

Energy Savings Potential of Occupancy Sensors

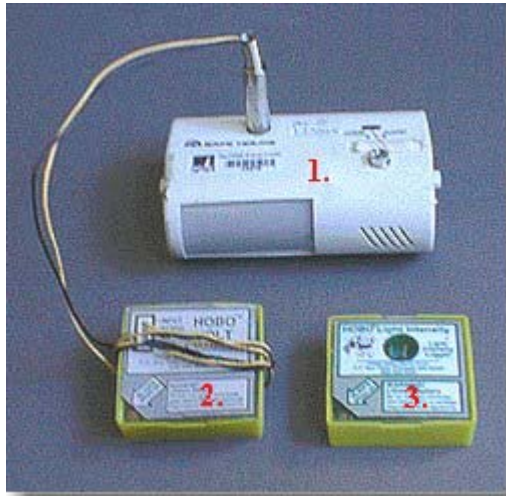


Figure 1 Occupancy Sensor Toolkit:
1) Modified occupancy sensor 2) HOB0 volt datalogger 3) LOBO light intensity logger

Occupancy sensor lighting controls can save energy by turning off lights when a space is unoccupied. Determining the savings potential for this control application is usually difficult and often based on rules of thumb. The Pacific Energy Center has developed a toolkit that can assist in determining the savings potential of occupancy sensor controls for a given location. The toolkit consists of a reconfigured infrared motion sensor connected to a voltage logger to monitor when people are in a space and a light logger to determine how long lights are on.

Occupancy Sensor Toolkit Components

To facilitate evaluating the possibility of installing an occupancy sensor within a space, we have developed an occupancy toolkit comprised of a modified motion detector, A Hobo Volt datalogger, at least one Hobo Light logger .

Procedure

Launch loggers for the desired period. Two weeks of monitoring is an appropriate length of time for most spaces. Shorter periods risk anomalies in the data from unusual occupant activity.

- Plug the Hobo Volt into the jack located on top of the motion detector as seen in figure 1.
- Place the motion detector (with Hobo Volt plugged in) in a location that will allow it to "see" people moving within the space. Note that the motion detector has a wide horizontal view, but a narrow vertical view (fig 2). It is capable of detecting motion up to 30 feet away. It detects motion best when a person moves across the view rather than directly towards or away from the sensor. **DO NOT** place the sensor where it will be struck with direct sunlight, where it will experience extreme temperatures or where it will "see" people moving outside the space you are analyzing. The LED light on the sensor allows you to test its sensitivity and view range.

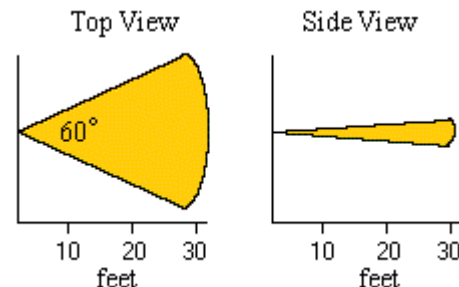


Figure 2 Infrared occupancy sensor's approximate detection angles and ranges

- Secure firmly. Turn the motion detector switch to "Chime".
- Note that the HoboLight logger (labeled 3) is inside the undercabinet fixture. Place the HoboLight logger in or near a light fixture in the space, with the sensor facing the light. The logger should be positioned so that it does not see daylight sources. Be careful not to place the logger too close to the lamp where the temperature might get above 150 °F. Fluorescent lamps are usually safe since their surface temperature is low compared to an incandescent lamp.
- Leave logger in the field collecting data for at least two weeks. Also, make sure to leave a note on or near the sensor and logger with a contact name and phone number.
- Retrieve the loggers and sensor from the field and download the data. (See the Logbook Software application note.)
- Compare the occupancy patterns with the operation of the lights to see the savings potential of an occupancy sensor control.

For more information about this method of analysis and sample graphs, please refer to the [Lighting Analysis Worksheet](#) application note.



Figure 3 Occupancy study toolkit placed to monitor of under-cabinet task light use and occupancy.