

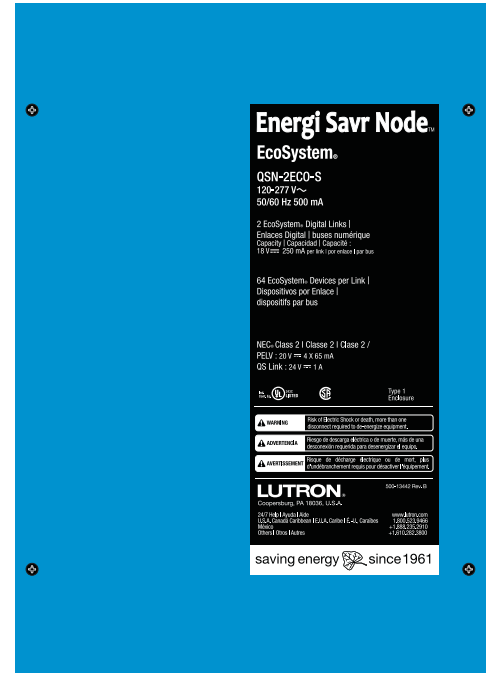
Energi Savr Node™ with EcoSystem®

The Energi Savr Node™ family is a group of intelligent, modular products for the control of lighting loads. This document describes the Energi Savr Node™ unit with EcoSystem®, which can control all EcoSystem® compatible products including EcoSystem® ballasts and modules and Hi-lume® EcoSystem™ LED drivers.

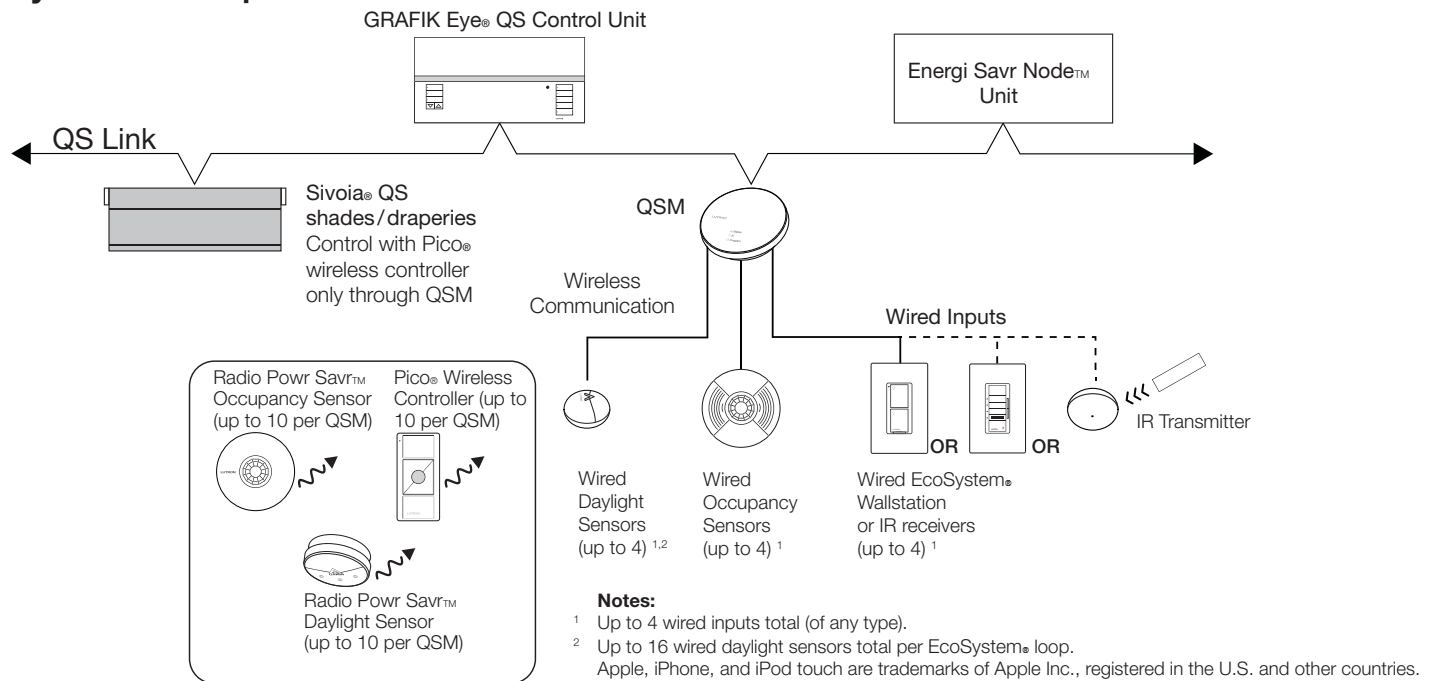
- Energi Savr Node™ unit with EcoSystem® with 1 EcoSystem® Digital Loop (QSN-1ECO-S).
- Energi Savr Node™ unit with EcoSystem® with 2 EcoSystem® Digital Loops (QSN-2ECO-S).

Features

- Powers up to 2 EcoSystem® Digital Loops (QSN-2ECO-S).
- Easy system programming with an intuitive application for *Apple iPhone* or *iPod touch* mobile digital devices (required for non-Quantum® systems).
- Four occupancy sensor inputs for automated control of lights.
- Four daylight sensor inputs automatically adjust light levels based on the amount of natural light entering through the windows.
- Four IR receiver inputs for personal control.
- Includes QS control link for seamless integration of lights, control stations, and QS sensor modules.
- Expand the number of sensors and controls using the QS Sensor Module (QSM) or sensors connections on EcoSystem® ballasts and modules.
- Connect directly to other Energi Savr Node™ units, GRAFIK Eye® QS units, or Quantum® systems to expand functionality and control.
- BAA-compliant model numbers available. Add a “U” prefix to the model number.



