Overview

Emergency lighting is an important aspect of designing a lighting system for commercial spaces. The system requirements are defined by several codes and standards. These requirements can be fulfilled by using a variety of equipment and methods.

The purpose of this application note is to provide an understanding of basic emergency system components, how those components work with Lutron products, and to show how to wire emergency load control devices to Vive system devices. It is not intended to provide a design guide for emergency systems. This guide focuses on installations in the United States. Consult local and national codes for emergency lighting requirements in other countries.
What Lutron Product Do You Have?

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PowPak 0–10 V Fixture Control - FCJS-010
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Vive Integral Fixture Control and Driver with Self-Powered DALI Link - DFCSJ-OEM-OCC/RF
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Vive Integral Fixture Control with EcoSystem Driver and Battery Backup
- Fixture is powered by normal power and controlling an emergency load - Page 61

Vive Integral Fixture Control and Driver with Self-Powered DALI Link with Battery Backup
- Fixture is powered by normal power and controlling an emergency load - Page 63
Applications of Emergency Lighting with a Vive System

In this section, the text and wiring diagrams explain how various Vive load controllers work with emergency lighting applications and other third-party equipment. All information presented here is for reference only. Always check the appropriate codes and standards, the Authority Having Jurisdiction (AHJ), and the installation instructions for the requirements of all equipment included in the design of an emergency lighting system.

Applications for Vive Emergency PowPak Devices

Emergency PowPak devices listed in this application note are intended for use in emergency power systems that provide a period of power interruption when transferring to the emergency power source (i.e. diesel generators). Power interruption during transfer time must be greater than a 250 ms for the Emergency PowPak devices to enter emergency mode. A list of these devices is provided below:

- Emergency PowPak 0–10 V Dimming Module (Model # RMJS-8T-DV-B-EM)
- Emergency PowPak Relay Module With Softswitch (Model # RMJS-16R-DV-B-EM)
- Emergency PowPak 0–10 V Fixture Control (Model # FCJS-010-EM)
- Emergency PowPak EcoSystem Fixture Control (Model # FCJS-ECO-EM)

Emergency PowPak devices are **NOT** intended for use with the following types of emergency lighting systems:
- Fixtures containing integral inverters or battery backup drivers

Additional Notes

1. Fire alarm integration is not available with Emergency PowPak devices. For fire alarm integration in Vive, refer to all other emergency devices referenced within this document.
2. A Vive hub should **NEVER** be used to commission a standalone Vive system. Emergency PowPak devices require communication from the hub to prevent permanent lockout (even after return to normal power operation) if a power loss were to occur.
Vive Emergency Lighting

Some Vive products can achieve emergency lighting requirements without using third-party devices (e.g., ALCRs, battery backup ballasts). When designing an emergency lighting system, it may not be necessary to force all lighting to 100%, which can help to reduce the load on a backup power source (e.g., a generator). The table below shows which Vive products have programmable emergency light levels and the methods for programming them. This programming is available only when not using third-party emergency devices, which typically force all connected lighting to 100%.

### Vive Emergency Load Controllers

<table>
<thead>
<tr>
<th>Product</th>
<th>Model Number</th>
<th>Vive Hub</th>
<th>Emergency Light Level</th>
<th>How to Program</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vive 0–10 V powPak units</td>
<td>RMJS-8T-DV-B-EM FCJS-010-EM</td>
<td>Without hub</td>
<td>100%</td>
<td>Not programmable</td>
</tr>
<tr>
<td>Vive 0–10 V powPak units</td>
<td>RMJS-8T-DV-B-EM FCJS-010-EM</td>
<td>With hub</td>
<td>0–100%</td>
<td>Vive app or web page</td>
</tr>
<tr>
<td>Vive EcoSystem powPak units</td>
<td>FCJS-ECO-EM</td>
<td>Without hub</td>
<td>100%</td>
<td>Not programmable</td>
</tr>
<tr>
<td>Vive EcoSystem powPak units</td>
<td>FCJS-ECO-EM</td>
<td>With hub</td>
<td>0–100%</td>
<td>Vive app or web page</td>
</tr>
</tbody>
</table>

### Vive Normal (non-emergency) Load Controllers

All load controllers shown below do not sense for loss of normal power, and cannot be sent to a configurable level during a normal power loss. Equipment can be used to sense loss of normal power, such as the LUT-SHUNT and the LUT-ATS-D. This equipment would bypass the controls to send the loads to 100% (not configurable). Since the controls would be powered down and bypassed, the emergency lighting level is not determined by the controls.

