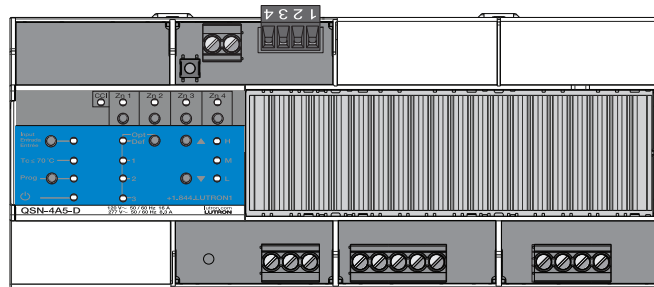


Energi Savr Node PRO LED+ Phase Adaptive Power Module

The Energi Savr Node (ESN) family is a group of modular products for the control of lighting loads and motor loads.

This document describes the following product:
QSN-4A5-D: 4-zone power module for phase control dimming of lighting loads



QSN-4A5-D

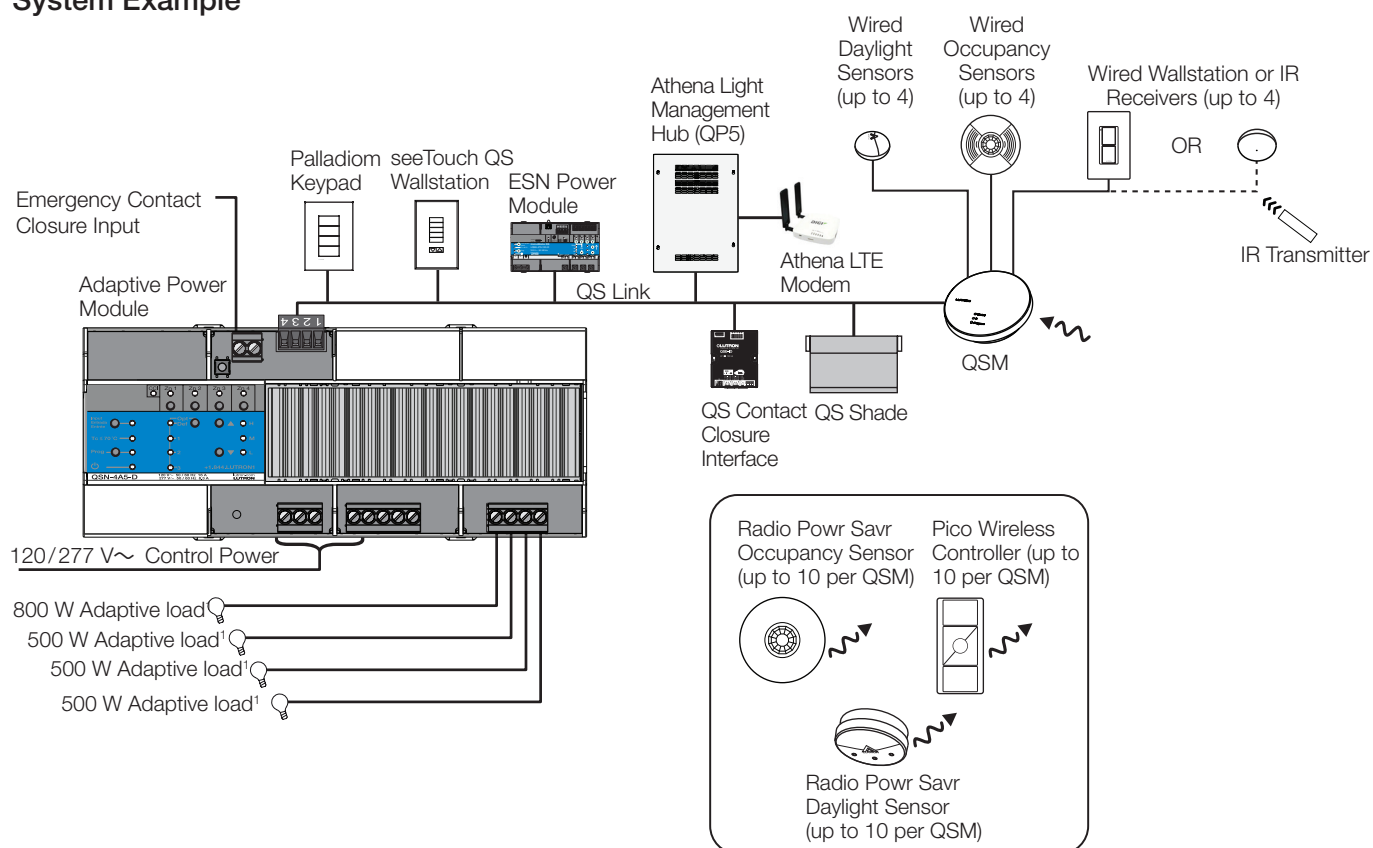
Features

- PRO LED+ Phase Adaptive power modules can be used in an Athena system.
- Includes QS link for seamless integration of lights and controls.
- An auto-detect mode is available to detect and configure forward-phase or reverse-phase dimming for incandescent/halogen, electronic/magnetic low-voltage and neon/cold cathode light sources.
- A locked forward-phase or reverse-phase mode is available.
- Controls dimmable LED loads. Refer to www.lutron.com/ledtool for compatibility with dimmable LED light sources.
- NEMA SSL 7A-2015 compliant for compatibility with solid state lighting.
- RTISS technology compensates for incoming line-voltage variations such as changes in Root Mean Square (RMS) voltage, frequency shifts (up to $\pm 2\%$ change in frequency/second), harmonics and line noise.
- RTISS-TE technology allows for true instantaneous voltage compensation for incoming line-voltage variations. Only operates in reverse-phase when "voltage-comp." is enabled.
- RTISS-ICM technology is able to withstand high-inrush LEDs, bulb blowouts, and direct shorts
- Provides air gap off (when all zones are off).
- Integral protection for common temporary over-current and over-voltage conditions.
- LEDs on the module provide diagnostic information.
- Buttons on the module provide override control.
- Emergency contact closure input (CCI).
- Evaluated by UL® for use in emergency lighting systems in accordance with UL924 when paired with a LUT-ELI-3PH (UL® file E234628).
- Power failure memory automatically returns the outputs to the levels they were set to prior to a power outage.

Job Name:

Model Numbers:

Job Number:



¹ See "Output Zone Ratings" in "Specifications" section, for specific load types ratings.

² Up to 4 wired sensors total (of any type) per QSM.

³ The maximum number of daylight sensors (wired and wireless) that an ESN module can support is 4 (1 per zone).

Job Name:	Model Numbers:
Job Number:	

