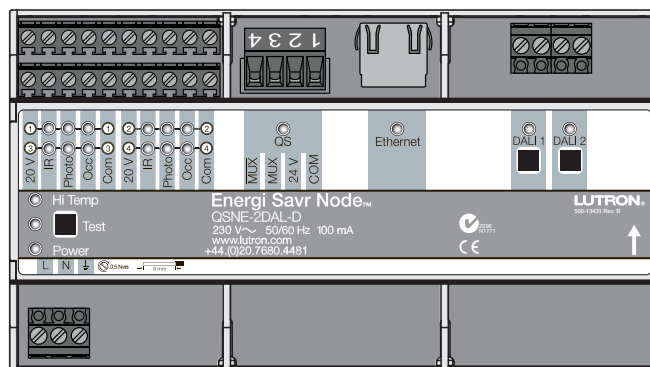


Energi Savr Node™ for DALI

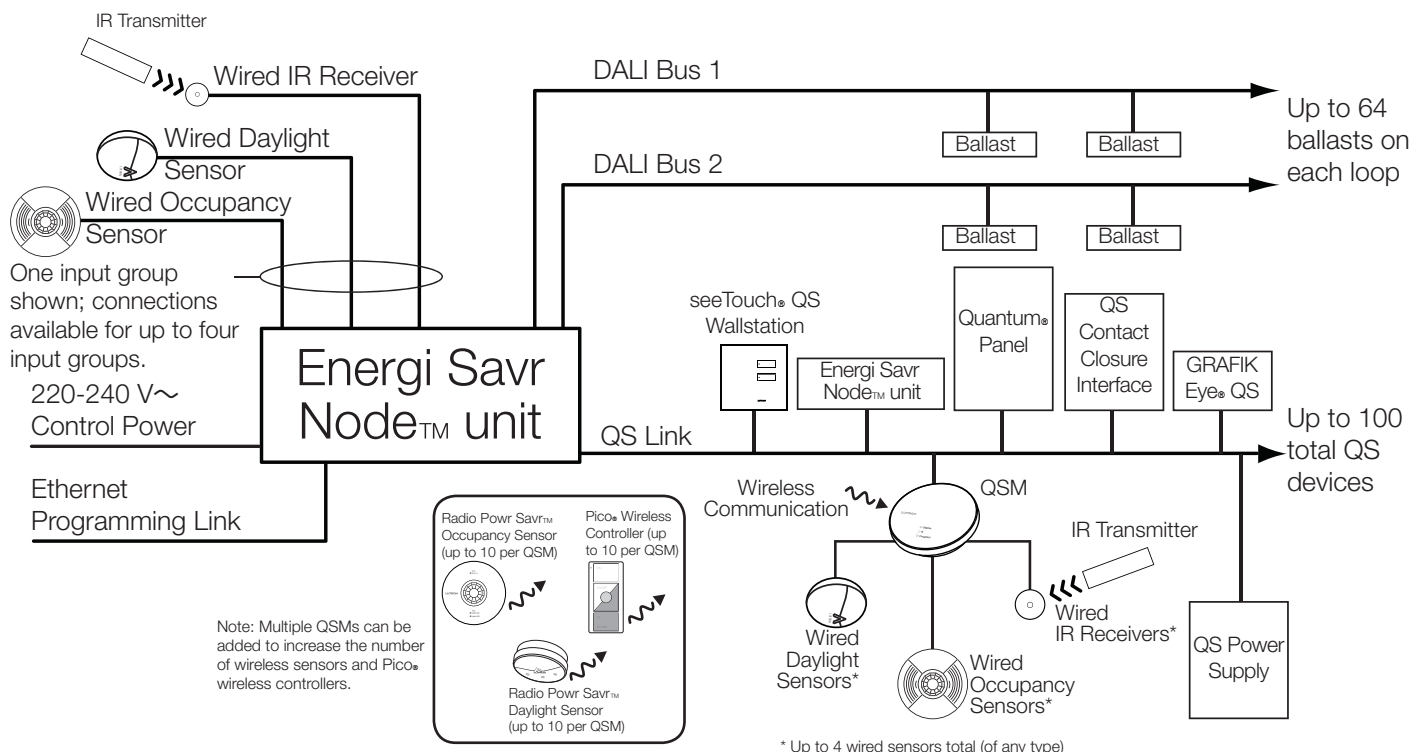
The Energi Savr Node™ unit is a DIN-rail mounted controller for DALI-compliant Digital Addressable loads. It provides DALI bus power and control for two independent DALI Buses with up to 64 ballasts each. The Energi Savr Node™ unit also provides direct connections and power for the following Lutron devices:

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



Features

- Provides power for two buses of DALI compliant digital addressable loads (up to 250 mA per bus).
- Each DALI Bus can control a maximum of 16 zones.
- 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.
- 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.