System Example



Job Name:	Model Numbers:
Job Number:	

Specifications

Energi Savr Node™ with EcoSystem®

Regulatory Approvals

- UL® Listed
- CSA
- NOM Certified
- Lutron® Quality Systems registered to ISO 9001.2008
- Complies with requirements for use in other spaces used for environmental air (plenums) per NEC® 2014 300.22(C)(3)
- Meets the Canadian National Building Code plenum requirements for a concealed space used as a plenum within a floor or roof assembly

Power

- Control Power: 120-277 V~ 50/60 Hz
- Lightning strike protection meets ANSI/IEEE standard 62.31-1980. Can withstand voltage surges of up to 6000 V~ and current surges of up to 3000 A
- Current draw: 0.5 A
- 10-year power failure memory: restores lighting to levels prior to power interruption

Environment

- Ambient Temperature Operating Range: 32 °F to 104 °F (0 °C to 40 °C)
- Relative humidity: less than 90% non-condensing.
- For indoor use only

Terminals

- Control Power wiring: 14 AWG to 12 AWG (2.5 mm² to 4.0 mm²)
- EcoSystem® Digital Loop Wiring: 18 AWG to 12 AWG (1.0 mm² to 4.0 mm²)
- Input Group Wiring: 22 AWG to 12 AWG (0.5 mm² to 4.0 mm²)
- QS Loop Wiring: 22 AWG to 12 AWG (0.5 mm² to 4.0 mm²)

Physical Design

- NEMA Type 1, IP-20 protection.

Mounting

- Surface-mount

Programming Requirements

- An *Apple iPod touch* or *iPhone* mobile digital device with the Energi Savr app is required for programming Energi Savr Node™ with EcoSystem® systems
- The Energi Savr app is available from the *Apple App Store* online store
- The Energi Savr app cannot be used to program the Energi Savr Node™ with EcoSystem® units when installed as part of a Quantum® system
- The *Apple iPod touch* or *iPhone* communicates with the Energi Savr Node™ unit via a WiFi router (not included)
- See “Wiring: System Programming Connection” section for further information

Input Default Associations

- Energi Savr Node™ with EcoSystem® units are pre-programmed from the factory to respond to inputs wired directly to the Energi Savr Node™ with EcoSystem® unit
- Programmable CCI activates a scene using a normally open momentary closure by default

Apple, iPhone, and iPod touch are trademarks of Apple Inc., registered in the U.S. and other countries. AppStore is a service mark of Apple Inc.

<p>Job Name:</p> <p>Job Number:</p>	<p>Model Numbers:</p>
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Specifications *(continued)*

EcoSystem®

- Control up to 64 EcoSystem® compatible devices (ballast, modules, or LED drivers) per EcoSystem® Digital Loop (up to 128 devices per Energi Savr Node™ with EcoSystem® unit):
 - EcoSystem® ballasts and modules
 - Hi-lume® EcoSystem™ LED drivers
- Digitally define areas and zones.
- Configure wired or wireless sensors and controls to control devices on multiple EcoSystem® Digital Loops and/or multiple Energi Savr Node™ units.
- Automatic replacement of a single failed ballast, module, or driver.
- Simple method of replacing multiple failed ballasts, modules, or drivers.
- EcoSystem® Digital Loop can be wired as Class 1 or IEC PELV/NEC® Class 2 for maximum wiring flexibility.

Occupancy Sensors

- Use Lutron® LOS series of wired occupancy sensors in occupancy mode to control one or more areas.
- Use Lutron® occupancy sensors in vacancy mode to automatically turn the lights off in an area after it becomes vacant.
- Use Lutron® occupancy sensors to automatically turn the lights on in area when it becomes occupied and to automatically turn the lights off in an area after it becomes vacant.
- Each of the four occupancy inputs can power one Lutron® occupancy sensor.
- Each area’s occupied light level and unoccupied light level can be programmed independently.
- Up to four additional Lutron® Wired Occupancy Sensors or ten additional Radio Powr Savr™ Occupancy/Vacancy Sensors can be assigned per QS Sensor Module (QSM) on the QS link.

seeTouch® QS Controls

- seeTouch® QS wallstations can be configured as a zone toggle or scene wallstation.
- In zone toggle mode, zone buttons are able to turn one or more zones on and off.
- In scene mode, buttons are able to recall scenes in one or more areas.
- All buttons on a wallstation will be in the same mode - zone toggle or scene.
- LED indicator displays zone or scene status.
- A single button can control lights or shades/draperies, but not both.

IR Wallstation or Receiver Input

- Four inputs for IR receivers or wallstations for control of lighting zones can be connected directly to the Energi Savr Node™ with EcoSystem® unit.
- Use Lutron® CC-4BRL-WH wallstations to control one or more zones.
- Use Lutron® EC-IR-WH or EC-DIR-WH ceiling mount sensors to control one or more zones.
- Up to four additional wired wallstations or IR receivers can be assigned per QSM on the QS link

Daylight Sensors

- Lutron® daylight sensors allow daylight harvesting with programmable effect on light output.
- Four daylight sensors can be connected directly to the Energi Savr Node™ with EcoSystem® unit.
- Use Lutron® EC-DIR-WH sensors to control one or more daylight rows.
- Alternatively, up to four additional Lutron® Wired Daylight Sensors or ten additional Radio Powr Savr™ Daylight Sensors can be assigned per QSM on the QS link.
- Control 4 daylight rows per area with a maximum of 2 daylight sensors per area.

<p>Job Name:</p> <p>Job Number:</p>	<p>Model Numbers:</p>
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Specifications *(continued)*

Contact Closure Input (CCI)

- Activate scenes using momentary or maintained closures from an external device like a timeclock.
- Start or stop Afterhours mode using a maintained closure.
- Enable or disable Load Shed mode to save energy during peak demand periods using a maintained closure.
- The attached device must provide a dry contact closure or solid-state output.
- Configurable for normally open (NO) or normally closed (NC) operation.
- Input is miswire-protected up to 36 V_{AC}.

Emergency Contact Closure Input

- By default, contact closure input from Lutron® Emergency Lighting Interface (LUT-ELI-3PH), security, or fire alarm systems turns all zones on to full output when emergency state is detected.
- Emergency contact closure input is normally closed (NC). The Energi Savr Node™ unit with EcoSystem® is shipped with a jumper pre-installed.
- Response of each zone is configurable.
- Attached devices, by default, will go to maximum output and ignore control inputs.
- No operations will be allowed until emergency signal is cleared.
- The attached device must provide a normally-closed (NC) dry contact closure or solid-state output.
- Input is miswire-protected up to 36 V_{AC}.
- Emergency CCI cannot control other Energi Savr Node™ units.
- See Application Note #140, “EcoSystem® Ballasts and Emergency Wiring” at www.lutron.com for more details.

