

Controlling Lutron QS Shading Solutions in Vive Wireless System

Overview

The total light in commercial spaces is generally only controlled by adjusting/dimming the electric light. Lutron Electronics motorized shading solutions increases accessibility to control natural light and not only utilizing half of the space's potential. Total light management is key to optimizing occupant comfort and productivity. This can only be done by controlling all light sources with systems from a single manufacturer, providing a seamless experience for the occupant.

Lutron offers several solutions to combine electric and natural light control, from manual control to system-level automation and programming. There are two ways to accomplish motorized shading and Vive lighting controls together:

1. Matching aesthetics by using separate systems for ease of operation
2. Including pre-programmed timeclock events to achieve automated functionality directly within a single system-level software, such as Vive wireless system

When designing a system that utilizes shades in conjunction with Lutron's Vive wireless system, it is important to first understand the desired end result. Will the owner of the system merely want matching aesthetics on the wall? Or will they want some level of automation utilizing timeclock events? This application note will help provide guidance on how to effectively design a system that will take care of the customer to achieve total light management.

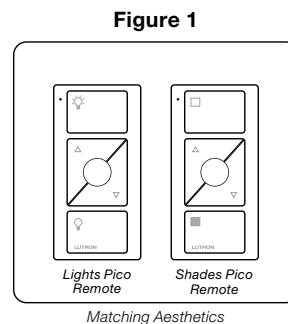
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NOTE: While roller shades are the most common example, throughout this document, the terms "shade," "shades," and "shading" refer and apply to any or all products available in the Lutron QS line of window treatment solutions, to include roller shades and drapery.

1 Unified Control

1.1 Unified Control with Matching Aesthetics

There are two important aspects that lead to a great user experience and the impression of a high quality system. First, the end-user needs to be able to understand and identify how to operate the wall controls, and second, the system will need to work seamlessly all of the time. For an integrated appearance, Lutron recommends providing a lights Pico remote and a shades Pico remote ganged together (as seen in Figure 1). This provides seamless aesthetics and intuitive controls to the end-user. To ensure seamless performance, Lutron recommends a single manufacturer for lighting, shades, and controls that will be responsible for the lighting and shading systems' operation.

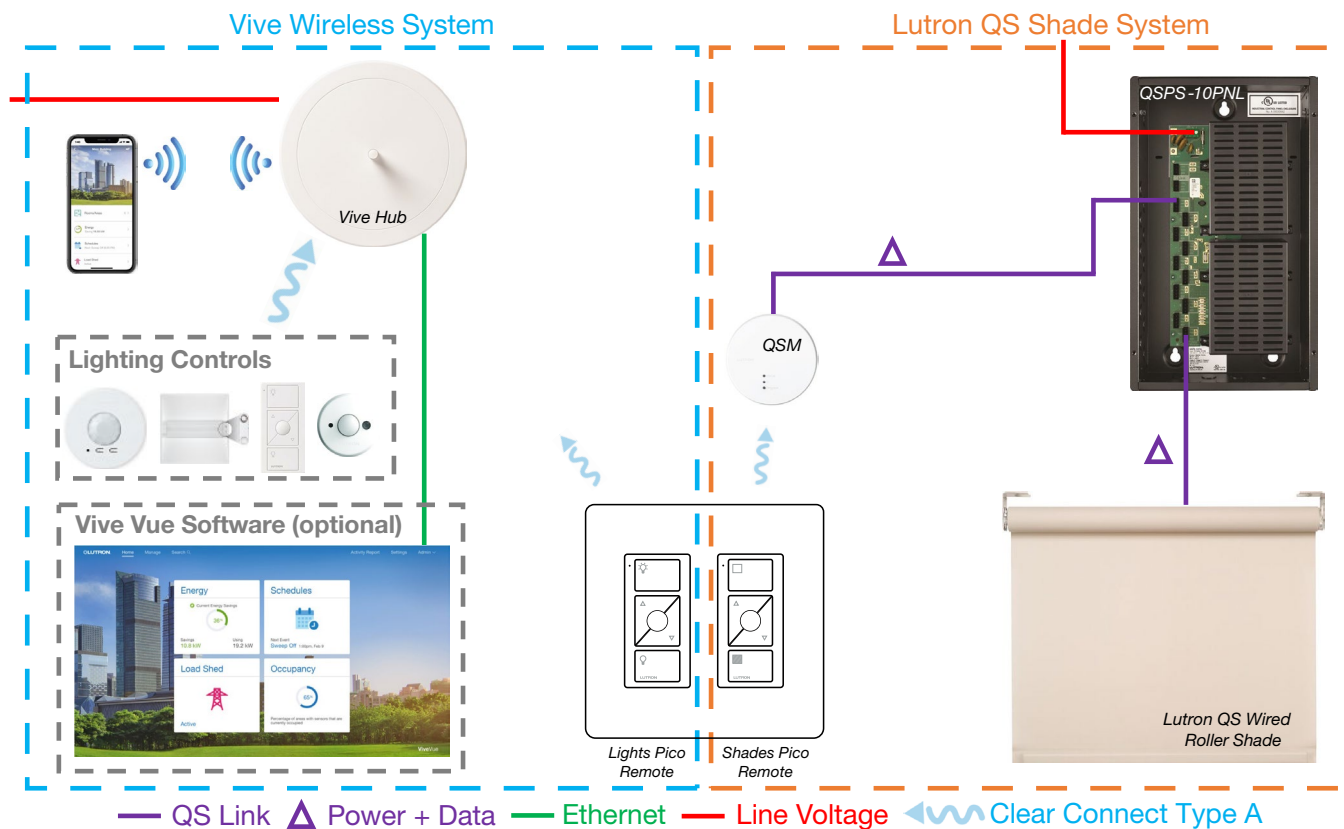


Occupants of a space often want control of both natural and electric light to maximize their comfort and productivity. When those controls have matching aesthetics, the user only needs to learn and understand one type of control. From a design perspective, matching aesthetics result in a clean and cohesive look.

