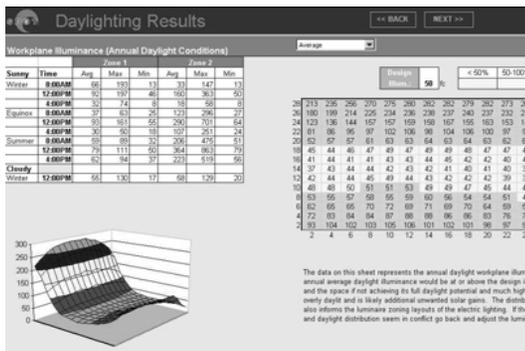


## SENSOR CHALLENGES HINDER DAYLIGHTING AND ELECTRIC LIGHTING INTEGRATION

Lighting professionals have long struggled with ensuring proper integration of daylighting and electric lighting while also quickly estimating energy savings from designs. Photosensor systems vary widely, greatly impacting daylighting and electric lighting performance. However, few design professionals have tools to help them account for variations.

The Sensor Placement and Orientation Tool (SPOT™) was developed to promote successful daylighting and electric lighting integration while maximizing energy savings. This free software package also helps designers establish correct photosensor placement relative to the proposed lighting design.

It analyzes overall system design performance prior to field installation and commissioning. Developed with classrooms in mind, SPOT™ may also be applied to other spaces, such as offices.



SPOT screen shot showing daylighting calculation results

## SPOT SOFTWARE

SPOT WAS CREATED TO ANALYZE PHOTOSENSOR SELECTION AND PLACEMENT IN CLASSROOM APPLICATIONS, ENSURING APPROPRIATE YEAR-ROUND LIGHTING LEVELS AND MAXIMIZING DAYLIGHTING ENERGY SAVINGS.

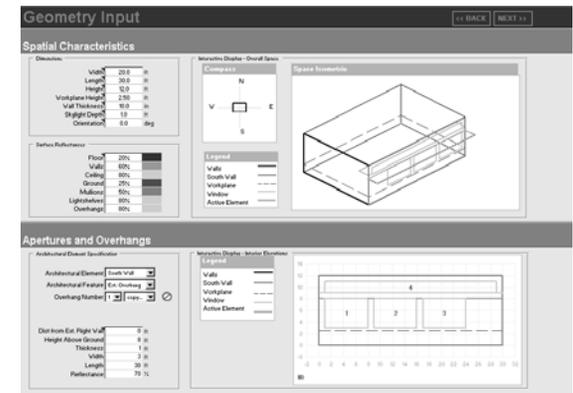


SPOT accounts for many variables, such as room geometry, surface reflectances, solar orientation, electric lighting layout, and window design.

SPOT consists of a Microsoft Excel interface with a mostly invisible Radiance calculation engine. Based on user inputs, the tool calculates nighttime illumination levels and the range of daylight contribution throughout the year.

It allows the user to test various photosensor placements and evaluate alternate designs. Annual illuminance averages and energy performance data allow the user to evaluate the daylighting and electric lighting design.

## DESIGN DAYLIGHTING AND ELECTRIC LIGHTING AND ANALYZE RESULTS



SPOT Software Screen Shot

Lighting designers using SPOT can quickly and easily optimize photosensor placement and estimate daylighting savings, which can be 10 to 60 percent, depending on system design.

### Benefits

- Simple, easy-to-use interface
- No cost to purchase
- Comprehensive inputs ensure accurate analysis
- Software based on industry-standard daylighting analysis tool (Radiance)
- Multiple libraries of default values provided for basic use
- Widespread customization available for advanced users
- Extensive analysis output: sensor placement, electric lighting and daylighting illumination levels, and annual energy performance
- Reinforces capability to provide better illumination uniformity and improve occupant satisfaction

## INTERESTED?

Architects, facility managers, contractors, design engineers, building scientists, code developers, commissioning agents, and utility staff can take advantage of the SPOT software package.

Key next steps include:

- Widespread distribution of SPOT freeware
- Train user groups on SPOT operation
- Demonstrate successful application in real-world projects and validate results
- Stimulate photosensor manufacturers to provide standard performance data
- Develop an extensive database of manufacturers' photosensor performance
- Integrate SPOT usage into standard practice for lighting designers and specifiers

To obtain SPOT or learn more, visit [www.archenergy.com/SPOT](http://www.archenergy.com/SPOT)

This project was part of the PIER Lighting Research Program. To view other project results, visit [www.energy.ca.gov/pier](http://www.energy.ca.gov/pier).

Information about other LRP technologies can be found on the following web sites:

- PIER LRP – Improved Classroom Photosensor  
[www.archenergy.com/lrp/products/photosensor.htm](http://www.archenergy.com/lrp/products/photosensor.htm)
- PIER LRP – Integrated Classroom Lighting System  
[www.archenergy.com/lrp/products/classroom.htm](http://www.archenergy.com/lrp/products/classroom.htm)



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# SENSOR PLACEMENT AND ORIENTATION TOOL



OPTIMIZE DAYLIGHTING  
AND ELECTRIC  
LIGHTING INTEGRATION



Public Interest  
Energy Research