Functionality with GRAFIK Eye® QS

- Energi Savr Node™ with EcoSystem® areas follow GRAFIK Eye® QS unit scene activations when associated with the GRAFIK Eye® QS unit.
- Energi Savr Node™ with EcoSystem® areas respond to commands initiated by the GRAFIK Eye® QS unit astronomic time clock when associated with the GRAFIK Eye® QS unit.
- Energi Savr Node™ with EcoSystem® areas operate in Afterhours mode when associated with a GRAFIK Eye® QS unit that is in Afterhours mode.
- Zones on Energi Savr Node™ units cannot be associated with zone controls on GRAFIK Eye® QS units.

Functionality with QSE-IO

- Energi Savr Node™ unit with EcoSystem® responds to scene commands initiated by the QSE-IO, if the QSE-IO DIP switches have been set to either Scene Selection mode, Zone Toggle mode, Partition mode, or Occupancy Sensor mode.

Functionality with QSE-CI-NWK-E

- Integrate the Energi Savr Node™ unit with EcoSystem® with touchscreens, PCs, A/V systems, or other digital systems and devices.
- Recall scenes and set/adjust zone levels.

Job Name:	Model Numbers:
Job Number:	

Specifications *(continued)*

QS Sensor Module (QSM)

- Use the QSM to integrate Radio Powr Savr™ Occupancy/Vacancy sensors, Radio Powr Savr™ Daylight sensors, and Pico® Wireless Controllers with an Energi Savr Node™ unit with EcoSystem®.
- Associate up to 99 QSMs per Energi Savr Node™ unit with EcoSystem®.
- Assign up to 10 Radio Powr Savr™ Occupancy sensors per QSM.
- Assign up to 10 Radio Powr Savr™ Daylight sensors per QSM.
- Assign up to 10 Pico® Wireless Controllers per QSM.
- Connect up to 100 wired or wireless sensors of each type per QS link.
- Wire and power up to 4 wired sensors per QSM:
 - Daylight sensors
 - Occupancy sensors
 - Infrared (IR) receivers or wallstations
- The Radio Powr Savr™ sensors and Pico® Wireless Controllers associated with the QSM should be mounted within 60 ft (18 m) line of sight, or 30 ft (9 m) through walls, of the QSM.
- Refer to QSM Specification Submittal for more information.

EcoSystem® Digital Loop Limits

- Up to 64 EcoSystem® compatible fluorescent ballasts and/or LED drivers per EcoSystem® digital loop.
- Sensor and control communication limits:
 - 16 daylight sensors
 - 64 occupancy sensors
 - 64 infrared (IR) receivers or wallstations

A sensor or control counts as a device on the EcoSystem® digital loop if it is wired to an EcoSystem® ballast on the same loop, or is programmed to communicate with a fluorescent ballast or LED driver on the EcoSystem® digital loop.
- EcoSystem® compatible fluorescent ballasts and LED drivers on the EcoSystem® digital loop do not count as QS devices.

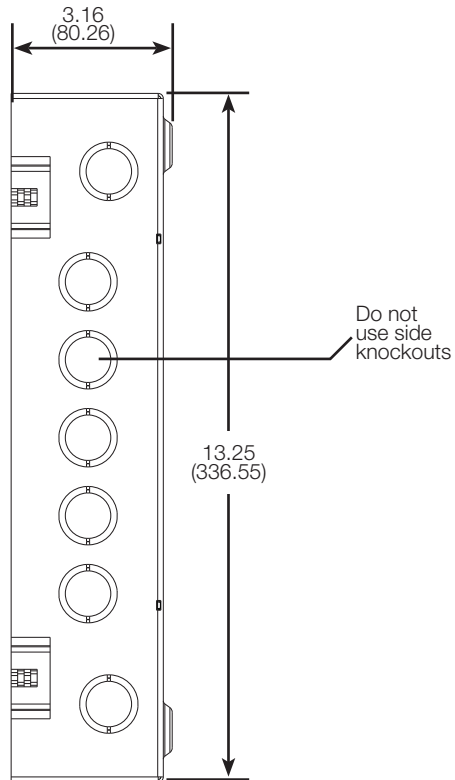
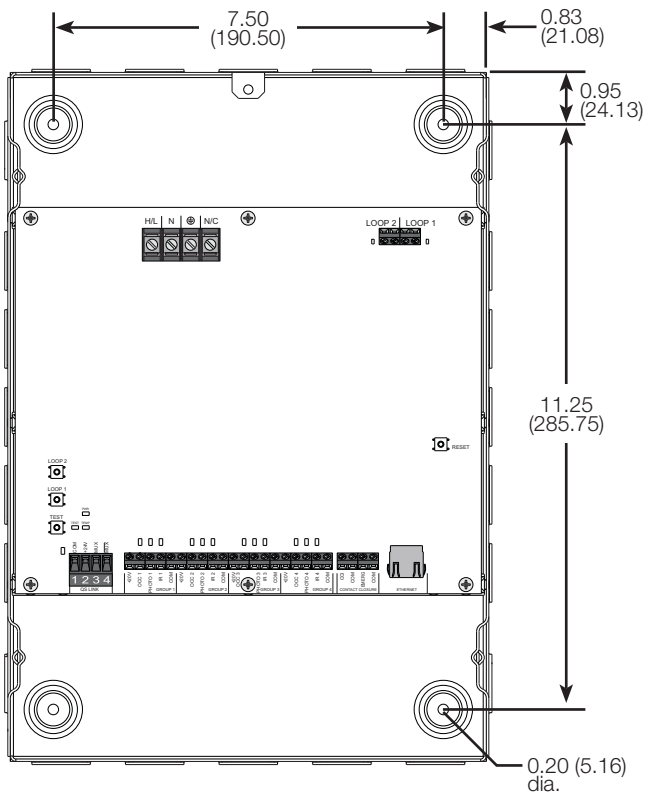
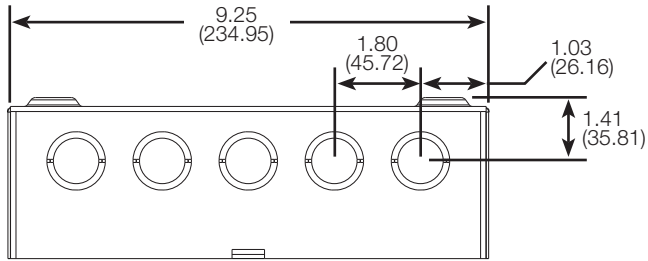
QS Link Limits

- Each Energi Savr Node™ unit with EcoSystem® can provide up to 30 Power Draw Units for other QS devices. Refer to the QS Link Power Draw Units specification submittal (Lutron® P/N 369405) for more information concerning Power Draw Units.
- The QS Link can have up to 100 devices and 100 zones.
- Each Energi Savr Node™ unit with EcoSystem® counts as 1 device towards the 100 device limit.
- Each Energi Savr Node™ unit with EcoSystem® can count as 1 to 100 zones towards the 100 zone limit, depending on the number of zones created (up to 512 zones in a Quantum® system).
- A maximum of 8 EcoSystem® digital loops may be connected to the QS link. Energi Savr Node™ unit with EcoSystem® counts as up to 64 or up to 128 ballasts.