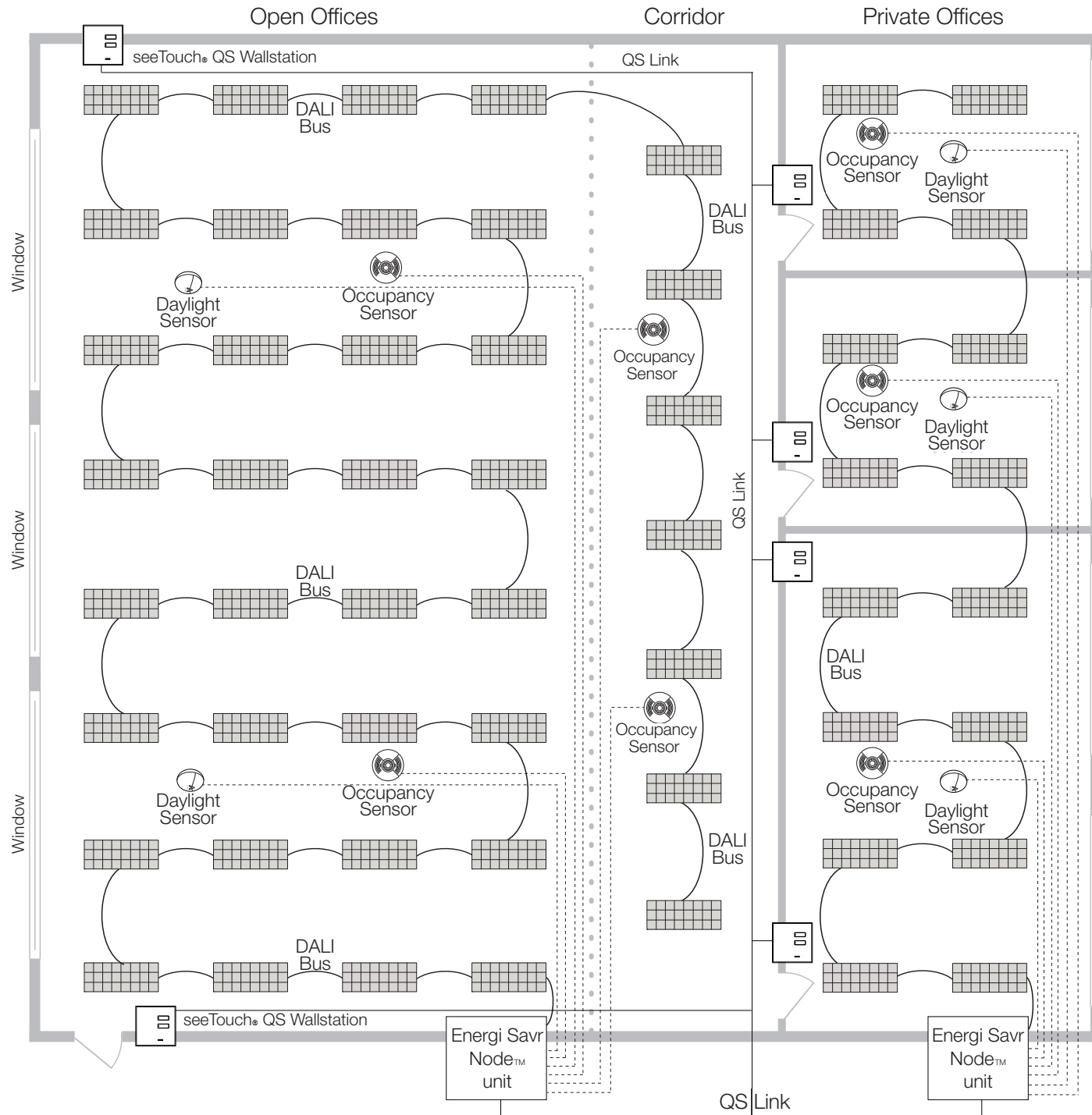


Job Name:

Model Numbers:

Job Number:

Typical Application: Requires commissioning

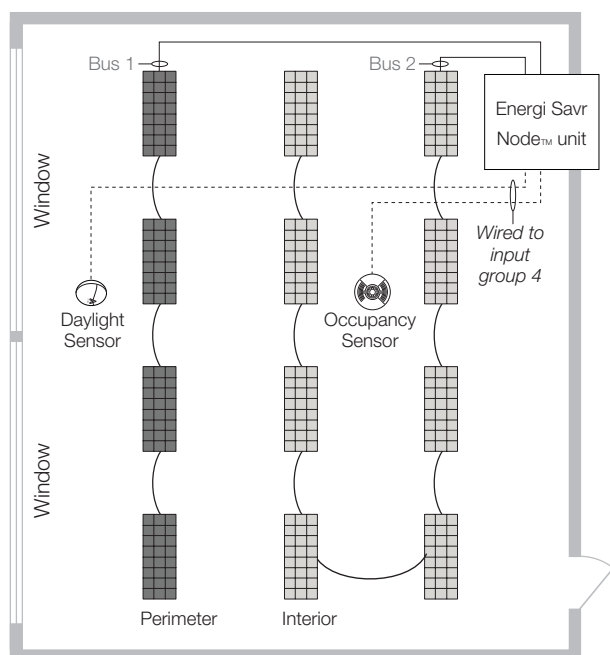


Job Name:

Model Numbers:

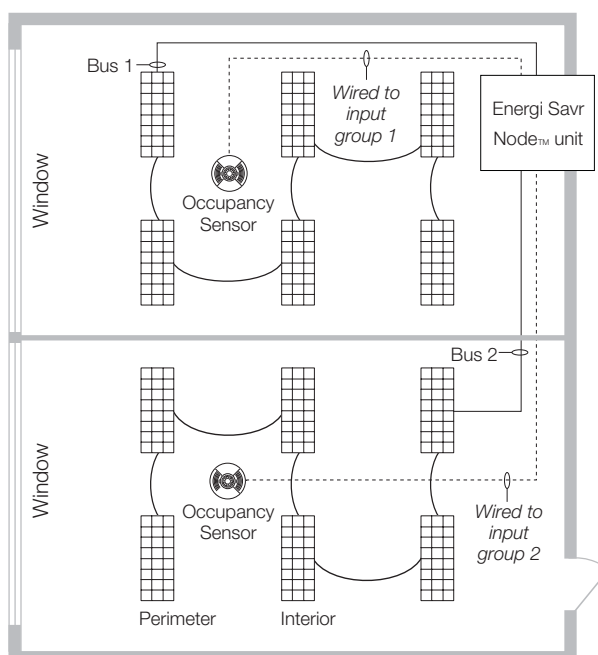
Job Number:

Simple Applications: Preconfigured modes require no commissioning



Preconfigured Mode 1 Perimeter Daylighting

- * Four fixtures shown on Bus 1 and eight fixtures shown on Bus 2, however, up to 64 fixtures can be connected per bus.



Preconfigured Mode 2 Two Zones with Occupancy Sensors

- * Six fixtures shown on each bus, however, up to 64 fixtures can be connected per bus.

Default Behavior for Sensor Connections

	Occupancy Sensor	Daylight Sensor
Connected to input group 1	Controls Bus 1 only	Controls Bus 1 only
Connected to input group 2	Controls Bus 2 only	Controls Bus 2 only
Connected to input group 3	Controls both Buses	Controls both Buses with equal daylight gain
Connected to input group 4	Controls both Buses	Controls both Buses with lower daylight gain on Loop 2

Troubleshooting and Maintenance Features

- Maintains redundant memory of ballast programming for ease of single or multiple ballast replacement.
- After installation, "TEST" button verifies DALI 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

- 220-240 V~ 50/60 Hz, max current draw 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.
- DALI Bus Output: 18 V== 250 mA maximum per bus.

Standards

- IEC 60669-2-1
- Lutron Quality Systems registered to ISO 9001.2008.
- For commercial use, Class A only.

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 mm² to 4.0 mm²
- DALI Bus Wiring: 1.0 mm² to 4.0 mm²
- QS Link Wiring: 0.5 mm² to 4.0 mm²
- Input Wiring: 0.5 mm² to 2.5 mm²

Mounting

- Intended to mount within an IP20 (minimum) rated consumer panel or breaker panel with integrated DIN rail and dead cover.
- Width = 9 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 *App Store* 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.

DALI Buses

- Up to 64 DALI compliant loads on each bus can be addressed and grouped into 16 zones.
- Energi Savr Node™ unit supplies 250 mA to power each bus.
- DALI Bus wires are polarity insensitive and topology-free.