Specifications

Adaptive Power Module

Power

- 120 V~ 50/60 Hz, 16 A maximum total input current
- 277 V~ 50/60 Hz, 8.3 A maximum total input current
- 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.

Regulatory Approvals

- Lutron Quality Systems registered to ISO 9001.2015
- cULus Listed
- NOM Certified
- ICES-5(B)/NMB-5(B)
- FCC Class B
- NEMA SSL 7A-2015

Environment

- See **Mounting** on page 6 for thermal specifications.
- Relative humidity: less than 90% non-condensing.
- For indoor use only.

Output Zone Ratings

- Each zone has no minimum load requirement.
- When programmed to "auto detect" mode, the module starts in reverse-phase and if an incompatible load is detected, it will convert to forward-phase.
- Internal relay provides an air gap off when all zones are off.
- One load type per zone.
- Output must not be used to control receptacles. If controlling plug-in lamps, installation must ensure a method of preventing non-rated loads being plugged into the module. An example is a dedicated receptacle with an alternate plug load such as a Duplex Dimming Receptacle (NTR-15-DDTR-WH) and Dimming Lamp Plug (RP-FDU-10-WH). For a full model list, please refer to Lutron P/N 369269 at www.lutron.com

- Output must be directly connected to the load.
- Output breakers or switches must not be used.
- Run a separate neutral for each load circuit. A common neutral connection is not recommended.
- The module may be powered by Ground Fault Circuit Interrupter (GFCI) or Arc Fault Circuit Interrupter (AFCI) if required. If using a GFCI or an AFCI incorporating GFCI protection, maximum wire length between the module and the load must be less than 100 ft (30 m). Load circuit wiring (from breaker to module to load) must be run in its own non-metallic conduit, or nuisance tripping may occur.
- For applications requiring 0–10 V_{DC} control, use Ten Volt Interface (GRX-TVI) or the QSN-4T5-120-D.
- For applications requiring higher wattage ratings, use a power booster (PHPM-PA-120-WH, PHPM-PA-DV-WH, or PHPM-PA-277/DV).
- For dimmable loads only. For applications requiring switching control, use a PHPM-SW-DV-WH interface or the QSN-4S8-120-D.
- Works up to the output current rating with all dimmable LED drivers whose inrush current does not exceed NEMA410 standards for electronic ballast/driver.

