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Progressive solutions in greener optimization of public lighting in Euro-MED area

UPGRADED TOOL FOR PUBLIC LIGHTING GIS REGISTRATION

https://prolightmed.interreg-euro-med.eu/

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Progressive solutions in greener optimization of public lighting in Euro-MED area

Project id	Euro-MED0200447
Name of the lead partner organisation	Opština Tuzi
Name of the lead partner organisation inEnglish	Municipality of Tuzi
Project title	Progressive solutions in greener optimization ofpublic lightning in EURO-MED area
Project acronym	ProLIGHTmed
Programme priority	Greener MED
Specific objective	RSO2.4: Promoting climate change adaptation and disaster risk prevention, resilience, taking into account eco-system based approaches
Project duration in months	30
Project mission	Promoting green living areas
Project category	Test project (Thematic Project)

Deliverable number and title	D.1.3.1 Upgraded tool for Public lighting GIS registration
WP number and name	WP1 Joint approach for improvement of energy efficiency in public lighting of EURO-MED region
Activity number and name	A 1.3 Introduction of tool for Public lighting GIS registration
Partner in charge (author)	PP2 – ENA – Energy and Environment Agency of Arrábida
Partners involved	MoT, UBBSLA, MOL, MoA, CoK, DiTNE, TUC-ReSEL.
Date of production	February 2025

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Tool for Public lighting GIS registration – User Manual

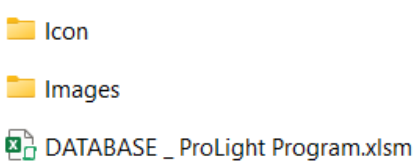
1. Required resources

- A desktop computer capable of running Microsoft Excel spreadsheets (with macros) and with Google Earth installed.
- A tablet with a Windows operating system, equipped with a camera, and capable of running Microsoft Excel spreadsheets (with macros) and with Google Earth installed.
- A USB drive for transferring files between the desktop computer and the tablet.
- A lux meter for measuring light intensity.
- A rangefinder or measuring tape for measuring the width of the road.

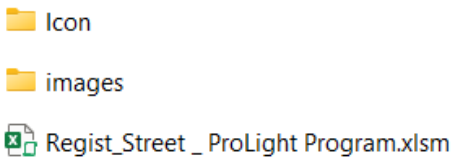
2. The Tool

This tool is designed to register public lighting systems for the purpose of managing and optimising lighting infrastructure. It consists of two Excel spreadsheets:

- **DATABASE _ ProLight Program.xlsm**: Used on the desktop computer. This application facilitates the registration and optimisation of public lighting systems. It requires a dedicated folder on your computer with the following file structure.



- **Regist_Street _ ProLight Program.xlsm**: Used on the tablet. This application allows for field data collection about installed lighting systems. It requires a dedicated folder on your tablet with the following file structure.



For both spreadsheets to function correctly, macros must be enabled.

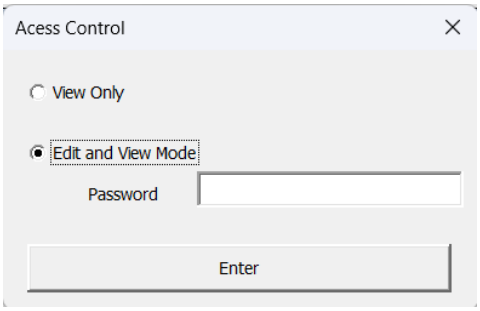
This tool also uses Google Earth for georeferencing lighting points, so the application must be installed.

The tool can be used for various purposes:

- Registration of public lighting systems.
- Aggregation of data about public lighting systems.
- Identification of redundancies within databases.
- Data extraction for project planning.
- User Manual for the Public Lighting Registration Tool
- Consultation and editing of public lighting system data.
- Spatial visualisation of public lighting systems.

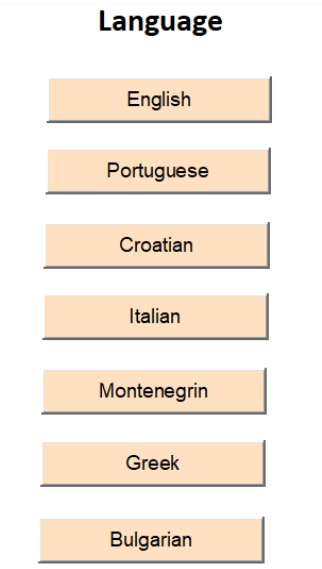
3. Access

The database has two usage modes:



- **View only**: Allows data viewing only (no data entry is permitted).
- **Edit and view mode**: Allows data viewing and editing. To access this mode, the password is required: **prolight**

The tool is available in multiple languages.



To translate the menus, navigate to the **Language** tab and select the desired language.

4. Database

This spreadsheet consists of various sections described below.

4.1 Streets

This section is for characterising the streets where public lighting systems will be surveyed. This characterisation must be done before data collection begins.

