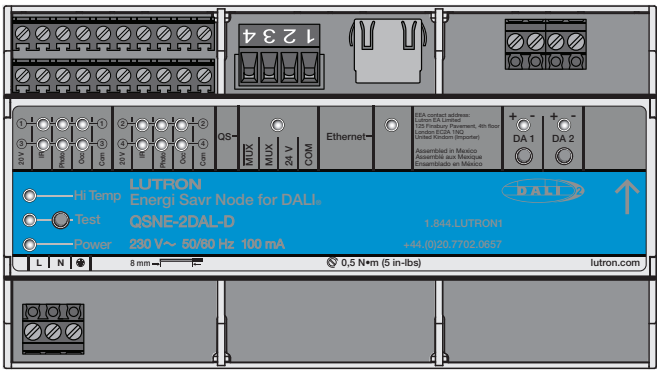
369243l 1 06.12.20

Energi Savr Node for DALI®

The Energi Savr Node unit is a DALI-2® certified single master DIN-rail mounted application controller for DALI®-compliant digital addressable loads. It provides DALI® bus power and control for two independent DALI® buses with up to 64 DALI®-compliant digital addressable dimming loads 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

- Single master application controller
- Provides power for two buses of DALI®-compliant digital addressable dimming loads. 128 mA guaranteed current, 250 mA maximum supply current per bus.
- Supports up to 16 DALI® groups on each DALI® bus.
- Supports both non-maintained and maintained DALI® self-contained emergency fixtures when part of a Quantum system. (The Quantum software identifies DALI® Emergency fixtures using the fixture manufacturer specified identification method, can modify prolong time, and can activate and monitor the driver's function self test, and duration self test). See Lutron's spec for DALI® Emergency software: www.lutron.com/TechnicalDocumentLibrary/369551_QSW-DEM-PP-A.pdf
- Supports two channel tunable-white applications (one channel color temperature control and one channel light intensity control) with Quantum V3.4.
- Lamp and control gear failure reporting
- Single channel control gear auto replacement
- Field configurable system failure level, min and max levels, fade rate, and fade time.
- 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.

DALI® Compatibility

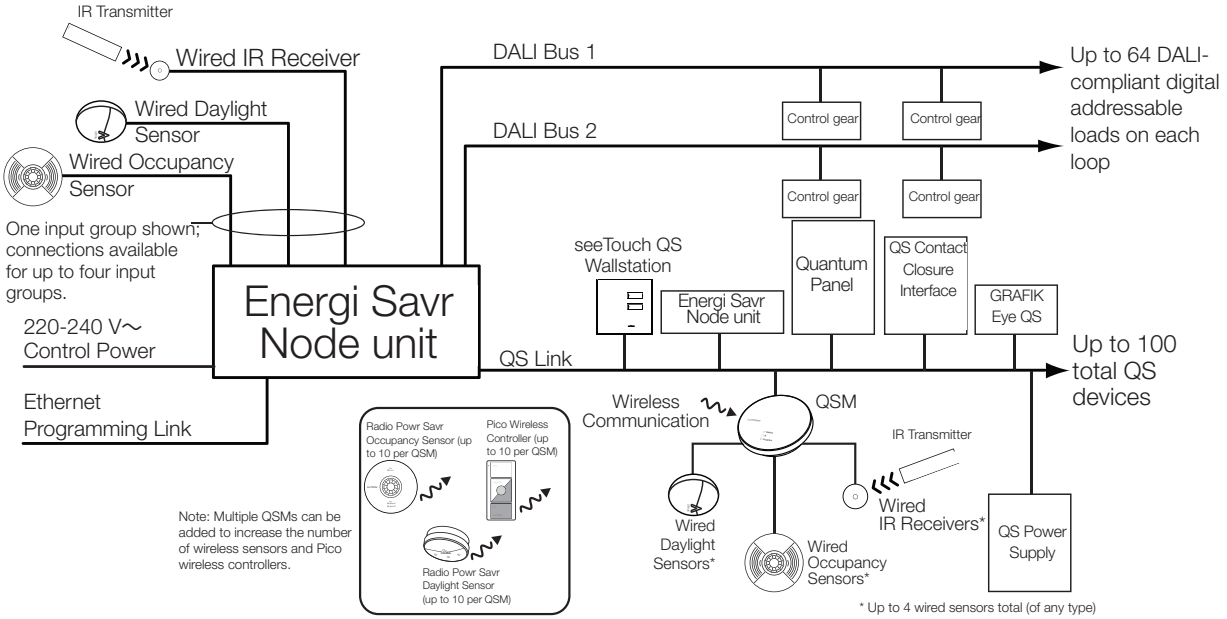
The Lutron DALI® Energi Savr Node (ESN) is DALI-2® certified by the Digital Illumination Interface Alliance (DiiA)®. In order to ensure compatibility with Lutron DALI® controllers, the connected DALI® LED drivers and fluorescent ballasts must be DALI-2® certified and marked. In addition to compatibility, it is important to select high-quality and high-performance LED drivers and fluorescent ballasts. DALI-2® certified devices are readily available from many manufacturers and are tested for compatibility with the standard. For a complete list of available DALI-2® certified devices, see the DiiA® website at https://www.digitalilluminationinterface.org/products. DALI® devices that are not listed on the DiiA® website and are not marked DALI-2® cannot be considered DALI-2® certified.

