



# IoT Light Exposure Sensors

## Technology Overview

A key component of a healthy building is its lighting control system. Circadian lighting control systems mirror natural daylight cycles to minimize impact on circadian rhythms. The advanced lighting systems consider time of day and location to adjust intensity, color tuning, and correlated color temperature.

IoT light exposure sensors provide a more complete picture and analysis of a building's lighting system than sensors that rely solely on illuminance values. The sensors track spectral power distribution (SPD), a measure of the energy of a light source at each wavelength of the visible spectrum. SPD data is used to make calculations that can quantify circadian impact and the non-visible effects of light.

IoT light exposure sensors can be used in two ways: as a validation tool to map and evaluate an existing circadian lighting system and as a source of control data, where input data informs intensity and spectrum adjustments. They can be worn on a person, capturing individual light exposure data, or fixed throughout the space.

## Why is GSA Interested?

Most of today's lighting control systems operate with inadequate data. Their sensors only capture illuminance levels, excluding many factors that impact circadian health. IoT light exposure sensors allow for more effective lighting control strategies that may benefit occupants' mood, sleep, hormone regulation, and overall health.

There is limited data about the actual experience of light exposure, with most studies conducted in clinical settings. IoT light exposure sensors bring data collection to real-world settings, leading to enhanced building design and the development of new lighting control systems.

## Deployment Potential

IoT light exposure sensors are small and lightweight. While there are no requirements regarding building size, age, or location, spaces with varying light exposure are likely to benefit the most.

*Green Proving Ground (GPG), in collaboration with the U.S. Department of Energy, is evaluating the real-world performance of IoT light exposure sensors in federally owned buildings within GSA's inventory. The technology will be provided by Blue Iris Labs and coordinated with other ongoing evaluations of this technology.*