

GEOGIS

Getting started guide

Version 14.097
Revision C
October 2015

STONEX® Srl | Via Cimabue 39 | 20851 -Lissone (MB)| Italy
Phone +390392783008 ; +390392785575 | Fax+390392789576 |
www.stonexpositioning.com



1	Software installation and activation	1
1.1.	System requirements	1
1.2.	Installing the GeoGis software onto a device powered by the Windows Mobile operating system	1
	Step 1: Install Microsoft connection management software onto the computer	1
	Step 2: Connect the device to an office computer	2
	Step 3: Uninstall any previous versions of GeoGis software	3
	Step 4: Check that you have enough space on the device	4
	Step 5: Install the GeoGis software onto the device	4
1.3.	Activating the GeoGis software	5
1.3.1.	GeoGis Trial mode	6
2	Software structure	7
2.1.	Starting the GeoGis software	7
2.2.	The GeoGis software display	7
2.3.	Status bar and GNSS position	7
2.4.	Main Menu	9
2.5.	File formats	9
2.5.1.	GeoGis file format	9
2.5.2.	ESRI shapefile format	9
2.6.	Main Menu sections	10
	Section 1: GPS preferences	11
	Section 2: Job manager	11
	Section 3: Program preferences	12
	Section 4: Data transfer	12
	Section 5: Activate GeoGis license	12
2.7.	GPS settings	13
2.7.1.	GSM settings	14
2.7.2.	Ntrip settings	14
2.8.	General preferences	15
3	User interface and data handling	17
3.1.	GeoGis toolbar	17
3.1.1.	Log point feature	17
3.1.2.	Stakeout	19
3.1.3.	GNSS path	20
3.1.4.	Calculation functions	21

3.2.	Database.....	22
3.2.1.	Add attributes to the database.....	22
3.2.2.	Add pictures to the database.....	23

4 GeoGis - Tutorials..... 25

Tutorial 1:	Save GPS point feature then add attribute and picture	25
Tutorial 2:	Save GPS point feature then add a picture using internal camera.....	31
Tutorial 3:	Create closed outline and area calculation.....	33
Tutorial 4:	Calculation of area by linking points	39

1

Software installation and activation

1.1. System requirements

The GeoGis software runs on handheld devices running any of the following Microsoft operating systems:

- Windows Mobile 6, 6.1 and 6.5 operating systems
- Windows Mobile version 5.0 operating system

To install the GeoGis software onto a device powered by the Windows Mobile operating system and to transfer files between a desktop computer and a Windows Mobile powered device, you must have the appropriate Microsoft software installed on your computer or Tablet PC.

The software you use to manage the connection between the device and the computer depends on the operating system the office computer is running. If the computer is running:

- Windows Vista or Windows 7, make sure you have downloaded and installed the Windows Mobile Device Center.
- Windows XP, make sure you have installed the appropriate version of Microsoft ActiveSync® technology.

1.2. Installing the GeoGis software onto a device powered by the Windows Mobile operating system

This section describes how to install the GeoGis software onto a supported Windows Mobile powered device.

The installation procedure comprises the following steps:

1. Install Microsoft connection management software onto the office computer.
2. Connect the Windows Mobile powered device to the office computer.
3. Uninstall any previously installed versions of the GeoGis software.
4. Check that you have enough space on the device to install the GeoGis software.
5. Install the GeoGis software.

More information about each step is provided below.

Step 1: Install Microsoft connection management software onto the computer

Note – You must install the Windows Mobile Device Center or ActiveSync technology onto the computer before you connect the device.

To install software onto a Windows Mobile powered device, you must connect the device to the office computer. If the computer is running:

- 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.

Installing the Windows Mobile Device Center

The Windows Vista and Windows 7 operating systems include a basic connectivity driver for Windows Mobile powered devices. This driver allows you to transfer files from the device to your computer.

To install software onto a Windows Mobile powered device, or to use the more advanced desktop synchronization features with your device, you must install Windows Mobile Device Center 6 (or later) onto your office computer.

Installing ActiveSync technology

ActiveSync technology may be supplied on a CD with the Windows Mobile powered device, or you can download it from Microsoft site.

You can download the Windows Mobile Device Center or ActiveSync from www.microsoft.com/windowsphone/en-us/apps/65-downloads.aspx

Step 2: Connect the device to an office computer

1. Make sure that the device and the computer are turned on.
2. Connect the device to the office computer using either a USB cable connection or Bluetooth® wireless technology.

For more information on connecting the device to a computer, refer to the documentation for the Windows Mobile powered device.

When the device is connected, a window appears on the office computer that enables you to manage the connection.

3. If the office computer is running:

- **Windows Vista or Windows 7 operating system:**

- a. If the Autoplay window appears, close the window.
- b. The Windows Mobile Device Center window displays the message Connected:



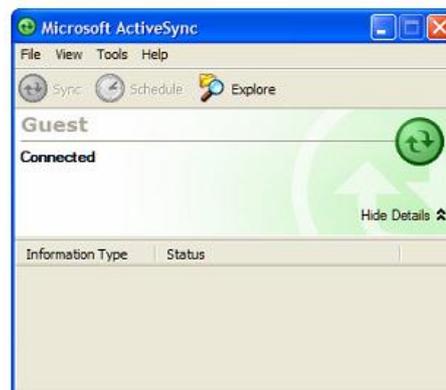
- c. Click *Connect without setting up your device*.
- d. Use the Windows Mobile Device Center to back up data files and uninstall any previous versions of the software.

• **Windows XP operating system:**

- a. If the Synchronization Setup Wizard appears, click **Cancel** to close the wizard:



- b. The Microsoft ActiveSync window displays the message Connected:



- c. Use ActiveSync technology to back up data files and uninstall any previous versions of the software.

For more information, refer to the *ActiveSync Help*.

Step 3: Uninstall any previous versions of GeoGIS software

Before installing a new version of the GeoGIS software, it is required that you uninstall any previously installed versions of the GeoGIS software from the Windows Mobile powered device and the office computer.

Step 4: Check that you have enough space on the device

It is required that you install the GeoGis software to an internal non-volatile storage location, if such a location is available. This leaves more storage and program memory available on the device.

Before you install the GeoGis software, make sure that you have enough free space on the device. The GeoGis software requires at least 18MB of free space. If you are installing it to a secondary internal storage location, the GeoGis software requires at least 18MB of free space in that location, plus 8MB of RAM.

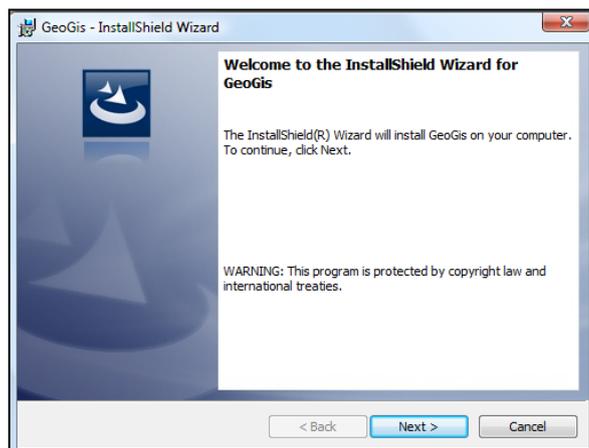
If there is not enough memory space on the device, a message appears during installation, indicating the amount of memory left on the device.

Click **Cancel**, remove any unwanted programs or data files from the device, and/or increase storage memory. Then start the installation again.

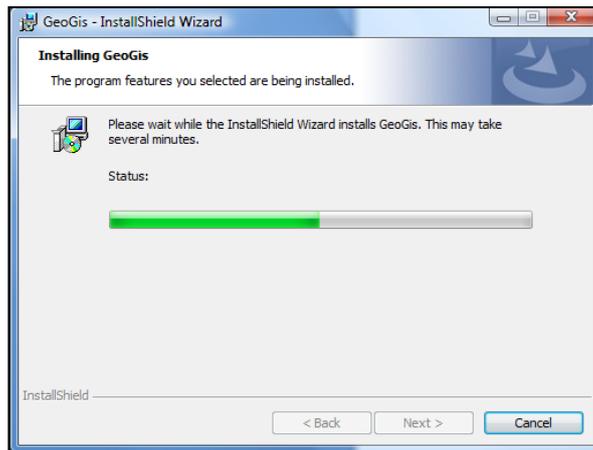
If memory space in the secondary internal storage location is insufficient, the installation may appear to complete successfully, but error messages may appear when you try to run the GeoGis software. If this happens, make more space available in the secondary storage location and then install the software again.

Step 5: Install the GeoGis software onto the device

1. Before you begin, make sure that:
 - the GeoGis software is not running on the device.
 - you have closed all applications on the device.
2. On the office computer, click **GeoGisWMSetup.exe** included in the CD installation software.
3. On the Welcome screen, click **Next** to start the Setup Wizard:



4. Wait until the end of the upload stage.



Note – Do not disconnect the device until the complete installation of the GeoGis software: check the device display and wait for a complete installation of the software. Depending on the software distribution, the Setup Wizard will install all the software dependencies required by the GeoGis software.