Short Table

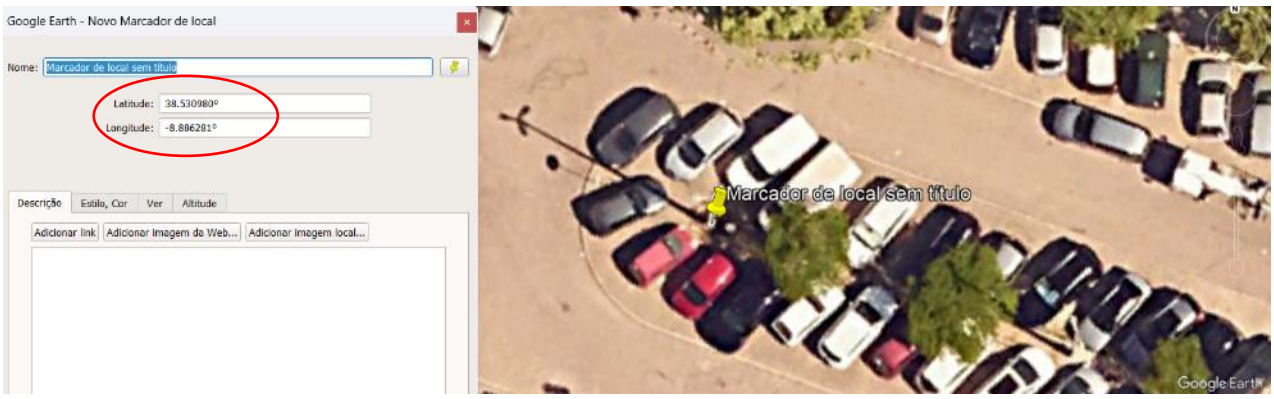
ID	Update Date	Locality	Street	Parish	Location notes
1	18/01/2025	Local A	Street A	Parish A	
2	18/01/2025	Local A	Street B	Parish A	
3	18/01/2025	Local B	Street AA	Parish A	
4	18/01/2025	Local B	Street BB	Parish A	

4.2 Load Light Points

This section is for preparing fieldwork to survey lighting points.

Each light point must be characterised by its geographic coordinates. Google Earth is recommended for this process due to its simplicity and lack of associated costs, although other applications can also be used.

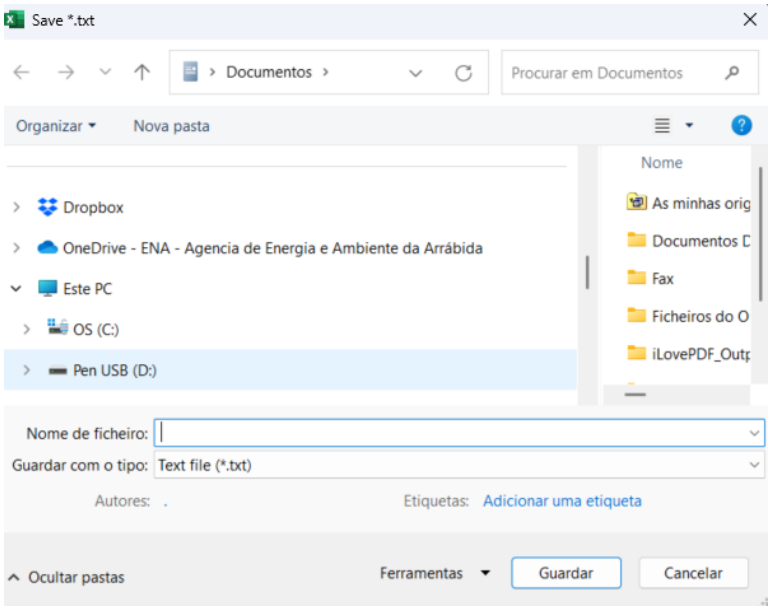
With Google Earth, place a pin on the light point and record its coordinates



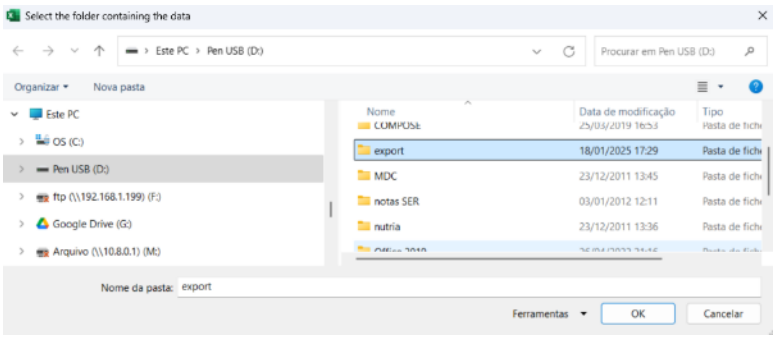
Additional data can be recorded if more information is available.