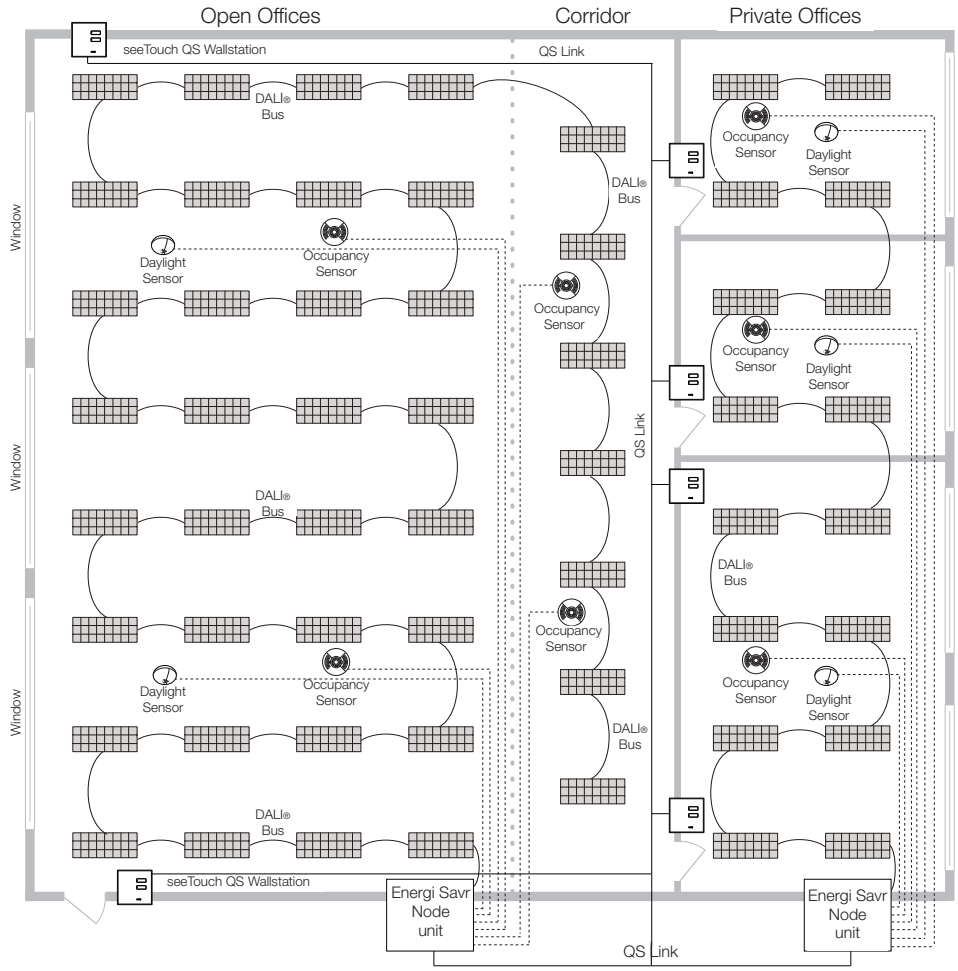
The DALI® version-1 standard does not ensure compatibility. To apply the original DALI® version-1 mark on LED drivers and fluorescent ballasts, no verification of the test results was required, and manufacturers could self-declare compliance and apply the DALI® mark. If you would like to use an LED driver or fluorescent ballast that is not DALI-2® certified but carries a DALI® version-1 logo, Lutron recommends that these devices be tested to ensure compatibility. Lutron is able to perform this testing on request. Samples of the drivers and light engines must be submitted to Lutron and the expected turnaround time is 6 to 8 weeks after the drivers are received. Fees for testing may apply. Lutron recommends that this testing be performed before the fixtures and lighting controls are purchased and installed. Contact your Lutron sales representative for more information.

