# Energi Savr Node™ for EcoSystem®

The Energi Savr Node™ 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 each. The Energi Savr Node™ unit also provides direct connections and power for the following Lutron® devices:

- Occupancy sensors
- Daylight sensors
- IR receivers
- QS devices
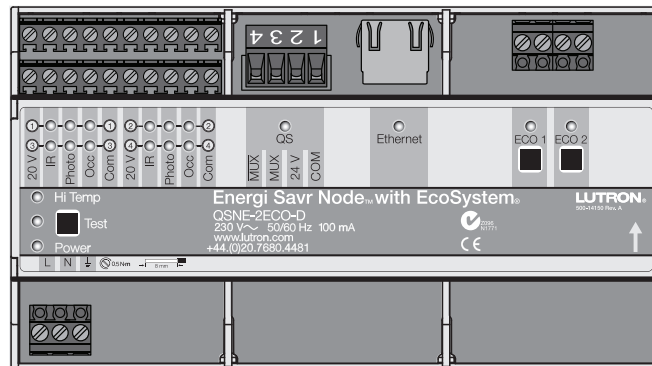
Features

- 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.
- Default configuration requires no commissioning.
- Four occupancy sensor inputs for automated control of lights in areas.
- 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 or compatible Lutron® IR wallstation controls.
- Add more occupancy sensors, daylight sensors, or IR receivers by connecting QS Sensor Modules (QSMs).
- Includes QS link for seamless integration of lights, motorized window treatments, control stations, and QS Sensor Modules.
- Energi Savr Node™ units and QS Sensor Modules can be used in a Quantum® system to control and manage light in an entire building.
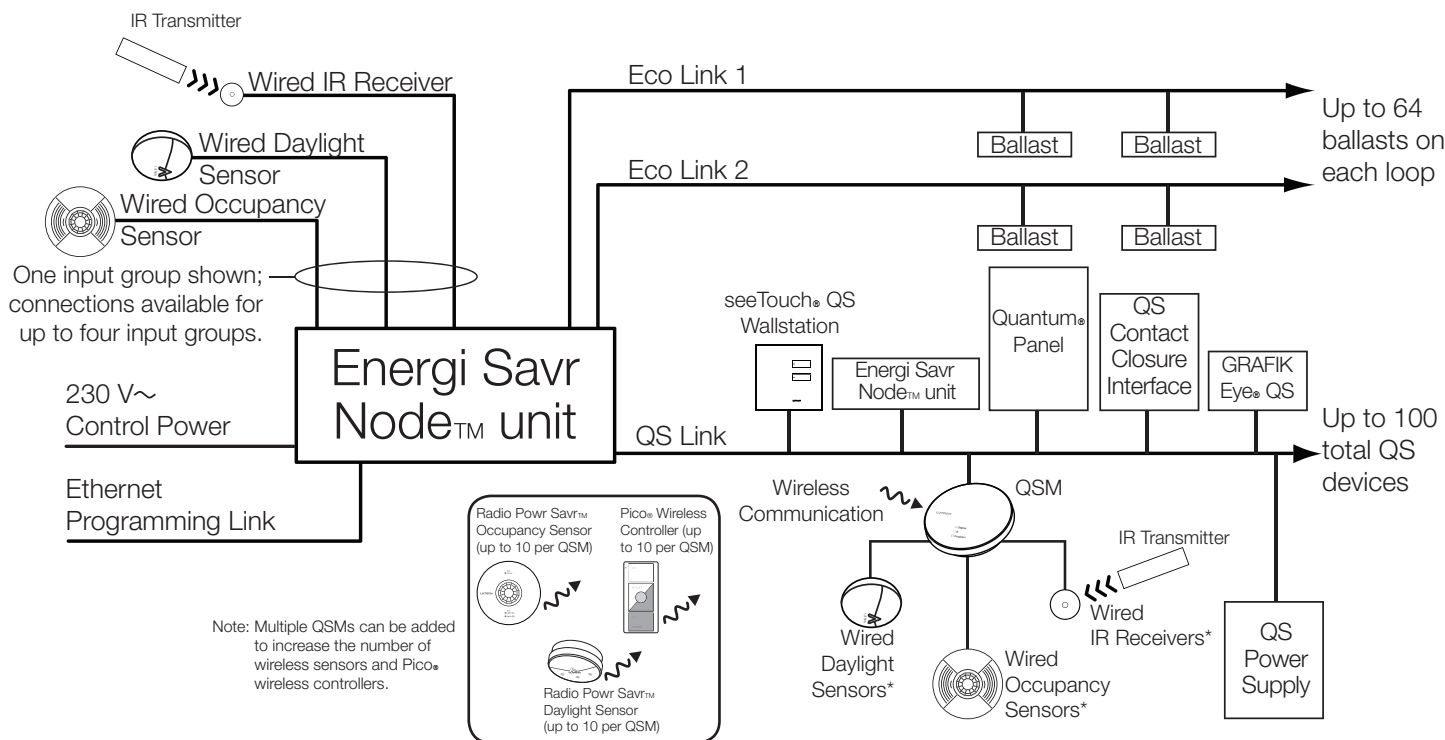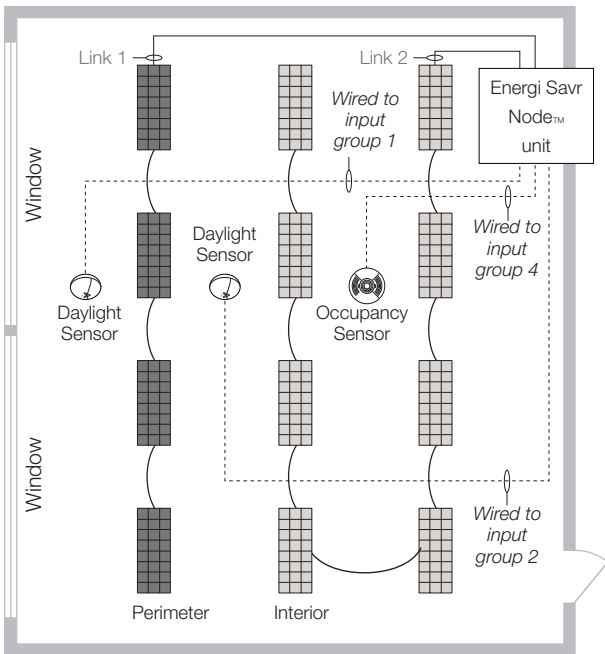
Job Name:	Model Numbers:
Job Number:	

