March 23, 2024

OkMap Desktop
GPS Mapping software

https://www.okmap.org

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Introduction

Links

Product links

Web site	https://www.okmap.org
Forum	https://www.okmap.org/forum
OkMap Desktop	https://www.okmap.org/en/okmapDesktopFeatures.aspx
This manual	https://www.okmap.org/download/okmap_en.pdf

Installation

Software installation

Warning: Before installing OkMap is necessary, if not already installed, download Microsoft Framework 4.7.2 and install it on your computer.
Microsoft Framework 4.7.2 is preinstalled on Windows 10 version 1803 or above.

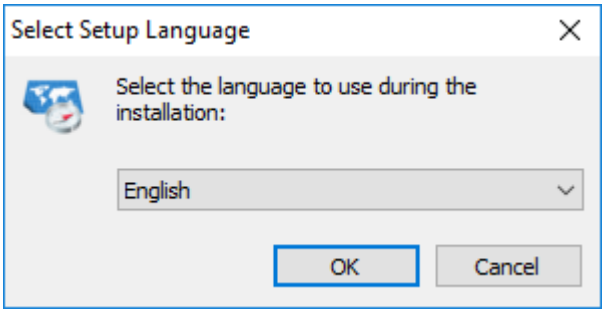
Download the OkMap Desktop installation kit trial version *OkMap.zip*.
Extract from the zip file the *OkMap.exe* file and open it (double *click* with left mouse button).

After opened *OkMap.exe* the following window will be shown (example with Windows 10):

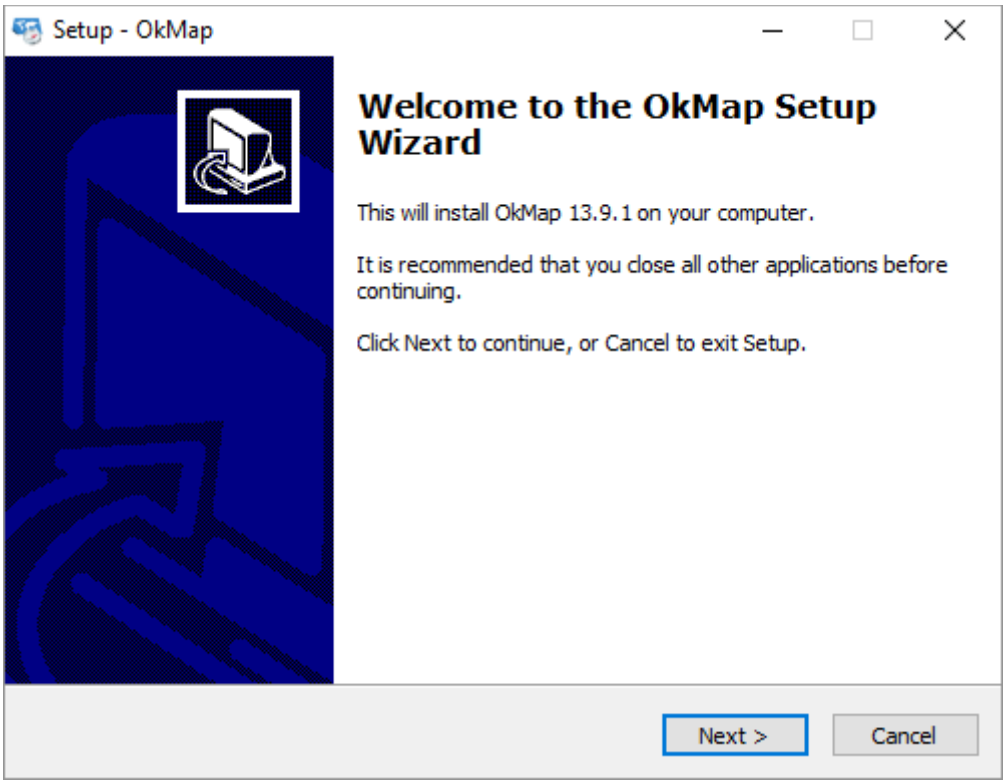
Click on *More information* text.

Press the button *Run anyway*.
It's asked a confirmation to launch an App that makes changes to the device.
Choose *Yes*.

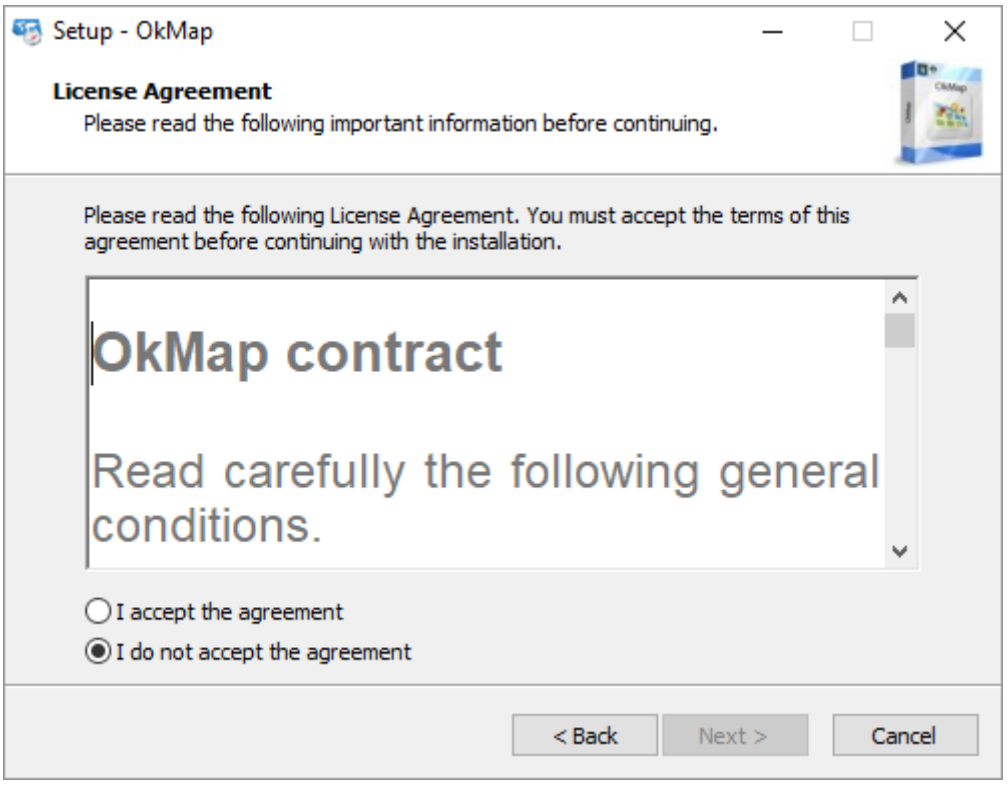
Then you are asked to select the language of the installation.



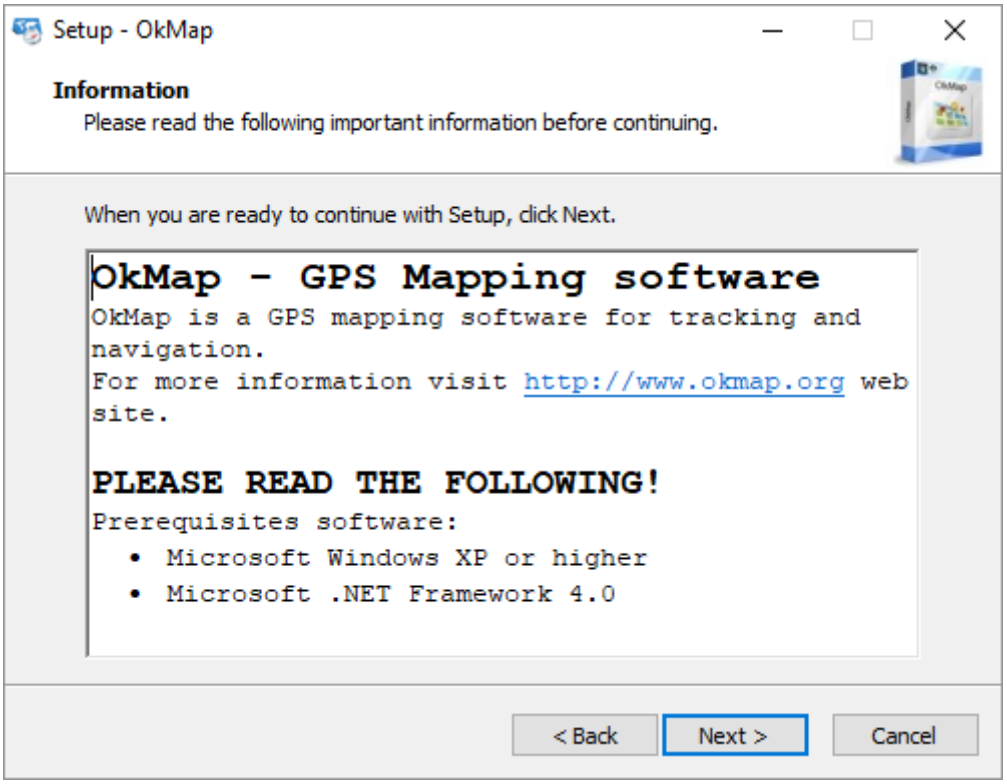
Select your language and then press the *OK* button.



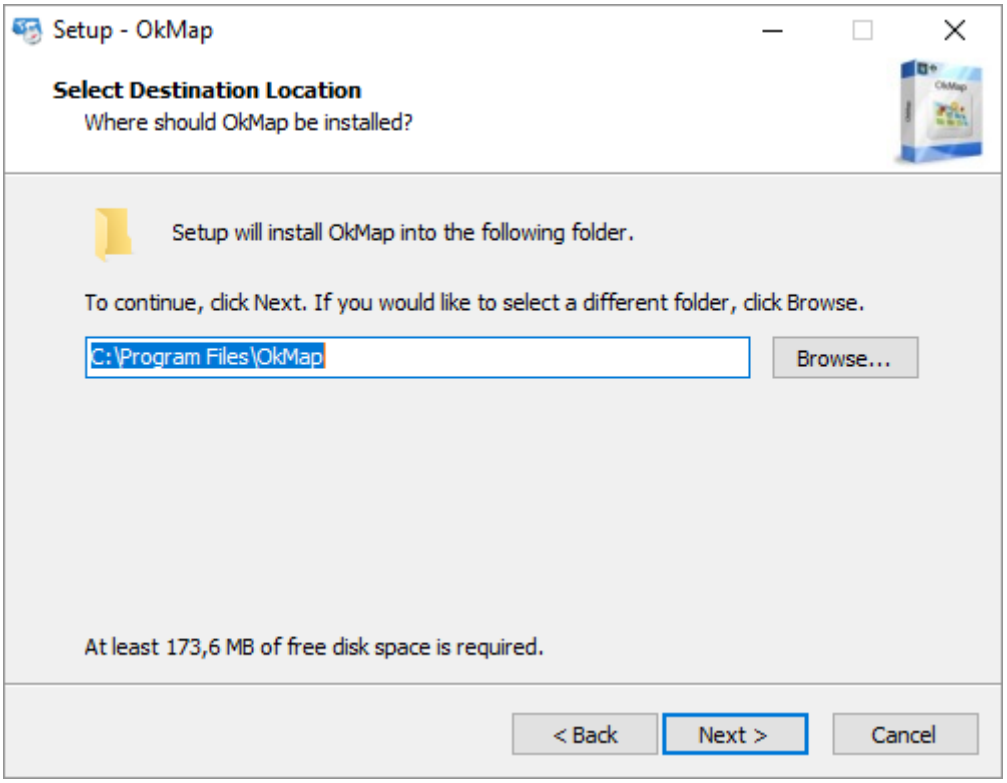
Read the page content and press the *Next* button.



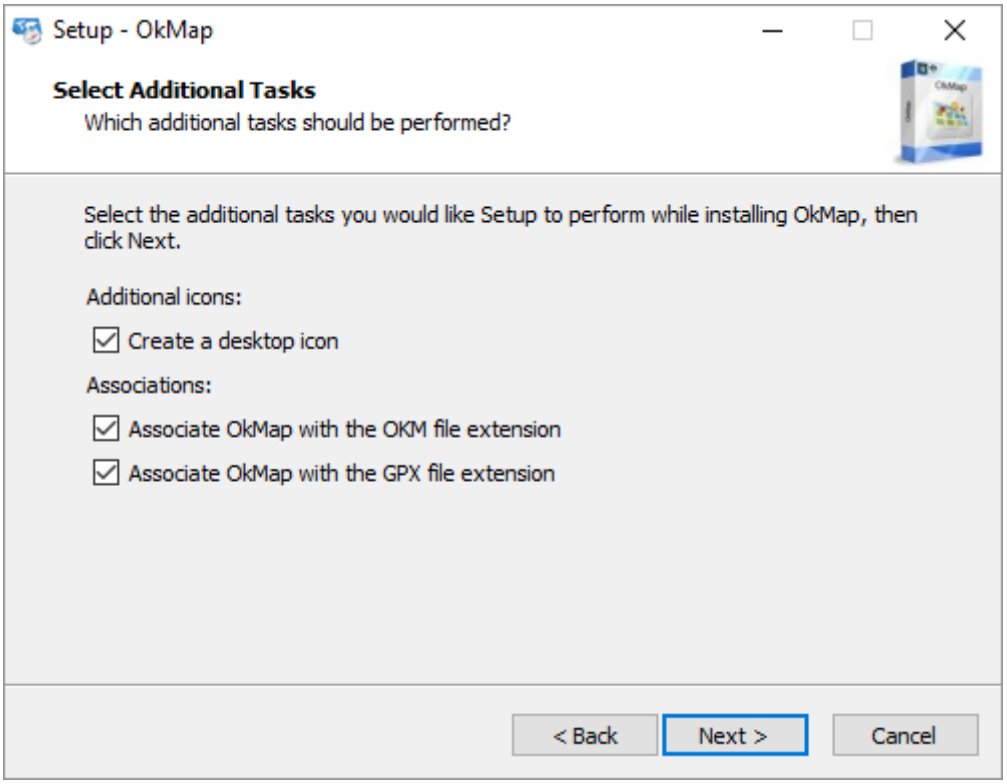
Read carefully the contract with the end user that must be accepted in order to continue with the installation of the software.
Press on the choice *I accept the agreement*.
Press the *Next* button.



Read carefully the content of the page with particular regard to the prerequisites.
Press the *Next* button.



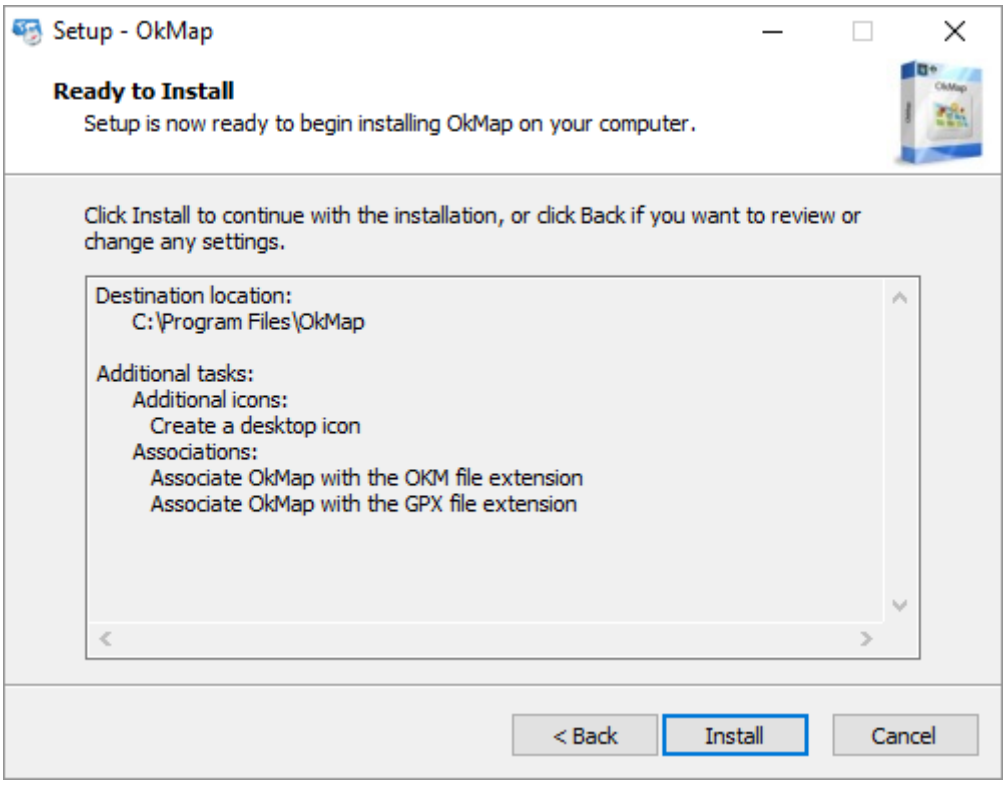
In this window you can choose the destination folder of the files to be installed.
If you do not have any special reasons, leave the defaults suggested by the installation program.
Press the *Next* button.



In this window, you can select additional tasks to perform during installation:

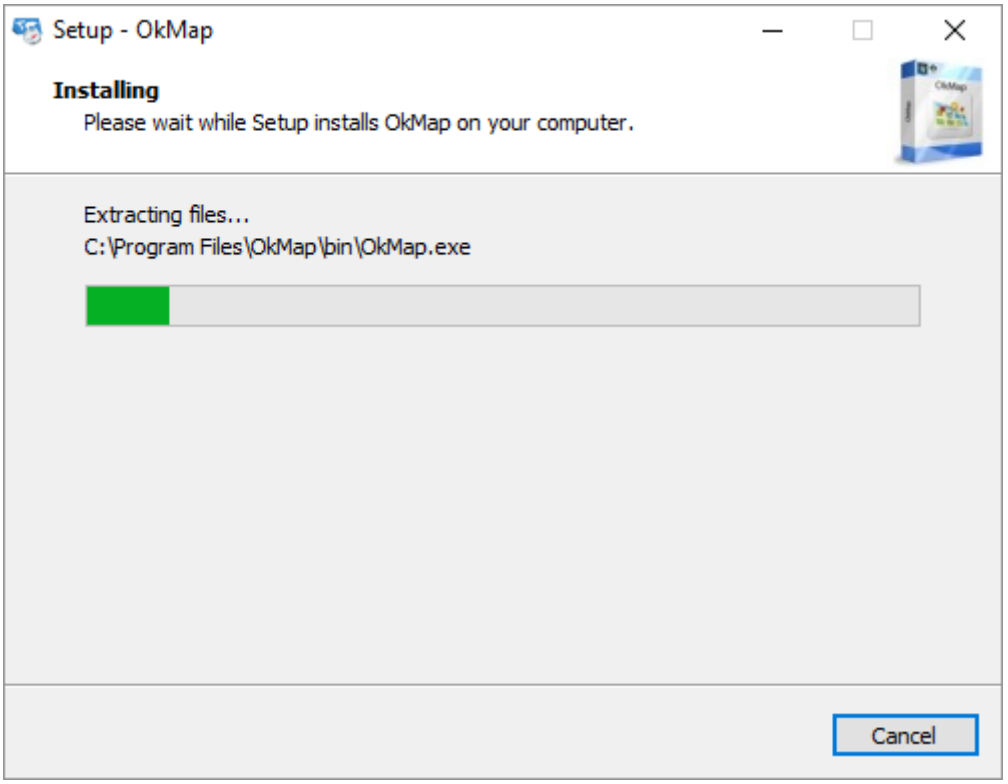
- Create a desktop icon
- Associate OkMap with some file extensions (.okm and .gpx)

Press the *Next* button.

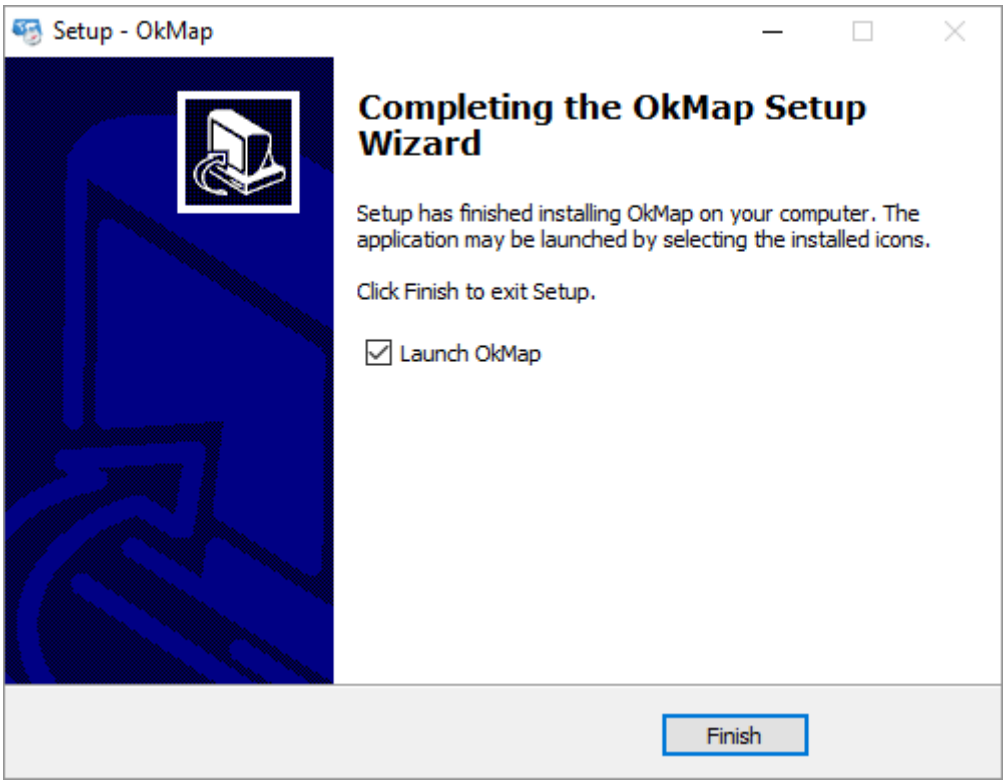


Check the settings and then press the *Install* button.

The program now proceeds with the installation of OkMap. The process will last a few moments.



At the end the following window is displayed:



The program has been correctly installed.
You can select whether to start OkMap immediately.
Press the *End* button to exit.

The installation creates the *OkMap* item in the Start menu.

When an error occurs

When an error occurs, perform the following steps:

- Ensure you have installed Microsoft Framework 4.0 (https://docs.microsoft.com/en-us/dotnet/framework/migration-guide/how-to-determine-which-versions-are-installed).
  If necessary, proceed with its installation (https://www.microsoft.com/en-US/download/details.aspx?id=17718).

- For Windows XP, delete the folder:
  C:\Documents and Settings\<*user*>\Local Settings\Application Data\GianPaoloSaliola\OkMap

- For Windows 7 or above delete the folder:
  C:\Users\<*user*>\AppData\Local\GianPaoloSaliola\OkMap

- Reinstall OkMap.

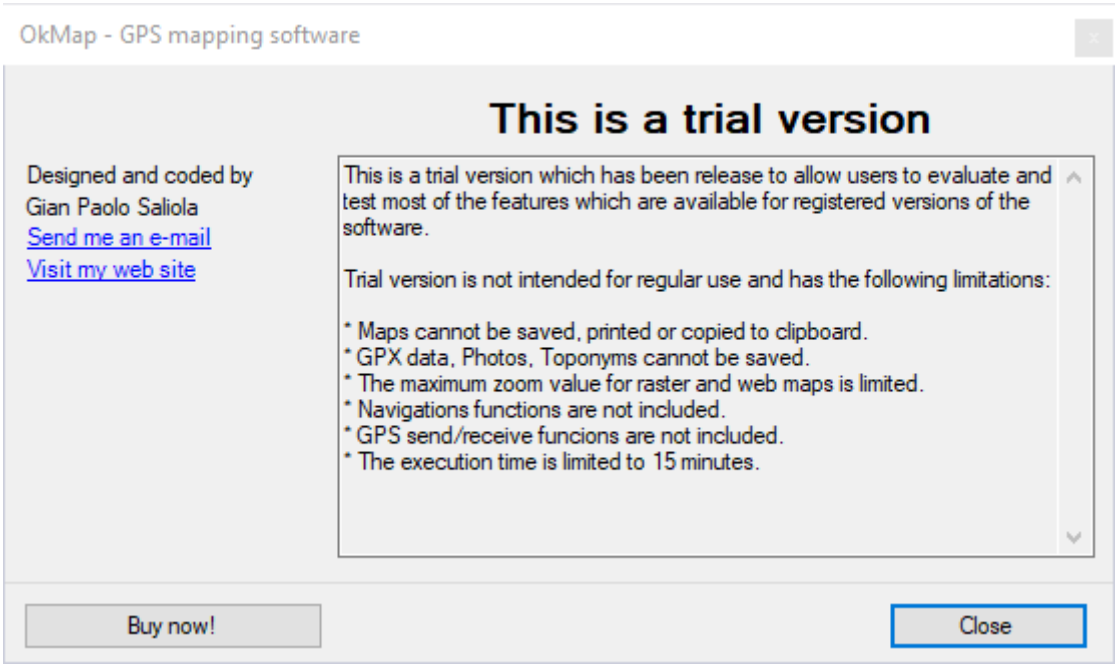
If the error persists after these attempts, please contact us.

First start

Starting OkMap

After started, OkMap displays for a few moments a window indicating the status of the initialization phase.

Then the main window is displayed and within this a further window that indicates this is a trial version.



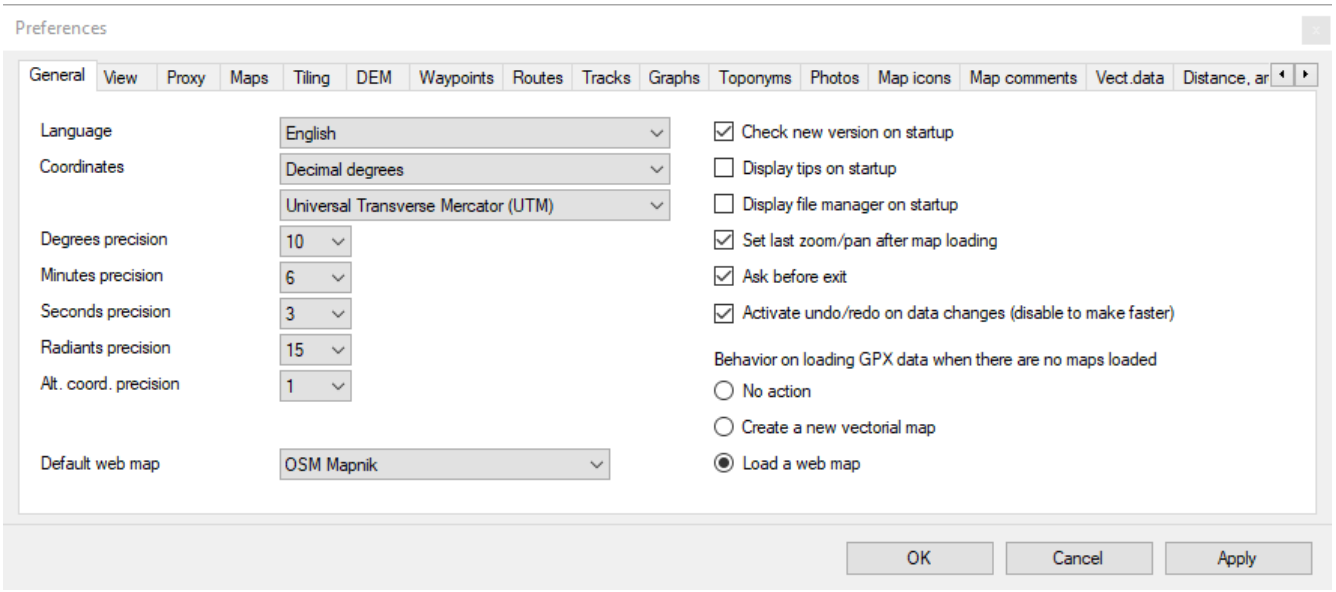
Carefully read the information and press the *Close* button.

You can change the language of the interface to read the contents of this window at the next reboot in your own language (if any).

Change the language

To change the OkMap interface language use the *Utilities – Preferences* menu.

The preferences page is displayed in English language.

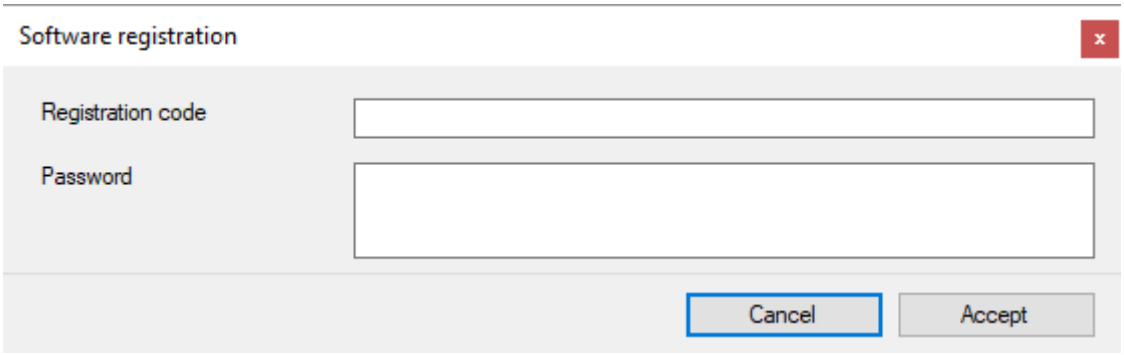


Select your language in the *Language* combo box and press the *OK* button.
OkMap will ask to restart, choose *Yes* and wait for the program to restart.

Registration of OkMap

After purchasing OkMap a registration code and a password are received to unlock the trial version functionality.

To register OkMap use the *Utilities - Register* menu.



Enter in the corresponding fields the registration code and password received at the purchasing time.

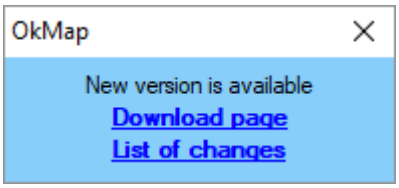
To avoid possible typing errors you can use the *copy-paste* method.

Once the codes have been entered, press the *Confirm* button.
The *Cancel* button closes the window without registering the product.

Please note that **the OkMap license is valid for one PC only**.

Release of new versions

When a new version is released, a small warning box appears at the bottom right of the screen when OkMap starts.



Clicking on the *Download page* link, the web page where you can download the new version of OkMap is opened.

With the *List of changes* link, the web page where are listed the latest version (and previous) news is opened.

If you purchased OkMap, simply download and install the latest trial version of the product on the same computer where a previous version was registered.
The new version will be automatically registered.

Information

To get information about the installed version, use the *File - About* menu.

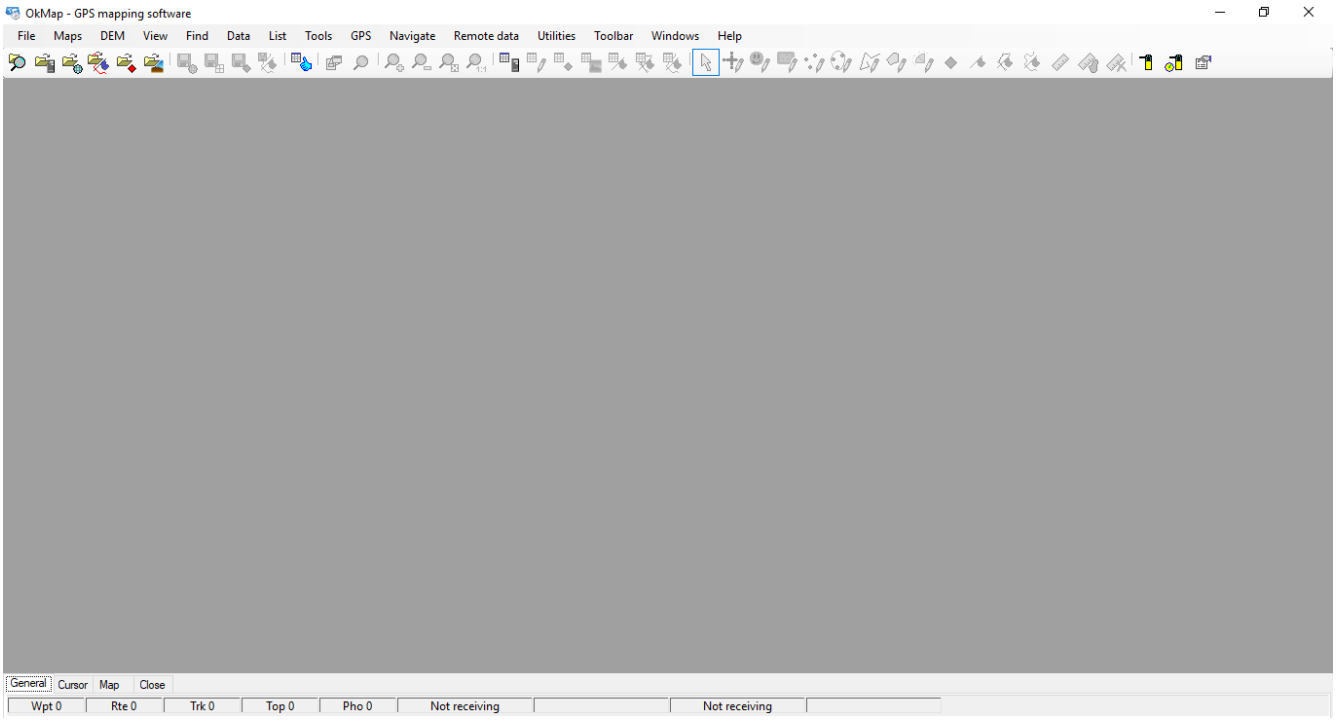
In this window you can identify the version of the installed product and the license registration code.

The *System Info* button starts the *Windows System information* program where you can find detailed information about your operating system.

To send an email to support use the *Send me an email* link.
To visit the OkMap website click on the *Visit my web site* link.

Interface organization

Main window



This window acts as a container and allows you to host other windows (multi document interface). With this technique it is possible, for example, to work with several maps at the same time.

Lockable windows

Most windows are opened in the main window and may or may not be docked using the mouse (*drag & dock*).
These features are unblocked by default.
To unlock / block these features use the *Utilities – Lock docking* menu.

To close all windows, use the *Utilities - Close all windows* menu.

When the main window is closed, OkMap automatically closes all the windows contained in it and ends the execution.
The closure of the application may require confirmation as specified in the Preferences - General function.

Reset all to factory default

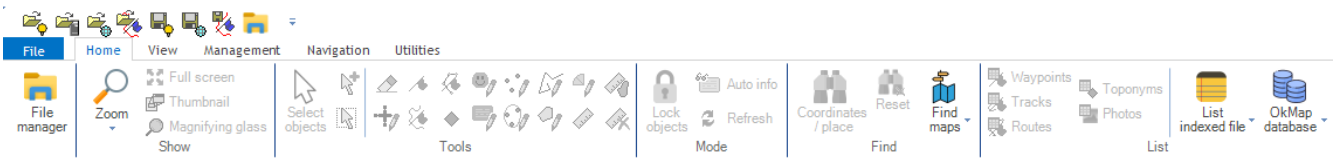
To restore the factory settings of windows and data tables, use the *Utilities – Reset all to factory default* menu.
This function acts on:

- window size
- position of the windows
- placement of columns in data tables
- default sorting in data tables

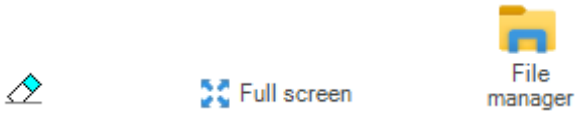
It proves useful in the event of a change of the screen resolution or in the event of anomalies.

Ribbon

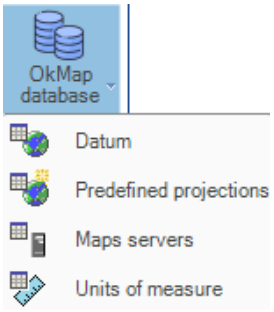
The ribbon is the control through which the user sends the main commands to the application. It looks like this:



Components can be small (button only), medium (button + short description) or large (large button with description).

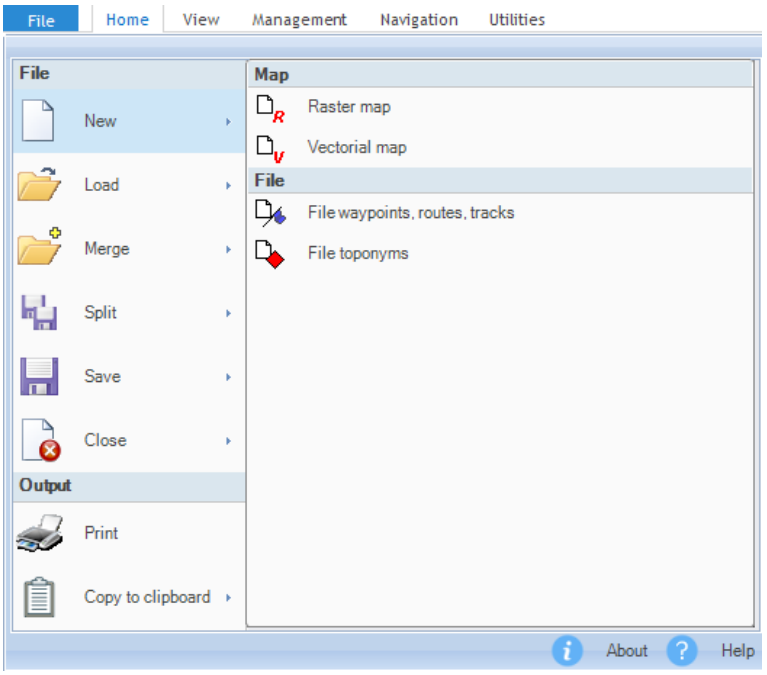


In some cases, the buttons can open a dropdown containing a list of other second level buttons.



There are some components that activate or deactivate functions. They can be presented as a classic checkbox or as a two-state button that changes color when activated.

Then, there is the File menu which is particular and acts like a classic drop-down menu with small icons and descriptions.



At the bottom of the box there are some buttons (options) such as the *About* button (information on the application) and *Help* (user manual in English or Italian).

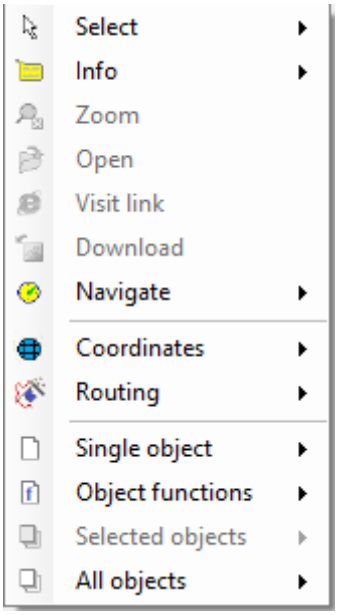
For convenience, all components of the toolbar will later be referred to as menus. It will also indicate the path of the menus, to activate a function, in the form menu1 - menu2 - ...

All components of the file menu and the rest of the ribbon show an extended description if you hover over the mouse for a moment (tooltip).

At the top left of the blue bar, there is a small arrow pointing down that opens a drop-down menu that can customize the top of the ribbon.
It is possible to automatically minimize the ribbon or add or remove some commands at the top of the bar itself.

Context menu

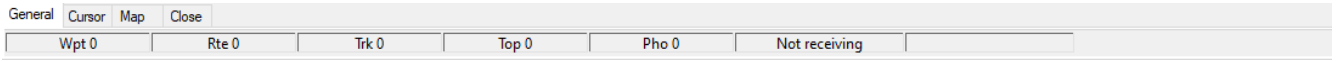
The context menu is activated by clicking with the right mouse button (where provided).



These items can be grouped on multiple levels like in the menu.
The second level is displayed when you click with the left mouse button on the top-level menu (drop-down) and so on for the next level menus.
Once the last menu level has been opened, the corresponding function can be activated by clicking with the left mouse button.

When the menu item refers to a function that cannot be activated in that context, the text is displayed in light color.

Status bar



The status bar is located at the bottom of the main window and is used to display some information. It is divided into three tabs, each of which is divided into several cells.

Positioning the mouse for at least two seconds on a cell shows a brief description of its content (tooltip).

The first tab contains the following information:

- Number of loaded waypoints
- Number of loaded routes
- Number of loaded tracks
- Number of loaded toponyms
- Number of loaded photos
- The status of the remote data reception by the OkMap server (in reception / not in reception)
- Date-time of the last position sent to the OkMap server

The second tab contains the following information:

- Size (width and height) of the current map in pixels
- Position of the mouse pointer (X and Y) in pixels
- Coordinates of the mouse pointer expressed as specified in the first format in the Preferences - General function and according with the datum/projection of the map
- Coordinates of the mouse pointer expressed as specified in the second format in the Preferences - General function and according with the datum/projection of the map
- Coordinates of the mouse pointer expressed as specified in the third format in the Preferences - General function and according with the datum/projection specified in Preferences - Grids (button *Set default projection*)
- Altitude relative to the mouse pointer (note 1) expressed in the unit of measure indicated in the function Preferences - Distance, area

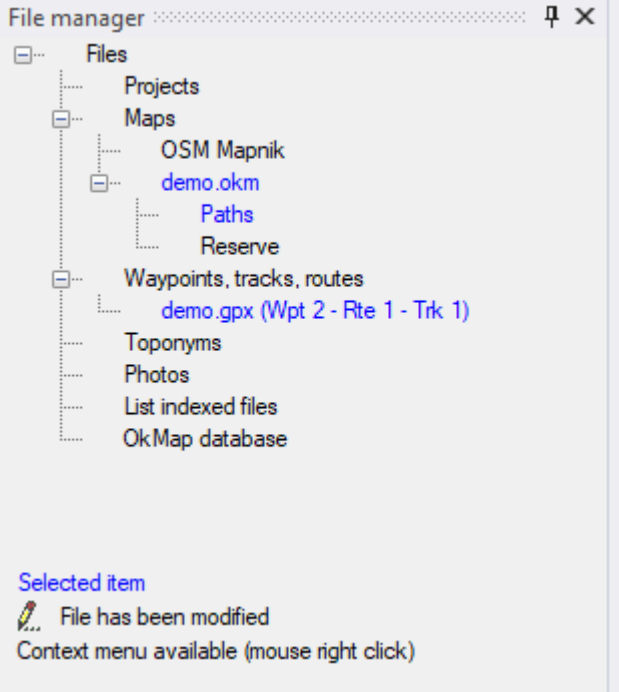
The third tab contains the following information:

- Size (width and height) of the current map in pixels
- Reference datum used by the map
- Projection used by the map
- Map scale (m/pixel)
- Zoom factor (% for raster maps or level for web maps)
- Distance calculated between different points drawn with the Distance tool expressed in the unit of measurement indicated in the function Preferences - Distance, area)
- Area of a polygon calculated according to the points drawn with the Area tool expressed in the unit of measure indicated in the function Preferences - Distance, area)
- Auto info indicator
- Objects blocked indicator

Note 1 - The altitude data is shown only if the DEM (Digital Earth Model) data has been downloaded in SRTM-1 or SRTM-3 format (file with extension .hgt) relative to the area covered by the current map. The DEM data can be downloaded automatically if you have an internet connection (see Download DEM data).

File manager

It's a utility function to manage the files opened by the OkMap application.



The types of files are:

Types of file	System files	User files	Multi-file	Selectable
Projects			X	
Maps			X	X
Waypoints, routes, tracks			X	X
Toponyms			X	X
Photos			X	X
List indexed files		X		
OkMap database	X			

The items listed can be expanded or collapsed to facilitate reading.
There is a specialized context menu for each type of file.
A file can be selected with the context menu *Select...*

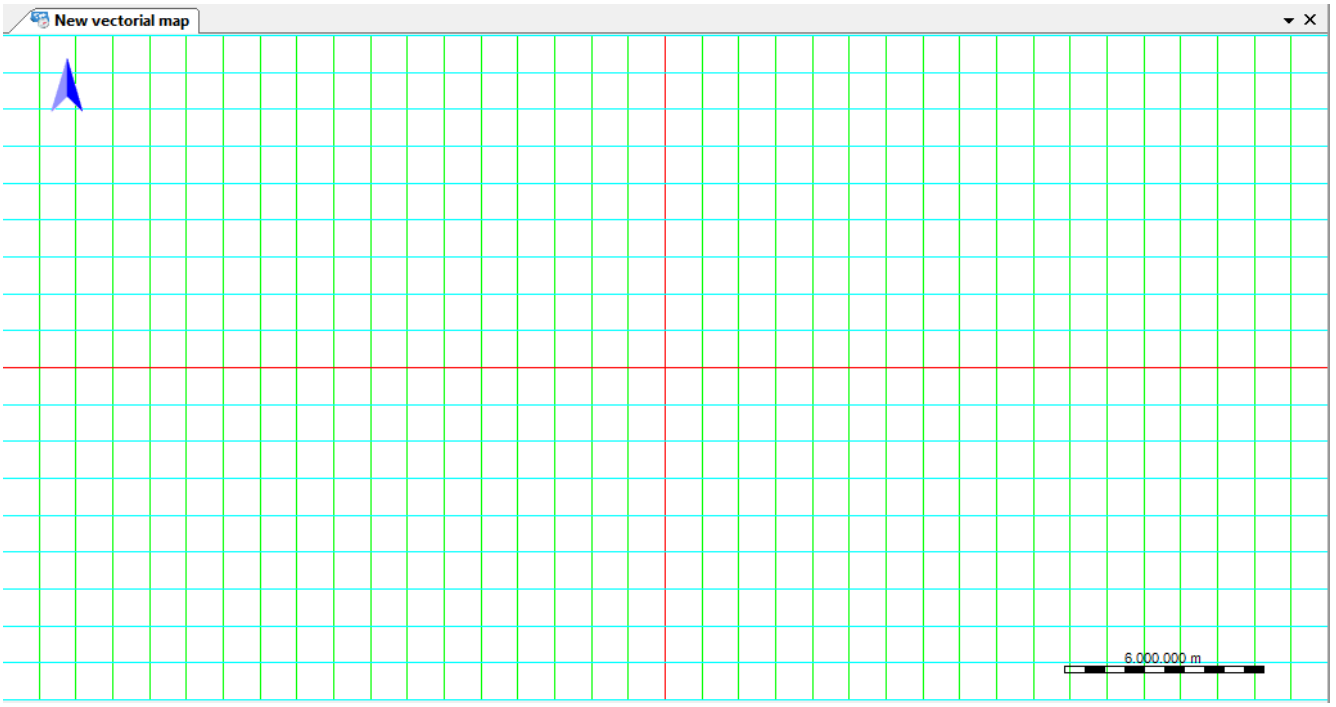
System files are single and cannot be selected.

Each type of file can have only one file selected: it is the current file on which will be added, for example, the objects drawn on the map or extracted the elements in the functions of the *List* menu.

Selecting a map has the effect of making current the window in which it is displayed.

The selected files are highlighted in blue.
The icon indicates that the corresponding file has been modified and not yet saved.
New files created and not yet saved are named with <New file>.

Map window



This window is used to display raster maps, vectorial maps and web maps.

The functions that can be activated by the mouse depend on the tool selected in the *Home - Tools* menu.

You can carry out operations of moving the map (panning), zooming the map, creating vectorial objects, waypoints, routes and tracks, selecting objects, calculating distances and areas, and many other functions.

In this window you can view:

- the mini-map (only for raster maps)
- the magnifying glass (only for raster or web maps)
- the direction of the north on the map (top-left position)
- the map scale (low-right position)
- the geographic grid (lat./lon.)
- the metric grid

Clicking with the right mouse button the context menu is activated.

Full-screen view

To view in full screen, use the *Home - Full Screen* menu or press Alt+0.

To return to the normal display, press the *Escape* key.

Mini-map

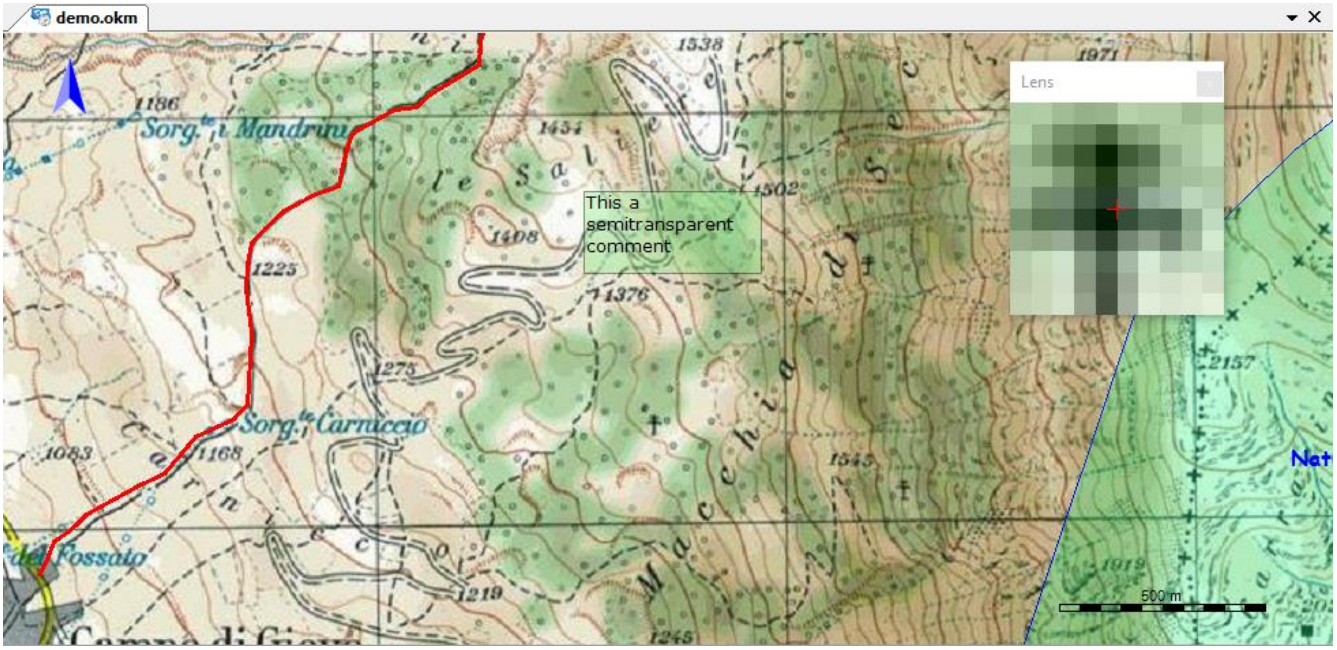
The mini-map displays the entire image of the map in a small window (thumbnail). It can only be displayed for raster maps.

To display the mini-map use the *Home - Thumbnail* menu.
To hide the mini-map click on the cross in the upper right corner.

A red rectangle, displayed inside the mini-map, shows the portion of the map visible in the main window. The size of this rectangle depends on the zoom factor selected.

Clicking with the left mouse button, in a point of the mini-map, will move the main map (panning) so as to display this point in the middle of the window.

Magnifying glass



The lens windows displays a strong magnification of the map image around the mouse pointer. It can only be displayed for raster or web maps.

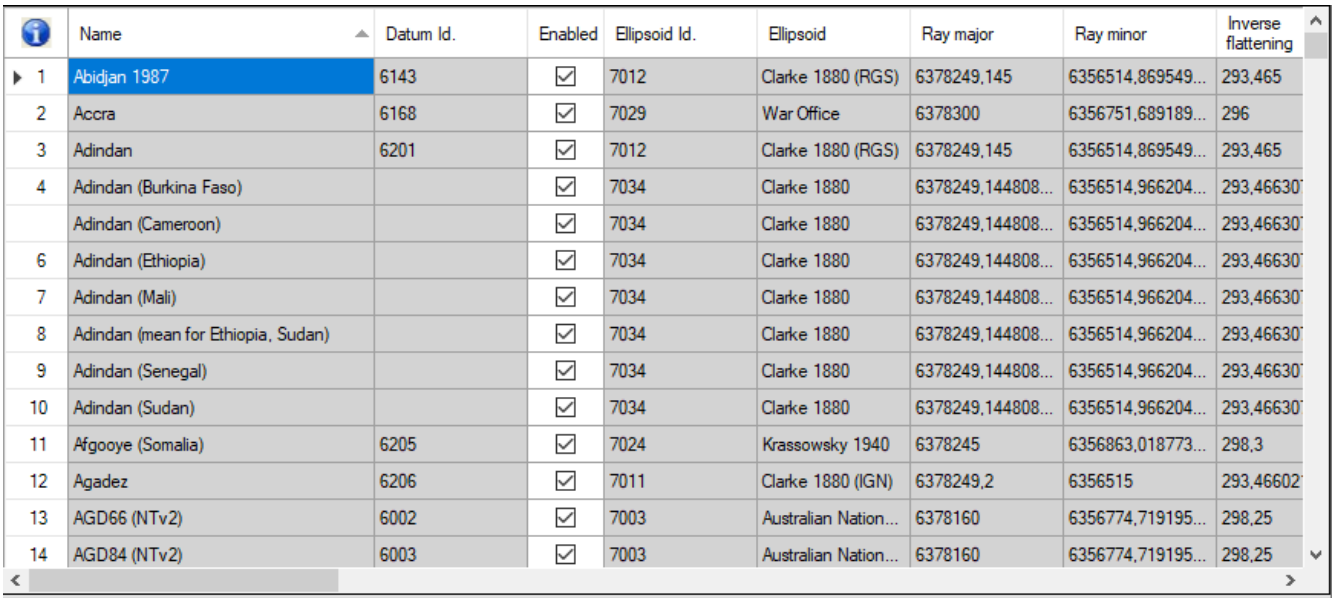
To display the Magnifying glass use the *Home – Magnifying glass* menu.
To hide the Magnifying glass click on the cross in the upper right corner.

It is useful in precision operations such as positioning the georeferencing points of a raster map or creating a waypoint.

Data tables

Tables or data *grids* are often used to represent lists of structured information.

An example relative to the datums list is shown.



	Name	Datum Id.	Enabled	Ellipsoid Id.	Ellipsoid	Ray major	Ray minor	Inverse flattening
1	Abidjan 1987	6143	☑	7012	Clarke 1880 (RGS)	6378249,145	6356514,869549...	293,465
2	Accra	6168	☑	7029	War Office	6378300	6356751,689189...	296
3	Adindan	6201	☑	7012	Clarke 1880 (RGS)	6378249,145	6356514,869549...	293,465
4	Adindan (Burkina Faso)		☑	7034	Clarke 1880	6378249,144808...	6356514,966204...	293,46630
	Adindan (Cameroon)		☑	7034	Clarke 1880	6378249,144808...	6356514,966204...	293,46630
6	Adindan (Ethiopia)		☑	7034	Clarke 1880	6378249,144808...	6356514,966204...	293,46630
7	Adindan (Mali)		☑	7034	Clarke 1880	6378249,144808...	6356514,966204...	293,46630
8	Adindan (mean for Ethiopia, Sudan)		☑	7034	Clarke 1880	6378249,144808...	6356514,966204...	293,46630
9	Adindan (Senegal)		☑	7034	Clarke 1880	6378249,144808...	6356514,966204...	293,46630
10	Adindan (Sudan)		☑	7034	Clarke 1880	6378249,144808...	6356514,966204...	293,46630
11	Afgooye (Somalia)	6205	☑	7024	Krassowsky 1940	6378245	6356863,018773...	298,3
12	Agadez	6206	☑	7011	Clarke 1880 (IGN)	6378249,2	6356515	293,46602
13	AGD66 (NTv2)	6002	☑	7003	Australian Nation...	6378160	6356774,719195...	298,25
14	AGD84 (NTv2)	6003	☑	7003	Australian Nation...	6378160	6356774,719195...	298,25

The tables are composed of the following parts:

- A headboard containing the titles of the columns.
- A central body containing the cells belonging to the rows and columns of the table.
- A first column that cannot be edited and contains the line numbers.
- An eventual last line where you can insert new elements (if the insertion function is foreseen).
- A vertical scroll bar to the right of the table (displayed only if the number of rows exceeds those visible in the available space).
- A horizontal scroll bar below the table (displayed only if the number of columns exceeds those visible in the available space).
- An icon at the top left where you can place the mouse to get some information (data description, item current number, total number of items, sort fields)

Non-editable fields are highlighted with a gray background.

In the editable fields sometimes appears a light blue icon with a small arrow at the bottom; clicking with the left mouse button on it appears a window where you can choose the value to be entered in the field by selecting it from a list of predetermined values.

Above the data tables can appear fields (usually one or two) that allow you to filter the data shown in the rows of the table below.

To filter the data, simply select the field to be filtered in the appropriate drop-down menu and type, in the adjacent field, the value used as a filter (contained value).

To scroll the table vertically, you can use the mouse wheel.

To insert new elements (where provided), scroll the table and move to the last empty row prepared for this purpose.

To change the display order of the rows click with the left mouse button on the head of the table in correspondence of the column for which you want to obtain the ordering of the lines; a further click will alternately change the order from ascending to descending.

To change the display order of the columns click with the left mouse button on the head of the table in correspondence with the column that you want to move and drag it with the mouse button pressed in the desired position.

To select a row, click with the left mouse button on the column containing the row numbers corresponding to the row to be selected; holding down the *Ctrl* key you can add additional lines to the list of selected lines; holding down the *Shift* key selects the lines in the interval between the current row and the previously selected row.

To select all the rows, simply click with the left mouse button on the upper left icon corresponding to the column containing the line numbers.

The selected rows can be copied to the clipboard with the *Ctrl+C* key. The copied lines can be pasted, for example, in a text editor or spreadsheet.

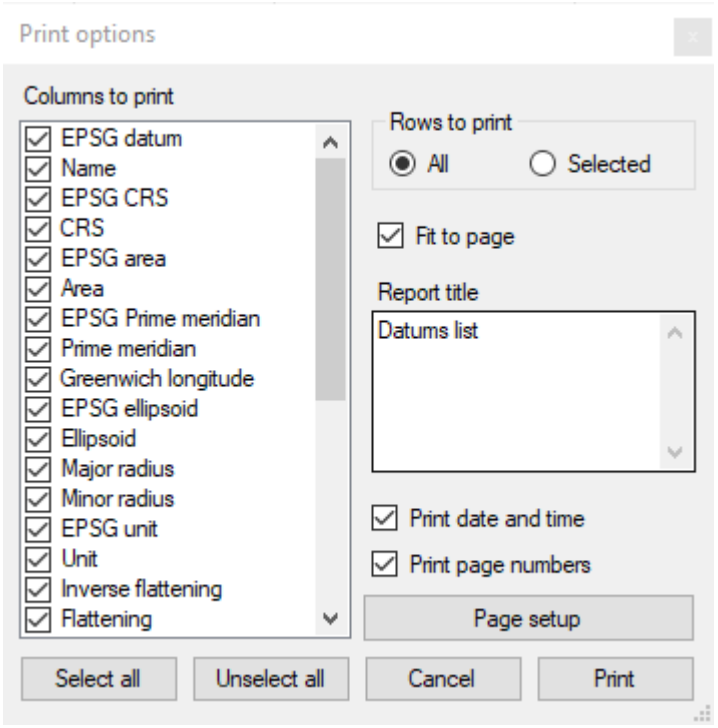
To delete the selected lines (if provided) press the *Delete* key; the program will request a confirmation before proceeding with the cancellation.

To increase or decrease the width of a column, place the mouse on the head of the table at the end of the desired column; a cursor will appear indicating the redefinition mode; hold down the left mouse button and drag the end of the column to the left (increase width) or to the right (decrease width); release the mouse to the desired size.

To increase or decrease the height of a row, place the mouse on the first column of the table (row number) at the end of the desired row; a cursor will appear indicating the redefinition mode of the row height; hold down the left mouse button and drag the end of the row down (increase height) or up (decrease height); release the mouse to the desired height.

Generally, a context menu is available in which the following standard items are always available:

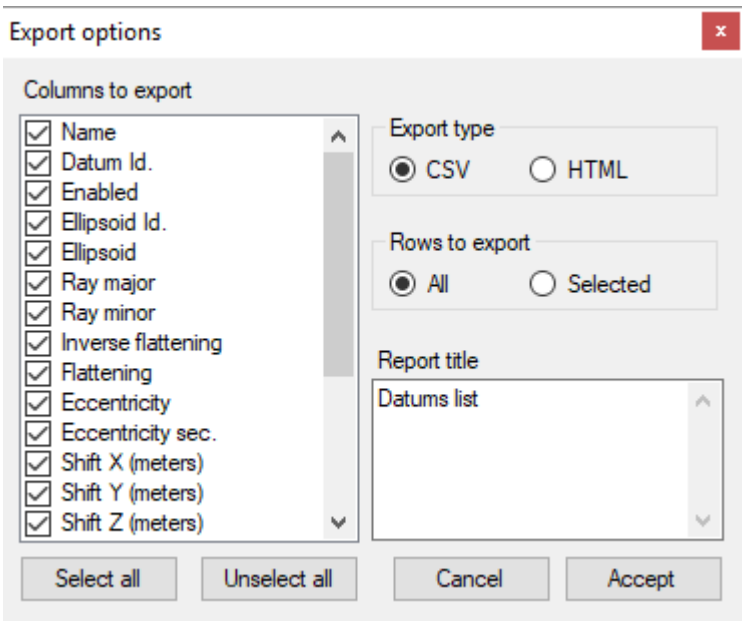
- *Default grid layout*: restores the size of the table columns to their original state.
- *Grid print*: produces a printout of the contents of the data table. To customize the printout, the following window is displayed (example taken from the datums list).



In this window you can:

- select the fields to be printed
- choose whether to print all the lines or the selected lines only
- enter the print title
- indicate whether to print the current date and time
- indicate whether to print page numbers

- *Grid export*: produces a file with the contents of the data table
  To customize the data to be extracted, the following window is displayed (example taken from the datums list).

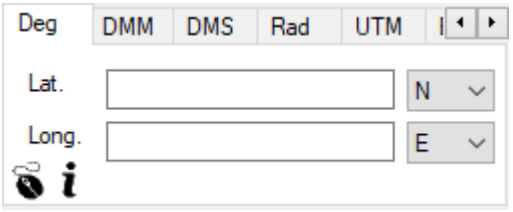


In this window you can:

- select the fields to extract
- choose the type of output (CSV or HTML)
- choose whether to extract all the rows or the selected rows only
- enter the title of the table

Enter the coordinates

Whenever you need to enter the coordinates, OkMap displays a box where you can select the type of representation you want to use.



The type of representation is selected by clicking on the tab at the top of the box. The two arrows on the right allow you to slide the tabs to the left and right, viewing those that are hidden for reasons of space.

After entering the coordinates in a representation mode, conversion can be obtained automatically changing from one mode to another.
In the conversion operations, where not explicitly highlighted in the list below, the datum and the projection specified in the context are used.

The possible representations are:

- Deg: geographical coordinates expressed in decimal degrees
- GMM: geographical coordinates expressed in degrees and decimal minutes
- GMS: geographical coordinates expressed in degrees, minutes and decimal seconds
- Rad: geographical coordinates expressed in decimal radians
- UTM (Universal Transverse Mercator): metric coordinates according to the UTM projection (east, north, zone 1-60 and north / south hemisphere)
- ECEF (Earth-Centered Earth-Fixed): geocentric cartesian coordinates (X, Y, Z)
- OLC: Open Location Code coordinates (if in short format it is necessary to indicate the location)
- GeoRef (World Geographic Reference System): GeoRef geographical coordinates (area, longitude and latitude)
- USNG (United States National Grid): USNG metric coordinates based on UTM projection (zone, X, Y)
- MGRS (Military Grid Reference System): MGRS metric coordinates based on UTM projection (zone, X, Y)
- BNG (British National Grid): BNG metric coordinates based on a particular Transverse Mercator projection and OSGB 1970 datum (SN) (zone, X, Y)
- IG (Irish grid): IG metric coordinates based on a particular projection Transverse Mercator and datum Ireland 1965 (Ireland) (zone, X, Y)
- Metric: metric coordinates (X, Y) according to the map projection or according to the one indicated in the Preferences – Grid (depending on the context); if a default projection is not defined in the preferences, a warning message is displayed

A context menu (or mouse on icon) is available with the following items:

- *Copy coordinates*: stores the coordinates in the clipboard for subsequent operations
- *Paste coordinates*: inserts the coordinates previously stored in the clipboard with the *Copy coordinates* command
- *Clean coordinates*: clear the typed coordinates
- *Copy coordinates (text format)*: copies the coordinates to the clipboard in text format for uses outside OkMap
- *Paste coordinates (text format)*: inserts the coordinates previously stored in the clipboard with the command *Copy coordinates (text format)*.
  The coordinates can also have been copied outside OkMap as long as they are in the form lat;lon with decimals separated by dots (USA format).
- *Set coordinates*: Set the coordinates found and display them on the open maps with a crosshair icon
- *Paste home coordinates*: insert the coordinates stored in Preferences - Coordinates
- *Paste found coordinates*: insert the previous found coordinates with the *Find – Find coordinates / place* menu.
- *Paste GPS coordinates*: insert the coordinates returned by the GPS or by the simulator
- *Sel. waypoint*: select a waypoint from a list
- *Sel. toponym*: select a toponym from a list
- Save waypoint: create a new waypoint with the coordinates indicated
- Save toponym: create a new toponym with the coordinates indicated
- *Geocoding info*: allows you to determine the coordinates of a location and vice versa
- *External services*: launches external utility services focused on the indicated coordinates such as: maps, mountain profiles, weather forecasts, declination calculation, starry sky, etc.
- *Information*: provide information about datum and projection used in metric coordinates

The geocoding function, in order to be activated, requires the acquisition of an *API key* to be included in the preferences. Refer to the Preferences – Geocoding & Routing section for how to acquire the *API key*.

Placing the mouse on the icon , you will get information on the datum of the geographic coordinates and on the possible projection used in the determination of the metric coordinates.

Shortcuts

Ribbon menu	
Key	**Function**
Alt+F	File manager
Alt+0	Full screen
Alt+I	Auto info
Alt+L	Lock objects on map
Alt+C	Center map in navigation
Alt+5	Refresh drawing
Alt+Z	Undo changes
Alt+Y	Redo changes
Alt+S	Select
Alt+6	Select by adding
Alt+7	Select with rectangle
Alt+8	Eraser for points
Alt+A	New georeferenced point
Alt+B	GPS communication
Alt+N	NMEA communication
Alt+R	Record GPS track
Alt+W	Save waypoint position
Alt+X	Proximity waypoint alarm
Alt+H	Switch maps during navigation
Alt+P	Preferences
Map context menu	
Key	**Function**
Ctrl+C	Copy the coordinates
Ctrl+X	Copy the coordinates in text format
Ctrl+S	Set the coordinates
Ctrl+W	Create waypoint
Ctrl+T	Create toponym
Ctrl+M	View the compass on the map
Ctrl+G	Geocoding information
Ctrl+E	Select all objects
Ctrl+D	Deselect all objects
Ctrl+I	Invert object selection
Alt+Canc	Delete selected track points

To activate the shortcuts, you must first activate the corresponding tab on the ribbon.

Datum

What is a datum

A datum defines a coordinate system based on a solid geometric figure that approximates the shape of the Earth.

The shape of the Earth

The shape of the Earth can be approximated, more and more precisely, to:

- A **sphere**.
- An **ellipsoid** that can be defined mathematically by the semi major axis and by the crushing at the poles.
- A **geoid** that would coincide with the surface of the seas if these spread over the whole planet with the same density and temperature and in the absence of perturbations due to the currents of winds and tides.

In the cartography the **ellipsoid** is used because it is mathematically easy and sufficiently precise.
The ellipsoid can be oriented according to the terrestrial area to be represented.

Definition of Datum

A datum defines a coordinate system through:

- The reference ellipsoid (semi-major axis and flattening).
- The position of the ellipsoid with respect to the center of the Earth (3 spatial coordinates: x, y, z and possibly other 3 rotation parameters: x, y, z and a scale parameter).

Each reference ellipsoid takes a specific name (e.g.: Bessel 1841, Clarke 1866, International 1924, WGS84, etc.).

Different datums can refer to the same ellipsoid. What distinguishes these datums is the position of the ellipsoid relative to the center of the Earth. These datums are used in different geographical areas to obtain greater accuracy in the local area.

Even the datum are defined with a unique name that recalls the name of the ellipsoid and the region where they are applied, such as *South American 1969 (Brazil)*.

In recent years there has been a need to define an international datum (*WGS84*) with origin at the center of the Earth (x=y=z=0).

Coordinate systems

The **geographical coordinates** are measured in **latitude** and **longitude** and are expressed in degrees.

The latitude varies from the north pole (90) decreasing to the equator (0) and decreasing further to the south pole (-90).

The longitude varies from the meridian of Greenwich (0) growing towards the east to the opposite meridian (180) and decreasing towards the west to the same opposite meridian (-180).

When expressing the geographical coordinates, it is always necessary to indicate the reference datum because different datums produce different coordinates for the same point.

Datum and OkMap

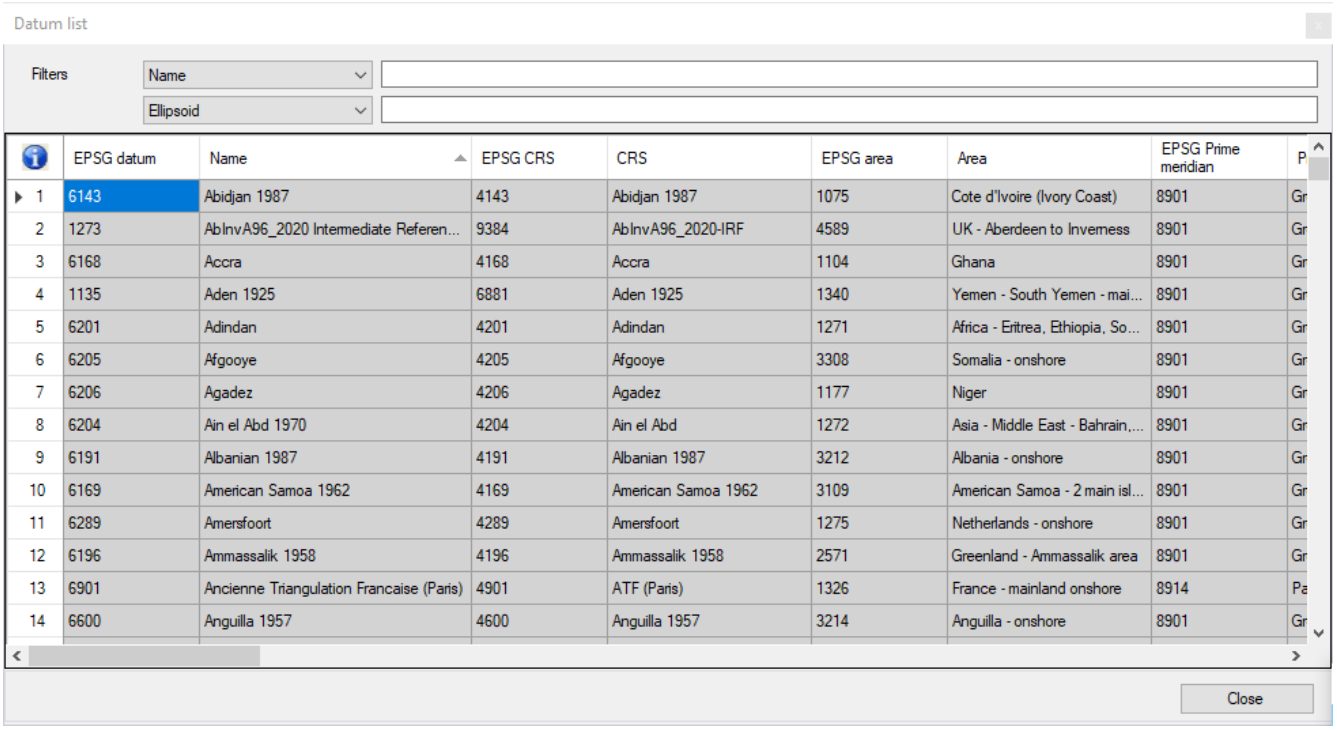
Predefined datums

OkMap provides a list of several hundred datums most used in the world to facilitate the definition of the used coordinate system.

List of datums

This function produces the list of datums available in OkMap with their characteristics.
The information displayed in this window are:

- EPSG datum
- Datum name
- EPSG CRS
- CRS description
- EPSG Area
- Area description
- EPSG prime meridian
- Prime meridian
- Longitude from Greenwich
- Ellipsoid
  - Reference ellipsoid
  - EPSG ellipsoid
  - Ellipsoid name
  - Major radius of the Earth
  - Minor radius of the Earth
  - EPSG unit of measure
  - Unit of measure
  - Inverse flattening
  - Flattening
  - Eccentricity
  - Eccentricity sec.
- Position of the ellipsoid with respect to the center of the earth
  - Shift X (meters)
  - Shift Y (meters)
  - Shift Z (meters)
  - X rotation (seconds)
  - Y rotation (seconds)
  - Z rotation (seconds)
  - Scale (ppm)
- Deprecated (yes/no)
- Names used in other systems
  - ECW name
  - OziExplorer name
  - CompeGPS name
  - GPS TrackMaker name



	EPSG datum	Name	EPSG CRS	CRS	EPSG area	Area	EPSG Prime meridian	P
1	6143	Abidjan 1987	4143	Abidjan 1987	1075	Cote d'Ivoire (Ivory Coast)	8901	Gr
2	1273	AbInvA96_2020 Intermediate Referen...	9384	AbInvA96_2020-IRF	4589	UK - Aberdeen to Inverness	8901	Gr
3	6168	Accra	4168	Accra	1104	Ghana	8901	Gr
4	1135	Aden 1925	6881	Aden 1925	1340	Yemen - South Yemen - mai...	8901	Gr
5	6201	Adindan	4201	Adindan	1271	Africa - Eritrea, Ethiopia, So...	8901	Gr
6	6205	Afgooye	4205	Afgooye	3308	Somalia - onshore	8901	Gr
7	6206	Agadez	4206	Agadez	1177	Niger	8901	Gr
8	6204	Ain el Abd 1970	4204	Ain el Abd	1272	Asia - Middle East - Bahrain,...	8901	Gr
9	6191	Albanian 1987	4191	Albanian 1987	3212	Albania - onshore	8901	Gr
10	6169	American Samoa 1962	4169	American Samoa 1962	3109	American Samoa - 2 main isl...	8901	Gr
11	6289	Amersfoort	4289	Amersfoort	1275	Netherlands - onshore	8901	Gr
12	6196	Ammassalik 1958	4196	Ammassalik 1958	2571	Greenland - Ammassalik area	8901	Gr
13	6901	Ancienne Triangulation Francaise (Paris)	4901	ATF (Paris)	1326	France - mainland onshore	8914	Pa
14	6600	Anguilla 1957	4600	Anguilla 1957	3214	Anguilla - onshore	8901	Gr

To activate this function, use the *Home – OkMap database - Datum* menu.

With this function you can deactivate some datums in order to obtain a more contained list in all the circumstances in which a reference datum must be indicated.

To activate or deactivate a datum, click on the *Active* column corresponding to the row relating to the datum to be modified; a check mark will indicate if the row is active or not.

For more information on the general use of tables, see the Data tables section.

To save the modified data and exit the function, press the *Ok* button.
To exit the function without saving the data, press the *Cancel* button.
Press the *Apply* button to save the modified data.
To refresh the list, press the *Refresh* button.

Projections

What is a projection

A projection of a cartographic map is a mathematical formula used to convert the three-dimensional shape of the earth's surface in a two-dimensional shape as a map (direct projection) and back (reverse projection).

A direct projection then transforms a system of spherical coordinates into a Cartesian coordinate system while a reverse projection takes care of doing the opposite.

Cartesian coordinates are based on a system of two orthogonal axes (x, y).
The location of a point is given by the intersection of the two values.

Classification according to spatial properties

Since the earth's surface is curved, the process of projection distorts always one or more of the following spatial properties:

- areas
- distances
- angles

There are many types of projection each of one capable of representing one or more spatial properties but not all at once.

The projections are grouped into categories according to the spatial properties that are able to represent:

- **Equivalent or equal-area or authalic**: the areas of all regions are represented in the same proportion of the original surface, e.g. maintain the relationship between the surfaces. Shapes, angles and dimensions are distorted in most areas of the map.

- **Equidistant or linear**: maintain a constant scale along all the great circles (the shortest distance between two points). No projection can be both equivalent and equidistant because the requirements of scale for compliance and for the equivalence are contradictory.