<p>Job Name:</p> <p>Job Number:</p>	<p>Model Numbers:</p>
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Mechanical Dimensions

All dimensions shown as in (mm)



Job Name:	Model Numbers:
Job Number:	

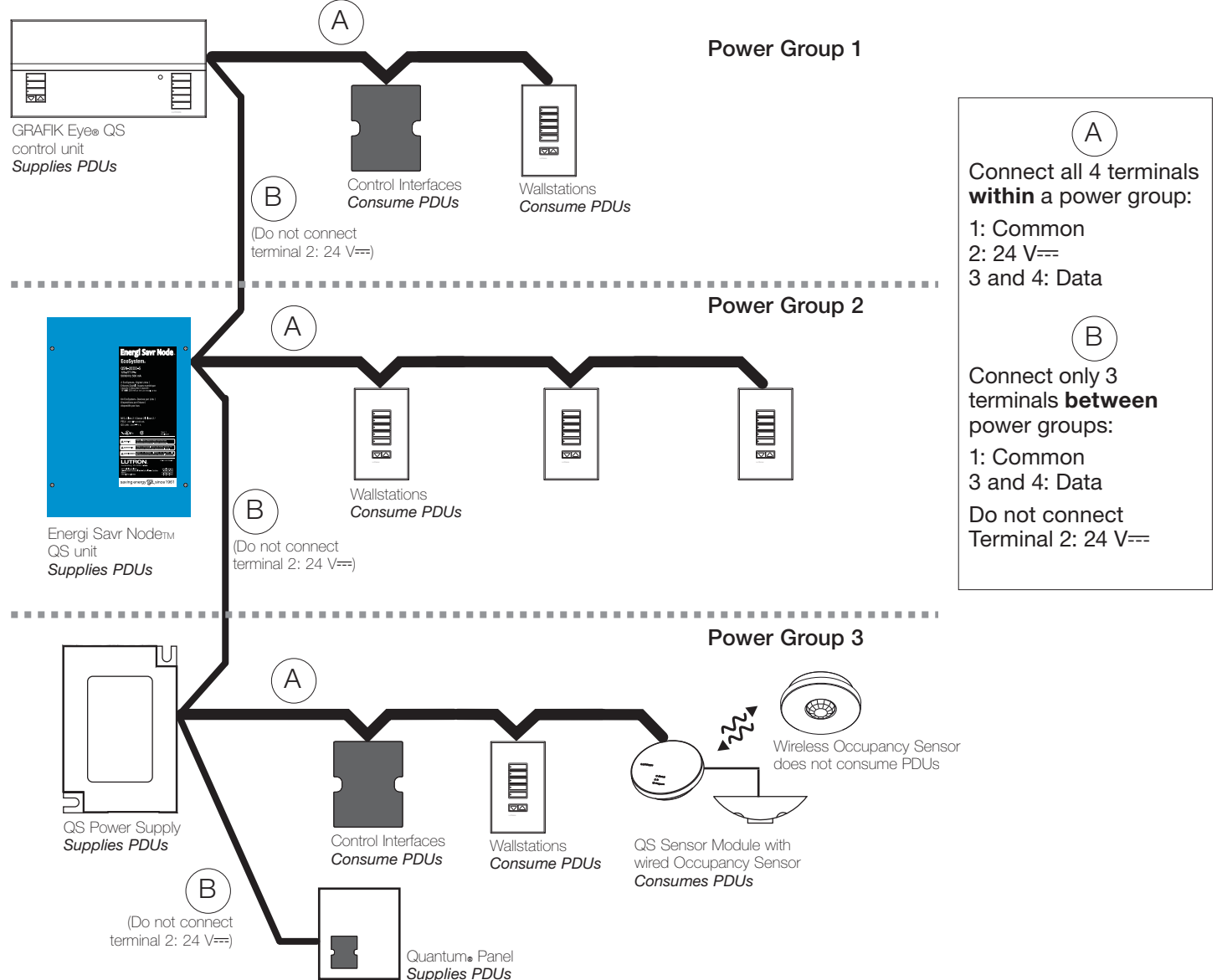
Power Draw Units (PDUs) on the QS Link

On the QS link, there are devices that supply power and devices that consume power. Each device has a specific number of 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® P/N 369405) for more information concerning PDU's.

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.

Power Group Wiring Example



Note: Each QS link has a limit of 100 total devices; device count can vary depending on your system and your connected devices.

Job Name:	Model Numbers:
Job Number:	

