LUTRON

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Revision B
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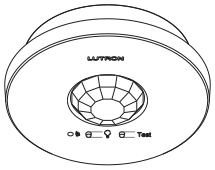
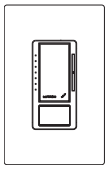
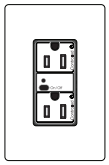
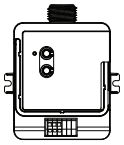
Combining Occupancy Sensors of Different Types in Vive Systems

This application note covers the occupancy/vacancy sensor operation within a Vive system when sensors and load controllers of multiple types are used together in a space. The devices covered by this application note are as follows:

Description	Name Used in this Document	Model Numbers Covered
Radio Powr Savr wireless occupancy sensors OR Wired occupancy sensors via a wireless interface	Wireless sensors 	LRF2-OCR2B-P LRF2-OWLB-P LRF2-OKLB-P LRF2-OHLB-P LRF2-VCR2B-P LRF2-VWLB-P LRF2-VKLB-P LRF2-VHLB-P RMJS-OT-DV with wired sensor(s)
Vive integral fixture controllers with sensors	Fixture-mount controls 	DFCSJ-OEM-OCC FCJS-010 with FC-SENSOR or FC-VSENSOR FCJS-ECO with FC-SENSOR or FC-VSENSOR
Maestro RF dimmer or switch with integral sensor	Maestro sensors 	MRF2S-8SD010 MRF2S-8SS MRF2S-8SDV010 MRF2S-8SSV
Vive wireless receptacles	Wireless receptacles 	CAR2S-15-STR CAR2S-15-DTR CAR2S-20-STR CAR2S-20-DTR
PowPak 20 A receptacle control relay module	PowPak receptacle controls 	RMJS-20R-DV-B RMJS-20RCCO1DV-B

The Vive system uses two methods of mapping occupancy sensors to loads, depending on the sensor type being used:

Occupancy Method	Description	Applies to
Occupancy assignment	Devices are assigned to the sensors directly	Wireless sensors Maestro sensors
Occupancy grouping	Fixture sensors are grouped together to form larger occupancy groups	Fixture-mount controls

This app note describes the operation in cases where installations contain a combination of both methods. In most cases, combining sensors of different types in one area will result in the sensors working in an “additive” way (space is occupied when any sensor sees motion, and is unoccupied only when no sensors see motion). However, there are some exceptions to this, as explained on the next page.

Combining Wireless Sensors or Maestro Sensors with Fixture-Mount Controls

- Applications WITHOUT a Vive Hub: If you associate a wireless sensor or Maestro sensor to a fixture-mount control in a system without a hub, the lights will turn on if either sensor sees motion and turn off only when neither sees motion.
- Applications WITH a Vive Hub: If you associate a wireless sensor or Maestro sensor and a fixture-mount control in a system with a hub, the lights will only change state based on the occupancy status of the wireless sensor or Maestro sensor. **The occupancy sensor on the fixture-mount control will be ignored.**

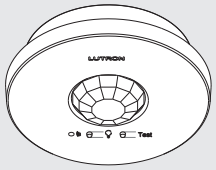
Combining Wireless Sensors with Fixture-Mount Controls and Maestro Sensors

- Applications WITHOUT a Vive Hub: If you associate a wireless sensor to a fixture-mount control in a system without a hub, the sensors will work together. If you associate that same wireless sensor to a Maestro sensor, the sensors will work together. However, the Maestro sensor and the fixture-mount control do not communicate with each other, and therefore cannot have their sensors associated with one another.
- Applications WITH a Vive Hub: If you associate a wireless sensor to a fixture-mount control with a hub and add a Maestro sensor to the same area, the lights will change state based on the combined status of the wireless sensor and the Maestro sensor. **The sensor on the fixture-mount control will be ignored.**

For other combinations of sensors, the sensors will work in an additive way; the lights will turn on if any sensor sees motion and will turn off only when no sensor sees motion. Occupancy Sensor Functionality without a Hub:

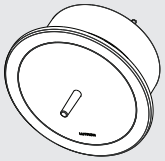
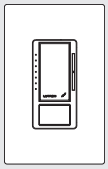
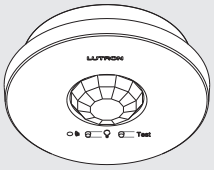
Occupancy Sensor Functionality without a Hub:

If a wireless sensor is added to a Maestro sensor or fixture-mount control, then each control will combine their information with the wireless sensor. If either sensor or control sees motion, then the control will go to the occupied programming. For the control to go to its vacancy programming, both the sensor and control have to timeout after seeing no motion. The area is marked vacant once all sensors timeout (after they no longer see motion). If there are no wireless sensors, then all controls act independently based on their own sensor data.

