



IESVE
Trial Support
Material

www.iesve.com

Lighting Design

Lighting Design

The IES-VE offers a few applications that address daylight simulation and lighting design:

- **SunCast** is intended for solar shading calculations, to check shading and solar penetration, not for lighting, and is covered separately.
- **RadianceIES** is a detailed 3D simulation tool designed to predict daylight, and the appearance of internal spaces prior to construction. This is covered separately.
- **LightPro**, allows you to place light fittings anywhere in a room for subsequent analysis using FlucsPro or RadianceIES.
- **FlucsPro** is a sophisticated tool for analysing combined artificial and natural light-levels for daylight harvesting
- **FlucsDL**, offers the daylighting only capabilities of FlucsPro, allowing you to perform point-by-point analysis to determine daylighting levels within a room, or group of rooms.

LightPro: Luminaire Placement



LightPro facilitates the accurate positioning of luminaires within your model for artificial lighting calculations.

Luminaires may be placed singly or in arrays, and their beam centres may be pointed in any direction you require. The luminaires you place here may be used in FlucsPro and Radiance for artificial lighting calculations.

You need to select a room and go down to the middle level of decomposition to place luminaires. If you are in axonometric view, you can place arrays, while in plan view you can choose to place an array or a single light fitting.



You will see that the interface is a lot like ModelIT: the luminaires you place will be stored in the ModelIT file.

First, choose to place either  a single light fitting or  an array of light fittings in the selected space.

The array will be set out according to the options selected on the ceiling grid tab. You can control all the features of the luminaires through the relevant dialogue boxes shown as tabs at the bottom of the screen:

- **General** - shows the attributes of the selected room, including the selected lighting template.
- **Light fitting defaults** - shows defaults for light fittings in the selected room.
- **Database** - shows the default light fitting for the room and allows access to the lighting database.

The program has access to the IES lighting database that holds information about luminaires and lamps. FlucsPro and Radiance use the information from the database for design or analysis purposes. An extensive system database is provided but this can be supplemented with your own data.

- **Ceiling grid** - shows the ceiling grid settings for the selected room, and how the light fittings will be set out on the grid if you choose an array.
- **Placement** - shows the default placement settings for the selected room.
- **Placed light fittings** - show the actual light fittings already placed within the selected room. You can click on a single fitting in the model to select it for editing if desired.

More information at https://help.iesve.com/ve2019/dialogue_boxes_4.htm#

You can also move, copy or delete luminaires. Once placed, even if you placed all fittings as an array, they can be individually edited in the **placed light fittings** tab.

You can choose to work with 1, 2 or 4 viewports by selecting your preferred option from the View drop-down menu.

For more information, go to https://help.iesve.com/ve2019/lightpro_2.htm#

FlucsPro: Lighting Design

FlucsPro is a sophisticated tool for analysing the combined (or separate) impact of artificial and natural light-levels for daylight harvesting.

It enables quick, early-stage analysis.

Add Components, eg. Desks and Chairs



If you would like to place items in the model to see the lighting across tables and chairs for example, you will first need to import the components from the library using the **Add components from library** button on the top toolbar, or you will have to go into components in the applications list, to either edit an existing component or create a new one from scratch.



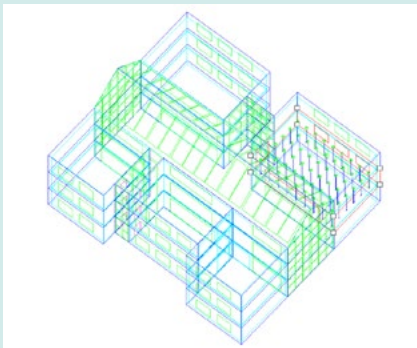
Next, you will need to place the component in the model, by going down to the middle level of decomposition and switching to **Component** mode.

Place component

You can then use the **Place component** button to put the component into the model, and the standard editing buttons to move it around or rotate as required.

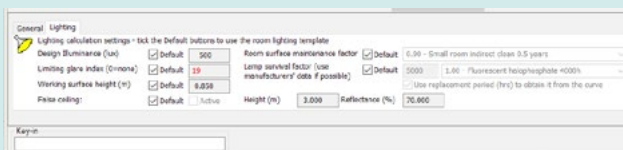
For more information, go to https://help.iesve.com/ve2019/component_modeller_.htm?#

Setting Lighting Defaults for a Selected Space



If you have already placed luminaires in a space using LightPro, you will see them in FlucsPro when you switch to this application.

