pg. 2.4.3	**GRAFIK 7000**™ **Switching** see Commercial Systems Technical Guide P/N 367-573
System maximums		
Processors	1	32
Zones	512	16,384[1]
Control station devices (Wallstations and interfaces)	32 (96 w/ expansion module)	6,144
Switching panels	16	4,000
Relays	512 (1 per zone)	192,000 (32 processors of 125 panels with 48 relays each)
Switching panels		
Relays per panel		
with breakers	8-42	4-42
Feed through	8-48	4-48
System features		
Astronomical timeclock	Yes	Yes
Maximum number of Timeclock events	500	10,000
Partitioning & sequencing	n/a	Standard
Conditional logic	n/a	Standard
Computer required for setup & changes	n/a	Yes
Setup & operation software	n/a	Standard
Graphical control software	RS232	Optional
BMS integration	BACnet, LonWorks, RS232 or contact closure input/output	BACnet, LonWorks, RS232 or contact closure input/output
Telephone interface	Optional	Optional
Warranty	1 year (w/o commissioning) 8-year limited warranty and additional service programs available.	2 years 8-year limited warranty and additional service programs available.
Start-up	Telephone support standard; field service optional	Field service standard; may require multiple visits

Footnotes, pg. 1.1.3

1. Increased zone, circuit, control station and switching panel capabilities are available by linking multiple GRAFIK 7000P processors.

Warranties, commissioning and service

Prior to installation
Lutron's customer service and quotations specialists are involved from the beginning of the job process. We can help you select the right lighting control system for your needs, quote the job, and coordinate delivery and commissioning.

Telephone start-up service
Telephone assisted start-up is standard with Softswitch128™. It includes:
- One scheduled toll-free phone support by a Lutron technical representative to guide you through the initial start-up of the installed system
- 1-year parts only warranty

Lutron's enhanced limited warranty*
All factory-commissioned Lutron products are covered by Lutron's Enhanced Limited Warranty, which covers Lutron labor, travel, and parts. It includes:
- 24-hour/7-days a week toll-free telephone technical support (800-523-9466)
- 5-year limited warranty on ballasts
- 8-year Replacement Parts Program (Lutron ballasts and servers not included) for credit against the purchase price upon return of the defective parts at the following rates:
  – 100% for the first 2 years of operation
  – 50% for years 3, 4, and 5 of operation
  – 25% for years 6, 7, and 8 of operation

- **Lutron's 2-year Silver Support & Maintenance Plan**
  – No charge with a factory commissioned system
  – Covers 100% parts, labor and Lutron travel expenses for 2 years from the date of system commissioning.

- **Archived database**
  While commissioning the system, our field service engineer will download a copy of the system database to be stored in archives at Lutron. This allows Lutron to restore the full capabilities of your system in the event of data corruption, without time-consuming reprogramming.

- **Remote diagnostics**
  By dialing directly into your system, we can identify and repair system failures quickly and with minimal disruption (for those systems with dial-in capabilities). Remote access requires an analog telephone line connection (provided by system owner).

2-Star and 3-Star factory commissioning
2-Star commissioning includes Lutron Enhanced Limited Warranty (described above), 2-year Silver Level Support & Maintenance Plan, PLUS
- One Lutron factory commissioning visit to start up your Lutron system and conduct training

3-Star Commissioning is standard with Softswitch128™ and includes all the benefits of 2-Star Commissioning, PLUS
- Three separate job site visits by Lutron Field Service Engineers to
  (1) conduct prewire inspection,
  (2) perform system start-up and install system software/database, and
  (3) train operator/end-user
* Call Lutron for complete warranty information

Lutron's Support & Maintenance Plans
Each Lutron Support & Maintenance Plan extends the coverage on your Lutron system and offers a variety of other services, training, and repair benefits. The price of each plan is based on the type of coverage you choose, and the size and age of your previously-commissioned Lutron lighting control system. Choose the plan that best suits your needs, or talk to us about a Custom Plan to meet your specific requirements.

Lutron Silver Support & Maintenance Plan
- Covers 100% parts, labor and travel expenses
  This coverage can be purchased to provide coverage for up to 10 years from the date of commissioning. This guarantees long-term reliability, covering all of the parts and Lutron labor and travel costs that are usually associated with a non-warranty repair visit.

Lutron Gold Support & Maintenance Plan
Includes all the benefits of Lutron Silver Support & Maintenance Plan, PLUS

- **Annual comprehensive preventative maintenance**
  Comprehensive preventative maintenance will be performed on an annual basis to maximize the performance of your system and minimize system downtime. During the service check, software is upgraded to the most current version, where applicable.

- **Annual training and consultation visit**
  A Lutron field engineer will conduct training sessions with new and experienced employees to review the programming and utilization of your system and update your staff on new capabilities or enhancements that can be added to your system.

- **Remote real-time programming**
  A Lutron programmer can dial in and make parameter changes, real-time with instructions from your authorized administrator.

Lutron Platinum Support & Maintenance Plan
Includes all the benefits of Lutron Gold Support & Maintenance Plan, PLUS

- **A guaranteed 24-hour response time**

Annual Support & Maintenance Plans backed by world-class field service engineers
Lutron Support & Maintenance Plans ensure that annual service checks, training, diagnostics, and all other maintenance services will be performed regularly and exclusively by Lutron field service engineers. Service plans are renewable each year for a maximum of 10 years from the date of original system commissioning.
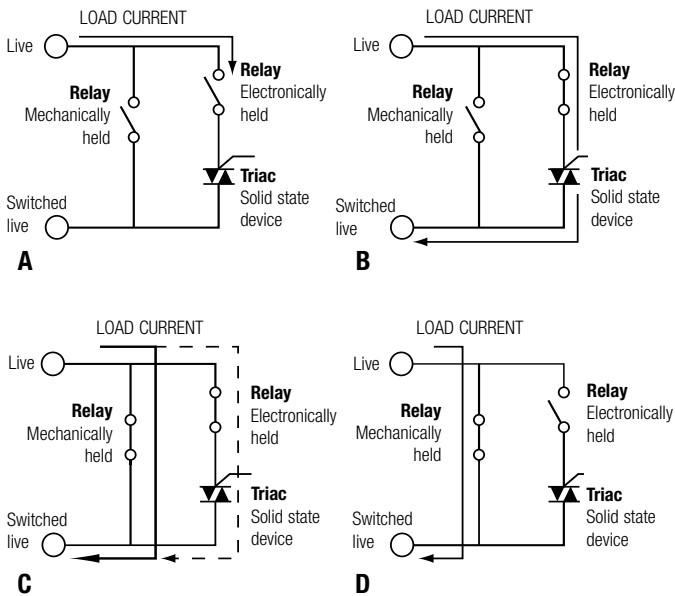
Section 2

1,000,000 cycle switching modules

Lutron's exclusive Softswitch™ circuitry opens and closes the relay contacts without arcing.

The benefits

Even when fully loaded, the arc reduction extends a relay's average rated life to more than 1,000,000 on/off cycles.

Recommended specifications
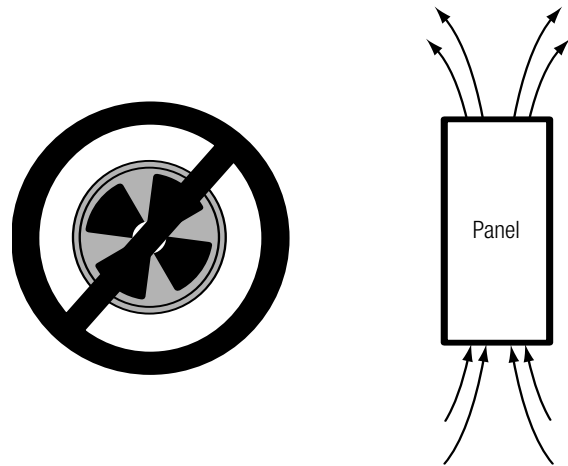
Switching modules shall:

1. Be operated in a manner that ensures no arcing will occur at the mechanical contacts when power is applied to or removed from the load circuits.
2. Have a minimum rated lifetime of 1,000,000 cycles at 16A.
3. Maintain an open air gap when in the off state.
4. Switch semiconductor out of circuit to ensure highest efficiency.

Convection cooling

Panels are cooled naturally via air convection.

The benefits

No fan to worry about failing, no filters to replace, no maintenance.
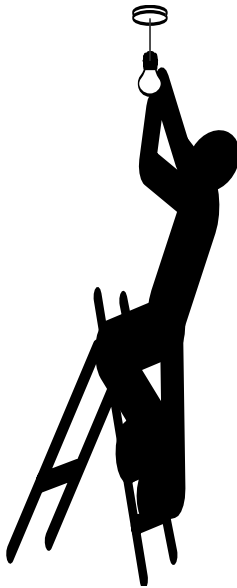

Recommended specifications

Switching modules shall be cooled naturally via air convection.

Air gap off

An air gap is provided in each switching circuit.

The benefits

Without this, the leakage current of the switching circuit may cause electrical shock when servicing lamps or a fire if a fixture or lamp source fails violently.

Recommended specifications

Each switching circuit shall have an air gap to totally disconnect power from the load so that no leakage current shall be present at the fixture(s) when all outputs are in the off state.

Lightning strike surge protection

Special circuitry protects the modules from surges.

The benefits

Protects your modules from power surges during a storm (or from within the building).
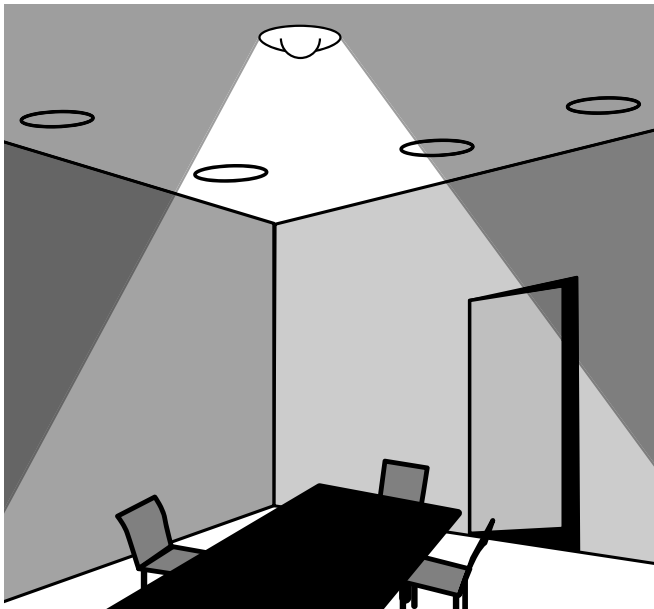
Recommended specifications

Switching modules shall meet IEEE standard c62.41, tested to withstand voltage surges of up to 6,000 volts and 3,000 amps. Switching modules shall meet IEC 61000-4-5 surge requirements.

Emergency mode

Selected circuits go to full-on when normal power fails either automatically (see the application note on pg. 2.11.1), or manually (by cycling power to the switching module).

The benefits

You won't be in the dark during emergencies.

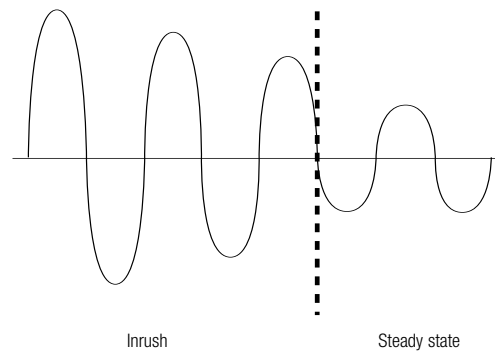### Recommended specifications

Switching modules shall go to full-on mode when power to the switching module is cycled without a control input or with a loss of normal power.

Inrush current

Switching modules are designed to withstand inrush of 50 times operating current.

The benefits

Switching modules last longer and do not fail under high inrush conditions such as bulb burnouts and switching electronic fluorescent ballasts on.

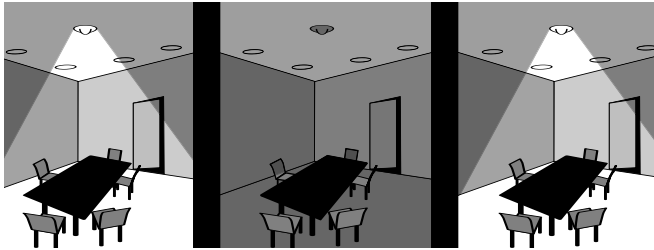Inrush   Steady state

Recommended specifications

Switching modules shall withstand an inrush of 50 times operating current.

Power failure memory

Keeps lights as you left them when power is restored.

The benefits

Minimizes the inconvenience of power service interruptions by returning lights to previous level.
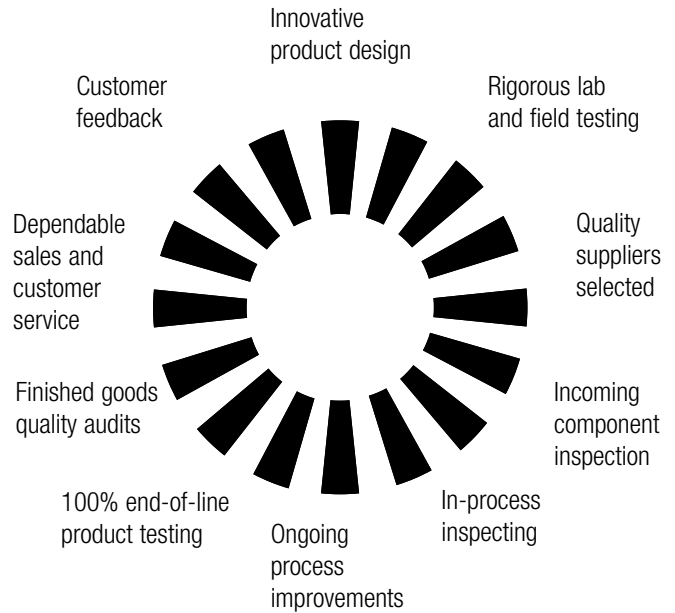
Recommended specifications

Switching modules shall incorporate power-failure memory. Should power be interrupted and subsequently returned, the lights will come back on to the same level set prior to the power interruption. Restoration to some other default level is not acceptable.

World-class quality process

For over 40 years, Lutron has designed, manufactured, and delivered quality lighting control products.

The benefits

Reliable product quality, dependable service, and continual innovation.

Innovative product design

Customer feedback

Rigorous lab and field testing

Dependable sales and customer service

Quality suppliers selected

Finished goods quality audits

Incoming component inspection

100% end-of-line product testing

Ongoing process improvements

In-process inspecting

Recommended specifications

Manufacturer shall be Lutron Electronics. Manufacturer shall be at least ISO 9001:2000 registered.

Step 1	
Determine number of circuits and select Switching Panels	• Decide how many relays are required. Each relay is rated for 16A continuous. • Choose panels with branch circuit breakers or feed through panels. • Determine the power feed for the relay panel.

Mini XPS Softswitch™ Panel

Standard Panel 8-42 Circuits with Breaker Protection

Design Tips

☐ A system is limited to:
  16 panels maximum
  512 circuits maximum

☐ Specify from 8-42 relays in a breaker panel
  Specify from 8-48 relays in a feed through panel

☐ Each panel has two contact closure inputs, for use with occupancy sensors or other equipment. Additional contact closure inputs can be added using an OMX-AV or seeTouch wallstation.

☐ Locate panels throughout the building to reduce wire runs.

☐ Use combination normal/emergency panels to save space by combining normal and emergency circuits in separate sections in the same enclosure. (see page 2.4.9)

Prefix
XPS for Softswitch128 panels.

Circuits
Total circuits (switch legs) in the panel.

Control Supply Voltage
120 for 100 – 127V or 208V
277 for 277V
347 for 347V
Blank for 120/277V dual voltage

Feed
FT for feed through panels.
4ML for 3 phase 4 wire feeders.
3ML for 1 phase 3 wire feeders.