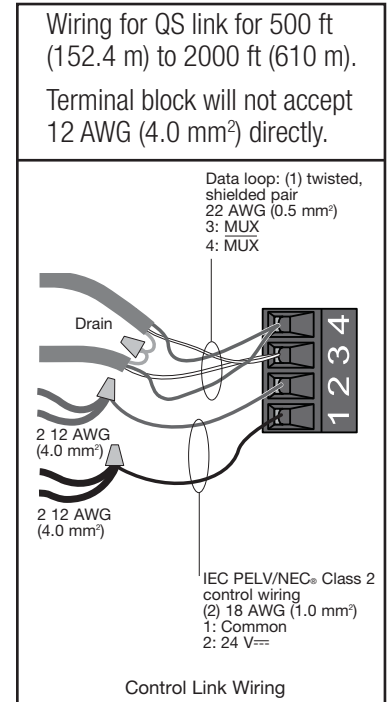
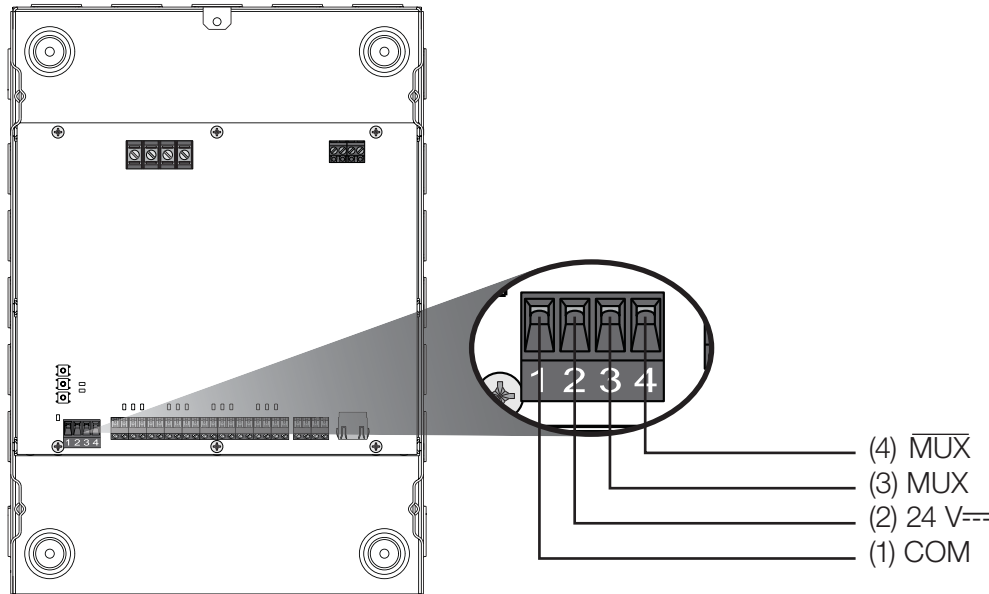
Wiring: QS Link

- QS link communication uses IEC PELV/NEC® Class 2 wiring. Follow all local and national electrical codes when installing IEC PELV/NEC® Class 2 wiring with line voltage wiring.
- The total distance of the QS link wiring must not exceed 2000 ft (610 m).

QS Link Wiring Distance	Wire Gauge	Available from Lutron in one cable:
Less than 500 ft (152.4 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 pair 22 AWG (0.5 mm ²), twisted and shielded*	
500 ft (152.4 m) to 2000 ft (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 pair 22 AWG (0.5 mm ²), twisted and shielded*	

* Alternate Data-only cable: Use approved data loop cable (22 AWG [0.5 mm²] twisted/shielded) from Belden, model #9461.

Energi Savr Node™ unit with EcoSystem®



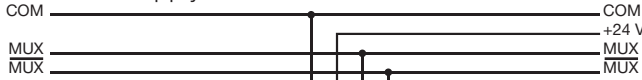
- QS Link Wiring:**
- 22 AWG to 12 AWG (0.5 mm² to 4.0 mm²)

Job Name:	Model Numbers:
Job Number:	

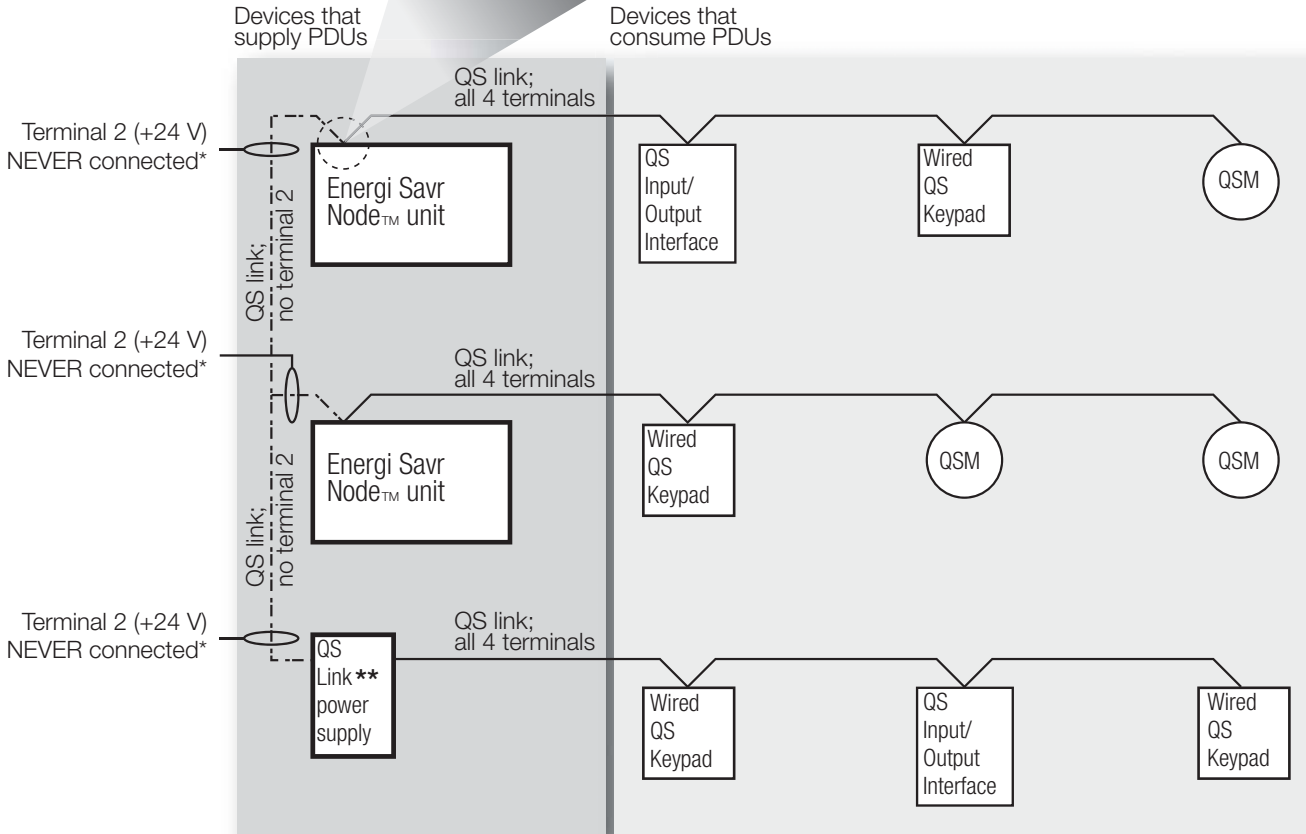
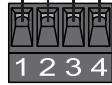
Wiring: QS Link (continued)

