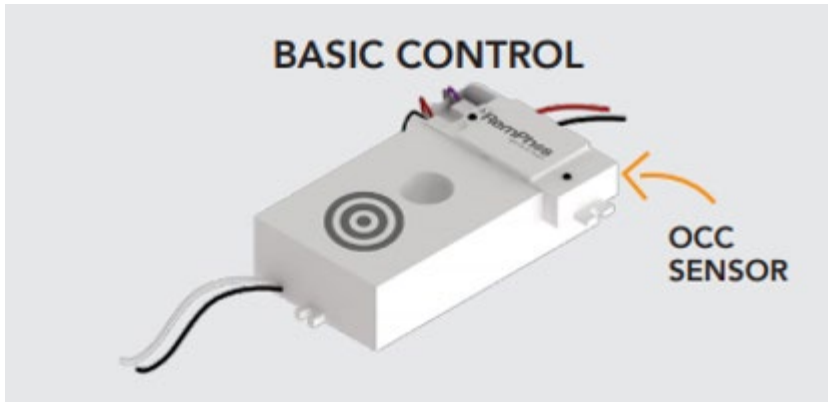


“OCC” Motion Sensor Guide: how to program and use



Light Efficient Design

RemPhos

Sensor Selector Guide...

Contact us for a copy of our sensor selector guide to provide you with more in depth information on our various options.

Sensor Selector Guide

	Standard Sensor (up to 25ft)	High Ceiling Sensor (25-50ft)	Network - wireless (DLC NLC) Option #1	Network - wireless (DLC NLC) Option #2	Application Notes
Lamps					
All LED screw-ins & LED tubes	Hynall HNS-205	Hytronik HC403VRC-KD	LG Sensor Connect (Zigbee)	Avi-On (Bluetooth)	Bulbs and tubes that do not have an external driver will be on/off only for control (no dimming)
Retrofit Kits					
LEDBARKIT - external driver	Hynall HNS-205	Hytronik HC403VRC-KD	LG Sensor Connect (Zigbee)	Avi-On (Bluetooth)	Comes standard with 10V dimmable drivers, so controls will dim LEDs
LEDCR/SR retrofit	Hynall HNS-111	N/A	LG Sensor Connect (Zigbee)	Avi-On (Bluetooth)	Comes standard with 10V dimmable drivers, so controls will dim LEDs
LEDBLOCK G3* <i>be careful during install, mount sensor below LED module, so that fan does not trip the sensor</i>	Hynall HNS-205	Hytronik HC403VRC-KD	LG Sensor Connect (Zigbee)	Avi-On (Bluetooth)	DOES NOT come standard with 10V dimmable driver. Standard kit includes non dimmable driver. Must upgrade to 10V dimmable driver if you wish to dim the kit down, otherwise the sensors will work but on/off only.
Indoor Fixtures					
SR/CR powered drums/sconce fixtures	Hynall HNS-111	N/A	LG Sensor Connect (Zigbee)	Avi-On (Bluetooth)	Comes standard with 10V dimmable drivers, so controls will dim LEDs
LIVC G2 - stairwell	Hynall HNS-111	N/A	LG Sensor Connect (Zigbee)	Avi-On (Bluetooth)	Comes standard with 10V dimmable drivers, so controls will dim LEDs
LEDPANEL G3	Hynall HNS-205	N/A	LG Sensor Connect (Zigbee)	Avi-On (Bluetooth)	Comes standard with 10V dimmable drivers, so controls will dim LEDs
LED Linear Highbays	Leviton HSB-011	Leviton HSB-011	LG Sensor Connect (Zigbee)	Avi-On (Bluetooth)	Comes standard with 10V dimmable drivers, so controls will dim LEDs
LED Circular Highbays	Contact engineering	Contact engineering	LG Sensor Connect (Zigbee)	Avi-On (Bluetooth)	Comes standard with 10V dimmable drivers, so controls will dim LEDs
Comes standard with 10V dimmable drivers, so controls will dim LEDs					
LEDAL G2	N/A	Hytronik HC403VRC-KD Remote: HRC-05 *photocell does not work	LG Sensor Connect (Zigbee)	Avi-On (Bluetooth)	Comes standard with 10V dimmable drivers, so controls will dim LEDs

Which sensors does this presentation apply to?

