

## Energi Savr Node 0-10 V $\equiv$ Power Module

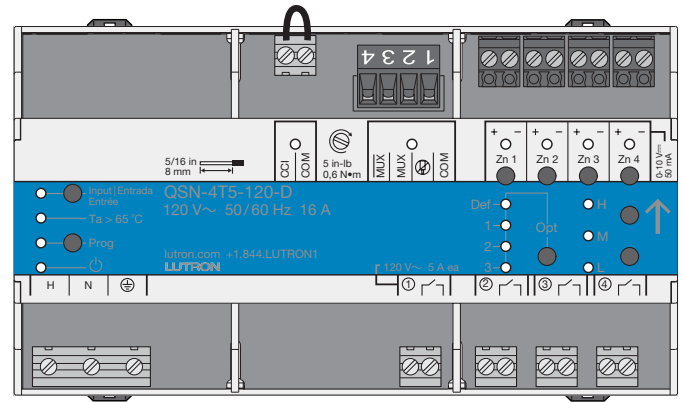
The Energi Savr Node (ESN) family is a group of modular products for the control of lighting loads.

This document describes the following:

QSN-4T5-120-D: 4-zone ESN for 0-10 V $\equiv$ / Switching lighting loads

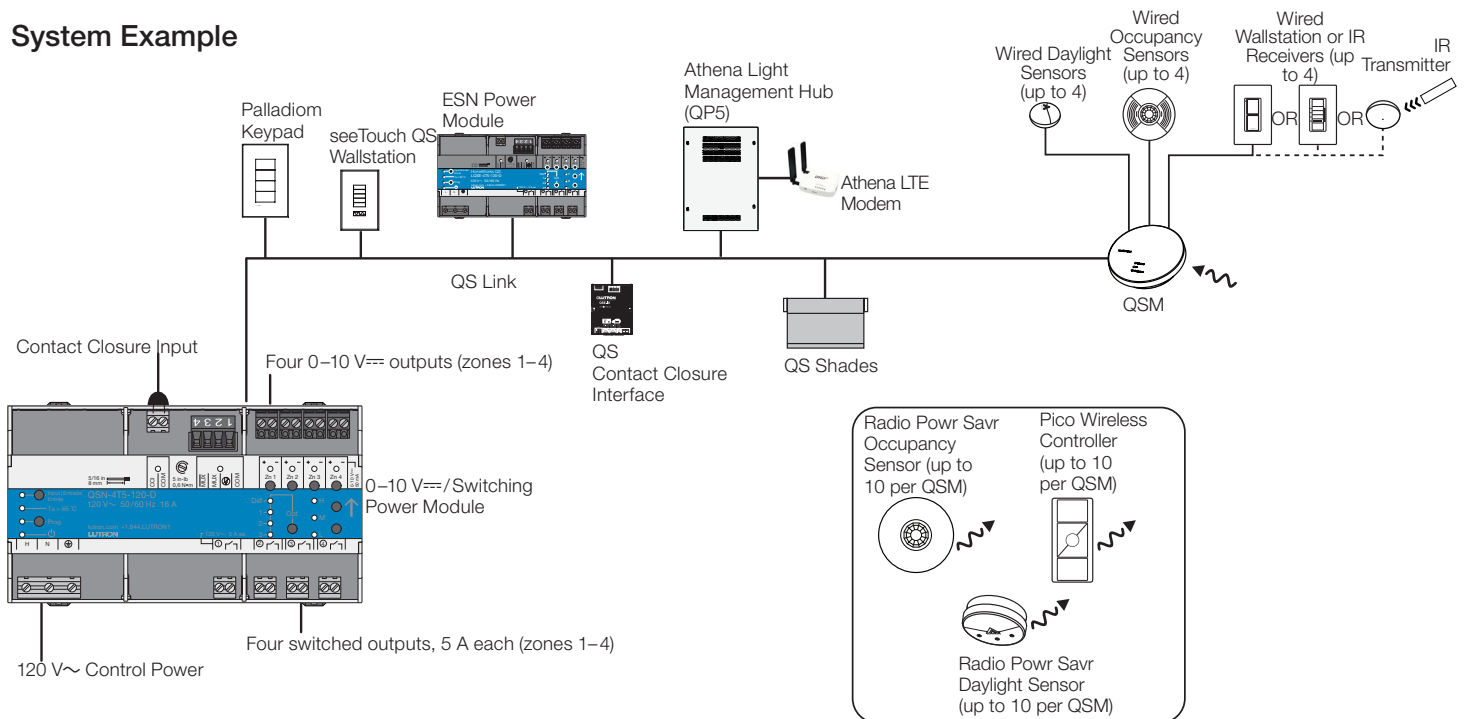
### Features

- 0-10 V $\equiv$  power module can be used in an Athena system.
- Includes QS link for seamless integration of lights and control.
- Auto sink and source capability for 0-10 V $\equiv$  outputs.
- Buttons on the module provide override control.
- LEDs on the module provide diagnostic information.
- 0-10 V $\equiv$  power module can be used for 0-10 V $\equiv$  and switching applications only.
- Emergency contact closure input (CCI).
- Power failure memory automatically returns the outputs to the levels they were set to prior to a power outage.
- Switched outputs utilize latching relays to maintain relay state if control power is lost.
- 0-10 V $\equiv$  fixtures used with this ESN must support switching power to turn on/off.



QSN-4T5-120-D

### System Example



Job Name:	Model Numbers:
Job Number:	

## Specifications

### Power

- 120 V<sub>AC</sub> 50/60 Hz 5 A of switching load per zone  
16 A maximum per module
- Lightning strike protection meets ANSI/IEEE standard 62.31-1980. Can withstand voltage surges of up to 6000 V<sub>AC</sub> 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
