CAD PROJEKT K&A

Operation manual

Visualisation
The illumination of the project

CAD Kitchens 8.0, CAD Decor 4.0, CAD Decor PRO 4.0

www.en.cadprojekt.com.pl

INTRODUCTION

This manual describes the use of lights in visualization. I describe their type and properties.

We wish you a pleasant and fruitful work with our software!

CAD Projekt K&A team

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Visualization - defining and editing lighting

1. Introductory remarks

Light is an indispensable decorative element in a project, and its proper use makes it possible not only to achieve a realistic appearance of the designed room, but also to bring out all its aesthetic qualities and create a unique interior atmosphere. Therefore, knowledge of the principles of appropriate lighting editing should be important for any professional. Technological achievements in the field of imaging and 3D graphics used in the program allow you to create a light setting of the designed interior, which will not only add to its charm, but also faithfully reflect reality.

2. Types of light sources in the program

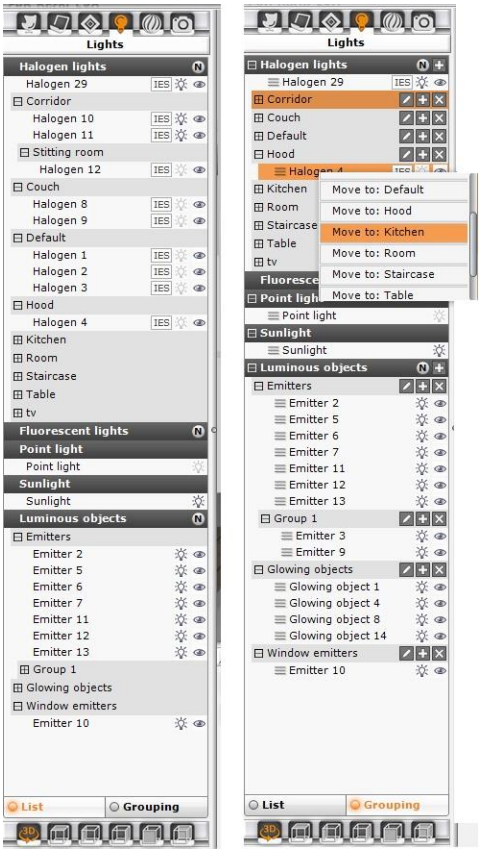


Illustration 1 View of the list of lights (left) and the list with grouping option (right)

There are five types of light sources:

- halogens;
- fluorescent light;
- point light;
- sunlight;
- luminous objects, i.e. with imparted emission, illumination, or both

Halogen and fluorescent lights are real existing objects that can be inserted into a project in the .4CAD environment using the interior equipment bases.

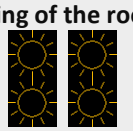
Each lighting element, entered into the project, will appear in the list in the **"Lights"** panel in the left menu(Illustration 1) In addition, the following are present on it:

- default light sources:
- four halogen lights in the ceiling of the room, with no fixtures (light points);
- pointlight;
- sunlight;
- any objects that have been given the property of emission (emitting their own light) or illumination (imitation glow) in the visualization).

Individual light sources are assigned to their respective categories and numbered. After clicking on the selected item in the list with the left mouse button, the outline of the cone of light that the given source casts will appear in the visualization preview The given object is at this point ready for editing (the editing functions available for it appear in the right menu). The rules for editing individual light sources are described in the following subsections. In addition to the lights inserted by the user, default light sources appear in the program.

Note: When you click on the icon N on the "Halogens" bar, the list of lights and the project will display the halogen numbers (Illustration 2), which makes it easier, for example, to assign lights to the appropriate group. The numbering does not display on the preview of Radiosity calculation results - to see it while Radiosity calculations are in progress, after selecting the button N left click on the visualization preview to temporarily disable the display of calculation effects.

Note: When you select any item in the list of lights, the editing functions available for it will appear in the right menu You can edit several light sources simultaneously.

