

HomeWorks® QS

Technical Specification Guide

International Edition (220V – 240V)



LUTRON®

save energy with Lutron™ ®

Table of Contents

Front Room Equipment	Spec P/N	Last Rev Date
Keypads		
Wired Devices		
seeTouch	369-353a	10/29/10
International seeTouch	369-607a	01/19/12
RF Devices		
seeTouch Table Top	369-349c	03/26/12
Pico	369-408b	04/25/11
Wired / RF Devices		
Dynamic Keypad	369-394b	01/19/12
Main Units		
GRAFIK Eye QS	Multiple	Varies
Sensors		
Wireless Sensors		
Occupancy/Vacancy	369-480b	08/23/11
Wired Sensors		
CDT Series	LOS-CDT	09/04/08
CIR Series	LOS-CIR	09/04/08
CUS Series	LOS-CUS	09/04/08
WDT Series	LOS-WDT	11/04/08
WIR Series	LOS-WIR	7/16/10

Back Room Equipment	Spec P/N	Last Rev Date
Processor and Repeater		
Processor	369-376	07/11/11
Hybrid Repeater	369-351b	02/10/12
Interfaces		
Contact Closure Inputs/Outputs	qse-io	10/06/09
DMX Interface	369-372b	08/12/11
Cool Master HVAC Controller	*Specification Sheet Coming Soon*	

Enclosures, Panels, and Power Modules	Spec P/N	Last Rev Date
LV14 Low Voltage Enclosure	369-604a	01/18/12
LV21 Low Voltage Enclosure	369-381b	12/14/11
Feed-Through Panels	369-600a	01/10/12
Breaker Panels (PBK8, RCBO8)	*Specification Sheet Coming Soon*	
Remote Power Modules (RPMs)	369-547b	04/20/12
Module Interface	369-545a	04/20/12
EcoSystem Power Module	369-611a	02/17/12
Phase Adaptive Power Module	369-583b	01/31/12
Motor Control Power Module	369-614a	03/02/12
Switching/0-10V Power Module	369-610a	02/17/12
DALI Power Module	*Specification Sheet Coming Soon*	
Power Supplies		
DIN Rail Power Supply	369-404a	03/04/11
PNL-8 Power Kit	369-585a	11/11/11
Smart Panel Power Supply	086-101b	03/26/09
Plug In Power Supply	086-108	02/05/09
Power Boosters and Load Interfaces		
Power Booster Interface	pb-1	01/29/07
Electronic Low Voltage Interface	elvi-1	06/13/07
Fluorescent Ballast Interface	fdbi-1	06/13/07
GRX-TVI	369-247a	03/22/10
LUT-LBX	369-477a	09/01/11
EcoSystem Ballasts and Drivers		
H-Series Ballasts	369-266e	03/08/12
A-Series EcoSystem/3-Wire Driver	369-325d	10/25/11
A-Series Forward Phase Driver	369-543a	10/25/11

Supporting Documentation	Spec P/N	Last Rev Date
Wiring and PDU Guidelines	n/a	05/03/12
Networking Guide	n/a	02/14/11

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Front Room Equipment

Keypads

HomeWorks QS Wired seeTouch® Architectural Keypads

HomeWorks QS *seeTouch* keypads provide homeowners with a simple and elegant way to operate lights, shades/draperies, motorized screens, thermostats, and many other devices.

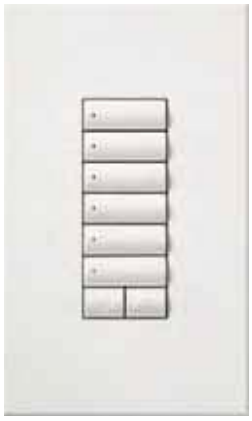
HomeWorks QS *seeTouch* keypads feature large, easy-to-use buttons, plus a unique backlit engraving option that makes the keypads readable any time of the day or night. *seeTouch* buttons are rounded, allowing engraving to be displayed at an upward angle, increasing readability.

Replacement Kits are available in a variety of colors and with custom engraving to clearly identify each button's function. The flexible design of the keypads allows the color, number of buttons, and button configuration to be changed by installing a new engraved Replacement Kit.

All *HomeWorks* QS wired *seeTouch* models have two contact closure inputs on the back of the unit which provide independent functions from the front buttons. Other options include configurations with infrared receiver and raise/lower buttons.

Use Lutron® Nova T☆® wallplates. Wallplates are included with the keypad. *Lutron Nova T☆* wallplates snap on with no visible means of attachment.





HomeWorks QS wired *seeTouch* architectural keypads are available in many button configurations, shown on the following two pages. They are also available in insert (*above left*) and non-insert (*above right*) styles. The insert style allows decorator-style controls to be easily ganged using *Lutron Nova T☆* wallplates.

HomeWorks® QS Wired seeTouch® Architectural Keypads

Non-Insert Style Architectural Keypads

Model Numbers

HQWA-W1BN-XX*	1 Button Keypad
RKA-W1BN-XX*-E	Engraved Replacement Kit
HQWA-W2BSN-XX*	2 Button Keypad
RKA-W2BSN-XX*-E	Engraved Replacement Kit
HQWA-W3BSN-XX*	3 Button Keypad
RKA-W3BSN-XX*-E	Engraved Replacement Kit
HQWA-W3BSRLN-XX*	3 Button with Raise/Lower Keypad
RKA-W3BSRLN-XX*-E	Engraved Replacement Kit
HQWA-W4BSN-XX*	4 Button Keypad
RKA-W4BSN-XX*-E	Engraved Replacement Kit
HQWA-W4SN-XX*	4 Scene with Raise/Lower Keypad
RKA-W4SN-XX*-E	Engraved Replacement Kit
HQWA-W5BN-XX*	5 Button Keypad
RKA-W5BN-XX*-E	Engraved Replacement Kit
HQWA-W5BRLN-XX*	5 Button with Raise/Lower Keypad
RKA-W5BRLN-XX*-E	Engraved Replacement Kit
HQWA-W5BIRN-XX*	5 Button with Raise/Lower Keypad and Infrared Receiver
RKA-W5BIRNXX*-E	Engraved Replacement Kit
HQWA-W6BN-XX*	6 Button Keypad
RKA-W6BN-XX*-E	Engraved Replacement Kit
HQWA-W6BRLN-XX*	6 Button with Raise/Lower Keypad
RKA-W6BRLN-XX*-E	Engraved Replacement Kit
HQWA-W7BN-XX*	7 Button Keypad
RKA-W7BN-XX*-E	Engraved Replacement Kit
HQWA-W1RLDN-XX*-E	Engraved Replacement Kit
RKA-W1RLDN-XX*	Dual Group with Raise/Lower Keypad
HQWA-W2RLDN-XX*	Dual Group with Dual Raise/Lower Keypad
RKA-W2RLDN-XX*-E	Engraved Replacement Kit
HQWA-W3BDN-XX*	Dual Group Keypad
RKA-W3BDN-XX*-E	Engraved Replacement Kit


HQWA-W1BN


HQWA-W2BSN


HQWA-W3BSN


HQWA-W3BSRLN


HQWA-W4BSN


HQWA-W4SN


HQWA-W5BN


HQWA-W5BRLN


HQWA-W5BIRN


HQWA-W6BN


HQWA-W6BRLN


HQWA-W7BN


HQWA-W1RLDN


HQWA-W2RLDN


HQWA-W3BDN

*"XX" in the model number represents color/finish code. See **Colors and Finishes** at end of document.

HomeWorks® QS Wired seeTouch® Architectural Keypads

Insert Style Architectural Keypads

Model Numbers

HQWA-W1BI-XX*	1 Button Keypad
RKA-W1BI-XX*-E	Engraved Replacement Kit
HQWA-W2BSI-XX*	2 Button Keypad
RKA-W2BSI-XX*-E	Engraved Replacement Kit
HQWA-W3BSI-XX*	3 Button Keypad
RKA-W3BSI-XX*-E	Engraved Replacement Kit
HQWA-W3BSRLI-XX*	3 Button with Raise/Lower Keypad
RKA-W3BSRLI-XX*-E	Engraved Replacement Kit
HQWA-W4BSI-XX*	4 Button Keypad
RKA-W4BSI-XX*-E	Engraved Replacement Kit
HQWA-W4SI-XX*	4 Scene with Raise/Lower Keypad
RKA-W4SI-XX*-E	Engraved Replacement Kit
HQWA-W5BI-XX*	5 Button Keypad
RKA-W5BI-XX*-E	Engraved Replacement Kit
HQWA-W5BRLI-XX*	5 Button with Raise/Lower Keypad
RKA-W5BRLI-XX*-E	Engraved Replacement Kit
HQWA-W5BIRI-XX*	5 Button with Raise/Lower Keypad and Infrared Receiver
RKA-W5BIRIXX*-E	Engraved Replacement Kit
HQWA-W6BI-XX*	6 Button Keypad
RKA-W6BI-XX*-E	Engraved Replacement Kit
HQWA-W6BRLI-XX*	6 Button with Raise/Lower Keypad
RKA-W6BRLI-XX*-E	Engraved Replacement Kit
HQWA-W7BI-XX*	7 Button Keypad
RKA-W7BI-XX*-E	Engraved Replacement Kit
HQWA-W1RLDI-XX*-E	Engraved Replacement Kit
RKA-W1RLDI-XX*	Dual Group with Raise/Lower Keypad
HQWA-W2RLDI-XX*	Dual Group with Dual Raise/Lower Keypad
RKA-W2RLDI-XX*-E	Engraved Replacement Kit
HQWA-W3BDI-XX*	Dual Group Keypad
RKA-W3BDI-XX*-E	Engraved Replacement Kit


HQWA-W1BI


HQWA-W2BSI


HQWA-W3BSI


HQWA-W3BSRLI


HQWA-W4BSI


HQWA-W4SI


HQWA-W5BI

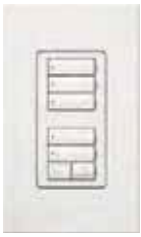

HQWA-W5BRLI


HQWA-W5BIRI

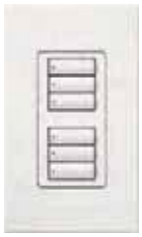

HQWA-W6BI


HQWA-W6BRLI


HQWA-W7BI


HQWA-W1RLDI


HQWA-W2RLDI


HQWA-W3BDI

*"XX" in the model number represents color/finish code. See **Colors and Finishes** at end of document.

HomeWorks® QS Wired seeTouch® Architectural Keypads

Specifications

Model Numbers	See pages 2 and 3 for complete lists of model numbers.
Power	24 V⎓ 30 mA PELV (Class 2: USA)
Typical Power Consumption	0.6 W Test conditions: all backlights on medium intensity, two LEDs on (two presets active), keypad powered at 24 V⎓
Regulatory Approvals	UL, cUL, NOM, FCC, IC, COFETEL
Environment	Ambient operating temperature: 32 °F to 104 °F (0 °C to 40 °C), 0% to 90% humidity, non-condensing. Indoor use only.
Communications	Connects to QS wired device link on *Homeworks* QS processor.
ESD Protection	Tested to withstand electrostatic discharge without damage or memory loss, in accordance with IEC 61000-4-2.
Surge Protection	Tested to withstand surge voltages without damage or loss of operation, in accordance with IEEE C62.41-1991 Recommended Practice on Surge Voltages in Low-Voltage AC Power Circuits.
Power Failure	Power failure memory: should power be interrupted, the keypad will return to its previous state when power is restored.
Mounting	U.S. wallbox 3½ in (89 mm) deep, 2¼ in (57 mm) deep minimum, or low-voltage mounting bracket
Wiring	Control wire must be 1 pair 18 AWG (1.0 mm^2) PELV (Class 2: USA) for power and 1 pair 22 to 18 AWG (0.5 to 1.0 mm^2) PELV (Class 2: USA) twisted/shielded for data (see **Wiring**).
Warranty	8 Year Limited Warranty. http://www.lutron.com/resiinfo

Design Features

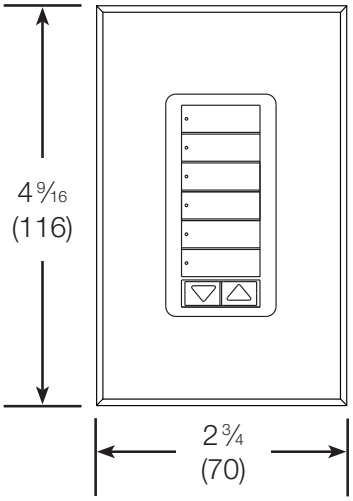
- Green status LEDs.
- Backlit button/engraving.
- Field-changeable Replacement Kits make for easy customization.
- All terminal block inputs are over-voltage and miswire-protected against wire reversals and shorts.
- Use Lutron® Nova T☆® wallplates. Wallplates are included with the keypad.
- *Lutron Nova T☆* wallplates snap on with no visible means of attachment.
- Use Replacement Kits to change color, button configuration, or engraving.

HomeWorks® QS Wired seeTouch® Architectural Keypads

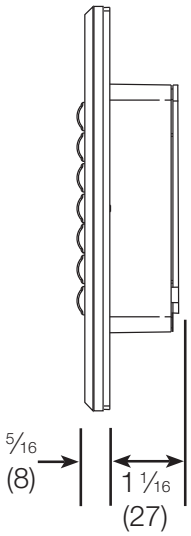
Dimensions

All dimensions are shown as in (mm)

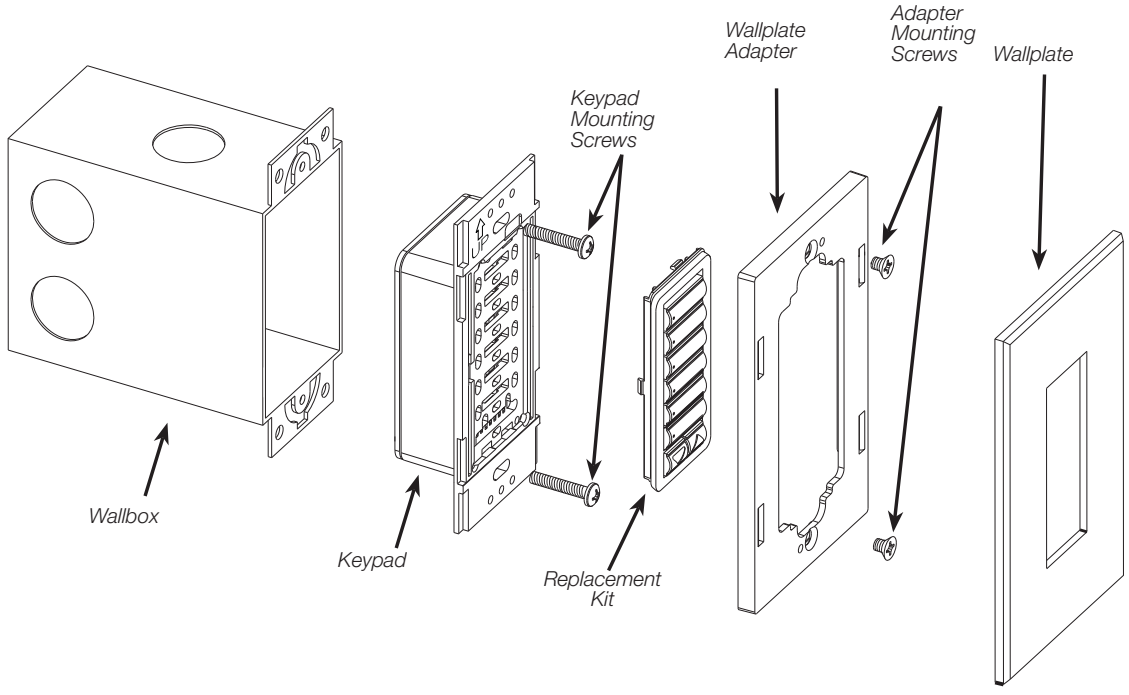
Front View



Side View

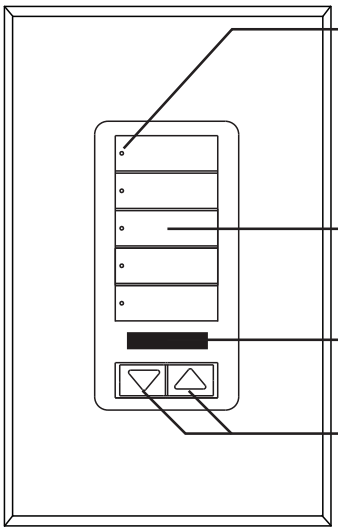


Mounting and Parts Identification



HomeWorks® QS Wired seeTouch® Architectural Keypads

Operation



Status LEDs
Show which keypad button has been activated.

Keypad Buttons
Press to activate desired levels or positions.

IR Receiver
Use a compatible IR remote to activate button functions.

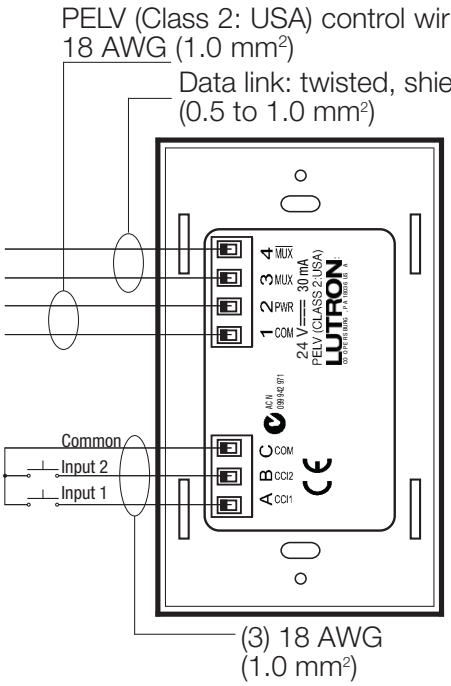
Raise/Lower Buttons
Lights increase or decrease in intensity and shades/draperies move towards the open or close limit.

HomeWorks® QS Wired seeTouch® Architectural Keypads

Wiring

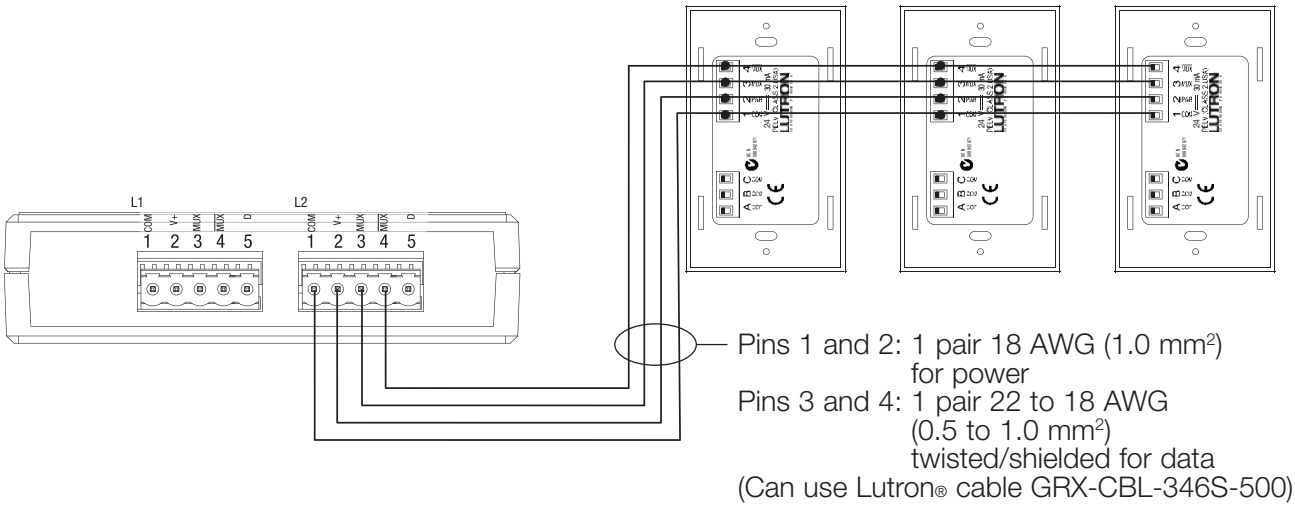
Wiring Notes

- Keypad wiring may be in a daisy-chain, star or T-tap configuration.
- The total length of wire on a QS wired link is not to exceed 2000 ft (610 m).
- Up to 100 devices can be connected to the QS wired link. This can include seeTouch® keypads along with other devices as defined in the HomeWorks QS software.
- An external power supply may be required depending on the total current draw of all wired devices on the processor link.



Contact Closure Notes

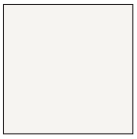
- The contact closure inputs can be used with either dry contact closures or ground-referenced solid-state outputs.
- The outputs must stay in the closed or open states for at least 40 ms in order to be recognized by the keypad.

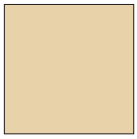


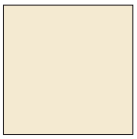
HomeWorks® QS Wired seeTouch® Architectural Keypads

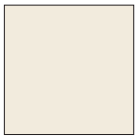
Colors and Finishes

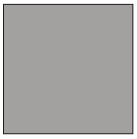
Architectural Matte Finishes


White
WH


Ivory
IV

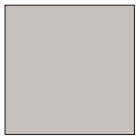

Almond
AL


Light Almond
LA

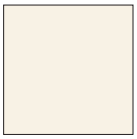

Gray
GR


Brown
BR

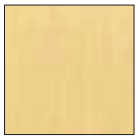

Black
BL

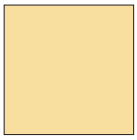

Taupe
TP

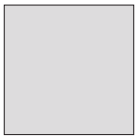

Sienna
SI


Beige
BE

Architectural Metal Finishes (wallplates only)

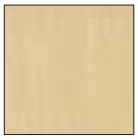

Satin Brass
SB


Bright Brass
BB


Bright Chrome
BC


Clear Anodized Aluminum
CLA


Black Anodized Aluminum
BLA

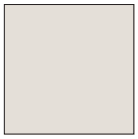

Brass Anodized Aluminum
BRA

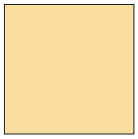

Antique Brass
QB


Antique Bronze
QZ


Satin Chrome
SC


Satin Nickel
SN


Bright Nickel
BN


Gold
AU

When ordering metal wallplates, it is recommended to order the keypad in Black (BL).

- Due to printing limitations, colors and finishes shown cannot be guaranteed to perfectly match actual product colors.
- Color chip keychains are available for more precise color matching:

  Architectural Matte Finishes- AM-CK-1
  Architectural Metal Finishes - AMTL-CK-1

HomeWorks® QS Wired International seeTouch® Keypads

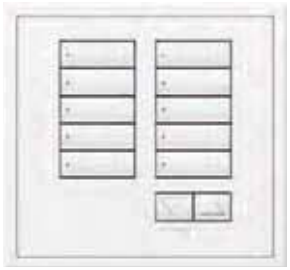
HomeWorks® QS International seeTouch® keypads provide homeowners with a simple and elegant way to operate lights, shades/draperies, motorized screens, thermostats, and many other devices.

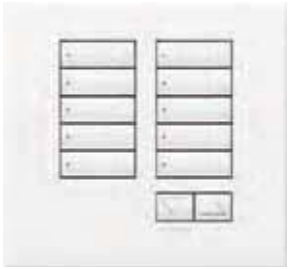
HomeWorks® QS International seeTouch® keypads feature large, easy-to-use buttons, plus a unique backlit engraving option that makes the keypads readable any time of the day or night. seeTouch® buttons are rounded, allowing engraving to be displayed at an upward angle, increasing readability.

Replacement Kits are available in a variety of colors and with custom engraving to clearly identify each button's function. The flexible design of the keypads allows the color, number of buttons, and button configuration to be changed by installing a new engraved Replacement Kit.

All HomeWorks® QS wired international seeTouch® models have two contact closure inputs on the back of the unit which provide independent functions from the front buttons. Other options include configurations with infrared receiver.

Wallplates are purchased separately and snap on with no visible means of attachment.





HomeWorks® QS wired international seeTouch® keypads are available in many button configurations, shown on the following pages. They are also available in insert (*above left*) and non-insert (*above right*) styles. The insert style allows for ganging.

Specifications

Regulatory

- CE, C-tick

Power Input (Control Link Terminal 2)

Low-voltage type PELV. Operating voltage: 24 V⎓

Key Design Features

- Field-changeable button and faceplate assemblies allow easy customization.
- Meets IEC 801-2. Tested to withstand 15 kV electro-static discharge without damage or memory loss.
- Faceplate snaps on with no visible means of attachment.
- Available as an “insert” style control for multi-ganging.
- Use Faceplate Replacement Kits to change color, button configuration, or engraving.
- Faceplate Replacement Kits may also be used to convert between non-insert and insert configurations.

System Communications and Capacity

- Low-voltage type PELV wiring connects Wallstations to other devices on the QS Link.
- A QS Link can have up to 100 devices; International seeTouch® QS counts as one device and no zones on the QS Link.

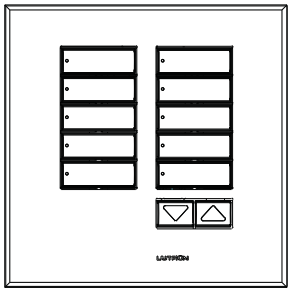
Terminals

Accept up to two 1.0 mm² (18 AWG) typical.

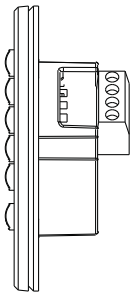
Environment

0 - 40 °C (32 - 104 °F). Relative humidity less than 90% non-condensing.

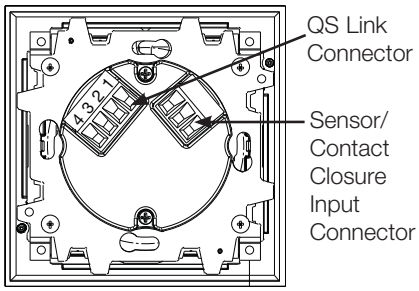
Front View

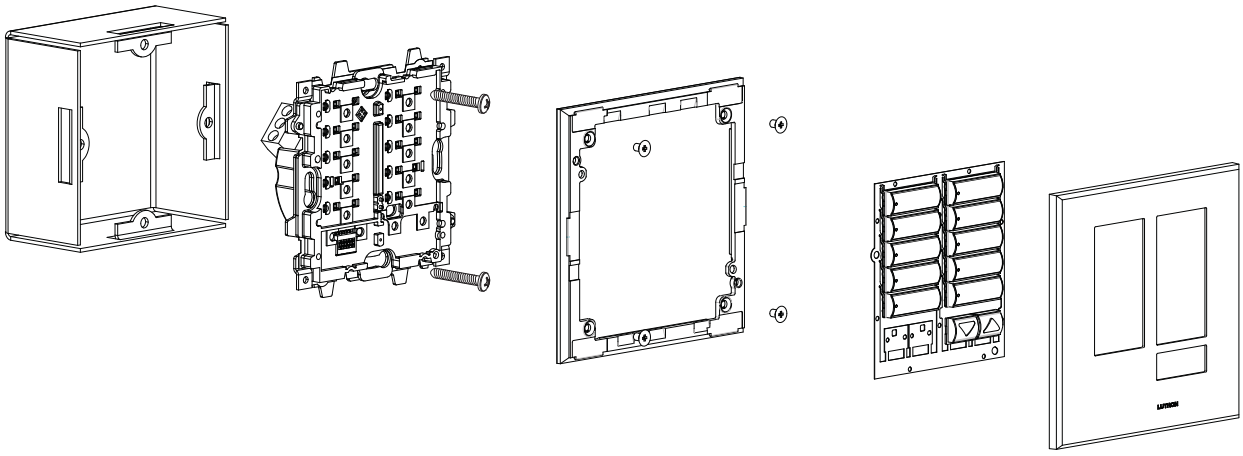


Side View



Back View





HomeWorks® QS Wired International seeTouch® Keypads
Non-Insert Style Architectural Keypads

Model Numbers

Base Units

HQWIS-NB-NONE-XX*	International seeTouch® without Wallplate or Button Kit
HQWIS-NBIR-NONE-XX*	International seeTouch® with IR without Wallplate or Button Kit

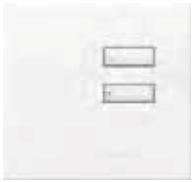
Button/Faceplate Kits

HWIS-2B-F-XX*	2 button non-insert
HWIS-3B-F-XX*	3 button non-insert
HWIS-4B-F-XX*	4 button non-insert
HWIS-5BRL-F-XX*	5 button non-insert with raise/lower
HWIS-5BRLIR-F-XX*	5 button non-insert with raise/lower and IR
HWIS-6BRL-F-XX*	6 button non-insert with raise/lower
HWIS-7BRL-F-XX*	7 button non-insert with raise/lower
HWIS-8BRL-F-XX*	8 button non-insert with raise/lower
HWIS-8BRLIR-F-XX*	8 button non-insert with raise/lower and IR
HWIS-10BRL-F-XX*	10 button non-insert with raise/lower

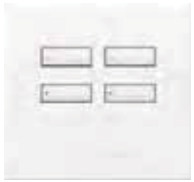
Replacement Button Kits

SIB-2B-XX*-E	2 button replacement kit
SIB-3B-XX*-E	3 button replacement kit
SIB-4B-XX*-E	4 button replacement kit
SIB-5BRL-XX*-E	5 button replacement kit with raise/lower
SIB-5BRLIR-XX*-E	5 button replacement kit with raise/lower and IR
SIB-6BRL-XX*-E	6 button replacement kit with raise/lower
SIB-7BRL-XX*-E	7 button replacement kit with raise/lower
SIB-8BRL-XX*-E	8 button replacement kit with raise/lower
SIB-8BRLIR-XX*-E	8 button replacement kit with raise/lower and IR
SIB-10BRL-XX*-E	10 button replacement kit with raise/lower

*"XX" in the model number represents color/finish code.
See **colors and finishes** at end of document.

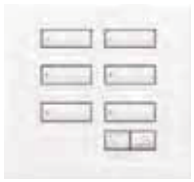

*HWIS-F-2B-XX**

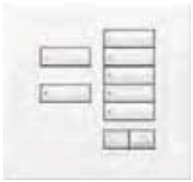

*HWIS-F-3B-XX**

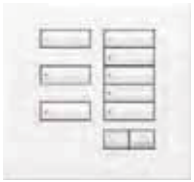

*HWIS-F-4B-XX**

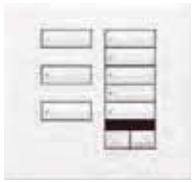

*HWIS-F-5BRL-XX**


*HWIS-F-5BRLIR-XX**


*HWIS-F-6BRL-XX**


*HWIS-F-7BRL-XX**


*HWIS-F-8BRL-XX**


*HWIS-F-8BRLIR-XX**


*HWIS-F-10BRL-XX**

Ordering Example:

HQWIS-NB-NONE (for base unit) plus
HWIS-2B-F-AW (for button/faceplate kit)

HomeWorks® QS Wired International seeTouch® Keypads
Insert Style Architectural Keypads

Model Numbers

Base Units

HQWIS-NB-NONE-XX*	International seeTouch® without Wallplate or Button Kit
HQWIS-NBIR-NONE-XX*	International seeTouch® with IR without Wallplate or Button Kit

Button/Faceplate Kits

HWIS-2B-I-XX*	2 button insert
HWIS-3B-I-XX*	3 button insert
HWIS-4B-I-XX*	4 button insert
HWIS-5BRL-I-XX*	5 button insert with raise/lower
HWIS-5BRLIR-I-XX*	5 button insert with raise/lower and IR
HWIS-6BRL-I-XX*	6 button insert with raise/lower
HWIS-7BRL-I-XX*	7 button insert with raise/lower
HWIS-8BRL-I-XX*	8 button insert with raise/lower
HWIS-8BRLIR-I-XX*	8 button insert with raise/lower and IR
HWIS-10BRL-I-XX*	10 button insert with raise/lower

Replacement Button Kits

SIB-2B-XX*-E	2 button replacement kit
SIB-3B-XX*-E	3 button replacement kit
SIB-4B-XX*-E	4 button replacement kit
SIB-5BRL-XX*-E	5 button replacement kit with raise/lower
SIB-5BRLIR-XX*-E	5 button replacement kit with raise/lower and IR
SIB-6BRL-XX*-E	6 button replacement kit with raise/lower
SIB-7BRL-XX*-E	7 button replacement kit with raise/lower
SIB-8BRL-XX*-E	8 button replacement kit with raise/lower
SIB-8BRLIR-XX*-E	8 button replacement kit with raise/lower and IR
SIB-10BRL-XX*-E	10 button replacement kit with raise/lower

*"XX" in the model number represents color/finish code.
See **colors and finishes** at end of document.


*HWIS-I-2B-XX**


*HWIS-I-3B-XX**


*HWIS-I-4B-XX**


*HWIS-I-5BRL-XX**


*HWIS-I-5BRLIR-XX**


*HWIS-I-6BRL-XX**


*HWIS-I-7BRL-XX**


*HWIS-I-8BRL-XX**


*HWIS-I-8BRLIR-XX**

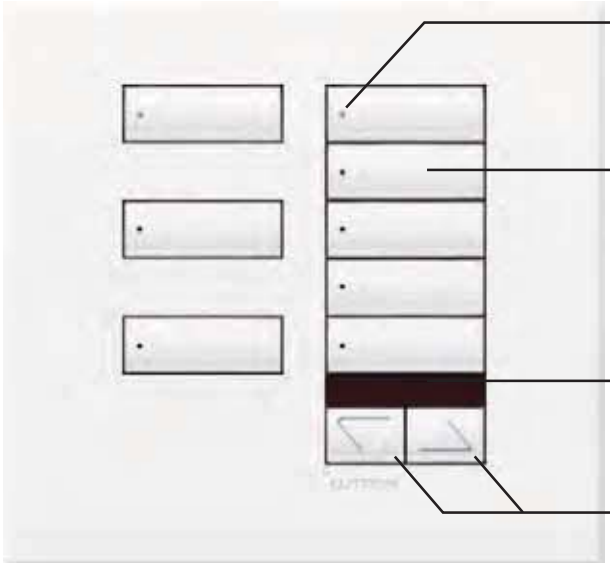

*HWIS-I-10BRL-XX**

Ordering Example:

HQWIS-NB-NONE (for base unit) plus
HWIS-2B-F-AW (for button/faceplate kit)

HomeWorks® QS Wired International seeTouch® Architectural Keypads

Operation



Status LEDs
Show which keypad button has been activated.

Keypad Buttons
Press to activate desired levels or positions.

IR Receiver
Use a compatible IR remote to activate button functions.

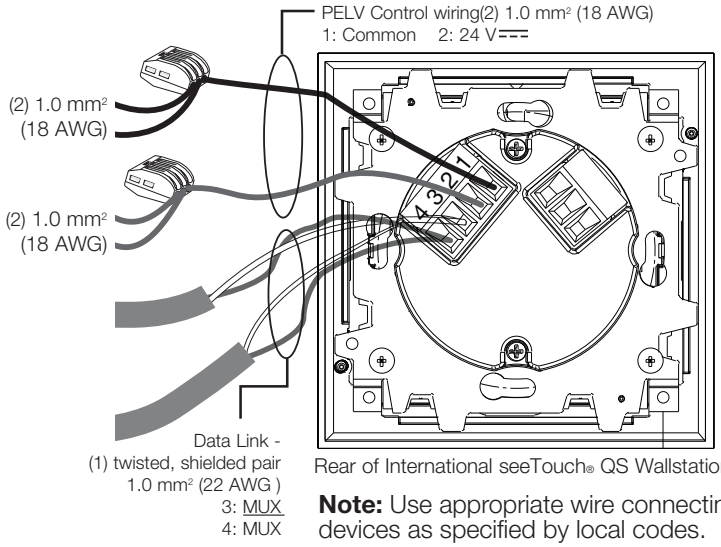
Raise/Lower Buttons
Lights increase or decrease in intensity and shades/draperies move towards the open or close limit.

Wallstation Installation

Control Station Device (CSD) Link Wiring

- Use low-voltage PELV wiring to connect Wallstations to the QS link.
- Make connections inside the wallbox or in a switch/junction box with a maximum wire length of 2.5 m (8 ft) from the link to the Wallstation.
- Two 1.0 mm² (18 AWG) conductors for common (terminal 1) and 24 V⎓ (terminal 2). These will not fit in terminals. Connect as shown.
- One shielded, twisted pair 1.0 mm² (22 AWG) for data link (terminals 3 and 4).
- Connect Drain/Shield as shown. Do not connect to Ground (Earth) or Wallstation. Connect the bare drain wires and cut off the outside shield.

Wiring to Control Link



Note: Use appropriate wire connecting devices as specified by local codes.

Faceplate Information

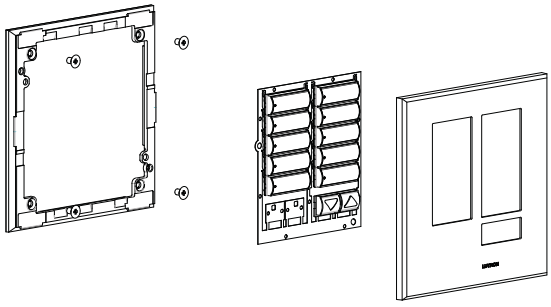
Faceplate Replacement Kits

Use Faceplate Replacement Kits to change: colors, button configuration, engraving, between insert and non-insert versions. Each Kit includes an adapter, button assembly, and wallplate.

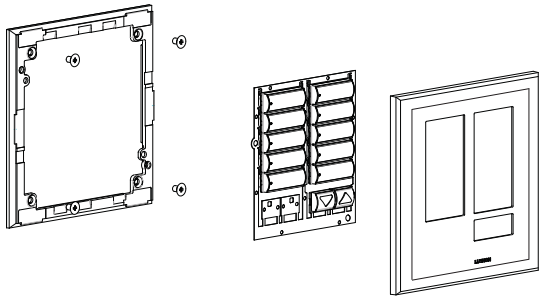
Model Numbers for Kits

HWIS-2BN	HWIS-2BI
HWIS-3BN	HWIS-3BI
HWIS-4BN	HWIS-4BI
HWIS-5BRLN	HWIS-5BRLI
HWIS-5BRLIRN	HWIS-5BRLIRI
HWIS-6BRLN	HWIS-6BRLI
HWIS-7BRLN	HWIS-7BRLI
HWIS-8BRLN	HWIS-8BRLI
HWIS-8BRLIRN	HWIS-8BRLIRI
HWIS-10BRLN	HWIS-10BRLI

Non-Insert Kit



Insert Kit



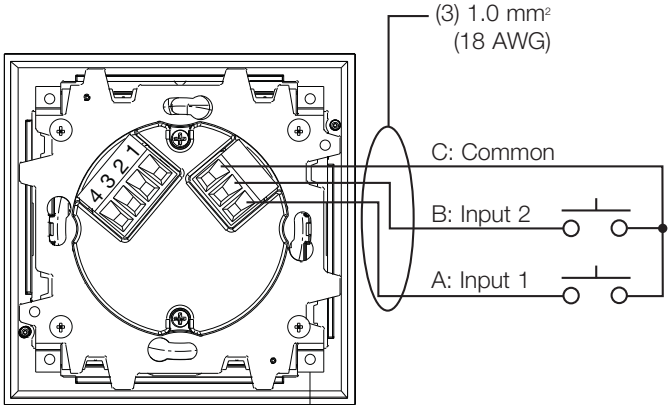
Contact Closure Inputs

Specifications

- Inputs must be dry contact closure or ground-referenced solid-state outputs:
- Wallstation is miswire protected up to 36 V⎓.
- Outputs must stay in the closed or open states for at least 40 msec in order to be recognized by the Wallstation.
- To ensure compatibility with wired occupancy sensors, only use sensors with the Relay model option – those with model numbers ending with R (LOS-CDT-xxxxR or LOS-WDT-R).

Contact Closure Input Wiring

- Use low-voltage PELV wiring to connect the contact closure inputs to the Wallstation.



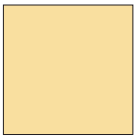
Rear of Homeworks® QS Wired International seeTouch® Wallstation

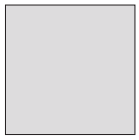
HomeWorks® QS Wired seeTouch® Architectural Keypads

Colors and Finishes

Architectural Metal Finishes (wallplates only)

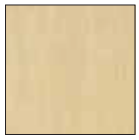

Satin Brass
SB


Bright Brass
BB


Bright Chrome
BC


Clear Anodized Aluminum
CLA


Black Anodized Aluminum
BLA

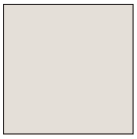

Brass Anodized Aluminum
BRA

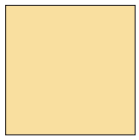

Antique Brass
QB


Antique Bronze
QZ

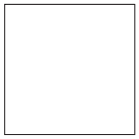

Satin Chrome
SC


Satin Nickel
SN


Bright Nickel
BN


Gold
AU

Satin Finishes


Arctic White
AC


Argentum
AR


Mica
MC

When ordering metal wallplates, it is recommended to order the keypad in Black (BL).

- Due to printing limitations, colors and finishes shown cannot be guaranteed to perfectly match actual product colors.
- Color chip keychains are available for more precise color matching.

HomeWorks® QS RF seeTouch® Tabletop Keypads

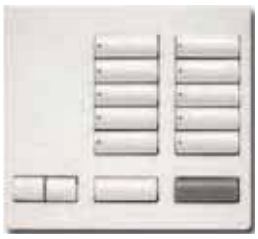
HomeWorks® QS RF seeTouch® Tabletop Keypads provide homeowners with a simple and elegant way to operate lights, shades/draperies, motorized screens, thermostats, and many other devices.

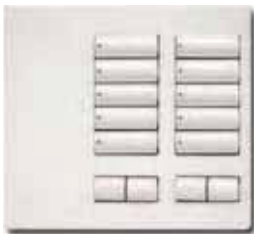
HomeWorks® QS RF seeTouch® Keypads feature large, easy-to-use buttons, plus a unique backlit engraving option that makes the Keypads readable any time of the day or night. The Keypad buttons are rounded, making them easier to read.

The versatile design of HomeWorks® QS RF seeTouch® Tabletop Keypads allows them to be mounted on a wall, placed on top of a table, or used as a cordless Keypad. The Keypads can be powered by a DC adapter or with 2 AAA batteries. Battery powered Tabletop Keypads will shut off after a short period of inactivity in order to conserve battery power.


HQY-T5RL*


HQY-T5CRL*


HQY-T10RL*


HQY-T10CRL*


HQY-T15RL*


HQY-T15CRL*

*"Y" in the model number represents frequency code

Model Numbers

HQR-T5RL-XX*, HQR-T5RL-XX*-BA, HQK-T5RL-XX, HQM-T5RL-XX*, HQQ-T5RL-XX*, HQN-T5RL-XX*	5 button with Master On/Off and Raise/Lower.	HQR-T5CRL-XX*, HQR-T5CRL-XX*-BA, HQK-T5CRL-XX*, HQM-T5CRL-XX*, HQQ-T5CRL-XX*, HQN-T5CRL-XX*	5 button with Column Raise/ Lower.
LFK-T5RL-XX*-E	Engraved Faceplate	LFK-T5CRL-XX*-E	Engraved Faceplate
RK-T5RL-XX*-E	Engraved Button Kit	RK-T5CRL-XX*-E	Engraved Button Kit
HQR-T10RL-XX*, HQR-T10RL-XX*-BA, HQK-T10RL-XX*, HQM-T10RL-XX*, HQQ-T10RL-XX*, HQN-T10RL-XX*	10 button with Master On/Off and Raise/Lower.	HQR-T10CRL-XX*, HQR-T10CRL-XX*-BA, HQK-T10CRL-XX*, HQM-T10CRL-XX*, HQQ-T10CRL-XX*, HQN-T10CRL-XX*	10 button with Column Raise/ Lower.
LFK-T10RL-XX*-E	Engraved Faceplate	LFK-T10CRL-XX*-	Engraved Faceplate
RK-T10RL-XX*-E	Engraved Button Kit	RK-T10CRL-XX*-E	Engraved Button Kit
HQR-T15RL-XX*, HQR-T15RL-XX*-BA, HQK-T15RL-XX*, HQM-T15RL-XX*, HQQ-T15RL-XX*, HQN-T15RL-XX*	15 button with Master On/Off and Raise/Lower.	HQR-T15CRL-XX*, HQR-T15CRL-XX*-BA, HQK-T15CRL-XX*, HQM-T15CRL-XX*, HQQ-T15CRL-XX*, HQN-T15CRL-XX*	15 button with Column Raise/ Lower.
LFK-T15RL-XX*-E	Engraved Faceplate	LFK-T15CRL-XX*-	Engraved Faceplate
RK-T15RL-XX*-E	Engraved Button Kit	RK-T15CRL-XX*-E	Engraved Button Kit

* "XX" in the model number represents color/finish code. See **Colors and Finishes** at end of document.

HomeWorks® QS RF seeTouch® Tabletop Keypads

Specifications

Model Numbers	Keypads: HQR-T5RL-XX*; HQR-T5RL-XX-BA; HQK-T5RL-XX; HQM-T5RL-XX*; HQQ-T5RL-XX*; HQN-T5RL-XX*; HQR-T10RL-XX*; HQR-T10RL-XX-BA; HQK-T10RL-XX*; HQM-T10RL-XX*; HQQ-T10RL-XX*; HQN-T10RL-XX*; HQR-T15RL-XX*; HQR-T15RL-XX-BA; HQK-T15RL-XX*; HQM-T15RL-XX*; HQQ-T15RL-XX*; HQN-T15RL-XX*; HQR-T5CRL-XX*; HQR-T5CRL-XX-BA; HQK-T5CRL-XX*; HQM-T5CRL-XX*; HQQ-T5CRL-XX*; HQN-T5CRL-XX*; HQR-T10CRL-XX*; HQR-T10CRL-XX-BA; HQK-T10CRL-XX*; HQM-T10CRL-XX*; HQQ-T10CRL-XX*; HQN-T10CRL-XX*; HQR-T15CRL-XX*; HQR-T15CRL-XX-BA; HQK-T15CRL-XX*; HQM-T15CRL-XX*; HQQ-T15CRL-XX*; HQN-T15CRL-XX* Faceplate/Button Kits: LFK-T5RL-XX*-E; RK-T5RL-XX*-E; LFK-T10RL-XX*-E; RK-T10RL-XX*-E; LFK-T15RL-XX*-E; RK-T15RL-XX*-E; LFK-T5CRL-XX*-E; RK-T5CRL-XX*-E; LFK-T10CRL-XX*-E; RK-T10CRL-XX*-E; LFK-T15CRL-XX*-E; RK-T15CRL-XX*-E
Power	DC adapter: Input: 100-240 V~ 50/60 Hz 6.5 W Output: 9 V⎓ 300 mA **Battery powered:** 2 AAA alkaline (included) 1.5 V each
Typical Power Consumption	0.6 W Test conditions: all backlights on medium intensity, nightlight mode enabled, six LEDs on (two presets active per column), Keypad powered by a 9 V⎓ adapter (T120-9DC-3).
Regulatory Approvals	**DC adapter:** UL Listed for U.S. and Canada, NOM **Tabletop Keypad:** FCC, IC, COFETEL, ANATEL, CE, TRA, SUPERTEL; SUTEL
Environment	Ambient operating temperature: 32 °F to 104 °F (0 °C to 40 °C), 0% to 90% humidity, non-condensing. Indoor use only.
Communications	HomeWorks® QS RF seeTouch® Tabletop Keypads communicate with the system through Radio Frequency (RF) and must be located within 30 ft (9 m) of an RF hybrid repeater.
ESD Protection	Tested to withstand electrostatic discharge without damage or memory loss, in accordance with IEC 61000-4-2.
Surge Protection	Tested to withstand surge voltages without damage or loss of operation, in accordance with IEEE C62.41-1991 Recommended Practice on Surge Voltages in Low-Voltage AC Power Circuits.
Power Failure	Power failure memory: should power be interrupted, the Keypad will return to its previous state when power is restored.
Mounting	Mounting bracket included for optional wall mount applications.
Warranty	http://www.lutron.com/resiinfo

HomeWorks® QS RF seeTouch® Tabletop Keypads

Design Features

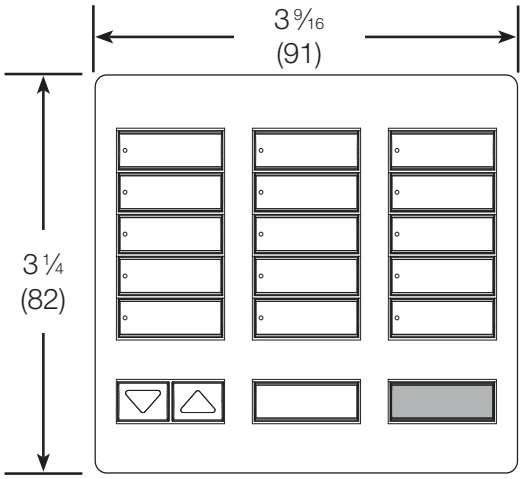
- At the press of a single button, lights fade ON or OFF to desired levels and shades/draperies open or close to desired positions.
- Light levels and shade/drapery positions can be fine-tuned by pressing and holding the raise/lower buttons.
- Programmable to select whole-house or single-room preset levels or positions.
- Green LEDs for status and button/engraving backlighting.
- Adjustable backlight intensity.
- Prepaid engraving included. Redeemable for one engraved button kit.
- Tabletop Keypad Button action is “Wake-up and Activate” - A single button press will “wake up” and activate selected button.

HomeWorks® QS RF seeTouch® Tabletop Keypads

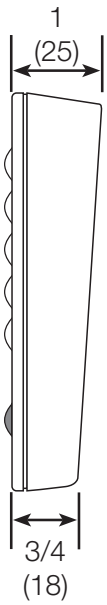
Dimensions

All dimensions are shown as in (mm)

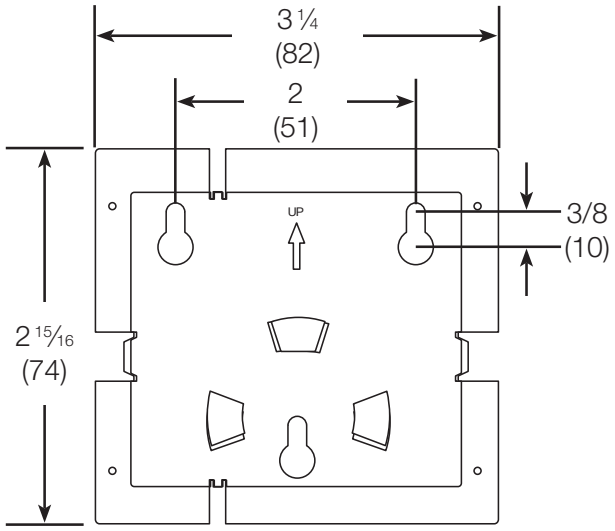
Keypad Front View



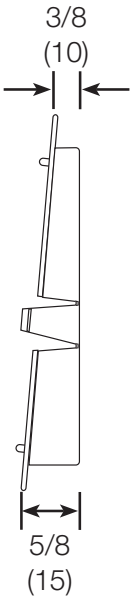
Keypad Side View



Mounting Bracket Front View



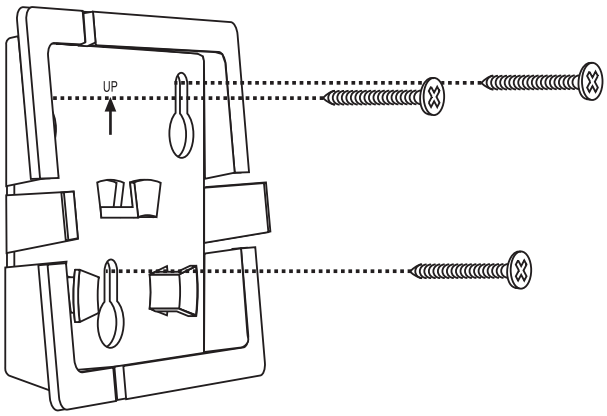
Mounting Bracket Side View



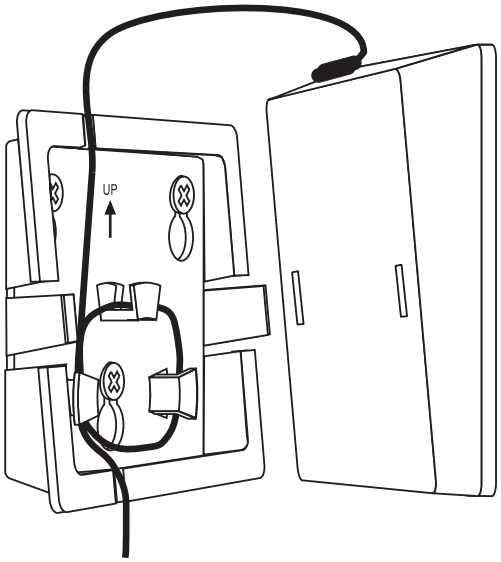
HomeWorks® QS RF seeTouch® Tabletop Keypads

Wall Mounting (optional)

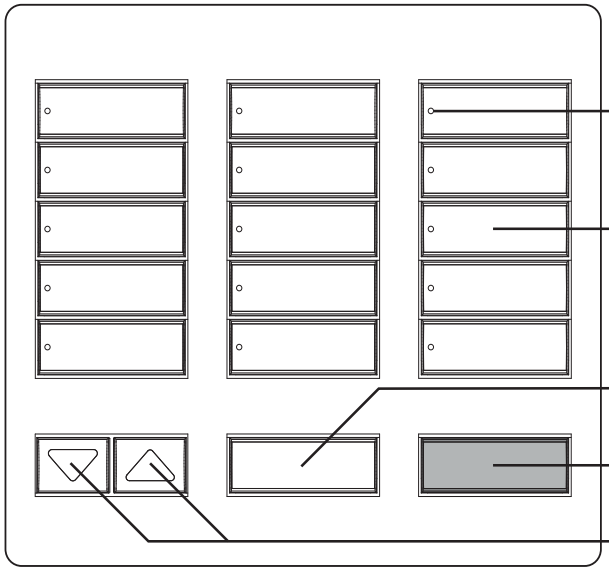
Attach mounting bracket to wall using the supplied wall anchors and screws.



If using the DC adapter, wrap excess cord around the cord holder and snap Keypad onto the mounting bracket.



Operation



Status LEDs
Show which Keypad button has been activated.

Keypad Buttons
Press to activate desired levels or positions.

All On Button
Turn all lights to full on and shades/draperies to open.

All Off Button
Turn all lights off and shades/draperies to closed.

Raise/Lower Buttons
Lights increase or decrease in intensity and shades/draperies move towards the open or close limit.

Colors and Finishes

Keypads and Engraved Button Kits
Satin Finishes

Snow
SW


Midnight
MN

- Due to printing limitations, colors and finishes shown cannot be guaranteed to perfectly match actual product colors.
- Color chip keychains are available for more precise color matching:

  Satin Finishes – SC-CK-1
  Architectural Metal Finishes – AMTL-CK-1

Engraved Faceplate Kits
Satin Finishes

Snow
SW


Midnight
MN

Engraved Faceplate Kits
Metal Finishes

When ordering metal faceplates, it is recommended to order the keypad in Midnight (MN).

Satin Brass
SB

Bright Brass
BB

Bright Chrome
BC

Clear Anodized
Aluminum
CLA


Black Anodized
Aluminum
BLA


Brass Anodized
Aluminum
BRA


Antique Brass
QB


Antique Bronze
QZ

Satin Chrome
SC

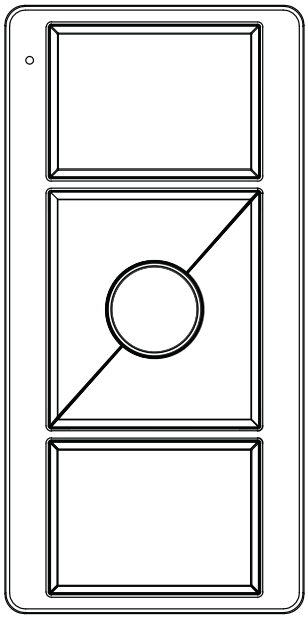

Satin Nickel
SN

Bright Nickel
BN

369-408b 1 04.25.11

Pico Wireless Control and Pedestal (for regions other than North America)

The *Pico* wireless control is a flexible and easy to use device that allows the user to control Lutron® wireless load control devices. It can also be configured as a scene or zone control in GRAFIK Eye® QS wireless and Guestroom Solutions applications. The *Pico* wireless control can function as a tabletop control on a pedestal or as a lightweight, handheld remote. The battery operated *Pico* wireless control requires no external power or communication wiring.



Pico wireless control

Features

- Provides control for the following:
  - Sivoia® QS wireless systems
  - *GRAFIK Eye* QS wireless systems
  - Rania® wireless systems
  - Energi Savr Node™ and Quantum® systems, through the use of a QS sensor module
  - Guestroom Solutions
- Control available in a variety of button marking options.
- Easy reconfiguration for use as a handheld remote or table top control, with the use of the optional pedestal (sold separately).
- Tabletop pedestal available in a single and dual configuration in both black and white.
- Battery powered *Pico* wireless control requires no wiring.
- Battery included with *Pico* wireless control.
- Can provide control to blinds, curtains or lighting devices within a 9 m (30 ft) range.
- For wall mount applications, inquire with Lutron's Customer Service at www.lutron.com

LUTRON® SPECIFICATION SUBMITTAL Page: 1

Job Name:	Model Numbers:	
Job Number:		

Specifications

Regulatory

- Lutron® Quality Systems registered to ISO 9001.2008.

QSRKP-

- CE - Marked (European Union)
- TRA Type Approved (United Arab Emirates)
- CITC Type Approved (Kingdom of Saudi Arabia)

QSRMP- (-2, -2R, and -3R only)

- SRRC Type Approved (Mainland China)
- IDA Registered (Singapore)

QSRNP-

- WPC Type Approved (India)

Power

- Operating Voltage 3 V⎓
- (1) CR2032 Battery (included)

Key Design Features

- Configurable to be used as a handheld remote or table top control.
- Optional pedestal is available in a single configuration for converting the *Pico* wireless control to a tabletop control. The pedestal is also available in a dual configuration for two *Pico* wireless controls. Pedestals sold separately.

System Communication and Capacity

- *Pico* wireless controls communicate using Radio Frequency (RF) at 868 MHz, limited 868 MHz, or 865 MHz FM.
- Thousands of system addresses prevent interference between systems.
- *Pico* wireless controls can be assigned to control blinds, curtains or lighting devices that are within a 9 m (30 ft) range.
- Can be configured as a scene or zone control in GRAFIK Eye® QS wireless and Guestroom Solutions applications.

Mounting Considerations

- Mounting of any RF devices on or in close proximity to a metal surface will drastically reduce the effective range of radio signal transmission or reception.
- All RF devices must be mounted on non-conductive materials to ensure proper performance.

Environment

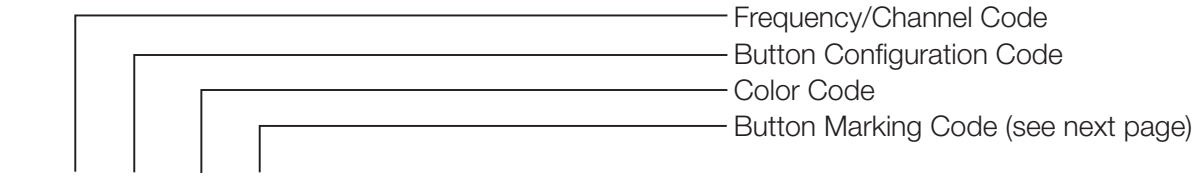
- Ambient operating temperature: 0 ˚C to 60 ˚C (32 ˚F to 140 ˚F)
- Maximum 90% non-condensing relative humidity
- Indoor use only

Warranty

- 1 year limited warranty

Job Name:	Model Numbers:	
Job Number:		

Model Number



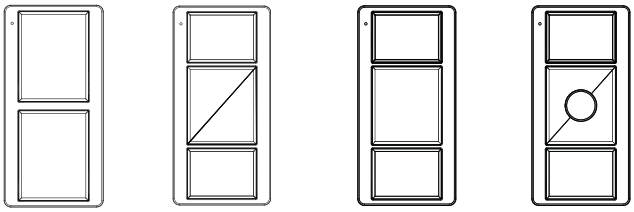
Frequency/Channel Codes:

Code
K — 868.1 - 869.8 MHz
M — 868.1 - 868.5 MHz (-2, -2R, and -3R only)
N — 865.5 - 866.5 MHz

Contact Lutron's Customer Service at www.lutron.com for frequency/channel code compatibility with your particular geographic region, and for integrating with other Lutron® lighting and shading products.

Button Configuration Codes:

Button Configuration	Code
2 Button	2
2 Button with Raise/Lower	2R
3 Button	3 (not available with QSRMP-)
3 Button with Raise/Lower	3R



2 Button (2) | 2 Button with Raise/Lower (2R) | 3 Button (3) | 3 Button with Raise/Lower (3R)

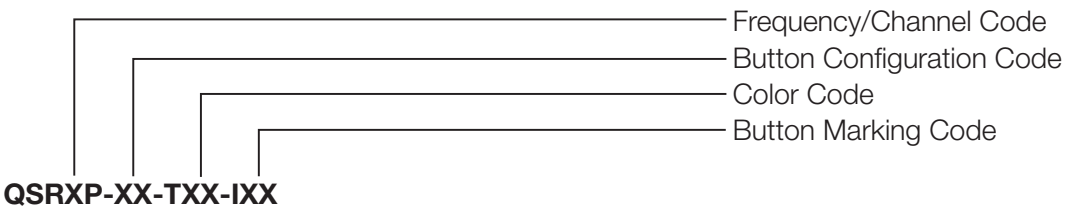
Color Codes:

Color	Code
Artic White	AW
Black	BL

Continued on next page...

Job Name:	Model Numbers:	
Job Number:		

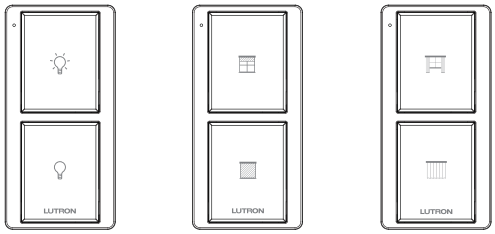
Model Number (continued)



Button Marking Codes:

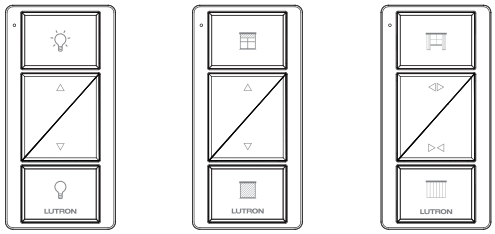
Button Marking Options	Code
Light	03
Roller Blind	04
Curtain	13

2 Button



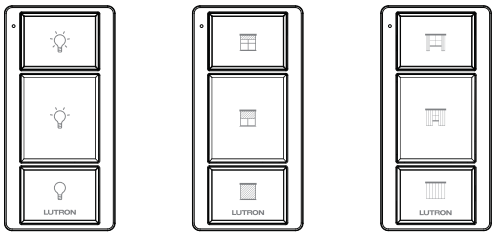
Light (03) | Roller Blind (04) | Curtain (13)

2 Button with Raise/Lower



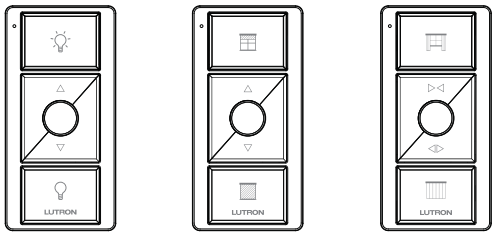
Light (03) | Roller Blind (04) | Curtain (13)

3 Button (not available with QSRMP-)



Light (03) | Roller Blind (04) | Curtain (13)

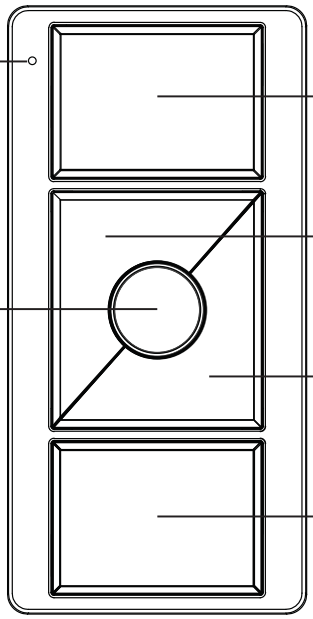
3 Button with Raise/Lower



Light (03) | Roller Blind (04) | Curtain (13)

Job Name:	Model Numbers:	
Job Number:		

Operation



LED
Flashes when a button on the *Pico* wireless control is pressed.

Preset Button
(3 & 3R models only)

Tap once:
Devices go to preset levels/positions. Activates scene 16 when used in scene mode with GRAFIK Eye® QS wireless and Guestroom Solutions applications.

Press and hold:
To save new preset level or position, press and hold until the LED stops flashing (6 seconds).

Top Button
Lights brighten to full intensity and shades/draperies go to open limit. Activates scene 1 when used in scene mode with *GRAFIK Eye* QS wireless and Guestroom Solutions applications.

Raise Button (2R & 3R models only)
Lights increase in intensity and shades/draperies move towards open limit.

Lower Button (2R & 3R models only)
Lights decrease in intensity and shades/draperies move towards close limit.

Bottom Button
Lights dim to off and shades/draperies go to close limit. Activates "OFF" scene when used in scene mode with *GRAFIK Eye* QS wireless and Guestroom Solutions applications.

Job Name:	Model Numbers:	
Job Number:		

Pico® Pedestal Model Number

Pedestals sold separately. Available in gloss finish only.

QSA—PED*X-XX*

Color Code
Capacity Code

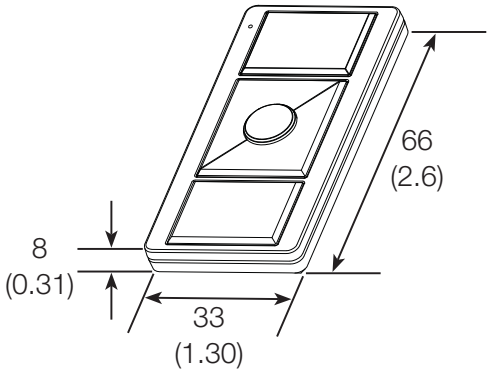
Capacity	Capacity Code
Single	1
Dual	2

Color	Color Code
White	WH
Black	BL

Dimensions

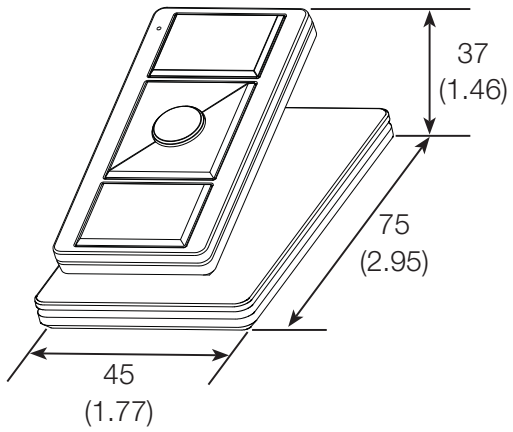
Measurements shown as: mm (in)

Pico Wireless Control



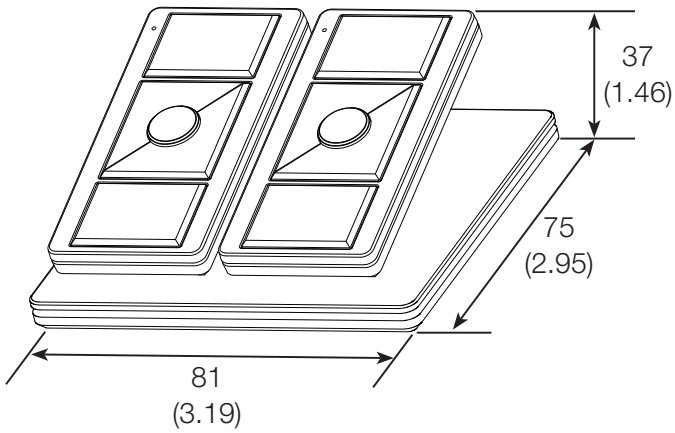
Single Pedestal

Pedestals sold separately.



Dual Pedestal

Pedestals sold separately.



Job Name:	Model Numbers:	
Job Number:		

HomeWorks® QS Dynamic Keypads

Dynamic Keypads provide the functionality of multiple Lutron® keypads in an easy-to-navigate, intuitive arrangement. Dynamic Keypads help reduce wall clutter by combining control of several functions into a convenient, single point of control for multiple systems including: lights, shades/draperies, and HVAC equipment.



Dynamic Keypads are easy to set up and are simple and intuitive to program and adjust to your specific needs. The display screen clearly displays the system and device status. The intuitive user interface combines the cognition of a seeTouch® keypad with the flexibility of an LCD screen touch interface.

Dynamic Keypads combine superior aesthetics with energy savings. On screen button labeling for the Dynamic Keypad is done automatically while you program the system.

Model Number

HQ-J-DK420-XX* Dynamic Keypad (434 MHz/wired)

HQ-W-DK420-XX* Dynamic Keypad (wired only)

* "XX" in the model number represents color/finish code.
See **Colors and Finishes** below.

Colors and Finishes

Dynamic Keypads are available in 2 colors.

White
WH

Black
BL

HomeWorks® QS Dynamic Keypads

Specifications

Model Number	HQ-J-DK420-XX, HQ-W-DK420-XX
Power	24 V⎓ 113 mA
Typical Power Consumption	1.5 W; 6 Power Draw Units* (PDUs). Test conditions: LCD backlight on at 80%, buttons backlight on at 28%, while in use. *For more information about PDUs, please see the HomeWorks® QS Wiring and Power Guidelines document on the HomeWorks® QS Resource Website.
Regulatory Approvals	UL, cUL, FCC, IC, SCT, CE, CTICK
Environment	Ambient operating temperature: 32 °F to 104 °F (0 °C to 40 °C), 0%-90% humidity, non-condensing. Indoor use only.
Communications	Dynamic Keypads communicate with the system through the Wired QS Link or through Radio Frequency (RF). When using RF (HQ-J models only), the Dynamic Keypad must be located within 30 ft (9 m) of a repeater. System devices operate on frequencies between 431.0 MHz and 437.0 MHz. To improve system commissioning time, Lutron recommends no more than ten Dynamic Keypads per RF Link. QS Link wired installations offer faster commissioning time.
ESD Protection	Tested to withstand electrostatic discharge without damage or memory loss, in accordance with IEC 61000-4-2.
Surge Protection	Tested to withstand surge voltages without damage or loss of operation, in accordance with IEEE C62.41-1991 Recommended Practice on Surge Voltages in Low-Voltage AC Power Circuits.
Power Failure	Power failure memory: should power be interrupted, the Dynamic Keypad will return to its previous state when power is restored.
Mounting	The Dynamic Keypad must be installed in a flat, hollow wall (i.e. not concrete wall). If gap between wall and mounting frame is larger than the thickness of a credit card, wall must be repaired to eliminate gap. Otherwise, damage to the Keypad may result. Custom mounting frame included. Minimum wall depth: 2¼ in (57 mm). Wall thickness range: 1/4 in (6 mm) to 1 in (25 mm).
Wiring	**RF:** Two 18 AWG (1.0 mm^2) IEC PELV / NEC® Class 2 cable. **Wired:** Two 22 AWG (0.5 mm^2) twisted shielded and two 18 AWG (1.0 mm^2) IEC PELV / NEC® Class 2 cable. Use Lutron® cable GRX-CBL-346S.
Warranty	8 Year Limited Warranty. www.lutron.com/TechnicalDocumentLibrary/HomeWorks_Warranty.pdf

Design Features

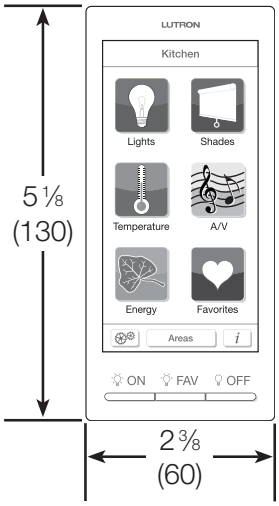
- Simple, intuitive control of lights, shades/draperies, compatible HVAC equipment, and Audio/Visual equipment from a single location.
- The capacitive touch interface provides a rich user experience and flexible control for a single room or an entire home.
- Use individual pages for simple control of lighting, shades/draperies, and temperature in rooms throughout the home.
- Wireless or wired installation.
- Three hard buttons provide instant access to frequently used lighting functions.
- Ensures reliable system control through Lutron's patented Clear Connect™ RF technology (HQ-J models only) or through wired QS link.
- Slim 0.5 in (13 mm) profile off the wall.
- Reduces wall clutter by combining multiple controls into one control.
- Create or modify on-screen buttons easily through system Design and Programming Utility.

HomeWorks® QS Dynamic Keypads

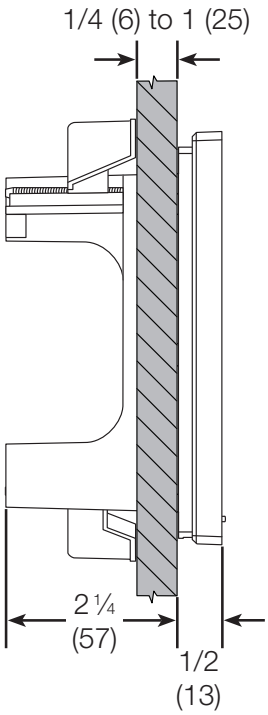
Dimensions

All dimensions are shown as in (mm)

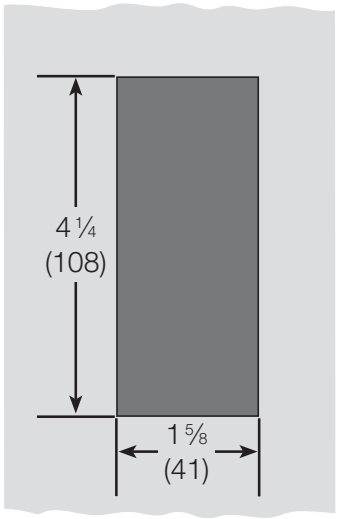
Front View



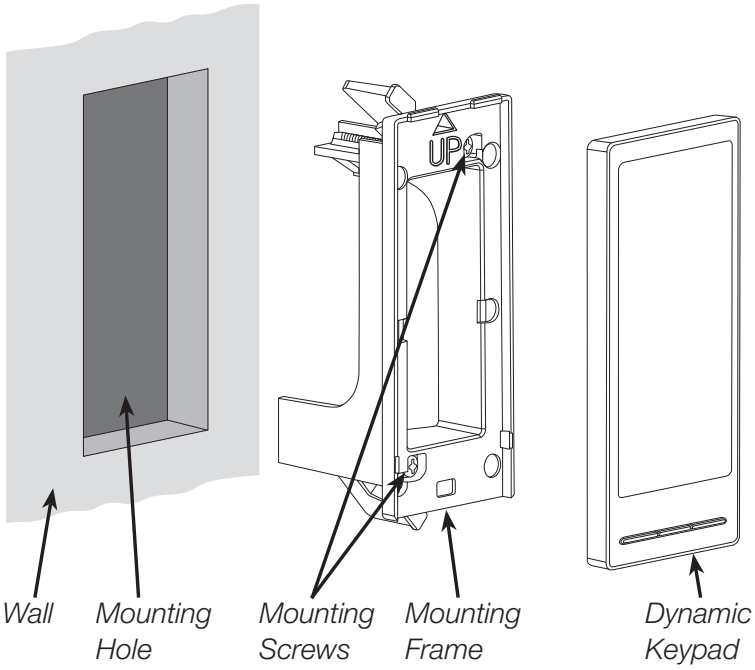
Side View



Mounting Hole



Mounting and Parts Identification

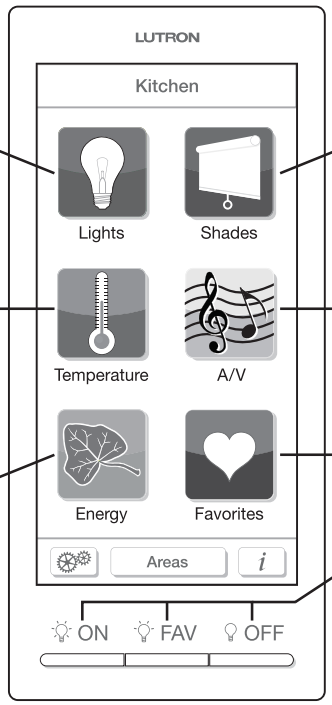


Note: The Dynamic Keypad must be installed in a flat, hollow wall (i.e. not concrete wall). If gap between wall and mounting frame is larger than the thickness of a credit card, wall must be repaired to eliminate gap. Otherwise, damage to the Keypad may result.

HomeWorks® QS Dynamic Keypads

Operation

Front View



Lights
Control and monitor lighting scenes or individual lights in multiple areas of the home.

Temperature
View the current temperature and adjust set point, system mode, and schedule.

Energy
View current energy saving mode and adjust "Green" button settings.

Shades
Control and monitor individual or groups of shades/draperies in multiple areas of the home.

Audio/Video
Access basic controls or A/V equipment by integrating with a third-party A/V control processor.

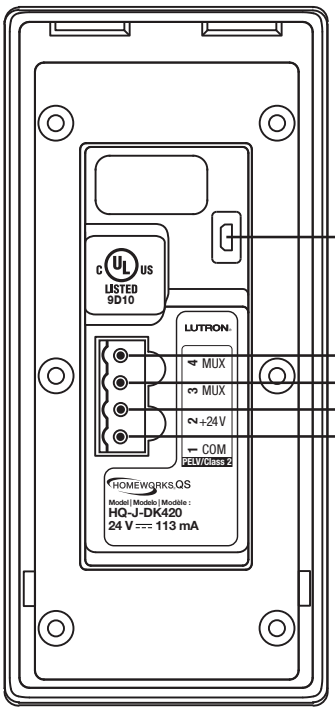
Favorites
Quickly access most frequently used system functions.

Backlit Hard Buttons
Provide instant access to frequently used lighting functions.

Note: Backlighting is adjustable and can be programmed to turn off when in standby mode.

Connections

Rear View

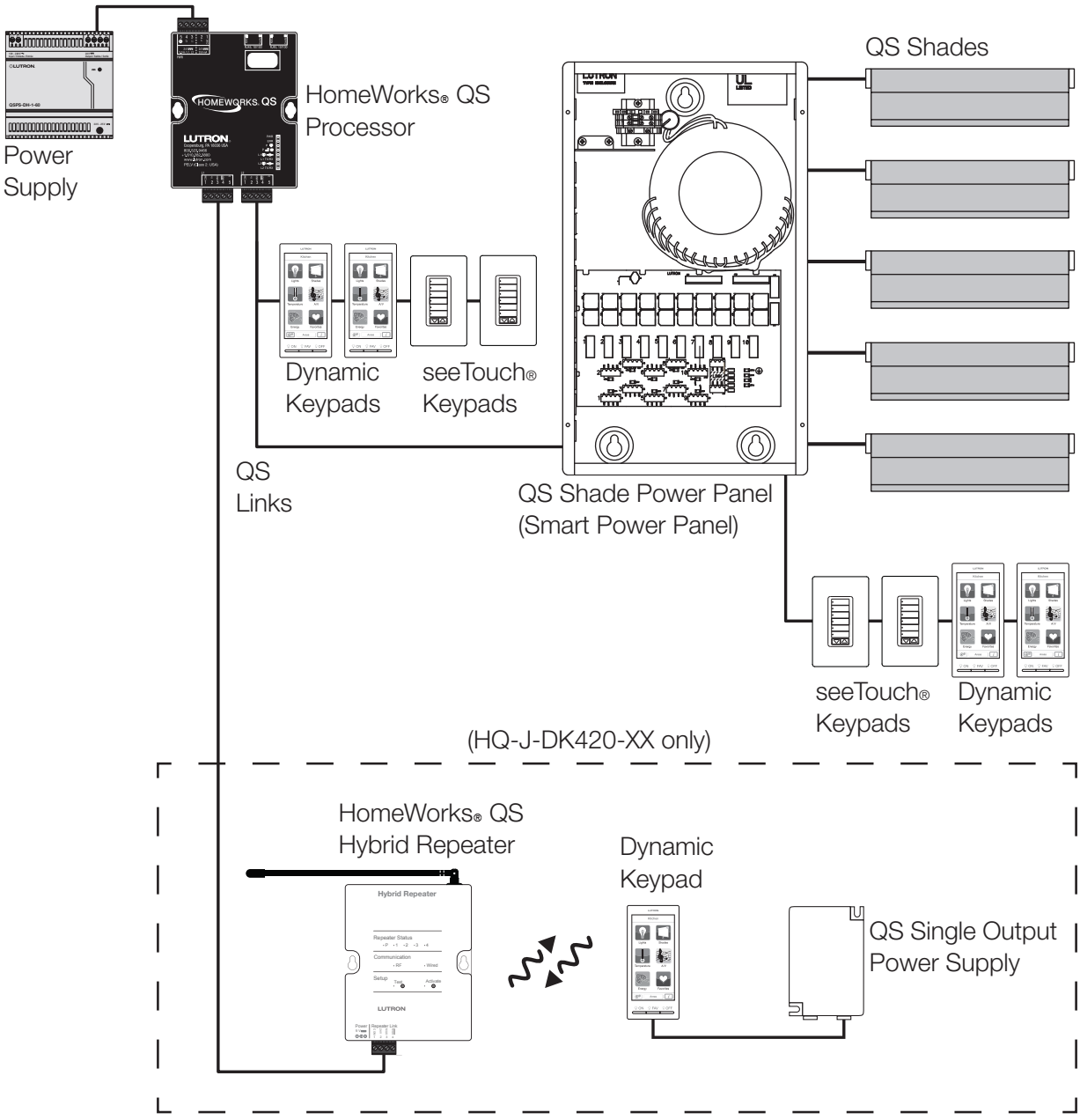


Mini-B USB
For firmware upgrade.

Control Link Wiring
MUX
MUX
+24 V⎓
COM

HomeWorks® QS Dynamic Keypads

Wiring Diagram



Note: To improve system commissioning time, Lutron recommends no more than ten Dynamic Keypads per RF Link. QS Link wired installations offer faster commissioning time.

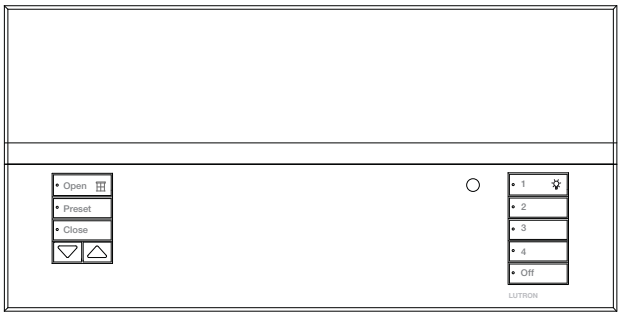
Main Units

GRAFIK Eye® QS

The GRAFIK Eye® QS controls up to six zones of light. The GRAFIK Eye® QS will operate the following sources with a continuous Square Law dimming curve or on a full conduction non-dim basis:

- Incandescent
- Tungsten Halogen
- Electronic Low-Voltage (ELV) Switched
- Magnetic Low-Voltage (MLV) Transformer
- Metal Halide/High Pressure Sodium Switched
- Neon/Cold Cathode
- Lutron Tu-Wire® Electronic Fluorescent Dimming Ballasts

The GRAFIK Eye® QS can be configured for wired (QS link) or wireless (RF link) communication.



GRAFIK Eye® QS

Model Numbers

QSGRJ-3P-XX*	3 zones, 120-240 V~
QSGRJ-4P-XX*	4 zones, 120-240 V~
QSGRJ-6P-XX*	6 zones, 120-240 V~
QSGRJ-3P-1XX*	3 zones, 1 extra button column, 120-240 V~
QSGRJ-3P-TXX*	3 zones, translucent cover, 120-240 V~
QSGRJ-3P-1TXX*	3 zones, 1 extra button column, translucent cover, 120-240 V~
QSGRJ-4P-1XX*	4 zones, 1 extra button column, 120-240 V~
QSGRJ-4P-TXX*	4 zones, translucent cover, 120-240 V~
QSGRJ-4P-1TXX*	4 zones, 1 extra button column, translucent cover, 120-240 V~
QSGRJ-6P-1XX*	6 zones, 1 extra button column, 120-240 V~
QSGRJ-6P-TXX*	6 zones, translucent cover, 120-240 V~
QSGRJ-6P-1TXX*	6 zones, 1 extra button column, translucent cover, 120-240 V~
QSGFP-	Faceplate kit

* "XX" in the model number represents color/finish code. See **Colors and Finishes** at the end of document.

Specifications

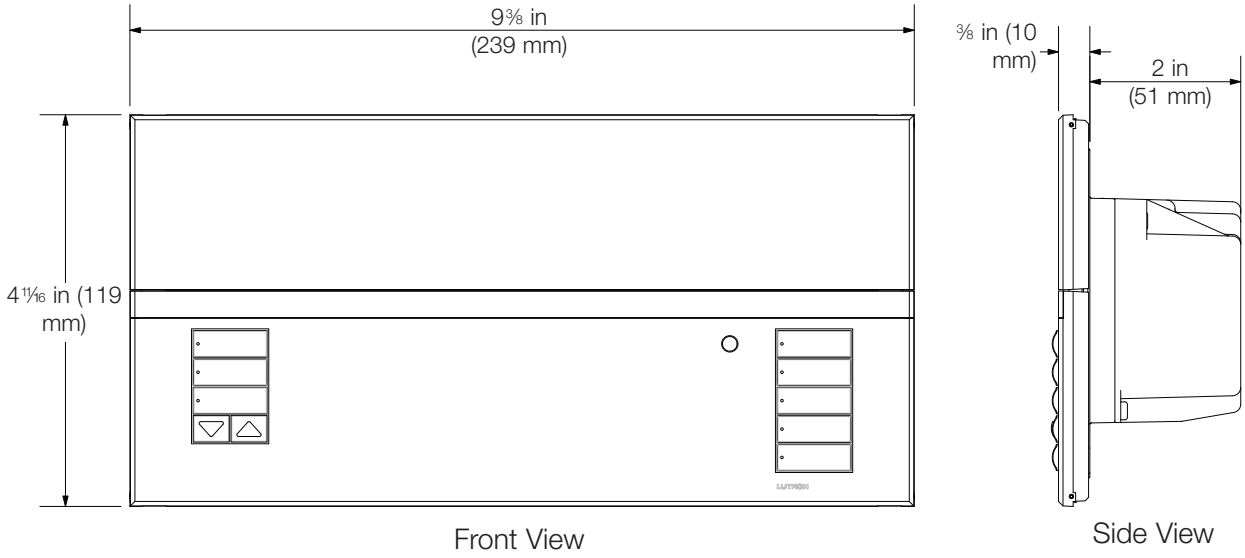
Model Numbers	See previous page
Power	120 V~, 220–240 V~ (non CE), 50/60 Hz
Typical Power Consumption	7 W, 0 Power Draw Units (PDUs). **The GRAFIK Eye® QS is not powered from the link, Pin 2 should not be connected.** Typical Power Consumption test conditions: all loads off, one button LED on.
Regulatory Approvals	UL, CSA, FCC, IC, SCT, NOM, CEC (Title 24)
Environment	Ambient operating temperature: 32 °F to 104 °F (0 °C to 40 °C) Ambient operating humidity: 0-90% humidity, non-condensing. Indoor use only.
Communications	Low-voltage type IEC PELV/NEC® Class 2 wiring connects GRAFIK Eye® QS to processor. Each HomeWorks® QS processor has two configurable links. GRAFIK Eye® QS communicates with the processor via the QS link or RF link.
ESD Protection	Tested to withstand electrostatic discharge without damage or memory loss, in accordance with IEC 801-2.
Surge Protection	Tested to withstand surge voltages without damage or loss of operation, in accordance with IEEE C62.41-1991 Recommended Practice on Surge Voltages in Low-Voltage AC Power Circuits.
Power Failure	Provides 10-year power failure memory: Automatically restores lighting to levels prior to power interruption.
Mounting	Installs in a standard 4-gang U.S. wallbox, 3½ in (89 mm) deep is strongly recommended. Always allow at least 4½ in (114 mm) clearance above and below the control unit to provide adequate space for cooling. Wallplate snaps on with no visible means of attachment.
Line Voltage Wiring	Each line voltage terminal can accept one 12 AWG (4.0 mm^2) wire.
IEC PELV/NEC® Class 2 QS System Low-Voltage Wiring	System communication uses low-voltage wiring. Wiring can be daisy-chained or T-tapped. Wiring must be run separately from line/mains voltage. IEC PELV/NEC® Class 2 wiring link requires: Two 18 AWG (0.75 mm^2) conductors for control power. One twisted, shielded pair of 22 AWG (0.34 mm^2) for data link. Available from Lutron, P/N GRX-CBL-346S; check compatibility in your area. Total length of control link must not exceed 2000 ft (610 m).
Warranty	8 Year Limited Warranty. http://www.lutron.com/resiinfo

Design Features

- Contains RTISS Equipped® technology to compensate in real time for incoming line voltage variations: No visible flicker with +/-2% change in RMS voltage/cycle and +/-2% change in frequency/second.
- Buttons are programmable to select scene or room preset levels or positions
- Wallplate snaps on with no visible means of attachment.
- Can be configured for wired (QS link) or wireless (RF link) communication.

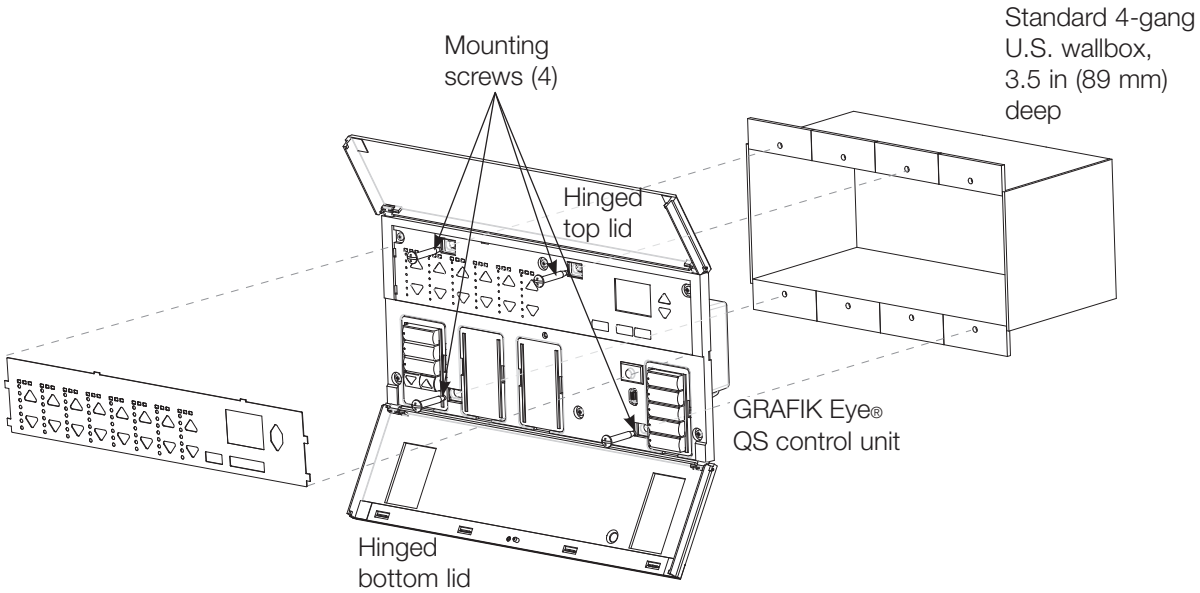
Dimensions

Dimensions shown as: in (mm)



Fits into a 4-gang U.S. backbox, 3.5 in (89 mm) deep; Lutron P/N 241400

Mounting



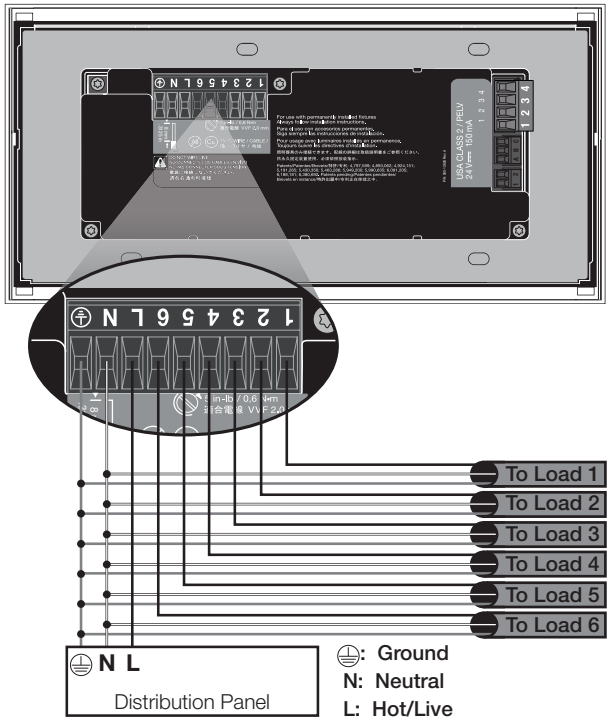
Load Capacity

	120 V~ 50/60 Hz	220–240 V~ 50/60 Hz
Unit Capacity (watts)	2000 W	3000 W
Magnetic Low-Voltage	2000 VA / 1600 W	3000 VA / 2400 W
Zone Capacity (watts)	25–800 W	40 – 1200 W
Magnetic Low-Voltage	25–800 VA / 25–600 W	40–1200 VA / 40–960 W

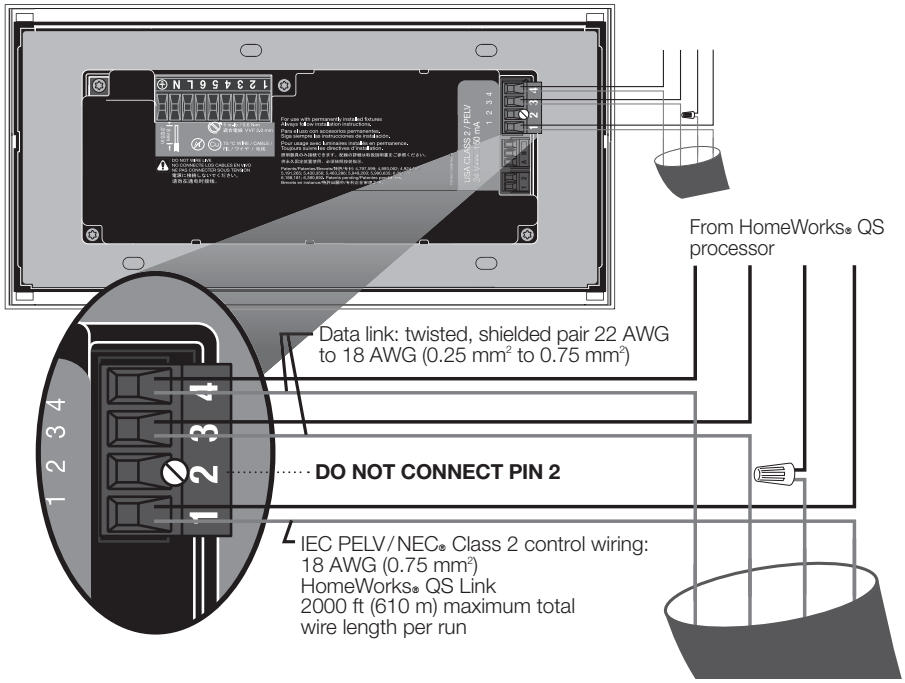
Load Type Notes

- When dimming Electronic Low-Voltage (ELV) lighting, an ELV interface (such as PHPM-PA-DV-WH) must be used with the control unit. Before installing an ELV light source, verify with the manufacturer that their transformer can be dimmed.
- When controlling 0–10 V loads, a Ten Volt Interface (GRX-TVI) must be used with the control unit.
- Not all zones must be connected; however, **connected zones must have a minimum load as specified above.**
- Maximum total lighting load for a Magnetic Low-Voltage (MLV) varies by input voltage **(specified above):**
  — 120 V~: 800 VA / 600 W
  — 220–240 V~: 1200 VA / 960 W
- No zone may be loaded with more than the capacity specified above. For higher wattage applications, or for 277 V~ applications, use Lutron® power module PHPM-PA, PHPM-WBX, PHPM-PA-DV, PHPM-SW, or PHPM-WBX-DV.

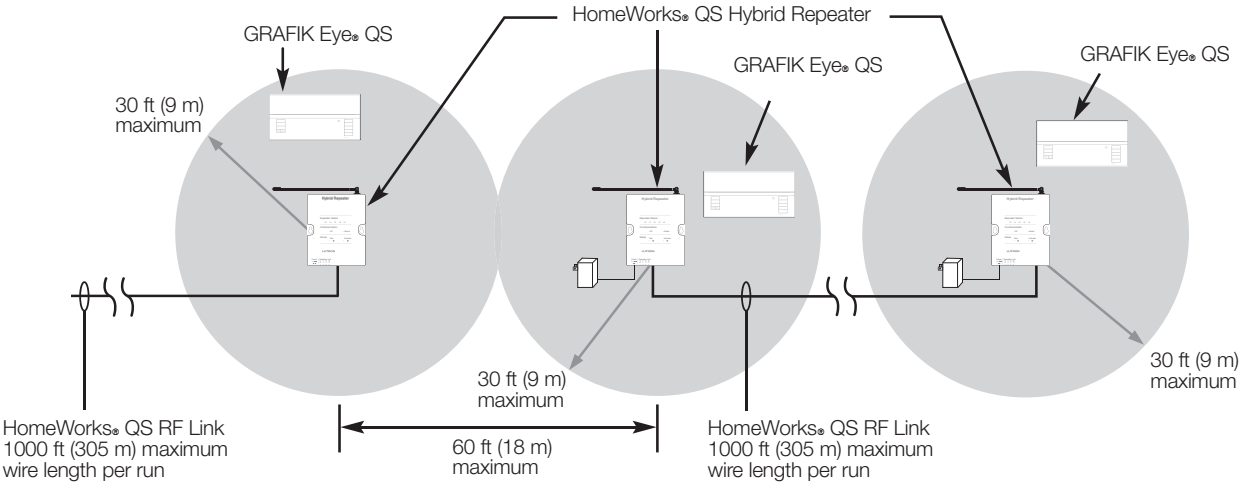
Power and Load Wiring



QS Link Wiring

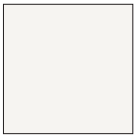


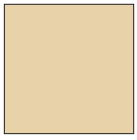
RF Link

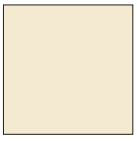


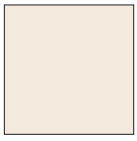
Colors and Finishes

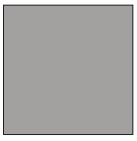
Architectural Matte Finishes (standard)


White
WH


Ivory
IV

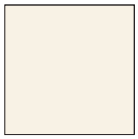

Almond
AL


Light
Almond
LA


Gray
GR


Brown
BR


Black
BL


Beige
BE

Architectural Metal Finishes (Faceplate kit only)

Satin Brass
SB


Bright Brass
BB

Bright Chrome
BC

Clear Anodized
Aluminum
CLA


Black Anodized
Aluminum
BLA


Brass Anodized
Aluminum
BRA


Antique Brass
QB


Antique Bronze
QZ

Satin Chrome
SC


Satin Nickel
SN


Bright Nickel
BN

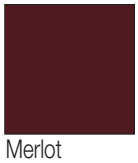
- Due to printing limitations, colors and finishes shown cannot be guaranteed to perfectly match actual product colors.
- Color chip keychains are available for more precise color matching:

  Architectural Matte Finishes- AM-CK-1
  Architectural Metal Finishes - AMTL-CK-1

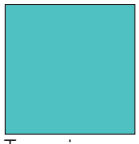
Colors and Finishes (continued)

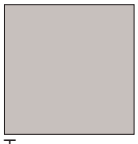
Satin Finishes (Faceplate kit only)

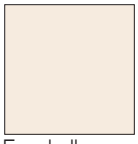

Hot
HT

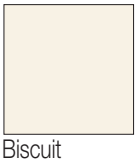

Merlot
MR


Plum
PL


Turquoise
TQ


Taupe
TP


Eggshell
ES


Biscuit
BI


Snow
SW

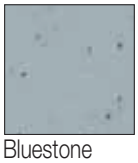

Palladium
PD


Midnight
MN


Sienna
SI


Terracotta
TC


Greenbriar
GB


Bluestone
BG


Mocha Stone
MS


Goldstone
GS

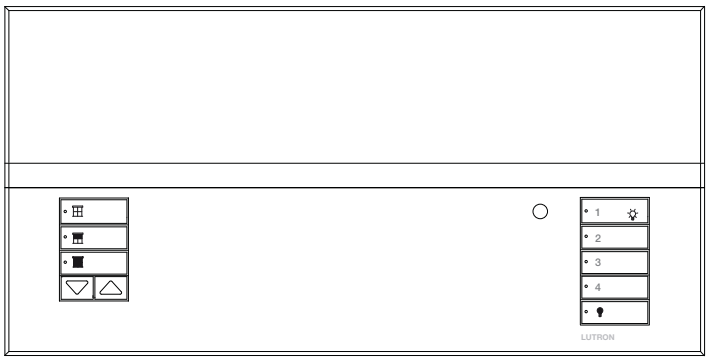

Desert Stone
DS


Stone
ST


Limestone
LS

- Due to printing limitations, colors and finishes shown cannot be guaranteed to perfectly match actual product colors.
- Color chip keychains are available for more precise color matching:
  Satin Finishes - SC-CK-1

GRAFIK Eye® QS Wireless Control Unit (230 V~ CE)

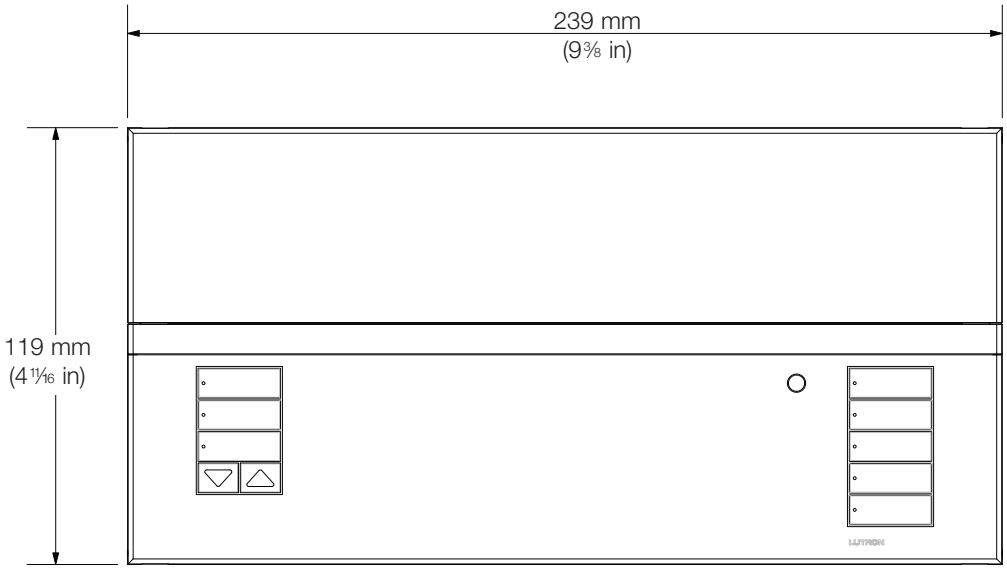


Description

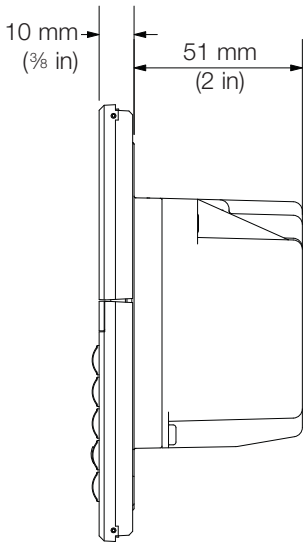
GRAFIK Eye QS Wireless is the premier energy-saving light and window treatment control. *GRAFIK Eye* QS includes an astronomic timeclock, intuitive lighting presets, and direct window treatment control. Now with wireless technology, you can use the *GRAFIK Eye* QS Wireless to seamlessly integrate with a variety of Lutron wireless products and systems, including Radio Powr Savr™ occupancy, vacancy, and daylight sensors, Sivoia® QS Wireless window treatments, Pico® wireless control, and other *GRAFIK Eye* wireless products. Additionally, the *GRAFIK Eye* QS Wireless is compatible with all Lutron wired QS products and systems.

GRAFIK Eye QS Wireless is compatible with Quantum®.

Mechanical Dimensions



Front View



Side View

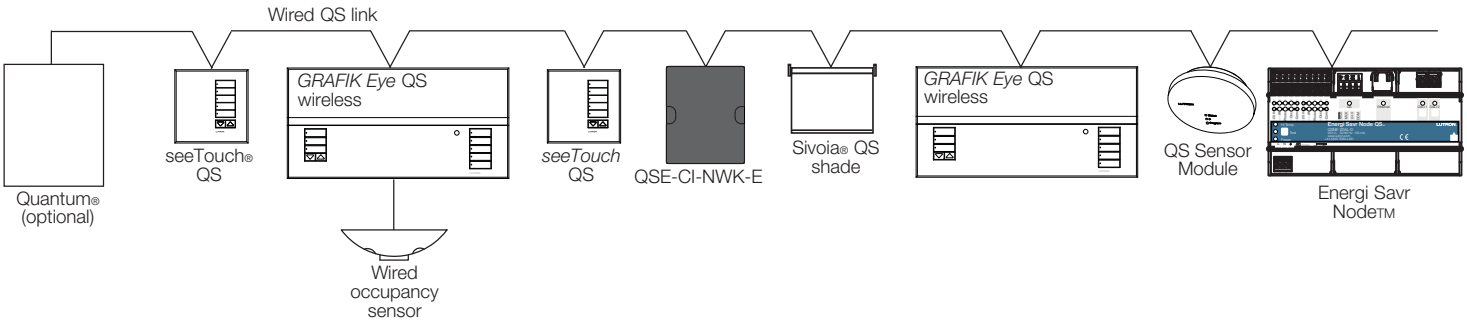
Fits into a 4-gang U.S. backbox, 89 mm (3.5 in) deep; Lutron P/N 241-400

Job Name:	Model Numbers:	
Job Number:		

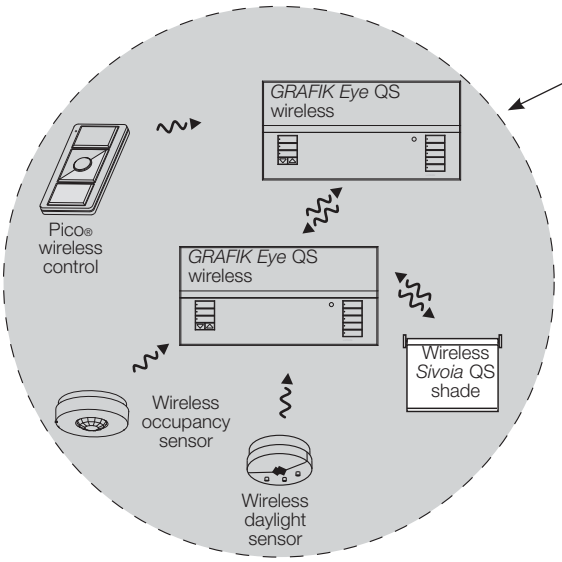
System Topologies

The GRAFIK Eye® QS Wireless can be specified in three different system topologies. Examples of each are shown below.

Example of Wired System

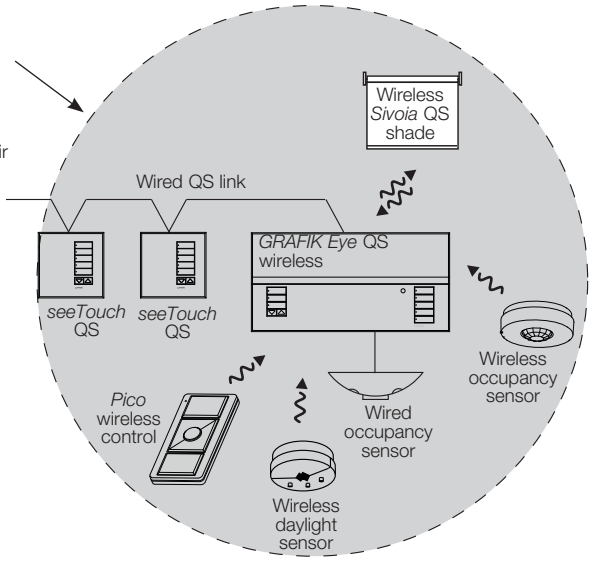


Example of *GRAFIK Eye*-centric Wireless System



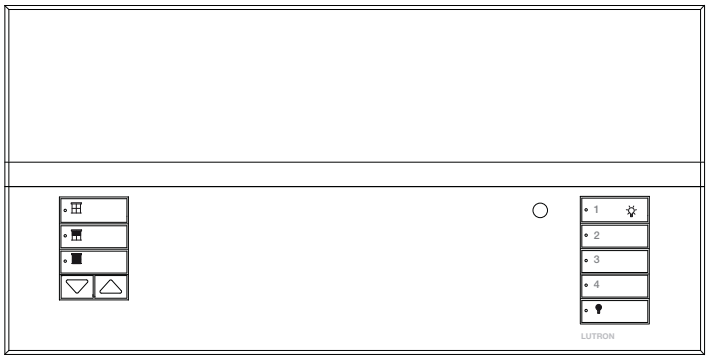
10 m (30 ft) wireless range; 20 m (60 ft) in open air

Example of Mixed *GRAFIK Eye*-centric Wired/Wireless System

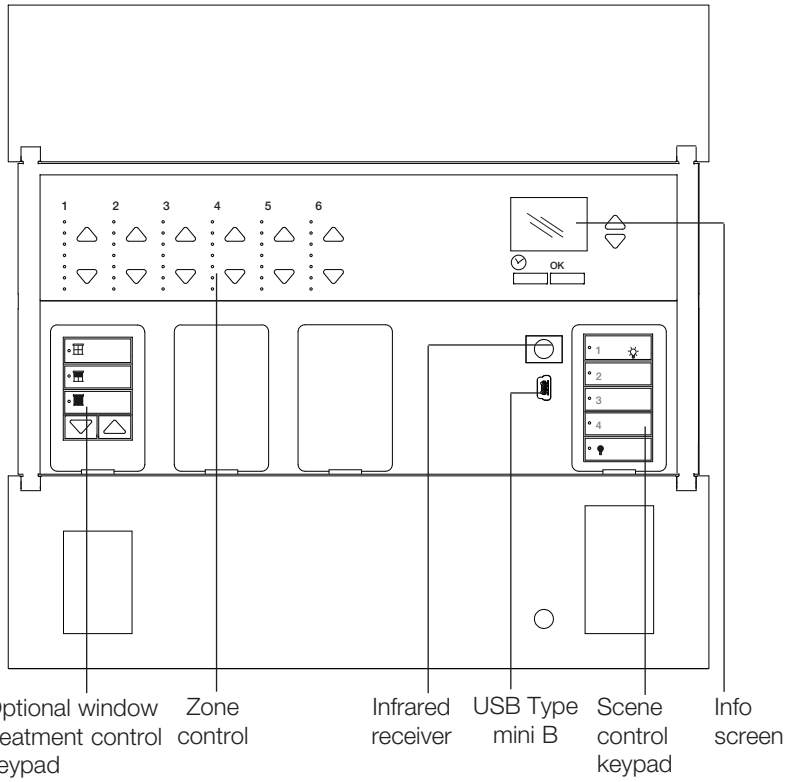


Job Name:	Model Numbers:	
Job Number:		

369315 Rev. A 3 03.07.11



Note: Symbol-based Engraving (-SGN) shown.



Features

- Lutron's proprietary Clear Connect™ RF technology. Operates in 868 MHz band.
- Pushbutton recall of four preset lighting scenes, plus Off.
- Twelve (12) additional scenes accessible through other QS devices, such as seeTouch® QS wallstations.
- Optional integrated window treatment control buttons, which can also be added to the unit after installation.
- Master override buttons to raise and lower all lights.
- Allows setup of lighting scenes and window treatment presets using buttons on the control unit.
- Built-in infrared (IR) receiver.
- External IR connection.
- Built-in astronomic timeclock.
- Info screen shows zone light level percentage, energy savings, zone labeling, and programming.
- Lockout option prevents accidental changes.
- One occupancy sensor input and 24 V⎓ power for occupancy sensor.
- QS communication link for seamless integration of lights, motorised window treatments, wallstations, and integration interfaces.
- Compatible with all Lutron QS system components.
- Wireless communication for seamless integration with a variety of Lutron wireless products and systems, including Radio PowrSavr™ occupancy and vacancy sensors, Sivoia® QS wireless window treatments, Pico® wireless control, and other GRAFIK Eye® QS wireless products.
- Backlit buttons with engraving make unit easy to locate and operate.
- Available in a variety of colours and finishes.

Job Name:	Model Numbers:	
Job Number:		

Specifications

Input Power

- 230 V~ 50 Hz

Lighting Sources/Load Types

Controls the following lighting sources with a smooth, continuous square law dimming curve or on a full conduction non-dim basis:

- Incandescent
- Halogen
- Magnetic low-voltage transformer
- Neon and cold cathode
- Non-dim (incandescent, magnetic low-voltage, or neon/cold cathode)

Controls the following lighting sources with a smooth, continuous square law dimming curve or on a full conduction non-dim basis through separate power interfaces:

- Electronic low-voltage transformer
- Non-dim
- 0 - 10 V

Key Design Features

- RF meets IEC 801-2.
- Lightning strike protection meets ANSI/IEEE standard 62.41-1980. Can withstand voltage surges of up to 6 000 V~ and current surges of up to 3 000 A.
- Tested to withstand 16 kV electrostatic discharge without damage or memory loss.
- RTISS™-equipped: Compensates in real time for incoming line voltage variations (no visible flicker with +/-2% change in RMS voltage per cycle, and +/-2% Hz change in frequency per second).
- Power failure memory retains programming and light level settings for up to 10 years in the event of a power loss.
- The GRAFIK Eye® QS supplies 3 Power Draw Units (PDUs) on the QS link.
  For complete information, see “Power Draw Units on the QS Link,” Lutron PN 369405
- Faceplate is hinged at the top and bottom, and stays open at 180° for ease of access.

Environment

- 0 to 40 °C (32 to 104 °F)
- Relative humidity less than 90% non-condensing

Compliance

- CE

Scene and Shade Buttons

- Large, rounded buttons are easy to use.
- Backlit buttons with optional engraving make it easy to find and to operate the control unit in low light conditions (backlight can be disabled).
- Optional button engraving is angled up to the eye for easy reading.
- Predefined label stickers are included for field labeling.
- 4 preset lighting scenes, plus Off, are accessible from the front of the control unit.
- 12 additional scenes are stored in the control unit and are accessible from seeTouch® QS wallstations and QS interfaces.
- Light levels fade smoothly between scenes. Fade time can be set differently for each scene: 0 to 59 seconds, or 1 to 60 minutes. Maximum fade time from Off is 3 seconds.

Shade Control

- The *GRAFIK Eye* QS can include up to 3 shade button columns. Each column has backlit open, preset, close, and raise/lower buttons.
- Each shade button column can be programmed to operate one shade or a group of shades. (Shades may be assigned to more than one shade button column).
- Faceplates are available with 1, 2 and 3 shade button columns.

Wireless shade limitations:

- Access to the Sivoia® QS Wireless electronic drive unit (EDU) is required to associate shades with the *GRAFIK Eye* QS and set their raise/lower limits.
- Wired and wireless shades may not be programmed into the same shade button column; however, both may be used on the same *GRAFIK Eye* QS control unit.
- Scene commands that affect wireless shades across multiple shade button columns will have a 1-second delay from column to column. This does not occur in RadioRA® 2 systems.

Zone Control

- Each zone has a dedicated raise and lower button to adjust the zone.
- Each zone has a dedicated 7 LED bar graph for level status. Percentage of light level and energy saved is displayed on the info screen.
- All zone information has blue backlit LEDs. Backlight turns off when idle for 30 seconds.

Job Name:	Model Numbers:	
Job Number:		

Specifications

Info Screen

- OLED (organic LED) screen is viewable from all angles.
- Screen turns off when idle for 30 seconds.
- Programmable zone labels.
- Programmable scene labels.
- Status of real-time zone percentage and energy savings.
- Programmable timeclock schedules.
- Programmable window treatment labels.

Astronomic Timeclock

- Integral to all units.
- 7 daily schedules available.
- One available holiday schedule is programmable by date up to one year in advance.
- 25 events per day maximum.
- Timeclock events are programmable to control scenes that affect any Energi Savr Node™ unit connected on the QS link without changing the local scene on the GRAFIK Eye® QS.
- Astronomic times are programmable by integral city database or by entering latitude and longitude. Times automatically adjust throughout the year based on location.
- Automatically adjusts for Daylight Saving Time (DST), adjusted for the new dates; DST is programmable.
- Local timeclock events can activate any of the following features:
  - Scenes 1 to 16 and Off
  - Any available window treatment presets
  - Start and End afterhours mode
  - Enable and Disable daylighting for all zones/groups
  - Enable and Disable occupancy for occupancy/vacancy sensors
  - Enable and Disable occupied events for all occupancy sensors

System Communications and Capacities

- Low-voltage type IEC PELV/NEC® Class 2 wiring connects control units, wallstations, motorised window treatments, and control interfaces.
- A QS system can have up to 100 devices and 100 zones.
- A QS system can have up to 30 wireless devices.

Infrared

- Infrared (IR) receiver allows infrared transmitters to select 8 scenes, raise/lower lighting zones, or raise/lower window treatments.
- Transmitter buttons imitate buttons on faceplate.
- 15 m (50 ft) line of sight range.
- Terminal block infrared input for connection to a wired IR input from third-party equipment.
- IR can be disabled via programming.
- Works with Lutron GRX-IT and GRX-8IT infrared remote controls.

Accessory Controls and Devices

- Wired seeTouch® QS keypads can be added to the control link.
- Each *GRAFIK Eye* QS can power up to 3 wired *seeTouch* QS controls.

Wireless RF Compatibility

- Features Lutron's proprietary Clear Connect™ RF Technology
- Operates in the 868 MHz band
- Compatible with other Lutron wireless products/systems, such as:
  - Pico® (P/N QSR8P and QSRKP)
  - Radio Powr Savr™ occupancy/vacancy/daylight sensors (P/N LRF3-)
  - Sivoia® QS wireless products
  - Other *GRAFIK Eye* QS wireless units (P/N QSGRK-)

Accessory Controls: QS Sensor Module (QSM3)

- The QS Sensor Module provides a means to link wired or wireless occupancy and daylight sensors to a *GRAFIK Eye* QS via the wired QS link.
  - Occupancy sensors wired (or wirelessly linked) to a QS Sensor Module can be used by one or more *GRAFIK Eye* QS control units on the wired link.
  - Daylight sensors wired (or wirelessly linked) to a QS Sensor Module can be used by one or more *GRAFIK Eye* QS control units on the wired link.
  - *Pico* wireless controls can control either one or more zones or scenes on the *GRAFIK Eye* QS.
  - Infrared sensors can control either one or more zones or scenes on the *GRAFIK Eye* QS. Functionality varies; refer to the documentation for the QS Sensor Module for details.

Job Name:	Model Numbers:	
Job Number:		

Specifications

Accessory Controls: Contact Closure Input/Output Interface (QSE-IO)

- Recalls preset light levels for the following set of scenes on the GRAFIK Eye® QS:
  Scenes 1-4 and Off Scenes 9-12 and Off
  Scenes 5-8 and Off Scenes 13-16 and Off
- Sequence scenes 5-16, Enable/Disable Zone Lockout, Enable/Disable Scene Lockout, Enable/Disable Panic Mode, Enable/Disable Timeclock.
- Occupancy Sensors. An individual input counts as 1 occupancy sensor for the *GRAFIK Eye* QS. Each input can be assigned to either Scene Control or Zone Control (please refer to the Occupancy Sensor(s) section of this guide).
- Zone Toggle. Allows an input to toggle one or more zones to a preset level and off.
- Shade Output mode. A Shade Column on the *GRAFIK Eye* QS can be linked to control outputs 1-3 and/or outputs 4-5 on the QSE-IO.

Accessory Controls: DMX Output Interface (QSE-CI-DMX)

- Any zone on the *GRAFIK Eye* QS control unit can be mapped to any single DMX512 Channel.
- Any zone on the *GRAFIK Eye* QS control unit can be simultaneously mapped to any three DMX512 channels (providing RGB/CMY control).
- DMX loads cannot be used with daylighting.

Accessory Controls: Ethernet and RS232 Interface (QSE-CI-NWK-E)

- Allows for monitoring and control of the outputs and local scenes of the *GRAFIK Eye* QS.

Accessory Controls: QS Keyswitch Wallstations (QSWS2-KS)

- Recalls preset light levels for any two scenes including Off
- Allows fine-tuning (raise/lower level) of a zone or group of zones
- Starts/Stops scene sequencing (Scenes 1-4 or Scenes 5-16)
- Enables/Disables Timeclock
- Enables/Disables occupancy sensors
- Enables/Disabled daylight sensors
- Allows toggle of Zone(s) to a preset level and off
- Enables/Disables panic mode
- Starts/Stops afterhours mode

Other Accessory Controls and Devices

- Energi Savr Node™ QS (ESN)

Occupancy Sensor(s)

- The GRAFIK Eye QS works with occupancy sensors through either:
  - Scene Control: Up to four sensors activate user-selectable occupancy and vacancy scenes.
  - Zone Control: up to four sensors per zone activate user-selected occupancy and vacancy zone levels.
- Occupancy sensors may include:
  - Contact closure sensors wired to CCI input on back of *GRAFIK Eye* QS
  - Wireless Radio Powr Savr™ occupancy or vacancy sensors (model numbers starting with LRF3)
  - Wired or wireless sensors connected QS Sensor Module (QSM)
- If any sensor in a group detects occupancy, then the *GRAFIK Eye* QS will go to the designated occupancy scene or zone level.
- If all sensors in a group detect vacancy, then the *GRAFIK Eye* QS will go to the designated vacancy scene or zone level.

Accessory Controls: Pico® Wireless Control (QSR8P models)

- The *Pico* Wireless Control is battery powered. It can control *GRAFIK Eye* QS wireless control units within a 10 m (30 ft) range (20 m/60 ft in open air). It provides the following features:
  - Control of one or more zones on the *GRAFIK Eye* QS Wireless: turns zone(s) on or off, raises/lowers zone(s), and goes to user-defined preset level
  - Scene control: the *Pico* can access scene 1, scene 16, and Off on the *GRAFIK Eye* QS, and can raise and lower lighting levels

Job Name:	Model Numbers:	
Job Number:		

Specifications

Daylight Sensor(s)

- The GRAFIK Eye® QS allows daylight sensors to control one or more lighting zones to adjust electric light levels based on measured daylight levels.
- Daylight sensors may include:
  - Wireless Radio Powr Savr™ (model numbers starting with LRF3)
  - Wired or wireless sensors connected to a QS sensor module (QSM)
- A daylight sensor can control one or more *GRAFIK Eye* QS zones:
  - Each zone can be calibrated to target light levels
  - A zone can be controlled by no more than one daylight sensor
- Daylight control can be enabled or disabled on a scene-by-scene basis
  - By default, daylight control is enabled in all scenes

Note: Daylight control through the *GRAFIK Eye* QS only affects lighting loads. Shade groups cannot be controlled by daylight sensors. Daylighting does not affect DMX or RGB/CMY DMX loads.

Contact Closure Input (CCI) with Power Supply Output

- Each *GRAFIK Eye* QS has one contact closure input (Terminal A).
  - The attached device must provide a dry contact closure or solid-state output.
  - Input is miswire-protected up to 36 V⎓.
- The contact closure is capable of accepting the following types of inputs:
  - Maintained (default): The *GRAFIK Eye* QS control unit will act on both a contact closure and a contact open/release event.
  - Momentary: The *GRAFIK Eye* QS control unit will act on only contact closure events.
- Each *GRAFIK Eye* QS can supply 50 mA maximum at 24 V⎓.
  - Useful for powering occupancy sensors.
  - An auxiliary power supply must be used if the device requires more than 50 mA.
- The CCI is capable of operating in the following modes
  - Occupancy: If an occupancy sensor is wired directly to the *GRAFIK Eye* QS.
  - Emergency: This setting allows the *GRAFIK Eye* QS to work with a LUT-ELI. When an emergency situation is detected, all lights will go to full on, and no operations will be allowed until the emergency signal is cleared.
  - Afterhours: Allows the CCI to start and end the afterhours mode.
  - Timeclock: Allows the CCI to enable and disable the timeclock.
  - Scene Lockout: Prevents the user from making any changes to the control unit. The current scene will stay on until the CCI enables normal operation.
  - Save Never: Prevents any changes from being saved while the CCI is being used.
  - Disable CCI: The CCI will have no effect on the system and will not appear on the list of available sensors.

Security Lockout Password

- A 4-digit password (using characters A to Z and 0 to 9) can be enabled/disabled to lock out access to the Programming Menu.
- By default there is no password enabled on the *GRAFIK Eye* QS.
- If case the 4-digit password is forgotten, contact Lutron Technical Support to regain access.

Job Name:	Model Numbers:	
Job Number:		

Specifications

Capacities		
Zones	Unit Capacity (watts)	Zone Capacity Capacity (watts)
3	1 500	500
4	2 000	500
6	2 300	500

Load Type Notes

- For applications with ELV loads or load wattages exceeding the specified capacities, please refer to specifications for Lutron power modules (NGRX-PB-CE; NGRX-ELVI-CE; ELVI-1000-CE).
- Not all loads must be connected; however, connected zones must have a minimum load of 40 W.
- Maximum total lighting load for a magnetic low-voltage zone is 500 VA / 400 W.
- No zone may be loaded with more than 500 W.

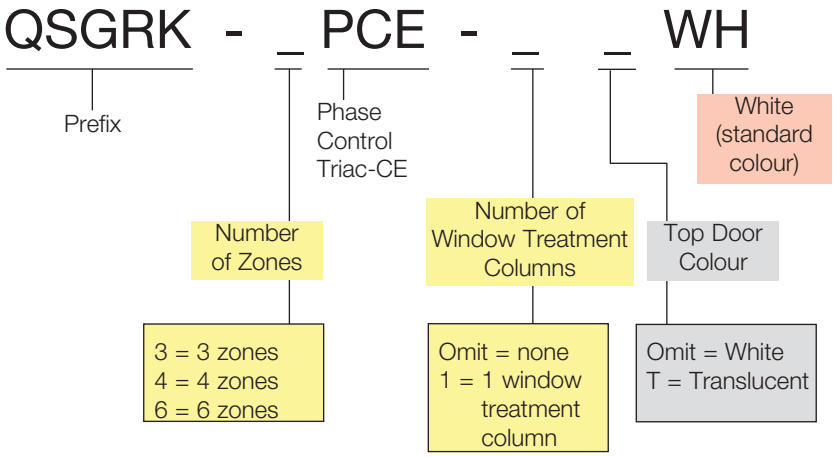
System Limits

- The QS wired communication link is limited to 100 devices (wired or wireless) or 100 zones.

Job Name:	Model Numbers:	
Job Number:		

GRAFIK Eye® QS Wireless
Standard Model Numbers

See following pages for Ordering Custom (Non-Standard) Model Numbers
See Standard Colour Combinations page for faceplate, stripe, and button colours



Example:
QSGRK-6PCE-1TWH
6-zone standard white unit with 1 window treatment column and translucent top door.

Unit will ship unengraved with engraving certificate that customer can redeem at no charge.

Available Standard Model Numbers

3 Zones	4 Zones	6 Zones
QSGRK-3PCE-WH	QSGRK-4PCE-WH	QSGRK-6PCE-WH
QSGRK-3PCE-TWH	QSGRK-4PCE-TWH	QSGRK-6PCE-TWH
QSGRK-3PCE-1WH	QSGRK-4PCE-1WH	QSGRK-6PCE-1WH
QSGRK-3PCE-1TWH	QSGRK-4PCE-1TWH	QSGRK-6PCE-1TWH

Important Note:

For any non-standard units, you must order **BOTH** a base unit and a Faceplate Kit. Please see the Custom Ordering Information on the following pages.

Job Name:	Model Numbers:	
Job Number:		

GRAFIK Eye® QS Wireless
Custom Colour Options and Model Numbers
You must order a Base Unit and a Faceplate Kit

See Standard Colour Combinations page for faceplate, stripe, and button colours

Base Unit

QSGRK - _ PCE

- QSGRK — Prefix
- _ — Number of Zones
  - 3 = 3 zones
  - 4 = 4 zones
  - 6 = 6 zones
- PCE — Phase Control Triac-CE

Example:

QSGRK-6PCE
6-zone base unit
and
QSGFP-2IV-SGN
Ivory faceplate kit with two window treatment columns and symbol-based engraving

Faceplate Kit

(includes coordinating stripe and buttons; see Standard Colour Combinations page)

QSGFP - - -

- QSGFP — Faceplate Prefix
- Number of Window Treatment Columns
  - Omit = none
  - 1 = 1 column
  - 2 = 2 columns
  - 3 = 3 columns
- Top Door Colour
  - Omit = same as unit
  - T = Translucent
- Colour/Finish
- Keypad Engraving Code

Faceplate Custom Colour/Finish Codes

Architectural Matte Finishes

Standard (ship in 48 hours)

White	WH
Ivory	IV
Beige	BE
Gray	GR
Brown	BR
Black	BL
Almond	AL
Light Almond	LA

Architectural Metal Finishes

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

Anodised Aluminum Finishes

Clear	CLA
Black	BLA
Brass	BRA

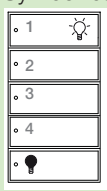
Satin Colour Matte Finishes

Snow	SW
Biscuit	BI
Eggshell	ES
Taupe	TP
Midnight	MN
Limestone	LS
Stone	ST
Desert Stone	DS
Terracotta	TC
Hot	HT
Goldstone	GS
Palladium	PD
Plum	PL
Turquoise	TQ
Bluestone	BG
Sea Glass	SG
Greenbrier	GB
Sienna	SI
Merlot	MR
Mocha Stone	MS

Keypad Engraving Codes

Omit = Unengraved
Ships with engraving certificate that customer can redeem at no charge

SGN = Symbol-based Engraving



Lighting keypad


Window treatment column

NST = Non-Standard Text Engraving
Please visit the *GRAFIK Eye* QS website at **www.lutron.com/grafikeyeqs** for custom engraving forms. Submit completed form with order, and unit will ship engraved as specified by customer.

Job Name:	Model Numbers:	
Job Number:		

GRAFIK Eye® QS Wireless
Custom Options and Model Numbers

See previous pages for Standard and Other Custom Model Numbers
See Standard Colour Combinations page for faceplate, stripe, and button colours

Custom Button Kit

QSGB - 5B - WH -

- QSGB — Custom Button Kit Prefix
- 5B — Button Configuration
- WH — Button Colour/Finish
- Keypad Engraving Code

3BRL = 3-button with raise/lower (window treatment column)
5B = 5-button (lighting keypad)

Button Kit Custom Colour/Finish Codes

Architectural Matte Finishes

White	WH
Ivory	IV
Beige	BE
Gray	GR
Brown	BR
Black	BL
Almond	AL
Light Almond	LA

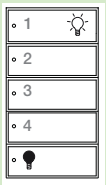
Satin Colour Matte Finishes

Snow	SW
Biscuit	BI
Eggshell	ES
Taupe	TP

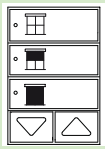
Keypad Engraving Codes

Omit = Unengraved
Ships with engraving certificate that customer can redeem at no charge

SGN = Symbol-based Engraving



Lighting keypad


Window treatment column

NST = Non-Standard Text Engraving
Please visit the *GRAFIK Eye* QS website at **www.lutron.com/grafikeyeqs** for custom engraving forms. Submit completed form with order, and unit will ship engraved as specified by customer.

Custom Stripe Kit

QSGS - WH

- QSGS — Stripe Kit Prefix
- WH — Stripe Colour/Finish

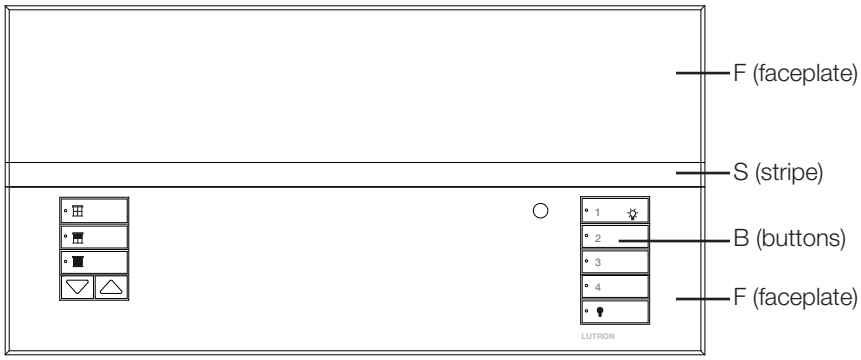
Stripe Custom Colour/Finish Codes

Same as Faceplate colours on previous page

Job Name:	Model Numbers:	
Job Number:		

369315 Rev. A 12 03.07.11

GRAFIK Eye® QS Wireless Standard Colour Combinations
See previous pages for Standard and Custom Model Numbers



Faceplate is comprised of a top and bottom. The bottom will always be the colour indicated under "faceplate." The top may be the same colour or translucent. Use the chart for faceplates that have the same colour top and bottom. If a translucent lid is chosen, the stripe will automatically be the same colour as the bottom lid.

Example:
If you order QSGRK-4PCE-1WH, your *GRAFIK Eye* QS with 4 lighting zones and 1 window treatment column will come with a white faceplate (both top and bottom), gray stripe, and white buttons.

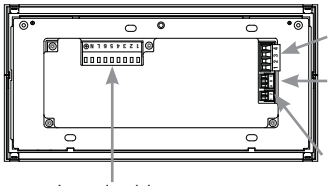
Suffix	Faceplate (F)	Stripe (S)	Button (B)
Architectural Matte			
WH	White	Gray	White
IV	Ivory	Beige	Ivory
BE	Beige	Ivory	Beige
GR	Gray	Black	Gray
BR	Brown	Black	Brown
BL	Black	Gray	Black
AL	Almond	Light Almond	Almond
LA	Light Almond	Almond	Light Almond
Architectural Metal			
BB	Bright Brass	Black	Black
BC	Bright Chrome	Black	Black
BN	Bright Nickel	Black	Black
SB	Satin Brass	Black	Black
SC	Satin Chrome	Black	Black
SN	Satin Nickel	Black	Black
QB	Antique Brass	Black	Black
QZ	Antique Bronze	Black	Black
Anodised			
CLA	Clear	Black	Black
BLA	Black	Black	Black
BRA	Brass	Black	Black
International Wallbox			
AR	Argentum	Black	Black
MC	Mica	Gray	Black
AW	Arctic White	Gray	White

Suffix	Faceplate (F)	Stripe (S)	Button (B)
Satin Matte			
MN	Midnight	Gray	Black
TP	Taupe	Gray	Taupe
SW	Snow	Gray	Snow
ES	Eggshell	Beige	Eggshell
BI	Biscuit	Eggshell	Biscuit
LS	Limestone	Gray	Gray
ST	Stone	Gray	Gray
DS	Desert Stone	Taupe	Taupe
TC	Terracotta	Taupe	Taupe
BG	Bluestone	Gray	Gray
HT	Hot	Taupe	Taupe
MR	Merlot	Taupe	Taupe
SI	Sienna	Brown	Brown
GB	Greenbrier	Gray	Gray
SG	Sea Glass	Gray	Gray
MS	Mocha Stone	Taupe	Taupe
GS	Goldstone	Ivory	Ivory
PD	Palladium	Gray	Gray
PL	Plum	Taupe	Taupe
TQ	Turquoise	Gray	Gray

Job Name:	Model Numbers:	
Job Number:		

Wiring Diagrams

Terminations



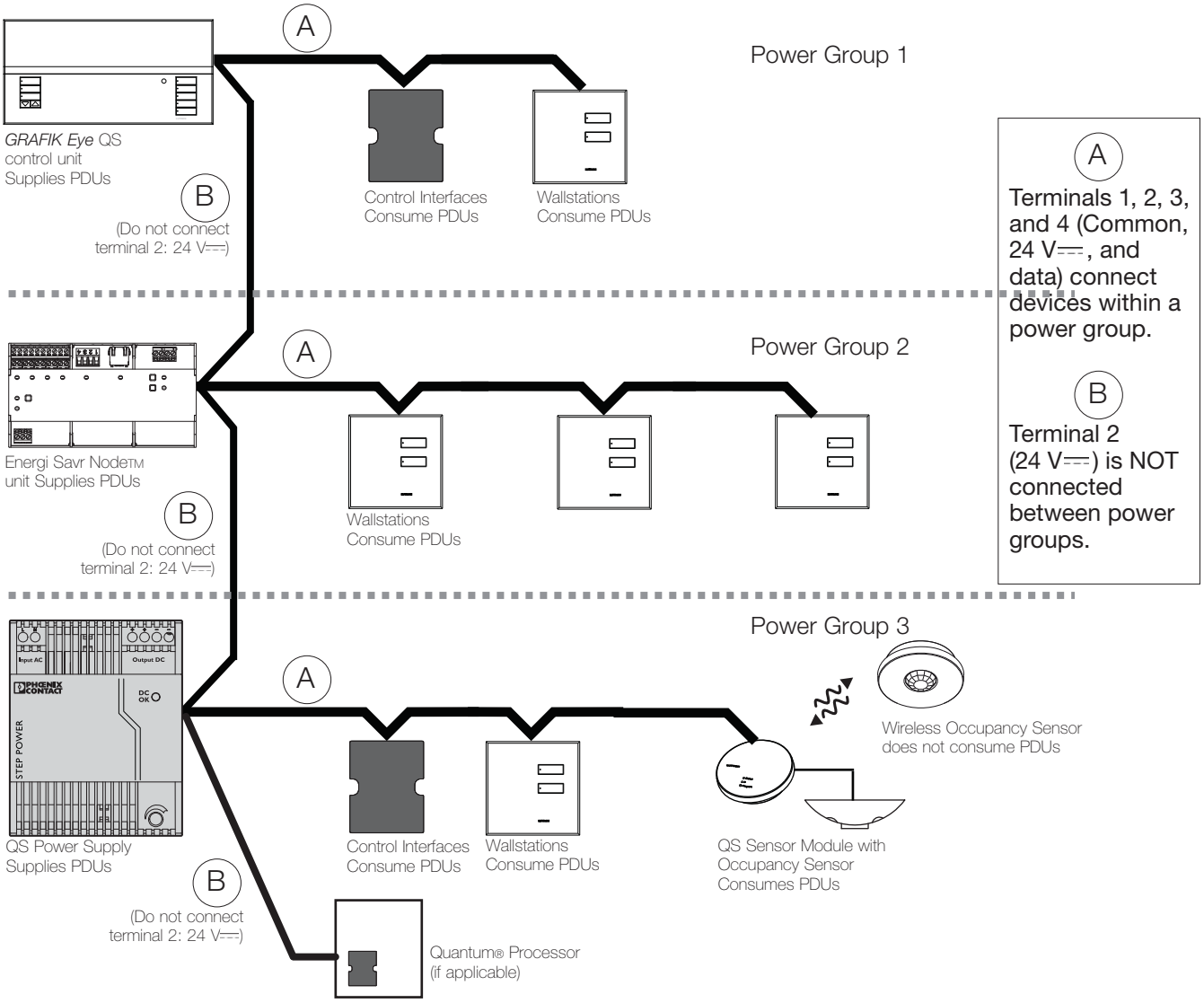
Job Name:	Model Numbers:	
Job Number:		

Power Group Wiring Example

On the QS link, there are devices that supply power and devices that consume power. Each device has a specific number of Power Draw Units (PDUs) it either supplies or consumes. A Power Group consists of one device that supplies power and one or more devices that consume power; each Power Group may have only one power-supplying device. Refer to the QS Link Power Draw Units specification submittal (Lutron PN 369405) for more information concerning PDUs.

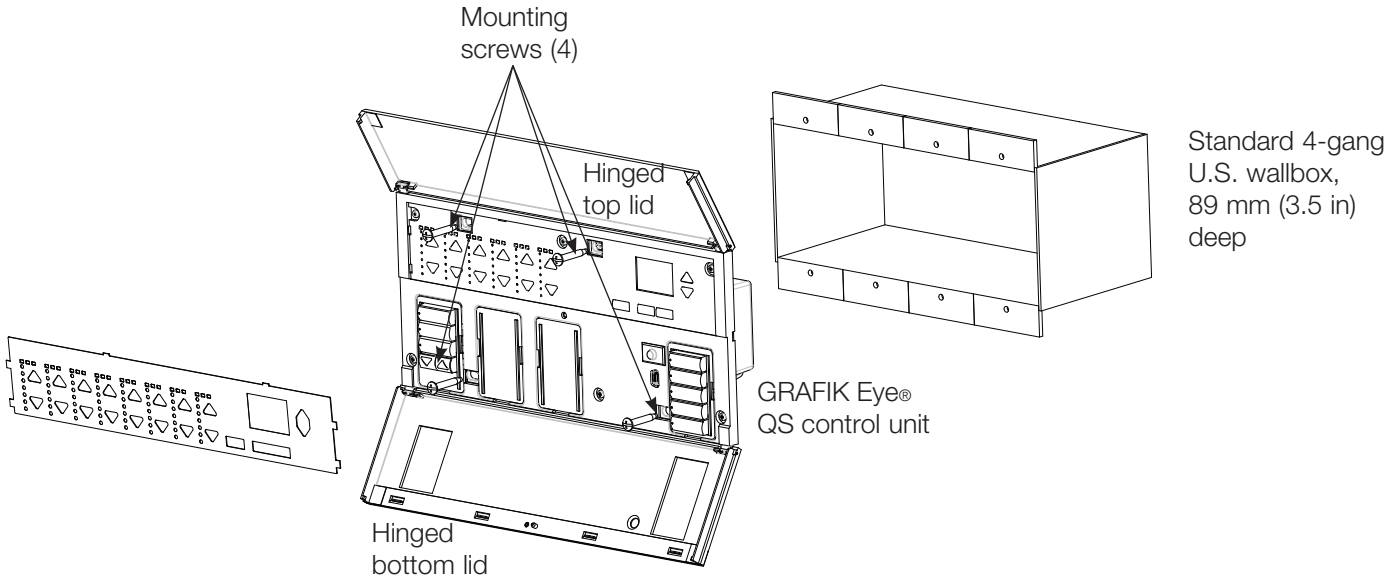
Within Power Groups on the QS link, connect all 4 terminals (1, 2, 3, and 4), shown by the letter A in the diagram. Between devices on the QS link that supply power, connect only terminals 1, 3, and 4 (NOT terminal 2), shown by the letter B on the diagram. Refer to the specific device documentation for wiring details.

Wiring can be T-tapped or daisy-chained.

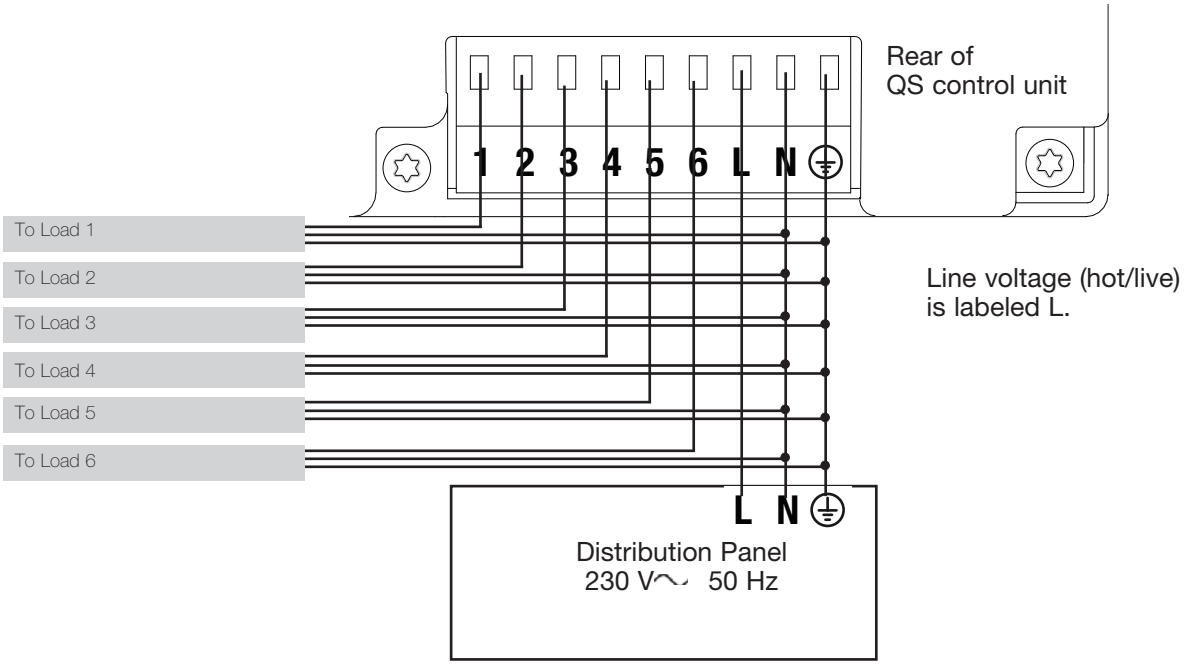


Job Name:	Model Numbers:	
Job Number:		

Mounting



Line Voltage Wiring



- Pull power wiring from distribution panel and to light fixtures.
- Each line voltage terminal can accept one 2.5 mm^2 (12 AWG) wire.
- Consult Lutron for non-dim relay wiring and/or load side emergency transfer wiring.

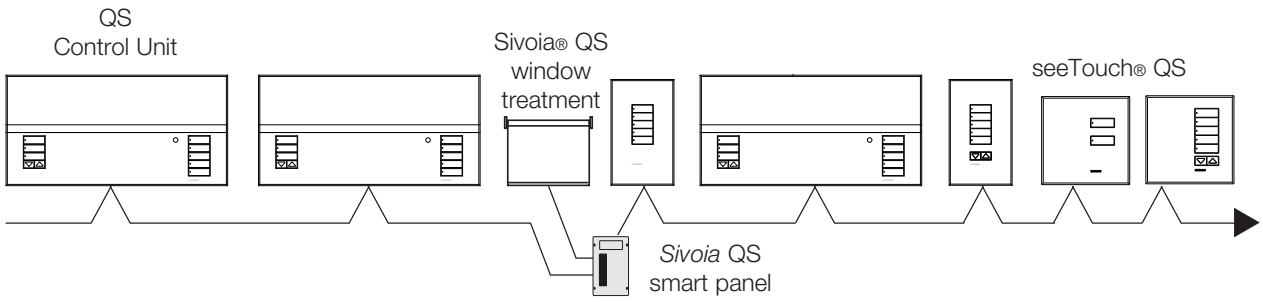
Job Name:	Model Numbers:	
Job Number:		

369315 Rev. A 16 03.07.11

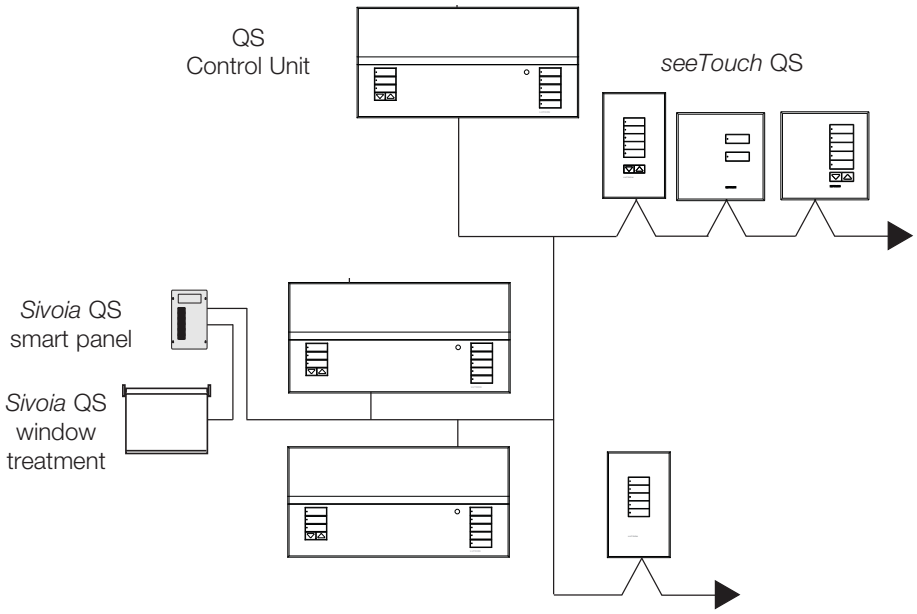
IEC PELV/NEC® Class 2 QS System Low-Voltage Wiring

- System communication uses low-voltage wiring.
- Wiring can be daisy-chained or T-tapped.
- Wiring must be run separately from line/mains voltage.
- IEC PELV/NEC® Class 2 wiring link requires:
  Two 1.0 mm² (18 AWG) conductors for control power.
  One twisted, shielded pair of 0.5 mm² (22 AWG) for data link.
  Available from Lutron, P/N GRX-CBL-346S; check compatibility in your area.
- Total length of control link must not exceed 610 m (2 000 ft).

Daisy-Chain Wiring Example

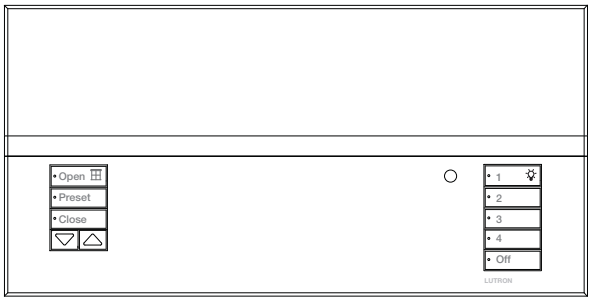


T-Tap Wiring Example



Job Name:	Model Numbers:	
Job Number:		

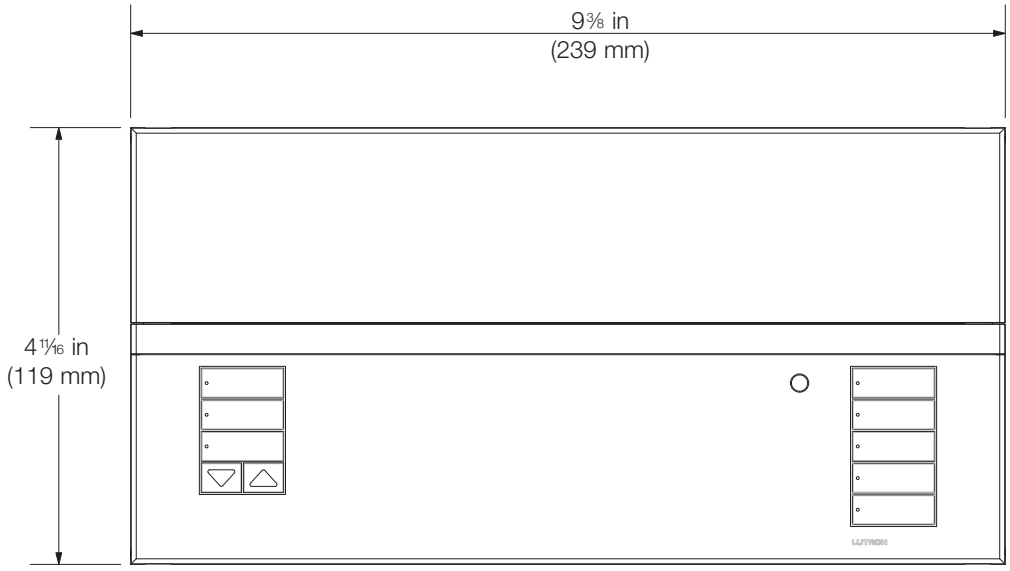
GRAFIK Eye® QS Wireless Control Unit with EcoSystem®



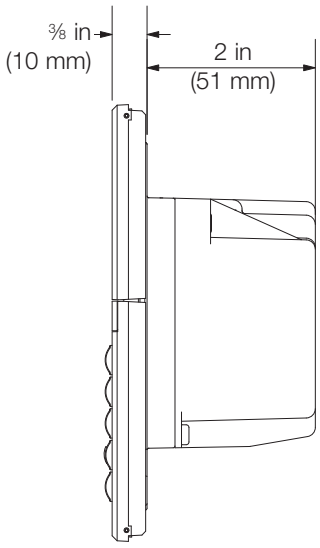
Description

GRAFIK Eye® QS Wireless with EcoSystem® is the premier energy-saving lighting and shade control. The GRAFIK Eye® QS control unit features an astronomic timeclock and intuitive lighting presets, which are seamlessly integrated with EcoSystem® fluorescent ballasts and LED drivers, and Lutron's QS components and systems. Now with wireless technology and an integral EcoSystem® bus supply, you can use the GRAFIK Eye® QS Wireless control unit with EcoSystem® to control ballasts and shades without interfaces, and integrate with a variety of Lutron wireless products and systems, including Radio Powr Savr™ occupancy, vacancy, and daylight sensors, Sivoia® QS wireless shades, Pico® wireless control, and other GRAFIK Eye® QS wireless control units. Additionally, the GRAFIK Eye® QS wireless control unit is compatible with all Lutron wired QS products and systems, including Quantum®.

Mechanical Dimensions



Front View



Side View

Fits into a 4-gang U.S. backbox, 3½ in (89 mm) deep; Lutron P/N 241-400

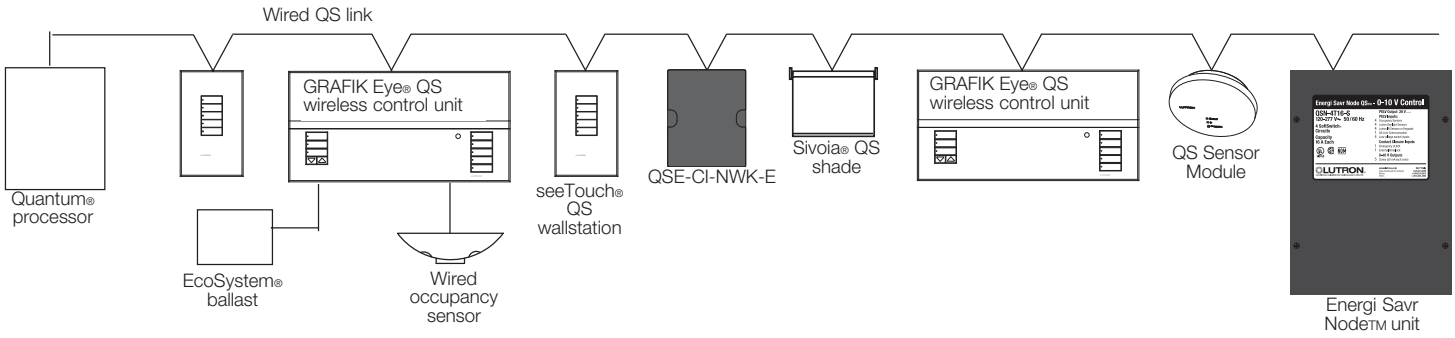
LUTRON® SPECIFICATION SUBMITTAL Page 1

Job Name:	Model Numbers:	
Job Number:		

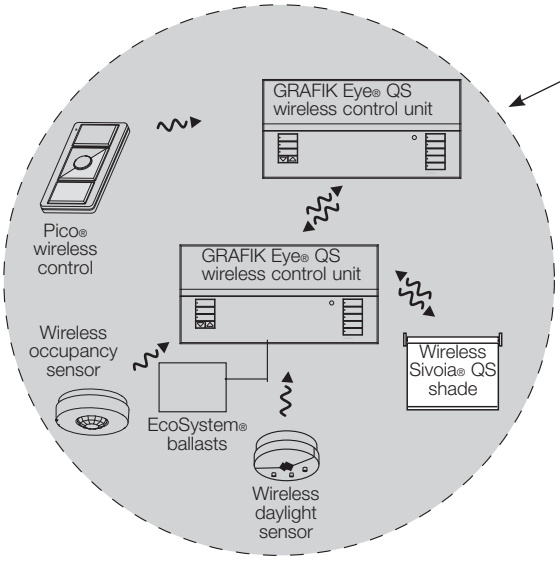
System Topologies

The GRAFIK Eye® QS Wireless control unit with EcoSystem® can be specified in three different system topologies. Examples of each are shown below.

Example of Wired System

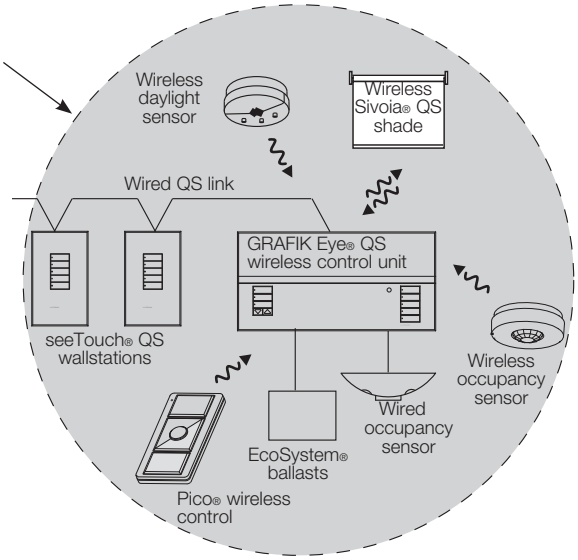


Example of GRAFIK Eye®-centric Wireless System



30 ft (10 m) wireless range; 60 ft (20 m) in open air

Example of Mixed GRAFIK Eye®-centric Wired/Wireless System



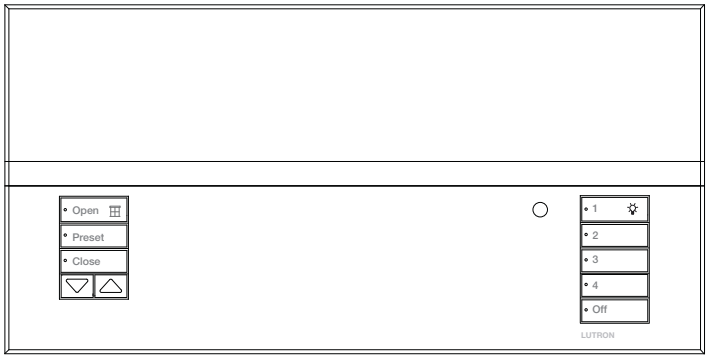
Job Name:	Model Numbers:	
Job Number:		

Application Suggestions and Differences between GRAFIK Eye® QS with EcoSystem® and Standard EcoSystem® Bus Supply

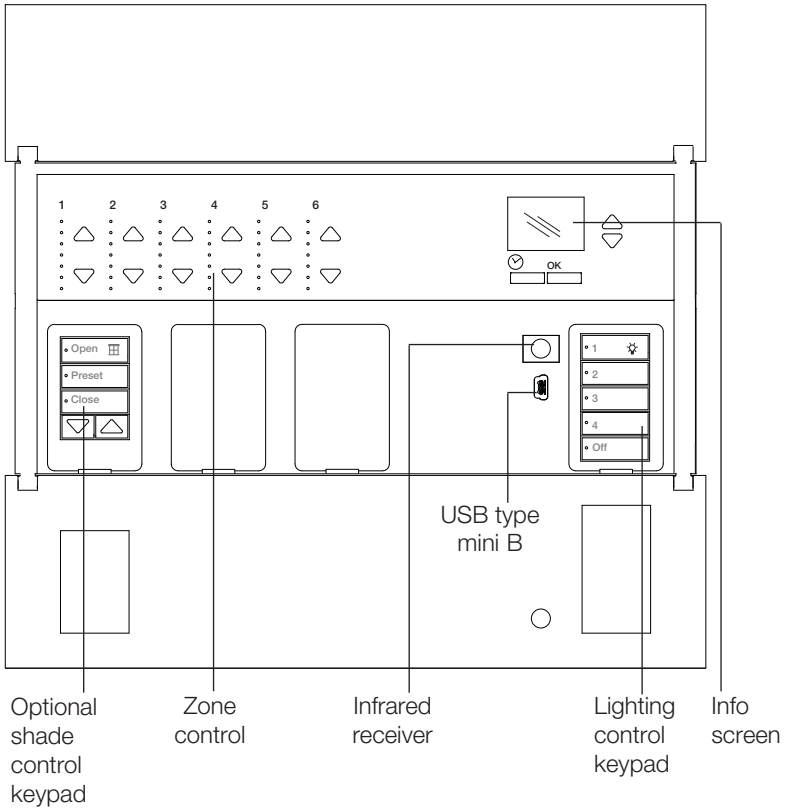
	GRAFIK Eye® QS with EcoSystem®	Energi Savr Node™ with EcoSystem®
Suggested/Recommended Applications	**Single rooms, partitioned spaces, e.g., conference room, classroom, ballroom, lobby**	**Open spaces, multiple enclosed rooms, e.g., open office, window offices**
Programming Method	Info Screen on the QS control unit	Via Energi Savr Node™ App for *iPod* mobile digital device
Integral Timeclock	Yes	No
Compatible with seeTouch® QS Keypads	Yes	Yes
Compatible with EcoSystem® Wall Controls	No	Yes
Compatible with EcoSystem® IR Sensors	No	Yes
Includes dry contact closure for integration to BMS or Security Systems	Yes	Yes
Input Voltage	120-127 or 220-240 V~ 50/60 Hz	120/240/277 V~ 50/60 Hz
Number of EcoSystem® Busses	1	1 or 2
Number of Zones	6, 8, or 16	Programmable
Number of Line-Voltage Outputs	3 (Zones 1-3 only)	--
Compatible with other QS Devices	Yes	Yes

iPod is a trademark of Apple Inc., registered in the United States and other countries.

Job Name:	Model Numbers:	
Job Number:		



Note: General Engraving (-EGN) shown.



Features

- Lutron's proprietary Clear Connect™ RF technology. Operates in the 434 MHz band.
- Pushbutton recall of four preset lighting scenes, plus Off.
- Twelve (12) additional scenes accessible through other QS devices, such as seeTouch® QS wallstations.
- Zones 1, 2, and 3 can control many light source types directly and others using power modules.
- Optional integrated shade control buttons, which can also be added to the unit after installation.
- Master override buttons to raise and lower all lights.
- Allows setup of lighting scenes and shade presets using buttons on the control unit.
- Built-in infrared (IR) receiver.
- External IR connection.
- Built-in astronomic timeclock.
- Info screen shows zone light level percentage, energy savings, zone labeling, programming, and EcoSystem® setup.
- Lockout option prevents accidental changes.
- One occupancy sensor input and 24 V⎓ power for occupancy sensor.
- QS communication link for seamless integration of lights, motorized window treatments, occupancy sensors, wallstations, and integration interfaces.
- Compatible with all Lutron QS system components.
- Wireless communication for seamless integration with a variety of Lutron wireless products and systems, including Radio Powr Savr™ occupancy, vacancy, and daylight sensors, Sivoia® QS wireless shades, Pico® wireless controls, and other GRAFIK Eye® QS Wireless control units.
- Control up to 6, 8, or 16 EcoSystem® zones from internal bus supply.
- Zones 1, 2, and 3 are integral line voltage dimming zones and can be optionally programmed as EcoSystem® zones.
- Up to 64 EcoSystem® or Hi-lume® 3D ballasts can be addressed and grouped to zones.
- Integral EcoSystem® setup and programming replaces the need for a handheld programmer (C-PDA-CLR does not communicate with the GRAFIK Eye® QS with EcoSystem® control unit)
- Backlit buttons with engraving make unit easy to locate and operate.
- Available in a variety of colors and finishes.

Job Name:	Model Numbers:	
Job Number:		

Specifications

Input Power

- 120 - 127 V~ 50/60 Hz
- 220 - 240 V~ 50/60 Hz

Listings (120 - 127 V~)

- UL
- CSA
- NOM
- CEC (Title 24)
- FCC Part 15 Class B
- IC RSS-210
- SCT

Environment

- 32 to 104 °F (0 to 40 °C)
- Relative humidity less than 90% non-condensing

Lighting Sources/Load Types

- EcoSystem® and Hi-lume® 3D ballasts, and Hi-lume® LED drivers (available on all zones).

  Zones 1, 2, and 3 can control the following lighting sources with a smooth, continuous square law dimming curve or on a full conduction non-dim basis:
- Incandescent
- Halogen
- Magnetic low-voltage transformer
- Lutron Tu-Wire® electronic fluorescent dimming ballast
- Advance Mark X® electronic dimming ballast
- Neon and cold cathode
- Non-dim (incandescent, magnetic low-voltage, Tu-Wire®, or neon/cold cathode)
- Cree LR4/6, 120 V~ fixtures (for loading capacities, please refer to the LED report card located at www.lutron.com/LEDtool)
  Please refer to “Capacities” for more information.

  Zones 1, 2, and 3 can control the following lighting sources with a smooth, continuous square law dimming curve or on a full conduction non-dim basis through separate Lutron power modules:
- Electronic low-voltage transformer
- Lutron Hi-lume®, Eco-10®, and Compact SE electronic fluorescent dimming ballast
- Non-dim
- 0 - 10 V

Key Design Features

- RF meets FCC Part 15 Class B.
- Lightning strike protection meets ANSI/IEEE standard 62.41-1980. Can withstand voltage surges of up to 6000 V~ and current surges of up to 3000 A.
- Tested to withstand 16 kV electrostatic discharge without damage or memory loss.
- RTISS™-equipped: Compensates in real time for incoming line voltage variations (no visible flicker with +/-2% change in RMS voltage per cycle, and +/-2% Hz change in frequency per second).
- Power failure memory retains programming and light level settings for up to 10 years in the event of a power loss.
- The GRAFIK Eye® QS control unit supplies 3 Power Draw Units (PDUs) on the QS link.
  For complete information, see “Power Draw Units on the QS Link,” Lutron PN 369405
- Faceplate is hinged at the top and bottom, and stays open at 180° for ease of access.
- Direct control of 120 V~ and 277 V~ EcoSystem®, Hi-lume® 3D, and Hi-lume® LED ballasts (no interface required).

Scene and Shade Buttons

- Large, rounded buttons are easy to use.
- Backlit buttons with optional engraving make it easy to find and to operate the control unit in low light conditions (backlight can be disabled).
- Optional button engraving is angled up to the eye for easy reading.
- Predefined label stickers are included for field labeling.
- 4 preset lighting scenes, plus Off, are accessible from the front of the control unit.
- 12 additional scenes are stored in the control unit and are accessible from seeTouch® QS wallstations and QS interfaces.
- Light levels fade smoothly between scenes. Fade time can be set differently for each scene: 0 to 59 seconds, or 1 to 60 minutes. Maximum fade time from Off is 3 seconds.

Job Name:	Model Numbers:	
Job Number:		

Specifications

Shade Control

- The GRAFIK Eye® QS control unit can include up to 3 shade button columns. Each column has backlit open, preset, close, and raise/lower buttons.
- Each shade button column can be programmed to operate one shade or a group of shades. (Shades may be assigned to more than one shade button column).
- Faceplates are available with 1, 2 and 3 shade button columns.

Wireless shade limitations:

- Access to the Sivoia® QS Wireless electronic drive unit (EDU) is required to associate shades with the GRAFIK Eye® QS control unit and set their raise/lower limits.
- Wired and wireless shades may not be programmed into the same shade button column; however, both may be used on the same GRAFIK Eye® QS control unit.
- Scene commands that affect wireless shades across multiple shade button columns will have a 1-second delay from column to column. This does not occur in RadioRA® 2 systems.

Zone Control

- Each zone has a dedicated raise and lower button to adjust the zone.
- Each zone has a dedicated 7 LED bar graph for level status. Percentage of light level and energy saved is displayed on the info screen.
- All zone information has blue backlit LEDs. Backlight turns off when idle for 30 seconds.

Info Screen

- OLED (organic LED) screen is viewable from all angles.
- Screen turns off when idle for 30 seconds.
- Programmable zone labels.
- Programmable scene labels.
- Status of real-time zone percentage and energy savings.
- Programmable timeclock schedules.
- Programmable shade labels.

Astronomic Timeclock

- Integral to all units.
- 7 daily schedules available.
- One available holiday schedule is programmable by date up to one year in advance.
- 25 events per day maximum.
- Timeclock events are programmable to control scenes that affect any Energi Savr Node™ unit connected on the QS link without changing the local scene on the GRAFIK Eye® QS control unit.
- Astronomic times are programmable by integral city database or by entering latitude and longitude. Times automatically adjust throughout the year based on location.
- Automatically adjusts for Daylight Saving Time (DST), adjusted for the new dates; DST is programmable.
- Local timeclock events can activate any of the following features:
  - Scenes 1 to 16 and Off
  - Any available shade presets
  - Start and End afterhours mode
  - Enable and Disable daylighting for all zones/groups
  - Enable and Disable occupancy for occupancy/vacancy sensors
  - Enable and Disable occupied events for all occupancy sensors

System Communications and Capacities

- Low-voltage type IEC PELV/NEC® Class 2 wiring connects control units, wallstations, motorized shades, and control interfaces.
- A QS system can have up to 100 devices and 100 zones.
- A QS system can have up to 30 wireless devices.
- Class 1/Class 2 wiring connects ballast to control unit.

Infrared

- Infrared (IR) receiver allows infrared transmitters to select 8 scenes, raise/lower lighting zones, or raise/lower shades.
- Transmitter buttons imitate buttons on faceplate.
- 50 ft (15 m) line of sight range.
- Terminal block infrared input for connection to a wired IR input from third-party equipment.
- IR can be disabled via programming.
- Works with Lutron GRX-IT and GRX-8IT infrared remote controls.

Job Name:	Model Numbers:	
Job Number:		

Specifications

Accessory Controls: seeTouch® QS Wallstations (QSWS2)

- Wired seeTouch® QS keypads provide the following features:
  - Access to one or more of the 16 scenes on the GRAFIK Eye® QS Wireless control unit
  - Zone toggle, partitioning, sequencing, fine tune, panic mode, and timeclock enable/disable
  - Contact closure inputs
  - Various other functions that are available on specific wallstation configurations. Refer to the seeTouch® specification submittal.

Accessory Controls: Pico® Wireless Control (QSR4P or MRF2 models)

- The Pico® Wireless Control is battery powered. It can control GRAFIK Eye® QS wireless control units within a 30 ft (10 m) range (60 ft/20 m in open air). It provides the following features:
  - Control of one or more zones on the GRAFIK Eye® QS Wireless control unit: turns zone(s) on or off, raises/lowers zone(s), and goes to user-programmable preset level
  - Scene control: the Pico® wireless control can access scene 1, scene 16, and Off on the GRAFIK Eye® QS control unit, and can raise and lower lighting levels

Accessory Controls: QS Sensor Module (QSM2)

- The QS Sensor Module provides a means to link wired or wireless occupancy and daylight sensors to a GRAFIK Eye® QS control unit via the wired QS link.
  - Occupancy sensors wired (or wirelessly linked) to a QS Sensor Module can be used by one or more GRAFIK Eye® QS control units on the wired link.
  - Daylight sensors wired (or wirelessly linked) to a QS Sensor Module can be used by one or more GRAFIK Eye® QS control units on the wired link.
  - Pico wireless controls can control either one or more zones or scenes on the GRAFIK Eye® QS control unit.
  - Infrared sensors can control either one or more zones or scenes on the GRAFIK Eye® QS control unit. Functionality varies; refer to the documentation for the QS Sensor Module for details.

Accessory Controls: Contact Closure Input/Output Interface (QSE-IO)

- Recalls preset light levels for the following set of scenes on the GRAFIK Eye® QS control unit:
  Scenes 1-4 and Off Scenes 9-12 and Off
  Scenes 5-8 and Off Scenes 13-16 and Off
- Sequence scenes 5-16, Enable/Disable Zone Lockout, Enable/Disable Scene Lockout, Enable/Disable Panic Mode, Enable/Disable Timeclock.
- Occupancy Sensors. An individual input counts as 1 occupancy sensor for the GRAFIK Eye® QS control unit. Each input can be assigned to either Scene Control or Zone Control (please refer to the Occupancy Sensor(s) section of this guide).
- Zone Toggle. Allows an input to toggle one or more zones to a preset level and off.
- Shade Output mode. A Shade Column on the GRAFIK Eye® QS control unit can be linked to control outputs 1-3 and/or outputs 4-5 on the QSE-IO.

Accessory Controls: DMX Output Interface (QSE-CI-DMX)

- Any zone on the GRAFIK Eye® QS control unit can be mapped to any single DMX512 Channel.
- Any zone on the GRAFIK Eye® QS control unit can be simultaneously mapped to any three DMX512 channels (providing RGB/CMY control).
- DMX loads cannot be used with daylighting.

Accessory Controls: Ethernet and RS232 Interface (QSE-CI-NWK-E)

- Allows for monitoring and control of the outputs and local scenes of the GRAFIK Eye® QS control unit.

Accessory Controls: QS Keyswitch Wallstations (QSWS2-KS)

- Recalls preset light levels for any two scenes including Off
- Allows fine-tuning (raise/lower level) of a zone or group of zones
- Starts/Stops scene sequencing (Scenes 1-4 or Scenes 5-16)
- Enables/Disables Timeclock
- Enables/Disables occupancy sensors
- Enables/Disabled daylight sensors
- Allows toggle of Zone(s) to a preset level and off
- Enables/Disables panic mode
- Starts/Stops afterhours mode

Other Accessory Controls and Devices

- Energi Savr Node® QS (ESN). Refer to the Specification Submittal for complete details.

Job Name:	Model Numbers:	
Job Number:		

Specifications

Wireless RF Compatibility

- Lutron's proprietary Clear Connect™ RF Technology
- Operates in the 434 MHz band
- Compatible with other Lutron wireless products/systems, such as:
  - Pico® wireless control (P/N QSR4P or MRF2)
  - Radio Powr Savr™ occupancy/vacancy/daylight sensors (P/N LRF2-)
  - Sivoia® QS wireless products
  - Other GRAFIK Eye® QS wireless control units (P/N QSGRJ-)

Occupancy Sensor(s)

- The GRAFIK Eye® QS control unit works with occupancy sensors through either:
  - Scene Control: Up to four sensors activate user-selectable occupancy and vacancy scenes.
  - Zone Control: up to four sensors per zone activate user-selected occupancy and vacancy zone levels.
- Occupancy sensors may include:
  - Contact closure sensors wired to CCI input on back of GRAFIK Eye® QS control unit
  - Wireless Radio Powr Savr™ occupancy or vacancy sensors (model numbers starting with LRF2)
  - Wired sensors connected to EcoSystem® ballasts or interfaces
  - Wired or wireless sensors connected to a QS Sensor Module (QSM)
- If any sensor in a group detects occupancy, then the GRAFIK Eye® QS control unit will go to the designated occupancy scene or zone level.
- If all sensors in a group detect vacancy, then the GRAFIK Eye® QS control unit will go to the designated vacancy scene or zone level.

Daylight Sensor(s)

- The GRAFIK Eye® QS control unit with EcoSystem® works with compatible daylight sensors to adjust electric light levels based on measured daylight levels. Sensors can be configured to control either GRAFIK Eye® QS zones or groups of EcoSystem® loads independent of zoning.
- Daylight sensors may include:
  - Wireless Radio Powr Savr™ (model numbers starting with LRF2)
  - Wired sensors connected to EcoSystem® ballasts or interfaces
  - Wired or wireless sensors connected to a QS sensor module (QSM)
- In Zone Mode, a daylight sensor can control one or more GRAFIK Eye® QS zones. Each zone can be calibrated to target light levels.
  - A zone can be controlled by no more than one daylight sensor
- In Group Mode, a daylight sensor can control one or more EcoSystem® loads, regardless of how they are zoned on the GRAFIK Eye® QS control unit.
  - A group can be controlled by a single daylight sensor
  - Each group can be calibrated to independent target light levels
  - Up to 16 groups are available
- Daylight control can be enabled or disabled on a scene-by-scene basis
  - By default, daylight control is enabled in all scenes

Note: Daylight control through the GRAFIK Eye® QS control unit only affects lighting loads. Shade groups cannot be controlled by daylight sensors. Daylighting does not affect DMX or RGB/CMY DMX loads.

Job Name:	Model Numbers:	
Job Number:		

Specifications

Contact Closure Input (CCI) with Power Supply Output

- Each GRAFIK Eye® QS control unit has one contact closure input (Terminal A).
  - The attached device must provide a dry contact closure or solid-state output.
  - Input is miswire-protected up to 36 V⎓.
- The contact closure is capable of accepting the following types of inputs:
  - Maintained (default): The GRAFIK Eye® QS control unit will act on both a contact closure and a contact open/release event.
  - Momentary: The GRAFIK Eye® QS control unit will act on only contact closure events.
- Each GRAFIK Eye® QS control unit can supply 50 mA maximum at 24 V⎓.
  - Useful for powering occupancy sensors.
  - An auxiliary power supply must be used if the device requires more than 50 mA.
- The CCI is capable of operating in the following modes
  - Occupancy: If an occupancy sensor is wired directly to the GRAFIK Eye® QS control unit.
  - Emergency: This setting allows the GRAFIK Eye® QS control unit to work with a LUT-ELI. When an emergency situation is detected, all lights will go to full on, and no operations will be allowed until the emergency signal is cleared.
  - Afterhours: Allows the CCI to start and end the afterhours mode.
  - Timeclock: Allows the CCI to enable and disable the timeclock.
  - Scene Lockout: Prevents the user from making any changes to the control unit. The current scene will stay on until the CCI enables normal operation.
  - Save Never: Prevents any changes from being saved while the CCI is being used.
  - Disable CCI: The CCI will have no effect on the system and will not appear on the list of available sensors.

Security Lockout Password

- A 4-digit password (using characters A to Z and 0 to 9) can be enabled/disabled to lock out access to the Programming Menu.
- By default there is no password enabled on the GRAFIK Eye® QS control unit.
- If case the 4-digit password is forgotten, contact Lutron Technical Support to regain access.

Job Name:	Model Numbers:	
Job Number:		

Capacities

	220 - 240 V~ 50 / 60 Hz	120 - 127 V~ 50 / 60 Hz
Unit Capacity (watts)	3000	2000
MLV	3000 VA / 2400 W	2000 VA / 1600 W
Zone Capacity (watts)	40 – 1200	25 – 800
MLV	40 – 1200 VA / 40 – 960 W	25 – 800 VA / 25 – 600 W

Load Type Notes (Zones 1, 2 and 3)

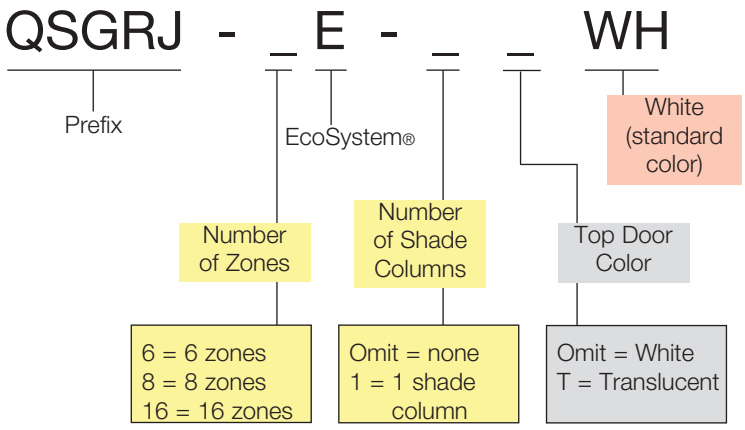
- All electronic low-voltage (ELV) lighting used with an interface must be rated for reverse phase control dimming. Before installing an ELV light source, verify with the manufacturer that their transformer can be dimmed. When dimming, an ELV interface (such as the PHPM-PA-DV-WH) must be used with the control unit.
- Not all zones must be connected; however, connected zones must have a minimum load as specified above.
- Maximum total lighting load for a magnetic low-voltage (MLV) varies by input voltage:
  - 120 - 127 V~: 800 VA / 600 W
  - 220 - 240 V~: 1200 VA / 960 W
- Maximum total lighting load for Lutron Tu-Wire® and Advance Mark X® electronic dimming ballasts (120 to 127 V~ only) must not exceed 6 A per zone or 16 A per unit.
- No zone may be loaded with more than the capacity specified above. For higher wattage applications, or for 277 V~ applications, use Lutron power module PHPM-PA, PHPM-WBX, PHPM-PA-DV, PHPM-SW, or PHPM-WBX-DV.
- For controlling low-wattage loads (CFL, LED) in a non-dim application, contact Lutron Technical Support for the appropriate solution.

System Limits

- The QS wired communication link is limited to 100 devices or 100 zones.

Job Name:	Model Numbers:	
Job Number:		

GRAFIK Eye® QS Wireless with EcoSystem®
Standard Model Numbers
See following pages for Ordering Custom (Non-Standard) Model Numbers
See Standard Color Combinations page for faceplate, stripe, and button colors



Example:
QSGRJ-6E-1TWH
6-zone standard white unit with 1 shade column and translucent top door.

Unit will ship unengraved with engraving certificate that customer can redeem at no charge.

Available Standard Model Numbers

6 Zones	8 Zones	16 Zones
QSGRJ-6E-WH	QSGRJ-8E-WH	QSGRJ-16E-WH
QSGRJ-6E-TWH	QSGRJ-8E-TWH	QSGRJ-16E-TWH
QSGRJ-6E-1WH	QSGRJ-8E-1WH	QSGRJ-16E-1WH
QSGRJ-6E-1TWH	QSGRJ-8E-1TWH	QSGRJ-16E-1TWH

Important Note:

For any non-standard units, you must order **BOTH** a base unit and a Faceplate Kit. Please see the Custom Ordering Information on the following pages.

Job Name:	Model Numbers:	
Job Number:		

GRAFIK Eye® QS Wireless with EcoSystem®
Custom Color Options and Model Numbers
You must order a Base Unit and a Faceplate Kit
See Standard Color Combinations page for faceplate, stripe, and button colors

Base Unit

QSGRJ - _ E

- QSGRJ - Prefix
- _ Number of Zones
  - 6 = 6 zones
  - 8 = 8 zones
  - 16 = 16 zones
- E EcoSystem®

Example:

QSGRJ-6E
6-zone base unit
and
QSGFP-2IV-EGN
Ivory faceplate kit with two shade columns and general engraving

Faceplate Kit
(includes coordinating stripe and buttons)

QSGFP - - -

- QSGFP - Faceplate Prefix
- Number of Shade Columns
  - Omit = none
  - 1 = 1 column
  - 2 = 2 columns
  - 3 = 3 columns
- Top Door Color
  - Omit = same as unit
  - T = Translucent
- Color/Finish
- Keypad Engraving Code

Faceplate Custom Color/Finish Codes

Architectural Matte Finishes
Standard (ship in 48 hours)

White	WH
Ivory	IV
Beige	BE
Gray	GR
Brown	BR
Black	BL
Almond	AL
Light Almond	LA

Architectural Metal Finishes

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 Finishes

Clear	CLA
Black	BLA
Brass	BRA

Satin Color Matte Finishes

Snow	SW
Biscuit	BI
Eggshell	ES
Taupe	TP
Midnight	MN
Limestone	LS
Stone	ST
Desert Stone	DS
Terracotta	TC
Hot	HT
Goldstone	GS
Palladium	PD
Plum	PL
Turquoise	TQ
Bluestone	BG
Sea Glass	SG
Greenbriar	GB
Sienna	SI
Merlot	MR
Mocha Stone	MS

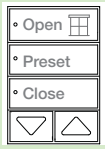
Keypad Engraving Codes

Omit = Unengraved
Ships with engraving certificate that customer can redeem at no charge

EGN = General Engraving



Lighting keypad



Shade column

NST = Non-Standard Text Engraving
Please visit the GRAFIK Eye® QS website at **www.lutron.com/grafikeyeqs** for custom engraving forms. Submit completed form with order, and unit will ship engraved as specified by customer.

Job Name:	Model Numbers:	
Job Number:		

GRAFIK Eye® QS Wireless with EcoSystem®
Custom Options and Model Numbers

See previous pages for Standard and Other Custom Model Numbers
See Standard Color Combinations page for faceplate, stripe, and button colors

Custom Button Kit

QSGB - 5B - WH -

- QSGB: Custom Button Kit Prefix
- 5B: Button Configuration
- WH: Button Color/Finish
- Keypad Engraving Code

3BRL = 3-button with raise/lower (shade column)
5B = 5-button (lighting keypad)

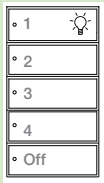
Button Kit Custom Color/Finish Codes

Architectural Matte Finishes		Satin Color Matte Finishes	
White	WH	Snow	SW
Ivory	IV	Biscuit	BI
Beige	BE	Eggshell	ES
Gray	GR	Taupe	TP
Brown	BR		
Black	BL		
Almond	AL		
Light Almond	LA		

Keypad Engraving Codes

Omit = Unengraved
Ships with engraving certificate that customer can redeem at no charge

EGN = General Engraving



Lighting keypad



Shade column

NST = Non-Standard Text Engraving
Please visit the GRAFIK Eye® QS website at **www.lutron.com/grafikeyeqs** for custom engraving forms. Submit completed form with order, and unit will ship engraved as specified by customer.

Custom Stripe Kit

QSGS - WH

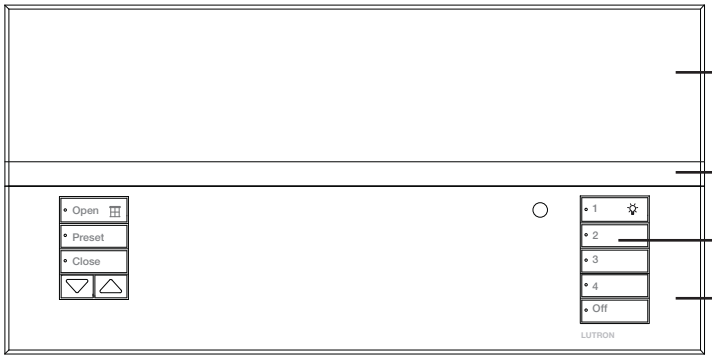
- QSGS: Stripe Kit Prefix
- WH: Stripe Color/Finish

Stripe Custom Color/Finish Codes

Same as Faceplate colors on previous page

Job Name:	Model Numbers:	
Job Number:		

GRAFIK Eye® QS Wireless with EcoSystem®
Standard Color Combinations
See previous pages for Standard and Custom Model Numbers



Faceplate is comprised of a top and bottom. The bottom will always be the color indicated under "faceplate." The top may be the same color or translucent. Use the chart for faceplates that have the same color top and bottom. If a translucent lid is chosen, the stripe will automatically be the same color as the bottom lid.

Example:
If you order QSGRJ-6E-1WH, your GRAFIK Eye® QS with 6 lighting zones and 1 shade column will come with a white faceplate (both top and bottom), gray stripe, and white buttons.