While such an arrangement means that the lighting and shade systems are separated on the back end, it allows the wall controls to be ganged together with matching wall control aesthetics combining them within the space. The Vive wireless system controls the electric light while the Lutron QS shading system controls natural light. While there is no solar automation (Hyperion system), timeclock, or software control of the shades, the occupants will have complete manual control over the light entering the space.

The shading system requires one or more Lutron QS wired shades, a QSM (QSM2-XW) paired with a window treatment-specific Pico remote control, and the necessary shade power supplies. One power panel (QSPS-10PNL) is needed per ten Lutron QS shade drives. For more information about power supplies see the [QS Smart Panel Specification Submittal \(P/N 085335\)](#).

Figure 2: Unified Control with Matching Aesthetics



Refer to the [Sivoia QS Wiring and Programming Guide](#) for information on wiring and programming a Lutron QS shading system. Refer to the [Vive System Programming User Guide](#) for information on programming a Vive wireless system.

1 Unified Control (continued)

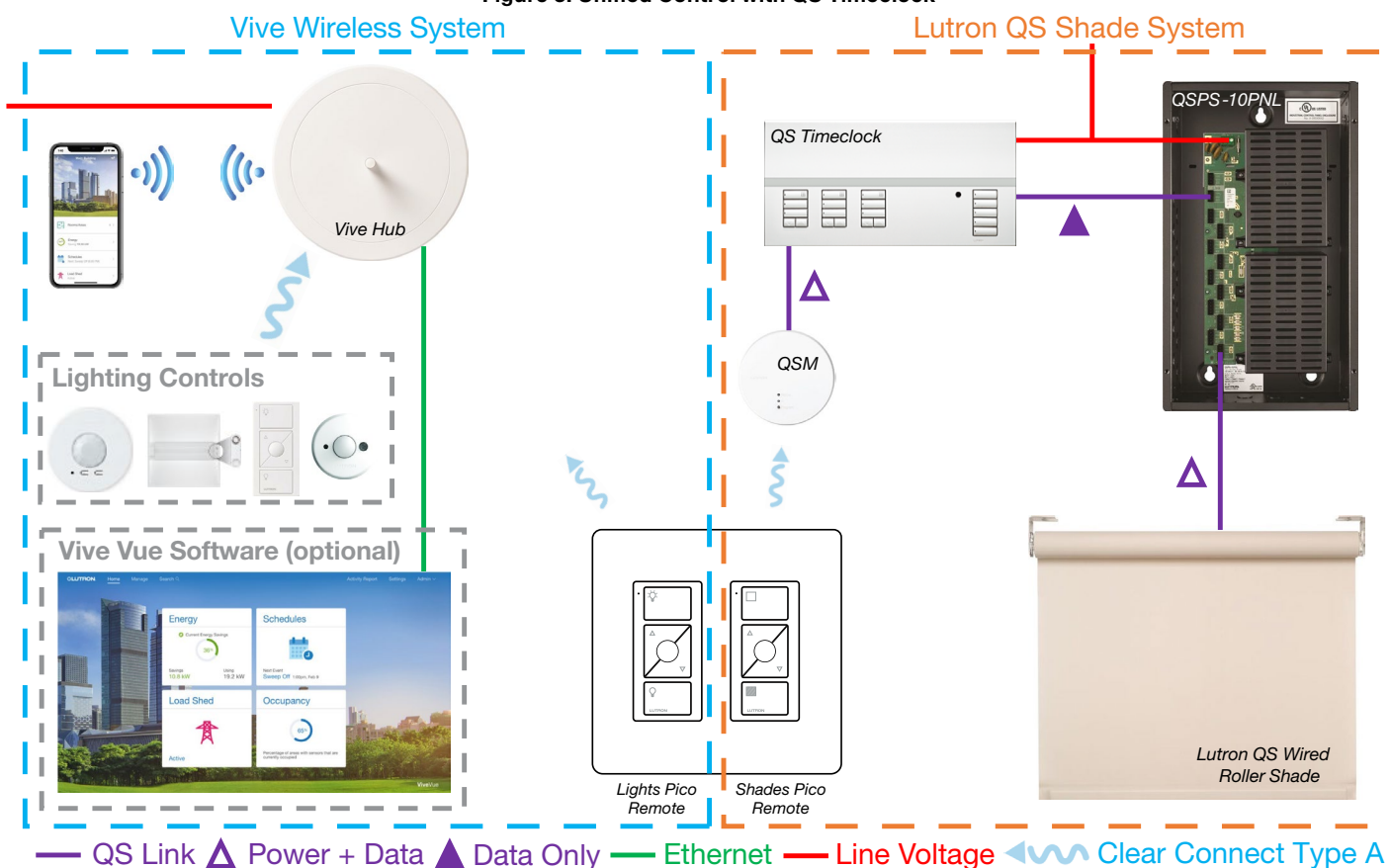
1.2 Unified Control with QS Timeclock

In addition to matching aesthetics, the next level of control incorporates a level of automation via predefined timeclock events that occur without user intervention.

