

Forest Integration Roadmap

TECHNICAL INTEGRATION ROADMAP

A technical selling and commissioning document for Forest Shuttle motors with Lutron control. This guide brings together the control roadmap, connector diagrams, serial command reference and Lutron interface sheets.

1**Choose the motor and track**

Record motor / receiver revision, drapery weight, track length, bend radius and draw.

2**Choose the control route**

Dry contacts for direction commands; RS485 through a compatible integration controller for serial control and feedback.

3**Confirm the Lutron interface**

Identify the actual Lutron system and supported output device. QSE-IO and legacy visor references are separate hardware routes.

4**Bench test, then commission**

Prove limits, direction, stop logic, contact timing and power recovery before fitting the completed draperies.

Reference plates preserve manufacturer circuit geometry. These are integration options to validate, rather than a claim that every Forest model pairs natively with every Lutron system.

Control options roadmap

TECHNICAL INTEGRATION ROADMAP

Route	Control / feedback / integration requirement
Dry contact	Open / close / stop; no position feedback from the contacts. Use supported Lutron contact outputs.
RS485	Addressed serial commands and position queries; compatible controller / gateway and validated motor receiver required.
RF remote / wall control	Direct local motor control. Does not establish Lutron compatibility.
Wi-Fi dongle	The 2025 Forest roadmap describes feedback; verify exact dongle and current integration support.
Bond RF route	The 2025 roadmap shows RF integration without motor position feedback; validate project-specific controller support.

2025 motor selection	Straight / curved hanging load
Eco (S)	100 / 90 lb; 24 VDC, 40 W, 1 Nm
HD (M)	160 / 120 lb; 24 VDC, 65 W, 1.5 Nm
iOn battery	55 / 40 lb; 14.8 VDC, 30 W, 1 Nm

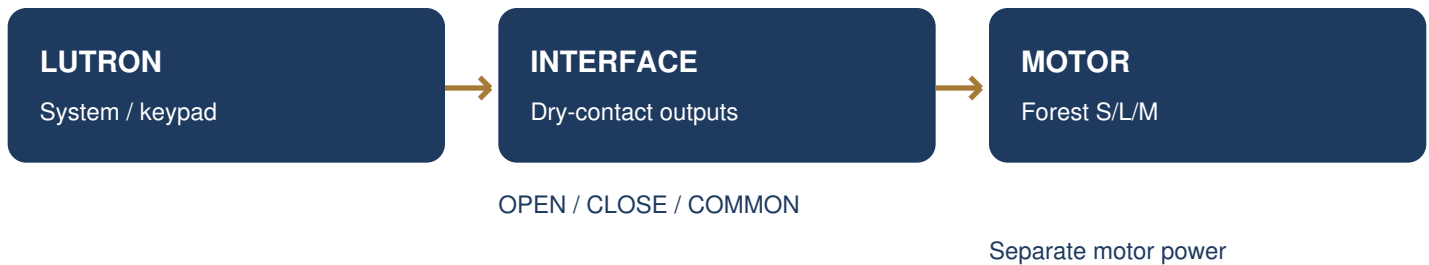
Use the supplied specifications for final selection. The RS485 sheet explicitly names S/L/M receivers 5232000000, 5232000001 and 5232000003; do not assume every iOn revision supports the same serial instructions.

Dry-contact wiring

TECHNICAL INTEGRATION ROADMAP

Functional signal path	Isolated contacts only
Lutron controller	Supported system + approved interface
Interface NO + COM	Two direction outputs; common routed to motor common
Motor control connector	Open / Close / Common per exact motor pinout
Motor power	Separate rated power supply. Contacts do not supply motor power.

Contact schedule — OPEN = 1 to 3. CLOSE = 8 to 3. STOP = 1 and 8 together to 3.



This is a functional wiring roadmap, not a physical plug orientation drawing. Use the original connector plate in the reference appendix. Confirm output timing and stop behavior on the sample motor before site programming.

Motor input mode	Meaning
Pulse (default)	A short closure starts a complete run.
Continuous	Movement continues while the direction contact is held.
Single-button operation	Open / stop / close / stop sequence; verify mode and installation needs.

STOP is model-specific. Forest Shuttle S/L/M closes both direction contacts to common simultaneously. Do not substitute the model 475 second-action stop logic.

RS485 bus and addressing

TECHNICAL INTEGRATION ROADMAP

Item	Supplied Forest serial reference
Connection	Controller to PORT 2 on first motor. Pin 2 = RS485b; pin 3 = GND; pin 5 = RS485a.
Topology / limits	Daisy chain preferred. Up to 32 motors / 1200 m (3936 ft) per supplied sheet. Star restrictions remain in the original reference.
Port configuration	Standard port mode is RS232. Sheet describes 29 configuration presses and a 5-second confirmation hold to select RS485; verify motor revision first.
Serial settings	9600 baud, 8 data bits, no parity, 1 stop bit; X-on / X-off. Case-sensitive ASCII.
Addresses	Three characters; default OWN; broadcast 000. Assign unique addresses before individual queries.
Message frame	# + three-character address + command + optional data + semicolon or carriage return. ? requests information.
Position scale	00 closed / reference; 99 open / limit. Set motor limits before scene and position work.

A serial gateway must be deliberately selected and programmed. The RS485 motor bus is not the Lutron QS communication link.

Serial command reference 1

TECHNICAL INTEGRATION ROADMAP

Code	Example	Meaning
A	#SH2ASH1;	Address-change acknowledgement
c	#SH1c;	Close to 00
d	#SH1dA40;	Define scene A at 40
d	#SH1d-;	Clear scenes
d	#SH1dA?;	Query scene A; standard terminator added
d	#SH1dA50;	Scene reply A at 50
E	#SH1Ebz;	Error: busy; ro read-only, nc not calibrated, ml message lost
g	#SH1gA;	Run scene A
i	#SH1i;	Identify, blink 20 seconds
m	#SH1m40;	Move to position 40

Scene identifiers: 0–9, A–Z and a–z. Query individual addresses to avoid competing replies. Original reference pages are reproduced in the appendix.

Serial command reference 2

TECHNICAL INTEGRATION ROADMAP

Code	Example	Meaning
o	#SH1o;	Open to 99
p	#SH1pRD;	Reset command family; see caution
r	#SH1r?;	Request current position
r	#SH1r40;	Position report
s	#SH1s;	Stop
v	#SH1v?;	Request version
v	#SH1vT11;	Version report
@	#OWN@SH2;	Readdress default OWN to SH2
~	#SH1~;	Randomize address

Scene identifiers: 0–9, A–Z and a–z. Query individual addresses to avoid competing replies. Original reference pages are reproduced in the appendix.

Commissioning and source checks

TECHNICAL INTEGRATION ROADMAP

1**Prove local mechanics**

Run unloaded and with the specified drapery load; set limits and verify direction.

2**Prove individual commands**

Test open, close, mid-travel stop and each intended scene from the real controller.

3**Prove failure recovery**

Check reboot / power loss / manual movement and retained settings; record actual behavior.

4**Hand over a documented system**

Record motor revision, addresses, pin schedule, output timings, loads, limits and tested scenes.

Source inconsistencies to resolve: #SH1dA40 defines 40 although the source explanation says 50. #OWN@SH2 addresses SH2 although its explanation says SH1. A scene query example omits the terminator. Reset examples use ! although the frame definition uses #. Confirm reset syntax with Forest before use.

FX and total reset options can alter scenes, direction and limits. Resetting is not a routine commissioning step. Keep the original sheet available and confirm the exact receiver firmware.

Reference plate index

TECHNICAL INTEGRATION ROADMAP

Appendix	All pages included
Forest 2025 specs / roadmap	2 landscape plates: motor comparison and control architecture
Forest dry-contact sheet	1 plate: ports / connector / operating modes
Forest RS485 protocol	3 plates: bus wiring, commands and reset reference
Lutron QSE-IO	10 plates: dimensions, mounting, terminal locations, wiring, application examples, modes and DIP switches
Wireless contact interface	7 legacy RadioRA 2 visor plates: specifications, mounting, inputs, outputs and wiring

Use PDF bookmarks to jump to each source page. The QSE-IO supplied PDF contains visible font artifacts in some spaces; circuit geometry and original labels are retained. Product-specific source sheets govern terminal orientation and electrical ratings.