<table>
<thead>
<tr>
<th>Product</th>
<th>Model Number</th>
<th>Vive Hub</th>
<th>Emergency Light Level</th>
<th>How to Program</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vive 0–10 V powPak units</td>
<td>RMJS-8T-DV-B RMJS-8TN-DV-B FCJS-010</td>
<td>With or without Vive hub</td>
<td>N/A</td>
<td>Not programmable</td>
</tr>
<tr>
<td>Vive EcoSystem powPak units</td>
<td>FCJS-ECO RMJS-ECO32-SZ</td>
<td>With or without Vive hub</td>
<td>N/A</td>
<td>Not programmable</td>
</tr>
<tr>
<td>Vive Integral Fixture Control</td>
<td>DFCSJ-OEM-RF DFCSJ-OEM-OCC</td>
<td>With or without Vive hub</td>
<td>N/A</td>
<td>Not programmable</td>
</tr>
<tr>
<td>Vive Maestro Dimmers and Switches</td>
<td>MRF2S-6CL MRF2S-6ND-120 MRF2S-6ELV120 MRF2S-6ANS MRF2S-8ANS120 MRF2S-8S-DV</td>
<td>With or without Vive hub</td>
<td>N/A</td>
<td>Not programmable</td>
</tr>
</tbody>
</table>
Emergency PowPak 0–10 V Dimming Module

Module is powered by normal and emergency power on a generator

In all applications, the Emergency PowPak 0–10 V Dimming Module is powered by normal and emergency power. During regular operation, the Automatic Transfer Switch is in the Normal position, allowing regular utility power to power the device. During emergency operation, the Automatic Transfer Switch is in the Emergency position, allowing emergency backup power to power the device. As a result, the device senses the power cycle and can no longer communicate with the Vive hub, thus entering emergency lighting mode until the Vive hub is re-energized. This applies to: RMJS-8T-DV-B-EM.

Note: When operating without a Vive hub, the Emergency PowPak 0–10 V Dimming Module senses a power cycle and enters emergency mode for 90 minutes.

IMPORTANT: This solution is not applicable for use with an Uninterruptable Power Supply (UPS) backup system. For solutions with an Uninterruptable Power Supply (UPS) backup system, please refer to page 7.

Wiring Schematic

* NOTE: Solution is not applicable for an Uninterruptable Power Supply (UPS) backup system. RMJS-8T-DV-B-EM must see a complete change-over of power from normal to emergency for the unit to go into emergency mode.

NOTE: Some applications (in the U.S.A.) require the PowPak module to be installed inside an additional junction box. For information about how to perform this installation see Application Note #423 (P/N 048423) at www.lutron.com Please consult all local and national electric codes for proper installation methods.
Emergency PowPak 0–10 V Dimming Module (continued)
Module is powered by normal and emergency power on a generator (continued)

Regular Operation

Emergency Operation

To additional RMJS-8T-DV-B or RMJS-8TN-DV-B PowPak units

To additional RMJS-8T-DV-B-EM PowPak units

To additional RMJS-8T-DV-B-EM PowPak units
Emergency PowPak 0–10 V \(\Rightarrow\) Dimming Module (continued)
Module is powered by normal and emergency power on a UPS

In all applications, the Emergency PowPak 0–10 V \(\Rightarrow\) Dimming Module is powered by normal and emergency power. During regular operation, the UL 1008 Transfer Switch is in the Normal position, allowing regular utility power to power the device. During emergency operation, the LUT-ATS-D senses the loss of normal power and creates a power interrupt to the Emergency PowPak. As a result, the device senses the power cycle and can no longer communicate with the Vive hub, thus entering emergency lighting mode until the Vive hub is re-energized. This applies to: RMJS-8T-DV-B-EM.

Note: When operating without a Vive hub, the Emergency PowPak 0–10 V \(\Rightarrow\) Dimming Module senses a power cycle and enters emergency mode for 90 minutes.

**Wiring Schematic**
Emergency PowPak 0–10 V Dimming Module (continued)
Module is powered by normal and emergency power on a UPS (continued)

Normal Operation
Emergency PowPak 0–10 V Dimming Module (continued)
Module is powered by normal and emergency power on a UPS (continued)

Emergency Operation

DIP Switch Settings on LUT-ATS-D

1. ON
2. OFF
3. ON
4. ON

LVS Controls LUT-ATS-D
Normal Voltage Sense
Normal Circuit Panel
Normal/Emergency Circuits Panel
120/247 V~
Emergency Feed
Neutral (N)
Line/Hot (L)
Switched Line/Hot
Normal/Emergency 0-10 V Driver
To additional RMJS-8T-DV-B-EM PowPak units
Normal/Emergency Feed
Junction Box
Junction Box
Hub
Power Supply
Neutral (N)
Common
Normal 0-10 V Driver
Normal 0-10 V Driver
RMJS-8T-DV-B-EM
RMJS-8T-DV-B
RMJS-8T-DV-B
RMJS-8T-DV-B
To additional RMJS-8T-DV-B PowPak units

Emergency Operation (continued)

Module is powered by normal and emergency power on a UPS (continued)

Emergency PowPak 0–10 V Dimming Module (continued)
Module is powered by normal and emergency power on a UPS (continued)
**PowPak 0–10 V Dimming Module**

**Module is powered by emergency power**

In an application where a 0–10 V PowPak dimming module is powered by emergency power and controlling emergency loads, an ALCR with a normally open relay and a normally closed relay is used. During regular operation, the module controls the load directly. During emergency operation, the device senses normal power is lost and the normally closed relay closes while the normally open relay opens. Doing this provides power to the load and interrupts the 0–10 V signal which should cause the load to go to high-end if the ballast or driver complies with IEC 60929 Annex E. An example of this type of ALCR is the LUT-SHUNT-D from LVS Controls. This applies to: **RMJS-8T-DV-B and RMJS-8TN-DV-B**.