Breaker Rating
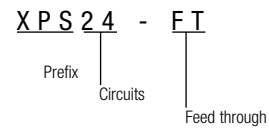Omit for feed through panels.
20 for 20A branch circuit breakers (20A branch circuit breakers have a 16A continuous load rating).
15 for 15A branch circuit breakers (15A branch circuit breakers have a 12A continuous load rating).

How to Build a Model Number

X P S 2 4 - 1 2 0 4 M L - 2 0

Prefix
  Circuits
    Control Supply Voltage
    Feed
      Breaker Rating
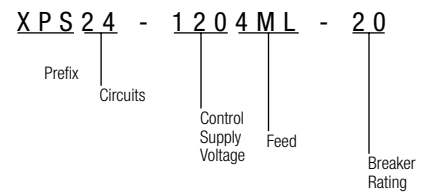
Dual Voltage Model Number

X P S 2 4 - F T

Prefix
  Circuits
    Feed through

Step 2

Add local controls and interfaces

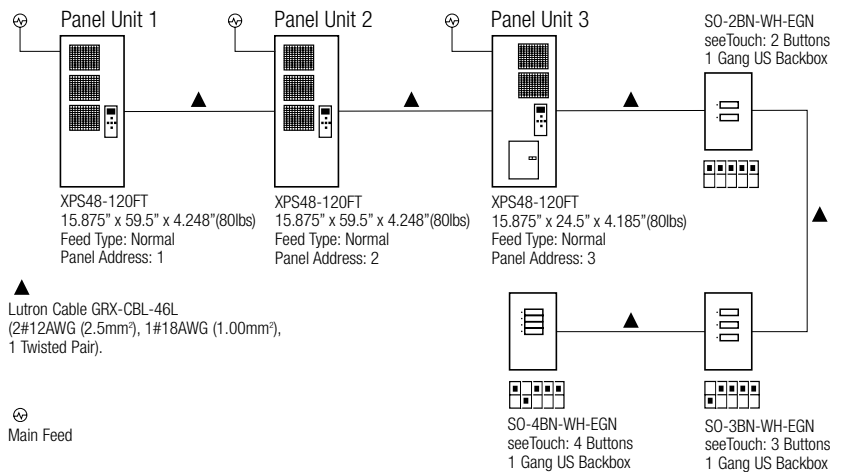**seeTouch™ 4-Button wallstation**

- Softswitch128 can have up to 32 wallstations and interfaces. The number of wallstations can be increased to a maximum of 96 if used with an expansion module. (see pg. 2.4.12)

- Define the number of buttons needed on a wallstation. For example, a 4-button wallstation, SO-4BN (see pg. 2.5.1 for control details). This wallstation can take the place of a 4-gang wallbox with toggle switches.

- Up to two occupancy sensors can be connected directly to each Softswitch128 controller using a power pack.

- An OMX-CI-RS232 (see pg. 2.6.5) interface allows integration with BMS or Touch Screens.

- An OMX-CCO-8 (see pg. 2.6.3) interface allows integration with third party A/V equipment and shades.

Design Tips

☐ Wallstations used in place of multiple switches reduces wall clutter.

☐ Use seeTouch wallstations with occupancy sensor/contact closure inputs to power occupancy sensors.

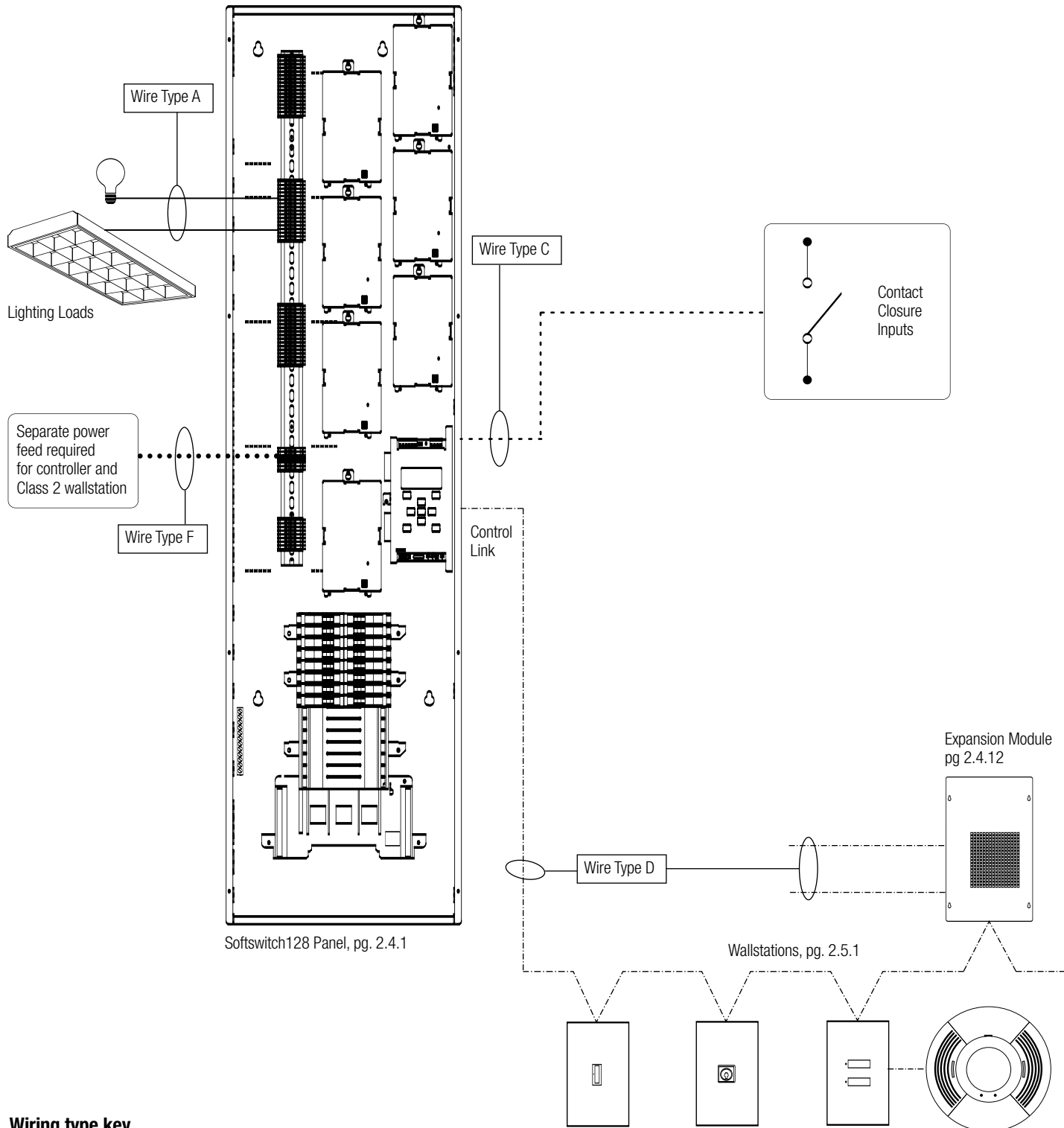☐ Use an expansion module to add a maximum of 96 wallstations.

Step 3

Support the design with one-line diagrams and written product specifications.

Panel Unit 1

Panel Unit 2

Panel Unit 3

SO-2BN-WH-EGN
seeTouch: 2 Buttons
1 Gang US Backbox

XPS48-120FT
15.875" x 59.5" x 4.248"(80lbs)
Feed Type: Normal
Panel Address: 1

XPS48-120FT
15.875" x 59.5" x 4.248"(80lbs)
Feed Type: Normal
Panel Address: 2

XPS48-120FT
15.875" x 24.5" x 4.185"(80lbs)
Feed Type: Normal
Panel Address: 3

▲
Lutron Cable GRX-CBL-46L
(2#12AWG (2.5mm²), 1#18AWG (1.00mm²),
1 Twisted Pair).

⊕
Main Feed

SO-4BN-WH-EGN
seeTouch: 4 Buttons
1 Gang US Backbox

SO-3BN-WH-EGN
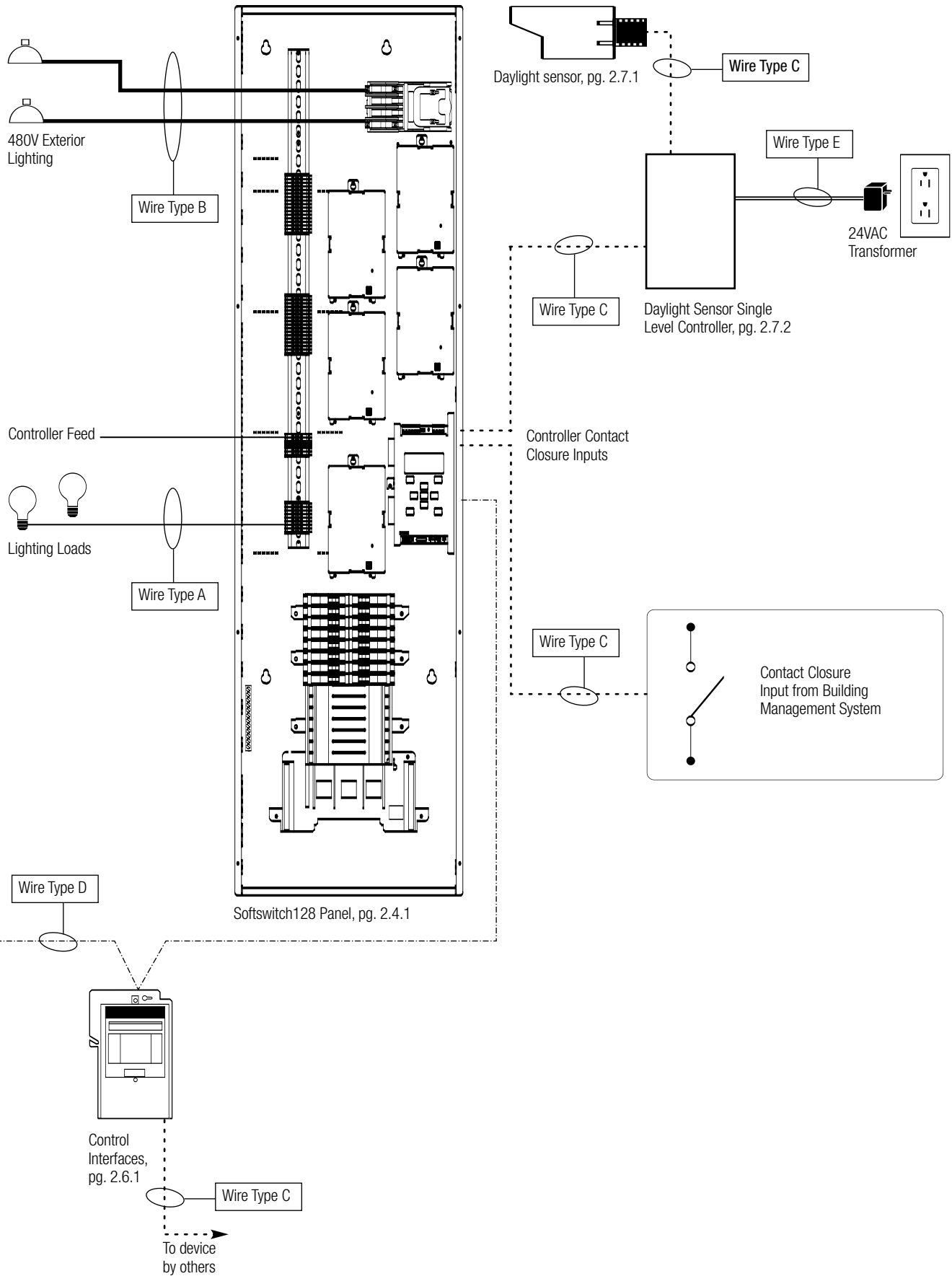seeTouch: 3 Buttons
1 Gang US Backbox

Design Tips

☐ Complete product specifications are available at www.lutron.com/switchingsystems

☐ Use Designer 6.0 Software or higher to create one-line drawings.
Ask your Lutron representative for more information.

Wire Type A

Lighting Loads

Wire Type C

Contact
Closure
Inputs

Separate power
feed required
for controller and
Class 2 wallstation

Wire Type F

Control
Link

Expansion Module
pg 2.4.12

Softswitch128 Panel, pg. 2.4.1

Wire Type D

Wallstations, pg. 2.5.1

Wiring type key

────────	Type A	(2) #12 AWG wires (120V/277V)
────────	Type B	(3) #12 AWG wires (480V)
- - - - - -	Type C	(2) #18 AWG Class 2 wires
–·–·–·–	Type D	(2) #12 AWG Class 2 wires + (1) twisted, shielded pair #18 AWG Class 2 wires (or Lutron Model #: GRX-CBL-46L)
────────	Type E	(3) #16 AWG wires (24VAC, plus earth ground)
••••••••••	Type F	(3) #12 AWG wires (120V/277V)

480V Exterior Lighting

Wire Type B

Daylight sensor, pg. 2.7.1

Wire Type C

Wire Type E

24VAC Transformer

Wire Type C

Daylight Sensor Single Level Controller, pg. 2.7.2

Controller Feed

Controller Contact Closure Inputs

Lighting Loads

Wire Type A

Wire Type C

Contact Closure Input from Building Management System

Wire Type D

Softswitch128 Panel, pg. 2.4.1

Control Interfaces, pg. 2.6.1

Wire Type C

To device by others

XPS Softswitch panel– feed through

XPS Softswitch panel with Breakers
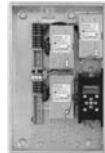
Mini XPS Softswitch panel– 8-16 circuits

Hot/Live

Parallel Switch
Mechanically Held Relay

Series Switch
Electronically Held Relay

Series Triac
Solid State Device

Switched Hot/Live
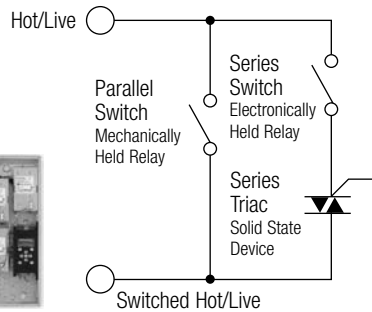
Million-cycle switching panel employs Lutron's patented **Softswitch™** technology

- Softswitch relay switches load with no arc. Lutron has verified an average rated relay life of 1,000,000 cycles (on/off)
- Standard panel ships in 3-5 business days
- Preassembled panels; field wiring is similar to a lighting distribution panel

Softswitch128 system map

- Use the map below to identify system component being reviewed in each section.
- For overall wiring information, see pg. 2.3.1

Sources

💡	Incandescent
	Magnetic low voltage
	Electronic low voltage
	Neon/cold cathode
	Fluorescent
	High-intensity discharge (non-dim only)
	Motors

Sources

Mini switching panel

Occupancy sensors

Switching panels

seeTouch™ wallstations-

1-Button wallstations

Control interfaces
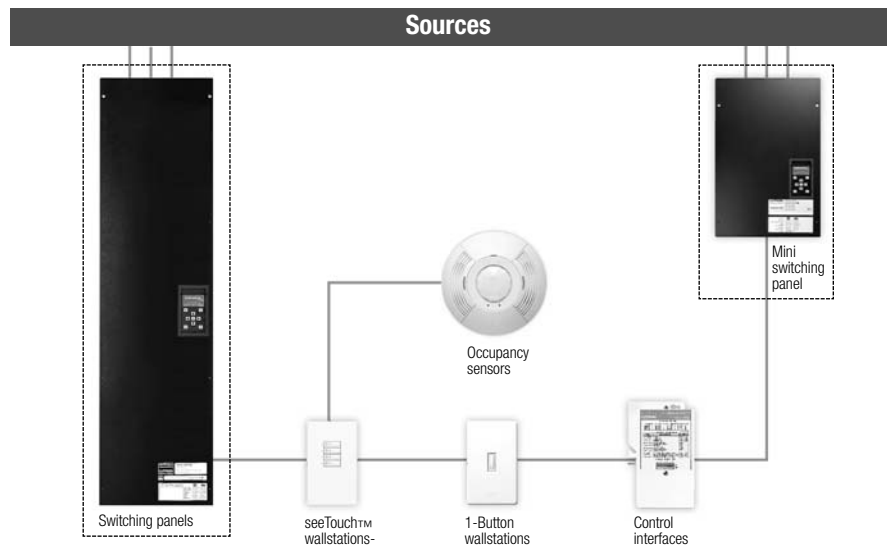
Design options

- Input feed – main lugs, feed-through
- Branch breakers – 15A, 20A
- Panel voltage – 120V, 208V, 277V, and 347V
- 480V contactor option available
- Operates on 50 or 60 Hz power
- Panel feed – single phase, split phase, or three phase
- Number of switch legs:
  8-48 (Feed-Through Panels)
  8-42 (Panels with Branch Breakers)

Specifications

- All voltages indicated are phase-to-neutral
- Panels may be in the middle of a control link; control link must be daisy-chained
- System can include up to 16 XPS panels
- Switching Panel installation instructions are available in multiple languages; contact Lutron or visit the Lutron website for more information

Mounting

- Indoor use only; NEMA Type 1 enclosure, IP-20 protection
- Mount only where ambient temperature will be 0-40ºC (32-104ºF) with a non-condensing relative humidity < 90%
- Flush mount between 16" studs or surface mount (standard and mini size only)
- Panels must mount within 7º of true vertical
- Panels generate audible noise, mount where acceptable
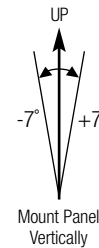
UP

-7° +7°

Mount Panel Vertically

Standards

Standards listed below apply to one or more products in the Lutron product line. Consult Lutron for specific information.

