

Quantum® Hub with Smart Power Panel

Installation Instructions

QP4-1P-PS120

 **LUTRON**®

QP4-1P-PS120

120 V~ 60 Hz

5.0A (Continuous), 9A (35% Duty Cycle) Max Input Current

Installation Instructions (Save these instructions)

Read and Follow all instructions.

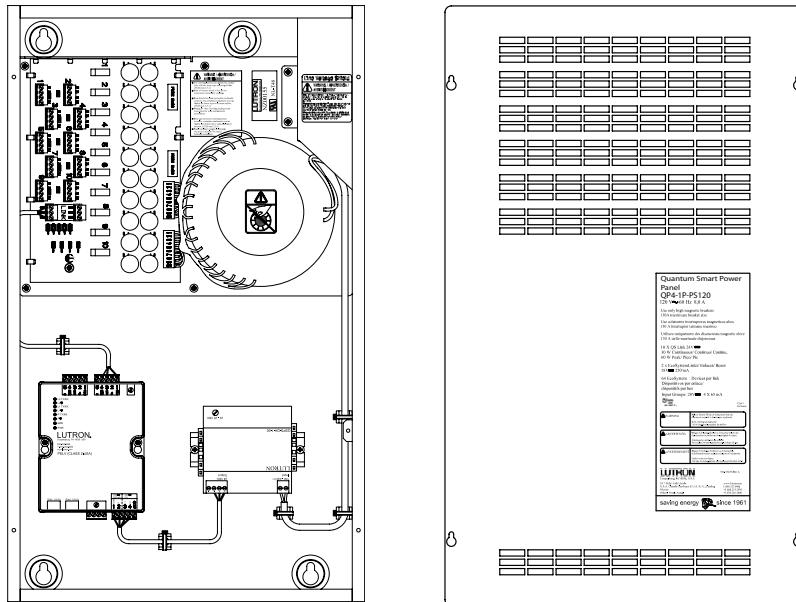
Tools Required:



NOTE: Panel Weight = 35 lbs (15.8 kg). Mounting hardware is not included due to the wide variety of wall materials. Customer should determine the appropriate mounting hardware for their specific needs.

Box Contents:

One (1) QP4-1P-PS120
with vented front cover



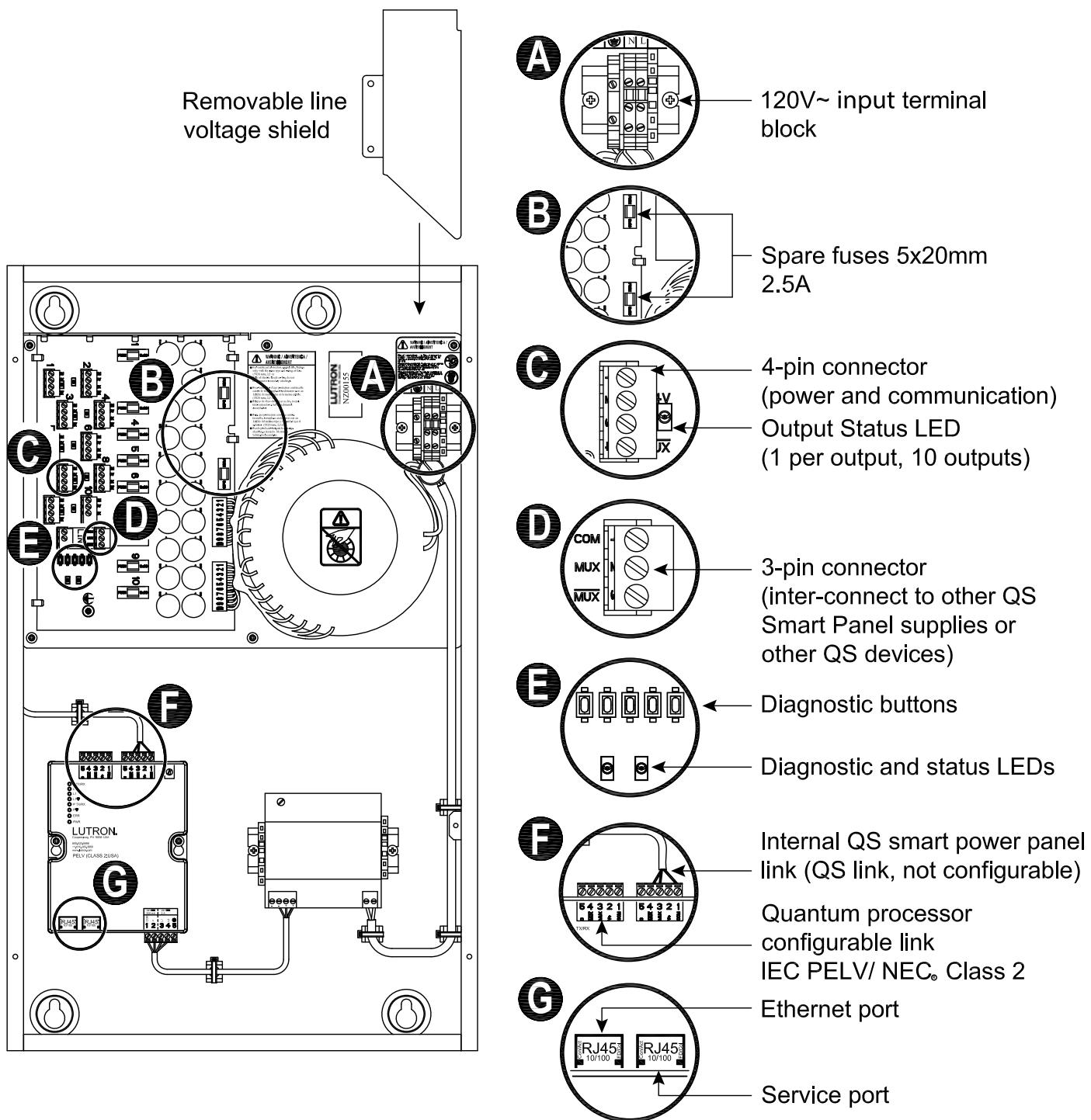
Important Notes

1. This product is intended for indoor use only.
2. Ambient temperature operating range 32 ° to 104 °F (0 °C to 40 °C).
3. Relative humidity less than 90 % non-condensing.
4. All wiring must be in accordance with national and local electrical codes.
5. QP4-1P-PS120 must be installed by a qualified electrician.

NOTE: Use only High Magnetic Breakers. One panel per dedicated 15 A circuit or two panels per dedicated 20 A circuit. 30 A maximum breaker size.

