

GEOGIS OFFICE

Tutorials

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Tutorial 1: Get ready to survey with GeoGis software

In this tutorial there is illustrated the common steps to prepare a survey dataset consisting of a base map and a set of informative attributes to use in a GPS survey with the GeoGis software:

1. Prepare the base map (import *dxf* file)
2. Change the coordinate system (optional)
3. Export the base map to ESRI shapefile format
4. Create a set of informative attributes (database)
5. Transfer dataset to GPS device

Note – The sequence of the steps above is intended as indicative suggestion. The steps sequence can be changed to meet job requirements.

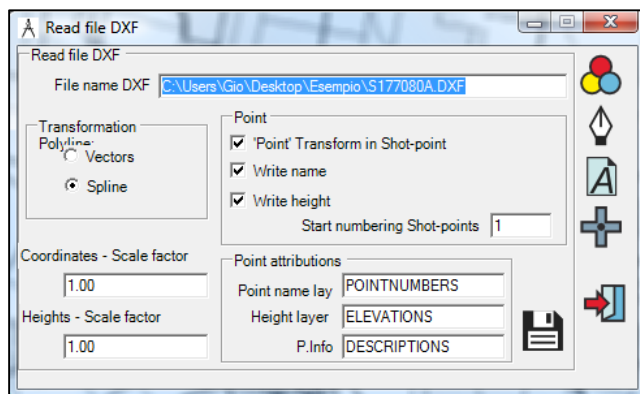
Step 1: Prepare the base map


A base map is a georeferenced file that can provide backing during GPS surveys. In this tutorial we will use a *dxf* file.

From the main menu click **File – Import – File DXF**.

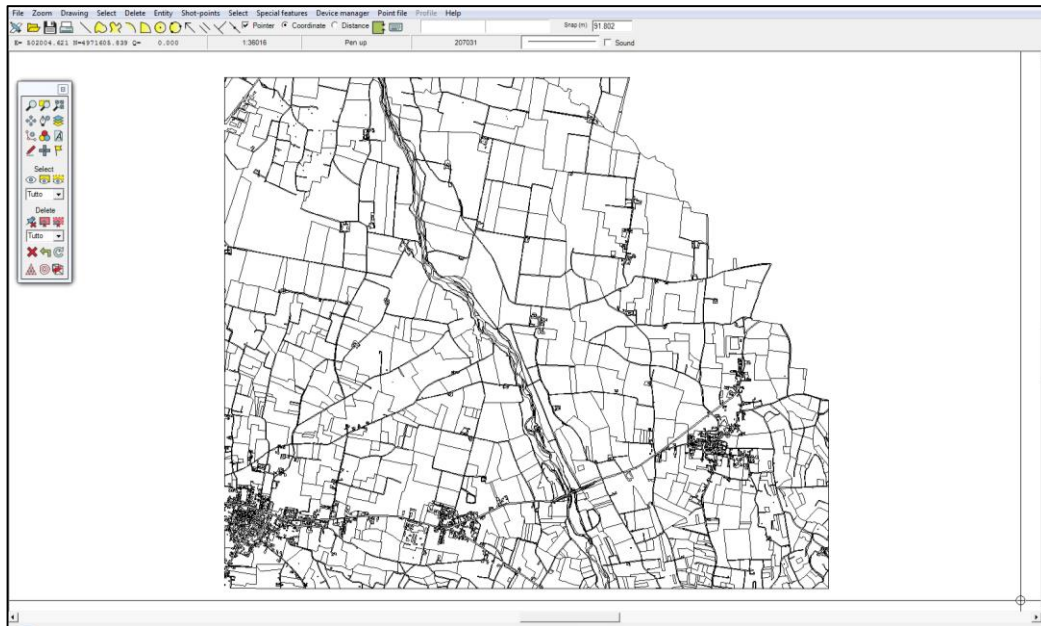
Select file to import and click **Open**.

Enter or confirm the import parameters.



Save settings, then save the file by clicking the  icon.

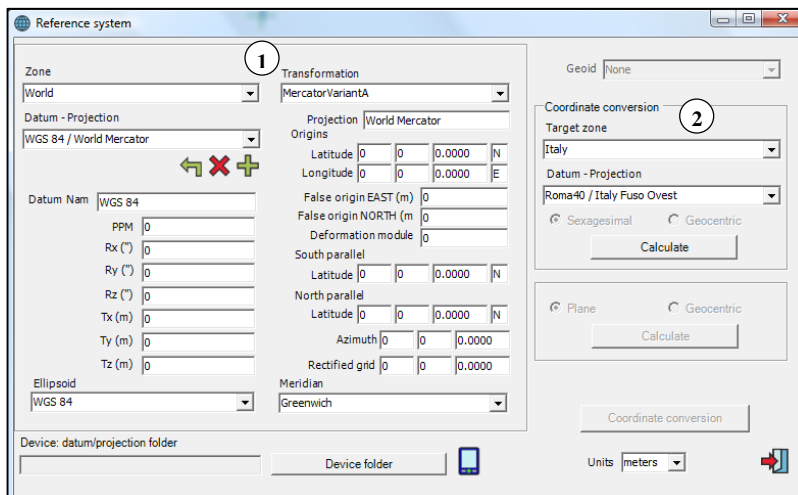
Save the new file in GeoGis Office format (*.dis).



Step 2: Change the coordinate system

This step (optional) is to change the coordinate system of a *.dis file, in case it does not correspond to the coordinate system chosen for the GPS survey.

From the main menu select **File – Coordinate conversion – Drawing: Change Datum/Reference systems**.



1. Select the Source settings of the base map (Zone, Datum-Projection, Transformation, Ellipsoid).
2. Select the Target settings of the base map (Zone, Datum-Projection).

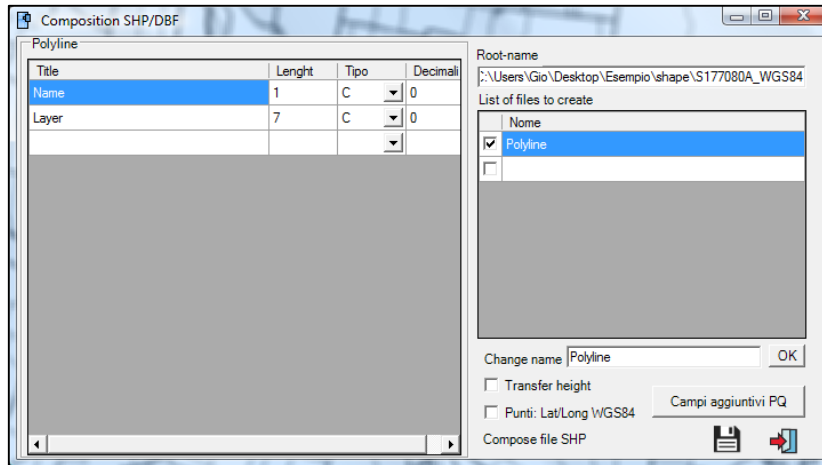
It is possible to create new set of datum and map projection by clicking **New Datum/Projection** and defining roto-translation, scale and projection settings (not described in this tutorial).

3. Click **Calculate** to apply changes to the reference system.

Step 3: Export the base map to ESRI shapefile format




From the main menu select **File – Export – File SHP**.

Enter the fileset root-name and confirm.



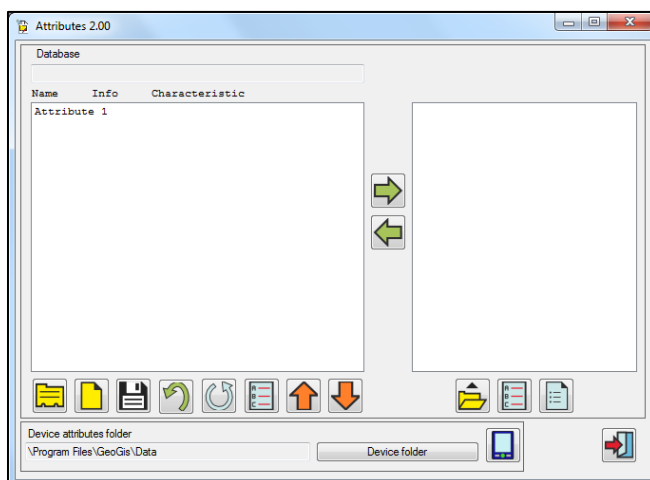
The software identifies the type of file to create (point, line, polyline) based on the specifics of the drawing; in the present case there will be created a *polyline* file, with the elements *Name* and *Layer* loaded from the original file.

Export file by clicking the  icon.

Nome	Ultima modifica	Tipo	Dimensione
 S177080A_Polyline.shp	31/05/2011 9.53	AutoCAD Shape S...	1,331 KB
 S177080A_Polyline.shx	31/05/2011 9.53	AutoCAD Compil...	27 KB
 S177080A_Polyline.dbf	31/05/2011 9.53	File DBF	31 KB

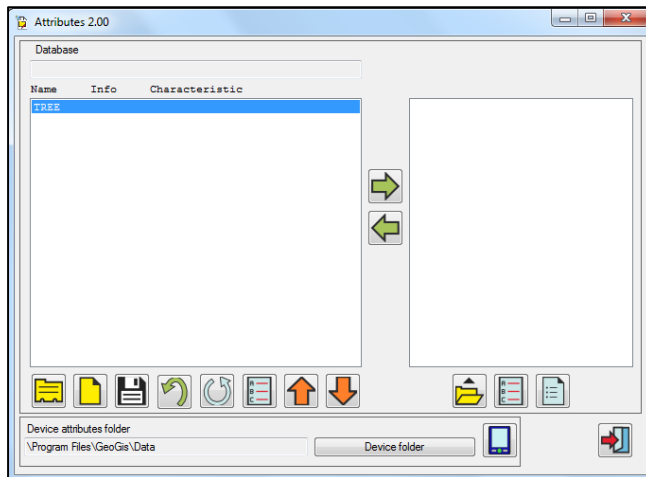
Step 4: Create a set of informative attributes

From the main menu select **Special Features – Attributes Editor**.