Typical Application: Requires commissioning
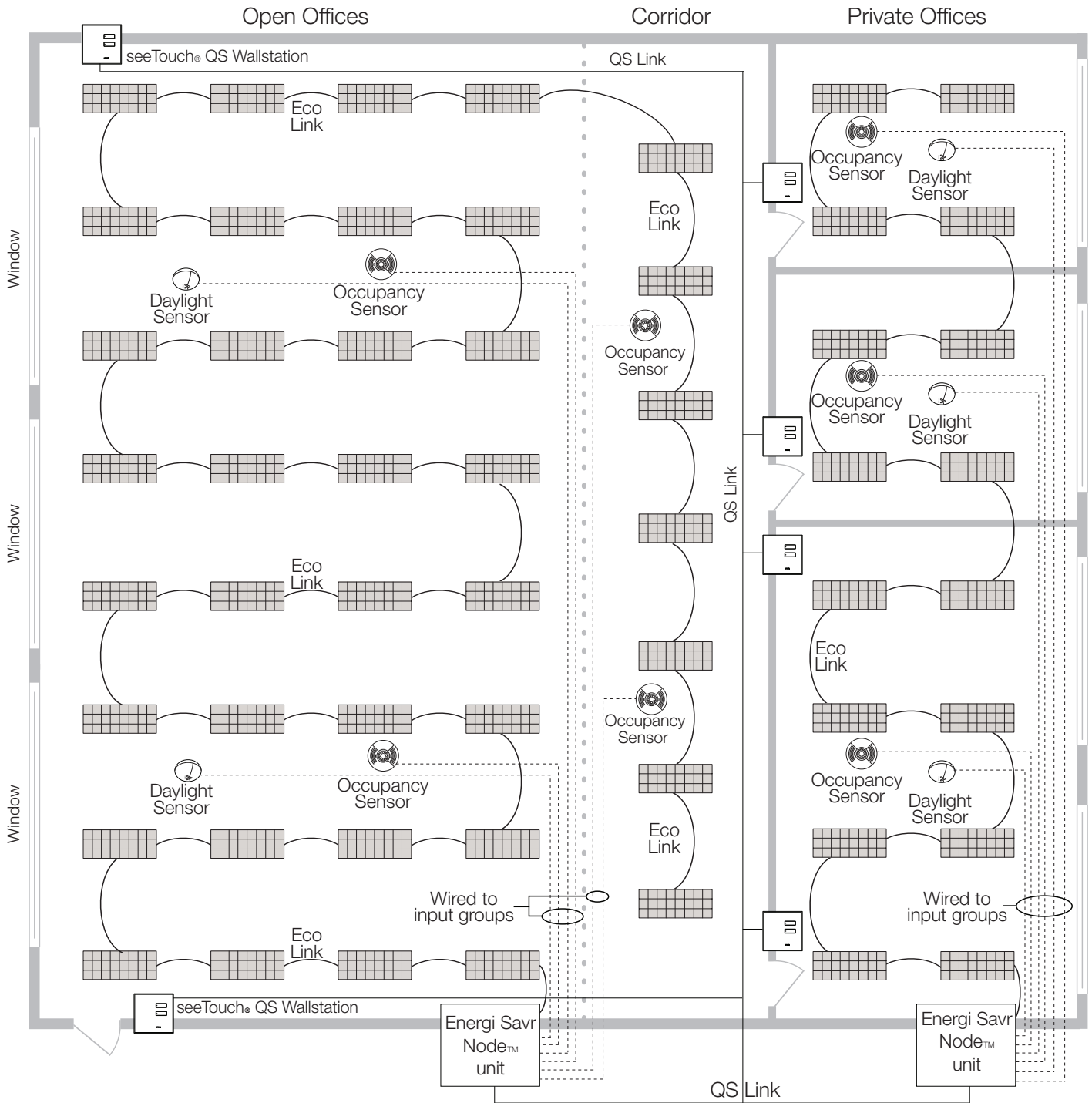
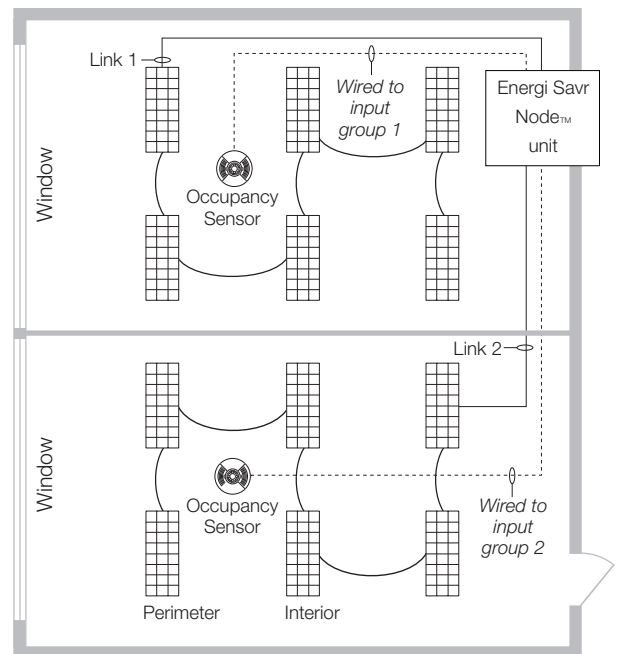| Job Name:	Model Numbers:
Job Number:	