6. Separate over current protection is required to be provided in accordance with Canadian Electrical Code, Part 1.
7. For continued protection against fire, replace only with the same type and rating of fuse. (Littelfuse 5 X 20 mm fast-acting fuse 216 P series 2,5 A)

QP4-1P-PS120 Smart Power Panel System Overview



Mounting the QP4-1P-PS120

- Surface mount panel indoors.
- Mount panel in an accessible and serviceable location.
- Water damages equipment. Mount in a location where the panel and processors will not get wet.
- Panel generates heat. Mount only where temperature will be 32°F to 104°F (0°C to 40°C).
- Use the keyholes located on the back of the enclosure to fasten the QP4-1P-PS120 to the wall. Use fasteners rated for a 50 lb. (23 kg) load (mounting hardware is not provided).

NOTICE: The equipment is air-cooled. Mount in a location where the vented front cover will not be blocked. A minimum of 1 ft. (300 mm) front clearance is required.

Power Wiring

Remove the high voltage barrier that covers the input power terminal block assembly (upper right corner).



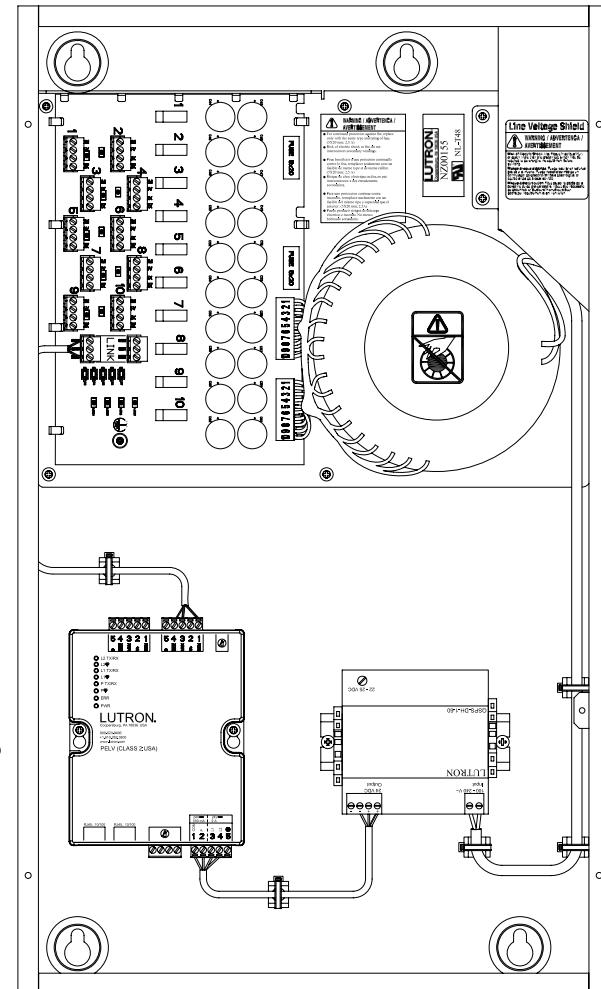
WARNING: SHOCK HAZARD. Risk of serious injury or death. Locate and lock the supply circuit breaker in the OFF position before wiring to the terminal blocks. Disconnect all input power before performing any kind of service.

Connect 120 V~ power wiring into the QP4-1P-PS120.

Remove one of the knockout tabs on the top right side of the enclosure near the input terminal blocks. Insert a strain relief into the knockout hole. Run the power wire through the strain relief (not included) to the input terminal blocks at the top right side of the panel. Tighten terminal blocks to 3.5 to 5 in-lbs. (0.4-0.6 N·m).

NOTE: Maximum of 1 QP4-1P-PS120 per 15 A Breaker. Maximum of 2 QP4-1P-PS120 per 20 A Breaker.

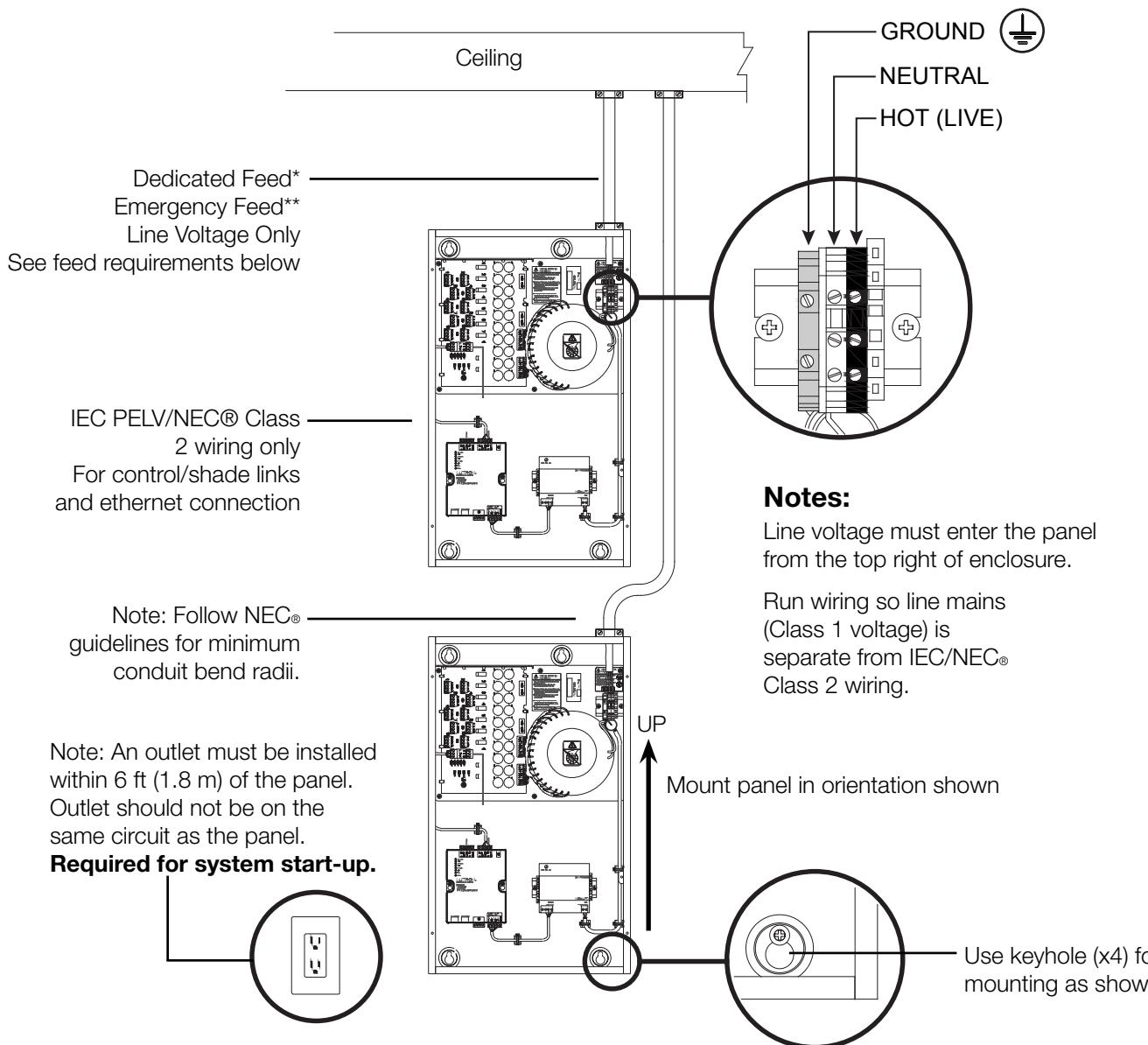
Maximum feed breaker size of 30 Amps. **Use only High-Magnetic breakers.**



Mount panel in orientation shown

Conduit Entry and Wiring

- An outlet must be installed within 6 ft (1.8 m) of the panel. The outlet should not be on the same circuit as the panel.
- Follow NEC® guidelines for minimum conduit bend radii.