1.3. Activating the GeoGis software

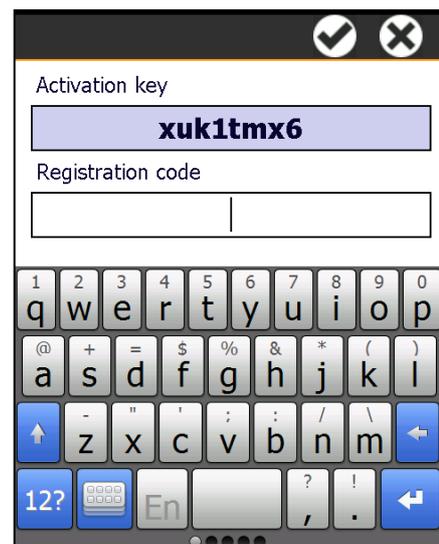
The GeoGis software must be activated once it is installed on a field computer that is powered by the Windows Mobile 5.0 software, or version 6, 6.1 or 6.5 operating system.

The GeoGis software will run on a field computer only when you have successfully activated the software.

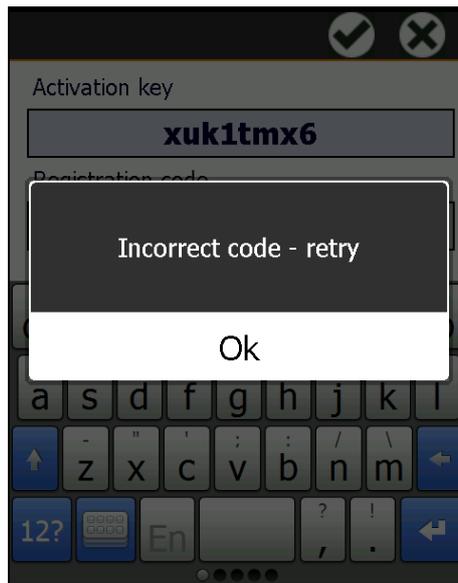
When you start the GeoGis software for the first time, an Activation key is automatically generated.

To get the Registration code please contact your local reseller.

Note – The Activation key is unambiguous and it is related to the hardware of your Windows Mobile handheld. A valid Registration code can be used to activate a single license of the GeoGis software on a single handheld device.



If a valid Registration code is not found, the following error message appears:



Tap **ok** to retry and enter a valid Registration code.

1.3.1. GeoGis Trial mode

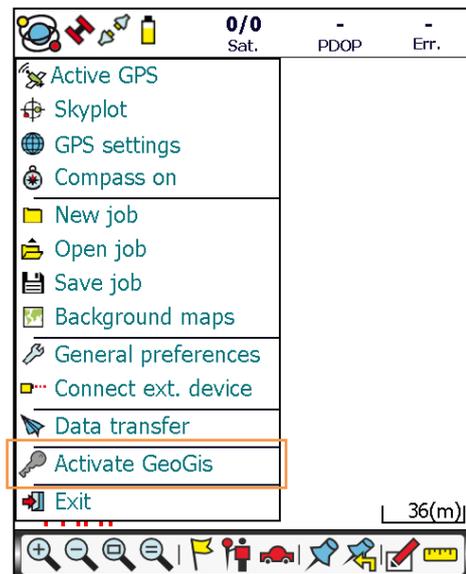
In order to activate the GeoGis software in Trial mode, ask your local reseller for a free of charge temporary registration code.

The GeoGis software in Trial mode will be fully operative for a period of **twenty (20)** consecutive days.

At the end of the trial period the software prompts for a new activation; it is possible to enter a permanent registration code as well as a new temporary code.

To enter a permanent registration code: it can be entered anytime, just tapping on the **Activate GeoGis** command which is available in the main menu.

Removal or uninstall of the program during the trial period will cause the expiration of the temporary license; a different registration code is required to reactivate the software.



Note - Temporary licenses cannot be combined. A new temporary license can be activated only after the expiration of the current (trial) license.

Temporary licenses are provided at discretion of Stonex® Europe, directly or through authorized resellers.

2.1. Starting the GeoGis software

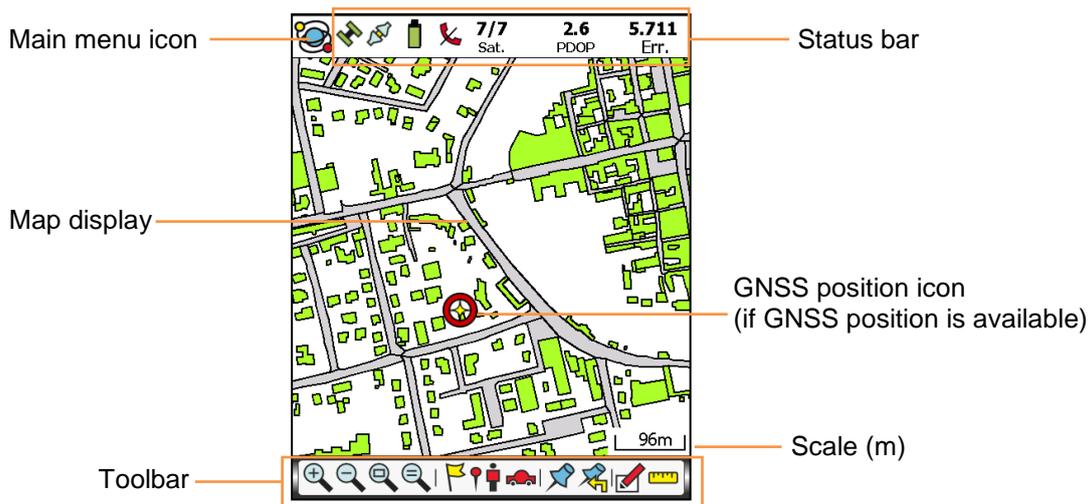
To start the GeoGis software, do one of the following:

- Tap /Programs/GeoGis.
- Tap and then tap the GeoGis icon on the recently-used programs list.

While the software is loading, a GeoGis splash-screen appears.

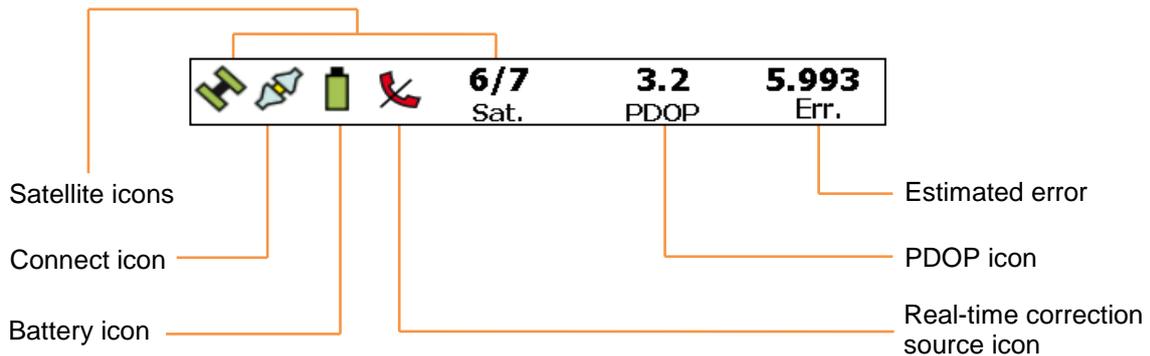
2.2. The GeoGis software display

The screen below shows the main form in the GeoGis software:



2.3. Status bar and GNSS position

The status bar appears at the top of the GeoGis software form and provides basic status information about the connected GNSS receiver:



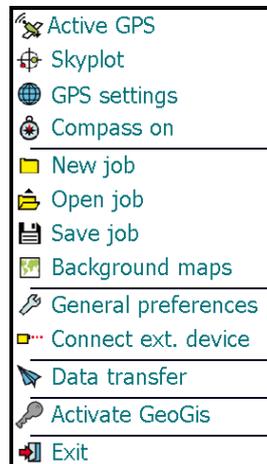
The status bar is always visible, but the icons displayed depend on the current status of the system.

Table below shows the icons that can appear.

Icon	Name	Description
	Satellite icon	Shows whether the receiver is tracking GNSS positions or not (green: yes, red: no). The number indicates how many satellites are being used to compute GNSS positions. You need at least four satellites to compute GNSS positions. If you tap the icon, the Skyplot panel appears.
	Connect icon	The icon has two states, depending on whether the receiver is connected or not. If the GeoGis software cannot connect to the GNSS receiver, a pop-up message appears.
	Real-time correction source icon	Shows that the GeoGis software is receiving real-time corrections from an external source: <ul style="list-style-type: none"> • red-phone icon: Shows that the GeoGis software is in <i>Autonomous</i> mode (uncorrected). • blue-phone icon: Shows that the GeoGis software is receiving DGPS or RTK float corrections through internet. • green-phone icon: Shows that the GeoGis software is receiving DGPS or RTK corrections through internet. • star icon: Shows that the GeoGis software is receiving real-time corrections from an SBAS satellite. If you tap the icon, a tooltip appears with information about the real-time status.
	Battery icon	Indicates the charge level of the GNSS receiver battery, if one is connected. From the top: <ul style="list-style-type: none"> • Fully charged. • Average level of charge. • Low charge. • Critical level of charge. If the connected receiver does not provide battery status information to GeoGis, the battery icon is not displayed. If you tap the icon, a tooltip appears with info about the battery charge.
	PDOP	Shows whether the geometry of the satellites is good or bad.
	Estimated error	Shows the estimated horizontal accuracy of the current GNSS position. The estimated accuracy value may be the estimated accuracy in the field, or it may be the predicted accuracy after post processing. If the connected receiver does not provide accuracy information to GeoGis, the estimated accuracy value is not displayed. Note – <i>The value depends on several factors, including satellite geometry and the type of the GNSS receiver.</i>
	GNSS position icon	Show the GNSS position, according with the set coordinate system. If you tap the icon, the GPS-coordinates table appears.