**Wiring Schematic**

![Wiring Schematic Diagram](image-url)
PowPak 0–10 V Dimming Module (continued)
Module is powered by emergency power (continued)

Regular Operation

Emergency Operation
PowPak 0–10 V Dimming Module (continued)

Module is powered by normal power

In an application where a 0–10 V PowPak dimming module is powered by normal power but controls an emergency load, an ALCR is used with a normally open relay and a normally closed relay that responds to a switched hot signal. During regular operation, the normally closed contact responds to the switched hot output of the module, while the normally open contact remains closed. During emergency operation, the device senses normal power is lost and the normally closed relay closes while the normally open relay opens. Doing this provides power to the load and interrupts the 0–10 V signal which should cause the load to go to high-end if the ballast or driver complies with IEC 60929 Annex E. An example of this type of ALCR is the LUT-ALCR-D from LVS Controls. This applies to: RMJS-8T-DV-B and RMJS-8TN-DV-B.

Wiring Schematic

Regular Utility Power

Emergency Power

Normal Power

Emergency Power

Normal Voltage Sense

Control State Sense

Switched Line / Hot

Normal Neutral

Normal Hot

Normal / Emergency Circuit Panel

UL® 1008 Transfer Switch

LVS Controls
LUT-ALCR-D

Blue / White

Yellow

Red

Violet

White

Black

Blue / White

Switched Line / Hot

Emergency Load

Regular Utility Power

Normal Power

Normal / Emergency Circuit Panel

PowPak Dimming Module

Lutron.com

EMERGENCY POWER

TEST

UTILITY POWER

Normal Power

Normal Neutral

Normal / Emergency Power

(–)

(+)

(–)

(+)
PowPak 0–10 V Dimming Module (continued)
Module is powered by normal power (continued)

Regular Operation

Emergency Operation
Emergency PowPak Relay Module with Softswitch

Module is powered by normal and emergency power on a generator

In all applications, the Emergency PowPak Relay Module with Softswitch is powered by normal and emergency power. During regular operation, the Automatic Transfer Switch is in the Normal position, allowing regular utility power to power the device. During emergency operation, the Automatic Transfer Switch is in the Emergency position, allowing emergency backup power to power the device. As a result, the device senses the power cycle and can no longer communicate with the Vive hub, thus entering emergency lighting mode until the Vive hub is re-energized. This applies to: RMJS-16R-DV-B-EM.

**Note:** When operating without a Vive hub, the Emergency PowPak Relay Module with Softswitch senses a power cycle and enters emergency mode for 90 minutes.

**IMPORTANT:** This solution is not applicable for use with an Uninterruptable Power Supply (UPS) backup system. For solutions with an Uninterruptable Power Supply (UPS) backup system, please refer to page 15.

**Wiring Schematic**

*NOTE:* Solution is not applicable for an Uninterruptable Power Supply (UPS) backup system. RMJS-16R-DV-B-EM must see a complete change-over of power from normal to emergency for the unit to go into emergency mode.
Emergency PowPak Relay Module with Softswitch (continued)
Module is powered by normal and emergency power on a generator (continued)

Regular Operation

Emergency Operation
Emergency PowPak Relay Module with Softswitch (continued)

Module is powered by normal and emergency power on a UPS

In all applications, the Emergency PowPak Relay Module with Softswitch is powered by normal and emergency power. During regular operation, the UL® 1008 Transfer Switch is in the Normal position, allowing regular utility power to power the device. During emergency operation, the LUT-ATS-D senses the loss of normal power and creates a power interrupt to the Emergency PowPak. As a result, the device senses the power cycle and can no longer communicate with the Vive hub, thus entering emergency lighting mode until the Vive hub is re-energized. This applies to: RMJS-8T-DV-B-EM.

Note: When operating without a Vive hub, the Emergency PowPak Relay Module with Softswitch senses a power cycle and enters emergency mode for 90 minutes.