Only terminals 1, 3, and 4 connected between devices that supply PDUs

All 4 terminals connected to QS link devices that consume PDUs



Terminal 2 NEVER connected between devices that supply PDUs

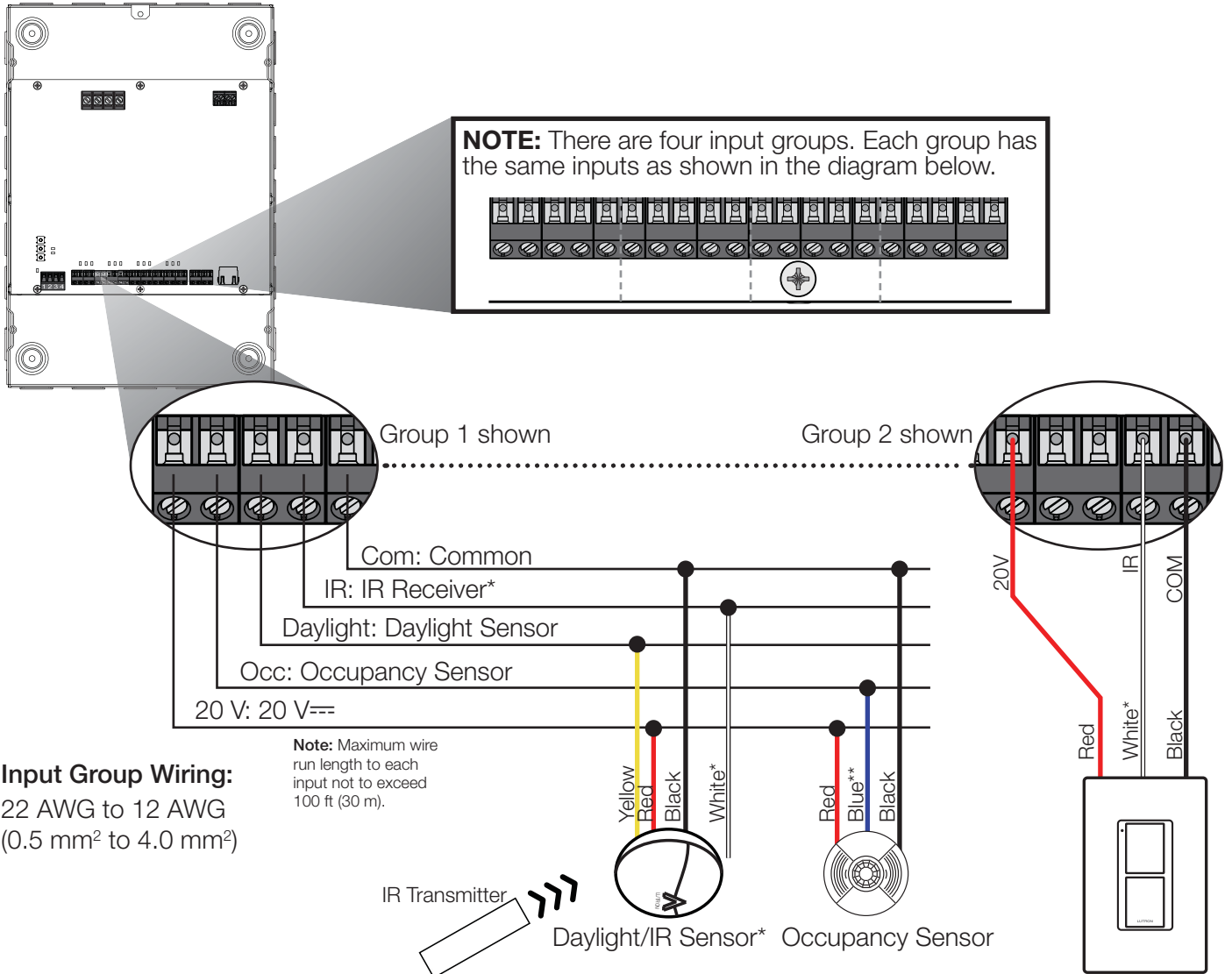


QS Link Wiring Rules

- * Terminal 2 (+24 V) should NEVER be connected between devices that supply PDUs.
- ** For QS Link power supply wiring connection details, refer to the installation instructions for the specific power supply model being used.

Job Name:	Model Numbers:
Job Number:	

Wiring: IEC PELV / NEC® Class 2 Inputs



Input Group Wiring:

- 22 AWG to 12 AWG (0.5 mm² to 4.0 mm²)

* **Note:** Only one IR device may be connected per input. If the IR signal from a daylight sensor is connected, a wall control may not be connected to the same input, and vice-versa.

**Connect the gray wire on -R model occupancy sensors.

Job Name:	Model Numbers:
Job Number:	