One device that can be programmed to control shade timeclock events is the QS Timeclock (QSGR-TC-3S-WH). Any number of shades on the QS link can be assigned to one, two, or three window-control groups (if more than 3 such groups are needed, then additional QS Timeclock units must be added). Each QS Timeclock features astronomic timekeeping and allows 25 automated events per day, repeatable by day-of-the-week and is adaptable to holiday schedules and Daylight Savings Time. Each event can set any one, two, or all three window-control groups to an open, a close, or a preset position or leave them unaffected. For example, you may leave conference rooms' and private offices' shades unaffected during the day while a corridor's or lobby's shades may change throughout the day.

The QS Timeclock provides a simple solution to automate and optimize the entry or blockage of natural light. For example, a morning timeclock event could lower roller shades for a building's east façade while raising the roller shades for the west façade. The opposite positioning may be programmed to take effect as the afternoon sun shifts westward.

Figure 3: Unified Control with QS Timeclock



In addition to the QS Timeclock, Lutron QS shades require a power supply. For more information about shade power supplies see the [QS Smart Panel Specification Submittal \(P/N 085335\)](#). The QS Timeclock provides programmable and manual open/preset/close plus manual raise/lower functionality for the shades, and a Pico remote (PJ2-3BRL) adds manual open/preset/close plus raise/lower functionality. When matching wall-control aesthetics is a priority, the QS Timeclock unit may be mounted remotely, such as in an electrical closet, while using wireless shading control via Pico remote(s) and QSM(s) in the space. The QS Timeclock hardware fits into a 4-gang backbox, and it will continue to provide programmable open/preset/close functionality with timeclock events, but the primary user interface would be Pico remote controls.

The QS Timeclock can be replaced by a Grafik Eye QS wall controller (shown above) for additional lighting control features while maintaining the same shade and timeclock functionality.

Refer to the [QS Timeclock Programming Guide](#) for information on programming Lutron QS shades with a QS Timeclock.

2 Unified Timeclock with Vive Wireless System

One example of total light management can be achieved with Lutron's Vive wireless system. The Vive wireless system has the ability to offer control of electric and natural light, integrated function and aesthetics, and system-wide control from a single software interface for a facility manager or end-user. In this application, the Vive wireless system integrates with the Lutron QS shading system via contact closures.

There are two major advantages of using Lutron's Vive wireless system to control the shades:

- Using a single software interface on a computer or mobile smart device for a unified timeclock, advanced lighting control, and basic shade control
- The assurance of a single manufacturer providing guaranteed and integral functionality across both interior lighting and window control systems

The Vive lighting control system will require a Vive wireless hub (HJS-X), lighting controls (as needed), and either the Vive app or Vive Vue for software programming timeclock events. To integrate Vive with the shading system, at least one Vive PowPak module with contact closure output (CCO) is needed per shade group (such as RMJS-CCO1-24-B)¹. One PP-DV is needed for every four low-voltage PowPak modules to provide the low-voltage power.

Lutron QS shades should be included as needed for the system. One power panel (QSPS-10PNL) is needed per ten Lutron QS shade drives. For more information about power supplies see the [QS Smart Panel Specification Submittal \(P/N 085335\)](#).

There are three system configurations that can provide a unified timeclock with a Vive wireless system. Each has advantages and disadvantages, and the specific configuration that should be used depends on what is needed for the application. See the specific section below for details about any additional products needed.

2.1 Shade Control using Pico Remote with Open/Close/Raise/Lower/Preset

Advantages:

- Wall controls with matching aesthetics
- Intuitive timeclock programming from the Vive hub or Vive Vue software for open/close as needed
- Manual raise/lower control of the shades in the space

Disadvantages:

- Shades will not be controllable within the Vive app or Vive Vue software except with timeclock events

2.2 Shade Control using Pico Remote with Open/Close and Vive Wireless System App Control

Advantages:

- QSM is not required resulting in fewer visible devices in the ceiling and less low voltage wiring
- Pico remote controls will appear in the Vive app (as seen in **Figure 6** on **page 7**) and/or Vive Vue software
- Wall controls with matching aesthetics

Disadvantages:

- Programming experience will be more difficult with this system configuration: during creation of a timeclock event in Vive Vue software or the Vive app, the CCO module command will be the opposite of the shade movement (i.e. setting the CCO modules to open will close the shades and vice versa, as seen in **Figure 7** on **page 7**)
- There is no manual raise/lower control of the shades, only fully open or fully closed

2.3 Shade Control with seeTouch QS Wall Control

Advantages:

- Manual raise/lower control of the shades in the space
- QSM is not required resulting in fewer visible devices in the ceiling
- More button configurations, engraving, and color options

Disadvantages:

- Shades wall controls will not have matching aesthetics with the lighting control wall controls
- Shades will not be controllable within the Vive app or Vive Vue except with timeclock events
- Less flexible control locations (e.g. no pedestal mount or movable remote control)