Default lighting type	Description
4 light points (halogen without fixtures) in the ceiling of the room 	- appear the first time you enter visualization mode; - have since been visible in the environment in the form of small symbols of suns; - are used to illuminate the scene before the user places their own light sources from the interior items bases; - working in the .4CAD environment, they can be freely moved and copied, or deleted if no longer needed; - in visualization mode are not visible (until editing, when the orange outline of the range of the light spot appears); - are subject to editing under the same rules as halogens inserted by the user (see: point 3); - light up when the button "**Show lights" <F1>** is selected.
Point light	- is an element that emits very strong light; - is used to illuminate the design when working with textures; - it is recommended to turn it off when generating the final view and saving the visualization to avoid overexposing the scene; - they can be moved and edited (see: point 5).
Sunlight	- intense light, passing through openings and glass elements, and stopping on impenetrable (opaque) elements in the same way as it happens in nature; - its source is far away from the project; - enters the room through windows, openings and doors with muntins; - in the visualization is displayed as a cuboid, the center of which is marked by a red line, directed to the center of the room; - is used to further emphasize the qualities of the interior, such as large decorative windows facing south, through which a large amount of natural, warm light enters the room; - can be edited, according to the rules described inin section 6.

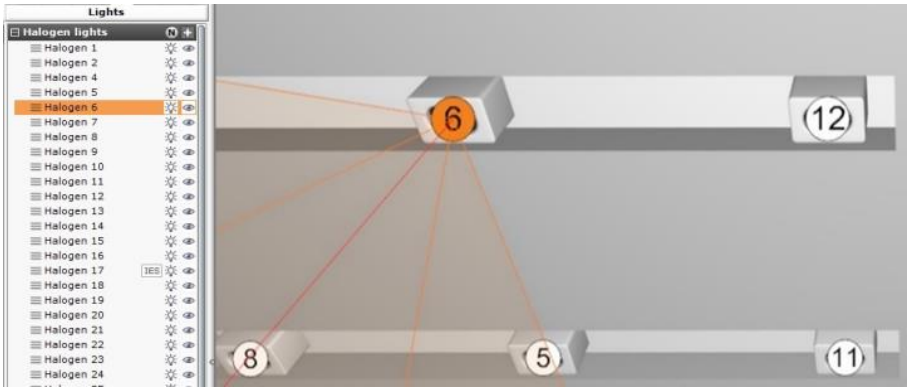


Illustration 2 Numbering of halogens in the project

3. Halogen editing

Halogens emit point light. Their editing involves:

- selecting the lighting element for editing with a left-click;
- more than one item can be edited at the same time;
- to select all items on the list, click on the first item to edit, hold down the **[Shift]** key and then click on the last item - all items on the list belonging to the given type will be selected;
- to selectively mark only some items in the list for one-time editing, hold down the key **[Ctrl]**;
- selected lights can be turned on or off by clicking the bulb symbol next to the name of the item in the list of lights, or by unchecking the **"Shining"** option in the right menu (Illustration 3);

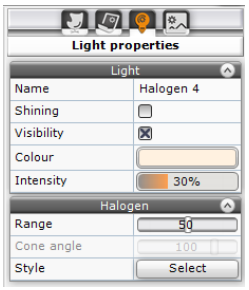


Illustration 3 Halogen editing functions in the riaht menu

- light sources can also be hidden, so that light fixtures remain invisible to the viewer despite emitting light - to do this, click on the eye symbol next to the name of a given element in the list of lights, or uncheck the **"Visibility"** option in the right menu;
- halogen editing is possible in terms of color, intensity , lights range and light cone angle, as well as light fixture style selection - these options are available in the right menu (Illustration 3); we describe them in detail in the table below.

Function	Description
Name	- this field displays the name of the object being edited;
Shining	- switching on and off the emission of light by a given source;
Visibility	- control the visibility of the light source (when you need to illuminate the project and you want to avoid showing light fixtures);
Color	- allows you to give the light any color you want; - when selected, the right menu opens a color palette with RGB values and sliders **"Colour"**, **"Saturation"**, **"Brightness"** (Illustration 4), offering various ways to determine the hue of the light emitted; - In addition, there is a panel **"Colour temperature"**, where you can find the shades of the most commonly available bulbs; - the selected color will be displayed in the bar above the palette; - to confirm the color selection, click the **"Ok"** button under the **"Color Temperature"** panel;
Intensity	- lights can shine at different intensities, on the principle: the higher the intensity, the more intense the light; - Its power is defined by moving the **"Intensity"** slider;
Range	- determines how extensive are the boundaries to which the light emitted by the source reaches; - when the range is minimal, the light will "blur" much before it reaches the end of the established cone (for example, in the case of a halogen mesh placed in the ceiling, it will not reach the floor); - at the maximum setting of the range, the light will "fill" the entire cone, with full intensity up to its limits (for example, for a ceiling halogen, it will form a clear circle on the floor);
Cone angle	- determines the area over which light from a given source spreads; - changes made for this parameter are visible in the preview in the visualization as you move the slider, the shape of the orange schematic cone, coming out of the light source in