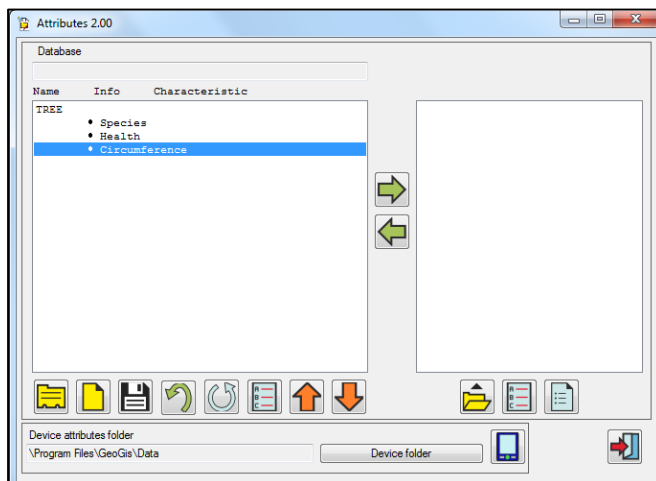
On the first row enter the Attribute name; in this tutorial will be created the Attribute "TREE".

Press **Enter** on the keyboard to confirm the Attribute.




Enter the second level elements (Informations) that make up the Attributes, pressing **Enter** on the keyboard after each input; in this tutorial the following Information will be created:

- **Species**
- **Health**
- **Circumference**



For each Information you can add a list of alphanumeric elements (third level elements are called Characteristics); in this tutorial Characteristics are imported from an ASCII text file.

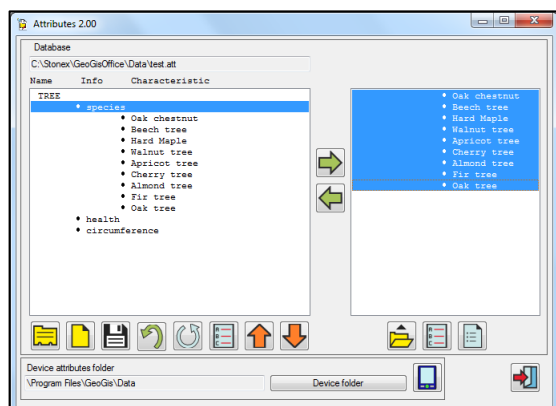
Nome	Ultima modifica	Tipo	Dimensione
Circumference.txt	30/05/2011 11.57	Documento di testo	1 KB
Health.txt	30/05/2011 11.57	Documento di testo	1 KB
Species.txt	30/05/2011 11.53	Documento di testo	1 KB

Select the Information to expand and press the **File** button  to import a text file.

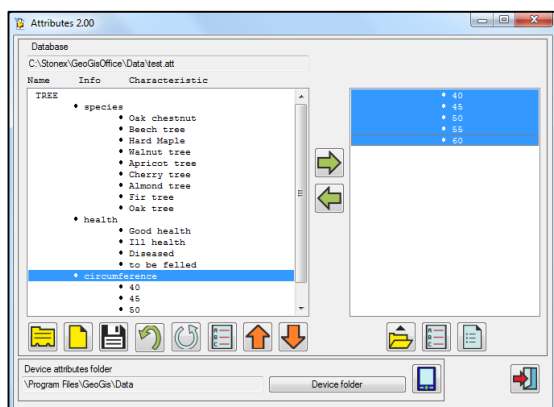
The file content is displayed in the right window of the Editor.


Select the Characteristics you want to add (<SHIFT + mouse left button> for multiple selection).

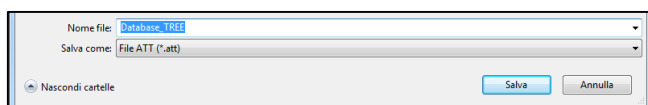
Press the **left arrow** button to add the Characteristics to the selected Information.



Repeat the previous task until the fulfillment of the Attribute.



When the Attribute is completed, press the **Save** button  to save the Database on the computer. The Database file extension is “*.att”.



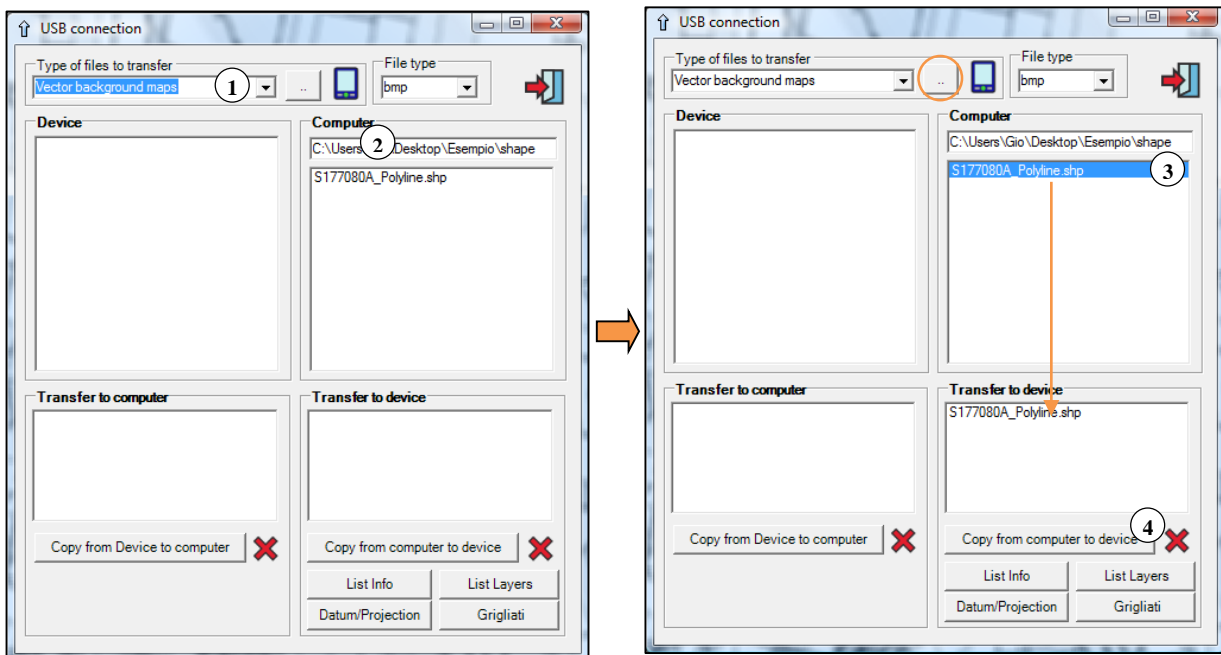
Step 5: Transfer dataset to GPS device

This step illustrates how to move the base map and the informative attribute to your GPS handheld device.

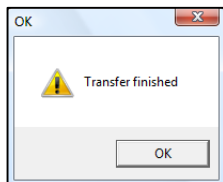
Transfer of the base map:

From the main menu select **Device manager – Connection**.

1. Select **Vector background maps**.
2. Select the file path (**Step 3**).



3. The selected file appears in the **Transfer to device** panel.
4. Click **Copy from computer to device** to start file transfer.



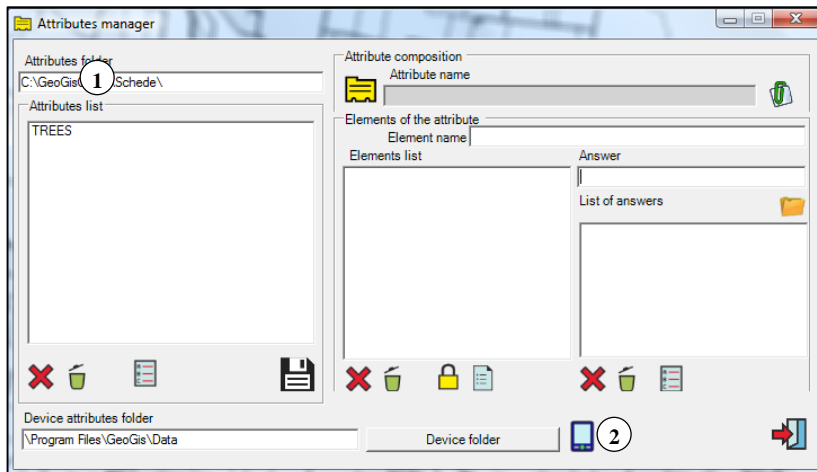
Note – If the GeoGis operative folders have been changed, change as well the device-computer transfer settings by clicking the [...] icon.

Transfer of the informative attributes:

From the main menu select **Special features – Attributes manager**.

Close GeoGis and all running programs on your handheld GPS device.