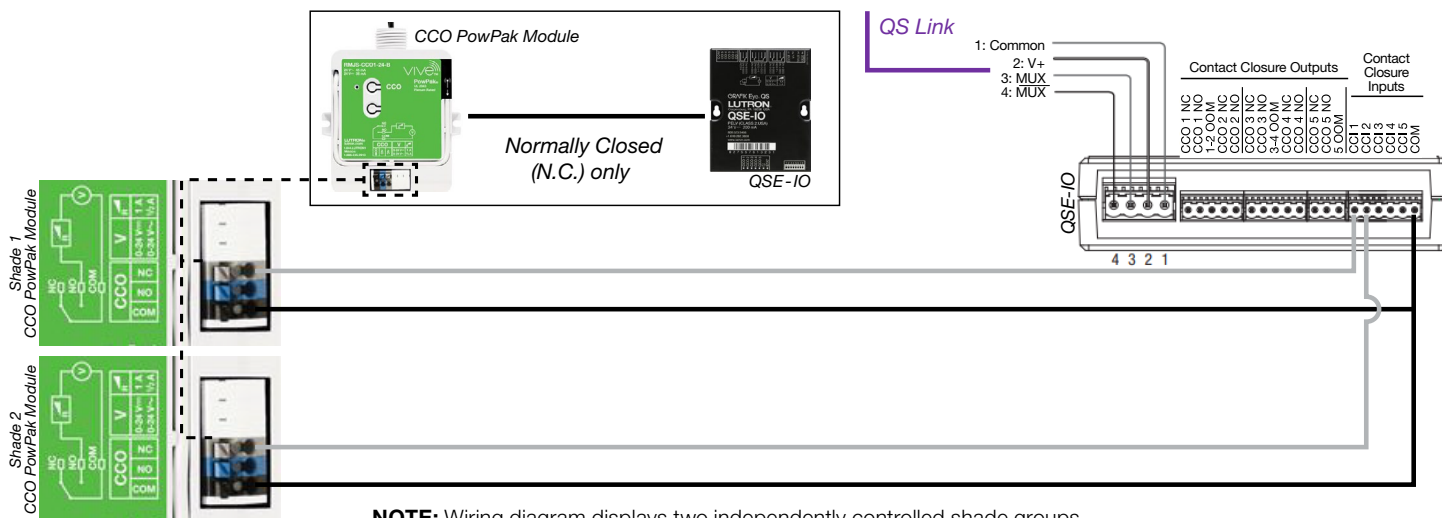
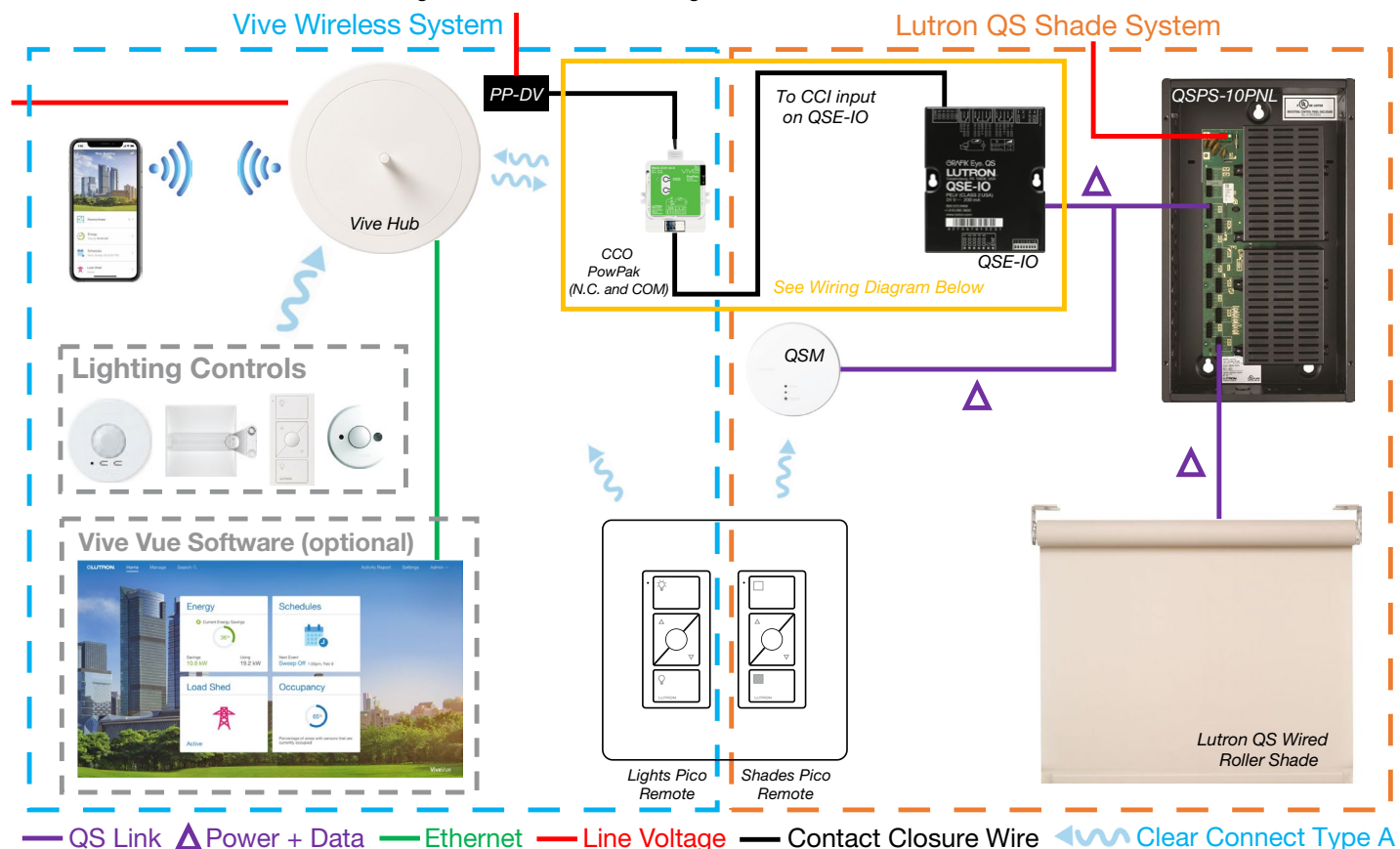
¹Preset functionality can be achieved with more CCO PowPak modules per shade group. Contact Lutron Technical Support or your local system sales engineer for assistance with this application.

