# Recommendation ${REC}: Install Motion Sensors for ${TYPE} Lighting

Recommended Action

It is recommended to install motion sensors for the ${TYPE} lighting with low occupancy percentage.

Summary of Estimated Savings and Implementation Costs

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| --- | --- |
| Recommendation Type | Lighting |
| Annual Cost Savings | ${ACS} |
| Implementation Cost | ${MIC} |
| Payback Period | ${MPB} |
| Annual Electricity Savings | ${ES} kWh |
| ARC Number | 2.7135.3 |

Current Practice and Observations

Leaving lights on when they are not needed is a large cause of wasted lighting energy. By wiring occupancy sensors or timers into the lighting circuits, lighting usage can be eliminated during unoccupied periods. In addition, occupancy sensors can be installed to create lighting zones, which allow lights to be turned on only in the area of occupancy and not turned on for the whole floor. There are several types of occupancy sensors available, including infrared, ultrasonic, and dual technology (our recommendation). Infrared units turn the lights on and off by detecting differences in the heat given off by a human body and the surroundings. These units are directional and work best in active areas, such as in an enclosed office where the light switch area has a clear view of the entire area. Ultrasonic sensors are fairly non-directional and work by bouncing ultrasonic sound waves off objects in the room and are activated when the sound waves return to the unit at either a faster or slower rate, indicating that someone has entered the room. Ultrasonic sensors should not be installed in areas where there is high airflow or vibration, small, unenclosed areas, or areas with ceilings above fourteen feet. Dual technology units include both IR and ultrasonic detection. These units turn lights on when both technologies detect motion and remain on as long as one of the technologies detects motion. The main benefit from dual technology is a reduced occurrence of false triggering; however, they are the most expensive of the three units mentioned. It is recommended to install a motion *dimmer* due to the availability of dimmable LEDs which are more successfully implemented in the manufacturing space.