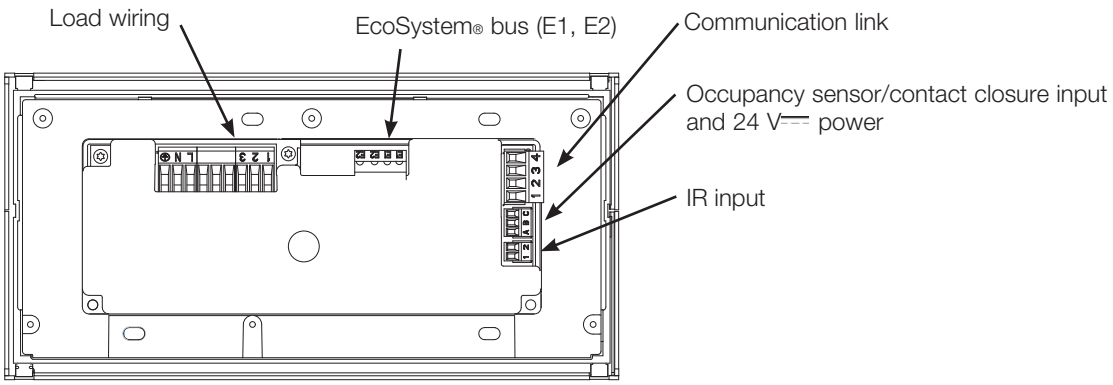
Suffix	Faceplate (F)	Stripe (S)	Button (B)
Architectural Matte			
WH	White	Gray	White
IV	Ivory	Beige	Ivory
BE	Beige	Ivory	Beige
GR	Gray	Black	Gray
BR	Brown	Black	Brown
BL	Black	Gray	Black
AL	Almond	Light Almond	Almond
LA	Light Almond	Almond	Light Almond
Architectural Metal			
BB	Bright Brass	Black	Black
BC	Bright Chrome	Black	Black
BN	Bright Nickel	Black	Black
SB	Satin Brass	Black	Black
SC	Satin Chrome	Black	Black
SN	Satin Nickel	Black	Black
QB	Antique Brass	Black	Black
QZ	Antique Bronze	Black	Black
Anodized			
CLA	Clear	Black	Black
BLA	Black	Black	Black
BRA	Brass	Black	Black

Suffix	Faceplate (F)	Stripe (S)	Button (B)
Satin Matte			
MN	Midnight	Gray	Black
TP	Taupe	Gray	Taupe
SW	Snow	Gray	Snow
ES	Eggshell	Beige	Eggshell
BI	Biscuit	Eggshell	Biscuit
LS	Limestone	Gray	Gray
ST	Stone	Gray	Gray
DS	Desert Stone	Taupe	Taupe
TC	Terracotta	Taupe	Taupe
BG	Bluestone	Gray	Gray
HT	Hot	Taupe	Taupe
MR	Merlot	Taupe	Taupe
SI	Sienna	Brown	Brown
GB	Greenbriar	Gray	Gray
SG	Sea Glass	Gray	Gray
MS	Mocha Stone	Taupe	Taupe
GS	Goldstone	Ivory	Ivory
PD	Palladium	Gray	Gray
PL	Plum	Taupe	Taupe
TQ	Turquoise	Gray	Gray

Job Name:	Model Numbers:	
Job Number:		

Overview

Terminations



Wire Gauge	Maximum *EcoSystem* Bus Length
12 AWG (4.0 mm²)	2200 ft (671 m)
14 AWG (2.5 mm²)	1400 ft (427 m)
16 AWG (1.5 mm²)	900 ft (275 m)
18 AWG (1.0 mm²)	570 ft (175 m)

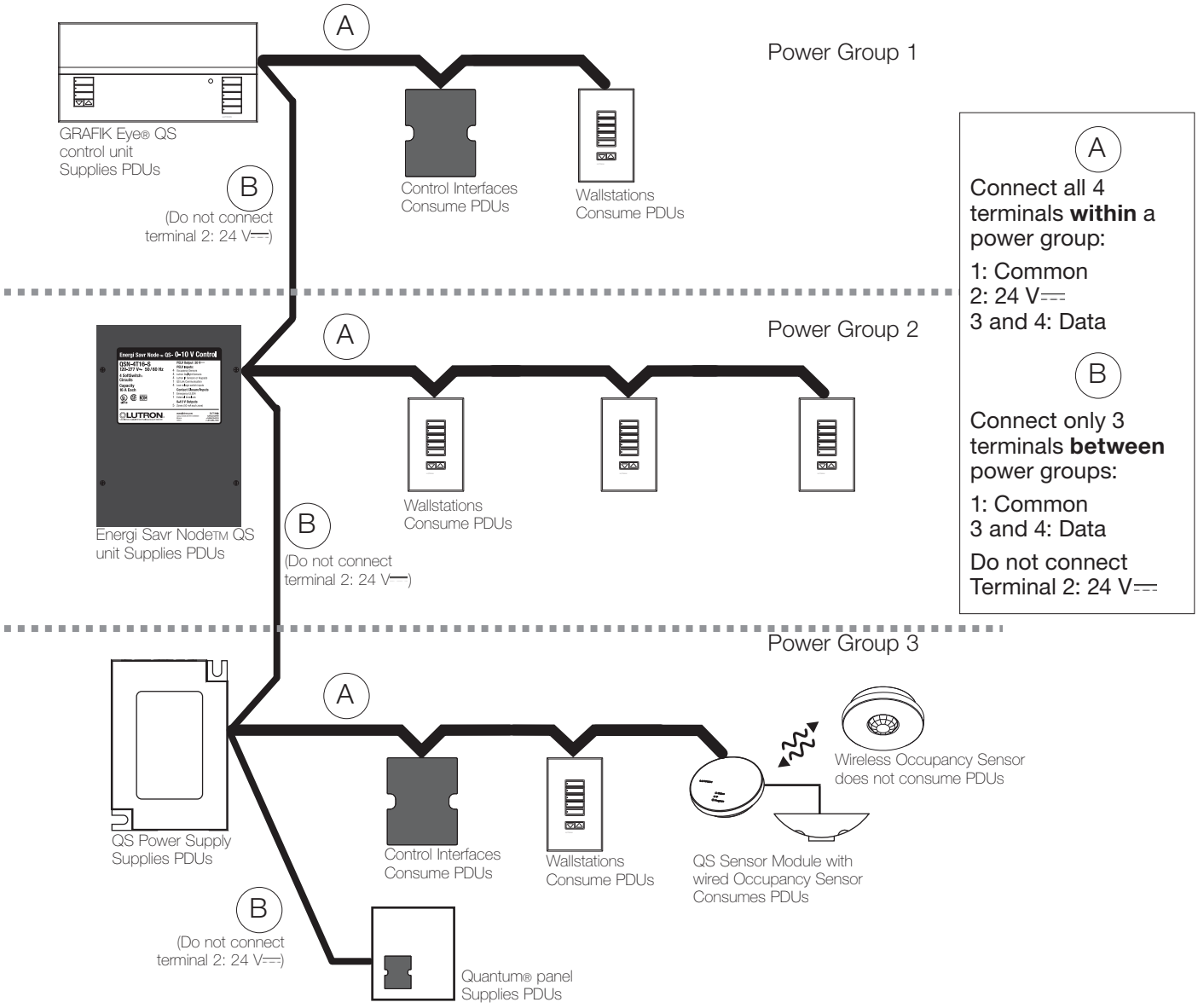
Job Name:	Model Numbers:	
Job Number:		

Power Group Wiring Example

On the QS link, there are devices that supply power and devices that consume power. Each device has a specific number of Power Draw Units (PDUs) it either supplies or consumes. A Power Group consists of one device that supplies power and one or more devices that consume power; each Power Group may have only one power-supplying device. Refer to the QS Link Power Draw Units specification submittal (Lutron PN 369405) for more information concerning PDUs.

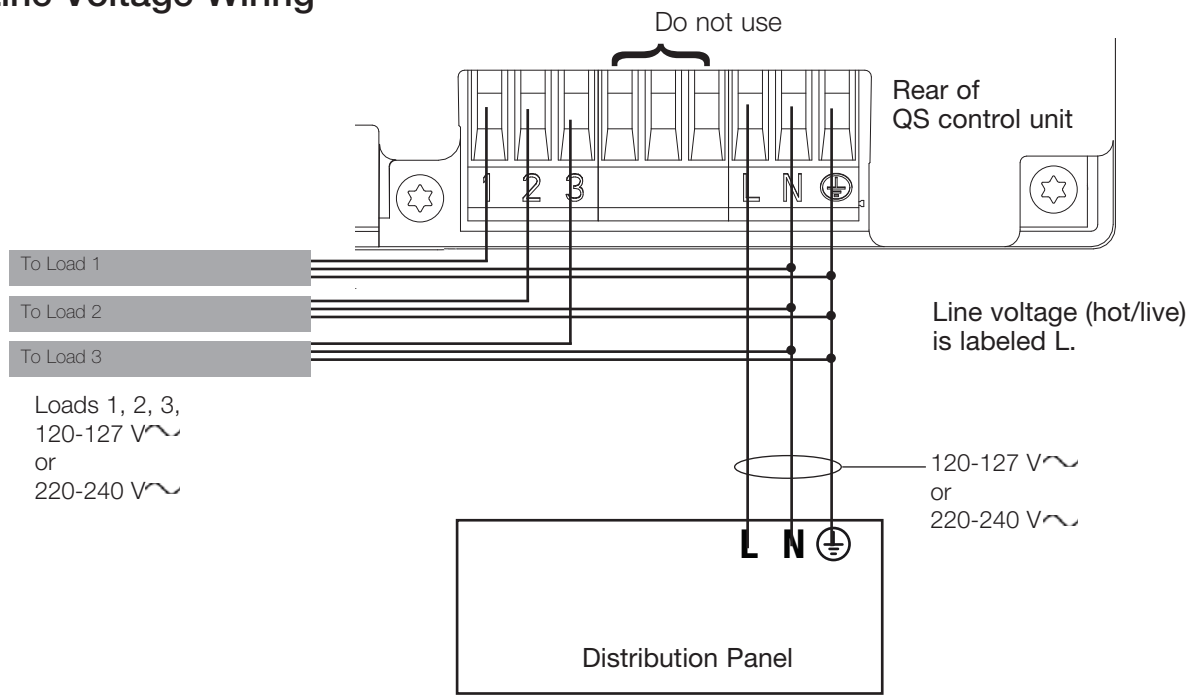
Within Power Groups on the QS link, connect all 4 terminals (1, 2, 3, and 4), shown by the letter A in the diagram. Between devices on the QS link that supply power, connect only terminals 1, 3, and 4 (NOT terminal 2), shown by the letter B on the diagram.

Wiring can be T-tapped or daisy-chained.



Job Name:	Model Numbers:	
Job Number:		

Line Voltage Wiring

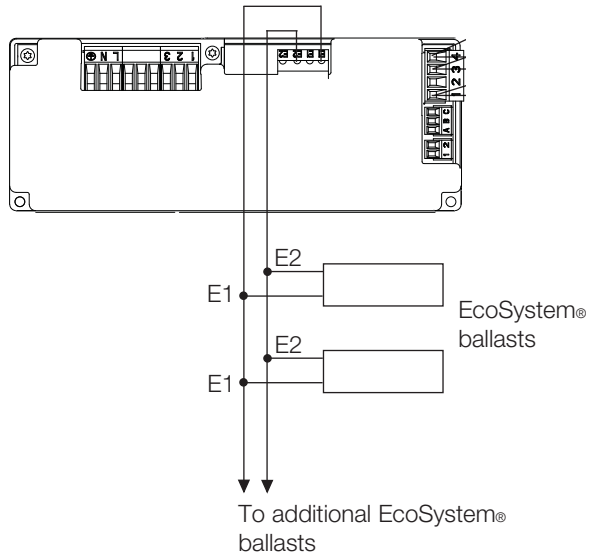


- Pull power wiring from distribution panel and to light fixtures.
- Each line voltage terminal can accept one 12 AWG (2.5 mm²) wire.
- Consult Lutron for non-dim relay wiring and/or load side emergency transfer wiring.

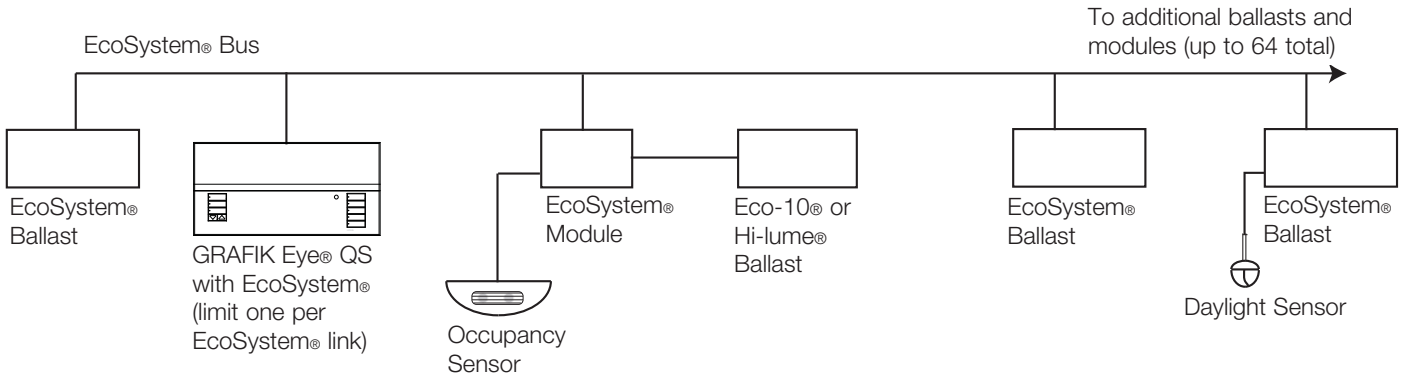
Job Name:	Model Numbers:	
Job Number:		

EcoSystem® Bus Wiring

EcoSystem® Bus Link Terminal Detail



EcoSystem® Bus Wiring Example



Job Name:	Model Numbers:	
Job Number:		

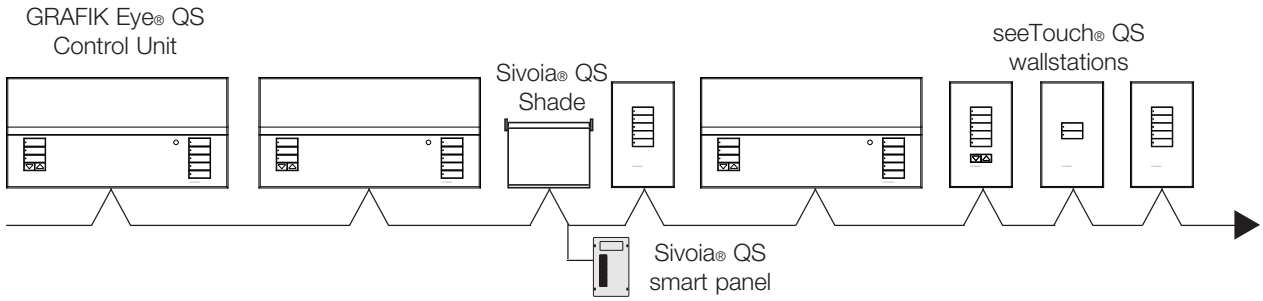
IEC PELV/NEC® Class 2 QS System Wiring

- Wiring can be daisy-chained or T-tapped.
- Wiring must be run separately from line/mains voltage.
- Total length of control link must not exceed 2000 ft (610 m).

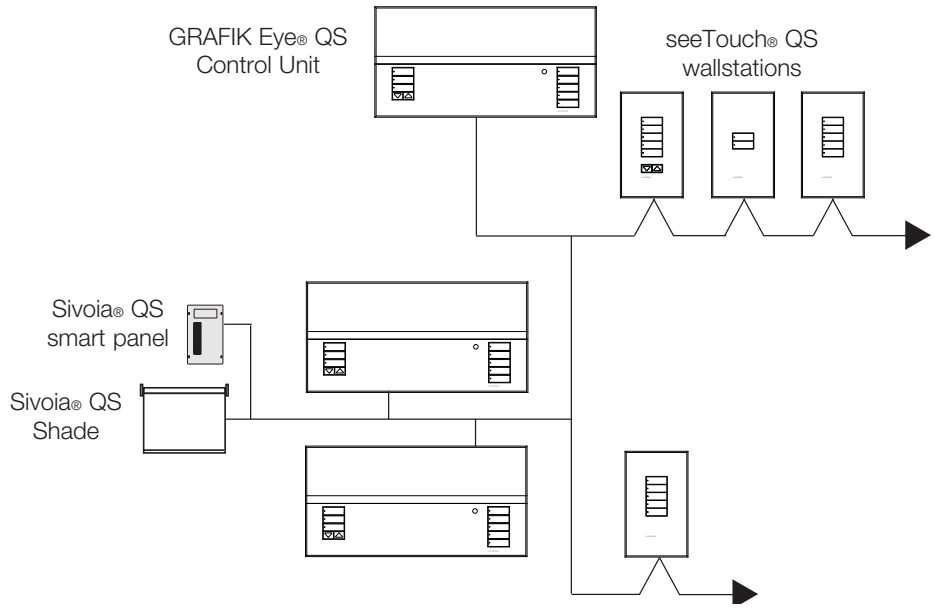
Wire Sizes (check compatibility in your area)

QS Link Wiring Length	Wire Gauge	Lutron Cable Part Number
Less than 500 ft (153 m)	Power (terminals 1 and 2) 1 pair 18 AWG (1.0 mm²)	GRX-CBL-346S (non-plenum) GRX-PCBL-346S (plenum)
	Data (terminals 3 and 4) 1 twisted, shielded pair 22 AWG (0.5 mm²)	
500 to 2000 ft (153 to 610 m)	Power (terminals 1 and 2) 1 pair 12 AWG (4.0 mm²)	GRX-CBL-46L (non-plenum) GRX-PCBL-46L (plenum)
	Data (terminals 3 and 4) 1 twisted, shielded pair 22 AWG (0.5 mm²)	

Daisy-Chain Wiring Example

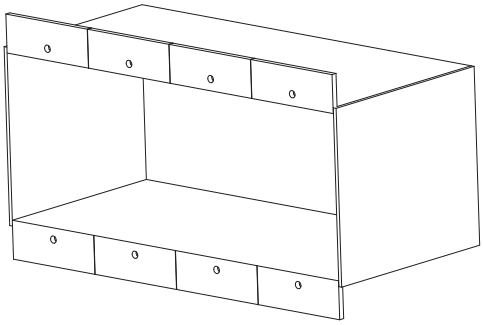


T-Tap Wiring Example

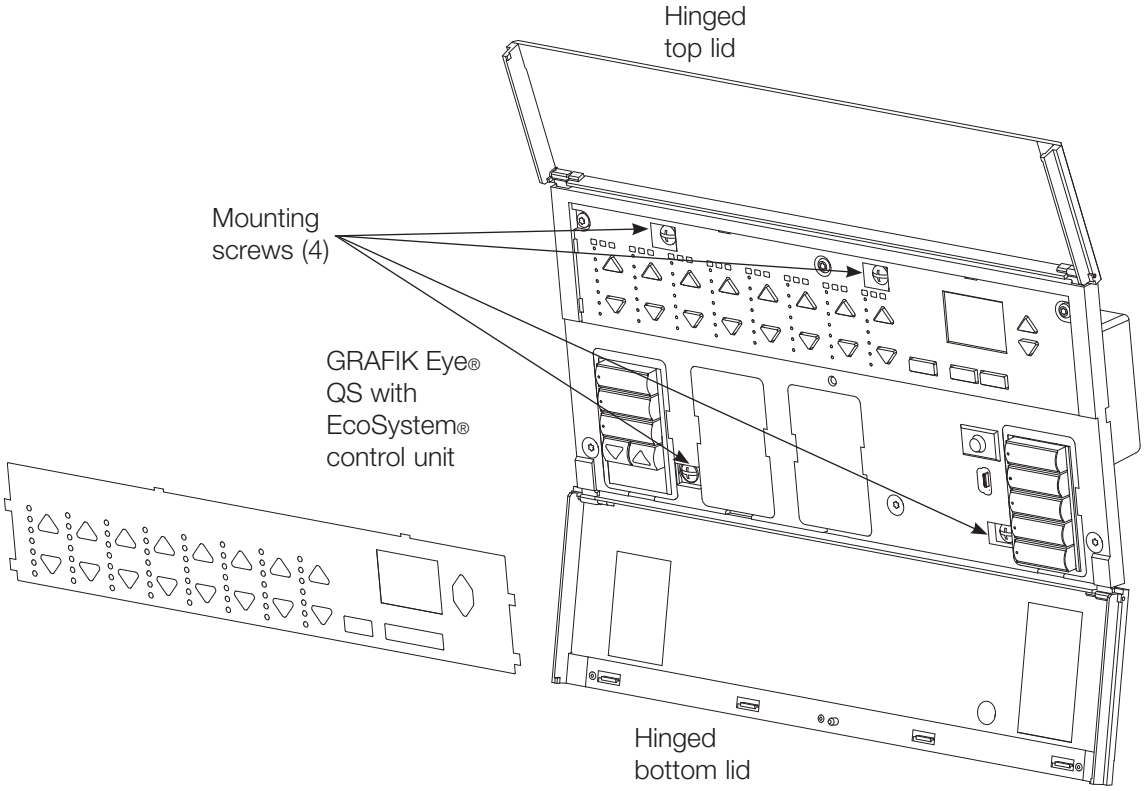


Job Name:	Model Numbers:	
Job Number:		

Mounting

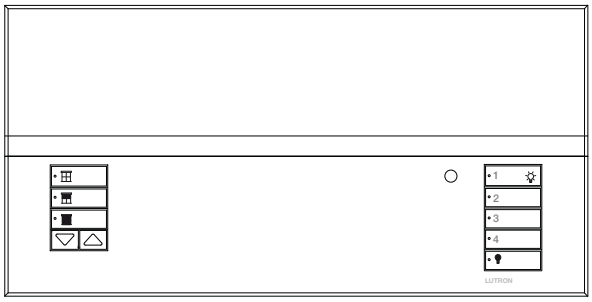


Standard 4-gang U.S. wallbox, 3½ in (89 mm) deep (available from Lutron, P/N 241-400)



Job Name:	Model Numbers:	
Job Number:		

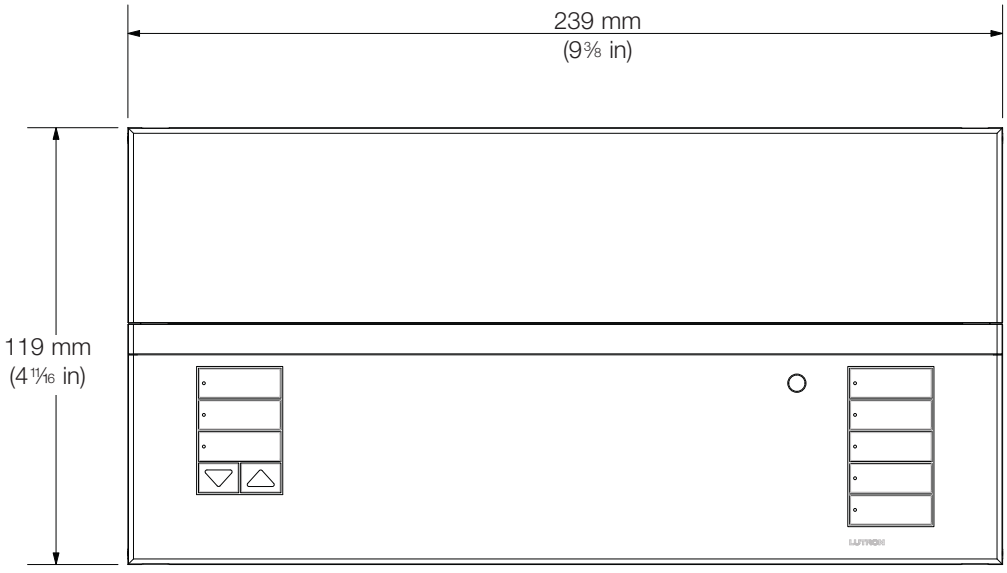
GRAFIK Eye® QS Wireless Control Unit with DALI (CE)



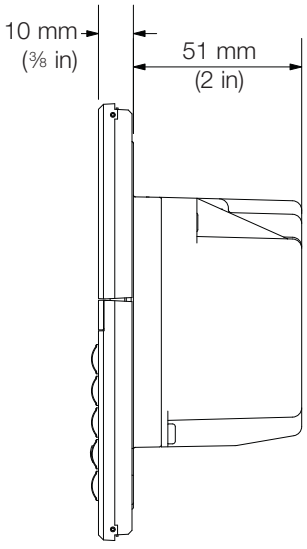
Description

GRAFIK Eye QS with DALI is the premier energy-saving lighting and shade control. *GRAFIK Eye* QS features an astronomic timeclock, intuitive lighting presets, and direct shade control, which are seamlessly integrated with DALI-compliant output devices, and Lutron's QS components and systems. Now with wireless technology and an integral DALI-compliant bus supply, you can use the *GRAFIK Eye* QS Wireless with DALI to control digital loads and shades without interfaces, and integrate with a variety of Lutron wireless products and systems, including Radio Powr Savr™ occupancy, vacancy, and daylight sensors, Sivoia® QS Wireless shades, Pico™ wireless control, and other *GRAFIK Eye* QS wireless units. Additionally, the *GRAFIK Eye* QS Wireless is compatible with all Lutron wired QS products and systems.
GRAFIK Eye QS Wireless with DALI is compatible with Quantum®.

Mechanical Dimensions



Front View



Side View

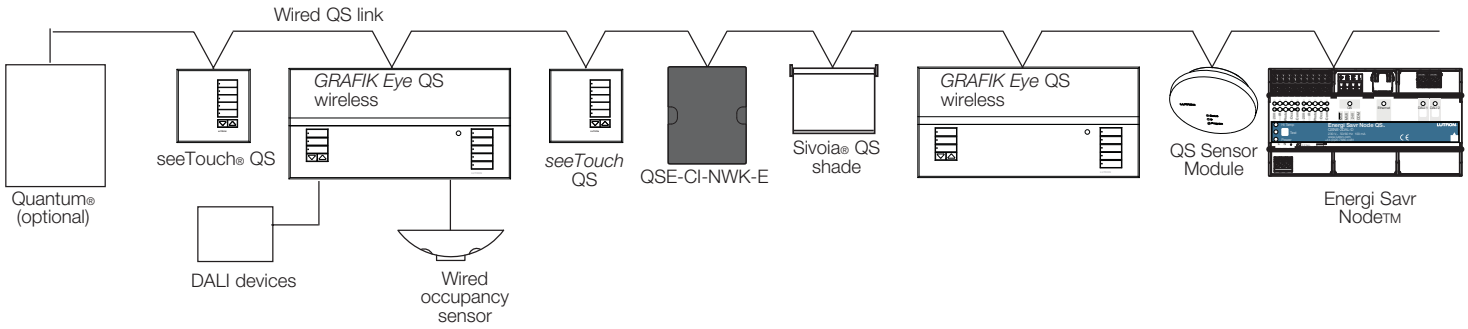
Fits into a 4-gang U.S. backbox, 89 mm (3.5 in) deep; Lutron P/N 241-400

Job Name:	Model Numbers:	
Job Number:		

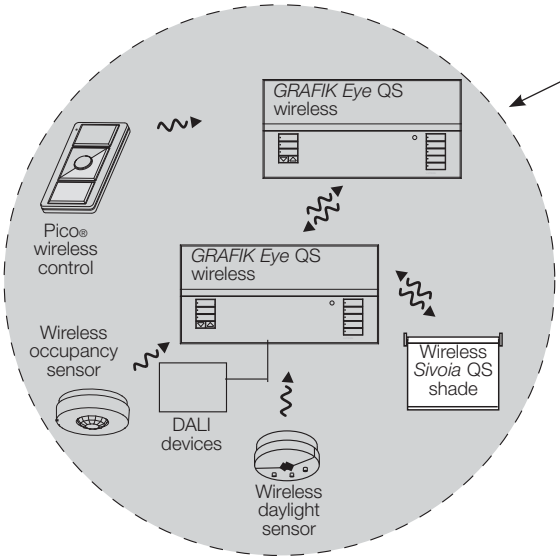
System Topologies

The GRAFIK Eye® QS Wireless with DALI can be specified in three different system topologies. Examples of each are shown below.

Example of Wired System

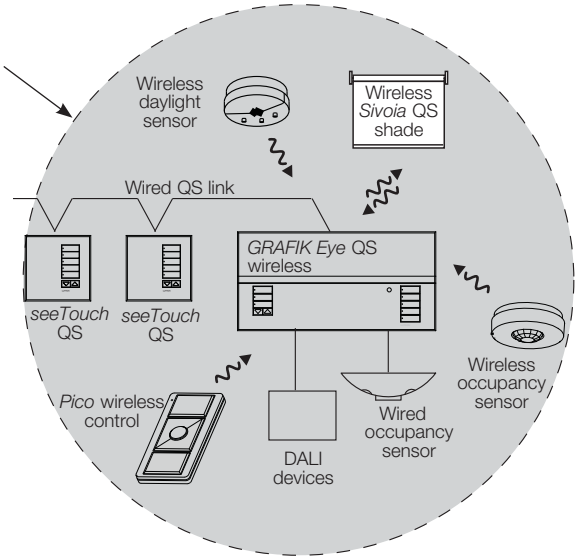


Example of *GRAFIK Eye*-centric Wireless System



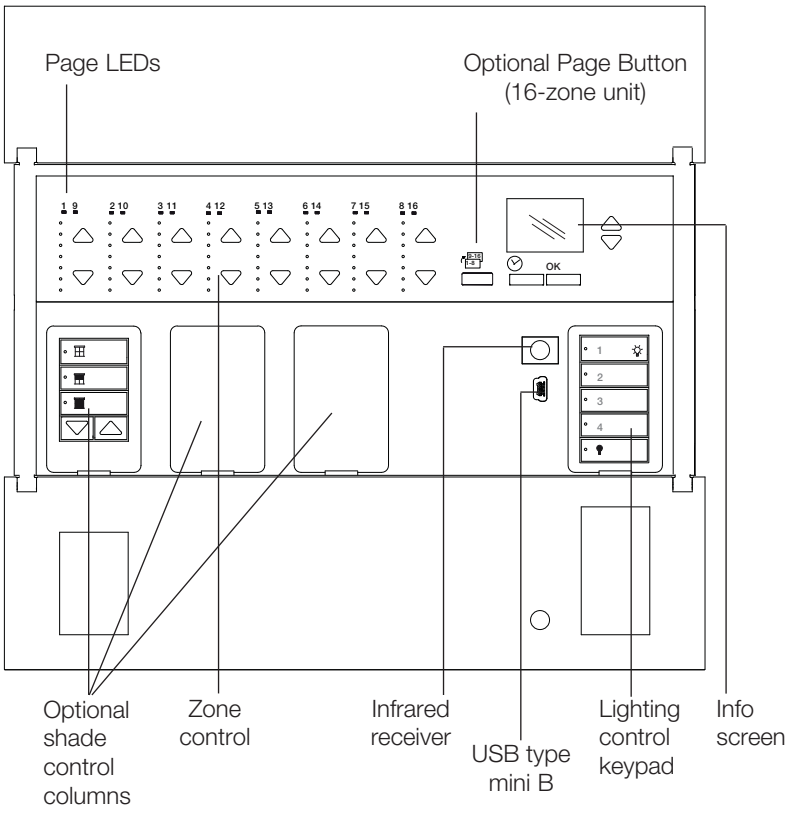
10 m (30 ft) wireless range; 20 m (60 ft) in open air

Example of Mixed *GRAFIK Eye*-centric Wired/Wireless System



Job Name:	Model Numbers:	
Job Number:		

369316 Rev. A 3 03.07.11



Note: Symbol-based (-SGN) engraving shown.

Features

- Lutron's proprietary Clear Connect™ RF technology. Operates in 868 MHz band.
- Pushbutton recall of four preset lighting scenes, plus Off.
- Twelve (12) additional scenes accessible through other QS devices, such as seeTouch® QS wallstations.
- Optional integrated shade control buttons, which can also be added to the unit after installation.
- Master override buttons to raise and lower all lights.
- Allows setup of lighting scenes and shade presets using buttons on the control unit.
- Built-in infrared (IR) receiver.
- External IR connection.
- Built-in astronomic timeclock.
- Info screen shows zone light level percentage, energy savings, zone labeling, programming, and Digital Addressable Load setup.
- Lockout option prevents accidental changes.
- One occupancy sensor input and 24 V⎓ power for occupancy sensor.
- QS communication link for seamless integration of lights, motorised window treatments, wallstations, and integration interfaces.
- Compatible with all Lutron QS system components.
- Wireless communication for seamless integration with a variety of Lutron wireless products and systems, including Radio Powr Savr™ occupancy and vacancy sensors, Sivoia® QS wireless shades, Pico® wireless control, and other GRAFIK Eye® QS wireless products.
- Control up to 6, 8, or 16 zones of DALI-compliant loads from internal bus supply.
- Up to 64 DALI-compliant output devices can be addressed and grouped into zones.
- Backlit buttons with engraving make unit easy to locate and operate.
- Available in a variety of colours and finishes.

Job Name:	Model Numbers:	
Job Number:		

Specifications

Input Power

- 220-240 V~ 50/60 Hz

Lighting Sources/Load Types

- Up to 64 DALI-compliant output devices (devices must comply with IEC/EN 60929) can be addressed and grouped into zones.
- Before system is addressed, Zone 1 will transmit broadcast commands to all DALI-compliant loads wired to the GRAFIK Eye® QS.

Key Design Features

- RF meets IEC 801-2.
- Tested to withstand 16 kV electrostatic discharge without damage or memory loss.
- Tested to withstand voltage surges of up to 6 000 V~ and current surges of up to 3 000 A. Lightning strike protection meets ANSI/IEEE 62.41-1980 standard.
- Power failure memory retains programming and light level settings for up to 10 years in the event of a power loss.
- The *GRAFIK Eye* QS supplies 3 Power Draw Units (PDUs) on the QS link.
  For complete information, see “Power Draw Units on the QS Link,” Lutron PN 369405.
- Faceplate is hinged at the top and bottom, and stays open at 180° for ease of access.

Environment

- 0 to 40 °C (32 to 104 °F)
- Relative humidity less than 90% non-condensing

Compliance

- CE

Scene and Shade Buttons

- Large, rounded buttons are easy to use.
- Backlit buttons with optional engraving make it easy to find and to operate the control unit in low light conditions (backlight can be disabled).
- Optional button engraving is angled up to the eye for easy reading.
- Predefined label stickers are included for field labeling.
- 4 preset lighting scenes, plus Off, are accessible from the front of the control unit.
- 12 additional scenes are stored in the control unit and are accessible from seeTouch® QS wallstations and QS interfaces.
- Light levels fade smoothly between scenes. Fade time can be set differently for each scene: 0 to 59 seconds, or 1 to 60 minutes. Maximum fade time from Off is 3 seconds.

Shade Control

- The *GRAFIK Eye* QS can include up to 3 shade button columns. Each column has backlit open, preset, close, and raise/lower buttons.
- Each shade button column can be programmed to operate one shade or a group of shades. (Shades may be assigned to more than one shade button column).
- Faceplates are available with 1, 2 and 3 shade button columns.

  Wireless shade limitations:
- Access to the Sivoia® QS Wireless electronic drive unit (EDU) is required to associate shades with the *GRAFIK Eye* QS and set their raise/lower limits.
- Wired and wireless shades may not be programmed into the same shade button column; however, both may be used on the same *GRAFIK Eye* QS control unit.
- Scene commands that affect wireless shades across multiple shade button columns will have a 1-second delay from column to column.

Zone Control

- Each zone has a dedicated raise and lower button to adjust the zone.
- Each zone has a dedicated 7 LED bar graph for level status. Percentage of light level and energy saved is displayed on the info screen.
- All zone information has blue backlit LEDs. Backlight turns off when idle for 30 seconds.

Info Screen

- OLED (organic LED) screen is viewable from all angles.
- Screen turns off when idle for 30 seconds.
- Programmable zone labels.
- Programmable scene labels.
- Status of real-time zone percentage and energy savings.
- Programmable timeclock schedules.
- Programmable shade labels.

Job Name:	Model Numbers:	
Job Number:		

Specifications

Astronomic Timeclock

- Integral to all units.
- 7 daily schedules available.
- One available holiday schedule is programmable by date up to one year in advance.
- 25 events per day maximum.
- Timeclock events are programmable to control scenes that affect any Energi Savr Node™ unit connected on the QS link without changing the local scene on the GRAFIK Eye® QS.
- Astronomic times are programmable by integral city database or by entering latitude and longitude. Times automatically adjust throughout the year based on location.
- Automatically adjusts for Daylight Saving Time (DST), adjusted for the new dates; DST is programmable.
- Local timeclock events can activate any of the following features:
  - Scenes 1 to 16 and Off
  - Any available window treatment presets
  - Start and End afterhours mode
  - Enable and Disable daylighting for all zones/groups
  - Enable and Disable occupancy for occupancy/vacancy sensors
  - Enable and Disable occupied events for all occupancy sensors

System Communications and Capacities

- Low-voltage type IEC PELV/NEC® Class 2 wiring connects control units, wallstations, motorised shades, and control interfaces.
- A QS system can have up to 100 devices and 100 zones.
- A QS system can have up to 30 wireless devices.
- Class 1/Class 2 wiring connects DALI-compliant output devices to control unit.

Infrared

- Infrared (IR) receiver allows infrared transmitters to select 8 scenes, raise/lower lighting zones, or raise/lower shades.
- Transmitter buttons imitate buttons on faceplate.
- 15 m (50 ft) line of sight range.
- Terminal block infrared input for direct contact with external IR connection.
- IR can be disabled via programming.
- Works with Lutron GRX-IT and GRX-8IT infrared remote controllers.

Accessory Controls: seeTouch® QS Wallstations (QSWS2)

- Wired seeTouch® QS keypads provide the following features:
  - Access to one or more of the 16 scenes on the *GRAFIK Eye* QS Wireless
  - Zone toggle, partitioning, sequencing, fine tune, panic mode, and timeclock enable/disable
  - Contact closure inputs
  - Various other functions that are available on specific wallstation configurations. Refer to the *seeTouch* specification submittal.

Wireless RF Compatibility

- Lutron's proprietary Clear Connect™ RF Technology operates in the 868 MHz band
- Compatible with other Lutron wireless products/ systems, such as:
  - Pico® (P/N QSR8P and QSRKP)
  - Radio Powr Savr™ occupancy/vacancy/daylight sensors (P/N LRF3-)
  - Sivoia® QS wireless products
  - Other *GRAFIK Eye* QS wireless units (P/N QSGRK-)

Accessory Controls: QS Sensor Module (QSM3)

- The QS Sensor Module provides a means to link wired or wireless occupancy and daylight sensors to a *GRAFIK Eye* QS via the wired QS link.
  - Occupancy sensors wired (or wirelessly linked) to a QS Sensor Module can be used by one or more *GRAFIK Eye* QS control units on the wired link.
  - Daylight sensors wired (or wirelessly linked) to a QS Sensor Module can be used by one or more *GRAFIK Eye* QS control units on the wired link.
  - *Pico* wireless controls can control either one or more zones or scenes on the *GRAFIK Eye* QS.
  - Infrared sensors can control either one or more zones or scenes on the *GRAFIK Eye* QS. Functionality varies; refer to the documentation for the QS Sensor Module for details.

Job Name:	Model Numbers:	
Job Number:		

Specifications

Accessory Controls: Contact Closure Input/Output Interface (QSE-IO)

- Recalls preset light levels for the following set of scenes on the GRAFIK Eye® QS:
  Scenes 1-4 and Off Scenes 9-12 and Off
  Scenes 5-8 and Off Scenes 13-16 and Off
- Sequence scenes 5-16, Enable/Disable Zone Lockout, Enable/Disable Scene Lockout, Enable/Disable Panic Mode, Enable/Disable Timeclock.
- Occupancy Sensors. An individual input counts as 1 occupancy sensor for the *GRAFIK Eye* QS. Each input can be assigned to either Scene Control or Zone Control (please refer to the Occupancy Sensor(s) section of this guide).
- Zone Toggle. Allows an input to toggle one or more zones to a preset level and off.
- Shade Output mode. A Shade Column on the *GRAFIK Eye* QS can be linked to control outputs 1-3 and/or outputs 4-5 on the QSE-IO.

Accessory Controls: DMX Output Interface (QSE-CI-DMX)

- Any zone on the *GRAFIK Eye* QS control unit can be mapped to any single DMX512 Channel.
- Any zone on the *GRAFIK Eye* QS control unit can be simultaneously mapped to any three DMX512 channels (providing RGB/CMY control).
- DMX loads cannot be used with daylighting.

Accessory Controls: Ethernet and RS232 Interface (QSE-CI-NWK-E)

- Allows for monitoring and control of the outputs and local scenes of the *GRAFIK Eye* QS.

Accessory Controls: QS Keyswitch Wallstations (QSWS2-KS)

- Recalls preset light levels for any two scenes including Off
- Allows fine-tuning (raise/lower level) of a zone or group of zones
- Starts/Stops scene sequencing (Scenes 1-4 or Scenes 5-16)
- Enables/Disables Timeclock
- Enables/Disables occupancy sensors
- Enables/Disabled daylight sensors
- Allows toggle of Zone(s) to a preset level and off
- Enables/Disables panic mode
- Starts/Stops afterhours mode

Other Accessory Controls and Devices

- Energi Savr Node™ QS(ESN)

Occupancy Sensor(s)

- The *GRAFIK Eye* QS works with occupancy sensors through either:
  - Scene Control: Up to four sensors activate user-selectable occupancy and vacancy scenes.
  - Zone Control: up to four sensors per zone activate user-selected occupancy and vacancy zone levels.
- Occupancy sensors may include:
  - Contact closure sensor wired to CCI input on back of *GRAFIK Eye* QS
  - Wireless *Radio Powr Savr* occupancy or vacancy sensors (model numbers starting with LRF3)
  - Wired or wireless sensors connected QS Sensor Module (QSM)
- If any sensor in a group detects occupancy, then the *GRAFIK Eye* QS will go to the designated occupancy scene or zone level.
- If all sensors in a group detect vacancy, then the *GRAFIK Eye* QS will go to the designated vacancy scene or zone level.

Accessory Controls: Pico® Wireless Control (QSR8P models)

- The *Pico* Wireless Control is battery powered. It can control *GRAFIK Eye* QS wireless control units within a 10 m (30 ft) range (20 m/60 ft in open air). It provides the following features:
  - Control of one or more zones on the *GRAFIK Eye* QS Wireless: turns zone(s) on or off, raises/lowers zone(s), and goes to user-defined preset level
  - Scene control: the *Pico* can access scene 1, scene 16, and Off on the *GRAFIK Eye* QS, and can raise and lower lighting levels

Job Name:	Model Numbers:	
Job Number:		

Specifications

Daylight Sensor(s)

- The GRAFIK Eye® QS with DALI works with compatible daylight sensors to adjust electric light levels based on measured daylight levels. Sensors can be configured to control either *GRAFIK Eye* QS zones or groups of DALI loads independent of zoning.
- Daylight sensors may include:
  - Wireless Radio Powr Savr™ (model numbers starting with LRF3)
  - Wired or wireless sensors connected to a QS sensor module (QSM3)
- In Zone Mode, a daylight sensor can control one or more *GRAFIK Eye* QS zones. Each zone can be calibrated to target light levels.
  - A zone can be controlled by no more than one daylight sensor
- In Group Mode, a daylight sensor can control one or more DALI loads, regardless of how they are zoned on the *GRAFIK Eye* QS.
  - A group can be controlled by a single daylight sensor
  - Each group can be calibrated to independent target light levels
  - Up to 16 groups are available
- Daylight control can be enabled or disabled on a scene-by-scene basis
  - By default, daylight control is enabled in all scenes

Note: Daylight control through the *GRAFIK Eye* QS only affects lighting loads. Shade groups cannot be controlled by daylight sensors. Daylighting does not affect DMX or RGB/CMY DMX loads.

Security Lockout Password

- A 4-digit password (using characters A to Z and 0 to 9) can be enabled/disabled to lock out access to the Programming Menu.
- By default there is no password enabled on the *GRAFIK Eye* QS.
- If case the 4-digit password is forgotten, contact Lutron® Technical Support to regain access.

Contact Closure Input (CCI) with Power Supply Output

- Each *GRAFIK Eye* QS has one contact closure input (Terminal A).
  - The attached device must provide a dry contact closure or solid-state output.
  - Input is miswire-protected up to 36 V⎓.
- The contact closure is capable of accepting the following types of inputs:
  - Maintained (default): The *GRAFIK Eye* QS control unit will act on both a contact closure and a contact open/release event.
  - Momentary: The *GRAFIK Eye* QS control unit will act on only contact closure events.
- Each *GRAFIK Eye* QS can supply 50 mA maximum at 24 V⎓.
  - Useful for powering occupancy sensors.
  - An auxiliary power supply must be used if the device requires more than 50 mA.
- The CCI is capable of operating in the following modes
  - Occupancy: If an occupancy sensor is wired directly to the *GRAFIK Eye* QS, choose this setting so that the occupancy sensor will work correctly.
  - Emergency: This setting allows the *GRAFIK Eye* QS to work with a LUT-ELI. When an emergency situation is detected, all lights will go to full on, and no operations will be allowed until the emergency signal is cleared.
  - Afterhours: Allows the CCI to start and end the afterhours mode.
  - Timeclock: Allows the CCI to enable and disable the timeclock.
  - Scene Lockout: Prevents the user from making any changes to the control unit. The current scene will stay on until the CCI enables normal operation.
  - Never Save: Prevents any changes from being saved while the CCI is being used.
  - Disable CCI: The CCI will have no effect on the system and will not appear on the list of available sensors.

Unit Dissipation

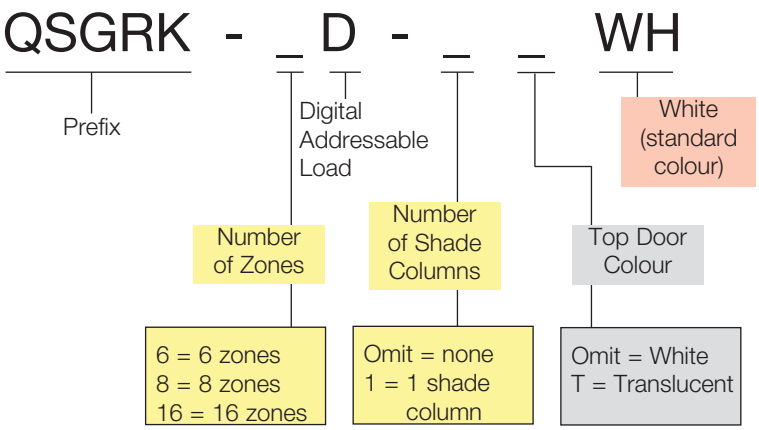
- All models of *GRAFIK Eye* QS Wireless for Digital Addressable Loads dissipate no more than 35 BTUs/hour.

System Limits

- The QS wired communication link is limited to 100 devices (wired or wireless) or 100 zones.
- The QS wireless communication link supports up to 30 wireless devices.

Job Name:	Model Numbers:	
Job Number:		

GRAFIK Eye® QS Wireless for Digital Addressable Loads
Standard Model Numbers
See following pages for Ordering Custom (Non-Standard) Model Numbers
See Standard Colour Combinations page for faceplate, stripe, and button colours



Example:
QSGRK-16D-1TWH
16-zone standard white unit with 1 shade column and translucent top door.

Unit will ship unengraved with engraving certificate that customer can redeem at no charge.

Available Standard Model Numbers

6 Zones	8 Zones	16 Zones
QSGRK-6D-WH	QSGRK-8D-WH	QSGRK-16D-WH
QSGRK-6D-TWH	QSGRK-8D-TWH	QSGRK-16D-TWH
QSGRK-6D-1WH	QSGRK-8D-1WH	QSGRK-16D-1WH
QSGRK-6D-1TWH	QSGRK-8D-1TWH	QSGRK-16D-1TWH

Important Note:

For any non-standard units, you must order **BOTH** a base unit and a Faceplate Kit. Please see the Custom Ordering Information on the following pages.

Job Name:	Model Numbers:	
Job Number:		

GRAFIK Eye® QS Wireless for Digital Addressable Loads
Custom Colour Options and Model Numbers
You must order a Base Unit and a Faceplate Kit
See Standard Colour Combinations page for faceplate, stripe, and button colours

Base Unit

QSGRK - _ D

- QSGRK — Prefix
- _ — Number of Zones
  - 6 = 6 zones
  - 8 = 8 zones
  - 16 = 16 zones
- D — Digital Addressable Loads

Example:

QSGRK-6D
6-zone base unit
and
QSGFP-2IV-SGN
Ivory faceplate kit with two shade columns and symbol-based engraving

Faceplate Kit
(includes coordinating stripe and buttons; see Standard Colour Combinations page)

QSGFP - - -

- QSGFP — Faceplate Prefix
- Number of Shade Columns
  - Omit = none
  - 1 = 1 column
  - 2 = 2 columns
  - 3 = 3 columns
- Top Door Colour
  - Omit = same as unit
  - T = Translucent
- Colour/Finish
- Keypad Engraving Code

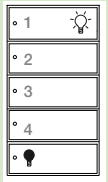
Faceplate Custom Colour/Finish Codes

Architectural Matte Finishes		Architectural Metal Finishes		Satin Colour Matte Finishes	
White	WH	Bright Brass	BB	Snow	SW
Ivory	IV	Bright Chrome	BC	Biscuit	BI
Beige	BE	Bright Nickel	BN	Eggshell	ES
Gray	GR	Satin Brass	SB	Taupe	TP
Brown	BR	Satin Chrome	SC	Midnight	MN
Black	BL	Satin Nickel	SN	Limestone	LS
Almond	AL	Antique Brass	QB	Stone	ST
Light Almond	LA	Antique Bronze	QZ	Desert Stone	DS
				Terracotta	TC
		Anodised Aluminum Finishes		Hot	HT
		Clear	CLA	Goldstone	GS
		Black	BLA	Palladium	PD
		Brass	BRA	Plum	PL
				Turquoise	TQ
				Bluestone	BG
				Sea Glass	SG
				Greenbrier	GB
				Sienna	SI
				Merlot	MR
				Mocha Stone	MS

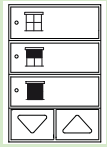
Keypad Engraving Codes

Omit = Unengraved
Ships with engraving certificate that customer can redeem at no charge

SGN = International (symbol-based) Engraving



Lighting keypad


Shade column

NST = Non-Standard Text Engraving
Please visit the *GRAFIK Eye* QS website at **www.lutron.com/grafikeyeqs** for custom engraving forms. Submit completed form with order, and unit will ship engraved as specified by customer.

Job Name:	Model Numbers:	
Job Number:		

GRAFIK Eye® QS Wireless for Digital Addressable Loads

Custom Options and Model Numbers

See previous pages for Standard and Other Custom Model Numbers
See Standard Colour Combinations page for faceplate, stripe, and button colours

Custom Button Kit

QSGB - 5B - WH -

- QSGB — Custom Button Kit Prefix
- 5B — Button Configuration
- WH — Button Colour/Finish
- (blank) — Keypad Engraving Code

3BRL = 3-button with raise/lower (shade column)
5B = 5-button (lighting keypad)

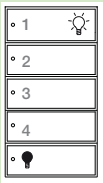
Button Kit Custom Colour/Finish Codes

Architectural Matte Finishes		Satin Colour Matte Finishes	
White	WH	Snow	SW
Ivory	IV	Biscuit	BI
Beige	BE	Eggshell	ES
Gray	GR	Taupe	TP
Brown	BR		
Black	BL		
Almond	AL		
Light Almond	LA		

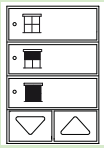
Keypad Engraving Codes

Omit = Unengraved
Ships with engraving certificate that customer can redeem at no charge

SGN = Symbol-based Engraving



Lighting keypad


Shade column

NST = Non-Standard Text Engraving
Please visit the *GRAFIK Eye* QS website at **www.lutron.com/grafikeyeqs** for custom engraving forms. Submit completed form with order, and unit will ship engraved as specified by customer.

Custom Stripe Kit

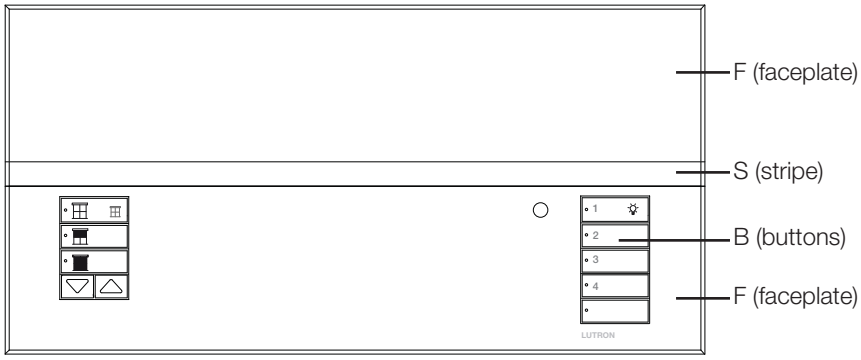
QSGS - ____

- QSGS — Stripe Kit Prefix
- ____ — Stripe Colour/Finish

Stripe Custom Colour/Finish Codes
Same as Faceplate colours on previous page

Job Name:	Model Numbers:	
Job Number:		

GRAFIK Eye® QS Wireless for Digital Addressable Loads
Standard Colour Combinations
See previous pages for Standard and Custom Model Numbers



Faceplate is comprised of a top and bottom. The bottom will always be the colour indicated under “faceplate.” The top may be the same colour or translucent. Use the chart for faceplates that have the same colour top and bottom. If a translucent lid is chosen, the stripe will automatically be the same colour as the bottom lid.

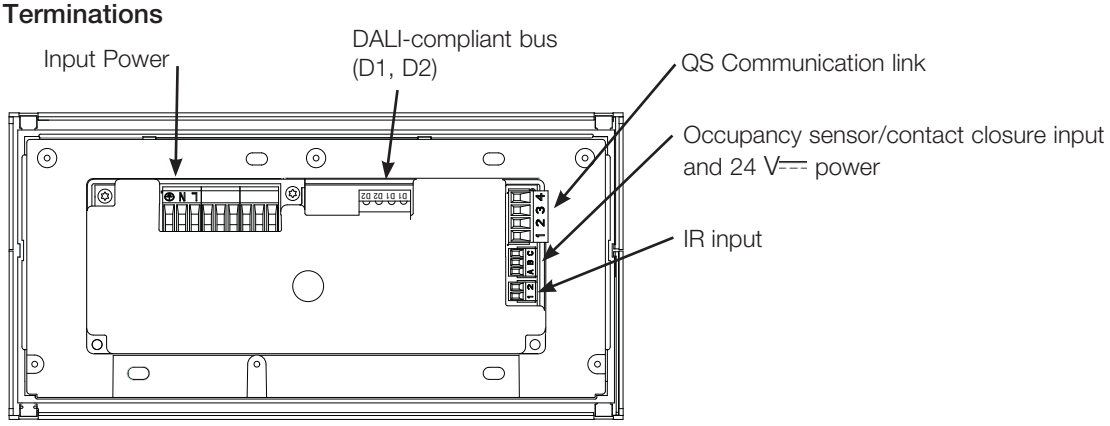
Suffix	Faceplate (F)	Stripe (S)	Button (B)
Architectural Matte			
WH	White	Gray	White
IV	Ivory	Beige	Ivory
BE	Beige	Ivory	Beige
GR	Gray	Black	Gray
BR	Brown	Black	Brown
BL	Black	Gray	Black
AL	Almond	Light Almond	Almond
LA	Light Almond	Almond	Light Almond
Architectural Metal			
BB	Bright Brass	Black	Black
BC	Bright Chrome	Black	Black
BN	Bright Nickel	Black	Black
SB	Satin Brass	Black	Black
SC	Satin Chrome	Black	Black
SN	Satin Nickel	Black	Black
QB	Antique Brass	Black	Black
QZ	Antique Bronze	Black	Black
Anodised			
CLA	Clear	Black	Black
BLA	Black	Black	Black
BRA	Brass	Black	Black

Suffix	Faceplate (F)	Stripe (S)	Button (B)
Satin Matte			
MN	Midnight	Gray	Black
TP	Taupe	Gray	Taupe
SW	Snow	Gray	Snow
ES	Eggshell	Beige	Eggshell
BI	Biscuit	Eggshell	Biscuit
LS	Limestone	Gray	Gray
ST	Stone	Gray	Gray
DS	Desert Stone	Taupe	Taupe
TC	Terracotta	Taupe	Taupe
BG	Bluestone	Gray	Gray
HT	Hot	Taupe	Taupe
MR	Merlot	Taupe	Taupe
SI	Sienna	Brown	Brown
GB	Greenbrier	Gray	Gray
SG	Sea Glass	Gray	Gray
MS	Mocha Stone	Taupe	Taupe
GS	Goldstone	Ivory	Ivory
PD	Palladium	Gray	Gray
PL	Plum	Taupe	Taupe
TQ	Turquoise	Gray	Gray

Job Name:	Model Numbers:	
Job Number:		

Overview

Terminations



Wire Gauge	Maximum DALI-compliant Bus Wire Length
4.0 mm² (12 AWG)	671 m (2 200 ft)
2.5 mm² (14 AWG)	427 m (1 400 ft)
1.5 mm² (16 AWG)	275 m (900 ft)
1.0 mm² (18 AWG)	175 m (570 ft)

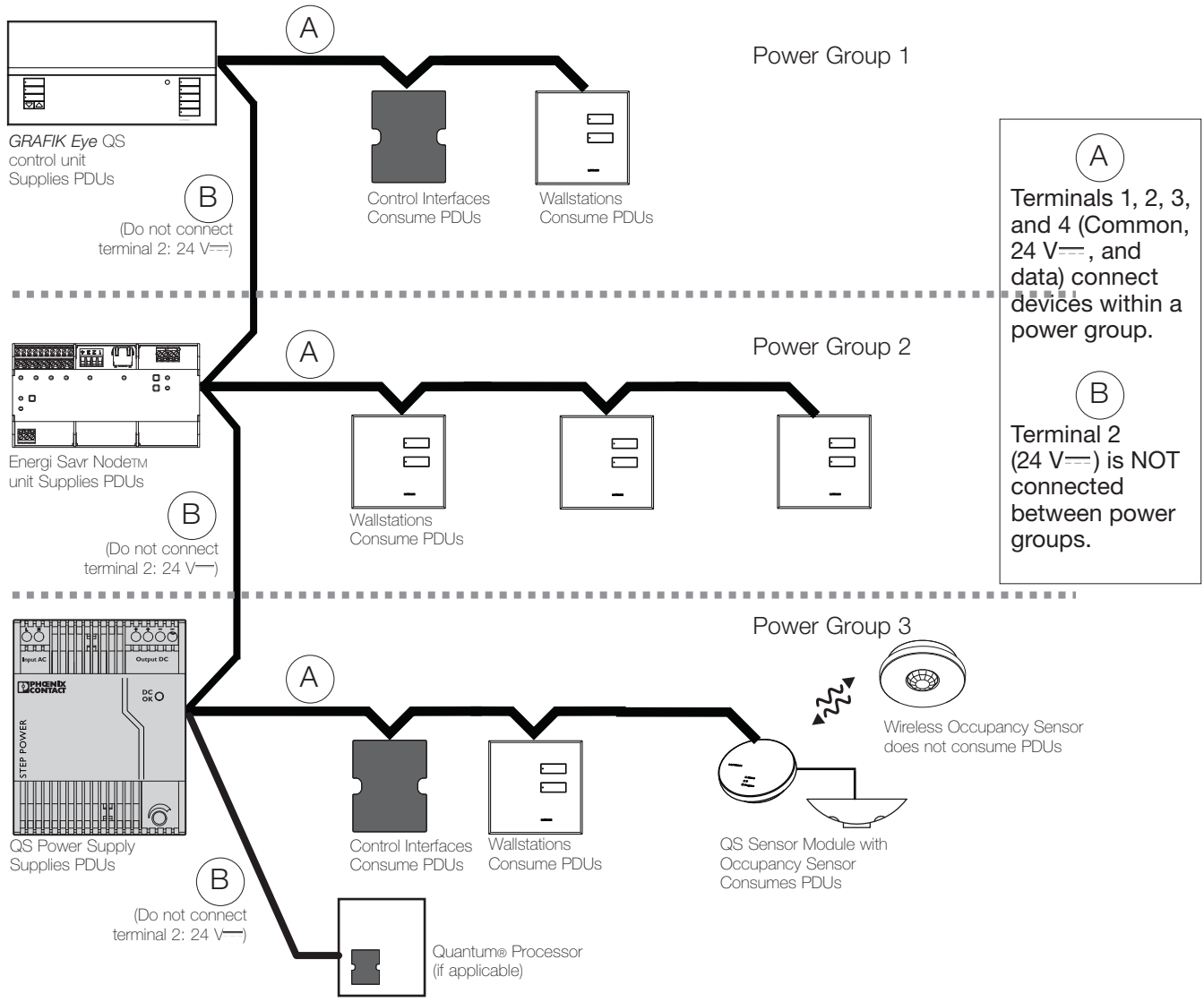
Job Name:	Model Numbers:	
Job Number:		

Power Group Wiring Example

On the QS link, there are devices that supply power and devices that consume power. Each device has a specific number of Power Draw Units (PDUs) it either supplies or consumes. A Power Group consists of one device that supplies power and one or more devices that consume power; each Power Group may have only one power-supplying device. Refer to the QS Link Power Draw Units specification submittal (Lutron PN 369405) for more information concerning PDUs.

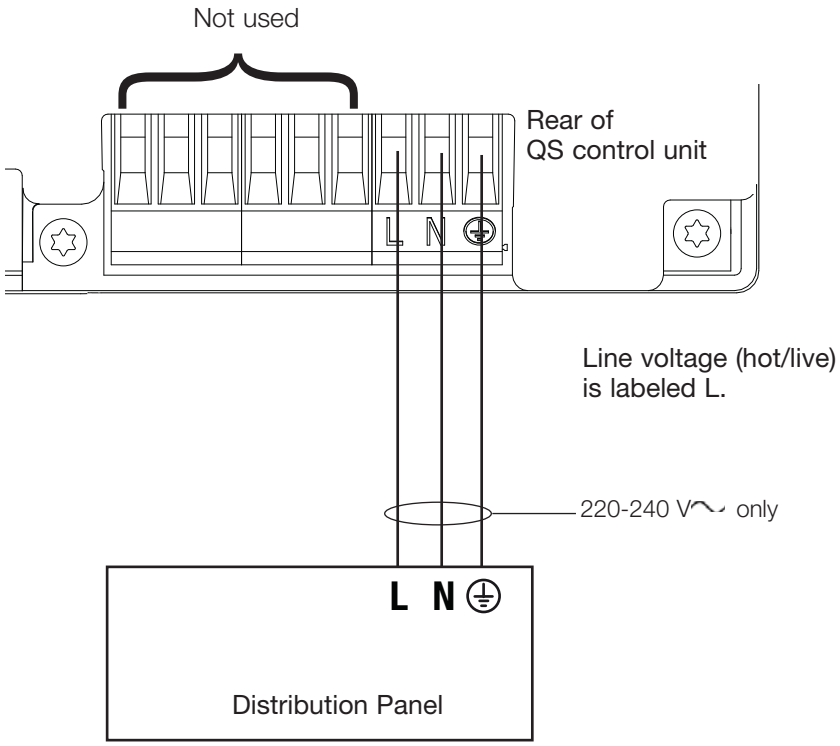
Within Power Groups on the QS link, connect all 4 terminals (1, 2, 3, and 4), shown by the letter A in the diagram. Between devices on the QS link that supply power, connect only terminals 1, 3, and 4 (NOT terminal 2), shown by the letter B on the diagram. Refer to the specific device documentation for wiring details.

Wiring can be T-tapped or daisy-chained.



Job Name:	Model Numbers:	
Job Number:		

Line Voltage Wiring

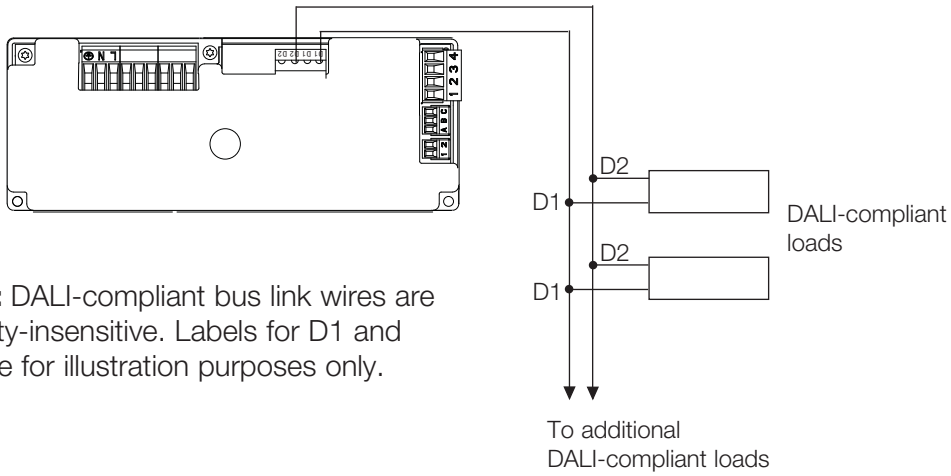


- Pull power wiring from distribution panel and to light fixtures.
- Each line voltage terminal can accept one 2.5 mm^2 (12 AWG) wire.
- Consult Lutron for non-dim relay wiring and/or load side emergency transfer wiring.

Job Name:	Model Numbers:	
Job Number:		

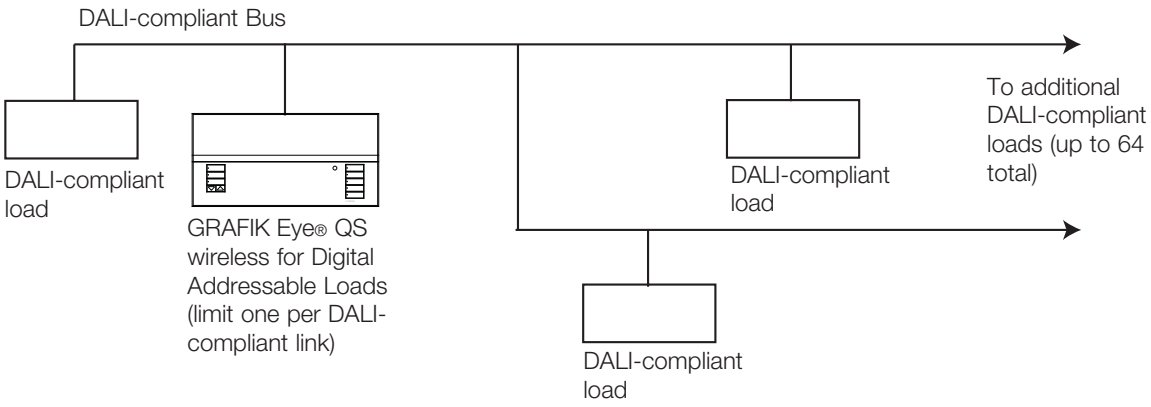
DALI-Compliant Bus Wiring

DALI-Compliant Bus Link Terminal Detail



Note: DALI-compliant bus link wires are polarity-insensitive. Labels for D1 and D2 are for illustration purposes only.

DALI-Compliant Bus Wiring Example

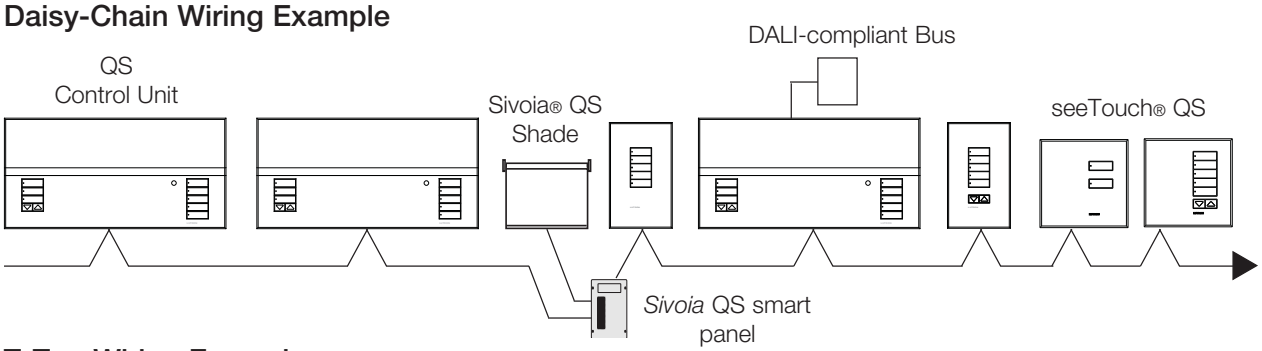


Job Name:	Model Numbers:	
Job Number:		

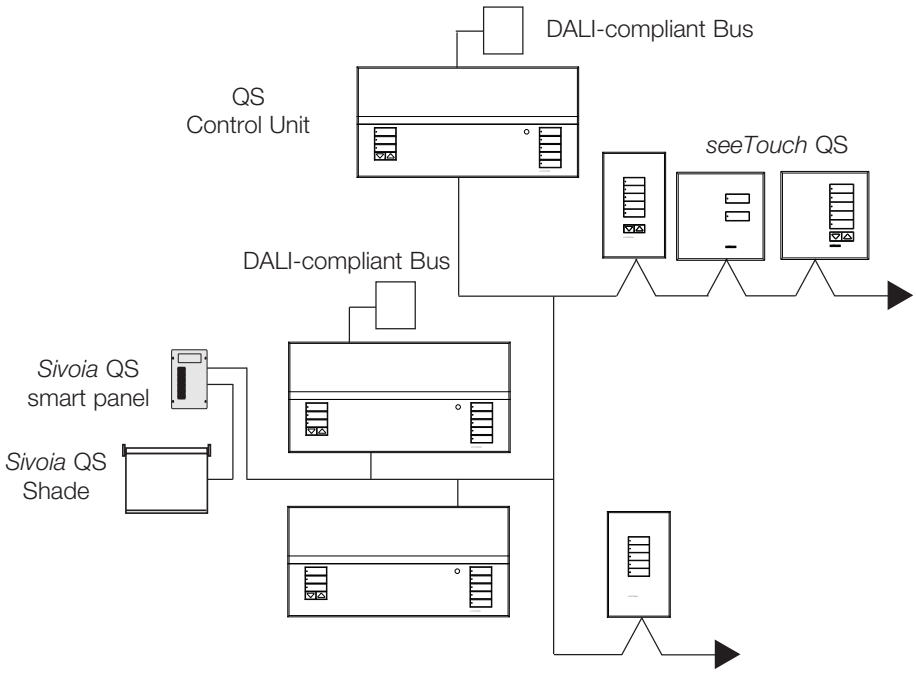
IEC PELV/NEC® Class 2 QS Link Wiring

- System communication uses low-voltage wiring.
- Wiring can be daisy-chained or T-tapped.
- Wiring must be run separately from line/mains voltage.
- IEC PELV/NEC® Class 2 wiring link requires:
  - Two 1.0 mm² (18 AWG) conductors for control power.
  - One twisted, shielded pair of 1.0 mm² (22 AWG) for data link.
  - Available from Lutron, P/N GRX-CBL-346S; check compatibility in your area.
- Total length of control link must not exceed 610 m (2 000 ft).

Daisy-Chain Wiring Example

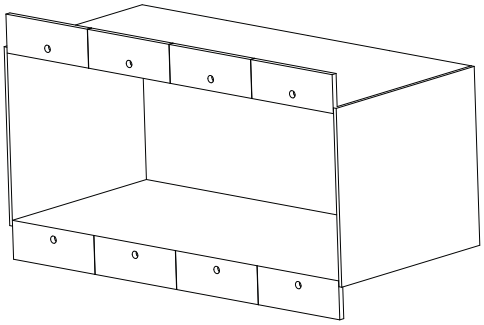


T-Tap Wiring Example

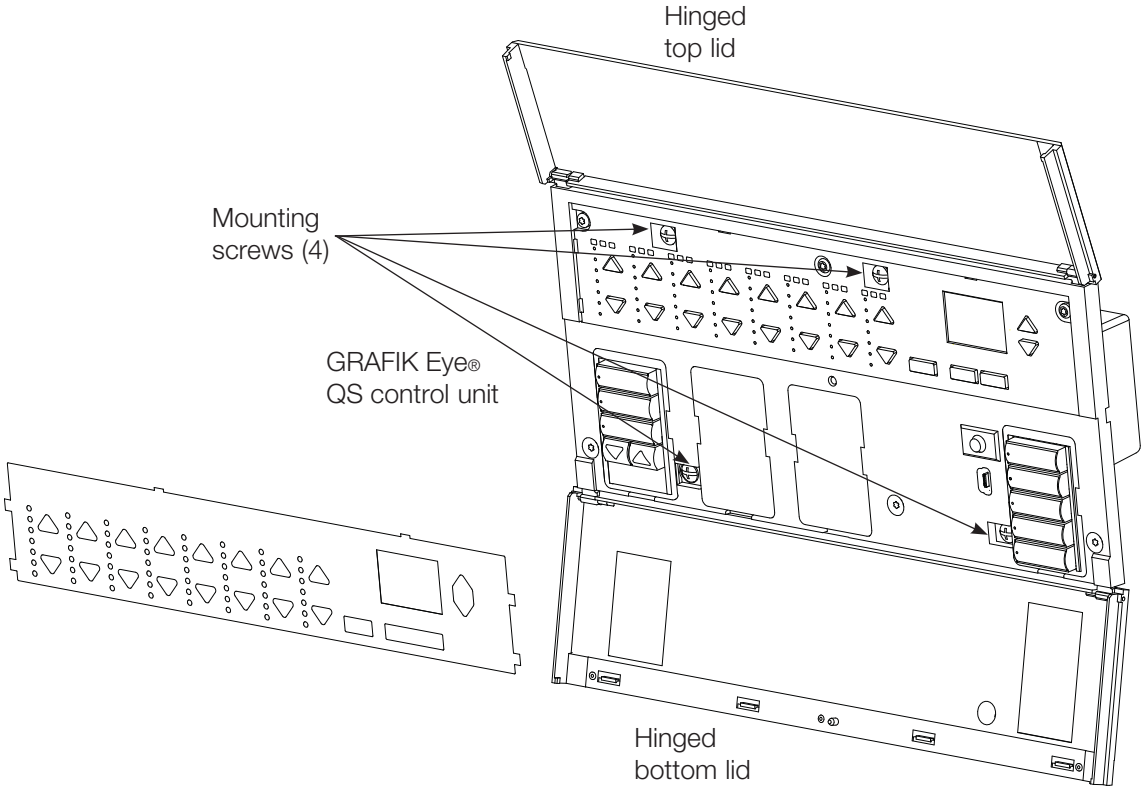


Job Name:	Model Numbers:	
Job Number:		

Mounting



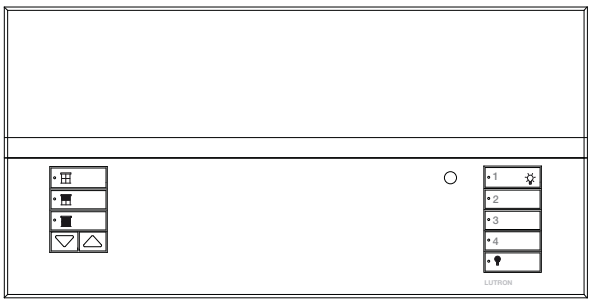
Standard 4-gang
U.S. wallbox,
89 mm (3.5 in) deep
(available from
Lutron, P/N 241-400)



Job Name:	Model Numbers:	
Job Number:		

369318 Rev. B 1 11.18.11

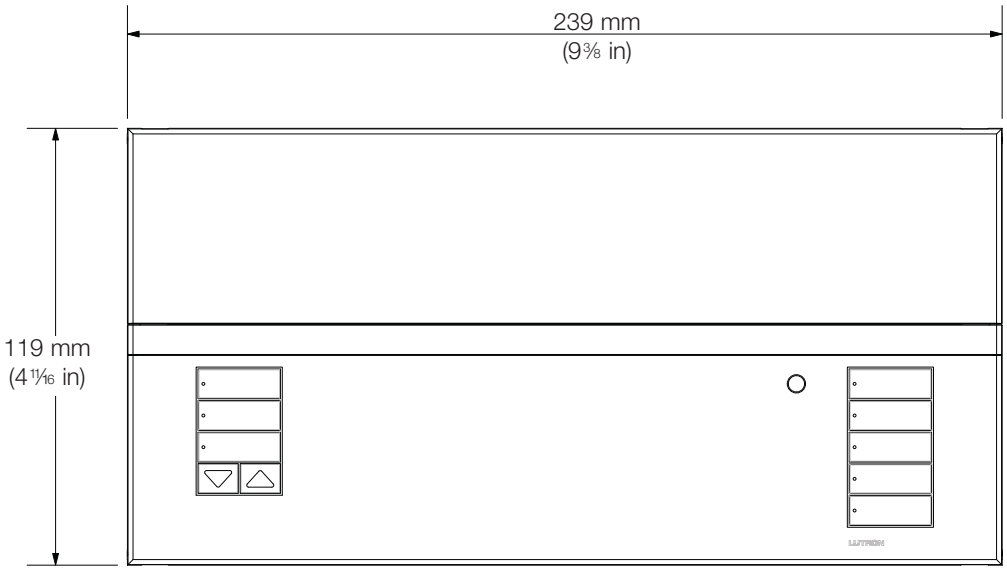
GRAFIK Eye® QS Wireless Control Unit with DALI (CE Limited)



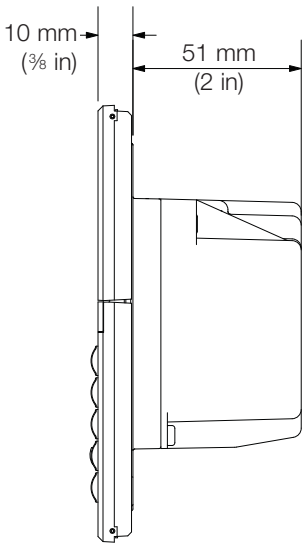
Description

GRAFIK Eye® QS with DALI is the premier energy-saving lighting and shade control. GRAFIK Eye® QS features an astronomic timeclock, intuitive lighting presets, and direct shade control, which are seamlessly integrated with DALI-compliant output devices, and Lutron's QS components and systems. Now with wireless technology and an integral DALI-compliant bus supply, you can use the GRAFIK Eye® QS Wireless with DALI to control digital loads and shades without interfaces, and integrate with a variety of Lutron wireless products and systems, including Radio Powr Savr™ occupancy, vacancy, and daylight sensors, Sivoia® QS Wireless shades, Pico™ wireless control, and other GRAFIK Eye® QS wireless units. Additionally, the GRAFIK Eye® QS Wireless is compatible with all Lutron wired QS products and systems.
GRAFIK Eye® QS Wireless with DALI is compatible with Quantum®.

Mechanical Dimensions



Front View



Side View

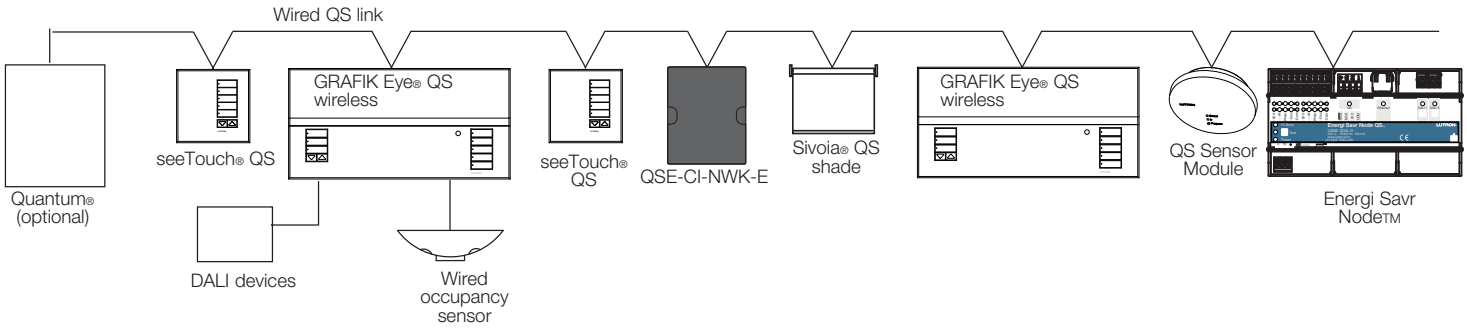
Fits into a 4-gang U.S. backbox, 89 mm (3.5 in) deep; Lutron P/N 241-400

Job Name:	Model Numbers:	
Job Number:		

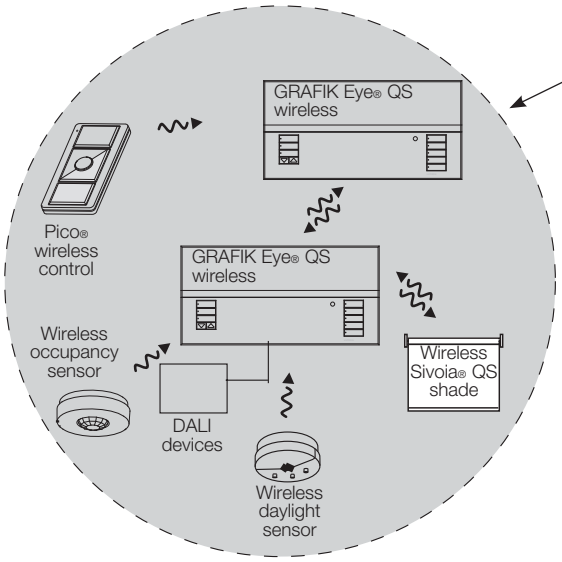
System Topologies

The GRAFIK Eye® QS Wireless with DALI can be specified in three different system topologies. Examples of each are shown below.

Example of Wired System

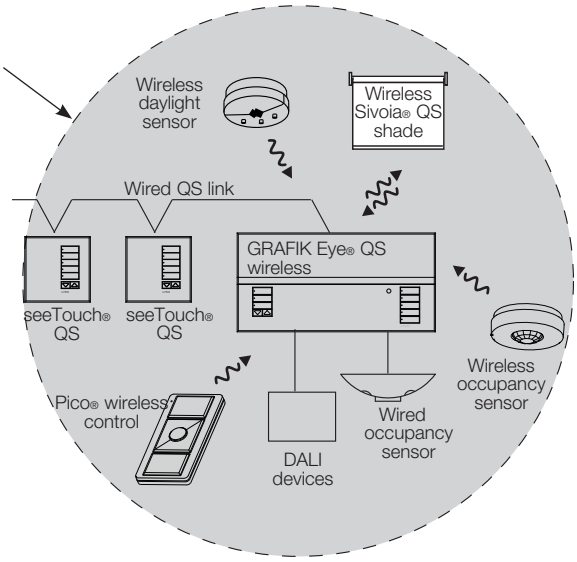


Example of GRAFIK Eye®-centric Wireless System

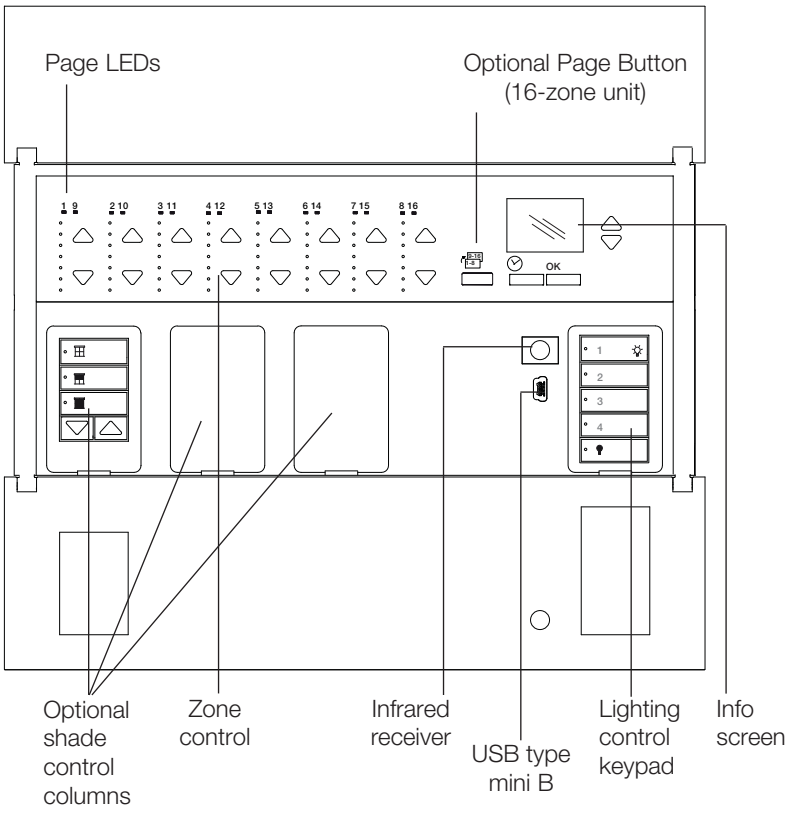


10 m (30 ft) wireless range; 20 m (60 ft) in open air

Example of Mixed GRAFIK Eye®-centric Wired/Wireless System



Job Name:	Model Numbers:	
Job Number:		



Note: Symbol-based (-SGN) engraving shown.

Features

- Lutron's proprietary Clear Connect™ RF technology. Operates in limited 868 MHz band.
- Pushbutton recall of four preset lighting scenes, plus Off.
- Twelve (12) additional scenes accessible through other QS devices, such as seeTouch® QS wallstations.
- Optional integrated shade control buttons, which can also be added to the unit after installation.
- Master override buttons to raise and lower all lights.
- Allows setup of lighting scenes and shade presets using buttons on the control unit.
- Built-in infrared (IR) receiver.
- External IR connection.
- Built-in astronomic timeclock.
- Info screen shows zone light level percentage, energy savings, zone labeling, programming, and Digital Addressable Load setup.
- Lockout option prevents accidental changes.
- One occupancy sensor input and 24 V⎓ power for occupancy sensor.
- QS communication link for seamless integration of lights, motorised window treatments, wallstations, and integration interfaces.
- Compatible with all Lutron QS system components.
- Wireless communication for seamless integration with a variety of Lutron wireless products and systems, including Radio Powr Savr™ occupancy and vacancy sensors, Sivoia® QS wireless shades, Pico® wireless control, and other GRAFIK Eye® QS wireless products.
- Control up to 6, 8, or 16 zones of DALI-compliant loads from internal bus supply.
- Up to 64 DALI-compliant output devices can be addressed and grouped into zones.
- Backlit buttons with engraving make unit easy to locate and operate.
- Available in a variety of colours and finishes.

Job Name:	Model Numbers:	
Job Number:		

Specifications

Input Power

- 220-240 V~ 50/60 Hz

Lighting Sources/Load Types

- Up to 64 DALI-compliant output devices (devices must comply with IEC/EN 60929) can be addressed and grouped into zones.
- Before system is addressed, Zone 1 will transmit broadcast commands to all DALI-compliant loads wired to the GRAFIK Eye® QS.

Key Design Features

- RF meets IEC 801-2.
- Tested to withstand 16 kV electrostatic discharge without damage or memory loss.
- Tested to withstand voltage surges of up to 6 000 V~ and current surges of up to 3 000 A. Lightning strike protection meets ANSI/IEEE 62.41-1980 standard.
- Power failure memory retains programming and light level settings for up to 10 years in the event of a power loss.
- The GRAFIK Eye® QS supplies 3 Power Draw Units (PDUs) on the QS link.
  For complete information, see “Power Draw Units on the QS Link,” Lutron PN 369405.
- Faceplate is hinged at the top and bottom, and stays open at 180° for ease of access.

Environment

- 0 to 40 °C (32 to 104 °F).
- Relative humidity less than 90% non-condensing.

Compliance

- CE

Scene and Shade Buttons

- Large, rounded buttons are easy to use.
- Backlit buttons with optional engraving make it easy to find and to operate the control unit in low light conditions (backlight can be disabled).
- Optional button engraving is angled up to the eye for easy reading.
- Predefined label stickers are included for field labeling.
- 4 preset lighting scenes, plus Off, are accessible from the front of the control unit.
- 12 additional scenes are stored in the control unit and are accessible from seeTouch® QS wallstations and QS interfaces.
- Light levels fade smoothly between scenes. Fade time can be set differently for each scene: 0 to 59 seconds, or 1 to 60 minutes. Maximum fade time from Off is 3 seconds.

Shade Control

- The GRAFIK Eye® QS can include up to 3 shade button columns. Each column has backlit open, preset, close, and raise/lower buttons.
- Each shade button column can be programmed to operate one shade or a group of shades. (Shades may be assigned to more than one shade button column).
- Faceplates are available with 1, 2 and 3 shade button columns.

Wireless shade limitations:

- Access to the Sivoia® QS Wireless electronic drive unit (EDU) is required to associate shades with the GRAFIK Eye® QS and set their raise/lower limits.
- Wired and wireless shades may not be programmed into the same shade button column; however, both may be used on the same GRAFIK Eye® QS control unit.
- Scene commands that affect wireless shades across multiple shade button columns will have a 1-second delay from column to column.

Zone Control

- Each zone has a dedicated raise and lower button to adjust the zone.
- Each zone has a dedicated 7 LED bar graph for level status. Percentage of light level and energy saved is displayed on the info screen.
- All zone information has blue backlit LEDs. Backlight turns off when idle for 30 seconds.

Info Screen

- OLED (organic LED) screen is viewable from all angles.
- Screen turns off when idle for 30 seconds.
- Programmable zone labels.
- Programmable scene labels.
- Status of real-time zone percentage and energy savings.
- Programmable timeclock schedules.
- Programmable shade labels.

Job Name:	Model Numbers:	
Job Number:		

Specifications

Astronomic Timeclock

- Integral to all units.
- 7 daily schedules available.
- One available holiday schedule is programmable by date up to one year in advance.
- 25 events per day maximum.
- Timeclock events are programmable to control scenes that affect any Energi Savr Node™ unit connected on the QS link without changing the local scene on the GRAFIK Eye® QS.
- Astronomic times are programmable by integral city database or by entering latitude and longitude. Times automatically adjust throughout the year based on location.
- Automatically adjusts for Daylight Saving Time (DST), adjusted for the new dates; DST is programmable.
- Local timeclock events can activate any of the following features:
  - Scenes 1 to 16 and Off
  - Any available window treatment presets
  - Start and End afterhours mode
  - Enable and Disable daylighting for all zones/groups
  - Enable and Disable occupancy for occupancy/vacancy sensors
  - Enable and Disable occupied events for all occupancy sensors

System Communications and Capacities

- Low-voltage type IEC PELV/NEC® Class 2 wiring connects control units, wallstations, motorised shades, and control interfaces.
- A QS system can have up to 100 devices and 100 zones.
- A QS system can have up to 30 wireless devices.
- Class 1/Class 2 wiring connects DALI-compliant output devices to control unit.

Infrared

- Infrared (IR) receiver allows infrared transmitters to select 8 scenes, raise/lower lighting zones, or raise/lower shades.
- Transmitter buttons imitate buttons on faceplate.
- 15 m (50 ft) line of sight range.
- Terminal block infrared input for direct contact with external IR connection.
- IR can be disabled via programming.
- Works with Lutron GRX-IT and GRX-8IT infrared remote controllers.

Accessory Controls: seeTouch® QS Wallstations (QSWS2)

- Wired seeTouch® QS keypads provide the following features:
  - Access to one or more of the 16 scenes on the GRAFIK Eye® QS Wireless
  - Zone toggle, partitioning, sequencing, fine tune, panic mode, and timeclock enable/disable
  - Contact closure inputs
  - Various other functions that are available on specific wallstation configurations. Refer to the seeTouch® specification submittal.

Wireless RF Compatibility

- Features Lutron's proprietary Clear Connect™ RF Technology
- Operates in the limited 868 MHz band
- Compatible with other Lutron wireless products/systems, such as:
  - Pico® (P/N QSRMP-)
  - Radio Powr Savr™ occupancy/vacancy/daylight sensors (P/N LRF4-)
  - Sivoia® QS wireless products
  - Other GRAFIK Eye® QS wireless units (P/N QSGRM-)

Accessory Controls: Pico® Wireless Control (P/N QSRMP-)

- The Pico® Wireless Control is battery powered. It can control GRAFIK Eye® QS wireless control units within a 10 m (30 ft) range (20 m/60 ft in open air). It provides the following features:
  - Control of one or more zones on the GRAFIK Eye® QS Wireless: turns zone(s) on or off, raises/lowers zone(s), and goes to user-defined preset level
  - Scene control: the Pico® can access scene 1, scene 16, and Off on the GRAFIK Eye® QS, and can raise and lower lighting levels

Job Name:	Model Numbers:	
Job Number:		

Specifications

Accessory Controls: QS Sensor Module (QSM4)

- The QS Sensor Module provides a means to link wired or wireless occupancy and daylight sensors to a GRAFIK Eye® QS via the wired QS link.
  - Occupancy sensors wired (or wirelessly linked) to a QS Sensor Module can be used by one or more GRAFIK Eye® QS control units on the wired link.
  - Daylight sensors wired (or wirelessly linked) to a QS Sensor Module can be used by one or more GRAFIK Eye® QS control units on the wired link.
  - *Pico* wireless controls can control either one or more zones or scenes on the GRAFIK Eye® QS.
  - Infrared sensors can control either one or more zones or scenes on the GRAFIK Eye® QS. Functionality varies; refer to the documentation for the QS Sensor Module for details.

Accessory Controls: Contact Closure Input/Output Interface (QSE-IO)

- Recalls preset light levels for the following set of scenes on the GRAFIK Eye® QS:
  Scenes 1-4 and Off Scenes 9-12 and Off
  Scenes 5-8 and Off Scenes 13-16 and Off
- Sequence scenes 5-16, Enable/Disable Zone Lockout, Enable/Disable Scene Lockout, Enable/Disable Panic Mode, Enable/Disable Timeclock.
- Occupancy Sensors. An individual input counts as 1 occupancy sensor for the GRAFIK Eye® QS. Each input can be assigned to either Scene Control or Zone Control (please refer to the Occupancy Sensor(s) section of this guide).
- Zone Toggle. Allows an input to toggle one or more zones to a preset level and off.
- Shade Output mode. A Shade Column on the GRAFIK Eye® QS can be linked to control outputs 1-3 and/or outputs 4-5 on the QSE-IO.

Accessory Controls: DMX Output Interface (QSE-CI-DMX)

- Any zone on the GRAFIK Eye® QS control unit can be mapped to any single DMX512 Channel.
- Any zone on the GRAFIK Eye® QS control unit can be simultaneously mapped to any three DMX512 channels (providing RGB/CMY control).
- DMX loads cannot be used with daylighting.

Accessory Controls: Ethernet and RS232 Interface (QSE-CI-NWK-E)

- Allows for monitoring and control of the outputs and local scenes of the GRAFIK Eye® QS.

Accessory Controls: QS Keyswitch Wallstations (QSWS2-KS)

- Recalls preset light levels for any two scenes including Off
- Allows fine-tuning (raise/lower level) of a zone or group of zones
- Starts/Stops scene sequencing (Scenes 1-4 or Scenes 5-16)
- Enables/Disables Timeclock
- Enables/Disables occupancy sensors
- Enables/Disabled daylight sensors
- Allows toggle of Zone(s) to a preset level and off
- Enables/Disables panic mode
- Starts/Stops afterhours mode

Other Accessory Controls and Devices

- Energi Savr Node® QS (ESN)

Occupancy Sensor(s)

- The GRAFIK Eye® QS works with occupancy sensors through either:
  - Scene Control: Up to four sensors activate user-selectable occupancy and vacancy scenes.
  - Zone Control: up to four sensors per zone activate user-selected occupancy and vacancy zone levels.
- Occupancy sensors may include:
  - Contact closure sensor wired to CCI input on back of GRAFIK Eye® QS
  - Wireless Radio Powr Savr™ occupancy or vacancy sensors (model numbers starting with LRF4)
  - Wired or wireless sensors connected QS Sensor Module (QSM)
- If any sensor in a group detects occupancy, then the GRAFIK Eye® QS will go to the designated occupancy scene or zone level.
- If all sensors in a group detect vacancy, then the GRAFIK Eye® QS will go to the designated vacancy scene or zone level.

Job Name:	Model Numbers:	
Job Number:		

Specifications

Daylight Sensor(s)

- The GRAFIK Eye® QS with DALI works with compatible daylight sensors to adjust electric light levels based on measured daylight levels. Sensors can be configured to control either GRAFIK Eye® QS zones or groups of DALI loads independent of zoning.
- Daylight sensors may include:
  - Wireless Radio Powr Savr™ (model numbers starting with LRF4)
  - Wired or wireless sensors connected to a QS sensor module (QSM4)
- In Zone Mode, a daylight sensor can control one or more GRAFIK Eye® QS zones. Each zone can be calibrated to target light levels.
  - A zone can be controlled by no more than one daylight sensor
- In Group Mode, a daylight sensor can control one or more DALI loads, regardless of how they are zoned on the GRAFIK Eye® QS.
  - A group can be controlled by a single daylight sensor
  - Each group can be calibrated to independent target light levels
  - Up to 16 groups are available
- Daylight control can be enabled or disabled on a scene-by-scene basis
  - By default, daylight control is enabled in all scenes

Note: Daylight control through the GRAFIK Eye® QS only affects lighting loads. Shade groups cannot be controlled by daylight sensors. Daylighting does not affect DMX or RGB/CMY DMX loads.

Security Lockout Password

- A 4-digit password (using characters A to Z and 0 to 9) can be enabled/disabled to lock out access to the Programming Menu.
- By default there is no password enabled on the GRAFIK Eye® QS.
- If case the 4-digit password is forgotten, contact Lutron Technical Support to regain access.

Contact Closure Input (CCI) with Power Supply Output

- Each GRAFIK Eye® QS has one contact closure input (Terminal A).
  - The attached device must provide a dry contact closure or solid-state output.
  - Input is miswire-protected up to 36 V⎓.
- The contact closure is capable of accepting the following types of inputs:
  - Maintained (default): The GRAFIK Eye® QS control unit will act on both a contact closure and a contact open/release event.
  - Momentary: The GRAFIK Eye® QS control unit will act on only contact closure events.
- Each GRAFIK Eye® QS can supply 50 mA maximum at 24 V⎓.
  - Useful for powering occupancy sensors.
  - An auxiliary power supply must be used if the device requires more than 50 mA.
- The CCI is capable of operating in the following modes
  - Occupancy: If an occupancy sensor is wired directly to the GRAFIK Eye® QS, choose this setting so that the occupancy sensor will work correctly.
  - Emergency: This setting allows the GRAFIK Eye® QS to work with a LUT-ELI. When an emergency situation is detected, all lights will go to full on, and no operations will be allowed until the emergency signal is cleared.
  - Afterhours: Allows the CCI to start and end the afterhours mode.
  - Timeclock: Allows the CCI to enable and disable the timeclock.
  - Scene Lockout: Prevents the user from making any changes to the control unit. The current scene will stay on until the CCI enables normal operation.
  - Never Save: Prevents any changes from being saved while the CCI is being used.
  - Disable CCI: The CCI will have no effect on the system and will not appear on the list of available sensors.

Unit Dissipation

- All models of GRAFIK Eye® QS Wireless for Digital Addressable Loads dissipate no more than 35 BTUs/hour.

System Limits

- The QS wired communication link is limited to 100 devices (wired or wireless) or 100 zones.
- The QS wireless communication link supports up to 30 wireless devices.

Job Name:	Model Numbers:	
Job Number:		

GRAFIK Eye® QS Wireless for Digital Addressable Loads
Custom Colour Options and Model Numbers
You must order a Base Unit and a Faceplate Kit
See Standard Colour Combinations page for faceplate, stripe, and button colours

Base Unit

QSGRM - _ D

- QSGRM — Prefix
- _ — Number of Zones
  - 6 = 6 zones
  - 8 = 8 zones
  - 16 = 16 zones
- D — Digital Addressable Loads

Example:

QSGRM-6D
6-zone base unit
and
QSGFP-2IV-SGN
Ivory faceplate kit with two shade columns and symbol-based engraving

Faceplate Kit
(includes coordinating stripe and buttons; see Standard Colour Combinations page)

QSGFP - - -

- QSGFP — Faceplate Prefix
- Number of Shade Columns
  - Omit = none
  - 1 = 1 column
  - 2 = 2 columns
  - 3 = 3 columns
- Top Door Colour
  - Omit = same as unit
  - T = Translucent
- Colour/Finish
- Keypad Engraving Code

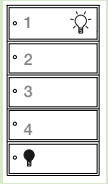
Faceplate Custom Colour/Finish Codes

Architectural Matte Finishes		Architectural Metal Finishes		Satin Colour Matte Finishes	
White	WH	Bright Brass	BB	Snow	SW
Ivory	IV	Bright Chrome	BC	Biscuit	BI
Beige	BE	Bright Nickel	BN	Eggshell	ES
Gray	GR	Satin Brass	SB	Taupe	TP
Brown	BR	Satin Chrome	SC	Midnight	MN
Black	BL	Satin Nickel	SN	Limestone	LS
Almond	AL	Antique Brass	QB	Stone	ST
Light Almond	LA	Antique Bronze	QZ	Desert Stone	DS
				Terracotta	TC
		Anodised Aluminum Finishes		Hot	HT
		Clear	CLA	Goldstone	GS
		Black	BLA	Palladium	PD
		Brass	BRA	Plum	PL
				Turquoise	TQ
				Bluestone	BG
				Sea Glass	SG
				Greenbriar	GB
				Sienna	SI
				Merlot	MR
				Mocha Stone	MS

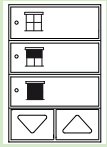
Keypad Engraving Codes

Omit = Unengraved
Ships with engraving certificate that customer can redeem at no charge

SGN = International (symbol-based) Engraving



Lighting keypad


Shade column

NST = Non-Standard Text Engraving
Please visit the GRAFIK Eye® QS website at **www.lutron.com/grafikeyeqs** for custom engraving forms. Submit completed form with order, and unit will ship engraved as specified by customer.

Job Name:	Model Numbers:	
Job Number:		

GRAFIK Eye® QS Wireless for Digital Addressable Loads
Custom Options and Model Numbers
See previous pages for Standard and Other Custom Model Numbers
See Standard Colour Combinations page for faceplate, stripe, and button colours

Custom Button Kit

QSGB - 5B - WH -

- QSGB: Custom Button Kit Prefix
- 5B: Button Configuration
- WH: Button Colour/Finish
- Keypad Engraving Code

3BRL = 3-button with raise/lower (shade column)
5B = 5-button (lighting keypad)

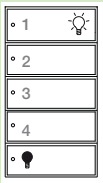
Button Kit Custom Colour/Finish Codes

Architectural Matte Finishes		Satin Colour Matte Finishes	
White	WH	Snow	SW
Ivory	IV	Biscuit	BI
Beige	BE	Eggshell	ES
Gray	GR	Taupe	TP
Brown	BR		
Black	BL		
Almond	AL		
Light Almond	LA		

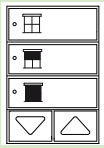
Keypad Engraving Codes

Omit = Unengraved
Ships with engraving certificate that customer can redeem at no charge

SGN = Symbol-based Engraving



Lighting keypad


Shade column

NST = Non-Standard Text Engraving
Please visit the GRAFIK Eye® QS website at **www.lutron.com/grafikeyeqs** for custom engraving forms. Submit completed form with order, and unit will ship engraved as specified by customer.

Custom Stripe Kit

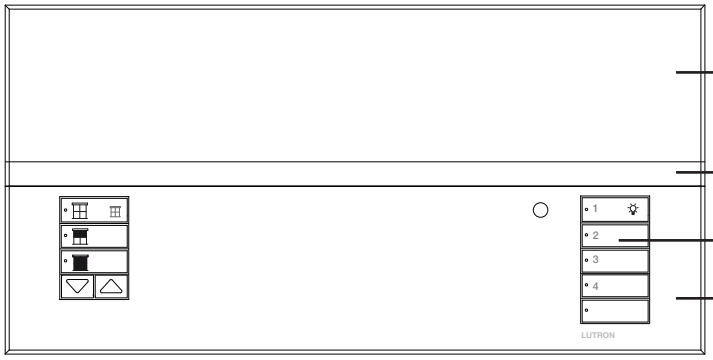
QSGS - ____

- QSGS: Stripe Kit Prefix
- ____: Stripe Colour/Finish

Stripe Custom Colour/Finish Codes
Same as Faceplate colours on previous page

Job Name:	Model Numbers:	
Job Number:		

GRAFIK Eye® QS Wireless for Digital Addressable Loads
Standard Colour Combinations
See previous pages for Standard and Custom Model Numbers



Faceplate is comprised of a top and bottom. The bottom will always be the colour indicated under “faceplate.” The top may be the same colour or translucent. Use the chart for faceplates that have the same colour top and bottom. If a translucent lid is chosen, the stripe will automatically be the same colour as the bottom lid.

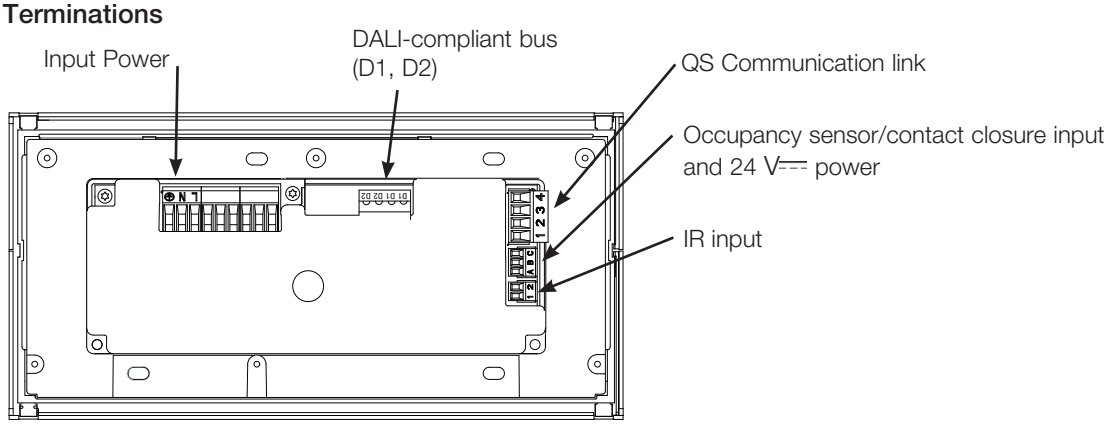
Suffix	Faceplate (F)	Stripe (S)	Button (B)
Architectural Matte			
WH	White	Gray	White
IV	Ivory	Beige	Ivory
BE	Beige	Ivory	Beige
GR	Gray	Black	Gray
BR	Brown	Black	Brown
BL	Black	Gray	Black
AL	Almond	Light Almond	Almond
LA	Light Almond	Almond	Light Almond
Architectural Metal			
BB	Bright Brass	Black	Black
BC	Bright Chrome	Black	Black
BN	Bright Nickel	Black	Black
SB	Satin Brass	Black	Black
SC	Satin Chrome	Black	Black
SN	Satin Nickel	Black	Black
QB	Antique Brass	Black	Black
QZ	Antique Bronze	Black	Black
Anodised			
CLA	Clear	Black	Black
BLA	Black	Black	Black
BRA	Brass	Black	Black

Suffix	Faceplate (F)	Stripe (S)	Button (B)
Satin Matte			
MN	Midnight	Gray	Black
TP	Taupe	Gray	Taupe
SW	Snow	Gray	Snow
ES	Eggshell	Beige	Eggshell
BI	Biscuit	Eggshell	Biscuit
LS	Limestone	Gray	Gray
ST	Stone	Gray	Gray
DS	Desert Stone	Taupe	Taupe
TC	Terracotta	Taupe	Taupe
BG	Bluestone	Gray	Gray
HT	Hot	Taupe	Taupe
MR	Merlot	Taupe	Taupe
SI	Sienna	Brown	Brown
GB	Greenbriar	Gray	Gray
SG	Sea Glass	Gray	Gray
MS	Mocha Stone	Taupe	Taupe
GS	Goldstone	Ivory	Ivory
PD	Palladium	Gray	Gray
PL	Plum	Taupe	Taupe
TQ	Turquoise	Gray	Gray

Job Name:	Model Numbers:	
Job Number:		

Overview

Terminations



Wire Gauge	Maximum DALI-compliant Bus Wire Length
4.0 mm² (12 AWG)	671 m (2 200 ft)
2.5 mm² (14 AWG)	427 m (1 400 ft)
1.5 mm² (16 AWG)	275 m (900 ft)
1.0 mm² (18 AWG)	175 m (570 ft)

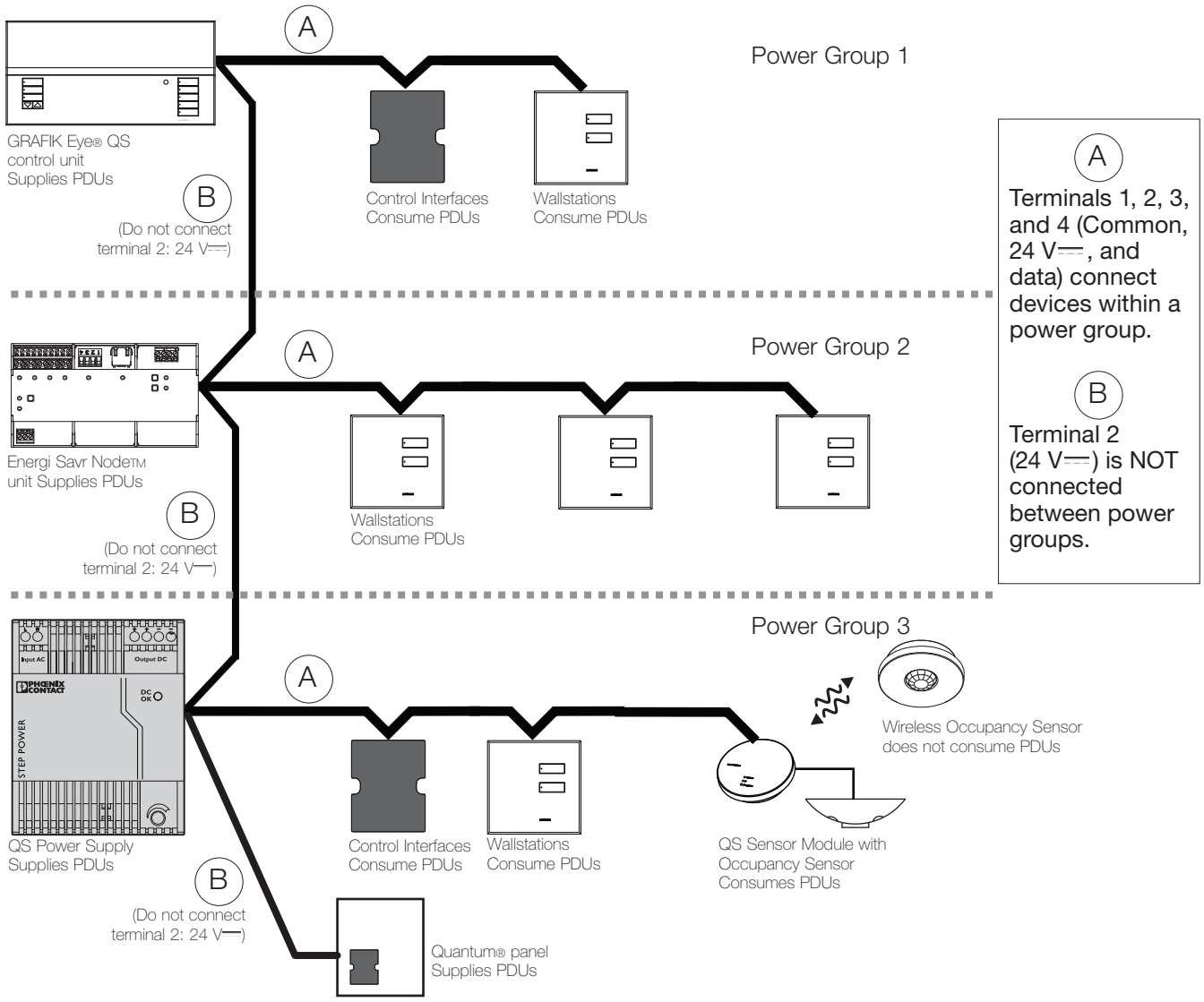
Job Name:	Model Numbers:	
Job Number:		

Power Group Wiring Example

On the QS link, there are devices that supply power and devices that consume power. Each device has a specific number of Power Draw Units (PDUs) it either supplies or consumes. A Power Group consists of one device that supplies power and one or more devices that consume power; each Power Group may have only one power-supplying device. Refer to the QS Link Power Draw Units specification submittal (Lutron PN 369405) for more information concerning PDUs.

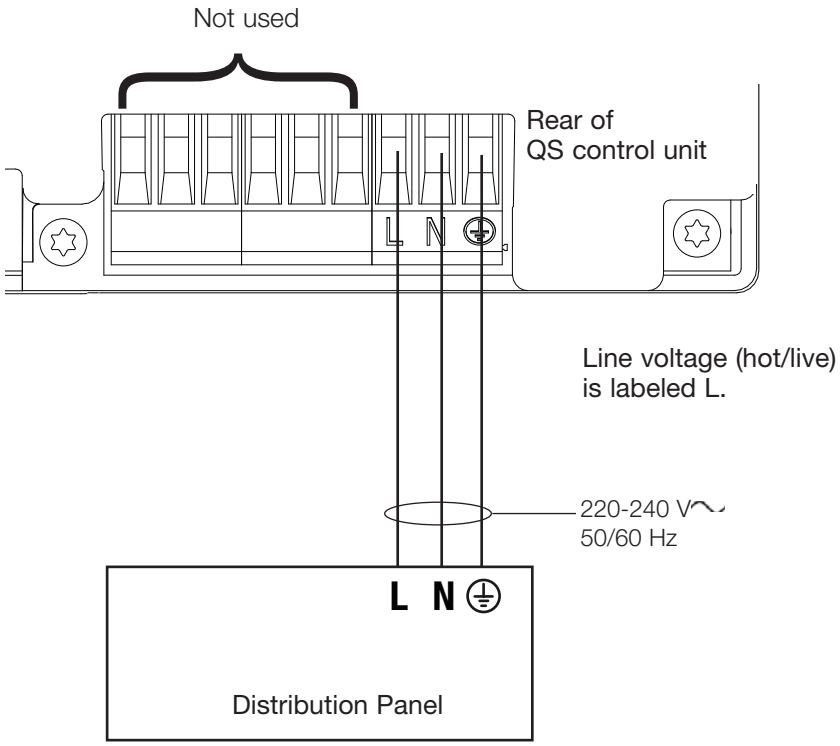
Within Power Groups on the QS link, connect all 4 terminals (1, 2, 3, and 4), shown by the letter A in the diagram. Between devices on the QS link that supply power, connect only terminals 1, 3, and 4 (NOT terminal 2), shown by the letter B on the diagram. Refer to the specific device documentation for wiring details.

Wiring can be T-tapped or daisy-chained.



Job Name:	Model Numbers:	
Job Number:		

Line Voltage Wiring

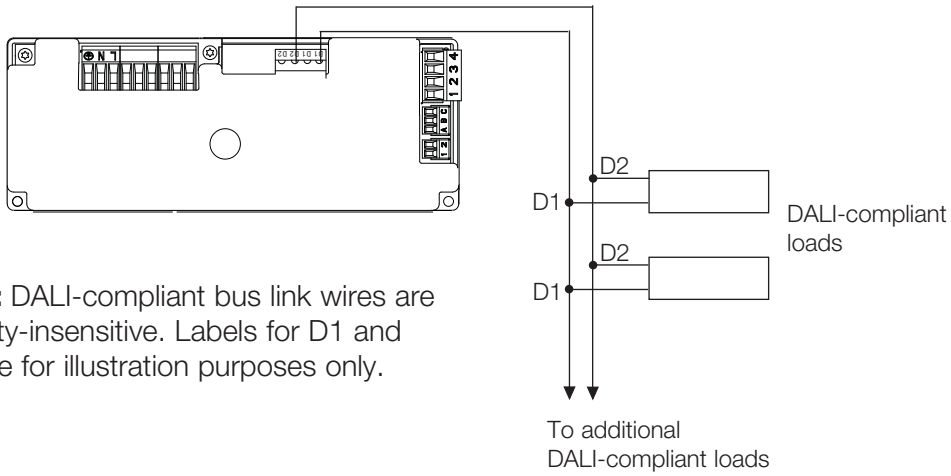


- Pull power wiring from distribution panel and to light fixtures.
- Each line voltage terminal can accept one 2.5 mm^2 (12 AWG) wire.
- Consult Lutron for non-dim relay wiring and/or load side emergency transfer wiring.

Job Name:	Model Numbers:	
Job Number:		

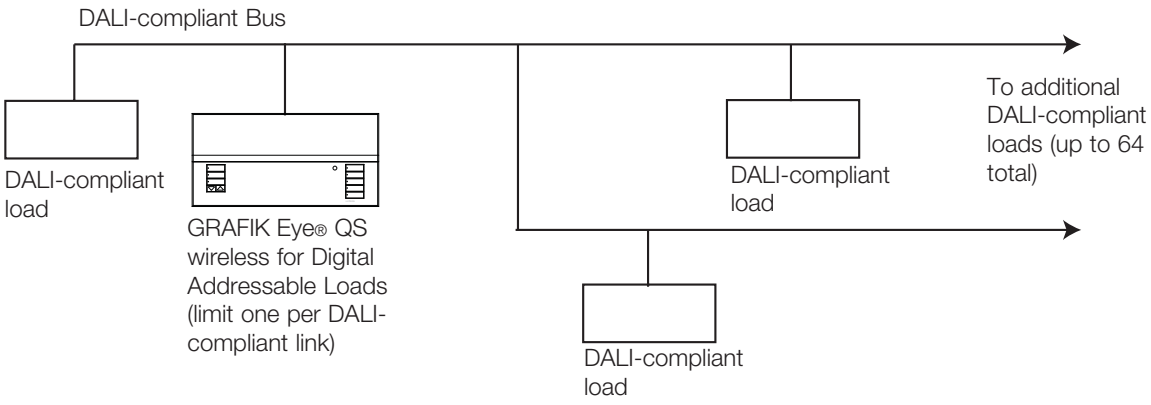
DALI-Compliant Bus Wiring

DALI-Compliant Bus Link Terminal Detail



Note: DALI-compliant bus link wires are polarity-insensitive. Labels for D1 and D2 are for illustration purposes only.

DALI-Compliant Bus Wiring Example

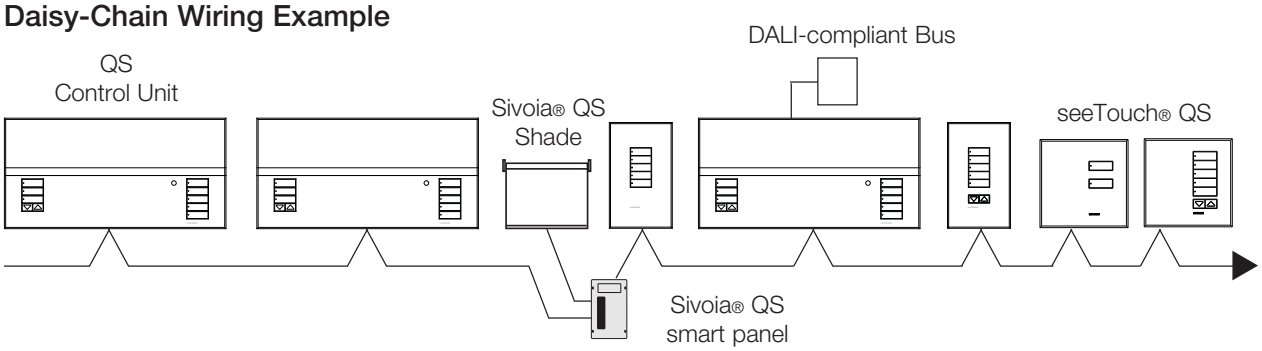


Job Name:	Model Numbers:	
Job Number:		

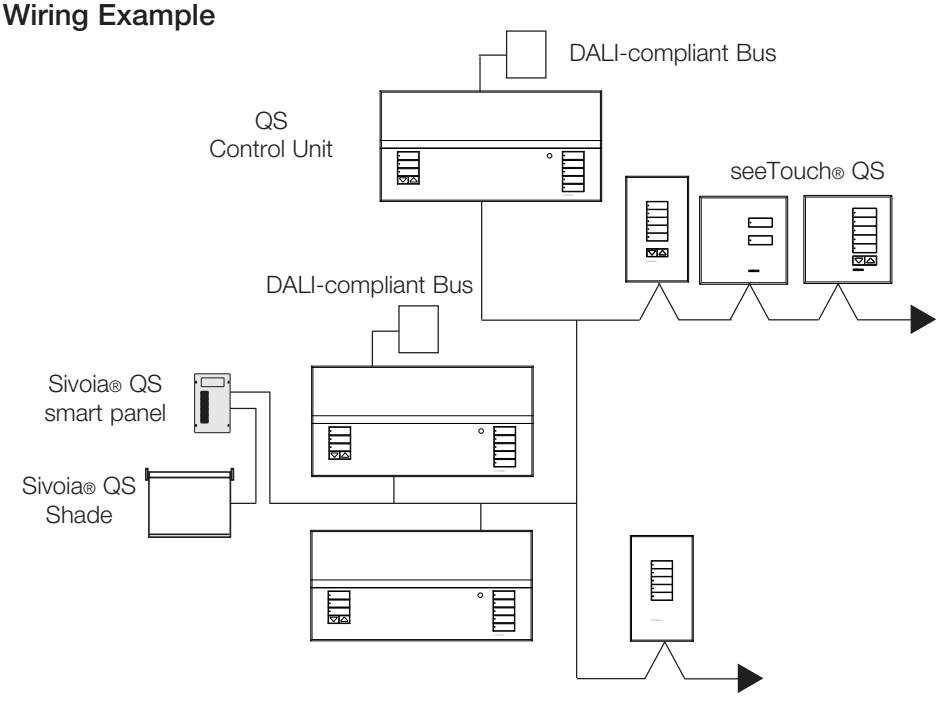
IEC PELV/NEC® Class 2 QS Link Wiring

- System communication uses low-voltage wiring.
- Wiring can be daisy-chained or T-tapped.
- Wiring must be run separately from line/mains voltage.
- IEC PELV/NEC® Class 2 wiring link requires:
  - Two 1.0 mm² (18 AWG) conductors for control power.
  - One twisted, shielded pair of 1.0 mm² (22 AWG) for data link.
  - Available from Lutron, P/N GRX-CBL-346S; check compatibility in your area.
- Total length of control link must not exceed 610 m (2 000 ft).

Daisy-Chain Wiring Example

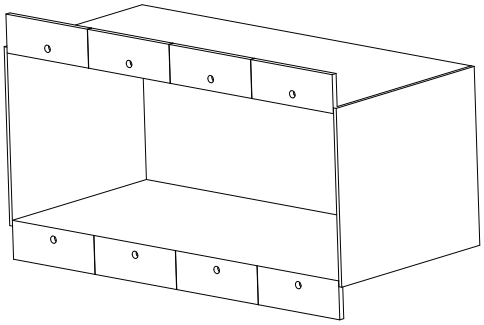


T-Tap Wiring Example

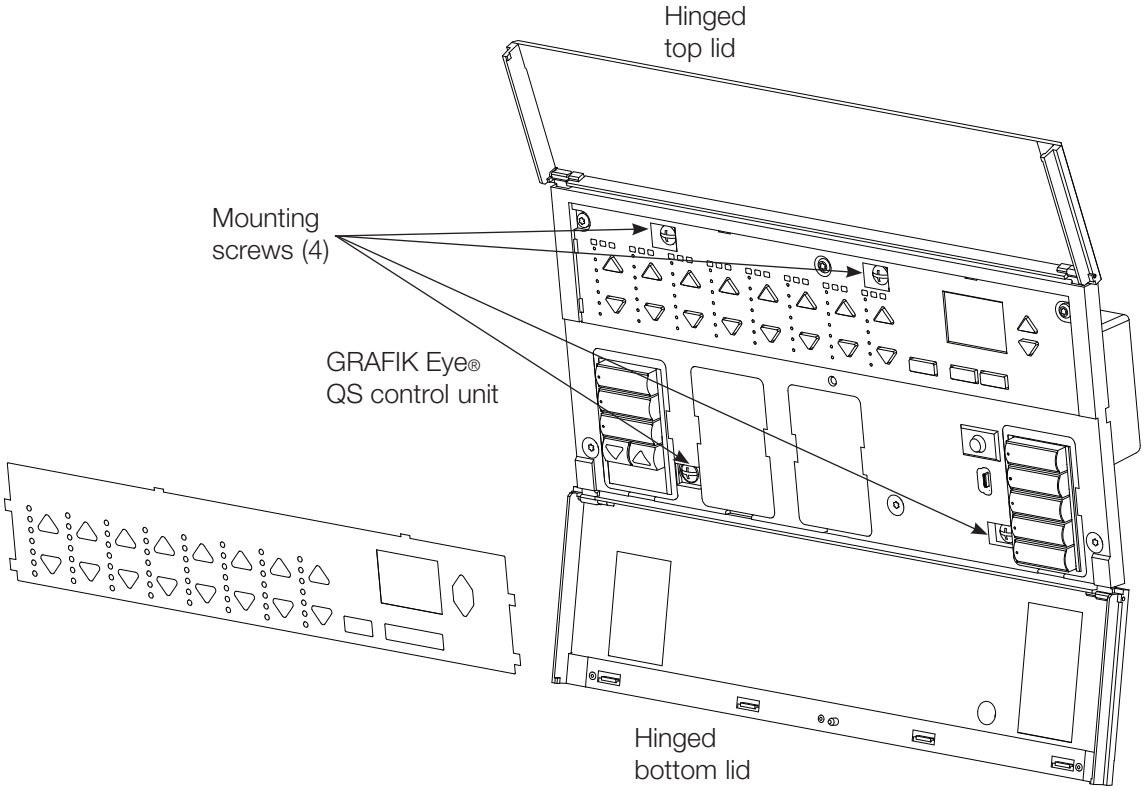


Job Name:	Model Numbers:	
Job Number:		

Mounting



Standard 4-gang
U.S. wallbox,
89 mm (3.5 in) deep
(available from
Lutron, P/N 241-400)



Job Name:	Model Numbers:	
Job Number:		

Lutron Approved DALI Ballasts

The Lutron policy requires that all DALI ballasts connected to Lutron DALI controllers be tested to meet the DALI specification called out in the IEC Standard 60929. We have found that although many DALI device manufacturers claim to make devices that meet the DALI standard, the devices fail when tested against a standard DALI qualification tester.

As a service to our customers, we have pre-qualified ballasts from reputed vendors. To lower installation and commissioning costs, we strongly encourage our customers to use devices from the approved list. Please check for updates to this list at www.lutron.com.

If it is not possible to find an approved device that meets your job needs, please contact your Lutron salesperson, applications engineer or construction manager. We might be able to recommend an alternative. If not we might, at our discretion, charge a fee to test the ballast of your choice for compliance to the DALI standard.

If you need to send a DALI device to us for testing, please contact your Lutron salesperson, applications engineer or construction manager for a quote.

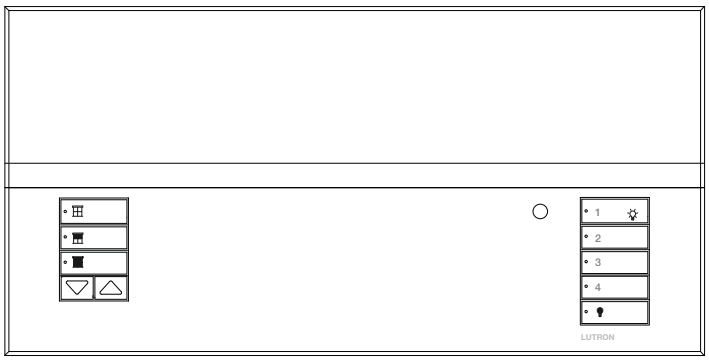
Our goal is to create a hassle free commissioning process for our customers.

Manufacturer	Model Number	Date Tested	# of Lamps	Wattage	Lamp Type
Phillips	HF-R TD 14-35 TL5 EII	March 11th 2010	1	14-35 W	TL5
Phillips	HF-R TD 240 PL-L EII	March 11th 2010	2	40 W	PL-L
Phillips	HF-R TD 318 TLD EII	March 11th 2010	3	18 W	TL-D
Osram	QTI DALI 2x28/54 DIM	March 11th 2010	2	28,54 W	T5
Osram	QTI DALI 1x14/24 DIM	March 11th 2010	1	14,24 W	T5
Osram	QTI DALI 1x28/54 DIM	March 11th 2010	1	28,54 W	T5
Osram	QTi DALI 4X14/24 DIM	March 11th 2010	4	14,24 W	T5
Osram	QTi DALI 2X35/49/80 DIM:	March 11th 2010	2	35?9,80 W	T5
Osram	QTi DALI 2X14/24 DIM	March 11th 2010	2	14,24 W	T5
Osram	QTi DALI 3X14/24 DIM	March 11th 2010	3	14,24 W	T5
Osram	QTi DALI-T/E 1X18-57 DIM	March 11th 2010	1	18,57 W	T8
Osram	QTi DALI 4X18 DIM:	March 11th 2010	4	18 W	T8
Osram	QTi DALI 1x35/49/80 DIM	March 11th 2010	1	35,49,80 W	T5
Osram	QTI DALI-T/E 2X 18/42	March 11th 2010	2	18,42 W	T8
TRIDONIC.ATCO	PCA 1/14 T5 EXCEL one4all LP	March 11th 2010	1	14 W	T5
TRIDONIC.ATCO	PCA 1/28 T5 EXCEL one4all LP	March 11th 2010	1	28 W	T5
TRIDONIC.ATCO	DALI-PCD 300 one4all	March 11th 2010	1	30-300 VA	INC LV HAL
TRIDONIC.ATCO	PCA 2/26 TCD EXCEL one4all	March 11th 2010	2	26 W	TC-TEL
TRIDONIC.ATCO	PCA 1/40 T5c EXCEL one4all	March 11th 2010	1	40 W	T5C
TRIDONIC.ATCO	PCA 2/40 TCL EXCEL one4all	March 11th 2010	2	40 W	TC-L
TRIDONIC.ATCO	PCA 2/35 T5 EXCEL one4all LP	March 11th 2010	2	35 W	T5
TRIDONIC.ATCO	PCA 4/14 T5 EXCEL one4all	March 11th 2010	4	14 W	T5
TRIDONIC.ATCO	TE-DC2 0300 D101 one4all	March 11th 2010		300 VA	ELV
TRIDONIC.ATCO	TE-0150 one4all sc	March 11th 2010		150 VA	ELV
TRIDONIC.ATCO	TE-0105 one4all sc	March 11th 2010	1	20-105 W	INC LV HAL
Helvar	EL2X28si	March 11th 2010	2	28 W	T5
Sylvania	QTP 1x14 T5/UNV Dali	March 11th 2010	1	14 W	T5

Job Name:	Model Numbers:	
Job Number:		

369317 Rev. A 1 03.07.11

GRAFIK Eye® QS Wireless Control Unit (230 V~ CE Limited)



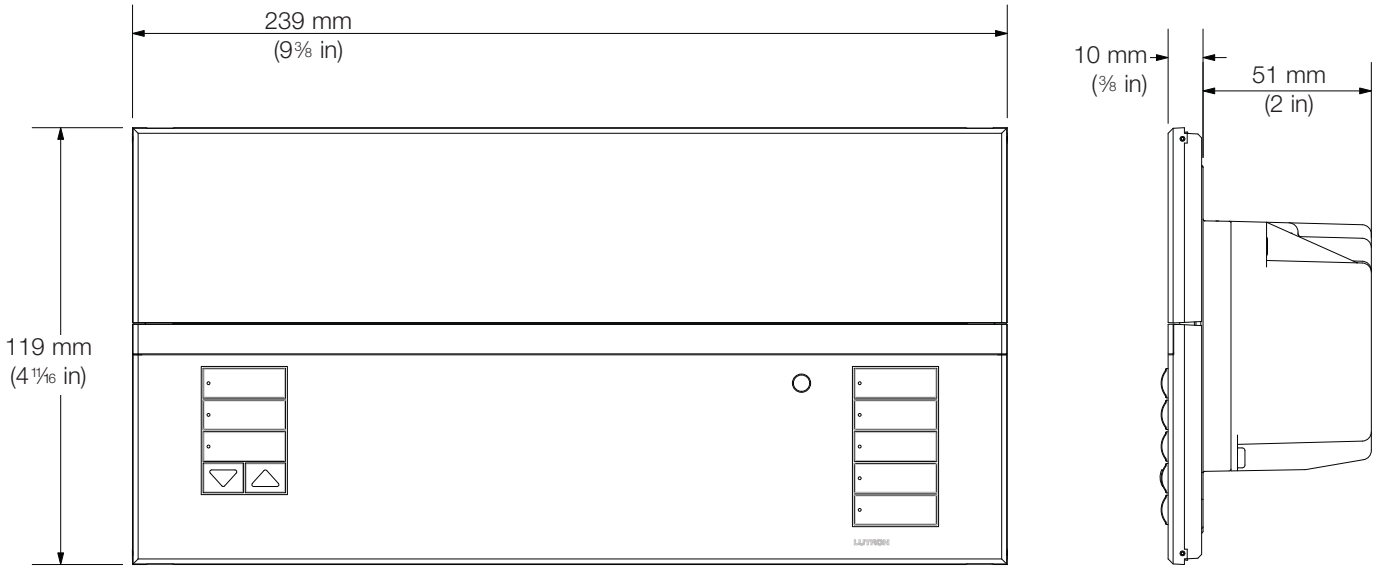
Description

GRAFIK Eye QS Wireless is the premier energy-saving light and window treatment control. *GRAFIK Eye* QS includes an astronomic timeclock, intuitive lighting presets, and direct window treatment control. Now with wireless technology, you can use the *GRAFIK Eye* QS Wireless to seamlessly integrate with a variety of Lutron wireless products and systems, including Radio Powr Savr™ occupancy, vacancy, and daylight sensors, Sivoia® QS Wireless window treatments, Pico® wireless control, and other *GRAFIK Eye* wireless products. Additionally, the *GRAFIK Eye* QS Wireless is compatible with all Lutron wired QS products and systems.

GRAFIK Eye QS Wireless is compatible with Quantum®.

Mechanical Dimensions

Fits into a 4-gang U.S. backbox, 89 mm (3.5 in) deep;
Lutron P/N 241-400



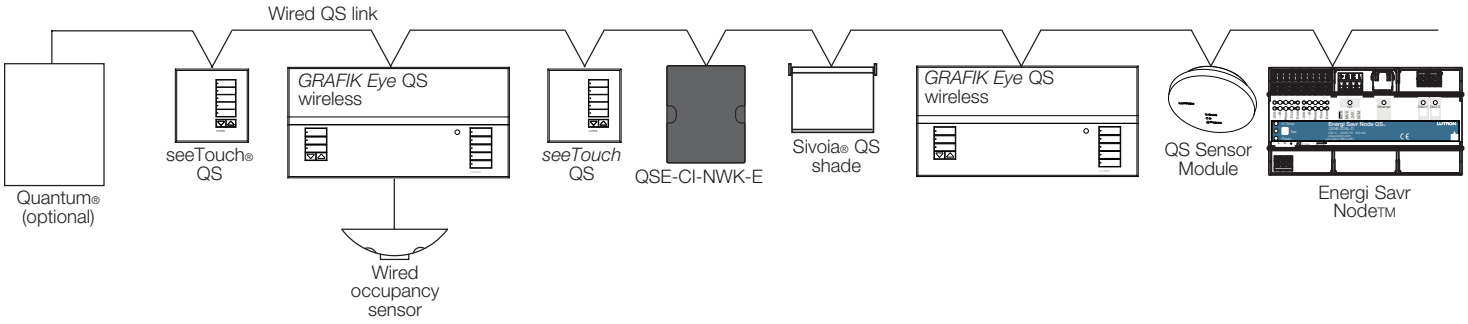
Front View | Side View

Job Name:	Model Numbers:	
Job Number:		

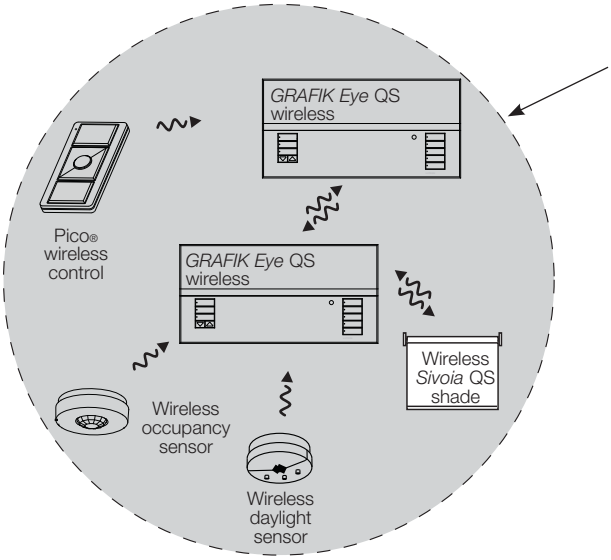
System Topologies

The GRAFIK Eye® QS Wireless can be specified in three different system topologies. Examples of each are shown below.

Example of Wired System

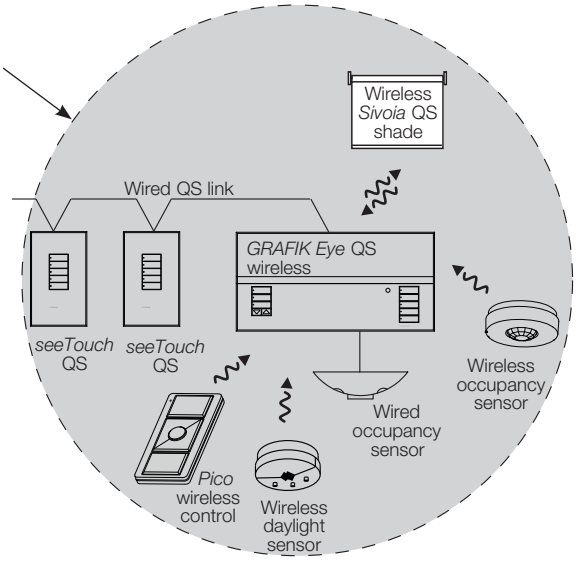


Example of *GRAFIK Eye*-centric Wireless System



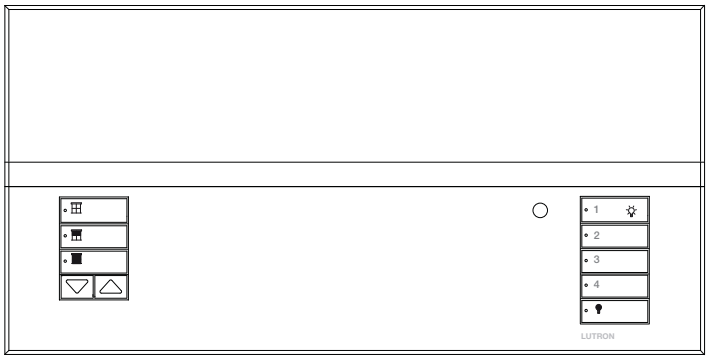
10 m (30 ft) wireless range; 20 m (60 ft) in open air

Example of Mixed *GRAFIK Eye*-centric Wired/Wireless System

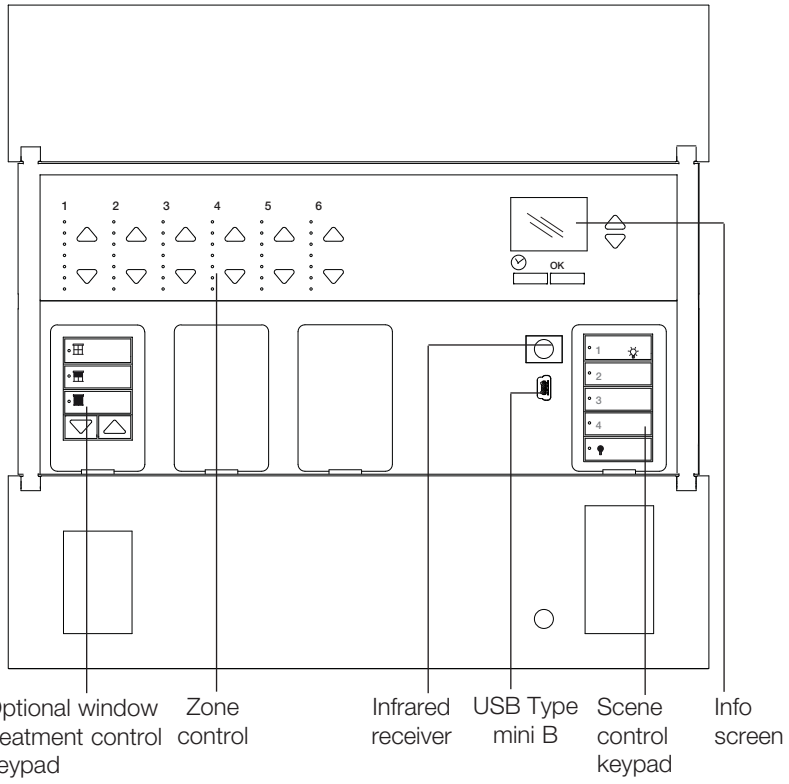


Job Name:	Model Numbers:	
Job Number:		

369317 Rev. A 3 03.07.11



Note: Symbol-based Engraving (-SGN) shown.



Features

- Lutron's proprietary Clear Connect™ RF technology. Operates in limited 868 MHz band.
- Pushbutton recall of four preset lighting scenes, plus Off.
- Twelve (12) additional scenes accessible through other QS devices, such as seeTouch® QS wallstations.
- Optional integrated window treatment control buttons, which can also be added to the unit after installation.
- Master override buttons to raise and lower all lights.
- Allows setup of lighting scenes and window treatment presets using buttons on the control unit.
- Built-in infrared (IR) receiver.
- External IR connection.
- Built-in astronomic timeclock.
- Info screen shows zone light level percentage, energy savings, zone labeling, and programming.
- Lockout option prevents accidental changes.
- One occupancy sensor input and 24 V⎓ power for occupancy sensor.
- QS communication link for seamless integration of lights, motorised window treatments, wallstations, and integration interfaces.
- Compatible with all Lutron QS system components.
- Wireless communication for seamless integration with a variety of Lutron wireless products and systems, including Radio PowrSavr™ occupancy and vacancy sensors, Sivoia® QS wireless window treatments, Pico® wireless control, and other GRAFIK Eye® QS wireless products.
- Backlit buttons with engraving make unit easy to locate and operate.
- Available in a variety of colours and finishes.

Job Name:	Model Numbers:	
Job Number:		

Specifications

Input Power

- 230 V~ 50 Hz

Lighting Sources/Load Types

Controls the following lighting sources with a smooth, continuous square law dimming curve or on a full conduction non-dim basis:

- Incandescent
- Halogen
- Magnetic low-voltage transformer
- Neon and cold cathode
- Non-dim (incandescent, magnetic low-voltage, or neon/cold cathode)

Controls the following lighting sources with a smooth, continuous square law dimming curve or on a full conduction non-dim basis through separate power interfaces:

- Electronic low-voltage transformer
- Non-dim

Key Design Features

- RF meets IEC 801-2.
- Lightning strike protection meets ANSI/IEEE standard 62.41-1980. Can withstand voltage surges of up to 6 000 V~ and current surges of up to 3 000 A.
- Tested to withstand 16 kV electrostatic discharge without damage or memory loss.
- RTISS™-equipped: Compensates in real time for incoming line voltage variations (no visible flicker with +/-2% change in RMS voltage per cycle, and +/-2% Hz change in frequency per second).
- Power failure memory retains programming and light level settings for up to 10 years in the event of a power loss.
- The GRAFIK Eye® QS supplies 3 Power Draw Units (PDUs) on the QS link.
  For complete information, see “Power Draw Units on the QS Link,” Lutron PN 369405.
- Faceplate is hinged at the top and bottom, and stays open at 180° for ease of access.

Environment

- 0 to 40 °C (32 to 104 °F)
- Relative humidity less than 90% non-condensing

Compliance

- CE

Scene and Shade Buttons

- Large, rounded buttons are easy to use.
- Backlit buttons with optional engraving make it easy to find and to operate the control unit in low light conditions (backlight can be disabled).
- Optional button engraving is angled up to the eye for easy reading.
- Predefined label stickers are included for field labeling.
- 4 preset lighting scenes, plus Off, are accessible from the front of the control unit.
- 12 additional scenes are stored in the control unit and are accessible from seeTouch® QS wallstations and QS interfaces.
- Light levels fade smoothly between scenes. Fade time can be set differently for each scene: 0 to 59 seconds, or 1 to 60 minutes. Maximum fade time from Off is 3 seconds.

Shade Control

- The *GRAFIK Eye* QS can include up to 3 shade button columns. Each column has backlit open, preset, close, and raise/lower buttons.
- Each shade button column can be programmed to operate one shade or a group of shades. (Shades may be assigned to more than one shade button column).
- Faceplates are available with 1, 2 and 3 shade button columns.

  Wireless shade limitations:
- Access to the Sivoia® QS Wireless electronic drive unit (EDU) is required to associate shades with the *GRAFIK Eye* QS and set their raise/lower limits.
- Wired and wireless shades may not be programmed into the same shade button column; however, both may be used on the same *GRAFIK Eye* QS control unit.
- Scene commands that affect wireless shades across multiple shade button columns will have a 1-second delay from column to column.

Zone Control

- Each zone has a dedicated raise and lower button to adjust the zone.
- Each zone has a dedicated 7 LED bar graph for level status. Percentage of light level and energy saved is displayed on the info screen.
- All zone information has blue backlit LEDs. Backlight turns off when idle for 30 seconds.

Job Name:	Model Numbers:	
Job Number:		

Specifications

Info Screen

- OLED (organic LED) screen is viewable from all angles.
- Screen turns off when idle for 30 seconds.
- Programmable zone labels.
- Programmable scene labels.
- Status of real-time zone percentage and energy savings.
- Programmable timeclock schedules.
- Programmable window treatment labels.

Astronomic Timeclock

- Integral to all units.
- 7 daily schedules available.
- One available holiday schedule is programmable by date up to one year in advance.
- 25 events per day maximum.
- Timeclock events are programmable to control scenes that affect any Energi Savr Node™ unit connected on the QS link without changing the local scene on the GRAFIK Eye® QS.
- Astronomic times are programmable by integral city database or by entering latitude and longitude. Times automatically adjust throughout the year based on location.
- Automatically adjusts for Daylight Saving Time (DST), adjusted for the new dates; DST is programmable.
- Local timeclock events can activate any of the following features:
  - Scenes 1 to 16 and Off
  - Any available window treatment presets
  - Start and End afterhours mode
  - Enable and Disable daylighting for all zones/groups
  - Enable and Disable occupancy for occupancy/vacancy sensors
  - Enable and Disable occupied events for all occupancy sensors

System Communications and Capacities

- Low-voltage type IEC PELV/NEC® Class 2 wiring connects control units, wallstations, motorised window treatments, and control interfaces.
- A QS system can have up to 100 devices and 100 zones.
- A QS system can have up to 30 wireless devices.

Infrared

- Infrared (IR) receiver allows infrared transmitters to select 8 scenes, raise/lower lighting zones, or raise/lower window treatments.
- Transmitter buttons imitate buttons on faceplate.
- 15 m (50 ft) line of sight range.
- Terminal block infrared input for connection to a wired IR input from third-party equipment.
- IR can be disabled via programming.
- Works with Lutron GRX-IT and GRX-8IT infrared remote controls.

Accessory Controls and Devices

- Wired seeTouch® QS keypads can be added to the control link.
- Each *GRAFIK Eye* QS can power up to 3 wired *seeTouch* QS controls.

Wireless RF Compatibility

- Features Lutron's proprietary Clear Connect™ RF Technology
- Operates in the limited 868 MHz band
- Compatible with other Lutron wireless products/systems, such as:
  - Pico® Wireless Control (P/N QSRMP-)
  - Radio Powr Savr™ occupancy/vacancy/daylight sensors (P/N LRF4-)
  - Sivoia® QS wireless products
  - Other *GRAFIK Eye* QS wireless units (P/N QSGRM-)

Accessory Controls: QS Sensor Module (QSM4)

- The QS Sensor Module provides a means to link wired or wireless occupancy and daylight sensors to a *GRAFIK Eye* QS via the wired QS link.
  - Occupancy sensors wired (or wirelessly linked) to a QS Sensor Module can be used by one or more *GRAFIK Eye* QS control units on the wired link.
  - Daylight sensors wired (or wirelessly linked) to a QS Sensor Module can be used by one or more *GRAFIK Eye* QS control units on the wired link.
  - *Pico* wireless controls can control either one or more zones or scenes on the *GRAFIK Eye* QS.
  - Infrared sensors can control either one or more zones or scenes on the *GRAFIK Eye* QS. Functionality varies; refer to the documentation for the QS Sensor Module for details.

Job Name:	Model Numbers:	
Job Number:		

Specifications

Accessory Controls: Contact Closure Input/Output Interface (QSE-IO)

- Recalls preset light levels for the following set of scenes on the GRAFIK Eye® QS:
  Scenes 1-4 and Off Scenes 9-12 and Off
  Scenes 5-8 and Off Scenes 13-16 and Off
- Sequence scenes 5-16, Enable/Disable Zone Lockout, Enable/Disable Scene Lockout, Enable/Disable Panic Mode, Enable/Disable Timeclock.
- Occupancy Sensors. An individual input counts as 1 occupancy sensor for the *GRAFIK Eye* QS. Each input can be assigned to either Scene Control or Zone Control (please refer to the Occupancy Sensor(s) section of this guide).
- Zone Toggle. Allows an input to toggle one or more zones to a preset level and off.
- Shade Output mode. A Shade Column on the *GRAFIK Eye* QS can be linked to control outputs 1-3 and/or outputs 4-5 on the QSE-IO.

Accessory Controls: DMX Output Interface (QSE-CI-DMX)

- Any zone on the *GRAFIK Eye* QS control unit can be mapped to any single DMX512 Channel.
- Any zone on the *GRAFIK Eye* QS control unit can be simultaneously mapped to any three DMX512 channels (providing RGB/CMY control).
- DMX loads cannot be used with daylighting.

Accessory Controls: Ethernet and RS232 Interface (QSE-CI-NWK-E)

- Allows for monitoring and control of the outputs and local scenes of the *GRAFIK Eye* QS.

Accessory Controls: QS Keyswitch Wallstations (QSWS2-KS)

- Recalls preset light levels for any two scenes including Off
- Allows fine-tuning (raise/lower level) of a zone or group of zones
- Starts/Stops scene sequencing (Scenes 1-4 or Scenes 5-16)
- Enables/Disables Timeclock
- Enables/Disables occupancy sensors
- Enables/Disabled daylight sensors
- Allows toggle of Zone(s) to a preset level and off
- Enables/Disables panic mode
- Starts/Stops afterhours mode

Other Accessory Controls and Devices

- Energi Savr Node™ QS (ESN)

Occupancy Sensor(s)

- The *GRAFIK Eye* QS works with occupancy sensors through either:
  - Scene Control: Up to four sensors activate user-selectable occupancy and vacancy scenes.
  - Zone Control: up to four sensors per zone activate user-selected occupancy and vacancy zone levels.
- Occupancy sensors may include:
  - Contact closure sensors wired to CCI input on back of *GRAFIK Eye* QS
  - Wireless *Radio Powr Savr* occupancy or vacancy sensors (model numbers starting with LRF4)
  - Wired or wireless sensors connected QS Sensor Module (QSM)
- If any sensor in a group detects occupancy, then the *GRAFIK Eye* QS will go to the designated occupancy scene or zone level.
- If all sensors in a group detect vacancy, then the *GRAFIK Eye* QS will go to the designated vacancy scene or zone level.

Accessory Controls: Pico® Wireless Control (P/N QSRMP-)

- The *Pico* Wireless Control is battery powered. It can control *GRAFIK Eye* QS wireless control units within a 10 m (30 ft) range (20 m/60 ft in open air). It provides the following features:
  - Control of one or more zones on the *GRAFIK Eye* QS Wireless: turns zone(s) on or off, raises/lowers zone(s), and goes to user-defined preset level
  - Scene control: the *Pico* can access scene 1, scene 16, and Off on the *GRAFIK Eye* QS, and can raise and lower lighting levels

Job Name:	Model Numbers:	
Job Number:		

Specifications

Daylight Sensor(s)

- The GRAFIK Eye® QS allows daylight sensors to control one or more lighting zones to adjust electric light levels based on measured daylight levels.
- Daylight sensors may include:
  - Wireless Radio Powr Savr™ (model numbers starting with LRF4)
  - Wired or wireless sensors connected to a QS sensor module (QSM4)
- A daylight sensor can control one or more *GRAFIK Eye* QS zones:
  - Each zone can be calibrated to target light levels
  - A zone can be controlled by no more than one daylight sensor
- Daylight control can be enabled or disabled on a scene-by-scene basis
  - By default, daylight control is enabled in all scenes

Note: Daylight control through the *GRAFIK Eye* QS only affects lighting loads. Shade groups cannot be controlled by daylight sensors. Daylighting does not affect DMX or RGB/CMY DMX loads.

Contact Closure Input (CCI) with Power Supply Output

- Each *GRAFIK Eye* QS has one contact closure input (Terminal A).
  - The attached device must provide a dry contact closure or solid-state output.
  - Input is miswire-protected up to 36 V⎓.
- The contact closure is capable of accepting the following types of inputs:
  - Maintained (default): The *GRAFIK Eye* QS control unit will act on both a contact closure and a contact open/release event.
  - Momentary: The *GRAFIK Eye* QS control unit will act on only contact closure events.
- Each *GRAFIK Eye* QS can supply 50 mA maximum at 24 V⎓.
  - Useful for powering occupancy sensors.
  - An auxiliary power supply must be used if the device requires more than 50 mA.
- The CCI is capable of operating in the following modes
  - Occupancy: If an occupancy sensor is wired directly to the *GRAFIK Eye* QS.
  - Emergency: This setting allows the *GRAFIK Eye* QS to work with a LUT-ELI. When an emergency situation is detected, all lights will go to full on, and no operations will be allowed until the emergency signal is cleared.
  - Afterhours: Allows the CCI to start and end the afterhours mode.
  - Timeclock: Allows the CCI to enable and disable the timeclock.
  - Scene Lockout: Prevents the user from making any changes to the control unit. The current scene will stay on until the CCI enables normal operation.
  - Save Never: Prevents any changes from being saved while the CCI is being used.
  - Disable CCI: The CCI will have no effect on the system and will not appear on the list of available sensors.

Security Lockout Password

- A 4-digit password (using characters A to Z and 0 to 9) can be enabled/disabled to lock out access to the Programming Menu.
- By default there is no password enabled on the *GRAFIK Eye* QS.
- If case the 4-digit password is forgotten, contact Lutron® Technical Support to regain access.

Job Name:	Model Numbers:	
Job Number:		

Specifications

Capacities		
Zones	Unit Capacity (watts)	Zone Capacity Capacity (watts)
3	1 500	500
4	2 000	500
6	2 300	500

Load Type Notes

- For applications with ELV loads or load wattages exceeding the specified capacities, please refer to specifications for Lutron power modules (NGRX-PB-CE; NGRX-ELVI-CE; ELVI-1000-CE).
- Not all loads must be connected; however, connected zones must have a minimum load of 40 W.
- Maximum total lighting load for a magnetic low-voltage zone is 500 VA / 400 W.
- No zone may be loaded with more than 500 W.

System Limits

- The QS wired communication link is limited to 100 devices (wired or wireless) or 100 zones.

Job Name:	Model Numbers:	
Job Number:		

GRAFIK Eye® QS Wireless
Custom Colour Options and Model Numbers
You must order a Base Unit and a Faceplate Kit
See Standard Colour Combinations page for faceplate, stripe, and button colours

Base Unit

QSGRM - _ PCE

- QSGRM — Prefix
- _ — Number of Zones
  - 3 = 3 zones
  - 4 = 4 zones
  - 6 = 6 zones
- PCE — Phase Control Triac-CE

Example:

QSGRM-6PCE
6-zone base unit
and
QSGFP-2IV-SGN
Ivory faceplate kit with two window treatment columns and symbol-based engraving

Faceplate Kit
(includes coordinating stripe and buttons; see Standard Colour Combinations page)

QSGFP - - -

- QSGFP — Faceplate Prefix
- Number of Window Treatment Columns
  - Omit = none
  - 1 = 1 column
  - 2 = 2 columns
  - 3 = 3 columns
- Top Door Colour
  - Omit = same as unit
  - T = Translucent
- Colour/Finish
- Keypad Engraving Code

Faceplate Custom Colour/Finish Codes

Architectural Matte Finishes

Standard (ship in 48 hours)	
White	WH
Ivory	IV
Beige	BE
Gray	GR
Brown	BR
Black	BL
Almond	AL
Light Almond	LA

International Wallbox Finishes

Argentum	AR
Mica	MC
Arctic White	AW

Architectural Metal Finishes

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

Anodised Aluminum Finishes

Clear	CLA
Black	BLA
Brass	BRA

Satin Colour Matte Finishes

Snow	SW
Biscuit	BI
Eggshell	ES
Taupe	TP
Midnight	MN
Limestone	LS
Stone	ST
Desert Stone	DS
Terracotta	TC
Hot	HT
Goldstone	GS
Palladium	PD
Plum	PL
Turquoise	TQ
Bluestone	BG
Sea Glass	SG
Greenbrier	GB
Sienna	SI
Merlot	MR
Mocha Stone	MS

Keypad Engraving Codes

Omit = Unengraved
Ships with engraving certificate that customer can redeem at no charge

SGN = Symbol-based Engraving



Lighting keypad


Window treatment column

NST = Non-Standard Text Engraving
Please visit the *GRAFIK Eye* QS website at **www.lutron.com/grafikeyeqs** for custom engraving forms. Submit completed form with order, and unit will ship engraved as specified by customer.

Job Name:	Model Numbers:	
Job Number:		

GRAFIK Eye® QS Wireless
Custom Options and Model Numbers
See previous pages for Standard and Other Custom Model Numbers
See Standard Colour Combinations page for faceplate, stripe, and button colours

Custom Button Kit

QSGB - 5B - WH -

- QSGB: Custom Button Kit Prefix
- 5B: Button Configuration
- WH: Button Colour/Finish
- Keypad Engraving Code

3BRL = 3-button with raise/lower (window treatment column)
5B = 5-button (lighting keypad)

Button Kit Custom Colour/Finish Codes

Architectural Matte Finishes

White	WH
Ivory	IV
Beige	BE
Gray	GR
Brown	BR
Black	BL
Almond	AL
Light Almond	LA

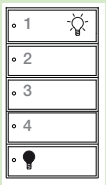
Satin Colour Matte Finishes

Snow	SW
Biscuit	BI
Eggshell	ES
Taupe	TP

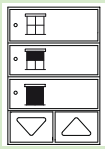
Keypad Engraving Codes

Omit = Unengraved
Ships with engraving certificate that customer can redeem at no charge

SGN = Symbol-based Engraving



Lighting keypad


Window treatment column

NST = Non-Standard Text Engraving
Please visit the *GRAFIK Eye* QS website at **www.lutron.com/grafikeyeqs** for custom engraving forms. Submit completed form with order, and unit will ship engraved as specified by customer.

Custom Stripe Kit

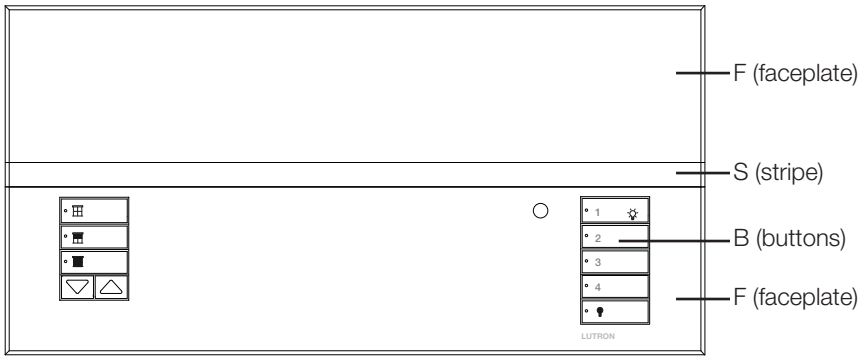
QSGS - WH

- QSGS: Stripe Kit Prefix
- WH: Stripe Colour/Finish

Stripe Custom Colour/Finish Codes
Same as Faceplate colours on previous page

Job Name:	Model Numbers:	
Job Number:		

GRAFIK Eye® QS Wireless Standard Colour Combinations
See previous pages for Standard and Custom Model Numbers



Faceplate is comprised of a top and bottom. The bottom will always be the colour indicated under “faceplate.” The top may be the same colour or translucent. Use the chart for faceplates that have the same colour top and bottom. If a translucent lid is chosen, the stripe will automatically be the same colour as the bottom lid.

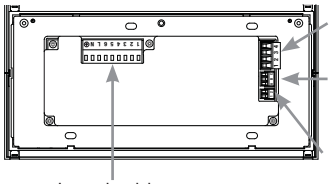
Suffix	Faceplate (F)	Stripe (S)	Button (B)
Architectural Matte			
WH	White	Gray	White
IV	Ivory	Beige	Ivory
BE	Beige	Ivory	Beige
GR	Gray	Black	Gray
BR	Brown	Black	Brown
BL	Black	Gray	Black
AL	Almond	Light Almond	Almond
LA	Light Almond	Almond	Light Almond
Architectural Metal			
BB	Bright Brass	Black	Black
BC	Bright Chrome	Black	Black
BN	Bright Nickel	Black	Black
SB	Satin Brass	Black	Black
SC	Satin Chrome	Black	Black
SN	Satin Nickel	Black	Black
QB	Antique Brass	Black	Black
QZ	Antique Bronze	Black	Black
Anodised			
CLA	Clear	Black	Black
BLA	Black	Black	Black
BRA	Brass	Black	Black
International Wallbox			
AR	Argentum	Black	Black
MC	Mica	Gray	Black
AW	Arctic White	Gray	White

Suffix	Faceplate (F)	Stripe (S)	Button (B)
Satin Matte			
MN	Midnight	Gray	Black
TP	Taupe	Gray	Taupe
SW	Snow	Gray	Snow
ES	Eggshell	Beige	Eggshell
BI	Biscuit	Eggshell	Biscuit
LS	Limestone	Gray	Gray
ST	Stone	Gray	Gray
DS	Desert Stone	Taupe	Taupe
TC	Terracotta	Taupe	Taupe
BG	Bluestone	Gray	Gray
HT	Hot	Taupe	Taupe
MR	Merlot	Taupe	Taupe
SI	Sienna	Brown	Brown
GB	Greenbrier	Gray	Gray
SG	Sea Glass	Gray	Gray
MS	Mocha Stone	Taupe	Taupe
GS	Goldstone	Ivory	Ivory
PD	Palladium	Gray	Gray
PL	Plum	Taupe	Taupe
TQ	Turquoise	Gray	Gray

Job Name:	Model Numbers:	
Job Number:		

Wiring Diagrams

Terminations



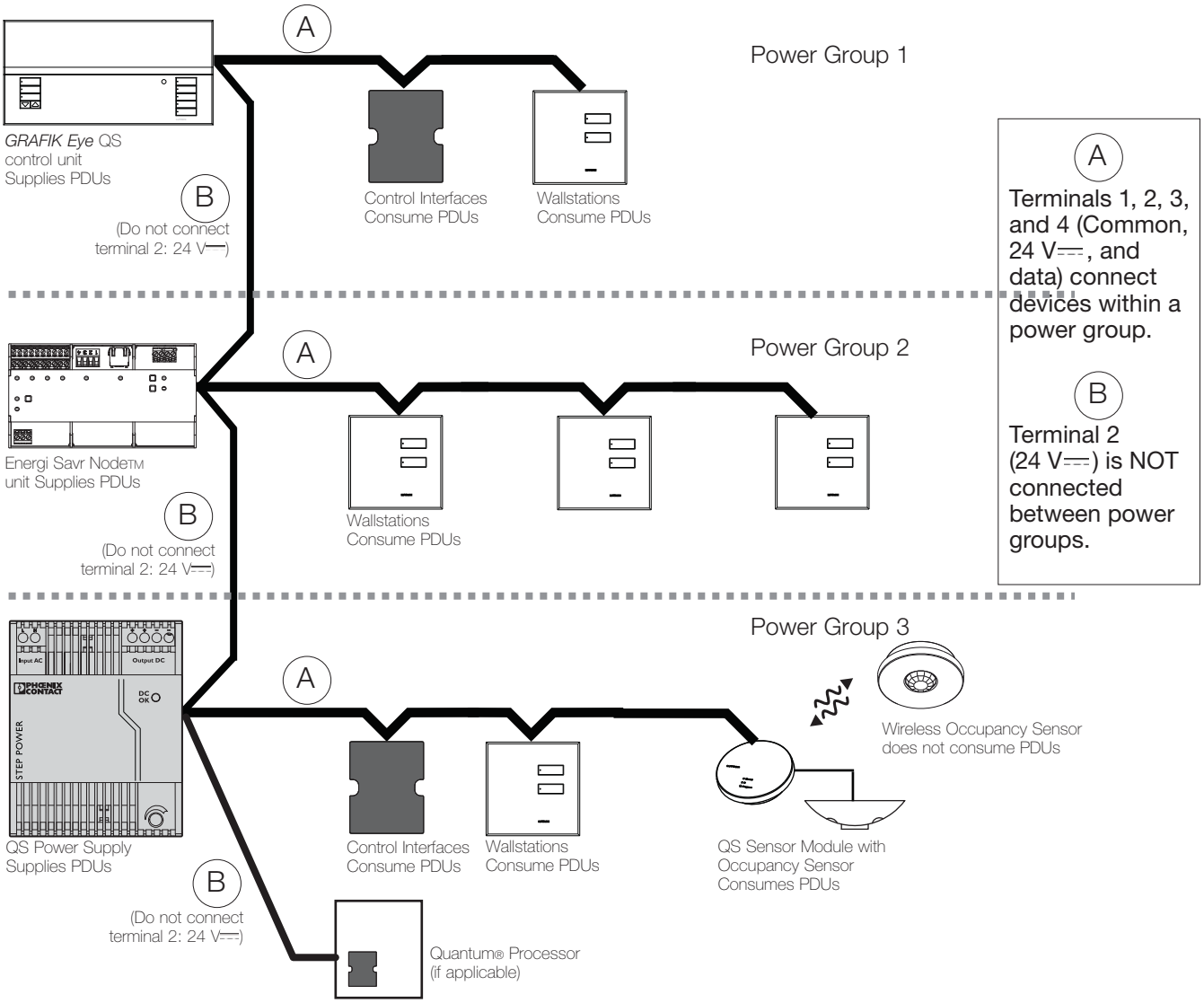
Job Name:	Model Numbers:	
Job Number:		

Power Group Wiring Example

On the QS link, there are devices that supply power and devices that consume power. Each device has a specific number of Power Draw Units (PDUs) it either supplies or consumes. A Power Group consists of one device that supplies power and one or more devices that consume power; each Power Group may have only one power-supplying device. Refer to the QS Link Power Draw Units specification submittal (Lutron PN 369405) for more information concerning PDUs.

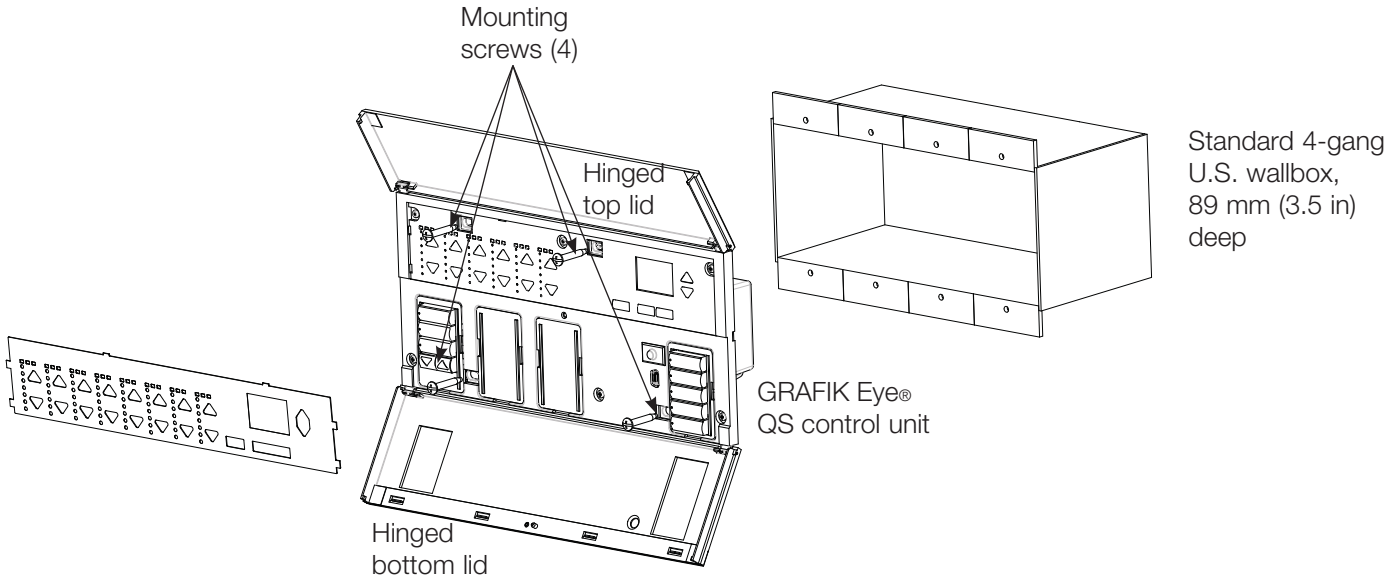
Within Power Groups on the QS link, connect all 4 terminals (1, 2, 3, and 4), shown by the letter A in the diagram. Between devices on the QS link that supply power, connect only terminals 1, 3, and 4 (NOT terminal 2), shown by the letter B on the diagram. Refer to the specific device documentation for wiring details.

Wiring can be T-tapped or daisy-chained.

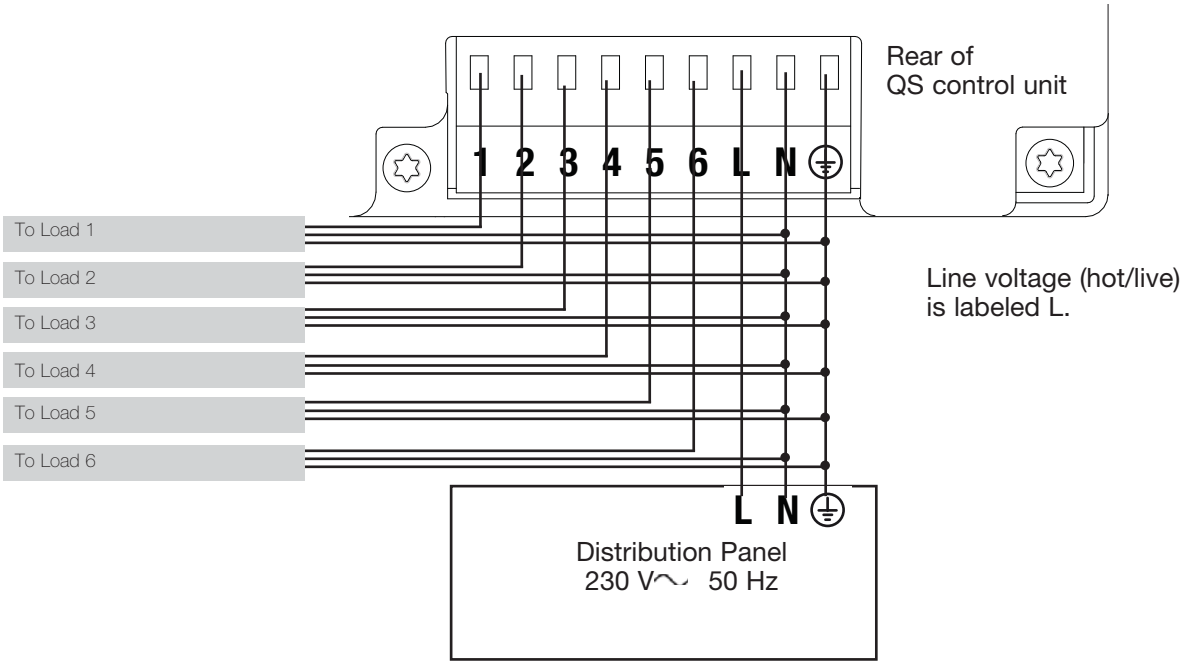


Job Name:	Model Numbers:	
Job Number:		

Mounting



Line Voltage Wiring



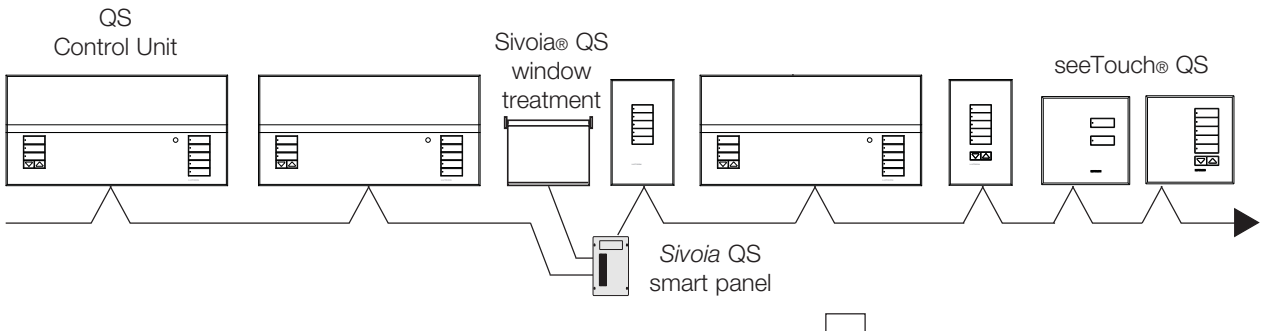
- Pull power wiring from distribution panel and to light fixtures.
- Each line voltage terminal can accept one 2.5 mm^2 (12 AWG) wire.
- Consult Lutron for non-dim relay wiring and/or load side emergency transfer wiring.

Job Name:	Model Numbers:	
Job Number:		

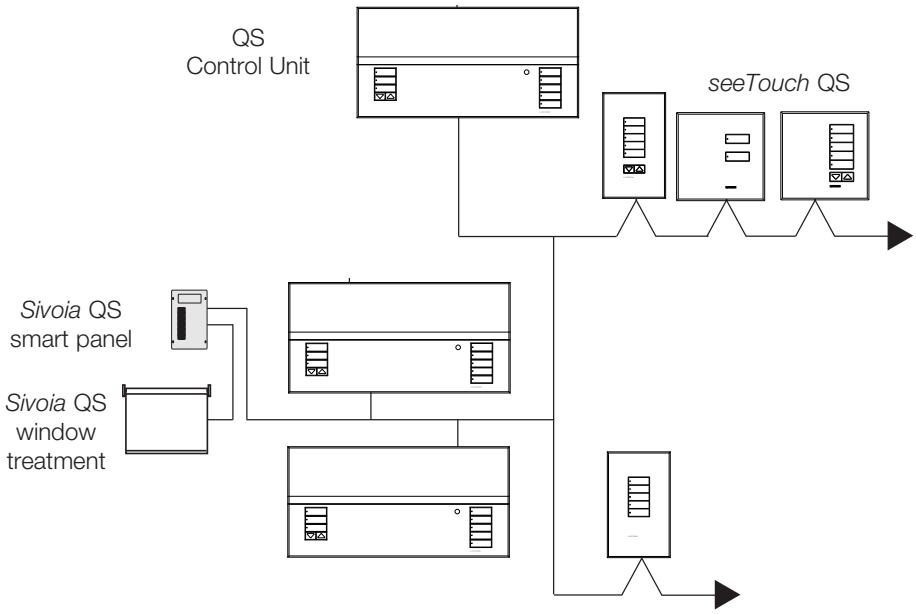
IEC PELV/NEC® Class 2 QS System Low-Voltage Wiring

- System communication uses low-voltage wiring.
- Wiring can be daisy-chained or T-tapped.
- Wiring must be run separately from line/mains voltage.
- IEC PELV/NEC® Class 2 wiring link requires:
  Two 1.0 mm² (18 AWG) conductors for control power.
  One twisted, shielded pair of 0.5 mm² (22 AWG) for data link.
  Available from Lutron, P/N GRX-CBL-346S; check compatibility in your area.
- Total length of control link must not exceed 610 m (2 000 ft).

Daisy-Chain Wiring Example



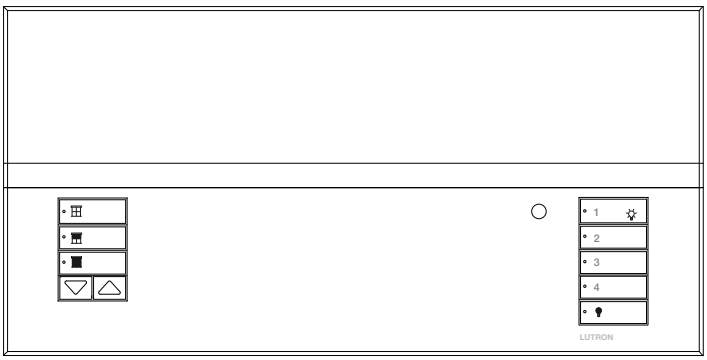
T-Tap Wiring Example



Job Name:	Model Numbers:	
Job Number:		

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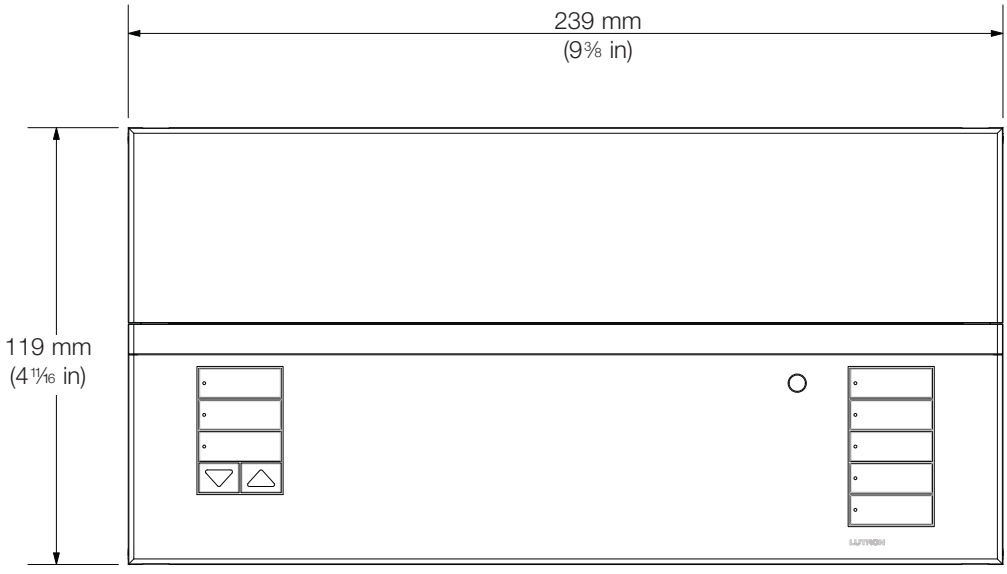
GRAFIK Eye® QS Wireless Control Unit (230 V~ Limited 434 MHz)



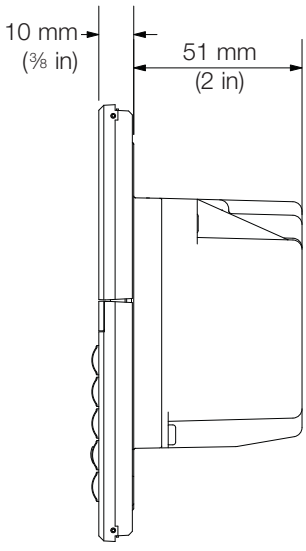
Description

GRAFIK Eye® QS Wireless is the premier energy-saving light and window treatment control. GRAFIK Eye® QS includes an astronomic timeclock, intuitive lighting presets, and direct window treatment control. Now with wireless technology, you can use the GRAFIK Eye® QS Wireless to seamlessly integrate with a variety of Lutron wireless products and systems, including Radio Powr Savr™ occupancy, vacancy, and daylight sensors, Sivoia® QS Wireless window treatments, Pico® wireless controls, and other GRAFIK Eye® wireless products. Additionally, the GRAFIK Eye® QS Wireless is compatible with all Lutron wired QS products and systems, including Quantum®.

Mechanical Dimensions



Front View



Side View

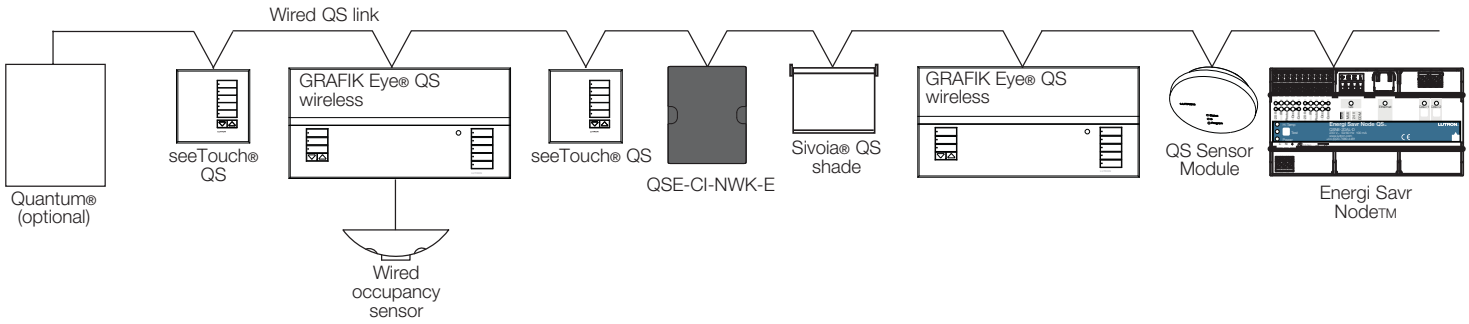
Fits into a 4-gang U.S. backbox, 89 mm (3.5 in) deep; Lutron P/N 245-254 or 76 mm (3.0 in) deep; Lutron P/N 241-400.

Job Name:	Model Numbers:	
Job Number:		

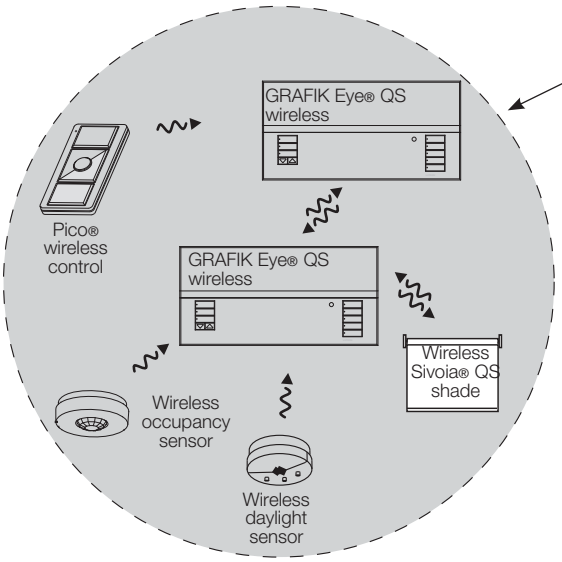
System Topologies

The GRAFIK Eye® QS Wireless can be specified in three different system topologies. Examples of each are shown below.

Example of Wired System

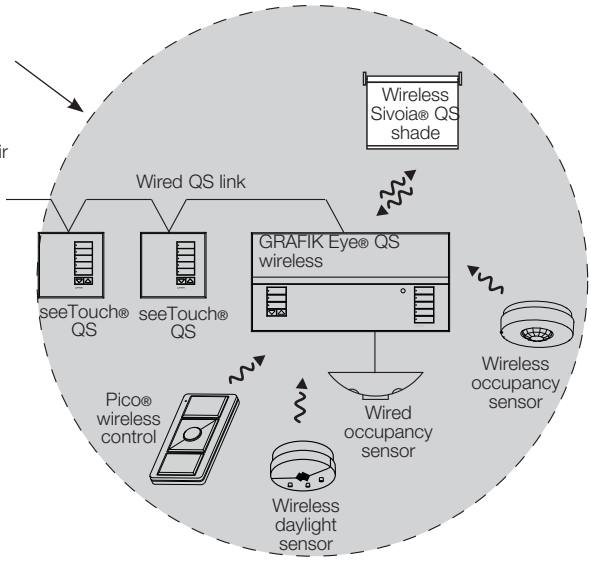


Example of GRAFIK Eye®-centric Wireless System

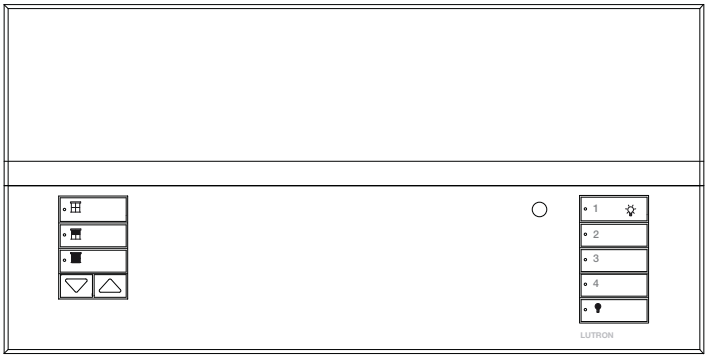


10 m (30 ft) wireless range; 20 m (60 ft) in open air

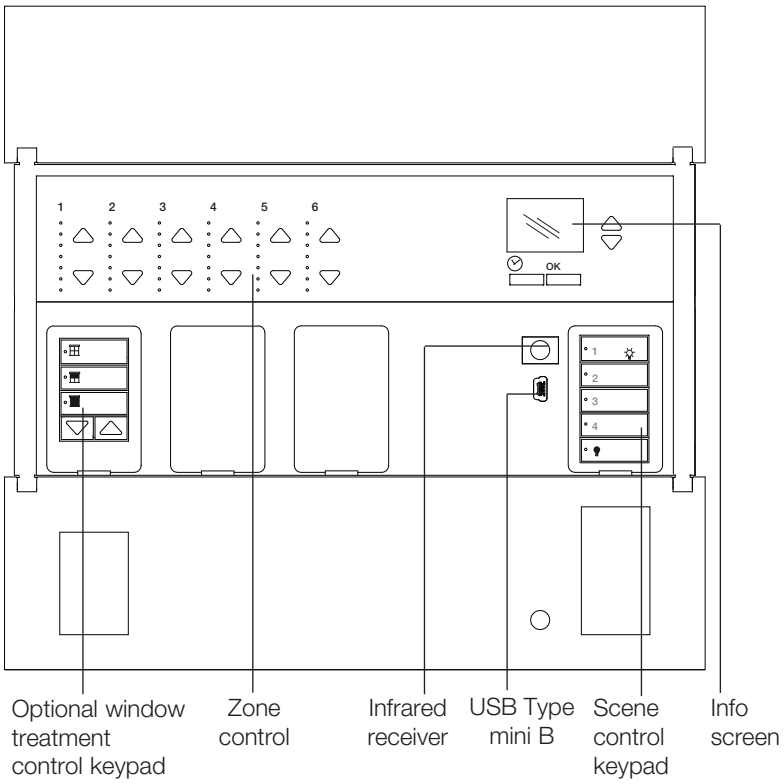
Example of Mixed Wired/GRAFIK Eye®-centric Wireless System



Job Name:	Model Numbers:	
Job Number:		



Note: Symbol-based Engraving (-SGN) shown.



Features

- Lutron's proprietary Clear Connect™ RF technology. Operates in Limited 434 MHz band.
- Pushbutton recall of four preset lighting scenes, plus Off.
- Twelve (12) additional scenes accessible through other QS devices, such as seeTouch® QS wallstations.
- Optional integrated window treatment control buttons, which can also be added to the unit after installation.
- Master override buttons to raise and lower all lights.
- Allows setup of lighting scenes and window treatment presets using buttons on the control unit.
- Built-in infrared (IR) receiver.
- External IR connection.
- Built-in astronomic timeclock.
- Info screen shows zone light level percentage, energy savings, zone labeling, and programming.
- Lockout option prevents accidental changes.
- One occupancy sensor input and 24 V⎓ power for occupancy sensor.
- QS communication link for seamless integration of lights, motorised window treatments, wallstations, and integration interfaces.
- Compatible with all Lutron QS system components.
- Wireless communication for seamless integration with a variety of Lutron wireless products and systems, including Radio Powr Savr™ occupancy and vacancy sensors, Sivoia® QS wireless window treatments, Pico® wireless control, and other GRAFIK Eye® QS wireless products.
- Backlit buttons with engraving make unit easy to locate and operate.
- Available in a variety of colours and finishes.

Job Name:	Model Numbers:	
Job Number:		

Specifications

Input Power

- 230 V~ 50/60 Hz

Lighting Sources/Load Types

Note: Maximum load 500 W per zone; 2 300 W total
Controls the following lighting sources with a smooth, continuous square law dimming curve or on a full conduction non-dim basis:

- Incandescent
- Halogen
- Magnetic low-voltage transformer
- Neon and cold cathode
- Non-dim (incandescent, magnetic low-voltage, or neon/cold cathode)

Controls the following lighting sources with a smooth, continuous square law dimming curve or on a full conduction non-dim basis through separate power interfaces:

- Electronic low-voltage transformer
- Non-dim
- 0 - 10 V

Key Design Features

- Lightning strike protection meets ANSI/IEEE standard 62.41-1980. Can withstand voltage surges of up to 6 000 V~ and current surges of up to 3 000 A.
- Tested to withstand 16 kV electrostatic discharge without damage or memory loss.
- RTISS™-equipped: Compensates in real time for incoming line voltage variations (no visible flicker with +/-2% change in RMS voltage per cycle, and +/-2% Hz change in frequency per second).
- Power failure memory retains programming and light level settings for up to 10 years in the event of a power loss.
- The GRAFIK Eye® QS supplies 3 Power Draw Units (PDUs) on the QS link.
  For complete information, see “Power Draw Units on the QS Link,” Lutron PN 369405.
- Faceplate is hinged at the top and bottom, and stays open at 180° for ease of access.

Environment

- 0 to 40 °C (32 to 104 °F)
- Relative humidity less than 90% non-condensing

Listings

- RF meets FCC 15.231

Scene and Shade Buttons

- Large, rounded buttons are easy to use.
- Backlit buttons with optional engraving make it easy to find and to operate the control unit in low light conditions (backlight can be disabled).
- Optional button engraving is angled up to the eye for easy reading.
- Predefined label stickers are included for field labeling.
- 4 preset lighting scenes, plus Off, are accessible from the front of the control unit.
- 12 additional scenes are stored in the control unit and are accessible from seeTouch® QS wallstations and QS interfaces.
- Light levels fade smoothly between scenes. Fade time can be set differently for each scene: 0 to 59 seconds, or 1 to 60 minutes. Maximum fade time from Off is 3 seconds.

Shade Control

- The GRAFIK Eye® QS can include up to 3 shade button columns. Each column has backlit open, preset, close, and raise/lower buttons.
- Each shade button column can be programmed to operate one shade or a group of shades. (Shades may be assigned to more than one shade button column).
- Faceplates are available with 1, 2 and 3 shade button columns.

<u>Wireless shade limitations:</u>

- Access to the Sivoia® QS Wireless electronic drive unit (EDU) is required to associate shades with the GRAFIK Eye® QS and set their raise/lower limits.
- Wired and wireless shades may not be programmed into the same shade button column; however, both may be used on the same GRAFIK Eye® QS control unit.
- Scene commands that affect wireless shades across multiple shade button columns will have a 1-second delay from column to column. This does not occur in RadioRA® 2 systems.

Zone Control

- Each zone has a dedicated raise and lower button to adjust the zone.
- Each zone has a dedicated 7 LED bar graph for level status. Percentage of light level and energy saved is displayed on the info screen.
- All zone information has blue backlit LEDs. Backlight turns off when idle for 30 seconds.

Job Name:	Model Numbers:	
Job Number:		

Specifications

Info Screen

- OLED (organic LED) screen is viewable from all angles.
- Screen turns off when idle for 30 seconds.
- Programmable zone labels.
- Programmable scene labels.
- Status of real-time zone percentage and energy savings.
- Programmable timeclock schedules.
- Programmable window treatment labels.

Astronomic Timeclock

- Integral to all units.
- 7 daily schedules available.
- One available holiday schedule is programmable by date up to one year in advance.
- 25 events per day maximum.
- Timeclock events are programmable to control scenes that affect any Energi Savr Node™ unit connected on the QS link without changing the local scene on the GRAFIK Eye® QS.
- Astronomic times are programmable by integral city database or by entering latitude and longitude. Times automatically adjust throughout the year based on location.
- Local timeclock events can activate any of the following features:
  - Scenes 1 to 16 and Off
  - Any available window treatment presets
  - Start and End afterhours mode
  - Enable and Disable daylighting for all zones/groups
  - Enable and Disable occupancy for occupancy/vacancy sensors
  - Enable and Disable occupied events for all occupancy sensors

System Communications and Capacities

- Low-voltage type IEC PELV/NEC® Class 2 wiring connects control units, wallstations, motorised window treatments, and control interfaces.
- A QS system can have up to 100 devices and 100 zones.
- A QS system can have up to 30 wireless devices.

Infrared

- Infrared (IR) receiver allows infrared transmitters to select 8 scenes, raise/lower lighting zones, or raise/lower window treatments.
- Transmitter buttons imitate buttons on faceplate.
- 15 m (50 ft) line of sight range.
- Terminal block infrared input for connection to a wired IR input from third-party equipment.
- IR can be disabled via programming.
- Works with Lutron GRX-IT and GRX-8IT infrared remote controls.