- UL<sup>®</sup> 924

### Environment

- See **Mounting** on page 4 for thermal specifications.
- Room ambient temperature is between 32 °F and 104 °F (0 °C and 40 °C)
- Relative humidity: less than 90% non-condensing
- For indoor use only

### Output Zone Ratings

- Each zone is rated at 5 A for switching (maximum of 16 A per module). Rated for incandescent, ELV, MLV, and electronic ballast lighting loads.
- Switched outputs utilize latching relays to maintain relay state if control power is lost.
- 0-10 V<sub>DC</sub> rated for 50 mA maximum output, source or sink per zone.
- For applications requiring higher wattage ratings, use the PHPM-SW-DV-WH interface or refer to App Note #779 (P/N 048779) on [www.lutron.com](http://www.lutron.com) for alternatives.
- For applications requiring phase adaptive dimming, use the QSN-4A5-D phase adaptive power module.
- 0-10 V<sub>DC</sub> fixtures must support switching power to turn on/off. Use switched outputs to switch fixtures according to wiring diagram shown on page 6.
- Minimum voltage (Off, when relay is open) at the 0-10 V<sub>DC</sub> terminals of the ESN module is 1.0 V when 0-10V wires are loaded to 50 mA. Voltage at the fixture will vary; refer to App Note #587 (P/N 048587) on [www.lutron.com](http://www.lutron.com) "How far can I run a low-voltage 0-10V circuit" to determine required wire gauges, lengths, and compatibility.