LUTRON SPECIFICATION SUBMITTAL Page 1

Job Name:	Model Numbers:	
Job Number:		

Typical Application: Requires commissioning

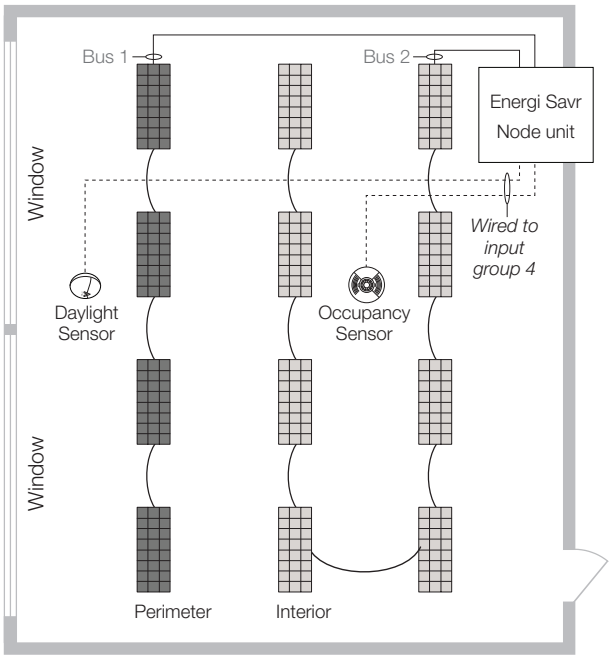




Job Name:	Model Numbers:	
Job Number:		

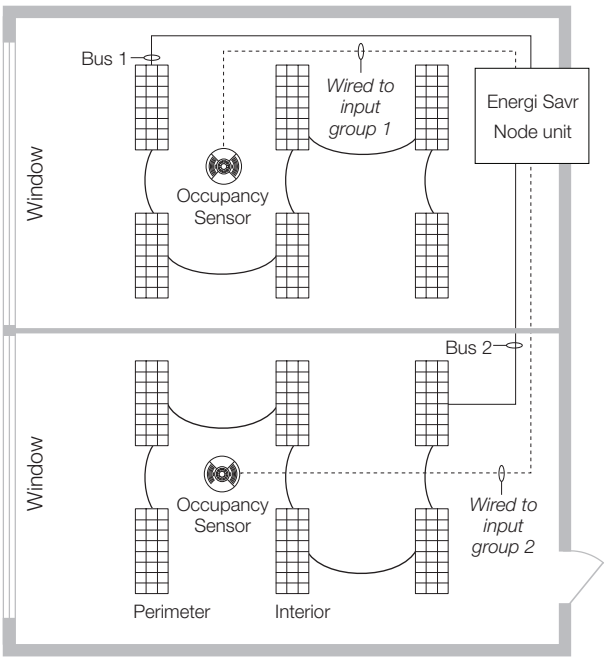
369243I 3 06.12.20

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 control gear programming for ease of single or multiple control gear 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 control gear 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 6000 V~ and current surges of up to 3000 A.
- DALI® Bus Output: 18 V⎓ 128 mA guaranteed supply current, 250 mA maximum supply current per bus.

Standards

- IEC 60669-2-5
- DALI-2® certified
- Lutron Quality Systems registered to ISO 9001:2015.
- 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 mm^2 to 4.0 mm^2 (12 AWG to 18 AWG)
- DALI® Bus Wiring: 0.5 mm^2 to 4.0 mm^2 (12 AWG to 22 AWG)
- QS Link Wiring: 0.5 mm^2 to 4.0 mm^2 (12 AWG to 22 AWG)
- Input Wiring: 0.5 mm^2 to 2.5 mm^2 (14 AWG to 22 AWG)

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).
- For more information on mounting and installation in panels with integrated DIN rail see Lutron P/N 048466 at www.lutron.com

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 the **Programming Options** section for further information.

DALI® Buses

- Up to 64 DALI® compliant dimming loads on each bus can be addressed and grouped into 16 zones.
- Energi Savr Node unit has an integrated bus power supply that provides a guaranteed current of 128 mA (maximum of 250 mA) to power each bus.
- Energi Savr Node unit is a single master controller and therefore no other controllers may exist on the same DALI® bus.
- Some DALI® loads may be polarity sensitive; refer to individual manufacturers' specifications for proper connection to the DALI® bus.
- Short circuit protection with automatic re-start.

