



LITESTAR

user manual

LIGHTING DESIGN SOFTWARE IN WINDOWS

version 10.0 English 31 OCTOBER 2007



The current document is the exclusive property of the OxyTech Company. All the information herein contained may be altered without notice.

This document may not be copied or transmitted in any form, whether via mechanical or electronic equipment, without the written permission of the OxyTech company.

All calculations and technical information contained herein shall be considered as examples and therefore shall not be used directly as project data.

Unless otherwise stated, all references to names, companies and data are purely incidental.

The cover illustrations are property of the legitimate owners.

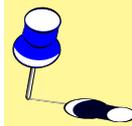


ONLY LITESTAR Pro

The following functions are available with the program LITESTAR Plus:

- management of regular/irregular roads
- tunnels
- floodlights
- 2D and 3D DXF files
- electrical lines
- furniture management
- dynamic rendering (only static is available).

These functions are highlighted with an orange POST-IT note.



NOTE

The parts highlighted with a yellow POST-IT note, where possible, refer to information that requires particular underlining.

INTRODUCTION TO THE PROGRAM

LITESTAR is a Program Suite which includes the following modules:



Litecalc is a **lighting engineering calculation** program for interior and exterior areas (large areas, roads, tunnels) with view functions for results tables, graphs and photo-realistic images of the area itself from different viewpoints by means of ray-tracing and radiosity rendering



Liswin is an **operative electronic catalog** with parametric and tree product search functions, data updating via Internet, from CD-ROM and manual, product and accessory technical data sheet management in various languages exportable in PDF and RTF formats



Lisman is an **estimate module** with functions for importing project lists from Litecalc and Liswin, for management of documents such as metric processing, lists and offers which can be handled in different languages and exported in PDF and RTF formats.



Lisdat is the **catalog data management** module with manual data input or database import



Photowin is the **photometry management** module with functions for manual input, import from standard files and goniophotometers, view and printout of photometric tables and graphs in various languages



Photoview is the **photometry view** module with view functions and printouts of photometric tables and graphs in various languages.

INDEX

| | | | |
|--|----|---|----|
| INTRODUCTION TO THE PROGRAM | 3 | WIZARD PROJECT | 19 |
| MINIMUM HARDWARE-SOFTWARE CONFIGURATION | 7 | Interiors | 19 |
| PROGRAM AND DATA INSTALLATION AND ACTIVATION | 7 | Roads | 21 |
| PHOTOMETRIC ARCHIVE ACTIVATION (UPDATING) | 8 | General | 21 |
| CATALOG ARCHIVE ACTIVATION (UPDATING) | 8 | Roads | 24 |
| Litecalc – Introductory Notes | 9 | Luminaires | 26 |
| | | Tunnels | 27 |
| | | Luminance Curve | 29 |
| | | Electrical Lines | 30 |
| | | AREA | 33 |
| | | Create New Area | 33 |
| | | Create/Modify Area | 36 |
| | | Library | 36 |
| | | Scale Room | 37 |
| | | Colors and Reflectances | 37 |
| | | Modify Color and Reflectance | 38 |
| | | Working Plane Definition | 39 |
| | | Add Working Plane | 39 |
| | | LUMINAIRES | 40 |
| | | Add Luminaire | 41 |
| | | Lamps | 42 |
| | | Add Luminaires in Groups | 43 |
| | | Insertion by Row and Column | 43 |
| | | Add Luminaires from Illuminance Value (Automatic Calculation) | 44 |
| | | Symmetrize Luminaires | 44 |
| | | Duplicate Luminaire | 45 |
| | | Linear Duplication | 45 |
| | | Circular Duplication | 45 |
| | | Relative Luminaire Movement | 46 |
| | | Relative Z Rotation | 46 |
| | | Luminaire Aiming | 46 |
| | | Delete Luminaire | 47 |
| | | Multiple Selection | 47 |
| | | Luminaires List | 48 |
| | | Interference Check | 49 |
| | | Open Luminaires Configuration | 49 |
| | | Save Luminaire Configuration | 49 |
| | | Properties | 49 |
| | | STRUCTURES | 50 |
| | | Add Structure | 50 |
| | | Structure Symmetrization | 51 |
| BASIC CONCEPTS | 9 | | |
| Direct and Indirect Luminaires | 9 | | |
| Bounding Box | 9 | | |
| Reflections | 9 | | |
| Cartesian References and Luminaire Aiming | 9 | | |
| Static Tool Bar - Project Functions | 10 | | |
| Choosing a Command from a Menu | 10 | | |
| Selection of a Function from a Work Window | 10 | | |
| Selecting an Icon | 10 | | |
| Selection of a File from a List | 10 | | |
| Tool Bars | 10 | | |
| Static Tool Bar - Room Functions | 11 | | |
| Context Sensitive Tool Bar - Furniture Functions | 11 | | |
| Context Sensitive Tool Bar - Luminaire Functions | 11 | | |
| PROGRAM LIMITS | 12 | | |
| HOW TO RUN THE PROGRAM | 12 | | |
| FIRST PROJECT INSERTION | 12 | | |
| FILE | 14 | | |
| New Project | 15 | | |
| New Project - Keep DXF | 15 | | |
| Open Project | 15 | | |
| Save Project | 15 | | |
| Project Info | 16 | | |
| Open Image | 16 | | |
| Set Cover | 16 | | |
| Print | 17 | | |
| Customize | 18 | | |
| Import | 18 | | |
| EDIT | 19 | | |



LITECALC

| | |
|---------------------------|----|
| Documents | 93 |
| Product Elimination | 93 |
| Price Lists..... | 93 |
| Currency..... | 94 |
| Manufacturer Data | 94 |
| Configuration..... | 95 |



LISMAN

| | |
|-----------------------------------|-----|
| Lisman – Introductory Notes | 97 |
| Lisman Management..... | 97 |
| PROJECT | 97 |
| SUB-PROJECT..... | 98 |
| New | 98 |
| OFFER..... | 100 |



LISDAT

| | |
|--|-----|
| Lisdat - database data entry and alteration..... | 101 |
|--|-----|



PHOTOWIN

| | |
|---|-----|
| Photowin – Introductory Notes | 99 |
| Photometry Management..... | 99 |
| Maintenance | 100 |
| Update..... | 100 |
| Update via WEB..... | 100 |
| Windows..... | 101 |
| Global..... | 101 |
| Object | 102 |
| Input of New Files | 102 |
| Input of New Data (Luminaires, Measurements, Lamps, Tables)..... | 102 |
| Import..... | 108 |
| Import from FDB..... | 108 |
| File Import | 109 |
| Autoimport..... | 109 |



PHOTOVIEW

| | |
|---|-----|
| Export..... | 110 |
| Luminaires – Generals, Floodlights, Roads | 111 |
| Measurements – Generals, Floodlights, Roads | 113 |
| Lamps | 114 |
| Tables..... | 114 |
| File Import | 115 |
| Photoview – Introductory Notes | 117 |
| Graph and Table Management..... | 117 |
| Luminaires..... | 117 |
| FILE..... | 117 |
| EDIT | 118 |
| OPTIONS | 118 |
| VIEW | 119 |
| General Data Table | 119 |
| Values and Angles Table (Intensity Matrix)..... | 120 |
| Polar and Cartesian | 120 |
| Classification | 121 |
| Beam (Beam Diagram) | 121 |
| UGR Table..... | 122 |
| Isolux representation..... | 122 |
| Isocandela representation..... | 123 |
| CIE Utilization (CIE Utilization and Utilance Factors). 124 | |
| CIE Utilization..... | 124 |
| Söllner (Söllner Glare Diagram) | 124 |
| Luminance values | 125 |

MINIMUM HARDWARE-SOFTWARE CONFIGURATION

Before installing the program, it is advisable to check that the configuration of your computer corresponds at least to the following characteristics (minimum configuration):

- Computer PC Pentium
- RAM Memory 16 Mb
- Disk Drive multi-session 16X speed CD-Rom
- Hard Disk with at least 20Mb free for the program. More than 200 Mb for files
- Video resolution 800x600 pixels
- Mouse Windows compatible
- Operating System Windows® 2000 – Windows XP® – Vista®– Windows NT® v.4.0 (Service Pack 3) (Windows e Windows NT are registered trade marks of Microsoft Corporation)

PROGRAM AND DATA INSTALLATION AND ACTIVATION

PROGRAMM INSTALLATION AND ACTIVATION

In the case of personalized programs distributed by the companies to the market, activation of the program and photometric and catalog files is automatic.



NOTE

1. Place the supplied CD-ROM/DVD in the CD ROM drive
2. If the Auto run mode is active the main disk menu will appear automatically, otherwise select 'Run' from the Windows Start menu.

Type or click d:\Setup + Enter (d: this is the CD ROM /DVD drive: example D:\ or E:\ or F:\)

If the program has been downloaded from Internet run the program.
3. When the menu Window appears select the installation language.
4. Follow the instructions on screen
5. At the end of the installation run the program. The program is, at this step, utilizable in the reduced form
6. Place the supplied Update disk in the disk drive A:\ or B:\
7. Respond <Yes> to the activation request window: at this point the program automatically proceeds to load the personalized configuration (data and logo)

In case the Update files were e-mailed by OxyTech it's necessary to define the directory where the files were loaded using the available window.



NOTE

The installed program must be of the same kind of the Update disk (LIT-ESTAR with LITESTAR Pro).



NOTE

8. Exit the program and re-launch it to activate the new configuration: the program is now ready to use.

PHOTOMETRIC ARCHIVE ACTIVATION (UPDATING)



NOTE

The basic photometric archive is not empty, it includes the Ready to Use data of the companies.

- 1 Insert the CD ROM Data Disk supplied with the program CD ROM (Program Disk) in the drive
- 2 Enter the program and activate the Photometric Server from the Windows Toolbar or by means of the CATALOG/Photometries function
- 3 Select the MAINTENANCE/Update function to activate the window with the list of available photometric data (left-hand column).



NOTE

Please ask the OxyTech commercial service for activation of the data on the right.

- 4 Select the files you require from the column on the left of the window and, on conclusion, press OK: the program automatically proceeds to import the selected files (the import process, according to the size of the files to be imported, may take a long time: it is therefore advisable to import the data in groups)
- 5 When import is concluded the data is ready for use.



NOTE

Data may also be imported/updated via Internet; in this case select the MAINTENANCE/Update function via WEB and repeat points from 3 to 4.

CATALOG ARCHIVE ACTIVATION (UPDATING)



NOTE

The basic catalog archive is not empty, it includes the Ready to Use data of the companies.

1. Insert the CD ROM Data Disk supplied with the program CD ROM (Program Disk) in the drive
2. Enter the program and activate the CATALOG/Search and Data Sheets function
3. Select the Search function (Binocular icon)
4. Set the search parameters (for example, select one or more products and set the option 'Exteriors – Roads') and select the Computer-CD ROM icon (LOCAL ECOD function): the program proceeds to search for the data on CD ROM and to import it
5. When import is concluded the data is ready for use.



NOTE

Data may also be imported/updated via Internet; in this case select the Computer-World function (ECOD function) after setting the search parameters.

Litecalc – Introductory Notes

Litecalc is designed to calculate the lighting parameters of an indoor installation using luminaires measured according to the C-Gamma system described in CIE24 and CIE27 Recommendations (road luminaires) and V-H (floodlights). The program calculates the illuminance and luminance values on all surfaces of the room/area, including furniture, also taking into consideration the shadows cast by the latter.

BASIC CONCEPTS

Direct and Indirect Luminaires

(See also Section on Luminaires)

A luminaire is always measured with the light emitting plane perpendicular to the luminous axis (Gamma 0°). This assumes the emission is always direct even though actually the emission is indirect (light towards the ceiling).

It is then necessary to rotate the luminaire through 180° in order to install it in the right working position.

You may prefer to enter data in the photometric table of an indirect luminaire so that the emission corresponds to Gamma 180° and then it is not necessary to rotate the luminaire.



NOTE

Bounding Box

This is the box containing the object under consideration, e.g. a room, a piece of furniture or a luminaire.

Reflections

The program can be used for irregularly shaped areas and the reflections on different surfaces are calculated using the Lambert method (perfectly diffuse reflections) or using the R and C reduced reflection factor tables.

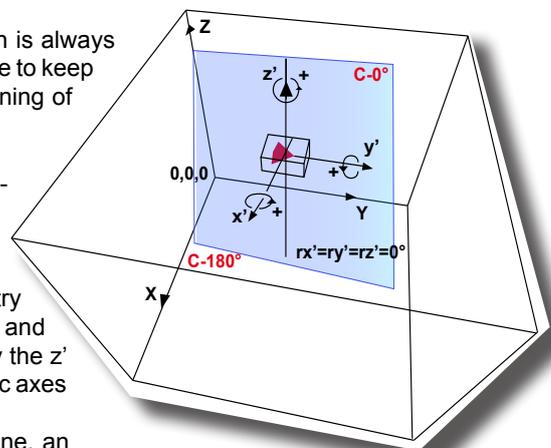
Cartesian References and Luminaire Aiming

Absolute Cartesian Axes and Room/Area: the area in question is always associated to three Cartesian axes X, Y, Z and it is always advisable to keep the bottom left hand corner of the plan associated with the beginning of the axes (X=0, Y=0 and Z=0) as shown in the figure.

Relative Cartesian Axes and Luminaires: each luminaire is associated to its set of three intrinsic Cartesian luminaire axes x', y' and z' relative to the absolute triplet X, Y and Z according to which the rotations or aimings of the luminaires are considered.

The photometric system of C- semiplanes, to which the photometry is referred, agrees with the intrinsic luminaire axes system x', y', and z', where the C-0° semiplane corresponds to the plane formed by the z' axes and by the positive part of y'. Each rotation around the intrinsic axes also involves the rotation of the C- planes group.

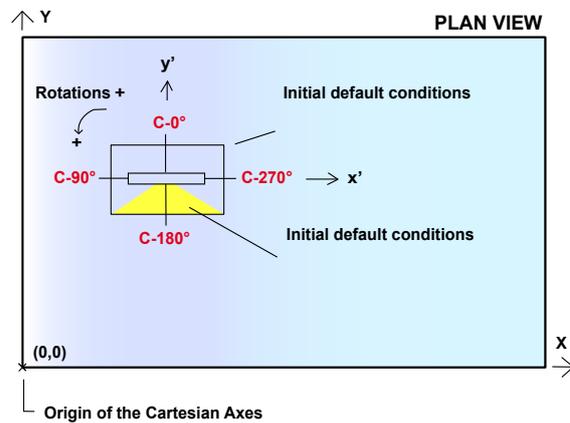
To determine the direction of the C-0° semiplane, origin semiplane, an arrow/pyramid has been inserted in the luminaire and its point indicates the direction of the C-0° semiplane as in the figure. The C-0° semiplane is generally perpendicular to the lamp.



Cartesian and Angular References

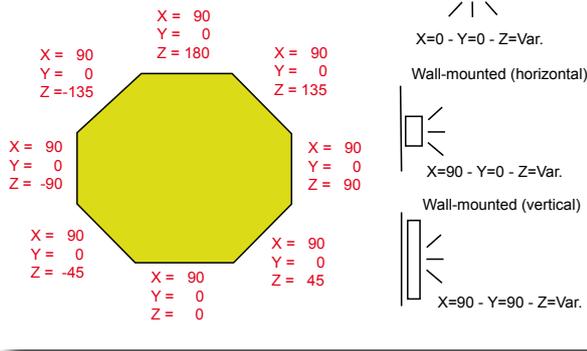
Function Buttons: these are the buttons that appear in the various windows which, when pressed, enable you to carry out a certain operation, for example, OK to confirm the inserted data or Cancel to cancel the operation.

Default Condition: the default condition according to which the luminaires are positioned in the area establishes all the rotation angles x', y' and z' equal to zero. In this case the luminaire has its own aiming/luminous axis directed downwards perpendicular to the work plane.



C- Half-planes Direction and Rotations

EXAMPLE OF LUMINAIRES POSITIONING
Horizontal angle positioning for wall-mounted luminaires (in case of vertical positioning take $Y = 90^\circ$)



Example of Luminaire Positioning

Positive Rotation Direction: the rotations of a luminaire around its own intrinsic axes are considered positive when the observer sees them in an anticlockwise direction when located on the positive side of the x' , or y' or z' axis.

Choosing a Command from a Menu

A function can be selected by either using the mouse and clicking on the selected function with the left button or moving the up and down or right and left arrow keys and then pressing Enter.

Selection of a Function from a Work Window

A function can be selected by either using the mouse and clicking on the selected function with the left button or moving from one function to another with the TAB key and then pressing Enter.

Selecting an Icon

The icons associated with the corresponding functions are found in the menus of the Menu Bar. To select an icon, and thus activate the corresponding function, click on it with the left mouse button.

Selection of a File from a List

The program uses file list windows. To open one of these files double click on the name, enter the name in the appropriate box and click OK or move up and down the list with the arrows keys and then press Enter.

Tool Bars

Any command from the Menu can be quickly activated using the tool bar. The tool bar consists of a group of icons each connected to a command from the Menu.

Litecalc uses 4 different tool bars, 2 static and 2 context sensitive.

The Toolbars are positioned by default in the upper section of the Work Area below the Menu Bar: They can however be organized vertically: to do this click with the left mouse button on the upper line of the active toolbar and, keeping it pressed, move onto the Work Plane and release the button. The toolbar will thus be shown vertically and can be moved by clicking on its description and moving the mouse arrow into the new position.

The program also allows you to discover the functions of each icon; place the mouse arrow on the icon and after a few seconds the program will show the relative description.

Static Toolbar - Project Functions

| | |
|--|--|
| | Project New - Open - Save - Information |
| | Room / Area Open - Save - Create - Delete |
| | Room / Area Scale - Colors and Reflectances - Working Plane |
| | Furniture Open - Save - Delete |
| | Luminaires Open - Save - Delete |
| | Calculations - Rendering |
| | Printing Project - About Exit |

| | |
|--|--|
| | Add Furniture - Add Box - Interference Check - Furniture List |
| | Add Luminaires - Add Luminaires in Groups - interference Check - Luminaires Lista |
| | Pan - Zoom - Grid |
| | View Top - Front - Side - Fit View Room |
| | View Axes - Grid - Redraw |
| | Bboxes - Complete View - Chage Colors and Reflectances - Select Surface |
| | Summary Results - Calculationsi - Rendering |

Static Tool Bar - Room Functions

| | |
|--|---|
| | Furniture Duplicate - Properties - Delete |
| | Furniture Movei - List |
| | Absolute Rotations - Relative Rotation around the Z Axis relative to Furniture |
| | Pan - Zoom - Grid |
| | View Top - Front - Side - Fit View Room |
| | View Axes - Grid - Redraw |
| | View Bboxes - Complete |

Context Sensitive Tool Bar - Furniture Functions

| | |
|--|--|
| | Luminaires Duplicate - Delete - Move |
| | Luminaires List - Propperties - Aiming with Mouse |
| | Absolute Rotations - Relative Rotation around Z Axis of Luminaire |
| | Pan - Zoom - Grid |
| | View Top - Front - Side - Fit View Room |
| | View Axes - Grid - Redraw |
| | View Bboxes - Complete |

Context Sensitive Tool Bar - Luminaire Functions

PROGRAM LIMITS

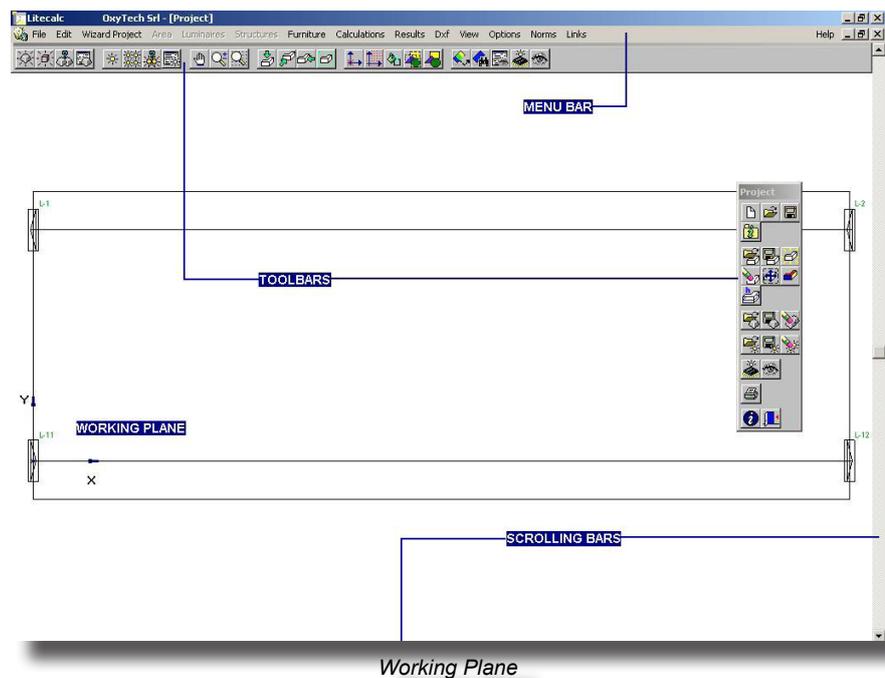
The program works within the following limits:

- *ROOM/AREA SHAPE* Irregular also with curved elements
- *MAXIMUM DIMENSIONS* X=10.000 m Y=10.000 m Z=10.000 m
- *TOTAL NUMBER OF LUMINAIRES* Function of RAM
- *NUMBER OF DIFFERENT TYPES OF LUMINAIRES* Function of RAM

HOW TO RUN THE PROGRAM

To run the program, choose one of the following options:

- selecting the Litecalc icon from the Program Group window by clicking twice rapidly on it
- use the Execute command in the Program Manager and type d:\Directory Name \INTERF and press Enter (the default directory name is OxyTech)



- run the File Manager and select d:\Directory Name\BIN\INTERF.

FIRST PROJECT INSERTION

When you enter the program the Work Area appears, made up of the following parts:

- **Menu Bar** with commands to work on the project placed on the upper part
- **Toolbars** with icons related to the commands of the Menu Bar
- **Working Plane** used for graphical input
- **Scrolling Bars (Right Hand Side)** used to move the room from left to right or vice versa and from top to bottom or vice versa

The Menu Bar has the following commands:

- **File** with Create, Open and Save commands;
- **Edit** cancel or restore the last selected function, to move the origin of the Cartesian axes, measure distances
- **Guided Project** for project management of parameterized areas which can be set by the operator;
- **Room** with all the features to handle luminaires in the room
- **Luminaires** with all the features to handle luminaires in the room;
- **Structures** management functions for lighting device structures such as floodlight masts or modular elements for interiors;
- **Furniture** with all the commands to input furniture in the area;
- **Calculations** to calculate the lighting parameters;
- **Results** to manage the visualization of the tables of results and graphics for all the surfaces of the room under consideration.
- **DXF** to manage import and export of DXF files;
- **View** for managing different viewpoints from which to see the area, for defining rendering, for passing from bboxes view of the structural elements, (only the parallelepiped enclosing the structural elements is visualized) to complete;
- **Options** to set the configuration of the Tool Bars, the grid and the axis origin of the working plane ;
- **Norms** for management of the lighting design sector and emergency Norms; a Norm can be selected from a list or an index;
- **Links** to access the functions
 - **Liswin** – Operative Electronic Catalog;
 - **Lisman** – Estimate Module;
 - **Photowin** – Photometry Management;
 - **Lisdat** – Catalog Data Management
- **Help** to manage:
 - **Info** – various information on the services offered by the company
 - **Encyclopedia** – the encyclopedia of lighting engineering terms
 - **Tutorial** – automatic demonstration of the program
 - **Manual** – the online guide to the program.

In this phase it is not necessary to insert the code or name of the project, this may be done at the end while saving):



NOTE



File Menu

FILE

This menu allows you to use the different features related to the project files and to quit the program.

When you choose File a menu appears which includes the following commands:



- New Project to define a new project;
- New Project - Keep DXF to define a new project while keeping a previously imported DXF background;
- Open Project to open a previously defined project in the archive;
- Save Project to save a project;
- Project Info allows you to input the information related to the project;
- Properties to open the properties window which indicates the number of elements present in the project, the type of project whether guided or free and the arrows to move from one window to another in the current project;
- Open Image to open an external image and add it to the images list;
- Organize Projects for access to the Windows Explorer window and management of operations connected with the project file such as name change or its movement into a different folder;
- Set Cover with which to select the 3D view of the area to be printed on the cover;
- Printer Setup for printer configuration. Selection of this function activates the typical Windows printer setup window;
- Print to print project data, results and graphics;
- Customize to customize designer data;
- Update to activate the new program configuration with a diskette supplied by the company. Place this activation diskette in the drive and select the function; the program will proceed to update the program setup and any files used.
- Import allows you to convert the projects of a previous version of LITESTAR from .LTS or .RUN to LPJ format; it also allows program startup without activation disk if a previous version with the same primary version number is installed (for example 4.xx) and the import of the photometric file (FOTOM. FDB) from the archive of the previous program;
- 1..4 The last four projects processed can be reopened;
- Exit to exit the program and return to the Program Manager

New Project

Selection of this function leads to the Working Plane where, if a previously unsaved project is active, the program asks if it may save the project before allowing new elements to be inserted.

The program does not ask, in this first phase, for definition of a new project code; this may be done at the end of the work or explicitly with the FILE/Save Project function (advisable).

Definition of the study area of a project may be achieved in 3 different ways (Note: in this phase it is not necessary to insert the code or name of the project, this may be done at the end while saving):

A. ROOM/Create Area – by defining the plan of the area itself and subsequently the height of the area if interior (in this case the ceiling may only be plane). In this case it is advisable to have as background the DXF file of the project under examination which facilitates the definition of the area to be illuminated. To activate this mode select AREA/Create Area from the menu ROOM/Create Area

B. AREA/Create/Modify Area – if no previously defined project is active the program presents a rectangular area which can be modified either by entering new vertex coordinates or by dragging the vertices with the mouse. To activate this mode select ROOM/Create/Modify Area

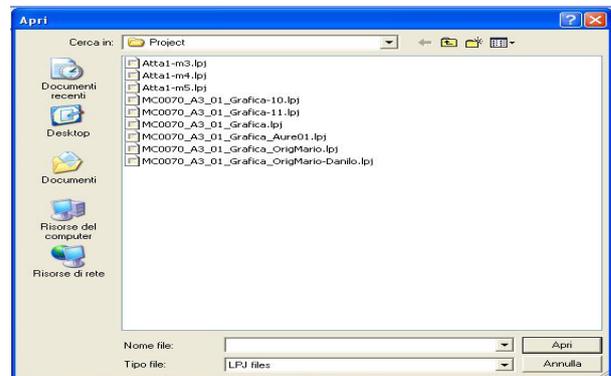
C. ROOM/Library – by selecting a room or an area from the library; in this case the room ceiling may also not be plane (for example vault, sloping etc.). To activate this mode select AREA/Area Library.

New Project - Keep DXF

This function allows you to keep the DXF file previously imported as background. It is used when the project to be realized consists of several rooms. It is possible to create each individual room, save the project and subsequently, by selecting the New Project - Keep DXF function, create a new room while keeping the imported DXF.

Open Project

Selection of this function opens the window shown in the figure in which you can select the name of a saved project: once you have inserted the name in File Name, select Open and the project will be opened.



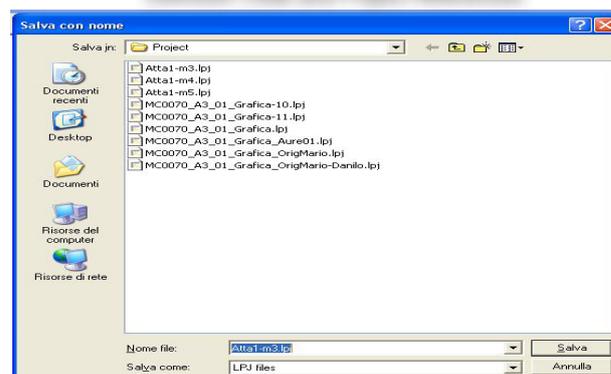
Definition Code and Project References

Save Project

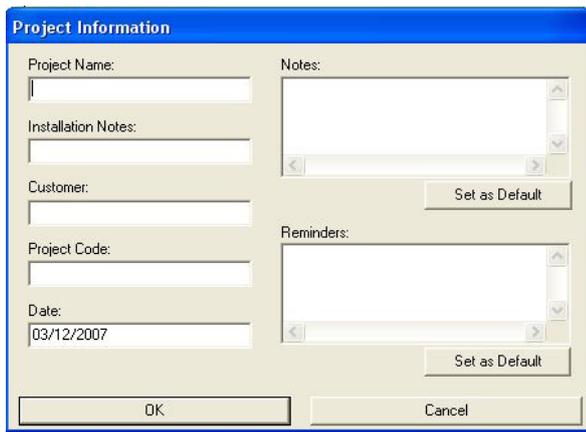
This command allows you to save a project. After selecting the command the project name window appears on the screen. At this point you can also change the name of the project. This is useful when you are working on different solutions for the same project.

If the project data has not yet been defined the program asks you to input it (see the Project Info command).

The project is saved in a single LPJ extension file: this file can then be inserted in any work folder, if necessary also on the network.



Project Save



The dialog box titled "Project Information" contains the following fields and controls:

- Project Name: [Text Input]
- Installation Notes: [Text Input]
- Customer: [Text Input]
- Project Code: [Text Input]
- Date: [Text Input] (03/12/2007)
- Notes: [Text Area]
- Reminders: [Text Area]
- Buttons: "Set as Default" (twice), "OK", "Cancel"

Project Information

Project Info

This command allows you to input further information related to the project. The window shown appears on the screen and you can enter the following data:

- Project Name
- Project Notes
- Customer
- Project Code
- Date

The window contains two other boxes where you can input further notes and reminders. All this data is printed on the project cover page.

Open Image

The Open Image function allows access to the selection window: after selecting the image and pressing OK the program opens the image management module and visualizes the image.



NOTE

The addition of images to the list is also possible by means of the rendering function.

The management module contains the following menus:

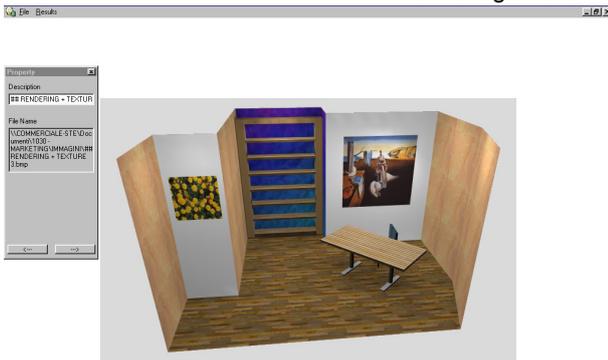


Image Management Module

- **File** with the functions;
- **Open Image** to open a new image;
- **Save with Name** to save the visualized image with a different name;
- **Properties** to open or close the image properties window in which the image name and path are shown; this window also contains the keys for moving in sequence from one program window to another
- Close to close the current image;

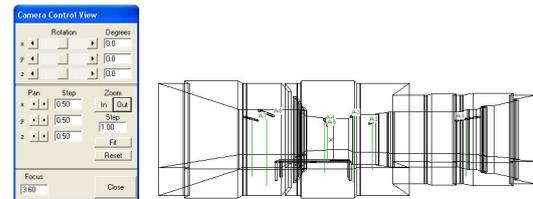
- **Results** with the functions::
- **Cascade - Tile** to superimpose or open side by side all the windows that make up the project
- **Arrange Icons** to visualize the icons of the window.
The lower part of the menu shows the project name, the selection of which returns you to the main screen (Working Plane), and the directory of the listed images, the selection of one of which causes the image to be shown on screen.

Set Cover

This option manages the 3D area visualization functions to enable selection of the view to be printed in the General Information section of the project printout. The 3D view presents the window in which to define the best point of observation and which contains the following functions:

- Rotations to rotate the area around the vertical axis Z and the horizontal axes X and Y where the axes X, Y and Z are absolute axes. This rotation can be effected by pressing the left mouse button on the left and right arrows, by clicking on the intermediate square with the left mouse button and, keeping it pressed, moving it to the right or left, or by defining the degrees of rotation shown on the right ;

- Pan to move the area along the 3 X, Y and Z-axes. The step of this movement can be defined in the right-hand box;
- Zoom to enlarge (IN) or reduce (OUT) the area according to the set step which can be modified;
- Fit to center the area in the middle of the screen when repeated zooms or movements have been effected;
- Reset to return the area view, after repeated movements or zooms, to its original condition;
- Focus to define the focal length with which the area is seen.

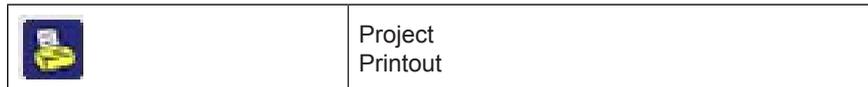


View Definition

The defined view will be the one printed on the first page of the project. Close enables you to return to the Working Plane.

Print

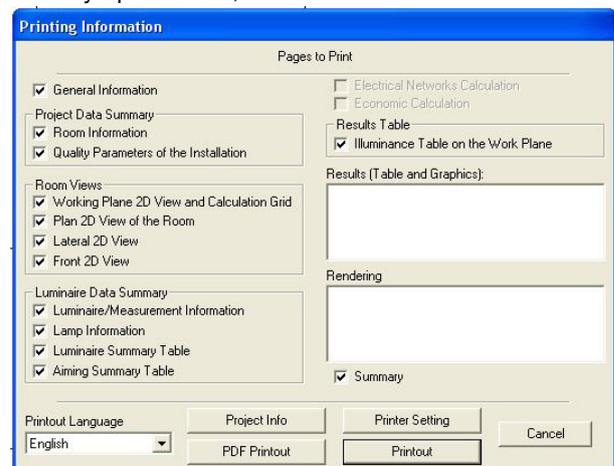
This command allows you to print the project data, results table and 2D and 3D views of the room under consideration. This also allows you to save the parts of the project to be printed on PDF files.



The window that opens on selection of this function allows you to define which of these printouts to make: general data, aimings, lamps and luminaire data, area views, results, graphs and renderings or external images previously opened and, finally, the summary. You may also choose whether or not to print the results of the electrical lines and economical calculations.

In the lower part of the window you can decide:

- the printout language from those available
- to modify any project information (Project Info Function) previously defined: if none has been previously defined the program automatically presents the relative window (Project Information Window) to be completed before proceeding but, if you wish, it is also possible to print without defining any element
- to enter the printer configuration window.
- to save the selected project elements on PDF files. In this case the program opens the window in which to enter the name of the PDF file to be saved and, on confirmation, proceeds to create the file which can be viewed with Acrobat Reader or other management programs for PDF files.



Printout Selection

The Project Info window, which is opened by clicking the Project Info button, allows you to enter the following data:

- Project Name
- Project Notes
- Customer Name
- Project Code
- Date.

You may also modify the project Notes and Reminders which the program prints on the project cover page.

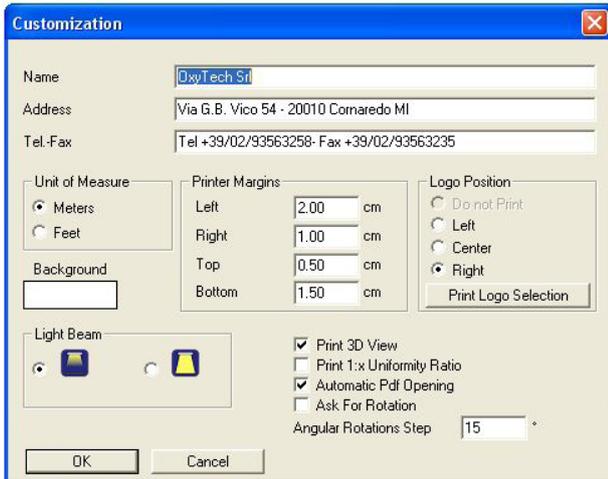
When all the data has been entered, click OK to confirm and the program will proceed to print the selected items. If you click Cancel, the program will return to the Working Plane.

Customize

This feature allows you to alter the customization of the program. The customization window allows you to modify the following strings:

- Company Name or Lighting Designer or Institution
- Address
- Telephone and Fax Number.

Certain elements of the program can also be set such as the unit of measurement used (metric or Anglo-Saxon), print margins, position of the print logo, drawing background, activation of luminaire light beam type, activation of 3D view print on the front page and of uniformity ratios according to the 1:x format.



Customize

Selection of "Request rotation" and the relative "Angular Rotations Step" value intervene on the functioning of the project editing taskbar, allowing the use of the set values as standard.

If the function is active, rotation is not requested but pressing a button at the same time as the CTRL



key will switch the state.

If the function has not been set in the window it can be recalled by pressing one of the abovementioned buttons with the CTRL key.

Select OK to confirm the modification or Cancel to quit the command without saving.

Import

The Import function allows:

- the conversion of projects from a previous version of LITESTAR from .LTS or .RUN to LPJ format
- import of the photometric file (FOTOM.FDB) from the previous program archive.

The operational sequence to follow is, in this order:

- activate the program with activation files
- import the previous photometric file (FDB Import function) – optional operation: it is however possible, after program startup, to import the new photometries with the MAINTENANCE/Update function of the Photowin

Procedure:

- select the FDB Import function
- select the FDB file to be imported and confirm.
- convert the projects in LTS or RUN format (Convert LTS > LPJ and Convert RUN > LPJ function)



NOTE

Optional operation but recommended in that it makes project back-up easier.

Procedure:

- select the Convert LTS > LPJ or Convert RUN > LPJ function
- select the LTS or RUN file (from the \DATA\Prjs folder) to be imported and confirm. More than one project may be selected at a time.

EDIT

The Modify menu contains the general management functions of the project and in particular the functions:

- Undo to cancel modifications or errors previously made in the project (for example, replace a luminaire in its original position after moving it etc.)
- Redo to refresh the state of the project after 1 or more cancellation operations
- Move Origin: this function is useful when you wish to move the origin of the drawing to a more suitable point. Selection of the function opens a window in which to enter the movement values x, y and z
- Measure Distances: this function is useful for measuring the distance in [m] between 2 points of the Working Plane. Once it has been activated, select the first point and then the second with the mouse and the program will show a segment in red: the measurement of the segment is highlighted in the upper left part of the screen. By selecting a greater number of points more distances can be defined. Press the right mouse button to activate the context sensitive menu which includes the pan, zoom, grid and fit area functions, in addition to exit for exiting the function (this is also possible by pressing the ESC key).



Edit Menu

WIZARD PROJECT

The Wizard Project menu allows you to manage the functions associated with the simplified setting of roads and tunnels and of the electrical lines.

The menu presents the following features:

- Interiors to set an interiors project by choosing a room whether rectangular, L-shaped or from the library with addition of luminaires by rows and columns, also with automatic calculation;
- Simplified Roads to define a road lighting installation according to CIE 30 Recommendation and to automatically calculate the pole interdistance optimizing longitudinal uniformity;
- Regular/Irregular Roads for managing roads with more than one carriageway with luminaires of different kinds and heights and according to different types;
- Tunnels to define a rectilinear road tunnel installation;
- Electrical lines to calculate the drop in voltage at the ends of the electricity lines of road lighting installations and interiors.



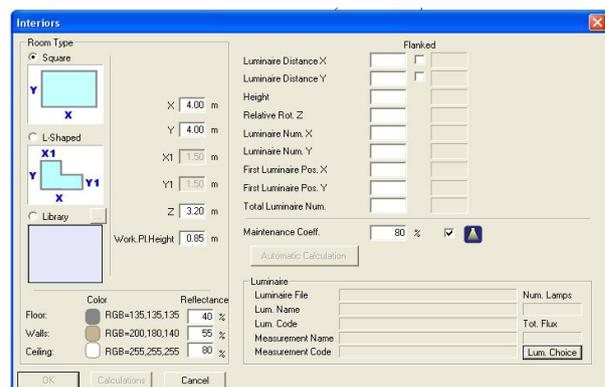
Wizard Project Menu

Interiors

This function allows you to automatically define a lighting device installation in an interior chosen from the available options.

Selection of the function opens the window in which to define the following elements:

- Room Type: this is where you can choose the room you wish to work on from the available options which are:
 - Rectangular plan room: in this case you must enter the measurements of the length, A, width, B, and height, H
 - L-shaped room: there are 5 measurements to be entered here, A, B, C and D as shown in the figure as well as the height H
 - Room from library: selection of this button opens the window containing the rooms available in the library; when you choose



Internal Parameters Definition

one of these the program shows the window in which to choose the dimensions of the bounding box of the room.

o define the colors and reflectances of the floor, walls and ceiling. Here only one wall color can be defined: if you wish to have walls of different colors you have to use the Area/Change Color and Reflectance function.

- Luminaire Type: here you can define the luminaire/photometry data to be used in the project. To select press on the Selection key and the program will access the photometric database management functions (please refer to the LUMINAIRES/Add Luminaire function): once selection has been made the program shows the data in the relevant fields.
- Luminaire Layout: this section allows you to define the layout of the luminaires with the following options:
- By rows and columns (please refer to the Luminaires/Add Luminaires by Rows and Columns function)
- By means of calculating the total flux with which, given the average illuminance value of the area Working Plane, the program calculates the total number of luminaires needed to achieve the required level. To access the function press the Automatic Calculation key to open the relative window (please refer to the Luminaires/Add Luminaires Automatically function).

Finally press OK and the program proceeds to complete the relevant fields for luminaire layout in the Wizard Project/Interiors window.



NOTE

The WIZARD PROJECT/Interiors function handles only one luminaire at a time; should you wish to insert other luminaires after the area, luminaire type and layout have been defined and confirmed, you must select Free Project from the WIZARD PROJECT menu with which the project is reopened and you can gain access to the functions for adding other luminaires.

The lower part of the window contains the following buttons:

- OK: to confirm the insertion and leave the function. The program thus proceeds to automatically create the area complete with the luminaires in their projected layout
- Calculations: to directly access the calculations functions (Calculations/Start function)
- Cancel: to leave the function without saving the insertions made.

Roads

This function allows automatic definition of roads in configurations in conformity with norms, multi-lane with sidewalks, grassy areas and cycling paths, using different types of luminaires also at different heights.

Calculation can be effected in conformity with the norms or in free configuration. At each new access the program presents the last selected mode.

Selection of the function "Wizard Project" à "Roads" leads to an area in which the road under examination can be set out and modified in all its parts including selection and positioning of luminaires. To exit the road calculation area select "Wizard Project" à "Free Project" and then answer "NO" to the question "Do you want to return to Regular/Irregular Roads?".

Once a calculation has been set it is necessary to press the "Reset" button in the "General" section to modify the calculation parameters.

Functional Buttons

La finestra è dotata di 3 bottoni funzionali principali:

OK to confirm entry and move on to the next phase



Norm

If entry is not complete the program does not proceed and shows the missing element



NOTE

Calculations for direct access to the calculation functions (CALCULATIONS/ Start function) and

Cancel to cancel the operation and return to the Work Area view.

This window shows 3 folders (Tags), General, Roads and Luminaires: the active folder when the function is selected is General.

Norm

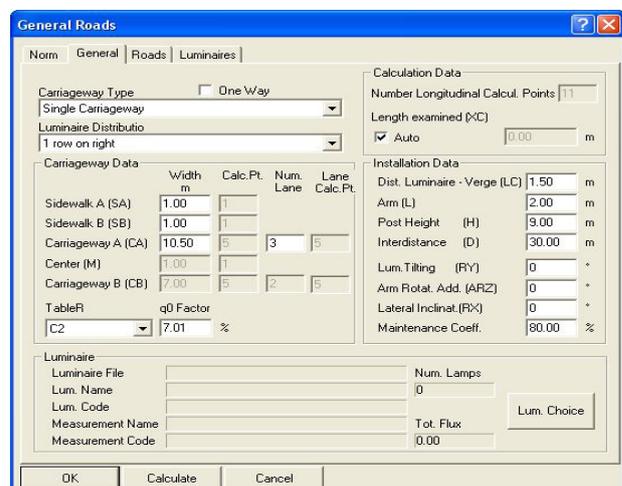
The Norm folder allows you to select the norm in conformity with which calculation is to be made. The available norms are: CIE 30, UNI 10439, CIE 140, CEN UNI 13201. The field "Age of observer", expressed in years, is editable when the norm requires it. The standard age is 2 years old. The field is active only for norms CIE 140 and CEN 13201.

General

This folder allows insertion of road parameters with which to create different configurations of roads and luminaires. The editability of each field depends on the road configuration and norm selected: fields such as the selection of number of calculation points are restricted by the calculation required by the norm.

The elements that can be set are therefore the following:

- One Way – defines whether the group of roads (carriageways) is traveled along in one direction or, if deactivated, in two opposite directions
- Carriageway Type – you can choose from the following options:



General

- Single Carriageway: in this case the program would create one carriageway and 2 sidewalks at its sides with the dimensions defined in the Carriageway Data section
- Two Symmetrical Carriageways: the program would create two carriageways of equal width, a central reservation and two sidewalks at the sides with the dimensions defined in the Carriageway Data section
- Two Asymmetrical Carriageways: the program would create two carriageways of different widths, a central reservation and 2 sidewalks at the sides with the dimensions defined in the Carriageway Data section
- Installation Type – you can choose between the following options that vary according to the type of carriageway selected:
 - Single Carriageway
 - One row on right
 - One row on left
 - Two opposite rows
 - Two staggered rows
 - Symmetrical Carriageways
 - Two opposite rows
 - Two staggered rows
 - One central row in each carriageway
 - Two opposite rows in each carriageway
 - Two staggered rows in each carriageway
 - Asymmetrical Carriageways
 - Two opposite rows
 - Two staggered rows
 - One central row in each carriageway
 - One row – Two rows opposite
 - One row – Two rows staggered
 - One row – Two rows opposite with double points in the central reservation
 - One row – Two rows staggered with double points in the central reservation.
 - Carriageway Data – here definition is made of the width of the road element [m] considered (carriageway, central reservation and sidewalks) and of the transversal calculation points of each element as well as the reduced reflection factor table (R Tables: C1, C2, R1,) and relative q_0 factor equal for each road element

Should a method conforming with the norms be selected, certain parameters such as number and position of the calculation points will be set according to this method and will, therefore, no longer be of the user's choice.