Plain-language companion: plumridge.com/rust-proof-hardware/motorization/roadmap-explained/

FOREST SHUTTLE SPECIFICATIONS



SHUTTLE® HD (M)

SHUTTLE® ECO (S)

SHUTTLE® iOn



SPECIFICATIONS

FEATURES

VOLTAGE SHUTTLE	24V DC
RECEIVER	Internal, optional
POWER SUPPLY	External, 100-240V AC - 1.5A, 50-60Hz; Output 24V DC - 2.7A
MAX POWER	65W
TORQUE	1.5 Nm
TRAVEL SPEED	5.5" per second standard 7" per second maximum
NOISE LEVEL	< 40 dB(A)
MAXIMUM WEIGHT	160 lbs per motor 120 lbs per motor - curved track
DIMENSIONS	2.76" x 1.97" x 9.5"
CERTIFICATIONS/MARKINGS	CE/FCC/DOE
COLOR OPTIONS	White / Black
TOUCH CONTROL TECHNOLOGY	✓
INTEGRATED EMERGENCY CONTROL	✓
RF COMMUNICATION STANDARD	✓
Z-WAVE COMMUNICATION	-
AUTOMATION SYSTEM COMPATIBLE	✓ using RS485 & dry contacts
WI-FI COMPATIBLE	✓
WORKS WITH WIFI DONGLE	✓
CAN BE USED WITH CURVED TRACK	✓
PLUG & PLAY	✓
WARRANTY	10 Years

VOLTAGE SHUTTLE	24V DC
RECEIVER	Internal
BATTERY	External, 100-240V AC - 0.8A, 50-60Hz; Output 24V DC - 2.5A
MAX POWER	40W
TORQUE	1.0 Nm
TRAVEL SPEED	5.5" per second standard 7" per second maximum
NOISE LEVEL	< 40 dB(A)
MAXIMUM WEIGHT	100 lbs per motor 90 lbs per motor - curved track
DIMENSIONS	2.76" x 1.97" x 7.5"
CERTIFICATIONS/MARKINGS	CE/FCC/DOE
COLOR OPTIONS	White
TOUCH CONTROL TECHNOLOGY	✓
INTEGRATED EMERGENCY CONTROL	✓
RF COMMUNICATION STANDARD	✓
Z-WAVE COMMUNICATION	-
AUTOMATION SYSTEM COMPATIBLE	✓ using RS485 & dry contacts
WI-FI COMPATIBLE	✓
WORKS WITH WIFI DONGLE	✓
CAN BE USED WITH CURVED TRACK	✓
PLUG & PLAY	✓
WARRANTY	10 Years

SPECIFICATIONS

FEATURES

VOLTAGE SHUTTLE	14.8V DC
RECEIVER	Internal
BATTERY	Lithium iOn battery + charger (3-4 months between charges)
MAX POWER	30W
TORQUE	1.0 Nm
TRAVEL SPEED	5.5" per second standard
NOISE LEVEL	< 40 dB(A)
MAXIMUM WEIGHT	55 lbs per motor 40 lbs per motor - curved track
DIMENSIONS	2" x 3" x 12.25"
CERTIFICATIONS/MARKINGS	CE/FCC/DOE
COLOR OPTIONS	White
TOUCH CONTROL TECHNOLOGY	✓
INTEGRATED EMERGENCY CONTROL	✓
RF COMMUNICATION STANDARD	✓
Z-WAVE COMMUNICATION	-
AUTOMATION SYSTEM COMPATIBLE	✓ using RS485 & dry contacts
WI-FI COMPATIBLE	✓
WORKS WITH WIFI DONGLE	✓
CAN BE USED WITH CURVED TRACK	✓
PLUG & PLAY	✓
WARRANTY	10 Years on motor 2 years on battery pack

Our wide variety of control options make finding a fit for your windows easy – controlling the drapes by hand, wall switch, remote or even by home automation system.



TOUCH CONTROL
Open or close your drapes with a gentle tug.



FOREST REMOTE CONTROLS
We offer two types of RF remote controls: the EasyTouch and the Diamond Sense.

- The EasyTouch controls up to 6 systems, with the option to deactivate unused channels.
- The Diamond Sense is a 15- or 2-channel remote with an LED display. Systems can be operated manually or with the integrated timer.

Both remotes have a range of up to 98 feet.



BOND BRIDGE PRO
With the Bond Bridge Pro, easily pair your Forest remote and get app control for Forest motorized window coverings and other devices all in one place.



SIDEKICK GEN 3 REMOTE
5- or 1-channel remote control. Pairs directly with drapery motor. Use with Bond Bridge Pro or without. Estimated 10-year battery life.

FOR ADDITIONAL CONTROL OPTIONS, SEE THE ROADMAP ON THE FOLLOWING PAGES.

Drapery Controls Roadmap

Choose how the draperies will be controlled. Five distinct routes, with feedback and interface requirements shown separately.

01

LOCAL RF

Wall switch / remote

RF

Local operation

Wall switch, Diamond Sense, Easy Touch and Sidekick Gen 3.

DIRECT MOTOR CONTROL

No automation platform is required for direct local RF operation.

02

WI-FI / APP

Voice and app control

Wi-Fi

With feedback

Motor Wi-Fi dongle; local and remote app operation.

INTEGRATION REFERENCES

works with Hey Google

works with alexa

works with Hey Siri

CRESTRON

Control4

Cloud-dependent services must be available for the cloud integrations.

03

RF BRIDGE

Voice and app control

RF + Bond Bridge Pro

Without feedback

RF bridge route. Confirm the bridge and motor compatibility.

bond

INTEGRATION REFERENCES

somfy.

works with Hey Google

works with alexa

works with SmartThings

Control4

CRESTRON

SAVANT

ELAN

RTI

U-C

HOMEBRIDGE

JOSH

Hubitat

Other supported platforms may be possible.

04

SERIAL BUS

Wired building automation

RS485

With feedback

Addressed motor commands through a compatible controller / gateway.

INTEGRATION REFERENCES

Control4

CRESTRON

SAVANT

RTI

Other supported platforms may be possible; use an installation specialist.

05

DRY CONTACT

Wired building automation

Isolated contact closures

Without feedback

Supported contact-output interface. Test open / close / stop logic.

INTEGRATION REFERENCES

Control4

CRESTRON

SAVANT

LUTRON

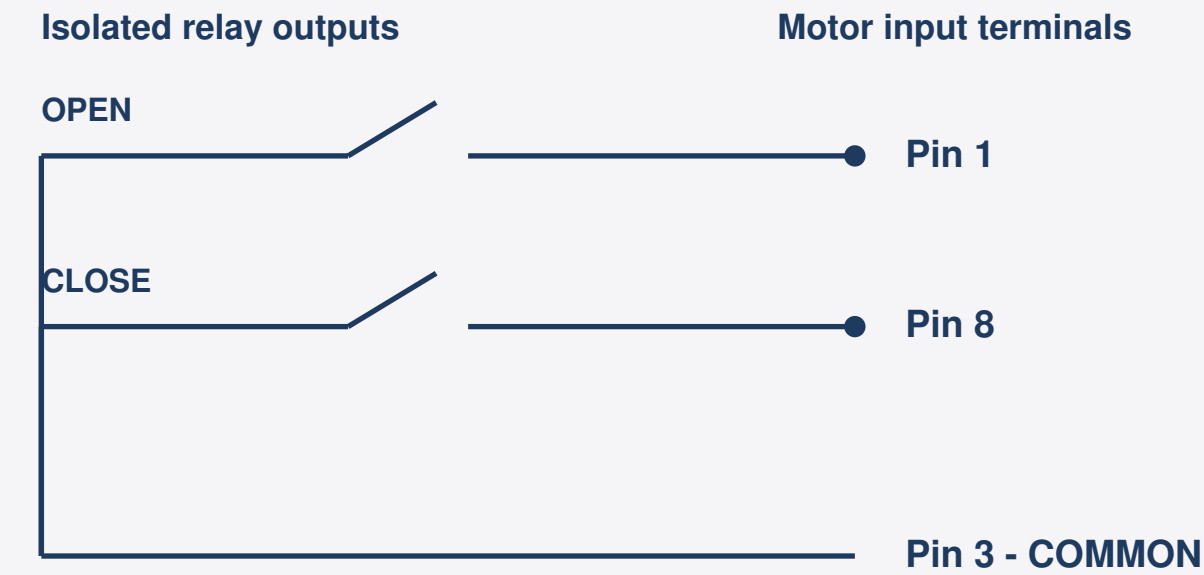
Other supported platforms may be possible; use an installation specialist.

Project check: These logos reproduce integration references in the supplied roadmap. Confirm the actual motor revision, firmware, interface and platform support. The separate RS485 sheet expressly names S/L/M receivers; do not assume every battery model supports its serial instructions.

Dry-Contact Wiring Roadmap

Shuttle S / L / M receiver - PORT 1 or PORT 2. Use potential-free contacts on pins 1, 3 and 8.

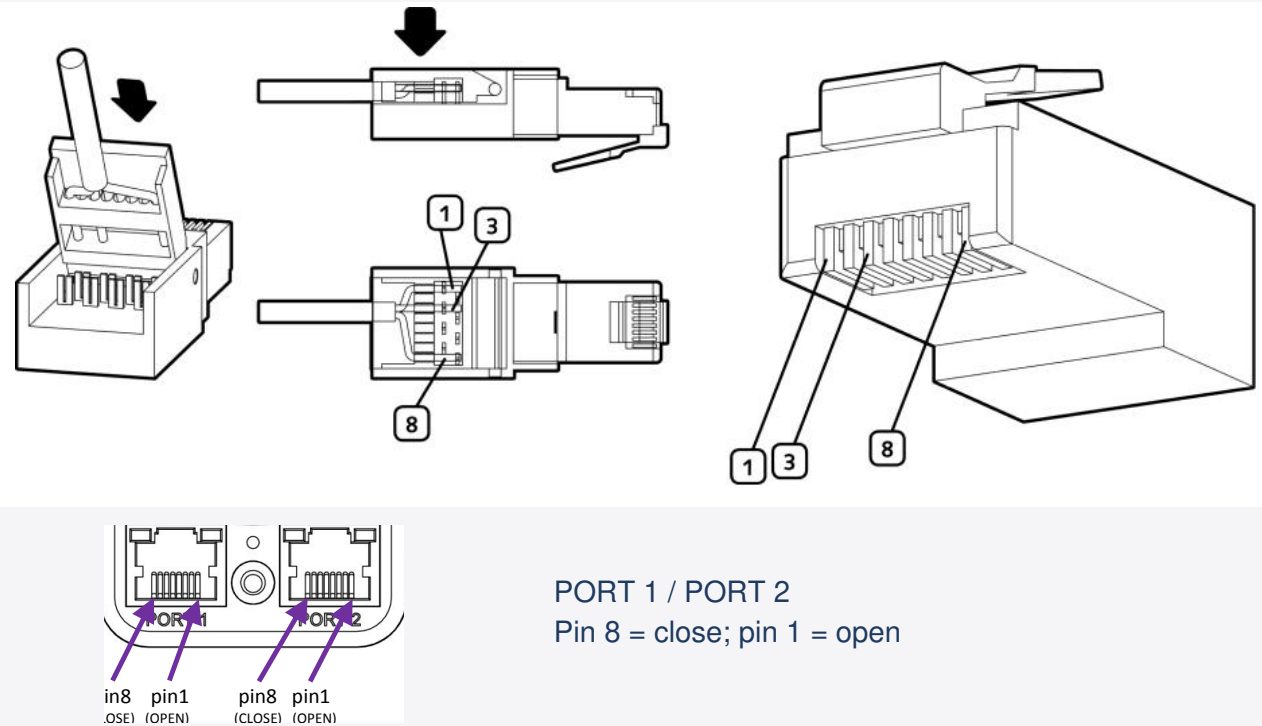
FUNCTIONAL CONTROL WIRING



OPEN: close pin 1 to pin 3.
CLOSE: close pin 8 to pin 3.
STOP: close pins 1 and 8 to pin 3 together.