### Terminals (Torque, wire gauge & type ratings)

- Mains wiring: 5 in-lbs (0.6 N•m)  
16 AWG to 10 AWG (1.0 mm<sup>2</sup> to 4.0 mm<sup>2</sup>)  
(single wire, solid or stranded)
- Zone wiring: 5 in-lbs (0.6 N•m)  
16 AWG to 10 AWG (1.0 mm<sup>2</sup> to 4.0 mm<sup>2</sup>)  
(single wire, solid or stranded)
- CCI wiring: 5 in-lbs (0.6 N•m)  
20 AWG to 10 AWG (0.5 mm<sup>2</sup> to 4.0 mm<sup>2</sup>)  
(single wire, solid or stranded)  
20 AWG to 16 AWG (0.5 mm<sup>2</sup> to 1.0 mm<sup>2</sup>)  
(two wires, solid or stranded)
- 0-10 V<sub>DC</sub> wiring: 5 in-lbs (0.6 N•m)  
20 AWG to 16 AWG (0.5 mm<sup>2</sup> to 1.0 mm<sup>2</sup>)  
(single wire, solid or stranded)
- QS link: 5 in-lbs (0.6 N•m)

#### Power:

20 AWG to 10 AWG (0.5 mm<sup>2</sup> to 4.0 mm<sup>2</sup>)

#### Data:

22 AWG to 18 AWG (0.34 mm<sup>2</sup> to 0.75 mm<sup>2</sup>)  
(1 twisted, screened pair)

See **Wiring: QS Link** section on page 8

### Programming and Compatibility Requirements

- Setup and programming of the switching power module is done through the Athena programming software.
- Athena software version 20.4 or higher is required.

### QS Link Limits

- Each 0-10 V<sub>DC</sub> module counts as one device toward the QS link device limit, and up to 4 zones toward the QS link zone limit.

<p><b>Job Name:</b></p>  <p><b>Job Number:</b></p>	<p><b>Model Numbers:</b></p>
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## Out of Box Functionality

### Normal Mode Operation

- Zone buttons:
  - Selects zone to control
- Raise/Lower buttons:
  - Turns loads on and off
  - Dim loads up and down

### Emergency Contact Closure Input (CCI)

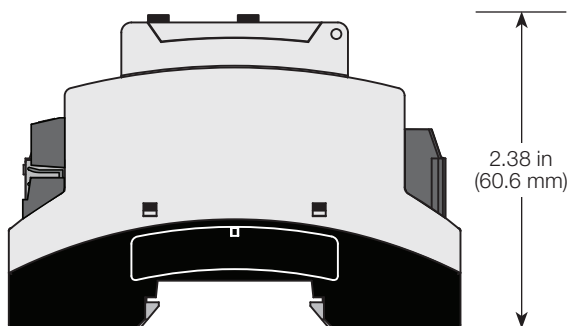
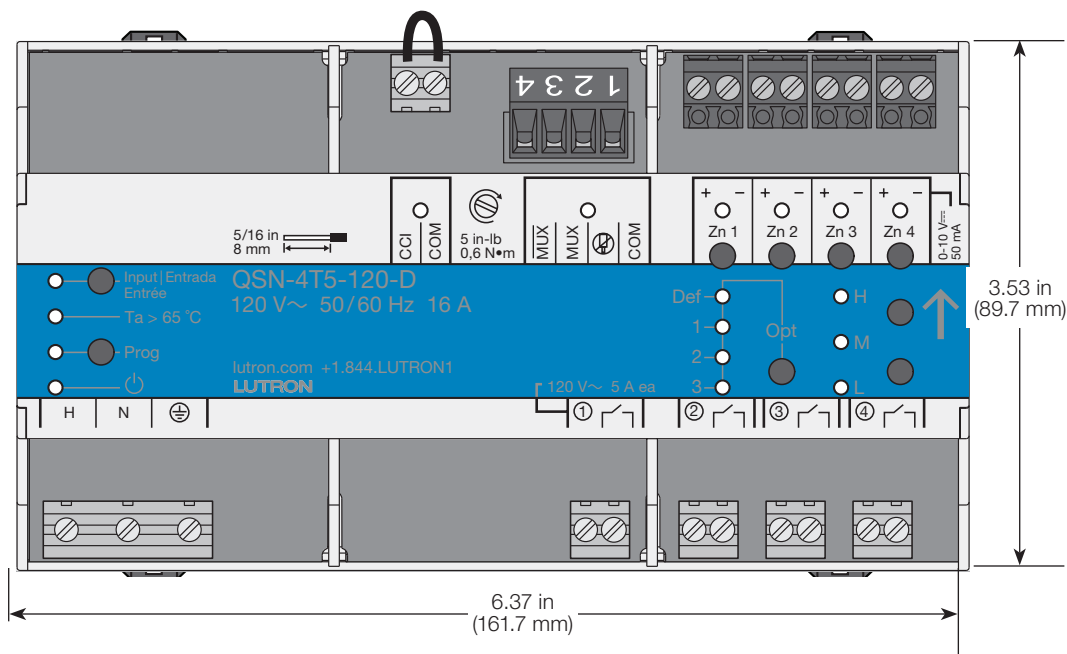
- The CCI behaves as an emergency contact closure input.
- If the CCI is open, the unit will enter emergency mode, which will turn on all loads and disable control from other devices.
- When the CCI is closed or jumpered (factory default), unit zones will return to the settings or levels they were at prior to entering emergency mode.