- **Conforming or isogonic or orthomorfic or autogonal**: preserves angles. The compass rose is the same in every point on the surface of the globe (except the poles). It is impossible that a projection is both conform and equivalent.

- **Compromise:** they achieve an acceptable compression by minimizing the various types of deformation. On the other hand, in these projections, all the different possible deformations are present to a limited extent.

Classification according to geometric principles

The projections are further classified based on geometric principles on which they are based:

- **Perspective**: they are obtained by a plane tangent to the sphere at any point of the same and by the variation of the observation point, are distinguished in:
  - **Centrographic**: the point of observation coincides with the center of the sphere and projected on the plane of polar gnomonic map.
  - **Stereographic**: the observation point is on the surface of the sphere opposite to the projection plane.
  - **Orthographic**: infinity and is projected on the tangent plane at the opposite pole.
- **Conic**: are made by projecting the points of the sphere on a cone tangent to a parallel.
- **Cylindrical**: are obtained by wrapping the globe with a cylinder tangent to the equator.
- **Mathematics**: are used to realize small scale maps and representing the entire surface of the Earth in the form of circles, ovals or other shapes also interrupted.

Most used projections

Here is a list of most used map projections and their scope of use (the list is alphabetical and not in order of importance):

- **Albers Equal-area Conic**: Equivalent, Conic. Used for large regions that extend from east to west.
- **Equidistant Conic**: Equidistant, Conic. Used for mid latitudes and small regions.
- **Lambert Azimuthal Equal-area**: Equivalent, azimuthal. Used for the polar regions.
- **Lambert Conformal Conic**: Conforming, Conic. Used for large regions that extend from east to west.
- **Mercator**: Conforming, Cylindrical. Used for the regions bordering the equator. Useful because the nautical lines are straight.
- **Miller**: Cylindrical, not Conforming not Equivalent. For atlases and maps that require little distortion near the polar regions.
- **Oblique Mercator**: Conforming, Cylindrical. Used for areas that extend obliquely so the equator.
- **Orthographic**: Azimuthal, not Conforming not Equivalent. Used to produce a view of Earth seen from space.
- **Robinson**: Pseudocylindrical, not Conforming not Equivalent. Mainly used for the production of atlases.
- **Sinusoidal**: Pseudocylindrical, Equivalent. Used for large areas (Africa, South America) which has a north-south extension.
- **Stereographic**: Azimuthal, Conforming. Used for the polar regions.
- **Transverse Mercator**: Cylindrical, Conforming. Used mainly in the region that extends north-south.

Projections used according to the scale

Here is a list of projections that are most appropriate for use according to the scale to be adopted:

- **World**: Mercator, Miller and Robinson.
- **Hemisphere**: Lambert Azimuthal Equal-area and Stereographic
- **Continent, oceans and regions**: Albers Equal-area Conic, Equidistant Conic (Simple Conic), Lambert Azimuthal Equal-area, Lambert Conformal Conic, Stereographic, and Transverse Mercator
- **Medium and large scale**: Lambert Conformal Conic, Stereographic and Transverse Mercator

Projections used by OkMap

Projection parameters

The mathematical models that are based on map projections are characterized by a set of parameters that define how to transform coordinates in Cartesian coordinates.

The type and the number of the parameters depend on the projection.

The following chart illustrates the parameters for all the projections used in OkMap (in alphabetical order).

Proiezione	x0	y0	lam0	phi0	k0	Azim	bear	phi1	phi2
Albers Equal Area	x	x	x	x	x			x	x
Bonne	x	x	x	x					
Cassini-Soldner	x	x	x	x	x				
Equidistant Cylindrical (Spherical)	x	x	x	x					
Hotine Oblique Mercator (variant A)	x	x	x	x	x	x	x		
Hotine Oblique Mercator (variant B)	x	x	x	x	x	x	x		
Lamvert Azimuthal Equal Area	x	x	x	x					
Lambert Conic Conformal (1SP)	x	x	x	x	x				
Lambert Conic Conformal (2SP)	x	x	x	x	x			x	x
Mercator (variant A)	x	X	x	x	x				
Mercator (variant B)	x	x	x	x				x	
Orthographic	x	x	x	x					
Popular Visualisation Pseudo Mercator	x	x	x	x					
Swiss Oblique Cylindrical	x	x	x	x	x				
Transverse Mercator	x	x	x	x	x				

Where:

Parameter	Description
x0	False East: linear value applied to the origin of the coordinate x
y0	False North: linear value applied to the origin of the coordinate y
lam0	Central meridian / Longitude of the origin of the map (-180, 180)
phi0	Central parallel / Latitude of the origin of the map (-90, 90)
k0	Scale factor at the central meridian (0.1, 1.0)
azim	Azimuth of the line that passes through the center of projection (-90, 90)
bear	Direction of the center of the line (-90, 90)
phi1	First standard parallel (-90, 90)
phi2	Second standard parallel (-90, 90)

Predefined projections

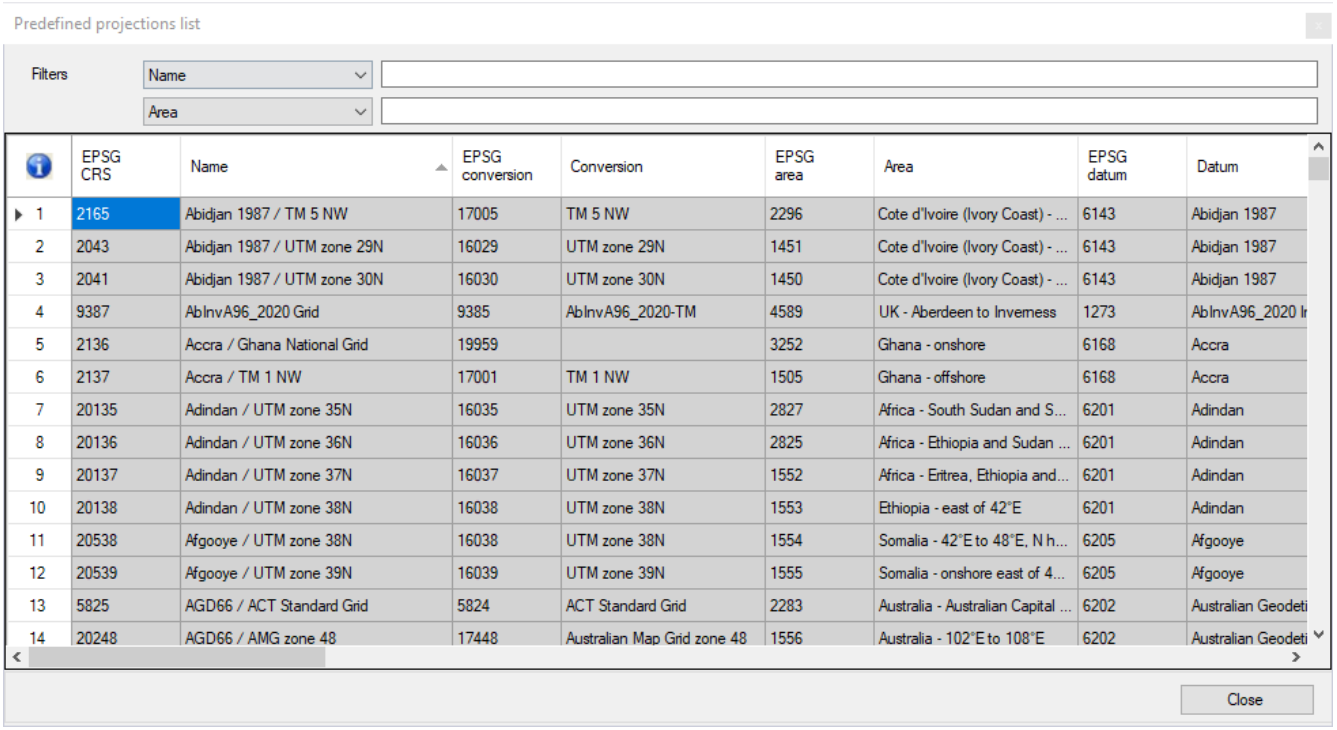
A predefined projection in OkMap is the set of a datum and a projection with all its parameters. All this defines both the model of the coordinates used, and all the information needed to transform the coordinates from geographic into a two-dimensional Cartesian model and vice versa.

OkMap provides a list of several thousand of predefined projections / datums used in the drafting of cartographic maps to facilitate the task of georeferencing raster maps and the definition of vectorial maps.

List of predefined projections

This function produces the list of predefined projections available in OkMap with their characteristics.
The information displayed in this window are:

- EPSG CRS
- CSR description
- EPSG conversion
- Conversion
- EPSG area
- Area
- EPSG datum
- Datum name
- EPSG projection
- Projection name
- Parameters of the projection
  - False east
  - False north
  - EPSG unit of measure
  - Unit of measure
  - Center of longitude
  - Center of latitude
  - Scale factor x
  - Scale factor y
  - Azimuth center line
  - Center direction line
  - First standard latitude
  - Second standard latitude
- Deprecated (yes/no)
- Names used in other systems
  - ECW name
  - OziExplorer name
  - CompeGPS name
  - GPS TrackMaker name
  - OruxMap name



To activate this function, use the *Home – OkMap database – Predefined projections* menu.

With this function you can deactivate some elements in order to obtain a smaller list in all the circumstances in which a predefined projection must be indicated.

To activate or deactivate a predefined projection, click on the *Active* column corresponding to the row relating to the projection to be modified; a check mark will indicate if the row is active or not.

Some rows cannot be activated because the corresponding projection is not implemented in OkMap; they are however present for future developments.

For more information on the general use of tables, see the Data tables section.

To save the modified data and exit the function, press the *Ok* button.
To exit the function without saving the data, press the *Cancel* button.
Press the *Apply* button to save the modified data.
To refresh the list, press the *Refresh* button.

Maps

Types of maps

Cartographic programs can be divided into two categories: those that use georeferenced vectorial cartography (vectorial maps), and those that use graphic files (.tif, .jpg, .bmp, etc..), purchased or obtained by scanning a paper map and then properly georeferenced or calibrated (raster maps).

OkMap can use both the types of maps, even simultaneously.

The calibration procedure of a raster map allows to store additional geo-referencing information to the map image so that the mapping software can always know, based on the coordinates expressed in pixels, the relative geographic coordinates and vice versa.

The calibration of a raster map can be done as long as you know:

- the datum that defines the reference system of geographical coordinates
- the projection system used to draw the map and the relative parameters (center of the projection, false east, false north, scale, etc.)
- the correspondences between the absolute coordinates of the map (in pixels) and the geographical coordinates of at least 2 points (better if 3 or more)

Raster maps can be used as a background for the representation of waypoints (points of interest), routes, tracks and as a background for navigation.

A vectorial map is a rectangle of certain size in which to draw a certain amount of vectorial data (points, lines, polygons) able to represent a given territory in its different forms (border lines, rivers, lakes, roads, etc...).

Creating a vetctor map needs to know:

- the datum that defines the reference system of geographical coordinates
- the projection system used to draw the map and the relative parameters (center of the projection, false east, false north, scale, etc.)
- the scale factor (meters per pixel)

The vectorial maps can be used, like the raster maps, as a background for the representation of waypoints (points of interest), routes, tracks and as a background for navigation.

In hybrid maps (raster + vectorial) the limits of the map are defined by the boundaries of the raster map and the vectorial data are drawn over the image of the raster map.

Calibrate a raster map

What is calibration

For calibration of a raster map we mean the georeferencing process that allows the software to know the geographic coordinates of any point (expressed in pixel coordinates) of the map image and vice versa.

A video is available for this function.

The method used involves the transformation of the geographical coordinates into distances from the center of the map (expressed in meters) and, subsequently, the resolution of a system of linear equations that determines the calibration coefficients of the map.

The method of transformation of the coordinates used and the number of determined coefficients, depend on the number of points defined during the calibration of the map.

OkMap uses the following methods:

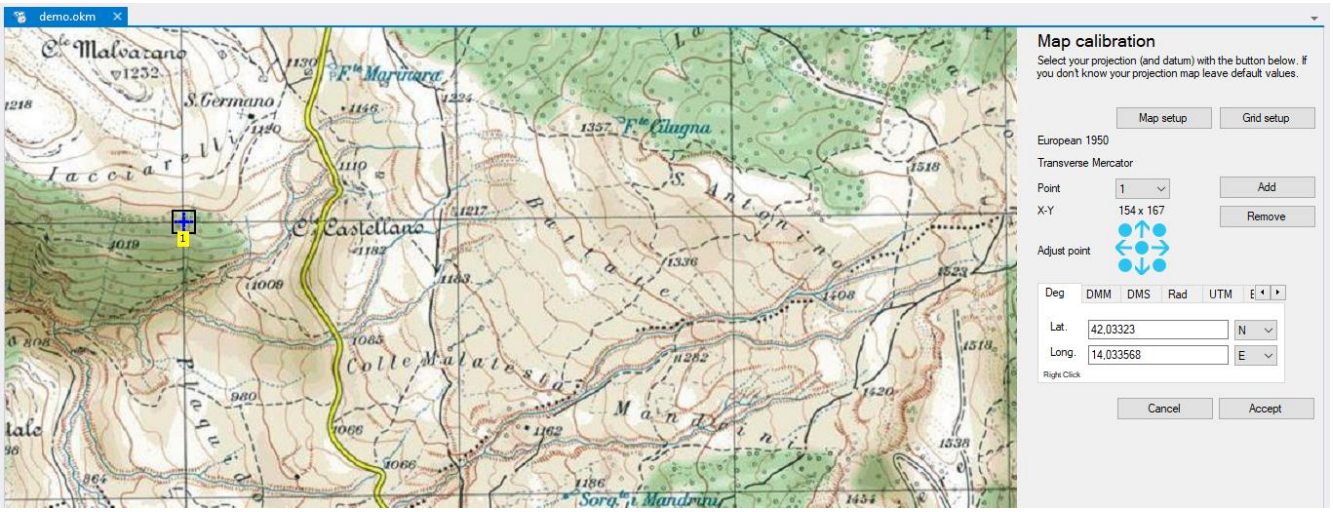
- **similarity** - when two points of calibration are suggested. Four coefficients are determined to manage the **scale** (scaling or stretching) and the **displacement** (shifting)
- **affine** - when three points of calibration are suggested. Six coefficients are determined to manage the **scale** (scaling or stretching), the **rotation**, the **distortion** (rotation or skewing) and **displacement** (shifting)
- **similar with average of the coefficients** - when are suggested more than three points of calibration. The affine method is used by taking three points at a time and finally made the average of the coefficients.

OkMap does not use the polynomial method of a higher order than the first (non-linear) that would allow to georeference deformed maps in an uneven way (for example when they are the result of a paper scan).

Calibration procedure

To calibrate a map, open the image file of the map to be calibrated using the *File - New - Raster map* menu. A box is opened on the right side of the window containing the information needed for calibration.

This box can be extended by placing the mouse on the left margin.



Map setup

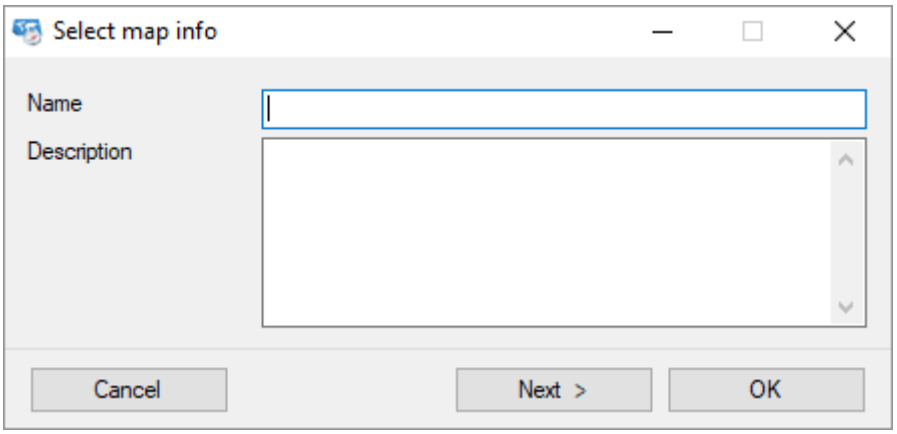
You can enter the datum and the map projection during the calibration procedure (*Map setup* button) or after loading a map with the *Management – Map parameters* menu.

Not performing this operation during calibration is equivalent to indicating *WGS84* as datum and *Equidistant Cylindrical (Spherical)* as projection (*Equirectangular*).

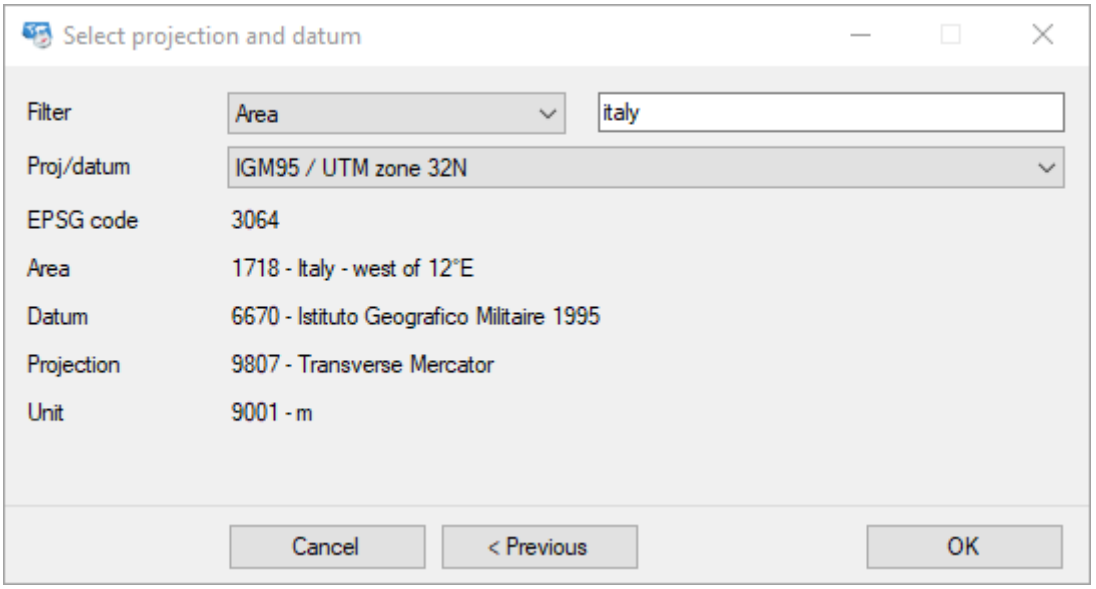
A series of windows (wizards) are displayed to enter the characteristics of the map (name, description, datum, projection and related parameters).

To switch from one window to another use the *Next* > and < *Previous* buttons.
To end the wizard press the *OK* button.
To cancel the procedure press *Cancel* button.

The first window is used to enter the name and description of the map (optional).



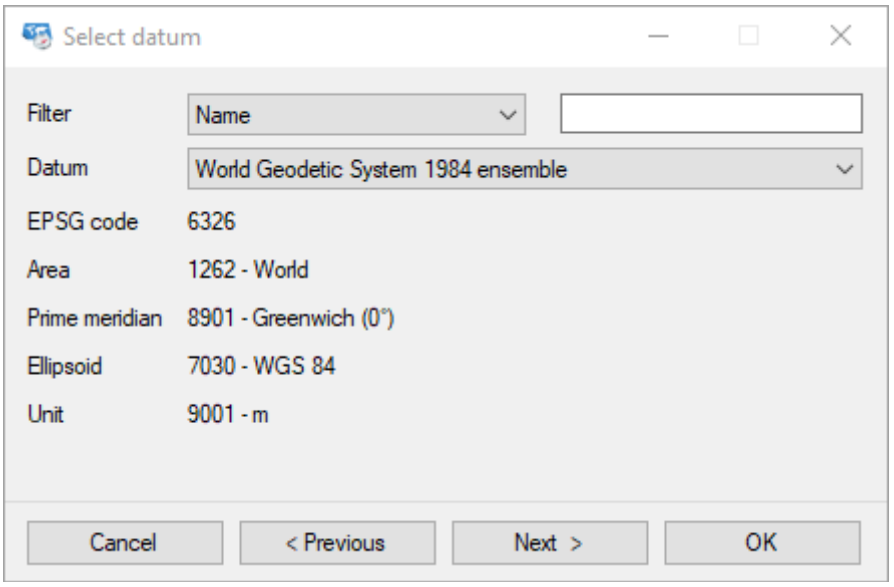
The next window is used to enter the datum, the type of projection and the related parameters.
Selectable values are contained in a database that contains a large number of definitions used by most countries in the drafting of their own maps.



To reduce the number of selectable values, use the filter field (for example, by typing the country to which the map refers).

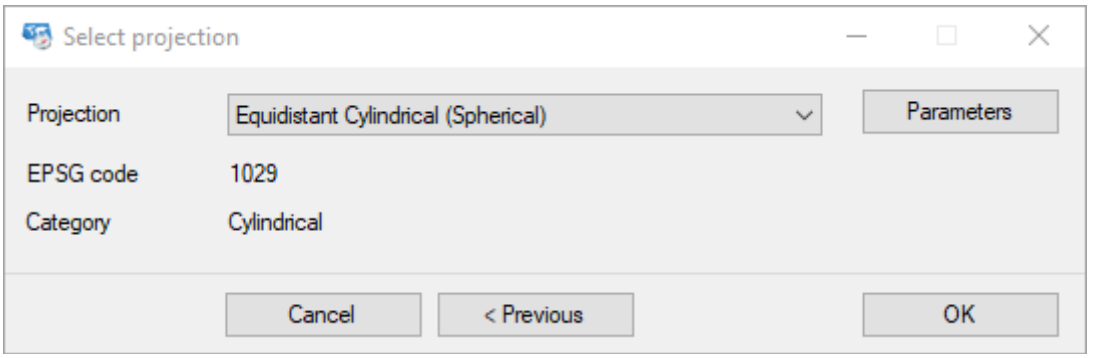
Once the selection has been made, the wizard ends. If it is not possible to identify a suitable projection, you can proceed to a manual selection of the information by selecting the value <Customized projection ...> and pressing the *Next* > button.

In this case a window is displayed for choosing the datum used by the map.



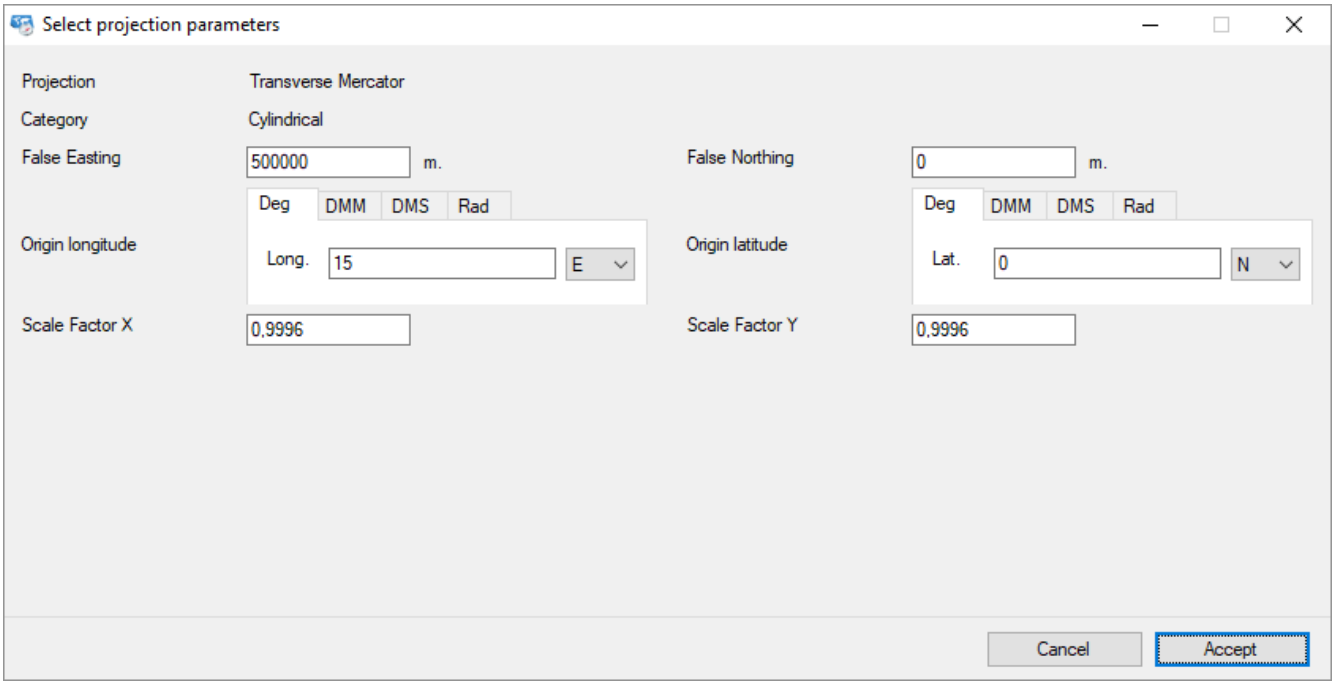
To reduce the number of selectable values, use the filter field (for example, by typing a part of the name of the datum to which the map refers).

Proceeding forward, a window is displayed to define the type of projection used by the map.



If the desired projection does not appear in the list and the map surface covers a small region, we can obtain a fair approximation by selecting the *Equidistant Cylindrical (Spherical)* projection.

Once the projection has been selected, press the *Parameters* button to enter the projection parameters.



The type and number of parameters depend on the projection in question. For more information, see the paragraph Parameters projections of page What is a projection.

Do not make the selection of parameters is equivalent to setting the center of the projection on the *Greenwich* meridian to the equator, the false east and north to zero and the scale factor to 1.

The *Accept* button acquires the information relating to the parameters and displays the window to choose the projection.
The *Cancel* button closes the window without acquiring data.

Finally, the *Ok* button concludes the wizard for the map setup.

Georeferencing points

Now you just have to choose the known points on the map and enter their coordinates.
Known points can be:

- Crosses of meridians and parallels whose coordinates are known (generally the maps showing the metric or geographic grids show the coordinates at the edges).
- A precise location on the map whose coordinates are known.

Select the *Home - Tools - New georeference point* menu.

Click with the left mouse button on the map image in the known point. The cross cursor makes the task easier and the magnifying glass can help you to locate the precise point.

Once this is done, an icon appears on the selected point; the position of the point can be perfected using the four directional green arrows that move it one pixel in the desired direction.

The 4 round green icons at the corners place the georeferencing point at the 4 corners of the map, while the central one places it at the center of the map.

The coordinates of the point expressed in pixels (X-Y) are displayed below the combo box indicating the number of the current point.

Once the point has been selected, enter the coordinates in the appropriate box at the bottom right.

If you manually enter the coordinates, you can choose their representation mode as indicated in the paragraph Enter the coordinates.

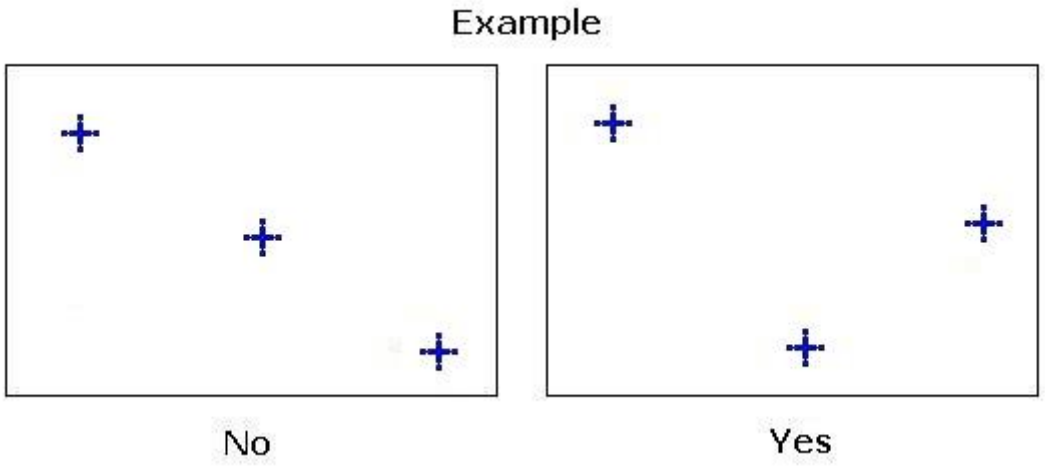
To add a new georeferencing point use the *Add* button. The current point is displayed on the map with the icon highlighted by a rectangle.

The *Point* combo box displays the number of the current point. The current point can be changed and its coordinates (if already entered) will be displayed automatically.

A point and its coordinates can be deleted with the *Remove* button.

Before completing the georeferencing procedure it is necessary to attribute at least two points (better if three or more).

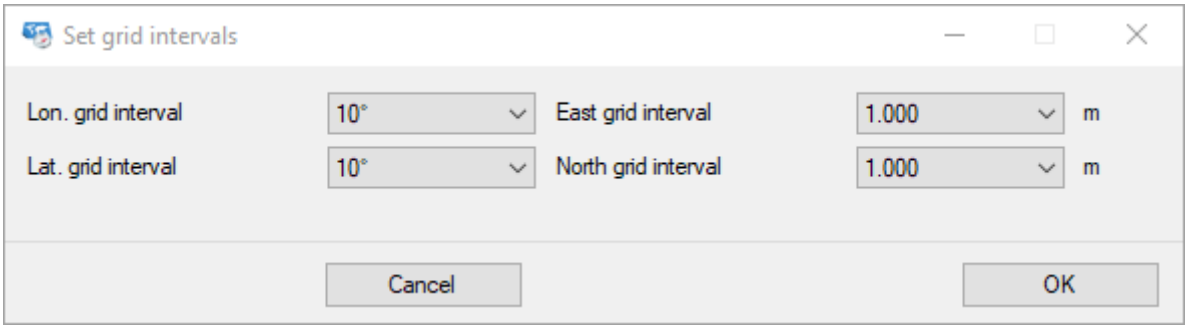
Avoid choosing positions aligned in the two axes because georeferencing would be unreliable or in some cases it would be impossible to solve the equation system at the basis of the determination of the calibration coefficients.



Once all the georeferencing points have been entered and the georeferencing procedure has been completed, press the *Accept* button.

Grid setup

You can enter the information for the design of the geographic and / or metric grid during the calibration procedure calibration procedure (*Grid setup* button) or after loading a map with the *Management – Map grid* menu.



For the design of the geographical grid, the following must be entered:

- Longitude grid interval (expressed in degrees)
- Latitude grid interval (expressed in degrees)

For the design of the metric grid, the following must be entered:

- East grid interval (expressed in kilometers or meters)

- North grid interval (expressed in kilometers or meters)

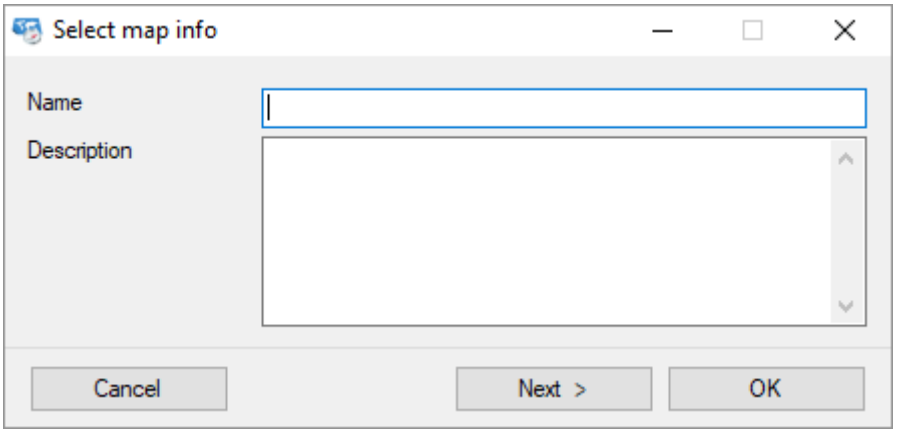
The metric grid is based on the same projection / datum indicated to georeference the map.

Create a vectorial map

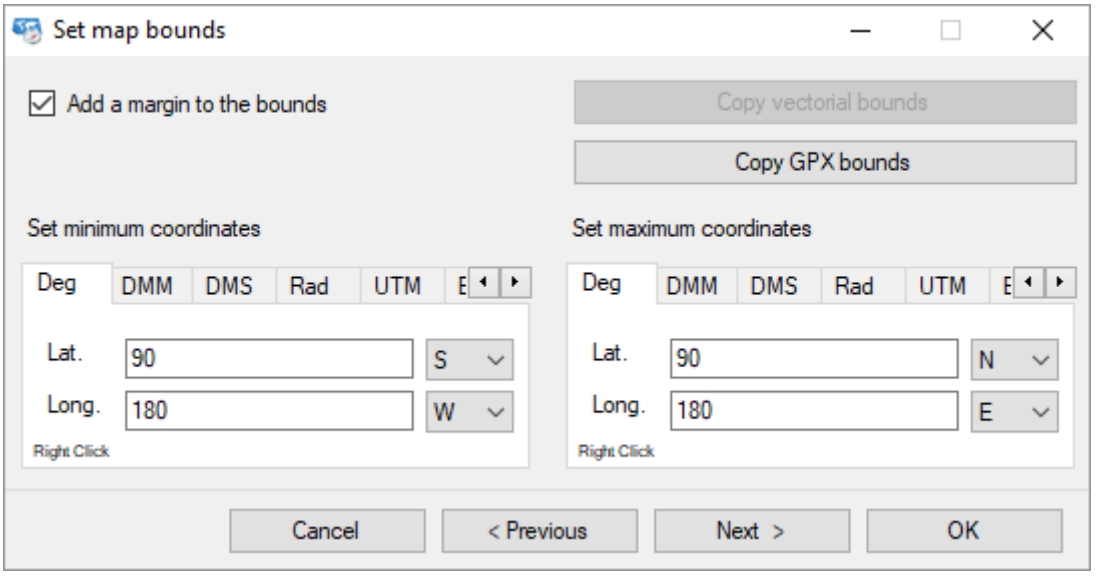
To create a vectorial map use the *File - New - Vectorial map* menu.
A series of windows (wizards) are displayed to enter the characteristics of the map (name, description, datum, projection and related parameters).

To switch from one window to another use the *Next* > and < *Previous* buttons.
To end the wizard press the *OK* button.
To cancel the creation of the vectorial map, press the *Cancel* button.

The first window is used to enter the name and description of the map (optional).



The next window is used to enter the geographical limits of the vectorial map you want to create.



The geographical limits are expressed in terms of minimum coordinates (geographical position at the top left of the map) and maximum coordinates (geographical position at the bottom right).

To understand how to enter the coordinates, refer to the paragraph Enter the coordinates.

With the *Copy GPX bounds* button, you can automatically enter the coordinates using the bounds of the GPX data loaded.

A small margin can be added to the GPX data bounds by checking the *Add a margin to bounds* checkbox. This option allows you to better view the objects that are near the edge of the map.

The wizard continues with the choice of the projection / datum to be used and the procedure is completely similar to what is described in the paragraph Map setup.

Once the procedure is finished, an empty map will be displayed on which you can draw your vectorial data or import it from external files.

It is also possible to modify the properties of the grids, as for the raster maps, using the *Management – Map grid* menu.
The procedure is described in the section Grid setup.

Load a map

To load a raster or vectorial map use the *File - Load - Map* menu.
In the window that opens you can choose the format of the map by selecting the value in the box adjacent to the file name.

The managed formats are listed in the following table.

Format	Extension	Raster	Vectorial	Via GDAL
OkMap	.okm	X	X	
ECW	.ecw	X		
GeoTiff	.tif	X		
World file	.tfw,.jgw,.pgw,.gfw,.bpw	X		
Google Earth	.kmz, .kml	X		
Encrypted Google Earth	.ekmz	X		
JNX BirdsEye	.jnx	X		
OziExplorer	.map	X		
CompeGPS	.imp	X		
CompeGPS TwoNav	.rmap	X		
GPS TrackMaker	.gtm	X		
RMap	.sqlitedb	X		
MBTiles	.mbtiles	X		
OruxMaps	.xml	X		
GpsTuner	.gmi	X		
JPEG2000	.jp2	X		X
Geospatial PDF	.pdf	X		X
Other formats	*	X		X

The map window has a context menu that can be opened with the right mouse button.
It allows you to perform multiple operations related with the objects present in the cursor position (precisely context).

A second context menu can be opened with the middle mouse button.
The functions of this context menu are dedicated to the waypoints and photos present at the mouse position.

OkMap format

It is the native format with which OkMap works for both raster and vectorial maps.

If it is a raster map, OkMap opens the corresponding image file declared in the .okm file; this file must reside in the same folder as the .okm file.

If the map has been opened in the past it will be displayed with the zoom / scale factor used the previous time. (if indicated in the Preferences - General function, with the *Set last zoom/pan after map loading* field).

From version 16.0.0, OkMap changes the format in which the maps are stored, from version 1.1 to version 2.1. This new format allows you to store EPSG Geodetic Parameter Dataset codes actively maintained by the IOGP (International Association of Oil & Gas Producers Geomatics Committee).

When a map is loaded, the software asks if you want to update the map storage format to the new format (strongly recommended).

ECW format

The ECW (Enhanced Compression Wavelet) format allows you to store images, usually aerial or satellite, in compressed format.

All the geographical references are contained within the ECW file and are therefore already georeferenced.

However, if the projection is of RAW type it means that these references are absent for which it is necessary to calibrate the ECW file like any other map image.

If the projection type is ECW LOCAL it means that the projection / datum used is not known. In this case OkMap will refer to what is specified in the Preferences – Grids with the *LOCAL ECW Projection - Set Altern. Grid* button.

The procedure is completely automated and no further information is required.

GeoTiff format

The GeoTiff format allows you to embed geographic references within a TIFF image in the form of metadata. Software that cannot interpret geographical references can still read the image contained within it.

The procedure is completely automated and no further information is required.

World file format

It is a text file containing the georeferencing information of the map.
In particular it contains six coefficients for the affine transformation that describes the position, scale and rotation of the raster image on the map.
It does not contain any information on the projection and the datum used.

The file extension is assigned based on the following matches:

World file	Image file
.gfw	.gif
.jgw	.jpg
.pgw	.png
.tfw	.tif
.bpw	.bmp

Often the world file is related to a ".prj" fie that contains information about datum and projection used by the map (WKT format).

Once the file has been selected, if the ".prj" file is missing, a wizard similar to the one seen in the calibration of a map is displayed.

Google Earth format

The KML (Keyhole Markup Language) format is an XML-based language to represent both maps and navigation data (points of interest, tracks). In this case OkMap only loads the map.

The maps are divided into multiple tiles to speed up the rendering process, especially in mobile devices.

Loading a map in this format requires a slightly higher processing time as it is necessary to reconstruct the entire image of the map starting from the different tiles.

The procedure is completely automated and no further information is required.

The KMZ format is the zipped version of KML format.

Encrypted Google Earth format

These maps are the encrypted version of KMZ maps.

They can be purchased from ediMap at https://www.edimapstore.com/mappe-citta-per-mobile-90.

JNX BirdsEye format

JNX files are used in Garmin devices to show raster maps by subscription to the Birdseye service.

The maps are divided into multiple tiles to speed up the rendering process in mobile devices.

Loading a map in this format requires a slightly higher processing time as it is necessary to reconstruct the entire image of the map starting from the different tiles.

If the file contains multiple layers, OkMap will only read the most detailed level.
If the resulting image is too large to be managed, the file cannot be loaded.

The procedure is completely automated and no further information is required.

OziExplorer format

The OziExplorer format is used by the homonymous software for Windows.

The procedure is completely automated and no further information is required.

With this function you can also load the OZF2 and OZFX3 formats.

CompeGPS format

The CompeGPS format is used by the homonymous software for Windows.

The procedure is completely automated and no further information is required.

CompeGPS TwoNav format

The CompeGPS TwoNav format is used by the homonymous GPS devices.

The maps are divided into multiple tiles to speed up the rendering process in mobile devices.

Loading a map in this format requires a slightly higher processing time as it is necessary to reconstruct the entire image of the map starting from the different tiles.

If the file contains multiple layers, OkMap will only read the most detailed level.
If the resulting image is too large to be managed, the file cannot be loaded.

The procedure is completely automated and no further information is required.

GPS TrackMaker format

The GPS TrackMaker format is used by the homonymous software for Windows.

The procedure is completely automated and no further information is required.

RMap format

The RMap format is based on Sqlite database, a database engine widely used in mobile devices.

The maps are divided into multiple tiles to speed up the rendering process in mobile devices.

Loading a map in this format requires a slightly higher processing time as it is necessary to reconstruct the entire image of the map starting from the different tiles.

If the file contains multiple layers, OkMap will only read the most detailed level.
If the resulting image is too large to be managed, the file cannot be loaded.

The procedure is completely automated and no further information is required.

MBTiles format

It is a similar format to RMap. The same considerations therefore apply.

OruxMaps format

The OruxMaps format is used by the homonymous software for Android.

The maps are divided into multiple tiles in order to speed up the rendering process in Android devices.

Loading a map in this format requires a slightly higher processing time as it is necessary to reconstruct the entire image of the map starting from the different tiles.

If the file contains multiple layers, OkMap will only read the most detailed level.
If the resulting image is too large to be managed, the file cannot be loaded.

The procedure is completely automated and no further information is required.

GPSTuner format

The GPSTuner format is used by the homonymous software for Android and iOS.

The procedure is completely automated and no further information is required.

JPEG2000

The JPEG2000 format allows you to embed geographic references within a JPEG image in the form of metadata. Software that cannot interpret geographical references can still read the image contained within it.

It’s possible add one or more GDAL parameters to be used in the translation process (see Load via GDAL).

Geospatial PDF

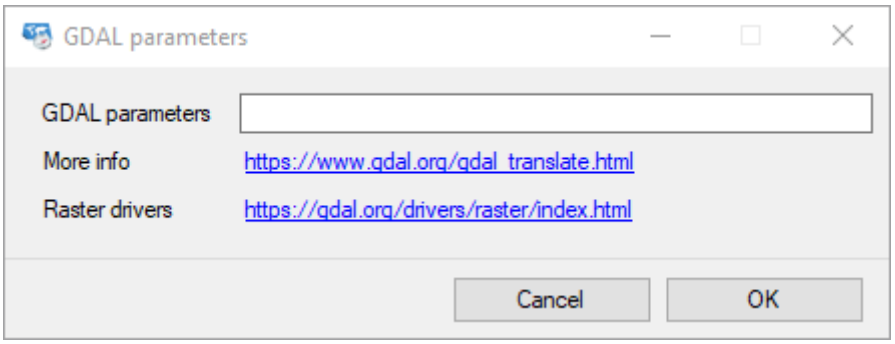
The GeoPDF format allows you to embed geographic references within a PDF document in the form of metadata. Software that cannot interpret geographical references can still read the image contained within it.

It's possible add one or more GDAL parameters to be used in the translation process (see Load via GDAL).

Load via GDAL (*.*)

This function uses the GDAL raster library to convert a map to GeoTiff and then load it into OkMap.

It's possible add one or more GDAL parameters to be used in the translation process.
Parameters must be preceded by the "—config" directive.



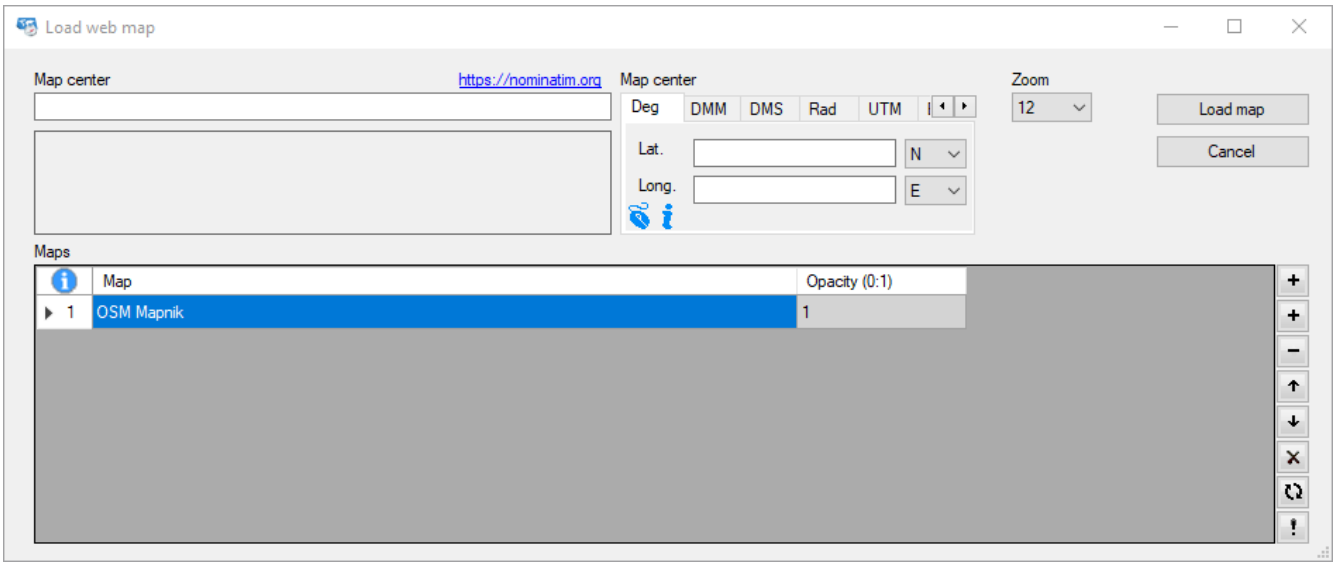
To see the command parameters, visit this web page.
To see the supported file formats, visit this web page.

Press the *OK* button to load the map.
To exit the window without loading the map, press the *Cancel* button.

Load a web map

You can load a map directly from a WMS server (Web map service) or TMS (Tile map service) as long as an internet connection is available.

To load a web map, use the *File - Load - Web map* menu.



The coordinates to be entered refer to the center of the map to be loaded.
For how to enter the coordinates, refer to the paragraph Enter the coordinates.

Alternatively, you can enter an address (eg street, city, state) in the *Map center* textbox at the top. Once the address has been validated, the coordinates will be selected automatically.

This function to be activated requires the acquisition of an *API key* to be included in the preferences. Refer to the Preferences – Geocoding & Routing section for how to acquire the *API key*.

The web map list contains the list of WMS/TMS servers to download maps from and any local raster maps.
The list must be sorted by map overlap.
The choice of the web maps is made through a page similar to the one described in List of maps servers.

To add a web map, use the first button +.
To add a raster local map, use the second button +.
To remove a map, select it and then press the button −.
It is possible to move the maps by giving the order of the levels with the buttons ↑ and ↓.
The button ✕ deletes the list of maps.
The button 🗘 restores the default list.
The button ! saves the map list for next time.

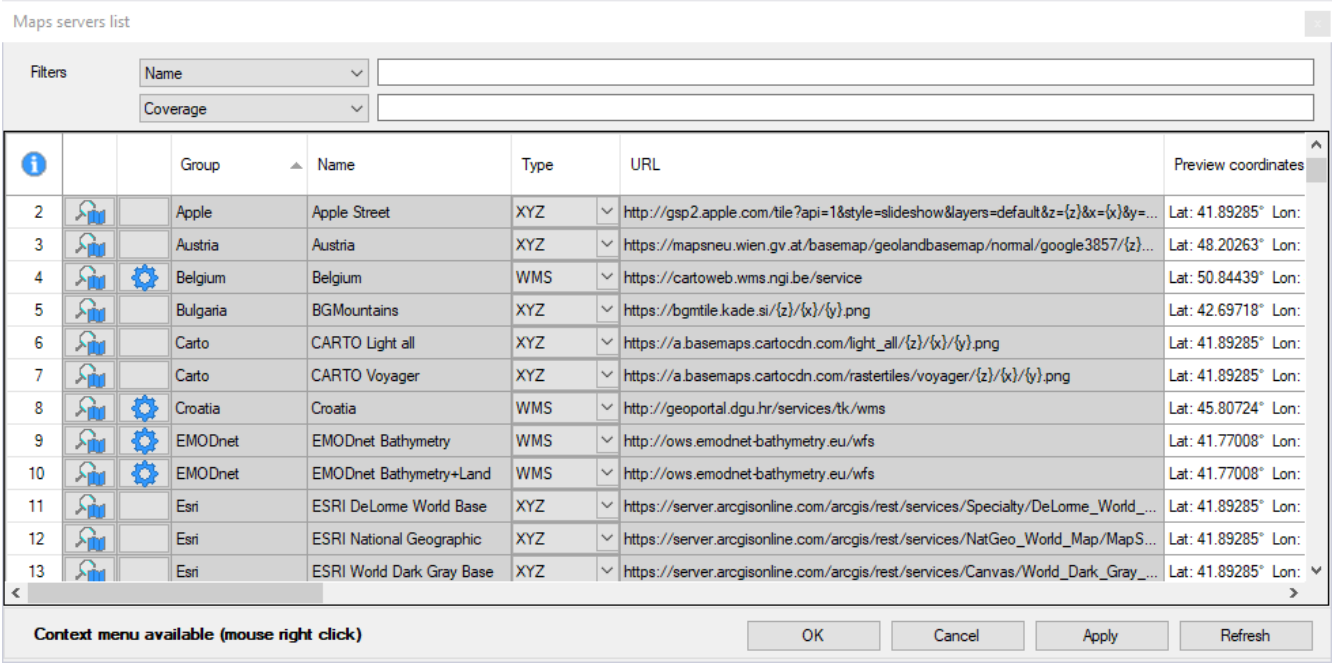
For each local raster map the opacity factor (decimal values from 0 to 1) can be specified. The value 1 represents the total opacity.
The system manages at most the equivalent of 250 tiles of 1000 pixels per side.

The system manages a maximum of the equivalent of 250 tiles of 1000 pixels per side.

To confirm the loading of the maps, press the *Load map* button.
To cancel the operation in progress, press the *Cancel* button.

List of maps servers

In OkMap a series of TMS/WMS/WMTS servers are defined for loading web maps.
These servers can be viewed using the *Home – OkMap database - Maps Servers* menu.



The data shown in this window are used to access and download maps from TMS/WMS/WMTS servers.

The lists the data for accessing the servers.
The information displayed in this table are:

- Map preview button: to display a preview of the map centered on the coordinates specified below
- Capabilities display button: usable only for WMS services
- Group: to group maps by provider. Any API keys needed to access the service can be specified at Group level
- Name: name of the service
- Type: type of service (XYZ / WMS)
- URL: web address of the service
- Preview coordinates: coordinates in which to center the preview of the web map
- API key required: this is a read-only field that highlights the need to specify an API key to access the service; the API key is replaced with the string {apikey} possibly contained in the URL
- Server nodes: these are the server nodes if there are more than one; the server nodes are separated by a comma and possibly replaced with the string {s} contained in the URL
- WMS Version: version of the capabilities of the WMS service
- WMS layers: these are the names of the WMS service layers to be displayed. The button alongside opens a selectable list of available layers (see below)
- Map image format
- WMS Projection: if necessary, the projection in PROJ4 code must be implemented in the second table (body) and indicated in this field
- WMTS style
- WTMS Matrix Set
- Attributions: these are the attributions imposed by the service usage policy
- HTTP Referer: is the value of the HTTP header named “Referer”
- Coverage: geographical area covered by the service (informative only)
- Min zoom: Minimum zoom for the map (informative only)
- Max zoom: Maximum zoom for the map (informative only)
- Active: to possibly deactivate an unused server

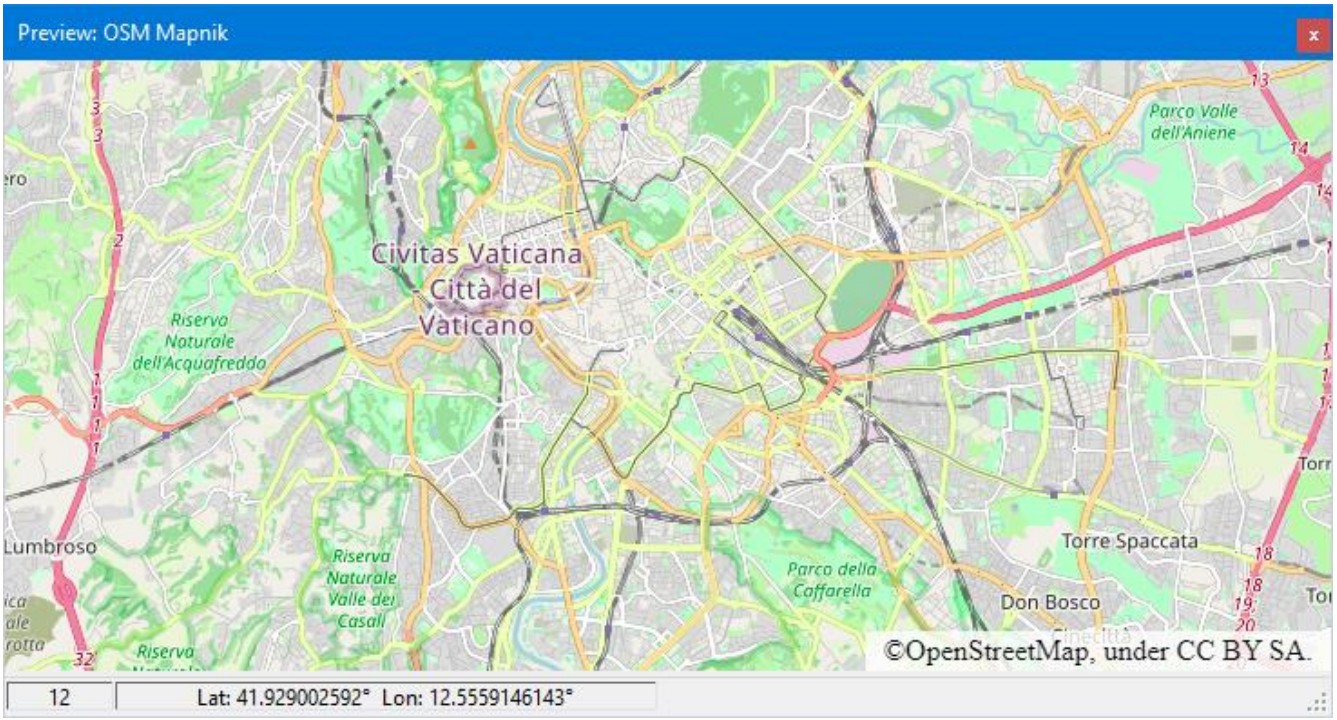
- Map can saved: indicates whether the service can be used in the Maps Server function (see service policies)
- Custom: Specifies if the code was added by the user (editable)

Experienced users can eventually add new servers by inserting new lines in the tables.

To save the modified data and exit the function, press the *Ok* button.
To exit the function without saving the data, press the *Cancel* button.
Press the *Apply* button to save the modified data.
To refresh the list, press the *Refresh* button.

For more information on the general use of tables, see the section Data tables.

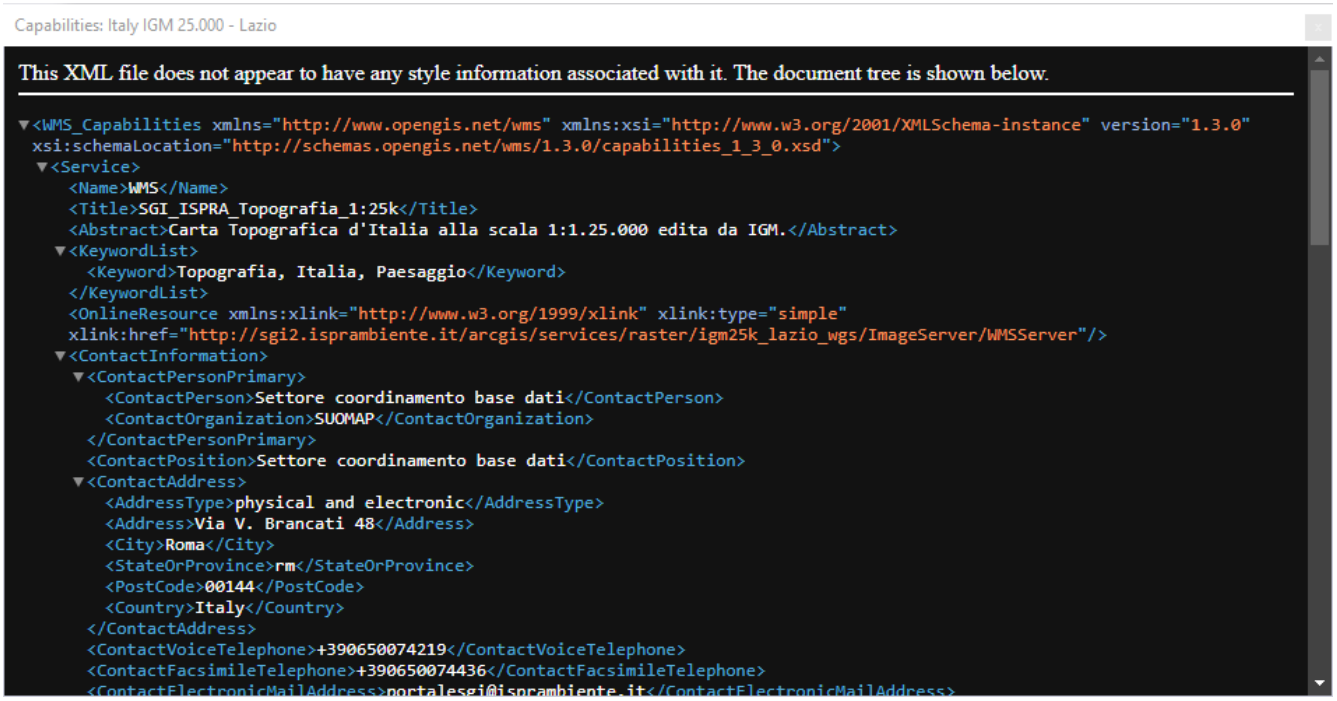
Here is an example of a preview of a web map:



In the status bar it is possible to view the zoom level and the geographical coordinates of the cursor.
The cursor coordinates are shown in the status bar according with the coordinates types specified in Preferences – Coordinates (see Status bar).

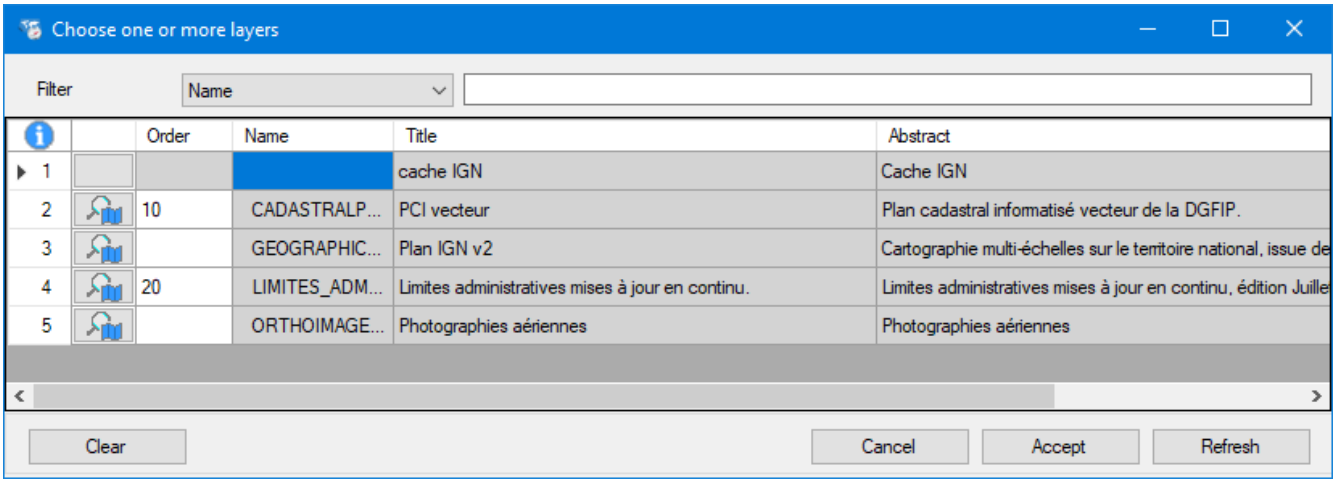
The map can be moved by moving the mouse with the left button pressed.
The zoom can be changed using the mouse wheel.

Below is an example of viewing the capabilities of a WMS service:



A context menu (right mouse button) allows copying of the xml text to the clipboard.

Below is an example of displaying the list of layers available for a WMS service:

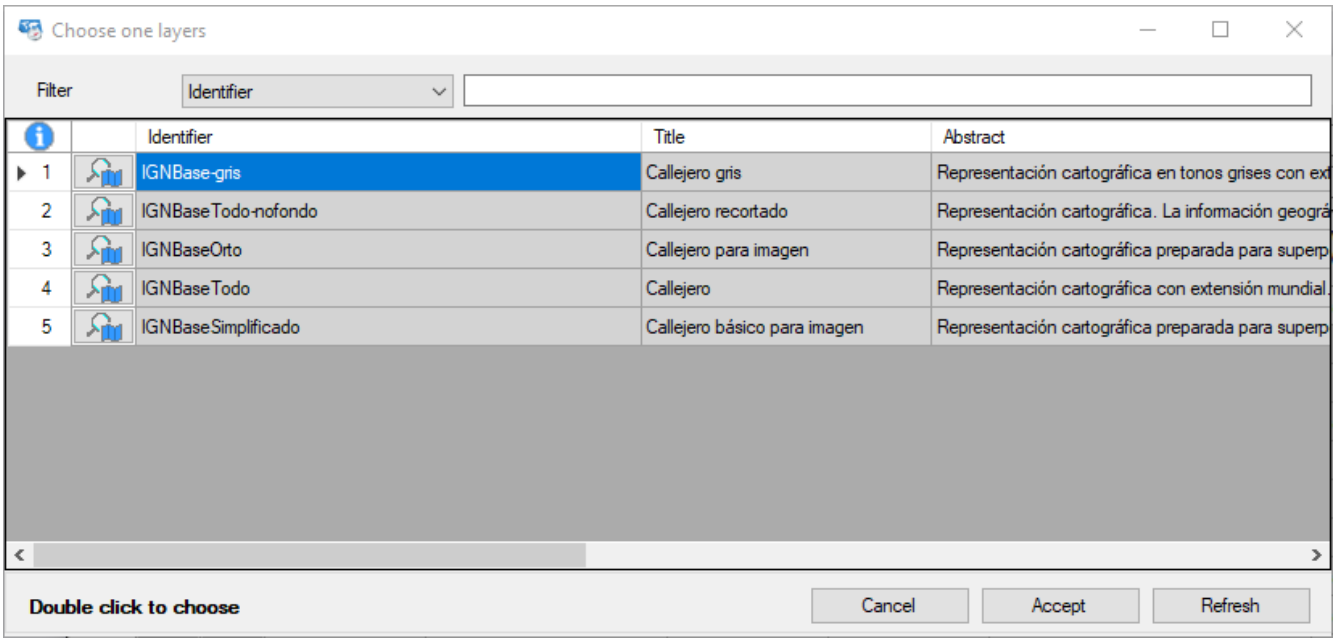


Map preview button: to preview the map layer centered on the coordinates specified on the previous page.

To select one or more layers, enter a number in the *Order* field.
The layers will be stacked in ascending order based on that field.

The *Clean* button deletes all selected layers.
The *Confirm* button acquires the information relating to the layers and returns to the List of maps servers.
The *Cancel* button closes the window without acquiring the data.

Below is an example of displaying the list of layers available for a WMTS service:



Map preview button: to display a preview of the map layer centered on the coordinates specified on the previous page.

To select a layer, double click on the corresponding row.

The *Confirm* button acquires the information relating to the selected layer and returns to the list of map servers.
The *Cancel* button closes the window without acquiring the data.

Save a map

Once the calibration procedure of a raster map, the creation of a vectorial map or the modification of the attributes of a map has been completed, you can save the new version of the map in a file.

Saving the map is activated using the *File - Save - Map* menu.
By default, the last open file (save as) is reproposed.

If the map is of the raster type, you can choose the map format by selecting the value in the *Save as* type box. The managed formats are listed in the following table.

Format	Extension	Raster	Vectorial	North oriented	Via GDAL
OkMap	.okm	X	X		
GeoTiff	.tif	X			
World file	.tfw,.jgw,.pgw,.gfw,.bpw	X			
Garmin custom map	.kmz	X			
Google Earth KMZ	.kmz	X			
Google Earth KMZ 2.2	.kmz	X			
Google Earth KML	.kml	X			
Google Earth KML 2.2	.kml	X			
JNX BirdsEye 3	.jnx	X		X	
JNX BirdsEye 4	.jnx	X		X	
OziExplorer	.map	X			
CompeGPS	.imp	X			
CompeGPS TwoNav	.rmap	X			
GPS TrackMaker	.gtm	X			
OruxMaps	.xml	X			
TomTom	.sat	X			
GpsTuner	.gmi	X			
Other formats	*	X			X

OkMap format

It is the native format with which OkMap works; it is used both for raster and vectorial maps.

If it is a raster map, the file must reside in the same folder as the image file.

The following information is saved in the OkMap (.okm) format file:

- Name and description of the map
- Geographical bounds of the map
- Image file name (only in case of raster map)
- Dimensions in pixels of the image file (only for raster maps)
- Projection / datum used and related parameters
- Characteristics of the grids
- Calibration points and their geographical coordinates (only in case of raster map)
- Direct and inverses coefficients of calibration (only in case of raster map)
- Vectorial data (a raster map can contain vectorial data)

The procedure is completely automated and no further information is required.

GeoTiff format

The GeoTiff format allows you to embed geographic references within a TIFF image in the form of metadata. Software that cannot interpret geographical references can still read the image contained within it.

A single file with the .tif extension is produced.

The procedure is completely automated and no further information is required.

World file format

It is a text file containing the georeferencing information of the map.
In particular it contains six coefficients for an affine transformation that describes the position, scale and rotation of the raster image on the map.
It does not contain any information on the projection and the datum used.

The file extension is assigned based on the following matches:

World file	Image file
.gfw	.gif
.jgw	.jpg
.pgw	.png
.tfw	.tif
.bpw	.bmp

If the image file extension is not in the table, the original extension is used followed by the *w* character.

Other than the World file, a ".prj" file is created containing information about the projection type and datum used by the map.

A window appears allowing you to indicate the type of WKT to be produced.

To end the saving procedure, press the *OK* button.
To cancel the procedure, press the *Cancel* button.

Garmin custom maps format

This format is used to produce maps to be used offline in many handheld GPS models produced by the Garmin manufacturer.

This is the same Google Earth KMZ format in which, however, constraints are imposed by the manufacturer:

- Maximum 100 tiles
- Maximum size of each tile = 1 megapixel (1024 x 1024 pixels)

If the size of the map does not allow these limits to be respected, OkMap will apply an optimally calculated reduction factor. However, this reduction factor may degrade the image quality if the original map is very large.

The procedure is completely automated and no further information is required.

Google Earth KMZ/KML format

The KML (Keyhole Markup Language) format is an XML-based language to represent both maps and navigation data (points of interest, tracks). In this case OkMap only saves the map.

The maps are divided into multiple cards to speed up the rendering process, especially in mobile devices.

Saving a map in this format takes slightly longer processing time as it is necessary to split the map image into different tiles.

The extension 2.2 allows to store the coordinates of the four corners of each tile instead of the only references north, east, south, west and the angle of rotation.
However, the format with 2.2 extensions is not always compatible with other software.

It is not necessary that the tiles are oriented to the north.

The xml file is saved in a file named *doc.xml* while the tiles are contained in the *files* folder and are generally in JPG format.

The KMZ format is the KML format (*doc.xml* + *files* folder) compressed in ZIP format but with a .kmz extension.

The parameters that can be set on the Preferences – Tiling page are:
- Format of tile images (JPG, TIF, PNG, GIF, BMP)
- Image quality (JPG only)
- Transparency (0-255 = opaque)
- Drawing order (0-100 = on top)
- Image resizing filter

The procedure is completely automated and no further information is required.

JNX BirdsEye 3 and 4 format

JNX files are used in Garmin devices to show raster maps by subscription to the Birdseye service.

The maps are split into multiple cards to speed up the rendering process in mobile devices.

Saving a map in this format takes slightly longer processing time because you need to rotate the map so that it is aligned to the north and split the resulting image into different tiles.

A single file with the extension .jnx is produced.

There are two types of format: 3 and 4. The format 4 differs from 3 because it allows to store the drawing order of tiles to manage any overlap between different maps.

The parameters that can be set on the Preferences – Tiling page are:
- JPG Image quality
- Scale (5 m-800 km)
- Drawing order (0-100 = on top)
- Image resizing filter

The procedure is completely automated and no further information is required.

OziExplorer format

The OziExplorer format is used by the homonymous software for Windows.

The image file of the map must have extension: .bmp, .tif, .jpg, .png, .cap, .ecw, .jp2.

A single file with the .map extension is produced.

The procedure is completely automated and no further information is required.

CompeGPS format

The CompeGPS format is used by the homonymous software for Windows.

The image file of the map must have extension: .jpg, .jpeg, .jp2, .png, .bmp, .gif, .tif, .tiff, .ecw.

A single file with the .imp extension is produced.

The procedure is completely automated and no further information is required.

CompeGPS TwoNav format

The CompeGPS TwoNav format is used by the homonymous GPS devices.

The maps are divided into multiple cards with 256 pixels each side in order to speed up the rendering process in GPS devices.

Saving a map in this format takes slightly longer processing time as it is necessary to split the map image into different tiles.

The parameters that can be set on the Preferences – Tiling page are:
- Image quality
- Image resizing filter

The procedure is completely automated and no further information is required.

GPS TrackMaker

The GPS TrackMaker format is used by the homonymous software for Windows.

A single file with the .gtm extension is produced.

The procedure is completely automated and no further information is required.

OruxMaps format

The OruxMaps format is used by the homonymous software for Android.

The maps are divided into multiple cards with 512 pixels each side in order to speed up the rendering process in Android devices.

A folder is created containing:

- an *OruxMapsImages.db* file in Sqlite format containing the images of the tiles, their position and the zoom factor
- a file with the extension *.otrk2.xml* in XML format contain the georeferencing information

Saving a map in this format takes slightly longer processing time as it is necessary to split the map image into different tiles.

The parameters that can be set on the Preferences – Tiling page are:
- Format of tile images (JPG, TIF, PNG, GIF, BMP)
- Image quality (JPG only)
- Image resizing filter

The procedure is completely automated and no further information is required.

TomTom format

This format is used to produce maps to be used offline in many GPS models produced by the manufacturer TomTom.

Saving a map in this format takes slightly longer processing time as it is necessary to split the map image into different tiles.

A folder is created containing:
- Tiles of 512 pixels on each side
- Files with the extension .sat (one for each tile) contain the georeferencing information of the corresponding tile

The parameters, that can be set on the Preferences – Tiling page, are:
- Format of tile images (JPG, TIF, PNG, GIF, BMP)
- Image quality (JPG only)
- Minimum and maximum zoom
- Image resizing filter

The procedure is completely automated and no further information is required.

GPSTuner format

The GPSTuner format is used by the homonymous software for Android and iOS.

The image file of the map must have extension: .jpg, .gif, .bmp, .png.

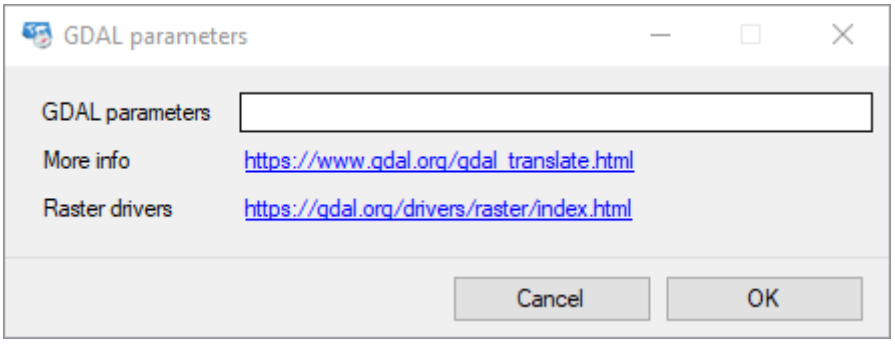
A file is produced with a .gmi extension containing georeferencing information.

The procedure is completely automated and no further information is required.

Other formats

This function save temporarily the map in GeoTiff format and then uses the GDAL raster library to convert the map from GeoTiff to the required format.

It’s possible add one or more GDAL parameters to be used in the translation process.
Parameters must be preceded by the “—config” directive.



In some cases, the parameters are suggested by default.
In the case of MbTiles maps, the GDALaddo program is used to add some layers relating to lower zoom levels.

To see the command parameters, visit this web page.
To see the supported file formats, visit this web page.

Press the *OK* button to save the map.
To exit the window without saving the map, press the *Cancel* button.

Modify a map

Change the calibration of a raster map

Changing the calibration of a raster map may be necessary when you notice that the georeferencing procedure does not produce good results.

This usually occurs when:

- You display a grid and note that this does not coincide with the one drawn above the map.
- You place the mouse on a grid intersection and the coordinates displayed in the status bar do not coincide with the real coordinates shown on the edge of the map.
- You place the mouse on a known point and the coordinates displayed in the status bar do not match the known ones.
- You use the *Utility - Google - Google Earth (map + GPX)* function and, using the transparency slider, you notice that there is not a good overlap between your own map and the Google Earth map.

This procedure also allows the modification of some characteristics of the map such as the name and description.

To change the calibration of a loaded raster map, use the *Management - Map parameters* menu.

The calibration modification procedure is completely identical to that described on the Calibrate a raster map page.

Modify a vectorial map

Modify a vectorial map can be useful for:

- Change the name and / or description of the map
- Change the geographical bounds of the map
- Change the datum
- Modify the projection and / or the related parameters

To change the characteristics of a loaded vectorial map, use the *Management - Map parameters* menu.

The editing procedure is completely identical to that described on the Create a vectorial map page.

The only difference is that the two buttons to set the bounds of the map may be active :

- *Copy vectorial data bounds* (if vectorial data is present)
- *Copy GPX bounds* (if GPX data are loaded)

The first button automatically fills the geographical bounds of the map using the geographical bounds of the vectorial data, limiting or extending the area covered by the vectorial map.

Similarly, the second button performs the same operation using the bounds of the loaded GPX data.

A small margin can be added to the boundaries of vectorial data or GPX data by checking the *Add a margin to the bounds* checkbox. This option allows you to better view the objects that are near the edge of the map.

Map image

Save the map image to file

It is used to obtain a copy of the map image with all the graphic elements drawn on it.

To obtain a copy of the map image use the *File - Save - Map image at the zoom level* menu or the *File - Save - Map Screenshot* menu.

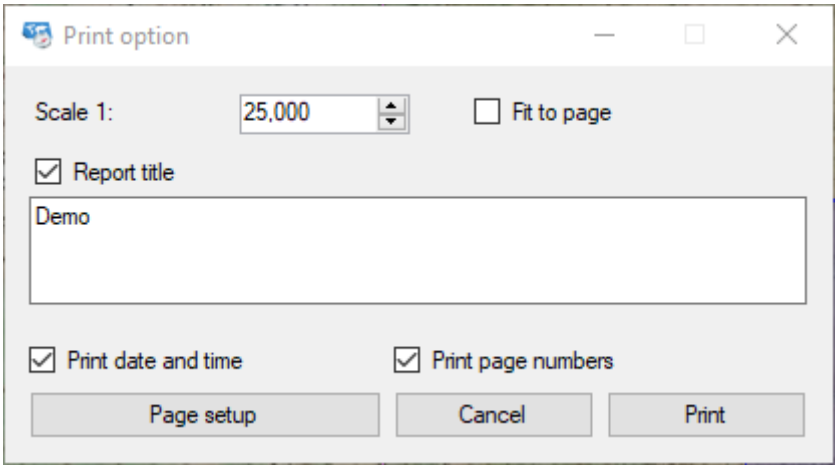
The first saves the entire image of the map at the current zoom level while the second only the map portion as it is displayed.

A dialog box for saving the image file is displayed. The supported formats are: tif, jpg, png, gif, bmp, wmf, emf.

Print the map image

It is used to obtain a print of the map image with all the graphic elements drawn on it.

To obtain the print of the map image use the *File - Print* menu.
A dialog box for choosing the print options to be used is displayed.



The options are self-explanatory.
You can change the print page settings using the *Page setup* button.

Copy the map image to the clipboard

It is used to obtain a copy in the clipboard of the map image with all the graphic elements drawn on it.

The image can later be pasted, for example, into an office document to create documentation.

