Vive Integral Fixture Controls

This device is designed to operate as part of a Vive lighting control system. If used in a standalone (non-system) application, functionality is limited to default settings.

The Vive integral fixture control is a radio frequency (RF) device that controls either Lutron EcoSystem or DALI drivers based on RF input from Pico remote controls, Radio Powr Savr wireless sensors, or Vive hubs. It is intended to be mounted to a fixture at the fixture manufacturer's facility.

Models Available

Model Number	Description
DFCSJ-OEM-OCC	Vive Integral Fixture Control with Sensor
DFCSJ-OEM-RF	Vive Integral Fixture Control (RF only)

- DFCSJ-OEM-OCC:

    – Measures light in the space (daylighting) while detecting people moving within an area using passive infrared to determine occupancy.

    – Controls the lights to balance the light level in the space, combining convenience, exceptional energy savings, and ease of installation.

    – Contains two wires which connect to either a driver with integrated self-powered DALI link or to the fixture control digital link interface.

    – For default settings, see page 2.

- DFCSJ-OEM-RF

    – Provides wireless control of the fixture when neither occupancy nor daylight sensing is needed.

    – Contains two wires which connect to either a driver with integrated self-powered DALI link or to the fixture control digital link interface.

Communication with RF input devices is accomplished using Lutron Clear Connect RF Technology. See **Applications and Selecting the Right Control** on page 12 for more details on selecting the appropriate device.
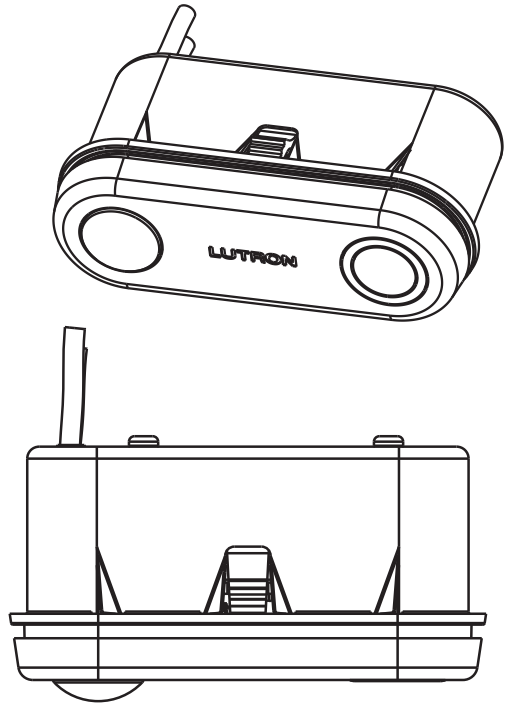
Vive Integral Fixture Control (scale 1:1)
(DFCSJ-OEM-OCC shown)

See pages 10 & 11 for system diagram

These products are also compatible with the Vive hub (software version 1.5 and above) which enables a simple setup process using a standard web browser on any Wi-Fi enabled phone, tablet or computer. It also enables control and monitoring of all Vive devices. The Vive hub can be added at any time. System reprogramming will be required. For a complete list of features supported with the Vive hub, see specification submittal 369902 at www.lutron.com

Specifications

Vive Integral Fixture Controls

Regulatory Approvals

- cULus Listed (UL244A - listing E174075)
- Complies with requirements for use in other spaces used for environmental air (plenums) per NEC® 2014 300.22(C)(3)
- FCC compliant with the limits for a Class B digital device
- IC (Industry Canada)
- Controls DALI-compliant loads

Power/Load

- IEC SELV/NEC® Class 2
- Operating voltage: 9.5–20.5 V⎓
- Operating current: 250 mA max
- Connects to Lutron EcoSystem LED drivers*, OPTOTRONIC® by eldoLED® drivers, or Advance Xitanium® SR drivers
  – See page 4 for maximum number of drivers

Colors

- Available in White only

Environmental

- Ambient operating temperature: 32 °F to 131 °F (0 °C to 55 °C), 0%–90% humidity, non-condensing; indoor use only

Warranty

- 5 Year Limited Warranty. For additional Warranty information, please visit: www.lutron.com/TechnicalDocumentLibrary/3601321.pdf

Wiring

- Wires: 600 V⎓ rated, 18 AWG (0.75 mm²) solid copper conductor

Mounting

- Vive integral fixture control mounts to a fixture (not intended for external/remote mounting).
- See pages 5 and 6 for dimensions

Frequency

- 431.0–437.0 MHz (U.S.A., Canada, Mexico)

Range

- Wireless sensors and controls must be located within 60 ft (18 m) from each other in the line of sight, or 30 ft (9 m) through walls.
- Devices must be located within 71 ft (22 m) of the Vive hub.
- Utilizes Lutron Clear Connect RF Technology

Default Sensor Settings for DFCSJ-OEM-OCC (adjustable ONLY via the Vive hub user interface unless otherwise noted)

- Occupancy sensor timeout: 15 minutes
- Occupancy sensor sensitivity: Medium
- Mode: Occupancy detection (auto-ON, auto-OFF)
- Occupied light level: 100% (note this can also be changed with a Pico remote and Radio Powr Savr sensor - see App Note #556 (048556) at www.lutron.com)
- Daylighting: Enabled
- Daylighting dims lights to OFF from low light level when sufficient ambient light is present for 15 minutes or more.