Simple Applications: Preconfigured modes require no commissioning

Preconfigured Mode 1
Perimeter Daylighting
* Four fixtures shown on Link 1 and eight fixtures shown on Link 2, however, up to 64 fixtures can be connected per Link.

Preconfigured Mode 2
Two Zones with Occupancy Sensors
* Six fixtures shown on each Link, however, up to 64 fixtures can be connected per Link.

Default Behavior for Sensor Connections

	Occupancy Sensor	Daylight Sensor
Connected to input group 1	Controls Link 1 only	Controls Link 1 only
Connected to input group 2	Controls Link 2 only	Controls Link 2 only
Connected to input group 3	Controls both Links	Controls both Links with equal daylight setting
Connected to input group 4	Controls both Links	Controls both Links with equal daylight setting

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 and sensors.
• After installation, Energi Savr Node™ unit identifies ballast communication failures.

Job Name:	Model Numbers:
Job Number:	

Specifications

Power

- 230 V∼ 50/60 Hz, 100 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.
- Eco Link Output: 18 V⎓ 250 mA maximum per Link.

Standards

- IEC 60669-2-1
- Lutron Quality Systems registered to ISO 9001.2008.

Environment

- Ambient Temperature Operating Range: 0 °C to 40 °C.
- Relative humidity: less than 90% non-condensing.
- 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
- Input Wiring: 0,5 mm^2 to 2,5 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

- An *Apple iPod touch* or *iPhone* mobile digital device with the Energi Savr app is required for programming Energi Savr Node™ systems.
- The Energi Savr app is available from the AppStore online store.
- The Energi Savr app cannot be used to program the Energi Savr Node™ 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.

EcoSystem®

- Control up to 64 EcoSystem®-compatible devices (ballast, modules, or LED drivers) per EcoSystem® Digital Link (up to 128 devices per Energi Savr Node™ with EcoSystem® unit):
  — EcoSystem® ballasts and modules
  — EcoSystem® H-Series ballasts
  — Hi-lume® 3D ballasts
  — Hi-lume® LED drivers
  — Hi-lume® A-Series LED drivers
- Digitally define areas and zones.
- Configure wired or wireless sensors and controls to control devices on multiple EcoSystem® Digital Links 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 Link can be wired as Mains voltage or IEC PELV for maximum wiring flexibility.

QS Link Limits

- A QS link can have up to 100 zones (outputs), 100 devices and 512 ballasts.
- Each Energi Savr Node™ unit counts as one device toward the 100 device limit.
- Each assigned zone counts toward the 100 zone limit (up to 512 zones in a Quantum® system).
- Each Energi Savr Node™ (QSNE-2ECO-D) unit can supply 3 power draw units. Refer to the QS Link Power Draw Units specification submittal (Lutron P/N 369405) for more information concerning Power Draw Units.
- A maximum of 8 EcoSystem® digital links may be connected to the QS link.

QS Link Sensor Limits:

- 100 wired or wireless occupancy sensors.
- 100 wired or wireless daylight sensors.
- 100 wired wallstations or Pico® wireless controllers.

Job Name:	Model Numbers:
Job Number:	

Sensors Connected to the Energi Savr Node™ Unit

- Power Supply Outputs (4)
  — 20 V⎓ 50 mA maximum.
  — An auxiliary power supply must be used if the device requires more than 50 mA.

Occupancy/Vacancy Sensors

- Use vacancy sensors to automatically turn the lights off in an area a fixed time after it becomes vacant.
- Use occupancy sensors to automatically turn the lights on in area when it becomes occupied and to automatically turn the lights off in an area a fixed time after it becomes vacant.
- Four occupancy sensors can connect directly to the Energi Savr Node™ unit.
- Each area's occupied level and unoccupied level can be programmed.
- Occupancy sensor must provide a dry contact closure or solid-state output.

Daylight Sensors

- Lutron® daylight sensors allow daylight harvesting with programmable gain settings in up to four gain groups per area.
- Four daylight sensors can connect directly to the Energi Savr Node™ unit.

Infrared Receivers

- Use Lutron® IR receivers for personal control of individual lighting zones.
- Four IR receivers can connect directly to the Energi Savr Node™ unit.

Other QS System Components

QSM (QS Sensor Module) - Integrating Wired and Wireless Inputs

- Use the QSM to integrate Radio Powr Savr™ Occupancy/Vacancy sensors, Radio Powr Savr™ Daylight sensors, and Pico® Wireless Controllers to control zones on the Energi Savr Node™ unit.
- Assign up to 10 Radio Powr Savr™ Occupancy/Vacancy sensors per Energi Savr Node™ unit via QSM.
- Assign up to 10 Radio Powr Savr™ Daylight sensors per Energi Savr Node™ unit via QSM.
- Assign up to 10 Pico® Wireless Controllers per Energi Savr Node™ unit via QSM.
- Add additional wired and wireless inputs by adding QS Sensor Modules to the QS link.
- Wire and power up to 4 wired inputs (of any type) total
  — Daylight sensors
  — Occupancy sensors
  — Infrared (IR) receivers
- The Radio Powr Savr™ sensors and Pico® Wireless Controllers associated with the QSM should be mounted within 18 m line of sight, or 9 m through walls, of the QSM.
- Refer to QSM Specification Submittal for more information.

seeTouch® QS Controls

- seeTouch® QS wallstations can be configured to control Energi Savr Node™ unit zones.
- Select one of 16 scenes and off in Energi Savr Node™ unit areas.
- Control individual lighting zones in Energi Savr Node™ unit areas.
- Each Energi Savr Node™ unit can power up to three seeTouch® QS controls.
- LED indicator displays the status of programmed lights.