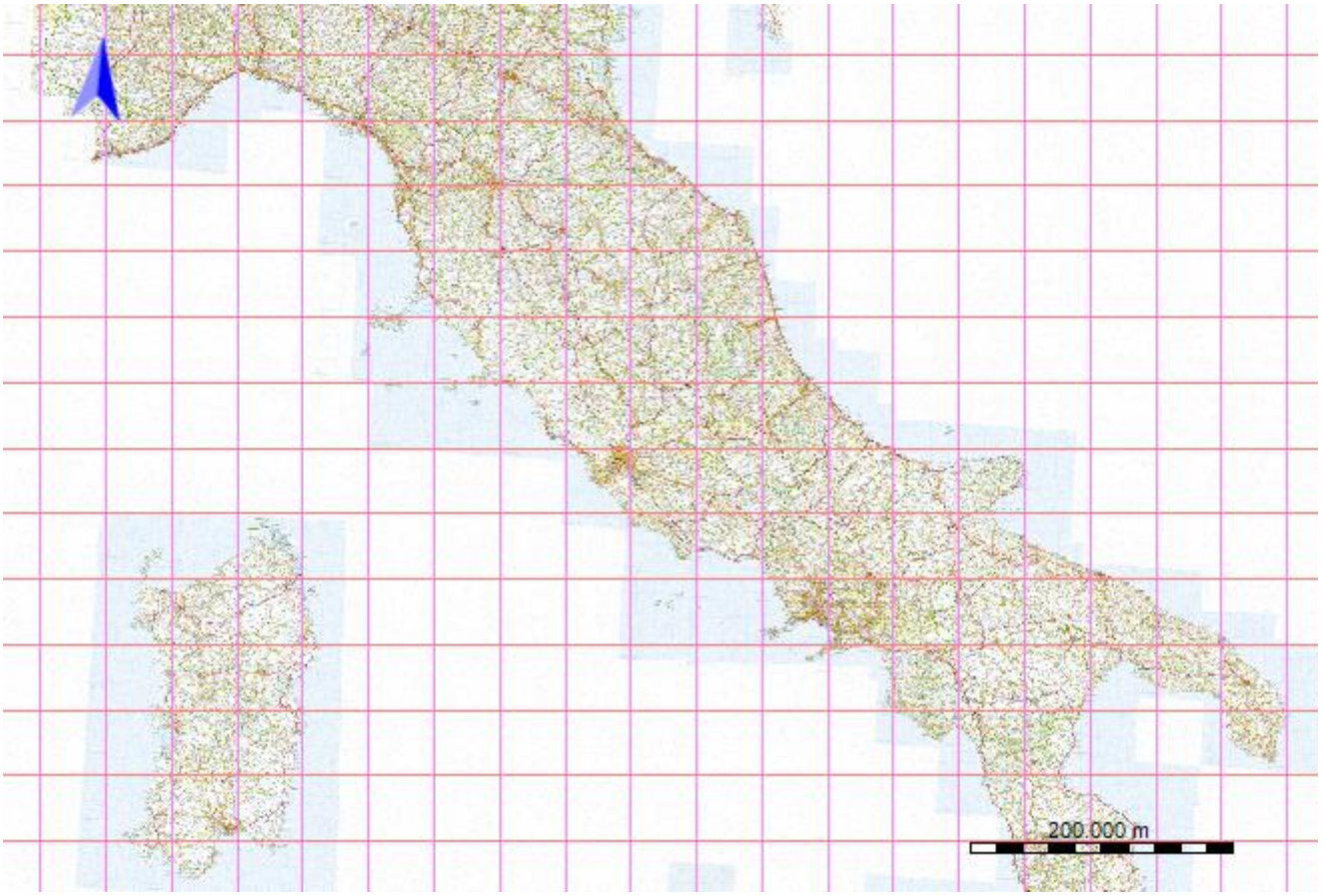
To obtain a copy of the image in the clipboard use the *File - Copy to clipboard - Map image at zoom level* menu or the *File - Copy to clipboard - Map screenshot* menu.

The first copy the entire image of the map at the current zoom level while the second only the map portion as it is displayed.

Grids

The grids constitute a series of lines parallel to the meridians and to the terrestrial parallels as those represented on the maps (geographical grid).

It is also possible to display a metric grid where the lines are equidistant from each other.



The grids can be drawn on all types of maps.

For web maps, the projection to be used in the metric grid design can be specified in the Preferences – Grids page.

Displaying grids allows you to quickly verify if a raster map has been calibrated correctly; in this case the lines drawn by OkMap will accurately match those drawn on the map.

Some maps show the geographic grid while others the metric one.

To display or hide grids, use the *View - Lat/Lon grid* menu or the *View - Metric grid* menu.

The grid display will take place only if the grid properties have been correctly indicated using the *Management – Map grid* menu.
The procedure is indicated in the section Grid setup.

If the indicated parameters produce a too dense grid, the design is deactivated, thus avoiding a degradation of the performances. To reactivate the grid display, you must first change its properties.

A denser sub-grid can be displayed in light gray color.
The sub-grid can be displayed for both the geographic grid (divided into 6 parts) and the metric grid (divided into 10 parts).

DEM data

The acronym DEM stands for Digital Elevation Model or a digital representation of the Earth's surface.

There are different formats of DEM data; in particular OkMap uses the following formats:

- SRTM-3 with a resolution of 3 arc seconds (about 90 meters)
- SRTM-1 with a resolution of 1 arc second (about 30 meters)

The acronym SRTM stands for Shuttle Radar Topography Mission. This project was carried out by NASA (National Aeronautics and Space Administration) and the NGA (National Geospatial-Intelligence Agency).

OkMap uses, for example, DEM data for:

- Know the altitude above sea level of each point on the map
- Assign the relative altitude to each GPX point (waypoint, track point)
- Calculate the minimum and maximum altitude and the uphill and downhill differences in a track
- Build the graph on the progress of the altitude in a track

The files have the extension .hgt and have the name made according to the following format:

- Hemisphere (1 character N/S)
- Latitude (2 numeric characters)
- East / West (1 character E/W)
- Longitude (3 numeric characters)

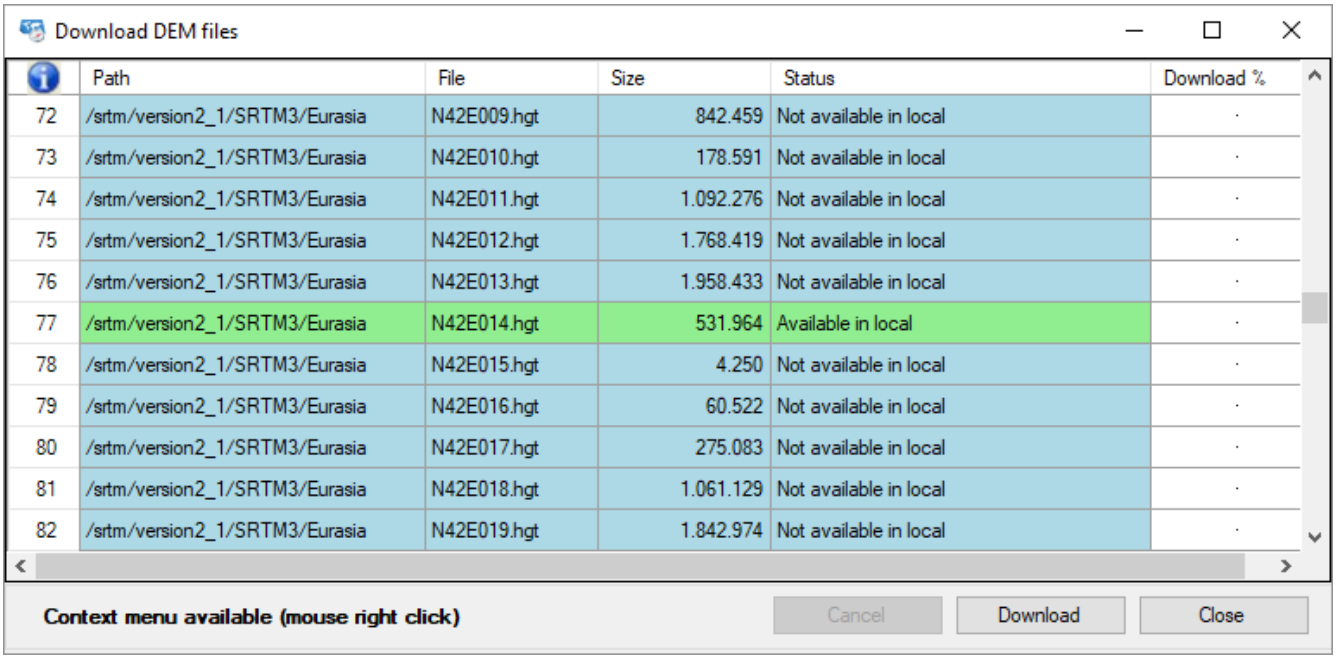
There is a function to download the DEM data needed to cover a previously loaded map.

Download the DEM data

To download the DEM files needed to cover the current map, use the *Management - Download DEM files* menu.

A window containing a table with the following information is displayed:

- *Path*: relative path of the file on the site
- *File*: name of the DEM file
- *Size*: DEM file size in bytes
- *Status*: available locally, not available locally, download in progress ...
- *Download %*: progress of download in percentage



For more information on the general use of tables, see the section Data tables.

To start downloading files, press the *Download* button. During the download process, the progress bar with the percentage of completion is shown in the *Download %* column.

The download can be canceled at any time by pressing the *Cancel* button; the cancellation will take place at the end of the download of the current file.

The colors of the lines give status information:

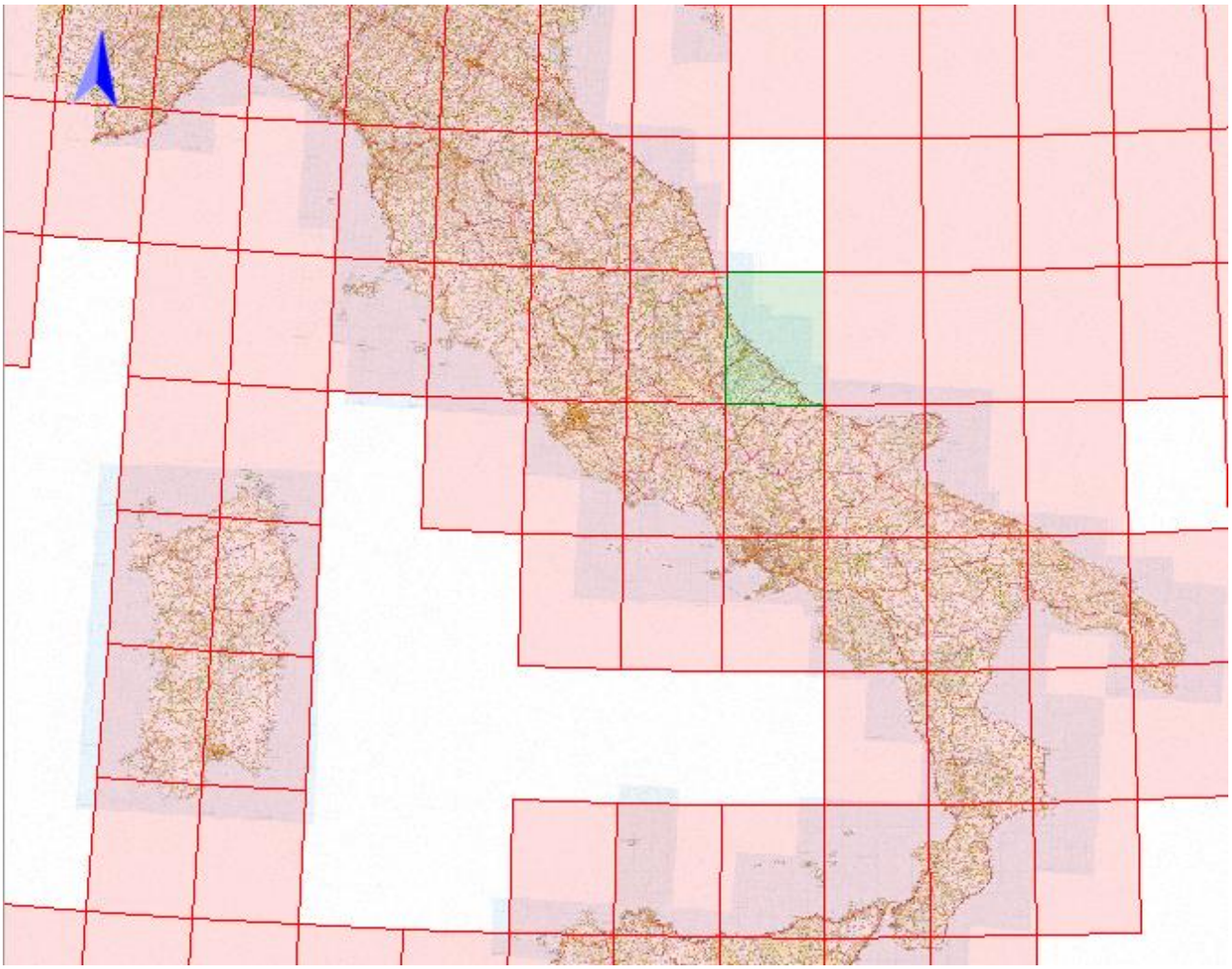
- Green - Available locally
- Light blue - Not available locally (so to download)
- Yellow – Download in progress

Downloading a single DEM file is possible with a context menu function after view DEM data bounds.

View DEM data bounds

It allows to display on a map the rectangles that represent the limits of the DEM data available locally or not.

To view the geographical bounds of DEM files, use the *View – Bounds – View DEM bounds* menu.



You can display / hide the names of the DEM files using the *View – Bounds – View DEM labels* menu.

If the auto info function is activated (*Home – Auto info* menu), placing the mouse inside the boundaries of the DEM data, a box is displayed containing the name of the file and whether available locally or not.

In any case, to view information on DEM files, you can use the right mouse button and select the *Info - dem...* context menu.

To download a single DEM file, use the *Download - dem...* context menu.

To download multiple DEM files at the same time, see the section Download the DEM data.

Working with maps

Change the scale / zoom

The image of a raster map can be zoomed in or out using the zoom factor. The 100% zoom factor indicates that the image is displayed in full size. When the zoom factor is increased, the image is enlarged, and vice versa is reduced.

Likewise, for a vectorial map, the scale is defined which indicates how many meters are represented by a pixel. Decreasing the number of meters represented by a pixel will result in an enlargement of the image, vice versa this will be reduced.

For a web map, the zoom factor is defined by an integer that is, in OkMap, between 4 and 20. The lower the zoom value, the greater the area covered by the web map and vice versa.

To change the zoom level (raster or web map) or scale (vectorial map) you can use the mouse wheel forward or backward.

Alternatively, you can use the Home - *Zoom* - *Zoom + / -* menus for raster or web maps and the *Home* - *Zoom* - *Scale + / -* menus for vectorial maps. In the case of raster or vectorial maps you will get an increase / decrease of the zoom / scale factor of 20%, while in the case of web maps the zoom level will be increased / decreased by one unit.

Through the menu *Home* - *Zoom* - *Fit on page* you will get a zoom / scale level such that the map will be shown entirely in the space provided by the window; this function does not make sense for web maps.

The *Zoom* and *Scale* menus also provide some default levels.
Example:
- 50%, 100%, 120%, etc... for raster maps
- 100 m / pixel, 1 km / pixel, etc. for vectorial maps
- 4, 5, 6, ... 20 for web maps

You can use the left mouse button while holding down the *Alt* key to draw a rectangle by which to zoom the map.

Finally, you can zoom in on a set of selected objects (vector data, waypoints, tracks, routes, photos, toponyms) with the *Home* - *Zoom* - *Zoom on selected* menu.

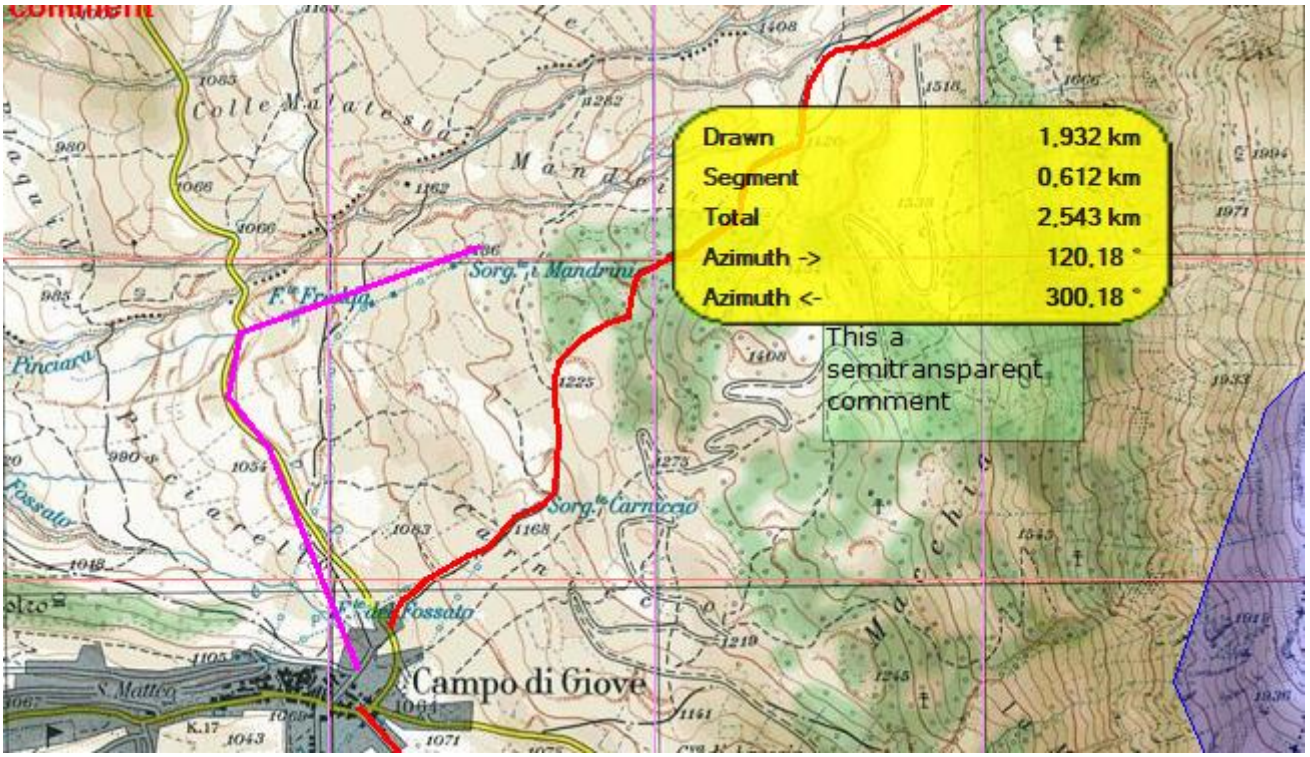
Moving the map

If the zoom or scale factor is such that the displayed image is only a portion of the entire map (this is always true for web maps), you can move the image in 4 directions, by selecting the *Home* - *Tools* - *Select* menu and using one of the following methods:

- Press the left mouse button and drag it.
- Use the 4 arrows on the keyboard.
- Double click with the left mouse button on a point on the map; this function moves (if possible) the point in the central position of the map area.
- Use the mini-map (in case of raster maps)
- Position the mouse on the edges of the map or on the corners and press the left mouse button; this mode is also possible when the *Select* tool is not selected.

Distance calculation

This function is used to calculate the distance between two or more points directly on the map with the aid of the mouse.



To activate the distance calculation function, use the *Home - Tools - Distance* menu; click with the left mouse button on the map to indicate the starting point; then indicate, by the same method, the intermediate points and the end point.

On the map a broken line is drawn which unites the points drawn and which represents the path to be measured; the characteristics of the line and the unit of measure of the result can be customized with the Preferences - Distance, area function.

The calculated measure is shown at the bottom in the status bar - map.

If the distance of the single section is less than 100 km, the visible part as the crow flies is colored in green while the non-visible part is colored in red. If the section exceeds 100 km, it is colored fuchsia.
The colors can be customized with the Preferences - Distance, area feature.

If the *Home - Auto info* menu is active, a box with the following information is displayed during distance drawing:

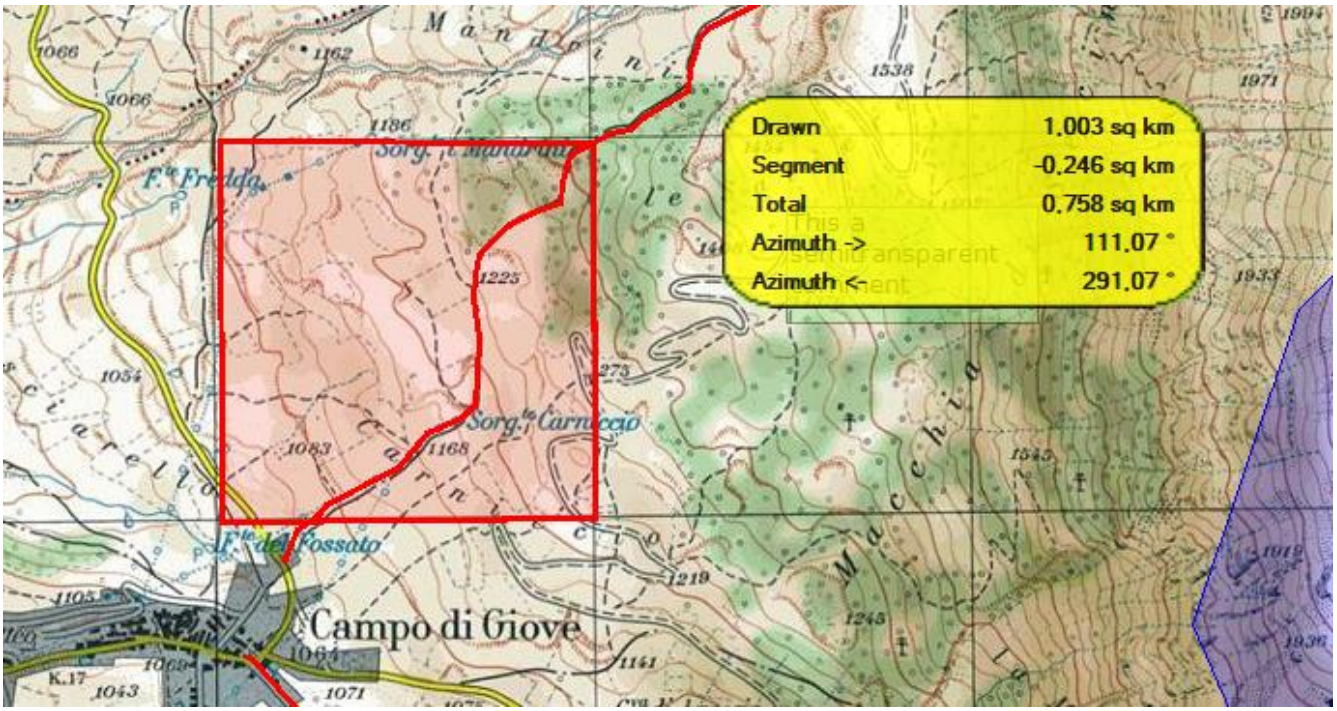
- Calculated distance
- Delta distance to the cursor position
- Total distance (sum of previous values)
- Direction of the cursor from the last point
- Inverse direction

If you hold down the left mouse button and drag the pointer, the points are added in succession automatically (*freehand* drawing). The distance between points is the same as used to create tracks and defined in the Preferences – Tracks function.

To cancel the measurement and the line on the map use the *Home - Tools - Reset distance and area* menu.

Area calculation

This function is used to calculate an area directly on the map with the aid of the mouse.



To activate the area calculation function, use the *Home - Tools - Area* menu; click with the left mouse button on the map to indicate the first node of the polygon; then indicate, with the same method, the remaining nodes of the polygon.

On the map a polygon is drawn that identifies the area to be measured; the characteristics of the line and the unit of measure of the result can be customized with the function Preferences - Distance, area function.

The calculated measure is shown at the bottom in the status bar - map.

If the *Home - Auto info* menu is active, a box with the following information is displayed during the area drawing:

- Calculated area
- Delta area at the cursor position
- Total area (sum of previous values)
- Direction of the cursor from the last point
- Inverse direction

To cancel the measurement and the polygon on the map use the *Home - Tools - Reset distance and area* menu.

Cursor functions

The cursor functions can be activated via the context menu (right mouse button) on the current map and act on the indicated point.

Copy the coordinates

Activates with the *Coordinates - Copy Coordinates* context menu.
The coordinates of the point are copied to the clipboard in internal format for the exclusive use of OkMap.

For example, they can be pasted to other places where entering of coordinates are requested.

Using the *Coordinate - Copy Coordinates (text format)* menu, you can copy the coordinates of the point in the clipboard in text format for uses outside the OkMap software.

Set coordinates

It is activated with the *Coordinates - Set coordinates* context menu.
A placeholder icon appears as when searching for a point on the map with the *Find - Coordinates* menu.

It can be useful for creating a temporary placeholder.

To avoid the display of the icon on the map use the *Find - Reset coordinates* menu.

Save a waypoint

It is activated with the *Coordinates - Save waypoint* context menu.
A new waypoint is saved in the current GPX file with the name set to a progressive number.

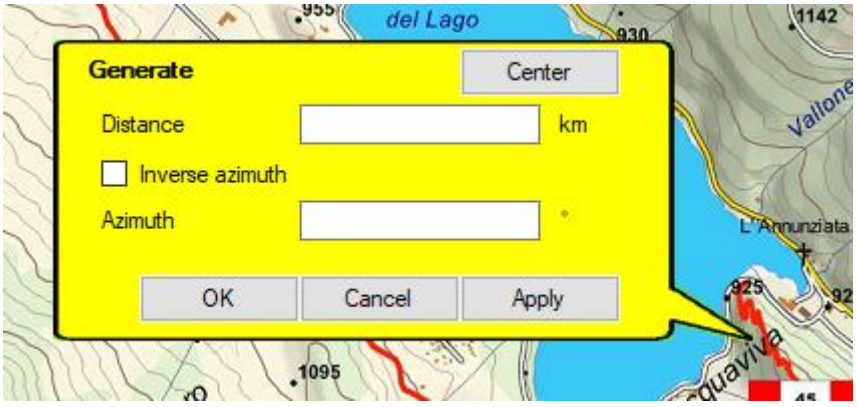
Save a toponym

It is activated with the *Coordinates - Save toponym* context menu.
A new toponym is saved with the name set to a progressive number.

Generate a waypoint

It is activated with the *Coordinates – Generate waypoint* menu.
It can be used to create a waypoint from the selected point knowing the distance and direction.

A form is displayed to request the generation parameters.



The required parameters are:
- Distance: it is the distance of the waypoint to be generated from the selected point
- Inverse Azimuth: Select the item if you want to insert the 180 ° complement in the Azimuth item.
- Azimuth: is the direction (or reverse direction) of the waypoint to be generated from the selected point

Find the maps

It is activated with the *Coordinates - Find maps* context menu.
This function can only be activated if the maps have been indexed first (see paragraph Indexing maps).

The window shown in the paragraph List the available maps appears.
All indexed maps containing the selected point are listed.
To open a map, double-click on the corresponding row.

Find waypoints, routes, tracks

It is activated with the *Coordinates - Find waypoints, routes, tracks* context menu.
This function can only be activated if the waypoints, routes and tracks files have been indexed first (see paragraph Indexing the files of waypoints, routes, tracks).

The window shown in the paragraph List the files of waypoints, routes, tracks appears.
All indexed files containing the selected point are listed.
To open a file, double-click on the corresponding row.

Download DEM

It is activated with the *Coordinates – Download DEM* context menu.
The DEM elevation data relating to the selected point are downloaded locally.
It is necessary that:
- DEM data is available for the selected point (ex: they are not available in the open sea)
- DEM data is not already available locally

A progress bar indicates the progress of the download.

Show compass

It is activated with the *Coordinates – Show compass* context menu.
A compass is shown on the map.

The compass color can be customized on the Preferences - Maps page.

To hide the compass, use the *Coordinates – Show compass* context menu again.

Geocoding information

It is activated with the *Coordinates - Geocoding info* context menu.
A window containing information about the selected location is displayed.

Geotag photos

It is activated with the *Coordinates - Photo geotag (multi)* context menu.
The *open file* dialog opens to select one or more photos.
The *latitude*, *longitude* and, if available, the *altitude* tags, related to the coordinates indicated on the map, will be saved in the selected photos.

External services

Launches external utility services focused on the indicated coordinates such as: maps, mountain profiles, weather forecasts, declination calculation, starry sky, etc.

Object rendering

Lock objects on the map

The objects on the map are blocked by default and they cannot be moved with the mouse. This is to prevent objects from being unintentionally moved.

To unlock / block objects on the map use the *Home - Lock objects* menu.

To learn how to move objects, refer to the paragraph Moving an object.

Auto info

The auto info mode can be activated or not with the *Home – Auto info* menu.
If activated, when you place the cursor on an object drawn on the map, a window automatically appears showing its main characteristics.

Redraw

In some circumstances it may be necessary to force the rendering of the objects drawn on the map.

To do this use the *Home – Refresh* menu.

Search functions

Search for objects on the maps

To locate an object on the opened maps, perform the following steps:

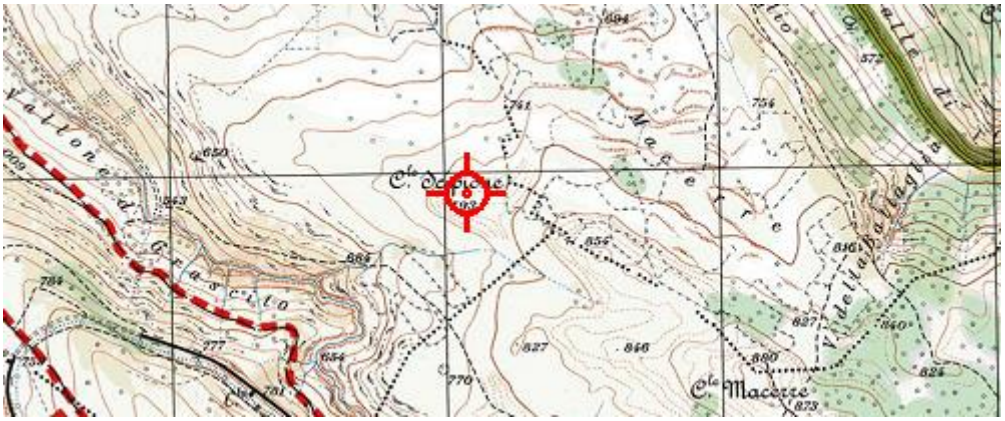
- Open (if not already opened) the File manager window using the *Home – File manager* menu.
- Expand the *Waypoints, tracks, routes* / Toponyms / Photos node.
- Click with the right mouse button on the file containing the object to search
- Choose *List waypoints* / *List tracks* / *List routes* / *List toponyms* / *List photos* context menu
- Click with the right mouse button on the row of the list containing the object to locate on the current map (for tracks click on a track point and for routes click on a route waypoint)
- Choose *Find on opened maps* context menu.
- In the opened maps a red viewfinder will appear in the point where is positioned the object searched (if the map contains it)

Find coordinates / places

To find a geographical point on a map, you can use the *Home – Find - Coordinates / place* menu.

The Coordinates selection window appears, to which a special paragraph is dedicated.

Once the coordinates have been selected, if the point is inside the current map, a red icon will be displayed at the point identified and the map will be centered accordingly.



To avoid displaying the icon on the map use the *Home - Find – Reset* menu.

Reset found coordinates

To reset the found coordinates use the *Home - Find – Reset* menu.

The red viewfinder designed on the opened maps will disappears.

Search for maps

Prepare maps indexing

With the indexing function you can create a file with a list of all the maps available in your archives, each with its own characteristics.

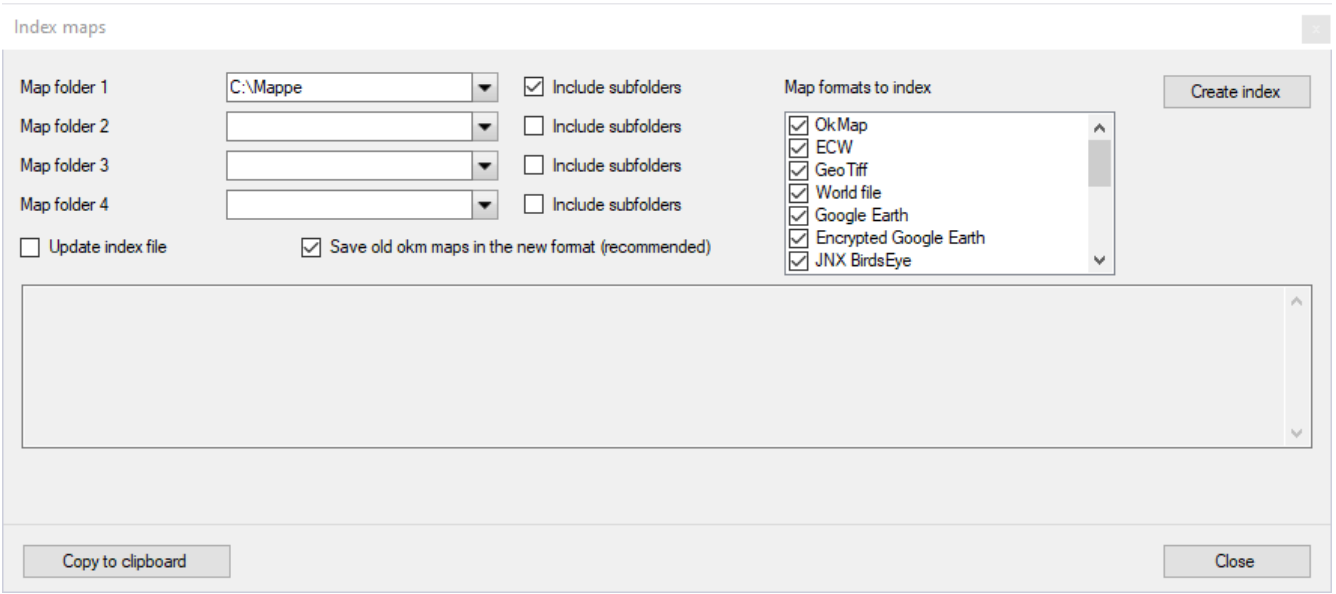
Once this file is built, you can list the available maps or view the map limits on a general map.

To index the maps perform the following steps:

- Use the Preferences - Maps function to indicate, in the *Map folder 1/4* fields, the folders where the maps are stored (you can indicate up to four different folders). You can use the ... buttons to open a dialog for choosing the folder.
- If necessary, click on the *Include subfolders* fields to indicate whether the search should also be extended in the relevant sub-folders.
- Indicate in the adjacent list which map formats you want to index (extending the search to tiled maps can affect the performance of the indexing function).
- Confirm the changes made with the *OK* button.

Index the maps

This function is activated with the *Utilities - Index maps* menu.
Before activating this function, make sure you have carried out the preparation operations.



The folders containing the maps to be indexed are proposed as indicated in the *Preferences - Maps*. It is possible to modify or add folders up to a maximum of 4.

The *Update index file* indicator specifies whether the maps found should be added to those already indexed or not. If the file is updated, the maps already present in the index will be updated while the maps that no longer exist will be deleted from the index itself.

The *Save old okm maps in the new format* indicator allows you to automatically update the maps in OkMap format from the old version 1.1 to the new version 2.1. This new format stores the codes and descriptions of the official EPSG database (strongly recommended).

To activate the indexing function, press the *Create index* button.
At the end of the processing will be shown in the central panel any maps that have not been indexed for any format problems.
This text can be copied to the clipboard with the *Copy to clipboard* button.
To close the window, use the *Close* button.

List the available maps

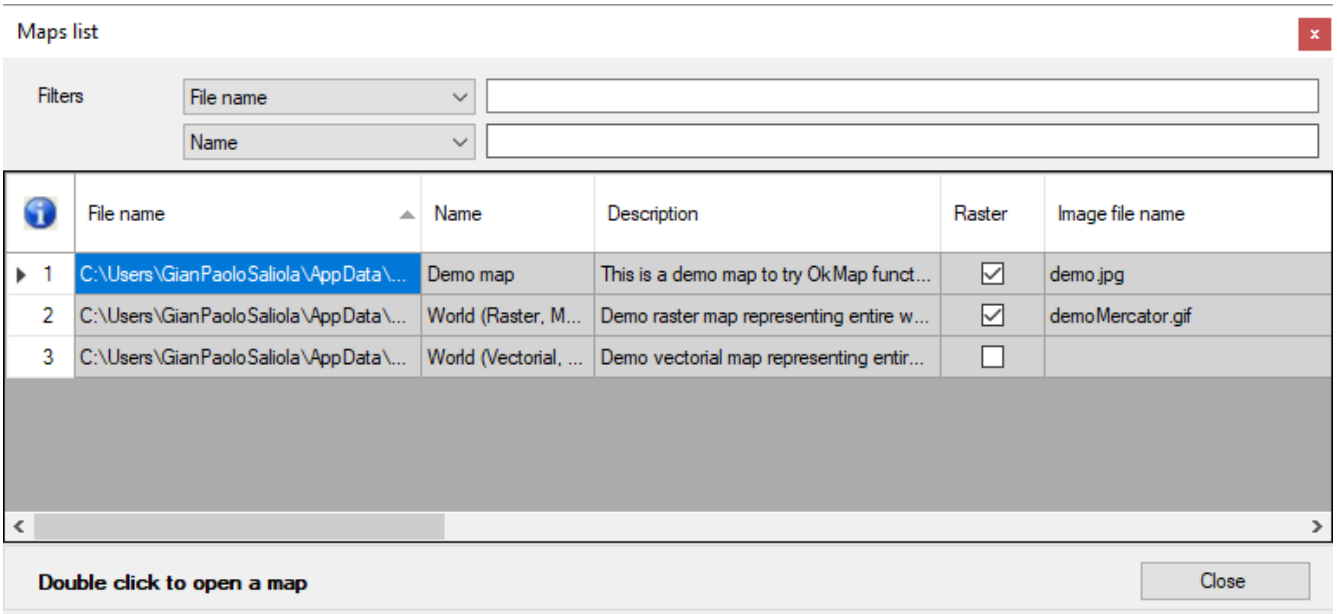
It lists all the characteristics of the indexed maps and eventually allows you to choose a map to open.

To view the list of maps it is first necessary to carry out the preparation and indexing operations.

To view the list of indexed maps, use the *Home – List indexed files - List maps* menu.

A table is displayed containing the following information:

- File name
- Last edit
- Map name
- Map description
- Indicator if raster map (or vectorial)
- Image file name (if raster)
- EPSG code and CSR
- EPSG code and Datum
- EPSG code and Projection
- Size in pixels of the map (if raster)
- Area covered by the map
- Geographical bounds of the map



To load a map, *double-click* with the left mouse button on the corresponding row.

For more information on the general use of tables, see the section Data tables.

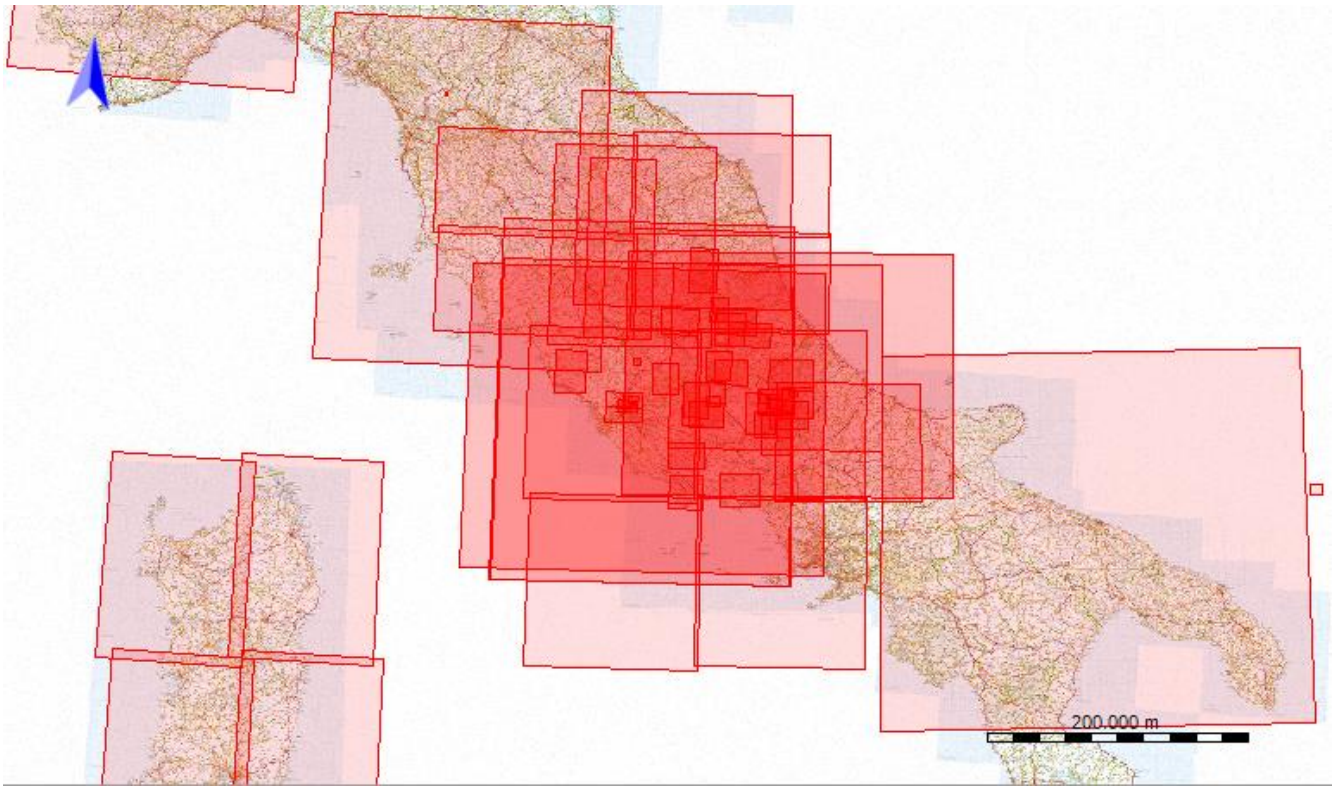
To exit the function, press the *Close* button.

Alternatively, you can use the *Home – List indexed files – List maps by position* menu. This function, before displaying the list of maps, interposes a window where you can indicate a geographical position to limit the list to the only maps whose bounds contain this position (see paragraph Coordinates selection).

View the maps bounds

It allows to display the limits of the maps indexed on a general map of great extension.

To view the limits of the indexed maps use the *View - Bounds - View maps bounds* menu.



To view the limits of the maps, it is first necessary to carry out the preparation and indexing operations.

You can display / hide map names using the *View - Bounds - View maps labels* menu.

If the auto info function is activated (*Home – Auto info* menu), positioning the mouse inside the borders of the maps, a box is displayed containing the name, description and file of the relative map.

In any case, to view information on the map, you can use the right mouse button, click inside the borders of a map and select the *Info - map...* context menu.

To open a map use the *Open - map...* context menu.

Find a map

You can find maps adjacent to the current map using the *Home - Find maps* menu.

Through the submenu it will be possible to specify the search direction:

- *To the north*
- *To the south*
- *To the east*
- *To the west*
- *To the center*

The *To the center* submenu searches for maps that partially overlap with the loaded map.

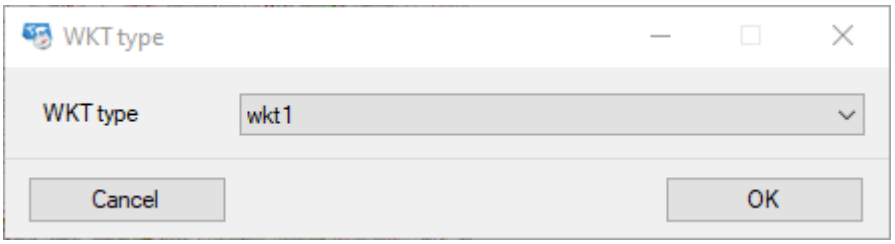
The result of the search is shown in a window identical to that described in the paragraph List the available maps.

To find the maps, it is first necessary to carry out the preparation and indexing operations.

Create a WKT file

With this function it is possible to create a WKT file containing the georeferencing specifications of a map or vector file.

A wizard similar to the one used in calibrating a map appears.
The first window is used to acquire the WKT file format.



WKT files are saved with the ".prj" extension.

Display / hide objects

On the map are displayed a series of graphic objects that can be hidden or not according to their type.
Some of these objects are characterized by labels that can be displayed or not.
Labels cannot be displayed if the corresponding object is not displayed.

To do this use the *View* menu and then the type of objects you want to display / hide.

The default settings of these menus can be stored in the Preferences – View page.

The objects that can be displayed / hidden are:

- Map north
- Map scale
- Navigation
  - Proximity circle
  - Bearing
- Waypoints, routes, tracks
  - Waypoints
  - Waypoints proximity circle
  - Waypoints labels
  - Routes
  - Routes wpt proximity circle
  - Routes labels
  - Tracks
  - Tracks last position
  - Tracks proximity circle
  - Tracks bands
  - Tracks bearing
  - Tracks labels
- Map features
  - Toponyms
  - Photos
  - Map icons
  - Map comments
- Vectorial data
  - Vectorial data
  - Vectorial labels
- Grids
  - Lat/Lon grid
  - Lat/Lon grid labels
  - Metric grid
  - Metric grid labels
- Georeferencing points

Vectorial data, themes and shapes

Vectorial data allow you to define *vectorial graphics* by which it is possible to describe an image (in our case a map).

Vectorial data consists of simple elements (shapes) such as points, multipoints, lines, polygons and pies, coded and stored on the basis of their geographic or metric coordinates.

A point (or a multipoint) is identified through its own coordinates (or the coordinates of the individual points that constitute a multipoint), while a line or a polygon through the coordinates of its own nodes.

Points (or multipliers) are typically used to describe territorial elements such as wells, piles, trees; the lines to describe roads, railways, rivers, level curves; polygons to describe buildings, lakes, borders of cities, regions, nations.

Some common operations that also affect the shape have been described in the section Operations ob objects.

Vectorial themes

Generally, vectorial data is classified into themes so as to group all roads, buildings, rivers, etc...

The purpose of this classification is also to be able to assign different graphic layouts to each vectorial theme. The graphic layouts define, for example, the colors, the thickness of the lines, the fill colors (backgrounds), etc...

All the shapes belonging to a vectorial theme inherit their graphic properties, unless they are attributed to the single shape.

Moreover, thanks to this classification, you can select which vectorial themes to draw graphically (rendering).

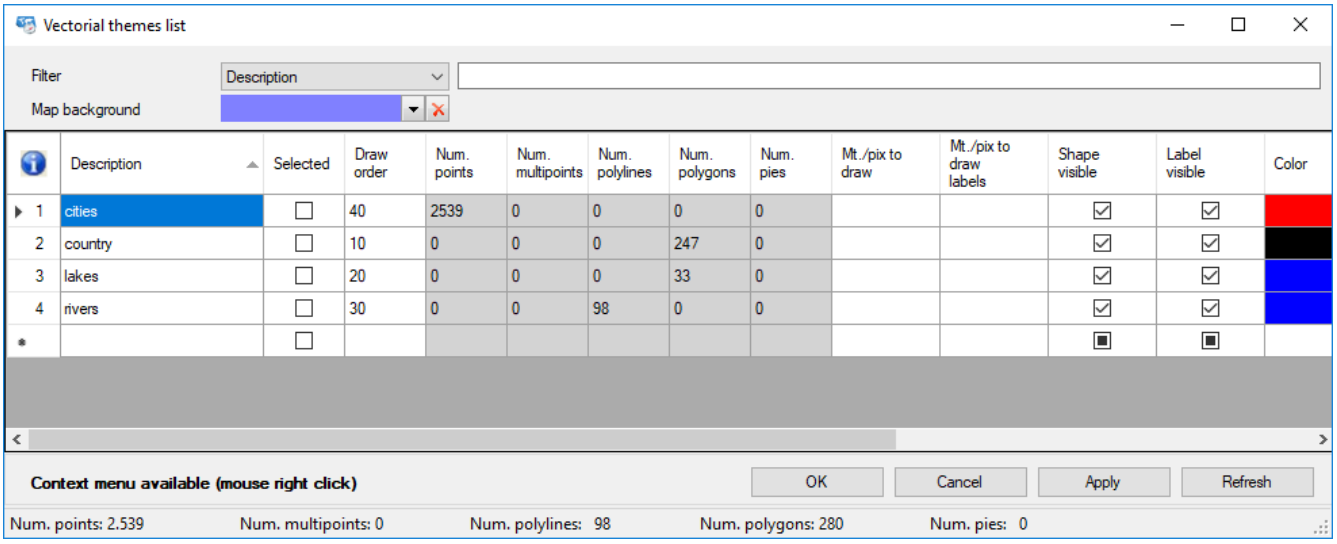
List of vectorial themes

Through this function you can modify the properties of vectorial themes, delete one or more themes and create new ones.

To get the list of vectorial themes use the *Management – List themes* menu.

The information displayed in this window are:

- Description of the theme (unique)
- Selected (Yes/No)
- Draw order
- Number of points (not editable)
- Number of multiples (not editable)
- Number of lines (not editable)
- Number of polygons (not editable)
- Number of pies (not editable)
- M/pixel to draw
- M/pixel to draw labels
- Shape visible or hidden
- Label visible or hidden
- Color of the shape
- Thickness of the line
- Pattern of the line
- Fill color of the shape
- Opacity of the shape fill color
- Font label of the shape
- Rotation of the text



In this function you can change the background color of the map.
It is also possible to select a theme or not by modifying the value contained in the *Selected* column; selecting a theme allows you to create new vectorial objects belonging to it; for this reason you can select only one theme at a time.

For more information on the general use of tables, see the section Data tables.

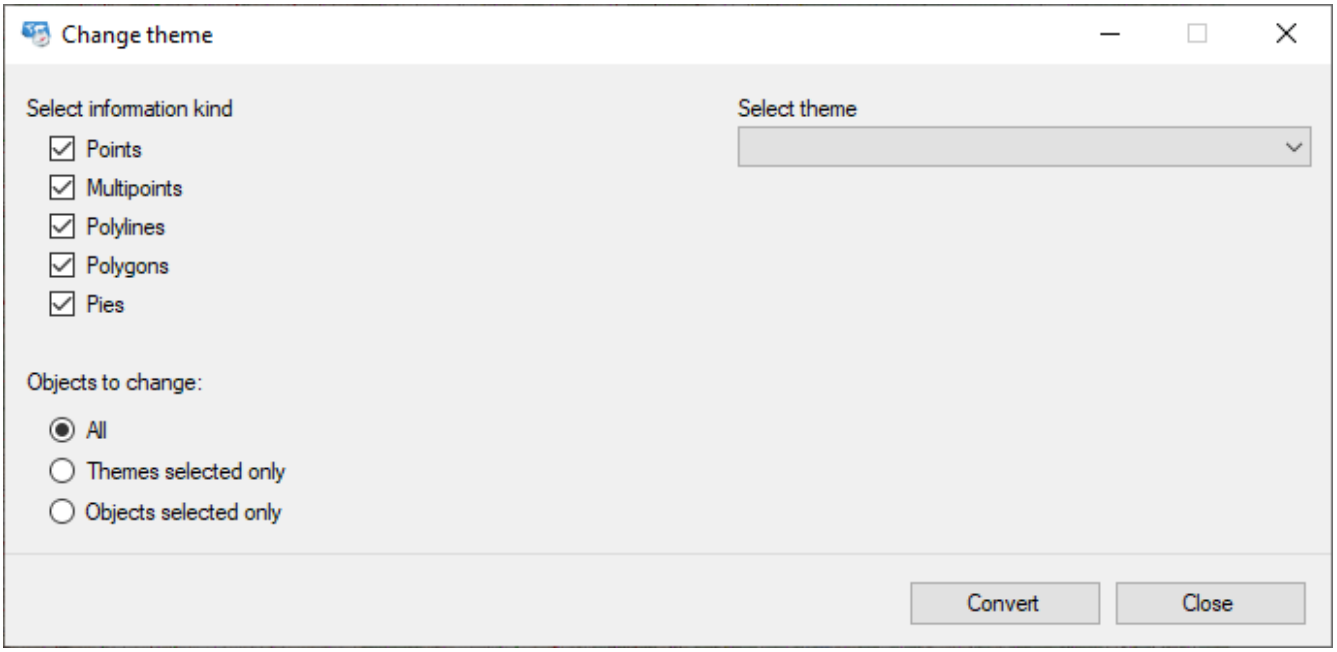
At the bottom of the window there is a status bar which shows the number of total shapes by type.

To save the modified data and exit the function, press the *Ok* button.
To exit the function without saving the data, press the *Cancel* button.
Press the *Apply* button to save the modified data.
To refresh the list, press the *Refresh* button.

Change theme

You can use this function to move vectorial data from a theme to another one.

To activate the function use the *Management – Change theme* menu.



Select the types of vectorial data you want to change (points, multipoints, lines, polygons and/or pies).

Choose if you want to change:
- All vectorial data
- Those related to selected themes
- Only the selected shapes

Finally choose the new theme to be assigned to the selected vectorial data.

To move data from the original theme to the new one, press the *Convert* button.
To exit the window, press the *Close* button.

Shape

Shape of type point

The *point* belongs to the category of vectorial objects (shape).

A point is identified through its own coordinates; it is generally used to describe point-like territorial elements such as wells, piles, trees.
The properties of a point are:

- Membership vectorial theme
- Label
- Visible (Yes/No)
- Geographic coordinates

Shape of type multipoint

The *multipoint* belongs to the category of vectorial objects (shape).

A multipoint consists of a set of points; it is generally used to describe multiple point-like territorial elements such as poles, trees.
The properties of a point in a multipoint are:

- Membership vectorial theme
- Label
- Visible (Yes/No)
- Geographic coordinates

Shape of type line

The *line* belongs to the category of vectorial objects (shape).

A line (open broken line) consists of a set of points that define its own nodes; it is generally used to describe territorial elements such as roads, railways, rivers, level curves.
The properties of a line are:

- Membership vectorial theme
- Label
- Visible (Yes/No)
- A list of points (nodes) with the following properties:
    - Geographic coordinates

Shape of type polygon

The *polygon* belongs to the category of vectorial objects (shape).

A polygon (closed broken line) consists of a set of points that define its own nodes; it is generally used to describe territorial elements such as buildings, lakes, city boundaries, regions, nations.
The properties of a polygon are:

- Membership vectorial theme
- Label
- Visible (Yes/No)
- A list of points (nodes) with the following properties:
  - Geographic coordinates

Shape of type pie

The *pie* belongs to the category of vectorial objects (shape).

A cake consists of a circular sector possibly divided by several circumferential arcs.
The properties of a pie are:

- Membership vectorial theme
- Label
- Visible (Yes/No)
- Starting angle
- Total angle
- Radius
- Number of circles
- Number of segments

Import and export vectorial data

Import vectorial data

Importing vectorial data means to include vectorial data from another source in the current map by converting, if necessary, projection and reference datum.

The import is activated with the *Management - Import - Vectorial data (multi)* menu.
A dialog opens which allows one or more files to be opened.

The type of input data can be as follows:

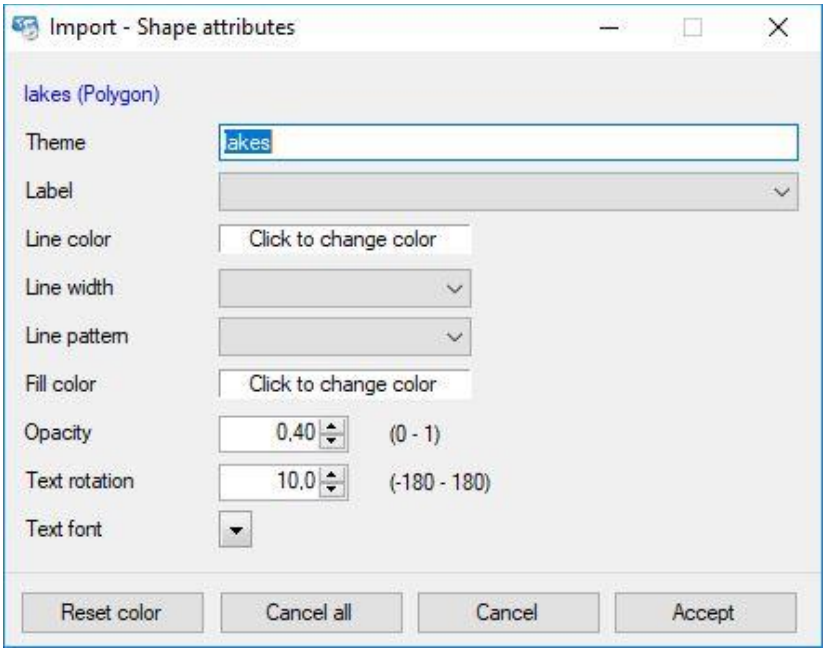
Format	Extension
OkMap	.okm
ESRI shape file	.shp
OpenStreetMap	.xml

Before importing the data, it is necessary to create a vectorial map or to load a raster or web map.

If you load a web map, since it cannot be saved directly locally, it is possible to save the vector data with the Export vectorial data function.

The following procedure is used only in the case of ESRI shape file.

Some attributes are required for creating vector themes.
A vectorial theme is created for each imported file.



For each imported file / vectorial theme, the following is required:

- The name of the theme (if it already exists, replacement is asked).
- The field of the .dbf database linked to the .shp data containing the label to be assigned to each shape.
- The color to assign to the shape.
- The thickness of the line to be used in the shape design.
- The pattern of the line to be used to draw shapes.
- The fill color (pattern) to assign to the shape.
- The opacity of the fill color.
- The rotation in degrees of the labels text.
- The font and color to be used to draw the labels text.

The *Reset color* button cancels the color choices made in *Shape color* and *Fill color* boxes.

The *Cancel All* button cancels the choices made for the current theme and skips the request for all the following themes (file .shp).

The *Cancel* button cancels the choices made for the current theme and switches to the next theme (.shp file).

The *Accept* button accepts the choices made for the current theme and switches to the next theme (.shp file).

Export vectorial data

To export vectorial data in OkMap format use the *Management – Export – Vectorial data* menu.

A dialog opens which allows you to select the file where to export data.

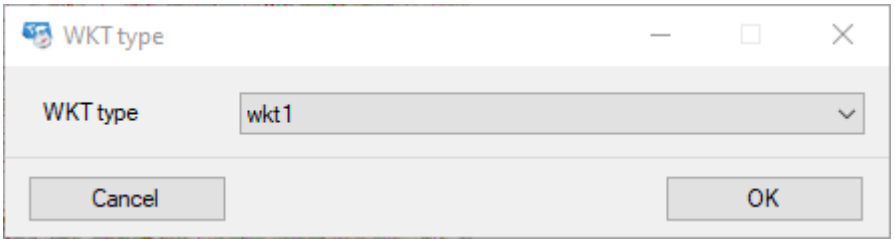
An OkMap vectorial map will be produced and this can be used to import itself into another map (raster or web) or load as a new vectorial map.

Export ESRI shape vectorial data

The export of ESRI shape vectorial data is activated via the *Management - Export - SHP vectorial data* menu.

A dialog box is opened to select the folder in which the ESRI shape files will be saved.

A window is then opened that allows the acquisition of the WKT file format to be produced.



For each existing vectorial theme, four files will be created, according to ESRI standards, with the extension .shp, .dbf, .shx and .prj (containing the WKT specifications).

The .dbf files are organized according to the following scheme:

- ID: numerical progressive
- NAME: label of the shape
- COLOR: color of the shape
- FILLCOLOR: fill color (pattern) of the shape
- LINEWIDTH: thickness of the line used in the shape design

Add-ons of maps

The add-ons of map are *graphic objects* that can be drawn on the map to enrich the information content.
The types are:

- Icons
- Comments
- Photo
- Toponyms

Add-ons are part of the map design, are treated similarly to vectorial objects and are saved in the OkMap map file (.okm).

They are useful for:

- Add a small drawing (icon) to a point on the map
- Add textual information to a map (comment)
- Add links to sites that report useful information about a particular point on the map (icons and comments)
- Add references to a file at a particular point on the map (icons and comments); the file can be opened with a simple click of the mouse
- View your photos on maps at the points where they were taken
- Add new toponyms to the maps

Some common operations that also apply to add-ons have been described in the section Operations on objects.

Icons

The *icon* belongs to the category of add-on of maps.

An icon consists of a small image and is typically used to add information on a map.

The properties of an icon are:

- Description
- Comment
- Associated file
- External Link
- Visible yes/no
- Bitmap
- Draw order
- Icon orientation
- Scalable (yes/no)
- Geographic coordinates

Comments

The *comment* belongs to the category of add-on of maps.

A comment consists of a box with text inside and is typically used to add information on a map.

The properties of a comment are:

- Description
- Comment
- Associated file
- External Link
- Font
- Visible yes/no
- Background color
- Border color
- Thickness of the border line
- Opacity factor
- Box sizes
- Geographic coordinates

Toponyms

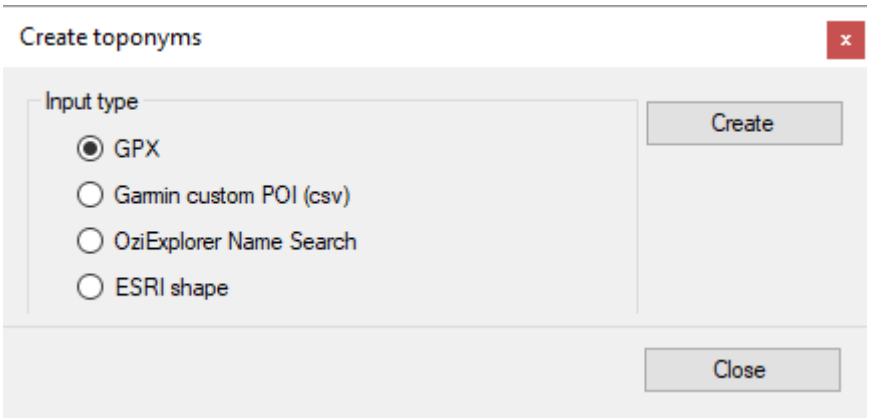
By toponym we mean a proper name of a geographical place.
In OkMap toponyms can be created in a file using other formats as source or drawn directly on the maps.

They can be useful for searching for places on maps.

Some common operations that also concern toponyms have been described in the section Operations on objects.

Create the toponyms

To create toponyms from files in other formats use the *Utilities* - *Create toponyms* menu.



Select the input format by choosing one of the options and press the *Create* button.

A dialog opens to select one or more input files.

If the ESRI shape option is chosen, the procedure provides for the acquisition of further information; this is done in a similar way to the Import vectorial data SHP function.

After conversion operations a dialog box is opened to save the toponyms in a file with the extension .top.

The file will contain the following information:

- Toponym name
- Selected (Yes/No)
- Type 1
- Type 2
- Type 3
- Coordinates
- Altitude
- Visible (Yes/No)

Types 1-3 are used to classify the toponym according to own needs.

The *Close* button closes the window.

Load the toponyms

To load a toponym file use the *File - Load - Toponyms (multi)* menu.
One or more files with the .top extension previously created with the Create the toponyms function or created on the map and then saved (see paragraph Save the toponyms) can be indicated.

Once the file is uploaded, the toponyms are automatically drawn on the loaded maps.

Save the toponyms

To save the selected file of toponyms, use the *File - Save - Toponyms* - ... menu.
To save all modified toponyms files, use the *File - Save - All toponyms* menu.

Merge of toponyms files

To merge the contents of two or more toponym files, use the *File - Merge - Toponyms (multi) - ...* menu and choose the file in which to merge the contents with that of other files.

In the dialog that follows, select one or more files whose contents will be merged with the previously selected file.

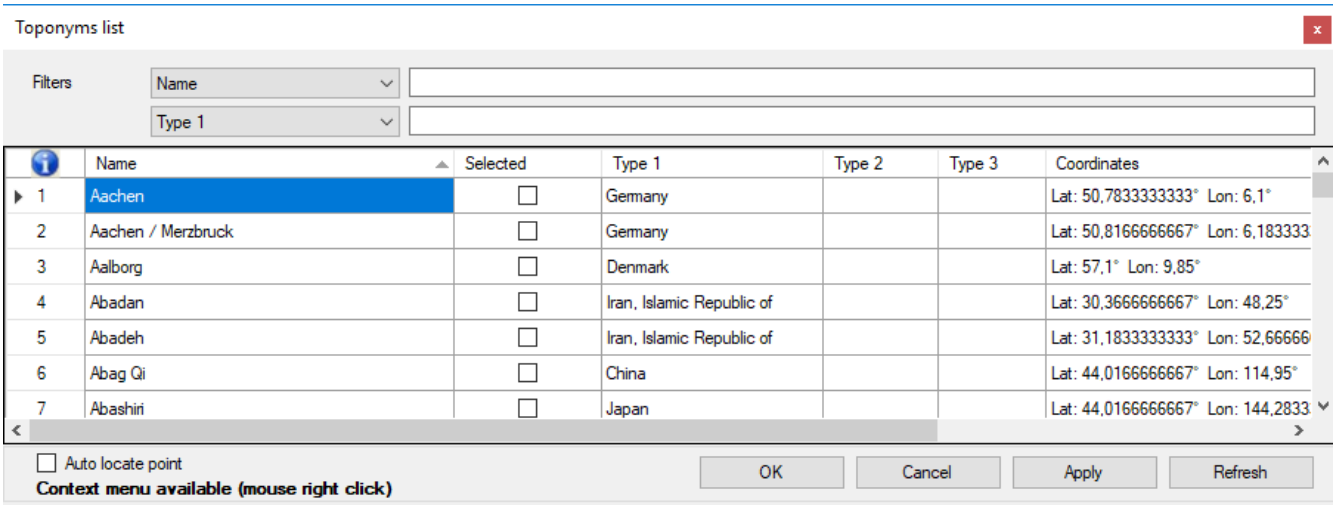
Close a loaded toponyms file

To close the selected toponym file, use the *File - Close - Toponyms - ...* menu.
To close all loaded toponyms files, use the *File - Close - All toponyms* menu.

List of toponyms

To obtain the list of the toponyms of the current file use the *Home - List – Toponyms* menu.

The window displays all the properties of the toponyms shown in the Create the toponyms section.



For more information on the general use of tables, see the section Data tables.

In this table there is a context menu with the following items (besides the standard ones already seen in the paragraph Data tables):

- *Select All*: automatically sets the *Selected* value to true in all toponyms
- *Deselect all*: automatically sets the *Selected* value to false in all toponyms
- *Select highlighted*: automatically sets the *Selected* value to true in all the highlighted toponyms
- *Deselect highlighted*: automatically sets the *Selected* value to false in all the highlighted toponyms
- *Copy coordinates*: copy the coordinates of the toponym to the clipboard
- *Find on opened maps*: Position the current map so as to center the current toponym if possible (it is highlighted with a red crosshair)
- *Set DEM altitude*: set the altitude on the current toponym using the DEM data available locally. A message indicates the unavailability of altimetric data.
- *Set DEM altitude for selected*: set the altitude on all selected toponyms using the DEM data available locally. A message indicates the unavailability, even partial, of the altimetric data.

If *Auto locate point* is activated, when clicking on a toponym, this will be located on all opened maps.

To save the modified data and exit the function, press the *Ok* button.
To exit the function without saving the data, press the *Cancel* button.
Press the *Apply* button to save the modified data.
To refresh the list, press the *Refresh* button.

Assign the altitude to toponyms

You can attribute the altitude to a toponym using the DEM data available locally using the List of toponyms function, using the *Set DEM altitude* or *Set DEM altitude for selected* context menu.

Alternatively, you can click with the right mouse button on the toponym and select the *Other functions - Set DEM altitude - toponym ...* context menu.
A message indicates the unavailability of altimetric data.

Photos

If you have geo-referenced photos, you can display icons on the map at the points where they were taken.
Icons can be oriented in the direction of the shot.

To achieve this it is necessary that the photo files contain, in their metadata, the information about the coordinates and the direction of the shot.

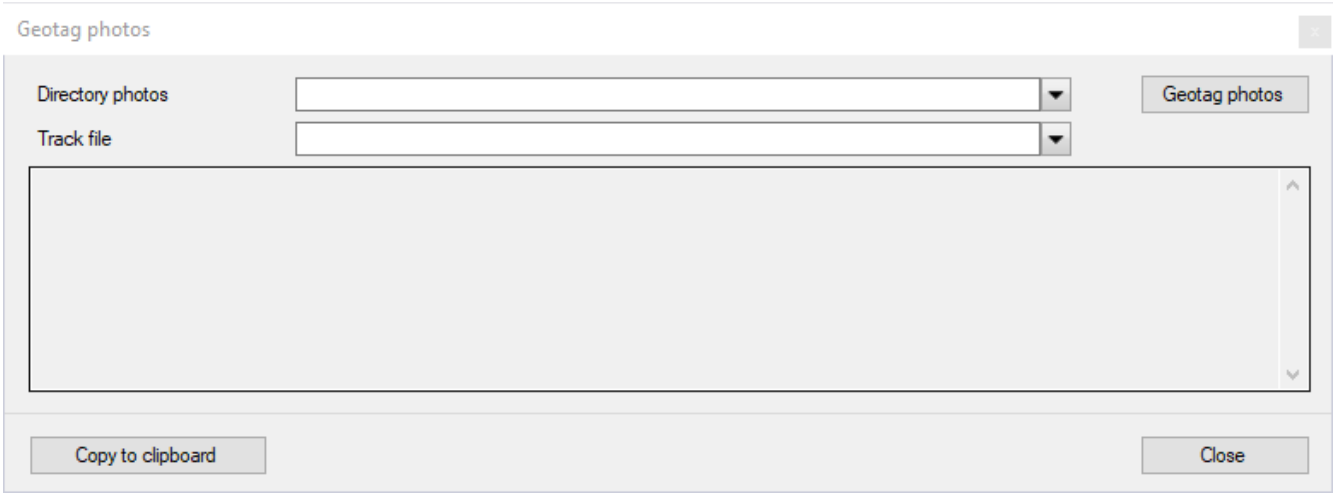
Many state-of-the-art cameras, as well as smartphones, have a GPS inside, so when they create the photo file they also store the geo-referencing metadata.

However, there are some software that allow you to insert such metadata photo by photo with a post-processing; of course it is necessary to know the coordinates in which the photo was taken.

Some common operations that also affect photos have been described in the section Operations on objects.

Geotag photos

If you have non-geotagged photos taken while recording a track, you can automatically assign them the GPS tags using this function.



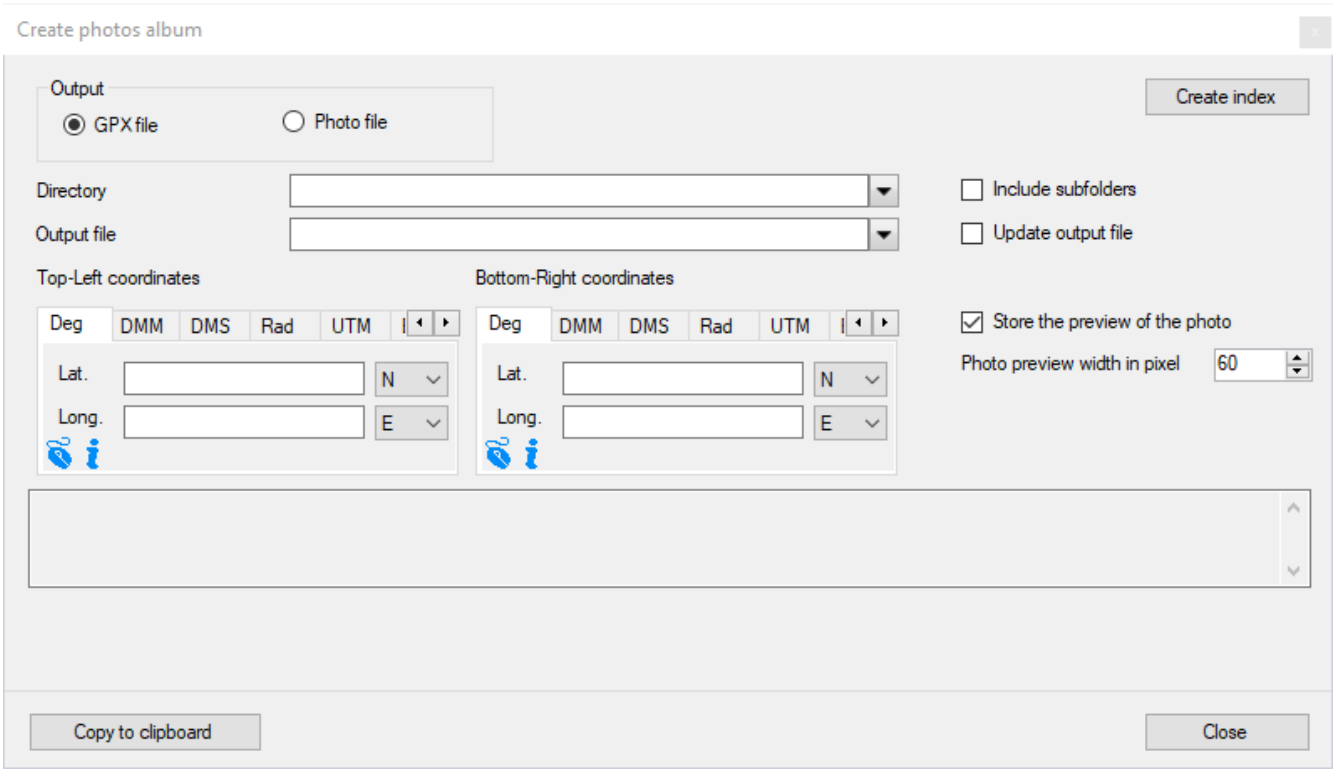
It is necessary to indicate:

- The *folder* where the photo files are stored
- The GPX file that contains the track recorded when the photos was taken (*Track file*)

To create the file, press the *Geotag photos* button.

Create a photo album

To display the icons of the photos on the maps you must first create one or more albums using the *Utilities - Procedures - Create photos list* function.



It is necessary to indicate:

- The output format of the album file (GPX file or Photo file).
- The *folder* where the photo files are stored
- If the related sub-folders are to be explored also (*Include subfolders*).
- The album file of the photos to be created (*Output file*). A photo file (in OkMap proprietary format) or a GPX file containing waypoints with links to photo files can be created.
- Whether photos need to be added to an existing album or a new album must be created (*Update output file*). In this case, the photos already existing in the album will be updated while the no longer existing photos will be deleted from the album itself. When generating waypoints, photos that no longer exist are deleted from the waypoint links, which are however kept.
- The geographical bounds (optional), expressed as top left and bottom right coordinates, to filter the photos to be taken into consideration.
- If you want to store the preview of the photo (necessary to view the previews on the maps)
- The width in pixels of the preview

To create the file, press the *Create* button.
A progress bar shows the progress of processing.

At the end of the processing, any photos that have not been indexed due to the lack of georeferencing tags will be shown in the central pane.

This text can be copied to the clipboard with the *Copy to clipboard* button.

It will also create the indicated file with .pho extension.
The file will contain the following information:

- Photo file name
- Size in pixels (width and height)
- Title
- Comment
- Author
- Keyword
- Subject
- Links to external urls
- Camera brand
- Camera model
- Orientation of the photo shot
- Date and time of shooting
- Coordinates
- Altitude
- Altitude reference (0=above sea level)
- Direction
- Direction reference (T=true north / M=magnetic)
- Preview image (if required)
- Visible photo
- Selected photo

To exit the function, press the *Close* button.

Load the photos

To load a photo album, use the *File - Load - Photo (multi)* menu.
One or more files with a .pho extension previously created with the Create a photo album function can be indicated.

Once the file is loaded, the photo icons are automatically drawn on the loaded maps.

Save the photos

To save the selected file of photos, use the *File - Save - Photos* - ... menu.
To save all modified photos files, use the *File - Save - All photos* menu.

Merge of photos files

To merge the contents of two or more photo files, use the *File - Merge - Photos (multi) - ...* menu and choose the file in which to merge the contents with that of other files.

In the dialog that follows, select one or more files whose contents will be merged with the previously selected file.