Locality / Parish	Local A / Parish A													
ID	Date	Latitude	Longitude	Place	Armature type	Lamp type	Lamp shape	Column type	Maintenance status	Armature height [m]	Road width [m]	Light intensity [lux]	Lamp power [W]	Number of light points
1		38.530977	-8.886277	Street A	Protruding diffuse	Sodium	Ovoid	Metallic						3,00
2		38.530908	-8.886097	Street A										2,00
3		38.530922	-8.885829	Street B	Flat diffuser	Sodium	Ovoid	Metallic						1,00
4		38.530768	-8.885928	Street B	Flat diffuser	Sodium	Ovoid							1,00
5		38.531128	-8.886162	Street A	Decorative	Sodium	Ovoid	Concrete						1,00
6		38.531267	-8.886198	Street A	Decorative	Sodium	Ovoid	Concrete						1,00
7		38.531140	-8.885814	Street A										1,00

The **Export data to mobile application** button exports all the information from this section to the application used for field surveys. It is recommended to use a USB drive for data transfer from the desktop computer to the tablet where you will conduct the field survey.



The **Load data from mobile application** button imports the information collected during field surveys by selecting the folder where the export was saved.

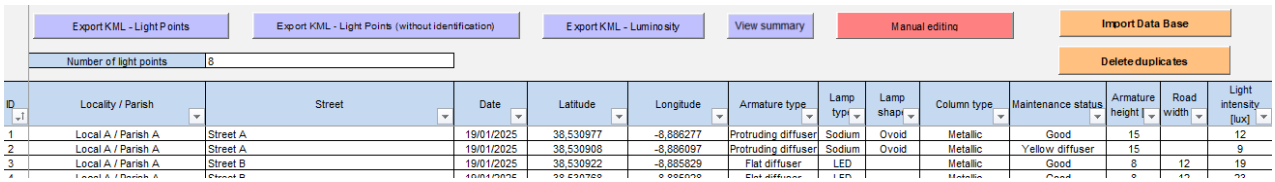


The **Load data on Database** button transfers all information to the database.

The **Clear Data** button clears all data from this section.

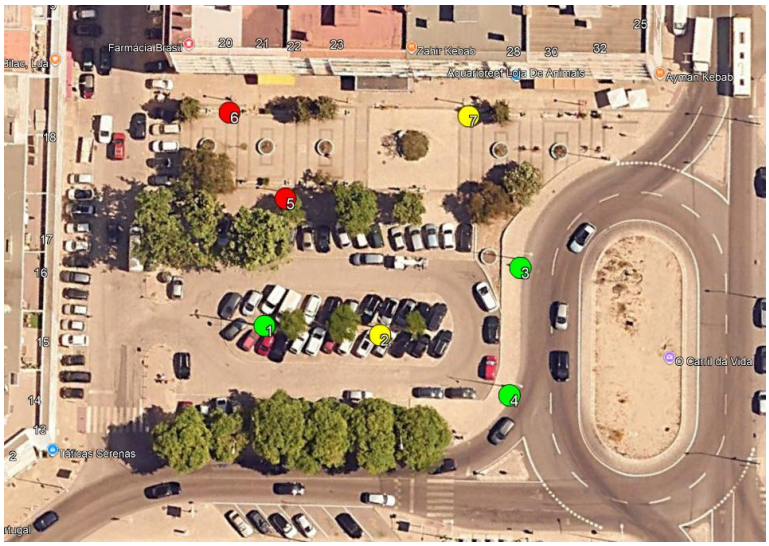
4.3 Light Points

This section allows the viewing and editing of light points.

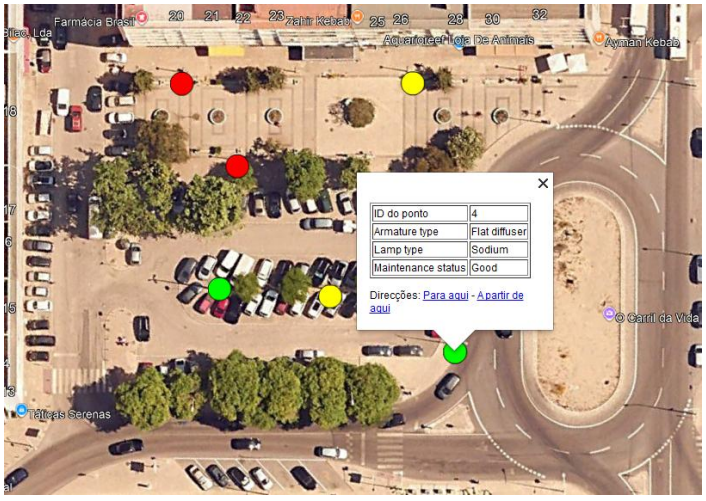


ID	Locality / Parish	Street	Date	Latitude	Longitude	Armature type	Lamp typ	Lamp shap	Column type	Maintenance status	Armature height	Road width	Light intensity [lux]
1	Local A / Parish A	Street A	19/01/2025	38,530977	-8,886277	Protruding diffuser	Sodium	Ovoid	Metallic	Good	15		12
2	Local A / Parish A	Street A	19/01/2025	38,530908	-8,886097	Protruding diffuser	Sodium	Ovoid	Metallic	Yellow diffuser	15		9
3	Local A / Parish A	Street B	19/01/2025	38,530922	-8,885829	Flat diffuser	LED		Metallic	Good	8	12	19

Export KML creates a .kml file that can be opened with Google Earth, showing the location of light points.