* Requires use of the Lutron DFC-OEM-DBI to provide power to the Vive integral fixture controls.

Specifications *(continued)*

Vive Integral Fixture Controls (continued)

DFCSJ-OEM-OCC Features (these do not apply to DFCSJ-OEM-RF)

Occupancy/Vacancy Functionality:

- Passive infrared motion detection with exclusive Lutron XCT Technology for major and minor motion detection.
- 360° field-of-view.
- 144 ft^2 (43.9 m^2) major motion and minor motion coverage based on 9 ft (2.75 m) ceiling height. See page 7 for more details.

Daylight Sensor Functionality:

- Daylight sensor has simple, automatic calibration out-of-the-box.
- Designed to give a linear response to changes in light level.
- Detects ambient light level changes from 0 to 1600 lx (0 to 150 fc).
- Daylight compensation through Lutron reliable closed loop proportional control. For more information, see www.lutron.com/TechnicalDocumentLibrary/daylighting_white-paper.pdf

DFCSJ-OEM-OCC/RF Features

- Power failure memory
- 2-wire connection between a Vive integral fixture control, an EcoSystem driver, and a fixture control digital link interface
  – The wires are non-polarized to prevent mis-wires between the DALI terminals
- Measured power available when connected to a driver that has that capability (such as Advance Xitanium® SR or OPTOTRONIC® by eldoLED®). Accuracy is defined by the driver specification.
- Measured power uses power reported from the driver. Theoretical power requires the user to specify a max power value in the Vive app/UI, and calculates power based on the current load level.

Fixture Level Settings
(adjustable via the Vive hub user interface)

- Low-end trim adjustment (default is minimum level for Lutron EcoSystem drivers). Also adjustable using Pico wireless control. See App Note #556 (048556) at www.lutron.com
- High-end trim adjustment (default is 100% for Lutron EcoSystem drivers). Also adjustable using Pico wireless control. See App Note #556 (048556) at www.lutron.com
- Minimum Light Level Setting (optional). Certain applications, such as hallways, may require that the lights never turn off. For these areas, select the minimum light level option and the load will lower to programed low-end level.
- Favorite light level can be set using a Pico remote control.

Specifications *(continued)*

Compatible Drivers** (see Application Note #642 (048642) at www.lutron.com for wiring diagrams)

Model Number	Description	Type of Power Reporting	Maximum Number of Drivers*	Notes/Limitations
OTi85 / 120-277/2A3 DX L OTi50 / 120-277/1A4 DX L OTi30 / 120-277/1A0 DX L	OPTOTRONIC® by eldoLED®	Measured	2	– More than 2 drivers requires the re-configuration of additional drivers to de-activate DALI power supply. – If more than 3 drivers are connected, this changes from measured to theoretical power.
Xl040C110V054VPT1 Xl040C110V054VPT2*** Xl075C200V054VPT1 Xl075C200V054VPT3	Advance Xitanium® SR Driver	Measured	3	– More than 3 drivers requires the reconfiguration of additional drivers to de-activate DALI power supply. – If more than 3 drivers are connected, this changes from measured to theoretical power.
LDE1	Lutron EcoSystem	Calculated	4	– Requires the use of the Lutron DFC-OEM-DBI to provide power to the Vive Integral Fixture controls. Reference Fixture Control Digital Interface specification for details (https://assets.lutron.com/a/documents/3691288_eng.pdf)

 * For applications that require more than the maximum number of drivers shown here, contact the driver manufacturer.

** Lutron evaluates that the driver can properly communicate with the Vive Integral Fixture control using DALI commands. Lutron does not evaluate performance or quality data on the driver. Lutron recommends that the customer evaluate the entire system (driver, light engine, fixture, etc.) together with actual samples to determine if dimming and other performance metrics of the driver meets the customer's needs.

***Driver Xl040C110V054VPT2 requires ferrite bead additions in order to work with Vive in-fixture controller. Refer to Application Note #642 for correct wiring instructions.