QS Link Limits

- A QS link can have up to 100 zones (outputs) and 100 devices.
- Each Energi Savr Node™ unit counts as one device toward the 100 device limit.
- Each assigned zone counts toward the 100 zone limit.
- Each Energi Savr Node™ (QSNE-2DAL-D) unit can supply 3 power draw units. Refer to the QS Link Power Draw Units specification submittal (Lutron PN 369405) for more information concerning Power Draw Units.

QS Link Sensor Limits:

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

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Job Name:	Model Numbers:
Job Number:	

Sensors Connected to the Energi Savr Node™ Unit

- Power Supply Outputs (4)
 - 20 V $\overline{=}$ 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.

IR Controls

- Use Lutron IR receivers or wired Pico® keypads for personal control of individual lighting zones.
- Four IR devices 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 buttons when associated with the GRAFIK Eye® QS.
- Energi Savr Node™ unit zones can be configured to respond to scene commands initiated by the GRAFIK Eye® QS astronomic time clock when associated with the GRAFIK Eye® QS.
- 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

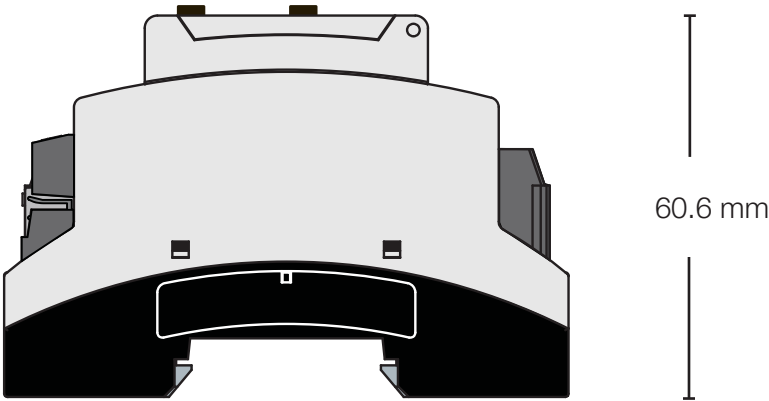
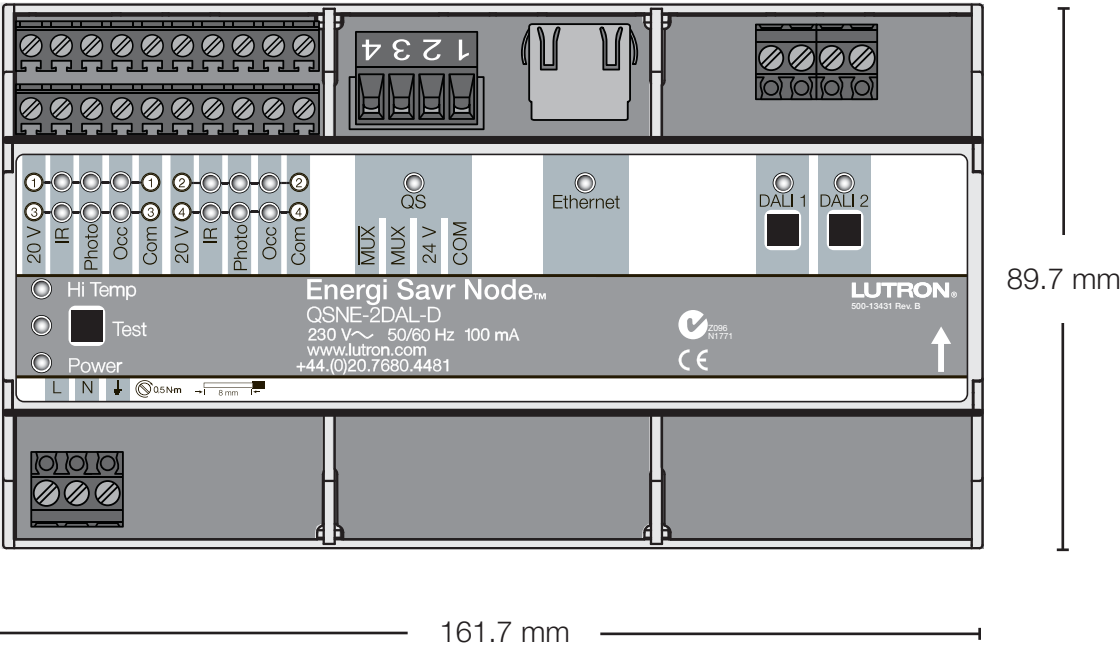
- Integrate Energi Savr Node™ units with touchscreens, PCs, A/V systems or other digital systems and devices.