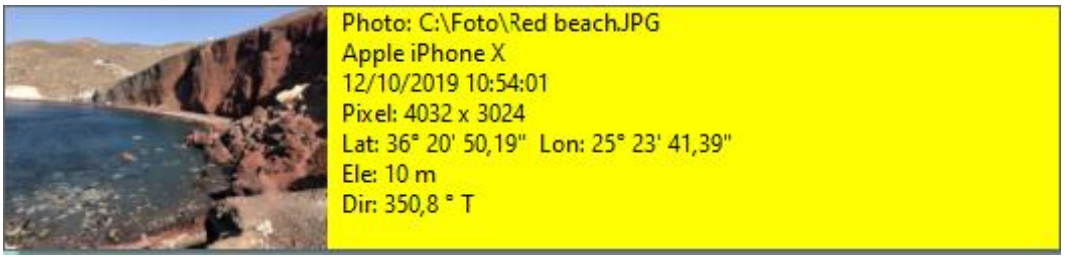
Close a loaded photo file

To close the selected photo file, use the *File - Close - Photo - ...* menu.
To close all loaded photo files, use the *File menu - Close - All photos* menu.

Photo information

To get information on a photo is sufficient, if activated the auto info function (menu *Home - Auto info*), place the mouse on the icon of the photo itself.

A window containing some properties of the photo appears.



In any case you can click with the right mouse button on the icon and select the *Info - photo ...* context menu.
A window containing the properties and a preview of the photo is opened.

Clicking on the *Open file* link will display the photo with the application associated with the file extension.

Clicking on the image, the photo file properties window will be displayed.
The *Details* tab will show all the information contained in the file tags.

View a photo

To view a photo, simply double click on the photo icon itself.

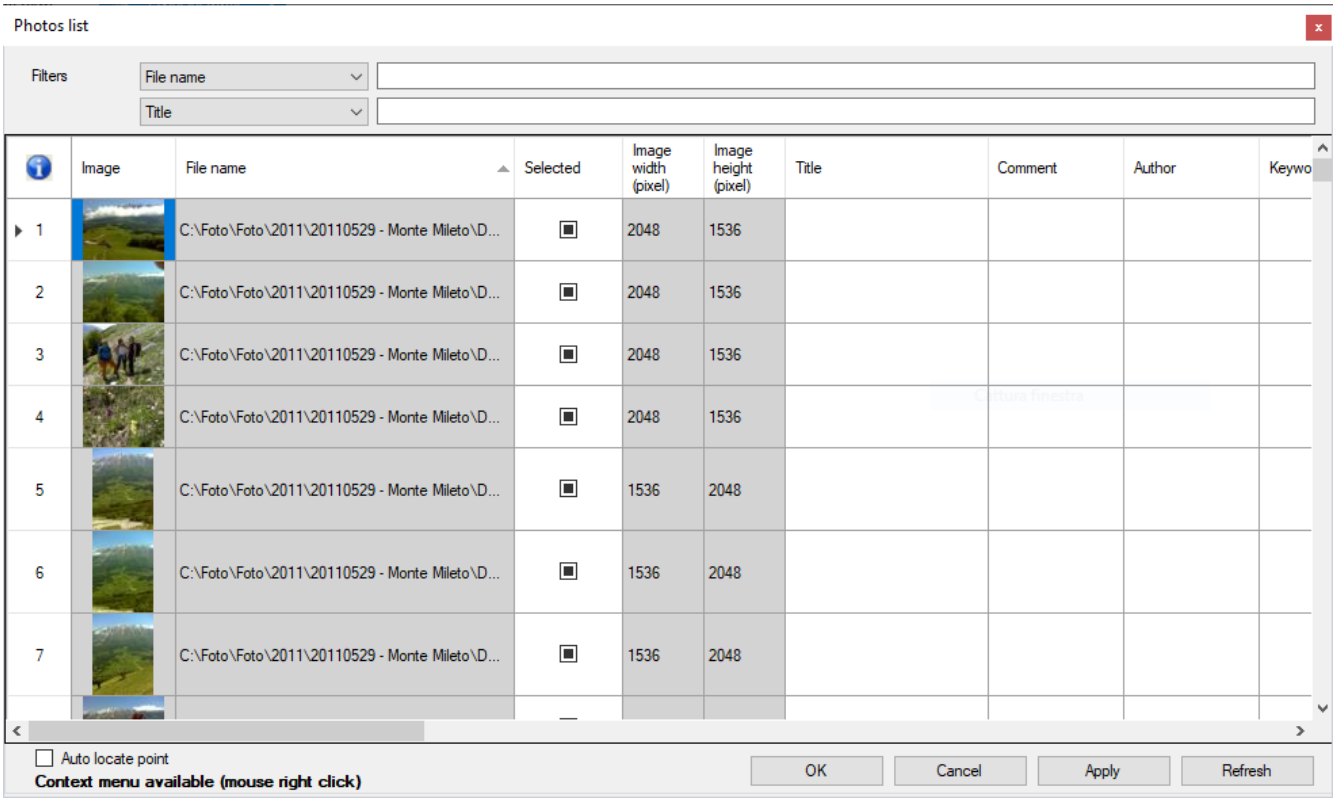
Alternatively, you can use the *Open - photo ...* context menu.

The photo will be displayed with Windows Photo Viewer or with the application associated to the file extension depending on what is chosen in the Preferences - Photo function.

List of photos

To get the list of photos included in the current album use the *Home - List – Photos* menu.

The window displays all the properties of the photos shown in the paragraph Create a photo album.



For more information on the general use of tables, see the section Data tables.

In this table there is a context menu with the following items (besides the standard ones already seen in the paragraph Data tables):

- *Select All*: automatically sets the *Selected* value to true in all photos
- *Deselect all*: automatically sets the *Selected* value to false in all photos
- *Select highlighted*: automatically sets the *Selected* value to true in all the highlighted photos
- *Deselect highlighted*: automatically sets the *Selected* value to false in all the highlighted photos
- *Open photo*: view the photo with the application associated with the file extension
- *Show properties*: displays the file properties window
- *Copy coordinates*: copy the coordinates where the photo was taken to the clipboard
- *Find on opened maps*: Position the current map so as to center the place where the photo was taken if possible (it is highlighted with a red viewfinder)

To view the photo with the application associated, simply double click on the corresponding row of the table.

If activated *Auto locate point*, when clicking on a photo, it will be located on all open maps.

To save the modified data and exit the function, press the *Ok* button.
To exit the function without saving the data, press the *Cancel* button.
Press the *Apply* button to save the modified data.
To refresh the list, press the *Refresh* button.

Waypoints, routes, tracks

Waypoints, routes and tracks are data typically treated by GPS.
They are generally stored in a standard format called GPX.

The acronym GPX stands for GPs eXchange format. This is an XML data format specifically designed for the exchange of GPS data between applications and web services on the Internet.

The acronym XML stands for eXtensible Markup Language. It is a markup metalanguage, or an extensible markup language as it allows you to create custom tags.

More information on the GPX format can be found at
http://www.topografix.com/GPX_for_developers.asp.

More information on the XML language can be found at http://www.w3.org/XML.

Operations on waypoints, routes, tracks

Load waypoints, routes, tracks

To load a data file containing waypoints, routes or tracks use the *File - Load - Waypoints, routes, tracks (multi)* menu.

In the window opened you can enter one or more files and choose the data format by selecting the value in the box adjacent to the file name.

The managed formats are listed in the following table.

Format	Extension
GPS eXchange	gpx
CompeGPS data files	wpt
EasyGPS waypoints binary format	loc
Flexible and Interop. data Transfer activity	fit
Fugawi	txt
G7ToWin data files	g7t
Garmin Logbook XML	xml
Garmin MapSource gdb	gdb
Garmin MapSource mps	mps
Garmin MapSource - txt (tab delimited)	txt
Garmin POI database	txt
Garmin Points of Interest	gpi
Geocaching waypoints	loc
GeoJson	json
Google Directions XML	xml
Google Earth Kml	kml
Google Earth Kmz	kmz
Google Navigator Tracklines	trl
GPS TrackMaker	gtm
Kompass (DAV) Track	tk
Kompass (DAV) Waypoints	wp
NMEA 0183 sentences	log
OkMap remote devices log	log
OpenStreetMap data files	osm
OziExplorer waypoints	wpt
OziExplorer routes	rte
OziExplorer tracks	plt
TomTom Itineraries	itn
TomTom Places Itineraries	itn
TomTom POI file (.asc)	asc
TomTom POI file (.ov2)	ov2
Universal csv with field structure in first line	csv

Save waypoints, routes, tracks

To save the selected file of waypoints, routes and tracks, use the *File - Save - Waypoints, routes, tracks* menu.

In the window displayed, you can choose the data format by selecting the value in the Save as combo box.
The managed formats are listed in the following table.

Formato	Estensione
GPS eXchange	gpx
CompeGPS data files	wpt
EasyGPS waypoints binary format	loc
Franson GPSGate Simulation	gpssim
Fugawi	txt
Garmin Logbook XML	xml
Garmin MapSource gdb	gdb
Garmin MapSource mps	mps
Garmin MapSource - txt (tab delimited)	txt
Garmin POI database	txt
Garmin Points of Interest	gpi
Geocaching waypoints	loc
GeoJson	json
Google Earth Kml	kml
Google Earth Kmz	kmz
Google Navigator Tracklines	trl
GPS TrackMaker	gtm
HTML waypoints	html
Kompass (DAV) Track	tk
Kompass (DAV) Waypoints	wp
NMEA 0183 sentences	log
OpenStreetMap data files	osm
OziExplorer (wpt,rte,plt)	wpt
TomTom Itineraries	itn
TomTom Places Itineraries	itn
TomTom POI file (.asc)	asc
TomTom POI file (.ov2)	ov2
Universal csv with field structure in first line (waypoints)	csv
Universal csv with field structure in first line (tracks)	csv
Universal csv with field structure in first line (routes)	csv

The name of the open file is proposed.

In the case of the GPX format, the following window appears:

In this window you can specify:

- The name of GPX file
- The description of GPX file

The Ok button accepts the information and saves the data.
The Cancel button does not save the data.

Merge files of waypoints, routes, tracks

To merge the contents of two or more files of waypoints, routes, tracks use the *File - Merge - Waypoints, routes, tracks (multi)* - ... menu and choose the file in which to merge the contents with that of other files.

In the dialog that follows, select one or more files whose contents will be merged with the selected file.

The file formats treated are the same as those already covered in the paragraph Load waypoints, routes, tracks.

Split files of routes, tracks

To split the selected file containing routes and tracks, use the File – Split – Routes, tracks - … menu.

In the dialog that follows, select the folder where the single files will be saved.
The files present in this folder with the same name will be replaced.

Close a loaded file of waypoints, routes, tracks

To close the selected file of waypoints, routes, tracks, use the *File - Close - Waypoints, routes, tracks - ...* menu.
To close all previously loaded file of waypoints, routes, tracks use the *File - Close - All waypoints, routes, tracks* menu.

Icon file name nomenclature

The file name of icons has the following naming conventions:

File name starts with	Behavior
TOP_	The icon is positioned over the point on the map
BOT_	The icon is positioned under the point on the map
RGT_	The icon is positioned on the right of the point on the map
LFT_	The icon is positioned on the left of the point on the map
other	The icon is centered respect the point on the map

Waypoints

Waypoint is an English term used to define the point to which a boat is heading. In reality it can be any geographical point whose coordinates are known and possibly other information.

A waypoint can be designed with OkMap, transferred to a GPS and used as a reference point during navigation.

A particular case of waypoints are POIs (Point Of Interest); they represent points of particular interest such as museums, hotels, restaurants, service areas, etc.

The terminology used by OkMap always uses the term waypoint.

The properties of a waypoint managed in OkMap are:

- General
  - Waypoint name
  - Comment on the waypoint
  - Waypoint description
  - Origin of the waypoint
  - Link (url) to additional information on the waypoint
  - Symbol to use (default list)
  - Type of waypoint
  - Altitude above sea level
  - Date-hour
  - Geographic coordinates
  - Visible or hidden
- Bitmap
  - Bitmap to draw on the map
- Label
  - Label visible or hidden
  - Font label
- Proximity
  - Proximity circle visible or hidden
  - Proximity circle color
  - Proximity circle opacity
  - Proximity circle width

A waypoint can be created, for example:

- from opening a file created by OkMap or another application
- from receiving GPX data contained in a GPS device
- from receiving remote data via socket
- from saving the current position during navigation
- from saving after a conversion or calculation
- directly drawing it on the map

Some common operations that also concern waypoints have been described in the Operations on objects section.

List of waypoints

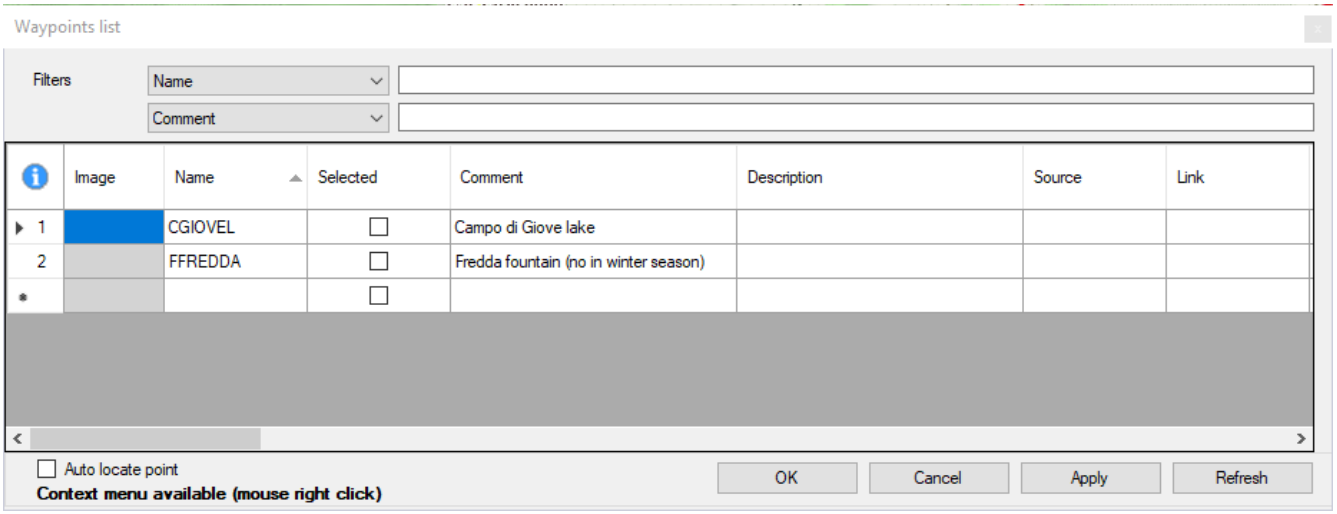
Through this function you can create new waypoints, modify the properties of existing waypoints and delete one or more waypoints.

To get the waypoint list use the *Home - List - Waypoints* menu.

The information displayed in this window are all the already listed properties of waypoints plus the following not editable information:

- Distance
- Azimuth

These values are calculated for each waypoint starting from the one indicated with the *Compute distances* context menu.



You can select a waypoint or not by modifying the value contained in the *Selected* column; selecting a set of waypoints allows you to perform group operations such as editing or deleting multiple items.

For more information on the general use of tables, see the section Data tables.

In this table there is a context menu with the following items (besides the standard ones already seen in the paragraph Data tables):

- *Select All*: Automatically sets the *Selected* value to true in all waypoints
- *Unselect all*: automatically sets the *Selected* value to false in all waypoints
- *Select highlighted*: automatically sets the *Selected* value to true in all the highlighted waypoints
- *Unselect highlights*: automatically sets the *Selected* value to false in all the highlighted waypoints
- *Open link*: Opens the ink associated with the waypoint (if specified). It can be a link, a file or an image.
- *Show properties*: Opens the properties, if the link refers to a file or image.
- *Copy coordinates*: copy the coordinates of the waypoint to the clipboard
- *Find on opened maps*: Position the current map to center the current waypoint if possible (highlighted with a red crosshair)
- *Compute distances*: calculate, on all the waypoints in the list, the distance from the current waypoint and the direction of the line that virtually joins the two waypoints.
- *Set DEM altitude*: set the altitude on the current waypoint using the DEM data available locally. A message indicates the unavailability of altimetric data.
- *Set DEM altitude for selected*: set the altitude on all selected waypoints using the DEM data available locally. A message indicates the unavailability, even partial, of the altimetric data.

To view any image specified in the link with the associated application, simply double click on the corresponding row of the table.

If *Auto locate point* is activated, when clicking on a waypoint, this will be located on all opened maps.

To save the modified data and exit the function, press the *Ok* button.
To exit the function without saving the data, press the *Cancel* button.
Press the *Apply* button to save the modified data.
To refresh the list, press the *Refresh* button.

Assign the altitude to a waypoint

You can attribute the altitude to a waypoint using the DEM data available locally using the List of waypoints function, using the *Set DEM altitude* context menu.

Alternatively, you can click with the right mouse button on the waypoint icon and select the *Other functions - Set DEM altitude - waypoint ...* context menu. A message indicates the unavailability of the altimetric data.

Navigate to a waypoint

This function is used to obtain indications on the direction to follow to reach a waypoint; of course it requires the use of an integrated or connected GPS device.

To navigate to a waypoint click with the right mouse button on the waypoint icon and select the *Navigate - waypoint ...* context menu.

The Navigate to a waypoint function is activated.

Routes

By route we mean a set of Waypoints in sequence, such as to define a route. This route typically represents a nautical route in which each waypoint indicates a change of course or a route on the road where each waypoint indicates a road deviation (crossroads, junctions, roundabouts, exits, etc.).

A route can be designed with OkMap, transferred to a GPS and used to get directions during navigation, near the waypoints (change of course).

The properties of a route managed in OkMap are:

- General
  - Name of the route
  - Comment on the route
  - Route description
  - Origin of the route
  - Link (url) to additional information on the route
  - Type of route
  - Visible or hidden
- Line
  - Color to use in the drawing on the map
  - Thickness of the line
  - Line pattern
- Label
  - Label visible or hidden
  - Font label
- A list of waypoints, which defines the route, with the same properties already examined for waypoints

For example, a route can be created:

- from opening a file created by OkMap or another application
- from receiving GPX data contained in a GPS device
- directly drawing it on the map

Some common operations that also concern the routes have been described in the section Operations on objects.

List of routes

With this function you can create new routes, modify the properties of the routes, the properties of their waypoints and delete one or more routes or one or more waypoints.

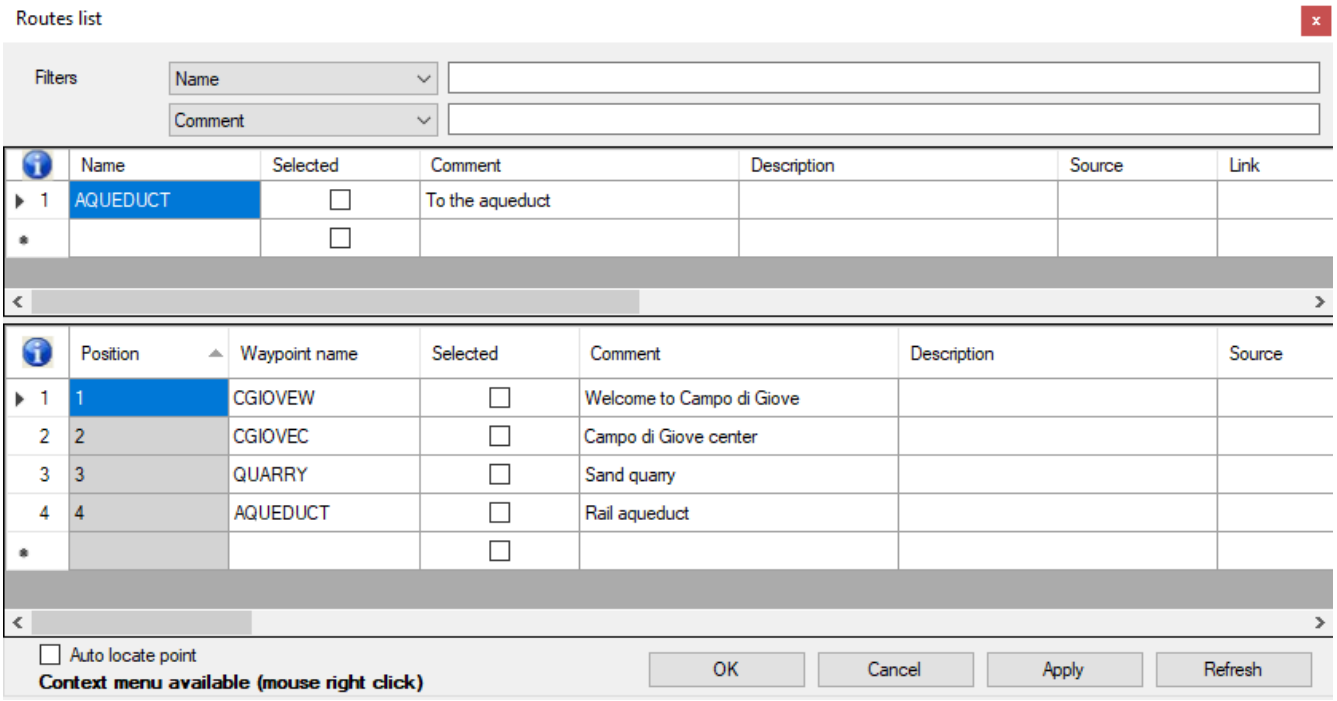
To obtain the list of routes use the *Home - List - Routes* menu.

This function shows two tables: routes and waypoints.
By clicking on the individual routes in the first table, all the relative waypoints are displayed in the second table.

The first table (routes) contains all the properties of the routes already listed plus the following non-modifiable information:

- Number of waypoints belonging the route

The second table (route waypoints) contains all the already listed properties of the waypoints.



You can select or not the routes or waypoints by modifying the value contained in the *Selected* column; selecting a set of routes or waypoints allows group operations such as editing or deleting multiple items.

For more information on the general use of tables, see the section Data tables.

In the first table (routes) there is a context menu with the following items (besides the standard ones already seen in the paragraph Data tables):

- *Select All*: Automatically sets the *Selected* value to true in all routes
- *Unselect all*: automatically sets the *Selected* value to false in all routes
- *Select highlighted*: automatically sets the *Selected* value to true in all the highlighted routes
- *Unselect highlights*: automatically sets the *Selected* value to false in all the highlighted routes
- *Export data*: produces a CSV file containing a list of routes waypoints with other important calculated values
- *Set DEM altitude*: set the altitude on all the waypoints of the current route using the DEM data available locally. A message indicates the unavailability of altimetric data.
- *Set DEM altitude for selected*: set the altitude on all the waypoints of all selected routes using the DEM data available locally. A message indicates the unavailability, even partial, of the altimetric data.
- *Duplicate route*: create a new route with the same waypoints contained in the current one. The name of the new route will be the same as the name of the original route preceded by "C.".
- *Invert route*: create a new route with the same waypoints contained in the current one but in reverse sequence. The name of the new route will be the same as the name of the original route preceded by "I.".
- *Add to Join route*: add all waypoints contained in the current route to the route named JOIN. If the JOIN route does not exist it is automatically created with the same characteristics as the current route.

In the second table (route waypoints) there is a context menu with the following items (besides the standard ones already seen in the paragraph Data tables):

- *Select All*: Automatically sets the *Selected* value to true in all waypoints
- *Unselect all*: automatically sets the *Selected* value to false in all waypoints
- *Select highlighted*: automatically sets the *Selected* value to true in all the highlighted waypoints

- *Unselect highlights*: automatically sets the *Selected* value to false in all the highlighted waypoints
- *Copy coordinates*: copy the coordinates of the waypoint to the clipboard
- *Find on opened maps*: Position the current map to center the current waypoint if possible (highlighted with a red crosshair)
- *Set DEM altitude*: set the altitude on the current waypoint using the DEM data available locally. A message indicates the unavailability of altimetric data.
- *Set DEM altitude for selected*: set the altitude on all selected waypoints using the DEM data available locally. A message indicates the unavailability, even partial, of the altimetric data.
- *Move down*: move the current waypoint after the next waypoint (if the current waypoint is not the last).
- *Move up*: move the current waypoint before the previous waypoint (if the current waypoint is not the first).

If *Auto locate point* is activated, when clicking on a waypoint of a route, this will be located on all opened maps.

To save the modified data and exit the function, press the *Ok* button.
To exit the function without saving the data, press the *Cancel* button.
Press the *Apply* button to save the modified data.
To refresh the list, press the *Refresh* button.

Duplicate a route

You can duplicate a route with the List of routes function, using the *Duplicate route* context menu.

Alternatively, you can click with the right mouse button anywhere on the line that joins two route waypoints and select the *Other functions - Duplicate - route ...* context menu.

A new route is created with the same waypoints contained in the one indicated. The name of the new route will be the same as the name of the original route preceded by "C.".

Invert a route

You can invert the sequence of the waypoints of a route with the List of routes function, using the *Invert route* context menu.

Alternatively, you can click with the right mouse button anywhere on the line that joins two route waypoints and select the *Other functions - Invert - route ...* context menu.

A new route is created with the same waypoints contained in the one indicated, but in reverse sequence. The name of the new route will be the same as the name of the original route preceded by "I.".

Join the routes

You can add all the waypoints contained in a route to another route named *JOIN*, with the function List of routes, using the context menu *Add to Join route*.

Alternatively, you can click with the right mouse button anywhere on the line that joins two route waypoints and select the *Other functions - Add to Join - route ...* context menu.

All waypoints contained in the current route are added to the route named *JOIN*. If the *JOIN* route does not exist it is automatically created with the same characteristics as the current route.

Assign the altitude to a route

You can assign the altitude to the waypoints of a route using the DEM data available locally with the List of routes function, using the *Set DEM altitude* context menu.

Alternatively, you can click with the right mouse button on any point of the line that joins two waypoints of the route and select the *Other functions - Set DEM altitude - route ...* context menu. A message indicates the unavailability of the altimetric data.

If you want to assign the altitude to a single waypoint of the route, select the route and then click with the right mouse button on the route waypoint and select the *Other functions - Set DEM altitude - route waypoint ...* context menu.

Adjust the altitude of a route

You can adjust the altitude of the waypoints of a route with the List of routes function, using the *Adjust altitude* context menu.

Alternatively, you can click with the right mouse button on any point of the line that joins two waypoints of the route and select the *Other functions - Adjust altitude - route ...* context menu.

An input box allows to specify the value in meters to be add or subtract to the altitudes of the route waypoints.

Navigate along a route

This function is used to obtain indications on the direction to follow to navigate along a route; of course it requires the use of an integrated or connected GPS device.

To navigate along a route, click with the right mouse button anywhere on the line connecting two route waypoints and select the *Navigate - route ...* context menu.

The Navigate along a route function is activated.

Tracks

By trace we mean a set of points in sequence very close together, such as to define a path. This route can be of any nature (road, path, etc. ..) and is generally detected by GPS while traveling.

A track can also be designed with OkMap, transferred to a GPS and used, during navigation, to follow the path in a precise way.
The properties of a track managed in OkMap are:

- General
  - Track name
  - Comment on the track
  - Track description
  - Origin of the track
  - Link (url) to additional information about the track
  - Type of track
  - Visible or hidden
- Line
  - Color to use in the drawing on the map
  - Thickness of the line
  - Line pattern
- Label
  - Label visible or hidden
  - Font label
- End position
  - Last position visible or hidden
  - End position bitmap
- Bearing
  - Bearing line visible or hidden
  - Bearing line color
  - Bearing line width
- Proximity
  - Proximity circle visible or hidden
  - Proximity circle color
  - Proximity circle opacity
  - Proximity circle width
- Band
  - Band visible or hidden
  - Band color
  - Band opacity
  - Band width
- A list of points, which defines the route, with the following properties:
  - Number of the segment to which the point belongs
  - Relative position of the point in the segment
  - Selected (Yes/No)
  - Geographic coordinates
  - Altitude above sea level
  - Date/time of point detection

For example, a track can be created:

- from opening a file created by OkMap or another application
- from receiving GPX data contained in a GPS device
- from receiving remote data via socket
- from recording while surfing with GPS
- directly drawing it on the map

Some common operations that also affect the traces have been described in the section Operations on objects.

List of tracks

With this function you can create new tracks, modify the properties of the tracks, the properties of the relative points and delete one or more tracks or one or more points.

To get the track list use the *Home - List - Tracks* menu.

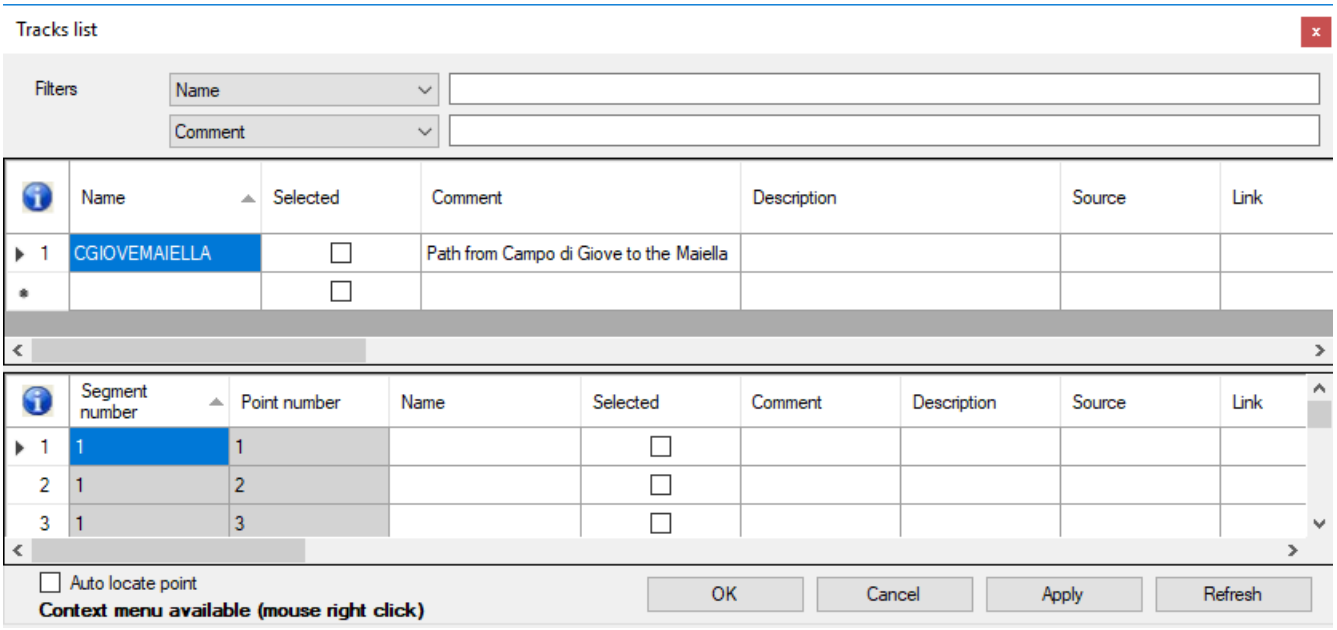
This function shows two tables: tracks and points.
Clicking on the individual tracks in the first table all the relative points are shown in the second one.

The first table (tracks) contains all the already listed properties of the tracks plus the following non-editable information:

- Number of segments of the track
- Number of points of the track

The second table (points) contains the following information:

- Number of the segment to which the point belongs (not editable)
- Relative position of the point in the segment (not editable)
- Point name
- Selected (Yes/No)
- Geographic coordinates
- Altitude above sea level
- Date/time of point detection



Tracks or points can be selected or not by modifying the value contained in the *Selected* column; selecting a set of tracks or points allows group operations such as editing or deleting multiple items.

For more information on the general use of tables, see the section Data tables.

In the first table (tracks) a context menu is available with the following items (in addition to the standard ones already seen in the paragraph Data tables):

- *Select All*: Automatically sets the *Selected* value to true in all tracks
- *Unselect all*: automatically sets the *Selected* value to false in all tracks
- *Select highlighted*: automatically sets the *Selected* value to true in all the highlighted tracks
- *Unselect highlights*: automatically sets the *Selected* value to false in all the highlighted

tracks
- Statistics: displays a window with track statistics
- Graphs: displays a window with track graphs
- *Export data*: produces a CSV file containing a list of track points with proximity waypoints and toponyms and other important calculated values
- *Set DEM altitude*: set the altitude on all the points of the current track using the DEM data available locally. A message indicates the unavailability of altimetric data.
- *Set DEM altitude for selected*: set the altitude on all the points of all selected tracks using the DEM data available locally. A message indicates the unavailability, even partial, of the altimetric data.
- *Set travel time*: estimate travel time by assigning date and time to all points of the current track. The flat walking speed is defined in the Preferences - Tracks function.
- *Set travel time for selected*: estimate travel time by assigning date and time to all points on selected tracks.
- *Simplify track*: create a new simplified track with a maximum number of points equal to that defined in the Preferences - Tracks function. The name of the new track will be the same as the name of the original track preceded by "S.".
- *Smoothing track*: applies a smoothing algorithm to the points of the track. The number of points used by the algorithm is defined in the Preferences - Tracks function. The name of the new track will be the same as the name of the original track preceded by "H.".
- *Smoothing track altitudes*: apply a smoothing algorithm to the altitudes of the track. The number of points used by the algorithm is defined in the Preferences - Tracks function. The name of the new track will be the same as the name of the original track preceded by "A.".
- *Duplicate track*: create a new track with the same points contained in the current one. The name of the new track will be the same as the name of the source track preceded by "C.".
- *Invert track*: create a new track with the same points contained in the current one but in inverted sequence. The name of the new track will be the same as the name of the original track preceded by "I.".
- *Merge segments*: all segments of the track are merged into a single segment.
- *Add to Join track*: add all the points contained in the current track to the track named JOIN. If the JOIN track does not exist it is automatically created with the same characteristics as the current track.

In the second table (track points) a context menu is available with the following items (in addition to the standard ones already seen in the paragraph Data tables):

- *Select All*: Automatically sets the *Selected* value to true in all points
- *Unselect all*: automatically sets the *Selected* value to false in all points
- *Select highlighted*: automatically sets the *Selected* value to true in all the highlighted points
- *Unselect highlights*: automatically sets the *Selected* value to false in all the highlighted points
- *Copy coordinates*: copy the coordinates of the point to the clipboard
- *Find on opened maps*: Position the current map to center the current point if possible (highlighted with a red crosshair)
- *Set DEM altitude*: set the altitude on the current point using the DEM data available locally. A message indicates the unavailability of altimetric data.
- *Set DEM altitude for selected*: set the altitude on all selected points using the DEM data available locally. A message indicates the unavailability, even partial, of the altimetric data.
- *New segment*: starting from the current point, a new segment is created, thus breaking the current track at that point.
- *Divide track*: a new track is created excluding the points that precede the current one. The name of the new track will be the same as the name of the original track preceded by "N.".

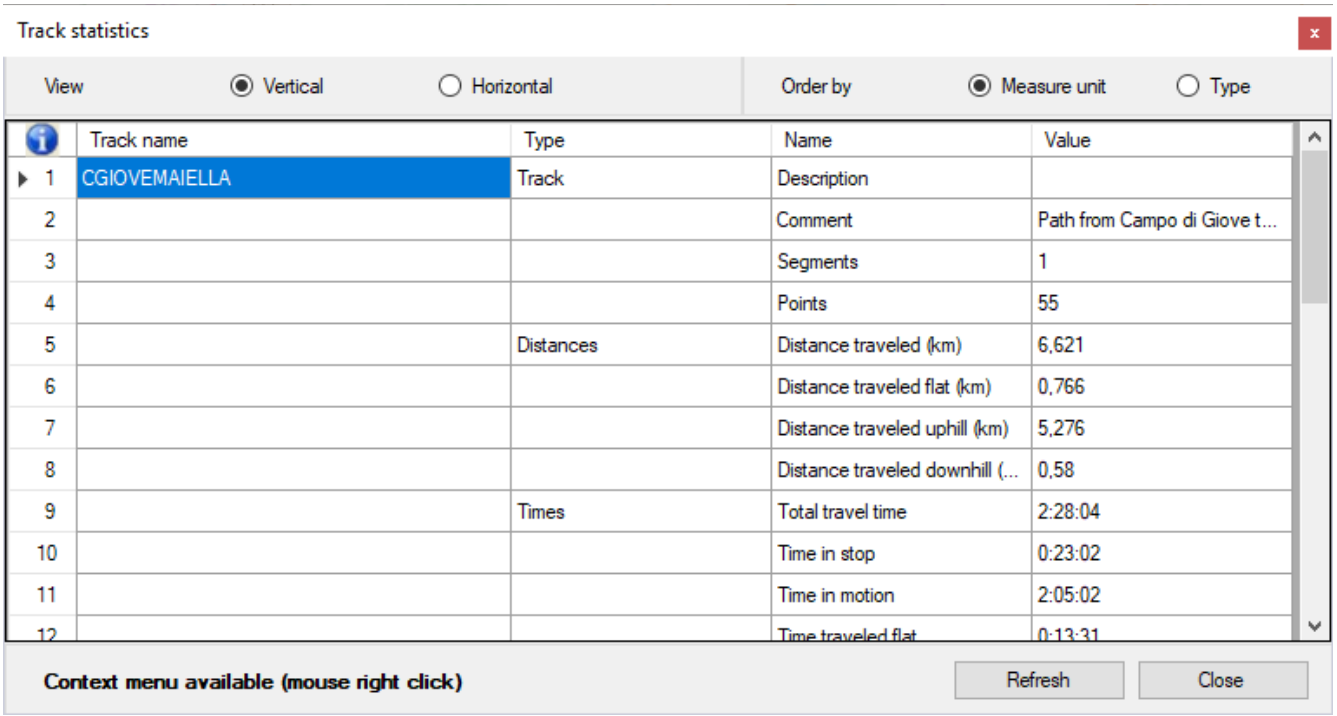
If *Auto locate point* is activated, when clicking on a point of a track, this will be located on all opened maps.

To save the modified data and exit the function, press the *Ok* button.
To exit the function without saving the data, press the *Cancel* button.
Press the *Apply* button to save the modified data.
To refresh the list, press the *Refresh* button.

Track statistics

You can obtain statistical information of a track with the List of tracks function, using the Statistics context menu.

Alternatively, you can click with the right mouse button on any point of the line joining two points of the track and select the *Other functions - Statistics - track ...* context menu.



The information displayed in this window can be:
- displayed vertically or horizontally
- sorted by Measure unit or Type

Information such as: times, duration and speed are available only if the points contain the *date time* information.

Information on the altitudes and differences in level are only available if the points contain the *Altitude* information.

The table contains a context menu with the following items (in addition to the standard ones already seen in the Data tables section):

- *Find start of track on opened maps*: position the loaded maps to center the start point of the current track if possible (highlighted with a red crosshair)
- *Find end of track on opened maps*: position the loaded maps to center the end point of the current track if possible (highlighted with a red crosshair)
- *Select track*: Select the current track
- *Graphs*: Opens the Track graphs window
- *Export data*: produces a CSV file containing a list of track points with proximity waypoints and toponyms and other important calculated values

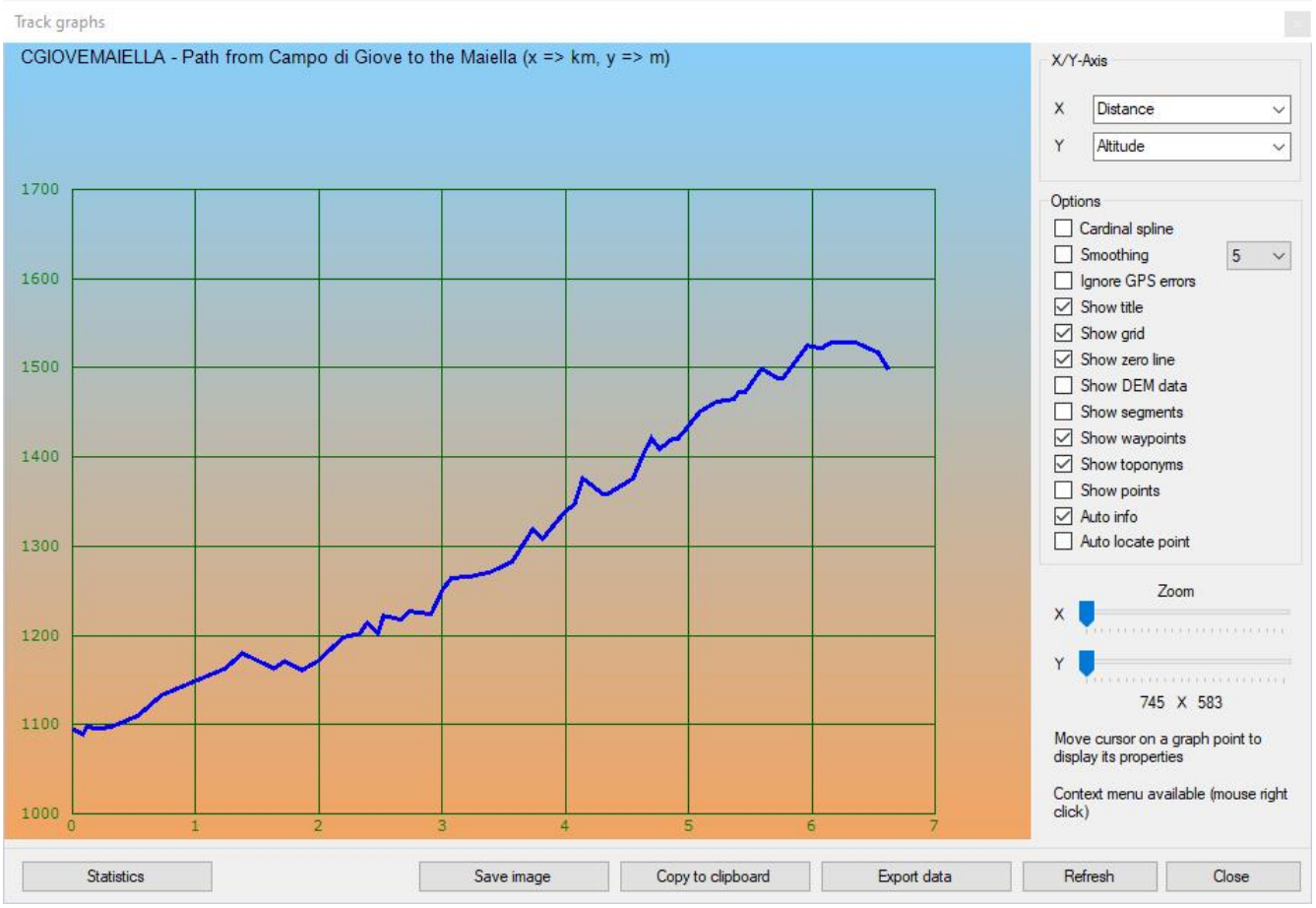
To exit the function, press the *Close* button.
To refresh the list, press the *Refresh* button.

To obtain the statistics of all the loaded tracks, refer to the Data – Tracks statistics section.

Track graphs

You can obtain graphs of a track with the List of tracks function, using the *Graphs* context menu.

Alternatively, you can click with the right mouse button anywhere on the line that joins two points of the track and select the *Other functions - Graphs - track ...* context menu.



These types of graphs can be produced (X/Y axis) if data is available:

- Distance / Altitude
- Distance / Speed
- Distance / Rate of uphill
- Distance / Slope
- Distance / Time
- Time / Altitude
- Time / Speed
- Time / Rate of uphill
- Time / Slope
- Time / Distance

Some charts will only be shown if the points contain the *Altitude* information (or *Time* in case of speed).

You can select some options to change the chart or view other information:

- Cardinal spline
- Smoothing
- Ignore GPS errors
- Show title
- Show grid
- Show zero line
- Show DEM data
- Show segments
- Show waypoints
- Show toponyms
- Show points
- Auto info
- Auto locate point

Moving the mouse on the single points of the graph you get information (if available and *Auto info* is selected) on the relative point of the track:

- Segment number
- Point number
- Altitude
- Distance from the start of the track
- Time spent since the beginning of the track
- Date/time of point detection
- Instantaneous speed
- Slope in degrees and percentage

If activated *Auto locate point*, when clicking on a point in the graph, this will be located on all opened maps.

Two cursors (respectively for the x and y axis) operate on the respective zoom factors, thus expanding the two axes in order to make the two units of measurement comparable.

In addition, a context menu with the following functions is available on the graph points:

- *Info*: some information about the current track point are displayed
- *Select track point*: Select the current track point
- *Copy coordinates*: copy the coordinates of the track point to the clipboard
- *Copy coordinates (text format)*: copies the coordinates to the clipboard in text format for uses outside OkMap
- *Set coordinates*: position the loaded maps to center the current track point if possible (highlighted with a red crosshair icon)
- *Save waypoint*: save a new waypoint with the coordinates of the current track point
- *Save toponym*: save a new toponym with the coordinates of the current track point
- *Find maps*: a window opens that lists the maps that contain the current track point (see List the available maps)
- *Find waypoints, routes, tracks*: a window opens that lists the waypoint, route and track files relative to the current track point area (see List the files of waypoints, routes, tracks)
- *Geocoding info*: information on the geographical location of the current track point are displayed
- *External services*: launches external utility services focused on the indicated coordinates such as: maps, mountain profiles, weather forecasts, declination calculation, starry sky, etc.

At the bottom of the window there are some buttons:

- *Statistics*: opens the Track statistics window
- *Save image*: save the graphic image in a file
- *Copy to clipboard*: copy the image of the chart to the clipboard

- *Export data*: produces a CSV file containing a list of track points with proximity waypoints and toponyms and other important calculated values
- *Refresh*: re-render the graph
- *Close*: close the window

Simplify a track

You can simplify a track with the List of tracks function, using the *Simplify track* context menu.

Alternatively, you can click with the right mouse button on any point of the line that joins two points of the track and select the *Other functions - Simplify - track ...* context menu.

A new track is created with a maximum number of points equal to that defined in the Preferences - Tracks function. The name of the new track will be the same as the name of the original track preceded by "S.".

Smoothing of the points of a track

Smoothing can be applied to the points of a track with the List of tracks function, using the *Smoothing track* context menu.

Alternatively, you can click with the right mouse button anywhere on the line that joins two points of the track and select the *Other functions - Smoothing - track ...* context menu.

The number of points used by the algorithm that calculates the average can be configured in the Preferences - Tracks function.

The name of the new track will be the same as the name of the original track preceded by "H.".

Smoothing of the altitudes of a track

You can apply smoothing to the altitudes of a track with the List of tracks function, using the *Smoothing track altitudes* context menu.

Alternatively, you can click with the right mouse button anywhere on the line that joins two points of the track and select the *Other functions - Smoothing altitudes - track ...* context menu.

The number of points used by the algorithm that calculates the average can be configured in the Preferences - Tracks function.

The name of the new track will be the same as the name of the original track preceded by "A.".

Duplicate a track

You can duplicate a track with the List of tracks function, using the *Duplicate track* context menu.

Alternatively, you can click with the right mouse button anywhere on the line joining two points of the track and select the *Other functions - Duplicate - track ...* context menu.

A new track is created with the same points contained in the one indicated. The name of the new track will be the same as the name of the source track preceded by "C.".

Invert a track

You can reverse the sequence of the points of a track with the List of tracks function, using the *Invert track* context menu.

Alternatively, you can click with the right mouse button anywhere on the line that joins two points of the track and select the *Other functions - Invert - track ...* context menu.

A new track is created with the same points contained in the indicated one, but in reverse sequence. The name of the new track will be the same as the name of the original track preceded by "I.".

Join the tracks

You can add all the points contained in a track to another track called JOIN, with the List of tracks function, using the *Add to Join track* context menu.

Alternatively, you can click with the right mouse button anywhere on the line that joins two points of the track and select the *Other functions - Add to Join - track ...* context menu.

All points contained in the current track are added to the track named JOIN. If the JOIN track does not exist it is automatically created with the same characteristics as the current track.

Merge the segments of a track

You can merge the segments of a track with the List of tracks function, using the *Merge segments* context menu.

Alternatively, you can click with the right mouse button anywhere on the line that joins two points of the track and select the *Other functions - Merge segments - track ...* context menu.

Assign the altitude to a track

You can attribute the altitude to the points of a track using the DEM data available locally with the List of tracks function, using the *Set DEM altitude* context menu.

Alternatively, you can click with the right mouse button on any point of the line that joins two points of the track and select the *Other functions - Set DEM altitude - track ...* context menu. A message indicates the unavailability of the altimetric data.

If you want to assign the altitude to only one point of the track, select the track and then click with the right mouse button on the track point and select the *Other functions - Set DEM altitude - track point ...* context menu.

Estimate the travel time of a track

You can estimate the travel time of a track with the List of tracks function, using the *Set travel time* context menu.

Alternatively, you can click with the right mouse button on any point of the line that joins two points of the track and select the *Other functions - Set travel time - track ...* context menu.

Adjust the altitude of a track

You can adjust the altitude of the points of a track with the List of tracks function, using the *Adjust altitude* context menu.

Alternatively, you can click with the right mouse button on any point of the line that joins two points of the track and select the *Other functions - Adjust altitude - track ...* context menu.

An input box allows to specify the value in meters to be add or subtract to the altitudes of the track points.

Adjust the travel time of a track

You can adjust the travel time of the points of a track with the List of tracks function, using the *Adjust time* context menu.

Alternatively, you can click with the right mouse button on any point of the line that joins two points of the track and select the *Other functions - Adjust time - track ...* context menu.

An input box allows to specify the value in minutes to be add or subtract to the time of the track points.

Create a track with the routing function

You can create a track that follows a road route using the map context menu.

The operations to be carried out are the following:

- Position the cursor at the beginning of the path and use the *Routing - From here* context menu
- Position the cursor at the end of the path and use the *Routing - To here* context menu
- Use the *Routing – Calculate track* context menu

Use the *Routing - Reset* context menu to cancel the selection of departure and arrival of the route.

Navigate along a track

This function is used to obtain indications on the direction to follow to navigate along a track; of course, it requires the use of an integrated or connected GPS device.

To navigate along a track, click with the right mouse button anywhere on the line that joins two points of the track and select the *Navigate - track ...* context menu.

The Navigate along a track function is activated.

Indexing waypoints, routes, tracks files

Prepare indexing of files of waypoints, routes, tracks

With the indexing function you can create a file with a list of all the files of waypoints, routes, tracks available in your archives, each with its own characteristics.

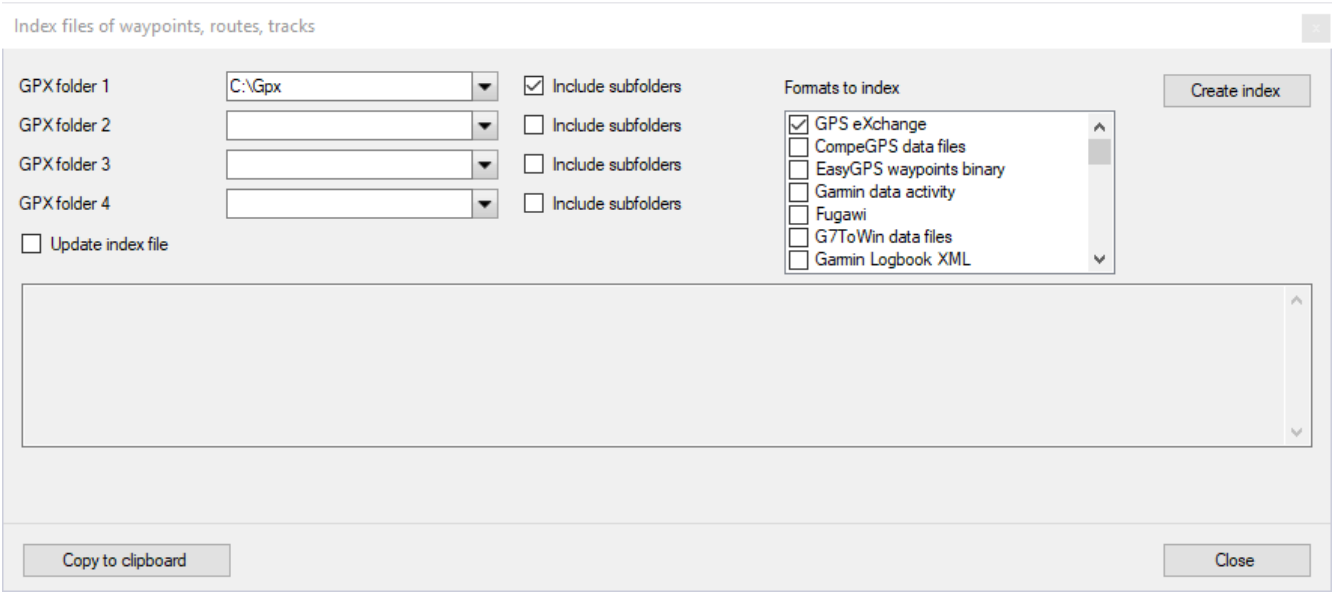
Once this file is built, you can List the files of waypoints, routes, tracks.

To index the files, perform the following steps:

- Use the Preferences - GPX function to indicate, in the *Folder 1/4* fields, the folders where the files are stored (you can indicate up to four different folders). You can use the ... buttons to open a dialog for choosing the folder.
- If necessary, click on the *Include subfolders* fields to indicate whether the search should also be extended in the relevant sub-folders.
- Indicate in the adjacent list which file formats you want to index.
- Confirm the changes made with the *OK* button.

Indexing the files of waypoints, routes, tracks

This function is activated with the *Utilities* - *Index GPX files* menu.
Before activating this function, make sure you have carried out the preparation operations.



The folders containing the files to be indexed are proposed as indicated in the *Preferences - GPX*. It is possible to modify or add folders up to a maximum of 4.

The *Update index file* indicator specifies whether the found files should be added to those already indexed or not. If the file is updated, the files already present in the index will be updated while the files that no longer exist will be deleted from the index itself.

To activate the indexing function, press the *Create index* button.
At the end of the processing will be shown in the central panel any files that have not been indexed for any format problems.
This text can be copied to the clipboard with the *Copy to clipboard* button.
To close the window, use the *Close* button.

List the files of waypoints, routes, tracks

This function is available after having opened a map.

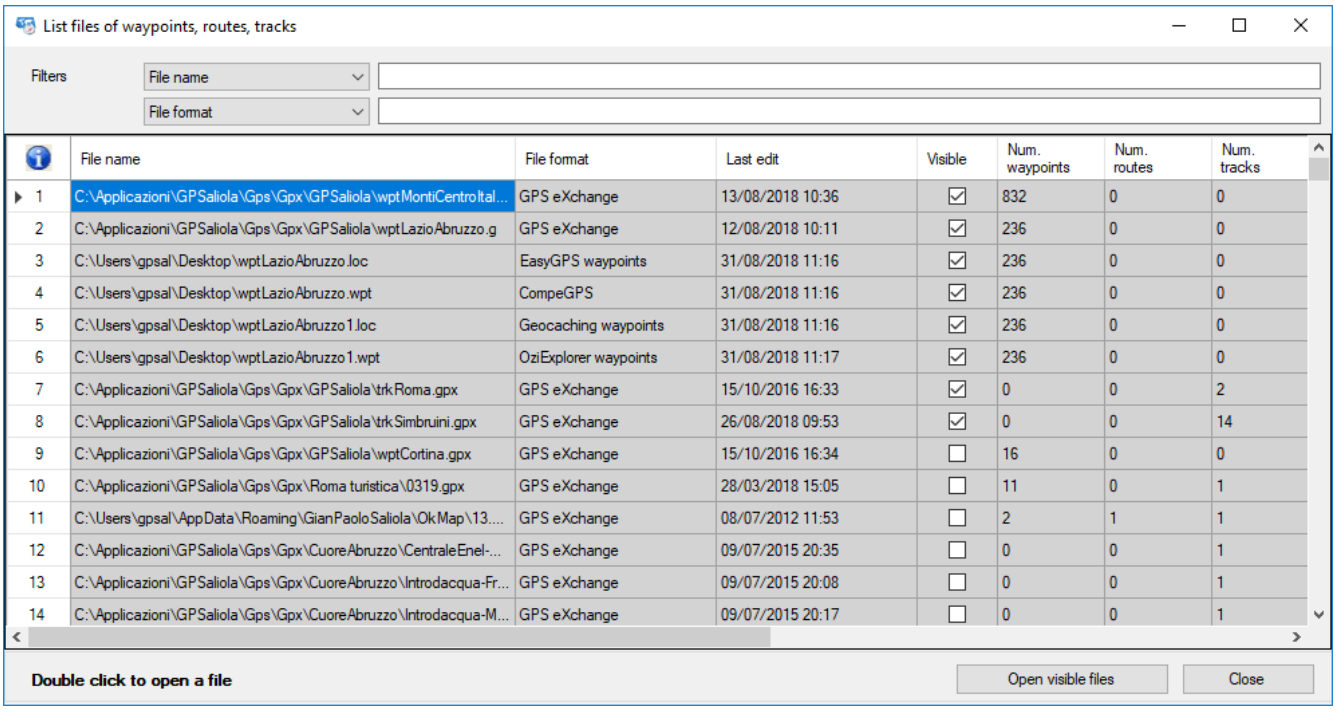
It lists all the characteristics of the indexed files of waypoints, routes, tracks and eventually allows you to choose a file to open or open all the visible files on the current map.

To view the list of files it is first necessary to carry out the preparation and indexing operations.

To view the list of indexed files, use the *Home – List indexed files - List files of waypoints, routes, tracks* menu.

A table is displayed containing the following information:

- File name
- File format
- Last edit
- Visible on current map
- Number of waypoints
- Number of routes
- Number of tracks
- Geographical bounds of the file



	File name	File format	Last edit	Visible	Num. waypoints	Num. routes	Num. tracks
1	C:\Applicazioni\GPSaliola\Gps\Gpx\GPSaliola\wptMontiCentroItal...	GPS eXchange	13/08/2018 10:36	☑	832	0	0
2	C:\Applicazioni\GPSaliola\Gps\Gpx\GPSaliola\wptLazioAbruzzo.g	GPS eXchange	12/08/2018 10:11	☑	236	0	0
3	C:\Users\gpsal\Desktop\wptLazioAbruzzo.loc	EasyGPS waypoints	31/08/2018 11:16	☑	236	0	0
4	C:\Users\gpsal\Desktop\wptLazioAbruzzo.wpt	CompeGPS	31/08/2018 11:16	☑	236	0	0
5	C:\Users\gpsal\Desktop\wptLazioAbruzzo1.loc	Geocaching waypoints	31/08/2018 11:16	☑	236	0	0
6	C:\Users\gpsal\Desktop\wptLazioAbruzzo1.wpt	OziExplorer waypoints	31/08/2018 11:17	☑	236	0	0
7	C:\Applicazioni\GPSaliola\Gps\Gpx\GPSaliola\trkRoma.gpx	GPS eXchange	15/10/2016 16:33	☑	0	0	2
8	C:\Applicazioni\GPSaliola\Gps\Gpx\GPSaliola\trkSimbruini.gpx	GPS eXchange	26/08/2018 09:53	☑	0	0	14
9	C:\Applicazioni\GPSaliola\Gps\Gpx\GPSaliola\wptCortina.gpx	GPS eXchange	15/10/2016 16:34	☐	16	0	0
10	C:\Applicazioni\GPSaliola\Gps\Gpx\Roma turistica\0319.gpx	GPS eXchange	28/03/2018 15:05	☐	11	0	1
11	C:\Users\gpsal\AppData\Roaming\GianPaoloSaliola\OkMap\13....	GPS eXchange	08/07/2012 11:53	☐	2	1	1
12	C:\Applicazioni\GPSaliola\Gps\Gpx\CuoreAbruzzo\CentraleEnel-...	GPS eXchange	09/07/2015 20:35	☐	0	0	1
13	C:\Applicazioni\GPSaliola\Gps\Gpx\CuoreAbruzzo\Introdacqua-Fr...	GPS eXchange	09/07/2015 20:08	☐	0	0	1
14	C:\Applicazioni\GPSaliola\Gps\Gpx\CuoreAbruzzo\Introdacqua-M...	GPS eXchange	09/07/2015 20:17	☐	0	0	1

To load a file, *double-click* with the left mouse button on the corresponding row.

For more information on the general use of tables, see the section Data tables.

To exit the function, press the *Close* button.

Alternatively, you can use the *Home – List indexed files – List files of waypoints, routes, tracks by position* menu. This function, before displaying the list of files, interposes a window where you can indicate a geographical position to limit the list to the only files whose bounds contain this position (see paragraph Coordinates selection).

If a map is opened, it's possible to find the files whose bounds are inside the map using the *Home – List indexed files – List of waypoints, routes, tracks inside map* menu.

Objects that can be drawn on the map

This chapter describes the common operations that can be applied through the context menu (right mouse button) to different types of objects drawn on the maps.

The typical operations of each type of object are described in the following paragraphs.

Objects types

The content of this chapter applies to the following types of objects:

- GPX data
  - Waypoints
  - Routes
  - Tracks
- Add-ons of maps
  - Photos
  - Toponyms
  - Icons
  - Comments
- Vectorial data
  - Points
  - Multipoints
  - Lines
  - Polygons
  - Pies

Operations on objects

Create an object

It applies to:

- Waypoints
- Routes
- Tracks
- Toponyms
- Icons
- Comments
- Points
- Multipoints
- Lines
- Polygons
- Pies

To create a new object on the map it is necessary to select the appropriate tool with the menu *Home - Tools - New...* and click with the left mouse button on the map in the desired position.

For objects composed of multiple points or waypoints, you can continue the drawing by clicking on the map. Objects composed of multiple points or waypoints are:

- Waypoints of routes
- Points of tracks
- Multipoints
- Lines
- Polygons

In the case of tracks you can use the freehand drawing technique by holding down the left mouse button and dragging the pointer; in this way the other points will be added automatically in succession. The distance between points is defined in the Preferences – Tracks function with the *Free hand design* field.

In the case of routes, if the *Home - Auto info* menu is active, a box with the following information is displayed during the area drawing:

- Calculated area
- Delta area at the cursor position
- Total area (sum of previous values)
- Direction of the cursor from the last point
- Inverse direction

Through the editing function, you can specify the properties of the new object.
To know the properties of each object refer to the appropriate paragraphs.

To create a further object made up of several points, select the *Home - Tools - Select* menu, click on a point on the map where there are no objects (deselect all objects) and then select the *Home - Tools - New...* menu again.

In the case of vectorial data select first, if necessary, the current theme with the List – Themes function.

Select an object

It applies to:

- Waypoints
- Routes
- Waypoints of routes
- Tracks
- Points of tracks
- Toponyms
- Photos
- Icons
- Comments
- Points
- Multipoints
- Points of multipoints
- Lines
- Points of lines
- Polygons
- Points of polygons
- Pies

Selecting a set of objects allows you to perform group operations such as editing or deleting.

Selecting a single object is useful when you want to add points or waypoints.

To select an object, you can use one of the following methods:

- Click on the map with the left mouse button on any part of the object.
- In case of overlapping objects, click with the right mouse button on any part of the object to be selected and use the *Select - ....* context menu.
- To add other objects to the selection, hold down the *Ctrl* key and click on the other objects you want to add (or activate menu *Home - Tools - Select by adding*).
- To select a group of neighboring objects, draw a rectangle by holding down the *Shift* key and the left mouse button (or activate menu *Home - Tools - Select with rectangle*).
- To add a group of neighboring objects hold down the *Ctrl* and *Shift* keys (or equivalent menu) and draw a rectangle as in the previous case.
- To invert the selection of objects use the *Invert selection* context menu.
- To deselect all objects, click anywhere on the map where there are no objects or use the *Deselect all* context menu.
- To select the points or the waypoints that make up an object, first select the object and then the point(s) inside it. The same rules described above apply to the *Ctrl* and *Shift* keys.
- Use the *Home - List - ...* menu and activate the check mark in the *Selected* column in the row corresponding to the object to be selected (it only applies to Toponyms, Waypoints, Routes and Tracks).

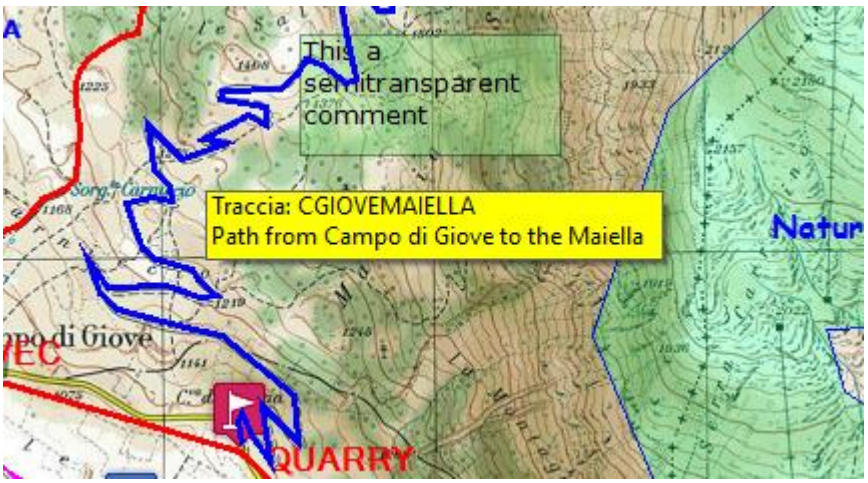
Information about an object

It applies to:

- Waypoints
- Routes
- Waypoints of routes
- Tracks
- Points of tracks
- Photos
- Toponyms
- Photos
- Icons
- Comments
- Points
- Multipoints
- Points of multipoints
- Lines
- Points of lines
- Polygons
- Points of polygons
- Pies

To get information on an object, if the auto info function is activated (*Home – Auto info* menu), position the mouse anywhere on the object.

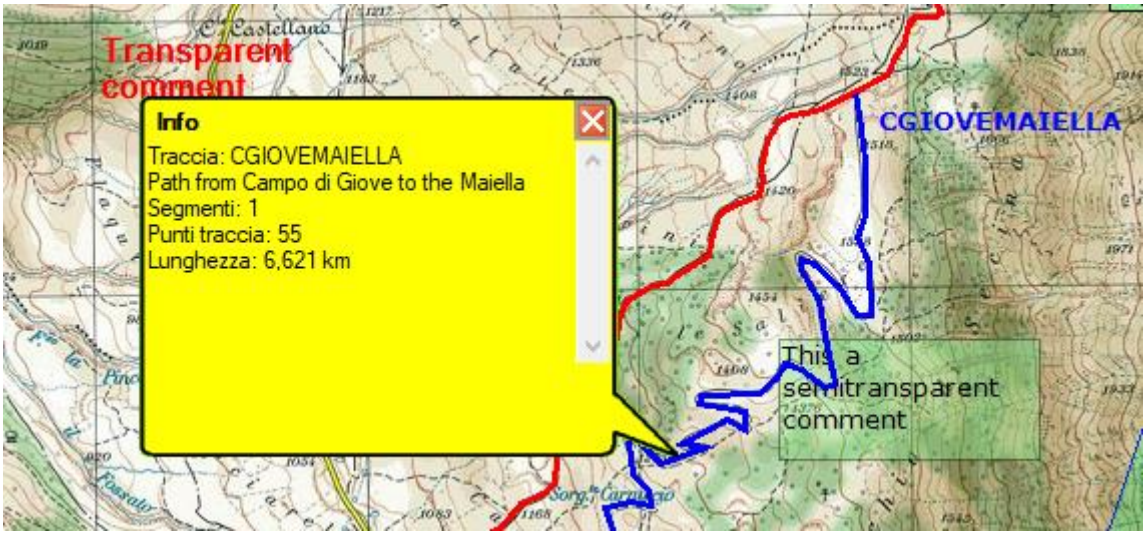
A window containing some properties of the object is displayed.
By way of example, the following figure refers to a track.



In any case you can click with the right mouse button on any part of the object and select the *Info - ...* context menu.

In the case of a Waypoint with a link to an image or a Photo, a preview of the image will be displayed.

A window containing some properties of the object is displayed.
By way of example, the following figure refers to a track.



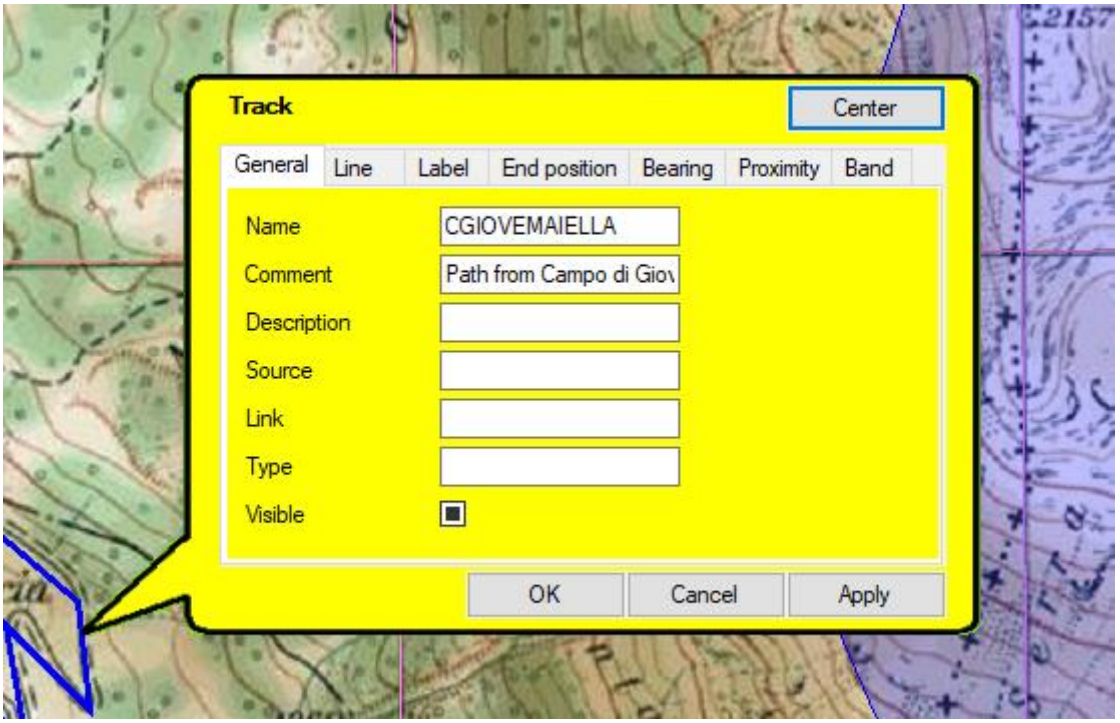
Change the properties of an object

It applies to:

- Waypoints
- Routes
- Waypoints of routes
- Tracks
- Points of tracks
- Toponyms
- Foto
- Photos
- Icons
- Comments
- Points
- Multipoints
- Lines
- Polygons
- Pies

To change the properties of an object click with the right mouse button on any part of the object and select the *Modify - ...* context menu.

A window containing the properties of the object is displayed.
By way of example, the following figure refers to a track.



The *Center* button can be used to center the window in the center of the screen.

Where you see an icon with a small arrow pointing down means that a guided information entry function has been set up; pressing the icon opens a window that depends on the type of information that must be entered.

The icon with a cross is used to cancel the selection made previously and restore what has been defined globally in the Preferences function or in the respective vectorial theme (the latter applies only to vectorial data).

To save the modified data and exit the function, press the *Ok* button.
To exit the function without saving the data, press the *Cancel* button.
Press the *Apply* button to save the modified data.

Alternatively, you can edit an object using the *Home - List - ...* menu (applies only to Toponyms, Waypoints, Routes and Tracks).

Add a point to an object

It applies to:

- Waypoints of routes
- Points of tracks
- Points of multipoints
- Points of lines
- Points of polygons

To add a point or a waypoint at the end of an object, select the object, then select the appropriate tool with the *Home - Tools - New … point* menu and finally click with the left mouse button on the map in the position relative to the point you intends to add.

To add a point within an object, select the object, then select the point before the one you want to insert, then proceed as seen above.

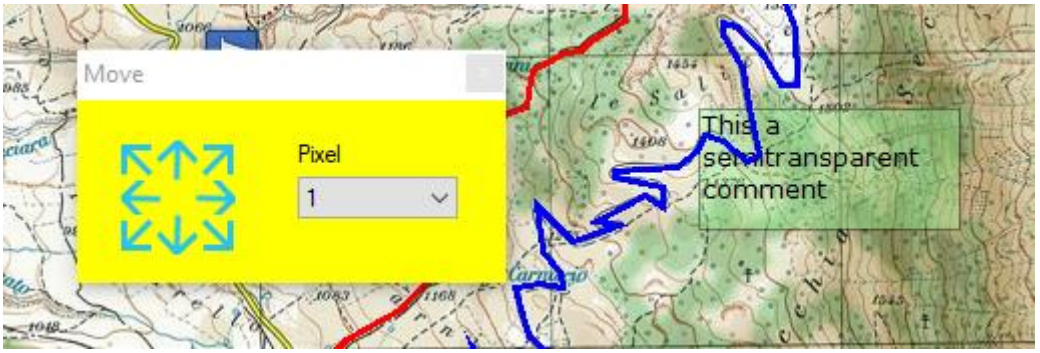
Move an object

It applies to:

- Waypoints
- Routes
- Tracks
- Toponyms
- Icons
- Comments
- Points
- Multipoints
- Lines
- Polygons
- Pies

To move an object click with the right mouse button on any part of the object and select the context *Move - ...* menu.

A window opens with the buttons containing the directional arrows.



Press the buttons to move the object in the desired direction.

The displacement occurs as many pixels as indicated in the adjacent combo box.

Alternatively, you can click with the left mouse button on the object to be moved, hold down and move the object to the desired position.
This function is only possible if the *Home - Lock objects* menu is deactivated.

Hide and view an object

It applies to:

- Waypoints
- Routes
- Tracks
- Toponyms
- Photos
- Icons
- Comments
- Points
- Multipoints
- Lines
- Polygons
- Pies

To hide / display an object click with the right mouse button on any part of the object and select the *Hide - ...* context menu.

Alternatively, you can hide / display an object using the *Home - List - ...* menu (applies only to Toponyms, Waypoints, Routes and Tracks).

Delete an object

It applies to:

- Waypoints
- Routes
- Waypoints of routes
- Tracks
- Points of tracks
- Toponyms
- Photos
- Icons
- Comments
- Points
- Multipoints
- Points of multipoints
- Lines
- Points of lines
- Polygons
- Points of polygons
- Pies

To delete an object click with the right mouse button on any part of the object and select the *Delete - ...* context menu.

Alternatively, you can delete an object using the *Home - List - ...* menu (only applies to Toponyms, Waypoints, Routes and Tracks).

In the case of the points of an object, you can use the Eraser tool (Ctrl+Shift+F2).
Before deleting the points of an object, it is necessary to select the desired object.

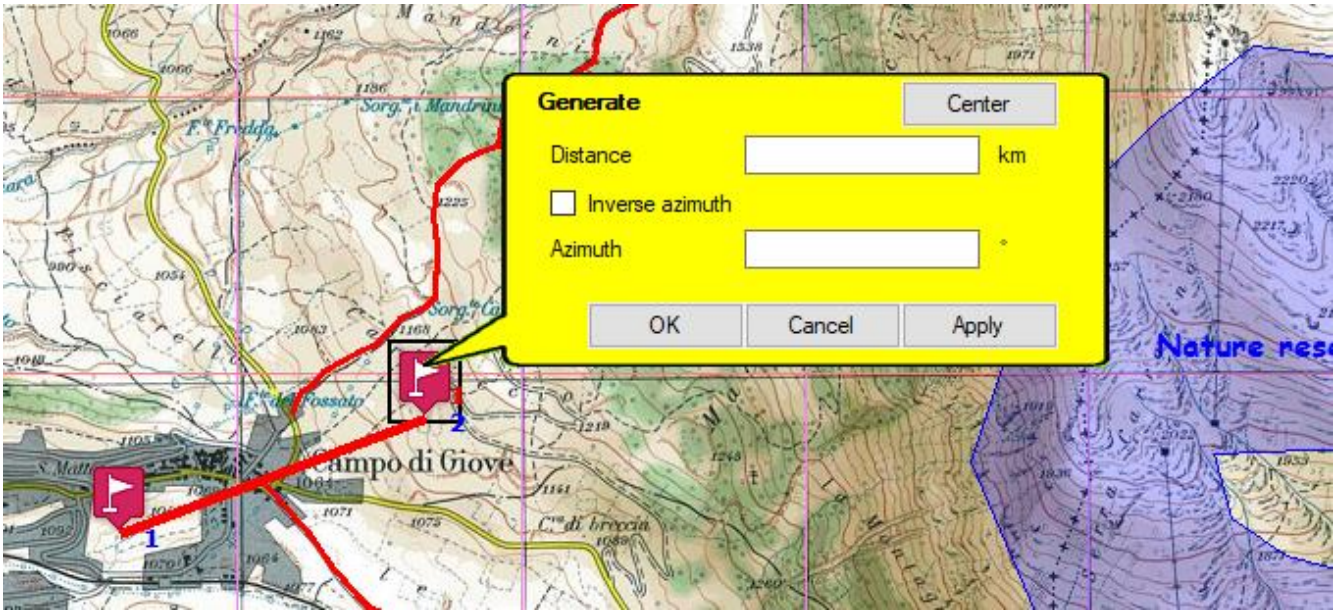
Generate an object

It applies to:

- Waypoints
- Waypoints of routes
- Points of tracks

To generate an object click with the right mouse button on any part of the object and select the *Generate - ...* context menu.