1. Check the **Attributes list** content.
2. Click icon to start file transfer.

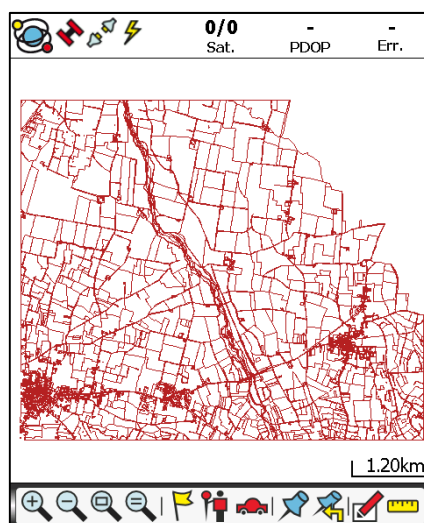
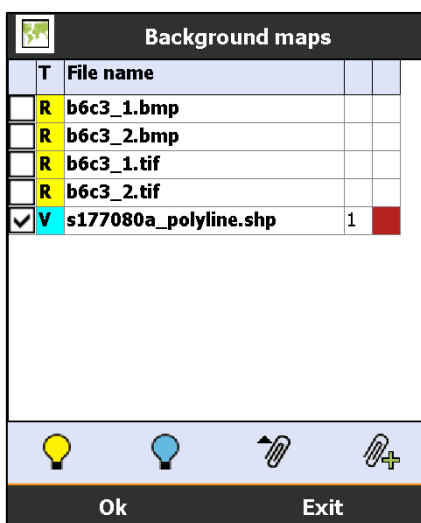


Note – If the GeoGis operative folders have been changed, change as well the device-computer transfer settings by clicking the **Device folder** button.

Load the base map on the GeoGis software:

The base map file is ready to use in the **Background maps** section of the GeoGis software.

See [GeoGis_Getting started guide – File formats, pag. 9](#).



The attribute is ready to use in the **Database** section of the GeoGis software.
See [GeoGis_Getting started guide – Database, pag. 20.](#)



To add values to the list, use the upper data-entry field and tap the **+** icon.
To find a specific value in the list, use the upper data-entry field and tap the **🔍** icon.

Tutorial 2: ESRI shapefile

This tutorial illustrates common steps to manage ESRI shapefiles dataset in a GPS survey with the GeoGis software:

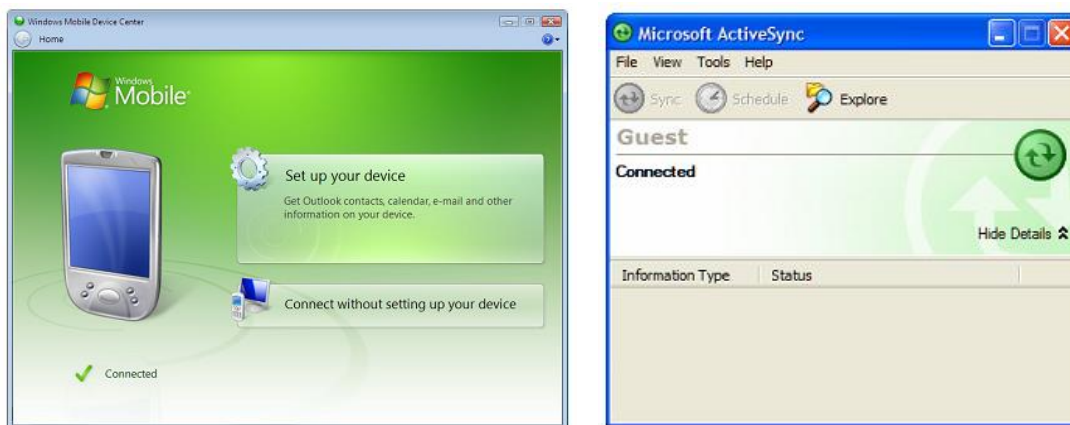
1. Connection between computer and GPS handheld
2. Shapefiles selection and transfer to GPS handheld
3. Use shapefiles as active background map in the GeoGis software

Step 1: Connection between computer and GPS handheld

Connect the Windows Mobile GPS handheld to the computer and wait the Microsoft connection software detects the device.

- The Windows Vista or Windows 7 operating system, use the Windows Mobile Device Center to manage the connection.
- The Windows XP operating system, use Microsoft ActiveSync technology to manage the connection.

See [GeoGis_Getting started guide – Software installation and activation, pag. 1](#).

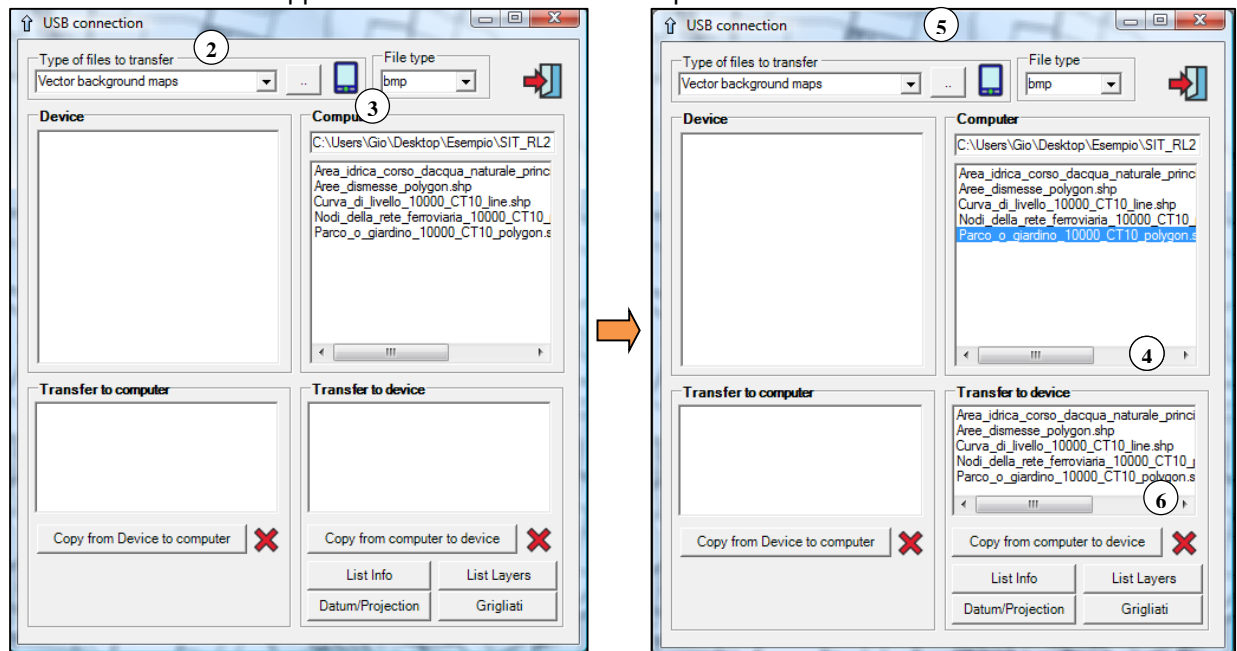


Step 2: Shapefiles selection and transfer to GPS handheld

From the main menu select **Device manager – Connection**.

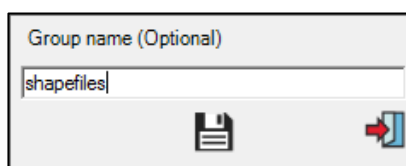
1. Close GeoGis and all running programs on your handheld GPS device.
2. Select **Vector background maps**.
3. Select the file path.

4. The selected files appear in the **Transfer to device** panel.



Note – In the list are displayed only files with shp extension. The software will automatically detect and transfer the whole fileset of the shapefile.

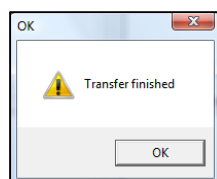
5. (Optional) If the GeoGis operative folders have been changed, change as well the device-computer transfer settings.
6. Click **Copy from computer to device** to start file transfer.
7. (Optional) The software asks if you want to create a **group** file on your GPS handheld in order to wrap up the base map files. Create a group file allows you to quickly load several map files at the same time.



Click **Save** icon to create group and start file transfer.

Click **Exit** icon to start file transfer without create group file.

Do not disconnect the device until the transfer is finished.