Wiring Schematic
Emergency PowPak Relay Module with Softswitch (continued)
Module is powered by normal and emergency power on a UPS (continued)

Normal Operation

Normal/Emergency Circuit Panel
Normal/Emergency Power
Normal Neutral
Normal Line/Hot
Normal Voltage Sense
LVS Controls LUT-ATS-D
120/277 V~
Normal Feed
Neutral (N)
24 V~
Common
Power Supply
Hub
Junction Box
Switched Line/Hot
To additional RMJS-16R-DV-B-EM PowPak units
Normal/Emergency Load
Normal Circuit Panel
Normal Power
Emergency Power
Regular Utility Power
Emergency Power (UPS)
Regular Utility Power

DIP Switch Settings on LUT-ATS-D
ON
OFF
Common
Power Supply
Hub
Junction Box
Switched Line/Hot
To additional RMJS-16R-DV-B PowPak units
Normal/Emergency Load
Normal Neutral
Normal Line/Hot
Normal Voltage Sense
LVS Controls LUT-ATS-D
120/277 V~
Normal Feed
Neutral (N)
24 V~
Common
Power Supply
Hub
Junction Box
Switched Line/Hot
To additional RMJS-16R-DV-B-EM PowPak units
Normal/Emergency Load
Normal Circuit Panel
Normal Power
Emergency Power
Regular Utility Power
Emergency Power (UPS)
Regular Utility Power
Emergency PowPak Relay Module with Softswitch (continued)
Module is powered by normal and emergency power on a UPS (continued)

Emergency Operation
PowPak Relay Module With Softswitch

Module is powered by emergency power

In an application where a PowPak relay module has power during an emergency, an ALCR with a normally closed relay (simple shunt relay) is used. During regular operation, normal power is present and the contact in the shunt relay is open, which allows the module to function. When normal power is lost, the contact in the shunt relay closes and bypasses the local control by providing power to the load. An example of an ALCR with a normally closed relay is LUT-SHUNT from LVS Controls. This shunt relay can be used with switching PowPak modules, which include:

- RMJS-16R-DV-B
- RMJS-5R-DV-B
- RMJS-16RCCO1DV-B
- RMJS-5RCCO1-DV-B
- RMJS-20R-DV-B
- RMJS-20RCCO1DV-B

Wiring Schematic
PowPak Relay Module With Softswitch (continued)

Module is powered by emergency power (continued)

Regular Operation

Emergency Operation
PowPak Relay Module With Softswitch (continued)

Module is powered by normal power

In an application where a PowPak relay module does not have power during an emergency, but is controlling emergency loads during regular operation, an ALCR with a normally closed relay that responds to the switched hot output of the module is used. During regular operation, normal power is present and the relay in the ALCR will respond to switched hot output of the module. When normal power is lost, the contact in the ALCR will close and provide power to the emergency load. An example of an ALCR like this is LUT-ALCR from LVS controls. This relay can be used with switching PowPak modules, which include:

- RMJS-16R-DV-B
- RMJS-5R-DV-B
- RMJS-16RCCO1-DV-B
- RMJS-5RCCO1-DV-B
- RMJS-20R-DV-B
- RMJS-20RCCO1-DV-B

Wiring Schematic
PowPak Relay Module With Softswitch (continued)
Module is powered by normal power (continued)

Regular Operation

Emergency Operation
Emergency PowPak 0–10 V Fixture Control

Fixture Control is powered by normal and emergency power on a generator.

In all applications, the Emergency PowPak 0–10 V Fixture Control is powered by normal and emergency power. During regular operation, the Automatic Transfer Switch is in the Normal position, allowing regular utility power to power the device. During emergency operation, the Automatic Transfer Switch is in the Emergency position, allowing emergency backup power to power the device. As a result, the device senses the power cycle and can no longer communicate with the Vive hub, thus entering emergency lighting mode until the Vive hub is re-energized. This applies to: FCJS-010-EM.

Note: When operating without a Vive hub, the Emergency PowPak 0–10 V Fixture Control senses a power cycle and enters emergency mode for 90 minutes.

IMPORTANT: This solution is not applicable for use with an Uninterruptable Power Supply (UPS) backup system. For solutions with an Uninterruptable Power Supply (UPS) backup system, please refer to page 23.

Wiring Schematic

* NOTE: Solution is not applicable for an Uninterruptable Power Supply (UPS) backup system. FCJS-010-EM must see a complete change-over of power from normal to emergency for the unit to go into emergency mode.
Emergency PowPak 0–10 V Fixture Control (continued)

Fixture Control is powered by normal and emergency power on a generator (continued)

Regular Operation

Emergency Operation
Emergency PowPak 0–10 V Fixture Control (continued)
Fixture Control is powered by normal and emergency power on a UPS

In all applications, the Emergency PowPak Fixture Control is powered by normal and emergency power. During regular operation, the UL\textsuperscript{R} 1008 Transfer Switch is in the Normal position, allowing regular utility power to power the device. During emergency operation, the LUT-ATS-D senses the loss of normal power and creates a power interrupt to the Emergency PowPak. As a result, the device senses the power cycle and can no longer communicate with the Vive hub, thus entering emergency lighting mode until the Vive hub is re-energized. This applies to: FCJS-010-EM.