Export KML – light Points (without identification) exports light points without their identification. This visualization mode can be very useful when we want to display hundreds or thousands of points on the map.



When a light point is selected on the map, additional information is displayed.

In both previous maps, each light point is represented by a symbol. The following table presents the meaning of each symbol.

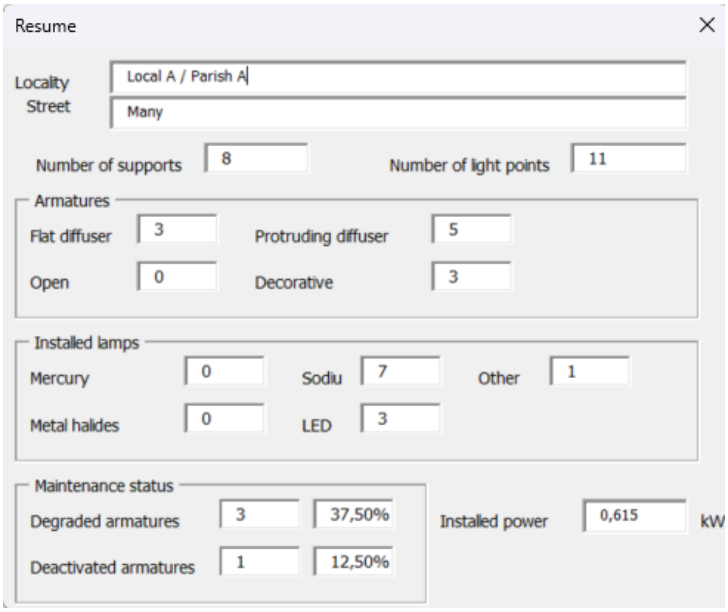
Light points			
Lamp Type	Ballast	Conservation State	Icon
Sodium	Ferromagnetic	Good	
Sodium	Ferromagnetic	Degraded	
Sodium	Electronic	Good	
Sodium	Electronic	Degraded	
Mercury	Ferromagnetic	Good	
Mercury	Ferromagnetic	Degraded	
Mercury	Electronic	Good	
Mercury	Electronic	Degraded	
Iodides	Ferromagnetic	Good	
Iodides	Ferromagnetic	Degraded	
Iodides	Electronic	Good	
Iodides	Electronic	Degraded	
LED	-	Good	
LED	-	Degraded	
Others	-	Good	
Others	-	Degraded	
-	-	No information available	

Export KML – luminosity exports light points with a colour scale.

The colour scale ranges from red (1 lux) to green (29 lux). If the light point is rated at 0 lux, it is displayed in solid red. If the light point has a luminosity greater than 29 lux, it is displayed in white.

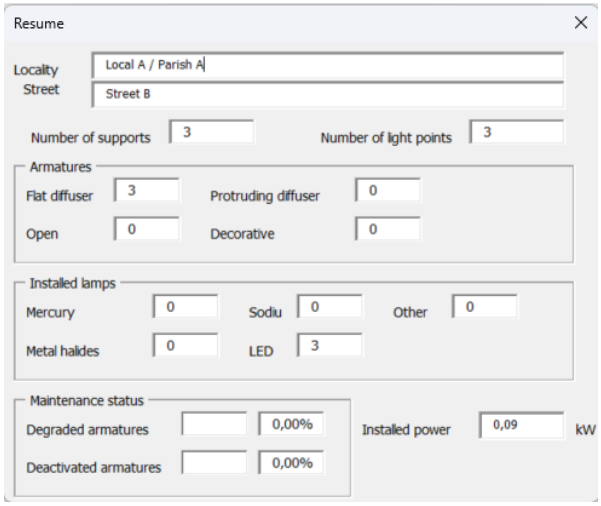
View summary

The **View summary** button provides quick data about the analysed area.



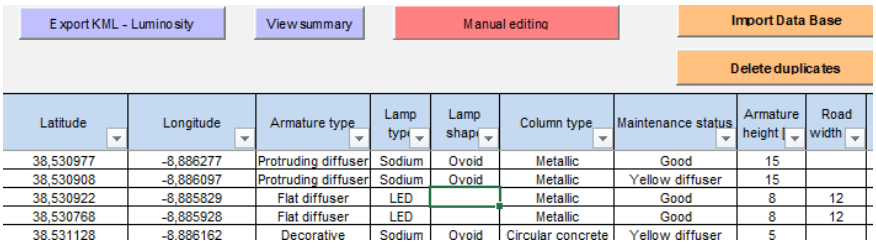
To analyse specific areas, filter the database to display the relevant light points and apply **View summary**.