PHYSICAL CONNECTOR REFERENCE

Plug views and port details preserve the original pin orientation.



PORT 1 / PORT 2
Pin 8 = close; pin 1 = open

KEEP SIGNALS AND MOTOR POWER SEPARATE

Automation contacts send commands only. They do not supply motor power. Use the correct motor power arrangement for the exact model; the supplied sheet shows a separate 24 VDC supply for S and M.

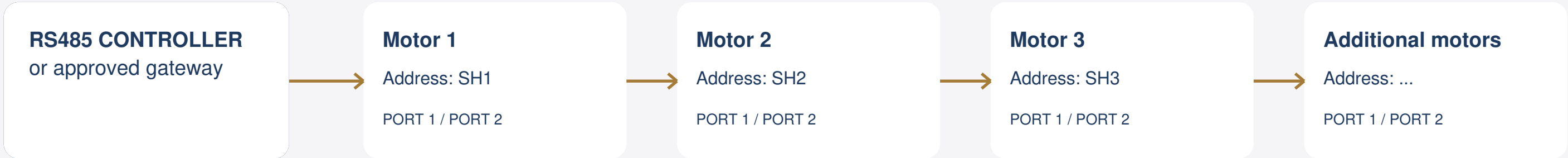
INPUT MODES

Pulse (default): a brief closure starts a full run. **Continuous:** movement while the contact remains made.
Single button: open / stop / close / stop sequence. Verify the programmed mode before commissioning.

RS485 Bus Roadmap

Addressed serial control for compatible Shuttle S / L / M receivers. Daisy-chain wiring is the preferred architecture.

CONTROLLER TO FIRST MOTOR, THEN MOTOR TO MOTOR



Connect controller to PORT 2 of first motor

Pin 2 = RS485b Pin 3 = GND Pin 5 = RS485a

Up to 32 motors and 1200 m (3936 ft) of physical bus wiring in the supplied reference.

SERIAL MESSAGE ROADMAP

9600 baud / 8 data bits / no parity / 1 stop bit

X-on / X-off; case-sensitive ASCII.

+ address + command + optional data + terminator

Terminator: semicolon or carriage return.

A question mark requests information.

Example: #SH1r?; requests motor SH1 position.

Position scale: 00 closed; 99 open.

CONFIGURE, ADDRESS, THEN TEST

1. Confirm the receiver revision.

The supplied sheet names S/L/M receiver variants.

2. Select RS485 mode.

The source describes 29 configuration presses, then a 5-second confirmation hold; verify revision first.

3. Assign unique three-character addresses.

Default OWN; use individual addresses for feedback.

4. Test movement and position queries.

Set limits first; retain the full command reference.



Connecting the FX-bus (RS485) of an Eco (S) or Eco HD (M) Shuttle receiver to Home Automation

Table of commands/messages:

command character and description		command/message direction	number of characters and description		example	explanation
A	acknowledge address change	from Shuttle	0	none	#SH2ASH1;	address changed of SH1 to SH2
c	close	to Shuttle	0	none	#SH1c;	close device SH1 (00%)
d	define a scene	to Shuttle	var.	scene *1, 00-99% or NS to not act on this scene	#SH1dA40;	define scene A to 50% of device SH1
d	request scene setting	to Shuttle	1	- (minus sign) means clear all scenes	#SH1d-;	clear all scenes of device SH1
d	report scene setting	from Shuttle	2	scene *1, question mark	#SH1dA?	request scene A of device SH1
d	report scene setting	from Shuttle	3	scene *1, 00-99% or NS if not in scene	#SH1dA50;	scene A of device SH1 defined at 50%
E	an error occurred	from Shuttle	2	2 characters describing error bz = busy, ro = read only, nc = not calibrated ml = message lost either uplink or downlink	#SH1Ebz;	error: device SH1 is busy
g	execute scene	to Shuttle	1	scene *1	#SH1gA;	device SH1 move to scene A
i	indentify using green LED 1	to Shuttle	0	none	#SH1i;	led on device SH1 blinks for 20 sec.
m	move to position	to Shuttle	2	2 digits from 00 to 99 = destination position in % *2	#SH1m40;	device SH1 move to 40%
o	open	to Shuttle	0	none	#SH1o;	open device SH1 (to 99%)
p	reset Shuttle	to Shuttle	2	2 characters, RD = "FX" default, R* = total reset *3	#SH1pRD;	reset device SH1 to "FX" default
r	request current position	to Shuttle	1	question mark	#SH1r?	request position of device SH1
r	report current position	from Shuttle	2	2 digits from 00 to 99 = current position in % *2	#SH1r40;	device SH1 at 40%
s	stop	to Shuttle	0	none	#SH1s;	stop device SH1
v	request version	to Shuttle	1	question mark	#SH1v?	request version number of SH1
v	report version	from Shuttle	3	3 characters	#SH1vT11;	version number of SH1 is T11
@	re-address	to Shuttle	3	3 characters (0-9 or A-Z)	#OWN@SH2;	re-address OWN to SH1
~	randomize your address	to Shuttle	0	none	#SH1~;	randomize address of SH1

*1 means scene number 0 to 9, A to Z, a to z

*2 00 means at reference position (close position), 99 means at limit away from reference (open position), limits must be set before these messages happen.

*3 see reset table on next page

"0" = zero, except for "o" (lower case "o")



Connecting the FX-bus (RS485) of an Eco (S) or Eco HD (M) Shuttle receiver to Home Automation

Reset table:

setting	"FX" default, e.g. !SH1pRD;	total reset, e.g. !SH1pR*;
limits and current position	not changed	cleared
touch impulse options	not changed	enabled with easy sensitivity
open/close direction	set to original	set to original
master or slave setting	not	not
Z-wave positions	not changed	not changed
FX scenes	cleared	cleared
FX address	not changed	not changed

Notes:

- The FX-bus is only for the Shuttle S, L and M receiver (no: 5232000000, 5232000001 and 5232000003)
- addressing ALL Shuttle motors: address 000
- address "OWN" on every single Shuttle can be re-addressed by means of the @-command

Connections:

- FX gateway is connected to PORT 2 of the first Shuttle. Port 2 serial communication: pin 2 = RS485b, pin 3 = GND, pin 5 = RS485a
- The cable between Shuttle motors can be UTP/FTP or flat cable. Daisy-chain and/or star configuration is allowed.
- All 8 pins of the RJ45 plugs can be connected between Shuttle motors. If less than 8 cores available, at least connect pin2, pin 3 and pin 5.

Serial Connection parameters:

- 9600 baud 8N1 (8 data bits, no parity, 1 stop bit). No sync characters. Case matters everywhere.
- Extended ASCII characters (0x80-0xFF) NOT allowed anywhere.
- Flow control: X-on / X-off.

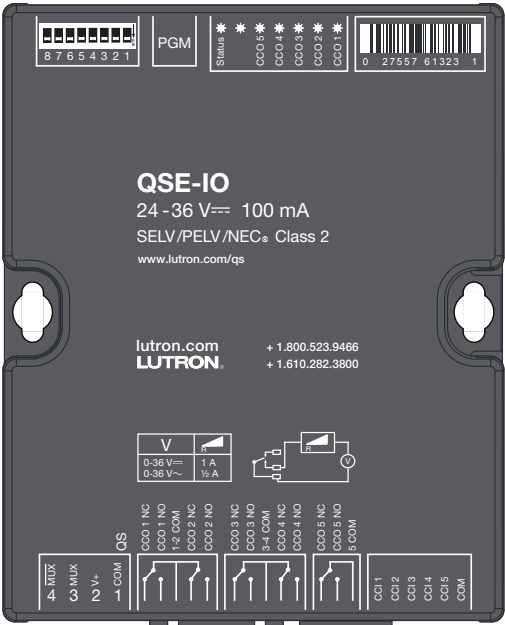
QSE-IO Control Interface

The QSE-IO contact closure interface provides integration with third-party equipment requiring contact closure input/output, including occupancy and vacancy sensors; motorized projection screens, skylights, and window shades; AV equipment; security systems; movable partition walls; and timeclocks. One QSE-IO interface provides five (5) dry contact closure outputs and five (5) inputs.

For complete functionality, programming instructions, and detailed DIP switch settings, see the QSE-IO Programming Guide, www.lutron.com/TechnicalDocumentLibrary/040391.pdf

Features

- Integrates a QS control system with equipment that has contact-closure inputs and outputs.
- Provides five inputs and five dry contact closure outputs.
- Provides both normally open (NO) and normally closed (NC) contacts.
- May be programmed to control or be controlled on a QS system.