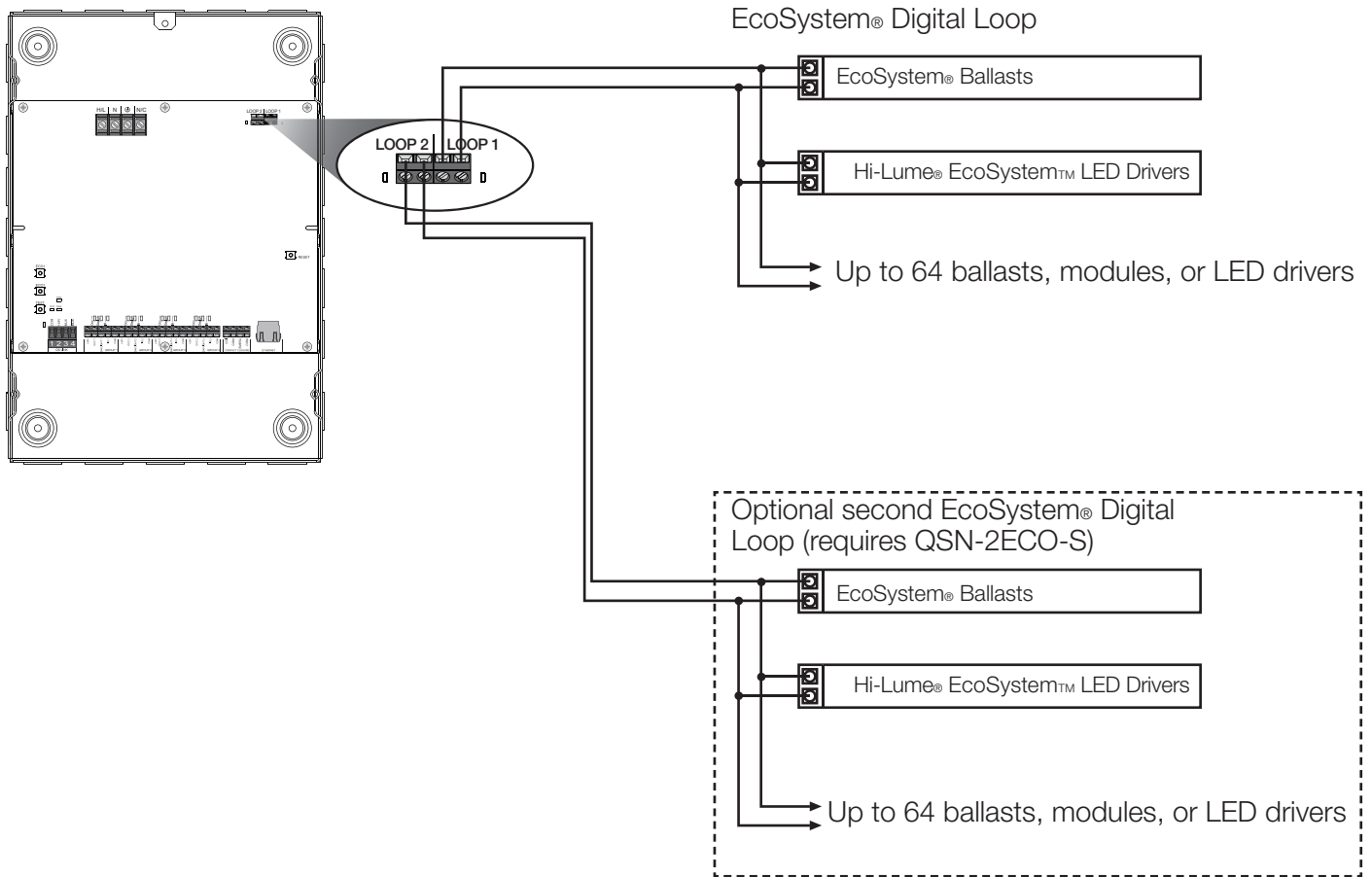
Wiring Diagram: EcoSystem® Digital Loop

Wiring Notes

- Can be wired as Class 1 or IEC PELV/NEC® Class 2 (see App Note #142, “EcoSystem® Bus Class 1 and IEC PELV/NEC® Class 2 Listing” at www.lutron.com for more details).
- Polarity free.
- Topology free.
- EcoSystem® Digital Loops are not electrically isolated from each other. A miswire or short on one EcoSystem® Digital Loop will affect both loops.

Wire Gauge	Maximum EcoSystem® Digital Loop Wire Length
12 AWG (4.0 mm ²)	2200 ft (671 m)
14 AWG (2.5 mm ²)	1400 ft (427 m)
16 AWG (1.5 mm ²)	900 ft (275 m)
18 AWG (1.0 mm ²)	570 ft (175 m)

Energi Savr Node™ unit with EcoSystem®



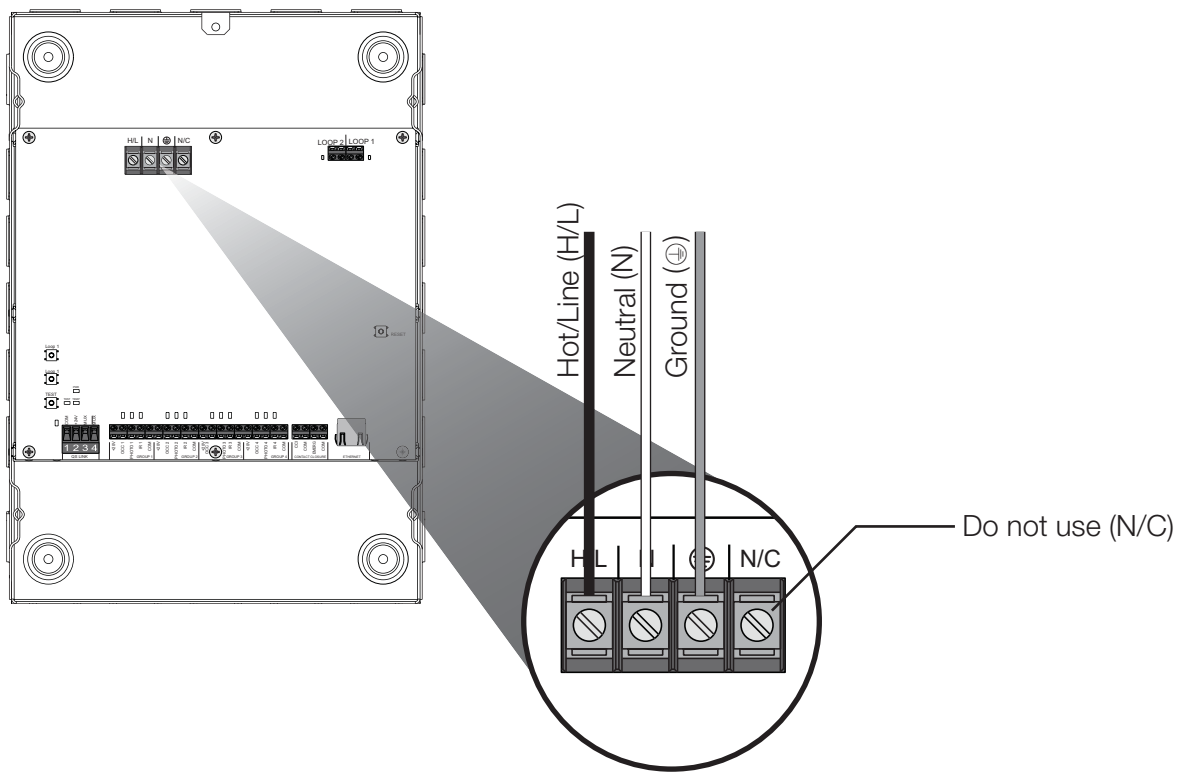
Job Name:	Model Numbers:
Job Number:	

Wiring: Control Power

Wiring Notes

- Control Power wiring should be from a normal, non-emergency feed for proper operation of the Energi Savr Node™ unit with EcoSystem®.
- Power terminals accept (1) or (2) 14 AWG to 12 AWG (2.5 mm² to 4.0 mm²) solid or stranded wire.