2.4. Main Menu

The main menu of the GeoGis software is activated by tapping the main menu icon . See [Main Menu sections, page 10](#).



2.5. File formats

The GeoGis software can directly manage the following file formats:

- GeoGis (.*gps* proprietary format)
- ESRI shapefile
- Raster files (bmp, tif, Geotiff, jpg, gif) as background maps

2.5.1. GeoGis file format

The *gps* file is the operative format of the GeoGis software.

When you start a new job, or modify an existing one, features and database attributes are stored in a *gps* file.

The *jobname.gps* files are located in the folder **Job** of the GeoGis directory.

To start an empty job, tap **New job** in the GeoGis Main menu.

See [Section 2: Job Manager – New job, page 11](#)

To open an existing job, tap **Open job** in the GeoGis Main menu.

See [Section 2: Job Manager – Open job, page 11](#)

2.5.2. ESRI shapefile format

The GeoGis software can read and operate ESRI shapefiles as *active background* files.

An *active background* is a layer with a distinctive feature: the file cannot be fully edited but you can access what is contained (features and database attributes) and use it into the GeoGis workflow. Particularly you can:

- Pick out, inspect, and stake out features
- Modify existing shapefile attributes
- Import *dbf* framework into the GeoGis database framework

The GeoGis software considers ESRI shapefiles as background files, so they must be placed in the folder **Map** of the GeoGis directory.

See [Section 2: Job Manager – Background maps, page 11](#)

With the GeoGis software you can easily convert a *.gps* file into an ESRI shapefile, without having to export it on the office computer.

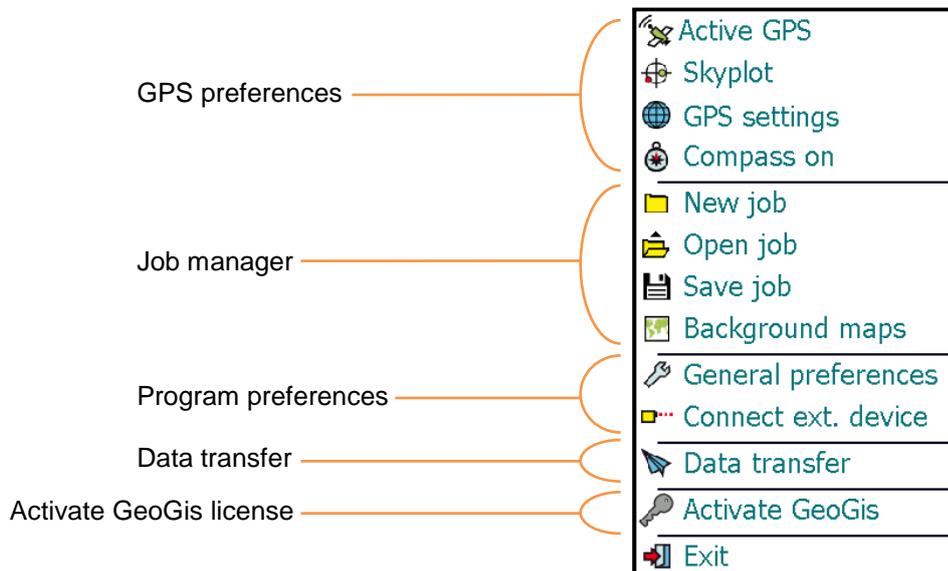
To do so, just **save** the job in the ESRI shapefile format, the files are stored in the folder **Map** of the GeoGis directory.

See [Section 2: Job Manager – Save job, page 11](#)

Note – When you save a job in ESRI shapefile format, a backup of the job will also be automatically stored in *gps* format.

2.6. Main Menu sections

The GeoGis software is composed by the following four sections:



Tap **Exit** to close the GeoGis software.

The main functions of each section in the GeoGis software are described in the following tables:

Section 1: GPS preferences

Icon	Name	Description
	Active GPS	Start/Stop the GPS position tracking. If the GeoGis software cannot connect to the GNSS receiver, a pop-up message is displayed: use the GPS manager function to correct the GNSS receiver settings.
	Disable GPS	See GPS Settings, page 13 for further details.
	Skyplot	Open the Skyplot screen and the Satellite Information. <ul style="list-style-type: none"> • GPS satellites are marked in yellow color. • GLONASS satellites are marked in red color. • GALILEO¹ Satellites are marked in cyan color (predisposition only). • SBAS satellites are marked in green color. • NOT OPERATING satellites are marked in grey color. A tooltip appears when you tap a satellite in the Skyplot screen, providing information about the selected satellite.
	GPS settings	Displays the configuration functions of the GPS: <ul style="list-style-type: none"> • GPS manager • Coordinate system • Real time • GPS utility See GPS Settings, page 13 for further details.
	Compass on/off	Displays a compass icon in the top left of the display. Note – <i>The electronic compass is a piece of hardware and it is not available on all the GNSS devices².</i> <i>The GeoGis software provides also a compass function that combines the GPS position and the direction in which you are moving to determine the orientation. To obtain a correct orientation it is necessary that the receiver is in motion.</i>

Section 2: Job manager

Icon	Name	Description
	New job	Create a new job in <i>.gps</i> format
	Open job	Open an existing job in <i>.gps</i> file format.
	Save job	Save the current job. The GeoGis software lets you choose the save format: <ul style="list-style-type: none"> • GeoGis <i>.gps</i> format. • <i>ESRI shapefile</i> format.
	Background maps	Display raster, vector map files and online Google maps in the Map display. The GeoGis software allows you to create groups of raster and vector images: you can load multiple maps at a time (both raster and vector files) in just one step. For the proper display of the maps, the coordinate system set in the GeoGis software must be the same of the background files. Use of the online Google static maps service (icon ) requires: <ul style="list-style-type: none"> - Active GPS connection on the GPS device; - ISP connection on the GPS device; Note – <i>Use of the Google Static Maps API is free of charge and it is subject to terms of use defined by Google. No warranties are given about the availability of the map service.</i>

¹ Experimental satellites GIOVE-A and GIOVE-B.

² e-compass function is supported by Stonex S3 handheld.

Section 3: Program preferences

Icon	Name	Description
	General preferences	<p>Displays the general preferences of the GeoGis software:</p> <ul style="list-style-type: none">• Program folders• Label / Layer• Info / Controls <p>See General preferences, page 15 for further details.</p>
	Connect/Disconnect external device	<p>External devices for measuring or data collection can be connected via Bluetooth. By default, the GeoGis software supports the TruPulse360B rangefinder (Laser Technology inc).</p>

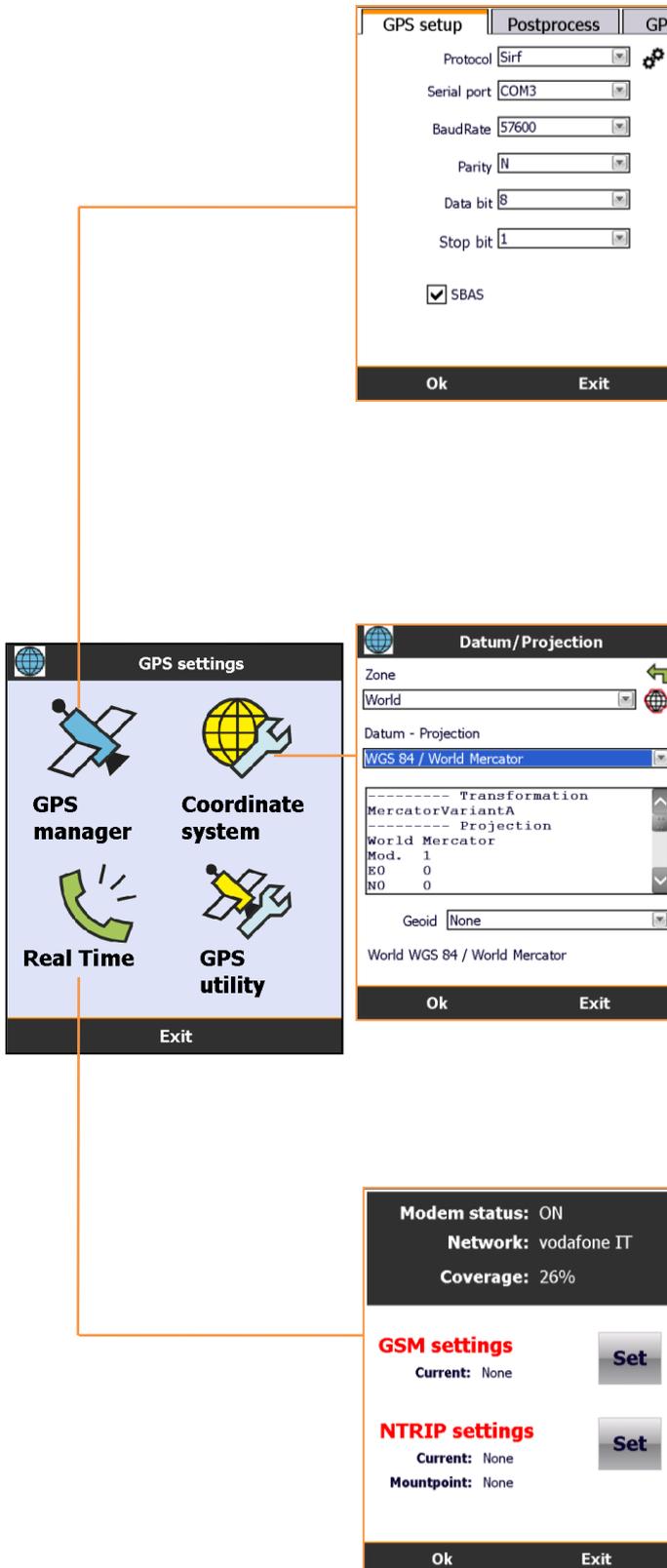
Section 4: Data transfer

Icon	Name	Description
	Data transfer	<p>Data transfer is only available in the advanced version of the GeoGis software.</p> <p>The GeoGis software allows you to send real-time data via Internet. There are two ways of sending data:</p> <ul style="list-style-type: none">• The <i>direct transmission</i> mode allows to connect to a client remote server to send data in real-time during the course of the survey. <p>Note – <i>It is required a stable internet connection and that the remote server (with a static IP address) is up and running the client receiving software for the entire duration of the survey.</i></p> <ul style="list-style-type: none">• The <i>send jobs</i> mode allows you to compress (zip) and send the finished jobs through the Internet in two ways:<ul style="list-style-type: none">- IP address connection (see the Note above)- email addresses <p>Note – <i>The e-mail transmission is via SMTP protocol.</i></p>