QSE-IO Contact Closure Interface

Job Name:		
Job Number:		
Model Numbers:		

Specifications

Regulatory Approvals

- UL® Listed
- cUL® Listed
- CE compliant
- RoHS compliant

Power

- SELV/PELV/NEC® Class 2
- Operating voltage: 24–36 V $\overline{=}$ 100 mA

QS Link Limits

- Each QSE-IO control interface counts as 1 device and 5 zones.
- Each QSE-IO control interface consumes 3 Power Draw Units (PDU) on the QS link. Refer to the QS Link Power Draw Units Specification Submittal (P/N 369405) at www.lutron.com for more information.
- The maximum wiring length for the QS link is 2000 ft (610 m).

Environment

- 32 °F to 104 °F (0 °C to 40 °C).
- Relative humidity less than 90% non-condensing.
- Indoor use only.
- Unit generates heat, maximum 8 BTU/hr.

Functionality and Operating Modes

- Using the inputs, contact closures in other equipment can operate control units to:
 - Select scenes
 - Adjust scenes to reflect status of movable walls
 - Toggle any combination of zones in the system between Off and a configurable preset value
 - Turn lights on or off and/or move shades based on room occupancy
 - Perform special functions such as sequencing, panic, control lockout, or timeclock disable
- Using the outputs, scene and/or zone changes in control units can:
 - Trigger outputs to control other equipment
 - Provide status feedback to other equipment

Functionality and Operating Modes (continued)

- Using the inputs, contact closures in other equipment can operate Sivoia QS window treatments to:
 - Open or close.
 - Raise, lower, or stop.
 - Select one of three adjustable presets.
- Using the outputs, key presses on QS window treatment keypads or GRAFIK Eye QS window treatment buttons can:
 - Trigger outputs to other motorized window treatment equipment
- Scene selection
- Occupancy sensor
- Zone toggle
- Shade input
- Special functions
- Shade output
- Partitioning
- For a full list of functionality and operating modes, please see the Operating Modes and Dipswitch Settings table on Pages 8 and 9

Requirements

- QS Link Power Supply, such as a:
 - GRAFIK Eye QS
 - QS Link power supply, such as the QSPS-P1-1-50
 - Energi Savr Node QS
 - Quantum light management hub
- QS Communication Link (SELV/PELV/NEC® Class 2) (see QS Link Wire Sizes table)

Job Name:		
Job Number:		
Model Numbers:		

Specifications (continued)

Five Input Terminals

- Accept maintained inputs and momentary inputs with 40 msec minimum pulse times
- Off-state leakage current must be less than 100 µA
- Open circuit voltage: 36 V $\overline{=}$ maximum
- Inputs must be dry contact closure, solid state, open collector, or active-low (NPN)/active high (PNP) output
 - Open collector NPN or active-low on-state voltage must be less than 2 V $\overline{=}$ and sink 3.0 mA
 - Open collector PNP or active-high on-state voltage must be greater than 12 V $\overline{=}$ and source 3.0 mA

Five Output Terminals

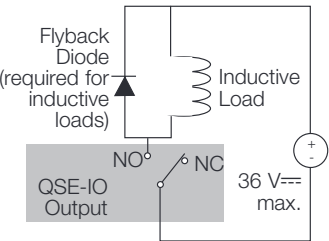
- Provide selectable maintained or momentary (1/4 second) outputs (SELV/PELV/NEC® Class 2 rated only)
- The QSE-IO is not rated to control unclamped, inductive loads. Inductive loads include, but are not limited to, relays, solenoids, and motors. To control these types of equipment, a flyback diode must be used (DC voltages only). See "Terminal Locations"
- Output relays are non-latching (if relays are closed and power is lost, relays will open)

Status LEDs

- Five Status LEDs light when associated output is active (on)

Output Ratings

Supply Voltage	Resistive Load 
0–36 V $\overline{=}$	1.0 A
0–36 V $\sim$	0.5 A



⚠WARNING – Entrapment Hazard – To avoid the risk of entrapment, serious injury, or death, these controls must not be used to control equipment that is not visible from every control location or that could create hazardous situations if operated accidentally or through malfunction (for example, motorized gates, garage doors, industrial doors, microwave ovens, heating pads, fireplaces, space heaters, etc.). It is the installer’s responsibility to ensure that these controls are connected only to suitable loads and equipment types and that such equipment is visible from every control location. Failure to do so could result in serious injury or death.

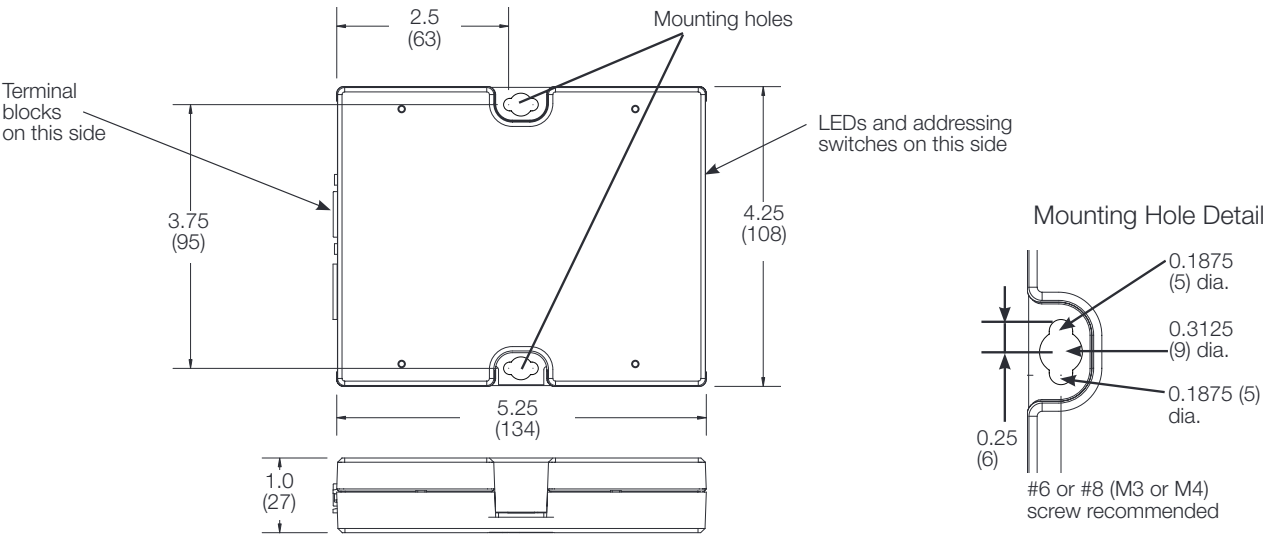
 **LUTRON** SPECIFICATION SUBMITTAL

Page 3

Job Name:		
Job Number:		
Model Numbers:		

Dimensions

Dimensions are in inches (mm)



Mounting Options

Mount where terminal blocks, switches, and LEDs are accessible. Strip 3/8 in (10 mm) of insulation from wires. Each data link terminal will accept up to two 18 AWG (1.0 mm²) wires. Connect wiring as shown on the Wiring page. LED 1 lights continuously (Power) and LED 7 blinks rapidly (Data Link RX) when the SELV/PELV/NEC® Class 2 Data Link is installed correctly. Choose from the following mounting methods:

1 Direct Wall Mounting

Mount the control interface directly on a wall, as shown in Mounting Methods at right, using screws (not included). When mounting, provide sufficient space for connecting cables.

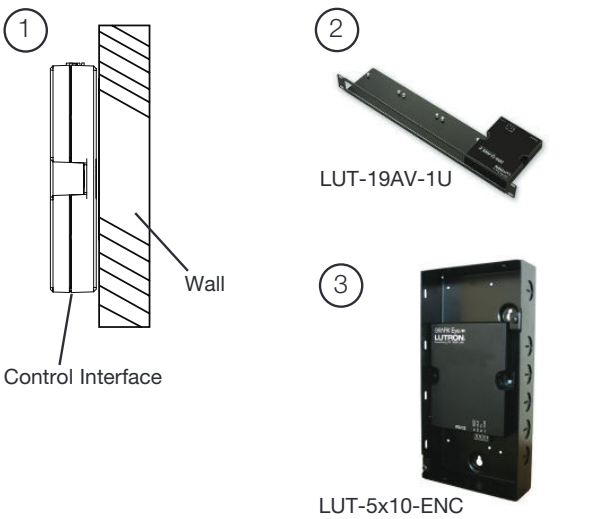
2 Rack Mounting

Place the unit in the LUT-19AV-1U AV rack using screws provided with the unit. The LUT-19AV-1U will hold up to four units.

3 Enclosed Wall Mounting

If conduit is desired for wiring, use the LUT-5x10-ENC to mount one unit.