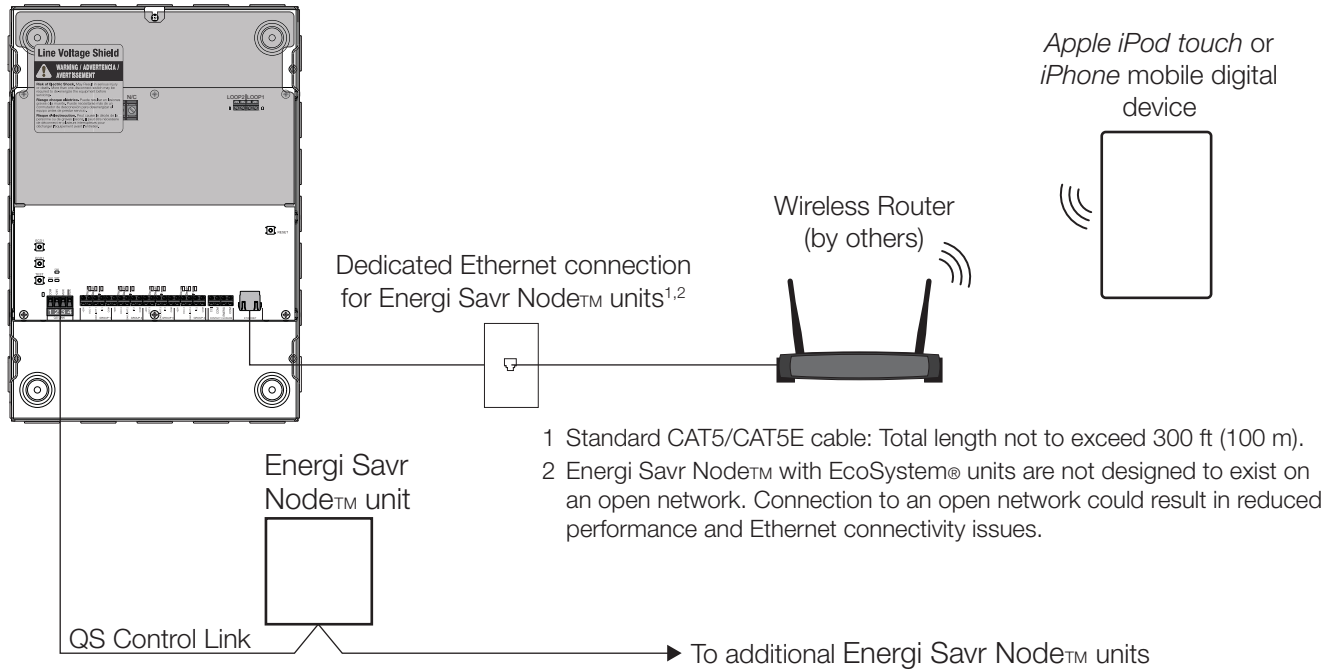
Energi Savr Node™ unit with EcoSystem®



Job Name:	Model Numbers:
Job Number:	

Wiring: System Programming Connection

Energi Savr Node™™ unit with EcoSystem®



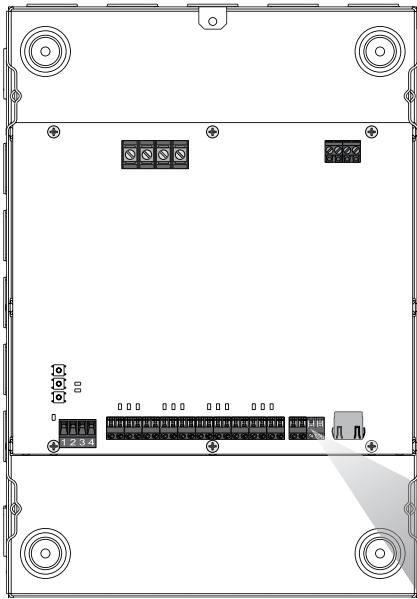
- Wireless router only required for programming with an *Apple iPod touch* or *iPhone*.
- Wireless router may be removed for normal operation.
- Lutron recommends that an Energi Savr Node™™ unit with EcoSystem® be wired to an Ethernet jack in the space for ease of access and proximity to power for the wireless router.
- Works with any standard wireless router that supports multicast packets.
- *Apple iPod touch* or *iPhone* can program other Energi Savr Node™™ units connected to an Energi Savr Node™™ unit with EcoSystem® via the QS Link (except when part of a Quantum® system).
- Energi Savr app is required (except when part of a Quantum® system) to program Energi Savr Node™™ units with EcoSystem® and is available from the *Apple AppStore* online marketplace.

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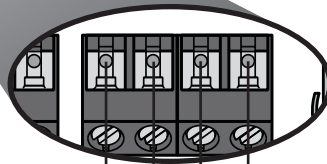
Job Name:	Model Numbers:
Job Number:	

Wiring: Contact Closure Inputs

Energi Savr Node™ unit with EcoSystem®



- Accepts 22 AWG to 12 AWG (0.5 mm² to 4.0 mm²) solid or stranded wires.
- Maximum wire run distance: 250 ft (76 m).



CCI: Contact Closure Input

Com: Common

Com: Common

Emerg: Emergency Contact Closure Input

Emergency CCI

- The attached device must provide a closed dry contact closure or solid-state output.
- Input is miswire-protected up to 36 V_{AC}.
- The Energi Savr Node™ with EcoSystem® unit is shipped with a jumper pre-installed in the Emergency Contact Closure Input.
- Emergency mode is activated by opening the Emergency Contact Closure. Pre-installed jumper must be removed to utilize this function.
- See Application Note #140, “EcoSystem® Ballasts and Emergency Wiring” at www.lutron.com for more details.

Programmable CCI

- The attached device must provide a dry contact closure or solid-state output.
- Input is miswire-protected up to 36 V_{AC}.

Job Name:	Model Numbers:
Job Number:	