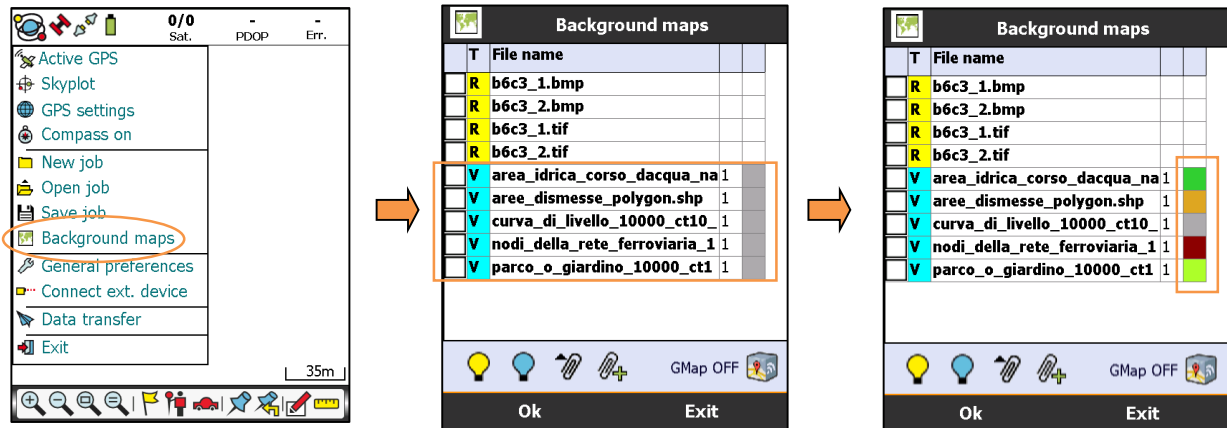


Load the base map on the GeoGis software:

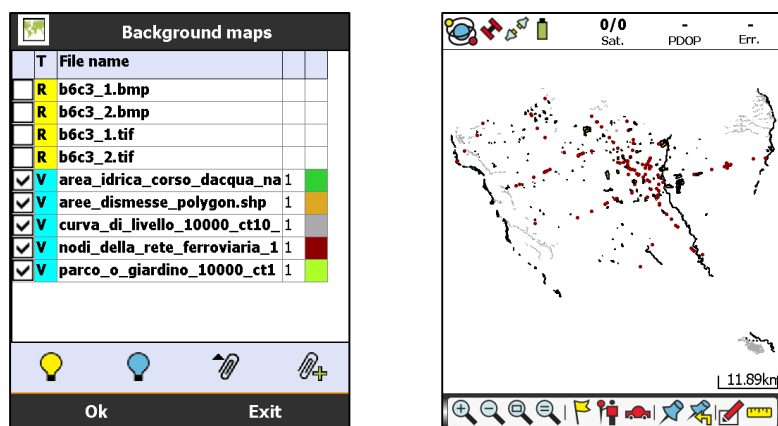
From the main menu select **Background maps**.

The shape files are displayed in the list.

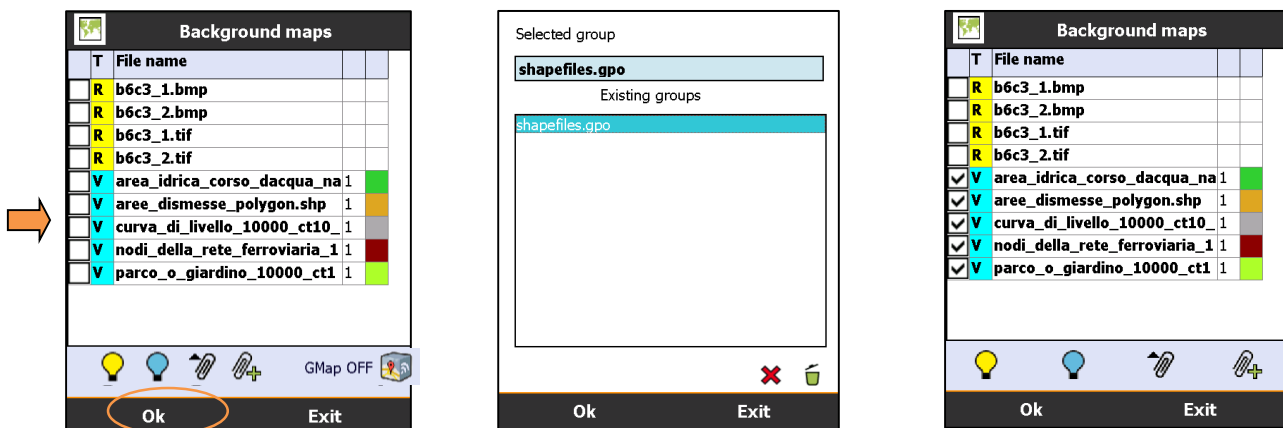
With the stylus, define the look and feel of the graphics.



With the stylus, select the files to open and tap **OK**.



As an alternative you can select the **group** file created in **Step 2**.



Step 3: Use shapefiles as active background map in the GeoGis software

ESRI Shapefiles are displayed as active background maps.

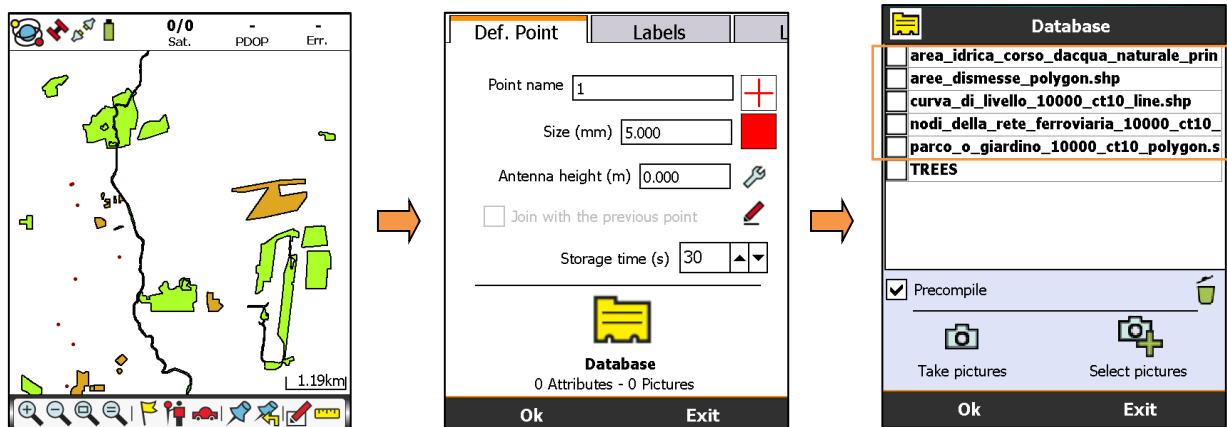
The file frame of an active background map cannot be modified.

Database records may instead be edited and imported into the GeoGis database frame.

Tap the **Log point feature** icon to add a point feature to the current job.

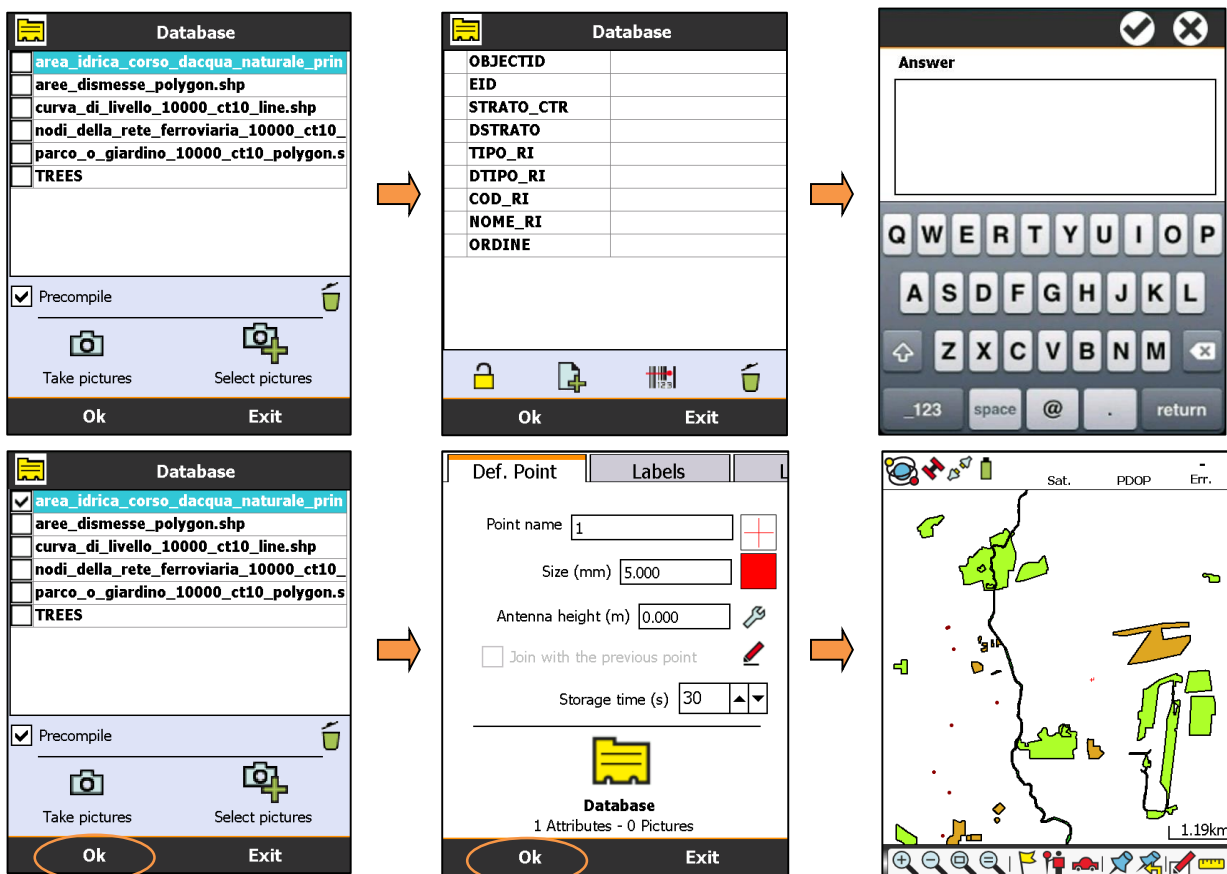
Modify or confirm the graphic details of the element.

Tap **Database** icon to add informative attributes.



The *dbf* file frame of the shapefiles is automatically imported into GeoGis database frame.

The new attributes can be used in the GeoGis workflow.