Mounting Methods

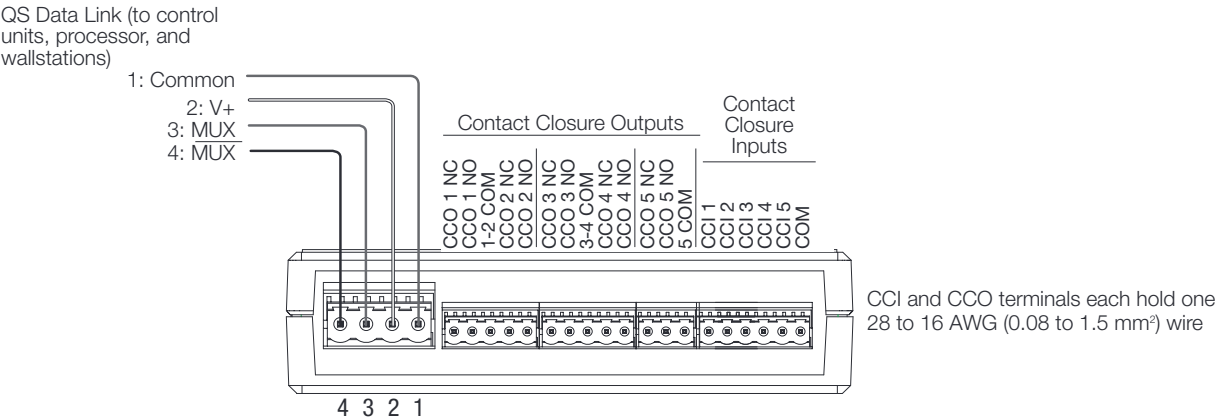


SPECIFICATION SUBMITTAL

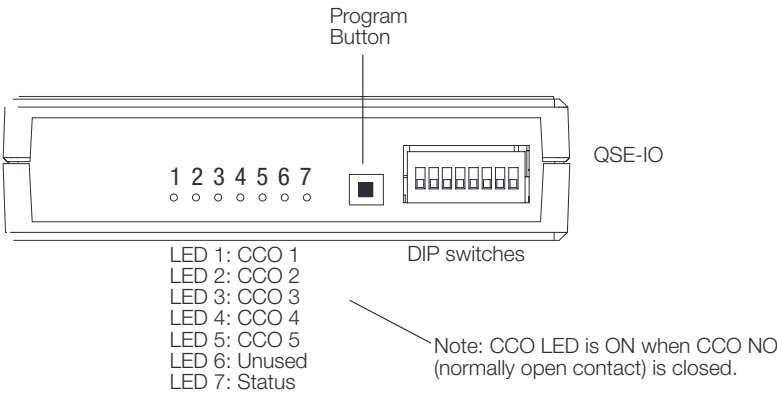
Page 4

Job Name:			
Job Number:			
Model Numbers:			

Terminal Locations



LED and DIP Switch Locations



QS Link Wire Sizes (check compatibility in your area)

QS Link Wiring Length	Wire Gauge	Lutron® Cable Part Number
< 500 ft (153 m)	Power (terminals 1 and 2) 1 pair 18 AWG (1.0 mm²)	GRX-CBL-346S (non-plenum) GRX-PCBL-346S (plenum)
	Data (terminals 3 and 4) 1 twisted, shielded pair 22 AWG (0.5 mm²)	
500 to 2000 ft (153 to 610 m)	Power (terminals 1 and 2) 1 pair 12 AWG (4.0 mm²)	GRX-CBL-46L (non-plenum) GRX-PCBL-46L (plenum)
	Data (terminals 3 and 4) 1 twisted, shielded pair 22 AWG (0.5 mm²)	

 SPECIFICATION SUBMITTAL

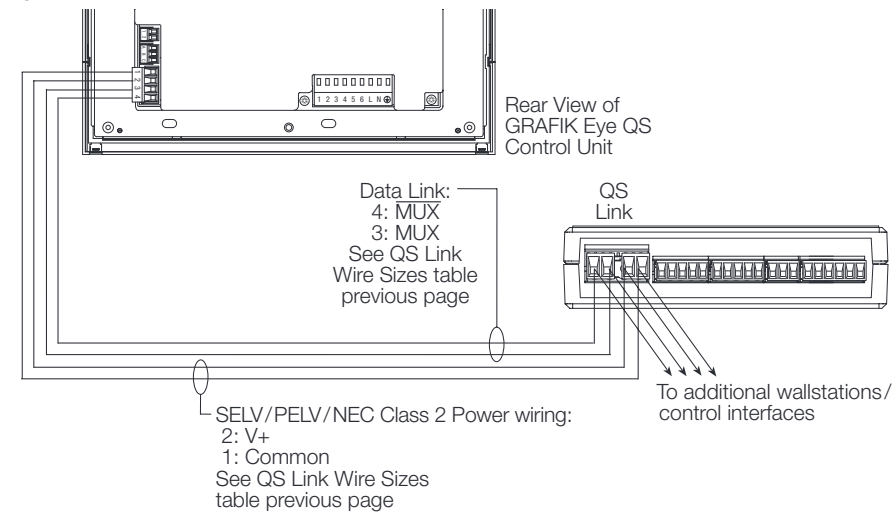
Page 5

Job Name:	Model Numbers:		
Job Number:			

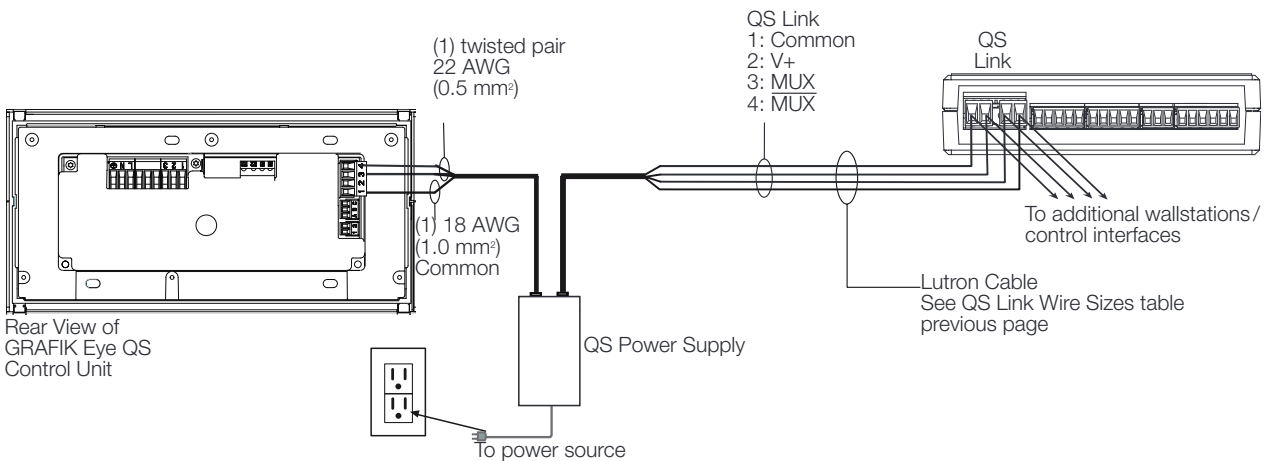
QS Link Wiring Methods (choose one)

- System communication uses SELV/PELV/NEC® Class 2 wiring.
 - Follow all local and national electrical codes when installing SELV/PELV/NEC® Class 2 wiring with line voltage/mains wiring.
 - Each terminal accepts up to two 18 AWG (1.0 mm²) wires.
 - Total length of control link must not exceed 2000 ft (610 m).
 - Typical Wire Sizes: See QS Link Wire Sizes table, previous page.
- Connect the terminal 1, 3, and 4 connections to all control units, wallstations, and control interfaces in the QS system. For terminal 2 connectivity, please refer to the wiring diagrams below.

Powered by GRAFIK Eye QS Control Unit



Powered by a QS Link Power Supply



LUTRON SPECIFICATION SUBMITTAL

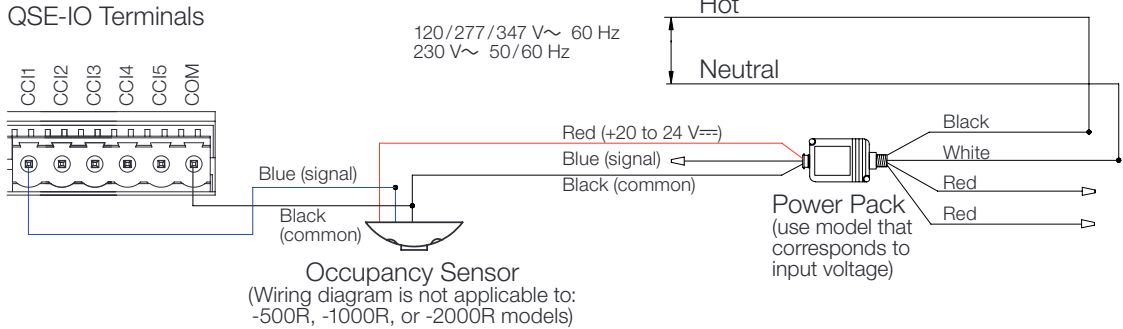
Page 6

Job Name:	Model Numbers:		
Job Number:			

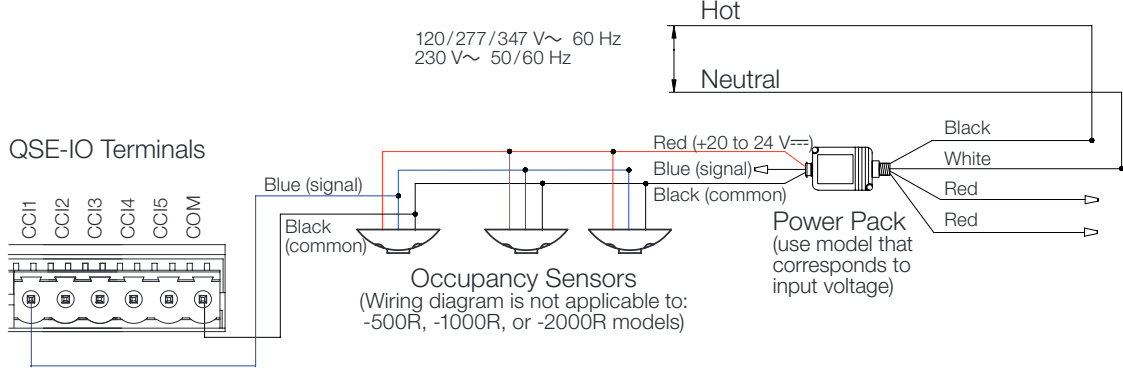
Wiring Application Examples

NOTE: Refer to Spec Submittal #369653 LOS-CDT Series on www.lutron.com for wiring details regarding Models -500R, -1000R, and -2000R for wiring the dry contact output from LOS sensors to the QSE-IO (e.g. 7 wire Occ Sensor with photocell)

1 Lutron Occupancy Sensor Wired to 1 QSE-IO Device Input



3 Lutron Occupancy Sensors Wired to 1 QSE-IO Device Input



Note: When used with a GRAFIK Eye QS standalone system in partitioned areas, each occupancy sensor input will only control the individual area. Changes in occupancy sensor state will not control adjacent areas. If partitioning functionality is required a Quantum processor is needed.