Note: When operating without a Vive hub, the Emergency PowPak Fixture Control senses a power cycle and enters emergency mode for 90 minutes.

Wiring Schematic
Emergency PowPak 0–10 V Fixture Control (continued)
Fixture Control is powered by normal and emergency power on a UPS (continued)
Emergency PowPak 0–10 V Fixtures Control (continued)

Fixture Control is powered by normal and emergency power on a UPS (continued)

Emergency Operation

[Diagram of system configuration]

DIP Switch Settings on LUT-ATS-D

ON

OFF

[Diagram of switch settings]
PowPak 0–10 V Fixture Control

In an application where a PowPak Fixture Control is powered by emergency power and is controlling an emergency load, an ALCR is used with a normally open relay and a normally closed relay. During regular operation, the Fixture Control controls the loads directly. During emergency operation, the ALCR senses normal power is lost and the normally closed relay closes while the normally open relay opens. Doing this provides power to the load and interrupts the 0–10 V signal which should cause the load to go to high-end if the ballast or driver complies with IEC 60929 Annex E. An example of this type of ALCR is LUT-SHUNT-D from LVS Controls. This applies to: FCJS-010.
PowPak 0–10 V Fixture Control (continued)
Fixture Control is powered by emergency power (continued)

Regular Operation

Emergency Operation
Emergency PowPak EcoSystem Fixture Control

Fixture Control is powered by normal and emergency power on a generator.

In all applications, the Emergency PowPak is powered by normal and emergency power. During regular operation, the Automatic Transfer Switch is in the Normal position, allowing regular utility power to power the device. During emergency operation, the Automatic Transfer Switch is in the Emergency position, allowing emergency backup power to power the device. As a result, the device senses the power cycle and can no longer communicate with the Vive hub, thus entering emergency lighting mode until the Vive hub is re-energized. This applies to: FCJS-ECO-EM.

Note: When operating without a Vive hub, the Emergency PowPak senses a power cycle and enters emergency mode for 90 minutes.

IMPORTANT: This solution is not applicable for use with an Uninterruptable Power Supply (UPS) backup system. For solutions with an Uninterruptable Power Supply (UPS) backup system, please refer to page 30.

Wiring Schematic

*NOTE: Solution is not applicable for an Uninterruptable Power Supply (UPS) backup system. FCJS-ECO-EM must see a complete change-over of power from normal to emergency for the unit to go into emergency mode.
Emergency PowPak EcoSystem Fixture Control (continued)

Fixture Control is powered by normal and emergency power on a generator (continued)

Regular Operation

Emergency Operation
Emergency PowPak EcoSystem Fixture Control (continued)

Fixture Control is powered by normal and emergency power on a UPS

In all applications, the Emergency PowPak EcoSystem Fixture Control is powered by normal and emergency power. During regular operation, the UL1008 Transfer Switch is in the Normal position, allowing regular utility power to power the device. During emergency operation, the LUT-ATS-D senses the loss of normal power and creates a power interrupt to the Emergency PowPak. As a result, the device senses the power cycle and can no longer communicate with the Vive hub, thus entering emergency lighting mode until the Vive hub is re-energized. This applies to: FCJS-ECO-EM.

Note: When operating without a Vive hub, the Emergency PowPak EcoSystem Fixture Control senses a power cycle and enters emergency mode for 90 minutes.

Wiring Schematic
Emergency PowPak EcoSystem Fixture Control (continued)

Fixture Control is powered by normal and emergency power on a UPS (continued)

Normal Operation
Emergency PowPak EcoSystem Fixture Control (continued)
Fixture Control is powered by normal and emergency power on a UPS (continued)

Emergency Operation

[Diagram showing the power flow and switch settings]

DIP Switch Settings on LUT-ATS-D

ON

OFF

[Diagram showing the connections and switch settings]
PowPak EcoSystem Fixture Control

Fixture Control is powered by emergency power

In an application where a PowPak Fixture Control is powered by emergency power and is controlling an emergency load, an ALCR is used with a normally open relay and a normally closed relay. During regular operation, the PowPak Fixture Control controls the loads directly. During emergency operation, the ALCR senses normal power is lost and the normally closed relay closes while the normally open relay opens. Doing this provides power to the load and interrupts the EcoSystem signal which causes the load go to high-end. An example of this type of ALCR is LUT-SHUNT-D from LVS Controls. This applies to: FCJS-ECO and RMJS-ECO32-SZ.