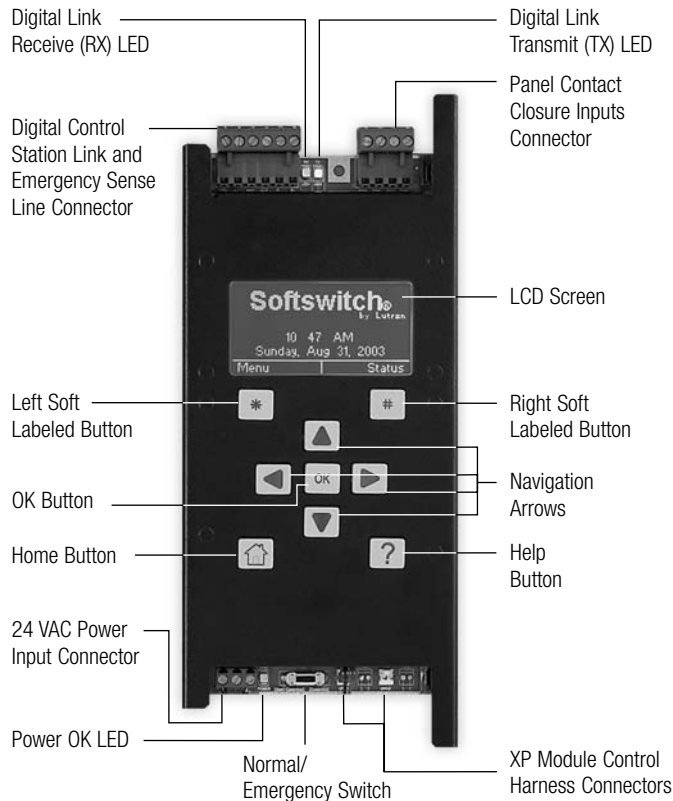LUTRON Quality Systems registered to ISO 9001

CE (UL) (SA) NOM V T

emc A BAUART GEPRÜFT TYPE APPROVED (D) KEMA KEUR D-E

Softswitch128 Controller

The Softswitch128 Controller is used to configure the entire Softswitch128 System. The controller features an LCD user interface to facilitate programming all switching system and astronomical time clock (ATC) parameters. A detailed program guide can be found on at www.lutron.com/switchingsystems

Digital Link Receive (RX) LED

Digital Link Transmit (TX) LED

Panel Contact Closure Inputs Connector

Digital Control Station Link and Emergency Sense Line Connector

LCD Screen

Softswitch®
by Lutron
10 47 AM
Sunday, Aug 31, 2003
Menu   Status

Left Soft Labeled Button

Right Soft Labeled Button

OK Button

Navigation Arrows

Home Button

Help Button

24 VAC Power Input Connector

Power OK LED

Normal/ Emergency Switch

XP Module Control Harness Connectors

Softswitch128 Controller Details

- Program wallstations
- Integrated astronomical or time-of-day time clock
- Two integrated contact closure inputs
- Overrides for controls, time clock, and switch legs
- Located in the Softswitch128 panel for easy access

Wallstation Programming

Every wallstation button or contact closure input can be assigned one of the following functions:

- Toggle - each press of the button, turn of the keyswitch or contact closure input toggles the assigned circuits between on and off; If the assigned circuits are in a mixed state (some on and some off), the circuits will turn on
- Pattern - Turns the assigned circuits and contact closure outputs to a programmed state; each output is defined individually
- Delay To Off - The button press will turn the circuit(s) off after the set amount of time (1 - 90 minutes)
- Enable/Disable time clock

Astronomical or Time-of-day Time Clock Programming

- Automates switching and contact closure outputs
  - up to 500 user-defined events
  - 7 daily schedules
  - 40 holiday schedules
  - each schedule may have 25 events
- ATC events automatically:
  - select patterns or
  - start/end afterhours mode
- Copy and paste of events for fast programming
- ATC events may be triggered by:
  - time of day or
  - sunrise or sunset offset
- System location is programmable by:
  - internal city database or
  - specifying latitude and longitude
- Automatically adjusts for:
  - leap year
  - daylight savings time (where applicable)
- Programmable afterhours mode with user-selectable "blink warn" and user programmable refresh time
- System clock is accurate to two minutes per year, or better

120V 8 – 42 circuits
Branch breaker protection

Dimensions

Standard Panel
8-28 Circuits

W: 15.88" (404mm)
H: 59.50" (1514mm)
D: 4.25" (108mm)

wt: 80 lbs (37kg)
Ship wt: 90 lbs (41kg)

Type	Model No. Prefix	No. of Circuits	Voltage	Feed Type [1]	Main Lugs (ML) Isolator Switch (IS)	Branch Circuit Breaker Capacity (A) [2]	Maximum Feed (A)	Maximum Switched Hot Load (A)
Available model numbers (Model No. Example: XPS8-1204ML-15)								
XPS8	**120V**							
	XPS	8-	120	4	ML-	15	200	12
	XPS	8-	120	4	ML-	20	200	16
XPS12	**120V**							
	XPS	12-	120	4	ML-	15	200	12
	XPS	12-	120	4	ML-	20	200	16
XPS16	**120V**							
	XPS	16-	120	4	ML-	15	200	12
	XPS	16-	120	4	ML-	20	200	16
XPS20	**120V**							
	XPS	20-	120	4	ML-	15	200	12
	XPS	20-	120	4	ML-	20	200	16
XPS24	**120V**							
	XPS	24-	120	4	ML-	15	200	12
	XPS	24-	120	4	ML-	20	200	16
XPS28	**120V**							
	XPS	28-	120	4	ML-	15	200	12
	XPS	28-	120	4	ML-	20	200	16
XPS32	**120V**							
	XPS	32-	120	4	ML-	15	225	12
	XPS	32-	120	4	ML-	20	225	16
XPS36	**120V**							
	XPS	36-	120	4	ML-	15	225	12
	XPS	36-	120	4	ML-	20	225	16
XPS40	**120V**							
	XPS	40-	120	4	ML-	15	225	12
	XPS	40-	120	4	ML-	20	225	16
XPS42	**120V**							
	XPS	42-	120	4	ML-	15	225	12
	XPS	42-	120	4	ML-	20	225	16

Footnotes, pg. 2.4.3

1   Feed types—phase-to-neutral only. 2= 1Ø,2W; 3= 1Ø,3W; 4= 3Ø,4W; FT=Feed Through.

2   20/16A, 15/12A continuous load rating.

Note: Panels listed above are Lutron standard panels. Consult Lutron for additional capabilities, such as job-specific circuit requirements.

277V/347V 8 – 28 circuits
Branch breaker protection

Dimensions

Large Panel

W: 23.50" (600mm)
H: 63.50" (1613mm)
D: 6.25" (159mm)

wt: 135 lbs (61.3kg)
Ship wt: 145 lbs (66kg)

Dimensions

Large Panel (shown)
32-42 Circuits

W: 23.50" (600mm)
H: 63.50" (1613mm)
D: 6.25" (159mm)

wt: 135 lbs (61.3kg)
Ship wt: 145 lbs (66kg)

Type	Model No. Prefix	No. of Circuits	Voltage	Feed Type [1]	Main Lugs (ML) Isolator Switch (IS)	Branch Circuit Breaker Capacity (A) [2]	Maximum Feed (A)	Maximum Switched Hot Load (A)
Available model numbers (Model No. Example: XPS8-2774ML-20)								
XPS8	**277V**							
	XPS	8-	277	4	ML-	20	250	16
	347V [3]							
	XPS	8-	347	4	ML-	20	250	16
XPS12	**277V**							
	XPS	12-	277	4	ML-	20	250	16
	347V [3]							
	XPS	12-	347	4	ML-	20	250	16
XPS16	**277V**							
	XPS	16-	277	4	ML-	20	250	16
	347V [3]							
	XPS	16-	347	4	ML-	20	250	16
XPS20	**277V**							
	XPS	20-	277	4	ML-	20	250	16
	347V [3]							
	XPS	20-	347	4	ML-	20	250	16
XPS24	**277V**							
	XPS	24-	277	4	ML-	20	250	16
	347V [3]							
	XPS	24-	347	4	ML-	20	250	16
XPS28	**277V**							
	XPS	28-	277	4	ML-	20	250	16
	347V [3]							
	XPS	28-	347	4	ML-	20	250	16

Footnotes, pg. 2.4.4

1 Feed types – phase-to-neutral only. 2= 1Ø,2W; 3= 1Ø,3W; 4= 3Ø,4W; FT=Feed Through.

2 20/16A continuous load rating.

3 Contact Lutron for availability.

Note: Panels listed above are Lutron standard panels. Consult Lutron for additional capabilities,
       such as job-specific circuit requirements.

**277V/347V 32 – 42 circuits
Branch breaker protection**

Dimensions

Extra Large Panel

W: 23.50" (600mm)
H: 82.00" (2085mm)
D: 6.25" (159mm)

wt: 225 lbs (102kg)
Ship wt: 235 lbs (107kg)

Type	Model No. Prefix	No. of Circuits	Voltage	Feed Type [1]	Main Lugs (ML) Isolator Switch (IS)	Branch Circuit Breaker Capacity (A) [2]	Maximum Feed (A)	Maximum Switched Hot Load (A)
Available model numbers (Model No. Example: XP32-2774ML-20)								
XPS32 277V								
	XPS	32-	277	4	ML-	20	300	16
347V[3]								
	XPS	32-	347	4	ML-	20	300	16
XPS36 277V								
	XPS	36-	277	4	ML-	20	300	16
347V[3]								
	XPS	36-	347	4	ML-	20	300	16
XPS40 277V								
	XPS	40-	277	4	ML-	20	300	16
347V[3]								
	XPS	40-	347	4	ML-	20	300	16
XPS42 277V								
	XPS	42-	277	4	ML-	20	300	16
347V[3]								
	XPS	42-	347	4	ML-	20	300	16

Footnotes, pg. 2.4.5

1 Feed types—phase-to-neutral only. 2= 1Ø,2W; 3= 1Ø,3W; 4= 3Ø,4W; FT=Feed Through.

2 20/16A, 15/12A continuous load rating.

3 Contact Lutron for availability.

Note: Panels listed above are Lutron standard panels. Consult Lutron for additional capabilities, such as job-specific circuit requirements.

LUTRON

120V/277V/347V 8 – 16 circuits
Feed through

Dimensions

Mini Panel

W: 15.88" (404mm)
H: 24.50" (623mm)
D: 4.25" (108mm)

wt: 27 lbs (12.2kg)
Ship wt: 30 lbs (13.5kg)

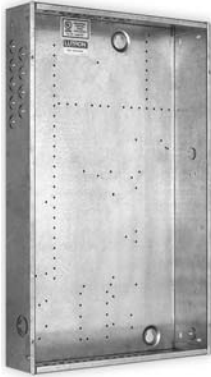| Type	Model No. Prefix	No. of Switching Circuits	Switching Circuit Switching Voltage	Feed Type	Maximum Feed (A)	Maximum Switched Hot Load (A)
Available model numbers (Model No. Example: XPS8-120FT; XPS8-FT for Dual Voltage)						
XPS8 120V						
	XPS	8-	120	FT₁	20	16
277V						
	XPS	8-	277	FT₁	20	16
120/277V (Dual Voltage)						
	XPS	8-		FT₁	20	16
347V₂						
	XPS	8-	347	FT₁	20	16
XPS12 120V						
	XPS	12-	120	FT₁	20	16
277V						
	XPS	12-	277	FT₁	20	16
120/277V (Dual Voltage)						
	XPS	12-		FT₁	20	16
347V₂						
	XPS	12-	347	FT₁	20	16
XPS16 120V						
	XPS	16-	120	FT₁	20	16
277V						
	XPS	16-	277	FT₁	20	16
120/277V (Dual Voltage)						
	XPS	16-		FT₁	20	16
347V₂						
	XPS	16-	347	FT₁	20	16

Footnotes, pg. 2.4.6

1 FT=Feed through only; feed wires terminate at terminal blocks. Branch breaker protection provided by others.

2 Contact Lutron for availability.

Note: Panels listed above are Lutron standard panels. Consult Lutron for additional capabilities, such as job-specific circuit requirements.

**120V/277V/347V 20 – 28 circuits
Feed through**

Type	Model No. Prefix	No. of Switching Circuits	Switching Circuit Switching Voltage	Feed Type	Maximum Feed (A)	Maximum Switched Hot Load (A)
Available model numbers (Model No. Example: XPS20-120FT; XPS20-FT for Dual Voltage)						
XPS20	**120V**					
	XPS	20-	120	FT[1]	20	16
	277V					
	XPS	20-	277	FT[1]	20	16
	120/277V (Dual Voltage)					
	XPS	20-		FT[1]	20	16
	347V[2]					
	XPS	20-	347	FT[1]	20	16
XPS24	**120V**					
	XPS	24-	120	FT[1]	20	16
	277V					
	XPS	24-	277	FT[1]	20	16
	120/277V (Dual Voltage)					
	XPS	24-		FT[1]	20	16
	347V[2]					
	XPS	24-	347	FT[1]	20	16
XPS28	**120V**					
	XPS	28-	120	FT[1]	20	16
	277V					
	XPS	28-	277	FT[1]	20	16
	120/277V (Dual Voltage)					
	XPS	28-		FT[1]	20	16
	347V[2]					
	XPS	28-	347	FT[1]	20	16

Dimensions

Standard Panel

W: 15.88" (404mm)
H: 59.50" (1514mm)
D: 4.25" (108mm)

wt: 80 lbs (37kg)
Ship wt: 90 lbs (41kg)

Footnotes, pg. 2.4.7

1   FT=Feed through only; feed wires terminate at terminal blocks.
    Branch breaker protection provided by others.

2   Contact Lutron for availability.

Note: Panels listed above are Lutron standard panels. Consult Lutron for additional capabilities,
         such as job-specific circuit requirements.