Feed Requirements:

* Lutron recommends using a dedicated circuit for lighting control devices.

** Emergency feed is recommended so that the system status can be monitored during an emergency event. If this is not required, normal power can be used.

QS Smart Power Panel Link Rules

The following QS Smart Power Panel Link rules must be observed for proper operation:

1. Maximum of 100 devices per each QS Smart Power Panel Link (such as a GRAFIK Eye® QS, see Touch® QS keypad, QS Smart Panel power supply, or Sivoia® QS shade drive unit) due to 100 available link addresses.

NOTE: Each QP4-1P-PS120 counts as 2 of the 100 allowed devices

2. Maximum 2000 ft (600 m) of cable inter-connecting multiple QS Smart Panel power supplies.

NOTE: When inter-connecting multiple QS Smart Panel power supplies, the 3-pin communication link MUST be used. These panels CANNOT be inter-connected using one of the 4-pin outputs.

3. Maximum 2000 ft (600 m) of cable to devices from each QS Smart Power Panel (all 10 outputs combined)

4. Only use cable with at least one twisted/shielded pair for communications (MUX and ~~MUX~~)

NOTE: Secondary wiring must be of type CL2, CL2P, CL2R, CL2X or other cable with equivalent or better electrical, mechanical, and flammability ratings in accordance with local and national electric code.

Table 1: QS Smart Power Panel Link Rules

QP4-1P-PS120 Wiring Guidelines for Smart Power Panel Outputs (x10)					
Maximum devices per one output (panel provides up to 10 outputs)*		Maximum distance per one output based on wire gauge***			
Shades	+ Devices	Pins 1 and 2 (Voltage and Common)			
		12 AWG 4 mm ² QSH-CBL-L-500 QSH-CBPL-L-500	16 AWG 1.5 mm ² QSH-CBL-M-500 QSH-CBPL-M-500	18 AWG 1 mm ² GRX-CBL-346S-500 GRX-PCBL-346S-500	
None	Up to 50 power draw units**	1250 ft (375 m)***	500 ft (150 m)***	250 ft (75 m)***	
None	Up to 25 power draw units**	2000 ft (600 m)***	1000 ft (300 m)***	600 ft (175 m)***	
1 Sivoia® QS shade	Up to 1 power draw unit**	500 ft (150 m)***	200 ft (60 m)***	125 ft (35 m)***	
2 Sivoia® QS roller 64, ≤ 30 sq ft (2.75 sq m) each					
3 Sivoia® QS roller 64, ≤ 20 sq ft (1.8 sq m) each		200 ft (60 m)***	75 ft (20 m)***	50 ft (15 m)***	
2 Sivoia® QS roller 100, ≤ 50 sq ft (4.6 sq m) each					

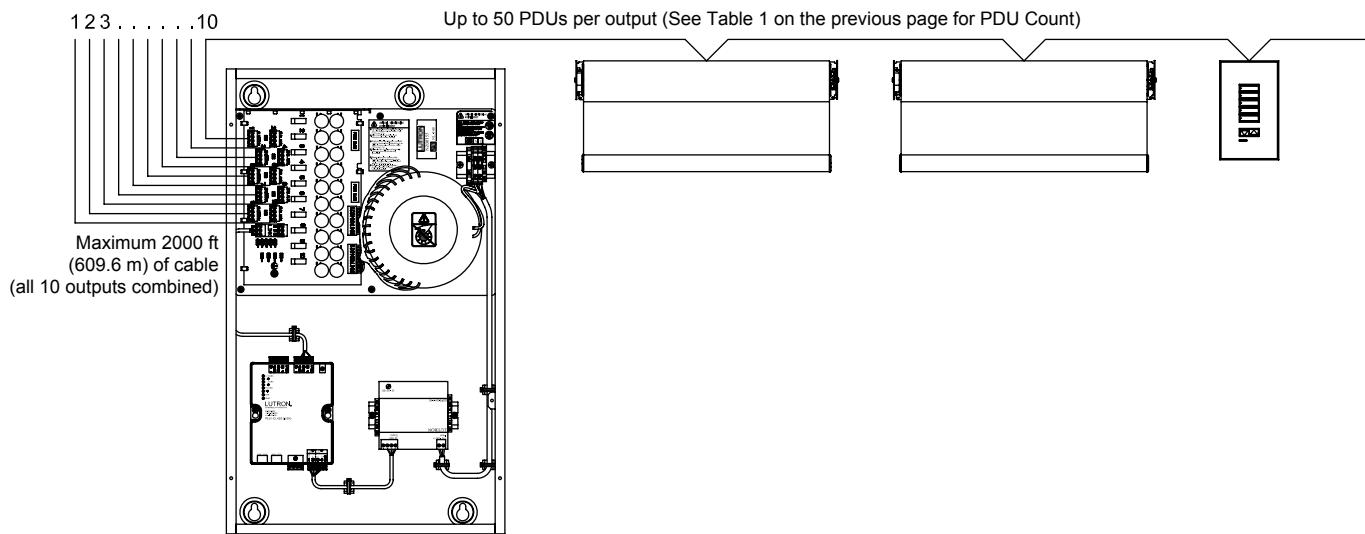
Important Notes:

* Maximum of 1 Quantum Hub with Smart Power Panel, plus 98 additional devices combined across the entire QS Smart Power Panel link.