Tutorial 3: Work with a raster map file

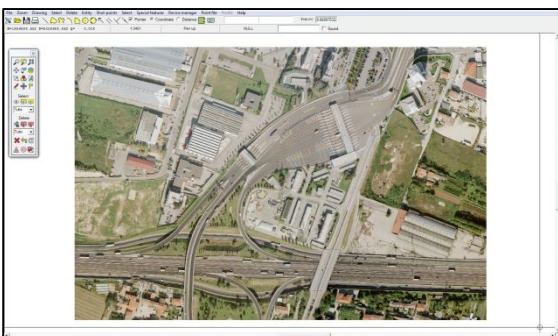
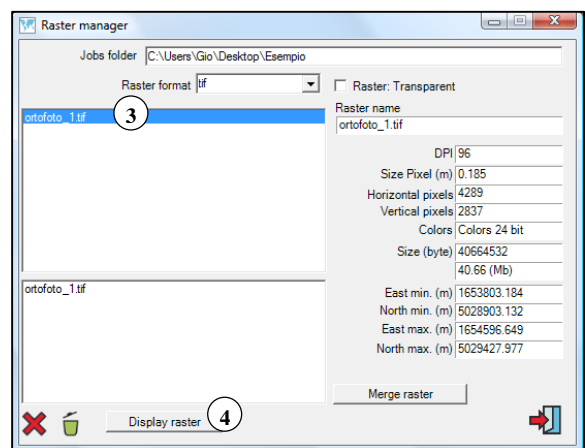
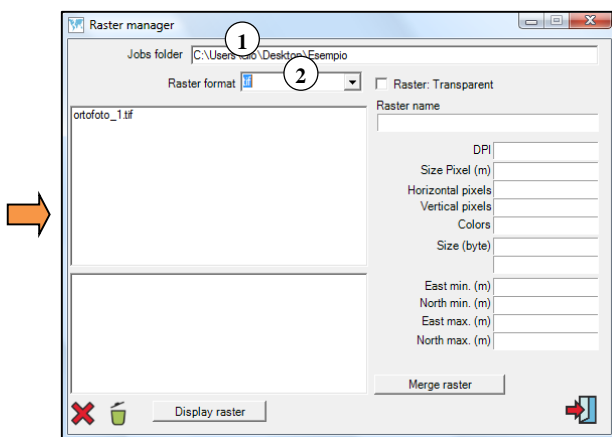
This tutorial illustrates common steps to manage raster map files with the GeoGis software:

1. Import raster map file
2. Clip/tile the raster map file (Optional)
3. Connection between computer and GPS handheld device
4. Transfer the (clipped) raster files to GPS handheld device
5. Use the (clipped) raster files in the GeoGis software

Step 1: Import raster map file

From the main menu select **File – Import – New raster image**.

1. Select the raster file path.
2. Select the raster file format.
3. The selected raster file appears in the lower panel, graphic features and coordinates are displayed in the right table.
4. Click **Display raster**.



Step 2: Clip/tile the raster map file

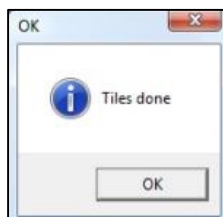
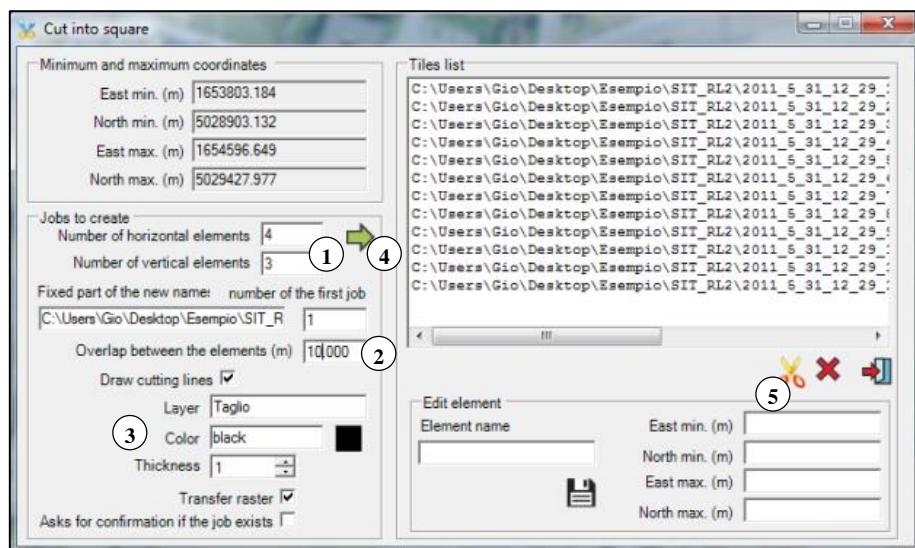
This step (optional) illustrates how to clip the image or divide it into a fixed number of tiles. This step is given if the file size exceeds the RAM capacity of the Windows Mobile software. The result of the clipping/tiling function will be one or more images, smaller than the original and therefore more manageable in the Windows Mobile environment.

In this tutorial, a tile-splitting routine is performed.

From the main menu select **File – Clip – Tiles clip**.

1. Set the number of horizontal and vertical parts of the tiling grid.
2. Set the overlap tile margin (recommended).
3. Set graphic options of the tiling routine.
4. Click the arrow icon to show the clipped files in the **Tiles list**.
5. Click the scissors icon to start the tiling routine.

Wait the end of the tiling routine.



Step 3: Connection between computer and GPS handheld device

Connect the Windows Mobile GPS handheld to the computer and wait the Microsoft connection software detects the device.

- The Windows Vista or Windows 7 operating system, use the Windows Mobile Device Center to manage the connection.
- The Windows XP operating system, use Microsoft ActiveSync technology to manage the connection.

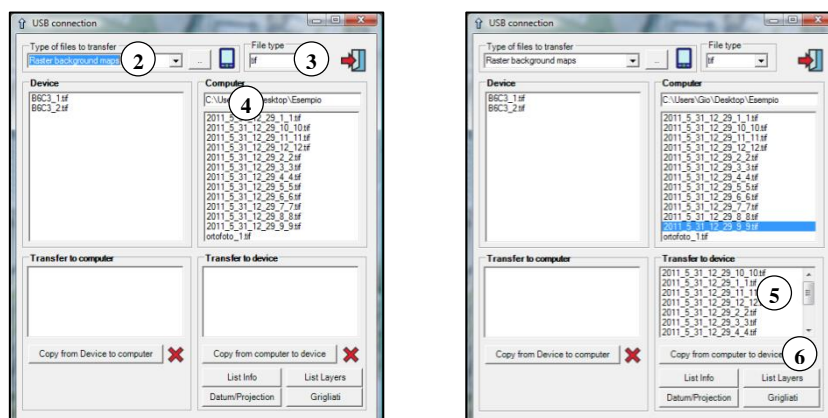
See [GeoGis_Getting started guide – Software installation and activation, pag. 1.](#)



Step 4: Transfer the (clipped) raster files to GPS handheld device

From the main menu select **Device manager – Connection**.

1. Close GeoGis and all running programs on your handheld GPS device.
2. Select **Raster background maps**.
3. Select the raster file format.
4. Select the file path.
5. The selected raster files appear in the **Transfer to device** panel.
6. Click **Copy from computer to device** button to start the transfer.

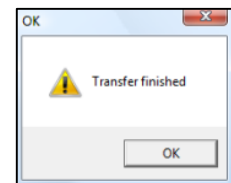


7. (Optional) The program asks if you want to create a group file on your GPS handheld (GeoGIS) to wrap up the base map files. Create a group file allows you to quickly load several map files at the same time.

Click **Save** icon to create group and start file transfer.

Click **Exit** icon to start file transfer without create group file.

Do not disconnect the device until the transfer is finished.