Section 5: Activate GeoGis license

Icon	Name	Description
	Activate GeoGis	<p>Function visible only if GeoGis is operating in Trial mode.</p> <p>Allows to enter a software registration code (permanent or trial).</p> <p>The function is dismissed when a permanent registration code is validated by the software.</p>

2.7. GPS settings



- **Tab - GPS setup:**

Sets the transmission protocol and the serial port settings.



The Restart icon allows to restore the GPS settings if the receiver is turned off or the battery is removed for long periods of time.

- **Tab - Postprocess:**

Prepares the raw files for post-processing differential correction.

Note – NMEA protocol does not allow the creation of raw data file.

- **Tab - GPS utility:**

Allow to enter the antenna settings/model, PDOP, Elevation and SNR values.

- **Coordinate system:**

Use the Coordinate system form to select the coordinate system: a single Zone hosts specific combinations of Datum and projection.



- **Datum/Projection:**

- Modify settings of the current reference system.
- Add new reference systems (Datum and projection) to the current Zone.
- Create new World zones.



- **Restore Defaults:**

Restore defaults reference systems of the GeoGis software (all user-defined reference systems will be lost).

- **Real Time:**

Allows to enable real-time corrections broadcasted through GSM network.

GSM settings: allows to set the connection to a ISP (Internet service provider), according to the specifications provided by the adopted GSM internet provider.

Tap **Set** button to select or create a ISP connection.

Ntrip settings: allows to set the parameters of the Ntrip broadcaster in order to get differential correction via GSM network (above step).

Tap **Set** button to select or create a new Ntrip connection.

Note – The red color means that settings are incomplete or missing.

2.7.1. GSM settings

Select an existing connection from the pull-down menu or tap the **Set** button to create a new connection.

- **Name:**
Enter the name of the new connection (user defined value)
- **APN:**
Enter the Access Point Name requested by your mobile Internet provider (e.g: "mobile.vodafone.it")
- **Username and Password:**
Enter username and password if requested by your mobile Internet provider

Tap **Ok** button to save the settings and return to Real Time main page.

2.7.2. Ntrip settings

Enter parameters to configure the connection to the Ntrip broadcaster service.

- **Tab - Internet:**
Name: Enter the name of the new connection (user defined value)
Address and Port: Enter the IP address and port number of the Ntrip internet service.
Server: Choose the server mode: Default or Ntrip (Ntrip is recommended for VRS networks).
Username and Password: Enter the user login credential.

- Mountpoint:** Chose the correction type from the pull-down menu or leave it blank if a mountpoint has not yet been selected (first connection): the mountpoint SourceTable will be displayed later.
- Base type:** Select **VRS** if you are connecting to a Virtual Reference Station network. Select **Single Base** if you are connecting to a stand-alone base station.
- Diff. Mode:** List of the supported protocols for the differential data (leave it blank if you are not sure).
- Time limit:** Latency time in case of interruption of the connection data flow.
- Auto-conenction:** Start connection automatically at start up using the defined parameters.

- **Tab - RTCM:**
Receiver settings for the differential correction. GeoGis will auto configure the settings for Stonex S7 devices.

2.8. General preferences

Program folders:

Use the Program folders form to edit the folders used by the GeoGis software to read and store file and data.

• Tab - Labels:

Use the *Labels* form to create brief descriptions and associate them to the features.

• Tab - Layer:

Use the *Layers* form to create CAD layers and associate them to the features. As a result, when you export a GeoGis job in DXF format, each feature will be associated with a specific layer.

• Waiting for storage (s):

During this amount of time, the GeoGis software acquires measures to calculate the final coordinates of the point feature. If the GNSS receiver is in *Autonomous* mode (no incoming Real-Time differential corrections) a time value between 10 and 30 seconds is recommended to increase the accuracy of the measures.

• XY and height tolerance:

Are the values of accuracy beyond which the measurement is considered unreliable. In this case, a warning message-box is displayed.

• Visual Field:

Indicate the default extent of the visual field.

• Visual field Max extent:

Indicate the maximum extent of the visual field.

• Recover last job configuration:

Recover raster and vector background files associated with the current job (if any).

• Attributes: Block:

Prevent the user to edit an attribute's field if the property is set to: locked, auto-filling or if it includes a predefined list of characteristics.

• DBF: Modify:

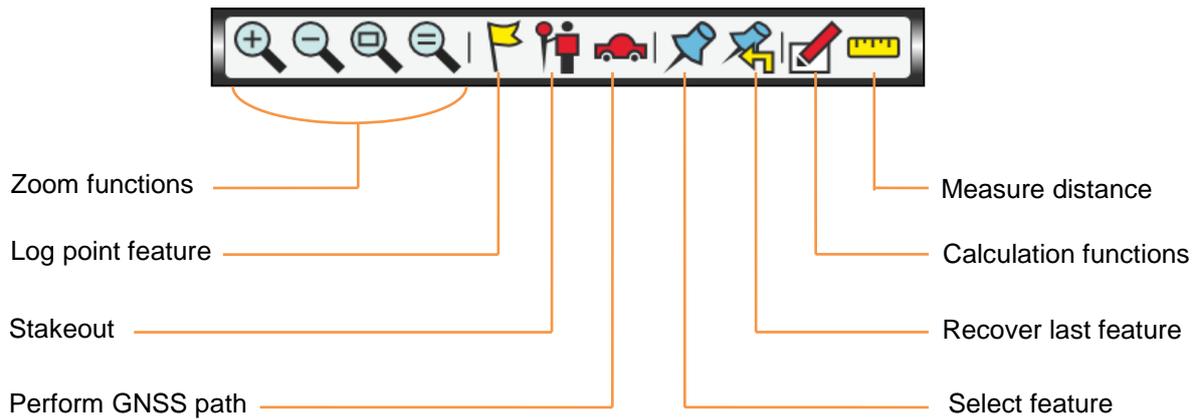
Related to informative Attributes: allows the user to modify the properties (length and type) of the attribute's fields.

3

User interface and data handling

3.1. GeoGis toolbar

The GeoGis software offers a simple toolbar to assist tasks during a survey.



3.1.1. Log point feature

Use the *Def.Point* panel to set the graphic features, the attributes of the point and finally store the GNSS position. If the receiver is not connected, the point can be entered manually by tapping on the map with the stylus.

The screenshot shows the 'Def. Point' panel with the following fields and controls:

- Point name: 
- Size (mm): 
- Antenna height (m): 
- Join with the previous point 
- Storage time (s):  

At the bottom, there is a folder icon labeled 'Database' with '0 Attributes - 0 Pictures' below it. The panel has 'Ok' and 'Exit' buttons at the bottom.

- **Labels and Layers:**
See [General Preferences, page 15](#)
- **Point name:**
The point name.
- **Symbol and color:**
Graphic features of the point.
- **Antenna height (m):**
Set and modify the antenna height.
- **Join with the previous point:**
Join consecutive points with a line starting from the first point after the activation of the function.
- **Storage time:**
The point coordinates are estimated using the average of the measurements during the period assigned in the numeric count (1 epoch = 1 sec.).
To change the default settings:
See [General Preferences – Info/Controls, page 15](#)

After setting the features of the point and the time of storage tap **OK** to start storing the point feature.

The screenshot shows a dialog box with the following content:

- Radio buttons: Store the average, Store last measure
- Elapsed time: 3/30
- Estim. XY error (m): 1.329
- Estim. Z error (m): 0.305
- Max tolerance (m) XY=10.000 Q=10.000
- 4/5 Sat. (Signal strength indicator)
- 6.4 PDOP (Precision Dilution of Precision)
- Coordinates table:

East (m)	518708.633
North (m)	5049560.953
Height (m)	282.970
- Database icon and text: Database, 0 Attributes - 0 Pictures
- Buttons: Ok, Exit

- **Store the average:**

The final coordinates are estimated using the average of all the GNSS measures.

- **Store the last measure:**

The final coordinates coincide with the last set of GNSS measures.

- **Elapsed time:**

When the counter reaches the storage time value, the point is automatically stored and the GeoGis software return to the main form.

Note - To store the point feature without waiting for the counter to reach the storage time limit, tap **OK**.

- **Estimated XY and Z error:**

It is an estimated error on the current set of measures.

- **Max tolerance:**

The storing will be stopped if the predicted accuracy is beyond the indicated values.