2 Unified Timeclock with Vive Wireless System (continued)

2.1 Shade Control using Pico Remote with Open/Close/Raise/Lower/Preset

In this application, the occupant has full control of their shades with a unified aesthetic, making the control easy to understand. The Pico shades remote shown provides local control for open/close with a customizable preset, and raise/lower for personalized fine tuning as designed. Additionally, facility managers have the ability to set open/close timeclock events to occur as needed either through the Vive app or Vive Vue software. The CCO module will be labeled as open/close in the programming software which will follow how the shades will react (open/close).

Figure 4: Shade Control using Pico Remote with Raise/Lower



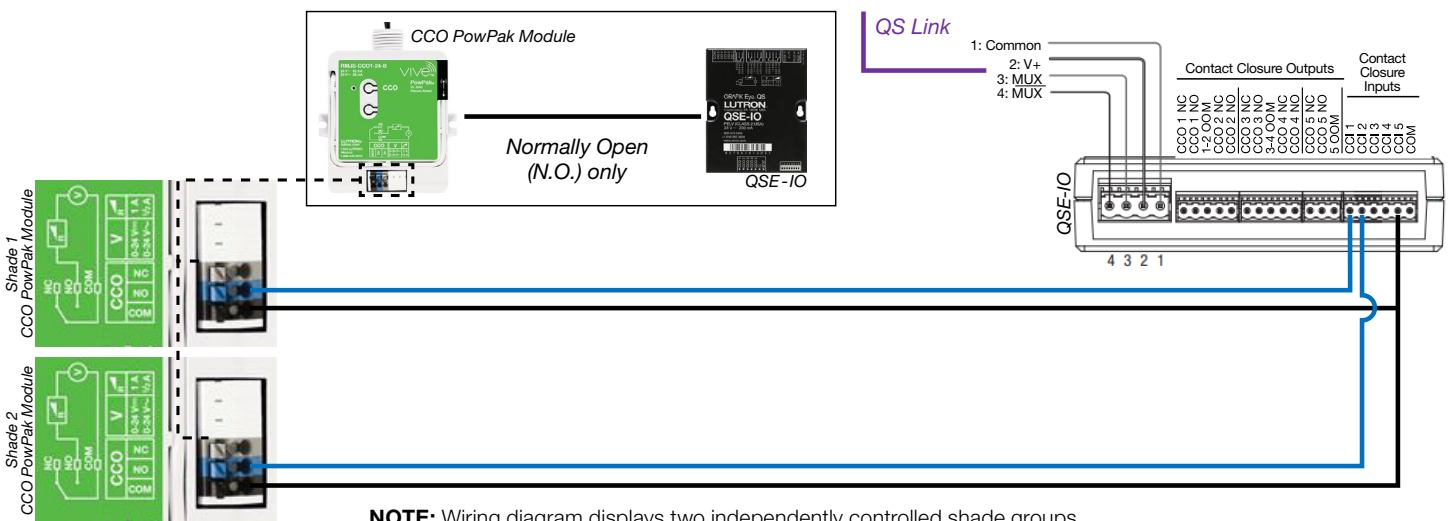
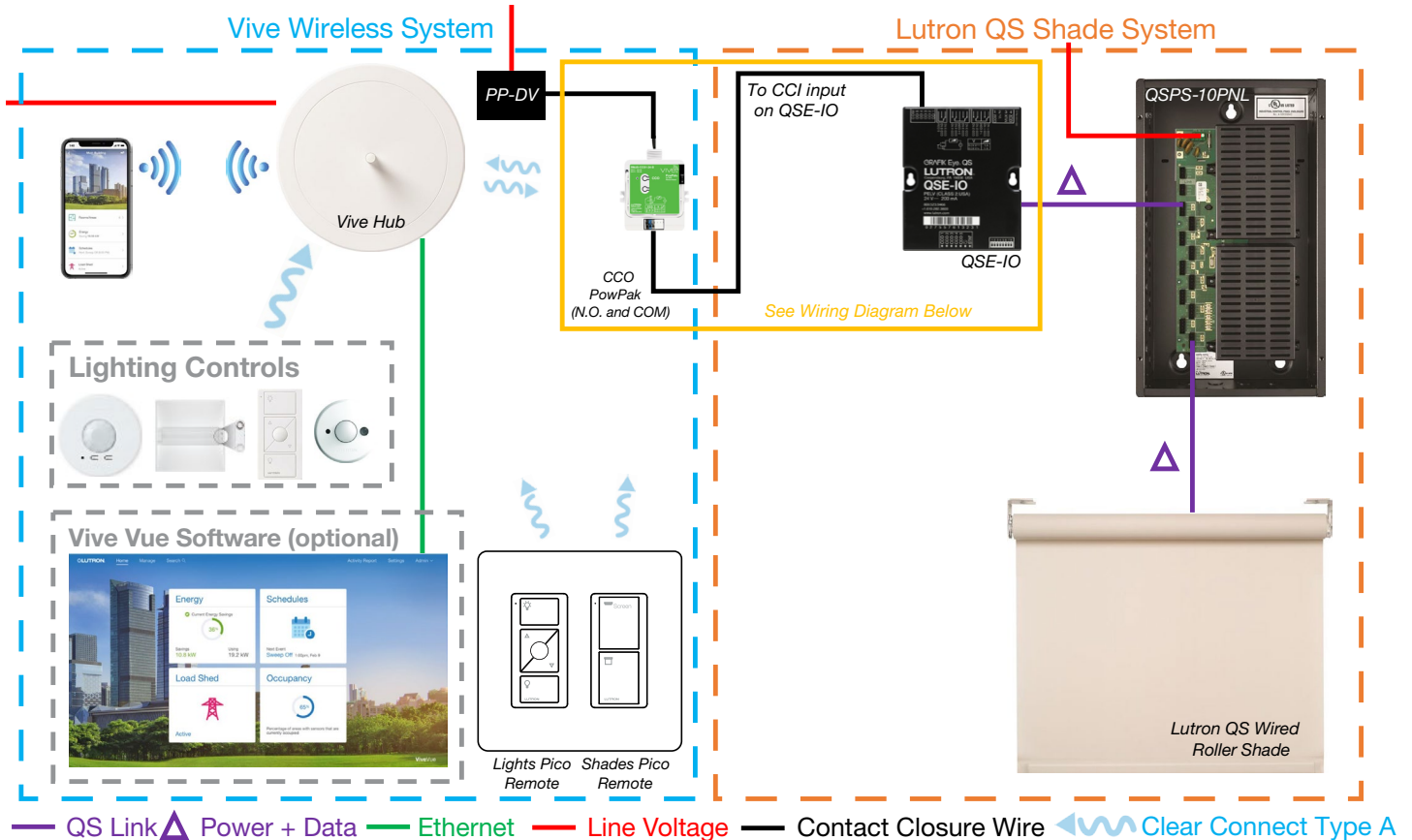
NOTE: Wiring diagram displays two independently controlled shade groups.