For more information regarding Advance Xitanium® SR drivers, visit
https://www.na.mytechnology.portal.signify.com/public-dashboard/public-download-center.html?folderUUID=2210007c-3214-4363-8200-eee18f1b9985

For the Advance Xitanium® SR design guide, visit
https://www.na.mytechnology.portal.signify.com/dam/jcr:0a3d5f57-c68d-45f7-8724-150425e49c62/Advance%20Xitanium%20SR%20LED%20Drivers%20Design-in%20Guide%20(PAd-1500DG).pdf

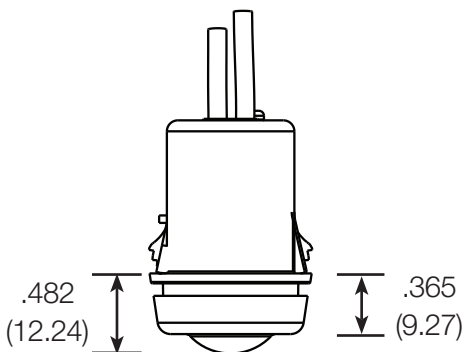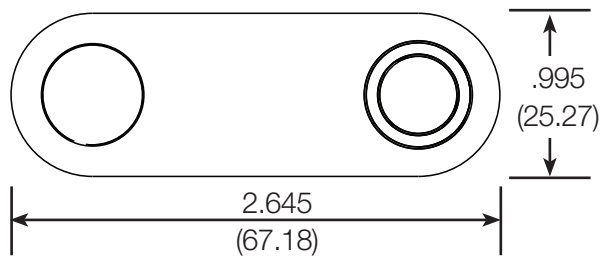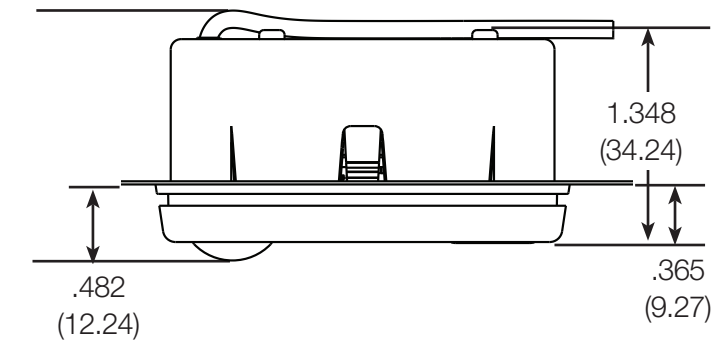For more information regarding OPTOTRONIC® by eldoLED® drivers, visit
www.osram.us/ds/products/led-fixture-components/power-supplies/constant-current-indoor/p001_ds_product_detail_121.jsp
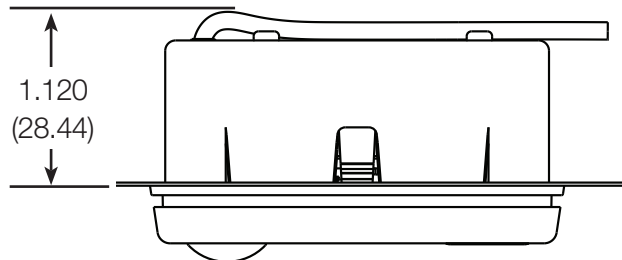
Job Name:	Model Numbers:
Job Number:	

Dimensions

Measurements shown as: in (mm)

DFCSJ-OEM-OCC

1.348
(34.24)

.482
(12.24)

.365
(9.27)

.995
(25.27)

2.645
(67.18)

.482
(12.24)

.365
(9.27)
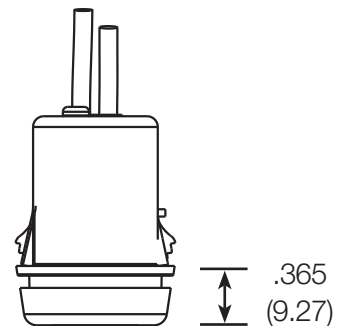
Minimum Depth Required in Fixture
(as measured from front face of fixture)

1.120
(28.44)

DFCSJ-OEM-RF

1.348
(34.24)

.365
(9.27)

.995
(25.27)

2.645
(67.18)

.365
(9.27)

Minimum Depth Required in Fixture
(as measured from front face of fixture)

1.120
(28.44)