See [General Preferences– Info/Controls, page 15](#)

- **Planimetric coordinates:**

Show the planimetric coordinates of the point feature, according with the local coordinate system (Datum and Projection)

See [GPS settings– Coordinate system, page 13](#)

- **Database**

Associate attributes, pictures and documents to the point feature.

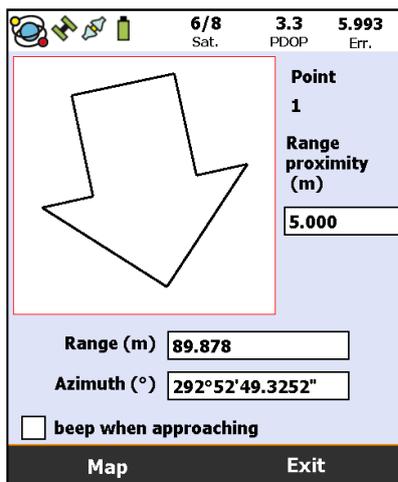
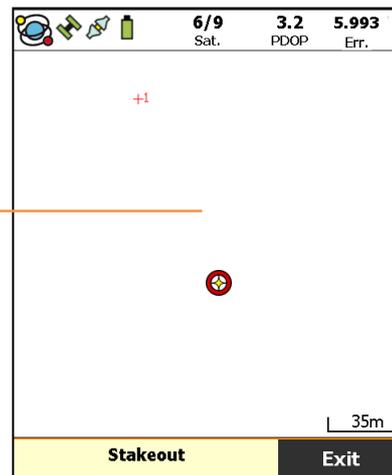
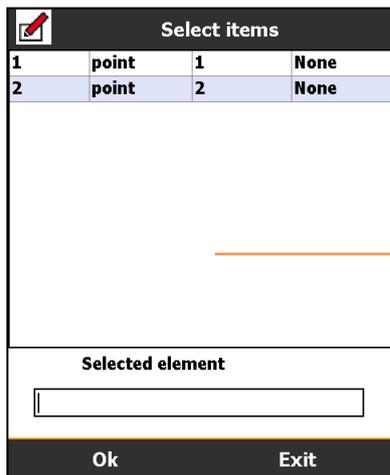
See [Database, page 22](#)

Tip - To save time, you can compile attributes while the GeoGis software is collecting the point feature.

3.1.2. Stakeout

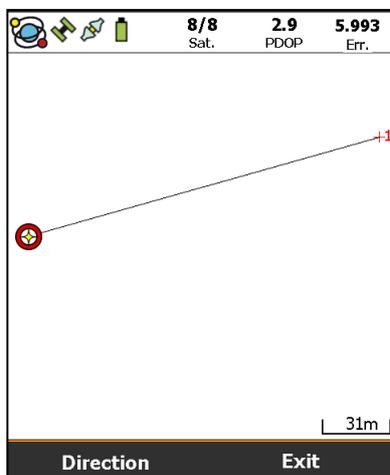
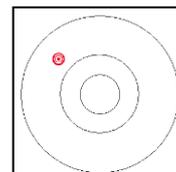
To perform stakeout, the GeoGis software asks to select the point feature to trace. Selection may occur in two ways:

- selection with stylus
- selection from the list of the stored features



Follow the arrow to approaching the point to be staked:

- **Range proximity (m):**
Indicates the distance from the point at which the directional arrow is replaced by the target screen, to allow a more accurate search of the point feature.
- **Range (m):**
Indicates the distance from the point feature.
- **Azimuth (°):**
It is the angular distance between the direction of the North and the direction in which the perpendicular falls to a point on the horizon, calculated moving clockwise.
- **beep when approaching:**
A beep sounds when you enter in the proximity range:

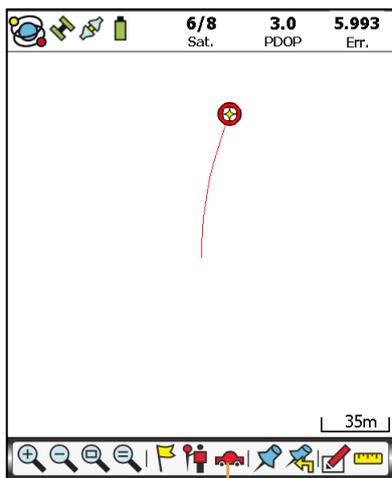
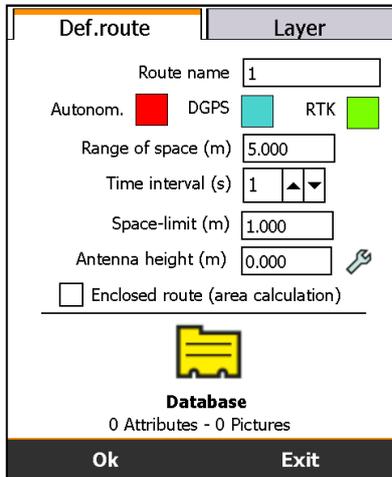


Tap **Map** to display the graphical display: the target feature point and the current GNSS position are connected by a line.

Tap **Direction** to go back to the directional arrow screen.

3.1.3. GNSS path

Use the *Def. Route* panel to set the graphic features, the attributes of the route and start tracking the GNSS path. If the receiver is not connected, the route cannot be started.



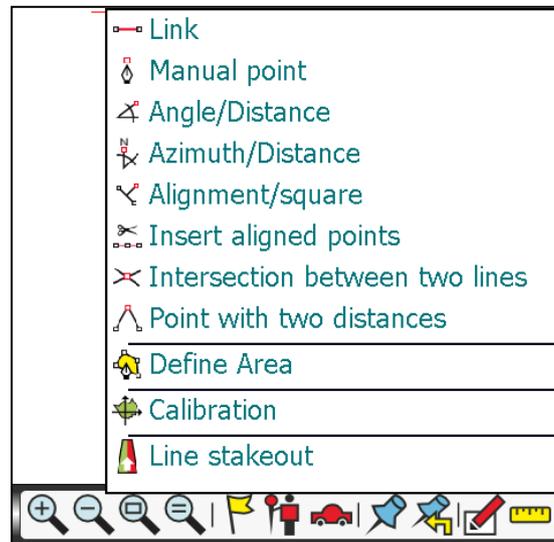
To complete the current route, tap again the icon in the toolbar.

- **Layer:**
See [General Preferences, page 15](#)
 - **Route name:**
The route name.
 - **Autonomous, DGPS, RTK colors:**
The path can be drawn in different colors depending on the presence and type of the differential correction source.
 - **Time interval (s):**
Frequency of the GNSS measurements.
 - **Range of space (m):**
Minimum distance between the GNSS measures.
- Note – The Time interval and the Range of space are complementary values: you can use both or just one of them (in this case, set to zero the parameter you don't want to use).*
- **Space-limit:**
During a route, the GeoGis software records GNSS positions according to the *Space-limit* value (sec.) or according to the *Range of space* value (m).
Set a *Space limit* value to avoid recording GNSS measures in excess: for example when you stand still or when you move at low speed.
 - **Antenna height (m):**
Set and modify the antenna height.
 - **Enclosed route (area calculation):**
When a route is completed, the contour line is closed creating a feature with inner area.
 - **Database**
Associate attributes, pictures and documents to the route.
See [Database, page 22](#)

Tip - When the route function is active, GeoGis is still able to store GPS points: the route tracking is hanged during the point measure and automatically resumed at the end of the measurement.

3.1.4. Calculation functions

Below are listed the calculation functions of the GeoGis software:



- **Link:** join two selected point with a line.
- **Manual point:** enter a manual point feature.
- **Angle/Range:** calculates a point defined by an angle and distance. The angle is defined by the orientation between two selected points (positive clockwise, negative counterclockwise).
- **Azimuth/Range:** calculates a point defined by distance and azimuth.
- **Alignment/square:** calculates a point defined by distance and angle. Define an alignment between two points: starting from the first edge, define a direction through angle and distance (angle is defined by the initial alignment). The square is defined by distance, traced with a 90 degree angle, away from the edge of the previous distance.
- **Insert aligned points:** calculates a series of aligned and equally spaced points, defined by the alignment of the edges and the number of parts.
- **Intersection between two lines:** calculate the intersection of two lines.
- **Point with two distances:** calculates the intersection of the distances traced by two points.
- **Define Area:** defines the inner area of a closed contour.
- **Calibration:** procedure of georeferencing or site calibration.
- **Line stakeout:** function to perform line stakeout.