Wireless RF Compatibility

- Lutron's proprietary Clear Connect™ RF Technology operates in the Limited 434 MHz band
- Compatible with other Lutron wireless products/systems, such as:
  - Pico® (P/N QSRQP-)
  - Radio Powr Savr™ occupancy/vacancy/daylight sensors (P/N LRF7-)
  - Sivoia® QS wireless products
  - Other GRAFIK Eye® QS wireless units (P/N QSGRQ-)

Accessory Controls: seeTouch® QS Wallstations (QSWE)

- Wired seeTouch® QS wallstations provide the following features:
  - Access to one or more of the 16 scenes on the GRAFIK Eye® QS Wireless control unit
  - Zone toggle, partitioning, sequencing, fine tune, panic mode, and timeclock enable/disable
  - Contact closure inputs
  - Certain functions are only available on specific wallstation configurations. Refer to the seeTouch® QS specification submittal.

Accessory Controls: Pico® Wireless Control (QSRQP models)

- The Pico® Wireless Control is battery powered. It can control GRAFIK Eye® QS wireless control units within a 10 m (30 ft) range (20 m/60 ft in open air). It provides the following features:
  - Control of one or more zones on the GRAFIK Eye® QS Wireless: turns zone(s) on or off, raises/lowers zone(s), and goes to user-defined preset level
  - Scene control: the Pico® can access scene 1, scene 16, and Off on the GRAFIK Eye® QS, and can raise and lower lighting levels

Job Name:	Model Numbers:	
Job Number:		

Specifications

Accessory Controls: QS Sensor Module (QSM7)

- The QS Sensor Module provides a means to link wired or wireless occupancy and daylight sensors to a GRAFIK Eye® QS via the wired QS link.
  - Occupancy sensors wired (or wirelessly linked) to a QS Sensor Module can be used by one or more GRAFIK Eye® QS control units on the wired link.
  - Daylight sensors wired (or wirelessly linked) to a QS Sensor Module can be used by one or more GRAFIK Eye® QS control units on the wired link.
  - Pico® wireless controls can control either one or more zones or scenes on the GRAFIK Eye® QS.
  - Infrared sensors can control either one or more zones or scenes on the GRAFIK Eye® QS. Functionality varies; refer to the documentation for the QS Sensor Module for details.

Accessory Controls: Contact Closure Input/Output Interface (QSE-IO)

- Recalls preset light levels for the following set of scenes on the GRAFIK Eye® QS:
  Scenes 1-4 and Off Scenes 9-12 and Off
  Scenes 5-8 and Off Scenes 13-16 and Off
- Sequence scenes 5-16, Enable/Disable Zone Lockout, Enable/Disable Scene Lockout, Enable/Disable Panic Mode, Enable/Disable Timeclock.
- Occupancy Sensors. An individual input counts as 1 occupancy sensor for the GRAFIK Eye® QS. Each input can be assigned to either Scene Control or Zone Control (please refer to the Occupancy Sensor(s) section of this guide).
- Zone Toggle. Allows an input to toggle one or more zones to a preset level and off.
- Shade Output mode. A Shade Column on the GRAFIK Eye® QS can be linked to control outputs 1-3 and/or outputs 4-5 on the QSE-IO.

Accessory Controls: DMX Output Interface (QSE-CI-DMX)

- Any zone on the GRAFIK Eye® QS control unit can be mapped to any single DMX512 Channel.
- Any zone on the GRAFIK Eye® QS control unit can be simultaneously mapped to any three DMX512 channels (providing RGB/CMY control).
- DMX loads cannot be used with daylighting.

Accessory Controls: Ethernet and RS232 Interface (QSE-CI-NWK-E)

- Allows for monitoring and control of the outputs and local scenes of the GRAFIK Eye® QS.

Accessory Controls: QS Keyswitch Wallstations (QSWS2-KS)

- Recalls preset light levels for any two scenes including Off.
- Allows fine-tuning (raise/lower level) of a zone or group of zones.
- Starts/Stops scene sequencing (Scenes 1-4 or Scenes 5-16)
- Enables/Disables Timeclock
- Enables/Disables occupancy sensors
- Enables/Disabled daylight sensors
- Allows toggle of Zone(s) to a preset level and off.
- Enables/Disables panic mode.
- Starts/Stops afterhours mode.

Other Accessory Controls and Devices

- Energi Savr Node™ QS (ESN)

Unit Dissipation

- All models of GRAFIK Eye® QS Wireless control units (230 V~ Limited 434 MHz) dissipate no more than 100 BTUs/hour (29.3 W).

Job Name:	Model Numbers:	
Job Number:		

Specifications

Occupancy Sensor(s)

- The GRAFIK Eye® QS works with occupancy sensors through either:
  - Scene Control: Up to four sensors activate user-selectable occupancy and vacancy scenes.
  - Zone Control: up to four sensors per zone activate user-selected occupancy and vacancy zone levels.
- Occupancy sensors may include:
  - Contact closure sensors wired to CCI input on back of GRAFIK Eye® QS
  - Wireless Radio Powr Savr™ occupancy or vacancy sensors (model numbers starting with LRF7)
  - Wired or wireless sensors connected QS Sensor Module (QSM7)
- If any sensor in a group detects occupancy, then the GRAFIK Eye® QS will go to the designated occupancy scene or zone level.
- If all sensors in a group detect vacancy, then the GRAFIK Eye® QS will go to the designated vacancy scene or zone level.

Daylight Sensor(s)

- The GRAFIK Eye® QS allows daylight sensors to control one or more lighting zones to adjust electric light levels based on measured daylight levels.
- Daylight sensors may include:
  - Wireless Radio Powr Savr™ (model numbers starting with LRF7)
  - Wired or wireless sensors connected to a QS sensor module (QSM7)
- A daylight sensor can control one or more GRAFIK Eye® QS zones:
  - Each zone can be calibrated to target light levels
  - A zone can be controlled by no more than one daylight sensor
- Daylight control can be enabled or disabled on a scene-by-scene basis
  - By default, daylight control is enabled in all scenes

Note: Daylight control through the GRAFIK Eye® QS only affects lighting loads. Shade groups cannot be controlled by daylight sensors. Daylighting does not affect DMX or RGB/CMY DMX loads.

Contact Closure Input (CCI) with Power Supply Output

- Each GRAFIK Eye® QS has one contact closure input (Terminal A).
  - The attached device must provide a dry contact closure or solid-state output.
  - Input is miswire-protected up to 36 V⎓.
- The contact closure is capable of accepting the following types of inputs:
  - Maintained (default): The GRAFIK Eye® QS control unit will act on both a contact closure and a contact open/release event.
  - Momentary: The GRAFIK Eye® QS control unit will act on only contact closure events.
- Each GRAFIK Eye® QS can supply 50 mA maximum at 24 V⎓.
  - Useful for powering occupancy sensors.
  - An auxiliary power supply must be used if the device requires more than 50 mA.
- The CCI is capable of operating in the following modes
  - Occupancy: If an occupancy sensor is wired directly to the GRAFIK Eye® QS.
  - Emergency: This setting allows the GRAFIK Eye® QS to work with a LUT-ELI. When an emergency situation is detected, all lights will go to full on, and no operations will be allowed until the emergency signal is cleared.
  - Afterhours: Allows the CCI to start and end the afterhours mode.
  - Timeclock: Allows the CCI to enable and disable the timeclock.
  - Scene Lockout: Prevents the user from making any changes to the control unit. The current scene will stay on until the CCI enables normal operation.
  - Save Never: Prevents any changes from being saved while the CCI is being used.
  - Disable CCI: The CCI will have no effect on the system and will not appear on the list of available sensors.

Security Lockout Password

- A 4-digit password (using characters A to Z and 0 to 9) can be enabled/disabled to lock out access to the Programming Menu.
- By default there is no password enabled on the GRAFIK Eye® QS.
- In case the 4-digit password is forgotten, contact Lutron Technical Support to regain access.

Job Name:	Model Numbers:	
Job Number:		

Specifications

Capacities		
Zones	Unit Capacity (watts)	Zone Capacity Capacity (watts)
6	2 300	500

Load Type Notes

- For applications with ELV loads or load wattages exceeding the specified capacities, please refer to specifications for Lutron power modules (NGRX-PB-AU; NGRX-ELVI-AU; NGRX-FDBI-AU).
- Not all loads must be connected; however, connected zones must have a minimum load of 40 W.
- Maximum total lighting load for a magnetic low-voltage zone is 500 VA / 400 W.
- No zone may be loaded with more than 500 W.
- For controlling low-wattage loads (CFL, LED) in a non-dim application, contact Lutron Technical Support for the appropriate solution.

System Limits

- The QS wired communication link is limited to 100 devices (wired or wireless) or 100 zones.

GRAFIK Eye® QS Wireless
Custom Colour Options and Model Numbers
You must order a Base Unit and a Faceplate Kit
See Standard Colour Combinations page for faceplate, stripe, and button colours

Base Unit

QSGRQ - 6 PCE

- QSGRQ: Prefix
- 6: 6 Zones
- PCE: Phase Control Triac-CE

Example:

QSGRQ-6PCE
6-zone base unit
and
QSGFP-2IV-SGN
Ivory faceplate kit with two window treatment columns and symbol-based engraving

Faceplate Kit
(includes coordinating stripe and buttons; see Standard Colour Combinations page)

QSGFP - - -

- QSGFP: Faceplate Prefix
- Number of Window Treatment Columns: Omit = none; 1 = 1 column; 2 = 2 columns; 3 = 3 columns
- Top Door Colour: Omit = same as unit; T = Translucent
- Colour/Finish
- Keypad Engraving Code

Faceplate Custom Colour/Finish Codes

Architectural Matte Finishes

Standard (ship in 48 hours)

White	WH
Ivory	IV
Beige	BE
Gray	GR
Brown	BR
Black	BL
Almond	AL
Light Almond	LA

Architectural Metal Finishes

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

Anodised Aluminum Finishes

Clear	CLA
Black	BLA
Brass	BRA

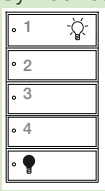
Satin Colour Matte Finishes

Snow	SW
Biscuit	BI
Eggshell	ES
Taupe	TP
Midnight	MN
Limestone	LS
Stone	ST
Desert Stone	DS
Terracotta	TC
Hot	HT
Goldstone	GS
Palladium	PD
Plum	PL
Turquoise	TQ
Bluestone	BG
Sea Glass	SG
Greenbrier	GB
Sienna	SI
Merlot	MR
Mocha Stone	MS

Keypad Engraving Codes

Omit = Unengraved
Ships with engraving certificate that customer can redeem at no charge

SGN = Symbol-based Engraving



Lighting keypad


Window treatment column

NST = Non-Standard Text Engraving
Please visit the GRAFIK Eye® QS website at **www.lutron.com/grafikeyeqs** for custom engraving forms. Submit completed form with order, and unit will ship engraved as specified by customer.

Job Name:	Model Numbers:	
Job Number:		

GRAFIK Eye® QS Wireless
Custom Options and Model Numbers

See previous pages for Standard and Other Custom Model Numbers
See Standard Colour Combinations page for faceplate, stripe, and button colours

Custom Button Kit

QSGB - 5B - WH -

- QSGB: Custom Button Kit Prefix
- 5B: Button Configuration
- WH: Button Colour/Finish
- Keypad Engraving Code

3BRL = 3-button with raise/lower (window treatment column)
5B = 5-button (lighting keypad)

Button Kit Custom Colour/Finish Codes

Architectural Matte Finishes

White	WH
Ivory	IV
Beige	BE
Gray	GR
Brown	BR
Black	BL
Almond	AL
Light Almond	LA

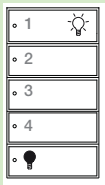
Satin Colour Matte Finishes

Snow	SW
Biscuit	BI
Eggshell	ES
Taupe	TP

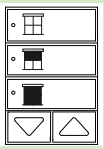
Keypad Engraving Codes

Omit = Unengraved
Ships with engraving certificate that customer can redeem at no charge

SGN = Symbol-based Engraving



Lighting keypad


Window treatment column

NST = Non-Standard Text Engraving
Please visit the GRAFIK Eye® QS website at **www.lutron.com/grafikeyeqs** for custom engraving forms. Submit completed form with order, and unit will ship engraved as specified by customer.

Custom Stripe Kit

QSGS - WH

- QSGS: Stripe Kit Prefix
- WH: Stripe Colour/Finish

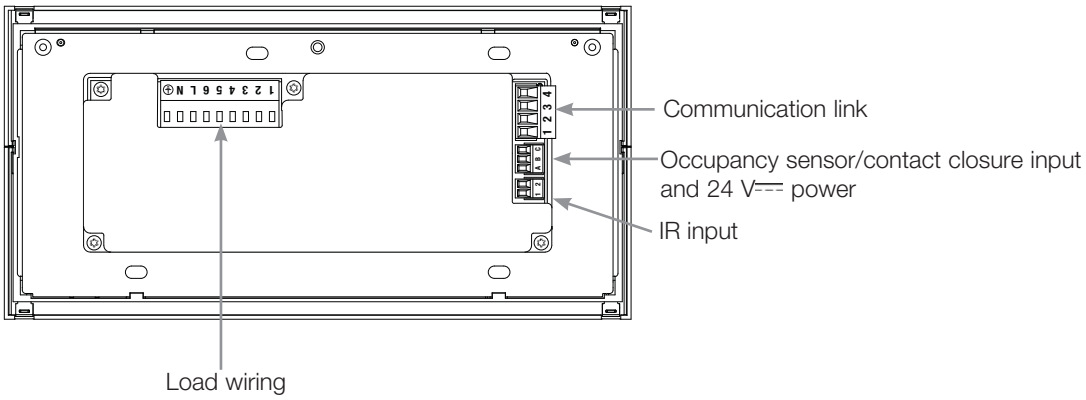
Stripe Custom Colour/Finish Codes

Same as Faceplate colours on previous page

Job Name:	Model Numbers:	
Job Number:		

Wiring Diagrams

Terminations



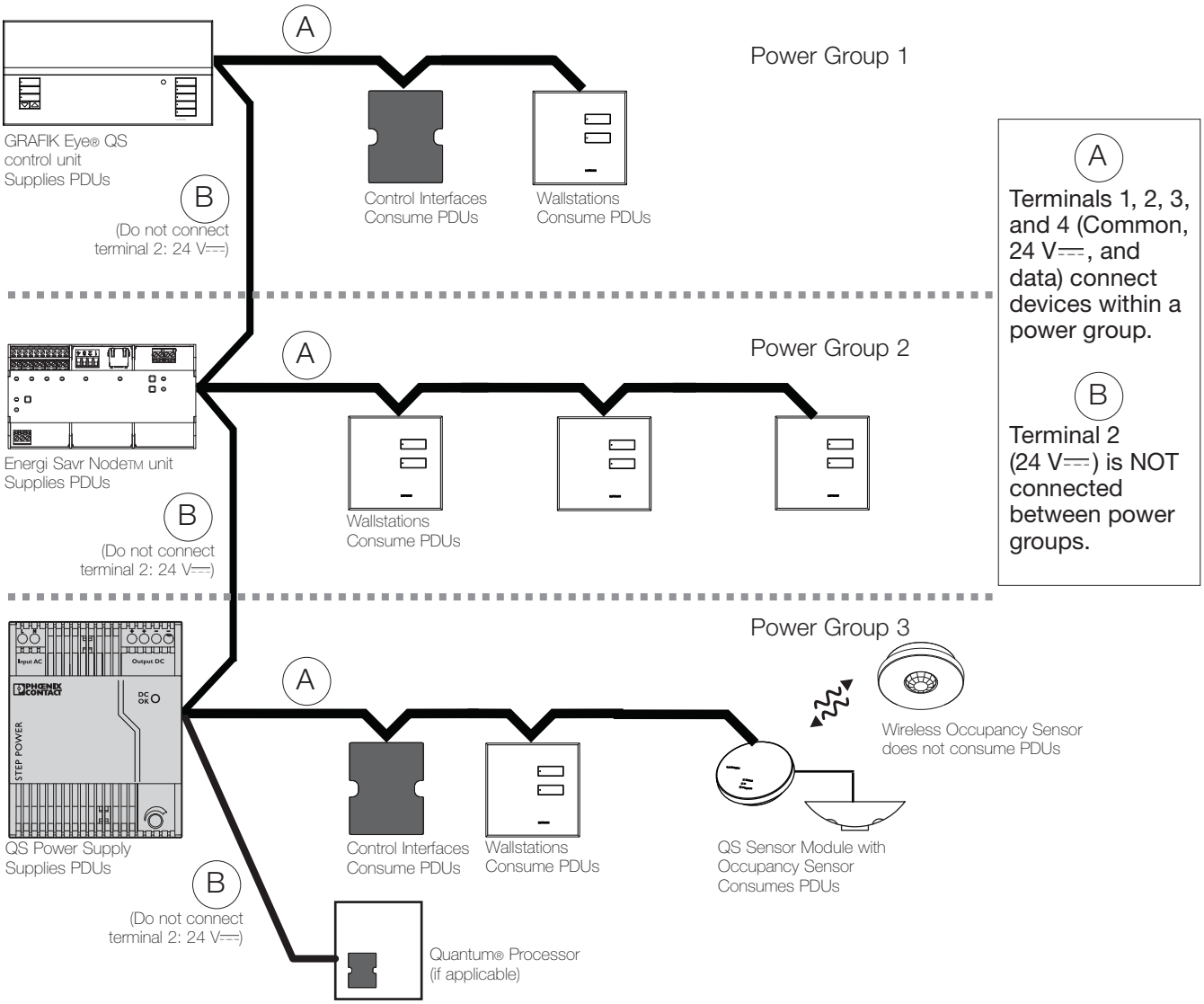
Job Name:	Model Numbers:	
Job Number:		

Power Group Wiring Example

On the QS link, there are devices that supply power and devices that consume power. Each device has a specific number of Power Draw Units (PDUs) it either supplies or consumes. A Power Group consists of one device that supplies power and one or more devices that consume power; each Power Group may have only one power-supplying device. Refer to the QS Link Power Draw Units specification submittal (Lutron PN 369405) for more information concerning PDUs.

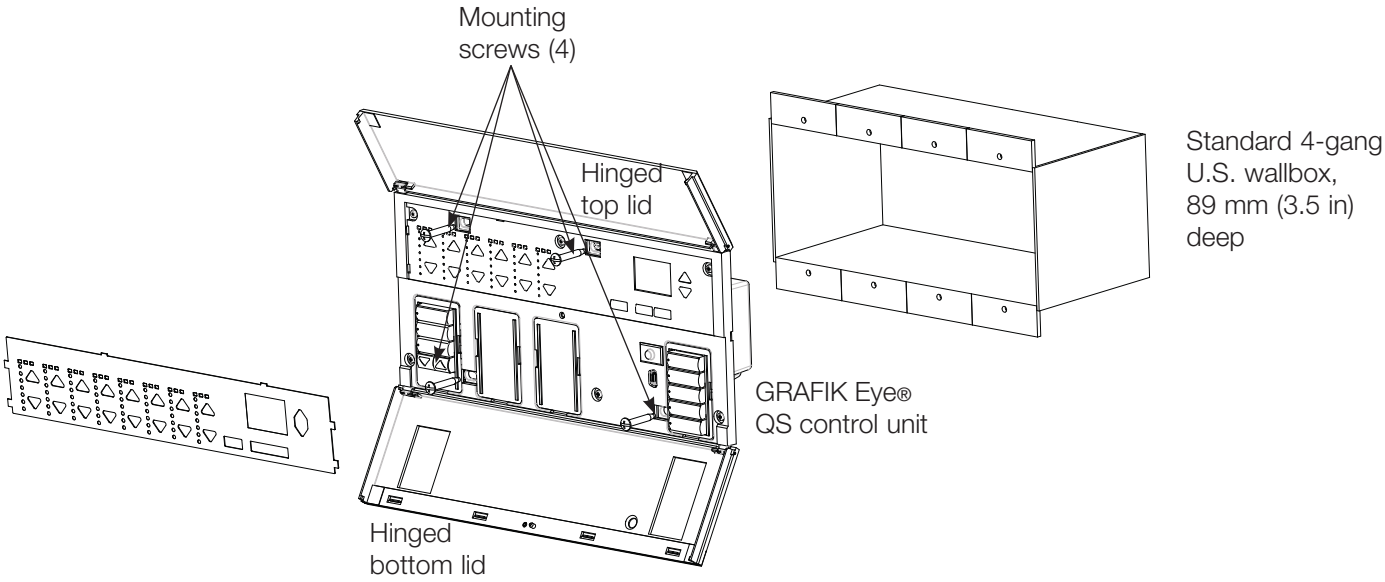
Within Power Groups on the QS link, connect all 4 terminals (1, 2, 3, and 4), shown by the letter A in the diagram. Between devices on the QS link that supply power, connect only terminals 1, 3, and 4 (NOT terminal 2), shown by the letter B on the diagram. Refer to the specific device documentation for wiring details.

Wiring can be T-tapped or daisy-chained.

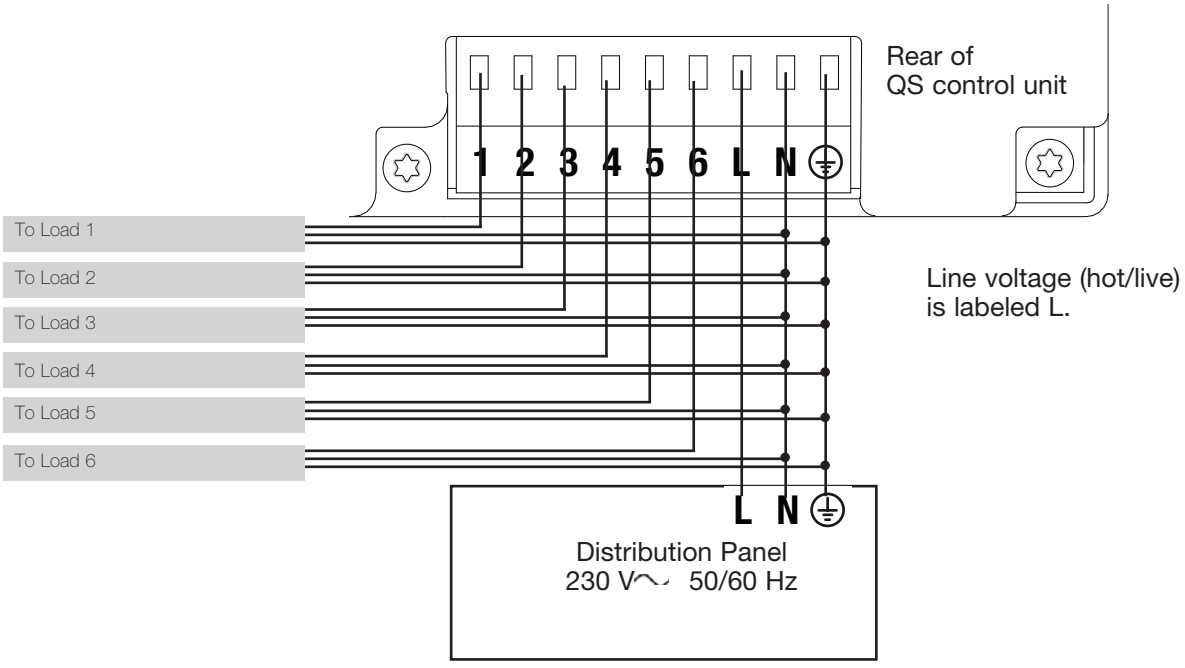


Job Name:	Model Numbers:	
Job Number:		

Mounting



Line Voltage Wiring



- Pull power wiring from distribution panel and to light fixtures.
- Each line voltage terminal can accept one 4.0 mm^2 (12 AWG) wire.
- Consult Lutron for non-dim relay wiring and/or load side emergency transfer wiring.

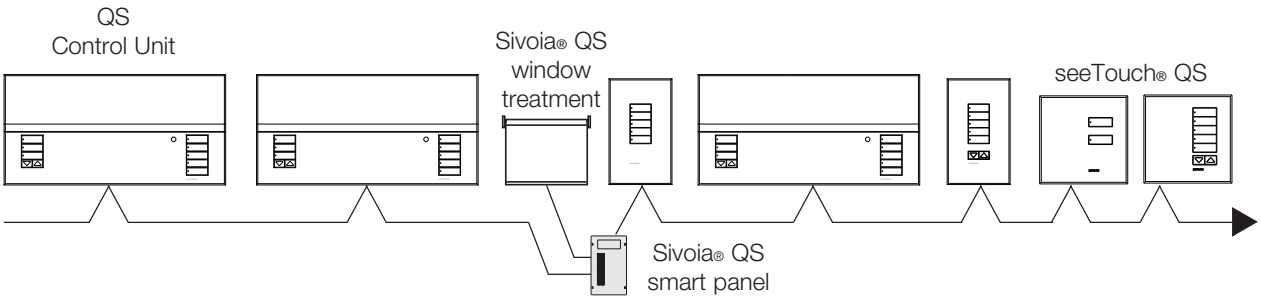
Job Name:	Model Numbers:	
Job Number:		

IEC PELV/NEC® Class 2 QS System Low-Voltage Wiring

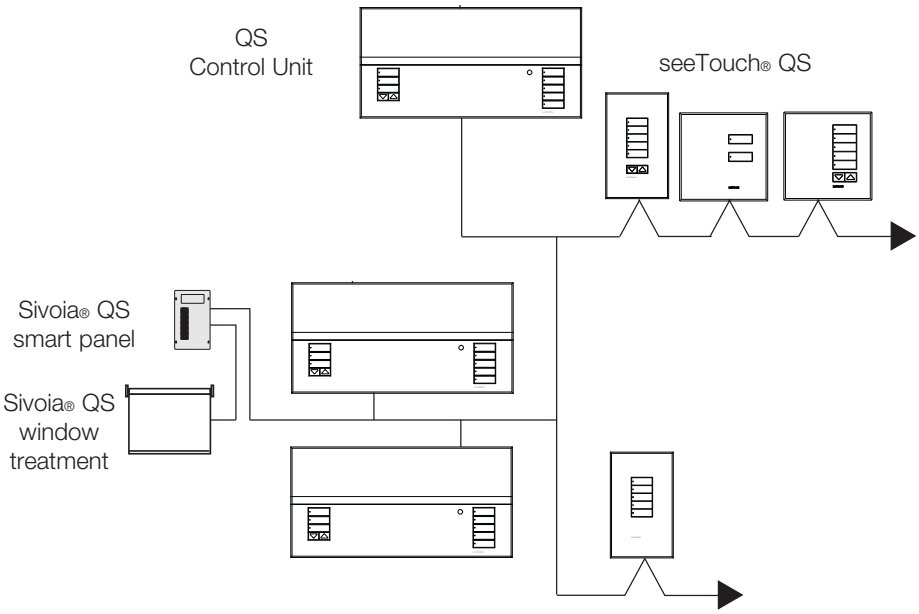
- System communication uses low-voltage wiring.
- Wiring can be daisy-chained or T-tapped.
- Wiring must be run separately from line/mains voltage.
- Total length of control link must not exceed 610 m (2 000 ft).
- IEC PELV/NEC® Class 2 wiring link:

QS Link Wiring Length	Wire Gauge	Lutron Cable Part Number
Less than 153 m (500 ft)	Power (terminals 1 and 2) 1 pair 1.0 mm² (18 AWG)	GRX-CBL-346S (non-plenum) GRX-PCBL-346S (plenum)
	Data (terminals 3 and 4) 1 twisted, shielded pair 0.5 mm² (22 AWG)	
153 to 610 m (500 to 2 000 ft)	Power (terminals 1 and 2) 1 pair 4.0 mm² (12 AWG)	GRX-CBL-46L (non-plenum) GRX-PCBL-46L (plenum)
	Data (terminals 3 and 4) 1 twisted, shielded pair 0.5 mm² (22 AWG)	

Daisy-Chain Wiring Example



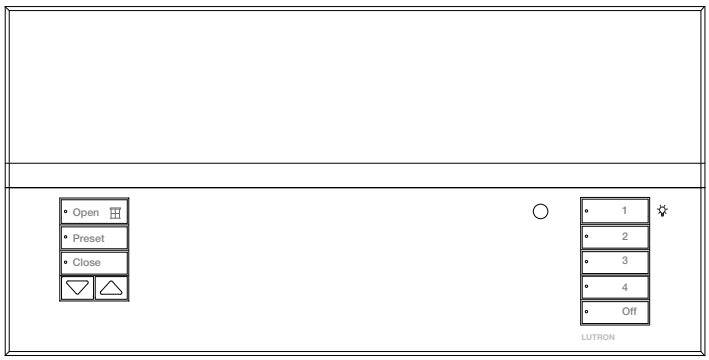
T-Tap Wiring Example



Job Name:	Model Numbers:	
Job Number:		

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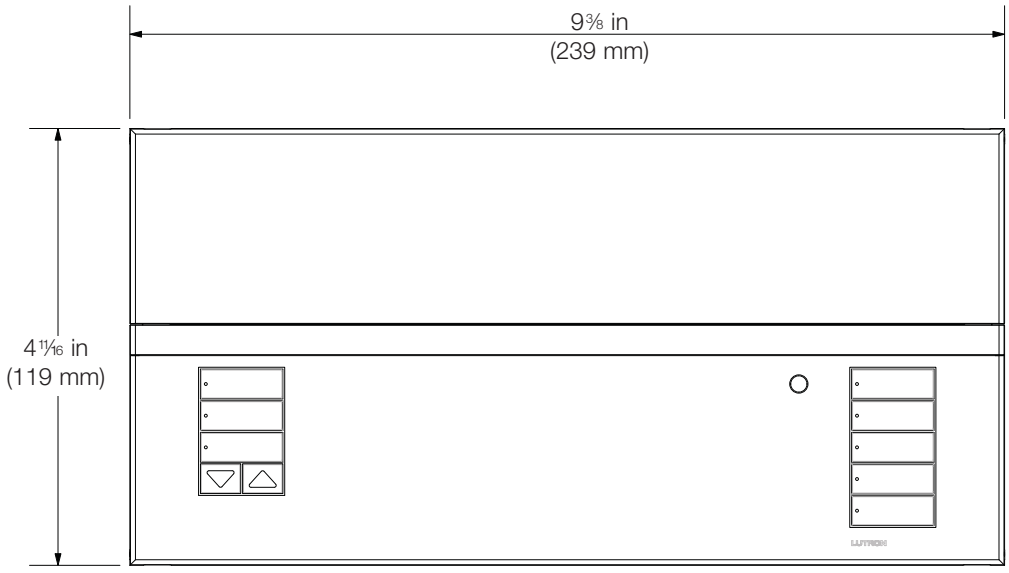
GRAFIK Eye® QS Wireless Control Unit



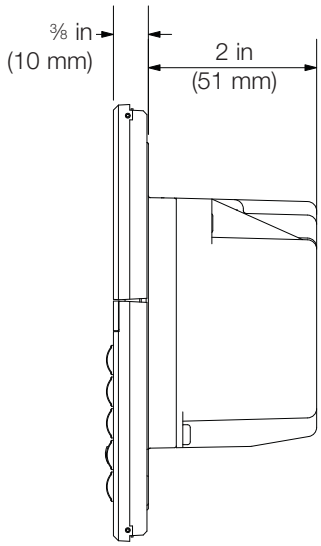
Description

GRAFIK Eye® QS Wireless is the premier energy-saving light and shade control. GRAFIK Eye® QS includes an astronomic timeclock, intuitive lighting presets, and direct shade control. Now with wireless technology, you can use the GRAFIK Eye® QS Wireless to seamlessly integrate with a variety of Lutron wireless products and systems, including RadioRA® 2, Radio Powr Savr™ occupancy, vacancy, and daylight sensors, Sivoia® QS Wireless shades, Pico® wireless controls, and other GRAFIK Eye® QS Wireless control units. Additionally, the GRAFIK Eye® QS Wireless is compatible with all Lutron wired QS products and systems, including Quantum® systems.

Mechanical Dimensions



Front View



Side View

Fits into a 4-gang U.S. backbox, 3½ in (89 mm) deep; Lutron P/N 241-400

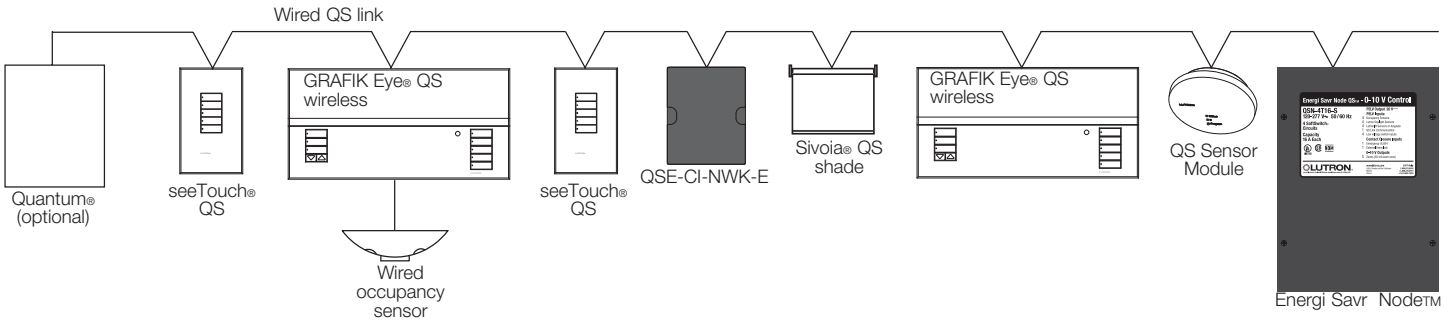
LUTRON® SPECIFICATION SUBMITTAL

Job Name:	Model Numbers:	
Job Number:		

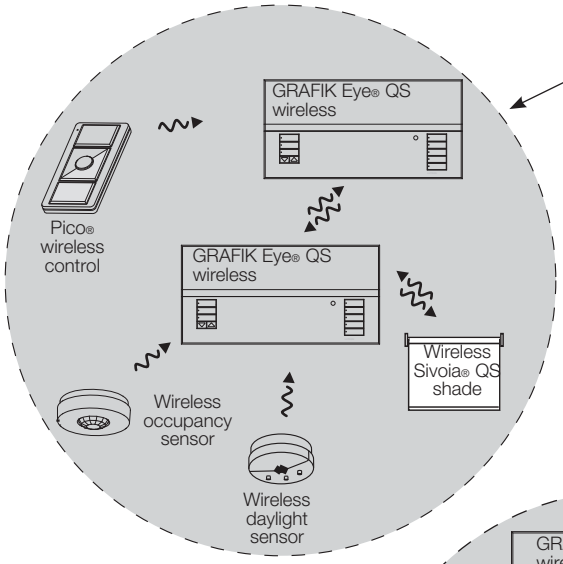
System Topologies

The GRAFIK Eye® QS Wireless can be specified in four different system topologies. Examples of each are shown below.

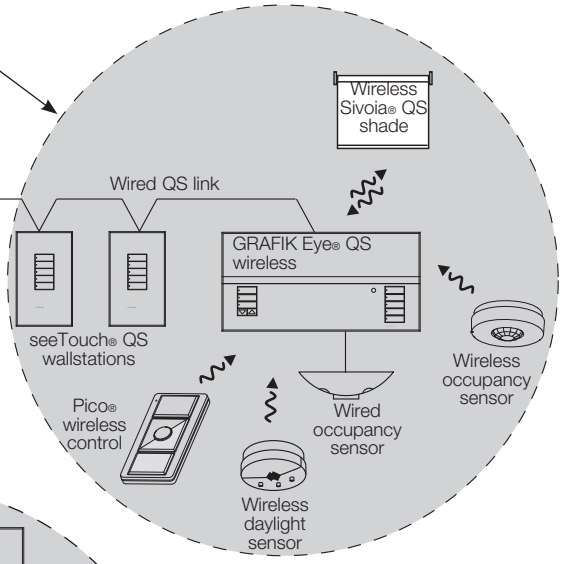
Example of Wired System



Example of GRAFIK Eye®-centric Wireless System



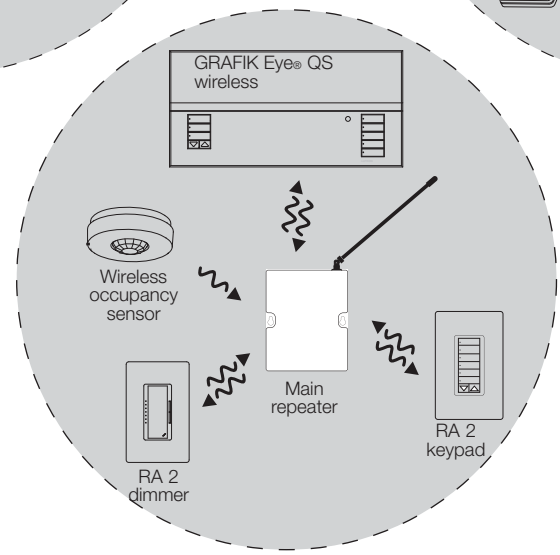
Example of Mixed Wired/GRAFIK Eye®-centric Wireless System



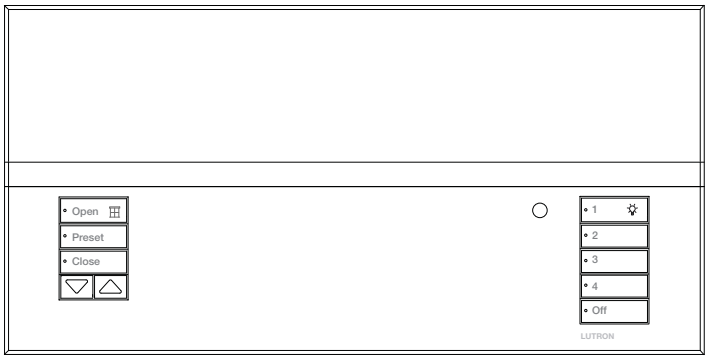
Example of Wireless System with Main Repeater (RadioRA® 2)

Refer to RadioRA® 2 documentation (www.lutron.com/radiora2) for specification information.

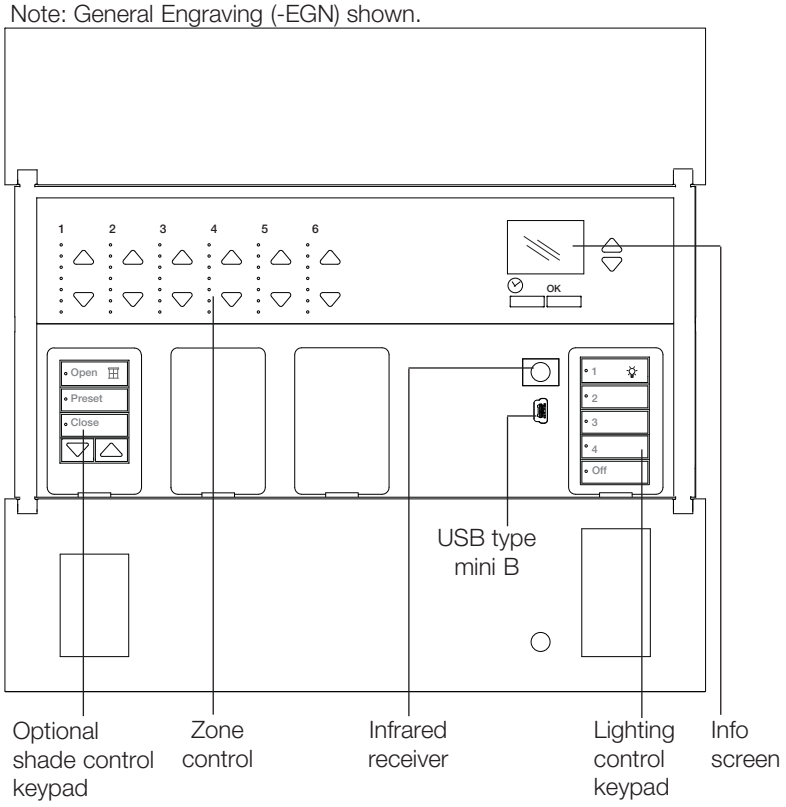
Note: Wired QS link is disabled when the GRAFIK Eye® QS is added to a RadioRA® 2 system.



Job Name:	Model Numbers:	
Job Number:		



Note: General Engraving (-EGN) shown.



Features

- Lutron's proprietary Clear Connect™ RF technology. Operates in the 431.0 – 437.0 MHz band.
- Pushbutton recall of four preset lighting scenes, plus Off.
- Twelve (12) additional scenes accessible through other QS devices, such as seeTouch® QS wallstations.
- Optional integrated shade control buttons, which can also be added to the unit after installation.
- Master override buttons to raise and lower all lights.
- Allows setup of lighting scenes and shade presets using buttons on the control unit.
- Built-in infrared (IR) receiver.
- External IR connection.
- Built-in astronomic timeclock.
- Info screen shows zone light level percentage, energy savings, zone labeling, and programming.
- Lockout option prevents accidental changes.
- One occupancy sensor input and 24 V⎓ power for occupancy sensor.
- QS communication link for seamless integration of lights, motorized window treatments, occupancy sensors, wallstations, and integration interfaces.
- Compatible with all Lutron QS system components.
- Wireless communication for seamless integration with a variety of Lutron wireless products and systems, including RadioRA® 2, Radio Powr Savr™ occupancy, vacancy, and daylight sensors, Sivoia® QS wireless shades, Pico® wireless control, HomeWorks® QS, and other GRAFIK Eye® QS wireless control units.
- Backlit buttons with engraving make unit easy to locate and operate.
- Available in a variety of colors and finishes.

Job Name:	Model Numbers:	
Job Number:		

Specifications

Input Power and Ratings

	240 V~ 50 / 60 Hz	120 V~ 50 / 60 Hz
Unit Capacity (watts)	2400	1200
MLV	2400 VA / 1920 W	1200 VA / 960 W
Zone Capacity (watts)	40 – 1200	25 – 800
MLV	40 – 1200 VA / 40 – 960 W	25 – 800 VA / 25 – 600 W

Environment

- 32 to 104 °F (0 to 40 °C)
- Relative humidity less than 90% non-condensing

Lighting Sources/Load Types

Controls the following lighting sources with a smooth, continuous square law dimming curve or on a full conduction non-dim basis:

- Incandescent
- Halogen
- Magnetic low-voltage transformer
- Lutron Tu-Wire® electronic fluorescent dimming ballast
- Advance Mark X® electronic dimming ballast
- Neon and cold cathode
- Non-dim (incandescent, magnetic low-voltage, Tu-Wire®, or neon/cold cathode)
- Cree LR4/6, 120 V~ fixtures

  For loading capacities, refer to the LED report card located at www.lutron.com/LEDtool

Controls the following lighting sources with a smooth, continuous square law dimming curve or on a full conduction non-dim basis through separate Lutron power interfaces:

- Electronic low-voltage transformer
- Lutron Hi-lume® and Eco-10® electronic fluorescent dimming ballasts
- Non-dim
- 0 - 10 V

Regulatory Approvals

- ANATEL

Key Design Features

- Lightning strike protection meets ANSI/IEEE standard 62.41-1980. Can withstand voltage surges of up to 6000 V~ and current surges of up to 3000 A.
- Tested to withstand 16 kV electrostatic discharge without damage or memory loss.
- RTISS equipped®: Compensates in real time for incoming line voltage variations (no visible flicker with +/-2% change in RMS voltage per cycle, and +/-2% Hz change in frequency per second).
- Power failure memory retains programming and light level settings for up to 10 years in the event of a power loss.
- The GRAFIK Eye® QS supplies 3 Power Draw Units (PDUs) on the QS link.
  For complete information, see “Power Draw Units on the QS Link,” Lutron PN 369405.
- Faceplate is hinged at the top and bottom, and stays open at 180° for ease of access.

Scene and Shade Buttons

- Large, rounded buttons are easy to use.
- Backlit buttons with optional engraving make it easy to find and to operate the control unit in low light conditions (backlight can be disabled).
- Optional button engraving is angled up to the eye for easy reading.
- Predefined label stickers are included for field labeling.
- 4 preset lighting scenes, plus Off, are accessible from the front of the control unit.
- 12 additional scenes are stored in the control unit and are accessible from seeTouch® QS wallstations and QS interfaces.
- Light levels fade smoothly between scenes. Fade time can be set differently for each scene: 0 to 59 seconds, or 1 to 60 minutes. Maximum fade time from Off is 3 seconds.

Job Name:	Model Numbers:	
Job Number:		

Specifications

Shade Control

- The GRAFIK Eye® QS can include up to 3 shade button columns. Each column has backlit open, preset, close, and raise/lower buttons.
- Each shade button column can be programmed to operate one shade or a group of shades. (Shades may be assigned to more than one shade button column).
- Faceplates are available with 1, 2 and 3 shade button columns.

Wireless shade limitations:

- Access to the Sivoia® QS Wireless electronic drive unit (EDU) is required to associate shades with the GRAFIK Eye® QS and set their raise/lower limits.
- Wired and wireless shades may not be programmed into the same shade button column; however, both may be used on the same GRAFIK Eye® QS control unit.
- Scene commands that affect wireless shades across multiple shade button columns will have a 1-second delay from column to column. This does not occur in RadioRA® 2 systems.

Zone Control

- Each zone has a dedicated raise and lower button to adjust the zone.
- Each zone has a dedicated 7 LED bar graph for level status. Percentage of light level and energy saved is displayed on the info screen.
- All zone information has blue backlit LEDs. Backlight turns off when idle for 30 seconds.

Info Screen

- OLED (organic LED) screen is viewable from all angles.
- Screen turns off when idle for 30 seconds.
- Programmable zone labels.
- Programmable scene labels.
- Status of real-time zone percentage and energy savings.
- Programmable timeclock schedules.
- Programmable shade labels.

Astronomic Timeclock

- Integral to all units.
- 7 daily schedules available.
- One available holiday schedule is programmable by date up to one year in advance.
- 25 events per day maximum.
- Timeclock events are programmable to control scenes that affect any Energi Savr Node™ unit connected on the QS link without changing the local scene on the GRAFIK Eye® QS.
- Astronomic times are programmable by integral city database or by entering latitude and longitude. Times automatically adjust throughout the year based on location.
- Automatically adjusts for Daylight Savings Time (DST), adjusted for the new dates; DST is programmable.
- Local timeclock events can activate any of the following features:
  - Scenes 1 to 16 and Off
  - Any available shade presets
  - Start and End afterhours mode
  - Enable and Disable daylighting for all zones/groups
  - Enable and Disable occupancy for occupancy/vacancy sensors
  - Enable and Disable occupied events for all occupancy sensors

Job Name:	Model Numbers:	
Job Number:		

Specifications

System Communications and Capacities

- Low-voltage type IEC PELV/NEC® Class 2 wiring connects control units, wallstations, motorized shades, and control interfaces.
- A QS system can have up to 100 devices and 100 zones.
- A GRAFIK Eye® can have up to 30 wireless devices associated to it.

Infrared

- Infrared (IR) receiver allows infrared transmitters to select 8 scenes, raise/lower lighting zones, or raise/lower shades.
- Transmitter buttons imitate buttons on faceplate.
- 50 ft (15 m) line of sight range.
- Terminal block infrared input for connection to a wired IR input from third-party equipment.
- IR can be disabled via programming.
- Works with Lutron GRX-IT and GRX-8IT infrared remote controls.

Accessory Controls: seeTouch® QS Wallstations (QSWS2 or QSWE)

- Wired seeTouch® QS keypads provide the following features:
  - Access to one or more of the 16 scenes on the GRAFIK Eye® QS Wireless
  - Zone toggle, partitioning, sequencing, fine tune, panic mode, and timeclock enable/disable
  - Contact closure inputs
  - Certain functions are only available on specific wallstation configurations. Refer to the seeTouch® QS specification submittal.

Accessory Controls: Pico® Wireless Control (QSR4P or MRF2 models)

- The Pico® Wireless Control is battery powered. It can control GRAFIK Eye® QS wireless control units within a 30 ft (10 m) range (60 ft/20 m in open air). It provides the following features:
  - Control of one or more zones on the GRAFIK Eye® QS Wireless: turns zone(s) on or off, raises/lowers zone(s), and goes to user-defined preset level
  - Scene control: the Pico® can access scene 1, scene 16, and Off on the GRAFIK Eye® QS, and can raise and lower lighting levels
- Use the QSR4P in systems with a RadioRA® 2 main repeater. The MRF2 models will NOT work with RadioRA® 2.

Accessory Controls: QS Sensor Module (QSM2)

- The QS Sensor Module provides a means to link wired or wireless occupancy and daylight sensors to a GRAFIK Eye® QS via the wired QS link.
- Occupancy sensors, daylight sensors, and Pico® wireless devices can be shared by one or more GRAFIK Eye® control units on the QS link.
  - Occupancy sensors wired (or wirelessly linked) to a QS Sensor Module can be used by one or more GRAFIK Eye® QS control units on the wired link.
  - Daylight sensors wired (or wirelessly linked) to a QS Sensor Module can be used by one or more GRAFIK Eye® QS control units on the wired link.
  - Pico® wireless controls can control either one or more zones or scenes on the GRAFIK Eye® QS.
  - Infrared sensors can control either one or more zones or scenes on the GRAFIK Eye® QS. Functionality varies; refer to the documentation for the QS Sensor Module for details.

Accessory Controls: Contact Closure Input/Output Interface (QSE-IO)

- Recalls preset light levels for the following set of scenes on the GRAFIK Eye® QS:
  Scenes 1-4 and Off Scenes 9-12 and Off
  Scenes 5-8 and Off Scenes 13-16 and Off
- Sequence scenes 5-16, Enable/Disable Zone Lockout, Enable/Disable Scene Lockout, Enable/Disable Panic Mode, Enable/Disable Timeclock.
- Occupancy Sensors. An individual input counts as 1 occupancy sensor for the GRAFIK Eye® QS. Each input can be assigned to either Scene Control or Zone Control (please refer to the Occupancy Sensor(s) section of this guide).
- Zone Toggle. Allows an input to toggle one or more zones to a preset level and off.
- Shade Output mode. A Shade Column on the GRAFIK Eye® QS can be linked to control outputs 1-3 and/or outputs 4-5 on the QSE-IO.
- Refer to the Specification Submittal for the QSE-IO for a full list of its available features.

Accessory Controls: DMX Output Interface (QSE-CI-DMX)

- Any zone on the GRAFIK Eye® QS control unit can be mapped to any single DMX512 Channel.
- Any zone on the GRAFIK Eye® QS control unit can be simultaneously mapped to any three DMX512 channels (providing RGB/CMY control).
- DMX loads cannot be used with daylighting.

Job Name:	Model Numbers:	
Job Number:		

Specifications

Accessory Controls: Ethernet and RS232 Interface (QSE-CI-NWK-E)

- Allows for monitoring and control of the outputs and local scenes of the GRAFIK Eye® QS.

Accessory Controls: QS Keyswitch Wallstations (QSWS2-KS)

- Recalls preset light levels for any two scenes including Off
- Allows fine-tuning (raise/lower level) of a zone or group of zones
- Starts/Stops scene sequencing (Scenes 1-4 or Scenes 5-16)
- Enables/Disables Timeclock
- Enables/Disables occupancy sensors
- Enables/Disabled daylight sensors
- Allows toggle of Zone(s) to a preset level and off
- Enables/Disables panic mode
- Starts/Stops afterhours mode

Other Accessory Controls and Devices

- Energi Savr Node™ QS (ESN)

Wireless RF Compatibility

- Features Lutron's proprietary Clear Connect™ RF Technology
- Operates in the 431.0 – 437.0 MHz band
- Compatible with other Lutron wireless products/systems, such as:
  - Pico® (P/N QSR4P or MRF2)
  - Radio Powr Savr™ occupancy/vacancy/daylight sensors (P/N LRF2-)
  - RadioRA® 2 wireless system
  - Sivoia® QS wireless products
  - Other GRAFIK Eye® QS wireless units (P/N QSGRJ-)
  - HomeWorks® QS system

Occupancy Sensor(s)

- The GRAFIK Eye® QS works with occupancy sensors through either:
  - Scene Control: Up to four sensors activate user-selectable occupancy and vacancy scenes.
  - Zone Control: Up to four sensors per zone activate user-selected occupancy and vacancy zone levels.
- Occupancy sensors may include:
  - Contact closure sensors wired to CCI input on back of GRAFIK Eye® QS
  - Wireless Radio Powr Savr™ occupancy or vacancy sensors (model numbers starting with LRF2)
  - Wired or wireless sensors connected QS Sensor Module (QSM)
- If any sensor in a group detects occupancy, then the GRAFIK Eye® QS will go to the designated occupancy scene or zone level.
- If all sensors in a group detect vacancy, then the GRAFIK Eye® QS will go to the designated vacancy scene or zone level.

Daylight Sensor(s)

- The GRAFIK Eye® QS allows daylight sensors to control one or more lighting zones to adjust electric light levels based on measured daylight levels.
- Daylight sensors may include:
  - Wireless Radio Powr Savr™ (model numbers starting with LRF2)
  - Wired or wireless sensors connected to a QS sensor module (QSM)
- A daylight sensor can control one or more GRAFIK Eye® QS zones:
  - Each zone can be calibrated to target light levels
  - A zone can be controlled by no more than one daylight sensor
- Daylight control can be enabled or disabled on a scene-by-scene basis
  - By default, daylight control is enabled in all scenes

Note: Daylight control through the GRAFIK Eye® QS only affects lighting loads. Shade groups cannot be controlled by daylight sensors. Daylighting does not affect DMX or RGB/CMY DMX loads.

Job Name:	Model Numbers:	
Job Number:		

Specifications

Contact Closure Input (CCI) with Power Supply Output

- Each GRAFIK Eye® QS has one contact closure input (Terminal A).
  - The attached device must provide a dry contact closure or solid-state output.
  - Input is miswire-protected up to 36 V⎓.
- The contact closure is capable of accepting the following types of inputs:
  - Maintained (default): The GRAFIK Eye® QS control unit will act on both a contact closure and a contact open/release event.
  - Momentary: The GRAFIK Eye® QS control unit will act on only contact closure events.
- Each GRAFIK Eye® QS can supply 50 mA maximum at 24 V⎓.
  - Useful for powering occupancy sensors.
  - An auxiliary power supply must be used if the device requires more than 50 mA.
- The CCI is capable of operating in the following modes
  - Occupancy: If an occupancy sensor is wired directly to the GRAFIK Eye® QS, choose this setting so that the occupancy sensor will work correctly.
  - Emergency: This setting allows the GRAFIK Eye® QS to work with a LUT-ELI. When an emergency situation is detected, all lights will go to full on, and no operations will be allowed until the emergency signal is cleared.
  - Afterhours: Allows the CCI to start and end the afterhours mode.
  - Timeclock: Allows the CCI to enable and disable the timeclock.
  - Scene Lockout: Prevents the user from making any changes to the control unit. The current scene will stay on until the CCI enables normal operation.
  - Never Save: Prevents any changes from being saved while the CCI is being used.
  - Disable CCI: The CCI will have no effect on the system and will not appear on the list of available sensors.

Security Lockout Password

- A 4-digit password (using characters A to Z and 0 to 9) can be enabled/disabled to lock out access to the Programming Menu.
- By default there is no password enabled on the GRAFIK Eye® QS.
- If case the 4-digit password is forgotten, contact Lutron Technical Support to regain access.

Job Name:	Model Numbers:	
Job Number:		

Capacities

	240 V~ 50 / 60 Hz	120 V~ 50 / 60 Hz
Unit Capacity (watts)	2400	1200
MLV	2400 VA / 1920 W	1200 VA / 960 W
Zone Capacity (watts)	40 – 1200	25 – 800
MLV	40 – 1200 VA / 40 – 960 W	25 – 800 VA / 25 – 600 W

Load Type Notes

- All electronic low-voltage (ELV) lighting used with an interface must be rated for reverse phase control dimming. Before installing an ELV light source, verify with the manufacturer that their transformer can be dimmed. When dimming, an ELV interface (check compatibility in your area for correct model; see www.lutron.com/qs for more information) must be used with the control unit.
- Not all zones must be connected; however, connected zones must have a minimum load as specified above.
- Maximum total lighting load for a magnetic low-voltage (MLV) varies by input voltage:
  - 120 V~: 800 VA / 600 W
  - 240 V~: 1200 VA / 960 W
- Maximum total lighting load for Lutron Tu-Wire® and Advance Mark X® electronic dimming ballasts (120 V~ only) must not exceed 6 A per zone or 10 A per unit.
- No zone may be loaded with more than the capacity specified above. For higher wattage applications, use a Lutron PHPM power module (check compatibility in your area for correct model; see www.lutron.com/qs for more information).
- For controlling low-wattage loads (CFL, LED) in a non-dim application, contact Lutron Technical Support for the appropriate solution.

System Limits

- The QS wired communication link is limited to 100 devices or 100 zones.

Job Name:	Model Numbers:	
Job Number:		

GRAFIK Eye® QS Wireless
Custom Color Options and Model Numbers
You must order a Base Unit and a Faceplate Kit

See Standard Color Combinations page for faceplate, stripe, and button colors

Base Unit

QSGRJ - _ PBA

- QSGRJ - Prefix
- _ Number of Zones
  - 3 = 3 zones
  - 4 = 4 zones
  - 6 = 6 zones
- PBA Phase Control Triac

Example:

QSGRJ-6PBA
6-zone base unit
and
QSGFP-2IV-EGN
Ivory faceplate kit with two shade columns and general engraving

Faceplate Kit
(includes coordinating stripe and buttons)

QSGFP - - -

- QSGFP Faceplate Prefix
- Number of Shade Columns
  - Omit = none
  - 1 = 1 column
  - 2 = 2 columns
  - 3 = 3 columns
- Top Door Color
  - Omit = same as unit
  - T = Translucent
- Color/Finish
- Keypad Engraving Code

Faceplate Custom Color/Finish Codes

Architectural Matte Finishes
Standard (ship in 48 hours)

White	WH
Ivory	IV
Beige	BE
Gray	GR
Brown	BR
Black	BL
Almond	AL
Light Almond	LA

Architectural Metal Finishes

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 Finishes

Clear	CLA
Black	BLA
Brass	BRA

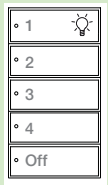
Satin Color Matte Finishes

Snow	SW
Biscuit	BI
Eggshell	ES
Taupe	TP
Midnight	MN
Limestone	LS
Stone	ST
Desert Stone	DS
Terracotta	TC
Hot	HT
Goldstone	GS
Palladium	PD
Plum	PL
Turquoise	TQ
Bluestone	BG
Sea Glass	SG
Greenbrier	GB
Sienna	SI
Merlot	MR
Mocha Stone	MS

Keypad Engraving Codes

Omit = Unengraved
Ships with engraving certificate that customer can redeem at no charge

EGN = General Engraving



Lighting keypad



Shade column

NST = Non-Standard Text Engraving
Please visit the GRAFIK Eye® QS website at **www.lutron.com/grafikeyeqs** for custom engraving forms. Submit completed form with order, and unit will ship engraved as specified by customer.

Job Name:	Model Numbers:	
Job Number:		

GRAFIK Eye® QS Wireless
Custom Options and Model Numbers

See previous pages for Standard and Other Custom Model Numbers
See Standard Color Combinations page for faceplate, stripe, and button colors

Custom Button Kit

QSGB - 5B - WH -

- QSGB: Custom Button Kit Prefix
- 5B: Button Configuration
- WH: Button Color/Finish
- Keypad Engraving Code

3BRL = 3-button with raise/lower (shade column)
5B = 5-button (lighting keypad)

Button Kit Custom Color/Finish Codes

Architectural Matte Finishes		Satin Color Matte Finishes	
White	WH	Snow	SW
Ivory	IV	Biscuit	BI
Beige	BE	Eggshell	ES
Gray	GR	Taupe	TP
Brown	BR		
Black	BL		
Almond	AL		
Light Almond	LA		

Keypad Engraving Codes

Omit = Unengraved
Ships with engraving certificate that customer can redeem at no charge

EGN = General Engraving



Lighting keypad



Shade column

NST = Non-Standard Text Engraving
Please visit the GRAFIK Eye® QS website at **www.lutron.com/grafikeyeqs** for custom engraving forms. Submit completed form with order, and unit will ship engraved as specified by customer.

Custom Stripe Kit

QSGS - WH

- QSGS: Stripe Kit Prefix
- WH: Stripe Color/Finish

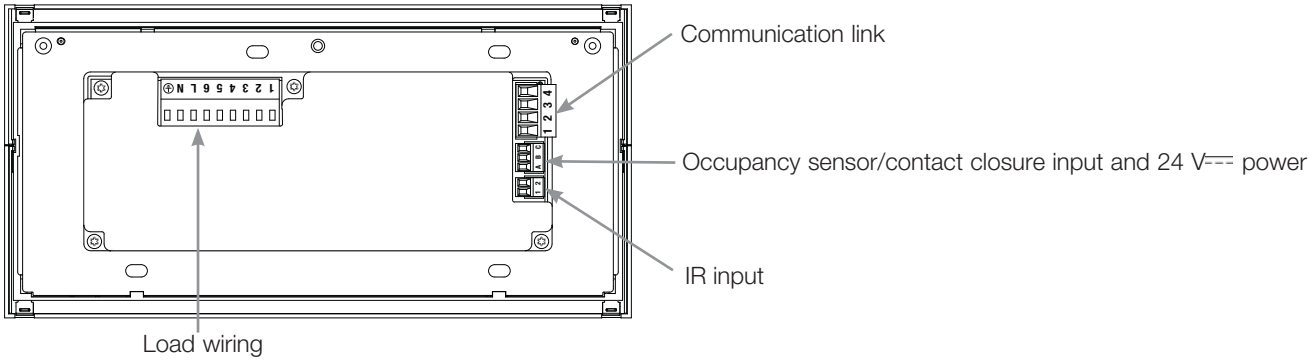
Stripe Custom Color/Finish Codes

Same as Faceplate colors on previous page

Job Name:	Model Numbers:	
Job Number:		

Wiring Diagrams

Terminations



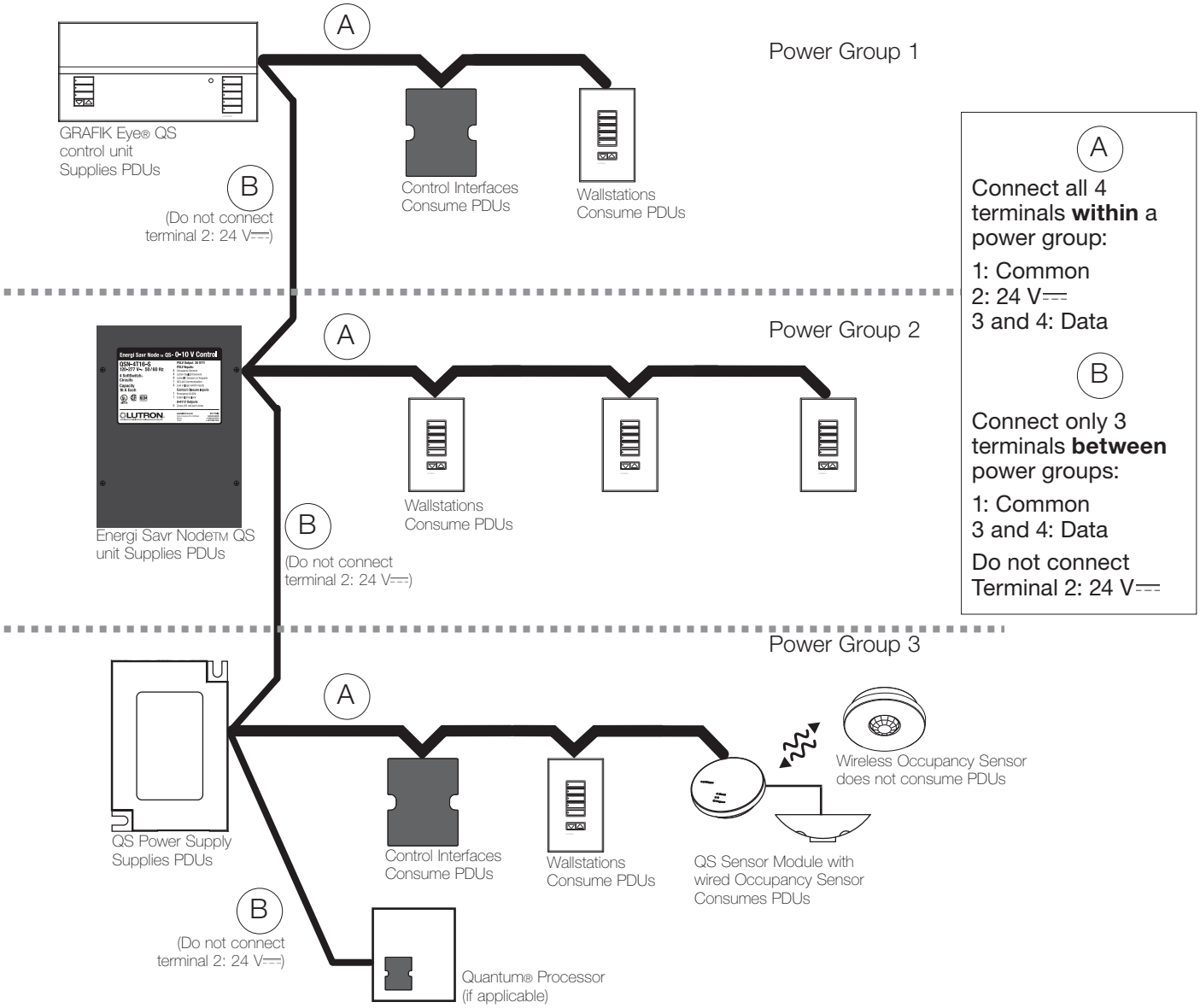
Job Name:	Model Numbers:	
Job Number:		

Power Group Wiring Example

On the QS link, there are devices that supply power and devices that consume power. Each device has a specific number of Power Draw Units (PDUs) it either supplies or consumes. A Power Group consists of one device that supplies power and one or more devices that consume power; each Power Group may have only one power-supplying device. Refer to the QS Link Power Draw Units specification submittal (Lutron PN 369405) for more information concerning PDUs.

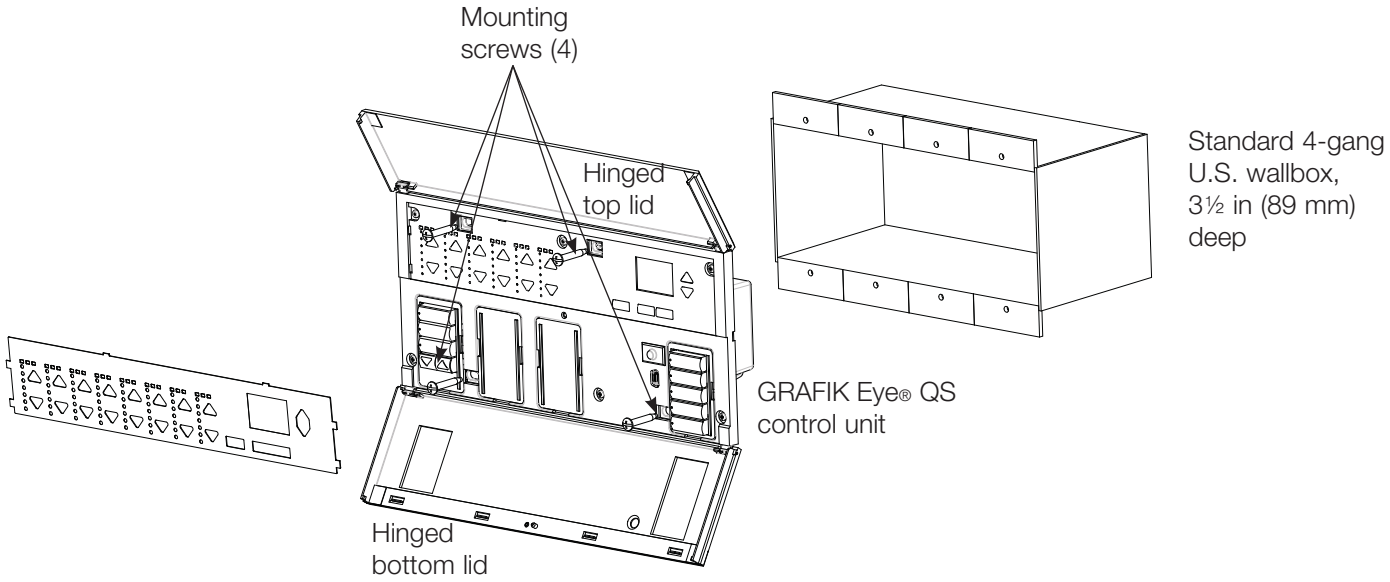
Within Power Groups on the QS link, connect all 4 terminals (1, 2, 3, and 4), shown by the letter A in the diagram. Between devices on the QS link that supply power, connect only terminals 1, 3, and 4 (NOT terminal 2), shown by the letter B on the diagram.

Wiring can be T-tapped or daisy-chained.

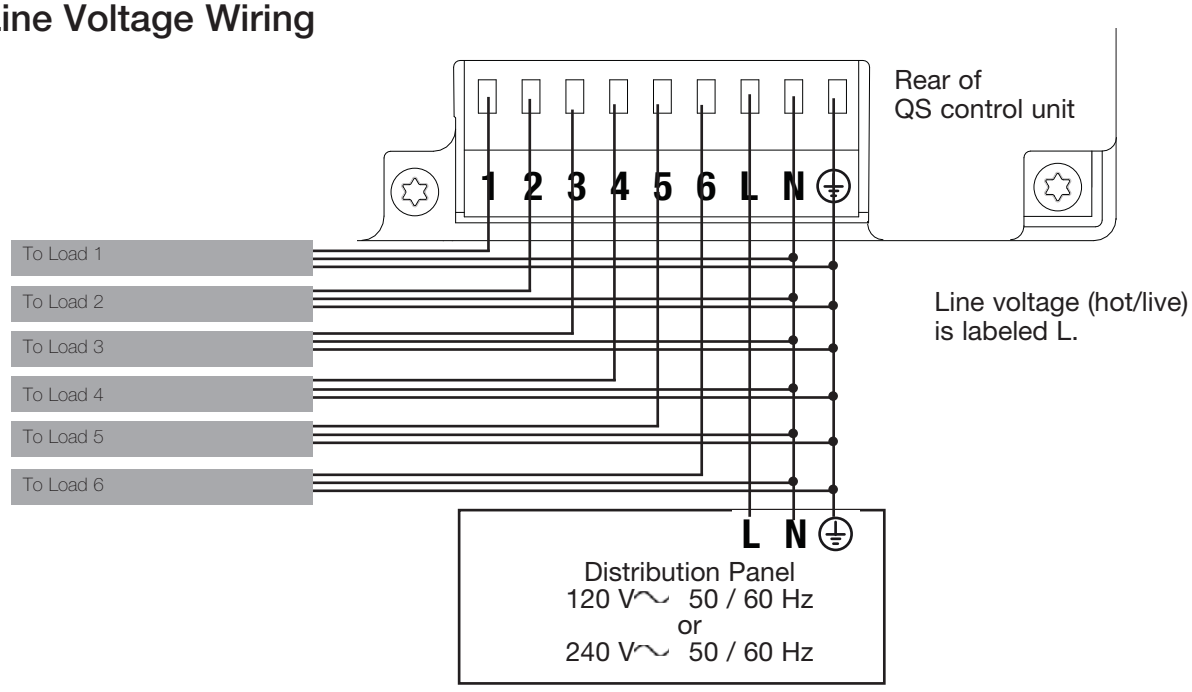


Job Name:	Model Numbers:	
Job Number:		

Mounting



Line Voltage Wiring



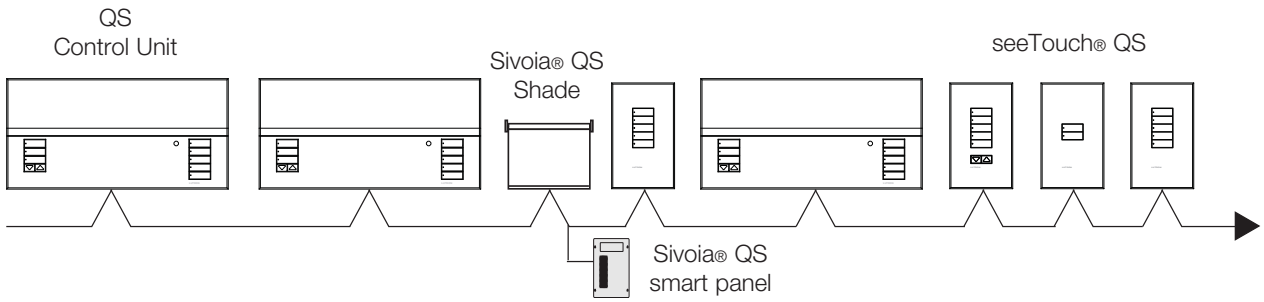
- Pull power wiring from distribution panel and to light fixtures.
- Each line voltage terminal can accept one 12 AWG (2.5 mm²) wire.
- Consult Lutron for non-dim relay wiring and/or load side emergency transfer wiring.

Job Name:	Model Numbers:	
Job Number:		

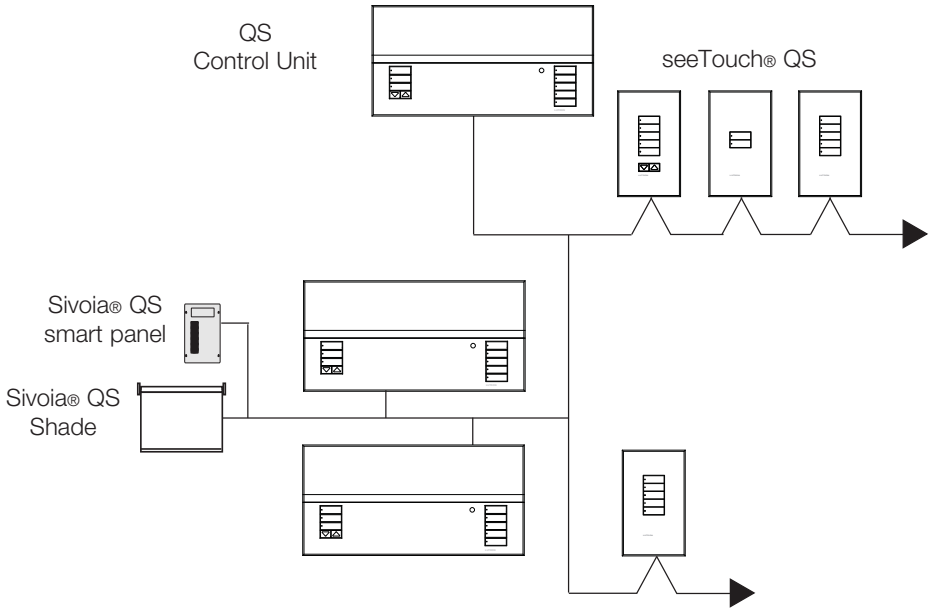
IEC PELV/NEC® Class 2 QS System Wiring

- System communication wiring can be daisy-chained or T-tapped.
- Wiring must be run separately from line/mains voltage.
- IEC PELV/NEC® Class 2 wiring link requires:
  Two 18 AWG (1.0 mm²) conductors for control power.
  One twisted, shielded pair of 22 AWG (0.5 mm²) for data link.
  Available from Lutron, P/N GRX-CBL-346S; check compatibility in your area.
- Total length of control link must not exceed 2000 ft (610 m).

Daisy-Chain Wiring Example



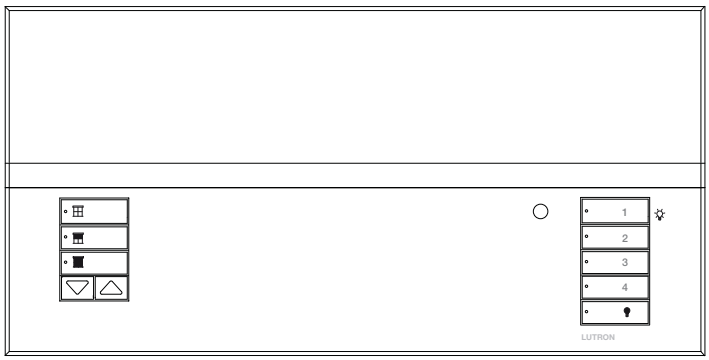
T-Tap Wiring Example



Job Name:	Model Numbers:	
Job Number:		

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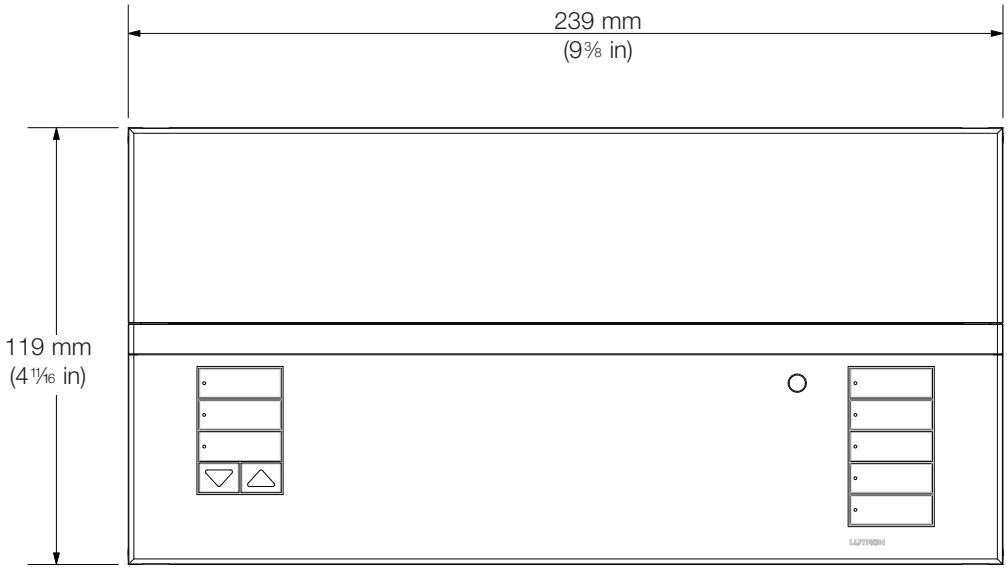
GRAFIK Eye® QS Wireless Control Unit (230 V~ 865 MHz)



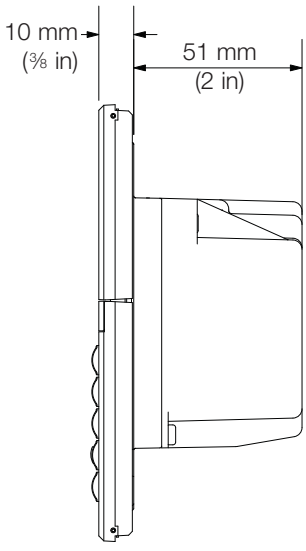
Description

The GRAFIK Eye® QS Wireless control unit is the premier energy-saving light and window treatment control. The GRAFIK Eye® QS control unit includes an astronomic timeclock, intuitive lighting presets, and direct window treatment control. Now with wireless technology, you can use the GRAFIK Eye® QS Wireless control unit to seamlessly integrate with a variety of Lutron wireless products and systems, including Radio Powr Savr™ occupancy, vacancy, and daylight sensors, Sivoia® QS Wireless window treatments, Pico® wireless controls, and other GRAFIK Eye® wireless products. Additionally, the GRAFIK Eye® QS Wireless control unit is compatible with all Lutron wired QS products and systems, including Quantum®.

Mechanical Dimensions



Front View



Side View

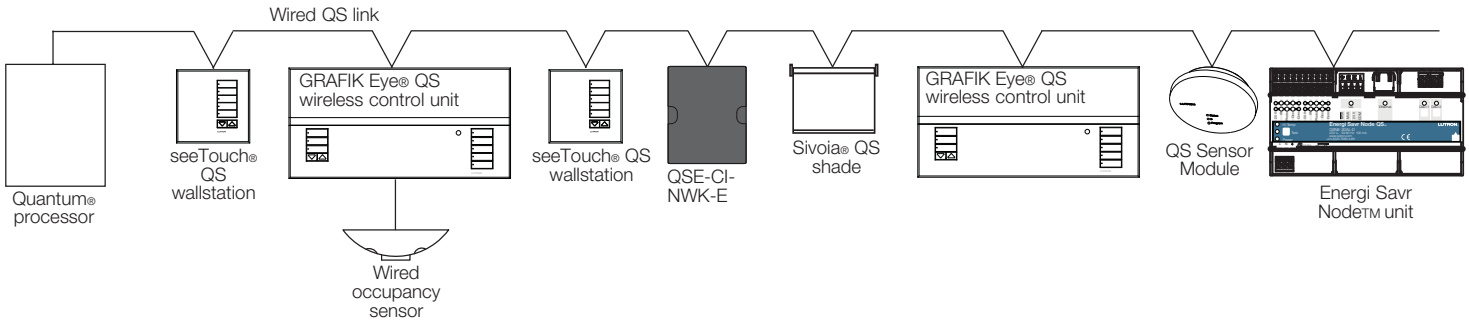
Fits into a 4-gang U.S. backbox, 89 mm (3½ in) deep, Lutron P/N 245-254; or 76 mm (3 in) deep, Lutron P/N 241-400.

Job Name:	Model Numbers:	
Job Number:		

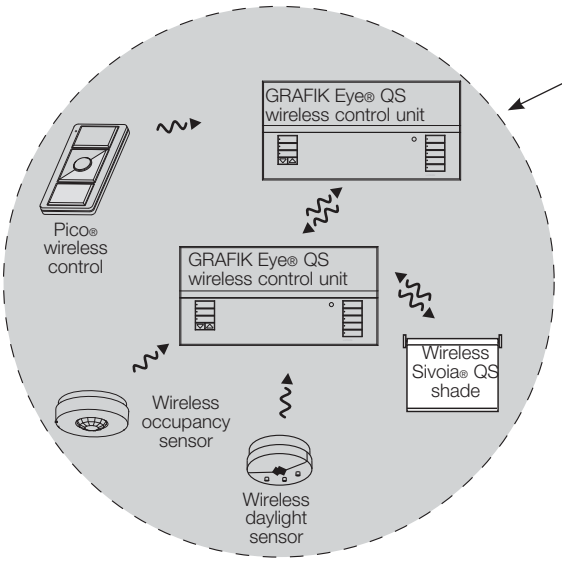
System Topologies

The GRAFIK Eye® QS Wireless control unit can be specified in three different system topologies. Examples of each are shown below.

Example of Wired System

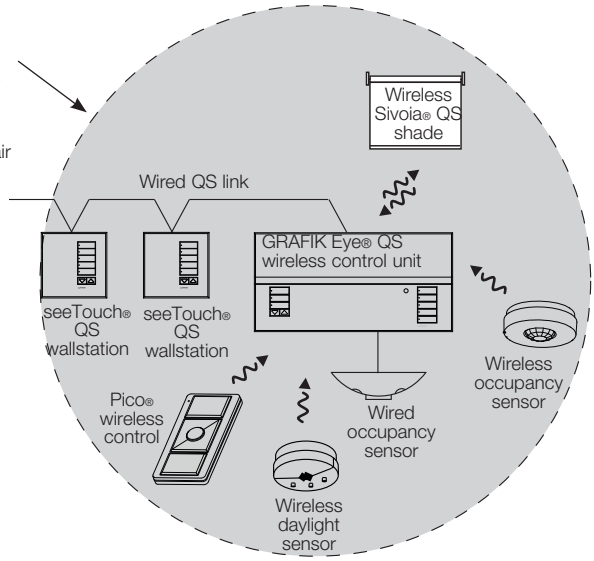


Example of GRAFIK Eye®-centric Wireless System



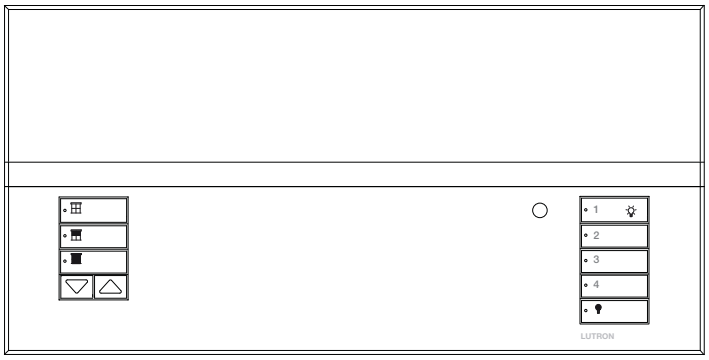
10 m (30 ft) wireless range; 20 m (60 ft) in open air

Example of Mixed Wired/GRAFIK Eye®-centric Wireless System

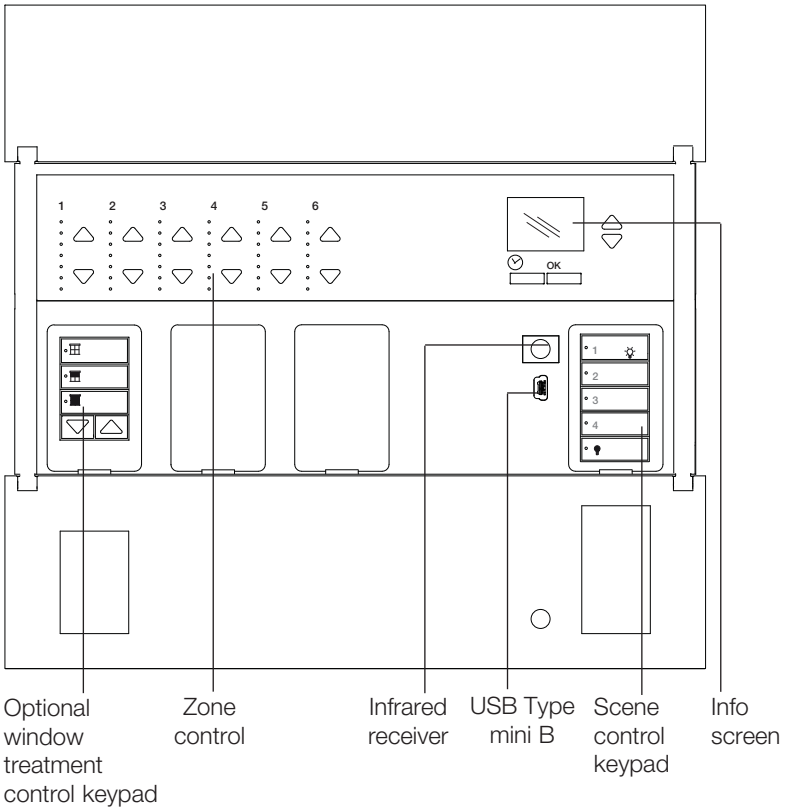


Job Name:	Model Numbers:	
Job Number:		

369420 Rev. B 3 11.18.11



Note: Symbol-based Engraving (-SGN) shown.



Features

- Lutron's proprietary Clear Connect™ RF technology. Operates in 865 MHz band.
- Pushbutton recall of four preset lighting scenes, plus Off.
- Twelve (12) additional scenes accessible through other QS devices, such as seeTouch® QS wallstations.
- Optional integrated window treatment control buttons, which can also be added to the unit after installation.
- Master override buttons to raise and lower all lights.
- Allows setup of lighting scenes and window treatment presets using buttons on the control unit.
- Built-in infrared (IR) receiver.
- External IR connection.
- Built-in astronomic timeclock.
- Info screen shows zone light level percentage, energy savings, zone labeling, and programming.
- Lockout option prevents accidental changes.
- One occupancy sensor input and 24 V⎓ power for occupancy sensor.
- QS communication link for seamless integration of lights, motorized window treatments, wallstations, and integration interfaces.
- Compatible with all Lutron QS system components.
- Wireless communication for seamless integration with a variety of Lutron wireless products and systems, including Radio Powr Savr™ occupancy and vacancy sensors, Sivoia® QS wireless window treatments, Pico® wireless control, and other GRAFIK Eye® QS wireless products.
- Backlit buttons with engraving make unit easy to locate and operate.
- Available in a variety of colors and finishes.

Job Name:	Model Numbers:	
Job Number:		

Specifications

Input Power

- 230 V~ 50 Hz

Lighting Sources/Load Types

Note: Maximum load 500 W per zone; 2 300 W total. Controls the following lighting sources with a smooth, continuous square law dimming curve or on a full conduction non-dim basis:

- Incandescent
- Halogen
- Magnetic low-voltage transformer
- Neon and cold cathode
- Non-dim (incandescent, magnetic low-voltage, or neon/cold cathode)

Controls the following lighting sources with a smooth, continuous square law dimming curve or on a full conduction non-dim basis through separate power interfaces:

- Electronic low-voltage transformer
- Non-dim
- 0 - 10 V

Key Design Features

- Protection Class: IP20.
- Lightning strike protection meets ANSI/IEEE standard 62.41-1980. Can withstand voltage surges of up to 6 000 V~ and current surges of up to 3 000 A.
- Tested to withstand 16 kV electrostatic discharge without damage or memory loss.
- RTISS™-equipped: Compensates in real time for incoming line voltage variations (no visible flicker with +/-2% change in RMS voltage per cycle, and +/-2% Hz change in frequency per second).
- Power failure memory retains programming and light level settings for up to 10 years in the event of a power loss.
- The GRAFIK Eye® QS control unit supplies 3 Power Draw Units (PDUs) on the QS link.
  For complete information, see “Power Draw Units on the QS Link,” Lutron PN 369405.
- Faceplate is hinged at the top and bottom, and stays open at 180° for ease of access.

Environment

- 0 to 40 °C (32 to 104 °F)
- Relative humidity less than 90% non-condensing

Regulatory Approvals

- WPC

Scene and Shade Buttons

- Large, rounded buttons are easy to use.
- Backlit buttons with optional engraving make it easy to find and to operate the control unit in low light conditions (backlight can be disabled).
- Optional button engraving is angled up to the eye for easy reading.
- Predefined label stickers are included for field labeling.
- 4 preset lighting scenes, plus Off, are accessible from the front of the control unit.
- 12 additional scenes are stored in the control unit and are accessible from seeTouch® QS wallstations and QS interfaces.
- Light levels fade smoothly between scenes. Fade time can be set differently for each scene: 0 to 59 seconds, or 1 to 60 minutes. Maximum fade time from Off is 3 seconds.

Shade Control

- The GRAFIK Eye® QS control unit can include up to 3 shade button columns. Each column has backlit open, preset, close, and raise/lower buttons.
- Each shade button column can be programmed to operate one shade or a group of shades. (Shades may be assigned to more than one shade button column).
- Faceplates are available with 1, 2 and 3 shade button columns.

Wireless shade limitations:

- Access to the Sivoia® QS Wireless electronic drive unit (EDU) is required to associate shades with the GRAFIK Eye® QS control unit and set their raise/lower limits.
- Wired and wireless shades may not be programmed into the same shade button column; however, both may be used on the same GRAFIK Eye® QS control unit.
- Scene commands that affect wireless shades across multiple shade button columns will have a 1-second delay from column to column. This does not occur in RadioRA® 2 systems.

Zone Control

- Each zone has a dedicated raise and lower button to adjust the zone.
- Each zone has a dedicated 7 LED bar graph for level status. Percentage of light level and energy saved is displayed on the info screen.
- All zone information has blue backlit LEDs. Backlight turns off when idle for 30 seconds.

Job Name:	Model Numbers:	
Job Number:		

Specifications

Info Screen

- OLED (organic LED) screen is viewable from all angles.
- Screen turns off when idle for 30 seconds.
- Programmable zone labels.
- Programmable scene labels.
- Status of real-time zone percentage and energy savings.
- Programmable timeclock schedules.
- Programmable window treatment labels.

Astronomic Timeclock

- Integral to all units.
- 7 daily schedules available.
- One available holiday schedule is programmable by date up to one year in advance.
- 25 events per day maximum.
- Timeclock events are programmable to control scenes that affect any Energi Savr Node™ unit connected on the QS link without changing the local scene on the GRAFIK Eye® QS control unit.
- Astronomic times are programmable by integral city database or by entering latitude and longitude. Times automatically adjust throughout the year based on location.
- Local timeclock events can activate any of the following features:
  - Scenes 1 to 16 and Off
  - Any available window treatment presets
  - Start and End afterhours mode
  - Enable and Disable daylighting for all zones/groups
  - Enable and Disable occupancy for occupancy/vacancy sensors
  - Enable and Disable occupied events for all occupancy sensors

System Communications and Capacities

- Low-voltage type IEC PELV/NEC® Class 2 wiring connects control units, wallstations, motorized window treatments, and control interfaces.
- A QS system can have up to 100 devices and 100 zones.
- A QS system can have up to 30 wireless devices.

Infrared

- Infrared (IR) receiver allows infrared transmitters to select 8 scenes, raise/lower lighting zones, or raise/lower window treatments.
- Transmitter buttons imitate buttons on faceplate.
- 15 m (50 ft) line of sight range.
- Terminal block infrared input for connection to a wired IR input from third-party equipment.
- IR can be disabled via programming.
- Works with Lutron GRX-IT and GRX-8IT infrared remote controls.

Wireless RF Compatibility

- Lutron's proprietary Clear Connect™ RF Technology operates in the 865 MHz band.
- Compatible with other Lutron wireless products/systems, such as:
  - Pico® wireless control (P/N QSRNP-)
  - Radio Powr Savr™ occupancy/vacancy/daylight sensors (P/N LRF5-)
  - Sivoia® QS wireless products
  - Other GRAFIK Eye® QS wireless control units (P/N QSGRN-)

Accessory Controls: seeTouch® QS Wallstations (QSWS2)

- Wired seeTouch® QS wallstations provide the following features:
  - Access to one or more of the 16 scenes on the GRAFIK Eye® QS Wireless control unit
  - Zone toggle, partitioning, sequencing, fine tune, panic mode, and timeclock enable/disable
  - Contact closure inputs
  - Certain functions are only available on specific wallstation configurations. Refer to the seeTouch® QS specification submittal.

Accessory Controls: Pico® Wireless Control (QSRNP models)

- The Pico® Wireless Control is battery powered. It can control GRAFIK Eye® QS wireless control units within a 10 m (30 ft) range (20 m/60 ft in open air). It provides the following features:
  - Control of one or more zones on the GRAFIK Eye® QS Wireless control unit: turns zone(s) on or off, raises/lowers zone(s), and goes to user-defined preset level
  - Scene control: the Pico® can access scene 1, scene 16, and Off on the GRAFIK Eye® QS control unit, and can raise and lower lighting levels

Job Name:	Model Numbers:	
Job Number:		

Specifications

Accessory Controls: QS Sensor Module (QSM5)

- The QS Sensor Module provides a means to link wired or wireless occupancy and daylight sensors to a GRAFIK Eye® QS control unit via the wired QS link.
  - Occupancy sensors wired (or wirelessly linked) to a QS Sensor Module can be used by one or more GRAFIK Eye® QS control units on the wired link.
  - Daylight sensors wired (or wirelessly linked) to a QS Sensor Module can be used by one or more GRAFIK Eye® QS control units on the wired link.
  - Pico® wireless controls can control either one or more zones or scenes on the GRAFIK Eye® QS control unit.
  - Infrared sensors can control either one or more zones or scenes on the GRAFIK Eye® QS control unit. Functionality varies; refer to the documentation for the QS Sensor Module for details.

Accessory Controls: Contact Closure Input/Output Interface (QSE-IO)

- Recalls preset light levels for the following set of scenes on the GRAFIK Eye® QS control unit:
  Scenes 1-4 and Off Scenes 9-12 and Off
  Scenes 5-8 and Off Scenes 13-16 and Off
- Sequence scenes 5-16, Enable/Disable Zone Lockout, Enable/Disable Scene Lockout, Enable/Disable Panic Mode, Enable/Disable Timeclock.
- Occupancy Sensors. An individual input counts as 1 occupancy sensor for the GRAFIK Eye® QS control unit. Each input can be assigned to either Scene Control or Zone Control (please refer to the Occupancy Sensor(s) section of this guide).
- Zone Toggle. Allows an input to toggle one or more zones to a preset level and off.
- Shade Output mode. A Shade Column on the GRAFIK Eye® QS control unit can be linked to control outputs 1-3 and/or outputs 4-5 on the QSE-IO.
- For a full list of features, refer to the QSE-IO Specification Submittal.

Accessory Controls: DMX Output Interface (QSE-CI-DMX)

- Any zone on the GRAFIK Eye® QS control unit can be mapped to any single DMX512 Channel.
- Any zone on the GRAFIK Eye® QS control unit can be simultaneously mapped to any three DMX512 channels (providing RGB/CMY control).
- DMX loads cannot be used with daylighting.

Accessory Controls: Ethernet and RS232 Interface (QSE-CI-NWK-E)

- Allows for monitoring and control of the outputs and local scenes of the GRAFIK Eye® QS control unit.

Accessory Controls: QS Keyswitch Wallstations (QSWS2-KS)

- Recalls preset light levels for any two scenes including Off.
- Allows fine-tuning (raise/lower level) of a zone or group of zones.
- Starts/Stops scene sequencing (Scenes 1-4 or Scenes 5-16).
- Enables/Disables Timeclock.
- Enables/Disables occupancy sensors.
- Enables/Disabled daylight sensors.
- Allows toggle of Zone(s) to a preset level and off.
- Enables/Disables panic mode.
- Starts/Stops afterhours mode.

Other Accessory Controls and Devices

- Energi Savr Node™ QS (ESN). Refer to the Specification Submittal for details.

Job Name:	Model Numbers:	
Job Number:		

Specifications

Occupancy Sensor(s)

- The GRAFIK Eye® QS control unit works with occupancy sensors through either:
  - Scene Control: Up to four sensors activate user-selectable occupancy and vacancy scenes.
  - Zone Control: up to four sensors per zone activate user-selected occupancy and vacancy zone levels.
- Occupancy sensors may include:
  - Contact closure sensors wired to CCI input on back of GRAFIK Eye® QS control unit
  - Wireless Radio Powr Savr™ occupancy or vacancy sensors (model numbers starting with LRF5)
  - Wired or wireless sensors connected QS Sensor Module (QSM5)
- If any sensor in a group detects occupancy, then the GRAFIK Eye® QS control unit will go to the designated occupancy scene or zone level.
- If all sensors in a group detect vacancy, then the GRAFIK Eye® QS control unit will go to the designated vacancy scene or zone level.

Daylight Sensor(s)

- The GRAFIK Eye® QS control unit allows daylight sensors to control one or more lighting zones to adjust electric light levels based on measured daylight levels.
- Daylight sensors may include:
  - Wireless Radio Powr Savr™ units (model numbers starting with LRF5)
  - Wired or wireless sensors connected to a QS sensor module (QSM5)
- A daylight sensor can control one or more GRAFIK Eye® QS control unit zones:
  - Each zone can be calibrated to target light levels
  - A zone can be controlled by no more than one daylight sensor
- Daylight control can be enabled or disabled on a scene-by-scene basis:
  - By default, daylight control is enabled in all scenes

Note: Daylight control through the GRAFIK Eye® QS control unit only affects lighting loads. Shade groups cannot be controlled by daylight sensors. Daylighting does not affect DMX or RGB/CMY DMX loads.

Contact Closure Input (CCI) with Power Supply Output

- Each GRAFIK Eye® QS control unit has one contact closure input (Terminal A).
  - The attached device must provide a dry contact closure or solid-state output.
  - Input is miswire-protected up to 36 V⎓.
- The contact closure is capable of accepting the following types of inputs:
  - Maintained (default): The GRAFIK Eye® QS control unit will act on both a contact closure and a contact open/release event.
  - Momentary: The GRAFIK Eye® QS control unit will act on only contact closure events.
- Each GRAFIK Eye® QS control unit can supply 50 mA maximum at 24 V⎓.
  - Useful for powering occupancy sensors.
  - An auxiliary power supply must be used if the device requires more than 50 mA.
- The CCI is capable of operating in the following modes
  - Occupancy: If an occupancy sensor is wired directly to the GRAFIK Eye® QS control unit.
  - Emergency: This setting allows the GRAFIK Eye® QS control unit to work with a LUT-ELI. When an emergency situation is detected, all lights will go to full on, and no operations will be allowed until the emergency signal is cleared.
  - Afterhours: Allows the CCI to start and end the afterhours mode.
  - Timeclock: Allows the CCI to enable and disable the timeclock.
  - Scene Lockout: Prevents the user from making any changes to the control unit. The current scene will stay on until the CCI enables normal operation.
  - Save Never: Prevents any changes from being saved while the CCI is being used.
  - Disable CCI: The CCI will have no effect on the system and will not appear on the list of available sensors.

Security Lockout Password

- A 4-character password (using characters A to Z and 0 to 9) can be enabled/disabled to lock out access to the Programming Menu.
- By default there is no password enabled on the GRAFIK Eye® QS control unit.
- In case the 4-digit password is forgotten, contact Lutron Technical Support to regain access.

Job Name:	Model Numbers:	
Job Number:		

Specifications

Capacities		
Zones	Unit Capacity (watts)	Zone Capacity (watts)
6	2 300	500

Load Type Notes

- For applications with ELV loads or load wattages exceeding the specified capacities, please refer to specifications for Lutron power modules or interfaces (NGRX-PB-AU; NGRX-ELVI-AU; NGRX-FDBI-AU).
- Not all loads must be connected; however, connected zones must have a minimum load of 40 W.
- Maximum total lighting load for a magnetic low-voltage zone is 500 VA / 400 W.
- No zone may be loaded with more than 500 W.
- For controlling low-wattage loads (CFL, LED) in a non-dim application, contact Lutron Technical Support for the appropriate solution.

System Limits

- The QS wired communication link is limited to 100 devices (wired or wireless) or 100 zones.

Job Name:	Model Numbers:	
Job Number:		

GRAFIK Eye® QS Wireless
Custom Color Options and Model Numbers
You must order a Base Unit and a Faceplate Kit
See Standard Color Combinations page for faceplate, stripe, and button colors

Base Unit

QSGRN - 6 PCE

- QSGRN: Prefix
- 6: 6 Zones
- PCE: Phase Control Triac-CE

Example:
QSGRN -6PCE
6-zone base unit
and
QSGFP-2IV-SGN
Ivory faceplate kit with two window treatment columns and symbol-based engraving

Faceplate Kit
(includes coordinating stripe and buttons; see Standard Color Combinations page)

QSGFP - - -

- Faceplate Prefix
- Number of Window Treatment Columns: Omit = none; 1 = 1 column; 2 = 2 columns; 3 = 3 columns
- Top Door Color: Omit = same as unit; T = Translucent
- Color/Finish
- Keypad Engraving Code

Faceplate Custom Color/Finish Codes

Architectural Matte Finishes

Standard (ship in 48 hours)

White	WH
Ivory	IV
Beige	BE
Gray	GR
Brown	BR
Black	BL
Almond	AL
Light Almond	LA

Architectural Metal Finishes

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 Finishes

Clear	CLA
Black	BLA
Brass	BRA

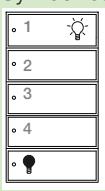
Satin Color Matte Finishes

Snow	SW
Biscuit	BI
Eggshell	ES
Taupe	TP
Midnight	MN
Limestone	LS
Stone	ST
Desert Stone	DS
Terracotta	TC
Hot	HT
Goldstone	GS
Palladium	PD
Plum	PL
Turquoise	TQ
Bluestone	BG
Sea Glass	SG
Greenbriar	GB
Sienna	SI
Merlot	MR
Mocha Stone	MS

Keypad Engraving Codes

Omit = Unengraved
Ships with engraving certificate that customer can redeem at no charge

SGN = Symbol-based Engraving



Lighting keypad


Window treatment column

NST = Non-Standard Text Engraving
Please visit the GRAFIK Eye® QS website at **www.lutron.com/grafikeyeqs** for custom engraving forms. Submit completed form with order, and unit will ship engraved as specified by customer.

Job Name:	Model Numbers:	
Job Number:		

GRAFIK Eye® QS Wireless
Custom Options and Model Numbers

See previous pages for Standard and Other Custom Model Numbers
See Standard Color Combinations page for faceplate, stripe, and button colors

Custom Button Kit

QSGB - 5B - WH -

- QSGB: Custom Button Kit Prefix
- 5B: Button Configuration
- WH: Button Color/Finish
- Keypad Engraving Code

3BRL = 3-button with raise/lower (window treatment column)
5B = 5-button (lighting keypad)

Button Kit Custom Color/Finish Codes

Architectural Matte Finishes		Satin Color Matte Finishes	
White	WH	Snow	SW
Ivory	IV	Biscuit	BI
Beige	BE	Eggshell	ES
Gray	GR	Taupe	TP
Brown	BR		
Black	BL		
Almond	AL		
Light Almond	LA		

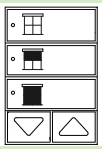
Keypad Engraving Codes

Omit = Unengraved
Ships with engraving certificate that customer can redeem at no charge

SGN = Symbol-based Engraving



Lighting keypad


Window treatment column

NST = Non-Standard Text Engraving
Please visit the GRAFIK Eye® QS website at **www.lutron.com/grafikeyeqs** for custom engraving forms. Submit completed form with order, and unit will ship engraved as specified by customer.

Custom Stripe Kit

QSGS - WH

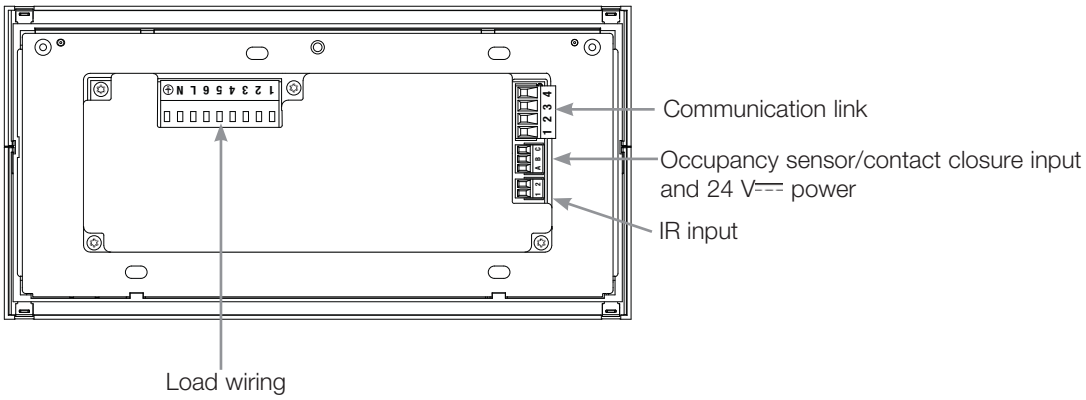
- QSGS: Stripe Kit Prefix
- WH: Stripe Color/Finish

Stripe Custom Color/Finish Codes
Same as Faceplate colors on previous page

Job Name:	Model Numbers:	
Job Number:		

Wiring Diagrams

Terminations



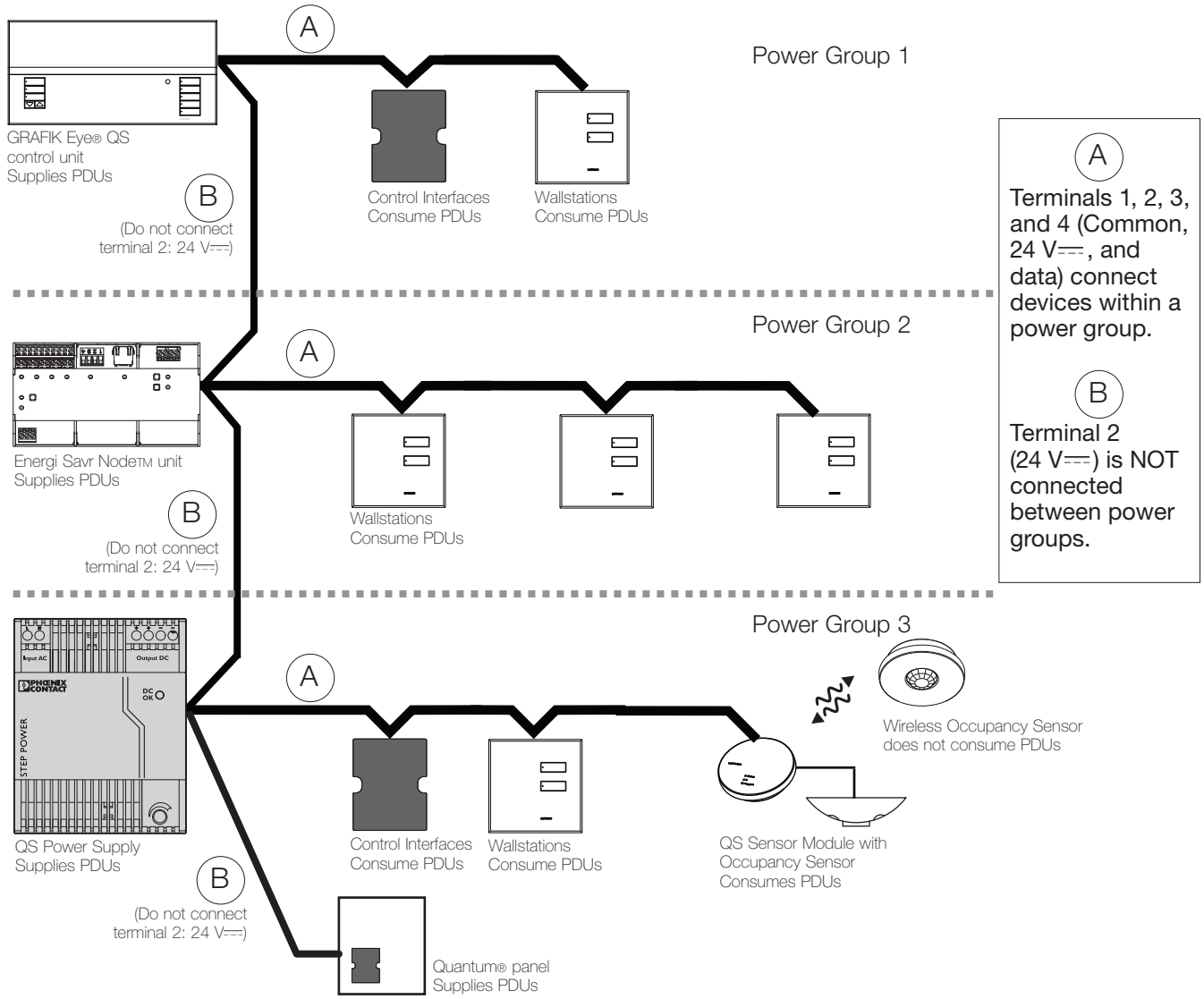
Job Name:	Model Numbers:	
Job Number:		

Power Group Wiring Example

On the QS link, there are devices that supply power and devices that consume power. Each device has a specific number of Power Draw Units (PDUs) it either supplies or consumes. A Power Group consists of one device that supplies power and one or more devices that consume power; each Power Group may have only one power-supplying device. Refer to the QS Link Power Draw Units specification submittal (Lutron PN 369405) for more information concerning PDUs.

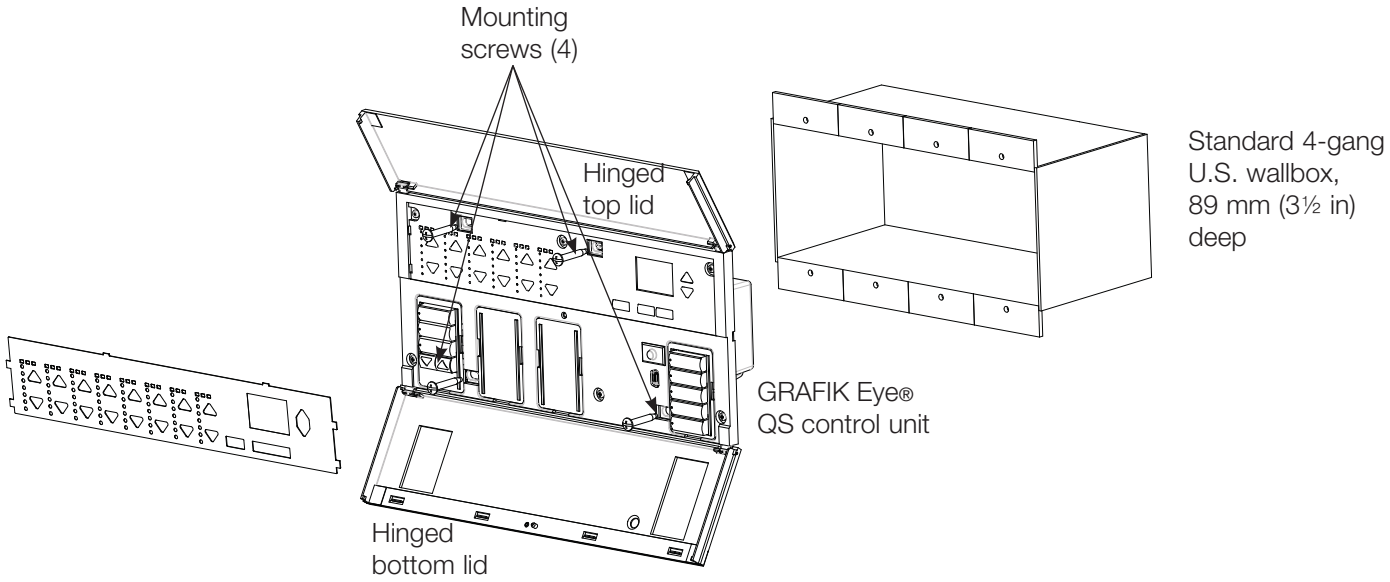
Within Power Groups on the QS link, connect all 4 terminals (1, 2, 3, and 4), shown by the letter A in the diagram. Between devices on the QS link that supply power, connect only terminals 1, 3, and 4 (NOT terminal 2), shown by the letter B on the diagram. Refer to the specific device documentation for wiring details.

Wiring can be T-tapped or daisy-chained.

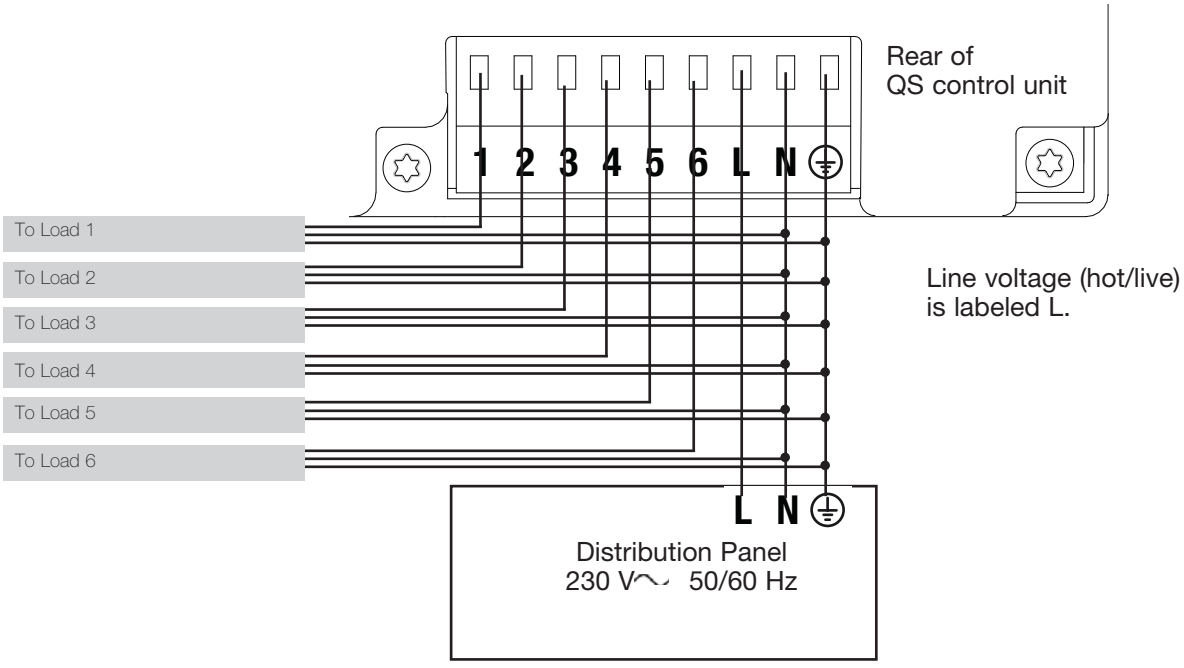


Job Name:	Model Numbers:	
Job Number:		

Mounting



Line Voltage Wiring



- Pull power wiring from distribution panel and to light fixtures.
- Each line voltage terminal can accept one 4,0 mm² (12 AWG) wire.
- Consult Lutron for non-dim relay wiring and/or load side emergency transfer wiring.

Job Name:	Model Numbers:	
Job Number:		

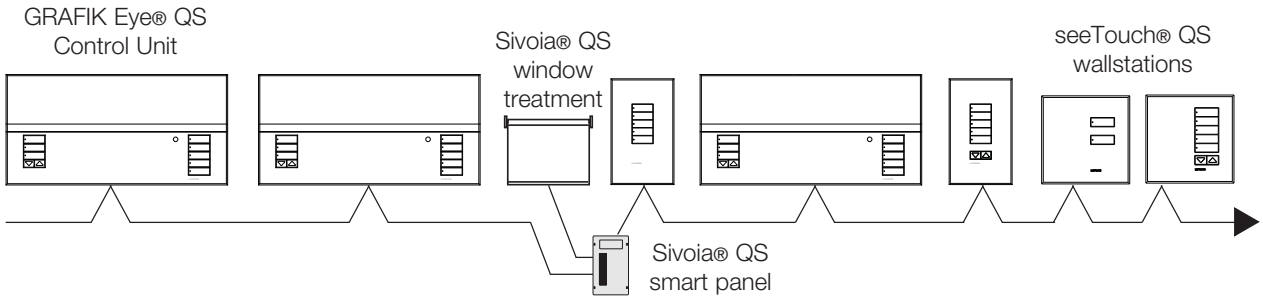
IEC PELV/NEC® Class 2 QS System Wiring

- Wiring can be daisy-chained or T-tapped.
- Wiring must be run separately from line/mains voltage.
- Total length of control link must not exceed 610 m (2 000 ft).

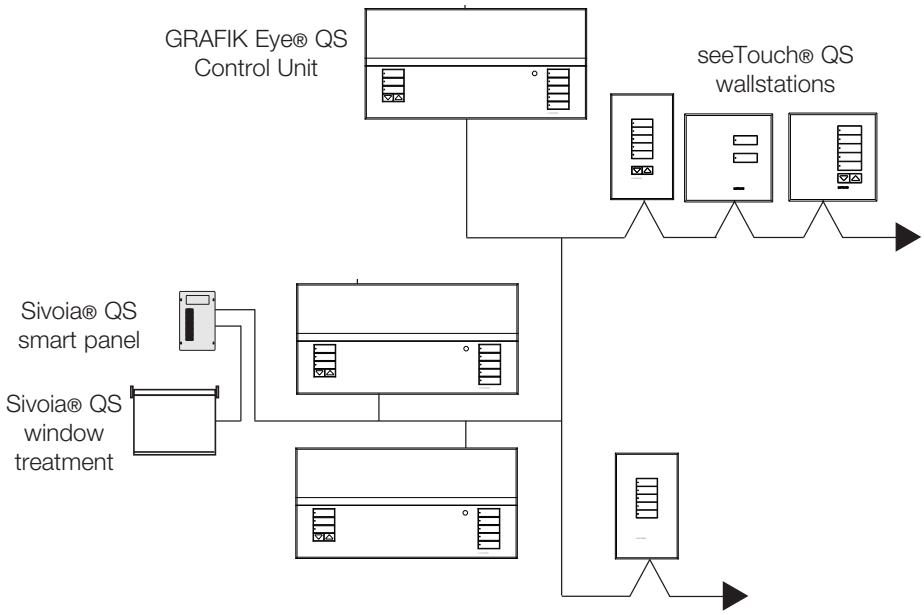
Wire Sizes (check compatibility in your area)

QS Link Wiring Length	Wire Gauge	Lutron Cable Part Number
Less than 153 m	Power (terminals 1 and 2) 1 pair 1,0 mm²	GRX-CBL-346S (non-plenum) GRX-PCBL-346S (plenum)
	Data (terminals 3 and 4) 1 twisted, shielded pair 0,5 mm²	
153 to 610 m	Power (terminals 1 and 2) 1 pair 4,0 mm²	GRX-CBL-46L (non-plenum) GRX-PCBL-46L (plenum)
	Data (terminals 3 and 4) 1 twisted, shielded pair 0,5 mm²	

Daisy-Chain Wiring Example



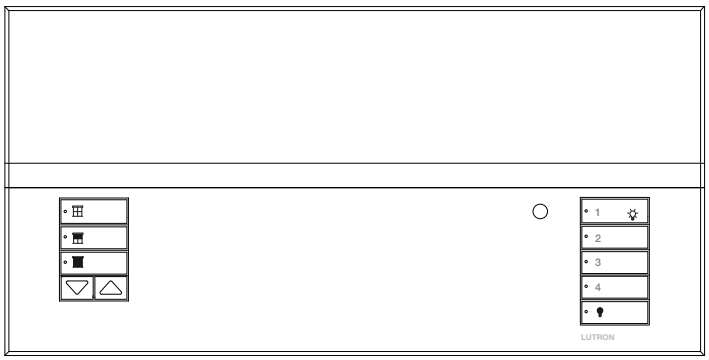
T-Tap Wiring Example



Job Name:	Model Numbers:	
Job Number:		

369311 Rev. A 1 03.07.11

GRAFIK Eye® QS Control Unit (230 V~ CE)



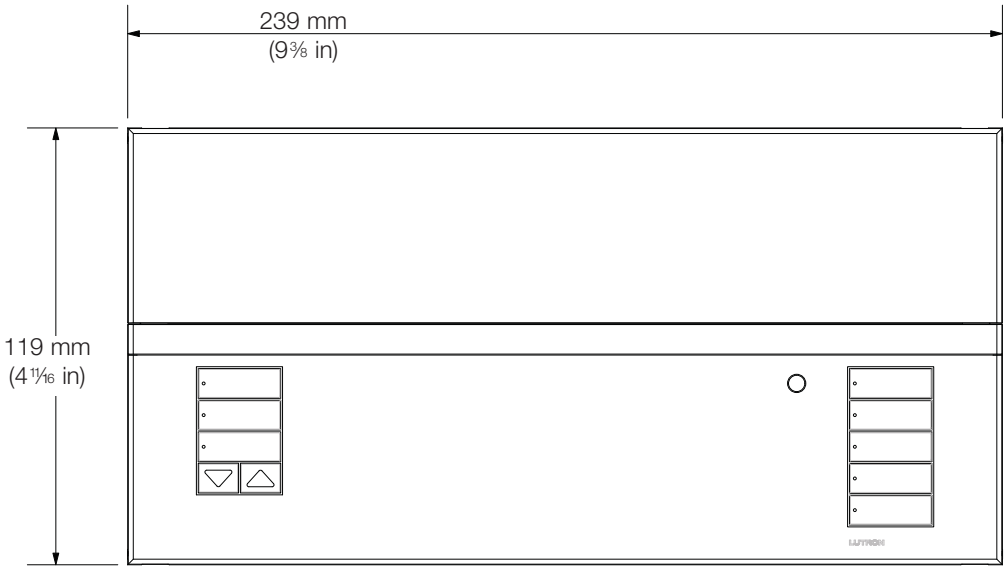
Description

GRAFIK Eye QS is the premier energy-saving light and window treatment control. *GRAFIK Eye* QS includes an astronomic timeclock, intuitive lighting presets, and direct window treatment control. Additionally, the *GRAFIK Eye* QS is compatible with all Lutron wired QS products and systems.

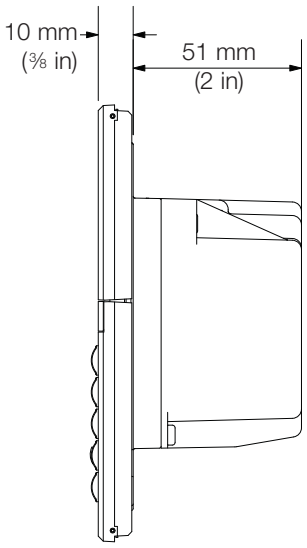
GRAFIK Eye QS is compatible with Quantum®.

Mechanical Dimensions

Fits into a 4-gang U.S. backbox, 3.5 in (89 mm) deep;
Lutron P/N 241-400



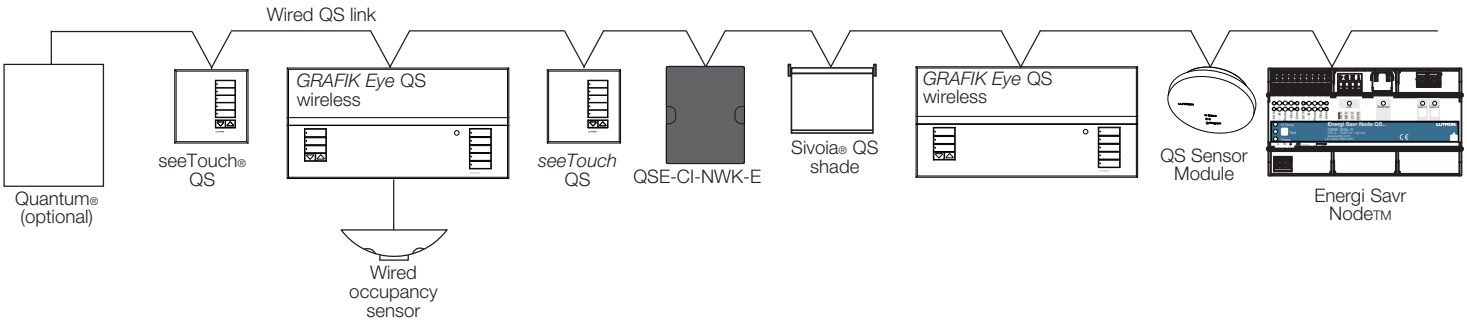
Front View



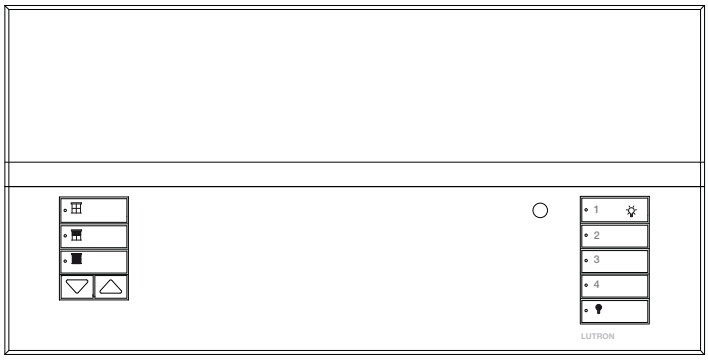
Side View

System Topology

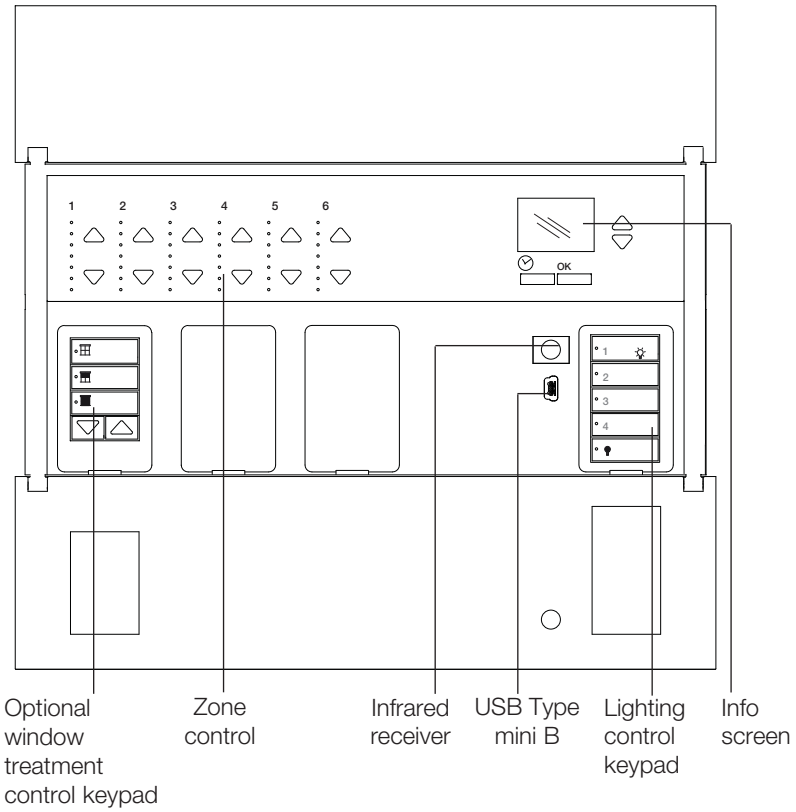
Example of Wired System



Job Name:	Model Numbers:	
Job Number:		



Note: Symbol-based Engraving (-SGN) shown.



Features

- Pushbutton recall of four preset lighting scenes, plus Off.
- Twelve (12) additional scenes accessible through other QS devices, such as seeTouch® QS wallstations.
- Optional integrated window treatment control buttons, which can also be added to the unit after installation.
- Master override buttons to raise and lower all lights.
- Allows setup of lighting scenes and window treatment presets using buttons on the control unit.
- Built-in infrared (IR) receiver.
- External IR connection.
- Built-in astronomic timeclock.
- Info screen shows zone light level percentage, energy savings, zone labeling, and programming.
- Lockout option prevents accidental changes.
- One occupancy sensor input and 24 V⎓ power for occupancy sensor.
- QS communication link for seamless integration of lights, motorised window treatments, wallstations, and integration interfaces.
- Compatible with all Lutron QS system components.
- Backlit buttons with engraving make unit easy to locate and operate.
- Available in a variety of colours and finishes.

Job Name:	Model Numbers:	
Job Number:		

Specifications

Input Power

- 230 V~ 50 Hz

Lighting Sources/Load Types

Controls the following lighting sources with a smooth, continuous square law dimming curve or on a full conduction non-dim basis:

- Incandescent
- Halogen
- Magnetic low-voltage transformer
- Neon and cold cathode
- Non-dim (incandescent, magnetic low-voltage, or neon/cold cathode)

Controls the following lighting sources with a smooth, continuous square law dimming curve or on a full conduction non-dim basis through separate power interfaces:

- Electronic low-voltage transformer
- Non-dim
- 0 - 10 V

Key Design Features

- Lightning strike protection meets ANSI/IEEE standard 62.41-1980. Can withstand voltage surges of up to 6 000 V~ and current surges of up to 3 000 A.
- Tested to withstand 16 kV electrostatic discharge without damage or memory loss.
- RTISS™-equipped: Compensates in real time for incoming line voltage variations (no visible flicker with +/-2% change in RMS voltage per cycle, and +/-2% Hz change in frequency per second).
- Power failure retains programming and light level settings for up to 10 years in the event of a power loss..
- The *GRAFIK Eye* QS supplies 3 Power Draw Units (PDUs) on the QS link.
  For complete information, see “Power Draw Units on the QS Link,” Lutron PN 369405
- Faceplate is hinged at the top and bottom, and stays open at 180° for ease of access.

Environment

- 32 to 104 °F (0 to 40 °C).
- Relative humidity less than 90% non-condensing.

Compliance

- CE

Scene and Window Treatment Buttons

- Large, rounded buttons are easy to use.
- Backlit buttons with optional engraving make it easy to find and to operate the control unit in low light conditions (backlight can be disabled).
- Optional button engraving is angled up to the eye for easy reading.
- Predefined label stickers are included for field labeling.
- 4 preset lighting scenes, plus Off, are accessible from the front of the control unit.
- 12 additional scenes are stored in the control unit and are accessible from seeTouch® QS wallstations and QS interfaces.
- Light levels fade smoothly between scenes. Fade time can be set differently for each scene: 0 to 59 seconds, or 1 to 60 minutes. Maximum fade time from Off is 3 seconds.

Shade Control

- The *GRAFIK Eye* QS can include up to 3 shade button columns. Each column has backlit open, preset, close, and raise/lower buttons.
- Each shade button column can be programmed to operate one shade or a group of shades. (Shades may be assigned to more than one shade button column).
- Faceplates are available with 1, 2 and 3 shade button columns.

Zone Control

- Each zone has a dedicated raise and lower button to adjust the zone.
- Each zone has a dedicated 7 LED bar graph for level status. Percentage of light level and energy saved is displayed on the info screen.
- All zone information has blue backlit LEDs. Backlight turns off when idle for 30 seconds.

Info Screen

- OLED (organic LED) screen is viewable from all angles.
- Screen turns off when idle for 30 seconds.
- Programmable zone labels.
- Programmable scene labels.
- Status of real-time zone percentage and energy savings.
- Programmable timeclock schedules.
- Programmable window treatment labels.

Job Name:	Model Numbers:	
Job Number:		

Specifications

Astronomic Timeclock

- Integral to all units.
- 7 daily schedules available.
- One available holiday schedule is programmable by date up to one year in advance.
- 25 events per day maximum.
- Timeclock events are programmable to control scenes that affect any Energi Savr Node™ QS unit connected on the QS link without changing the local scene on the GRAFIK Eye® QS.
- Astronomic times are programmable by integral city database or by entering latitude and longitude. Times automatically adjust throughout the year based on location.
- Automatically adjusts for Daylight Saving Time (DST), adjusted for the new dates; DST is programmable.
- Local timeclock events can activate any of the following features:
  - Scenes 1 to 16 and Off
  - Any available window treatment presets
  - Start and End afterhours mode
  - Enable and Disable daylighting for all zones/groups
  - Enable and Disable occupancy for occupancy/vacancy sensors
  - Enable and Disable occupied events for all occupancy sensors

System Communications and Capacities

- Low-voltage type IEC PELV/NEC® Class 2 wiring connects control units, wallstations, motorised window treatments, and control interfaces.
- A QS system can have up to 100 devices and 100 zones.

Infrared

- Infrared (IR) receiver allows infrared transmitters to select 8 scenes, raise/lower lighting zones, or raise/lower window treatments.
- Transmitter buttons imitate buttons on faceplate.
- 15 m (50 ft) line of sight range.
- Terminal block infrared input for connection to a wired IR input from third-party equipment.
- IR can be disabled via programming.
- Works with Lutron GRX-IT and GRX-8IT infrared remote controls.

Accessory Controls: seeTouch® QS Wallstations (QSWS2)

- Wired *seeTouch* QS keypads provide the following features:
  - Access to one or more of the 16 scenes on the *GRAFIK Eye* QS Wireless control unit
  - Zone toggle, partitioning, sequencing, fine tune, panic mode, and timeclock enable/disable
  - Contact closure inputs
  - Certain functions are only available on specific wallstation configurations. Refer to the *seeTouch* QS specification submittal.

Accessory Controls: QS Sensor Module (QSM)

- The QS Sensor Module provides a means to link wired or wireless occupancy and daylight sensors to a *GRAFIK Eye* QS via the wired QS link.
  - Occupancy sensors wired (or wirelessly linked) to a QS Sensor Module can be used by one or more *GRAFIK Eye* QS control units on the wired link.
  - Daylight sensors wired (or wirelessly linked) to a QS Sensor Module can be used by one or more *GRAFIK Eye* QS control units on the wired link.
  - Infrared sensors can control either one or more zones or scenes on the *GRAFIK Eye* QS. Functionality varies; refer to the documentation for the QS Sensor Module for details.
  - *Pico* wireless controls can control either one or more zones or scenes on the *GRAFIK Eye* QS.

Accessory Controls: Contact Closure Input/Output Interface (QSE-IO)

- Recalls preset light levels for the following set of scenes on the *GRAFIK Eye* QS:
  Scenes 1-4 and Off Scenes 9-12 and Off
  Scenes 5-8 and Off Scenes 13-16 and Off
- Sequence scenes 5-16, Enable/Disable Zone Lockout, Enable/Disable Scene Lockout, Enable/Disable Panic Mode, Enable/Disable Timeclock.
- Occupancy Sensors. An individual input counts as 1 occupancy sensor for the *GRAFIK Eye* QS. Each input can be assigned to either Scene Control or Zone Control (please refer to the Occupancy Sensor(s) section of this guide).
- Zone Toggle. Allows an input to toggle one or more zones to a preset level and off.
- Shade Output mode. A Shade Column on the *GRAFIK Eye* QS can be linked to control outputs 1-3 and/or outputs 4-5 on the QSE-IO.

Job Name:	Model Numbers:	
Job Number:		

Specifications

Accessory Controls:
DMX Output Interface (QSE-CI-DMX)

- Any zone on the GRAFIK Eye® QS control unit can be mapped to any single DMX512 Channel.
- Any zone on the *GRAFIK Eye* QS control unit can be simultaneously mapped to any three DMX512 channels (providing RGB/CMY control).
- DMX loads cannot be used with daylighting.

Accessory Controls: Ethernet and RS232 Interface (QSE-CI-NWK-E)

- Allows for monitoring and control of the outputs and local scenes of the *GRAFIK Eye* QS.

Accessory Controls: QS Keyswitch Wallstations (QSWS2-KS)

- Recalls preset light levels for any two scenes including Off
- Allows fine-tuning (raise/lower level) of a zone or group of zones
- Starts/Stops scene sequencing (Scenes 1-4 or Scenes 5-16)
- Enables/Disables Timeclock
- Enables/Disables occupancy sensors
- Enables/Disabled daylight sensors
- Allows toggle of Zone(s) to a preset level and off
- Enables/Disables panic mode
- Starts/Stops afterhours mode

Other Accessory Controls and Devices

- Energi Savr Node® QS (ESN)

Occupancy Sensor(s)

- The *GRAFIK Eye* QS works with occupancy sensors through either:
  - Scene Control: Up to four sensors activate user-selectable occupancy and vacancy scenes.
  - Zone Control: up to four sensors per zone activate user-selected occupancy and vacancy zone levels.
- Occupancy sensors may include:
  - Contact closure sensors wired to CCI input on back of *GRAFIK Eye* QS
  - Wired sensors connected to *Energi Savr Node*
  - Wired or wireless sensors connected QS Sensor Module (QSM)
- If any sensor in a group detects occupancy, then the *GRAFIK Eye* QS will go to the designated occupancy scene or zone level.
- If all sensors in a group detect vacancy, then the *GRAFIK Eye* QS will go to the designated vacancy scene or zone level.

Daylight Sensor(s)

- The *GRAFIK Eye* QS allows daylight sensors to control one or more lighting zones to adjust electric light levels based on measured daylight levels.
- Daylight sensors may include:
  - Wired or wireless sensors connected to a QS sensor module (QSM)
- A daylight sensor can control one or more *GRAFIK Eye* QS zones:
  - Each zone can be calibrated to target light levels
  - A zone can be controlled by no more than one daylight sensor
- Daylight control can be enabled or disabled on a scene-by-scene basis
  - By default, daylight control is enabled in all scenes

Note: Daylight control through the *GRAFIK Eye* QS only affects lighting loads. Shade groups cannot be controlled by daylight sensors. Daylighting does not affect DMX or RGB/CMY DMX loads.

Job Name:	Model Numbers:	
Job Number:		

Contact Closure Input (CCI) with Power Supply Output

- Each GRAFIK Eye® QS has one contact closure input (Terminal A).
  - The attached device must provide a dry contact closure or solid-state output.
  - Input is miswire-protected up to 36 V⎓.
- The contact closure is capable of accepting the following types of inputs:
  - Maintained (default): The *GRAFIK Eye* QS control unit will act on both a contact closure and a contact open/release event.
  - Momentary: The *GRAFIK Eye* QS control unit will act on only contact closure events.
- Each *GRAFIK Eye* QS can supply 50 mA maximum at 24 V⎓.
  - Useful for powering occupancy sensors.
  - An auxiliary power supply must be used if the device requires more than 50 mA.
- The CCI is capable of operating in the following modes
  - Occupancy: If an occupancy sensor is wired directly to the *GRAFIK Eye* QS.
  - Emergency: This setting allows the *GRAFIK Eye* QS to work with a LUT-ELI. When an emergency situation is detected, all lights will go to full on, and no operations will be allowed until the emergency signal is cleared.
  - Afterhours: Allows the CCI to start and end the afterhours mode.
  - Timeclock: Allows the CCI to enable and disable the timeclock.
  - Scene Lockout: Prevents the user from making any changes to the control unit. The current scene will stay on until the CCI enables normal operation.
  - Save Never: Prevents any changes from being saved while the CCI is being used.
  - Disable CCI: The CCI will have no effect on the system and will not appear on the list of available sensors.

Security Lockout Password

- A 4-digit password (using characters A to Z and 0 to 9) can be enabled/disabled to lock out access to the Programming Menu.
- By default there is no password enabled on the *GRAFIK Eye* QS.
- If case the 4-digit password is forgotten, contact Lutron® Technical Support to regain access.

Job Name:	Model Numbers:	
Job Number:		

Specifications

Capacities		
Zones	Unit Capacity (watts)	Zone Capacity Capacity (watts)
3	1 500	500
4	2 000	500
6	2 300	500

Load Type Notes

- For applications with ELV loads or load wattages exceeding the specified capacities, please refer to specifications for Lutron power modules (NGRX-PB-CE; NGRX-ELVI-CE; ELVI-1000-CE).
- Not all loads must be connected; however, connected zones must have a minimum load of 40 W.
- Maximum total lighting load for a magnetic low-voltage zone is 500 VA / 400 W.
- No zone may be loaded with more than 500 W.

System Limits

- The QS wired communication link is limited to 100 devices (wired or wireless) or 100 zones.

Job Name:	Model Numbers:	
Job Number:		

GRAFIK Eye® QS
Custom Colour Options and Model Numbers
You must order a Base Unit and a Faceplate Kit
See Standard Colour Combinations page for faceplate, stripe, and button colours

Base Unit

QSGR - _ PCE

- QSGR — Prefix
- _ — Number of Zones
  - 3 = 3 zones
  - 4 = 4 zones
  - 6 = 6 zones
- PCE — Phase Control Triac-CE

Example:

QSGR-6PCE
6-zone base unit
and
QSGFP-2IV-SGN
Ivory faceplate kit with two window treatment columns and symbol-based engraving

Faceplate Kit
(includes coordinating stripe and buttons; see Standard Colour Combinations page)

QSGFP - - -

- QSGFP — Faceplate Prefix
- Number of Window Treatment Columns
  - Omit = none
  - 1 = 1 column
  - 2 = 2 columns
  - 3 = 3 columns
- Top Door Colour
  - Omit = same as unit
  - T = Translucent
- Colour/Finish
- Keypad Engraving Code

Faceplate Custom Colour/Finish Codes

Architectural Matte Finishes

Standard (ship in 48 hours)	
White	WH
Ivory	IV
Beige	BE
Gray	GR
Brown	BR
Black	BL
Almond	AL
Light Almond	LA

Architectural Metal Finishes

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

Anodised Aluminum Finishes

Clear	CLA
Black	BLA
Brass	BRA

Satin Colour Matte Finishes

Snow	SW
Biscuit	BI
Eggshell	ES
Taupe	TP
Midnight	MN
Limestone	LS
Stone	ST
Desert Stone	DS
Terracotta	TC
Hot	HT
Goldstone	GS
Palladium	PD
Plum	PL
Turquoise	TQ
Bluestone	BG
Sea Glass	SG
Greenbrier	GB
Sienna	SI
Merlot	MR
Mocha Stone	MS

Keypad Engraving Codes

Omit = Unengraved
Ships with engraving certificate that customer can redeem at no charge

SGN = Symbol-based Engraving



Lighting keypad


Window treatment column

NST = Non-Standard Text Engraving
Please visit the *GRAFIK Eye* QS website at **www.lutron.com/grafikeyeqs** for custom engraving forms. Submit completed form with order, and unit will ship engraved as specified by customer.

Job Name:	Model Numbers:	
Job Number:		

GRAFIK Eye® QS
Custom Options and Model Numbers
See previous page for Custom Model Numbers
See Standard Colour Combinations page for faceplate, stripe, and button colours

Custom Button Kit

QSGB - 5B - WH -

- QSGB: Custom Button Kit Prefix
- 5B: Button Configuration
- WH: Button Colour/Finish
- Keypad Engraving Code

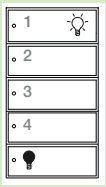
3BRL = 3-button with raise/lower (window treatment column)
5B = 5-button (lighting keypad)

Button Kit Custom Colour/Finish Codes

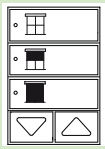
Architectural Matte Finishes		Satin Colour Matte Finishes	
White	WH	Snow	SW
Ivory	IV	Biscuit	BI
Beige	BE	Eggshell	ES
Gray	GR	Taupe	TP
Brown	BR		
Black	BL		
Almond	AL		
Light Almond	LA		

Keypad Engraving Codes

Omit = Unengraved
Ships with engraving certificate that customer can redeem at no charge
SGN = Symbol-based Engraving



Lighting keypad


Window treatment column

NST = Non-Standard Text Engraving
Please visit the *GRAFIK Eye* QS website at **www.lutron.com/grafikeyeqs** for custom engraving forms. Submit completed form with order, and unit will ship engraved as specified by customer.

Custom Stripe Kit

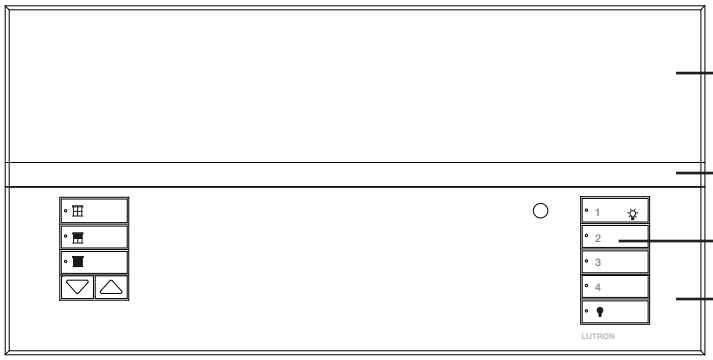
QSGS - WH

- QSGS: Stripe Kit Prefix
- WH: Stripe Colour/Finish

Stripe Custom Colour/Finish Codes
Same as Faceplate colours on previous page

Job Name:	Model Numbers:	
Job Number:		

GRAFIK Eye® QS Standard Colour Combinations
See previous pages for Custom Model Numbers



Faceplate is comprised of a top and bottom. The bottom will always be the colour indicated under "faceplate." The top may be the same colour or translucent. Use the chart for faceplates that have the same colour top and bottom. If a translucent lid is chosen, the stripe will automatically be the same colour as the bottom lid.

Example:
If you order QSGR-4PCE-1WH, your *GRAFIK Eye* QS with 4 lighting zones and 1 window treatment column will come with a white faceplate (both top and bottom), gray stripe, and white buttons.

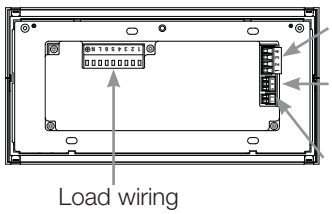
Suffix	Faceplate (F)	Stripe (S)	Button (B)
Architectural Matte			
WH	White	Gray	White
IV	Ivory	Beige	Ivory
BE	Beige	Ivory	Beige
GR	Gray	Black	Gray
BR	Brown	Black	Brown
BL	Black	Gray	Black
AL	Almond	Light Almond	Almond
LA	Light Almond	Almond	Light Almond
Architectural Metal			
BB	Bright Brass	Black	Black
BC	Bright Chrome	Black	Black
BN	Bright Nickel	Black	Black
SB	Satin Brass	Black	Black
SC	Satin Chrome	Black	Black
SN	Satin Nickel	Black	Black
QB	Antique Brass	Black	Black
QZ	Antique Bronze	Black	Black
Anodised			
CLA	Clear	Black	Black
BLA	Black	Black	Black
BRA	Brass	Black	Black
International Wallbox			
AR	Argentum	Black	Black
MC	Mica	Gray	Black
AW	Arctic White	Gray	White

Suffix	Faceplate (F)	Stripe (S)	Button (B)
Satin Matte			
MN	Midnight	Gray	Black
TP	Taupe	Gray	Taupe
SW	Snow	Gray	Snow
ES	Eggshell	Beige	Eggshell
BI	Biscuit	Eggshell	Biscuit
LS	Limestone	Gray	Gray
ST	Stone	Gray	Gray
DS	Desert Stone	Taupe	Taupe
TC	Terracotta	Taupe	Taupe
BG	Bluestone	Gray	Gray
HT	Hot	Taupe	Taupe
MR	Merlot	Taupe	Taupe
SI	Sienna	Brown	Brown
GB	Greenbrier	Gray	Gray
SG	Sea Glass	Gray	Gray
MS	Mocha Stone	Taupe	Taupe
GS	Goldstone	Ivory	Ivory
PD	Palladium	Gray	Gray
PL	Plum	Taupe	Taupe
TQ	Turquoise	Gray	Gray

Job Name:	Model Numbers:	
Job Number:		

Wiring Diagrams

Terminations



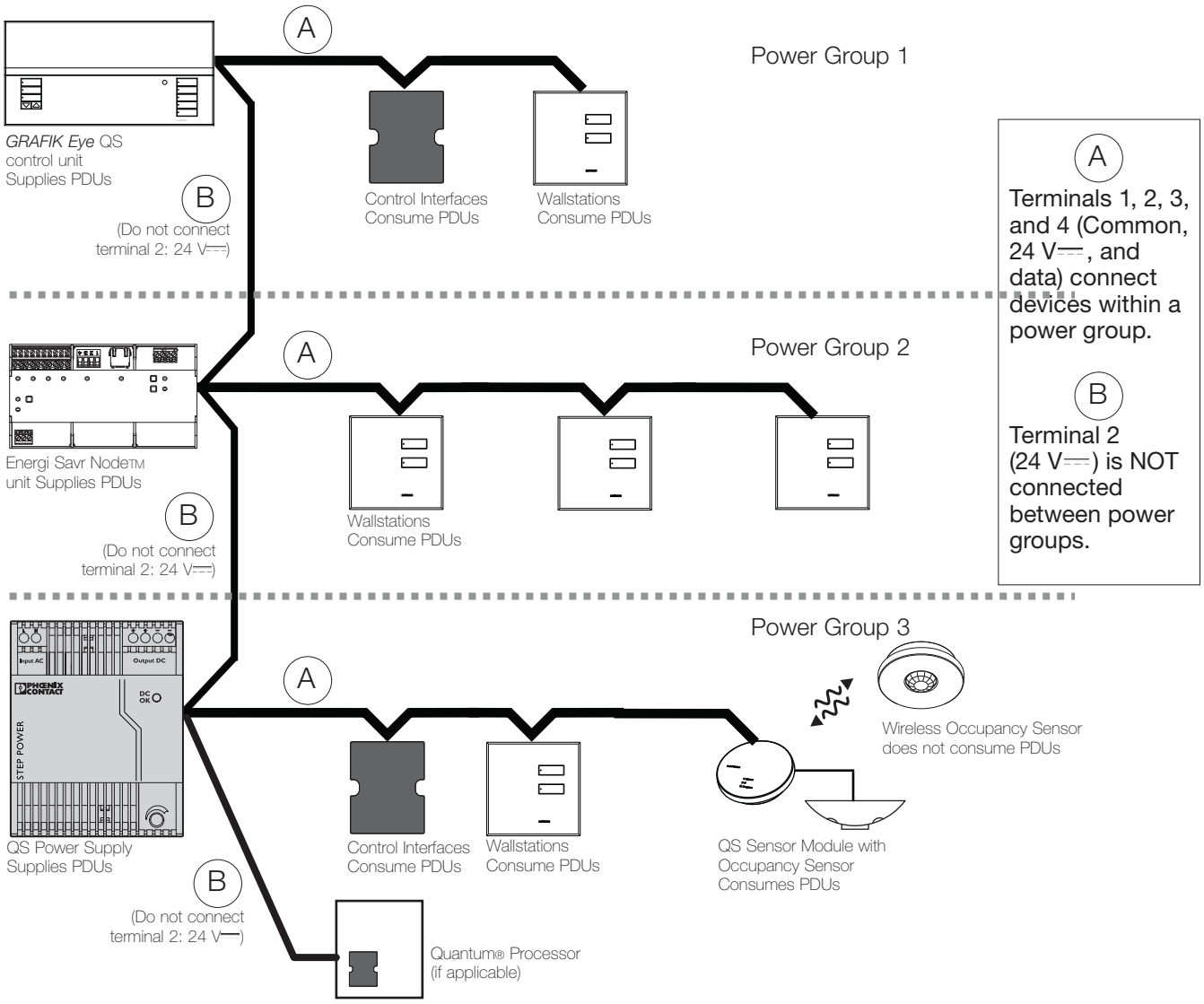
Job Name:	Model Numbers:	
Job Number:		

Power Group Wiring Example

On the QS link, there are devices that supply power and devices that consume power. Each device has a specific number of Power Draw Units (PDUs) it either supplies or consumes. A Power Group consists of one device that supplies power and one or more devices that consume power; each Power Group may have only one power-supplying device. Refer to the QS Link Power Draw Units specification submittal (Lutron PN 369405) for more information concerning PDUs.

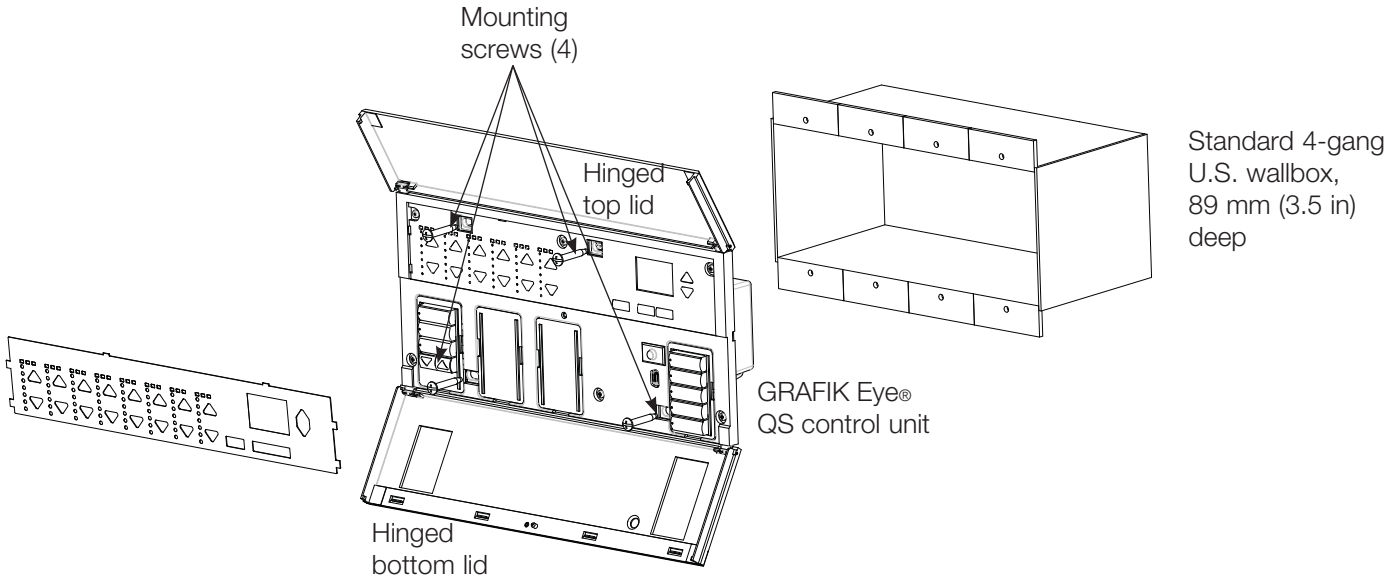
Within Power Groups on the QS link, connect all 4 terminals (1, 2, 3, and 4), shown by the letter A in the diagram. Between devices on the QS link that supply power, connect only terminals 1, 3, and 4 (NOT terminal 2), shown by the letter B on the diagram. Refer to the specific device documentation for wiring details.

Wiring can be T-tapped or daisy-chained.

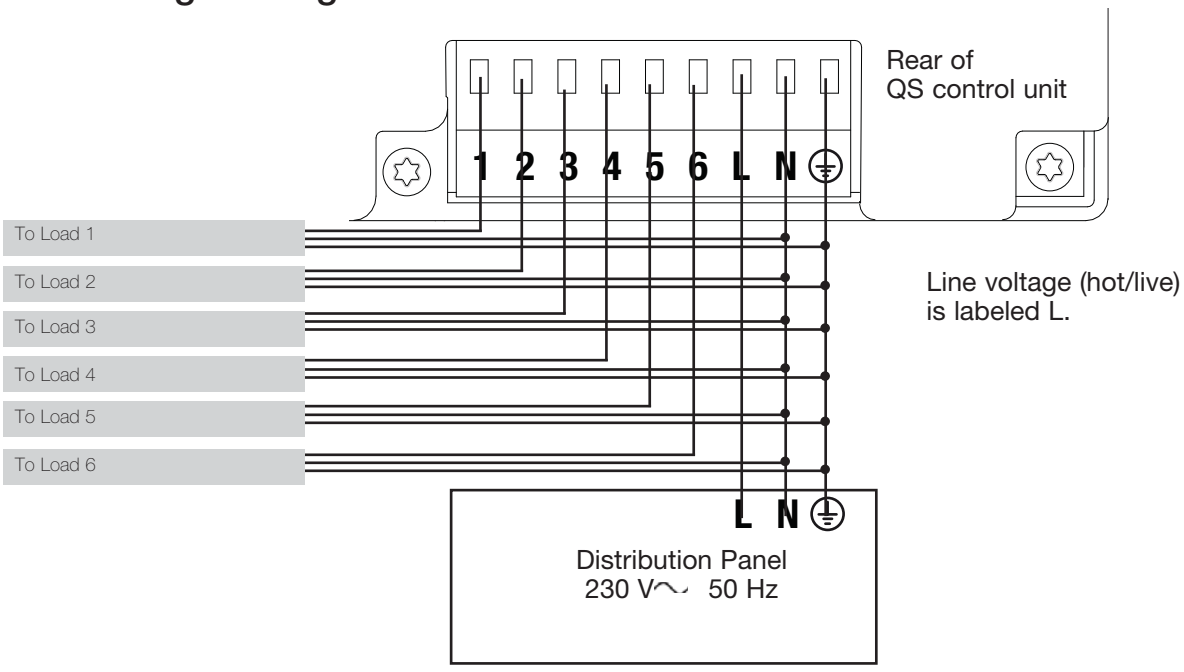


Job Name:	Model Numbers:	
Job Number:		

Mounting



Line Voltage Wiring



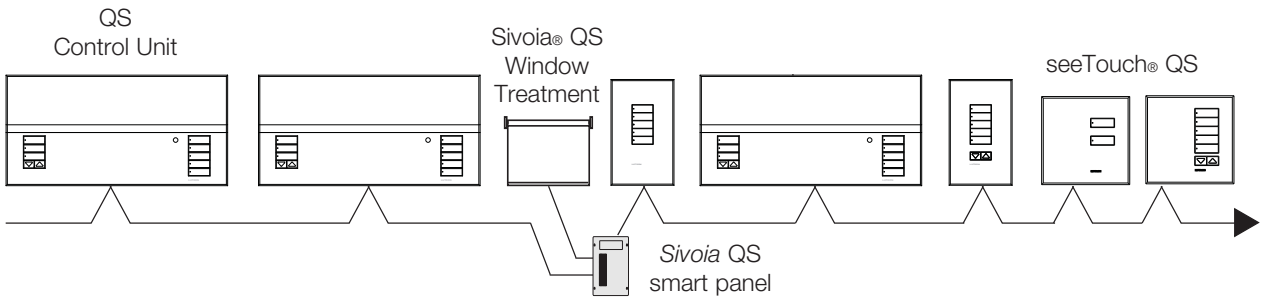
- Pull power wiring from distribution panel and to light fixtures.
- Each line voltage terminal can accept one 2.5 mm^2 (12 AWG) wire.
- Consult Lutron for non-dim relay wiring and/or load side emergency transfer wiring.

Job Name:	Model Numbers:	
Job Number:		

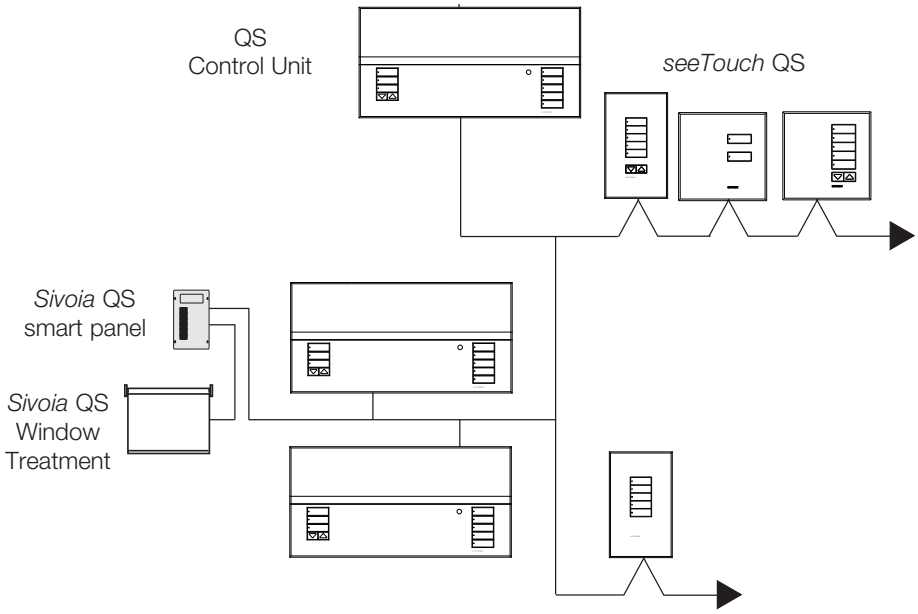
IEC PELV/NEC® Class 2 QS System Low-Voltage Wiring

- System communication uses low-voltage wiring.
- Wiring can be daisy-chained or T-tapped.
- Wiring must be run separately from line/mains voltage.
- IEC PELV/NEC® Class 2 wiring link requires:
  Two 1.0 mm² (18 AWG) conductors for control power.
  One twisted, shielded pair of 0.5 mm² (22 AWG) for data link.
  Available from Lutron, P/N GRX-CBL-346S; check compatibility in your area.
- Total length of control link must not exceed 610 m (2 000 ft).

Daisy-Chain Wiring Example

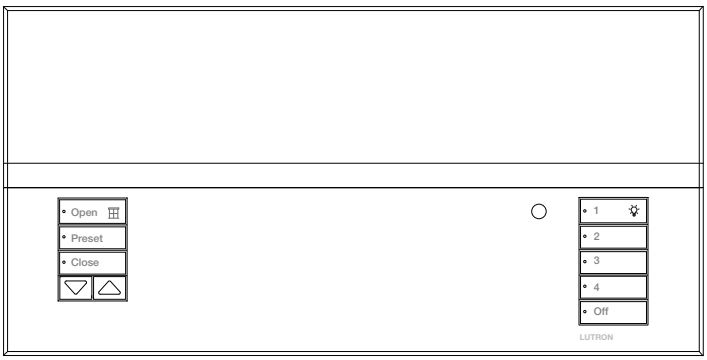


T-Tap Wiring Example



Job Name:	Model Numbers:	
Job Number:		

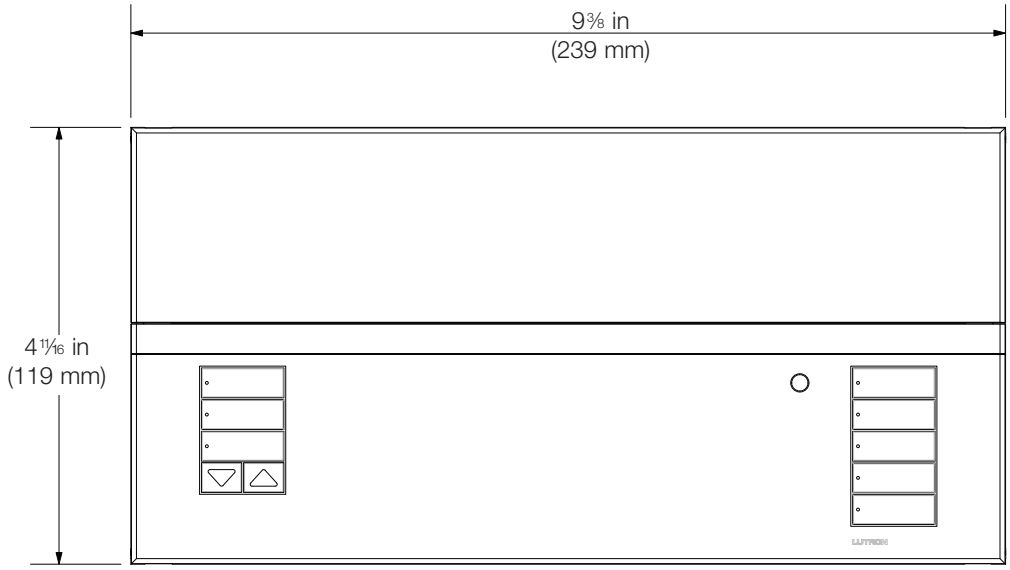
GRAFIK Eye® QS Control Unit



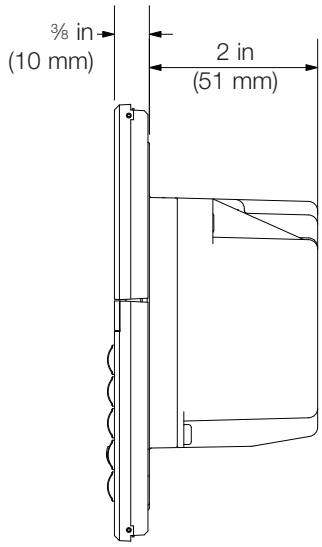
Description

GRAFIK Eye® QS is the premier energy-saving light and shade control. The GRAFIK Eye® QS control unit includes an astronomic timeclock, intuitive lighting presets, and direct shade control. Additionally, the GRAFIK Eye® QS control unit is compatible with all Lutron wired QS products and systems, including Quantum® systems.

Mechanical Dimensions



Front View

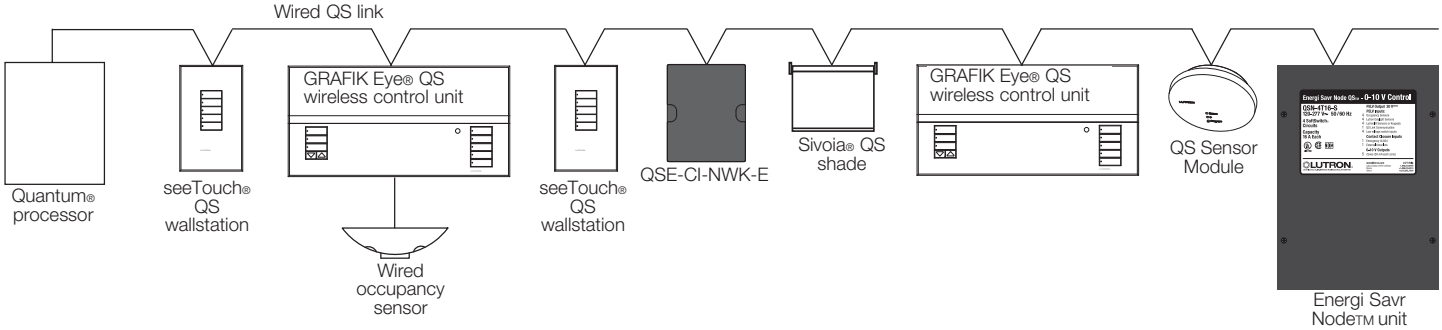


Side View

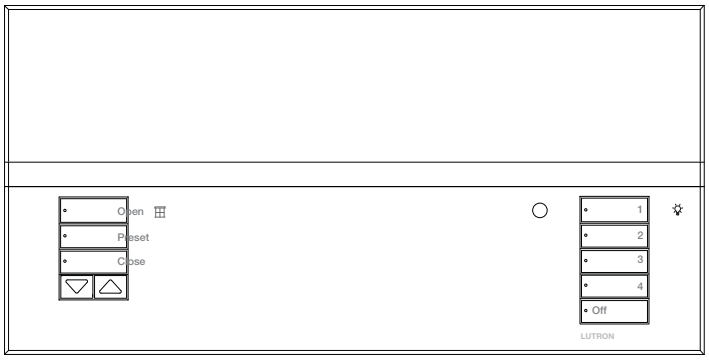
Fits into a 4-gang U.S. backbox, 3½ in (89 mm) deep; Lutron P/N 241-400

System Topology

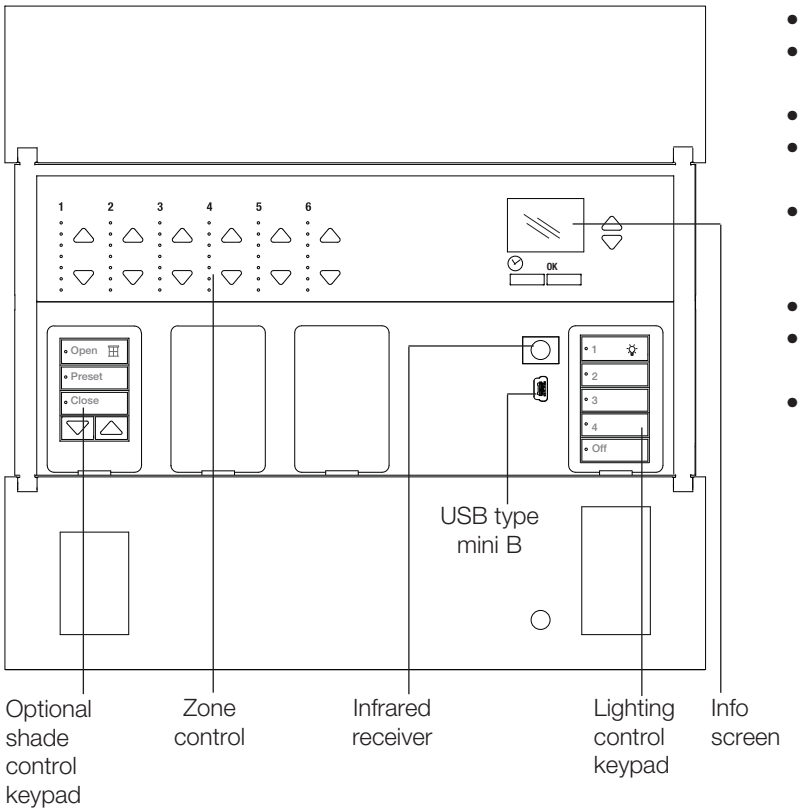
Example of Wired System



Job Name:	Model Numbers:	
Job Number:		



Note: General Engraving (-EGN) shown.



Features

- Pushbutton recall of four preset lighting scenes, plus Off.
- Twelve (12) additional scenes accessible through other QS devices, such as seeTouch® QS wallstations.
- Optional integrated shade control buttons, which can also be added to the unit after installation.
- Master override buttons to raise and lower all lights.
- Allows setup of lighting scenes and shade presets using buttons on the control unit.
- Built-in infrared (IR) receiver.
- External IR connection.
- Built-in astronomic timeclock.
- Info screen shows zone light level percentage, energy savings, zone labeling, and programming.
- Lockout option prevents accidental changes.
- One occupancy sensor input and 24 V⎓ power for occupancy sensor.
- QS communication link for seamless integration of lights, motorized window treatments, occupancy sensors, wallstations, and integration interfaces.
- Compatible with all Lutron QS system components.
- Backlit buttons with engraving make unit easy to locate and operate.
- Available in a variety of colors and finishes.

Job Name:	Model Numbers:	
Job Number:		

Specifications

Input Power

- 120 - 127 V~ 50/60 Hz
- 220 - 240 V~ 50/60 Hz

Listings (120 - 127 V~)

- UL
- CSA
- NOM
- CEC (Title 24)

Environment

- 32 to 104 °F (0 to 40 °C).
- Relative humidity less than 90% non-condensing.

Lighting Sources/Load Types

Controls the following lighting sources with a smooth, continuous square law dimming curve or on a full conduction non-dim basis:

- Incandescent
- Halogen
- Magnetic low-voltage transformer
- Lutron Tu-Wire® electronic fluorescent dimming ballast
- Advance Mark X® electronic dimming ballast
- Neon and cold cathode
- Non-dim (incandescent, magnetic low-voltage, Tu-Wire®, or neon/cold cathode)
- Cree LR4/6, 120 V~ fixtures (for loading capacities, please refer to the LED report card located at www.lutron.com/LEDtool)
  Please refer to “Capacities” for more information.

Controls the following lighting sources with a smooth, continuous square law dimming curve or on a full conduction non-dim basis through separate Lutron power interfaces:

- Electronic low-voltage transformer
- Lutron Hi-lume® and Eco-10® electronic fluorescent dimming ballast
- Non-dim
- 0 - 10 V

Key Design Features

- Lightning strike protection meets ANSI/IEEE standard 62.41-1980. Can withstand voltage surges of up to 6000 V~ and current surges of up to 3000 A.
- Tested to withstand 16 kV electrostatic discharge without damage or memory loss.
- RTISS™-equipped: Compensates in real time for incoming line voltage variations (no visible flicker with +/-2% change in RMS voltage per cycle, and +/-2% Hz change in frequency per second).
- Power failure memory retains programming and light level settings for up to 10 years in the event of a power loss.
- The GRAFIK Eye® QS control unit supplies 3 Power Draw Units (PDUs) on the QS link.
  For complete information, see “Power Draw Units on the QS Link,” Lutron PN 369405.
- Faceplate is hinged at the top and bottom, and stays open at 180° for ease of access.

Scene and Shade Buttons

- Large, rounded buttons are easy to use.
- Backlit buttons with optional engraving make it easy to find and to operate the control unit in low light conditions (backlight can be disabled).
- Optional button engraving is angled up to the eye for easy reading.
- Predefined label stickers are included for field labeling.
- 4 preset lighting scenes, plus Off, are accessible from the front of the control unit.
- 12 additional scenes are stored in the control unit and are accessible from seeTouch® QS wallstations and QS interfaces.
- Light levels fade smoothly between scenes. Fade time can be set differently for each scene: 0 to 59 seconds, or 1 to 60 minutes. Maximum fade time from Off is 3 seconds.

Job Name:	Model Numbers:	
Job Number:		

Specifications

Shade Control

- The GRAFIK Eye® QS control unit can include up to 3 shade button columns. Each column has backlit open, preset, close, and raise/lower buttons.
- Each shade button column can be programmed to operate one shade or a group of shades. (Shades may be assigned to more than one shade button column).
- Faceplates are available with 1, 2 and 3 shade button columns.

Zone Control

- Each zone has a dedicated raise and lower button to adjust the zone.
- Each zone has a dedicated 7 LED bar graph for level status. Percentage of light level and energy saved is displayed on the info screen.
- All zone information has blue backlit LEDs. Backlight turns off when idle for 30 seconds.

Info Screen

- OLED (organic LED) screen is viewable from all angles.
- Screen turns off when idle for 30 seconds.
- Programmable zone labels.
- Programmable scene labels.
- Status of real-time zone percentage and energy savings.
- Programmable timeclock schedules.
- Programmable shade labels.

Astronomic Timeclock

- Integral to all units.
- 7 daily schedules available.
- One available holiday schedule is programmable by date up to one year in advance.
- 25 events per day maximum.
- Timeclock events are programmable to control scenes that affect any Energi Savr Node™ unit connected on the QS link without changing the local scene on the GRAFIK Eye® QS control unit.
- Astronomic times are programmable by integral city database or by entering latitude and longitude. Times automatically adjust throughout the year based on location.
- Automatically adjusts for Daylight Saving Time (DST), adjusted for the new dates; DST is programmable.
- Local timeclock events can activate any of the following features:
  - Scenes 1 to 16 and Off
  - Any available shade presets
  - Start and End afterhours mode
  - Enable and Disable daylighting for all zones/groups
  - Enable and Disable occupancy for occupancy/vacancy sensors
  - Enable and Disable occupied events for all occupancy sensors

System Communications and Capacities

- Low-voltage type IEC PELV/NEC® Class 2 wiring connects control units, wallstations, motorized shades, and control interfaces.
- A QS system can have up to 100 devices and 100 zones.

Infrared

- Infrared (IR) receiver allows infrared transmitters to select 8 scenes, raise/lower lighting zones, or raise/lower shades.
- Transmitter buttons imitate buttons on faceplate.
- 50 ft (15 m) line of sight range.
- Terminal block infrared input for connection to a wired IR input from third-party equipment.
- IR can be disabled via programming.
- Works with Lutron GRX-IT and GRX-8IT infrared remote controls.

Job Name:	Model Numbers:	
Job Number:		

Specifications

Accessory Controls: seeTouch® QS Wallstations (QSWS2)

- Wired seeTouch® QS wallstations provide the following features:
  - Access to one or more of the 16 scenes on the GRAFIK Eye® QS control unit
  - Zone toggle, partitioning, sequencing, fine tune, panic mode, and timeclock enable/disable
  - Contact closure inputs
  - Certain functions are only available on specific wallstation configurations. Refer to the seeTouch® QS specification submittal.

Accessory Controls: QS Sensor Module (QSM2)

- The QS Sensor Module provides a means to link wired or wireless occupancy and daylight sensors to a GRAFIK Eye® QS control unit via the wired QS link.
  - Occupancy sensors wired (or wirelessly linked) to a QS Sensor Module can be used by one or more GRAFIK Eye® QS control units on the wired link.
  - Daylight sensors wired (or wirelessly linked) to a QS Sensor Module can be used by one or more GRAFIK Eye® QS control units on the wired link.
  - Infrared sensors can control either one or more zones or scenes on the GRAFIK Eye® QS control unit. Functionality varies; refer to the documentation for the QS Sensor Module for details.
  - Pico® wireless controls wirelessly linked to a QS Sensor Module can be used to control one or more zones or scenes on the GRAFIK Eye® QS control unit.

Accessory Controls: Contact Closure Input/Output Interface (QSE-IO)

- Recalls preset light levels for the following set of scenes on the GRAFIK Eye® QS control unit:
  Scenes 1-4 and Off Scenes 9-12 and Off
  Scenes 5-8 and Off Scenes 13-16 and Off
- Sequence scenes 5-16, Enable/Disable Zone Lockout, Enable/Disable Scene Lockout, Enable/Disable Panic Mode, Enable/Disable Timeclock.
- Occupancy Sensors. An individual input counts as 1 occupancy sensor for the GRAFIK Eye® QS control unit. Each input can be assigned to either Scene Control or Zone Control (please refer to the Occupancy Sensor(s) section of this guide).
- Zone Toggle. Allows an input to toggle one or more zones to a preset level and off.
- Shade Output mode. A Shade Column on the GRAFIK Eye® QS control unit can be linked to control outputs 1-3 and/or outputs 4-5 on the QSE-IO.

Accessory Controls: DMX Output Interface (QSE-CI-DMX)

- Any zone on the GRAFIK Eye® QS control unit can be mapped to any single DMX512 Channel.
- Any zone on the GRAFIK Eye® QS control unit can be simultaneously mapped to any three DMX512 channels (providing RGB/CMY control).
- DMX loads cannot be used with daylighting.

Accessory Controls: Ethernet and RS232 Interface (QSE-CI-NWK-E)

- Allows for monitoring and control of the outputs and local scenes of the GRAFIK Eye® QS control unit.

Accessory Controls: QS Keyswitch Wallstations (QSWS2-KS)

- Recalls preset light levels for any two scenes including Off.
- Allows fine-tuning (raise/lower level) of a zone or group of zones.
- Starts/Stops scene sequencings (Scenes 1-4 or Scenes 5-16)
- Enables/Disables Timeclock
- Enables/Disables occupancy sensors
- Enables/Disabled daylight sensors
- Allows toggle of Zone(s) to a preset level and off.
- Enables/Disables panic mode.
- Starts/Stops afterhours mode.

Other Accessory Controls and Devices

- Energi Savr Node™ QS (ESN). See the specification submittal for complete details.

Occupancy Sensor(s)

- The GRAFIK Eye® QS control unit works with occupancy sensors through either:
  - Scene Control: Up to four sensors activate user-selectable occupancy and vacancy scenes.
  - Zone Control: up to four sensors per zone activate user-selected occupancy and vacancy zone levels.
- Occupancy sensors may include:
  - Contact closure sensors wired to CCI input on back of GRAFIK Eye® QS control unit
  - Wired or wireless sensors connected QS Sensor Module (QSM)
- If any sensor in a group detects occupancy, then the GRAFIK Eye® QS control unit will go to the designated occupancy scene or zone level.
- If all sensors in a group detect vacancy, then the GRAFIK Eye® QS control unit will go to the designated vacancy scene or zone level.

Job Name:	Model Numbers:	
Job Number:		

Specifications

Daylight Sensor(s)

- The GRAFIK Eye® QS control unit allows daylight sensors to control one or more lighting zones to adjust electric light levels based on measured daylight levels.
- Daylight sensors may include:
  - Wired or wireless sensors connected to a QS sensor module (QSM)
- A daylight sensor can control one or more GRAFIK Eye® QS control unit zones:
  - Each zone can be calibrated to target light levels
  - A zone can be controlled by no more than one daylight sensor
- Daylight control can be enabled or disabled on a scene-by-scene basis
  - By default, daylight control is enabled in all scenes

Note: Daylight control through the GRAFIK Eye® QS control unit only affects lighting loads. Shade groups cannot be controlled by daylight sensors. Daylighting does not affect DMX or RGB/CMY DMX loads.

Contact Closure Input (CCI) with Power Supply Output

- Each GRAFIK Eye® QS control unit has one contact closure input (Terminal A).
  - The attached device must provide a dry contact closure or solid-state output.
  - Input is miswire-protected up to 36 V⎓.
- The contact closure is capable of accepting the following types of inputs:
  - Maintained (default): The GRAFIK Eye® QS control unit will act on both a contact closure and a contact open/release event.
  - Momentary: The GRAFIK Eye® QS control unit will act on only contact closure events.
- Each GRAFIK Eye® QS control unit can supply 50 mA maximum at 24 V⎓.
  - Useful for powering occupancy sensors.
  - An auxiliary power supply must be used if the device requires more than 50 mA.
- The CCI is capable of operating in the following modes
  - Occupancy: If an occupancy sensor is wired directly to the GRAFIK Eye® QS control unit.
  - Emergency: This setting allows the GRAFIK Eye® QS control unit to work with a LUT-ELI. When an emergency situation is detected, all lights will go to full on, and no operations will be allowed until the emergency signal is cleared.
  - Afterhours: Allows the CCI to start and end the afterhours mode.
  - Timeclock: Allows the CCI to enable and disable the timeclock.
  - Scene Lockout: Prevents the user from making any changes to the control unit. The current scene will stay on until the CCI enables normal operation.
  - Save Never: Prevents any changes from being saved while the CCI is being used.
  - Disable CCI: The CCI will have no effect on the system and will not appear on the list of available sensors.

Security Lockout Password

- A 4-character password (using characters A to Z and 0 to 9) can be enabled/disabled to lock out access to the Programming Menu.
- By default there is no password enabled on the GRAFIK Eye® QS control unit.
- If case the 4-digit password is forgotten, contact Lutron Technical Support to regain access.

Job Name:	Model Numbers:	
Job Number:		

Capacities

	220 - 240 V~ 50 / 60 Hz	120 - 127 V~ 50 / 60 Hz
Unit Capacity (watts)	3000	2000
MLV	3000 VA / 2400 W	2000 VA / 1600 W
Zone Capacity (watts)	40 – 1200	25 – 800
MLV	40 – 1200 VA / 40 – 960 W	25 – 800 VA / 25 – 600 W

Load Type Notes (Zones 1, 2 and 3)

- All electronic low-voltage (ELV) lighting used with an interface must be rated for reverse phase control dimming. Before installing an ELV light source, verify with the manufacturer that their transformer can be dimmed. When dimming, an ELV interface (such as the PHPM-PA-DV-WH) must be used with the control unit.
- Not all zones must be connected; however, connected zones must have a minimum load as specified above.
- Maximum total lighting load for a magnetic low-voltage (MLV) varies by input voltage:
  - 120 - 127 V~: 800 VA / 600 W
  - 220 - 240 V~: 1200 VA / 960 W
- Maximum total lighting load for Lutron Tu-Wire® and Advance Mark X® electronic dimming ballasts (120 to 127 V~ only) must not exceed 6 A per zone or 16 A per unit.
- No zone may be loaded with more than the capacity specified above. For higher wattage applications, or for 277 V~ applications, use Lutron power module PHPM-PA, PHPM-WBX, PHPM-PA-DV, PHPM-SW, or PHPM-WBX-DV.
- For controlling low-wattage loads (CFL, LED) in a non-dim application, contact Lutron Technical Support for the appropriate solution.

System Limits

- The QS wired communication link is limited to 100 devices or 100 zones.

Job Name:	Model Numbers:	
Job Number:		

GRAFIK Eye® QS Control Unit
Custom Color Options and Model Numbers
You must order a Base Unit and a Faceplate Kit

See Standard Color Combinations page for faceplate, stripe, and button colors

Base Unit

QSGR - _ P

- QSGR — Prefix
- _ — Number of Zones
  - 3 = 3 zones
  - 4 = 4 zones
  - 6 = 6 zones
- P — Phase Control Triac

Example:

QSGR-6P
6-zone base unit
and
QSGFP-2IV-EGN
Ivory faceplate kit with two shade columns and general engraving

Faceplate Kit
(includes coordinating stripe and buttons)

QSGFP - - -

- QSGFP — Faceplate Prefix
- Number of Shade Columns
  - Omit = none
  - 1 = 1 column
  - 2 = 2 columns
  - 3 = 3 columns
- Top Door Color
  - Omit = same as unit
  - T = Translucent
- Color/Finish
- Keypad Engraving Code

Faceplate Custom Color/Finish Codes

Architectural Matte Finishes

Standard (ship in 48 hours)

White	WH
Ivory	IV
Beige	BE
Gray	GR
Brown	BR
Black	BL
Almond	AL
Light Almond	LA

Architectural Metal Finishes

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 Finishes

Clear	CLA
Black	BLA
Brass	BRA

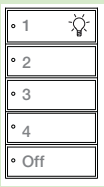
Satin Color Matte Finishes

Snow	SW
Biscuit	BI
Eggshell	ES
Taupe	TP
Midnight	MN
Limestone	LS
Stone	ST
Desert Stone	DS
Terracotta	TC
Hot	HT
Goldstone	GS
Palladium	PD
Plum	PL
Turquoise	TQ
Bluestone	BG
Sea Glass	SG
Greenbriar	GB
Sienna	SI
Merlot	MR
Mocha Stone	MS

Keypad Engraving Codes

Omit = Unengraved
Ships with engraving certificate that customer can redeem at no charge

EGN = General Engraving



Lighting keypad



Shade column

NST = Non-Standard Text Engraving
Please visit the GRAFIK Eye® QS website at **www.lutron.com/grafikeyeqs** for custom engraving forms. Submit completed form with order, and unit will ship engraved as specified by customer.

Job Name:	Model Numbers:	
Job Number:		

GRAFIK Eye® QS Control Unit
Custom Options and Model Numbers
See previous page for Other Custom Model Numbers
See Standard Color Combinations page for faceplate, stripe, and button colors

Custom Button Kit

QSGB - 5B - WH -

- QSGB: Custom Button Kit Prefix
- 5B: Button Configuration
- WH: Button Color/Finish
- Keypad Engraving Code

3BRL = 3-button with raise/lower (shade column)
5B = 5-button (lighting keypad)

Button Kit Custom Color/Finish Codes

Architectural Matte Finishes		Satin Color Matte Finishes	
White	WH	Snow	SW
Ivory	IV	Biscuit	BI
Beige	BE	Eggshell	ES
Gray	GR	Taupe	TP
Brown	BR		
Black	BL		
Almond	AL		
Light Almond	LA		

Keypad Engraving Codes

Omit = Unengraved
Ships with engraving certificate that customer can redeem at no charge

EGN = General Engraving



Lighting keypad



Shade column

NST = Non-Standard Text Engraving
Please visit the GRAFIK Eye® QS website at **www.lutron.com/grafikeyeqs** for custom engraving forms. Submit completed form with order, and unit will ship engraved as specified by customer.

Custom Stripe Kit

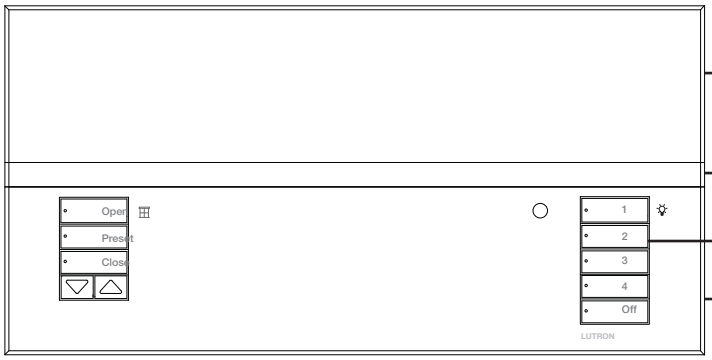
QSGS - WH

- QSGS: Stripe Kit Prefix
- WH: Stripe Color/Finish

Stripe Custom Color/Finish Codes
Same as Faceplate colors on previous page

Job Name:	Model Numbers:	
Job Number:		

GRAFIK Eye® QS Control Unit Standard Color Combinations
See previous pages for Custom Model Numbers



Faceplate is comprised of a top and bottom. The bottom will always be the color indicated under "faceplate." The top may be the same color or translucent. Use the chart for faceplates that have the same color top and bottom. If a translucent lid is chosen, the stripe will automatically be the same color as the bottom lid.

Example:
If you order QSGR-4P-1WH, your GRAFIK Eye® QS control unit with 4 lighting zones and 1 shade zone will come with a white faceplate (both top and bottom), gray stripe, and white buttons.