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Page

Job Name:	Model Numbers:
Job Number:	
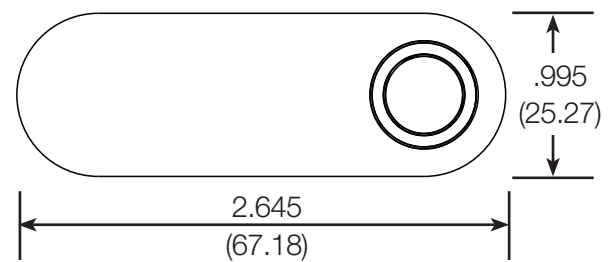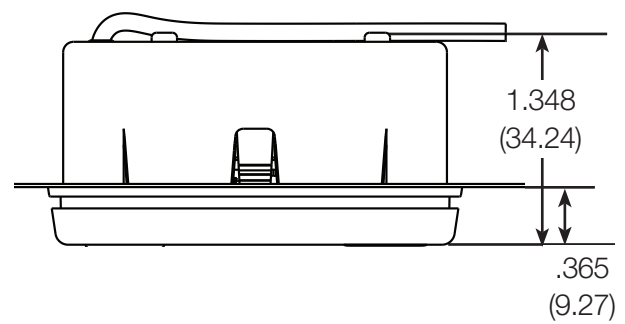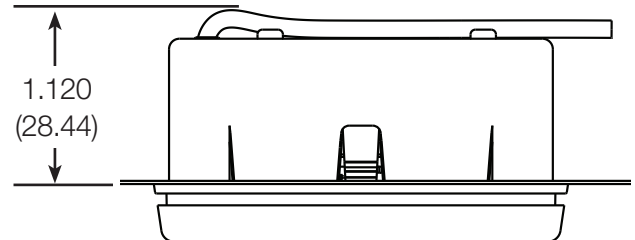
Dimensions *(continued)*

Measurements shown as: in (mm)

Knockout Dimensions

2X R .408 (10.36)

.816 ± .005
(20.72 ± 0.127)

2.481 ± .005
(63.02 ± 0.127)

Job Name:	Model Numbers:
Job Number:	

Range Diagrams

Ceiling

9 ft
(2.7 m)

Floor

15 ft	9 ft	3 ft	0	3 ft	9 ft	15 ft
(4.6 m)	(2.7 m)	(0.9 m)		(0.9 m)	(2.7 m)	(4.6 m)
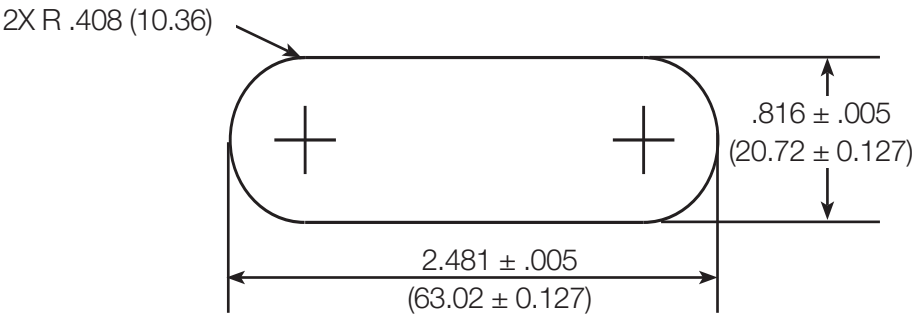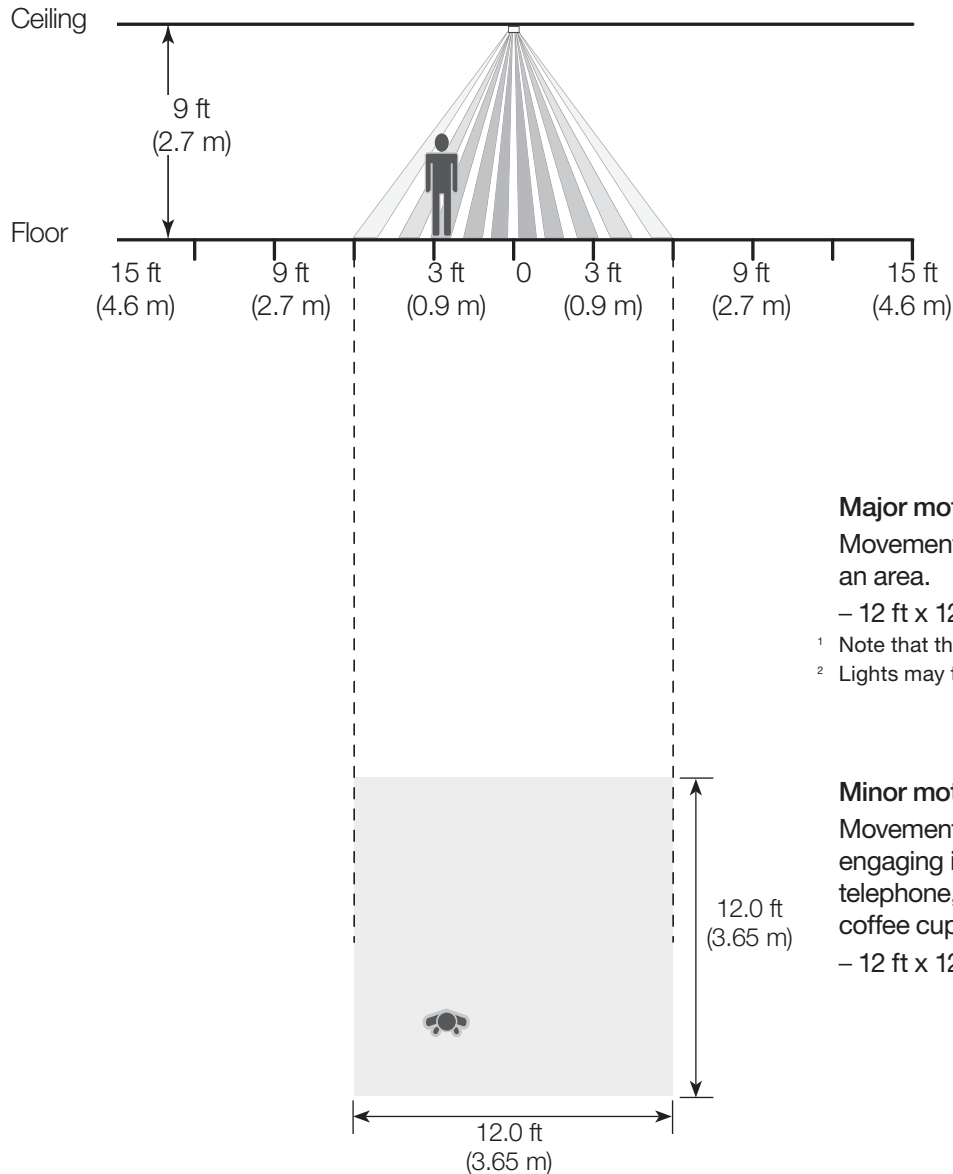
Major motion:

Movement of a person entering or passing through an area.

– 12 ft x 12 ft (144 ft²)(3.65 m x 3.65 m [13.3 m²])[1,2]

[1] Note that this is for the high sensitivity setting.

[2] Lights may turn on outside the major motion area.

12.0 ft
(3.65 m)

Minor motion:

Movement of a person occupying an area and engaging in small activities (e.g., reaching for a telephone, turning the pages of a book, picking up a coffee cup, etc.)

– 12 ft x 12 ft (144 ft²)(3.65 m x 3.65 m [13.3 m²])
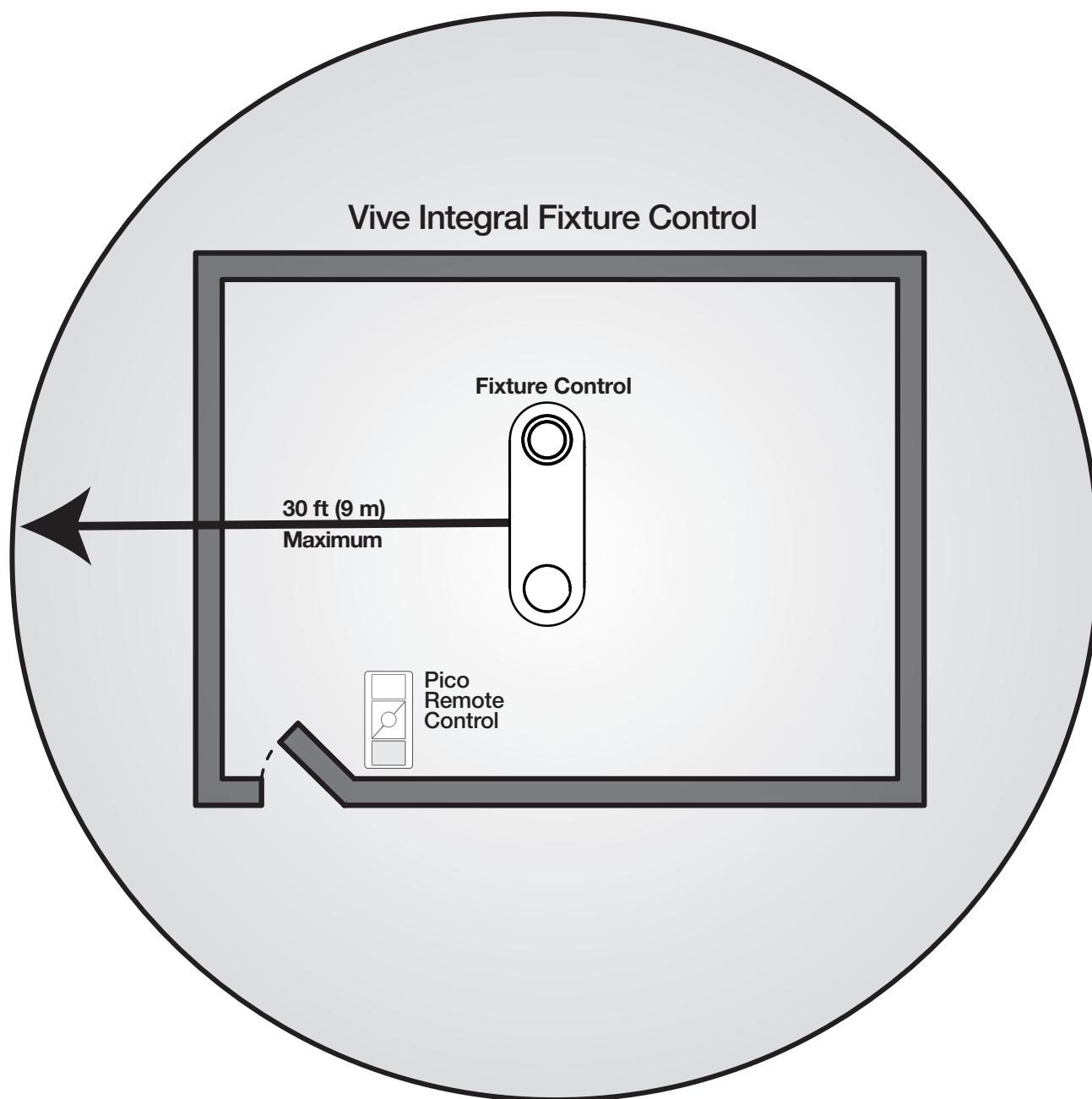
12.0 ft
(3.65 m)