Job Name:

Model Numbers:

Job Number:

Specifications *(continued)*

Output Zone Ratings *(continued)*

Each zone is rated for the following wattage and load types^{A, B}:

120 V~ Ratings: 16 A maximum per module		
Load Type	Zone 1 Rating	Zone 2, 3 and 4 Rating (per zone)
LED (reverse-phase) ^B	6.6 A	4.2 A
Lutron Hi-lume A-series LTE ^F	4.0 A (20 drivers maximum)	3.0 A (13 drivers maximum)
LED SSL7A-2015 (forward-phase) ^E	400 W	200 W
Incandescent/Halogen, ELV	800 W	500 W
Neon/Cold Cathode, MLV ^D	800 VA (600 W ^C)	500 VA (380 W ^C)
277 V~ Ratings: 8.3 A maximum per module		
Load Type	Zone 1 Rating	Zone 2, 3 and 4 Rating (per zone)
LED (reverse-phase) ^B	2.9 A	1.8 A
Incandescent/Halogen, ELV	800 W	500 W
Neon/Cold Cathode, MLV ^D	800 VA (525 W ^C)	500 VA (375 W ^C)

^A Additional load type options are available in the programming software suite, some may require an interface. Contact Lutron for details.

^B Works with all dimmable LED drivers whose inrush current does not exceed NEMA410 standards for electronic ballast/drivers. Refer to www.lutron.com/ledtool for specific LED compatibility information and recommended LED light sources.

^C Actual lamp wattage.

^D Only use iron core transformers intended for use with an electronic switch or dimmer per Clause 8.3 of IEC/EN 60669-2-1.

^E Complies with SSL7A-2015 when configured in the programming software suite to LED forward phase with low-end trim set to 10% and high-end trim set to 90%.

^F Load type must be set to "Hi-lume 1% 2-Wire LTE LED", with low-end trim = 32% and high-end trim = 78%. Setting the proper trim and load type is necessary to ensure optimal performance and 1% dimming capability.

Job Name:	Model Numbers:
Job Number:	

Specifications *(continued)*

Terminals (Torque, wire gauge & type ratings)

- Mains wiring: 5 in-lbs (0.6 N•m)
14 AWG to 10 AWG (2.5 mm² to 4.0 mm²)
(single wire, solid or stranded)
- Zone wiring: 5 in-lbs (0.6 N•m)
14 AWG to 10 AWG (2.5 mm² to 4.0 mm²)
(single wire, solid or stranded)
- CCI wiring: 5 in-lbs (0.6 N•m)
20 AWG to 10 AWG (0.5 mm² to 4.0 mm²)
(single wire, solid or stranded)
20 AWG to 16 AWG (0.5 mm² to 1.5 mm²)
(two wires, solid or stranded)
- QS link: 5 in-lbs (0.6 N•m)

Power (terminal 1):

22 AWG to 12 AWG (0.25 mm² to 2.5 mm²)
(single wire, solid or stranded)

22 AWG to 18 AWG (0.25 mm² to 1.0 mm²)
(two wires, solid or stranded)

Data (terminals 3 and 4):

1 pair, twisted and screened,

22 AWG to 12 AWG (0.25 mm² to 2.5 mm²)
(single wire, solid or stranded)

22 AWG to 18 AWG (0.25 mm² to 1.0 mm²)
(two wires, solid or stranded)

Programming and Compatibility Requirements

- Setup and programming of the Phase Adaptive Power Module is done through the Athena programming software.
- Athena software version 20.4 or higher is required.

QS Link Limits

- Each power module counts as one device toward the QS link device limit, and four switchlegs toward the switchleg limit.

Out of Box Functionality

This section describes the default functionality when the module is first installed.