Job Name:  Job Number:	Model Numbers:
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## Mounting

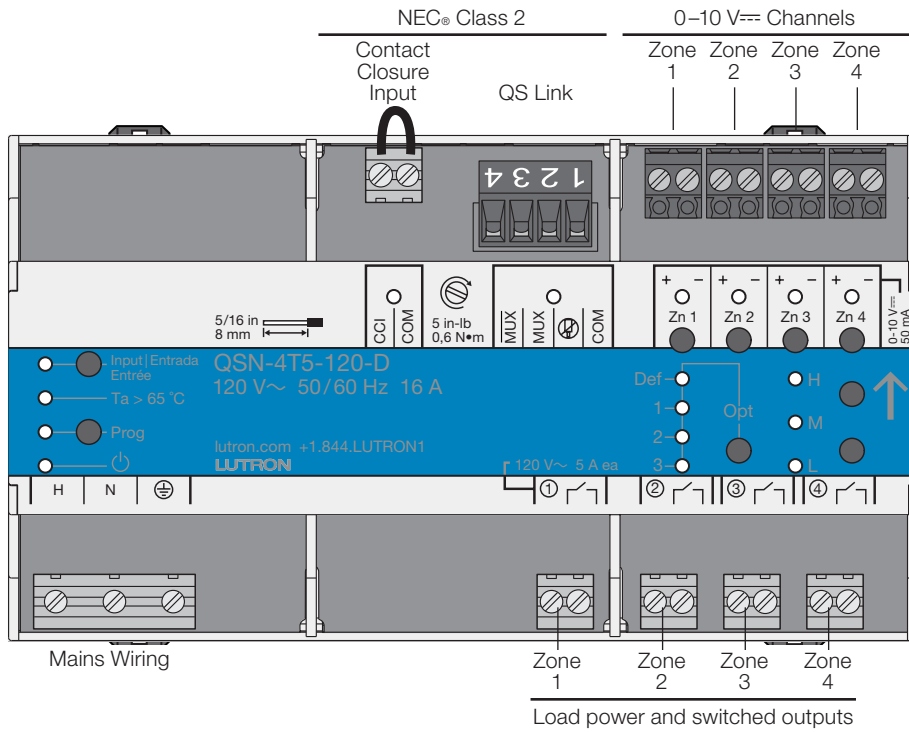
- Module is 9 DIN modules wide, 8.5 in (216 mm).
- Mount in a Lutron DIN panel (see Lutron specification submittal 3691183 at [www.lutron.com](http://www.lutron.com)).
- Mount unit in orientation shown.
- Mount to DIN rail by pressing unit onto the rail with the clips locked. To remove from rail, unlock clips using a screwdriver.
- Mount the module where audible noise is acceptable (internal relays click).
- Mount in an accessible and serviceable location.
- Unit generates heat, maximum 4 BTUs/hr.
- Mount unit such that all the conditions below are met:
  - Ambient temperature operating range (inside mounting panel): 32 °F to 104 °F (0 °C to 40 °C)
  - Calibration point maximum: 149 °F (65 °C)

