

# Create an Illuminance Plane

## Tutorial Overview

We will create a simple planar illuminance plane which is useful for evaluating the overall beam or pattern produced by your luminaire. The illuminance plane is comprised of an array of cells (based on the number of rows and columns) that count the number of simulation rays and their magnitude to determine the illuminance of that cell. The units of illuminance are footcandles (fc, Imperial) or lux (lx, International System), and is defined as the lumens per unit area (square feet or square meters).

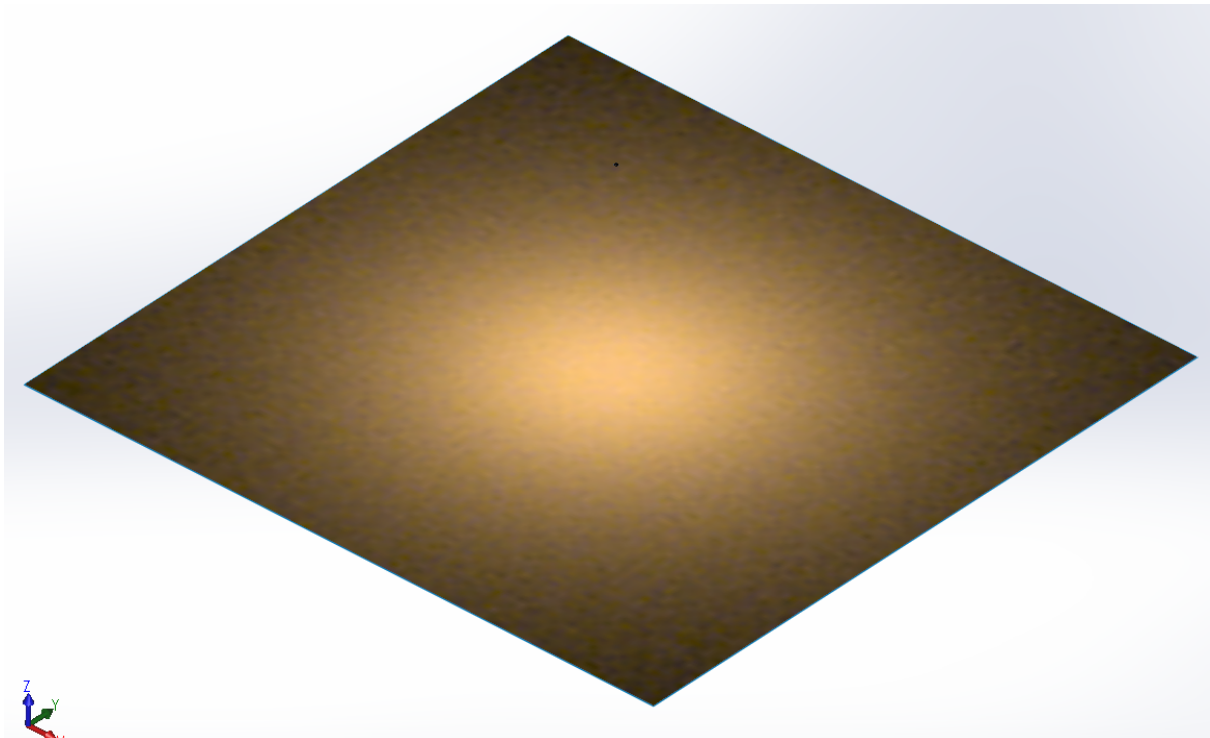
### Topics Covered

- Illuminance Plane
- Raytrace settings
- Results in SOLIDWORKS

Skill Level - Beginner

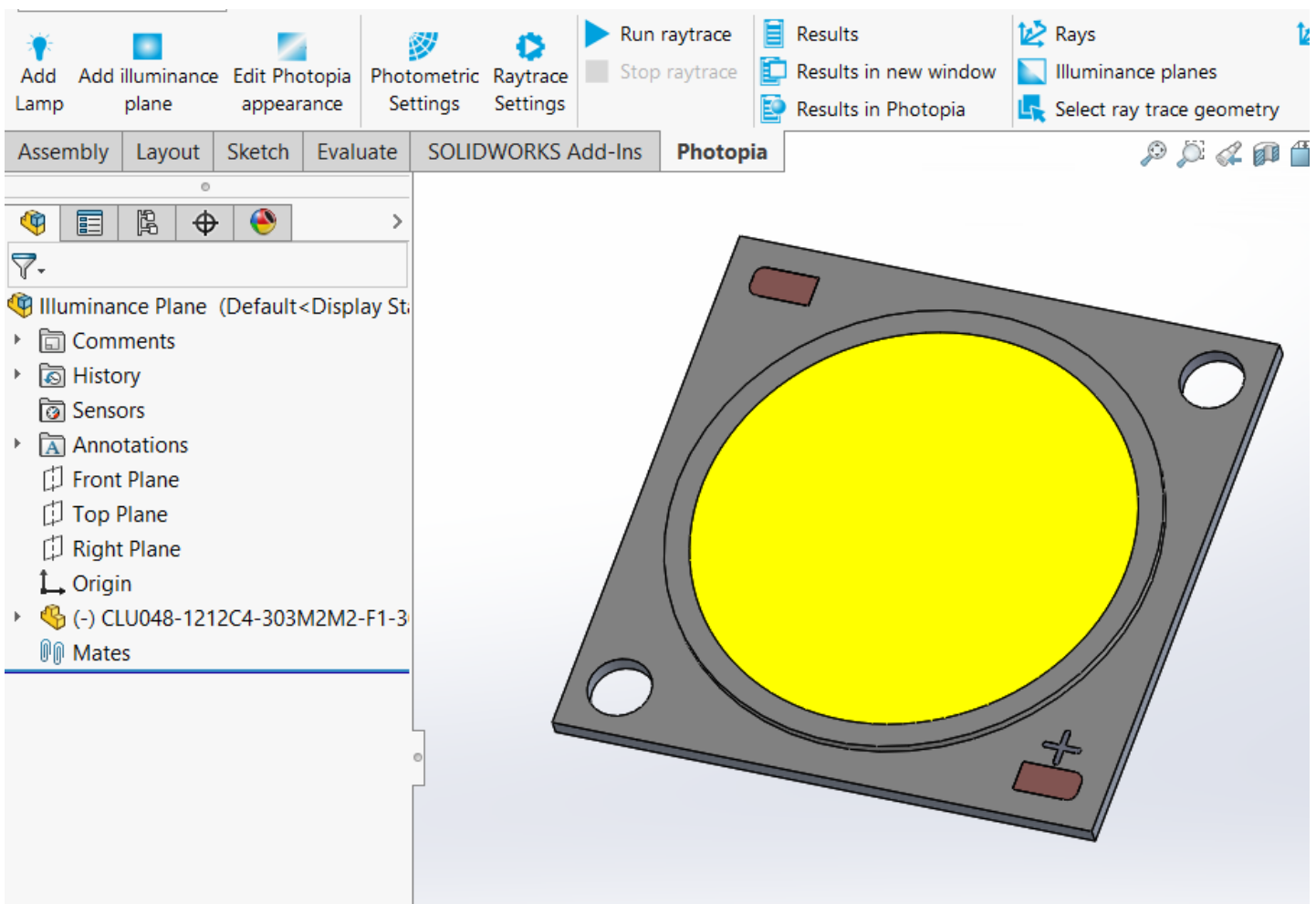
Interface - Photopia for SOLIDWORKS

Estimated Completion Time - 15min