120V/277V/347V 32 – 48 circuits Feed through

Dimensions

Standard Panel

W: 15.88" (404mm)
H: 59.50" (1514mm)
D: 4.25" (108mm)

wt: 80 lbs (37kg)
Ship wt: 90 lbs (41kg)

Type	Model No. Prefix	No. of Switching Circuits	Switching Circuit Switching Voltage	Feed Type	Maximum Feed (A)	Maximum Switched Hot Load (A)
Available model numbers (Model No. Example: XPS32-120FT; XPS32-FT for Dual Voltage)						
XPS32 120V						
	XPS	32-	120	FT[1]	20	16
277V						
	XPS	32-	277	FT[1]	20	16
120/277V (Dual Voltage)						
	XPS	32-		FT[1]	20	16
347V[2]						
	XPS	32-	347	FT[1]	20	16
XPS36 120V						
	XPS	36-	120	FT[1]	20	16
277V						
	XPS	36-	277	FT[1]	20	16
120/277V (Dual Voltage)						
	XPS	36-		FT[1]	20	16
347V[2]						
	XPS	36-	347	FT[1]	20	16
XPS40 120V						
	XPS	40-	120	FT[1]	20	16
277V						
	XPS	40-	277	FT[1]	20	16
120/277V (Dual Voltage)						
	XPS	40-		FT[1]	20	16
347V[2]						
	XPS	40-	347	FT[1]	20	16
XPS44 120V						
	XPS	44-	120	FT[1]	20	16
277V						
	XPS	44-	277	FT[1]	20	16
120/277V (Dual Voltage)						
	XPS	44-		FT[1]	20	16
347V[2]						
	XPS	44-	347	FT[1]	20	16
XPS48 120V						
	XPS	48-	120	FT[1]	20	16
277V						
	XPS	48-	277	FT[1]	20	16
120/277V (Dual Voltage)						
	XPS	48-		FT[1]	20	16
347V[2]						
	XPS	48-	347	FT[1]	20	16

Footnotes, pg. 2.4.8

1 FT=Feed through only; feed wires terminate at terminal blocks.
Branch breaker protection provided by others.

2 Contact Lutron for availability.

Note: Panels listed above are Lutron standard panels. Consult Lutron for additional capabilities, such as job-specific circuit requirements.

120V/277V 8 - 28 circuits
Combination Normal/Emergency
Panel Feed through

Type	Model No. Prefix	No. of Switching Circuits	Panel type – emergency	No. of emergency circuits	Feed Type	Custom Panel Suffix
Available model numbers (Model No. Example: XPS8-EM8-FT-CGP1632)						
XPS8						
	XPS	8	EM	4	FT₁	CGP1632
	XPS	8	EM	8	FT₁	CGP1632
XPS12						
	XPS	12	EM	4	FT₁	CGP1632
	XPS	12	EM	8	FT₁	CGP1632
XPS16						
	XPS	16	EM	4	FT₁	CGP1632
	XPS	16	EM	8	FT₁	CGP1632
XPS20						
	XPS	20	EM	4	FT₁	CGP1632
	XPS	20	EM	8	FT₁	CGP1632
XPS24						
	XPS	24	EM	4	FT₁	CGP1632
	XPS	24	EM	8	FT₁	CGP1632
XPS28						
	XPS	28	EM	4	FT₁	CGP1632
	XPS	28	EM	8	FT₁	CGP1632

Standard-size Softswitch128 feed-through panels are available with internal separation allowing normal and emergency circuits to be wired into the same enclosure. Normal circuits are wired into the top section of the enclosure. Emergency circuits are wired into the bottom section of the enclosure. Each section is controlled by its own Softswitch128 controller, and the sections are considered as separate panels during system programming. Please contact an electrical inspector to ensure that the normal/emergency panel mentioned above complies with your local electrical codes.

— Normal Section

— Electrical Barrier

— Emergency Section

Dimensions

Combination Normal/Emergency Panel

W: 15.88" (404mm)
H: 59.50" (1514mm)
D: 4.25" (108mm)

wt: 80 lbs (37kg)
Ship wt: 90 lbs (41kg)
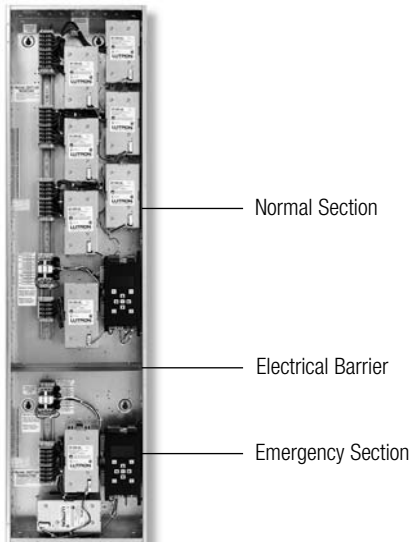
Footnotes, pg. 2.4.9

1 FT=Feed through only; feed wires terminate at terminal blocks.
   Branch breaker protection provided by others.

2 Contact Lutron for availability.

Note: Panels listed above are Lutron standard panels. Consult Lutron for additional capabilities,
       such as job-specific circuit requirements.

Product	Model

Rough-in panel tubs

Rough-in panel tubs

Mini Tub   **TUB16**
    up to 16 circuits

Standard Tub   **TUB48**
    20 – 48 circuits

- Empty panel capable of being mounted without switching gear installed
- Use to pre-wire for installation of SINT interiors

Dimensions

Mini Panel (shown)

W: 15.88" (404mm)
H: 24.50" (623mm)
D: 4.25" (108mm)

Dimensions

Standard Panel

W: 15.88" (404mm)
H: 59.50" (1514mm)
D: 4.25" (108mm)

Mini switching panel interiors
120V/277V 8 – 16 circuits
Feed through

Mounts in Mini Tub (TUB 16)

Shipped with front cover, not shown

Type	Model No. Prefix	No. of Switching Circuits	Switching Circuit Switching Voltage	Feed Type	Maximum Feed (A)	Maximum Switched Hot Load (A)
Available model numbers (Model No. Example: SINT8-120FT)						
SINT8 120V						
	SINT	8-	120	FT₁	20	16
277V						
	SINT	8-	277	FT₁	20	16
SINT12 120V						
	SINT	12-	120	FT₁	20	16
277V						
	SINT	12-	277	FT₁	20	16
SINT16 120V						
	SINT	16-	120	FT₁	20	16
277V						
	SINT	16-	277	FT₁	20	16

Footnotes, pg. 2.4.10

1 FT=Feed through only; feed wires terminate at terminal blocks. Branch breaker protection provided by others.

2 Contact Lutron for availability.

Note: Panels listed above are Lutron standard panels. Consult Lutron for additional capabilities, such as job-specific circuit requirements.

**Standard switching panel interiors
120V/277V 20 – 48 circuits
Feed through**

**Mounts in Standard
Tub (TUB 48)**

Shipped with front
cover, not shown

Type	Model No. Prefix	No. of Switching Circuits	Switching Circuit Switching Voltage	Feed Type	Maximum Feed (A)	Maximum Switched Hot Load (A)
Available model numbers (Model No. Example: SINT20-120FT)						
SINT20 120V						
	SINT	20-	120	FT[1]	20	16
277V						
	SINT	20-	277	FT[1]	20	16
SINT24 120V						
	SINT	24-	120	FT[1]	20	16
277V						
	SINT	24-	277	FT[1]	20	16
SINT28 120V						
	SINT	28-	120	FT[1]	20	16
277V						
	SINT	28-	277	FT[1]	20	16
SINT32 120V						
	SINT	32-	120	FT[1]	20	16
277V						
	SINT	32-	277	FT[1]	20	16
SINT36 120V						
	SINT	36-	120	FT[1]	20	16
277V						
	SINT	36-	277	FT[1]	20	16
SINT40 120V						
	SINT	40-	120	FT[1]	20	16
277V						
	SINT	40-	277	FT[1]	20	16
SINT44 120V						
	SINT	44-	120	FT[1]	20	16
277V						
	SINT	44-	277	FT[1]	20	16
SINT48 120V						
	SINT	48-	120	FT[1]	20	16
277V						
	SINT	48-	277	FT[1]	20	16

Footnotes, pg. 2.4.11

1 FT=Feed through only; feed wires terminate at terminal blocks.
   Branch breaker protection provided by others.

2 Contact Lutron for availability.

Note: Panels listed above are Lutron standard panels. Consult Lutron for additional capabilities,
       such as job-specific circuit requirements..

Product	Model

Dimensions
W: 5.00" (127mm)
H: 7.75" (197mm)
D: 2.50" (64mm)[2]
Mounts on a 4.00" square utility box

Link booster

MX-RPTR[1,2]
MX-RPTR-220/240

- Extends control station/wallstation and power panel links by 2000 ft
- Maximum of three (3) repeaters may be used per link
- Total maximum length including boosters: 8000 ft

Dimensions
W: 5.00" (127mm)
H: 7.75" (197mm)
D: 2.50" (64mm)[2]
Mounts on a 4.00" square utility box

Expansion module

XPS-E-120/277 - FT
XPS-E-220/240 - FT

- Provides increased number of links:
  - 3 links with up to 32 control stations per link for a total of 96 control stations per system

Footnotes, pg. 2.4.12

1 Class 2/PLGV control wiring.
2 Counts as one of 32 maximum Control Station Devices on CSD link.

Product	Model

Dimensions
W: 5.00" (127mm)
H: 7.75" (197mm)
D: 2.50" (64mm)

Mounts on a 4.00"
square utility box

Emergency Light Interface   LUT-ELI-3PH

The LUT-ELI is UL924 Listed as "Emergency Lighting and Power Equipment."

The LUT-ELI senses the normal (non-essential) line voltage on all three phases (3PH) of normal power. When one or more phases of power are lost, the LUT-ELI will send a signal to the Softswitch128 controller with emergency (essential) power, causing it to enter the emergency lighting mode. Any lights controlled by these devices will go to the emergency light level setting (factory set to 100% intensity). When normal power is restored the lights will return to their previous status.

The interface mounts to a standard 4" x 4" junction box. It is powered by RadioTouch™, GP, XP, or LP panel's 24-volt supply. The interface can detect 100 to 347 VAC 50/60Hz.

- UL 924 Listed
- Pilot light indicates the phase status
- A test switch is provided to simulate an emergency situation
- The interface has normally open or normally closed inputs for a Fire Alarm Control Panel (FACP)
- Sense voltage range is 100-347VAC 50/60Hz, 3 Phase
- Sense voltage input to the LUT-ELI MUST be from the NORMAL (Non-Essential) power source.

3 Phase Diagram
Guide to Power Source Wiring

Wire:	Connects to:
Red Wire	Phase A
Red Wire	Phase B
Red Wire	Phase C
White Wire	Neutral
Green Wire	Ground
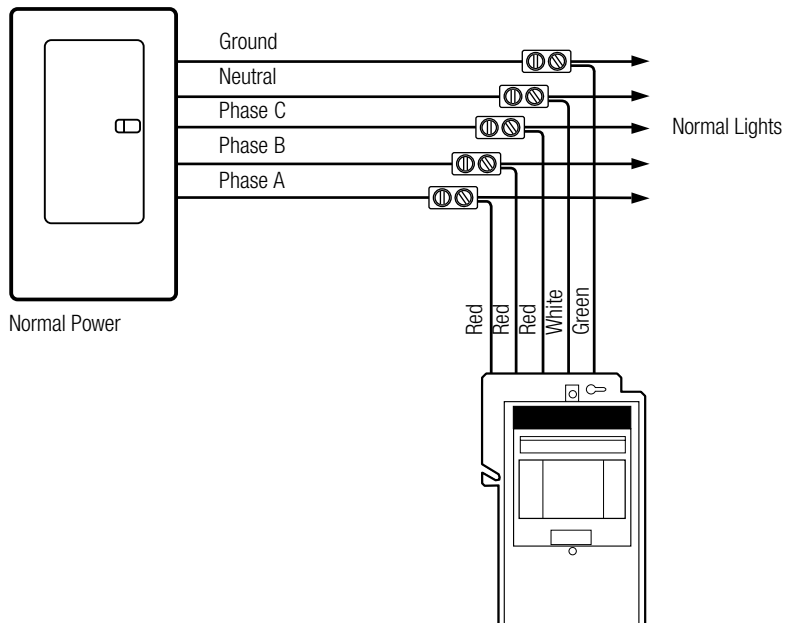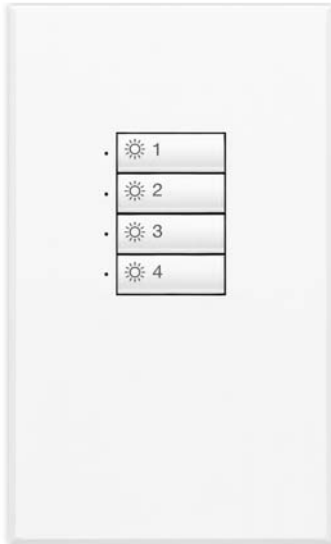
seeTouch Wallstation

Softswitch System Map

- Use the map at right to identify system component being reviewed in each section
- For overall wiring information, see pg. 2.3.1

Wallstation features

- **Softswitch128** System wallstations can be configured through the panel's controller to perform a variety of functions for local control of system (e.g. select patterns of light, toggle circuits, delay to off, select patterns of contact closure outputs)

- **seeTouch**™ wallstations offer:
  - Large, rounded buttons that are easy to use
  - User-changeable button and faceplate assemblies which make for easy customization
  - Optional engraving is angled up to the eye for easy reading
  - On-button engraving and backlit buttons for improved clarity of control functions in low light conditions
  - Three engraving options: General, Standard Text, & Non-Standard Text Engraving (Visit the website at www.lutron.com/seetouch)

| **seeTouch** | **1-Button** | **Keyswitch** | **European** |
| pgs. 2.5.2 | wallstation pg. 2.5.4 | wallstation pg. 2.5.4 | wallstation pg. 2.5.5 |

Sources

Mini switching panel

Occupancy sensors

Switching panels   seeTouch wallstations   1-Button wallstations   Control interfaces
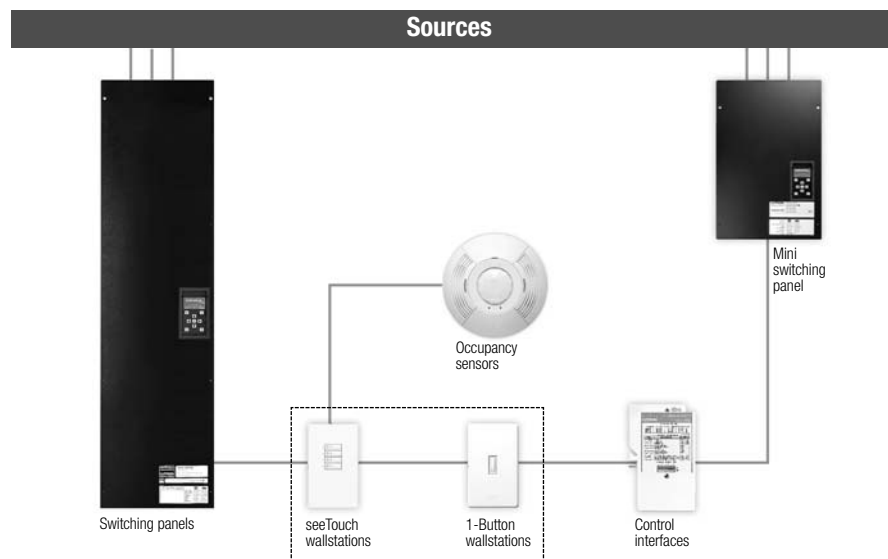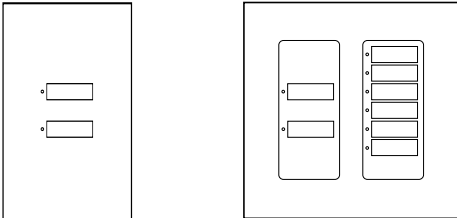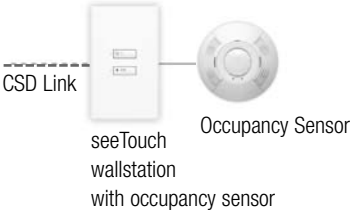
Specifications

- Wire specification and maximums:
  - Wire: (2) #12 AWG (2.5mm2), (1) twisted, shielded pair #18 AWG (1.0mm2) plus (1) #18 AWG (1.0mm2); for Lutron cable, see pg. 2.5.4
  - Distance: 2,000' (610m); 8,000' (2400m) with use of three MX-RPTR, pg. 2.4.12
  - Installation: Daisy chain (no home-run wiring)
- Power:
  - 24V --- fullwave (from Softswitch128 Controller)
- Configuration:
  - Through panel's controller
- Mounting:
  - Standard US wallbox unless otherwise noted
  - No derating required when multiganged

Standards

Standards listed below apply to one or more products in the Lutron product line. Consult Lutron for specific information.