	question, changes; - if a given light is to cover the widest possible area with its area, set the slider to maximum; - while if the item is to emit light only over a small area, set the slider to minimum;
Style	- this option allows you to select the shape of the light spot, generated by the light source in the project (light distribution style), i.e. the appearance of the light cast by the source, for example, on a nearby wall; - with styles, you can get original and realistic lighting effects for the scene; - IES files are a digital representation of the characteristics of real existing sources, that is, a record of the intensity and geometry of the distribution of light emitted by them; - IES data is provided by lighting manufacturers as text files that can be downloaded from the Internet; - there are 32 ready-made luminaire styles to choose from in the program (Illustration 5) and, in addition, you can load your own IES files, downloaded from the Internet or created by yourself; - To select a style, double click on it in the list with the left mouse button or click once with the left mouse button and confirm the selection with the button in the upper right corner of the list (Illustration 5); - To use your own IES file, select the **"Load IES"** button, then in the newly opened **"Open"** window, point to the desired file and click **"Open"**; - To deselect the IES data and return to your own halogen settings (given using the **"Color"**, **"Intensity"**, **"Range"**, **"Cone Angle"** options), click the **"Halogen"** button; - on the list of lights next to the halogens with assigned IES styles displays the designation - -. IES, and after hovering over it - a preview of the given style.

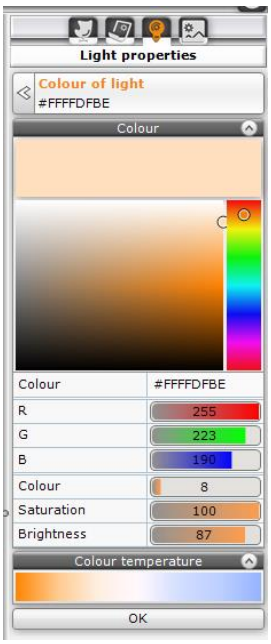


Illustration 4 Light color selection panel

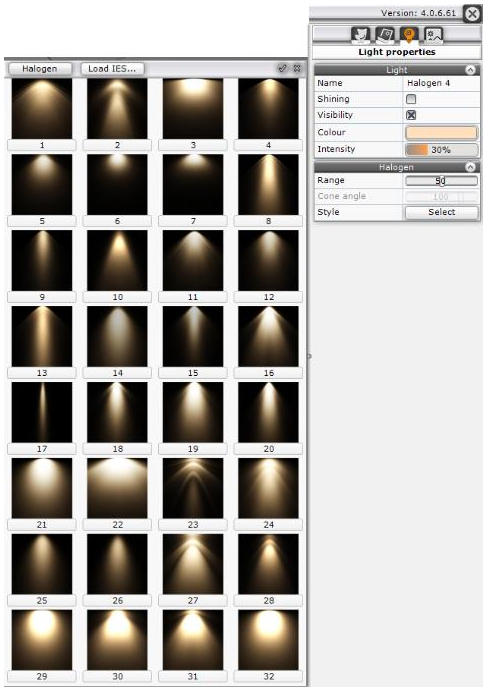


Illustration 5 Styles of light laws (IES data) to choose from

All changes in halogen settings can be tracked in real time in the visualization. The program continuously recalculates the new set values and adjusts the appearance of the scene to the currently established ones, which allows you to directly verify the effect of the settings and correct them if necessary.

4. Editing fluorescent lights

Fluorescent lights are lighting elements that emit linear light. The editing options are shown in Illustration 6.