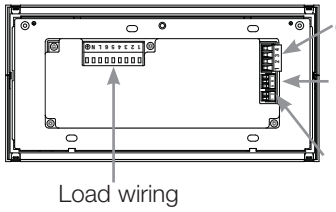
Suffix	Faceplate (F)	Stripe (S)	Button (B)
Architectural Matte			
WH	White	Gray	White
IV	Ivory	Beige	Ivory
BE	Beige	Ivory	Beige
GR	Gray	Black	Gray
BR	Brown	Black	Brown
BL	Black	Gray	Black
AL	Almond	Light Almond	Almond
LA	Light Almond	Almond	Light Almond
Architectural Metal			
BB	Bright Brass	Black	Black
BC	Bright Chrome	Black	Black
BN	Bright Nickel	Black	Black
SB	Satin Brass	Black	Black
SC	Satin Chrome	Black	Black
SN	Satin Nickel	Black	Black
QB	Antique Brass	Black	Black
QZ	Antique Bronze	Black	Black
Anodized			
CLA	Clear	Black	Black
BLA	Black	Black	Black
BRA	Brass	Black	Black

Suffix	Faceplate (F)	Stripe (S)	Button (B)
Satin Matte			
MN	Midnight	Gray	Black
TP	Taupe	Gray	Taupe
SW	Snow	Gray	Snow
ES	Eggshell	Beige	Eggshell
BI	Biscuit	Eggshell	Biscuit
LS	Limestone	Gray	Gray
ST	Stone	Gray	Gray
DS	Desert Stone	Taupe	Taupe
TC	Terracotta	Taupe	Taupe
BG	Bluestone	Gray	Gray
HT	Hot	Taupe	Taupe
MR	Merlot	Taupe	Taupe
SI	Sienna	Brown	Brown
GB	Greenbriar	Gray	Gray
SG	Sea Glass	Gray	Gray
MS	Mocha Stone	Taupe	Taupe
GS	Goldstone	Ivory	Ivory
PD	Palladium	Gray	Gray
PL	Plum	Taupe	Taupe
TQ	Turquoise	Gray	Gray

Job Name:	Model Numbers:	
Job Number:		

Wiring Diagrams

Terminations



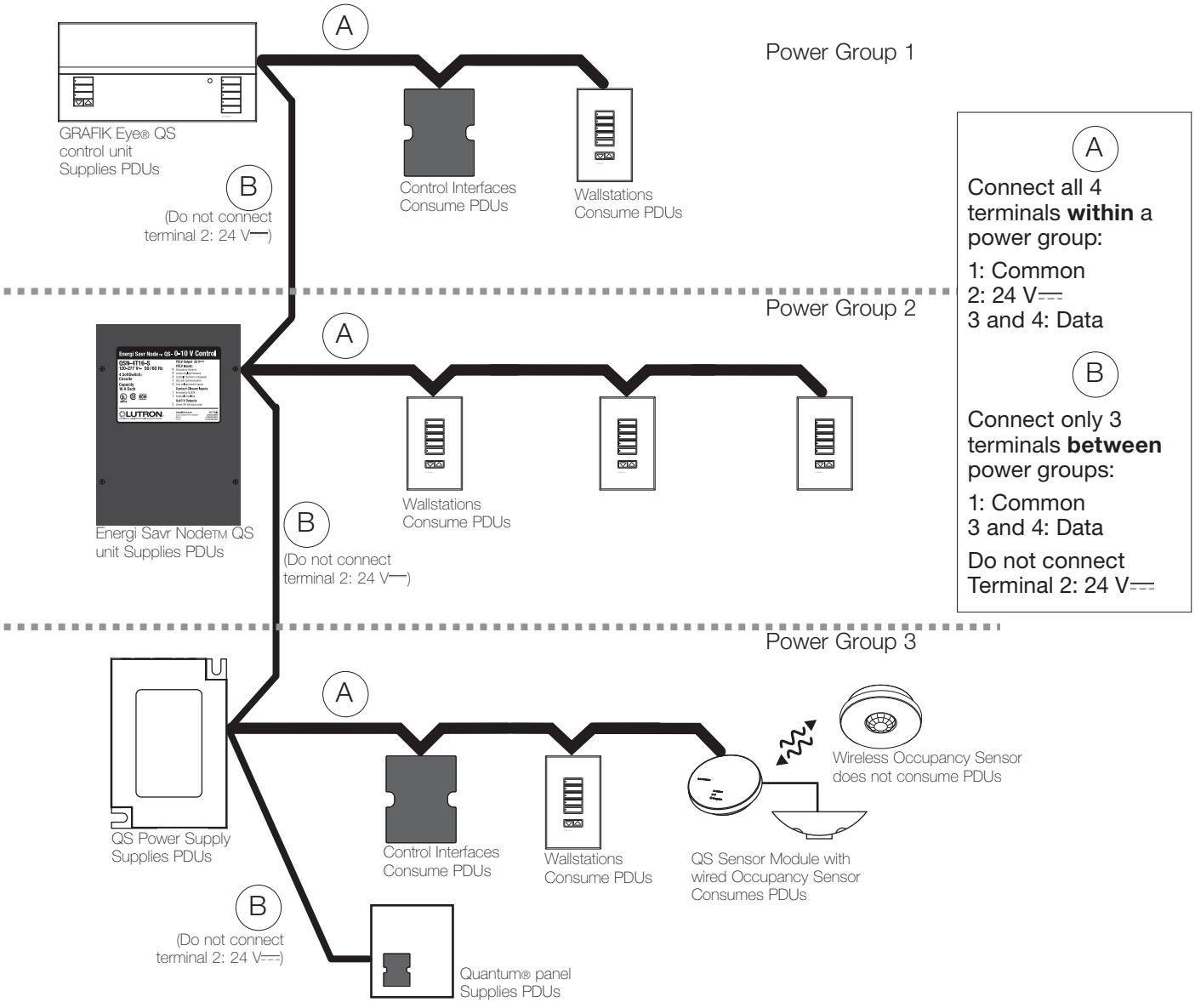
Job Name:	Model Numbers:	
Job Number:		

Power Group Wiring Example

On the QS link, there are devices that supply power and devices that consume power. Each device has a specific number of Power Draw Units (PDUs) it either supplies or consumes. A Power Group consists of one device that supplies power and one or more devices that consume power; each Power Group may have only one power-supplying device. Refer to the QS Link Power Draw Units specification submittal (Lutron PN 369405) for more information concerning PDUs.

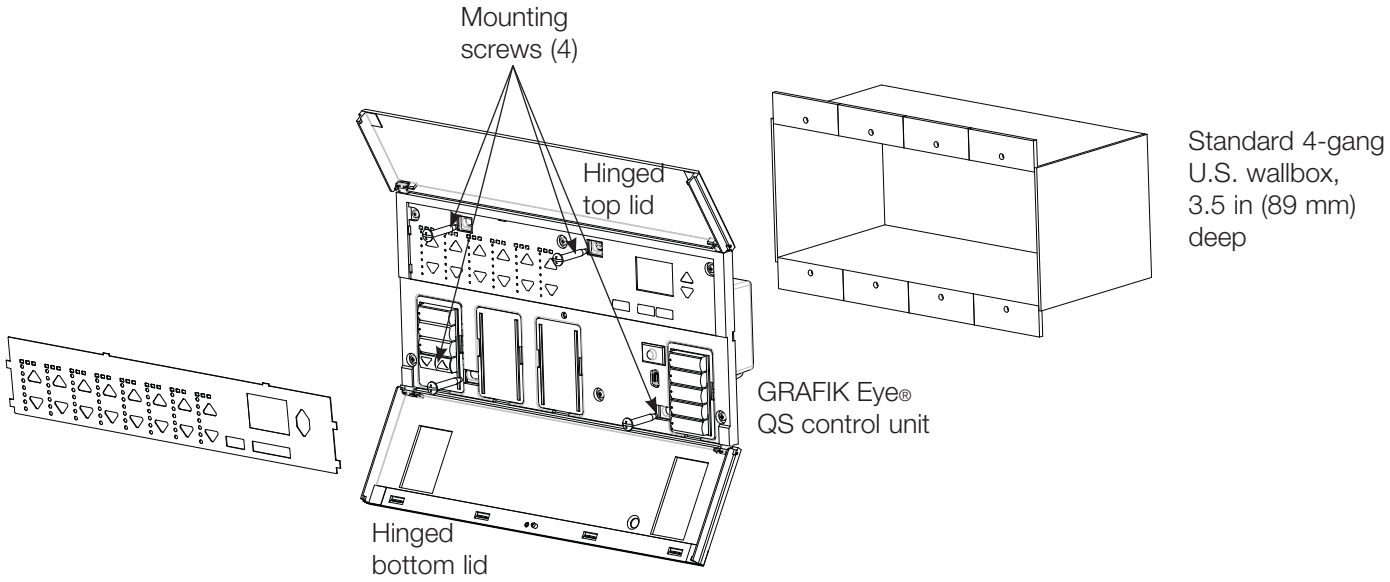
Within Power Groups on the QS link, connect all 4 terminals (1, 2, 3, and 4), shown by the letter A in the diagram. Between devices on the QS link that supply power, connect only terminals 1, 3, and 4 (NOT terminal 2), shown by the letter B on the diagram.

Wiring can be T-tapped or daisy-chained.

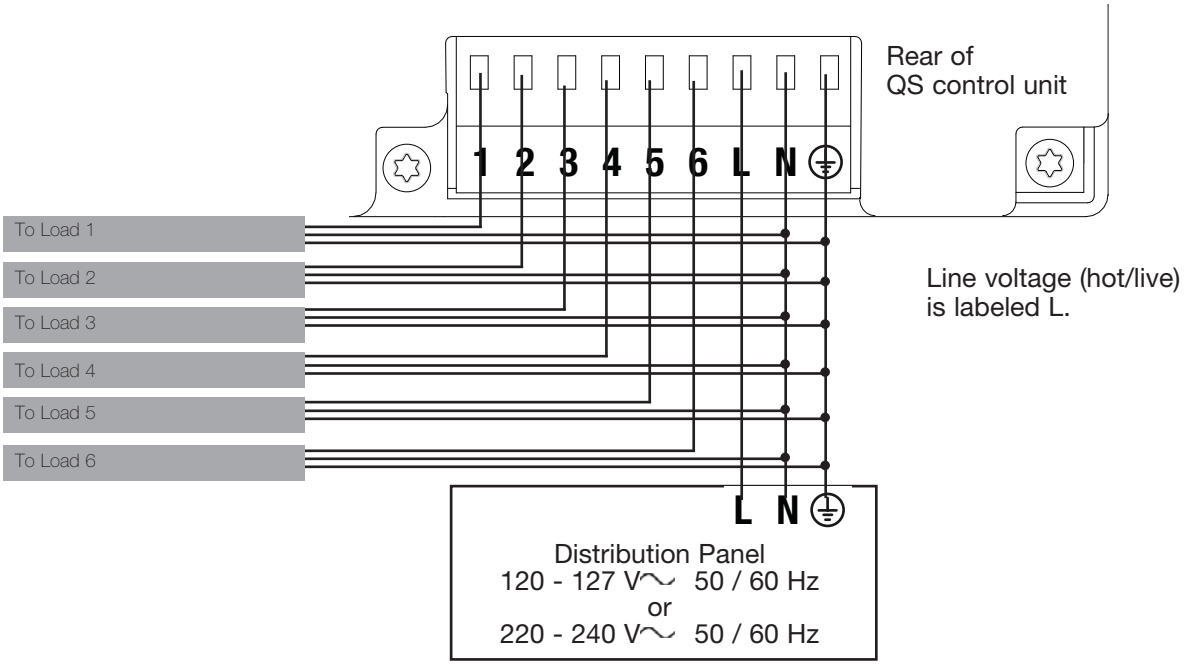


Job Name:	Model Numbers:	
Job Number:		

Mounting



Line Voltage Wiring



- Pull power wiring from distribution panel and to light fixtures.
- Each line voltage terminal can accept one 12 AWG (2.5 mm²) wire.
- Consult Lutron for non-dim relay wiring and/or load side emergency transfer wiring.

Job Name:	Model Numbers:	
Job Number:		

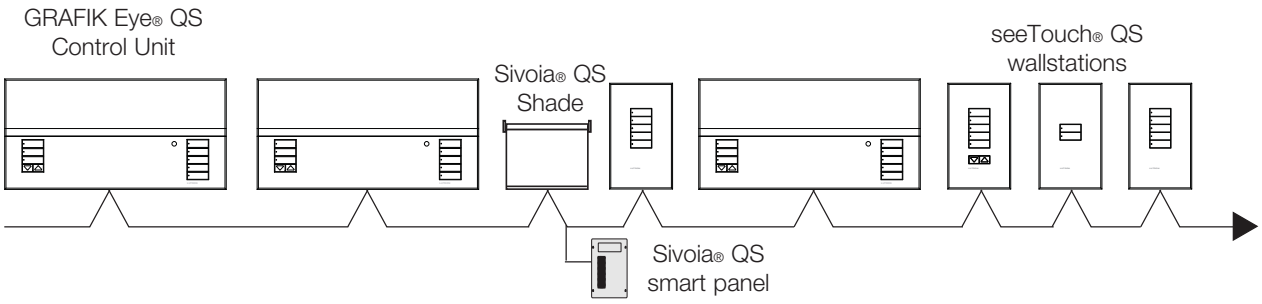
IEC PELV/NEC® Class 2 QS System Wiring

- Wiring can be daisy-chained or T-tapped.
- Wiring must be run separately from line/mains voltage.
- Total length of control link must not exceed 2000 ft (610 m).

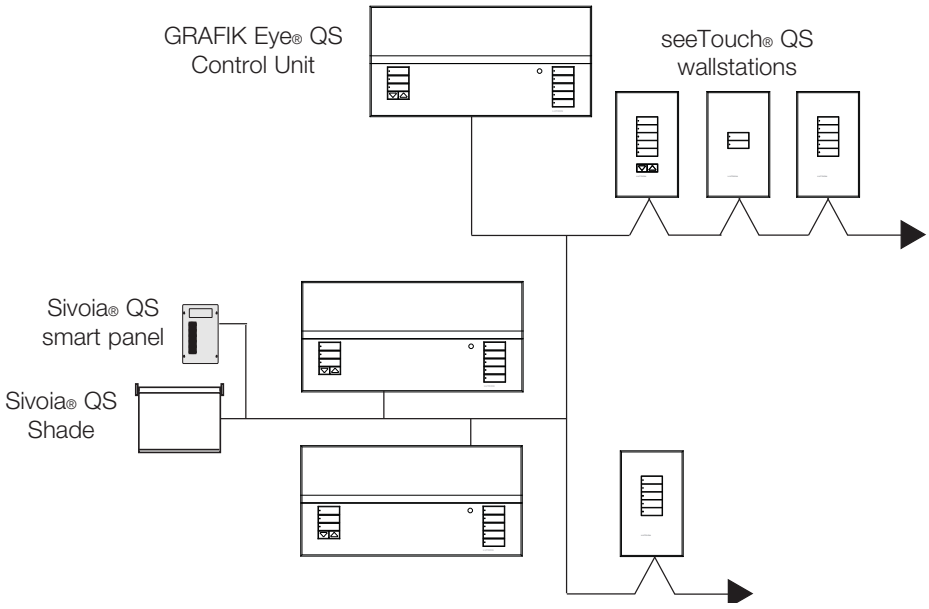
Wire Sizes (check compatibility in your area)

QS Link Wiring Length	Wire Gauge	Lutron Cable Part Number
Less than 500 ft (153 m)	Power (terminals 1 and 2) 1 pair 18 AWG (1.0 mm^2)	GRX-CBL-346S (non-plenum) GRX-PCBL-346S (plenum)
	Data (terminals 3 and 4) 1 twisted, shielded pair 22 AWG (0.5 mm^2)	
500 to 2000 ft (153 to 610 m)	Power (terminals 1 and 2) 1 pair 12 AWG (4.0 mm^2)	GRX-CBL-46L (non-plenum) GRX-PCBL-46L (plenum)
	Data (terminals 3 and 4) 1 twisted, shielded pair 22 AWG (0.5 mm^2)	

Daisy-Chain Wiring Example



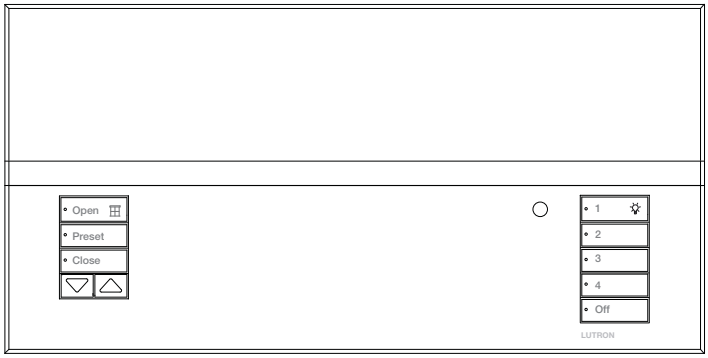
T-Tap Wiring Example



Job Name:	Model Numbers:	
Job Number:		

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GRAFIK Eye® QS Control Unit with EcoSystem®



Description

GRAFIK Eye® QS with EcoSystem® is the premier energy-saving lighting and shade control. The GRAFIK Eye® QS control unit features an astronomic timeclock and intuitive lighting presets, which are seamlessly integrated with EcoSystem® fluorescent ballasts and LED drivers, and Lutron's QS components and systems. Additionally, the GRAFIK Eye® QS with EcoSystem® control unit is compatible with all Lutron wired QS products and systems, including Quantum®.

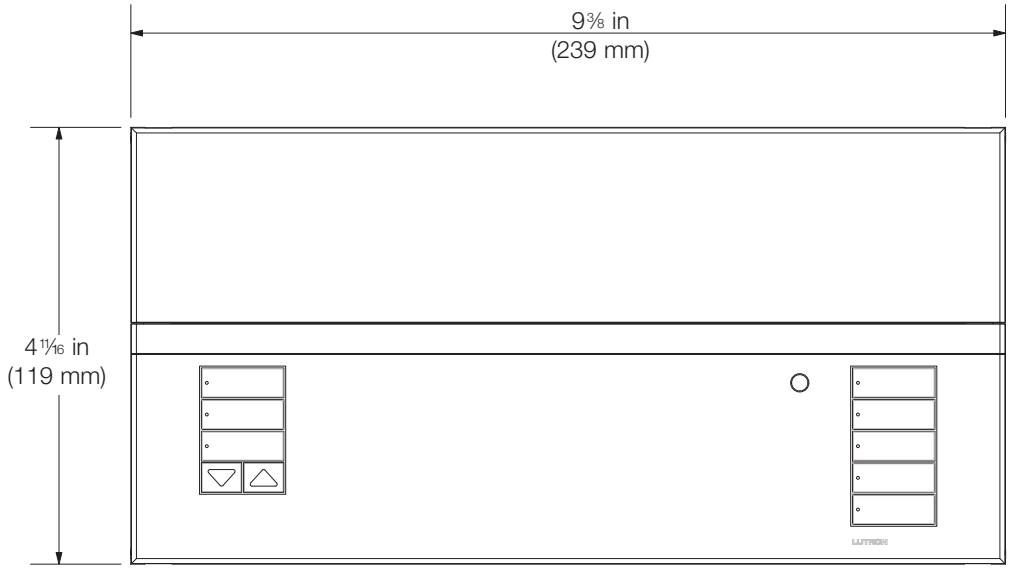
Application Suggestions and Differences between GRAFIK Eye® QS with EcoSystem® and Standard EcoSystem® Bus Supply

	GRAFIK Eye® QS with EcoSystem®	Energi Savr Node™ with EcoSystem®
Suggested/Recommended Applications	**Single rooms, partitioned spaces, e.g., conference room, classroom, ballroom, lobby**	**Open spaces, multiple enclosed rooms, e.g., open office, window offices**
Programming Method	Info Screen on the QS control unit	Via Energi Savr Node™ App for *iPod* mobile digital device
Integral Timeclock	Yes	No
Compatible with seeTouch® QS Keypads	Yes	Yes
Compatible with EcoSystem® Wall Controls	No	Yes
Compatible with EcoSystem® IR Sensors	No	Yes
Includes dry contact closure for integration to BMS or Security Systems	Yes	Yes
Input Voltage	120-127 or 220-240 V~ 50/60 Hz	120/240/277 V~ 50/60 Hz
Number of EcoSystem® Busses	1	1 or 2
Number of Zones	6, 8, or 16	Programmable
Number of Line-Voltage Outputs	3 (Zones 1-3 only)	--
Compatible with other QS Devices	Yes	Yes

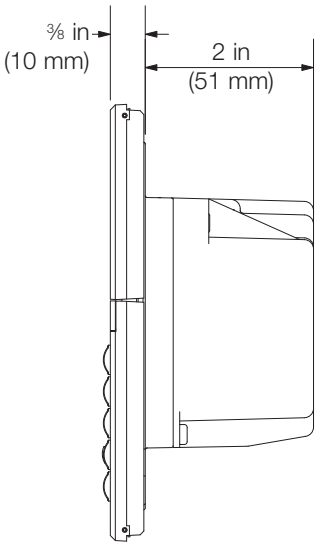
iPod is a trademark of Apple Inc., registered in the United States and other countries.

Job Name:	Model Numbers:	
Job Number:		

Mechanical Dimensions



Front View

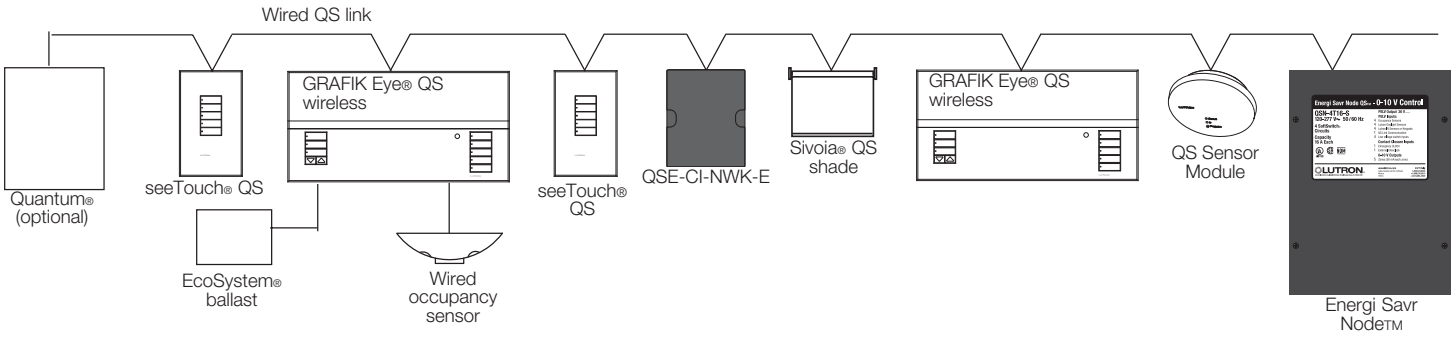


Side View

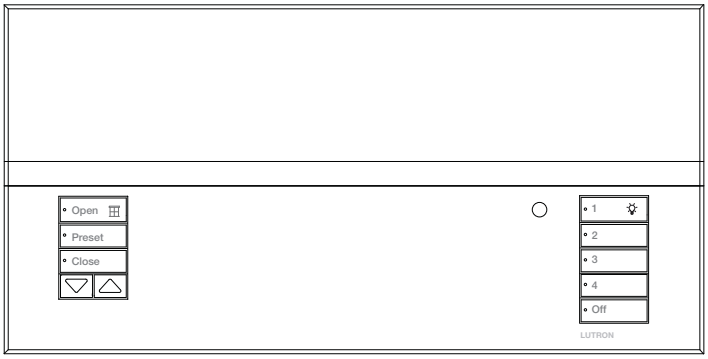
Fits into a 4-gang U.S. backbox, 3½ in (89 mm) deep; Lutron P/N 241-400

System Topology

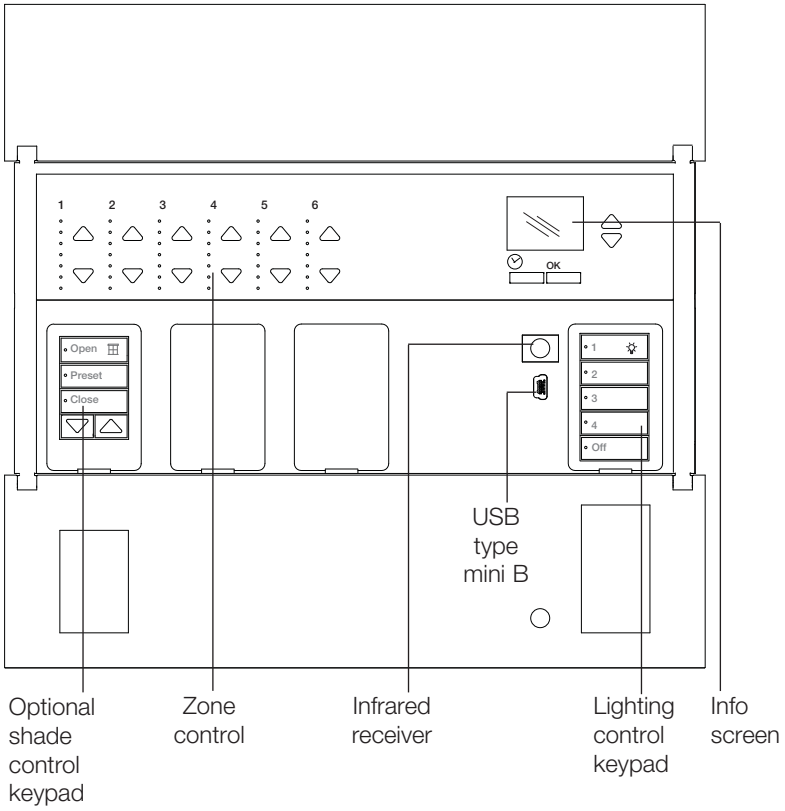
Example of Wired System



Job Name:	Model Numbers:	
Job Number:		



Note: General Engraving (-EGN) shown.



Features

- Pushbutton recall of four preset lighting scenes, plus Off.
- Twelve (12) additional scenes accessible through other QS devices, such as seeTouch® QS wallstations.
- Zones 1, 2, and 3 can control many light source types directly and others using power modules.
- Optional integrated shade control buttons, which can also be added to the unit after installation.
- Master override buttons to raise and lower all lights.
- Allows setup of lighting scenes and shade presets using buttons on the control unit.
- Built-in infrared (IR) receiver.
- External IR connection.
- Built-in astronomic timeclock.
- Info screen shows zone light level percentage, energy savings, zone labeling, programming, and EcoSystem® setup.
- Lockout option prevents accidental changes.
- One occupancy sensor input and 24 V⎓ power for occupancy sensor.
- QS communication link for seamless integration of lights, motorized window treatments, occupancy sensors, wallstations, and integration interfaces.
- Compatible with all Lutron QS system components.
- Control up to 6, 8, or 16 EcoSystem® zones from internal bus supply.
- Zones 1, 2, and 3 are integral line voltage dimming zones and can be optionally programmed as EcoSystem® zones.
- Up to 64 EcoSystem® or Hi-lume® 3D ballasts can be addressed and grouped to zones.
- Integral EcoSystem® setup and programming replaces the need for a handheld programmer (C-PDA-CLR does not communicate with GRAFIK Eye® QS with EcoSystem®)
- Backlit buttons with engraving make unit easy to locate and operate.
- Available in a variety of colors and finishes.

Job Name:	Model Numbers:	
Job Number:		

Specifications

Input Power

- 120 - 127 V~ 50/60 Hz
- 220 - 240 V~ 50/60 Hz

Listings (120 - 127 V~)

- UL
- CSA
- NOM
- CEC (Title 24)

Environment

- 32 to 104 °F (0 to 40 °C).
- Relative humidity less than 90% non-condensing.

Lighting Sources/Load Types

- EcoSystem®, Hi-lume® 3D, and Hi-lume® LED ballasts (available on all zones).

  Zones 1, 2, and 3 control the following lighting sources with a smooth, continuous square law dimming curve or on a full conduction non-dim basis:
- Incandescent
- Halogen
- Magnetic low-voltage transformer
- Lutron Tu-Wire® electronic fluorescent dimming ballast
- Advance Mark X® electronic dimming ballast
- Neon and cold cathode
- Non-dim (incandescent, magnetic low-voltage, Tu-Wire®, or neon/cold cathode)
- Cree LR4/6, 120 V~ fixtures (for loading capacities, please refer to the LED report card located at www.lutron.com/LEDtool)
  Please refer to “Capacities” for more information.

  Zones 1, 2, and 3 control the following lighting sources with a smooth, continuous square law dimming curve or on a full conduction non-dim basis through separate Lutron power modules:
- Electronic low-voltage transformer
- Lutron Hi-lume®, Eco-10®, and Compact SE™ electronic fluorescent dimming ballast
- Non-dim
- 0 - 10 V

Key Design Features

- Lightning strike protection meets ANSI/IEEE standard 62.41-1980. Can withstand voltage surges of up to 6000 V~ and current surges of up to 3000 A.
- Tested to withstand 16 kV electrostatic discharge without damage or memory loss.
- RTISS™-equipped: Compensates in real time for incoming line voltage variations (no visible flicker with +/-2% change in RMS voltage per cycle, and +/-2% Hz change in frequency per second).
- Power failure memory retains programming and light level settings for up to 10 years in the event of a power loss.
- The GRAFIK Eye® QS supplies 3 Power Draw Units (PDUs) on the QS link.
  For complete information, see “Power Draw Units on the QS Link,” Lutron PN 369405
- Faceplate is hinged at the top and bottom, and stays open at 180° for ease of access.
- Direct control of 120 V~ and 277 V~ EcoSystem®, Hi-lume® 3D, and Hi-lume® LED ballasts (no interface required).

Scene and Shade Buttons

- Large, rounded buttons are easy to use.
- Backlit buttons with optional engraving make it easy to find and to operate the control unit in low light conditions (backlight can be disabled).
- Optional button engraving is angled up to the eye for easy reading.
- Predefined label stickers are included for field labeling.
- 4 preset lighting scenes, plus Off, are accessible from the front of the control unit.
- 12 additional scenes are stored in the control unit and are accessible from seeTouch® QS wallstations and QS interfaces.
- Light levels fade smoothly between scenes. Fade time can be set differently for each scene: 0 to 59 seconds, or 1 to 60 minutes. Maximum fade time from Off is 3 seconds.

Job Name:	Model Numbers:	
Job Number:		

Specifications

Shade Control

- The GRAFIK Eye® QS control unit can include up to 3 shade button columns. Each column has backlit open, preset, close, and raise/lower buttons.
- Each shade button column can be programmed to operate one shade or a group of shades. (Shades may be assigned to more than one shade button column).
- Faceplates are available with 1, 2 and 3 shade button columns.

Zone Control

- Each zone has a dedicated raise and lower button to adjust the zone.
- Each zone has a dedicated 7 LED bar graph for level status. Percentage of light level and energy saved is displayed on the info screen.
- All zone information has blue backlit LEDs. Backlight turns off when idle for 30 seconds.

Info Screen

- OLED (organic LED) screen is viewable from all angles.
- Screen turns off when idle for 30 seconds.
- Programmable zone labels.
- Programmable scene labels.
- Status of real-time zone percentage and energy savings.
- Programmable timeclock schedules.
- Programmable shade labels.

Astronomic Timeclock

- Integral to all units.
- 7 daily schedules available.
- One available holiday schedule is programmable by date up to one year in advance.
- 25 events per day maximum.
- Timeclock events are programmable to control scenes that affect any Energi Savr Node™ QS unit connected on the QS link without changing the local scene on the GRAFIK Eye® QS control unit.
- Astronomic times are programmable by integral city database or by entering latitude and longitude. Times automatically adjust throughout the year based on location.
- Automatically adjusts for Daylight Saving Time (DST), adjusted for the new dates; DST is programmable.
- Local timeclock events can activate any of the following features:
  - Scenes 1 to 16 and Off
  - Any available shade presets
  - Start and End afterhours mode
  - Enable and Disable daylighting for all zones/groups
  - Enable and Disable occupancy for occupancy/vacancy sensors
  - Enable and Disable occupied events for all occupancy sensors

System Communications and Capacities

- Low-voltage type IEC PELV/NEC® Class 2 wiring connects control units, wallstations, motorized shades, and control interfaces.
- A QS system can have up to 100 devices and 100 zones.
- Class 1/Class 2 wiring connects ballast to control unit.

Infrared

- Infrared (IR) receiver allows infrared transmitters to select 8 scenes, raise/lower lighting zones, or raise/lower shades.
- Transmitter buttons imitate buttons on faceplate.
- 50 ft (15 m) line of sight range.
- Terminal block infrared input for connection to a wired IR input from third-party equipment.
- IR can be disabled via programming.
- Works with Lutron GRX-IT and GRX-8IT infrared remote controls.

Job Name:	Model Numbers:	
Job Number:		

Specifications

Accessory Controls: seeTouch® QS Wallstations (QSWS2)

- Wired seeTouch® QS keypads provide the following features:
  - Access to one or more of the 16 scenes on the GRAFIK Eye® QS control unit
  - Zone toggle, partitioning, sequencing, fine tune, panic mode, and timeclock enable/disable
  - Contact closure inputs
  - Various other functions that are available on specific wallstation configurations. Refer to the *seeTouch* specification submittal.

Accessory Controls: QS Sensor Module (QSM2)

- The QS Sensor Module provides a means to link wired or wireless occupancy and daylight sensors to a GRAFIK Eye® QS control unit via the wired QS link.
  - Occupancy sensors wired (or wirelessly linked) to a QS Sensor Module can be used by one or more GRAFIK Eye® QS control units on the wired link.
  - Daylight sensors wired (or wirelessly linked) to a QS Sensor Module can be used by one or more GRAFIK Eye® QS control units on the wired link.
  - Infrared sensors can control either one or more zones or scenes on the GRAFIK Eye® QS control unit. Functionality varies; refer to the documentation for the QS Sensor Module for details.
  - Pico® wireless controls wirelessly linked to a QS Sensor Module can be used to control one or more zones or scenes on the GRAFIK Eye® QS control unit.

Accessory Controls: Contact Closure Input/Output Interface (QSE-IO)

- Recalls preset light levels for the following set of scenes on the GRAFIK Eye® QS control unit:
  Scenes 1-4 and Off Scenes 9-12 and Off
  Scenes 5-8 and Off Scenes 13-16 and Off
- Sequence scenes 5-16, Enable/Disable Zone Lockout, Enable/Disable Scene Lockout, Enable/Disable Panic Mode, Enable/Disable Timeclock.
- Occupancy Sensors. An individual input counts as 1 occupancy sensor for the GRAFIK Eye® QS control unit. Each input can be assigned to either Scene Control or Zone Control (please refer to the Occupancy Sensor(s) section of this guide).
- Zone Toggle. Allows an input to toggle one or more zones to a preset level and off.
- Shade Output mode. A Shade Column on the GRAFIK Eye® QS control unit can be linked to control outputs 1-3 and/or outputs 4-5 on the QSE-IO.

Accessory Controls: DMX Output Interface (QSE-CI-DMX)

- Any zone on the GRAFIK Eye® QS control unit can be mapped to any single DMX512 Channel.
- Any zone on the GRAFIK Eye® QS control unit can be simultaneously mapped to any three DMX512 channels (providing RGB/CMY control).
- DMX loads cannot be used with daylighting.

Accessory Controls: Ethernet and RS232 Interface (QSE-CI-NWK-E)

- Allows for monitoring and control of the outputs and local scenes of the GRAFIK Eye® QS control unit.

Accessory Controls: QS Keyswitch Wallstations (QSWS2-KS)

- Recalls preset light levels for any two scenes including Off.
- Allows fine-tuning (raise/lower level) of a zone or group of zones.
- Starts/Stops scene sequencing (Scenes 1-4 or Scenes 5-16)
- Enables/Disables Timeclock
- Enables/Disables occupancy sensors
- Enables/Disabled daylight sensors
- Allows toggle of Zone(s) to a preset level and off.
- Enables/Disables panic mode.
- Starts/Stops afterhours mode.

Other Accessory Controls and Devices

- Energi Savr Node™ QS (ESN). See the SPecification SUbmittal for complete details.

Occupancy Sensor(s)

- The GRAFIK Eye® QS control unit works with occupancy sensors through either:
  - Scene Control: Up to four sensors activate user-selectable occupancy and vacancy scenes.
  - Zone Control: Up to four sensors per zone activate user-selected occupancy and vacancy zone levels.
- Occupancy sensors may include:
  - Contact closure sensors wired to CCI input on back of GRAFIK Eye® QS control unit
  - Wired or wireless sensors connected QS Sensor Module (QSM)
- If any sensor in a group detects occupancy, then the GRAFIK Eye® QS control unit will go to the designated occupancy scene or zone level.
- If all sensors in a group detect vacancy, then the GRAFIK Eye® QS control unit will go to the designated vacancy scene or zone level.

Job Name:	Model Numbers:	
Job Number:		

Specifications

Daylight Sensor(s)

- The GRAFIK Eye® QS with EcoSystem® control unit works with compatible daylight sensors to adjust electric light levels based on measured daylight levels. Sensors can be configured to control either GRAFIK Eye® QS zones or groups of EcoSystem® loads independent of zoning.
- Daylight sensors may include:
  - Wired sensors connected to EcoSystem® ballasts or interfaces
  - Wired or wireless sensors connected to a QS sensor module (QSM)
- In Zone Mode, a daylight sensor can control one or more GRAFIK Eye® QS zones. Each zone can be calibrated to target light levels.
  - A zone can be controlled by no more than one daylight sensor
- In Group Mode, a daylight sensor can control one or more EcoSystem® loads, regardless of how they are zoned on the GRAFIK Eye® QS control unit.
  - A group can be controlled by a single daylight sensor
  - Each group can be calibrated to independent target light levels
  - Up to 16 groups are available
- Daylight control can be enabled or disabled on a scene-by-scene basis
  - By default, daylight control is enabled in all scenes

Note: Daylight control through the GRAFIK Eye® QS control unit only affects lighting loads. Shade groups cannot be controlled by daylight sensors. Daylighting does not affect DMX or RGB/CMY DMX loads.

Contact Closure Input (CCI) with Power Supply Output

- Each GRAFIK Eye® QS control unit has one contact closure input (Terminal A).
  - The attached device must provide a dry contact closure or solid-state output.
  - Input is miswire-protected up to 36 V⎓.
- The contact closure is capable of accepting the following types of inputs:
  - Maintained (default): The GRAFIK Eye® QS control unit will act on both a contact closure and a contact open/release event.
  - Momentary: The GRAFIK Eye® QS control unit will act on only contact closure events.
- Each GRAFIK Eye® QS control unit can supply 50 mA maximum at 24 V⎓.
  - Useful for powering occupancy sensors.
  - An auxiliary power supply must be used if the device requires more than 50 mA.
- The CCI is capable of operating in the following modes
  - Occupancy: If an occupancy sensor is wired directly to the GRAFIK Eye® QS control unit.
  - Emergency: This setting allows the GRAFIK Eye® QS control unit to work with a LUT-ELI. When an emergency situation is detected, all lights will go to full on, and no operations will be allowed until the emergency signal is cleared.
  - Afterhours: Allows the CCI to start and end the afterhours mode.
  - Timeclock: Allows the CCI to enable and disable the timeclock.
  - Scene Lockout: Prevents the user from making any changes to the control unit. The current scene will stay on until the CCI enables normal operation.
  - Save Never: Prevents any changes from being saved while the CCI is being used.
  - Disable CCI: The CCI will have no effect on the system and will not appear on the list of available sensors.

Security Lockout Password

- A 4-digit password (using characters A to Z and 0 to 9) can be enabled/disabled to lock out access to the Programming Menu.
- By default there is no password enabled on the GRAFIK Eye® QS control unit.
- If case the 4-digit password is forgotten, contact Lutron Technical Support to regain access.

Job Name:	Model Numbers:	
Job Number:		

Capacities

	220 - 240 V~ 50 / 60 Hz	120 - 127 V~ 50 / 60 Hz
Unit Capacity (watts)	3000	2000
MLV	3000 VA / 2400 W	2000 VA / 1600 W
Zone Capacity (watts)	40 – 1200	25 – 800
MLV	40 – 1200 VA / 40 – 960 W	25 – 800 VA / 25 – 600 W

Load Type Notes (Zones 1, 2 and 3)

- All electronic low-voltage (ELV) lighting used with an interface must be rated for reverse phase control dimming. Before installing an ELV light source, verify with the manufacturer that their transformer can be dimmed. When dimming, an ELV interface (such as the PHPM-PA-DV-WH) must be used with the control unit.
- Not all zones must be connected; however, connected zones must have a minimum load as specified above.
- Maximum total lighting load for a magnetic low-voltage (MLV) varies by input voltage:
  - 120 - 127 V~: 800 VA / 600 W
  - 220 - 240 V~: 1200 VA / 960 W
- Maximum total lighting load for Lutron Tu-Wire® and Advance Mark X® electronic dimming ballasts (120 to 127 V~ only) must not exceed 6 A per zone or 16 A per unit.
- No zone may be loaded with more than the capacity specified above. For higher wattage applications, or for 277 V~ applications, use Lutron power module PHPM-PA, PHPM-WBX, PHPM-PA-DV, PHPM-SW, or PHPM-WBX-DV.
- For controlling low-wattage loads (CFL, LED) in a non-dim application, contact Lutron Technical Support for the appropriate solution.

System Limits

- The QS wired communication link is limited to 100 devices or 100 zones.

Job Name:	Model Numbers:	
Job Number:		

GRAFIK Eye® QS with EcoSystem® Control Unit
Custom Color Options and Model Numbers
You must order a Base Unit and a Faceplate Kit
See Standard Color Combinations page for faceplate, stripe, and button colors

Base Unit

QSGR - _ E

- QSGR - Prefix
- _ Number of Zones
  - 6 = 6 zones
  - 8 = 8 zones
  - 16 = 16 zones
- E EcoSystem®

Example:

QSGR-6E
6-zone base unit
and
QSGFP-2IV-EGN
Ivory faceplate kit with two shade columns and general engraving

Faceplate Kit
(includes coordinating stripe and buttons)

QSGFP - - -

- QSGFP Faceplate Prefix
- Number of Shade Columns
  - Omit = none
  - 1 = 1 column
  - 2 = 2 columns
  - 3 = 3 columns
- Top Door Color
  - Omit = same as unit
  - T = Translucent
- Color/Finish
- Keypad Engraving Code

Faceplate Custom Color/Finish Codes

Architectural Matte Finishes

Standard (ship in 48 hours)

White	WH
Ivory	IV
Beige	BE
Gray	GR
Brown	BR
Black	BL
Almond	AL
Light Almond	LA

Architectural Metal Finishes

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 Finishes

Clear	CLA
Black	BLA
Brass	BRA

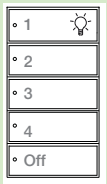
Satin Color Matte Finishes

Snow	SW
Biscuit	BI
Eggshell	ES
Taupe	TP
Midnight	MN
Limestone	LS
Stone	ST
Desert Stone	DS
Terracotta	TC
Hot	HT
Goldstone	GS
Palladium	PD
Plum	PL
Turquoise	TQ
Bluestone	BG
Sea Glass	SG
Greenbriar	GB
Sienna	SI
Merlot	MR
Mocha Stone	MS

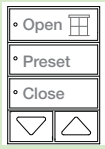
Keypad Engraving Codes

Omit = Unengraved
Ships with engraving certificate that customer can redeem at no charge

EGN = General Engraving



Lighting keypad



Shade column

NST = Non-Standard Text Engraving
Please visit the GRAFIK Eye® QS website at **www.lutron.com/grafikeyeqs** for custom engraving forms. Submit completed form with order, and unit will ship engraved as specified by customer.

Job Name:	Model Numbers:	
Job Number:		

GRAFIK Eye® QS with EcoSystem® Control Unit
Custom Options and Model Numbers
See previous page for Custom Model Numbers
See Standard Color Combinations page for faceplate, stripe, and button colors

Custom Button Kit

QSGB - 5B - WH -

- QSGB: Custom Button Kit Prefix
- 5B: Button Configuration
- WH: Button Color/Finish
- Keypad Engraving Code

3BRL = 3-button with raise/lower (shade column)
5B = 5-button (lighting keypad)

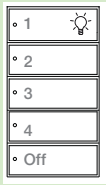
Button Kit Custom Color/Finish Codes

Architectural Matte Finishes		Satin Color Matte Finishes	
White	WH	Snow	SW
Ivory	IV	Biscuit	BI
Beige	BE	Eggshell	ES
Gray	GR	Taupe	TP
Brown	BR		
Black	BL		
Almond	AL		
Light Almond	LA		

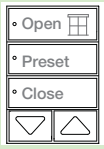
Keypad Engraving Codes

Omit = Unengraved
Ships with engraving certificate that customer can redeem at no charge

EGN = General Engraving



Lighting keypad



Shade column

NST = Non-Standard Text Engraving
Please visit the GRAFIK Eye® QS website at **www.lutron.com/grafikeyeqs** for custom engraving forms. Submit completed form with order, and unit will ship engraved as specified by customer.

Custom Stripe Kit

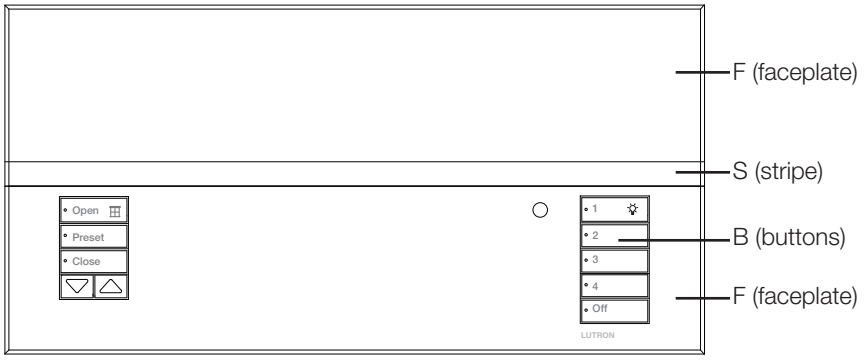
QSGS - WH

- QSGS: Stripe Kit Prefix
- WH: Stripe Color/Finish

Stripe Custom Color/Finish Codes
Same as Faceplate colors on previous page

Job Name:	Model Numbers:	
Job Number:		

GRAFIK Eye® QS with EcoSystem® Control Unit
Standard Color Combinations
See previous pages for Custom Model Numbers



Faceplate is comprised of a top and bottom. The bottom will always be the color indicated under "faceplate." The top may be the same color or translucent. Use the chart for faceplates that have the same color top and bottom. If a translucent lid is chosen, the stripe will automatically be the same color as the bottom lid.

Example:
If you order QSGR-6E-1WH, your GRAFIK Eye® QS control unit with 6 lighting zones and 1 shade column will come with a white faceplate (both top and bottom), gray stripe, and white buttons.

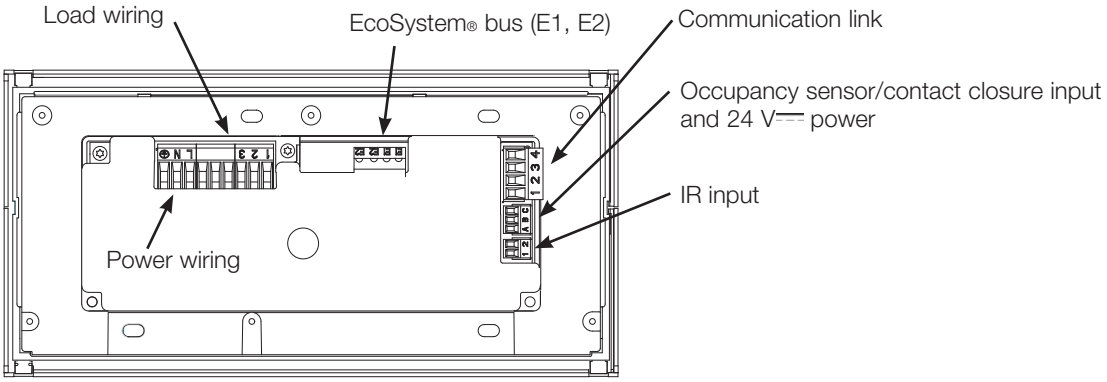
Suffix	Faceplate (F)	Stripe (S)	Button (B)
Architectural Matte			
WH	White	Gray	White
IV	Ivory	Beige	Ivory
BE	Beige	Ivory	Beige
GR	Gray	Black	Gray
BR	Brown	Black	Brown
BL	Black	Gray	Black
AL	Almond	Light Almond	Almond
LA	Light Almond	Almond	Light Almond
Architectural Metal			
BB	Bright Brass	Black	Black
BC	Bright Chrome	Black	Black
BN	Bright Nickel	Black	Black
SB	Satin Brass	Black	Black
SC	Satin Chrome	Black	Black
SN	Satin Nickel	Black	Black
QB	Antique Brass	Black	Black
QZ	Antique Bronze	Black	Black
Anodized			
CLA	Clear	Black	Black
BLA	Black	Black	Black
BRA	Brass	Black	Black

Suffix	Faceplate (F)	Stripe (S)	Button (B)
Satin Matte			
MN	Midnight	Gray	Black
TP	Taupe	Gray	Taupe
SW	Snow	Gray	Snow
ES	Eggshell	Beige	Eggshell
BI	Biscuit	Eggshell	Biscuit
LS	Limestone	Gray	Gray
ST	Stone	Gray	Gray
DS	Desert Stone	Taupe	Taupe
TC	Terracotta	Taupe	Taupe
BG	Bluestone	Gray	Gray
HT	Hot	Taupe	Taupe
MR	Merlot	Taupe	Taupe
SI	Sienna	Brown	Brown
GB	Greenbriar	Gray	Gray
SG	Sea Glass	Gray	Gray
MS	Mocha Stone	Taupe	Taupe
GS	Goldstone	Ivory	Ivory
PD	Palladium	Gray	Gray
PL	Plum	Taupe	Taupe
TQ	Turquoise	Gray	Gray

Job Name:	Model Numbers:	
Job Number:		

Overview

Terminations



Wire Gauge	Maximum EcoSystem® Bus Length
12 AWG (4.0 mm²)	2200 ft (671 m)
14 AWG (2.5 mm²)	1400 ft (427 m)
16 AWG (1.5 mm²)	900 ft (275 m)
18 AWG (1.0 mm²)	570 ft (175 m)

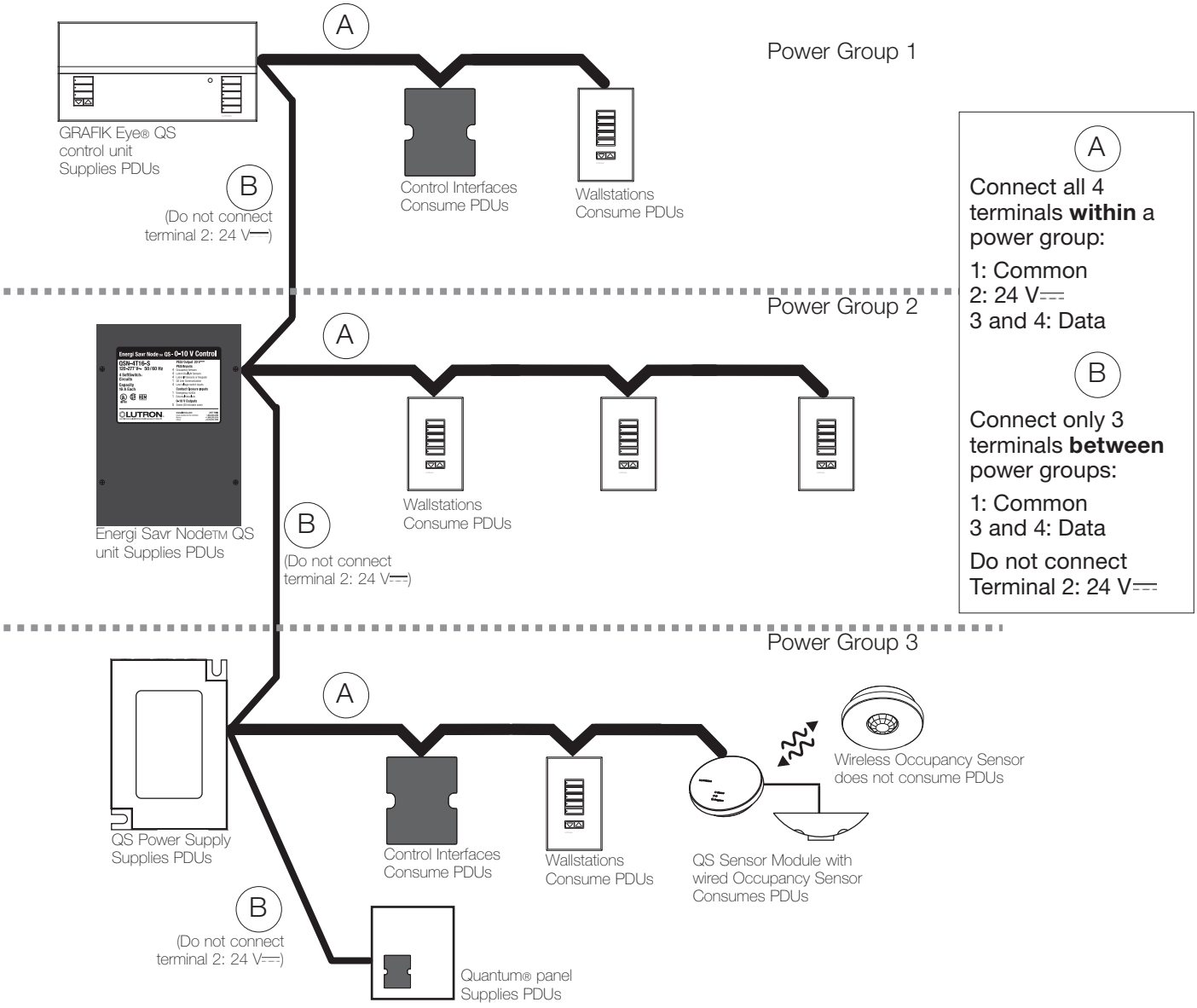
Job Name:	Model Numbers:	
Job Number:		

Power Group Wiring Example

On the QS link, there are devices that supply power and devices that consume power. Each device has a specific number of Power Draw Units (PDUs) it either supplies or consumes. A Power Group consists of one device that supplies power and one or more devices that consume power; each Power Group may have only one power-supplying device. Refer to the QS Link Power Draw Units specification submittal (Lutron PN 369405) for more information concerning PDUs.

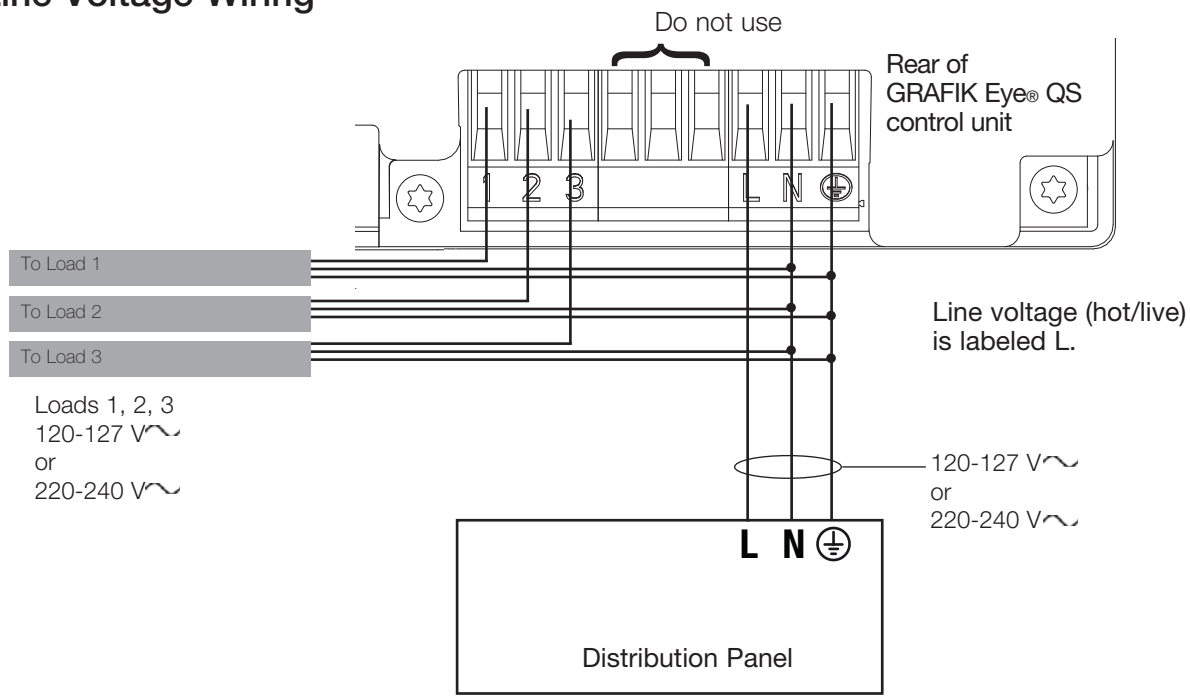
Within Power Groups on the QS link, connect all 4 terminals (1, 2, 3, and 4), shown by the letter A in the diagram. Between devices on the QS link that supply power, connect only terminals 1, 3, and 4 (NOT terminal 2), shown by the letter B on the diagram.

Wiring can be T-tapped or daisy-chained.



Job Name:	Model Numbers:	
Job Number:		

Line Voltage Wiring

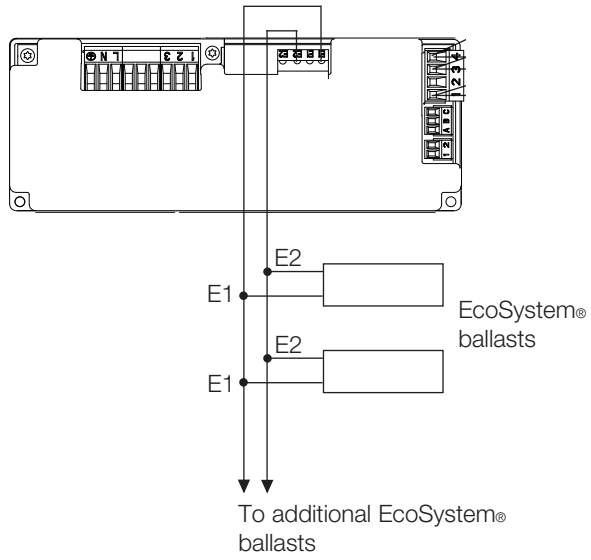


- Pull power wiring from distribution panel and to light fixtures.
- Each line voltage terminal can accept one 12 AWG (2.5 mm^2) wire.
- Consult Lutron for non-dim relay wiring and/or load side emergency transfer wiring.

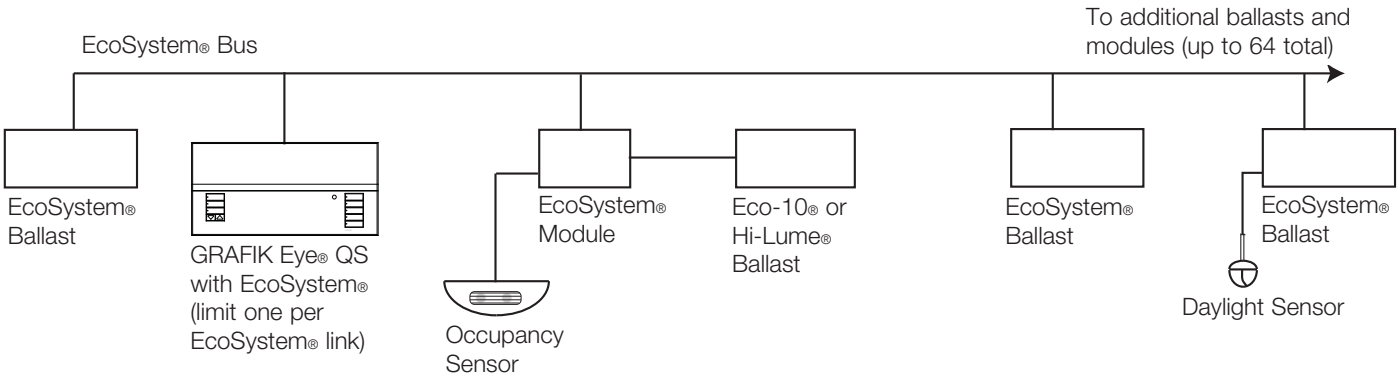
Job Name:	Model Numbers:	
Job Number:		

EcoSystem® Bus Wiring

EcoSystem® Bus Link Terminal Detail



EcoSystem® Bus Wiring Example



Job Name:	Model Numbers:	
Job Number:		

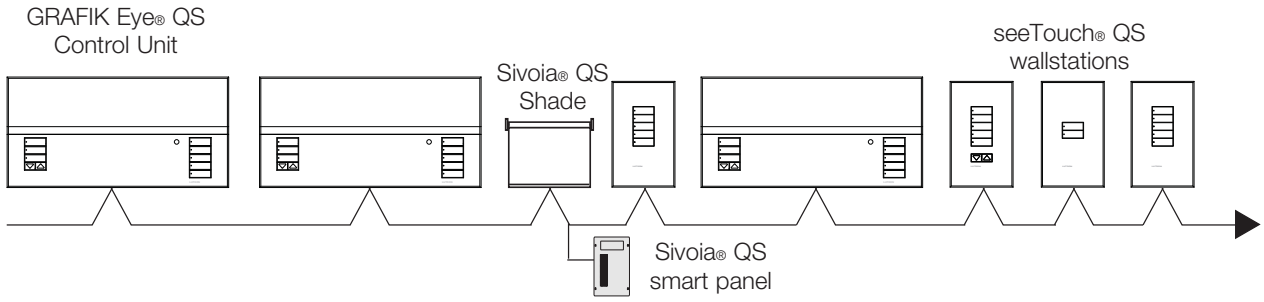
IEC PELV/NEC® Class 2 QS System Wiring

- Wiring can be daisy-chained or T-tapped.
- Wiring must be run separately from line/mains voltage.
- Total length of control link must not exceed 2000 ft (610 m).

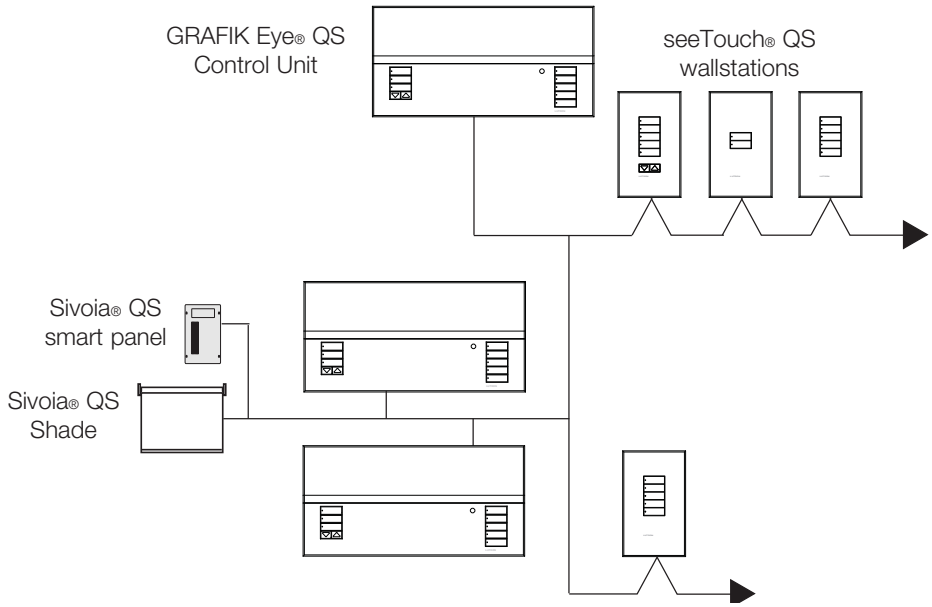
Wire Sizes (check compatibility in your area)

QS Link Wiring Length	Wire Gauge	Lutron Cable Part Number
Less than 500 ft (153 m)	Power (terminals 1 and 2) 1 pair 18 AWG (1.0 mm²)	GRX-CBL-346S (non-plenum) GRX-PCBL-346S (plenum)
	Data (terminals 3 and 4) 1 twisted, shielded pair 22 AWG (0.5 mm²)	
500 to 2000 ft (153 to 610 m)	Power (terminals 1 and 2) 1 pair 12 AWG (4.0 mm²)	GRX-CBL-46L (non-plenum) GRX-PCBL-46L (plenum)
	Data (terminals 3 and 4) 1 twisted, shielded pair 22 AWG (0.5 mm²)	

Daisy-Chain Wiring Example

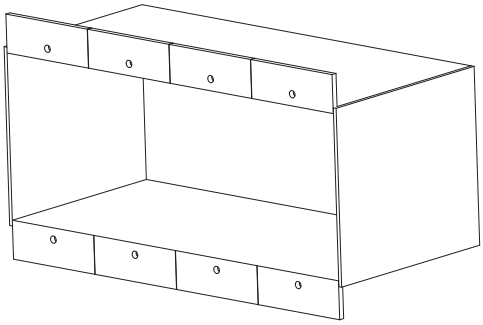


T-Tap Wiring Example

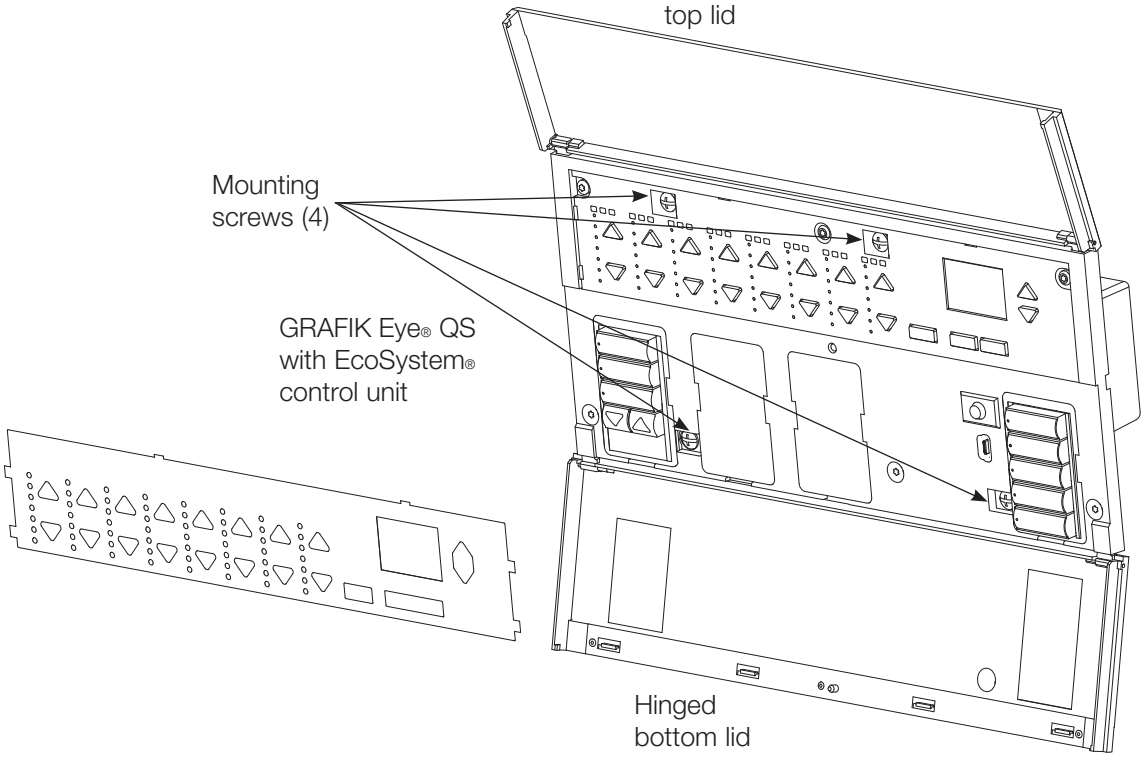


Job Name:	Model Numbers:	
Job Number:		

Mounting

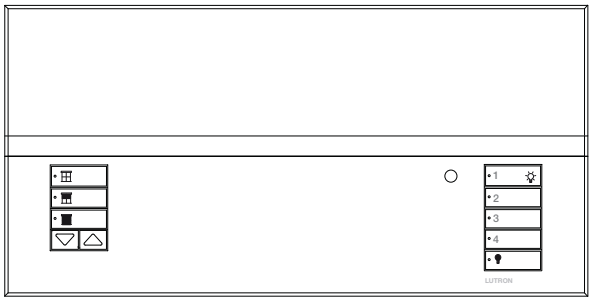


Standard 4-gang
U.S. wallbox,
3½ in (89 mm) deep
(available from
Lutron, P/N 241-400)



Job Name:	Model Numbers:	
Job Number:		

GRAFIK Eye® QS Control Unit with DALI (CE)

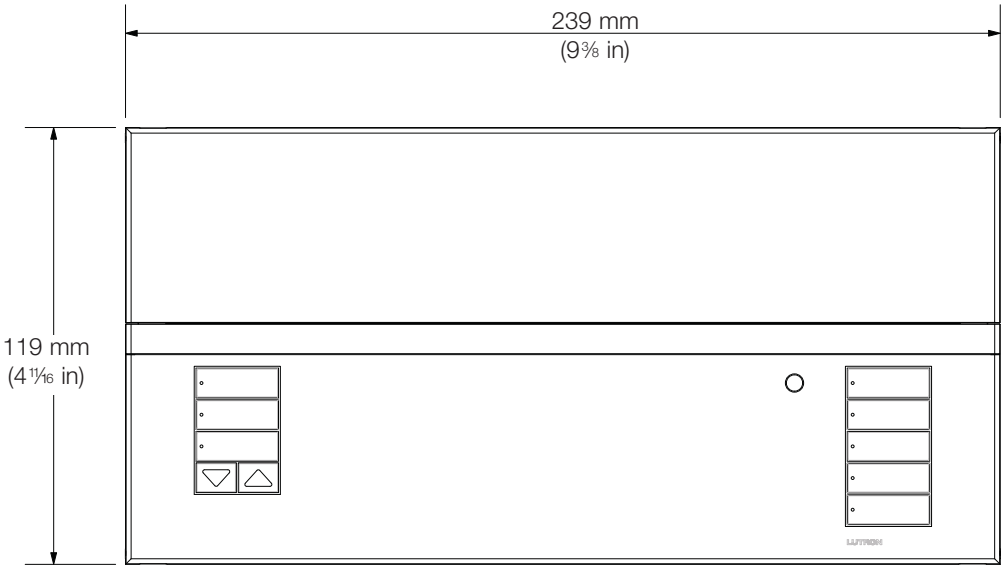


Description

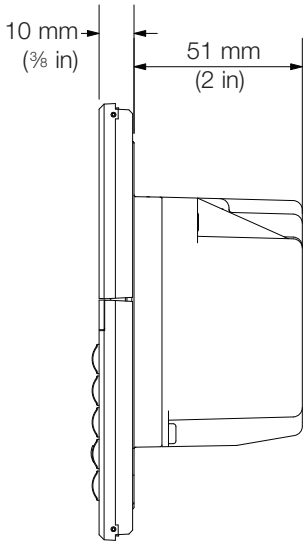
GRAFIK Eye QS with DALI is the premier energy-saving lighting and shade control. *GRAFIK Eye* QS features an astronomic timeclock, intuitive lighting presets, and direct shade control, which are seamlessly integrated with DALI-compliant output devices, and Lutron's QS components and systems. Now with an integral DALI-compliant bus supply, you can use the *GRAFIK Eye* QS with DALI to control digital loads and shades without interfaces, and integrate with a variety of Lutron products and systems, including Sivoia® QS shades and all Lutron wired QS products and systems.

GRAFIK Eye QS with DALI is compatible with Quantum®.

Mechanical Dimensions



Front View

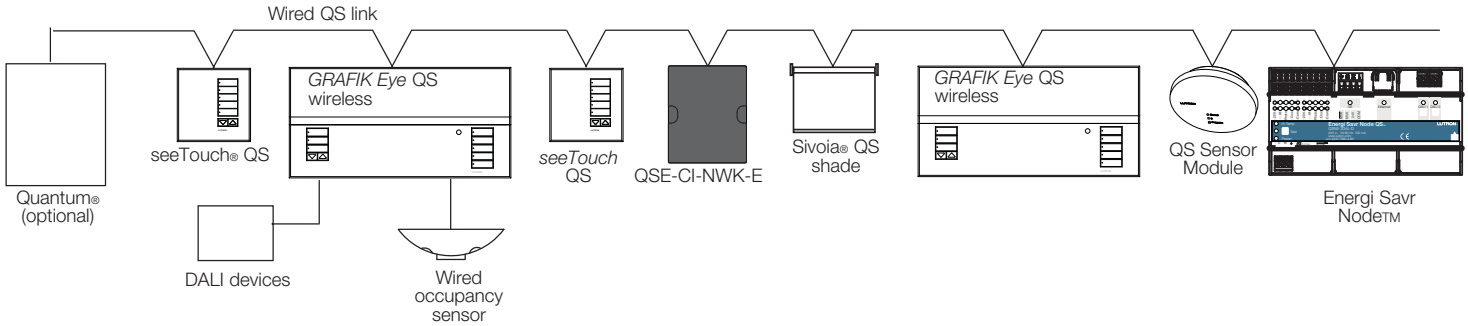


Side View

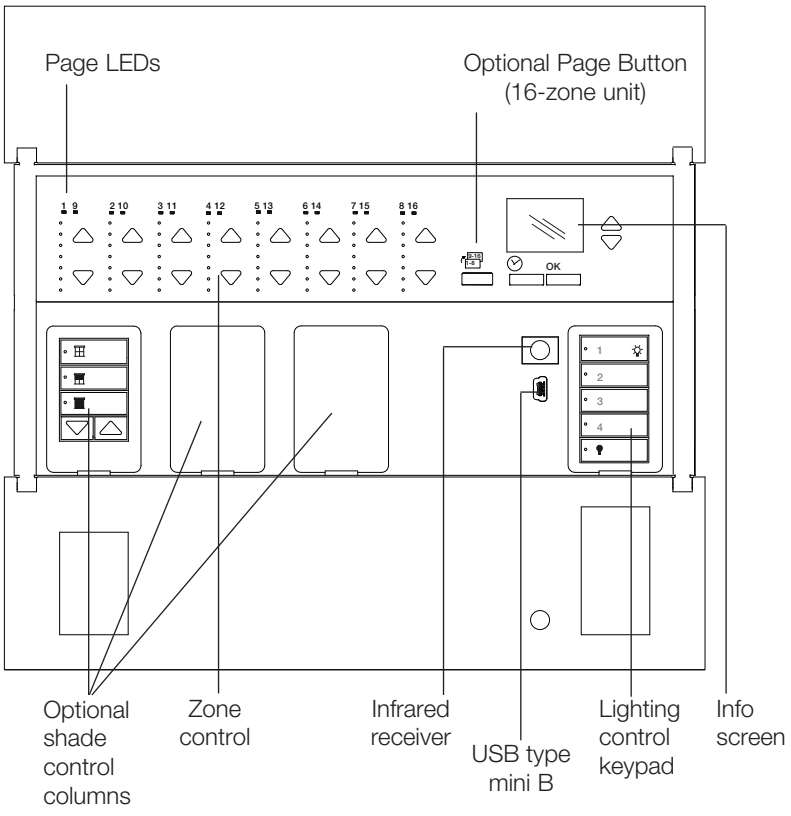
Fits into a 4-gang U.S. backbox, 89 mm (3.5 in) deep; Lutron P/N 241-400

System Topology

Example of Wired System



Job Name:	Model Numbers:	
Job Number:		



Note: Symbol-based (-SGN) engraving shown.

Features

- Pushbutton recall of four preset lighting scenes, plus Off.
- Twelve (12) additional scenes accessible through other QS devices, such as seeTouch® QS wallstations.
- Optional integrated shade control buttons, which can also be added to the unit after installation.
- Master override buttons to raise and lower all lights.
- Allows setup of lighting scenes and shade presets using buttons on the control unit.
- Built-in infrared (IR) receiver.
- External IR connection.
- Built-in astronomic timeclock.
- Info screen shows zone light level percentage, energy savings, zone labeling, programming, and Digital Addressable Load setup.
- Lockout option prevents accidental changes.
- One occupancy sensor input and 24 V⎓ power for occupancy sensor.
- QS communication link for seamless integration of lights, motorised window treatments, wallstations, and integration interfaces.
- Compatible with all Lutron QS system components.
- Control up to 6, 8, or 16 zones of DALI-compliant loads from internal bus supply.
- Up to 64 DALI-compliant output devices can be addressed and grouped into zones.
- Backlit buttons with engraving make unit easy to locate and operate.
- Available in a variety of colours and finishes.

Job Name:	Model Numbers:	
Job Number:		

Specifications

Input Power

- 220-240 V~ 50/60 Hz

Lighting Sources/Load Types

- Up to 64 DALI-compliant output devices (devices must comply with IEC/EN 60929) can be addressed and grouped into zones.
- Before system is addressed, Zone 1 will transmit broadcast commands to all DALI-compliant loads wired to the GRAFIK Eye® QS.

Key Design Features

- RF meets IEC 801-2.
- Tested to withstand 16 kV electrostatic discharge without damage or memory loss.
- Tested to withstand voltage surges of up to 6 000 V~ and current surges of up to 3 000 A. Lightning strike protection meets ANSI/IEEE 62.41-1980 standard.
- Power failure memory retains programming and light level settings for up to 10 years in the event of a power loss.
- The *GRAFIK Eye* QS supplies 3 Power Draw Units (PDUs) on the QS link.
  For complete information, see “Power Draw Units on the QS Link,” Lutron PN 369405
- Faceplate is hinged at the top and bottom, and stays open at 180° for ease of access.

Environment

- 0 to 40 °C (32 to 104 °F).
- Relative humidity less than 90% non-condensing.

Compliance

- CE

Scene and Shade Buttons

- Large, rounded buttons are easy to use.
- Backlit buttons with optional engraving make it easy to find and to operate the control unit in low light conditions (backlight can be disabled).
- Optional button engraving is angled up to the eye for easy reading.
- Predefined label stickers are included for field labeling.
- 4 preset lighting scenes, plus Off, are accessible from the front of the control unit.
- 12 additional scenes are stored in the control unit and are accessible from seeTouch® QS wallstations and QS interfaces.
- Light levels fade smoothly between scenes. Fade time can be set differently for each scene: 0 to 59 seconds, or 1 to 60 minutes. Maximum fade time from Off is 3 seconds.

Shade Control

- The *GRAFIK Eye* QS can include up to 3 shade button columns. Each column has backlit open, preset, close, and raise/lower buttons.
- Each shade button column can be programmed to operate one shade or a group of shades. (Shades may be assigned to more than one shade button column).
- Faceplates are available with 1, 2 and 3 shade button columns.

Zone Control

- Each zone has a dedicated raise and lower button to adjust the zone.
- Each zone has a dedicated 7 LED bar graph for level status. Percentage of light level and energy saved is displayed on the info screen.
- All zone information has blue backlit LEDs. Backlight turns off when idle for 30 seconds.

Info Screen

- OLED (organic LED) screen is viewable from all angles.
- Screen turns off when idle for 30 seconds.
- Programmable zone labels.
- Programmable scene labels.
- Status of real-time zone percentage and energy savings.
- Programmable timeclock schedules.
- Programmable shade labels.

Job Name:	Model Numbers:	
Job Number:		

Specifications

Astronomic Timeclock

- Integral to all units.
- 7 daily schedules available.
- One available holiday schedule is programmable by date up to one year in advance.
- 25 events per day maximum.
- Timeclock events are programmable to control scenes that affect any Energi Savr Node™ unit connected on the QS link without changing the local scene on the *GRAFIK Eye* QS.
- Astronomic times are programmable by integral city database or by entering latitude and longitude. Times automatically adjust throughout the year based on location.
- Automatically adjusts for Daylight Saving Time (DST), adjusted for the new dates; DST is programmable.
- Local timeclock events can activate any of the following features:
  - Scenes 1 to 16 and Off
  - Any available window treatment presets
  - Start and End afterhours mode
  - Enable and Disable daylighting for all zones/groups
  - Enable and Disable occupancy for occupancy/vacancy sensors
  - Enable and Disable occupied events for all occupancy sensors

System Communications and Capacities

- Low-voltage type IEC PELV/NEC® Class 2 wiring connects control units, wallstations, motorised shades, and control interfaces.
- A QS system can have up to 100 devices and 100 zones.
- Class 1/Class 2 wiring connects DALI-compliant output devices to control unit.

Infrared

- Infrared (IR) receiver allows infrared transmitters to select 8 scenes, raise/lower lighting zones, or raise/lower shades.
- Transmitter buttons imitate buttons on faceplate.
- 15 m (50 ft) line of sight range.
- Terminal block infrared input for direct contact with external IR connection.
- IR can be disabled via programming.
- Works with Lutron GRX-IT and GRX-8IT infrared remote controllers.

Accessory Controls: seeTouch® QS Wallstations (QSWS2)

- Wired *seeTouch* QS keypads provide the following features:
  - Access to one or more of the 16 scenes on the *GRAFIK Eye* QS Wireless
  - Zone toggle, partitioning, sequencing, fine tune, panic mode, and timeclock enable/disable
  - Contact closure inputs
  - Certain functions are only available on specific wallstation configurations. Refer to the *seeTouch* QS specification submittal.

Accessory Controls: QS Sensor Module (QSM)

- The QS Sensor Module provides a means to link wired or wireless occupancy and daylight sensors to a *GRAFIK Eye* QS via the wired QS link.
  - Occupancy sensors wired (or wirelessly linked) to a QS Sensor Module can be used by one or more *GRAFIK Eye* QS control units on the wired link.
  - Daylight sensors wired (or wirelessly linked) to a QS Sensor Module can be used by one or more *GRAFIK Eye* QS control units on the wired link.
  - Infrared sensors can control either one or more zones or scenes on the *GRAFIK Eye* QS. Functionality varies; refer to the documentation for the QS Sensor Module for details.
  - *Pico* wireless controls can control either one or more zones or scenes on the *GRAFIK Eye* QS.

Accessory Controls: Contact Closure Input/Output Interface (QSE-IO)

- Recalls preset light levels for the following set of scenes on the *GRAFIK Eye* QS:
  Scenes 1-4 and Off Scenes 9-12 and Off
  Scenes 5-8 and Off Scenes 13-16 and Off
- Sequence scenes 5-16, Enable/Disable Zone Lockout, Enable/Disable Scene Lockout, Enable/Disable Panic Mode, Enable/Disable Timeclock.
- Occupancy Sensors. An individual input counts as 1 occupancy sensor for the *GRAFIK Eye* QS. Each input can be assigned to either Scene Control or Zone Control (please refer to the Occupancy Sensor(s) section of this guide).
- Zone Toggle. Allows an input to toggle one or more zones to a preset level and off.
- Shade Output mode. A Shade Column on the *GRAFIK Eye* QS can be linked to control outputs 1-3 and/or outputs 4-5 on the QSE-IO.

Job Name:	Model Numbers:	
Job Number:		

Specifications

Accessory Controls:
DMX Output Interface (QSE-CI-DMX)

- Any zone on the GRAFIK Eye® QS control unit can be mapped to any single DMX512 Channel.
- Any zone on the *GRAFIK Eye* QS control unit can be simultaneously mapped to any three DMX512 channels (providing RGB/CMY control).
- DMX loads cannot be used with daylighting.

Accessory Controls: Ethernet and RS232 Interface (QSE-CI-NWK-E)

- Allows for monitoring and control of the outputs and local scenes of the *GRAFIK Eye* QS.

Accessory Controls: QS Keyswitch Wallstations (QSWS2-KS)

- Recalls preset light levels for any two scenes including Off
- Allows fine-tuning (raise/lower level) of a zone or group of zones
- Starts/Stops scene sequencing (Scenes 1-4 or Scenes 5-16)
- Enables/Disables Timeclock
- Enables/Disables occupancy sensors
- Enables/Disabled daylight sensors
- Allows toggle of Zone(s) to a preset level and off
- Enables/Disables panic mode
- Starts/Stops afterhours mode

Other Accessory Controls and Devices

- Energi Savr Node™ QS (ESN)

Occupancy Sensor(s)

- The *GRAFIK Eye* QS works with occupancy sensors through either:
  - Scene Control: Up to four sensors activate user-selectable occupancy and vacancy scenes.
  - Zone Control: up to four sensors per zone activate user-selected occupancy and vacancy zone levels.
- Occupancy sensors may include:
  - Contact closure sensor wired to CCI input on back of *GRAFIK Eye* QS
  - Wired sensors connected to *Energi Savr Node*
  - Wired or wireless sensors connected QS Sensor Module (QSM)
- If any sensor in a group detects occupancy, then the *GRAFIK Eye* QS will go to the designated occupancy scene or zone level.
- If all sensors in a group detect vacancy, then the *GRAFIK Eye* QS will go to the designated vacancy scene or zone level.

Daylight Sensor(s)

- The *GRAFIK Eye* QS with DALI works with compatible daylight sensors to adjust electric light levels based on measured daylight levels. Sensors can be configured to control either *GRAFIK Eye* QS zones or groups of DALI loads independent of zoning.
- Daylight sensors may include:
  - Wired or wireless sensors connected to a QS sensor module (QSM)
- In Zone Mode, a daylight sensor can control one or more *GRAFIK Eye* QS zones. Each zone can be calibrated to target light levels.
  - A zone can be controlled by no more than one daylight sensor
- In Group Mode, a daylight sensor can control one or more DALI loads, regardless of how they are zoned on the *GRAFIK Eye* QS.
  - A group can be controlled by a single daylight sensor
  - Each group can be calibrated to independent target light levels
  - Up to 16 groups are available
- Daylight control can be enabled or disabled on a scene-by-scene basis
  - By default, daylight control is enabled in all scenes

Note: Daylight control through the *GRAFIK Eye* QS only affects lighting loads. Shade groups cannot be controlled by daylight sensors. Daylighting does not affect DMX or RGB/CMY DMX loads.

Job Name:	Model Numbers:	
Job Number:		

Specifications

Contact Closure Input (CCI) with Power Supply Output

- Each GRAFIK Eye® QS has one contact closure input (Terminal A).
  - The attached device must provide a dry contact closure or solid-state output.
  - Input is miswire-protected up to 36 V⎓.
- The contact closure is capable of accepting the following types of inputs:
  - Maintained (default): The *GRAFIK Eye* QS control unit will act on both a contact closure and a contact open/release event.
  - Momentary: The *GRAFIK Eye* QS control unit will act on only contact closure events.
- Each *GRAFIK Eye* QS can supply 50 mA maximum at 24 V⎓.
  - Useful for powering occupancy sensors.
  - An auxiliary power supply must be used if the device requires more than 50 mA.
- The CCI is capable of operating in the following modes
  - Occupancy: If an occupancy sensor is wired directly to the *GRAFIK Eye* QS, choose this setting so that the occupancy sensor will work correctly.
  - Emergency: This setting allows the *GRAFIK Eye* QS to work with a LUT-ELI. When an emergency situation is detected, all lights will go to full on, and no operations will be allowed until the emergency signal is cleared.
  - Afterhours: Allows the CCI to start and end the afterhours mode.
  - Timeclock: Allows the CCI to enable and disable the timeclock.
  - Scene Lockout: Prevents the user from making any changes to the control unit. The current scene will stay on until the CCI enables normal operation.
  - Never Save: Prevents any changes from being saved while the CCI is being used.
  - Disable CCI: The CCI will have no effect on the system and will not appear on the list of available sensors.

Unit Dissipation

- All models of *GRAFIK Eye* QS for Digital Addressable Loads dissipate no more than 35 BTUs/hour.

System Limits

- The QS wired communication link is limited to 100 devices or 100 zones.

Security Lockout Password

- A 4-digit password (using characters A to Z and 0 to 9) can be enabled/disabled to lock out access to the Programming Menu.
- By default there is no password enabled on the *GRAFIK Eye* QS.
- If case the 4-digit password is forgotten, contact Lutron® Technical Support to regain access.

Job Name:	Model Numbers:	
Job Number:		

GRAFIK Eye® QS for Digital Addressable Loads
Custom Colour Options and Model Numbers
You must order a Base Unit and a Faceplate Kit
See Standard Colour Combinations page for faceplate, stripe, and button colours

Base Unit

QSGR - _ D

- QSGR – Prefix
- _ – Number of Zones
  - 6 = 6 zones
  - 8 = 8 zones
  - 16 = 16 zones
- D – Digital Addressable Loads

Example:

QSGR-6D
6-zone base unit
and
QSGFP-2IV-SGN
Ivory faceplate kit with two shade columns and symbol-based engraving

Faceplate Kit
(includes coordinating stripe and buttons; see Standard Colour Combinations page)

QSGFP - - -

- QSGFP – Faceplate Prefix
- Number of Shade Columns
  - Omit = none
  - 1 = 1 column
  - 2 = 2 columns
  - 3 = 3 columns
- Top Door Colour
  - Omit = same as unit
  - T = Translucent
- Colour/Finish
- Keypad Engraving Code

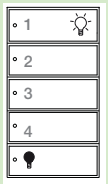
Faceplate Custom Colour/Finish Codes

Architectural Matte Finishes		Architectural Metal Finishes		Satin Colour Matte Finishes	
White	WH	Bright Brass	BB	Snow	SW
Ivory	IV	Bright Chrome	BC	Biscuit	BI
Beige	BE	Bright Nickel	BN	Eggshell	ES
Gray	GR	Satin Brass	SB	Taupe	TP
Brown	BR	Satin Chrome	SC	Midnight	MN
Black	BL	Satin Nickel	SN	Limestone	LS
Almond	AL	Antique Brass	QB	Stone	ST
Light Almond	LA	Antique Bronze	QZ	Desert Stone	DS
				Terracotta	TC
		Anodised Aluminum Finishes		Hot	HT
		Clear	CLA	Goldstone	GS
		Black	BLA	Palladium	PD
		Brass	BRA	Plum	PL
				Turquoise	TQ
				Bluestone	BG
				Sea Glass	SG
				Greenbrier	GB
				Sienna	SI
				Merlot	MR
				Mocha Stone	MS

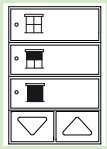
Keypad Engraving Codes

Omit = Unengraved
Ships with engraving certificate that customer can redeem at no charge

SGN = International (symbol-based) Engraving



Lighting keypad


Shade column

NST = Non-Standard Text Engraving
Please visit the *GRAFIK Eye* QS website at **www.lutron.com/grafikeyeqs** for custom engraving forms. Submit completed form with order, and unit will ship engraved as specified by customer.

Job Name:	Model Numbers:	
Job Number:		

GRAFIK Eye® QS for Digital Addressable Loads
Custom Options and Model Numbers
See previous pages for Standard and Other Custom Model Numbers
See Standard Colour Combinations page for faceplate, stripe, and button colours

Custom Button Kit

QSGB - 5B - WH -

- QSGB — Custom Button Kit Prefix
- 5B — Button Configuration
- WH — Button Colour/Finish
- Keypad Engraving Code

3BRL = 3-button with raise/lower (shade column)
5B = 5-button (lighting keypad)

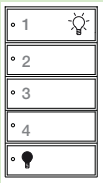
Button Kit Custom Colour/Finish Codes

Architectural Matte Finishes		Satin Colour Matte Finishes	
White	WH	Snow	SW
Ivory	IV	Biscuit	BI
Beige	BE	Eggshell	ES
Gray	GR	Taupe	TP
Brown	BR		
Black	BL		
Almond	AL		
Light Almond	LA		

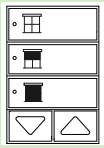
Keypad Engraving Codes

Omit = Unengraved
Ships with engraving certificate that customer can redeem at no charge

SGN = Symbol-based Engraving



Lighting keypad


Shade column

NST = Non-Standard Text Engraving
Please visit the *GRAFIK Eye* QS website at **www.lutron.com/grafikeyeqs** for custom engraving forms. Submit completed form with order, and unit will ship engraved as specified by customer.

Custom Stripe Kit

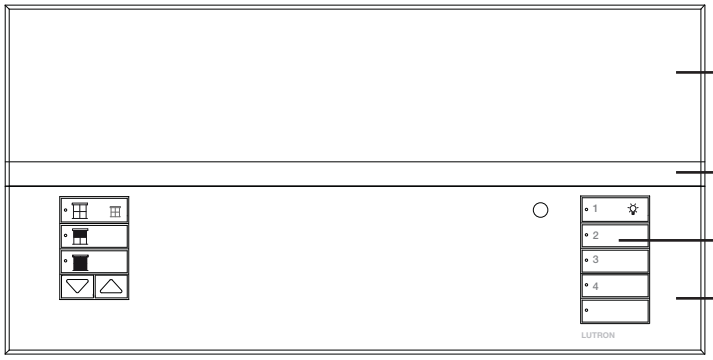
QSGS - ____

- QSGS — Stripe Kit Prefix
- ____ — Stripe Colour/Finish

Stripe Custom Colour/Finish Codes
Same as Faceplate colours on previous page

Job Name:	Model Numbers:	
Job Number:		

GRAFIK Eye® QS for Digital Addressable Loads
Standard Colour Combinations
See previous pages for Standard and Custom Model Numbers



Faceplate is comprised of a top and bottom. The bottom will always be the colour indicated under “faceplate.” The top may be the same colour or translucent. Use the chart for faceplates that have the same colour top and bottom. If a translucent lid is chosen, the stripe will automatically be the same colour as the bottom lid.

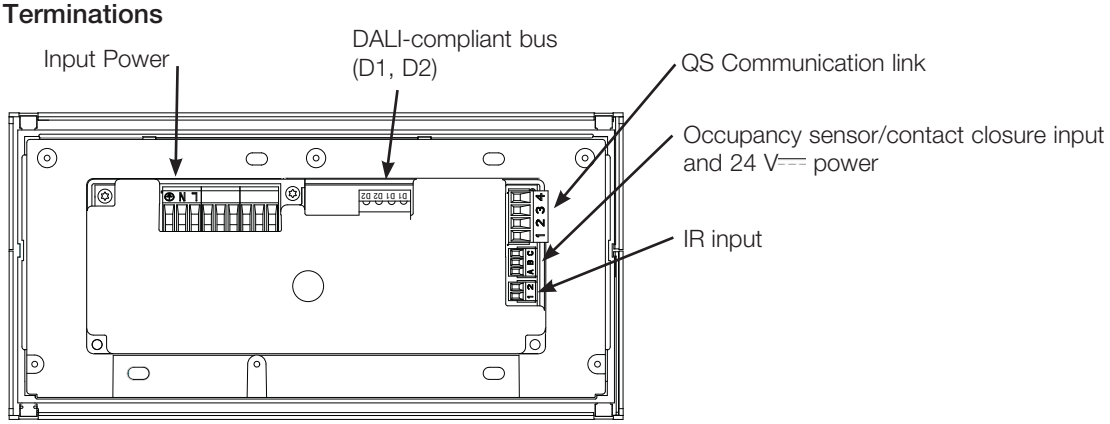
Suffix	Faceplate (F)	Stripe (S)	Button (B)
Architectural Matte			
WH	White	Gray	White
IV	Ivory	Beige	Ivory
BE	Beige	Ivory	Beige
GR	Gray	Black	Gray
BR	Brown	Black	Brown
BL	Black	Gray	Black
AL	Almond	Light Almond	Almond
LA	Light Almond	Almond	Light Almond
Architectural Metal			
BB	Bright Brass	Black	Black
BC	Bright Chrome	Black	Black
BN	Bright Nickel	Black	Black
SB	Satin Brass	Black	Black
SC	Satin Chrome	Black	Black
SN	Satin Nickel	Black	Black
QB	Antique Brass	Black	Black
QZ	Antique Bronze	Black	Black
Anodised			
CLA	Clear	Black	Black
BLA	Black	Black	Black
BRA	Brass	Black	Black

Suffix	Faceplate (F)	Stripe (S)	Button (B)
Satin Matte			
MN	Midnight	Gray	Black
TP	Taupe	Gray	Taupe
SW	Snow	Gray	Snow
ES	Eggshell	Beige	Eggshell
BI	Biscuit	Eggshell	Biscuit
LS	Limestone	Gray	Gray
ST	Stone	Gray	Gray
DS	Desert Stone	Taupe	Taupe
TC	Terracotta	Taupe	Taupe
BG	Bluestone	Gray	Gray
HT	Hot	Taupe	Taupe
MR	Merlot	Taupe	Taupe
SI	Sienna	Brown	Brown
GB	Greenbrier	Gray	Gray
SG	Sea Glass	Gray	Gray
MS	Mocha Stone	Taupe	Taupe
GS	Goldstone	Ivory	Ivory
PD	Palladium	Gray	Gray
PL	Plum	Taupe	Taupe
TQ	Turquoise	Gray	Gray

Job Name:	Model Numbers:	
Job Number:		

Overview

Terminations



Wire Gauge	Maximum DALI-compliant Bus Wire Length
4.0 mm² (12 AWG)	671 m (2 200 ft)
2.5 mm² (14 AWG)	427 m (1 400 ft)
1.5 mm² (16 AWG)	275 m (900 ft)
1.0 mm² (18 AWG)	175 m (570 ft)

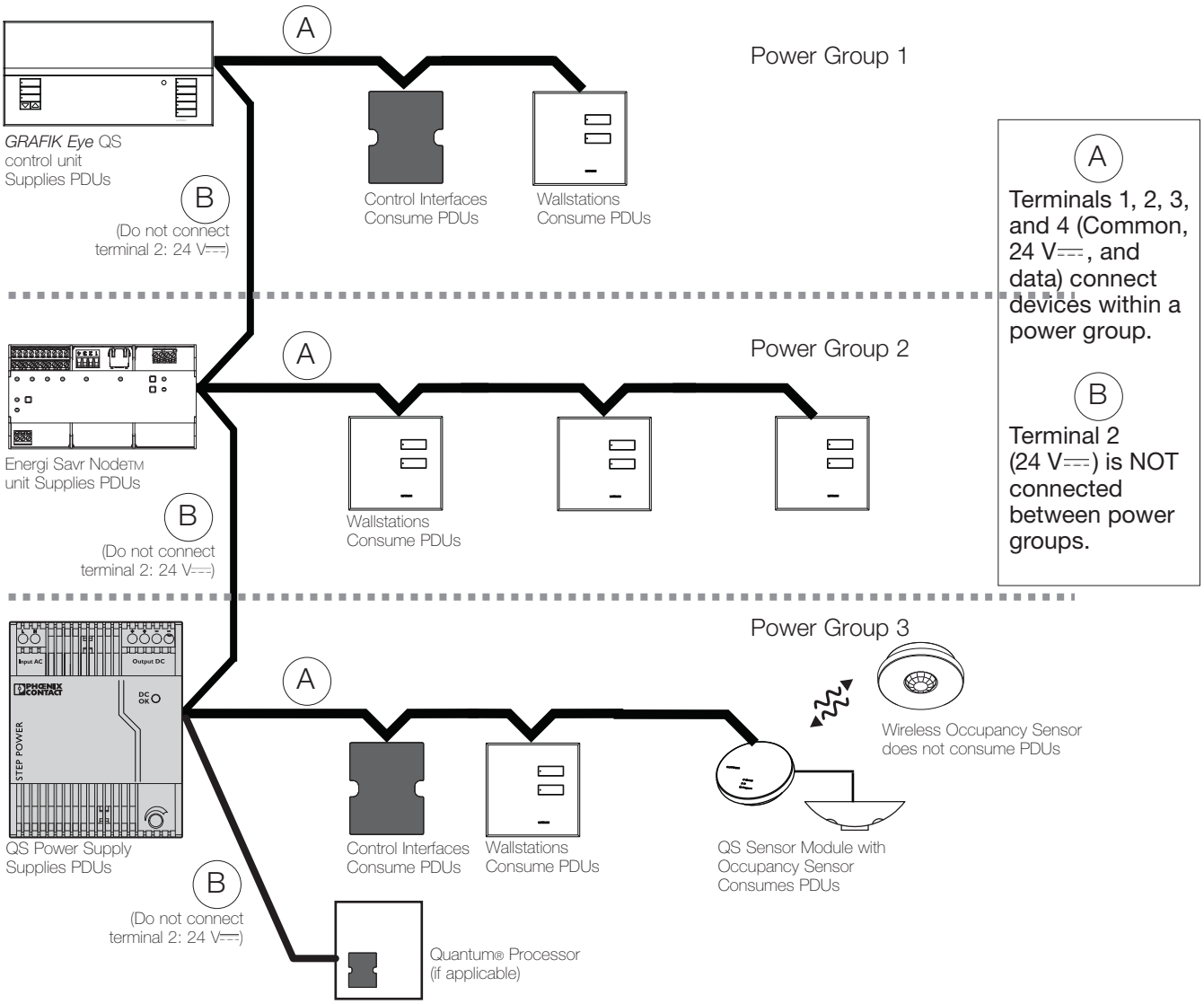
Job Name:	Model Numbers:	
Job Number:		

Power Group Wiring Example

On the QS link, there are devices that supply power and devices that consume power. Each device has a specific number of Power Draw Units (PDUs) it either supplies or consumes. A Power Group consists of one device that supplies power and one or more devices that consume power; each Power Group may have only one power-supplying device. Refer to the QS Link Power Draw Units specification submittal (Lutron PN 369405) for more information concerning PDUs.

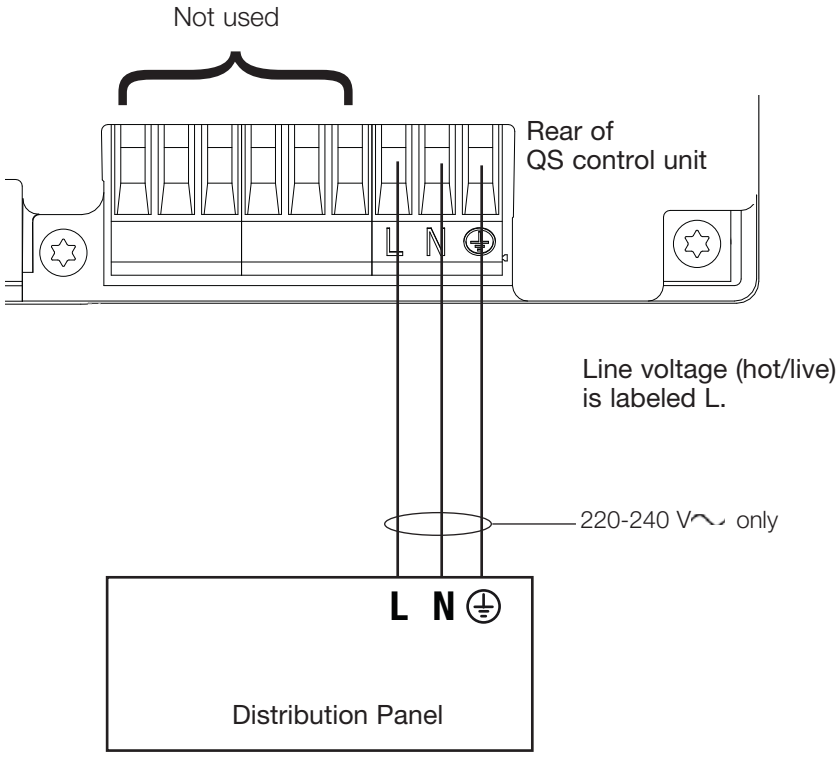
Within Power Groups on the QS link, connect all 4 terminals (1, 2, 3, and 4), shown by the letter A in the diagram. Between devices on the QS link that supply power, connect only terminals 1, 3, and 4 (NOT terminal 2), shown by the letter B on the diagram. Refer to the specific device documentation for wiring details.

Wiring can be T-tapped or daisy-chained.



Job Name:	Model Numbers:	
Job Number:		

Line Voltage Wiring

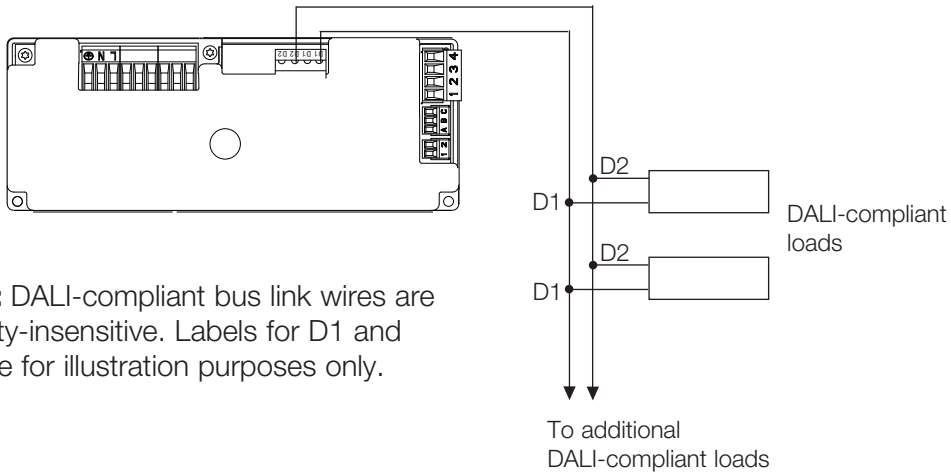


- Pull power wiring from distribution panel and to light fixtures.
- Each line voltage terminal can accept one 2.5 mm^2 (12 AWG) wire.
- Consult Lutron for non-dim relay wiring and/or load side emergency transfer wiring.

Job Name:	Model Numbers:	
Job Number:		

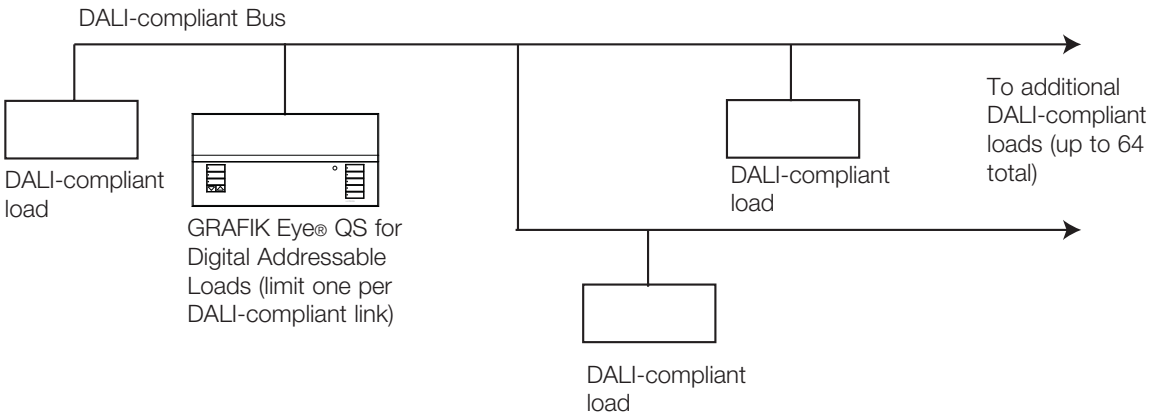
DALI-Compliant Bus Wiring

DALI-Compliant Bus Link Terminal Detail



Note: DALI-compliant bus link wires are polarity-insensitive. Labels for D1 and D2 are for illustration purposes only.

DALI-Compliant Bus Wiring Example

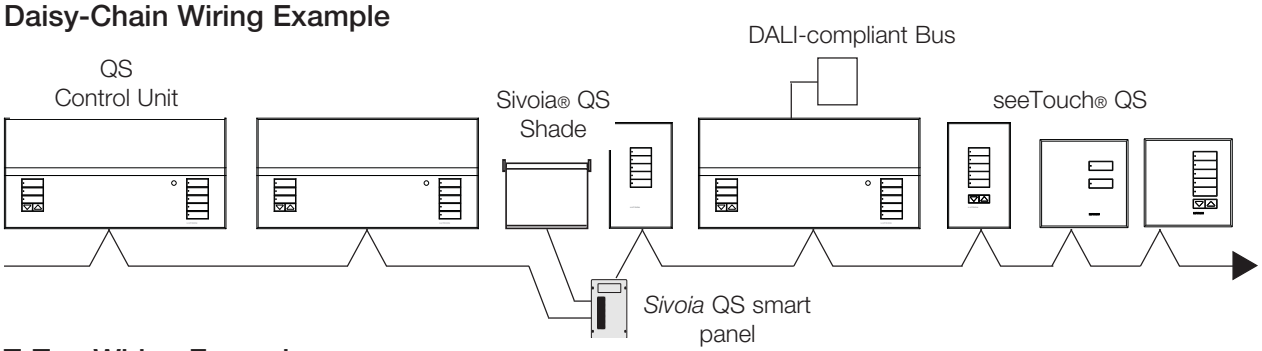


Job Name:	Model Numbers:	
Job Number:		

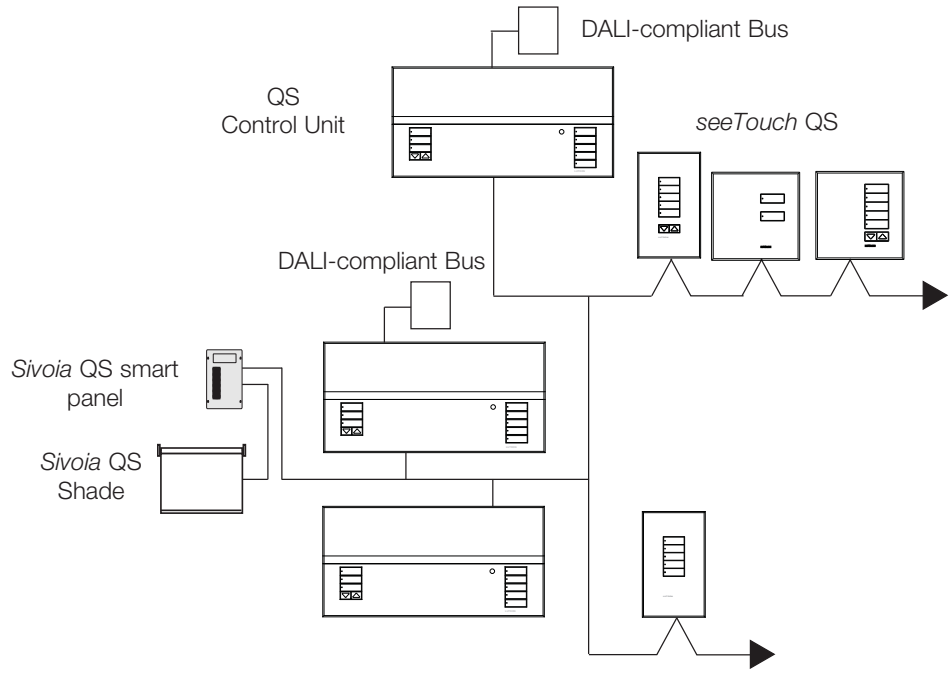
IEC PELV/NEC® Class 2 QS Link Wiring

- System communication uses low-voltage wiring.
- Wiring can be daisy-chained or T-tapped.
- Wiring must be run separately from line/mains voltage.
- IEC PELV/NEC® Class 2 wiring link requires:
  - Two 1.0 mm² (18 AWG) conductors for control power.
  - One twisted, shielded pair of 1.0 mm² (22 AWG) for data link.
  - Available from Lutron, P/N GRX-CBL-346S; check compatibility in your area.
- Total length of control link must not exceed 610 m (2 000 ft).

Daisy-Chain Wiring Example

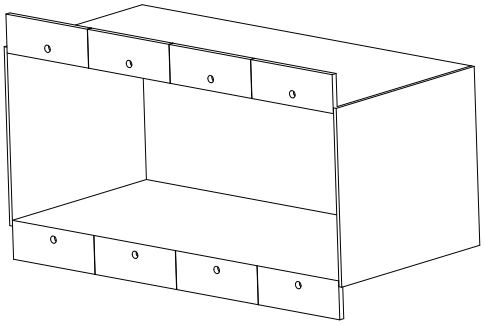


T-Tap Wiring Example

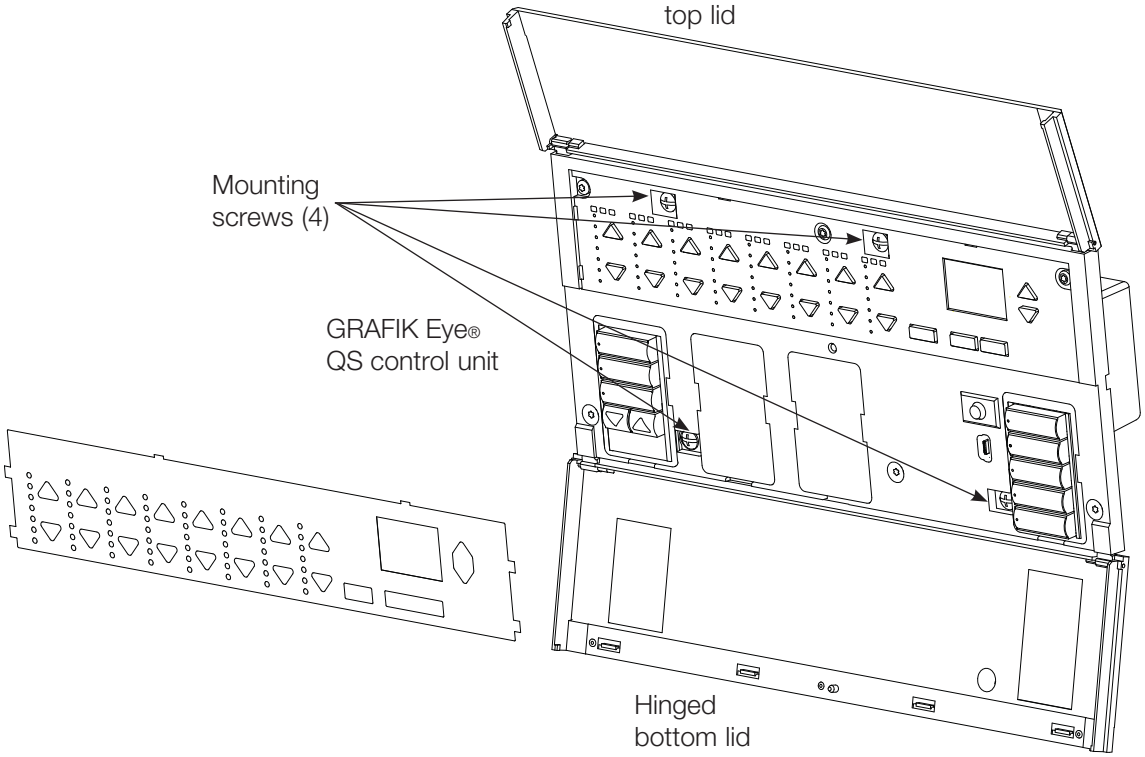


Job Name:	Model Numbers:	
Job Number:		

Mounting



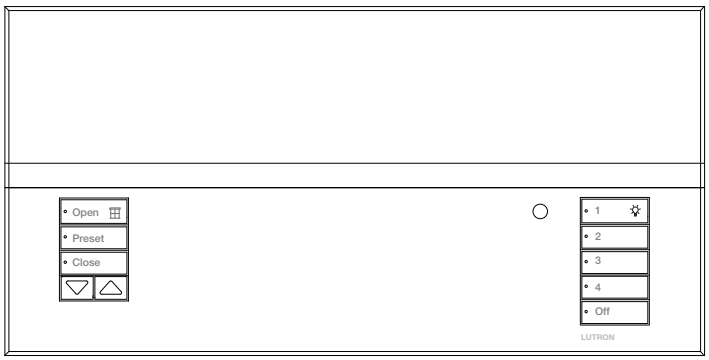
Standard 4-gang
U.S. wallbox,
89 mm (3.5 in) deep
(available from
Lutron, P/N 241-400)



Job Name:	Model Numbers:	
Job Number:		

369430 Rev. A 1 04.25.11

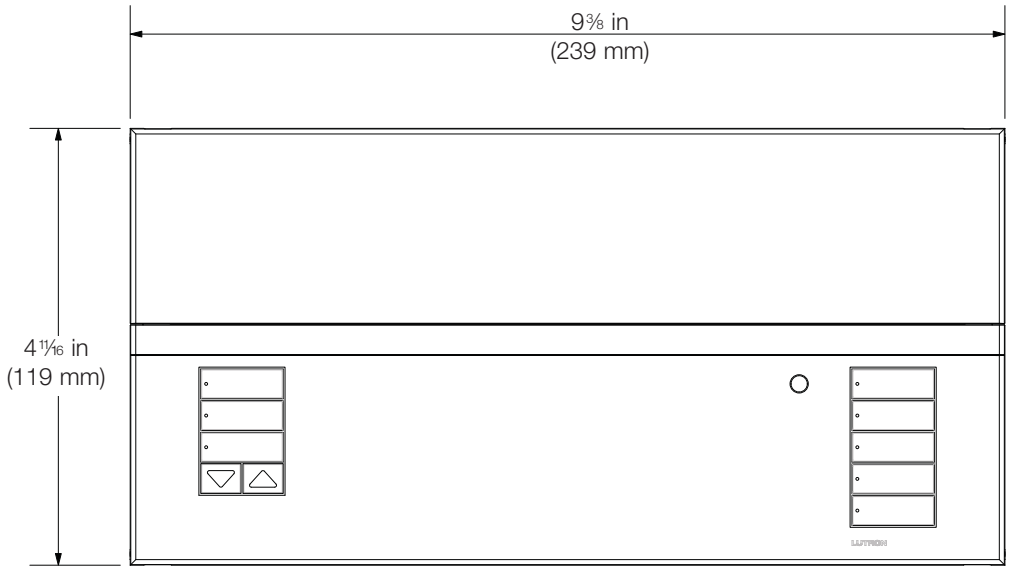
GRAFIK Eye® QS Control Unit



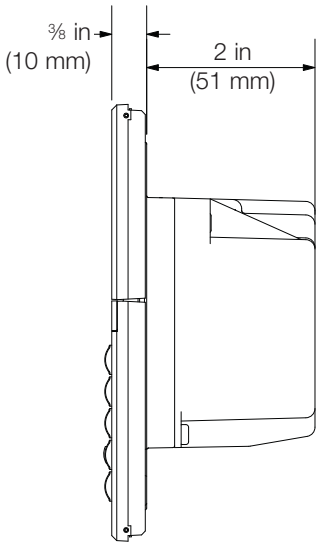
Description

GRAFIK Eye® QS is the premier energy-saving light and shade control. GRAFIK Eye® QS includes an astronomic timeclock, intuitive lighting presets, and direct shade control. Additionally, the GRAFIK Eye® QS is compatible with all Lutron wired QS products and systems, including Quantum®.

Mechanical Dimensions



Front View

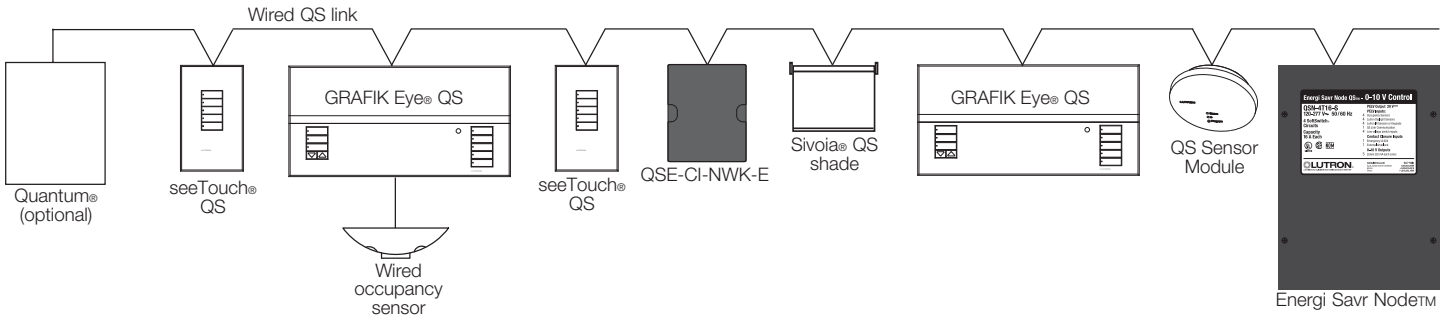


Side View

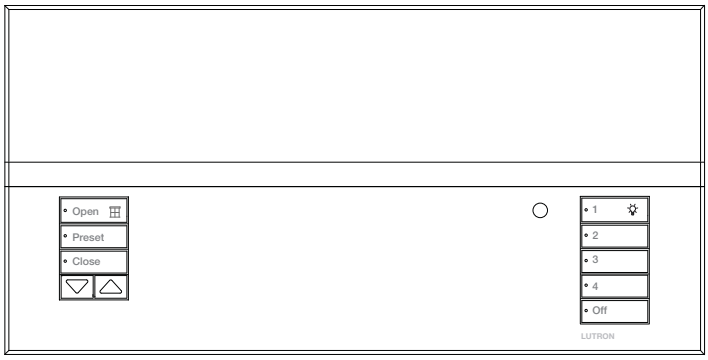
Fits into a 4-gang U.S. backbox, 3½ in (89 mm) deep; Lutron P/N 241-400.

System Topology

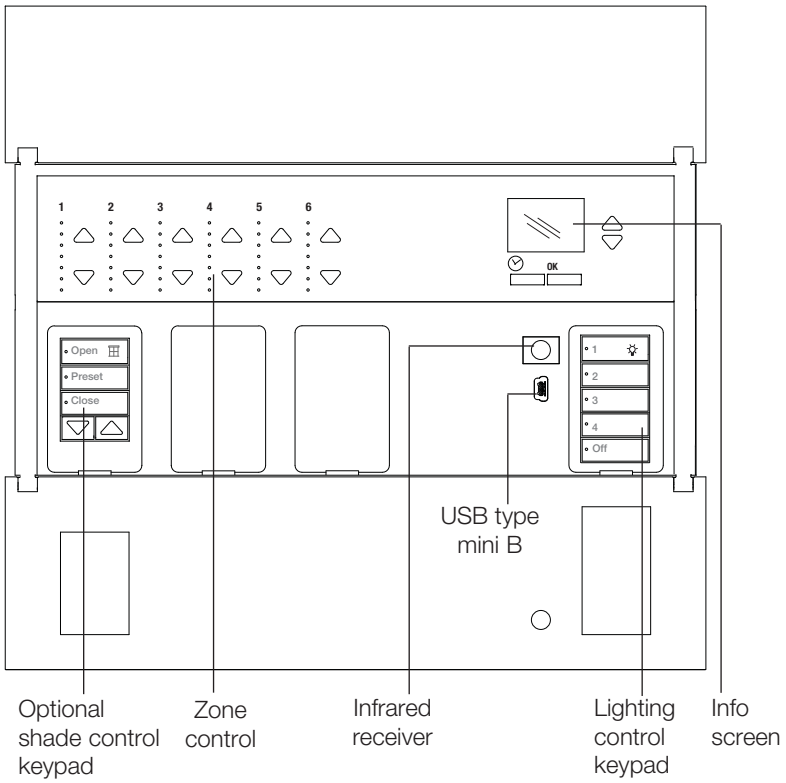
Example of Wired System



Job Name:	Model Numbers:	
Job Number:		



Note: General Engraving (-EGN) shown.



Features

- Pushbutton recall of four preset lighting scenes, plus Off.
- Twelve (12) additional scenes accessible through other QS devices, such as seeTouch® QS wallstations.
- Optional integrated shade control buttons, which can also be added to the unit after installation.
- Master override buttons to raise and lower all lights.
- Allows setup of lighting scenes and shade presets using buttons on the control unit.
- Built-in infrared (IR) receiver.
- External IR connection.
- Built-in astronomic timeclock.
- Info screen shows zone light level percentage, energy savings, zone labeling, and programming.
- Lockout option prevents accidental changes.
- One occupancy sensor input and 24 V⎓ power for occupancy sensor.
- QS communication link for seamless integration of lights, motorized window treatments, occupancy sensors, wallstations, and integration interfaces.
- Compatible with all Lutron QS system components.
- Backlit buttons with engraving make unit easy to locate and operate.
- Available in a variety of colors and finishes.

Job Name:	Model Numbers:	
Job Number:		

Specifications

Input Power

- 100 V~ 50/60 Hz

Environment

- 32 to 104 °F (0 to 40 °C).
- Relative humidity less than 90% non-condensing.

Lighting Sources/Load Types

Controls the following lighting sources with a smooth, continuous square law dimming curve or on a full conduction non-dim basis:

- Incandescent
- Halogen
- Magnetic low-voltage transformer
- Neon and cold cathode
- Non-dim (incandescent, magnetic low-voltage, or neon/cold cathode)
  Please refer to “Capacities” for more information.

Controls the following lighting sources with a smooth, continuous square law dimming curve or on a full conduction non-dim basis through separate Lutron power interfaces:

- Electronic low-voltage transformer
- Non-dim
- 0 - 10 V

Capacities

	100 V~ 50 / 60 Hz
Unit Capacity (watts)	1600
MLV	1600 VA / 1200 W
Zone Capacity (watts)	25 – 600
MLV	25 – 600 VA / 25 – 480 W

Load Type Notes

- All electronic low-voltage (ELV) lighting used with an interface must be rated for reverse phase control dimming. Before installing an ELV light source, verify with the manufacturer that their transformer can be dimmed. When dimming, an ELV interface (such as the PHPM-PA-DV-WH) must be used with the control unit.
- Not all zones must be connected; however, connected zones must have a minimum load as specified above.
- No zone may be loaded with more than the capacity specified above. For higher wattage applications, use Lutron power module PHPM-PA-JA or PHPM-SW-JA.

System Limits

- The QS wired communication link is limited to 100 devices or 100 zones.

Key Design Features

- Lightning strike protection meets ANSI/IEEE standard 62.41-1980. Can withstand voltage surges of up to 6000 V~ and current surges of up to 3000 A.
- Tested to withstand 16 kV electrostatic discharge without damage or memory loss.
- RTISS™-equipped: Compensates in real time for incoming line voltage variations (no visible flicker with +/-2% change in RMS voltage per cycle, and +/-2% Hz change in frequency per second).
- Power failure memory retains programming and light level settings for up to 10 years in the event of a power loss.
- The GRAFIK Eye® QS supplies 3 Power Draw Units (PDUs) on the QS link.
  For complete information, see “Power Draw Units on the QS Link,” Lutron PN 369405.
- Faceplate is hinged at the top and bottom, and stays open at 180° for ease of access.

Scene and Shade Buttons

- Large, rounded buttons are easy to use.
- Backlit buttons with optional engraving make it easy to find and to operate the control unit in low light conditions (backlight can be disabled).
- Optional button engraving is angled up to the eye for easy reading.
- Predefined label stickers are included for field labeling.
- 4 preset lighting scenes, plus Off, are accessible from the front of the control unit.
- 12 additional scenes are stored in the control unit and are accessible from seeTouch® QS wallstations and QS interfaces.
- Light levels fade smoothly between scenes. Fade time can be set differently for each scene: 0 to 59 seconds, or 1 to 60 minutes. Maximum fade time from Off is 3 seconds.

Job Name:	Model Numbers:	
Job Number:		

Specifications

Shade Control

- The GRAFIK Eye® QS can include up to 3 shade button columns. Each column has backlit open, preset, close, and raise/lower buttons.
- Each shade button column can be programmed to operate one shade or a group of shades. (Shades may be assigned to more than one shade button column).
- Faceplates are available with 1, 2 and 3 shade button columns.

Zone Control

- Each zone has a dedicated raise and lower button to adjust the zone.
- Each zone has a dedicated 7 LED bar graph for level status. Percentage of light level and energy saved is displayed on the info screen.
- All zone information has blue backlit LEDs. Backlight turns off when idle for 30 seconds.

Info Screen

- OLED (organic LED) screen is viewable from all angles.
- Screen turns off when idle for 30 seconds.
- Programmable zone labels.
- Programmable scene labels.
- Status of real-time zone percentage and energy savings.
- Programmable timeclock schedules.
- Programmable shade labels.

Astronomic Timeclock

- Integral to all units.
- 7 daily schedules available.
- One available holiday schedule is programmable by date up to one year in advance.
- 25 events per day maximum.
- Timeclock events are programmable to control scenes that affect any Energi Savr Node™ unit connected on the QS link without changing the local scene on the GRAFIK Eye® QS.
- Astronomic times are programmable by integral city database or by entering latitude and longitude. Times automatically adjust throughout the year based on location.
- Local timeclock events can activate any of the following features:
  - Scenes 1 to 16 and Off
  - Any available shade presets
  - Start and End afterhours mode
  - Enable and Disable daylighting for all zones/groups
  - Enable and Disable occupancy for occupancy/vacancy sensors
  - Enable and Disable occupied events for all occupancy sensors

System Communications and Capacities

- Low-voltage type IEC PELV/NEC® Class 2 wiring connects control units, wallstations, motorized shades, and control interfaces.
- A QS system can have up to 100 devices and 100 zones.

Infrared

- Infrared (IR) receiver allows infrared transmitters to select 8 scenes, raise/lower lighting zones, or raise/lower shades.
- Transmitter buttons imitate buttons on faceplate.
- 50 ft (15 m) line of sight range.
- Terminal block infrared input for connection to a wired IR input from third-party equipment.
- IR can be disabled via programming.
- Works with Lutron GRX-IT and GRX-8IT infrared remote controls.

Job Name:	Model Numbers:	
Job Number:		

Specifications

Accessory Controls: seeTouch® QS Wallstations (QSWS2)

- Wired seeTouch® QS keypads provide the following features:
  - Access to one or more of the 16 scenes on the GRAFIK Eye® QS
  - Zone toggle, partitioning, sequencing, fine tune, panic mode, and timeclock enable/disable
  - Contact closure inputs
  - Certain functions are only available on specific wallstation configurations. Refer to the *seeTouch* QS specification submittal.

Accessory Controls: QS Sensor Module (QSMX-4W)

- The QS Sensor Module provides a means to link wired occupancy and daylight sensors to a GRAFIK Eye® QS via the wired QS link.
  - Occupancy sensors wired to a QS Sensor Module can be used by one or more GRAFIK Eye® QS control units on the wired link.
  - Daylight sensors wired to a QS Sensor Module can be used by one or more GRAFIK Eye® QS control units on the wired link.
  - Infrared sensors can control either one or more zones or scenes on the GRAFIK Eye® QS. Functionality varies; refer to the documentation for the QS Sensor Module for details.

Accessory Controls: Contact Closure Input/Output Interface (QSE-IO)

- Recalls preset light levels for the following set of scenes on the GRAFIK Eye® QS:
  Scenes 1-4 and Off Scenes 9-12 and Off
  Scenes 5-8 and Off Scenes 13-16 and Off
- Sequence scenes 5-16, Enable/Disable Zone Lockout, Enable/Disable Scene Lockout, Enable/Disable Panic Mode, Enable/Disable Timeclock.
- Occupancy Sensors. An individual input counts as 1 occupancy sensor for the GRAFIK Eye® QS. Each input can be assigned to either Scene Control or Zone Control (please refer to the Occupancy Sensor(s) section of this guide).
- Zone Toggle. Allows an input to toggle one or more zones to a preset level and off.
- Shade Output mode. A Shade Column on the GRAFIK Eye® QS can be linked to control outputs 1-3 and/or outputs 4-5 on the QSE-IO.

Accessory Controls: DMX Output Interface (QSE-CI-DMX)

- Any zone on the GRAFIK Eye® QS control unit can be mapped to any single DMX512 Channel.
- Any zone on the GRAFIK Eye® QS control unit can be simultaneously mapped to any three DMX512 channels (providing RGB/CMY control).
- DMX loads cannot be used with daylighting.

Accessory Controls: Ethernet and RS232 Interface (QSE-CI-NWK-E)

- Allows for monitoring and control of the outputs and local scenes of the GRAFIK Eye® QS.

Accessory Controls: QS Keyswitch Wallstations (QSWS2-KS)

- Recalls preset light levels for any two scenes including Off.
- Allows fine-tuning (raise/lower level) of a zone or group of zones.
- Starts/Stops scene sequencings (Scenes 1-4 or Scenes 5-16)
- Enables/Disables Timeclock
- Enables/Disables occupancy sensors
- Enables/Disabled daylight sensors
- Allows toggle of Zone(s) to a preset level and off.
- Enables/Disables panic mode.
- Starts/Stops afterhours mode.

Other Accessory Controls and Devices

- Energi Savr Node™ QS (ESN)

Occupancy Sensor(s)

- The GRAFIK Eye® QS works with occupancy sensors through either:
  - Scene Control: Up to four sensors activate user-selectable occupancy and vacancy scenes.
  - Zone Control: up to four sensors per zone activate user-selected occupancy and vacancy zone levels.
- Occupancy sensors may include:
  - Contact closure sensors wired to CCI input on back of GRAFIK Eye® QS
  - Wired sensors connected QS Sensor Module (QSM)
- If any sensor in a group detects occupancy, then the GRAFIK Eye® QS will go to the designated occupancy scene or zone level.
- If all sensors in a group detect vacancy, then the GRAFIK Eye® QS will go to the designated vacancy scene or zone level.

Job Name:	Model Numbers:	
Job Number:		

Specifications

Daylight Sensor(s)

- The GRAFIK Eye® QS allows daylight sensors to control one or more lighting zones to adjust electric light levels based on measured daylight levels.
- Daylight sensors may include:
  - Wired sensors connected to a QS sensor module (QSM)
- A daylight sensor can control one or more GRAFIK Eye® QS zones:
  - Each zone can be calibrated to target light levels
  - A zone can be controlled by no more than one daylight sensor
- Daylight control can be enabled or disabled on a scene-by-scene basis
  - By default, daylight control is enabled in all scenes

Note: Daylight control through the GRAFIK Eye® QS only affects lighting loads. Shade groups cannot be controlled by daylight sensors. Daylighting does not affect DMX or RGB/CMY DMX loads.

Contact Closure Input (CCI) with Power Supply Output

- Each GRAFIK Eye® QS has one contact closure input (Terminal A).
  - The attached device must provide a dry contact closure or solid-state output.
  - Input is miswire-protected up to 36 V⎓.
- The contact closure is capable of accepting the following types of inputs:
  - Maintained (default): The GRAFIK Eye® QS control unit will act on both a contact closure and a contact open/release event.
  - Momentary: The GRAFIK Eye® QS control unit will act on only contact closure events.
- Each GRAFIK Eye® QS can supply 50 mA maximum at 24 V⎓.
  - Useful for powering occupancy sensors.
  - An auxiliary power supply must be used if the device requires more than 50 mA.
- The CCI is capable of operating in the following modes
  - Occupancy: If an occupancy sensor is wired directly to the GRAFIK Eye® QS.
  - Emergency: This setting allows the GRAFIK Eye® QS to work with a LUT-ELI. When an emergency situation is detected, all lights will go to full on, and no operations will be allowed until the emergency signal is cleared.
  - Afterhours: Allows the CCI to start and end the afterhours mode.
  - Timeclock: Allows the CCI to enable and disable the timeclock.
  - Scene Lockout: Prevents the user from making any changes to the control unit. The current scene will stay on until the CCI enables normal operation.
  - Save Never: Prevents any changes from being saved while the CCI is being used.
  - Disable CCI: The CCI will have no effect on the system and will not appear on the list of available sensors.

Security Lockout Password

- A 4-digit password (using characters A to Z and 0 to 9) can be enabled/disabled to lock out access to the Programming Menu.
- By default there is no password enabled on the GRAFIK Eye® QS.
- If case the 4-digit password is forgotten, contact Lutron Technical Support to regain access.

Job Name:	Model Numbers:	
Job Number:		

GRAFIK Eye® QS
Custom Color Options and Model Numbers
You must order a Base Unit and a Faceplate Kit
See Standard Color Combinations page for faceplate, stripe, and button colors

Base Unit

QSGR - _ PJA

- QSGR — Prefix
- _ — Number of Zones
  - 3 = 3 zones
  - 4 = 4 zones
  - 6 = 6 zones
- PJA — Phase Control Triac

Example:

QSGR-6PJA
6-zone base unit
and
QSGFP-2IV-EGN
Ivory faceplate kit with two shade columns and general engraving

Faceplate Kit
(includes coordinating stripe and buttons)

QSGFP - - -

- QSGFP — Faceplate Prefix
- Number of Shade Columns
  - Omit = none
  - 1 = 1 column
  - 2 = 2 columns
  - 3 = 3 columns
- Top Door Color
  - Omit = same as unit
  - T = Translucent
- Color/Finish
- Keypad Engraving Code

Faceplate Custom Color/Finish Codes

Architectural Matte Finishes

Standard (ship in 48 hours)

White	WH
Ivory	IV
Beige	BE
Gray	GR
Brown	BR
Black	BL
Almond	AL
Light Almond	LA

Architectural Metal Finishes

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 Finishes

Clear	CLA
Black	BLA
Brass	BRA

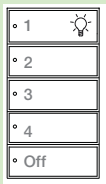
Satin Color Matte Finishes

Snow	SW
Biscuit	BI
Eggshell	ES
Taupe	TP
Midnight	MN
Limestone	LS
Stone	ST
Desert Stone	DS
Terracotta	TC
Hot	HT
Goldstone	GS
Palladium	PD
Plum	PL
Turquoise	TQ
Bluestone	BG
Sea Glass	SG
Greenbrier	GB
Sienna	SI
Merlot	MR
Mocha Stone	MS

Keypad Engraving Codes

Omit = Unengraved
Ships with engraving certificate that customer can redeem at no charge

EGN = General Engraving



Lighting keypad



Shade column

NST = Non-Standard Text Engraving
Please visit the GRAFIK Eye® QS website at **www.lutron.com/grafikeyeqs** for custom engraving forms. Submit completed form with order, and unit will ship engraved as specified by customer.

Job Name:	Model Numbers:	
Job Number:		

GRAFIK Eye® QS
Custom Options and Model Numbers

See previous page for Other Custom Model Numbers
See Standard Color Combinations page for faceplate, stripe, and button colors

Custom Button Kit

QSGB - 5B - WH -

- QSGB: Custom Button Kit Prefix
- 5B: Button Configuration
- WH: Button Color/Finish
- Keypad Engraving Code

3BRL = 3-button with raise/lower (shade column)
5B = 5-button (lighting keypad)

Button Kit Custom Color/Finish Codes

Architectural Matte Finishes		Satin Color Matte Finishes	
White	WH	Snow	SW
Ivory	IV	Biscuit	BI
Beige	BE	Eggshell	ES
Gray	GR	Taupe	TP
Brown	BR		
Black	BL		
Almond	AL		
Light Almond	LA		

Keypad Engraving Codes

Omit = Unengraved
Ships with engraving certificate that customer can redeem at no charge

EGN = General Engraving



Lighting keypad



Shade column

NST = Non-Standard Text Engraving
Please visit the GRAFIK Eye® QS website at **www.lutron.com/grafikeyeqs** for custom engraving forms. Submit completed form with order, and unit will ship engraved as specified by customer.

Custom Stripe Kit

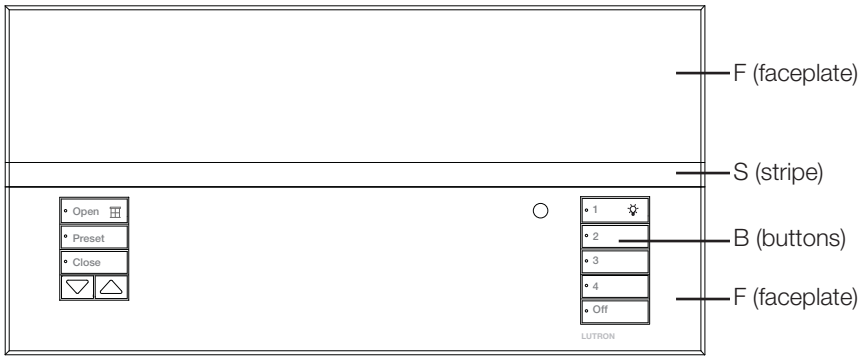
QSGS - WH

- QSGS: Stripe Kit Prefix
- WH: Stripe Color/Finish

Stripe Custom Color/Finish Codes
Same as Faceplate colors on previous page

Job Name:	Model Numbers:	
Job Number:		

GRAFIK Eye® QS Standard Color Combinations
See previous pages for Custom Model Numbers



Faceplate is comprised of a top and bottom. The bottom will always be the color indicated under "faceplate." The top may be the same color or translucent. Use the chart for faceplates that have the same color top and bottom. If a translucent lid is chosen, the stripe will automatically be the same color as the bottom lid.

Example:
If you order QSGR-4P-1WH, your GRAFIK Eye® QS with 4 lighting zones and 1 shade zone will come with a white faceplate (both top and bottom), gray stripe, and white buttons.

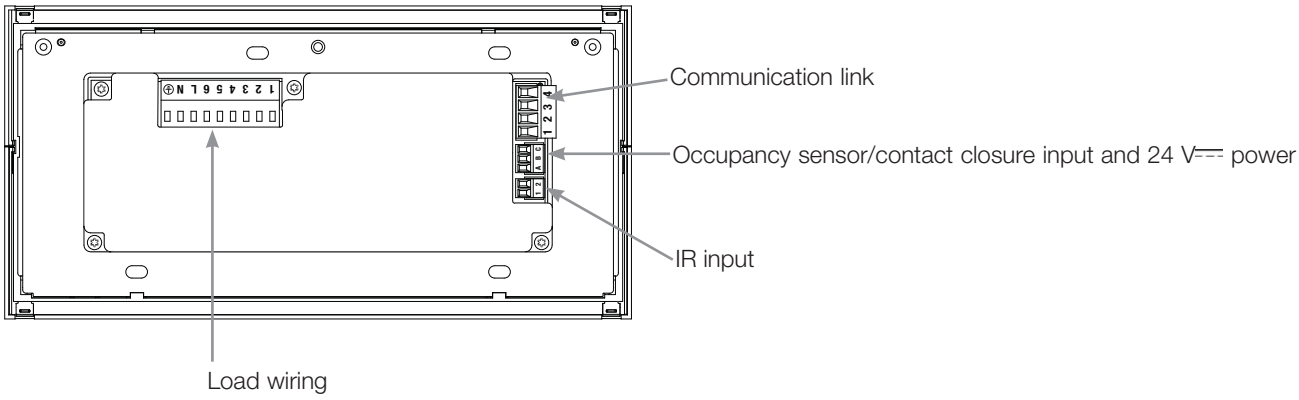
Suffix	Faceplate (F)	Stripe (S)	Button (B)
Architectural Matte			
WH	White	Gray	White
IV	Ivory	Beige	Ivory
BE	Beige	Ivory	Beige
GR	Gray	Black	Gray
BR	Brown	Black	Brown
BL	Black	Gray	Black
AL	Almond	Light Almond	Almond
LA	Light Almond	Almond	Light Almond
Architectural Metal			
BB	Bright Brass	Black	Black
BC	Bright Chrome	Black	Black
BN	Bright Nickel	Black	Black
SB	Satin Brass	Black	Black
SC	Satin Chrome	Black	Black
SN	Satin Nickel	Black	Black
QB	Antique Brass	Black	Black
QZ	Antique Bronze	Black	Black
Anodized			
CLA	Clear	Black	Black
BLA	Black	Black	Black
BRA	Brass	Black	Black

Suffix	Faceplate (F)	Stripe (S)	Button (B)
Satin Matte			
MN	Midnight	Gray	Black
TP	Taupe	Gray	Taupe
SW	Snow	Gray	Snow
ES	Eggshell	Beige	Eggshell
BI	Biscuit	Eggshell	Biscuit
LS	Limestone	Gray	Gray
ST	Stone	Gray	Gray
DS	Desert Stone	Taupe	Taupe
TC	Terracotta	Taupe	Taupe
BG	Bluestone	Gray	Gray
HT	Hot	Taupe	Taupe
MR	Merlot	Taupe	Taupe
SI	Sienna	Brown	Brown
GB	Greenbrier	Gray	Gray
SG	Sea Glass	Gray	Gray
MS	Mocha Stone	Taupe	Taupe
GS	Goldstone	Ivory	Ivory
PD	Palladium	Gray	Gray
PL	Plum	Taupe	Taupe
TQ	Turquoise	Gray	Gray

Job Name:	Model Numbers:	
Job Number:		

Wiring Diagrams

Terminations



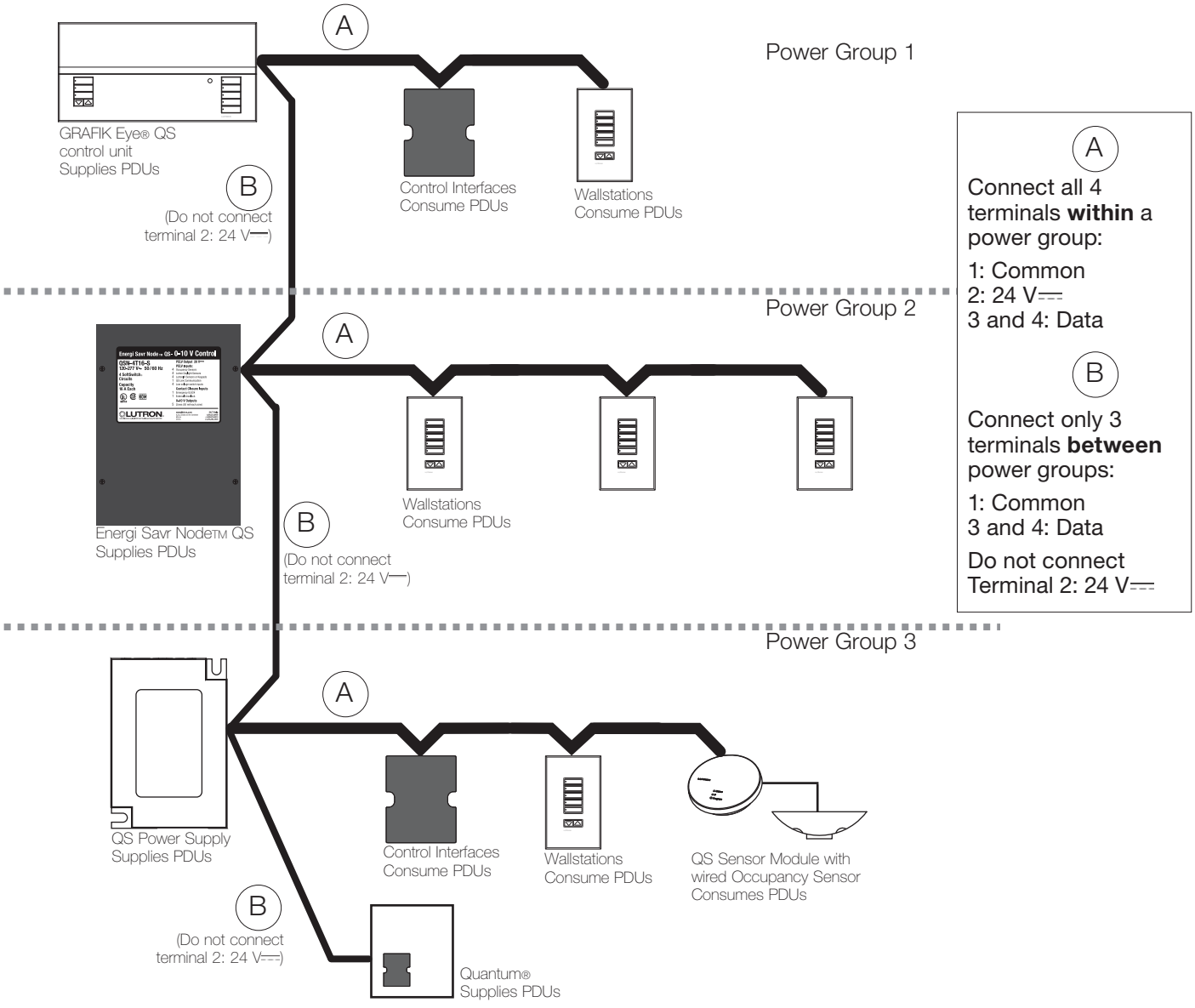
Job Name:	Model Numbers:	
Job Number:		

Power Group Wiring Example

On the QS link, there are devices that supply power and devices that consume power. Each device has a specific number of Power Draw Units (PDUs) it either supplies or consumes. A Power Group consists of one device that supplies power and one or more devices that consume power; each Power Group may have only one power-supplying device. Refer to the QS Link Power Draw Units specification submittal (Lutron PN 369405) for more information concerning PDUs.

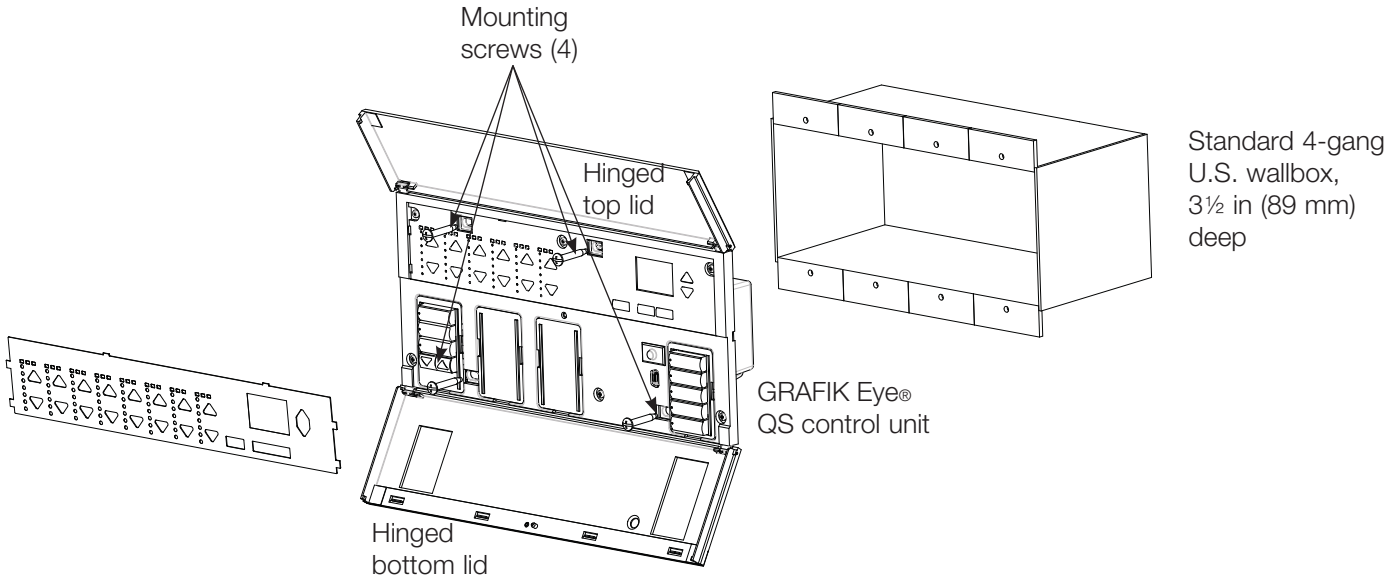
Within Power Groups on the QS link, connect all 4 terminals (1, 2, 3, and 4), shown by the letter A in the diagram. Between devices on the QS link that supply power, connect only terminals 1, 3, and 4 (NOT terminal 2), shown by the letter B on the diagram.

Wiring can be T-tapped or daisy-chained.

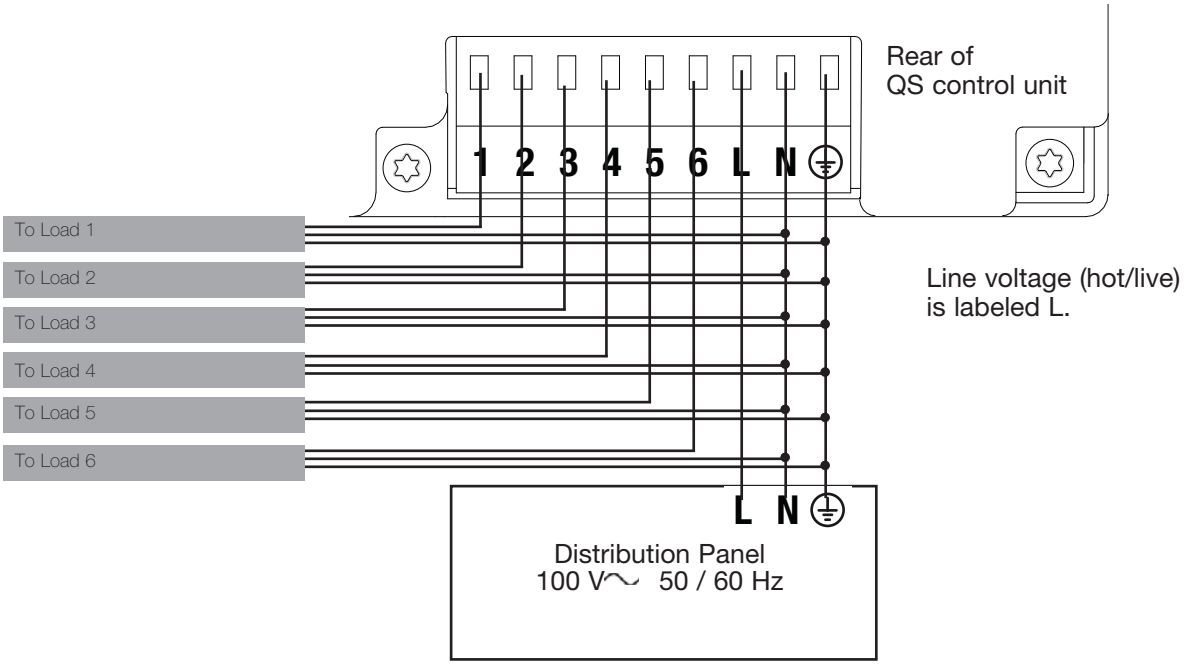


Job Name:	Model Numbers:	
Job Number:		

Mounting



Line Voltage Wiring



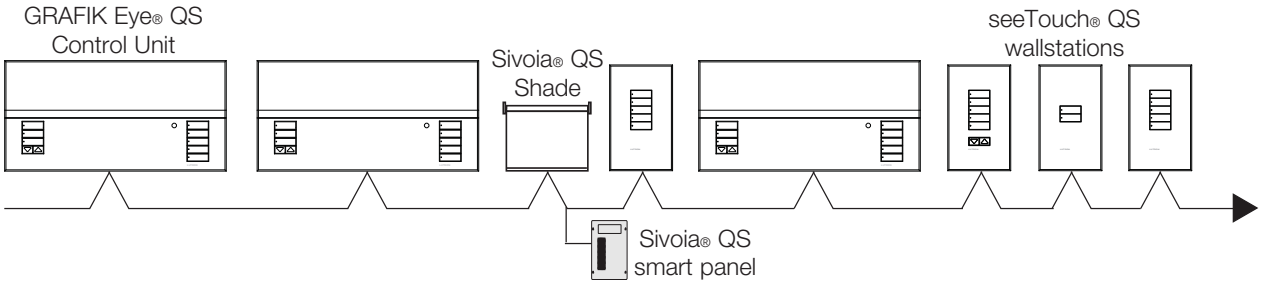
- Pull power wiring from distribution panel and to light fixtures.
- Each line voltage terminal can accept one 12 AWG (2.5 mm^2) wire.
- Consult Lutron for non-dim relay wiring and/or load side emergency transfer wiring.

Job Name:	Model Numbers:	
Job Number:		

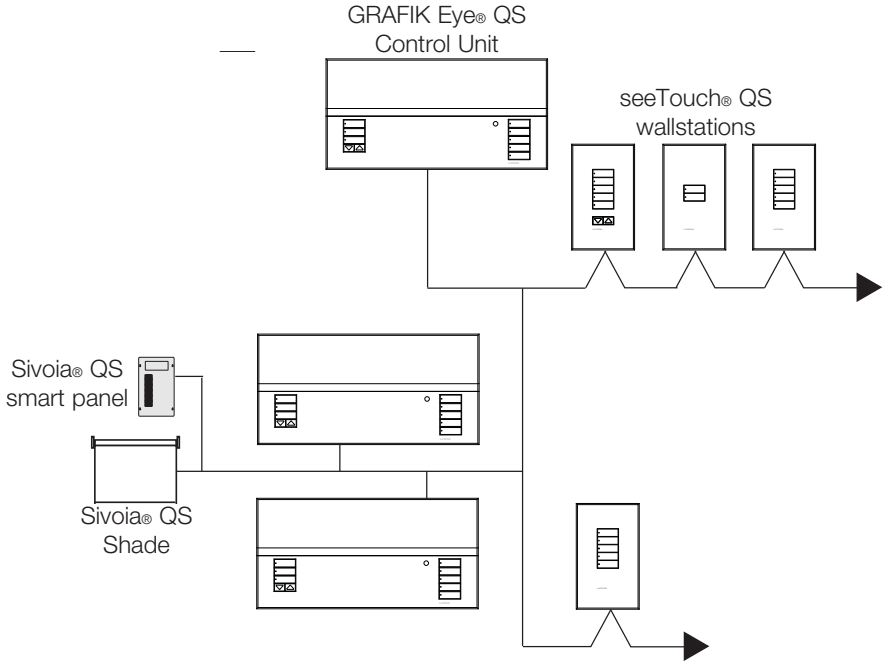
IEC PELV/NEC® Class 2 QS System Low-Voltage Wiring

- System communication uses low-voltage wiring.
- Wiring can be daisy-chained or T-tapped.
- Wiring must be run separately from line/mains voltage.
- IEC PELV/NEC® Class 2 wiring link requires:
  - Two 18 AWG (1.0 mm²) conductors for control power.
  - One twisted, shielded pair of 22 AWG (0.5 mm²) for data link.
  - Available from Lutron, P/N GRX-CBL-346S; check compatibility in your area.
- Total length of control link must not exceed 2000 ft (610 m).

Daisy-Chain Wiring Example



T-Tap Wiring Example



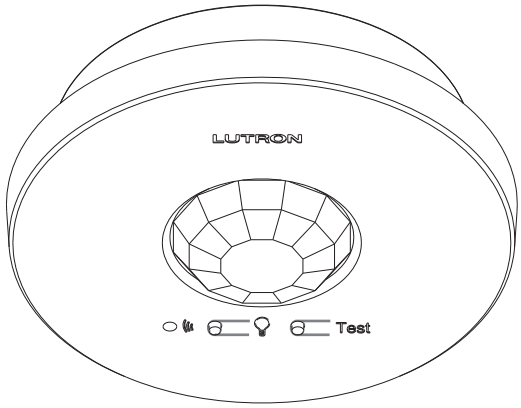
Job Name:	Model Numbers:	
Job Number:		

Sensors

369-480 Rev B 1 08.23.11

Wireless Ceiling Mount Sensor

Lutron's ceiling-mounted occupancy/vacancy sensors are wireless, battery-powered passive infrared (PIR) sensors that automatically control lights via RF communication to compatible dimming and switching devices. These sensors detect the heat from people (IR radiation of 9.5 µm) moving within an area to determine when the space is occupied. The sensors then wirelessly transmit the appropriate commands to the associated dimming and switching devices to turn the lights on or off automatically. They combine both convenience and exceptional energy savings potential along with ease of installation.



Features

- Wireless occupancy sensor has 3 settings available: Auto-On/Auto-Off, Auto-On Low-Light/Auto-Off, and Manual-On/Auto-Off
- Auto-On Low-Light feature will only turn lights on automatically if there is less than approximately 10 Lux (1 fc) of ambient light
- Vacancy only model available to meet California (U.S.A.) Title 24 requirements
- Uses Clear Connect™ technology
- Passive infrared motion detection with exclusive Lutron XCT™ Technology for fine motion detection
- 360˚ coverage ranges from 324 sq ft (98 sq m) to 676 sq ft (206 sq m), depending on mounting height
- Simple and intuitive adjustments available for Timeout, Auto-On, and Activity settings
- Supports advanced occupancy features, such as dependent occupancy groups and customizable occupied/unoccupied presets in some systems
- Multiple sensors can be added for extended coverage—refer to product specification submittal of receiving device to determine system limits
- Lens illuminates during test mode to verify ideal locations
- Multiple ceiling-mount methods available for different ceiling materials
- Front accessible test buttons make setup easy
- 10-year battery life design
- RoHS compliant

Models Available

- LRFX-OCR2B-P-WH
  - Color Code
  - Frequency/Channel Code
- LRF2-VCR2B-P-WH
  - *Vacancy Only Sensor*
  - Available for Channel Code 2 Only

Frequency/Channel Codes

2 = 431.0 – 437.0 MHz (US, Canada, Mexico, Brazil)
3 = 868.125 – 869.850 MHz (Europe and UAE)
4 = 868.125 – 868.475 MHz (China and Singapore)
5 = 865.5 – 866.5 MHz (India)
6 = 312.3 – 314.8 MHz (Japan)
7 = 433.05 – 434.79 MHz (Hong Kong)

Color Code

WH = White

Compatible RF Devices

- For use with Lutron® products only
- Communicates to various wireless Lutron® systems*

* *Contact Lutron® Customer Service at www.lutron.com for frequency/channel code compatibility with your particular geographic region, and for integrating with other Lutron® lighting and shading products.*

Job Name:	Model Numbers:	
Job Number:		

Specifications

Regulatory

- Lutron® Quality Systems Registered to ISO 9001:2008

Standards

LRF2-

- FCC certified
- IC certified
- COFETEL certified
- ANATEL certified
- SUTEL certified
- Meets CA (U.S.A.) Energy Commission Title 24 requirements

LRF3-

- CE Marked (European Union) [expected Q4 2011]
- TRA Type Approved (United Arab Emirates) [expected Q4 2011]

LRF4-

- SRRC Type Approved (Mainland China) [expected Q4 2011]
- iDA Registered (Singapore) [expected Q4 2011]

LRF5-

- WPC Type Approved (India)

LRF6-

- 007YUUL0689

LRF7-

- FCC certified

Power/Performance

- Operating voltage: 3 V ⎓
- Operating current: 14 µA nominal
- Requires one CR 123 lithium battery
- 10-year battery life design
- Non-volatile memory (saved changes are stored during power loss)

Environment

- Temperature: 32 ˚F to 104 ˚F (0 ˚C to 40 ˚C)
- For indoor use only

Range

- **LRF2, LRF3, LRF4, LRF5, LRF7**
  Local load controls must be located within 60 ft (18 m) line of sight, or 30 ft (9 m), through walls, of a sensor.
- **LRF6**
  Local load controls must be located within 40 ft (12.2 m) line of sight or 23 ft (7 m), through walls, of a sensor.

Sensor Coverage Test

- Front accessible test button
- Lens illuminates orange in response to motion during test mode and is visible from 60 ft (18 m)

Wireless Communication Test

- Front accessible test button
- Turn associated loads on and off

Timeout Options

- 1 minute *
- 5 minutes
- 15 minutes – default setting
- 30 minutes

Auto-On Options (Occupancy Versions Only)

- “Enabled” * – Sensor turns lights ON and OFF automatically – default setting.
- “Low Light” – Sensor turns lights ON automatically only in low ambient light conditions. Sensor turns lights OFF automatically.
- “Disabled” ** – Lights must be turned ON manually from dimming or switching device. Sensor turns lights OFF automatically.

Activity Options

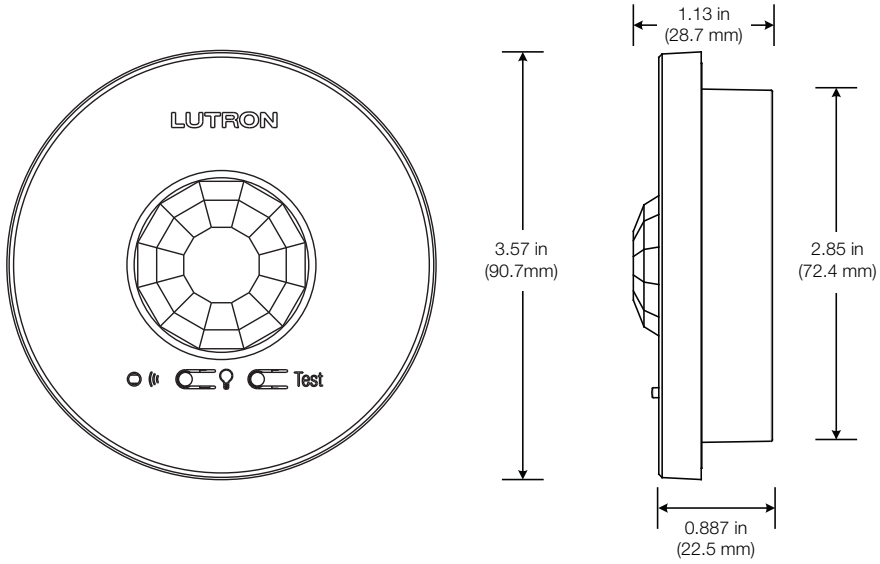
- Low Activity – default setting
- Medium Activity
- High Activity

* Intended for use in high-activity, briefly occupied areas only

** There is a 15-second grace period that begins when the lights are automatically turned off, during which the lights will automatically turn back on in response to motion. This grace period is provided as a safety and convenience feature in the event the lights turn off while the room is still occupied, so that the user does not need to manually turn the lights back on. After 15 seconds, the grace period expires and the lights must be manually turned on.

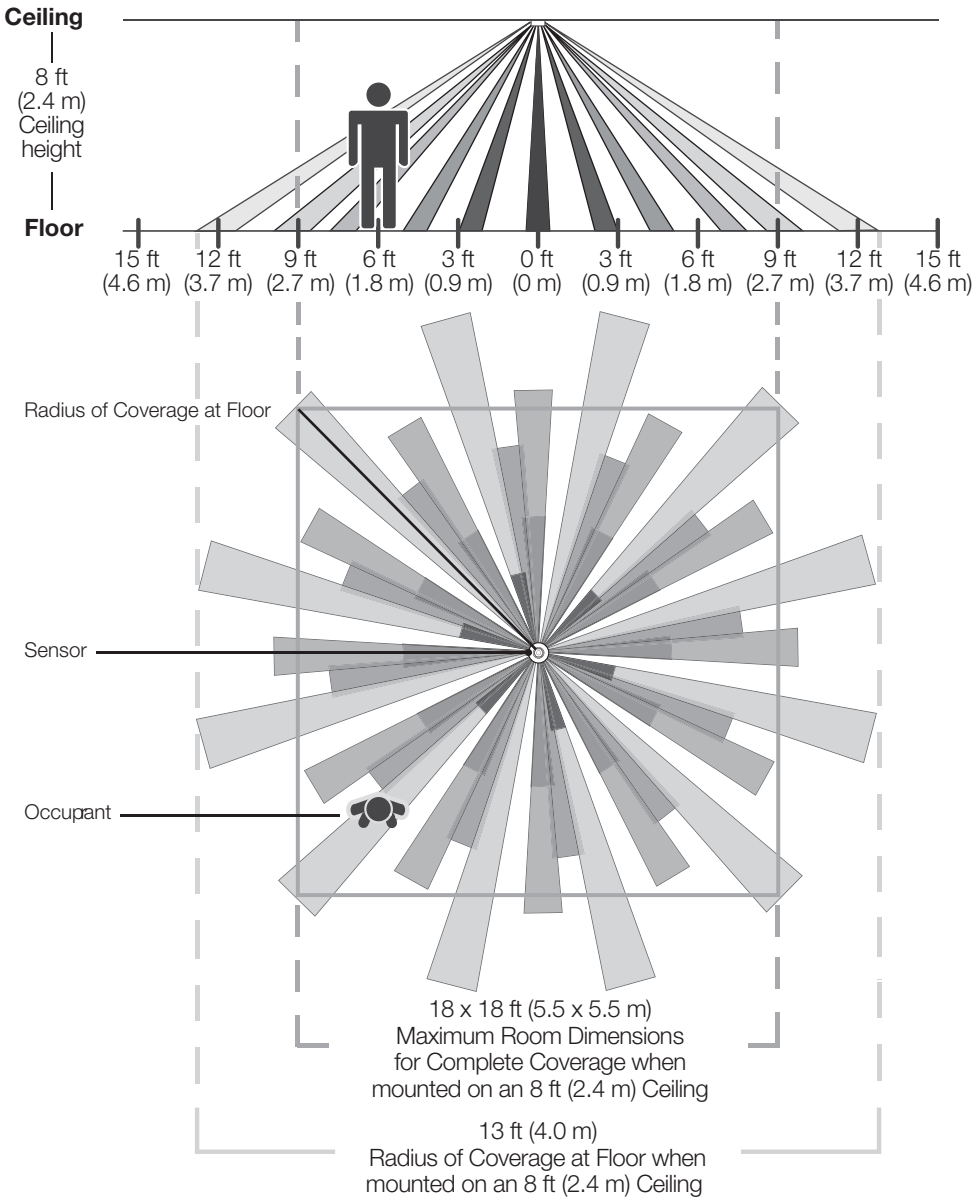
Job Name:	Model Numbers:	
Job Number:		

Dimensions



Job Name:	Model Numbers:	
Job Number:		

Range Diagrams



Sensor Coverage Chart (for sensor mounted in center of room)

Ceiling height	Maximum room dimensions for complete floor coverage*	
8 ft (2.4 m)	18 ft x 18 ft (5.5 m × 5.5 m)	324 ft² (30.2 m²)
9 ft (2.7 m)	20 ft x 20 ft (6.1 m × 6.1 m)	400 ft² (37.2 m²)
10 ft (3.0 m)	22 ft x 22 ft (6.7 m × 6.7 m)	484 ft² (44.9 m²)
12 ft (3.7 m)	26 ft x 26 ft (7.9 m × 7.9 m	676 ft² (62.4 m²)

* 12 ft (3.7 m) is the recommended maximum mounting height

Job Name:	Model Numbers:	
Job Number:		

Installation Overview

Sensor Placement

- The sensor's ability to detect motion requires line of sight of room occupants. The sensor must have an unobstructed view of the room. **DO NOT** mount behind or near tall cabinets, shelves, hanging fixtures, ceiling fans, etc. The sensor cannot see through glass objects such as patio or shower doors.
- Hot objects and moving air currents can affect the sensor's performance. To ensure proper operation, the sensor should be mounted at least 4 ft (1.2 m) away from HVAC vents and light bulbs that are below the ceiling line.
- The sensor's performance depends on a temperature differential between the ambient room temperature and that of room occupants. Warmer rooms may reduce the sensor's ability to detect occupants.
- ***LRF2, LRF3, LRF4, LRF5, LRF7:*** The sensor should be mounted within 60 ft (18 m) line of sight or 30 ft (9 m) through walls of the associated dimming and switching receiving devices.
- ***LRF6:*** The sensor should be mounted within 40 ft (12.2 m) line of sight or 23 ft (7 m) through walls, of the associated dimming and switching receiving devices.

Mounting

- Temporary mounting is optional to test sensor coverage and wireless communication before permanently installing the sensor.

Drop Ceiling (Compressed Fiber Ceiling Tile)

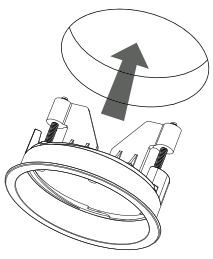
- The ceiling tile mounting wire is provided for both temporary and permanent mounting of the sensor to ceiling tiles. It is designed to allow temporary mounting, testing, and repositioning (if necessary) of the sensor without damaging a ceiling tile. Once the sensor's final position has been chosen, the mounting wire should be twisted to lock the sensor in place permanently.

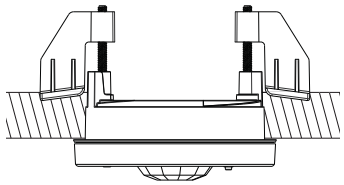
Solid Ceiling (Drywall, Plaster, Concrete, or Wood)

- Temporary mounting: Ten (10) temporary mounting strips can be purchased in the kit L-CMDPIRKIT for temporarily mounting and testing the sensor.
- Permanent mounting: Screws and anchors (for drywall or plaster) provided to mount sensor.

Recess Mount

- Do not recess mount ceiling sensor in a metal surface.
- Ceiling mount clamps internally to ceiling. Sensor twist-locks into mount, sits flush with ceiling (as shown below).
- Opening is 3 in (76.2 mm) in diameter.
- Purchased as a separate kit: L-CRMK-WH.

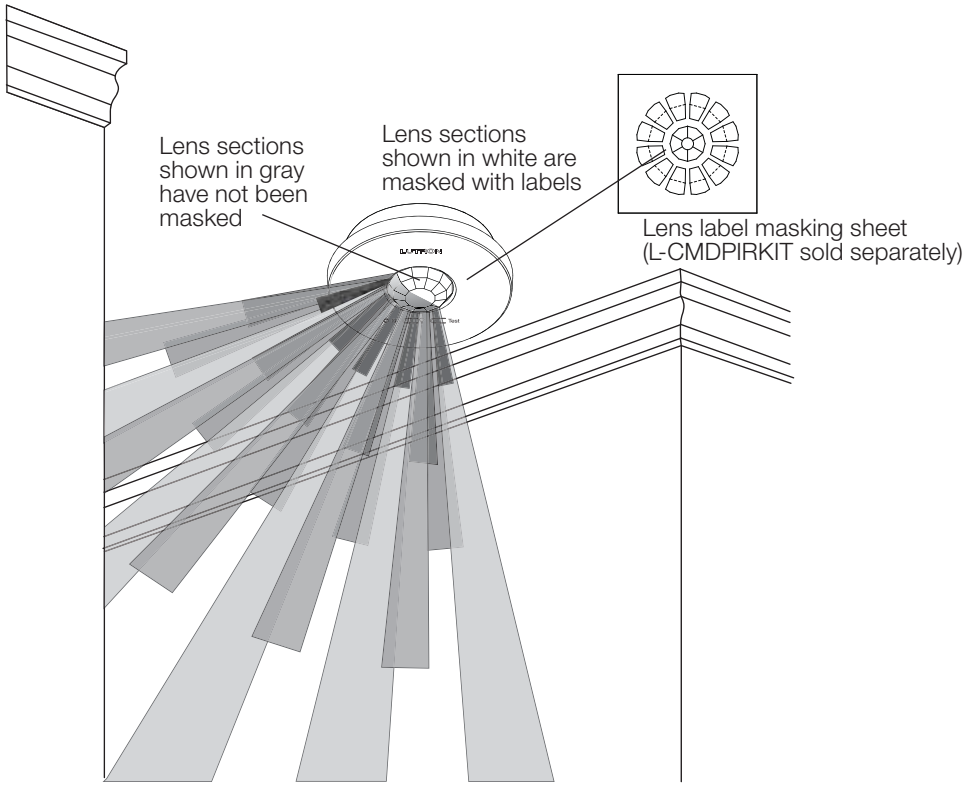




Job Name:	Model Numbers:	
Job Number:		

Lens Masking

Whenever possible, the sensor should be installed in a location where it cannot easily see into areas outside the intended space, such as hallways or adjacent rooms. If this situation cannot be avoided, portions of the lens may be masked to block the sensor's view of the undesired areas. Ten (10) PIR Lens Masks can be purchased in the kit L-CMDPIRKIT.



Job Name:	Model Numbers:	
Job Number:		

Dual Technology Ceiling Mount Sensor



The LOS-CDT Series ceiling-mount dual-technology sensors can integrate into Lutron systems or function as stand-alone controls using a Lutron power pack. The technology eliminates manual sensitivity and timer adjustments during installation and over the life of the product.

Features

- Intelligent, continually adapting sensor
- Ultrasonic (US) combined with passive infrared (PIR) sensing provide high sensitivity, high noise immunity, and excellent false tripping immunity
- Suited for complex environments that are difficult to control with single-technology sensors
- Snap-locks to ceiling-mounted cover plate
- Non-Volatile Memory: settings saved in protected memory are not lost during power outages
- 500 to 2000 sq.ft. (46 to 186 m^2) coverage when mounted on an 8 - 12 ft. (2.4 to 3.7 m) ceiling; 180° and 360° field of view
- Affords choice of turning lights off or dimming to a preset level in the unoccupied state when integrated with a Lutron system.

Models Available

Cat. No.	Color	Coverage	Field of View
LOS-CDT-500-WH	White	500 sq.ft. (46 m^2)	180°
LOS-CDT-500R-WH	White	500 sq.ft. (46 m^2)	180°
LOS-CDT-1000-WH	White	1000 sq.ft. (93 m^2)	180°
LOS-CDT-1000R-WH	White	1000 sq.ft. (93 m^2)	180°
LOS-CDT-2000-WH	White	2000 sq.ft. (186 m^2)	360°
LOS-CDT-2000R-WH	White	2000 sq.ft. (186 m^2)	360°

Self-Adaptive Feature

The LOS-CDT Series ceiling-mount occupant sensors combine both (US) motion detection for maximum sensitivity and passive infrared (PIR) motion detection for false triggering immunity. The self-adapting internal microprocessor analyzes the composite sum of both signals to eliminate time-consuming adjustments and callbacks found in non-intelligent sensors.

Job Name:	Model Numbers:	
Job Number:		

Specifications

Timer Adjustment

- Automatic mode: Continually adapting sensor automatically adjusts settings to the space
- Manual mode: 8 to 30 minutes
- Test mode: 8 seconds

LED Lamp

- Red: infrared motion detected
- Green: ultrasonic motion detected

Housing

- Rugged, high-impact, injection-molded plastic
- Color-coded leads 6 in. (15 cm)

Power

- Operating voltage: 20 - 24 V⎓, PELV (Class 2: USA) low-voltage
- Operating current: 33 mA nominal
- Control output: 20 - 24 V⎓ active high logic control signal with short-circuit protection, open collector when unoccupied

Operating Environment

- Temperature: 32 to 104 °F (0 to 40 °C)
- Relative humidity: less than 95%, non-condensing
- For indoor use only

Adaptive Functions

- Installation: 60 minutes
- Learning: 4 weeks for response to error conditions, air current adaptation, and timer optimization
- Post-learning occupancy periods
  - —24-hour circadian occupancy periods learned
  - —Weekly occupancy periods learned
- Adjustments in post-learning period
  - —Generally occupied periods (threshold = high-sensitivity mode)
  - —Generally unoccupied periods (threshold = miser mode)

Contact Rating (R Models only)

- SPDT 500 mA rated at 24 V⎓ isolated relay

Photo Cell (R Models only)

- Prevents light from turning on when there is sufficient natural light
- Sensitivity: 0 - 1,000 LUX adjustable

Dimensions



Front View



Side View

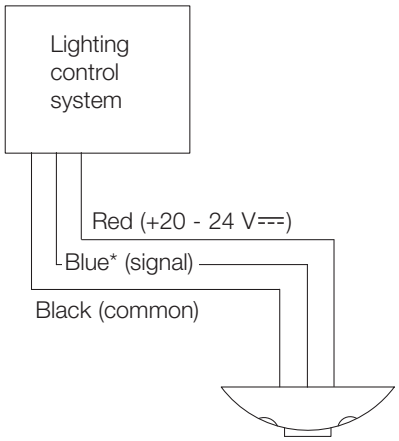
Measurements are in inches (mm)

Job Name:	Model Numbers:	
Job Number:		

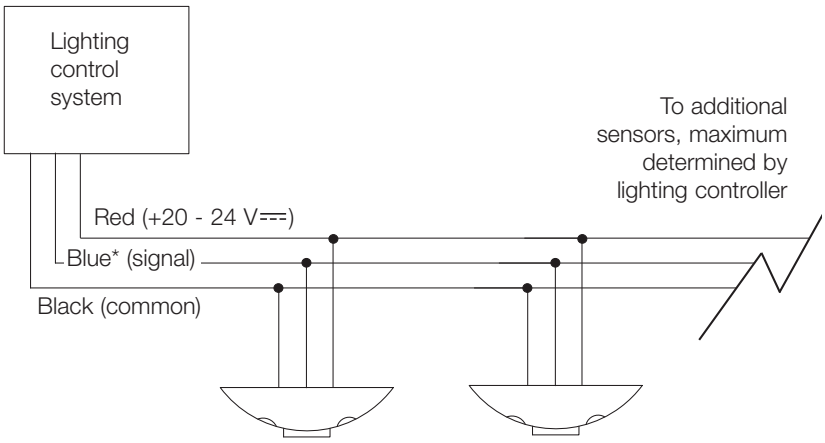
Wiring

Note: Power pack may be required when interfaced to lighting control system; see below.

Single Sensor to System



2 or More Sensors to System



*Note: Use gray wire for -R model.

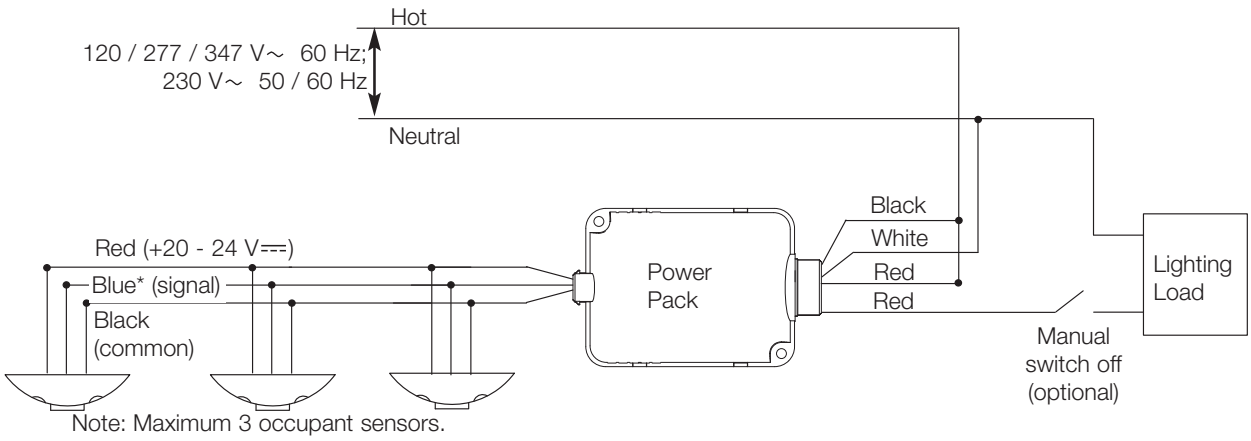
Power Supply Options

Lutron Lighting Control System	Power Pack Required?
Digital microWATT™	No
EcoSystem®	No
GRAFIK 5000 / 6000 / 7000™	No, when used with seeTouch® wallstations with occupant sensor connections.
GRAFIK Eye® 3000 / 4000	Yes
HomeWorks®	Yes
LCP128™	No, when used with *seeTouch* wallstations with occupant sensor connections.
microWATT®	No
RadioRA®	Yes
RadioTouch®	No
Softswitch128®	No, when used with *seeTouch* wallstations with occupant sensor connections.

Job Name:	Model Numbers:	
Job Number:		

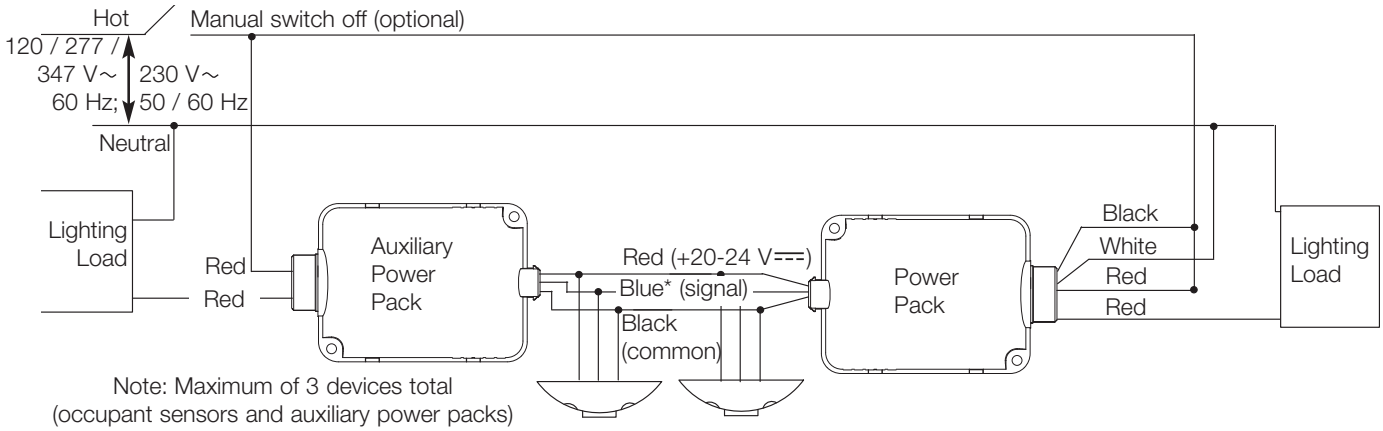
Wiring: Stand-Alone Control

1 to 3 Sensors with Power Pack



Note: Maximum 3 occupant sensors.

Switching Multiple Loads with Auxiliary Power Packs



Note: Maximum of 3 devices total (occupant sensors and auxiliary power packs) can be connected to a power pack.

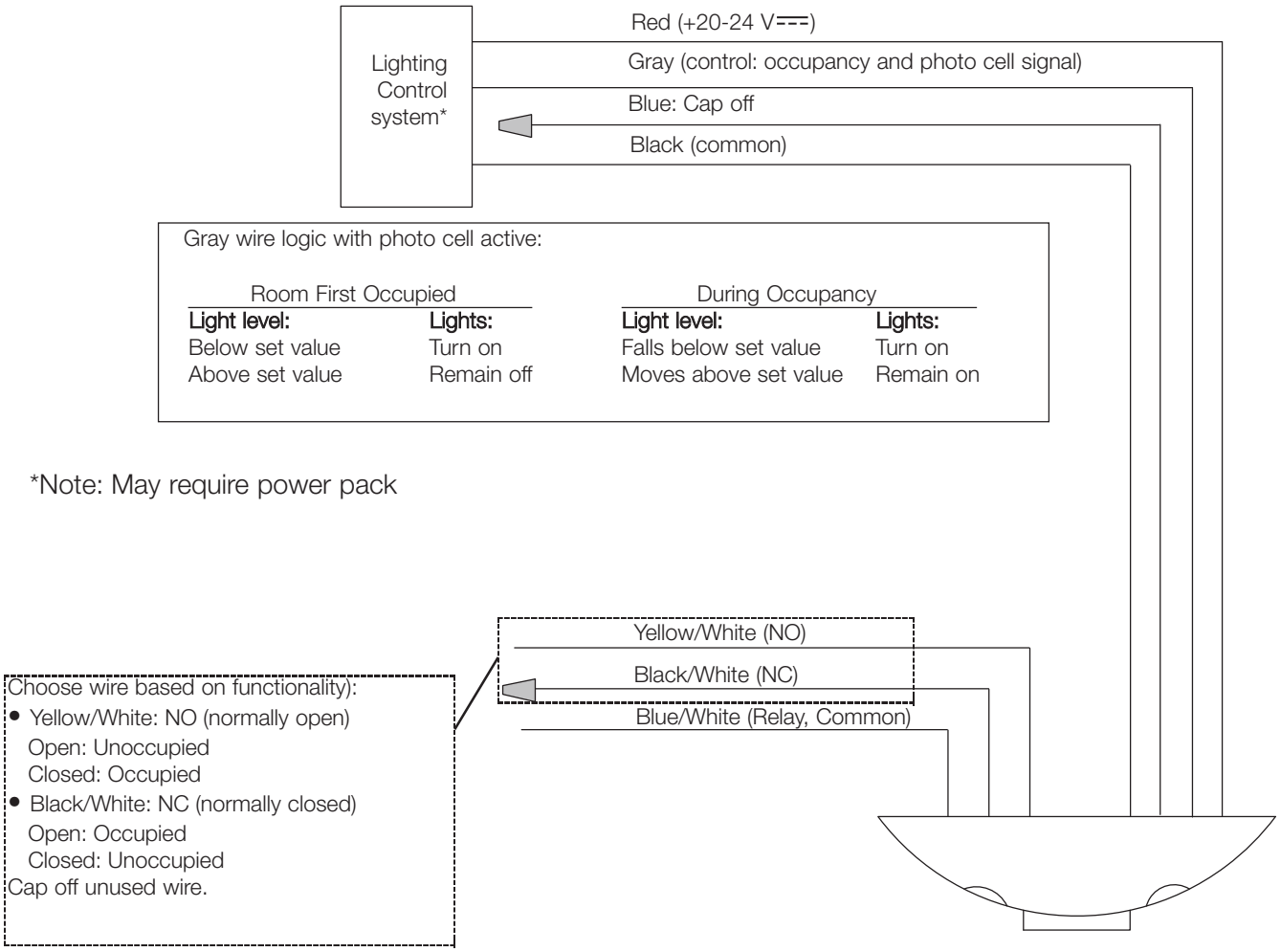
*Note: Use gray wire for -R model.

Job Name:	Model Numbers:	
Job Number:		

Wiring

Relay Model Option

LOS-CDT-xxxxR only



*Note: May require power pack

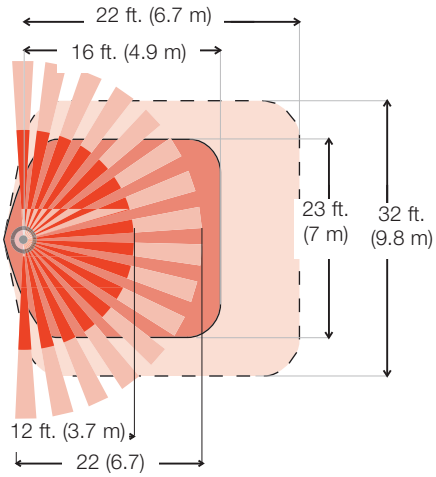
Job Name:	Model Numbers:	
Job Number:		

Installation

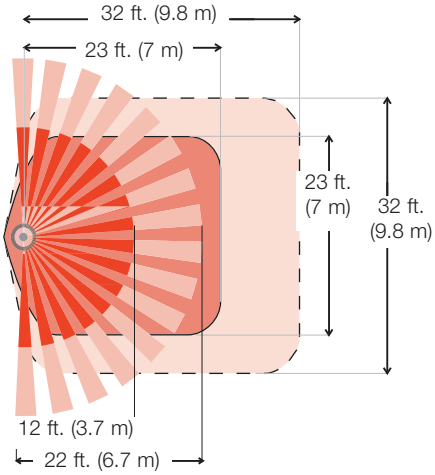
Sensor Placement

- The occupant sensor must have an unobstructed view of the room. Do not mount behind or near tall cabinets, shelves, indirect hanging fixtures, etc.
- Keep the occupant sensor away from air flow from ventilation outlets, windows, fans, etc.
- If installing a 180° occupant sensor (500 and 1000 models), place the sensor on the same wall as the doorway so that traffic in a hallway will not affect the sensor; otherwise, place in center of room.
- Closely follow the diagrams shown concerning major and minor motion coverage. The sensor can detect major motion (such as a person taking a half-step) at a greater distance than it can detect minor motion (such as writing or typing at a desk).
- Decrease total coverage area by 15% for “soft” rooms (for example, heavy draperies or heavy carpeting).