The Hynall HNS-111 and HNS-205 sensors used in most of our products

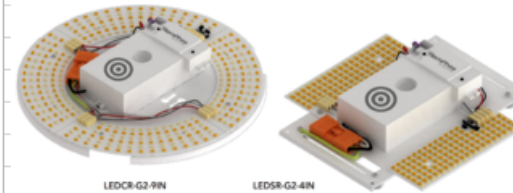
Hynall HNS-111

[Link](#)

Remote: HNS-IR12



- Occupancy sensing technology: high frequency radar. Can work behind glass or plastic. Clear or diffused.
- Photocell technology: advanced photocell technology can tell the difference between ambient (natural) light and LED (artificial light). Can work behind glass or plastic. Clear or diffused.
- Wireless networking/grouping: NO
- Wiring: 12V voltage in, 0-10V dimming wires from driver
- Mounting notes: integrated antennae, unit is low voltage so ok to be exposed
- How to adjust settings: remote control only (HNS-



Hynall HNS-111 mounted to the top of the LEDCR & LEDSR

Hynall HNS-205

[Link](#)

Remote: HNS-IR12

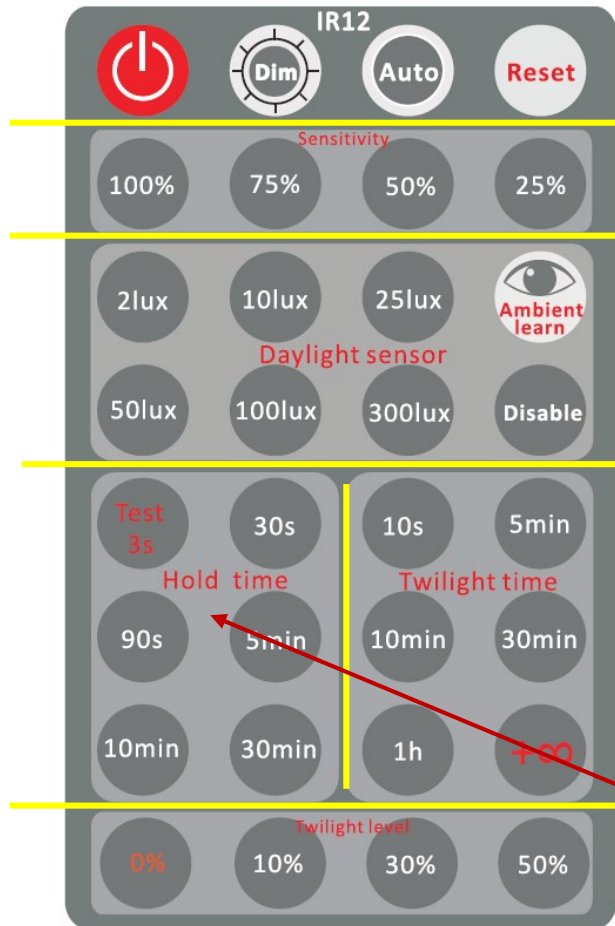


- Occupancy sensing technology: high frequency radar. Can work behind glass or plastic. Clear or diffused.
- Photocell technology: smart photocell technology can tell the difference between ambient (natural) light and LED (artificial light). Can work behind glass or plastic. Clear or diffused.
- Wireless networking/grouping: NO
- Wiring: line voltage in, line voltage out to driver, 0-10V dimming wires from driver
- Mounting notes: the control body can be mounted under the ballast cover. The detached antennae is low voltage (RJ45 phone cable connection) and can be mounted anywhere in the fixture
- How to adjust settings: either by dip-switch or by remote control (HNS-IR12)



example of LEDBARKIT-external driver w/ HNS-205 control retrofitting a 2ft wrap fixture

Remote Overview



Main Controls

- On/Off – will turn fixture on and off
 - No need to use this, for test purposes only
- Dim – will dim the brightness of the fixture
 - No need to use this, for test purposes only
- Auto – no need to use this
- Reset – returns all settings to factory default (see next slide)

Sensitivity

- Distance sensor will activate with motion

Daylight Sensor

- If activated – will turn fixture off during bright sunlight
- If deactivated – fixture will stay on even with sunlight
- This is NOT daylight harvesting/dimming. Fixture can only turn off, not dim with bright light.