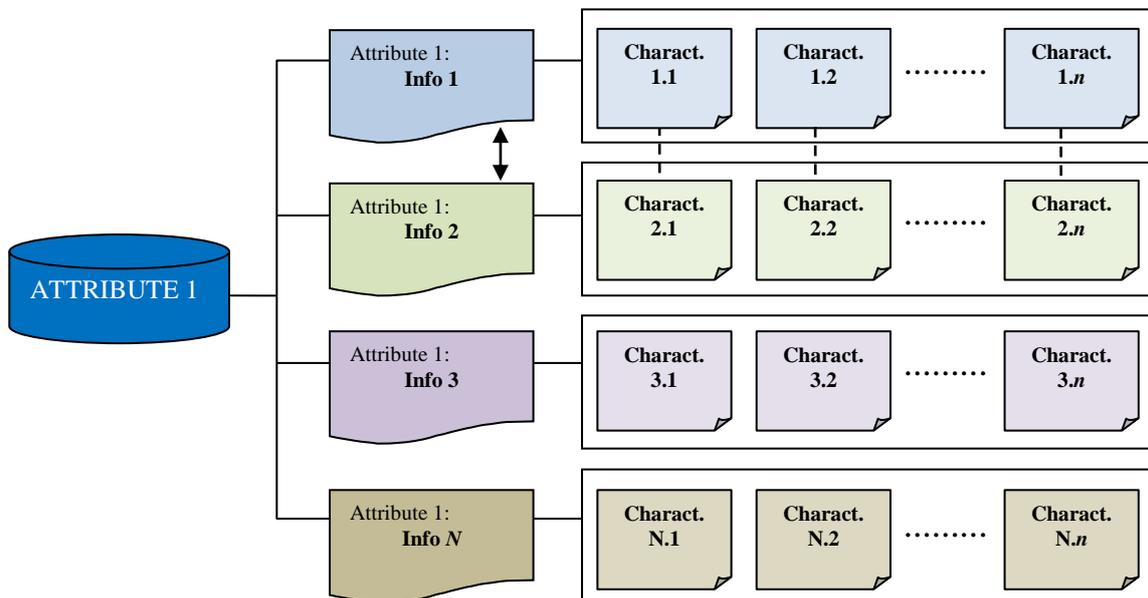
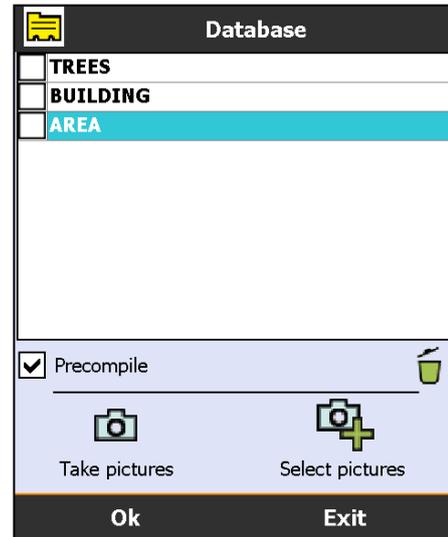
3.2. Database

The Database feature of the GeoGis software allows you to assign attributes, pictures and documents to the features.

3.2.1. Add attributes to the database

Each attribute (eg: trees, building, area, etc.) can be composed of much information each information can be associated with several characteristics, according to the following scheme:

Note – To create attributes use the GeoGis Office software (Attributes manager module). The GeoGis Office software is bundled with the GeoGis software.



You can also create links between several information.

E.g: if a link between **Info 1** and **Info 2** is set (double-headed arrow), the content of *Info 1* is related to the content of *Info 2* and vice versa in the hierarchy indicated by the dotted lines.

This feature allows you to save time during the compilation of the attributes and create secure connecting link between data.

3.2.2. Add pictures to the database

The GeoGis software allows you to add pictures to the database associated with the survey features.

If the handheld is equipped with digital camera, just tap the *Take pictures* icon to take pictures.

To add pictures to the database, just tap the *Select pictures* icon and chose the pictures from the preview screen.

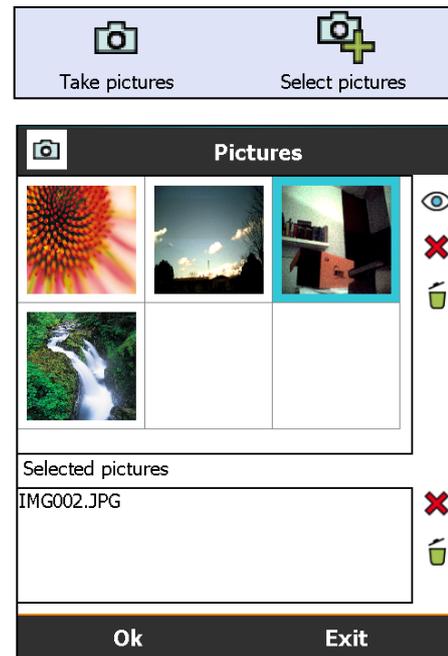
Tap **OK** to add the selected pictures to the database.

Pictures taken with embedded handheld digital camera are usually stored in the Windows Mobile picture folder (\My Documents\My Pictures).

To correctly display images preview with the GeoGis software, the resolution of the pictures must be less than 1600x1200 pixel.

If you change the storage path on the Windows Mobile handheld, remember to update the GeoGis **Pictures** folder as well.

See [General Preferences – program folders](#), page 15.



Tutorial 1: Save GPS point feature then add attribute and picture

The following example will illustrate the operational steps to perform the more traditional GPS surveying of a point feature, with the later addition of attribute and picture.

1. Connect the GNSS receiver and wait for the fix of at least 4 satellites
2. Start GPS measure
3. Add informative attribute
4. Add digital picture (previously acquired)
5. Save GPS point feature

Note – The sequence of the steps above is intended as a reference guide.

In particular, since the storage of GPS point feature (step 2) and the insertion of attributes and images (points 3 and 4) are three independent processes, the workflow can change to meet the requirements.

Step 1: Connect the GNSS receiver and wait for the fix of at least 4 satellites

From GeoGis main menu, tap **Active GPS** and wait for the time required to fix the satellites (minimum of 4 satellites).

See [GPS settings – GPS manager, pag. 13](#) for the correct setting of the GNSS receiver.



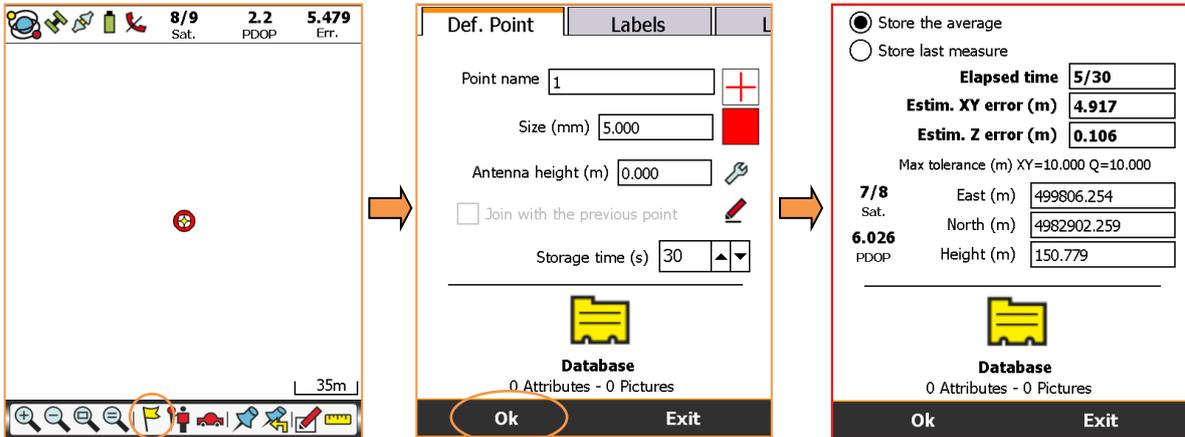
Once connected, GeoGis shows the GPS coordinates table with the geographic and cartographic coordinates of the current GPS position and information about Datum and map projection. Tap OK to go back to the map display.

See [GPS settings – Coordinate system, pag. 13](#) to set the reference system.

Step2: Start GPS measure

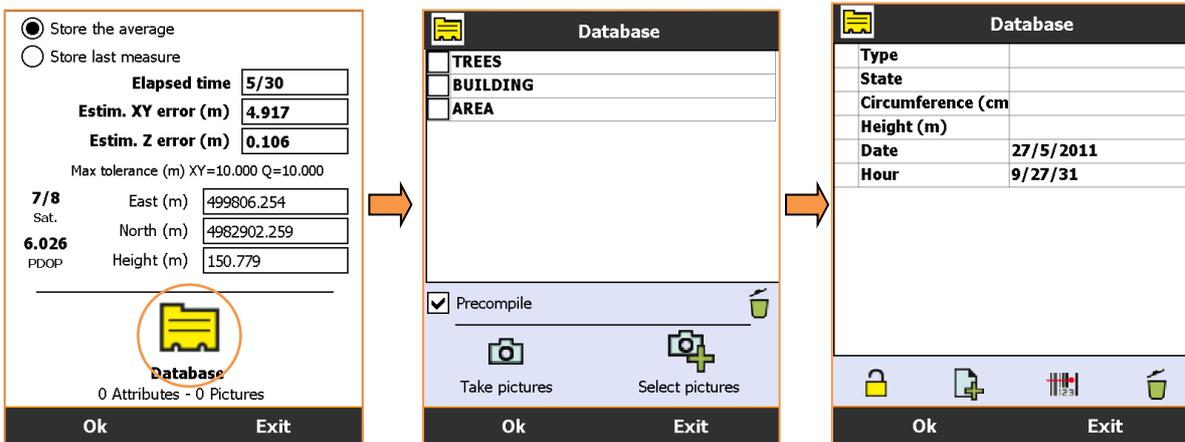
Tap the **Log point feature** icon.

Enter the point name (if you want to change the numerical order), define the graphic features, the antenna height (if you use external antenna) and the length of the measurement cycle (Storage time). Tap **OK** to start the measure.