98		Number of light points	3	
99				
100	ID	Locality / Parish	Street	Date
103	3	Local A / Parish A	Street B	19/01/2025
104	4	Local A / Parish A	Street B	19/01/2025
108	8	Local A / Parish A	Street B	19/01/2025
109				



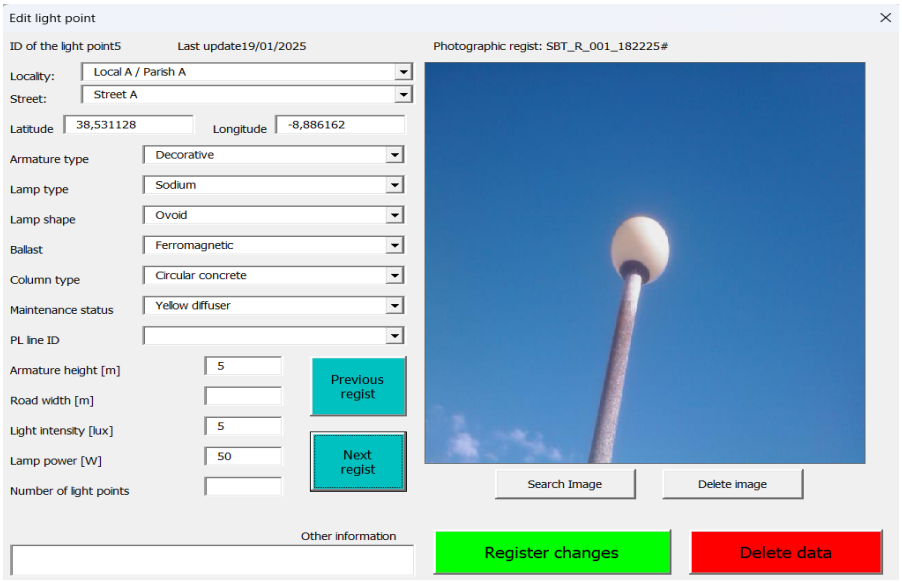
Manual editing / Optimized editing

In **Manual editing** mode, database fields can be edited manually.



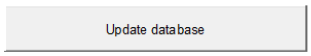
Latitude	Longitude	Armature type	Lamp typ	Lamp shap	Column type	Maintenance status	Armature height	Road width
38,530977	-8,886277	Protruding diffuser	Sodium	Ovoid	Metallic	Good	15	
38,530908	-8,886097	Protruding diffuser	Sodium	Ovoid	Metallic	Yellow diffuser	15	
38,530922	-8,885829	Flat diffuser	LED		Metallic	Good	8	12
38,530768	-8,885928	Flat diffuser	LED		Metallic	Good	8	12
38.531128	-8.886162	Decorative	Sodium	Ovoid	Circular concrete	Yellow diffuser	5	

In **Optimised editing** mode, editing each light point in the database is done via a form.



Import Data Base

The **Import Database** button gives access to the Import Database section, which allows data to be imported from other databases. Simply copy the lighting system data



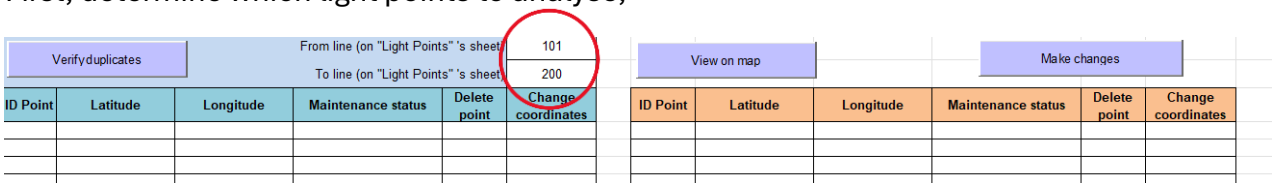
Locality / Parish	Street	Latitude	Longitude	Armature height [m]	Light intensity [lux]	Lamp power [W]	Number of light points
New place / New parish	New street	1	1	5	12	50	1

and proceed with **Update Database**. If the locality, parish, or street does not exist, it must be created in the **Streets** section.

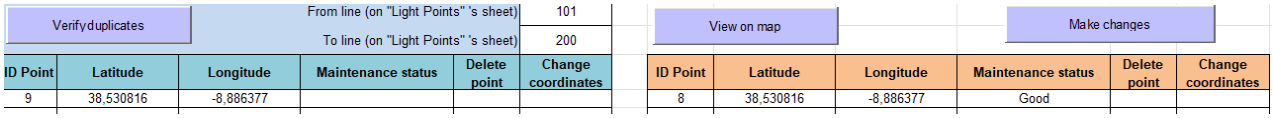
Detect duplicates

The **Detect duplicates** button gives access to the Detect Duplicates section, which checks the distance between all light points in the database to identify duplicates.