Major Motion Sensor Coverage Chart

Ceiling Height	Major Motion Coverage Area (ft²) *
8 ft (2.4 m)	114
9 ft (2.7 m)	144
10 ft (3.0 m)	178
12 ft (3.7 m)	256

* 12 ft (3.7 m) is the recommended maximum mounting height

Job Name:	Model Numbers:
Job Number:	

Range Diagrams *(continued)*

Vive Integral Fixture Control

Fixture Control

30 ft (9 m) Maximum

Pico Remote Control

NOTE: Wireless sensors and controls must be located within 60 ft (18 m) line of sight of each other, or 30 ft (9 m) through walls.

Job Name:	Model Numbers:
Job Number:	

Meeting RF Performance Criteria Background

LED drivers are electrically very noisy, and this noise gets coupled onto the LEDs, LED load wires, driver power wires, and control wires, which can cause issues for RF controls. All RF controls are sensitive to this type of interference which can be generated by a driver, cell phone, or Wi-Fi router. Lutron has encountered cases where an LED driver can interfere with the RF system and reduce the range to an unacceptable level. The Vive integral fixture control has been designed to be resilient to these issues.

Expectations

In order to guarantee the specified RF performance of the fixture, the following requirements must be met:

1. Lutron expects OEM to maintain the integrity of the Vive integral fixture control. Removal or modification of the shield or other components will void the warranty.

2. The Fixture Control Self-Test is the key to determining if the fixture meets Lutron's criteria for acceptable RF performance.

   See App Note #642 (048642) at www.lutron.com for detailed information.

   Important Note: The Vive integral fixture control is not intended for retrofit kits that do not allow for the full kit assembly to be 100% tested at the fixture manufacturer's facility. Examples of non-compliant fixtures include but are not limited to "guts only kits," where testing the fixture does not leave the components in a position representative of the final installation case.

   Retrofit kit manufacturers must perform the Fixture Control Self-Test during the design phase with a full fixture as the customer would install it (including pan), varying those parameters that can change when the kit is installed in the field (i.e. incoming power wire length; power wire bundling, etc.) to verify that a pass (green light) is achieved in all these conditions.

Best Practices for Mounting Fixtures in Final Application

- To ensure optimal operation, the Vive integral fixture control should be mounted at least 4 ft (1.2 m) away from HVAC vents, intakes, and light bulbs that are below the ceiling line.
- Some fixtures may be used for return/supply air. In these applications it is recommended to use the DFCSJ-OEM-RF with area occupancy sensors (LRF2- model family).
- Devices emitting Radio Frequency (RF) energy can affect the performance of sensors. To ensure optimal operation, DFCSJ-OEM-OCC should be mounted at least 4 ft (1.2 m) away from devices that emit radio waves (e.g., microwave ovens, wireless routers, other wireless devices).
- To detect motion, the sensor requires line-of-sight of room occupants. The sensor must have an unobstructed view of the room. Do NOT mount behind or near tall cabinets, shelves, hanging fixtures, ceiling fans, etc. The sensor cannot see through glass objects (e.g., patio or shower doors).
- The performance of the sensor depends on a temperature differential between the ambient room temperature and that of room occupants. Warmer rooms may reduce the ability of the sensor to detect occupants.
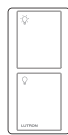
Job Name:	Model Numbers:
Job Number:	