## Initial Assembly Setup

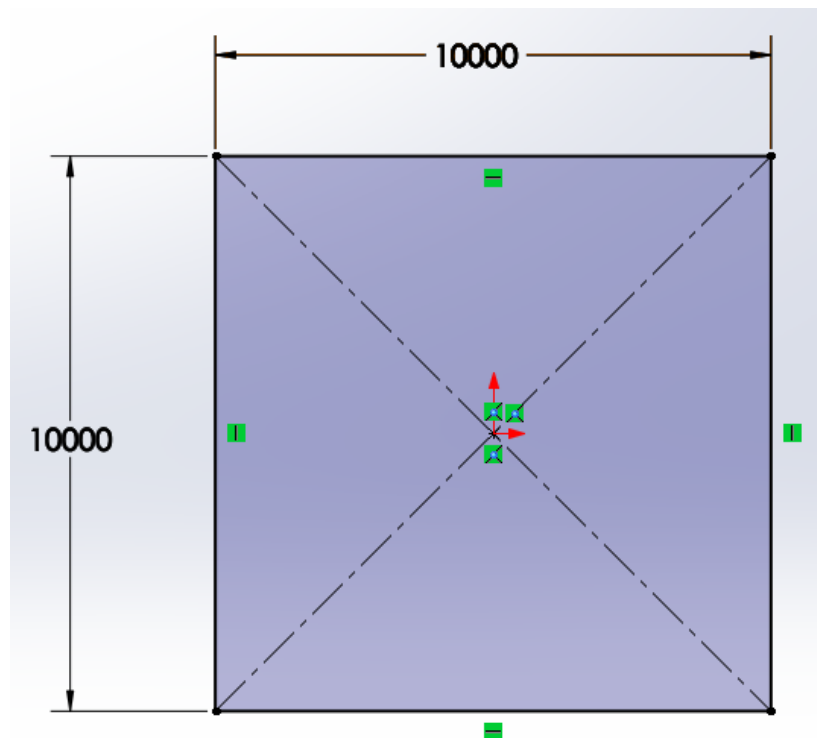
1. Open SOLIDWORKS and start a new Assembly document.
2. Make your assembly units in Metric (MMGS).
3. Save the assembly as "Illuminance Plane".
4. From the Photopia CommandManager, click "Add Lamp".
5. Click on "Browse Lamps". In the "Choose a Lamp" menu type "CLU048" into the search bar, this will narrow the list to the Citizen CLU048-1212C4 lamp model. Double click on the "CLU048-1212C4-303M2M2-F1-3000K" lamp designation. Click OK (✓) to insert the lamp at the assembly origin.



6. Save the assembly.

## Create the Plane Part

7. Go to File > New, and select a new part document.
8. Make your part units in Metric (MMGS).
9. Save the part as "IP 10m x 10m x 3m Below".
10. Begin a new sketch on the Front Plane.
11. Draw a center rectangle with the center at the Part origin and so the sides are 10m long:



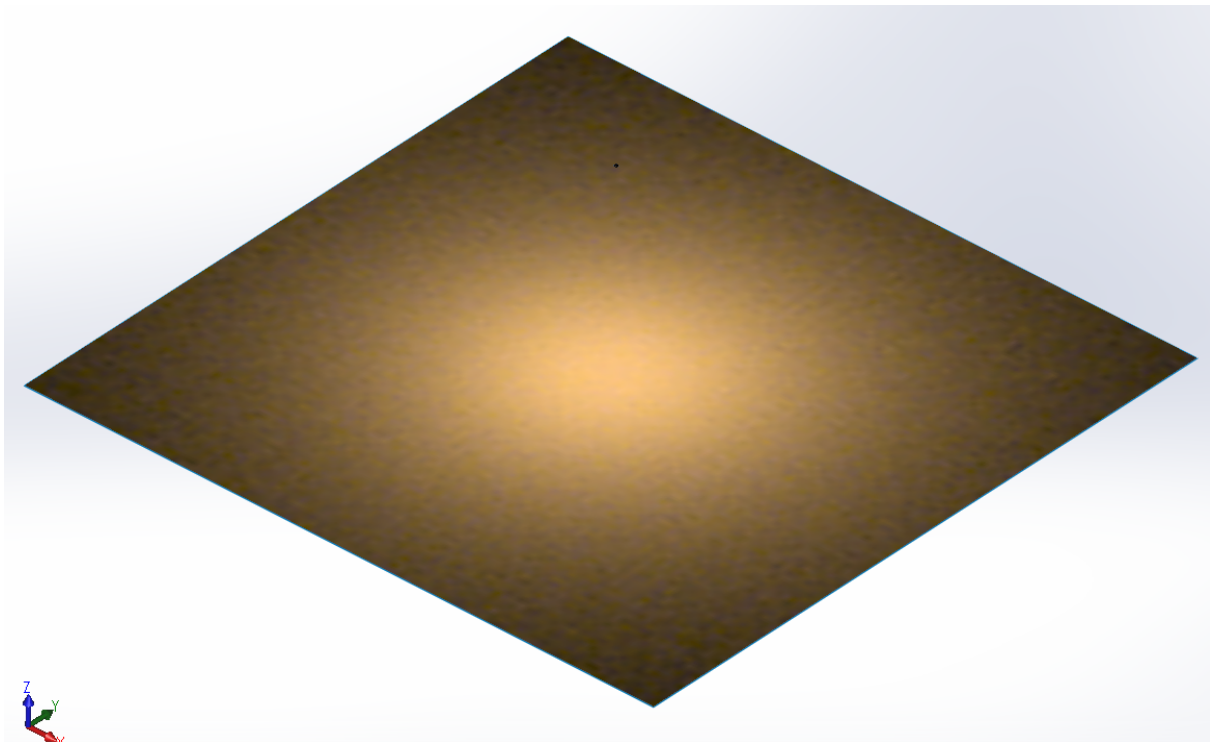
12. Go to Insert > Surface > Planar, and select the rectangle as the Bounding Entity. Click OK (✓) to complete