Emergency Contact Closure Input (CCI)

- Normal mode: The unit can dim loads as normal and respond to button presses, occupancy sensors, daylight sensors, timeclock events and preset scene calls.
- Emergency mode: When the Emergency CCI is open, the unit will override the light output to its emergency level and enter lockout mode. It will not respond to any button presses, occupancy sensors, daylight sensors, timeclock events, or preset scene calls.
- Return from Emergency mode to Normal mode: Once the Emergency CCI is closed or jumpered, the zones will return to the previous light level and it will again respond to button presses, occupancy sensors, daylight sensors, timeclock events, and preset scene calls.

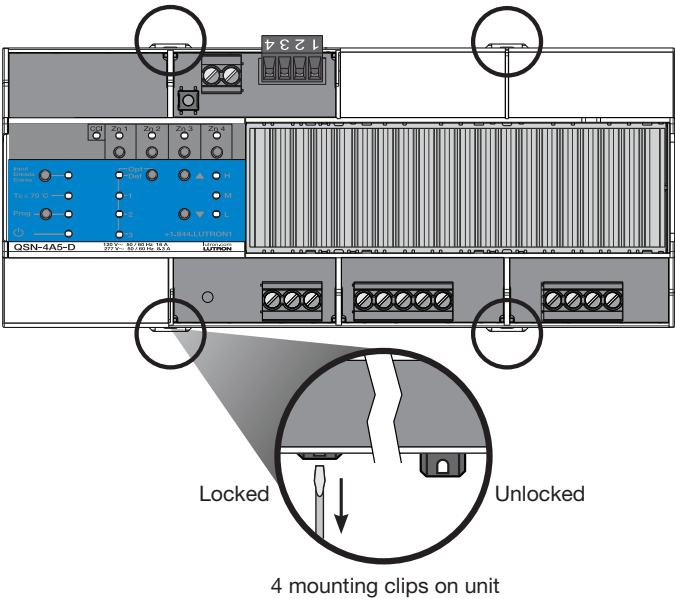
Normal Mode Operation

- By default each zone is set to an Auto Detect load type with ON and OFF control only. Each zone will turn load ON or OFF until it is configured via module programming.
- Zone and raise/lower buttons on the unit can be used to:
 - Turn loads ON and OFF.
 - Dim loads up and down after they are configured in programming utility.

Job Name:	Model Numbers:
Job Number:	

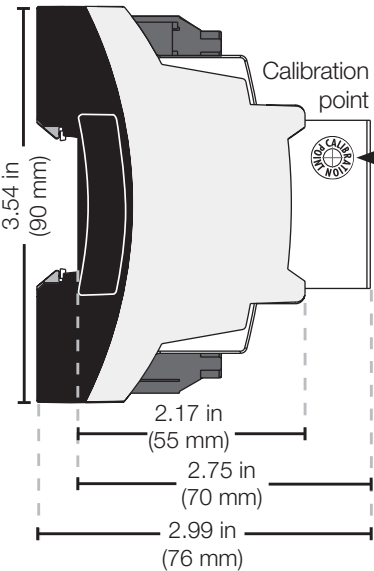
Mounting

- Module is 12 DIN modules wide, 8.5 in (216 mm).
- Mount in a Lutron DIN panel (see Lutron specification submittal 3691183 at www.lutron.com).
- Mount module in orientation shown.
- Mount to DIN rail by pressing the module onto the rail with the clips locked. To remove from rail, unlock clips using a screwdriver.
- Mount the module where audible noise is acceptable (internal relays click).
- Mount in an accessible and serviceable location.
- The module generates heat, maximum 75 BTUs/Hour.
- Mount module such that all the conditions below are met:
 - Room ambient temperature is between 32 °F and 104 °F (0 °C and 40 °C)
 - Calibration point maximum: 158 °F (70 °C)