Hold Time

- Amount of time after no motion is sensed before dimming down to the dimmed or “twilight level”

Twilight Time

- Amount of time after no motion is sensed before turning completely off (add hold time to this)

Twilight Level

- Desired dimmed light level (see next slides to calculate energy usage)



Default Settings

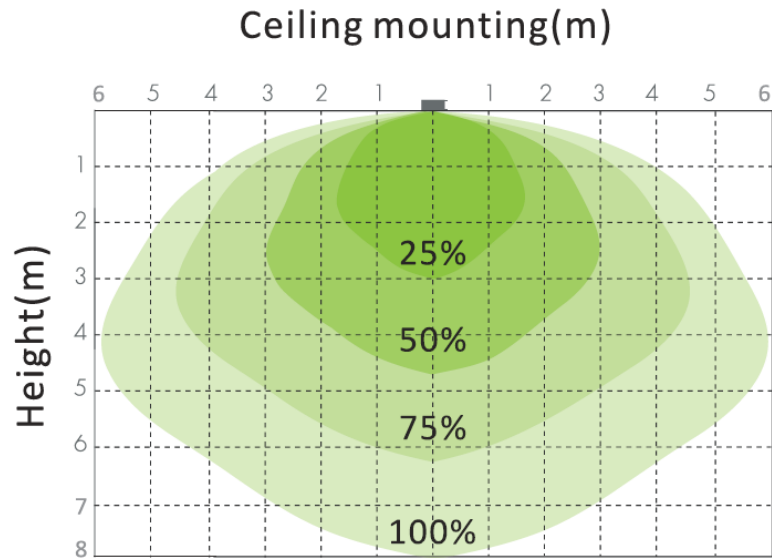
Reset Button

- 100% or 75% Sensitivity
 - 100% for LIVC and LEDPANEL
 - 75% for LEDCR/LESR/Drums/Sconces
- Disable Daylight Sensor
 - Fixture never turns off even in bright sunlight
- 5min Second Hold Time
 - Fixture will dim to the dimmed level or twilight level after 5minutes
- Infinity Twilight Time
 - Fixture never turns completely off (so fixture will only go between high and low). Typically in 24/7 lit areas, you do not want the lights to completely turn off
- 30% Twilight Level
 - Fixture dims down to 30% light level
 - See additional slide to understand power consumption implications

