Lighting Controls Best Practices for Private Offices

Acuity Brands has been helping to design private offices and other spaces for many years, and we want to share our best practices that we learned over time. Occupants often look at their office as an expression of themselves; there is a need to design a purposefully flexible and captivating space while still being mindful of other requirements. Here are a few things to consider for a private office's lighting control system--an item that can aid in the space's flexibility and allure.
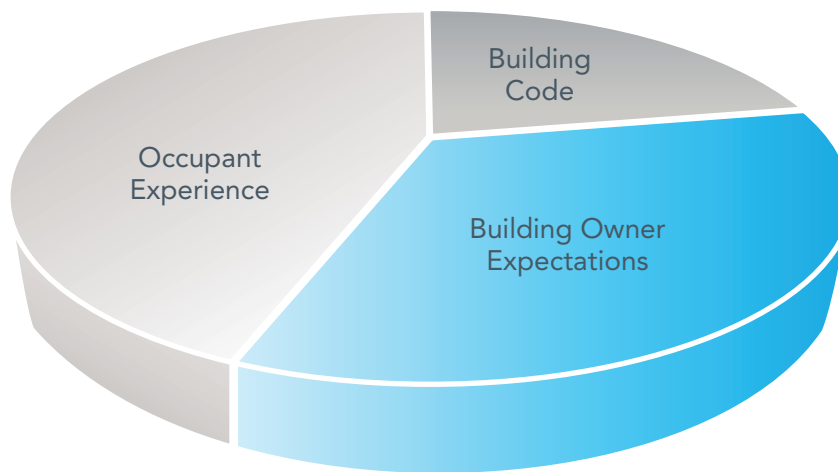
Design and Specification

The considerations below illustrate the requirements of a private office and touch on some more subtle nuances that may be overlooked, if not part of a standard checklist for a quality project.

Common Code Requirements

In most building energy code requirements, the following lighting control strategies are needed to aid in achieving compliance for a private office. It is preferable to have a lighting controls solution that has all the capabilities listed below:

- Manual control, possibly including dimming

- Auto-off by occupancy

- Photocell control when an office has windows

- Receptacle control

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Private Office

Pie chart showing three segments: Building Code, Building Owner Expectations, and Occupant Experience.

What are the Key Code Requirements?

Most spaces will require occupancy sensing. Energy code may dictate vacancy sensing (manual-on control), but an acceptable alternative is often automatic-on to a reduced light level. This alternative may be well received by the customer because it provides the convenience of lights turning on automatically, while also providing additional energy savings for those that never bring their lights above 50%.

Building Owner and Occupant Expectations

A building owner expects a return on investment over time through efficiency and productive employees. Employees are productive in a space where they are comfortable, and a private office is the easiest space to accommodate personalization for the occupant.

Often, there is a tradeoff between what code requires and what the building owner and occupant want. There is a way to meet the needs of both. However, it requires driving value into the space so that an occupant feels appreciated. Remember, a private office is seen by an occupant as their home away from home. By adding value to their space, you increase their feeling of self-worth, which results in more productive employees.

According to a recent DesignLights Consortium® (DLC) report[1], the average energy savings from all networked lighting control systems is 49%. The DLC report states that a private office has an average savings of 63%, which is on par with the office building type average savings.

Customization - One way that modern control systems can do this is by offering device settings adjustments to occupants through software or service-level agreements. If extending this ability to occupants through software, user credentials should be used to limit access to settings that are on devices outside of a user's space. If a service agreement is in place, occupants can ask a remotely located professional to update settings for them. Regardless of the method, giving an occupant a means to control how their space operates is a quick way to show that their comfort is top of mind.

Confidence - At its core, the occupant would like the lights to turn on at a comfortable and consistent level; this will avoid complaints and maintenance calls. They want to control the space to maximize their comfort, to have conveniently located wall switches, and to have control devices and sensors that respond reliably to both manual and automatic commands. Occupant confidence translates to less waste and more productivity.