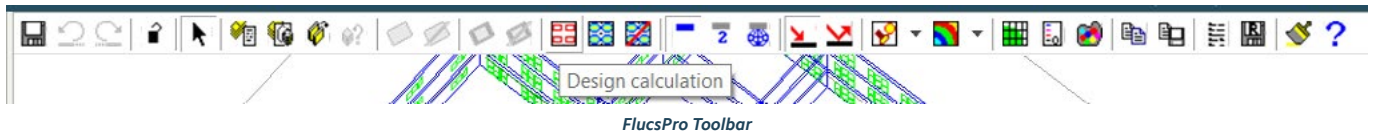
Use the **levels of decomposition** to move down to the space.



You can now pick the Lighting tab at the bottom of the screen to set the default values for the light fittings.

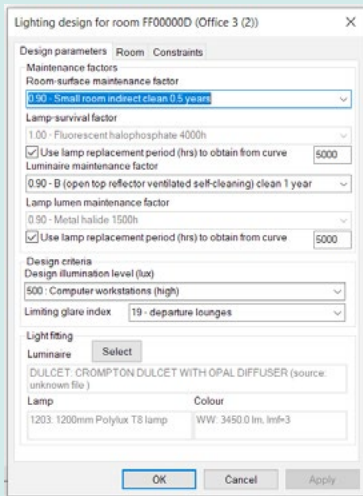
These include factors such as the required design illuminance, maintenance factors and mounting height. If you un-tick the default boxes, you can choose new options from the drop-down menus.

Perform Lighting Design Calculation for a Selected Space

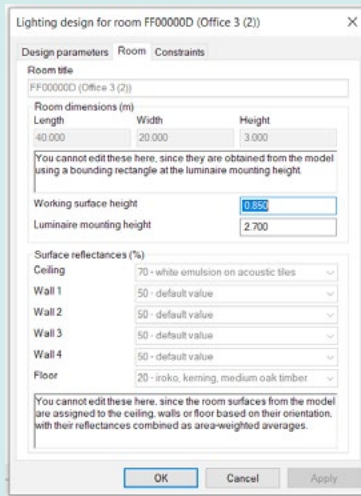


With some light fittings positioned, select the space to evaluate, and perform a design calculation to calculate the required number of fittings to meet the design lighting level. This will bring up a dialogue box with 3 tabs:

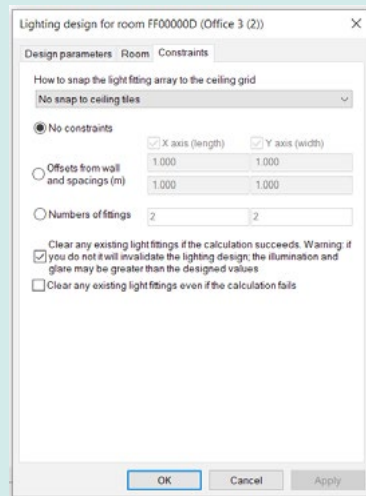
Work through these dialogue boxes, selecting appropriate values for your room.



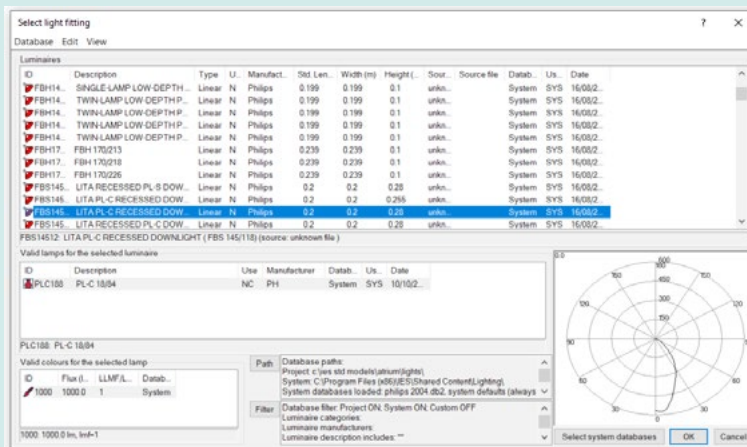
Design Parameters



Room



Constraints



Luminaire Selection

If you wish to change the luminaire on the Design tab, click on **Select**.

You have the option to **Select system databases** in the bottom right, which gives you access to a large range of default luminaires.

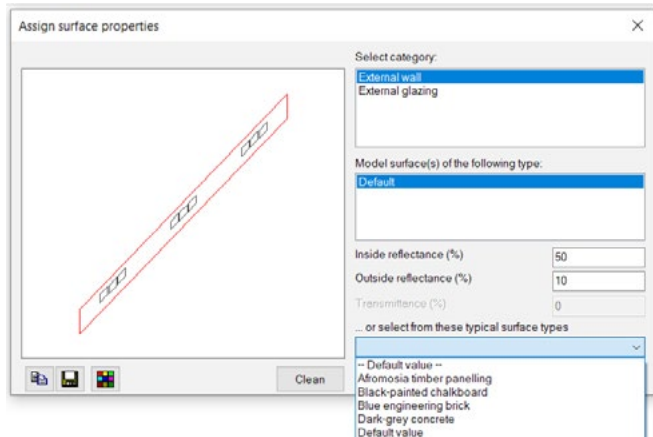
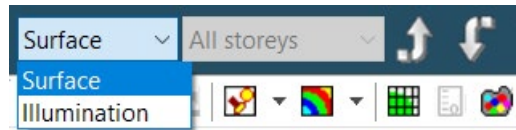
Once complete, you will get a list of design options: if none of them pass, you will need to perform another design calculation with an alternative fitting.