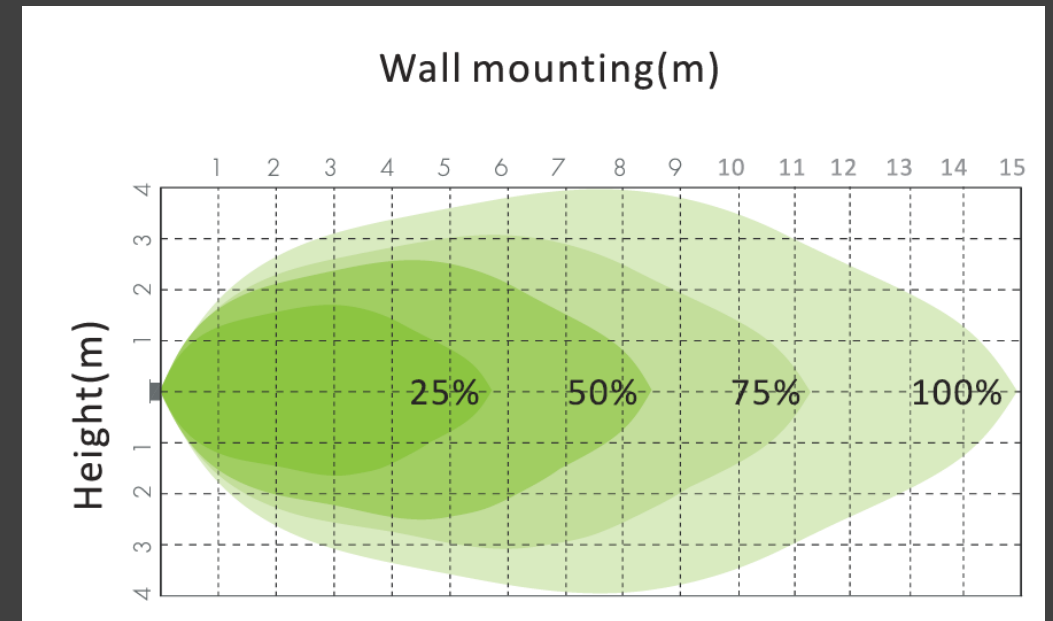
More info on sensitivity

The sensor uses high frequency radar (or sometimes referred to as microwave) which is a completely safe (FCC compliant) method to sense motion. It can pick up motion through glass or plastic lenses and will work great in either ceiling mount or wall mount applications.

Note: please contact us for details if you need a larger coverage pattern



Ceiling Mount



Wall Mount

*Multiply meters by "3" to
convert to feet*

(for example 8m = 24ft)

More info on daylight Sensor

Daylight Holdoff – On/ Off

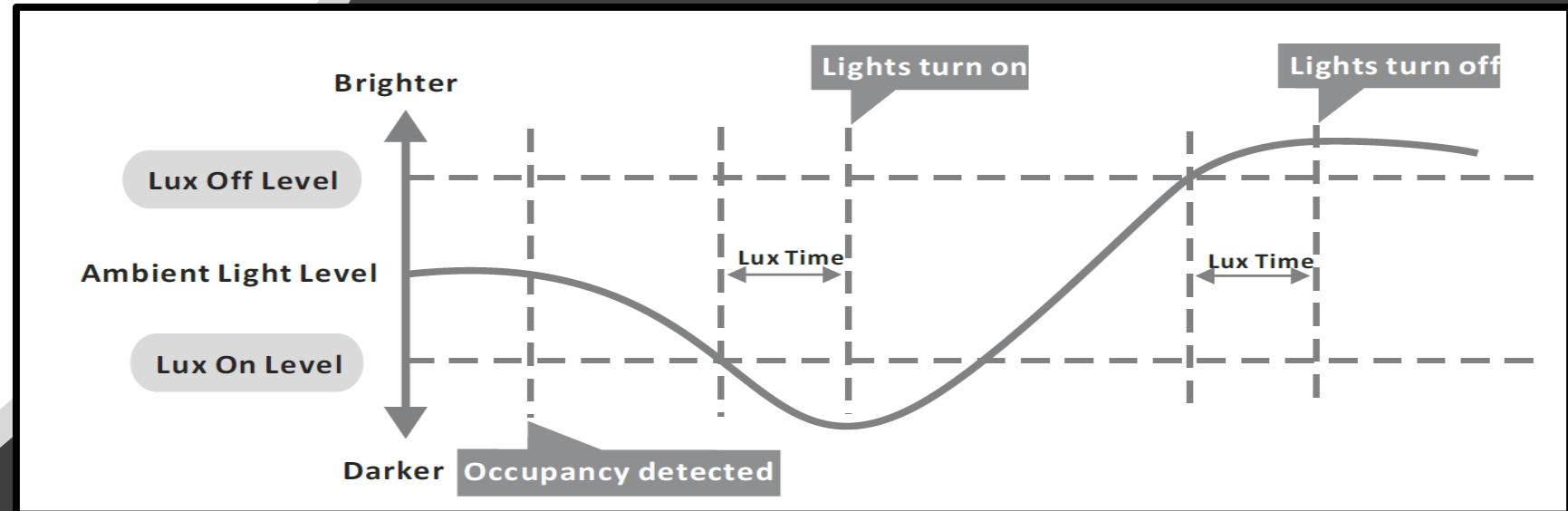
These sensors feature a daylight holdoff feature. The default mode is for this feature to be deactivated. If activated on the remote – it will keep the fixture turned off (even in the presence of motion) during bright sunlight hours.

Note that this photocell sensor is Intelligent and can be used even Behind a diffused lens!