NOTE

In the case of sidewalks and central reservations the program automatically assigns a regular reflection to the surface defining it a pre-set reflection factor)

- Luminaire Data – this section allows you to choose the luminaire to be used in the installation; in the case of regular roads, there is only one. Please refer to the Add Luminaire function
- Calculation Data – here you can define certain calculation elements such as:
 - Number of Longitudinal Calculation Points: these are the calculation points in longitudinal direction (parallel to the road axis) taken within the area (stretch of road) under examination
 - Length of Stretch under Examination (XC): this is the length of the stretch of road under examination should the Auto option be deactivated. If the Auto option is activated 2 different cases may be presented:
 - If the Virtual Row of the Luminaires folder is activated the program considers a stretch of road between 2 successive luminaires



NOTE

If there are two or more rows of luminaires with different interdistances the program considers the row with the greatest interdistance.

The program automatically adds to the row a number of luminaires/poles that fit 5 times in the installation height before the area and 12 times after the area in the case of single traffic, 12 times both before and after in the case of two way traffic

- If the Virtual Row option in the Luminaires folder is deactivated the program considers a stretch of road corresponding to the number of poles defined in the Number of Poles box without adding other elements either before or after the area under examination

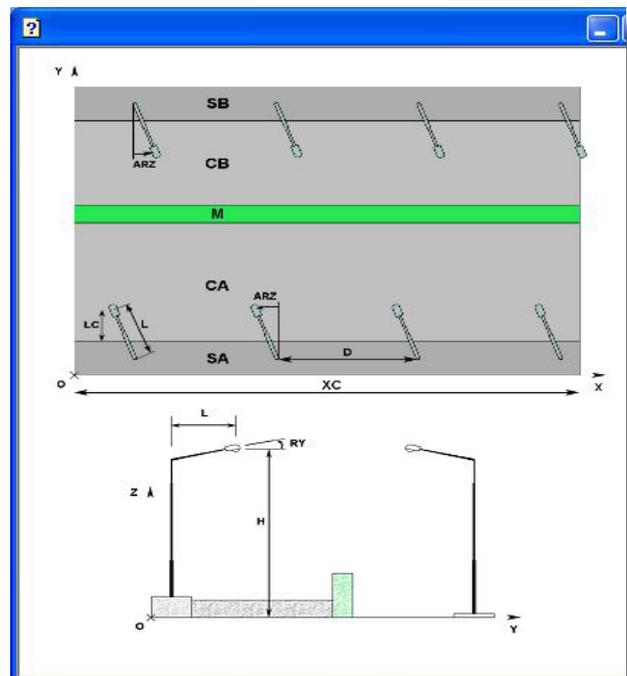
Should there be two or more rows of luminaires with different pole numbers and interdistances, the program considers the row with the greatest total length,



NOTE

- Installation Data – here you define the data relative to luminaire installation such as:

- Luminaire-Verge Distance (LC) [m]: the distance between the luminaire upright and the verge on which the pole stands
- Bracket (L) [m]: the projection length of the pole bracket on the horizontal plane
- Luminaire Height (H) [m]: the height at which the luminaires are positioned, taken as the height of the luminous center from the road surface at height 0 m
- Interdistance (D) [m]: the interdistance between two consecutive poles/luminaires positioned on the same side
- Luminaire Inclination (RY) [°]: the inclination according to which the luminaire is rotated around the axis parallel to the road axis and passing through its own luminous center. 0° inclination is obtained with horizontal luminaire and vertical luminous axis and rotation is positive when the luminaire rotates anti-clockwise for an observer who has the pole supporting the luminaire on his left.



General - Help Window

This rotation takes place around the intrinsic y axis of the luminaire since, in the default positioning of luminaires in a road, these are rotated 90° around their own vertical axis with respect to the X axis



NOTE

- Additional Bracket Rotation (ARZ) [°]: a luminaire positioned by default has the luminaire/bracket rotated by 90°, if positioned on the right with respect to a driver who arrives from the left (please refer to illustration) or 270° if on the right, with respect to the 0 reference taken according to the positive X axis. The additional rotation (ARZ) is necessary when rotation beyond 90° or 270° is required. ARZ additional rotation depends also on the traffic direction: if an additional rotation (for example 20°) is applied to a configuration of 2 opposite rows in a single traffic direction there will be a rotation of 90+20° for the right-hand row and of 270+20° for the left-hand row; in the case of two way traffic it will be 90+20° and 270+20°.
- Lateral Inclination (RX) [°]: this inclination allows you to rotate the luminaire around its own intrinsic x axis, that is around the axis parallel

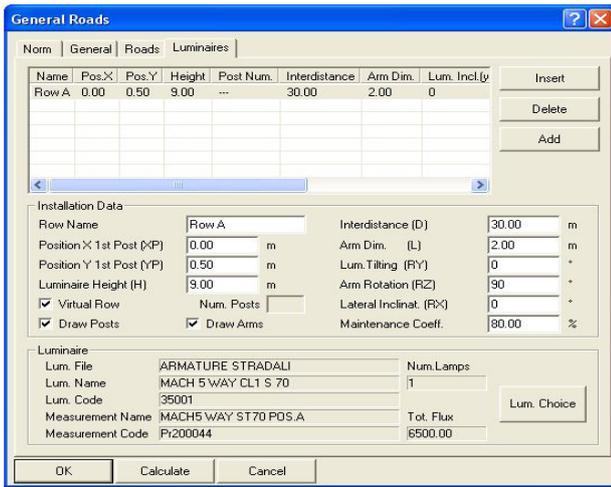
to the lamp and passing through it.

- Maintenance Coefficient [%]: the maintenance coefficient which is the same for all luminaires takes into account the reduction of the lamp flux in time as well as the dirt factor which causes a further reduction of luminous flow from the luminaire.

A dual carriageway is considered by default a two way traffic system: should the dual carriageway be one way the option 'One Way' must be selected. In this case the program considers the traffic direction from left to right.

Roads

Selection of the 'Roads' Tag opens the window in which to define new road elements such as lanes, sidewalks or grassy areas (areas of vegetation between one lane and another or between a sidewalk and a lane). The order and type of element can be inserted and modified in a table. Buttons alongside the table allow the following functions:



- Duplicate: duplicates the selected table element;
- Delete: the selected table element is deleted;
- New: allows a new element to be inserted in the list. The main element of the list is called "zone". The zone is identified by the name that appears in the left column of the grid. Each zone may be composed of a number of elements. Pressing the "New" key shows a list from which to choose whether to add a new zone or new element to the current zone.

Roads

In the definition of the different zone characteristics the following parameters can be defined:



Roads

- Description: this is the name or reference given to the road element to be defined
- Lane Width (W) [m]: this is the width of the lane / sidewalk / grassy area
- Direction of traffic: to identify the traffic direction
- Zone description: name of the zone;
- Zone width: this indicates the total width of the zone, also as a sum of the single elements composing it. The field is not editable.
- Zone type: the type of zone can be identified so as to define the way in which to carry out the calculation in that specific zone. The available zone types are: Secondary, Motor traffic and Cyclist/Pedestrian..
- Class of Illumination: this allows you to choose from the different classes into which regulations subdivide roads according to traffic volume and speed, and position with respect to the city center
- Zone Height [m]: this is the height of the zone with respect to the reference plane at height 0 m; in fact the program allows calculation to be made also for roads situated at heights other than 0 m as in the case, for example, of flyovers or sidewalks;
- Surround width: the dimension can be modified for calculation of the lateral visibility parameter sr.
- Color: this is the color to be attributed to the road element, useful when producing a rendering after the calculations
- Diffuse/Non-Diffuse: here you can define the reflection type of the surfaces

under examination choosing between *Diffuse* (according to Lambert's Law on regular reflection), for which only the Reflection Factor must be defined (percentage between 0% and 100%: it is advisable never to use a reflection of 100%), and *Non-diffuse* (not regular but real reflection) for which you must define the Reduced Reflection Factor Table from tables C1, C2, R1 ... R4 and the q_0 reflection factor. In the latter case the position of the observer must be defined (x relative to the origin and y relative to the right-hand verge of the carriageway stretch) to allow for calculation of the luminances on the stretch of road under examination; in the case of diffuse reflection the position of the observer is unimportant since the luminance values are independent of his position (all observers see the same luminance values).

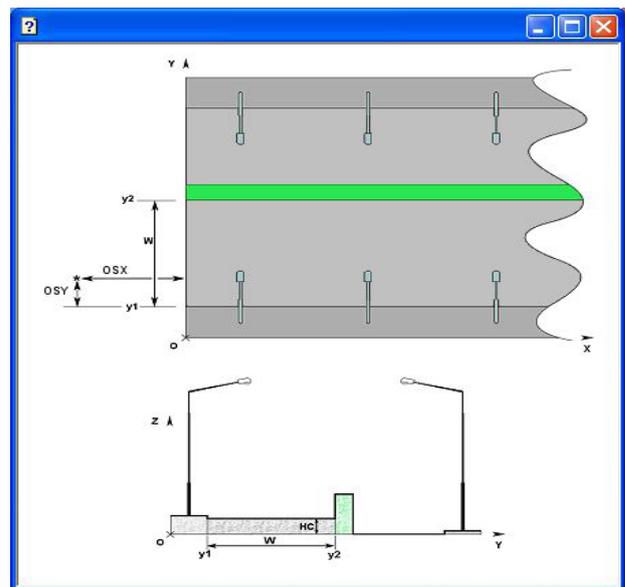
Luminaires

Selection of the 'Luminaires' Tag opens the window in which to define the rows of luminaires to associate with the stretch of road under examination.

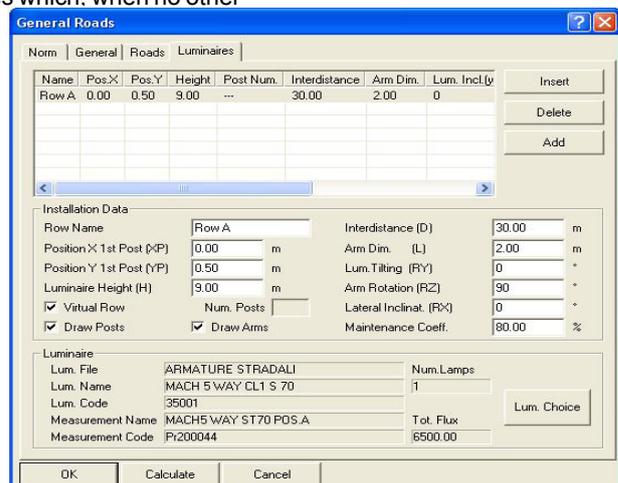
- **Insert:** this allows you to insert a new row of luminaires which, when no other row is already present, takes on the default values. If there are already inserted rows, on selecting of one of these, and pressing the Insert button, the program proceeds to insert first the selected element and then a new one with the characteristics of the first
- **Delete:** this allows you to delete the element from the selected table
- **Add:** this performs the same function as Insert but the new element is added to the already inserted elements.

For the definition of the different characteristics the following parameters can be defined:

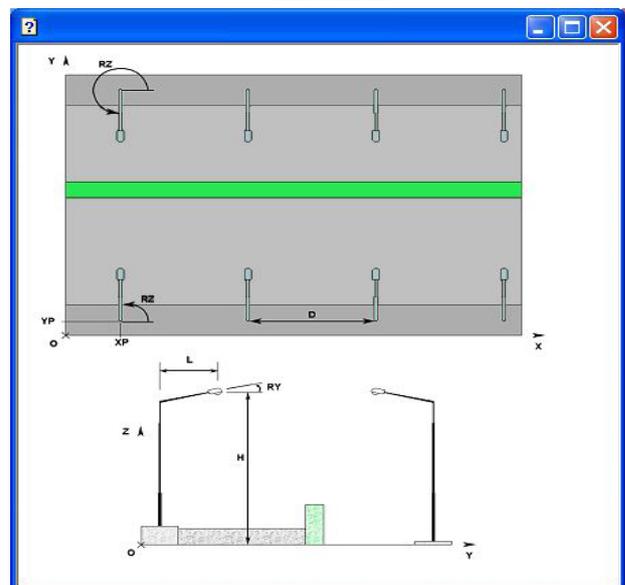
- **Row Name:** this is the name or reference attributed to the row of luminaires to be defined (for example Row A or Row 1 ...)
- **Position X – Y First Pole [m]:** these are the absolute X and Y coordinates of the first pole in the row
- **Luminaire Height (H) [m]:** this is the luminaire installation height and corresponds to the distance between the reference plane at 0 m height and the luminous center of the luminaire
- **Interdistance (D) [m]:** the interdistance between 2 consecutive luminaires in the same row
- **Bracket (L) [m]:** the projection length of the pole bracket on the horizontal plane
- **Luminaire Inclination (RY) [°]:** this is the inclination (rotation) of the luminaire around its own y axis (please refer to [Cartesian References and Luminaire Aiming](#) in the Introduction)



Roads - Help Windows



Luminaires



Luminaires - Help Window

- Bracket Rotation (RZ) [°]: the rotation around the vertical axis (z) of the luminaire bracket taking the positive X axis as 0 reference
- Lateral inclination (RX) [°]: the inclination (rotation) of the luminaire around its own x axis (please refer to [Cartesian References and Luminaire Aiming](#) in the Introduction)
- Maintenance Coefficient [%]: the maintenance coefficient which is the same for all luminaires in the row takes into account the reduction of the lamp flux in time as well as the dirt factor which causes a further reduction of the luminous flow from the luminaire.
- Virtual Row: if the option is activated the program prolongs the row of luminaires outside the area under examination to take into account the contribution of all the luminaires; the number of luminaires added is equal to the number of luminaires/poles that fit in 5 times the installation height before the area and 12 after (the direction of the driver is observed) if the traffic is one way, 12 times both before and after if the traffic is two way. If the option is not activated the program asks for definition of the length of the row
- Draw Poles: the program draws the poles when activated, but this is not required when inserting a number of luminaires mounted on a single pole which has to be defined only once
- Draw Bracket: if activated the program draws the bracket, that is the joining element between pole and luminaire.
- provoca un'ulteriore riduzione del flusso luminoso.

Each row can host different types of lighting elements: in the "Luminaire" section the luminaire of the row can be chosen by selecting the Select Luminaire button: please refer in this case to the Luminaires/Add Luminaire function.

Tunnels

This function allows you to automatically define a lighting installation in a rectilinear road tunnel tract.

The parameters to be defined are:

- Tunnel Type – this is the type of tunnel section which can be selected from one of the available four types (barrel-, rectangular-section, etc.)
- Dimensions – these are the dimensions characterizing the tunnel such as:
 - Length: the length of the tract of tunnel [m]
 - Height: the height in the central part of the tunnel [m]
 - Lane Width: the lane width, all taken as being the same width [m]
 - Number of Lanes: the total number of lanes inside the tunnel
 - Distance Verge-L (Left) – R (Right) Wall: this is the distance across the road between the verge and the base of the wall itself [m]; this distance allows the definition of the pavement
- Luminaires – to define the data relative to luminaire type and positioning:
 - Height [m]: the height at which the luminaires are positioned, intended as the height of the luminous center from the road surface
 - Installation Type: the type according to which the rows of luminaires are organized which can be chosen from:
 - one row on the right verge
 - one row on the left verge
 - two facing rows
 - two quincuncial rows
 - one row on median strip
 - one row centrally and on the verges
 - Inclination [°]: the inclination according to which the luminaire is rotated around the axis parallel to the road which passes through its luminous center. 0° inclination is obtained with horizontal luminaire and vertical luminous axis and rotation is positive when the luminaire rotates in anti-clockwise direction with respect to an observer who has the post bearing the luminaire on his left
 - Rotation [°]: the rotation according to which the luminaire is rotated around the vertical axis which passes through its luminous center. 0° rotation corresponds to luminaire with semi-plane C-0° towards the right, as in roads where the default condition considers all luminaires rotated by -90° with respect to the norm (for example Interiors)
 - Lateral Inclination [°]: the inclination according to which the luminaire is rotated around the axis perpendicular to the road which passes through its luminous center. 0° inclination is obtained with horizontal luminaire and vertical luminous axis and rotation is positive when the luminaire rotates in anti-clockwise direction with respect to an observer who has the luminaire in front of him and the post bearing the luminaire behind the latter.



ONLY LITESTAR Pro

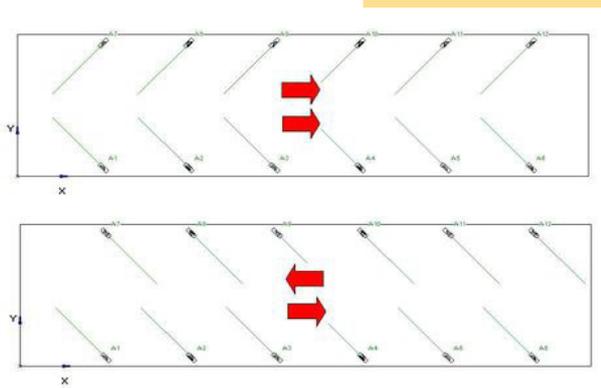
Tunnel Parameters Definition

- Interdistance [m]: the interdistance between two consecutive posts positioned on the same side
- Row Start [m]: the position of the first luminaire in the row to be set out longitudinally along the X axis
- Row Length [m]: the total length of the row of luminaires intended as the distance between the centerpoints of the first and last luminaires
- Left Verge Distance [m]: the distance of the vertical axis passing through the luminous center onto the road surface from the left verge of the road. It is considered positive if measured towards the middle of the road
- Right Verge Distance [m]: the distance from the vertical axis passing through the luminous center onto the road surface from the right verge of the road. It is considered positive if measured towards the middle of the road
- Maintenance Coefficient [%]: the maintenance coefficient which is the same for all luminaires.

The luminaire parameter definition section also includes the Lum. Select. (Luminaire Selection) button with which to gain access to the management functions of the photometric database and select the photometry to be used in the project. Please refer to the chapter Luminaires/Add Luminaire concerning this.

- Carriageway – to define the parameters relative to the carriageway such as:
 - One Way or Two Way: this allows handling of the plus and minus rotation of the luminaires positioned along the left row of the tunnel. For example, in the case of positioning asymmetric luminaires counter-flow, i.e. in the opposite direction to that of the traffic, the setting of the luminaires in the 2 cases would be as seen in the figure.
 - R Table: the reduced reflection factor table with which road surface luminances are calculated. 2 different kinds of table, R and C, are available
 - q₀ Factor: the reflection factor determining the table.
- Walls – to define the parameters relative to the type of wall reflection whether Diffusive Walls (in this case you need define only the Reflection Coefficient) or Non-Diffusive Walls (in this case you must define both the R- C- Table to be applied and the relative q₀ value: this solution however leads to an error, and therefore to approximation in the results, due to the fact that the reduced reflection factor tables are only valid when the observer is situated on the carriageway at a distance of 60m from the first calculation point whereas as regards the walls the observer is placed on a vertical plane which is the continuation of the tunnel wall itself.

The active buttons in the window are:



One Way - Two Ways

- **OK** to confirm entry and leave the function. The program then automatically proceeds to create the section of tunnel defined
- **Luminance Curve** to access the function for determining the luminance curve inside tunnels (see description below)
- **Calculations** for direct access to the calculation functions (CALCULATIONS/Start function)
- **Cancel:** to leave the function

Luminance Curve

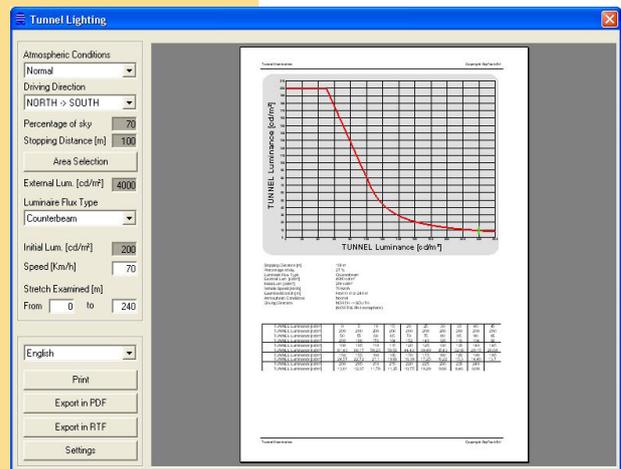
With this function you can define the theoretical luminance trend curve inside the tunnel according to Recommendations CIE 88 1990.

The parameters to define are as follows:

- Atmospheric Conditions – this is the state of the area around the entrance to the tunnel and seen inside the cone with an angle of 20° typical of the field of vision of the human eye. It is possible to choose between Normal and Snow
- Driving Direction – this is the direction of the traffic to be chosen from 4 possible options: North-South – South-North – East-West – West-East
- Choose Environment – this option allows you to define the type of environment around the tunnel. You can choose from 8 available type proposals for reference for recreating as closely as possible the actual situation. Each image is associated with default values of the Stopping Distance [m] and Percentage of Sky [%] within the visual field of 20°, values which can be modified when necessary (stopping distance can be chosen from 60, 100 and 160 m). When definition is complete press OK to confirm or Cancel to exit without making any modifications.

If you select OK the program shows in the main window the 2 values of the stopping distance and percentage of sky in the visual field and indicates the total value of External Luminance [cd/m²] calculated according to the choices made: External Luminance, also called L₂₀, is the total luminance of the area as perceived by the eye of the observer-driver in the field of 20°, supposing that the observer is looking in the direction of the tunnel exit

- Lighting System – this is the type of lighting system utilized on the basis of the prevailing luminous emission of the luminaires: you can choose between Counterbeam (luminous emission is mostly in the opposite direction to the traffic) and Symmetrical (luminous emission is both opposite and in the direction of the traffic and subdivided in equal parts) Selection of system type allows you to define the value of the L_{th}/L₂₀ ratio, (see following table), that is to say the ratio between the luminance in the entrance stretch (threshold) of the tunnel and the external luminance and, therefore, to determine the value of threshold luminance L_{th}, shown in the relevant box.



Luminance Curve

| | Lighting Systems | |
|-----------------------|---------------------|---------------------|
| | Counterbeam | Symmetrical |
| Stopping Distance [m] | $k = L_{th}/L_{20}$ | $k = L_{th}/L_{20}$ |
| 60 | 0,04 | 0,05 |
| 100 | 0,05 | 0,06 |
| 160 | 0,07 | 0,10 |

- Speed [km/h] – this is the speed of the motor vehicle that is approaching entry to the tunnel
- Stretch Examined [m] – here you can define the stretch of tunnel between the beginning and end under examination.

Several selection keys or windows are available such as:

- Define – to define the language to be used in the ratio
- Print – to proceed to document printout

- Export PDF–RTF – to export the document in PDF or RTF format
- Settings – to configure the document and certain calculation parameters:
- Northern Hemisphere – Southern Hemisphere: to choose the hemisphere in which to carry out calculation
- Horizontal – Vertical: to define orientation of the print module
- Abscissa – Ordinates: to define the grid step according to the 2 axes
- Colors – to define the colors of Line 1 (L_{th} luminance curve), Line 2 (indication of Limit of Stretch Examined) and Background, Axes and drawing text.
- Exit – to leave the program module.

Electrical Lines

This function allows you to calculate the fall in voltage at the ends of single-phase and three-phase electrical distribution lines of lighting installations with luminaires installed in continuous rows also with several branches.

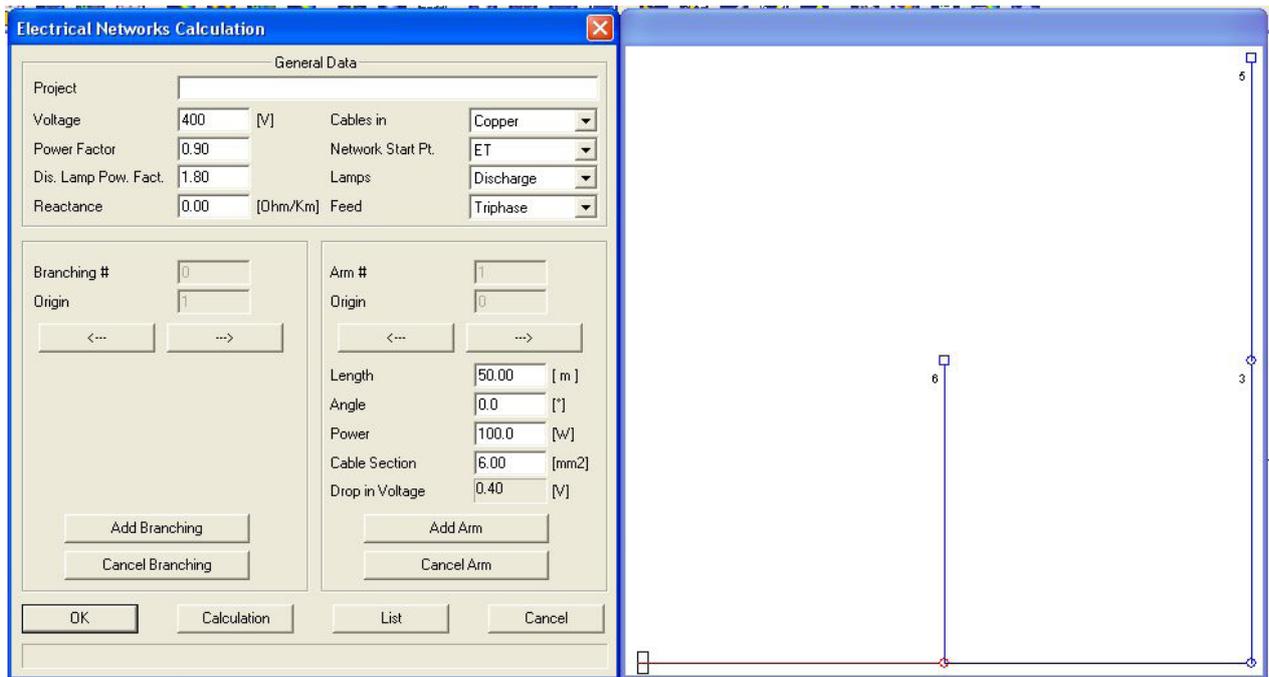
Its selection opens the data input window which features 3 sections:

- **General Data** in which to enter installation data such as:

- Project – here you can insert a project description or reference code
- Voltage [V] – this is the line feed voltage and can be single phase (for example 230V) or triphase (for example 380): it is important that in whichever case the suitable type of feed is selected from the Feed box
- Power Factor ($\cos\phi$) - this is a number from 0 to 1
- Power Factor for Discharge Lamps – this is the factor to apply to the basic voltage drop formula in order to consider the hardest working conditions at the time of lamp turn-on. This value is fixed by national legislation: for discharge lamps it is usually 1,8
- Reactance [Ohm/km] – this is the reactance of the system calculated in [Ohm/km]
- In Cables – this allows you to define the type of cables used in the installation; the choice is between Copper and Aluminum
- Line Start – this allows a choice between ET and CM according to the type of feed (ET = transformer room; CM = switchboard). The choice does not however affect the project
- Lamps – this allows you to choose what type of lamp to use whether Discharge or Incandescent.
- Feed – here you can define whether the feed line is single phase or triphase; the choice between the two is important to be able to apply the correct formula.

The program allows you to define different ramifications each made up of different branches whose management is described below:

- **Ramification Section** - in this part a new ramification can be inserted starting from the active point of a branch (a branch is active when it is red – a branch is a single element of a ramification).
To enter a new ramification press Add Ramification and the program automatically adds the first branch of the new ramification, automatically giving it a ramification number in sequence (Ramification Number field) and indicating the origin from which the ramification starts (Origin field).



Electrical Lines Definition

To move from one ramification to the other use the left-right arrows: with the right arrow the ramification number decreases, with the left it increases, always however by one.

To add a second branch to the ramification please refer to the Branch section.

The program also allows you to delete a ramification: in this case select it with the right-left arrows and then press the Delete Ramification key.

- **Branch Section** – this part of the window allows branch data to be entered or modified. To enter a new branch press Add Branch and the program activates a new branch with preset data such as:
 - Length [m] – this is the length of the distance between 2 consecutive luminaires
 - Angle [°] – this is the angle of the branch with respect to 0° reference (0° reference has horizontal direction towards the right)
 - Wattage [W] – this is the wattage of the added luminaire lamp
 - Cable Section [mm²] – this is the section of the cable that joins two consecutive luminaires or a luminaire and the feed point

In the Voltage [V] Fall box, the program shows the calculated value of the fall in voltage between the selected luminaire and the feed point.

To enter a new branch select Add Branch: the program automatically proceeds to add the new branch according to the preset parameters which may be modified at any time. To delete a branch just press Delete Branch.

The insertion of each branch is visualized on the drawing plane; the drawing created is in scale with the dimensions of the inserted branches.

Functional Buttons

The window has 4 functional buttons:

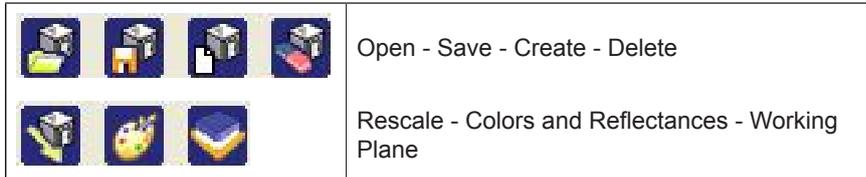
- **Cancel** to cancel the operation and return to the Work Area
- **Calculation** to calculate the fall in voltage which is then shown in the Voltage Fall field

- **List** to show the calculation results and data such as the current in each branch [A], the partial voltage drop in each junction [V] and the total voltage drop [V]
- **Confirm** to save data and results.

AREA

The Area menu includes all the commands to handle the Room, from surface color definition to room scaling.

Icons (Toolbar Room)



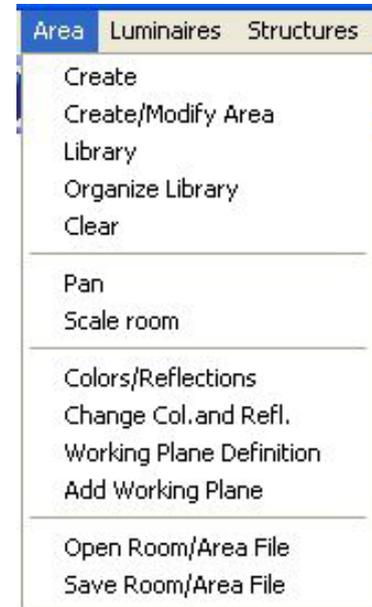
The menu presents the following features:

- Create Room to create a new area of interiors or exteriors
- Create/Modify Area to create a rectangular plan area or modify a previously defined plan.
- Library to access standard configurations of rooms with irregular ceilings
- Organize Library to access the Windows Explorer window for handling operations connected with the library files such as name change or their movement into a different folder
- Cancel to cancel the existing environment on the working plane
- Pan to move the origin of the absolute Cartesian axes X-Y-Z system with respect to the area under examination
- Scale Room to scale the room according to needs
- Colors/Reflectances to change the colors and reflectances of the room surfaces
- Working Plane to change the working plane height
- Add Working Plane to add a calculation detail;
- Open Room to open an existing room or to access the list of predefined Rooms
- Save Room to save the current room without luminaires and furniture.

Let us consider each in detail.

Create New Area

Create Area allows you to create a completely new area or to replace an existing one (the operation is only possible after the operator's confirmation): in this case the furniture and luminaire configuration, if already set, remains unchanged.



Area Menu

In many cases it is helpful to have the plan drawing of the area you are working on as a background on which to more easily draw the area concerned; this can be done by importing a file in DXF 2D format (this is the AutoCAD data exchange format also used by many other CAD programs) by means of the DXF/Import as Background function.

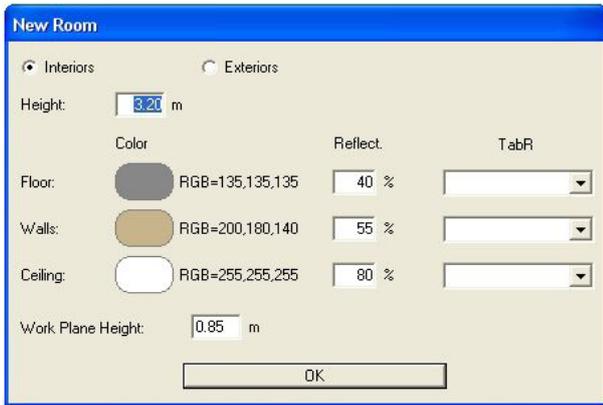


NOTE

The first step is to select the AREA/Create Area function with which the program activates the lower Toolbar and the entry functions via mouse.

The plan may be entered in three different ways even within the same project:

- using the mouse and grid points: click (left button) on the Working Area and then move the mouse across the screen. As you move the mouse the segment will be displayed. The segment has two anchor points on the grid. The second anchor point is set when you press the mouse button. Its co-ordinates are shown in the Lower Working Bar. Further segments can be added to the line until the room plan has been fully defined. Note: the line must be closed at the end by clicking on the starting point.



Room Data Definition

You may also input curved walls. The program approximates a curve with a broken line of linear segments whose number of sides is defined by the user. Click on the right button of the mouse (instead of the left one) and drag the mouse across the screen. The radius length and the mouse co-ordinates are shown on the top left-hand corner of the monitor. The end point of the curve is set when you press the left button of the mouse. A window appears on the screen and you should enter the number of sides of the curve. The lower the number of sides used the quicker the program will run. Confirm the input by clicking OK.

The last segment can be inserted using the Last and End keys in the Lower Working Bar: the first allows you to close the dotted line and to have a wall closing the area; in the second case the program does not consider the wall and the area is to be considered open.

- using the Lower Working Bar: you can input segments of defined length and direction. Click on the angle box and input a value. A value of zero means the segment is parallel to the x-axis. If a positive angle of rotation is entered the line segment is rotated counter clockwise as you look at the Working Area. Press the TAB key and then enter the length of the segment. Click OK to confirm input. Instead of using the TAB key you can select different points of the box using the mouse. The relative position of the second extreme of the segment is indicated by the relevant boxes.

The Lower Toolbar also includes the following buttons:

- **PAN**: this allows movement of the drawing within the Working Plane. On selection of the PAN button the mouse arrow is substituted by the drawing of a hand: by pressing the left mouse button the drawing is captured and may be moved in all directions within the Working Plane
- **ZOOM**: this allows enlargement or reduction of the drawing (zoom in and zoom out). There are 2 modes:
 - Pressing the left mouse button and moving the mouse upwards effects enlargement (zoom in), moving it downwards reduces the drawing (zoom out)
 - Pressing the right button and keeping it pressed, the program opens a rectangle whose contents are enlarged to occupy the whole screen when the button is released

To enlarge, (zoom in), rotate the mouse wheel forwards, rotate backwards to reduce the drawing (zoom out)

- **GRID**: this function allows you to change the step of the Working Plane grid and therefore to change the scale according to which the drawing is represented. Selection of GRID opens the window in which to manually insert the grid step: select OK to confirm input.

When changing from input via mouse to that of the Lower Toolbar the program momentarily deactivates the definition of the segments using grid and mouse: to reactivate click once with the left mouse button on the Working Plane.

The last segment can be inserted using the Last and End keys in the lower toolbar: the first allows you to close the dotted line and to have a wall closing the area; in the second case the program does not consider the wall and the area is to be considered open.

- using the mouse without using the grid points. This is a fast, but not very precise way to input the room plan. Position the mouse arrow on any point of the Working Area, hold down the Shift key and press the left button of the mouse. It is important here too to close the polygonal at the end.

Should you wish to eliminate a segment of the room that has just been entered, press the ESC key and repeat the operation to eliminate other segments. Once the polygonal has been closed it is not possible to eliminate any segments and, to do so, the room must be entered again from the beginning.

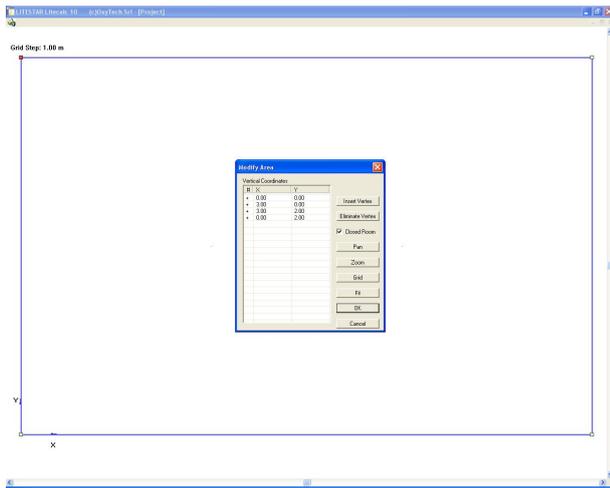


NOTE

These 3 options may be used alternatively to define the same project. Once the geometry of the room has been concluded by closing the shape, the program displays the window in which to define the following parameters of the room:

- area type whether Interior or Exterior: alternative type option
- the height of the room [m] taking into consideration that it has a plane ceiling
- the color, reflectance and R tables of reduced reflection factors for floor, walls and ceiling
 - Color Definition: to define the color of the surface just click on the surface color and this opens a window in which to choose the desired color or set the 3 RGB values precisely.
 - Reflectance Definition: the central column is used for reflectance definition, with a percentage (%) between 0% and 100% that indicates the quantity of light reflected by the surface under examination. On selection of the surface color the program automatically associates a predefined reflectance value that may however be altered if necessary. The definition of this value, without defining any R table, indicates that the type of reflectance is of the regular or diffuse kind, also called Lambertian reflectance
 - R and C Table Definition: R tables are reduced reflection factor tables and allow for the definition of surface reflectance types that are different from the normal diffuse kind. The R and C tables have been designed for calculating the illuminance values in road lighting installations and refer to an observer driving at a height of 1.5 m from the road surface, i.e. who sees the calculation points from an angle of approximately 1°. The R and C tables are two-dimensional matrixes without the elevation coordinate (since the angle of vision is close to 1° it is considered negligible): their use in an interior, where the calculation points are very close to the observer, is therefore not recommended.

Select OK on conclusion of parameter definition and the program will return to the working plane.



Modify Area

Create/Modify Area

This function has 2 different modes depending on the state of the program, that is whether or not there is a plan in the Working Plane.

On selection of the function, the program displays a rectangular area when a plan in the Working Plane is not available whereas if an area has already been defined, the program displays its perimeter: in both cases the sides of the perimeter are blue and the vertices are marked with small squares.

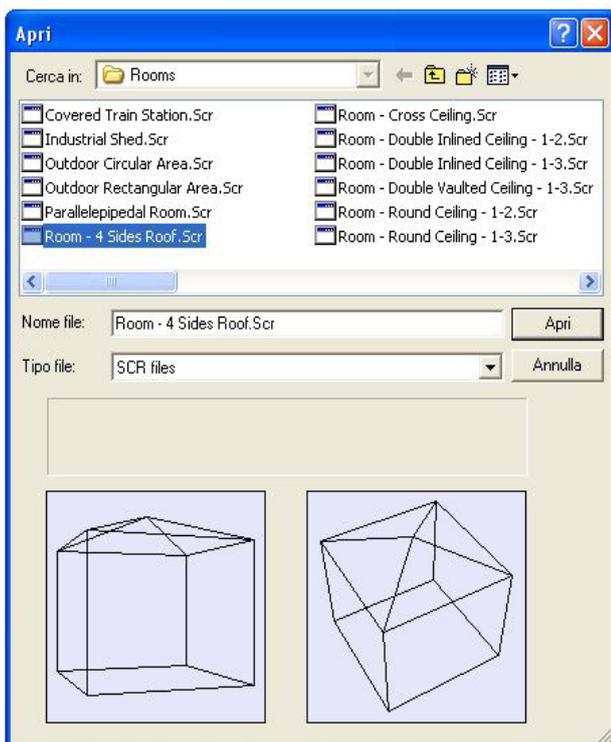
By keeping the left mouse button pressed on one of the vertex squares of the area (the vertex is thus automatically activated and becomes red) and moving over the working plane the area is automatically modified.

If the movement is made without pressing Shift, it occurs with SNAP activated (that is to say that the movement only occurs on the grid points), whereas, if Shift is pressed, the movement is free.

The Modify Area window is also available and features the

following characteristics:

- From the X and Y vertex coordinates: clicking on one of the available boxes enables you to edit the field in which the new coordinate is to be entered; to move among the various boxes use the TAB key which can also be used for confirming the entered data
- Insert Vertex: this allows a new vertex of the area to be inserted after the active red vertex. The area path direction is anti-clockwise
- Eliminate Vertex: to eliminate the active red vertex and the corresponding parts of the area
- Closed Room: on selection of Closed Room the program proceeds to close the area with a wall that corresponds to the last section of the perimeter
- PAN: to activate PAN (movement) of the area on the Working Plane
- ZOOM: to activate ZOOM (enlargement/reduction) of the area on the Working Plane



Library

• GRID: to activate the grid management window of the Working Plane which is characterized by the following elements:

- Step [m]: this is the step between 2 consecutive grid points
- Multiple 1 [m]: indicates after how many steps the grid point is represented by a small '+'
- Multiple 2 [m]: indicates after how many steps the grid point is represented by a large '+'
- Start X – Y – Z: indicates the offset of the points grid with respect to the axes origin. Where necessary it is preferable that the SNAP/grid points are in different positions from those defined with Step.

Library

The AREA/Library allows you to choose rooms from the library of predefined shapes which can be re-scaled according to your needs. The library also contains rooms with non-plane ceilings, such as vaults, spires, sloping planes etc.

To access the library choose the Area/Library command

and the window from which to select the predefined area appears on the screen.

When you select a room or area you are asked to enter the dimensions of its bounding box adjusting the default values as well as the height of the working surface. After confirming input another window appears on the screen where you enter the colors and reflectances of the floor, walls and ceiling.

To define the surface color just click on the surface color and a window opens in which to choose the desired color or precisely establish the 3 RGB values.

The program associates to each color a corresponding value of reflectance: this percentage value is to be taken as the average value and may be modified as required. Finally select OK to confirm selection.

Color and Reflectance Definition

Scale Room

The Scale Room command allows you to modify the dimensions, and thus the shape, of the room along the X, Y, Z planes (X, Y for exteriors)

If you choose this command a window with the room bounding box dimensions in meters appears. Input the new bounding box dimensions and click OK to confirm. The room will be remodeled with the new dimensions.

Now a window appears on the screen where you input the working plane height. Click OK to confirm input, or Cancel to cancel any changes and you return to the Working Plane.

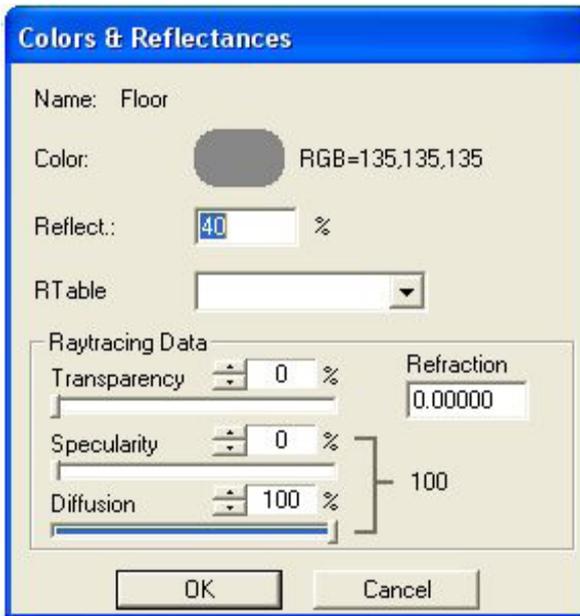
Scale Room

Colors and Reflectances

This command allows you to modify:

- previously defined colors and reflectances of the surfaces of the room.
- Color Definition: to define the color of the surface just click on the surface color and this opens a window in which to choose the desired color or set the 3 RGB values precisely.
- Reflectance Definition: the central column is used for reflectance definition, with a percentage (%) between 0% and 100% that indicates the quantity of light reflected by the surface under examination. On selection of the surface color the program automatically associates a predefined reflectance value that may however be altered if necessary.
The definition of this value, without defining any R table, indicates that the type of reflectance is of the regular or diffuse kind, also called Lambertian reflectance
- R and C Table Definition: R tables are reduced reflection factor tables and allow for the definition of surface reflectance types that are different from the normal diffuse kind.
The R and C tables have been designed for calculating the illuminance values in road lighting installations and refer to an observer driving at a height of 1.5 m from the road surface, i.e. who sees the calculation points from an angle of approximately 1°. The R and C tables are two-dimensional matrixes without the elevation coordinate (since the angle of vision is close to 1° it is considered negligible): their use in an interior, where the calculation points are very close to the observer, is therefore not recommended.

Select OK on conclusion of parameter definition and the program will return to the working plane.