First, determine which light points to analyse,

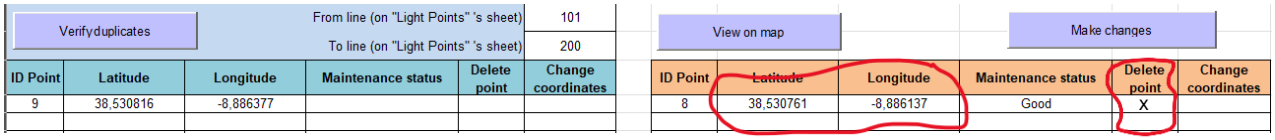


then click **Verify duplicates**.



Duplicate points can be viewed on the map using **View on map**.

To fix the duplication, simply correct the geographic coordinates of the light point, select the desired action (delete the point or change the coordinates) and click **Make changes**.

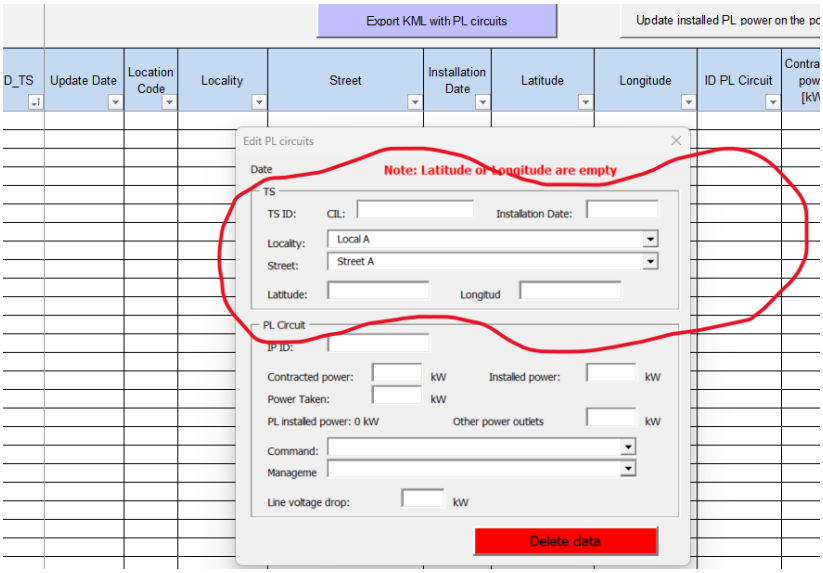


The changes will be saved to the database.

5. Public Lighting Circuit

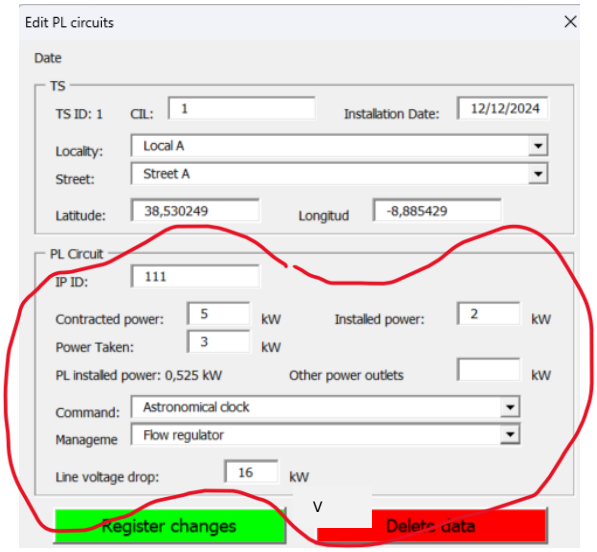
This section records and analyses the energy distribution networks for public lighting.

It is necessary to identify the transformer supplying power to the public lighting line.



v

Subsequently, information about the public lighting power line must be recorded.



v

Each light point (in the **Light Points** section) must be assigned the identifier of the power line supplying it.

Longitude	ID PL Circuit	Contracted power [kW]	Installed power [kW]	Powe Take [kW
-8,885429	111	5	2	
-8,88542	112	5	3	