Job Name:	Model Numbers:
Job Number:	

Other QS System Components

Communication with GRAFIK Eye® QS control units

- Energi Savr Node™ unit zones can be configured to respond to GRAFIK Eye® QS scene changes, such as scene button presses and timeclock events.
- Energi Savr Node™ areas can be configured to respond to scene commands initiated by Grafik Eye® QS astronomic time clock.
- Energi Savr Node™ unit operates in afterhours mode when associated with a GRAFIK Eye® QS that is in afterhours mode.

Communication with QSE-IO

- Energi Savr Node™ unit zones respond to scene commands initiated by the QSE-IO in scene selection mode or occupancy sensor mode.
- Energi Savr Node™ unit can be configured to respond to zone toggle or occupancy sensor commands initiated by the QSE-IO in zone toggle mode or occupancy sensor mode.

Communication with QSE-CI-NWK-E

- Integrate Energi Savr Node™ units with touchscreens, PCs, A/V systems or other digital systems and devices.

EcoSystem® Digital Link Limits

- Up to 64 EcoSystem®-compatible fluorescent ballasts and/or LED drivers per EcoSystem® digital link.
- Sensor and control communication limits
  — 16 daylight sensors
  — 32 occupancy sensors
  — 64 infrared (IR) receivers or wallstations
  A sensor or control counts as a device on the EcoSystem® digital link if it is wired to an EcoSystem® ballast on the same link, or is programmed to communicate with a fluorescent ballast or LED driver on the EcoSystem® digital link.
- EcoSystem®-compatible fluorescent ballasts and LED drivers on the EcoSystem® digital link do not count as QS devices.

  Note: 16 daylight sensors can communicate to a given EcoSystem® digital link, up to 32 daylight sensors for a 2-link unit.
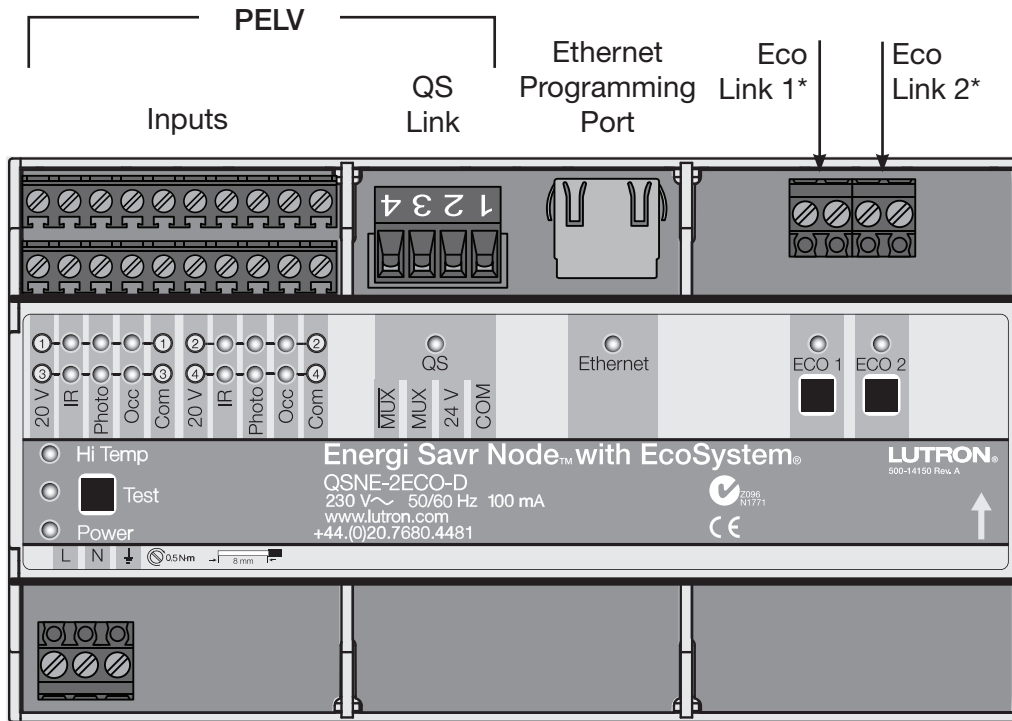
Mechanical Dimensions

89,7 mm
(3,53 in)

161,7 mm
(6,36 in)