Job Name:

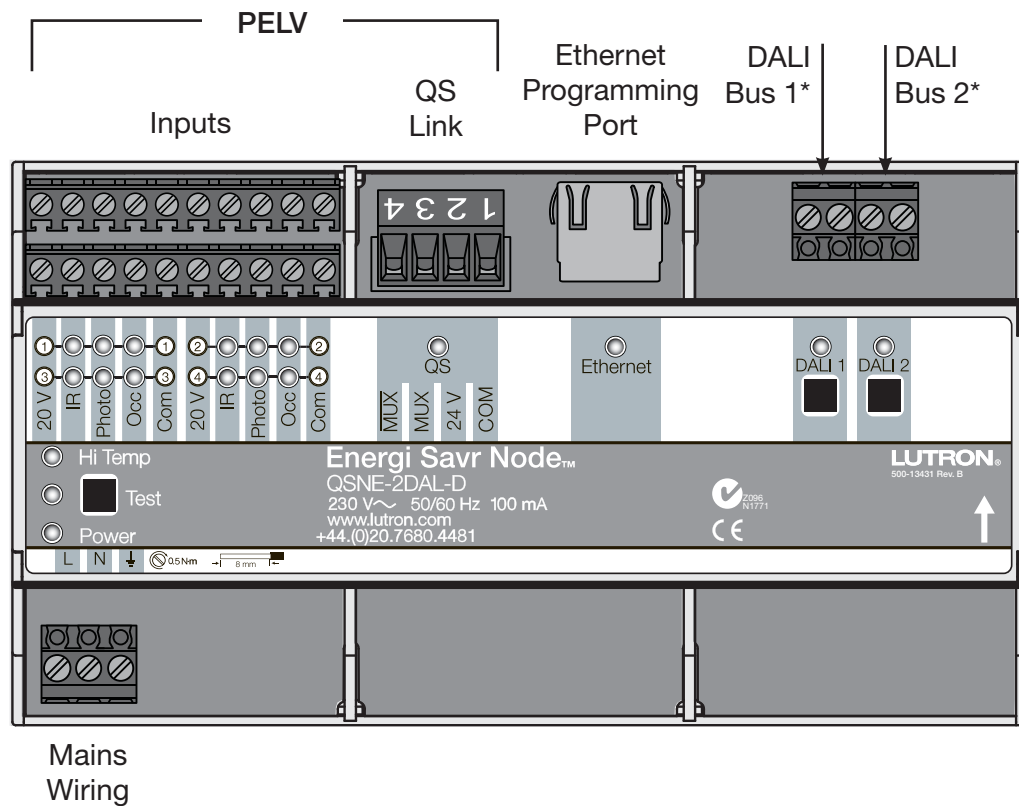
Model Numbers:

Job Number:

Mechanical Dimensions



Overview of Wiring Terminals

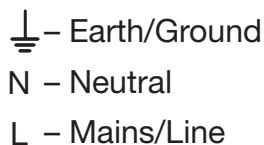


* Wire DALI according to local codes.

Job Name:

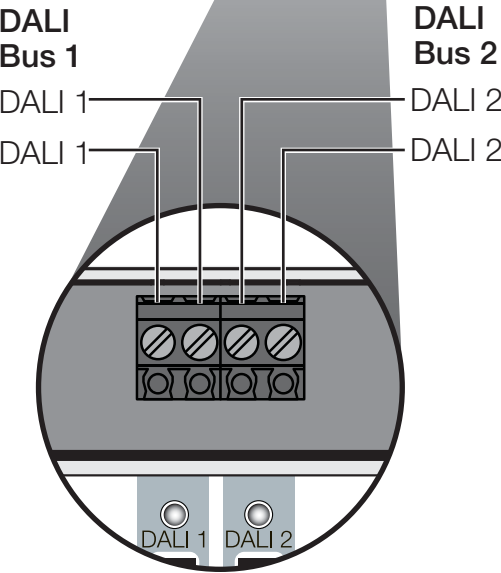
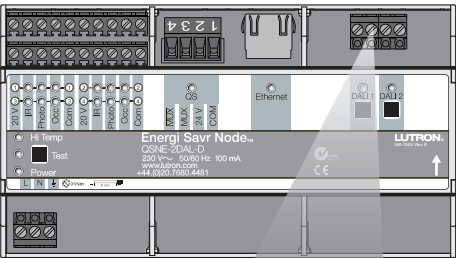
Model Numbers:

Job Number:



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

Wiring: DALI Bus



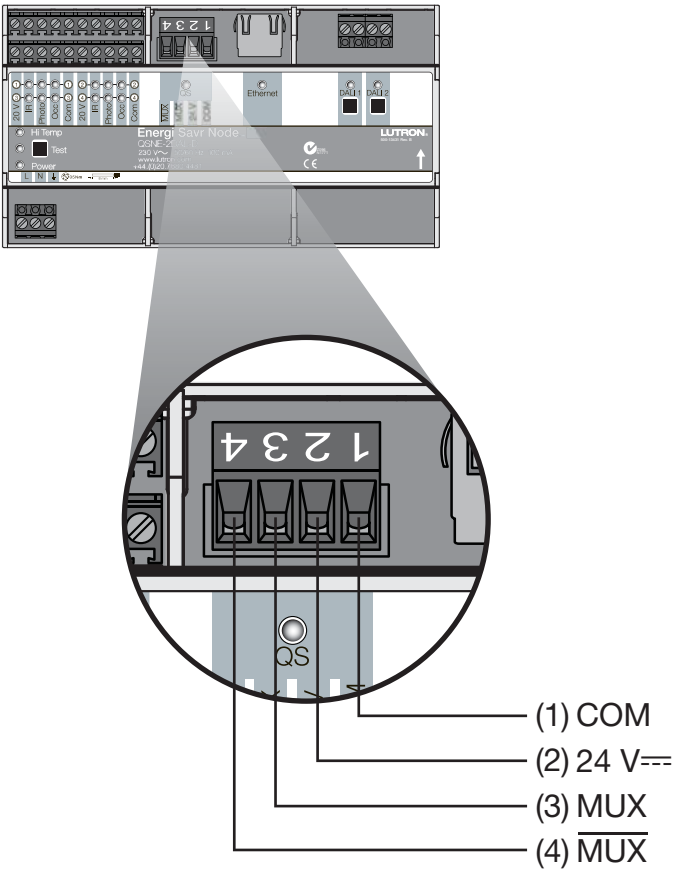
The Energi Savr Node™ unit will supply power to an independent DALI Bus, which supports a maximum of 64 ballasts per bus.

DALI Wiring

- DALI wiring is not SELV.
- DALI wiring is treated as mains voltage, and thus may be run within the same sheathing.
- Ensure that there is no greater than a 2 V~ drop between the Energi Savr Node™ unit and the end of the DALI Bus.
- Consult all national and local electrical codes for separation requirements.

Wire Gauge	Maximum DALI-compliant Bus Wire Length
1.5 mm ²	300 m
0.75 mm ²	150 m
0.50 mm ²	100 m

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.

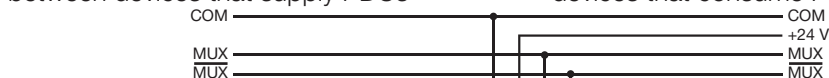
QS Link Wiring Length	Wire Gauge	Available from Lutron in one cable:
Less than 153 m	Power (terminals 1 and 2): 1 pair 1.0 mm ²	GRX-CBL-346S (non plenum)
	Data (terminals 3 and 4): 1 pair 0.5 mm ² , twisted and shielded	GRX-PCBL-346S (plenum)
153 m to 610 m	Power (terminals 1 and 2): 1 pair 4.0 mm ²	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 mm² for data link (MUX, MUX).