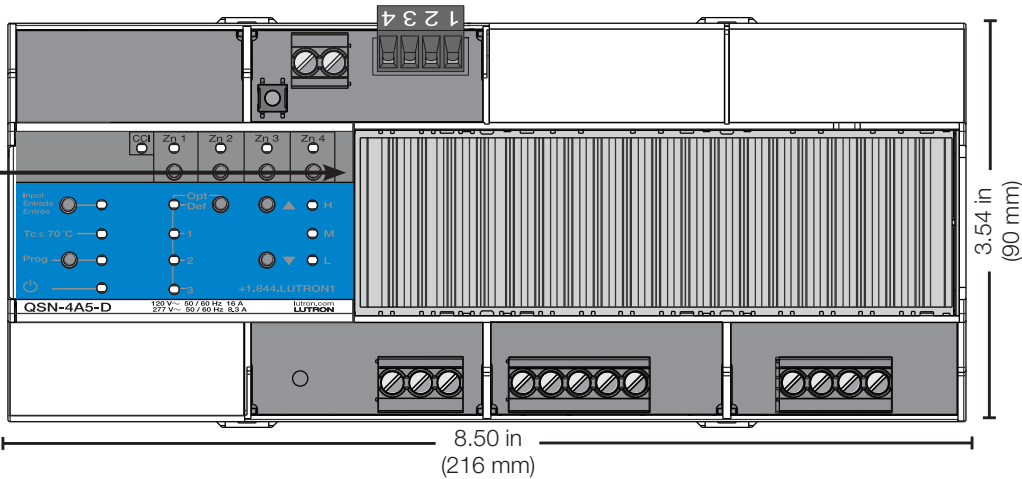


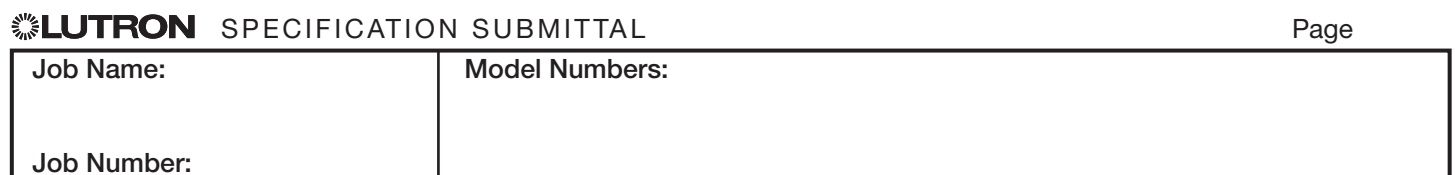
Mechanical Dimensions

Left Side View



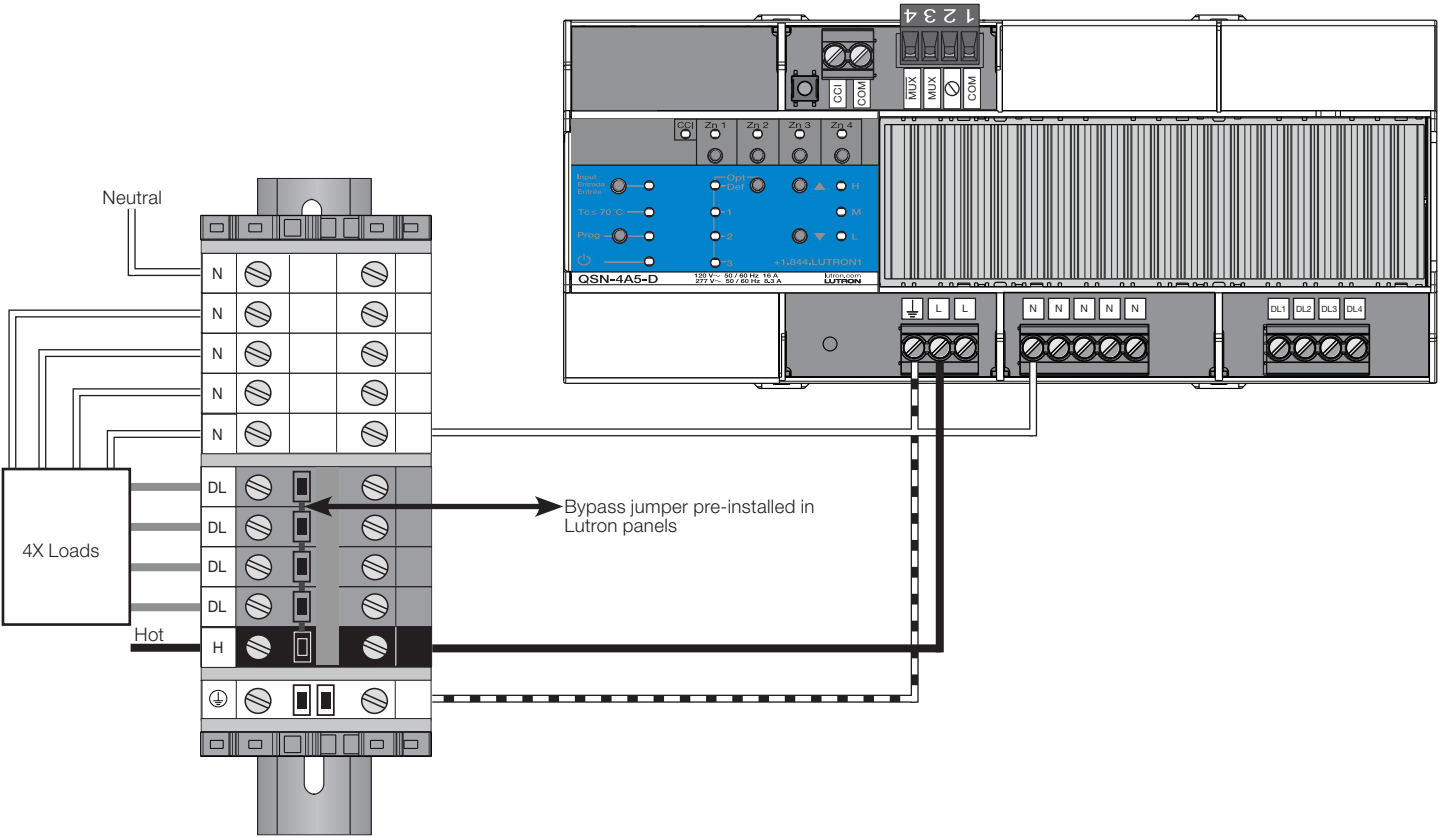
Front View



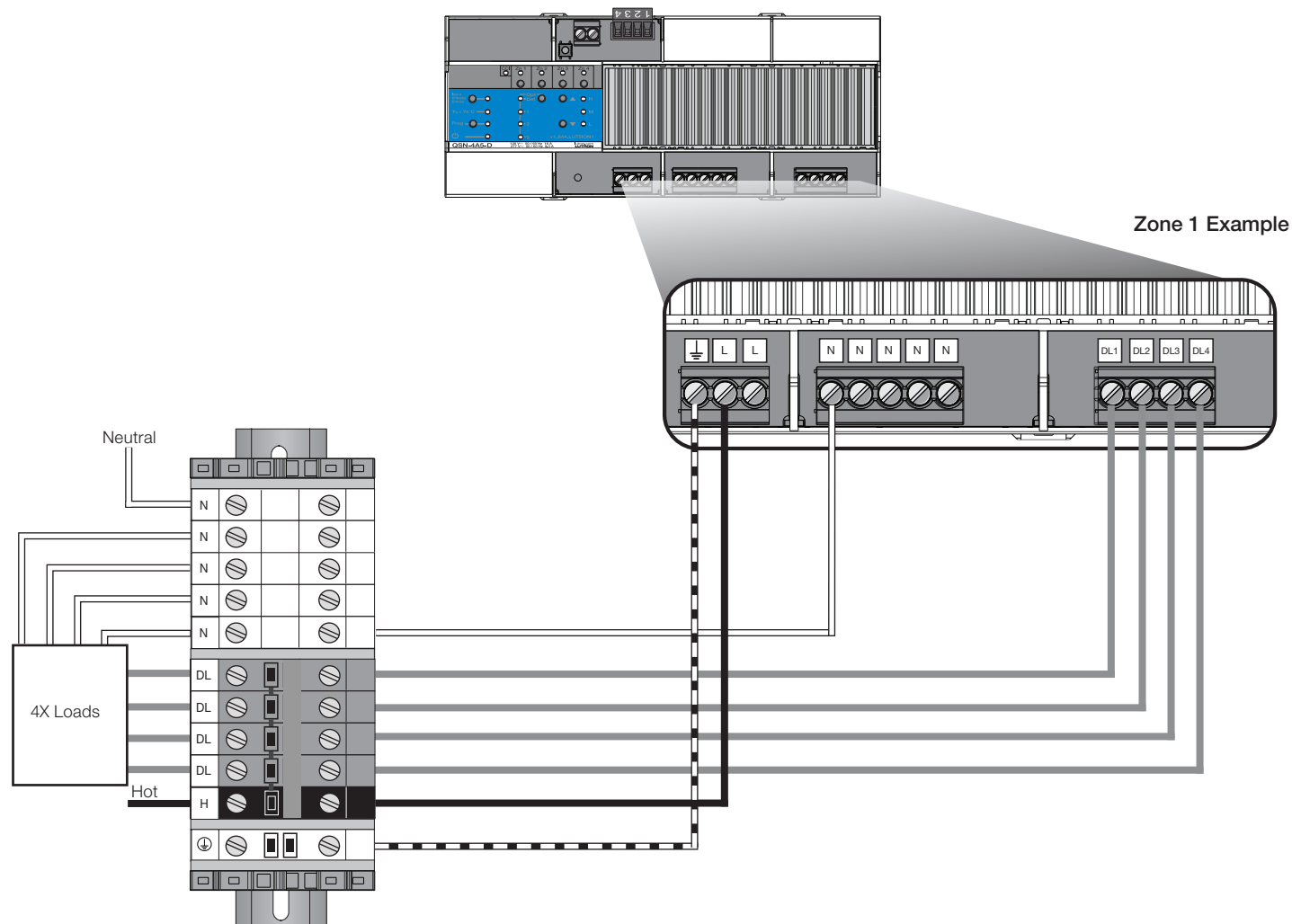


Verify Wiring

- Apply power to loads to identify any load or wiring faults prior to connecting loads to the module.
 - Reference the Lutron panel spec sheets 3691183 at www.lutron.com for alternate wiring verification method. Optional pre-stripped wiring harness sold separately, Lutron P/N PDW-D-DV.