2 Unified Timeclock with Vive Wireless System (continued)

2.2 Shade Control using Pico Remote with Open/Close and Vive Wireless System App Control

This application is used when the end-user does not require raise/lower or a preset for their shading wall controls. This allows the system to be configured with the Pico remotes communicating directly to the Vive CCO PowPak module, eliminating the need for the QSM device. In this scenario, a 2-button, single-shade group Pico remote (PJ2-2B-GXX-L02 or PJ2-2B-GXX-S08), a 4-button, single shade group (one light-group and one shade-group) Pico remote (PJ2-4B-GXX-LS21), or a 4-button, dual-shade group Pico remote (PJ2-4B-GXX-S21) may be used. The Pico remote shown below is PJ2-2B-GXX-S08.

Figure 5: Shade Control using Pico Remote and Vive Wireless System App

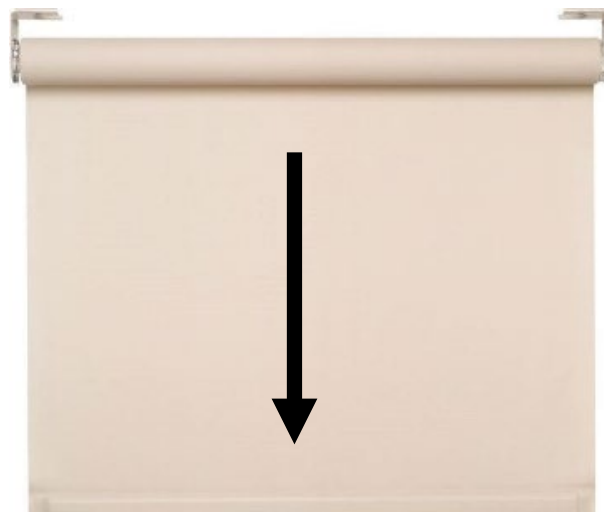
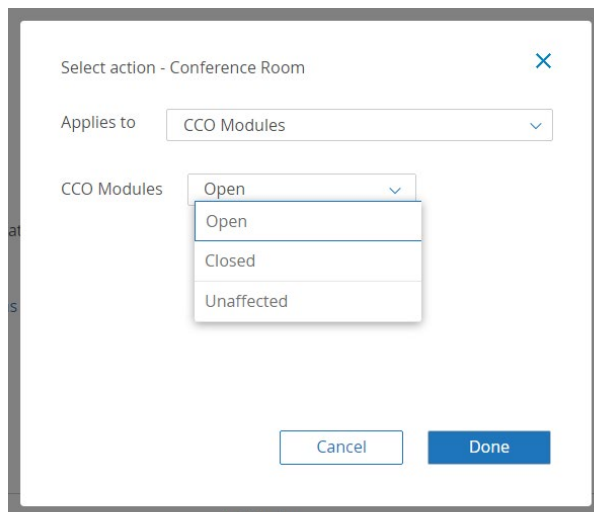