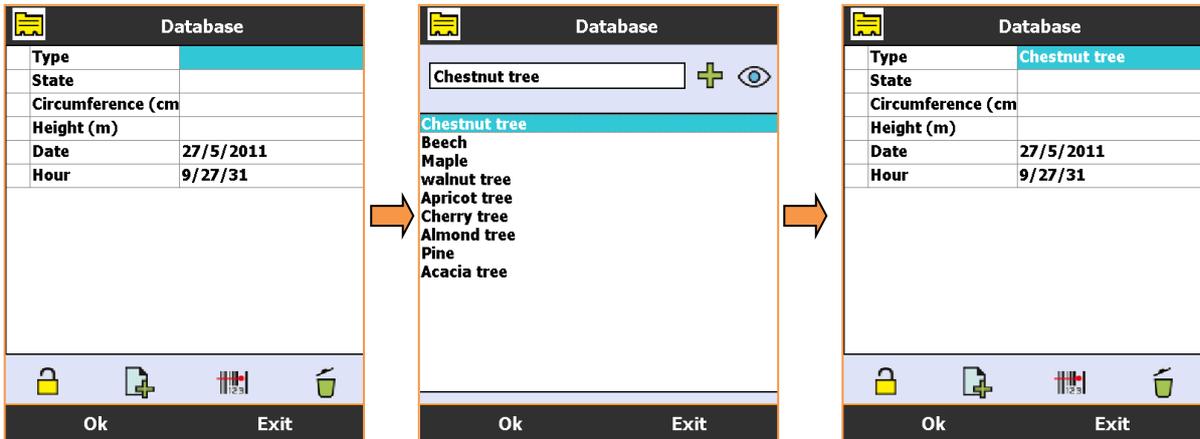


Step 3: Add informative attribute

Tap **Database** to add one or more attributes, while the GPS point feature is being measured. Select an attribute to view its contents.



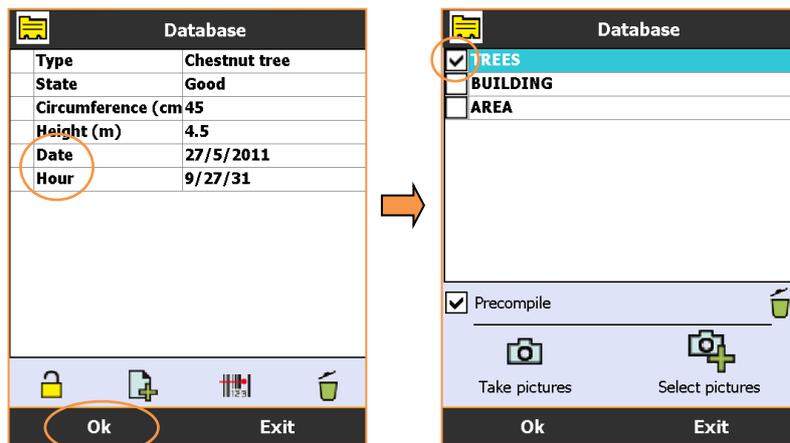
Click in the blank fields to enter values or choose them from a list.
Click **OK** to confirm the attribute.



Repeat the input of the remaining values of the attribute.

The **Date** and **Time** fields are automatically filled by the program and can be left empty.

Tap **OK** to go back to the attributes list, the presence of the flag (shown) indicates that the attribute has been filled.

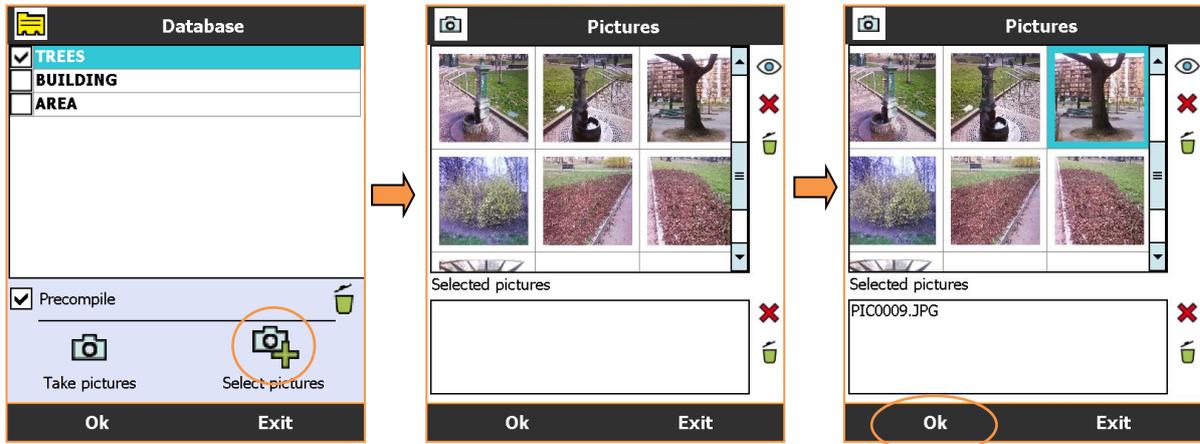


Note – For each GPS point feature (and for every graphic item) you can associate several attributes. Repeat Step 3 to add more attributes.

Step 4: Add digital picture

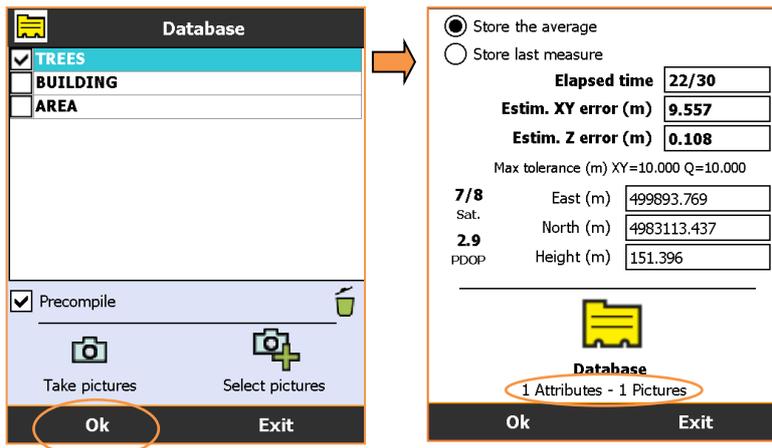
Tap **Select pictures**.

Select the picture from the preview screen and tap **OK**.



Tap **OK** to go back to the GPS storage screen.

The program highlight the presence of a database containing one attribute and one picture.



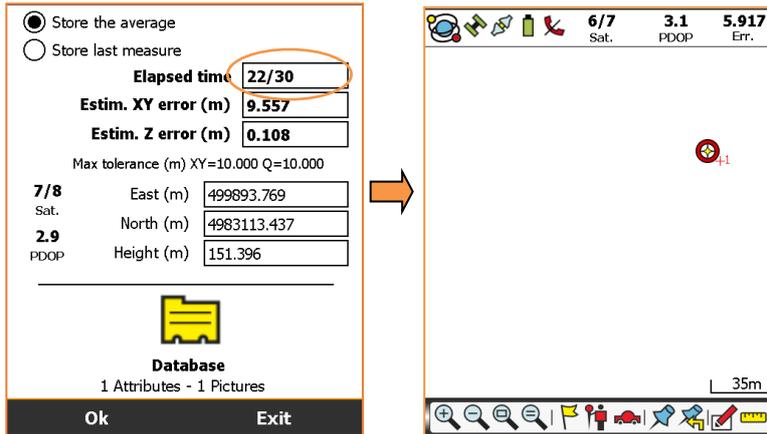
Note – For each GPS point feature (and for every graphic items) you can associate several pictures. Repeat Step 4 to add more pictures.

Step 5: Save GPS point feature

The GPS point feature can be saved in two ways.

Automatic mode:

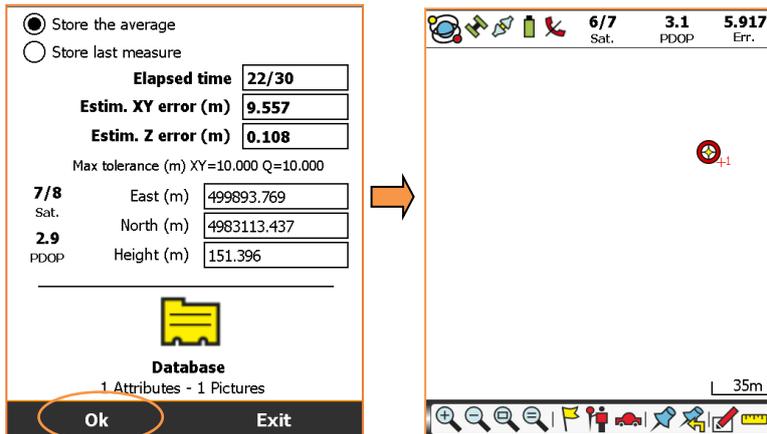
At the end of the measurement cycle (elapsed time=storage time) the GPS point feature is automatically stored.



If Step 3 and 4 requires longer time than the memorization of the GPS point (elapsed time > storage time), the measurement cycle is extended till the Database completion.

Manual mode:

At any moment tap **OK** to save the GPS point without wait the end of the measurement cycle.



Tutorial 2: Save GPS point feature then add a picture using internal camera

The following example will illustrate the operational steps to perform the more traditional GPS surveying of a point feature, with the later addition of a picture taken with the internal digital camera of the handheld.