- To verify wiring:
 1. Turn off power.
 2. Connect loads directly to Line/Hot to bypass the module and protect it from wiring faults.
 3. Apply power, ensure the desired loads are powered and properly wired.
 4. Turn off power and connect loads to DL terminals on module for normal operation.



Mains Voltage Wiring



Wiring from Distribution to Module

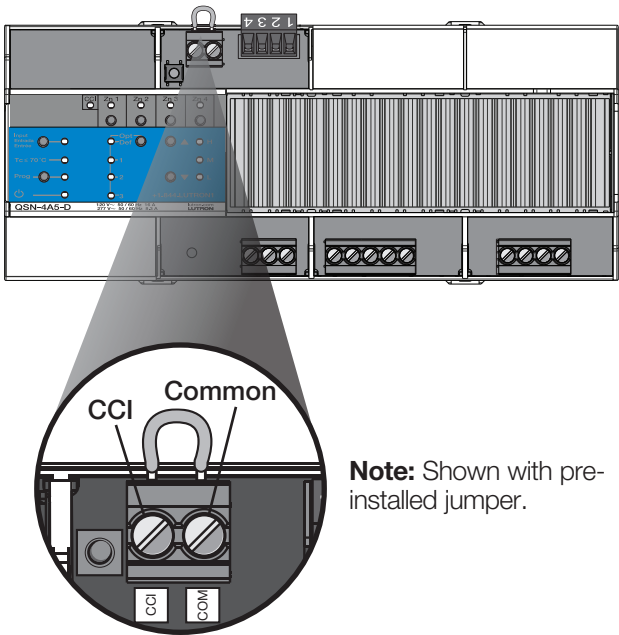