Change Single Surface Colors and Reflectances

Modify Color and Reflectance

This function is used to change the color and related reflectance or R table of one of the room or furniture surfaces. It also allows you to define the surface parameters useful for realizing Ray Tracing calculations such as:

- **Specularity:** to define the level of specularity between 0 (no specularity) and 1 (maximum specularity). Should you require the surface to be perfectly specular (mirror) the surface must be black with no more than 10% reflection
- **Roughness:** this is the roughness index of material and may have whole values
- **Transparency:** to define the transparency level of the surface between 0 (no transparency) and 1 (maximum transparency)
- **Refraction:** this is the refraction index of the material; some of the more commonly used materials have the following refraction indices: ice 1.31 – water 1.33 – glass 1.50 – flint glass 1.65.



NOTE

To start the Ray Tracing calculation use the specific function in the rendering module (VIEWS/3D View function).

Selection of the Change Color and Reflectance function opens the 2D view of the area and its management functions found in the lower toolbar are:

- **PAN:** this allows movement of the drawing within the Working Plane. On selection of the PAN button the mouse arrow is substituted by the drawing of a hand: by pressing the left mouse button the drawing is captured and may be moved in all directions within the Working Plane
- **ZOOM:** this allows enlargement or reduction of the drawing (zoom in and zoom out). There are 2 modes:
 - Pressing the left mouse button and moving the mouse upwards effects enlargement (zoom in), moving it downwards reduces the drawing (zoom out)
 - Pressing the right button and keeping it pressed, the program opens a rectangle whose contents are enlarged to occupy the whole screen when the button is released

To enlarge, (zoom in), rotate the mouse wheel forwards, rotate backwards to reduce the drawing (zoom out)

- **GRID:** this function allows you to change the step of the Working Plane grid and therefore to change the scale according to which the drawing is represented. Selection of GRID opens the window in which to manually insert the grid step: select OK to confirm input.
- **Plan-Front-Side:** is used to change the view between plan, front elevation and side elevation
- **Fit:** automatically re-scales the room in order to make best use of the available space
- **OK:** is used to confirm the selection of a surface. To select a surface point the mouse arrow at it and press the left key of the mouse, if the wrong surface is selected it can be deselected by pressing the same key a second time. Repeat the operation to select the desired surface.

After pressing OK the program at this point opens a window in which to modify the color or reflectance or R table of the selected surface and to define the Ray Tracing parameters; in the lower right hand part of the window is shown a sample of the selected color.

Once these parameters have been defined press OK to confirm or Cancel to abandon the function without modifying anything.

Working Plane Definition

You can change the working plane height using this command. When you choose the command a window appears on the screen where you can change the previously defined height. The working plane height should be entered in meters. Click OK to confirm the new input, or Cancel to exit the command without saving changes.

Add Working Plane

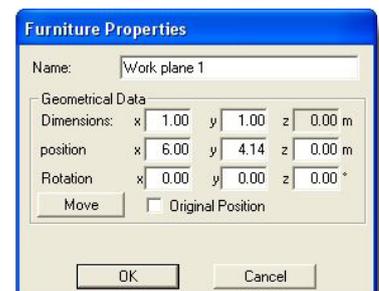
This allows you to insert a particular calculation surface on which to carry out measurement. This surface may be defined by its dimensions and position in the area and its rotation by the axes.

The surface is transparent and non-reflecting.

There is no limit to the number of surfaces that can be inserted.



Working Plane Height Definition

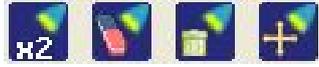


Add Working Plane

LUMINAIRES

This command allows you to manage the luminaires in the room under considera

Icons (Toolbar Project)

| | |
|---|--|
|  | Luminaires Duplicate - Delete - Delete All - Move |
|  | Luminaires List - Properties - Aiming with mouse |
|  | Absolute Rotations |
|  | Relative Rotation around Z Axis of Luminaire |
|  | Pan - Zoom - Grid |
|  | View Top - Front - Side - Fit View Room |
|  | View Axes - Grid - Redraw |
|  | View Bboxes - Complete |



NOTE

The current luminaire is represented by a red line.



Luminaires Menu

- Add Luminaire to add a new luminaire from the database
- Add Luminaire Groups to position a group of luminaires at constant intervals between consecutive luminaires or to automatically insert the luminaires at regular positions given the average illuminance value to be obtained
- Symmetrize Luminaires for a luminaire or group of luminaires with respect to one or more axes
- Duplicate Luminaire to copy the current luminaire, creating a new one
- Relative Luminaire Movement to effect luminaire movement along the 3 Cartesian axes
- Relative Z Rotation to effect a rotation of the current luminaire around its own vertical axis through its centerpoint
- Aim Luminaire to graphically aim the luminaire in a specific direction
- Delete Luminaire to delete the current element
- Multiple Selection to select (mark) a number of luminaires and create a group on which to effect elimination, movement or substitution operations
- Luminaires List to view the list of inserted luminaires and carry out relative movement and rotation operations

- Verify Interference to verify that the objects have no mutual points of interference
- Delete to delete all inserted luminaires
- Open Configuration to open a luminaire configuration previously saved
- Save Configuration to save a luminaire configuration defined in the project
- Properties to access the window showing the data of the selected luminaire

Let us consider each in detail.

Add Luminaire

This command allows you to select a new luminaire from the available library and to position it in the room. Luminaire selection first requires the definition of the type of device whether for Interior, Exterior or Road Lighting where the first and the last are measured according to the C-γ system and the second with the V-H system.

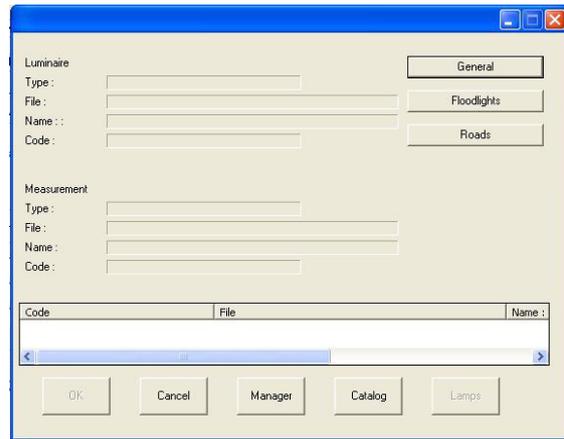
On selection of the type, for example, Interior, the program displays a window showing:

- File: This is the group of files in which the luminaires are organized. The file can be changed by clicking on the name or on the arrow towards the bottom right at which point the list of available file appears.
- List: this is the list of luminaires in the selected file where the luminaire code and relative description are displayed.
- Information (Measurement): here the information related to luminaire measurements such as the name of the measurement file, the measurement name and code; when all the data is complete the polar diagram associated with the measurement of the selected luminaire is shown on the right of the data. The data and polar measurement diagram are visualized at the same time as the luminaire list is scrolled. Each luminaire is usually associated with a single measurement but it is possible for a luminaire to have more than one photometry, such as in the case of luminaires with different possible lamp positions or which use dichroic lamps. In the case of more than one measurement associated with the same luminaire the program activates the Next and Previous functions with which to scroll the list of measurements associated with the selected luminaire.

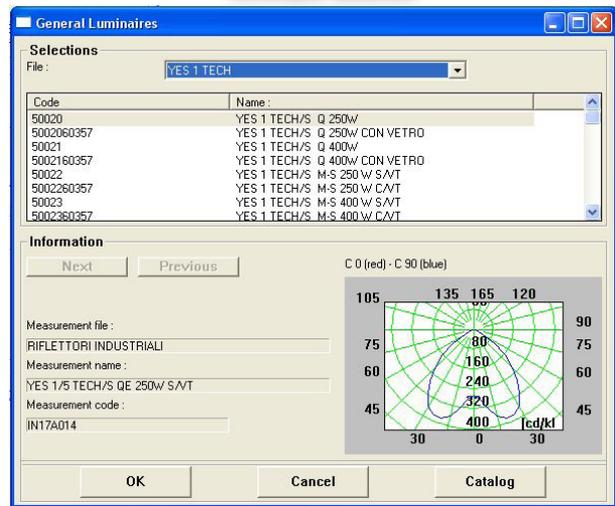
Once the photometry has been selected press OK (Cancel to quit the selection) and the program shows the selection window with completed Measurement and Luminaire items.

This window offers the following options:

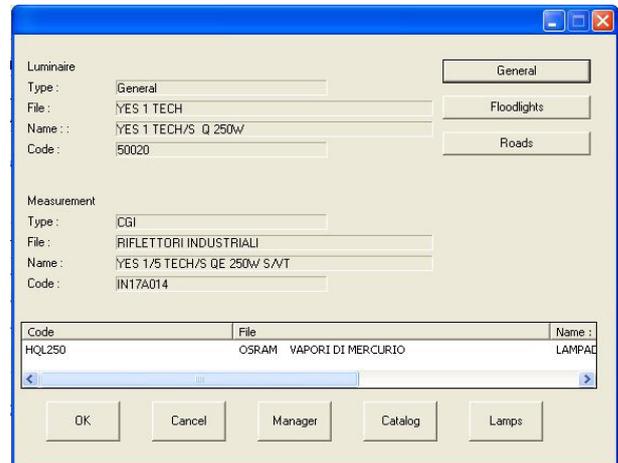
- Manager for access to the photometry management module (in this case refer to the Photowin module)
- Catalog for access to product catalog and management functions (please refer to Links/Operative Electronic Catalog - Liswin)



Luminaire Selection

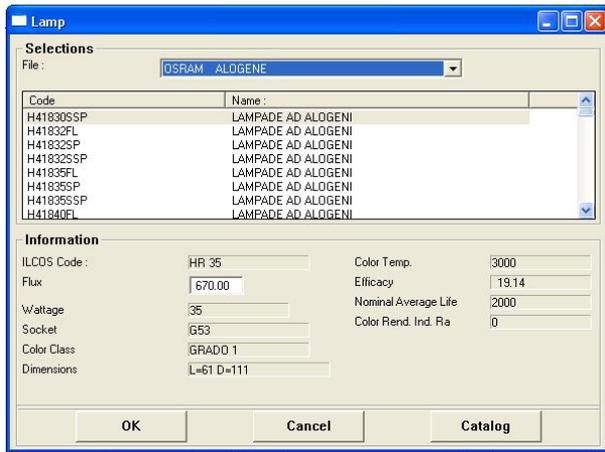


Luminaire List and Polar Diagram Selection



Luminaire Selection





Lamp Selection

- Lamps for access to lamp catalog

Click on the right mouse button on the drawing area to insert a luminaire in the indicated point; this opens a window in which you will find, amongst others, the menu item "Add luminaire here".

Lamps

The default lamp associated with the luminaire can be changed or substituted by entering the Lamp File using the 'Lamps' function key.

If you wish to change the default lamp first highlight it by clicking on it with the mouse; at this point, selecting Lamps the program displays the window showing the type of file (fluorescent, sodium lamps, etc.), the lamps contained in the file with the default lamp highlighted and, in the lower part, the technical data of the highlighted lamp: this data is all in read-only format apart from the lamp flux [lm] which can be modified; in this case calculation will be carried out according to the new value inserted.

The lamp list can be scrolled by selecting a different lamp, which will then take the place of the default lamp, and confirming your choice with OK.

The lamp list can be scrolled by selecting another lamp to replace the default lamp confirming the choice with OK.

It is also possible to access the lamp file without highlighting the default lamp; in this case the file can only be used for consultation.

#####

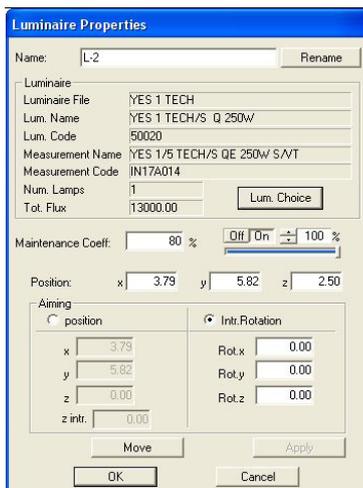
Once the new luminaire has been chosen press Enter or click with mouse on OK.



If the luminaire and associated measurement derive from import of photometric data in standard formats (such as Eulumdat, Cibse TM14, IESNA86, IESNA91 and IESNA95, LTLI), on selection of OK to confirm your choice, the program shows the selection window of the lamp or lamps to be associated with the luminaire.

After choosing the lamp or lamps, confirm the operation and the program will proceed to the following window.

At this point the program displays a window, showing the characteristics of the product under examination in the upper section, in which to input the following data:



Luminaire Properties Window

- Name (label): this is the identifying element of the luminaire
- Luminaire: this includes the references of the luminaire, associated measurement and lamp as well as the button (Luminaire Selection) to regain access to luminaire selection from the photometric database
- Maintenance Factor: this represents the percentage of flux emitted by the luminaire, with respect to its original condition, because of dirt and opacity of the reflector and refractor
- Off-On: by pressing on one of the 2 buttons it is possible to turn off or on the selected luminaire, and to dim it either by using the up-down arrows varying its value (max 100%, min 0%) or by pressing and moving the cursor to the left or right
- X, Y and Z position: this is the luminaire position according to the 3 absolute X, Y and Z coordinates
- Aiming: this is the aiming of the luminaire (directing) definable both in terms of Cartesian X, Y and Z and angular coordinates related to the rotation around the luminous axis of the luminaire itself (z) (intrinsic) and in terms of angular coordinates considered as rotations around the 3 axes of the luminaire (rotation).

Select OK to confirm input, Cancel to return to the Work Area without luminaire input

Once the first choice of luminaire has been made and the Add Luminaire function has been newly selected, the program directly accesses the Luminaire Properties window in which, if you wish to change the current luminaire, you must select the Luminaire Selection button.



NOTE

Add Luminaires in Groups

This function allows you to regularly add luminaires, by row and column, into the area under examination or to have the program insert them automatically given the average illuminance value required on the working plane.

Insertion by Row and Column

To insert a group of luminaires of the same type by row and column it is necessary to define the following parameters:

- **X-Y Luminaire Distance:** this is the distance between two consecutive luminaires in the same row, along both the X and Y axes
- **Height:** the height at which the luminaires are positioned, measured between the floor and the luminous center of the luminaires
- **Re Rotation:** this is the rotation of all the luminaires around their own vertical axis passing through the luminous center
- **Number of X – Y Luminaires:** this represents the number of luminaires along the X and Y axis
- **Position of First X – Y Luminaire:** the position of the first luminaire with respect to the origin of the axes
- **Total Number of Luminaires:** this is the total number of devices
- **Maintenance Coefficient:** this represents the percentage of flux that the luminaire emits taking into account luminous loss due to dirt and opacity of the reflector and refractor.

| Add Luminaires in Groups | | |
|--|------------------------------------|--|
| Flanked | | |
| Luminaire Distance X | <input type="text"/> | <input type="checkbox"/> |
| Luminaire Distance Y | <input type="text"/> | <input type="checkbox"/> |
| Height | <input type="text" value="2.928"/> | |
| Relative Rot. Z | <input type="text" value="0"/> | |
| Luminaire Num. X | <input type="text"/> | |
| Luminaire Num. Y | <input type="text"/> | |
| First Luminaire Pos. X | <input type="text"/> | |
| First Luminaire Pos. Y | <input type="text"/> | |
| Total Luminaire Num. | <input type="text"/> | |
| Maintenance Coeff. | <input type="text" value="80"/> % | <input checked="" type="checkbox"/> |
| Automatic Calculation | | |
| Luminaire | | |
| Luminaire File | YES 1 TECH | Num. Lamps |
| Lum. Name | YES 1 TECH/S Q 250W | 1 |
| Lum. Code | 50020 | Tot. Flux |
| Measurement Name | YES 1/5 TECH/S QE 250W S/VT | 13000.00 |
| Measurement Code | IN17A014 | <input type="button" value="Lum. Choice"/> |
| <input checked="" type="checkbox"/> Delete Previous Luminaires | | |
| <input type="button" value="OK"/> | | <input type="button" value="Cancel"/> |

Luminaire Positioning

It is also possible to define direct or indirect light luminaires: in the case of direct illuminance click on the box to the left of the graphic symbol of the beam opening; in the opposite case the program proceeds to automatically rotate this reference by 180° positioning the emission upwards.

The data must be input in the left-hand column (with white background edit boxes) while the right-hand column shows the same data, calculating and completing the remaining data should those input be insufficient. If they are insufficient the error condition is indicated on the right of the screen (Insufficient Data). If the input data is incompatible, the program displays the text 'Incompatible Data' on the right of the screen: this happens, for example, when the number of luminaires along X and Y is equal to 2x2 while the figure entered in the luminaire number edit box is 6.

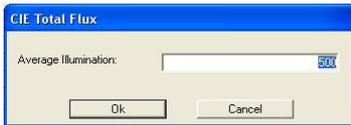
Centrally, between the two columns, is the 'Side by Side' column with 2 edit boxes corresponding to the 2 possible distances between the luminaires (X and Y): clicking on one of the 2 edit boxes the 'V' appears meaning that the luminaires are side by side in continuous rows.

Should the area under examination be of irregular geometry and one or more luminaires be situated outside it, the program will automatically eliminate them.



NOTE

The window also includes the active luminaire data and the Select Luminaire key should you wish to change it by means of the management functions of the photometric database.



Automatic Calculation

Automatic Calculation

Selecting Automatic Calculation, the program proceeds to determine the number of luminaires according to the average illuminance value required on the working plane and to position them automatically in regular rows and columns.

Selection of the function opens the window in which to define the average illuminance level [lux] on the working plane.

When you have input all the parameters and clicked OK (Cancel to quit the command) a window appears on the screen with the calculated number of luminaires and the number of rows and columns. Click OK to accept the proposal and position the luminaires. Click Cancel if you want to edit the parameters again.



If the total number of luminaires cannot be divided evenly into rows and columns (e.g. when the total number is 17) the program automatically adds or subtracts luminaires in order to obtain a regular configuration.

The calculation of the total number of luminaires is based on the area of the room bounding box. If the room is irregular, some of them may be outside the room: those outside will automatically be deleted.

After entering the data select OK or Cancel to exit without adding luminaires.

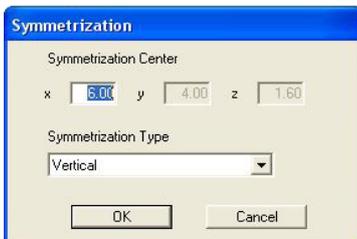


Simplified: calculation is made according to the algorithm contained in the CIE 52 recommendations, which considers neither shadows nor furniture and is only valid in the following conditions:

- In parallelepiped rooms
- Where the luminaires are not narrow beam
- Where the room surfaces, and particular the floor, have a reflectance value of less than 75%.

If this calculation is applied outside these limits, although this is possible, quite considerable value errors may result.

The use of this calculation is advisable in the initial phase of the project because of its extreme speed.



Luminaires Symmetrization

Symmetrize Luminaires

This function symmetrizes one or more selected luminaires with respect to a vertical or horizontal axis or with respect to both.

To select a number of luminaires press the control key (Ctrl) and, keeping it pressed, click on the individual luminaires with the left mouse button. Each selected luminaire will be highlighted in red.

The 2 possible symmetries are:

- Simple vertical or horizontal with which a symmetrical copy of the selected luminaire or luminaires is created
- Double vertical and horizontal with which 3 copies of the selected luminaire or luminaires symmetrical to the 2 axes are created. Symmetrization can only be effected on the plane. Selection of the function opens the window in which to define the symmetrization parameters, that is to say:
 - the center of symmetrization is the point through which pass the symmetry axis, in the case of simple symmetrization, or the symmetry axes, in the case of double symmetry
 - symmetrization type: symmetrization may be effected in 3 ways:
 - Horizontal: a new structure symmetrical to the first is created along a horizontal axis passing through the center of symmetrization of which, in this case, only the y coordinate can be defined. Symmetrization is effected parallel to the Y axis

- **Vertical:** a new structure symmetrical to the first is created along a vertical axis passing through the center of symmetrization of which, in this case, only the x coordinate can be defined. Symmetrization is effected parallel to the X axis
- **Vertical/Horizontal:** 3 new structures, symmetrical to the first, are inserted along a horizontal and a vertical axis passing through the center of symmetrization of which, in this, case, the x and y coordinates can be defined. Symmetrization is effected parallel to the X and Y axes.

Select OK and the program proceeds to insert the new elements; otherwise select Cancel to return to the Working Plane.

Duplicate Luminaire

This function allows you to duplicate the current luminaire both linearly and circularly.

Linear Duplication

Duplication takes place along a directrix managed both tabularly and graphically:

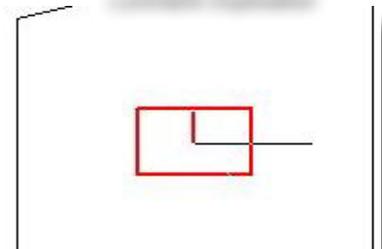
- the first asks you to define the parameters shown in the window (tabular duplication), i.e.:
 - the angle of the line along which the luminaires will be duplicated. 0° corresponds to the positive side of the X axis;
 - the step between one luminaire and the other [m]
 - The total number of luminaires required.

Once you have defined the parameters and selected OK the program automatically duplicates the luminaires and places them in the room;

- the second is activated by selecting the Mouse Aiming function in the duplication window; the area view is automatically shown as well as the current luminaire in red from whose center emerges a segment which ends in the mouse arrow. After defining the segment and its direction press the left button to confirm: the program now opens a window in which to define the number of luminaires to be added which are entered by selecting OK; if instead you select Cancel, the program returns to the Working Plane abandoning the function.

You can also define the x and y [m] coordinates of the second point of the segment by means of the 2 x and y boxes of the duplication window.

Luminaire Duplication



Example of Luminaire Duplication



NOTE

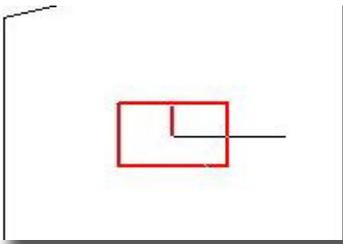
Circular Duplication

Duplication takes place along a directrix managed both tabularly and graphically:

- the first asks you to define the parameters shown in the window (tabular duplication), i.e.:
 - the Angle of the radius of the circumference on which the luminaires [$^\circ$] will be duplicated
 - the radius of the circumference [m]
 - the number of luminaires to be added.

It is then necessary to define whether or not the luminaire should rotate around the center of the duplication circumference: if so the flag (V sign) must be activated.

Luminaire Duplication



Example of Luminaire Duplication

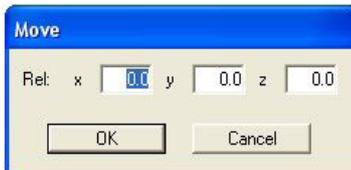
After defining these parameters select OK and the program proceeds to duplicate and represent the luminaires.

- the second is activated by selecting the Mouse Aiming function in the duplication window; the area view is automatically shown as well as the current luminaire in red from whose center emerges a segment which ends in the mouse arrow: this segment indicates the radius of the duplication circumference and its angle with respect to the horizontal reference. After defining the radius press the left button to confirm: the program at this point opens a window in which to define the number of luminaires to be added which are entered by selecting OK; if instead you select Cancel, the program returns to the Working Plane abandoning the function.



NOTE

You can also define the x and y [m] coordinates of the center of the duplication circumference by means of the 2 x and y boxes of the duplication window.



Selected Luminaire Movement

Relative Luminaire Movement

To move a luminaire in the room to a new position you enter the displacement in the window shown in the figure.

The displacement is defined relative to the x, y and z axes.

Once you have input the value or values of any single displacement and clicked OK the program will automatically move the current luminaire to the new position.



NOTE

You can also move a luminaire using the mouse. Click on the luminaire to be moved with the left mouse button and, keeping the button pressed, move the arrow to the new position and then release the button.

The luminaire will then be moved to the new position.



Selected Luminaire Rotation

Relative Z Rotation

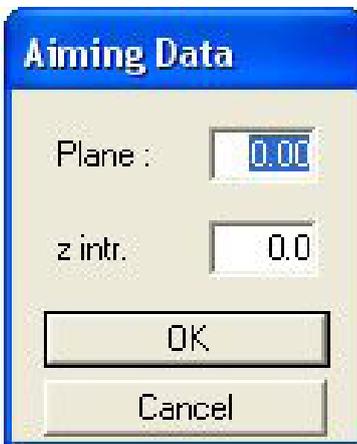
This command allows you to rotate a luminaire in space inside the environment: this rotation is relative in that it is effected with respect to the intrinsic triplet of the element itself.

Selection of the object and rotation function opens the window illustrated in the figure.

After entering the value of the angle, press Enter or click on OK and the program will proceed to rotate the selected object by the defined angle.

Rotation is effected around the Z axis associated with the luminaire and may have a value between + and - 360°.

Rotation is counter clockwise as you look at the plan of the room.



Aiming Data

Luminaire Aiming

On selection of the function the window appears in which to define:

- Plane:** this is the measurement [m] missing from the 2D-plan view according to which the plane on which the mouse moves is positioned. For example, if the current 2D view is the working plane (visualized coordinates X and Y) the missing Z coordinate is the one to be defined
- Intrinsic Z:** this is the rotation [°] that must be given to the luminaire around its own luminous axis (axis that is perpendicular to the area of light emission). For example, in the case of a fluorescent lamp luminaire, the rotation with intrinsic Z = 0° always occurs with horizontal lamps whereas, by setting for example int Z = 90°, rotation will occur with vertical lamps.

Select OK and the program shows the 2D view, selected luminaire and its luminous axis which ends at the tip of the mouse pointer, representing the aiming point. As you move the mouse the aiming is altered and the luminaire rotates accordingly.

If the Light Beam option is active in the Options menu, the program also shows the projection of the cone of light from the luminaire onto the area under examination and the axis of maximum emission in red to distinguish it from that of aiming which is green.



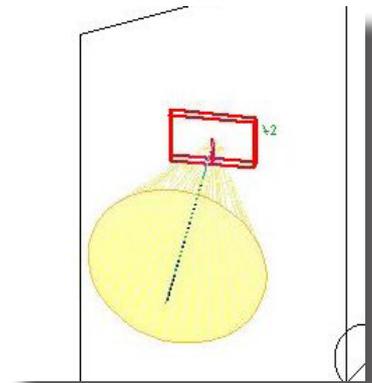
NOTE

Multiple Selection

The Multiple Selection function allows you to determine an area with the help of the mouse and to select (mark) all the luminaires inside it -which, using the data tables, may later be moved and changed

Follow these steps:

1. Select the 'Multiple Selection' function from the menu
2. On the 2D view of the working plane/floor, which appears after selection, define the area around the luminaires to be marked. To do this click with the mouse on the view: with each click of the mouse after the first (starting point), the program draws segments to form the sides of the shape that then join at the starting point thus closing the selection area
3. Once the shape has been closed determining the selection area the program displays the Luminaire Data Table with the luminaires indicated on the left (those positioned in the selection area) marked with a V.



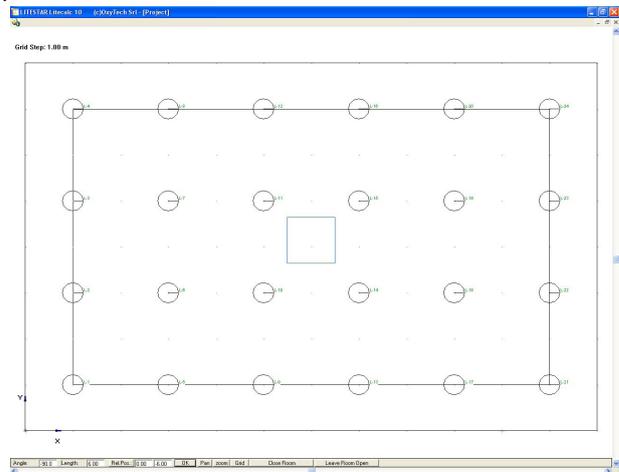
Example of Light Beam

Alla chiusura della poligonale si aprirà la finestra Lista Apparecchi. Vedi la voce.

Luminaire Group

Selection of a number of elements can be made directly in the drawing by clicking with the mouse on the element and keeping the CTRL key pressed. Both lighting and furniture elements can be selected and moved on the plan all together. Press the right mouse button to activate a menu from which a group can be created. This group can be moved around the area with the mouse or, by using the right mouse button, a menu can be opened with which to:

- duplicate the group using the normal duplication menu;
- remove the grouping which allows the group to be broken up and to return to the individual luminaires;
- select properties and thus check position and inclination. .

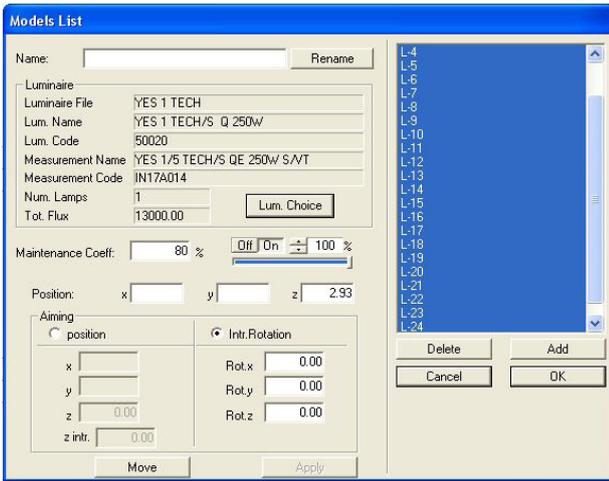


Selection Area Definition

Luminaires List

The Luminaire List function allows you to view a panel with which to check the inserted and selected lighting devices.

On the right of the list are shown the references to the different luminaires inserted



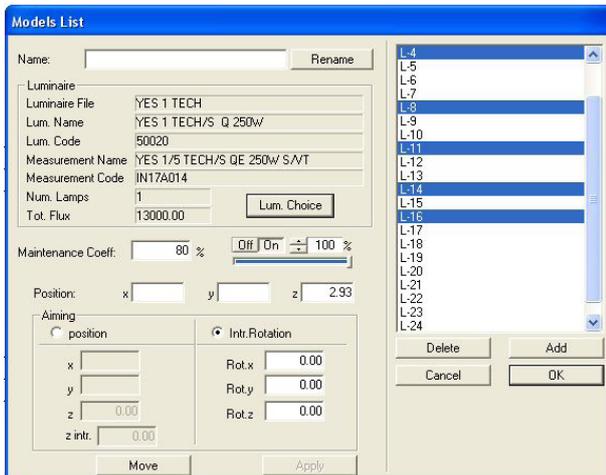
Luminaire List

in the project, these can be checked individually or as a group by modifying the common characteristics. Selection of luminaires from the list conforms with standard list handling: a single luminaire may be selected or, to obtain a continuous selection, select the first required luminaire and, keeping the SHIFT key pressed, click on the last. The CTRL key allows selection of luminaires without requiring them to be in sequence.

The “Apply” button in the lower part of the window allows you to make the modifications active.

Selection of the function opens the window in which to handle the following data:

- Name (label): this is the identifying element of the luminaire
- Luminaire: includes the references of the luminaire, associated measurement and lamp as well as the (Select Luminaire) key to regain access to luminaire selection from the photometric database
- Maintenance Coefficient: represents the flux percentage emitted by the luminaire, reduced with respect to original conditions, as a result of dirt and dullness of the reflector and refractor



Properties Luminaire List

- Off-On: pressing one of the 2 buttons, it is possible to turn the selected luminaire Off or On, and dim it either by using the up-down arrows varying its value (max 100%, min 0%) or by moving the pressed cursor to the left or right
- X, Y and Z Position [m]: this is the luminaire position according to the 3 absolute coordinates X, Y and Z
- Aiming: this is the luminaire aiming (direction) that can be defined both in terms of Cartesian X, Y and Z and angular coordinates relative to rotation around the luminous axis of the luminaire itself (intrinsic Z) and in terms of angular coordinates intended as rotations around the 3 luminous axes of the luminaire (rotation).

Interference Check

The program does not automatically carry out the interference check on the objects inserted in the room but the operator can request this by selecting the ‘Verify Interference’ function.

Interference is verified by bounding box and not by the actual shape of the objects.

Should the program find points or areas of interference, it shows the error with a suitable window.

Open Luminaires Configuration

Open file allows you to load a luminaire configuration previously input and saved.

This function is extremely useful when repetitive luminaire configurations are often used as in network structures or systems.

The luminaires saved with the Save Configuration function maintain the same characteristics as the original luminaires and therefore, to be able to handle them, you have to change their name in Luminaires List.

Save Luminaire Configuration

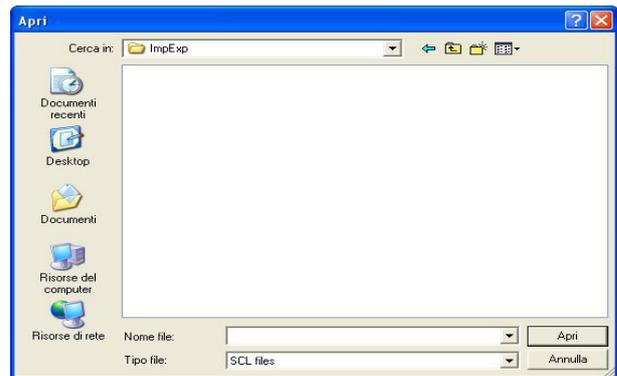
This command allows you to save the current luminaire configuration in a file.

Saving is automatic and the program assigns the same name to the configuration as that given to the project with .SCL extension.

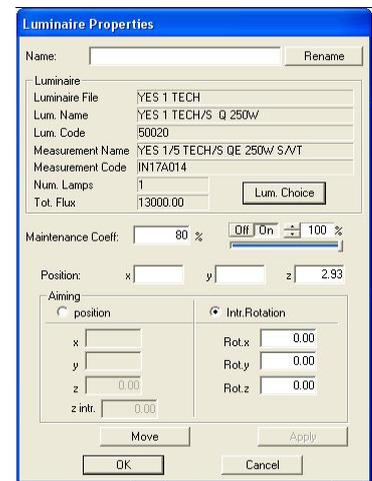
Properties

Selection of the function opens the window in which to handle the following data:

- Name (label): this is the identifying element of the luminaire
- Luminaire: includes the references of the luminaire, associated measurement and lamp as well as the (Select Luminaire) key to regain access to luminaire selection from the photometric database
- Maintenance Coefficient: represents the flux percentage emitted by the luminaire, reduced with respect to original conditions, as a result of dirt and dullness of the reflector and refractor
- Off-On: pressing one of the 2 buttons, it is possible to turn the selected luminaire Off or On, and dim it either by using the up-down arrows varying its value (max 100%, min 0%) or by moving the pressed cursor to the left or right
- X, Y and Z Position [m]: this is the luminaire position according to the 3 absolute coordinates X, Y and Z
- Aiming: this is the luminaire aiming (direction) that can be defined both in terms of Cartesian X, Y and Z and angular coordinates relative to rotation around the luminous axis of the luminaire itself (intrinsic Z) and in terms of angular coordinates intended as rotations around the 3 luminous axes of the luminaire (rotation).



Open Luminaire Configuration



Luminaire Properties Window

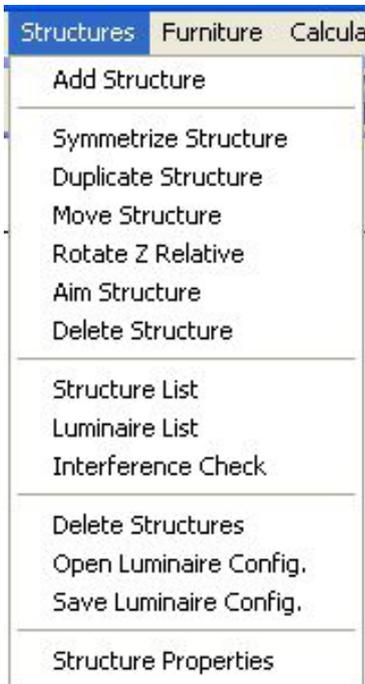
STRUCTURES

The Structure function allows you to create plane panels on which to order the luminaires in rows and columns. Examples of structures are modular unit elements typical of interiors or structures for roads or sports fields.



NOTE

The current structure is represented with red lines.



Structures Menu

- Add Structure to add a tower taken as a whole (group) of several luminaires placed on this
- Structure Symmetrisation to (symmetrically reproduce) the selected structure, creating one or more that are symmetrical to the first
- Duplicate Structure to duplicate the selected structure creating one or several structures with the same characteristics.
- Relative Structure Movement with which to define the movement of the structure, using the special window, through the 3 relative movements (x, y, z) [m]
- Relative Z Rotation [°] to rotate the structure around the intrinsic vertical Z-Axis, using the special window, in which to enter the rotation value
- Aim Structure to graphically modify the aiming of the structure rack; selection of this function opens the window in which to define the coordinate of the plane on which the mouse moves with respect to the Cartesian planes: this is necessary because, since work is always done on a 2-dimensional view, the missing coordinate must be defined. Once the distance of the mouse plane from the Cartesian plane and the intrinsic rotation of the rack have been confirmed, press OK and the program will show an axis connecting the rack to the mouse arrow: by moving the mouse a new aiming position is determined and, therefore, a new rack aiming
- Cancel Structure to cancel the selected floodlight structure
- Structures List to access the list of available structures and modify their table data such as position, number of elements, size of panel
- Luminaires List to handle insertion of luminaires on the structure as well as data modification of previously inserted luminaires
- Verify Interference to verify interference between the various structures
- Delete Structure to eliminate all the structures on the working plane
- Open Configuration to open a structure configuration previously saved with Save Configuration
- Save Configuration to save the current structure configuration
- Structure Properties to access the management window of the characteristic parameters of the structure such as the name given to it, the number of rows and columns of the rack, its coordinates (x, y, z) of position [m] and its aiming.

Let us consider each in detail.

Add Structure

This function allows you to enter a structure, that is a number of luminaires (also called geometric group) all belonging to the same support.

On selection of the function a window appears in which to define the structure parameters which are:

- **Name:** this is the name to be given to the Structure (example: Structure 1 or South Structure etc.)
- **Number of Rows and Columns:** this is the number of luminaire rows and columns in which to position the luminaires; the product of the number of rows by the number of columns gives the total number of luminaires
- **Position [m] (x, y, z):** these are the structure position coordinates (x and y) and its height (z) with respect to the system of absolute coordinates
- **Aiming:** this is the aiming of the rack on which the luminaires are positioned which can be expressed in Cartesian coordinates (x, y, z) [m] and intrinsic rotation (z.intr.) [°] (in this case aiming is meant as the point given by the intersection of the axis perpendicular to the rack which comes from its geometric centerpoint and the area under examination; the rack may be further rotated around this axis thus obtaining intrinsic rotation) or angular rotation (Rot x, y, z) [°] with which rotation of the rack can be effected around the intrinsic or relative axes (x, y, z) of the rack itself; these are parallel to the absolute axes.
After defining the structure parameters and confirming the input the program proceeds to represent the structure on the work plane.

Structure Data Definition Window

Structure Symmetrization

This function allows you to symmetrize (symmetrically reproduce) the selected structure, creating one or more that are symmetrical to the first, with the same number of luminaires as the original structure that are also positioned and aimed symmetrically.

There are 2 possible types of symmetrization (symmetrical reproduction):

- Simple vertical or horizontal with which a Structure symmetrical to the original structure is created
- Double vertical or horizontal with which 3 other structures symmetrical to the original structure are produced.

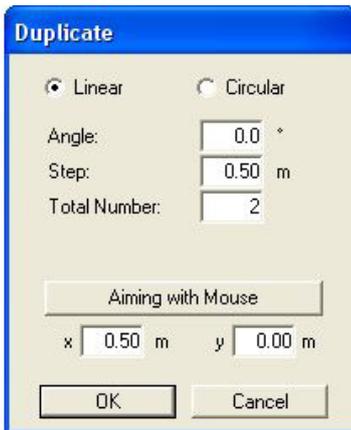
Symmetrization is only possible on the plane

Selecting the function opens the window in which to define the parameters for symmetrization, that is:

- **Symmetrization center:** this is the point of passage of the symmetry axis, in the case of simple symmetry, or the symmetry axes, in the case of double symmetry
- **Symmetrization type:** 3 types of symmetrization can be obtained:
 - **Horizontal:** a new structure symmetrical to the first is created on a horizontal axis that passes through the symmetry center of which, in this case, only the y coordinate can be defined. Symmetrization takes place parallel to the y axis
 - **Vertical:** a new structure symmetrical to the first is created on a vertical axis that passes through the symmetry center of which, in this case, only the x coordinate can be defined. Symmetrization takes place parallel to the x axis

Structure Symmetrization

- Vertical/Horizontal: 3 new structures symmetrical to the first are created on one horizontal and one vertical axis that pass through the symmetry center of which, in this case, the x and y coordinates can be defined. Symmetrization takes place parallel to the x and y axes.



Structure Duplication

Select OK and the program proceeds to enter the new elements while, if you select Annul, it returns to the Work Plane.

Duplicate Structure

This function allows you to duplicate the selected structure creating one or more with the same characteristics and the same number of eventual luminaires, which maintain the same aiming characteristics as the original structure.

Selection of the function opens the window in which to define the method of effecting the duplication, of which there are 2, the first tabular and the second graphic:

- In the first case (tabular duplication) the parameters shown in the window must be defined, that is to say:
 - the Angle of the line on which to duplicate the structure. The reference 0 corresponds to the X positive axis
 - the step between one structure and another [m]
 - the number of structures to be added to the original.

After defining these parameters select OK and the program proceeds to duplicate the structures and position them on the area under examination;

- in the second case (graphic duplication), on selection of Aiming with the Mouse, the program automatically proceeds to show the view of the area and the current structure with a segment coming from its center whose other end is in the mouse pointer. Once the segment and its direction have been defined press the left mouse button to confirm and the program will show the window in which to define the number of structures to be added to the original which are input by selecting OK; if instead you select Annul, the program will return to the Work Plane abandoning the function.

Structures List

Clicking on the working plane with the right mouse button a context menu appears from which select Structure List for managing the structure parameters.

The window is made up of an upper tabular section and a lower section showing the functions that can be used with the table.

The upper table contains, from the left, the following columns:

- the selection column; to mark (select) a structure click with the mouse to the left of the name while, to select a number of structures, click keeping the Ctrl (Control) key pressed; selection is shown with the \checkmark sign. To deselect a Structure repeat the same operation clicking on the structure you want to deselect.
- The reference, or description, of the structure; it is a useful label for recognizing the structure
- The column of rack rows and columns
- The position of the structure centerpoint with respect to the relative reference (xb, yb, zb) [m] (centerpoint of the rack)
- Rack aiming which can be expressed both in Cartesian coordinates (xp, yp, zp) and rotation around the intrinsic axis of the rack (ra) and in polar coordinates (rotations around the system of Cartesian x, y, z axes of the luminaire itself).

The lower part of the table indicates the current luminaire with below the manage-

ment functions which are:

- **Add:** this allows the input of a new active structure which is automatically placed at the end of the table
- **Move:** allows movement of the structure as definable in the window that appears on selection of this function
- **Cancel:** allows cancellation of the marked structures after confirmation for each structure
- **Panel:** allows you to modify the x and y dimensions of the rack
- **OK:** to confirm modifications and return to the Working Plane.

| | Structure: | Number Rows | Number Columns | Centerpoint | | | Aiming | | |
|-------------------------------------|------------|-------------|----------------|-------------|------|------|-----------|--------|--------|
| | | | | xb | yb | zb | Rotate rx | ry | rz |
| <input checked="" type="checkbox"/> | M-1 | 2 | 2 | 0.00 | 0.00 | 2.50 | 0.00 | -90.00 | 0.00 |
| <input checked="" type="checkbox"/> | M-1_D1 | 2 | 2 | 12.00 | 0.00 | 2.50 | 0.00 | -90.00 | 180.00 |
| <input type="checkbox"/> | | | | | | | | | |
| <input type="checkbox"/> | | | | | | | | | |
| <input type="checkbox"/> | | | | | | | | | |
| <input type="checkbox"/> | | | | | | | | | |
| <input type="checkbox"/> | | | | | | | | | |
| <input type="checkbox"/> | | | | | | | | | |

Structure Management Window

Luminaires List

On selection of this function the program presents the window for managing the luminaires belonging to the selected structure.

The window is made up of an upper tabular section and a lower section showing the functions that can be used with the table.