Wiring Schematic

Regular Utility Power

Emergency Power

UL® 1008 Transfer Switch

Normal Power

Emergency Power

Normal/Circuit Panel

Normal Voltage Sense

Normal Hot

Normal Neutral

Normal Power

Normal Voltage Sense

LVS Controls

LUT-SHUNT-D
PowPak EcoSystem Fixture Control (continued)

Fixture Control is powered by emergency power (continued)

Regular Operation

Emergency Operation

Regular Utility Power

Emergency Power

Regular Utility Power

Emergency Power

Regular Utility Power

Emergency Power

Regular Utility Power

Emergency Power

Emergency Load

LVS Controls LUT-SHUNT-D
Maestro Wireless Dimmers Not Requiring a Neutral Connection

Dimmer is powered by emergency power

In an application where a dimmer has power during an emergency, an ALCR with a normally closed relay (simple shunt relay) is used. During regular operation, normal power is present and the contact in the shunt relay is open, which allows the dimmer to function. When normal power is lost, the contact in the shunt relay closes and bypasses the dimmer by providing power to the load. Simple shunt relays are not recommended for use with reverse phase dimmers. An example of an ALCR with a normally closed relay is the LUT-SHUNT from LVS Controls. This applies to: MRF2S-6CL.

Wiring Schematic

Regular Utility Power

Emergency Power

Normal Power

Emergency Power

UL® 1008 Transfer Switch

Normal/Emergency Power

Line/Hot

Neutral

Brass Terminal

Black Terminal

Dimmed Hot

Emergency Load

Normal Circuit Panel

Normal Hot

Normal Neutral

Normal Voltage Sense

LVS Controls

LUT-SHUNT

Maestro Wireless Dimmer

4 Switched Line/Hot

5 White

TEST

2 Yellow

1 Black

www.lutron.com/support
Maestro Wireless Dimmers Not Requiring a Neutral Connection (continued)
Dimmer is powered by emergency power (continued)

Regular Operation

![Diagram of Regular Operation]

Emergency Operation

![Diagram of Emergency Operation]
Maestro Wireless Dimmers Not Requiring a Neutral Connection (continued)

Dimmer is powered by normal power

In an application where a dimmer is powered by normal power and is controlling an emergency load, an Automatic Transfer Switch (ATS) with multiple normally open and multiple normally closed relays are used. During regular operation, the dimmer controls the load directly. During emergency operation, the ATS senses when normal power is lost and transfers from the dimmer to emergency power, sending the load to high-end. The device is commonly called a load-side transfer switch. An example of an ATS like this is LUT-ATS-D from LVS Controls. This applies to: MRF2S-6CL.

Wiring Schematic

Regular Utility Power

Emergency Power

Normal Power

Normal Hot

Maestro Wireless Dimmer

Brass Terminal

Normal Neutral

Normal Voltage Sense

LVS Controls LUT-ATS-D

Normal / Emergency Circuit Panel

Load (Line / Hot)

Load (Neutral)

Emergency Load

Normal Load

Normal / Emergency Power

UL® 1008 Transfer Switch

Normal Power

Regular Utility Power

Normal Circuit Panel

Black Terminal

Dimmed Line / Hot

Normal Power

www.lutron.com/support
Maestro Wireless Dimmers Not Requiring a Neutral Connection (continued)

Dimmer is powered by normal power (continued)

Regular Operation

- **Regular Utility Power**
  - Normal Power
  - Emergency Power

- **Emergency Power**
  - Normal Power
  - Emergency Power

- **Normal Circuit Panel**
  - Normal Hot
  - Normal Neutral

- **Maestro Wireless Dimmer**
  - Black Terminal
  - Brass Terminal

- **LVS Controls LUT-ATS-D**
  - Neutral Line/Hot
  - Load (Line/Hot)
  - Load (Neutral)

- **Emergency Operation**
  - Normal Power
  - Emergency Power
  - Regular Utility Power
  - Normal Hot
  - Normal Neutral

- **Emergency Circuit Panel**
  - Normal Voltage Sense
  - Emergency Load
  - Normal Load
  - Dimmed Line/Hot

- **LVS Controls LUT-ATS-D**
  - Neutral Line/Hot
  - Load (Line/Hot)
  - Load (Neutral)
Maestro Wireless Dimmers Requiring a Neutral Connection
Dimmer is powered by emergency power

In an application where a dimmer has power during an emergency, an ALCR with a normally closed relay (simple shunt relay) is used. During regular operation, normal power is present and the contact in the shunt relay is open, which allows the dimmer to function. When normal power is lost, the contact in the shunt relay closes and bypasses the dimmer by providing power to the load. Simple shunt relays are not recommended for use with reverse phase dimmers. An example of an ALCR with a normally closed relay is the LUT-SHUNT from LVS Controls. This applies to: MRF2S-6ND.