## Mechanical Dimensions



Job Name:	Model Numbers:
Job Number:	

# Overview of Wiring Terminals



Job Name:	Model Numbers:
Job Number:	

## Mains Voltage Wiring

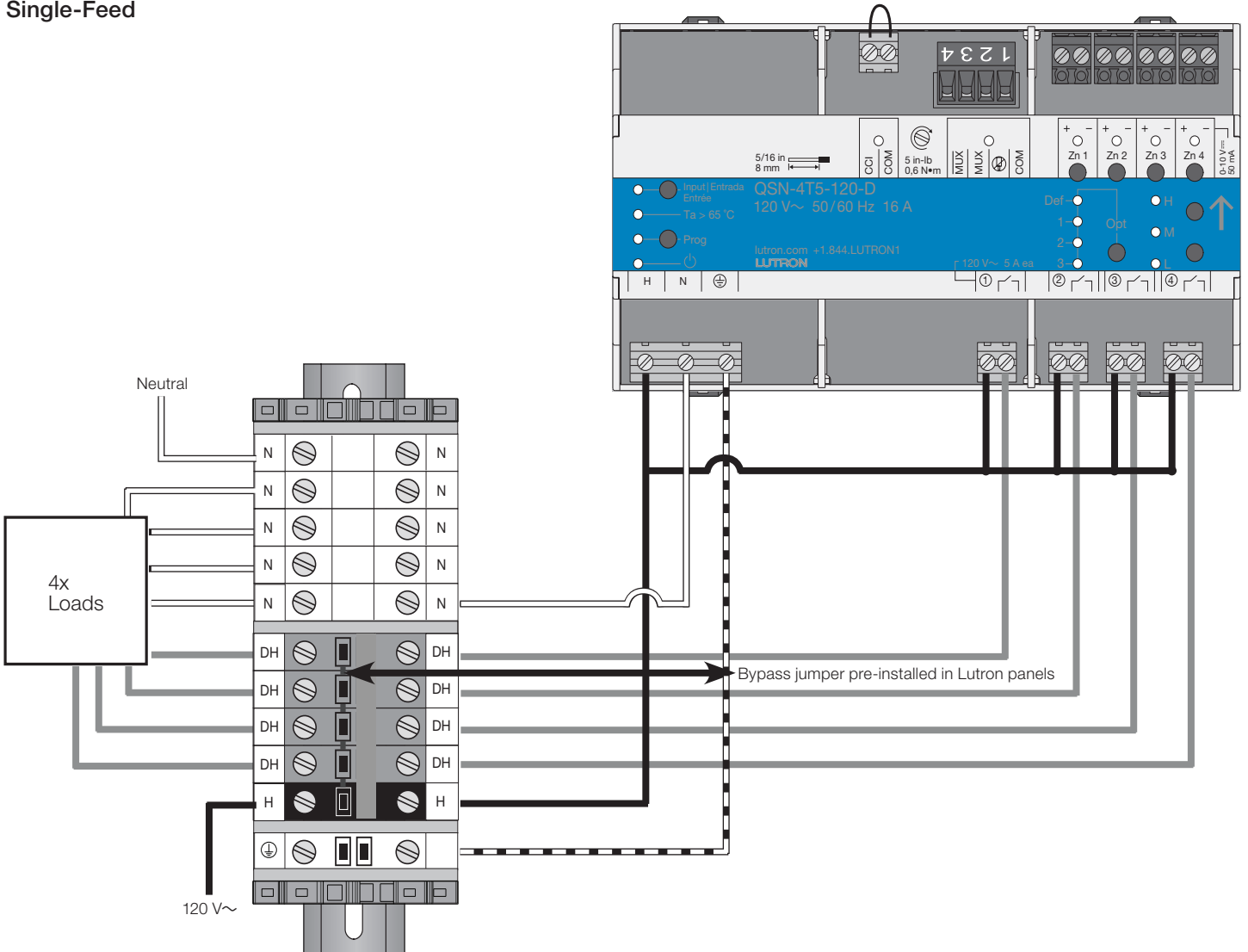
### Wiring from Distribution Panel to Energi Savr Node