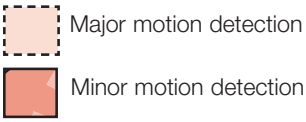
Range Diagrams

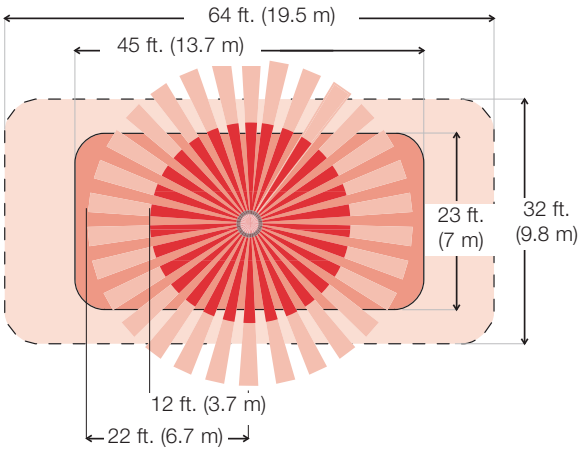


LOS-CDT-500



LOS-CDT-1000





LOS-CDT-2000

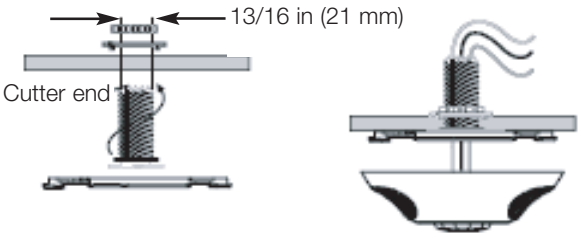
Job Name:	Model Numbers:	
Job Number:		

Installation

Mounting

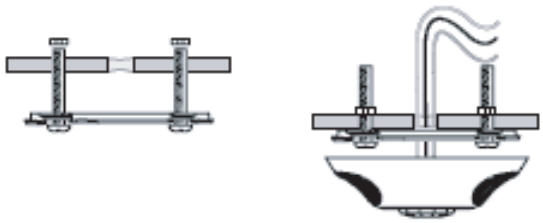
Normal Mounting

Twist and lock threaded mounting post onto cover plate. Drill through ceiling tile with assembly, using cutter end of the threaded mounting post. Secure with washer and nut.



Mounting to Non-Standard Ceiling or Fixture

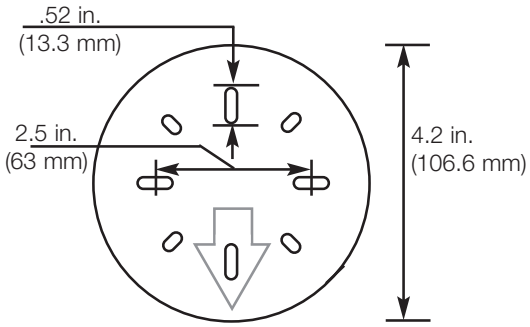
Mount twist-lock cover plate using mounting screws, nuts, and washers (included). Drill/punch wire routing hole through ceiling tile at center of cover plate.



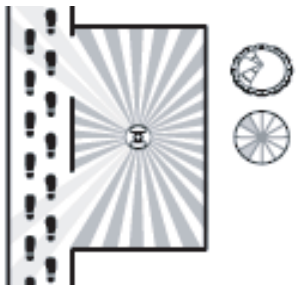
Wire Lengths

# Sensors	1	2	3	1	2	1
# Aux. PP	0	0	0	1	1	2
22 AWG	750 ft.	375 ft.	250 ft.	375 ft.	250 ft.	250 ft.
0.5 mm^2	365 m	180 m	120 m	90 m	120 m	120 m
20 AWG	1200 ft.	600 ft.	400 ft.	600 ft.	400 ft.	400 ft.
0.75 mm^2	730 m	365 m	240 m	365 m	240 m	365 m
18 AWG	2400 ft.	1200 ft.	800 ft.	1200 ft.	800 ft.	800 ft.

Mounting Plate Dimensions



Using the Infrared Mask



Center Ceiling Mount
(Mask blocks sensor seeing out doorway into hall)



Corner Ceiling Mount
(No mask needed)

Typical Mask Patterns



Conference Room Mask | 180° Mask | Full Mask



Rectangular Areas | Over the Door | Specific Areas You Wish to Mask

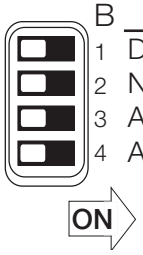
Job Name:	Model Numbers:	
Job Number:		

Sensor Adjustments

Override Settings



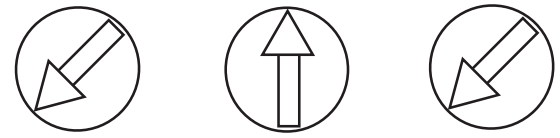
A		Off (Default)	On
Auto/Manual	1	Automatic (Normal)	Manual on/off (Override)
Threshold	2	Auto Threshold Adjustment	High Sensitivity (Low turn-on threshold)
LED Motion Indicator	3	Lights indicate motion	Disable LED Indicator
Reset Learned Settings	4	Retain Settings (Normal)	Erase all learned settings, restart Learning (Toggle On)



B		Off	On
Strong Airflow Compensation	1	Disable Compensation (Normal)	Enable Compensation
Over Doorway Installation	2	No (Normal)	Yes (Use increased turn-on threshold)
Timer Adjust	3	Adjust Timer Automatically	Use Manual Setting (No adjustment)
Auto Sensitivity	4	Adjust Sensitivity Automatically	Adjust Sensitivity Manually

Timer Test Mode

1. Remove the retainer cover.
2. Rotate the black timer adjustment knob to about midway (12 o'clock).
3. Return setting to minimum setting (full CCW).

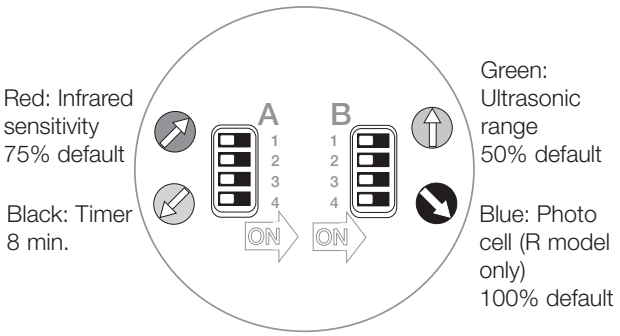


Factory Settings | 12 o'clock | Full CCW

Note: The timer will remain in the 8-second test mode for 1 hour, then automatically reset to 8 minutes.

4. To manually take the timer out of the 8-second test mode, turn the timer adjustment approximately 1/16" clockwise to make the setting slightly above minimum (just above the 8-minute setting).

Factory Settings



Job Name:	Model Numbers:	
Job Number:		

Installation

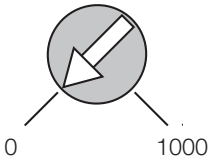
Adjusting the "Lights Not On" Level

LOS-CDT-xxxxR only

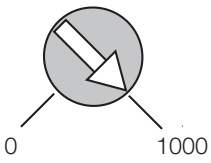
1. Place timer in Test Mode (see page 7).
2. Set photo cell to max.
   Turn the blue knob full clockwise (lights on no matter how bright the natural light is), then about 30 degrees counterclockwise.
3. Check for Lights-Out.
   Move from underneath the sensor, and remain still until the lights turn off. Move around normally to turn the light on.
4. Adjust to desired level.
   If lights remain off, adjust the blue knob another 30 degrees counterclockwise and repeat step 3 until the lights turn on.
   Note: Set blue knob to 100% to disable photo cell functionality and leave secondary dry contact closure output functionality intact.

Control Settings (Blue Knob)

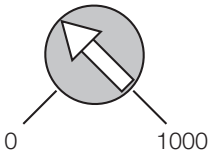
LOS-CDT-xxxxR only



Minimum (low):
Lights will never come on, even though room is occupied.



Maximum (high):
Photo cell has no effect on operation (factory setting).



Normal:
200 to 600 LUX is normal range.

Job Name:	Model Numbers:	
Job Number:		

Infrared Ceiling Mount Sensor



The LOS-CIR Series ceiling-mount passive infrared sensors can integrate into Lutron systems or function as stand-alone controls using a Lutron power pack. The sensor uses a small semiconductor heat detector that resides behind a multi-zone optical lens. The sensor's detector is sensitive to the heat emitted by the human body. In order to trigger the sensor, the source of heat must move from one range of detection to another. Non-moving hot objects will not cause the lights to turn on.

Features

- Intelligent, continually adapting passive infrared (PIR) sensor
- Passive infrared sensing
- Reliable motion detection with high error immunity
- Snap-locks to ceiling-mounted cover plate
- Non-Volatile Memory: settings saved in protected memory are not lost during power outages
- 450 to 1500 sq.ft. (42 to 140 m^2) coverage when mounted on an 8 - 12 ft. (2.4 - 3.7 m) ceiling
- Affords choice of turning lights off or dimming to a preset level in the unoccupied state when integrated with a Lutron system.

Models Available

Cat. No.	Color	Coverage	Field of View
LOS-CIR-450-WH	White	450 sq.ft. (42 m^2)	360°
LOS-CIR-1500-WH	White	1500 sq. ft. (140 m^2)	360°

Self-Adaptive Feature

The LOS-CIR Series ceiling-mount occupant sensors provides reliable detection with high error immunity. The internal microprocessor analyzes the information from the PIR technology and determines the optimum setting to use in order to properly cover the space.

Job Name:	Model Numbers:	
Job Number:		

Specifications

Timer Adjustment

- Automatic mode: Continually adapting sensor automatically adjusts settings to the space
- Manual mode: 8 to 30 minutes
- Test mode: 8 seconds

LED Lamp

- Red: infrared motion detected

Housing

- Rugged, high-impact, injection-molded plastic
- Color-coded leads 6 in. (15 cm)

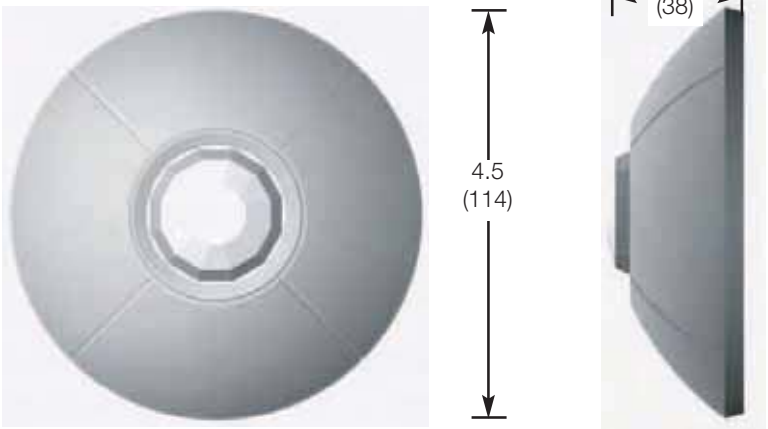
Power

- Operating voltage: 20 - 24 V⎓, PELV (Class 2: USA) low-voltage
- Operating current: 33 mA nominal
- Control output: 20 - 24 V⎓ active high logic control signal with short-circuit protection, open collector when unoccupied
- UL and CUL listed

Operating Environment

- Temperature: 32 to 104 °F (0 to 40 °C)
- Relative humidity: less than 95%, non-condensing
- For indoor use only

Dimensions



Front View

Side View

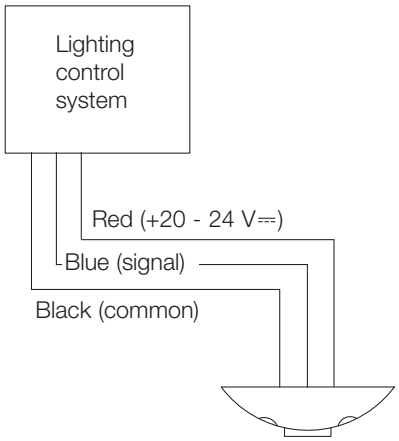
Measurements are in inches (mm)

Job Name:	Model Numbers:	
Job Number:		

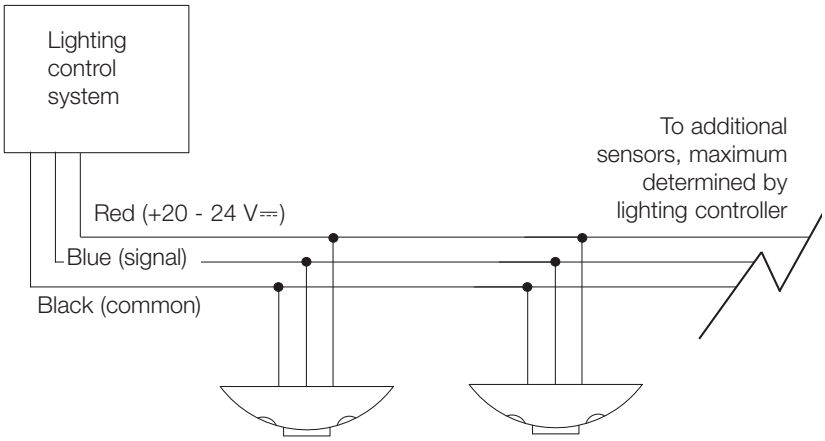
Wiring

Note: Power pack may be required when interfaced to lighting control system; see below.

Single Sensor to System



2 or More Sensors to System



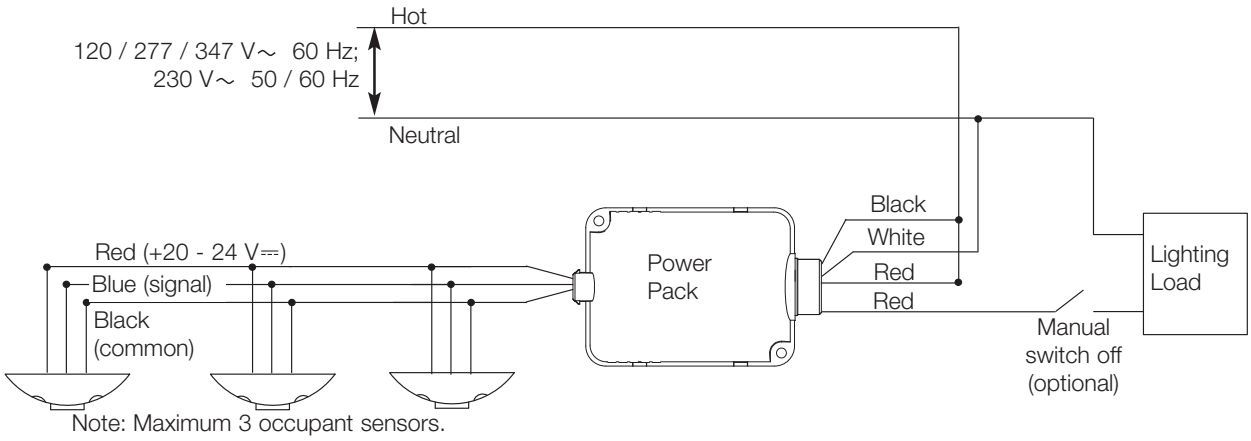
Power Supply Options

Lutron Lighting Control System	Power Pack Required?
Digital microWATT™	No
EcoSystem®	No
GRAFIK 5000 / 6000 / 7000	No, when used with seeTouch® wallstations with occupant sensor connections.
GRAFIK Eye® 3000 / 4000	Yes
HomeWorks®	Yes
LCP128™	No, when used with *seeTouch* wallstations with occupant sensor connections.
microWATT®	No
RadioRA®	Yes
RadioTouch®	No
Softswitch128®	No, when used with *seeTouch* wallstations with occupant sensor connections.

Job Name:	Model Numbers:	
Job Number:		

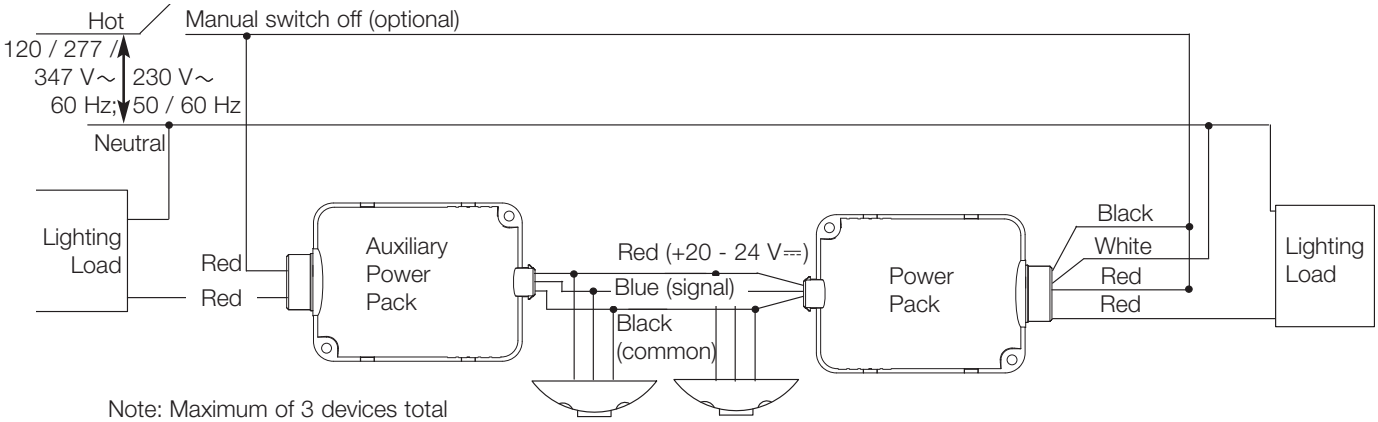
Wiring: Stand-Alone Control

1 to 3 Sensors with Power Pack



Note: Maximum 3 occupant sensors.

Switching Multiple Loads with Auxiliary Power Packs



Note: Maximum of 3 devices total (occupant sensors and auxiliary power packs) can be connected to a power pack.

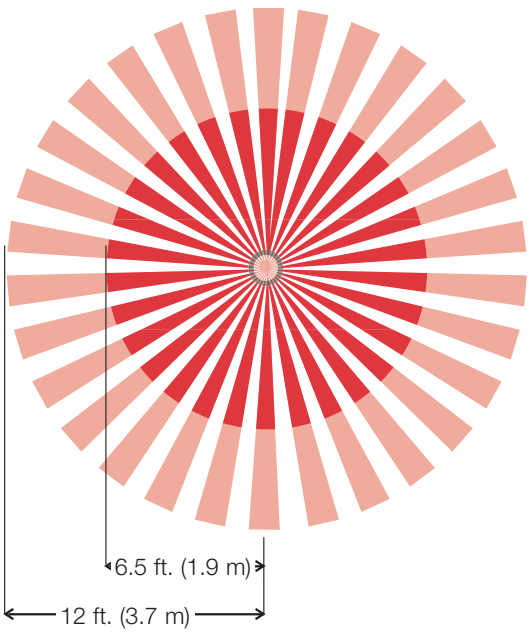
Job Name:	Model Numbers:	
Job Number:		

Installation

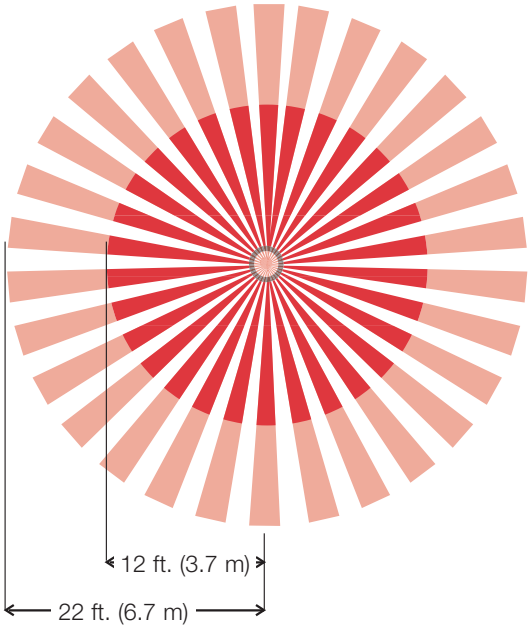
Sensor Placement

- The occupant sensor must have an unobstructed view of the room. Do not mount behind or near tall cabinets, shelves, indirect hanging fixtures, etc.
- Keep the occupant sensor away from air flow from ventilation outlets, windows, fans, etc.
- Closely follow the diagrams shown concerning major and minor motion coverage. The sensor can detect major motion (such as a person taking a half-step) at a greater distance than it can detect minor motion (such as writing or typing at a desk).
- May not detect occupancy with no significant difference between ambient and body temperatures.

Range Diagrams



LOS-CIR-450



LOS-CIR-1500

Major motion detection

Minor motion detection

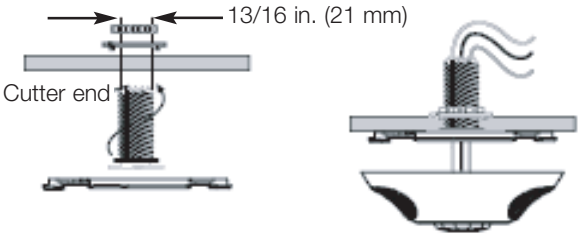
Job Name:	Model Numbers:	
Job Number:		

Installation

Mounting

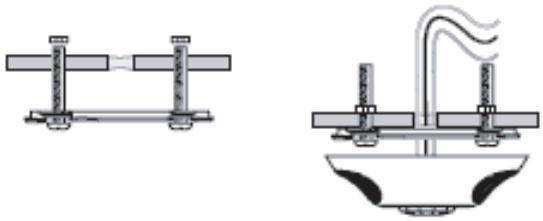
Normal Mounting

Twist and lock threaded mounting post onto cover plate. Drill through ceiling tile with assembly, using cutter end of the threaded mounting post. Secure with washer and nut.



Mounting to Non-Standard Ceiling or Fixture

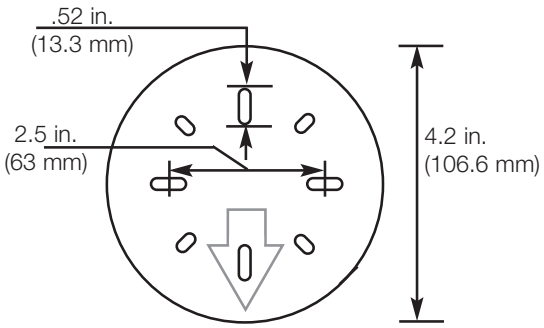
Mount twist-lock cover plate using mounting screws, nuts, and washers (included). Drill/punch wire routing hole through ceiling tile at center of cover plate.



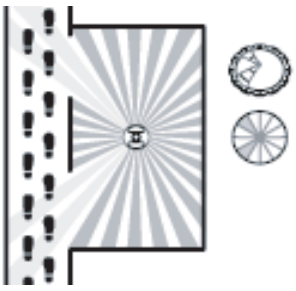
Wire Lengths

# Sensors	1	2	3	1	2	1
# Aux. PP	0	0	0	1	1	2
22 AWG	750 ft.	375 ft.	250 ft.	375 ft.	250 ft.	250 ft.
0.5 mm^2	365 m	180 m	120 m	90 m	120 m	120 m
20 AWG	1200 ft.	600 ft.	400 ft.	600 ft.	400 ft.	400 ft.
0.75 mm^2	730 m	365 m	240 m	365 m	240 m	365 m
18 AWG	2400 ft.	1200 ft.	800 ft.	1200 ft.	800 ft.	800 ft.

Mounting Plate Dimensions



Using the Infrared Mask



Center Ceiling Mount
(Mask blocks sensor seeing out doorway into hall)



Corner Ceiling Mount
(No mask needed)

Typical Mask Patterns



Conference Room Mask | 180° Mask | Full Mask



Rectangular Areas | Over the Door | Specific Areas You Wish to Mask

Job Name:	Model Numbers:	
Job Number:		

Sensor Adjustments

Override Settings



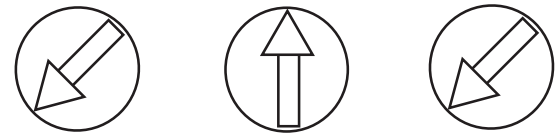
A		Off (Default)	On
Auto/Manual	1	Automatic (Normal)	Manual on/off (Override)
Threshold	2	Auto Threshold Adjustment	High Sensitivity (Low turn-on threshold)
LED Motion Indicator	3	Lights indicate motion	Disable LED Indicator
Reset Learned Settings	4	Retain Settings (Normal)	Erase all learned settings, Restart Learning (Toggle On)



B		Off	On
Strong Airflow Compensation	1	Disable Compensation (Normal)	Enable Compensation
Over Doorway Installation	2	No (Normal)	Yes (Use increased turn-on threshold)
Timer Adjust	3	Adjust Timer Automatically	Use Manual Setting (No adjustment)
Auto Sensitivity	4	Adjust Sensitivity Automatically	Adjust Sensitivity Manually

Timer Test Mode

1. Remove the retainer cover.
2. Rotate the black timer adjustment knob to about midway (12 o'clock).
3. Return setting to minimum setting (full CCW).



Factory Settings | 12 o'clock | Full CCW

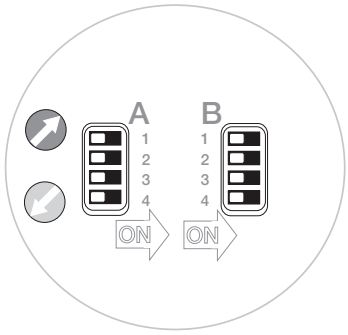
Note: The timer will remain in the 8-second test mode for 1 hour, then automatically reset to 8 minutes.

4. To manually take the timer out of the 8-second test mode, turn the timer adjustment approximately 1/16" clockwise to make the setting slightly above minimum (just above the 8-minute setting).

Factory Settings

Red: Infrared sensitivity 75% default

Black: Timer 8 min.



Job Name:	Model Numbers:	
Job Number:		

Ultrasonic Ceiling Mount Sensor



The LOS-CUS Series ceiling-mount ultrasonic sensors can integrate into Lutron systems or function as stand-alone controls using a Lutron power pack. Any movement within the sensor's range causes a shift in the original emitted frequency. The sensor's receiver identifies any change in frequency as motion and either turns the lights on or maintains lights on.

Features

- Intelligent, continually adapting ultrasonic sensor
- Snap-locks to ceiling-mounted cover plate
- Excellent minor motion sensitivity
- Non-Volatile Memory: settings saved in protected memory are not lost during power outages
- 500 to 2000 sq.ft. (46 to 186 m^2) coverage when mounted on an 8 - 12 ft. (2.4 to 3.7 m) ceiling
- Affords choice of turning lights off or dimming to a preset level in the unoccupied state when integrated with a Lutron system.

Models Available

Cat. No.	Color	Coverage	Field of View
LOS-CUS-500-WH	White	500 sq.ft. (46 m^2)	180°
LOS-CUS-1000-WH	White	1000 sq.ft. (93 m^2)	180°
LOS-CUS-2000-WH	White	2000 sq.ft. (186 m^2)	360°

Self-Adaptive Feature

Designed to meet the challenges found in a wide variety of spaces, the LOS-CUS Series provides reliable detection with high minor motion detection. The intelligent, continually adapting sensor technology eliminates manual sensitivity and timer adjustments during installation and over the life of the product. The internal microprocessor analyzes the information from the ultrasonic technology and determines the optimum setting to use in order to properly cover the space. Should the room be reconfigured (e.g., new furniture), the software will adapt to continue to provide correct time out for the lights.

Job Name:	Model Numbers:	
Job Number:		

Specifications

Timer Adjustment

- Automatic mode: Continually adapting sensor automatically adjusts settings to the space
- Manual mode: 8 to 30 minutes
- Test mode: 8 seconds

LED Lamp

- Green: ultrasonic motion detected

Housing

- Rugged, high-impact, injection-molded plastic
- Color-coded leads 6 in. (15 cm)

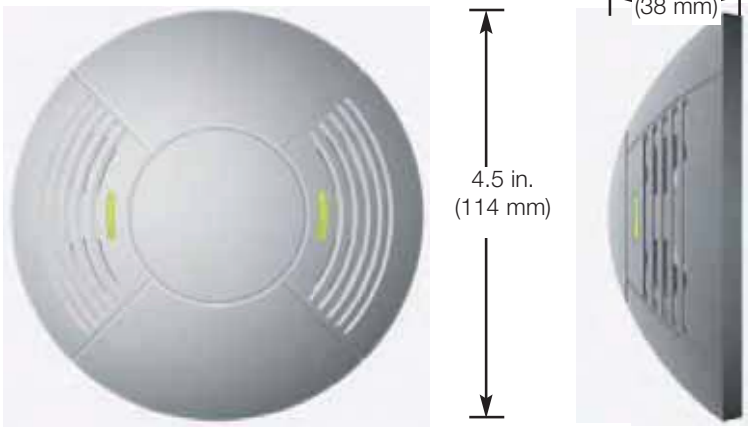
Power

- Operating voltage: 20 - 24 V⎓, PELV (Class 2: USA) low-voltage
- Operating current: 33 mA nominal
- Control output: 20 - 24 V⎓ active high logic control signal with short-circuit protection, open collector when unoccupied
- UL and CUL listed

Operating Environment

- Temperature: 32 to 104 °F (0 to 40 °C)
- Relative humidity: less than 95%, non-condensing
- For indoor use only

Dimensions



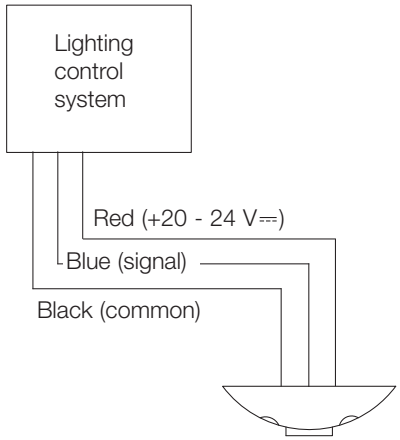
Front View Side View

Job Name:	Model Numbers:	
Job Number:		

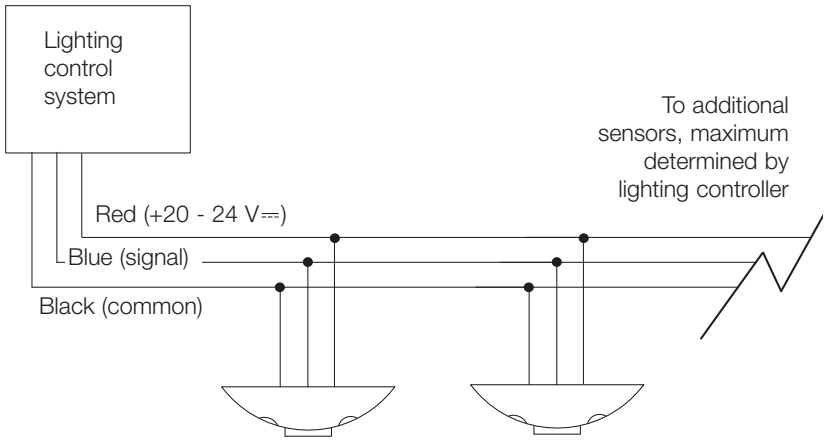
Wiring

Note: Power pack may be required when interfaced to lighting control system; see below.

Single Sensor to System



2 or More Sensors to System



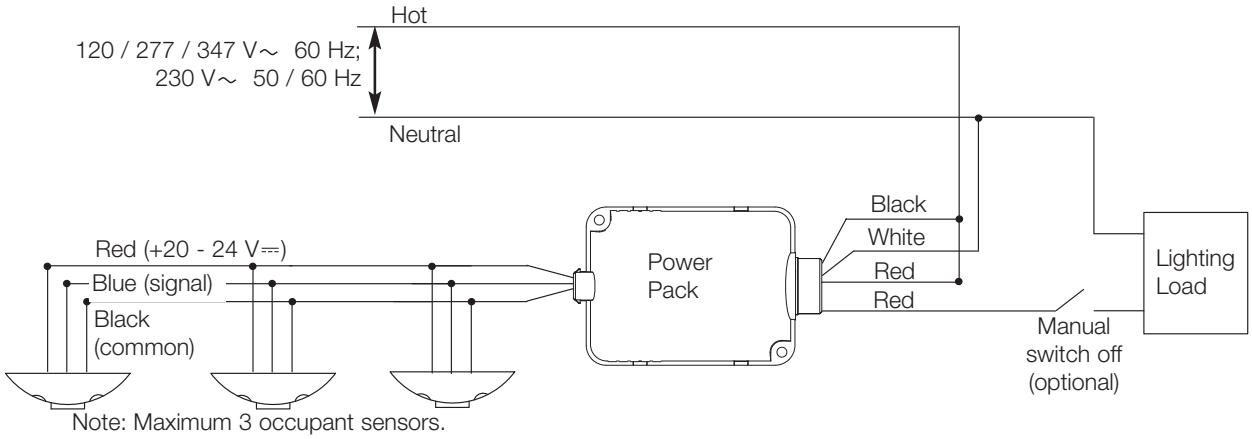
Power Supply Options

Lutron Lighting Control System	Power Pack Required?
Digital microWATT™	No
EcoSystem®	No
GRAFIK 5000 / 6000 / 7000	No, when used with seeTouch® wallstations with occupant sensor connections.
GRAFIK Eye® 3000 / 4000	Yes
HomeWorks®	Yes
LCP128™	No, when used with *seeTouch* wallstations with occupant sensor connections.
microWATT®	No
RadioRA®	Yes
RadioTouch®	No
Softswitch128®	No, when used with *seeTouch* wallstations with occupant sensor connections.

Job Name:	Model Numbers:	
Job Number:		

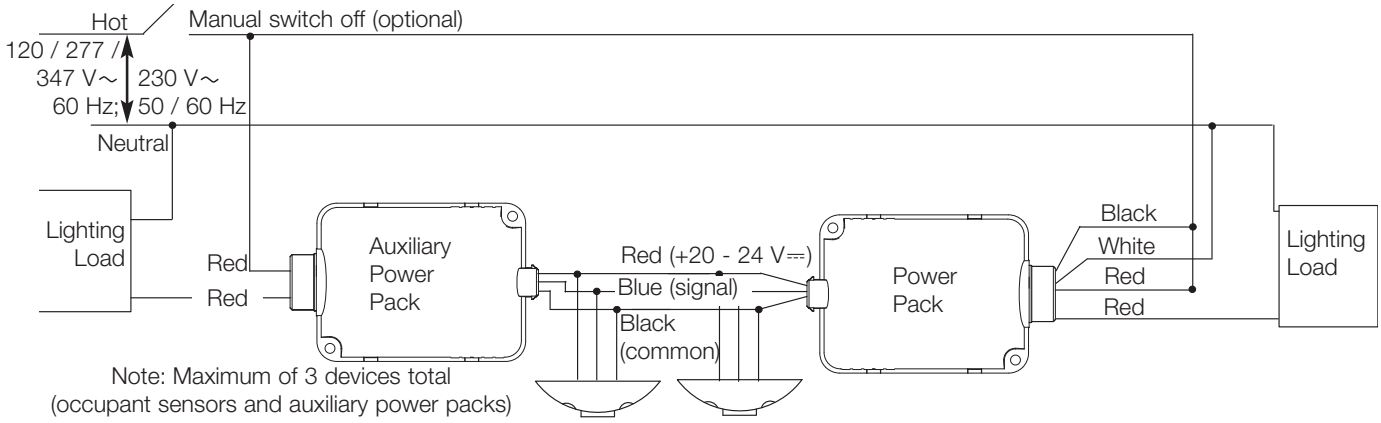
Wiring: Stand-Alone Control

1 to 3 Sensors with Power Pack



Note: Maximum 3 occupant sensors.

Switching Multiple Loads with Auxiliary Power Packs



Note: Maximum of 3 devices total (occupant sensors and auxiliary power packs) can be connected to a power pack.

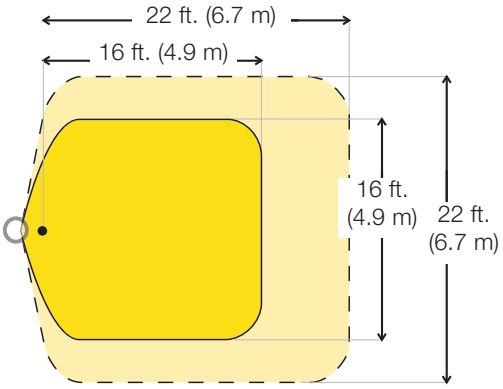
Job Name:	Model Numbers:	
Job Number:		

Installation

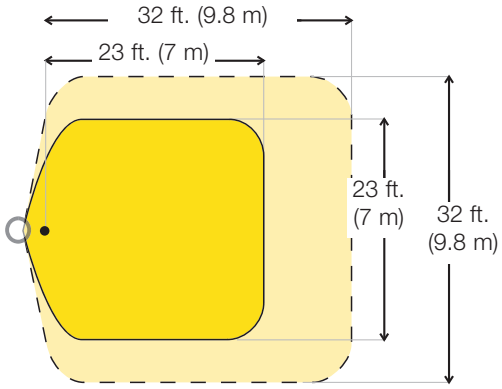
Sensor Placement

- Mount the sensor so the grilles face the open portion of the room and are not facing a nearby wall, window, or other obstructing object.
- Keep the occupant sensor away from air flow from ventilation outlets, windows, fans, etc.
- If installing a 180° occupant sensor (500 and 1000 models), place the sensor on the same wall as the doorway so that traffic in a hallway will not affect the sensor; otherwise, place in center of room.
- Closely follow the diagrams shown concerning major and minor motion coverage. The sensor can detect major motion (such as a person taking a half-step) at a greater distance than it can detect minor motion (such as writing or typing at a desk).
- Decrease total coverage area by 15% for “soft” rooms (for example, heavy draperies or heavy carpeting).

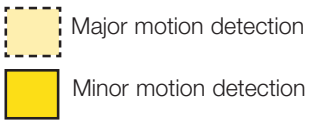
Range Diagrams

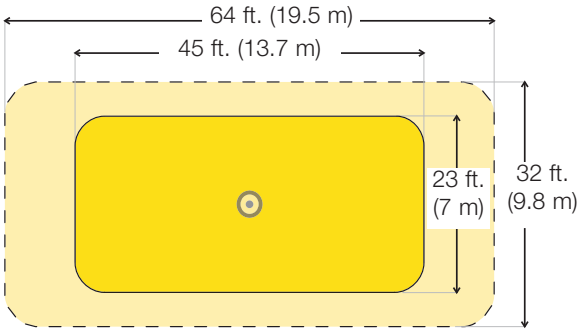


LOS-CUS-500



LOS-CUS-1000





LOS-CUS-2000

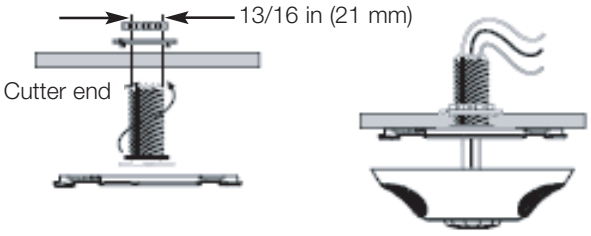
Job Name:	Model Numbers:	
Job Number:		

Installation

Mounting

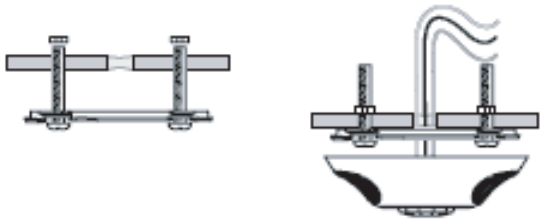
Normal Mounting

Twist and lock threaded mounting post onto cover plate. Drill through ceiling tile with assembly, using cutter end of the threaded mounting post. Secure with washer and nut.



Mounting to Non-Standard Ceiling or Fixture

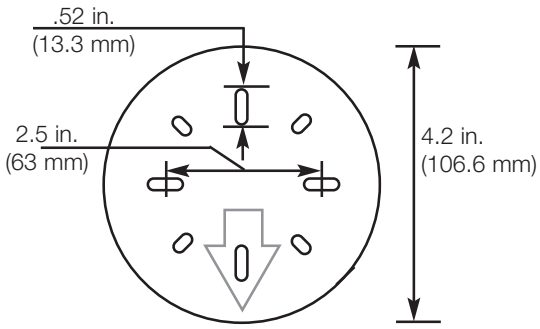
Mount twist-lock cover plate using mounting screws, nuts, and washers (included). Drill/punch wire routing hole through ceiling tile at center of cover plate.



Wire Lengths

# Sensors	1	2	3	1	2	1
# Aux. PP	0	0	0	1	1	2
22 AWG	750 ft.	375 ft.	250 ft.	375 ft.	250 ft.	250 ft.
0.5 mm^2	365 m	180 m	120 m	90 m	120 m	120 m
20 AWG	1200 ft.	600 ft.	400 ft.	600 ft.	400 ft.	400 ft.
0.75 mm^2	730 m	365 m	240 m	365 m	240 m	365 m
18 AWG	2400 ft.	1200 ft.	800 ft.	1200 ft.	800 ft.	800 ft.

Mounting Plate Dimensions



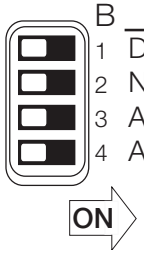
Job Name:	Model Numbers:	
Job Number:		

Sensor Adjustments

Override Settings



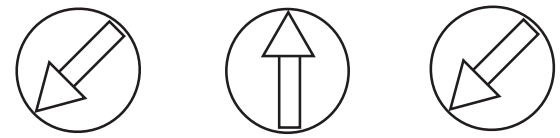
A		Off (Default)	On
Auto/Manual	1	Automatic (Normal)	Manual on/off (Override)
Threshold	2	Auto Threshold Adjustment	High Sensitivity (Low turn-on threshold)
LED Motion Indicator	3	Lights indicate motion	Disable LED Indicator
Reset Learned Settings	4	Retain Settings (Normal)	Erase all learned settings, Restart Learning (Toggle On)



B		Off	On
Strong Airflow Compensation	1	Disable Compensation (Normal)	Enable Compensation
Over Doorway Installation	2	No (Normal)	Yes (Use increased turn-on threshold)
Timer Adjust	3	Adjust Timer Automatically	Use Manual Setting (No adjustment)
Auto Sensitivity	4	Adjust Sensitivity Automatically	Adjust Sensitivity Manually

Timer Test Mode

1. Remove the retainer cover.
2. Rotate the black timer adjustment knob to about midway (12 o'clock).
3. Return setting to minimum setting (full CCW).

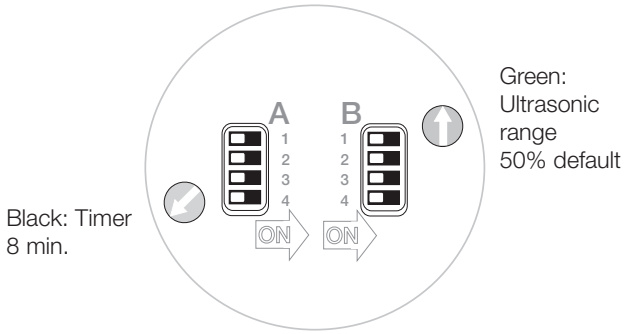


Factory Settings | 12 o'clock | Full CCW

Note: The timer will remain in the 8-second test mode for 1 hour, then automatically reset to 8 minutes.

4. To manually take the timer out of the 8-second test mode, turn the timer adjustment approximately 1/16" clockwise to make the setting slightly above minimum (just above the 8-minute setting).

Factory Settings



Job Name:	Model Numbers:	
Job Number:		

Dual Technology Wall Mount Occupancy Sensor



The LOS-WDT Series wall-mount dual-technology sensors are used to control lighting in spaces that have pendant fixtures, ceiling fans, or high ceilings (more than 12 ft./ 3.7 m), where ceiling-mount occupant sensors would not function reliably. The adaptive technology eliminates manual sensitivity and timer adjustments during installation and over the life of the product.

Features

- Intelligent, continually adapting sensor
- Ultrasonic (US) combined with passive infrared (PIR) sensing provide high sensitivity, high noise immunity, and excellent false tripping immunity
- Suited for complex environments that are difficult to control with single-technology sensors
- Flexible base mounting on wall or ceiling
- Aim and lock: base mount permits fast alignment
- Non-Volatile Memory: settings saved in protected memory are not lost during power outages
- 1600 sq.ft. (488 m^2) of coverage when used where the ceiling height is between 8 - 12 ft. (2.4 - 3.7 m)
- Affords choice of turning lights off or dimming to a preset level in the unoccupied state when integrated with a Lutron system.

Models Available

Cat. No.	Color	Coverage	Field of View
LOS-WDT-WH	White	1600 sq.ft. (488 m^2)	110°
LOS-WDT-R-WH	White	1600 sq.ft. (488 m^2)	110°

Self-Adaptive Feature

The LOS-WDT Series wall-mount occupancy sensors combine both ultrasonic (US) motion detection for maximum sensitivity and passive infrared (PIR) motion detection for false triggering immunity. The self-adapting internal microprocessor analyzes the composite sum of both signals to eliminate time-consuming adjustments and callbacks found in non-intelligent sensors.

Job Name:	Model Numbers:	
Job Number:		

Specifications

Timer Settings

- Automatic mode: Continually adapting sensor automatically adjusts settings to the space
- Manual mode: 4 to 30 minutes
- Test mode: 8 seconds

LED Lamp

- Red: infrared motion
- Green: ultrasonic motion

Housing

- High-impact, injection molded plastic housing
- 6 in. (15 cm) color-coded lead wires

Power

- Operating voltage: 20 - 24 V⎓, Class 2 (PELV) low-voltage
- Operating current: 33 mA nominal
- Control output: 20 - 24 V⎓ active high logic control signal with short-circuit protection, open collector when unoccupied
- UL and CUL listed

Operating Environment

- Temperature: 32 to 104 °F (0 to 40 °C)
- Relative humidity: 0% to 95%, non-condensing
- For indoor use only

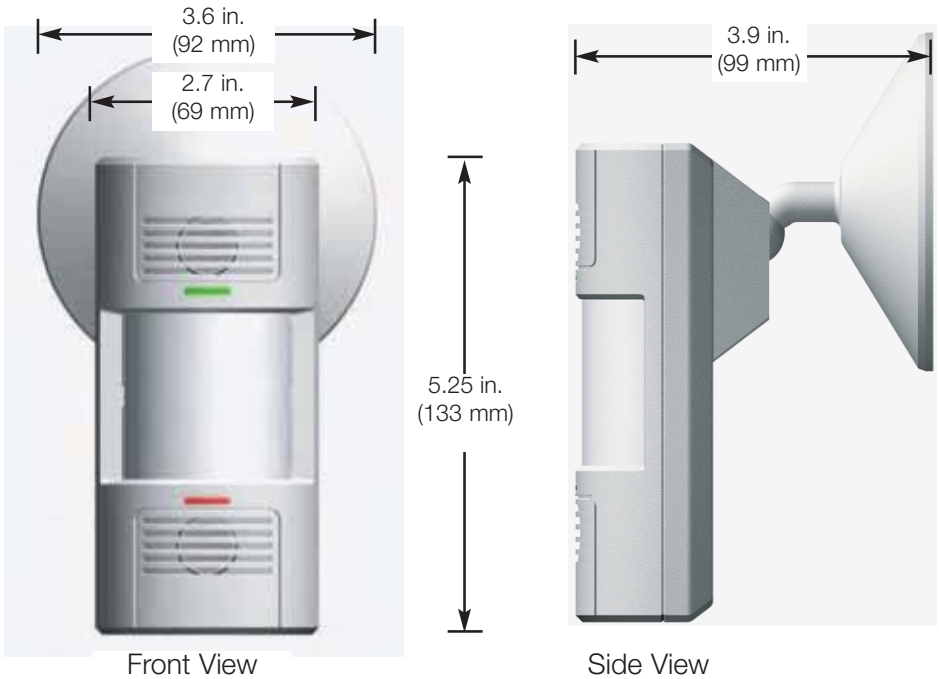
Contact Rating (R Models only)

- SPDT 500 mA rated at 24 V⎓ isolated relay

Photo Cell (R Models only)

- Prevents light from turning on when there is sufficient natural light
- Sensitivity: 20 - 3,000 LUX adjustable

Dimensions



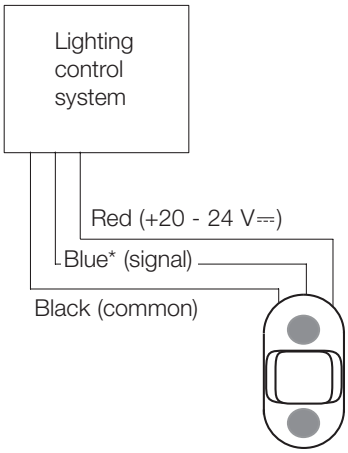
Front View Side View

Job Name:	Model Numbers:	
Job Number:		

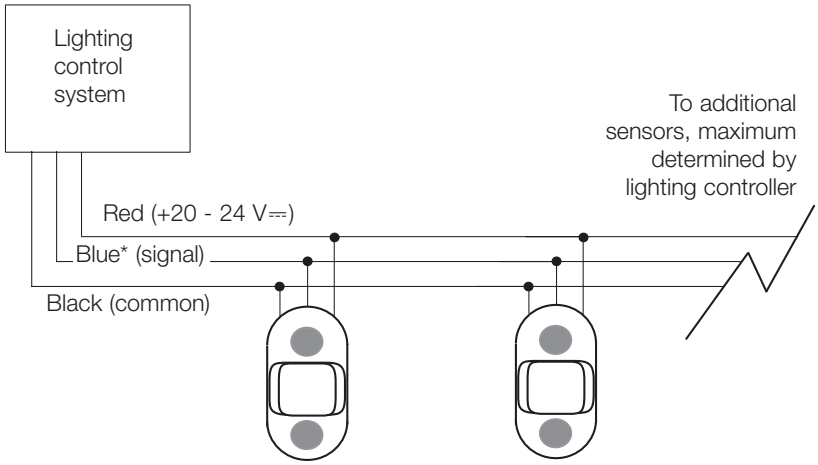
Wiring

Note: Power pack may be required when interfaced to lighting control system; see below.

Single Sensor to System



2 or More Sensors to System



*Note: Use gray wire for -R model.

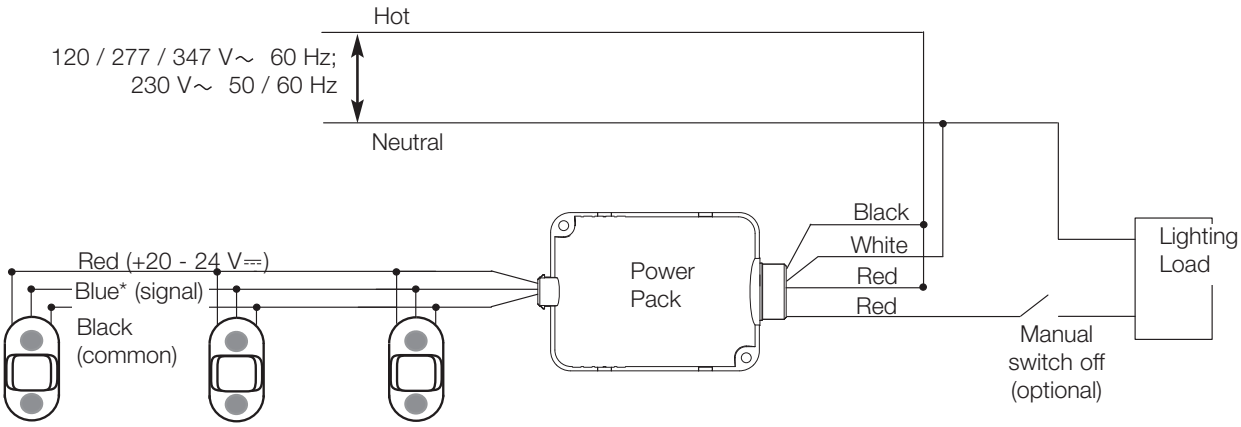
Power Supply Options

Lutron Lighting Control System	Power Pack Required?
Digital microWATT™	No
EcoSystem®	No
GRAFIK 5000 / 6000 / 7000	No, when used with seeTouch® wallstations with occupant sensor connections.
GRAFIK Eye® 3000 / 4000	Yes
HomeWorks®	Yes
LCP128™	No, when used with *seeTouch* wallstations with occupant sensor connections.
microWATT®	No
RadioRA®	Yes
RadioTouch®	No
Softswitch128®	No, when used with *seeTouch* wallstations with occupant sensor connections.

Job Name:	Model Numbers:	
Job Number:		

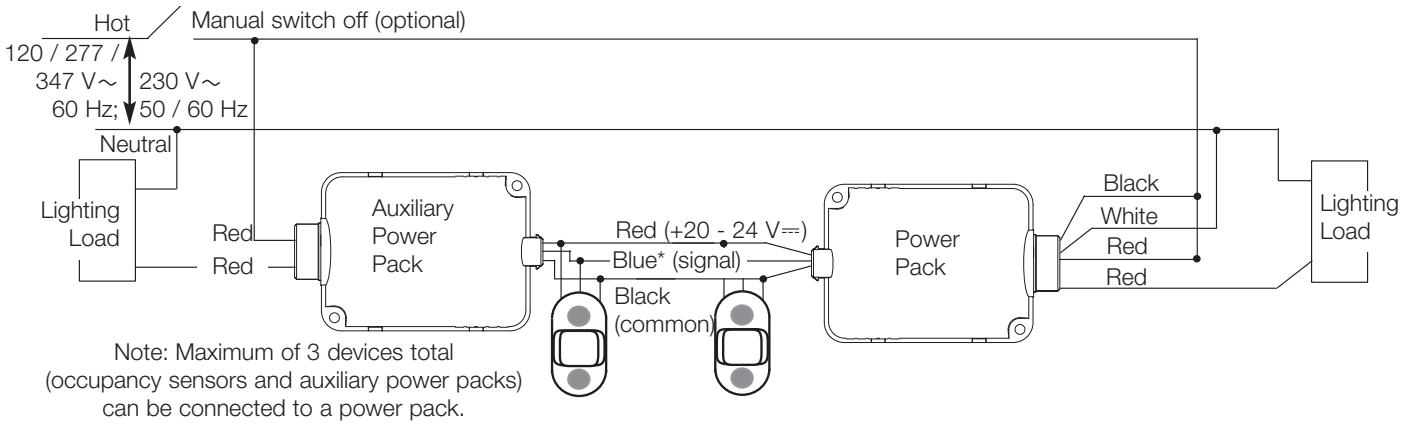
Wiring: Stand-Alone Control

1 to 3 Sensors with Power Pack



Note: Maximum 3 occupancy sensors.

Switching Multiple Loads with Auxiliary Power Packs



Note: Maximum of 3 devices total (occupancy sensors and auxiliary power packs) can be connected to a power pack.

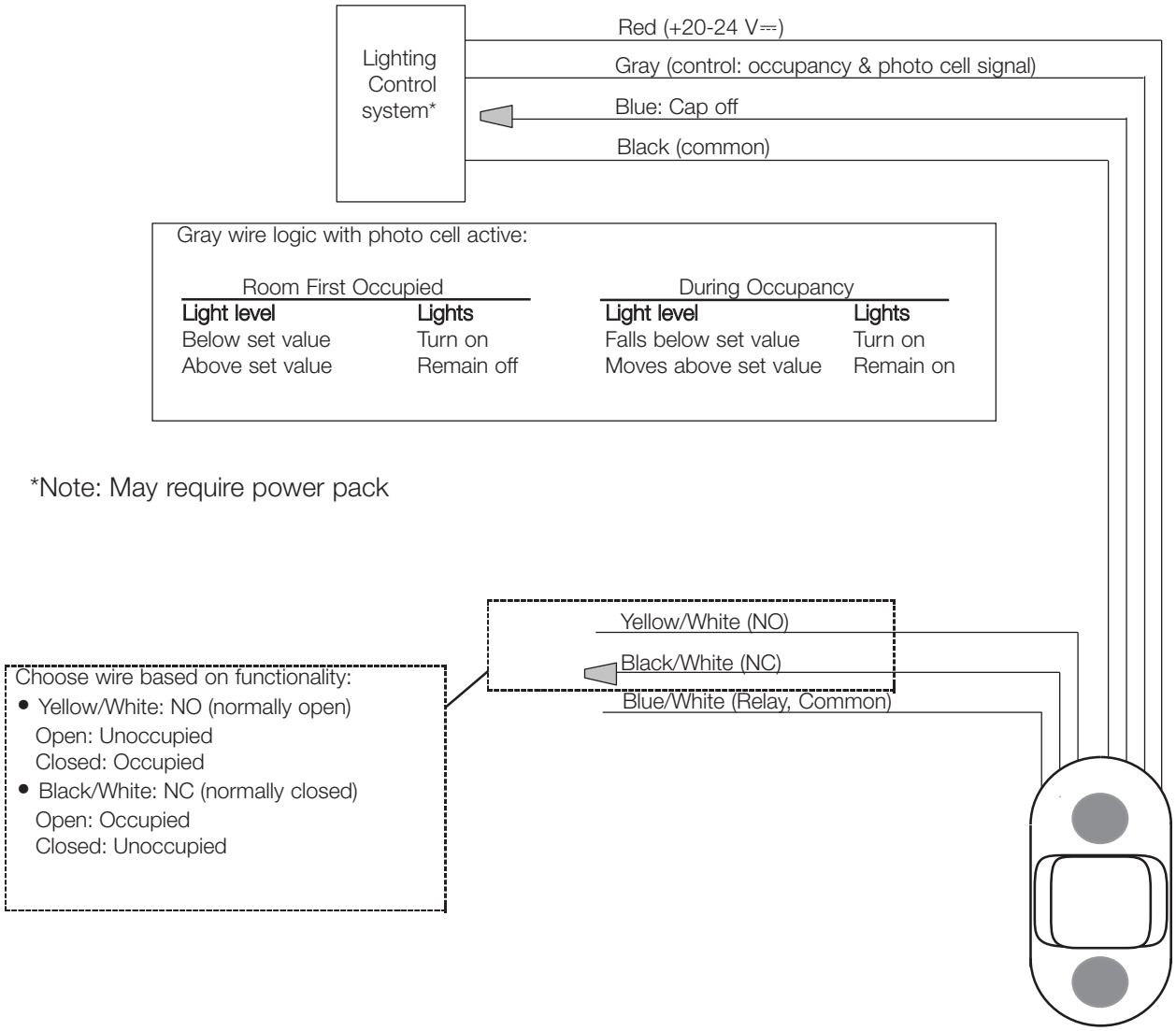
*Note: Use gray wire for -R model.

Job Name:	Model Numbers:	
Job Number:		

Wiring

Relay Model Option

LOS-WDT-R only



*Note: May require power pack

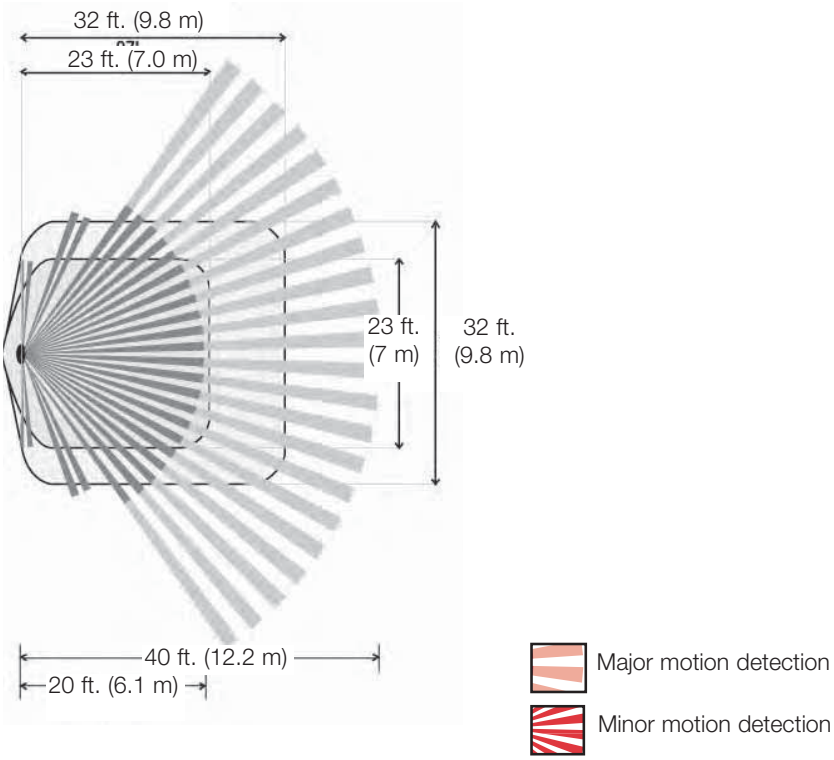
Job Name:	Model Numbers:	
Job Number:		

Installation

Sensor Placement

- The occupant sensor must have an unobstructed view of the room entrance. Do not mount behind or near tall cabinets, shelves, indirect hanging fixtures, etc.
- Keep the occupant sensor away from air flow from ventilation outlets, windows, fans, etc.
- Place the sensor on the same wall as the doorway so that traffic in a hallway will not affect the sensor.
- Closely follow the diagrams shown concerning major and minor motion coverage. The sensor can detect major motion (such as a person taking a half-step) at a greater distance than it can detect minor motion (such as writing or typing at a desk).
- Decrease total coverage area by 15% for “soft” rooms (for example, heavy draperies or heavy carpeting).

Range Diagrams



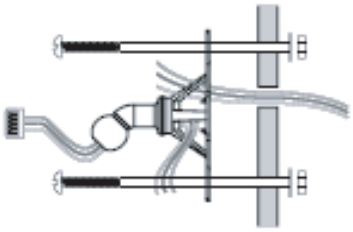
Job Name:	Model Numbers:	
Job Number:		

Installation

Mounting

Mounting to Wall or Ceiling Tile

Redrill wiring routing hole and (2) mounting holes using Mounting Bracket as template. Route wires through wall and mounting bracket. Secure mounting bracket to wall/ceiling tile using mounting screws, nuts, and washers (included).



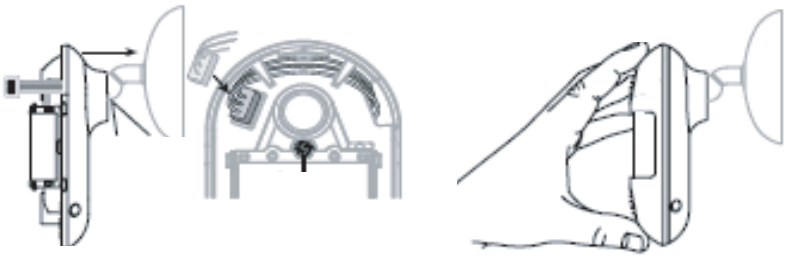
Mounting in Acoustic Ceiling Tile

Twist threaded mounting post onto Mounting Bracket. Drill through ceiling tile with assembly. Secure with washer and nut. Route wiring through Mounting Bracket and connect to wire harness. Snap bracket cover in place to conceal wiring and bracket.



Either Method

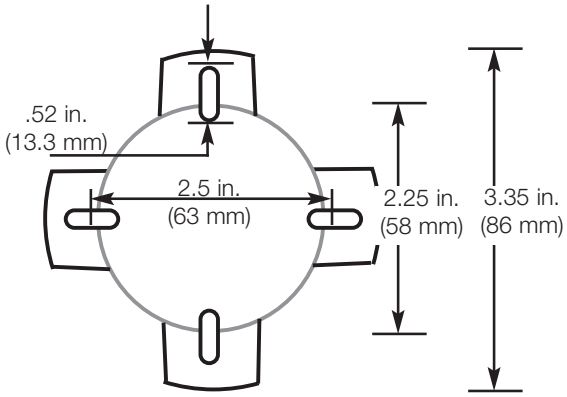
Feed wiring harness through the back of the sensor body and out the exit slot. Snap sensor onto mounting post. Plug wiring harness into connector on the left side (opposite exit slot) and place wiring under wire tabs. Align sensor and tighten position locking screw.



Wire Lengths

# Sensors	1	2	3	1	2	1
# Aux. PP	0	0	0	1	1	2
22 AWG	750 ft.	375 ft.	250 ft.	375 ft.	250 ft.	250 ft.
0.5 mm^2	365 m	180 m	120 m	90 m	120 m	120 m
20 AWG	1200 ft.	600 ft.	400 ft.	600 ft.	400 ft.	400 ft.
0.75 mm^2	730 m	365 m	240 m	365 m	240 m	365 m
18 AWG	2400 ft.	1200 ft.	800 ft.	1200 ft.	800 ft.	800 ft.

Mounting Plate Dimensions

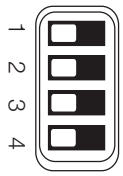


Job Name:	Model Numbers:	
Job Number:		

Sensor Adjustments

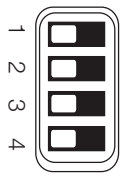
Override Settings

A



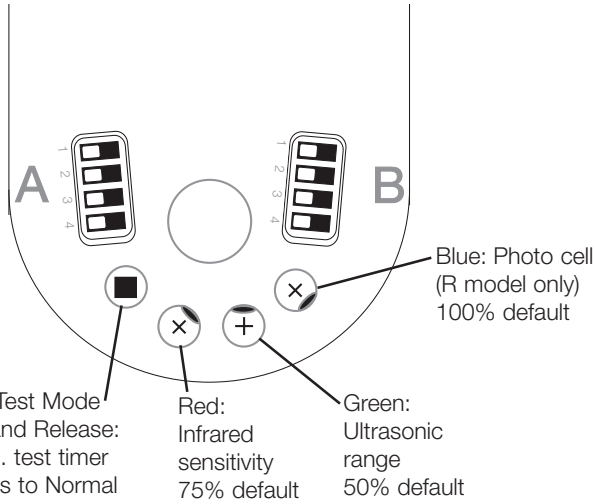
	Off (Default)	On
1	Automatic (Normal)	Manual lights on (Override)
2	Not used	Not used
3	LED on (Normal)	LED off
4	Retain Settings (Normal)	Any change resets learned settings

B



	Off	On
1	OFF } 8 min.	ON } 15 min.
2	OFF } 4 min.	ON } 30 min.
3	Auto Timer Adjust On	Auto Timer Adjust Off
4	Auto Sensitivity Adjust On	Auto Sensitivity Adjust Off

Factory Settings



Job Name:	Model Numbers:	
Job Number:		

Installation

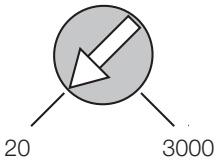
Adjusting the "Lights Not On" Level

LOS-WDT-R only

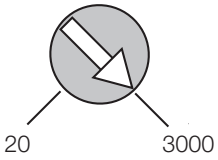
1. Place timer in Test Mode (see page 7).
2. Set photo cell to max.
   Turn the blue knob full clockwise (lights on no matter how bright the natural light is), then 30 degrees counterclockwise.
3. Check for Lights-Out.
   Move from underneath the sensor, and remain still until the lights turn off. Move around normally to turn the light on.
4. Adjust to desired level.
   If lights remain off, adjust the blue knob another 30 degrees counterclockwise and repeat step 3 until the lights turn on.
   Note: Set blue knob to 100% to disable photo cell functionality and leave secondary dry contact closure output functionality intact.

Control Settings (Blue Knob)

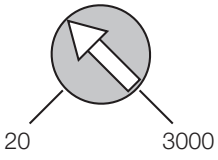
LOS-WDT-R only



Minimum (low):
Lights will never come on, even though room is occupied.



Maximum (high):
Photo cell has no effect on operation (factory setting).



Normal:
200 to 600 LUX is normal range.

Job Name:	Model Numbers:	
Job Number:		

Infrared Wall Mount Occupancy Sensor



The LOS-WIR wall-mounted passive infrared sensor is used in spaces with pendant fixtures, ceiling fans, or high ceilings (more than 12 ft./3.7 m). The sensor detects large body motions over 40 ft. (12 m) away, and smaller motions such as hand movements up to 25 ft. (7.6 m) away.

Features

- Intelligent, continually adapting sensor
- Passive infrared (PIR) sensing
- Excellent false tripping immunity
- Use in rooms with pendant fixtures and storage areas
- Flexible base mounting on wall or ceiling
- Aim and lock: base mount permits fast alignment
- Non-Volatile Memory: settings saved in protected memory are not lost during power outages
- 1,600 sq.ft. (488 m^2) of coverage when used where the ceiling height is between 8 - 12 ft. (2.4 - 3.7 m)
- Affords choice of turning lights off or dimming to a preset level in the unoccupied state when integrated with a Lutron system.

Models Available

Cat. No.	Color	Coverage	Field of View
LOS-WIR-WH	White	1600 sq.ft. (288 m^2)	110°

Self-Adaptive Feature

Designed to meet the challenges found in a wide variety of spaces, the LOS-WIR works well in spaces with overhead fans and space heaters. Work areas, storage facilities, storerooms, indoor garages, and rooms with pendant fixtures are ideal. The internal microprocessor analyzes the information from the PIR technology and determines the optimum setting to use in order to properly cover the space.

The LOS-WIR identifies, records, and learns normal occupancy cycles of a space. Over an initial 4-week period, the sensor logs room occupancy for each 24-hour period. The information gathered by the sensor is used to automatically adjust the dual internal sensitivity bias threshold. This technology eliminates time-consuming adjustments and callbacks found in non-intelligent sensors.

Job Name:	Model Numbers:	
Job Number:		

Specifications

Timer Settings

- Automatic mode: Continually adapting sensor automatically adjusts settings to the space
- Manual mode: 4 to 30 minutes
- Test mode: 8 seconds

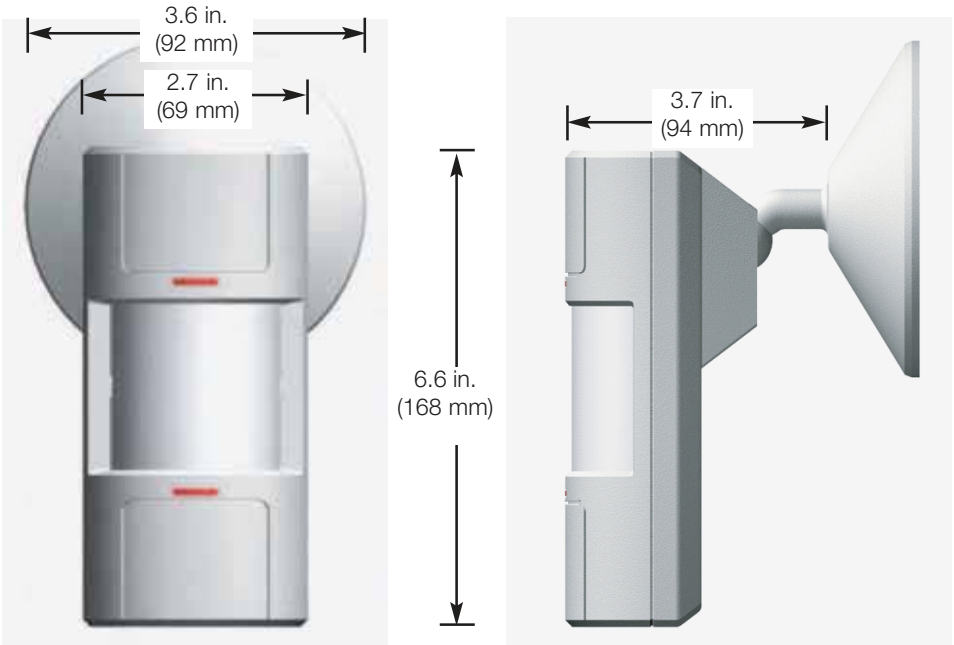
Operating Environment

- Temperature: 32 to 104 °F (0 to 40 °C)
- Relative humidity: 0% to 95%, non-condensing
- For indoor use only

Power

- Operating voltage: 20 - 24 V⎓, PELV (Class 2: USA) low-voltage
- Operating current: 33 mA nominal
- Control output: 20 - 24 V⎓ active high logic control signal with short-circuit protection, open collector when unoccupied
- UL and CUL listed

Dimensions



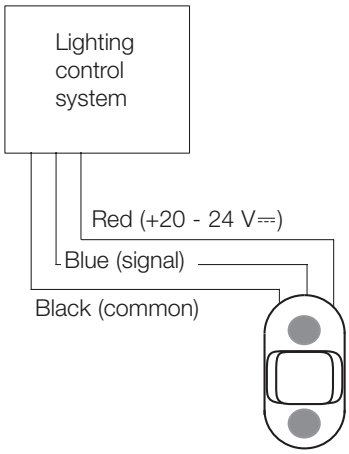
Front View Side View

Job Name:	Model Numbers:	
Job Number:		

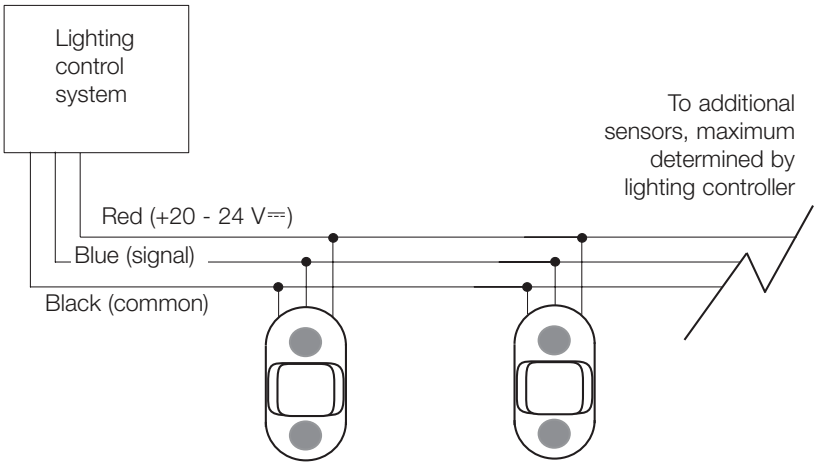
Wiring

Note: Power pack may be required when interfaced to lighting control system; see below.

Single Sensor to System



2 or More Sensors to System



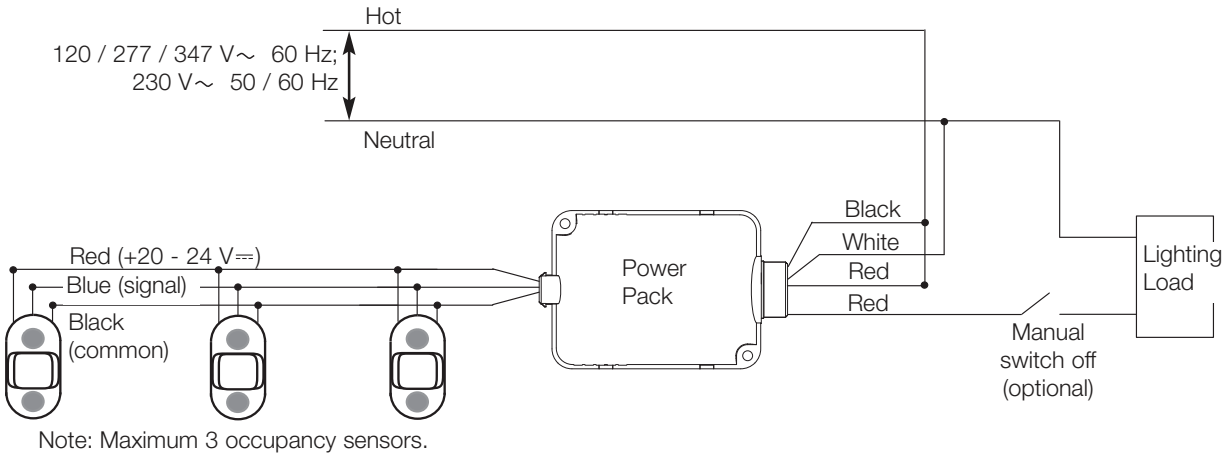
Power Supply Options

Lutron Lighting Control System	Power Pack Required?
Digital microWATT™	No
EcoSystem®	No
GRAFIK 5000 / 6000 / 7000	No, when used with seeTouch® wallstations with occupant sensor connections.
GRAFIK Eye® 3000 / 4000	Yes
HomeWorks®	Yes
LCP128™	No, when used with *seeTouch* wallstations with occupant sensor connections.
microWATT®	No
RadioRA®	Yes
RadioTouch®	No
Softswitch128®	No, when used with *seeTouch* wallstations with occupant sensor connections.

Job Name:	Model Numbers:	
Job Number:		

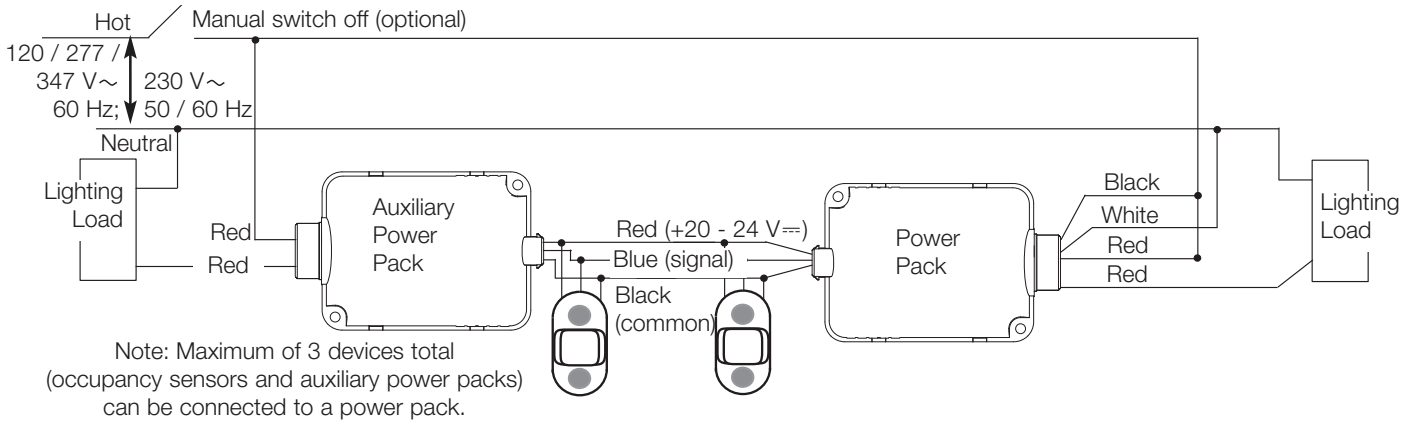
Wiring: Stand-Alone Control

1 to 3 Sensors with Power Pack



Note: Maximum 3 occupancy sensors.

Switching Multiple Loads with Auxiliary Power Packs



Note: Maximum of 3 devices total
(occupancy sensors and auxiliary power packs)
can be connected to a power pack.

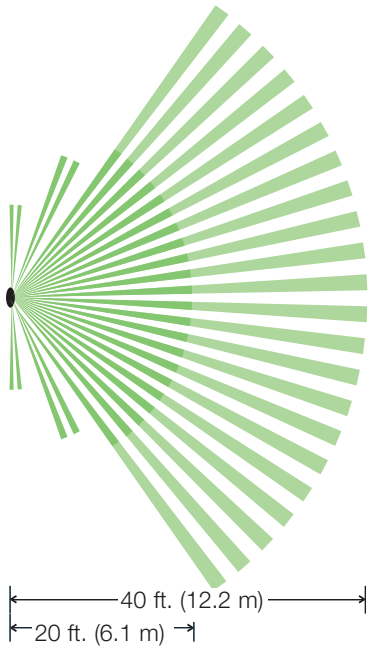
Job Name:	Model Numbers:	
Job Number:		

Installation

Sensor Placement

- The occupant sensor must have an unobstructed view of the room. Do not mount behind or near tall cabinets, shelves, indirect hanging fixtures, etc.
- Keep the occupant sensor away from air flow from ventilation outlets, windows, fans, etc.
- Closely follow the diagrams shown concerning major and minor motion coverage. The sensor can detect major motion (such as a person taking a half-step) at a greater distance than it can detect minor motion (such as writing or typing at a desk).
- May not detect occupancy with no significant difference between ambient and body temperatures.

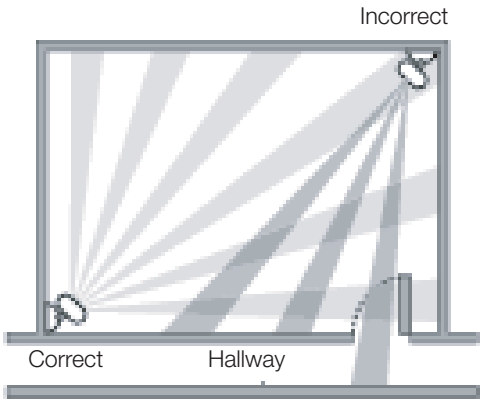
Range Diagram



Minor motion detection

Major motion detection

Sensor Placement



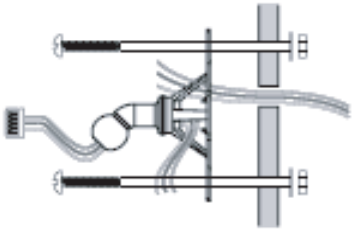
Job Name:	Model Numbers:	
Job Number:		

Installation

Mounting

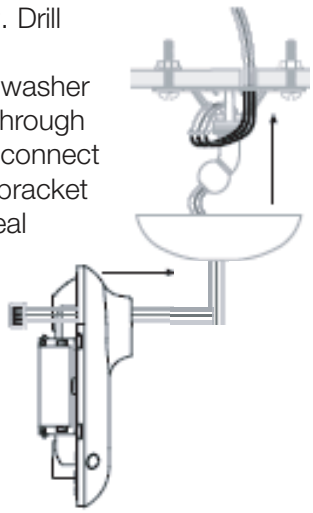
Mounting to Wall or Ceiling Tile

Redrill wiring routing hole and (2) mounting holes using Mounting Bracket as template. Route wires through wall and mounting bracket. Secure mounting bracket to wall/ceiling tile using mounting screws, nuts, and washers (included).



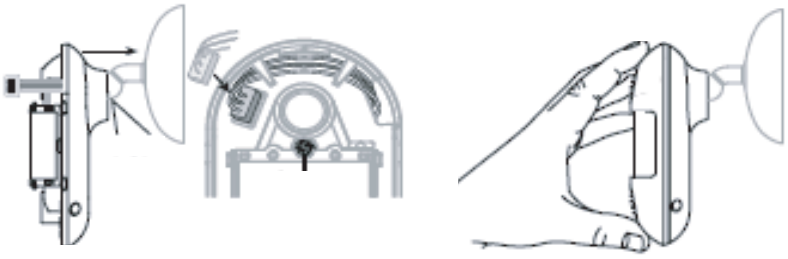
Mounting in Acoustic Ceiling Tile

Twist threaded mounting post onto Mounting Bracket. Drill through ceiling tile with assembly. Secure with washer and nut. Route wiring through Mounting Bracket and connect to wire harness. Snap bracket cover in place to conceal wiring and bracket.



Either Method

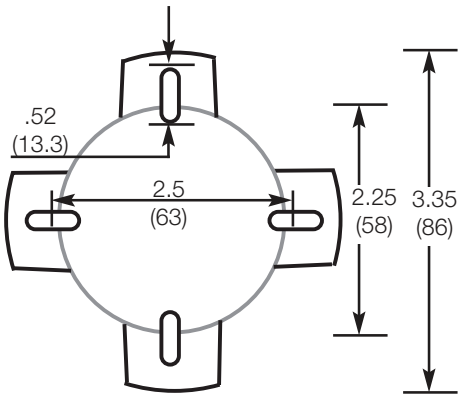
Feed wiring harness through the back of the sensor body and out the exit slot. Snap sensor onto mounting post. Plug wiring harness into connector on the left side (opposite exit slot) and place wiring under wire tabs. Align sensor and tighten position locking screw.



Wire Lengths

# Sensors	1	2	3	1	2	1
# Aux. PP	0	0	0	1	1	2
22 AWG	750 ft.	375 ft.	250 ft.	375 ft.	250 ft.	250 ft.
0.5 mm^2	365 m	180 m	120 m	90 m	120 m	120 m
20 AWG	1200 ft.	600 ft.	400 ft.	600 ft.	400 ft.	400 ft.
0.75 mm^2	730 m	365 m	240 m	365 m	240 m	365 m
18 AWG	2400 ft.	1200 ft.	800 ft.	1200 ft.	800 ft.	800 ft.

Mounting Plate Dimensions



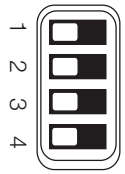
Measurements are in inches (mm)

Job Name:	Model Numbers:	
Job Number:		

Sensor Adjustments

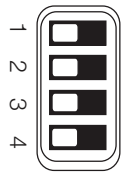
Override Settings

A



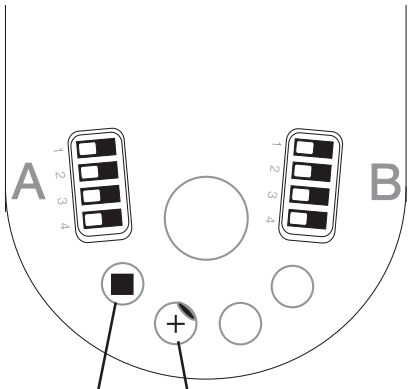
	Off (Default)	On
1	Automatic (Normal)	Manual lights on (Override)
2	Not used	Not used
3	LED on (Normal)	LED off
4	Retain Settings (Normal)	Any change resets learned settings

B



	Off				On			
1	OFF	8	OFF	4	ON	15	ON	30
2	OFF	min.	ON	min.	OFF	min.	ON	min.
3	Auto Timer Adjust On				Auto Timer Adjust Off			
4	Auto Sensitivity Adjust On				Auto Sensitivity Adjust Off			

Factory Settings



Timer Test Mode
Push and Release:
8 sec. test timer
(resets to Normal
after 1 hour)
Push and Hold (flash):
Normal timer

Red: Infrared
sensitivity
75% default

Job Name:	Model Numbers:	
Job Number:		

Back Room Equipment

Processor and Repeater

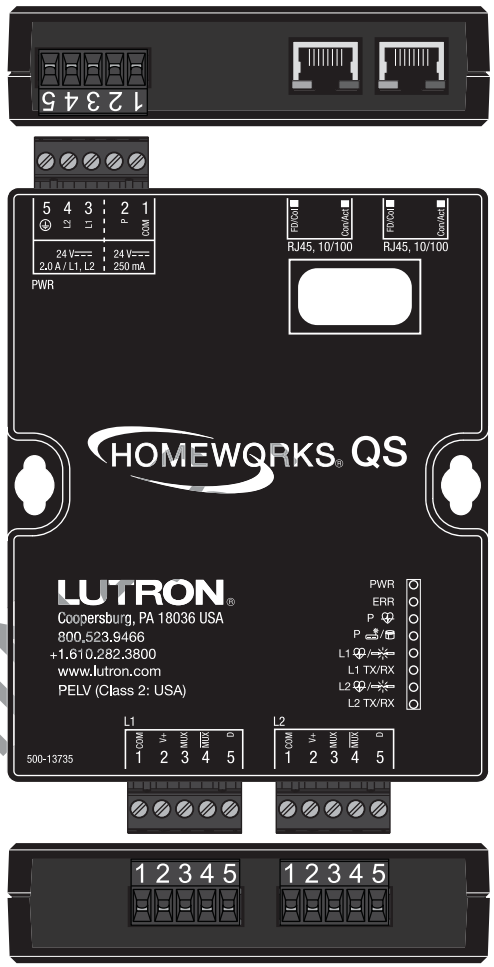
HomeWorks® QS Processor

The HomeWorks® QS processor provides control and communication to HomeWorks® QS system components.

The Ethernet links allow communication to the HomeWorks® QS software, integration with third party systems and communication between multiple processors. HomeWorks® QS processors may be connected using either standard networking or using ad-hoc networking. All processors on a project must be connected to a single network. The HomeWorks® QS software and all integration equipment must be connected to the same network as the processors.

The processor is powered from the QSPS-DH-1-60 power supply. Refer to the HomeWorks® QS software to determine link power requirements.

The HomeWorks® QS processor can be installed in a L-LV21, L-LV14, PNL-8 panel or enclosure.



Processor Capabilities

Each HomeWorks® QS processor has 2 links that can be individually configured as one of three types:

- HomeWorks® / HomeWorks® QS Power Panels
  16 addresses / 256 zones
- HomeWorks® QS Wired Device Link
  99 devices / 512 zones
- HomeWorks® QS RF Link
  99 devices / 100 zones

PRELIMINARY

Model Number

HQP6-2 HomeWorks® QS Processor

HomeWorks® QS Processor

Specifications

Model Numbers	HQP6-2
Power	Processor (P): 24 V⎓ 250 mA Links (L1 / L2): 24 V⎓ 2 A per link
Typical Power Consumption	5 W; 8 Power Draw Units (PDUs) Test conditions: Two Ethernet links connected, both device links in use
Regulatory Approvals	UL, cUL, CE, CTICK
Environment	Indoor use only. 32 °F to 104 °F (0 °C to 40 °C), 0% to 90% humidity, non-condensing
Heat Generated	17 BTU/hr — typical (24 BTU/hr with 2 links at 2 A each output)
Cooling Method	Passive Cooling
Power Failure Memory	System data stored in non-volatile memory. Timeclock retention for 10 years
Internal Timeclock	±1 minute per year
Miswire Protection	All terminal block inputs are over-voltage and miswire protected against wire reversals and shorts.
Low-Voltage Link Wire Type	Two pair — one pair 18 AWG (0.75 mm^2), one pair 18 to 22 AWG (0.34 to 0.75 mm^2) twisted shielded — IEC PELV / NEC® Class 2 cable
Low-Voltage Power Wire Type	18 AWG (0.75 mm^2)
Communications	Ethernet, RS485 (QS, RF, Power Panel)
Link Capacities	HomeWorks® / HomeWorks® QS Power Panels 16 addresses / 256 zones HomeWorks® QS Wired Device Link 100 devices / 500 zones HomeWorks® QS RF Link 100 devices / 100 zones
ESD Protection	Meets or exceeds the IEC 61000-4-2 standard
Surge Protection	Meets or exceeds ANSI/IEEE C62.41 standard
Mounting	Mounts in HQ-LV21, L-LV14, L-LV21, PNL-8 panel or enclosure
Dimensions	With terminal blocks (as shown): 4.27 in (108 mm) x 6.0 in (152 mm) Without terminal blocks: 4.27 in (108 mm) x 5.26 in (134 mm)
Connections	Two 5-pin removable terminal blocks* for Links 1 and 2. One 5-pin removable terminal block* for Power Input. Two RJ-45 standard Ethernet connections. *Each terminal will accept up to two 18 AWG (0.75 mm^2) wires.
Warranty	http://www.lutron.com/resiinfo

PRELIMINARY

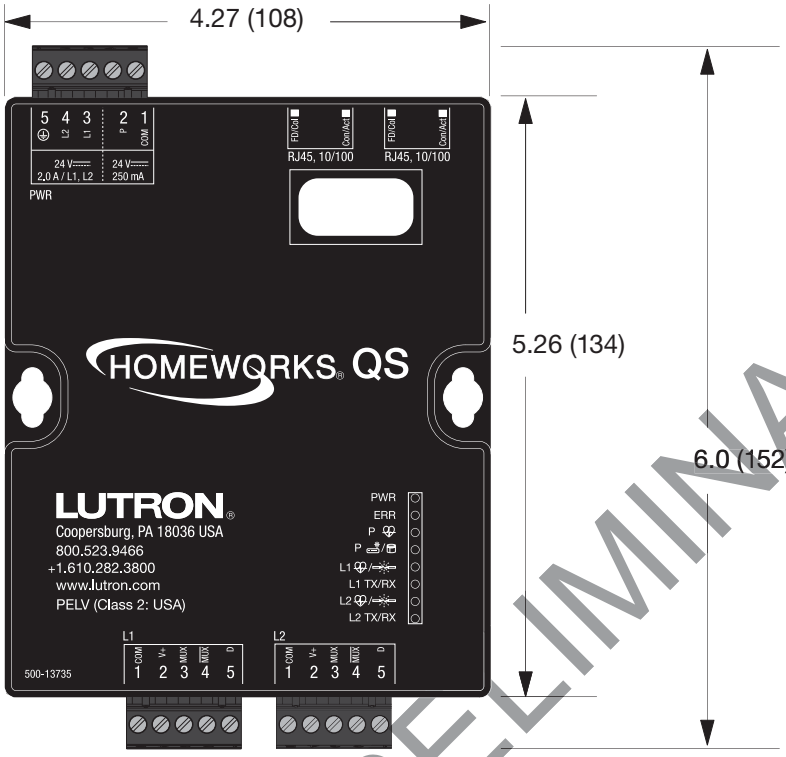
NEC is a registered trademark of the National Fire Protection Association, Quincy, Massachusetts.

HomeWorks® QS Processor

Dimensions

Dimensions shown as: in (mm)

Front View



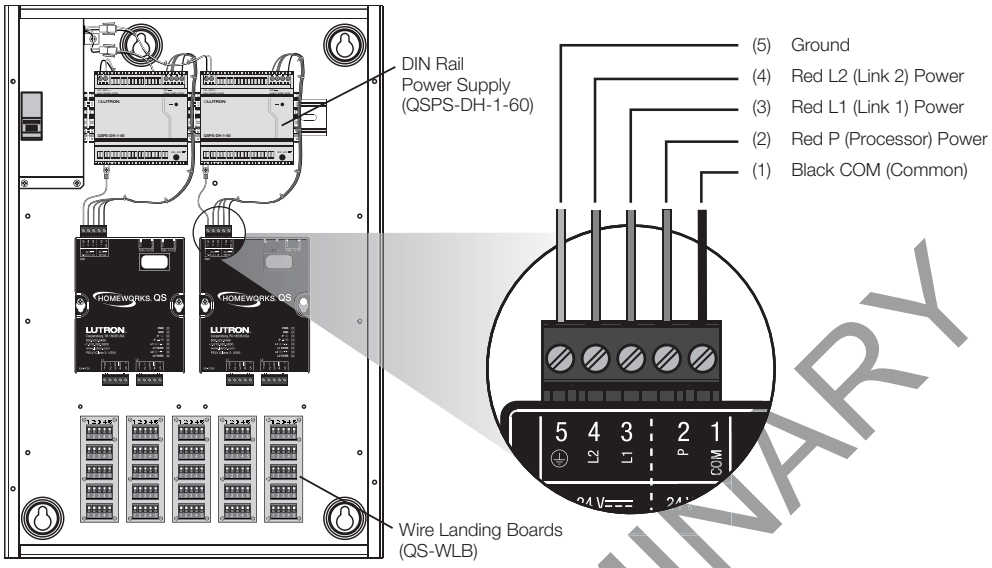
Side View



PRELIMINARY

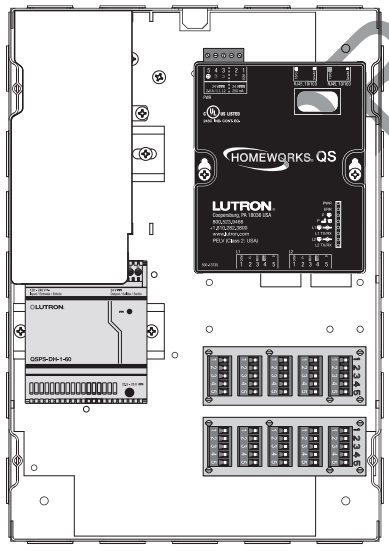
HomeWorks® QS Processor

Mounting

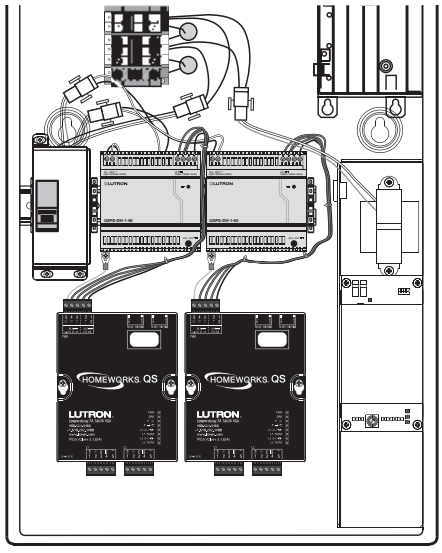


LV21

PRELIMINARY



LV14

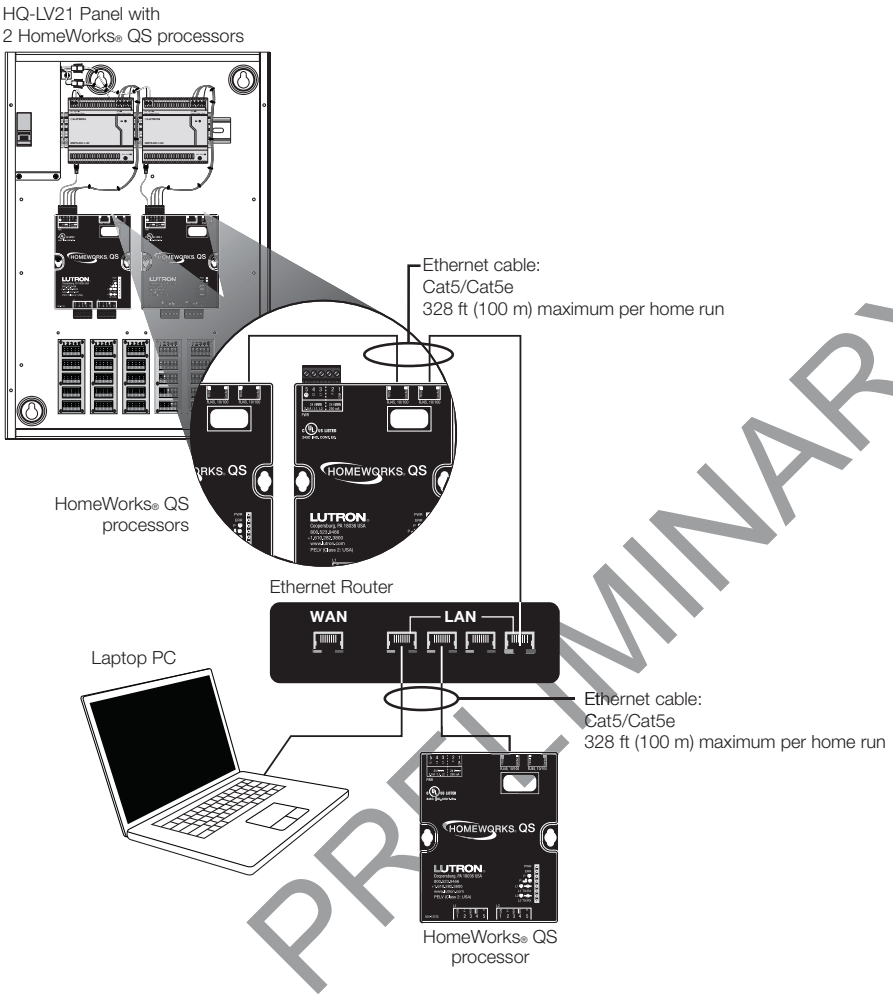


PNL-8

HomeWorks® QS Processor

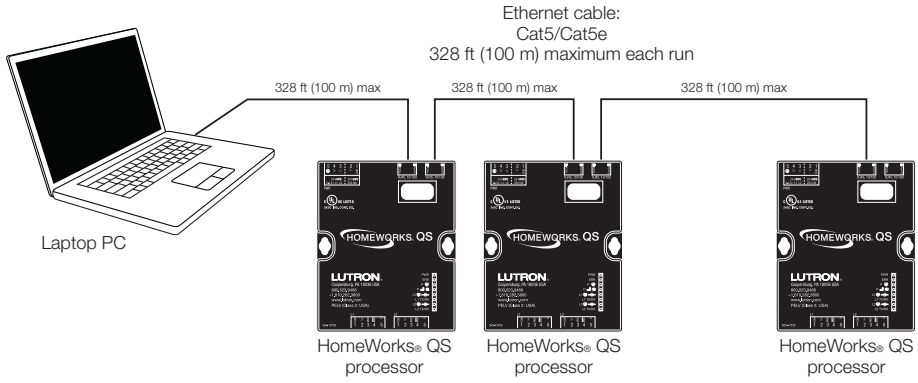
Wiring Diagrams — Networking

Standard Networking: Connection using an Ethernet hub/switch/router



PRELIMINARY

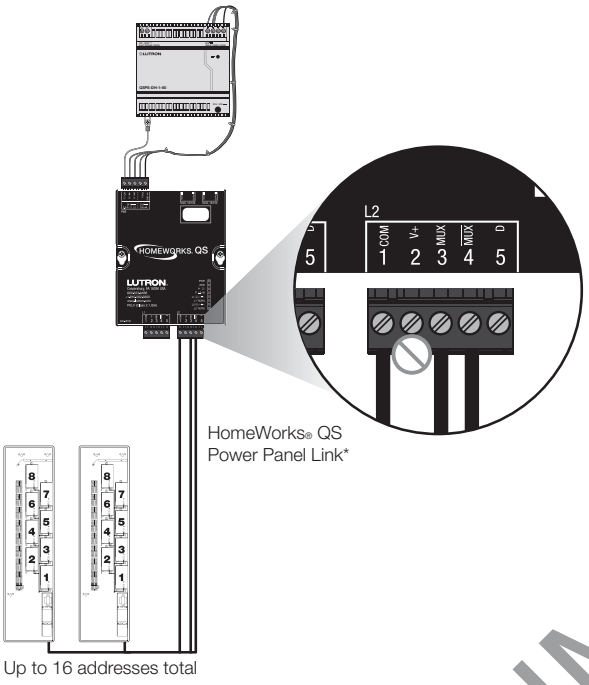
Ad-hoc Networking: Direct Ethernet connection from PC to processors



Up to 5 processors can be daisy-chained

HomeWorks® QS Processor

Wiring Diagrams—Power Panel Link

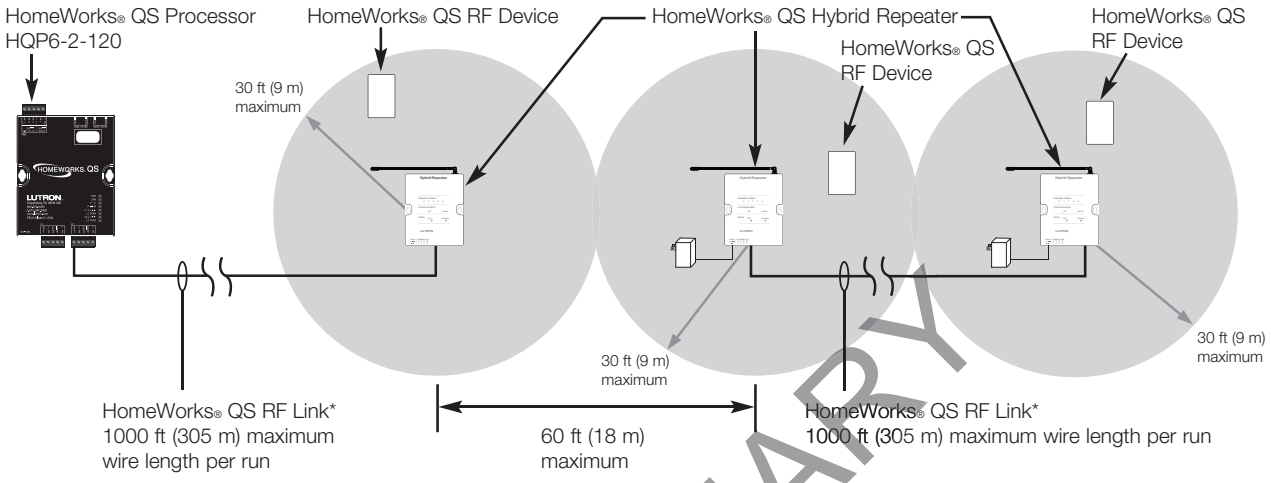


* Pin 2 does not get connected when using a power panel link.

PRELIMINARY

HomeWorks® QS Processor

Wiring Diagrams—HomeWorks® QS RF Link

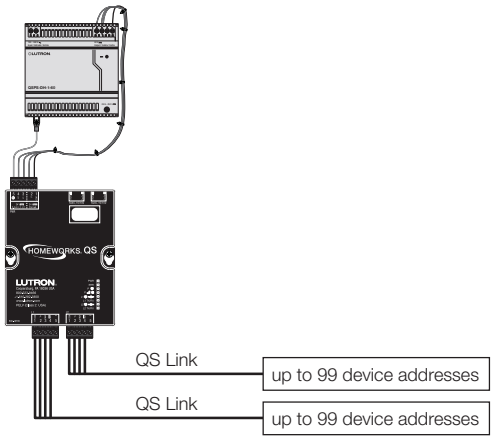


PRELIMINARY

* HomeWorks® QS Hybrid Repeaters can be powered from the Processor link or a wall-mount transformer. If powering from a wall-mount transformer, Pin 2 does not get connected.

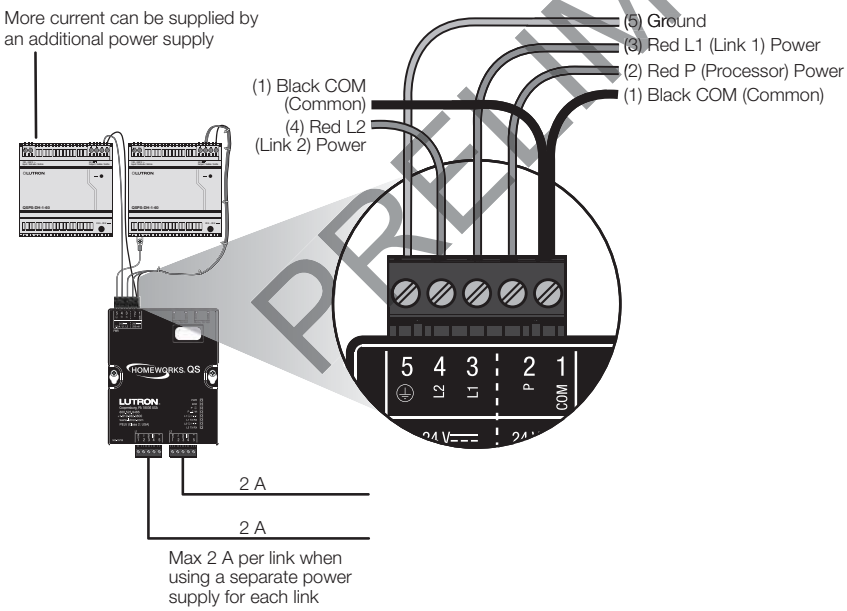
HomeWorks® QS Processor

Wiring Diagrams—QS Link



Max 2A combined Draw from processor when powering both links from the same power supply

Wiring Diagrams—Link Power

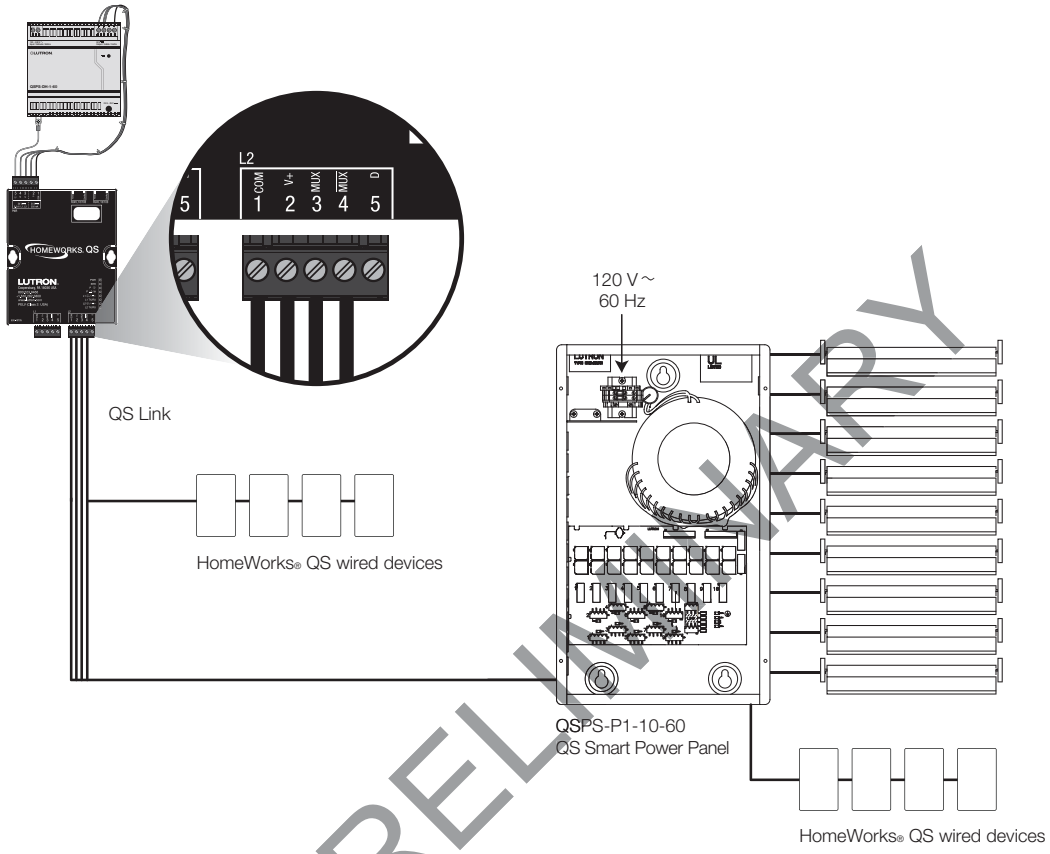


Max 2 A per link when using a separate power supply for each link

PRELIMINARY

HomeWorks® QS Processor

Wiring Diagrams—QS Wired Device Link with Shades (Controllable Window Solutions)



PRELIMINARY

HomeWorks® QS Hybrid Repeaters

HomeWorks® QS Hybrid Repeaters add wireless Radio Frequency (RF) communication and extend the range of RF signals that are sent between dimmers, switches, keypads, visor control receivers, shades/draperies, and other devices. Repeaters ensure error-free communication between system components and prevent interference from neighboring systems.



The first repeater connects to the HomeWorks® QS processor to provide RF communication that extends up to 30 ft (9 m) in every direction. Up to four (4) total Hybrid Repeaters can be used per link to extend the RF range for larger system applications. Each Repeater has an RF range of 30 ft (9 m) between repeater and devices or 60 ft (18 m) between repeaters, covering a total area of approximately 2500 sq ft (232 m^2).

Model Numbers	Frequency
HQR-REP-120	434 MHz
HQK-REP	868 MHz
HQM-REP	868 MHz Limited
HQN-REP	865 MHz
HQR-REP-120-BA	434 MHz (Brazil)
HQQ-REP	434 MHz Limited

Only available in White (WH).

HomeWorks® QS software will select the correct frequency/channel code for compatibility with your particular geographic region.

HomeWorks® QS Hybrid Repeaters

Specifications

Model Number	HQR-REP-120; HQK-REP; HQM-REP; HQN-REP; HQR-REP-120-BA; HQQ-REP
Power	Hybrid Repeater: DC adapter: 9 V⎓ 300 mA Link: 24 V⎓ 50 mA DC adapter: Input: 100-240 V~ 50/60 Hz 6.5 W Output: 9 V⎓ 300 mA
Typical Power Consumption	Hybrid Repeater: 0.6 W Test conditions: one LED on, powered by a 9 V⎓ adapter.
Regulatory Approvals	Hybrid Repeater: FCC, IC, COFETEL, CE, CCC, TRA, CTICK, ANATEL, IDA, SUPERTEL, SUTEL
Environment	Ambient operating temperature: 32 °F to 104 °F (0 °C to 40 °C), 0% to 90% humidity, non-condensing. Indoor use only.
Low-Voltage Wire Type	Two pair – one pair 18 AWG (1.0 mm^2), one pair 22 AWG to 18 AWG (0.5 mm^2 to 1.0 mm^2) twisted shielded – NEC® Class 2/PELV cable. Required for connecting the first repeater to the processor and may be used to connect additional Hybrid Repeaters.
Communications	The first Hybrid Repeater communicates with the HomeWorks® QS processor on the RF wired link. Subsequent Repeaters may be wired on this link or may communicate over Radio Frequency (RF). All RF devices must be located within 30 ft (9 m) of a Repeater. All Repeaters must be within 60 ft (18 m) of another Repeater.
ESD Protection	Tested to withstand electrostatic discharge without damage or memory loss, in accordance with IEC 61000-4-2.
Surge Protection	Tested to withstand surge voltages without damage or loss of operation, in accordance with IEEE C62.41-1991 Recommended Practice on Surge Voltages in Low-Voltage AC Power Circuits.
Power Failure	Power failure memory: should power be interrupted, the Repeater will return to its previous state when power is restored.
Mounting	Mount on a wall, ceiling, or level surface using the two #6 (M3) screws provided.
Connections	Hybrid Repeater: RS485
Warranty	http://www.lutron.com/resiinfo

Design Features

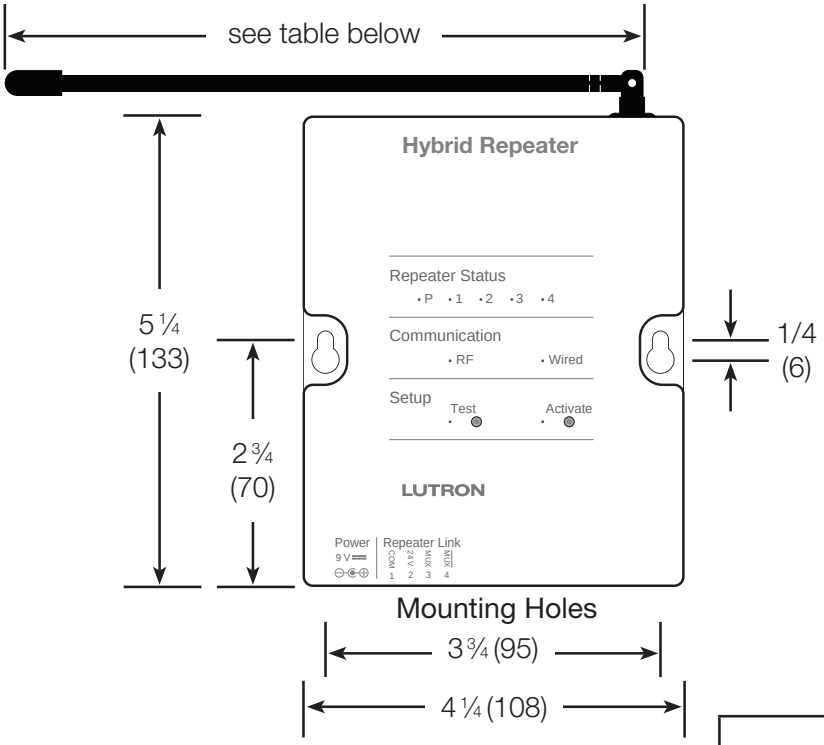
- Test button - enters the RF repeater test mode.
- Activate button - provides repeater activation within system.
- RS485 port to connect to the HomeWorks® QS RF link and to other repeaters through a wired link (daisy-chain).

HomeWorks® QS Hybrid Repeaters

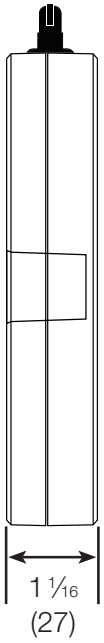
Dimensions

Measurements shown as: in (mm)

Front View



Side View

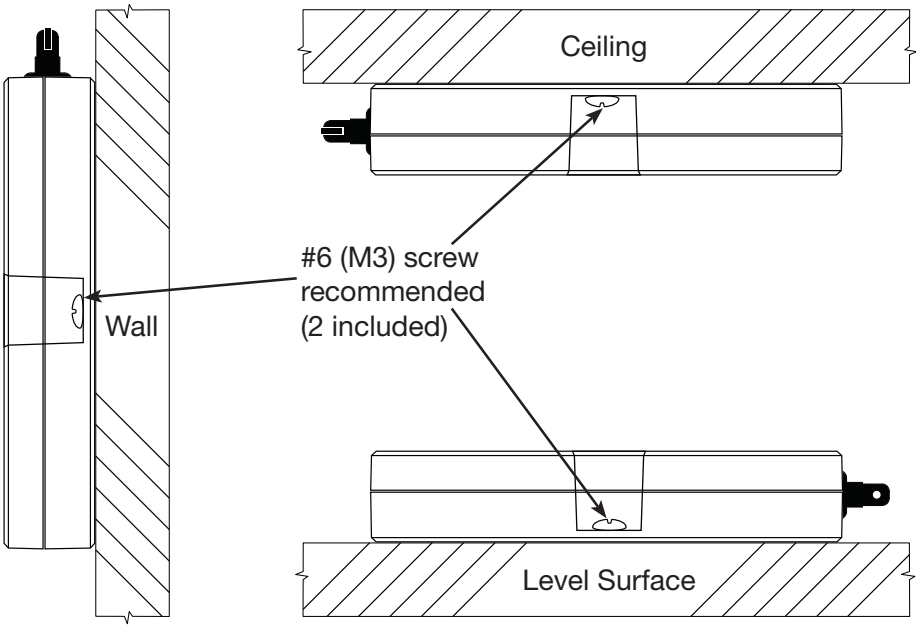


Model	Dimension
HQR-REP-120, HQR-REP-120-BA, HQQ-REP	6.25 (158.8)
HQK-REP, HQM-REP, HQN-REP	3.13 (79.4)

Mounting

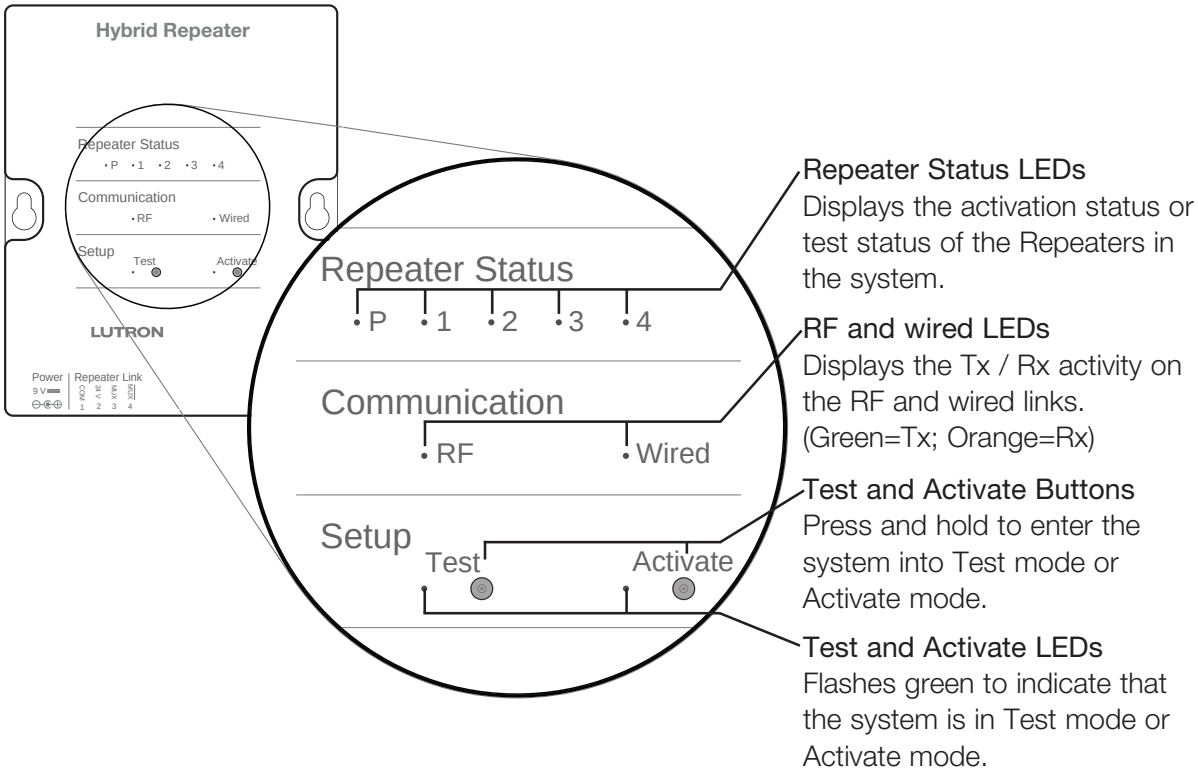
Vertical

Horizontal

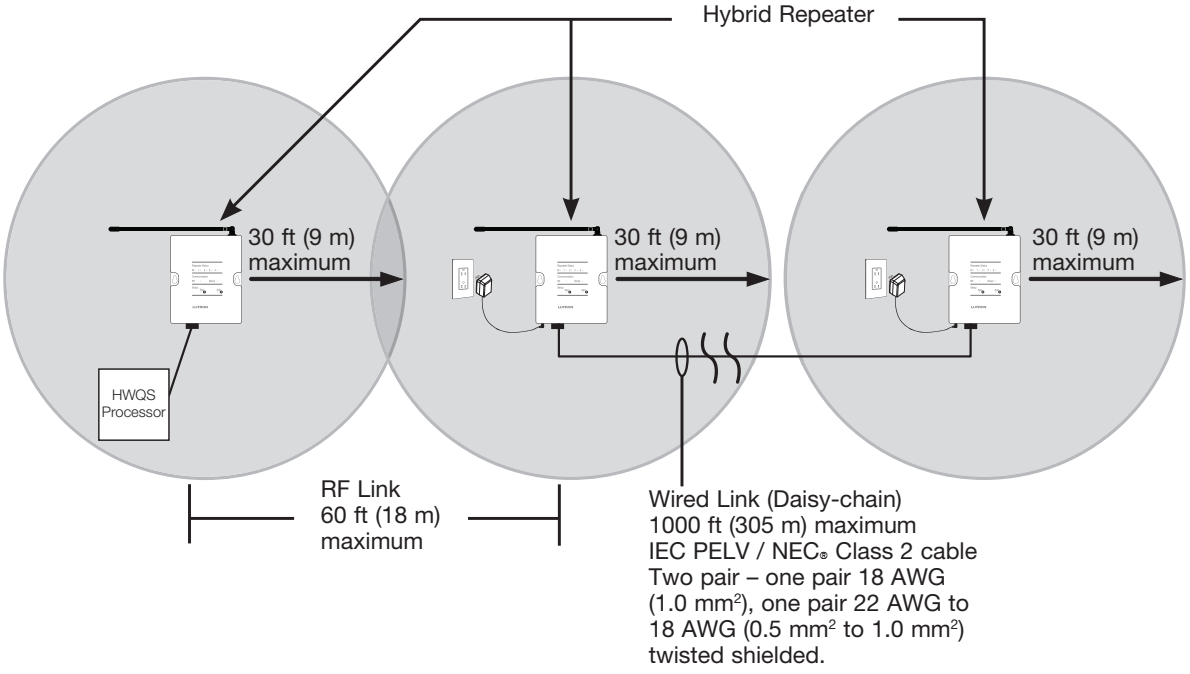


HomeWorks® QS Hybrid Repeaters

Operation



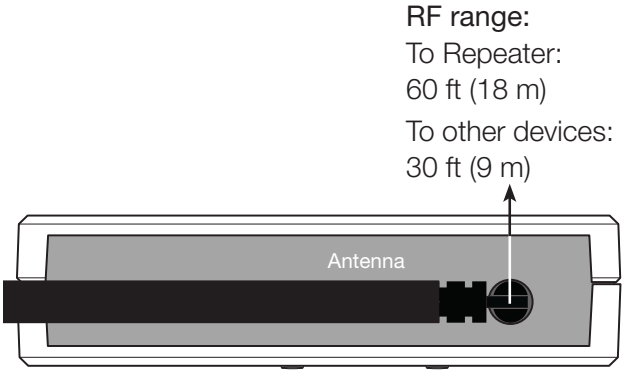
Wired and RF Configuration



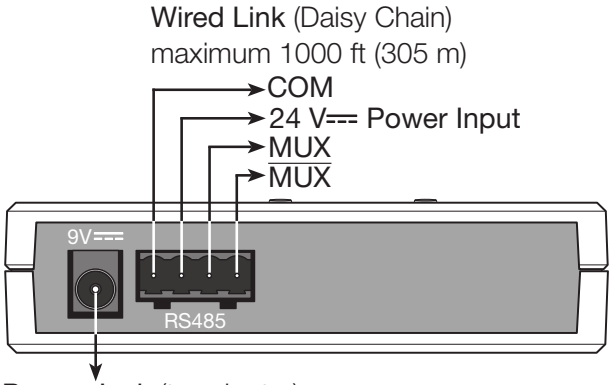
HomeWorks® QS Hybrid Repeaters

Connections

Top View



Bottom View



Power Jack (to adapter)
IEC PELV/NEC® Class 2

NOTE: Power must be provided by a 9 V⎓ adapter or 24 V⎓ power on the HomeWorks® QS processor link.

Interfaces

QSE-IO Control Interface



Description

- Integrates a *GRAFIK Eye* QS control system with equipment that has contact-closure I/O, including:
  – Motion and occupant sensors.
  – Timeclocks and push buttons.
  – Motorized projection screens, skylights, window shades, and movable walls.
  – AV equipment.
  – Security systems.
- May be programmed to control or be controlled by any combination of *GRAFIK Eye* QS control units or control any combination of *Sivoia* QS window treatments on the QS link.

Inputs/Outputs

- Provides five inputs and five dry contact closure outputs.
- Provides both normally open (NO) and normally closed (NC) contacts.
- Using the inputs, contact closures in other equipment can operate control units to:
  – Select scenes.
  – Adjust scenes to reflect status of movable walls.
  – Toggle any combination of zones in the system between Off and a configurable preset value.
  – Turn lights on or off and/or move shades based on room occupancy.
  – Perform special functions such as sequencing, panic, control lockout, or timeclock disable.
- Using the outputs, scene and/or zone changes in control units can:
  – Trigger outputs to control other equipment.
  – Provide status feedback to other equipment.
- Using the inputs, contact closures in other equipment can operate *Sivoia* QS window treatments to:
  – Open or close.
  – Raise, lower, or stop.
  – Select one of three adjustable presets.
- Using the outputs, key presses on QS window treatment keypads or *GRAFIK Eye* QS window treatment buttons can:
  – Trigger outputs to other motorized window treatment equipment.

Job Name:	Model Numbers:	
Job Number:		

Specifications

Power

- Low-voltage PELV (Class 2: USA). Operating voltage: 12 - 24 V⎓, 200 mA.
- Provides 2-way interface between preset lighting controls or window treatments and dry contact closure devices.
- Provides 5 inputs and 5 outputs. Outputs can control other manufacturers' equipment.

Operating Modes

- Scene selection
- Zone toggle
- Special functions
- Partitioning
- Occupant sensor
- Shade input
- Shade output

Five Input Terminals

- Accept maintained inputs and momentary inputs with 40 msec minimum pulse times.
- Off-state leakage current must be less than 100 µA.
- Open circuit voltage: 24 V⎓ maximum.
- Inputs must be dry contact closure, solid state, open collector, or active-low (NPN)/active high (PNP) output.
  - Open collector NPN or active-low on-state voltage must be less than 2 V⎓ and sink 3.0 mA.
  - Open collector PNP or active-high on-state voltage must be greater than 12 V⎓ and source 3.0 mA.

Five Output Terminals

- Provide selectable maintained or momentary (1/4-second) outputs (PELV/Class 2: USA rated only).
- The QSE-IO is not rated to control unclamped, inductive loads. Inductive loads include, but are not limited to, relays, solenoids, and motors. To control these types of equipment, a flyback diode must be used (DC voltages only). See diagram at right.
- Output relays are non-latching (if relays are closed and power is lost, relays will open).

Supply Voltage	Resistive Load
0-24 V⎓	1.0 A
0-24 V~	0.5 A

Status LEDs

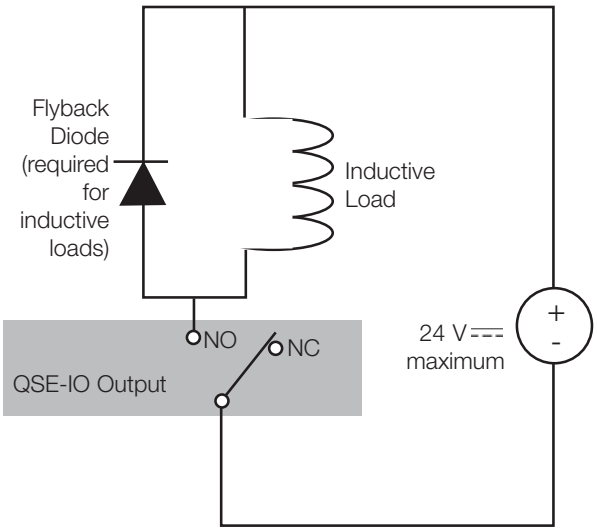
Five Status LEDs light when associated output is active (on).

System Communications and Capacity

- Low-voltage type PELV (Class 2: USA) wiring connects the QSE-IO Interface to control units and other components.
- QSE-IO counts as 1 device toward system maximum of 100 devices
- 3 wallstations maximum can be powered from one *GRAFIK Eye* QS control unit without external 24 V⎓ power supply; or 1 wallstation powered by a QSE-IO (QSE-IO counts as three wallstations, or three power draw units, in this use).

Environment

32-104 °F (0-40 °C). Relative humidity less than 90% non-condensing.



Job Name:	Model Numbers:	
Job Number:		

Operating Modes and DIP Switch Settings

- For scene selection and special function modes, one control unit or a group of control units may be assigned to be operated by the QSE-IO.
- With partitioning, zone toggle, and occupant sensor modes, a different control unit or group of control units may be assigned for each I/O closure.

Mode	Dipswitch 4 5 6 7 8	Contact Closures Invoke: Input 1	Input 2	Input 3	Input 4	Input 5	Inputs	Outputs
Scene selection		Scene 1	Scene 2	Scene 3	Scene 4	Scene off	Maintained or momentary	Maintained
		Scene 5	Scene 6	Scene 7	Scene 8	Scene off		
		Scene 9	Scene 10	Scene 11	Scene 12	Scene off		
		Scene 13	Scene 14	Scene 15	Scene 16	Scene off		
		Scene 1	Scene 2	Scene 3	Scene 4	Scene off	Maintained or Momentary	Momentary
		Scene 5	Scene 6	Scene 7	Scene 8	Scene off		
		Scene 9	Scene 10	Scene 11	Scene 12	Scene off		
		Scene 13	Scene 14	Scene 15	Scene 16	Scene off		
Special (maintained)		Sequence 5-16	Zone lockout	Scene lockout	Panic mode	Timeclock disable	Maintained only	Maintained
Special (momentary)		Sequence 5-16	Zone lockout	Scene lockout	Panic mode	Timeclock disable	Momentary only	
Shade input preset (“stop if moving”)		Shade Open	Shade Preset 1	Shade Preset 2	Shade Preset 3	Shade Close	Maintained or momentary	Maintained
Shade input preset (no “stop if moving”)								
Shade input raise, lower, stop		Shade Open	Shade Raise	Shade Lower	Shade Stop	Shade Close	Maintained	Maintained
Shade output		Open 1	Stop 1	Close 1	Open 2	Close 2	Maintained or momentary	Maintained (grouped 1-3; 4-5)
Partitioning (momentary)		Wall 1	Wall 2	Wall 3	Wall 4	Wall 5	Momentary only	Maintained
Partitioning (maintained)		Wall 1	Wall 2	Wall 3	Wall 4	Wall 5	Maintained only	Maintained
Occupant sensor (automatic on / off)		Closure causes scene 1 Open causes scene off					Maintained only	Maintained
Occupant sensor (manual on, automatic off)		Closure causes nothing Open causes scene off					Maintained only	Maintained

Note: “Stop if moving” means that if the shades are moving and the input closes, the shades will stop moving.

(chart continued next page)

Job Name: Model Numbers:

Job Number:

Operating Modes and DIP Switch Settings (continued)

Mode	Dipswitch 4	5	6	7	8	Contact Closures Invoke: Input 1	Input 2	Input 3	Input 4	Input 5	Inputs	Outputs
Zone Toggle (maintained)	↑	↑	↑	↑	↑	Toggle 1[1]	Toggle 2[1]	Toggle 3[1]	Toggle 4[1]	Toggle 5[1]	Maintained	Maintained
Zone Toggle (momentary)	↑	↑	↑	↑	↓	Toggle 1[1]	Toggle 2[1]	Toggle 3[1]	Toggle 4[1]	Toggle 5[1]	Momentary	
Zone Toggle with Raise/Lower (maintained)	↑	↑	↑	↓	↑	Toggle 1[1]	Toggle 2[1]	Toggle 3[1]	Raise[2]	Lower[2]	Maintained	
Zone Toggle with Raise/Lower (momentary)	↑	↑	↑	↓	↓	Toggle 1[1]	Toggle 2[1]	Toggle 3[1]	Raise[2]	Lower[2]	Momentary	

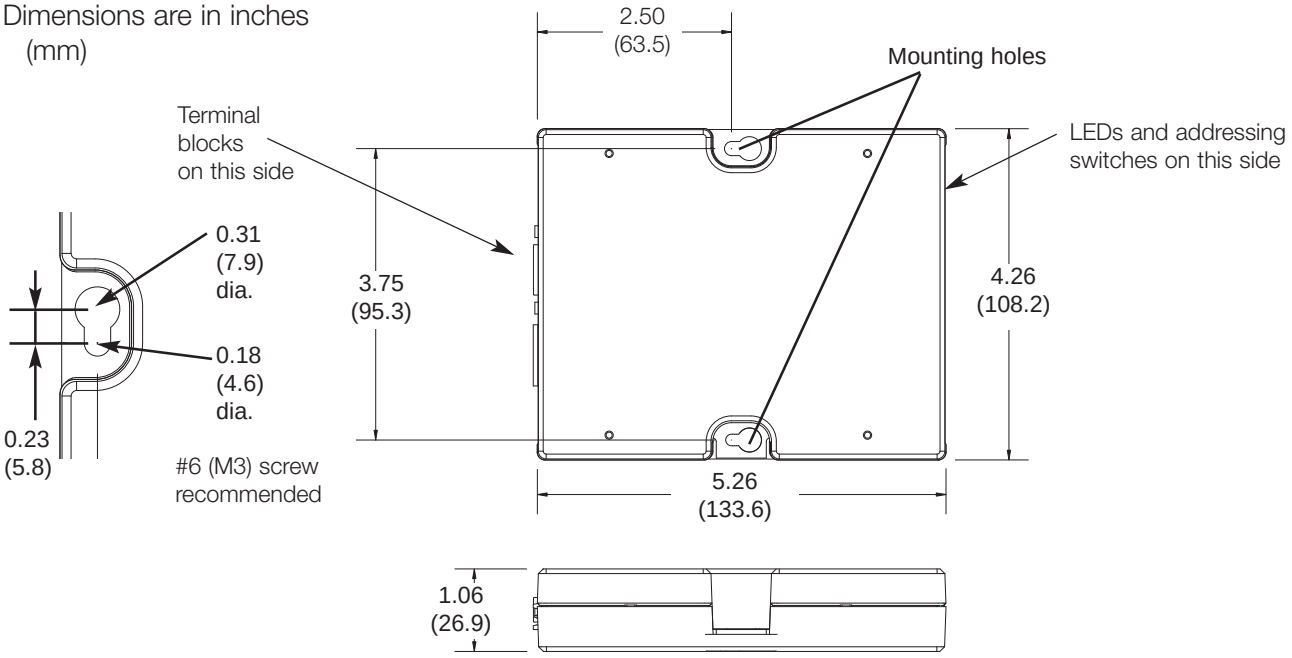
[1] Toggles user-assigned *GRAFIK Eye* QS zone(s) between Off and a preset value programmed by the user.

[2] Raise and Lower commands affect the last *GRAFIK Eye* zone(s) that were toggled by the QSE-IO.

Job Name:	Model Numbers:	
Job Number:		

Dimensions

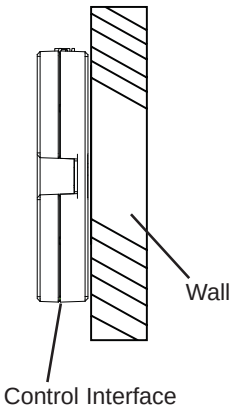
Dimensions are in inches
(mm)



Mounting

1. Mount the control interface directly on a wall, as shown in the Mounting Diagram, using screws (not included). When mounting, provide sufficient space for connecting cables.
   The unit can also be placed in the LUT-19AV-1U AV rack using the screws provided with the unit. The LUT-19AV-1U will hold up to four units.
   If conduit is desired for wiring, the LUT-5x10-ENC can be used to mount one unit.
   Mount where terminal blocks, switches, and LEDs are accessible.
2. Strip 3/8 in. (10 mm) of insulation from wires. Each data link terminal will accept up to two #18 AWG (1.0 mm^2) wires.
3. Connect wiring as shown in the Wiring Diagram (next page).

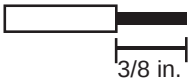
Mounting Diagram




LUT-19AV-1U


LUT-5x10-ENC

Wire Strip Length

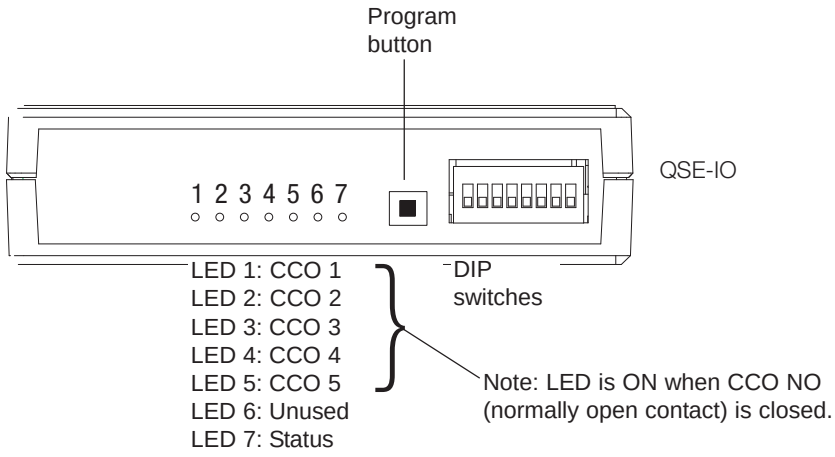


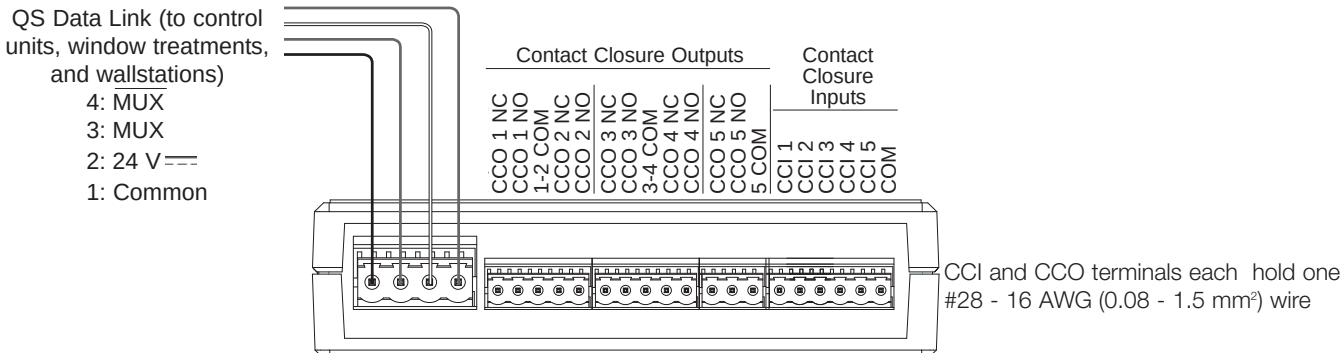
Note: Contact closure output relays click audibly when switching. Mount where this will not cause inconvenience.

Job Name:	Model Numbers:	
Job Number:		

Low-Voltage PELV (Class 2: USA) Wiring

- Wire the QSE-IO Interface to the PELV (Class 2: USA) QS link using the MUX terminal (3) on the front of the unit.
- Each terminal accepts up to two #18 AWG (1.0 mm²) wires.
- Consult *GRAFIK Eye* QS control unit specification submittal for more details.



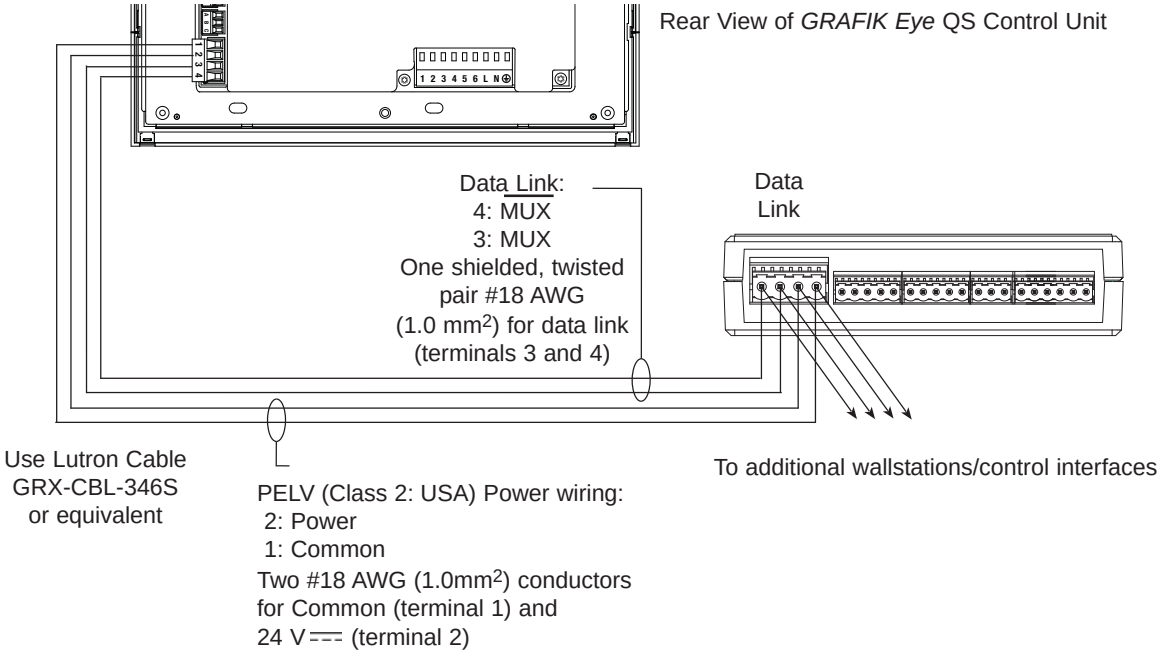


Job Name:	Model Numbers:	
Job Number:		

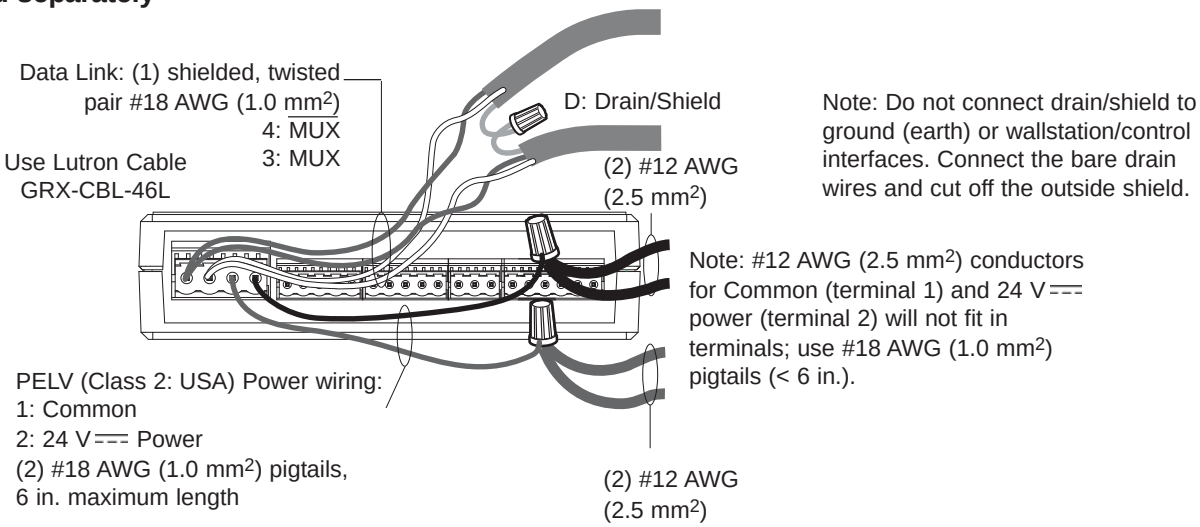
PELV (Class 2: USA) Terminal Connections

- Install in accordance with all applicable regulations.
- **CAUTION:** Do **not** connect line voltage/mains power to device. Improper wiring can result in personal injury or damage to the device or to other equipment.
- This control can use PELV (Class 2: USA) wiring methods. Check with your local electrical inspector for compliance with national and local codes and wiring practices.
- Each terminal accepts up to two #18 AWG (1.0 mm^2) wires.

Control Interface Wiring: Powered by *GRAFIK Eye* QS Control Unit



Control Interface Wiring: Powered separately



Job Name:	Model Numbers:	
Job Number:		

369372 Rev. B 1 08.12.11

QSE-CI-DMX Control Interface



Description

The QSE-CI-DMX operates either in a standalone QS system or a Quantum® system. It performs different functions depending on the system in which it is operating.

QS Standalone System

The QSE-CI-DMX control interface allows zones on a GRAFIK Eye® QS to control DMX512-controlled devices. Any zone on the GRAFIK Eye® QS can be mapped to either a single DMX512 channel or to three separate DMX512 channels, for RGB/CMY color-control applications.

Quantum® System

The DMX channels (maximum of 32) are mapped to Quantum® zones, and can be programmed as 1-channel lighting, 1-channel integration, or 3-channel RGB/CMY. If the QSE-CI-DMX is part of a Quantum® system, GRAFIK Eye® QS zones cannot be programmed to control DMX channels.

Key Features

- Map any zone on a GRAFIK Eye® QS control unit or any Quantum® zone to any single DMX512 channel
- Map any zone on a GRAFIK Eye® QS control unit or any Quantum® zone simultaneously to three DMX512 channels for RGB/CMY color-control
- Integral RGB/CMY lookup table that maps GRAFIK Eye® QS zone intensities or Quantum® zone intensities to RGB/CMY values (colors)
- RGB/CMY table can be customized by using the Lutron QS Color Configuration Tool (PC application available on the CD packaged with the QSE-CI-DMX, and on www.lutron.com/qs), or within the Quantum® Q-Design™ software

Limitations

- In a Quantum® system, only 32 DMX channels can be programmed per device. The 32 channels can be any of the 512 available addresses, so DMX combiners can be used if more than 32 DMX channels need to be controlled from a single DMX universe.
- Daylighting is not supported for DMX loads.
- Loadshedding is not supported for DMX loads.
- Nightlighting is not supported for DMX loads.
- 1-channel lighting can be raised/lowered, but 1-channel integration and RGB can not. (Note: In a stand-alone system, raise/lower cycles through the RGB color table.)

Requirements

The QSE-CI-DMX requires the following:

- At least one GRAFIK Eye® QS control unit connected to the QSE-CI-DMX through the QS communication link,
  or
  A Quantum® system
- QS Link power supply; either:
  - GRAFIK Eye® QS control unit, as long as the GRAFIK Eye® QS control unit is NOT powering any other QS link devices drawing a total of two (2) or more power draw units
  - QS Link power supply, such as the QSPS-P1-1-50
    or
    a Quantum® Light Management Hub
  - Note that the QSE-CI-DMX consumes 2 power draw units on the QS link; see the QS Link Requirements and Wiring section for more information
- DMX512 link terminators at both ends of the DMX512 link (available from Lutron, part number LT-1)
- QS Communication Link Wire (IEC PELV/NEC® Class 2)
  See the Wire Sizes table.

Job Name:	Model Numbers:	
Job Number:		

Example Application

The QSE-CI-DMX can be programmed so that any or all zones on a GRAFIK Eye® QS control unit can control either 3 channels (e.g., RGB) or 1 channel (i.e., intensity of a single light). Raising or lowering a zone will change the color (for a 3-channel zone) or the intensity (for a 1-channel zone).

If, for example, you have an RGB LED fixture and a single stage light, you can configure your settings so that:

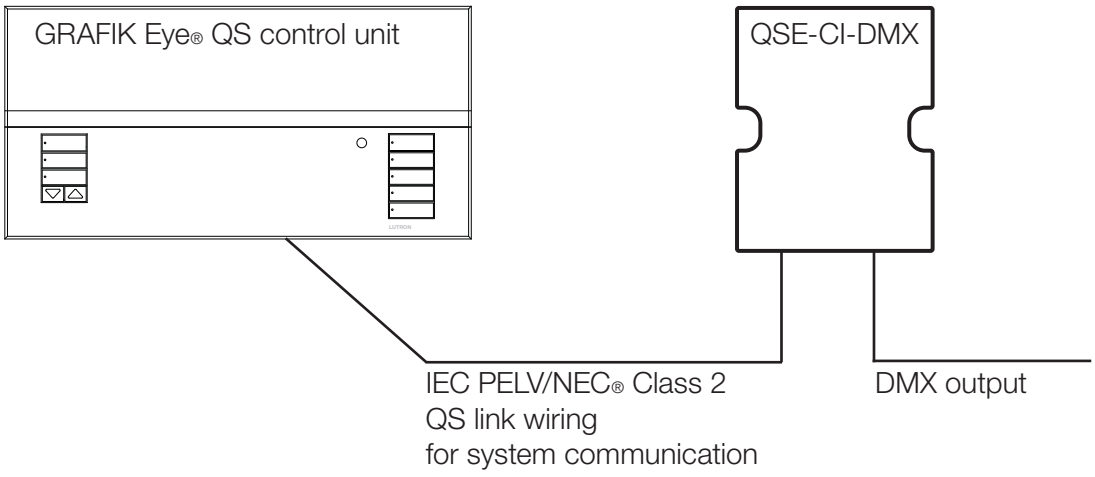
- Channels 3, 4, and 5 correspond to the red, green, and blue channels on the RGB LED fixture
- Channel 7 corresponds to the stage light

You can then set up the GRAFIK Eye® QS control unit so that:

- Zone 3's intensity = desired RGB fixture color
- Zone 6's intensity = desired stage light intensity

When you select a preprogrammed scene on the GRAFIK Eye® QS control unit:

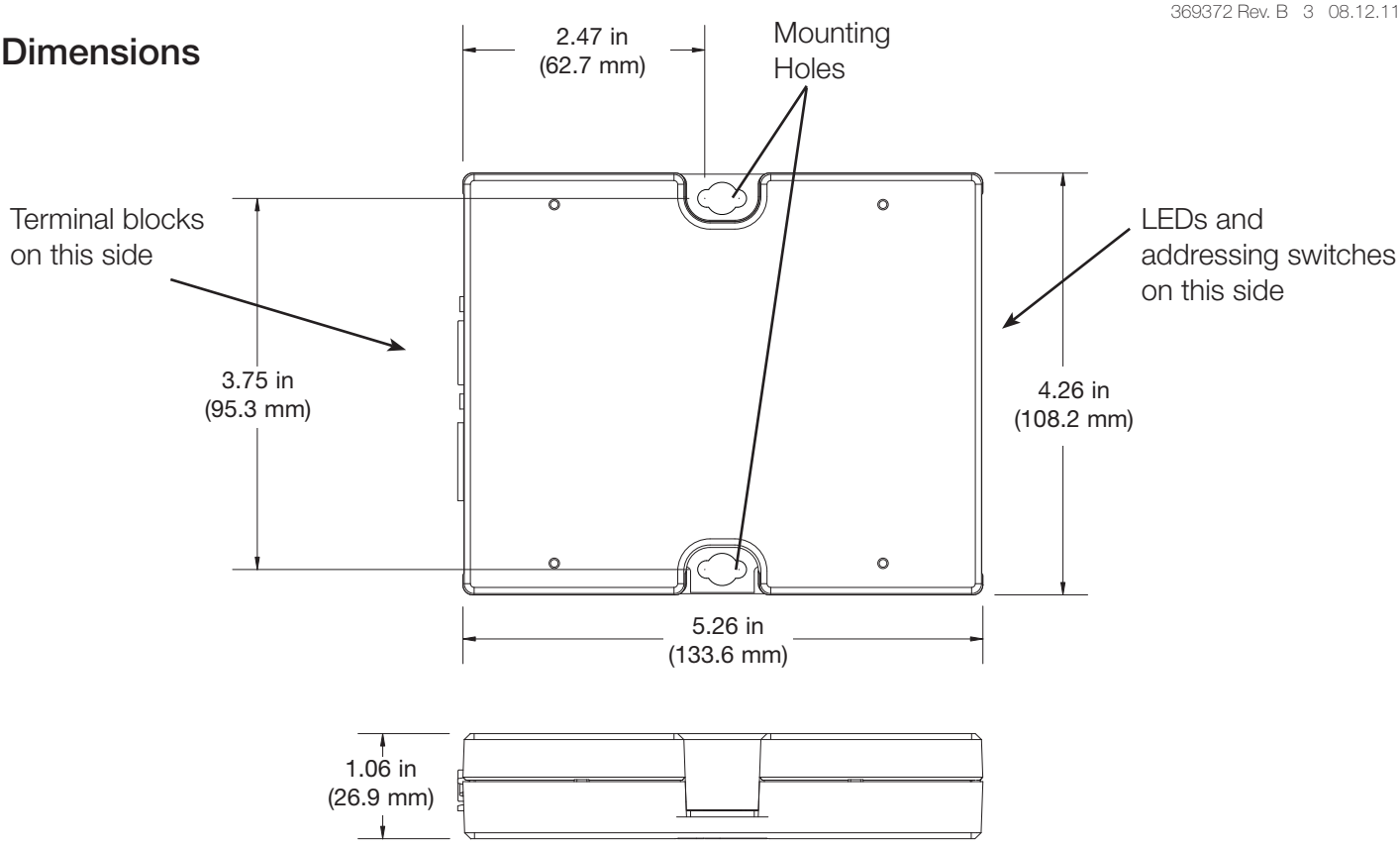
- The QSE-CI-DMX converts the scene's zone intensities into DMX512 channel settings.
- The RGB LED fixture will go to the color programmed for that scene, and the stage light will go to the desired intensity.



Job Name:	Model Numbers:	
Job Number:		

369372 Rev. B 3 08.12.11

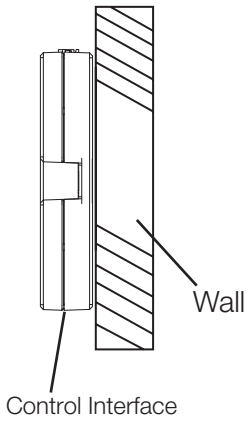
Dimensions



Mounting

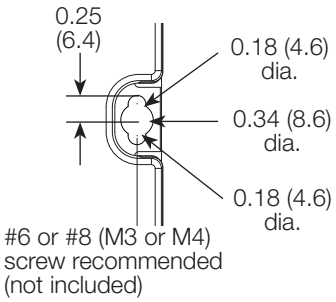
1. Mount the control interface directly on a wall, as shown in the Mounting Diagram, using screws (not included). When mounting, provide sufficient space for connecting cables.
   The unit can also be placed in the LUT-19AV-1U AV rack using the screws provided with the unit. The LUT-19AV-1U will hold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

Mounting Diagram



Mounting Hole Detail

Dimensions shown as in (mm)



Wire Strip Length





LUT-5x10-ENC



LUT-19AV-1U

Job Name:	Model Numbers:	
Job Number:		

Specifications

Power Requirements

- Low-voltage IEC PELV/NEC® Class 2
- Operating Voltage: 24 V⎓ 65 mA

Environment

- 32 - 104 °F (0 - 40 °C).
- Relative humidity less than 90% non-condensing.

System Capabilities/Limits

QS Link System Limits (for units controlled by a GRAFIK Eye® QS control unit)

- 100 QS devices per QS link.
- 100 zones per QS link.

QS Link System Limits (for units controlled by a Quantum® system)

- 99 QS devices per QS link.
- 512 switch legs per link (each DMX channel = 1 switch leg).
- 32 DMX channels per QSE-CI-DMX control interface.

QS Link Wiring Limits

- Total length of link must not exceed 2000 ft (610 m).
- Do not allow IEC PELV/NEC® Class 2 wires to contact line/mains wires.

DMX512 Link System Limits

- Consult your DMX equipment installer.

DMX512 Link Wiring Limits

- Each terminal can accept up to two 18 AWG (1.0 mm^2) wires.
- Link must be 1000 ft (305 m) or less.
- DMX Link must begin and end with link terminators (available from Lutron; part number LT-1).
- Three pins on the DMX connector for connecting the QSE-CI-DMX to DMX512-controlled equipment.

Job Name:	Model Numbers:	
Job Number:		

369372 Rev. B 5 08.12.11

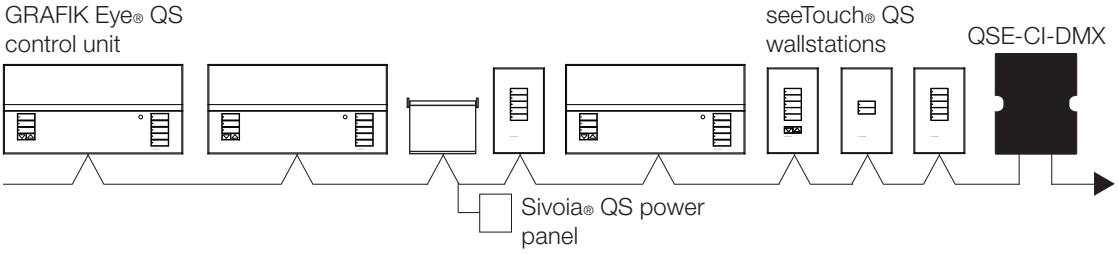
IEC PELV/NEC® Class 2 QS Link Requirements and Wiring

- System communication uses IEC PELV/NEC® Class 2 wiring.
- Wiring can be daisy-chained or T-tapped (see below).
- Wiring must be run separately from line/mains voltage.
- Total length of control link must not exceed 2000 ft (610 m).
- Connect the terminal 1, 3, and 4 connections to all control units, wallstations, and control interfaces. See Powering the QSE-CI-DMX for pin 2 connectivity.
- The QSE-CI-DMX consumes 2 Power Draw Units (PDUs) on the QS link. FOr more information, see “Power Draw Units on the QS Link”, PN 369405 at www.lutron.com/qs.

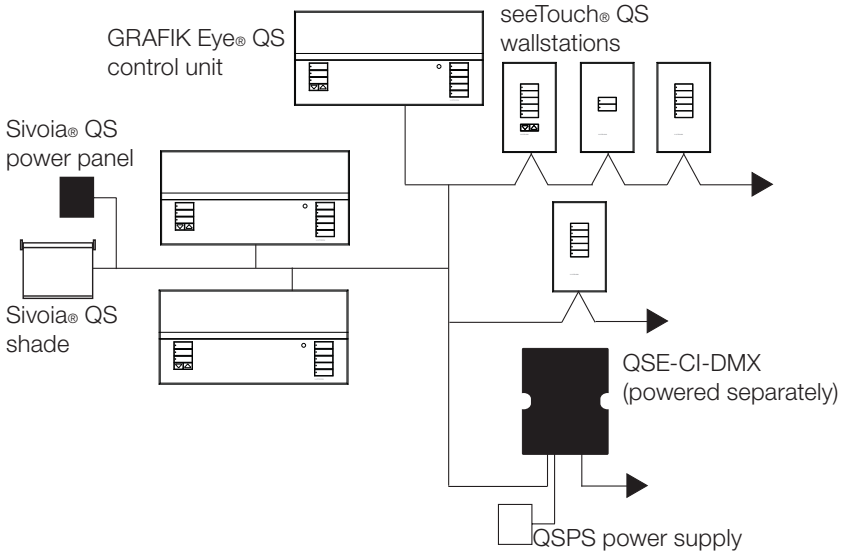
Wire Sizes (check compatibility in your area)

QS Link Wiring Length	Wire Gauge	Lutron Cable Part Number
Less than 500 ft (153 m)	Power (terminals 1 and 2) 1 pair 18 AWG (1.0 mm²)	GRX-CBL-346S (non-plenum) GRX-PCBL-346S (plenum)
	Data (terminals 3 and 4) 1 twisted, shielded pair 22 AWG (0.5 mm²)	
500 to 2000 ft (153 to 610 m)	Power (terminals 1 and 2) 1 pair 12 AWG (4.0 mm²)	GRX-CBL-46L (non-plenum) GRX-PCBL-46L (plenum)
	Data (terminals 3 and 4) 1 twisted, shielded pair 22 AWG (0.5 mm²)	

Daisy-Chain Wiring Example



T-Tap Wiring Example



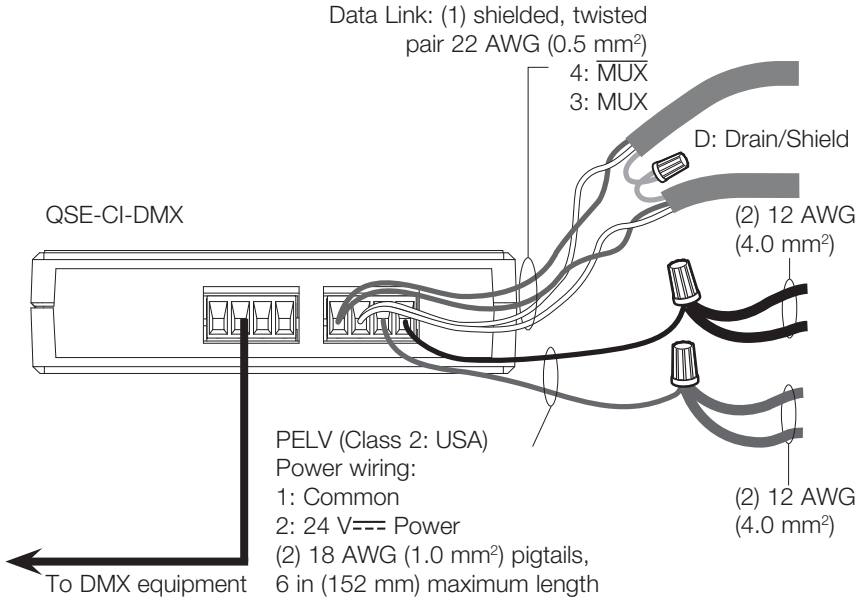
Job Name:	Model Numbers:	
Job Number:		

IEC PELV/NEC® Class 2 Terminal Connections

Wire Sizes (check compatibility in your area)

QS Link Wiring Length	Wire Gauge	Lutron Cable Part Number
Less than 500 ft (153 m)	Power (terminals 1 and 2) 1 pair 18 AWG (1.0 mm²)	GRX-CBL-346S (non-plenum) GRX-PCBL-346S (plenum)
	Data (terminals 3 and 4) 1 twisted, shielded pair 22 AWG (0.5 mm²)	
500 to 2000 ft (153 to 610 m)	Power (terminals 1 and 2) 1 pair 12 AWG (4.0 mm²)	GRX-CBL-46L (non-plenum) GRX-PCBL-46L (plenum)
	Data (terminals 3 and 4) 1 twisted, shielded pair 22 AWG (0.5 mm²)	

Connect Drain/Shield as shown. Do not connect to Ground (Earth) or Wallstation/Control Interfaces. Connect the bare drain wires and cut off the outside shield.



Note: Do not connect Drain/Shield to Ground (Earth) or Wallstation/Control Interfaces. Connect the bare drain wires and cut off the outside shield.

Note: 12 AWG (2.5 mm²) conductors for Common (terminal 1) and 24 V⎓ Power (terminal 2) will not fit in terminals; use 18 AWG (1.0 mm²) pigtails (< 6 in/152 mm).

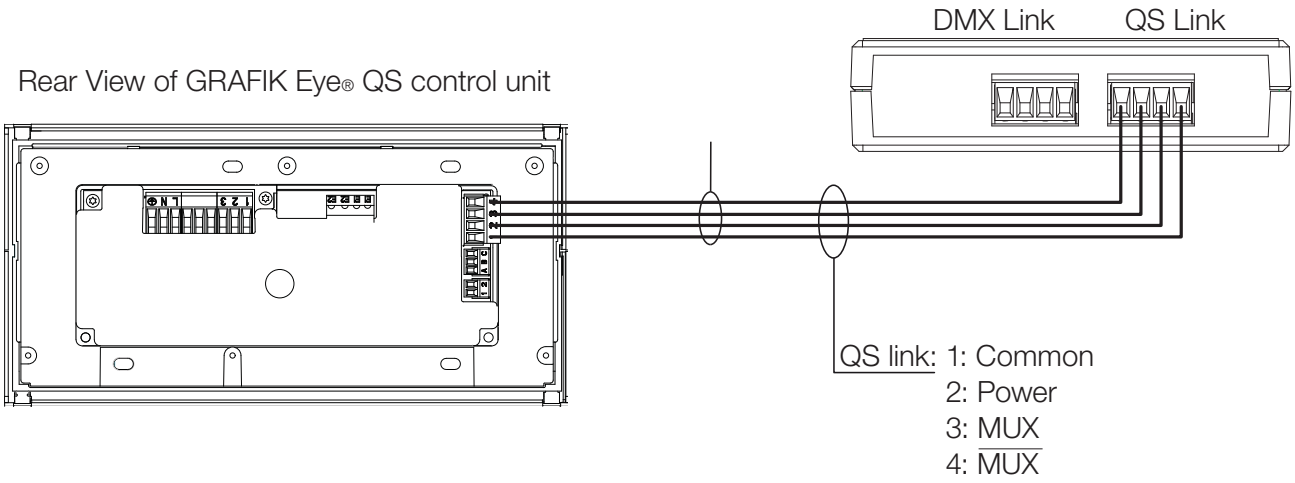
Job Name:	Model Numbers:	
Job Number:		

Powering the QSE-CI-DMX

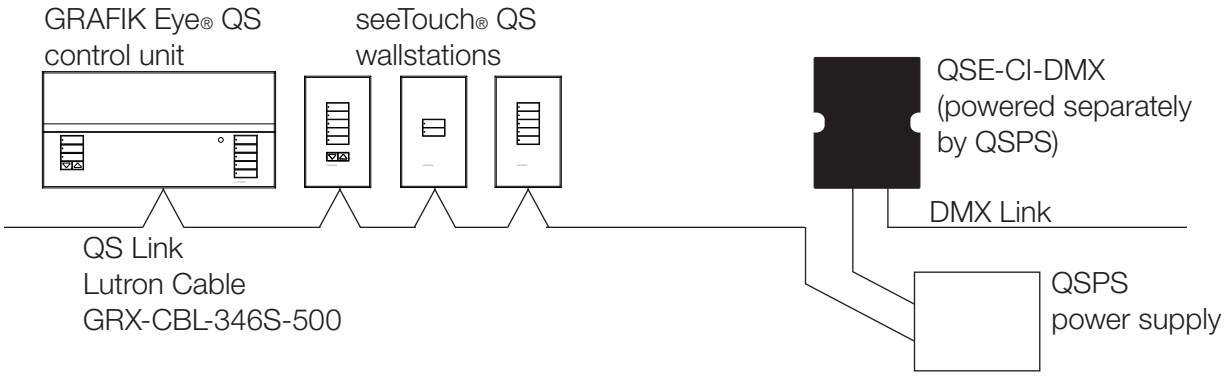
- Power for one QSE-CI-DMX counts as two devices toward the maximum of three devices per GRAFIK Eye® QS control unit when powered off of Pin 2 of the GRAFIK Eye® QS.
- Another option is to power the QSE-CI-DMX from a QS Link power supply (QSPS-P1-1-50, QSPS-P2-1-50, or QSPS-P3-1-50); a QS shade panel power supply (QSPS-P2-10-60 for 230 V~, or QSPS-P1-10-60 for 120 V~); or a Quantum® light management hub.

Wiring Examples

QSE-CI-DMX Powered by a GRAFIK Eye® QS Control Unit



QSE-CI-DMX Powered by a QSPS Power Supply



Job Name:	Model Numbers:	
Job Number:		

DMX512 Link Wiring

Connect the DMX link terminals on the QSE-CI-DMX interface to input terminals on DMX512-controlled equipment.

- Each terminal on the LUT-DMX accepts two 18 AWG (1.0 mm^2) wires.
- Link must be 1000 ft (305 m) or less.
- Link must begin and end with link terminators (available from Lutron; part number LT-1).

Pin on QSE-CI-DMX Terminal	Connection to DMX Equipment
1: DMX512 system COMMON	DMX512 system COMMON Note: Do NOT connect to COMMON on GRAFIK Eye® QS control unit or other Lutron equipment
NC	Not connected
3: DMX512 system DATA +	DMX512 system DATA +
4: DMX512 system DATA -	DMX512 system DATA -

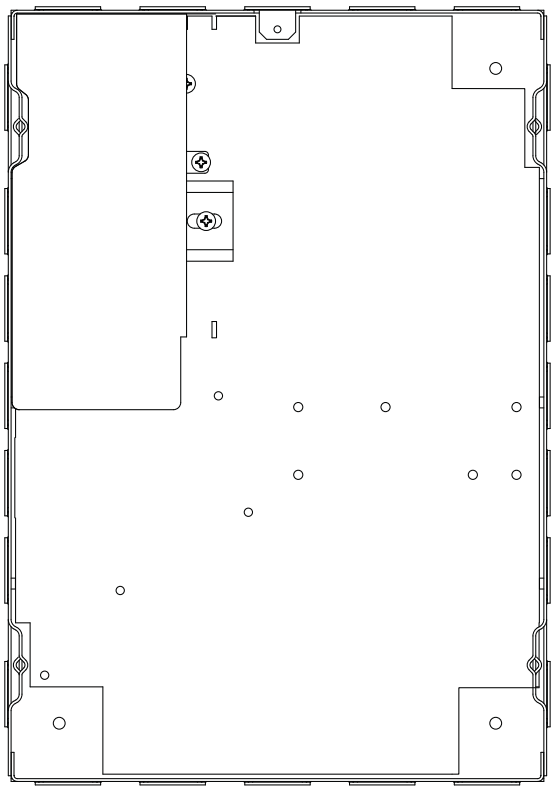
Enclosures, Panels, and Power Modules

Low-Voltage Enclosure

Low-voltage enclosures may be surface-mounted in an electrical closet or equipment room. Both the number of enclosures and the types of components within them are customized to fit the size, lighting plan, and design of a home. Low-voltage enclosures can be distributed throughout the home near the rooms they are controlling, to provide maximum flexibility during installation of the low-voltage wiring. Low-voltage enclosures cannot house remote power modules (RPMs).

14-inch Low-Voltage Enclosure

The 14-inch low-voltage enclosure provides a compact housing for mounting one processor or one system interface and up to two wire landing boards (QS-WLB). The enclosure accepts one 120 V~ (LQ-LV14-120) or 220-240 V~ (L-LV14-230) feed to power the panel, which is self-contained in an enclosed area, thus allowing access to only the low-voltage connections when the enclosure cover is removed.



Low-Voltage Enclosure)

Model Number

LQ-LV14-120	120 V~ Low-Voltage Enclosure
L-LV14-230	220-240 V~ Low-Voltage Enclosure



Low-Voltage Enclosure Cover

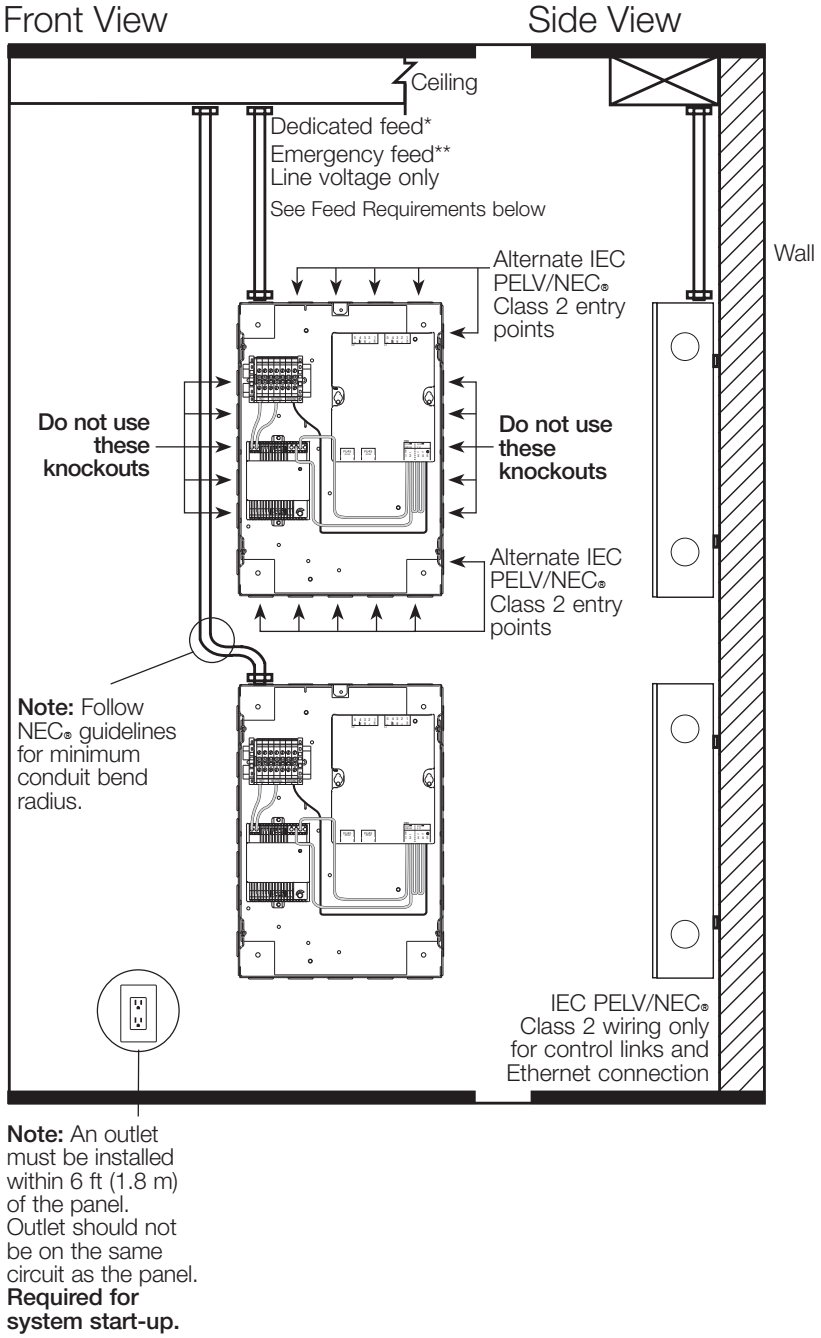
Low-Voltage Enclosure

Specifications

Model Numbers	LQ-LV14-120 L-LV14-230
Power	120 V~ Power Input 50/60 Hz 2 A (LQ-LV14-120) 220-240 V~ Power Input 50/60 Hz 1 A (L-LV14-230)
Regulatory Approvals	UL, CSA CE, ✔ C-tick (L-LV14-230)
Environment	Ambient operating temperature: 32 °F to 104 °F (0 °C to 40 °C) Ambient operating humidity: 0-90% humidity, non-condensing. Indoor use only.
Mounting	Enclosure may be surface-mounted. Mount the enclosure so that line-voltage wiring will be at least 6 ft (1.8 m) from audio or electronic equipment and wiring. **Mount Enclosure** using the following method (mounting hardware is not provided): **Surface Mount –** Use keyholes with bolts sufficient for 100 lb (45 kg) load, 1/4 in (M6) bolts recommended. **NOTICE:** This equipment is air-cooled. Mount in a location where there is at least 12 in (305 mm) of clearance in front of the enclosure. **NOTICE:** Power supply will hum slightly and internal relays will click while in use. Mount in a location where such noise is acceptable.
Dimensions	**Enclosure:** 13.3 in (337 mm) x 9.2 in (235 mm) x 3.16 in (80 mm) **Cover:** 21.5 in (546 mm) x 15.386 in (391 mm)
Construction	**Enclosure:** 16-gauge powder coated sheet metal. **Cover:** 16-gauge powder coated metal cover. Cover is attached using four philips-head screws.
Capacity	Enclosure can accomodate one processor or system interface device and two wire landing boards (QS-WLB).
Line-Voltage Connections	Use copper wire only, supply conductors rated at 167 ºF (75 °C). Use supplied wire connections to connect to corresponding power supply harnesses.
Warranty	8 Year Limited Warranty. http://www.lutron.com/technicaldocumentlibrary/homeworks_warranty.pdf

Low-Voltage Enclosure

Mounting



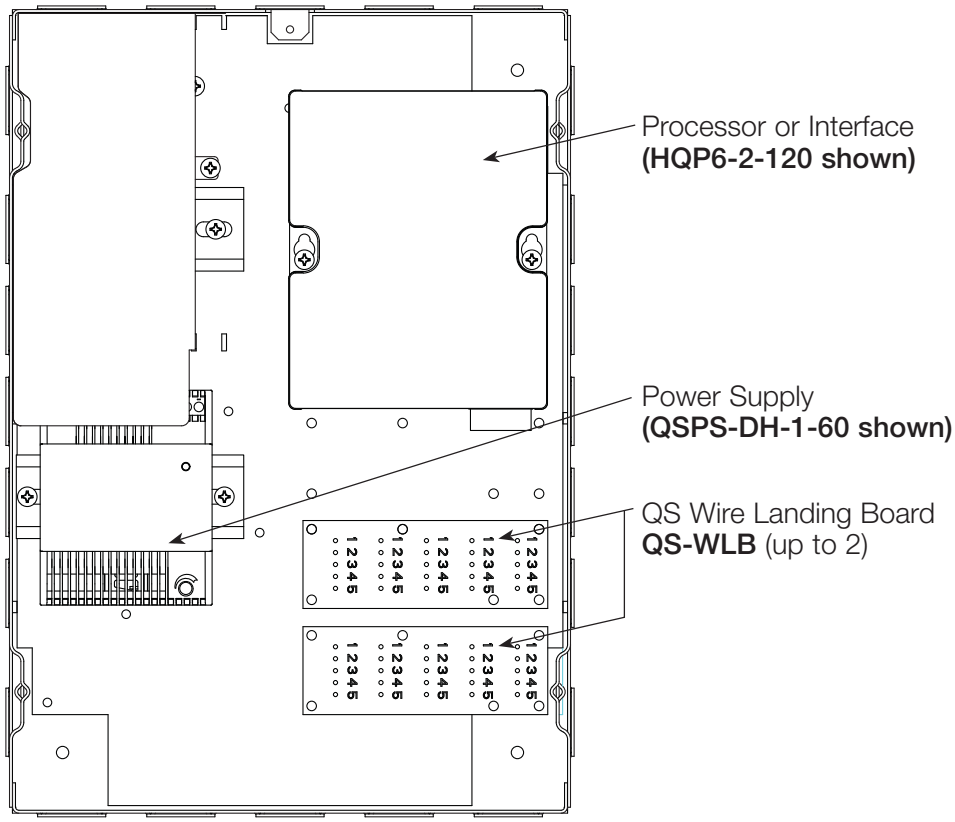
Feed Requirements

*Lutron recommends using a dedicated circuit for lighting control devices.

**Emergency feed is recommended so that the system status can be monitored during an emergency event. If this is not required, normal power can be used.

Low-Voltage Enclosure

Configuration



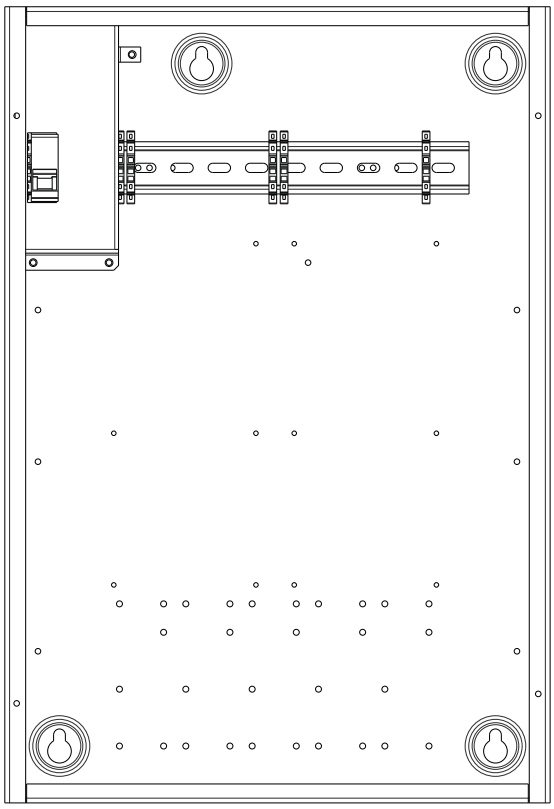
Low-Voltage Enclosure

Low-voltage enclosures may be either surface-mounted or flush-mounted in an electrical closet or equipment room. Both the number of enclosures and the types of components within them are customized to fit the size, lighting plan, and design of a home. Low-voltage enclosures can be distributed throughout the home near the rooms they are controlling, to provide maximum flexibility during installation of the low-voltage wiring.

21-inch Low-Voltage Enclosure

The 21-inch low-voltage enclosure provides a compact housing for mounting up to two HomeWorks® QS processors or up to two system interfaces and up to five wire landing boards (QS-WLB).

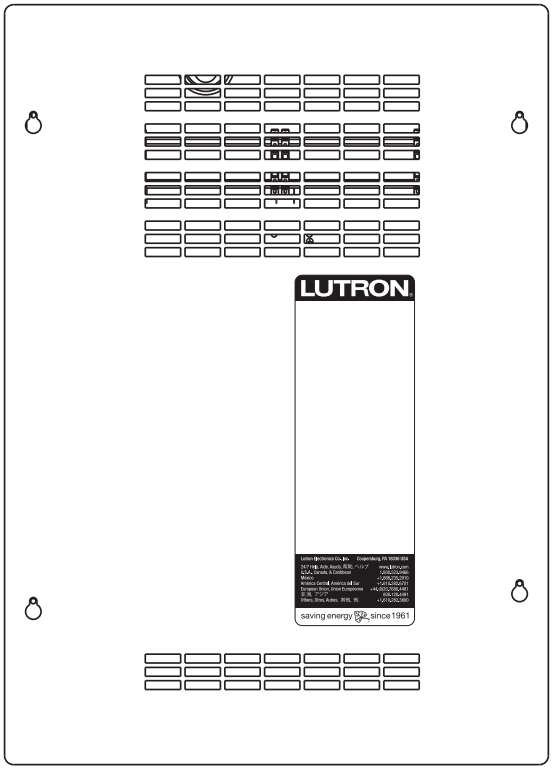
The enclosure accepts one 120 V~ (HQ-LV21-120) or 220-240 V~ (L-LV21-230) feed to power the panel, which is self-contained in an enclosed area, thus allowing access to only the low-voltage connections when the enclosure cover is removed.



Low-Voltage Enclosure

Model Number

HQ-LV21-120	120 V~ Low-Voltage Enclosure
L-LV21-230	220-240 V~ Low-Voltage Enclosure



Low-Voltage Enclosure Cover

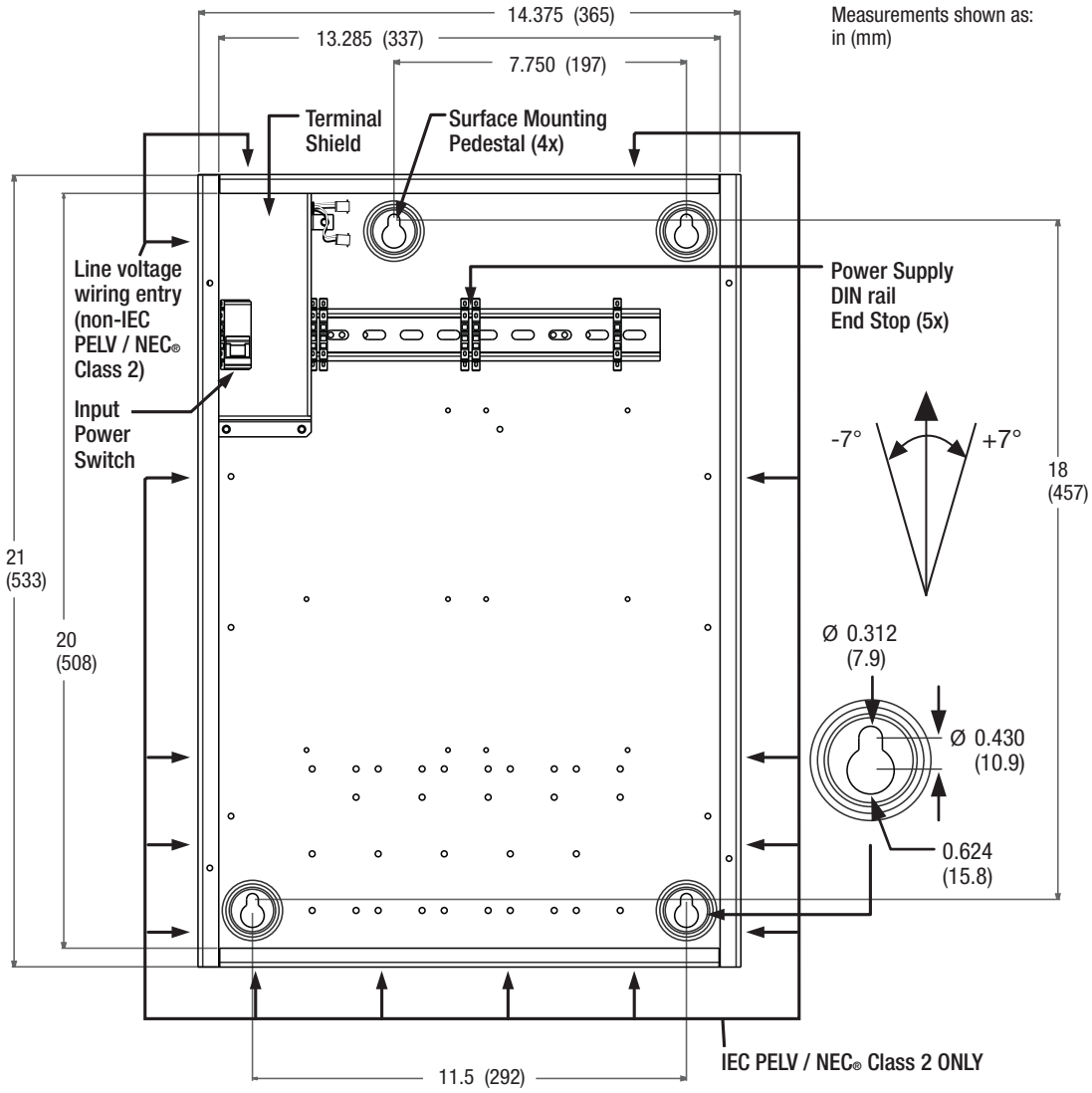
Low-Voltage Enclosure

Specifications

Model Numbers	HQ-LV21-120 L-LV21-230
Power	120 V~ Power Input 50/60 Hz 2 A (HQ-LV21-120) 220-240 V~ Power Input 50/60 Hz 2 A (L-LV21-230)
Regulatory Approvals	UL, CSA, NOM (HQ-LV21-120) CE, C-tick (L-LV21-230)
Environment	Ambient operating temperature: 32 °F to 104 °F (0v°C to 40 °C) Ambient operating humidity: 0-90% humidity, non-condensing. Indoor use only.
Mounting	Enclosure may be surface-mounted or recess-mounted. Enclosure fits between standard 16 in (41 cm) on-center stud framing. Mount the enclosure so that line-voltage wiring will be at least 6 ft (1.8 m) from audio or electronic equipment and wiring. **Mount Enclosure** using one of the following methods (mounting hardware is not provided): **a. Surface Mount –** Use keyholes with bolts sufficient for 100 lb (45 kg) load, 1/4 in (M6) bolts recommended. **b. Recess Mount –** Use screws sufficient for 100 lb (45 kg) through the corners of the enclosure. Mount enclosure fully into the stud bay, with the back flush against the inner wall surface. Enclosure is 4.088 in (104 mm) deep past cover mounting tabs (including pedestal). Enclosure cover dimensions are 21.5 in x 15.386 in (546 mm x 391 mm). **NOTICE:** This equipment is air-cooled. Mount in a location where the vented cover will not be blocked. 12 in (305 mm) of clearance in front of the vents is required. **NOTICE:** Power supply will hum slightly and internal relays will click while in use. Mount in a location where such noise is acceptable.
Dimensions	**Enclosure:** 21 in (533 mm) x 14.375 in (365 mm) x 4.088 in (104 mm) **Cover:** 21.5 in (546 mm) x 15.386 in (391 mm)
Construction	**Enclosure:** 16-gauge powder coated sheet metal. **Cover:** 16-gauge powder coated metal cover. Cover is attached using four philips-head screws.
Capacity	Enclosure can accomodate two processors or system interface devices and five wire landing boards (QS-WLB). Examples: 1 Processor and 1 System Interface; 2 Processors; or 2 Interfaces
Line-Voltage Connections	Use copper wire only, supply conductors rated at 167 ºF (75 °C). Use supplied wire connections to connect to corresponding power supply harnesses.
Warranty	8 Year Limited Warranty. http://www.lutron.com/TechnicalDocumentLibrary/HomeWorks_Warranty.pdf

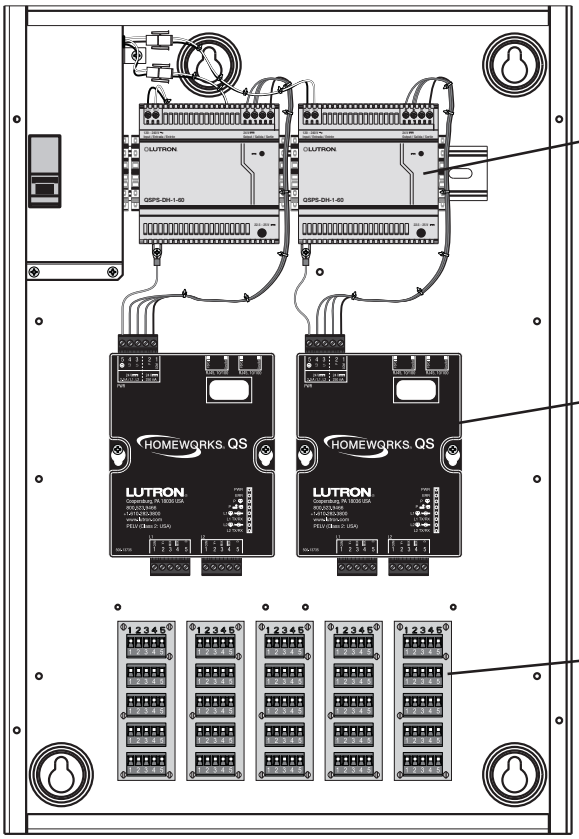
Low-Voltage Enclosure

Dimensions and Mounting



Low-Voltage Enclosure

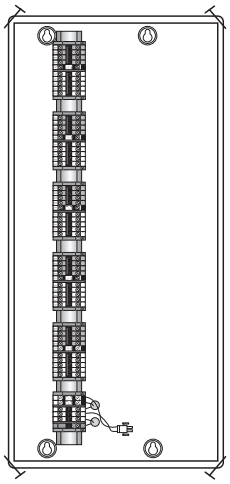
Configuration



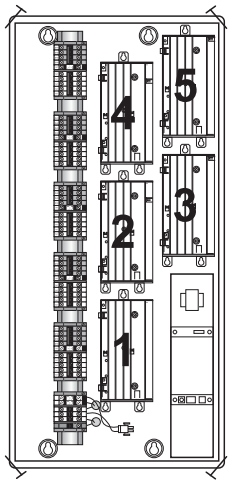
Control panels

Control panels are available in two different sizes, each of which may be either surface-mounted or recess-mounted in an electrical closet or other equipment room. The number of control panels—and the types of components within them—may be specified to fit the size, lighting plan, and design of a home. Control panels may be distributed throughout the home for added flexibility during installation of the line-voltage wiring.