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 P/N 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.

Job Name:	Model Numbers:	
Job Number:		

369243I 5 06.12.20

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.

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 (Lutron P/N 369242) 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 *(continued)*

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.

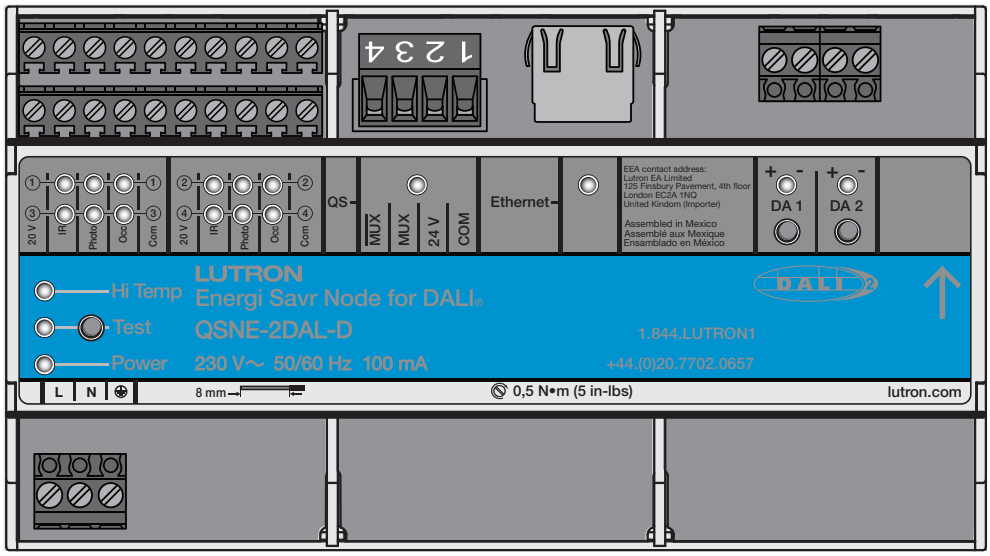
Communication with QSE-IO

- 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

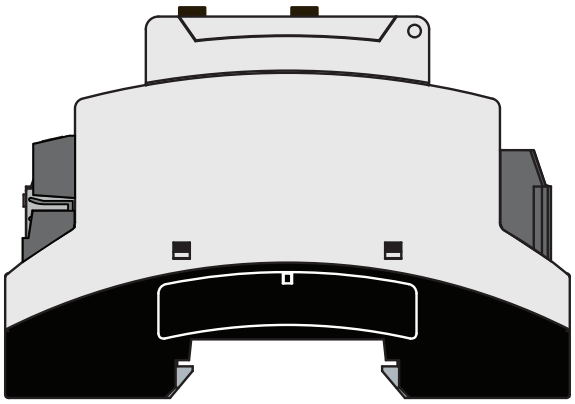
- Integrate Energi Savr Node units with touchscreens, PCs, A/V systems or other digital systems and devices.