3691039o 10 01.09.24
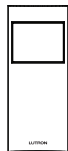
Wiring/System Diagram:
EcoSystem Driver(s) (configuration only for drivers without self-powered DALI link)

Maximum number of wireless devices that can be associated to one Vive integral fixture control:
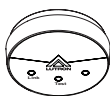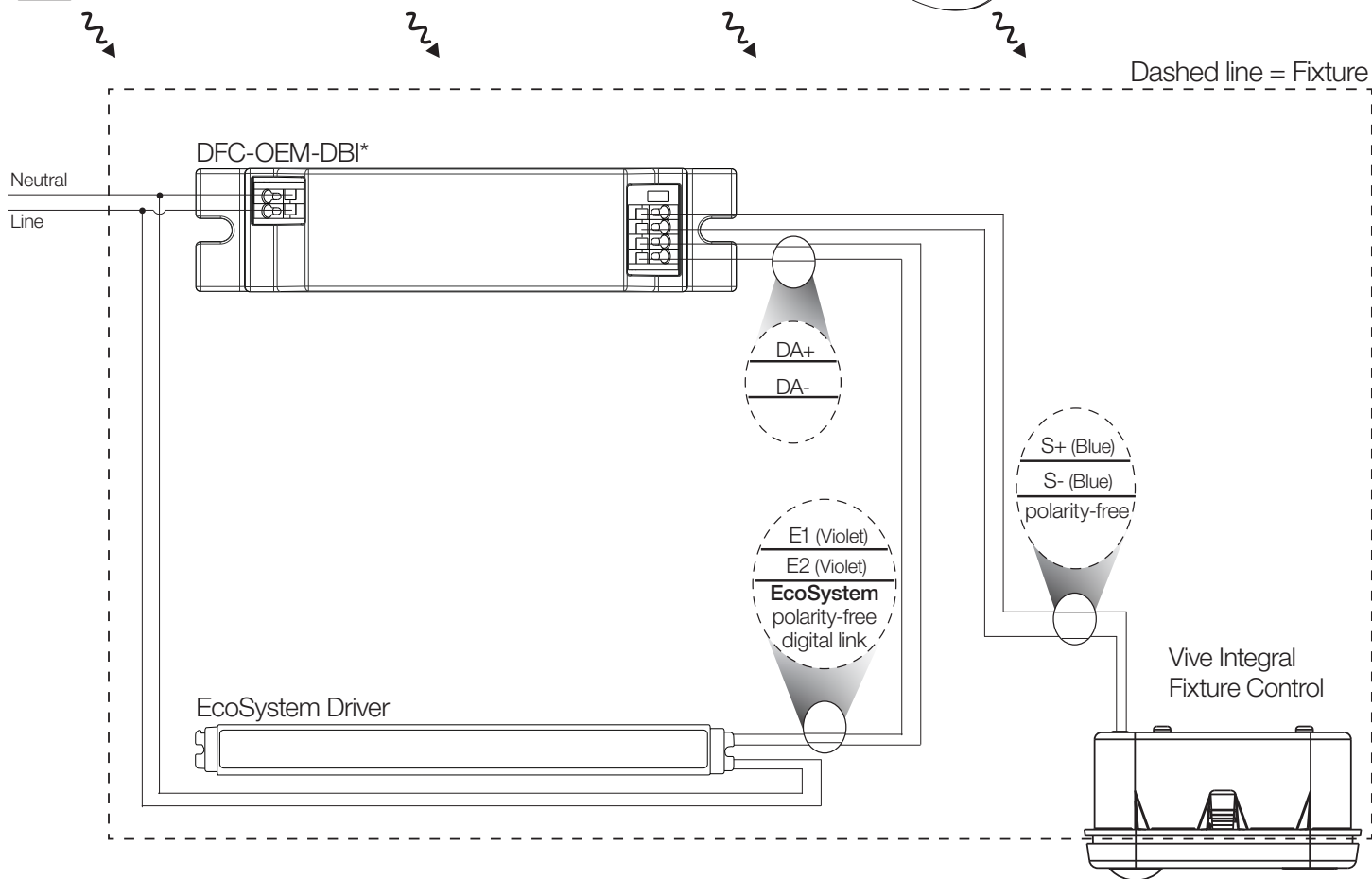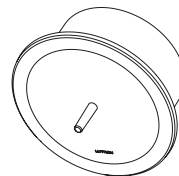
Pico Remote Control
(up to 10)

Radio Powr Savr
occupancy sensor
(up to 10)

Radio Powr Savr
daylight sensor
(1 maximum)

Vive Wireless Hub
(1 maximum)

Dashed line = Fixture

DFC-OEM-DBI*

Neutral

Line

DA+

DA-

S+ (Blue)

S- (Blue)

polarity-free

E1 (Violet)

E2 (Violet)

EcoSystem
polarity-free
digital link

Vive Integral
Fixture Control

EcoSystem Driver

* Previous versions of the DFC-OEM-DBI may have DA+/DA- labeled as E+/E-.