Control panels may contain optional components (sold separately) including Filter Choke Assembly, Module Interface, PowerKit, Power Supply Unit, Processor(s), Remote Power Module(s) (RPM), Ten Volt Modules (TVM), and Wire Landing Board(s).



HWI-PNL-5
HWI-PNL-5-CE



Shown with optional RPMs and one Module Interface installed

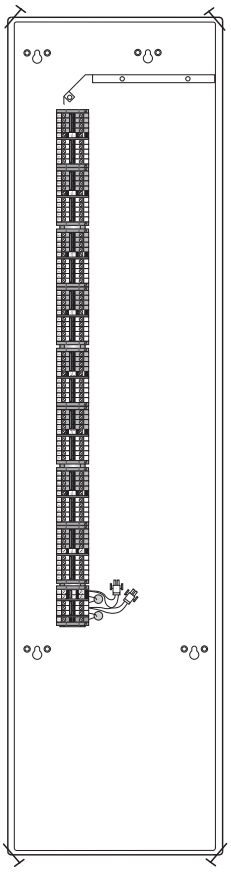
Model Numbers

HWI-PNL-5

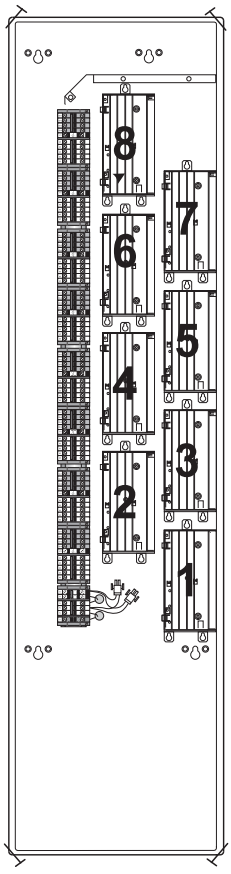
HWI-PNL-5-CE

HWI-PNL-8

HWI-PNL-8-CE



HWI-PNL-8
HWI-PNL-8-CE



Shown with optional RPMs installed

Control panels

Specifications

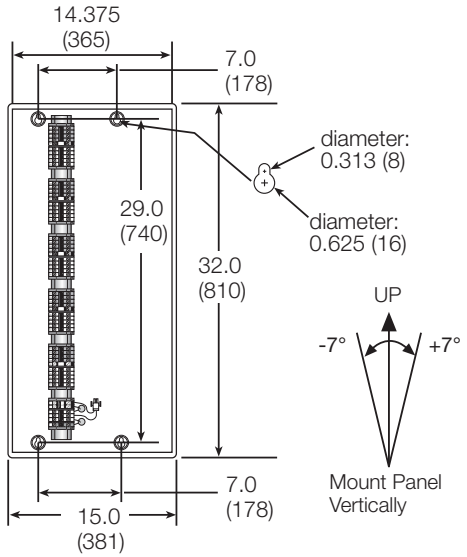
Model Numbers	HWI-PNL-5; HWI-PNL-5-CE HWI-PNL-8; HWI-PNL-8-CE
Power	120 V~ Power Input 50/60 Hz 2 A (HWI-PNL-5, HWI-PNL-8) 220-240 V~ Power Input 50/60 Hz 2 A (HWI-PNL-5-CE, HWI-PNL-8-CE)
Capacity	**HWI-PNL-5, HWI-PNL-5-CE:** Five RPMs* in any combination and one Module Interface **HWI-PNL-8, HWI-PNL-8-CE:** Eight RPMs* in any combination, one Module Interface, one PowerKit, one Processor, up to two Power Supply units and/or Wire Landing Boards (WLB) * 120 V~ HW-RPM-4A, HW-RPM-4U, HW-RPM-4FSQ, HW-RPM-4M, HW-RPM-4R 220-240 V~ HW-RPM-4A, HW-RPM-4E, HW-RPM-4U, HW-RPM-4M, HW-RPM-4R
Regulatory Approvals	UL, CSA, NOM (HWI-PNL-5, HWI-PNL-8) CE (HWI-PNL-5-CE, HWI-PNL-8-CE)
Environment	Ambient operating temperature: 32 to 104 °F (0 to 40 °C), 0 to 90% humidity, non-condensing. Indoor use only.
Cooling	Passive cooling
Line-Voltage Connections	DIN rail-mounted terminal blocks provided for line-voltage remote power module, module interface, and power supply wiring
DIN Rail Terminal Blocks	Terminal blocks will accept one 18 to 10 AWG (6.0 to 0.75 mm^2) wire. Terminal blocks should be tightened to 3.5 to 5.0 in-lb (0.40 to 0.57 N•m).
Ground Bar Terminals	**PNL-5, PNL-5-CE, PNL-8:** 23 ground termination points; **PNL-8-CE:** 46 ground termination points
Miswire Protection	All terminal blocks are shipped with bypass jumpers installed. After verifying that each circuit is wired correctly, remove the bypass jumpers for system operation
Dimensions	**HWI-PNL-5 and HWI-PNL-5-CE** **Control Panel:** 14.375 in (365 mm) x 32 in (813 mm) x 3.875 in (98 mm) **Cover:** 15.875 in (403 mm) x 32.5 in (826 mm) **HWI-PNL-8 and HWI-PNL-8-CE** **Control Panel:** 14.375 in (365 mm) x 59 in (1498 mm) x 4.125 in (105 mm) **Cover:** 15.875 in (403 mm) x 59.5 in (1511 mm)
Mounting	Control Panel may be surface-mounted or recess-mounted. Control Panel fits between standard 16 in (41 cm) on-center stud framing. Mount the Control Panel so that line-voltage wiring will be at least 6 ft (1.8 m) from audio or electronic equipment and wiring. Mount Control Panel using one of the following methods (mounting hardware is not provided): **a. Surface-Mount –** Use keyholes with bolts sufficient for 100 lb (45 kg) load, 1/4 in (M6) bolts recommended. **b. Recess-Mount –** Use screws sufficient for 100 lb (45 kg) through the corners of the Control Panel. Mount Control Panel fully into the stud bay, with the back flush against the inner wall surface. Control Panel is 4.09 in (104 mm) deep past cover mounting tabs (including pedestal). **NOTICE:** This equipment is air-cooled. Mount in a location where the vented cover will not be blocked. 12 in (305 mm) of clearance in front of the vents is required. **NOTICE:** Power supply will hum slightly and internal relays will click while in use. Mount in a location where such noise is acceptable.
Construction	**Control Panel:** 16-gauge galvanized sheet metal (unpainted). **Cover:** Painted (black) metal cover with ventilation holes. Cover is attached using phillips-head screws (included)
Warranty	8 Year Limited Warranty. http://www.lutron.com/TechnicalDocumentLibrary/HomeWorks_Warranty.pdf

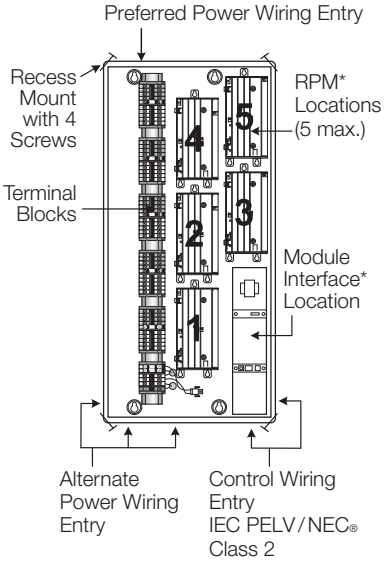
Control panels

Dimensions and Mounting

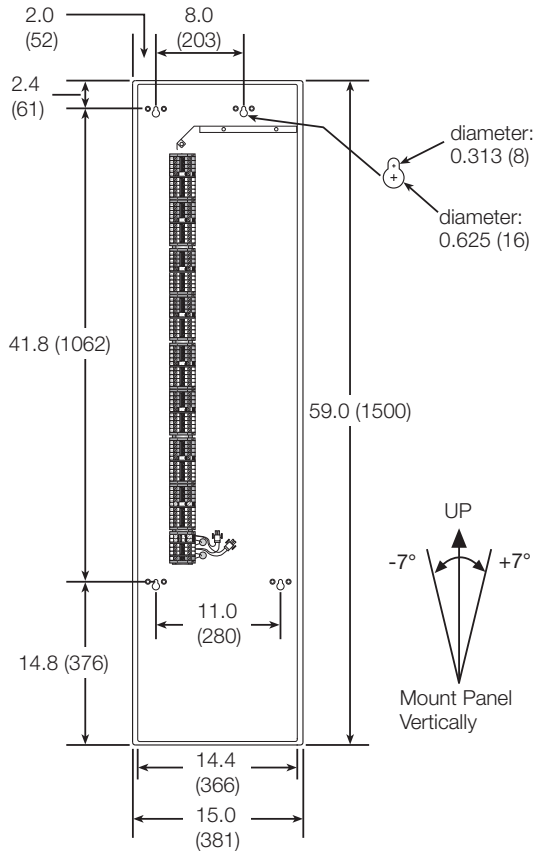
Measurements shown as: in (mm)

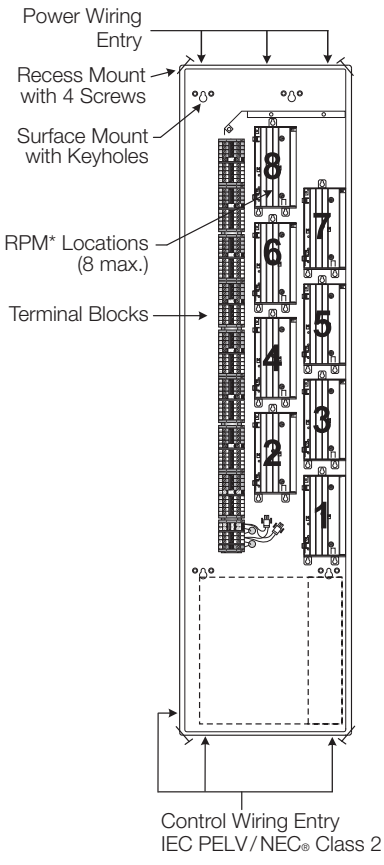
HWI-PNL-5 and HWI-PNL-5-CE





HWI-PNL-8 and HWI-PNL-8-CE



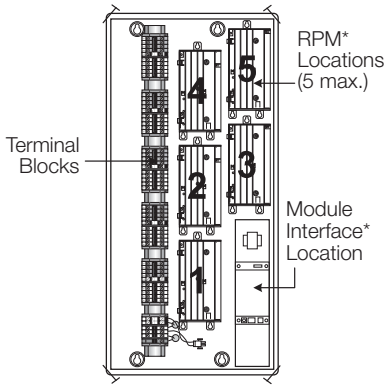


** Components sold separately*

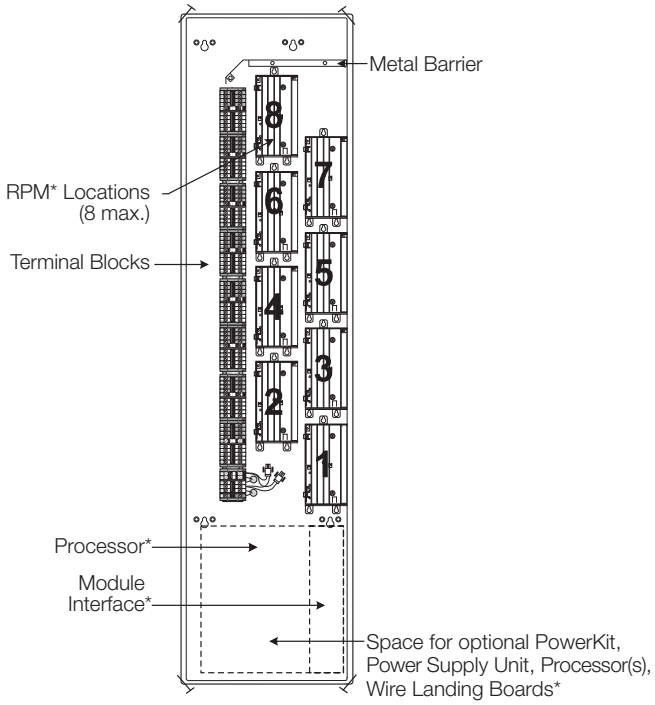
Control panels

Configurations

HWI-PNL-5 and HWI-PNL-5-CE



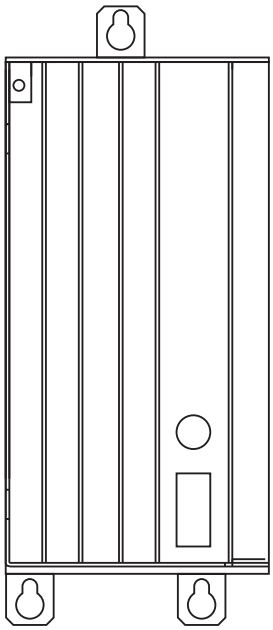
HWI-PNL-8 and HWI-PNL-8-CE



Note: Filter choke assembly may be installed in place of module 8.
0-10 V modules may be installed in place of module 8 and metal barrier. See Application Note #234 *"Using a Ten Volt Module (TVM) Kit to Control LED and Fluorescent Fixtures"* (http://resi.lutron.com/TechnicalInformation/AppNotesFAQs/tabid/180/Default.aspx) for more details.

** Components sold separately*

Remote Power Modules



Remote Power Modules (RPMs) are used to control lighting, motor, and fan loads. There are several different models of RPMs. Each model controls specific load types. The RPMs are mounted in remote power panels. Models HWI-PNL-8, HWAP-8D and HWBP-8D hold up to eight RPMs, HWI-PNL-5 holds up to five RPMs, and HWAP-2S and HWBP-2S hold up to two RPM-4R modules.

All RPMs must be connected to a module interface housed within the same panel enclosure. RPMs within an enclosure are connected to the module interface using a Lutron-provided harness. To minimize the effects of single power supply failure, each RPM is powered by its own internal power supply.

Model Numbers

HW-RPM-4A-120	120 V~	Adaptive Dimming Module
HW-RPM-4A-230	220-240 V~	Adaptive Dimming Module
HW-RPM-4E-230-CE	220-240 V~	ELV Dimming Module
HW-RPM-4FSQ-120	120 V~	Quiet Fan Speed Control Module
HW-RPM-4M-120	120 V~	Motor Control Module
HW-RPM-4M-230	220-240 V~	Motor Control Module
HW-RPM-4R	100-277 V~	Power Relay Module
HW-RPM-4U-120	120 V~	Dimming Module
HW-RPM-4U-230-CE	220-240 V~	Dimming Module
HW-RPM-4U-240	240 V~	Dimming Module

PRELIMINARY

Remote Power Modules

Specifications

Model Numbers	HW-RPM-4A-120, HW-RPM-4A-230, HW-RPM-4E-230-CE, HW-RPM-4FSQ-120, HW-RPM-4M-120, HW-RPM-4M-230, HW-RPM-4R, HW-RPM-4U-120, HW-RPM-4U-230-CE, and HW-RPM-4U-240
Power	
120 V~ 50/60 Hz:	HW-RPM-4A-120, HW-RPM-4FSQ-120, HW-RPM-4M-120, and HW-RPM-4U-120
220-240 V~ 50/60 Hz:	HW-RPM-4A-230, HW-RPM-4M-230, HW-RPM-4U-230-CE and HW-RPM-4U-240
100-277 V~ 50/60 Hz:	HW-RPM-4R
Capacity	HWAP-8D, HWBP-8D, and HWI-PNL-8, remote power panels will hold up to 8 RPMs. HWI-PNL-5 remote power panel will hold up to 5 RPMs. HWAP-2S and HWBP-2S remote power panels will hold up to 2 HW-RPM-4R modules.
Number of Outputs	4
Regulatory Approvals	UL, CSA, NOM
Environment	Ambient operating temperature: 32 °F to 104 °F (0 °C to 40 °C), 0 to 90% humidity, non-condensing. Indoor use only.
Cooling	Passive cooling.
Line-Votage Connections	Separate line-voltage feeds at the DIN rail terminal blocks for each RPM. Terminal blocks should be tightened to 3.5 in-lb to 5.0 in-lb (0.40 N•m to 0.57 N•m).
Low-Voltage Communications	Communication harness (included).
Wiring	Terminal blocks will accept one 18 AWG to 10 AWG (1.0 mm^2 to 2.5 mm^2) wire or two 18 AWG to 16 AWG (1.0 mm^2 to 1.5 mm^2) wires. **HW-RPM-4M-120, HW-RPM-4M-230 and HW-RPM-4R:** Require the installation of four additional gray terminal blocks (included) and three additional black terminal blocks (included) to be mounted on to the DIN rail assembly. HW-RPM-4R gray terminal blocks accept one 18 AWG to 8 AWG (1.0 mm^2 to 10 mm^2) wire or two 16 AWG to 12 AWG (1.5 mm^2 to 4.0 mm^2) wires.
Addressing	Manual rotary switch. Counts as 1 of 8 RPM addresses per module Interface.
Diagnostics	LED provided to indicate proper communications with module interface.
ESD Protection	Meets or exceeds the IEC 61000-4-2 standard.
Surge Protection	Meets or exceeds ANSI/IEEE standard c62.41.
Air Gap	**HW-4U-120, HW-4U-230-CE HW-RPM-4A-120, HW-RPM-4A-230 HW-4FSQ-120, and HW-RPM-4M-230:** Provided when all four circuits are off. **HW-RPM-4R:** Individual output airgap is provided when each circuit is off.
Fail Safe Operation	Rotary switch on the RPM allows for manual operation of each load.
Dimensions	3⅞ in (99 mm) wide x 7 in (178 mm) high
Lamp Buzz	Lamp debuzzing coils are available from Lutron to reduce lamp filament buzzing. (Lutron® model HW-HIFC-10-2, LDC-10-TCP, or LDC-16-TCP).
Interface Suppression	EMI/RFI suppression circuitry
Warranty	8 Year Limited Warranty. http://www.lutron.com/TechnicalDocumentLibrary/HomeWorks_Warranty.pdf

PRELIMINARY

Remote Power Modules

Load Type and Ratings

Model	Load Types[1]	Voltage/ Frequency	Minimum Load	Maximum Load Per:		Technology
				Output	Module	
HW-RPM-4A-120	INC, MLV, ELV, NCC, F2W	120 V~ 50/60 Hz	10 W	10 A	16 A	RTISS-TE™[6]
	LED[2]			400 W	1600 W	
HW-RPM-4A-230	INC, MLV, ELV, NCC	220-240 V~ 50/60 Hz	10 W	8 A	13 A	
	LED[2]			300 W	1200 W	
HW-RPM-4E-230-CE	INC, ELV[3]	220-240 V~ 50/60 Hz	10 W	10 A	16 A	N/A
HW-RPM-4FSQ-120	Fan Motor[4]	120 V~ 50/60 Hz	0.25 A	2 A	8 A	Quiet control circuitry
HW-RPM-4M-120	INC	120 V~ 50/60 Hz	0 A	3 A	16 A	Mechanical interlocked relays
	Motor (Bi-directional)			5 A (1/4 HP)		
HW-RPM-4M-230	INC	220-240 V~ 50/60 Hz	0 A	1.5 A	16 A	
	Motor (Bi-directional)			5 A (1/4 HP)		
HW-RPM-4R	Lighting	100-277 V~ 50/60 Hz	0 A	16 A	64 A	Softswitch®[7]
	Motor			(1/3 HP)		
HW-RPM-4U-120	INC,[5] MLV,[5] NCC, F2W, SFL	120 V~ 50/60 Hz	25 W	16 A	16 A	RTISS[8] Equipped®
	LED[2]			400 W	1600 W	
HW-RPM-4U-230-CE	INC, MLV, NCC, SFL	220-240 V~ 50/60 Hz	40 W	10 A	13 A	
	LED[2]			300 W	1200 W	
HW-RPM-4U-240	INC, MLV, NCC,SFL	220-240 V~ 50/60 Hz	40 W	16 A	16 A	
	LED[2]			300 W	1200 W	

PRELIMINARY

1 For higher wattages or for load types other than those listed, a Power Booster or Interface is required. For more details, refer to the HomeWorks® software.

2 This load type is not UL Listed or CSA Certified for use with this control. **NOTICE:** To avoid the risk of equipment damage, make sure that the LED lighting system used conforms to the Compatibility Guidelines for Lutron® Controls and LED Lighting Systems found at www.lutron.com/led.

3 Only use with ELV transformers. If used with MLV transformers, the module may be damaged and the warranty will be void.

4 Control up to 4 ceiling fans (1 per circuit). Do not use to control fans that have integrated fan speed controls (i.e., fan with a remote control). This module may hum or buzz when at medium-high fan setting. Do not connect to lighting loads. Damage to the module could result.

5 In rare cases, incandescent lamps and MLV transformers will "buzz" or "hum." The HW-HIFC-10-2 filter choke assembly reduces this hum. The filter choke assembly can be installed in place of module 8 in an HWI-PNL-8 remote power panel.

6 RTISS-TE™: (Real-Time Illumination Stability System-Trailing Edge). Same as RTISS, but operates on the trailing edge of the A/C sine wave. This allows for true instantaneous voltage compensation.

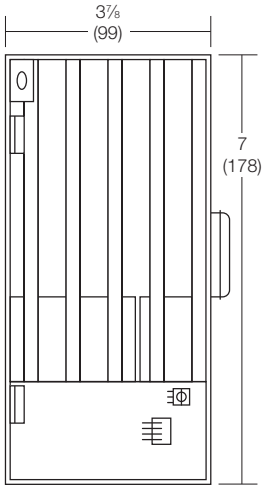
7 SoftSwitch®: Lutron® SoftSwitch® circuitry prevents the relay contacts from arcing. Even when fully loaded, the arc reduction extends a relay's average rated life to more than 1,000,000 on/off cycles.

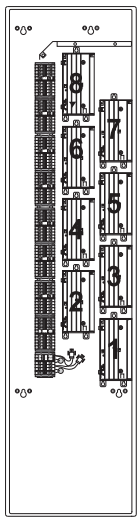
8 RTISS® (Real-Time Illumination Stability System). This Lutron® filter circuit technology compensates for incoming line-voltage variations, such as changes in Root Mean Square (RMS) voltage, frequency shifts, harmonics, and line noise.

Remote Power Modules

Dimensions & Mounting

Measurements shown as: in (mm)



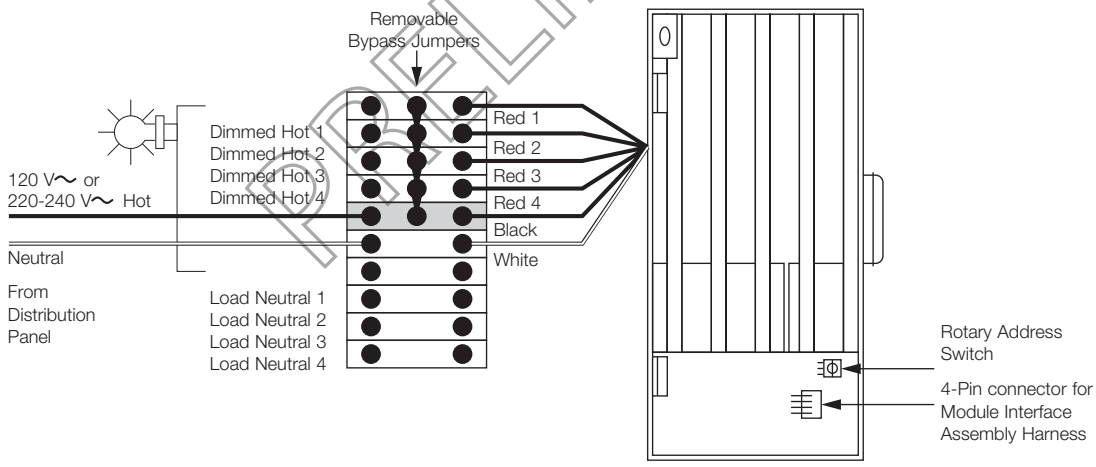


HWI-PNL-8 shown

PRELIMINARY

Wiring

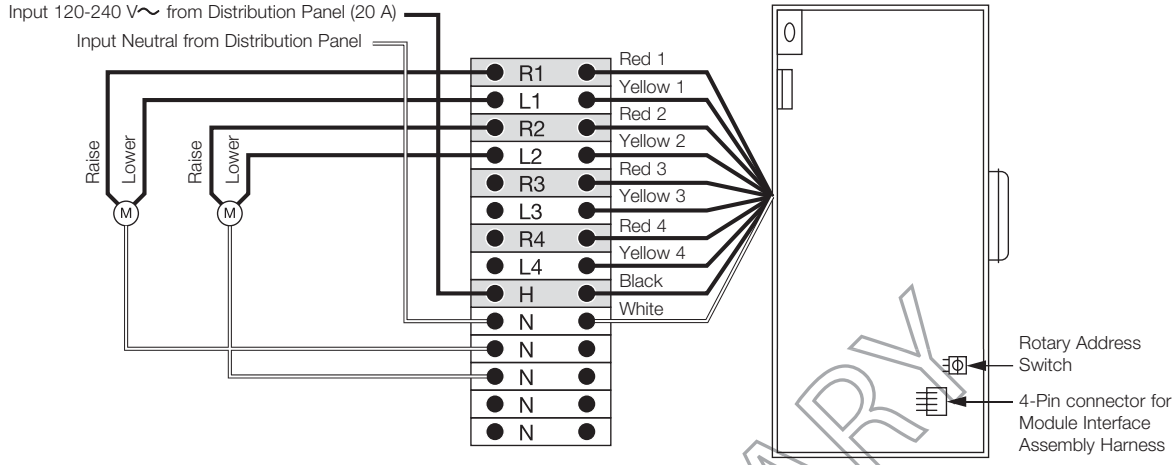
HW-RPM-4A-120, HW-RPM-4A-230, HW-RPM-4E-230-CE, HW-RPM-4FSQ-120, HW-RPM-4U-120, HW-RPM-4U-230-CE and HW-RPM-4U-240



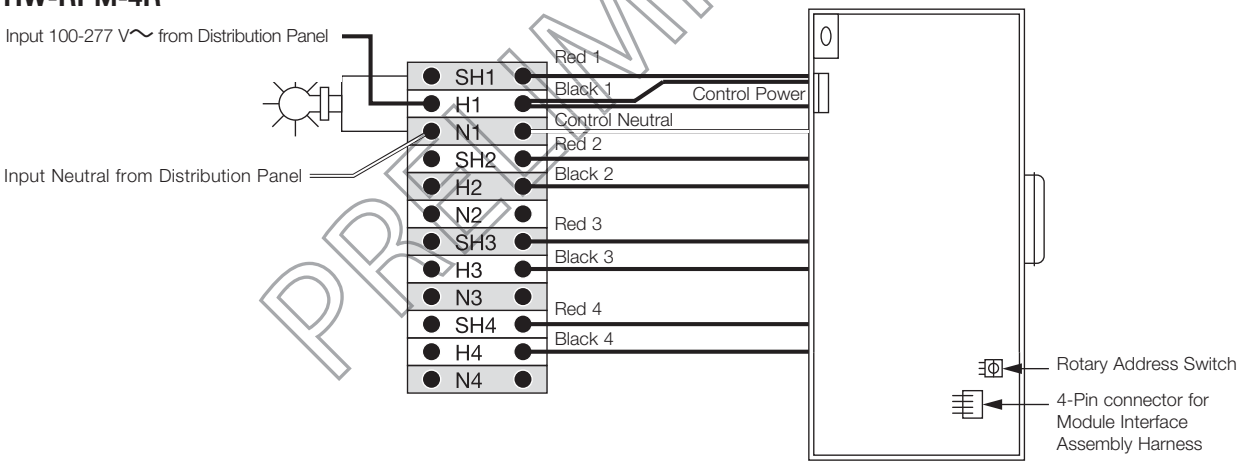
Remote Power Modules

Wiring (Continued)

HW-RPM-4M-120 and HW-RPM-4M-230



HW-RPM-4R



PRELIMINARY

Remote Power Modules

Address Switch position for
HW-RPM-4A-120, HW-RPM-4A-230, HW-RPM-4E-230-CE, HW-RPM-4FSQ-120, HW-RPM-4R, HW-RPM-4U-120, HW-RPM-4U-230-CE and HW-RPM-4U-240

Position	Module Output/Purpose
0	All outputs OFF
1-8	Address for normal operation
9, A	Not used
B	Output 1 ON Use for temporary lighting and zone testing
C	Output 2 ON Use for temporary lighting and zone testing
D	Output 3 ON Use for temporary lighting and zone testing
E	Output 4 ON Use for temporary lighting and zone testing
F	All outputs ON Use for temporary lighting and zone testing

Address Switch position for
HW-RPM-4M and HW-RPM-4M-230

Position	Module Output/Purpose
0	All relays OFF
1-8	Address for normal operation
9, A-D	Not used – All outputs OFF
E	All raise relays ON Use for directional motor testing
F	All lower relays ON Use for directional motor testing

Diagnostic LED status for
HW-RPM-4A-230 HW-RPM-4E-230-CE, HW-RPM-4FSQ-120, HW-RPM-4R, HW-RPM-4U-120, HW-RPM-4U-230-CE and HW-RPM-4U-240

LED Status	Possible Cause
Off	No power or defective module
1 blink per sec. “Heartbeat”	Normal operation
1 blink per 7 seconds “Lighthouse”	Not communicating with processor: • Module set on invalid or • Module set on invalid or diagnostic address • System not properly configured or addressed in HomeWorks® software
4 blinks; pause; repeat	• Module in manual override
10 blinks per sec.	• Zone error on one or more outputs

Zone Diagnostic LED Status
(HW-RPM-4A-120 and HW-RPM-4A-230 only)

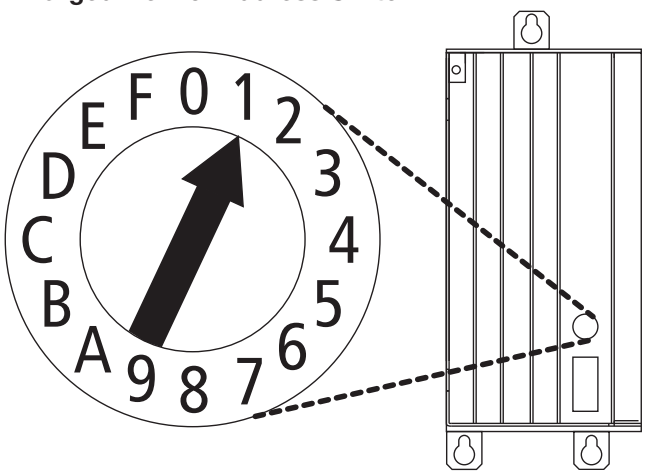
Zone LED Status	Load Status	Description
Off	OFF	Normal; Load Off
Continuously on	ON	Inandescent/electronic dimmer
1 blink per second	ON	Magnetic dimming

Error Codes

1 blink; pause; repeat	OFF	Load short circuit/overload[1]
2 blinks; pause; repeat	OFF	Inductive load[2]
3 blinks; pause; repeat	ON Full	Shorted component[3]
4 blinks; pause; repeat	OFF	DC detection[4]
10 blinks per sec.	All outputs OFF	Multiple errors[5]

[1] Locate and repair fault. Cycle power to RPM.
[2] Check software configuration. MLV load detected with ELV software setting.
[3] Replace RPM. Internal device (FET) shorted.
[4] Possible faulty MLV load.
[5] Multiple errors exist on this output. The relay has opened to protect the modules and all 4 outputs will be off..

Enlarged view of Address Switch



PRELIMINARY

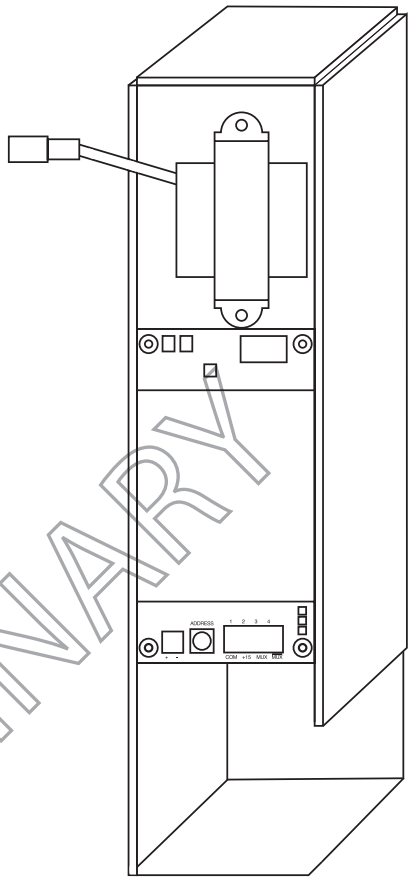
HomeWorks® Module Interface

A Module Interface controls up to eight Remote Power Modules (RPMs) in a remote power panel enclosure. The Module Interface manages communication between the RPMs and a processor. A Module Interface is powered from its own internal power transformer.

A Module Interface installs in HWI-PNL-8, HWBP-8D, HWAP-8D, or PBK8 with up to eight RPMs, in HWI-PNL-5 with up to five RPMs, or in HWBP-2S with up to two RPM-4Rs.

A manual override input is provided on each Module Interface, allowing a pre-determined lighting scene to be activated from designated override switches installed anywhere in the area.

Each processor has communication links that can be configured as power panel links dedicated to control up to 16 Module Interfaces. This connection must be daisy-chained and requires two pair IEC PELV/NEC® Class 2 wire – one pair 18 AWG (1.0 mm^2), one pair 18 AWG to 22 AWG (1.0 mm^2 to 0.5 mm^2) twisted shielded. Lutron® wire model GRX-CBL-346S-500 may be used.



Module Interface (HWI-MI-120)

Model Number

HWI-MI-120	120 V~ Module Interface
HWI-MI-230	220-240 V~ Module Interface

PRELIMINARY

HomeWorks® Module Interface

Specifications

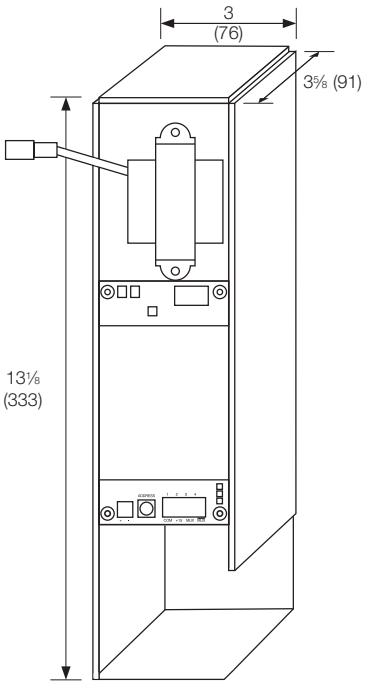
Model Number	HWI-MI-120, HWI-MI-230
Power	HWI-MI-120: 120 V~ 50/60 Hz 1 A HWI-MI-230: 230 V~ 50/60 Hz 0.5 A The Module Interface is powered by a separate line-voltage feed at the DIN rail terminal blocks and should not have terminal 2 connected on the processor communications link connector.
Typical Power Consumption	2 W
Regulatory Approvals	UL, CSA, NOM (HWI-MI-120) CE, C-tick (HWI-MI-230)
Environment	Ambient operating temperature: 32 °F to 104 °F (0 °C to 40 °C), 0 to 90% humidity, non-condensing. Indoor use only.
Cooling Method	Passive cooling.
Low-Votage Wire Type	Two pair IEC PELV/NEC® Class 2 wire – one pair 18 AWG (1.0 mm^2), one pair 18 AWG to 22 AWG (1.0 mm^2 to 0.5 mm^2) twisted shielded. Lutron® wire model GRX-CBL-346S-500 may be used.
Low-Voltage Wiring Configuration	Maximum wire length of 1000 ft (305 m). Must be wired in a daisy-chain configuration. Terminators are required if total cable length exceeds 50 ft (15 m).
Low-Voltage Connections	One 4-pin removable terminal block. Each of the four terminals will accept up to two 18 AWG (1.0 mm^2) wires.
Addressing	Via rotary switch. Counts as 1 of the 16 Module Interface addresses on a power panel link.
Diagnostics	Three LEDs for troubleshooting communications with the processor and the RPMs.
ESD Protection	Meets or exceeds the IEC 61000-4-2 standard.
Surge Protection	Meets or exceeds ANSI/IEEE standard c62.41.
Miswire Protection	All terminal block inputs are over-voltage and miswire protected against wire reversals and shorts.
Fail Safe Operations	The manual override scene is activated for all RPMs connected to the Module Interface by closing a switch that is wired between the two manual override terminals. The switch (or relay) contacts must be rated for switching 50 mA at 30 V⎓. A single switch can be used for multiple Module Interfaces wired in parallel, but proper polarity must be maintained across all units. In this configuration, the switch must be rated for the sum of the current for all of the Module Interfaces connected (i.e., six Module Interfaces wired to a single manual override switch requires a switch rated for 300 mA at 30 V⎓).
Mounting Dimensions	13⅛ in x 3 in x 3⅝ in (333 mm x 76 mm x 92 mm)
Mounting	Mount in the lower right-hand corner of a panel enclosure (HWI-PNL-8, HWBP-8D, HWAP-8D, HWI-PNL-5, or HWBP-2S)
Output	Compatible with HW-RPM-4U dimming module, HW-RPM-4A adaptive dimming module, HW-RPM-4FSQ fan speed module, HW-RPM-4M motor module, and HW-RPM-4R power relay module.
Warranty	8 Year Limited Warranty. http://www.lutron.com/technicaltocumentlibrary/homeworks_warranty.pdf

PRELIMINARY

HomeWorks® Module Interface

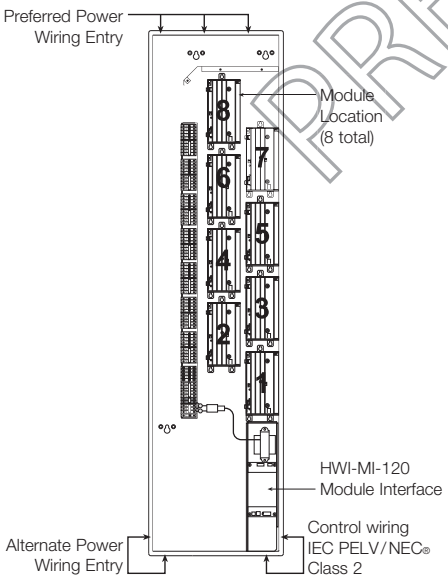
Dimensions

Measurements shown as: in (mm)

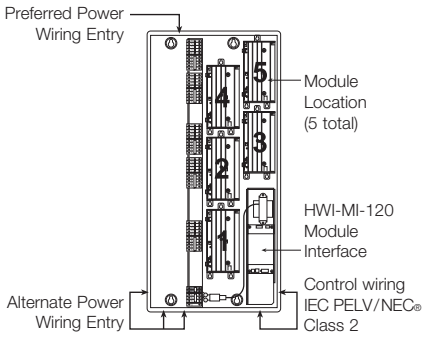


PRELIMINARY

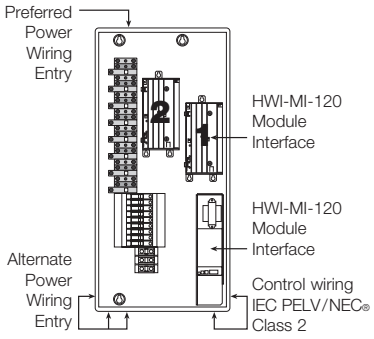
Configurations



8 Module Panel



5 Module Panel

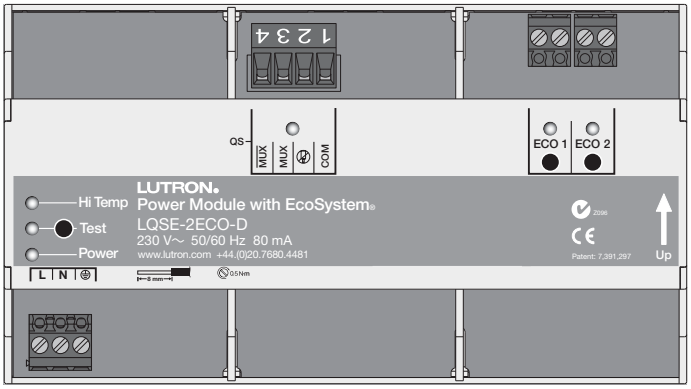


2 Module Panel

369-611a 1 02.17.12

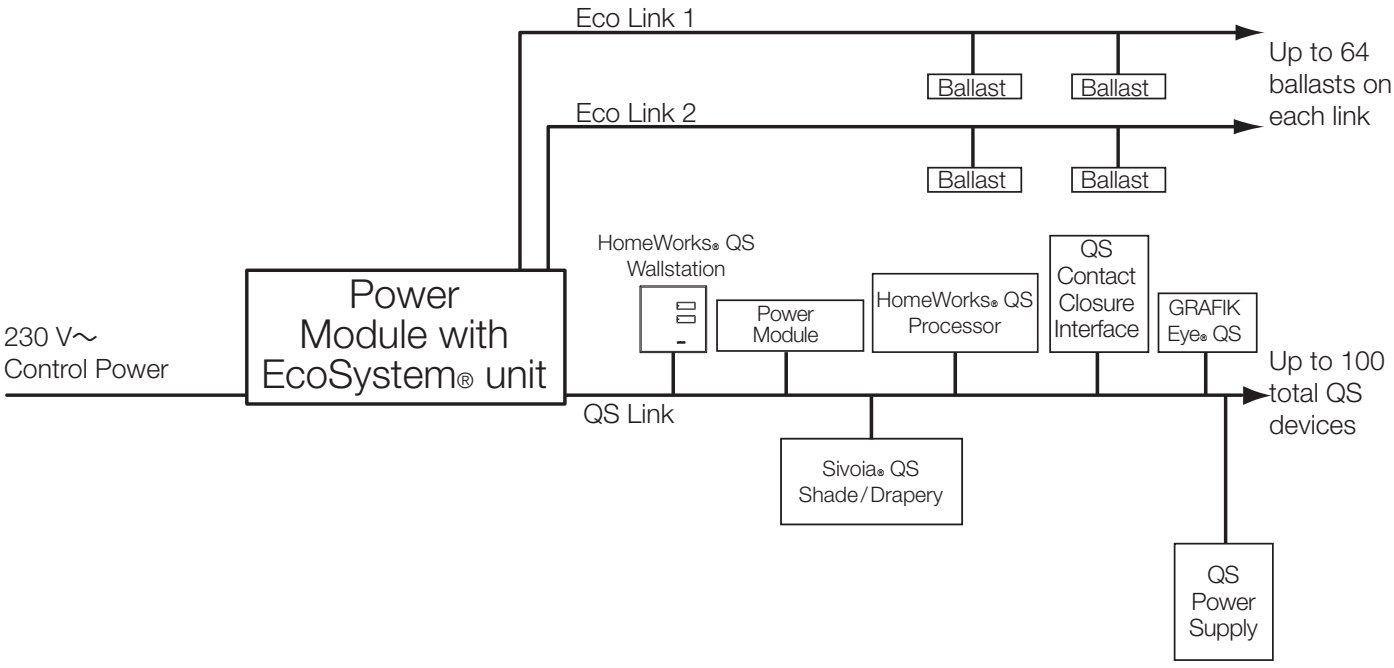
Power Module with EcoSystem®

The Power Module with EcoSystem® unit is a DIN-rail mounted Eco Link controller for EcoSystem® ballasts, drivers and devices. It provides Eco Link power and control for two independent Eco Links with up to 64 ballasts or drivers each.



Features

- Provides EcoSystem® Link power for either one or two links of EcoSystem® ballasts or drivers (up to 250 mA per link).
- Power failure memory retains control unit programming in the event of a power loss.
- Includes QS link for connection to a HomeWorks® QS system.
- Power Module with EcoSystem® unit can be used in a HomeWorks® QS system to control and manage light in an entire home or building.



LUTRON® SPECIFICATION SUBMITTAL Page

Job Name:	Model Numbers:
Job Number:	

369-611a 2 02.17.12

Specifications

Power

- 230 V~ 50/60 Hz, 80 mA
- Lightning strike protection meets ANSI/IEEE standard 62.31-1980. Can withstand voltage surges of up to 6 000 V~ and current surges of up to 3 000 A.
- Stand by power: 7 W
- BTUs/hour when fully loaded: 24
- Eco Link Output: 16 V⎓ 250 mA maximum per Link.

Standards

- IEC 60669-2-1
- Lutron Quality Systems registered to ISO 9001.2008.
- CE
- C-tick

Environment

- Ambient Temperature Operating Range: 0 ºC to 40 ºC.
- Relative humidity: less than 90% non-condensing.
- Calibration point maximum: 75 ºC
- For indoor use only.

Terminals

- Mains wiring: 1,0 mm^2 to 4,0 mm^2
- Eco Link Wiring: 1,0 mm^2 to 4,0 mm^2
- QS Link Wiring: 0,5 mm^2 to 4,0 mm^2

Mounting

- Intended to mount within an IP20 (minimum) rated consumer panel or breaker panel with integrated DIN rail and dead cover
- Width = 9 DIN modules (161,7 mm).

Programming Requirements

- Setup and programming of the Power Module with EcoSystem® unit is done through the HomeWorks® QS programming software.
- HomeWorks® QS software version 3.0 or higher required.

EcoSystem®

- Control up to 64 EcoSystem®-compatible devices (ballast or LED drivers) per EcoSystem® Digital Link (up to 128 devices per Power Module with EcoSystem® unit).
- Digitally define areas and zones.
- Automatic replacement of a single failed ballast or driver.
- Simple method of replacing multiple failed ballasts or drivers.
- EcoSystem® Digital Link can be wired as Mains voltage or IEC PELV for maximum wiring flexibility.

EcoSystem® Digital Link Limits

- Up to 64 EcoSystem®-compatible fluorescent ballasts and/or LED drivers per EcoSystem® digital link.
- EcoSystem®-compatible fluorescent ballasts and LED drivers on the EcoSystem® digital link do not count as QS devices.

QS Link Limits

- A QS link in a HomeWorks® QS system can have up to 512 zones (outputs) and 100 devices. A ballast or driver counts as 1 zone.
- Each Power Module with EcoSystem® unit counts as one device toward the 100 device limit.
- A maximum of 8 fully loaded EcoSystem® digital links may be connected to a single QS link.

HomeWorks® QS Wallstations

- HomeWorks® QS wallstations can be configured to control Power Module with EcoSystem® units with the HomeWorks® QS programming utility.
- LED indicator displays the status of programmed lights.

Troubleshooting and Maintenance Features

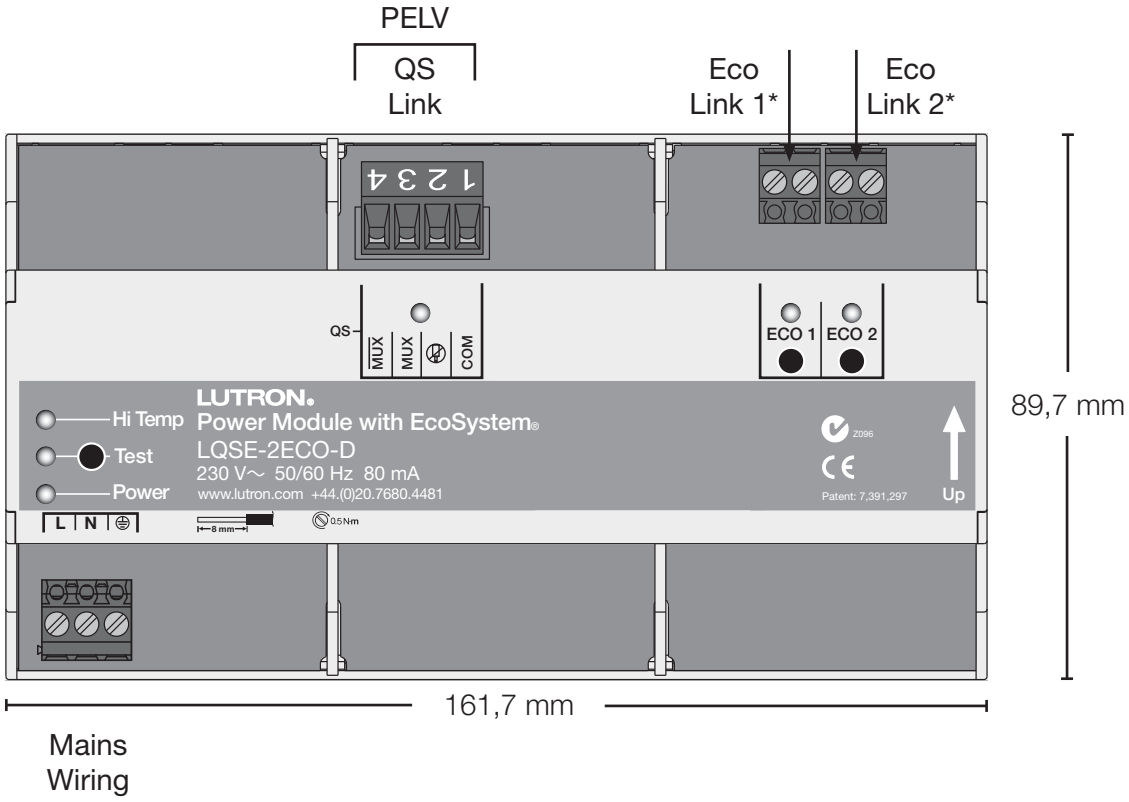
- Maintains redundant memory of ballast programming for ease of single or multiple ballast replacement.
- After installation, “TEST” button verifies Eco Link wiring on all fixtures.
- Status LEDs verify connections to control stations.
- After installation, Power Module with EcoSystem® unit identifies ballast communication failures.

LUTRON® SPECIFICATION SUBMITTAL Page

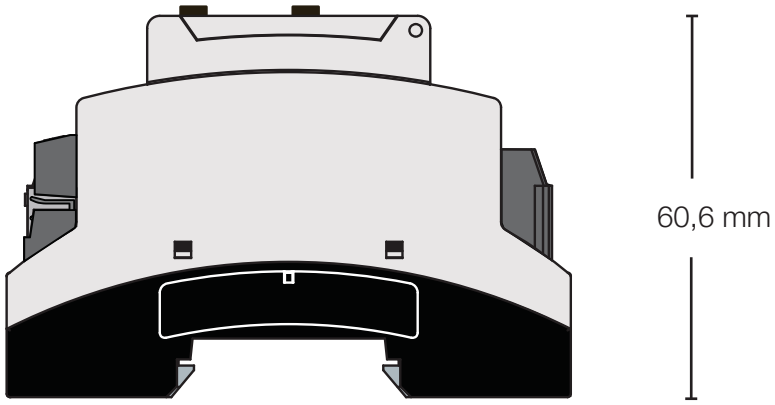
Job Name:	Model Numbers:
Job Number:	

369-611a 3 02.17.12

Overview of Wiring Terminals and Mechanical Dimensions

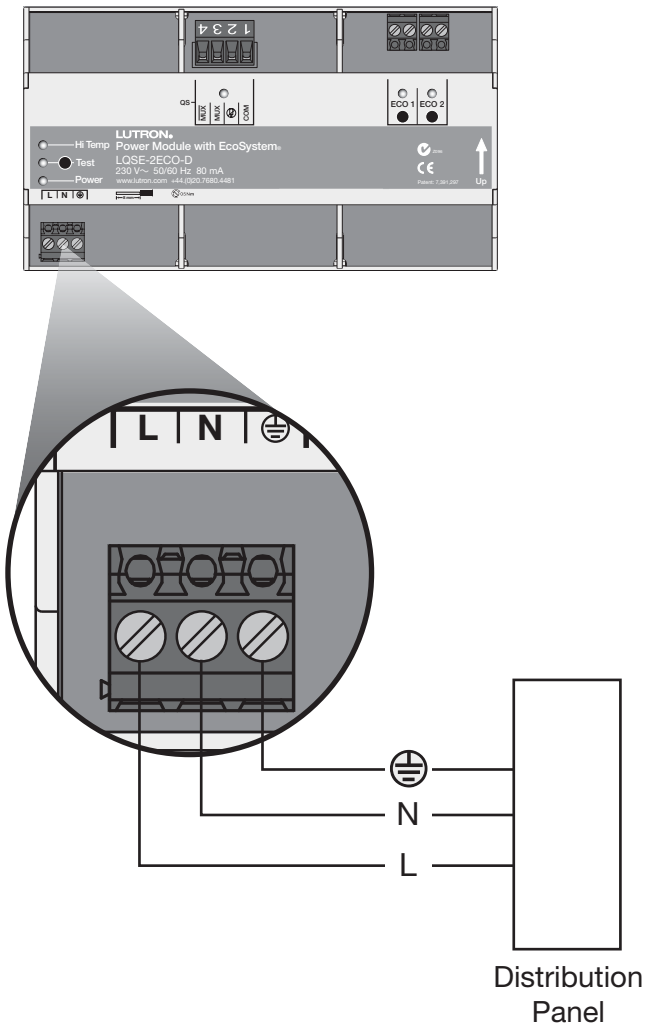


*Wire according to local codes.



Job Name:	Model Numbers:
Job Number:	

Wiring: Mains Voltage



⏚ – Earth/Ground

N – Neutral

L – Mains/Line

Wiring from Distribution to Power Module Unit

- Turn off all circuit breakers or isolators feeding the Power Module unit at the distribution panel.
- Run line, neutral, and earth/ground ⏚ wires from a 230 V~ 50/60 Hz feed to the Power Module with EcoSystem® unit.

Emergency Lighting Applications

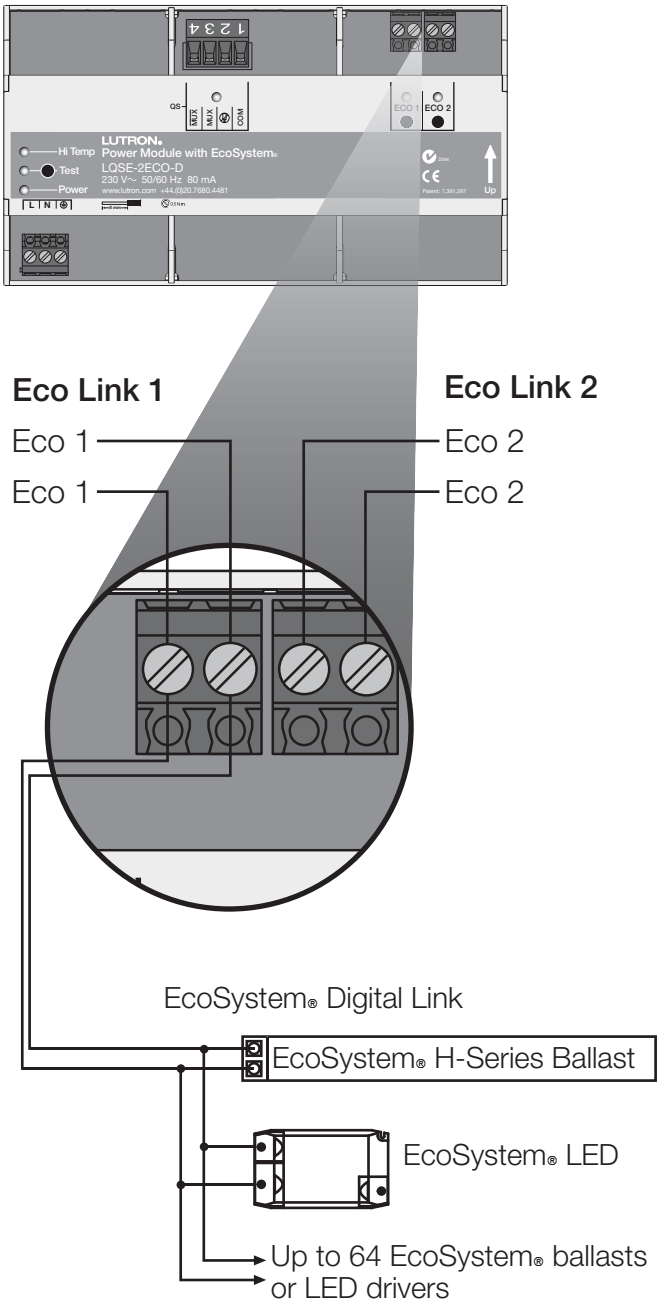
- Use normal (non-essential) power only to power the Power Module with EcoSystem® unit.
- EcoSystem® ballasts and drivers are programmed to enter emergency mode when the Eco link looses power.
- When normal power drops out, the Power Module with EcoSystem® unit will not power the Eco Links. When this occurs, ballasts powered from emergency feeds go to their emergency mode, full light output by default.

Mains Wiring and PELV Separation

- The Power Module with EcoSystem® unit is designed to separate mains wiring from IEC/PELV circuits.
- Follow appropriate local and national codes to avoid violating required separation guidelines.

Job Name:	Model Numbers:
Job Number:	

Wiring: Eco Link



Power Module with EcoSystem® unit will supply power to two independent Eco Links, which support a maximum of 64 ballasts per link.

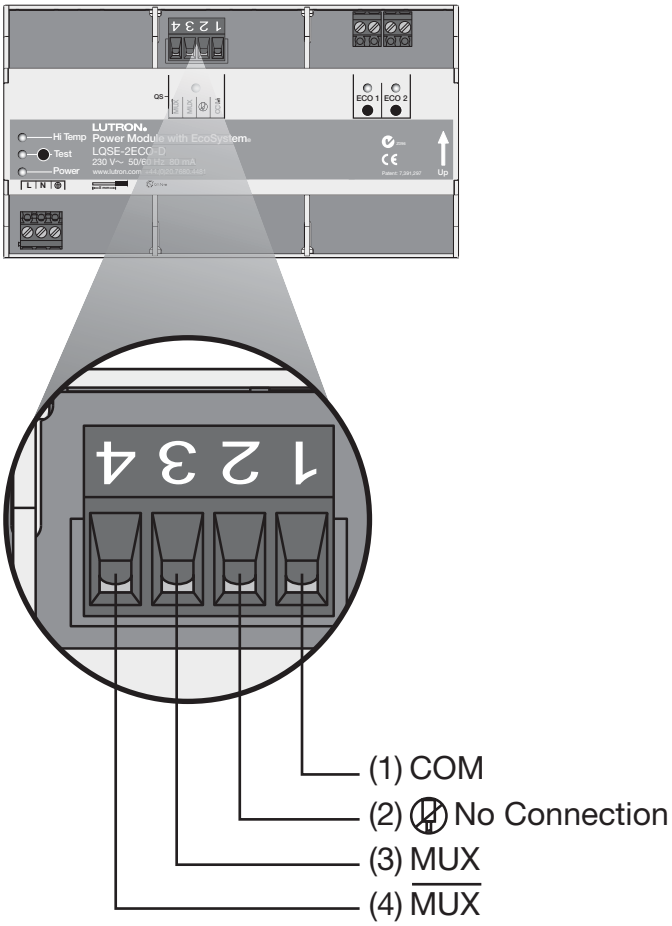
Eco Wiring

- EcoSystem® Digital Link can be wired as Mains voltage or IEC PELV for maximum wiring flexibility.
- The Link is polarity insensitive and can be wired in any topology.
- Consult all national and local electrical codes for separation requirements.

Wire Cross-Sectional Area	Maximum EcoSystem®-compliant Link Wire Length
4,0 mm^2	829 m
2,5 mm^2	518 m
1,5 mm^2	311 m
1,0 mm^2	207 m

Job Name:	Model Numbers:
Job Number:	

Wiring: QS Link



IEC PELV QS Link Wiring

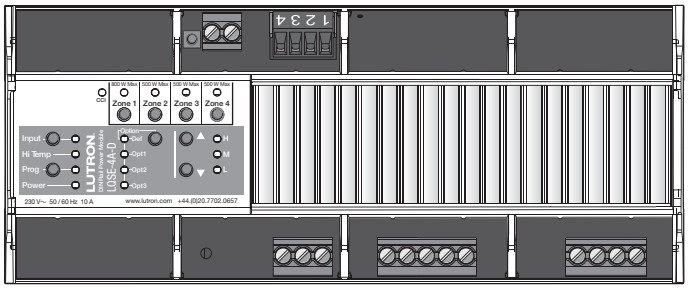
- Link communicates using IEC PELV wiring.
- Follow all applicable national and local codes for proper circuit separation and protection.
- Wiring may be daisy chained or t-tapped.
- Total length of QS link must not exceed 600 m.
- Do NOT connect terminal 2.
- Wire Gauge
  - Power (terminals 1 and 2): 1 pair 1,0 mm^2
  - Data (terminals 3 and 4): 1 pair 0,5 mm^2 to 1,0 mm^2 twisted and shielded
  - Can use Lutron® cable GRX-CBL-346S-500

Job Name:	Model Numbers:
Job Number:	

369-583b 1 01.31.12

DIN Rail Power Module

The DIN Rail Power Module family is a group of modular products for the control of lighting loads. This document describes the following product:
DIN Rail Power Module Phase Adaptive (model LQSE-4A-D)

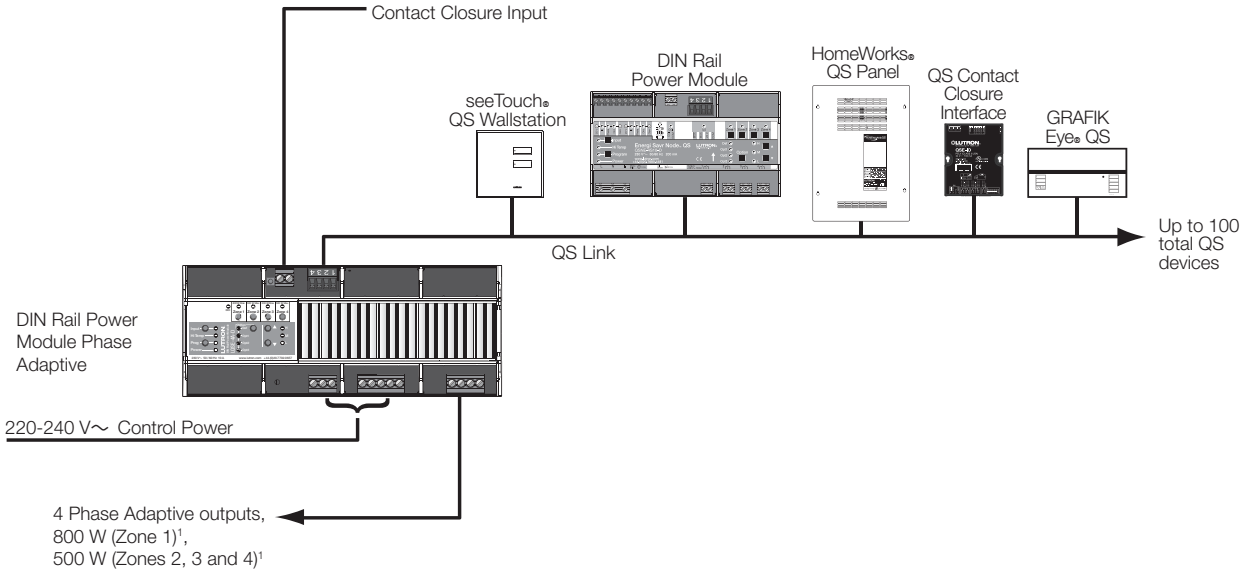


LQSE-4A-D

Features

- DIN Rail Power Modules can be used in a HomeWorks® QS system.
- Automatically selects leading edge or trailing edge dimming for incandescent/halogen, electronic/magnetic low voltage and neon/cold cathode light sources.
- Controls dimmable CFL/LED loads, contact Lutron® for compatibility with CFL/LED light sources.
- RTISS® technology ensures that each output dims smoothly and is flicker-free.
- Unit is 12 DIN modules (216 mm) wide.
- Provides air gap off (when all zones are off).
- Integral protection for common temporary overcurrent and over-voltage conditions.
- LEDs on front of unit provide diagnostic information.
- Includes QS link for seamless integration of lights and controls.

System Example



Notes:
1 See "Output Zone Ratings" in "Specifications" section, for specific load types ratings.

LUTRON® SPECIFICATION SUBMITTAL Page

Job Name:	Model Numbers:
Job Number:	

Out of Box Functionality

This section describes the default functionality when the unit is first installed.

Emergency Contact Closure Input (CCI)

- When the CCI is open, the DIN Rail Power Module will enter Emergency Mode, which will turn on all loads to their emergency level and disable control of local zones and QS devices.
- When the CCI is closed or jumpered, DIN Rail Power Module zones will return to the settings or levels they were at prior to entering Emergency Mode.
- CCI is local control only and cannot control other DIN Rail Power Module over the QS link. CCI on multiple DIN Rail Power Module may be connected to an Emergency or Manual override device in parallel if event is intended to affect multiple units.
- Emergency level is configurable for each zone.

Normal Mode Operation

- Zone and raise/lower buttons on the unit can be used to:
  —turn loads on and off.
  —dim loads up and down.

369-583b 3 01.31.12

Specifications

DIN Rail Power Module

Power

- 220-240 V~ 50/60 Hz
- Lightning strike protection meets ANSI/IEEE standard 62.31-1980. Can withstand voltage surges of up to 6 000 V and current surges of up to 3 000 A.

Standards

- IEC/EN 60669-2-1
- CE marked
- Lutron® Quality Systems registered to ISO 9001.2008

Environment

- Ambient Temperature Operating Range (inside mounting panel within 2 cm of unit): 0 ºC to 35 ºC
- Calibration point maximum: 70 ºC (see **Mounting** on page 4)
- Relative humidity: less than 90% non-condensing
- For indoor use only

Terminals

- Mains wiring: 1.2 N•m
  0.2-4 mm²
  (solid or stranded)
- Zone wiring: 1.2 N•m
  0.2-4 mm²
  (solid or stranded)
- CCI wiring: 0.5 N•m
  0.2-4 mm²
  (solid or stranded)
- QS Link: 0.5 N•m
  0.5-4 mm²
  (solid or stranded)

Mounting

- Use an IP20 (minimum) rated consumer panel or breaker panel with integrated DIN rail.
- Unit is 12 DIN modules (216 mm) wide.

Output Zone Ratings

- Automatically selects leading edge or trailing edge dimming or can also be manually configured for a specific load type.
- Patented RTISS® circuitry compensates in real time for incoming line frequency variations: up to ± 2% change in frequency/second.
- Internal relay provides an air gap off when all zones are off.
- Each zone has no minimum load requirement.
- Each zone is rated for the following load types[1, 2]:

Load Type	Zone 1 Rating	Zone 2, 3 and 4 Rating (per zone)
Incandescent/Halogen	800 W	500 W
Electronic Low Voltage	800 W	500 W
Magnetic Low Voltage	800 VA (600 W[3])	500 VA (375 W[3])
Neon/Cold Cathode	800 VA (600 W[3])	500 VA (375 W[3])

[1] Additional load type options are available in the HomeWorks® QS GUI, some may require an interface. Contact Lutron for details.
[2] Contact Lutron for compatibility with dimmable CFL/LED light sources.
[3] Actual lamp wattage

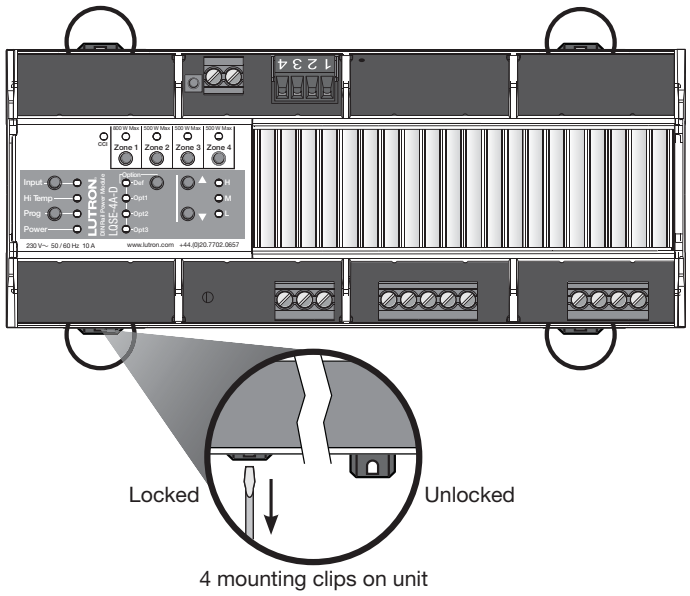
- One load type per zone.
- Output must be directly connected to the load. Load side switching is not recommended.
- Run a separate neutral for each load circuit. A common neutral connection is not recommended.
- Unit may be powered by Ground Fault Interrupter (GFI) or Residual Current Circuit Breaker with Overload (RCBO) protected circuit if required. Load circuit wiring (from breaker to unit to load) must be run in its own non-metallic conduit, or nuisance tripping may occur. Maximum 30.5 m (100 ft) between power module and load.

Job Name:	Model Numbers:
Job Number:	

369-583b 4 01.31.12

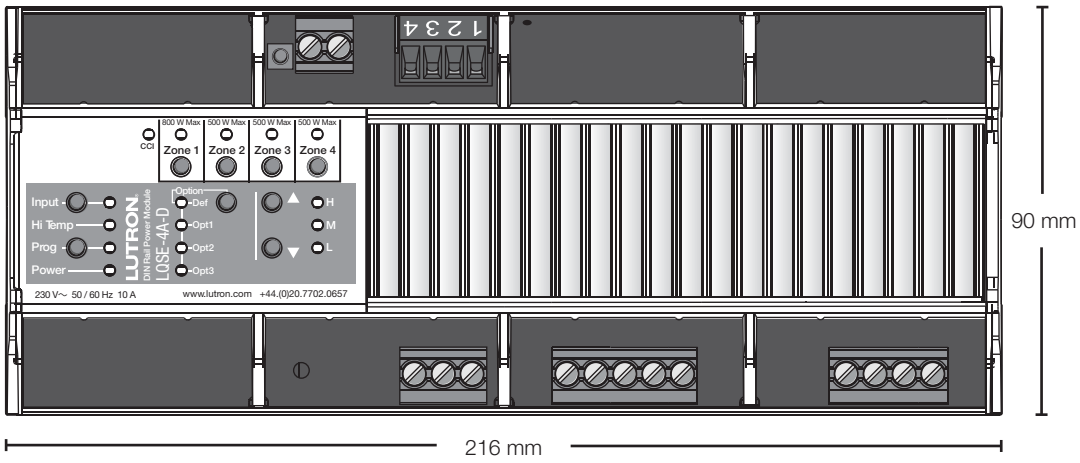
Mounting

- Mount in IP20 (minimum) rated consumer panel or breaker panel with integrated DIN rail.
- Mount unit in orientation shown.
- Unit may be mounted by unlocking the four mounting clips on the back of the unit. Clips must be locked once unit to securely attached the unit to the DIN rail.
- Mount in an accessible and serviceable location.
- Unit generates heat, maximum 75 BTUs/Hour
- Mount unit such that:
  - -Ambient Temperature Operating Range (inside mounting panel within 2 cm of unit): 0 ºC to 35 ºC
  - -Calibration point maximum: 70 ºC
  - -Derate unit or cool mounting panel as needed to maintain the above temperature requirements.

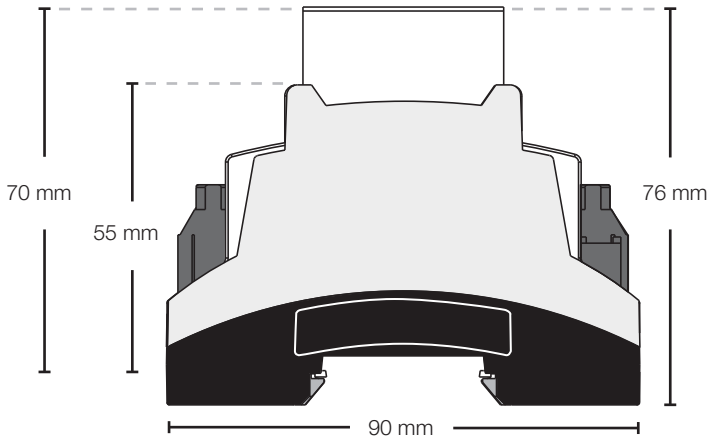


Mechanical Dimensions

Top View



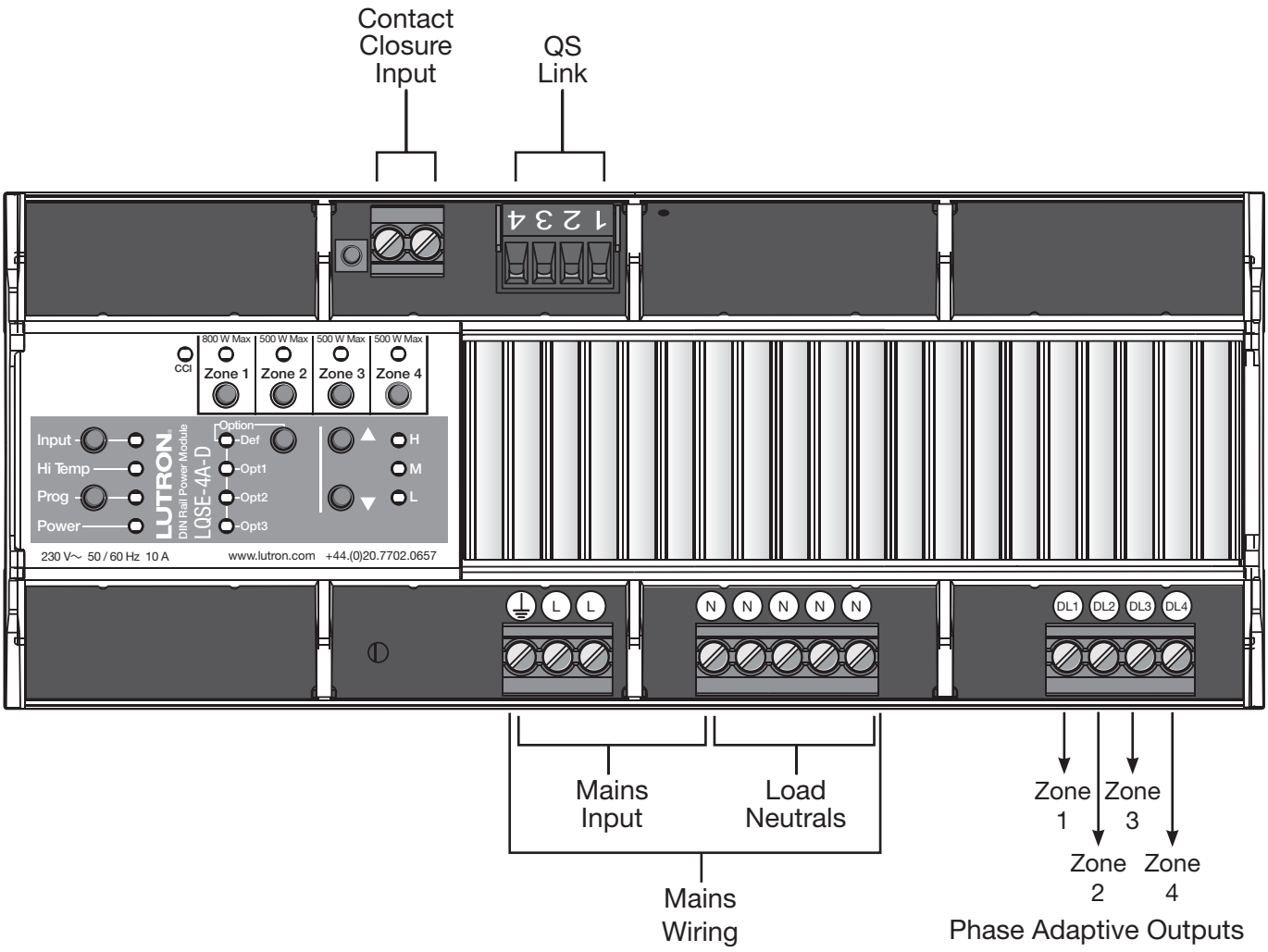
Side View



Job Name:	Model Numbers:
Job Number:	

Overview of Wiring Terminals

LQSE-4A-D

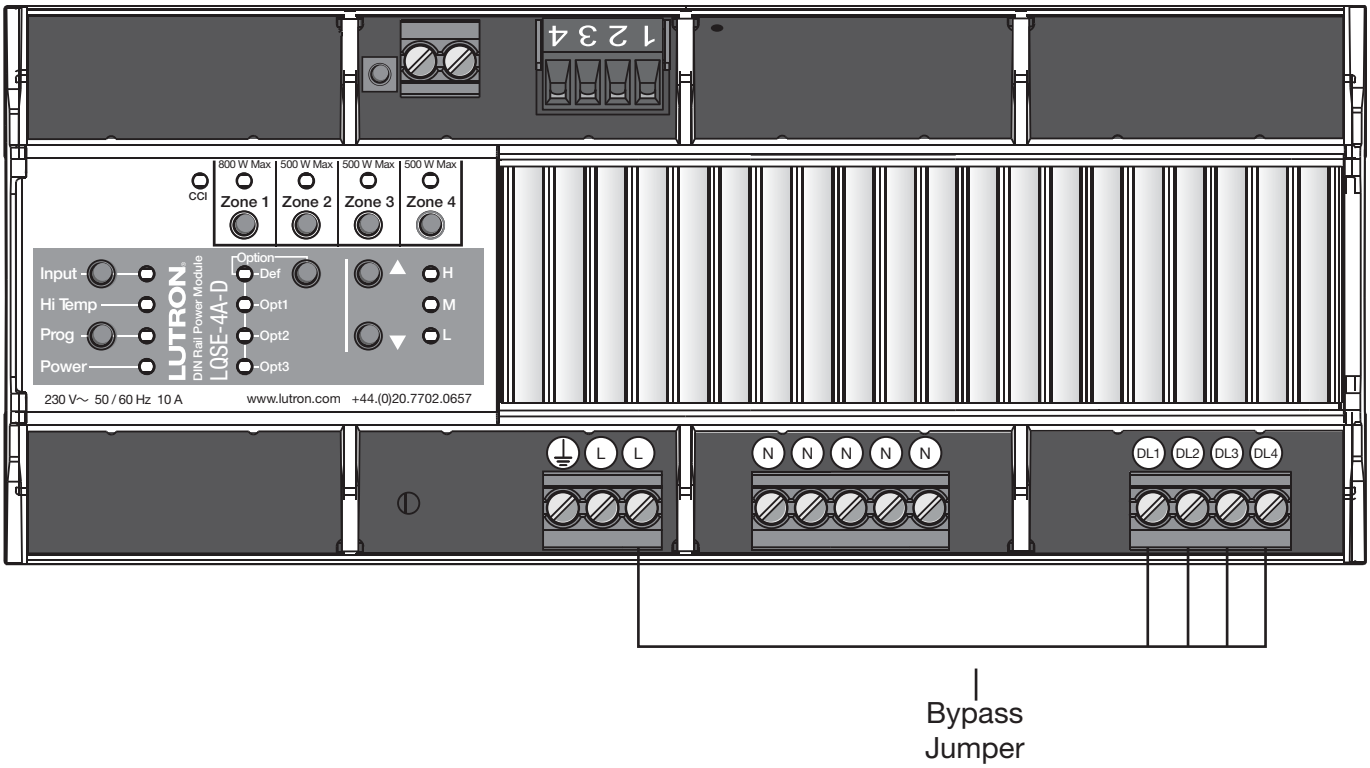


Job Name:	Model Numbers:
Job Number:	

Bypass Jumper

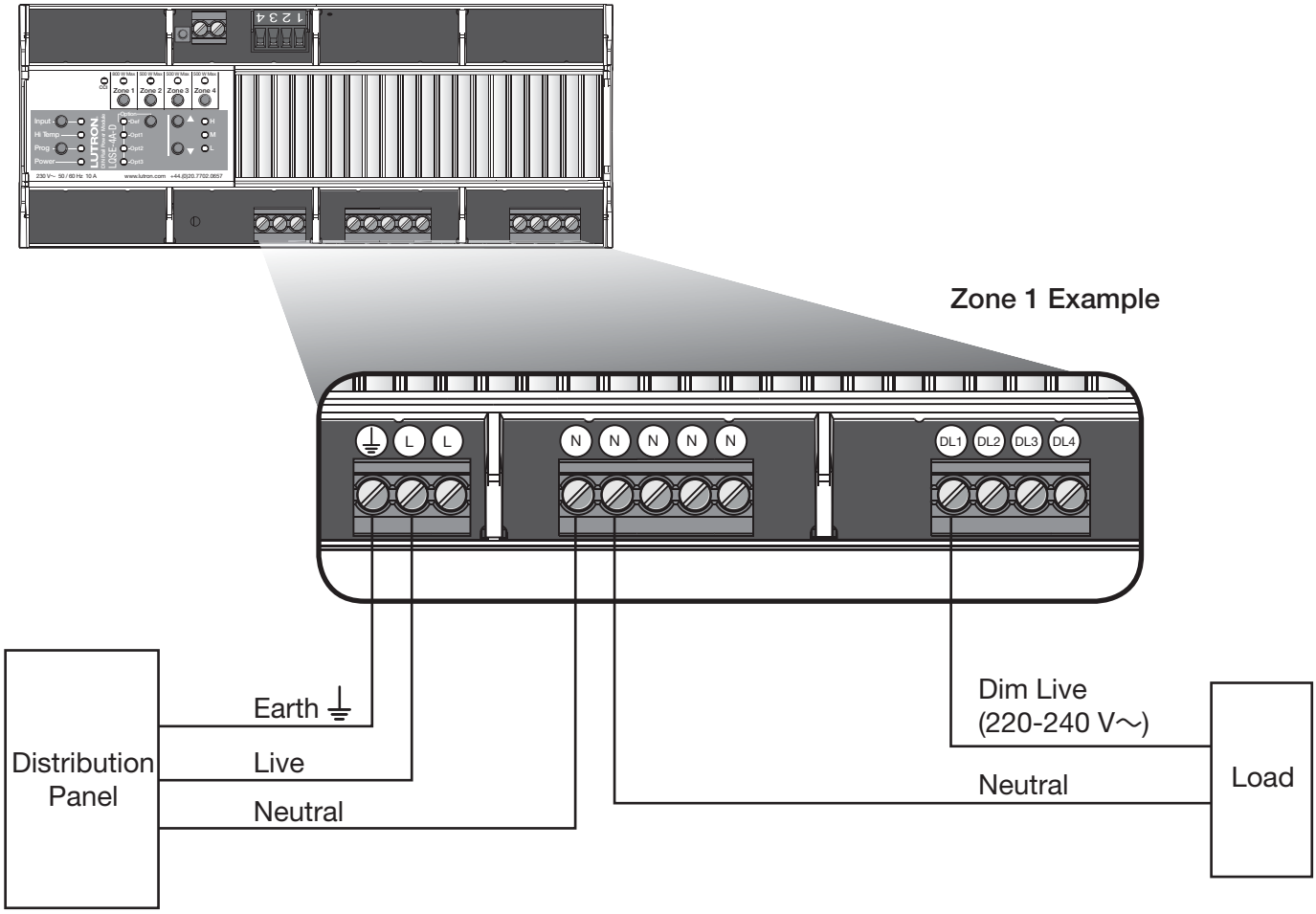
LQSE-4A-D

- Unit ships with bypass jumper pre-installed.
- Jumper should not be removed until load wiring is verified.



Job Name:	Model Numbers:
Job Number:	

Mains Voltage Wiring



Wiring from Distribution to DIN Rail Power Module

- Turn off all circuit breakers or isolators feeding the DIN Rail Power Module at distribution panel.
- Run live, neutral, and earth(⏚) wires from a 220-240 V~ 50/60 Hz feed to the DIN Rail Power Module unit.
- Run a separate neutral for each load circuit. A common neutral connection is not recommended.

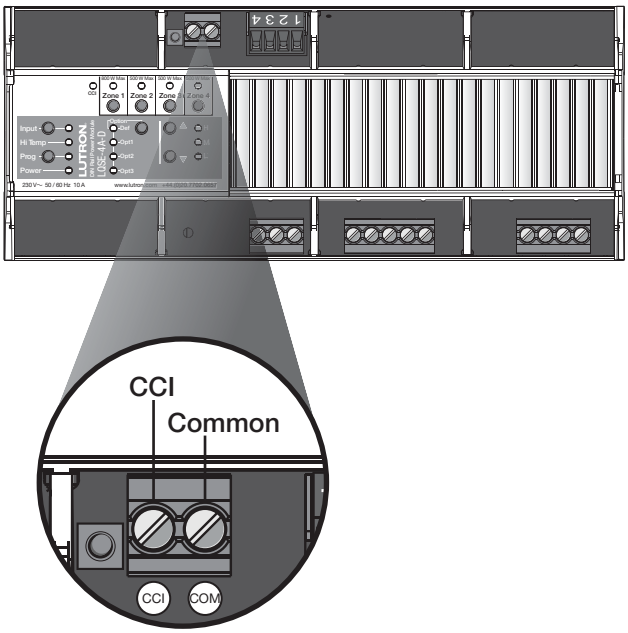
Mains Wiring and IEC PELV Separation

- Follow appropriate local and national codes to avoid violating required separation guidelines.

Job Name:	Model Numbers:
Job Number:	

369-583b 8 01.31.12

Wiring: Emergency Contact Closure Input



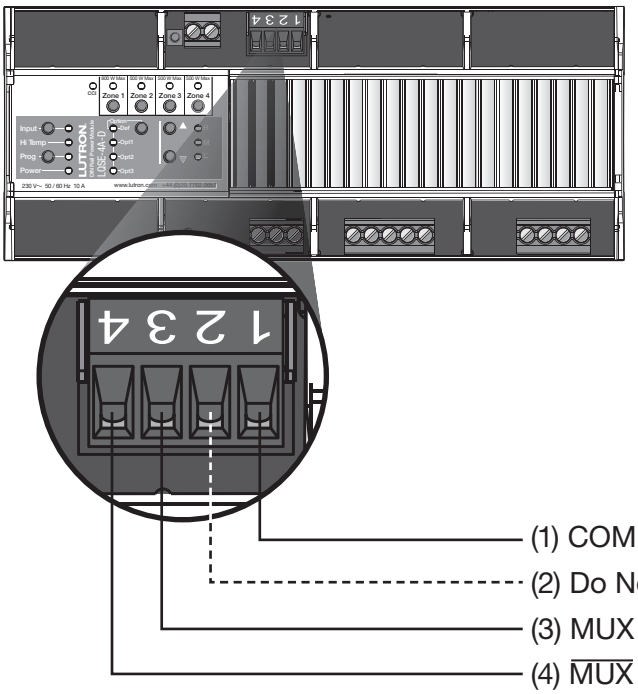
IEC PELV Emergency Contact Closure Input

- Contact Closure Input (CCI) wiring is IEC PELV. Follow all applicable national and local codes for proper circuit separation and protection.
- Turn off all breakers or isolators feeding the DIN Rail Power Module at distribution panel before servicing unit.
- When in emergency mode, all zone outputs will be at their programmed emergency light level (configurable to each zone, default is 100%). All sensors and controls are locked out.
- Emergency contact closure input is normally closed (NC). The DIN Rail Power Module is shipped with a jumper pre-installed.

Note: The DIN Rail Power Module will default to Emergency Mode if the CCI is left open. If no Emergency Contact Closure Input is required, please leave the wire jumper in the CCI terminals.

Job Name:	Model Numbers:
Job Number:	

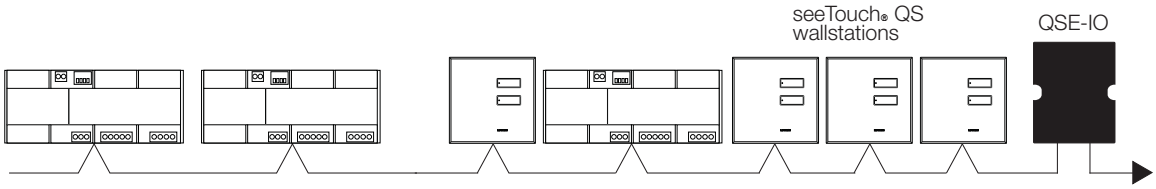
Wiring: QS Link



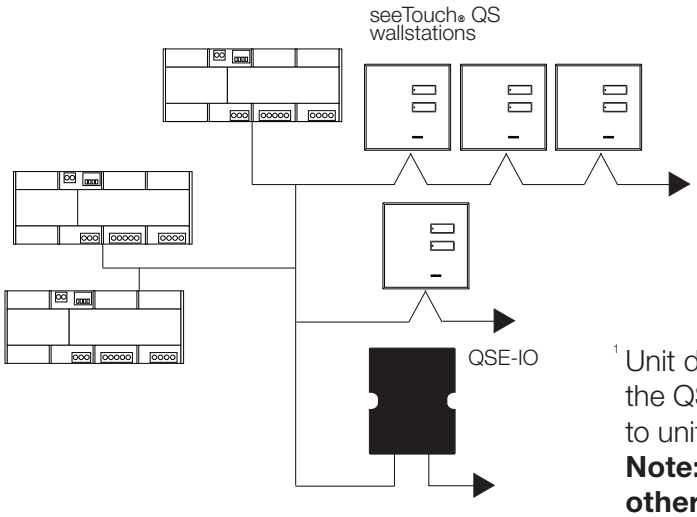
QS Link IEC PELV Wiring

- Link communicates using IEC PELV wiring.
- Turn off all breakers or isolators feeding the DIN Rail Power Module at distribution panel before servicing unit.
- Follow all applicable national and local codes for proper circuit separation and protection.
- Wiring may be daisy chained or t-tapped.
- Total length of QS link must not exceed 600 m.
- For lengths under 150 m, use two 1,0 mm² conductors for control power (24 V⎓, COM).
- For lengths over 150 m, use two 4,0 mm² conductors for control power (24 V⎓, COM).
- Use one, twisted-shielded pair of 1,0 mm² conductors for data link (MUX, $\overline{\text{MUX}}$).

Daisy-Chain Wiring Example



T-Tap Wiring Example



[1] Unit does not consume or supply PDUs on the QS link. Do not connect the 24 V⎓ wire to unit.

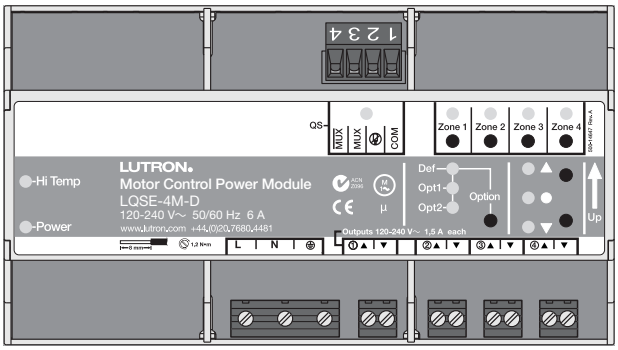
Note: 24 V⎓ wire must bypass the unit if other devices on the link consume PDUs.

Job Name:	Model Numbers:
Job Number:	

369614a 1 03.02.12

Motor Control Power Module

The Motor Control Power Module is an interface that provides seamless integration of HomeWorks® QS systems with AC blinds, shades, louvers, projection screens, or any compatible AC motor. It provides four (4) independently controllable AC raise/lower outputs from one common AC input feed.

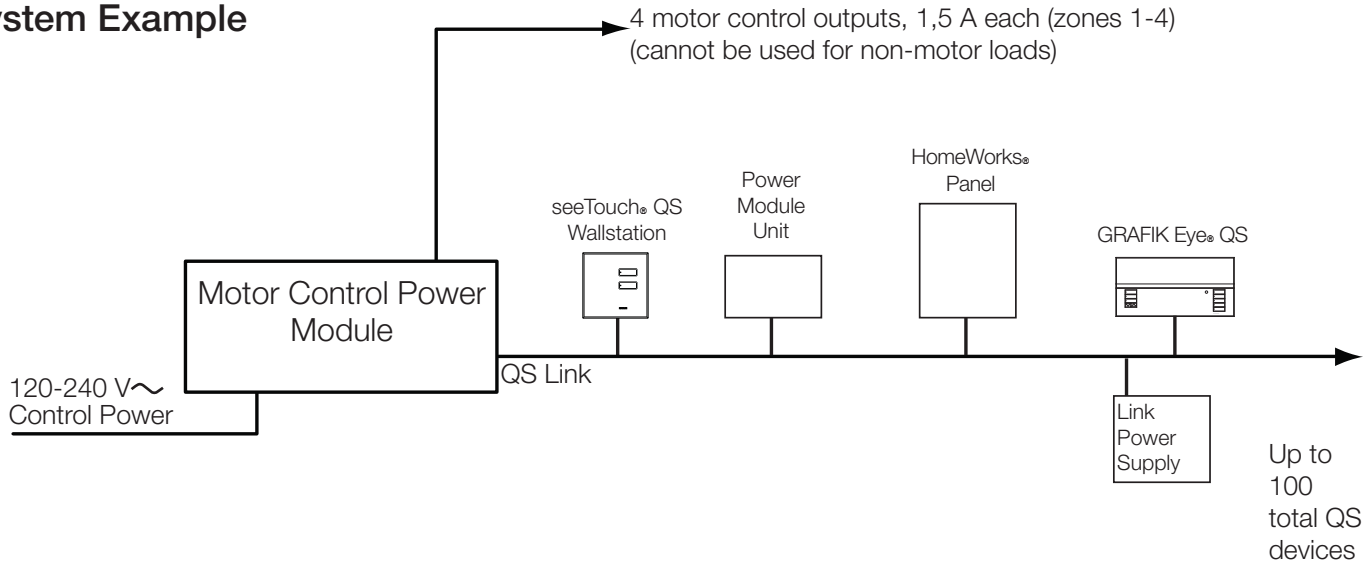


LQSE-4M-D

Features

In HomeWorks® QS systems, the Motor Control Power Module's high-voltage outputs for motor loads are fully programmable through the HomeWorks® system software.

System Example



LUTRON® SPECIFICATION SUBMITTAL Page

Job Name:	Model Numbers:
Job Number:	

Specifications

Input Power

- Input voltage: 120-240 V~ 50/60 Hz
- 6 A maximum total input current
- At standby (no motors being driven), power is less than 1 W.
- Lightning strike protection meets ANSI/IEEE standard 62.31-1980. Can withstand voltage surges of up to 6 000 V~ and current surges of up to 3 000 A.

Output Capacity

- 1,5 A maximum motor load per channel (not for lighting control)
- Each zone supports only one motor; do not wire motors in parallel
- Raise and Lower outputs are mechanically interlocked to prevent simultaneously activating Raise/Lower outputs.
- Designed to withstand 100 000 open/close cycles

Regulatory Requirements

- IEC/EN 60669-2-1, EN50428
- Lutron Quality Systems registered to ISO 9001.2008
- CE

Other Power Specifications

- Standby power:
  - 240 V~: 670 mW
  - 120 V~: 550 mW
- BTU/hour when fully loaded: 5

Environment

- Ambient temperature operating range (inside mounting panel): 0 ºC to 40 ºC (32 ºF to 104 ºF)
- Calibration point maximum: 65 ºC (149 ºF)
- Relative humidity: less than 90% non-condensing
- For indoor use only

Terminals

- Mains Wiring: 1,0 to 4,0 mm^2 (18 to 12 AWG)
- Zone Wiring: 1,0 to 4,0 mm^2 (18 to 12 AWG)
- QS Link Wiring: See Wiring: QS Link

Mounting

- Use an IP20 (minimum) rated consumer panel or breaker panel with integrated DIN rail
- Width = 9 modules (161,7 mm/6,4 in)

QS Link Limits

- A QS link can have up to 100 zones (outputs) and 100 devices.
- Each Motor Control Power Module counts as 4 zones (outputs) and 1 device on the QS link.
- The Motor Control Power Module (LQSE-4M-D) unit does not supply or consume power draw units. When using accessories (such as a keypad), an additional 24 V⎓ power supply or a link power supply must provide power and/or power draw units.
  For more information on Power Draw Units, see "Power Draw Units on the QS Link", Lutron PN 369405, at www.lutron.com/qs

Normal Mode Operation

- Zone Select button selects the desired zone; raise/lower buttons control the selected zone.
- Supports Open, Close, and Unaffected presets only; all other presets are ignored.
- Does not support shade groups or areas.
- Does not support discrete shade levels.
- Does not support scenes.

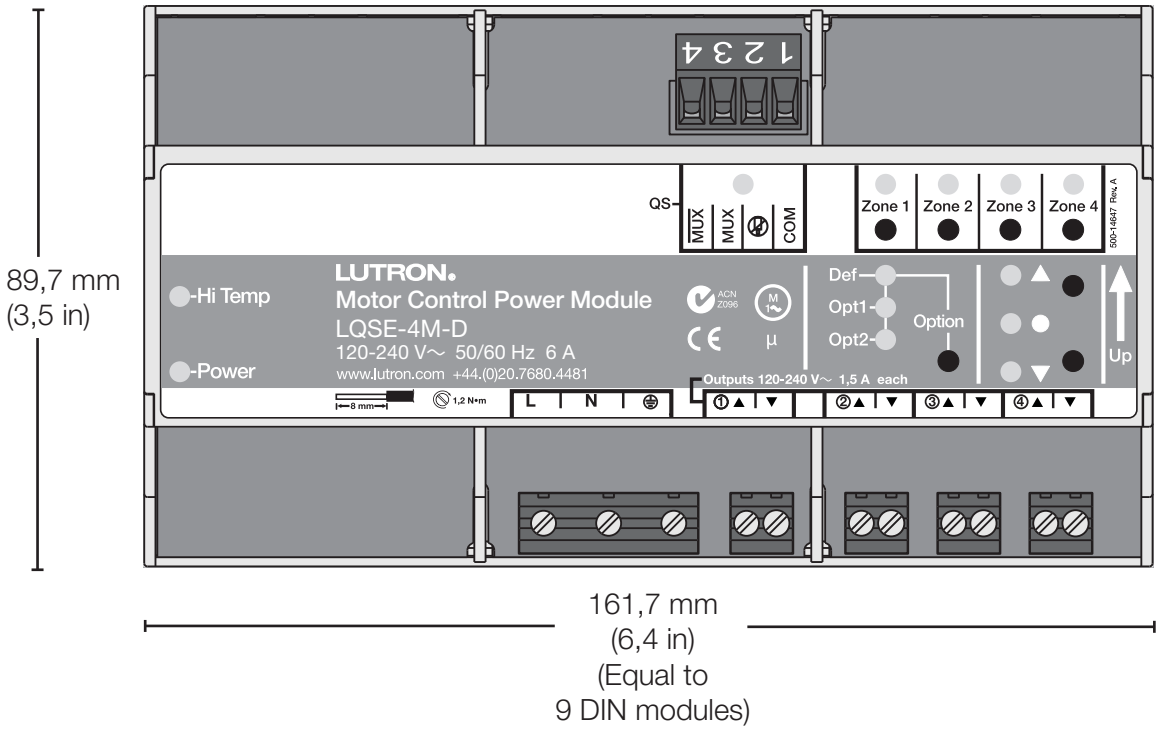
Configurable Parameters

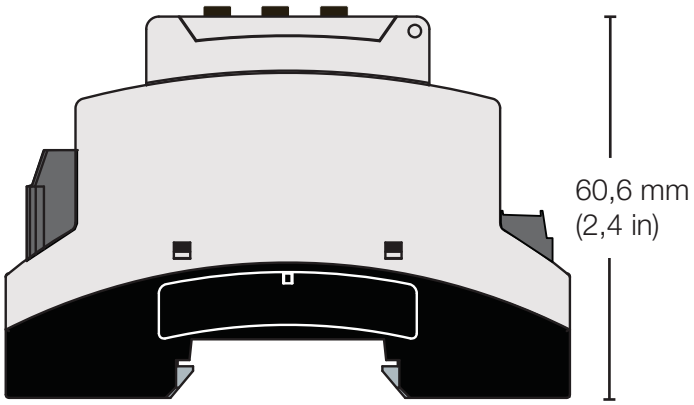
- Minimum On time (also called Jog Time): the minimum time for which the Raise/Lower relay will be turned on.
  Configurable from 80 ms to 3520 ms in 80 ms increments
  Default: 80 ms
- Interlock delay: the time both relays are de-energized while switching from Raise to Lower, or from Lower to Raise
  Configurable to 320 ms, 560 ms, or 960 ms
  Default: 320 ms
- Maximum On time (also called Travel Time or Time to Off): after this time, the relay is turned off as a precaution.
  Configurable from 10 seconds to 450 seconds in 10-seond increments
  Default: 80 seconds.

LUTRON® SPECIFICATION SUBMITTAL Page

Job Name:	Model Numbers:
Job Number:	

Mechanical Dimensions



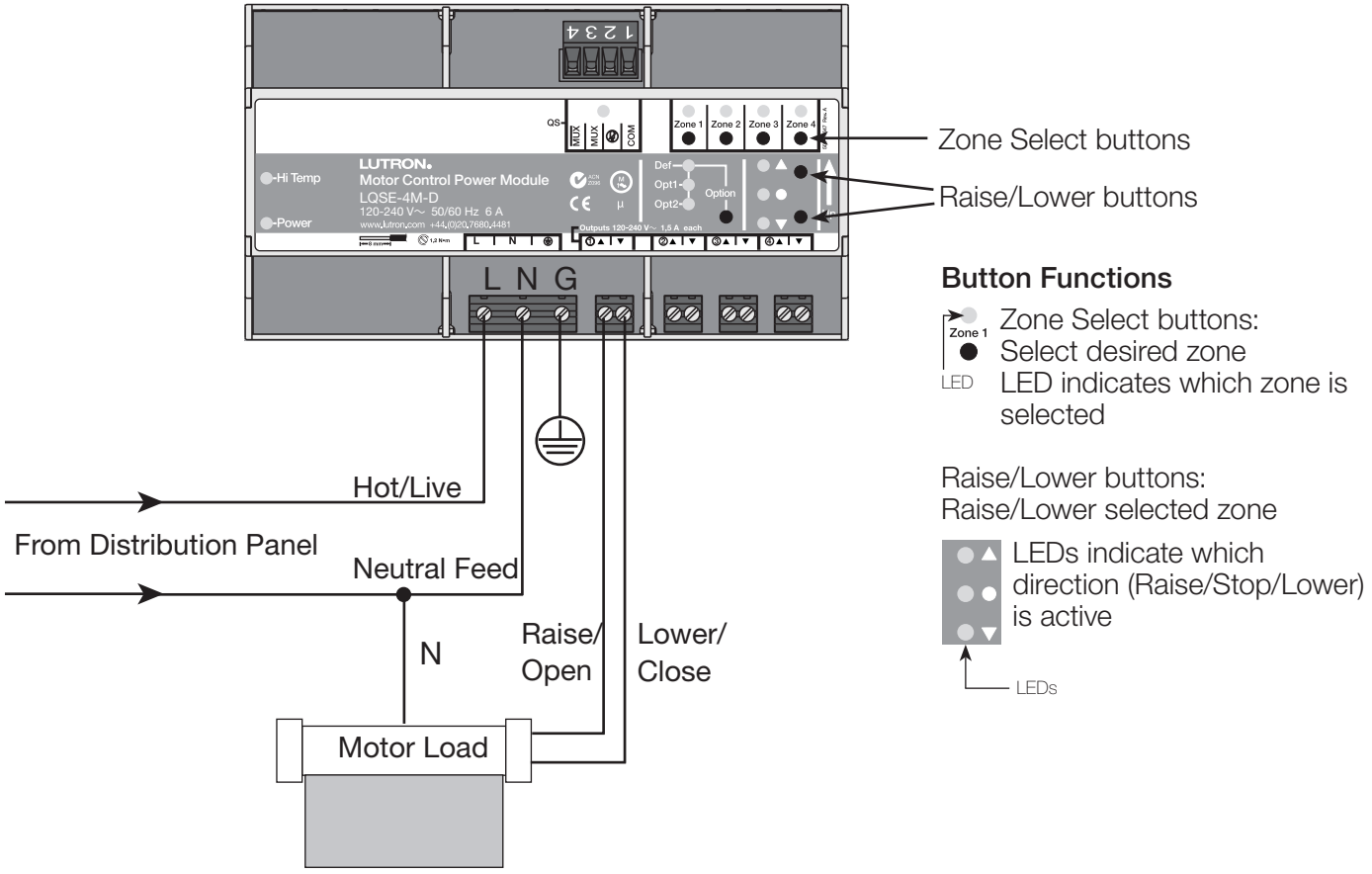


LUTRON® SPECIFICATION SUBMITTAL Page

Job Name:	Model Numbers:
Job Number:	

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Mains Voltage and Load Wiring



Button Functions

Zone 1
LED
Zone Select buttons:
Select desired zone
LED indicates which zone is selected

Raise/Lower buttons:
Raise/Lower selected zone

LEDs indicate which direction (Raise/Stop/Lower) is active

LEDs

Wiring from Distribution Panel to Motor Control Power Module

- Turn off all circuit breakers or isolators feeding the Motor Control Power Module unit at distribution panel.
- Run hot/live, neutral, and ground/earth (⏚) wires from a 120–240 V~ 50/60 Hz feed to the Motor Control Power Module.
- Follow appropriate local and national codes to avoid violating required separation guidelines between Mains wiring and IEC PELV/NEC® Class 2 wiring.

Note

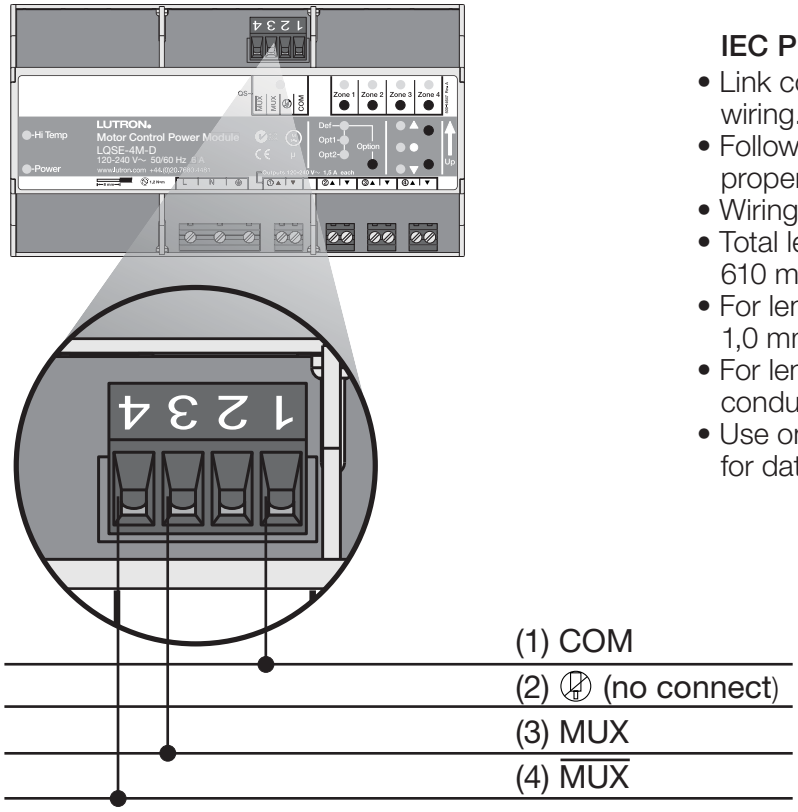
Before proceeding with the line voltage/mains wiring, set the upper/open and lower/close limits for each motor. Refer to the manufacturer's instructions for your specific motor.

LUTRON® SPECIFICATION SUBMITTAL Page

Job Name:	Model Numbers:
Job Number:	

369614a 5 03.02.12

Wiring: QS Link



IEC PELV/NEC® Class 2 QS Link Wiring

- Link communicates using IEC PELV/NEC® Class 2 wiring.
- Follow all applicable national and local codes for proper circuit separation and protection.
- Wiring may be daisy chained or t-tapped.
- Total length of QS link must not exceed 610 m (2 000 ft).
- For lengths under 150 m (500 ft), use 1,0 mm² (18 AWG) conductor for control power (COM).
- For lengths over 150 m (500 ft), use 4,0 mm² (12 AWG) conductor for control power (COM).
- Use one, twisted-shielded pair of 0,5 mm² (22 AWG) for data link (MUX, $\overline{\text{MUX}}$).

Wire Sizes (check compatibility in your area)

QS Link Wiring Length	Wire Gauge	Lutron Cable Part Number
Less than 150 m (500 ft)	Common (terminal 1) 1 1,0 mm² (18 AWG)	GRX-CBL-346S (non-plenum) GRX-PCBL-346S (plenum)
	Data (terminals 3 and 4) 1 twisted, shielded pair 0,5 mm² (22 AWG)	
150 to 610 m (500 to 2000 ft)	Common (terminal 1) 1 4,0 mm² (12 AWG)	GRX-CBL-46L (non-plenum) GRX-PCBL-46L (plenum)
	Data (terminals 3 and 4) 1 twisted, shielded pair 0,5 mm² (22 AWG)	

LUTRON® SPECIFICATION SUBMITTAL Page

Job Name:	Model Numbers:
Job Number:	

369-610a 1 02.17.12

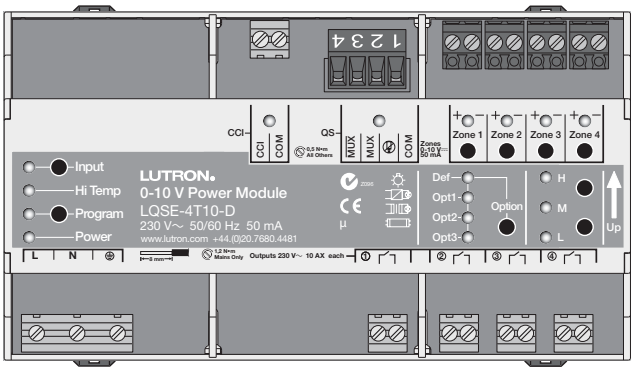
Power Module

The Power Module family is a group of modular products for the control of lighting loads. This document describes the following products:

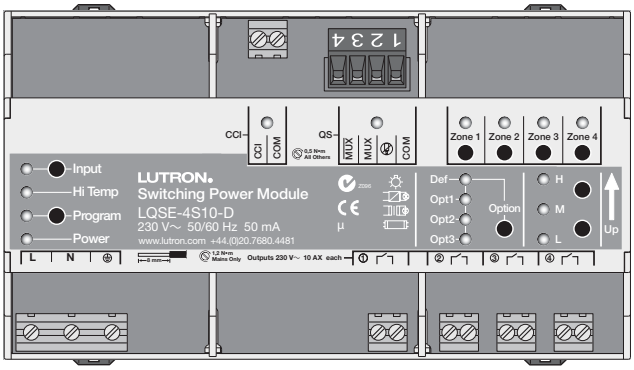
- Model Number: LQSE-4S10-D - Power Module unit for Switching only
- Model Number: LQSE-4T10-D - Power Module unit for 0-10 V/Switching

Features

- Includes QS link for seamless connection to a HomeWorks® QS system.
- Power Module units can be used in a HomeWorks® QS system to control and manage light in an entire home or building.

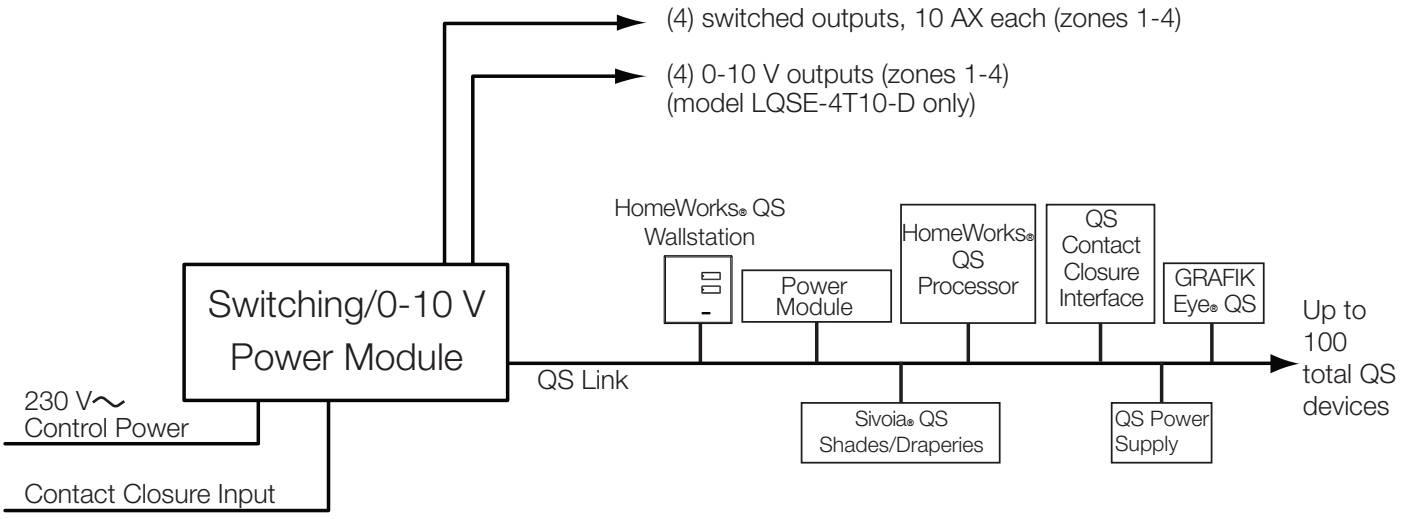


LQSE-4T10-D



LQSE-4S10-D

System Example



LUTRON® SPECIFICATION SUBMITTAL Page

Job Name:	Model Numbers:
Job Number:	

369-610a 2 02.17.12

Specifications

Power

- 230 V~ 50/60 Hz
- Lightning strike protection meets ANSI/IEEE standard 62.31-1980. Can withstand voltage surges of up to 6 000 V~ and current surges of up to 3 000 A.
- Current draw: 50 mA max
- Standby power : 1 W
- BTUs/hour when fully loaded: 4

Standards

- IEC/EN 60669-2-1, EN50428
- Lutron Quality Systems registered to ISO 9001:2008
- CE
- C-Tick

Environment

- Ambient Temperature Operating Range (inside mounting panel): 0 ºC to 40 ºC
- Calibration point maximum: 65 ºC
- Relative humidity: less than 90% non-condensing
- For indoor use only

Terminals

- Mains wiring: 0,5 mm^2 to 6,0 mm^2
- 0-10 V Wiring: 0,5 mm^2 to 2,5 mm^2
- CCI Wiring: 0,5 mm^2 to 6,0 mm^2
- Zone wiring: 0,5 mm^2 to 6,0 mm^2

Mounting

- Use an IP20 (minimum) rated consumer panel or breaker panel with integrated DIN rail
- Width = 9 modules (161,7 mm)

Output Zone Ratings

- Each zone is rated at 10 AX for switching. Rated for resistive, capacitive, or inductive lighting loads as defined by IEC/EN 60669-2-1.
- Switched outputs utilize latching relays to maintain relay state if control power is lost.
- 0-10 V rated for 50 mA maximum output, source or sink per zone.

HomeWorks® QS Wallstations

- HomeWorks® QS wallstations can be configured to control Power Modules with the HomeWorks® QS programming utility.
- LED indicator displays the status of programmed lights.

QS Link Limits

- A QS link in a HomeWorks® QS system can have up to 512 zones (outputs) and 100 devices.
- Each Power Module counts as one device toward the 100 device limit.

Manual Mode Operation

- Zone buttons:
  - — selects zone to control
- Raise/Lower buttons:
  - — turns loads on and off
  - — dim loads up and down (LQSE-4T10-D only)

NOTE: Program, Input, and Option buttons are not used in LQSE models.

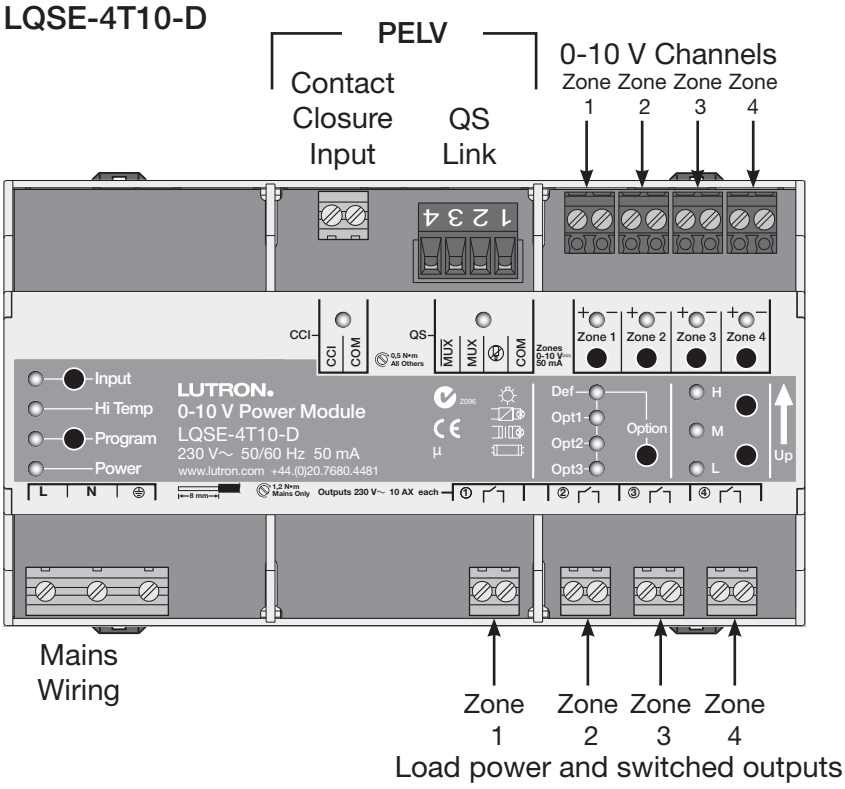
Contact Closure Input (CCI)

- The CCI behaves as a Manual Override Closure Input.
- If the CCI is open, the Power Module unit will enter Manual Override Mode, which will turn on all loads and disable control from other devices.
- When the CCI is closed or jumpered (factory default), Power Module unit zones will return to the settings or levels they were at prior to entering Manual Override Mode.

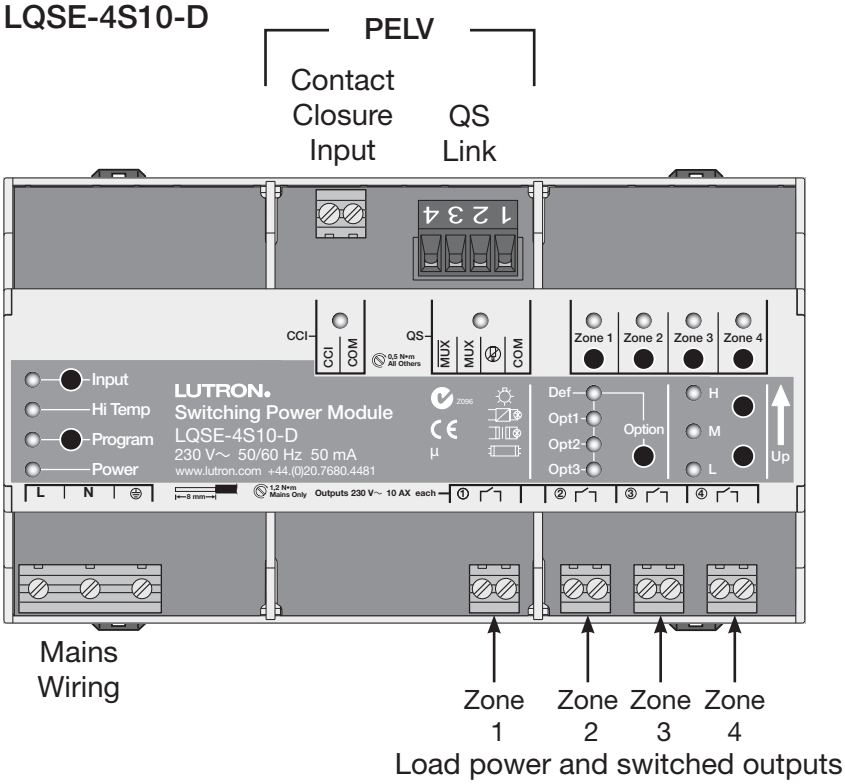
Job Name:	Model Numbers:
Job Number:	

Overview of Wiring Terminals

LQSE-4T10-D



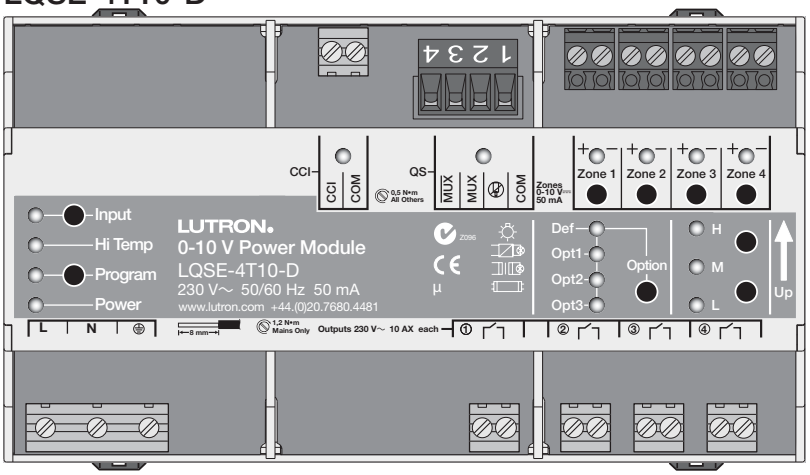
LQSE-4S10-D



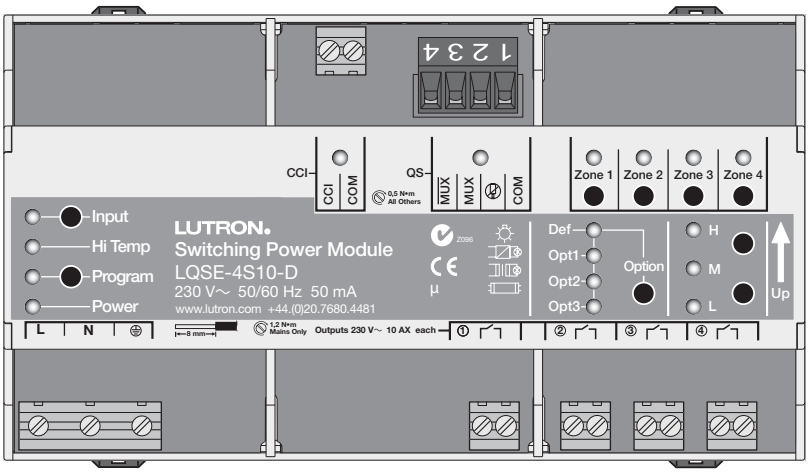
Job Name:	Model Numbers:
Job Number:	

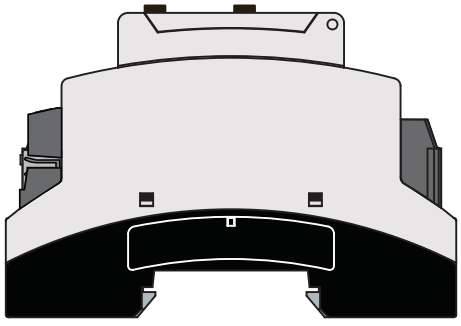
Mechanical Dimensions

LQSE-4T10-D



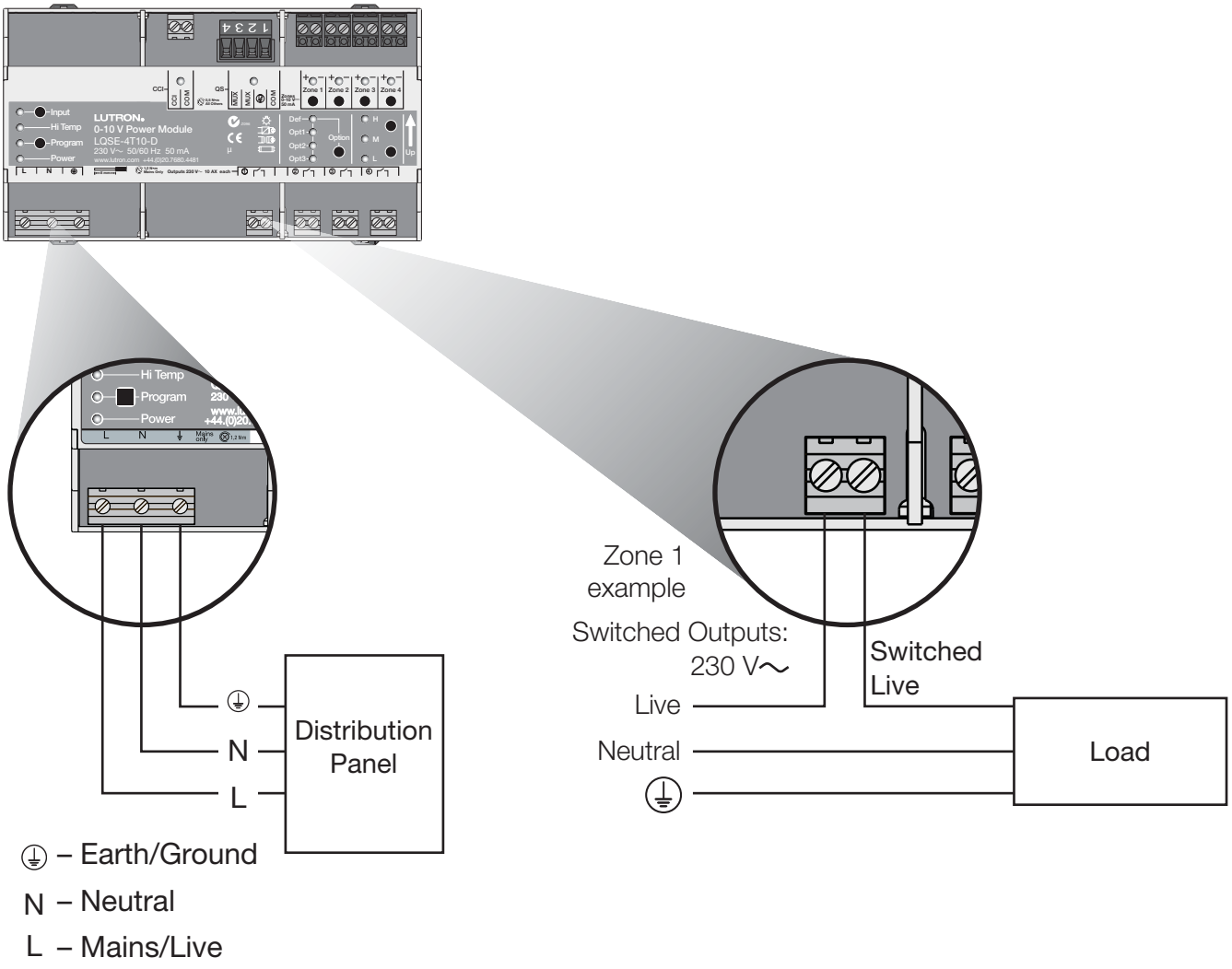
LQSE-4S10-D





Job Name:	Model Numbers:
Job Number:	

Mains Voltage Wiring



Wiring from Distribution to Power Module unit

- Turn off all circuit breakers or isolators feeding the Power Module unit at distribution panel.
- Run live, neutral, and earth (⏚) wires from a 230 V~ 50/60 Hz feed to the Power Module unit.

Mains Wiring and PELV Separation

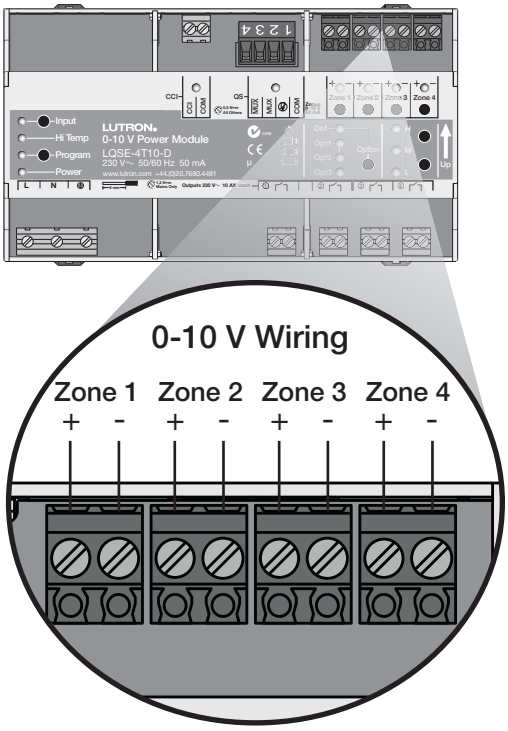
- Follow appropriate local and national codes to avoid violating required separation guidelines.

Behavior During Power Failure

- Relays do not change state when power is lost to the L/N/⏚ terminals. Follow local and national codes for emergency lighting requirements.

Job Name:	Model Numbers:
Job Number:	

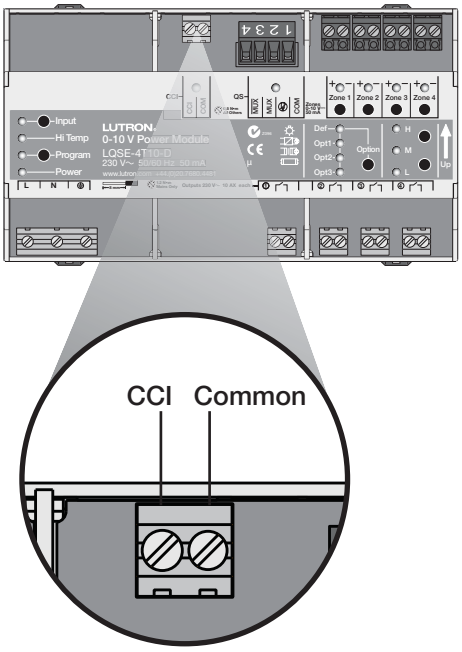
Wiring: 0-10 V



0-10 V Wiring
(LQSE-4T10-D only)

- 0-10 V zones 1-4 are double-insulated from all other inputs and outputs.
- 0-10 V zones 1-4 are not insulated from each other. They share the same common (negative "–" terminal).
- Connect only SELV/PELV circuits, or connect only non-SELV/PELV circuits to 0-10 V zones 1-4. Do not mix SELV/PELV circuits and non-SELV/PELV circuits.
- Follow all national and local electrical codes for separation requirements.

Wiring: Manual Override Contact Closure Input

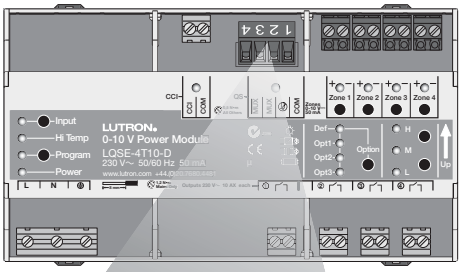


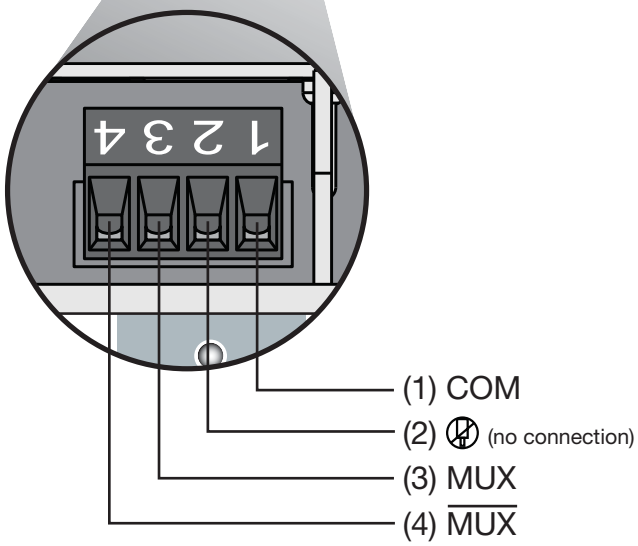
PELV Manual Override Contact Closure Input

- Contact Closure Input (CCI) wiring is PELV. Follow all applicable national and local codes for proper circuit separation and protection.
- When in Manual Override mode, all ballasts and modules will be at their programmed Manual Override light level (default is 100%). All other controls are locked out.
- Manual Override contact closure input is normally closed (NC). The Power Module unit is shipped with a jumper pre-installed.

Note: The Power Module unit will default to Manual Override Mode if the CCI is left open. If no Manual Override contact input is required, please leave the wire jumper in the CCI terminals.

Wiring: QS Link





IEC PELV QS Link Wiring

- Link communicates using IEC PELV wiring.
- Follow all applicable national and local codes for proper circuit separation and protection.
- Wiring may be daisy chained or t-tapped.
- Total length of QS link must not exceed 600 m.
- Wire Gauge:
  - Power (terminals 1 and 2): 1 pair 1,0 mm^2
  - Data (terminals 3 and 4): 1 pair 0,5 mm^2 to 1,0 mm^2, twisted and shielded.
  - Can use Lutron cable GRX-CBL-346S-500
- Do NOT connect terminal 2.

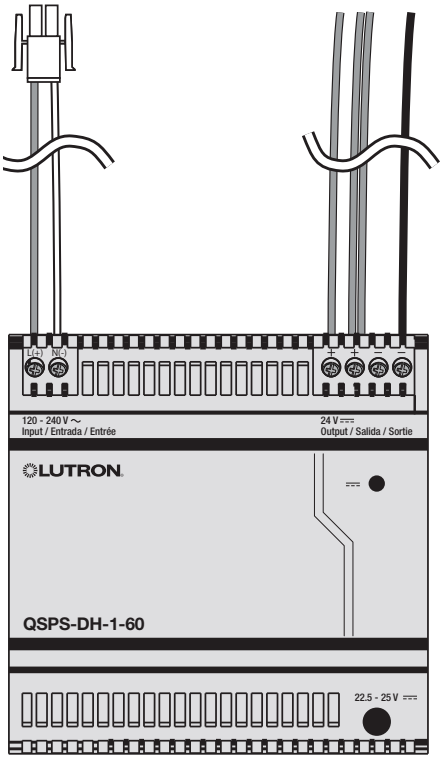
Power Supplies

HomeWorks QS Power Supply

The *HomeWorks* QS Power Supply provides power to the *HomeWorks* QS processor as well as system devices and interfaces.

Featuring easy assembly on a DIN rail, the power supply unit delivers 24 V⎓ output voltage and conforms with UL1310 for IEC PELV / NEC® Class 2 applications.

Use the *HomeWorks* QS design utility and power draw documentation for power management details.



HomeWorks QS Power Supply
(QSPS-DH-1-60)

Model Number

QSPS-DH-1-60	*HomeWorks* QS Power Supply

HomeWorks QS Power Supply

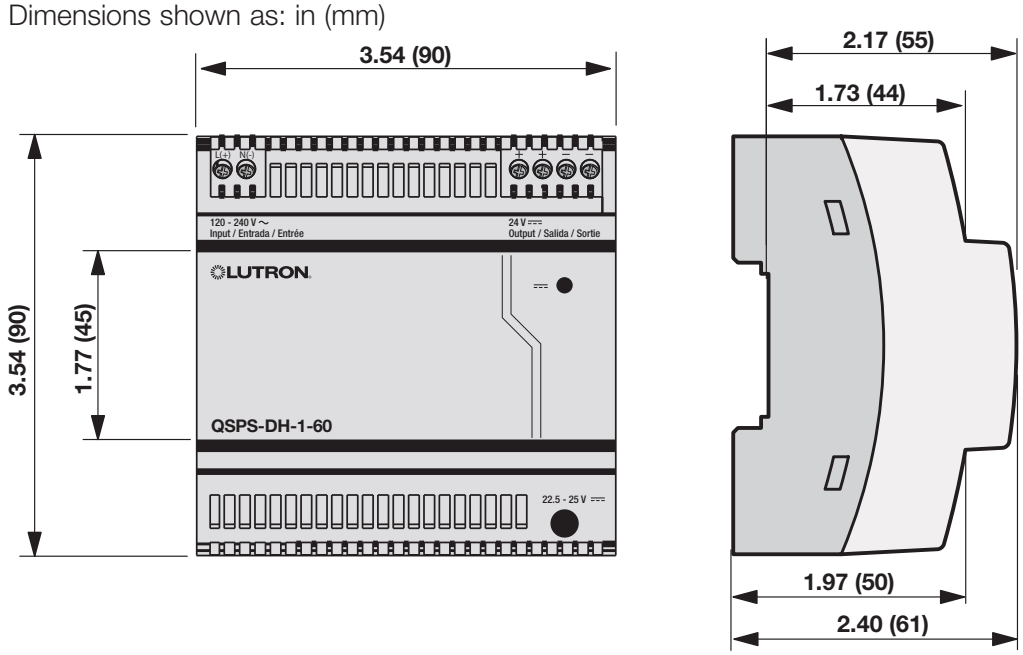
Specifications

Model Number	QSPS-DH-1-60
Power	**Input:** 100 V~ to 240 V~ 50 Hz to 60 Hz 0.7 A **Output:** 24 V⎓ 2.5 A **Power Draw Units* (PDUs):** supplies 75 * For more information about Power Draw Units (PDUs), please see the *HomeWorks® QS Wiring and Power Guidelines* document on the *HomeWorks* QS Resource Web Site
Environment	Ambient operating temperature: 32 °F to 131 °F (0 °C to 55 °C) . Ambient operating humidity: 0% to 90% humidity, non-condensing. Indoor use only.
Mounting	Mount using 1.38 in (35 mm) DIN rail.
Dimensions	3.54 in (90 mm) x 3.54 in (90 mm) x 2.40 in (61 mm)
Warranty	8 Year Limited Warranty. http://www.lutron.com/resiinfo
Regulatory Approvals	UL/cUL listed UL508, IEC PELV / NEC® Class 2 as per UL1310
Industrial Control Panel Supply	UL508
Class 2	UL1310
European Regulations	CE
Radiated Interference	EN 55011 Class B EN 55022
Conducted Radio Interferance	EN 55011 Class B EN 55022
Electrical Equipment for Machinery	EN 60204
Safety Transformers for Power Supply Units	IEC 61558-2-17
Electronic Equipment for Use in Electrical Power Installations	EN 50178/VDE 0160 (PELV)
SELV	IEC 60950 (SELV) and EN 60204 (PELV)
Safe Isolation	DIN VDE 0100-410 DIN VDE 0106-1010
Protection Against Electric Shock	DIN 57100-410 DIN VDE 0106-101
Limitation of Mains Harmonic Currents	EN 61000-3-2

HomeWorks QS Power Supply

Dimensions

Dimensions shown as: in (mm)



Mounting

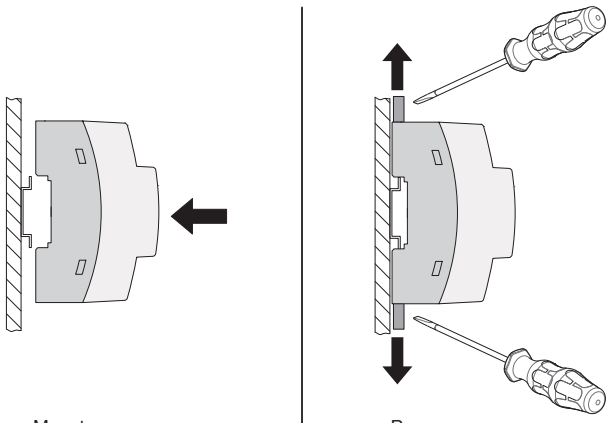
- The power supply can be snapped onto any DIN rail in accordance with EN 60715. The device must be mounted horizontally (connection terminal blocks on top).

Mount

To mount on a DIN rail, snap the device straight onto the DIN rail.

Remove

To remove from the DIN rail, pull the orange base latch outward then remove the device from the DIN rail.



Mount
Montaje
Monter
Instale

Remove
Retire
Retirez
Retire

HomeWorks QS Power Supply

Installation

NOTICE: The power supply unit is suitable for use in *HomeWorks* QS enclosures and applications ONLY.

NOTICE: Damage will result if this product is used with previous generations of *HomeWorks* products.

- Must be installed by a qualified individual in accordance with all applicable regulations.

  WARNING: Shock Hazard. Wiring with power ON could result in serious injury or death. To avoid the risk of electric shock locate and remove fuse or lock circuit breaker in the OFF position before installing or servicing equipment.

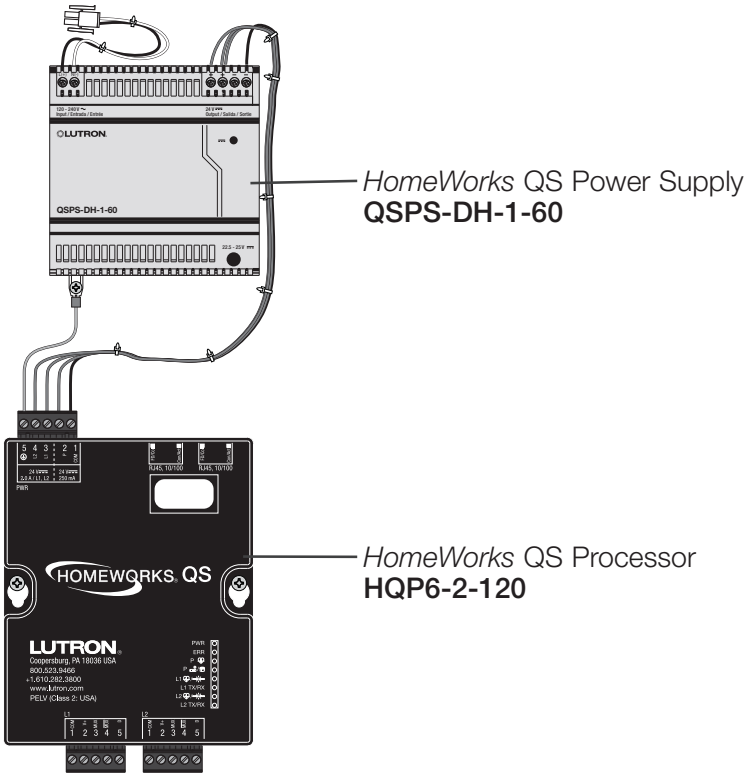
- Mount the Power Supply in a *HomeWorks* QS enclosure.

  NOTICE: The Power Supply is intended for indoor use only. Operate between 32 °F and 131 °F (0 °C and 55 °C), 0% to 90% humidity, non-condensing.

  NOTICE: This equipment is air-cooled. Mount in a location where the vented cover will not be blocked, minimum 1.18 in (30 mm) above and below is required to reduce the risk of overheating and possible damage to equipment. Failure to provide adequate space for cooling may result in overheating and void the warranty.

- Connect the input harness for the power supply into appropriate terminal blocks. Attach output harness to appropriate terminals for the connected device.
- Verify all connections before turning on power.

Wiring Diagram



HomeWorks QS Power Supply
QSPS-DH-1-60

HomeWorks QS Processor
HQP6-2-120

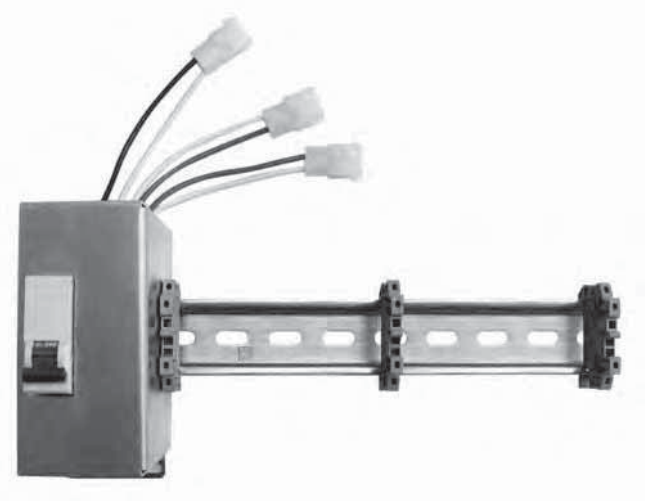
Example above shows wiring connection from the *HomeWorks* QS Power Supply **(QSPS-DH-1-60)** to a *HomeWorks* QS Processor **(HQP6-2-120)**

HomeWorks® QS PowerKit

The HomeWorks® QS PowerKit is necessary for installations that require the mounting of up to 2 HomeWorks® QS Processors (HQP6-2) in HWI-PNL-8 or HWI-PNL-8-CE.

The HomeWorks® QS PowerKit provides a simple power connection method and has an Input Power Switch that can be used to easily remove power to the HomeWorks® QS Power Supply units and the equipment they feed.

The PowerKit provides a mounting method for HomeWorks® QS Power Supply units (QSPS-DH-1-60), which are required to power the HomeWorks® QS Processors and provide link power for devices.



HomeWorks® QS PowerKit
(PNL-8-PWRKIT)

Model Number

PNL-8-PWRKIT	HomeWorks® QS PowerKit

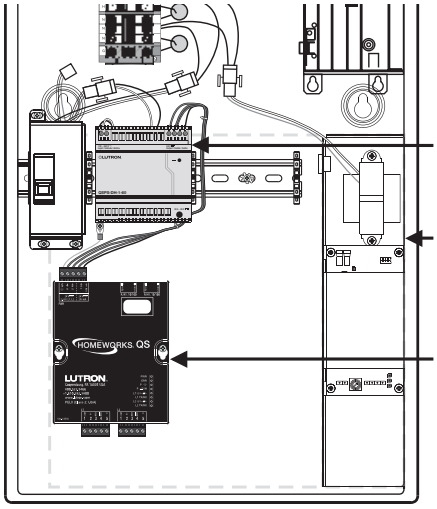
HomeWorks® QS PowerKit

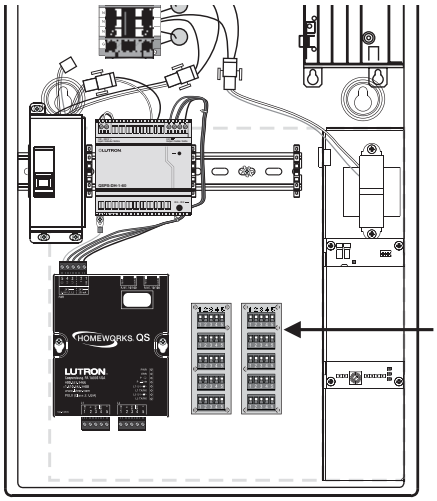
Specifications

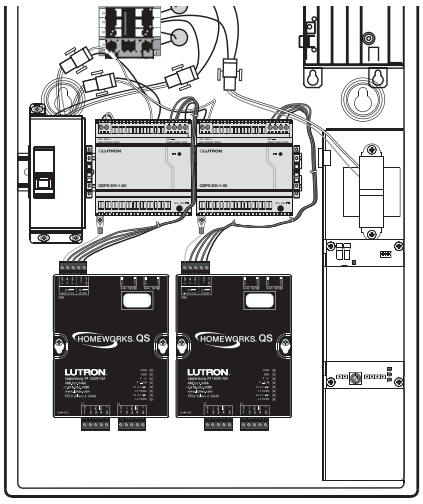
Model Number	PNL-8-PWRKIT
Power	120-240 V~ 50/60 Hz 2A
Capacity	Can accommodate up to two HomeWorks® QS Power Supply units (QSPS-DH-1-60)
Environment	Ambient operating temperature: 32 °F and 104 °F (0 °C and 40 °C). Ambient operating humidity: 0% to 90% humidity, non-condensing. Indoor use only.
Mounting	Mount in HWI-PNL-8 or HWI-PNL-8-CE using screws and washers provided
Connections	One Power Harness (quick connect to HWI-PNL-8) Two Supply Harnesses (quick connect to HomeWorks® QS Power Supply units)
Warranty	8 Year Limited Warranty. http://www.lutron.com/TechnicalDocumentLibrary/HomeWorks_Warranty.pdf

HomeWorks® QS PowerKit

Configuration Examples





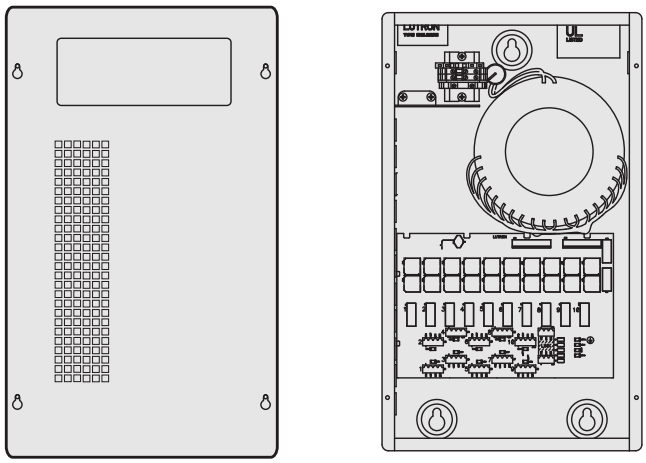


086-101 REV B 1 03.26.09

Sivoia QS | 230V Smart Panel power supply

The Sivoia QS Smart Panel power supply (QSPS-P2-10-60) is a 24 V⎓ hardwired power supply that is used with Lutron® QS lighting or shading devices. QSPS-P2-10-60 simplifies the wiring and organizes installations that require multiple power supplies. Each panel contains ten 30 W (60 W peak) power supplies, designed for use with Lutron QS lighting and shading devices.

QSPS-P2-10-60 is designed to be hardwired into a standard 230 V~ circuit. The panel contains fuses on each output to protect the device in the event of a miswire.



QSPS-P2-10-60
10 output Smart Panel power supply

Features

- 24 V⎓ supply that provides power to shades, drapery drive units, keypads, and accessories
- Simple wiring scheme uses 4-conductor low voltage link to provide power and communication for both QS electronic drive units (EDUs) and seeTouch QS keypads
- Flexible wiring topology for easy installation and integration
- 10 output panel provides power for 10 to 30 shades based on shade dimensions
- Smart diagnostics reduce installation time and system verification
- Confirms system communication and facilitates system installation
- Provides easy system testing with manual override buttons for shades and lighting

Job Name:	Model Numbers:
Job Number:	

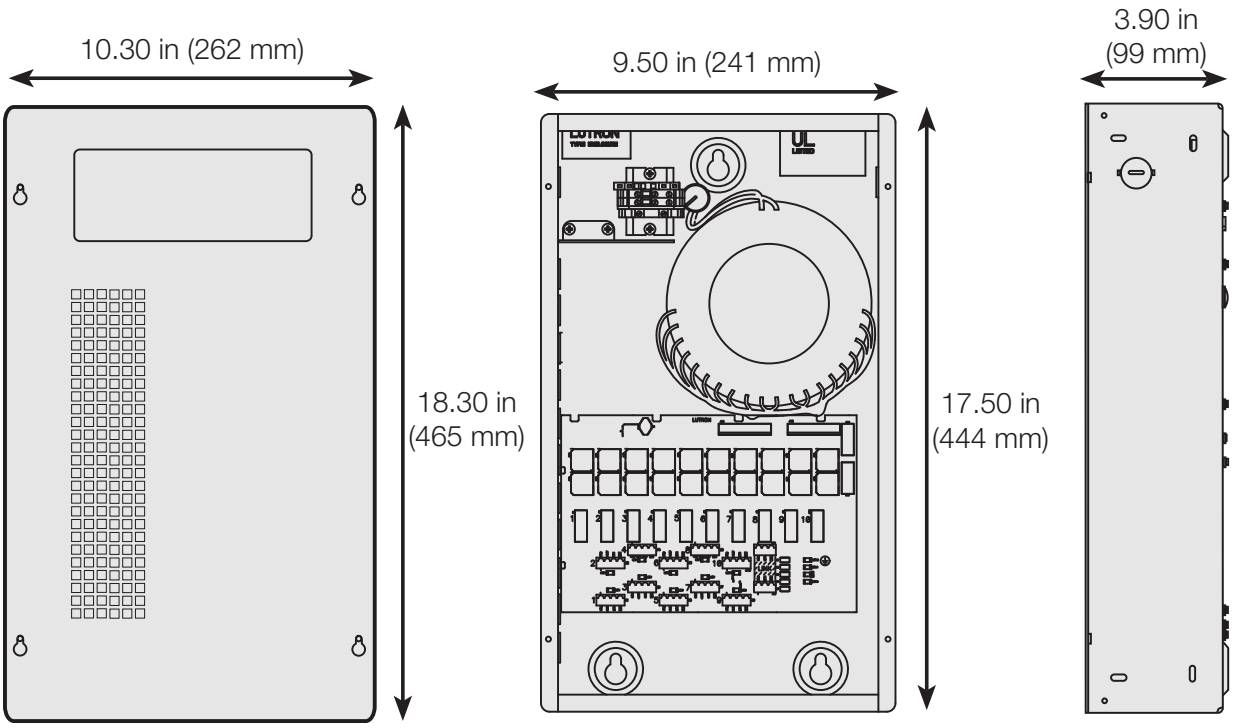
Specifications

Input Voltage	230 V~
Input current per QSPS-P2-10-60	4A/Panel Note: use only high magnetic breakers
Output Voltage	24 V⎓
Output Current	2.5 A
Operating Frequency	50/60 Hz
ESD Protection	(+/-) 16kV
Miswire Protection	Fuse on each output 2 spares included (5x20mm, 2.5 A fuse)
Wiring	Input wires to 230 V~ supply, output wires to Lutron QS lighting or shading devices
Wiring type	Input wires: 10-14 AWG (6-2.5 mm^2) stranded
	Output wires: 4 conductor 12-26 AWG (4-0.15 mm^2) stranded, twisted/shielded
Connections	Terminal blocks
Maximum QSPS-P2-10-60	2 panels per dedicated 10 A circuit
Maximum QSPS-P2-10-60	2 panels per dedicated 10 A circuit
Maximum feed breaker size	30 A
Weight	25 lbs (11.3 kg)
Regulatory Approvals	CE

Job Name:	Model Numbers:
Job Number:	

Dimensions

QSPS-P2-10-60



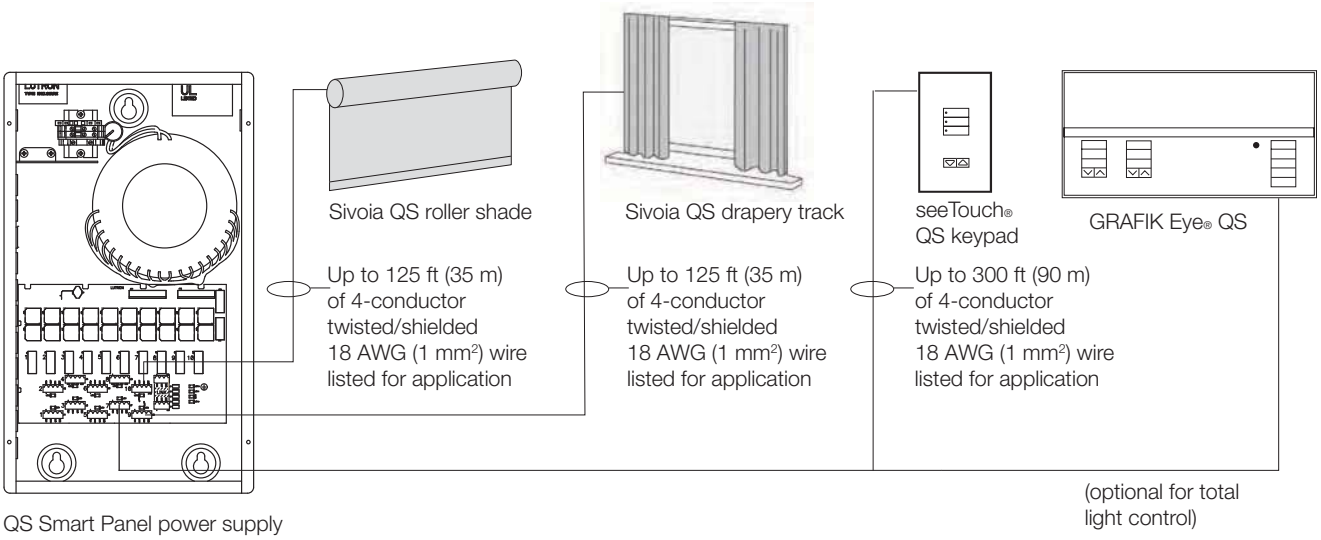
with cover

without cover

Job Name:	Model Numbers:
Job Number:	

086-101 REV B 4 03.26.09

System Wiring Overview: QS Smart Panel Power Supply



- Maximum 100 devices (Sivoia QS shades / drapery drive units, seeTouch QS keypads, GRAFIK Eye QS main units, and QS power supplies) per link
- Maximum 100 zones (Sivoia QS shades / drapery drive units and GRAFIK Eye QS lighting zones)

Job Name:	Model Numbers:
Job Number:	

QS Link Wiring

Link Rules

The following Link rules must be observed for proper operation.

- Maximum of 100 devices (such as a GRAFIK Eye® QS, seeTouch® QS keypad, smart panel power supply [QSPS-P2-10-60], or Sivoia® QS shade / drapery drive unit)
- Maximum of 100 zones - such as a Sivoia QS shade / drapery drive unit, or a lighting zone on a GRAFIK Eye QS
- Maximum 2000 ft (600 m) of cable connecting all QSPS-P2-10-60 panels
- Maximum 2000 ft (600 m) of cable to devices wired to each QSPS-P2-10-60
- Only use cable with at least one twisted/shielded pair for communications (MUX and $\overline{\text{MUX}}$)

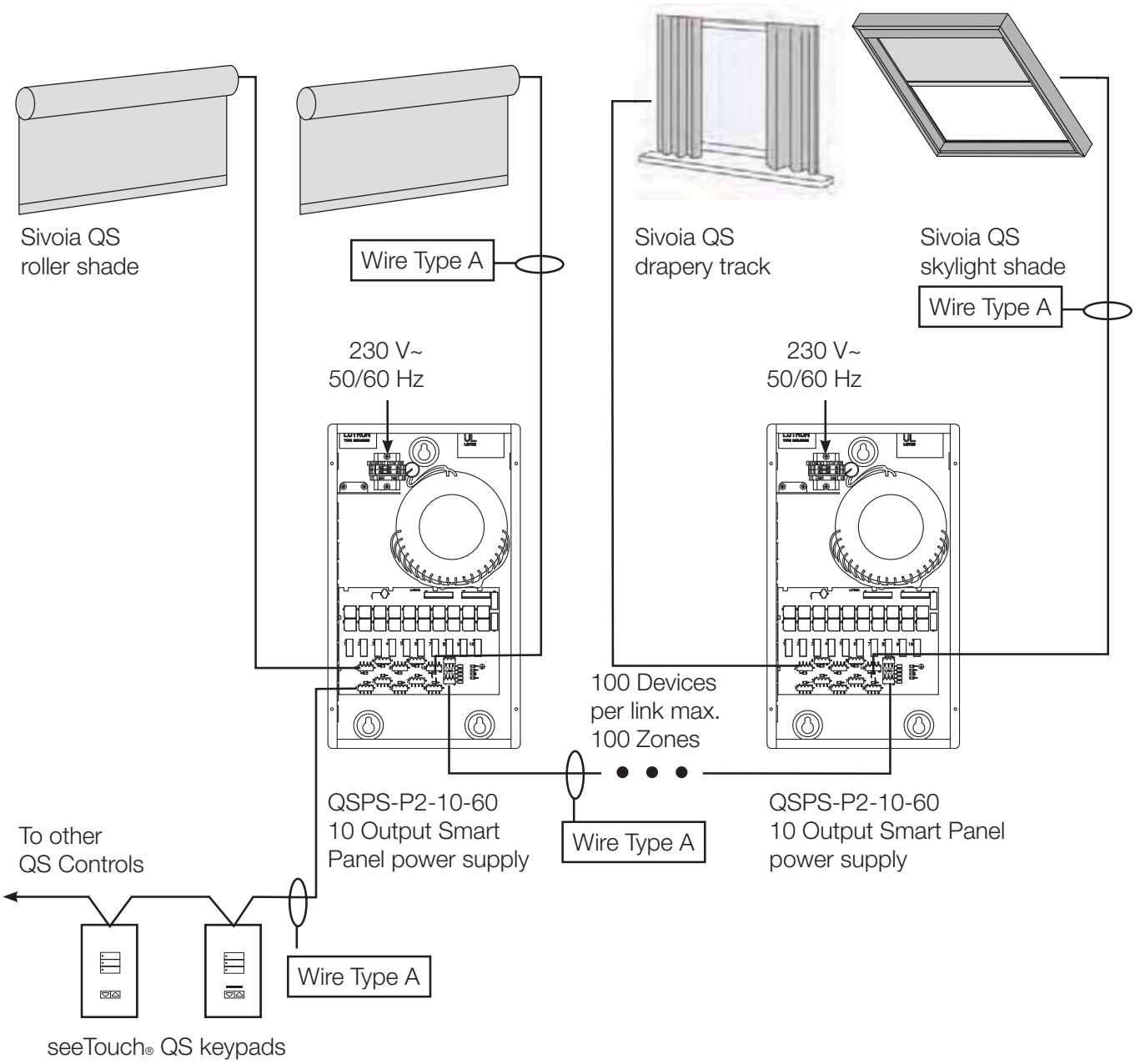
QS Smart Panel Power Supply Wiring Guide

Maximum devices per one output		Maximum distance per one output based on wire guage		
Shades + Controls		12 AWG ($4\ mm^2$) QSH-CBL-L-500 QSH-CBLP-L-500	16 AWG ($1.5\ mm^2$) QSH-CBL-M-500 QSH-CBLP-M-500	18 AWG ($1\ mm^2$) GRX-CBL-346S-500
None	Up to 8 seeTouch QS keypads	1200 ft (350 m)	500 ft (150 m)	300 ft (90 m)
1 Sivoia QS shade* / drapery drive unit	Up to 1 seeTouch QS keypad	500 ft (150 m)	200 ft (60 m)	125 ft (35 m)
2 Sivoia QS roller 64™, ≤ 30 sq ft (2.75 sq m) each	None	200 ft (60 m)	75 ft (20 m)	50 ft (15 m)
3 Sivoia QS roller 64, ≤ 20 sq ft (1.8 sq m) each	None			
2 Sivoia QS roller 100, ≤ 50 sq ft (4.6 sq m) each	None			

* roller 64, roller 100, roller 200CW, roller 225™, skylight

Job Name:	Model Numbers:
Job Number:	

Sivoia QS System Wiring:
Smart Panel power supply, single shade per output

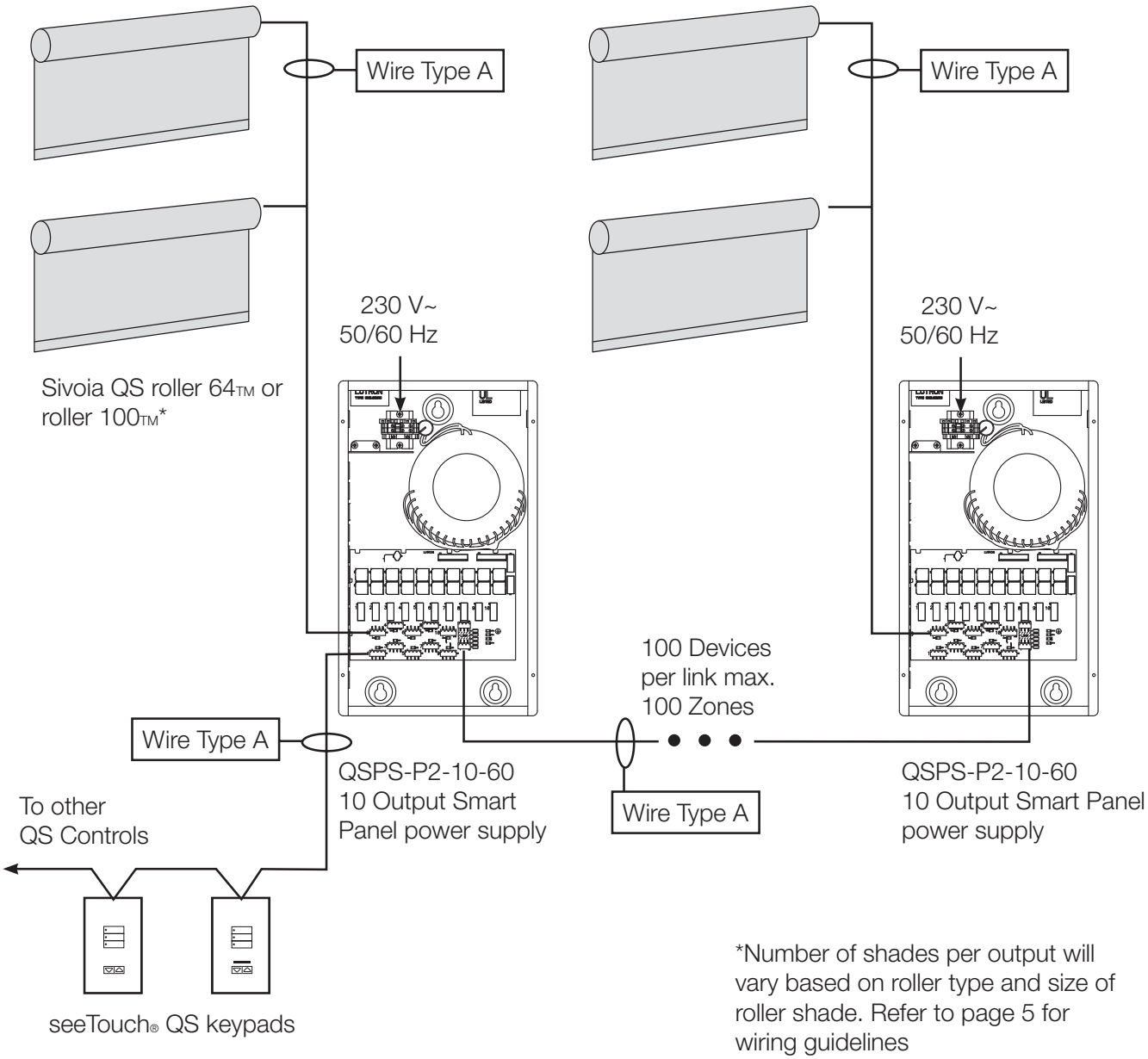


Wiring Type Key

Type A Communications Link: 4 Conductor (twisted and shielded), listed for application
Refer to wiring guide on pg. 5 for wire gauge based on distance
Maximum comm. link: – Up to 2000 ft (600 m) connecting
all QSPS-P2-10-60 panels

Job Name:	Model Numbers:
Job Number:	

Sivoia QS System Wiring:
Smart Panel power supply, two shades per output*



*Number of shades per output will vary based on roller type and size of roller shade. Refer to page 5 for wiring guidelines

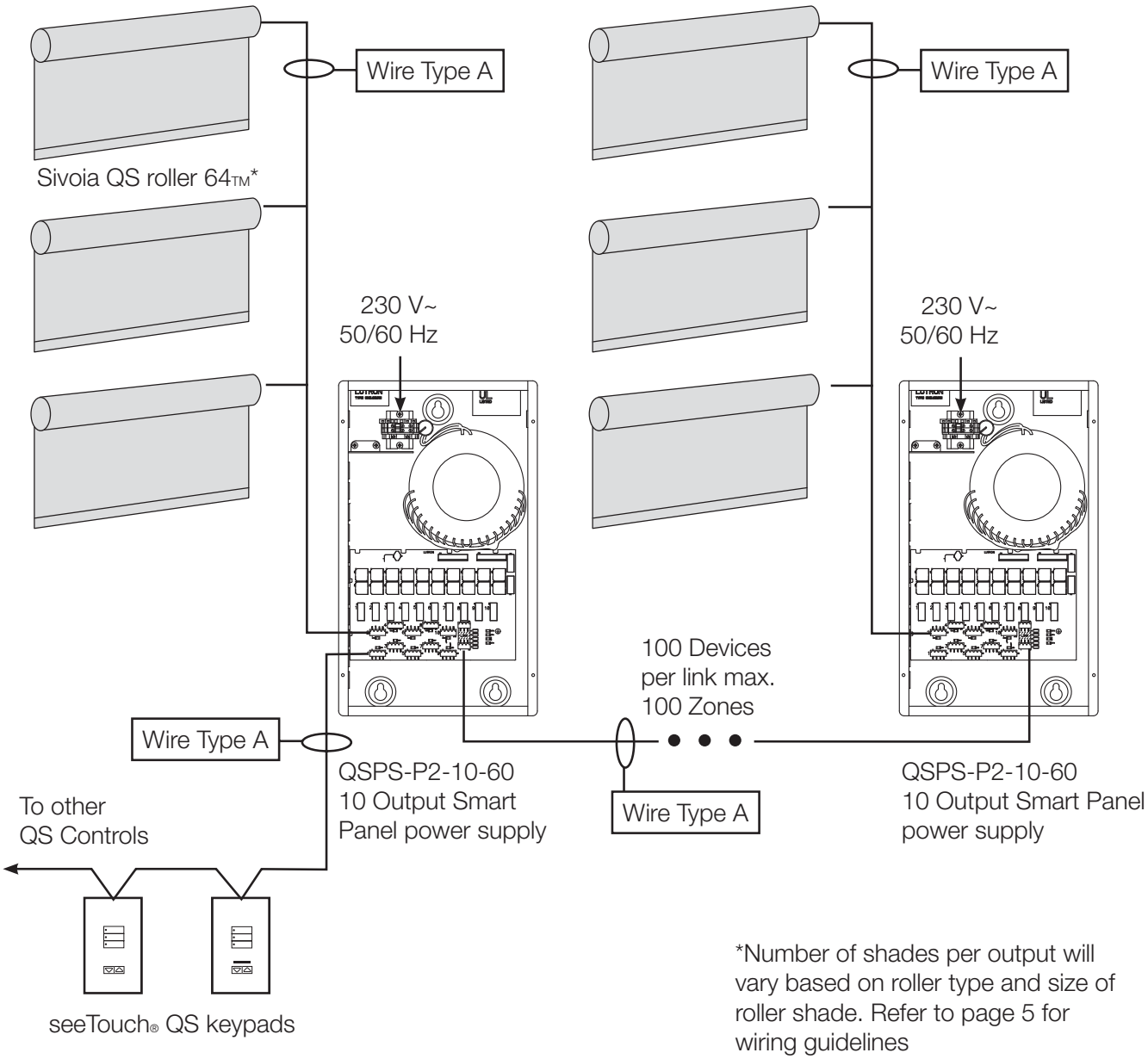
Wiring Type Key

Type A

Communications Link: 4 Conductor (twisted and shielded), listed for application
Refer to wiring guide on pg. 5 for wire gauge based on distance
Maximum comm. link: – Up to 2000 ft (600 m)
connecting all QSPS-P2-10-60 panels

Job Name:	Model Numbers:
Job Number:	

Sivoia QS System Wiring:
Smart Panel power supply, three shades per output*



*Number of shades per output will vary based on roller type and size of roller shade. Refer to page 5 for wiring guidelines

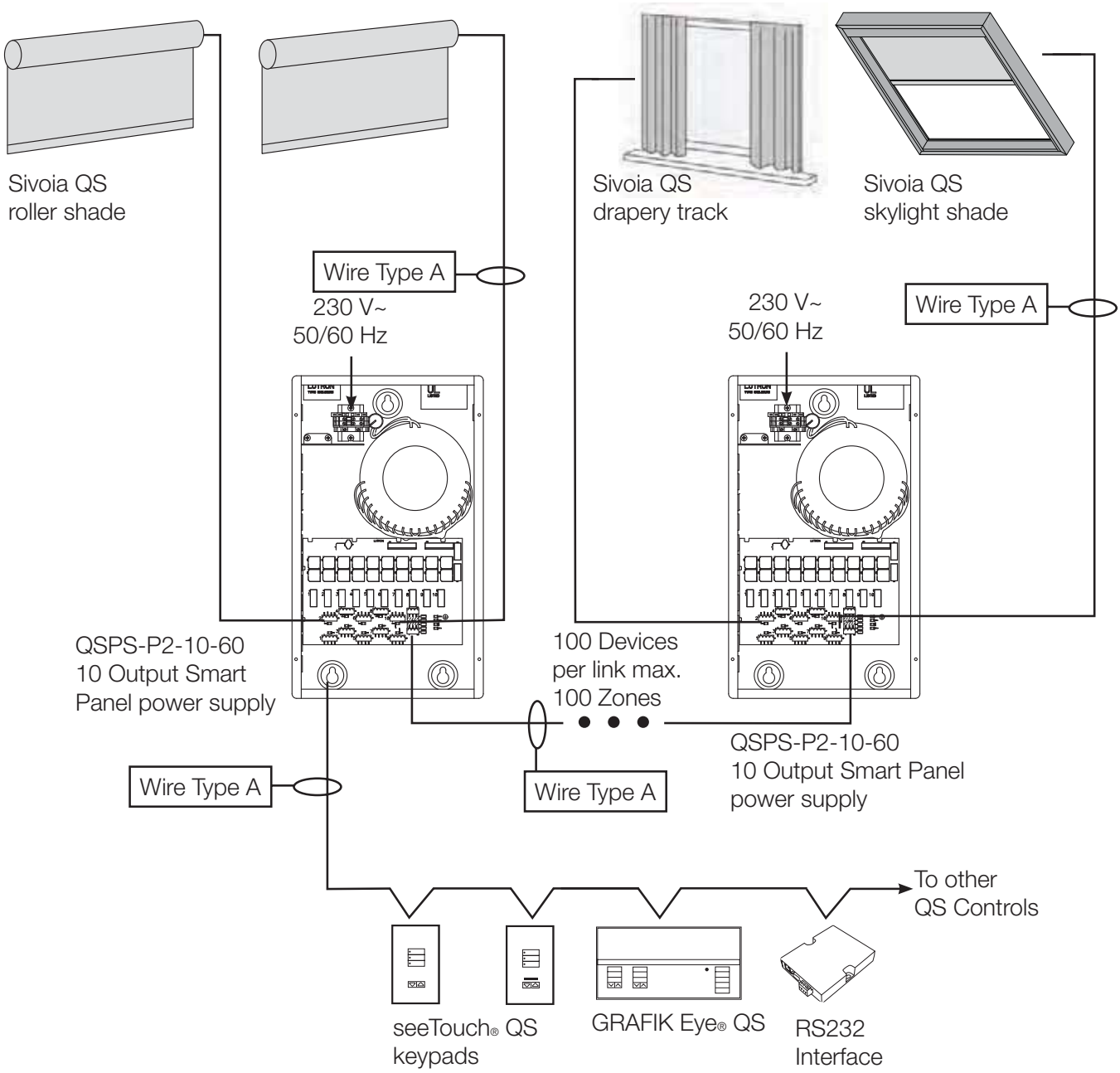
Wiring Type Key

Type A

Communications Link: 4 Conductor (twisted and shielded), listed for application
Refer to wiring guide on pg. 5 for wire gauge based on distance
Maximum comm. link: – Up to 2000 ft (600 m)
connecting all QSPS-P2-10-60 panels

Job Name:	Model Numbers:
Job Number:	

Sivoia QS with GRAFIK Eye® QS System Wiring: Smart Panel power supply, single shade per output



Wiring Type Key

Type A Communications Link: 4 Conductor (twisted and shielded), listed for application
Refer to wiring guide on pg. 5 for wire gauge based on distance
Maximum comm. link: – Up to 2000 ft (600 m)
connecting all QSPS-P2-10-60 panels

Job Name:	Model Numbers:
Job Number:	

Limited Warranty

SCOPE

This limited warranty ("Warranty") covers the Lutron supplied (a) Sivoia® QS Shade System ("Sivoia® QS Shade System"), (b) Sivoia QED® Shade System ("Sivoia QED® Shade System"), (c) manual shade system and (d) alternating current or a/c shade system (each of the foregoing being a "System"). Customer acknowledges and agrees that use of the System constitutes acceptance of all terms and conditions of this Warranty.

LIMITED WARRANTY

Subject to the exclusions and restrictions described below, Lutron warrants that each System will be free from manufacturing defects from the date of shipment by Lutron for a period of (a) one year as to the wall controls, interfaces, and system accessories of the Sivoia QS Shade System ("External Sivoia QS Components") and (b) eight years as to the other Systems and the electronic drive unit (EDU), shade fabric, and shade hardware of the Sivoia QS Shade System. If any manufacturing defect exists in the External Sivoia QS Components, so long as Customer promptly notifies Lutron of the defect within the one year warranty period and, if requested by Lutron, returns the defective part(s), Lutron will, at its option, either repair the defective part(s) or provide comparable replacement part(s). If any manufacturing defect exists in any of the components of a System other than the External Sivoia™ QS Components, so long as Customer promptly notifies Lutron of the defect within the eight year warranty period and, if requested by Lutron, returns the defective part(s), Lutron will, at its option, either repair the defective part(s) or issue a credit to the Customer against the purchase price of comparable replacement part(s) purchased from Lutron as provided below:

Number of Years from Date of Shipment	Percentage of Cost of Replacement Parts Credited by Lutron
Up to 2	100%
More than 2 but not more than 5	50%
More than 5 but not more than 8	25%
More than 8	0%

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

EXCLUSIONS AND RESTRICTIONS

This Warranty will be void, and Lutron and its suppliers will have no responsibility under this Warranty, if Lutron or its representatives cannot access any components of the System to inspect, diagnose problems with or repair the System or any of its components as a result of concealment or inaccessibility of such components within a building structure.

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

1. Damage, malfunction or inoperability diagnosed by Lutron or a Lutron approved third party as caused by normal wear and tear, abuse, misuse, incorrect installation, neglect, accident, interference or environmental factors, such as (a) use of incorrect line voltages fuses or circuit breakers; (b) failure to install, maintain and operate the System pursuant to the operating instructions provided by Lutron and the applicable provisions of the National Electrical Code and of the Safety Standards of

Job Name:	Model Numbers:
Job Number:	

Limited Warranty (continued)

Underwriter's Laboratories; (c) use of incompatible devices or accessories; (d) improper or insufficient ventilation; (e) unauthorized repairs or adjustments or alterations; (f) vandalism; (g) an act of God, such as fire, lightning, flooding, tornado, earthquake, hurricane or other problems beyond Lutron's control; or (h) direct exposure to corrosive materials.

2. On-site labor costs to diagnose issues with, and remove, repair, replace, adjust, reinstall and/or reprogram the System or any of its components.

3. Components and equipment external to the System, such as, non-Lutron lighting and automation systems; building wiring audio-visual equipment; and non-Lutron time clocks, photosensors and motion detectors.

4. The cost of repairing or replacing other property that is damaged when any System does not work properly, even if the damage was caused by the System.

THIS WARRANTY IS IN LIEU OF ALL OTHER EXPRESS WARRANTIES. ALL IMPLIED WARRANTIES, INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY AND OF FITNESS FOR A PARTICULAR PURPOSE, ARE LIMITED TO EIGHT YEARS FROM THE DATE OF SHIPMENT, EXCEPT THAT SUCH IMPLIED WARRANTIES ARE LIMITED TO ONE YEAR FROM THE DATE OF SHIPMENT AS TO THE EXTERNAL SIVOIA COMPONENTS.

NO LUTRON AGENT, EMPLOYEE OR REPRESENTATIVE HAS ANY AUTHORITY TO BIND LUTRON TO ANY AFFIRMATION, REPRESENTATION OR WARRANTY CONCERNING THE SYSTEMS. UNLESS AN AFFIRMATION, REPRESENTATION OR WARRANTY MADE BY AN AGENT, EMPLOYEE OR REPRESENTATIVE IS SPECIFICALLY INCLUDED HEREIN, OR IN STANDARD PRINTED MATERIALS PROVIDED BY LUTRON, IT DOES NOT FORM A PART OF THE BASIS OF ANY BARGAIN BETWEEN LUTRON AND CUSTOMER AND WILL NOT IN ANY WAY BE ENFORCEABLE BY CUSTOMER.

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NOTWITHSTANDING ANY DAMAGES THAT CUSTOMER MIGHT INCUR FOR ANY REASON WHATSOEVER (INCLUDING, WITHOUT LIMITATION, ALL DIRECT DAMAGES AND ALL DAMAGES LISTED ABOVE), THE ENTIRE LIABILITY OF LUTRON AND OF ALL OTHER PARTIES UNDER THIS WARRANTY ON ANY CLAIM FOR DAMAGES ARISING OUT OF OR IN CONNECTION WITH THE MANUFACTURE, SALE, INSTALLATION, DELIVERY, USE, REPAIR, OR REPLACEMENT OF THE SYSTEM, AND CUSTOMER'S SOLE REMEDY FOR THE FOREGOING, WILL BE LIMITED TO THE AMOUNT PAID BY CUSTOMER FOR THE SYSTEM. THE FOREGOING LIMITATIONS, EXCLUSIONS AND DISCLAIMERS WILL APPLY TO THE MAXIMUM EXTENT ALLOWED BY APPLICABLE LAW, EVEN IF ANY REMEDY FAILS ITS ESSENTIAL PURPOSE.

Job Name:	Model Numbers:
Job Number:	

Limited Warranty (continued)

THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS. YOU MAY ALSO HAVE OTHER RIGHTS WHICH VARY FROM STATE TO STATE. SOME STATES DO NOT ALLOW LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY LASTS OR THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATIONS OR EXCLUSIONS MAY NOT APPLY TO YOU.

WARRANTY CLAIMS, TECHNICAL ASSISTANCE AND WARRANTY INFORMATION.

Contact the Lutron Technical Support Center at the numbers provided on the following page or your local Lutron sales representative with questions concerning the installation or operation of the System or this Warranty, or to make a warranty claim. Please provide the exact model number when calling.

Lutron, the Sunburst logo, Sivoia and Sivoia QED are registered trademarks of Lutron Electronics Co., Inc.

Job Name:	Model Numbers:
Job Number:	

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www.lutron.com/shadingsolutions

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fax: +1 610.282.3090

email: shadinginfo@lutron.com

Shades Customer Service

USA and Canada (24 hrs/7days):
call: 800.446.1503

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Specification Submittal Sheet
for QS Smart Panel power supply

Job Name:	Model Numbers:
Job Number:	

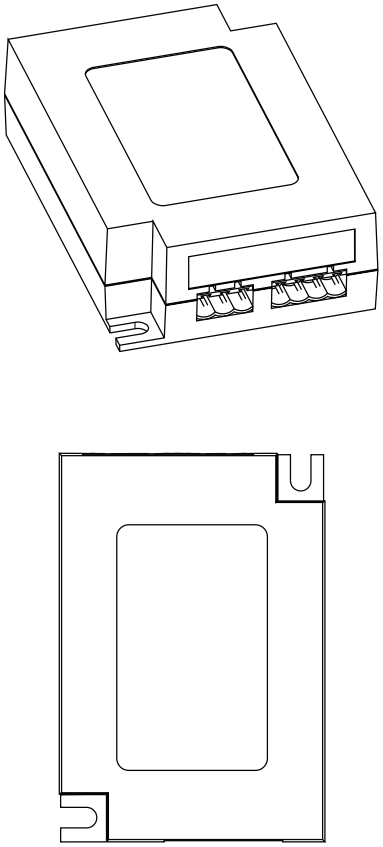
QS | Link power supply

The QS Link power supply (QSPS-P1-1-50/ QSPS-P2-1-50/ QSPS-P3-1-50) is a 24 V⎓ plug in power supply that is used with Lutron® QS lighting or shading devices.

The Link power supply plugs into a standard receptacle. The power supply is protected electronically in the event of a miswire, and will automatically reset when wiring is corrected.

Features

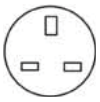
- 24 V⎓ supply that provides power to shades, drapery drive units, keypads, and accessories
- Simple wiring scheme uses 4-conductor, low voltage link to provide power and communication for QS electronic drive units (EDUs), seeTouch® QS keypads and QS integration interfaces
- Mounting tabs and small size allow for discrete installation
- Universal input voltage (100-240 VAC) enables global specification



QSPS-P1-1-50
Link power supply

Job Name:	Model Numbers:
Job Number:	

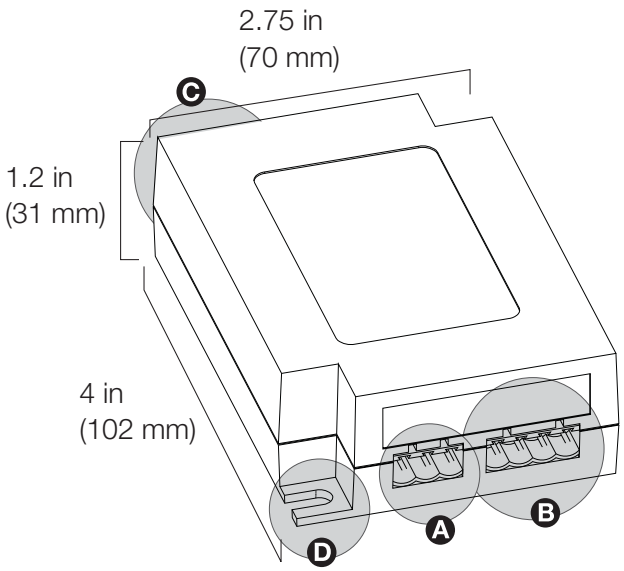
Specifications

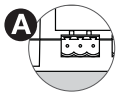
Input Voltage	100-240 V~
Input current (MAX)	1 A
Output Voltage	24 V⎓
Operating Frequency	50/60 Hz
ESD Protection	(+/-) 16 kV
Miswire Protection	Electronic Automatic Reset
Input Wiring	Available with 3 types of line cords. All 6 ft (1.8 m) Plugs into standard receptacle **QSPS-P1-1-50**  NEMA 5-15 Plug **QSPS-P2-1-50**  CEE 7/7Plug **QSPS-P3-1-50**  BS 1363 Plug
QS Link Wiring	4-conductor (power and communication) +24 V, COM, MUX, $\overline{\text{MUX}}$ 3-conductor (communication pass-through) COM, MUX, $\overline{\text{MUX}}$
Output connections	Detachable terminal blocks 12-26 AWG (4-0.15 mm^2) stranded, twisted/shielded
Weight	0.3 lb (0.14 kg)
Regulatory	UL (1310 CLASS2) CE (IEC 61558) CUL (CSA C22.2 #223)

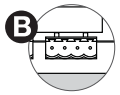
Job Name:	Model Numbers:
Job Number:	

Dimensions

QSPS-P1-1-50
QSPS-P2-1-50
QSPS-P3-1-50

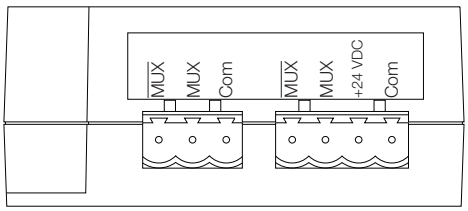



A 3-pin connector
Communication to
additional Power supplies


B 4-pin connector
Power and Communication
to QS shade or keypads


C Line voltage input

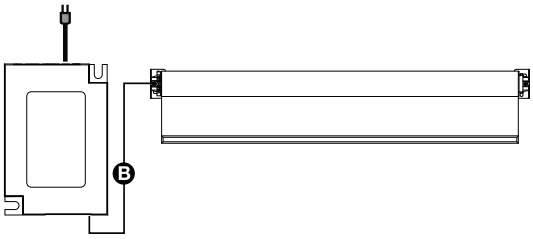

D Mounting tabs



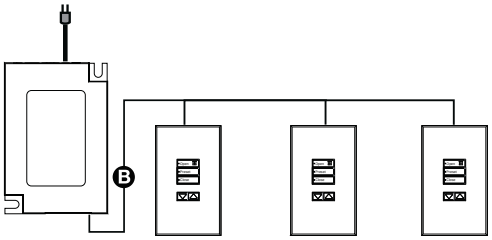
Job Name:	Model Numbers:
Job Number:	

System Wiring Overview: QS Link power supply

Example: Powering one shade / drapery drive unit
(max of one shade / drapery drive unit per output of a power supply)

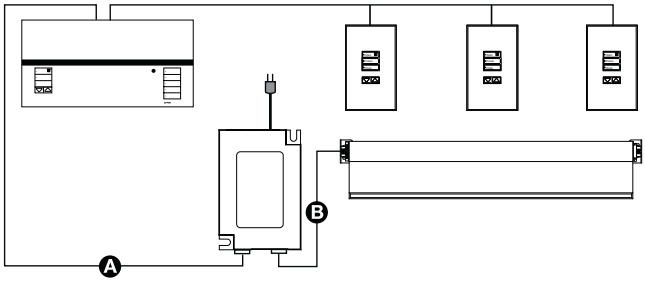


Example: Powering keypads



...up to 8 keypads
on link (B)

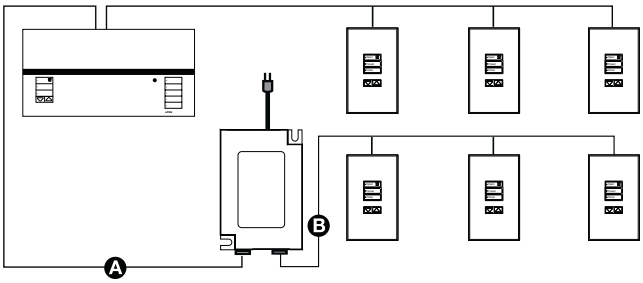
Example: Connecting to a *GRAFIK* Eye® QS (**Note:** *GRAFIK* Eye QS powered from line voltage)



Devices powered by
GRAFIK Eye QS

Devices powered
by supply

Example: Connecting to a *GRAFIK Eye* QS (**Note:** *GRAFIK* Eye QS powered from line voltage)



Devices powered by
GRAFIK Eye QS
(Refer to *GRAFIK* Eye QS spec submittal
for maximum devices that can be powered by
GRAFIK Eye QS

Devices powered by supply
...up to 8 keypads
on link (B)

Ⓐ Communication link (3 conductor)
Communications used to connect power supplies to each other or to *GRAFIK* Eye QS
12-26 AWG (4-0.15 mm²) standard, twisted/shielded

Ⓑ Power and communication link (4 conductor)
Provides power and communication to QS shades or keypads
12-26 AWG (4-0.15 mm²) standard, twisted/shielded

Job Name:	Model Numbers:
Job Number:	

QS Link Wiring

Link Rules

The following link rules must be observed for proper operation.