60,6 mm
(2,39 in)
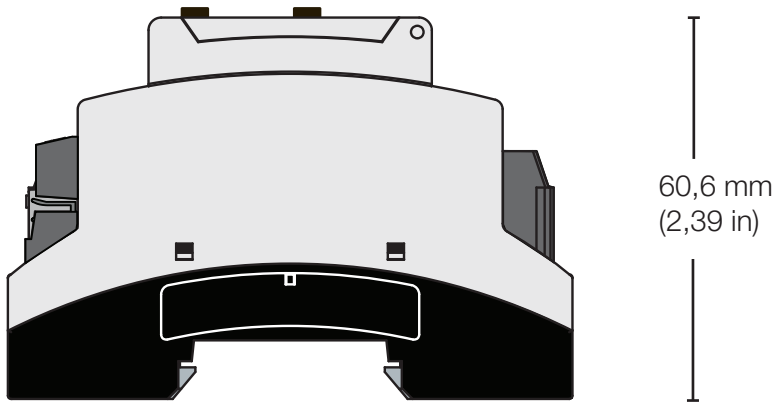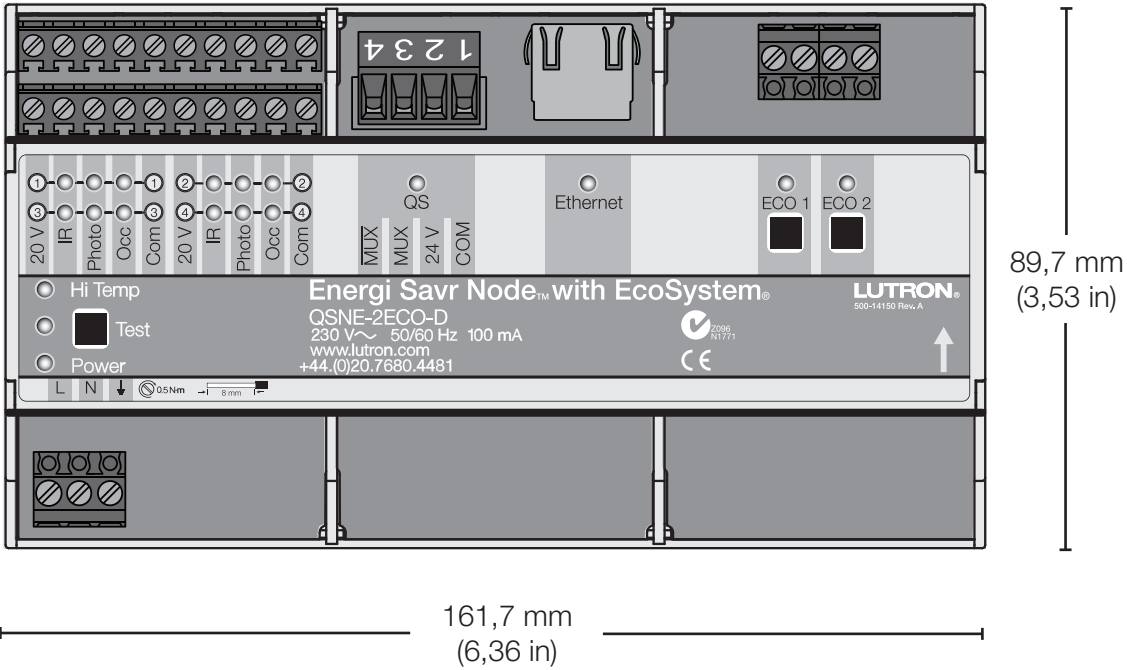
Job Name:	Model Numbers:
Job Number:	

Overview of Wiring Terminals

* Wire according to local codes.

Job Name:	Model Numbers:
Job Number:	

Wiring: Mains Voltage

Wiring from Distribution to Link Supply

- Turn off breaker at distribution panel.
- Run live, neutral, and $\perp$ wires from a 230 V$\sim$ 50/60 Hz feed to the Energi Savr Node™ unit.

Emergency Lighting Applications

- Use normal (non-essential) power only to power the Energi Savr Node.
- When normal power drops out, the Energi Savr Node™ 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 Low Voltage Separation

- The Energi Savr Node™ unit is designed to separate mains wiring from IEC/PELV circuits.
- Follow appropriate local and national codes to avoid violating required separation guidelines.

$\perp$ – Earth/Ground

N – Neutral

L – Mains/Live

Job Name:	Model Numbers:
Job Number:	

Wiring: Eco Link
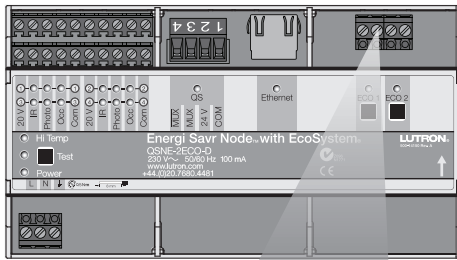
The Energi Savr Node™ unit will supply power to two independent Eco Links, which support a maximum of 64 ballasts per link.

Eco Wiring

• Eco wiring is not SELV.

• Eco wiring is treated as mains voltage, and thus may be run within the same sheathing.