The upper table contains, from the left, the following columns:

- the selection column; to mark (select) a luminaire click with the mouse to the left of the name while, to select a number of luminaires, click keeping the Ctrl (Control) key pressed; selection is shown with the \checkmark sign. To deselect a luminaire repeat the same operation clicking on the luminaire you want to deselect.
- the reference, or description, of the luminaire; it is a useful label for recognizing the luminaire
- the column of rack rows and columns; the program automatically numbers the positions starting from row 1 and column 1 with the luminaire positioned on the bottom right of the rack looking at it face on
- the position of the luminaire centerpoint with respect to the relative reference (xb, yb, zb) [m] (centerpoint of the rack)
- luminaire aiming which can be expressed both in Cartesian coordinates (xp, yp, zp) and rotation around the intrinsic axis of the luminaire (ra) and in polar coordinates (rotations around the system of Cartesian x, y, z axes of the luminaire itself).

| | Luminaire | Row | Column | Centerpoint | | | Aiming | | |
|-------------------------------------|-----------|-----|--------|-------------|-------|------|-----------|--------|------|
| | | | | xb | yb | zb | Rotate rx | ry | rz |
| <input type="checkbox"/> | M-1_L-1 | 1 | 1 | 0.00 | -0.12 | 2.38 | 0.00 | -90.00 | 0.00 |
| <input type="checkbox"/> | M-1_L-2 | 1 | 2 | 0.00 | 0.13 | 2.38 | 0.00 | -90.00 | 0.00 |
| <input type="checkbox"/> | M-1_L-3 | 2 | 1 | 0.00 | -0.12 | 2.63 | 0.00 | -90.00 | 0.00 |
| <input checked="" type="checkbox"/> | M-1_L-4 | 2 | 2 | 0.00 | 0.13 | 2.63 | 0.00 | -90.00 | 0.00 |
| <input type="checkbox"/> | | | | | | | | | |
| <input type="checkbox"/> | | | | | | | | | |
| <input type="checkbox"/> | | | | | | | | | |
| <input type="checkbox"/> | | | | | | | | | |

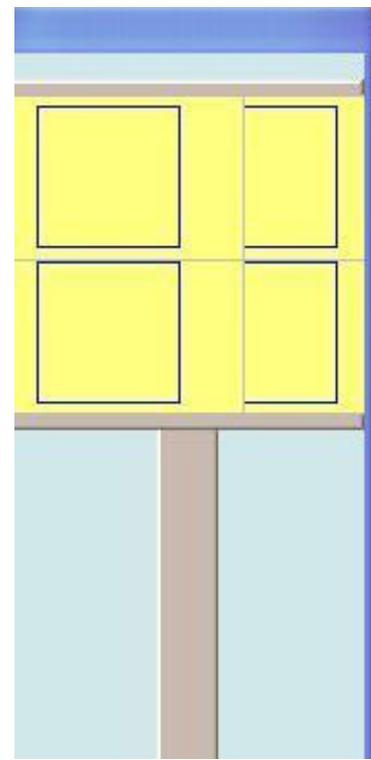
Archive: ALDGENI
 Luminaire: OKAY 500 NERG
 Lumin.Code: 30034
 Lamps Number: 1
 Measurem.: OKAY 500 H 500W
 Measur.Code: PRO21L00
 Flux [lm]: 9500.00

Structure Luminaire Management Window

None of the fields can be edited except the luminaire description and aiming coordinates columns.

The lower part of the table indicates the current luminaire with below the management functions which are:

- **ON-OFF:** this allows one or more luminaires to be turned on or off and, thus to include it or not in the calculation. The default condition for luminaires on input is 'Luminaire Lit = ON'. The unlit luminaires are shown in a paler color than those in the ON condition, usually in gray. To turn a luminaire on or off click on ON or OFF alternatively activating the button.
- **Add:** this allows the input of a new active luminaire which is automatically placed at the top of the table. The maximum number of luminaires that can be added is equal to the product of the rows by the columns previously defined for the Structure
- **Aim:** this allows graphic management of the aiming of one or more highlighted luminaires. After highlighting one or more luminaires (to highlight a number of luminaires press the Control key) press Aim and the program will





Context Menu

present the window in which to define the horizontal aiming plane [m] and the intrinsic rotation of the luminaire around its own axis [°] (Z intr. – reference of 0 = horizontal lamp), after which press OK, and the program will show the working plane with the aiming references of the luminaires connected to the mouse pointer: by moving the mouse and pressing its left button, the program automatically fixes the new aiming and the structure luminaires management window reappears for further operations

- **Delete:** this allows the elimination of the selected luminaires and each deletion must be confirmed by the operator
- **Change Maintenance Factor (Maintenance Coefficient):** this allows you to simultaneously modify the maintenance factors of the selected luminaires by clicking on the first column on the left: enter the data and select OK to confirm it.
- **Change (Photometry):** this allows access to the photometry selection window (refer to the Add Luminaire function) and the selection of a new photometry to substitute those previously given to the selected luminaires. The selected photometry becomes the current photometry and is used for the new inputs.
- **OK:** to confirm alterations and return to the Work Plane.



NOTE

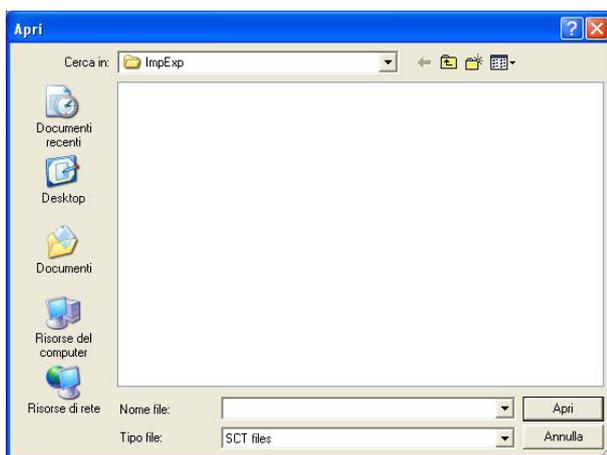
Suggestion: should you want to input different luminaires on the same rack we suggest you make a full insertion of luminaires of the same type, then select those to be substituted and choose the change function to substitute the previous photometry with the new one required.

Verify Interference

The program does not automatically carry out the interference check on the objects inserted in the room but the operator can request this by selecting the 'Verify Interference' function.

Interference is verified by bounding box and not by the actual shape of the objects.

Should the program find points or areas of interference, it shows the error with a suitable window.



Structures Configuration Opening

Open Structures Configuration

The function allows you to extract previously defined and saved floodlight structures configurations from the library. This function is very useful when repetitive structure systems are often used.

The structures saved with the Save Configuration function maintain the characteristics of the original structures and therefore, to be able to handle them, you have to change the names of the new elements entered in Structure List.

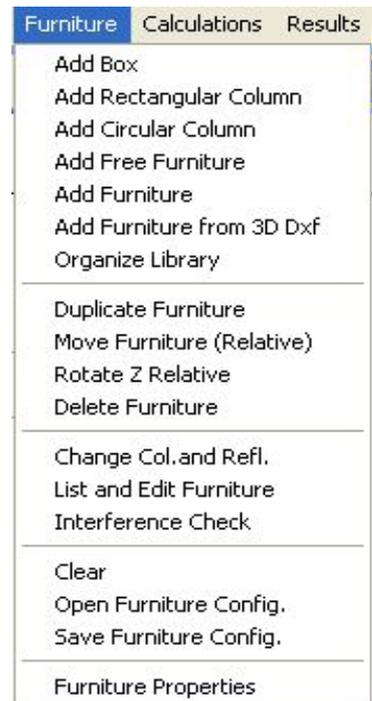
Save on File

The function saves the current structure configuration on file in its entirety.

The save operation is effected automatically and the program gives the configuration the same name given to the project with the .SCT extension.

FURNITURE

This command allows you to transfer all furniture from the library to the room under consideration. The menu offers 2 commands, one to load furniture from a library and a second one to input parallelepipeds, such as walls, cubes etc., to the room itself.



Furniture Menu

The selected item of furniture is highlighted with a green broken line and is considered the current item.

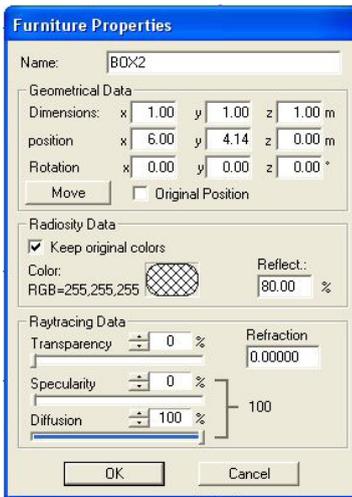


NOTE

The menu presents the following commands:

- Add Box to input a new parallelepiped into the room (walls, cubes...)
- Add rectangular pillar;
- Add circular pillar;
- Add extruded furniture;
- Add Furniture to input furniture from the library
- Add Furniture from 3D DXF to import an object of furniture previously created with the AutoCad program
- Organize Library to access the Windows Explorer window and handle operations connected with the library files such as name change or their movement into a different folder
- Duplicate Furniture to insert one or more copies of the selected piece of furniture
- Relative Furniture Movements to move an item along the 3 Cartesian axes
- Relative Z Rotation to effect rotation of the current object around the vertical axis of the triplet relative to the object, that is to say the triplet in agreement with the object with point of origin in the center point of the object itself
- Change Colors and Reflectances to alter the color and relative reflectance of the surface of a room element or item of furniture
- Delete Furniture to delete the current item
- Furniture List to show the furniture list and move or rotate the different items in the room

- Interference Check to see if the objects in the room interfere with each other.
- Clear to delete all the furniture in the room
- Open Configuration to open the furniture configuration defined and saved previously
- Save Configuration to save the furniture configuration defined with the project
- Furniture Properties to modify the data of the current furniture.



Box Definition

Add Box

Add rectangular pillar:

Add circular pillar:

Add extruded furniture:

These functions allow you to insert elements such as a box, rectangular pillar circular pillar or an element of any shape; in the window that appears when selected, the following are defined:

This function allows you to insert a parallelepiped-shaped element, by means of the window that opens when selected, with the following definitions:

- Name: this is an alpha-numerical string used both in the Furniture List and in the RESULTS/Select Surface functions. It can be changed as necessary

Geometrical Data

- Dimensions x, y and z [m]: these are the 3 measurements of the parallelepiped set at 1 m by default. These dimensions may be varied according to requirements
- Position x, y and z [m]: this is the position of the origin of the system of Cartesian axes relative to the furniture with respect to the absolute system of reference of the area
- Rotations x, y and z [°]: these are the furniture rotations around its own relative Cartesian axes



NOTE

The Original Positions flag indicates that the furniture will be positioned with default origin of the axes with respect to the absolute origin and rotations around its own axes, that is to say in accordance with the coordinates defined at the time of creating the furniture.

Radiosity Data

- Colors and Reflectances: in this section the colors and reflectances can be defined. The program always activates the Original Colors flag with which the colors defined in the basic model are maintained. Deactivating this, the color window opens and, by clicking on the color box, access is gained to the selection window in which to select the color and confirm. The program shows the selected color in the box and the RGB coordinates alongside. On the right, the reflectance value in %, which may vary between 0% and 100%, is shown: it is a single value that the program attributes to each surface of the object

Ray-Tracing Data

These are the surface parameters for realizing Ray Tracing calculation which are in detail:

- **Specularity:** to define the level of specularity of the surface between 0 (no specularity) and 1 (maximum specularity). Should you wish the surface to be perfectly specular (mirror) it must be black with reflection of not more than 10%

- **Roughness:** this is the index of roughness of the material and may take on whole values
- **Transparency:** to define the level of transparency of the surface between 0 (no transparency) and 1 (maximum transparency)
- **Refraction:** this is the refraction index of the material; some refraction indices of the most commonly used materials are: ice 1.31 – water 1.33 – glass 1.50 – flint glass 1.65.

To launch Ray Tracing calculation, use the special function of the rendering module (VIEWS/3D View function).



NOTE

Once definition is complete, select OK and the program inserts the element into the working plane according to the set parameters.

Add Furniture

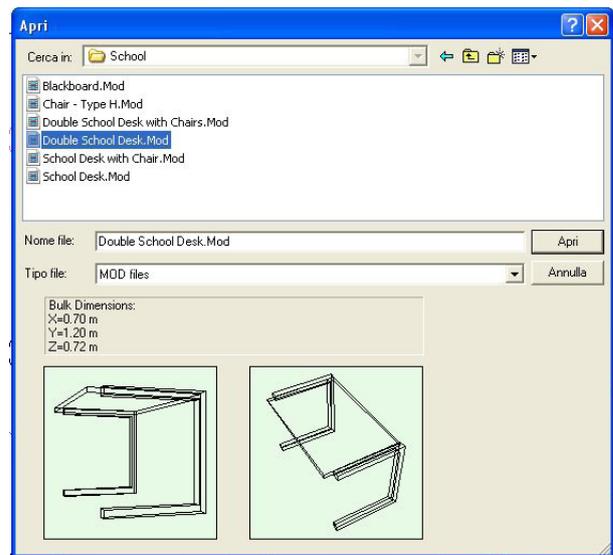
Selection of the function opens a window containing the folders in which the furniture is grouped according to its use: for example Transport contains all objects concerned with transport, House – Office all objects for houses and offices such as tables or cupboards. To enter a folder click twice with the mouse on the folder name or select the folder and click on Open.

Folder Configuration: the names of the various folders are in English by default but may be renamed or reorganized according to the individual requirements of each designer.

Insertion New Furniture: new furniture/objects may be inserted using the FURNITURE/ DXF 3D Import function.

Furniture Characteristics Configuration: on selection of furniture/object the program opens the window in which to define:

- **Name:** this is an alpha-numerical string used both in the Furniture List and in the RESULTS/Select Surface functions. It can be changed as necessary



Furniture Library

Geometrical Data

- **Dimensions x, y and z [m]:** these are the 3 measurements of the parallelepiped set at 1 m by default. These dimensions may be varied according to requirements
- **Position x, y and z [m]:** this is the position of the origin of the system of Cartesian axes relative to the furniture with respect to the absolute system of reference of the area
- **Rotations x, y and z [°]:** these are the furniture rotations around its own relative Cartesian axes

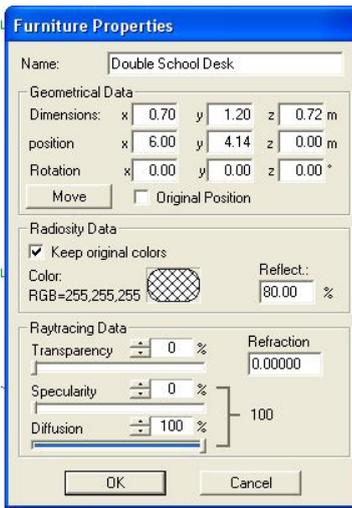
The Original Positions flag indicates that the furniture will be positioned with default origin of the axes with respect to the absolute origin and rotations around its own axes, that is to say in accordance with the coordinates defined at the time of creating the furniture.



NOTE

Radiosity Data

- **Colors and Reflectances:** in this section the colors and reflectances can be defined. The program always activates the Original Colors flag with which the colors defined in the basic model are maintained. Deactivating this, the color window opens and, by clicking on the color box, access is gained to the selection window in which to select the color and confirm. The program shows the selected color in the box and the RGB coordinates alongside. On the right, the reflectance value in %, which may vary between 0% and 100%, is shown: it is a single value that the program attributes to each surface of the object



Furniture Parameters Definition

Ray-Tracing Data

These are the surface parameters for realizing Ray Tracing calculation which are in detail:

- **Specularity:** to define the level of specularity of the surface between 0 (no specularity) and 1 (maximum specularity). Should you wish the surface to be perfectly specular (mirror) it must be black with reflection of not more than 10%
- **Roughness:** this is the index of roughness of the material and may take on whole values
- **Transparency:** to define the level of transparency of the surface between 0 (no transparency) and 1 (maximum transparency)
- **Refraction:** this is the refraction index of the material; some refraction indices of the most commonly used materials are: ice 1.31 – water 1.33 – glass 1.50 – flint glass 1.65.

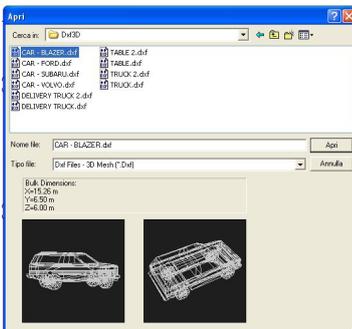


NOTE

To launch Ray Tracing calculation, use the special function of the rendering module (VIEWS/3D View function).

Once definition is complete, select OK and the program inserts the element into the working plane according to the set parameters.

To move the object into the desired position click on the object itself with the left mouse button and move the arrow in the desired direction keeping the button pressed: when the button is released the program automatically proceeds to show the object in its new position.



Import DXF 3D

Add Furniture from 3D DXF

This function allows you to import files of 3D objects previously created with AutoCAD 14, 2000 and 2002 3D solid modeler and saved according to the following instructions:

- create the 3D model in AutoCAD
- select the command `_3DSOUT` or insert it in the AutoCAD command bar. The program asks you to select the objects to be exported and the name of the destination file: in this way a *.3DS file is created
- open a new file as if you were going to start a new project
- select the command `_3DSIN` or insert it in the AutoCAD command bar. Then select the *.3DS file previously created: the program proceeds to import the object and visualize it
- finally select the DXFOUT function with which to export the file in DXF 3D format. At this point the file is ready to be imported into Litecalc.

To import a Dxf 3D object into Litecalc, at this point select the function choosing the file to import and confirming your choice by clicking on Open.

The program opens the window in which to define where to save the file starting from the Furniture subfolder of the program. The file is saved with .MOD extension and is an entirely new object added to the furniture elements already present that may be used with the FURNITURE/Add Furniture function.

After import the program proceeds to insert the imported element directly into the Working Plane.

Duplicate Furniture

This function allows you to duplicate the current furniture both linearly and circularly.

Linear Duplication

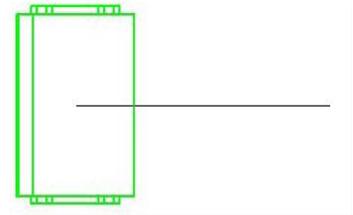
Duplication takes place along a directrix managed both tabularly and graphically:

- the first asks you to define the parameters shown in the window (tabular duplication), i.e.:
 - the Angle of the radius of the circumference on which the furniture [°] will be duplicated
 - the radius of the circumference [m]
 - the number of furniture items to be added.

After defining these parameters select OK and the program carries out the duplication of the furniture and their visualization;

- the second is activated by selecting the Aiming function with the Mouse in the duplication window, which automatically shows the area view and the current furniture in green from the center of which a segment connects with the mouse pointer. After defining the segment and its direction press the left mouse button to confirm: at this point the program shows the window with which to define the number of pieces to be added, which are inserted by selecting OK; whereas by selecting Cancel, the program returns to the Working Plane, leaving the function.

Duplicate Furniture



Example of Furniture Duplication

You can also define the x and y [m] coordinates of the second point of the segment by means of the 2 x and y boxes of the duplication window.



NOTE

Circular Duplication

Duplication takes place along a directrix managed both tabularly and graphically:

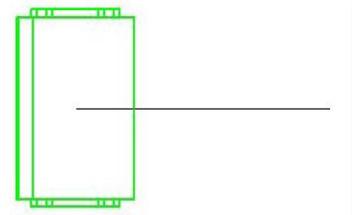
- the first asks you to define the parameters shown in the window (tabular duplication), i.e.:
 - the Angle of the radius of the circumference on which the furniture [°] will be duplicated
 - the radius of the circumference [m]
 - the number of furniture items to be added.

It is then necessary to define whether or not the furniture should rotate around the center of the duplication circumference: if so the flag (V sign) must be activated.

After defining these parameters select OK and the program proceeds to duplicate and represent the furniture.

- the second is activated by selecting the Mouse Aiming function in the duplication window; the area view is automatically shown as well as the current furniture in red from whose center emerges a segment which ends in the mouse arrow: this segment indicates the radius of the duplication circumference and its angle with respect to the horizontal reference. After defining the radius press the left button to confirm: the program at this point opens a window in which to define the number of items of furniture to be added which are entered by selecting OK; if instead you select Cancel, the program returns to the Working Plane abandoning the function.

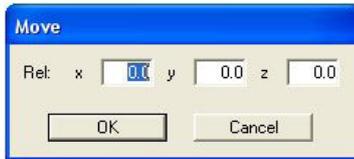
Duplicate Furniture



Example of Furniture Duplication

**NOTE**

You can also define the x and y [m] coordinates of the center of the duplication circumference by means of the 2 x and y boxes of the duplication window.



Furniture Movement

Relative Furniture Movements

To move an item of furniture to a new position you have to define the degree of displacement.

A window appears on the screen where you enter values of displacement in the x, y and z directions.

When you enter the value or values and click OK the item of furniture is moved to the new position.

**NOTE**

You can also use the mouse to move furniture. Click on the item and, keeping the left button of the mouse pressed, move the arrow to the new position, and then release the button. The item is moved inside its bounding box to avoid having to redraw it at each move.

Relative Z Rotation

This function allows rotation of the current furniture by one step equal to 5°, both via the menu and by using the opportune icon.

Rotation, in degrees (°), is understood to be around the Z-axis of the relative three with origin in the centerpoint of the object and integral with it.

Delete Furniture

Delete Furniture means eliminate an item from the scene. To do this it is necessary to select the item of furniture with the mouse to make it active (remember that the current models/furniture are those represented with broken green lines).

At this point on selection of the Delete Furniture function the program opens the confirmation window and after selecting OK, it proceeds to eliminate the furniture from the scene whereas if you select Cancel the furniture will not be deleted.

Modify Color and Reflectance

This function is used to change the color and related reflectance or R table of one of the room or furniture surfaces.

Once selected, a 2D view of the room appears together with the management functions in the lower tool bar, as listed below:

- **PAN:** this allows movement of the drawing within the Working Plane. On selection of the PAN button the mouse arrow is substituted by the drawing of a hand: by pressing the left mouse button the drawing is captured and may be moved in all directions within the Working Plane
- **ZOOM:** this allows enlargement or reduction of the drawing (zoom in and zoom out). There are 2 modes:
 - Pressing the left mouse button and moving the mouse upwards effects enlargement (zoom in), moving it downwards reduces the drawing (zoom out)
 - Pressing the right button and keeping it pressed, the program opens a rectangle whose contents are enlarged to occupy the whole screen when the button is released
 - To enlarge, (zoom in), rotate the mouse wheel forwards, rotate backwards to reduce the drawing (zoom out)
- **GRID:** this function allows you to change the step of the Working Plane grid and therefore to change the scale according to which the drawing is represented. Selection of GRID opens the window in which to manually insert the grid step: select OK to confirm input.

- **Plan-Front-Side:** is used to change the view between plan, front elevation and side elevation
- **Fit:** automatically re-scales the room in order to make best use of the available space
- **OK:** is used to confirm the selection of a surface. To select a surface point the mouse arrow at it and press the left key of the mouse, if the wrong surface is selected it can be deselected by pressing the same key a second time. Repeat the operation to select the desired surface.

It is advisable to change the 2D view, for example from plan to front elevation, in order to verify that the correct surface has been selected. The selected surface is outlined in blue.

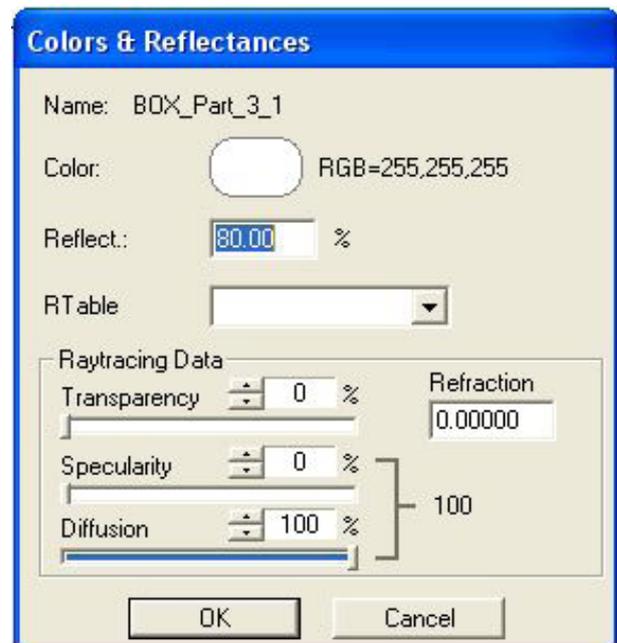
By pressing OK the window appears for modifying the color and reflectance or R table of the selected surface described in the upper part of the window; in the lower right-hand side of the same window the selected color is visualized.

Once these parameters have been defined press OK to confirm or Cancel to abandon the function without modifying anything.

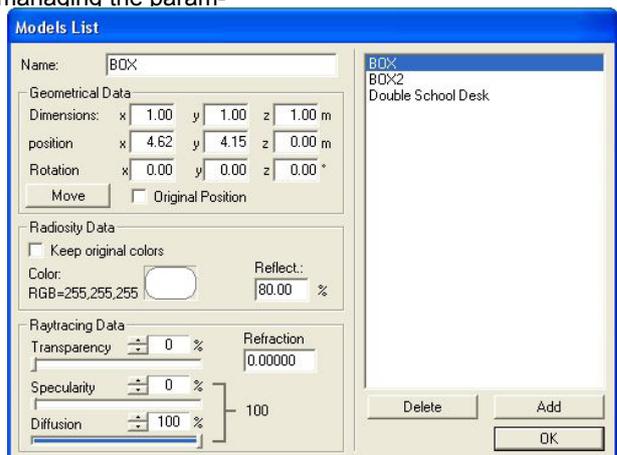
Furniture List

Selection of this function allows you to view the window for managing the parameters concerning the furniture inserted in the area such as:

- **Name:** this is the name that may be given to the object which serves as a reference within the project itself; this reference is not printed
- **Geometrical Data:** here are shown the Dimensions (x – y – z) [m] of the bounding box containing the selected furniture, Position (x – y – z) [m] of the furniture origin (generally the point corresponding to the centerpoint of the furniture but with z coordinate = 0) and Rotation (according to x – y – z) [°] of the object around the 3 axis passing through its centerpoint



Change Single Surface Colors and Reflectances



Furniture List

The Original Positions flag indicates that the furniture will be positioned with default origin of the axes with respect to the absolute origin and rotations around its own axes, that is to say in accordance with the coordinates defined at the moment of creating the furniture.



NOTE

- **Radiosity Data,** this means that here the parameters such as Colors and Reflectances can be handled. The program always activates the Original Colors flag with which the colors defined in the basic model are maintained. Deactivating this, the color window opens and, by clicking on the color box, access is gained to the selection window in which to select the color and confirm. The program shows the selected color in the box and the RGB coordinates alongside. On the right, the reflectance value in %, which may vary between 0% and 100%, is shown: it is a single value that the program attributes to each surface of the object (N.B.: should you wish to attribute different characteristics to a surface, use the AREA/Change Colors and Reflectances function)

- Raytracing Data: these are the surface parameters for realizing Ray Tracing calculation which are in detail:
 - **Specularity:** to define the level of specularity of the surface between 0 (no specularity) and 1 (maximum specularity). Should you wish the surface to be perfectly specular (mirror) it must be black with reflection of not more than 10%
 - **Roughness:** this is the index of roughness of the material and may take on whole values
 - **Transparency:** to define the level of transparency of the surface between 0 (no transparency) and 1 (maximum transparency)
 - **Refraction:** this is the refraction index of the material; some refraction indices of the most commonly used materials are: ice 1.31 – water 1.33 – glass 1.50 – flint glass 1.65.

On the right of the window appears the list of furniture items in the area and these can be selected with a click of the mouse (left button) or using the up-down arrows. It is also possible from this window to activate furniture deletion or the insertion of a new item.

After concluding parameter definition press OK to return to the Working Plane.

Delete Single Item of Furniture

To delete an item of furniture select the item from the list and then click Delete. The program will automatically delete it from the list.

Input Single Item of Furniture

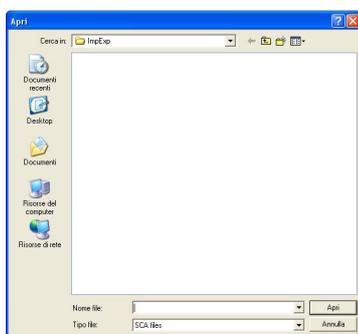
After selecting the command the furniture library list appears on the screen. Select the item you require and the program will automatically put it in the room after the name, color, reflectance and position have been defined.

Interference Check

The program does not automatically check for interference between objects in the room, but the feature exists and can be used if desired.

Objects are represented by their bounding box rather than their actual shape so that for example a chair under a table is recognized as interference even though this is not the case.

When there is interference an error message appears on the screen.



List of Saved Furniture

Open Configuration

Open File allows you to load from the library a previously saved item of furniture with .SCA extension

The furniture saved with the Save Configuration function maintains the characteristics of the original furniture and therefore, to be able to handle it, you have to change the name of the newly inserted furniture in Furniture List.

Save Configuration

This function allows you to save on file the current furniture configuration located in the area in its entirety: if there are 2 tables and 4 chairs they will be saved together in a single .SCA extension file.



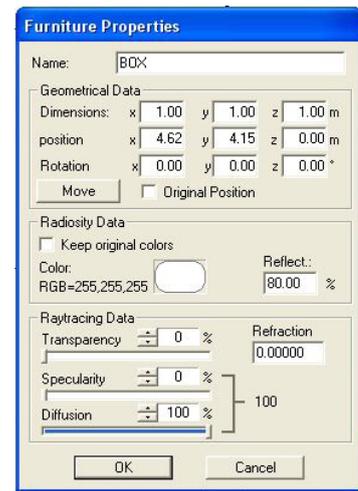
NOTE

Utility: this function is very useful should you need to manage the same furniture in different projects; once entered and saved a first time it will be immediately ready for subsequent projects.

Furniture Properties

The Furniture Properties function allows you to modify the furniture data:

- **Name:** this is an alphanumeric string used both in the Furniture List and in the RESULTS/Select Surface functions. This can be changed according to requirements
- **Dimensions x, y and z [m]:** these are the 3 dimensions of the furniture bounding box that can be rescaled according to requirements
- **Colors and Reflectances:** in this section the colors and reflectances can be defined. The program always activates the Original Colors flag with which the colors defined in the basic model are maintained. Deactivating this, the color window opens and, by clicking on the color box, access is gained to the selection window in which to select the color and confirm. The program shows the selected color in the box and the RGB coordinates alongside. On the right, the reflectance value in %, which may vary between 0% and 100%, is shown: it is a single value that the program attributes to each surface of the object
- **Position x, y and z [m]:** this is the position of the origin of the system of Cartesian axes relative to the furniture with respect to the absolute system of reference of the area
- **Rotations x, y and z [°]:** these are the furniture rotations around their own relative Cartesian axes



Furniture Properties

The Original Positions flag indicates that the furniture will be positioned with default origin of the axes with respect to the absolute origin and rotations around its own axes, that is to say in accordance with the coordinates defined at the time of creating the furniture.



NOTE

- **Raytracing Data:** these are the surface parameters for realizing Ray Tracing calculation, in detail:
 - **Specularity:** to define the level of specularity of the surface between 0 (no specularity) and 1 (maximum specularity). Should you wish the surface to be perfectly specular (mirror) it must be black with reflection of not more than 10%
 - **Roughness:** this is the index of roughness of the material and may take on whole values
 - **Transparency:** to define the level of transparency of the surface between 0 (no transparency) and 1 (maximum transparency)
 - **Refraction:** this is the refraction index of the material; some refraction indices of the most commonly used materials are: ice 1.31 – water 1.33 – glass 1.50 – flint glass 1.65.



NOTE

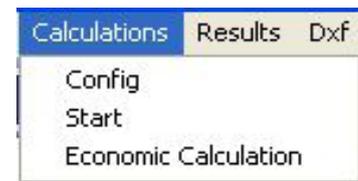
To launch Ray Tracing calculation, use the special function of the rendering module (VIEWS/3D View function).

Once definition is complete, select OK and the program inserts the element into the working plane according to the set parameters.

CALCULATION

The Calculation menu allows management of the lighting design parameters calculation and features the following functions

- Configure to define the calculations to be carried out on the current project and save the configuration: this project will then be selectable with the List Calculations function that allows you to define the list of calculations to be made in sequence. The window used for calculation definition is similar to that of the Start function to which we refer you.
- Start for access to the window for defining the calculations to be carried out on the current project on conclusion of which calculation is launched
- Economic Calculation for handling the Economic Calculation, simplified and complete, of the installation under consideration.



Calculation Menu

| | |
|--|---|
| | <p><u>Associated Icons</u> Calculations Start - View 3D</p> |
|--|---|

Start (Calculation)

This menu allows access to the functions:

- for calculating lighting parameters:
 - illuminances (Horizontal – always calculated – Vertical, Cylindrical and Semi-cylindrical) on all project surfaces, including furniture
 - luminances on all project surfaces, including furniture
 - glare
 - for exteriors according to CIE Recommendation for sports fields, algorithm also used for generic exterior areas with definition of any observer position and view direction, and for roads
 - for interiors with calculation of the CGI parameters (CIE recommendations 55), UGR and VCP.
 - Light Pollution according to Norm UNI 10.819 for exterior light installations
- for the economic calculation of the installation.

Illuminance and Luminance Calculation

If you select the function Calculation/Start, a window as show in the figure appears, where you have to enter the following parameters:

- **Calculation Type:** the program offers 2 types of calculation:
 - Only Direct: calculation is based on the direct light component, i.e. exclusively on the illumination of the surfaces by the luminaires without taking into consideration any inter-reflections between walls or other area surfaces
 - Complete: the calculation considers both the direct component and that deriving from inter-reflections between the area surfaces, whether walls or furniture. It is advisable to consider 7 inter-reflections, beyond this number there are no considerable variations in dimensions (full running)
- **Calculation Parameters:** the parameters calculated by the program are the following:
 -

Illuminances [lx]

- Horizontal Illuminance [lux]: this parameter is always calculated
- Vertical Illuminances [lux]: these illuminances are calculated in the 4 directions +X, -X, +Y and -Y parallel to the Cartesian axes on the vertical planes situated within the calculation grid points at the height of the working plane Luminance [cd/m²]: you can select calculation of the Luminance by clicking with the left mouse button on Luminances thus causing the V sign to appear on the left
- Cylindrical Illuminances [lux]: these illuminances are calculated on the cylinder contained in each of the calculation grid points at the height defined in the appropriate box (Calculation Height [m]).

These illuminances do not correspond, as may be thought, to the average of the 4 vertical illuminances in the 4 directions but they are proportional to them according to a $2/\pi$ factor. Cylindrical illuminances are not related to the position of the observer.

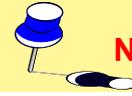
- **Semi-cylindrical Illuminances [lux]:** these illuminances are calculated on the semi-cylinder contained in each of the calculation grid points at the height defined in the appropriate box (Calculation Height [m]). Semi-cylindrical illuminance is related to the position of the observer and therefore, when selected, the program activates the 'Observer Position' button and shows its direction or position. Pressing the 'Observer Position' button opens the window in which, alternatively, you can define either the observer position (in this case the illuminances are calculated in its direction) or the direction defined with the angle of deviation, the β [°] angle (in this case the illuminances in the various points are all parallel according to the defined direction). The rotation origin axis for calculation of the angle is the X positive axis.
- **TV Illuminances in the direction of the Telecamera [lux]:** these illuminances are those in the direction of the telecamera or telecameras, since more than one can be defined. On selection of the function (a $\sqrt{\quad}$ appears beside the description) the program presents the window in which to define the telecamera position coordinates (coordinates x, y, z) or the direction of observation (β [°] angle of deviation on the horizontal plane and α [°] that of inclination) with the X positive axis as axis of reference for calculating the β angle, and the Z negative axis as that of the α angle: in the first case, the calculation planes are all perpendicular to the direction of telecamera observation – calculation point, in the second the planes in the various points are considered all oriented in the same way according to the angles β (on the horizontal plane) and α (angle of inclination): this means that the directions of observation are all parallel to each other (observer to infinity). On giving confirmation by pressing OK the program shows the defined coordinates in the box to the right of the heading 'TV Illuminance': to input another telecamera click on the coordinates box and press the INS button or press the 'Telecameras' button. To change the position of a telecamera select it by double clicking with the mouse, to cancel it press CANC.
The UNI parameter, if selected, allows you to define whether or not the calculation should be made according to UNI Norm 9316 or according to the corresponding CIE Recommendation: in this case the calculation planes in the various points are all to be considered vertical regardless of the position in height (z) of the telecamera or of the α angle.

- **Luminance [cd/m^2], Qc and Glare:** the program allows you to select Luminance calculation by clicking with the left mouse button on Luminances after which the V sign will appear on the left. Calculation is related to the type of surface reflection defined, whether diffuse or Lambertian reflection (only one surface reflection factor has been defined) or real reflection (a table of reduced reflection factors is defined for the surface according to the angle of observation and the incidence of the light beam: these tables are used in designing road lighting installations).

The Luminance calculation box also allows you to introduce the Observer's View Position and Direction (only one observer can be defined in the current version of the program). The definition of the position and direction of observation is necessary in calculating the luminances of the road surfaces for which the Reduced Reflectio Factor Tables are defined (C, R and N). The program automatically proposes a position and direction of observation which can be changed by clicking twice on it: in this case the program activates the 3 boxes of the x, y and z coordinates of the observer's position and those of

the direction of observation subdivided into Cartesian coordinates (these are 3 x, y and z coordinates which must be different from those of the observer's position) and polar coordinates (these are 2 angular coordinates, β for the deviation on the horizontal plane with x' axis coming from the observer's position parallel to the X+ axis as origin and α for the inclination with y' axis coming from the observer position parallel to the Y- axis).

The calculation of road installation luminances according to the CIE30 Recommendation is always carried out at the fixed height of 1.5 m)



NOTE

Qc Calculation: when luminance calculation is activated, and only in the case of tunnel calculations, the Qc parameter can also be calculated (calculation is active when the \surd sign appears to the right of the text Qc), that is to say the ratio between the vertical illuminance in one point in the opposite direction to that of the traffic and the luminance value in the same point. It is an a-dimensional measurement.

2 different Qc calculations are possible:

- **Static:** in this case luminance is calculated for a static observer (not in movement) with respect to an area defined by means of the parameters Calculation Area – Start x [m] (this is the start of the calculation area with respect to the absolute reference) and Length x [m] (this is the length of the study area long x). These parameters are activated by selecting Static Observer: it is active when the \surd sign appears to the left of the description.
- **Dynamic:** if Static Observer is not activated, calculation is carried out as Dynamic Observer, that is to say that the distance between the observer and the calculation points along the same track remain constant (observer in movement).

Calculation Definition

Selection of Glare Calculation: by activating luminance calculation you can also activate that of the glare (calculation is activated when the \surd sign appears on the right of the Glare text) which, according to the type of installation, may be:

- **Interiors:** the program carries out calculation of glare assessment parameters such as UGR (Unified Glare Rating), VCP (Visual Comfort Probability) and CGI (according to CIE Recommendations 55). More than one observer may be inserted by means of the window for defining the position (Cartesian x, y and z coordinates) and direction of observation (Cartesian x', y' and z' or β angular coordinates, for the deviation, and α for the inclination). Access to the input window is automatically gained when defining the first observer, and either by selecting the Observer key for observers after the first or by pressing the INS key (press CANC to eliminate one)
- **Roads CIE30:** here the program carries out calculation of the G (discomfort glare) Lv (veiling luminance) and Ti (threshold increase) parameters according to the CIE30 Recommendation. Only one observer position can be defined for luminance calculation and this coincides with that for the calculation of the glare assessment parameter (fixed observer coordinates input).
- **General Exterior Areas:** in this case the program carries out calculation of the G parameter according to CIE Recommendations for sports areas where 19 observers with predefined positions and observation directions are automatically inserted and the calculation of the GR parameter relative to the glare of spotlight masts in generic exterior areas with any observer position and view direction.

In the case of an outdoor area a reduced reflection factor table (C, R or N) can be associated. Should you do this, bear in mind that the observer must be positioned at a distance of 60 m from the first calculation point at a height of 1.5 m and have the point of observation towards the area in question.

- **Light Pollution:** the program allows you to select the calculation of light pollution parameters as specified in Norm UNI 10.819 such as Average Ratio Rn [%] and Maximum Intensity [cd/klm] of all the inserted luminaires.
- **Calculation Grid:** the available choices are Automatic, with which the program uses an adaptable grid according to the dimensions of the individual surfaces, and Non (to activate the non-automatic grid, which can therefore be defined by the operator, just deactivate the tick ✓ to the left of the Automatic text): in this case you can input the desired distance in [m] between consecutive points of the calculation grid both longitudinally and transversally; this setting is fixed and maintained for each surface of the area under examination and of the furniture.

The program allows you to choose between Centered and Bordered Grid: with the first the outermost calculation points of the grid are always within the area, whereas with the second these points are positioned on the perimeter of the area in question. A mixed grid Centered/Bordered or vice versa can be used according to the transversal (parallel to the Y axis) or longitudinal (parallel to the X axis) references.

The use of the free grid should be limited to those cases where there is no furniture: too large a grid, in fact, would take only one point into consideration for an element of furniture of reduced dimensions, limiting the result at the time of rendering.

Finally you can choose a fixed grid defined according to current international norms. The available fixed grids are:

- **UEFA (United European Football Association):** this grid is defined by UEFA for the calculation of lighting engineering parameters for football pitches
- **French:** this 25-point grid is defined by French norms for the calculation of lighting engineering parameters for football pitches.
Press Cancel to quit the Definition of Calculation Parameters window or start the calculation by clicking OK.
During calculation, a window appears showing the calculation status. The program first calculates the direct component and then the indirect one which, unlike the first, involves a longer time of elaboration, even considerably so. The longest calculation time occurs when considering the shadows.

The calculation process is carried out entirely in background and it is therefore possible to activate other operations during its development. It is however not advisable to alter the position of luminaires and/or furniture to avoid inconsistencies in the results. The program will however highlight any inconsistencies.

It is difficult to give a precise calculation time as this depends on the following parameters:

- the total number of surfaces in the room
- the number of luminaires
- the number of items of furniture and their surfaces
- if shadows are considered in the calculation
- the defined calculation grid.

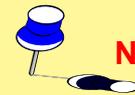
View Results - when calculations are concluded the program automatically presents the Results Summary from which to select the result to be visualized: please refer to the RESULTS chapter.

Deactivating Calculation Points (Point Elimination): for each results table it is possible to eliminate certain calculation values as in the case of points in areas of no interest (lateral areas of an interior or the central part of a road traffic circle). Elimination of one or more points causes automatic updating of the uniformity parameters.

The active functions are the following:

- Left mouse button: by keeping the button pressed and moving the arrow over a point, the point is deactivated if active, and activated if not
- Del Key (Delete): this allows the simultaneous deactivation of all the points
- Ins Key (Insert): this is the opposite of DEL and therefore activates all the previously deactivated points
- End Key: this reverses the situation, the active points are deactivated and vice versa.

The isolux curves are drawn independently of active or non-active calculation points



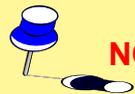
NOTE

To view the tables of illuminance and luminance values calculated for other surfaces in addition to graphs (isolux curves, spot and 3D diagrams) please refer to the RESULTS function in the menu bar.

Economic Calculation

Selection of the CALCULATIONS/Economic Calculation function opens the window where you define the parameters needed for calculating the costs of the installation.

This function can be accessed only if a project has been defined and the luminaires have been inserted.



NOTE

Economic Calculation is subdivided into 2 parts:

- Simplified Economic Calculation with which to obtain an estimate of the total price of luminaires and lamps
- Complete Economic Calculation with which different aspects of the investment are analyzed (total investment, plant amortization etc.).

You can choose one of the 2 calculation types by selecting one of the 2 buttons situated in the upper part of the window (Simplified – Complete): procedures for use are the same for both.

The economic calculation window is subdivided into 3 sections:

- **Luminaire Data**, which includes the fixed fields:
 - File Name
 - Luminaire Name
 - Luminaire Code
 - Number of Lamps

and the edit-boxes:

- Price of Single Luminaire [unit of exchange]
- Installation Costs of Single Luminaire [unit of exchange]
- Mounting Costs of Single Luminaire [unit of exchange]
- Working Hours per Year of the Luminaires [h].

Definition Economic Calculation Parameters

This section also includes the Previous and Next Luminaire keys with which you can move from one of the inserted luminaires to another.

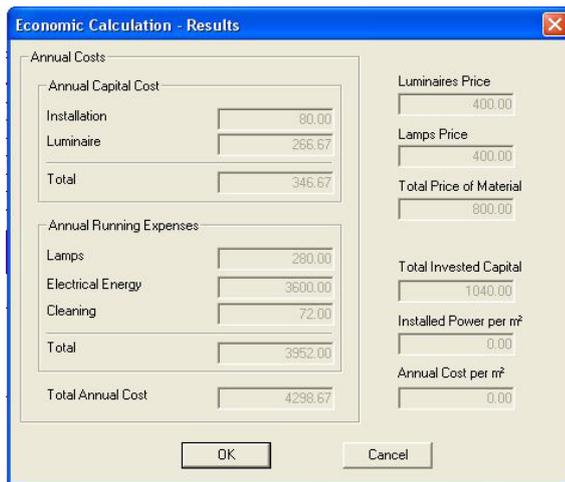
- **Lamp Data**, which includes the fixed fields:
 - File Name
 - Lamp Name
 - Lamp Code
 - Average Lamp Life [h]

and the edit-boxes:

- Lamp Power [W]
- Price per Lamp [unit of exchange]
- Single Lamp Replacement Cost [unit of exchange]

This section also includes the indication of the number of lamps per single luminaire and the Previous and Next Lamp keys with which you can move from one type of lamp to another should the luminaire use different lamps.

- **General Data**, which includes the edit-boxes:
 - Price per Kilowatt Hour [kWh]
 - Single Luminaire Cleaning Cost [unit of exchange]
 - Number of Cleanings per Year
 - Installation Amortization Costs [years]
 - Luminaire /Lamp Amortization Costs [years]
 - Surface of Area [m²].



Economic Calculation Results

When the data has been entered select OK and the program performs the calculations illustrating the results in the appropriate window.

The results include the following parameters:

- **Annual Costs** such as:
 - Annual Capital Cost subdivided into Installation, Luminaires and Total
 - Annual Running Expenses subdivided into Lamps, Electric Energy, Cleaning and Total concluding with the Total Annual Cost
 - **Total Invested Capital** which represents the capital to be invested for the purchase of luminaires and lamps, as well as the installation and mounting costs
 - **Installed Power per m²** given by the ratio between the total power installed and the room surface
 - **Annual Cost per m²** given by the ratio between the total cost of the plant divided by the surface of the working plane [m²] and the total number of years forecast for amortization of the plant.