Function	Description
Name	- this field displays the name of the object being edited;
Shining	- switching on and off the emission of light by a given source;
Visibility	- control the visibility of the light source (when you need to illuminate the project and you want to avoid showing light fixtures);
Colour	- the **"Colour"** button allows you to give the emitted light any color (the fluorescent tube itself, however, will only glow white - the condition for changing the color of the glow is to edit the material of the fluorescent tube (selecting the object in the scene by double-clicking with the left mouse buttons) and set the desired color; - after selecting the button, a panel opens in the right menu, where you can indicate the desired shade in several ways - by clicking on the palette, specifying RGB values (moving the sliders, or typing a number from the keyboard, having first clicked on the values with the right mouse button to edit them); - the selected color will be displayed on the bar next to the **"Colour"** button; - to approve, select the **"Ok"** button at the bottom of the panel; - to close without making changes, select the **[Esc]** button on the keyboard;
Intensity	- lights can shine at different intensities, on the principle: the higher the intensity, the more intense the light; - its power is defined by moving the slider **"Intensity".**

5. Point light editing

A spotlight is an additional lighting element in a project, used to illuminate the scene before existing physical light sources are inserted and adjusted accordingly, for example when applying textures. Its source is not visible in the environment or visualization, except when it is edited and moved. The spotlight should be turned off when creating the final appearance of the interior, as it can distort the distribution of lighting in it (e.g., the interior will appear brighter than it really is, or the direction of light will be different than the inserted lamps would indicate). To edit a spotlight, click with the left mouse button on the corresponding item in the list of lights. The parameters available for modification are presented in the table on the next page.

Function	Description
Name	- this field displays the name of the object being edited;
Shining	- switching on and off the emission of light by a given source;
Visibility	- function enabled by default and excluded from editing (greyed out), as it is not applicable to this light source: when the lights are turned on or the renderer is turned on, the spotlight is automatically hidden, as its source does not physically exist in the project; - a preview of the spotlight in the form of a yellow sphere is only visible when editing this light source;
Color	- as with the other lights, the color of the spotlight can be varied as needed (to make the scene look natural, you can give it a warm shade of yellow for daytime scenes, or blue - for night scenes); - to do so, select the **"Color"** button and indicate the desired shade;

Intensity	- the intensity of the spotlight can be modified in the same way as for the non-stationary sources; - it is worth noting that the intensity should not be excessive, as this will lead to overexposure of the scene;
Position	- the spotlight can be moved freely using the sliders **X, Y, Z** (Illustration 7); - moving the sliders has the immediate effect of moving the light source in the design (the spotlight is then represented by a yellow sphere).

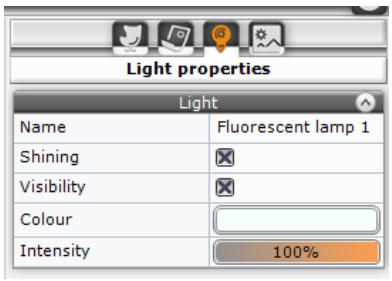


Illustration 6 Fluorescent lamp editing

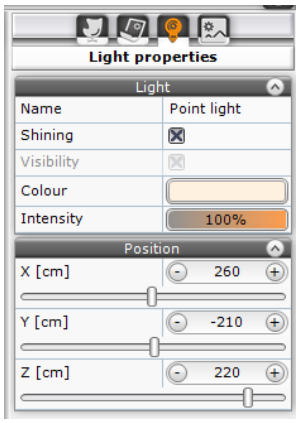


Illustration 7 Point light editing

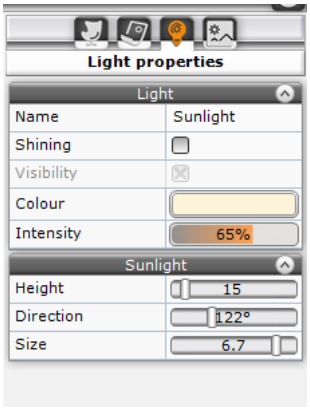


Illustration 8 Sunlight edition

6. Editing sunlight

To edit a sunlight, left-click on its position in the list of lights. The parameters to be modified in this case are **color**, **intensity**, **height** above the horizon and **direction** of light fall, and **size** (width) of its beam (Illustration 8). The edited sunlight appears in the preview as a cuboid, simulating light coming from afar. When changing direction, it moves in an orbit centered on the center of the room (this is determined by the red line inside the cuboid). The red axis of the perpendicular can also fall on a point other than the center of the room - if the user first uses the **"Sun shines at the object"** option, available under the right mouse button after selecting the object. If the sunlight is to be visible in the design, pa-member to turn on the **"Shine"** function, available in the right menu and under the bulb button in the list of lights, as this light is disabled by default when you first enter the visualization.

