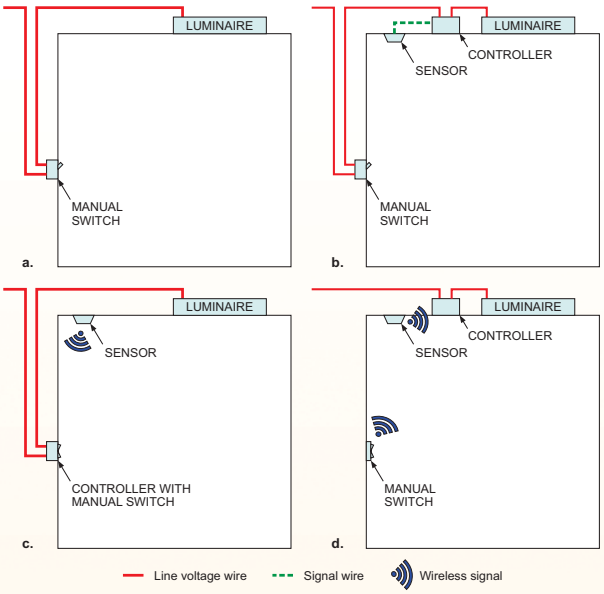
Lighting Answers: Wired and Wireless Lighting Controls

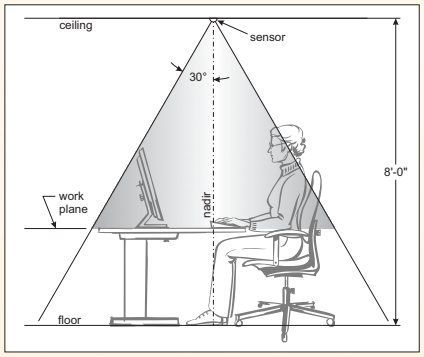
The National Lighting Product Information Program (NLPIP) conducted a study of wireless occupancy sensors and photosensors, focusing on control systems designed for a single room in a commercial building such as an office, classroom, or conference room. The investigation included occupancy sensor and photosensor features and performance, wireless communication performance, compatibility with lighting products, energy harvesting and storage capabilities, and capital costs of control systems. Results of the study are detailed in the report, *Lighting Answers: Comparison of Wired and Wireless Lighting Controls for Single Rooms.*

Key findings include:

- Wireless occupancy sensors from the evaluated brands were available with only passive infrared detection technology. The lack of wireless ultrasonic and dual technology occupancy detectors should be taken into consideration where furniture may block motion detection.
- The wireless occupancy sensors and photosensors tested had similar performance as equivalent wired sensors from the same manufacturer.
- NLPIP found little difference in the occupancy sensors' and photosensors' performance compared to that seen in previous NLPIP studies of these types of products.
- The wireless communication was robust in a typical office environment.
- For controllers that don't make use of a neutral wire and/or are installed in a switchbox without a neutral wire, operation could be an issue for lighting with electronic ballasts or drivers, so verification is needed.
- Photovoltaic energy harvesting by the tested occupancy sensors is likely to be insufficient at some ceiling locations. Installing a battery in the sensor will circumvent this problem.
- The tested wireless occupancy sensor systems had 54 to 128% higher capital costs than the equivalent wired systems from the same brand.



These simplified wiring diagrams show (a.) the lighting system without automated controls; (b.) an example of a wired control system; (c.) an example of a wireless control system with the manual switch and controller integrated into one device; (d.) a wireless control system with a separate manual switch and controller.



NLPIP tested occupancy sensors to 30° from nadir. The sensors were able to detect motion outside of the tested sectors.

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Lighting Answers: Comparison of Wired and Wireless Lighting Controls for Single Rooms is available free to the public, courtesy of the NLPIP sponsors, at www.lrc.rpi.edu/nlpip/publicationDetails.asp?id=944&type=2

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