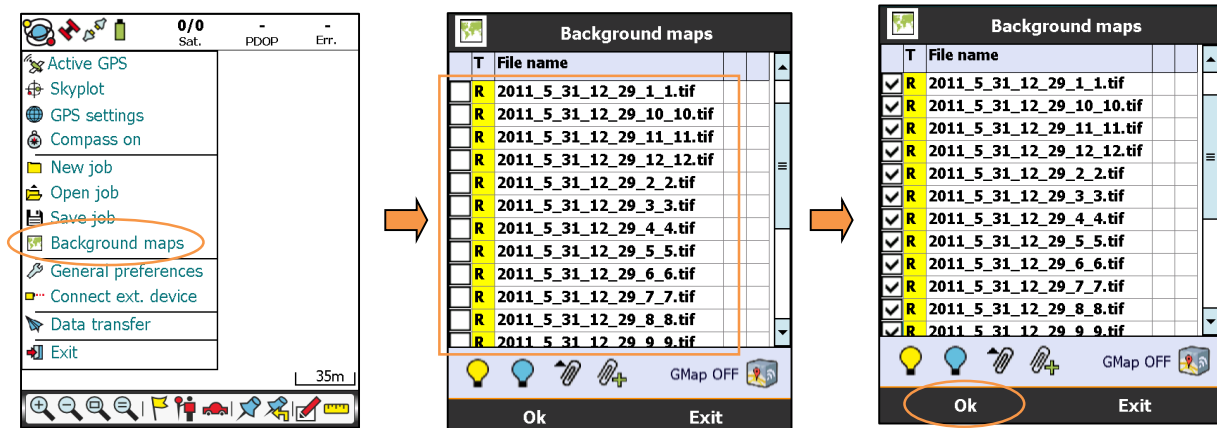


Step 5: Use the (clipped) raster files in the GeoGIS software

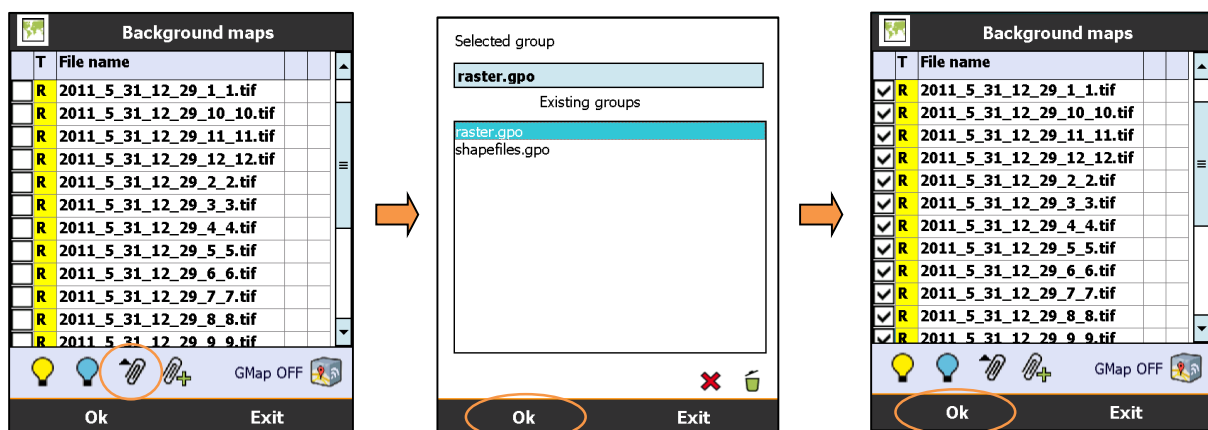
From the GeoGIS main menu select **Background maps**.

In the list you can find the transferred raster files.

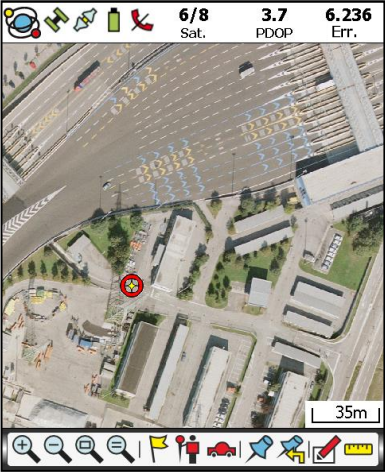
With the stylus, select the files to open and tap **OK**.



As an alternative you can select the **group** file created in [Step 4](#).



When the GPS is active and a **group** file is selected, GeoGIS automatically loads and displays only the map corresponding to the current GPS position. In this way you can use high-resolution raster map files without decreasing the survey performance.



Tutorial 4: Creation of Rinex files

This tutorial illustrates common steps to create post processing Rinex files:

1. Quick Rinex tool: convert raw GPS data (plf file) in to Rinex file
2. After post-processing: create an ASCII output coordinates file
3. Create corrected job

Step 1: QuickRinex tool: convert raw GPS data (plf file) into Rinex file

The Quick Rinex tool of GeoGis Office can create a kinematic Rinex file (Receiver Independent Exchange Format) that can be used as a rover file by using the main post processing software, which is available on the market.

From the main menu select **File – Quick Rinex – Create RINEX**.

1. Select the *plf* file on your pc. *plf* files are originally stored in the “Postprocessing” folder of the GeoGis software.

2. If necessary, select the *gps* file (GeoGis job file) corresponding to the *plf* post processing file.

This step is optional and allows to correct discrepancies between raw gps job file and post processed job file; for example: if during the survey some points have been deleted or modified.

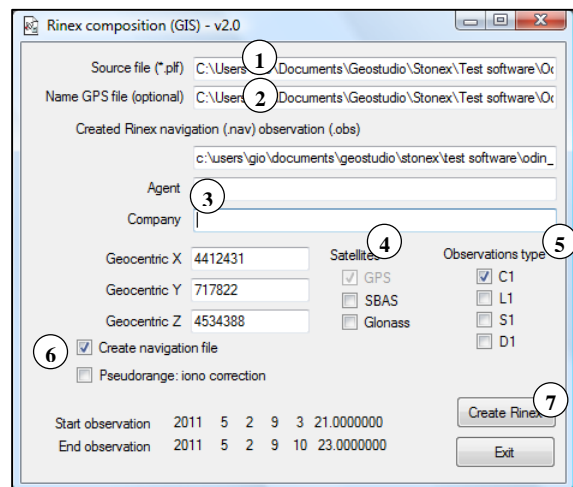
The procedure does not modify the source files (*gps* e *plf*) but affects the creation of the Rinex files.

3. Enter the **Agent** and **Company** information

4. Choose the GNSS constellation (GPS/GLONASS) and if you want also include SBAS signal in the computation (Satellite-Based Augmentation Systems).

5. Observation type:

C1: pseudoranges
L1: integrated carrier phase
S1: signal/noise ratio
D1: doppler



6. It is also possible to create the **navigation** Rinex file in addition to the **observation** file (some software requires both files to start the computation process); is it also possible to include the pseudorange ionospheric correction.
7. Click **Create Rinex** to generate Rinex files (extensions: *.o, *.n).

Once you have created the Rinex file, the differential corrections process can be made using the post-processing software.

Step 2: After post-processing: create an ASCII output coordinates file

The post processing software has to be able to create ASCII files with WGS84 geographic coordinates made as follow:

Point name, Latitude N, Longitude E, Altitude

ASCII file example:

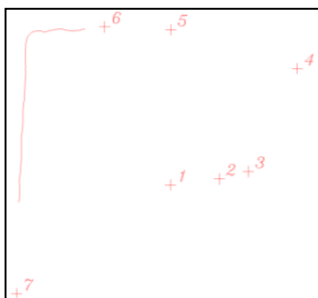
Point name	Latitude	Longitude	Altitude
POINT 1	45 27 10.38355 N	009 13 14.23929 E	00156.3650
POINT 2	45 27 10.60765 N	009 13 15.19789 E	00158.5162
POINT 3	45 27 10.60144 N	009 13 15.75125 E	00163.3732
POINT 4	45 27 12.10629 N	009 13 16.86440 E	00154.4334
POINT 5	45 27 13.02985 N	009 13 14.40423 E	00157.9834
POINT 6	45 27 12.92879 N	009 13 12.84929 E	00165.6131
POINT 7	45 27 08.75061 N	009 13 11.46115 E	00171.2070

Step 3: Create corrected job file

The Rinex files only contains the observation and navigation information for the GPS differential corrections. The differential correction process then produces a "spatially correct" output file but does not retain neither trace of graphical elements (such as lines, polygons, manual points) contained in the raw job nor informative database (attributes, labels, layers, photographs) associated to them.

GeoGis Office allows you to create a new job "spatially correct", and preserving the coordinate system, graphic elements and all the informative attributes of the raw job.

1. Open the GeoGis raw job.



- From the Main Menu select: **File – Quick Rinex – Create corrected job**

Select the ASCII file with the corrected GPS coordinates.

Note – The extension of the ASCII file can vary depending on the type of export process, the *.txt format is generally the most common, but custom ASCII formats can also be used.

Change or confirm the reference system of the new corrected job.

The 'Reference system' dialog box contains the following sections:

- Zone:** World
- Datum - Projection:** WGS 84 / UTM zone 32N
- Transformation:** TransversalMercator
- Projection:** UTM zone 32N
- Origins:**
 - Latitude: 0, Longitude: 9, False origin EAST (m): 500000.000, False origin NORTH (m): 0.000, Deformation module: 0.9996000
- Datum Nam:** WGS 84
- Ellipsoid:** WGS 84
- Meridian:** Greenwich
- Device:** datum/projection folder
- Device folder:** \Program Files\Geostudio GIS\ApoggioGIS
- Geoid:** None
- Target zone:** (empty)
- Datum - Projection:** (empty)
- Sexagesimal / Geocentric:** Sexagesimal
- Plane / Geocentric:** Plane
- Buttons:** Calculate, Coordinate conversion

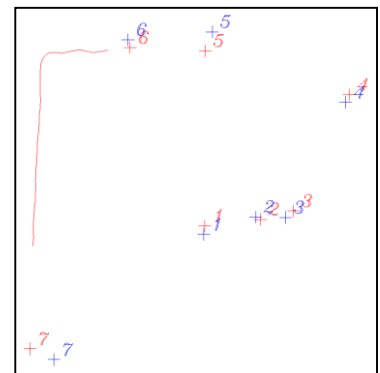
Click **Coordinate conversion** to start the creation of the new job.

The 'Corrections' dialog box displays a table of point coordinates and correction options:

POINT	1518762.238	5049663.280	201.648	518732.081	5049560.898	237.877	-1000030.157	-12.882	35.
POINT 2	1518732.425	5049592.970	196.479	518701.587	5049580.039	231.076	-1000030.837	-12.931	34.
POINT 3	1518742.246	5049637.722	193.107	518711.485	5049626.991	229.783	-1000030.761	-10.731	36.
POINT 4	1518755.541	5049601.943	190.422	518720.693	5049606.306	250.229	-1000034.848	4.362	59.

