



DayLight Harvesting Photocell Sensor Controls

One of the control stations that SwitchGenie offers is a DayLight Harvesting Photo sensor control.

The DHS Controller has a photocell in a plate mounted in the ceiling that looks down at where the lights are aimed. It senses the amount of light on the work surface.

The job of the photocell is to measure the light it sees and to adjust the settings on the SwitchWizard controlled fixtures that are on its control loop of control wire or wireless control.

The idea is that we have to tell it what the “base line” is.

The amount of light that comes from the fixtures, without any DAYLIGHT, at any setting is 100% of the required light. We need to do that by some signal from the control panel.

The baseline SETTING MUST BE DONE WITHOUT ANY DAYLIGHT.

On a four level SwitchGenie, push the control button (25%, 50%, 75% or 100%) that produces the amount of light that is the baseline and the OFF button and hold it for 10 seconds, it will set the Daylight Harvesting Sensor to take that setting as 100% of light required in the space.

That sets the MINIMUM light required in the space.

On a three level SwitchGenie, push the control button (33%, 66%, or 100%) that sets the baseline and OFF and hold it for 10 seconds, it will set the Daylight Harvesting Sensor to take that setting as 100% of light required in the space.

That sets the MINIMUM light required in the space.

On a two level SwitchGenie, push the control button (50% or 100%) that sets the baseline and OFF and hold it for 10 seconds, it will set the Daylight Harvesting Sensor to take that setting as 100% of light required in the space.

That sets the MINIMUM light required in the space.

Once the baseline is set to the minimum light requirement the Daylight harvesting sensor is set, The Daylight Harvesting Sensor, (photocell) “DHS” control knows what the minimum level of light that must be maintained in the space. This is the 100% level.

The DayLight Harvesting sensor has a microprocessor and it has 3 programs in its memory. It knows if the fixtures are 2 levels, 3 levels or 4 levels.

The DHS sensor software program performs as follows:

The two level sensor

When the sunlight increases and the photocell reads 160% of the base light, it will send a command to the SwitchGenie controlled fixtures to go from 100% to 50%. The light level in the space will then be 110% of the base line.

Then as the sunlight increases some more and the light level goes back to 160% the DHS then sends a command to go to OFF. That means that the light level goes back to 110% of the base level.

The daylight keeps the light level above 100% during the noontime. In the late afternoon as the sun begins to set and the daylight disappears the light levels begin to go down.

When the light level gets down to 110% the DHS send a command for the lights to go to 50%. Then the light levels reads 160%.

As the sunsets and the light level goes down to 110% again the DHS sends a command that turns the SW to 100%.

The light levels in the space never go below 100% of the base line of the light right required.

The three level sensor

The DHS has to be set at 100% and then when it gets to 150% it sends the 66% signal. When it gets back to 110% it sends the 33% signal and when it gets to 150% again it sends the off signal.

As the sun sets when it gets to 110% it turns on the 33%

When the sun sets and the light gets down to 110% again it turns on the 66% command

When it gets to 110% again it turns on 100% full bright.

The four level sensor

The DHS works in the same way with 4 steps.

Once the 100% level is set and the daylight increases and the light get to 135% then the DHS sends out the 75% command.

When it gets to 135% again it sends out the 50% command.

When it gets to the 135% again it sends out the 25% command.

When it gets to the 135% again, it sends out the off command.

In the middle of the day there is more than enough daylight to meet the minimum lighting requirement.

As the sun is setting and daylight goes away and the setting on the photo sensor reads 110% of the baseline setting, the DHS sends a command to go to the 25% level

When it gets down to 110% again it sends a command to go to the 50% level and

When it gets down to 110% again it sends the 75% command.

When it gets down to 110% again it sends a command to go to the 100% level and then it stays there.

The readings of the Photocell sensor must be slow enough so that a cloud, bird or momentary decrease in the light will not cause the lights to go on or off. The software must sense this delay and the sensor must get the correct reading for a time of 5 minutes before the controller acts on the reading. This is a fail-safe time delay that must be used when turning off or turning on the lamps.

The signals from the DayLight Harvesting Sensor can be sent by RF to the transceiver controlling the fixtures or by a telephone wire.

The DHS can work with an Occupancy Sensor as well. When the space is unoccupied the lights will be off even if the DHS is calling for light.