Select the design option you want and the luminaires will show in the space your model.

Perform Artificial Lighting Analysis for a Selected Space

With the luminaires positioned, you can now perform an artificial lighting analysis.

With the space selected, go down to the middle level of decomposition, and make sure you are using the **surface** mode.



Assign Surface Types



Assign surface types

You can then use the **Assign surface types** button to set the surface reflectance of each individual surface, either by entering a value, or by choosing a typical surface type from the drop-down menu. Alternately, if you go back up to the top level, you can set these values for all internal or all external walls, etc.

Then switch back to Illumination mode so that you can see lighting levels on the surfaces when the analysis has been done.



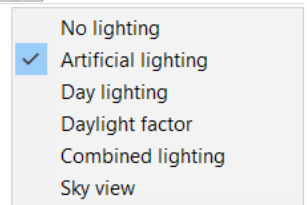
Analysis calculation

With everything set, use the **Analysis calculation** button to perform the analysis.

This will once again bring up a dialogue box with 6 different tabs under which you can set the various parameters for the analysis.

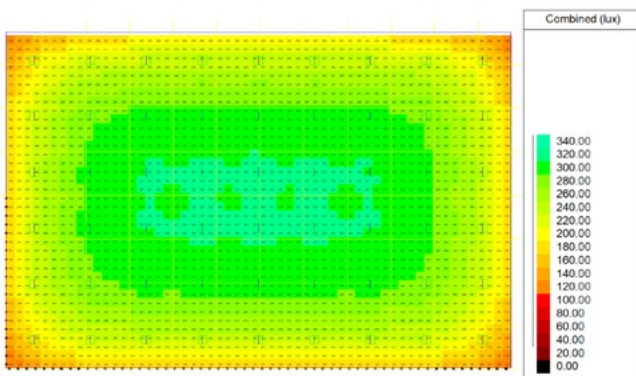
Use the tick boxes under the artificial and day lighting tabs to determine if calculations are to be run singly for one of these, or in conjunction.

If the data does not display after running the analysis, check that you have the correct space selected, are in the **Illumination** mode on the middle level of decomposition, and have selected a viable output for the calculation parameters under the **What data to display** drop-down menu.



Use the **How to display data** drop-down menu to select the graphic style you prefer.

- You can view and save the results in the content manager, and save bitmaps of the output.
- The results can be viewed in plan or axonometric view.
- You can toggle the view of luminaires on and off.
- Using the model tree, you can also choose to view results on selected surfaces.



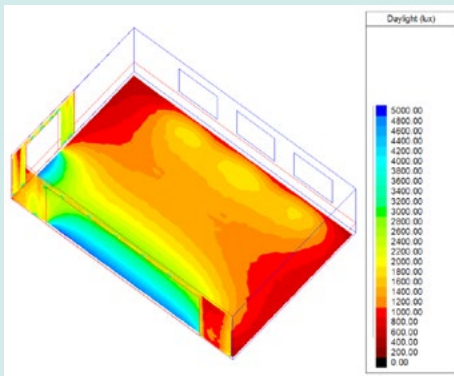
Perform Daylight Analysis for a Selected Space

You can also perform a daylighting analysis. Use the Analysis calculation button, and this time de-select all options in the Artificial lighting tab, and choose what sky you wish to use and the time and date for your daylight analysis.

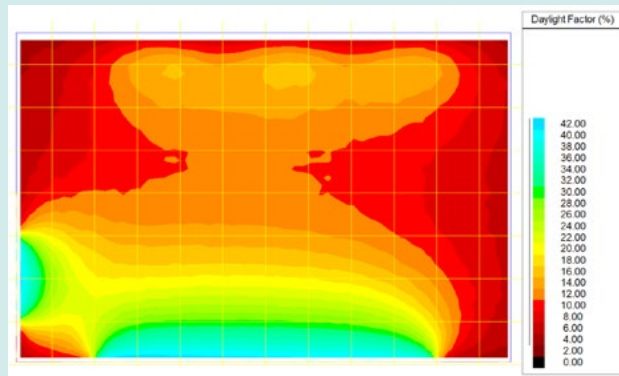
Once the analysis calculation has run, you can choose to view the results as:

- Day lighting – measured in lux or candelas/m²
- Daylight Factor – shown as a percentage
- You can also view surface luminance levels in cd/m² or surface illuminance levels in lux or fc

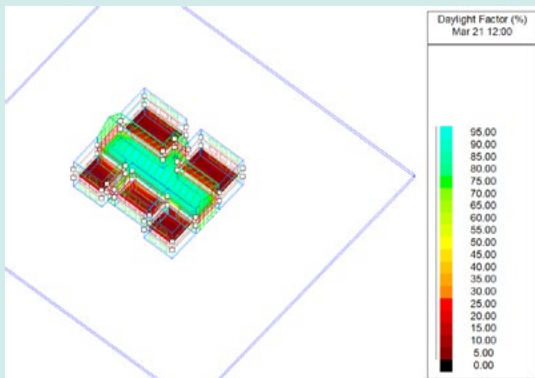
You can use the **Grid** option under the **Settings** drop-down menu to turn the view of the ceiling grid on/off in plan view.



Daylight Illuminance (lux)



Daylight Factor (%)

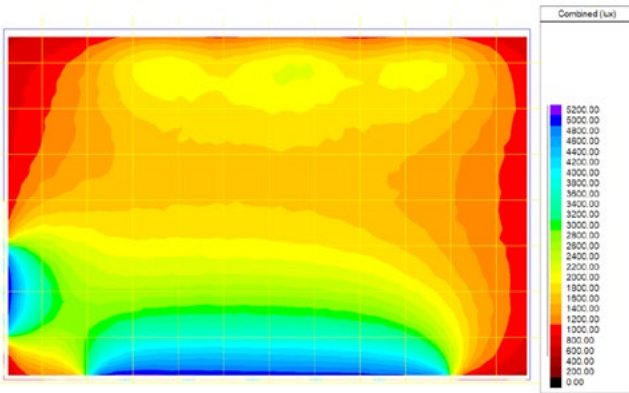


Daylight across multiple spaces and atrium

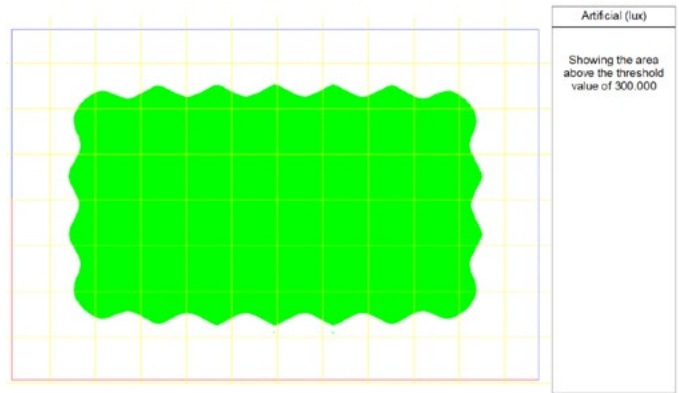
Viewing Combined Artificial and Daylight Lighting Levels

You can also view combined artificial and daylight lighting levels, separately or combined, on the working plane or any surface in the space.

You can also choose to view which areas are above or below a threshold value:



Combined Lighting (lux)



Artificial Lighting Threshold >300 lux



View a table of threshold areas

To check the threshold levels to meet regulatory compliance requirements, click on the button [View a table of threshold areas](#).

The results output can be changes by using the [Settings](#) drop-down menu and setting your [Preferences](#).

You can also run simulations on multiple rooms to perform overall evaluations.

Threshold Calculation

Building Results

Total floor area (m ²)	Total floor area above threshold (m ²)	Percentage floor area above threshold (%)	Area-weighted average daylight factor (%)	Area-weighted average illumination (lux)
477.703	477.703	100.0	46.3	5413.751

Rooms Included in the analysis

Room ID	Room name	Working plane	Floor area (m ²)	Floor area > threshold (m ²)	Percentage floor area > threshold (%)	Average illumination (%)
TRM10000	Atrium (1)	0	207.000	207.000	100.0	10334.954
A1_0000	A (1)	0	44.150	44.150	100.0	1611.930
B1_0000	B (1)	0	41.414	41.414	100.0	2126.259
C1_0000	C (1)	0	44.150	44.150	100.0	1549.173
D1_0000	D (1)	0	70.495	70.495	100.0	1548.549
E1_0000	E (1)	0	70.495	70.495	100.0	1561.057

Things to consider:

Increase amount of glazing (assess trade-off with energy consumption)

Evaluate size and shape of glass (glass above 2.3m (7'6") has greater impact)

Select a glass type with a different visible transmittance (TVis)

Evaluate other daylighting metrics such as glare

For more detailed technical info, go to the help pages at <https://help.iesve.com/ve2019/flucspro.htm#>