 SPECIFICATION SUBMITTAL

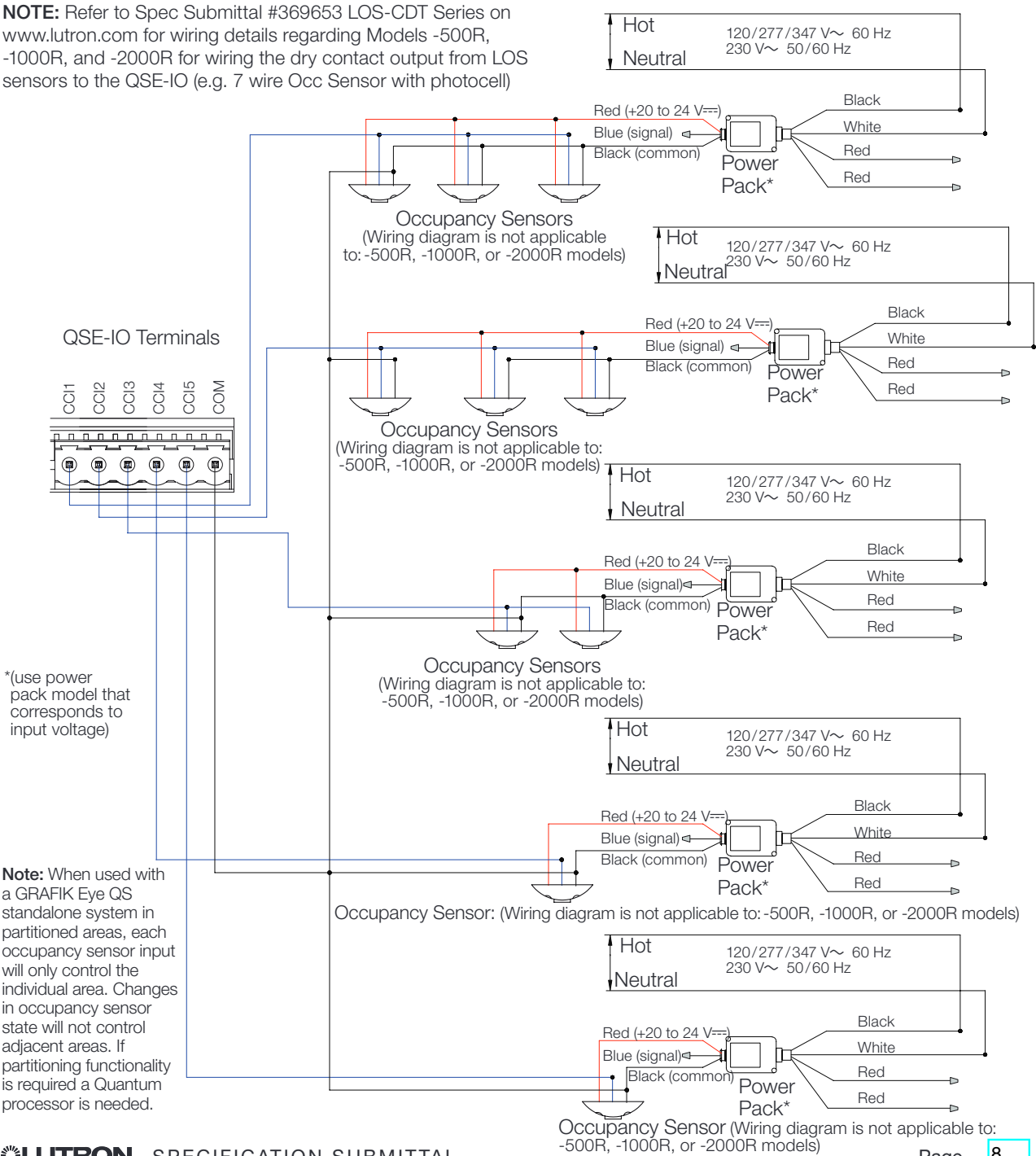
Page 7

Job Name:	Model Numbers:	
Job Number:		

Wiring Application Examples

Multiple Lutron Occupancy Sensors Wired to Multiple QSE-IO Device Inputs

NOTE: Refer to Spec Submittal #369653 LOS-CDT Series on www.lutron.com for wiring details regarding Models -500R, -1000R, and -2000R for wiring the dry contact output from LOS sensors to the QSE-IO (e.g. 7 wire Occ Sensor with photocell)



Job Name:		
Job Number:		
Model Numbers:		

QS System
QSE-IO
Control Interface

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QSE-IO Operating Modes and DIP Switch Settings Overview

Mode	Dip Switch						Contact Closures Invoke:						
Configuration	3	4	5	6	7	8	Input 1	Input 2	Input 3	Input 4	Input 5	Inputs	Outputs
Scene selection							Scene 1	Scene 2	Scene 3	Scene 4	Scene Off	Maintained or Momentary	Maintained
							Scene 5	Scene 6	Scene 7	Scene 8	Scene Off		
							Scene 9	Scene 10	Scene 11	Scene 12	Scene Off		
							Scene 13	Scene 14	Scene 15	Scene 16	Scene Off		
							Scene 1	Scene 2	Scene 3	Scene 4	Scene Off	Maintained or Momentary	Momentary
							Scene 5	Scene 6	Scene 7	Scene 8	Scene Off		
							Scene 9	Scene 10	Scene 11	Scene 12	Scene Off		
							Scene 13	Scene 14	Scene 15	Scene 16	Scene Off		
Special (maintained)							Sequence 5–16	Zone lockout	Scene lockout	Panic mode	Timeclock	Maintained	Maintained
Special (momentary)							Sequence 5–16	Zone lockout	Scene lockout	Panic mode	Timeclock	Momentary	
Special 2 (maintained)							Sequence 1–4	Zone lockout	Scene lockout	Panic mode	Afterhours mode	Maintained	Maintained
Special 2 (momentary)							Sequence 1–4	Zone lockout	Scene lockout	Panic mode	Afterhours mode	Momentary	
Shade input preset (“stop if moving”)							Shade open	Shade preset 1	Shade preset 2	Shade preset 3	Shade close	Maintained or Momentary	Maintained
Shade input preset (no “stop if moving”)							Shade open	Shade raise	Shade lower	Shade stop	Shade close	Momentary or Maintained	Maintained
Shade input dual group (“stop if moving”)							Open Group 1	Close Group 1	Open Group 2	Close Group 2	—	Maintained or Momentary	Maintained
Shade input dual group (no “stop if moving”)								Close Group 1	Open Group 2	Close Group 2	—	Momentary	Momentary
Shade input dual group (raise / lower)							Raise / Stop Group 1	Lower / Stop Group 1	Raise / Stop Group 2	Lower / Stop Group 2	—	Momentary	Momentary
Shade input toggle (“stop if moving”: open / stop / close / stop)							Toggle Group 1	Toggle Group 2	Toggle Group 3	Toggle Group 4	Toggle Group 5	Momentary	Momentary
Shade input toggle (no “stop if moving”: open / close)							Toggle Group 1	Toggle Group 2	Toggle Group 3	Toggle Group 4	Toggle Group 5	Maintained	Momentary
AC Shade output (maintained outputs)							Open Group 1	Stop Group 1	Close Group 1	Open Group 2	Close Group 2	Maintained or Momentary	Maintained
AC Shade output (momentary stop)							Open Group 1	Stop Group 1 if moving	Close Group 1	Open Group 2	Close Group 2	Maintained or Momentary	Maintained (except 2, which is Momentary)
AC Shade output (momentary outputs)							Open Group 1	Stop Group 1 if moving	Close Group 1	Open Group 2	Close Group 2	Maintained or Momentary	Momentary

Notes

- For AC shades with only 2 inputs (open/close), set DIP switch 1 to the up/on position to enable the feature that mimics “stop” (asserts both “open” and “close” CCOs together when a “stop” command is received).
- The QSE-IO provides no power, only a control signal, to AC shades. Refer to the instructions that came with your shades for more information.