Simplified Economic Calculation Results

The program also allows you to introduce currencies: selection of the relative button situated in the lower part of the data input window opens a window in which to input the currency, number of decimals and conversion factor.

To print the costs calculation results use the FILE/Print function.

RESULTS

This menu includes the functions concerned with the visualization of the results tables and relative graphs (isovalue curves, 3D and spot diagrams) of any surface in the project, from the area surfaces to those of the furniture, in addition to visualization of the parameters relative to glare.

Visualization of the table summarizing the results obtained from the calculations appears automatically at the end of calculation itself: in this table, described below, you may select from the main surfaces the one whose results you wish to see and from which to move on to the graphs.

The surfaces indicated in the summary table are only the main ones, that is those that are characteristic of the area (generic area, road, sidewalks etc.) or interior (floor, walls, ceiling) as well as that of the working plane. Should you wish to visualize the results on a different surface (for example that of a table) use the Select Surface function.

| | |
|---|--|
|  | Associated Icons (Room Toolbar) Select Surface |
|---|--|



Results Menu

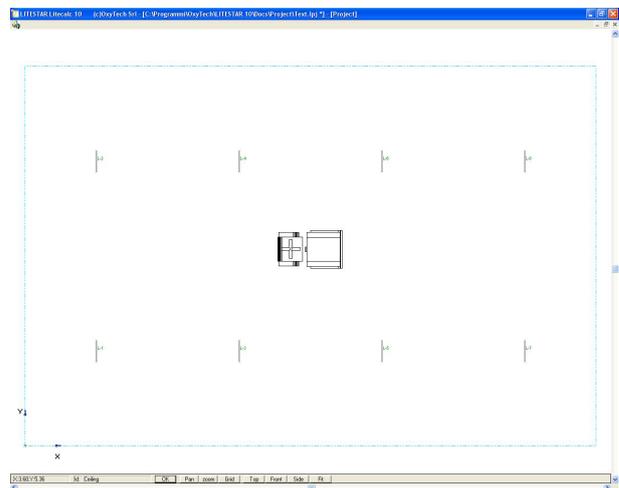
The relevant commands are:

- **Select Surface:** to choose a surface and specify how it shall be displayed
- **Results Summary:** this allows you to visualize the table summarizing the calculation results from which you may select the results tables you wish to be shown and from which to obtain the graphs
- **Working Plane – Floor Illuminances - Floor Luminances:** this allows direct viewing of the illuminance or luminance value table of the indicated surfaces
- **Close:** to exit the program
- **Stack:** to display the various windows containing tables, graphs and the working plane so that one is superimposed on the other
- **Tile:** to display the various windows containing tables, graphs and the working plane so that they are placed next to each other. The area of screen available for each window depends on the number of windows open
- **Display Icons:** to show icons

Select Surface

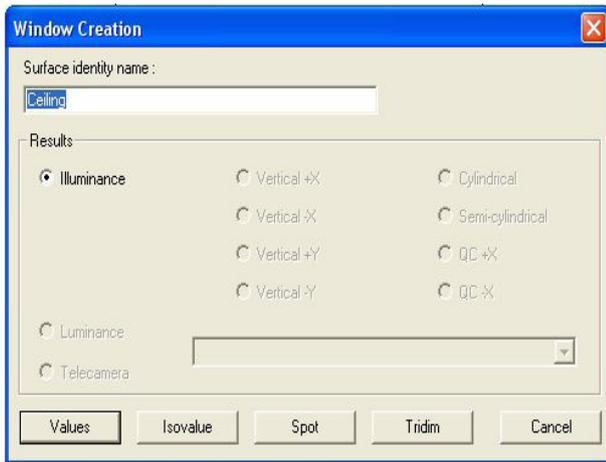
This command allows you to select the surface to be displayed. When you choose the command a view of the room appears on the screen with a toolbar containing the following functions:

- **Plus and Minus Key:** to enlarge or reduce the scale
- **Zoom:** to change the scale parameters, from the grid step to the zoom factor. Adjustments are made to the scale using the plus and minus keys
- **Plan-Front-Side:** to change from one view of the room to another. The options available are plan, front and side
- **Rescale:** to automatically rescale the room so that it fits in the available space
- **OK:** to confirm the surface selection. To select a surface, position the arrow of the mouse over it and click with the left button. If the correct surface is not selected (blue outline) keep pressing the left button of the mouse until the desired surface is selected.

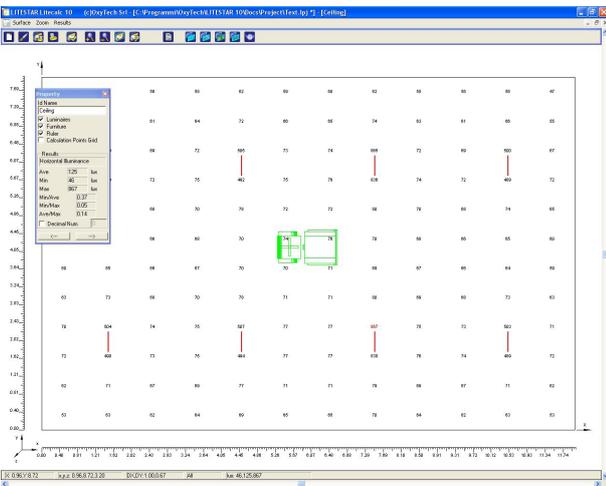


Surface Selection Mode

Press OK and the program opens the window in which to select the results visualization type (Illuminance or Luminance, if the latter has been calculated) and define the name to be given to the window/surface (this name is also used in the printouts: it should have a logical sense so as to better single out the surface under examination – for example: 'Upper Table'); you may also choose to visualize the luminaires on tables and graphs: to do this select the appropriate field and a V will appear on the box to the left.



Results View Type Selection



Values Table View

Plane.

After selecting, for example, Values and Illuminance the program shows the values table relative to the selected surface.

This view shows the area and its dimensions and the illuminance values [lux] calculated.

The lower bar gives the following information:

- the X and Y co-ordinates of the mouse relative to the axes associated with the surface (relative system)
- the x, y and z co-ordinates with respect to the absolute Cartesian axes
- the intervals Dx and Dy between the points of calculation
- indication of whether all the calculated values are displayed (All) or if some of them have not been displayed due to lack of space (Partial)
- the minimum (min), medium (med) and maximum (max) values of illuminance [lux] or luminance [cd/m²] of the surface.

Surface Properties Window – with the results or graphs you also find the Surface Properties window which includes the following elements:

- an editable field in which to enter the name to be given to the window/surface (this name is also used in the printouts: it should have a logical sense so as to better single out the surface under examination – for example: 'Upper Table')
- Luminaire selection fields to visualize or not the luminaires on results and graphs, Ruler with which to visualize the millimetric ruler associated with the area and Calculation Points with which to visualize the points in which the calculations have been made
- Results: in this part of the window is shown the type of measurement under examination whether Illuminances or Luminances, the respective medium, minimum and maximum values and the uniformities
- Right-Left Arrows: the two arrows are useful for moving from one visualization to another, including the Working

Area Zoom – from the visualization of a results table or graph it is possible to zoom onto an area of interest: to do this move the mouse arrow to the top left, press the right mouse button and create a rectangular selection area by moving the mouse downwards to the right. On releasing the button the program shows the window with which to select the type of representation after which it moves on to the relative visualization.

Icons – the icons and relative active functions in this window are:



Corresponds to the SURFACE/New Project function: its selection opens the selection window of a new project area (see INTRODUCTION TO THE PROGRAM)



Corresponds to the SURFACE / Redraw function: it allows you to refresh the screen



Corresponds to the SURFACE / Print Results and Project function: in the first case (Results) the program prints the table or graph on the screen, in the second it accesses the general print window of the project (see FILE/Print)..



NOTE

In the SURFACE menu the function Configure Printer is available for printer configuration



Corresponds to the SURFACE / Properties function: its selection activates the Properties window of the Surface under examination



Corresponds to the ZOOM / In + Out + Fit + Scale function. Zoom In + Out allows you to enlarge and reduce the visualization of the area while with Fit the visualization is shown within the screen area. With scale you can define the scale with which to visualize the table or graph that will then be the scale used for printing. Selection of the function opens the window in which to choose the scale: the possible solutions are:

- Fit Page with which the program will proceed to represent the area under consideration at its best inside the page
- Fit Values with which the program proceeds to choose the best scale to be able to reproduce the results on one or more pages
- 1:10 – 1:20 1:10.000 with which to choose a well defined scale according to which the area and relative values will be represente.



Corresponds to the RESULTS / Results Summary function: its selection activates the Results Summary window with which to obtain a synthesis of the calculated values (see description below)



Corresponds to the RESULTS / Isovalue (Curve) + Values + Spot (spot diagram) + 3D (three-dimensional diagram) function with which the program visualizes the tables and graphs of the selected surface.

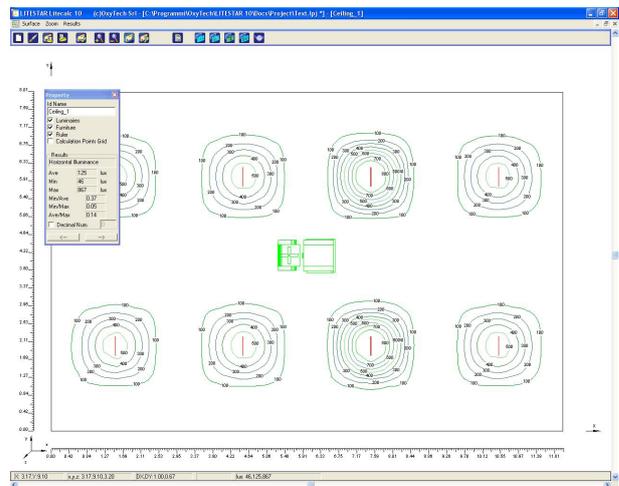


Corresponds to the RESULTS / Modify function: when this icon is selected the program returns to the window (short-cut) from which project definition started (for example: if a road has been defined with the WIZARD PROJECT/Regular/Irregular Roads function the program automatically returns to this window).

Deactivating Calculation Points (Point Elimination): for each results table it is possible to eliminate certain calculation values as in the case of points in areas of no interest (lateral areas of an interior or the central part of a road traffic circle). Elimination of one or more points causes automatic updating of the uniformity parameters.

The active functions are the following:

- Left mouse button: by keeping the button pressed and moving the arrow over a point, the point is deactivated if active, and activated if not
- Del Key (Delete): this allows the simultaneous deactivation of all the points
- Ins Key (Insert): this is the opposite of DEL and therefore activates all the previously deactivated points
- End Key: this reverses the situation, the active points are deactivated and vice versa.

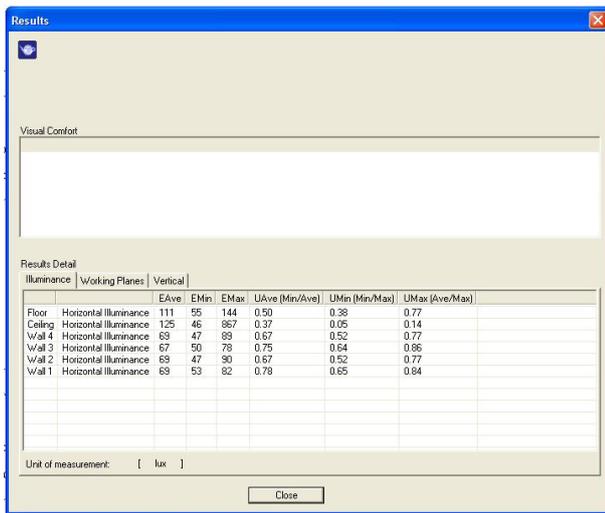


Selected Surface Values Table View

The isolux curves are drawn independently of active or non-active calculation points



NOTE



Results Summary window showing a table of lighting parameters. The table is titled 'Results Detail' and has columns for 'Illuminance', 'Working Planes', and 'Vertical'. The data is as follows:

| | | E Ave | E Min | E Max | U Ave (Min/Ave) | U Min (Min/Max) | U Max (Ave/Max) |
|---------|------------------------|-------|-------|-------|-----------------|-----------------|-----------------|
| Floor | Horizontal Illuminance | 111 | 95 | 144 | 0.50 | 0.38 | 0.77 |
| Ceiling | Horizontal Illuminance | 125 | 46 | 367 | 0.37 | 0.05 | 0.14 |
| Wall 4 | Horizontal Illuminance | 93 | 47 | 93 | 0.67 | 0.52 | 0.77 |
| Wall 3 | Horizontal Illuminance | 67 | 50 | 78 | 0.75 | 0.64 | 0.86 |
| Wall 2 | Horizontal Illuminance | 69 | 47 | 90 | 0.67 | 0.52 | 0.77 |
| Wall 1 | Horizontal Illuminance | 69 | 53 | 82 | 0.78 | 0.65 | 0.84 |

Unit of measurement: [lux]

Results Summary

Results Summary

This function allows you to visualize the results summary table of the calculated lighting engineering parameters.

The window is subdivided into 3 parts and the results shown depend on the type of calculation made (for example, in the case of road installations the parameters of Light Pollution may be shown while they would be absent in an interior installation):

- the upper part contains the results of Longitudinal Uniformity, of the glare parameters (G, Lv and Ti) and of light pollution for roads (the calculation is made according to Italian Norm UNI 10.819); in the case of interior or exterior installations this section is empty.

- Visual Comfort** – here the calculation results of visual comfort parameters are visualized for interiors (there are 3 parameters: UGR (unified glare rating) – VCP (visual comfort probability) – CGI (glare parameter no longer used) and for exteriors (GR: this is useful for evaluating glare in sports installations, its value must be lower than 50 not to reach

glare conditions)

- Results** – the window contains several sections according to the calculations selected: to go from one to the other click on one of the descriptions shown in the upper area.

The available options are:

- Illuminance [lx] for the values of the surfaces that make up the area under examination
- Working Planes [lx] for the values found on virtual surfaces such as, for example, illuminance values on the Working Plane, horizontal illuminances on the calculation plane of cylindrical illuminances and for telecameras
- Vertical [lx] for vertical illuminances in the 4 directions +X, -X, +Y and -Y
- Cylindrical/Semi-cylindrical [lx] for cylindrical and semi-cylindrical illuminances
- TV [lx] for vertical illuminances referring to telecameras defined in the calculation setup
- Luminance for the luminance values on relevant surfaces
- Qc [a-dimensional] for visualizing results of the Qc parameter calculation for tunnels given the ratio between vertical illuminance in the opposite direction from the traffic and the luminance value of the same point.

All the windows show the medium, minimum and maximum values and uniformity parameters $U_{med} (V_{min}/V_{max}) - U_{min} (V_{min}/V_{max}) - U_{max} (V_{med}/V_{max})$ corresponding to the main project surfaces (the floor, walls and ceiling for interiors, the area for exteriors, the carriageway, sidewalks and central reservation for roads; for all these the results of the working plane are then shown). In the case of Regular/Irregular Roads the Longitudinal Uniformities for each carriageway are also shown.

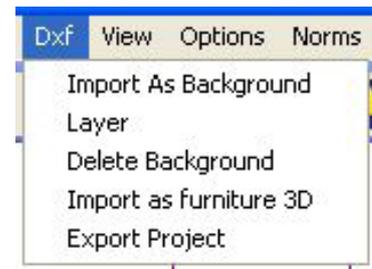
To select one of the tables available in the different sections click twice with the mouse on the description of the table to be viewed.

DXF

The DXF menu contains the functions useful for managing the DXF files generated by the AutoCAD programs or by other CAD systems which have the relative export function both in import and in export.

Selection of DXF from the menu bar shows the following options:

- **Import As Background** to import a 2D DXF file as background on which to build the area (see below)
- **Layer** to activate or deactivate the layers that compose the DXF drawing imported with the Import as Background function. Selection of the function opens the window showing the list of available layers which, at the time of import, are all made active. Click on the description of the layer to deactivate it if active or vice versa.
- **Eliminate Background** to eliminate the background previously imported and visualized as background
- **Import as Furniture 3D** to import a 3D DXF file to be added to the furniture list
- **DXF Export** to export in 3D DXF format the area generated with the program, the luminaires with aimings, the furniture, isolux curves and illuminance values on the working plane. The file can then be opened and managed by the AutoCAD program version 14, 2000 e 2002.



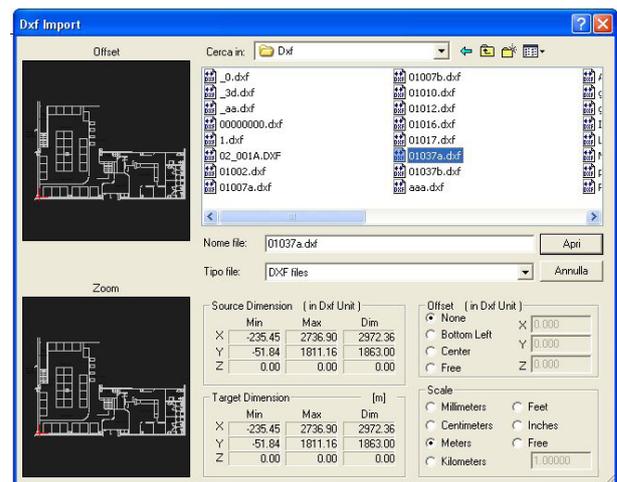
DXF Menu

Import As Background

The DXF Import function allows you to import a two-dimensional (2D) DXF file and represent it as background to the drawing.

Selection of the function opens the window in which to choose the file to be imported: all the file management functions typical of Windows Explorer are available, such as tree view, create new folder or list details view.

After selecting a DXF file the program shows its contents in the 2 windows on the left, one shows the offset (this represents how far the source is moved with respect to the area under examination), that is the source of the Cartesian axes and the drawing area, the other shows the zoom of the active part of the drawing.



Choose DXF File

In the lower part of the import window, there are these 4 sections:

- **Source Dimensions [DXF Units]:** these are the drawing dimensions in DXF units
- **Offset [DXF Units]:** in this section you can define the position of the axes' source with respect to the drawing area; 4 different options are available:
 - **None:** the source position is the original DXF file position
 - **Bottom Left:** the source is positioned in the bottom left of the drawing
 - **Centered:** the source is positioned in the center of the drawing
 - **Free:** in this case the source coordinates may be freely defined by the operator; on selection of this option the program activates the 3 X, Y and Z coordinates with which to define the offset of the new source with respect to the original DXF file position.
- **Target Dimensions [m]:** these are the dimensions of the drawing in [m] according to the unit chosen in the drawing unit of measurement definition

section (see Scale)

- Scale: in this section the unit of measurement with which to handle the drawing is defined. The available units are: millimeters [mm], centimeters [cm], meters [m], kilometers [km], feet [ft], inches [inch] and free, with which to define a scale of your own.



NOTE

Since the units of measurement cannot be handled in the DXF file, the unit must be chosen from the Scale section, observing the dimensions in the Final Dimensions section and making sure they are compatible with the drawing under examination.

To confirm import of the DXF file press Open.

Once the DXF file has been imported and visualized as background, the Area/ Create Area function must be used to define the edges of the study area and also whether this is interior (in which case the walls will be created) or exterior.

To ensure that the edges of the DXF drawing coincide with those of the study area defined with the Area/Create Area function (points SNAP), during the area definition phase the key must be pressed before clicking with the left mouse button.

The DXF background can be printed along with the various screen displays (value tables, graphs etc.) by selecting the relevant option from the Print window.

When drawing the area on the basis of the DXF design the following functions are active:

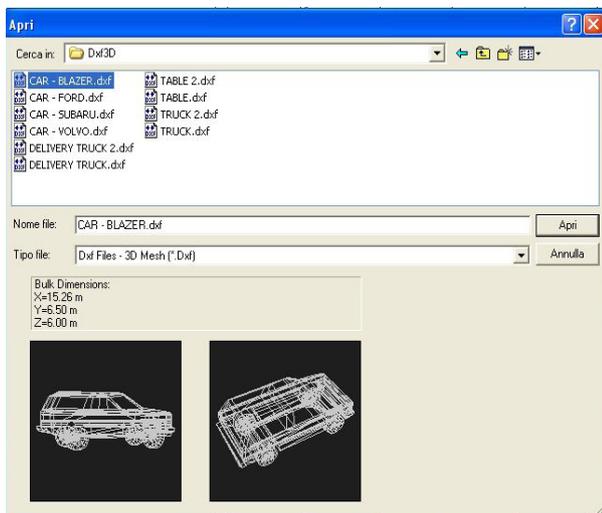
- no key pressed aligns to the grid;
- CTRL for snapping (capturing) the DXF drawing;
- SHIFT frees from the grid;
- ESC deletes the last line.

Import as Furniture 3D

This function allows you to import files of 3D objects previously created with AutoCAD 14, 2000 and 2002 3D solid modeler and saved according to the following instructions:

- create the 3D model in AutoCAD
- select the command `_3DSOUT` or insert it in the AutoCAD command bar. The program asks you to select the objects to be exported and the name of the destination file: in this way a *.3DS file is created
- open a new file as if you were going to start a new project
- select the command `_3DSIN` or insert it in the AutoCAD command bar. Then select the *.3DS file previously created: the program proceeds to import the object and visualize it
- finally select the DXFOUT function with which to export the file in DXF 3D format. At this point the file is ready to be imported into Litecalc.

To import a Dxf 3D object into Litecalc, at this point select the function choosing the file to import and confirming your choice by clicking on Open.



Import DXF 3D

The program opens the window in which to define where to save the file starting from the Furniture subfolder of the program.

The file is saved with .MOD extension and is an entirely new object added to the furniture elements already present that may be used with the FURNITURE/Add Furniture function.

VIEW

This menu contains all the commands required to visualize the project.

| | |
|---|---------------------------------------|
|    | Pan - Zoom - Modify Grid |
|     | Top - Front – Side Fit View Room |
|   | Axis - Grid |
|    | Redraw - Bounding Box – Complete View |
|  | 3D View (Rendering) |

The commands in this menu are:

- Top/Front/Side: these commands are used to pass from one 2D view of the room to another
- Pan: this allows movement of the drawing within the Working Plane. On selection of the PAN button the mouse arrow is substituted by the drawing of a hand: by pressing the left mouse button the drawing is captured and may be moved in all directions within the Working Plane
- Zoom: this allows enlargement or reduction of the drawing (zoom in and zoom out). There are 2 modes:
 - Pressing the left mouse button and moving the mouse upwards effects enlargement (zoom in), moving it downwards reduces the drawing (zoom out)
 - Pressing the right button and keeping it pressed, the program opens a rectangle whose contents are enlarged to occupy the whole screen when the button is released
- Grid: this function allows you to change the step of the Working Plane grid and therefore to change the scale according to which the drawing is represented. Selection of GRID opens the window in which to manually insert the grid step: select OK to confirm input.
- Fit Room: this command automatically scales the room so that it is clearly represented in the Working Area
- Bounding Box: the furniture may be visualized completely in all its individual parts or by Bounding Box, that is to say the parallelepiped that contains it
- Camera (3D View - Rendering): this is used to visualize the room in 3D and to manage all the commands related to rendering (photographic visualization of the scene) as well as the possibility, in the Litecalc program, to manage the surface textures.



View Menu

3D View

This option manages the 3D view and dynamic rendering functions of the area with the possibility of adding texture to the surfaces inside it, including furniture.

Selection of the function opens the Texture and Rendering management module window with the following menus:

- **File** to save the images and return to the project
- **View** to define the position of the point of observation of the scene
- **Tools** functions for recording the video, modification of shading
- **Texture** to access the texture management functions.
- **Rendering** to manage the images in radiosity.

File

The associated functions are



File Menu

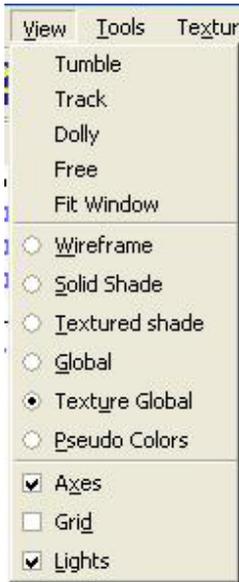


Save Screen Image – this allows you to save the view of the area on screen in a BMP. File. Select the function to open the window in which to confirm saving. The file is saved in the “\Docs\ImpExp” directory. The saved image is also entered in a temporary window and added to the Litestar print list.

Return to Project – selection of this function allows you to return to the Working Plane

View

The view functions of the scene and relative icons are:



View Menu



Tumble: to rotate the point of observation around the center of interest



Track: to move the point of observation vertically and horizontally



Dolly: to move the point of observation away from and towards the center of interest (horizontal movement)



Free: combine a key with the left mouse button to get the effects listed above.

- ALT + Left mouse button = Tumble
- CTRL + Left mouse button = Track
- SHIFT + Left mouse button = Dolly



Fit window (Center View): to return the area view to the center of the monitor positioning the XY plane horizontally, the X+ axis from left to right and the Z axis vertically.



Wireframe: only the perimeter of the various surfaces making up the scene are shown in different colors according to those previously defined.



Solid Shading: the surfaces are shown in previously selected colors.



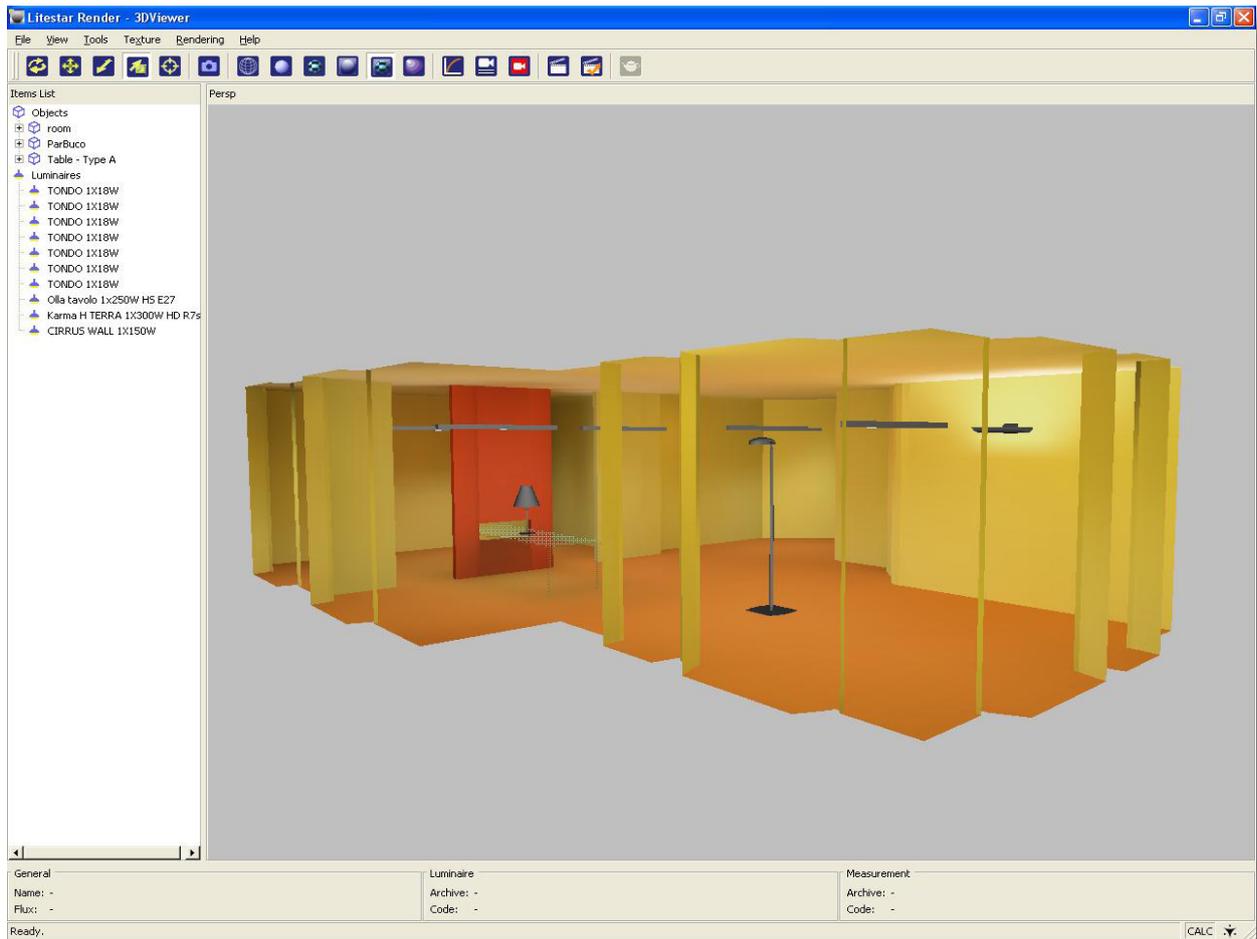
Solid Shading with Texture: the surfaces are shown in previously selected colors with the addition of textures.



Global: the calculation results of the area radiosity are shown on screen; this function cannot be activated if the illuminance calculations are unavailable.



Global Texture: the calculation results of the area radiosity with the addition of textures are shown on screen; this function cannot be activated if the illuminance calculations are unavailable.



View Menu

3D False Colors Diagram: this allows the area to be viewed in different shades of color corresponding to a scale shown in the lower part of the video. This is useful for understanding the distribution of the illuminances in 3D. Selection of the function opens a window in which to define:



- Colors: to choose between colors RGB or shades of gray;
- Curves: to choose the type of scale whether linear or logarithmic (Recalculate Values);
- Rescale: to set the maximum and minimum value for recalculating the color scale;

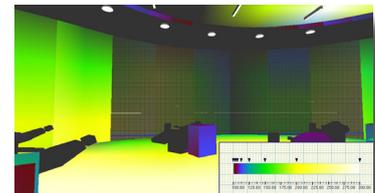
Press OK to view the area with the surfaces in false colors, press Cancel to return the program to the main screen.

To print the image in the project documentation, save it with the FILE/ Save Screen Image function.

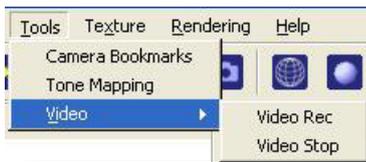
Apply to apply the modifications made to the view without leaving the panel.

Live / No Live: to apply the view modifications interactively.

- Axes Activation/deactivation of regular grid view
 Grid Activation/deactivation of the Cartesian axes
 Lights Activation/deactivation of lights view.



False Colors Image



Tools Menu

Tools

The functions and relative bar icons are:



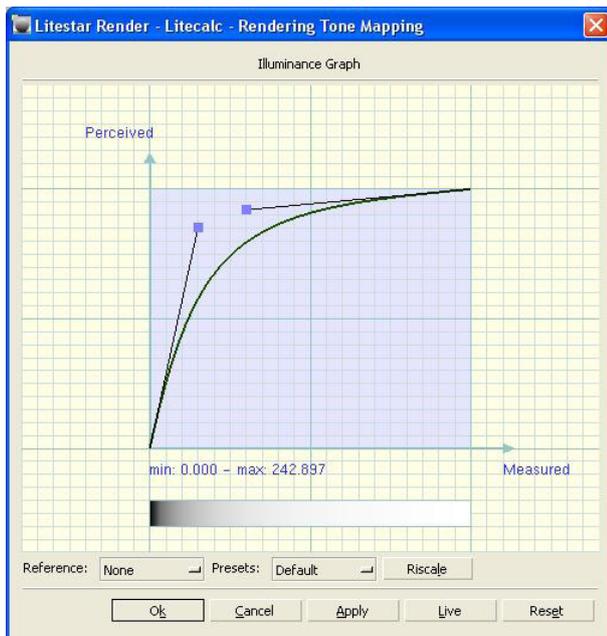
Tone mapping: this opens a window in which to modify the perception of the image. It therefore allows the correction of any discrepancies between what is expected and what the monitor or printer are able to represent.



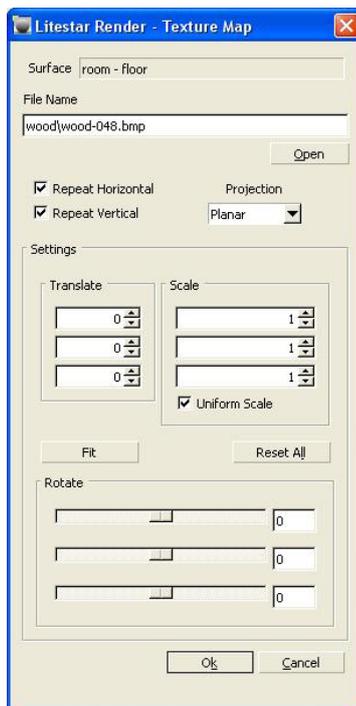
Camera bookmarks: this allows the insertion of signals that will be used as points of reference for recording/reproducing the videos.



Video recording: this starts or stops video recording.



Tone Mapping Menu



Texture Properties

Texture

A surface can be associated with a texture by activating the surface in the list on the left of the screen and selecting the function either from the menu or from the context menu that opens when the right mouse button is pressed:

- **Add** to associate a new texture to the selected surface. When this option is selected the program shows the Windows selection window from which to choose the required texture; this window also allows you to view the preview of the textures as well as the general list: to do this select the icon from the view menu, usually situated on the top right
- **Remove** to cancel the previously associated texture.
- **Properties** this opens the texture selection window in order to modify the settings.

The name of the selected texture and its folder are found in the File Name field; from here you can return to the texture selection window by pressing the Selection button should you wish to change it.

The following fields are also available:

- Repeat Horizontal and Vertical with which to duplicate the selected texture horizontally and/or vertically
- Projection: flat, spherical, cylindrical of the surface image.

The lower part of the window contains the Texture Setting section which features the following:

- **Reset:** this button resets all settings returning them to default conditions.
- **Translation [m]:** this allows a single texture to be moved according to the three x, y and z Cartesian axes of the surface (the z axis is that perpendicular to the surface)
- **Scale:** this allows definition of the scale factors in x, y and z according to which the selected texture is to be enlarged. After activating the Uniformity option, the factor set in one field is automatically set in the other 2
- **Rotation:** a texture can be rotated according to the 3 axes x, y and z so as to position it correctly on the surface under examination. To place a texture flat, the 3 rotations will all need to be set a 0 while to place it on a vertical wall parallel to the y axis it will be necessary to set the rotation according to axis x and axis y at 90°. Different rotations can however be set: in this case the texture will not be attached to the surface but its projection onto it will be shown.
- **Fit:** this extends the image to the limits of the selected surface.

Rendering

The Ray Tracing view functions

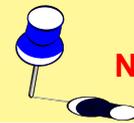


Ray Tracing: this button launches the creation of the Ray Tracing image for viewing reflections on the surfaces, including mirrors and glass



Settings: parameter setting.

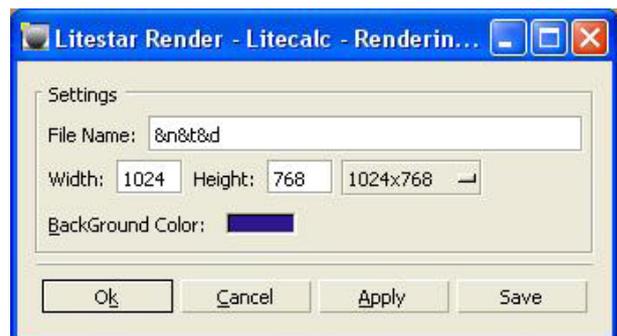
The surface properties regarding Ray Tracing parameters are set using the AREA/ Change Colors and Reflectances function.



NOTE

The parameters to be set are as follows:

- **File Name:** this is the name to be given to the image that is being created. The program automatically saves the image in the ImpExp folder of the program
- **Resolution:** dimensions of the final image. The user is supplied with a list of standard resolutions (320x240 – 640x480 – 768x576 – 1024x768 – 1280x1024 – HD 720 – HD 1080 – PAL – NTSC) by means of a drop-down menu. A customized resolution can however be specified (custom); in this case the width and height fields are available
- **Background Color:** sets the background color.
- **Apply:** applies the set parameters.
- **Save:** saves the settings in a configuration file.



Rendering Properties

The window shows the image extended to fit the window fully. The view can be modified with the following commands:



Track: to move the point of observation vertically and horizontally



Dolly: to move the point of observation away from and towards the center of interest (horizontal movement)

Free: combine a key with the left mouse button to get the effects listed above.



- ALT + left mouse button = Tumble

- CTRL + left mouse button = Track

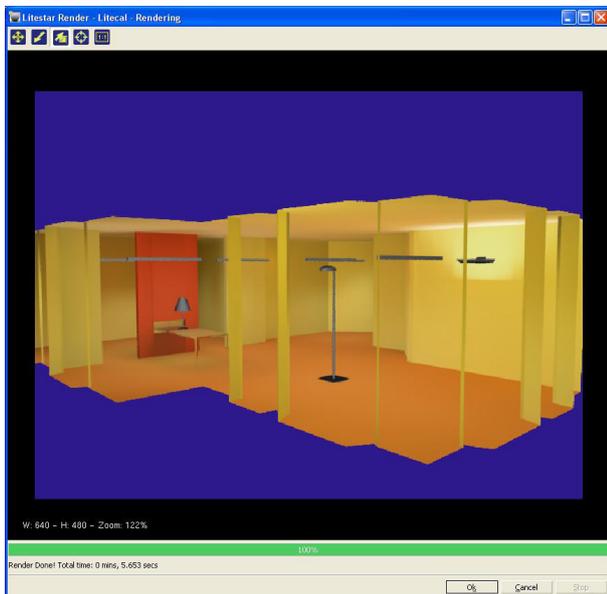
- Dolly SHIFT + left mouse button = Dolly



Fit window (Center View): to return the area view to the center of the monitor positioning the XY plane horizontally, the X+ axis from left to right and the Z axis vertically.



Fit 1:1: Returns the image zoom to 100%.



Rendering Image

OPTIONS

This command allows you to redraw the room components and to set the working tools.

Associated Icons

| | |
|---|------------------------------|
|  | View Axes - Grid - Redraw |
|  | View Bboxes - Complete |

Le funzioni disponibili sono:

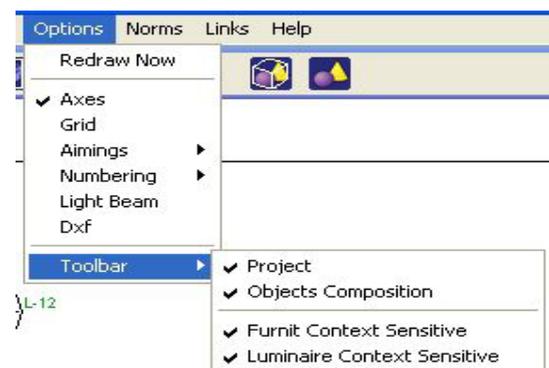
The commands available are:

- **Redraw Now:** redraws any components of the room, which have been hidden during displacements
- **Axis:** to display the axis origin. If 'axis' is checked then the origin of the axis is marked by a x sign on the bottom left hand side of the screen
- **Grid:** it allows you to decide whether grid points are displayed or not. If 'grid' is checked then the grid points are displayed
- **Aimings:** this allows you to activate or deactivate the segments representing mast and luminaire aimings. On its selection the menu appears in which to activate (or deactivate) the aimings of luminaires, masts and the luminaires on the masts. In the same menu you will find the None function with which to deactivate (or reactivate) the current aimings.
- **Numbering:** this allows you to activate or deactivate the numerical references of masts and luminaires. On its selection the menu appears in which to activate (or deactivate) the numbering of the luminaires, masts and luminaires on the masts. In the same menu you will also find the None function with which to deactivate (or reactivate) the current aimings.
- **Light Beam:** this option activates the representation of the light beam emitted by the luminaire onto the plane where the luminaire is being aimed using the LUMINAIRE/Aim Luminaire function, and also indicates the direction of the maximum luminous emission
- **Dxf:** this function is useful when you want to deactivate or reactivate the background visualization of a 2D Dxf file imported with the FILE/Dxf Import function
- **Toolbar:** to handle the 4 toolbars available with the program (a toolbar is a group of icons corresponding to the different commands available in the each menu). If you choose this command the program presents a second level menu which allows the user to decide which toolbars are displayed.

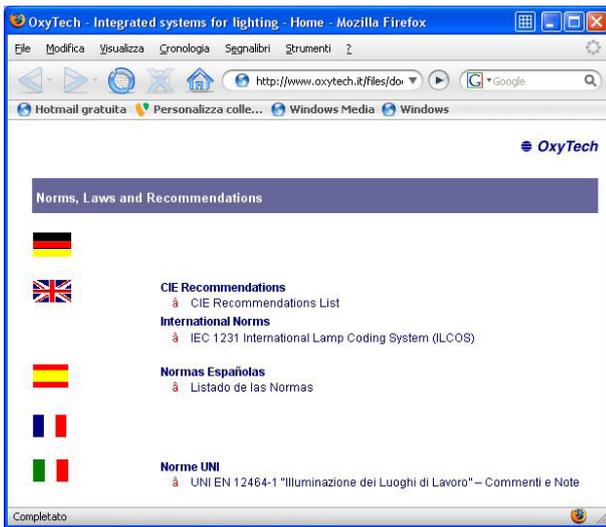
There are 4 toolbars available: one with the commands to define the room, another to manage the objects in the room, a third to manage the furniture and the last the luminaires. The last two menus are Context Sensitive which means that they are displayed only when you are working on furniture or luminaires.



Options Menu



Options Menu/Toolbar



Norms

NORMS

The Norms function allows you to handle useful brief information concerning the Norms to be applied to the project.

After selecting the function the window showing the summary of available Norms appears.

The available options for Norm handling are subdivided into 2 parts:

1. the first is the menu bar including the functions:

- File to open a different Norm file (Open), to print the selected Norm (Print Norm) or to quit Norm viewing (Exit)
- Modify to copy a section of the highlighted Norm (Copy) or to make particular notes (Note)
- Bookmark to define a bookmark in the point of the text where the cursor is positioned
- Options to define the presentation level of the Norm guide (Guide Always on Top), to visualize the chronology window of the operations effected with the guide (View Chronology Window), to define the Viewing character (Character) and to choose whether to use the system colors or not (System Colors)

2. The second is the toolbar which includes the functions:

- Summary for access to the list of available names
- Index to visualize the window showing the key words on which to carry out search to access the corresponding Norm (Index) or to find a Norm from any word included in the text of the Norm (Find)
- Previous to visualize the window previous to the current one
- Print to print the current subject matter.

LINKS

The Links menu allows you to move from one LITESTAR program module to another with the following available links:

-  Operative Electronic Catalog (Liswin)
-  Estimate Module (Lisman)
-  Photometry Management (Photowin)
-  Catalog Data Management (Lisdat)

HELP

The Help menu contains the following functions:

- Info: to activate the handling of various information, usually commercial, on the program and proposed services
- Encyclopaedia: for access to encyclopaedia management for information on lighting design parameters. Management is similar to that of the Help option in the program (see Index)
- Tutorial: to launch automatic demonstration of the main functions of the program
- Index: for access to the help management functions of the program
- About...: for access to the window indicating the program version and any information on copyright



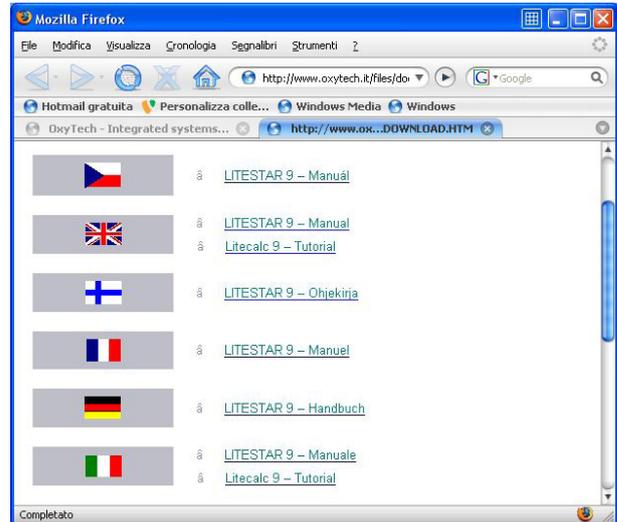
Help Menu

Index

On selection of this function, the window showing the summary of available help items appears.

The available functions in Help management are divided into 2 sections:

1. The first is the menu bar which includes the functions:
 - File: to open a different Help file if available (Open), to print the selected topic (Print Topic) or to exit from the Help visualization (Exit)
 - Edit: to copy a part of the Help highlighted (Copy) or to note particular information (Note)
 - Bookmark: to define a bookmark at the point in the text where the cursor is positioned
 - Options: to define the presentation level of the Help Guide (Guide Always on Top), to view the chronology window of the operations carried out with the guide (Visualize Steps Window), to define the view characters (Characters) and to choose whether or not to use the system colors (System Colors)
2. The second is the toolbar which include the functions:
 - Summary: for access to Help summary
 - Index: to view the window showing the key words on which to carry out search and to reach the corresponding Help section (Index) or to find a section of Help starting from any word contained in the Help text (Find)
 - Previous: to view the window previous to the current one
 - Print: to print the current topic



Help Summary

Liswin - Introductory Notes

Liswin is an operative electronic catalog because, in addition to allowing product search according to different systems and parameters, it allows the subsequent elaboration of the product data for the production of project documentation in accordance with the requirements of the operator.