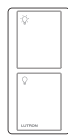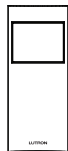| Job Name:	Model Numbers:
Job Number:	

Wiring/System Diagram: *(continued)*
DALI Driver with Integrated Self-Powered DALI Link

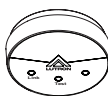**Maximum number of wireless devices that can be associated to one Vive integral fixture control:**
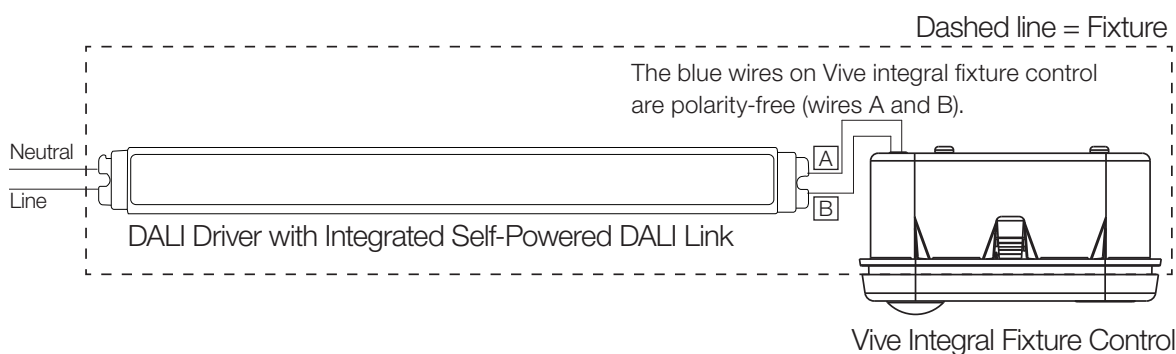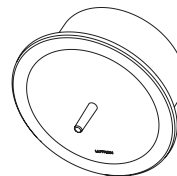
Pico Remote Control
(up to 10)

Radio Powr Savr
occupancy sensor
(up to 10)

Radio Powr Savr
daylight sensor
(1 maximum)

Vive Wireless Hub
(1 maximum)

Dashed line = Fixture

The blue wires on Vive integral fixture control
are polarity-free (wires A and B).

Neutral

Line

A

B

DALI Driver with Integrated Self-Powered DALI Link

Vive Integral Fixture Control

Terminal Connections

Advance Xitanium® SR:
A = SR+
B = SR−

OPTOTRONIC® by
eldoLED®:
A = DEXAL+
B = DEXAL−

Job Name:	Model Numbers:
Job Number:	

Applications and Selecting the Right Control

Suggested applications:

Vive Integral Fixture Control with Sensor:

- Great for individual control in cubicles
- Maximize energy savings (fixtures in unoccupied spaces do not turn on)
- Simplifies the determination of what is needed for a job
- Integrates directly to fixture

Radio Powr Savr sensors:

- Cover large areas with a single sensor
- Sensor can mount anywhere in the space
- In order to turn on and off multiple fixtures together (known as "grouping"), a Radio Powr Savr occupancy sensor or a Vive hub must be used.
- In order to have a row of fixtures dim up or down together in response to daylight, a Radio Powr Savr daylight sensor must be used.

Daylighting:

Radio Powr Savr vs. Vive Integral Fixture Control with Sensor

Vive integral fixture control with sensor has two options for daylighting:

1. Simple, no setup (out-of-the-box) daylight harvesting to a localized area. Vive integral fixture controls with sensors calibrate automatically.

2. Highly configurable daylight harvesting with additional sensors. Radio Powr Savr daylight sensors provide the ultimate flexibility in daylighting: target light level (tuning) and gain value (through calibration) can be adjusted independently. Daylighting rows/zones can be setup so that multiple fixtures dim in unison (also known as "grouping"). Radio Powr Savr daylight sensors can be placed anywhere since they are completely wireless, and performance can be optimized through placement and fine tuning.

Notes:

- When using a Radio Powr Savr daylight sensor in conjunction with a Vive integral fixture control with sensor, the Radio Powr Savr daylight sensor will provide the daylighting input to the driver, and the Vive integral fixture control with sensor daylighting input will be ignored.
- To expand coverage area:
  - Vive integral fixture controls can be grouped together using the Vive hub user interface.
  - Up to 10 RPS occupancy sensors can be associated to a Vive Integral fixture control.

For more information on integration the Vive integral fixture control into luminaires, please see Lutron App Note #642 (048642) on www.lutron.com

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Job Name:	Model Numbers:
Job Number:	