A window opens containing the information needed to generate the new object.
By way of example, the following figure refers to a route waypoint.



The *Center* button can be used to center the window in the center of the screen.

The information needed to generate the new object are:
- Distance
- Inverse azimuth
- Azimuth

Distance and azimuth are in the unit of measure specified at Preference – Distance, Area.

To generate the object and exit the function, press the *Ok* button.
To exit the function without generate the object, press the *Cancel* button.
Press the *Apply* button to generate the object without exit the function.

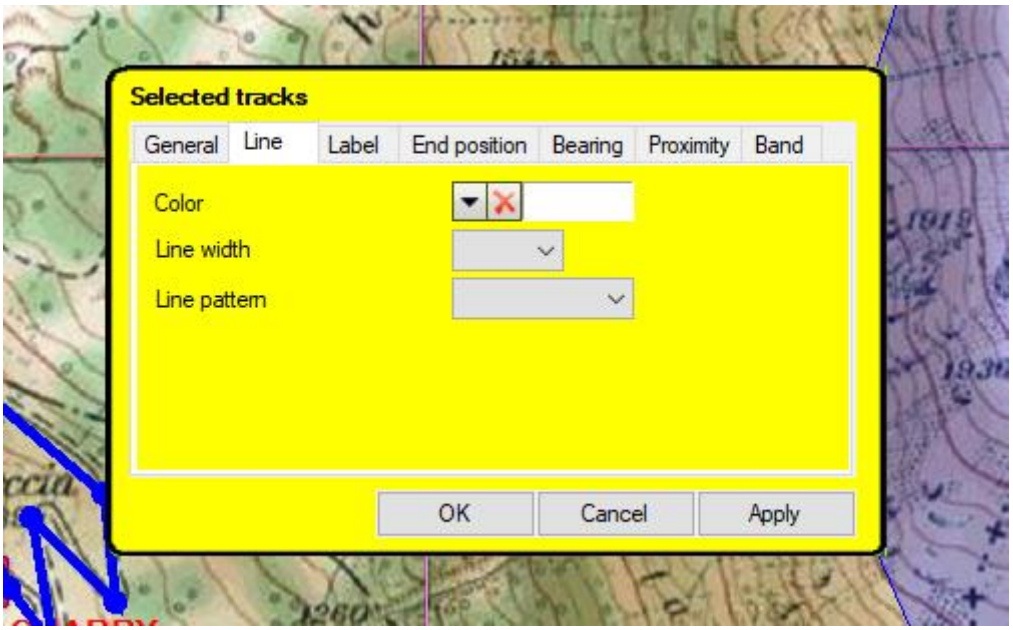
Modify the properties of the selected objects

It applies to:

- Waypoints
- Routes
- Waypoints of routes
- Tracks
- Toponyms
- Photos
- Points
- Multipoints
- Lines
- Polygons
- Pies
- Vectorial data

To change all the selected objects click with the right mouse button anywhere on the map and select the *Selected objects - Modify selected - ...* context menu.

A window opens containing a subset of information common to several objects:
By way of example, the following figure refers to a track.



The same considerations made for modifying an object are valid for use.

Move the selected objects

It applies to:

- Waypoints
- Routes
- Waypoints of routes
- Tracks
- Points of tracks
- GPX data
- Toponyms
- Icons
- Comments
- Points
- Multipoints
- Points of multipoints
- Lines
- Points of lines
- Polygons
- Points of polygons
- Pies
- Vectorial data

To move the selected objects click with the right mouse button anywhere on the map and select the *Selected objects - Move selected - ...* context menu.

The procedure is similar to what has already been seen in the section Move an object.

Hide the selected objects

It applies to:

- Waypoints
- Routes
- Tracks
- GPX data
- Toponyms
- Photos
- Icons
- Comments
- Points
- Multipoints
- Lines
- Polygons
- Pies
- Vectorial data
- All the objects

To hide the selected objects click with the right mouse button anywhere on the map and select the *Selected objects - Hide selected - ...* context menu.

Delete the selected objects

It applies to:

- Waypoints
- Routes
- Waypoints of routes
- Tracks
- Points of tracks
- GPX data
- Toponyms
- Photos
- Icons
- Comments
- Points
- Multipoints
- Points of multipoints
- Lines
- Points of lines
- Polygons
- Points of polygons
- Pies
- Vectorial data
- All the objects

To delete the selected objects click with the right mouse button anywhere on the map and select the *Selected objects - Delete selected - ...* context menu.

In addition, you can use the key combination Alt + DEL to delete selected points of any object.

Move all objects

It applies to:

- Waypoints
- Routes
- Tracks
- GPX data
- Toponyms
- Icons
- Comments
- Points
- Multipoints
- Lines
- Polygons
- Pies
- Vectorial data

To move all the objects click with the right mouse button anywhere on the map and select the *All objects - Move all - ...* context menu.

The procedure is similar to what has already been seen in the section Move an object.

View all hidden objects

It applies to:

- Waypoints
- Routes
- Tracks
- GPX data
- Toponyms
- Photos
- Icons
- Comments
- Points
- Multipoints
- Lines
- Polygons
- Pies
- Vectorial data
- All the objects

To view all the hidden objects click with the right mouse button anywhere on the map and select the *All objects - Unhide all - ...* context menu.

Delete all objects

It applies to:

- Waypoints
- Routes
- Tracks
- GPX data
- Toponyms
- Photos
- Icons
- Comments
- Points
- Multipoints
- Lines
- Polygons
- Pies
- Vectorial data
- All the objects

To delete all objects click with the right mouse button anywhere on the map and select the *All objects - Delete all - ...* context menu.

Select all

To select all the objects, use the *Select all* context menu.

Deselect all

To deselect all the objects, use the *Deselect all* context menu.

Invert the selection

To invert the selection (deselect the selected objects and select the others), use the *Invert selection* context menu.

Projects

What are projects

To facilitate the loading of maps and other coherent files, the concept of Project is introduced.

A project consists of the following elements:

- Maps (raster or vectorial)
- Web maps
- Waypoints, tracks, routes
- Toponyms
- Photos

Save a project

To save a project it is sufficient to load the elements of which it is made (see definition of Project) and use the *File - Save – Project* menu.

A file is created with a .okp extension that can be reloaded at a later time.

Automatically OkMap saves all maps, waypoints, tracks, routes, toponyms and photos whose data has been changed.
For each file a dialog box is opened to confirm or less the saving operation.

Load a project

To load a project, use the *File - Load – Project* menu.

A previously saved project file with a .okp extension is requested.

All the elements making up the project are automatically loaded.

Modify a project

To modify a project, it is sufficient to load it, close the elements to be excluded from the project itself, load the new elements to be included and finally save the project with the same name.

Management functions

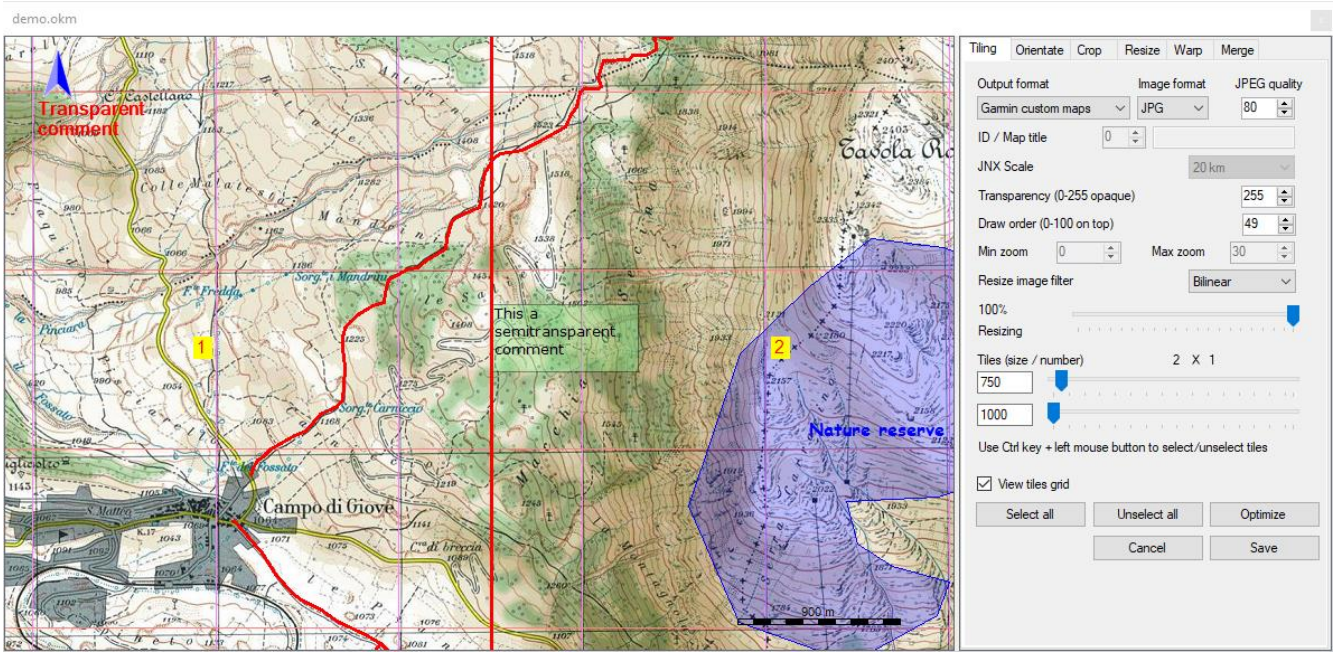
Maps

Map tiling / Garmin custom maps

It is a function able to divide the map orthogonally into smaller maps (tiles).

It is particularly useful for creating maps compatible with some GPS handhelds such as Garmin or with some apps for Android or iOS mobile devices.

A video is available for this function.



To activate this function, use the menu *Management – Map tiling – Map tiling / Garmin custom maps.*

The *View tiles grid* check box displays an orthogonal grid at the points where the map will be cut and the number of each tile.

Individual tiles can be selected by clicking with the Ctrl key + the left mouse button pressed on them.

To select all the tiles, press the *Select all* button. Similarly, to deselect all the tiles, use the *Deselect all* button.

The *Optimize* button automatically sets the best settings according to the selected format.

To start the function, press the *Save* button.

During processing, a progress bar will show the execution status.
To stop the generation process, press the *Stop* button.

The right pane (extendable by positioning the mouse in the left margin) allows you to customize:

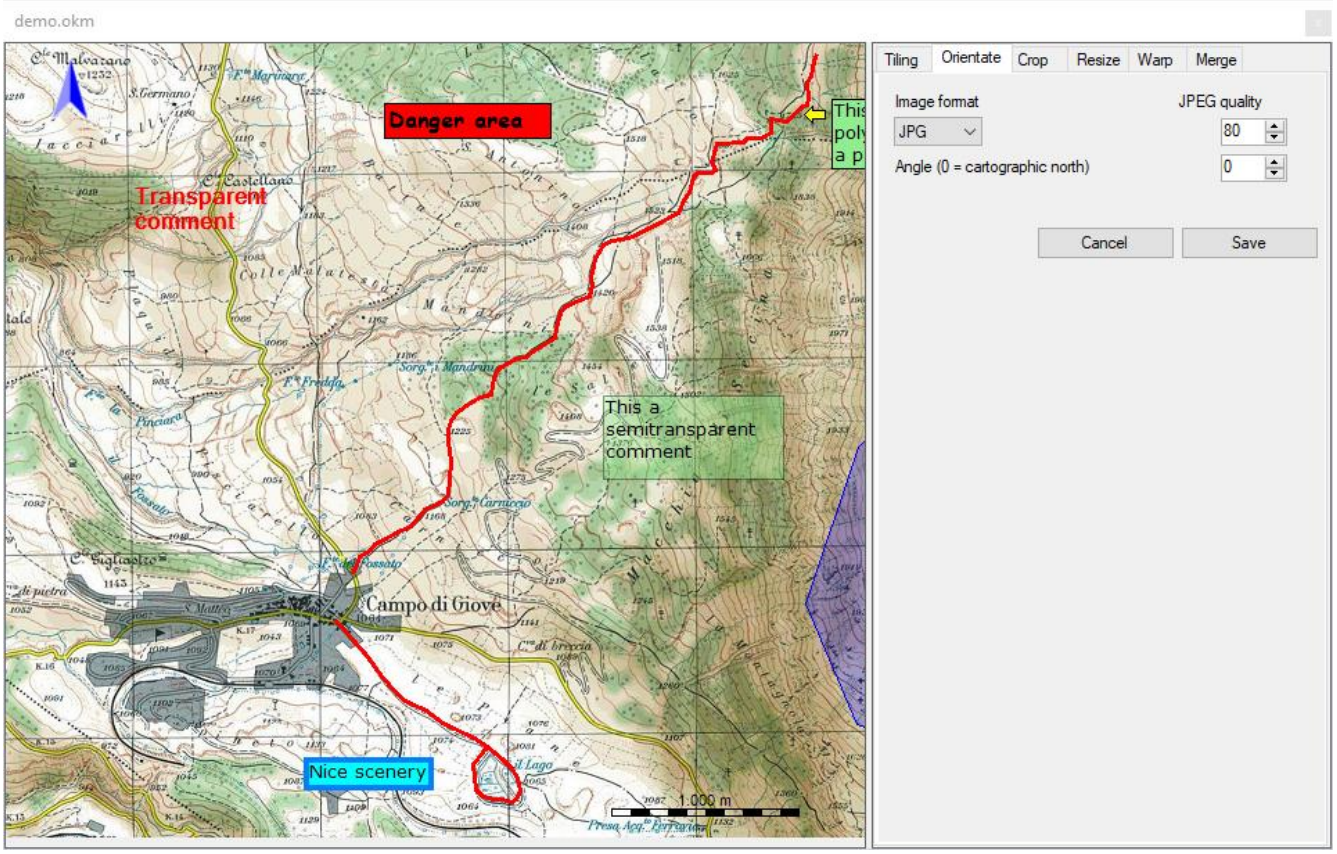
- The output format:
  - Garmin custom maps
  - Google Earth KMZ
  - Google Earth KMZ 2.2
  - Google Earth KML
  - Google Earth KML 2.2
  - JNX BirdsEye 3
  - JNX BirdsEye 4
  - OruxMaps
  - TomTom
  - OkMap

- The format of the images to be generated (JPG, TIF, PNG, GIF, BMP)
- The quality of JPEG images to be generated (0=Very bad, 100=Excellent)
- The ID and the title of the map (only for JNX)
- The JNX scale (only for JNX)
- The transparency factor (0=Transparent, 255=Opaque)
- Draw order (0=Invisible, 1-49=Vectorial data below, 50-100=On the top)
- Minimum and maximum zoom (for TomTom)
- The type of image filter to use in resizing operations
- The percentage of resizing of images to be generated
- The size (width and height) of the tiles to be generated or the number of tiles on the horizontal and vertical dimension using the scroll bars

Create an oriented a map

It is a function that creates a new map oriented according to a certain angle respect to the north.

It is particularly useful before a map tiling in a format that requires the map to be oriented to the north (e.g. JNX).



To activate this function, use the menu *Management – Map tiling – Create an oriented map*.

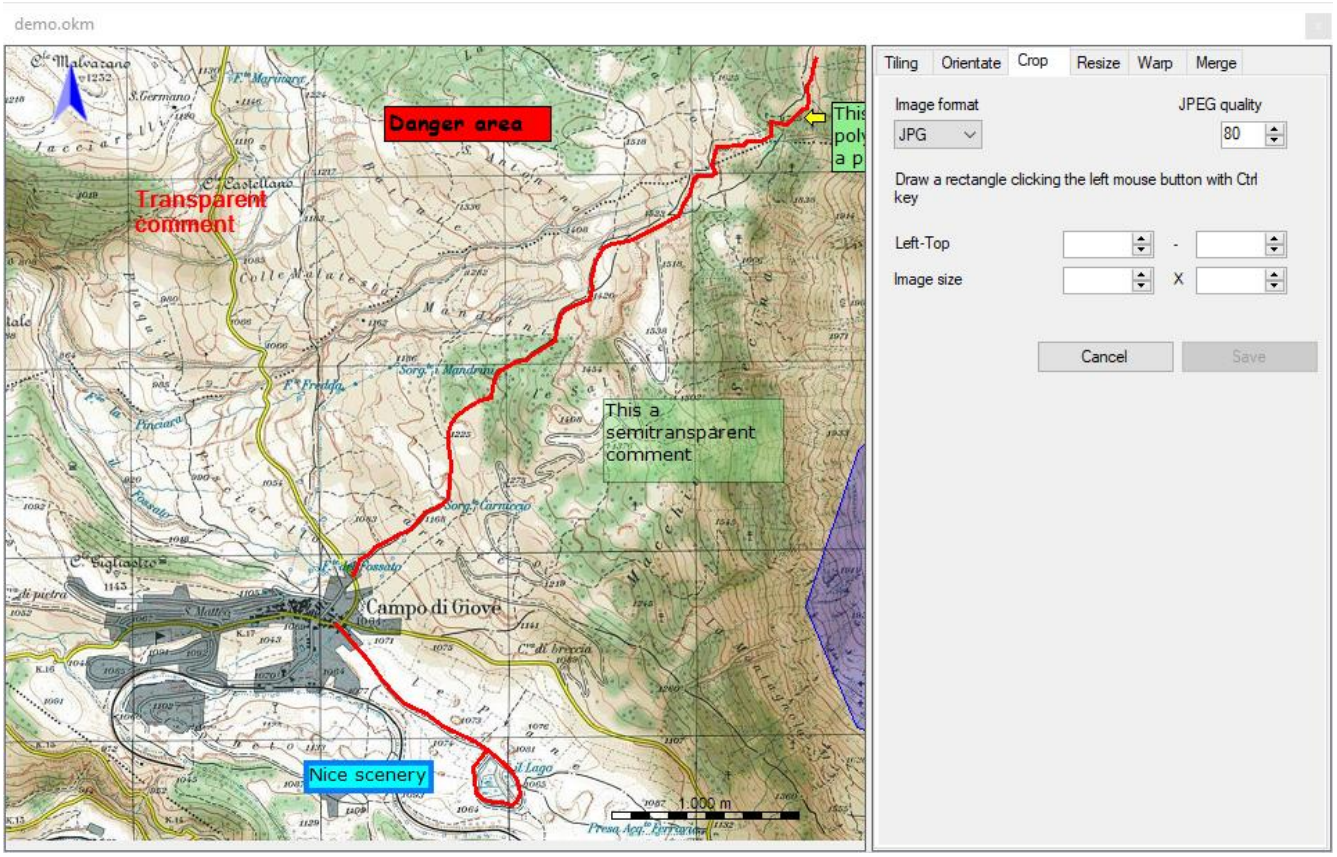
To start the function, press the *Save* button.

Before proceeding with the processing, it is possible to customize:

- The format of the images to be generated (JPG, TIF, PNG, GIF, BMP)
- The quality of JPEG images to be generated (0=Very bad, 100=Excellent)
- The angle with which the map will be oriented respect to the north

Create a cropped a map

It is a function that creates a new cropped map.



To activate this function, use the menu *Management – Map tiling – Create a cropped map*.

The part of the map to be cut out can be drawn with the left mouse button pressed together with the *Ctrl* key.
Alternatively, you can type the coordinates in pixels of the upper left point and the dimensions in pixel of the rectangle to be selected.

The dimension of the new map can be computed as follow:
- width = bottom right X coordinate – top left X coordinate
- height = bottom right Y coordinate – top left Y coordinate.

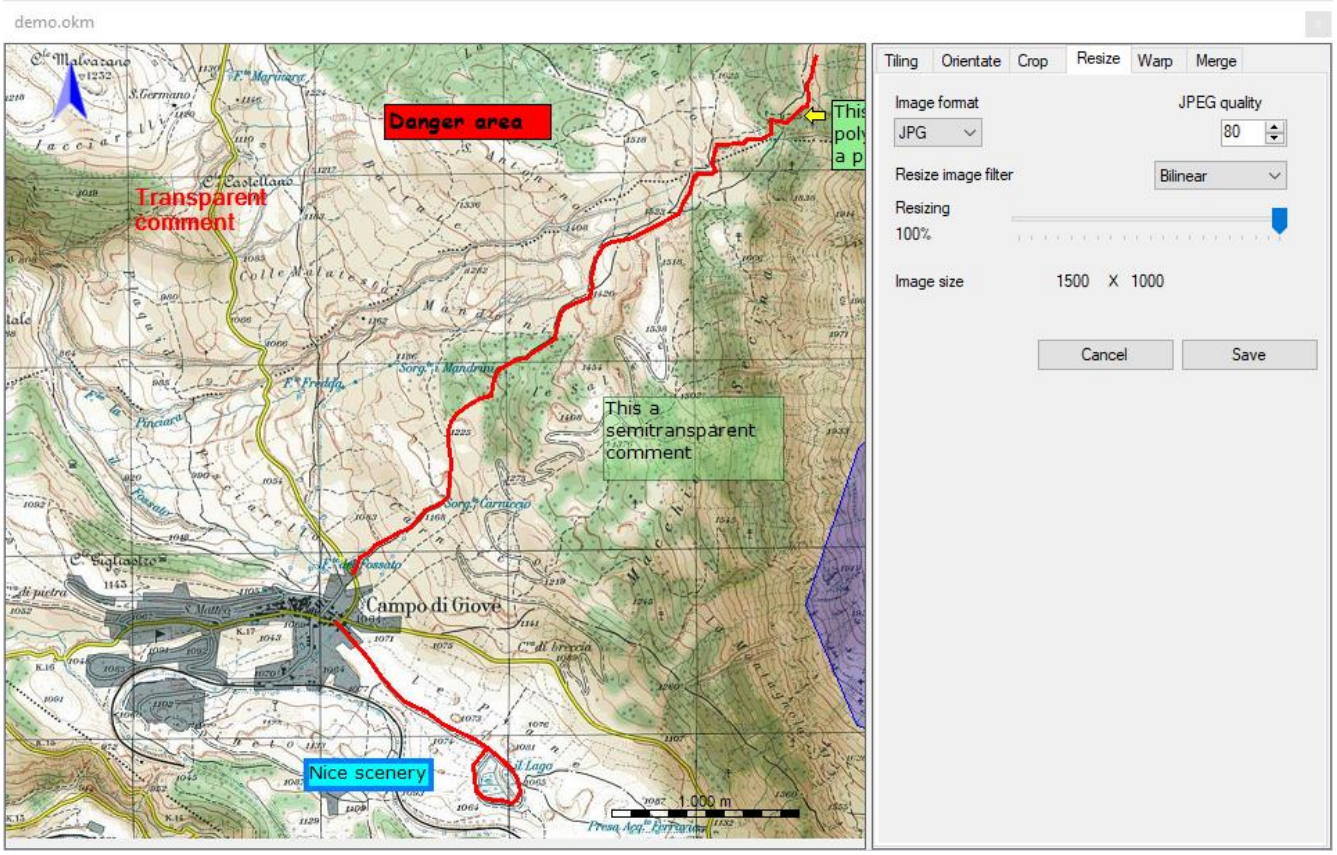
To start the function, press the *Save* button.

Before proceeding with the processing, it is possible to customize:

- The format of the images to be generated (JPG, TIF, PNG, GIF, BMP)
- The quality of JPEG images to be generated (0=Very bad, 100=Excellent)

Create a resized map

It is a function that creates a new map of smaller dimensions.



To activate this function, use the menu *Management – Map tiling – Create a resized map*.

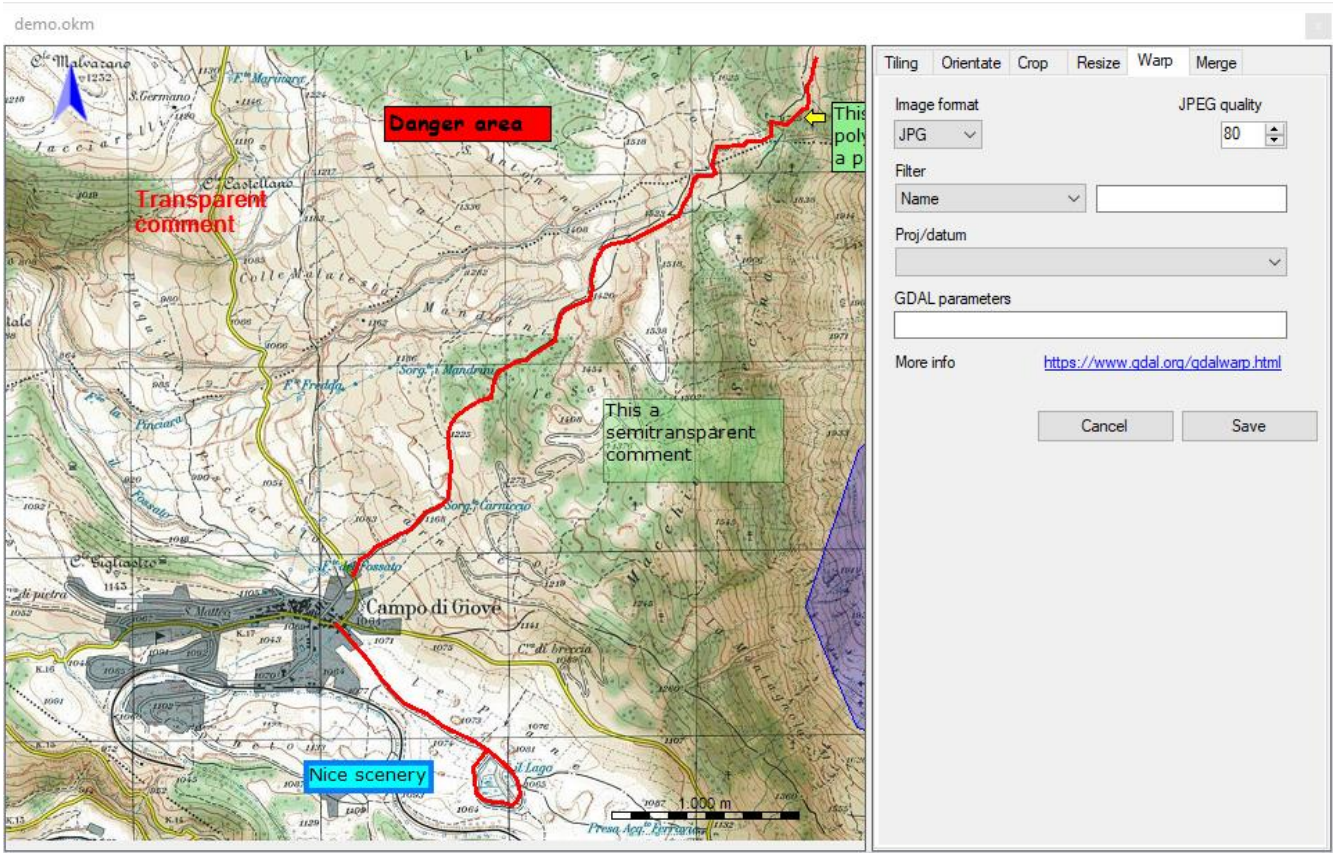
To start the function, press the *Save* button.

Before proceeding with the processing, it is possible to customize:

- The format of the images to be generated (JPG, TIF, PNG, GIF, BMP)
- The quality of JPEG images to be generated (0=Very bad, 100=Excellent)
- The type of image filter to use in resizing operations
- The percentage of resizing of map image to be generated

Create a warped map

It is a function that creates a warped map to adapt it to a new projection.



To activate this function, use the menu *Management – Map tiling – Create a warped map*.

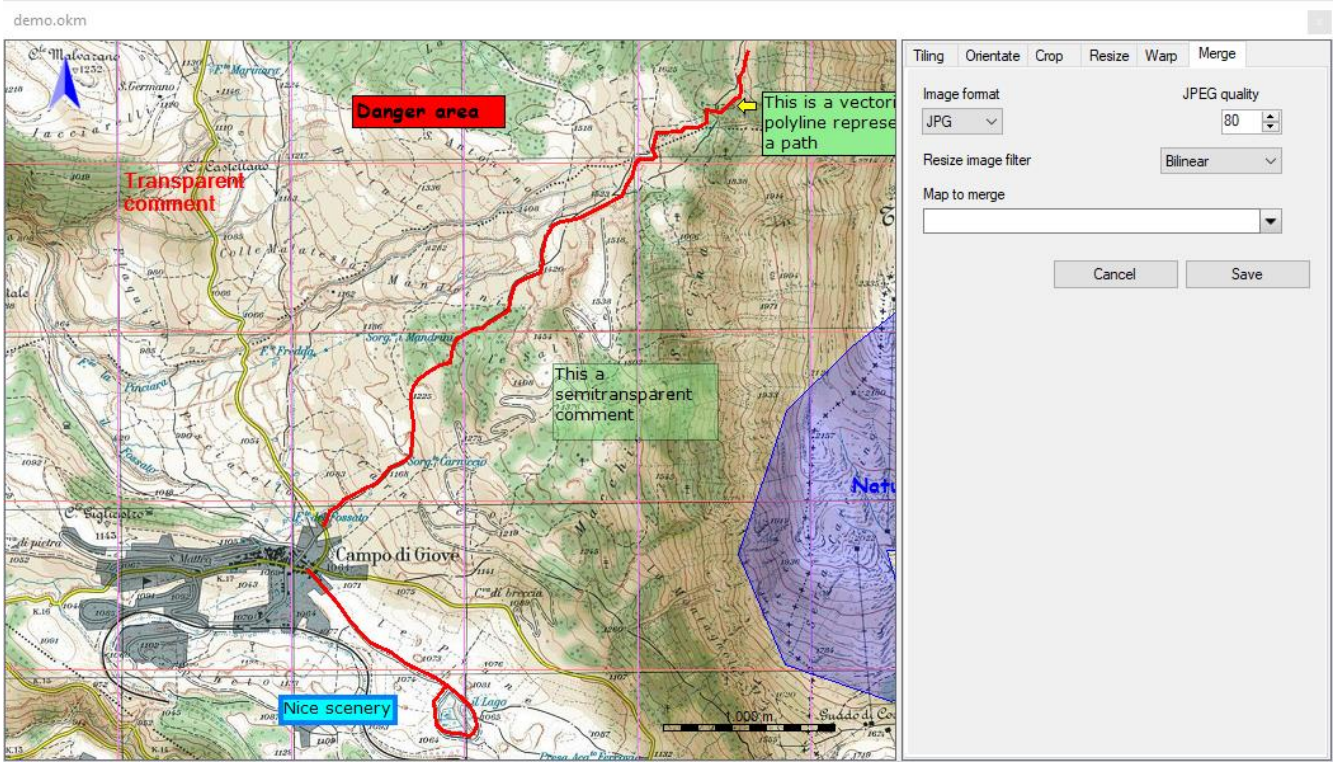
To start the function, press the *Save* button.

Before proceeding with the processing, it is possible to customize:

- The format of the images to be generated (JPG, TIF, PNG, GIF, BMP)
- The quality of JPEG images to be generated (0=Very bad, 100=Excellent)
- The projection/datum to be used to warp the image (you can use a filter to reduce the list of projections shown)
- One or more GDAL parameters (optional) to be used in the warping function (to see the parameters that can be used visit this web page).

Create a merged map

It is a function that creates a map resulting from the union of two maps.



To activate this function, use the menu *Management – Map tiling – Create a merged map*.

The maps are combined two at a time.
Select the *Map to merge* to specify the map that will be merged with the loaded map.
Finally press the *Save* button to merge the two maps.

Before proceeding with the processing, it is possible to customize:
- The format of the images to be generated (JPG, TIF, PNG, GIF, BMP)
- The quality of JPEG images to be generated (0=Very bad, 100=Excellent)
- The type of image filter to use in resizing operations

Consider the following:
- It's necessary that both maps have the same projection
- The loaded map is oriented according with the second map
- The map with more resolution is adapted to the other map with less resolution
- The second map is pasted on the first map

GPX

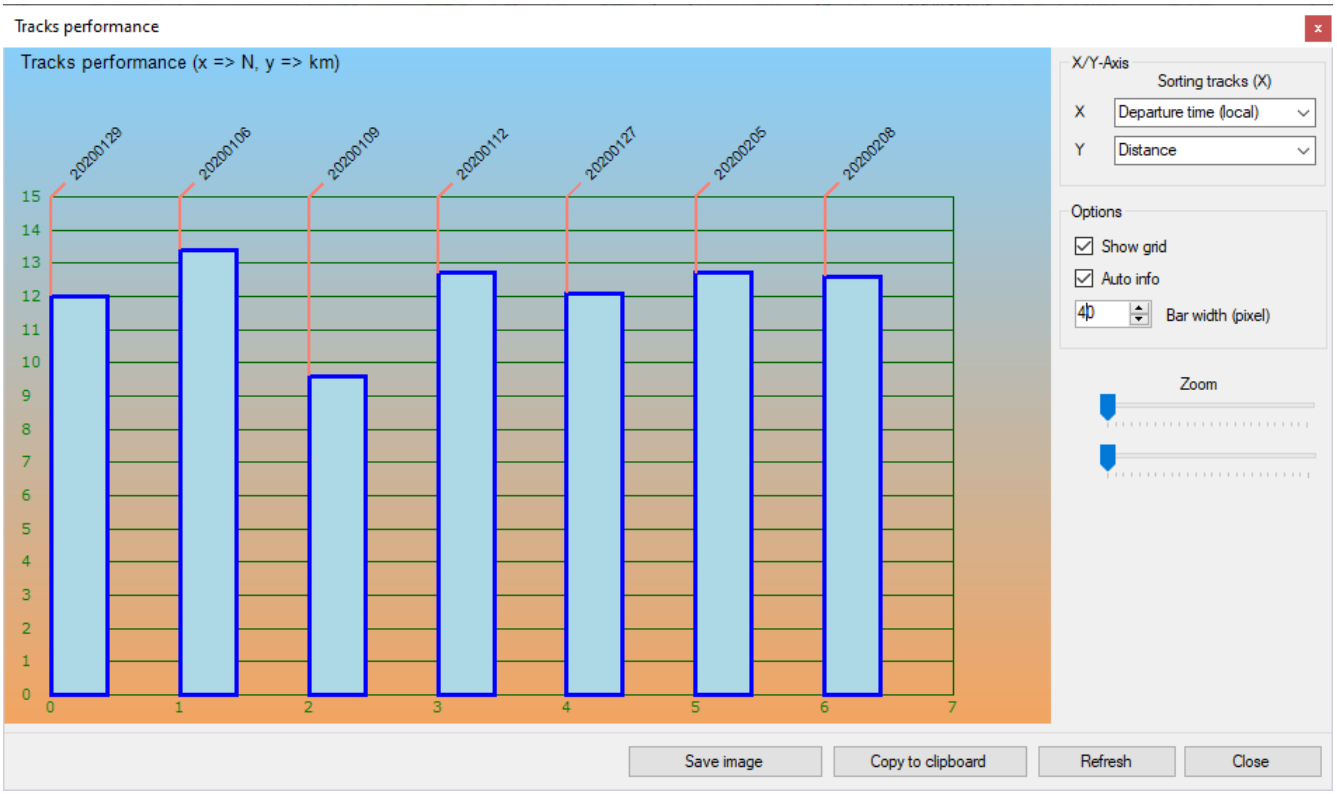
Tracks statistics

You can obtain the statistics of all the tracks loaded with the *Management - Tracks statistics* menu.

The window displayed is completely similar to the one already examined in the Track statistics section.

Tracks performance

You can obtain a performance analysis of all the tracks loaded with the *Management – Tracks performance* menu.



The X axis can be ordered for:

- Departure time
- Track name
- Track description
- Track comment
- Distance travelled
- Total Travel time
- Average speed
- Total ascent
- Total descent
- Calories consumed during trekking
- Lost body weight

The Y axis can represent the following values:
- Distance travelled
- Total Travel time
- Average speed
- Total ascent
- Total descent
- Calories consumed during trekking
- Lost body weight

A context menu is available on each bar:

- *Info*: some information about the current track point are displayed
- *Find start of track on opened maps*: position the loaded maps to center the start point of the current track if possible (highlighted with a red crosshair)
- *Find end of track on opened maps*: position the loaded maps to center the end point of the current track if possible (highlighted with a red crosshair)
- *Select track*: Select the current track
- *Statistics*: displays a window with track statistics
- *Graphs*: Opens the Track graphs window
- *Export data*: produces a CSV file containing a list of track points with proximity waypoints and toponyms and other important calculated values

At the bottom of the window there are some buttons:

- *Save image*: save the graphic image in a file
- *Copy to clipboard*: copy the image of the chart to the clipboard
- *Refresh*: re-render the graph
- *Close*: close the window

Download waypoints from OpenStreetMap

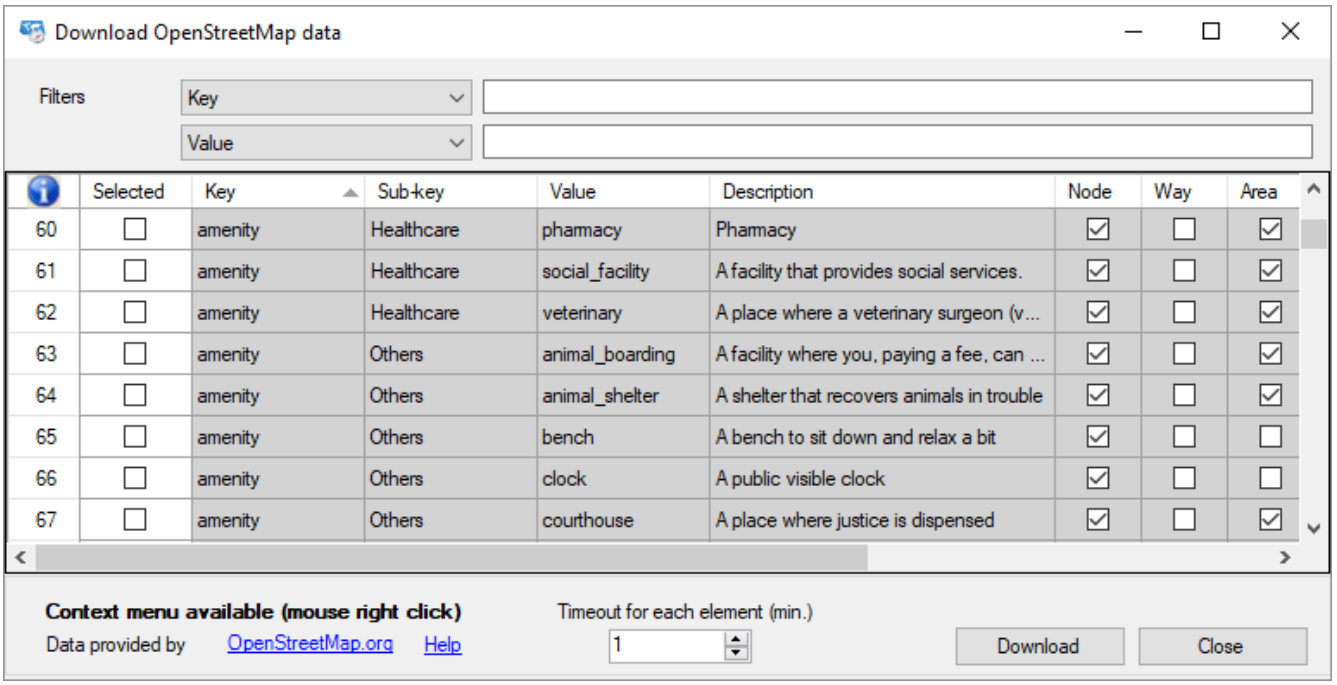
Through this function you can create new waypoints on the current map by downloading the information from the OpenStreetMap server.

It is activated with the *Management - Download OSM waypoints* menu.

The information displayed in this window represents the *feature* of OpenStreetMap that is how the vectorial data are typologically grouped:

- Selected (yes/no)
- Key
- Sub-key
- Value
- Description
- Node
- Way
- Area
- Relation
- Waypoint
- Status

The *Key - Sub-Key - Value* attributes are the unique identifier of the *feature*.
The *Description* is an example of how each individual *feature* is used.
For the *Node, Way, Area and Relation* fields, refer to the OpenStreetMap page.
The *Waypoint* field reports the number of waypoints downloaded for each feature at the end of processing.
The *Status* field reports at the end of processing a message that describes whether the operation was successful or what problems were found.



You can select a *feature* or not by modifying the value contained in the *Selected* column. Only the selected features will be processed.

For more information on the general use of tables, see the section Data tables.

In this table there is a context menu with the following items (besides the standard ones already seen in the paragraph Data tables):

- *Select all*: automatically sets the *Selected* to true value in all *features*
- *Deselect all*: automatically sets the value *Selected* to false in all the *features*

You can increase the *timeout* time for each *feature* up to a maximum of 10 minutes. This is the maximum time that can be dedicated to downloading the waypoints of each *feature*.

To start the waypoint download press the *Download* button.
To exit the function press the *Close* button.

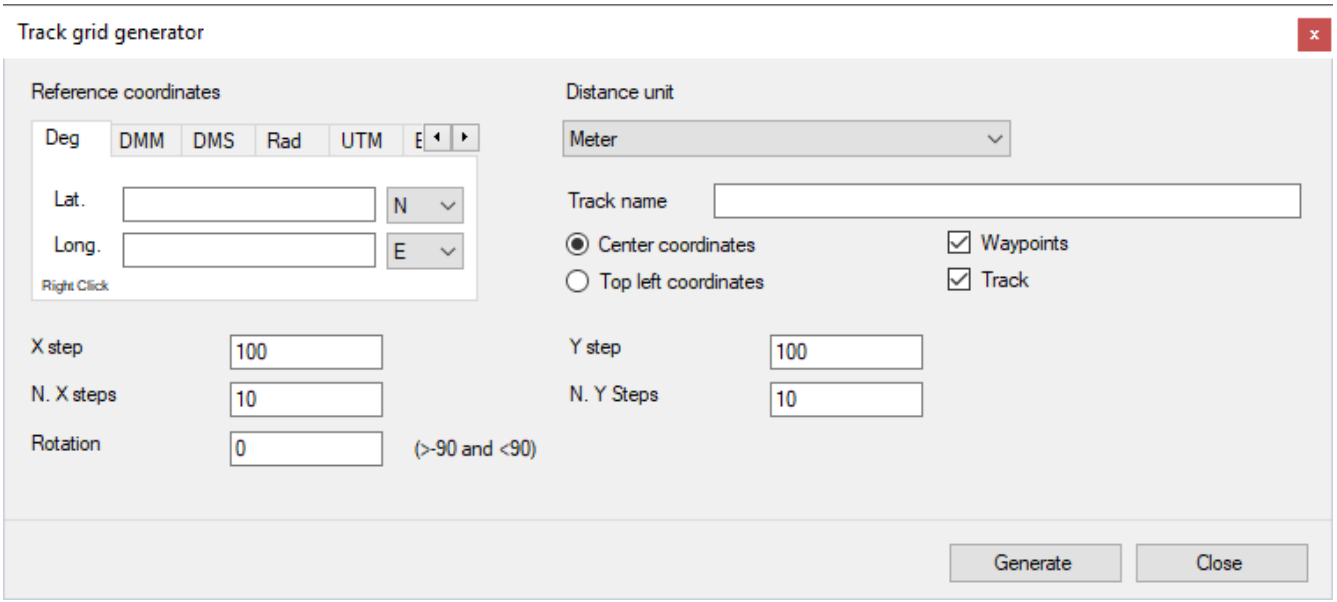
Generate tracks grids

This function is used to create a matrix of cells organized in a GPX track with the corresponding waypoints in the center of each cell.

It is particularly useful to divide the land in areas; these areas (cells) can be assigned to different teams to be used, for example, to search for people in difficulty.

To each team is assigned an area (marked by the central waypoint) and the GPX data generated by this function are copied into their GPSs for navigation; you will have the certainty that each team covers its area completely and does not invade areas assigned to other teams.

To activate the function, use the *Management - Track grid generator* menu.



Select the reference datum and the unit of measurement for distances.

Indicate the name of the track that will be also the prefix for the generated waypoints.
Indicate whether the coordinates shown refer to the geographical point of the center of the grid or of the top left of the grid.

Specify if you want to generate only the grid and/or waypoints.

Then enter the coordinates (see Enter the coordinates paragraph).

Specify the size of the X and Y axis (*X step* and *Y step*) of the cells.
Then indicate the number of cells to be generated in the direction of X and Y (*N. X steps* and *N. Y steps*).

Finally, specify a *Rotation* angle of the whole matrix by a certain number of degrees (> -90 and <90).

To generate the grid press the *Generate* button.
To exit the window press the *Close* button.

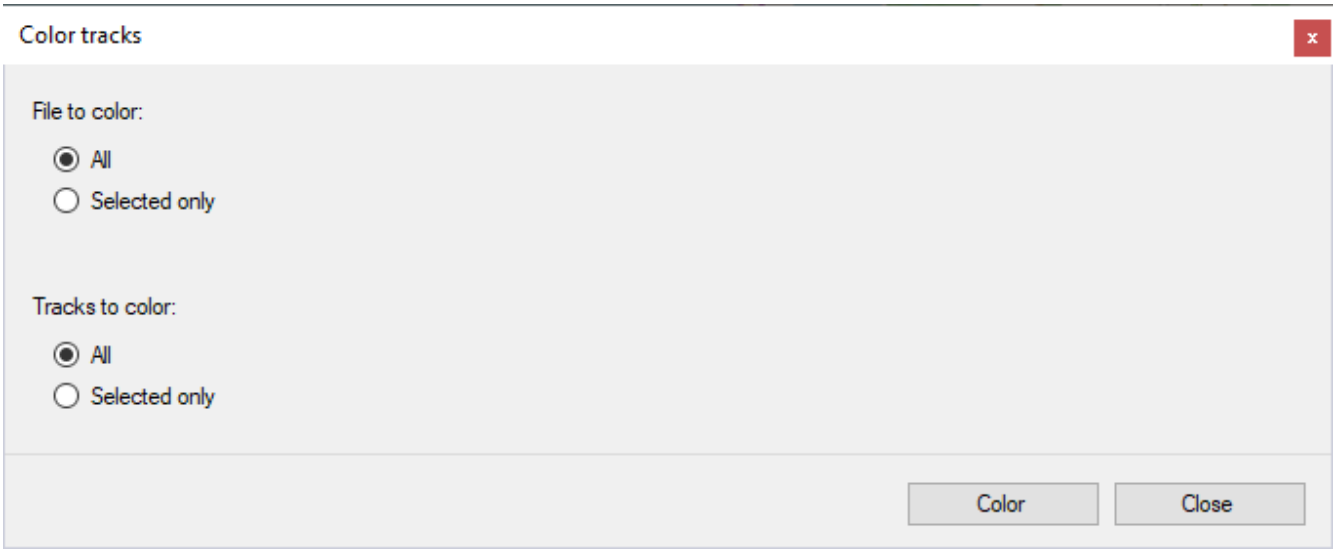
Copy the selected objects to another file

It is possible to copy selected objects (waypoints, tracks and routes) to the selected GPX file with the *Management - Copy selected GPX data to* menu

All selected objects of all opened GPX files will be copied except those that are already part of the destination file.

Color the tracks

To make several intersecting tracks more legible on the map, you can assign them a different color randomly using the following sub-menus of the main *Management – Color tracks* menu.

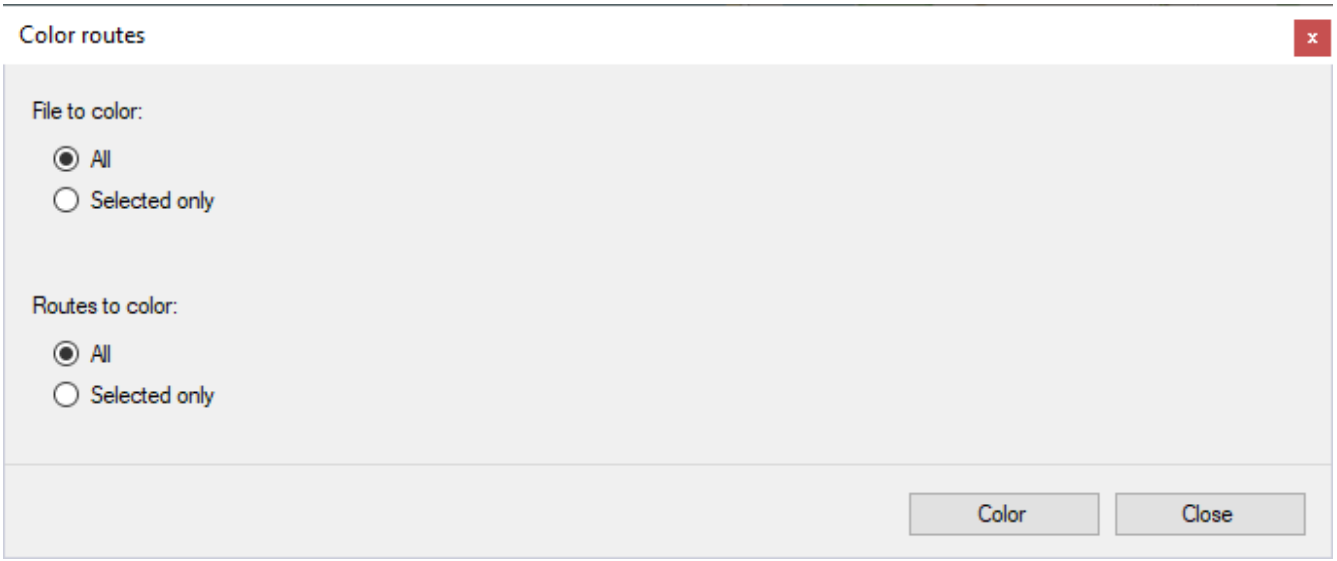


Choose if you want to color:
- All files or only the selected (current) one
- All tracks or only those selected

To color the tracks, press the *Color* button.
To exit the window, press the *Close* button.

Color the routes

To make several intersecting routes more legible on the map, you can assign them a different color randomly using the following sub-menus of the main *Management* - *Color routes* menu.



Choose if you want to color:
- All files or only the selected (current) one
- All routes or only those selected

To color the routes, press the *Color* button.
To exit the window, press the *Close* button.

Undo / redo GPX data changes

To cancel a change made to GPX data (waypoints, routes, tracks) use the *Management* - *Undo GPX changes* menu or type Ctrl+Z.

Likewise, to restore a canceled change use the *Management* - *Redo GPX changes* menu or type Ctrl+Y.

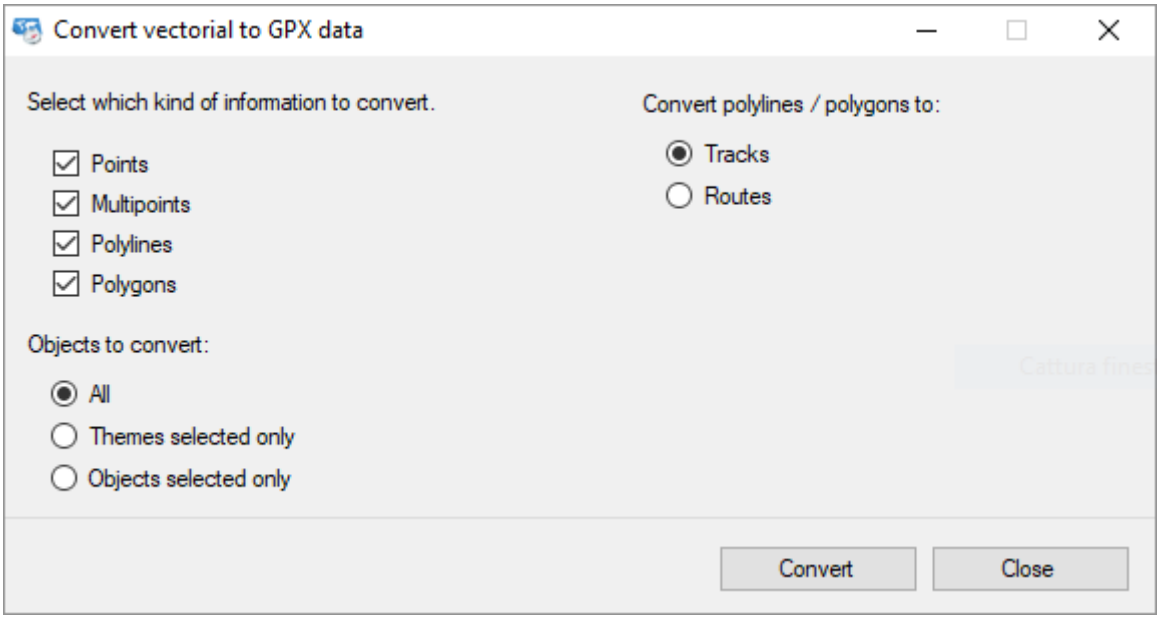
You can cancel / restore multiple changes made in sequence.

Conversion functions

Convert vectorial data into GPX data

You can use this function to transform points and multipoints into waypoints and lines and polygons into routes or tracks.

To activate the function, use the *Management - Conversions - Convert vectorial to GPX data* menu.



Select the types of vectorial data you want to convert (points, multipoints, lines and/or polygons).

Choose if you want to convert:
- All vectorial data
- Those related to selected themes
- Only the selected shapes

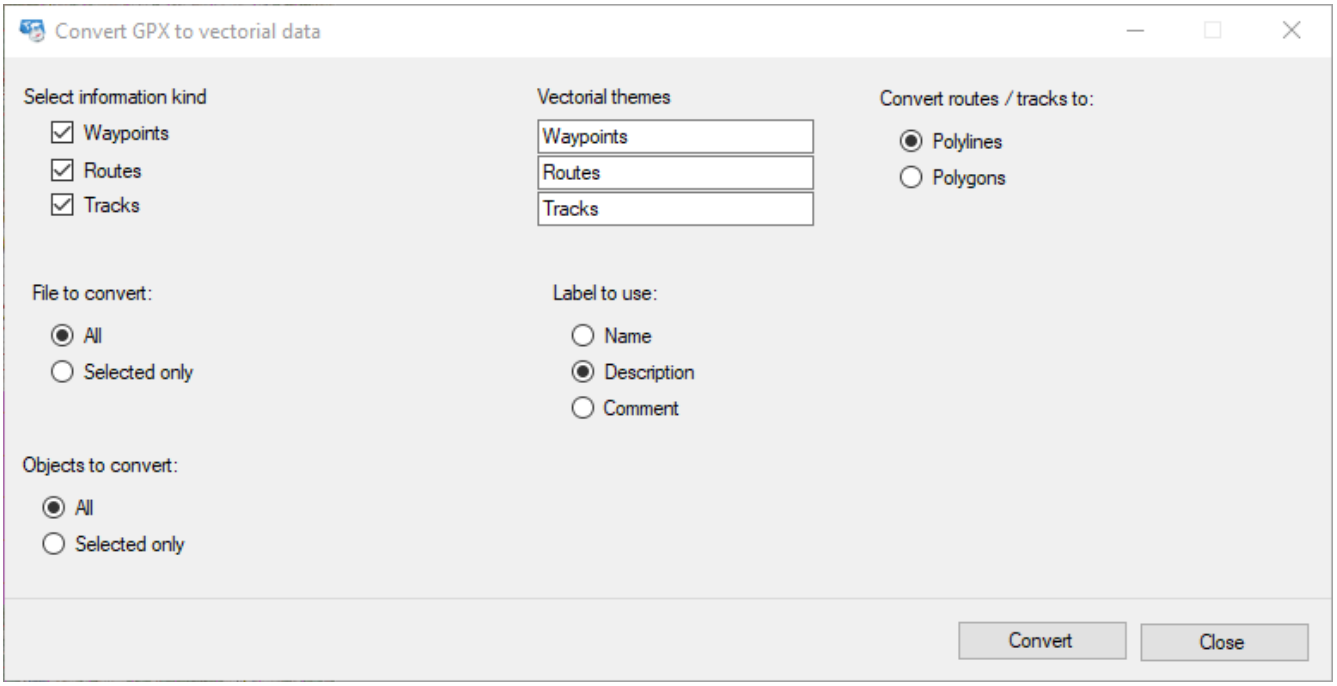
Finally choose whether lines and polygons are to be converted into routes or tracks.

To convert, press the *Convert* button.
To exit the window, press the *Close* button.

Convert GPX data into vectorial data

You can use this function to transform waypoints into points and routes and tracks into lines.

To activate the function, use the *Management - Conversions - Convert GPX to vectorial data* menu.



Select the GPX data types that you want to convert (waypoints, routes and/or tracks) and, if necessary, change the name of the proposed theme in the adjacent boxes.

If the themes do not exist, they are created automatically; it is then possible to modify their properties with the List of vectorial themes function.

Choose if you want to convert:
- All files or only the selected (current) one
- All GPX data or only selected ones

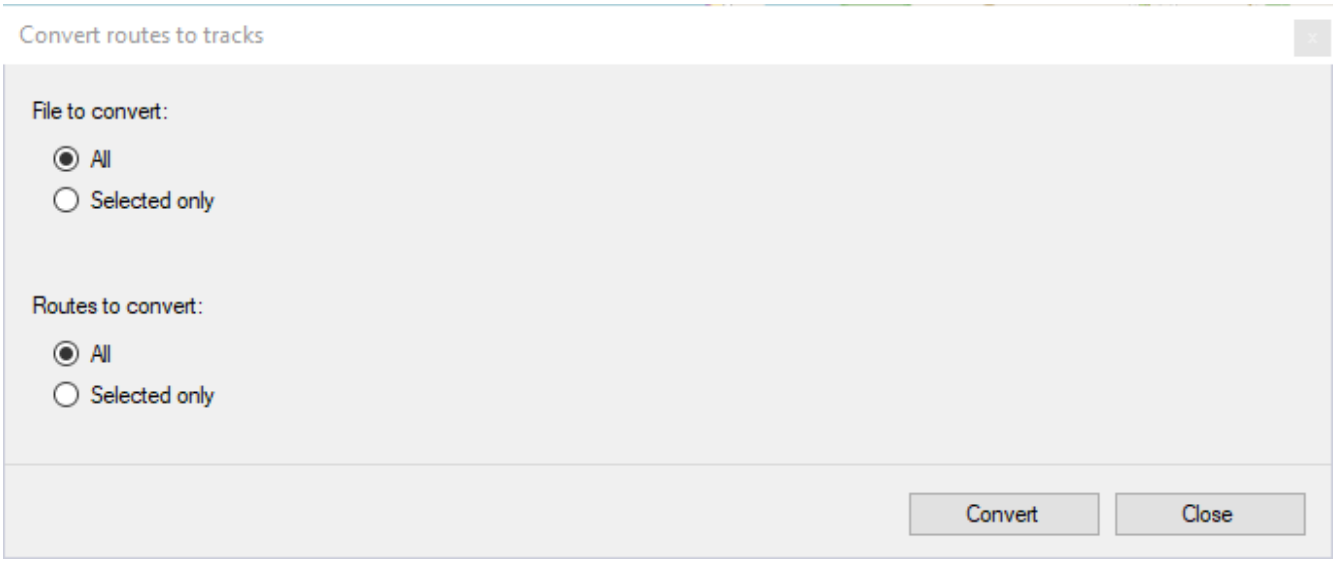
Finally choose which information you want to use as vectorial data label (name, description or comment).

To convert, press the *Convert* button.
To exit the window, press the *Close* button.

Convert routes into tracks

With this function you can convert routes into tracks.

To activate the function, use the *Management - Conversions - Convert routes to tracks* menu.



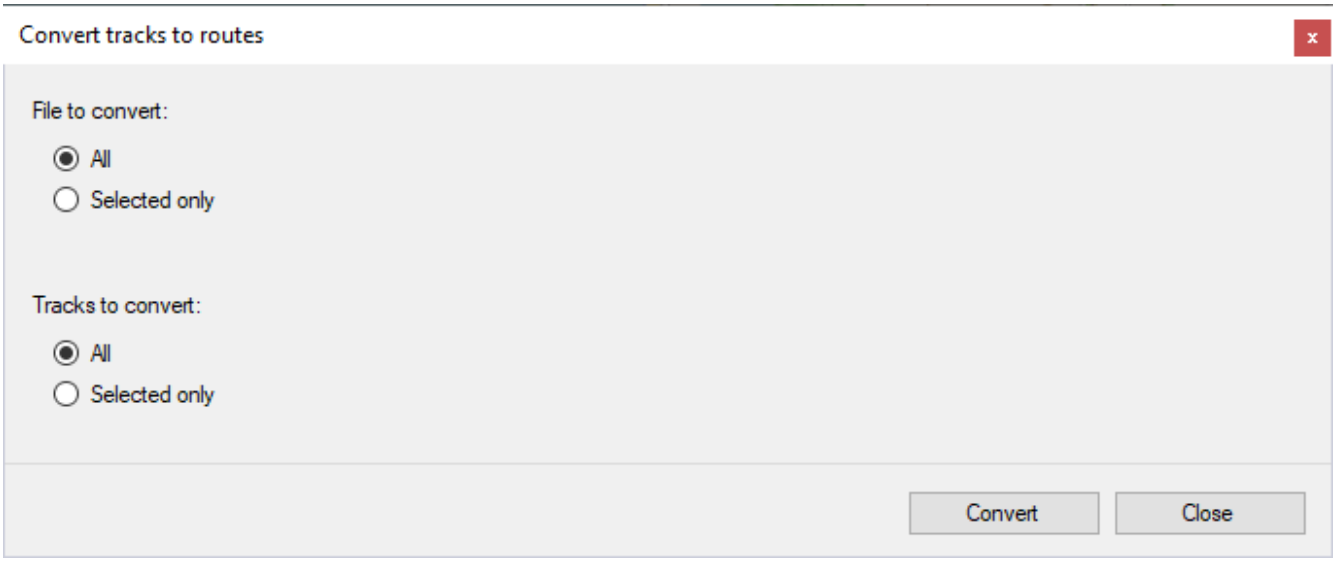
Choose if you want to convert:
- All files or only the selected (current) one
- All routes or only those selected

To convert, press the *Convert* button.
To exit the window, press the *Close* button.

Convert tracks into routes

With this function you can convert tracks into routes.

To activate the function, use the *Management - Conversions - Convert tracks to routes* menu.



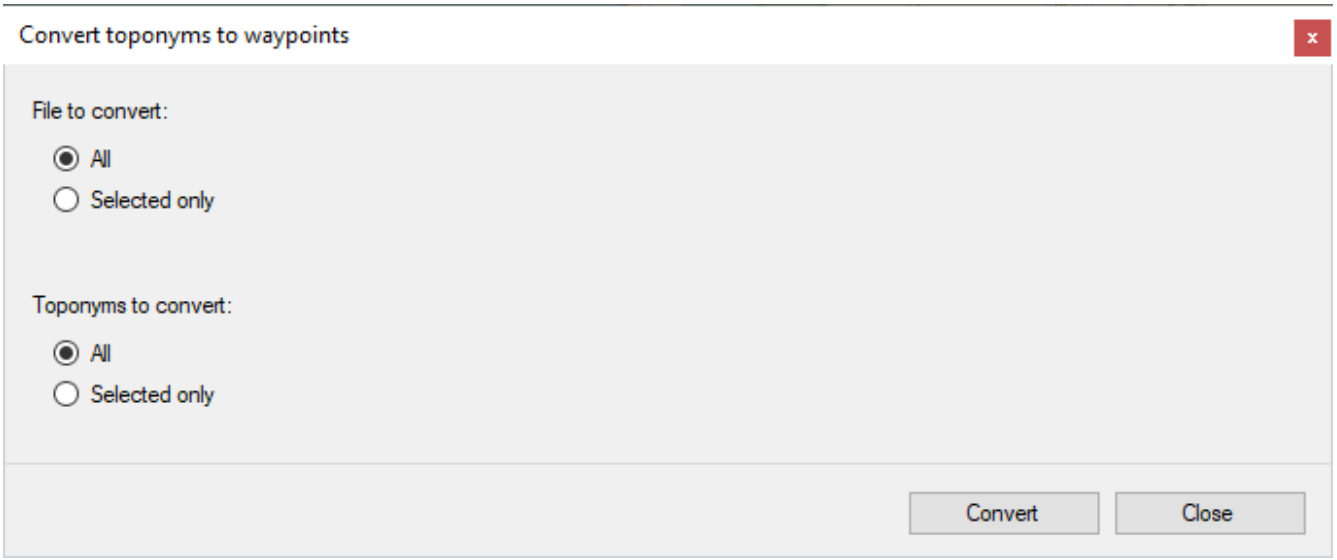
Choose if you want to convert:
- All files or only the selected (current) one
- All tracks or only those selected

To convert, press the *Convert* button.
To exit the window, press the *Close* button.

Convert toponyms into waypoints

With this function you can convert toponyms into waypoints.

To activate the function, use the *Management - Conversions - Convert toponyms to waypoints* menu.



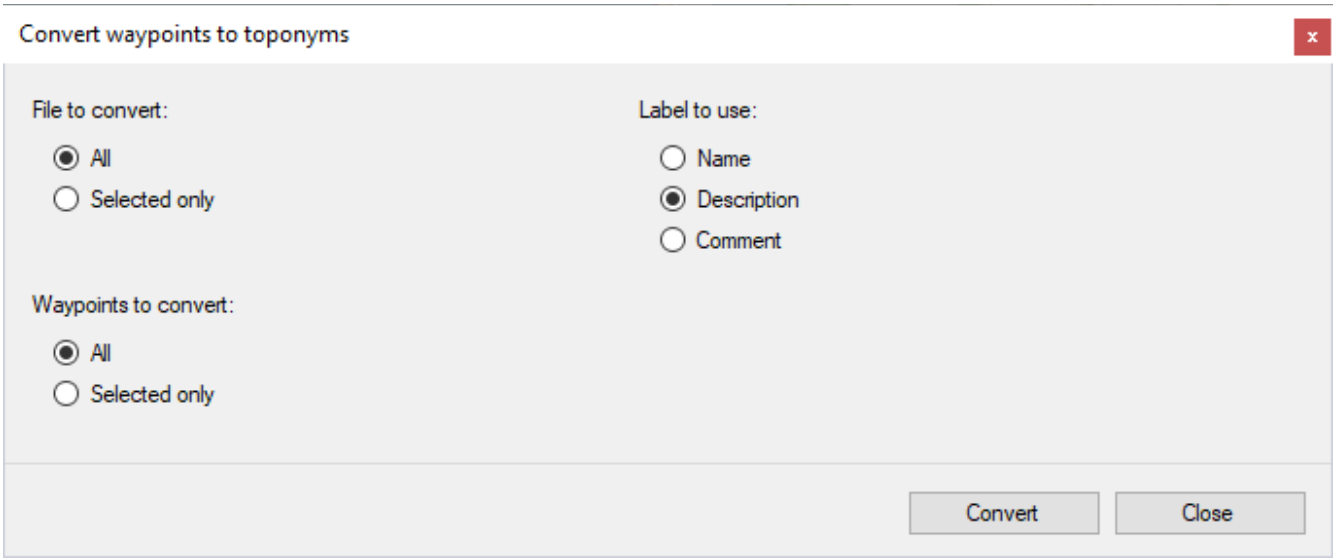
Choose if you want to convert:
- All files or only the selected (current) one
- All toponyms or only those selected

To convert, press the *Convert* button.
To exit the window, press the *Close* button.

Convert waypoints into toponyms

With this function you can convert waypoints into toponyms.

To activate the function, use the *Management - Conversions - Convert waypoints to toponyms* menu.



Choose if you want to convert:
- All files or only the selected (current) one
- All waypoints or only selected ones

Finally choose which information you want to use as label of toponyms (name, description or comment).

To convert, press the *Convert* button.
To exit the window, press the *Close* button.

GPS, Navigation and remote data

Communications with GPS

These functions should only be used for GPS devices that support a proprietary communication protocol. The latest generation GPS are seen as mass storage devices mounted on your computer for which you only need to copy GPX files to / from this device as if it were a common USB stick.

To activate these functions, it's necessary to enable "I use a GPS with proprietary protocol" in Preferences - General.

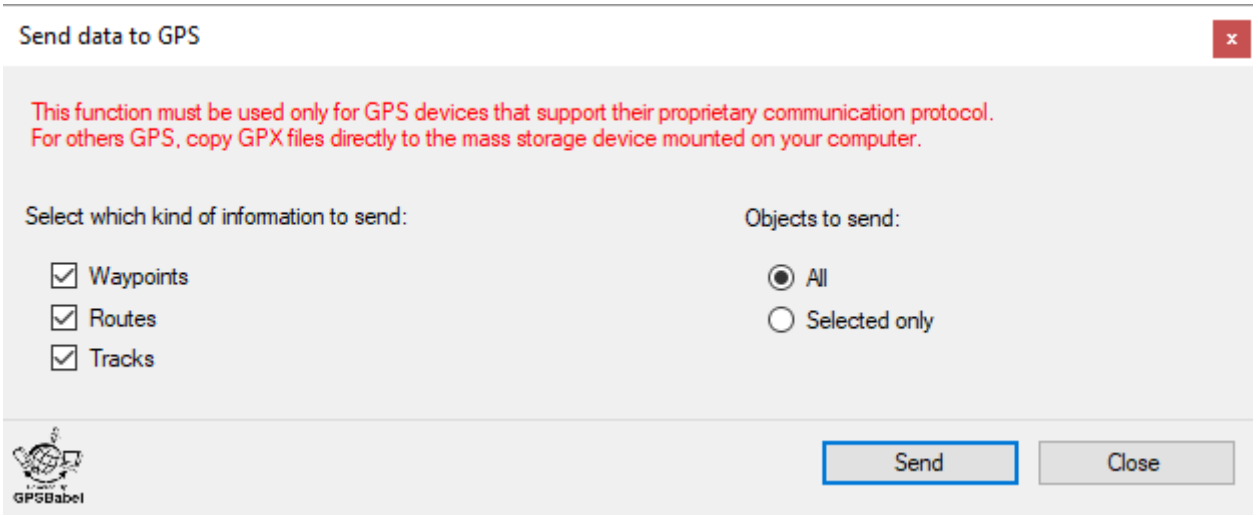
The supported GPS devices are:

GPS device	Direction	Waypoints	Routes	Tracks
Brauniger IQ Series Barograph	download	no	no	Yes
Garmin	down-upload	yes	yes	Yes
GlobalSat DG-100/BT-335	download	yes	no	Yes
GlobalSat DG-200	download	yes	no	yes
GlobalSat GH625XT GPS training watch	down-upload	yes	yes	yes
Holux M-241 (MTK based)	download	no	no	yes
Magellan	down-upload	yes	yes	yes
MiniHomer	download	yes	no	yes
MTK Logger	download	yes	no	yes
NaviGPS GT-11/BGT-11	down-upload	yes	yes	yes
SysTraq Venus	download	yes	no	yes
Wintec WBT-100/200	download	yes	no	yes
XAiOX iTrackU Logger	download	yes	no	yes

Send data to the GPS

Before accessing this feature, make sure you have correctly configured the parameters for communication with the GPS in the Preferences - GPS function.

To activate this function use the Navigation - *GPS* – *Send data* menu.



You can specify which types of GPX data you want to send to the GPS:

- Waypoint
- Routes
- Tracks

It is also possible to further select the objects to be transmitted belonging to the typologies specified above:

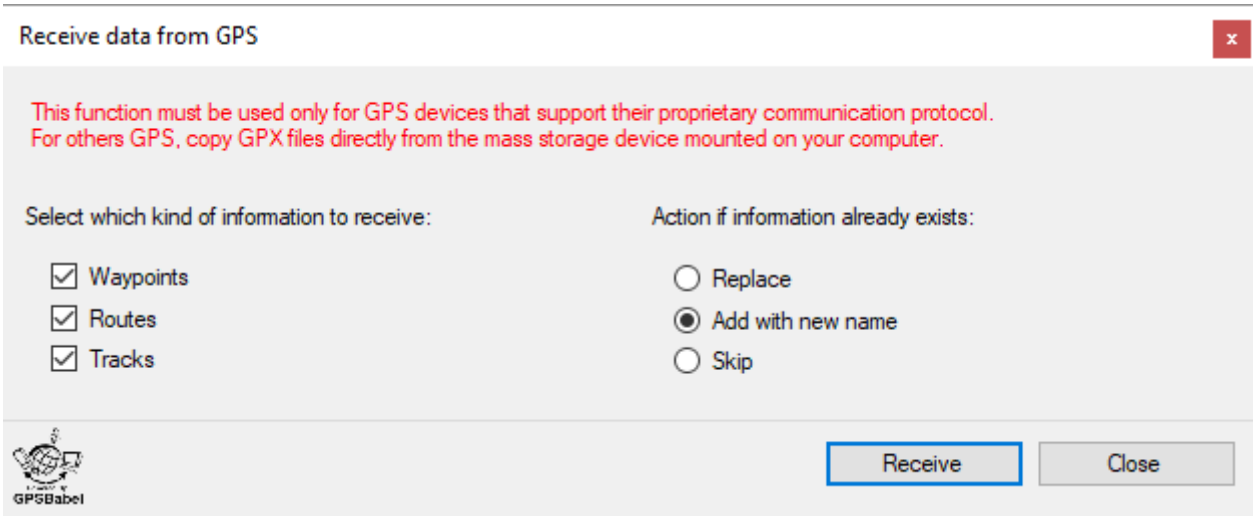
- *All*: all GPX data are sent.
- *Selected only*: only the selected GPX data are sent.

To activate the process, press the *Send* button.
To close the window, press the *Close* button.

Receive data from the GPS

Before accessing this feature, make sure you have correctly configured the parameters for communication with the GPS in the Preferences - GPS function.

To activate this function use the Navigation - *GPS – Receive data* menu.



You can specify which types of GPX data you want to receive from the GPS:

- Waypoint
- Routes
- Tracks

It is also possible to select the action to be taken in case the GPX object already exists:

- *Replace*: the existing GPX object is replaced with the received one.
- *Add with new name*: a new name is generated for the received GPX object.
- *Skip*: the received GPX object is ignored.

To activate the process, press the *Receive* button.
To close the window, press the *Close* button.

Turn off the GPS

Before accessing this feature, make sure you have correctly configured the parameters for communication with the GPS in the Preferences - GPS function.

To switch off the connected GPS use the *Navigation - GPS - Turn off* menu.
Only some GPS models are enabled to be turned off via software.

Navigation

Navigation with integrated GPS

Recent notebook computers have an integrated GPS device inside them.
To constantly receive the position returned by the integrated GPS in OkMap use the *Navigation - GPS communication* menu.

The received positions are used to create/update the track named ACTIVE LOG in the waypoints, routes, tracks current file. Each received position is queued to the ACTIVE LOG track.

In case of momentary loss of the GPS signal, the track is broken creating a new segment.

You can create multiple ACTIVE LOG tracks in different files; to do this it is sufficient to create a new waypoint, routes, tracks file and make it current (see paragraph File manager).

To close the communication with the GPS, use the *Navigation - GPS communication* menu again.

NMEA navigation

If an integrated GPS is not available, you can use an external Bluetooth or USB device. These devices normally use the NMEA 0183 protocol (or simply NMEA) to send data to the connected computer.

NMEA is a standard of interfacing between digital equipment and is mainly used in nautical applications (GPS, autopilot systems, echo sounders, etc.).

Only part of the protocol has relevance in the GPS area; in these cases the NMEA system is used to transmit data from a GPS receiver to a connected computer.
Communication takes place through text strings (sentences) that start with a $ character followed by a command and, subsequently, by the respective parameters.

You can establish a NMEA connection with a connected GPS with the *Navigation - NMEA communication* menu.
Before accessing this feature, make sure you have connected the GPS and have correctly configured the communication parameters in the Preferences - NMEA function.

To close the navigation mode (NMEA reception) use the *Navigation - NMEA Communication* menu again.

If communication with the GPS fails check:

- That the GPS is turned on and working
- The connection cable between computer and GPS or the Bluetooth communication.
- The communication parameters set in the Preferences - NMEA function.

NMEA protocol

All NMEA messages and commands data consist of ASCII characters (from decimal 20 to decimal 127 or from HEX 14 to HEX 7E).