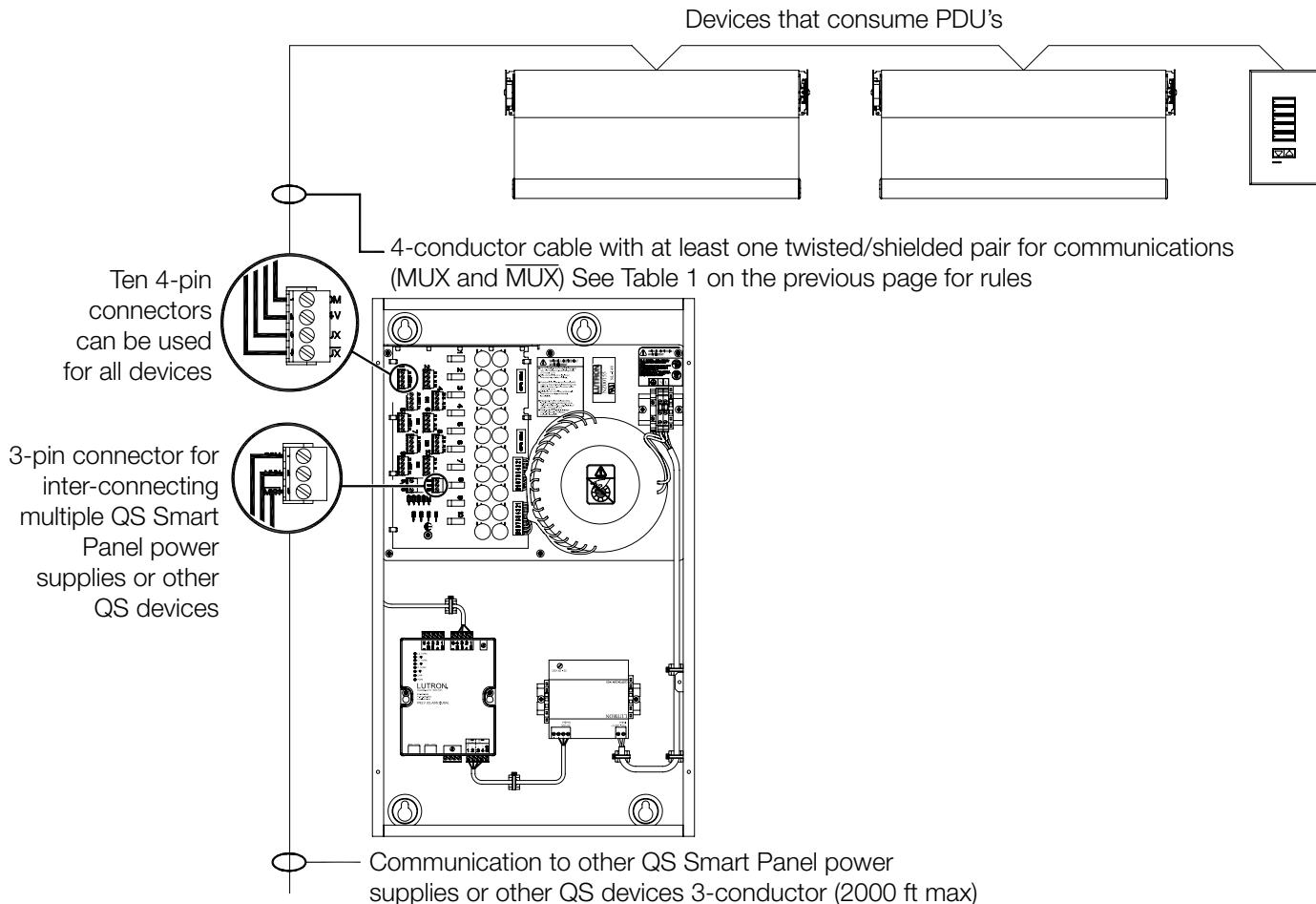
** One Power Draw Unit (PDU) = 1 QS wall station. See document 369-405 for a list of PDUs per product.

*** Maximum 2000 ft (600 m) of cable for all 10 outputs combined.

QS Smart Power Panel Link Wiring Rules



1. Terminal 2 (+24 V) should NEVER be connected between devices that supply PDUs.
2. If the application requires a separate power supply to power a link, refer to the installation instructions for the specific power supply model being used for wiring connection details.



Wiring the QP4-1P-PS120 Smart Power Panel Link

NOTE: See pages 5 & 6 for rules.

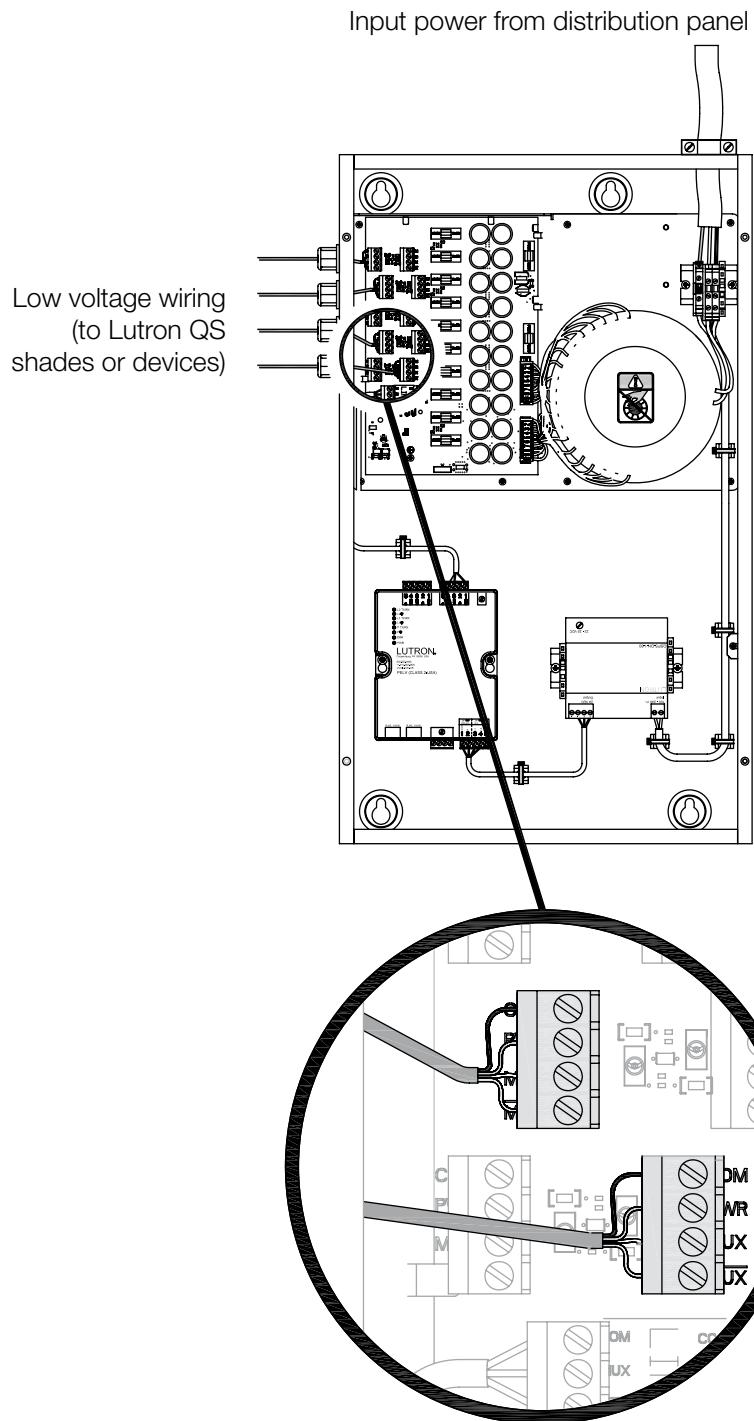
- Remove as many knockout tabs as necessary from the left side of the enclosure and insert strain reliefs.
- Run the low-voltage communication wiring from the Lutron QS shade and QS lighting devices through the strain reliefs to the terminal blocks.
- Strip insulation wire so that .25 in. (7 mm) of bare wire is exposed. Make sure to tighten the screws and that no insulation is inside of the terminal block.