LUTRON
Quality Systems
registered
to ISO 9001

Product	Model	Color	Suffix

seeTouch™

1-Button

2-Button

3-Button

4-Button

4-Button NRL

5-Button

6-Button

7-Button

Dimensions
W: 2.75" (70mm)
H: 4.56" (116mm)
D: 1.06" (27mm)[1]
Wallbox Size:
single-gang

seeTouch wallstations with contact closure input [2, 3]

No insert style

1-Button	**SO-1BN-**
2-Button	**SO-2BN-**
3-Button	**SO-3BN-**
4-Button	**SO-4BN-**
4-Button	**SO-4NRLN-**
5-Button	**SO-5BN-**
6-Button	**SO-6BN-**
7-Button	**SO-7BN-**

Insert style (for multigang use)

1-Button	**SO-1BI-**
2-Button	**SO-2BI-**
3-Button	**SO-3BI-**
4-Button	**SO-4BI-**
4-Button	**SO-4NRLI-**
5-Button	**SO-5BI-**
6-Button	**SO-6BI-**
7-Button	**SO-7BI-**

- Functions (configured through Controller):
- Toggle circuits
- Recall patterns of light
- Delay to off
- Recall patterns of contact closure outputs
- General Engraving option (EGN) shown
- For seeTouch model number guide, see pg. 2.10.1
- Inputs on back of wallstation for two contact closure inputs
- Contact Closure Input specifications
- Input must be dry contact closure or open collector (NPN) with:
- On-state saturation voltage less than 2.0V (line w/ 3 dots) at 0.1mA
- Off-state leakage current less than 50uA at 5V (line w/ 3 dots)
- Open circuit voltage 36V (line w/ 3 dots) maximum
- Short circuit current 4.0mA maximum

No Insert-style

Insert-style for
Multigang Applications

Footnotes, pg. 2.5.2

1   Depth includes wallplate and backbox. Wallplate depth is 0.31" (8mm).
2   Class 2/PELV control wiring.
3   Counts as one of 32 maximum Control Station Devices on CSD link.

Ordering example

SO-1BN-WH-EGN

add color/finish and engraving suffix to model #

For choices see:
www.lutron.com/seetouch

Matte finishes

Ships in 48 hrs.

White	WH
Ivory	IV
Beige	BE
Gray	GR
Brown	BR
Black	BL

Gloss (NEMA) finishes

Ships in 48 hrs.
(Insert models only)

White	GWH
Light Almond	GLA

Metal finishes

Ships in 4-6 weeks.

Bright Brass	BB
Bright Chrome	BC
Bright Nickel	BN
Satin Brass	SB
Satin Chrome	SC
Satin Nickel	SN
Antique Brass	QB
Antique Bronze	QZ

Anodized Aluminum

Clear	CLA
Black	BLA
Brass	BRA

Satin finishes

Ships in 48 hrs.

- See www.lutron.com/ products/colors for color offering and suffixes.

Customization

Ships in 4-6 weeks.

- Contact Lutron customer service for multigang wallplates, color matching, engraving/silk screening, and custom controls.

Locking covers

- See pg. 2.9.2 for more information.

	Product	Model	Color	Suffix

seeTouch™

1-Button

2-Button

3-Button

4-Button

4-Button NRL

5-Button

6-Button

7-Button

Dimensions
W: 2.75" (70mm)
H: 4.56" (116mm)
D: 1.06" (27mm)[1]

Wallbox Size:
single-gang

seeTouch wallstations with occupancy sensor/contact closure input[2, 3]

No insert style

1-Button	**SO-1BON-**
2-Button	**SO-2BON-**
3-Button	**SO-3BON-**
4-Button	**SO-4BON-**
4-Button	**SO-4NRLON-**
5-Button	**SO-5BON-**
6-Button	**SO-6BON-**
7-Button	**SO-7BON-**

Insert style (for multigang use)

1-Button	**SO-1BOI-**
2-Button	**SO-2BOI-**
3-Button	**SO-3BOI-**
4-Button	**SO-4BOI-**
4-Button	**SO-4NRLOI-**
5-Button	**SO-5BOI-**
6-Button	**SO-6BOI-**
7-Button	**SO-7BOI-**

- Functions (configured through Controller):
  - Toggle circuits
  - Recall patterns of light
  - Delay to off
  - Recall patterns of contact closure outputs
- Input on back of wallstation for one occupancy sensor. For more than one occupancy sensor see application note 2.11.10
- Occupancy sensor specifications:
  - Input for one occupancy sensor, pg. 2.11.10
  - Supply: 24V⎓, 50mA maximum
- General Engraving option (EGN) shown
- Wallstation supplies power for and receives a control signal back from one occupancy sensor. For more than one occupancy sensor see application note on page 2.11.10
- For seeTouch Model Number Guide, see pg. 2.10.1

CSD Link

seeTouch
wallstation
with occupancy sensor

Occupancy Sensor

Footnotes, pg. 2.5.3
1 Depth includes wallplate and backbox. Wallplate depth is 0.31" (8mm).
2 Class 2/PELV control wiring.
3 Counts as one of 32 maximum Control Station Devices on CSD link. seeTouch wallstation that is supplying power to an occupancy sensor counts as two control station devices.

Ordering example

SO-1BON-WH-EGN

add color/finish and engraving suffix to model #

For choices see:
www.lutron.com/seetouch

Matte finishes

Ships in 48 hrs.

White	WH
Ivory	IV
Beige	BE
Gray	GR
Brown	BR
Black	BL

Gloss (NEMA) finishes

Ships in 48 hrs.
(Insert models only)

White	GWH
Light Almond	GLA

Metal finishes

Ships in 4-6 weeks.

Bright Brass	BB
Bright Chrome	BC
Bright Nickel	BN
Satin Brass	SB
Satin Chrome	SC
Satin Nickel	SN
Antique Brass	QB
Antique Bronze	QZ

Anodized Aluminum

Clear	CLA
Black	BLA
Brass	BRA

Satin finishes

Ships in 48 hrs.

- See www.lutron.com/products/colors for color offering and suffixes.

Customization

Ships in 4-6 weeks.

- Contact Lutron customer service for multigang wallplates, color matching, engraving/silk screening, and custom controls.

Locking covers

- See pg. 2.9.2 for more information.

	Product	Model	Color	Suffix

1-Button/Keyswitch

Dimensions
W: 2.86" (73mm)
H: 4.60" (117mm)
D: 0.23" (5.8mm)[2]
Wallbox Size:
single-gang

Dimensions
W: 2.75" (70mm)
H: 4.56" (116mm)
D: 2.00" (51mm)[1]
Wallbox Size:
single-gang

1-Button wallstation

Without status light	**FOMX-1B**
With status light	**FOMX-1B-SL**

- Functions (configured through Controller):
  - Toggles any zone(s) ON/OFF with single tap button
  - Status LED is lit when zone is on
- Available in white (WH) only - white frame and white button
- Shipped with screwless Lutron Fassada Fashion Wallplates
- Can be ganged in standard opening multigang faceplates with other FOMX 1-Button wallstations; multigang Fassada™ Fashion wallplates available from Lutron

Keyswitch **NTOMX-KS**

- Provides momentary keyswitch control for two programmable functions (clockwise, counter-clockwise)
- Functions (configured through Controller):
  - Toggle circuits
  - Recall patterns of light
  - Delay to off
  - Recall patterns of contact closure outputs

Low-Voltage cable[4]

250' spool	**GRX-CBL-46L-250** (non-plenum)
	GRX-PCBL-46L-250 (plenum)
500' spool	**GRX-CBL-46L-500** (non-plenum)
	GRX-PCBL-46L-500 (plenum)

- Five conductors:
  two #12 AWG power wires;
  two #22 AWG control wires;
  one #18 AWG sense line

Footnotes, pg. 2.5.4

1 Depth includes wallplate and backbox. Wallplate depth is 0.30" (8mm).
2 Class 2/PELV control wiring.
3 Counts as one of 32 maximum Control Station Devices on CSD link.
4 For information on cable size and distance, see "Application Note W14" on the Lutron website.

Ordering example
NTOMX-KS-WH

add color/finish suffix to model #

Matte finishes
Standard, ships in 48 hrs.

White	WH
Ivory	IV
Beige	BE
Gray	GR
Brown	BR
Black	BL

Metal finishes
Ships in 4-6 weeks.

Bright Brass	BB
Bright Chrome	BC
Bright Nickel	BN
Satin Brass	SB
Satin Chrome	SC
Satin Nickel	SN
Antique Brass	QB
Antique Bronze	QZ

Anodized aluminum
Clear	CLA
Black	BLA
Brass	BRA

Customization
Ships in 4-6 weeks.

- Contact Lutron customer service for multigang wallplates, color matching, engraving/silk screening, and custom controls.

Locking covers
- See pg. 2.9.2 for more information.

	Product	Model	Color	Suffix

European-Style

Dimensions

W: 3.38" (86mm)
H: 3.38" (86mm)
D: 0.88" (22mm)[1]
Wallbox Size: UK/German,
single-gang

Dimensions

W: 3.38" (86mm)
H: 3.38" (86mm)
D: 0.88" (22mm)[1]
Wallbox Size: UK/German,
single-gang

2-button wallstation   EOMX-2B-[2, 3]

- Typical functions (configured through software):
  - Recalls preset light levels for two scenes
  - Reflects door status of one or two partitions
  - Enable/disable wallstations
  - Start/stop one sequence
  - Enable/disable timeclock/security override Scene 1
  - Fine-tuning of individual zones
- Mounts in UK/German wallbox (Lutron P/N 241-683)

4-button wallstation   EOMX-4B-[2, 3]

- Typical functions (configured through software):
  - Recalls preset light levels for four scenes plus off
  - Fine-tuning of light levels with master raise/lower
- Mounts in UK/German wallbox (Lutron P/N 241-683)

Ordering example

EOMX-2B-WH

add color/finish suffix to model #

Matte finishes

Standard, ships in 48 hrs.

White	WH
Black	BL

Metal finishes

Ships in 4-6 weeks.

Bright Brass	BB
Bright Chrome	BC
Bright Nickel	BN
Satin Brass	SB
Satin Chrome	SC
Satin Nickel	SN
Antique Brass	QB
Antique Bronze	QZ

Anodized aluminum

Clear	CLA
Black	BLA
Brass	BRA

Customization

Ships in 4-6 weeks.

- Contact Lutron customer service for multigang wallplates, color matching, engraving/silk screening, and custom controls.

Locking covers

- See pg. 2.9.2 for more information.

Footnotes, pg. 2.5.5
1 Depth includes wallplate and backbox. Wallplate depth is 0.48" (12mm).
2 Class 2/PELV control wiring.
3 Counts as one of 32 maximum Control Station Devices on CSD link.

Contact Closure Interface

Softswitch128 System Map
- Use the map at right to identify the system component being reviewed in this section
- For overall wiring information, see pg. 2.3.1

Control interface features
- Allows **Softswitch128** System to integrate with other manufacturers' equipment
- Connect through contact closure inputs/outputs
- RS232 integration
- Daylighting sensors and control

Sources

Switching panels · seeTouch wallstations · Occupancy sensor · 1-Button wallstations · Control interfaces · Mini switching panel

Specifications
- Wire specification and maximums for Control Station Device (CSD) Link:
  - Wire: (2) #12 AWG (2.5mm2) and (1) twisted shielded pair #18 AWG (1.0mm2)
  - For Lutron cable, see pg. 2.5.4
  - Distance: 2,000' (610m); 8,000' (2400m) with use of three MX-RPTR, pg. 2.4.12
  - Installation: Daisy chain (no home-run wiring)
- Power:
  - 24V ⎓ Full Wave (From Softswitch128 Controller)
- Configuration:
  - Through panel's controller

Standards
Standards listed below apply to one or more products in the Lutron product line. Consult Lutron for specific information.

LUTRON
Quality Systems
registered
to ISO 9001

	Contact Closures		Serial Links			
Features/functions	OMX-AV pg. 2.6.3	OMX-CCO-8 pg. 2.6.3	OMX-CI-RS232 pg. 2.6.5	OMX-CI-NWK-E pg. 2.6.5	BACnet® Interface pg. 2.6.4	LonWorks® Interface pg. 2.6.4
Preset scene control						
Select scene	●		●	●		
Scene status feedback	●		●[1]	●[1]		
Security/life safety						
Initiate a programmed "panic-on" mode through contact closure input	●					
Occupant response						
Lighting control based on occupancy	●					
Lockout						
Zone lock – prevent intensity changes on selected zones	●		●	●		
Scene lock – disable scene selection within a space	●		●	●		
Scheduling						
External time clock – scene selection through contact closure inputs	●					
Zone control						
Zone on/off status feedback	●		●[1]	●[1]	●	●
Open collector (NPN) output	●					
Dry contact closure output		●				
RS232 integration			●	●		
BACnet integration					●	
LonWork integration						●

Footnotes, pg. 2.6.2
1   Status is returned upon request

Product	Model

Dimensions
W: 5.00" (127mm)
H: 7.75" (197mm)
D: 2.50" (64mm)

Mounts on a 4.00"-square utility box

Contact closure interface   OMX-AV[1, 2]

- Provides two-way interface between Controls and Softswitch128 System
- Functions (configured through Controller):
  - Toggle circuits
  - Recall patterns of light
  - Delay to off
  - Recall patterns of contact closure outputs
- Five inputs and five outputs
- Inputs and outputs can be momentary or maintained
- Output requires external relay and power supply (30VDC maximum) by others for contact closure
- Inputs specification:
  - Input must be dry contact closure or open collector (NPN) with:
    - On-state saturation voltage less than 2.0VDC
    - Off-state leakage current less than 10 mA
  - Open circuit voltage 36V maximum
  - Short circuit current 4.0 mA maximum
- Outputs specification:
  - 38V maximum
  - 200 mA maximum
  - Open collector (NPN) output
  - On-state saturation voltage 1.0V maximum
  - Off-state leakage current 0.1 mA maximum
- Works with occupancy sensors, pg. 2.8.1
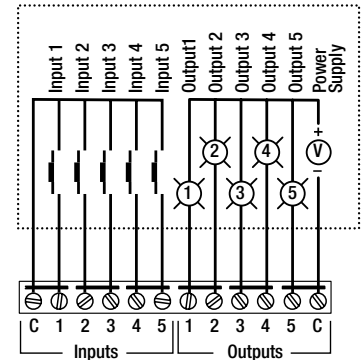
OMX-AV
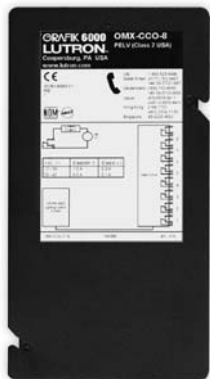
Dimensions
W: 5.75" (146mm)
H: 10.75" (273mm)
D: 2.00" (51mm)

Contact closure output interface OMX-CCO-8[1, 2]

- Provides eight dry contact closure outputs
- For integration to 3rd party controllable window treatments or A/V equipment
- May be wired as normally open (NO) or normally closed (NC)
- May be set to momentary or maintained contacts
- Output ratings: 0-30V, 10A and 30-42V, 0.5A

Footnotes, pg. 2.6.3
1 Class 2/PELV control wiring.
2 Counts as one of 32 maximum Control Station Devices on CSD link.