Return on Investment - A space still needs to operate in a way to maximize savings, which is accomplished by common, intelligent controls.

Light fixtures with embedded controls (Luminaire level lighting controls, LLLC) are a great way to see a return on investment more quickly. According to a 2020 report by the Design Lights Consortium, lighting control systems with LLLC achieve 14%-28% higher savings than non-LLLC systems. And by combining both sensor and output control capability—a common feature of LLLC systems—they are often less expensive initially than systems without, due to reduced installation cost.
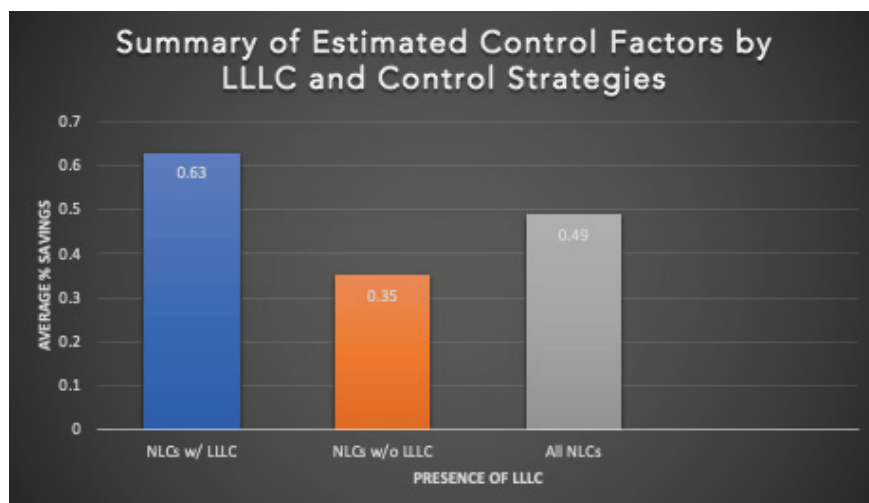
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Budget – "Savings over time" is a phrase that commonly characterizes lighting controls; however, by creating an atmosphere that is welcoming to employees, a business realizes an immediate return on its investment in indirect ways. And one would think that a "welcoming" space would be expensive to create, but advancements in lighting control technology have substantially reduced total system costs. A great way to save on the budget is to consider wireless lighting controls. Wireless technology has rapidly improved with range and ease of use, and they are easier to install. Systems are also more scalable, so a system can be installed as a stand-alone implementation while still delivering core necessities to improving employees' productivity. And it can be affordably upgraded to a networked solution, often with little extra hardware and faster ROI potential.

At a minimum, your private office design should include:

- Stand-alone or networked solution – Consider adding networkable hardware like a gateway or hub for faster ROI

- Wall switch

- Occupancy sensor

- Photocell (if windows are present)

- A relay to control the fixture (unless using luminaire-level lighting controls)

- A relay to control receptacles (where or when applicable)
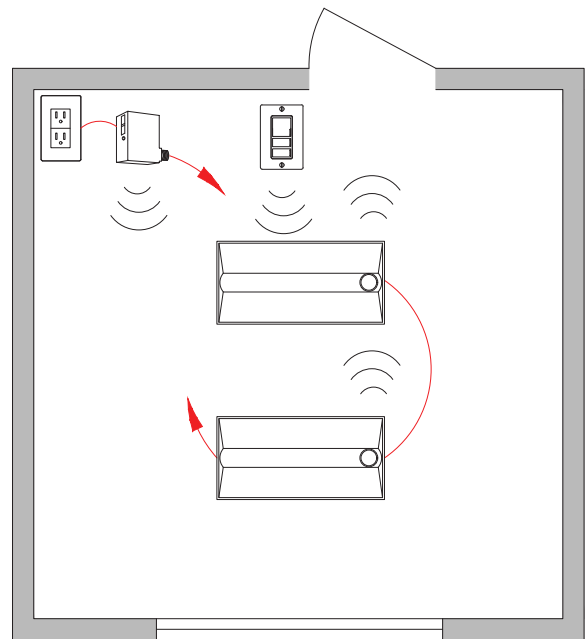
Additional Considerations:

- Fixture-embedded controls – clean aesthetics, reliable, less devices to install. Discrete sensors avoid ceiling clutter.