WARNING: SHOCK HAZARD.

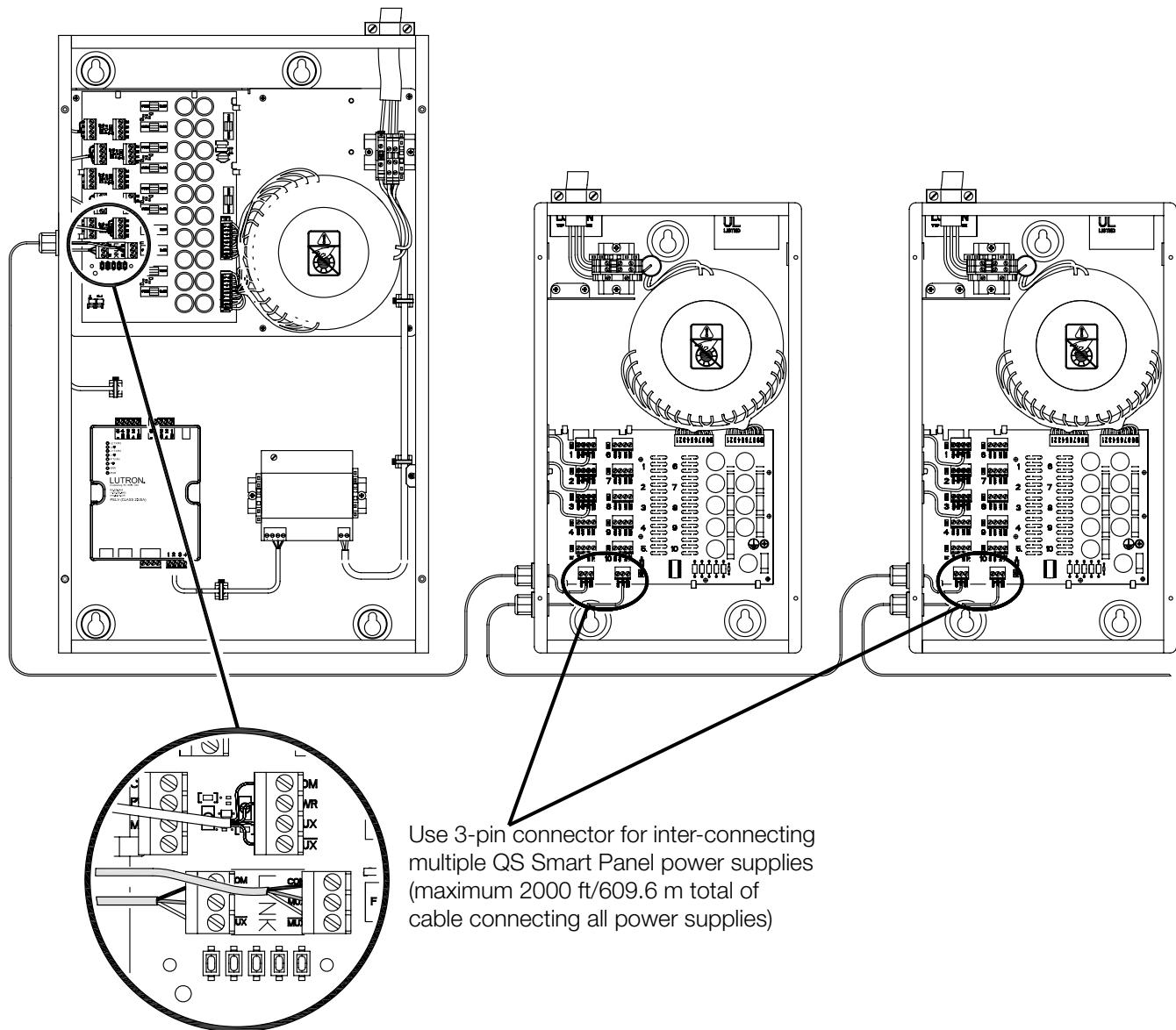
Risk of serious injury or death.
Locate and lock the supply circuit breaker in the OFF position before wiring to the terminal blocks.

Disconnect all input power before performing any kind of service.



Connecting Multiple QS Smart Power Panels to the QP4-1P-PS120

NOTE: See pages 5 & 6 for rules.



QP4-1P-PS120 Smart Power Panel Diagnostics

The QP4-1P-PS120 shade module provides built-in diagnostics to help troubleshoot and verify your installation.