Mechanical Dimensions



89.7 mm

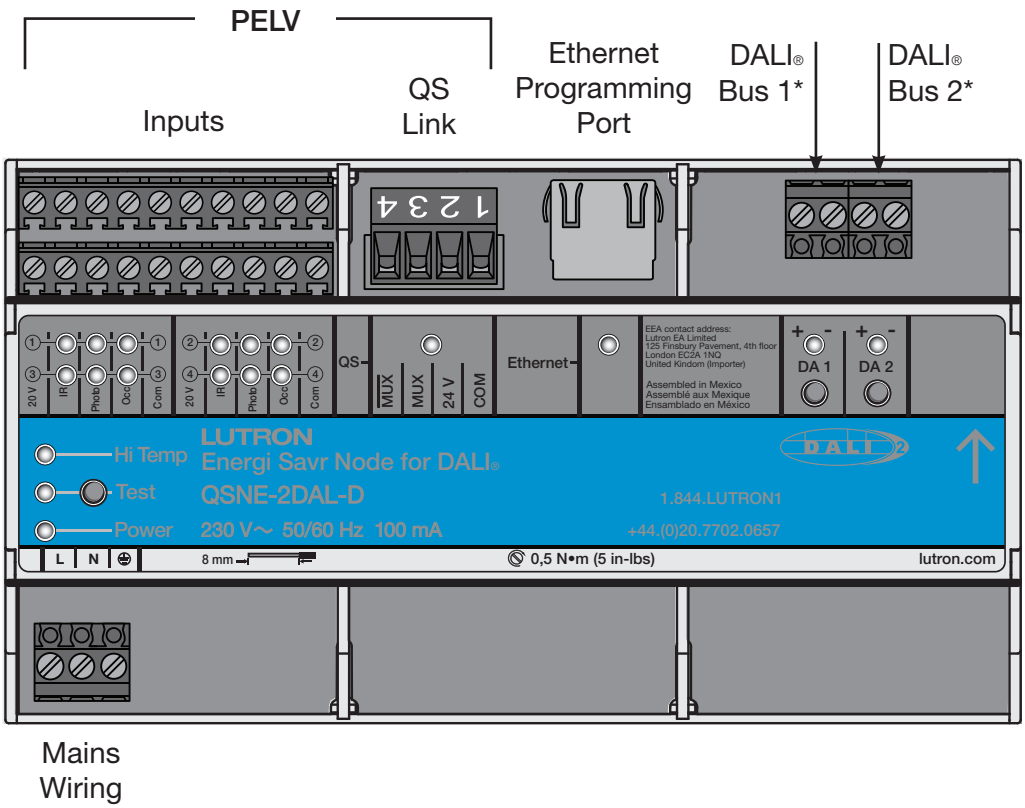
161.7 mm



60.6 mm

Job Name:	Model Numbers:	
Job Number:		

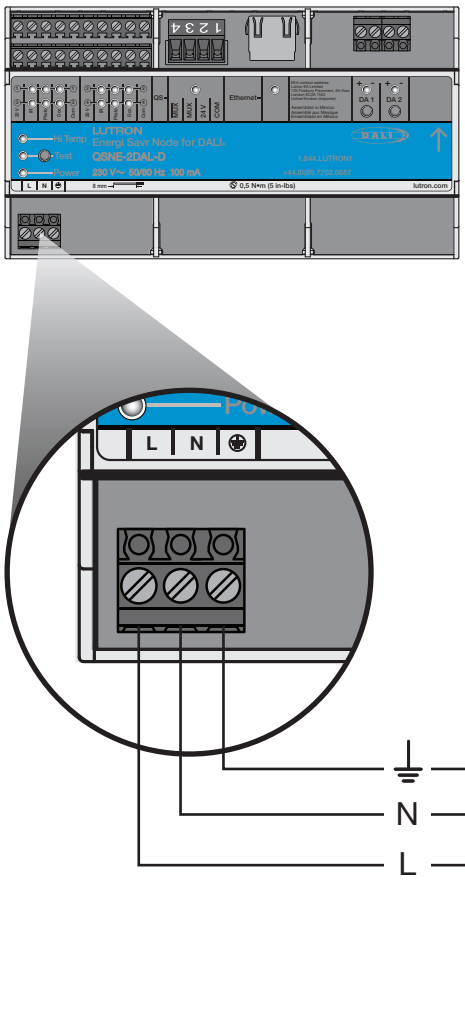
Overview of Wiring Terminals



* Wire DALI® according to local codes.

Job Name:	Model Numbers:	
Job Number:		

Wiring: Mains Voltage



⏚ – Earth / Ground

N – Neutral

L – Mains / Line

Wiring from Distribution to Bus Supply

- Turn off breaker at distribution panel.
- Run line, neutral, and ⏚ wires from a 220–240 V~ 50/60 Hz feed to the Energi Savr Node unit.