- Turn off all circuit breakers or isolators feeding the module at distribution panel.
- Run line/hot, neutral, and earth (⊕) wires from a 120/277 V~ 50/60 Hz feed to the module.
- Run a separate neutral for each load circuit.

Mains Wiring and NEC® Class 2 Separation

- Follow appropriate local and national codes to ensure proper separation.

Job Name:	Model Numbers:
Job Number:	

Wiring: Emergency Contact Closure Input



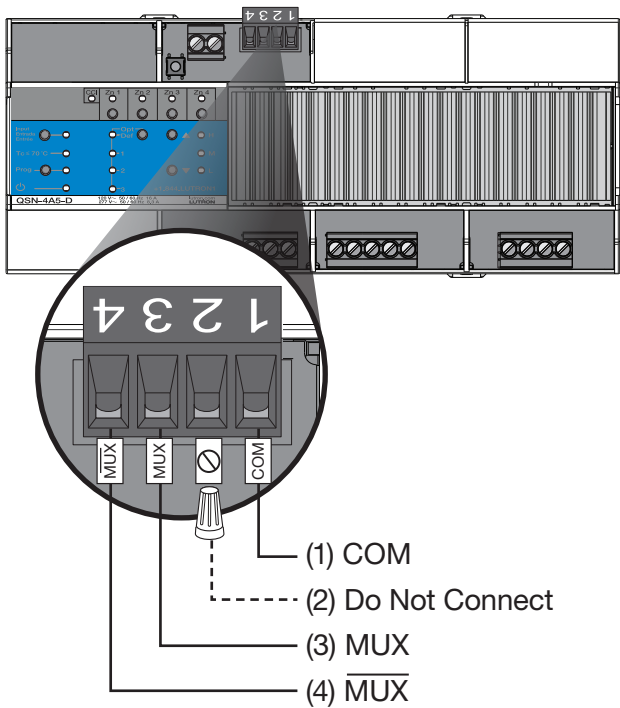
Note: Shown with pre-installed jumper.