• Consult all national and local electrical codes for separation requirements.
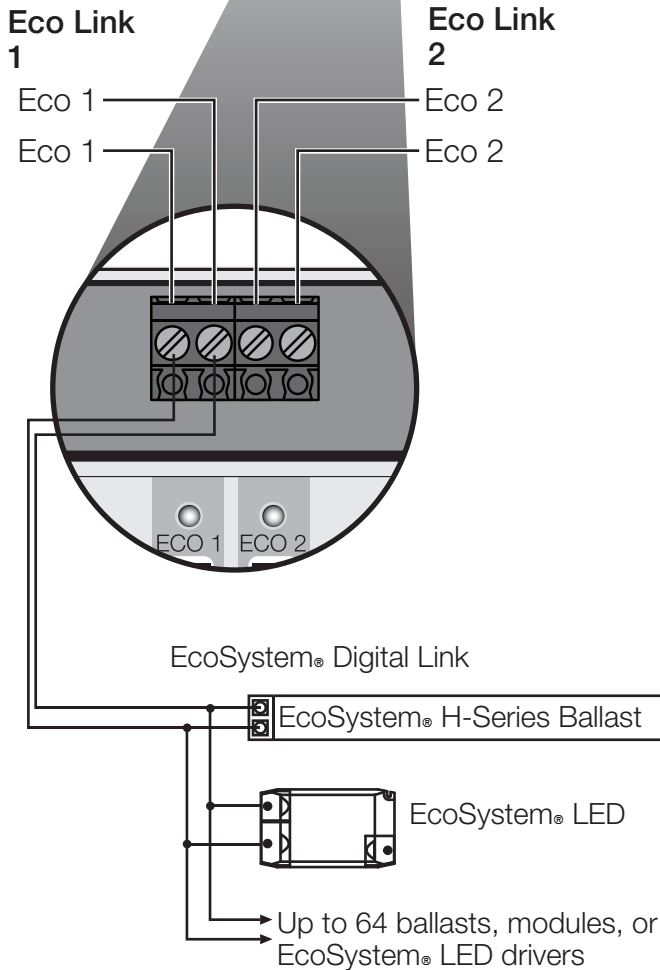
Wire Cross-Sectional Area	Maximum EcoSystem®-compliant Link Wire Length
4,0 mm^2	829 m
2,5 mm^2	518 m
1,5 mm^2	311 m
1,0 mm^2	207 m

Job Name:	Model Numbers:
Job Number:	

Wiring: QS Link

(1) COM
(2) 24 V⎓
(3) MUX
(4) $\overline{\text{MUX}}$

IEC PELV QS Link Wiring
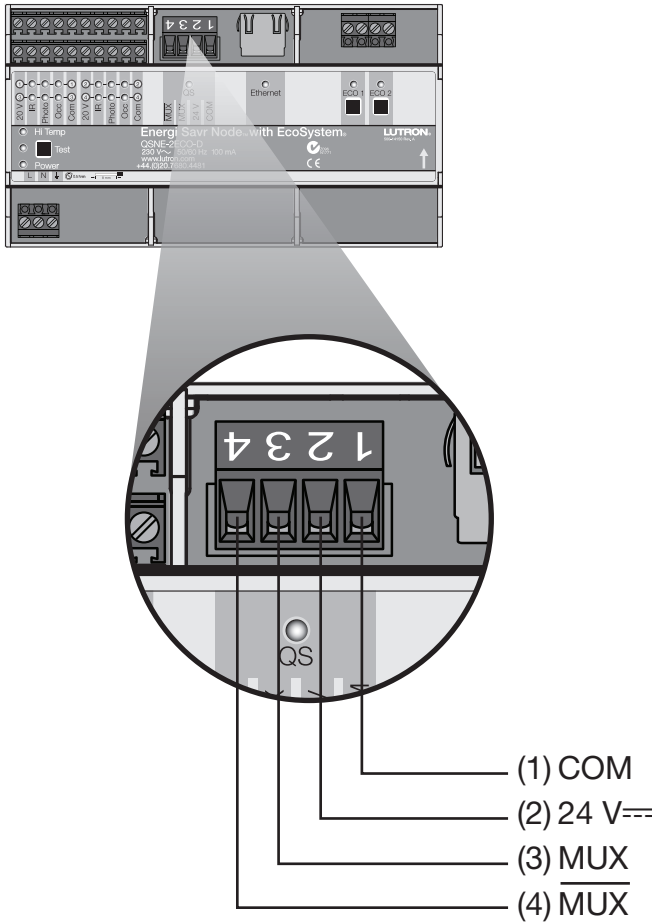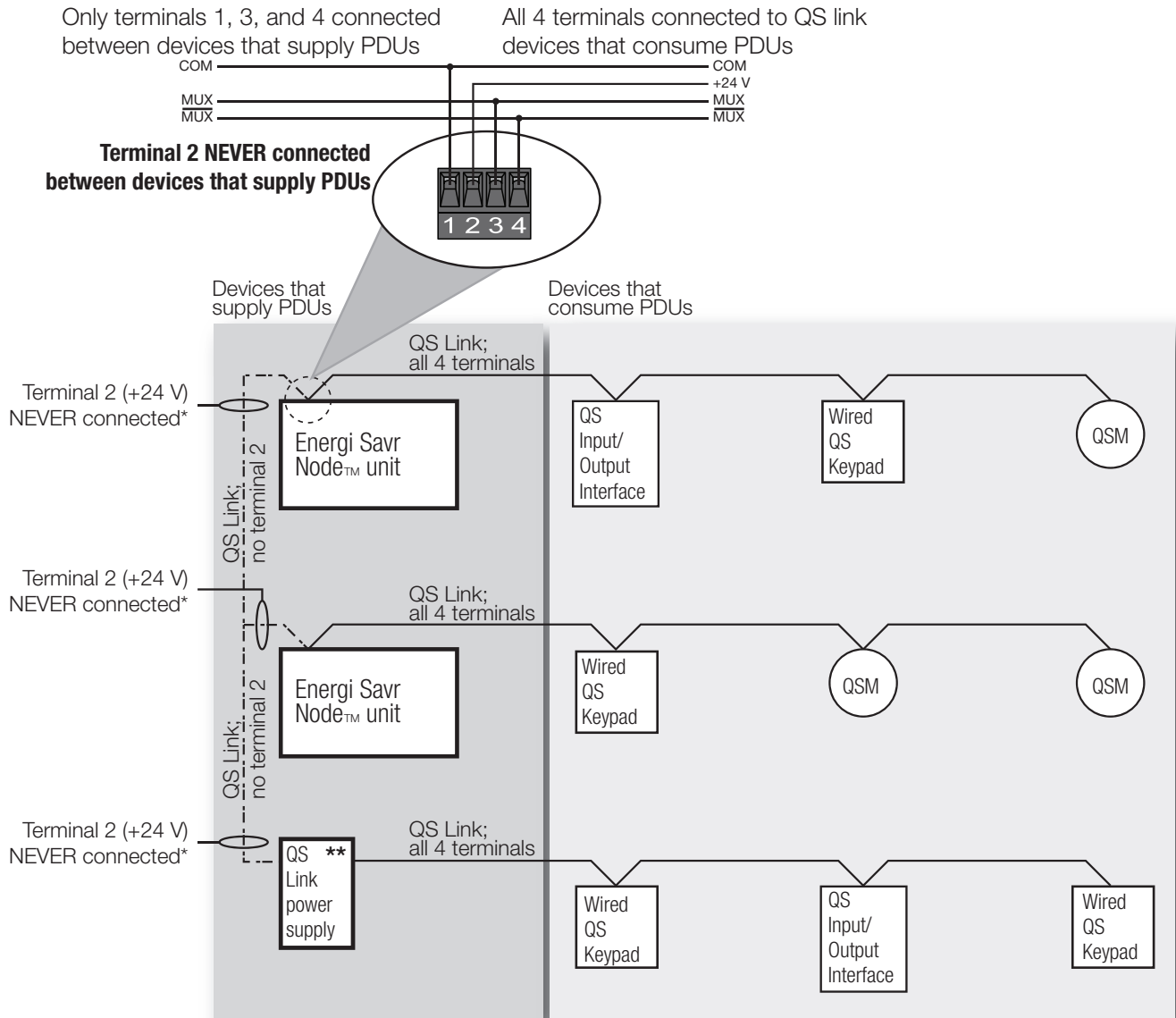
- Link communicates using IEC PELV wiring.