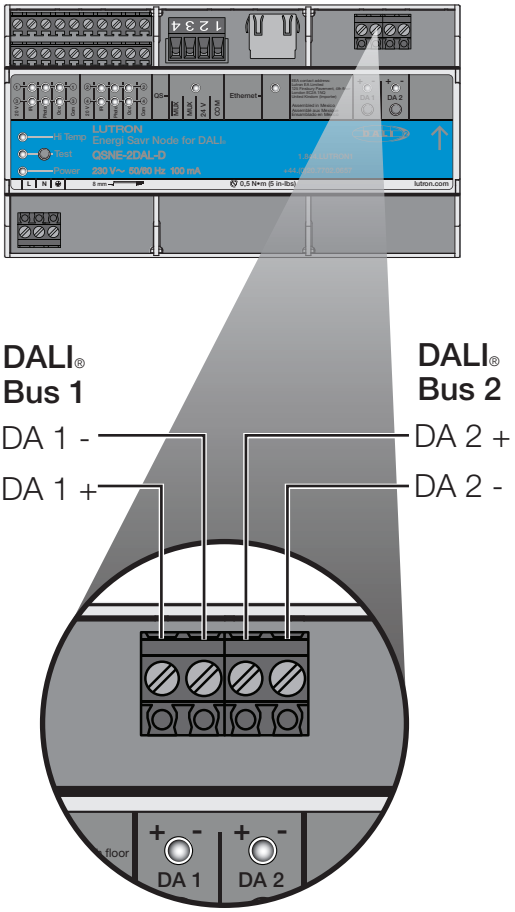
Emergency Lighting Applications

- Use normal (non-essential) power only.
- When normal power drops out, the Energi Savr Node unit will not power the DALI® buses. When this occurs, control gear 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 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 DALI®-compliant digital addressable loads per bus.

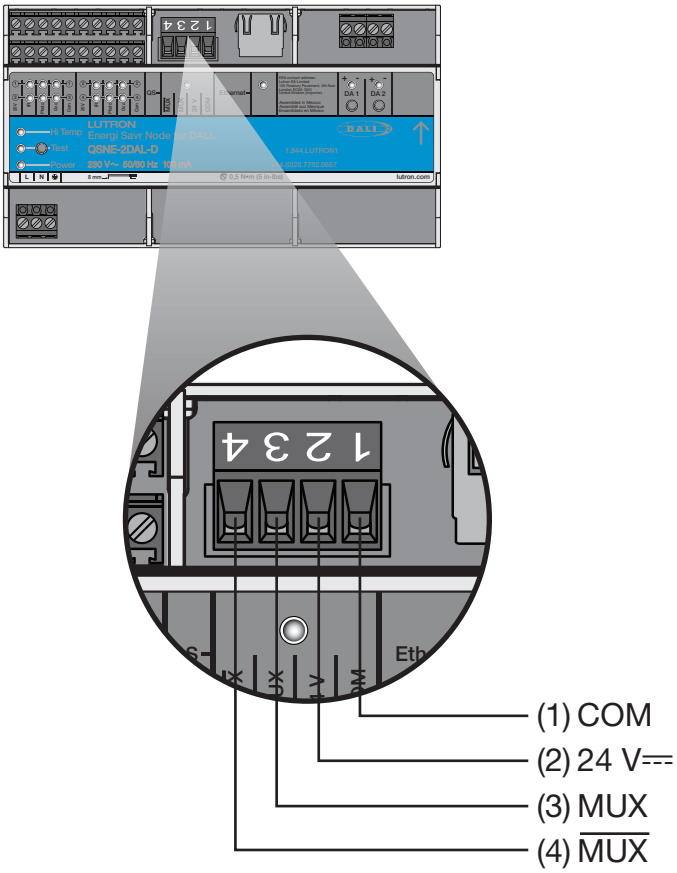
DALI® Wiring

- 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 mm² (16 AWG)	300 m
0.75 mm² (20 AWG)	150 m
0.50 mm² (22 AWG)	100 m

Job Name:	Model Numbers:	
Job Number:		