Controls Present in Area			
Maestro Sensor 	Wireless Sensor 	Fixture-Mount Control 	Behavior
X	X		Additive: Occupancy is determined by either sensor
	X	X	Additive: Occupancy is determined by either sensor
X	X	X	– Maestro sensor occupancy will be determined only by the Maestro sensor and wireless sensor – Fixture-mount control occupancy will be determined only by the fixture-mount control and wireless sensor
X		X	Sensors independently control their respective loads

Occupancy Sensor Functionality with a Hub:

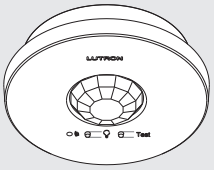
The hub will combine sensor information from Maestro sensors and wireless sensors. This means if any Maestro sensor or wireless sensor sees motion then the hub will set the area as occupied. The area is marked vacant only once all sensors timeout after they no longer see motion. Any fixtures with a fixture-mount control will ignore their own sensor data and follow the area state set by the Maestro sensor or wireless sensor. If an area only contains fixture-mount controls then each control will operate their fixture independently.

Controls Present in Area (Vive Hub) 			
Maestro Sensor 	Wireless Sensor 	Fixture-Mount Control 	Behavior
X	X		Additive: Occupancy is determined by either sensor
	X	X	Only a wireless sensor will determine occupancy state
X	X	X	A wireless sensor and Maestro sensor combined will determine occupancy state
X		X	Only a Maestro sensor will determine occupancy state

Occupancy Sensors controlling Wireless Receptacles and PowPak Receptacle Controls

Receptacle control in a Vive system can be achieved by either using a wireless receptacles or PowPak receptacle controls wired to a standard receptacle circuit. Maestro sensors, wireless sensors, or fixture-mount controls can be used to control these receptacle devices under the following scenarios:

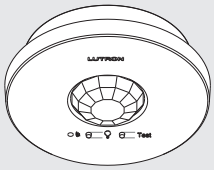
Load Control of PowPak Receptacle Controls or Wireless Receptacles without a Vive Hub

Controls Present in Area			
Maestro Sensor 	Wireless Sensor 	Fixture-Mount Control 	Behavior
		X	Receptacles not controlled by occupancy sensors
	X		Receptacles controlled via wireless sensor
X			Receptacles not controlled by occupancy sensors
X	X		Receptacles only controlled by wireless sensor
	X	X	Receptacles only controlled by wireless sensor
X	X	X	Receptacles only controlled by wireless sensor
X		X	Receptacles not controlled by occupancy sensors

- Note that PowPak receptacle controls and wireless receptacles cannot be set to respond to “Vacancy Only”. It will always respond to “Occupancy/Vacancy” and the occupied and unoccupied settings will always be “On” and “Off” respectively.

Occupancy Sensors controlling Wireless Receptacles and PowPak Receptacle Controls *(continued)*

Load Control of PowPak Receptacle Controls or Wireless Receptacles with a Vive Hub

Controls Present in Area (Vive Hub)			
Maestro Sensor 	Wireless Sensor 	Fixture-Mount Control 	Behavior
		X	Receptacles controlled via fixture-mount control
	X		Receptacles controlled via wireless sensor
X			Receptacles controlled via Maestro sensor
X	X		Receptacles controlled by wireless sensor and Maestro sensor combined
	X	X	Receptacles only controlled by wireless sensor
X	X	X	Receptacles only controlled by wireless sensor and Maestro sensor combined
X		X	Receptacles only controlled by Maestro sensor

- Note that PowPak receptacle controls and wireless receptacles cannot be set to respond to “Vacancy Only”. It will always respond to “Occupancy/Vacancy” and the occupied and unoccupied settings will always be “On” and “Off” respectively.

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