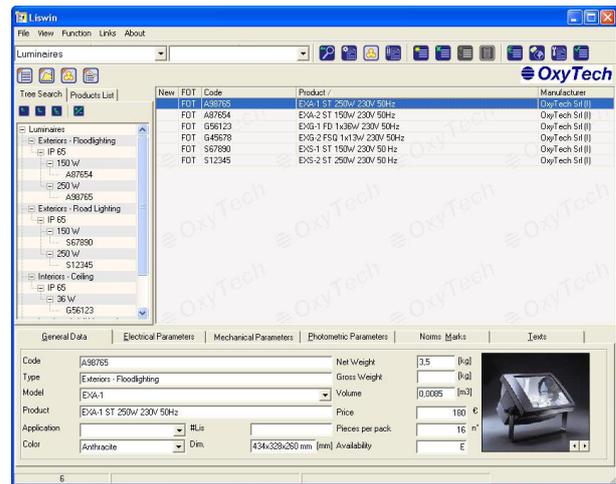
The Liswin program module manages the functions of:

- Parametric and tree search of products
- Processing of data sheets in different languages
- Price list management

Operative Catalog Management

On selection of the Liswin function the catalog viewer appears, made up of the following parts:

- An upper area made up of three menu bars;
- a second section, with tree search, of product list and table;
- the third section showing all technical and commercial data;
- a state bar where the number of products present in the archive and the selected archive are shown.



Catalog Viewer

Menu bars

Text Menus

The text menu bar made up of the menus:

File

The File menu allows you to manage the following functions:

- Data and Parametric Search Update to search for one or more products according to the parameters defined by the operator in the relative dialogue window
- Configuration for access to the parameter management section of the Liswin module, such as file paths or technical sheet colors
- Apply filter to apply the DB filter. It is necessary to exit the program so that the filter can be applied on re-entry. The filter allows the database fields to be updated to include something new such as: a new color, a new norm, a new trademark etc...
- Configuration (Linil will be applied) ??????
- Exit to leave the Liswin module. To exit you can also press the X on the top right.

View

The View menu allows you to manage the following functions:

- Manufacturer Data to view the active manufacturer's data
- Price List for access to price list management functions
- Product Elimination to activate the deletion of one or more products from the database
- Project List to activate management functions of the product lists to be used later with the estimate module (Lisman)

Functions

The Functions menu allows you to manage the following functions (the associated icon is shown in brackets):

- Find to search for a product according to the letters entered in the dialog window. Search is carried out on the active column (the one showing the triangle symbol in its description)
- Find Next to search for the next product to that found with the Find function
- Technical Data Sheet for access to the management module of the technical data sheet of the selected product. It is also sufficient to click twice on the selected product.
- Photometry to view, if the FOT indication to the left of the product is active,



File Menu



View Menu



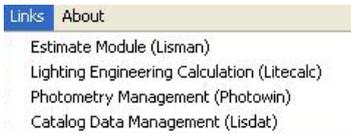
Functions Menu

the luminaire photometry

- Documents for access to the window showing the list of documents associated with the selected product (Excel, PDF files etc.)
- Delete to eliminate the selected product from the catalog
- Add to Project List to add the selected product to the project list which can then be imported with the Lisman program. (See also the Project List function from the View Menu)

Links

The Links menu allows you to move from one LITESTAR program module to another with the following available links, shown in copy in the third icon bar, are as follows:



Links Menu

-  ·Lighting Engineering Calculation (Litecalc)
-  ·Estimate Module (Lisman)
-  ·Photometry Management (Photowin)
-  ·Catalog Data Management (Lisdat)



About Menu

About

This opens a program cover window that indicates the program version.

Second Bar

The second bar shows in this order

A first drop-down menu from which to choose the type of product to be selected

- - Lighting appliances
 - Lamps
 - Reactors
 - Measurements

The second drop-down menu shows the list of activated manufacturers. Select one to gain selective access to the database of that manufacturer. On the second bar, aligned on the right, appears the manufacturer's logo, if present, or otherwise the name in text format.



-  Icon with which to open the window "Data update and parametric search".
-  Icon with which to open the Data Sheet window.
-  Icon with which to open the Photometry window.
-  Icon with which to open the Documents window.
-  Project list.
-  Product deletion. See paragraph.
-  Add to list.
-  Delete selected products.

-  Icon with which to open the Price List window.
-  Icon with which to open the Currency window.
-  Icon with which to open the Manufacturer window.
-  Icon with which to open the Setup window.

Third Bar

The third bar shows

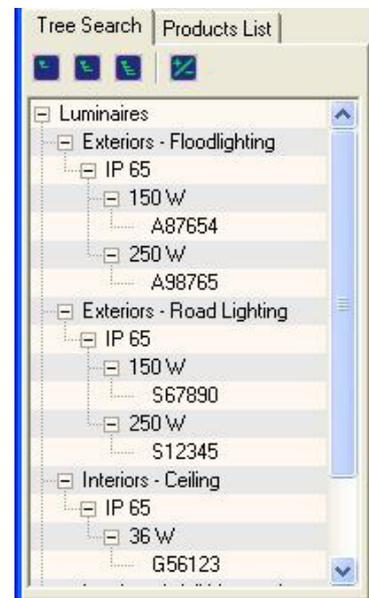
-  Icon with which to open the Lisman estimate module.
-  Icon with which to open the Litecalc lighting engineering calculation module.
-  Icon with which to open the Photowin photometry management module.
-  Icon with which to open the Lisdat catalog data management module.
- On the right the logo of the company whose product is being shown. Click on the logo to access the company's data window.

Lists section

Tree Search

Tree Search is activated by selecting the relative function from the menu or the icon from the bar. This opens the window showing the tree of products previously selected using the Parametric Search function.

This window contains the functions  that allow you to open the search tree on one of the three available levels (the levels correspond to different research parameters): click on one of the available codes to immediately view the product card.



Tree Search

Project List

Liswin allows you to create a list of products to be imported directly into the estimate program Lisman; this function appears on the left of the Product table.

Function

- Select one or more products from the product table on the left;
- Press the right mouse button and select Add to List from the context menu: the program proceeds to insert the selected products in the Import List window. Repeat the operation as necessary according to the number of products to be inserted
- In the "Product List" there are two icons that are reproduced in a context menu by pressing with the right mouse button on the List window:



Remove allows the selected product to be removed from the list while



Clear will clear the list.



Project List

| New | FOT | Code | Product / | Manufacture |
|-----|-----|--------|---------------------------|-----------------|
| | FOT | A33765 | EXA-1 ST 250W/230V/50Hz | OxyTech Srl (I) |
| | FOT | A87654 | EXA-2 ST 150W/230V/50Hz | OxyTech Srl (I) |
| | FOT | G56123 | EXG-1 FD 1x36W/230V/50Hz | OxyTech Srl (I) |
| | FOT | G45678 | EXG-2 FSQ 1x13W/230V/50Hz | OxyTech Srl (I) |
| | FOT | S67890 | EXS-1 ST 150W/230V/50 Hz | OxyTech Srl (I) |
| | FOT | S12345 | EXS-2 ST 250W/230V/50 Hz | OxyTech Srl (I) |

Numerical Free Edit Box

Product table

In the product table located on the right which includes the list of products selected using the Search function, the fields shown are: New (this shows if the product has recently been updated), FOT Photometry (this shows if there is a photometry available), Product Code, Product Description, Manufacturer.

Select a line in the list to show the relative data in the lower section, see paragraph "Technical and commercial data".

The active functions in this window are:

- Ricerca sulla lista: selezionare uno dei titoli delle colonne, digitare i primi caratteri dell'elemento ricercato, la lista si posizionerà sul primo degli elementi.
- Order: press on one of the headings of the tables columns and the program will automatically proceed to put that column in alphabetical order; press again to reverse the order. The ordered column becomes the active column. Il triangolo indica la direzione dell'ordine  dal maggiore al minore,  dal minore al maggiore.
- Double click (left mouse button) on a product: the program accesses the data sheet of the selected product, see paragraph "data sheet".
- Right mouse button: the program activates the context menu with the functions:
 - Find "CTRL+F" to search for a product according to the characters entered in the dialog window. When you insert a search element the program finds the first product on the list with the element (for example: if the active column is the code inserting 1234....., the program stops on the first code characterized by 1234..... provided that the product with that code is available)
 - Find Next "CTRL+N" to find the next product to that found with the Find function
 - Technical Data for access to the technical data management module of the selected product.
 - Photometry (to visualize the photometry of the luminaire, if the FOT indication on the left of the product is active).
 - Documents to give access to the window showing the list of documents associated with the selected product, Excel, PDF files etc.
 - Delete (to eliminate the selected product from the catalog).
 - Add to Project List: to add the selected product to the project list subsequently importable with the Lisman program

| General Data | Electrical Parameters | Mechanical Parameters | Photometric Parameters | Nomis Marks | Texts |
|--------------|---------------------------|-----------------------|------------------------|--------------|-------|
| Code | G45678 | Net Weight | 0,65 [kg] | | |
| Type | Inceles - Wall Mounted | Gross Weight | [kg] | | |
| Model | EXG-2 | Volume | 0,008 [m3] | | |
| Product | EXG-2 FSQ 1x13W/230V/50Hz | Price | 210 € | | |
| Application | Medical Areas | Pieces per pack | 10 n° | | |
| Color | White | Dim. | 340x170x60 mm | Availability | C |

Technical and Commercial Data

- Up – Down Arrows: allow vertical movement through the various products.

Technical and commercial data section

The section that contains details of the technical and commercial data is shown subdivided in paragraphs using different "TABS".

These TABS are in this order:

- General Data shows the commercial description, statistical classifications, logistic information, price list, and illustration. The space designed for the illustration shows, on the bottom right, navigation arrows if more than one image is present in the archive.
- Electrical Parameters shows the lamps connected, any information on batteries, emergency management and connected reactors.
- Mechanical Parameters IP degree, surfaces exposed to wind, IK degree.
- Photometric Parameters list of connected measurements and indication of limit angle.

- Norms Marks shows the list of conformity regulations for lighting devices and the symbols of the trademarks obtained.
- Texts – A drop-down menu allows you to view the Data Sheet text or 4 different Notes.

State Bar

The state bar that closes the window shows the number of products in the Product table and the selected archive.

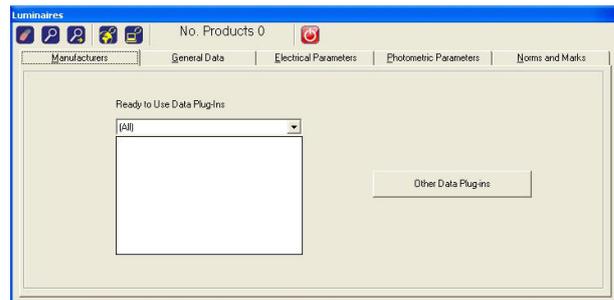
Secondary Windows

Parametric Search

Parametric Search is activated by selecting the Parametric Search function or the relative icon: the search masks are situated in the lower part of the video and are made up of a group of folders that contain the data subdivided by type: you can move from one folder to another by clicking with the left mouse button on the description (tag) of the folder

The available data edit boxes for search, independently of their type, are the following:

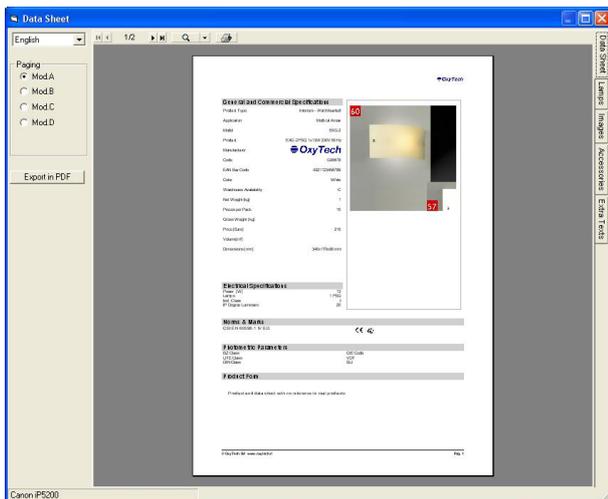
- fixed edit boxes (list fixed choice edit boxes): these cannot be edited but their description can be selected from a predefined list such as, for example, the color field
- free edit boxes: these are editable and can have a numerical or alphanumeric description input; in the first case numbers can be input and search can be carried out by using the operation symbols (>, <, =, * (inclusive)); in the second a description (string) is input and the search is carried out on all the elements, visualizing those that contain it.



Product Search

The filter functions are as follows:

-  Clean: this allows you to eliminate previously defined search elements
-  Search: this allows searching of the products corresponding to the defined search parameters
-  Search Subgroup: allows searching of products only in the previously defined group and according to the added search parameters
-  Search on Internet (ECOD function): this function, once the parameters have been set, allows search to be carried out not locally but on a remote server via Internet. Several seconds after launching the request to the remote server, the program responds by indicating the total number of elements found and then, after receiving confirmation, starts downloading the data. The program then repeats the request for confirmation before downloading images and texts. Once the downloading operation is complete, the program starts the database update operation, which may take several minutes. On conclusion the database is again ready to be consulted
-  Room Search (Local ECOD function): this function, once the parameters have been set, allows you to effect import of the products searched for locally from a CD-ROM or from a file. The database updating operation may take several minutes. When completed, the database is again ready to be consulted
-  Exit: to quit the search module.



Data Sheet

Data Sheet

The data sheet, with which to view and print product data, images and descriptions, is activated either by selecting the relative icon or by clicking twice with the left mouse button on the selected product.

The tools are situated to the left and right of and above the document.

The toolbar to the left of the card offers the following functions:

- **Language:** this is a fixed choice field with which to select the data sheet in one of the available languages
- **Page:** the program has 5 different formats of graphic paging (Mod.A - Mod.B - Mod.C - Mod.D - Mod. Consuline) for data sheets that can also be activated by clicking on the spot to the left of each description
- **PDF Export:** this allows you to export the data sheet in PDF format to be viewed with ADOBE Acrobat Reader

The command bar to the right of the data sheet contains the following functions:

- **Data Sheet:** visualizes the graph of the paged data sheet.
- **Lamps:** this allows you to choose alternatives to the lamps connected to the lighting device.
- **Images:** with this function you can choose the image Project List Data Sheet 92 to insert in the card. Selection of the function opens the window in which to choose the order and images to be viewed: you can insert a maximum of 3 images to be chosen from those available (up to a maximum of 10 highlighted in the lower part of the window). You can also insert fewer images, for example, if there are 3 available, the program will activate 3 boxes but 2 or even 1 may be chosen (click on 2 Im. or 1Im. in the upper left hand part of the window). To insert the image first click on it and then on the destination box: the order of insertion will then be that of the images on the card. The number of images depends on the graphs foreseen for each individual sheet.
- **Accessories:** this allows you to link any accessories to the data sheet.
- **Properties:** the program also allows customized text to be inserted in the sheet. To do this the fixed choice field must be activated and the relative text selected.

The upper part of the window includes the functions:

- To scroll the various pages of the document, of which the total number and current page are shown
- To handle screen zoom of the document; you can click on the magnifying glass to effect zoom in or zoom out and in addition select the type of visualization from the relative window
- To start document printout defining the settings.

Photometry

This opens the "Luminaires" window described in the Photowin module. This window allows access to all photometric details and relative photometric analyses. The window also launches the Photoview program for graphic visualization of photometric details by clicking with the right mouse button on the line of the list.

Documents

The Documents function allows you to view, if available, a series of documents associated with the selected product: these may be documents realized with the most common word-processors (Word) or view programs (Acrobat): it is essential that the relative program that the file requires be installed on the computer (for example Word for *.Doc files). It is also possible to access Autocad documents, such as DXF or DWG files (in this case Autocad or Volo View must be available), or to view Excel documents (XLS).

Product Elimination

Liswin allows you to delete one or more products from the catalog; selection of this function opens the Product Deletion window on the right of the Viewer.

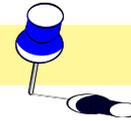
Function

- Select one or more products from the products table on the left (the products to be deleted must first be selected)
- Press the right mouse button and select Add to List from the context menu: the program proceeds to insert the selected products in the Product Deletion Window
- Now press the right mouse button on the Product Deletion window: this opens the context window in which to choose Remove to remove the selected product from the deletion list, Delete to delete all the products on the list and Reset to reset the list.



Product Elimination

The quantities can be entered directly in the Lisman estimate module.



NOTE

Price Lists

The Price Lists function allows you to manage the products price lists separately from the catalog itself; in fact one or more lists, provided they belong to the same group of products, can be added to the catalog, even at a later date.

It is important that the codes of the available products in the catalog correspond exactly to those in the list: if this is not so it is impossible to associate them.

Selection of the function opens the management window where the following functions are active:

- + to add a new list for the selected manufacturer: in fact several lists can be defined for the same manufacturer. Selection of the function opens the window in which to define the list description. Press OK to confirm, Cancel to quit.
- To import or export a list in CSV (comma separated values) format. After selecting the manufacturer, relative list and import or export icon, the program presents the dialog window in which to define the name of the list to be managed.
- To update the active list with any effected alterations
- To delete the active list of the selected manufacturer.

| Manufacturer | Description | #Lis | Evaluate |
|----------------------|-------------|------|----------|
| Havells Sylvania Itz | Generic | | Euro |
| Lasting Light | Generic | | Euro |
| Megaman | Generic | | Euro |
| OxyTech Srl (I) | Generic | | Euro |

Price List Management

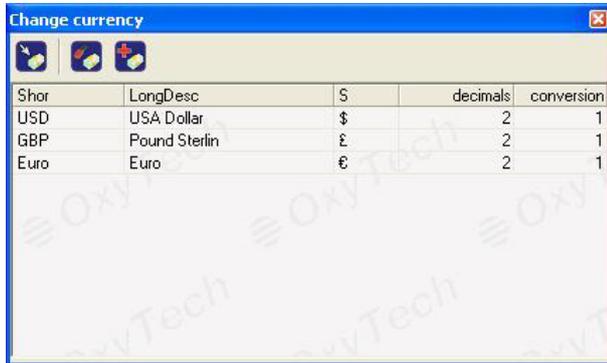
To select a manufacturer's list, just click twice on the list description: this opens the drop down menu from which to choose the list of interest. This then becomes the active list whose prices will be visualized in the technical sheets of the individual products.

Click twice on List Reference-Number to edit the field in which alterations can be made to the number or reference.

It is also possible to change the currency on a list that is already available: to do this click twice on the currency on the right of the window and select the new one. Then click on the highlighted manufacturer bar and the program asks if it should insert a

new list: if the answer is affirmative, the program adds the new list.

This also allows you to export the new list in CSV format editable with Excel and to have the prices immediately at your disposal in the original currency so as to bring about the required modifications. Once these are concluded the list may be newly imported.

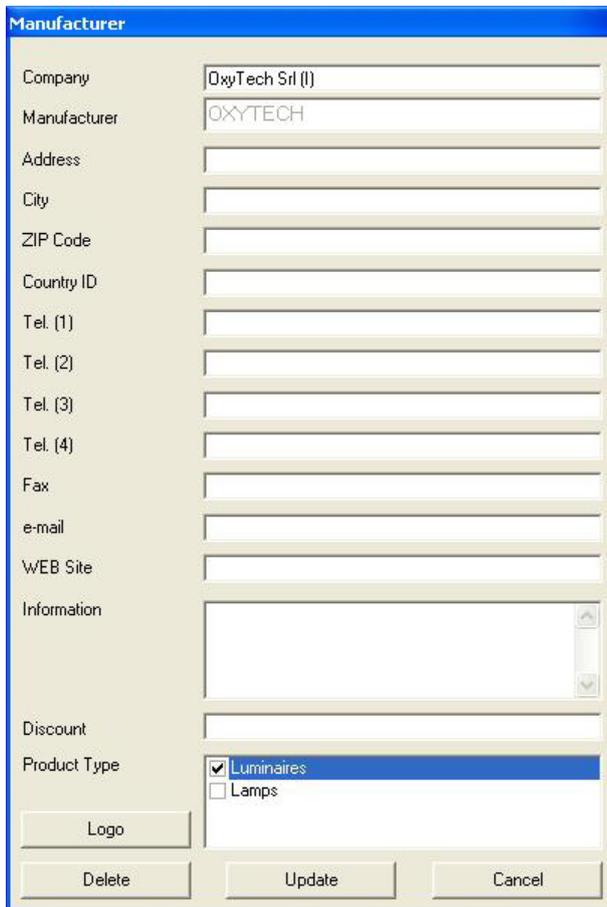


| Shor | LongDesc | \$ | decimals | conversion |
|------|---------------|----|----------|------------|
| USD | USA Dollar | \$ | 2 | 1 |
| GBP | Pound Sterlin | £ | 2 | 1 |
| Euro | Euro | € | 2 | 1 |

Currency

Currency

This window manages the different types of currency.



Manufacturer

Company: OxyTech Srl (I)

Manufacturer: OXYTECH

Address: _____

City: _____

ZIP Code: _____

Country ID: _____

Tel. (1): _____

Tel. (2): _____

Tel. (3): _____

Tel. (4): _____

Fax: _____

e-mail: _____

WEB Site: _____

Information: _____

Discount: _____

Product Type: Luminaires Lamps

Buttons: Logo, Delete, Update, Cancel

Manufacturer Data

Manufacturer Data

Selection of this function opens the management window of Manufacturer data such as:

- Company name
- Address
- Telephone numbers
- E-mail and WEB addresses
- General information on the product
- The type of products foreseen

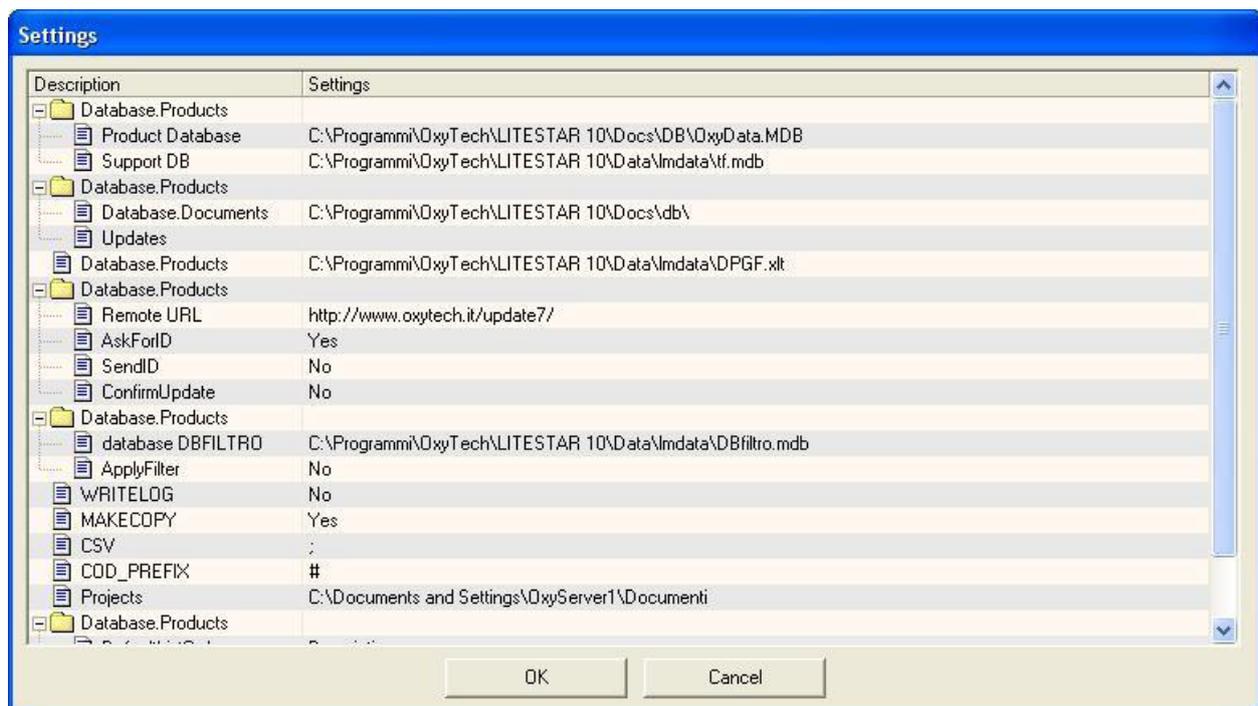
The window offers the following functions:

- Logo with which to associate a new logo
- Delete with which to delete all products in the catalog
- Update to update the company data, according to active permits
- Cancel with which to leave the window.

Configuration

The Configuration function opens the window in which to define the program configuration parameters which are:

- Database: this defines the path for finding the catalog database
- Technical Data Sheet: to configure the elements of the technical data sheet such as whether or not to show data groups (click on the bar of the selected field and select Yes/No from the drop down menu) and the colors of headings and subheadings (click on the color and choose the new color in the dialog window)
- Media: this defines the path (folders) of the project objects such as images and texts. These are subdivided in Update (the objects downloaded by means of updating functions via WEB) and Fixed (all the data available on CD-ROM)
- Default Startup: this defines the default conditions for table ordering (for New, FOT (Photometries), Code, Description and Manufacturer) and the type of product (Lighting Devices, Lamps ...)
- Internet Download: this defines the site from which to effect updating. It is advisable not to modify this without indication from OxyTech Srl
- Products: this indicates the path of eventual external support plug-ins (for example for exporting documents in Excel format)
- Documents: this indicates the path in which to save the documents created by the program (for example for export of technical data sheets in PDF or RTF formats).



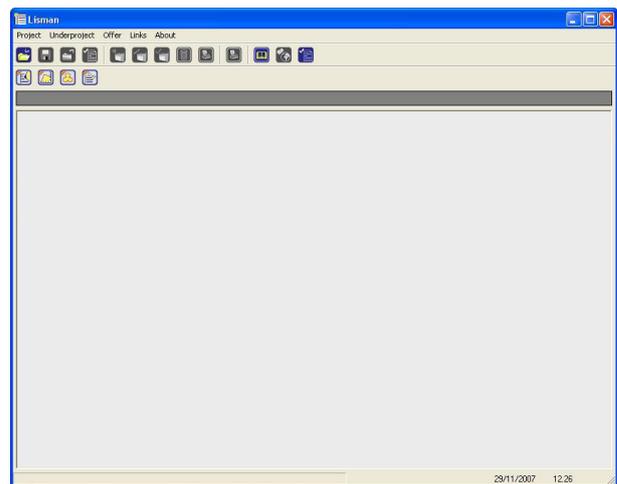
Configuration Window

Lisman – Introductory Notes

Lisman is an estimate program that allows automatic import of the products lists of projects realized with the calculation module Litecalc and of the lists created with the operative catalog module Liswin.

The Lisman program module manages the functions of:

- Creation of estimate projects composed of sub-projects (projects comprising various sub-projects as in the case of offices made up of different rooms)
- Import of project lists from the Litecalc module and of those created with the Liswin program
- Creation of estimates and offers that can also be exported in RTF and PDF formats.



Lisman Main Window

Lisman Management

Selection of the Lisman function open the main window made up of the following parts:

- the menu bar containing Project, Sub-project, Offers, Links and About (program notes) (see description below)
- the icon bar.

The functions in the Menu Bar are described below.

PROJECT

The Project menu allows you to handle the following functions:

- New to create a new project;
- Open to open a project created previously and saved in the archive;
- Save to save the current project;
- Save with Name to save the current project and define name of file;
- Close to close the current project;
- Properties for access to the properties of the current project;
- Configuration for access to the parameter management section of the Liswin/Lisman modules, such as the file paths or technical sheet colors;
- Exit to quit the Lisman program.

New

The New function opens the properties window in which to enter project elements that are:

- Description to enter the project description (alphanumerical)
- Project to enter the project code (alphanumerical)
- Notes to enter notes (alphanumerical)

The window also includes indication of the project creation data. Press OK and the program proceeds to save the characteristic data of the project.

New Project Definition

SUB-PROJECT

The Sub Project menu allows you to handle the following functions:



- Nuovo per creare un nuovo sotto progetto;



- Modifica per accedere alla finestra di gestione della lista di prodotti (Edita Sotto Progetto) per modificare quella precedentemente creata



- Elimina per eliminare il sotto progetto selezionato

- Seleziona per deselegionare o selezionare il sotto progetto ai fini della visualizzazione e del computo nei documenti che il programma può realizzare (computi metrici, liste materiali, offerte ...)



- Documenti per accedere alla gestione dei documenti con cui rappresentare le liste di prodotti (computi metrici e liste semplici)



- Proprietà per accedere alle proprietà del sotto progetto corrente.



New Sub-Project Definition

New

The New function opens the properties window in which to enter sub-project elements which are:

- Project to enter the project code (alphanumeric)
- Description to enter project description (alphanumeric)

cal)

The window also includes the indication Add which, if selected, allows you to add the sub-project to the documents (metric calculation, lists, offers ...). The selected sub-projects are represented in the sub-projects list in the viewer with the open file icon while the unselected ones are shown with the same icon marked with a red X.

On conclusion of insertion press OK and the program accesses the Edit Sub-Project window where you can:

- Import the list of a project realized with the calculation program: in this case, select the 'Browse' key, choose the project that interests you from the selection window and finally press the Import Project button. The program proceeds to import showing the various stages and eventual error situations in the right hand window. On conclusion of project import the program shows the list of products imported in the Products window



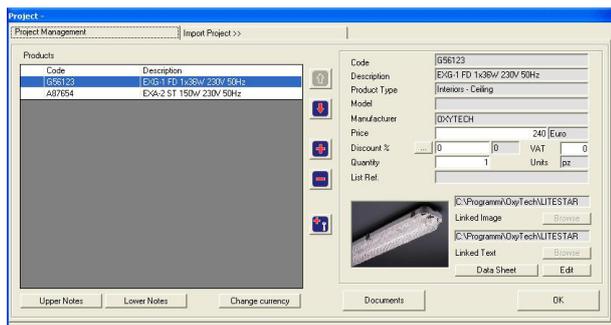
NOTE

The project should have been saved previously using File/Save Project function.

- Automatically import the list created using the Create List function from the Liswin catalog module: select the Liswin List Import button and the program proceeds to import showing the various stages and eventual error situations in the right hand window. On conclusion of project import the program shows the list of products imported in the Products window
- Manage currencies (**Change Currency** button) with which to modify the current currency or enter a new one. The procedure is as follows:

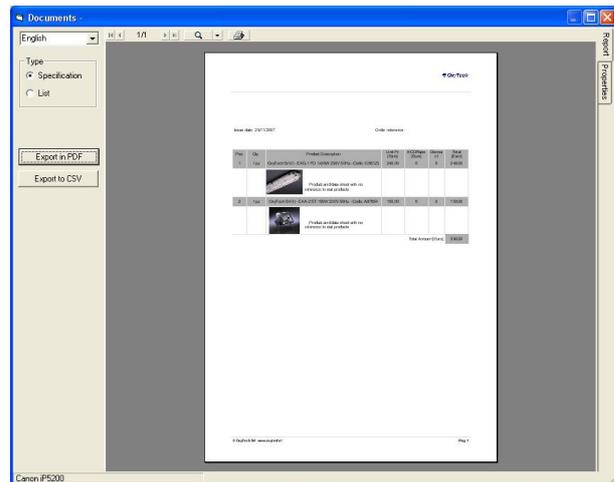
- New Currency (icon +): to insert a new currency, not available on the list of currencies, first press on the + icon, then enter the description, confirm and then modify the short description, the symbol and number of decimals by clicking twice on the relative field. It is also possible to set the Conversion Factor which is useful if you need to convert all the prices from one currency to another

- Modify Currency to modify a currency already available on the currency list just click twice on one of the available fields and then modify the short description or the description or the symbol and number of decimals. It is also possible to set the Conversion Factor which is useful if you need to



Project Management Window

- convert all the prices from one currency to another
- **Add a free element to the list:** in this case select the '+' button in the Products window and insert the various characteristics of the element in the right hand section.
- **Eliminate an element from the list:** select, in this case, the '-' button in the Products window and confirm the elimination of the selected product
- Visualize the characteristic elements of the product selected in the Products window and the commercial parameters of the proposal. These elements are visualized to the right of the Products window and include:
 - Code
 - Description
 - Product Type
 - Model
 - Producer
 - Price (numerical value) and Currency
- Discount %: on the right is found the '...' button with which to access the Discount Management window. Several different pre-established discount levels can be selected such as that proposed by the manufacturer (Only Manufacturer) not alterable, that of the customer (Only Customer) inserted in the address book, that of the product (Only Product) proposed by the manufacturer and not alterable and those that are a combination (Manufacturer + Customer, Customer + Product etc.); finally a Free Discount can be inserted. The available keys are: Cancel to return to the Project window without making any changes, Apply to All to apply the established discount to all the products in the current project and OK to apply discount only to the selected product.
- Quantity (no. of pieces of selected or inserted product) and units (for example pieces, kg ...)
- List Reference
- Vat %
- Visualize the image of the selected product in the lower right-hand section of the Project Management window, visualize the path where the image is saved and if necessary substitute it using the Browse button to select the folder containing other saved images, visualize the path of the associated text and if necessary substitute it using the Browse button to select the folder containing other saved texts (remember that associable texts must be in RTF format). An associated text may also be edited and modified: in this case use the Modify key or access the product data sheet directly.
- Access the print preview visualizing the product list that may be represented in 2 different formats, Specification and Product List (simple) by selecting the Printer icon. From the preview window you can move from one page to another of the document, enlarge or reduce it or access the print function. You can also choose from those available the language you require for the document and export it on file in RTF or PDF format. Finally it is also possible to modify the document properties choosing whether to encrypt the product code, whether or not to print the discount or images: to do this, deactivate or activate selection on the left of the fields
- Insert Notes Above and Notes Below to be printed before or after the list of products in the Metric Calculation or Product List
- OK to save data and return to Lisman viewer.



Metric Calculation Window

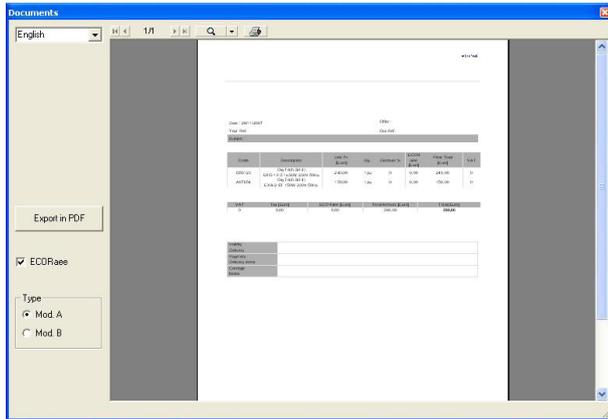
OFFER

The Offer menu allows access to the Offer document management functions (the associated icon is shown in brackets):



- Document to access the offer management functions

- Properties to access the offer accessory data such as offer number and subject or addressee selectable via MS Outlook address book.



Offer Document Management

Document

Selection of the function opens the window showing the preview of the offer. The window has the following tools:

- Document scroll keys such as page up and down arrows, document home and end
- Magnifier and drop down menu for enlarging and reducing the preview. The same operation, but by steps, can be performed by clicking on the document with the right mouse button
- Printer icon to access the print functions of the document to be printed
- Drop down menu to choose print language
- Keys for document export in RTF or PDF format
- Selection of document type between Mod.A (document with all products of each individual sub-project) and Mod.B (visualization of products in groups according to individual sub-projects).

Press and keep left mouse button pressed on the document to move the document itself.

LINKS

The Links menu allows you to move from one LITESTAR program module to another; the available links are the following (the associated icon is shown in brackets):

-  Icon with which you may open the Operative Electronic Catalog (Liswin).
-  Icon with which you may open the Lighting Engineering Calculation (Litecalc).
-  Icon with which you may open the Photometry Management (Photowin).
-  Icon with which you may open the Catalog Data Management (Lisdat).
-  Contacts to access the MS Outlook address book.
-  Currency to open the window where currency may be managed.

Lisdat - database data entry and alteration

This function allows you to enter and/or alter the catalog data in the database and to link the resources.

Select the icon to open a window in which you can:



click on the arrow and select the manufacturer with whom you intend working from the list. The manufacturer may be linked to the luminaires archive and/or that of the lamps. Once selected, this cannot be modified without exiting the module and re-entering;

- with  key you access the functions for creating a new archive in which to enter the data. In this section all the data related to the manufacturer's details are entered and possibly their logo which will be in jpg. Format.



Select the type of archive from the second drop-down menu.

If you enter a function that changes an existing archive, other options will appear:



allows you to select the product to be modified from a list;



Find Code: if it is not selected from the previous list, enter the desired product code in the list box, press the [Find] button and the program will proceed to visualize the product parameters in the sheet. If there are no items corresponding to the code entered, the program shows the error window.



Click on the arrows to move from the current element visualized back to the previous or on to the next

The sheet is handled by means of buttons situated at the bottom of the window:



this function allows you to export data or to import them from an external archive;



deletes a sheet from the archive;



deletes all the data in the sheet;



this function allows you to save the entry or modification carried out;



with this function the catalog data management window is closed and the program returns to the main manager without saving any modifications.

Manufacturer Data Entry

Data input may be effected through various sections subdivided on the basis of the type of data to be entered: in the case of lighting devices, the available sections are:

- General Data (code, description, type),
- Electrical Parameters (voltage, feed tension),
- Norms (Marks and Norms),



NOTE

Technical Data Sheet means the visualization according to a pre-established format (see modules A, B and C of Liswin) of the data present in the database; Product Data Sheet means the opening of a window which contains the list of external files associated with the chosen product.

- Media (links to images, texts, external files) and
- Connections (these are connections with external databases such as, for example, direct connection with the photometric database or feeders or lamps catalog).

The various sections have 4 different modes according to the type of data to be entered:

Free alphanumerical elements can be entered if not subject to predefined lists.

These fields allow entry of elements chosen from the list which is activated by the arrow situated on the right. Only one characteristic can be associated with the product.

This is the case of Norms and Marks in which the program presents a group of Marks and a list of Norms that are entered in the Marks and Norms list of the product with a simple click of the mouse.

This is the case of images, external texts or files in general that can be connected to the product you are entering.

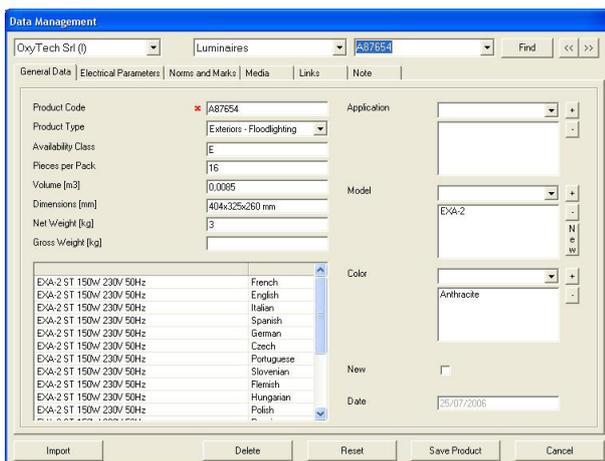
Files can be connected to the product in the following formats:

- images for the technical data sheet: JPG and BMP
- texts for the Product Data Sheet: TXT, DOC (Word)*, RTF (Word)*
- tables for the Product Data Sheet: XLS (Excel)*
- files for the Product Data Sheet: PDF (Acrobat)*, DXF+DWG (AutoCAD)*
- texts for the Technical Data Sheet: these are texts in RTF format which can be associated with the Data Sheet; there are 3 types: Specifications Description, Assembly Instructions, Product Data Sheet (General Description).



NOTE

In all those cases marked with an asterisk you must have special viewers available in CDOXY from the installation window (see TOOLS) or from the programs themselves (Word, Excel, Acrobat, AutoCAD ...).



The screenshot shows the 'Data Management' window for 'OxyTech Srl (t)'. The 'Luminaires' section is active, and the product code 'A87654' is selected. The 'General Data' tab is selected, showing various fields for product information. A list of languages is visible at the bottom, and a date field is set to '25/07/2006'.

| Product Code | Application |
|--------------|-------------|
| A87654 | |

| Product Type | Availability Class | Pieces per Pack | Volume [m3] | Dimensions [mm] | Net Weight [kg] | Gross Weight [kg] |
|---------------------------|--------------------|-----------------|-------------|-----------------|-----------------|-------------------|
| Exteriors - Floodlighting | E | 16 | 0.0085 | 404x325x280 mm | 3 | |

| Language |
|------------|
| French |
| English |
| Italian |
| Spanish |
| German |
| Czech |
| Portuguese |
| Slovenian |
| Flemish |
| Hungarian |
| Polish |

Manual Data Entry

Photowin – Introductory Notes

Photowin is the program that manages the lighting devices photometry data and lamp data.

The data are inserted in a database called **FOTOM.FDB** but this name may be changed according to requirements: this can only be done, however, from outside (with the use of programs such as Explore Resources) and when the program is not in use.

The database structure is based on the following subdivision of files:

- **Luminaires** – here all the commercial data of the luminaires are entered such as code, description, dimensions etc. generally parallel to the price list.
- **Measurements** – here the photometric data of the reflectors-refractors inserted in the luminaires and that can be linked to the luminaires are entered. For example, a number of measurements can be linked to one luminaire but it is also possible to link a number of luminaires to a single measurement. This organization allows for a notable saving of space and handling time with respect to the standard type Eulumdat, IES or TM14 files.
- **Lamps** – here the lamp data found in the commercial catalogs of the manufacturing companies are available. These lamp data must be linked to the respective measurements for normal program functioning.
- **Tables** – here the reduced reflection factor tables are entered, useful for calculating road lighting installations.

To better understand the workings of the Photowin program we advise you to use the program Tutorial (automatic demonstration) which may be downloaded from the Software Download area of WEBOXY, the OxyTech site (www.oxytech.it): to do this select **T** on the Photowin line.



Photometry Management

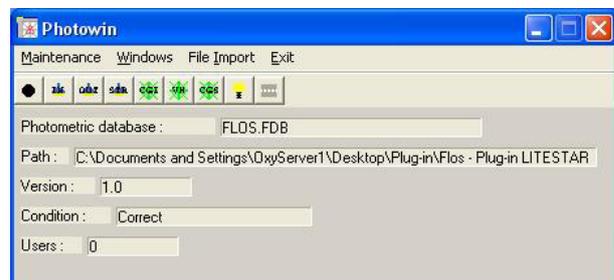
When the calculation program is started up, at the same time the Photometric Server is activated and this is shown by the button (Photometric Server) in the active applications toolbar of Windows, usually shown in the lower part of the screen.

After selecting this button the Photometric Server window appears containing the following elements:

- **Menu Bar** situated in the upper part
- **Toolbar** associated with the Menu Bar functions and situated below it
- a central area reserved for various data such as the name of the active photometric database, its path, version, state and total number of operators using the database at the same time.

The Menu Bar contains the following menus:

- **Maintenance** for access to the maintenance functions of the active database Automatic Updating – Change DataBase – Compress DataBase / Check)
- **Windows** for access to data management functions such as input, import and export
- **Import File** to import photometric files in standard formats Eulumdat, IESNA 86-91-95 LM63 and IESNA Gels, Cibse TM14 and LTLI in the FOTOM.FDB database of the program
- **Exit** to quit the server.



Photometric Database Manager

Maintenance

The Maintenance Menu has these functions:

- **Change Database** to open a new database in any folder and activate it or to create a new database: to do this enter a name that is not among those on the available .FDB files list and press Open; the program automatically opens the window requesting confirmation of the creation of a new database which will be automatically created on confirmation (N.B.: the database is created empty and it is advisable to proceed first to lamp file import, for example through the MAINTENANCE/Update via WEB function)
- **Update** to automatically update the active photometric file with the data supplied on file in FDB format
- **Update via WEB** to automatically update the active photometric file via Internet
- **Compress** to check and automatically compress the photometric database. Before starting the operation, the program saves the file in the same directory changing the extension from **NOME.FDB** to **NOMEBAK.FDB**: it is wholly advisable to transfer the NOMEBAK.FDB copy to another folder so as to avoid that successive compression operations go to overwrite the previous file.

Update

This function allows automatic updating of the active photometric file with data supplied in FDB format .

To activate updating carry out the sequence of operations below:

1. Select the MAINTENANCE/Update function
2. Select from the left-hand list (Active DS + DR Data) the file, or file, of the companies to be imported



NOTE

If the file to be imported appears in the right hand column please consult OxyTech commercial assistance

3. the program proceeds to automatically import the available selected files; the time of export depends on the dimensions and number of files to be imported and the speed of the computer used: the procedure could take a few hours.

The files are immediately ready for use when import terminates.



NOTE

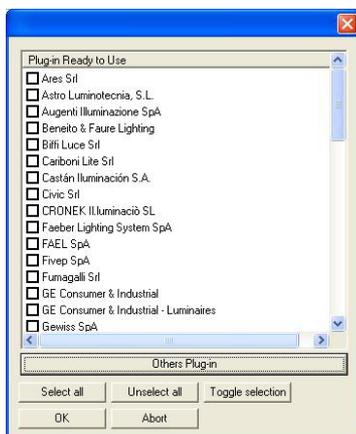
To be able to import the file, it must be suitably configured. If the program refuses to import please consult OxyTech technical service.

Update via WEB

Update via WEB, also called ECOD/Ftm, allows updating of the current photometric file with data in FDB format automatically downloadable from Internet.

To start update carry out the sequence of operations below:

1. Select the MAINTENANCE/Update via WEB function
2. At this point the list of companies that can be updated appears
3. Select one or more manufacturers from the list clicking on one or more boxes on the left
4. Press OK to start data update. The length of the process varies according to the number of files to be updated and their size. Once update is complete, the files are immediately ready for use.