NEC® Class 2 Contact Closure Input

- Contact closure input (CCI) wiring is NEC® Class 2.
- Follow all applicable national and local codes for proper circuit separation and protection.
- Turn off all breakers or isolators feeding the module at distribution panel before servicing unit.
- The CCI is a local control only and cannot control other units over the QS link. A maximum of 32 units may be connected in parallel to a CCO device (LUT-ELI-3PH) if the event is intended to affect multiple devices. Refer to Lutron's Emergency Lighting Application Note #106 (P/N 048106) on www.lutron.com for details.
- When in emergency mode, all zone outputs will be at their programmed emergency light level (configurable for each zone, default is 100%). All sensors and controls are locked out.
- Contact Closure Input is normally closed (N.C.). The unit is shipped with a jumper pre-installed.

Note: The unit will default to emergency mode if the CCI is left open. If no contact closure input is required, leave the wire jumper in the CCI terminals.

Wiring: QS Link



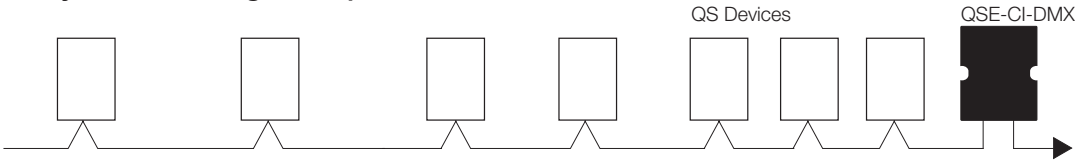
QS Link NEC® Class 2 Wiring

- Follow all applicable national and local codes for proper circuit separation and protection.
- Link communicates using NEC® Class 2 wiring.
- Device does not supply or consume PDUs.
- Wiring may be daisy-chained or T-tapped.
- Do NOT connect terminal 2.
- Optional QS link wiring harnesses sold separately, refer to Lutron specification submittal 3691183 on www.lutron.com for part numbers.

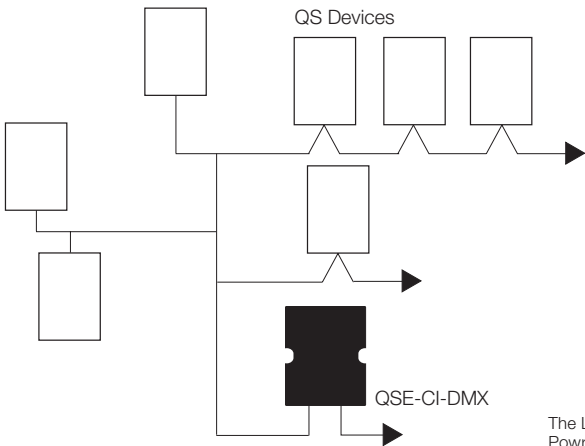
QS Link Wiring Options

Control Link Length	Wire Gauge (for terminals)	Available from Lutron in one cable:
Less than 500 ft (153 m)	Power (terminals 1 and 2): 1 pair 18 AWG (1.0 mm ²)	GRX-CBL-346S (non-plenum)
	Data (terminals 3 and 4): 1 pair 22 AWG (0.5 mm ²), twisted and screened	GRX-PCBL-346S (plenum)
500 ft (153 m) to 2000 ft (610 m)	Power (terminals 1 and 2): 1 pair 12 AWG (4.0 mm ²)	GRX-CBL-46L (non-plenum)
	Data (terminals 3 and 4): 1 pair 22 AWG (0.5 mm ²), twisted and screened	GRX-PCBL-46L (plenum)

Daisy-Chain Wiring Example



T-Tap Wiring Example



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