A NMEA message consists of fields as follows:
$<device id><message id>,<data field>,<data field>,,,.....*<checksum><CR><LF>

The "device id" is defined by two characters.
OkMap recognizes the follows:

- GP - GPS
- GL - GLONASS
- GA - Galileo
- GN - GPS, GLONASS, Galileo
- HC - Heading - Magnetic Compass

The "message id" is defined by three characters.
OkMap recognizes the follows:

- RMC - Recommended Minimum Navigation Information
- GGA - Global Positioning System Fix Data
- GLL - Geographic Position - Latitude/Longitude
- GSA - GPS DOP and active satellites
- GSV - Satellites in view
- VTG - Track made good and Ground speed
- ZDA - Time & Date - UTC, day, month, year and local time zone
- HDT - Heading - True (combined only with HC - Heading - Magnetic Compass)

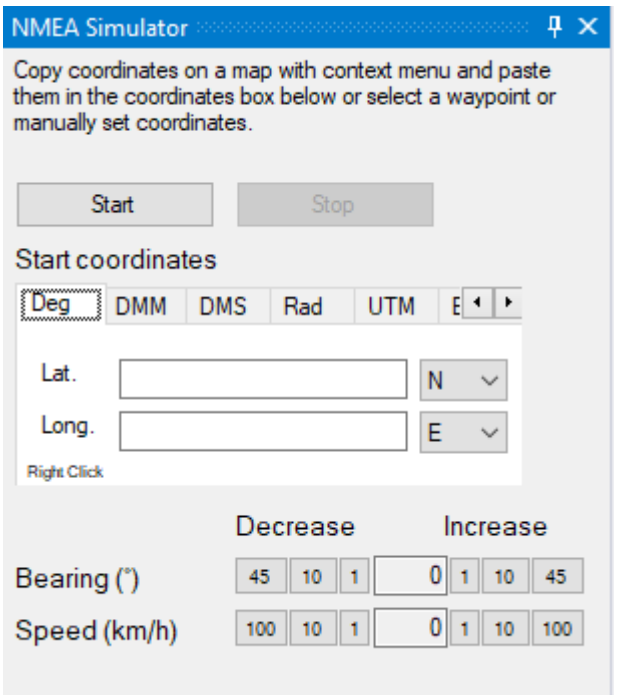
Message data fields are separated by commas and the message ends after checksum field with a carriage return <CR> and a line feed <LF> control characters.
Delimiter '*' precedes the checksum field.

Notice that data fields may be omitted (NULL); such data fields contain no characters but are still separated by commas.

NMEA simulator

There is the possibility of simulating the presence of a GPS.
This function emulates a NMEA connection and returns $GPRMC sentences.

To activate this function, use the *Navigation - NMEA Simulator* menu.



Before starting the simulation it is necessary to specify the starting coordinates (see paragraph Enter the coordinates).

To start the simulation, use the *Start* button.
To stop the simulation, use the *Stop* button.

You can change direction and speed by increasing / decreasing them with the respective buttons.

The time between simulating a position and the next is defined in the Preferences – Navig. page in the *NMEA simulator time* field.

NMEA simulator from file

This function emulates a NMEA connection and returns the sentences taken from a file.

To activate this function, use the *Navigation - NMEA Simulator from file* menu.

A dialog box for selecting the input file is opened.

The time between the sending of a sentence and the next one is defined in the Preferences – Navig. page in the *NMEA simulator time (from file)* field.

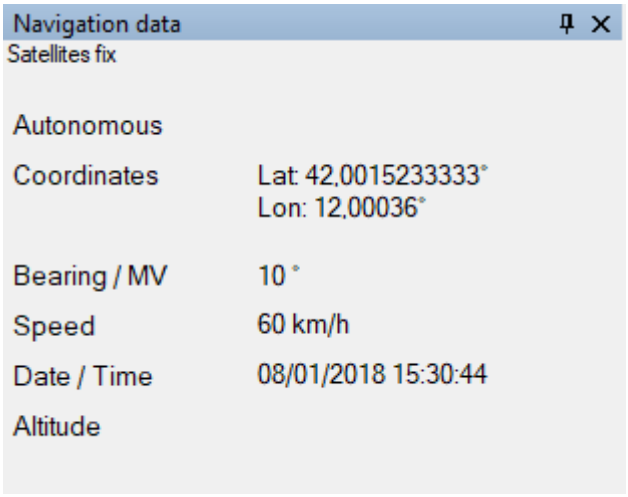
The simulation ends once the entire contents of the file are examined.

Navigation data

This function provides real-time information regarding the navigation data received from the GPS.

This function can only be used if navigation with integrated GPS, NMEA navigation or NMEA simulator is active.

To activate the function, use the *Navigation – Navigation tools - Navigation data* menu.



The information displayed in this window are:

- Connection status
- *Coordinates*: last position received
- *Bearing / VM*: followed direction and magnetic variation
- Speed: travel speed
- *Date / Time*: Date and time of the last received position
- *Altitude*: altitude above sea level of the last received position

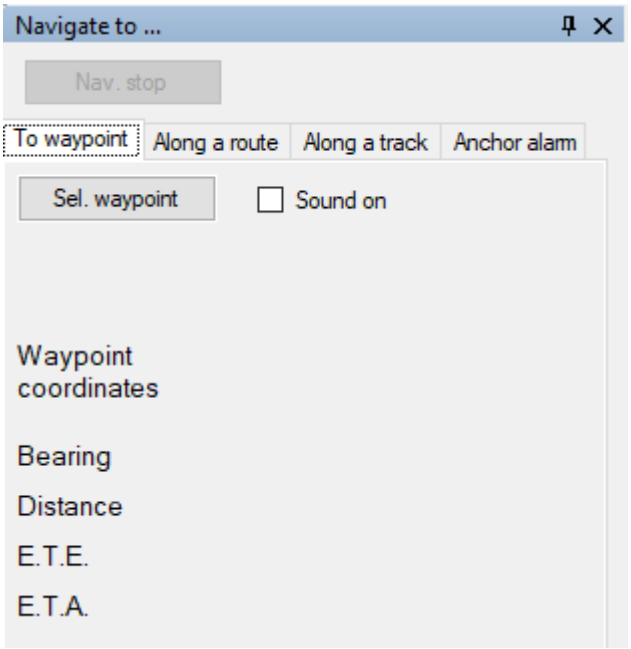
The information displayed is updated automatically as soon as they are made available by the GPS.

Navigate to a waypoint

This function provides real-time information to reach a waypoint during navigation.

This function can only be used if navigation with integrated GPS, NMEA navigation or NMEA simulator is active.

To activate the function, use the *Navigation – Navigation tools - Navigate to …* menu and click on the *A waypoint* tab.



With the *Sel. waypoint* button the destination waypoint is chosen; a table is displayed containing the list of selectable waypoints.

For more information on the general use of tables, see the section Data tables.

The information displayed in this window are:

- *Sound on*: if activated, near the waypoint, a sound is emitted; the wav file is configurable in the Preferences - Sounds function
- *Name of the selected waypoint*
- *Waypoint coordinates*
- *Bearing*: direction to follow
- *Distance*: distance that separates the current position from the waypoint
- *E.T.E.* (Estimated Time of Enroute): estimated time to reach the waypoint
- *E.T.A.* (Estimated Time of Arrival): estimated time of arrival at the waypoint

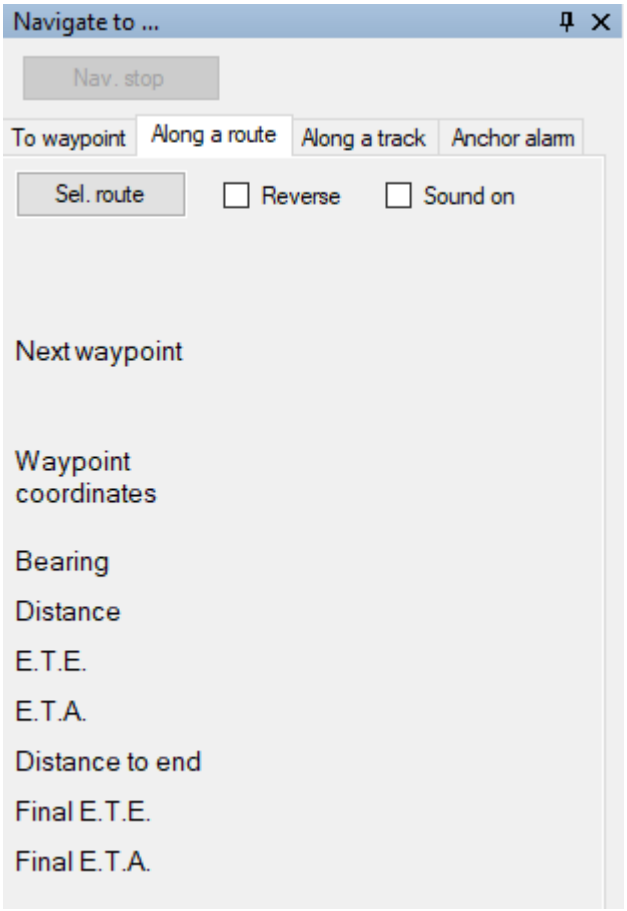
The information displayed is updated automatically as soon as it is made available by the GPS.

Navigate along a route

This function provides real-time information to follow a route during navigation.

This function can only be used if navigation with integrated GPS, NMEA navigation or NMEA simulator is active.

To activate the function, use the *Navigation – Navigation tools - Navigate to ...* menu and click on the *Along a route* tab.



With the *Sel. route* button the route to follow is selected; a table containing the list of selectable routes is displayed.

For more information on the general use of tables, see the section Data tables.

The information displayed in this window are:

- *Reverse*: if activated it follows the course starting from the end
- Sound on: if activated, near a course waypoint, a sound is emitted; the wav file is configurable in the Preferences - Sounds function
- *Name of the selected route*
- *Comment on the selected route*
- *Description of the selected route*
- *Next waypoint*: name of the next waypoint to reach
- *Waypoint coordinates*: coordinates of the next waypoint
- *Bearing*: direction to follow to reach the next waypoint
- *Distance*: distance that separates the current position from the next waypoint
- *E.T.E.* (Estimated Time of Enroute): estimated time to reach the next waypoint
- *E.T.A.* (Estimated Time of Arrival): estimated time of arrival at the next waypoint
- *Distance to end*: distance that separates the current position from the end of the route

- *Final E.T.E.* (Estimated Time of Enroute): estimated time to reach the end of the route
- *Final E.T.A.* (Estimated Time of Arrival): estimated time of arrival at the end of the route

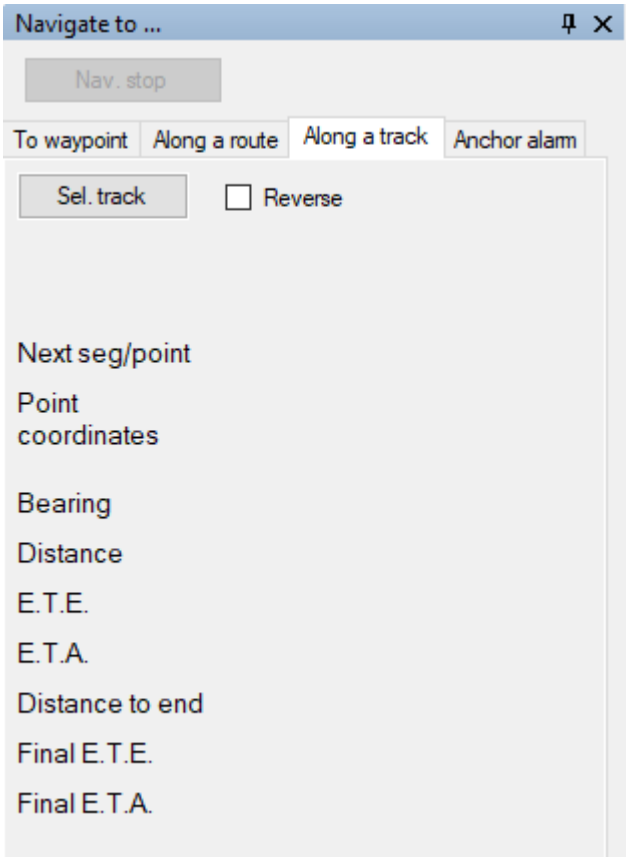
The information displayed is updated automatically as soon as it is made available by the GPS.

Navigate along a track

This function provides real-time information to follow a track during navigation.

This function can only be used if navigation with integrated GPS, NMEA navigation or NMEA simulator is active.

To activate the function, use the *Navigation – Navigation tools - Navigate to ...* menu and click on the *Along a track* tab.



With the *Sel. track* button, the track to be followed is selected; a table containing the list of selectable routes is displayed.

For more information on the general use of tables, see the section Data tables.

The information displayed in this window are:

- *Reverse*: if activated, the track follows from the end
- *Name of the selected track*
- *Comment on the selected track*
- *Description of the selected track*
- *Next seg/point*: number of the next segment and point of the track to reach
- *Point coordinates*: coordinates of the next point
- *Bearing*: direction to follow to reach the next point
- *Distance*: distance that separates the current position from the next point
- *E.T.E.* (Estimated Time of Enroute): estimated time to reach the next point
- *E.T.A.* (Estimated Time of Arrival): estimated time of arrival at the next point
- Distance at the end: distance that separates the current position from the end of the track
- Final *E.T.E.* (Estimated Time of Enroute): estimated time to reach the end of the track
- Final *E.T.A.* (Estimated Time of Arrival): estimated time of arrival at the end of the track

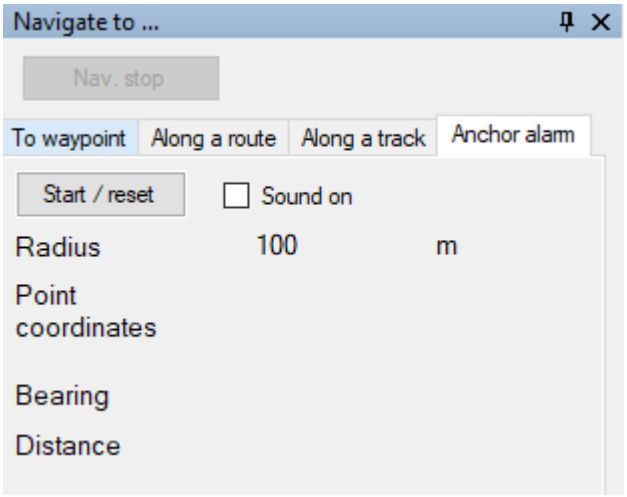
The information displayed is updated automatically as soon as it is made available by the GPS.

Anchor alarm

This function provides an alarm if you move too far from a preset point (anchor) during navigation.

This function can only be used if navigation with integrated GPS, NMEA navigation or NMEA simulator is active.

To activate the function, use the *Navigation – Navigation tools - Navigate to …* menu and click on the *Anchor alarm* tab.



Use the *Start / reset* button to set the reference point to be monitored.

To deactivate the alarm, deselect the *Sound on* option or establish a new reference point with the *Start / reset* button.

The information displayed in this window are:

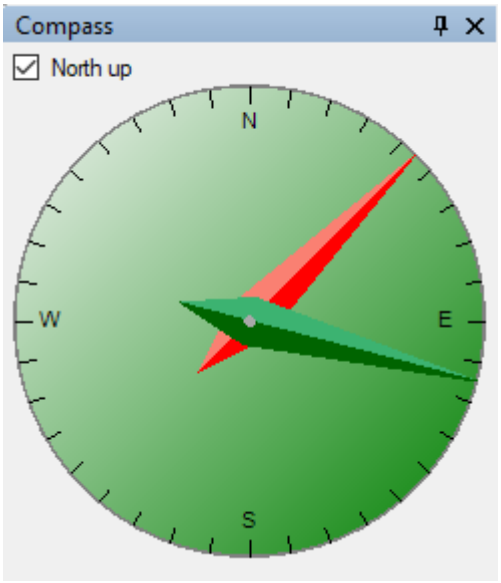
- Sound on: if activated, when you move away from the reference point too much, a sound is emitted; the wav file is configurable in the Preferences - Sounds function
- *Radius*: establishes the clearance distance necessary to trigger the alarm
- *Point coordinates*: coordinates of the reference point
- *Bearing*: direction to follow to return to the reference point
- *Distance*: distance that separates the current position from the reference point

The information displayed is updated automatically as soon as it is made available by the GPS.

Compass

This function can only be used if navigation with integrated GPS, NMEA navigation or NMEA simulator is active.

To activate the function, use the *Navigation – Navigation tools - Compass* menu.



The information displayed in this window are:

- A compass with a red needle indicating the direction followed and possibly a second green needle indicating the direction to follow when the *Navigate to* mode is activated.
- The background color can be:
  - Red: communication with the GPS failed
  - Yellow: the satellite signal is weak
  - Green: communication with the GPS working

- *North up*: if activated, fixes the north direction at the top center of the compass, otherwise the ring is rotated according to the direction followed

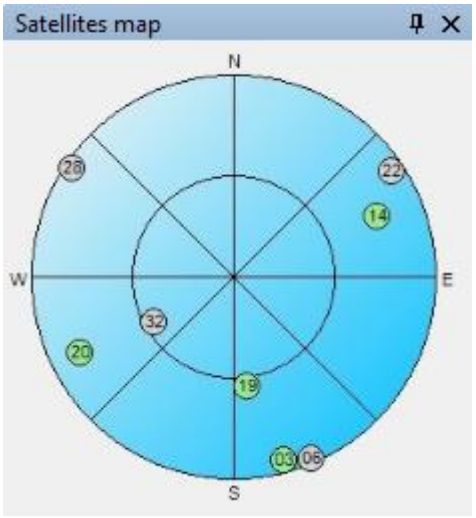
The information displayed is updated automatically as soon as it is made available by the GPS.

Satellites map

This function provides real-time information received from the GPS on the signal quality of the satellites in sight.

This function can only be used if navigation with integrated GPS or NMEA navigation is active.

To activate the function, use the *Navigation – Navigation tools – Satellites map* menu.



A sky map appears with the location of the satellites.
Each satellite is represented by a colored dot with the number of the satellite inside.
The meaning of the colors is as follows:

- Gray: satellite not used
- Red: SNR (Signal to Noise Ratio) <= 10
- Yellow: SNR (Signal to Noise Ratio) > 10 and <= 20
- Green: SNR (Signal to Noise Ratio) > 20

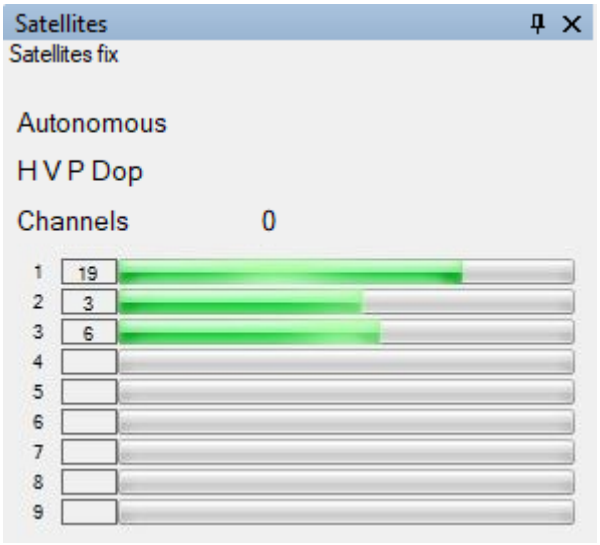
The information displayed is updated automatically as soon as it is made available by the GPS.

Satellites in sight

This function provides real-time information received from the GPS on the signal quality of the satellites in sight.

This function can only be used if navigation with integrated GPS or NMEA navigation is active.

To activate the function, use the *Navigation – Navigation tools – Satellites* menu.



The information displayed in this window are:

- *Connection status*
- *H V P Dop*: Horizontal, Vertical, Position DOP (Dilution of Precision) define the goodness of the geometry of the satellites in sight; if the satellites are close together then the geometry is weak and the value of PDO is high; if the satellites are distant, the geometry is strong and the DOP is low
- *Channels*: Number of active channels
- Channel table (maximum 20):
  - Value of the SNR (Signal to Noise Ratio)
  - *Bar graph* representing the SNR value

For DOP values, refer to the following table:

DOP	Rating
1	Ideal
2-3	Excellent
4-6	Good
7-8	Discreet
9-20	Poor
21-50	Bad

The information displayed is updated automatically as soon as it is made available by the GPS.

Record the GPS track log

This function is used to record a track (track log) with the data received from the GPS.

This function can only be used if navigation with integrated GPS, NMEA navigation or NMEA simulator is active.

To activate / deactivate the function use the *Navigation - Record track* menu.

The recorded track is called *ACTIVE LOG*.

Each time the track recording is reactivated, a new segment is created.

GPS track statistics

This function displays the statistics of the navigation track in real time.

This function can only be used if navigation with integrated GPS, NMEA navigation or NMEA simulator is active.

To activate the function, use the *Navigation - GPS track statistics* menu.
For information on the function, refer to the Track statistics paragraph.

The information displayed is updated automatically as soon as it is made available by the GPS.

GPS track graphs

This function displays real-time graphs of the navigation track.

This function can only be used if navigation with integrated GPS, NMEA navigation or NMEA simulator is active.

To activate the function, use the *Navigation - GPS track graphs* menu.
For information on the function, refer to the Track graphs paragraph.

The information displayed is updated automatically as soon as it is made available by the GPS.

Save the current position

This function is used to create a new waypoint in the current position during navigation.

This function can only be used if navigation with integrated GPS, NMEA navigation or NMEA simulator is active.

To activate the function, use the *Navigation - Save waypoint* menu.

The new waypoint will be added to the current file; the name will be used an automatically generated progressive number.

Proximity waypoint alarm

This function is used to give an acoustic signal during navigation when entering a radius of a nearby waypoint. The distance can be customized in the Preferences – Navig. page.

This function can only be used if navigation with integrated GPS, NMEA navigation or NMEA simulator is active.

To activate / deactivate the function, use the *Navigation – Navigation modes - Proximity waypoint alarm* menu.

Change map during navigation

This function is used during navigation to make current a different map (if found) when the current coordinates are out bounds the limits of the displayed map.

This function can only be used if navigation with integrated GPS, NMEA navigation or NMEA simulator is active.

To activate / deactivate the function, use the *Navigation – Navigation modes – Switch maps during navigation* menu.

Center the map during navigation

During the navigation mode it may be convenient to keep the current map centered on the geographical point in which you are located.

To activate / deactivate this function, use the *Navigation – Navigation modes - Center map during navigation* menu.

For more information on navigation mode, refer to the paragraph Navigation.

Send the position to remote OkMap

This function is used to send the current position during navigation to a remote computer running OkMap.

The computer that sends the data is called *client*, while the computer that receives the data is called *server*.
Multiple clients can send data simultaneously to the same server.
The same client cannot send data to multiple servers at the same time.

The OkMap server receives the data by activating the data receiving from OkMap function; this data can be visualized on a map obtaining the tracks related to the movement of the clients.

Before accessing this feature, make sure you have correctly configured the parameters for socket communication in the Preferences - Send OkMap function and that you are connected to the network.

This function can only be used if navigation with integrated GPS, NMEA navigation or NMEA simulator is active.

To activate / deactivate the function, use the *Navigation – Navigation modes – Send position to remote OkMap* menu.

Send a waypoint to remote OkMap

This function is used to send a waypoint to a remote computer running OkMap.

Read the instructions provided in the previous paragraph.

To activate the function, on the Map page, right-click on the waypoint and select the *Send to server* context menu.

Receive remote data

Receive data from OkMap

This function is used to receive current positions from remote clients using the Send position to remote OkMap function.

The computer that sends the data is called *client*, while the computer that receives the data is called *server*.
Multiple clients can send data simultaneously to the same server.
The same client cannot send data to multiple servers at the same time.

The received data can be visualized on a map in the form of tracks, constantly obtaining the geographical positions of the clients.

Before accessing this feature, make sure you have correctly configured the parameters for socket reception in the Preferences - Receive OkMap function and being connected to the network.

To activate / deactivate the function, use the *Navigation - Receive OkMap* menu.

For each client that sends data, a new track will be created with the same name as the client identifier (defined in the client with the Preferences - Send OkMap function).

To display the current position of clients with an icon, activate the *View - Tracks features – Tracks last position* menu.

The tracks on the map are continuously redesigned to guarantee the real-time display of the data received.
The time between a refresh and the next is defined in the Preferences – Navig. page. in the *Refresh forms time* field.

It is possible to activate a function to automatically save the GPX file containing the received tracks, specifying the time between a writing of the GPX file and the next one on the Preferences - Receive OkMap page with the *Auto save GPX (sec.)* field. A value of zero means that the GPX file is not automatically saved.

To implement an application that can send data to an OkMap server, refer to the OkMap protocol for remote data section.

If invalid data is received, the Receive Status field in the Status bar will be colored red.

OkMap protocol for remote data

Each position is sent to the server through a string containing fields separated by a semicolon character.

There are several versions of the protocol that have expanded over time.
OkMap, however, is backward compatible so any version of the protocol will be used OkMap will always be able to decode it.

For numerical values, always use the dot as a decimal separator.
In string type values, semicolon characters must be replaced with {sc}.

Original protocol
- Id: string that identifies the device that sends the data
- Longitude in decimal degrees: in the datum specified in Preferences - NMEA page (default WGS84)
- Latitude in decimal degrees: in the datum specified in Preferences - NMEA page (default WGS84)
- Altitude in meters
- UTC Date-Hour (Coordinated Universal Time) in MM/dd/yyyy hh:mm:ss format
- Speed in km/h (Double.MinValue if not specified)
- Direction in degrees from 0 to 359.9999… (Double.MinValue if not specified)
- Track line thickness in pixels: optional integer value
- Track line color in ARGB 32 bit format: optional integer value

Example:
TestLive;9.1376009;45.5064356;202.2;06/08/2012 15:09:47;0;0;3;-65536

$OKMAP-V01 protocol (usable from version 10.10.1)
- Protocol version = $OKMAP-V01
- Id: string that identifies the device that sends the data
- Longitude in decimal degrees: in the datum specified in Preferences - NMEA page (default WGS84)
- Latitude in decimal degrees: in the datum specified in Preferences - NMEA page (default WGS84)
- Altitude in meters
- UTC Date-Hour (Coordinated Universal Time) in MM/dd/yyyy hh:mm:ss format
- Speed in km/h (Double.MinValue if not specified)
- Direction in degrees from 0 to 359.9999… (Double.MinValue if not specified)
- New segment flag: (0=no, 1=yes); not significant for the first point
- Track line thickness in pixels: optional integer value
- Track line color in ARGB 32 bit format: optional integer value

Example:
$OKMAP-V01;TestLive;9.1376009;45.5064356;202.2;06/08/2012 15:09:47;0;0;0;3;-65536

$OKMAP-V02 protocol (usable from version 13.8.0)
Track point
- Protocol version = $OKMAP-V02
- Record type = T (track point)
- Id: string that identifies the device that sends the data
- Longitude in decimal degrees: in the datum specified in Preferences - NMEA page (default WGS84)
- Latitude in decimal degrees: in the datum specified in Preferences - NMEA page (default WGS84)
- Altitude in meters
- UTC Date-Hour (Coordinated Universal Time) in MM/dd/yyyy hh:mm:ss format
- Speed in km/h (Double.MinValue if not specified)
- Direction in degrees from 0 to 359.9999… (Double.MinValue if not specified)
- New segment flag: (0=no, 1=yes); not significant for the first point
- Track line thickness in pixels: optional integer value

- Track line color in ARGB 32 bit format: optional integer value
- Indicator whether to center the maps displayed on the received coordinates (optional 0=No, 1=Yes)

Example:
$OKMAP-V02;T;TestLive;9.1376009;45.5064356;202.2;06/08/2012 15:09:47;0;0;0;3;-65536;0

Waypoint
- Protocol version = $OKMAP-V02
- Record type = W (waypoint)
- Id: string that identifies the device that sends the data
- Name
- Comment: optional
- Description: optional
- Origin: optional
- Link: optional
- Symbol: optional
- Type: optional
- Longitude in decimal degrees: in the datum specified in Preferences - NMEA page (default WGS84)
- Latitude in decimal degrees: in the datum specified in Preferences - NMEA page (default WGS84)
- Altitude in meters
- UTC Date-Hour (Coordinated Universal Time): in MM/dd/yyyy hh:mm:ss format
- Icon bitmap: file path
- Proximity circle width: optional decimal value in meters
- Proximity circle color in ARGB 32 bit format: optional integer value
- Proximity circle opacity: optional decimal value between 0 and 1
- Indicator whether to center the maps displayed on the received coordinates (0=No, 1=Yes)
- Indicator to activate a sound when receiving a waypoint (0=No, 1=Yes)
- Image file name without path (optional)
- Image shooting direction in degrees from 0 to 359.9999… (Double.MinValue if not known) (must be specified only if image name is present)
- Direction type: T=True north, M=Magnetic north (optional, can be specified only if image name is present)
- Image in Base 64 String format (must be specified only if image name is present)

Example:
$OKMAP-V02;W;TestLive;WptName;;Description;;;;;9.1376009;45.5064356;202.2;06/08/2012 15:09:47;
C:\Program files\OkMap\data\symbols\top_flag-export-yellow.png;100; -65536;0.25;0;0

List of remote clients

This function is used to obtain a list of remote clients with their information.

To activate this function, use the *Navigation - Display remote object list* menu.

The list of objects shows the following information:
- Remote client identifier
- Remote client last position coordinates
- Altitude
- Date / hour
- Direction
- Speed
- Distance from reference client
- Direction from reference client

In this table there is a context menu with the following items (besides the standard ones already seen in the paragraph Data tables):

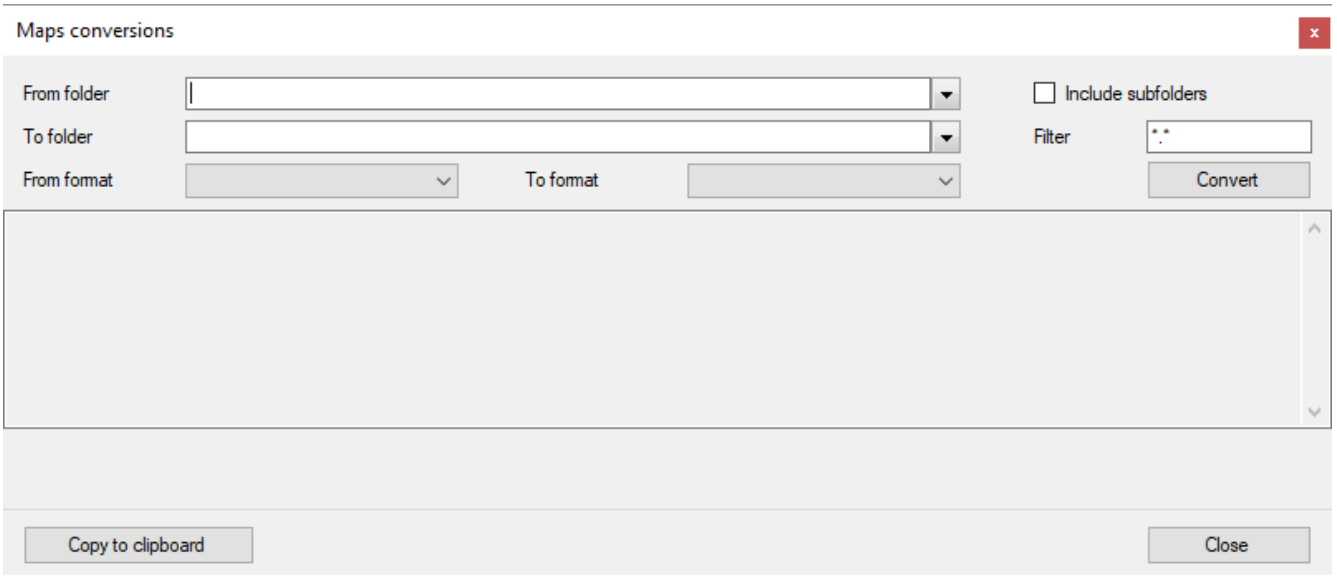
- *Calculate distances*: calculate, on all clients in the list, the distance from the current client (reference) and the direction of the line that virtually connects the two clients.
- *Find on opened maps*: Position the current map so that the current client is centered (highlighted with a red crosshair)
- *Copy coordinates*: copy the client's coordinates to the clipboard
- *Copy coordinates (text format)*: copies the coordinates to the clipboard in text format for uses outside OkMap
- *Save waypoint*: Save a waypoint with coordinates relative to the current client
- *Save toponym*: Save a toponym with coordinates relative to the current client
- *Geocoding info*: Displays a window with geocoding information about the current client's location

Utility functions

Maps

Convert maps

It is a function to convert multiple maps from one format to another.



To activate this function, use the *Utilities* - *Maps conversion* menu.

In the *From folder* field, specify the folder where are the maps to be converted.
Select *Include Subfolders* to browse files in the lower-level folder tree.
You can specify a pattern in the *Filter* field to select only some input files.
Specify in the *To folder* field the folder where to store the converted map files.
In the *From format* field, specify the source format of the maps:

- <All>
- OkMap
- ECW
- GeoTiff
- World file
- Google Earth
- JNX BirdsEye
- OziExplorer (including OZF2 and OZFX3 formats)
- CompeGPS
- GPS TrackMaker
- RMap
- MBTiles
- OruxMaps
- GPSTuner
- JPEG2000 driver based on OpenJpeg
- Geospatial PDF

In the *To format* field specify the destination format of the maps:

- OkMap
- GeoTiff
- World file
- Garmin custom maps
- Google Earth KMZ
- Google Earth KMZ 2.2
- JNX BirdsEye 3
- JNX BirdsEye 4

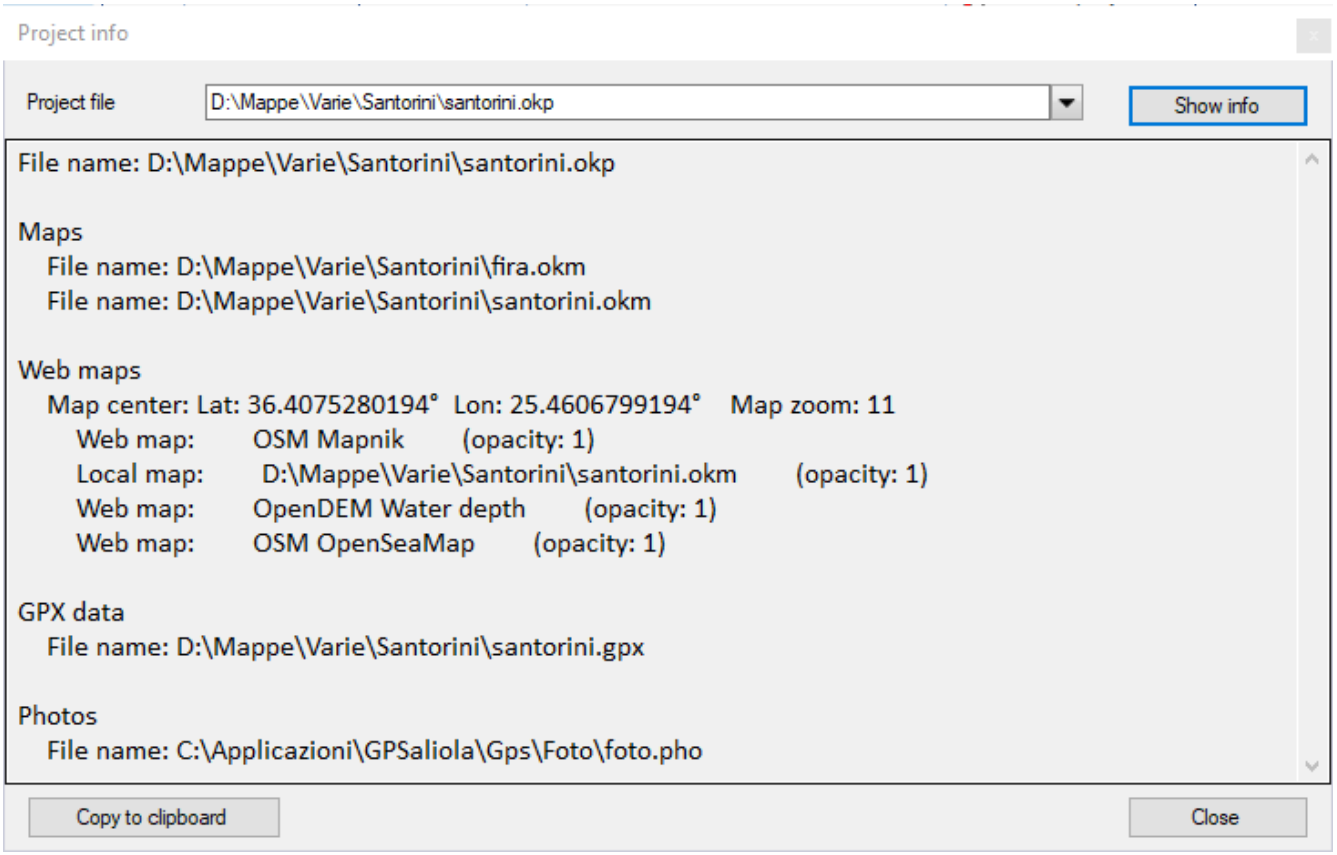
- OziExplorer
- OruxMaps
- TomTom
- GPSTuner
- Many other formats using GDAL

To start the conversion use the *Convert* button.
A list will be produced regarding the status of the conversions made.
This text can be copied to the clipboard with the *Copy to clipboard* button.
To close the window use the *Close* button.

Information

Show project info

You can use this function to know the content of a project file.



Type the name of the file to be scanned in the *Project file* field and press the *Show info* button.

The information is shown in the body of the window and can be copied to the clipboard with the *Copy to clipboard* button.

To exit the window, press the *Close* button.

View the tags of a file

You can use this function to know the metadata contained in a file.
It can be useful for understanding any problems concerning photo files.

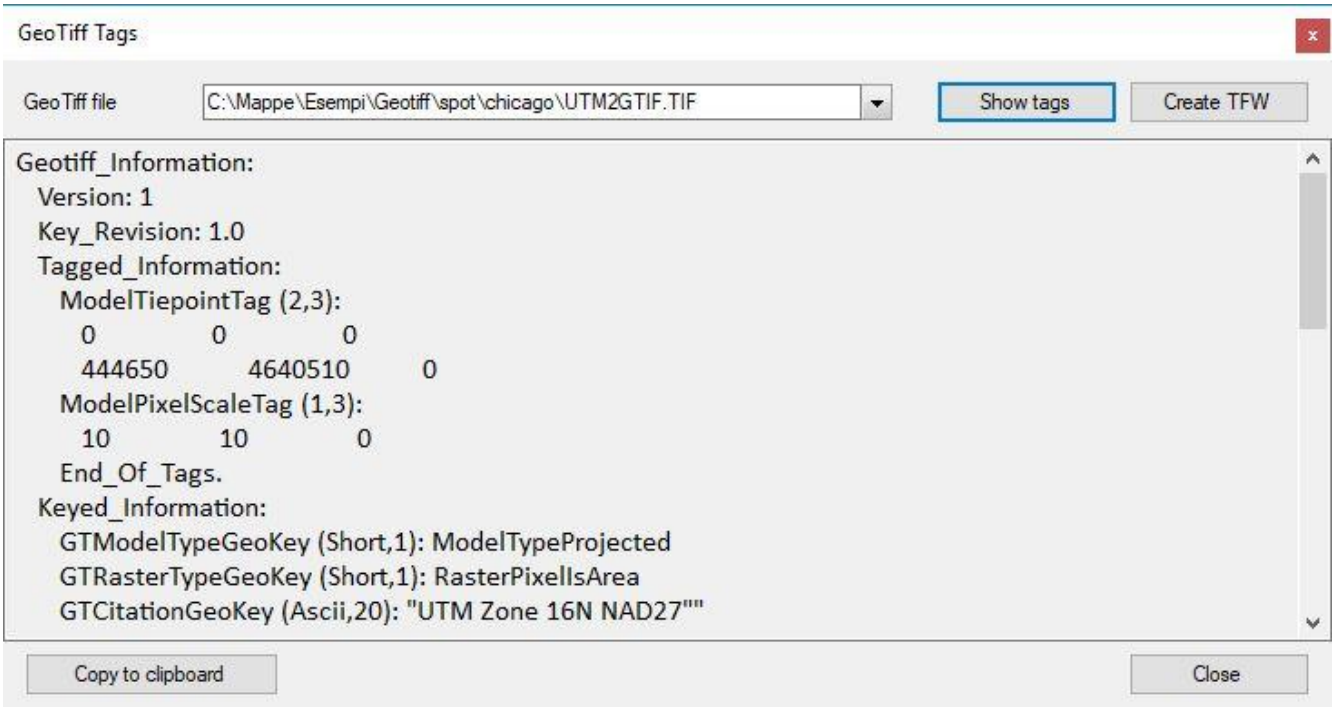
Type the name of the file to be scanned in the *file* field and press the *Show info* button.

The information is shown in the body of the window and can be copied to the clipboard with the *Copy to clipboard* button.

To exit the window, press the *Close* button.

View the tags of a GeoTiff file

You can use this function to know the metadata contained in a GeoTiff file.
It can be useful for understanding any problems concerning opening the file.



Type the name of the file to be scanned in the *GeoTiff file* field and press the *Show tags* button.

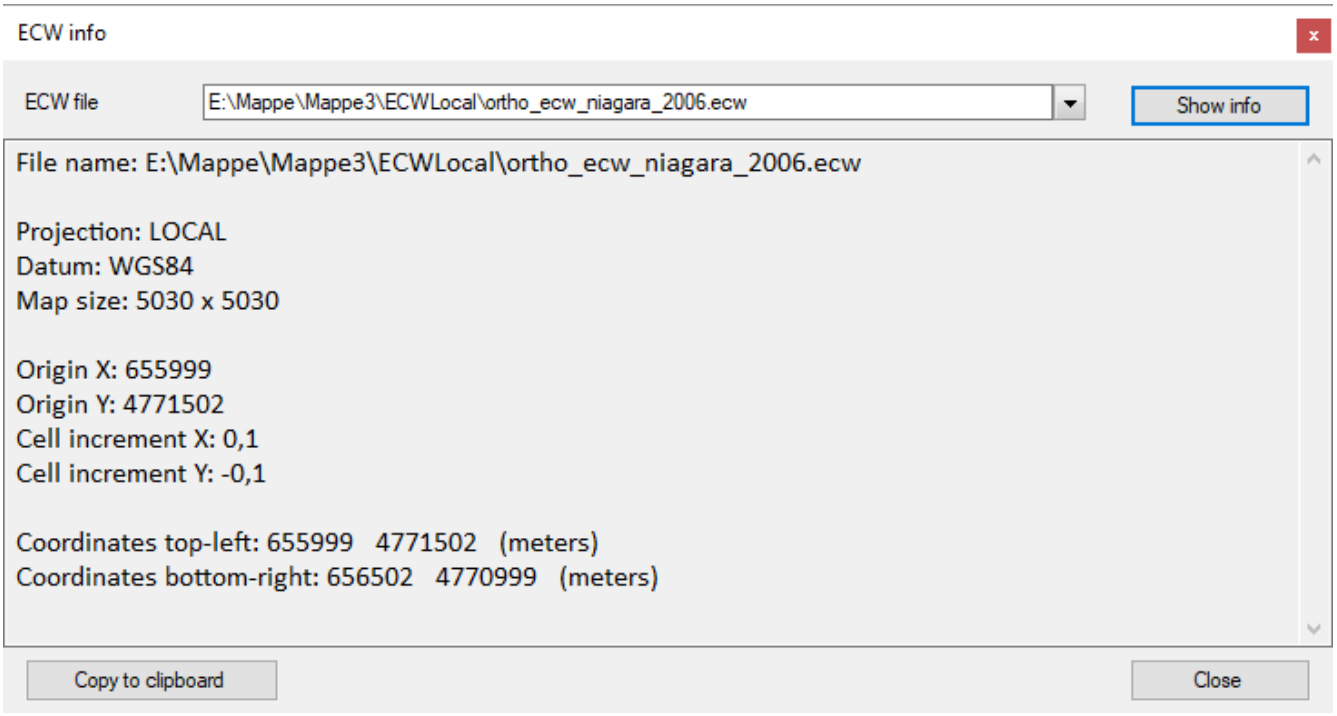
The information is shown in the body of the window and can be copied to the clipboard with the *Copy to clipboard* button.

To view and create the corresponding TFW file press the *Create TFW* button.

To exit the window, press the *Close* button.

View the info of an ECW file

You can use this function to know the georeferencing info contained in an ECW file.
It can be useful for understanding any problems concerning opening the file.



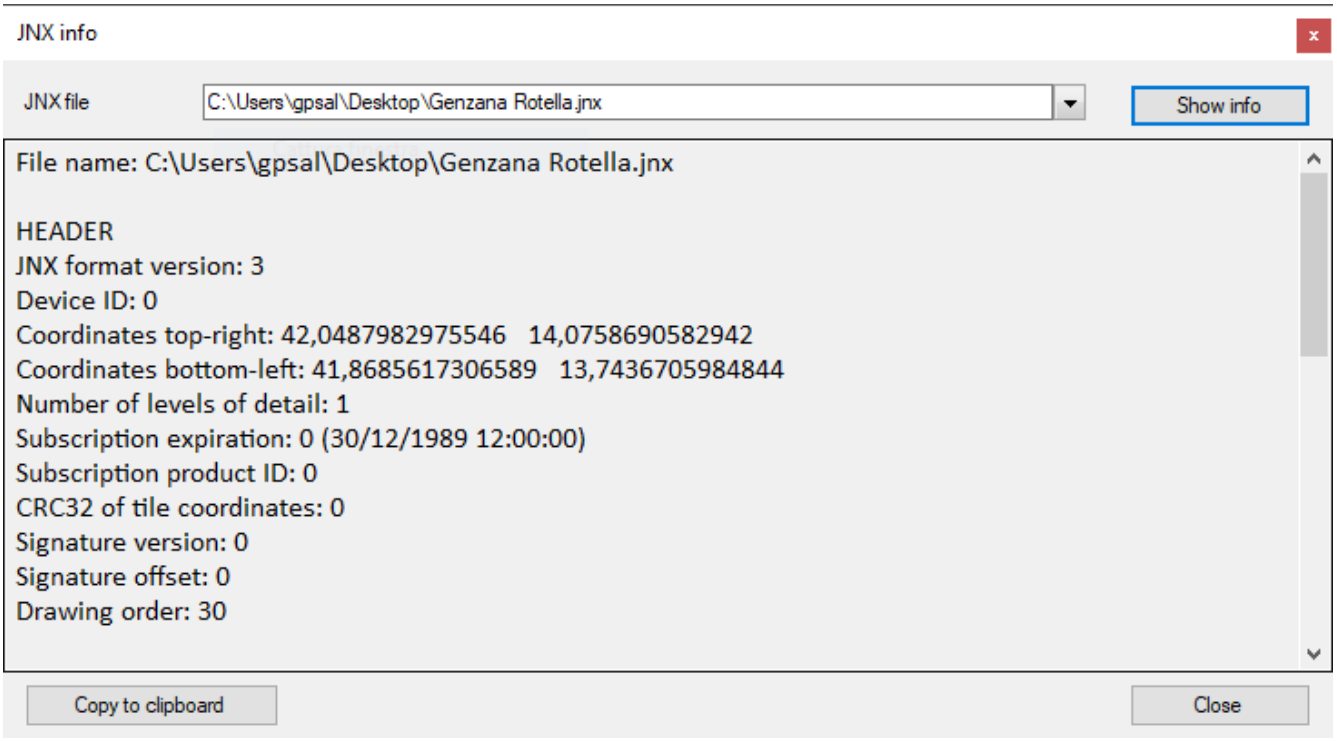
Type the name of the file to be scanned in the *ECW file* field and press the *Show info* button.

The information is shown in the body of the window and can be copied to the clipboard with the *Copy to clipboard* button.

To exit the window, press the *Close* button.

View the info of a JNX file

You can use this function to know the info contained in an JNX file.
It can be useful for understanding any problems concerning opening the file.



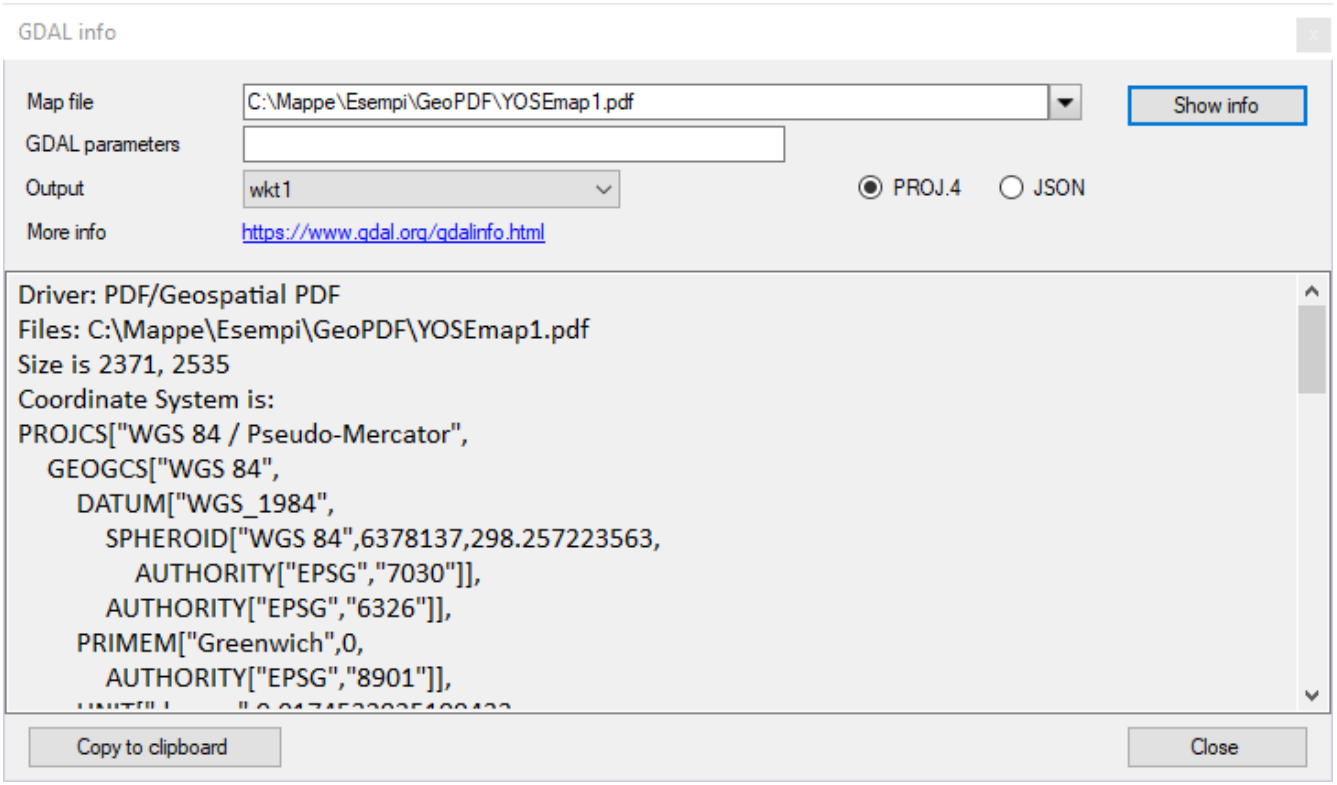
Type the name of the file to be scanned in the *JNX file* field and press the *Show info* button.

The information is shown in the body of the window and can be copied to the clipboard with the *Copy to clipboard* button.

To exit the window, press the *Close* button.

View the info of a map file via GDAL

You can use this function to know the information about a map file via the GDAL *gdalinfo* command.



Type the name of the map file to be analyzed in the *Map file* field and press the *Show info* button.

The information can be represented in JSON or PROJ.4 format.
The output can be represented in WKT1, WKT2, WKT2_2015 or WKT2_2018 format (see *Output* combo box).

The *GDAL parameters* field (optional) can be used to add one or more parameters to the GDAL *gdalinfo* command.

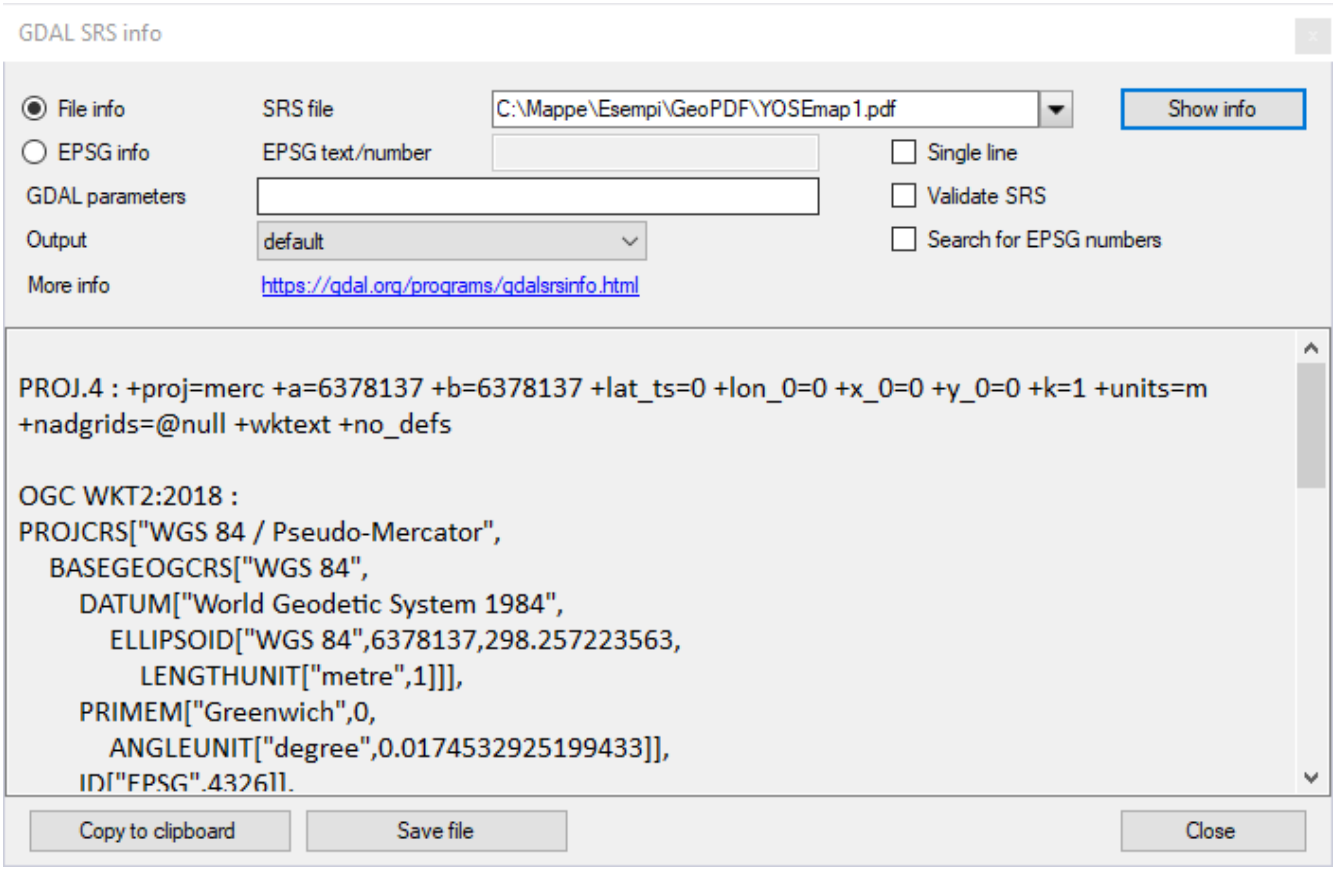
For more information about map format visit this web page.
For more information about parameters visit this web page.

The information is shown in the body of the window and can be copied to the clipboard with the *Copy to clipboard* button.

To exit the window, press the *Close* button.

View the info of a SRS file via GDAL

You can use this function to know the information about a SRS (Spatial Reference System) file via the GDAL *gdalsrsinfo* command.



Choose if you want to select a file or analyze a text or EPSG number (such as *WGS84* or *EPSG:4326* or *4326*), clicking *File info* or *EPSG info* option boxes.

Type the name of the SRS file to be analyzed or the EPSG text/number and press the *Show info* button.

The information can be represented in various output types (see *Output* combo box).

You can select the following options:
- Single line
- Validate SRS
- Search for EPSG numbers

The *GDAL parameters* field (optional) can be used to add one or more parameters to the GDAL *gdalsrsinfo* command.

For more information about parameters visit this web page.

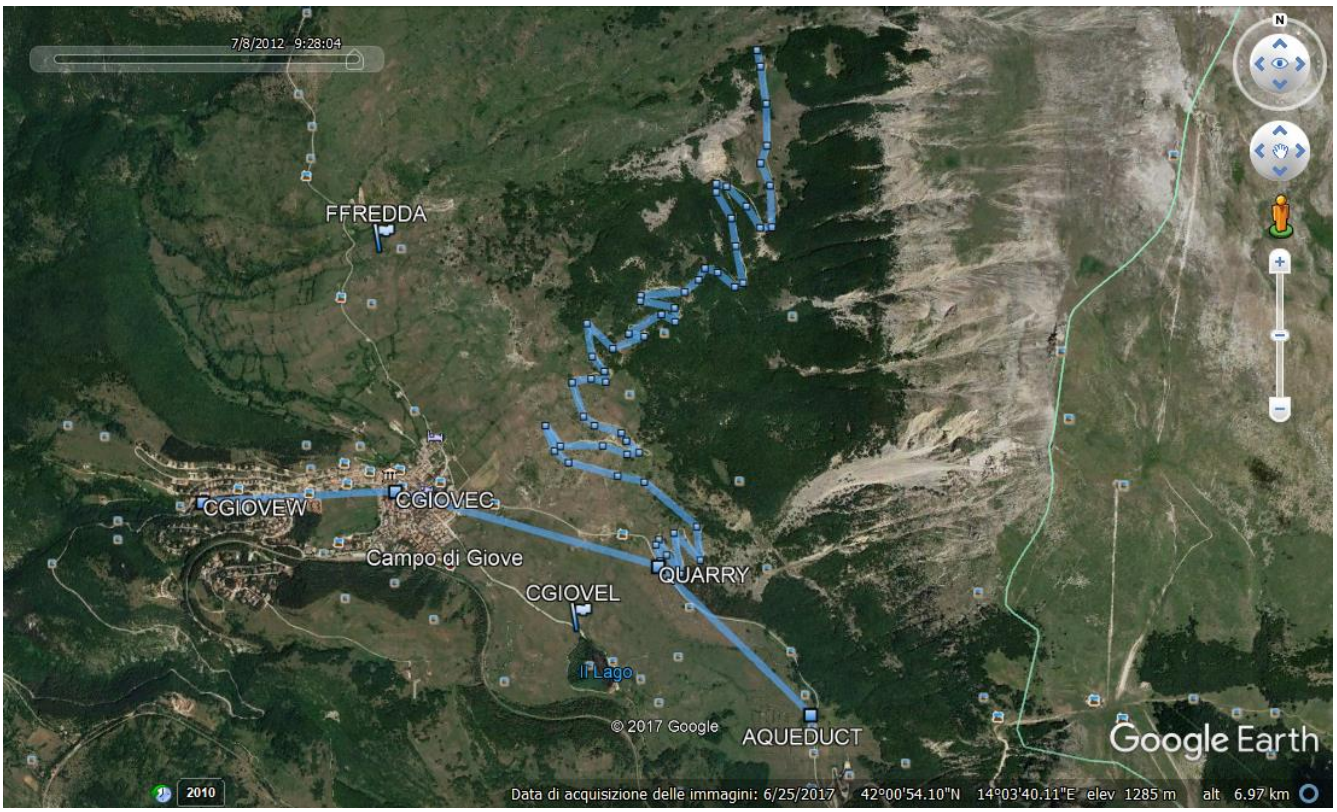
The information is shown in the body of the window and can be copied to the clipboard with the *Copy to clipboard* button or saved with the *Save file* button.

To exit the window, press the *Close* button.

Google

Google Earth (GPX)

This function is used to automatically open Google Earth (which must have been previously installed on your computer) to view the loaded GPX data.



To start Google Earth use the *Utilities - Google – View GPX in Google Earth* menu.
The computer must be connected to the internet.

Data is stored in Google Earth under the *Temporary places – OkMap* item.

Google Earth (photos)

This function is used to automatically open Google Earth (which must have been previously installed on your computer) to view the loaded photos.

To start Google Earth use the *Utilities - Google – View photos in Google Earth* menu.
The computer must be connected to the internet.

Data is stored in Google Earth under the *Temporary places – OkMap* item.

Google Earth (map)

This feature is used to automatically open Google Earth (which must have been previously installed on your computer) in the same position as the loaded map (only if raster) to view the map itself.

The current raster map is displayed in front of the Google Earth map as long as it has a compatible format (jpg, bmp, tif, tga, png, gif, ppm, pgm).

To activate Google Earth use the *Utilities - Google – View map in Google Earth* menu.
The computer must be connected to the internet.

Data is stored in Google Earth under the *Temporary places – OkMap* item.

Using the map transparency slider you can evaluate the calibration accuracy by analyzing the differences between the raster map and the Google Earth map.

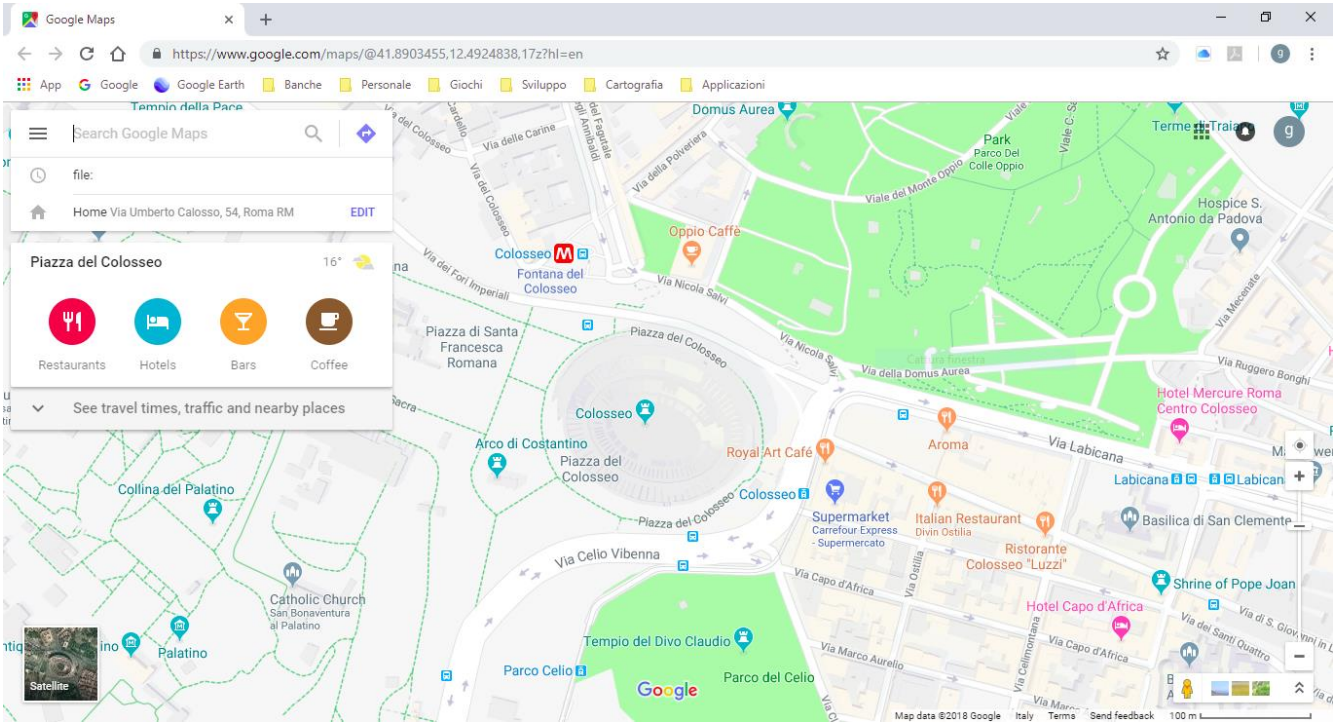
Google Earth is set by OkMap to already get a 3D view; it is still possible to act on Google Earth cursors to change the display mode.

It is possible, leaving Google Earth opened, returning to the OkMap program, loading another map and calling Google Earth again; in this way it is possible to obtain the union of different maps. The same thing can be done with GPX data and photos.

In the event of unexpected behavior, make sure that the .KML and .KMZ extensions are correctly associated with Google Earth.

Google Map (web)

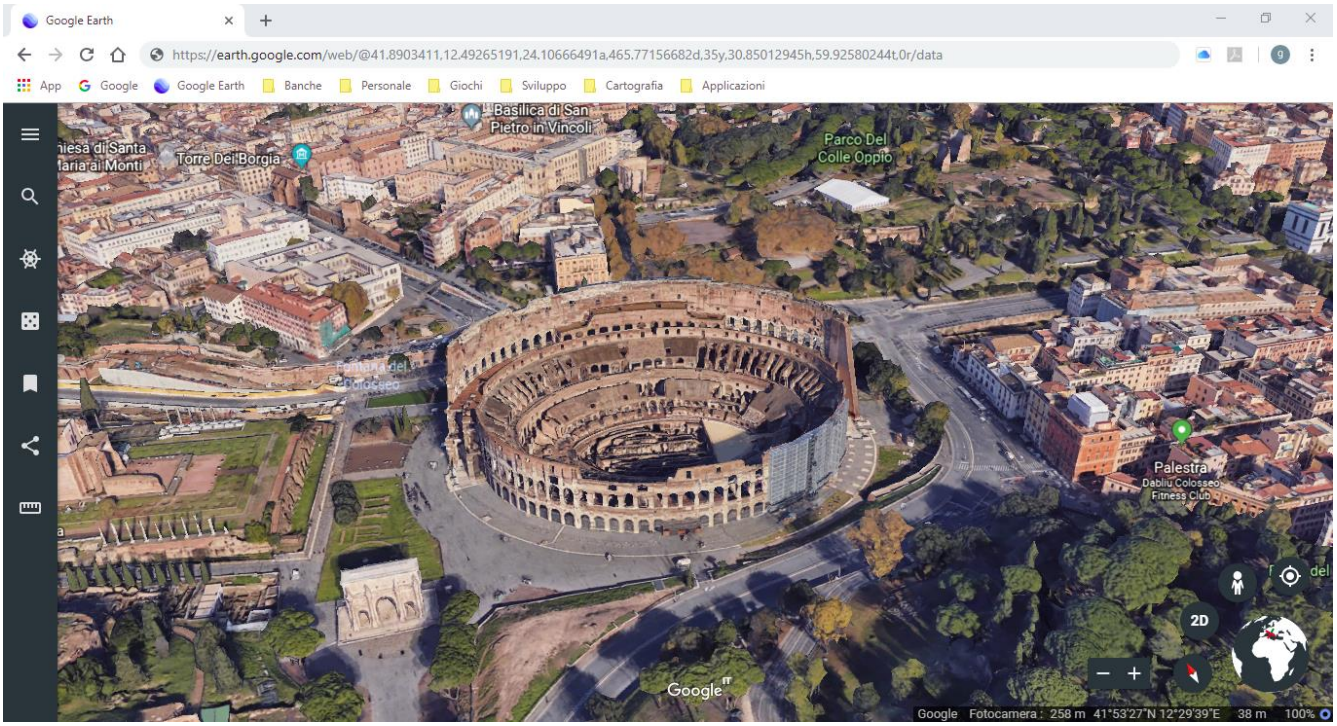
This function is used to open, in the default browser, the page of Google Map in the position relative to the center of the loaded map (web, raster or vectorial).



To activate this function, use the menu *Utilities - Google – View in web Google Map*.
The computer must be connected to the internet.

Google Earth (web)

This function is used to open, in the default browser, the Google Earth page in the position relative to the center of the loaded map (web, raster or vectorial).

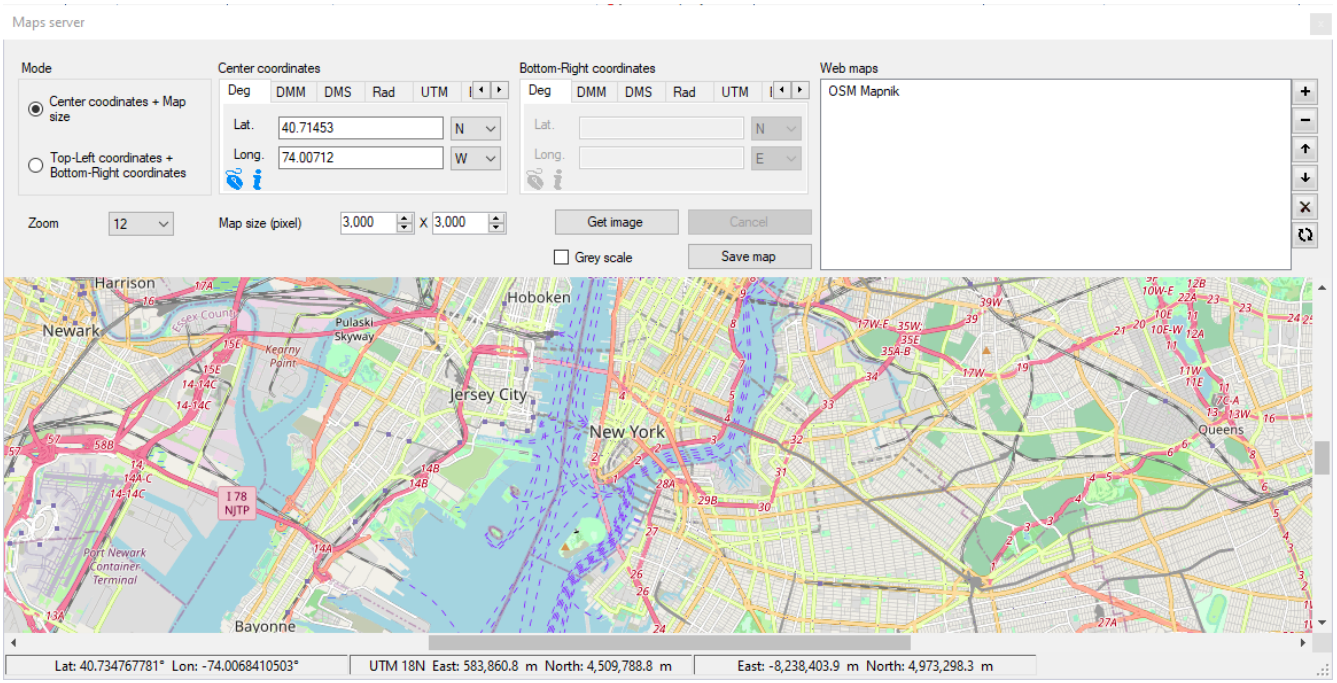


To activate this function, use the menu Utilities - Google – View in web Google Earth.
Currently this function is only possible if the default browser is Chrome.
The computer must be connected to the internet.

Web functions

Maps server

With this function you can download a map from a WMS / TMS server and save it locally generating a calibration file (.okm) for OkMap.



To activate this function, use the *Utilities* - *Maps Servers* menu.

This feature can be used in two modes:
- load a map entering the coordinates of the center of the map (see Enter the coordinates paragraph) and its size in pixel.
- load a map entering the coordinates of the top-left edge and the coordinates of bottom-right edge.

In every case you must select:
- The WMS / TMS server
- The list of the web maps
- The *zoom* level (0-20)

To display the map, press the *Get image* button.

The listed servers are the same shown in the List of the map servers function except for those that do not allow to save their maps locally (*Map can saved* unchecked).

To add a web map, use the button +.
To remove a web map, select it and then press the button −.
It is possible to move the maps by giving the order of the levels with the buttons ↑ and ↓.
The button ✕ deletes the list of maps.
The button 🗘 restores the default list.
The button ! saves the map list for next time.

The cursor coordinates are shown in the status bar according with the coordinates types specified in Preferences – Coordinates (see Status bar).

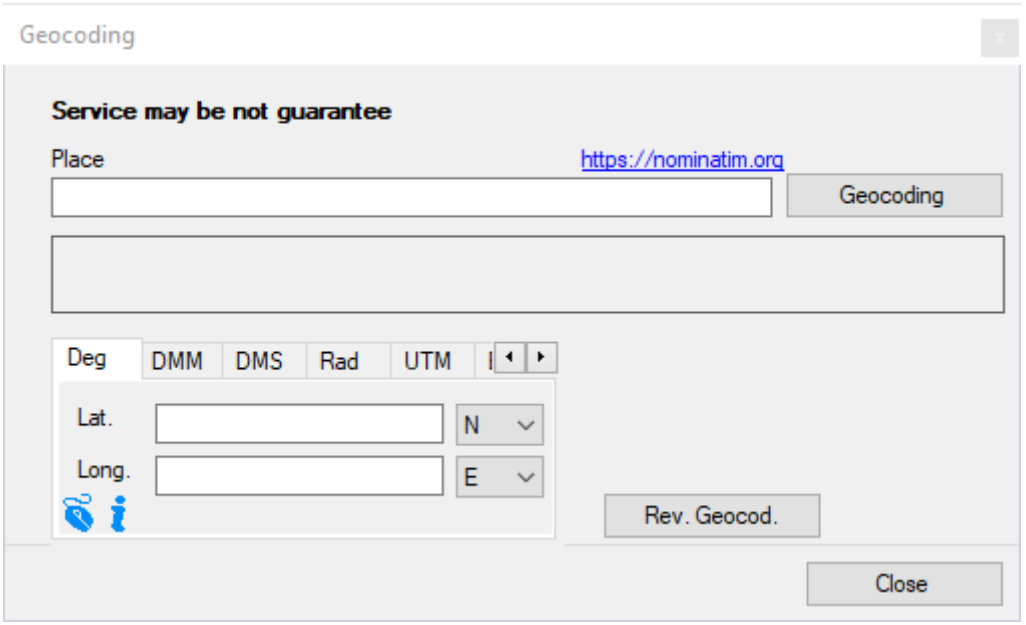
A context menu is available on the map:
- *Copy coordinates*: copy the coordinates of the cursor to the clipboard.

To save the map image and the corresponding calibration file for OkMap (.okm), press the *Save map* button.

It is possible to choose whether to save the image of the map in *gray scale* (less memory occupation).

Geocoding

It is a function that can determine the geographical coordinates based on an address (street, city, state).



To activate this function, use the *Utilities – Geocoding* menu.

To determine the geographical coordinates, enter the address at the top (e.g.: Fifth Avenue, New York, United States) and press the *Geocoding* button.

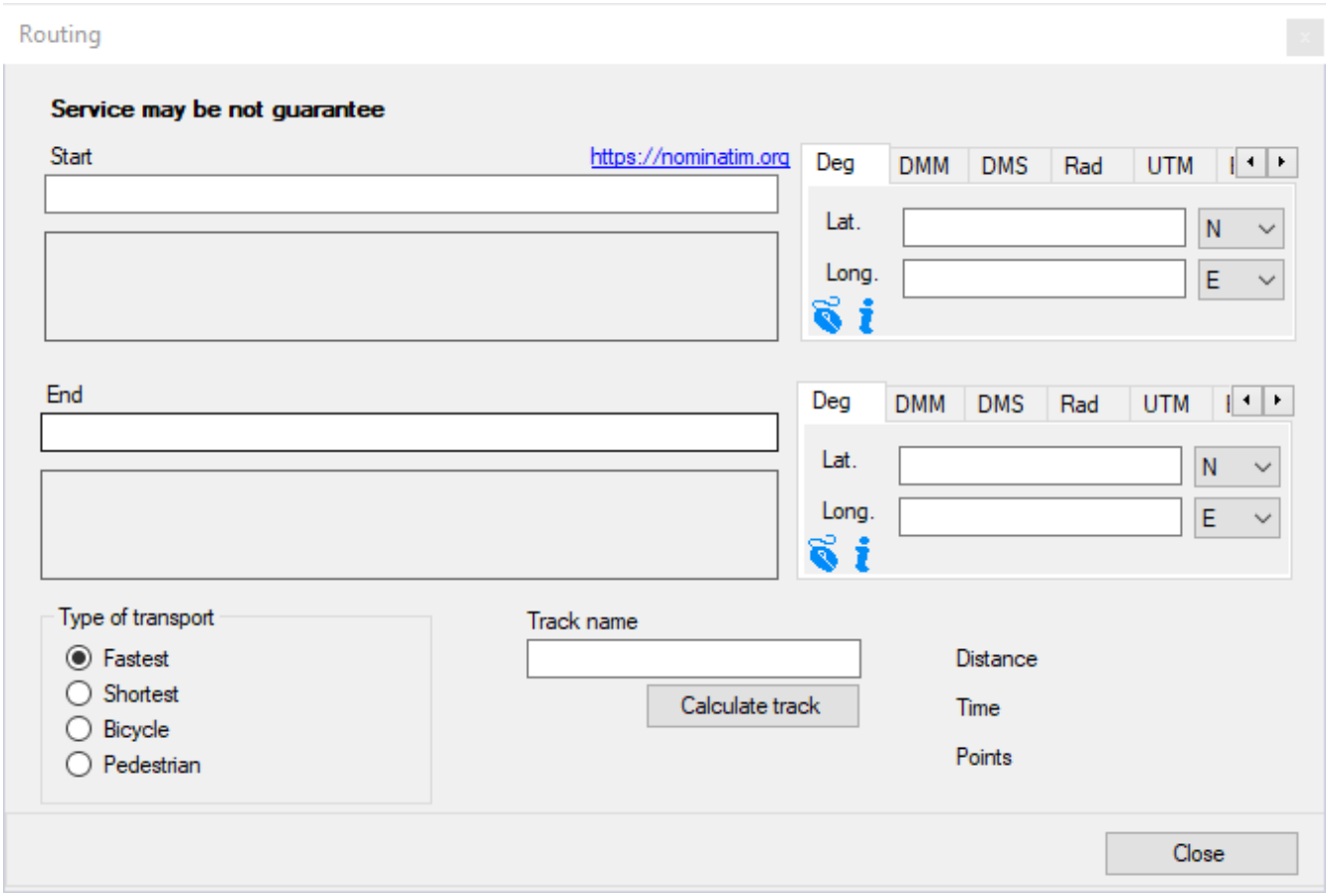
To perform the inverse calculation, enter the coordinates (see the Enter the coordinates paragraph) and press the *Rev. Geocod.* button.