1 Lux = 1 Lumen Per Square Meter

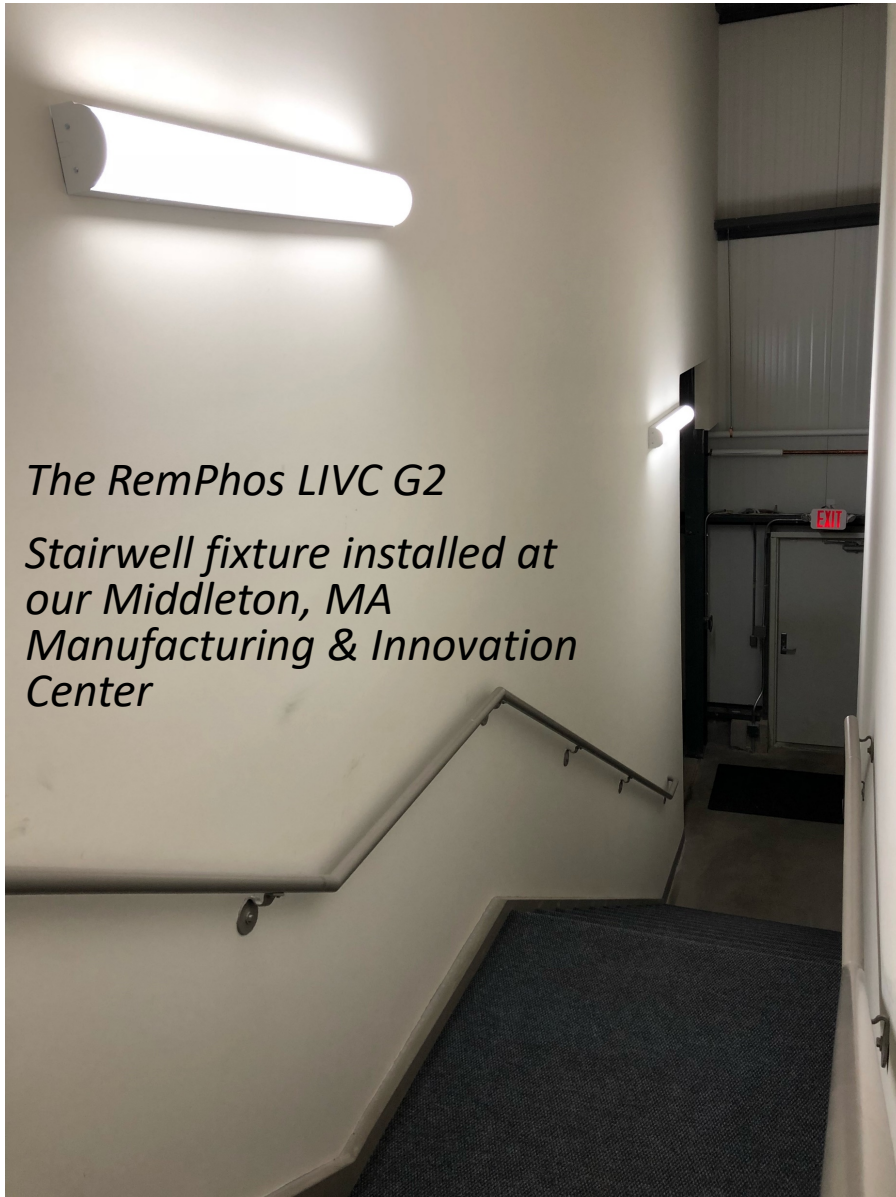
Daylight Harvesting - Dimming

Adjusts light output level based on amount of sunlight detected. This model of sensor does NOT have this feature. Contact us for info on an upgraded model if desired.



What environments are perfect for these sensors?

- Stairwells
- Corridors/ Hallways
- Closets
- Storage
- Warehouses
- Any area that is 24/7



*The RemPhos LIVC G2
Stairwell fixture installed at
our Middleton, MA
Manufacturing & Innovation
Center*

How do I calculate the wattage of the fixture at dimmed level?