Function	Description
Name	- this field displays the name of the object being edited;
Shining	- switching on and off the emission of light by a given source;
Visibility	- non-editable (grayed out) function, active by default, as it is not applicable to this light source since it is not physically present in the project; - a preview of the sunlight in the form of an orange cuboid is visible only when editing this light source;
Color	- the modification of the color of sunlight follows the same principle as for other light sources; - the recommended shade is a soft yellow - it mimics natural light well;
Intensity	- ensure that this parameter is set in the lower range - it is easy to overexpose the scene if the sunlight intensity is too high;
Height	- determines the height of the sun above the horizon; - if the sun "rises" or "sets", or if the room is located on a hill, for example, move the slider to the left - the sunlight will then fall from below; - to present the sun at the zenith, move the slider as far to the right as possible - the light will

	then fall almost vertically from above; - it is worth remembering that if you are presenting a scene at sunrise or sunset, the light should have a more reddish hue;
Direction	- is used to determine from which side sunlight enters the room; - when setting it up, it is worth bearing in mind the actual position of the interior in relation to the world directions;
Size	- determines the width of the beam of sunlight; - if the room is large and the default width is not enough for light to come in through all the windows, increase it by moving the slider to the right side.

7. Emitter edition

In the list of lights appear objects that have been given the property of emission, that is, any objects that emit light into the environment (such as window panes). You will find them in the **"Luminous objects"** category, together with the so-called backlights, i.e. objects that have been given the property of imitating glowing with intense light (glow), which, however, does not affect the distribution of lighting in the scene.

Function	Description
Name	- this field displays the name of the object being edited;
Shining	- switching on and off the emission of light by a given source;
Visibility	- controlling the visibility of the light source (allows hiding objects with broadcast emissions);
Color	- allows you to change the color of the emitted light;
Intensity	- allows you to change the intensity of the light;
Use emission color	- turns on or off the visibility of the selected color of the emitted light;
Glow	- allows you to adjust the degree of flare (imitation glow).

8. Glowing objects edition

Highlights are objects that are given the property of imitating a glow, but which do not affect the illumination of the scene. They belong to the parent category **"Luminous objects”**.

Function	Description
Name	- this field displays the name of the object being edited;
Shining	- switching on and off the emission of light by a given source;
Visibility	- controlling the visibility of the light source (allows you to hide objects with glow);
Color	- option inactive for objects with only backlights assigned, requires additionally assigning also the actual light emission (available under the slider "**Emission**”); - after giving object emission , the option becomes active and allows you to choose the color of the emitted light;
Emission	- this slider additionally gives the edited object also the property of light emission (the edited source then turns into an emitter and is automatically moved from the "**Glowing objects**" group to the "**Emitters**" group (after clicking between the tabs of the left menu, which refreshes the list of lights);
Use emission color	- this option becomes active when the object is given the emission property; - turns on or off the visibility of the selected color of the emitted light;
Glow	- this slider allows you to adjust the degree of flare (imitation glow).

9. Creating groups of lights

After enabling the **"Grouping"** view for the list of lights (Illustration 1 at the beginning of this manual) you can create groups by clicking on the button ✚ on the top bar of the given category of lights. You can give the group any name (e.g. "Kitchen", "Corridor"), confirming it with the button ☑. To edit the name, select the button ✎. To add a new group (or subgroup), click on the ✚.To delete a group, select the button ✖ on its bar.

Light sources can be transferred to the created group in two ways:

- drag-and-drop method, selecting light sources with left-clicking (to select more than one, use the **[Ctrl]** or **[Shift]** key on the keyboard - the first selects selectively, and the second selects all items lying between the first and second indicated items, inclusive), and then, holding down the left mouse button, point the cursor to the group to which the sources are to be added and release the mouse button;
- by selecting the sources to be moved and then choosing the group to which they are to be moved from the context menu under the right mouse button (Illustration 9).