This function to be activated requires the acquisition of an *API key* to be included in the preferences. Refer to the Preferences – Geocoding & Routing section for how to acquire the *API key*.

To close the window use the *Close* button.

Routing

It is a function that can determine the fastest or shortest track between two locations. This path can be saved as a track in the current file.



To activate this function, use the *Utilities* - *Routing* menu.

To determine the track, enter the departure and arrival locations (e.g.: Fifth Avenue, New York, United States) and press the *Calculate* button.

Alternatively, you can enter the coordinates of the departure and destination locations (see the Enter the coordinates paragraph).

It is possible to customize the type of transport:

- Fastest
- Shortest
- Bicycle
- Pedestrian

The calculated track can be saved in the current file by pressing the *Save track*; the name of the track must be typed in the near box.

To close the window, use the *Close* button.

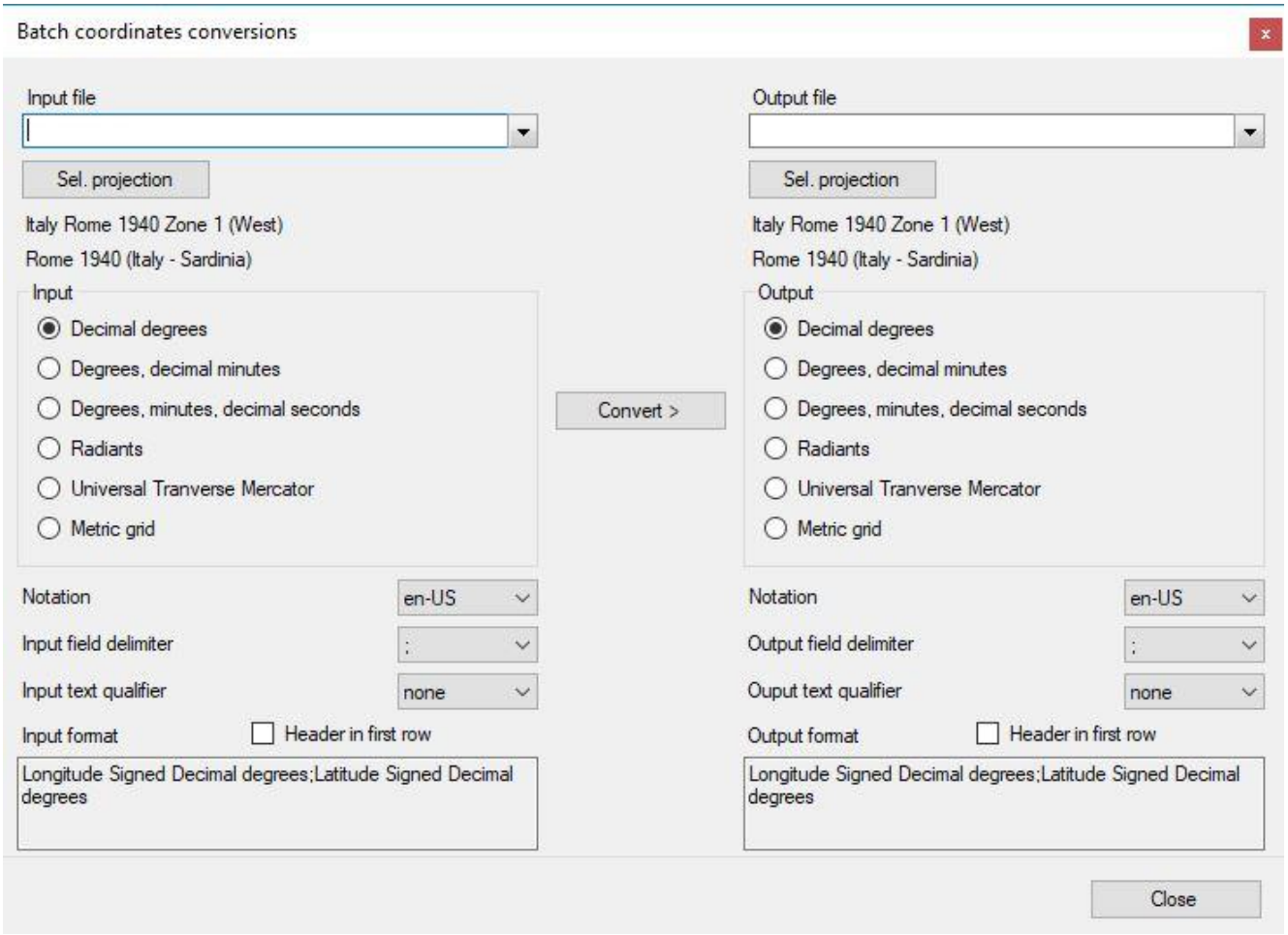
When a map is loaded, you can alternatively perform a routing function, using the context menu *Routing*.

Conversions

Convert the coordinates in batch mode

This function is used to perform coordinate conversions from one datum to another.

The coordinates are stored in an input file in csv format (comma separated value); an output file is produced in csv format according to the specifications indicated.



To activate the function, use the *Utilities - Conversions - Batch coordinates conversions* menu.

Select the input file and the output file.

Then select the source and destination projections.
The list shows only the active projections. To activate or deactivate one or more projections, use the List of predefined projections.

Then specify the format of the origin and destination coordinates.

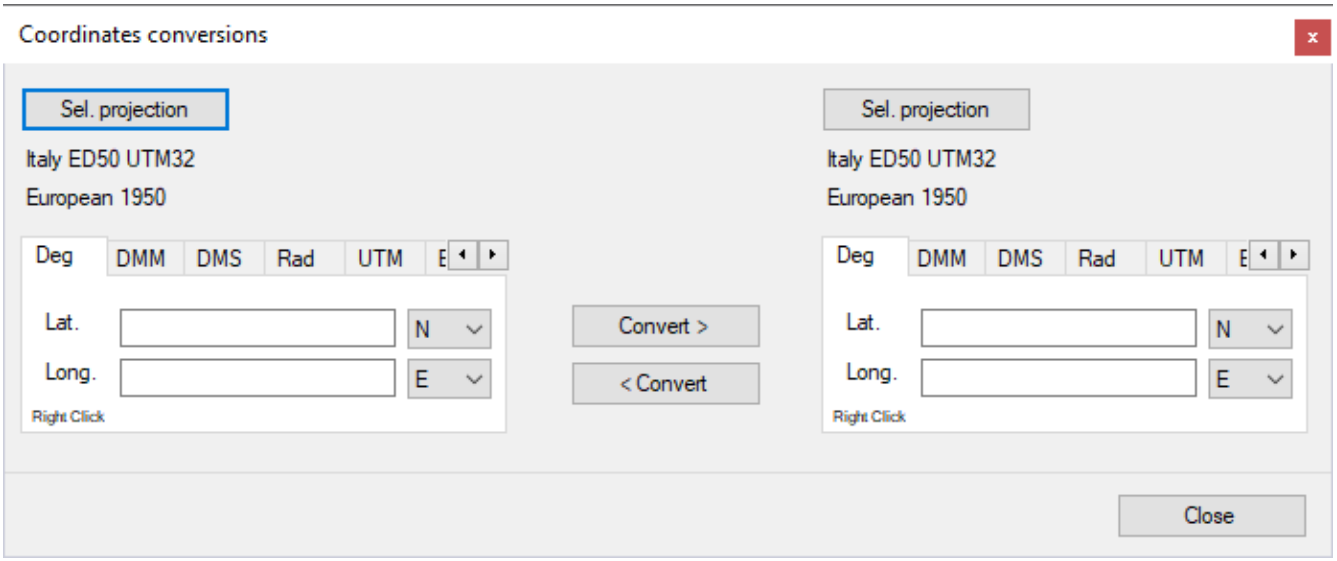
- Type of coordinates
- Notation of numeric fields
- Field delimiter
- Text qualifier
- Presence or absence of a header line

An example of the input and output format is displayed.

To convert, press the *Convert* > button.
To close the window, use the *Close* button.

Convert the coordinates

This function is used to perform coordinate conversions from one datum to another.



To activate the function, use the *Utilities* - *Conversions* - *Coordinates conversions* menu.

Then select the source and destination projections.
The list shows only the active projections. To activate or deactivate one or more projections, use the List of predefined projections.

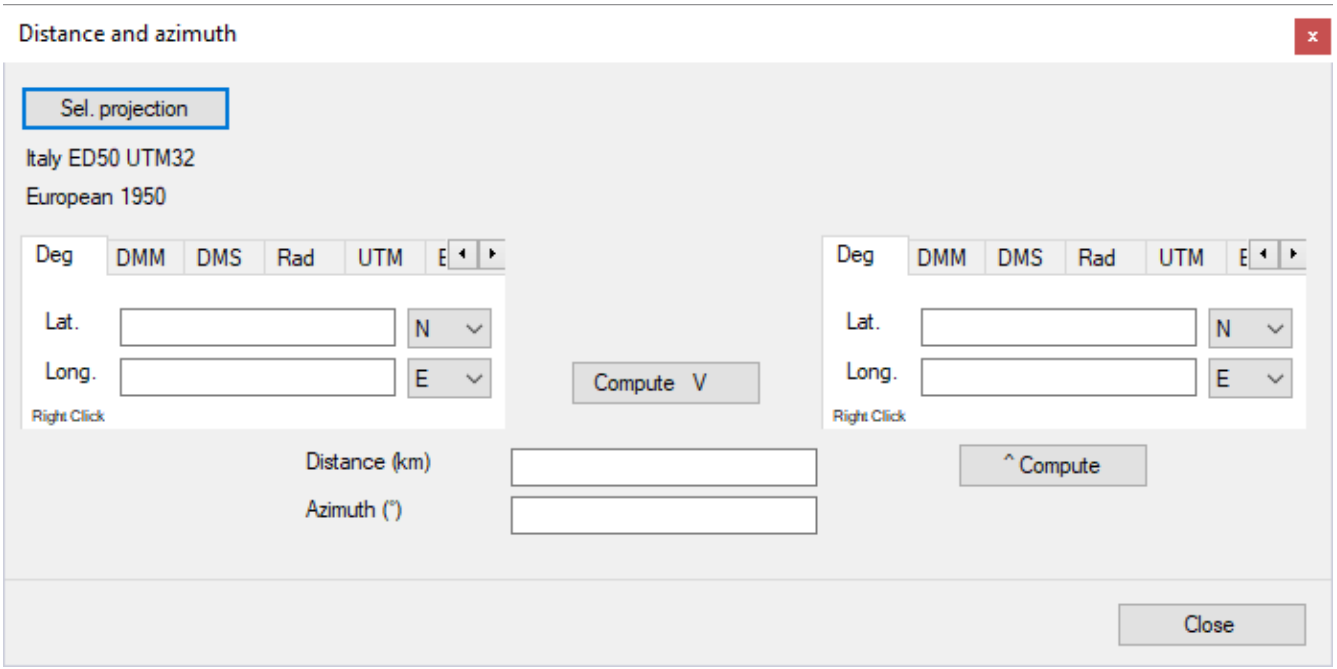
Then enter the origin coordinates (see Enter the coordinates paragraph).

To convert, press the *Convert* > button.
It is possible to perform a backward conversion by pressing the < *Convert* button.
To close the window, use the *Close* button.

Convert distances and azimuth

This function is used to:

- given two geographical points, calculate distance and azimuth
- given a geographical point, a distance and an azimuth, calculate a second geographical point



To activate the function, use the *Utilities - Conversions - Distances, azimuth* menu.

Then select projection.
The list shows only the active projections. To activate or deactivate one or more projections, use the List of predefined projections.

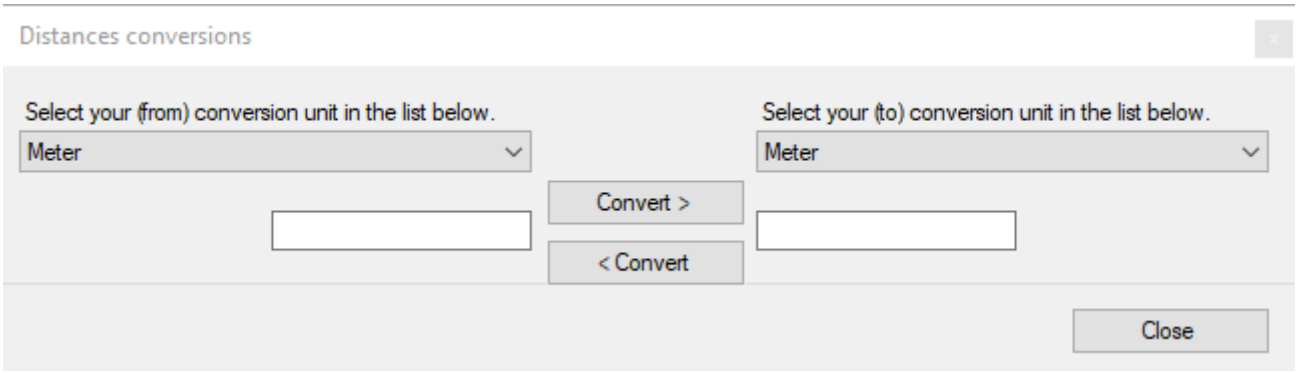
Then enter the origin and destination coordinates (see Enter the coordinates paragraph).

To start the calculation, press the *Calculate V* button.

It is possible to calculate the second geographic coordinates using the first coordinates, the distance (km) and the azimuth (degrees), by pressing the ^ *Calculate* button.
To close the window, use the *Close* button.

Convert the distances

It is used to convert a distance from one unit of measure to another.



To activate the function, use the *Utilities* - *Conversions* - *Distances conversions* menu.

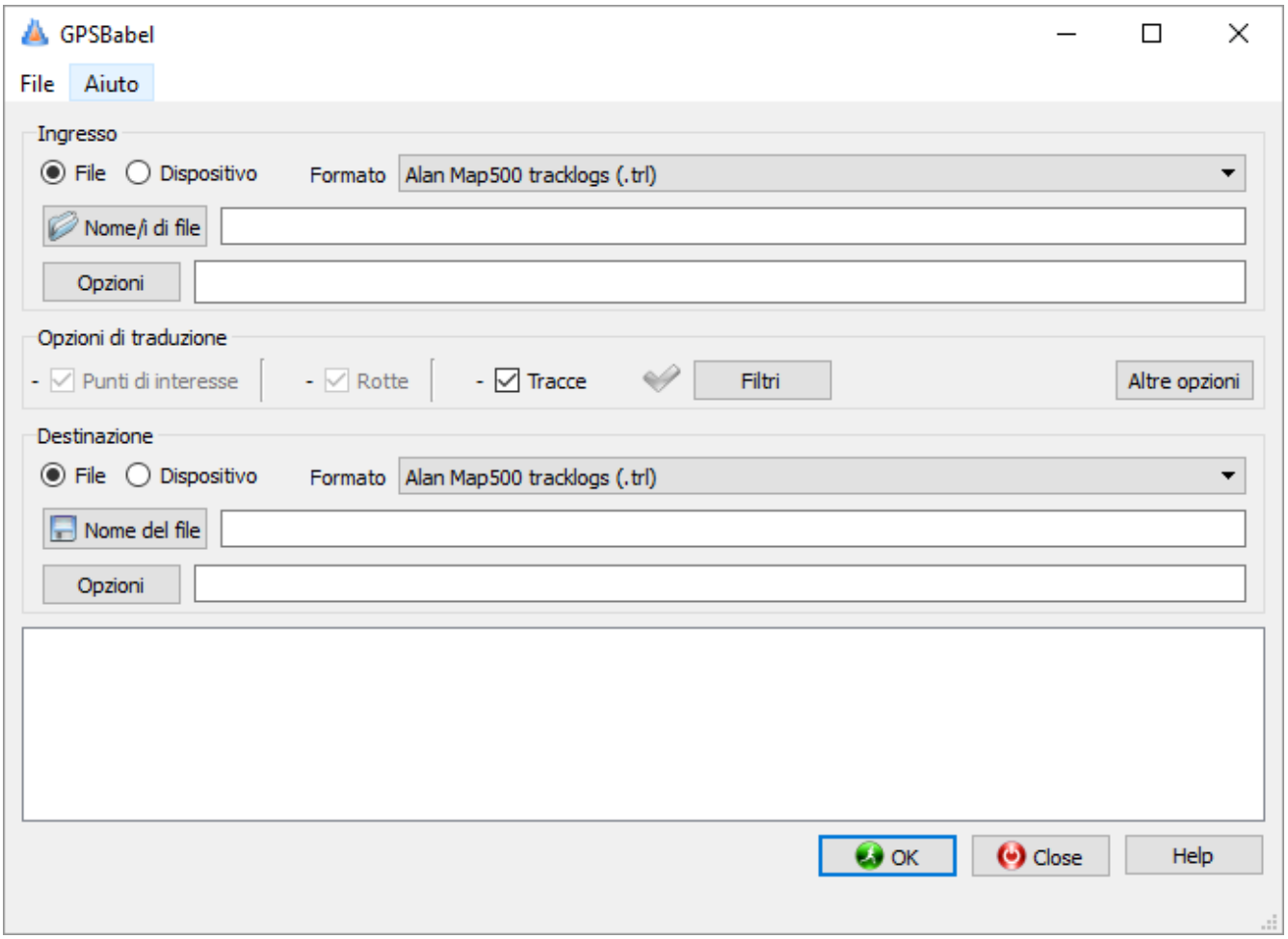
Select the units of measurement of origin and destination.
Type in the field on the left the value to be converted.

To start the calculation, press the *Convert* > button.
It is possible to perform the calculation backwards by pressing the < *Convert* button.
To close the window, use the *Close* button.

Convert with GPSBabel

GPSBabel provides a multitude of GPX data conversion functions from one format to another.

This component is from third parties, to get more information consult the site GPSbabel.org.



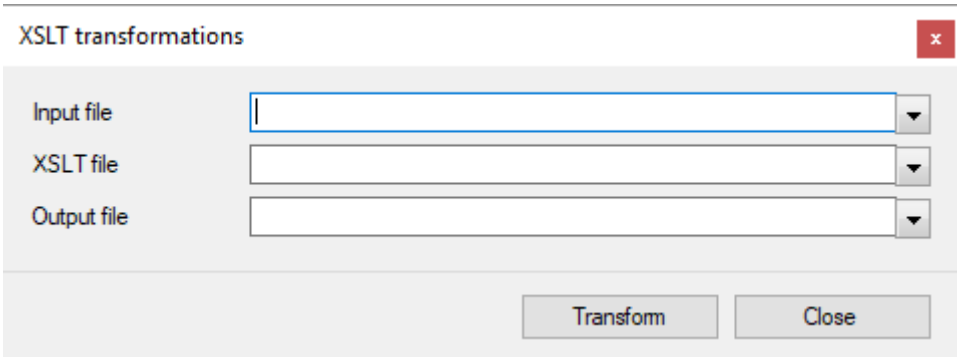
To activate this function, use the *Utilities - Conversions - GPSBabel converter* menu.

This function has its own help which can be viewed using the *Help - Help of GPSBabel* menu.

XSLT transformations

It provides a multitude of functions for converting data from one xml format to another, thanks to the XSLT transformation method.

For more information on the XSLT language, see the XSL Transformations (XSLT) website.

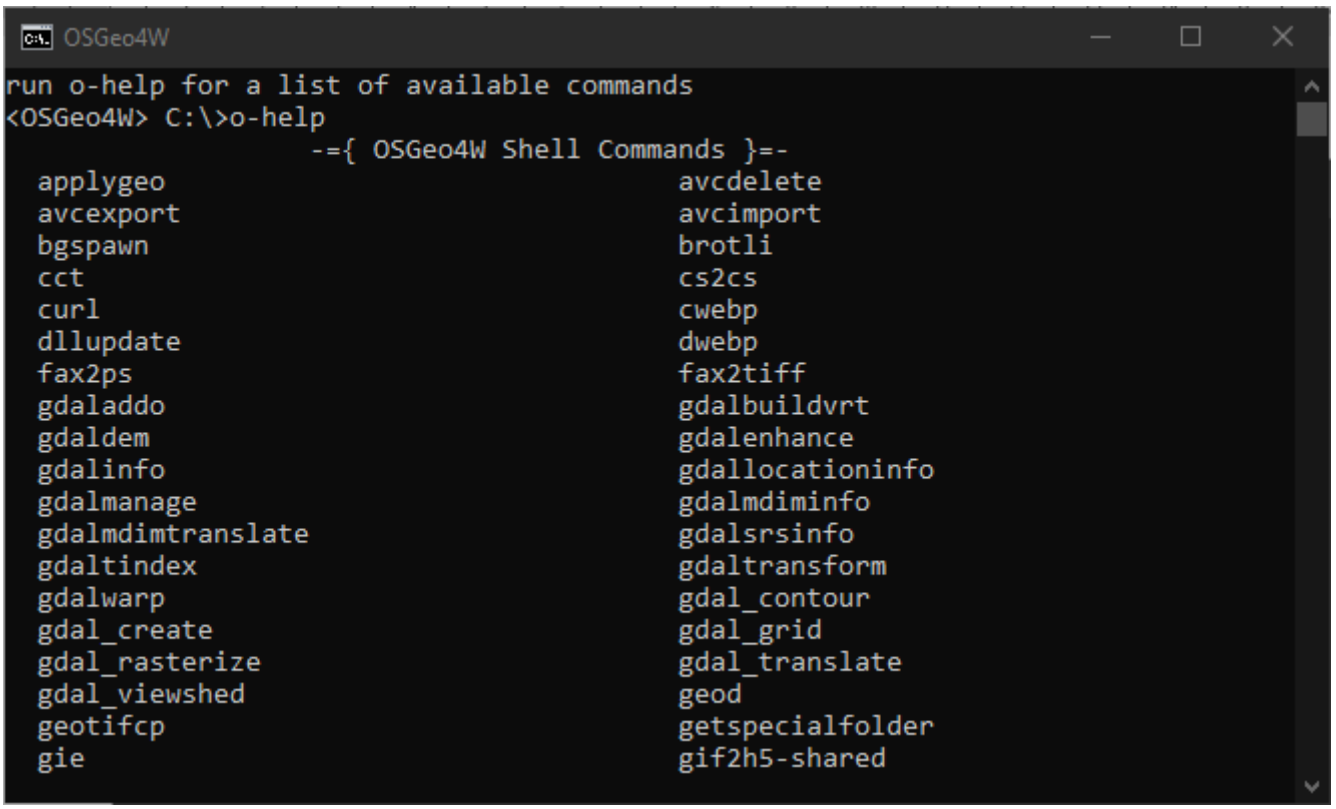


To activate this function, use the *Utilities* - *Conversions* - XSLT *Transformations* menu.

Indicate the input file, the XSLT transformation file and the output file in the appropriate fields.
To convert, press the *Transform* button.
To close the window, use the *Close* button.

OSGeo4W console

Opens a console that can be used to execute line commands contained in the OSGeo4W package.



For more information about commands, visit OSGeo4W web site.

Preferences

It is used to modify the default settings, thus customizing the application.

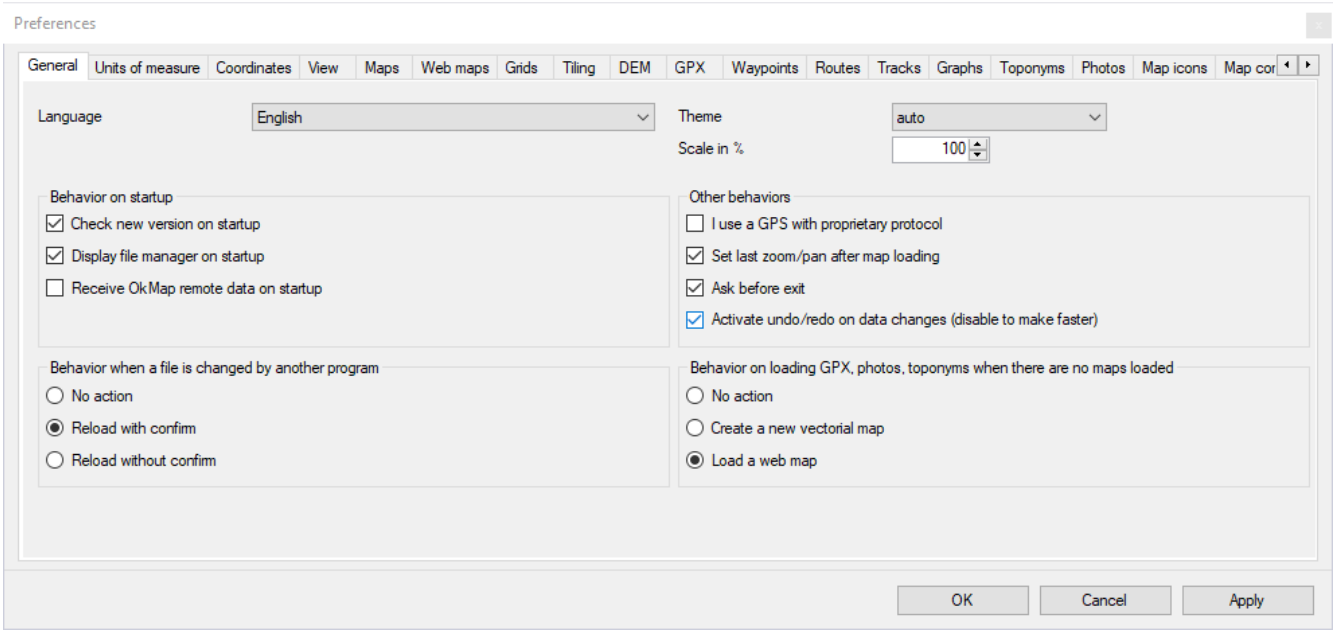
To activate this function use the *Utilities* - *Preferences* menu.

The window consists of several pages selectable with the tabs at the top.
Two arrows positioned to the right of the tabs allow you to slide the tabs to the left and right, viewing those that are hidden for reasons of space.

To save the modified data and exit the function, press the *Ok* button.
To exit the function without saving the data, press the *Cancel* button.
To save the modified data without exiting the function, press the *Apply* button.

Preferences - General

This page contains the general settings.

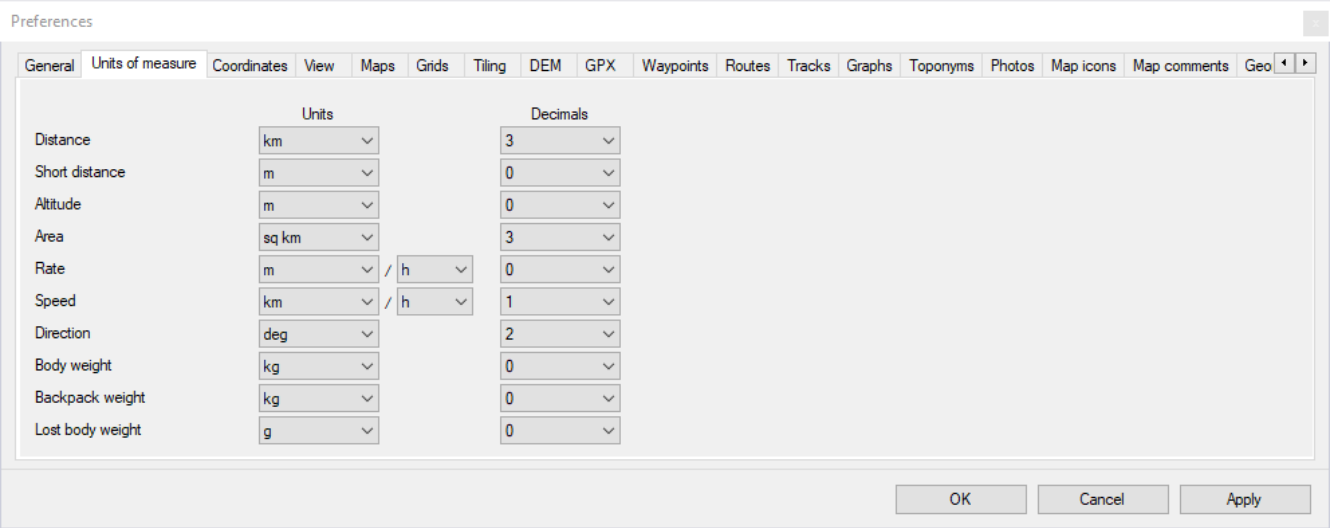


On this page you can customize:

- *Language*: is the language used in the interface; the modification of this information involves the closure and reopening of OkMap.
- *Theme*: the theme to be used in the general appearance of the windows (light, dark or auto); if "auto" is specified, the selected theme is the one specified in the system settings.
- *Scale in %*: the scale to be used in the representation of the windows and their contents.
- *Behavior on startup*:
  - *Check new versions on startup*: if active, after starting OkMap it is checked if new versions are available and in this case a window is opened at the bottom right for download.
  - *Display file manager on startup*: If active, the File manager window is automatically opened after starting OkMap.
  - *Receive OkMap remote data on startup*: If active, after starting OkMap the receiving of remote data from OkMap remote devices is started.
- *Other behaviors*:
  - *I use a GPS with proprietary protocol*: If enabled the Preference page "GPS" and the main menu *Navigation - GPS* are visible.
  - *Set last map zoom/pan after loading*: If enabled, after loading a map the last zoom and pan settings are restored.
  - *Ask before exit*: if active, OkMap asks for confirmation before closing.
  - *Activate undo/redo on data changes*: it enables the possibility of performing undo and redo operations on GPX data modifications. This function can be disabled to speed up changes to GPX data.
- *Behavior when a file is changed by another program*:
  - No action
  - Reload with confirm
  - Reload without confirm
- *Behavior on loading GPX data when there are no maps loaded*:
  - No action
  - Create a new vector map
  - Load a web map (according to the specified default)

Preferences – Units of measure

This page contains settings for the representation of distances and areas.



On this page you can customize:

- Distance
  - *Unit*: it is the unit of measure with which the computed distance is displayed in the status bar.
  - *Decimals*: is the number of decimal places (precision) with which the distance value is displayed.

- Short distances
  - *Unit*: it is the unit of measurement with which the small distances are represented.
  - *Decimals*: it is the number of decimal places (precision) with which the values of the small distances are displayed.

- Altitude
  - *Unit*: it is the unit of measurement with which the altitude is represented.
  - *Decimals*: this is the number of decimal places (precision) with which the altitude value is displayed.

- Area
  - *Unit*: it is the unit of measure with which the computed area is displayed in the status bar.
  - *Decimals*: is the number of decimal places (precision) with which the area value is displayed.

- Rate
  - *Unit*: it is the unit of measurement with which the rate of ascent and descent are represented.
  - *Decimals*: it is the number of decimal places (precision) with which the value of the rate of ascent and descent are displayed.

- Speed
  - *Unit*: it is the unit of measure with which the speed is represented.
  - *Decimals*: is the number of decimal places (precision) with which the speed value is displayed.

- Direction
  - *Unit*: it is the unit of measure with which the direction is represented.
  - *Decimals*: is the number of decimal places (precision) with which the value of the direction is displayed.

- Body weight
  - *Unit*: it is the unit of measure with which the body weight is represented.

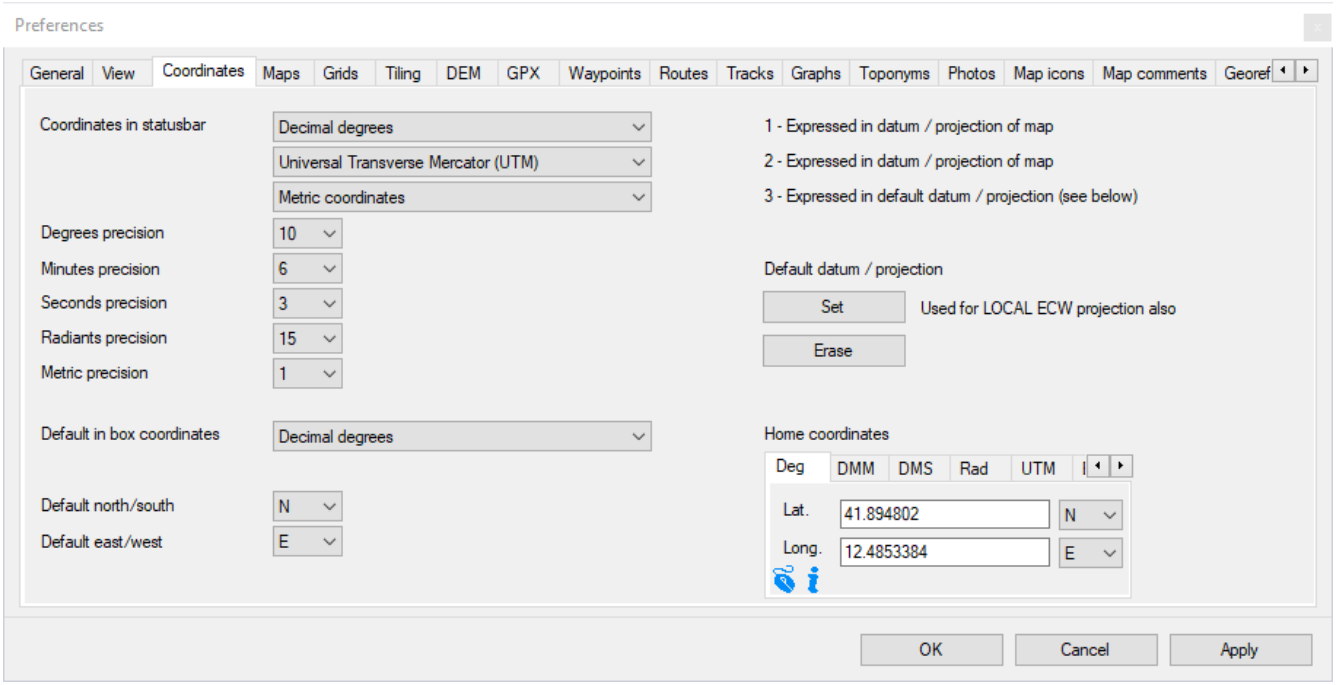
- *Decimals*: is the number of decimal places (precision) with which the value of the body weight is displayed.

- Backpack weight
  - *Unit*: it is the unit of measure with which the backpack weight is represented.
  - *Decimals*: is the number of decimal places (precision) with which the value of the backpack weight is displayed.

- Lost body weight
  - *Unit*: it is the unit of measure with which the lost body weight is represented.
  - *Decimals*: is the number of decimal places (precision) with which the value of the lost body weight is displayed.

Preferences – Coordinates

This page contains settings related to displaying coordinates.

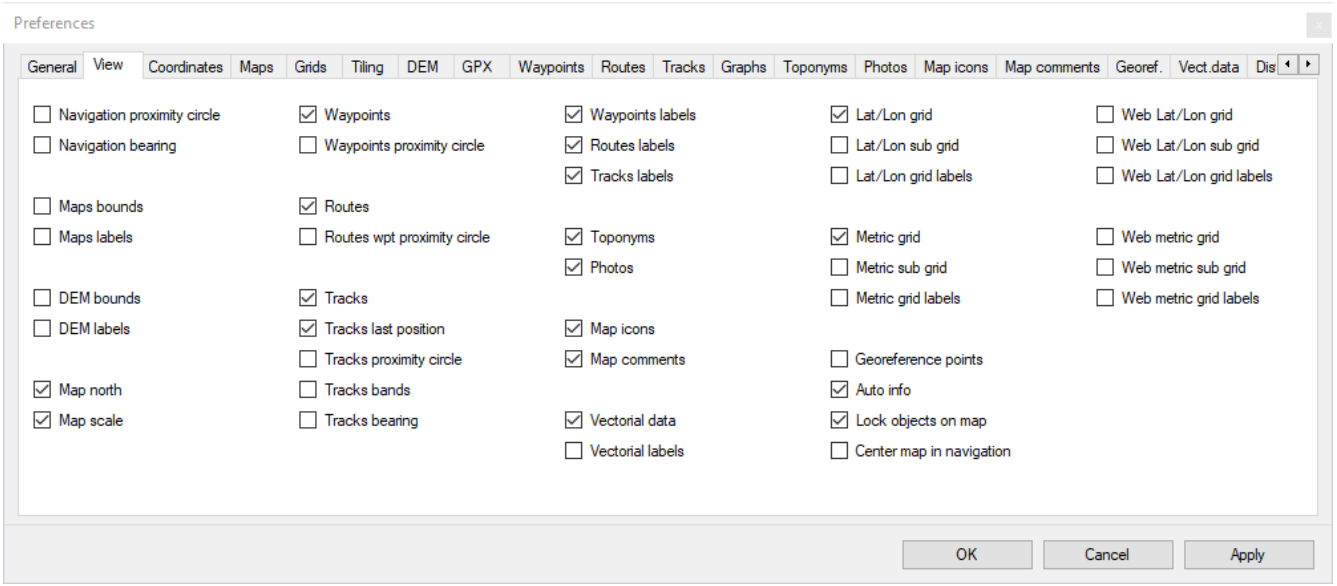


On this page you can customize:

- *Coordinates*: represents the display mode of the coordinates displayed in the status bar (3 selections).
- *Degrees precision*: it is the number of decimal places (precision) with which the degree value is displayed in the coordinates.
- *Minutes precision*: it is the number of decimal places (precision) with which the minutes value is displayed in the coordinates.
- *Seconds precision*: it is the number of decimal places (precision) with which the seconds value is displayed in the coordinates.
- *Radiants precision*: it is the number of decimal places (precision) with which the value in radians of the coordinates is displayed.
- *Metric precision*: is the number of decimal places (precision) with which the value is displayed east and north in the metric coordinates.
- *Default in box coordinates*: it is the tab (coordinates type) shown by default in the coordinates box.
- *Default north/south*: it is the default used in the north/south hemisphere in the coordinates box.
- *Default east/west*: it is the default used in the east/west hemisphere in the coordinates box.
- *Set default datum / projection*: set the default projection. It's used:
  - To calculate the third coordinates displayed in the status bar
  - as default for the calculation of the metric coordinates in the coordinate boxes when not referring to a map (which has its projection)
  - in loading ECW maps with LOCAL projection
- *Clear default datum / projection*: delete the previous projection set.
- *Home coordinates*: these are the coordinates you use most often (home); they can be called via the context menu in the coordinates box (see the Enter the coordinates paragraph).

Preferences - View

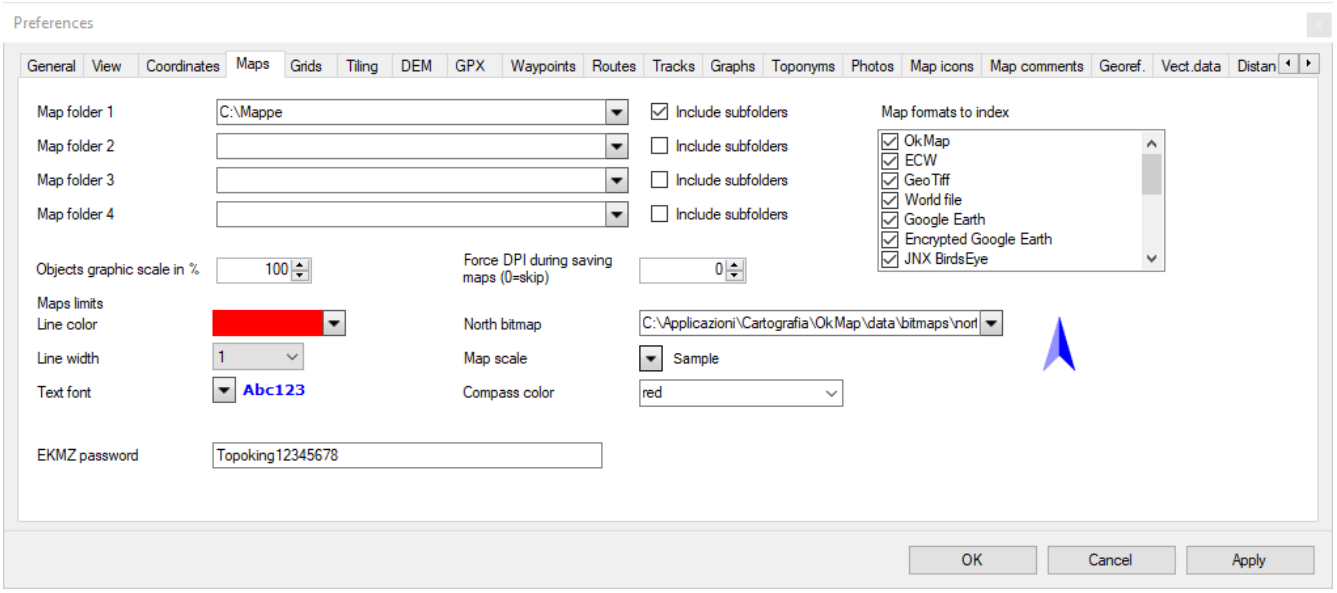
This page contains the default settings for displaying maps.



On this page you can customize the default options used in the *View* menu.

Preferences - Maps

This page contains settings related to processing and displaying maps.

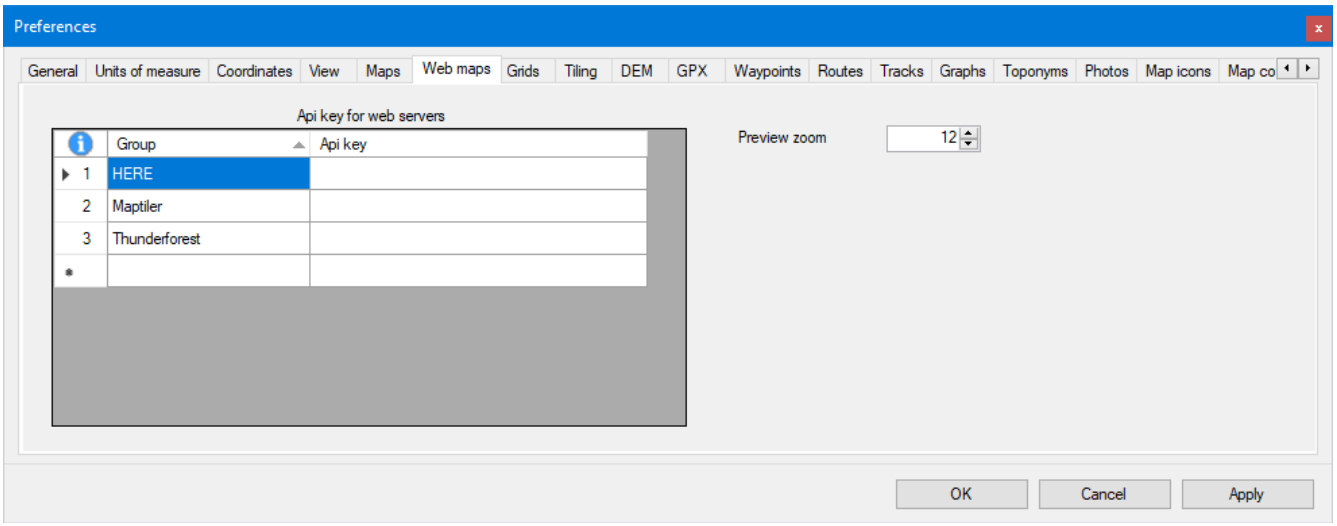


On this page you can customize:

- *Map folder 1/4*: this is the path where OkMap searches for maps (.okm files) to be indexed (up to four different paths can be specified).
- *Include subfolders*: it must be activated if you want to search the maps to be indexed in the respective sub-folders.
- *Map formats to index*: you can choose which map formats (among those supported) to index; indexing tiled maps can take a long time.
- *Objects graphic scale in %*: is the scale to be used in the representation of the graphic objects present on the maps.
- *Force DPI during saving images*: you can choose a value of DPI to assign at images when they are saved (0 = skip)
- *Line color*: it is the color used in drawing the limits of the maps.
- *Line width*: it is the thickness of the line in pixels used in drawing the limits of the maps.
- *Text font*: it is the font and the color used in the design of the labels related to the limits of the maps.
- *North bitmap*: this is the bitmap used to draw on the map the compass needle pointing to the north.
- *Map scale*: it is the font and the color used in the drawing of the map scale.
- *EKMZ Password*: is the password to use to open the maps in EKMZ format (encrypted KMZ). These maps can be purchased from ediMap at https://www.edimapstore.com/mappe-citta-per-mobile-90.

Preferences – Web maps

This page contains the settings relating to the management of web maps and in particular the API keys to be used in WMS/TMS services.



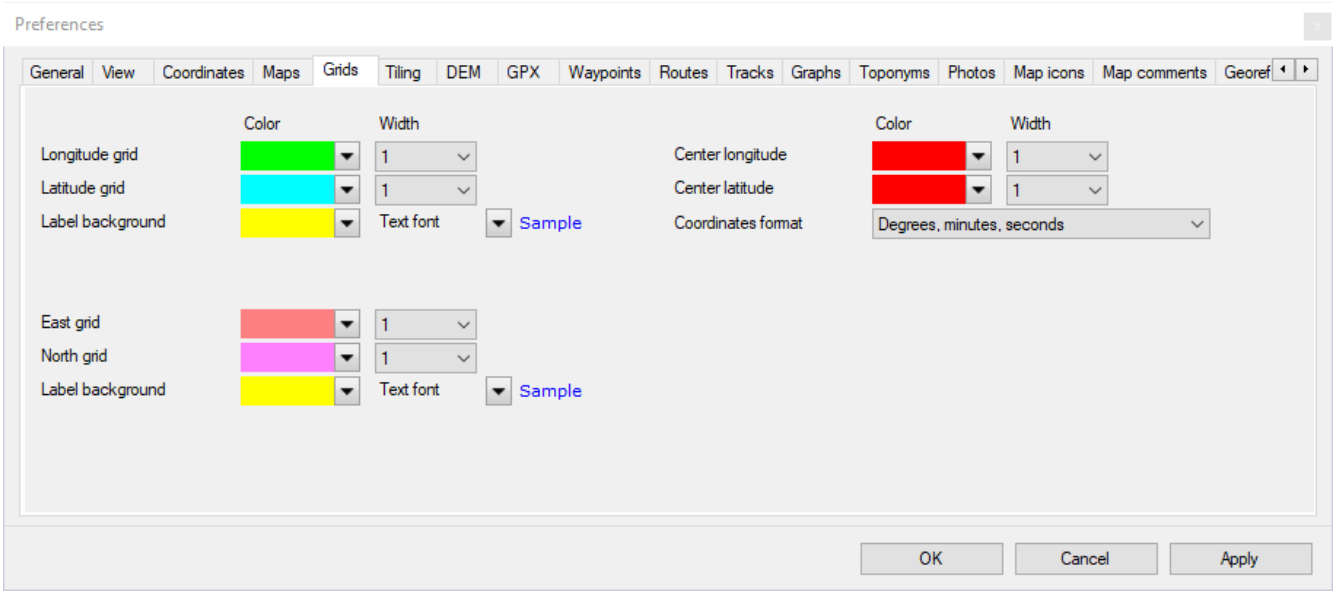
By default, two web map providers are already included in the OkMap installation and which require the insertion of the relative API keys.

The API keys can be requested on the respective websites of the suppliers. They can be free or in some cases paid.

On this page you can also change the default zoom level used to preview the map in the List of maps servers feature.

Preferences - Grids

This page contains settings related to the display of grids.

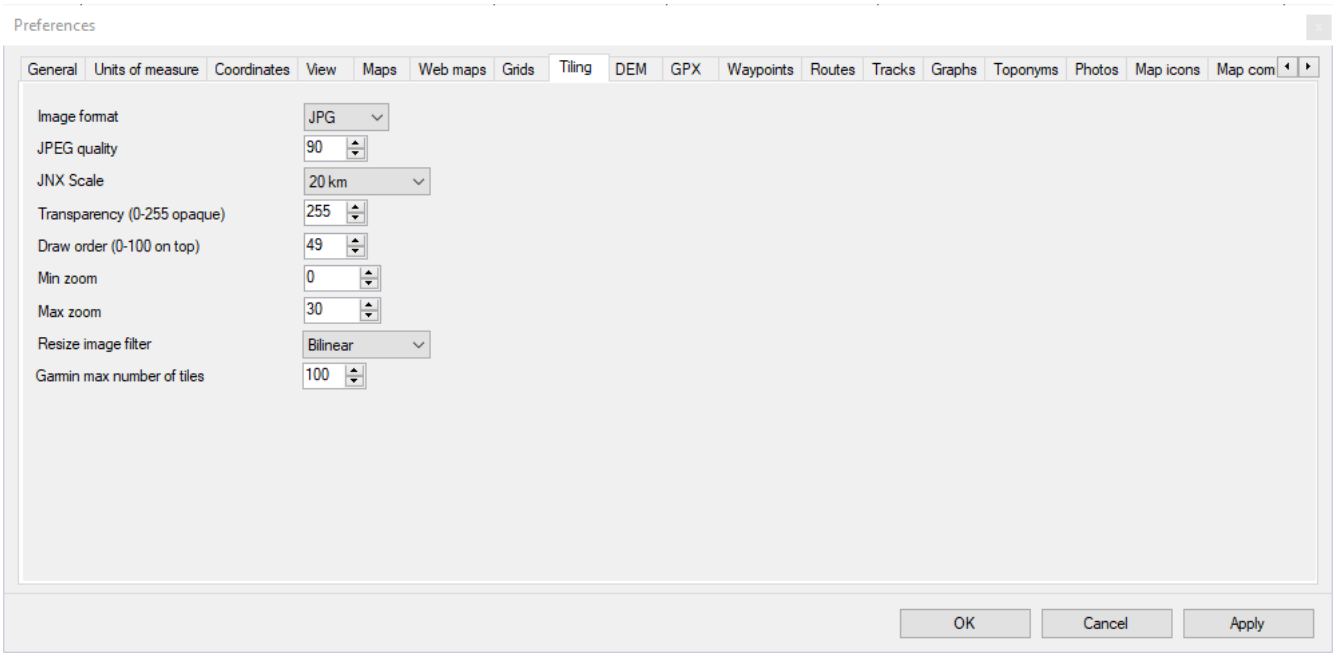


In this window it is possible to customize:

- *Longitude grid*: color and thickness of the line representing the meridians in the display of the grids.
- *Latitude grid*: color and thickness of the line representing the parallels.
- *Center longitude*: color and thickness of the line representing the reference meridian of the center of the projection.
- *Center latitude*: color and thickness of the line representing the reference parallel of the center of the projection.
- *Label background*: the background color of the grid coordinate labels.
- *Text font*: the font and color of the grid coordinate labels.
- *Coordinates format*: the format of the grid coordinates.
- *East grid*: color and thickness of the east-west lines in the metric grid.
- *North grid*: color and thickness of the north-south lines in the metric grid.
- *Label background*: the background color of the metric grid coordinate labels.
- *Text font*: the font and color of the metric grid coordinate labels.

Preferences – Tiling

This page contains settings related to map tiling.

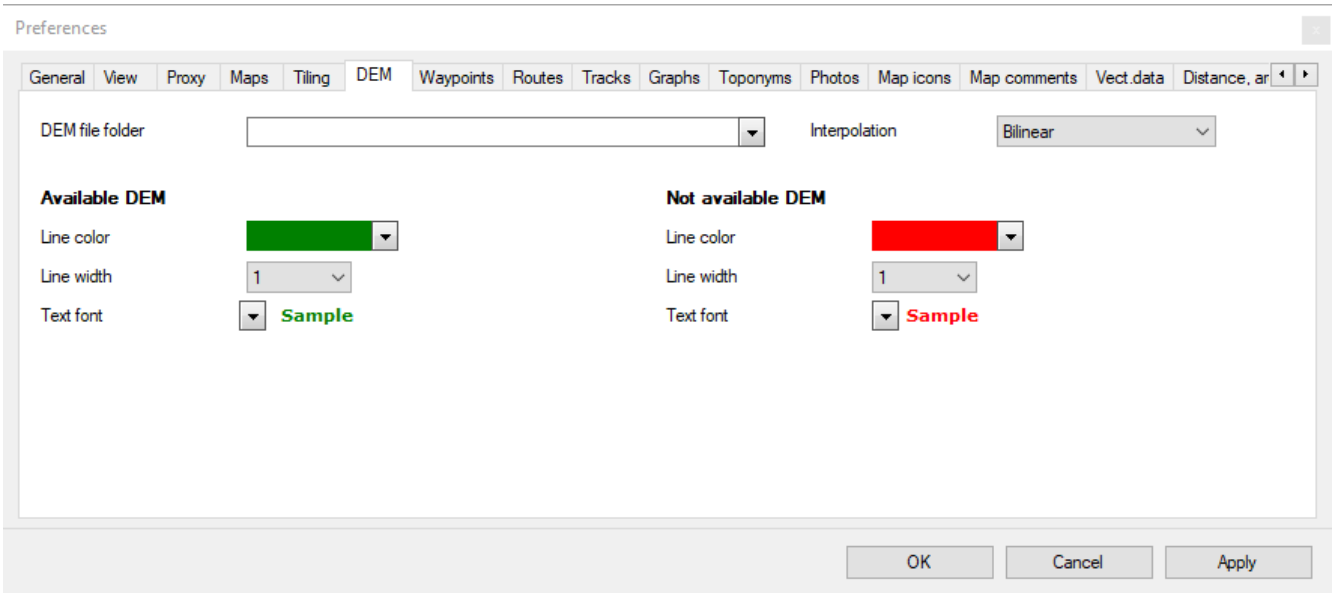


On this page you can customize:

- *Image format*: format in which the images must be produced
- *JPEG quality*: this is the percentage that indicates the default quality to be used when saving JPEG images (0=Very bad, 100=Excellent)
- *JNX scale*: it is the default scale used for the generation of JNX maps
- *Transparency*: this is the default transparency factor (0=Transparent, 255=Opaque)
- *Draw order*: and the default drawing order (0=Invisible, 1-49=Below vector data, 50-100=On the top)
- *Min zoom*: this is the default minimum zoom used for generating TomTom maps
- *Max zoom*: this is the default maximum zoom used for the generation of TomTom maps
- *Resize image filter*: This is the default filter type to use in image resizing operations
- *Garmin max number of tiles*: This is the maximum number of tiles allowed in your Garmin GPS for Garmin Custom Maps

Preferences - DEM

This page contains the settings for displaying DEM data.

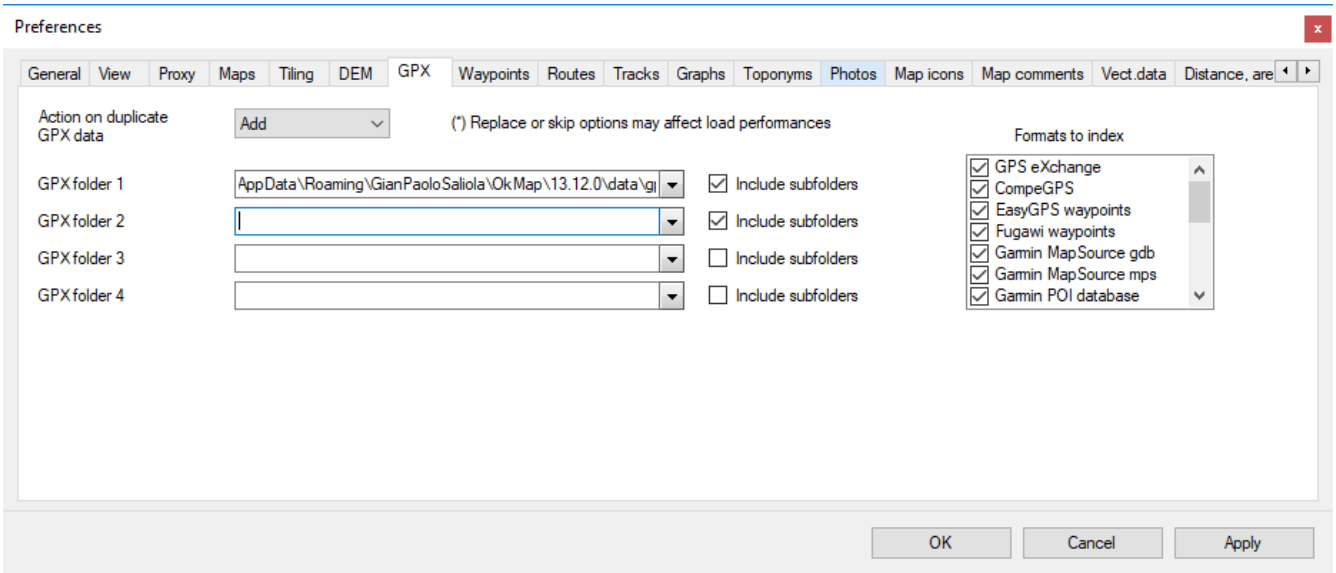


On this page you can customize:

- *DEM file folder*: this is the folder where the DEM files are stored.
- *Interpolation*: this is the type of interpolation to be used in the calculation of altitudes: *Level plane* or *Bilinear*.
- Available DEM
  - *Line color*: this is the color used in drawing the limits of the available DEM data.
  - *Line width*: it is the thickness of the line in pixels used in the drawing of the limits of the available DEM data.
  - *Text font*: it is the font and the color used in the design of the labels related to the limits of the available DEM data.
- Not available DEM
  - *Line color*: it is the color used in the design of the limits of the DEM data not available.
  - *Line width*: it is the thickness of the line in pixels used in the drawing of the limits of the DEM data not available.
  - *Text font*: it is the font and the color used in the design of the labels related to the limits of the DEM data not available.

Preferences – GPX

This page contains setting for processing files containing waypoints, routes and tracks.

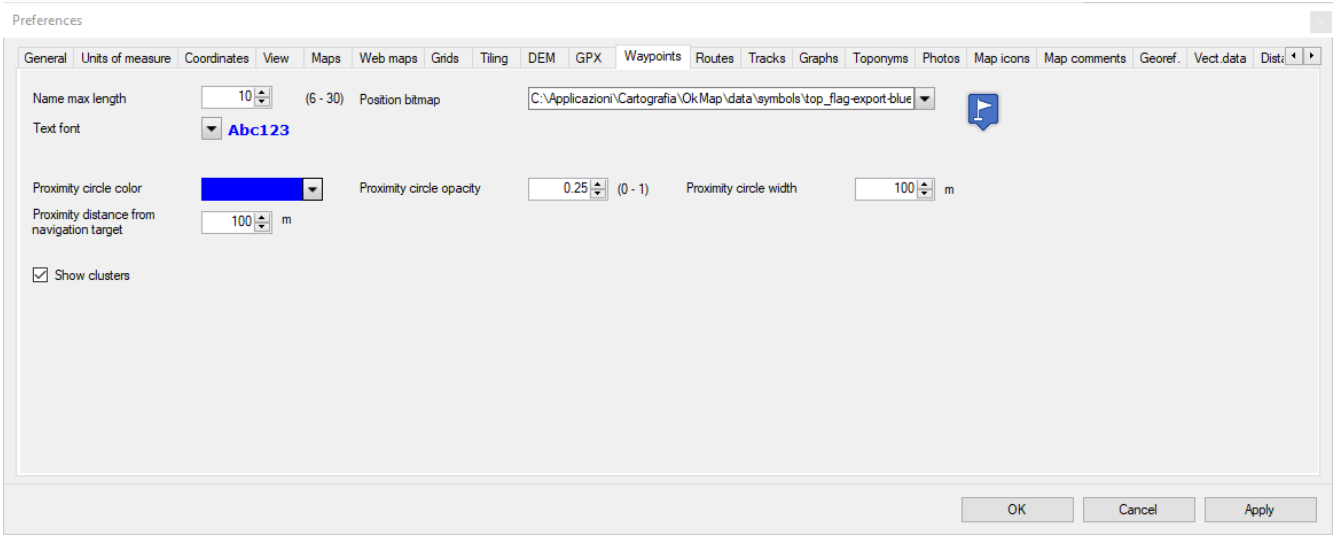


On this page you can customize:

- *Action on duplicate GPX data*: this is the action to take when trying to add a waypoint already existing among those loaded:
  - *Add*: A unique name is created for the new waypoint to be added.
  - *Ignore*: the duplicate waypoint is discarded.
  - *Replace*: the waypoint retains the name and replaces the existing one.
- *GPX folder 1/4*: this is the path where OkMap searches the files of waypoints, routes, tracks to be indexed (up to four different paths can be specified).
- *Include subfolders*: it must be activated if you want to search the files to be indexed in the respective sub-folders.
- *Formats to index*: you can choose which file formats (among those supported) to index.

Preferences - Waypoint

This page contains settings for viewing and processing waypoints.

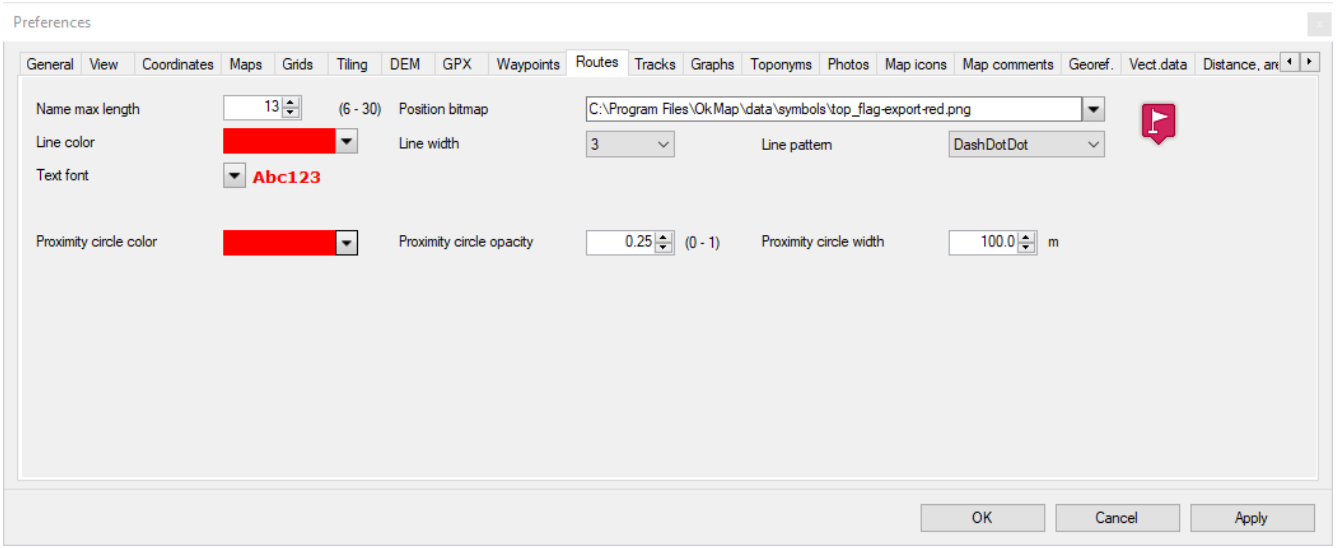


On this page you can customize:

- *Name max length*: is the maximum length in characters to be used for the names of the waypoints; serves to ensure compatibility with the GPS instrument used.
- *Position bitmap*: is the name of the bitmap file to be used in drawing waypoints.
- *Text font*: it is the font and the color used in the design of the waypoint labels.
- *Proximity circle color*: it is the color used in the drawing of the circles of proximity of the waypoints.
- *Proximity circle opacity*: it is the opacity of the color used in the drawing of the circles of proximity of the waypoints.
- *Proximity circle width*: it is the dimensions of the circle of proximity of the waypoints.
- *Proximity sound distance*: represents the distance from a waypoint within which a warning sound is emitted when navigating to a waypoint or navigating along a route.
- *Show clusters*: If activated, overlapping waypoints (even partially) on the map are displayed with a single icon that shows the number of waypoints represented.

Preferences - Routes

This page contains settings related to the display of routes.

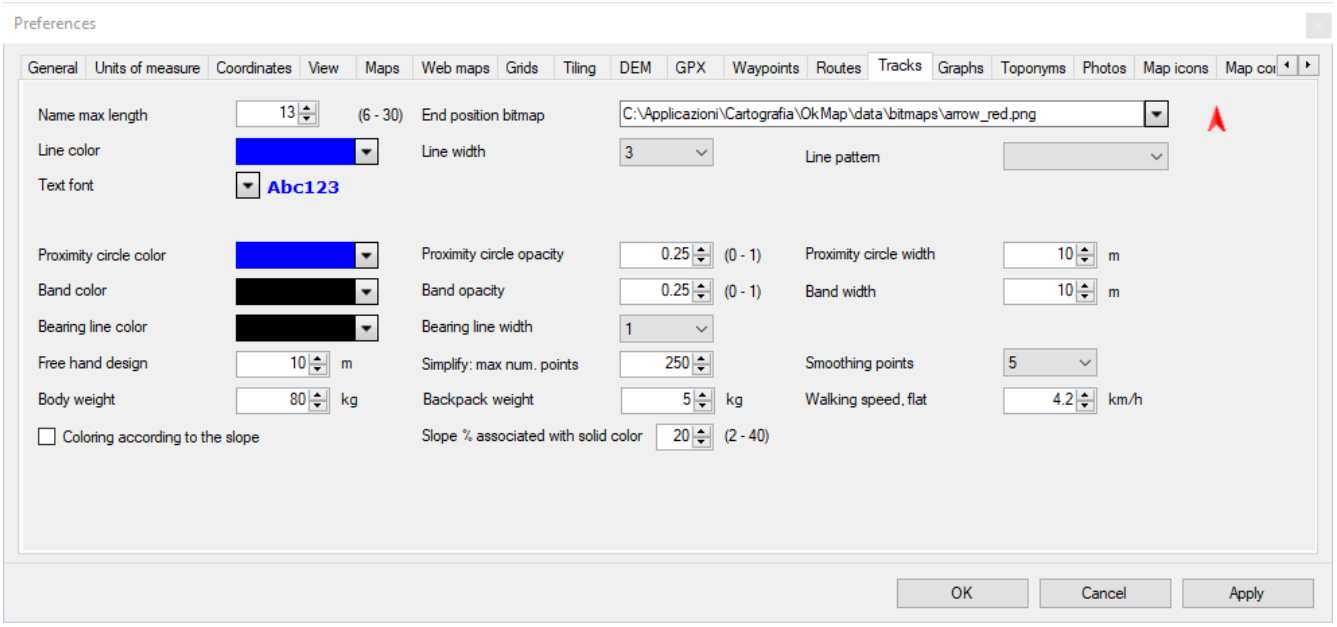


On this page you can customize:

- *Name max length*: is the maximum length in characters to be used for route names; serves to ensure compatibility with the GPS instrument used.
- *Position bitmap*: is the name of the bitmap file to be used in drawing waypoints.
- *Line color*: it is the color used in the design of the route lines.
- *Line width*: it is the thickness of the line in pixels used in the drawing of the routes.
- *Line pattern*: it is the type of pattern to be used to draw routes lines. It can be:
  - Dash
  - Dash dot
  - Dash dot dot
  - Dot
  - Solid (default if not specified)
- *Text font*: it is the font and the color used in the design of the route labels.
- *Proximity circle color*: it is the color used in the drawing of the circles of proximity of the route waypoints.
- *Proximity circle opacity*: it is the opacity of the color used in the drawing of the circles of proximity of the route waypoints.
- *Proximity circle width*: it is the dimensions of the circle of proximity of the route waypoints.

Preferences - Tracks

This page contains settings related to the display of the tracks.



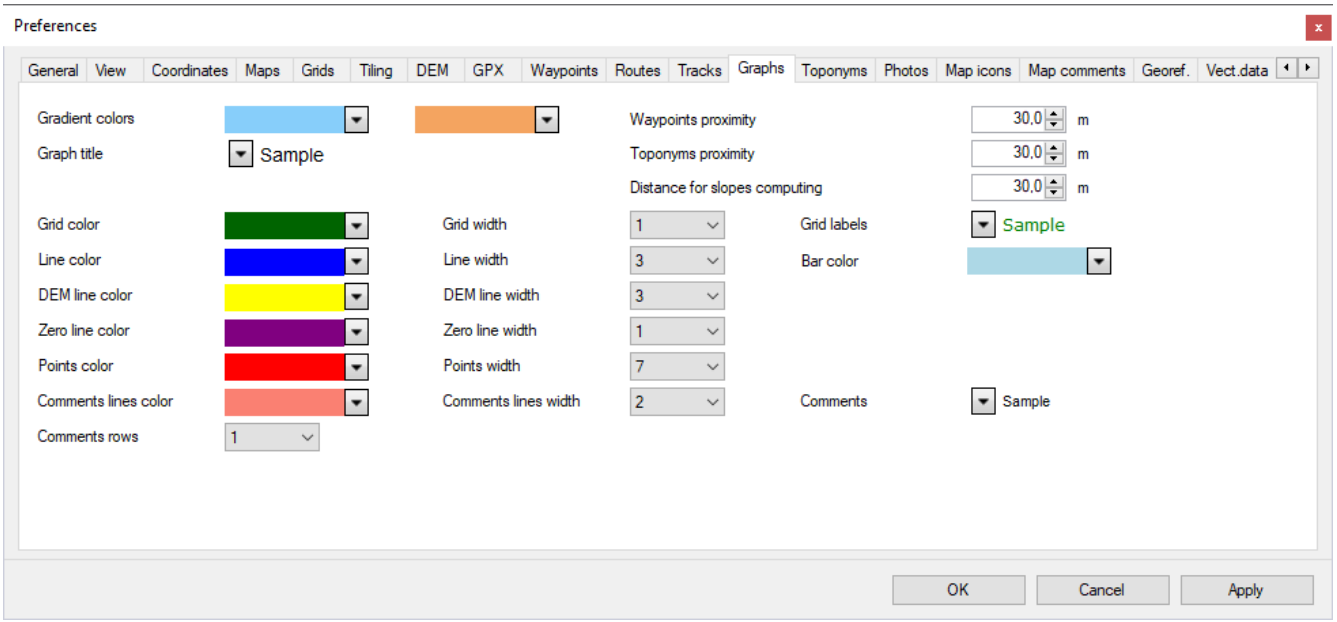
On this page you can customize:

- *Name max length*: is the maximum length in characters to be used for the names of the tracks; serves to ensure compatibility with the GPS instrument used.
- *End position bitmap*: is the name of the bitmap file to be used in the drawing of the final position of the tracks; this icon is useful for showing the point where remote clients are located when receiving remote data from OkMap.
- *Line color*: it is the color used in the drawing of the lines of the tracks.
- *Line width*: it is the thickness of the line in pixels used in the design of the tracks.
- *Line pattern*: it is the type of pattern to be used to draw tracks lines. It can be:
  - Dash
  - Dash dot
  - Dash dot dot
  - Dot
  - Solid (default if not specified)
- *Proximity circle color*: it is the color used in the drawing of the circles of proximity of the tracks.
- *Proximity circle opacity*: it is the opacity of the color used in the drawing of the circles of proximity of the traces.
- *Proximity circle width*: it is the dimension of the circle of proximity of the tracks.
- *Band color*: it is the color used in the drawing of the bands of the tracks.
- *Band opacity*: it is the opacity of the color used in the drawing of the bands of the tracks.
- *Band width*: this is the thickness of the band of the tracks.
- *Bearing line color*: it is the color used in the drawing of the tracks direction lines.
- *Bearing line width*: it is the thickness of the line in pixels used in the design of the tracks direction lines.
- *Text font*: is the font and color used in the design of the track labels.
- *Free drawing design*: this is the distance between the points in the free drawing of the tracks.
- *Simplify max num. points*: it is the maximum number of points of a track created by the simplify track function.
- *Smoothing points*: this is the number of points used by the track smoothing algorithm.
- *Body weight*: it is your weight expressed in kg (used to calculate the calories consumed).
- *Backpack weight*: it is the weight of the backpack in kg (used to calculate the calories consumed).
- *Walking speed, flat*: used to estimate travel times.

- *Coloring according to the slope*: if selected, the tracks are colored with red (uphill) tending to yellow (plain) and with green (descent), depending on the slope.
- *Slope % associated to solid color*: maximum uphill/downhill slope % associated with the solid red/green color.

Preferences - Graphs

This page contains settings related to the display of graphs.

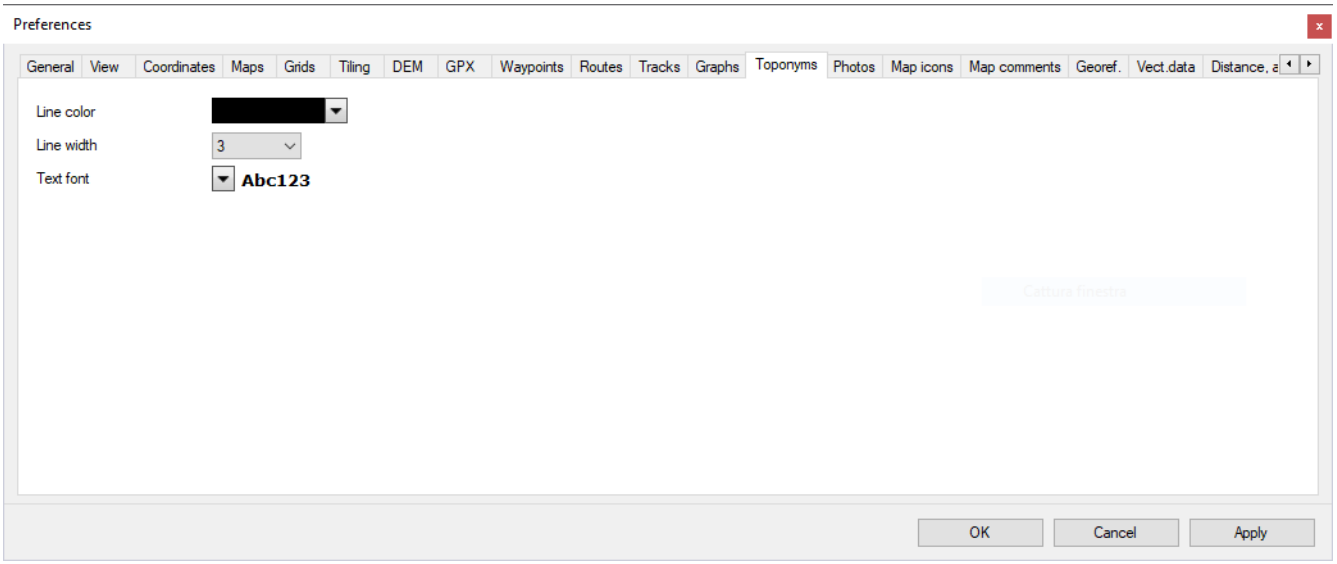


On this page you can customize:

- *Gradient colors*: The gradient colors of the chart background.
- *Graphic title*: is the font and color of the chart title.
- *Waypoints proximity*: It is the distance within which a waypoint is detected near the track
- *Toponyms proximity*: Is the distance within which a toponym is detected near the track
- *Distance for slope computing*: This is the distance used to calculate the slope of the track
- *Grid color*: is the color of the graph grid.
- *Grid width*: is the thickness of the graph grid line.
- *Grid labels*: is the font and color of the chart grid labels.
- *Line color*: it is the color of the main line of the graph.
- *Line width*: it is the thickness of the main line of the graph.
- *Bar color*: it is the fill color of bars in bar graphs.
- *DEM line color*: it is the color of the line of the DEM altitudes of the graph.
- *DEM line width*: it is the thickness of the line of DEM altitudes of the graph.
- *Zero line color*: it is the color of the reference line of the zero value.
- *Zero line width*: it is the thickness of the reference line of the zero value.
- *Points color*: it is the color used to draw the points of the graph.
- *Points width*: is the size in pixel of the points on the graph.
- *Comm. lines color*: it is the color used to draw the lines of the comments (waypoints and toponyms).
- *Comm. lines width*: this is the thickness of the comment lines.
- *Comments*: is the font and color used for comment descriptions.
- *Comments rows*: is the number of lines used for comment descriptions.