- Digital communication - controls that utilize digital communication have several advantages over traditional, analog controls. They offer more control capabilities, maximize customization of the space, offer opportunity for integration, and can generally be upgraded to a networked solution for quickend ROI.

Line Voltage
Wires

Line Power
Feed

Specification Guidance

These are specification items that enhance a private office, adding to what code requires without blowing the budget.

Requirement	Reason	Example Language
Instantaneous response	Slow communication between devices can cause distractions and impact occupant productivity.	Lighting control commands via switch, occupancy, and photocell broadcasts shall result in instantaneous, zone-wide, uniform responses.
Low-profile or embedded controls	Enhances the space aesthetics by limiting visual ceiling clutter, reduces initial installation cost.	Ceiling sensors shall support recessed installation or inclusion on luminaires in the space. Where luminaire inclusion is not available, the exposed profile of all ceiling sensors shall not extend further than 1" or 25mm below the ceiling.
Software supporting remote or mobile app configuration of the space	Easier adjustment of settings by the occupant.	Remote programming of devices via personal computer or mobile application shall be supported.
Custom labeling of wall switch buttons	Offers personalized control for the occupant or building owner to make controls easy to identify.	Devices with mechanical push-buttons shall be made available with custom button labeling. Graphic wall switches shall support labeling of digital sliders and scene buttons.
Dual technology occupancy sensors	Avoids mistaken lights-off situations.	Occupancy sensors installed in all private offices and personal spaces shall support an additional, "dual" sensing technology to reduce erroneous offs.
Digital communication	Allows for data to be exchanged between devices, which increases customization and allows for future upgradeability.	Lighting controls shall support two-way, digital communication. Lighting controls that utilize analog communication shall not be accepted.

Other Specification Considerations

To accelerate ROI, specify networked solution capabilities like the below.

Requirement	Reason	Example Language
Energy analysis software	To visualize and understand the reasons behind energy savings and to prove savings for energy initiatives.	Software shall include intuitive graphical screens in order to facilitate simple viewing of system energy performance.
Building automation integration	Lighting and HVAC are a significant portion of a building's energy spend and are the biggest sources of comfort complaints. Building automation integration offers many benefits, such as improved occupant comfort, energy efficiency gains, maintenance and serviceability, improved data on the usage of the building, and improved building value.	System shall interface with third party building management systems (BMS) to support two-way communication using industry standard BACnet/IP protocol, BACnet MS/TP protocol, or RESTful API.
Spatial analytics	Building owners can see how the building is being used and makes changes needed, investing in frequently used spaces and renovating or repurposing unused spaces.	Software shall allow for representation of all occupied and unoccupied spaces via transparent zones placed on a two-dimensional, graphic floorplan. System shall support trending of occupancy information, exportable through a CSV file.

Conclusion

For a private office, the emphasis is on the occupant and their experience. Driving value through focusing on the occupant and their experience, adhering to the building owner's asks for the building, and referencing code as a tertiary item on your checklist will create a recipe for success on your private office projects.

Jesse Collier | Product Manager | nLight® Lighting Controls

References

[1] Wen, Y., Frey, M., Luntz, B., Springfield, A., Kisch, T., & Kehmeier, E. (2020, September 24). Energy Savings from Networked Lighting Control (NLC) Systems with and without LLLC. Retrieved November 16, 2020, from https://www.designlights.org/lighting-controls/reports-tools-resources/

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