- Turn off all circuit breakers or isolators feeding the unit at the distribution panel.
- Run line/hot, neutral, and earth ( $\oplus$ ) wires from a 120 V $\sim$  50/60 Hz feed to the 0-10 V $\equiv$  unit.
- Follow appropriate local and national codes.

### Behavior During Power Failure

- Relays do not change state when power is lost to the H/N/ $\oplus$  terminals. Follow local and national codes for emergency lighting requirements.
- After a power failure, the 0-10 V $\equiv$  outputs return to their previous setting.

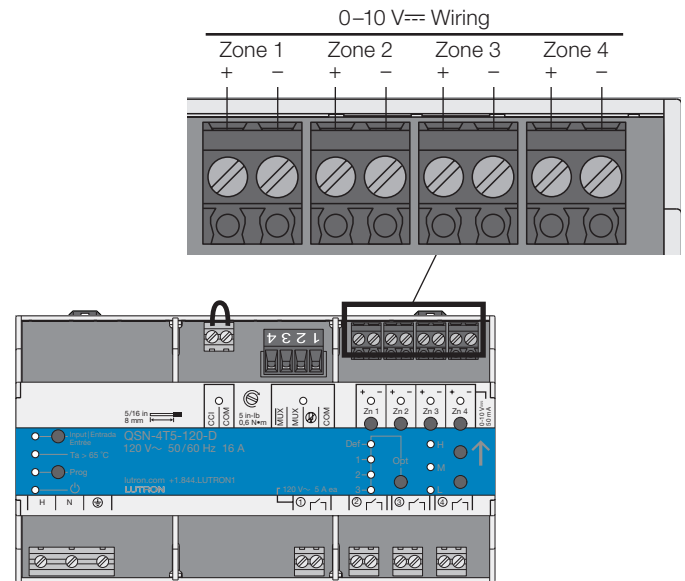
### Single-Feed



Job Name:	Model Numbers:
Job Number:	

### Wiring: 0-10 V<sub>DC</sub>

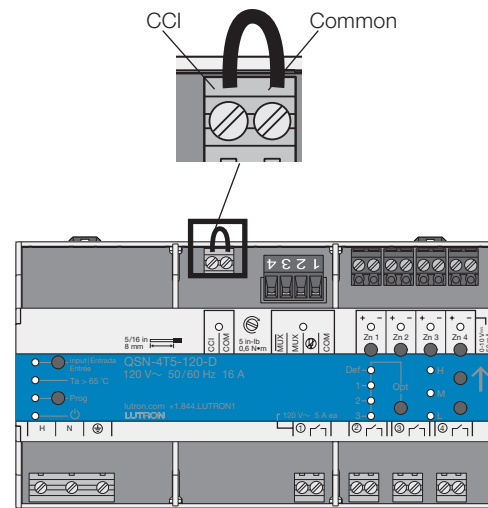
- 0-10 V<sub>DC</sub> zones 1-4 are double insulated from line voltage and the QS link but are not insulated from each other. They share the same common terminal (negative “-” terminal)
- Do not mix NEC® Class 2 circuits and non-NEC® Class 2 circuits for 0-10 V<sub>DC</sub> zone 1-4.
- Follow all national and local electrical codes for separation requirements.



### Wiring: Emergency 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.
- When in emergency mode, all drivers and zone outputs will be at their programmed emergency light level (default is 100%). All other controls are locked out.
- 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](http://www.lutron.com) for details.
- Emergency contact closure input is normally closed (NC). The unit is shipped with a jumper wire pre-installed.