Preferences - Toponyms

This page contains settings related to displaying toponyms.

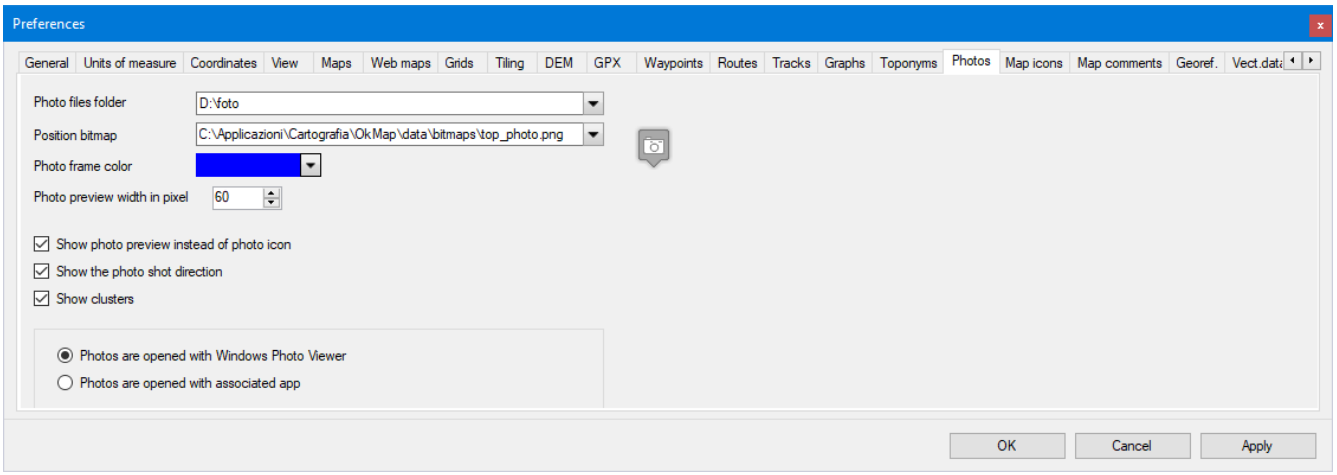


On this page you can customize:

- *Line color*: this is the color used in drawing toponym points.
- *Line width*: it is the thickness of the line in pixels used in the design of the points of toponyms.
- *Text font*: it is the font and the color used in the design of toponym labels.

Preferences - Photos

This page contains settings related to viewing photos.

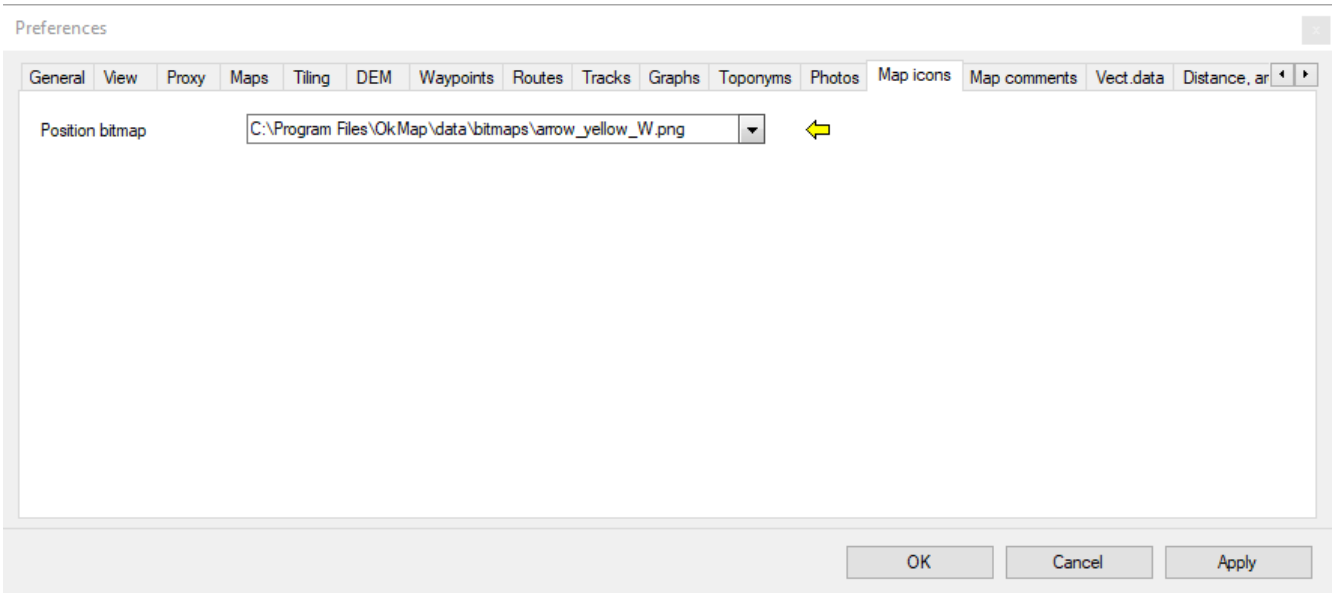


On this page you can customize:

- *Photo file folder*: This is the folder where the photo images are stored
- *Position bitmap*: is the name of the bitmap file to be used in drawing photos
- *Photo frame color*: it is the color used to draw the photo frame and the map pointer
- *Photo preview width in pixels*: The width in pixels of the photo preview on the map
- *Show photo preview instead of photo icon* on the maps
- *Show the photo shot direction*
- Viewing photos: *Through Windows Photo Viewer / Through the associated app*
- *Show clusters*: If activated, overlapping photos (even partially) on the map are displayed with a single icon that shows the number of photos represented.

Preferences – Map icons

This page contains settings related to the display of icons on maps.

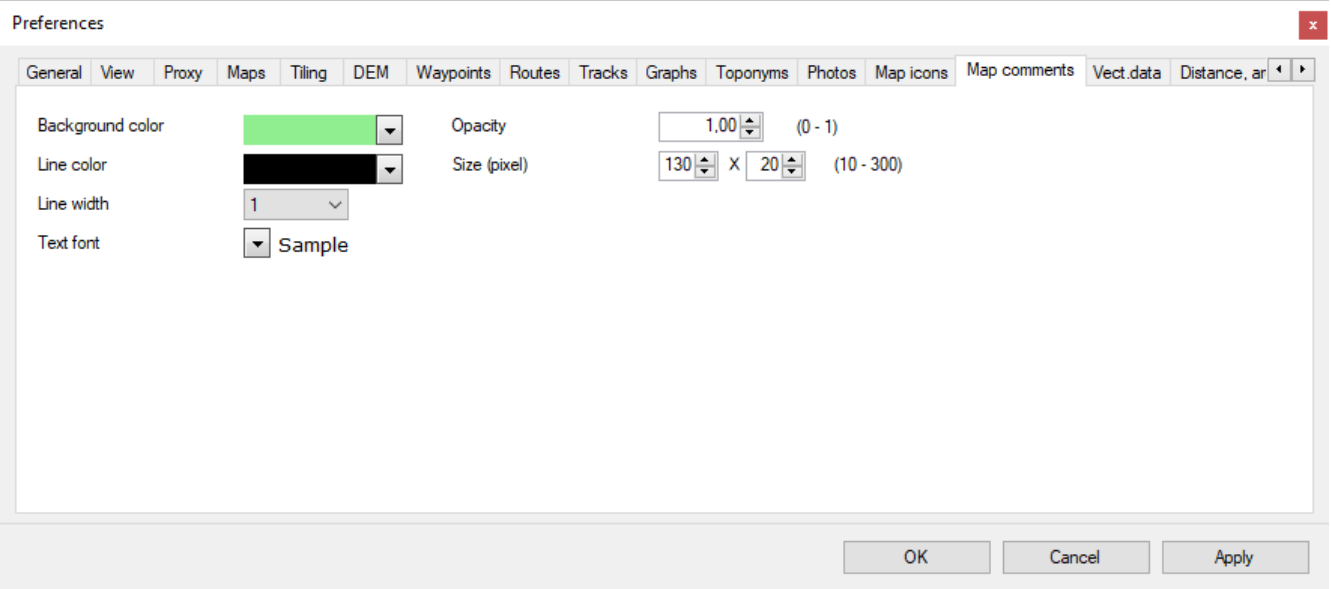


On this page you can customize:

- *Position bitmap*: is the name of the bitmap file to be used in drawing icons on maps.

Preferences – Map comments

This page contains settings related to the display of comments on maps.

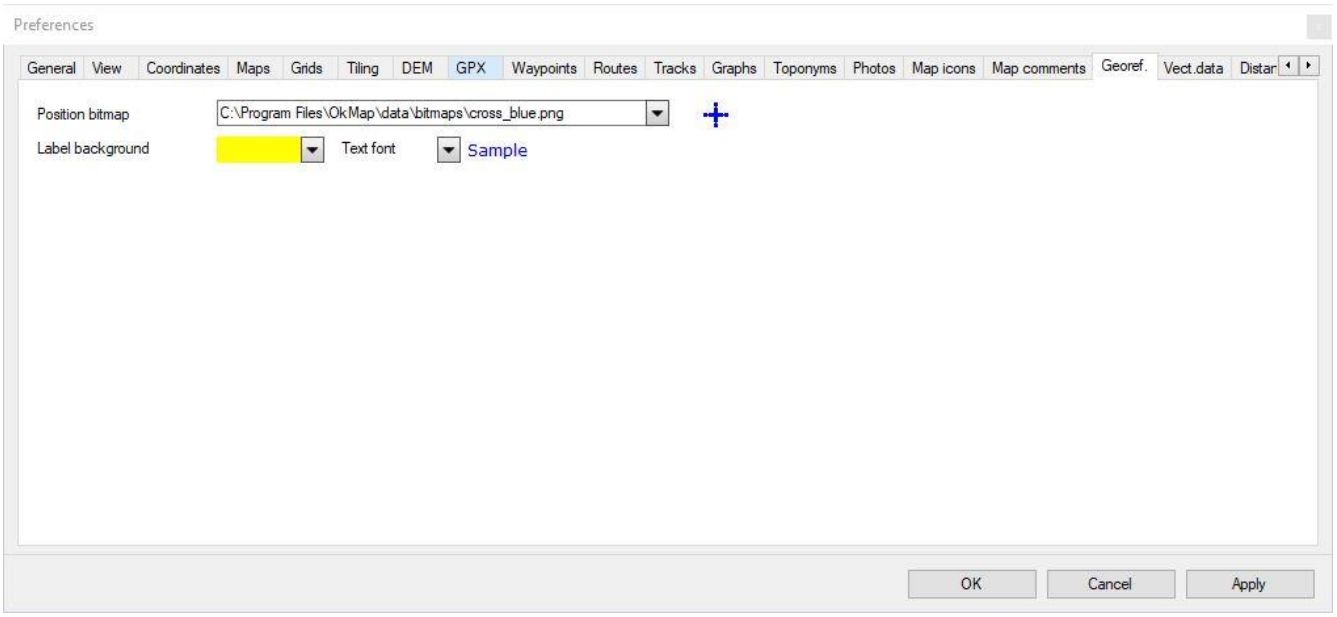


On this page you can customize:

- *Background color*: it is the background color to be used in the representation of comments on maps.
- *Line color*: it is the border color to be used in the representation of the comments on the maps.
- *Line width*: is the thickness of the line in pixels used to draw the border of the comments on the maps.
- *Text font*: it is the font and the color used in the design of the text of the comments on the maps.
- *Opacity*: it is the opacity factor used in drawing the text of the comments on the maps. The value ranges from 0 (transparent) to 255 (completely opaque).
- *Size (pixel)*: it is the size in pixel of the external box (width and height).

Preferences - Georeferencing

This page refers to the settings related to the display of the icons of the georeferencing points of the raster maps.

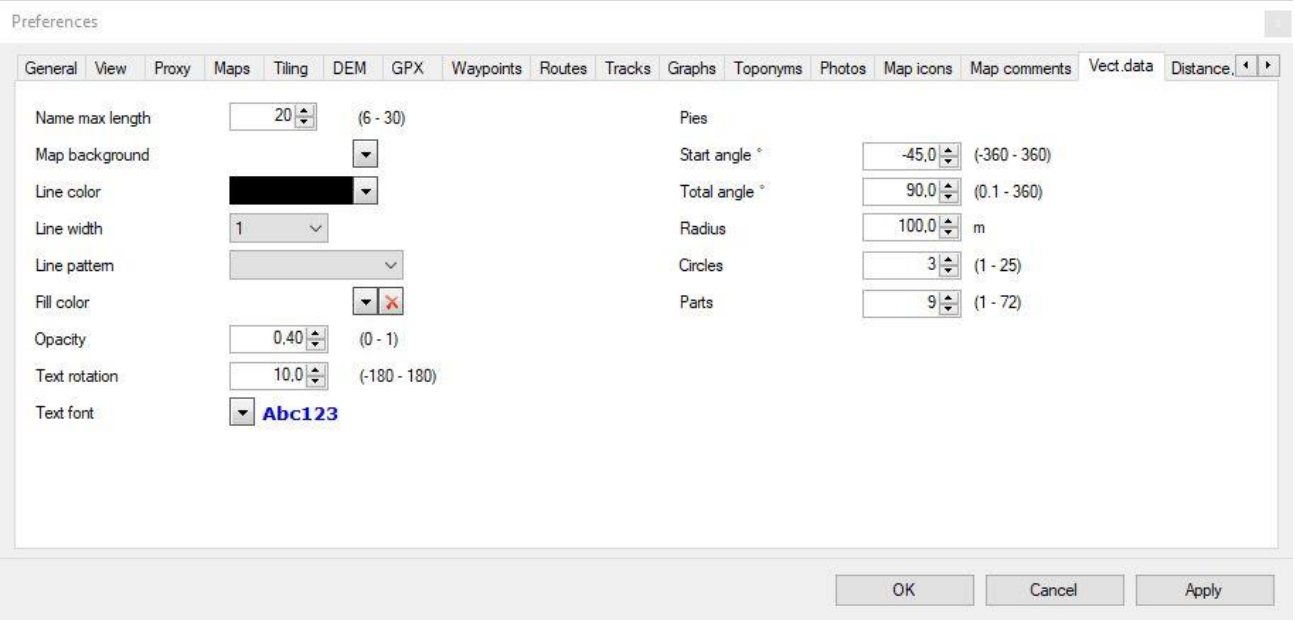


On this page you can customize:

- *Position bitmap*: is the name of the bitmap file to be used in the drawing of the georeferencing points of the raster maps.
- Label background: the background color for georeferencing point labels.
- *Text font*: font and color of georeferencing point labels.

Preferences – Vectorial data

This page contains the settings related to the display of vectorial data.

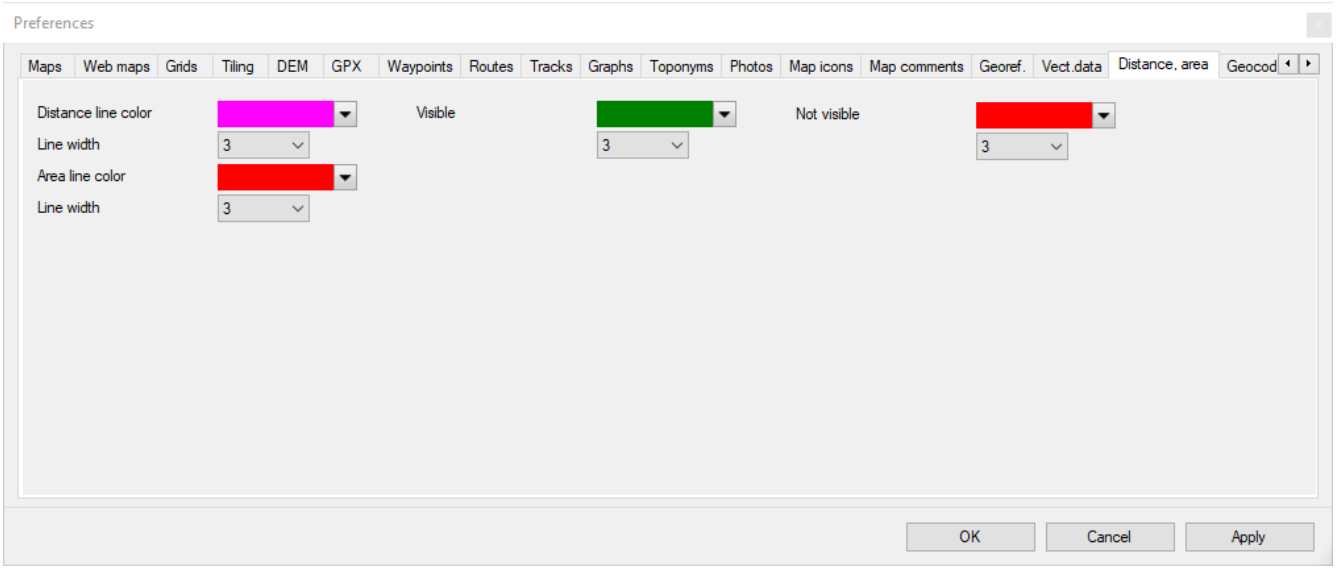


On this page you can customize:

- *Name max length*: is the maximum length in characters to be used for the names of the vectorial themes.
- *Map background*: it is the background color to be used in the representation of vectorial maps.
- *Line color*: this is the color used in the shape design (can be customized for each vectorial theme).
- *Line width*: it is the thickness of the line in pixels used in the shape drawing (it can be customized for each vectorial theme).
- *Line pattern*: it is the type of pattern to be used to draw lines (it can be customized for each vectorial theme). It can be:
  - Dash
  - Dash dot
  - Dash dot dot
  - Dot
  - Solid (default if not specified)
- *Fill Color*: is the fill color used in the shape design (can be customized for each vectorial theme).
- *Opacity*: it is the opacity of the fill color used in the shape design (can be customized for each vectorial theme).
- *Text font*: is the font and color used in the shape label design (can be customized for each vectorial theme).
- *Text rotation*: it is the rotation to be applied to the text of the shape labels (it can be customized for each vectorial theme).
- Pies: These are the values used to draw pies:
  - *Start angle*: It is the orientation angle of the cake (0 = top, 90 = right, etc...).
  - *Total angle*: It is the angle of the sector (max 360° = circumference).
  - *Radius*: It is the radius of the pie.
  - *Circles*: It is the number of circles inside the pie.
  - *Parts*: It is the number of segments inside the pie.

Preferences - Distance, area

This page contains settings for the representation of distances and areas.



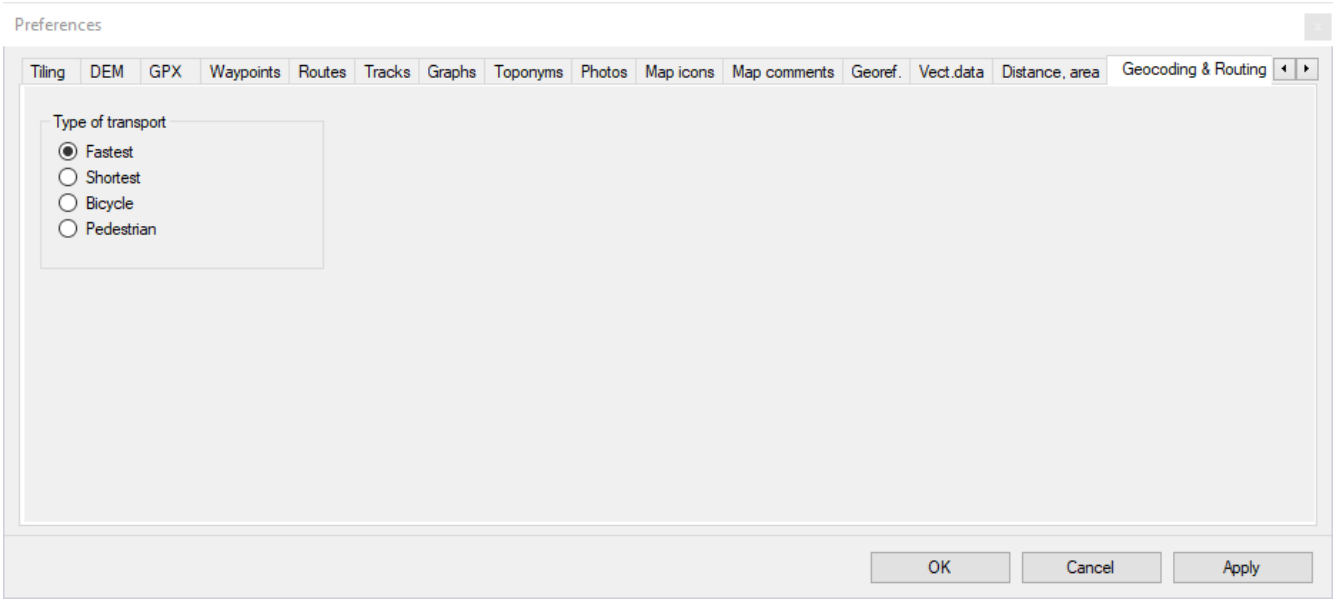
On this page you can customize:

- Distance
  - *Distance line color*: it is the color used in drawing distances lines.
  - *Line width*: it is the thickness in pixels of the line used in the drawing of distances.
  - Visible distance line color: this is the color used in drawing the sections visible as the crow flies.
  - Visible line width: it is the thickness of the line in pixels used in drawing the sections visible as the crow flies.
  - Not visible distance line color: this is the color used in drawing the sections not visible as the crow flies.
  - Not visible line width: it is the thickness of the line in pixels used in drawing the sections not visible as the crow flies.

- Area
  - *Area line color*: it is the color used in the drawing of the area polygons.
  - *Line width*: is the thickness of the line in pixels used in the drawing of the areas.

Preferences – Geocoding & Routing

This page contains the settings for geocoding and calculation of road routes (routing).



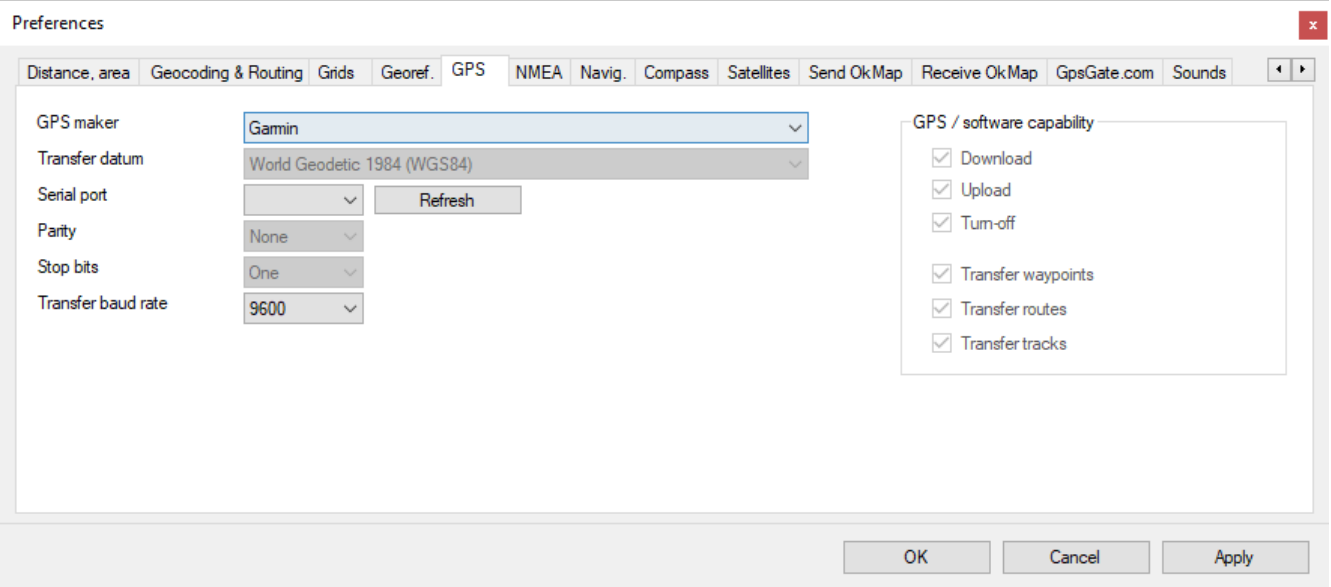
On this page you can customize:

- *Type of transport*: Fastest, shortest, bicycle, pedestrian.

Preferences - GPS

This page contains the settings related to the connection to the GPS for data transfer.

To activate this page, it's necessary to enable "I use a GPS with proprietary protocol" in Preferences - General.

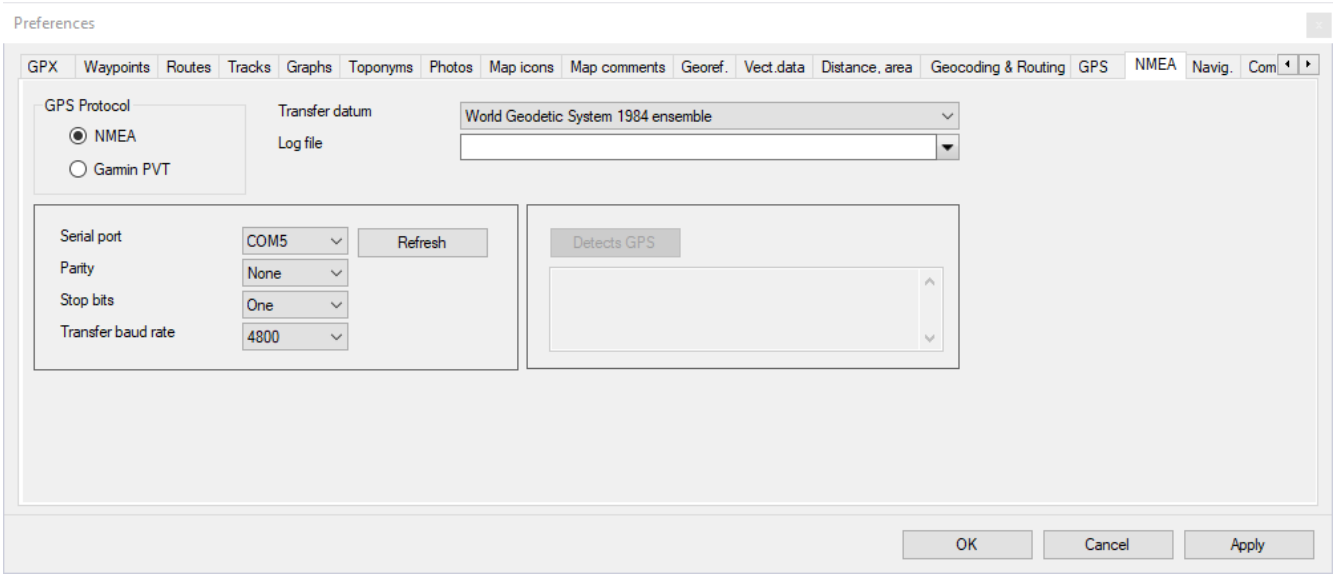


On this page you can customize the settings used in receiving and sending GPX data from/to GPS:

- *GPS maker*: it is the brand of the GPS used.
- *Transfer datum*: is the datum related to the received/transmitted GPX objects used by the GPS device (not modifiable and preset to WGS84).
- *Serial port*: it is the number of the COM port (among those available) through which the transfer takes place; the USB port can also be indicated.
- *Parity*: Parity check bit; it can be: None, Even, Odd and Mark (not modifiable and preset to None).
- *Bit stop*: Stop bit; it can be: None, One and Two (not modifiable and preset to One).
- *Transfer baud rate*: Transfer rate in bits per second.

Preferences - NMEA

This page contains the settings related to navigation with NMEA protocol.

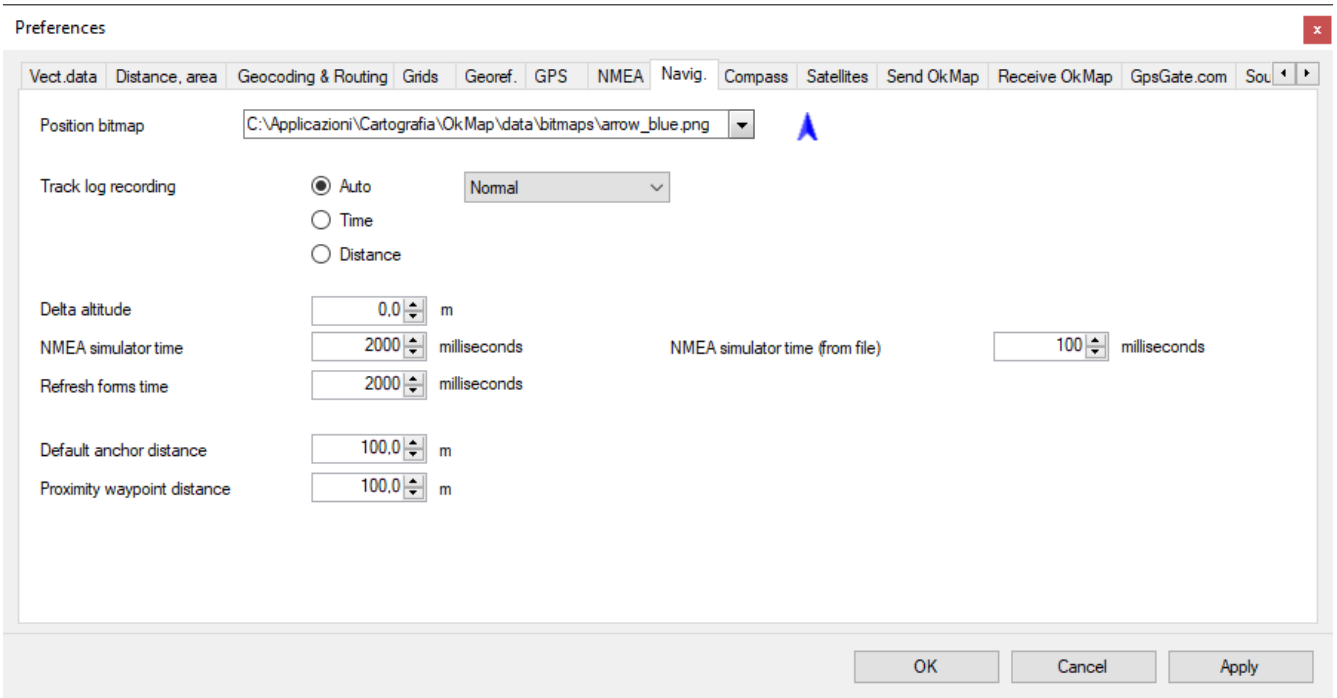


On this page you can customize the settings used in the communication with the GPS during NMEA navigation:

- *GPS protocol*: you can choose serial NMEA protocol or Garmin PVT protocol.
- *Transfer datum*: is the reference datum of the coordinates contained in the NMEA sentences received by the GPS device.
- *Log file*: if specified, this file stores all the NMEA records received by the GPS during navigation.
- Only for NMEA protocol:
  - *Serial port*: it is the number of the COM port (among those available) through which the transfer takes place.
  - *Parity*: Parity check bit; it can be: None, Even, Odd and Mark.
  - *Bit stop*: Stop bit; it can be: None, One and Two.
  - *Transfer baud rate*: Transfer rate in bits per second.
- Only for Garmin PVT protocol:
  - *Detect GPS*: detect the connected GPS and show GPS description and firmware version.

Preferences - Navigation

This page contains the settings related to the display of your position during navigation.

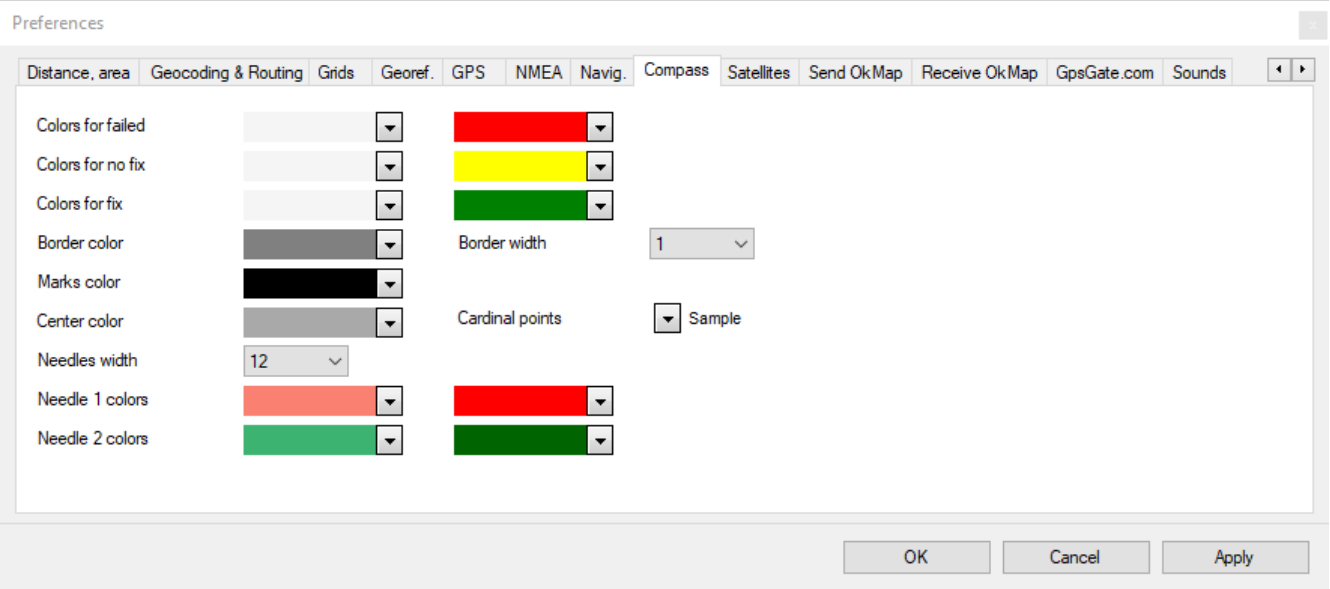


On this page you can customize:

- *Position bitmap*: is the name of the bitmap file to be used in the drawing of the current position on the map during navigation; this bitmap is subject to an angular rotation which indicates the direction followed.
- *Track log recording*: algorithm to be used in storing the track log (automatic, time or distance) and point storage density.
- *Delta altitude*: relative numerical value that will be added to the altitude returned by the GPS when recording the track.
- *NMEA simulator time*: time interval (in milliseconds) between the return of a position and the next during the simulation of a NMEA navigation.
- *NMEA simulator time (from file)*: time interval (in milliseconds) between the return of a position and the next during the simulation of a NMEA navigation from file.
- *Refresh forms time*: time interval (in milliseconds) between updating the navigation values in the open windows and the next one.
- *Default anchor distance*: distance beyond which the *anchor alarm* is triggered.
- *Waypoint proximity distance*: distance within which the alarm *reached proximity waypoint* is triggered.

Preferences - Compass

This page contains the settings related to the compass display.

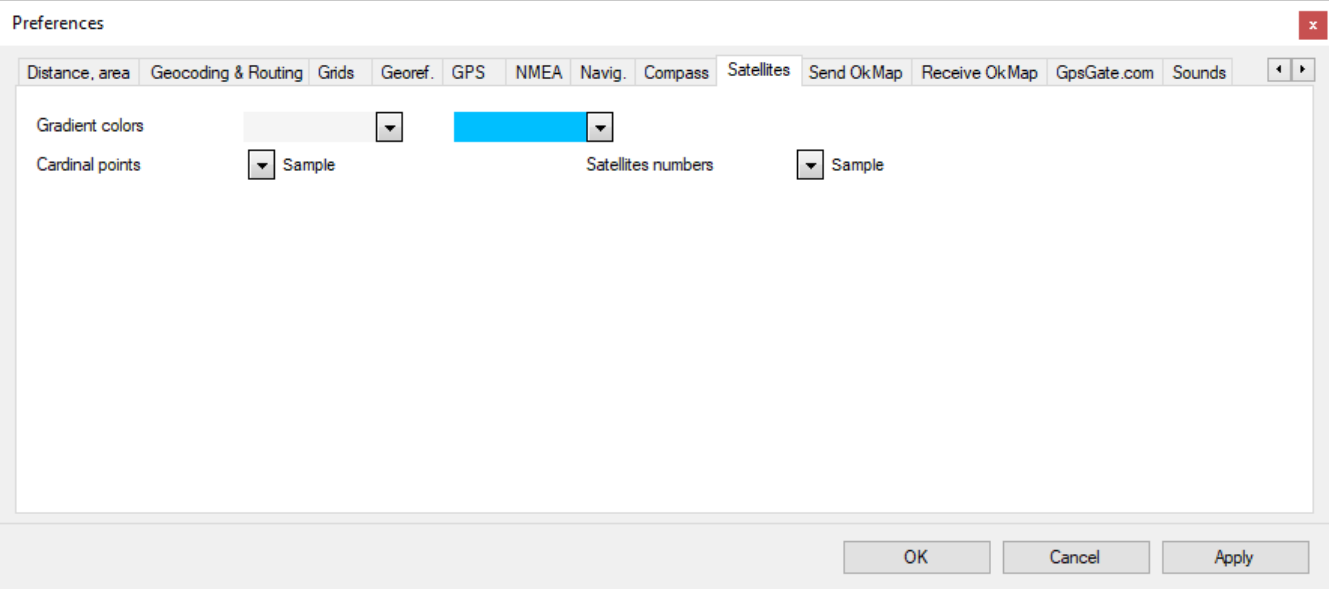


On this page you can customize:

- *Colors for failed*: the gradient colors used for the compass background when the state is *failed*.
- *Colors for no fix*: the gradient colors used for the compass background when the status is *no fix*.
- *Colors for fix*: the gradient colors used for the compass background when the state is *fix*.
- *Border color*: it is the color of the border of the compass.
- *Border width*: this is the thickness in pixel of the border of the compass.
- Marks color: it is the color of the marks around the compass.
- *Center color*: it is the color of the central point where the needles rotate.
- *Cardinal points*: it is the font and the color used to draw the cardinal points around the compass.
- *Needles width*: it is the thickness in pixel of the needles of the compass.
- *Needle 1 colors*: are the colors of the gradient used to draw the direction needle.
- *Needle 2 colors*: are the colors of the gradient used to draw the needle *navigates to* ....

Preferences - Satellites

This page contains the settings for viewing the satellite map.

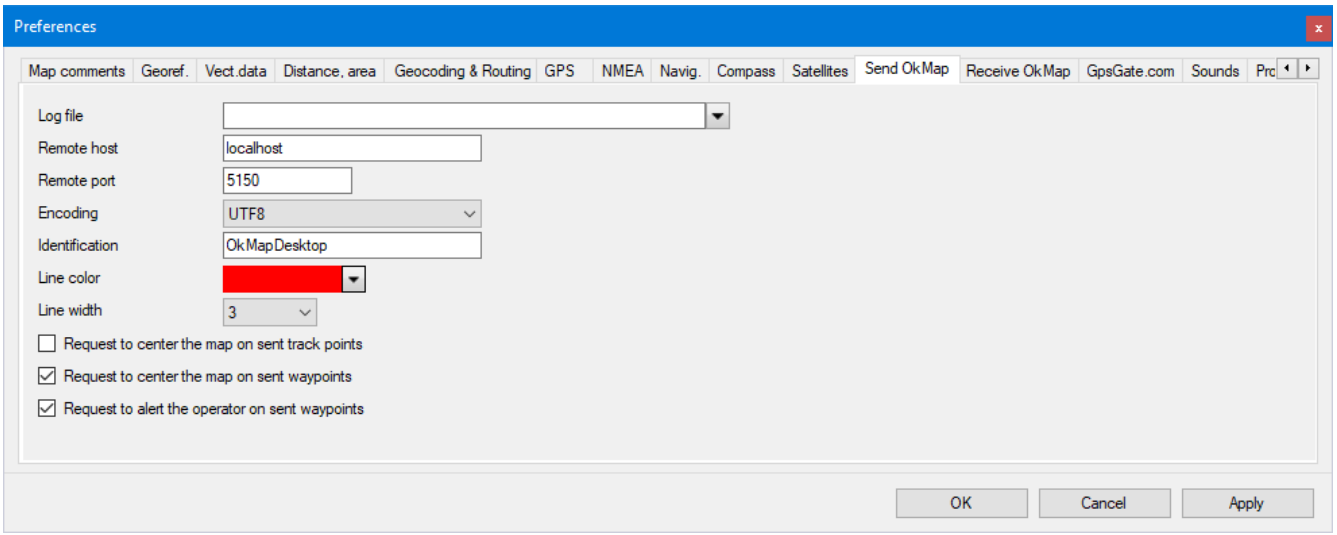


On this page you can customize:

- *Gradient colors*: the gradient colors of the map background.
- *Cardinal points*: it is the font and the color used to draw the cardinal points around the map.
- *Satellites numbers*: it is the font and the color used to draw the numbers of the satellites.

Preferences - Send OkMap

This page contains settings related to the function of sending your position via socket.

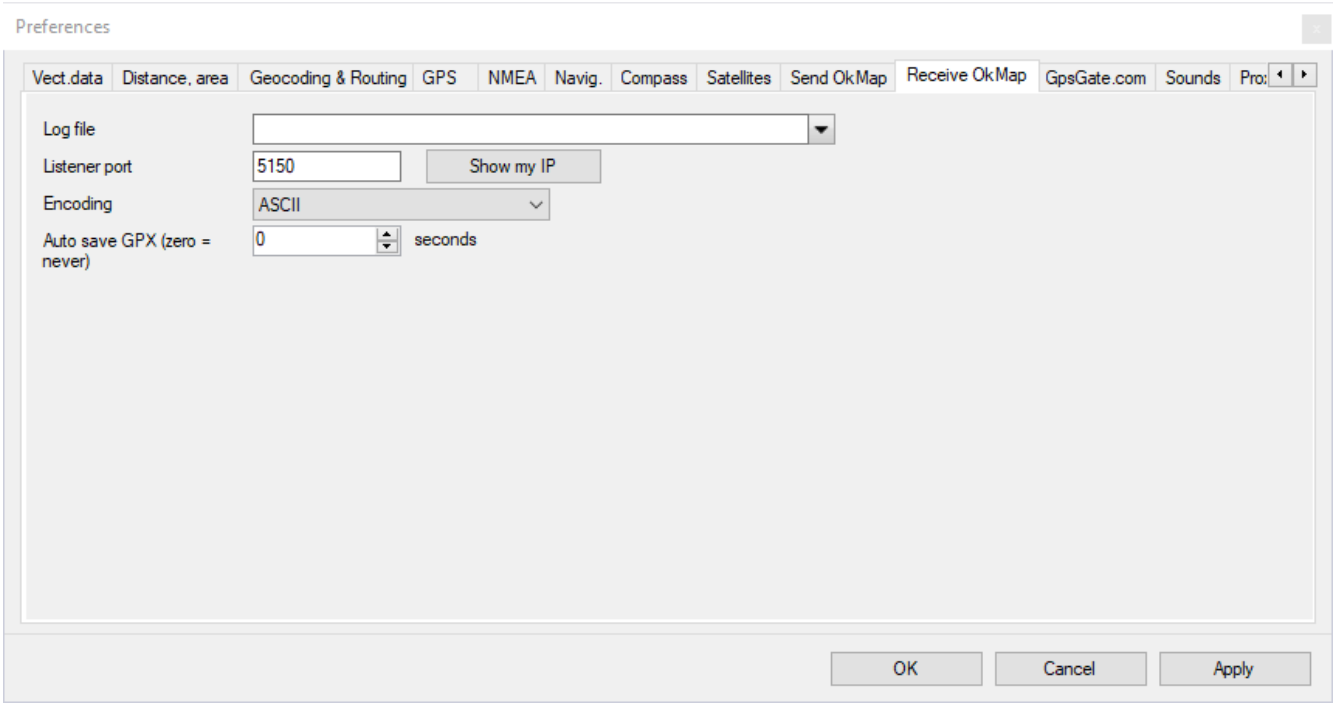


On this page you can customize the settings used in the communication with the remote server when sending your position during NMEA navigation:

- *Log file*: if specified, all the records sent to the remote server are stored in this file.
- *Remote host*: is the IP address of the remote server or the name to be resolved.
- *Remote port*: this is the port through which communication takes place; this port must be open in a firewall.
- *Encoding*: this is the character encoding to encode transmit data.
- *Identification*: is the string with which the remote server identifies the client.
- *Line color*: it is the color used in the drawing of the lines of the track.
- *Line width*: is the thickness in pixels of the track lines.
- *Request to center the map on sent track points*: Forces the maps displayed on the server to move to the received position.
- *Request to center the map on sent waypoints*: Forces the maps displayed on the server to be moved to the received waypoint.
- *Request to notify the operator on sent waypoints*: When a waypoint is received on the server, the operator is notified with an acoustic signal.

Preferences - Receive OkMap

This page contains settings related to receiving remote data from clients via a socket.

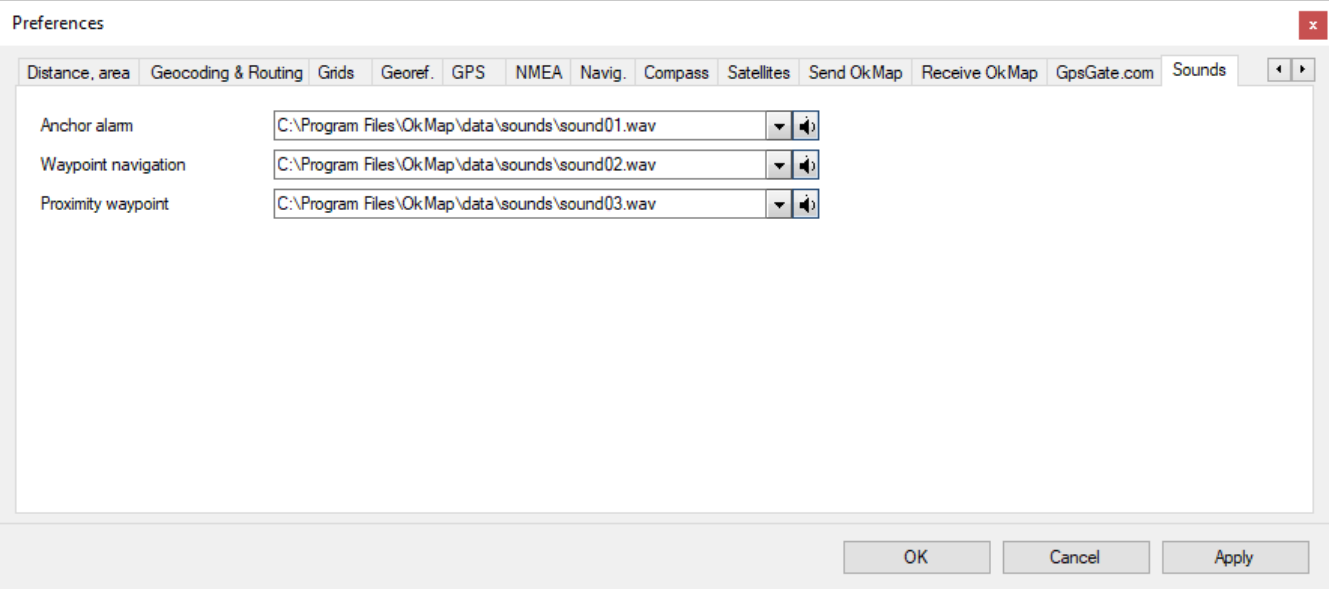


In this page it is possible to customize the settings used by OkMap to activate the receiving data from OkMap function:

- *Log file*: if specified, all the records received from the server are stored in this file.
- *Listener port*: it is the port through which communication takes place; this port must be open in a firewall.
- *Show my IP*: view the public IP address; this address must be communicated to the clients for the configuration of the remote server to which the position data will be send.
- *Encoding*: this is the character encoding to decode received data.
- *Auto save GPX (sec.)*: It is the time in seconds that elapses between an automatic saving and the next of the GPX file containing the received tracks. If the value is zero, no automatic saving will take place. If the GPX file has never been given a name it will be saved in the Documents folder with the file name equal to the current date-time.

Preferences - Sounds

This page contains settings related to the sound files used in navigation.

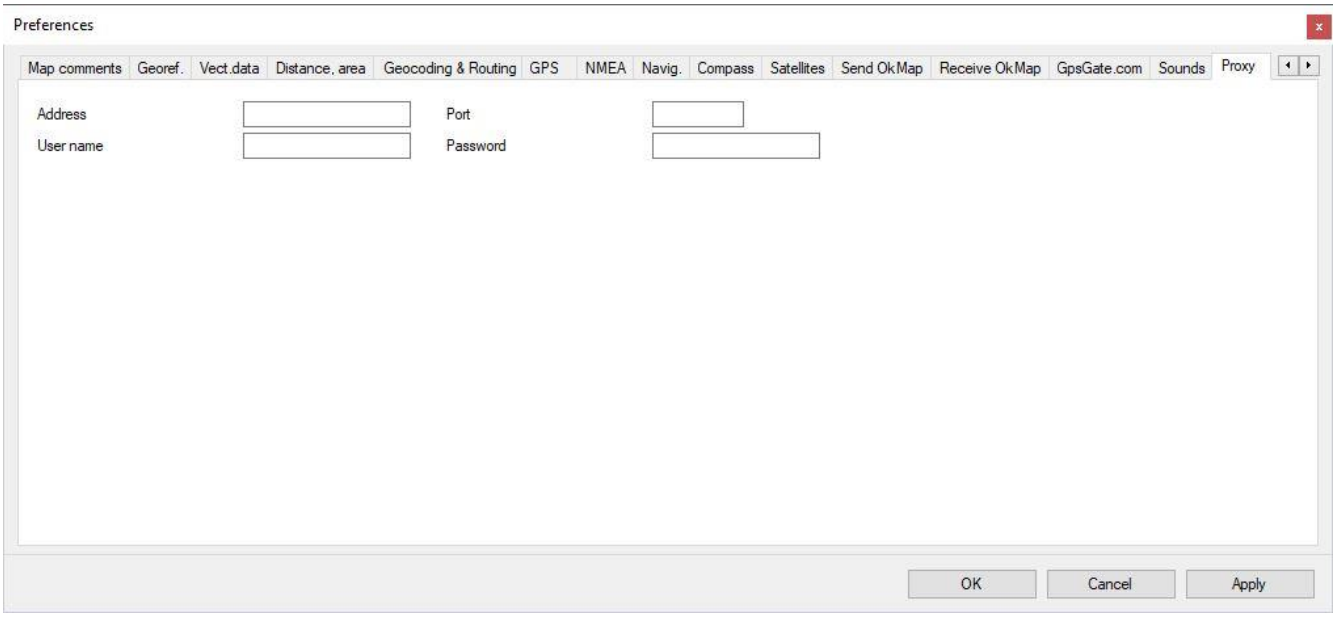


On this page you can customize:

- *Anchor alarm*: sound file used in the anchor alarm function.
- *Waypoint navigation*: sound file used when navigating to a waypoint or navigating along a route.
- *Proximity waypoint*: sound file used during navigation with the *proximity waypoint* alarm enabled.

Preferences - Proxy

This page contains the settings related to the use of a proxy server for internet connection.



On this page you can customize:

- *Address*: is the IP address of the proxy server.
- *Port*: is the port of the proxy server.
- *User name*: is the user's name to log in.
- *Password*: is the password to log in.

Glossary

A

Accuracy
Accuracy is the degree of precision in the positioning of lines and dots on paper. Many factors affect the accuracy with which the geographical features can be drawn on a map: the scale, the quality of the data source, the thickness of the lines adopted in the representation.

Actuality
is a measure of overall quality of a mapping which measures the percentage change between the time of detection and the current date.

Address matching
literally address detection, is an alternative system for data geocoding. With some software you can indeed build a system of reference that allows the identification of a point than through classical coordinate systems (e.g. Latitude and longitude) but by indications of addresses (street, house number, etc..) on, for instance, a road graph.

ADSL
ADSL stands means Asymmetric Digital Subscriber Line and is a technology that allows you to convert analog phone line (the traditional twisted pair copper) in a high speed digital line for an ultra-fast Internet access. ADSL is ideally suited to the way of browsing the Internet and to the use of multimedia content, both characterized by a greater flow of data from the network towards the user (downstream) and a smaller amount of data and control signals sent by the user to the network (upstream), which is why it is called 'asymmetric'.

Aero photogrammetric restitution
procedure which allows, using special instruments (analogue or digital photo renderer), to build a map (both on paper and digital) of a portion of land by stereoscopic aerial photographs.

Algorithm
algorithm well-defined complex instructions or operational requirements that govern the behavior of an operator (mechanical, electronic or human) to solve a problem. In a software corresponds to a set of instructions to the computer.

Arc
linear element stored in vector format consists of a begin pair of coordinates (starting node), a final pair of coordinates (end node) and a series of coordinate pairs such intermediate vertices. Each arc has a direction and a length. By combining several arcs together by the nodes it is possible to build some usable graphs, for example, for many types of analysis (road, hydrographic, etc.).

Area compared
see buffer.

Attribute
descriptive information associated with a geographic object and that characterizes it. Generally, in the GISs, indicates the features not graphics of the element or those that cannot be represented in the scale of acquisition. For example, they might be attributes of a linear element (arc) which represents a road: the type of pavement, the average number of vehicles in transit, width, etc..

B

Backup
process by which you can save the entire patrimony of the data on media that ensure its preservation over time.

Band
frequency range of the electromagnetic spectrum in which, for example, the satellite sensors operate which are able to separate the information collected in the visible and infrared (temperature, humidity, etc.).

Base mapping
is the set of maps covering a certain territory, built with topographic and photogrammetric techniques, that represent the plans (watercourses, roads, railways, bridges, houses, etc.) and the altimetry consists of elevation points or curves of level.

BIL (Band Interleaved by Line)
is a standard format for raster data, in which information on the various bands are sequencing at the line level (the value of the pixels of the first line of the first band is followed by the match in the second band and so on, before continuing with the second line).

BIP (Band Interleaved by Pixel)
is a standard format of raster data, in which information on the various bands are sequencing at the pixel level (the value of the pixel of the first band is followed by the match in the second band and so on, before continue with the second pixel).

Bit
character that represents one of the 2-digit binary system: 0 or 1. It is the smallest unit of information and also indicates the smallest store unit. The name derives from a contraction of BInary diglT.

Buffer, buffering
buffering is an analysis process belonging to the scope: topological overlay. It lets you create polygons around elements (areas of respect). With it you can determine for example the not building area around roads with heavy traffic or areas around military or industrial zones, etc.. The size and therefore the radius of the respect area can be defined by the attributes of the items buffered for example on the streets (linear elements) the width or depth of trade for the antennas (elements point) the power of signal for industrial zones (elements ranges) the pollution load.

Byte
array of 8 bits: it is the smallest addressable unit in memory and it corresponds to the codification of an alphanumeric character.

C

CAD (Computer Aided Design)
is a family of systems and software for computer-aided design, used for architectural design, civil relief, the mechanical and parametric design, the metric calculation, the design of wiring diagrams, etc..

Check point
a point of known coordinates recognizable on the image or the map that you want to georeference. Georeferencing algorithms usually require more control points (at least four) for each sheet.

Class of elements
a layer may contain several classes of information elements. Each geographic data can be represented by a class of elements such as an arc, a node, a polygon, an annotation, etc.. Each class of elements may have attributes associated with tables.

Classification
analytical procedure for the determination of classes that group homogeneous types of elements, such as the land use, the type of roads, the urbanization, etc..

Coherence
see logical congruence.

Compression
is a technique for compressing raster images to store them in less space. They used various compression algorithms, which generally must be followed by a decompression before the image can be used again.

Conformal projections
are projection systems generally used for mapping of oceans and atmosphere since they allow to maintain faithful to reality, the angular relationships between the elements and, therefore, the wind direction or against the weather.

Connection
is a topological properties of the elements of a GIS is represented by the sharing of an arc between two areas.

Connection
is a topological property of the elements of a GIS represented by sharing a node between two arcs.

Curves of level
is the set of constant quota lines that describes the plan land usually obtained by manually or automatically interpolation from a TIN, a DEM or DTM.

D

Data Bank
see database.

Database
database (or archive) means a set of information of different kinds. These data are organized according to precise criteria which allow a rapids consultation.

DBMS (Data Base Management System)
system for storing and searching for information in a database.

Decompression
see compression.

Default
means the default choices made by the system (or program) in the absence of an explicit indication of the user.

DEM (Digital Elevation Model)
is a raster data model that represents the elevation of the land. Can be generated from a plain rated or curves of level and is generally used for conducting analysis of visibility, generate longitudinal profiles, perform analysis of slope and exposure, etc..

Derived thematic maps
they are maps obtained by interpolation of observed values or maps obtained from the analysis and correlation of additional derived thematic maps.

Desktop
feature of computers and programs that can be placed on a desk and used by the user without requiring additional supports.

DIGEST
is an international standard that defines a data format typically used for topological data interchange among GIS.

Digital mapping
is the digital version of a traditional map, the location and description of the elements are stored in a series of files on your computer. To locate the position of the geographical elements is used a system of Cartesian coordinates x, y or x, y, z: each point is represented with a single pair of coordinates x, y, and each line is stored as an ordered set of coordinates x, y; each area is stored as an ordered set of x, y coordinates that define the outer segments

of the closed figure. With coordinates x, y is possible to represent points, lines and polygons as lists of coordinates, rather than as a drawing. In most cases, the storage elements using geographic coordinates of the real world: these coordinates represent a real location on the surface of the earth, in one of the so many coordinate systems. The relationship between geographic elements are expressed on a digital map, with the use of topology. The characteristics of the geographical features are stored in a computer file, usually called table, as a set of numbers and characters.

Digital
digital data information expressible through integers that can be stored on a magnetic support.

Digitizer
hardware device used for the manual acquisition of graphical information (maps, documents, etc..) in vector format. It allows an operator to draw with a cursor all the graphic elements that compose the document or the map to be scanned.

DIME (Dual Independent Map Encoding)
is a standard format for vector data used by the U.S. Census Bureau and had replaced since 1990 by TIGER.

Directory
logic partition of a mass storage, in which a user can store a set of files usually about a specific topic.

DTM (Digital Terrain Model)
literally digital terrain model, raster or vector, see DEM and TIN.

DXF (Drawing eXchange File format)
format for not topological vector data typical of the CAD used by AutoCAD, but also by many GIS, to exchange data.

Dynamic segmentation
is an extension of the data model of a GIS that allows to overlap to the physical topological structure a new physical topology, defined in a logical manner, without the need to change the data in the database. For example, data relating to a road network such as the state of the pavement, the frequency of accidents, speed limits can all be associated to the single traits (route) of the same graph that represents the road network.

E

Eliosynchronous orbit
the name comes from the fact that this orbital configuration the angle formed by joining the Sun - the center of the Earth and the orbital plane of the satellite is kept constant over time. This makes the passage of the satellite occurs at the same time for the same latitudes.

Entity
discontinuous objects belong to the category of entity, spatially delimited by precise boundaries and, possibly, characterized by specific attributes. Examples of entities are the allocation of territory in normative areas or the graph description of a network of transport infrastructure.

Equidistant projections
are projection systems that preserve the distances among determined points.

Equivalent projections
are projection systems that are generally used in cases where the user must compare the spatial dimensions (e.g. forests or areas for agriculture).

ERDAS
is the name of a software manufacturer for processing remotely sensed images used also to define a owned format for raster data.

Esaustivity
is a measure of overall quality of a cartography that measures the excess or the lack of information.

F

Field
in a table of attributes, indicating a location within a record dedicated to a single characteristic of each element of the table. See table of attributes.

G

Gauss-Boaga
is a system of coordinates in inverse cylindrical projection typically used for the cartography of the territory in Italy (IGMI, Inventory, Regional Technical Papers, etc..).

GB (Gigabyte)
unit of information in the memory, equal to one billion bytes (characters).

Genealogy
is a description of the overall quality of a mapping and it corresponds to all the information on the sources and on the treatments.

Generalization
algorithm present in many software GIS and CAD that allows you to prune the number of the vertices that compose one or more linear elements. The operations of generalization are necessary to prune a data and move it to a larger scale, removing the vertexes and making it the most linear element with the level of accuracy defined.

Geographic map
is a graphical representation of geographic elements or other spatial phenomena (lakes, rivers, roads, cities ...) which provides two types of information about the area represented: the position and the aspect. The location allows you to understand where a particular geographical feature is on the surface of the earth and what are its relationships with the other elements. The issue illustrates us both the qualitative characteristics (name, type ...) and those quantitative (area, length ...) of the represented element. Each map shows, in addition to descriptive and spatial information, some technical features that define and determine its use. These features include the scale, the accuracy, the projection system, the system of coordinates.

Geographic projection
is a system of global projection, historically used for first, based on the earth's subdivision in meridians and parallels. Its system of reference, latitude / longitude, measure the angular distances, respectively, starting from the reference plane of the equator and from the meridian of Greenwich.

Geographical Data Base
database dedicated to information of such territorial.

Geographical database
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Geomarketing
GIS application that displays the contents of a database, coupled by a geocode (municipality code, address, sales area, zip code, etc..) to a map, to view marketing phenomena affecting the territory and develop spatial analysis (distribution, counters, basins of use, compared with demographic, etc..).

Geometric congruence
is a parameter of local quality of a cartography defined as the absence of errors of form and position that cannot be detected without direct verification in the field.

Georeference
software procedure that consists of positioning, by points at known coordinates (control points), vector data or raster image in its respective area of real territory, according to a fixed reference system.

Geostationary satellite
an orbiting satellite above the equator at a height of about 36,000 km., whose period of revolution around the Earth coincides with a time of Earth's rotation. For this reason the satellite constantly see the same portion of the Earth (such as METEOSAT). Is also called geosynchronous satellite.

Geosynchronous satellite
see geostationary satellite

GIS (Geographical Information System)
a complex set of hardware, software, and human to acquire, to process, to analyze, to store and to return, in a graphical and alphanumeric format, data related to a territory.

Global quality
set of parameters that characterizes the quality of a geographical database as a whole (exhaustiveness, current affairs, genealogy).

GPS (Global Positioning System)
is a system that allows, through a receiver, a dedicated software and a constellation of satellites to determine the position on the ground and the altitude of a point, with an accuracy that varies from a few millimeters to a few meters depending on the type of equipment and operating procedures of relief used.

Graph
is a related set of arcs that, in a GIS, generally describes a network (road, hydrographic, technology, etc..). The GIS software have generally functions of analysis and modeling of networks based on a graph (optimal path, optimization of stops, location analysis, etc..).

GRASS (Geographical Resource Analysis Support System)
is the name of a software for image processing used to define the corresponding raster data format.

GRID
is the name of the extension of ESRI ARC/INFO processing databases in raster format and is also used to define the corresponding data format.

GUI (Graphical User Interface)
software for creating and managing graphical user interfaces. Allows the user to access the system functions through the mouse also and through simple graphical objects (buttons, scroll lists, icons, images, etc..).

I

IGES (Initial Graphics Exchange Standard)
ASCII vector data format not topological and uncompressed, typical of the CAD, made by the U.S. Department of Commerce and used, sometimes by GISs, to exchange data.

Image processing
set of activities concerning the development of images in raster format. Many of the techniques used in this discipline requires complex mathematical procedures with the objective to determine the phenomena described by the image such as, for instance in GIS, pollution, humidity and temperature to the ground, vegetation, etc..

Informatics system
Set of computer system hardware and software that characterize an information system.

Informative system
Set of information, system equipment, procedures and people who have the task of collecting, organizing, selecting, storing and communicating data concerning the activities of

an organization. Its aim is to provide operational decision makers all the information necessary to make the best choices possible.

Interpolation
technique through which it is possible to build a linear path, of which it is known only a discrete number of points. Constructing a grid of points you can get an estimate of the position of points that you do not possess.

ISDN
stands for 'Integrated Services Digital Networks', and is a term created by the organization ITU-T. It is, in practice, a total conversion to digital of the actual telephone net, using the existing wiring and switching equipment.

Isogonic
property of some projection systems to maintain unchanged the measures of the angles among straight lines.

K

KB (Kilobyte)
unit of information in memory, equal to one thousand bytes (characters).

L

Lambert
is a conic projection that can be conforming or equivalent, particularly used in the U.S. by the Geological Survey, in Italy and in France.

LANDSAT
family of satellites designed for observing the earth through multispectral sensors.

Latitude
see geographical projection.

Layer, Informative layer or Geographical layer
is the basic unit of data management and defines the positional and thematic attributes for elements of map of a given area. The informative layer or geographical layer are the set of homogeneous elements that compose a map, such as roads, rivers, forests, etc..

Layer
see informative layer.

Legend
is a tool on the papers that associates the graphic symbols used to the single thematic, for readability.

Library
set of software modules common to several programs.

Local quality
set of quality parameters for each individual mapping element (metric precision, resolution, semantic precision, consistency or logical consistency, geometric congruence).

Logical congruence
is a parameter of local quality of a mapping defined as the absence of inconsistency detected independently of a case in reality (a building on a street, two curves of level that intersect, an attribute with a value outside the indicated range, etc..).

Logical expression
consists of logical operators, operands and pairs of brackets, organized according to syntactic rules specified, so as to express a group of operations that provide a single result. It is used to make selections between classes of elements in the process of data analysis.

Logical operator
entities used to formulate, for instance in a database, the logical conditions for the selection of records in according with the values of the fields. See SQL.

Longitude
see geographical projection.

M

Mass memory
device that allows the permanent storage of data (generally the hard drive of the computer).

MB (Megabyte)
unit of information in memory, equal to one million bytes (characters).

Metadata
are information about the data sets in a database. A set of metadata can be considered consistent when, in the way most synthetic possible, provides an adequate description of the content, quality and characteristics of the data.

Metric precision
is a quality parameter of a local mapping defined as the difference in position of a point on the map compared to its real position in the national cartographic reference system.

Mosaicing
is the set of operations that, within the GIS, allows you to merge multiple maps in digital format to create a territorial continuity.

N

Nadir
the vertical drawn from any point within the earth's surface, where is the observer, meets the celestial sphere in two opposite points. Nadir is what lies below the horizon, the other, which is above, is the zenith.

Native format
source format in which an object (program, file, data) was originally written.

Node
is a point with topological characteristics describing the beginning or end of an arc.

Nominal scale
is a parameter that defines the scale of reference for a digital mapping according to the corresponding scale of a traditional cartography realized following the same requirements of metric accuracy.

NTF (National Transfer Format)
data format used for interchange of data between topological GIS (adopted by the Italian Inventory).

O

Object
physical or logical entity defined by a set of characteristics and rules of behavior which express the state of static or dynamic. For example in a GIS object could be the set of a telephone plant, its connections and its related management procedures.

Open source
mode of software distribution such that the programming code is issued along with the program.

Orthogonalization
see recording.

Orthophotography
technology for the production of orthophotos employing tools and procedures can provide a metric representation of the land in the form of photographic images.

Overlay, topological overlay
procedure of spatial analysis that allows to overlap and to intersect the layers uniting the information associated with each of them to produce a new layer of synthesis.

P

Pan
positioning function of the graphic images on the screen depending on the choice of a new central point or on the scroll of the graphic window.

Password
keyword, which is the access code for a given user name.

Path
ordered set of nodes and arcs that connect origin and destination.

Photogrammetric
see aero photogrammetric restitution.

Photo interpretation
technique that allows experts to determine and classify spatial phenomena by reading aerial photographs or remotely sensed images such as, for example, vegetation types, determination of faults or updating of existing cartographic maps.

Photo plain
mosaic of aerial photos straighten particularly applicable to flat land.

Pixel
contraction of picture element, is the basic component of a raster image characterized by an associated value.

Plotter
equipment that is used to draw graphs or drawings prepared by a computer. Can be a pen, electrostatic, inkjet or thermal transfer.

Plug-in
is the addition of some option / application to another application. Between sheets of Excel, for example, consists of inserting 'specific options' to see particular sheets.

Point
geometric element used to define the position of items that are points in the scale of acquisition, defined by a pair of coordinates (x, y) and eventually by a quota (z).

Polygon
closed area delimited by arcs.

Primary key
one or more fields whose values uniquely identify a row in a table of the database.

Process
the term process is intended to indicate an ordered sequence of operations whose final purpose is to obtain new data or revise existing ones in a form which facilitates the interpretation and evaluation. Fundamental elements for the definition of a process are the data, the operators and the links between the operators to determine their order of execution.

Projection systems
are systems that can represent the surface almost spherical Earth on a plane, keeping some conformity (isogons, equivalence, equidistance, etc..): the best known are the Geographical one, the UTM, the Gauss-Boaga and the Lambert others are the Conic, the Polar, the Stereographic, the Cylindrical and the Planar also variously combined.

Projection
see geographic projection.

Q

Query
set of SQL statements that allow you to extract information from the geographical and alphanumeric database

R

Raster image
any image can be thought of as consisting of a set of small equal areas (pixels), arranged along lines and columns, such as to constitute a matrix. The values associated with each cell may express both graphical information (color, shade of gray, etc.) and descriptive (temperature, slope, etc..).

Rasterization
operation that allows to automatically obtain a raster image from vector image or paper documents (scanner).

Record
group of contiguous positions of information (fields), including uneven, which can be accessed according to different modes. See table of attributes.

Recording
are the necessary techniques to georeference and rectify raster images. In fact, aerial photos and satellite images, as well as having to be positioned correctly (collimating the coordinates of known points on the ground with those of image objects) are also to be re-calculated using the angle from which it was taken.

Reference system
each projection has its own reference system from which it starts to calculate the distances. For example, the geography projection uses as a reference the intersection of the Greenwich meridian and the Equator, the UTM provides six degrees of predetermined segments called fused these divided into zones (for Italy 32, 33 and 34), the Gauss-Boaga, starts from Monte Mario (Rome) and uses coordinates conventionally measured in kilometers from 1500 to 2520 left and right of the meridian of reference.

Regression
is an interpolation between different statistical surveys, such that a correlation is identified between the data, often due to geometric curves.

Relational database
method of structuring data in the form of a collection of tables that are logically related to each other through shared fields. Each element can be found in relation to the table name, the name of the field, and the value of the primary key.

Relationship
in a relational database the relationship is the logical link among two tables of data through the primary and secondary keys.

Resolution
is a measure of quality local of a mapping and it corresponds to the size of the smallest detail represented in the mapping vector and to the length of the side of the cell (pixel) in raster format.

RLC (Run Length Coded)
is a standard of raster data compression. See compression.

Route
element at the base of the dynamic segmentation to which can be associated attributes. The route can be constituted by a portion or subset of arcs without its beginning or end node must coincide with the start or end of an arc.

Routine
compilation of a sequence of actions necessary to perform an operation, which are invoked by the program whenever it is necessary to perform such operation.

S

Scale
indicates, in practice, how many times a portion of the land surface has been reduced in order to be represented on a sheet of paper. It is expressed, in general, as the ratio between a distance on the paper and the corresponding distance on the ground. The ratio of scale used for a map determines the information content and the size of which can reasonably be represented. We define large-scale maps (1:500, 1:1000, 1:2000), medium scale (1:5000, 1: 10000) and small-scale (1:25000 onwards).

Scanner
hardware device for the automatic acquisition in digital format of graphic elements (maps, photos, pictures, etc..). Graphical information is stored in raster format. It is possible nevertheless through special tools software to convert such information in vector format (vectorization).

Secondary key
one or more fields whose values uniquely identify a row in another table of the database through a relationship with the primary key.

Semantic precision
is a quality parameter of a local mapping defined as the correspondence between reality and the qualitative attribute associated with the object.

Sensor
detector used in remote sensing that converts electromagnetic radiation into electrical signals interpretable. Active sensors measure the energy reflected by the objects, but emitted from a device on board. Active radar sensors, in particular, are characterized by the fact that they can operate even in the presence of weather disturbances, such as SAR (Synthetic Aperture Radar) on the satellite ERS-1. Passive sensors measure the energy emitted by the sun and reflected by the earth or energy spontaneously emitted from objects, such as the TM (Thematic Mapper) and MSS (Multi Spectral Scanning) on Landsat 5.

Shortest path
is an algorithm of analysis that can determine within a graph, the path that optimizes a parameter in the networks, the impedance or that determines the difficulty of crossing the auction of the graph, such as a road network the route that minimizes the distance or time within the limits of speed, track, maximum weight allowed, etc..

Simple thematic maps
maps entered into the system and here used without modification or GIS maps created internally but still represent 'primitive' maps, not derived from processing of other elements of the database.

SIT (Territorial Informative System)
Italian acronym corresponding to the Anglo-Saxon GIS.

Spatial data
data characterized by a geographical reference.

Spatial relationships
see topology, contiguity and connection.

SPOT (Système Probatoire d'Observation de la Terre)
satellite family for multispectral remote sensing system with mobile aim system. The definition on the ground is 20 meters for the multispectral and 10 meters for the panchromatic. The first launch of this French system dates back to 1986.

SQL (Structured Query Language)
structured language for the consultation and the selection of information in a relational database.

Symbols
are the graphical primitives used to represent on paper or video phenomena occurring in the territory. The symbols can be landing-nets to prime an area, linear (continuous, dashed, drawn - point, etc..), to trace linear features or point (cross, star, triangle, etc..), to indicate a specific location. Each symbol can be designed in a wide variety of colors.

T

Table of attributes
tables are an integral part of the layer information. Each table is for a homogeneous group of geographic map (roads, rivers, contours, etc..) and consists of a variable number of rows and columns. Each row (record) contains a description of a single geographical feature and each column (field or attribute) stores a specific type of information. The characteristics of the geographical elements are generally translated into numeric or alphabetic, before being inserted in the relevant table.

Template
in GISs, template are graphic elements (usually linear) that belong to different layers of information. The presence of templates greatly complicates the management of geographic database, for example by imposing rules for updating the data. If you update some elements of a layer information should be updated in all layers that contain words related to the same elements. A typical example is the limit for buildings in the layer on the building, which coincides with the start of the pavement layer on the streets.

Territorial continuity
means a continuous geographical coverage, in alternative to the classical subdivision by map sheets.

Thematism
representation of a raster or vector maps in which points, lines or surfaces are associated with symbols, textures, or colors that represent the result of analysis of quality (land use, zoning areas, intensity of traffic on a road, etc..).

Theodolite
topographical tool used for geodetic measures.

TIFF (Tag Image File Format)
is a standard format for the interchange of raster data.

TIGER (Topologically Integrated Geographic Encoding and Referencing)
is a standard format for vector data used by the U.S. Census Bureau since 1990 in place of DIME.

TIN (Triangulated Irregular Network)
literally irregular network of triangles, is a three-dimensional model of the terrain generated from a sparse set of points listed (rated plan) consists of a network of triangles as equiangular, equilateral, and therefore, not possible since which can interpolate contours, conduct analysis of visibility, generate longitudinal profiles, perform analysis of slope and exposure, etc..

Topology
is a set of rules to define explicitly the relationships, the relationships of connection and contiguity between spatial elements and to link these elements with their descriptions (attributes). In a topological data model, for example, you can recognize and identify the areas adjoining the lines that demarcate each area (boundaries).

UMTS
is the acronym of Universal Mobile Telephone System and stands for the third generation of mobile telephone services. The analogical network was the first generation of mobile telephony, the GSM network, which is still active, is the second. The new UMTS technology

seeks to improve and expand existing capacity of mobile technologies, radio and satellite, providing more capacity and a range of superior services. Through the new UMTS technology will be available a series of individual multimedia services, such as the association of the number of the person, and not to a number of customers or an office.

U

User-name
name by which the user is preventively identified to access a computer network, database or protected file.

User interface
is the set of tools, the purpose of which is the communication between the user and the procedures of the hardware and software system used.

UTM (Universal Transverse Mercator)
is a cylindrical projection inverse adopted worldwide.

V

Vector data
is a system for storing graphics data according to which the objects are stored according to the Cartesian coordinates of the points and lines that compose them.

Vectorialization
procedure that allows an automatic or semiautomatic way (e.g., with the assistance of an operator) to draw a set of vectors from a raster image.

W

Wizard
installation programs or assisted creation of documents or applications, which guide the user step by step towards a final objective.

Z

Zenith
see nadir.

Zoom
enlarging or reducing video function (in, out) present in the most of graphic software.