



ECU

**SUSTAINABLE ENERGY
AND ENVIRONMENTAL
ENGINEERING**

Occupancy Sensors:

A revolutionary way to optimize the usage of residential and commercial lighting.

Occupancy sensors are commonly known as “motion sensors” or “motion light sensors” and can be placed inside of a home in each room to control the lighting. These switches detect when someone enters the room, and will switch on for as long as there is motion. Once there is no motion, the lights will turn off. In addition to the occupancy sensor there is the vacancy sensor, and dimming sensor. The vacancy switch is turned on manually, and switches off when the room is vacant. The dimmer switch will automatically detect ambient light and adjust accordingly. If there is ample light from windows, the lights will not turn on. Furthermore, it can be adjusted manually to the user’s preference.

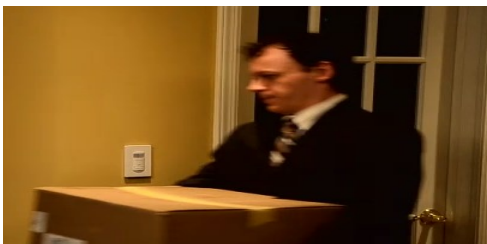
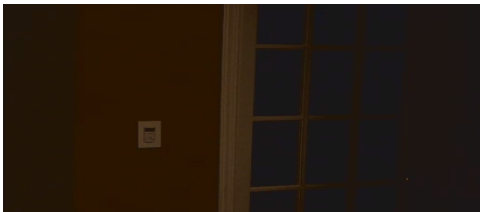
Don’t these sensors cost a fortune?

With lighting consuming 15% of a households electricity, changing to energy efficient lighting is a money saver. Although there is a higher initial investment cost than traditional light switches, there is substantial long term savings over an extended period dependent on how the user utilizes the sensors.

Sensors Prices			
	Occupancy Sensor	Vacancy Sensor	Dimmer Sensors
Price	\$29.99	\$35.99	\$39.99
*priced from Leviton.com, does not include processing and handling			

Hands Free Switch Operation

In addition to the hands free operation, there is also the option to adjust the amount of time that passes before the light turns off when there is no occupancy. You can choose from a range of 3 seconds to 30 minutes.



Pictured: Dimming sensor (left) and occupancy / vacancy sensor (right).

Applications of Occupancy Sensors

Occupancy sensors are optimal for areas with varying occupancy such as common areas, restrooms, private offices, linen closets, storage, etc. They can be especially useful in rental homes, to only use the amount of electricity needed, nothing more. With the combination of both occupancy sensors and energy efficient lighting such as LED lights, the energy saving will be most optimal.

Energy Saving Successes:

Below is an example of a company that evaluated its lighting energy consumption before and after implementing occupancy sensors.

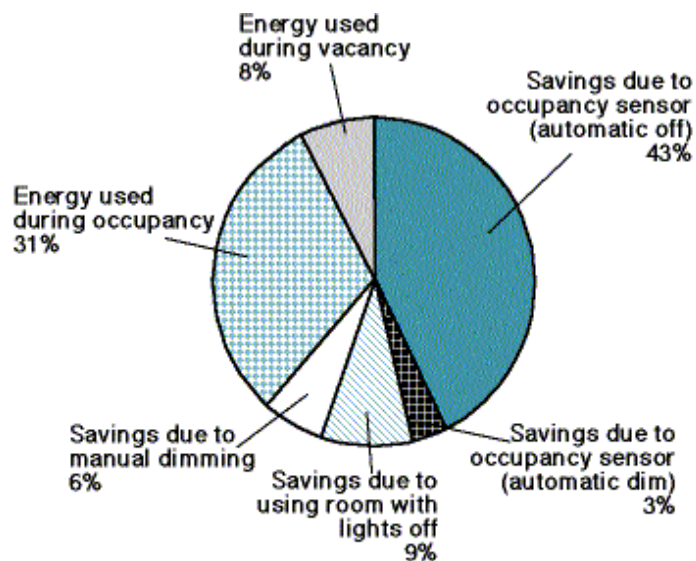
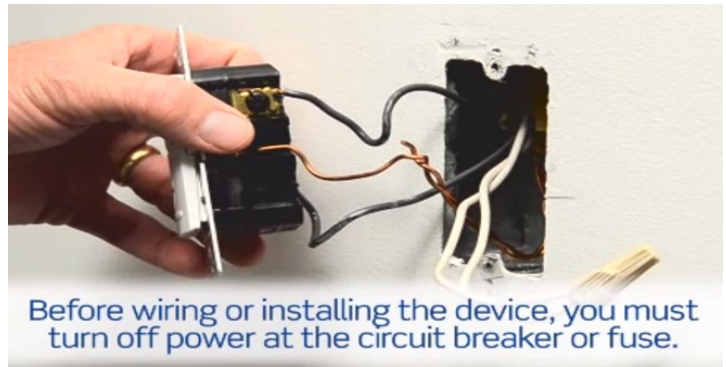


Figure 3. Energy for lighting in the entire building, based on a 10-hour lights on-full scenario



Installation and Implementation



Occupancy Sensors vs. Traditional Switches

Both occupancy sensors and traditional light switches have advantages and disadvantages for your lighting needs. This comparison will help to show you why occupancy sensors can be a truly revolutionary light-

Occupancy Sensor

- Turns off when not in use
- Useful for kids if their light is left on accidentally
- Conserves energy
- Makes lighting efficient
- Available at many hardware stores
- Simple to install
- May turn off when room is occupied if occupants are motionless

Traditional Switches

- Manual switching only
- Will not turn off if room is vacant
- Need an available hand to operate
- Cheap, but will fail eventually



Resources

www.energy.gov, www.lrc.rpi.edu/
www.leviton.com

Special Thanks to:

Environmental Protection Agency, EPA
East Carolina University, College of Engineering and Technology
Center for Sustainable Tourism

This document was made possible through a partnership between East Carolina University's College of Engineering and Technology's Center for Sustainability and Department of Engineering and the North Carolina Division of Environmental Assistance and Customer Service, with funding from the U.S. Environmental Protection Agency. Information presented is collected, maintained and provided for the convenience of the reader. While every effort is made to keep such information accurate and up-to-date, the state of North Carolina does not certify the accuracy of information that originates from third parties. Under no circumstances shall the state of North Carolina or the U.S. Environmental Protection Agency be liable for any actions taken or omissions made from reliance on any information contained herein from whatever source nor shall aforementioned parties be liable for any other consequences from any such reliance. Mention of a company should not be considered an endorsement by the State of North Carolina or the U.S. Environmental Protection Agency.