Wiring Schematic

Regular Utility Power

Emergency Power

Normal Power

Emergency Power

UL® 1008
Transfer Switch

Normal/Emergency Power

Regular Utility Power

Normal Circuit Panel

Normal Hot

Normal Neutral

Normal Voltage Sense

Maestro Wireless Dimmer

LVS Controls
LUT-SHUNT

LUTRON
Maestro Wireless Dimmers Requiring a Neutral Connection (continued)
Dimmer is powered by emergency power (continued)

Regular Operation

Emergency Operation

LUTRON
Customer Assistance — 1.844.LUTRON1
Maestro Wireless Dimmers Not Requiring a Neutral Connection (continued)

Dimmer is powered by normal power

In an application where a dimmer is powered by normal power and is controlling an emergency load, an Automatic Transfer Switch (ATS) with multiple normally open and multiple normally closed relays are used. During regular operation, the dimmer controls the load directly. During emergency operation, the ATS senses when normal power is lost and transfers from the dimmer to emergency power, sending the load to high-end. The device is commonly called a load-side transfer switch. An example of an ATS like this is LUT-ATS-D from LVS Controls. This applies to MRF2S-6ND.

Wiring Schematic

Regular Utility Power

Emergency Power

Normal Power

UL® 1008 Transfer Switch

Normal/Emergency Power

LVS Controls LUT-ATS-D

Normal Voltage Sense

Normal Circuit Panel

Normal Hot

Normal Neutral

Black Terminal

Maestro Wireless Dimmer

Brass Terminal

Load (Line/Hot)

Load (Neutral)

Emergency Load

Normal Load

Regular Utility Power

Normal Power

Normal Power

Emergency Power

Normal Power
Maestro Wireless Dimmers Not Requiring a Neutral Connection (continued)
Dimmer is powered by normal power (continued)

Regular Operation

Emergency Operation
Maestro Wireless Dimmers Requiring a Neutral Connection

Dimmer is powered by normal power

In an application where a reverse-phase dimmer is powered by normal power and is controlling an emergency load, an Automatic Transfer Switch (ATS) with multiple normally open and multiple normally closed relays are used. During regular operation, the dimmer controls the load directly. During emergency operation, the ATS senses when normal power is lost and transfers from the dimmer to emergency power, sending the load to high-end. This device is commonly called a load-side transfer switch. An example of a device like this LUT-ATS-D from LVS Controls. This applies to: MRF2S-ELV120.

Wiring Schematic
Maestro Wireless Dimmers Requiring a Neutral Connection (continued)

Dimmer is powered by normal power (continued)

Regular Operation

Emergency Operation
Maestro Wireless Switches Requiring a Neutral Connection

Switch is powered by emergency power

In an application where a switch has power during an emergency, an ALCR with a normally closed relay (simple shunt relay) is used. During regular operation, normal power is present and the contact in the shunt relay is open, which allows the switch to function. When normal power is lost, the contact in the shunt relay closes and bypasses the switch by providing power to the load. An example of an ALCR with a normally closed relay is the LUT-SHUNT from LVS Controls. This shunt relay can be used with Maestro Wireless switches, which include:

- MRF2S-6ANS
- MRF2S-8ANS120

Wiring Schematic
Maestro Wireless Switches Requiring a Neutral Connection (continued)
Switch is powered by emergency power (continued)

Regular Operation

Emergency Operation
Maestro Wireless Switches Requiring a Neutral Connection *(continued)*

Switch is powered by normal power

In an application where a switch does not have power during an emergency, but is controlling emergency loads during regular operation, an ALCR with a normally closed relay that responds to the switched hot output of the switch is used. During regular operation, normal power is present and the relay in the ALCR will respond to switched hot output of the switch. When normal power is lost, the contact in the ALCR will close and provide power to the emergency load. An example of an ALCR like this is LUT-ALCR from LVS controls. This relay can be used with Maestro Wireless switches, which include:

- MRF2S-6ANS
- MRF2S-8ANS120

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**Wiring Schematic**

**Regular Utility Power**

**Emergency Power**

**Regular Utility Power**

**Emergency Power**

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**UL® 1008 Transfer Switch**

**Normal/Emergency Power**

**Emergency Circuit Panel**

**Normal Power**

**Emergency Power**

**Normal Voltage Sense**

**Control-State Sense**

**Switched Line/Hot**

**Switched Line/Hot**

**Neutral**

**Neutral**

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**LVS Controls LUT-ALCR**

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**Maestro Wireless Switch**
Maestro Wireless Switches Requiring a Neutral Connection (continued)
Switch is powered by normal power (continued)

Regular Operation

Emergency Operation
Maestro Wireless Switches Not Requiring a Neutral Connection

Switch is powered by emergency power

In an application where a switch has power during an emergency, an ALCR with a normally closed relay (simple shunt relay) is used. During regular operation, normal power is present and the contact in the shunt relay is open, which allows the switch to function. When normal power is lost, the contact in the shunt relay closes and bypasses the switch by providing power to the load. An example of an ALCR with a normally closed relay is LUT-SHUNT from LVS Controls.