Photometry Update via WEB

Windows

The Windows menu has these functions:

- **Global** to activate the whole group of management windows of the photometric database
- **Luminaires (Generals, Floodlights, Roads)** to activate the luminaire management windows for generals, floodlights, and roads
- **Measurements (Generals, Floodlights, Roads)** to activate the measurement management windows for generals, floodlights and roads
- **Lamps** to activate the lamp management windows
- **Tables** for access to the reduced reflection factor tables management windows, generally used for calculating road installations (these tables describe the reflecting characteristics of road surfaces)

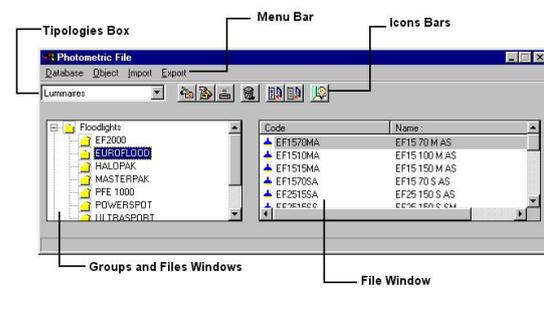


Windows Menu

Global

Selection of this function activates the Photometric File Main Management Window which contains the following elements:

- **Menu Bar** situated in the upper part
- **Type Box** to select the type of data on which you intend working whether Luminaires, Measurements, Lamps or Tables (these are the reduced reflection factor tables)
- **Toolbar** associated with the Menu Bar functions and situated below it
- the **Groups and Files Window** illustrating the tree of available folders (Groups) and subfolders (Files)
- the **File Window** illustrating the group of files available in the selected file.



Photometric File Main Management Window

To view or hide a subfolder (Files) click on the (+) or (-) sign alongside the selected folder.

Viewing can also be achieved by clicking twice on the selected folder.

The active functions in this window are:

- **Copy File:** this allows you to copy a file already created in the same archive or in a different one keeping or changing the original code.
Operation:
 - Highlight the file to be copied
 - Drag it above or below the original file with the left mouse button and then release the button
 - Confirm the destination of the file leaving unchanged the original and the destination files if you want to make a local copy, if not, select a different one; the same applies for the subsequent windows that may appear (for example the lamp window)
 - Define the code of the new element, if necessary, and confirm: the program proceeds to enter the new element in the File Window.
- **Order List:** this allows you to arrange the file lists in order by code or by name, both in alphabetical order (from A to Z) and the contrary (from Z to A).
Operation:
 - Click on the heading of the list (Code or Name): the program will proceed to arrange the items in order. For example, by clicking 3 times the program moves from the alphabetical list to the contrary to

- the alphabetical in sequence
- To save the list order press on the icon Save List from the icon bar.
- Print List:** this allows you to print the active file list on .HTM files.
Operation:
 - Click on the Print List icon
 - Select the file name from the list and its destination and confirm: the program proceeds to save the file in the indicated destination.

The active menus on the Menu Bar are the following:

- Database** to open or close a photometric database other than that activated by the startup of the program
- Object** to enable all operations on the available objects (folders and single files)
- Import** to activate the functions Import from FDB, File Import and Auto-import or return to the normal mode (Standard)
- Export** to activate export functions of the photometric files in standard formats.

Object

This menu contains the file management functions and in particular the following functions:

- Input:** to input new elements in the database, whether new files or new tables or data



New File Input Window

- Delete:** to delete one or more of the elements input in the photometric database
- Modify:** to modify one of the available elements in the database

Input

This function is useful for inputting new elements in the database whether luminaires, measurements, lamps or tables; in particular the following can be input:

- New files
- New luminaires, measurements, lamps or reduced reflection factor tables

Input of New Files

To input new files, whether luminaires, measurements, lamps or reduced reflection factor tables you must:

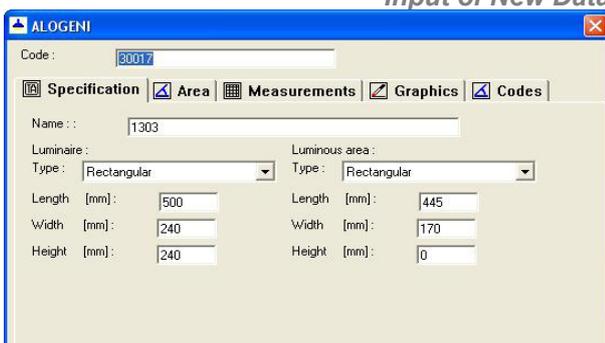
- Activate in the Type Box the data type (luminaires, measurements, lamps or tables) in which the new file should be input
- Select a file from the Groups and Files Window: just click on the file with the left mouse button and it will be highlighted
- Select the Object/Input function or press the INS key and the new file input window appears
- Insert the name of the new file and select the Save button: the program will automatically save the new file and add it to the tree.

Input of New Data (Luminaires, Measurements, Lamps, Tables)

The steps to follow to input new data, which vary according to the 4 data types, are as follows:

A. Luminaires

- Activate 'Luminaires' in the Type Box in the Main Management Window of the Photometric Database
- Activate the luminaire group whether for generals, floodlights or roads by clicking on it twice; this causes the appearance of the selected group tree of available files
- Activate the required file by clicking on it once; in the right-hand box the list of available elements appears



Luminaire Input Window

Clicking with the right mouse button on one of the available luminaires files opens the context menu with the Processing function for access to the graphic and table processing of the selected photometry and the Properties function for access to the luminaire properties. Please refer to the Photoview section.

**NOTE**

4. Highlight the File Window by clicking on one of the available files with the left mouse button or using the TAB key. The selected file, on the left, will remain highlighted but in gray
5. Select the Object/Input window or press INS and the new measurement input window appears
6. Now define the data such as:
 - a. the new measurement code
 - b. the luminaire Specification data and Description (Name), Type or Shape (rectangular, circular..) and dimensions (Length, Width and Height [mm]) both of the luminaire and of the luminous area
 - c. the dimensions of the luminous area, by selecting the Area window; these dimensions are automatically calculated by the program according to the specification data inserted but may be modified as necessary when the shape of the luminous volume is not parallelepiped as in the case of road luminaire refractors
 - d. the measurements and associated lamps by selecting the Measurements window. Here the measurements of the luminaire you are inserting and the associated lamps must be defined, the first in the upper box, the lamps in the lower one.

To associate one or more measurements you must:

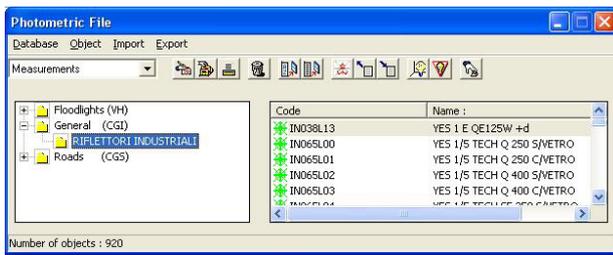
- activate the Main Management Window of the Photometric Database
- select Measurements from the Type Box
- activate the group and file from which the measurement is to be taken
- click with the mouse on the upper box, the measurements box, of the Luminaire Input Window. This activates the input
- click with the left mouse button on the File Window measurement and drag it (drag and drop operation) into the Measurements window finally releasing the button. During the dragging operation a barred circle appears when moving over non-active areas but this disappears when in the measurement box: on release of the mouse button the measurement is associated to the luminaire and recorded in the appropriate box

Only compatible measurements can be associated, that is only General type measurements (C- γ) can be associated to general luminaires, only Floodlight type measurements (V-H) to floodlight luminaires and only Road type measurements (C- γ) to road luminaires

**NOTE**To associate one or more lamps you must:

- activate the Main Management Window of the Photometric Database
- select Lamps
- activate the group and file containing the required lamp
- click with the mouse on the previously input measurement code which is thus highlighted: in the lower lamp box, a series of dots appears in correspondence with the code, file, name and letter code. Now click on the dots corresponding to the code, to highlight them
- click with the left mouse button on the chosen lamp and drag it (drag and drop operation) to the Lamps window finally releasing the button. During the dragging operation a barred circle appears when moving over non-active areas but this disappears when on the lamp box: on release of the mouse button the lamp is associated to the luminaire and recorded in the appropriate box
- on release of the mouse button the measurement is associated to the luminaire and recorded in the appropriate box

On conclusion of data definition select the Save button situated in the lower part of



Measurement Data Window

the input window and the program will save the data in the photometric database

B. Measurements

1. Activate 'Measurements' in the Type Box of the Main Management Window of the Photometric Database
2. Activate the measurement group from the Groups and Files Window choosing between Generals (C- γ), Floodlights (V-H) or Roads (C- γ) by clicking on it twice; in this way the file tree associated to the selected group will appear
3. Activate the selected group file by clicking on it once; the list of available files appears in the File Window on the right



NOTE

Clicking with the right mouse button on one of the available measurement files opens the context menu with the Processing function for access to the graphic and table processing of the selected photometry and the Properties function for access to the measurement properties. Please refer to the Photoview section.

4. Highlight the right-hand window showing the list of available elements. The selected file, in the left-hand window, will remain highlighted but in gray
5. Select the Object/Input function or press INS and the new measurement input window will appear
6. Now define the data such as:
 - a. the new measurement code
 - b. the specification data such as Name, Date on which the measurement was made, Operator, Measurement Distance [m] between photoelectric cell and luminous center, Total Flux [lm] of the lamps used, their Position and Total Number.

According to the Measurement Group, the following must also be defined:

1. Measurement of Generals Luminaires (C- γ)

Type of Symmetry:

- Non-symmetrical: measurement taken on 24 C planes with C=15° and $\gamma=5^\circ$ steps
- Symmetrical with respect to C plane 0-180°: measurement taken on 13 C planes with C=15° and $\gamma=5^\circ$ steps
- Symmetrical with respect to C plane 90-270°: measurement taken on 13 C planes with C=15° and $\gamma=5^\circ$ steps
- Symmetrical with respect to C planes 0-180° and 90-270°: measurement taken on 7 C planes with C=15° and $\gamma=5^\circ$ steps
- Rotosymmetrical: measurement taken on 1 C plane (C=0°) with $\gamma=5^\circ$ step

Maximum Angle γ :

- 90°: the measurement is taken on each plane every 5° from $\gamma=0^\circ$ to $\gamma=90^\circ$
- 180°: the measurement is taken on each plane every 5° from $\gamma=0^\circ$ to $\gamma=180^\circ$

2. Measurements for Floodlights (V-H)

Type of Symmetry:

- Non-symmetrical: measurement taken on 41 V planes between V=-90° and V=+90° and 41 H angles between H= -90° and H=+90°
- Symmetrical with respect to H=0° plane: measurement taken on 41 planes between V=-90° and V=+90° and 21 H angles between H=0° and H=+90°
- Symmetrical with respect to V=0° plane: measurement taken on 21 V planes between V=0° and V=+90° and 41 H angles between H=-90° and H=+90°

- Symmetrical with respect to $V=0^\circ$ and $H=0^\circ$ planes: measurement taken on 21 V planes between $V=0^\circ$ and $V=+90^\circ$ and 21 H angles between $H=0^\circ$ and $H=+90^\circ$
- Rotosymmetrical: measurement taken on 1 V plane (usually $V=0^\circ$) and 21 H angles between $H=0^\circ$ and $H=+90^\circ$

Type of Beam:

- Narrow beam
- Wide beam

3. Measurement of Luminaires for Roads (C- γ)

Type of Symmetry:

- Non-symmetrical: measurement taken through 360° from $C=270^\circ$ with steps defined by CIE Recommendation no.27
- Symmetrical with respect to the C plane $90-270$: measurement taken through 180° from $C=270^\circ$ with steps defined by CIE Recommendation no.27

Maximum Angle γ :

- 90° : the measurement is taken for each plane every 5° from $\gamma=0^\circ$ to $\gamma=90^\circ$
- 180° : the measurement is taken for each plane every 5° from $\gamma=0^\circ$ to $\gamma=180^\circ$

- c. Technical data such as Temperature [$^\circ\text{C}$] and Relative Humidity [%] of the laboratory where the measurement was taken, references to photoelectric cell used, Voltage [V] and Supply Current [A] of the luminaire in addition to eventual notes
- d. The angular steps (Angles) relative to the photometric table: in this window the program summarizes the angular steps, both for planes (C- or V-) and for angles (γ - or H-) set during input of symmetry and beam type or maximum angle γ . The standard setting can however be modified to define a personalized matrix.

In this case the active functions are:

- Shift-INS to input a new angular sequence both for planes and for angles. To activate this function click with the mouse on the second angular extremity and on the number of steps inside the interval and thus visualize the cursor. The program proposes its own angular sequence that the operator can modify as necessary
- Shift-DEL to eliminate an angular interval

- e. A maximum of 10 angular intervals can be defined. the Intensity Matrix in [cd/klm] in which to input the values. Use the up-down arrows to move vertically through the table, the Page Up and Page Down keys to move horizontally.

| | C | 0.00 | 15.00 | 30.00 |
|--------------|------|-------|-------|-------|
| * Constant | 0.00 | 65.85 | 65.85 | 65.85 |
| + Constant | 1.00 | 65.47 | 65.44 | 65.52 |
| Interpol | 2.00 | 65.04 | 64.99 | 65.13 |
| Ave | 3.00 | 64.51 | 64.49 | 64.68 |
| Flip Col. | 4.00 | 63.97 | 63.92 | 64.23 |
| Flip Row | 5.00 | 63.34 | 63.33 | 63.68 |
| Rotation | 6.00 | 62.70 | 62.68 | 63.14 |
| Flip on Axis | 7.00 | 62.03 | 62.03 | 62.57 |
| Flg = LI | 8.00 | 61.29 | 61.30 | 61.92 |
| LI = Flg | 9.00 | 60.60 | 60.60 | 61.29 |

Matrix Window

Once you are in the Matrix window the angular steps of planes and angles in the Angles window can no longer be altered.



NOTE

The Matrix window contains the following functions:

Normalize: this should be used when you want to normalize the matrix values. It may happen, in fact, that the values of $\gamma = 0^\circ$ of the C- semiplanes differ from one to the other even if the C- γ measurement system excludes this by definition; this may depend on various factors such as imperfect alignment of the goniophotometer device or slight variations in flux during the measurement. Normalization takes place on the average of all the values at $\gamma = 0^\circ$ or on the average of the values at $\gamma = 0^\circ$ of the highlighted columns

* Constant (Multiply by Constant): this should be used when it is necessary to multiply the matrix derived from goniophotometer measurement by a pre-established constant factor. This is the case, for example, for the factors supplied by certification authorities for

the calibration of luxmeters when the instruments themselves are not equipped with an internal registration system of this value

cd/klm > lux or lux > cd/klm: this option is useful when entering the data to set up the available data unit to be inserted



NOTE

This function is active only when the measurement lamp flux and distance have been entered

- f. the Lamps associated with the measurement taken from available catalogs.

To associate one or more lamps you must:

- activate the Main Management Window of the Photometric Database
- select Lamps from the Type Box
- activate the Lamp box in the Measurement input window
- click with the left mouse button on the chosen lamp and drag it (drag and drop operation) to the Lamp box in the measurement input window, finally releasing the button. During the dragging operation a barred circle appears when moving over non-active areas but this disappears when over the lamp box; on release of the mouse button the lamp is associated to the measurement and the relative description is shown in the window



NOTE

The dragging operation can be performed a number of times according to the total number of lamps to be associated with the measurement. The number of lamps may subsequently be altered, but this operation must be carried out with the greatest care.

- g. finally the Graphics window can be selected to view the curves after or during input for spot checks.

Selection of Graphics causes the window illustrating the following available graphics buttons to appear:

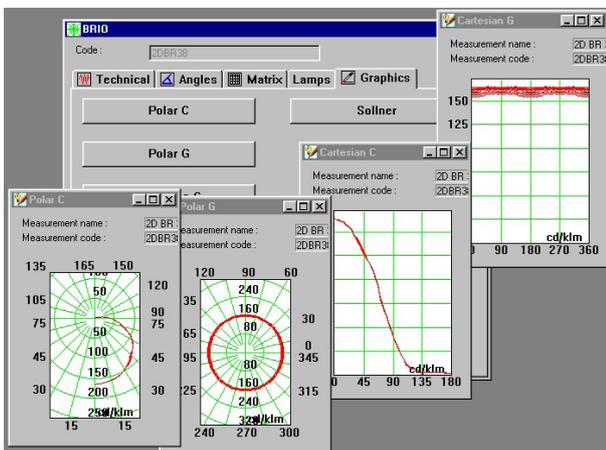
- C Polar Diagram: this is the polar diagram realized with constant C- or V- planes
- Gamma Polar Diagram: this is the polar diagram realized with constant Gamma- or H- angles
- C Cartesian Diagram: this is the Cartesian diagram realized with constant C- or H- planes
- Gamma Cartesian Diagram: this is the Cartesian diagram realized with constant Gamma- or H- angles.

To view one of the diagrams follow the steps below:

1. Activate the Matrix window and select one or more C- or V- planes or Gamma- or H- angles by clicking on the of the ordinate or x-axis values: the selected plane or angle will change its background color

2. Activate the Graphics window and select one or more of the available graphics. The graphics window can be moved and the Matrix window can then be reactivated to add or cancel selections. The program automatically represents the graphics in the appropriate windows.

On conclusion of data definition select the Save button situated in the lower part of the window and the program will save the data in the photometric database.



Graphics View and Plane/Angle Selection

In order to print the selectionned graphics displayed, activate the Management Menu clicking on the graphic symbol placed on the upper left corner of the Graphics window and select function Print.

**NOTE****C. Lamps**

1. Activate 'Lamps' in the Type Box of the Main Management Window of the Photometric Database
2. Select the lamp file in the Groups and Files Window by clicking on it once; the list of available elements in the file appears on the right in the File Window
3. Highlight the File Window by selecting any one of the elements. The departure file, in the Groups Window, will remain highlighted but in gray
4. Select the Object/Input function or press INS and the new lamp input window will appear
5. Now define the data such as:
 - a. the new lamp code
 - b. the lamp Specification data such as Description (Name) and ILCOS abbreviation
 - c. the Electrical data such as Life [h], Wattage [W], type of socket and Dimensions (Length and Width [mm])
 - d. the lighting design data such as Flux [lm], CR Degree, Color Temperature [°K], CRI and Efficacy [lumen/Watt]

On conclusion of data definition select the Save button situated in the lower part of the input window and the program will save the data in the photometric database.

D. Tables

1. Activate 'Tables' in the Type Box of the Main Management Window of the Photometric Database
2. Select the Illuminance or Luminance file and the available files will appear in the File Window.

In Illuminance selection the tables to be input must include reduced reflection factor values that enable you to obtain values that can be assimilated to illuminances using the Luminance calculation procedure (procedure allowed by CIE 30 Recommendations – STAN Program). Usually the available R0_E table is sufficient.

**NOTE**

3. Highlight the File Window showing the list of available elements. The selected file, in the left-hand window, remains highlighted but in gray
4. Select the Object/Input function or press INS and the new table input window will appear
5. Now define the data such as:
 - a. the new lamp code
 - b. the table Specification data such as Description (Name) and Name of Operator
 - c. the angular elements (Angles) relative to the tables: the program summarizes the angular steps in this window, both \square and $tg(\square)$ values. The reduced reflection factor table is fixed and cannot be altered
 - d. the Matrix of reduced reflection factors in which to input the values. Use the up-down arrows to move vertically through the table, the TAB key to move horizontally.

On conclusion of data definition select the Save button situated in the lower part of the input window and the program will save the data in the photometric database.

Import

This menu includes functions for importing photometric data in OxyTech FDB format and data in standard international formats such as:

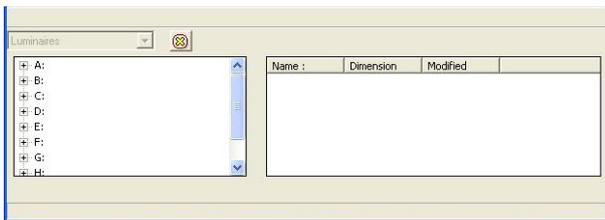
- CIE / CEN
- Eulumdat
- Cibse TM-14
- IESNA 86-91-95 Lm-63 – IESNA Gels
- LTLI

The available functions in the menu are:

- **FDB Import** allows you to import single objects (luminaires, measurements, lamps and tables) making up the photometric file in FDB format opened with the DATABASE / Open function
- **File Import** this allows import of photometric files in the recognized standard formats such as Eulumdat, Cibse TM14, IESNA86-91-95 as well as IESNA Gels (GE program) and LTLI
- **Auto-import** allows you to open the current database a second time and to carry out handling operations such as copy of a luminaire in a new file etc.
- **Import Gonio and Import New Gonio** are functions dedicated to the import of values obtained from goniophotometric readings with OxyTech T2 and T4 machines

Import from FDB

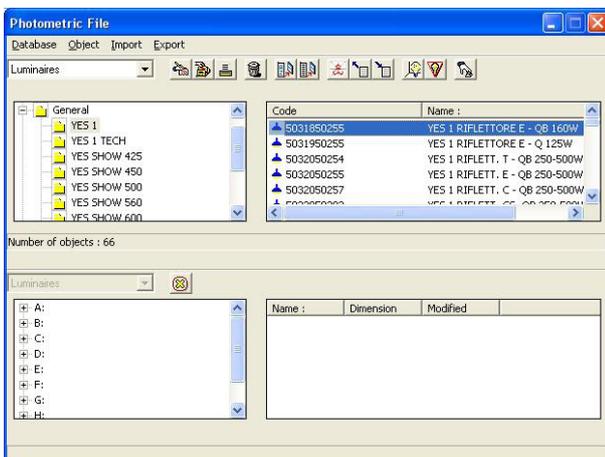
This function allows you to import single objects (luminaires, measurements, lamps and tables) making up the photometric file in FDB format opened with the DATABASE / Open function



Import from FDB (FDB Departure file not activated – point 1)

The necessary steps are as follows:

1. Select IMPORT/Import from FDB to open the Import from FDB window which appears below the Main Manager window
2. Select the DATABASE / Open function and activate the *.FDB photometric file (departure file) from which you want to choose several items from the list of luminaires, measurements, lamps or reduced reflection factor tables. The items in this file are shown in the windows in the bottom section of the import window.
3. Select the required file from the open *.FDB (departure file) of the photometric database; the right-hand section of the window shows the list of available luminaires, measurements, lamps or tables which can be selected using the usual Windows functions such as clicking on a single element or pressing Control-click or Shift-click to select a number of elements



Import from FDB (FDB Departure file activated – point 2)

4. Drag the selected items towards the file of destination taking care to keep the left mouse button pressed. The operation is similar to those that can be used for moving files in the Explorer program of Windows 95. During transfer the program automatically shows, with a barred circle near the point of the mouse, those areas in which the files cannot be unloaded and, with the icon of the file type, those areas where instead they can. On release of the mouse button, the program will proceed to import the selected files into the file base.

To return to Main Manager, select the symbol X.

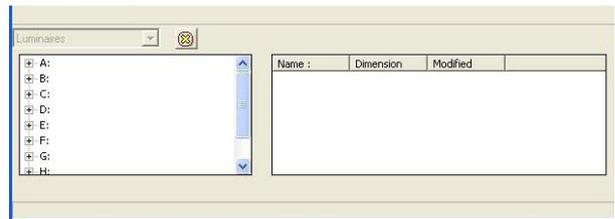
File Import

This function allows you to import photometric files in the standard recognized formats such as Eulumdat, Cibse TM14, IESNA86-91-95 LM63 and LTLI as well as IESNA GELS format typical of the program distributed by GE.

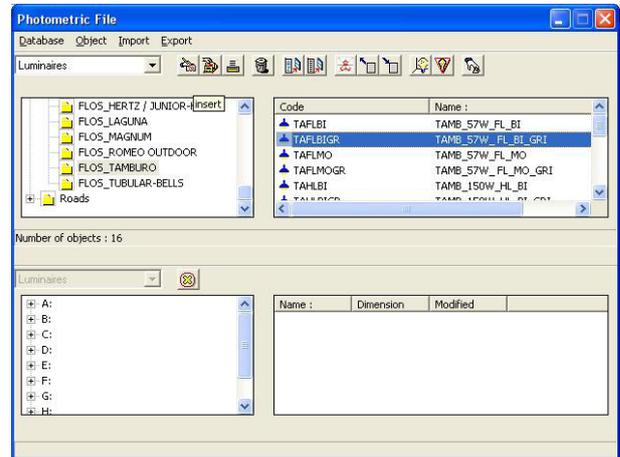
The operations to effect import are the following:

1. Select FILE/File Import and this opens the File Import window which illustrates the tree of available disks on the left-hand side
2. Select the folder which contains the files you want to import
3. Highlight one file by clicking with the left mouse button or a number of files using Control-click or Shift-click
4. Drag the selected items towards the file of destination taking care to keep the left mouse button pressed. The operation is similar to those that can be used for moving files in the Explorer program of Windows. During transfer the program automatically shows, with a barred circle, the areas in which the files cannot be unloaded and, with the icon of the file type, those areas instead where they can

Before transferring the files into the destination file, the program shows the window with its characteristics: select Copy to import, Skip to avoid import.



File Import (Disk tree – point 1)



File Import (Selected Files – point 3)

A file may possibly be highlighted although not in one of the foreseen standard formats; in this case the program shows the characteristics of the file but the Copy function will not work since import is impossible.



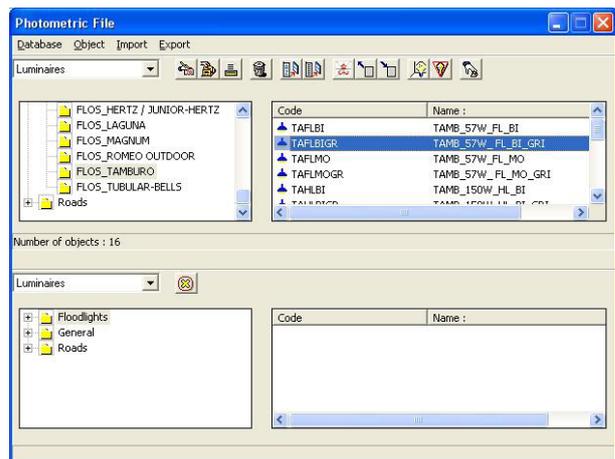
To return to Main Manager, select the symbol X.

Autoimport

This function allows you to effect management operations on the individual objects (luminaires, measurements, lamps and tables) that make up the photometric database in current FDB format.

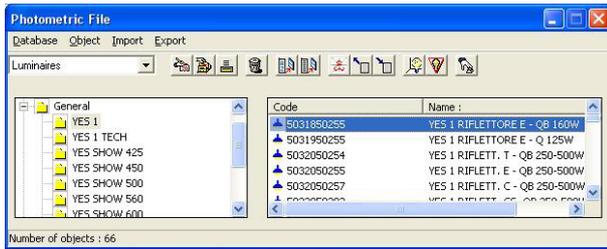
The operations to be carried out are as follows:

1. Select IMPORT/Autoimport and this will open the window that appears below the Main Manager window
2. Select the file that interests you from the open *.FDB photometric database tree (start file); in the right hand side of the window, the list of available luminaires, measurements, lamps or tables appears and these can be selected using the usual Windows functions, such as clicking on a single element, or Control-click or Shift-click to select more than one element
3. Drag the selected elements towards the destination file (upper section) taking care to keep the left button of the mouse pressed. During the dragging operation, the program automatically shows with a barred circle near the point of the mouse those areas in which you cannot download the file, with the icon of the file type those areas where you can. On release of the mouse button the program will proceed to copy the selected file in the file base.



Import from FDB (FDB start File activated – point 2)

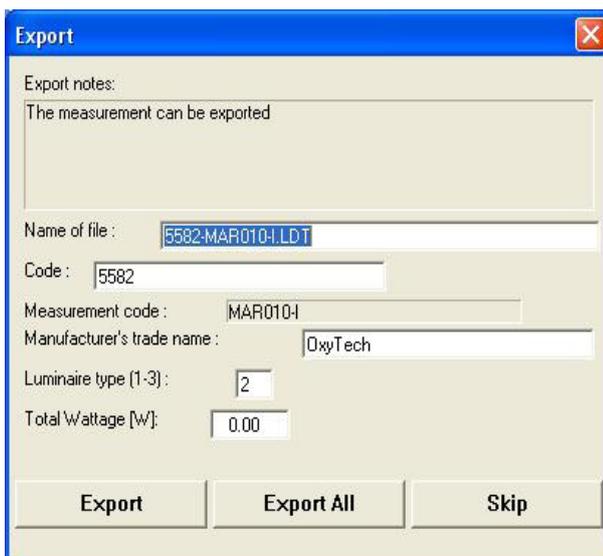
To return to Main Manager, select the symbol X.



Photometry Export Selection – Export (Point 2)



Standard Format File Selection Window (points 3-4)



Measurement Data and Export Confirmation Window
(Ref. point 4)

Export

This menu allows export of photometric data in standard international formats such as:

- CIE / CEN (not available in the current version)
- Eulumdat
- Cibse TM-14
- IESNA86-91-95 LM- 63
- LTLI.

To export photometric data located in the active *.FDB file in **Eulumdat** format you must:

1. Visualize the Main Manager and select the file that interests you
2. Highlight a file using the left mouse button or a number of files using Control-click or Shift-click on the list situated on the right
3. Select the Export function which causes the export window to appear
4. Define the type of export (Eulumdat) and the folder in which you want to unload the files using the normal Windows commands
5. Press OK to start export and the program will show the confirmation window, which is associated with every file previously selected. This window contains the following edit-boxes:

- **Export Notes:** here several notes on the type of file are found such as whether the file can be exported or not; in fact, depending on the type of format, it is possible that the data in the database is not sufficient to create the ASCII files
- **File Name:** the destination file name is automatically assigned by the program but can be altered
- **Code (Luminaire):** this is the luminaire code, which is input into the Eulumdat file. This code may be modified as necessary
- **Measurement Code:** this is the measurement code which is input into the Eulumdat file
- **Manufacturer's Name:** this is the name of the luminaire manufacturer or laboratory that carried out the measurement
- **Luminaire Type:** this allows you to distinguish between luminaire types according to the specifications proper to the Eulumdat file which are:
 - 1 = point source with non-symmetry around vertical axis
 - 2 = linear source
 - 3 = point source with other symmetry
- **Total Wattage:** here the total wattage [W] of the luminaire must be indicated intended as the sum of the wattage of the lamps.



NOTE

The edit-boxes in the same window but related to files in **IESNA86-91-95 LM-63** and **Cibse TM-14** formats are the following:

- **Export Notes:** here several notes on the type of file are found such as whether the file can be exported or not; in fact, depending on the type of format, it is possible that the data is not sufficient to create the ASCII files
- **File Name:** the destination file name is automatically assigned by the program but can be altered
- **Code (Luminaire):** this is the luminaire code, which is input into the Eulumdat file. This code may be modified as necessary

- Measurement Code: this is the measurement code which is input into the Eulumdat file
- Manufacturer's Name: this is the name of the luminaire manufacturer or laboratory that carried out the measurement
- Ballast Factor
- Total Wattage: here the total wattage [W] of the luminaire must be indicated intended as the sum of the wattage of the lamps.



The edit-boxes in the same window but related to the Scandinavian LTLI file format are the following:

- Export Notes: here several notes on the type of file are found such as whether the file can be exported or not; in fact, depending on the type of format, it is possible that the data is not sufficient to create the ASCII files
- File Name: the destination file name is automatically assigned by the program but can be altered
- Code (Luminaire): this is the luminaire code, which is input into the Eulumdat file. This code may be modified as necessary
- Measurement Code: this is the measurement code which is input into the Eulumdat file



6. Finally select Export to transfer the files in the selected format or Skip to annul the export operation of this file. Repeat the operation for all previously selected files.

Luminaires – Generals, Floodlights, Roads

The Luminaire (Generals – Floodlights – Roads) function allows access to the view functions of the photometric characteristics, both graphic and tabular, of the single luminaires whose management is identical in all 3 cases: therefore the following section deals only with Luminaires for Generals.

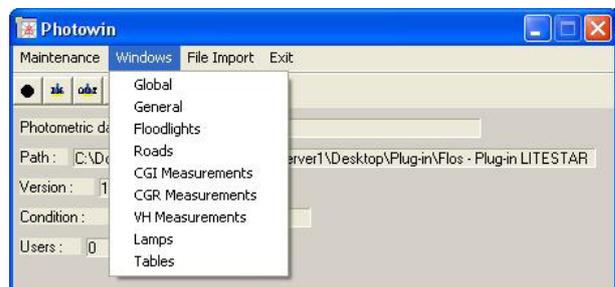
In order to view the luminaire characteristics these steps must be followed:

1. Select the WINDOWS/General Luminaires and the General Luminaires Manager appears. This window is subdivided into 2 parts and consists in:

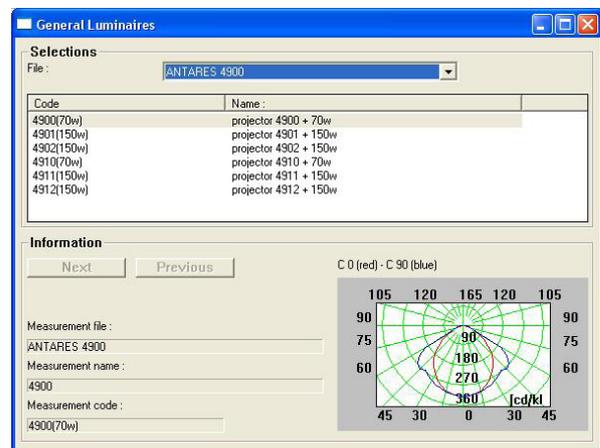
- Selection Area :
 - a ComboBox from which to select one of the available luminaire files
 - a list correspond-ing to the current luminaire file
- Information Area:
 - the description of file, name and code of the measurement associated with the luminaire
 - the relative photometric curve.

2. Click twice on the selected luminaire and the management window of the single luminaire appears, with the following elements:

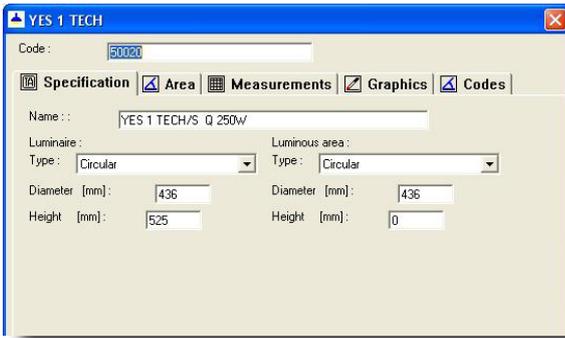
- luminaire code
- 3 windows with tags related to the following elements:



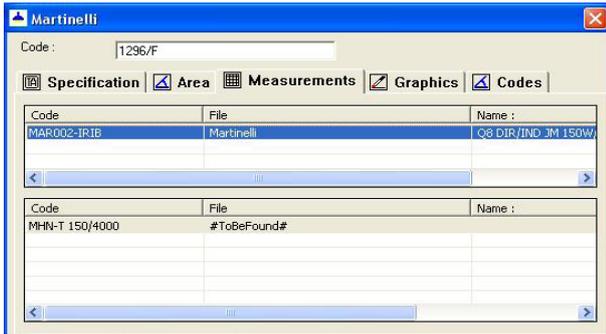
Windows Menu – Access to Luminaire Functions



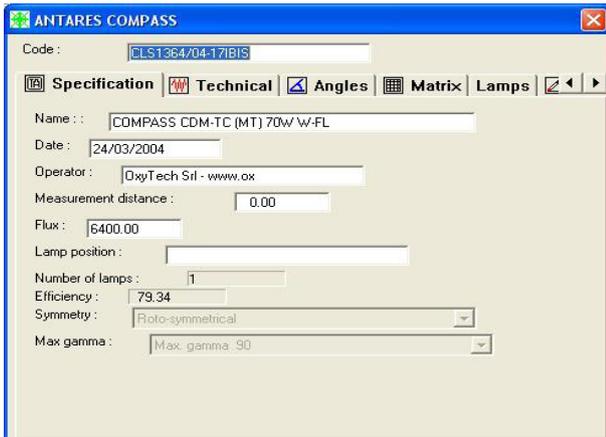
General Luminaire Management Window (Point 1)



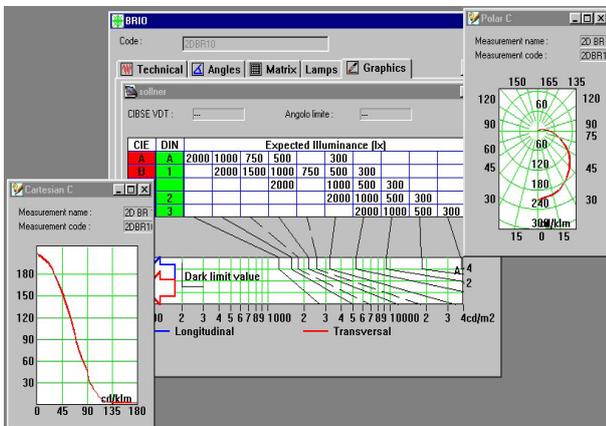
Luminaire Data Window (Point 2)



Luminaire Data Window (Point 2-Measurements)



View Type Option Window (Point 2-Measurements)



Graphics View and Plane/Angle Selection

(Point 2-Measurements-Matrix-2)

- Specification: to show the specification data of the luminaire such as Luminaire Description (Name), Type or Shape (Rectangular, Circular..) and dimensions (Length, Width and Height [mm]) both of the luminaire and of the luminous area for luminance/glare calculation
- Area: to show the data relative to the luminous area of the luminaire
- _Measurements: for access to the view mode management window. On selection of Measurements a window composed of 2 sub-windows appears, the first containing the measurements associated with the selected luminaire (more than one measurement can in fact be associated to a single luminaire) the second the lamps associated with the selected measurement
- Graphs: on selection of Graphs opens the window showing the available graph types which are:
 - Polar C Diagram: this is the polar diagram realized with constant C- planes
 - Polar Gamma Diagram: this is the polar diagram realized with constant Gamma- angles
 - Cartesian C Diagram: this is the Cartesian diagram realized with constant C- planes
 - Cartesian Gamma- Diagram: this is the Cartesian diagram realized with constant Gamma- angles.
 - Glare: this is the Soellner diagram which allows visualization of the luminance curve of the selected luminaire (this function is only available with general or street luminaires).

When this graph from the Luminaires section is visualized, only the luminance curves of the main semi-planes are shown, i.e. C-0° and C-90°.

Should you want to visualize the luminance curve of every semi-plane measured, you must select the corresponding measurement, visualize the glare diagram and choose from the Matrix section the semi-plane you wish to represent.



NOTE

In order to print the selectionned graphics displayed, activate the Management Menu clicking on the graphic symbol placed on the upper left corner of the Graphics window and select function Print.

Measurements – Generals, Floodlights, Roads

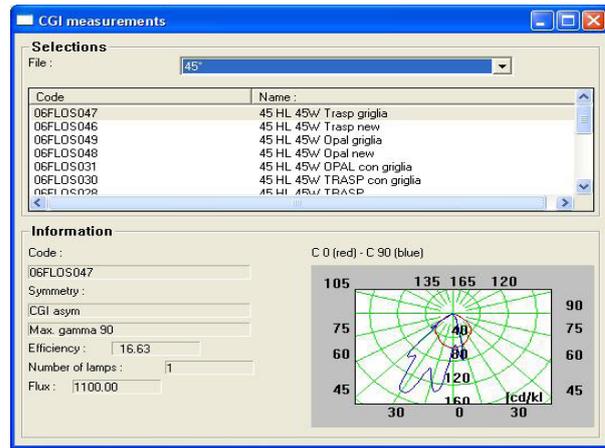
The Measurements (Generals – Floodlights – Roads) function allows access to the viewing functions of the photometric characteristics, both graphic and tabular, of the single measurements whose management is identical in all 3 cases: therefore the following section deals only with Luminaires for Generals.

To view the measurement characteristics the following steps must be followed:

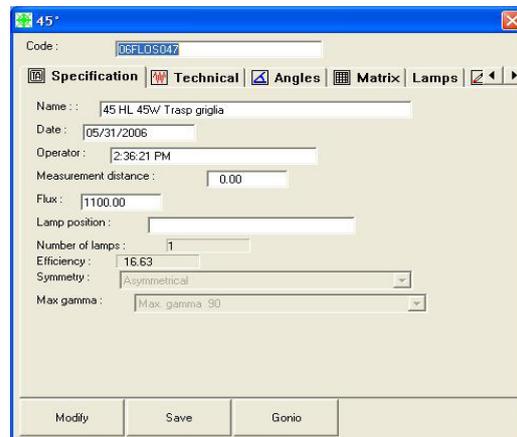
1. Select the WINDOWS/General Measurements function and the General Measurement Manager appears. This window is divided into 2 parts and contains:
 - **Selection Area:**
 - a ComboBox from which to select one of the available measurement files
 - a list correspond-ing to the current measurements file
 - **Information Area:**
 - measurement code
 - type of measurement symmetry including indication of the maximum Gamma value (90° or 180°)
 - efficiency measurement
 - total number of lamps in the luminaire

2. Click twice on the selected measurement and the view type option window appears containing the following elements:

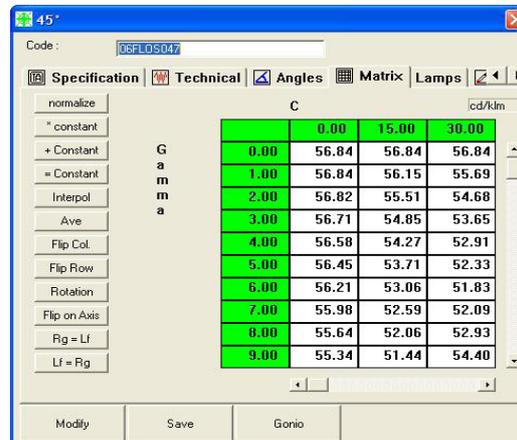
- **Specification:** here all the measurement specification data is recorded such as Name, Date, Operator, Measurement Distance [m], Total Flux [lm], Position and Total Number of Lamps
- **Technical data:** here all the technical data of the measurement is found such as the Temperature [°C] and Relative Humidity [%] of the laboratory where the measurement was carried out, the photoelectric cell used and the voltage [V] and the supply current [A] of the luminaire
- **Angles:** this is a summary of the angular steps related to the C- or V- planes and Gamma- or H- angles of the photometric table
- **Matrix:** this is the photometric table where, according to the C- or V- planes and Gamma- or H- angles, the values of luminous intensity in [cd/klm] are registered
- **Lamps:** this window shows the lamps associated with the measurement
- **Graphics:** on selection of Graphics a window appears containing the available graphics buttons which are:
 - Polar C Diagram: polar diagram realized with constant C- planes
 - Polar Gamma Diagram: polar diagram realized with constant Gamma- angles
 - Cartesian C Diagram: Cartesian diagram realized with constant C- planes
 - Cartesian Gamma- Diagram: Cartesian diagram realized with constant Gamma- angles



General Measurement Manager Window (Point 1)



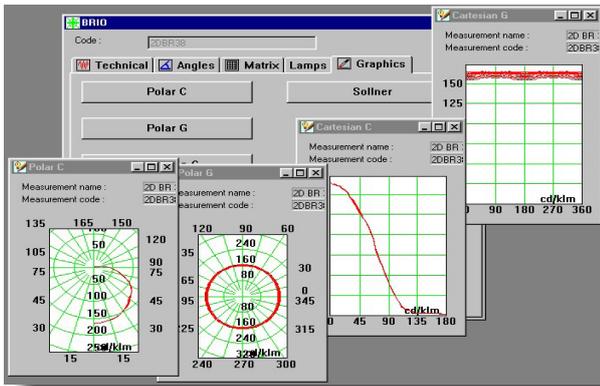
View Type Option Window (Point 2-Measurements)



Matrix Window (Point 2-Measurements-Matrix-1)

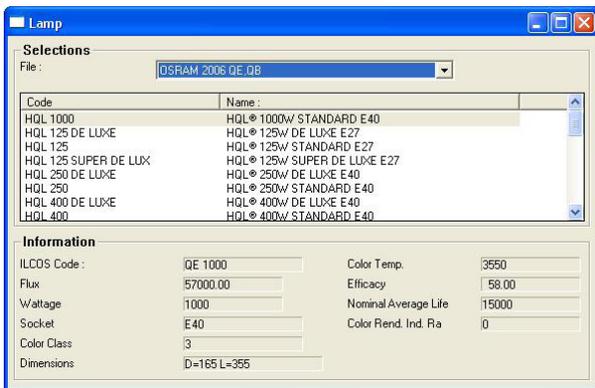
To view one of the diagrams follow the steps below:

1. Activate the Matrix window and select one or more C- or V- planes or Gamma- or H- angles by clicking on the ordinate or X-axis values: the plane or angle selected changes its background color.
2. Activate the Graphics window and select one of the available graphics. The



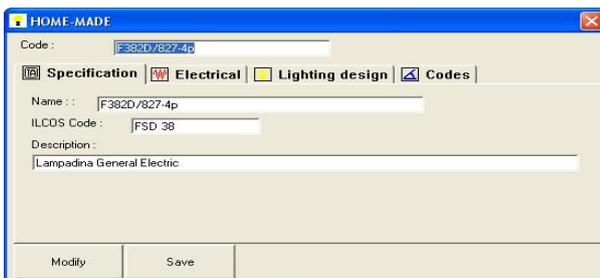
Graphics View and Plane/Angle Selection

(Point 2-Measurements-Matrix-2)



Lamp Manager Window

(Point 1)



Lamp Data Window

(Point 2)



Table Manager Window

(Point 1)

window can be moved so as to reactivate the Matrix window to add or cancel selections

Lamps

The WINDOWS/Lamps function allows access to the view functions of the characteristics of the available lamps in the files.