Legend:

Up / On

Down / Off

LUTRON SPECIFICATION SUBMITTAL

Page **9**

Job Name: 	Model Numbers:
Job Number: 	

QS System

QSE-IO

Control Interface

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QSE-IO Operating Modes and DIP Switch Settings Overview (continued)

Mode	Dip Switch						Contact Closures Invoke:						
Configuration	3	4	5	6	7	8	Input 1	Input 2	Input 3	Input 4	Input 5	Inputs	Outputs
Partitioning (momentary)							Wall 1	Wall 2	Wall 3	Wall 4	Wall 5	Momentary	Maintained
Partitioning (maintained)							Wall 1	Wall 2	Wall 3	Wall 4	Wall 5	Maintained	Maintained
Occupancy sensor (auto on/off)							Generates events on occupancy and vacancy					Maintained	Maintained
Occupancy sensor (manual on/auto off)							Generates events on vacancy only					Maintained	Maintained
Zone toggle (maintained)							Toggle 1	Toggle 2	Toggle 3	Toggle 4	Toggle 5	Maintained	Maintained
Zone toggle (momentary)							Toggle 1	Toggle 2	Toggle 3	Toggle 4	Toggle 5	Momentary	
Zone toggle with raise/lower (maintained)							Toggle 1	Toggle 2	Toggle 3	Raise	Lower	Maintained	
Zone toggle with raise/lower (momentary)							Toggle 1	Toggle 2	Toggle 3	Raise	Lower	Momentary	
Zone control (maintained output)							Toggle 1	Toggle 2	Toggle 3	Toggle 4	Toggle 5	Maintained	Maintained
							Toggle 1	Toggle 2	Toggle 3	Toggle 4	Toggle 5	Momentary	
Zone control (momentary output)							Pulse 1	Pulse 2	Pulse 3	Pulse 4	Pulse 5	Maintained	Momentary
							Pulse 1	Pulse 2	Pulse 3	Pulse 4	Pulse 5	Momentary	
Zone control (pulsed output)							Pulse 1	Pulse 2	Pulse 3	Pulse 4	Pulse 5	Maintained	Pulsed
							Pulse 1	Pulse 2	Pulse 3	Pulse 4	Pulse 5	Momentary	
Hotel configuration 1							Service (make up room)	Privacy (do not disturb)	Doorbell	Start/end afterhours mode	Toggle Scene 1 / Off	1-3: Maintained or Momentary 4-5: Maintained	Maintained (except 3)
Hotel configuration 2							Service (make up room)	Privacy (do not disturb)	Doorbell	Start/end afterhours mode	Enable/disable Scene lockout	1-3: Maintained or Momentary 4-5: Maintained	Maintained (except 3)
Integration configuration							Control output 1	Control output 2	Control output 3	Control output 4	Control output 5	Maintained or Momentary	Maintained or Momentary

Notes

- Occupancy sensor: Each input represents 1 sensor/group of sensors. Response to sensor event is programmable at the assigned lighting control.
- "Momentary" output pulse is of fixed duration (250 ms default).
- "Pulsed" output duration corresponds to activating button being held/released.
- Hotel: "Service" and "Privacy" are mutually exclusive; "Doorbell" is locked out when "Privacy" is active.
- DIP switch 1 must be up/on to activate the "Start/End Afterhours" feature on CCI4.
- DIP switch 2 must be up/on to activate the "Toggle Scene" or "Scene Blackout" feature on CCI 5.
- Occupancy sensors will not participate in partitioning logic.

Legend:

-  Up/On
-  Down/Off

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 LUTRON SPECIFICATION SUBMITTAL

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Job Name:	Model Numbers:	
Job Number:		

RadioRA 2 Visor Controls

RadioRA 2 Visor Controls allow lights, shades/draperies, and other equipment to be controlled from the car with just a touch of a button on a Visor Control Transmitter or a HomeLink[®] compatible visor control. Up to ten (10) Transmitters can be used with a Visor Control Receiver.

The Receiver provides two (2) Contact Closure Inputs (CCI) for integration with other systems and one (1) CCI for security systems. The CCIs can be configured to accept maintained or momentary contact closures. The security input is always a maintained CCI.

The Receiver also has four (4) maintained or momentary Contact Closure Outputs (CCO) to control up to four (4) garage doors or motorized gates.

Pre-printed and blank labels are included with the Visor Controls for naming scenes or buttons on both the Receiver and the Transmitter.

Model Numbers

RR-VCRX-WH*	Visor Control Receiver
LR-3B-H-SW**	Visor Control Transmitter

*Only available in White (WH).
**Only available in Snow (SW).



RR-VCRX-WH
Visor Control Receiver



LR-3B-H-SW
Visor Control Transmitter

 **HomeLink**
COMPATIBLE

HomeLink and the HomeLink Compatible logo are registered trademarks of Johnson Controls.

RadioRA 2 Visor Controls**Specifications**

Model Numbers	RR-VCRX-WH, LR-3B-H-SW
Power	Receiver: 9 V --- 300 mA DC adapter: Input: 120 V $\sim$ 60 Hz 6.5 W Output: 9 V --- 300 mA Transmitter: 6 V --- 10 mA (2 - CR2032, included – 10 year lifetime)
Typical Power Consumption	1.6 W Test conditions: two LEDs on (two presets active), powered by the 9 V --- adapter supplied, no CCOs or CCIIs active.
Regulatory Approvals	DC adapter: UL Listed for U.S. and Canada, NOM Receiver/Transmitter: FCC, IC, COFETEL
Environment	Receiver: Ambient operating temperature: 32 °F to 140 °F (0 °C to 60 °C), 0% to 90% humidity, non-condensing. Indoor use only. Transmitter: Ambient operating temperature: -40 °F to 235 °F (-40 °C to 113 °C), 0%-90% humidity, non-condensing. Meets the Society of Automotive Engineers (SAE) temperature standards.
Communications	Visor Controls communicate with the system through Radio Frequency (RF). The Receiver must be located within 30 ft (9 m) of a Repeater. The typical operating distance between a Receiver and a Transmitter is 150 ft (46 m).
ESD protection	Tested to withstand electrostatic discharge without damage or memory loss, in accordance with IEC 61000-4-2.
Surge Protection	Tested to withstand surge voltages without damage or loss of operation, in accordance with IEEE C62.41-1991 Recommended Practice on Surge Voltages in Low-Voltage AC Power Circuits.
Mounting	Mount Receiver on a wall, ceiling, or level surface using the two #6 (M3) screws provided. Clip Transmitter to a vehicle's visor.
Connections	2 Contact Closure Inputs, 1 security input, and 4 momentary or maintained Contact Closure Outputs.
Warranty	1 Year Limited Warranty. http://www.lutron.com/resiinfo

Design Features

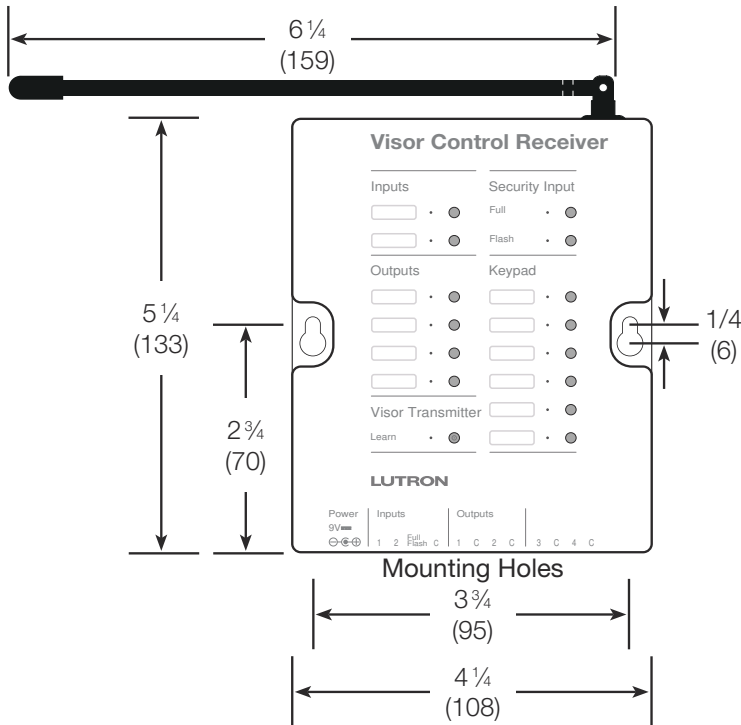
- Each output can be controlled locally at the Receiver or remotely by a Transmitter or keypad button.
- The Receiver 'Keypad' or 'Inputs' buttons can be programmed to light and shades/draperies.
- Full or Flash security options.
- The Transmitter can remotely control the 'Keypad', 'Security Input', and 'Outputs' buttons on the Receiver.

RadioRA 2 Visor Controls

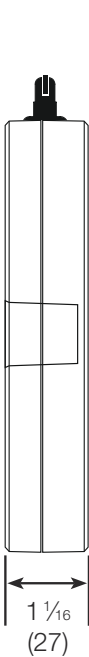
Dimensions

All dimensions are shown as ⁱⁿ
(mm)

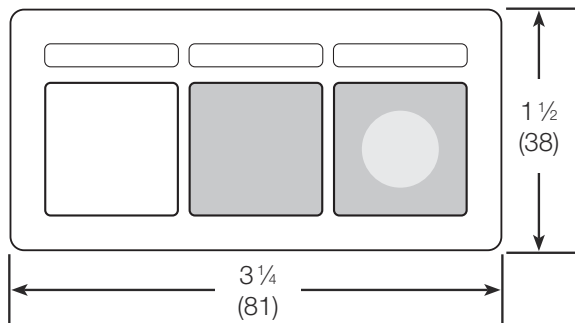
Receiver (Front)



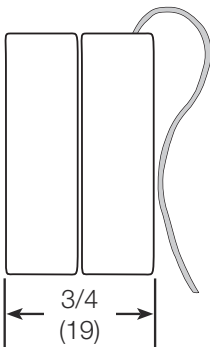
Receiver (Side)