Product	Model

BACnet® interface[1,2]

XPS-A-BAC-ET-120[1,2]
XPS-A-BAC-IP-120[1,2]

- Integrates Softswitch128 system with digital equipment (BMS) that supports BACnet.
- Requires (1) Lutron OMX-CI-RS232
- ET-120 uses BACnet Ethernet protocol
- IP-120 uses BACnet IP protocol

Dimensions
W: 6.10" (155mm)
H: 12.50" (317mm)
D: 3.30" (84mm)

BMS —————— ———— to system

BACnet   OMX-CI-RS232
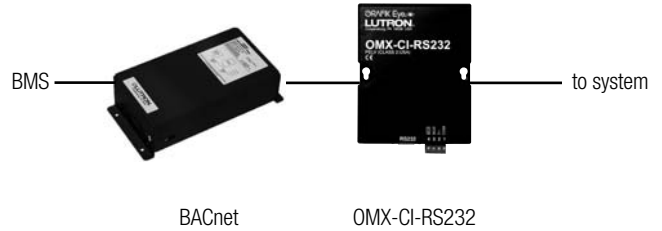
LonWorks® interface[1,2]   **XPS-A-LON-FT-120[1,2]**

- Integrates Softswitch128 system with digital equipment (BMS) that supports LonWorks communication
- Requires (1) Lutron OMX-CI-RS232

Dimensions
W: 6.10" (155mm)
H: 12.50" (317mm)
D: 3.30" (84mm)

BMS —————— ———— to system

XPS-A-LON   OMX-CI-RS232
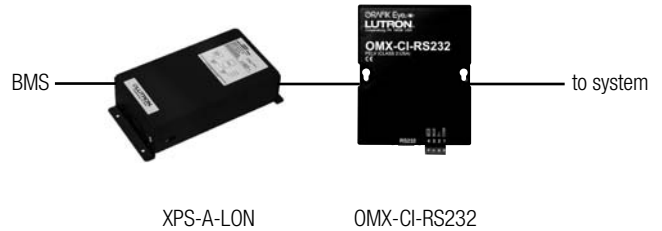
Footnotes, pg. 2.6.4
1 Class 2/PELV control wiring.
2 Counts as one of 32 maximum Control Station Devices on CSD link.

Product	Model

CI-RS232 interface   **OMX-CI-RS232**[1, 2]

- Integrates Softswitch128 system with digital equipment that supports RS232 communication
- Uses OMX-CI-RS232 command set

Dimensions
W: 3.75" (95.3mm)
H: 5.26" (133.6mm)
D: 1.06" (26.9mm)

CI-NWK interface   **OMX-CI-NWK-E**[1, 2]

- Integrates Softswitch128 system with digital equipment that supports TCP/IP communication over Ethernet
- Uses OMX-CI-RS232 command set

Dimensions
W: 3.75" (95.3mm)
H: 5.26" (133.6mm)
D: 1.06" (26.9mm)

Footnotes, pg. 2.6.5
1 Class 2/PELV control wiring.
2 Counts as one of 32 maximum Control Station Devices on CSD link.

Daylight sensor features

Daylight sensor

- Allows Softswitch128 System circuits to be switched ON or OFF based on the the light level detected
- Connect through contact closure inputs/outputs located on the panel
- Connect through contact closure inputs/outputs located seeTouch™ wallstations
- Can be used to override the astronomical and time-of-day clock for dark or cloudy days

Softswitch128 System Map
- Use the map at right to identify system component being reviewed in each section
- For overall wiring information, see pg. 2.3.1

Sources

Daylight sensor single level controller

Daylight sensor   24 VAC Transformer

Mini switching panel

Occupancy sensors

Switching panels   seeTouch wallstations   1-Button wallstations   Control interfaces

Specifications

- Wire specification and maximums for Control Station Device (CSD) Link:
  - Wire: (2) #12 AWG (2.5mm2) and (1) twisted shielded pair #18 AWG (1.0mm2)
  - For Lutron cable, see pg. 2.5.4
  - Distance: 2,000' (610m); 8,000' (2,400m) with use of three MX-RPTR, pg. 2.4.12
  - Installation: Daisy chain (no home-run wiring)
- Power:
  - 24V ⎓ Full Wave (From Softswitch128 Controller)
- Configuration:
  - Through Panel's Controller

Standards

Standards listed below apply to one or more products in the Lutron product line. Consult Lutron for specific information.

LUTRON Quality Systems registered to ISO 9001

Product	Model

Daylight sensor dimensions

L: 2.58" (66mm)
D: 1.28" (32mm)

**Daylight sensor single level
controller dimensions**

W: 2.57" (65mm)
H: 1.58" (90mm)
D: 4.75" (121mm)

Daylight sensor kits

Outdoor   **PC5AD**

40-500 fc

Indoor   **PC1A**

6-50fc

- Switches system circuits ON and OFF through
  a contact closure output based on the light level detected

- Light level settings are flexible to accommodate
  many different lighting environments

- Kit includes:
  - outdoor (PC5AD) or indoor (PC1A) daylight sensor
  - single level controller
  - 24VAC power supply transformer

Daylight sensor using seeTouch™

Daylight
sensor
Single Level
Controller

CSD Link

seeTouch
Wallstation
with CCI

Daylight
sensor

24 VAC
Transformer
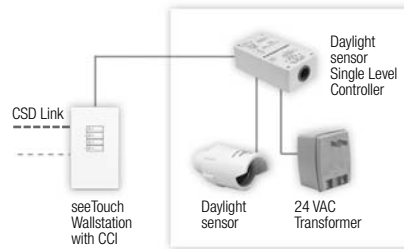
Daylight sensor using softswitch128 controller

Daylight
Sensor
Single Level
Controller

Switching
Panels

Daylight
Sensor

24 VAC
Transformer
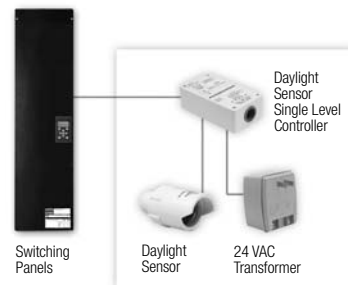
Occupancy sensor features

Occupancy Sensor

- Allows Softswitch128 System to integrate with other manufacturers' equipment
- Connect through contact closure inputs/outputs
- RS232 integration
- Daylighting sensors and control
- Occupancy sensors

Softswitch128 System Map

- Use the map at right to identify system component being reviewed in each section
- For overall wiring information, see pg. 2.3.1

Sources

Mini switching panel

Occupancy sensor

Dimming panels   seeTouch wallstations   1-Button wallstations   Control interfaces

Specifications

- Wire specification and maximums for Control Station Device (CSD) Link:
  - Wire: (2) #12 AWG (2.5mm2) and (1) twisted shielded pair #18 AWG (1.0mm2)
  - For Lutron cable, see pg. 2.5.4
  - Distance: 2,000' (610m); 8,000' (2,400m) with use of three MX-RPTR, pg. 2.4.12
  - Installation: Daisy chain (no home-run wiring)
- Power:
  - 24V Full Wave (From Softswitch128 Controller)
- Configuration:
  - Through Panel's Controller

Standards

Standards listed below apply to one or more products in the Lutron product line. Consult Lutron for specific information.

LUTRON Quality Systems registered to ISO 9001

Occupancy Sensor

Dimensions

W: 4.50" (114mm)

D: 1.40" (38mm)

Dual technology sensor

Model	Color	Coverage (sq ft)	Field of View
LOS-CDT-500-WH	White	500	180°
LOS-CDT-500R-WH	White	500	180°
LOS-CDT-1000-WH	White	1,000	180°
LOS-CDT-1000R-WH	White	1,000	180°
LOS-CDT-2000-WH	White	2,000	360°
LOS-CDT-2000R-WH	White	2,000	360°

Infrared sensor

Model	Color	Coverage (sq ft)	Field of View
LOS-CIR-450-WH	White	450	360°
LOS-CIR-1500-WH	White	1,500	360°

Ultrasonic sensor

Model	Color	Coverage (sq ft)	Field of View
LOS-CUS-500-WH	White	500	180°
LOS-CUS-1000-WH	White	1,000	180°
LOS-CUS-2000-WH	White	2,000	360°

- 20-24 VDC, Class 2 (PELV) low-voltage wiring
- Integrate with Lutron systems (no power pack needed) or function as stand-alone controls using a Lutron power pack
- Non-volatile memory (saved changes are stored during loss of power)
- Model with additional output (dry contact closure) available
- 8-second test mode to easily confirm proper operation

Dual technology sensor

Model	Color	Coverage (sq ft)	Field of View
LOS-WDT-WH	White	1,600	110°
LOS-WDT-R-WH[1]	White	1,600	110°

Infrared sensor

Model	Color	Coverage (sq ft)	Field of View
LOS-WIR-WH	White	1,600	110°

Occupancy Sensor

Dimensions

W: 2.70" (69mm)

H: 6.60" (168mm)

D: 3.20" (94mm)

Footnotes, pg. 2.8.2

1 Models with 'R' provide an additional dry contact closure to integrate with other building systems such as HVAC of security systems.

	Product	Model	Color	Suffix

Six-port frame jack [1,2,3]

NT-6PF-

- Field customizable, multi-port frame offering six ports (matching blanks provided in frame)
- Multiple connector types available (Phone, Cable, Fiber, BNC)
- Connectors snap to fit into frame
- Frame fits faceplates with a Designer opening
- Can be used in single and multigang applications

Connectors

- For use with 6-port frame (NT-6PF-), each connector fills one port.
- Connectors available in white (WH) only. For information about additional colors or connectors contact Lutron customer service.

Telephone jacks

6-conductor, RJ11,Category 3 **CON-1P-C3-WH**

8-conductor, RJ45,Category 5e **CON-1P-C5E-WH**

8-conductor, RJ45,Category 6 **CON-1P-C6-WH**

Fiber jacks

MT-RJ feed through **CON-1F-MTRJ-WH**

SC simplex **CON-1F-SC-WH**

LC non-flush mount **CON-1F-LC-WH**

ST style **CON-1F-ST-WH**

Cable jack

F-style, 75-Ohm coaxial cable **CON-1C-WH**

BNC jack

BNC connector, 50-Ohm **CON-1B-WH**

Footnotes, pg. 2.9.1

1 No derating required if ganged.
2 A physical barrier (partition) must exist when ganging with 120V products.
3 Trim is white around white, ivory, and beige telephone jacks. Trim is black around gray, brown, and black telephone jacks. Trim is black around custom and special metals.

Ordering example

NT-6PF-<u>WH</u>
add color/finish suffix to model #

Matte finishes

Standard, ships in 48 hrs.
White	WH
Ivory	IV
Beige	BE
Gray	GR
Brown	BR
Black	BL

Metal finishes

Ships in 4-6 weeks.
Bright Brass	BB
Bright Chrome	BC
Bright Nickel	BN
Satin Brass	SB
Satin Chrome	SC
Satin Nickel	SN
Antique Brass	QB
Antique Bronze	QZ

Anodized Aluminum
Clear	CLA
Black	BLA
Brass	BRA

Customization

Ships in 4-6 weeks.
- Contact Lutron customer service for multigang wallplates, color matching, engraving/silk screening, and custom controls.

Product	Model	Color	Suffix

1-Gang Dimensions
W: 2.75" (70mm)
H: 4.56" (116mm)
D: 0.30" (7.6mm)

2-Gang Dimensions
W: 4.56" (116mm)
H: 4.56" (116mm)
D: 0.30" (7.6mm)

3-Gang Dimensions
W: 6.32" (161mm)
H: 4.56" (116mm)
D: 0.30" (7.6mm)

4-Gang Dimensions
W: 8.45" (215mm)
H: 4.56" (116mm)
D: 0.30" (7.6mm)

Wallplates

1-Gang	**NT-R-FB-**
2-Gang	**NT-RR-FB-**
3-Gang	**NT-RRR-FB-**
4-Gang	**NT-RRRR-FB-**

- Opening fit insert-style wallstations
- No visible screws
- For larger sizes, contact Lutron

Lockable covers

1-Gang	**GRX-1GLC**
2-Gang	**GRX-2GLC**
3-Gang	**GRX-3GLC**
4-Gang	**GRX-4GLC**

- Prevents tampering with GRAFIK Eye® Control Units or wallstations
- Permits infrared operation
- Translucent smoked gray
- Cover slides left or right

Ordering example

NT-R-FB-<u>WH</u>
add color/finish suffix to model #

Matte finishes

Standard, ships in 48 hrs.
White	WH
Ivory	IV
Beige	BE
Gray	GR
Brown	BR
Black	BL

Metal finishes

Ships in 4-6 weeks.
Bright Brass	BB
Bright Chrome	BC
Bright Nickel	BN
Satin Brass	SB
Satin Chrome	SC
Satin Nickel	SN
Antique Brass	QB
Antique Bronze	QZ

Anodized Aluminum
Clear	CLA
Black	BLA
Brass	BRA

Customization

Ships in 4-6 weeks.
- Contact Lutron customer service for multigang wallplates, color matching, engraving/silk screening, and custom controls.

How to build seeTouch models

❶ **❷❸❹**   **❺** **❻** **❼**

| SO | – | 2B | O | N | – | WH | – | E | 01 |

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❶ Series	**❷** Button Configurations	**❸** Inputs	**❹** Non-Insert or Insert

SO – **2B** **O** **N**

Choose the button configuration.

Choose occupancy sensor inputs (O) or 2 standard contact closures (blank).

Use NON-INSERT (N) Models for a clean single-gang look. Use INSERT (I) Models for multigang applications.

SO — Wallstation with button and wallplate kit

Non-insert (N) models

| 1B | 2B | 3B | 4B | 4NRL | 5B | 6B | 7B |

Insert (I) models

| 1B | 2B | 3B | 4B | 4NRL | 5B | 6B | 7B |

2 CCI inputs on wallstation

N — Non-Insert for single-gang use

O — One occupancy sensor

I — Insert for multigang use

SR — Button and wallplate replacement kits

Includes wallplate adapter, button assembly, wallplate

Non-insert (N) models

| 1B | 2B | 3B | 4B | 4NRL | 5B | 6B | 7B |

Insert (I) models

| 1B | 2B | 3B | 4B | 4NRL | 5B | 6B | 7B |

N — Non-Insert for single-gang use

I — Insert for multigang use

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❺ Colors/Finishes

W H

Insert a Color/Finish code into the model number.

Matte

WH	White[3]
BE	Beige[3]
IV	Ivory[2]
GR	Gray[2]
BR	Brown[2]
BL	Black[2]

Gloss[1]

GWH	White[3]
GLA	Light Almond[3]

Metal

SB	Satin Brass[2]
BB	Bright Brass[2]
BC	Bright Chrome[2]
QB	Antique Brass[2]
QZ	Antique Bronze[2]
SC	Satin Chrome[2]
SN	Satin Nickel[2]
BN	Bright Nickel[2]
CLA	Clear Anodized Aluminum[2]
BLA	Black Anodized Aluminum[2]
BRA	Brass Anodized Aluminum[2]

Satin[1]

SW	Snow[3]
BI	Biscuit[3]
ES	Eggshell[3]
TP	Taupe[2]
MN	Midnight[2]
BT	Blue Mist[3]
LS	Limestone[2]
ST	Stone[2]
DS	Desert Stone[2]
TC	Terracotta[2]
OC	Ochre[2]
HT	Hot[2]
MR	Merlot[2]
GB	Greenbriar[2]
BG	Bluestone[2]
CB	Cobalt[2]
SI	Sienna[2]

Footnotes, pg. 49

1 Gloss and satin colors available for Insert models only.
2 Illuminated (backlit) text with opaque buttons. Metals have black buttons.
3 Illuminated (backlit) buttons with opaque text.

❻ Language

E

Standard Text Engraving is available in 13 languages. Insert a language code into the model number.

Arabic	**A**
Chinese	**C**
Danish	**D**
Dutch	**N**
English	**E**
French	**F**
German	**G**
Italian	**I**
Japanese	**J**
Portuguese, Brazil	**B**
Portuguese, Europe	**P**
Spanish, Europe	**S**
Spanish, Americas	**L**

Note: Language is not required for non-standard text engraving **NST**, see right.

❼ Engraving Choices

0 1

3 options are available for engraving. Insert an engraving code into the model number.

General

Add **GN** to model number. Language code is required.

Standard text

01 — **99**

Available in a number of standard choices. Language code and engraving number is required. For choices, see www.lutron.com/seetouch.

