Daylight Harvesting & setting lux levels

Note: The information in this guide is provided in good faith. Standards change and individual manufactures may have different requirements. Morban accept no responsibility for the accuracy of the information supplied within.

In principle this is a great way of saving energy by adjusting the lighting levels of the light fittings to accommodate the amount of available ambient light from windows etc. The amount of energy saved can range from about 20% to 60% but is very much down to the required light levels, the amount of external light available and the hours over which the lighting is required.

From a control perspective it can be as simple as turning the lights off above a certain level or with dimmable fittings maintaining a certain lux level over the floor space.

In reality there are many factors that determine the outcome with poor design and lack of consideration over sensor placement preventing systems from delivering the expected results.

Open loop control: is where the sensor is say on the outside of the area being controlled eg: in a skylight or on the outside of a building.

Closed loop: is where the sensor is mounted within the same area as the lights being controlled to maintain a specific level to say a desk.

Sensor Output: These often just output a value that changes with the light level and do not output a specific lux level. So these require calibration to achieve the lux required. Even those that are calibrated in lux need to go through this process as their placement will not be where the actual lux level is required.

In addition in most cases it is not the actual lux seen by the sensor that is measured but the lux from the surface that the sensor is pointing to. So with a ceiling sensor this might be a desk or a floor. From this it can also be seen that placing carpets over a concrete floor after calibration or placing something very reflective on a desk will affect the calibration and operation.

Placement: This is often very poorly considered and so compromises on the responsiveness and levels achieved are a given.

Hysteresis: Typically this is used together with time delays to prevent lights changing rapidly as say a cloud goes by. Often the time for the lights to dim is very slow compared to the time taken to brighten.

Setting lux levels

This is very subjective and actually quite hard to set accurately. Firstly the readings taken by your lux meter are very easily influenced by the proximity of people and the clothing they might be wearing such as hi-vis jackets. Secondly the value seen by the meter is unlikely to match that seen by the light sensor.

- **Determine the required lux level for a given task eg: Lighting at a desk might be 500lux whereas lighting to a circulation space might be 100lux**
- **Note the height and position of the measurement point on your floor plans for future reference**
- **The physical placement of the sensor may not allow you to provide the level of control that the designer was thinking of.**
- **Ensure that the room is fully decorated and furnished before calibration else document the current state of the area to protect yourself against comebacks**
- **Depending upon the control system used it might be very hard to set accurate levels during daylight hours and so out-of-hours working maybe required.**
- **Getting even coverage over a floor space is not going to happen with a single sensor.**