To view the lamp characteristics follow the steps below:

1. Select the WINDOWS /Lamps and the Lamp Manager appears. This window is divided into two parts and contains:

- Selection Area:
- a ComboBox from which to select one of the available lamp files
- a list corresponding to the current lamp file
- Information Area:
- lamp characteristics such as ILCOS, Flux [lm] ...

2. Clicking twice on one of the lamps in the list opens the window in which to view the different lamp data subdivided into:

- Specification: here the lamp specification data is found such as Group Name, ILCOS Name and Description
- Electrical data: here the electrical data of the lamp is found such as life [h], Wattage [W], Socket and Dimensions (Length and Width [mm]).
- Lighting data: this is a summary of data such as Flux [lm], CR Degree, Color Temperature [°K], CRI and Efficacy [lumen/Watt].

Tables

The WINDOWS/Measurements function allows access to the view functions of the reduced reflection factor tables generally used for calculating luminance values in road lighting installations (refer to CIE 30 Recommendations). To view the characteristics of one of the available tables follow the points described below:

1. Selecting the WINDOWS/Tables function opens the Tables Manager. This window is divided into 2 parts and contains:

- Selection Area:
- a ComboBox from which to select one of the available table files
- a list corresponding to the current table file
- Information Area:
- (not active in this version of the program)

2. Clicking twice on one of the tables in the list opens the

window where you can view the characteristics of the table subdivided into:

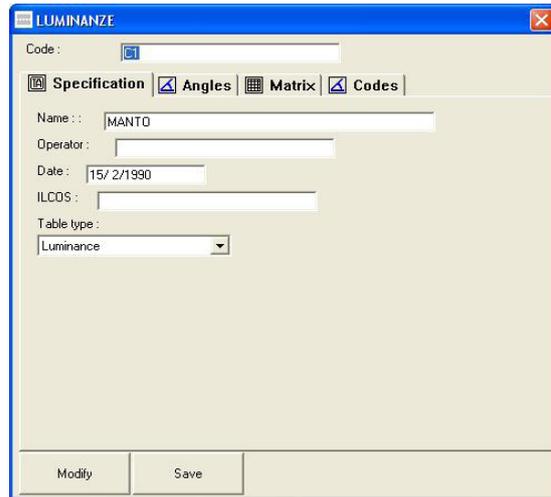
- Specification: here the specification data of the table is found such as Table Name and Operator
- Angles: this is a summary of the angular steps of the table
- Matrix: this is the actual table where, according to the C- or V- planes and Gamma- or H- angles, the reduced reflection factor values are registered according to the Beta and Delta angles.

File Import

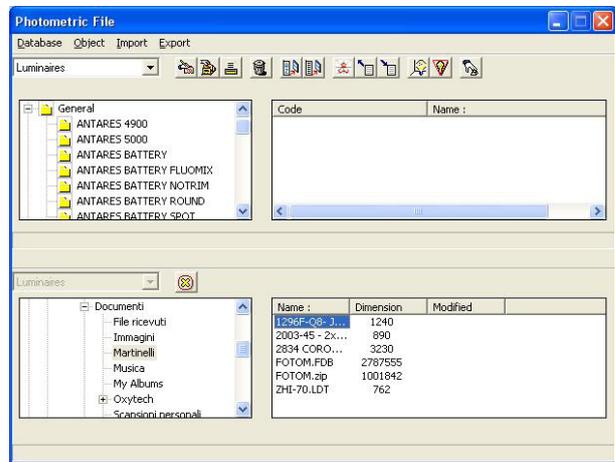
This function allows you to import photometric files in the standard recognized formats such as Eulumdat, Cibse TM14, IESNA86-91-95 LM63 and LTLI as well as IESNA GELS format typical of the program distributed by GE.

The operations to effect import are the following:

1. Select FILE/File Import and this opens the File Import window which illustrates the tree of available disks on the left-hand side
2. Select the folder which contains the files you want to import
3. Highlight one file by clicking with the left mouse button or a number of files using Control-click or Shift-click
4. Drag the selected items towards the file of destination taking care to keep the left mouse button pressed. The operation is similar to those that can be used for moving files in the Explorer program of Windows. During transfer the program automatically shows, with a barred circle, the areas in which the files cannot be unloaded and, with the icon of the file type, those areas instead where they can



*Table Data Window
(Point 2)*



Standard File Import

Before transferring the files into the destination file, the program shows the window with its characteristics: select Copy to import, Skip to avoid import.

A file may possibly be highlighted although not in one of the foreseen standard formats; in this case the program shows the characteristics of the file but the Copy function will not work since import is impossible.



NOTE

To return to Main Manager, select the symbol X.

PHOTOVIEW

Photoview is a program that processes the photometric data of lighting devices in graphs and tables.

To access Photoview you must:

- Enter Photowin;
- Select WINDOW/Global or click on the black dot;
- Open one of the available groups, General, Floodlights and Roads;
- Click on one of the available files on the left and the list of luminaires or measurements inserted in the file will appear on the right;
- Click with the right mouse button on one of the files or on the Graphs and Tables icon to open the context menu from which to choose the Graphs and Tables function, which opens the Photoview program.

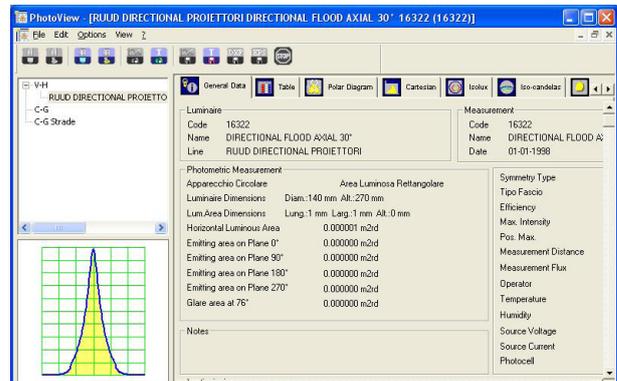
In the case of access via Luminaires and if more than one photometry associated with the same luminaire is available, one of these must be selected before activating Photoview.



Graph and Table Management Luminaires

Launch of the Photoview program activates the management window which is made up of the following parts:

- the **Menu Bar** situated in the upper area;
- the **ToolBar** associated with the Menu Bar functions and situated below it;
- a central section, to the right, for viewing the graphs and tables of the selected photometry;
- a central section, to the left, with a list showing the photometries currently open;
- again in the central section, visualization of a polar graph;
- a lower section where the general data of the product, the main characteristics of the measurement and the maximum dimensions are shown.



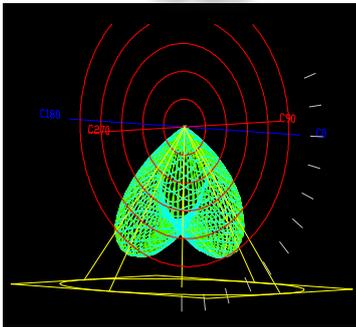
Photoview

The Menu Bar is made up of the following menu:

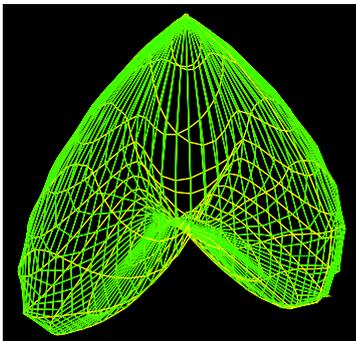
- **File** which includes graph and table print functions or their saving on file;
- **Edit** to manage editing functions such as the acquisition of an image or table in memory;
- **Options** for access to the configuration window of the program module;
- **View** to manage the graph view functions;
- **X (Exit)** to quit Photoview.



File Menu



Photometry 3D DXF



Luminance in 3D DXF

FILE

The File menu allows management of the following functions (the associated icon is shown on the left):



- Print All Preview to view on screen everything about the active product that can be printed.



- Print All to print everything about the active product that can be printed .



- Print Screen Preview to view the print preview of what is currently on screen.



- Print Screen to print the current graph. Selection of the function opens the system window in which to select the print elements. Press OK to confirm.

- Set Printer for access to the system window for printer management.

- Import file this allows a photometry to be imported in Eulumdat, IES and TM14 formats.

- This function is also active with "drag and drop": Just drag the file in the photometry list to access all viewing functions.



- Save Image to save the image (polar, Cartesian diagram) in an image in BMP, JPG, TGA, PCX or PNG format.



- Save Table as Text to save the photometric matrix or the selected table in a .TXT file.

- Save Photometry in 3D DXF to save the matrix in a 3D DXF file to view the photometric solid with a CAD program.

- Save Luminance in 3D DXF, to save the graphic element in 3D DXF format.



- Save Page as 2D DXF, to save the graphic element in 2D DXF format.

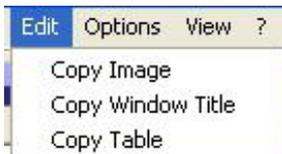


- Save Page as 2D PostScript to save, where possible, the graph in EPS format.

- Exit to quit the program; the same function can be performed by pressing on the X on the right of the window.

EDIT

The Edit menu allows management of the following functions (the associated icon is shown on the left):



Edit Menu



- Copy Image to copy the active image (Cartesian, polar diagram etc.) in the temporary memory. This image can then be pasted onto a different graphic application.

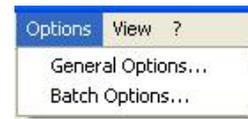
- Copy Window Heading to copy in the temporary memory the heading of the window corresponding with the description of the luminaire to be used with text applications.



- Copy Table to copy in the temporary memory the photometric matrix of the luminaire under examination to be used with text applications

OPTIONS

The Options menu contains two sub-headings with which to manage the following functions:

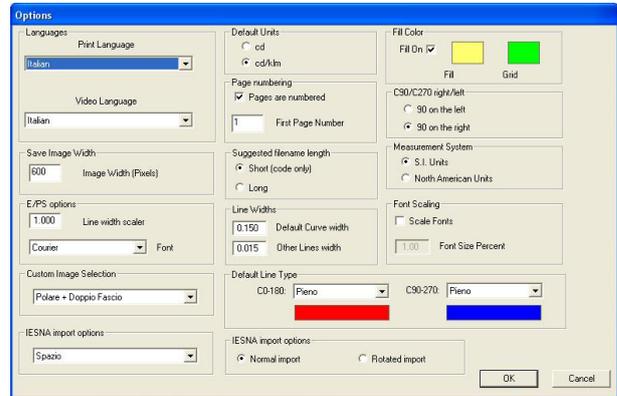


Options Menu

GENERAL OPTIONS

General Options for access to the module configuration management window. The following elements can be configured:

- Print Language with which to choose the language to be used for graph and table printouts;
- Screen Language to choose the language with which to manage the Photoview program on screen;;
- Image Width [pixels] with which to define the number of pixels per image width;
- EPS Options where the scale Factor for lines and predefined font with which to export the diagram can be set.
- Opzioni Import Options IESNA sspace, tab or semi-colon;
- Import Options IESNA allows rotation of the photometric curve when it has been created with an inverted system of coordinates.
- Measurement Unit to define the measurement unit for visualizing graphs and tables whether candela [cd] or candela on lumen [cd/klm];
- Page Numbering to define the number of the first page to be printed; page numbering can only be defined if the relative field is editable.
- Default file name for saving allows the use of long file names according to Windows specifications or to the 8+3 pattern used in the first DOS versions.
- Curve and grid line thickness;
- Setting of line type (full, broken, dotted) by default for octagonal curves C0-180, C90-270 and their color;
- Attivazione del colore per il riempimento e della griglia;
- C90/270 left/right to invert graph view;
- Unit of measurement – This allows you to choose between S.I. and North American Units;
- Font scaling, with the checkbox activated, the font size used for graph export can be varied in percentage terms.



General Options Menu

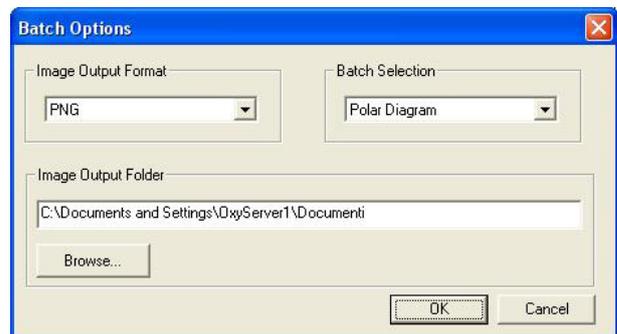
Press OK to confirm modifications, Cancel to exit the function without confirming modifications.

BATCH OPTIONS

This function allows export of the customized graph relative to the selection of a number of luminaires of which it is possible to define:

- Form of saving: PNG or EPS
- Type of graph to be exported;
- Image folder: to select the destination folder.

In the Photowin module, the batch function is activated by selecting a number of photometries, clicking with the right button and selecting “perform batch”.



Batch Options Menu



- Stops the batch procedure.



View Menu

VIEW

The View menu allows management of the following functions:

- Toolbar to activate or not the toolbar (icon bar); the bar is active when the ✓ sign appears on the left of the description;
- Stack to superimpose the active windows;
- Tile to place active windows side by side.

The menu shows in the lower part the photometries on the list at that moment; the active one shows the ✓ sign on its left.

Graph and Table Visualization

After selecting a luminaire and its photometry, if there is more than one available, the program shows the view window where you can select from the available graphs and tables to view the photometric matrix.

The possible options are:



- General Data Table



- Intensity Matrix



- Polar Diagram



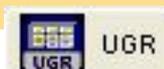
- Cartesian Diagram



- International Classifications and Zonal Diagram



- Beam Diagram



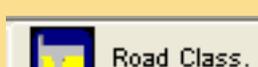
- UGR table



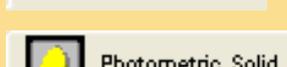
- Isolux diagram



- Isocandela diagram



- Roads classification



- Photometric solid;



- CIE Utilization and Utilance Factors



- Soellner Diagram



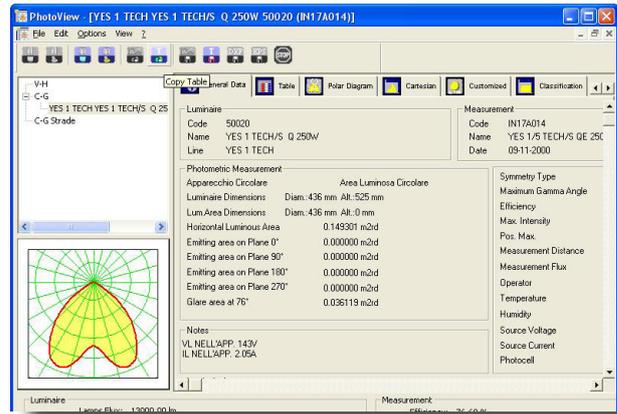
- Luminance diagram



ONLY LITESTAR Pro

General Data

Here the data of the luminaire, the associated measurement and the lamp are visualized.

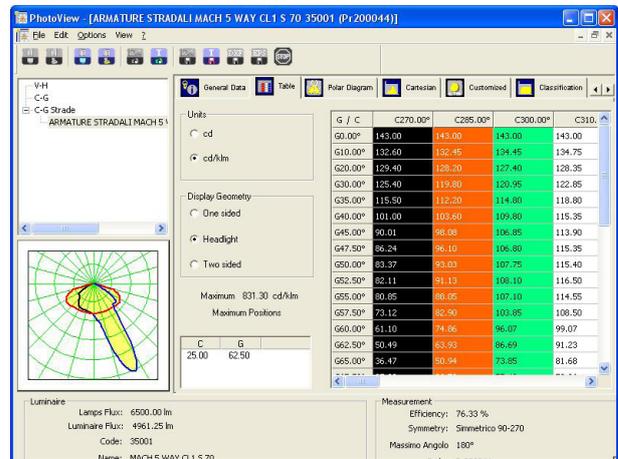


General Data

Values and Angles Table (Intensity Matrix)

The window shows the following elements:

- Measurement unit:
 - cd: the table values of intensity are shown in absolute candela;
 - cd/klm: the table values of intensity are shown in candela per kilolumen;
- View Geometry – this indicates how to graphically visualize the measurement semiplanes choosing between:
 - Monolateral: only the selected semiplane is visualized;
 - Facing: the selected semiplane and its complementary are visualized (for example, if the C- 5° semiplane is selected, the C- 5° will also be shown);
 - Bilateral: only the selected semiplane and its supplementary are visualized (for example, if the C- 5° semiplane is selected, the C-225° will also be shown);
- Indication of the maximum values and their position. In the table maximum values are displayed on a yellow background;
- C-Gamma or V-H Photometric Matrix;



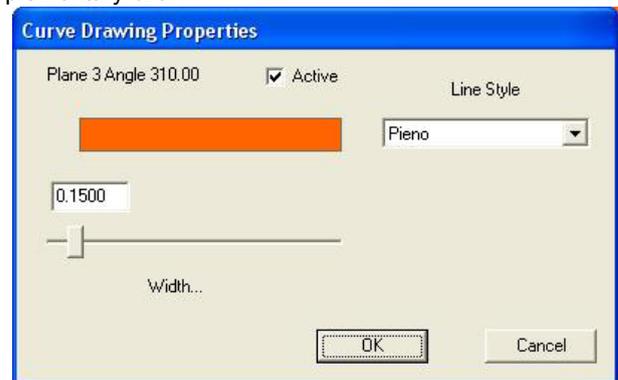
Intensity Matrix

The matrix shows all the values of intensity in [cd/klm]: to activate a semiplane just press with the mouse on the C- values line to open the properties window.

This window allows you to define:

- Whether the semiplane is active (ticked) or not (Active) (indication of the semiplane is shown on the top left);
- The color of the curve: press on the color box to access the window in which to select the desired color, and confirm with OK;
- The width of the curve: the dimension may be defined either by using the entry box or by using the cursor and moving it from right to left

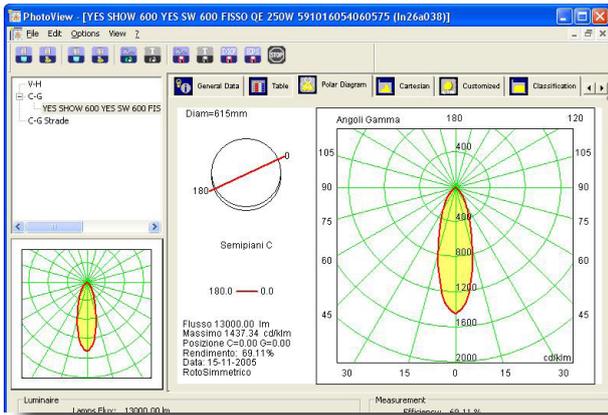
To confirm the changes press OK, Cancel to close the window without confirming.



Curve Properties

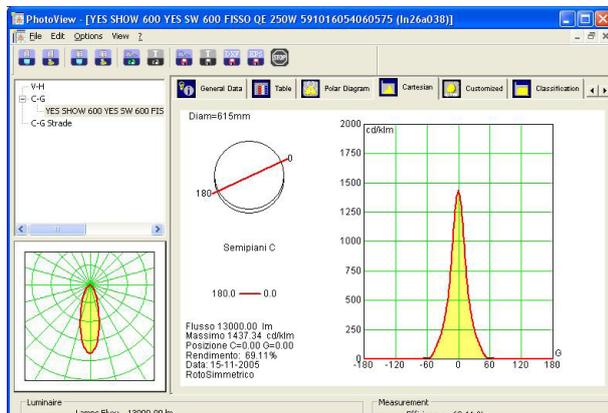
Semiplane selection is limited to 6. To view the selected semiplanes, one of the two available diagrams, Polar or Cartesian, must be selected.





Polar Graphs

- luminous yield [%]



Cartesian Graphs

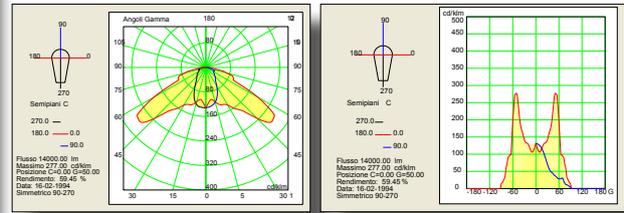
Polar and Cartesian

The polar and Cartesian graphs are useful for showing the intensity values (photometric matrices) in graph form.

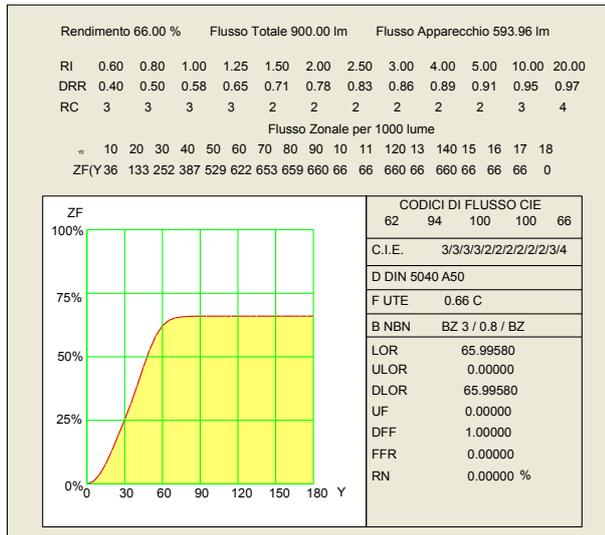
The difference between the 2 graphs depends on the type of representation of the data itself.

The window elements are:

- Indication of the luminaire dimensions in [mm]
- Graph representation of the selected C- semiplanes and their reference
- Indication of the Total Lamp Flux [lm]
- the maximum intensity value [cd/klm]
- and of its position according to the type of coordinates used (C-Gamma or V-H),
- the date of measurement and the type (symmetrical, asymmetrical).



Polar and Cartesian Graphs - EPS Export



Classification - EPS Export

Classification

This window shows the international photometric classifications of the luminaire.

The elements it contains are, from the top:

- Indication of luminaire yield [%], Total Lamp Flux [lm] and the flux emitted by the luminaire [lm]
- The DRR (Direct Room Ratio) and RC (Room Class) parameters according to the room index (RI) defined by CIE52
- Evaluation of zonal flux, with relative graph, according to CIE52
- International classifications such as:
- The CIE flux codes (ref. CIE52)
- The CIE, German DIN, French UTE and Belgian NBN photometric classifications

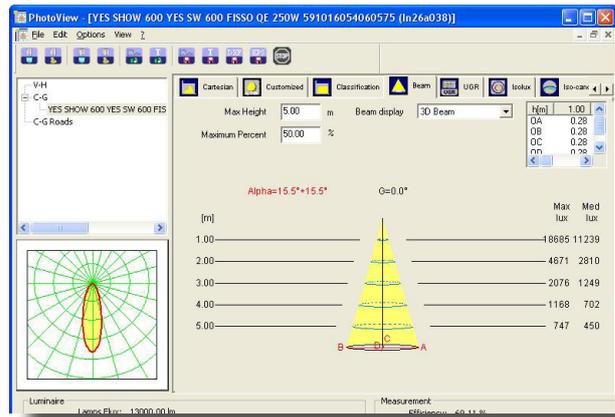
- Evaluation of the total flux LOR [%], downward flux DLOR [%] and upward flux ULOR [%]
- The values of UFF, DFF, FFR, AND RN [%].

Beam (Beam Diagram)

This window allows you to manage the beam diagram graphs.

The elements it contains are, from the top:

- **Maximum Height [m]:** this is the maximum distance at which to measure the beam. It is an edit box and therefore the desired value can be entered as required
- **Maximum Percentage [%]:** this is the percentage of the maximum value for $\Gamma=0^\circ$, or with respect to the axis of maximum intensity, according to which the beam diagram should be evaluated. It is an edit box and therefore the desired value can be entered as required
- **Cone View:** here you can select the type of view, whether 3D View or 2D View according to the C-0/80° and C-90/270° plane
- **Beam Diagram Axes Values:** here are shown the values of segments OA, OB, OC and OD according to the distance from the focal point
- **Graph and Table:** the graphs may be of 2 kinds, 3D and 2D, the latter represents the section of the D graphs along the longitudinal and transversal planes of the luminaire. The graph also shows the semi-spread according to the 2 principal semiplanes, each pair of which is called Alpha or Beta: the pairs of values may also be different according to whether the beam is symmetrical (the Alpha and Beta pairs are the same) or asymmetrical (in this case the pairs are different). The table area shows the distance of every single calculation plane (5 distances are always taken into consideration), the maximum value of illuminance [lux] along the beam axis according to the distance and the average value of illuminance in the areas subtended by the angle. The 2D graphs also show the beam diameter [m] according to the distance.



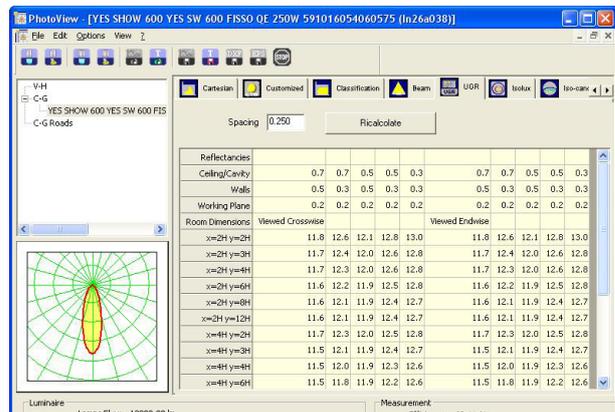
Beam Diagram Representation

The graph also gives indication of the semi-opening according to the 2 main semiplanes, the pairs indicated with Alpha and Beta: the two pairs of values can also be different according to whether the beam is symmetrical (the Alpha and Beta pairs are equal) or asymmetrical (in this case the pairs are different).

UGR Table

This is the UGR Table designed according to CIE 117 norm of 1995 to check the conformity of the lighting system to the EN 12464 standard as far as the control of unified glare due to artificial illumination is concerned. The UGR index expresses the unified glare due to artificial illumination according to the position of the lighting devices, the luminance of the walls and from the point of view of the users.

The table allows evaluation of the UGR values in standard installation conditions, i.e. in rectangular areas, with a single type of lighting device with regular geometry inside the area and from the most unfavorable longitudinal and transversal viewpoints.

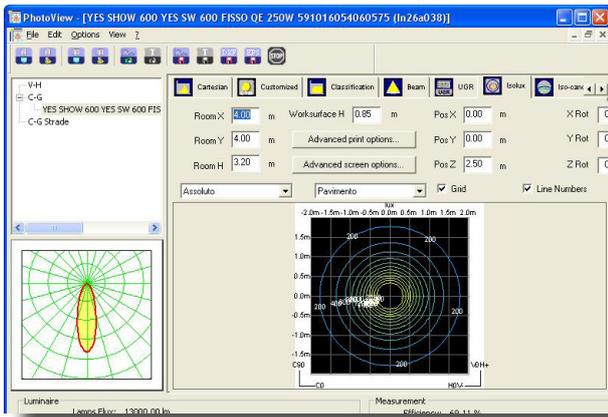


UGR Table

The UGR values range between 10 and 30, where 10 corresponds to the absence of glare and 30 to considerable physiological glare.

The EN 12464 standard contains a table of UGR limits for every type of environment, only valid however for rectangular areas with geometric placing of lighting devices.

The table is calculated using 0.25 as the default interdistance value. If a different value is entered, the table can be recalculated according to the new parameter.



Isolux Curve Representation

Isolux representation

This is the simulation of a photometric curve by means of the isolux representation of the illuminance calculation in a standard environment.

The results can be visualized on the six walls plus the working plane. The contribution of the inter-reflections is not taken into account in the calculation.

Customizations. Certain parameters may be modified in order to obtain visualization:

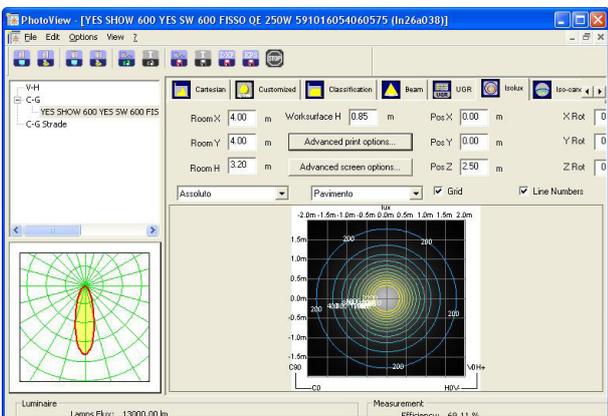
- the dimensions and height of the working plane in the test area can be modified;
- position X, Y and Z of the lighting device with relation to the area center;
- rotation X, Y and Z of the lighting element with relation to the center of the area;
- a combo field allows the visualization of the results related to floor, working plane, ceiling and the four walls;

- a combo field allows you to set the visualization of the results in terms of absolute values (in lux) or in percentages.

The dimensions are expressed in meters.

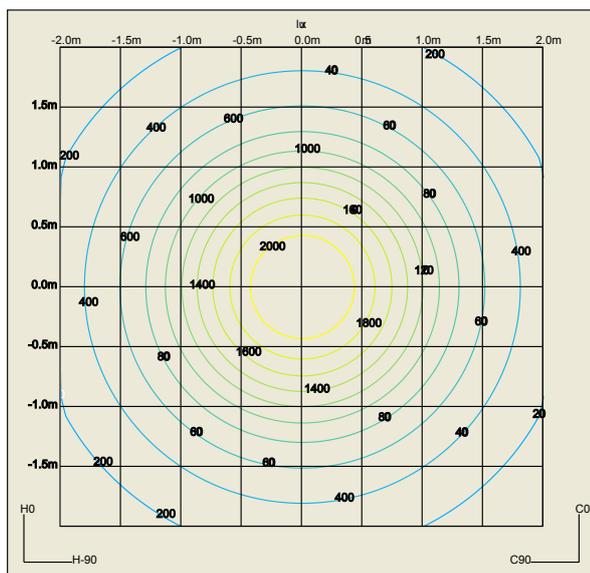
Other parameters are optional:

- show text - shows the values in lux in the points where calculation has been carried out;
- show lines - shows the lines of the isolux curves and the relative limit values;
- show shading - shows the state of the illuminances in various shades of gray;
- show maximum - shows the point or points where the maximum illuminance values are to be found;
- show grid - shows the dimensional grid;

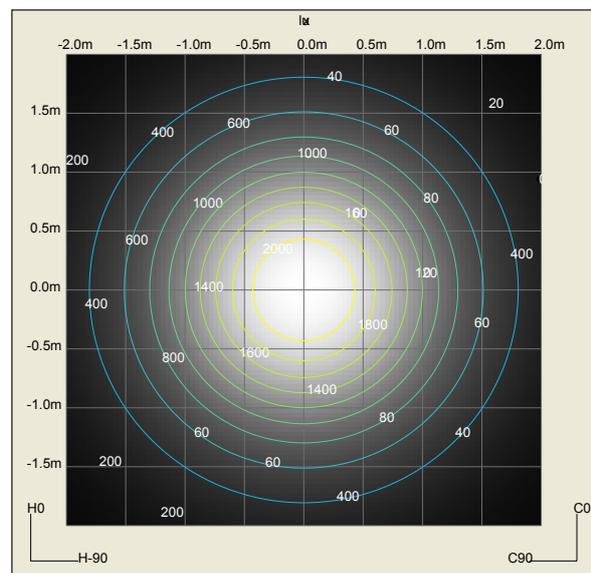


Isolux Representation with Shadows

- advanced - customizes area parameters.
- show isolux numbers – shows or hides the values on the isolux graph;
- Advanced options – customization of print and on-screen parameters (see paragraph).



Isolux - EPS Export



Isolux with Shadows - EPS Export

Isocandela representation

Representation of the movement of the isocandela values of a photometric curve through different kinds of projection.

It is possible to intervene dynamically both on the inclination and on the rotation of the lighting device.

View selection:

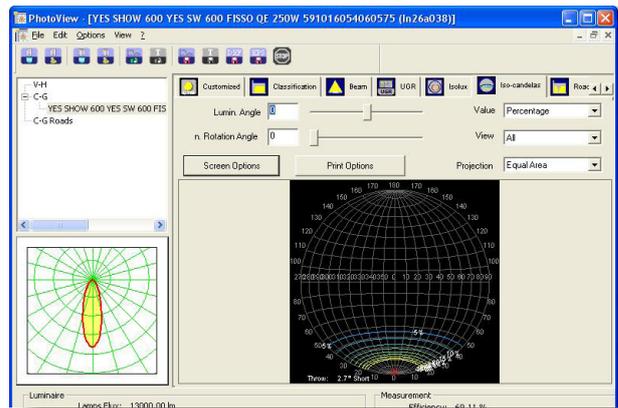
- all - represents the whole hemisphere;
- upper - represents the upper part of the hemisphere which corresponds to indirect lighting;
- lower - represents the lower part of the hemisphere which corresponds to direct lighting.

Different projection grids can therefore be selected:

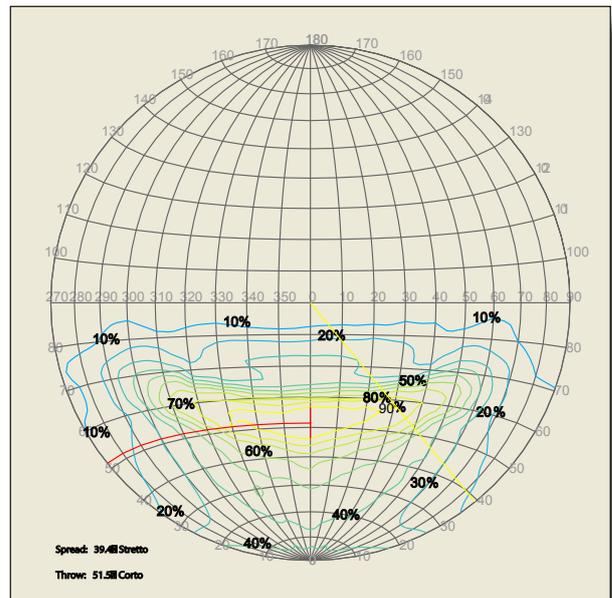
- orthographic;
- equivalent - in accordance with CIE 31-34- norms for representing roads photometries, with indication of throw and spread values;
- stereographic;
- sinusoidal
- Cartesian.

For each of these representations, the maximum value, throw value and level curve values can be shown.

- Advanced options – customization of print and screen parameters (see paragraph).



Isocandela curves (equivalent projection)



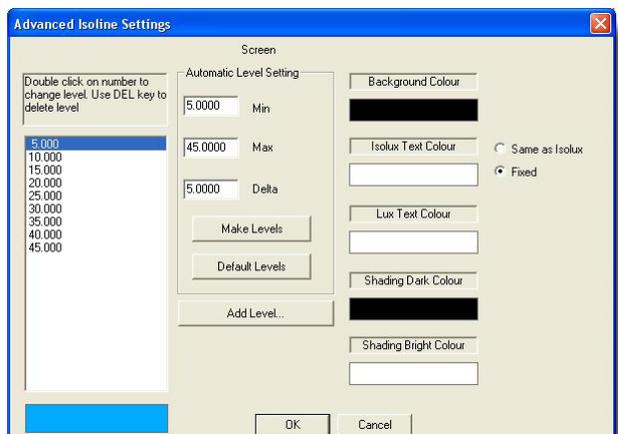
Isocandela curves EPS file Export (equivalent projection)

Advanced options for Isolux and Isocandela

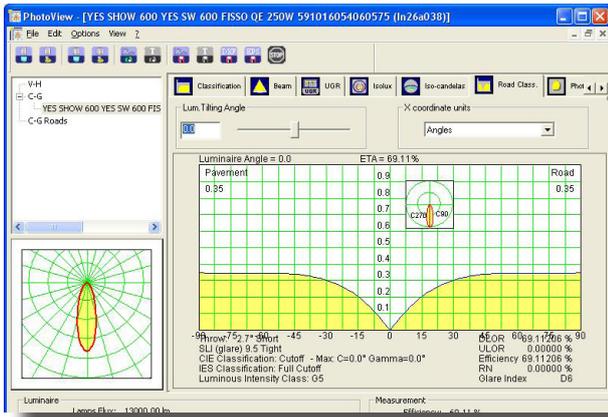
Customization of both the screen and print view is possible, in particular the following may be chosen:

- Number and color of levels;
- shift between automatic/manual values;
- background colors setting;
- isolux text colors setting - fixed or same as isolux;
- text color setting;
- dark shading setting;
- light shading setting.

The values of the isocandela curves may be expressed in absolute terms rather than in percentages.



Advanced options for screen and print



Roads classification

Roads classification

This window manages the utilization factors for road luminaires.

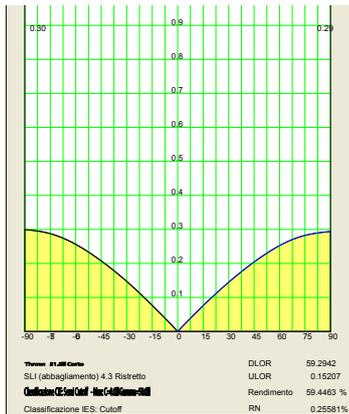
There is a control for modifying the inclination of the lighting device. A frame in the graph gives the visual perception of this inclination.

The graph shows the utilization factor lines divided into sidewalk side and road side.

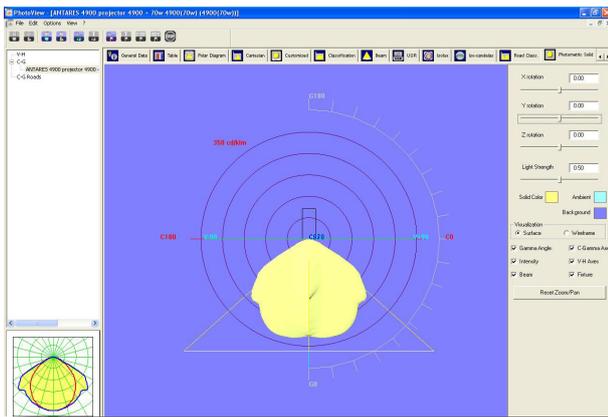
These data can be presented as the ratio between distance and height or expressed in angles.

The characteristic values of the lighting device are then shown:

- Indication of the Throw value
- SLI index
- CIE classification
- IES classification
- Class of luminous intensity
- DLOR
- ULOR
- Total yield
- RN
- Glare index.



Road Classification - EPS Expot



Photometric solid

Photometric solid

This window allows three-dimensional viewing of the photometric solid which can be rotated to appreciate all its aspects.

The controls on the panel are as follows:

- Rotation along X, Y, and Z axes.
- Light power allows variation of the intensity of color with which the solid is represented.
- The colors of the photometric solid, the axis from which the light derives and the background.
- Full color or wireframe view.
- Check boxes that allow viewing of: Gamma angles, intensity values, beam opening, C-Gamma or V-H axes.
- A button with which to reset the pan and zoom functions to standard.

The solid can be moved using the mouse by:

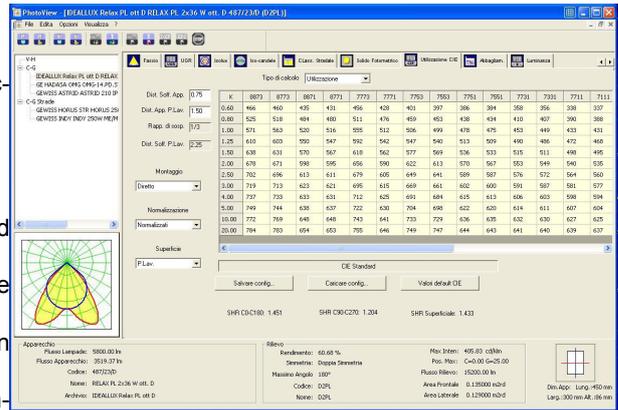
- Keeping the left button pressed to rotate the solid around the origin.
- Keeping the right button pressed to move the solid over the background.
- Using the wheel to move the solid closer or further away (zoom).
- By keeping the left button and shift button pressed, the solid moves closer or further away (zoom).

CIE utilization (CIE Utilization and Utilance factors)

This window manages utilization and utilance factors in accordance with CIE52.

The elements contained in it are, from the top:

- Type of Calculation selection between utilization and utilance factors
- Distance Luminaires/Ceiling in [m]: this field can be edited
- Distance Luminaires/Working Plane in [m] : this field can be edited
- Suspension Ratio meaning the ratio between the distance luminaires/ceiling and that between luminaires and working plane
- Distance Working Plane/Ceiling in [m]
- Mounting selected between direct luminaires (downward light emission) and indirect (upward light emission);
- Normalization: choice between normalized and non-normalized;
- Calculation Surface: this is the surface on which calculation of the factors is to be made and can be selected between walls, ceiling and working plane (generally only the last is used)
- Utilization/Utilance Factors Matrix according to set parameters, reflection factors of ceiling, frieze, walls and floor and K index. Clicking on one of these four reflection factors opens the window with which to modify the factors. Use then Save config.... to save the modifications giving the new series a distinguishing name (the configurations of saved values can be loaded by using Load config, use CIE default Values to load the standard CIE series).
- The index can be edited by clicking on the K value.
- Then the interdistance ratio values between luminaires and height of installation are shown.



CIE Utilization

Söllner (Söllner Glare Diagram)

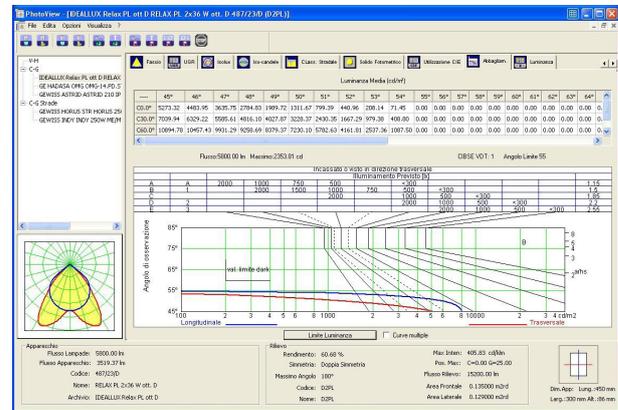
This window manages the Söllner glare diagram in accordance with CIE55

The elements contained are, from the top:

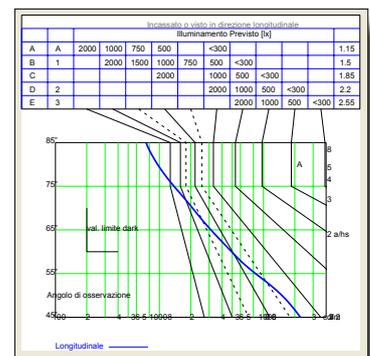
- Luminance values table in cd/m2 for each angle;
- VDT Cibse Classification;
- Söllner graph.
- Graph visualization according to models A and B.

It is therefore possible to set the acceptance limit values for luminance curves, the limit angle and the label that identifies this limit.

Two buttons permit: saving of the modified values in the configuration file and if required loading of the previously saved values.

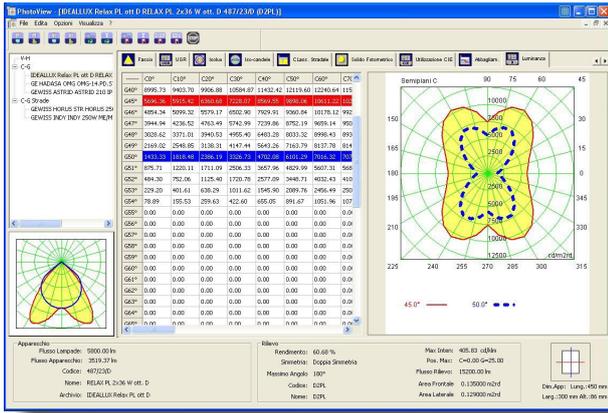


Luminance Abacus



Luminance Abacus - EPS Export

Luminance



The screen shows the luminance values of the photometric solid expressed in the cg system.

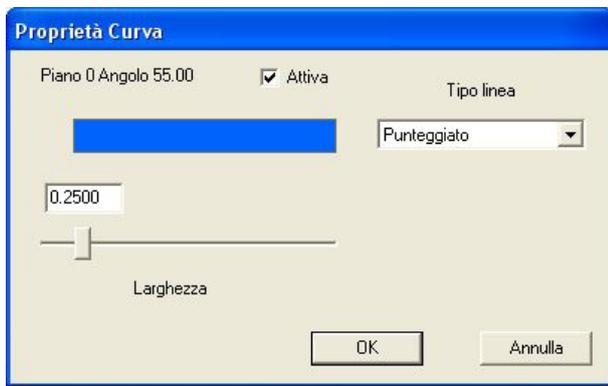
The C planes have spacing of 10° while the g angles have steps of 5° between 0° and 45° thereafter of 1 degree.

The screen presents a window divided in two areas, the first on the left shows the values, the second on the right shows the C semiplanes by means of a polar diagram.

By selecting a line of G angle values, the luminance value graph can be viewed.

It possible to set the values of color, lyne type (full, broken, dotted), line thickness for each line of the graph..

Luminance Abacus



Luminance Abacus - Curve Properties



OxyTech s.r.l.

Via G.B.Vico 54-56

I - 20010 CORNAREDO (MI) ITALY

info@oxytech.it

www.oxytech.it

Tel. +39 02 93563258

Fax +39 02 93563235