- 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.

QS Link Wiring Length	Wire Gauge	Available from Lutron in one cable:
Less than 153 m	*Power (terminals 1 and 2):* 1 pair 1,0 mm^2	GRX-CBL-346S (non plenum)
	Data (terminals 3 and 4): 1 pair 0,5 mm^2, twisted and shielded*	GRX-PCBL-346S (plenum)
153 m to 610 m	*Power (terminals 1 and 2):* 1 pair 4,0 mm^2	GRX-CBL-46L (non plenum)
	Data (terminals 3 and 4): 1 pair 0,5 mm^2, twisted and shielded*	GRX-PCBL-46L (plenum)

- Use one, twisted-shielded pair of 0,5 mm^2 for data link (MUX, $\overline{\text{MUX}}$).

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

COM

+24 V

MUX

MUX

COM

MUX

MUX

**Terminal 2 NEVER connected
between devices that supply PDUs**

1 2 3 4

Devices that
supply PDUs

Devices that
consume PDUs

QS Link;
all 4 terminals

Terminal 2 (+24 V)
NEVER connected*

QS Link; no terminal 2

Energi Savr
Node™ unit

QS
Input/
Output
Interface

Wired
QS
Keypad

QSM

Terminal 2 (+24 V)
NEVER connected*

QS Link;
all 4 terminals

QS Link; no terminal 2

Energi Savr
Node™ unit

Wired
QS
Keypad

QSM

QSM

Terminal 2 (+24 V)
NEVER connected*

QS Link;
all 4 terminals

QS   **
Link
power
supply

Wired
QS
Keypad

QS
Input/
Output
Interface

Wired
QS
Keypad

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: Input Groups

Electrical Contractors and Engineers

- All sensor wiring is IEC PELV. Follow all applicable national and local codes for proper circuit separation and protection.
- IEC PELV input terminals accept 1.0–2.5 mm² solid conductors.
- Mains voltage and IEC PELV wiring must be kept separate.

Wiring Instructions

- Turn off circuit breaker or isolator at distribution panel.

Occupancy Sensor

- Connect three conductors to three terminals as shown.
- One occupancy sensor can be wired to each input group.
- Sensor must be placed within 30 m of the Energi Savr Node™.

IR Receiver

- Connect the three conductors to the three terminals as shown.

IR Receiver (continued)

- Receiver must be placed within 30 m of the Energi Savr Node™ unit.
- One IR Receiver can be wired to each input group.
- If a daylight sensor and IR receiver are connected, do not connect the daylight sensor's IR output (white wire).

Daylight Sensor

- Connect the four conductors to the four terminals as shown.
- Terminals:

  Red = 20 V⎓   White = IR
  Black = Common   Yellow = Daylight
- Daylight Sensor must be placed within 30 m of the Energi Savr Node™ unit.
- One daylight sensor can be wired to each input group.
- Consult the daylight sensor specification sheet to properly locate the sensor.
- Do not place the sensor above pendants, fixtures, directly below lighting fixtures, or within skylight wells.