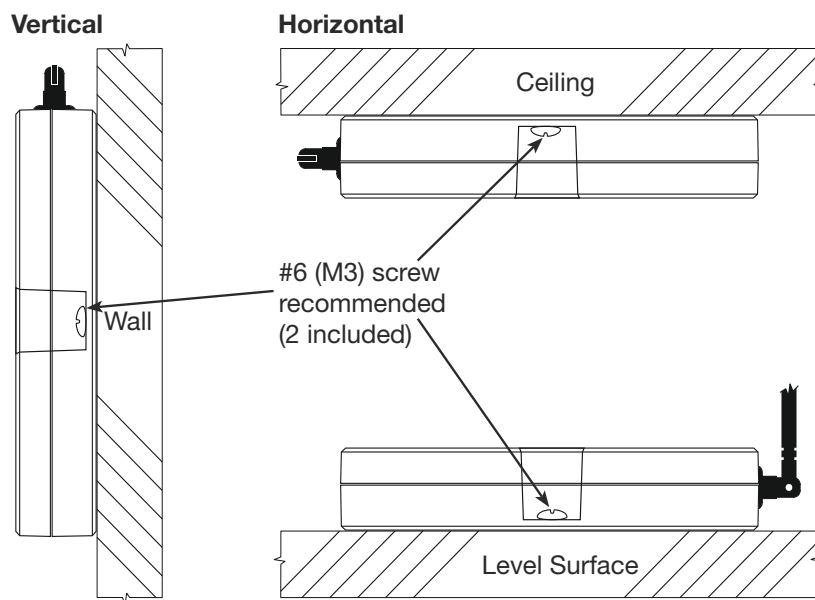
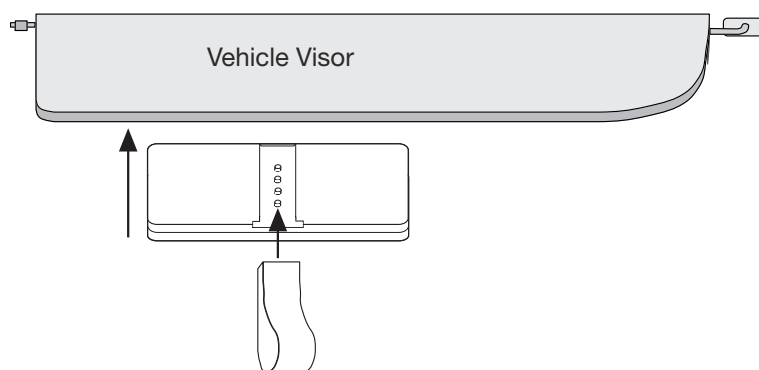


Transmitter (Front)



Transmitter (Side)

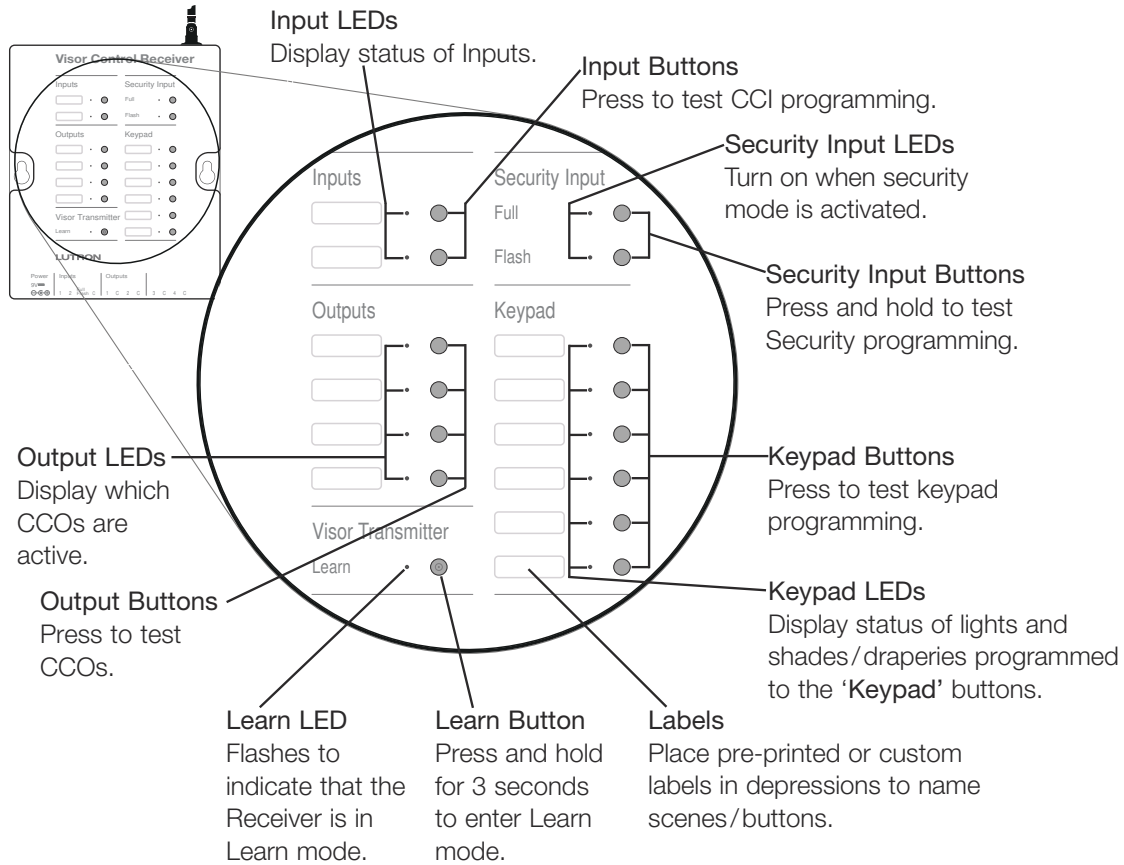


RadioRA 2 Visor Controls**Mounting****Receiver****Transmitter**

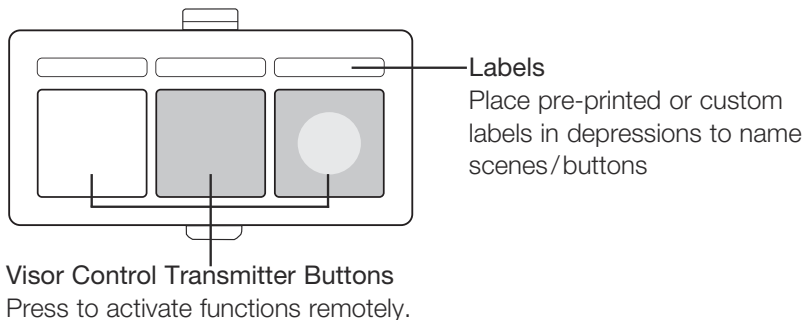
RadioRA 2 Visor Controls

Operation

Receiver



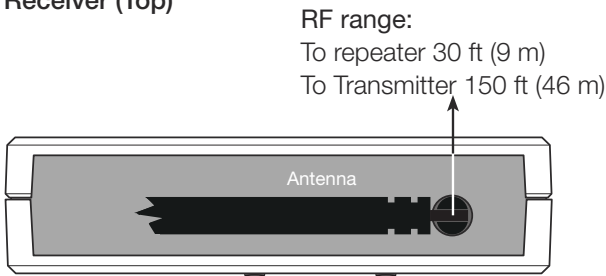
Transmitter



RadioRA 2 Visor Controls

Connections

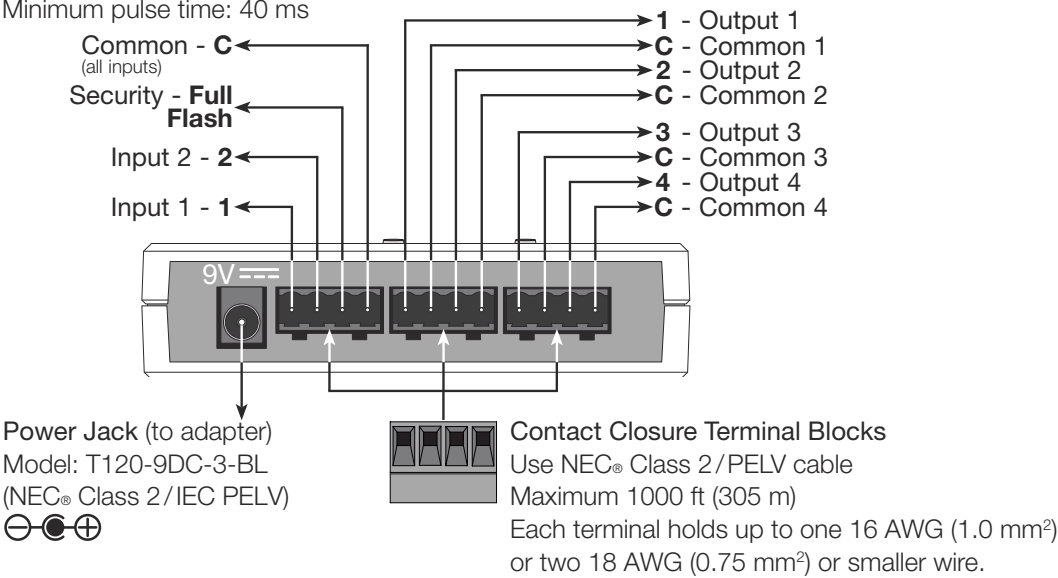
Receiver (Top)



Receiver (Bottom)

Contact Closure Inputs (CCI)
Dry contacts only.
ON saturation: <1 V_{DC} at 2 mA
OFF leakage: <1 µA at 9 V_{DC}
Minimum pulse time: 40 ms

Contact Closure Outputs (CCO)
Max Voltage / Current: See **Relay Contact Ratings** below.
Listed Class 2 / Certified PELV
Minimum close time: 500 ms



Relay Contact Ratings

Voltage	Resistive Load	Inductive Load
Up to 30 V _{DC}	1 A	0.2 A
Up to 30 V _{AC}	1 A	0.1 A
Up to 60 V _{DC}	0.5 A	Do not use.

RadioRA² product specifications

369-224c

09.02.10

RadioRA 2 Visor Controls

Wiring Diagram