2 Unified Timeclock with Vive Wireless System (continued)

Figure 6: Pico Remote Controls in Vive Wireless System App (Operation of Configuration 2.2)



Figure 7: Inverted Shade Function (Operation of Configuration 2.2)

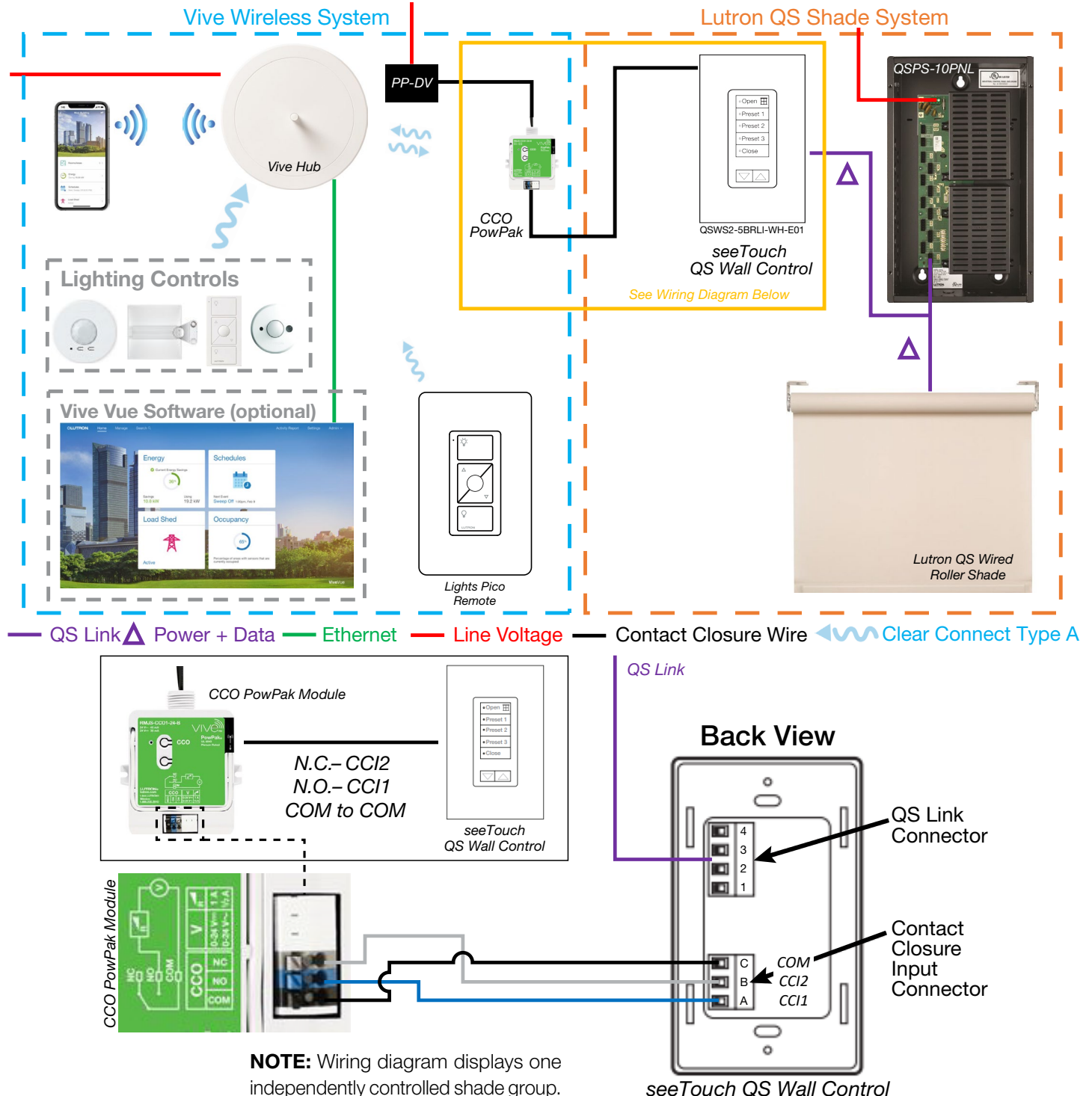


2 Unified Timeclock with Vive Wireless System (continued)

2.3 Shade Control with seeTouch QS Wall Control

This system configuration is suitable for applications where matching aesthetics are not important, and there is only one shade group to control. The Vive CCO PowPak module communicates to the seeTouch QS wall control keypad to open or close the shade via contact closures. The normally open relay will be wired to CCI1 on the keypad, and the normally closed relay will be wired to CCI2 on the keypad. The configuration utilizes one CCO PowPak module and one seeTouch QS wall control for each shade group controlled. Because the two aesthetics do not match, it is not recommended to gang the lights and shades wall controls together.