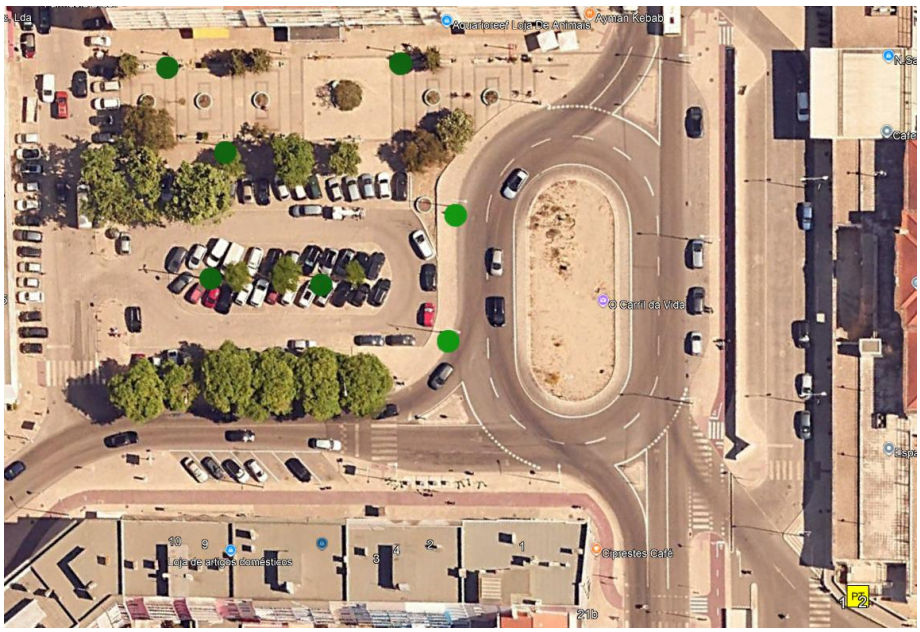
ty	Lamp power [W]	Number of light poi	Ballast	PL line ID	Image
	75	3	Ferromagnetic	111	
	75	2	Ferromagnetic	111	
	30	1	Electronic	112	
	30	1	Electronic	112	
	50	1	Ferromagnetic	111	SBT_R_001_182225#1.jpg
	50	1	Ferromagnetic	111	SBT_R_001_182339#1.jpg
	50	1	Ferromagnetic	111	STB_R_002_182648.jpg
	30	1	Electronic	112	

The **Update installed PL power on power line** button collects the installed lighting power for each public lighting circuit.

Update installed PL power on the power line

Longitude	ID PL Circuit	Contracted power [kW]	Installed power [kW]	Power Taken [kW]	PL installed power [kW]
-8,885429	111	5	2	3	525
-8,88542	112	5	3	3	90

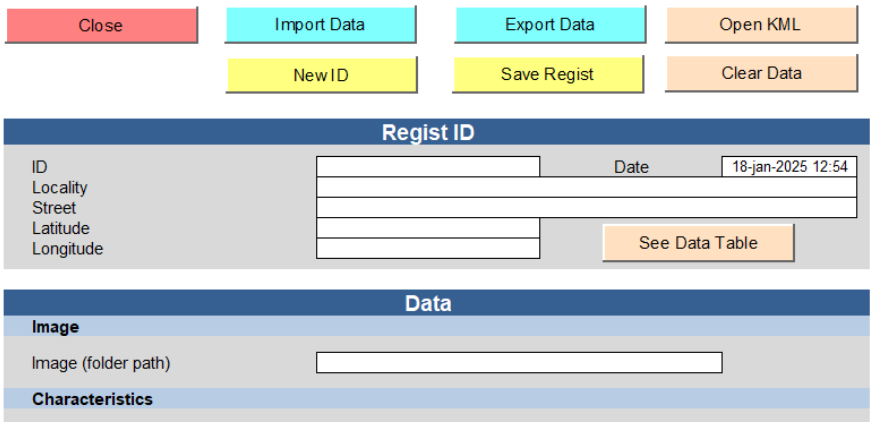
The **Export KML with PL circuits** button creates a .kml file (to be viewed in Google Earth) showing lighting points identified by circuits and the corresponding transformer.



In the previous map, each PL circuit is identified with a different color and the Tra PT rmer Station by

6. Regist_Street

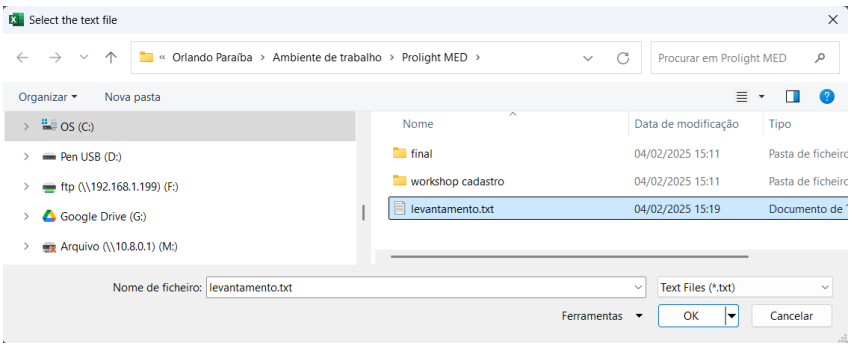
This spreadsheet is used for field data collection of lighting points.



The **Import Data** button imports the information prepared for fieldwork and exported from the **Load Light Points** section.

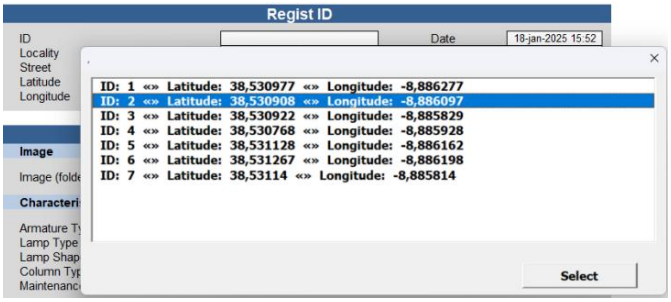
The **Export data to mobile application** button exports all the information from this section to the application used for field surveys. It is recommended to use a USB drive for data transfer from the desktop computer to the tablet where you will conduct the field survey.