- A major benefit of our 12V low voltage powered sensors is that they use very little power. Less than 0.2W.
- Therefore the wattage of the fixture at the dimmed level can easily be calculated based on multiply the wattage at high x the dimmed % and adding 0.2W
- Example for the 4ft LIVC G2 stairwell fixture with FlexWatt technology, set to 15W):



Dimmed (or twilight) level:	Wattage consumed on high	Formula	Wattage consumed when dimmed
10%	15W	$(15W * 10\%) + 0.2W$	1.7W
20%	15W	$(15W * 20\%) + 0.2W$	3.2W
30%	15W	$(15W * 30\%) + 0.2W$	4.7W
50%	15W	$(15W * 50\%) + 0.2W$	7.7W

Frequently Asked Questions (part 1)

Q: What if I only want the fixture to go on/off and never go to a dimmed low level?

A: YES this can be done. Take the remote and under the “TWIGHLIGHT LEVEL” press “0%”

Q: Can the sensor be installed behind or under a fixture lens?

A: YES. The sensor can see through any material except for metal. So, plastic or glass it will see right through. Clear or diffused lenses also do not matter, the sensor will see right through.

Q: I am worried that the motion sensor will be too sensitive. For example, I am mounting a fixture near an elevator, and I do not want the elevator to trip the motion sensor each time the car travels by. Is there a way I can quickly and easily test different detection ranges?

A: YES. Under “HOLD TIME” press the “Test -3s” button on the remote. This will go into a sequence where the fixture stays on for 3 seconds and turns off for 2 seconds and then repeats. Once you are in test mode – you can test different sensitivities by pressing the “100/75/50/25%” buttons on the remote under “SENSITIVITY”.

Q: Will the fixture dim down to different brightness (sometimes referred to as daylight dimming or harvesting) levels depending on sunlight?

A: NO. The standard sensor will only perform a “daylight holdoff” function meaning that if this setting is enabled on the remote (and its factory default is disabled), then it will turn the fixture off in sunlight, but it will not dim it. We do offer an upgraded sensor that will perform this function, contact us for details.

Frequently Asked Questions (part 2)

Q: What are the differences between a PIR, ultrasonic and high frequency radar/microwave motion sensor technologies? Which is the best?

A: **There is no one size fits all for motion sensor technology. Each has its advantages and disadvantages. PIR which stands for passive infrared, senses motion by sensing changes in heat. Ultrasonic senses motion by listening with a microphone to very high frequency changes. The limitation of PIR and ultrasonic is that they both must be external to the fixture. Light Efficient Design uses high frequency radar/microwave because its very sensitive to motion and can see right through materials (other than metal), making it perfect for retrofit where you want to install and hide the sensor under the lens.**

Q: Can the sensor see through concrete? For example in a stairwell?

A: **YES. If the sensitivity is at 100%, it could pick up motion through concrete. This works very well in a stairwell.**

Q: Is the motion sensor powered by 120V?

A: **NO. New for 2018, most of our sensors are powered by 12V DC line voltage. The advantage of powering them with 12V DC is that they are (a) smaller, (b) lower cost and (c) use less power...only 0.2W (compared to line voltage sensors that can use upwards of 3W).**

Q: What is the warranty on the sensors?

A: **The warranty on the sensor matches the warranty for the product it is paired with. If the product has a 10yr warranty, the sensor is warrantied for 10yrs.**

Frequently Asked Questions (part 3)

Q: Who manufactures these motion sensors?

A: We work with multiple lighting control manufacturers to design our products and have them made exclusively to our specification. They are assembled in factories that are UL certified.

Q: Can I purchase your sensors to use on non-Light Efficient Design/RemPhos lighting?

A: YES. Please contact us for pricing. These sensors will work with almost any lighting product if it has 0-10V dimming wires.

Q: If I install these sensors in fixtures, can those fixtures than be “grouped together”?

A: NO. These basic lighting controls can not be grouped together. Please contact us because we have other options such as Bluetooth and Zigbee wireless networked controls. Note that for many projects and customers, the non grouped basic sensors shown here will work just fine. We have thousands of successfully installed projects.

Q: I am working on a complicated project and need more support on ensuring that I design the project to use the correct sensors, can you help?

A: YES. We are here to help. We have in house engineering support with years of experience that would be happy to assist you! Please contact any of our sales team and they will put you in touch with our controls experts.