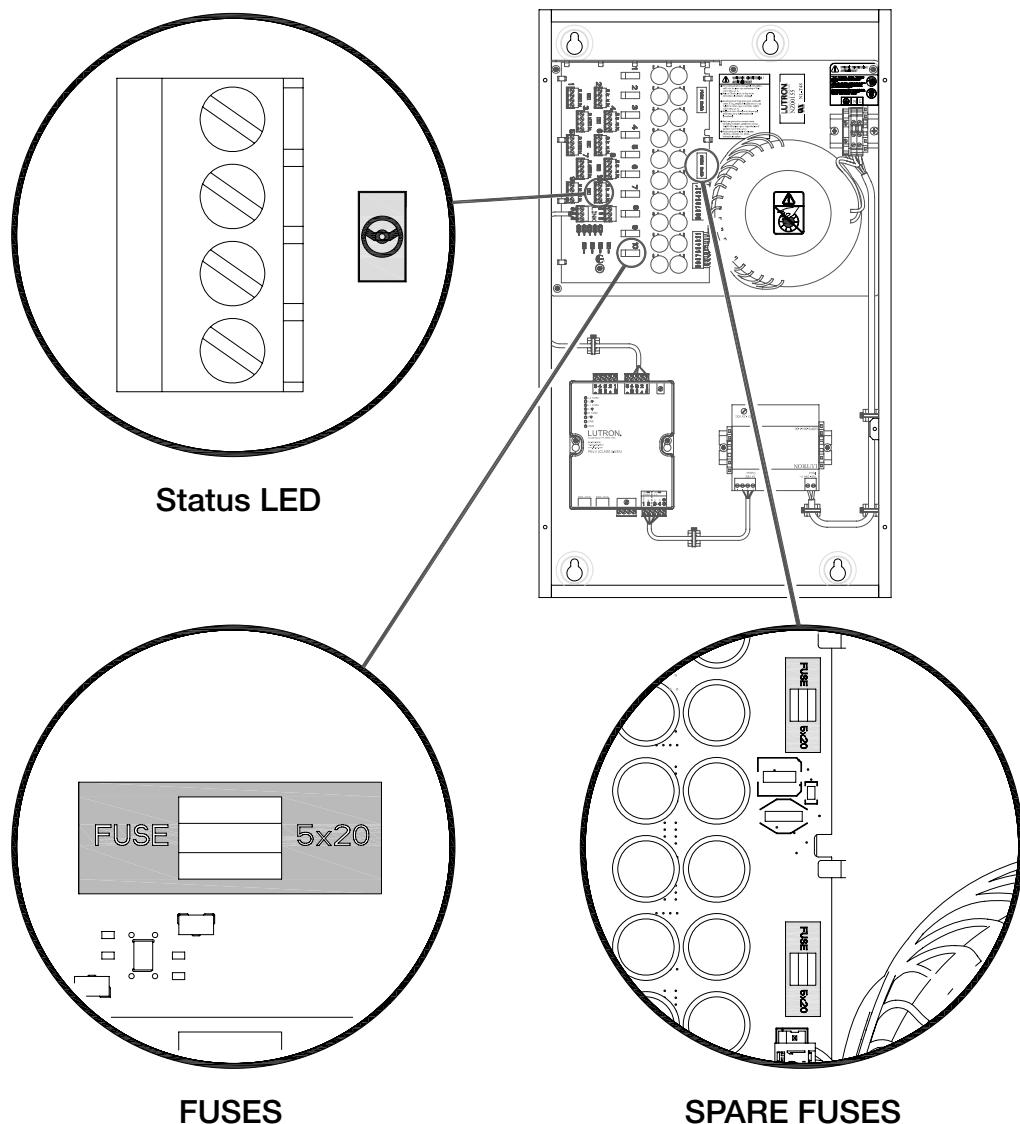
Output status LED ON indicates normal operation

Output status LED BLINKING indicates overload

If an output becomes overloaded, its status LED will blink to indicate the fault condition. To reset the status LED, push the "Reset Status LED" button. See page 10 for location.

Output status LED OFF indicates blown fuse

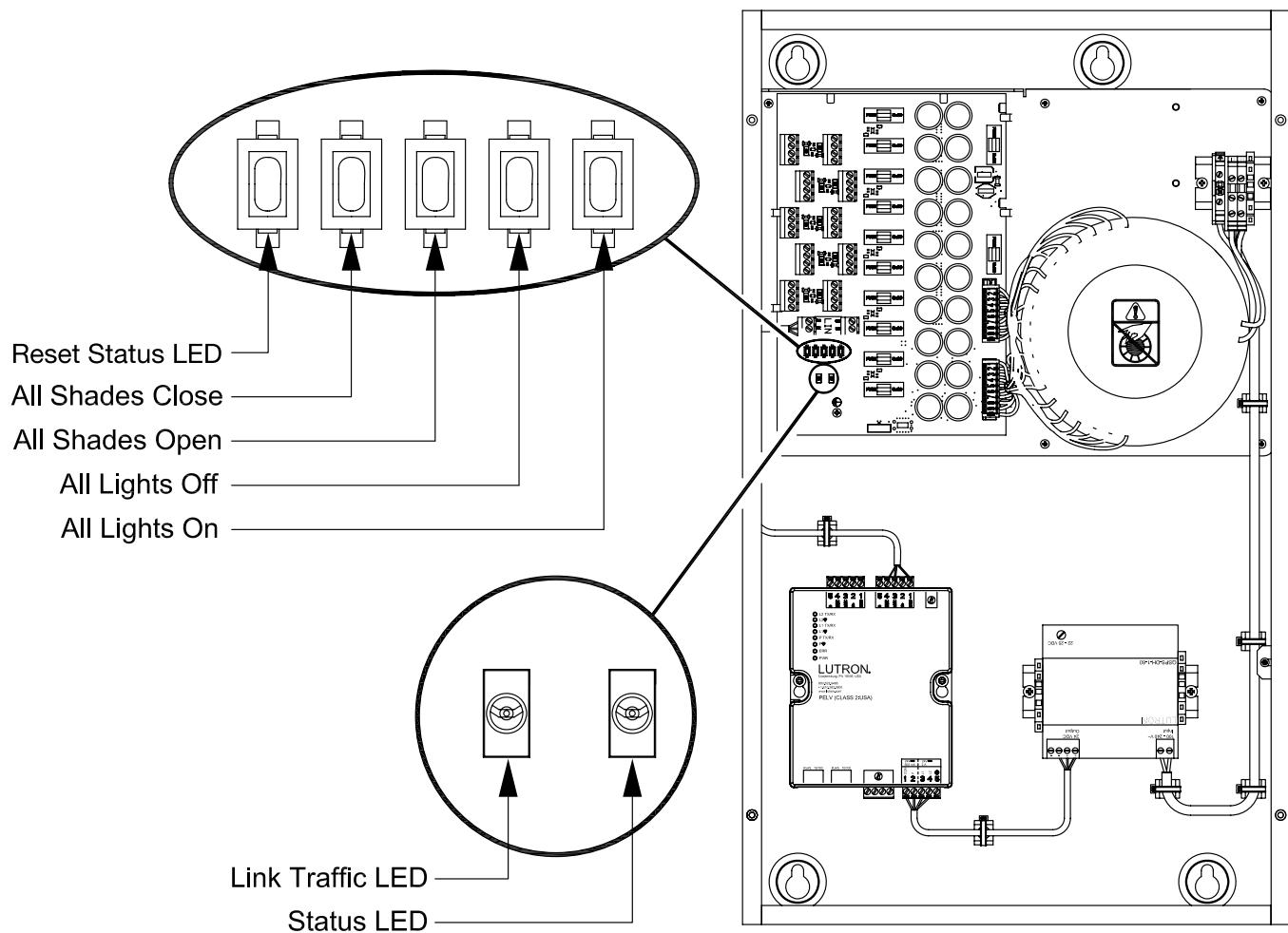
If an output status LED has turned off, the fuse will need to be replaced. The QP4-1P-PS120 comes with two spare 5x20 mm 2.5A fuses.



QP4-1P-PS120 Smart Power Panel Diagnostics (continued)

Communications link LED's

The QP4-1P-PS120 has two diagnostic LED's for the communications link.