Non-standard text

(Replacement Kits Only)

Offers customized button engraving to suit particular needs. To order, contact Lutron customer service. Add **NST** to model number. No language code is required.

Multigang Ordering

Controls: Order Insert (I) models for multigang installations. Contact Lutron for multigang installations using Non-Insert (N) models.

Wallplates: seeTouch button assemblies are NOT provided with multigang wallplates. Use the button assemblies provided with Insert (I) Models or Button Replacement Kits. Contact Lutron customer service for multigang wallplates.

Solution 1: Normal/Emergency application using Lutron Power Panels

Panel link requires three #18 AWG wires plus one pair of 22 AWG standed data cable. Use Lutron GRX-CBL-46L or equivalent

Control link requires two #12 AWG wires plus one pair of 22 AWG stranded data cable. Use Lutron GRX-CBL-46L or equivalent
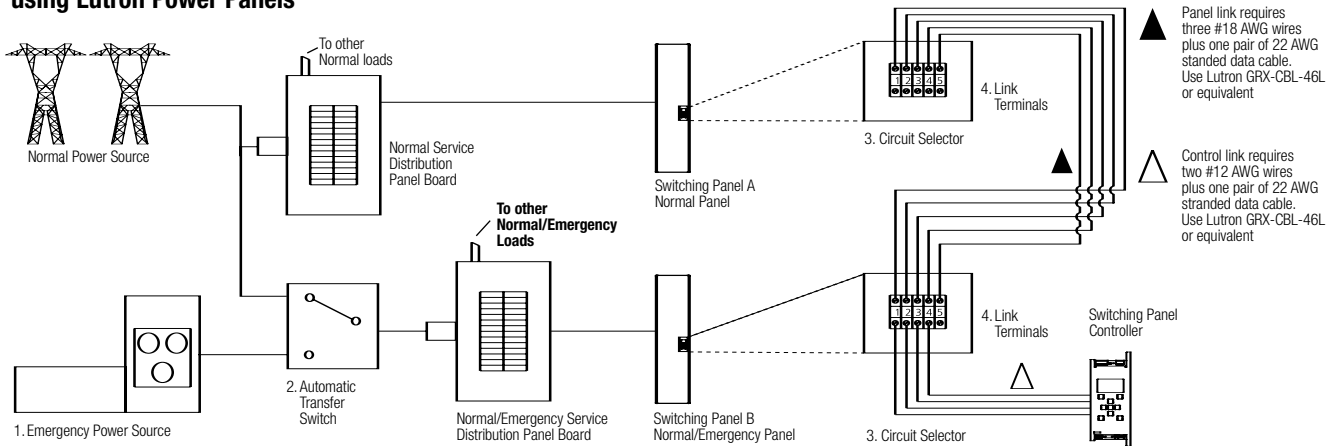
How it works

1. When Normal power is available, both the Normal and Normal/Emergency panels are energized and respond to controls.

2. Upon loss of Normal power, all circuits connected to the Normal panel go out.

3. The Circuit Selector in the Normal/Emergency Panel, via the Control Link sense line from the Normal panel, senses the loss of Normal power.

4. The Automatic Transfer Switch delivers power to the Normal/Emergency Panel from the Emergency Power Source.

5. When Emergency Power is on, the Circuit Selector in the Normal/Emergency Panel overrides all controls and sets all circuits connected to Normal/Emergency Panel to preset emergency levels (normally full-on).

6. Upon restoration of Normal power, the UL1008 transfer switch diverts power to the Normal/Emergency panel back to the Normal power source. The Circuit Selector in the Normal/Emergency panel returns intensity control back to the switching controls. All circuits in the Normal/Emergency panel and the Normal panel return to the intensity levels at which they were set prior to the loss of Normal power.

Solution 2: Normal/Emergency application using Automatic Transfer Switches
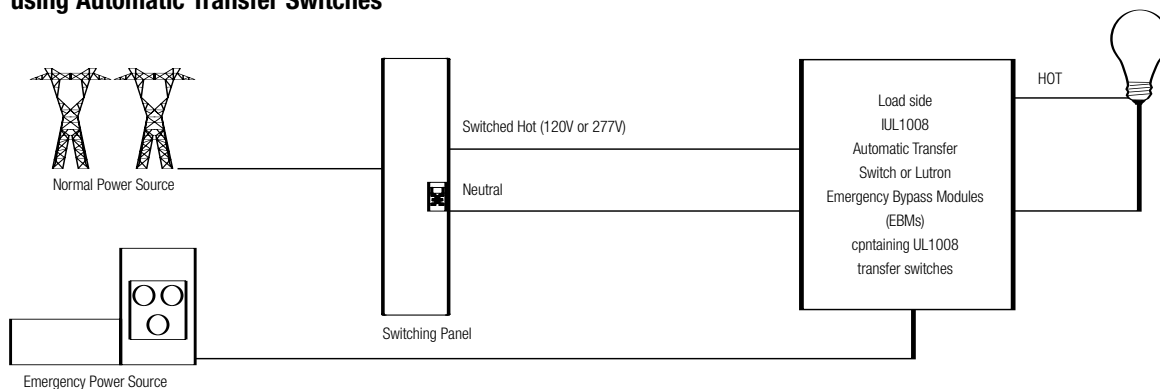

How it works

1. When Normal power is available, all circuits from the Normal panel are connected directly to the luminaires by the load side transfer switches. All circuits respond to the controls.

2. Upon loss of Normal power, the load side UL1008 Automatic Transfer Switch diverts that single circuit to the Emergency power source, completely bypassing the switching panel. Luminaires will go to full light output.

3. Upon restoration of Normal power, the load side transfer switch reconnects the luminaires to the Normal panel. The power failure memory feature in the controls will return all circuits in the Normal panel to the intensity levels at which they were set prior to the loss of Normal power.

Solution 3: Applications using constant hot for unit equipment

Utilize the constant hot terminal on each circuit to power the unit equipment that provides emergency lighting for the area served by the switching panel. This feature provides a convenient method to comply with NEC Code, Article 700-12(e) Unit Equipment, which require the branch circuit feeding the unit equipment to be the same branch circuit feeding the normal lighting in the area.

**Integrating GRAFIK Eye®
3000 series control units
with a Softswitch128 system**
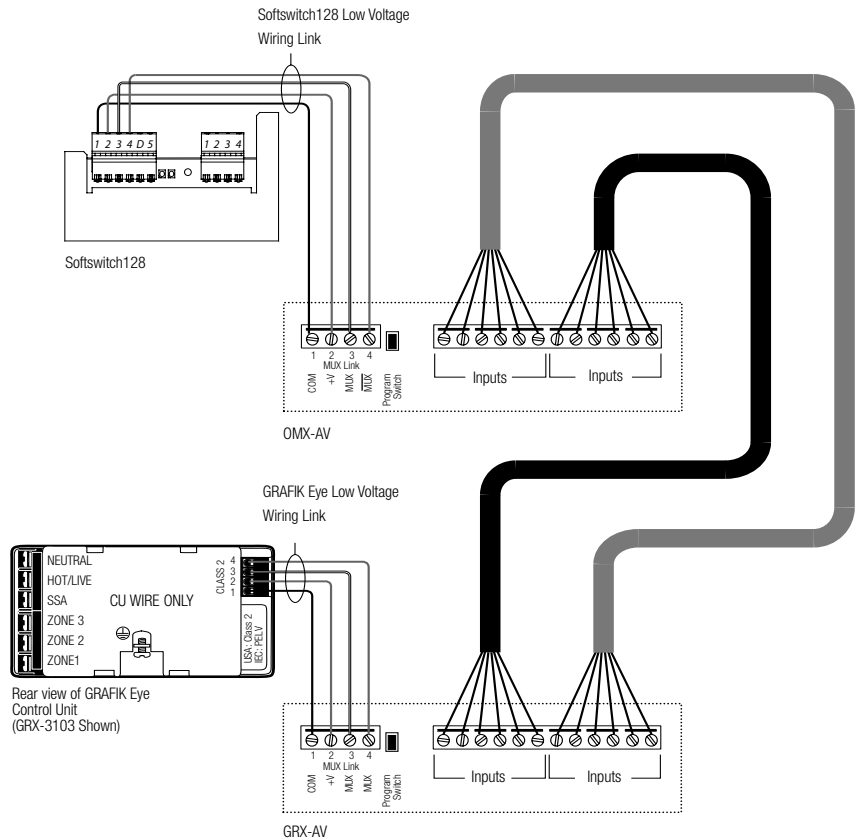
Setup and Programming

Program Inputs of OMX-AV Using Softswitch128 Controller
1) From the main menu, select Control Station Setup.
2) Select the address of the OMX-AV to configure.
3) Change the type to OMX-AV.
4) Select the contact closure input number to configure (OMX-AV provides 5 inputs).
   Contact Closure 1 corresponds to GRAFIK Eye Scene 1.
5) Select the Closure Action.
6) Select the pattern for the Softswitch128 system to perform when a contact closure is received.
7) Program the pattern and the circuits it controls accordingly.
8) Repeat steps 1 to 7 for each OMX-AV input.

Program Outputs of OMX-AV Using Softswitch128 Controller
To program any wallstation in the Softswitch128 system to select a GRAFIK Eye scene,
simply program a wallstation button as a pattern and set the contact closure outputs of the
OMX-AV as part of that pattern.
For example: If the GRAFIK Eye Scene 1 is to be selected, program the Softswitch128 pattern with the
OMX-AV output 1 as maintained closed, and OMX-AV outputs 2,3,4, and 5 as momentary open.

Program Inputs of GRX-AV
Set the DIP switches on the GRX-AV to assign which set of scenes will be selected on the
GRAFIK Eye when a contact closure input is received from the Softswitch128 system.

Program Outputs of GRX-AV
Set the DIP switches on the GRX-AV to assign which set of scenes selected on the GRAFIK
Eye will trigger contact closure outputs. Also, set the DIP switch for maintained. See
instruction manual for the GRX-AV for more details.

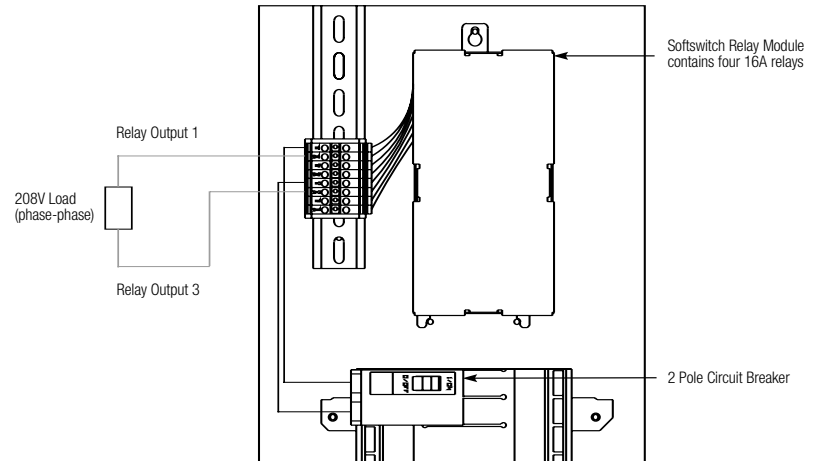### Notes:

1 For every GRAFIK Eye in the system that needs to be integrated with Softswitch128,
   both an OMX-AV and a GRX-AV are required, with the wiring as shown.

2 Functionality of the OMX-AV is programmed using the Softswitch128 controller.

3 Functionality of the GRX-AV and GRAFIK Eye is setup using DIP switches on the GRX-AV.

**208V switching using Lutron®
Softswitch™ relay technology**

Method 1 – 208V switching with two relays per load

This method provides an air-gap off for both switch legs and is recommended by Lutron. The diagram shows a Lutron Softswitch relay panel breaking both phases. The same can be accomplished using a distribution panel and a Lutron feedthrough panel. Breaking both legs requires the two relays controlling a load to be programmed the same.
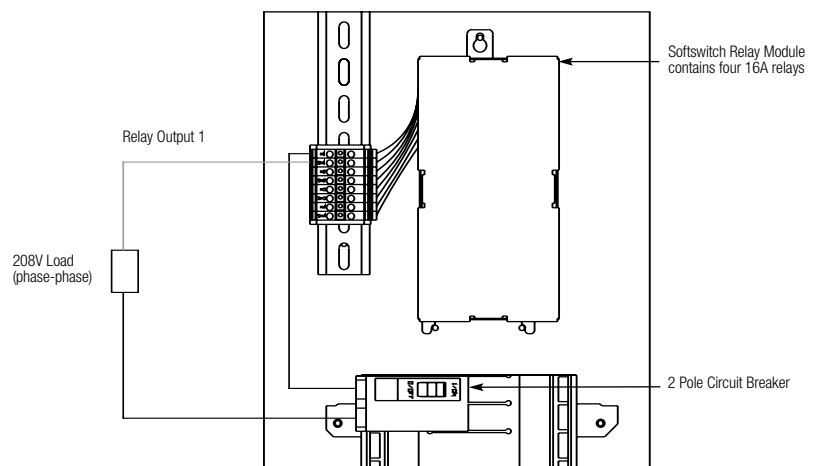
Relay Output 1

208V Load
(phase-phase)

Relay Output 3

Softswitch Relay Module
contains four 16A relays

2 Pole Circuit Breaker

Method 2 – 208V switching with one relay per load

Warning!
When the light is turned off by the Softswitch relay one of the load wires is still live with 120V. The only way to remove all power to the load is using the two pole breaker. This is recommended when relamping.

The diagram shows a Lutron Softswitch relay panel breaking a single phase. The same can be accomplished using a distribution panel and a Lutron feedthrough panel. Breaking one phase will turn off a circuit when properly wired, but will leave 120V relative to ground at one side of the load. The double pole breaker is the only way to break both phases with this configuration.

Relay Output 1

208V Load
(phase-phase)

Softswitch Relay Module
contains four 16A relays

2 Pole Circuit Breaker

Using a daylight sensor with the Softswitch128 system

Overview

The Softswitch128 controller can accept Class 2 dry contact closures to automatically control lights. This contact closure can come from a daylight sensor if daylight control is required. The wiring details for an outdoor/indoor daylight sensor are shown below.