Wiring: QS Link



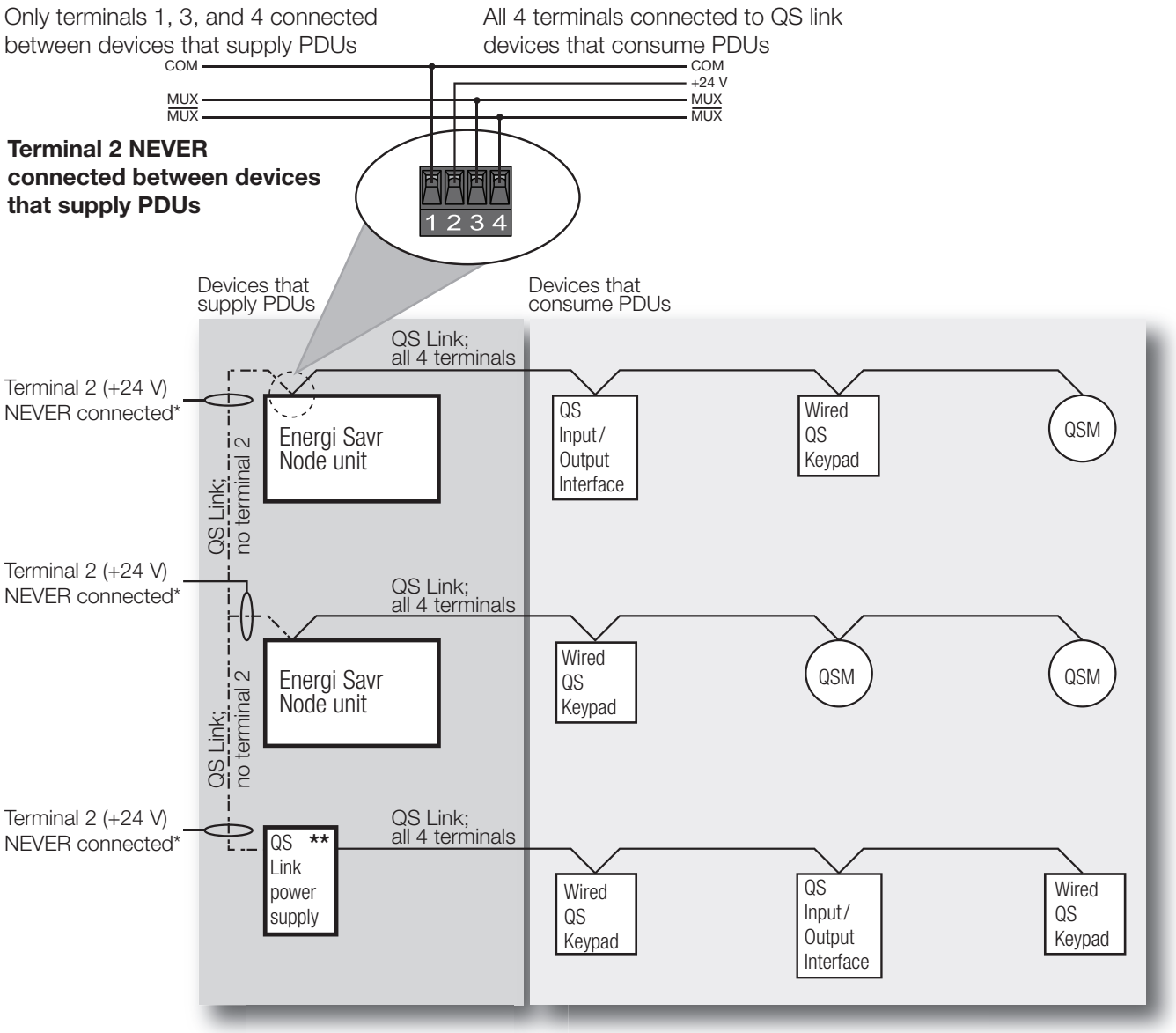
IEC PELV QS Link Wiring

- 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 610 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 mm² (18 AWG)	GRX-CBL-346S (non plenum) GRX-PCBL-346S (plenum)
	Data (terminals 3 and 4): 1 pair 0.5 mm² (22 AWG), twisted and shielded	
153 m to 610 m	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 pair 0.5 mm² (22 AWG), twisted and shielded	

- Use one, twisted-shielded pair of 0.5 mm² (22 AWG) for data link (MUX, $\overline{\text{MUX}}$).

Wiring: QS Link *(continued)*



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.

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 0.5 mm^2–2.5 mm^2 (12 AWG–22 AWG) 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)

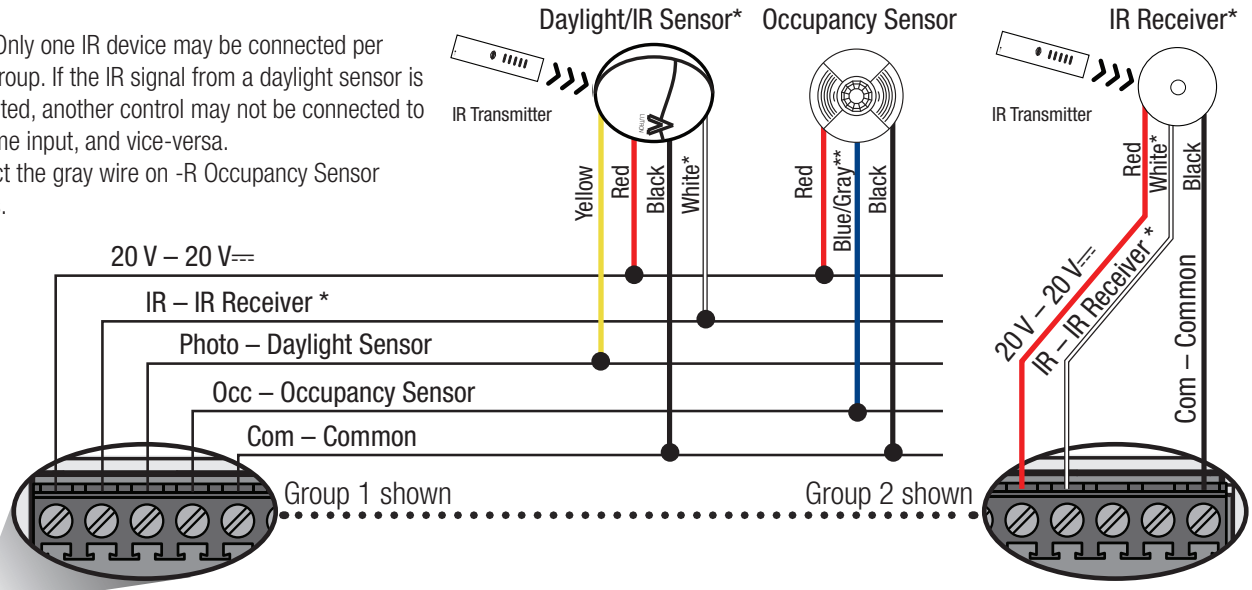
- Receiver must be placed within 30 m of the Energi Savr Node unit.
- One IR Receiver can be wired to each input group.
- If a daylight sensor and IR receiver are connected, do not connect the daylight sensor's IR output (white wire).