This applies to: **MRF2S-8S-DV**

**Wiring Schematic**

Regular Utility Power

Emergency Power

UL® 1008 Transfer Switch

Normal Power

Emergency Power

Regular Utility Power

Normal Circuit Panel

Normal Hot

Normal Neutral

Normal Voltage Sense

4 Blue

Yellow

LVS Controls LUT-SHUNT

Maestro Wireless Switch

Brass Terminal

Switched Line/Hot

Emergency Load
Maestro Wireless Switches Not Requiring a Neutral Connection (continued)
Switch is powered by emergency power (continued)

Regular Operation

Emergency Operation
Maestro Wireless Switches Not Requiring a Neutral Connection (continued)

Switch is powered by normal power

In an application where a switch does not have power during an emergency, but is controlling emergency loads during regular operation, an ALCR with a normally closed relay that responds to the switched hot output of the switch is used. During regular operation, normal power is present and the relay in the ALCR will respond to switched hot output of the switch. When normal power is lost, the contact in the ALCR will close and provide power to the emergency load. An example of an ALCR like this is LUT-ALCR from LVS controls. These apply to: MRF2S-8S-DV
Maestro Wireless Switches Not Requiring a Neutral Connection (continued)
Switch is powered by normal power (continued)

Regular Operation

Regular Utility Power

Emergency Power

Normal Utility Power

Emergency Power

Emergency Operation
Vive Integral Fixture Control with an EcoSystem Driver
Powered by normal/emergency power and controlling an emergency load

In the application where the Vive Integral Fixture Control is being used, an ALCR is used with a normally open relay. During regular operation the normally open relay is closed allowing the Vive Integral Fixture Control to control the load. During emergency operation, the normally open relay opens, breaking the communication to the load, resulting in the load going to high-end. An example of an ALCR like this is LUT-SHUNT-FM from Lutron. This applies to DFCSJ-OEM-OCC/RF with DFC-OEM-DBI.

Note: LUT-SHUNT-FM is intended to be installed at the factory of an OEM fixture manufacturer and not for field installation.

Wiring Schematic
Communicating when either E1 or E2 or open circuit is not (ALCR relay is open), the EcoSystem driver goes to programmed Emergency light level (100% by default).
Vive Integral Fixture Control with an EcoSystem Driver (continued)
Powered by normal/emergency power and controlling an emergency load (continued)

Emergency Operation

The EcoSystem driver goes to programmed Emergency light level (100% by default).
Vive Integral Fixture Control and Driver with Self-Powered DALI Link

Powered by normal/emergency power and controlling an emergency load

In the application where the Vive Integral Fixture Control is being used, an ALCR is used with a normally closed relay. During regular operation the normally closed relay is held open allowing the Vive Integral Fixture Control to control the load. During emergency operation, the normally closed relay closes and shorts the SR+/DEXAL+ and SR-/DEXAL-terminals, resulting in the load going to high-end. An example of an ALCR like this is LUT-SHUNT-FM from Lutron. This applies to DFCSJ-OEM-OCC/RF.

Note: LUT-SHUNT-FM is intended to be installed at the factory of an OEM fixture manufacturer and not for field installation.

Wiring Schematic

[Diagram showing the wiring schematic with labels for normal power, emergency power, UL 1008/1008 Transfer Switch, Normal/Emergency Circuit Panel, DFCSJ-OEM-OCC/RF, Normal Voltage Sense, and LUT-SHUNT-FM.]
**Vive Integral Fixture Control and Driver with Self-Powered DALI Link** (continued)

**Powered by normal/emergency power and controlling an emergency load** (continued)

**Regular Operation**

![Diagram](attachment:image1.png)

**Emergency Operation**

![Diagram](attachment:image2.png)
Vive Integral Fixture Control with EcoSystem Driver and Battery Backup
Powered by normal power and controlling an emergency load

Using a battery backup

In the application where the Vive Integral Fixture Control is being used with a battery backup is desired, no ALCR is used. When normal power is lost, the battery will provide power to the LED to provide light to the space. For additional information, please see Application Note #106; page 13 at www.lutron.com.

Wiring Schematic
Vive Integral Fixture Control with EcoSystem Driver and Battery Backup (continued)
Powered by normal power and controlling an emergency load (continued)
Using a battery backup (continued)

Regular Operation

![Diagram of Vive Integral Fixture Control with EcoSystem Driver and Battery Backup in Regular Operation]

Emergency Operation

![Diagram of Vive Integral Fixture Control with EcoSystem Driver and Battery Backup in Emergency Operation]
Vive Integral Fixture Control and Driver with Self-Powered DALI Link and Battery Backup

Powered by normal power and controlling an emergency load

Using a battery backup

In the application where the Vive Integral Fixture Control is being used with a battery backup, no ALCR is used. When normal power is lost, the battery will provide power to the LED to provide light to the space. For additional information, please see Application Note #106; page 13 at www.lutron.com.

Wiring Schematic
Vive Integral Fixture Control and Driver with Self-Powered DALI Link and Battery Backup (continued)
Powered by normal power and controlling an emergency load (continued)
Using a battery backup (continued)

Regular Operation

Emergency Operation