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



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Job Number:	

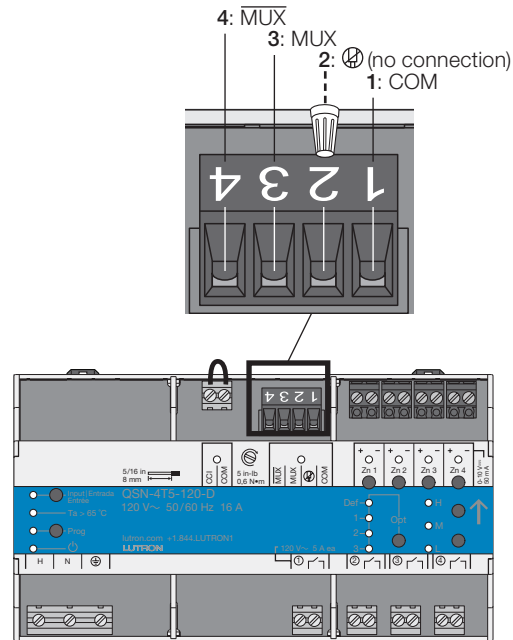
## Wiring: QS Link

### QS Link NEC® Class 2 Wiring

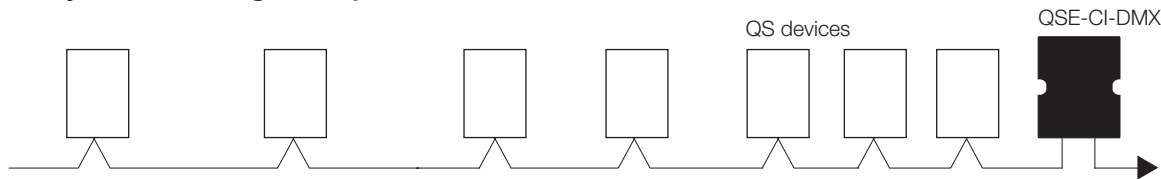
- Follow all applicable national and local codes for proper circuit separation and protection.
- Link communicates using NEC® Class 2 wiring.
- Device does not supply or consume PDUs.
- Wiring may be daisy-chained or T-tapped.
- Do NOT connect terminal 2.
- Optional QS link wiring harnesses sold separately,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

### QS Link Wiring Options

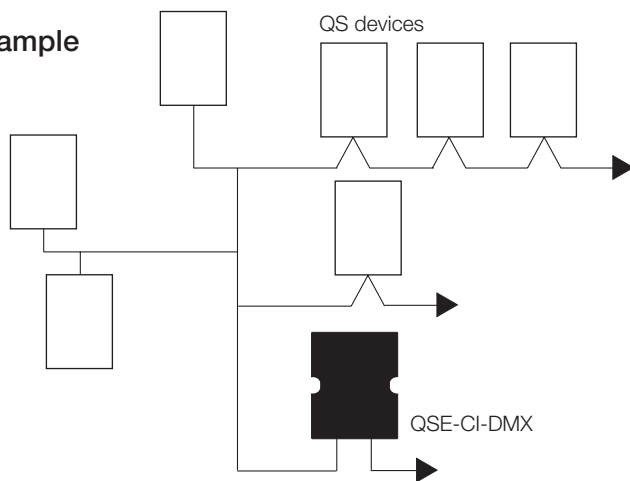
Control Link Length	Wire Gauge (for terminals)	Available from Lutron in one cable:
Less than 500 ft (153 m)	Power (terminals 1 and 2): 1 pair 18 AWG (1.0 mm <sup>2</sup> )	GRX-CBL-346S (non-plenum)
	Data (terminals 3 and 4): 1 pair 22 AWG (0.5 mm <sup>2</sup> ), twisted and screened	GRX-PCBL-346S (plenum)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



### Daisy-Chain Wiring Example



### T-Tap Wiring Example



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