Verify Communications from QP4-1P-PS120 to QS Shades

- To verify the communications of your system, tap, hold (5 seconds), tap, hold (5 seconds) the "All Shades Open" button. The QP4-1P-PS120 Smart Power Panel will try to communicate with all other Electronic Drive Units (EDUs). All EDUs communicating on the link will wiggle and flash their green LED quickly. If you discover any EDUs that are not wiggling, verify that the EDU is powered and wired properly.
- Link Diagnostics Mode will automatically time out after 10 minutes.
- To exit Link Diagnostics Mode, press and hold the "All Shades Open" button for 5 seconds.

Quantum® Processor Configured as QS Link

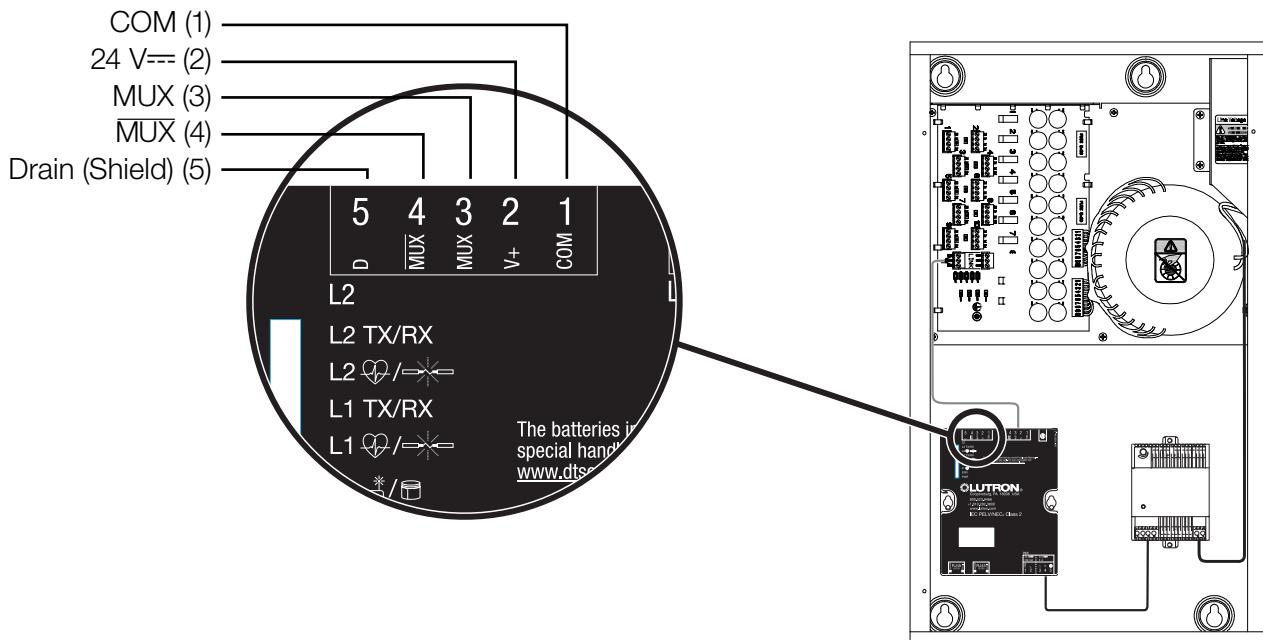


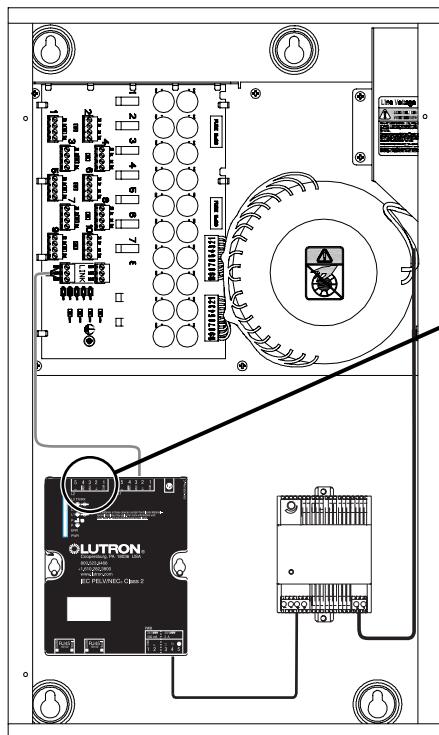
Table 2 - Quantum® Processor Configurable Link Rules: QS Link

Available Power Draw Units (PDUs)	Maximum Link Length	Wire Gauge	Available from Lutron in one cable
33	500 ft (152.4 m)	Power (terminals 1 and 2) 1 pair 18 AWG (1.0 mm ²) Data (terminals 3 and 4) 1 pair 22 AWG (0.5 mm ²) twisted and shielded	GRX-CBL-346S (non-plenum) GRX-PCBL-346S (plenum)
33	2000 ft (609.6 m)	Power (terminals 1 and 2) 1 pair 12 AWG (4.0 mm ²) Data (terminals 3 and 4) 1 pair 22 AWG (0.5 mm ²) twisted and shielded	GRX-CBL-46L (non-plenum) GRX-PCBL-46L (plenum)

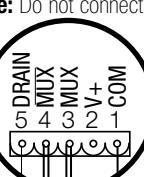
Notes

- System communication uses IEC PELV/NECR Class 2 low-voltage wiring.
- Follow all local and national electrical codes when installing IEC PELV/NECR Class 2 wiring with line voltage/mains wiring.
- Each terminal accepts up to two 18 AWG (1.0 mm²) wires or one 12 AWG to 22 AWG (4.0 mm² to 0.5 mm²) wire.
- A Quantum® Processor Configurable link can have up to 512 switch legs (controllable outputs) and 99 devices.
- Refer to the QS Link Power Draw Units Specification Submittal (Lutron® PN 369405) and the table above for information concerning Power Draw Units (PDUs).
- Wiring can be T-tapped or daisy-chained.
- Total length of control link must not exceed 2000 ft (600 m).
- Make all connections in the control unit's wallbox.