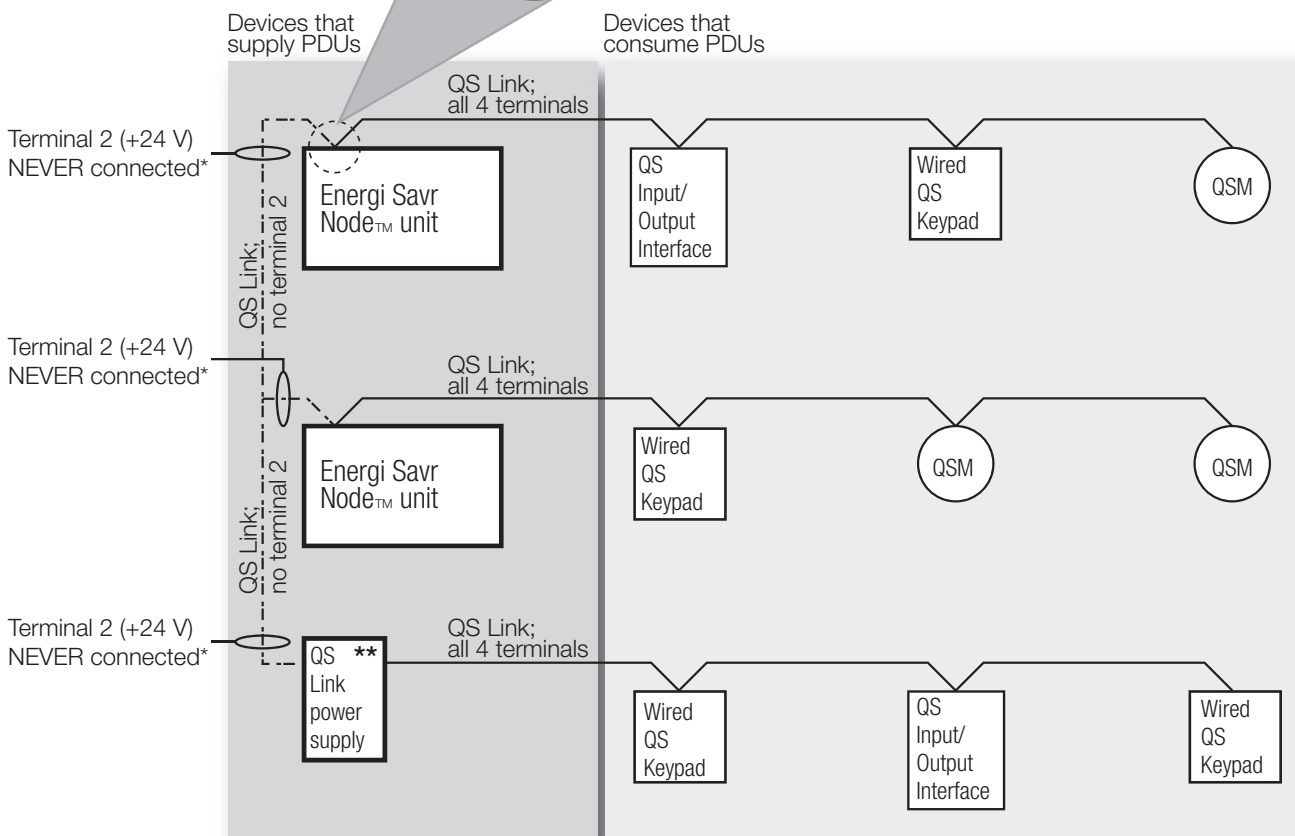
Wiring: QS Link (continued)

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 Inputs

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™ unit.

IR Receiver

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

IR Receiver (continued)