Figure 8: Shade control with seeTouch QS Wall Control



2 Unified Timeclock with Vive Wireless System (continued)

2.4 How to Program the System

The Vive wireless system outputs a contact closure to the Lutron QS shading system via Vive CCO PowPak modules. Within the Vive wireless system software, timeclock events are programmed to control these CCO PowPaks modules. With a Vive wireless system hub, timeclock events can be programmed from the Vive wireless system app during commissioning or after the job has been commissioned. If Vive Vue software is used, then the timeclocks can be set from within the Vive Vue software interface.

The Vive wireless system will label all CCO PowPak modules as CCO modules, and they cannot be renamed. In the applications described in 2.1 and 2.3, the system will refer to the device's relay as *OPEN* and *CLOSE* within the CCO PowPak modules, and that can be extrapolated to the shades' actions if wired as shown (closing the relay of the CCO module causes the shade to close, and opening the relay causes the shade to open).²

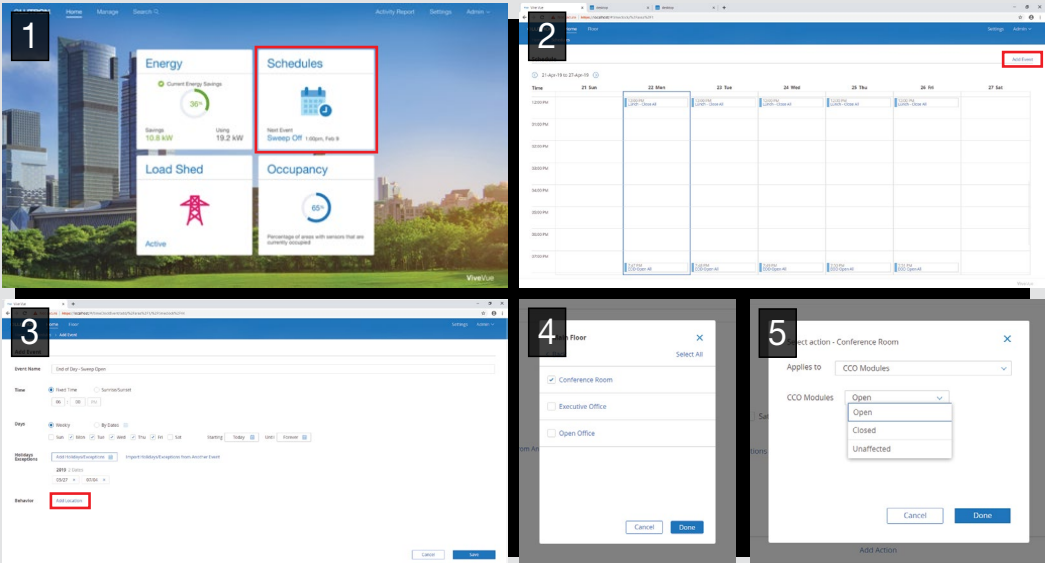
NOTE: In Vive 1.11 and later, each PowPak module can be individually controlled by a timeclock event. In Vive Vue software and prior to Vive 1.11, all CCO modules in a single area will function together. Contact Lutron Technical Support or your local system sales engineer to determine if your system provides zone level programming of timeclock events.

Figure 9: Setting Timeclock Events in Vive Vue Software

To add a timeclock event in the Vive Vue software, click the schedules tile (image #1) and click Add Event (image #2). Enter the Event Name, Time, Days, and applicable Holiday Exceptions.

Click Add Location (image #3). Then select the area(s) to control and click Done (image #4).

For each location added, click Add Action. Select which CCO modules to control open/close/unaffected (image #5).



The QSE-IO is the interface that accepts a contact closure input to the Lutron QS shading system. Refer to the [QSE-IO Control Interface Programming Guide](#) for detailed instructions on how to assign shades to specific contact closure inputs on the QSE-IO. It is suggested that the QSE-IO be programmed as "Shade Mode: Shade Input Toggle" with maintained inputs. This device can communicate to any and all shades connected to it via the QS link in 1 to 5 uniquely controlled groups. Each connected Lutron QS shade can be programmed to be a part of any, all, or none of the 5 shade groups.

²This does not apply to section 2.2 of this document because the Pico remote's intuitive usability is a higher priority in order to have the highest quality system.

3 Best and Worst Practices

Best Practices

- Ask questions early in the job process to have the best chances for success
- When possible, utilize consistent wall controls with matching aesthetics
- Wire the Vive CCO PowPak modules to the QSE-IO properly to ensure the Vive wireless system interface's verbage is not reversed (open command resulting in the shade closing and vice versa)
 - Understand a Vive wireless hub and a Pico remote are opposite in how they communicate to the CCO PowPak module(s) for shading applications

Worst Practices

- Using a single PowPak module to control both lights and shades together
- Using the CCO of the line voltage lighting relay PowPak modules (e.g. RMJS-5RCCO1, RMJS-16RCCO1, and RMJS-20RCCO1) for shades control to avoid using a low voltage PowPak module. These PowPak modules' CCO output will only follow occupancy status but not Pico remote control.
- Mistaking Lutron QS shading with Vive wireless system for a "mini-Hyperion" system; the applications described in this document can not move the shades in reaction to the amount of light sensed in the space
- Using more than open/close functionality within the Vive hub or Vive Vue software interface to control shades