the planar surface.
13. Save the part.

---

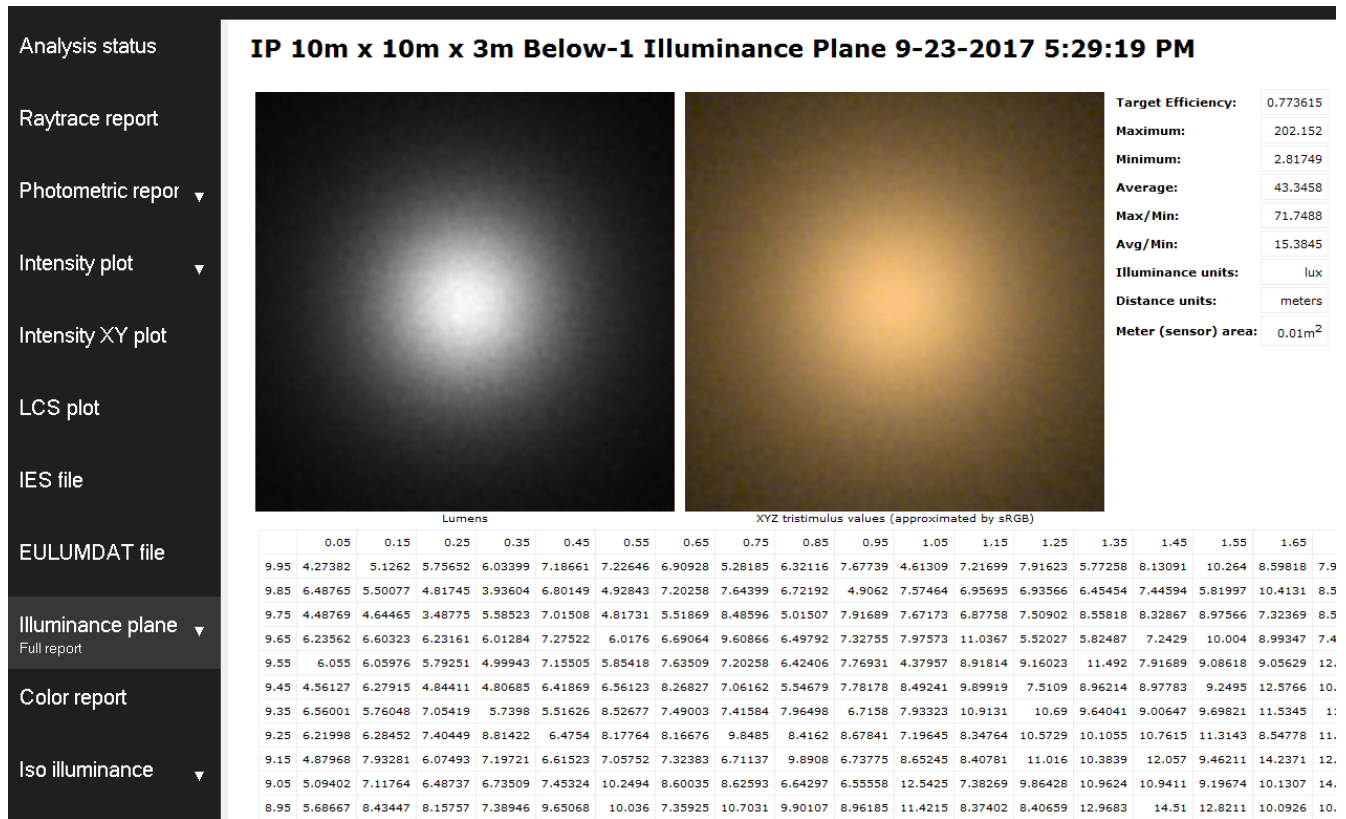
## Designate the Illuminance Plane and Run the Simulation