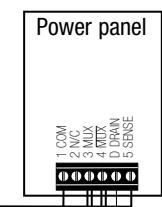
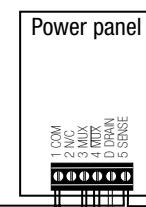
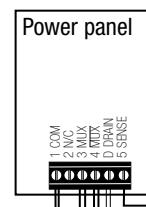
Quantum® Processor Configurable Link Wiring: Power Panel Link



Note: Do not connect V+



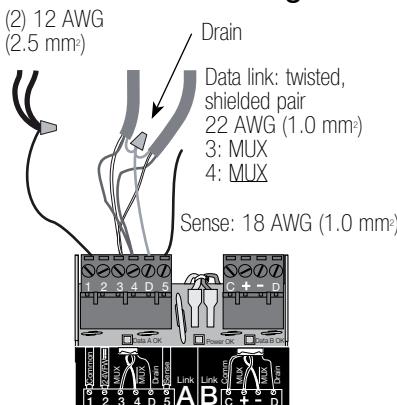
Control wiring
(1) 12 AWG
(2.5 mm²)
1: Common
Link terminator (LT-1)



Data link
(1) shielded, twisted pair
22 AWG (0.5 mm²)
3: MUX
4: MUX
D: Drain wire in shield (keep away from ground and all electronics)

Emergency/essential sense line
(1) 18 AWG (1.0 mm²)
5: Sense line
Sense line is used when there is a panel being supplied by an emergency/essential feed

Circuit Selector Wiring

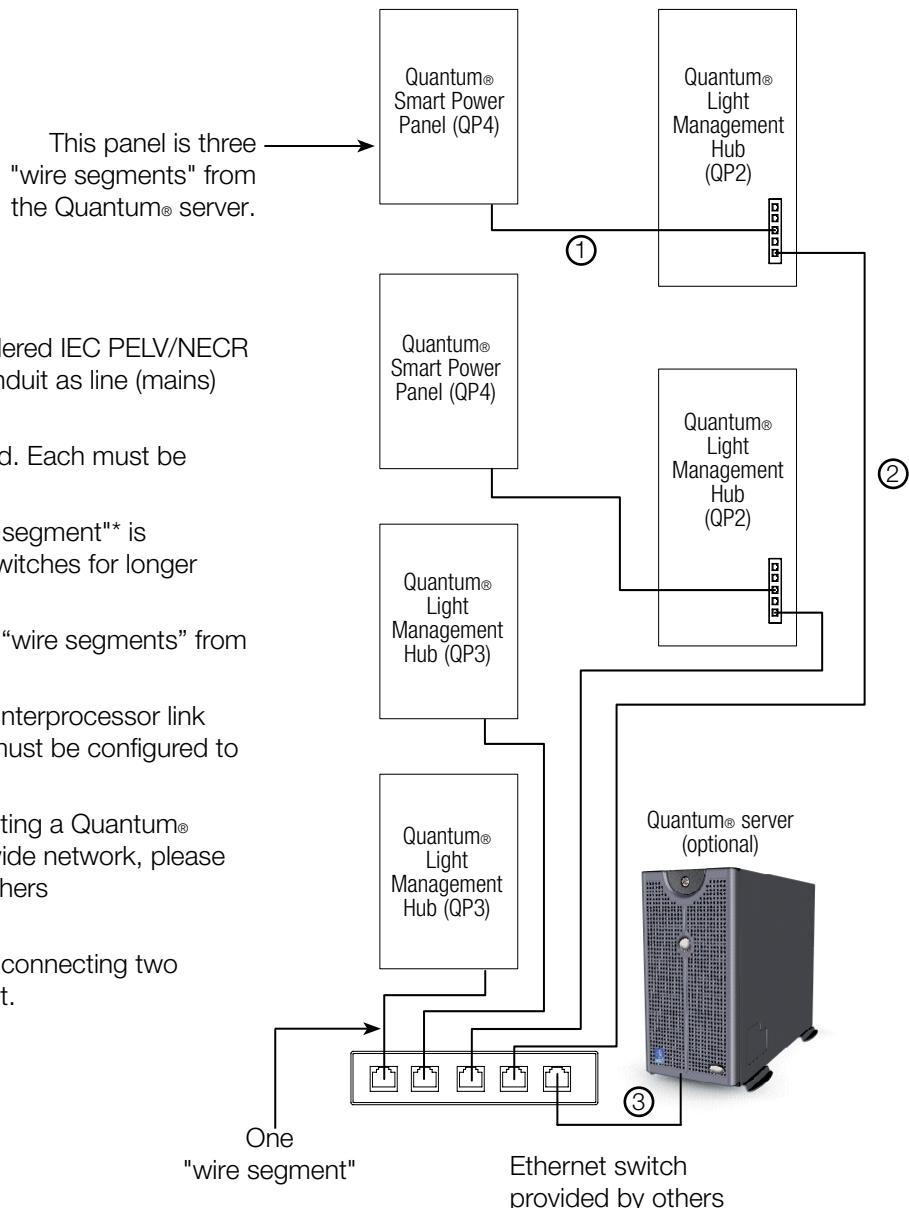


Notes

- Wiring must be daisy-chained (no T-taps).
- Maximum of 32 circuit selectors per link or 512 switch legs (controllable outputs) per link.
- It is not necessary to have the Quantum® Processor at the end of the link (it may be in the middle).
- The sense wire (terminal 5) is used whenever there is a panel being supplied by an emergency/essential feed; see power panel instructions for details.
- Each low-voltage IEC PELV/NEC® Class 2 terminal can accept only two 18 AWG (1.0 mm²) wires or one 12 AWG to 22 AWG (2.5 mm² to 0.5 mm²) wire. Connect as shown using appropriate wire connectors.
- Total length of control link may be no more than 2000 ft (600 m). If MUX-RPTR interface and GRX-CBL-46L cable are used, length may be up to 8000 ft (2400 m) by using multiple repeaters (MX-RPTR). Each MX-RPTR extends the link by 2000 ft (600 m).
- GRX-CBL-46L (non-plenum)/GRX-PCBL-46L (plenum) wiring cable is available from Lutron and contains two 12 AWG (2.5 mm²) conductors for control power, one twisted, shielded pair of 22 AWG (0.5 mm²) for data link, and one 18 AWG (1.0 mm²) conductor for emergency (essential) sense line.
- Link terminators are required at the beginning and end of power panel link.

Quantum® Processor Inter-Processor Link Wiring

Example of Inter-Processor Wiring: Riser Diagram



Notes

- The inter-processor wiring is considered IEC PELV/NECR Class 2; do not run in the same conduit as line (mains) voltage wiring.
- Processors cannot be daisy chained. Each must be connected to an Ethernet switch.
- Wiring distance for any single "wire segment" is 330 ft (100 m) max; use Ethernet switches for longer distances.
- Processors cannot be more than 6 "wire segments" from the server.
- Processors communicate over the interprocessor link using UDP Multicast; the network must be configured to allow this type of communication.
- For more information about connecting a Quantum® system to a corporate or building wide network, please refer to the Ethernet Network by Others spec sheet (QS-EO).

* A wire segment is a length of cable connecting two devices communicating over Ethernet.

Warranty

Limited Warranty

The warranty for your Lutron system was included with your original system submittal package. It can also be found at www.lutron.com/en-US/ResourceLibrary/warranty/Lim_Warranty_starting_Oct2011.pdf

Contact the Lutron Technical Support Center at the numbers provided below or your local Lutron sales representative with questions concerning the installation or operation of the System or this Warranty, or to make a warranty claim. Please provide the exact model number when calling.

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06/2013

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