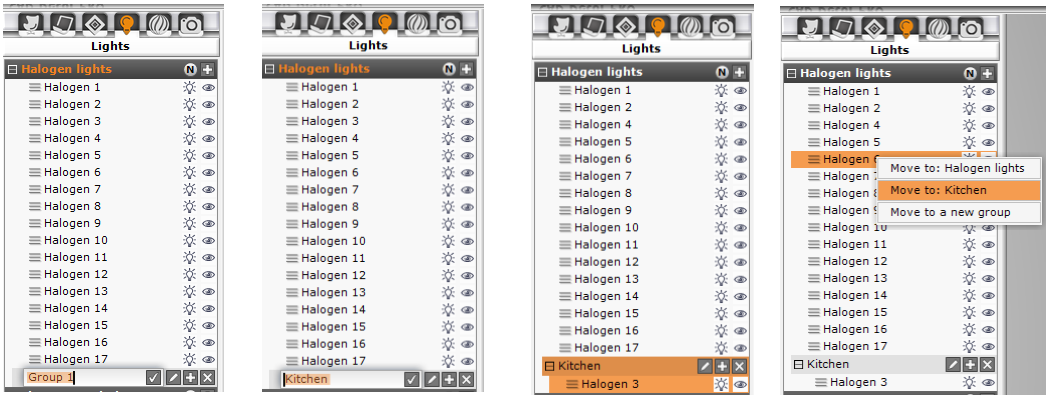


Illustration 9 Creating a group and adding a halogen to it.

Note: If a group is empty (no lights have been assigned to it) when you switch to another tab, it will be removed from the list.

10.Other lights list options

Lights can be turned on and off in groups. When you click on a parent category with the left mouse button, all its items will be selected (highlighted in orange). You can also click on the light sources one by one by holding down the **[Ctrl]** key on the keyboard, or select all items "from-to" by holding down **[Shift]**. After selecting any number of lights in this way, you can click on the eye icon, to hide or reveal them all at once, or the bulbs , to turn their illumination on or off. The **"Visibility"** and **"Shining"** options are also available in the right menu after editing the source (or any number) of light sources.

Additional information

1. Instructional videos

- Playlist, Visualization | Render"
- Night - day scene
- Inserting halogens in the shelf and copying them
- Sunlight settings

2. Shortcuts and commands

The document compares keyboard shortcuts in the .4CAD and visualization environments and lists the most frequently used commands in versions up to 3.Xi/7.X and version 4.X/8.X (both 34 and 64 bit versions of the environment). Find the document at: https://www.cadprojekt.com.pl/zasoby/pdf/opisy-techniczne/shortcuts-4-0-8-0-eng.pdf

This document provides an overview of keyboard shortcuts and commonly used commands in the .4CAD environment for visualization. The shortcuts and commands can be issued using either the mouse or keyboard. It can be accessed at: https://www.cadprojekt.com.pl/zasoby/pdf/opisy-techniczne/shortcuts-4-0-8-0-64bit-eng.pdf

In the above list, LPM and RMB stand for left and right mouse buttons, respectively. A command notation with a + sign (e.g. [Ctrl] + [Z]) indicates that both keys should be pressed simultaneously, while a notation with a >> symbol (e.g. [E] >> [Enter] or [Space]) means that you should first type E and then press [Enter] or the space bar.

Technical support
Mon-Fri from 8 a.m. to 5 p.m.
pomoc@cadprojekt.com.pl
tel. +48 61 662 38 83

Contact form

We would like to inform you that we provide training in the use of our programs. For more information, please visit our website: https://www.en.cadprojekt.com.pl/trainings/

Training section
szkolenia@cadprojekt.com.pl
tel. +48 505 138 863

CAD PROJEKT K&A

CAD Projekt K&A Sp.J. Dąbrowski, Sterczała, Sławek
ul. Rubież 46 | 61-612 Poznań | tel. +48 61 662 38 83
biuro@cadprojekt.com.pl | www.cadprojekt.com.pl