- Use only cable with at least one twisted/shielded pair for communiations ($\overline{\text{MUX}}$ and MUX)
- Total length of power supply link (A) wire plus device link (B) wire in entire system must be less than 2000 ft (609 m)

Maximum devices powered from one QSPS-PX-1-50		Total wire length of link (B) based on wire gauge		
Shades	Controls	12 AWG (4 mm²) QSH-CBL-L-500 QSH-CBLP-L-500	16 AWG (1.5 mm²) QSH-CBL-M-500 QSH-CBLP-M-500	18 AWG (1 mm²) GRX-CBL-346S-500
1 Slvoia QS shade/drapery drive unit	Up to 1 seeTouch® QS keypad	250 ft (75 m)	100 ft (30 m)	50 ft (15 m)
None	Up to 8 seeTouch® QS keypads*	1200 ft (350 m)	500 ft (150 m)	300 ft (90 m)

OR

* 2 seeTouch QS keypads may be exchanged for:

1 Ethernet & RS232 Control Interface (QSE-CI-NWK-E)

1 Contact Closure Input /Output Interface (QSE-IO)

Job Name:	Model Numbers:
Job Number:	

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call: 800.446.1503

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Specification Submittal Sheet
for QS Link power supply

Job Name:	Model Numbers:
Job Number:	

Power Boosters and Load Interfaces

NGRX-PB Power Booster



Description

- Provides capability for a zone on a GRAFIK Eye 3000 Series Control Unit to control a larger load. Allows the zone to dim or switch a fully-loaded circuit of lighting.
- Dims or switches most popular lighting sources and load types.
- Models available for 120 V~ , 220-240 V~ (non-CE), 230 V~ (CE), or 100 V~ input power.

Works with:

- GRAFIK Eye 3000 Series Control Units
- LP Dimming Panels
- HomeWorks Remote Power Panels
- Neutral-referenced wallbox dimmers by Lutron.

Models and Capacities

Input Power	Capacity	Model Number
120 V~	2000 W/VA[1]	NGRX-PB-WH
220-240 V~ (non-CE)	2400 W/VA	NGRX-PB-AU-WH
230 V~ (CE)	1200 W/VA (flush mount with faceplate) 1840 W/VA (surface mount without faceplate)	NGRX-PB-CE-WH
100 V~	1600 W/VA	NGRX-PB-JA-WH

Two Power Boosters may be used on a zone to double the capacity. Use the HP Dimming Module System for zones that exceed the capacity of the Power Booster.

[1] Measured current will not exceed continuous load rating due to voltage drop in the dimmer.

Job Name:	Model Numbers:
Job Number:	

Specifications

Power

- Input power: 120 V~ , 220-240 V~ (non-CE), 230 V~ (CE), or 100 V~ . All voltages 50/60 Hz, phase-to-neutral.
- Load (output) power: Phase independent of Control Unit.

Sources/Load Types

Operates these sources with a smooth continuous Square Law dimming curve or on a full conduction non-dim basis:

- Incandescent (Tungsten)
- Halogen
- Magnetic Low-Voltage Transformer[1]
- Lutron Tu-Wire™ Electronic Fluorescent Dimming Ballast
- Neon/Cold Cathode

Key Design Features

Patented RTISS™ circuitry compensates in real time for incoming line voltage variations: No visible flicker with +/-2% change in RMS voltage/cycle and +/-2% Hz change in frequency/second.

Terminals

Accept up to two #12 AWG (2.5 mm^2).

Environment

32 °F - 104 °F (0 °C - 40 °C). Relative humidity less than 90% non-condensing.

Mounting

Surface or recess mount indoors only.

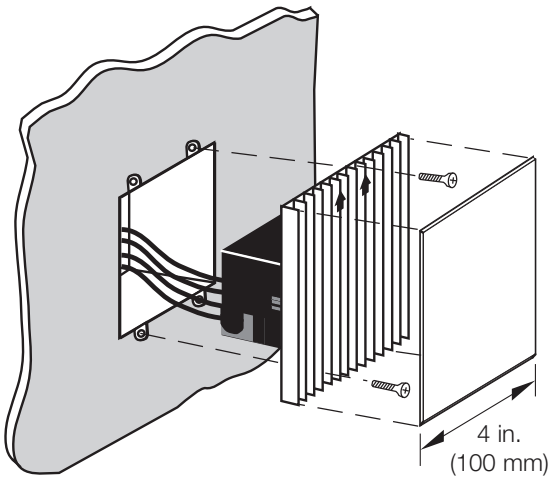
[1]Must have iron core (magnetic) transformers

Job Name:	Model Numbers:
Job Number:	

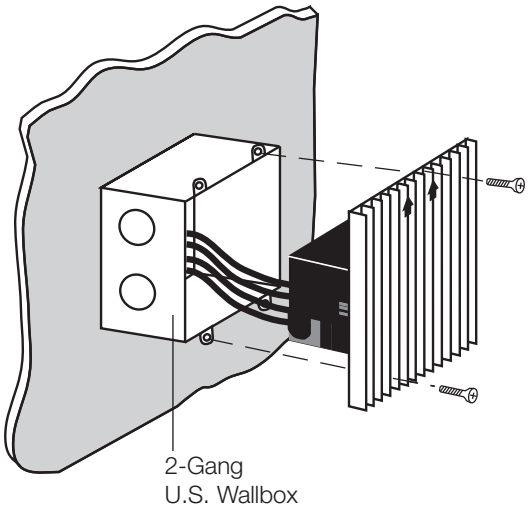
Dimensions And Mounting

- Recess or surface mount in 2-gang U.S. wallbox 3.5 in. (89 mm) deep. Indoors only.
- Power Booster generates heat; mount only where ambient temperature is 32 °F-104 °F (0 °C-40 °C).
- Mount with arrows facing up to ensure adequate cooling.
- Allow 4.5 in. (114 mm) above and below unit and between faceplates when mounting several in a vertical layout.
- For better heat dissipation, surface mount without faceplate.
- Mount so line (mains) voltage wiring is at least 6 feet (1.8 m) from sound or electronic equipment and wiring.
- Mount Interface within 7° of true vertical.

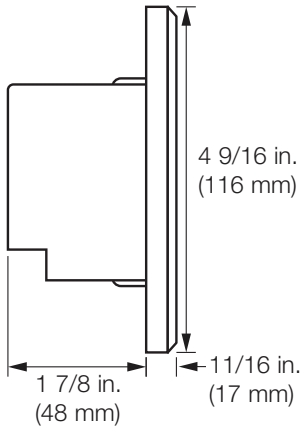
Recess Mount with Faceplate



Surface Mount without Faceplate



Side View



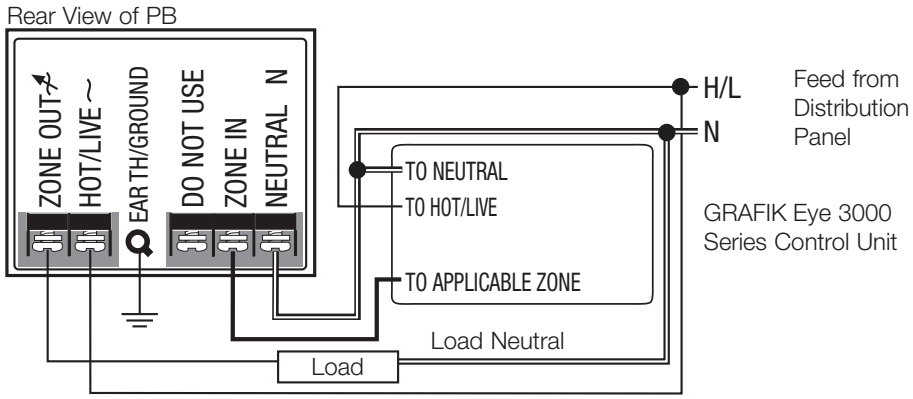
Job Name:	Model Numbers:
Job Number:	

Wiring

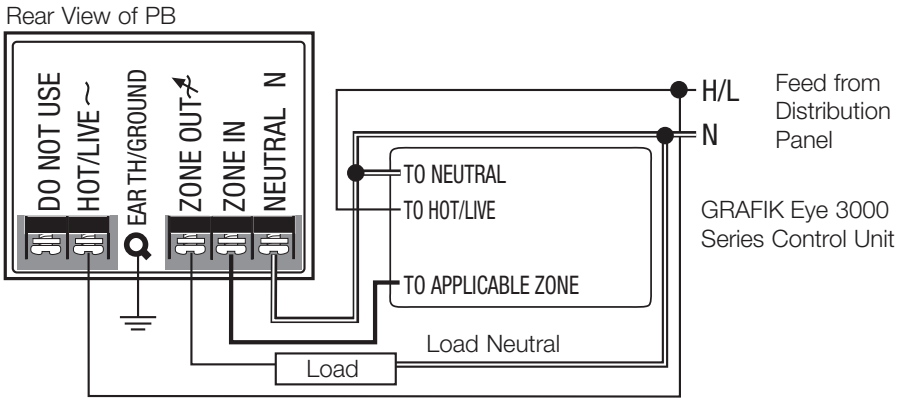
- Pull #12 AWG (2.5 mm²) Copper (Cu) wires (75 °C minimum) for input power and load circuit.
- Strip 1/2 in. (12 mm) insulation from wires before connecting.
- Run separate neutral for load circuit - no common neutrals. Neutral (N) terminal is for Control Unit, not the load neutral.

The Power Booster may be on the same circuit as the Control Unit *only if* the total load does not exceed the rating of the breaker.

Single-Feed Wiring for NGRX-PB 100 V~, 120 V~, and 220-240 V~



Single-Feed Wiring for NGRX-PB-CE (230 V~)

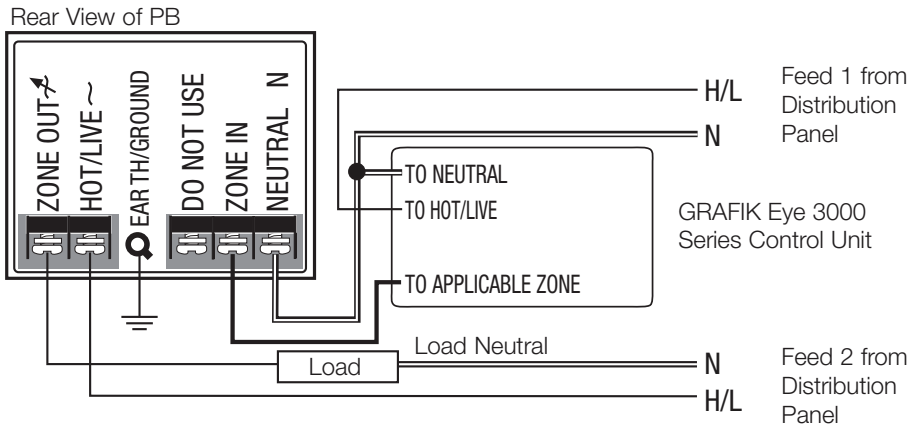


Job Name:	Model Numbers:
Job Number:	

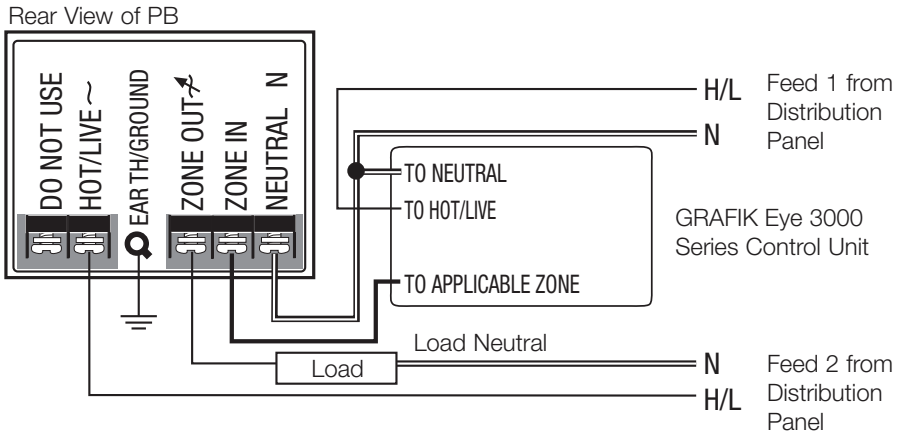
Multiple Power Feeds

The load breaker/MCB may be on a different phase than the control breaker/MCB.

Dual-Feed Wiring for NGRX-PB 100 V~, 120 V~, and 220-240 V~



Dual-Feed Wiring for NGRX-PB-CE (230 V~)



With Other Lutron Lighting Controls

To wire a Power Booster to lighting control equipment other than a GRAFIK Eye 3000 Series Control Unit:

- Run a Neutral wire from the control equipment to Neutral N on the PB.
- Run a dimmed hot wire from the control equipment to Zone In on the PB.

Job Name:	Model Numbers:
Job Number:	

ELVI Electronic Low-Voltage Interface



Description

- Provides capability for GRAFIK Eye 3000 Series Control Units and LP Dimming Panels to dim electronic transformer-supplied low-voltage lighting.
- Provides power and dimming for one zone.
- Models available for 120 V~, 220-240 V~ (non-CE), 230 V~ (CE), or 100 V~ input power.

Works with:

- GRAFIK Eye 3000 Series Control Units
- LP Dimming Panels
- HomeWorks Remote Power Panels
- Neutral-referenced wallbox dimmers by Lutron.

Models and Capacities

Input Power	Capacity	Model Number
120 V~	1000 W/VA	ELVI-1000
220-240 V~ (non-CE)	1200 W/VA	NGRX-ELVI-AU-WH
230 V~ (CE)	1200 W/VA	NGRX-ELVI-CE-WH
100 V~	1000 W/VA	NGRX-ELVI-JA-WH

Two ELVI Interfaces may be used on a zone to double the capacity.

Job Name:	Model Numbers:
Job Number:	

Specifications

Power

- Input power: 120 V~, 220-240 V~ (non-CE), 230 V~ (CE), or 100 V~. All voltages 50/60 Hz, phase-to-neutral.
- Load (output) power: Phase independent of Control Unit.

Sources/Load Types

- Operates electronic low-voltage lighting with a smooth continuous Square Law dimming curve or on a full conduction non-dim basis.
  - – Does not affect sound rating of electronic transformers.
  - – Does not cause lights to flicker or interact anywhere in dimming range.
  - – Dims to 0% (blackout).
- Works only with electronic (solid-state) low-voltage transformers that are manufacturer-approved for reverse-phase control dimming.
- Incandescent and electronic low-voltage sources may be controlled on the same zone. Up to 30% of the ELVI capacity may be used for incandescent lighting.

Key Design Features

Patented RTISS™ circuitry compensates in real time for incoming line voltage variations: No visible flicker with +/-2% change in RMS voltage/cycle and +/-2% Hz change in frequency/second.

Terminals

Accept up to two #12 AWG (2.5 mm^2).

Environment

32 - 104 °F (0 - 40 °C). Relative humidity less than 90% non-condensing.

Mounting

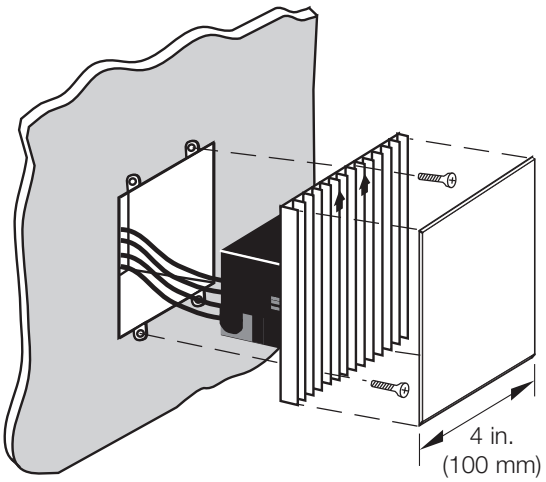
Surface or recess mount indoors only.

Job Name:	Model Numbers:
Job Number:	

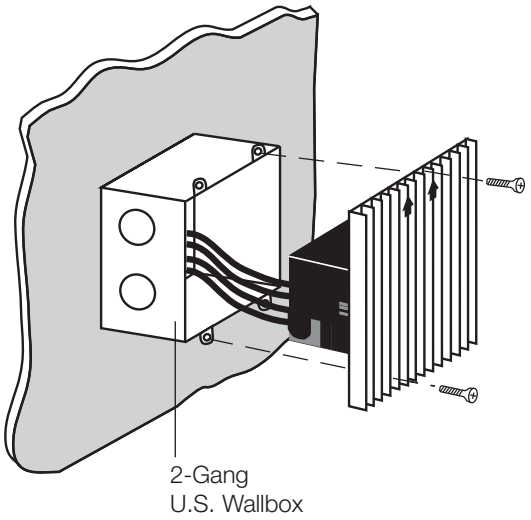
Dimensions And Mounting

- Recess or surface mount in 2-gang U.S. wallbox 3.5 in. (89 mm) deep. Indoors only.
- ELVI Interface generates heat; mount only where ambient temperature is 32 - 104 °F (0 - 40 °C).
- Mount with arrows facing up to ensure adequate cooling.
- Allow 4.5 in. (114 mm) above and below unit and between faceplates when mounting several in a vertical layout.
- For better heat dissipation, surface mount without faceplate.
- Mount so line (mains) voltage wiring is at least 6 feet (1.8 m) from sound or electronic equipment and wiring.
- Mount Interface within 7° of true vertical.

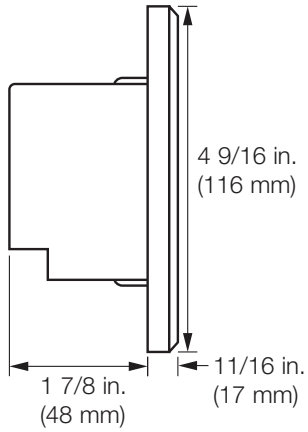
Recess Mount with Faceplate



Surface Mount without Faceplate



Side View



Job Name:	Model Numbers:
Job Number:	

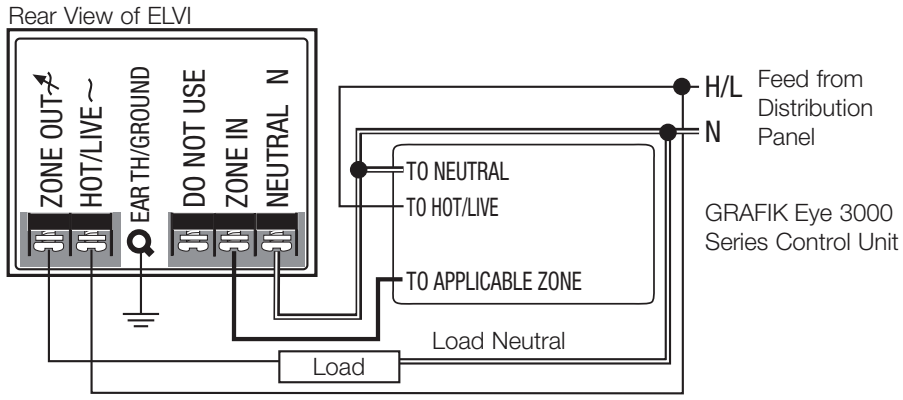
Wiring

- Pull #12 AWG (2.5 mm²) Copper (Cu) wires (75 °C minimum) for input power and load circuit.
- Strip 1/2 in. (12 mm) insulation from wires before connecting.
- Run separate neutral for load circuit - no common neutrals. Neutral (N) terminal is for Control Unit, not the load neutral.

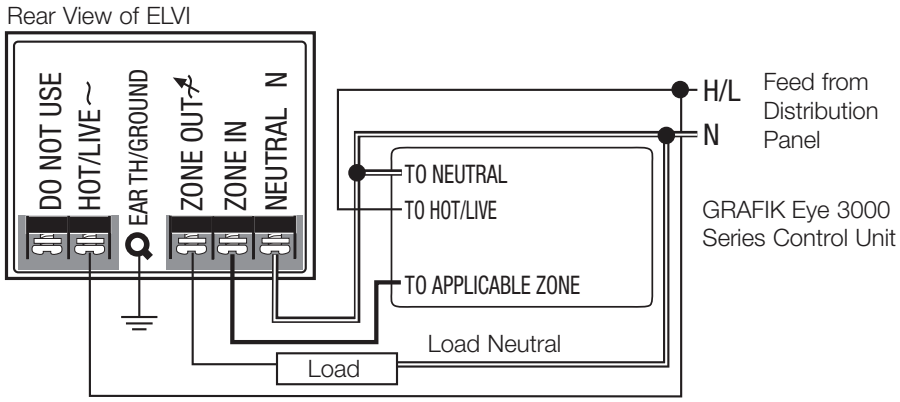
Single Power Feed

The ELVI Interface may be on the same circuit as the Control Unit *only if* the total load does not exceed the rating of the breaker.

Single-Feed Wiring for NGRX-ELVI 100 V~, 120 V~, and 220-240 V~



Single-Feed Wiring for NGRX-ELVI-CE (230 V~)

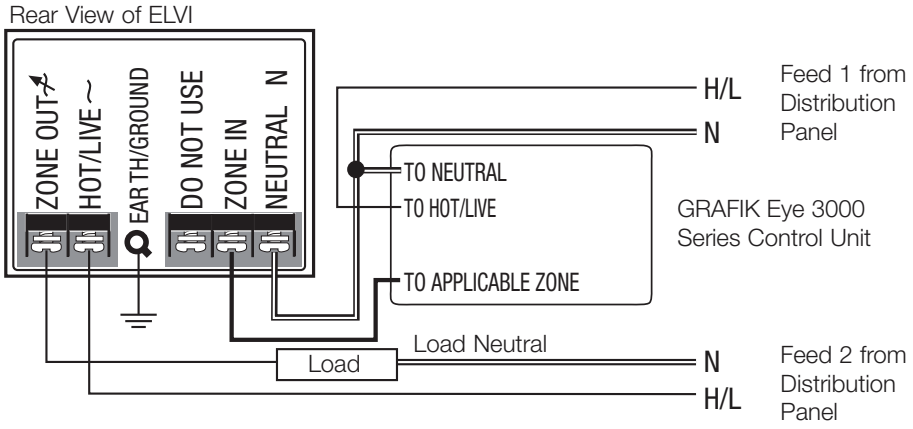


Job Name:	Model Numbers:
Job Number:	

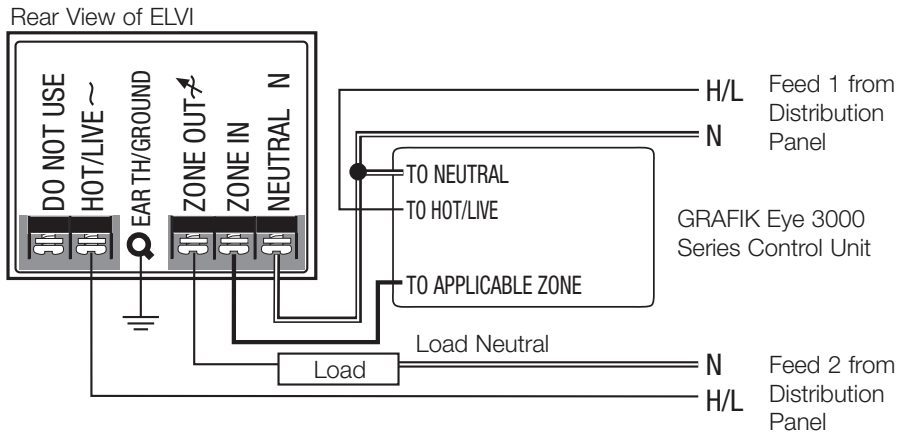
Wiring - Multiple Power Feeds

The load breaker/MCB may be on a different phase than the control breaker/MCB.

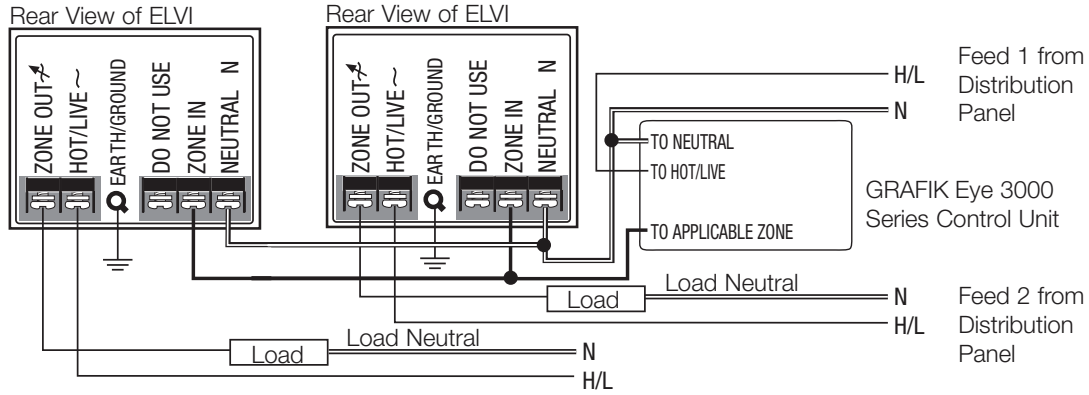
Dual-Feed Wiring for NGRX-ELVI 100 V~, 120 V~, and 220-240 V~



Dual-Feed Wiring for NGRX-ELVI-CE (230 V~)



Two ELVI Interfaces on a Zone (120 V~ and 220-240 V~ Example)



Job Name:	Model Numbers:
Job Number:	

FDBI Fluorescent Dimming Ballast Interface



Description

- Provides capability for GRAFIK Eye 3000 Series Control Units and LP Dimming Panels to dim fluorescent lights that have Lutron Hi-Lume® and Eco-10™ (Eco-Series) line-voltage control Electronic Dimming Ballasts.
- Models available for 120 V~, 220-240 V~ (non-CE), or 100 V~ input power.

Works with:

- GRAFIK Eye 3000 Series Control Units
- LP Dimming Panels
- HomeWorks Remote Power Panels
- Neutral-referenced wallbox dimmers by Lutron.

Models and Capacities

Input Power	Capacity	Model Number
120 V~	16 A	GRX-FDBI-16A-120
220-240 V~ (non-CE)	10 A	NGRX-FDBI-AU-WH
100 V~	16 A	NGRX-FPB1V-JA-WH

Job Name:	Model Numbers:
Job Number:	

Specifications

Power

- Input power: 120 V~, 220-240 V~ (non-CE), or 100 V~.
  All voltages 50/60 Hz, phase-to-neutral.
- Load (output) power: Phase independent of Control Unit.

Sources/Load Types

Operates Lutron Hi-lume® and Eco-10™ (Eco-Series) line-voltage control Electronic Fluorescent Dimming Ballasts with a smooth continuous Square Law dimming curve.

Key Design Features

Patented RTISS™ circuitry compensates in real time for incoming line voltage variations: No visible flicker with +/-2% change in RMS voltage/cycle and +/-2% Hz change in frequency/second.

Terminals

Accept up to two #12 AWG (2.5 mm^2).

Environment

32 - 104 °F (0 - 40 °C). Relative humidity less than 90% non-condensing.

Mounting

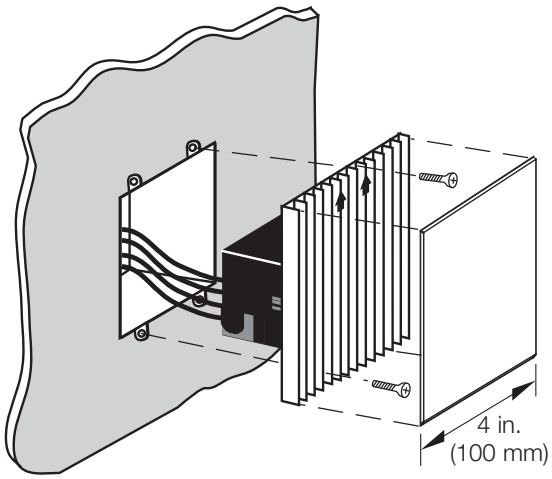
Surface or recess mount indoors only.

Job Name:	Model Numbers:
Job Number:	

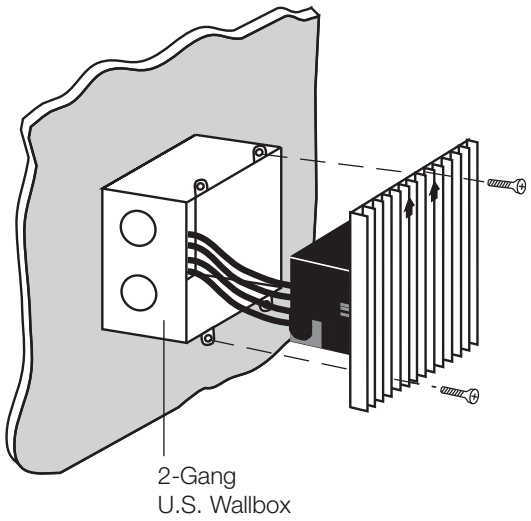
Dimensions And Mounting

- Recess or surface mount in 2-gang U.S. wallbox 3.5 in. (89 mm) deep. Indoors only.
- FDBI Interface generates heat; mount only where ambient temperature is 32 - 104 °F (0 - 40 °C).
- Mount with arrows facing up to ensure adequate cooling.
- Allow 4.5 in. (114 mm) above and below unit and between faceplates when mounting several in a vertical layout.
- For better heat dissipation, surface mount without faceplate.
- Mount so line (mains) voltage wiring is at least 6 feet (1.8 m) from sound or electronic equipment and wiring.
- Mount Interface within 7° of true vertical.

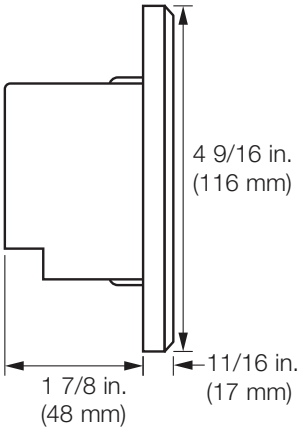
Recess Mount with Faceplate



Surface Mount without Faceplate



Side View



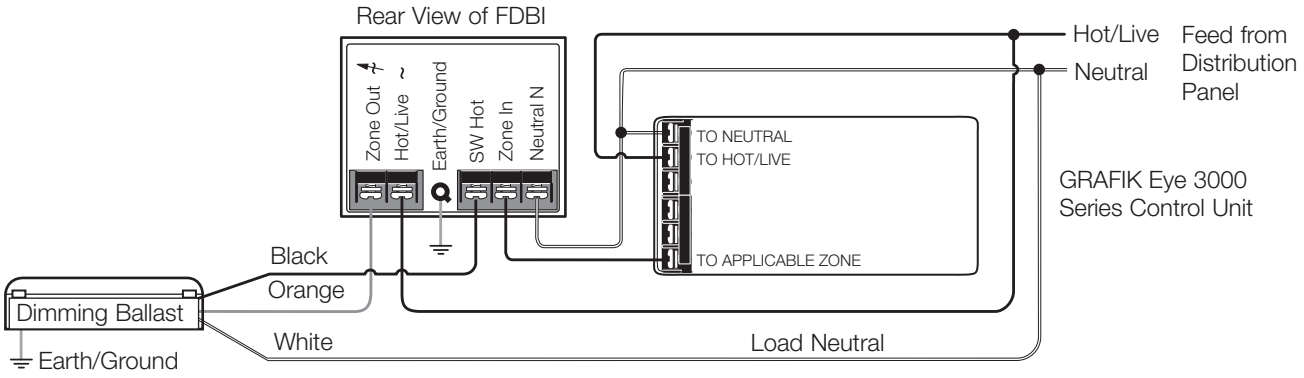
Job Name:	Model Numbers:
Job Number:	

Wiring

- Pull #12 AWG (2.5 mm²) Copper (Cu) wires (75 °C minimum) for input power and load circuit.
- Strip 1/2 in. (12 mm) insulation from wires before connecting.
- Run separate neutral for load circuit - no common neutrals. Neutral (N) terminal is for Control Unit, not the load neutral.

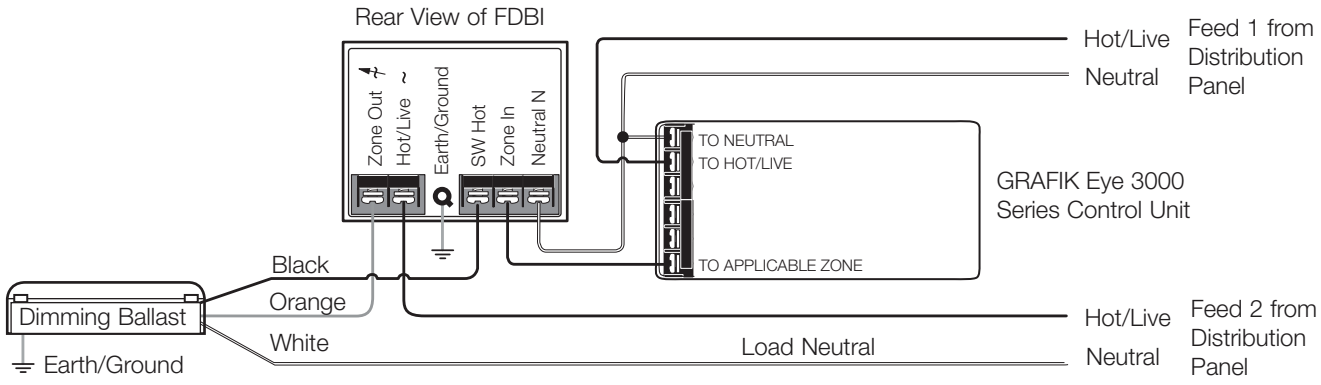
Single Power Feed

The FDBI may be on the same circuit as the Control Unit only if the total load does not exceed the rating of the breaker.



Multiple Power Feeds

The load breaker/MCB may be on a different phase than the control breaker/MCB.



With Other Lutron Lighting Controls

To wire an FDBI Interface to a fluorescent dimmer:

- Run a Neutral wire from the control equipment to Neutral N on the FDBI.
- Run a dimmed hot wire from the control equipment to Zone In on the FDBI.

Job Name:	Model Numbers:
Job Number:	

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GRX-TVI Ten Volt Interface

Features

- Provides 0-10 V control and ballast switching capabilities to switch and dim fluorescent and LED lights.
- Switches and dims 0-10 V electronic dimming ballasts powered by 100-277 V~ (ballast must provide 0-10 V source). Switches up to 16 A of electronic capacitive ballasts.
- Switches motors up to 1/4 HP @ 100-127 V~, 1/2 HP @ 200-277 V~.
- Up to five Ten Volt Interfaces may be connected to one Control Unit zone. This allows one zone to control up to five 16 A circuits of Electronic Dimming Ballasts or five motors.
- Provides 100-277 V~ power to loads.
- Requires 100-127 V~ or 200-240 V~ power for internal operations.



Compatible Controls

Family	Product	Wiring Diagram
Residential Systems	HW-RPM-4U	I, J
	HW-RPM-4A	I, J
	HWI-WPM-6D (Wallbox Power Module)	A, B
	HxD-6ND	C, D
	HWV-FDB-8A	E, F
	Rx-6ND	C, D
	RRD-10ND	C, D
Commercial Systems	LP-RPM-4U	I, J
	LP-RPM-4A	I, J
	GRAFIK Eye® Control Unit	A, B
	GP Panels	K, L

Family	Product	Wiring Diagram
Wallbox Flourescent 3-wire Dimmers	AYF-103P	E, F
	DVF-103P	E, F
	DVSCF-103P	E, F
	LXF-103PL	E, F
	MAF-6AM*	G, H
	MSCF-6AM*	G, H
	NF-10	E, F
	NF-103P	E, F
	NTF-10	E, F
	NTF-103P	E, F
	SF-10P	E, F
	SF-103P	E, F
	SPSF-6A*	G, H
	SPSF-6AM*	G, H
	VF-10	E, F
	VTF-6AM	G, H

* Note: These controls do not conform to IEC929 standard for 0-10 V output signal; they cannot reach the 1 V minimum.

LUTRON® SPECIFICATION SUBMITTAL Page 1

Job Name:	Model Numbers:	
Job Number:		

Specifications

Standards

- UL Listed in US and Canada
- NOM
- CE
- C-Tick

Power

- Load (output) power: 100-277 V~. Phase independent of lighting control.

0-10 V Dimming Control

- Output rating: 10 µA-300 mA. Sinks current only (ballast must source/provide 10 V supply). <1 V minimum, >10 V maximum

Zone Capacity

- Up to five Ten Volt Interfaces per Control Unit zone.

Key Design Features

- Complies with Standard UL 508.
- Provides a Class 2 isolated 0-10 V output signal that conforms to EN60929 and IEC929.
- Accepts a phase control signal (100-127 V~ or 200-240 V~; 50/60 Hz).

Terminals

- Each terminal accepts up to two 12 AWG (2.5 mm^2) conductors.

Physical Design

- Wall-mounted. Indoor use only. Type 1 enclosure.
- Weight: 4.25 lbs (2 kg).

Environment

- Temperature: 32 °F to 104 °F (0 °C to 40 °C)
- 0-90% humidity, non-condensing.

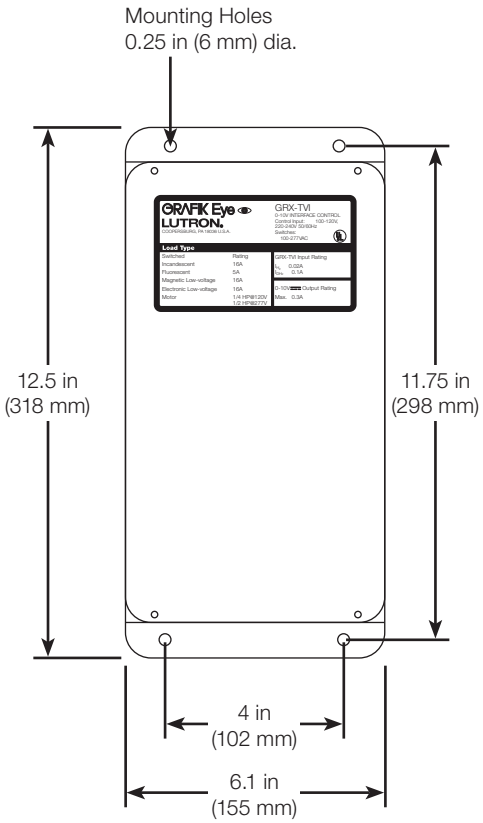
Switching Load Types and Capacities

Source/Load Type	100-127 V~ 200-277 V~	230 V~ (CE)
Fluorescent		
• Lutron Eco-10® (TVE Series)	16 A	—
• Electronic Capacitive Non-Dim	16 A	16 A
• Other manufacturers' 0-10 V ballasts	16 A	16 A
LED	16 A	16 A
Incandescent	16 A	16 A
Low-voltage	16 A	16 A
Metal Halide	16 A	16 A
Neon/Cold Cathode	16 A	16 A
Motor	1/4 HP @ 100-127 V~ 1/2 HP @ 200-277 V~	

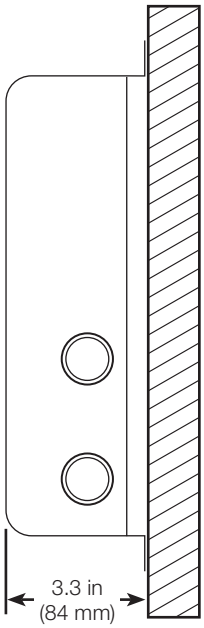
Dimensions and Mounting

- Mount only where ambient temperature is 32 °F to 104 °F (0 °C to 40 °C).
- Allow 4.5 in (114 mm) between Interfaces when mounting several in a vertical layout.
- Mount so that line (mains) voltage wiring is at least 6 ft (1.8 m) from sound or electronic equipment and wiring.
- Mount within 7° of true vertical.

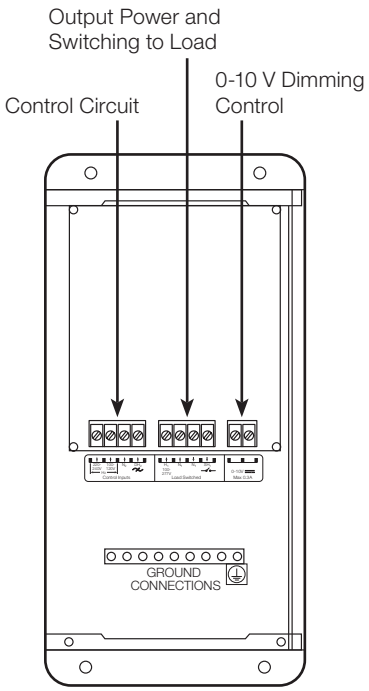
Front View
(cover closed)



Side View



Front View
(cover open)

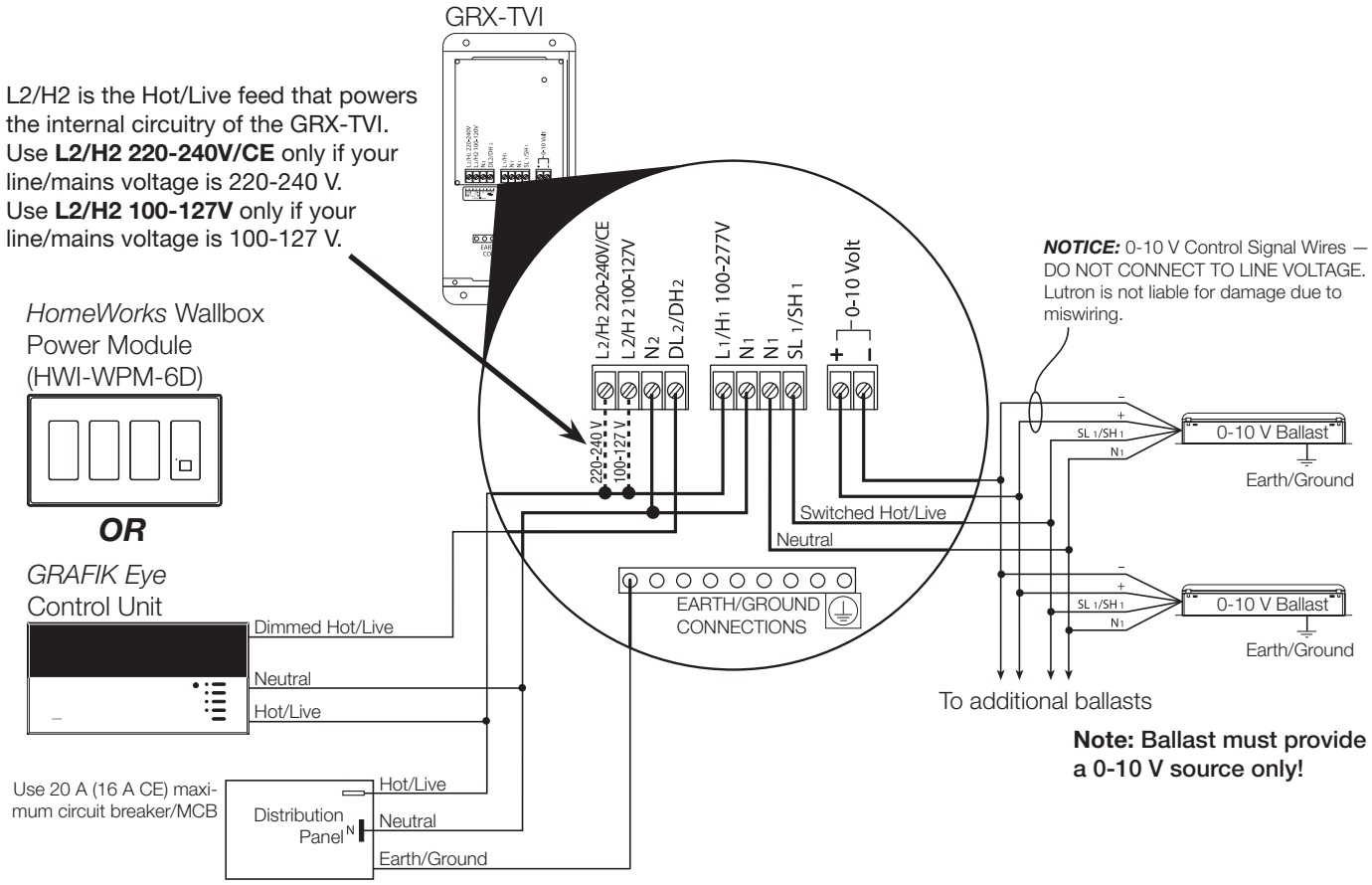


Job Name:	Model Numbers:	
Job Number:		

Wiring Diagrams

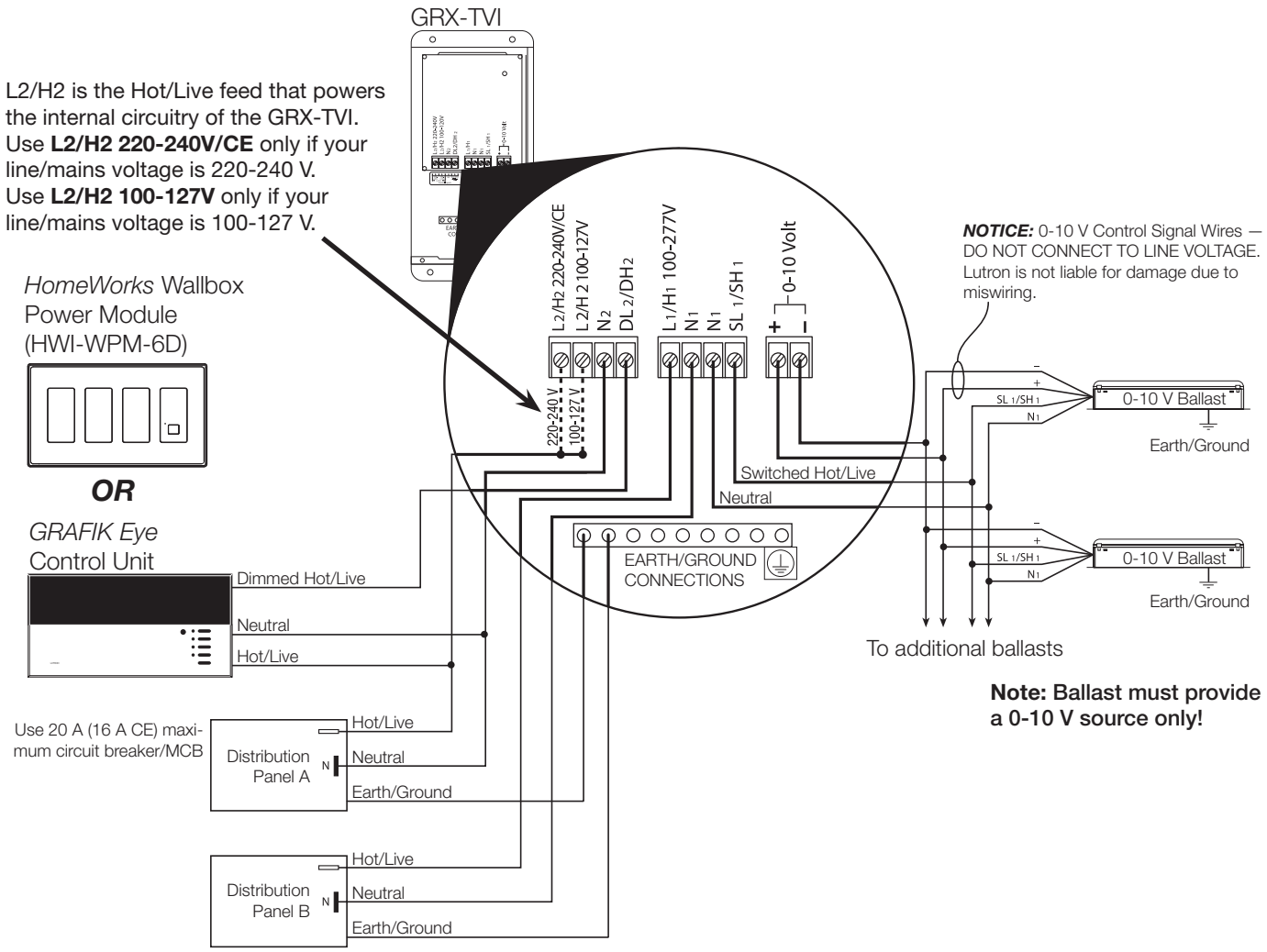
- Each terminal can accept up to two 12 AWG (2.5mm²) conductors.
- L1/H1 is the Live/Hot feed to power the load.
- L2/H2 (on the control circuit terminals) supplies operating power for the Ten Volt Interface.
- Wiring Diagrams A, C, E, G, and I show a GRX-TVI wired from one distribution panel. If the power requirement of the complete system is less than an MCB/circuit breaker rating, one feed can be jumpered inside the enclosure (as shown).
- Wiring Diagrams B, D, F, H, and J show a GRX-TVI wired from two separate distribution panels that may be different phases or voltages.
- Choose the correct L2/H2 terminal for your operating power.
  - Leave one terminal empty - do not use both.
  - Do not connect 277 V to either L2/H2 terminal.
  - Make sure L2/H2 is on the same phase as DL2/DH2 (Dimmed Live/Dimmed Hot) from the lighting control.
- Run separate neutrals for load circuit - no common neutrals.
- NEC® Class 2/IEC PELV, 0-10 V wiring from a ballast to the GRX-TVI must be separated from the power wiring. Enter the Class 2/PELV wires through the knockout adjacent to the 0-10 V terminal blocks. The Nomex® barrier ensures separation and is flexible to allow access to the terminals. The barrier must be in place when installation is complete.

Wiring Diagram A: HomeWorks® Wallbox Power Module/GRAFIK Eye® Control Unit — 1 Distribution Panel



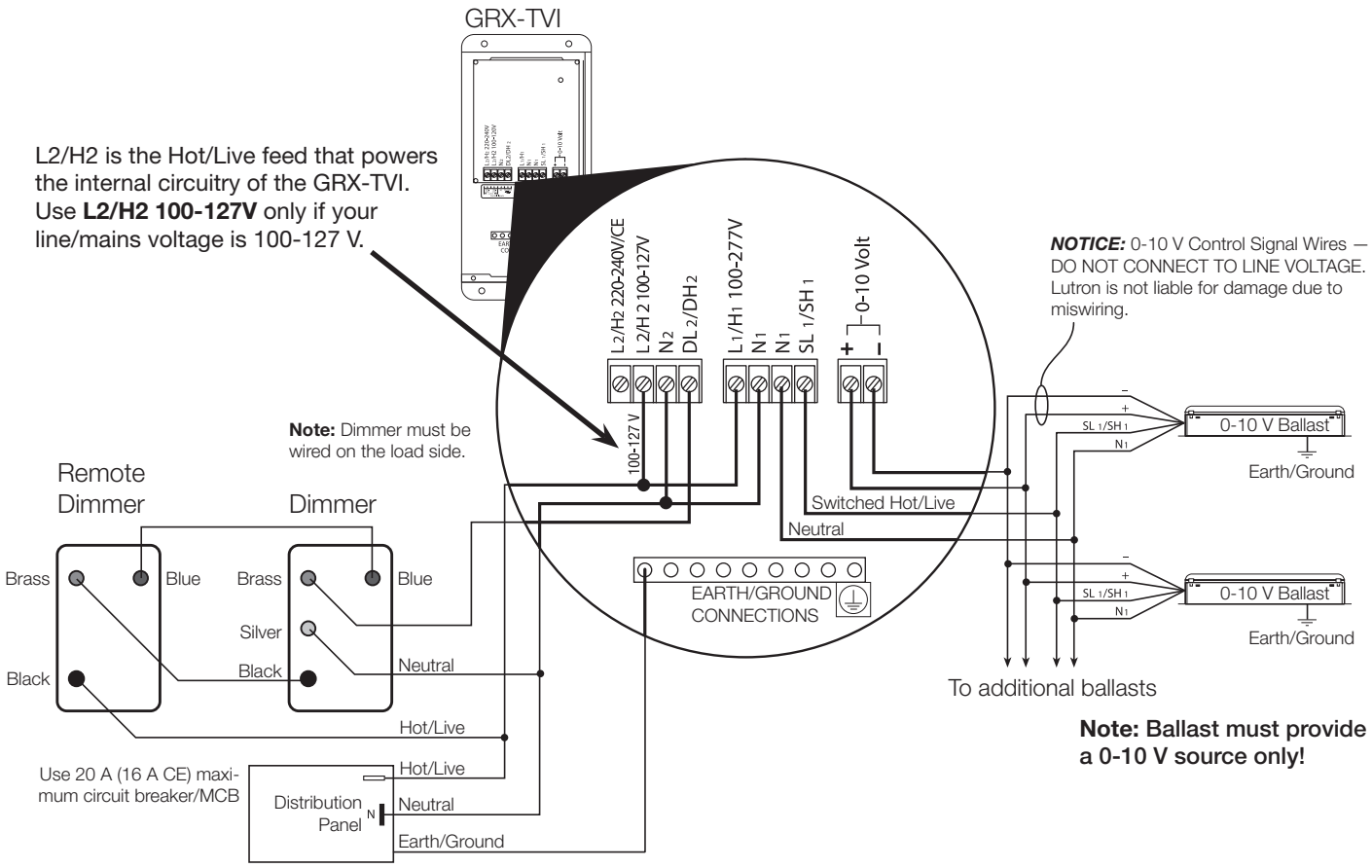
Job Name:	Model Numbers:	
Job Number:		

Wiring Diagram B: HomeWorks® Wallbox Power Module/GRAFIK Eye® Control Unit — 2 Distribution Panels



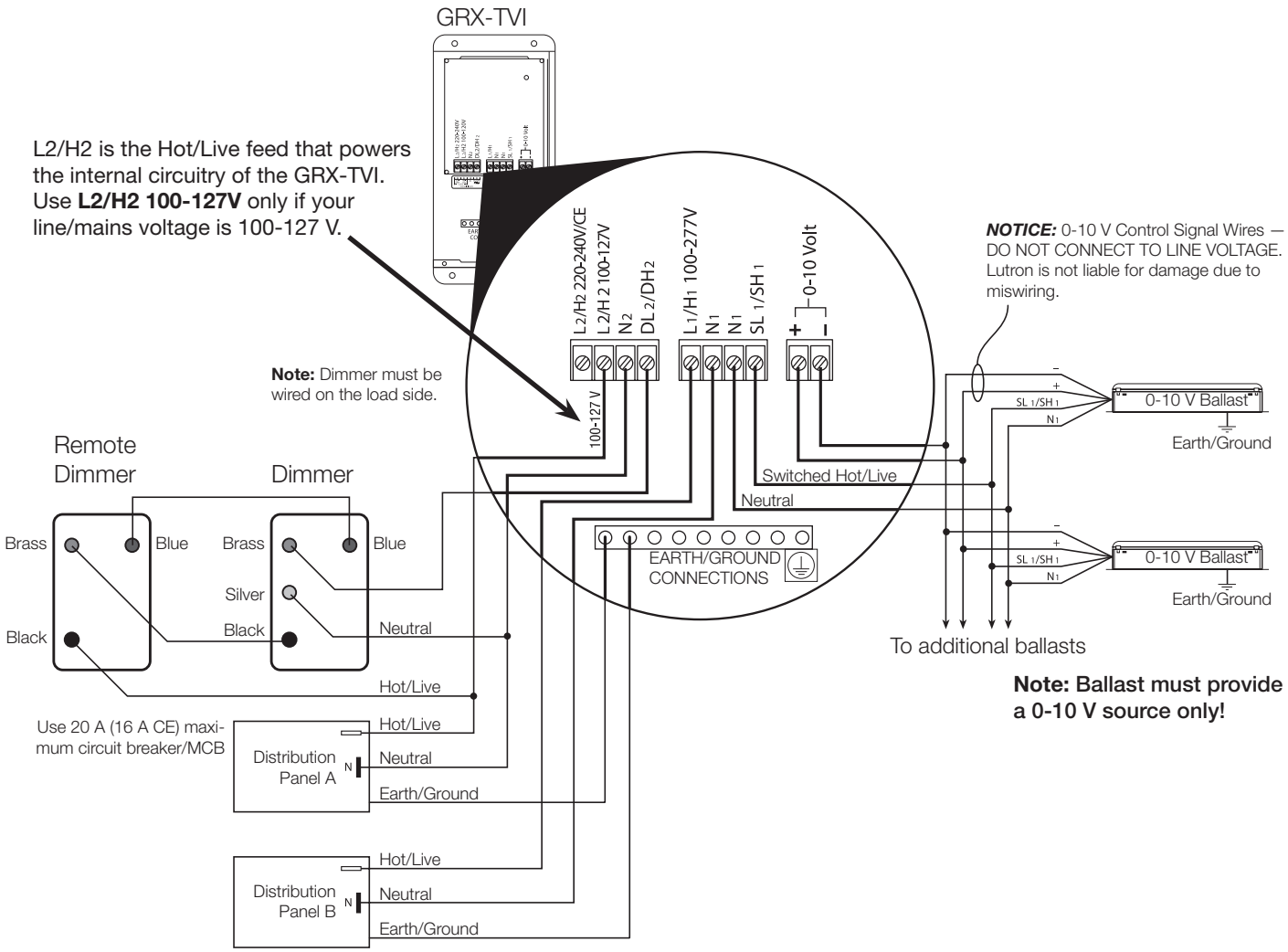
Job Name:	Model Numbers:	
Job Number:		

Wiring Diagram C: HomeWorks® Maestro®/RadioRA®/RadioRA® 2 Dimmers— 1 Distribution Panel



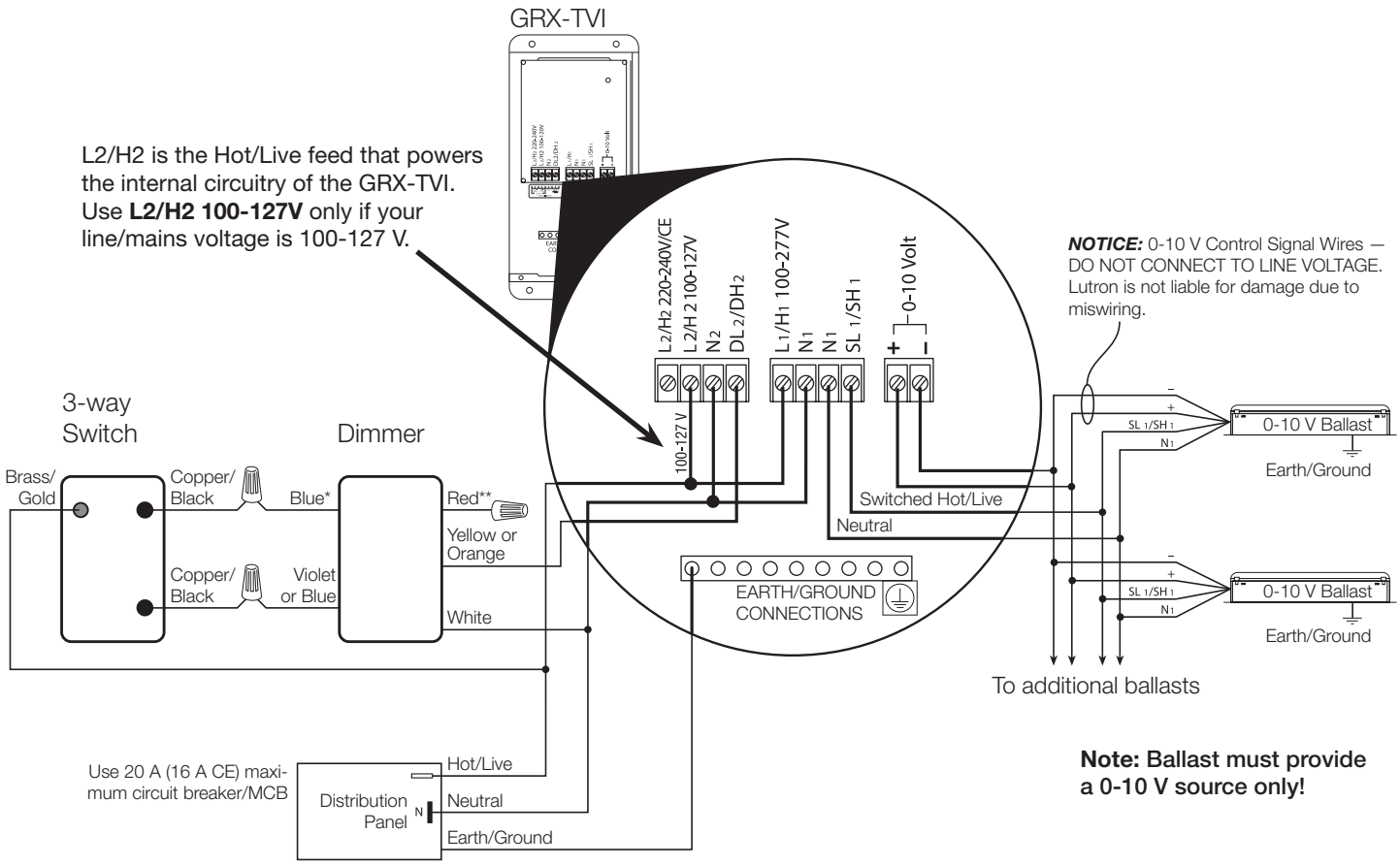
Job Name:	Model Numbers:	
Job Number:		

Wiring Diagram D: HomeWorks® Maestro®/RadioRA®/RadioRA® 2 Dimmers — 2 Distribution Panels



Job Name:	Model Numbers:	
Job Number:		

Wiring Diagram E: Ariadni®/Diva®/Lyneo®/Skylark®/Nova®/Nova T☆®/Vareo®
3-wire Fluorescent Dimmers — 1 Distribution Panel



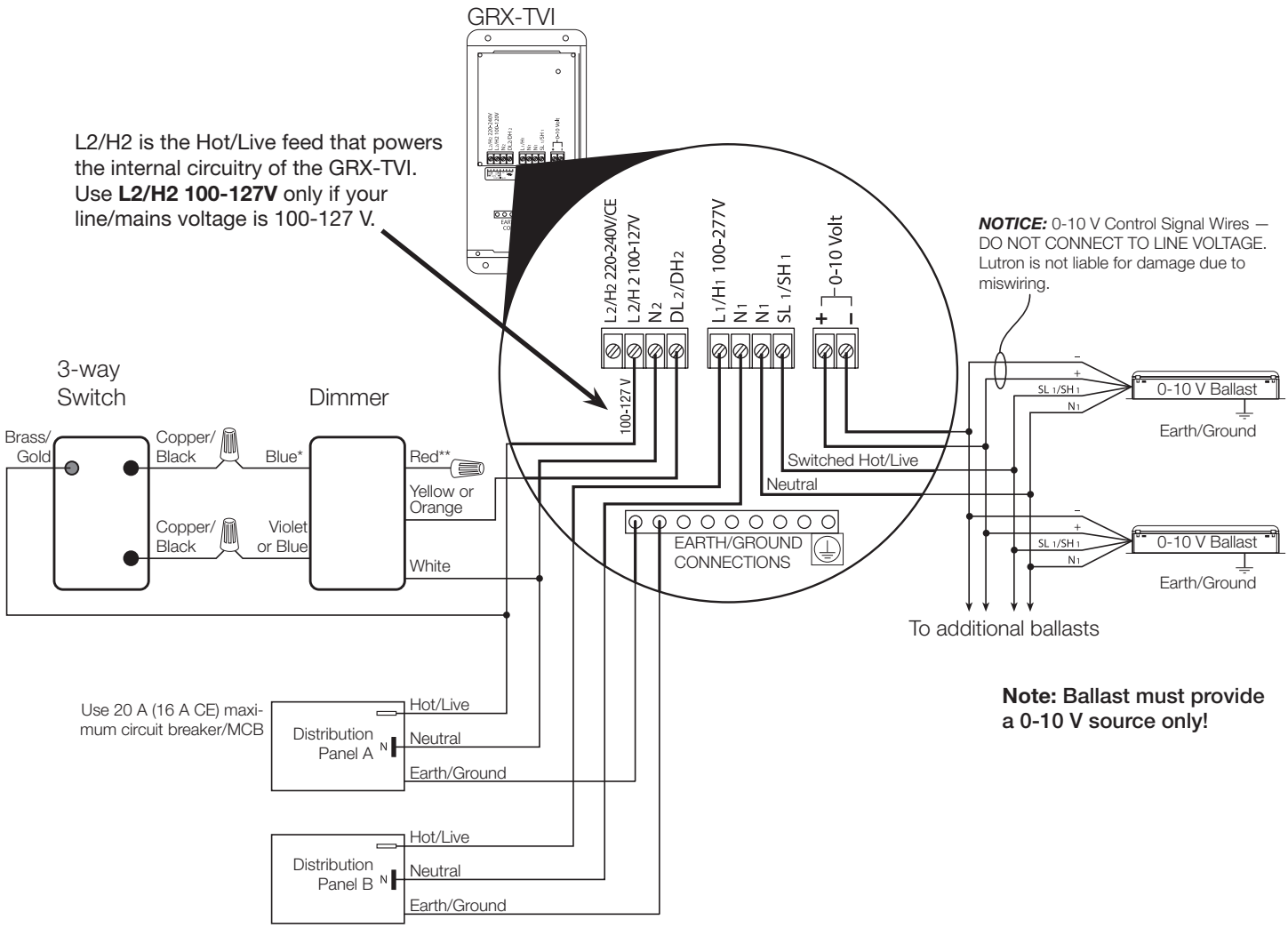
Note: Ballast must provide a 0-10 V source only!

* Single pole dimmers use black for the hot/live wire. Refer to the single-pole dimmer's installation instructions to identify the hot/live wire for that product.

** The red wire is not used. Cap off the red wire using a wire connector. Do not wire the red wire to ground or to any other wiring.

Job Name:	Model Numbers:	
Job Number:		

Wiring Diagram F: Ariadni®/Diva®/Lyneo®/Skylark®/Nova®/Nova T☆®/Vareo®
3-wire Fluorescent Dimmers — 2 Distribution Panels

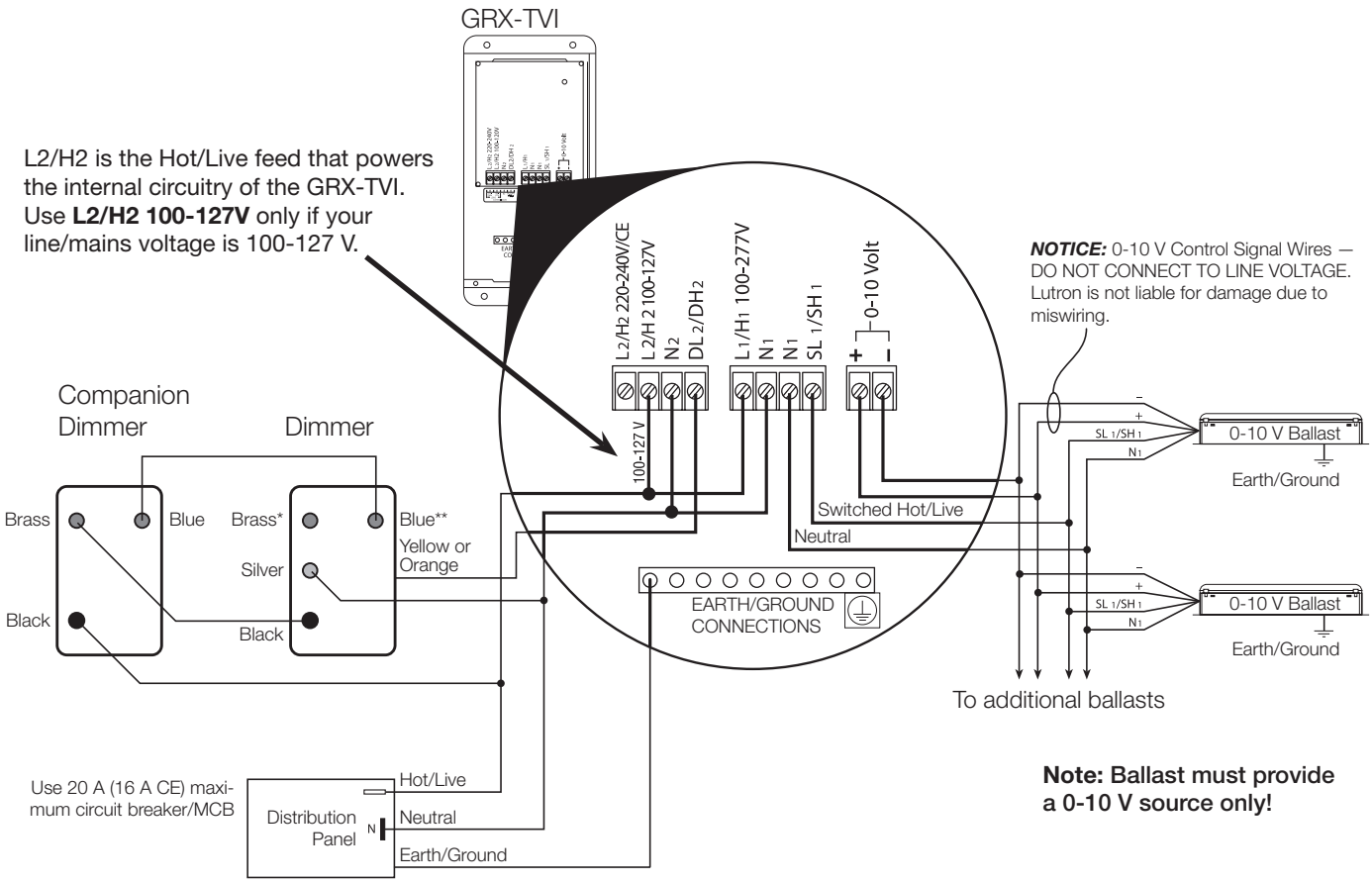


* Single pole dimmers use black for the hot/live wire. Refer to the single-pole dimmer's installation instructions to identify the hot/live wire for that product.

** The red wire is not used. Cap off the red wire using a wire connector. Do not wire the red wire to ground or to any other wiring.

Job Name:	Model Numbers:	
Job Number:		

Wiring Diagram G: Maestro®/Spacer System®/Vierti®
3-wire Fluorescent Dimmers — 1 Distribution Panel

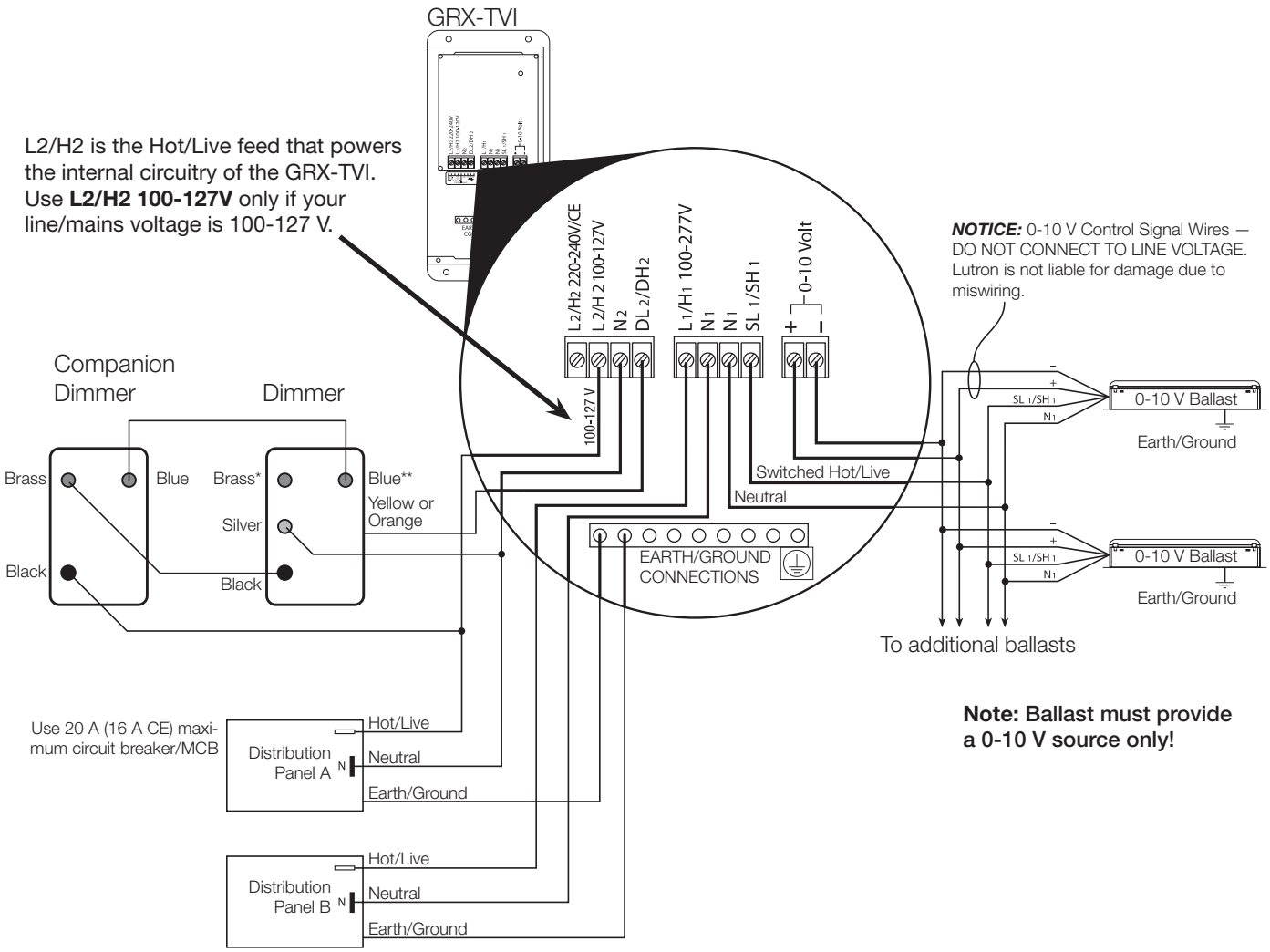


* The brass screw terminal is not used. Tighten the brass screw terminal. Do not connect the brass screw terminal to ground or to any other wiring.

** When used as a single-pole dimmer, the blue screw terminal is not used. When used as a single-pole dimmer, tighten the blue screw terminal—do not connect the blue screw terminal to ground or to any other wiring.

Job Name:	Model Numbers:	
Job Number:		

Wiring Diagram H: Maestro®/Spacer System®/Vierti®
3-wire Fluorescent Dimmers — 2 Distribution Panels



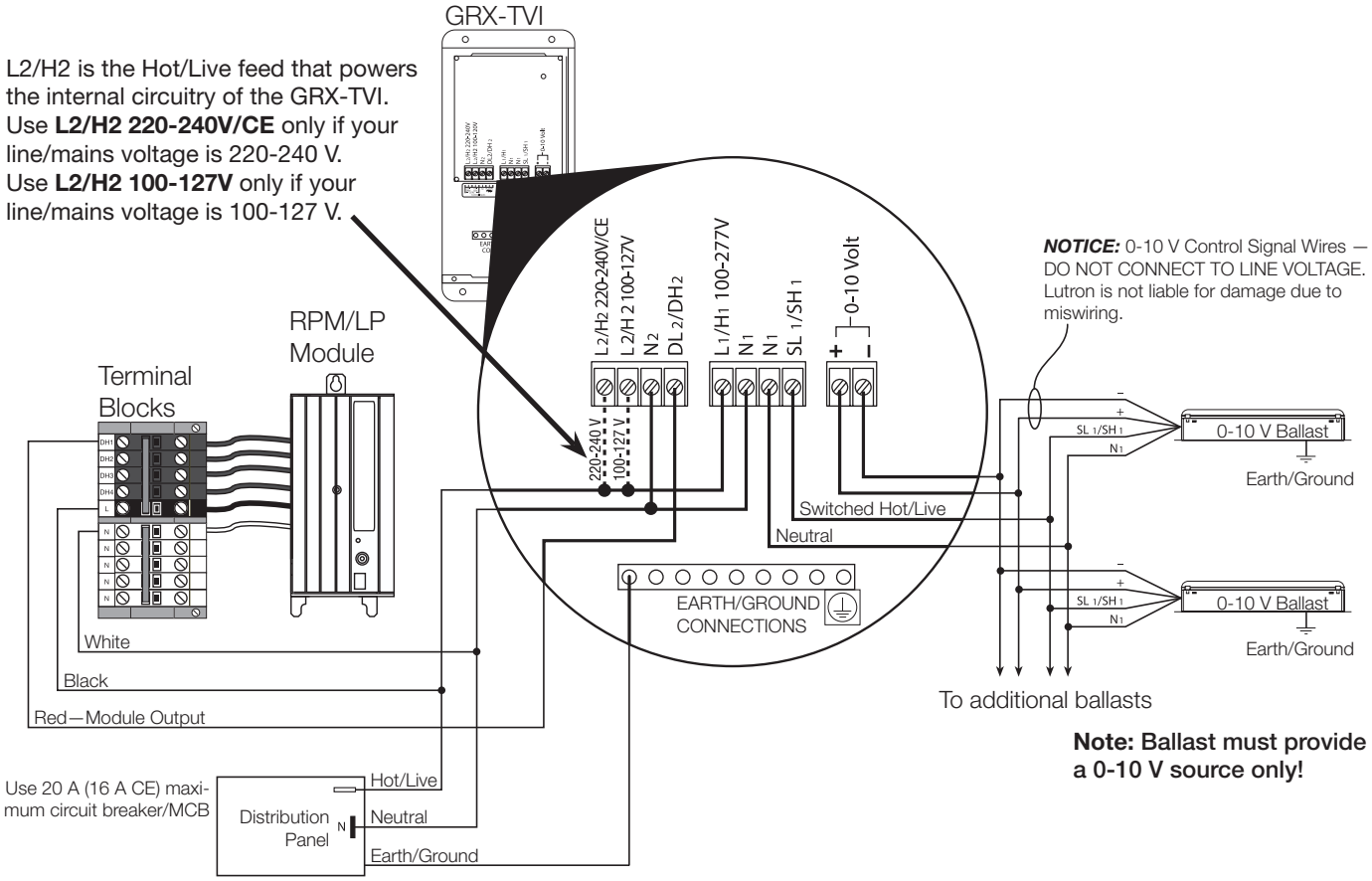
Note: Ballast must provide a 0-10 V source only!

* The brass screw terminal is not used. Tighten the brass screw terminal. Do not connect the brass screw terminal to ground or to any other wiring.

** When used as a single-pole dimmer, the blue screw terminal is not used. When used as a single-pole dimmer, tighten the blue screw terminal—do not connect the blue screw terminal to ground or to any other wiring.

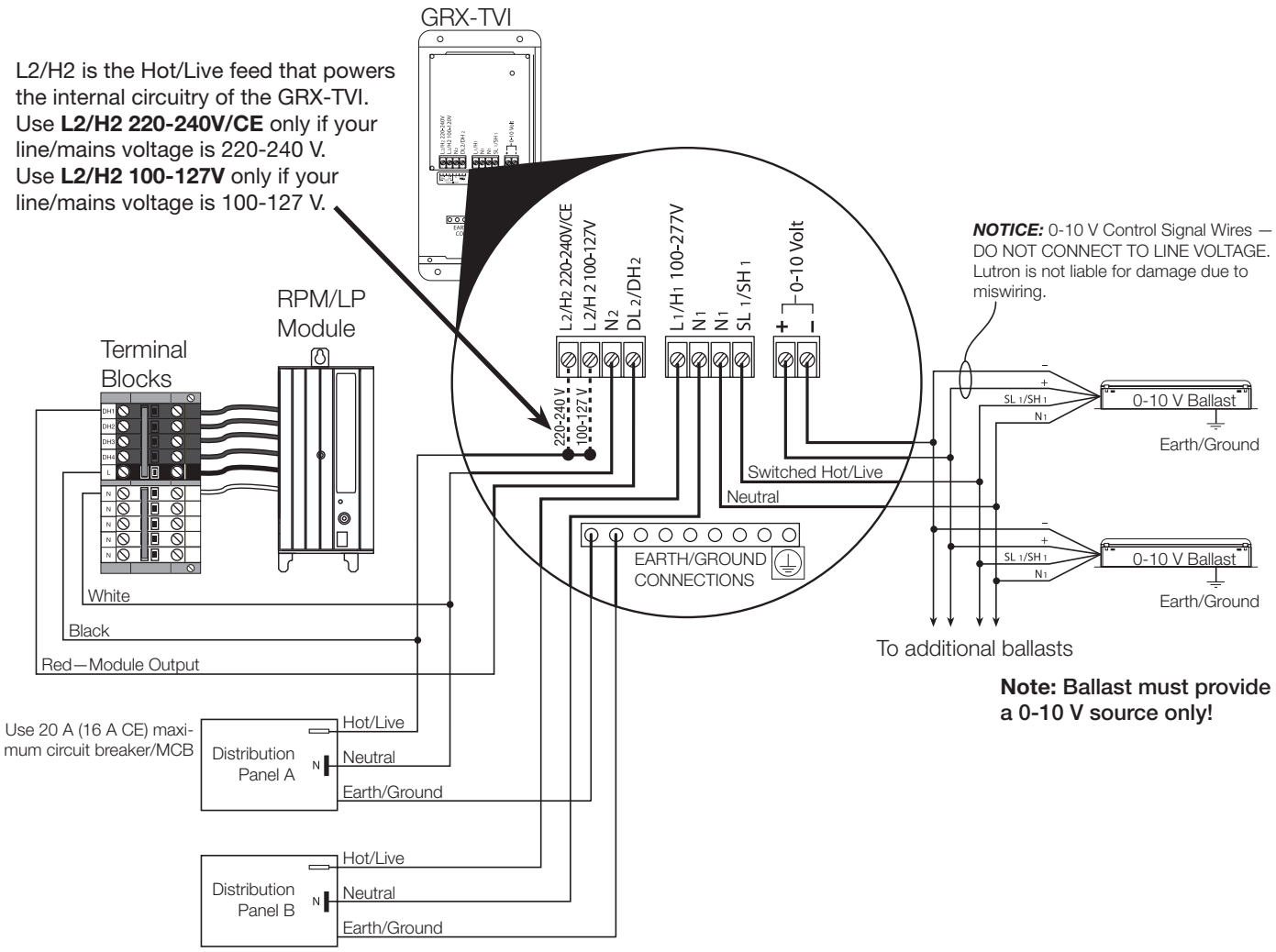
Job Name:	Model Numbers:	
Job Number:		

Wiring Diagram I: HomeWorks® Remote Power Module/LP Module — 1 Distribution Panel



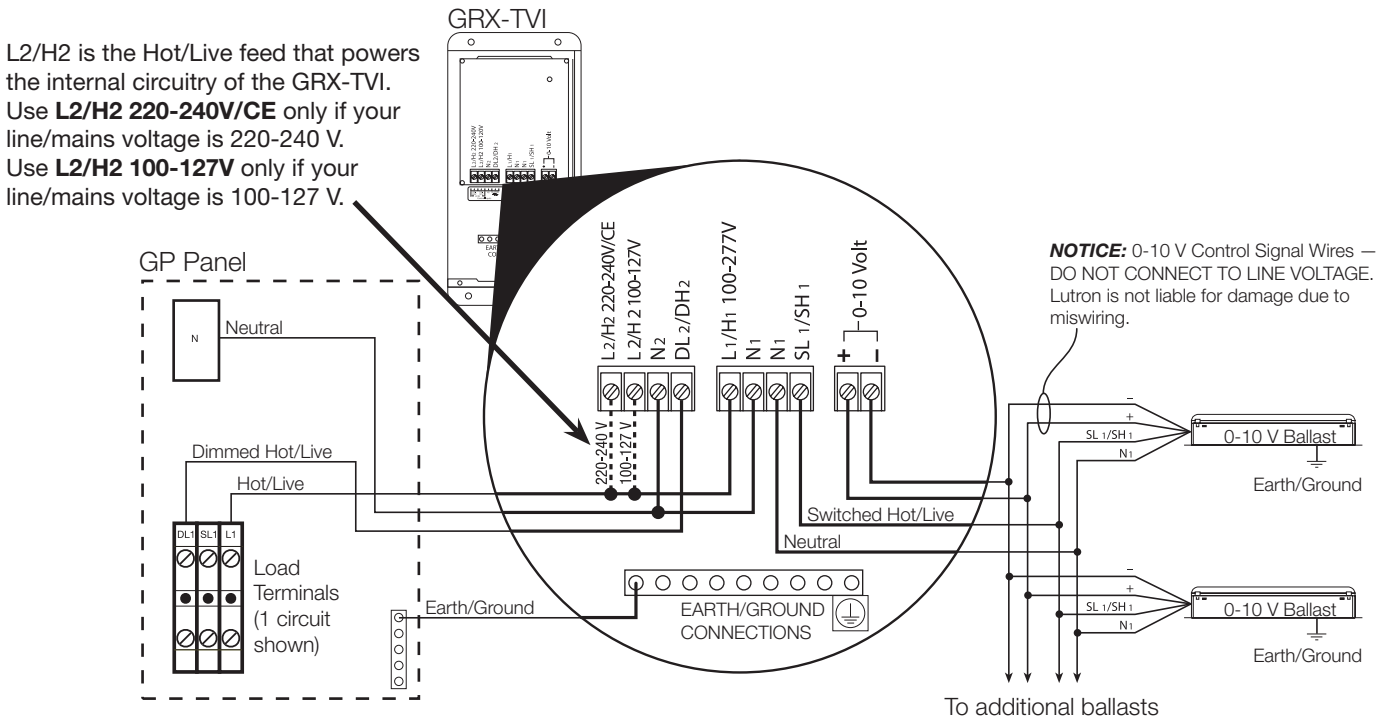
Job Name:	Model Numbers:	
Job Number:		

Wiring Diagram J: HomeWorks® Remote Power Module/LP Module — 2 Distribution Panels



Job Name:	Model Numbers:	
Job Number:		

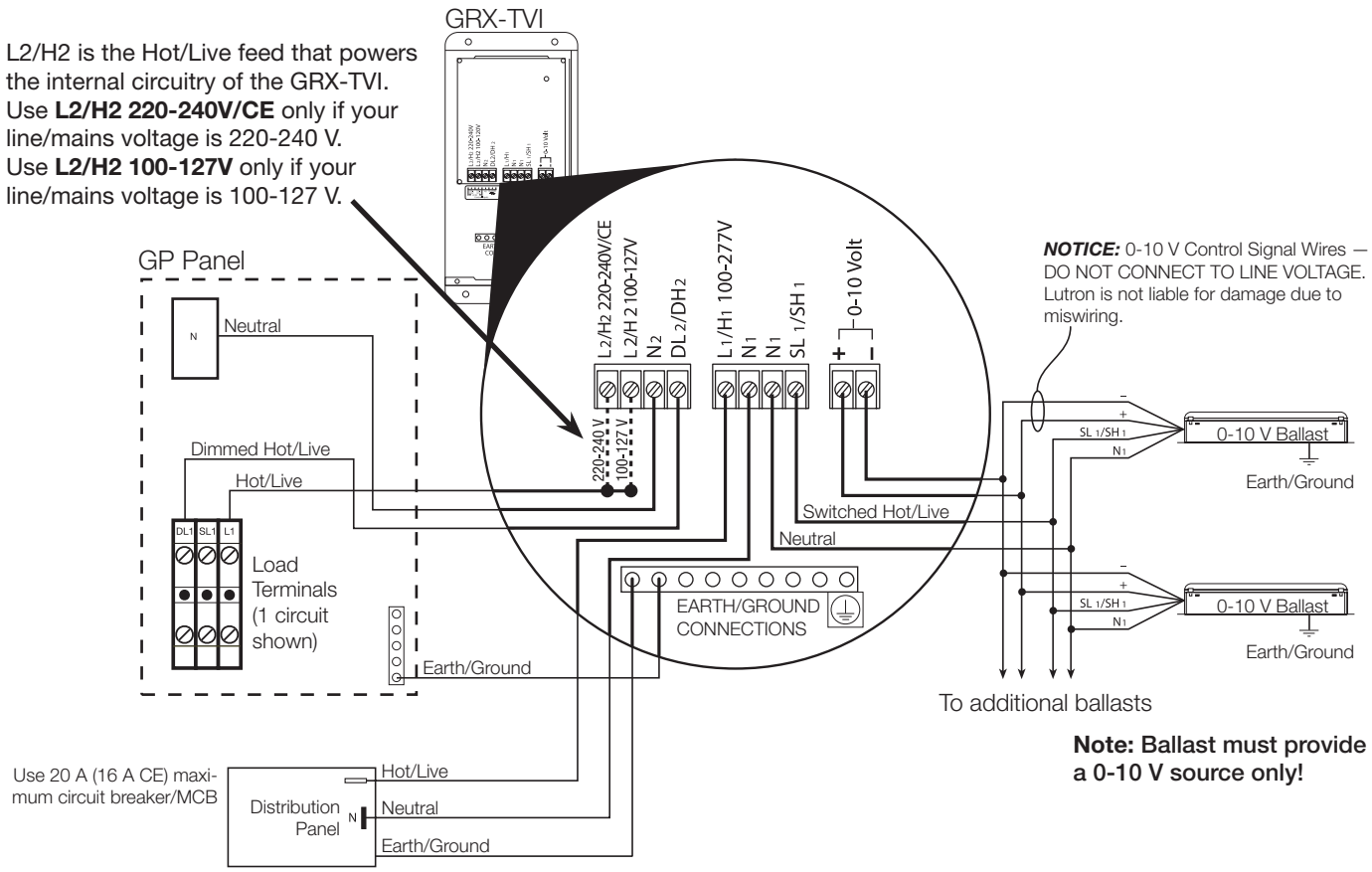
Wiring Diagram K: GP Panel — 1 Distribution Panel



Note: Ballast must provide a 0-10 V source only!

Job Name:	Model Numbers:	
Job Number:		

Wiring Diagram L: GP Panel — 2 Distribution Panels



Job Name:	Model Numbers:	
Job Number:		

LUT-LBX Synthetic Minimum Load



Description

- Provides capability for certain Lutron dimmers to control low-wattage loads from 0 watts up to the dimmer's minimum rating
- Presents a simulated load to the dimmer to meet the minimum load requirements even when the actual load is smaller.
- Works with forward phase or leading edge dimmers and reverse phase or trailing edge dimmers.
- Models available for 120 V~ and 220-240 V~ input power.
- This "load-side" equipment installs on the zone wiring in parallel with the lighting load.
- Dissapates a maximum of 10 watts when the controlling dimmer is near high-end.

Works with:

- GRAFIK Eye® 3000 Series control units
- LP RPM Dimmimg Modules
- HomeWorks® RPM Dimming Modules
- HomeWorks® WPM Dimming Modules
- Neutral-referenced Lutron dimmers
- Two-wire Lutron dimmers

Available Models

Input Power	Model Number
120 V~	LUT-LBX-WH
220 - 240 V~	LUT-LBX-CE-WH

Job Name:	Model Numbers:	
Job Number:		

Specifications

Input

- 120 V~ 100 mA 50/60 Hz (LUT-LBX)
- 220-240 V~ 65 mA 50/60 Hz (LUT-LBX-CE)
- Power dissipation less than 10 watts

Sources/Load Types*

Operates these sources when wired in parallel with the load:

- Incandescent (Tungsten)
- Halogen
- Magnetic Low-Voltage Transformer
- Electronic Low-Voltage Transformer
- Lutron Tu-Wire® Electronic Fluorescent Dimming Ballast
- Neon/Cold Cathode
- LED lighting (refer to Application Note #138 for further details)

Terminals

Accepts up to two 12 AWG (2.5 mm^2) wires.

Environment

32 - 104 °F (0 - 40 °C). Relative humidity less than 90% non-condensing.

Mounting

Surface or recess mount indoors only.

EMC Immunity

- Surge protection up to 6 kV, 3000 A, IEEE std. C62.41
- ESD protection up to 16 kV

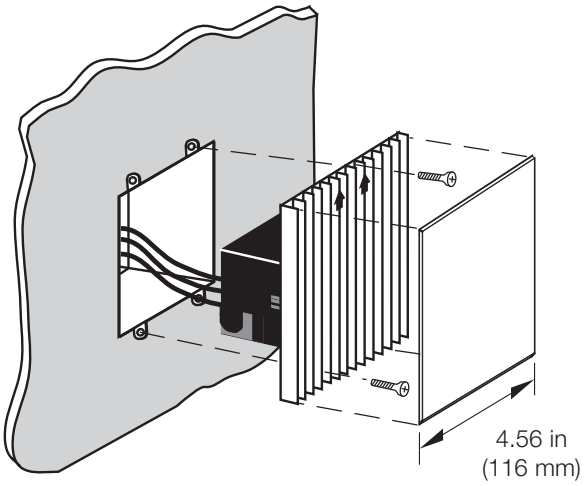
* The dimmer must be rated for the load type being used. The LUT-LBX does not change the approved load types of the dimmer, just the minimum load requirement. For example, MLV loads must still be used with MLV dimmers.

Job Name:	Model Numbers:	
Job Number:		

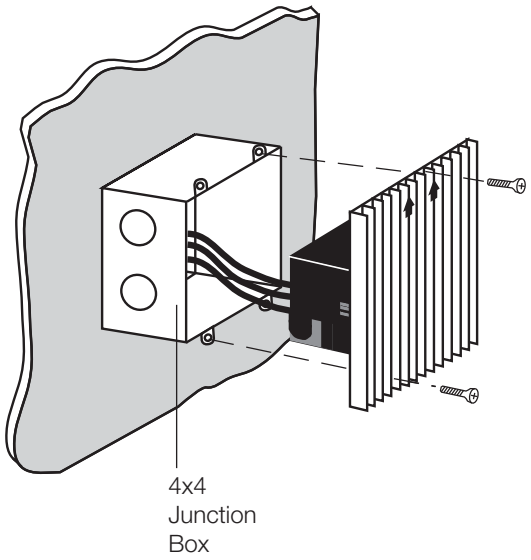
Dimensions and Mounting

- Recess or surface mount in provided 4x4 junction box (Lutron P/N 241-496) 3.5 in (89 mm) deep. Indoors only.
- LUT-LBX generates heat; mount only where ambient temperature is 32 - 104 °F (0 - 40 °C).
- Mount with arrows on yoke facing up to ensure adequate cooling.
- Allow 4.5 in (114 mm) above and below unit and between faceplates when mounting several in a vertical layout.
- For better heat dissipation, surface mount without faceplate.
- Mount so line (mains) voltage wiring is at least 6 ft (1.8 m) from sound or electronic equipment and wiring.
- Mount Interface within 7° of true vertical.

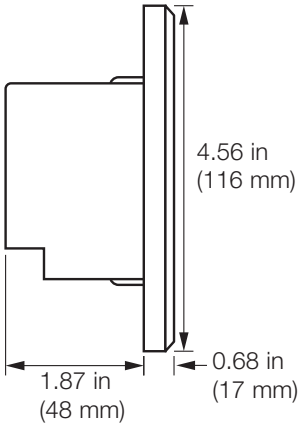
Recess Mount with Faceplate



Surface Mount without Faceplate



Side View

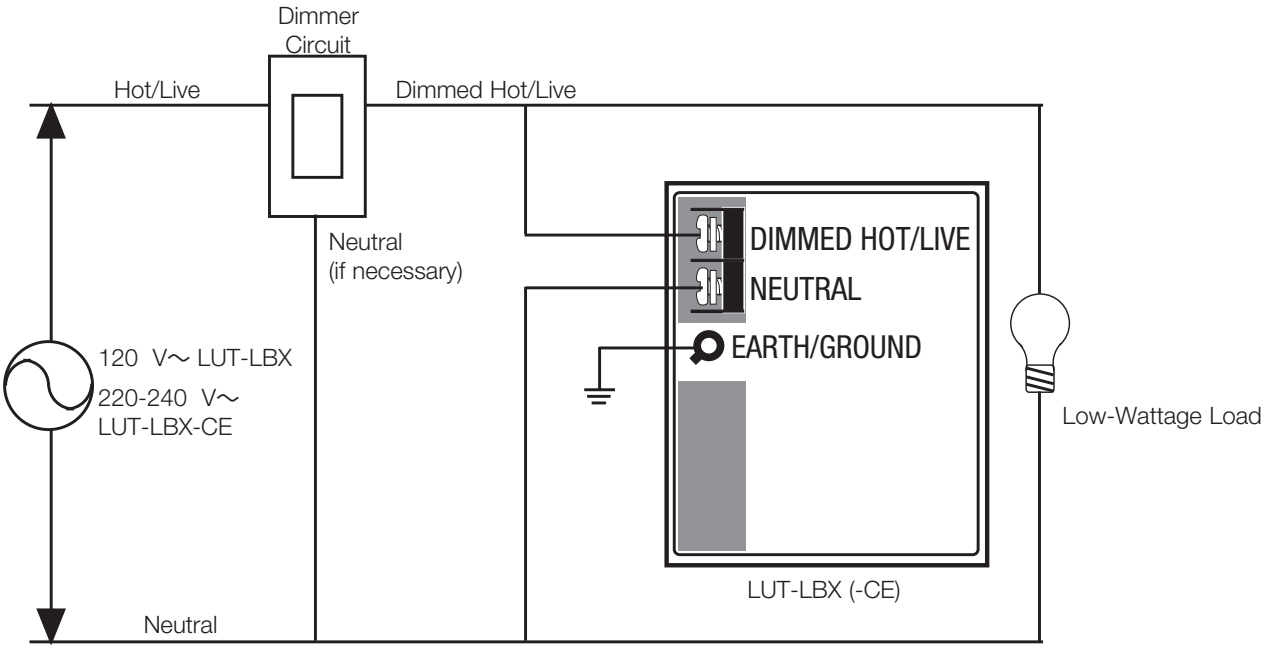


Job Name:	Model Numbers:	
Job Number:		

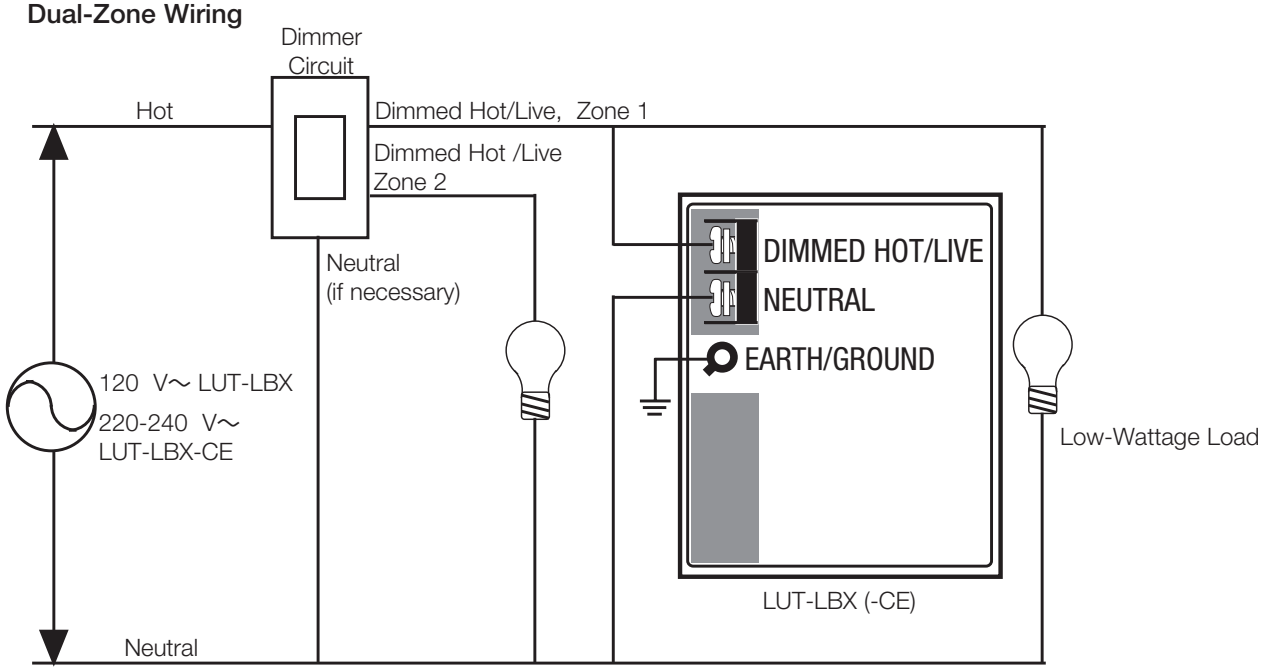
Wiring

- Pull 12 to 16 AWG (2.5 - 1.0 mm²) Copper (Cu) wires (75 °C minimum) for input power and load circuit.
- Strip 0.5 in (12 mm) insulation from wires before connecting.

Single-Zone Wiring



Dual-Zone Wiring



Job Name:	Model Numbers:	
Job Number:		

Ballasts and Drivers

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EcoSystem® H-Series Ballasts Overview

EcoSystem® H-Series digitally addressable ballasts provide a low-cost, flexible solution for any space in any application. Industry leading dimming to less than 1% meets the needs of the most demanding applications. Individual control with the EcoSystem® Digital Link eliminates the need to rewire, reduces design time, and provides a scalable solution from a small area to an entire building.



EcoSystem® H-Series, case type M

1.18 in (30 mm) W x 1.00 in (25 mm) H x 14.125 in (359 mm) L



EcoSystem® H-Series, case type G

2.38 in (60 mm) W x 1.0 in (25 mm) H x 9.5 in (241 mm) L

Features

- Continuous, flicker-free dimming from 100% to 1% or less for T8, and 1% for T5 and T5HO lamps.
- Compatible with Energi Savr Node™ with EcoSystem® unit, GRAFIK Eye® QS control unit, PowPak™ dimming module with EcoSystem® unit, and Quantum® software, allowing for integration into an existing or planned EcoSystem® lighting control solution.
- Programmed rapid start design preheats lamp cathodes before applying full arc voltage to ensure full-rated lamp life while dimming and cycling.
- 100% performance tested and burned in at factory.
- Lamps turn on to any dimmed level without going to full brightness.
- Low harmonic distortion throughout the entire dimming range maintains power quality.
- Frequency of operation ensures that ballast does not interfere with infrared devices operating between 38 kHz and 42 kHz.
- Ballasts maintain consistent light output for different lamp lengths, ensuring fixture-to-fixture uniformity
- Ultra-quiet operation.
- Ballast protected from miswires of any input power to control lead, or from lamp leads to each other and/or ground.
- End-of-lamp-life protection circuitry ensures safe operation throughout entire lamp life.
- Non-volatile memory restores all ballast settings after power failure.
- 100% compatible with all EcoSystem® digital controls.
- Custom ballast factors available for UL or CSA listed products. Design tool and specifications can be found at www.lutron.com/ballasttool

LUTRON® SPECIFICATION SUBMITTAL

Job Name:	Model Numbers:	
Job Number:		

Specifications

Standards

- California Energy Commission Listed.
- UL Listed (evaluated to the requirements of UL935).
- CSA certified (evaluated to the requirements of C22.2 No. 74).
- Class P thermally protected.
- Meets ANSI C82.11 High Frequency Ballast Standard.
- Meets FCC Part 18 Non-Consumer requirements for EMI/RFI emissions.
- Meets ANSI C62.41 Category A surge protection standards up to and including 4 kV.
- Manufacturing facilities employ ESD reduction practices that comply with the requirements of ANSI/ESD S20.20.
- Lutron® Quality Systems registered to ISO9001.2008.

Ballast Wiring & Mounting

- Ballast is grounded via a mounting screw to the fixture.
- Ballast mounts using two screws (or sheet metal feature and one screw) within a fluorescent fixture.
- Power and lamp wiring terminals accept one 18 to 16 AWG (0.75 to 1.5 mm^2) solid copper wire per terminal.

- **Lamp Seasoning**

  Refer to the lamp manufacturer's requirements for lamp seasoning requirements prior to dimming.

Environment

- Minimum lamp starting temperature: 50 °F (10 °C)
- Relative humidity: less than 90% non-condensing
- Sound Rating: Class A
- Maximum ballast case temperature: 80 °C

Performance

- Dimming Range: 100% to 0.7% measured Relative Light Output (RLO) for T8, 100% to 1% RLO for T5 and T5HO.
- Lamp Starting: programmed rapid start
- Lamp Current Crest Factor: less than 1.7
- Lamp Flicker: none visible
- Light Output Variation: constant ±2% light output for line voltage variations of ±10%
- Lamp Life: average lamp life meets or exceeds rating of lamp manufacturer.
- Power Factor: greater than 0.95
- Total Harmonic Distortion (THD): less than 10% *
- Operating Voltage: Universal input 120 V~, 220/240 V~, 277 V~ at 50 or 60 Hz
- Frequency of Operation: greater than 42 kHz
- Ballast Factor (BF): 1.0/1.17 for T8 lamps and 1.0 for T5 and T5HO lamps
- Standby Power: less than 1 W

Dimming Range for T8 lamps:

BF	Dimming Range (Max/Min [BF])	Dimming Ratio
1.17	1.17 / 0.0085	138:1
1.0	1.00 / 0.0085	118:1

Dimming Range for T5 and T5HO lamps:

BF	Dimming Range (Max/Min [BF])	Dimming Ratio
1.0	1.00 / 0.01	100:1

Warranty

- 5-year limited warranty with Lutron® field service commissioning (3-year standard warranty) from date of purchase. For additional Warranty information, please visit www.lutron.com/ResourceLibrary/warranty/Limited%20Comm.pdf

* Models EHDT817MU110, EHDT514MU110, EHDT521MU110 and EHDT521MU210 have less than 15% (THD).

Job Name:	Model Numbers:	
Job Number:		

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EcoSystem® H-Series Ballasts for Linear and U-Bend T8 Lamps

For proper dimming all lamps must comply to accepted standards, 17, 25 and 32 W lamps (NEMA LL9-2000)

Lamp Type	Lamp Watts (length)	Lamps per Ballast	Case Size	EcoSystem® H-Series Ballasts	Input Voltage (V~)	Ballast Current (A)	Ballast Factor (BF)	Input Power (W)	System Lumens* (lm)	System Efficacy* (lm/W)	Ballast Efficacy Factor (BEF)	Relative System Efficacy (RSE)
T8 and U-Bend 	32 W (48 in [122 cm])	1	M	EHD T832 M U 1 10	120 240 277	0.29 0.14 0.12	1.00 1.00 1.00	34.8 33.6 33.2	3000 3000 3000	86 89 90	2.87 2.98 3.01	0.92 0.95 0.96
		1	M	EHD T832 M U 1 17	120 240 277	0.34 0.17 0.15	1.17 1.17 1.17	40.8 40.8 41.6	3510 3510 3510	86 86 84	2.87 2.87 2.82	0.92 0.92 0.90
		2	M	EHD T832 M U 2 10	120 240 277	0.57 0.28 0.24	1.00 1.00 1.00	68.4 67.2 66.5	6000 6000 6000	88 89 90	1.46 1.49 1.50	0.94 0.95 0.96
		2	M	EHD T832 M U 2 17	120 240 277	0.65 0.32 0.28	1.17 1.17 1.17	78.0 76.8 77.6	7020 7020 7020	90 91 91	1.50 1.52 1.51	0.96 0.98 0.97
		3	G	EHD T832 G U 3 10	120 240 277	0.83 0.40 0.37	1.00 1.00 1.00	99.6 96.0 102.5	9000 9000 9000	90 94 88	1.00 1.04 0.98	0.96 1.00 0.94
		3	G	EHD T832 G U 3 17	120 240 277	0.95 0.47 0.41	1.17 1.17 1.17	114.0 112.8 113.6	10,530 10,530 10,530	92 93 93	1.03 1.04 1.03	0.99 1.00 0.99
	25 W (36 in [91 cm])	1	M	EHD T825 M U 1 10	120 240 277	0.26 0.11 0.11	1.00 1.00 1.00	31.2 26.4 30.5	1900 1900 1900	61 72 62	3.21 3.79 3.28	0.80 0.95 0.82
		2	M	EHD T825 M U 2 10	120 240 277	0.47 0.23 0.20	1.00 1.00 1.00	56.4 55.2 55.4	3800 3800 3800	67 69 69	1.77 1.81 1.81	0.89 0.91 0.90
	17 W (24 in [61 cm])	1	M	EHD T817 M U 1 10	120 240 277	0.18 0.09 0.08	1.00 1.00 1.00	21.6 21.6 22.2	1300 1300 1300	60 60 59	4.63 4.63 4.51	0.79 0.79 0.77
		2	M	EHD T817 M U 2 10	120 240 277	0.35 0.18 0.15	1.00 1.00 1.00	42.0 43.2 41.6	2600 2600 2600	62 60 63	2.38 2.31 2.41	0.81 0.79 0.82

* Actual number may vary with lamp model. Please consult lamp manufacturer for lamp-specific data.

Job Name:	Model Numbers:	
Job Number:		

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EcoSystem® H-Series Ballasts for T5 Linear Lamps

For proper dimming all lamps must comply to accepted standards, 14 W (60081-IEC-6520), 21 W (60081-IEC-6530) and 28 W (60081-IEC-6640)

Lamp Type	Lamp Watts (length)	Lamps per Ballast	Case Size	EcoSystem® H-Series Ballasts	Input Voltage (V~)	Ballast Current (A)	Ballast Factor (BF)	Input Power (W)	System Lumens* (lm)	System Efficacy* (lm/W)	Ballast Efficacy Factor (BEF)	Relative System Efficacy (RSE)
T5 Linear 	28 W (45.2 in [115 cm])	1	M	EHD T528 M U 1 10	120 240 277	0.28 0.13 0.12	1.00 1.00 1.00	33.6 31.2 33.0	2900 2900 2900	86 93 88	2.98 3.21 3.03	0.83 0.90 0.85
		2	M	EHD T528 M U 2 10	120 240 277	0.52 0.26 0.22	1.00 1.00 1.00	62.4 62.4 59.8	5800 5800 5800	93 93 97	1.60 1.60 1.67	0.90 0.90 0.94
	21 W (33.4 in [84 cm])	1	M	EHD T521 M U 1 10	120 240 277	0.22 0.11 0.10	1.00 1.00 1.00	26.3 26.3 26.6	2100 2100 2100	80 80 79	3.81 3.81 3.76	0.80 0.80 0.79
		2	M	EHD T521 M U 2 10	120 240 277	0.41 0.20 0.18	1.00 1.00 1.00	48.7 48.6 48.5	4200 4200 4200	86 86 87	2.05 2.06 2.06	0.86 0.86 0.87
	14 W (21.6 in [55 cm])	1	M	EHD T514 M U 1 10	120 240 277	0.16 0.08 0.07	1.00 1.00 1.00	19.2 19.2 19.4	1350 1350 1350	70 70 70	5.21 5.21 5.16	0.73 0.73 0.72
		2	M	EHD T514 M U 2 10	120 240 277	0.30 0.15 0.13	1.00 1.00 1.00	36.0 36.0 36.0	2700 2700 2700	75 75 75	2.78 2.78 2.78	0.78 0.78 0.78

EcoSystem® H-Series Ballasts for T5HO Linear Lamps

For proper dimming all lamps must comply to accepted standards, 24 W (60081-IEC-6620), 39 W (60081-IEC-6730) and 54 W (60081-IEC-6840)

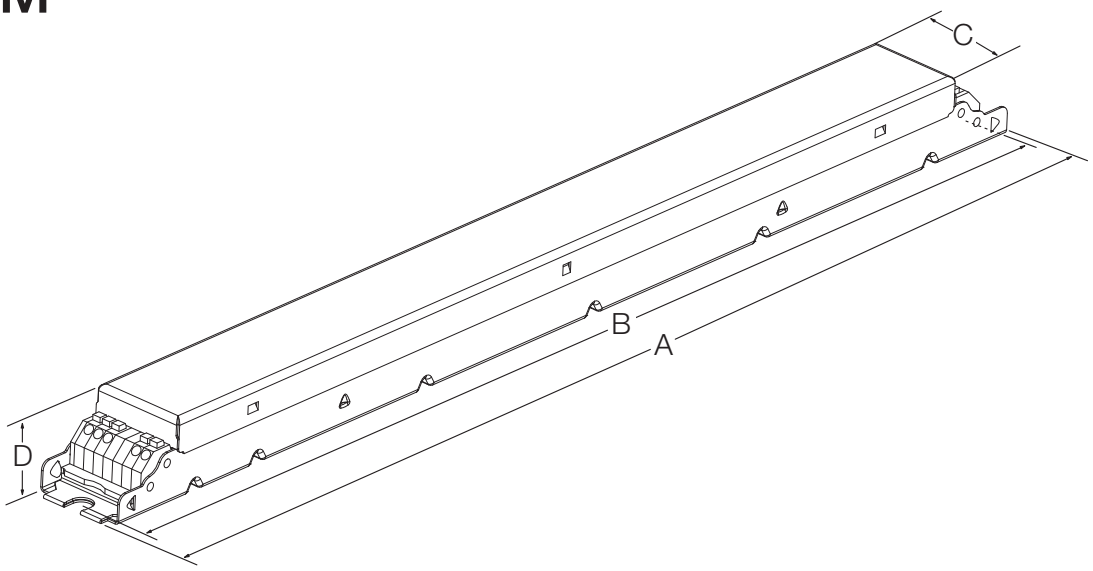
Lamp Type	Lamp Watts (length)	Lamps per Ballast	Case Size	EcoSystem® H-Series Ballasts	Input Voltage (V~)	Ballast Current (A)	Ballast Factor (BF)	Input Power (W)	System Lumens* (lm)	System Efficacy* (lm/W)	Ballast Efficacy Factor (BEF)	Relative System Efficacy (RSE)
T5HO Linear 	54 W (45.2 in [115 cm])	1	M	EHD T554 M U 1 10	120 240 277	0.54 0.26 0.23	1.00 1.00 1.00	64.8 62.4 63.7	5000 5000 5000	77 80 78	1.54 1.60 1.57	0.83 0.87 0.85
		2	M	EHD T554 M U 2 10	120 240 277	0.95 0.48 0.42	1.00 1.00 1.00	114.0 115.2 116.3	10,000 10,000 10,000	88 87 86	0.88 0.87 0.86	0.95 0.94 0.93
	39 W (33.4 in [84 cm])	1	M	EHD T539 M U 1 10	120 240 277	0.37 0.19 0.17	1.00 1.00 1.00	44.4 44.9 46.0	3500 3500 3500	79 78 76	2.25 2.23 2.17	0.88 0.87 0.85
		2	M	EHD T539 M U 2 10	120 240 277	0.70 0.35 0.29	1.00 1.00 1.00	84.0 84.0 81.4	7000 7000 7000	83 83 86	1.19 1.19 1.23	0.93 0.93 0.96
	24 W (21.6 in [55 cm])	1	M	EHD T524 M U 1 10	120 240 277	0.25 0.12 0.10	1.00 1.00 1.00	30.0 28.8 27.7	2000 2000 2000	67 69 72	3.33 3.47 3.61	0.80 0.83 0.87
		2	M	EHD T524 M U 2 10	120 240 277	0.46 0.23 0.20	1.00 1.00 1.00	54.6 55.2 55.4	4000 4000 4000	73 72 72	1.83 1.81 1.81	0.88 0.87 0.87

* Actual number may vary with lamp model. Please consult lamp manufacturer for lamp-specific data.

Job Name:	Model Numbers:	
Job Number:		

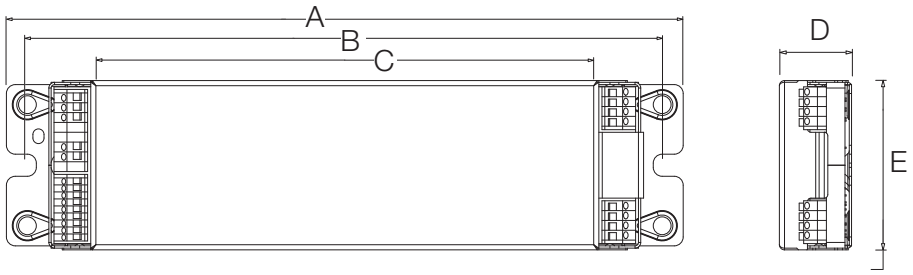
Case Dimensions

M



A	14.125 in (359 mm)
B	13.68 in (347 mm) (mounting center)
C	1.18 in (30 mm)
D	1.00 in (25 mm)

G



A	9.5 in (241 mm)
B	8.9 in (226 mm) (mounting center)
C	7.1 in (180 mm)
D	1.0 in (25 mm)
E	2.38 in (60 mm)

Job Name:	Model Numbers:	
Job Number:		

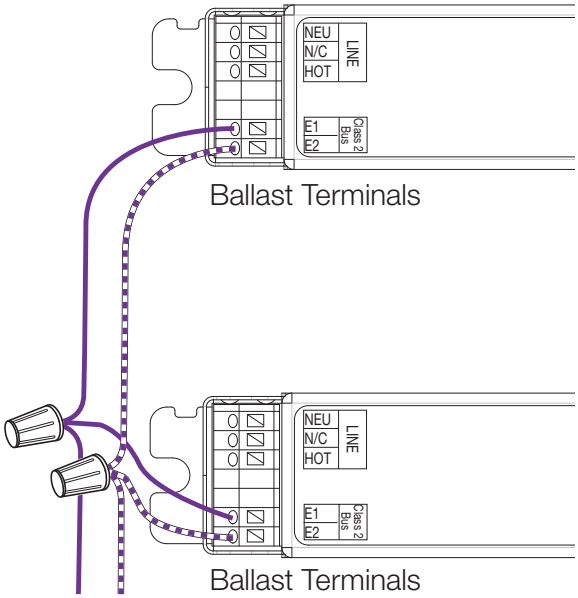
EcoSystem® H-Series Wiring Diagrams

EcoSystem® Digital Link Overview

- The EcoSystem® Digital Link wiring (E1 and E2) connects the digital ballasts and drivers together to form a lighting control system.
- Sensors do not directly connect to EcoSystem® H-Series ballasts.
- No 3-wire phase control with EcoSystem® H-Series ballasts.
- E1 and E2 (EcoSystem® digital link wires) are polarity insensitive and can be wired in any topology.
- An Energi Savr Node™ with EcoSystem® unit, GRAFIK Eye® QS control unit with EcoSystem®, or Quantum® dimming module with EcoSystem® provides power for the EcoSystem® digital link which supports up to 64 digital ballasts or LED drivers, 64 occupant sensors, 16 daylight sensors and 64 wall stations or IR receivers.
- PowPak™ dimming module with EcoSystem® provides power for the EcoSystem® digital link which supports up to 32 digital ballasts or LED drivers, 6 occupant sensors, 1 daylight sensor and 9 Pico® wireless controllers.
- All EcoSystem® Digital Link programming is completed by using the Energi Savr App for *Apple iPad*, *iPod Touch* or *iPhone* mobile digital device; GRAFIK Eye® QS with EcoSystem®; PowPak™ dimming module with EcoSystem®; or Quantum® System.

EcoSystem® Digital Link Wiring

- Ballast EcoSystem® Digital Link terminals accept one 18 to 16 AWG (0.75 to 1.5 mm²) solid copper wire per terminal.
- Make sure that the supply breaker to the Digital Ballast and EcoSystem® Digital Link Supply is OFF when wiring.
- Connect the two conductors to the two Digital Ballast terminals E1 and E2 as shown.
- Using two different colors for E1 and E2 will reduce confusion when wiring several ballasts together.
- The EcoSystem® Digital Link may be wired Class 1 or IEC/PELV NEC® Class 2. Consult applicable electrical codes for proper wiring practices.



To the EcoSystem® Digital Link Supply

Notes

- The EcoSystem® Digital Link Supply does not have to be located at the end of the Digital Link.
- EcoSystem® Digital Link length is limited by the wire gauge used for E1 and E2 as follows:

Wire Gauge	Digital Link Length (max)
12 AWG	2200 ft
14 AWG	1400 ft
16 AWG	900 ft
18 AWG	550 ft

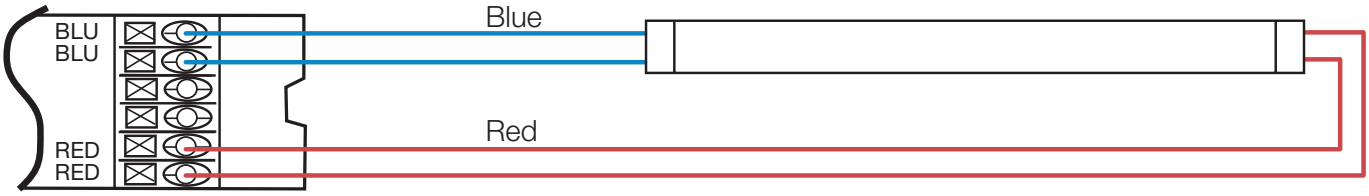
Wire Size	Digital Link Length (max)
4.0 mm²	825 m
2.5 mm²	515 m
1.5 mm²	310 m
1.0 mm²	205 m
0.75 mm²	155 m

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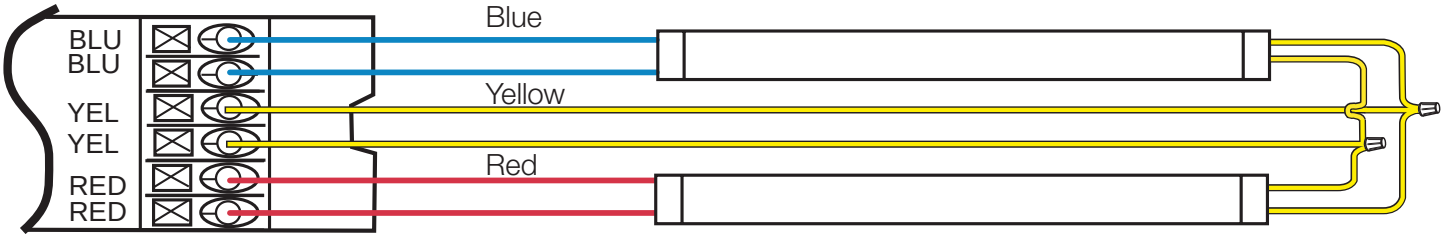
Job Name:	Model Numbers:	
Job Number:		

Wiring Diagrams for T8, T5, and T5HO linear lamps

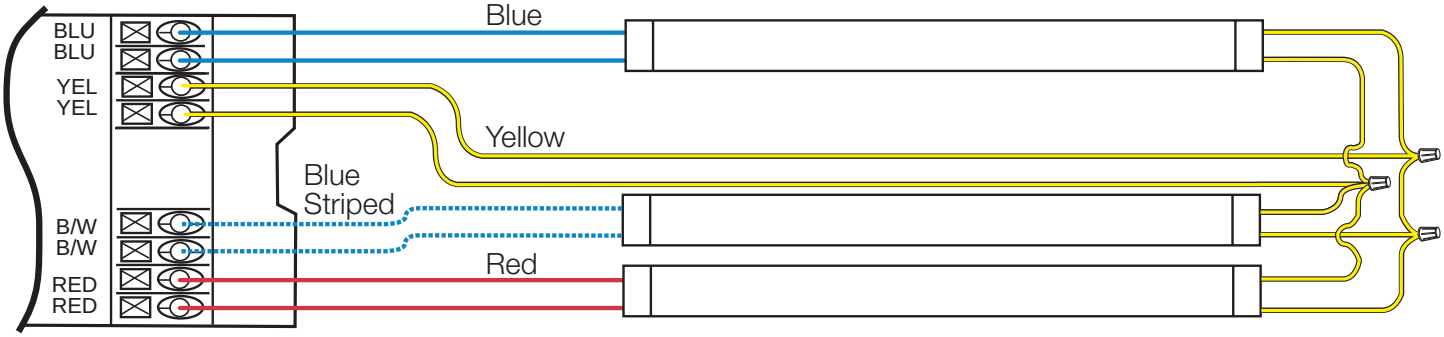
Wiring to One Lamp (C case shown)



Wiring to Two Lamps (C case shown)



Wiring to Three Lamps (G case shown)

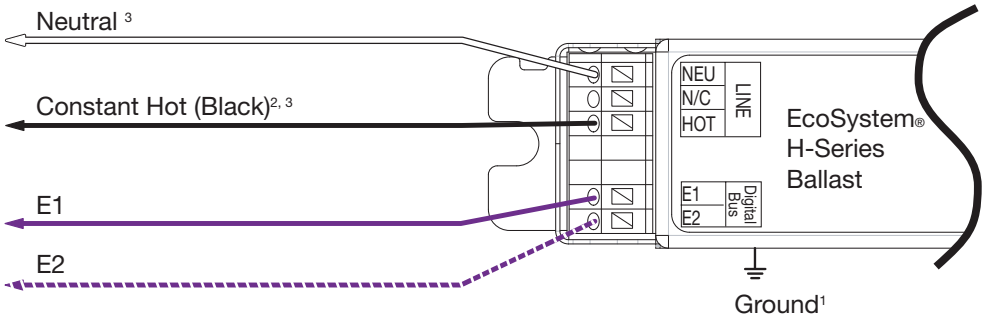


NOTICE

- Maximum ballast to lamp socket lead length is 7 ft (2 m).
- Wire colors shown are labeled on the ballast, but may vary depending upon fixture construction.

Job Name:	Model Numbers:	
Job Number:		

EcoSystem® Power Wiring Diagrams



[1] Ballast is grounded via the case.
[2] Wire colors shown are for Lutron® controls and ballasts only. Dimming control wires may not match ballast wire colors.
[3] Must not be wired to a switching device or system functionality will be lost.

Job Name:	Model Numbers:	
Job Number:		

ATTENTION ELECTRICIANS AND CONTRACTORS

Lamp Sockets

Lutron requires and NEMA® recommends sockets complying with IEC 60400. Inspect sockets for marks to ensure the socket complies with IEC 60400. Two examples of these marks are: and . Sockets **must** have a mark as well. Use Rapid Start sockets.

DO NOT use Instant Start sockets. See Lutron® App Note #122 or NEMA® doc LSD-34-2006.

Lamp Socket Wiring Tester

Use Socket Tester (FDB-LSWT-T5/T8) to verify proper lamp holder wiring.

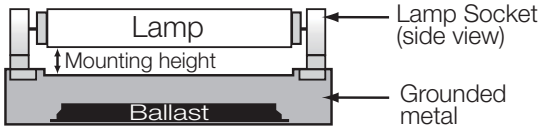
Available for purchase at www.lutronstore.com

Lamp Mounting

For proper lamp performance, lamps must be mounted at the correct height from the grounded metal surface. Having a fluorescent lamp too close to the grounded metal will make the minimum intensity too low and reduce lamp life. Having a fluorescent lamp too far away from the grounded metal will make the lamp flicker or not turn on at all. Refer to the table below for lamp mounting height requirements.

Lamp Mounting Height Requirements

Lamp Type	Lamp Mounting Height
T8 Linear	1/8 to 3/4 in (3.2 to 19.1 mm)
T5 Linear	1/16 to 3/8 in (1.6 to 9.5 mm)



IMPORTANT: Lamps must never touch ground plane and should be placed without obstruction.

Ballast/Socket Leads

Lead lengths from ballast to socket must not exceed 7 ft (2 m) for T8, T5, and T5HO linear lamps.

Ballast Operating Temperature

Ballast case temperature must not exceed 80 °C at any point on the ballast.

Wiring and Grounding

Ballast and lighting fixture must be effectively grounded. Ballasts must be installed per national and local electrical codes.

ATTENTION FACILITIES MANAGERS

PERFORMANCE

Lamp Seasoning

Consult lamp manufacturer's recommendations on lamp seasoning prior to dimming.

SERVICE

Replacement Parts

Use Lutron® replacement parts with exact model numbers. Consult Lutron if you have any questions.

Further Information

For further information, please visit us at www.lutron.com/ballasts or contact our 24-hour Technical Support Center at 1.800.523.9466.

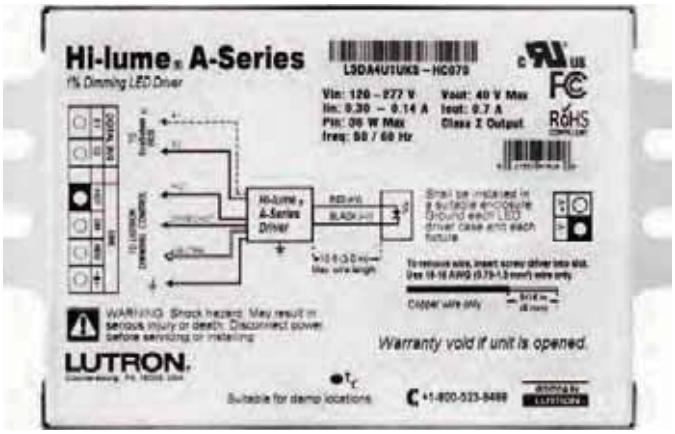
Job Name:	Model Numbers:	
Job Number:		

Hi-lume® A-Series Driver Overview EcoSystem® or 3-wire control

Hi-lume® A-Series Driver is a high-performance LED driver that provides smooth, continuous 1% dimming for virtually any LED fixture, whether it requires constant current or constant voltage. It is the most versatile LED driver offered today due to its compatibility with a wide variety of LED arrays, multiple form factors, and numerous control options.

Features

- Continuous, flicker-free dimming from 100% to 1%.
- Compatible with Energi Savr Node™ with EcoSystem® unit, GRAFIK Eye® QS control unit, PowPak™ dimming module with EcoSystem®, and Quantum® systems, allowing for integration into a planned or existing EcoSystem® lighting control solution. Please see chart at the end of this document or contact Lutron for details regarding compatible controls.
- Standard 3-wire line-voltage phase-control technology for consistent dimming performance and compatibility with all Lutron® 3-wire fluorescent controls.
- Protected from miswires of input power to EcoSystem® control inputs.
- 100% performance tested at factory.
- 100% burned in at factory.
- A rated lifetime of 50,000 hours @ t_C = 149 °F (65 °C).
- UL recognized for United States and Canada.
- FCC Part 15 compliant for commercial applications at 120 V~ or 277 V~.
- Pulse Width Modulation (PWM) or Constant Current Reduction (CCR) dimming methods available. See Application Note #360 for details.
- For more information please go to: www.lutron.com/HilumeLED



Hi-lume® A-Series, case type K

3.00 in (76 mm) W x 1.00 in (25 mm) H x 4.90 in (124 mm) L



Hi-lume® A-Series, case type M

1.18 in (30 mm) W x 1.00 in (25 mm) H x 14.25 in (362 mm) L

LUTRON® SPECIFICATION SUBMITTAL Page 1

Job Name:	Model Numbers:	
Job Number:		

Specifications

Performance

- Dimming Range: 100% to 1%
- Operating Voltage: 120-277 V~ at 50/60 Hz
- A rated lifetime of 50,000 hours @ t_c = 149 °F (65 °C). Contact Lutron for derating information.
- Patented thermal foldback protection
- LEDs turn on to any dimmed level without going to full brightness.
- Nonvolatile memory restores all driver settings after power failure.
- Power Factor: >0.90 at 40 W
- Standby Power Consumption: <1.0 W
- Total Harmonic Distortion (THD): <20% at 40 W
- Inrush Current: <2 A
- Inrush Current Limiting Circuitry: eliminates circuit breaker tripping, switch arcing and relay failure.
- Open circuit protected
- Short circuit protected
- Turn-on time: ≤ 1 second
- PWM Dimming Frequency: 550 Hz

Environmental

- Sound Rating: Class A.
- Relative Humidity: Maximum 90% non-condensing.
- Minimum operating ambient temperature t_a = 32 °F (0 °C).

Standards

- Meets ANSI C62.41 category A surge protection standards up to and including 4 kV.
- FCC Part 15 compliant for commercial applications at 120 V~ or 277 V~.
- Manufacturing facilities employ ESD reduction practices that comply with the requirements of ANSI/ESD S20.20.
- Lutron® Quality Systems registered to ISO 9001.2008.
- UL 8750 recognized.
- Class 2 output available.
- Models available to meet LED Driver requirements for Energy Star 1.1.

Driver Wiring & Mounting

- Driver is grounded by a mounting screw to the grounded fixture (or by terminal connection on the K case).
- Terminal blocks on the driver accept one solid wire per terminal from 18 to 16 AWG (0.75 to 1.5 mm^2).
- Fixture must be grounded in accordance with local and national electrical codes.
- Maximum driver–to–LED light engine wire length is 10 ft (3.0 m).

Job Name:	Model Numbers:	
Job Number:		

How to Build a Model Number: Hi-lume® A-Series

L3DA4U1U __ - _ _ ___

example: L3DA4U1UKS-HC070
For further assistance selecting your model number, contact our LED Center of Excellence at 1-877-346-5338 or LEDS@lutron.com

Case Size:
K = Compact
M = Stick

Case Style:
S = Studded (K case only)
N = Non-Studded

Current Level (for Constant Current):
020 = 0.20 A; 021 = 0.21 A . . . 210 = 2.10 A

Voltage Level (for Constant Voltage):
100 = 10.0 V; 105 = 10.5 V . . . 600 = 60.0 V

Driver Output:
C = Constant current driver with pulse width modulation (PWM) dimming
A = Constant current driver with constant current reduction (CCR) dimming
V = Constant voltage driver with pulse width modulation (PWM) dimming

LED Load Output Range (see the following pages for more detail):

Class 2 Constant Voltage
A = 10.0 V–12.0 V
B = 12.5 V–20.0 V
C = 20.5 V–24.0 V
D = 24.5 V–38.0 V

Isolated Non-Class 2 Constant Voltage
X = 38.5 V–60.0 V

Class 2 Constant Current
E = 0.20 A–0.50 A 30 V–54 V
F = 0.51 A–1.00 A 30 V–54 V
G = 0.20 A–0.70 A 8 V–20 V
H = 0.20 A–0.70 A 15 V–38 V
I = 0.71 A–1.05 A 8 V–20 V
J = 0.71 A–1.05 A 15 V–38 V
K = 1.06 A–1.50 A 8 V–20 V
L = 1.06 A–1.50 A 15 V–38 V
M = 1.51 A–2.10 A 8 V – 20 V

Isolated Non-Class 2 Constant Current
Y = 0.20 A–0.50 A 30 V–60 V
Z = 0.51 A–1.00 A 30 V–60 V

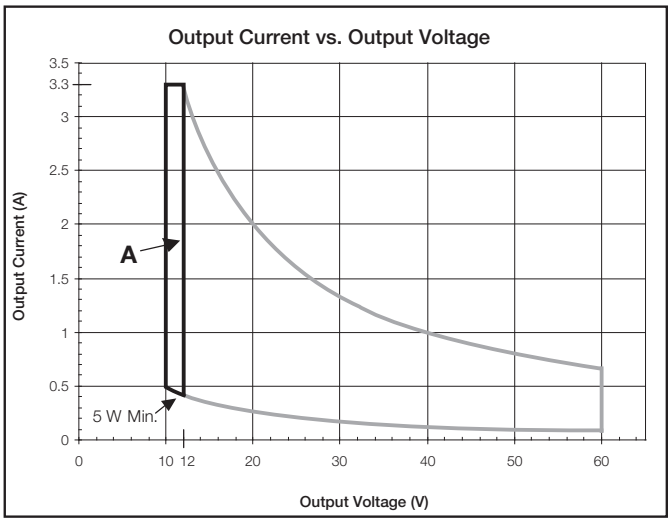
Job Name:	Model Numbers:	
Job Number:		

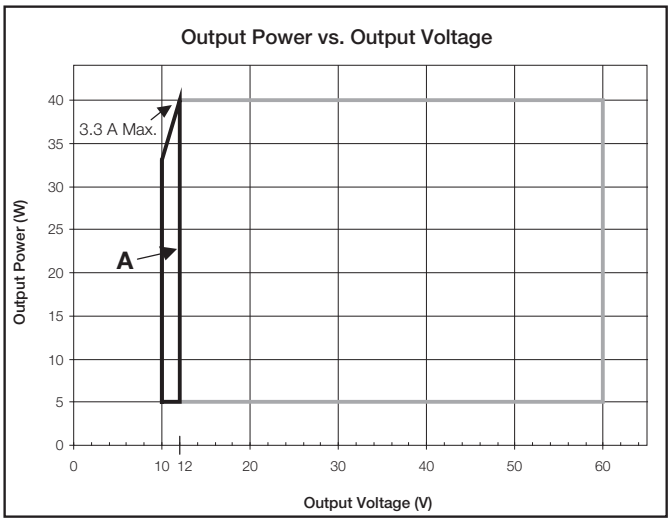
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"A" Output Range, Voltage Driver Models

Driver Type	Output Dimming Method	Output Voltage	Output Current	Output Power	Standards Recognition
Constant Voltage Driver (Class 2)	Pulse Width Modulation (PWM)	10.0 – 12.0 V	0.42 – 3.3 A	5 – 40 W	c UL us

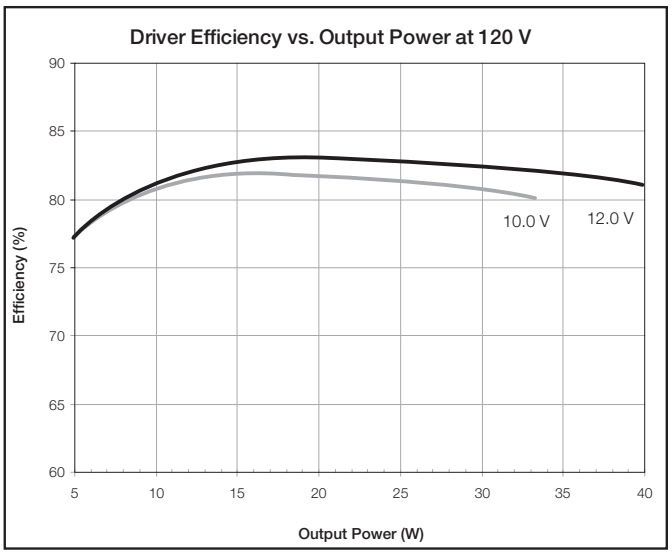
Voltage Driver Operation Range:

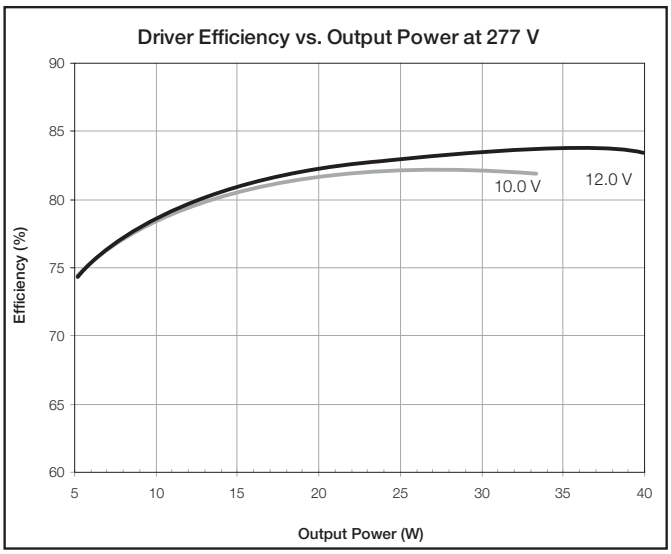




Typical Performance Specifications:

Parameter	120 V	240 V	277 V	Test Conditions
Input Current	390 mA	210 mA	170 mA	t_a = 25° C, 12.0 V, 40 W load, Max. Light Output, K enclosure
Power Factor	0.99	0.97	0.95	
THD	14%	17%	16%	
Driver Efficiency	81%	83%	83%	



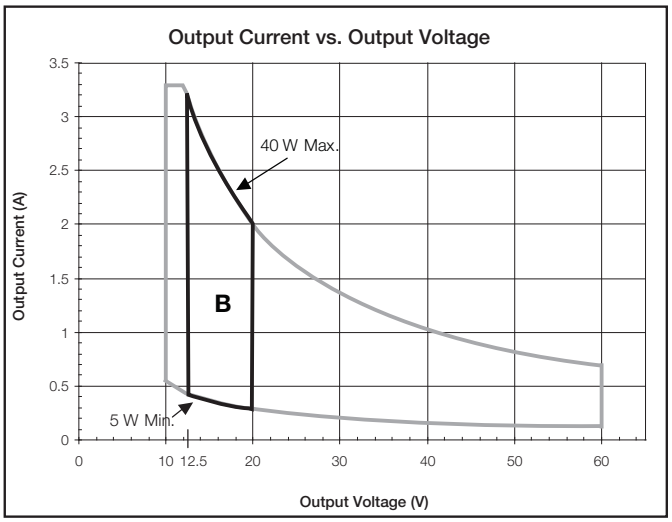


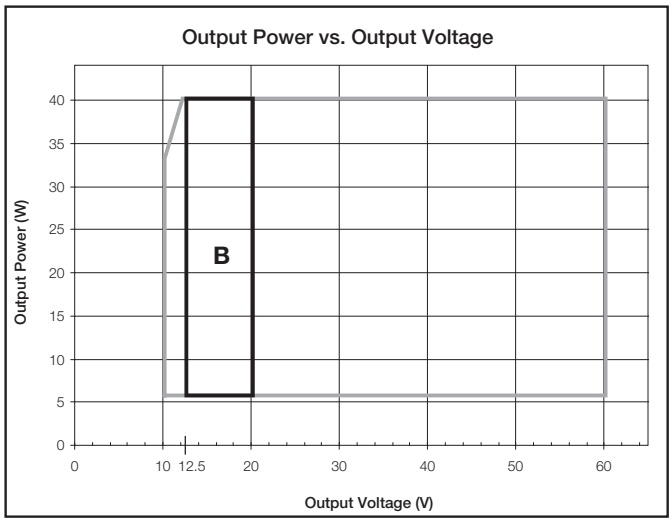
Job Name:	Model Numbers:	
Job Number:		

"B" Output Range, Voltage Driver Models

Driver Type	Output Dimming Method	Output Voltage	Output Current	Output Power	Standards Recognition
Constant Voltage Driver (Class 2)	Pulse Width Modulation (PWM)	12.5 – 20.0 V	0.25 – 3.2 A	5 – 40 W	c UL us

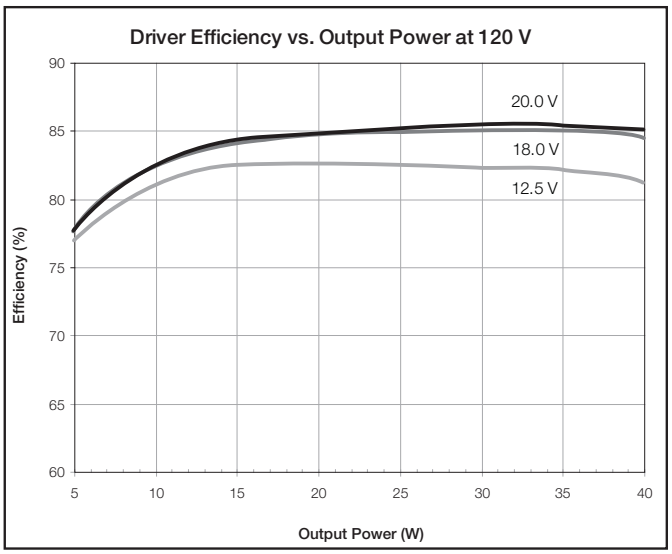
Voltage Driver Operation Range:

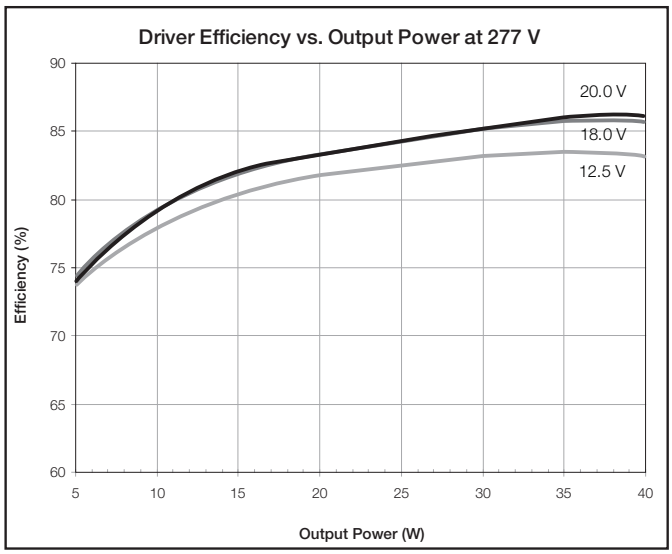




Typical Performance Specifications:

Parameter	120 V	240 V	277 V	Test Conditions
Input Current	390 mA	200 mA	170 mA	t_a = 25° C, 20.0 V, 40 W load, Max. Light Output, K enclosure
Power Factor	0.99	0.98	0.97	
THD	10%	8%	9%	
Driver Efficiency	85%	86%	87%	



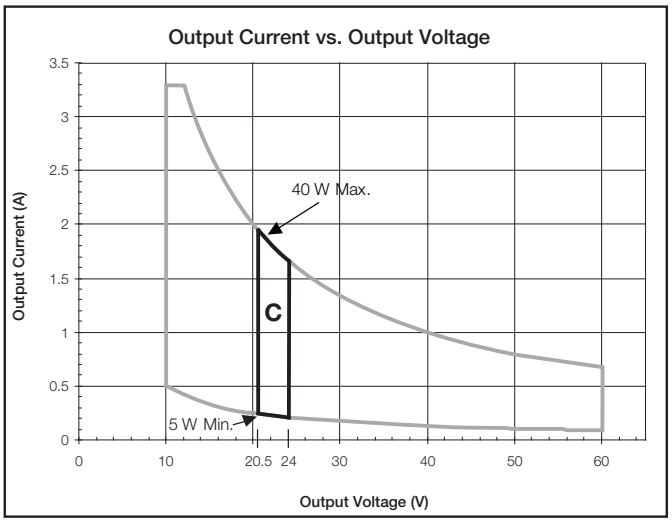


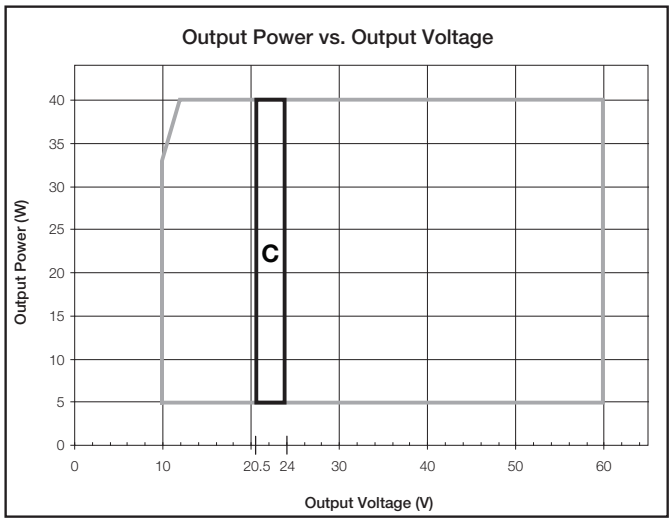
Job Name:	Model Numbers:	
Job Number:		

"C" Output Range, Voltage Driver Models

Driver Type	Output Dimming Method	Output Voltage	Output Current	Output Power	Standards Recognition
Constant Voltage Driver (Class 2)	Pulse Width Modulation (PWM)	20.5 – 24.0 V	1.95 – 0.21 A	5 – 40 W	c UL us

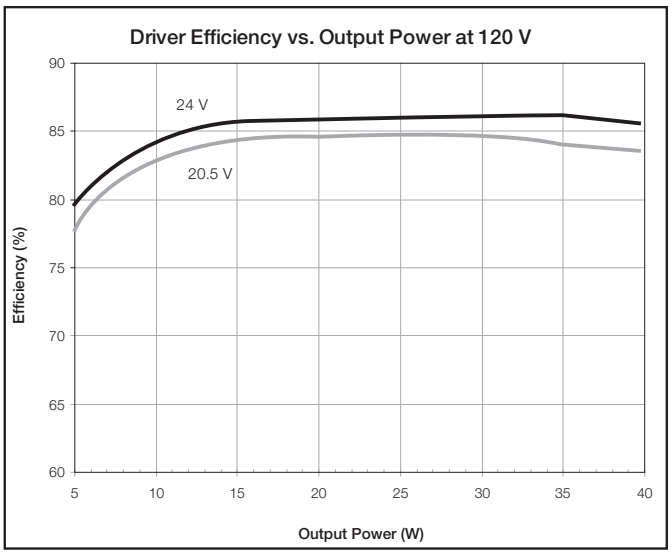
Voltage Driver Operation Range:

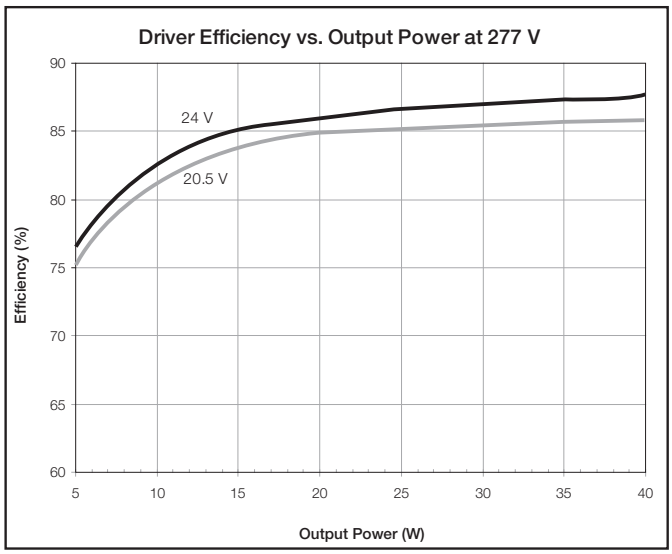




Typical Performance Specifications:

Parameter	120 V	240 V	277 V	Test Conditions
Input Current	370 mA	190 mA	170 mA	t_a = 25° C, 24.0 V, 40 W load, Max. Light Output, K enclosure
Power Factor	0.99	0.97	0.96	
THD	10%	10%	12%	
Driver Efficiency	86%	87%	88%	



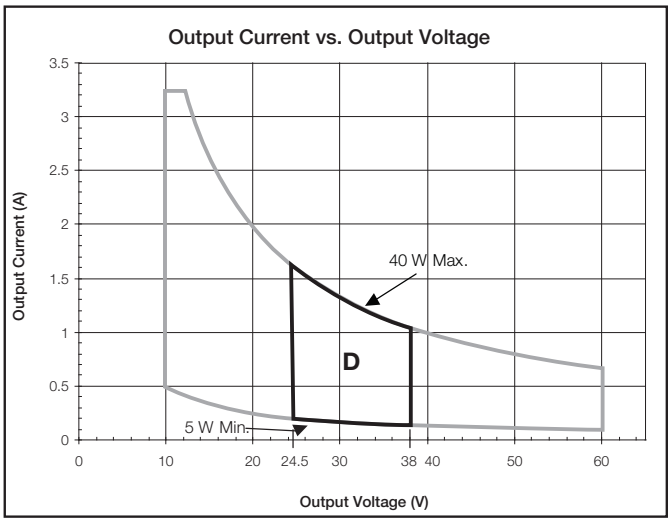


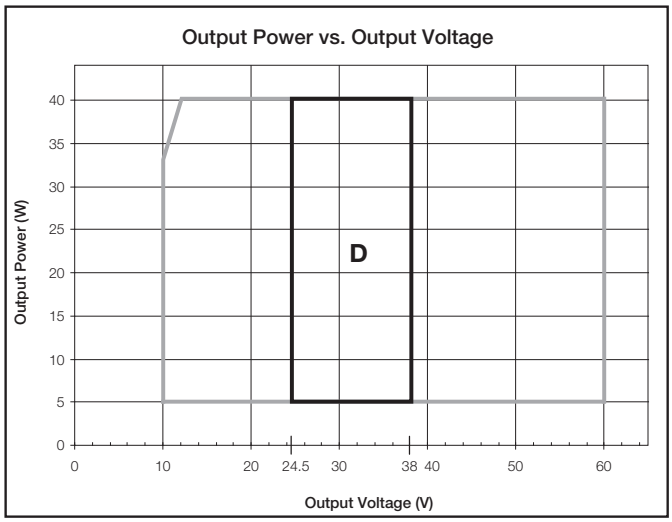
Job Name:	Model Numbers:	
Job Number:		

"D" Output Range, Voltage Driver Models

Driver Type	Output Dimming Method	Output Voltage	Output Current	Output Power	Standards Recognition
Constant Voltage Driver (Class 2)	Pulse Width Modulation (PWM)	24.5 – 38.0 V	0.13 – 1.63 A	5 – 40 W	c UL us

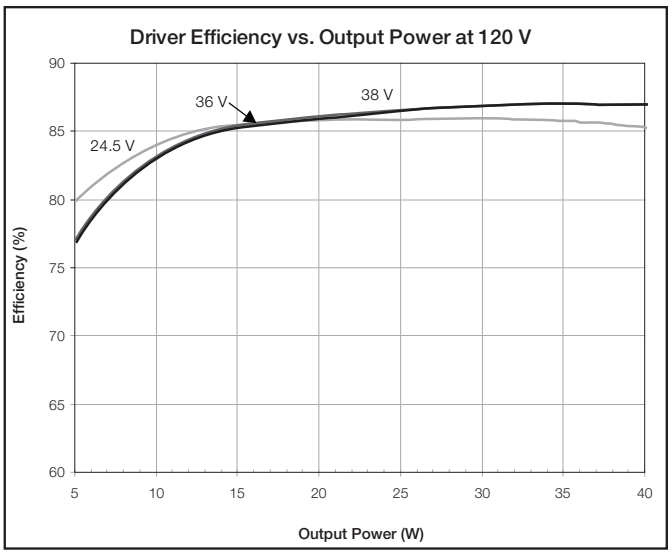
Voltage Driver Operation Range:

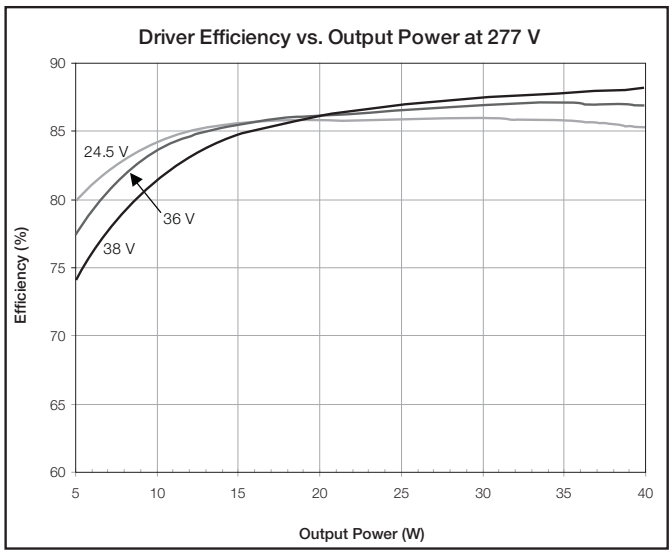




Typical Performance Specifications:

Parameter	120 V	240 V	277 V	Test Conditions
Input Current	370 mA	190 mA	170 mA	t_a = 25° C, 38.0 V, 40 W load, Max. Light Output, K enclosure
Power Factor	0.99	0.98	0.98	
THD	6%	9%	11%	
Driver Efficiency	87%	88%	88%	





Job Name:	Model Numbers:	
Job Number:		

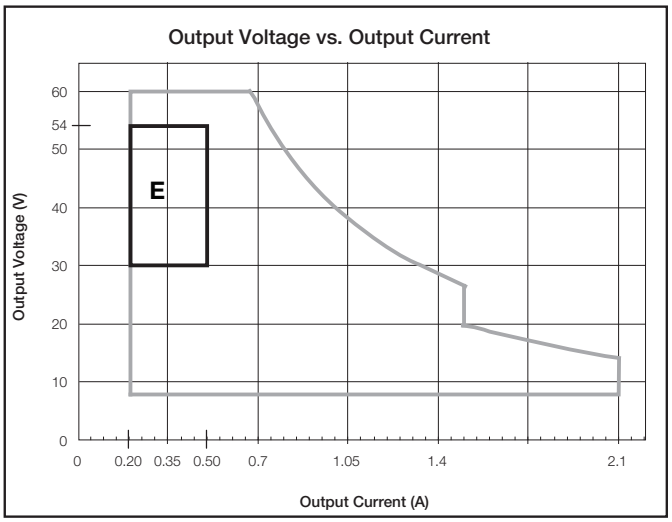
369-325 Rev. D 8 10.25.11

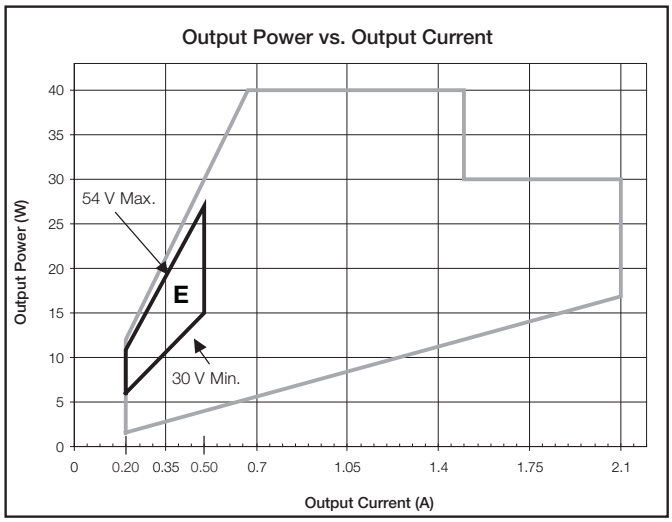
"E" Output Range, Current Driver Models

Driver Type	Output Dimming Method	Output Voltage	Output Current	Output Power	Standards Recognition*
Constant Current Driver (Class 2)	Constant Current Reduction (CCR)	30 – 54 V	0.20 – 0.50 A	6 – 27 W	

*UL recognized for U.S.A. only. Canadian standards do not allow Class 2 rated devices to exceed 42.4 V.

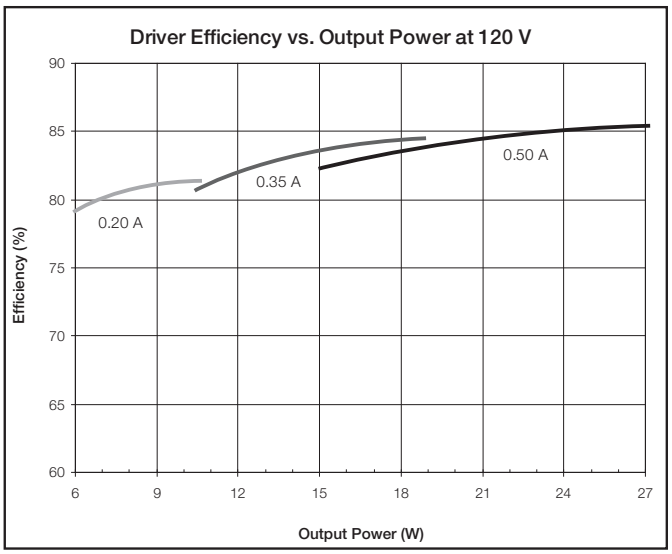
Current Driver Operation Range:

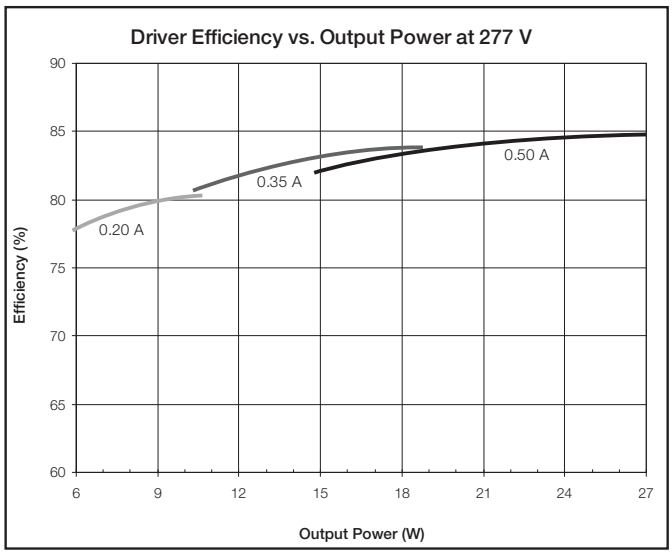




Typical Performance Specifications:

Parameter	120 V	240 V	277 V	Test Conditions
Input Current	260 mA	140 mA	110 mA	t_a = 25° C, 0.50 A, 27 W load, Max. Light Output, K enclosure
Power Factor	0.99	0.98	0.96	
THD	10%	10%	12%	
Driver Efficiency	85%	85%	85%	





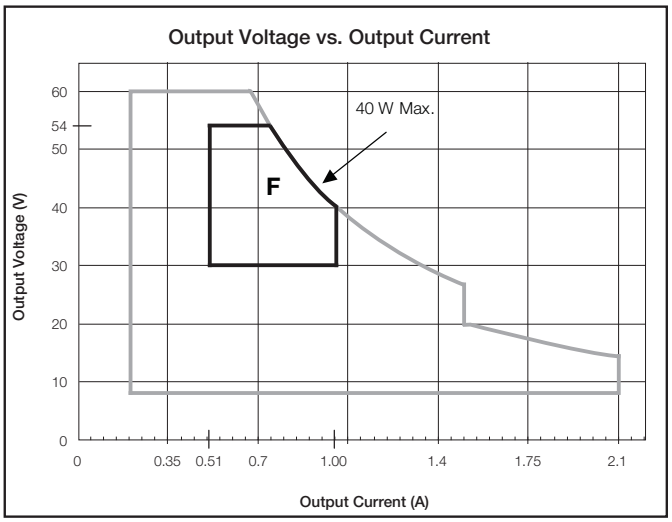
Job Name:	Model Numbers:	
Job Number:		

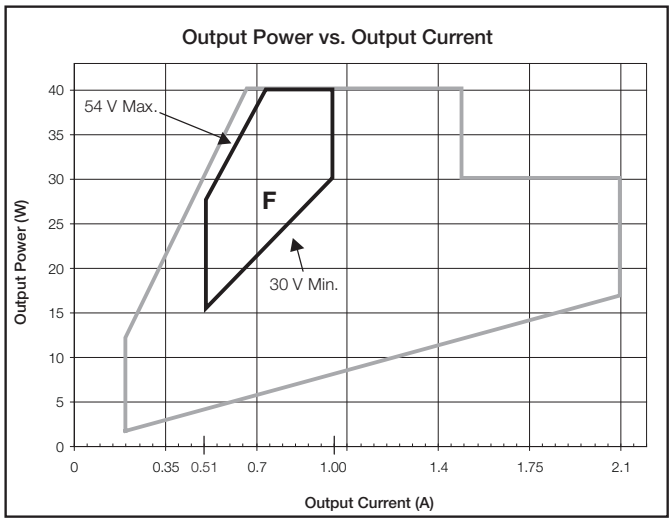
"F" Output Range, Current Driver Models

Driver Type	Output Dimming Method	Output Voltage	Output Current	Output Power	Standards Recognition*
Constant Current Driver (Class 2)	Constant Current Reduction (CCR)	30 – 54 V	0.51 – 1.00 A	15 – 40 W	

*UL recognized for U.S.A. only. Canadian standards do not allow Class 2 rated devices to exceed 42.4 V.

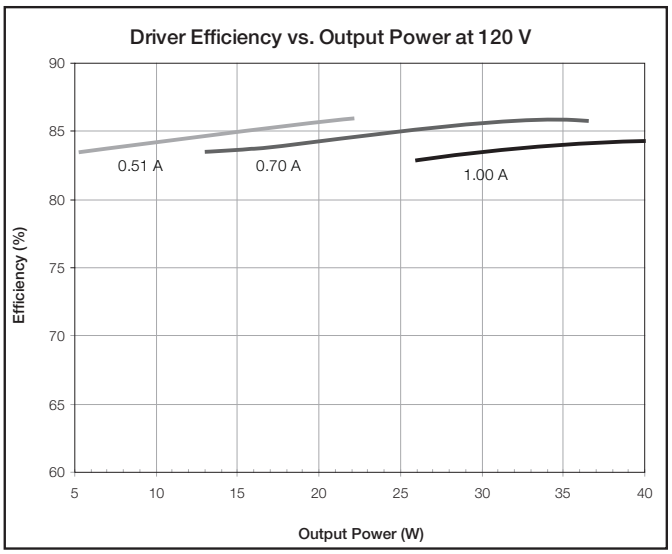
Current Driver Operation Range:

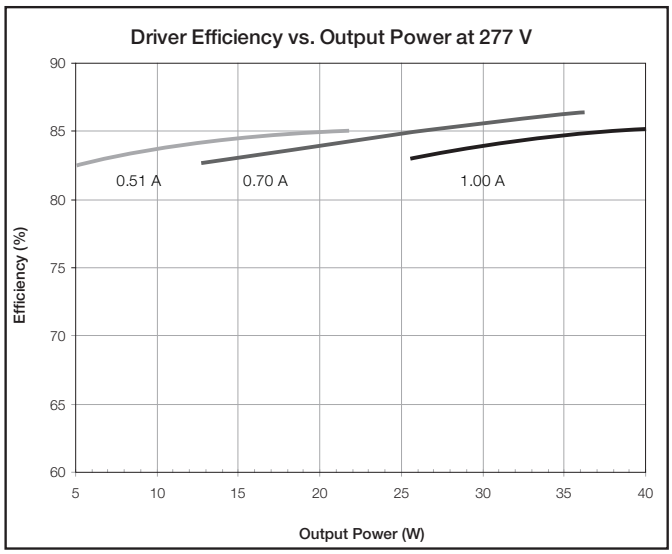




Typical Performance Specifications:

Parameter	120 V	240 V	277 V	Test Conditions
Input Current	380 mA	200 mA	160 mA	t_a = 25° C, 1.00 A, 40 W load, Max. Light Output, K enclosure
Power Factor	0.99	0.99	0.98	
THD	8%	9%	11%	
Driver Efficiency	84%	86%	86%	



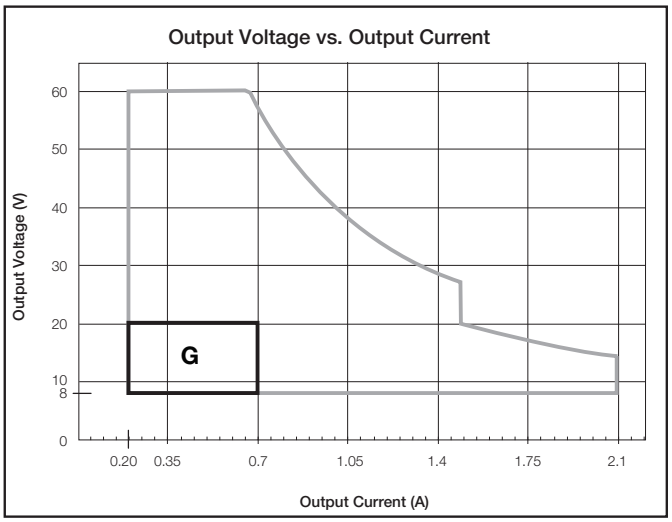


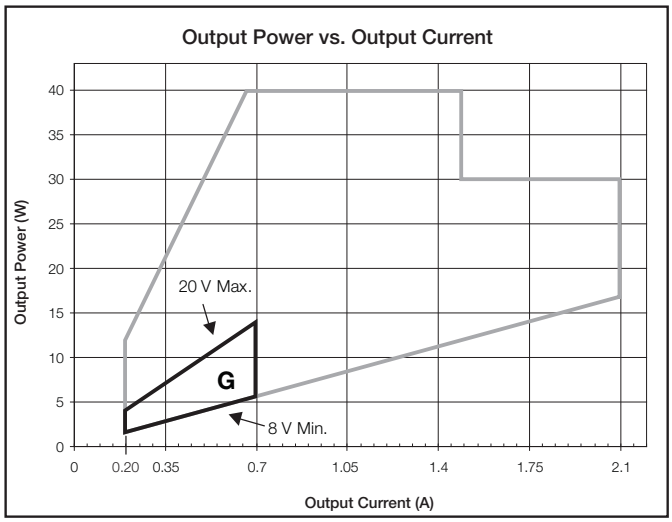
Job Name:	Model Numbers:	
Job Number:		

"G" Output Range, Current Driver Models

Driver Type	Output Dimming Method	Output Voltage	Output Current	Output Power	Standards Recognition
Constant Current Driver (Class 2)	Pulse Width Modulation (PWM) OR Constant Current Reduction (CCR)	8 – 20 V	0.20 – 0.70 A	2 – 14 W	c UL us

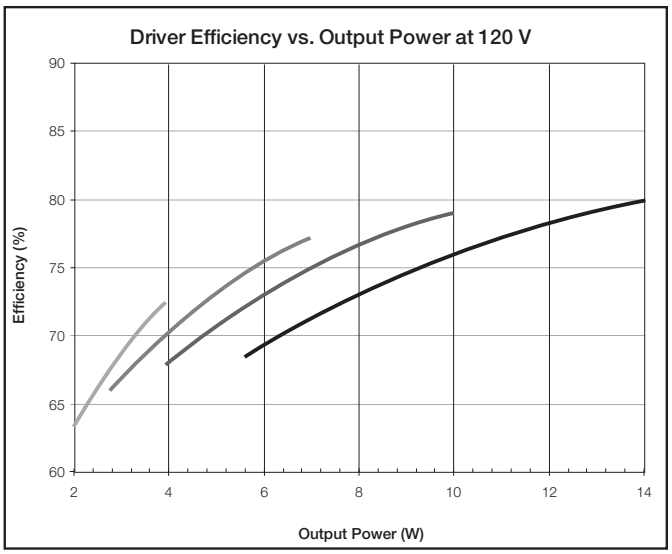
Current Driver Operation Range:

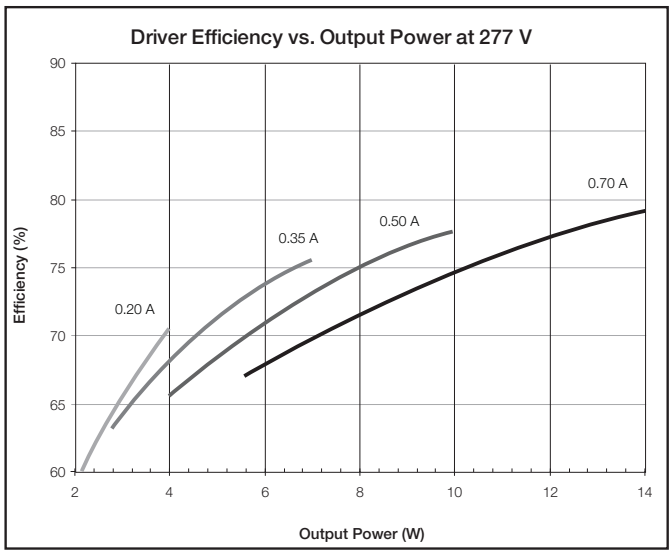




Typical Performance Specifications:

Parameter	120 V	240 V	277 V	Test Conditions
Input Current	140 mA	90 mA	70 mA	t_a = 25° C, 0.70 A, 14 W load, Max. Light Output, K enclosure
Power Factor	0.99	0.89	0.85	
THD	11%	16%	20%	
Driver Efficiency	80%	80%	79%	





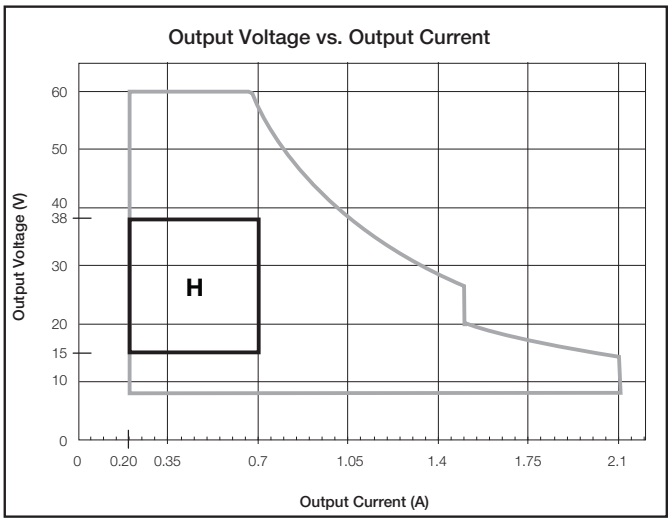
Job Name:	Model Numbers:	
Job Number:		

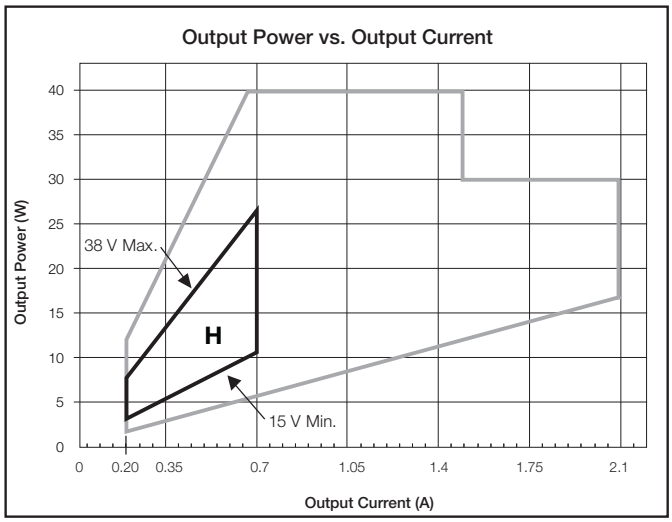
369-325 Rev. D 11 10.25.11

"H" Output Range, Current Driver Models

Driver Type	Output Dimming Method	Output Voltage	Output Current	Output Power	Standards Recognition
Constant Current Driver (Class 2)	Pulse Width Modulation (PWM) OR Constant Current Reduction (CCR)	15 – 38 V	0.20 – 0.70 A	3 – 26 W	c UL us

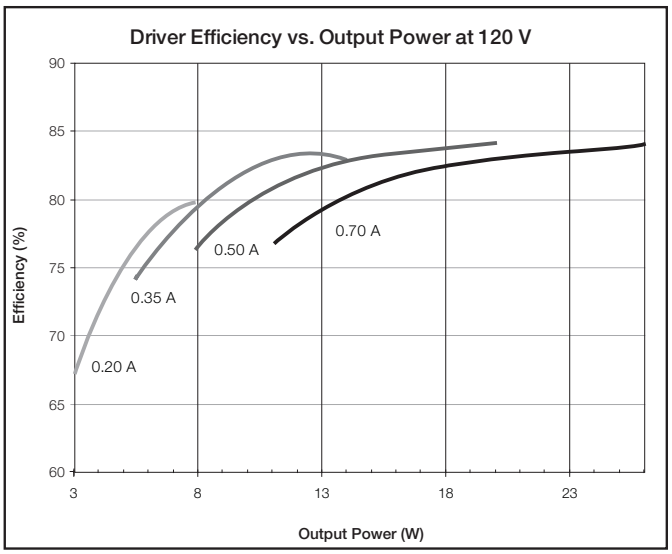
Current Driver Operation Range:

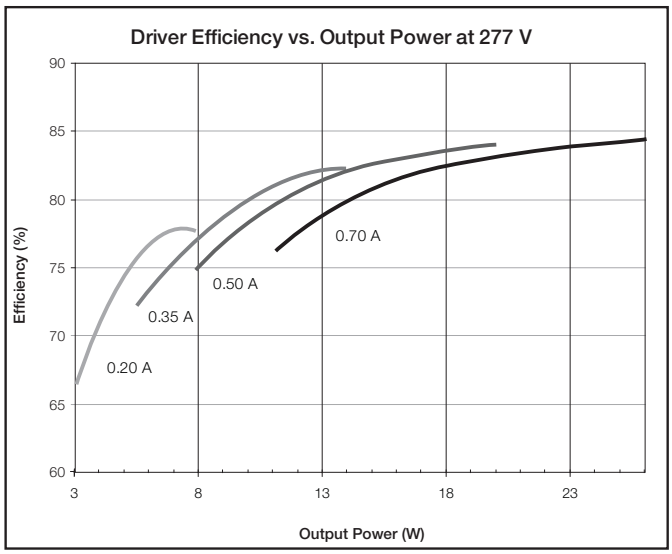




Typical Performance Specifications:

Parameter	120 V	240 V	277 V	Test Conditions
Input Current	270 mA	140 mA	120 mA	t_a = 25° C, 0.70 A, 26 W load, Max. Light Output, K enclosure
Power Factor	0.99	0.96	0.94	
THD	7%	10%	12%	
Driver Efficiency	84%	85%	85%	





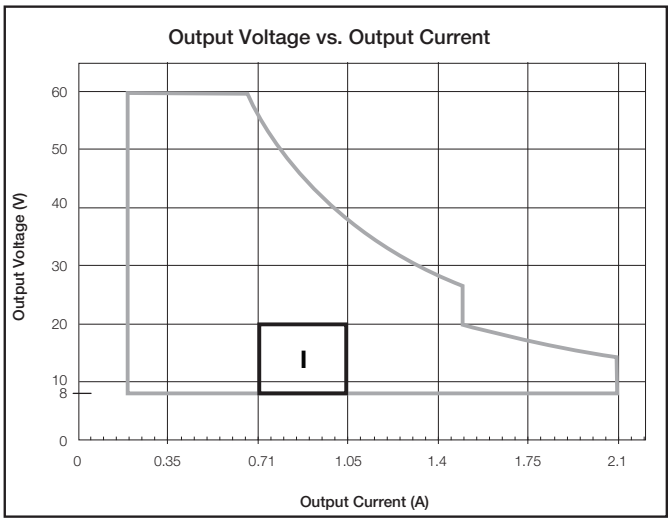
Job Name:	Model Numbers:	
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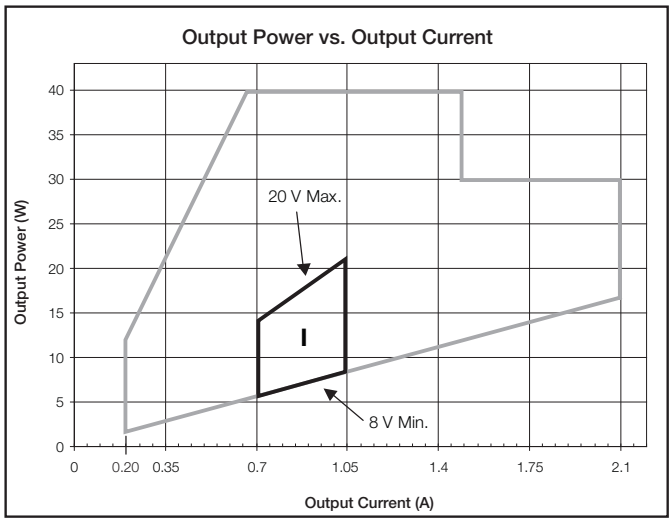
369-325 Rev. D 12 10.25.11

"I" Output Range, Current Driver Models

Driver Type	Output Dimming Method	Output Voltage	Output Current	Output Power	Standards Recognition
Constant Current Driver (Class 2)	Pulse Width Modulation (PWM) OR Constant Current Reduction (CCR)	8 – 20 V	0.71 – 1.05 A	6 – 21 W	c UL us

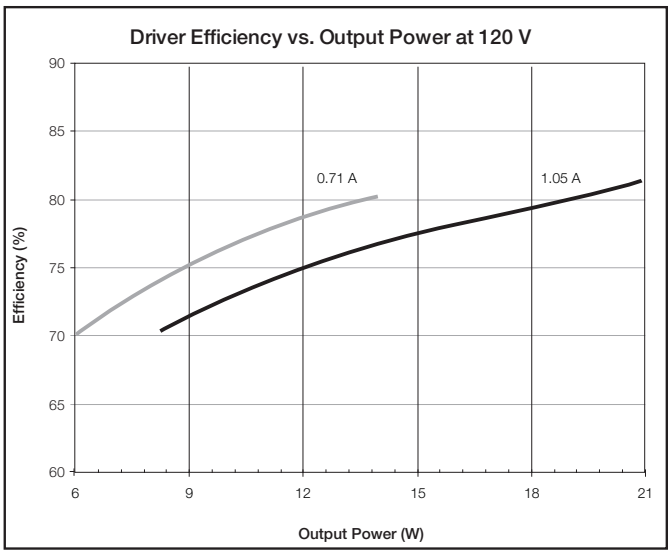
Current Driver Operation Range:

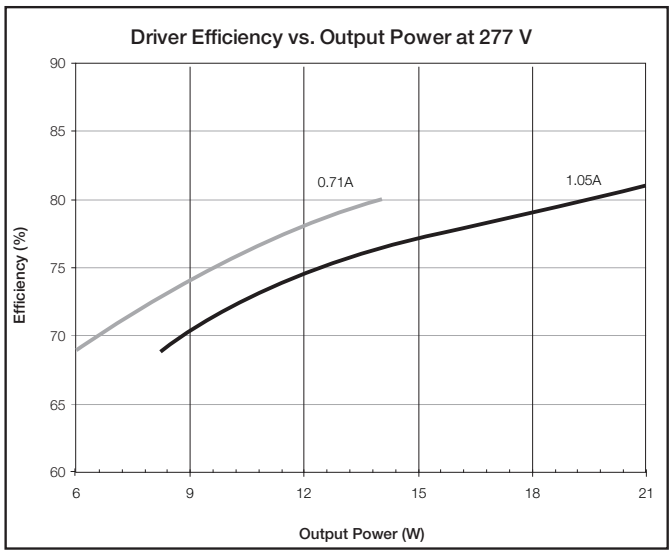




Typical Performance Specifications:

Parameter	120 V	240 V	277 V	Test Conditions
Input Current	210 mA	120 mA	100 mA	t_a = 25° C, 1.05 A, 21 W load, Max. Light Output, K enclosure
Power Factor	0.98	0.94	0.92	
THD	15%	13%	14%	
Driver Efficiency	82%	81%	81%	



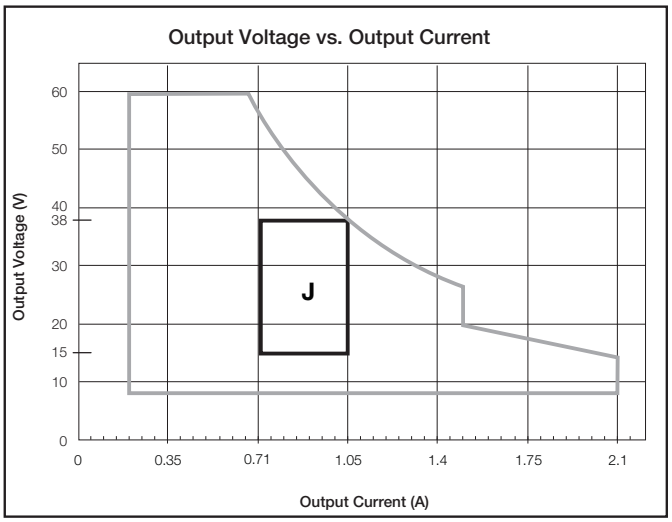


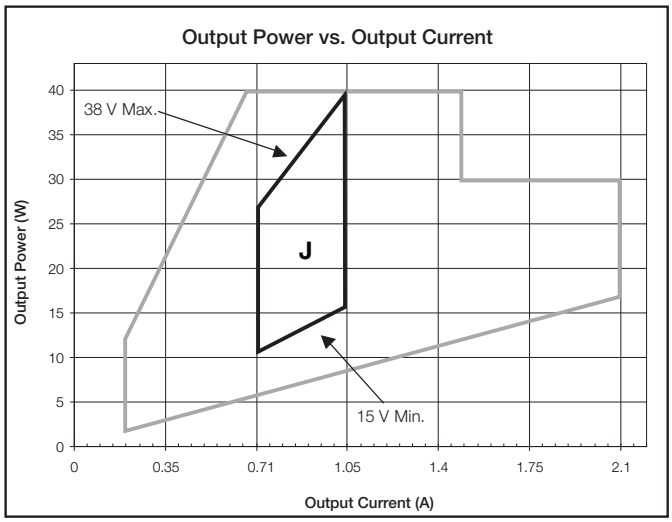
Job Name:	Model Numbers:	
Job Number:		

"J" Output Range, Current Driver Models

Driver Type	Output Dimming Method	Output Voltage	Output Current	Output Power	Standards Recognition
Constant Current Driver (Class 2)	Pulse Width Modulation (PWM) OR Constant Current Reduction (CCR)	15 – 38 V	0.71 – 1.05 A	11 – 40 W	c UL us

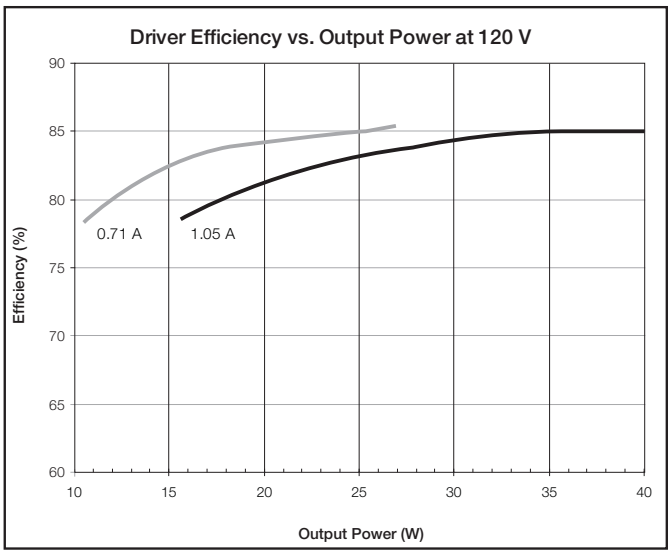
Current Driver Operation Range:

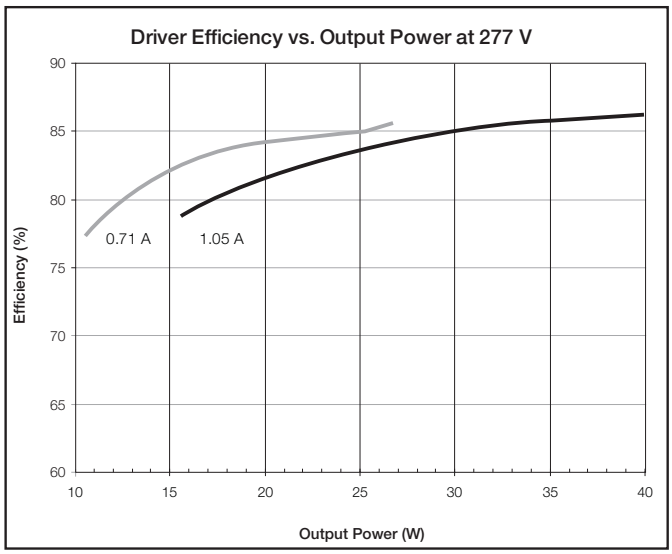




Typical Performance Specifications:

Parameter	120 V	240 V	277 V	Test Conditions
Input Current	390 mA	200 mA	170 mA	t_a = 25° C, 1.05 A, 40 W load, Max. Light Output, K enclosure
Power Factor	0.99	0.98	0.97	
THD	6%	9%	10%	
Driver Efficiency	85%	86%	86%	



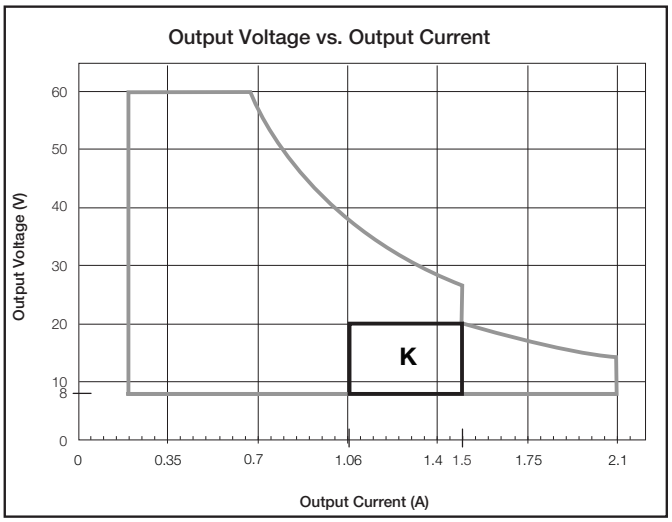


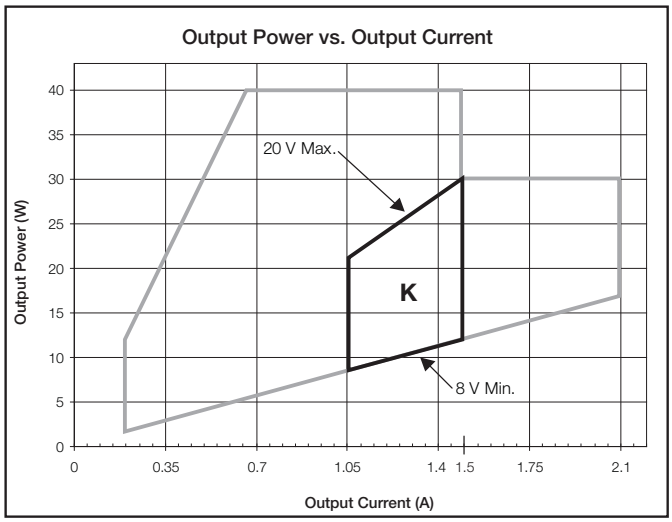
Job Name:	Model Numbers:	
Job Number:		

"K" Output Range, Current Driver Models

Driver Type	Output Dimming Method	Output Voltage	Output Current	Output Power	Standards Recognition
Constant Current Driver (Class 2)	Pulse Width Modulation (PWM) OR Constant Current Reduction (CCR)	8 – 20 V	1.06 – 1.50 A	9 – 30 W	c UL us

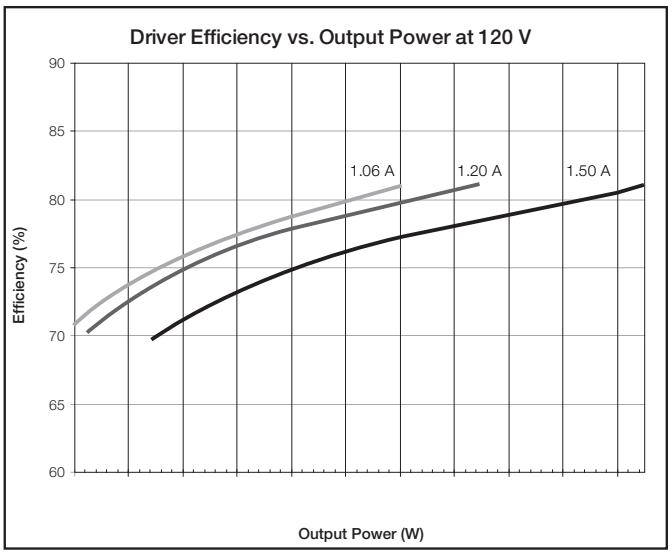
Current Driver Operation Range:

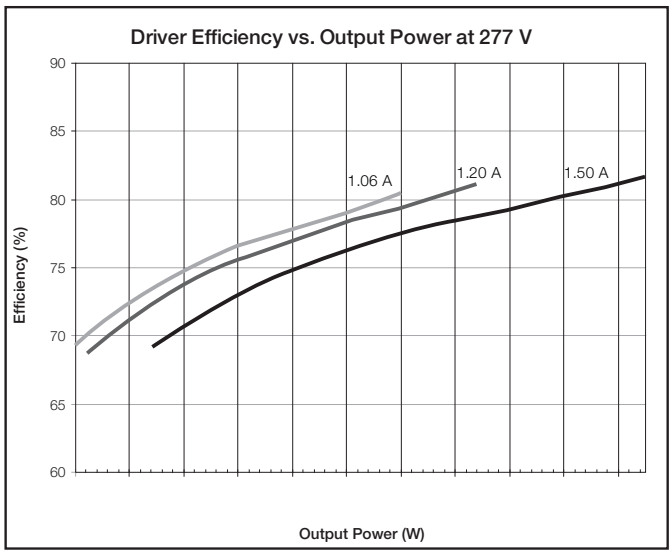




Typical Performance Specifications:

Parameter	120 V	240 V	277 V	Test Conditions
Input Current	310 mA	160 mA	130 mA	t_a = 25° C, 1.50 A, 30 W load, Max. Light Output, K enclosure
Power Factor	0.99	0.96	0.94	
THD	15%	17%	15%	
Driver Efficiency	81%	83%	82%	



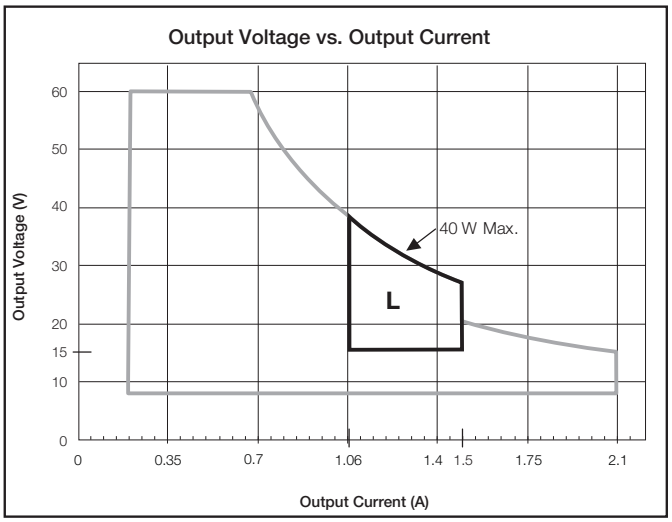


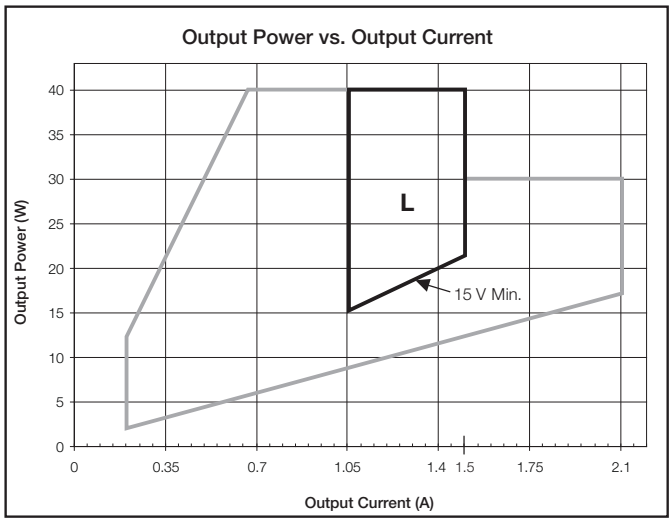
Job Name:	Model Numbers:	
Job Number:		

"L" Output Range, Current Driver Models

Driver Type	Output Dimming Method	Output Voltage	Output Current	Output Power	Standards Recognition
Constant Current Driver (Class 2)	Pulse Width Modulation (PWM) OR Constant Current Reduction (CCR)	15 – 38 V	1.06 – 1.50 A	16 – 40 W	c UL us

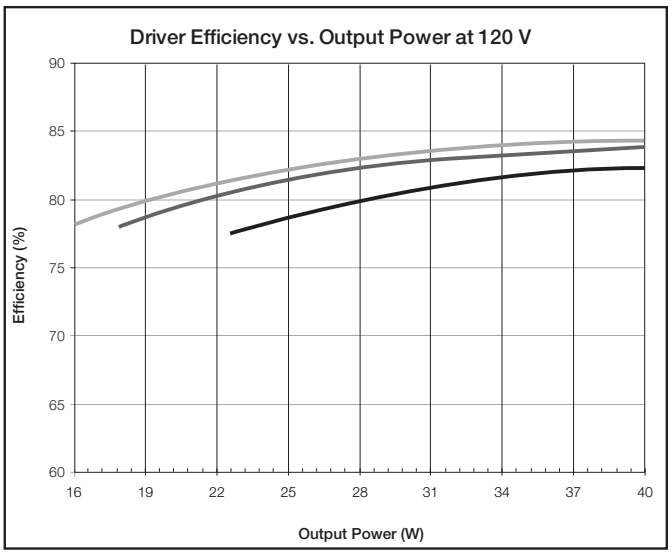
Current Driver Operation Range:

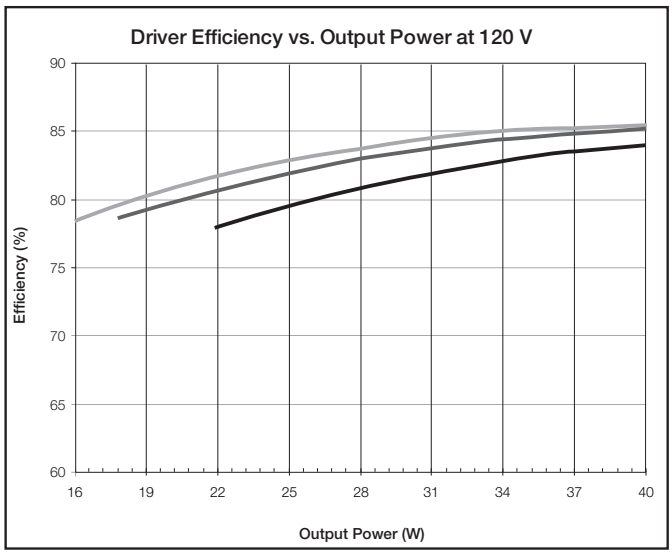




Typical Performance Specifications:

Parameter	120 V	240 V	277 V	Test Conditions
Input Current	390 mA	200 mA	180 mA	t_a = 25° C, 1.50 A, 40 W load, Max. Light Output, K enclosure
Power Factor	0.99	0.97	0.96	
THD	9%	13%	12%	
Driver Efficiency	83%	85%	85%	



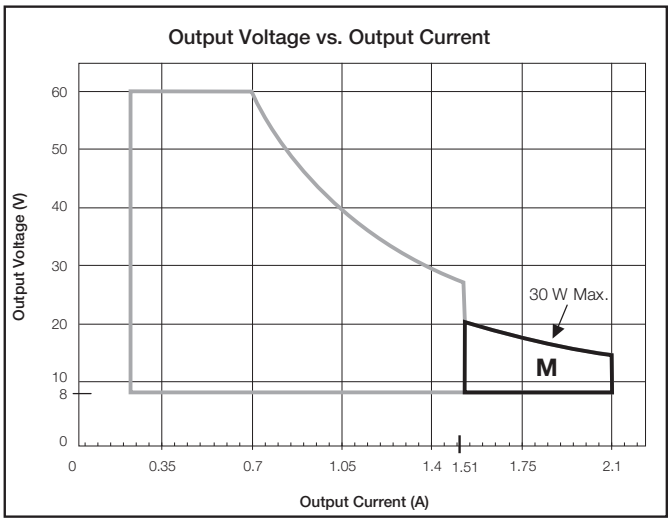


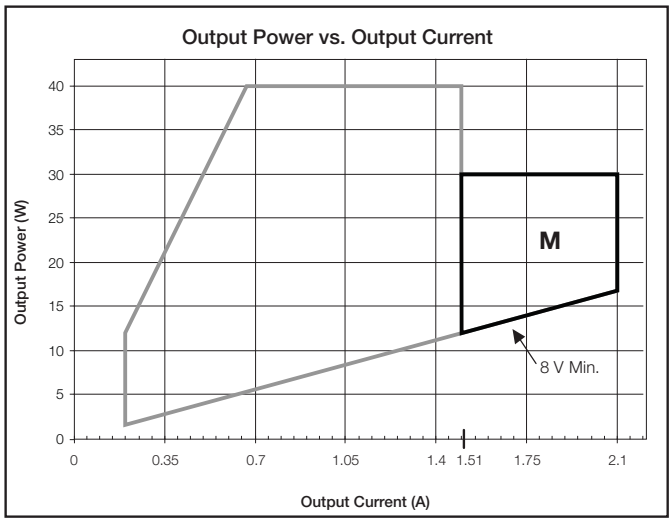
Job Name:	Model Numbers:	
Job Number:		

"M" Output Range, Current Driver Models

Driver Type	Output Dimming Method	Output Voltage	Output Current	Output Power	Standards Recognition
Constant Current Driver (Class 2)	Pulse Width Modulation (PWM) OR Constant Current Reduction (CCR)	8 – 19.9 V	1.51 – 2.10 A	12 – 30 W	c UL us

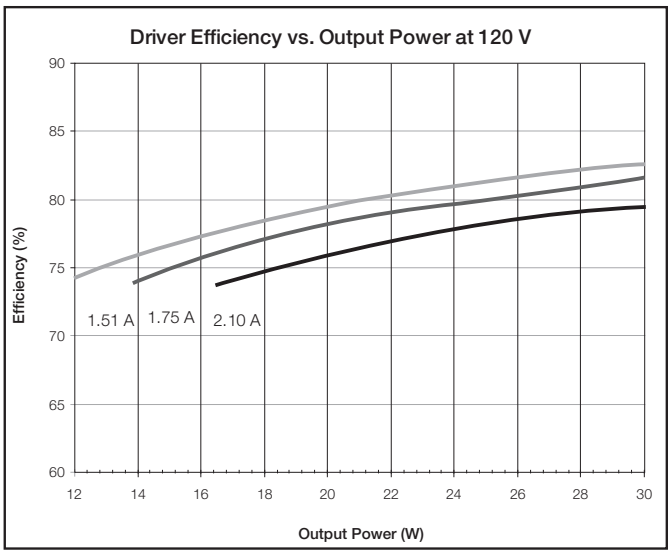
Current Driver Operation Range:

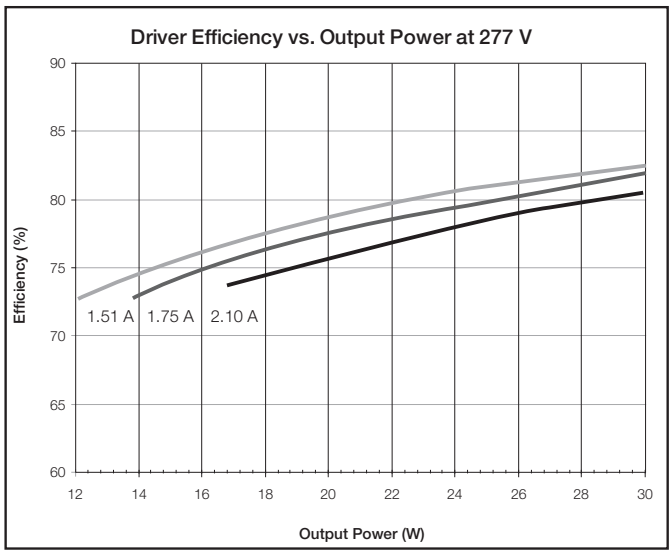




Typical Performance Specifications:

Parameter	120 V	240 V	277 V	Test Conditions
Input Current	310 mA	160 mA	140 mA	t_a = 25° C, 2.10 A, 30 W load, Max. Light Output, K enclosure
Power Factor	0.99	0.97	0.95	
THD	12%	12%	12%	
Driver Efficiency	80%	81%	81%	



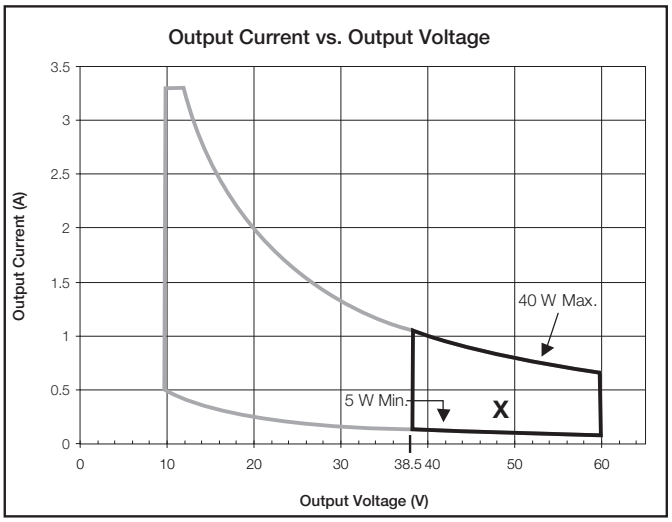


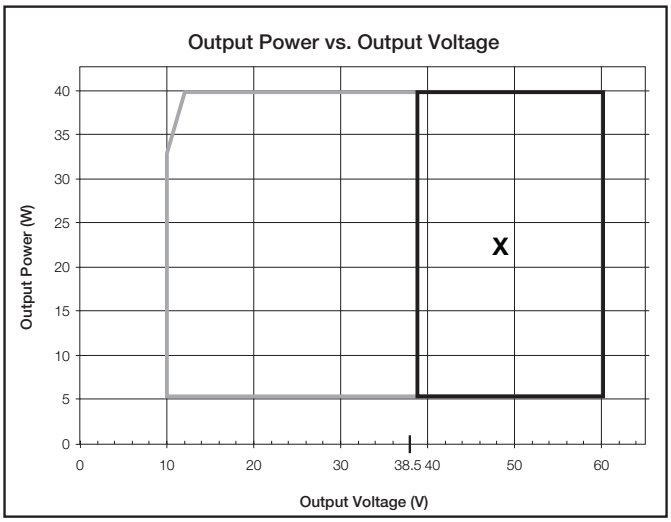
Job Name:	Model Numbers:	
Job Number:		

"X" Output Range, Voltage Driver Models

Driver Type	Output Dimming Method	Output Voltage	Output Current	Output Power	Standards Recognition
Constant Voltage Driver (Isolated, Non-Class 2)	Pulse Width Modulation (PWM)	38.5 – 60.0 V	0.08 – 1.04 A	5 – 40 W	c UL us

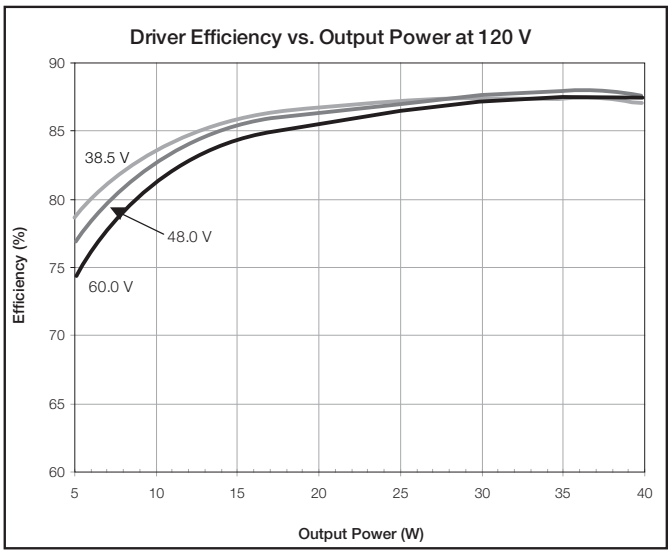
Voltage Driver Operation Range:

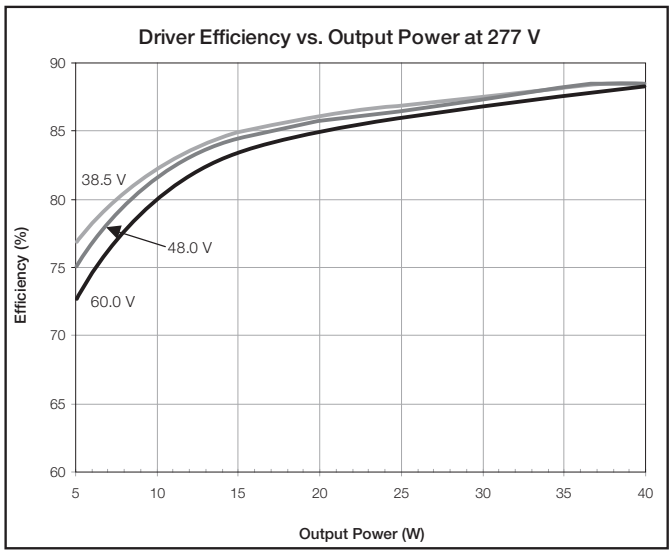




Typical Performance Specifications:

Parameter	120 V	240 V	277 V	Test Conditions
Input Current	380 mA	190 mA	170 mA	t_a = 25° C, 60.0 V, 40 W load, Max. Light Output, K enclosure
Power Factor	0.99	0.99	0.98	
THD	7%	6%	8%	
Driver Efficiency	88%	89%	89%	



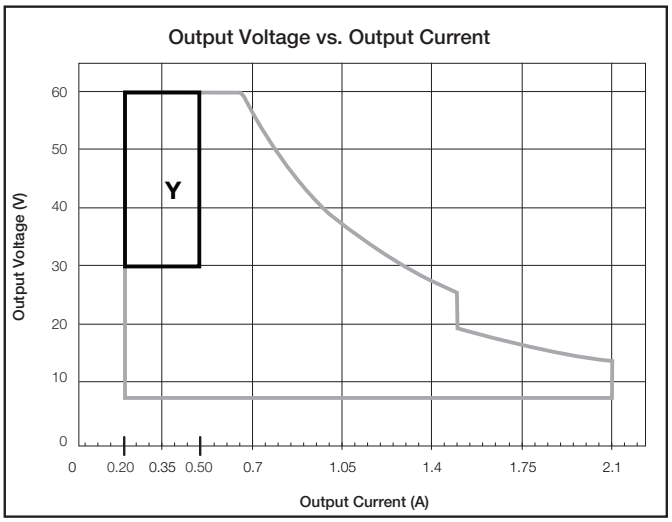


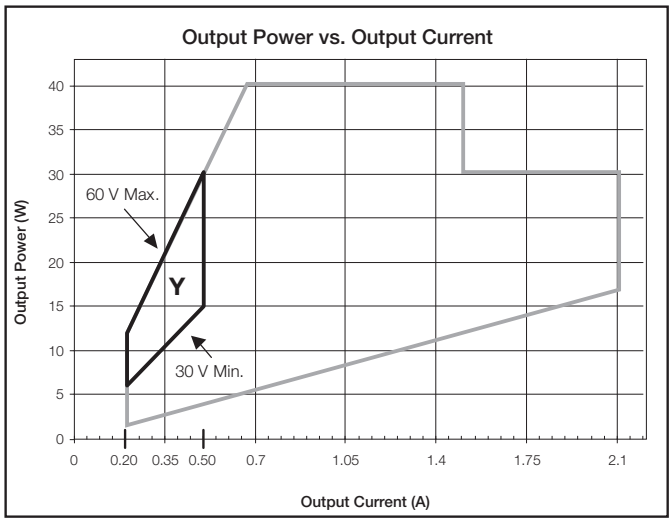
Job Name:	Model Numbers:	
Job Number:		

"Y" Output Range, Current Driver Models

Driver Type	Output Dimming Method	Output Voltage	Output Current	Output Power	Standards Recognition
Constant Current Driver (Isolated, Non-Class 2)	Pulse Width Modulation (PWM) OR Constant Current Reduction (CCR)	30 – 60 V	0.20 – 0.50 A	6 – 30 W	c UL us

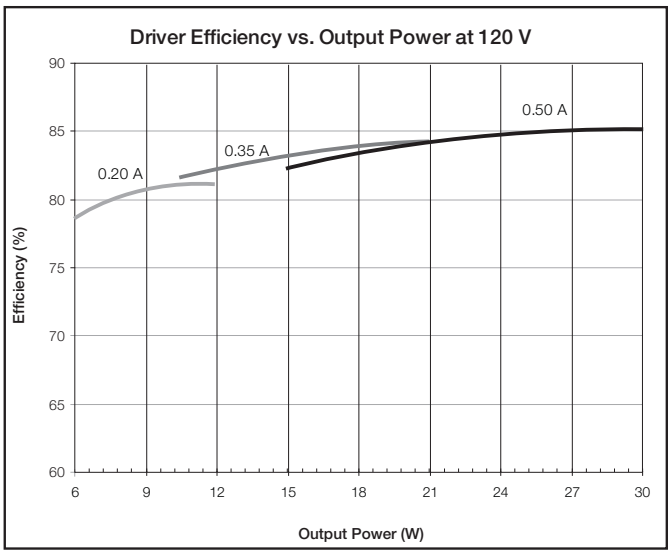
Current Driver Operation Range:

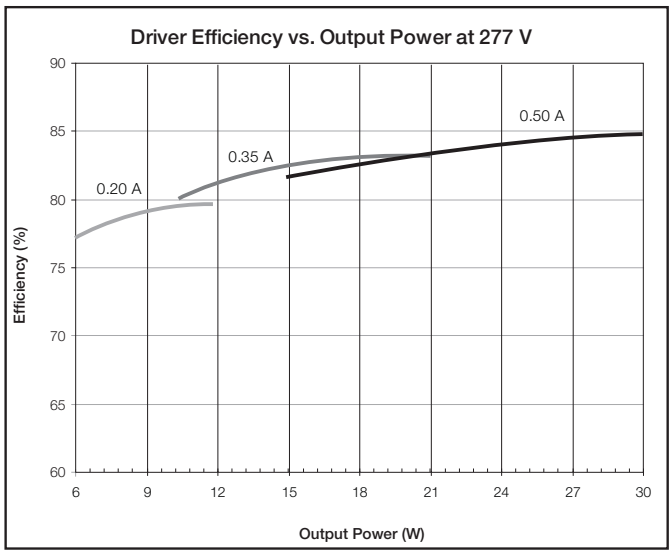




Typical Performance Specifications:

Parameter	120 V	240 V	277 V	Test Conditions
Input Current	280 mA	150 mA	120 mA	t_a = 25° C, 0.50 A, 30 W load, Max. Light Output, K enclosure
Power Factor	0.99	0.98	0.97	
THD	8%	9%	9%	
Driver Efficiency	85%	86%	86%	



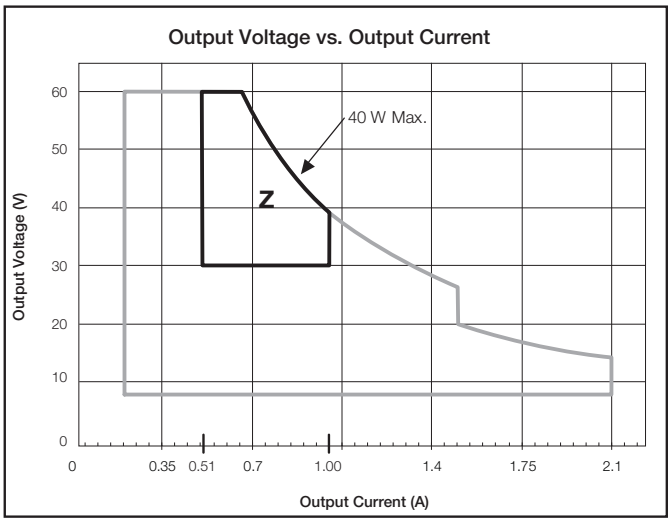


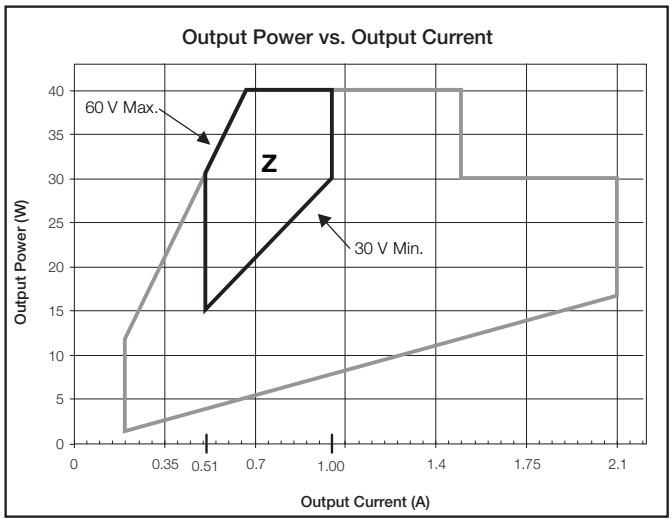
Job Name:	Model Numbers:	
Job Number:		

"Z" Output Range, Current Driver Models

Driver Type	Output Dimming Method	Output Voltage	Output Current	Output Power	Standards Recognition
Constant Current Driver (Isolated, Non-Class 2)	Pulse Width Modulation (PWM) OR Constant Current Reduction (CCR)	30 – 60 V	0.51 – 1.00 A	16 – 40 W	c UL us

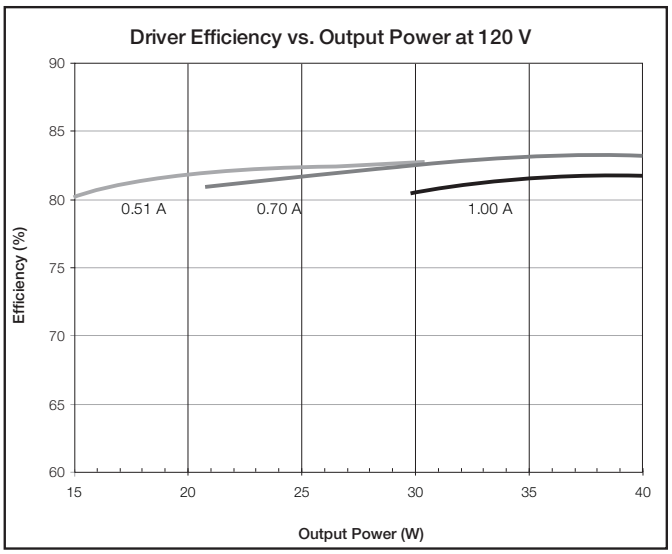
Current Driver Operation Range:

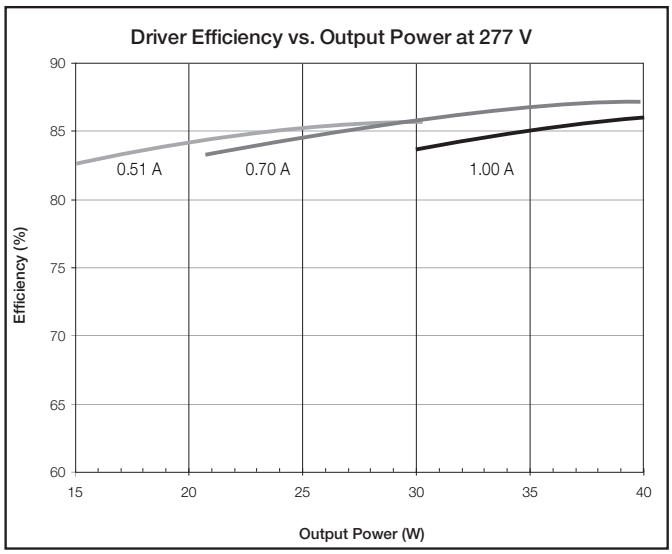




Typical Performance Specifications:

Parameter	120 V	240 V	277 V	Test Conditions
Input Current	380 mA	200 mA	160 mA	t_a = 25° C, 1.00 A, 40 W load, Max. Light Output, K enclosure
Power Factor	0.99	0.99	0.98	
THD	10%	8%	8%	
Driver Efficiency	84%	86%	86%	

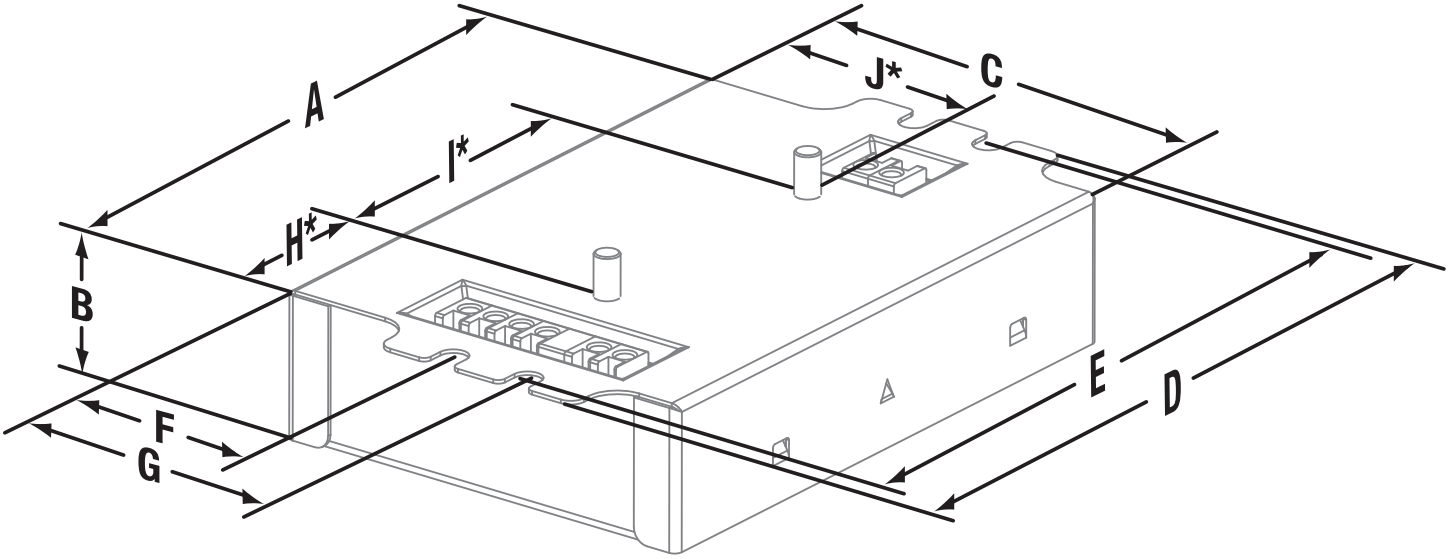




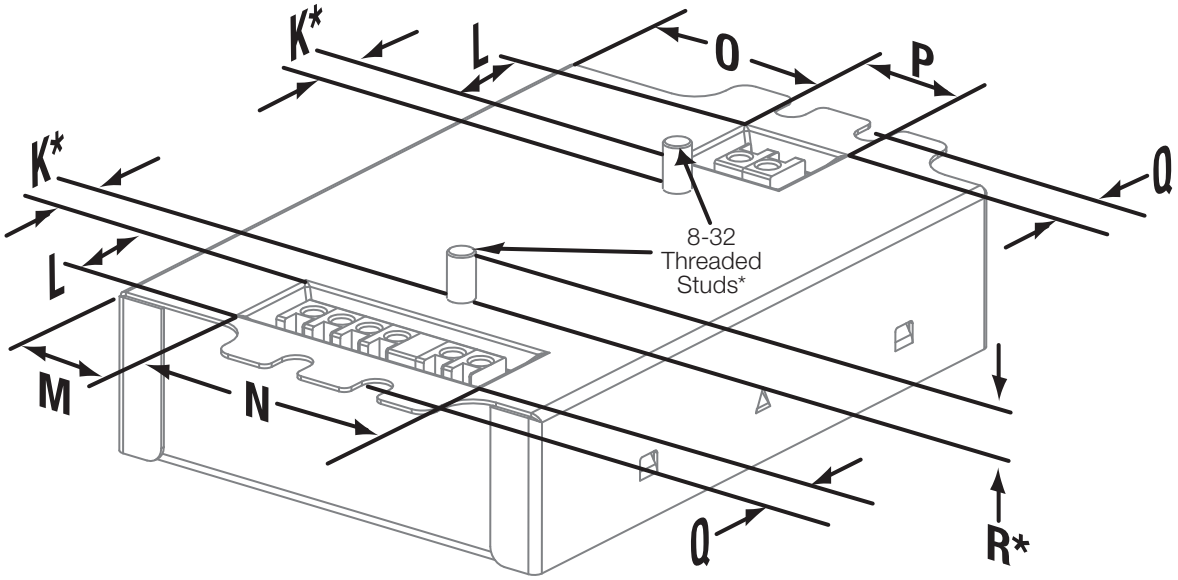
Job Name: Model Numbers:

Job Number:

K Case: Case Dimensions



K Case: Connector Location Dimensions

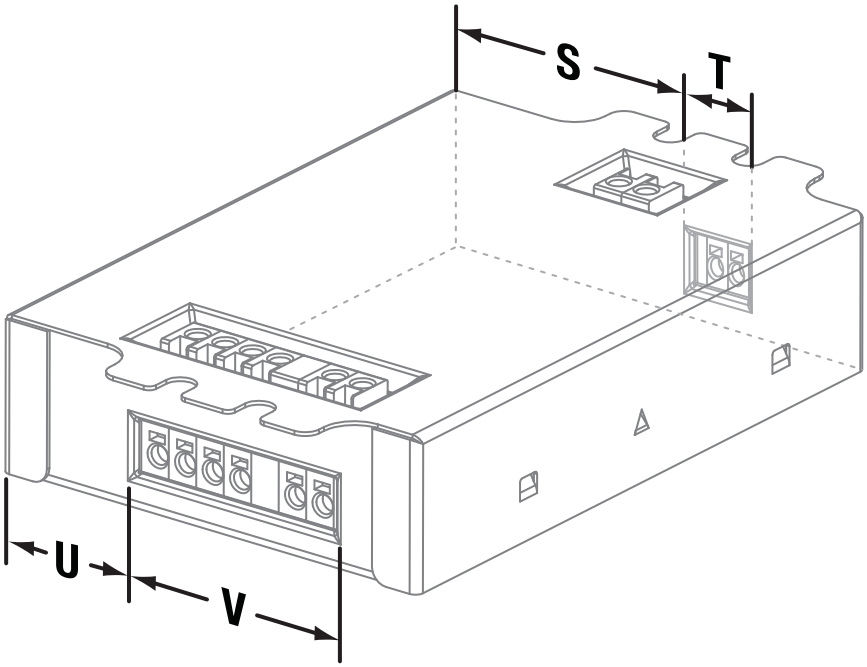


A	4.20 in (107 mm)	F	1.42 in (36 mm)	L	0.65 in (16.5 mm)	R*	0.29 in (7 mm)
B	1.00 in (25 mm)	G	1.99 in (51 mm)	M	0.75 in (19 mm)		
C	3.00 in (76 mm)	H*	1.11 in (28 mm)	N	1.73 in (44 mm)		
D	4.90 in (124 mm)	I*	2.00 in (51 mm)	O	1.33 in (34 mm)		
E	4.60 in (117 mm) (mounting center)	J*	1.60 in (41 mm)	P	0.74 in (19 mm)		
		K*	0.33 in (8.3 mm)	Q	0.32 in (8 mm)		

* Applies to studded K case only.

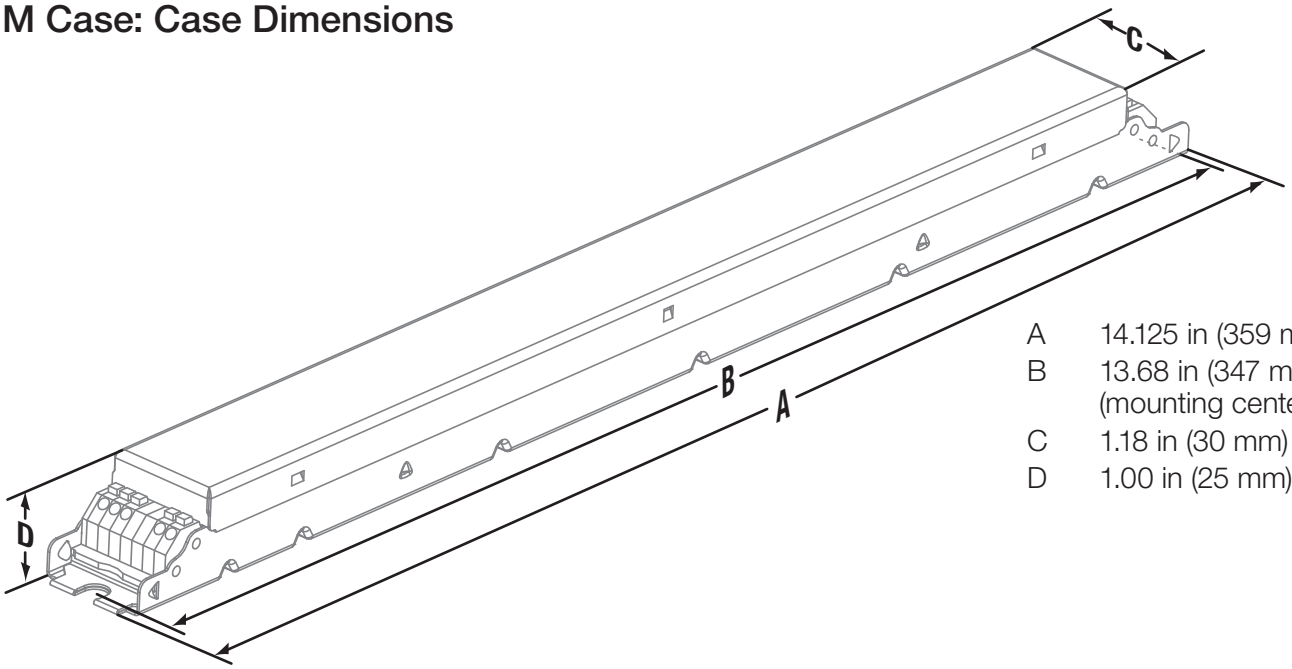
Job Name:	Model Numbers:	
Job Number:		

K Case: Side Entry Connector Location Dimensions (Non-Studded)



S	1.38 in (35 mm)
T	0.64 in (16 mm)
U	0.88 in (22 mm)
V	1.53 in (39 mm)

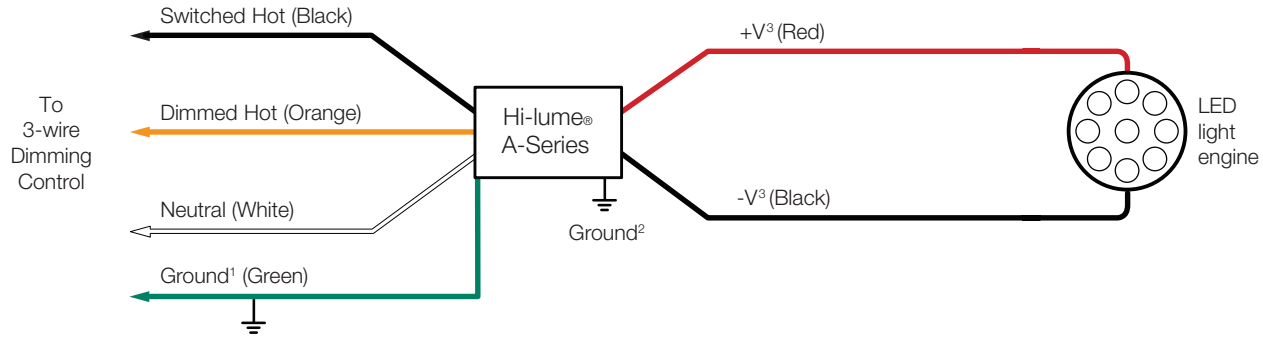
M Case: Case Dimensions



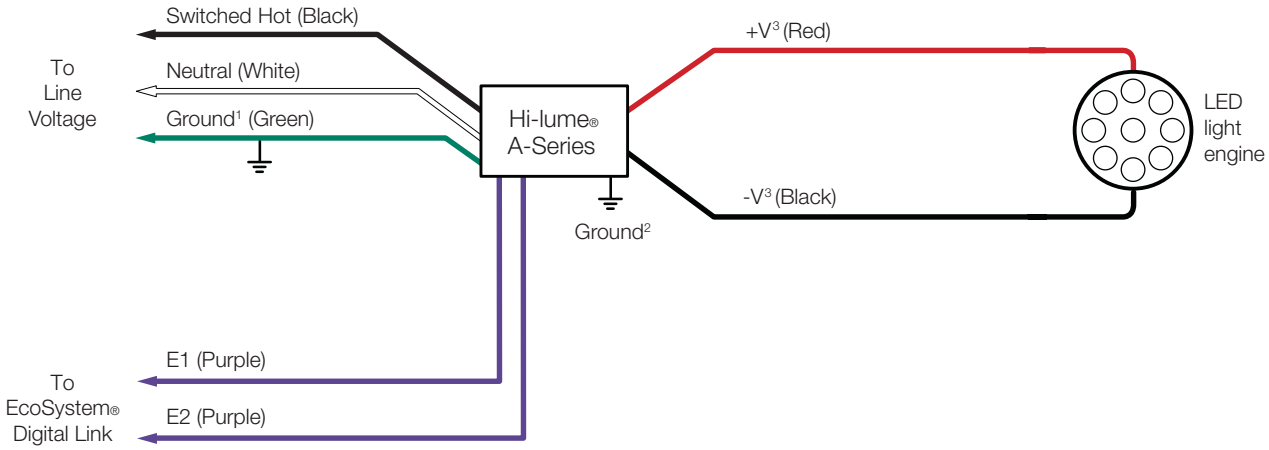
A	14.125 in (359 mm)
B	13.68 in (347 mm) (mounting center)
C	1.18 in (30 mm)
D	1.00 in (25 mm)

Job Name:	Model Numbers:	
Job Number:		

Wiring Diagram for 3-Wire Control



Wiring Diagram for EcoSystem® Digital Control



Note: Colors shown correspond to terminal blocks on driver.

[1] Ground wire connection available on K case models only.
[2] Fixture and driver case must be grounded in accordance with local and national electrical codes.
[3] Maximum driver–to–LED light engine wire length is 10 ft (3.0 m).

Job Name:	Model Numbers:	
Job Number:		

Compatible Controls

- Guaranteed performance specifications with the controls listed in the chart below.
- For assistance selecting controls, contact our LED Center of Excellence at 1-877-346-5338 or LEDS@lutron.com

Product	Part Number		Fixtures per Control[1]		Measured Light Output Range
	120 V	**277 V**	**120 V**	**277 V**	
Nova T☆®	NTF-10-	NTF-10-277-	1 – 41	1 – 44	100% – 1%
	NTF-103P-	NTF-103P-277-	1 – 20	1 – 33	100% – 1%
Nova®	NF-10-	NF-10-277-	1 – 41	1 – 44	100% – 1%
	NF-103P-	NF-103P-277-	1 – 20	1 – 33	100% – 1%
Vareo®	VF-10-		1 – 20	–	100% – 1%
Skylark®	SF-10P-	SF-12P-277-	1 – 20	1 – 33	100% – 1%
	SF-103P-	SF-12P-277-3	1 – 20	1 – 33	100% – 1%
Diva®	DVF-103P-	DVF-103P-277-	1 – 20	1 – 33	100% – 1%
	DVSCF-103P-	DVSCF-103P-277-	1 – 20	1 – 33	100% – 1%
Ariadni®	AYF-103P-	AYF-103P-277-	1 – 20	1 – 44	100% – 1%
Vierti®	VTF-6A-		1 – 15	1 – 33	100% – 1%
Maestro®	MAF-6AM-	MAF-6AM-277-	1 – 15	1 – 33	100% – 1%
	MSCF-6AM-	MSCF-6AM-277-	1 – 15	1 – 33	100% – 1%
Maestro Wireless®	MRF2-F6AN-DV-		1 – 15	1 – 33	100% – 1%
RadioTouch®	RTA-RX-F-		1 – 41	1 – 88	100% – 1%
Spacer System®	SPSF-6A-	SPSF-6A-277-	1 – 15	1 – 33	100% – 1%
	SPSF-6AM-	SPSF-6AM-277-	1 – 15	1 – 33	100% – 1%
Lyneo® Lx	LXF-103PL-	LXF-103PL-277-	1 – 20	1 – 33	100% – 1%
RadioRA® 2	RRD-F6AN-DV-		1 – 15	1 – 33	100% – 1%
HomeWorks® QS	HQRD-F6AN-DV		1 – 15	1 – 33	100% – 1%
Interfaces[2]	PHPM-3F-120		1 – 41	–	100% – 1%
	PHPM-3F-DV		1 – 41	1 – 88	100% – 1%
	GRX-FDBI-16A		1 – 41	1 – 88	100% – 1%
PowPak™ dimming Module with EcoSystem	RMJ-ECO32-DV-B		32 per EcoSystem link		100% – 1%
Energi Savr Node™ with EcoSystem®	QSN-1ECO-S, QSN-2ECO-S		64 per EcoSystem link		100% – 1%
GRAFIK Eye® QS with EcoSystem®	QSGRJ-_E, QSGR-_E		64 per EcoSystem link		100% – 1%
Quantum®	Various		64 per EcoSystem link		100% – 1%

[1] Fixtures per Control value assumes a 40 W fixture. Number of fixtures may be higher if wattage is less than 40 W and may be lower if ganged. See control specification submittal sheet for details.

[2] For use with 3-wire controls or Commercial Systems, RadioRA® Systems or Home Systems applications.

NOTE: Contact Lutron Technical Support for derating rules when using wallbox controls on the Hi-lume® A-Series LED Driver in multi-gang applications.

For the list of compatible controls, visit lutron.com/HiLumeLED and select “EcoSystem/3-wire Control Report Card.”

Job Name:	Model Numbers:	
Job Number:		

EcoSystem® Wiring Diagrams

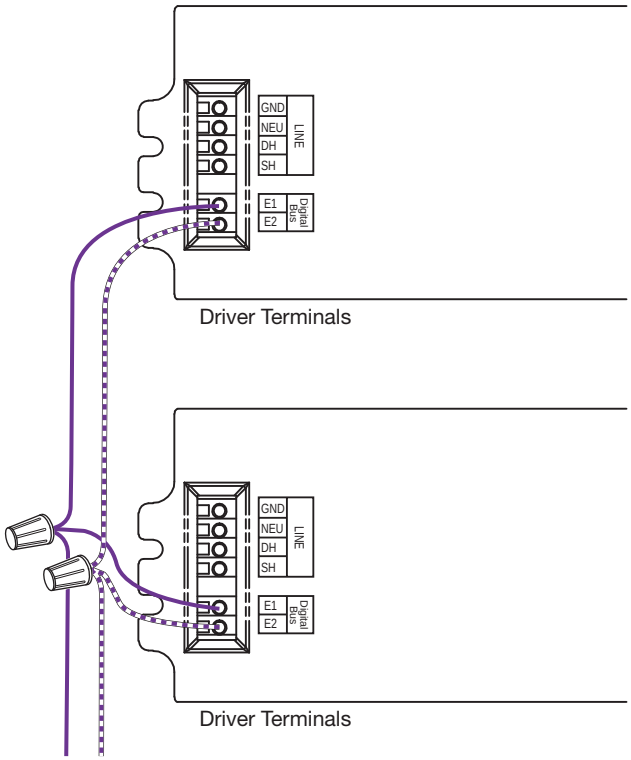
EcoSystem® Digital Link Overview

- The EcoSystem® Digital Link wiring (E1 and E2) connects the digital ballasts and drivers together to form a lighting control system.
- Each EcoSystem® Digital Link supports up to 64 digital ballasts, LED drivers or EcoSystem® Modules (e.g. C5-BMJ-16A, C5-XPJ-16A), 32 occupancy sensors (64 occupancy sensors with Energi Savr Node™ with EcoSystem®), 16 daylight sensors, and 64 wallstations or IR receivers.*
- Sensors do not directly connect to Hi-Lume® A-Series LED drivers.
- E1 and E2 (EcoSystem® digital link wires) are polarity insensitive and can be wired in any topology.
- An Energi Savr Node™ with EcoSystem® unit, GRAFIK Eye® QS control unit with EcoSystem®, PowPak™ dimming module with EcoSystem®, or Quantum® system provides power for the EcoSystem® Digital Link and supports system programming.*
- All EcoSystem® Digital Link programming is completed by using the Energi Savr App for *Apple iPad, iPod Touch* or *iPhone* mobile digital devices, GRAFIK Eye® QS with EcoSystem®, PowPak™ dimming module with EcoSystem®, or Quantum® System.

EcoSystem® Digital Link Wiring

- Driver EcoSystem® Digital Link terminals only accept one 18 to 16 AWG (0.75 to 1.5 mm²) solid copper wire per terminal.
- Make sure that the supply breaker to the Digital Driver and EcoSystem® Digital Link Supply is OFF when wiring.
- Connect the two conductors to the two Digital Driver terminals E1 and E2 as shown.
- Using two different colors for E1 and E2 will reduce confusion when wiring several drivers together.
- The EcoSystem® Digital Link may be wired Class 1 or IEC/PELV NEC® Class 2. Consult applicable electrical codes for proper wiring practices.

* PowPak™ dimming module with EcoSystem® provides power for the EcoSystem® Digital Link and can support 32 digital ballasts, LED drivers or EcoSystem® Modules, 6 Wireless Occupancy Sensors, 1 Wireless Daylight Sensor, and 9 Pico Wireless Controllers.



To the EcoSystem® Digital Bus and additional drivers and/or ballasts

Notes

- The EcoSystem® Digital Link Supply does not have to be located at the end of the Digital Link.
- EcoSystem® Digital Link length is limited by the wire gauge used for E1 and E2 as follows:

Wire Gauge	Digital Link Length (max)
12 AWG	2200 ft
14 AWG	1400 ft
16 AWG	900 ft
18 AWG	550 ft

Wire Size	Digital Link Length (max)
4.0 mm²	828 m
2.5 mm²	517 m
1.5 mm²	310 m
1.0 mm²	207 m
0.75 mm²	155 m

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Job Name:	Model Numbers:	
Job Number:		

ELECTRICIANS AND CONTRACTORS

Driver Leads

Maximum driver–to–LED light engine wire length is 10 ft (3.0 m).

Wiring and Grounding

Driver and lighting fixture must be grounded. Drivers must be installed per national and local electrical codes.

LED Load Replacement

For Class 2 rated drivers, the LED load can be changed while the driver is installed and powered.

Maximum Driver Operating Temperature

Driver case temperature (t_c) must not exceed UL conditions of acceptability in end product.

For 50,000 hour lifetime, driver case temperature (t_c) must not exceed 149 °F (65 °C).

FACILITIES MANAGERS

SERVICE

Warranty

For warranty information, please visit http://www.lutron.com/TechnicalDocumentLibrary/Ballast%20and%20Driver%20Warranty.pdf

Replacement Parts

When ordering Lutron® replacement parts please provide the full model number. Consult Lutron if you have any questions.

Further Information

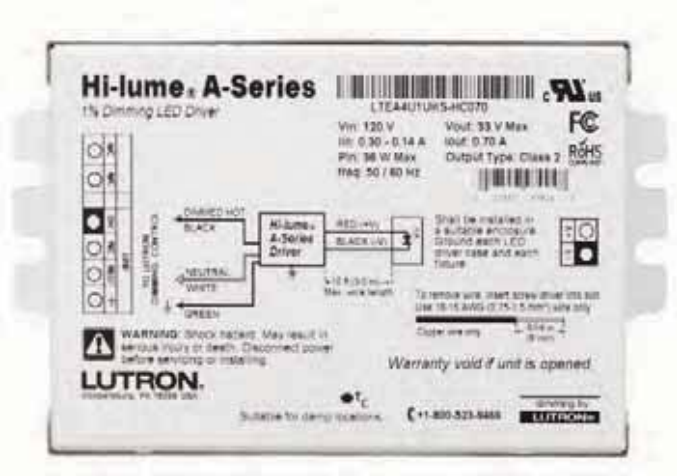
For further information, please visit us at www.lutron.com/hilumeLED or contact our LED Control Center of Excellence at 1.877.346.5338 or LEDs@lutron.com

Hi-lume® A-Series Driver Overview Forward Phase Control

Hi-lume® A-Series Driver is a high-performance LED driver that provides smooth, continuous 1% dimming for virtually any LED fixture, whether it requires constant current or constant voltage. It is the most versatile LED driver offered today due to its compatibility with a wide variety of LED arrays, multiple form factors, and numerous control options.

Features

- Continuous, flicker-free dimming from 100% to 1%.
- Guaranteed compatibility with selected Nova T☆®, Maestro Wireless®, Radio RA® 2, HomeWorks® QS, Grafik Eye® QS, Grafik System™, Quantum® and Stanza® dimmers. Please see chart at the end of this document or contact Lutron for details regarding compatible controls.
- 100% performance tested at factory.
- 100% burned in at factory.
- A rated lifetime of 50,000 hours @ t_c = 149 °F (65 °C).
- UL recognized for United States and Canada.
- FCC Part 15 compliant for commercial and residential applications at 120 V ∼.
- Pulse width modulation (PWM) or constant current reduction (CCR) dimming methods available. See Application Note #360 for details.
- For more information please go to: www.lutron.com/HilumeLED



Hi-lume® A-Series, case type K

3.00 in (76 mm) W x 1.00 in (25 mm) H x 4.90 in (124 mm) L



Hi-lume® A-Series, case type M

1.18 in (30 mm) W x 1.00 in (25 mm) H x 14.25 in (362 mm) L

LUTRON® SPECIFICATION SUBMITTAL Page 1

Job Name:	Model Numbers:	
Job Number:		

Specifications

Performance

- Dimming Range: 100% to 1%
- Operating Voltage: 120 V~ at 50/60 Hz (Forward Phase Control)
- A rated lifetime of 50,000 hours @ t_c = 149 °F (65 °C). Contact Lutron for derating information.
- Patented thermal foldback protection
- LEDs turn on to any dimmed level without going to full brightness.
- Nonvolatile memory restores all driver settings after power failure.
- Power Factor: >0.90 at 40 W
- Total Harmonic Distortion (THD): <20% at 40 W
- Inrush Current: < 2 A
- Inrush Current Limiting Circuitry: eliminates circuit breaker tripping, switch arcing and relay failure.
- Open circuit protected
- Short circuit protected
- Turn-on time: ≤ 1 second
- PWM Dimming Frequency: 550 Hz

Environmental

- Sound Rating: Class A.
- Relative Humidity: Maximum 90% non-condensing.
- Minimum operating ambient temperature (t_a) = 32 °F (0 °C).

Standards

- Meets ANSI C62.41 category A surge protection standards up to and including 4 kV.
- FCC Part 15 compliant for commercial and residential applications.
- Manufacturing facilities employ ESD reduction practices that comply with the requirements of ANSI/ESD S20.20.
- Lutron® Quality Systems registered to ISO 9001.2008.
- UL 8750 recognized.
- Class 2 output available.
- Models available to meet LED Driver requirements for Energy Star 1.1.

Driver Wiring & Mounting

- Driver is grounded by a mounting screw to the grounded fixture (or by terminal connection on the K case).
- Terminal blocks on the driver accept one solid wire per terminal from 18 to 16 AWG (0.75 to 1.5 mm^2).
- Fixture must be grounded in accordance with local and national electrical codes.
- Maximum driver–to–LED light engine wire length is 10 ft (3.0 m).

369-543 Rev. A 3 10.25.11

How to Build a Model Number: Hi-lume® A-Series

LTEA4U1U __ - _ _ ___

example: LTEA4U1UKS-HC070
For further assistance selecting your model number, contact our LED Center of Excellence at 1-877-346-5338 or LEDS@lutron.com

Case Size:
K = Compact
M = Stick

Case Style:
S = Studded (K case only)
N = Non-Studded

Current Level (for Constant Current):
020 = 0.20 A; 021 = 0.21 A . . . 210 = 2.10 A

Voltage Level (for Constant Voltage):
100 = 10.0 V; 105 = 10.5 V . . . 600 = 60.0 V

Driver Output:
C = Constant current driver with pulse width modulation (PWM) dimming
A = Constant current driver with constant current reduction (CCR) dimming
V = Constant voltage driver with pulse width modulation (PWM) dimming

LED Load Output Range (see the following pages for more detail):

Class 2 Constant Voltage
A = 10.0 V–12.0 V
B = 12.5 V–20.0 V
C = 20.5 V–24.0 V
D = 24.5 V–38.0 V

Isolated Non-Class 2 Constant Voltage
X = 38.5 V–60.0 V

Class 2 Constant Current
E = 0.20 A–0.50 A 30 V–54 V
F = 0.51 A–1.00 A 30 V–54 V
G = 0.20 A–0.70 A 8 V–20 V
H = 0.20 A–0.70 A 15 V–38 V
I = 0.71 A–1.05 A 8 V–20 V
J = 0.71 A–1.05 A 15 V–38 V
K = 1.06 A–1.50 A 8 V–20 V
L = 1.06 A–1.50 A 15 V–38 V
M = 1.51 A–2.10 A 8 V – 20 V

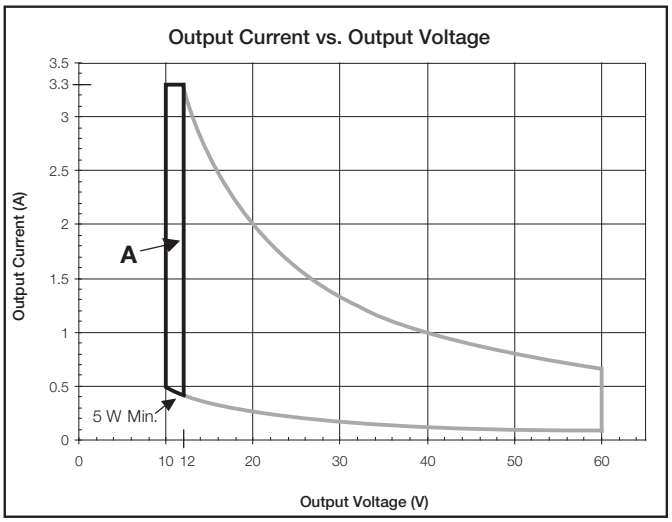
Isolated Non-Class 2 Constant Current
Y = 0.20 A–0.50 A 30 V–60 V
Z = 0.51 A–1.00 A 30 V–60 V

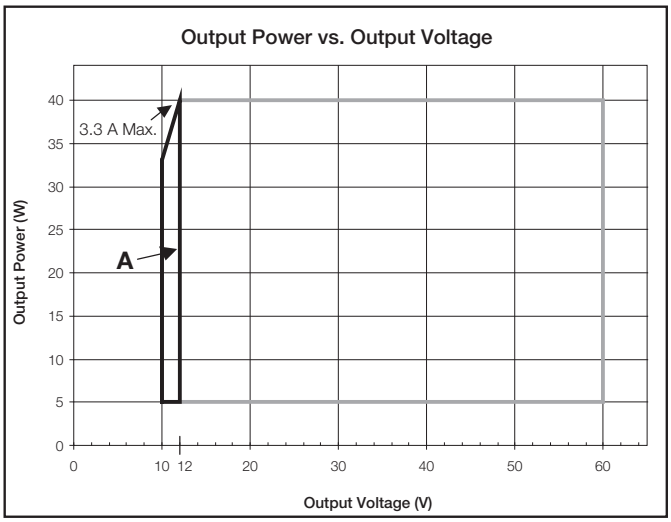
Job Name:	Model Numbers:	
Job Number:		

"A" Output Range, Voltage Driver Models

Driver Type	Output Dimming Method	Output Voltage	Output Current	Output Power	Standards Recognition
Constant Voltage Driver (Class 2)	Pulse Width Modulation (PWM)	10.0 – 12.0 V	0.42 – 3.3 A	5 – 40 W	c UL us

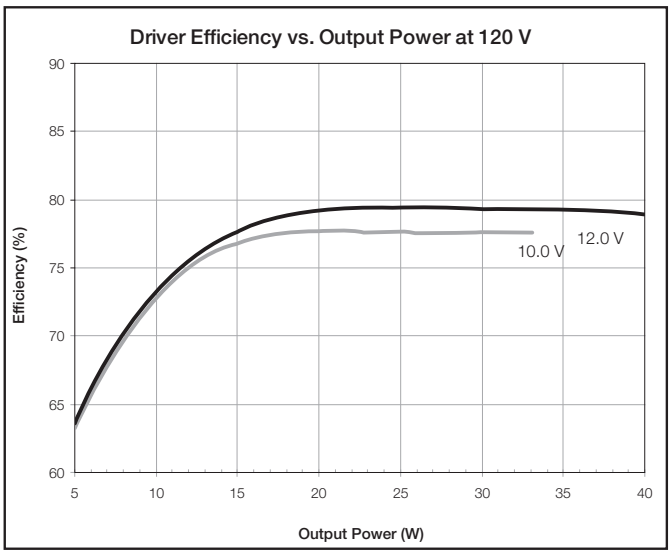
Voltage Driver Operation Range:





Typical Performance Specifications:

Parameter	Value	Test Conditions
Input Current	400 mA	t_a = 25° C, 12.0 V, 40 W load, Max. Light Output, K enclosure 120 V without a dimmer
Power Factor	0.98	
THD	16%	
Driver Efficiency	79%	

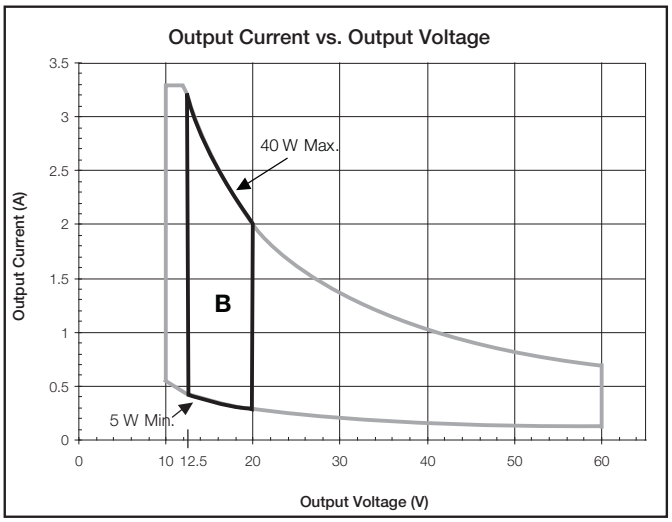


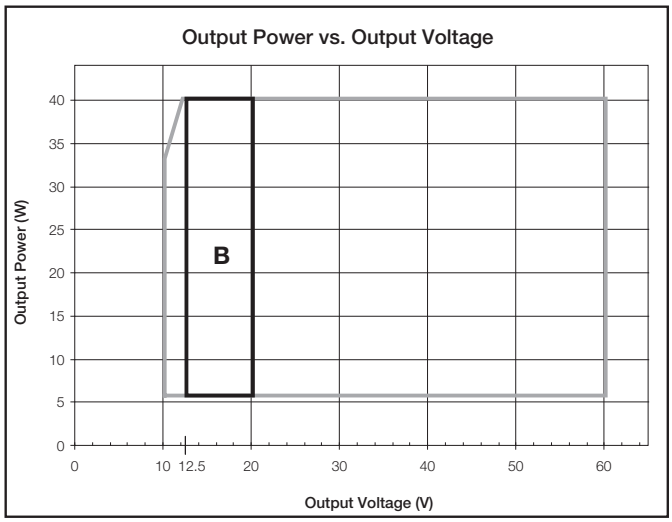
Job Name:	Model Numbers:	
Job Number:		

"B" Output Range, Voltage Driver Models

Driver Type	Output Dimming Method	Output Voltage	Output Current	Output Power	Standards Recognition
Constant Voltage Driver (Class 2)	Pulse Width Modulation (PWM)	12.5 – 20.0 V	0.25 – 3.2 A	5 – 40 W	c UL us

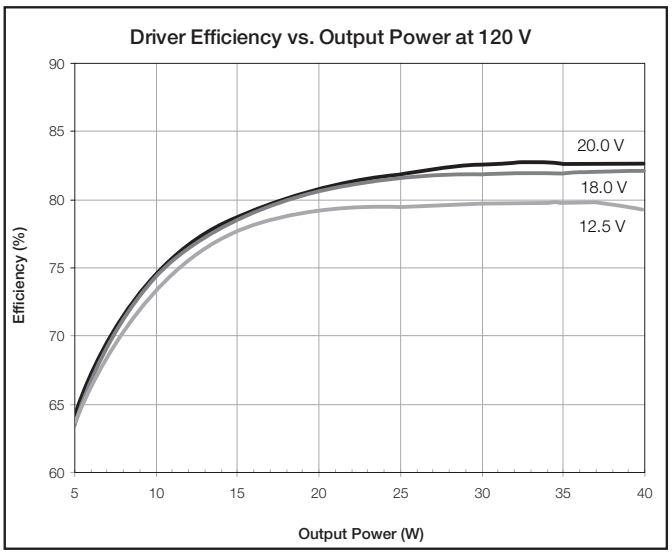
Voltage Driver Operation Range:





Typical Performance Specifications:

Parameter	Value	Test Conditions
Input Current	400 mA	t_a = 25° C, 20.0 V, 40 W load, Max. Light Output, K enclosure 120 V without a dimmer
Power Factor	0.99	
THD	9%	
Driver Efficiency	83%	

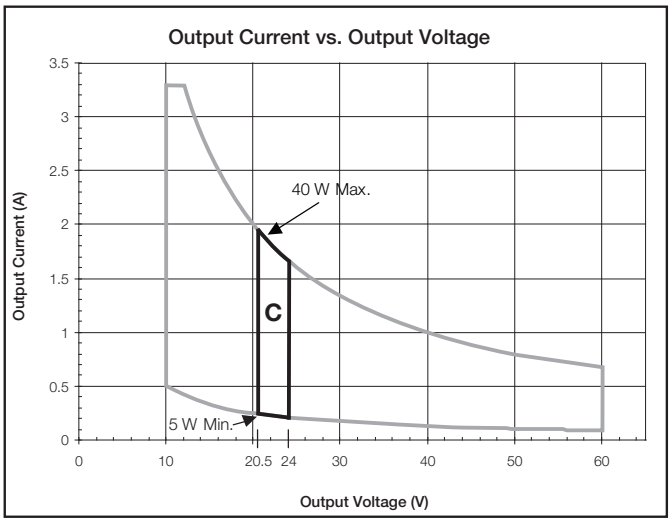


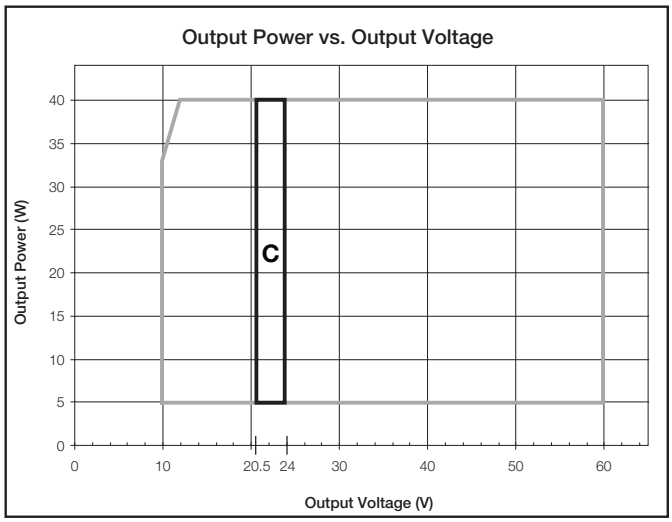
Job Name:	Model Numbers:	
Job Number:		

"C" Output Range, Voltage Driver Models

Driver Type	Output Dimming Method	Output Voltage	Output Current	Output Power	Standards Recognition
Constant Voltage Driver (Class 2)	Pulse Width Modulation (PWM)	20.5 – 24.0 V	1.95 – 0.21 A	5 – 40 W	c UL us

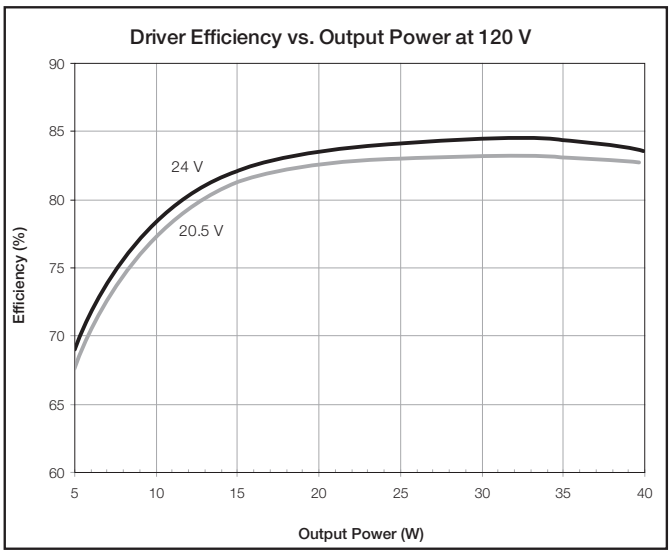
Voltage Driver Operation Range:





Typical Performance Specifications:

Parameter	Value	Test Conditions
Input Current	380 mA	t_a = 25° C, 24.0 V, 40 W load, Max. Light Output, K enclosure 120 V without a dimmer
Power Factor	0.99	
THD	10%	
Driver Efficiency	84%	

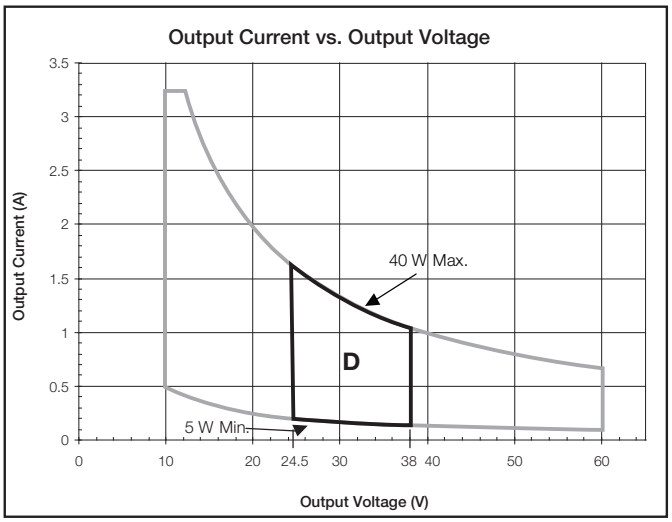


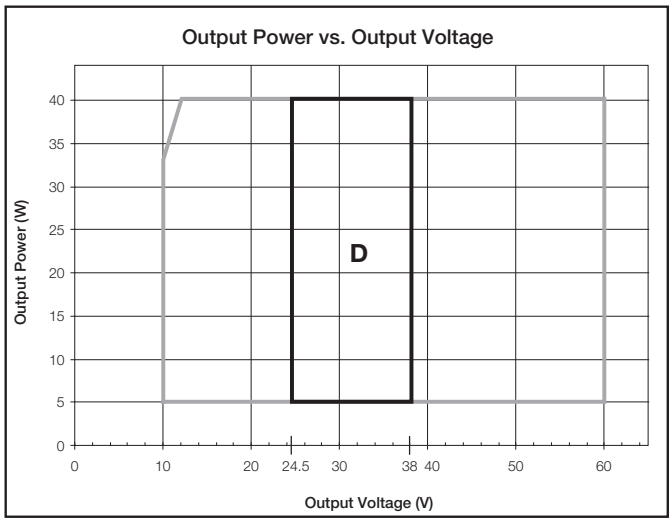
Job Name:	Model Numbers:	
Job Number:		

"D" Output Range, Voltage Driver Models

Driver Type	Output Dimming Method	Output Voltage	Output Current	Output Power	Standards Recognition
Constant Voltage Driver (Class 2)	Pulse Width Modulation (PWM)	24.5 – 38.0 V	0.13 – 1.63 A	5 – 40 W	c UL us

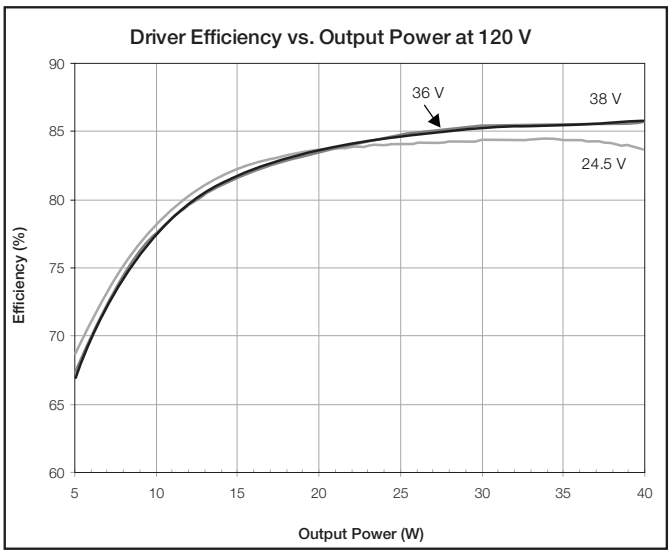
Voltage Driver Operation Range:





Typical Performance Specifications:

Parameter	Value	Test Conditions
Input Current	380 mA	t_a = 25° C, 38.0 V, 40 W load, Max. Light Output, K enclosure 120 V without a dimmer
Power Factor	0.99	
THD	7%	
Driver Efficiency	86%	



Job Name:	Model Numbers:	
Job Number:		

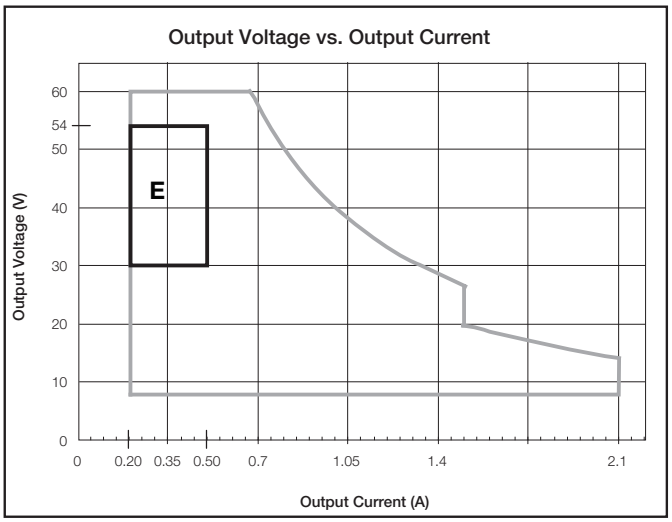
369-543 Rev. A 8 10.25.11

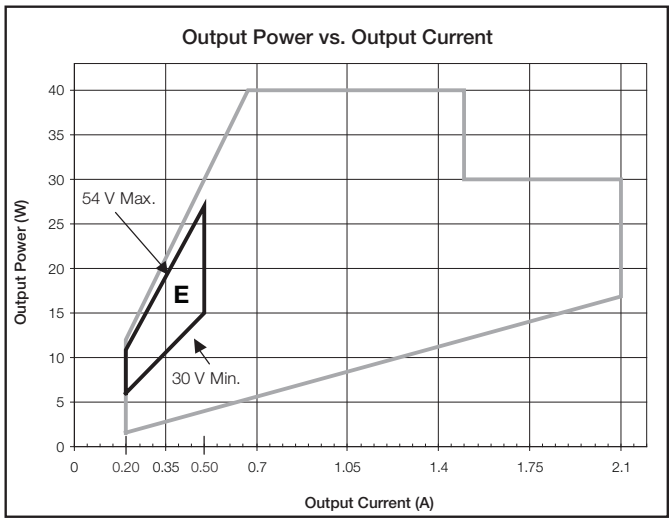
"E" Output Range, Current Driver Models

Driver Type	Output Dimming Method	Output Voltage	Output Current	Output Power	Standards Recognition*
Constant Current Driver (Class 2)	Constant Current Reduction (CCR)	30 – 54 V	0.20 – 0.50 A	6 – 27 W	

*UL recognized for U.S.A. only. Canadian standards do not allow Class 2 rated devices to exceed 42.4 V.

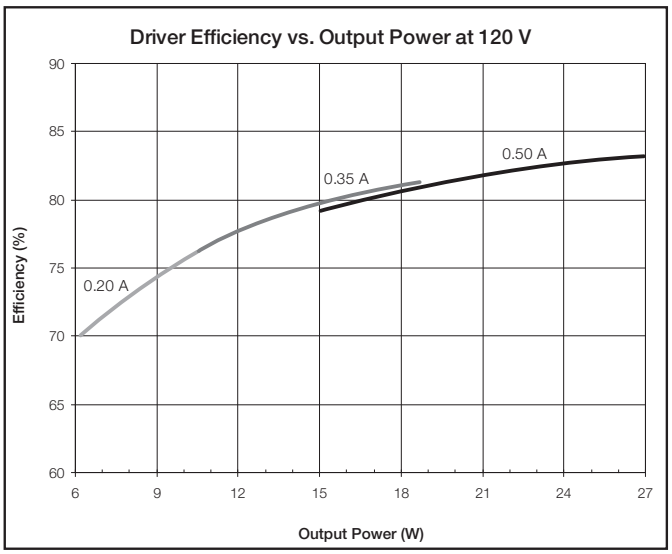
Current Driver Operation Range:





Typical Performance Specifications:

Parameter	Value	Test Conditions
Input Current	270 mA	t_a = 25° C, 0.50 A, 27 W load, Max. Light Output, K enclosure 120 V without a dimmer
Power Factor	0.99	
THD	10%	
Driver Efficiency	83%	



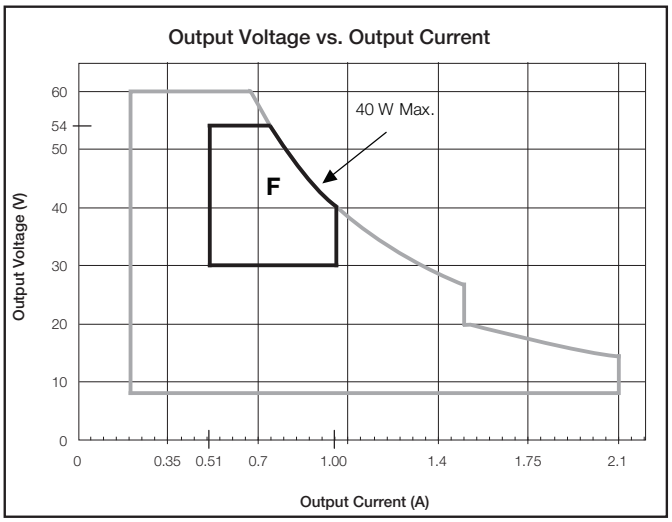
Job Name:	Model Numbers:	
Job Number:		

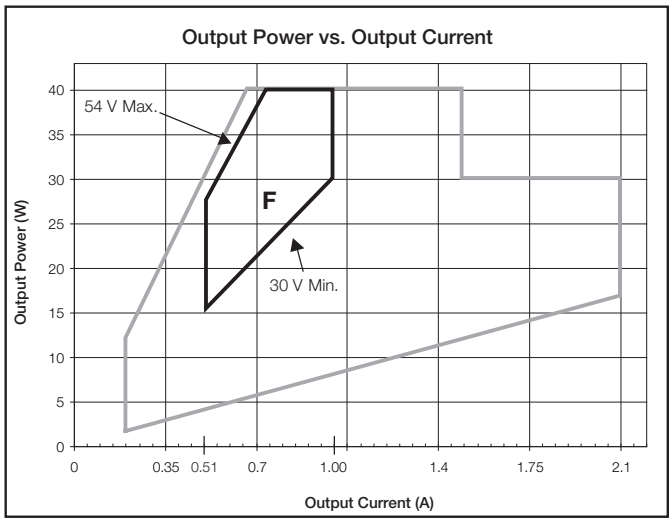
"F" Output Range, Current Driver Models

Driver Type	Output Dimming Method	Output Voltage	Output Current	Output Power	Standards Recognition*
Constant Current Driver (Class 2)	Constant Current Reduction (CCR)	30 – 54 V	0.51 – 1.00 A	15 – 40 W	

*UL recognized for U.S.A. only. Canadian standards do not allow Class 2 rated devices to exceed 42.4 V.

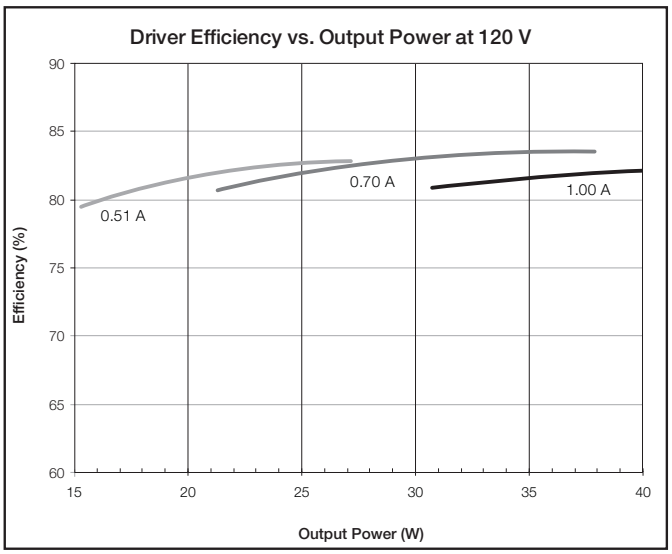
Current Driver Operation Range:





Typical Performance Specifications:

Parameter	Value	Test Conditions
Input Current	400 mA	t_a = 25° C, 1.00 A, 40 W load, Max. Light Output, K enclosure 120 V without a dimmer
Power Factor	0.99	
THD	7%	
Driver Efficiency	82%	

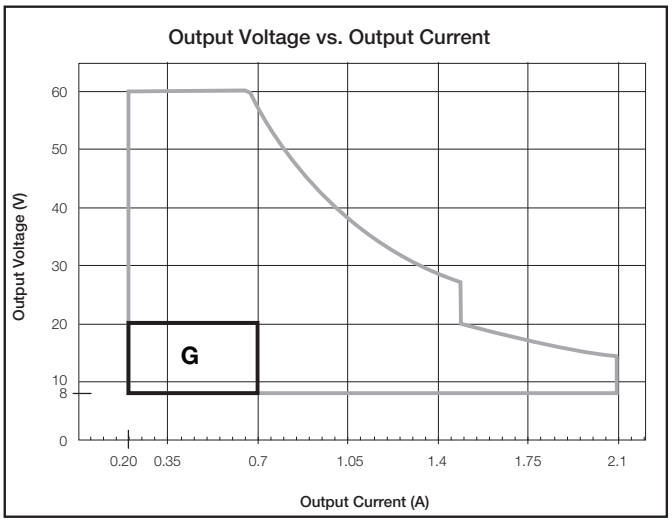


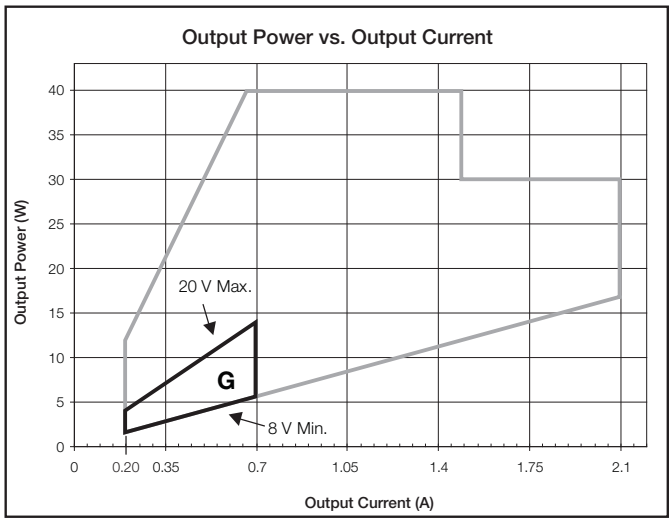
Job Name:	Model Numbers:	
Job Number:		

"G" Output Range, Current Driver Models

Driver Type	Output Dimming Method	Output Voltage	Output Current	Output Power	Standards Recognition
Constant Current Driver (Class 2)	Pulse Width Modulation (PWM) OR Constant Current Reduction (CCR)	8 – 20 V	0.20 – 0.70 A	2 – 14 W	c UL us

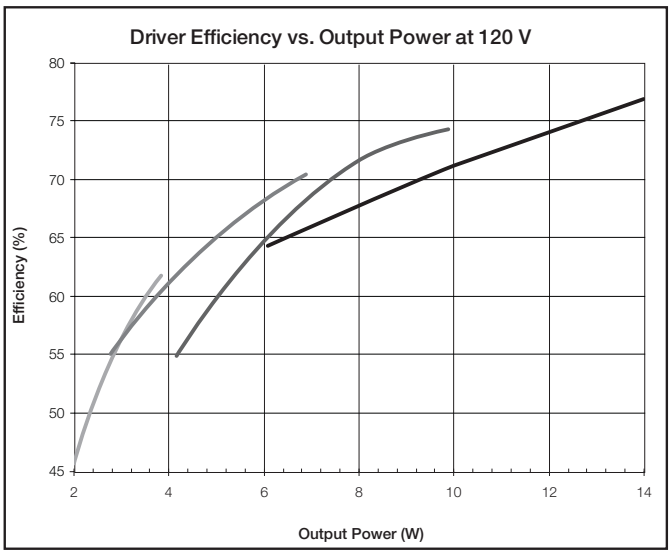
Current Driver Operation Range:





Typical Performance Specifications:

Parameter	Value	Test Conditions
Input Current	150 mA	t_a = 25° C, 0.70 A, 14 W load, Max. Light Output, K enclosure 120 V without a dimmer
Power Factor	0.99	
THD	12%	
Driver Efficiency	76%	

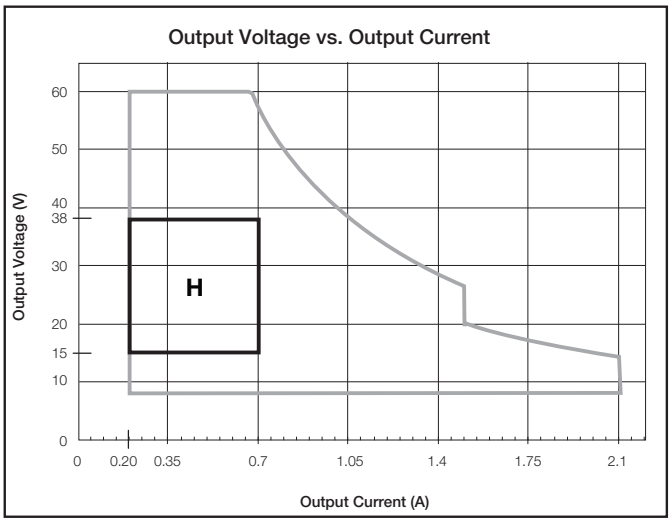


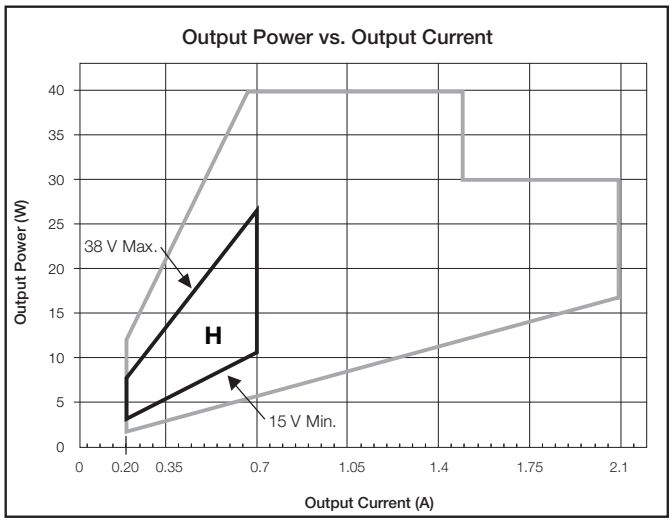
Job Name:	Model Numbers:	
Job Number:		

"H" Output Range, Current Driver Models

Driver Type	Output Dimming Method	Output Voltage	Output Current	Output Power	Standards Recognition
Constant Current Driver (Class 2)	Pulse Width Modulation (PWM) OR Constant Current Reduction (CCR)	15 – 38 V	0.20 – 0.70 A	3 – 26 W	c UL us

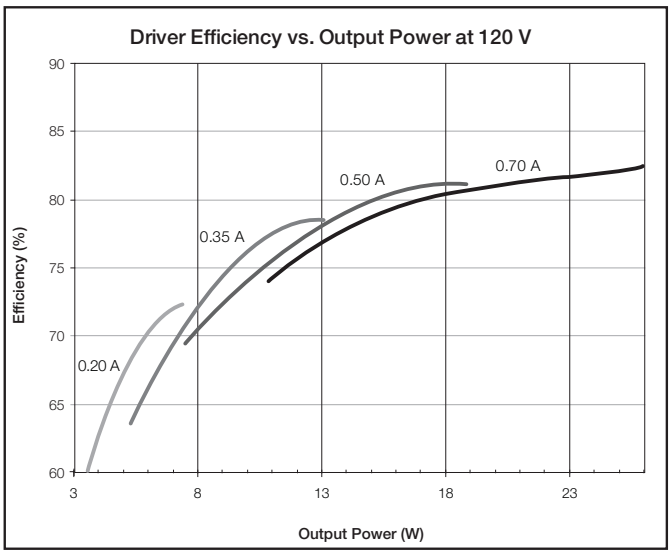
Current Driver Operation Range:





Typical Performance Specifications:

Parameter	Value	Test Conditions
Input Current	270 mA	t_a = 25° C, 0.70 A, 26 W load, Max. Light Output, K enclosure 120 V without a dimmer
Power Factor	0.99	
THD	8%	
Driver Efficiency	83%	

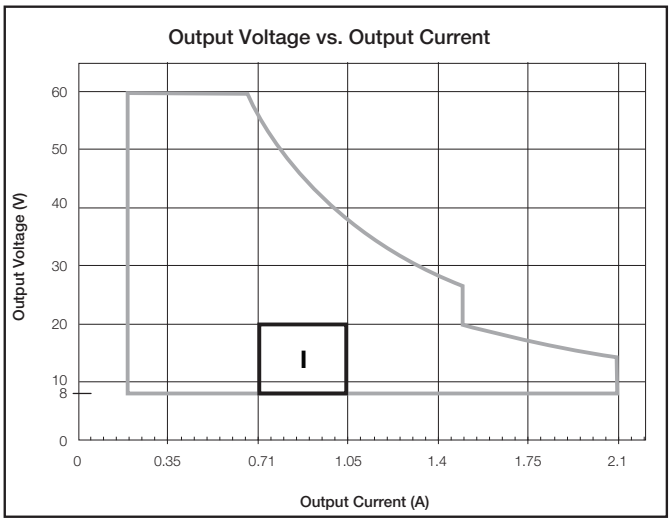


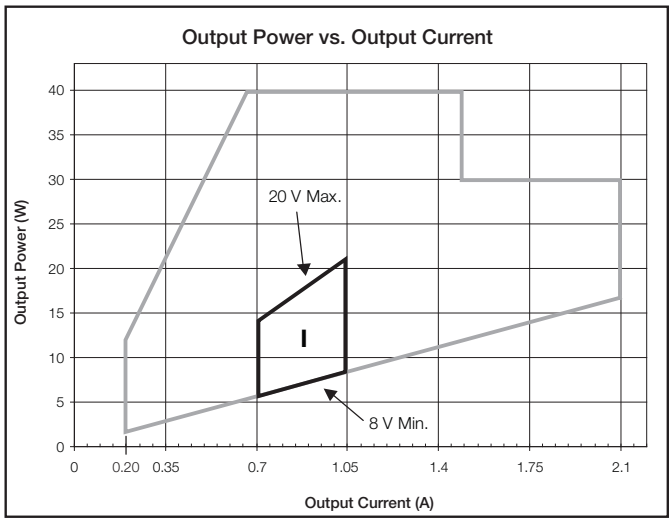
Job Name:	Model Numbers:	
Job Number:		

"I" Output Range, Current Driver Models

Driver Type	Output Dimming Method	Output Voltage	Output Current	Output Power	Standards Recognition
Constant Current Driver (Class 2)	Pulse Width Modulation (PWM) OR Constant Current Reduction (CCR)	8 – 20 V	0.71 – 1.05 A	6 – 21 W	c UL us

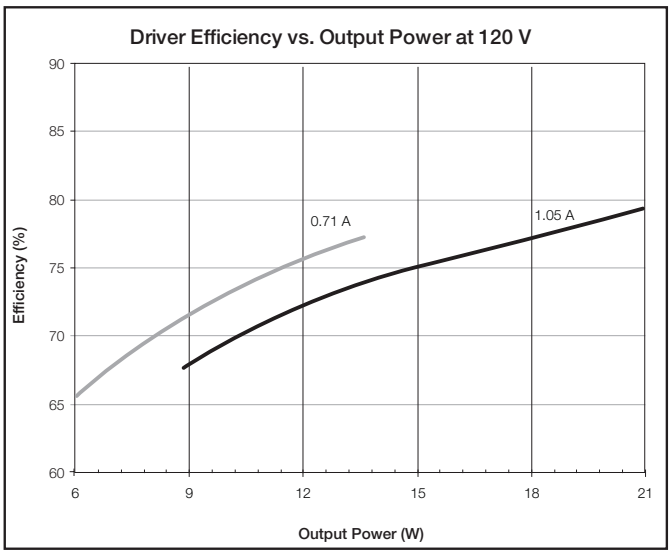
Current Driver Operation Range:





Typical Performance Specifications:

Parameter	Value	Test Conditions
Input Current	220 mA	t_a = 25° C, 1.05 A, 21 W load, Max. Light Output, K enclosure 120 V without a dimmer
Power Factor	0.99	
THD	11%	
Driver Efficiency	79%	

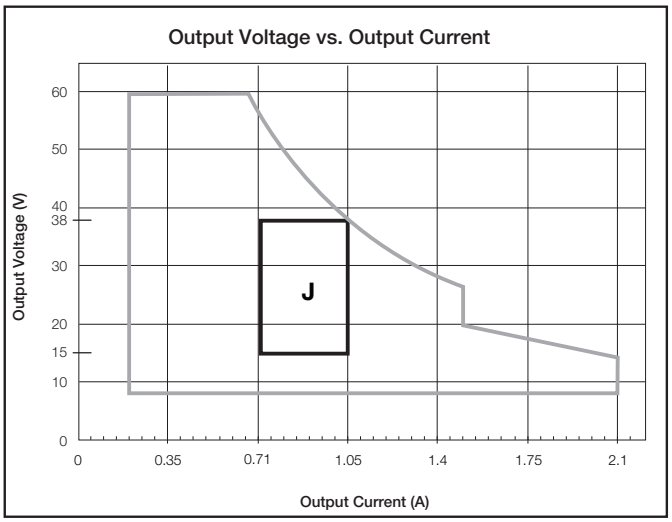


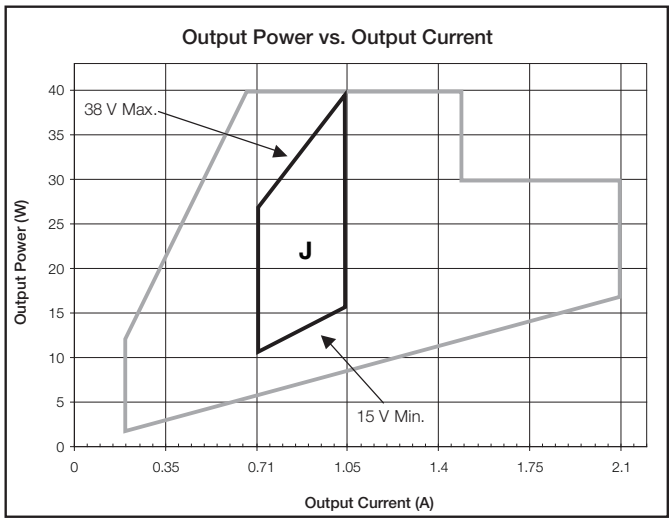
Job Name:	Model Numbers:	
Job Number:		

"J" Output Range, Current Driver Models

Driver Type	Output Dimming Method	Output Voltage	Output Current	Output Power	Standards Recognition
Constant Current Driver (Class 2)	Pulse Width Modulation (PWM) OR Constant Current Reduction (CCR)	15 – 38 V	0.71 – 1.05 A	11 – 40 W	c UL us

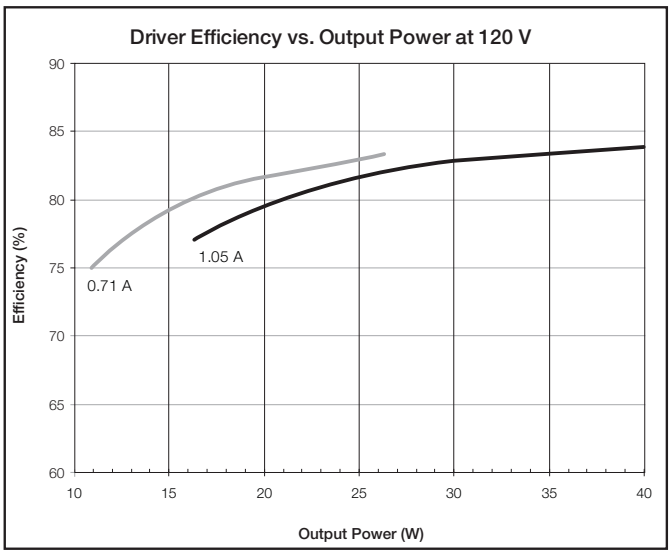
Current Driver Operation Range:





Typical Performance Specifications:

Parameter	Value	Test Conditions
Input Current	400 mA	t_a = 25° C, 1.05 A, 40 W load, Max. Light Output, K enclosure 120 V without a dimmer
Power Factor	0.99	
THD	7%	
Driver Efficiency	84%	

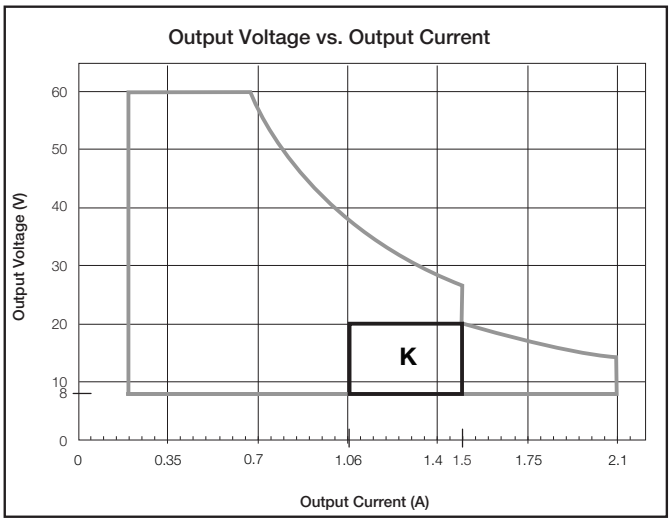


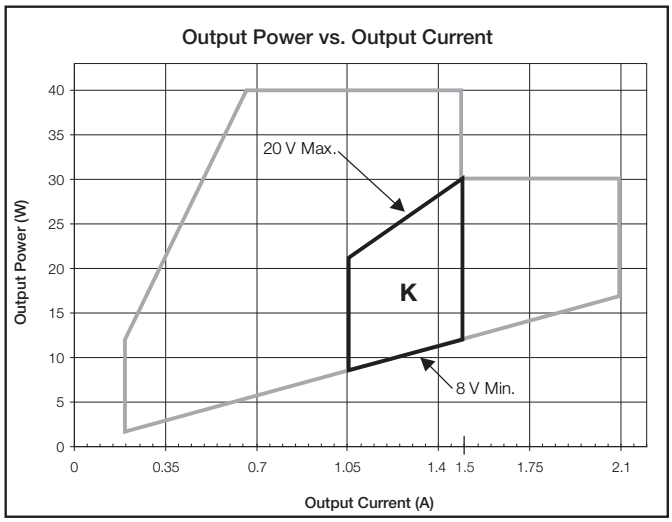
Job Name:	Model Numbers:	
Job Number:		

"K" Output Range, Current Driver Models

Driver Type	Output Dimming Method	Output Voltage	Output Current	Output Power	Standards Recognition
Constant Current Driver (Class 2)	Pulse Width Modulation (PWM) OR Constant Current Reduction (CCR)	8 – 20 V	1.06 – 1.50 A	9 – 30 W	c UL us

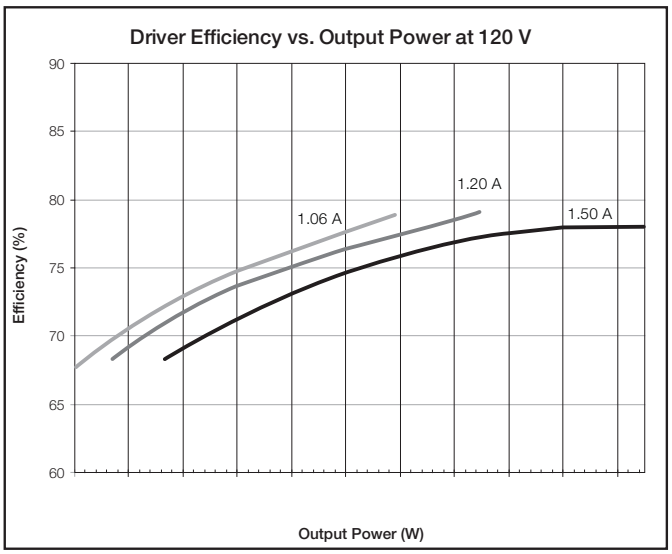
Current Driver Operation Range:





Typical Performance Specifications:

Parameter	Value	Test Conditions
Input Current	320 mA	t_a = 25° C, 1.50 A, 30 W load, Max. Light Output, K enclosure 120 V without a dimmer
Power Factor	0.99	
THD	12%	
Driver Efficiency	79%	

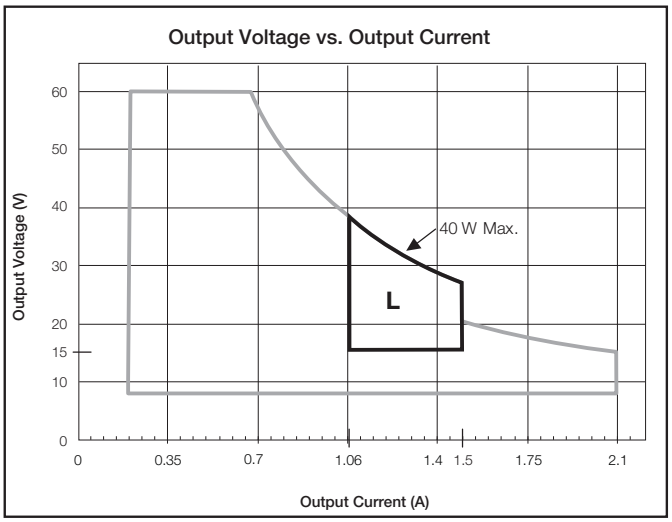


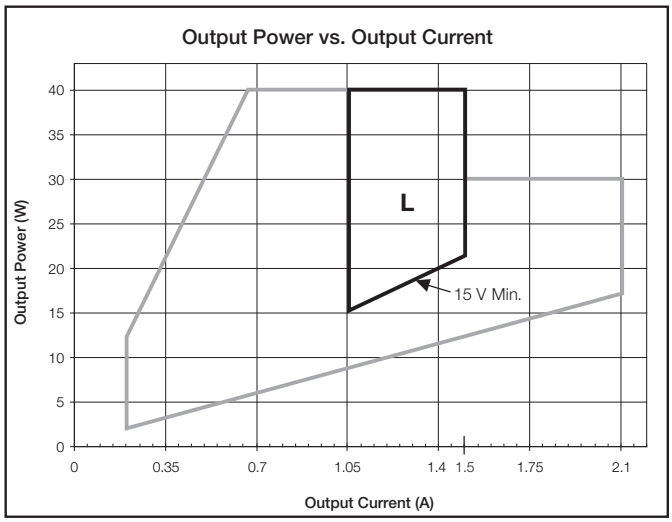
Job Name:	Model Numbers:	
Job Number:		

"L" Output Range, Current Driver Models

Driver Type	Output Dimming Method	Output Voltage	Output Current	Output Power	Standards Recognition
Constant Current Driver (Class 2)	Pulse Width Modulation (PWM) OR Constant Current Reduction (CCR)	15 – 38 V	1.06 – 1.50 A	16 – 40 W	c UL us

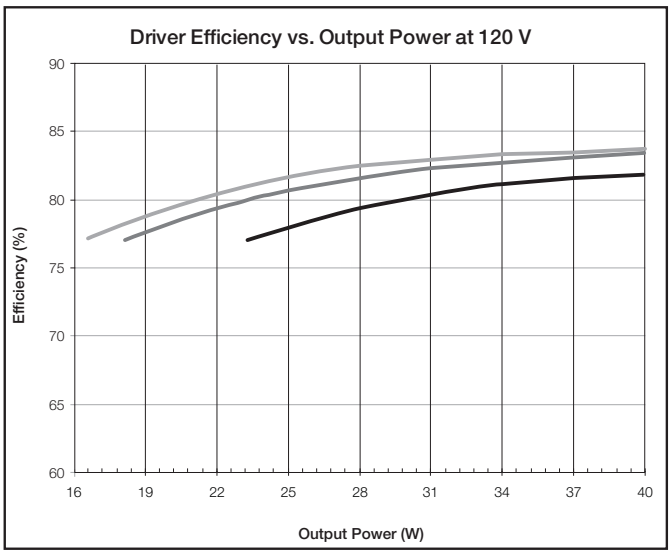
Current Driver Operation Range:





Typical Performance Specifications:

Parameter	Value	Test Conditions
Input Current	400 mA	t_a = 25° C, 1.50 A, 40 W load, Max. Light Output, K enclosure 120 V without a dimmer
Power Factor	0.99	
THD	9%	
Driver Efficiency	82%	

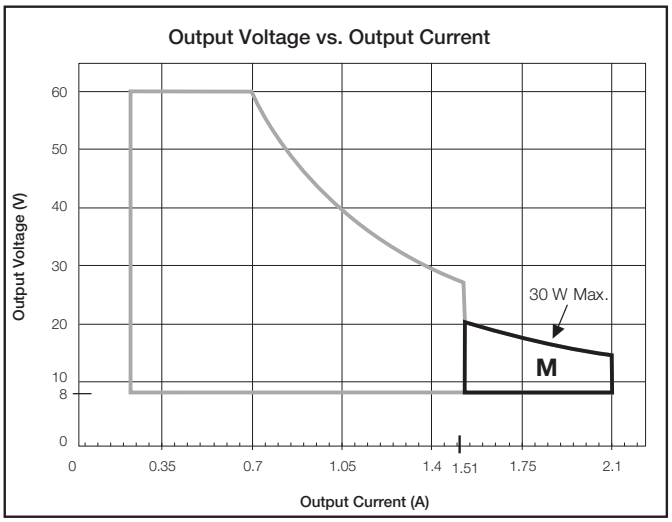


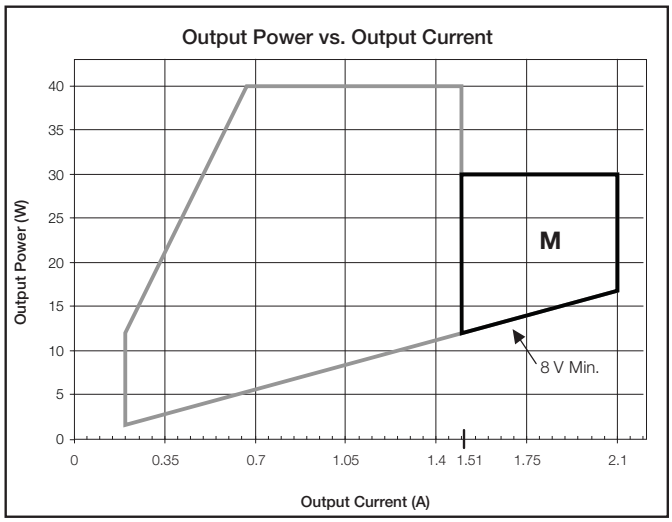
Job Name:	Model Numbers:	
Job Number:		

"M" Output Range, Current Driver Models

Driver Type	Output Dimming Method	Output Voltage	Output Current	Output Power	Standards Recognition
Constant Current Driver (Class 2)	Pulse Width Modulation (PWM) OR Constant Current Reduction (CCR)	8 – 19.9 V	1.51 – 2.10 A	12 – 30 W	c UL us

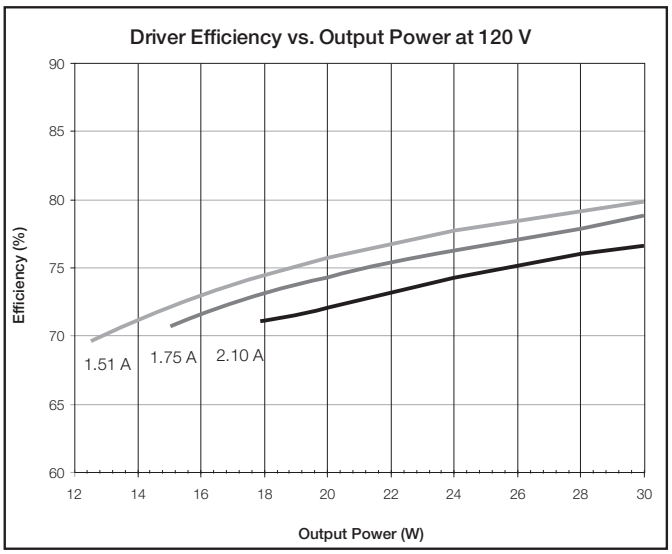
Current Driver Operation Range:





Typical Performance Specifications:

Parameter	Value	Test Conditions
Input Current	310 mA	t_a = 25° C, 2.10 A, 30 W load, Max. Light Output, K enclosure 120 V without a dimmer
Power Factor	0.99	
THD	14%	
Driver Efficiency	76%	

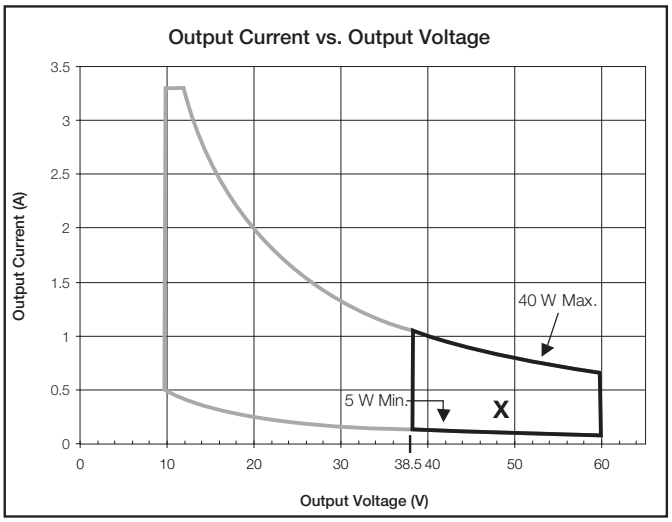


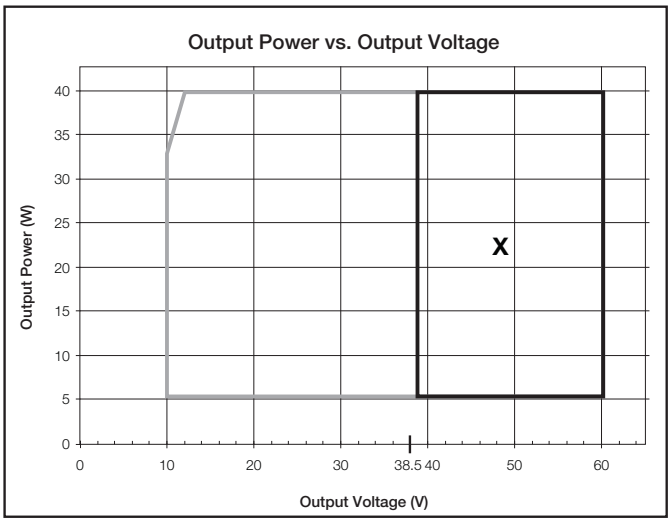
Job Name:	Model Numbers:	
Job Number:		

"X" Output Range, Voltage Driver Models

Driver Type	Output Dimming Method	Output Voltage	Output Current	Output Power	Standards Recognition
Constant Voltage Driver (Isolated, Non-Class 2)	Pulse Width Modulation (PWM)	38.5 – 60.0 V	0.08 – 1.04 A	5 – 40 W	c UL us

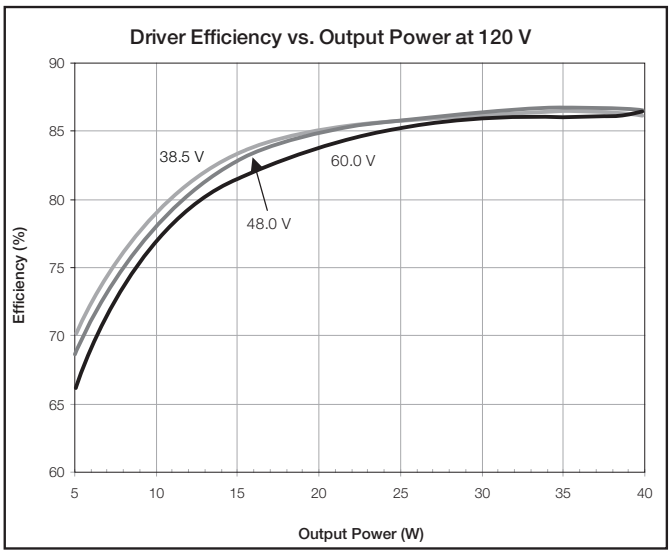
Voltage Driver Operation Range:





Typical Performance Specifications:

Parameter	Value	Test Conditions
Input Current	390 mA	t_a = 25° C, 60.0 V, 40 W load, Max. Light Output, K enclosure 120 V without a dimmer
Power Factor	0.99	
THD	10%	
Driver Efficiency	86%	

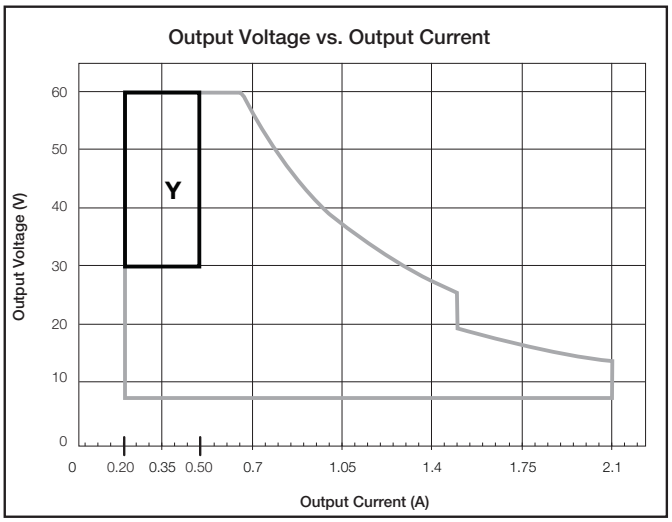


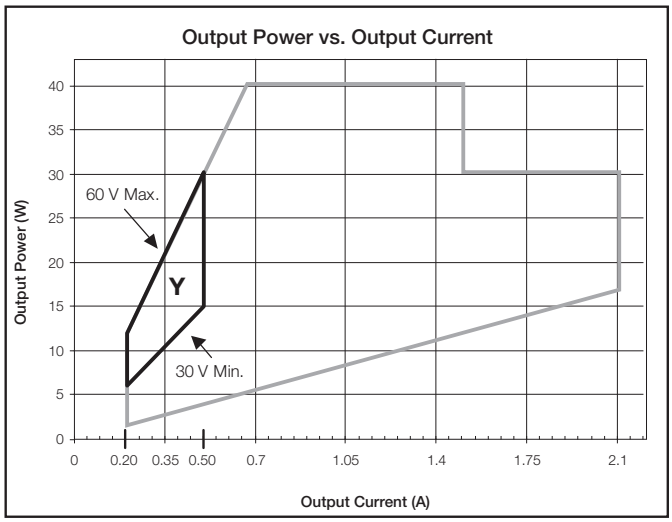
Job Name:	Model Numbers:	
Job Number:		

"Y" Output Range, Current Driver Models

Driver Type	Output Dimming Method	Output Voltage	Output Current	Output Power	Standards Recognition
Constant Current Driver (Isolated, Non-Class 2)	Pulse Width Modulation (PWM) OR Constant Current Reduction (CCR)	30 – 60 V	0.20 – 0.50 A	6 – 30 W	c UL us

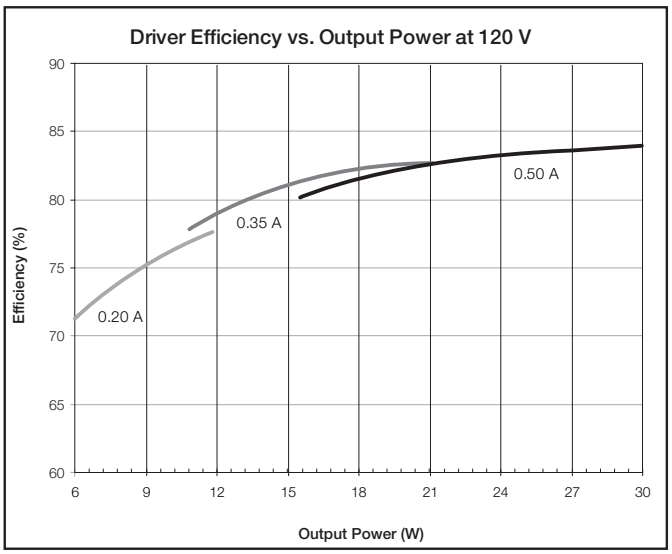
Current Driver Operation Range:





Typical Performance Specifications:

Parameter	Value	Test Conditions
Input Current	300 mA	t_a = 25° C, 0.50 A, 30 W load, Max. Light Output, K enclosure 120 V without a dimmer
Power Factor	0.99	
THD	11%	
Driver Efficiency	84%	

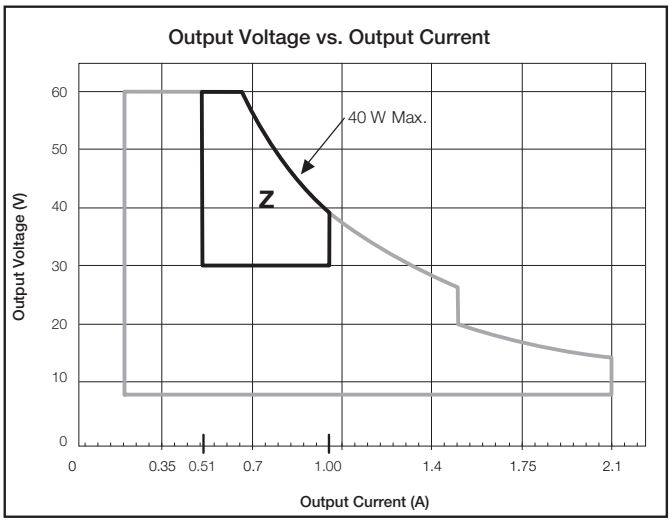


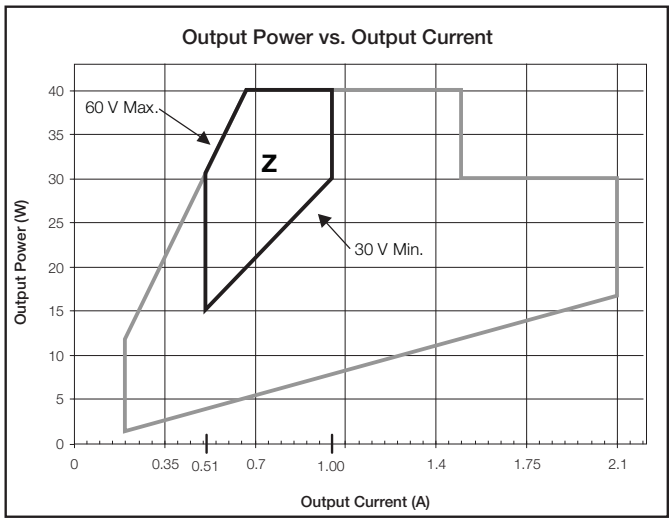
Job Name:	Model Numbers:	
Job Number:		

"Z" Output Range, Current Driver Models

Driver Type	Output Dimming Method	Output Voltage	Output Current	Output Power	Standards Recognition
Constant Current Driver (Isolated, Non-Class 2)	Pulse Width Modulation (PWM) OR Constant Current Reduction (CCR)	30 – 60 V	0.51 – 1.00 A	16 – 40 W	c UL us

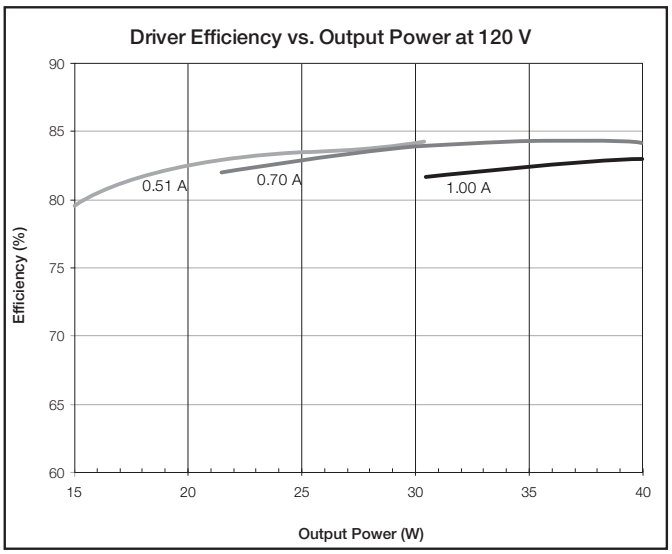
Current Driver Operation Range:





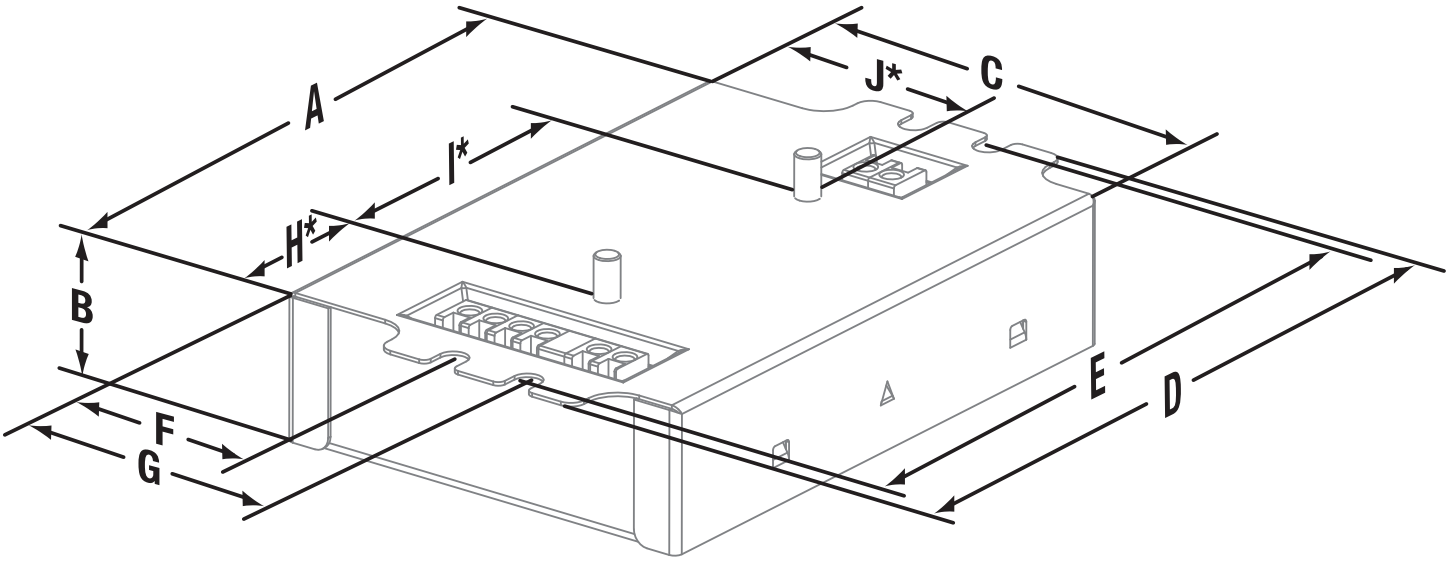
Typical Performance Specifications:

Parameter	Value	Test Conditions
Input Current	400 mA	t_a = 25° C, 1.00 A, 40 W load, Max. Light Output, K enclosure 120 V without a dimmer
Power Factor	0.99	
THD	8%	
Driver Efficiency	83%	

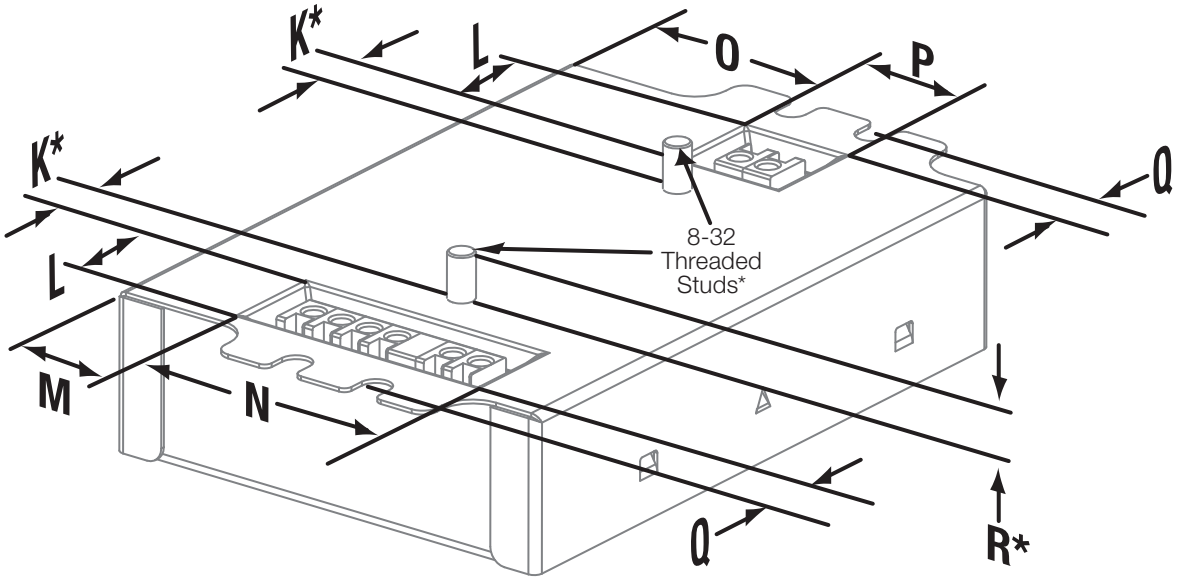


Job Name:	Model Numbers:	
Job Number:		

K Case: Case Dimensions



K Case: Connector Location Dimensions

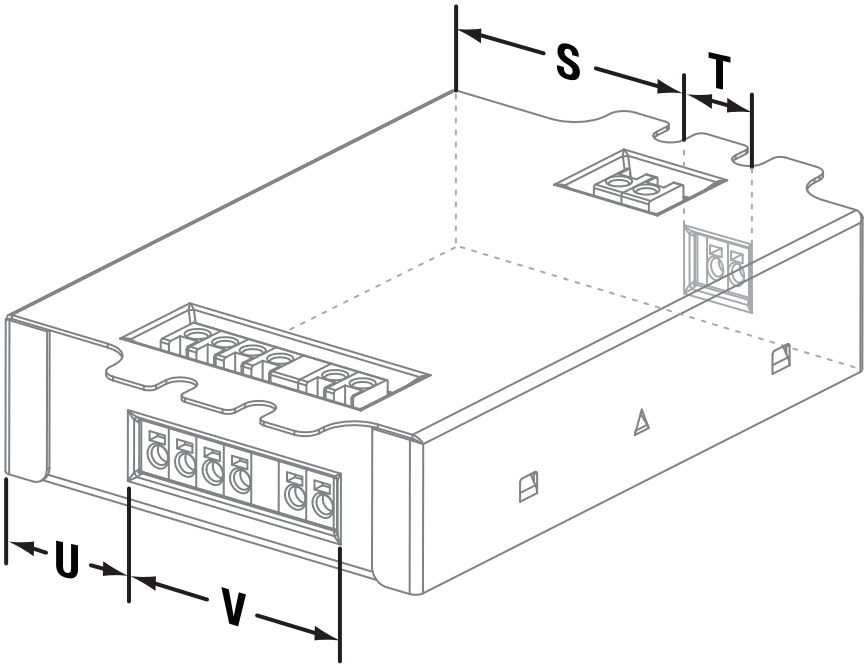


A	4.20 in (107 mm)	F	1.42 in (36 mm)	L	0.65 in (16.5 mm)	R*	0.29 in (7 mm)
B	1.00 in (25 mm)	G	1.99 in (51 mm)	M	0.75 in (19 mm)		
C	3.00 in (76 mm)	H*	1.11 in (28 mm)	N	1.73 in (44 mm)		
D	4.90 in (124 mm)	I*	2.00 in (51 mm)	O	1.33 in (34 mm)		
E	4.60 in (117 mm) (mounting center)	J*	1.60 in (41 mm)	P	0.74 in (19 mm)		
		K*	0.33 in (8.3 mm)	Q	0.32 in (8 mm)		

* Applies to studded K case only.

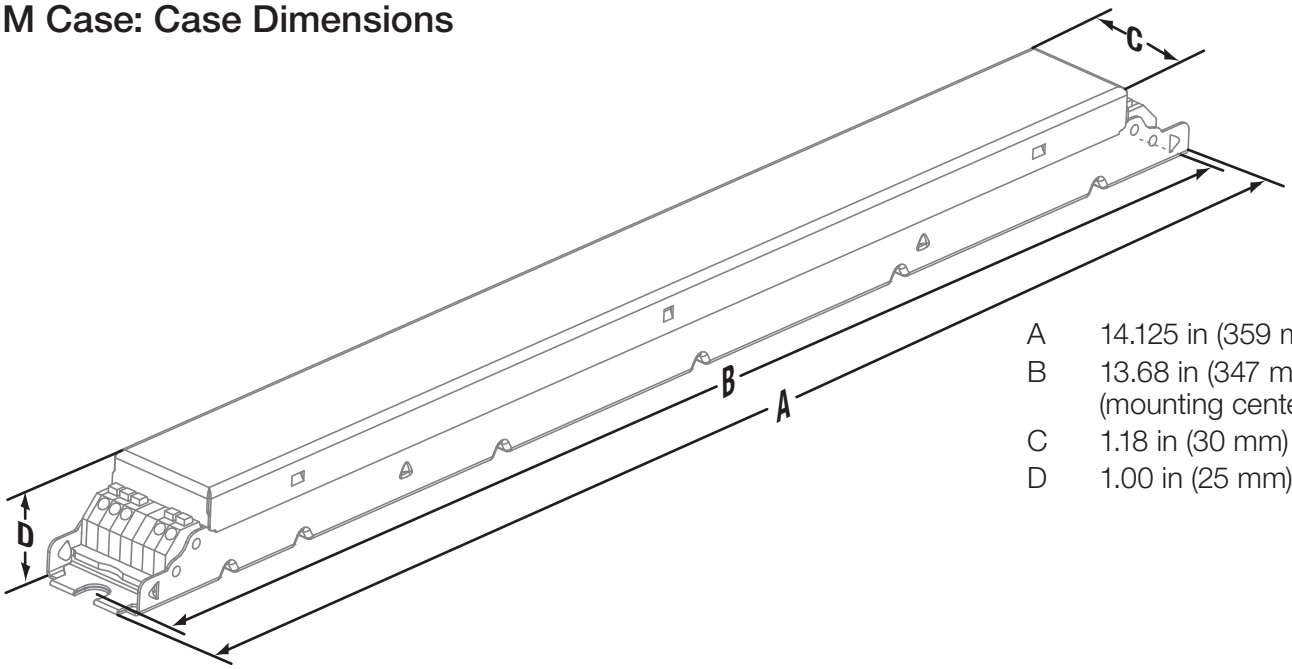
Job Name:	Model Numbers:	
Job Number:		

K Case: Side Entry Connector Location Dimensions (Non-Studded)



S	1.38 in (35 mm)
T	0.64 in (16 mm)
U	0.88 in (22 mm)
V	1.53 in (39 mm)

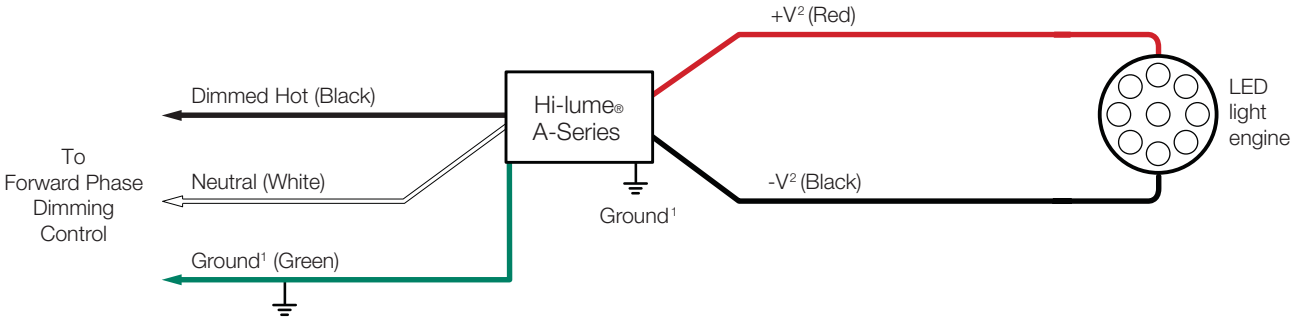
M Case: Case Dimensions



A	14.125 in (359 mm)
B	13.68 in (347 mm) (mounting center)
C	1.18 in (30 mm)
D	1.00 in (25 mm)

Job Name:	Model Numbers:	
Job Number:		

Wiring Diagram for Forward Phase Control



Note: Colors shown correspond to terminal blocks on driver.

1 Ground wire connection available on K case models only. Fixture and driver case must be grounded in accordance with local and national electrical codes.

2 Maximum driver–to–LED light engine wire length is 10 ft (3.0 m).

Job Name:	Model Numbers:	
Job Number:		

Compatible Controls

- Guaranteed performance specifications with the controls listed in the chart below.
- For assistance selecting controls, contact our LED Center of Excellence at 1-877-346-5338 or LEDS@lutron.com

Product	Part Number	Fixtures per Control (120 V only)	Measured Light Output Range
Nova T☆®	NTLV-600-CPN0199	1 – 8	100% – 1%
Maestro Wireless®	MRF2-6ND-120	1 – 8	100% – 1%
RadioRA® 2 1000 W	RRD-10ND	1 – 13	100% – 1%
RadioRA® 2 Adaptive dimmer*	RRD-6NA	1 – 8	100% – 1%
RadioRA® 600 W	RA-6ND	1 – 8	100% – 1%
RadioRA® 1000 W	RA-10ND	1 – 13	100% – 1%
HomeWorks® QS 600 W	HQRD-6ND	1 – 8	100% – 1%
HomeWorks® QS 1000 W	HQRD-10ND	1 – 13	100% – 1%
HomeWorks® QS Adaptive dimmer*	HQRD-6NA	1 – 8	100% – 1%
HomeWorks® QS WPM	HQRJ-WPM-6D-120	1 – 10 (per output)	100% – 1%
HomeWorks® 600 W dimmer	HRD-6ND	1 – 8	100% – 1%
HomeWorks® 1000 W dimmer	HWD-10ND, HRD-10ND	1 – 13	100% – 1%
HomeWorks® WPM	HWI-WPM-6D-120	1 – 10 (per output)	100% – 1%
GRAFIK Eye® QS	QSGR-, QSGRJ-	1 – 10 (per output)	100% – 1%
GRAFIK Eye® 3000	GRX-3100, GRX-3500	1 – 10 (per output)	100% – 1%
RPM-4U Module (LCP, HomeWorks®, GRAFIK Systems™, Quantum®)	HW-RPM-4U-120, LP-RPM-4U-120	1 – 10 (per output)	100% – 1%
RPM-4A Module* (LCP, HomeWorks®, GRAFIK Systems™, Quantum®)	HW-RPM-4A-120, LP-RPM-4A-120	1 – 13 (per output)	100% – 1%
GP Panels	Various	1 – 26	100% – 1%
Stanza®	SZ-6ND	1 – 8	100% – 1%

NOTE: Contact Lutron Technical Support for derating rules when using wallbox controls on the Hi-lume® A-Series LED Driver in multi-gang applications.

For the list of compatible controls, visit lutron.com/HiLumeLED and select “Forward Phase Control Report Card.”

* Phase adaptive dimmers must be configured to forward-phase mode.

Job Name:	Model Numbers:	
Job Number:		

ELECTRICIANS AND CONTRACTORS

Driver Leads

Maximum driver–to–LED light engine wire length is 10 ft (3.0 m).

Wiring and Grounding

Driver and lighting fixture must be grounded. Drivers must be installed per national and local electrical codes.

LED Load Replacement

For Class 2 rated drivers, the LED load can be changed while the driver is installed and powered.

Maximum Driver Operating Temperature

Driver case temperature (t_c) must not exceed UL conditions of acceptability in end product.

For 50,000 hour lifetime, driver case temperature (t_c) must not exceed 149 °F (65 °C).

FACILITIES MANAGERS

SERVICE

Warranty

For warranty information, please visit http://www.lutron.com/TechnicalDocumentLibrary/Ballast%20and%20Driver%20Warranty.pdf

Replacement Parts

When ordering Lutron® replacement parts please provide the full model number. Consult Lutron if you have any questions.

Further Information

For further information, please visit us at www.lutron.com/hilumeLED or contact our LED Control Center of Excellence at 1.877.346.5338 or LEDs@lutron.com

Supporting Documentation

Wiring and Power Guidelines

International Edition

Revision A

Overview

The wiring of a *HomeWorks* QS system has been made simpler through a reduction in the number of link types and a higher capacity of device addresses on each link compared to previous *HomeWorks* systems. The purpose of this document is to provide guidelines for how to wire and power *HomeWorks* QS devices.

Processor / Network Link:

Each *HomeWorks* QS processor has two RJ-45 Ethernet ports connected by an internal network switch. The Ethernet ports are used to connect processors together in a multi-Processor project, to connect Processors to the home network or other systems for integration and to connect processors to the *HomeWorks* QS software utility for activation, transfer and diagnostics. In a multi-Processor project, each Processor must be connected to the same Ethernet network for proper system operation. To provide for the most flexibility in network architecture, Ethernet cable should be run:

1. Between each processor and the home LAN or router.
2. Between each processor location in the home.

Having this Ethernet wiring in place will allow the Processor / Network Link to be connected in a variety of possible configurations, as described in the *HomeWorks* QS Networking Guide. Each network configuration has different benefits, but wiring in this method provides the most flexibility, especially since the home's networking hardware and software configurations may change over time. Please refer to the *HomeWorks* QS Networking Guide for details (http://resi.lutron.com/Portals/3/Support/App Notes - FAQs/HWQS/HomeWorks QS Networking.pdf).

Configurable Links:

Each *HomeWorks* QS Processor has two RS-485 configurable links that can be individually defined to be one of three types:

- *HomeWorks* Power Panel Link (16 MI addresses / 256 zones)
  - Module Interfaces (MI) and Remote Power Modules (RPM)
- *HomeWorks* QS RF Link (100 devices / 100 zones)
  - Dynamic Keypad, RF Sensors – Occupancy / Vacancy, Sivoia® QS Wireless Shades, *seeTouch* Tabletop Keypads, GRAFIK Eye® QS Main Units
- *HomeWorks* QS Wired Device Link (100 devices / 500 zones)
  - Control Interfaces, Dynamic Keypad, wired *seeTouch* Keypads, *GRAFIK Eye* QS Main Units, *Sivoia* QS shades

The link capacities shown above are the number of logical link addresses or devices that can be controlled on the link. In addition, you must be sure that the power requirements of the devices on each link are planned.

HomeWorks Power Panel Link:

HomeWorks | *HomeWorks* QS Power Panels, Module Interfaces and Remote Power Modules are powered by line-voltage feeds, and therefore do not get powered from the link. Module Interfaces are connected to the Processor on either link when configured as a Power Panel Link. The same standard Lutron 4-conductor cable (GRX-CBL-346S) that has been used in previous versions of *HomeWorks* can be used. This cable has one pair of 18-gauge and one pair of 22-gauge twisted/shielded conductors. Pin 2 should not be connected to the processor or Module Interfaces, as the power is supplied to the MI from a separate 24V~ transformer included with the MI. The Power Panel Link wiring can be daisy-chained from one MI to the next and has a limit of 1000 feet of total wire length. Refer to the HomeWorks Power Panel Link example on page 9.

HomeWorks QS RF Link:

HomeWorks QS RF Link devices are often powered by line-voltage, as is the case with dimmers, by a local power supply, as is the case with *Sivoia* QS Wireless Shades or RF Dynamic Keypads, or by batteries, as is the case with Radio Powr Savr sensors and Pico Wireless Controls. These devices do not get wired to the RF link.

Hybrid Repeaters are required to enable RF communication in *HomeWorks* QS, and at least one Hybrid Repeater must be wired to each RF Link configured on the processor. Each additional Hybrid Repeater (up to 4 total Hybrid Repeaters per link) can be wired

to the Processor RF Link, placed within 60 feet of another Hybrid Repeater (wireless), or wired to the RF Link on another Hybrid Repeater. Each Hybrid Repeater can be powered by the RF link on the processor (24VDC) or by a 9VDC plug-in transformer. The three main power and wiring options are:

1. Wired to RF Link for power and communication
2. Wired to RF Link for communication, locally powered
3. RF communication, locally powered

Refer to the HomeWorks QS RF Link example on page 10.

Lutron standard 4-conductor cable (GRX-CBL-346S) can be used with a maximum length of 1000 ft per wire run.

Sivoia QS Wireless shades are most often powered locally by individual plug-in power supplies (QSPS-P2-1-50 or QSPS-P3-1-50). *Sivoia* QS Wireless shades can also be powered by the ten-output smart power panel (QSPS-P2-10-60), if the wiring is practical. Each *Sivoia* QS Wireless shade requires its own RF Receiver, regardless of how the shade is powered.

Radio Powr Savr Sensors and Pico Wireless Controls are battery powered and do not require any wiring. Tabletop Keypads can also run on battery power or be powered locally with a 9VDC plug-in transformer.

HomeWorks QS Wired QS Device Link:

HomeWorks QS Wired QS Device Links consist mainly of devices that are powered by the QS Wired Link or dedicated power supplies and therefore the wiring and power requirements must be planned carefully. The power draw of each device is represented in Power Draw Units, or "PDUs." The table at the end of this document defines the PDU count for the various wired devices. Refer to page 11 for the HomeWorks QS Wired QS Device Link example.

Wired *seeTouch* Keypads, wired Dynamic Keypads, and interface devices all draw power from the QS Wired Link.

Lutron standard 4-conductor cable (GRX-CBL-346S) can be used to wire these devices. The QS Wired Link can be wired in daisy-chain, T-Tap, or star configurations, with a maximum wire length of 2000 feet per link. For ease of wiring, Wire Landing Boards (QS-WLB) can be used to land wire in the processor enclosure or a separate enclosure. Additionally, smart power panels (QSPS-P2-10-60) can be used to distribute power and provide multiple wire connections.

Pin 2 should not be connected to GRAFIK Eye QS main units and Wallbox Power Modules, as these devices source their own power and do not require power from the QS Link.

Sivoia QS Wired shades can be powered locally by individual plug-in power supplies (QSPS-P2-1-50 or QSPS-P3-1-50), or from the ten-output smart power panel (QSPS-P2-10-60). Powering one shade per output of the chosen power supply is a fail-safe wiring method. Each of these power supplies provides one or more 4-conductor terminals to be connected to the devices requiring power and communication, and an additional 3-conductor terminal block for landing the communication wiring (Common, MUX, MUX) from the processor.

Shades may require larger gauge power conductors to achieve the necessary wire run length. See the table at http://www.lutron.com/TechnicalDocumentLibrary/QS Power Supply Wiring and Power Draw Unit Guidelines.pdf for details. For example, one QS shade, powered by a QSPS-P2-10-60, with 16AWG power conductors (QSH-CBL-M-500) can have a maximum wire run of 200 ft.

In some cases, depending on the size of the shade, the QSPS-P2-10-60 power panel outputs can power two or three shades per output. This can save wire and labor and is useful on dual shade applications in cases where the shades are not large. Consult the Lutron Shading Solutions Product Guide (367-1455) for details and shade sizes where this is practical.

Powering the QS Link:

In planning how to assign devices to your QS Wired Link(s), it is helpful to consider the power requirements of the devices and power supplies you will use to power your devices. A table of Power Supply PDU outputs and device PDU requirements is shown below. All QS Wired Link devices are powered from 24VDC. Because the QS Wired Link can support as many as 100 devices, multiple power supplies will sometimes be necessary. It is common to power shades with dedicated power supplies, rather than from the QS Wired Link. Refer to page 6 for the HomeWorks QS Power Supply example. The chart on page 7 shows the Power Draw Units (PDUs) supplied by each power supply and consumed by each device.

HomeWorks QS Power Supply Example:

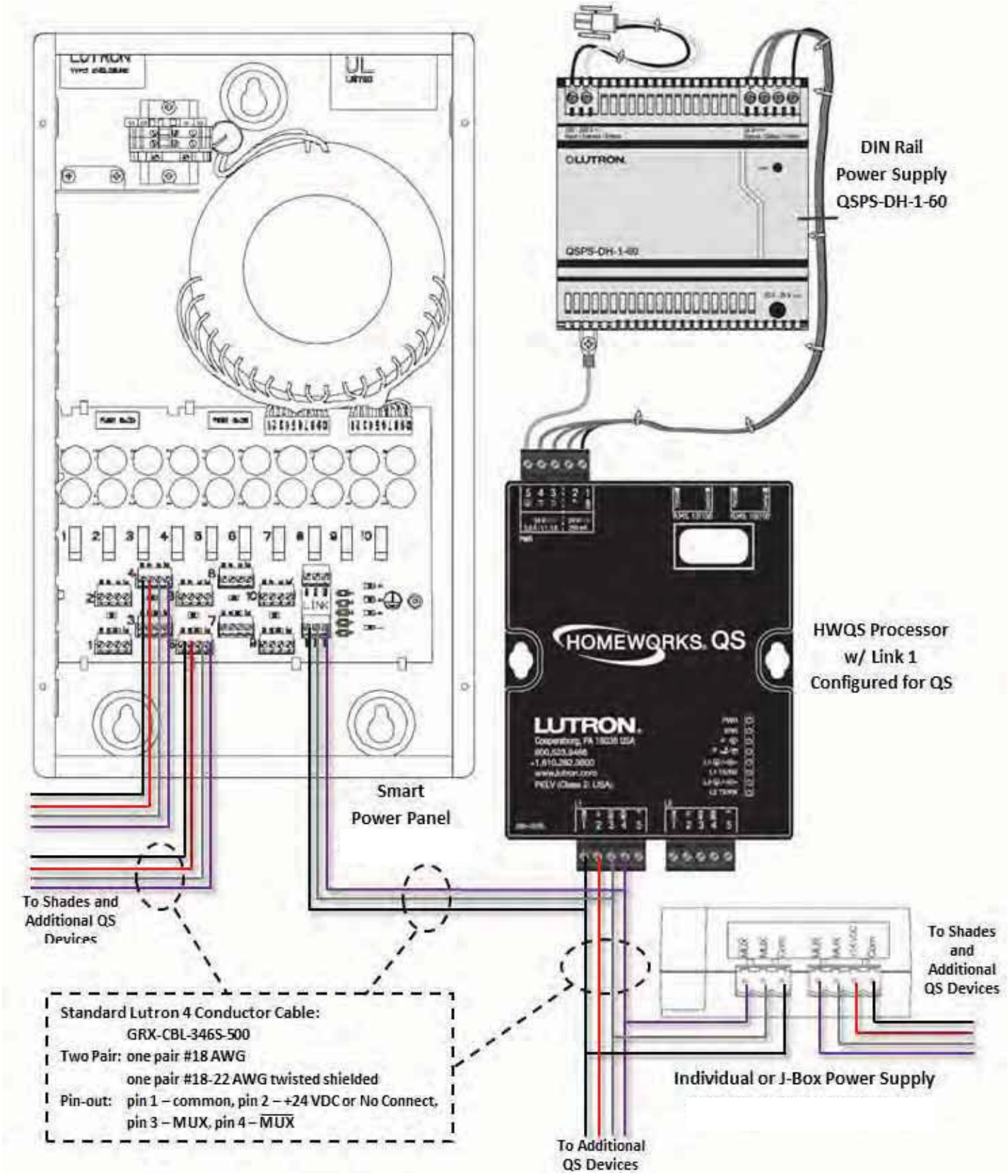
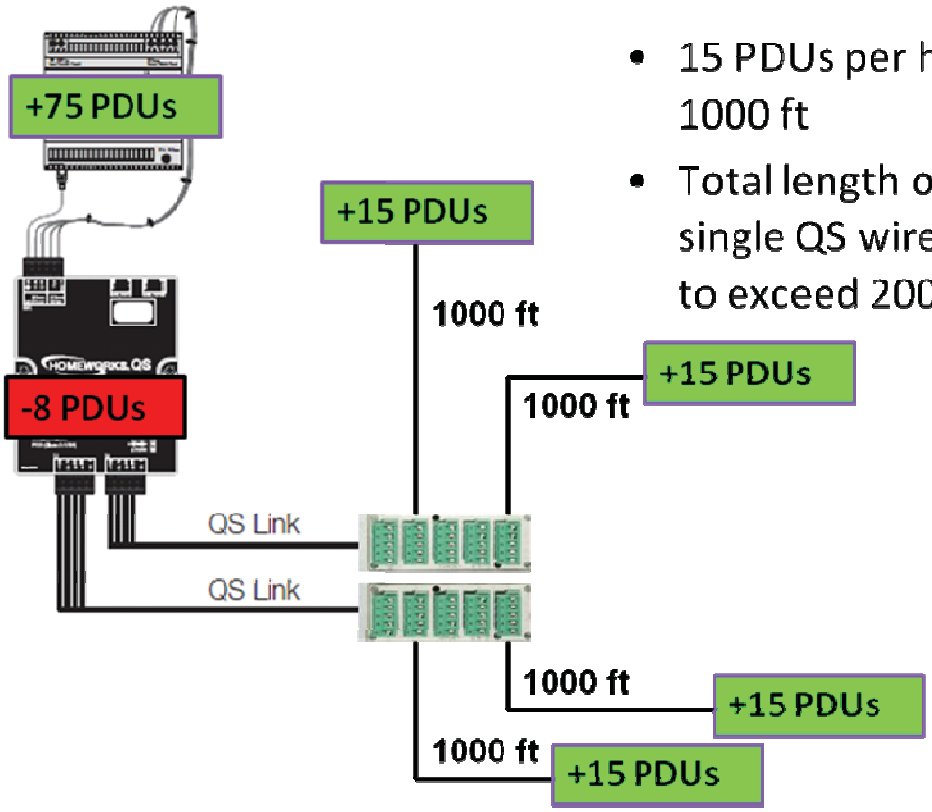


Table of Power Draw Units – PDUs

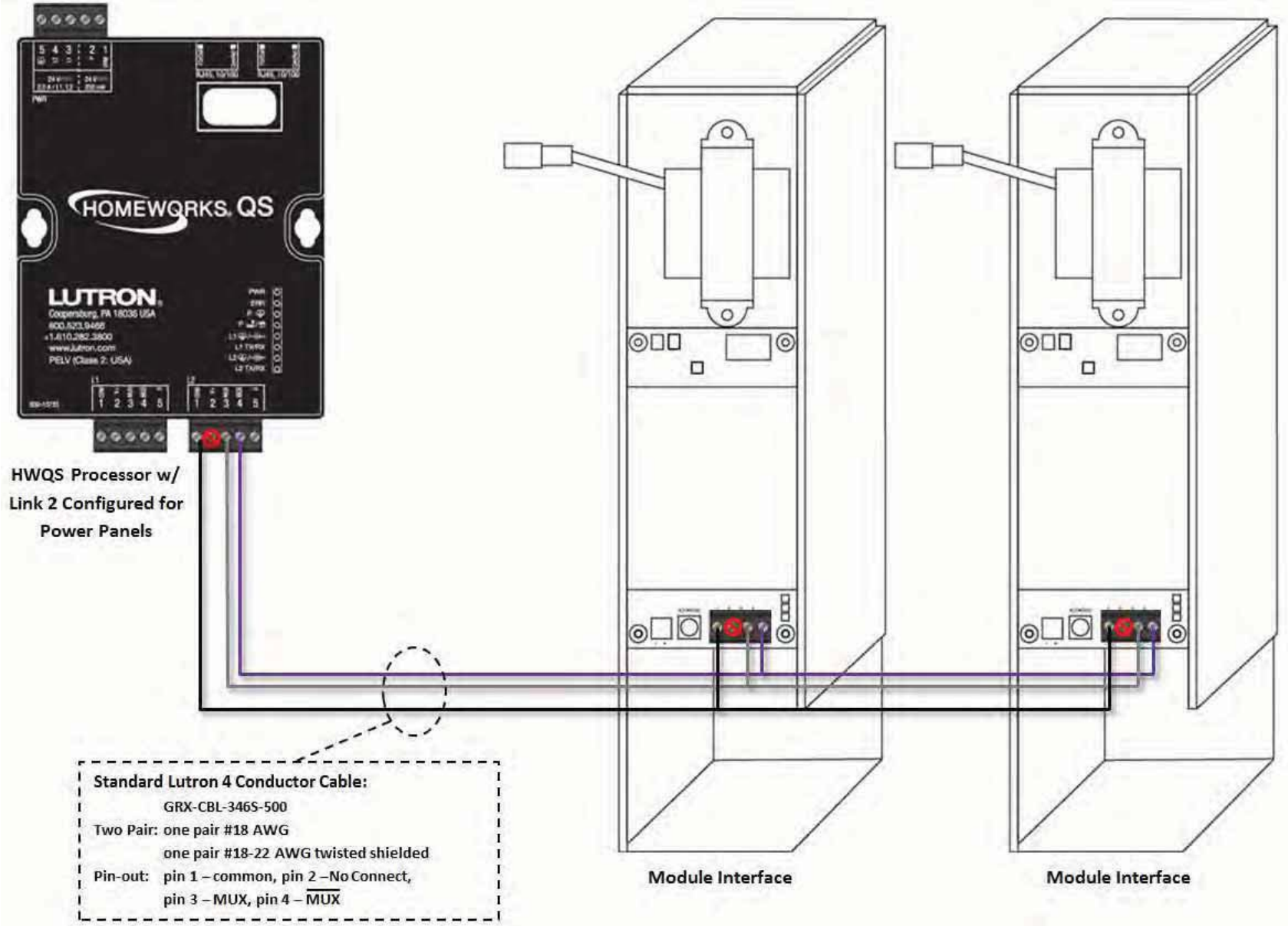
Power Supplies	**Model Number**	**PDU Output**
QS din-rail power supply (1 output)	QSPS-DH-1-60	75
QS smart panel power supply (10 output)	QSPS-P2-10-60	50 per output
QS plug-in power supply (1 output)	QSPS-P2-1-50 QSPS-P3-1-50	8

QS Devices	**Model Number**	**PDUs Required**
HomeWorks QS Processor	HQP6-2-	8
HWQS Hybrid Repeater (w/o plug-in)	HQR-REP-	3
HWQS Hybrid Repeater (using plug-in)	HQR-REP-	0
HWQS seeTouch Keypad	Various	1
HWQS Dynamic Keypad (wired only)	HQ-W-DK420-	6
HWQS CCI/CCO Interface	QSE-IO	3
HWQS RS-232 Interface	QSE-CI-NWK-E	2
HWQS DMX Interface	QSE-CI-DMX	2
GRAFIK Eye QS Main Unit	QSGRx-	0
DIN-Rail Power Module	LQSE-	0
Sivoia QS Wired Shade	See Sivoia QS Power Supply Guidelines	
Sivoia QS Wireless Shade		

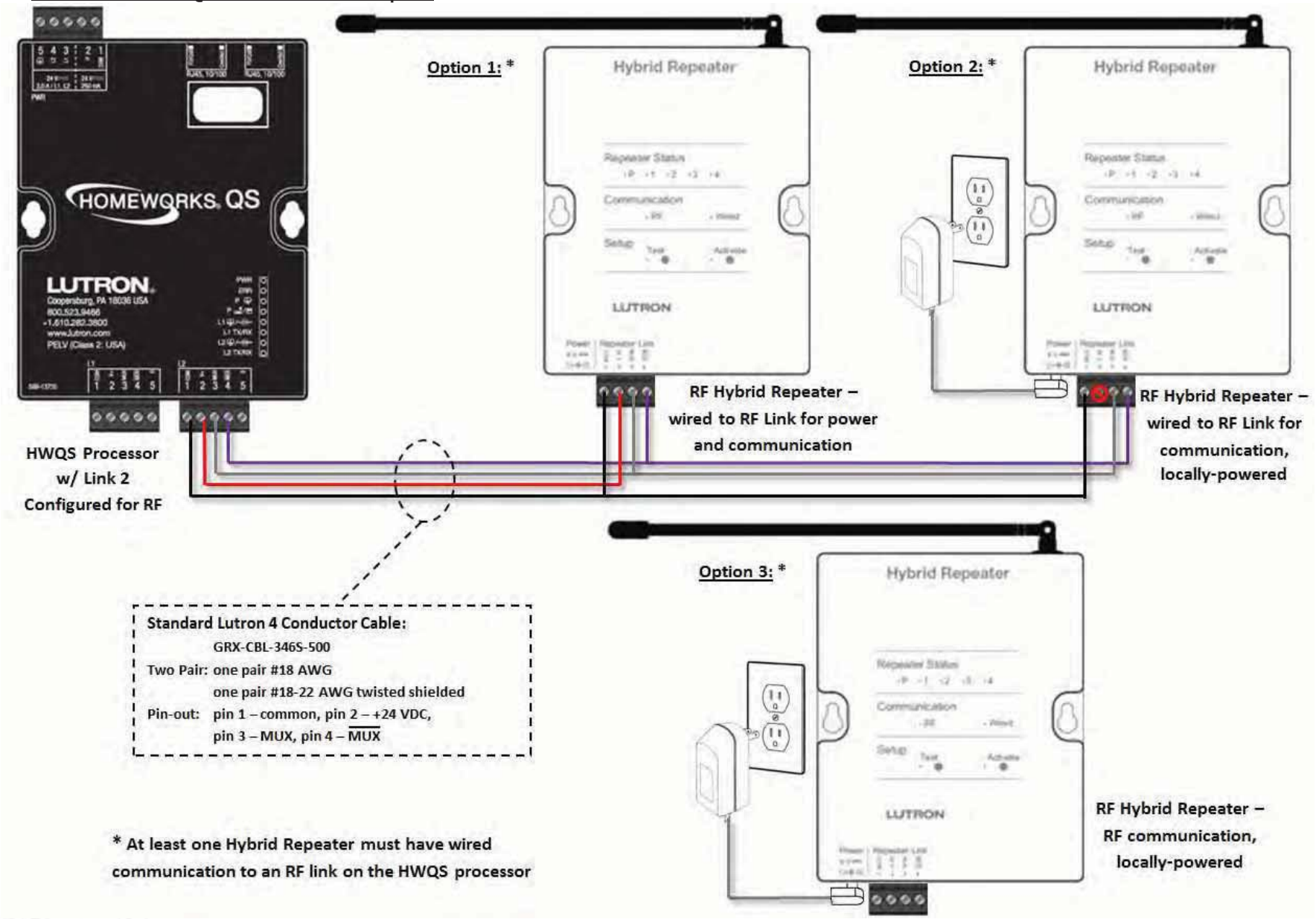


- 15 PDUs per home run of 1000 ft
- Total length of wire on a single QS wired link is not to exceed 2000 ft

HomeWorks Power Panel Link Example:



HomeWorks QS RF Link Example:



Networking Guide

Revision A

Table of Contents

Overview 3

Best Practices..... 3

Single Processor Connected to a Router 4

Multiple Processors, All Connected to a Router..... 5

Single Processor Directly Connected to a PC 6

Multiple Processors Daisy Chained Together 7

Multiple Processors – Maximum System..... 9

Maximum Ethernet Hops 10

How To Change Network Settings.....11

Basic Networking – Local Area Networks 13

Basic Networking – Wide Area Networks 15

Overview

HomeWorks QS has a very flexible networking architecture. The purpose of this guide is to aid the installer in determining the best approach for how to wire and configure the Processor Link (Ethernet). Many of the topics contained in this document are advanced. Consult a networking professional and provide him/her with this document.

Best Practices

1. Every processor in your project must be connected together using the Processor Link (Ethernet) for successful system operation. This can be through a router/switch or daisy-chained from one processor to the next using the built-in Ethernet switch. Ethernet replaces the inter-processor link used in HomeWorks Illumination systems.

2. A good practice is to run Ethernet wiring from a router/switch to each LV-21 enclosure, and daisy chain the Ethernet between the two processors in each LV-21 enclosure.

3. If your system has 4 or fewer processors, it is best to daisy chain the Processor Link (Ethernet) from one processor to the next and connect the first processor to the router. This ensures that the lighting system will continue to function in the event of a router failure.

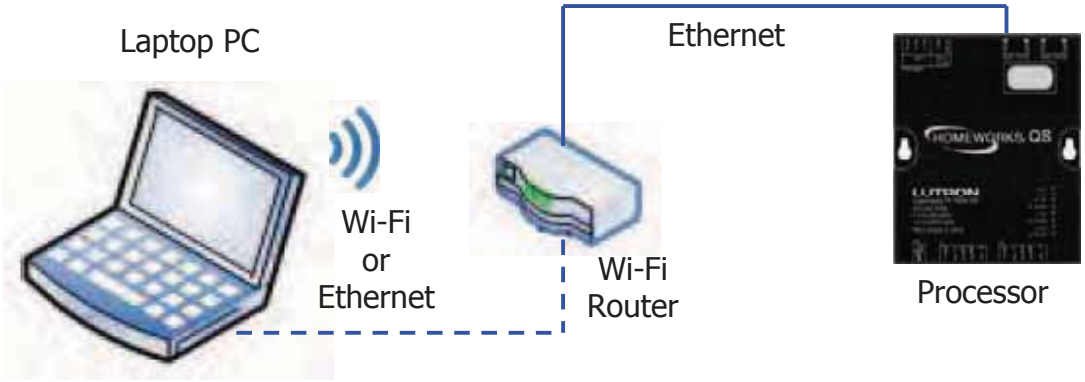
4. Ethernet wiring should be run from a router/switch to every processor in the project in case the processors need to be connected to the network. Ethernet wiring should also be run between each processor location. Having the wiring in place will allow for future networking architecture changes and provides the most flexibility.

5. A Wi-Fi enabled router may be used to connect the laptop to the HomeWorks QS system. This will allow the installer to carry the laptop around during the programming and activation of the system. Wi-Fi may also be needed if the homeowner wants to utilize an iPod or iPad to integrate to the HomeWorks QS system.

6. HomeWorks QS processors should be kept on quiet Ethernet networks or dedicated subnets. This will ensure Internet and home network traffic does not interfere with the operation of the lighting system.

7. Only one Ethernet port on the processor needs to be used when Ethernet is run to each processor from a router. Either of the Ethernet ports may be used in this case.

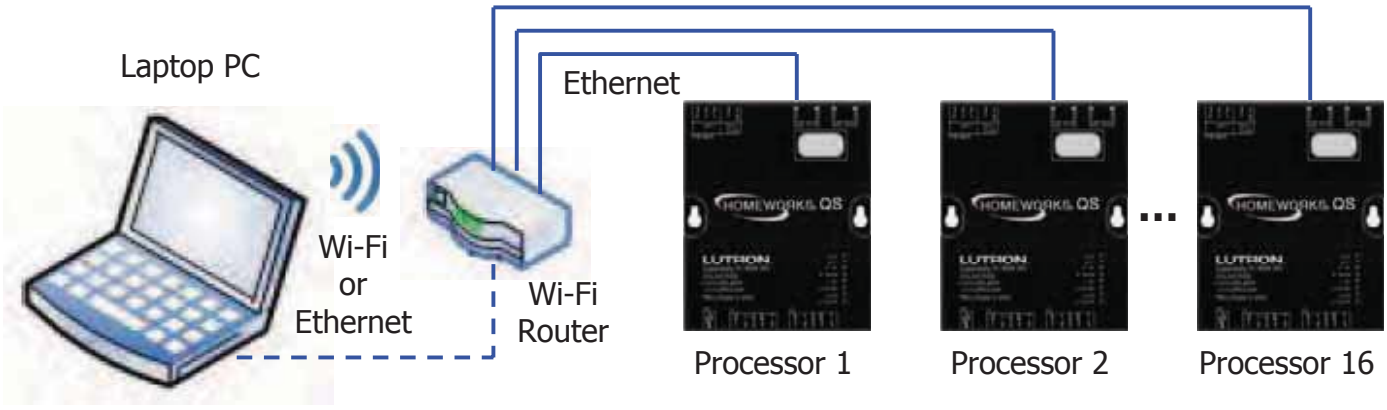
Single Processor Connected to a Router



Example A – DHCP		
WiFi/Ethernet enabled PC IP address DHCP Subnet mask DHCP	**Wi-Fi Router** IP address 192.168.1.1 Subnet mask 255.255.255.0 DHCP range 192.168.1.100-150 DHCP Enabled	**HomeWorks QS Processor** IP address DHCP Subnet mask DHCP
When to use This is the fastest way to setup your system. Every device will use DHCP and the router allocates IP addresses. Using a Wi-Fi router will allow you to carry your laptop around during activation and programming. Either one of the Ethernet ports on the processor can be connected to the router.		

Example B – Static IP		
WiFi/Ethernet enabled PC IP address DHCP Subnet mask DHCP	**Wi-Fi Router** IP address 192.168.1.1 Subnet mask 255.255.255.0 DHCP range 192.168.1.100-150 DHCP Enabled	**HomeWorks QS Processor** IP address 192.168.1.2 Subnet mask 255.255.255.0
When to use The processor is set up with a static IP address and the router will use DHCP to allocate IP addresses for the PC and other devices. Use this on jobs where the processor is accessed via integration using telnet so that the integration device (touchscreen, iPhone, etc) can always find the processor at the same IP address. The static IP address should be outside the range of DHCP addresses. Either one of the Ethernet ports on the processor can be connected to the router.		

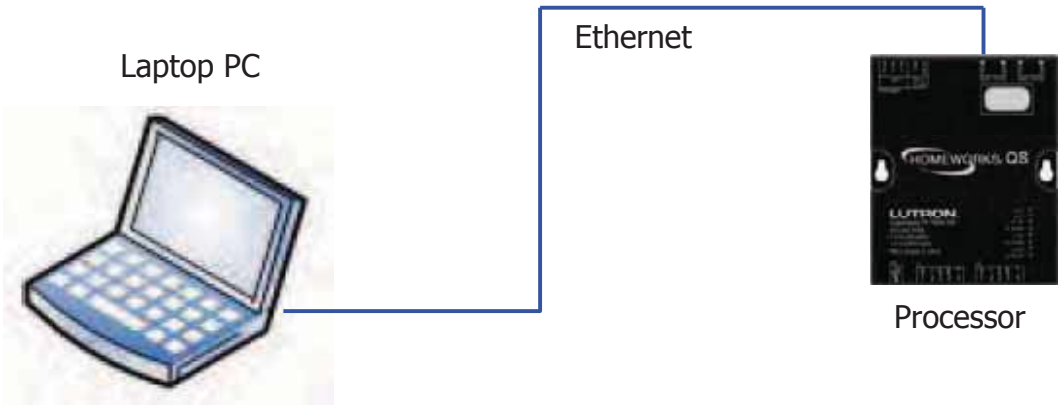
Multiple Processors, All Connected to a Router



Example C – DHCP					
WiFi/Ethernet enabled PC		**Wi-Fi Router**		**HomeWorks QS Processors**	
IP address	DHCP	IP address	192.168.1.1	IP address 1	DHCP
Subnet mask	DHCP	Subnet mask	255.255.255.0	IP address 2	DHCP
		DHCP range	192.168.1.100-150	IP address n	DHCP
		DHCP Enabled		Subnet mask	DHCP
When to use This is the fastest way to setup your system. Every device will use DHCP and the router allocates IP addresses. Using a Wi-Fi router will allow you to carry your laptop around during activation and programming. Either one of the Ethernet ports on the processor can be connected to the router. Every processor must be connected to the router. Up to 16 processors can be connected using this method.					

Example D – Static IP					
WiFi/Ethernet enabled PC		**Wi-Fi Router**		**HomeWorks QS Processors**	
IP address	DHCP	IP address	192.168.1.1	IP address 1	192.168.1.2
Subnet mask	DHCP	Subnet mask	255.255.255.0	IP address 2	192.168.1.3
		DHCP range	192.168.1.100-150	IP address n	192.168.1.n+1
		DHCP Enabled		Subnet mask	255.255.255.0
When to use The processors are set up with static IP addresses and the router will use DHCP to allocate IP addresses for the PC and other devices. Use this on jobs where the processors are accessed via integration using telnet so that the integration device (touchscreen, iPhone, etc) can always find the processors at the same IP addresses. The static IP addresses should be outside the range of DHCP addresses. Either one of the Ethernet ports on the processor can be connected to the router. Every processor must be connected to the router. Up to 16 processors can be connected using this method.					

Single Processor Directly Connected to a PC



Example E – Direct Ethernet Connection – DHCP		
Ethernet enabled PC IP address DHCP Subnet mask DHCP	**Standard Ethernet Cable Required**	**HomeWorks QS Processor** IP address DHCP Subnet mask DHCP
When to use This connection method should only be used when no router is available. A standard Ethernet cable can be used to connect the PC and the processor. There is no DHCP server available in this case, but the PC and processor will revert to using Link Local IP addresses after about two minutes. Either one of the Ethernet ports on the processor can be connected to the PC. Note: Processors ship with DHCP enabled. With the above configuration it may take up to two minutes for the HWQS software to recognize the processor after the Ethernet cable is connected.		

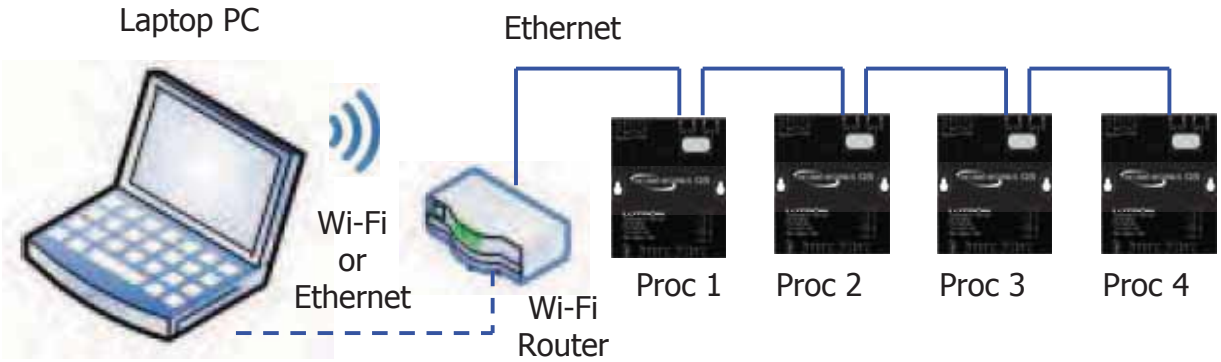
Example F – Direct Ethernet Connection – Static IP		
Ethernet enabled PC IP address 192.168.1.3 Subnet mask 255.255.255.0	**Standard Ethernet Cable Required**	**HomeWorks QS Processor** IP address 192.168.1.2 Subnet mask 255.255.255.0
When to use This connection method should only be used when no router is available. A standard Ethernet cable can be used to connect the PC and the processor. Both the PC and the processor will need to use static IP addresses. Either one of the Ethernet ports on the processor can be connected to the PC. Note: Processors ship with DHCP enabled. With the above configuration it may take up to two minutes for the HWQS software to recognize the processor after the Ethernet cable is connected.		

Multiple Processors Daisy Chained Together



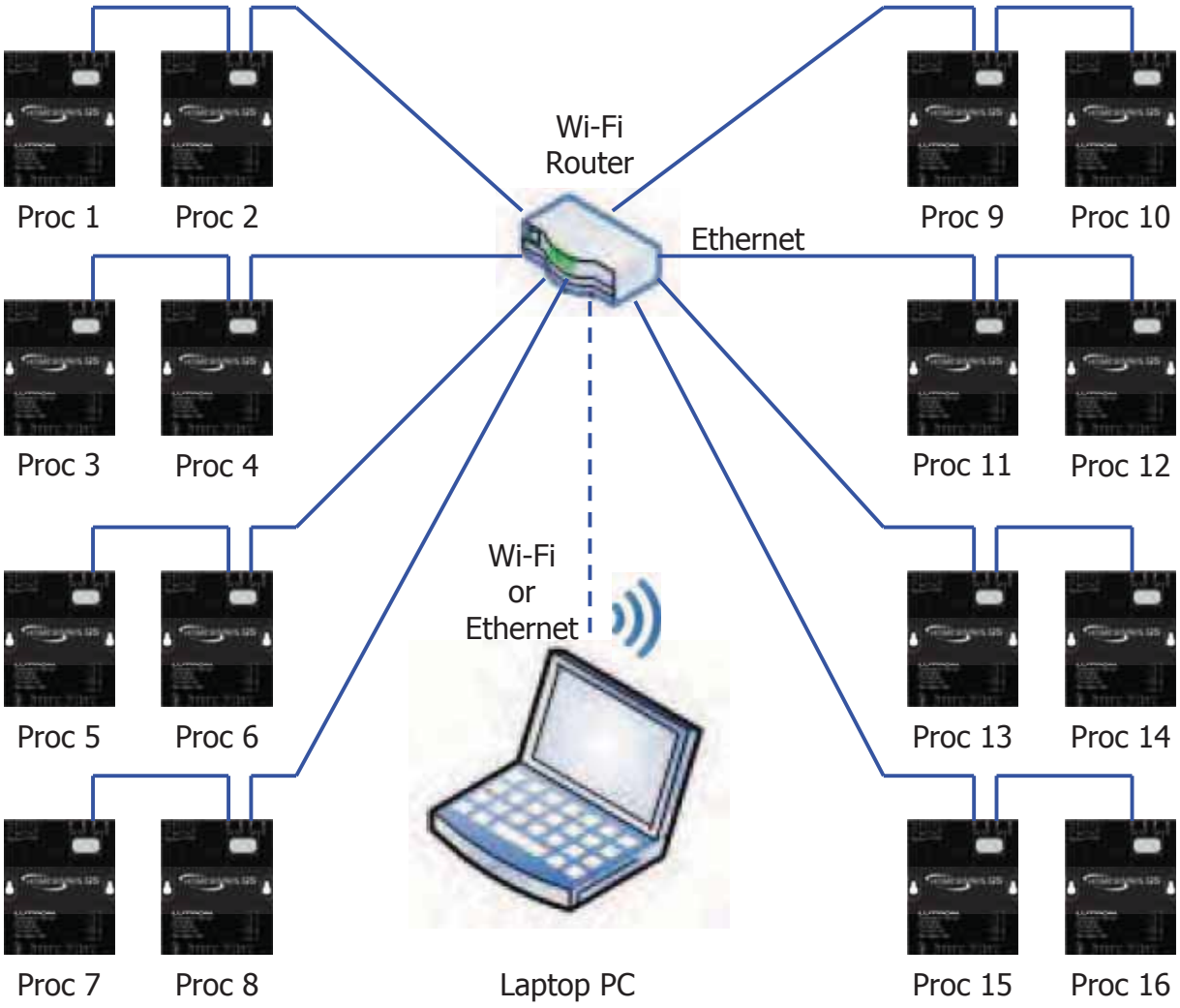
Example G – Daisy Chain with Direct Ethernet Connection (No Router) – DHCP		
WiFi/Ethernet enabled PC IP address DHCP Subnet mask DHCP	**Standard Ethernet Cable Required**	**HomeWorks QS Processors** IP address 1 DHCP … … IP address 5 DHCP Subnet mask DHCP
When to use This connection method should only be used when no router is available and the processors are not on an Ethernet network. A standard Ethernet cable can be used to connect the PC to one of the processors. Each processor has two Ethernet ports to allow daisy-chaining the processors together using Ethernet cables. Every processor must be connected to another processor or the PC. The PC and the processors will need to use static IP addresses. It is not recommended to exceed 5 processors connected using this method. Note: Processors ship with DHCP enabled. With the above configuration it may take up to two minutes for the HWQS software to recognize the processor after the Ethernet cable is connected.		

Example H – Daisy Chain with Direct Ethernet Connection (No Router) – Static IP		
WiFi/Ethernet enabled PC IP address 192.168.1.100 Subnet mask 255.255.255.0	**Standard Ethernet Cable Required**	**HomeWorks QS Processors** IP address 1 192.168.1.2 … … IP address 5 192.168.1.6 Subnet mask 255.255.255.0
When to use This connection method should only be used when no router is available and the processors are not on an Ethernet network. A standard Ethernet cable can be used to connect the PC to one of the processors. Each processor has two Ethernet ports to allow daisy-chaining the processors together using Ethernet cables. Every processor must be connected to another processor or the PC. The PC and the processors will need to use static IP addresses. It is not recommended to exceed 5 processors connected using this method. Note: Processors ship with DHCP enabled. With the above configuration it may take up to two minutes for the HWQS software to recognize the processor after the Ethernet cable is connected.		



Example I – Daisy Chain with Router					
WiFi/Ethernet enabled PC		**WiFi Router**		**HomeWorks QS Processors**	
IP address	DHCP	IP address	192.168.1.1	IP address 1	DHCP or 192.168.1.2
Subnet mask	DHCP	Subnet mask	255.255.255.0	…	…
		DHCP range	192.168.1.100-150	IP address 4	192.168.1.5
		DHCP Enabled		Subnet mask	255.255.255.0
When to use This connection method should only be used when it is not possible to connect Ethernet between the router and each processor. Standard Ethernet cables can be used to connect the PC and all of the processors. Each processor has two Ethernet ports to allow daisy-chaining the processors together using Ethernet cables. Every processor must be connected to another processor or the router. The PC and the processors can use DHCP or static IP addresses. The static IP addresses should be outside the range of DHCP addresses. It is not recommended to exceed 4 processors connected using this method.					

Multiple Processors – Maximum System



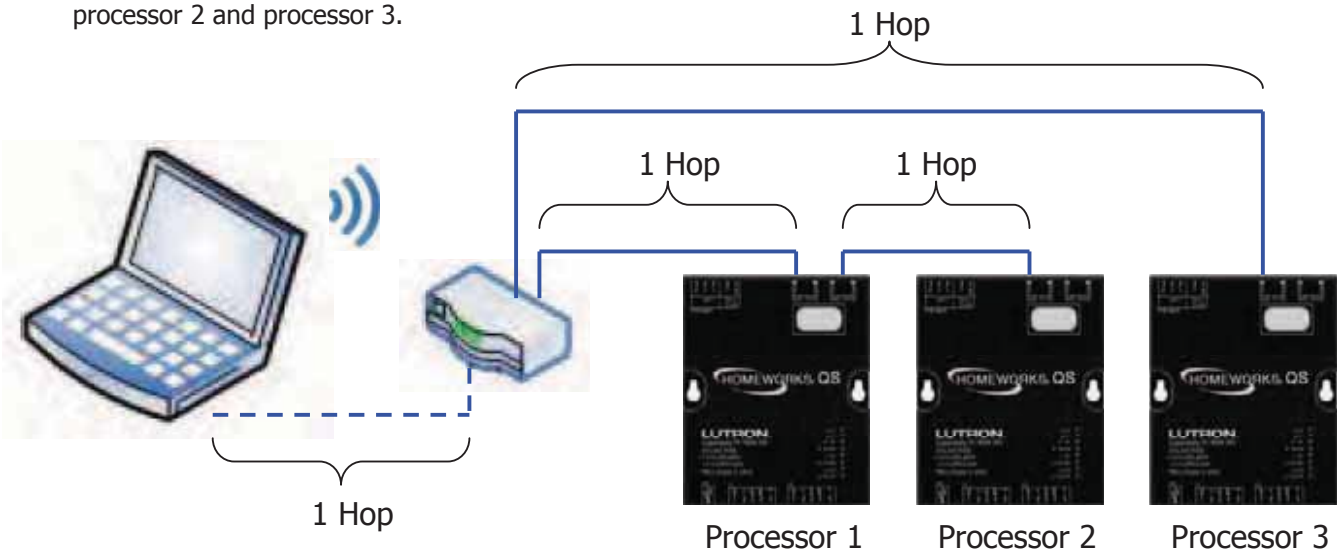
Example J – Hybrid Ethernet Connection					
WiFi/Ethernet enabled PC		**WiFi Router**		**HomeWorks QS Processors**	
IP address	DHCP	IP address	192.168.1.1	IP address 1	DHCP or 192.168.1.2
Subnet mask	DHCP	Subnet mask	255.255.255.0	…	…
		DHCP range	192.168.1.100-150	IP address 16	192.168.1.17
		DHCP Enabled		Subnet mask	255.255.255.0

When to use

This connection method can be used when Ethernet wiring cannot be run from a router to each individual processor. Typically two processors will be mounted in each LV-21 enclosure. These processors should be daisy-chained together with a single Ethernet connection between the LV-21 and the router. Standard Ethernet cables can be used to connect the PC and all of the processors. Each processor has two Ethernet ports to allow daisy-chaining the processors together using Ethernet cables. Every processor must be connected to another processor or the router. The PC and the processors can use DHCP or static IP addresses. The static IP addresses should be outside the range of DHCP addresses. Up to 16 processors can be connected in the system, however it is not recommended to have more than 2 processors daisy-chained together when using this method.

Maximum Ethernet Hops

For optimal system performance, no more than 5 Ethernet hops should exist between any two processors or any processor and the PC in the HomeWorks QS system. An Ethernet hop is best described as a connection between two devices (router, switch, processor, or PC). In the following example, there is only 1 Ethernet hop between processor 1 and processor 2, but there are 3 Ethernet hops between processor 2 and processor 3.



Connection Method	Ethernet Hops	Notes
A – DHCP, Single Processor	2	1 Processor
B – Static IP, Single Processor	2	1 Processor
C – DHCP, Multiple Processors Connected Through Router	2	
D – Static IP, Multiple Processors Connected Through Router	2	
E – Direct Ethernet Connection, Single Processor – DHCP	1	1 Processor, defaults to using Link Local IP addresses
F – Direct Ethernet Connection, Single Processor – Static IP	1	1 Processor
G – Direct Ethernet Connection to 1 Processor, Multiple Processors Daisy Chained – DHCP	Up to 5	Uses Link Local IP addresses. Not recommended for more than 5 processors.
H – Direct Ethernet Connection to 1 Processor, Multiple Processors Daisy Chained – Static IP	Up to 5	Not recommended for more than 5 processors.
I – 1 Processor Connected Through Router, Multiple Processors Daisy Chained	Up to 5	Not recommended for more than 4 processors.
J – Hybrid of Processors Connected Through Router and Daisy Chained	Up to 5	Not recommended to have more than 2 processors daisy-chained.

How To Change Network Settings

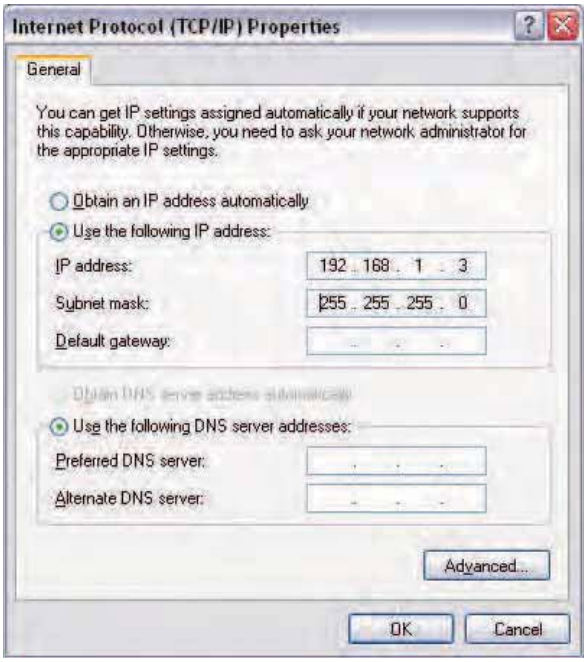
Step 1: Change your PC network settings

A. This step is only necessary when setting up a static IP address on your laptop or PC.
B. Go to the control panel and select Network Settings. Depending on whether you are connecting wirelessly or through a wire, right click and select 'Properties' on either your LAN or Wireless network connection.



C. Highlight the Internet Protocol (TCP/IP) settings and press the 'Properties' button.
D. Change the settings accordingly and save.

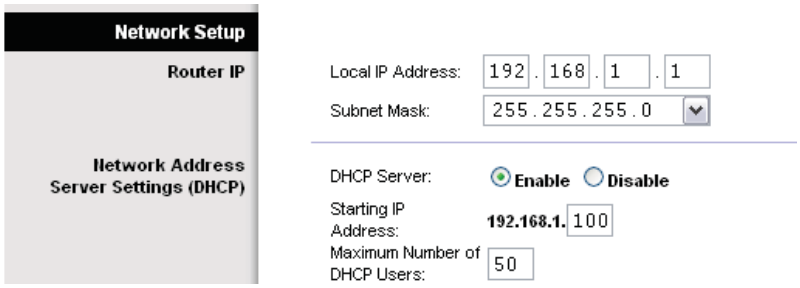




***NOTE: Windows XP shown. Contact operating system provider or a networking professional for other operating systems.**

Step 2: Change network settings on router

A. Connect your computer to your Wi-Fi router.
B. Open your web browser and type in your router's IP address:
    a. Linksys and Belkin default – 192.168.1.1
    b. D-Link and Netgear default – 192.168.0.1
    c. Other routers – consult your router's documentation
    d. If using DHCP, this is typically listed as the default gateway address.
C. Enter the user name and password. These vary by manufacturer and model. Some common ones are admin:admin or admin:password. Please consult your router's documentation.
D. Navigate to the Network setup, modify, and save your settings.



*NOTE: Linksys shown. For others, refer to router documentation.

Step 3: Change network settings on processors

A. Connect your processor(s) to your network.
B. Open the "Project Properties" in the HomeWorks QS software.
C. Uncheck the DHCP box beside the processor(s) and enter a static IP address in the "IP Address" field.
D. Set the gateway address and subnet mask to match the settings of your network.



Basic Networking – Local Area Networks

What is a network?

A network is a set of devices that are connected together to exchange digital information or commands. Devices can include desktop computers, laptops, Wi-Fi routers, or HomeWorks QS Processors. A local area network, or LAN, is a network of devices that are connected together by physical wires or over Wi-Fi and are in close physical proximity to each other.

What is an IP address?

An IP address, or Internet Protocol address, is a unique way to identify a device on your network. An IP address is analogous to a house number. On any given street, all the house numbers are unique just as on any given network all the IP addresses are unique.

An IP address consists of 4 "octets" of numbers ranging from 0 to 255.

Example
IP address: 192.168.1.100

How does a device on my network get an IP address?

Devices can get an IP address in multiple ways:
1. The device can have a static IP address assigned to it. The static IP address can be manually changed using configuration software for that device. See "What is a static IP address?"
2. A network device can hand out IP addresses when the network is powered up. See "What is DHCP?"
3. A device can choose its own IP address if set to DHCP and no network device is handing out IP addresses. See "What is Link Local?"

What is DHCP?

DHCP, or Dynamic Host Configuration Protocol, defines a series of events which would allow devices to systematically allocate IP addresses. In networks where DHCP is used, one device, called the DHCP host, is responsible for handing out IP addresses to all the other devices. The IP addresses are temporary and are re-allocated any time the host or devices are powered up.
The DHCP host hands out IP addresses from a range that was set up during the host's configuration. Devices that would like to receive IP addresses from the DHCP host are set up to obtain IP addresses automatically using DHCP. The DHCP host is usually your home router.

Example
DHCP IP address range: 192.168.1.100 to 192.168.1.149

What is a static IP address?

A static IP address is an IP address that doesn't change. A static IP address is manually configured before the network is used. Static IP configuration requires careful planning so that all devices have unique IP addresses.

What is Link Local?

If a device is configured to use DHCP but no DHCP server exists on the network, the device may choose to implement the Link Local protocol. This protocol allows the device to assume an IP address and verifies that no other device is using that IP address. This process may take up to two minutes. Link Local IP addresses all begin with 169.254.x.x.

Example
Link Local IP address: 169.254.1.123

Can I mix a DHCP network with a static IP addresses?

Yes, however careful planning must be given to the static IP addresses. The static IP addresses cannot be the same as the DHCP host's IP address and must fall outside of the range of the IP addresses the DHCP host hands out.

> *Example*
> *Router (DHCP host) IP address: 192.168.1.1*
> *Router DHCP range: 192.168.1.100 to 192.168.1.150*
> *HomeWorks QS Processor static IP address: 192.168.1.2*
> *Wi-Fi laptop using DHCP: given out from router. Changes each time laptop is connected to network*

What is a subnet mask?

A subnet mask is used to tell what messages are for this network and which are for another network. A subnet mask consists of 4 "octets" of numbers ranging from 0 to 255. The subnet masks should match on all devices that are part of the same network.

> *Example*
> *Subnet mask: 255.255.255.0*
> *The 255 in the first three octets forces the listening device to listen to any messages where the first three octets of the incoming IP address match. If the receiving device's IP address is 192.168.1.100 and the incoming message is from IP address 192.168.1.2, then the device should listen.*

What is a straight through or patch Ethernet cable?

A straight through or patch Ethernet cable (often referred to as simply an Ethernet cable) is a cable consisting of 4 pairs of twisted wire with an RJ-45 connector on each end. The wires connect straight through from one connector to the other (i.e. pin 1 connects to pin 1, pin 2 connects to pin 2, etc). This is the most common type of network cable and is used when connecting a device to a network through a router or switch.

What is a crossover Ethernet cable?

A crossover Ethernet cable is similar to a straight through Ethernet cable, with the exception that the pairs of wire are reversed from one connector to the other. This allows the transmit pairs on one connector to connect to the receive pairs on the other connector. This cable is often used when connecting two devices directly without a router in between, however is **not necessary** in HomeWorks QS.

Basic Networking – Wide Area Networks

What is a Wide Area Network?

A wide area network is collection of networks that are not physically connected together. Accessing your home network remotely from an office or other place away from your home is a WAN. The Internet is the most commonly known Wide Area Network.

How does your home network connect to the Internet?

Your home network is connected to the Internet via a gateway device. Cable modems and DSL modems are examples of gateway devices. Sometimes gateway devices are also routers.

What is a gateway IP address?

A gateway is a device that connects your network to the Internet such as a cable modem or DSL router. The gateway address only needs to be setup when you want to remotely access a device on your network from another device on the Internet. If your network is not connected to the Internet, then the gateway address is not used. If your device does not need to be accessed from the Internet, then the gateway address is also not used. The gateway address on a device should be set to the address of the gateway device. In most cases this is your network router.

Example
Router IP address: 192.168.1.1
Gateway address of devices attached to router: 192.168.1.1

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