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

** Connect the gray wire on -R Occupancy Sensor models.
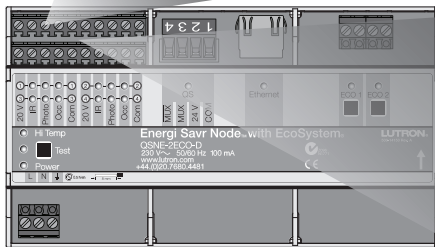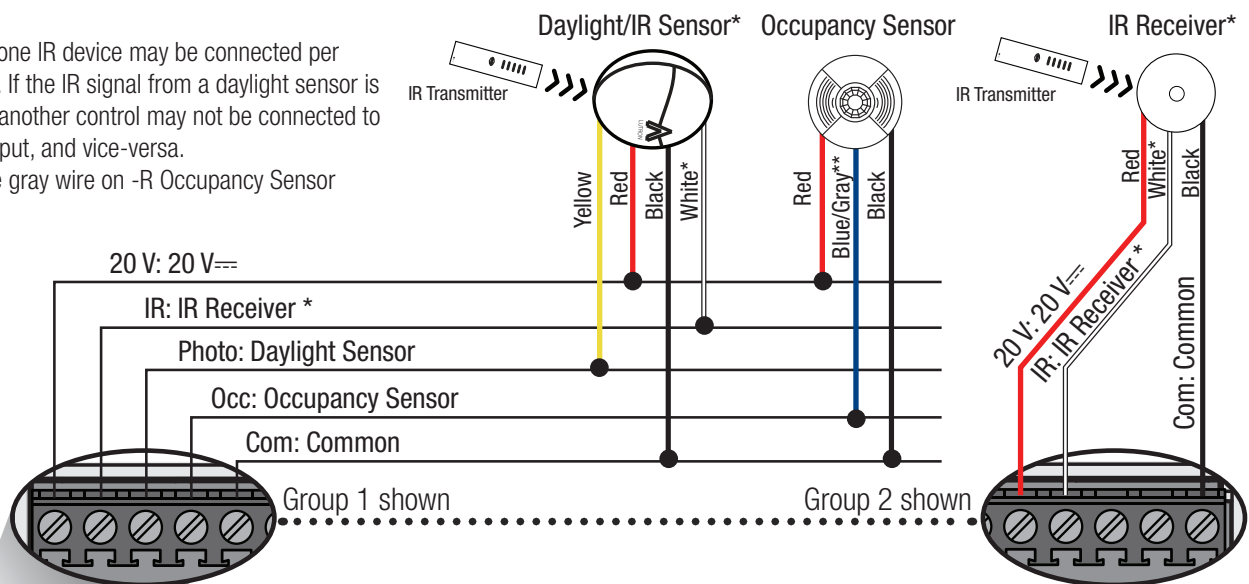
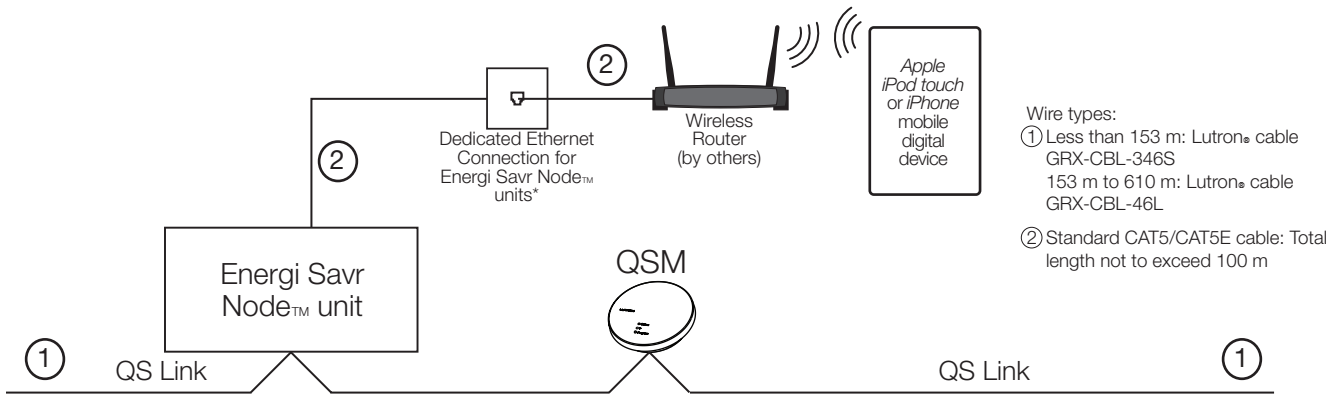**NOTE:** There are four sensor groups. Each group wires the same and is shown above.

Sensor Group 1   Sensor Group 2
Sensor Group 3   Sensor Group 4
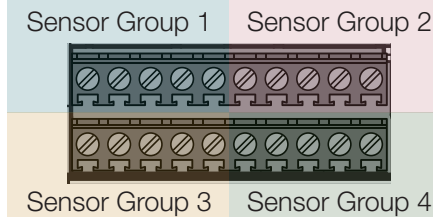
Job Name:	Model Numbers:
Job Number:	

Programming Options

Programming with *Apple iPod touch* or *iPhone*

• Use the intuitive programming application for the *Apple iPod touch* or *iPhone* to program systems with multiple Energi Savr Node™ units and QSMs on the QS link.

Dedicated Ethernet Connection for Energi Savr Node™ units*

Wireless Router (by others)

Apple iPod touch or *iPhone* mobile digital device

Energi Savr Node™ unit

QSM

QS Link

QS Link

Wire types:
① Less than 153 m: Lutron® cable GRX-CBL-346S
   153 m to 610 m: Lutron® cable GRX-CBL-46L
② Standard CAT5/CAT5E cable: Total length not to exceed 100 m

* Note: Energi Savr Node™ units are not designed to exist on an open network. Connection to an open network could result in reduced performance and Ethernet connectivity issues.

• Wireless router only required for programming with an *Apple iPod touch* or *iPhone*.
• Wireless router may be removed for normal operation.
• Ethernet connection may be made via integral Ethernet jack.
• Lutron recommends that integral Ethernet jack 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 all Energi Savr Node™ units connected to the QS link (except when part of a Quantum® system).
• Energi Savr app is required and is available from the *Apple* AppStore online marketplace.

Job Name:	Model Numbers:
Job Number:	