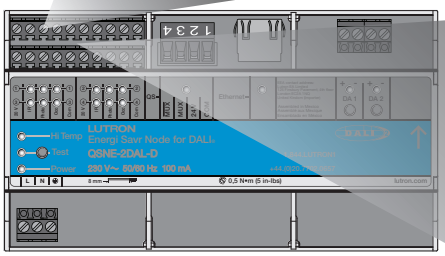
Daylight Sensor

- Connect the four conductors to the four terminals as shown.
- Terminals:
  Red = 20 V⎓ 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 (Lutron P/N 369262) to properly locate the sensor.
- Do not place the sensor above pendants, fixtures, directly below lighting fixtures, or within skylight wells.

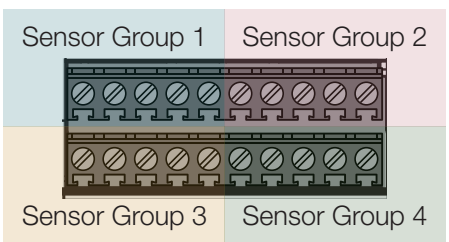
* **Note:** Only one IR device may be connected per input group. If the IR signal from a daylight sensor is connected, another control may not be connected to the same input, and vice-versa.

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





NOTE: There are four sensor groups. Each group wires the same and is shown above.

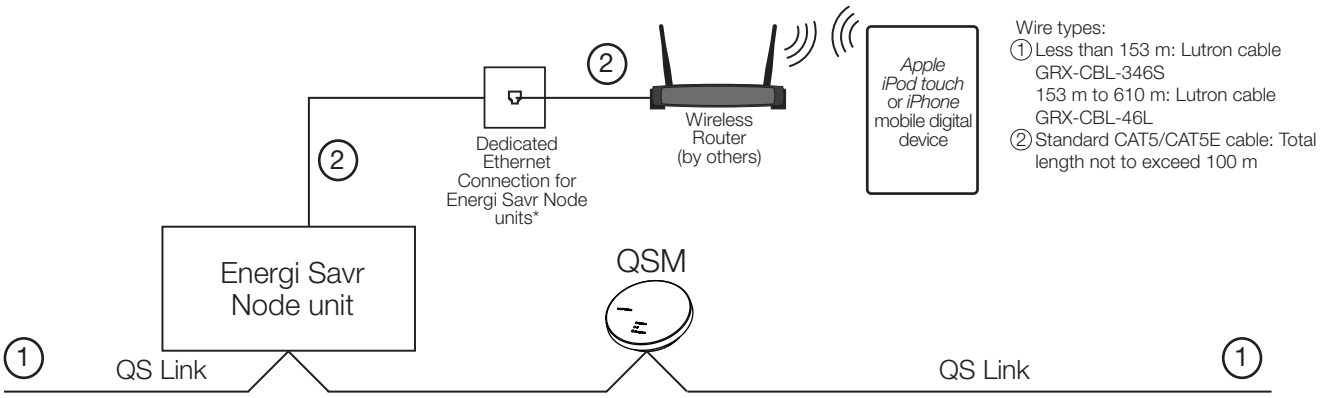


Job Name:	Model Numbers:	
Job Number:		

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.



* **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.

Job Name:	Model Numbers:	
Job Number:		