2009

# Razor's Edge Newsletter

Energy Systems Group

University of Arkansas, Fayetteville

RAZORS EDGE™
Efficiently Delivering Green Energy

Fall Issue
razors EDGE newsletter

# Occupancy Sensors Installed

Many of you will soon notice a small change to the light switch or the addition of a piece of equipment on the wall or ceiling.

These are occupancy sensors that will be installed to reduce lighting energy use when classrooms, offices, conference rooms and common areas are not in use. The strategy behind the operation of these occupancy sensors is that the lighting will be turned off after a specified time with no motion detected. These sensors will also tell the heating and cooling equipment when to go into occupied or standby mode. Most of these sensors are "dual technology" meaning that they check for motion using both infrared and ultrasonic means. It is designed to detect motion using the passive infrared sensor from sources (such as a person entering a room) within its field-of-view to automatically switch lights on. The ultrasonic sensor uses a non-audible, high frequency (40kHz) to sense Doppler shifts caused by motion in the space. The ultrasonic is more sensitive to small motion and does not rely on line of sight for detection. If both sensors have not detected any motion for the set timeout period, the lights will be turned off.

If you notice a delay in your lights turning on when you return to your classroom, this may be due to the placement of the infrared beams relative to the door. The occupancy sensors require that two or more infrared beams be "broken" or crossed before the sensor becomes active. If one of the beams is aimed directly at the door, you may need to walk into the room a little further until two or more beams have been crossed.

One of the great features of this new sensor is that it is self-adjusting. It has an internal microprocessor that continually analyzes, evaluates and automatically adjusts settings to keep performance at a maximum. The sensor learns the occupancy patterns of the space during the course of a day, for a seven day period. At any given time, the sensor will look at the collected data and adjust its ultrasonic sensitivity. The sensor will adjust the sensitivity to make it less likely to turn on during a period of non-occupancy and more likely to turn on during a period of occupancy.

In the case of a false-off (the lights turn off when the room is actually still occupied), the sensor will automatically increase the ultrasonic sensitivity to help avoid a repeat of the same conditions. Also, the delayed-off time duration will immediately be lengthened to prevent further false turn offs.

In many areas, the occupancy sensor will also be tied into the heating and air conditioning system for the room. This will capture additional energy savings by allowing the room temperature to drift a few degrees from the set point while the room is unoccupied. Upon someone entering the room and activating the lights the thermostat will return to normal operation. This will work during normal building operating hours as well as after hours.

If you have problems during the course of the project, notify John Ross (575-7996, jrr003@uark.edu) and we will find an appropriate solution.

## With an occupancy sensor, should I still turn off my lights when I leave the room?

Absolutely. The purpose of the sensor is to turn off the lights to save energy in rooms that are unoccupied. If you have already turned off the lights, that just adds to the savings without having to wait on the sensor's time delay. Turning off your light switch does not impact the sensor or affect its settings in any way. However, with your light switch off, the sensor will not be able to automatically turn on your lights when you enter the room.

RAZORS EDGE™
Efficiently Delivering Green Energy

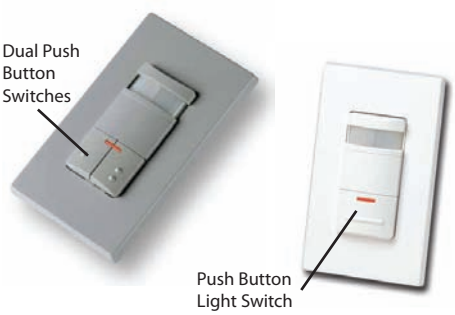
**If you would like a representative to come to one of your staff or faculty meetings to explain any of the energy conservation measures we are implementing on campus for the Razors EDGE project, please call 479-444-6356 and we will be happy to add you to our schedule.**

ESG ENERGY SYSTEMS GROUP

606 N. Razorback Road, Suite 206
Fayetteville, AR 72701
Phone: 479.444.6356
Fax: 479.444.6815
www.energysystemsgroup.com/razorsedge

UNIVERSITY OF ARKANSAS

## New Combination Sensor and Push-Button Light Switches




In many offices, you may find that your light switch has been replaced with a combination sensor and push-button light switch. This push button will work in the same way your previous light switch did in turning your lights on and off.

However, if your office has a two-button switch where each switch controls half of your lighting, your sensor has additional energy saving features built into it. If you leave your lights on and they are turned off by the sensor, when you return to your office the sensor will only turn on half of your existing lighting.

If that level of lighting is not sufficient, you simply push the second button as you pass by the switch to turn on all of your lights. This feature is there for those times when people enter the office just for cleaning or deliveries when full lighting is not necessary.

## Ultra Low Consumption Urinal System

The ultra low consumption (1/8 gallon per flush) urinal system is being installed on campus.

This system leads the way with ultra low water consumption, the latest in sensor technology, and high quality vitreous china.

This product is engineered for optimal performance and hygiene in demanding environments. It features sensor-operated, smart flush valve technology (powered by four AA batteries good for 200,000 flushes) that creates a sanitary, hands-free operation for users.

The sensor's blinking red light verifies that the user is detected, with a fast double-blink indicating the user has been present long enough to activate the flush valve (usually 6 to 8 seconds). The valve also has a small button for manual override in the event the battery life has been depleted.

## Campus Thermostat and Occupancy Schedules

Historically on campus, building heating and air conditioning systems have operated around the clock, and maintained constant temperatures whether or not the building was occupied.

As part of the Razor's Edge Energy Conservation project, building heating and air conditioning (HVAC) systems will operate at a reduced capacity whenever a building or areas within a building are not occupied, such as nights and weekends. The control systems will compare building interior temperatures and outdoor temperatures in order to bring the building back up to the normal operating temperatures when the building opens in the morning.

Buildings or special areas within a building that rely on continual operation of their HVAC systems for safety or process reasons, such as labs, will operate as needed to maintain critical temperatures and pressure relationships.

Where new room controls systems are installed, the new thermostats will typically be a digital type similar to the one shown below. You will be able to adjust the temperature on the thermostat between 71 and 75 degrees F.


During the times that the building is normally occupied, the thermostats will be programmed to maintain temperature within 1 degree F of their set point. During the times when the building is not normally occupied, the thermostat will be programmed to allow the temperature to drift a few degrees higher or lower than the set point.

Pushing the override button on the thermostat will return the thermostat to normal operation if you need to be in the building after normal operating hours.

Rooms that have ceiling mounted occupancy sensors may also have their HVAC systems interlocked to allow the temperature to drift a few degrees from the set point while the room is unoccupied. Upon someone entering the room and activating the lights, the thermostat will return to normal operation. This will work during normal building operating hours as well as after hours.

Where there are existing digital thermostats with similar capability as the new ones, they will be programmed to operate the same way.

If you have questions or problems during the course of the project, notify John Ross (575-7996, jrr003@uark.edu) and we will find an appropriate solution.