1. Contact Closure 1
2. Common
3. Contact Closure 2
4. Common

1 2 3 4 D 5

1 2 3 4

Softswitch128 Controller located inside the switching panel

1 2

24 VAC Transformer

Daylight Sensor Single Level Controller

1 2 3 4 5

Common

24 VAC

Daylight Sensor: PC5AD (Outdoor) or PC9AD (Indoor)
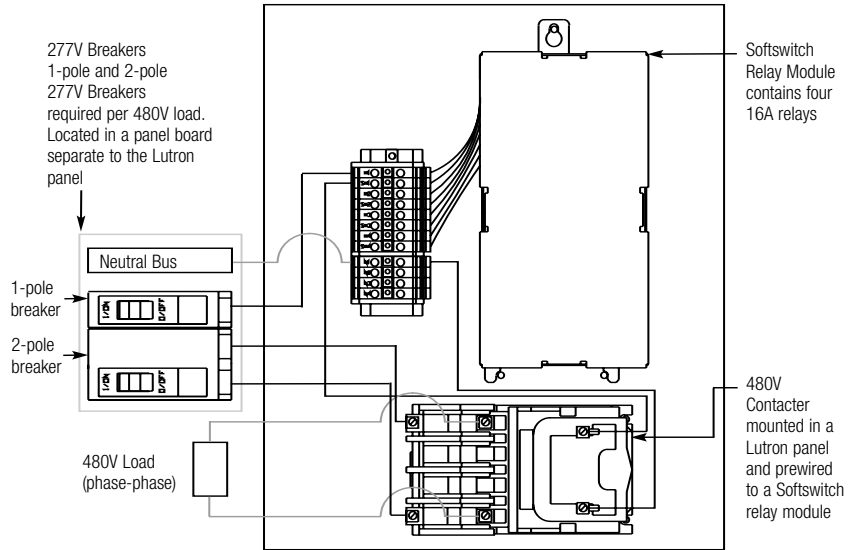
Earth Ground
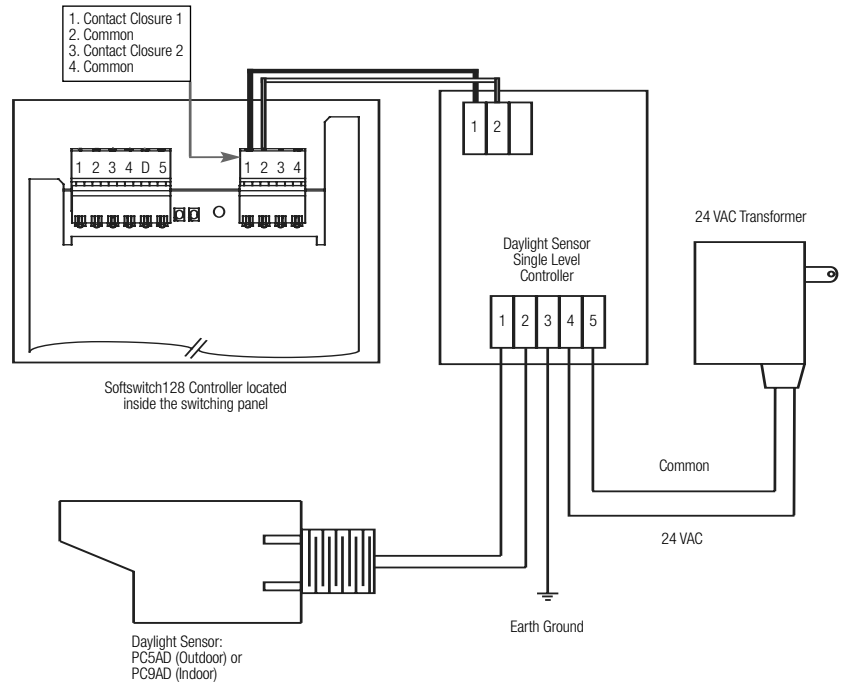
Wiring

The wiring diagram shows a Softswitch128 controller wired to a daylight sensor single level controller. The Softswitch128 controller can be programmed to allow the daylight sensor controlled contact closure to turn off or on lights. The details for programming the Softswitch128 controller can be found in the Softswitch128 Setup and Maintenance Guide.

**480V switching using lutron®
Softswitch relay technology**

The Lutron Softswitch relay module is not capable of switching a 480V load. 480V load switching is accomplished with a Lutron Softswitch relay module and a 480V contactor that are assembled into a Softswitch relay panel. The contactor is controlled by one of the relay outputs on a Softswitch module powered at 277V. The left side of the contactor allows for contractor wiring of a 2 pole 277V breaker and 480V load. This solution is detailed in the diagram below.

Note: Contact customer service to quote a panel capable of switching 480V loads.

277V Breakers 1-pole and 2-pole 277V Breakers required per 480V load. Located in a panel board separate to the Lutron panel

Neutral Bus

1-pole breaker

2-pole breaker

480V Load (phase-phase)

Softswitch Relay Module contains four 16A relays

480V Contacter mounted in a Lutron panel and prewired to a Softswitch relay module

Controlling Softswitch128 using the RadioRA® telephone interface

Overview

The Softswitch128 switching system can be controlled from any location worldwide by using the RadioRA Telephone Interface (RA-RC-3). The Telephone Interface provides capability to activate the following actions: toggle circuits, select a pattern, or turn off (with a specified time delay). By connecting the outputs from the Telephone Interface to the contact closure inputs on the Softswitch128 Controller, pressing buttons on any telephone will activate the desired action.
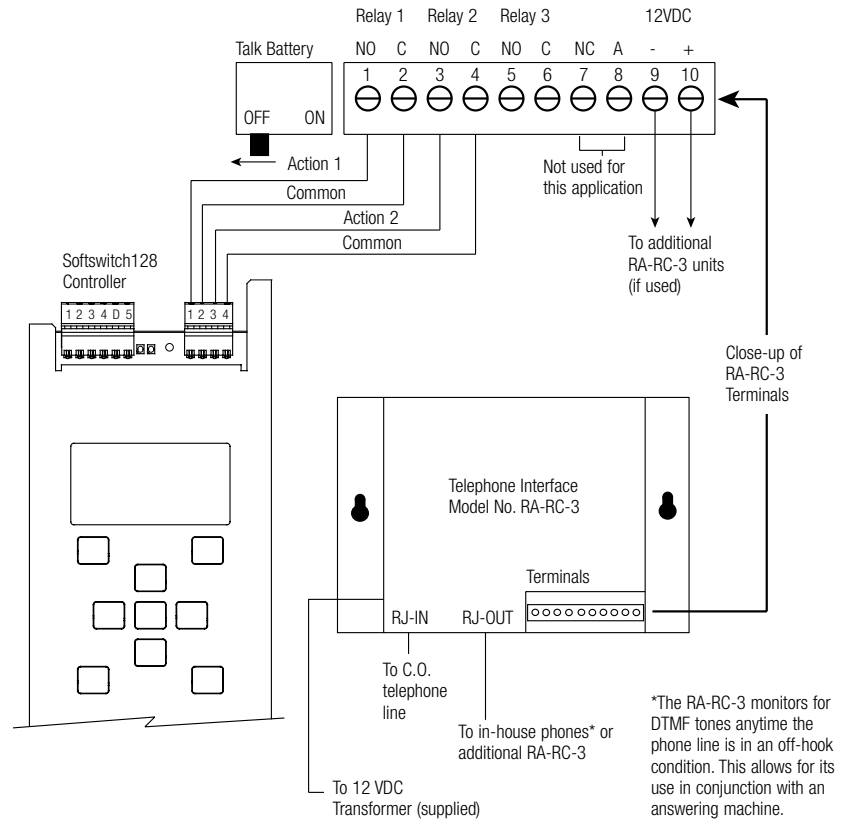

Wiring

The wiring diagram below shows how to wire up to two outputs from the RadioRA Telephone Interface to the contact closure inputs on the Softswitch128 Controller (located in the switching panel). The Telephone Interface provides up to three outputs - each Softswitch128 Controller provides two contact closure inputs. A dedicated phone line is recommended, but not required.

Controlling Softswitch128 using the RadioRA® telephone interface

Using an OMX-AV

Each Softswitch128 Controller provides two contact closure inputs. If additional inputs are required, an OMX-AV interface may be used in conjunction with the RA-RC-3 Telephone Interface. See below for wiring and programming using the OMX-AV.
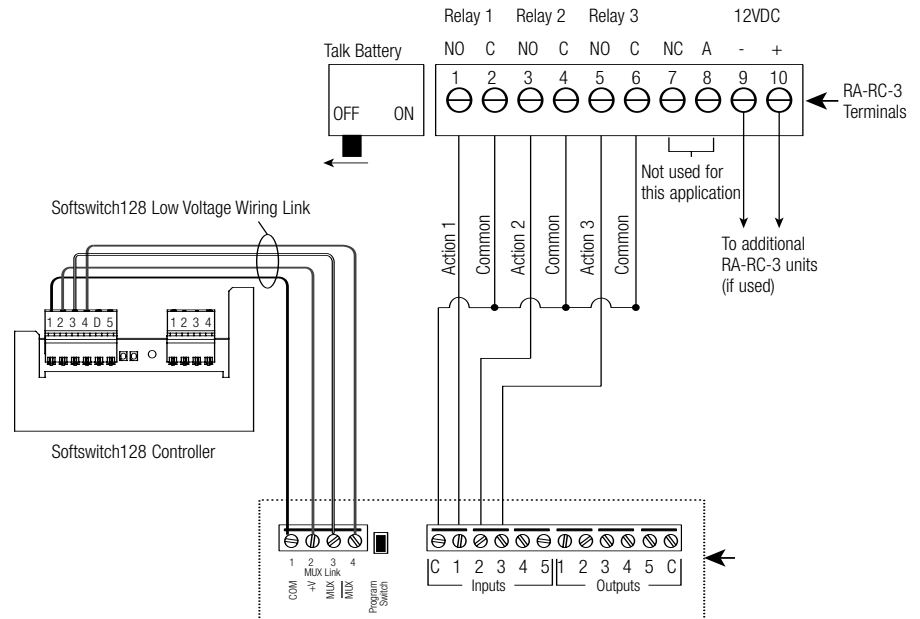
Program contact closure inputs of OMX-AV using Softswitch128 Controller:

1) From the main menu, select Control Station Setup.

2) Select the address of the OMX-AV to configure.

3) Change the type to OMX-AV.

4) Select the contact closure input number to configure (OMX-AV provides 5 inputs).

5) Select the Closure Action.

6) Select the type of action to perfom (Toggle, Pattern, or Delay to Off) when a contact closure is received. Refer to the Softswitch128 Setup and Maintenance Guide for a description of these types.

7) Program the action and the circuits accordingly.

8) Repeat steps 1 to 7 for each OMX-AV input.

Controlling Softswitch128 using the RadioRA® telephone interface

Operating the RA-RC-3

		Press	Response
1. Call the line to which the RA-RC-3 is connected.	The RA-RC-3 will answer after the set number of rings. **Note:** Lutron does not recommend operating the RA-RC-3 from in-house phones. Entering * followed by certain digits on in-house phones may change phone service functions (i.e., disable call waiting).		2 Beeps
2. Enter the operating access code.	This code was set in Step 4 previously.	* 6 digits	2 Beeps
3. Activate an action. Allow 5 seconds between activating any two actions.	Enter any action number (1, 2, or 3) and then 2. • Pressing 12 activates Action 1. • Pressing 22 activates Action 2. • Pressing 32 activates Action 3.	12 / 22 / 32	2 Beeps[1]
4. Hang up the phone.			

[1] 3 Beeps indicates an invalid entry or error.
 The RA-RC-3 will provide 4 Beeps and hang up if 20 seconds elapse without an entry. Repeat steps 1 and 2 to continue.

Using a Sentry Switch® with Softswitch128

Overview

A Sentry Switch switch may be used with a Softswitch128 system to provide local, line-voltage override control of lighting. During normal operation, the switch can be used to turn lighting on and off. When the Softswitch128 time clock turns lighting off in afterhours mode, the switch automatically resets itself to the off position. A user may then manually override afterhours mode, turning the lights back on using the Sentry Switch switch.
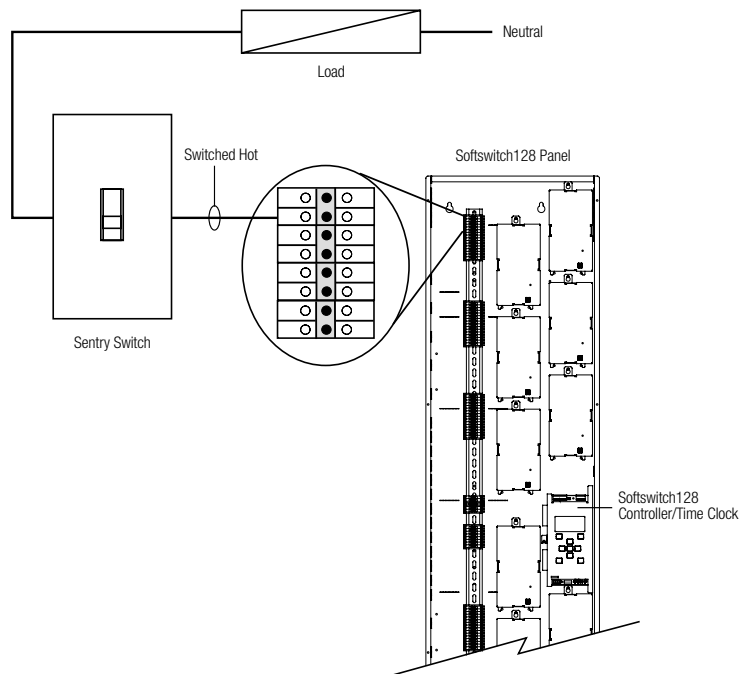
Important Note

The Sentry Switch switch is neither manufactured nor provided by Lutron. Its performance cannot be guaranteed by Lutron.

Power panels in outdoor applications

Overview

Lutron Power Panels are designed for indoor use and are constructed as NEMA Type 1 Enclosures. A NEMA Type 1 Enclosure is defined as: constructed for indoor use to provide a degree of protection to personnel against incidental contact with the enclosed equipment and to provide a degree of protection against falling dirt (from NEMA 250-2003).

In certain applications, Lutron Power Panels may require a greater degree of protection against dirt, dust, water, etc. due to their intended mounting location. Lutron Power Panels may be installed in a secondary enclosure with a higher NEMA rating provided that the following conditions are met:

1) The secondary enclosure is of a suitable NEMA type rating for the intended installation location.
2) Lutron requirements for environmental conditions of the Power Panel are maintained.

All Lutron Power Panels must be operated within the following environmental conditions:

1) Ambient temperature: 32°-104°F (0°- 40°C)
2) Non-condensing relative humidity less than 90%

Failure to maintain these conditions may affect the performance and the operating lifetime of the equipment.

Lutron does not supply Power Panels in secondary enclosures with higher NEMA ratings. Manufacturers of NEMA rated enclosures include (but are not limited to):

Hoffman   www.hoffmanonline.com
Trident Custom Enclosures   www.tridentce.com

Numerous NEMA enclosure ratings are available, each specifying a degree of protection against specific environmental conditions. If a secondary enclosure is required, it must be specified and installed in accordance with the manufacturer's requirements, accounting for the actual environmental conditions to which it will be exposed. The heat dissipation of the Power Panel must also be considered. Consult the appropriate Lutron technical documents for heat dissipation data for Power Panels. **Regardless of the enclosure type, the environmental conditions for Lutron Power Panels (listed above) must always be maintained.**

**Linking multiple occupancy sensors
to a wallstation**

Wiring

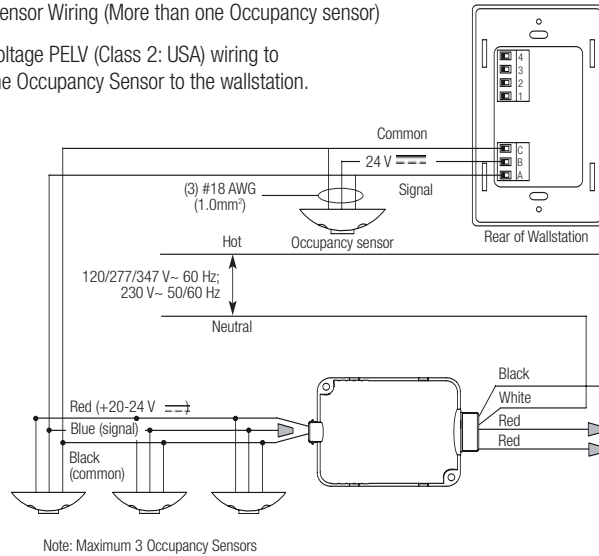Occupancy Sensor Wiring (One occupancy sensor)

- Use low-voltage PELV (Class 2: USA) wiring to
  connect the Occupancy Sensor to the wallstation.

Common
24 V
(3) #18 AWG
(1.0mm²)
Signal

Occupancy sensor

Rear of seeTouch
Wallstation
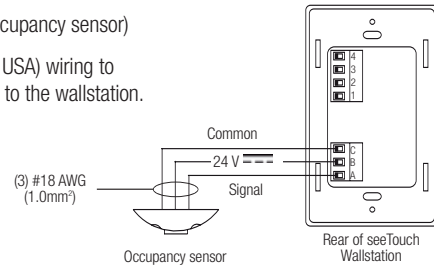
Occupancy Sensor Wiring (More than one Occupancy sensor)

- Use low-voltage PELV (Class 2: USA) wiring to
  connect the Occupancy Sensor to the wallstation.

Common
24 V
(3) #18 AWG
(1.0mm²)
Signal

Occupancy sensor

Rear of Wallstation

Hot

120/277/347 V~ 60 Hz;
230 V~ 50/60 Hz

Neutral

Black
White
Red
Red

Red (+20-24 V
Blue (signal)

Black
(common)

Note: Maximum 3 Occupancy Sensors

LUTRON®