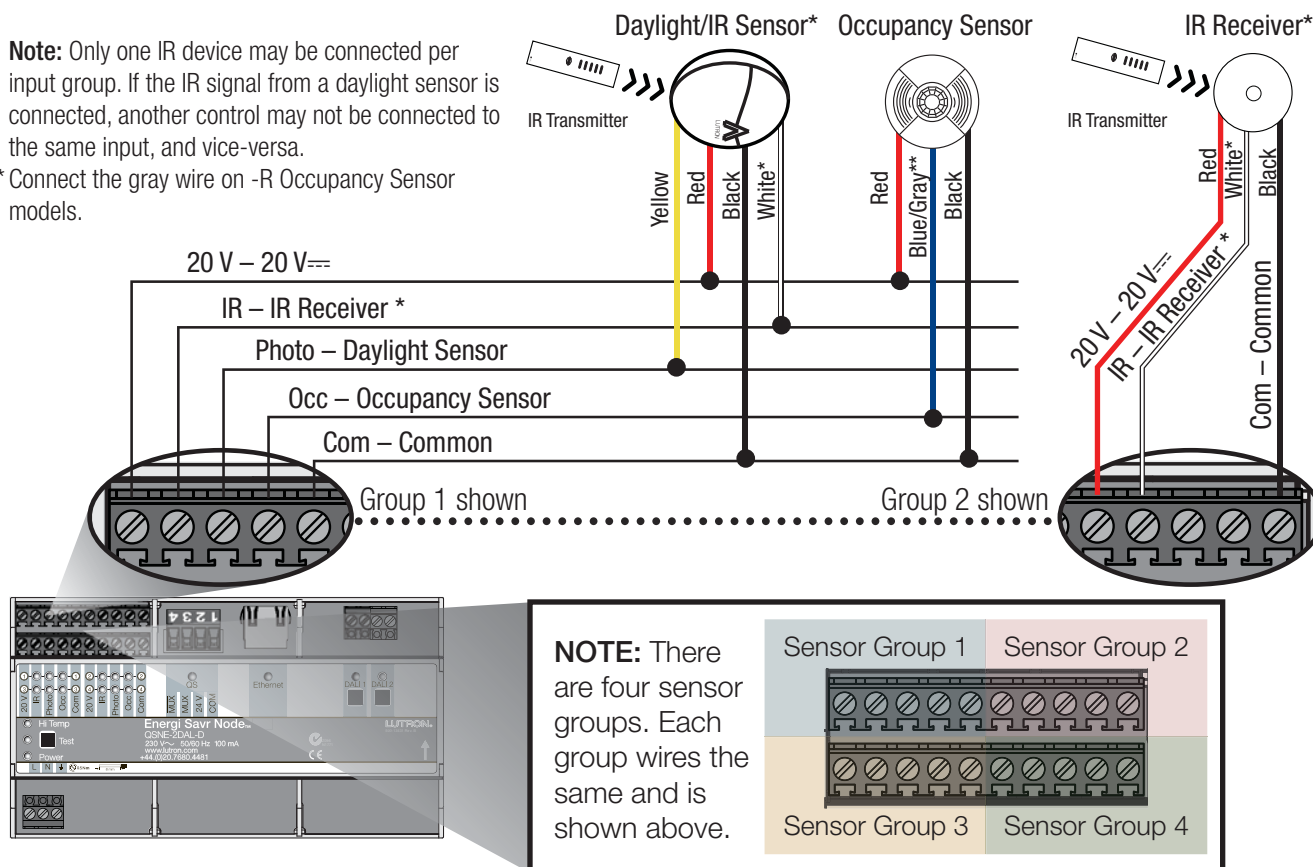
- Receiver must be placed within 30 m of the Energi Savr Node™ unit.
- One IR Receiver can be wired to each input group.
- If a daylight sensor and IR receiver are connected, do not connect the daylight sensor's IR output (white wire).

Daylight Sensor

- Connect the four conductors to the four terminals as shown.
- Terminals:
Red = 20 V==
Black = Common
White = IR
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.

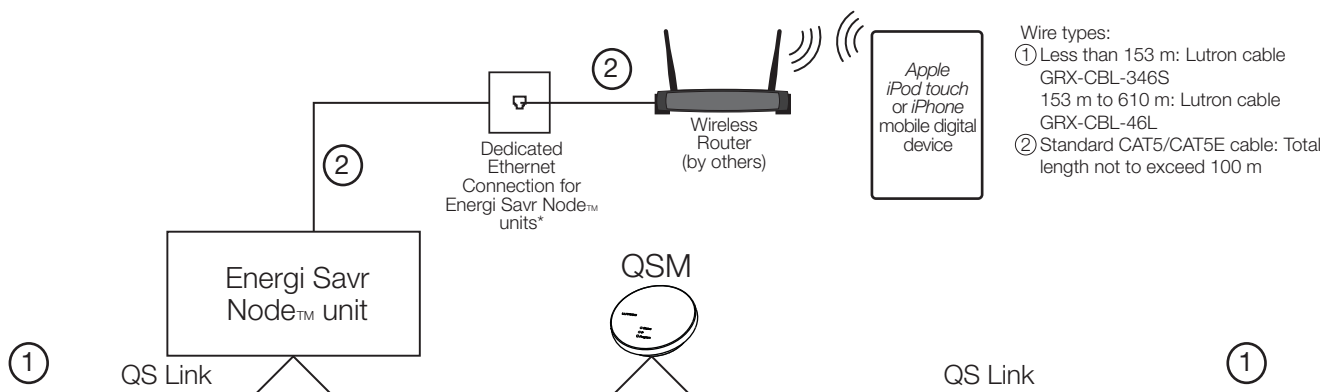
** Connect the gray wire on -R Occupancy Sensor models.



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.



* 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 App Store* online marketplace.

Lutron Qualified DALI Ballasts

All DALI ballasts connected to Lutron® DALI controllers must be tested to meet the DALI standard (IEC Standard 60929). Although many devices claim compliance with the DALI standard, many fail when tested using a DALI standard device tester.

For a complete list of Lutron® qualified DALI ballasts please refer to Application Note #482 for more information.

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LUTRON® SPECIFICATION SUBMITTAL

Page

Job Name:	Model Numbers:
Job Number:	