14. Go back to your Illuminance Plane assembly.
15. Click on the Assembly CommandManager, select "Insert Component", select the 10m x 10m surface part and click OK (✓) to add it to your assembly.
16. Right click on the surface and change the part from "fix" to "float".
17. Select the surface and under the Assembly CommandManager select "Move Component". Move the surface 3000mm By Delta XYZ in the -Z direction so the surface is in front of the emitting side of the COB.

18. Assign a Photopia Illuminance Plane to the surface part.
  - a. Orbit to an isometric view so you can see the surface below the COB.
  - b. Under the Photopia CommandManager select "Add illuminance plane".
  - c. For the plane parameters select the surface as your planar face and make sure the blue normal arrow is pointing towards the COB.
  - d. Select one of the 4 corners of the surface as the lower left corner.
  - e. Keep the column and row count at 100.
  - f. Click OK (✓) to add the illuminance plane.
19. Confirm your Photopia Photometric Settings.
  - a. Under the Photopia CommandManager select "Photometric Settings".
  - b. The photometric center will default to the assembly origin, which is also where we inserted our lamp.
  - c. Since we have just a single COB for our luminaire, the default settings are acceptable.
  - d. Click OK (✓) to save the Photometric Settings.
20. Confirm your Raytrace Settings.
  - a. Under the Photopia CommandManager select "Raytrace Settings".
  - b. We will again keep the default settings of 2.5mil rays and 25 ray reactions.
  - c. Change the sample ray count from 0 to 250 so you have a visualization of the raytrace.
  - d. Click OK (✓) to save the Raytrace Settings.
21. Save the assembly.
22. Under the Photopia CommandManager select "Run raytrace".
23. Under the Photopia CommandManager select "Illuminance Planes" to display the illuminance plane results in the model view:



24. Under the Photopia CommandManger select “Results”. This will open up the Photopia analysis results window. Click on “Illuminance Planes” and you will see the black and white shaded plot, the color shaded plot, and the text data of the illuminance of each cell across the plane:



25. Save the assembly.

## Complete

Congratulations! You have completed the “Create an Illuminance Plane” tutorial.

For more information and tutorials please visit our website at [www.Itioptics.com](http://www.Itioptics.com). If you have any questions don't hesitate to reach out to our support team at [photopia@Itioptics.com](mailto:photopia@Itioptics.com).