To avoid information loss, ensure that the file you previously exported using **Export data to mobile application** (on **Load Light Points** section), is transferred from the USB drive to the computer where you will conduct the field survey.

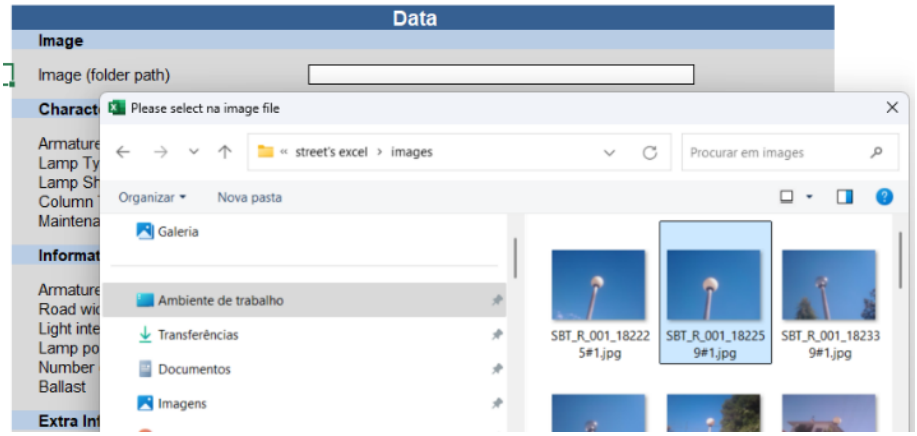


To register a light point:

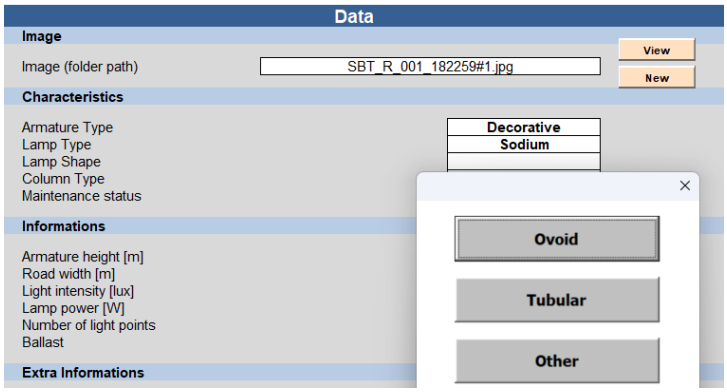
1- Select the light point to register.



2 - Take a photo of the luminaire and record it.

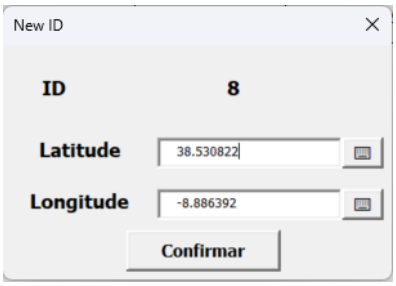


3 – Record the characteristics of the light point.

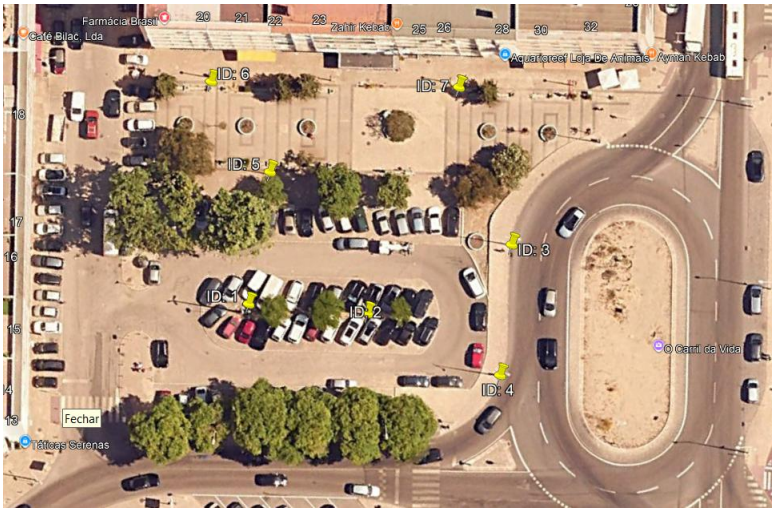


4 – Guardar o registo com o botão **Save Regist**

A new light point can be created using the **New ID** button.



The **Open KML** button allows the visualisation of points in Google Earth for better identification of light points to register.



The **Clear Data** button clears all fields.

All collected information can be viewed using the **See Data Table** button.

After completing field registration, use the **Export Data** button to export all information to the database. This export must be done via the USB drive.