Graphics section:


- Job with only corrected elements:** (empty)
- Fix of layers of corrected items:**
 - Corrected points: _CORRECT
 - Uncorrected points: _NON CORRECT
 - New routes: _CORRECT
 - New lines: _CORRECT
- Colors:**
 - New points color: Black
 - New routes color: Black
 - New lines color: Black
- Checkboxes:**
 - ☒ Overlap with corrected job
 - ☒ Transfer uncorrected points



In the above form it is possible to check the coordinates of the corrected points in the selected reference system and the differences from the raw points.

Enter a name for the new job (1)

Change or confirm the colors (2) of the graphics and the prefixes of the new job layers (3).

Click the  icon to save the new corrected file.

Tutorial 5: Creation of GIS attributes

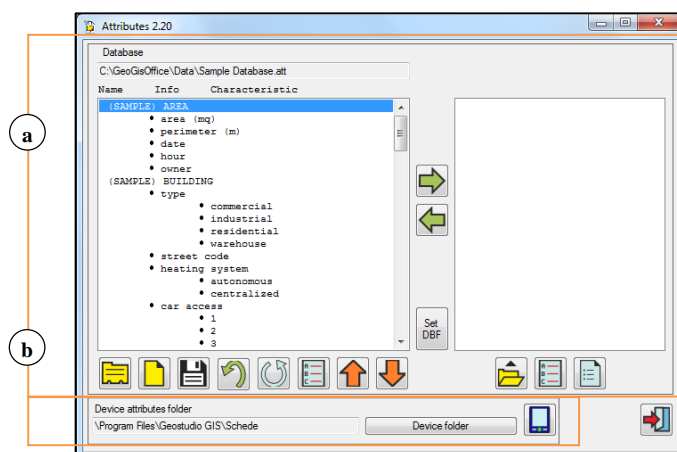
This tutorial illustrates steps to create customized informative attributes for the GeoGis software database:

1. Open the Attributes Editor tool of GeoGis Office
2. Database framework
3. Creation of a new Database
4. Update the Database on the handheld device

Step 1: Open the Attributes Editor tool of GeoGis Office

The concept of “attribute” corresponds to the creation of an informative database that can be used to add information to the field data.

From the main menu select **File – Special features – Attributes Editor**.



- a. Main panel of the Attributes Editor. A single Database can be made of several Attributes.
- b. Commands to transfer the Database on your GPS handheld.

Step 2: Database framework

The Database framework is based on a series of items arranged on three levels.

The top level is for the **Attributes**.

Any Attribute is made of items called **Information**.

Any Information can be made of several descriptive **Characteristics**.

Level	Title	Sample
Level I	Attribute	<i>(SAMPLE) BUILDING</i>
Level II	Information	<i>Type</i>
Level III	Characteristic	<i>commercial</i> <i>industrial</i> <i>residential</i> <i>warehouse</i>

Imagine the Database framework as a table divided into columns:

Attributes correspond to the feature (or to the theme) to which the table refers, **Information** correspond to the columns of the table. The number and type of data stored in the columns are user-defined according to the needs of data collection.

Characteristics correspond to the cells of each column. Any cell can be left undefined or it is also possible to create a list of predefined items to choose from; this is a time saving option that also allows to create more homogeneous table (Database).

Editor commands are represented by the following icons:

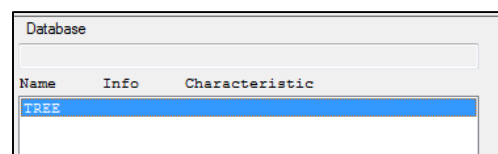


1. Open an existing Database.
2. Create a new Database.
3. Save the current Database.
4. Undo the last action.
5. Redo the last action.
6. Order the selected items in alphabetical order.
7. Move up the selected items.
8. Move down the selected items.
9. Import a list of Characteristics from a text file.
10. Enter predefined Characteristics.

Step 3: Creation of a new Database

To create a new Database, proceed as follow:

1. Press the button **New Database** (2)
Enter the name of the Attribute on the first row (e.g. "TREE").



- Press the mouse left button and select **Insert Info** to add an Information (Level II) to the Attribute (Level I).

Repeat point 2. to add all the Information in the Attribute.

(e.g. Species, Status, Circumference, Height)

- For any Information you can add a list of Characteristics.
- Select the item to expand, press the left mouse button and select **Insert Characteristic**.

Repeat point 3. To add all the Characteristics (e.g. "Pine", "Chestnut", "Linden")

A list of Characteristics can also be loaded from a text file pressing the **File** button (9).

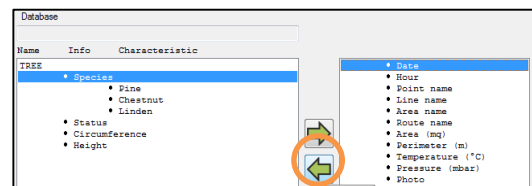
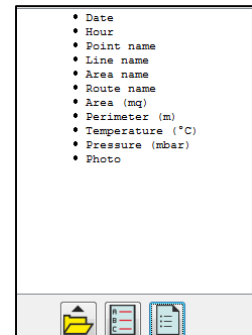
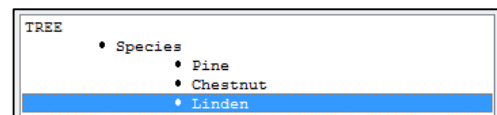
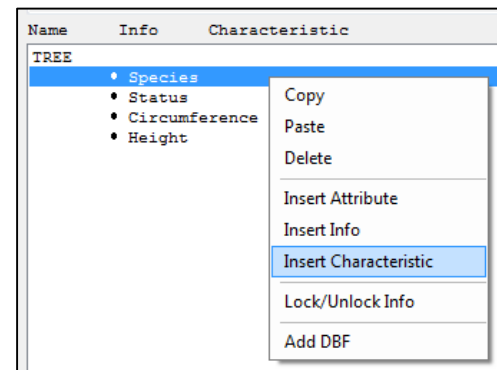
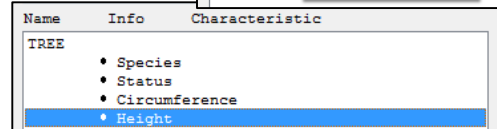
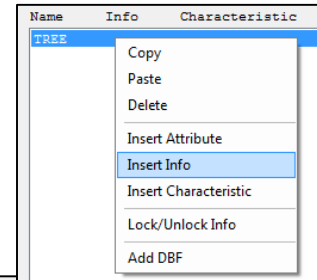
With the **Element list** button (10) you can also add a list of predefined Information.

A predefined Information is a special item: it will be self-completed by the program without user intervention.

Select the predefined Info to add (e.g. Date) and press the **left arrow** button to add it to the Database.

Use **Move up/down** arrows (7)(8) to put the element in the right place.

- When the Attribute is completed, press **Save** button (3) to store the Database on the computer. The file extension is ".att".



Tip – To speed up the creation of the Database you can use keyboard shortcuts to replace the mouse functions:


<ENTER>: Create the next item within an Attribute.

<CANC>: Delete the selected item.

<TAB>: *Change the hierarchy of an element within the Attribute (Info → Charact).*
<BKSPACE>: *Change the hierarchy of an element inside the Attribute (Info ← Charact).*
<SHIFT + left mouse button>: *Multiple selection.*
<CTRL + c>: *Copy selected elements.*
<CTRL + v>: *Paste selected elements.*

Step 4: Update the Database on the handheld device

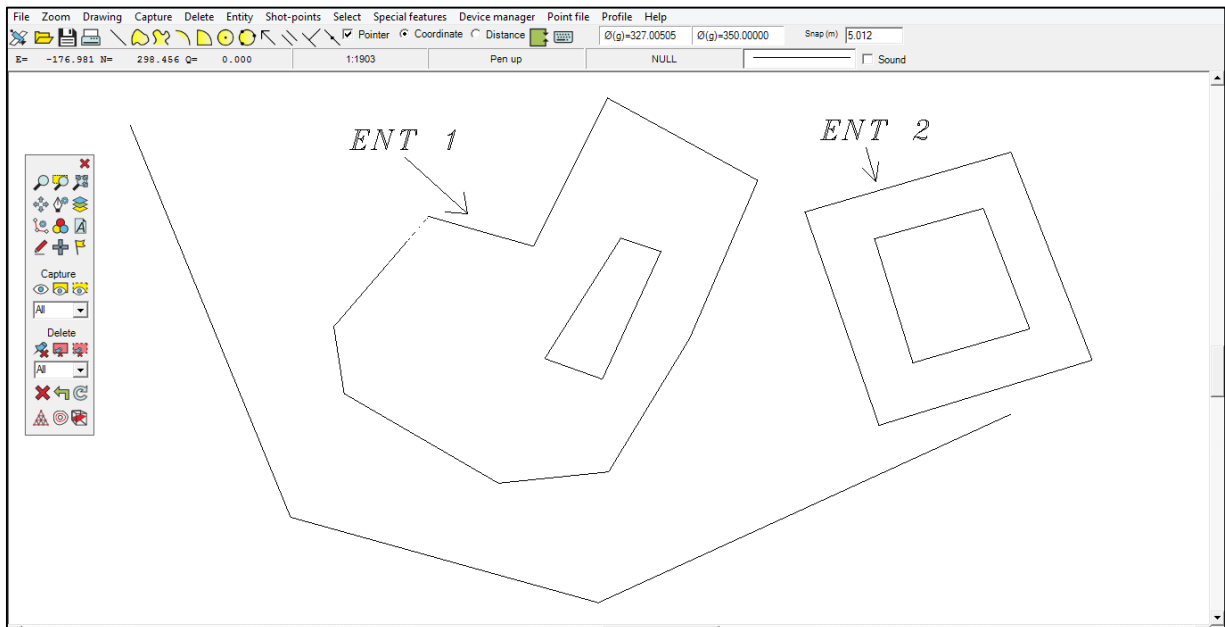
To update GeoGis database with the new Database:

1. Connect the device to the office computer using either a USB cable connection or Bluetooth® wireless technology.
2. Close all the programs running on the device, GeoGis included.
3. Click the transfer button 

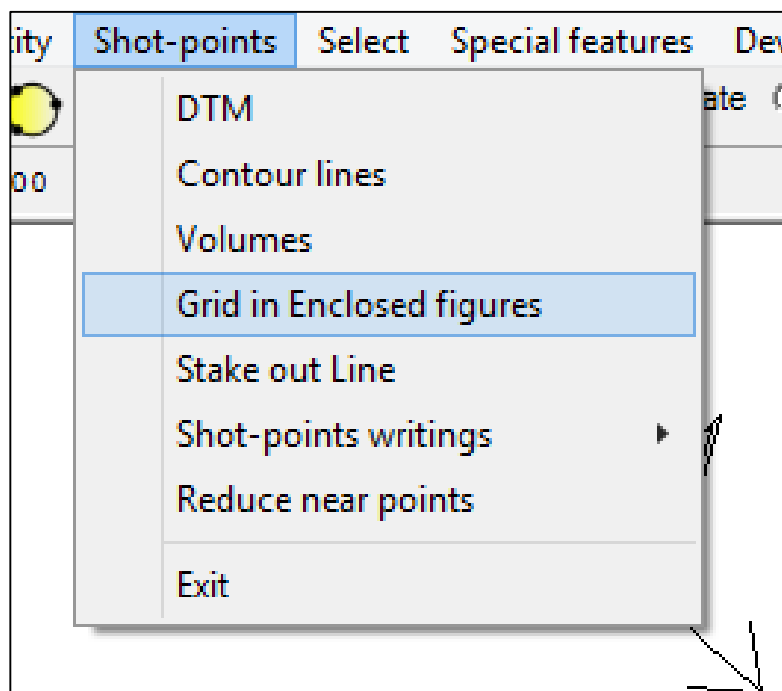
Note – *The transfer procedure creates on the computer a backup of the Databases that were previously saved on the handheld.*

Tutorial 6: Point gridding inside a closed figure

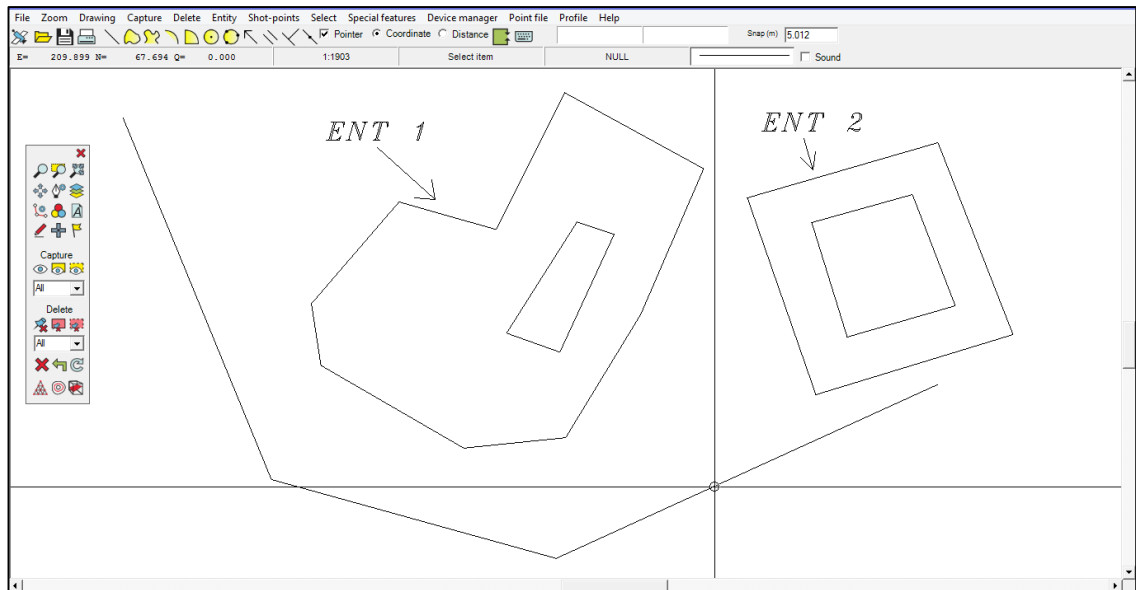
Consider the job example “testGriglia.dis” located in the “Job” folder of GeoGis Office.
The job is made by two closed figures.



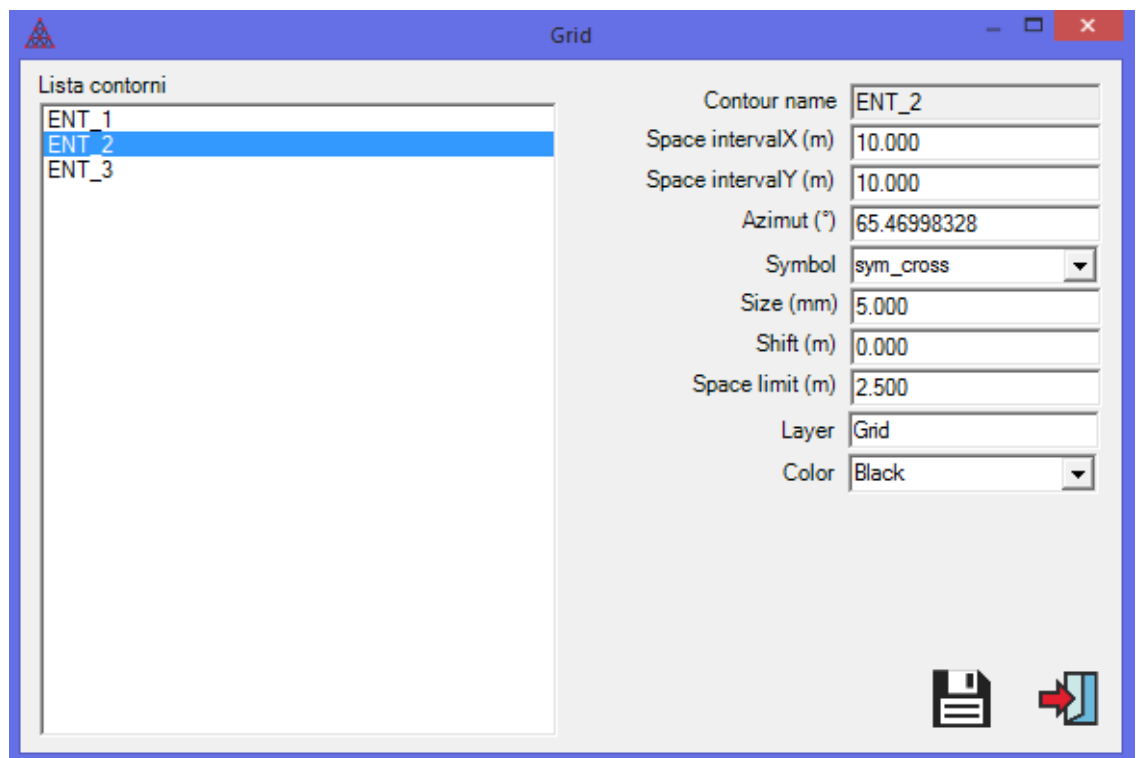
1. From the main menu select **Shot-points – Grid in Enclosed figures**



2. Press the mouse **left button** to select a line: the creation of the point grid will assume the direction of this line.
Press the mouse **right button**: the direction of the point grid is 90° (horizontal).



3. In the next panel, define the closed figure like an entity.



- **Space interval X/Y:** Spacing between the points
- **Azimuth:** Direction of the grid
- **Symbol:** Symbol to use
- **Size (mm):** Symbol dimension
- **Shift (m):** shift between the first points row and the next row
- **Space limit (mm):** Point is not drawn if the distance from the figure's border is lower than this value
- **Layer:** Points layer
- **Color:** Points color

Exit from procedure

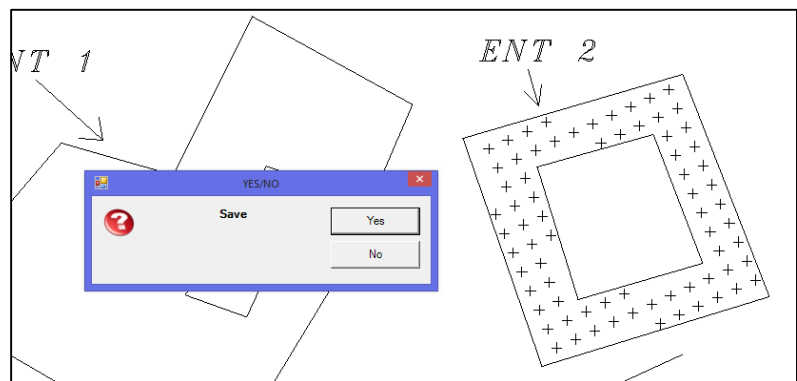


Start grid creation



In the following example

Grid with
Space interval = 10
Shift = 0



Grid with
Space interval = 10
Shift = 5