1. Connect the GNSS receiver and wait for the fix of at least 4 satellites
2. Prepare the GPS point feature
3. Take a picture and add it to the Database (with internal digital camera)
4. Save GPS point feature

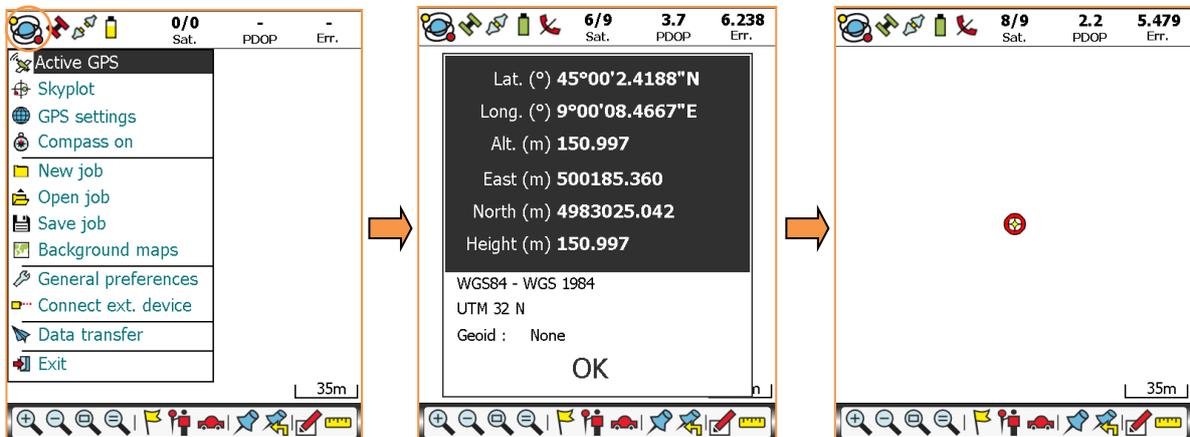
Note – The sequence of the steps above is intended as a reference guide.

In particular, since the setting of GPS point feature (step 2) and the insertion of pictures (points 3) are two independent processes, the workflow can change to meet the requirements.

Step 1: Connect the GNSS receiver and wait for the fix of at least 4 satellites

From GeoGis main menu, tap **Active GPS** and wait for the time required to fix the satellites (minimum of 4 satellites).

See [GPS settings – GPS manager, pag. 13](#) for the correct setting of the GNSS receiver.



Once connected, GeoGis shows the GPS coordinates table with the geographic and cartographic coordinates of the current GPS position and information about Datum and map projection.

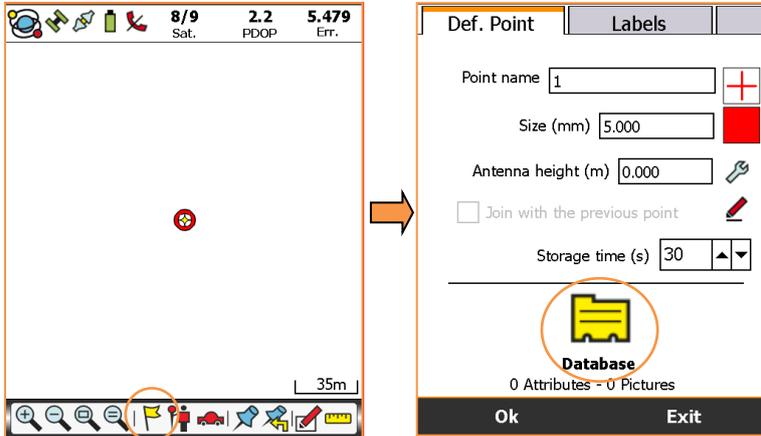
Tap **OK** to go back to the map display.

See [GPS settings – Coordinate system, pag. 13](#) to set the reference system.

Step 2: Prepare the GPS point feature

Tap the **Log point feature** icon.

Enter the point name (if you want to change the numerical order), define the graphic features, the antenna height (if you use external antenna) and the length of the measurement cycle (Storage time). Tap **Database**.



Step 3: Take a picture and add it to the Database

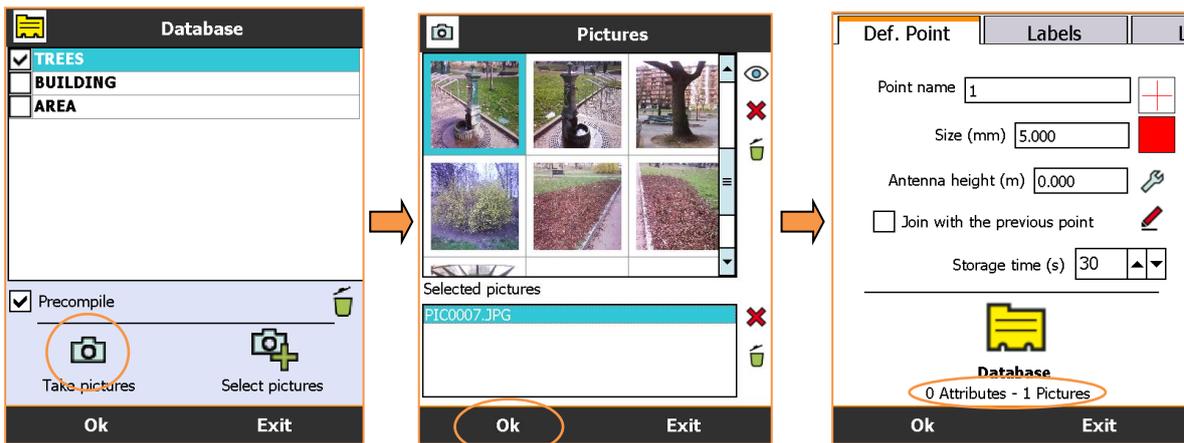
Tap **Take picture** to activate the integrated digital camera.

Frame and take a picture.

GeoGis save the *jpg* file and displays it the preview screen.

Tap **OK** and then **OK** again.

The program highlight the presence of a database containing one picture.



Note – For each GPS point feature (and for every graphic items) you can associate several pictures. Repeat Step 2 to add more pictures.

Step 4: Save GPS point feature

Tap **OK** to start the storage.

Def. Point Labels

Point name 1

Size (mm) 5.000

Antenna height (m) 0.000

Join with the previous point

Storage time (s) 30

Database
0 Attributes - 1 Pictures

Ok Exit

Automatic mode:

At the end of the measurement cycle (elapsed time=storage time) the GPS point feature is automatically stored.

Store the average
 Store last measure

Elapsed time 3/30

Estim. XY error (m) 4.016

Estim. Z error (m) 0.247

Max tolerance (m) XY=10.000 Q=10.000

6/7 Sat. East (m) 499809.941

3.6 PDOP North (m) 4982888.857

Height (m) 148.902

Database
0 Attributes - 1 Pictures

Ok Exit

6/7 Sat. 3.1 PDOP 5.917 Err.

35m

Manual mode:

At any moment tap **OK** to save the GPS point without wait the end of the measurement cycle.

Store the average
 Store last measure

Elapsed time 3/30

Estim. XY error (m) 4.016

Estim. Z error (m) 0.247

Max tolerance (m) XY=10.000 Q=10.000

6/7 Sat. East (m) 499809.941

3.6 PDOP North (m) 4982888.857

Height (m) 148.902

Database
0 Attributes - 1 Pictures

Ok Exit

6/7 Sat. 3.1 PDOP 5.917 Err.

35m

Tutorial 3: Create closed outline and area calculation

The following example will illustrate the operational steps to perform an area calculation, with the creation of a closed outline made of GPS points and lines.

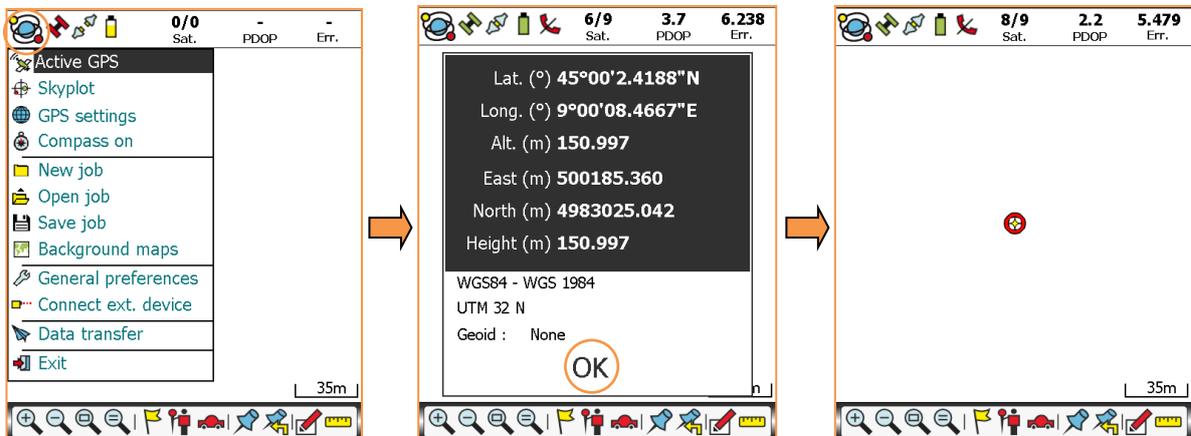
1. Connect the GNSS receiver and wait for the fix of at least 4 satellites
2. Save the first GPS point of the outline
3. Save the remaining GPS points using the option “Join with the previous point”
4. Create an Area feature using the newly created boundary

Note – To create a closed outline are required at least three points.

Step 1: Connect the GNSS receiver and wait for the fix of at least 4 satellites

From GeoGis main menu, tap **Active GPS** and wait for the time required to fix the satellites (minimum of 4 satellites).

See [GPS settings – GPS manager, pag.13](#) for the correct setting of the GNSS receiver.



Once connected, GeoGis shows the GPS coordinates table with the geographic and cartographic coordinates of the current GPS position and information about Datum and map projection. Tap **OK** to go back to the map display.

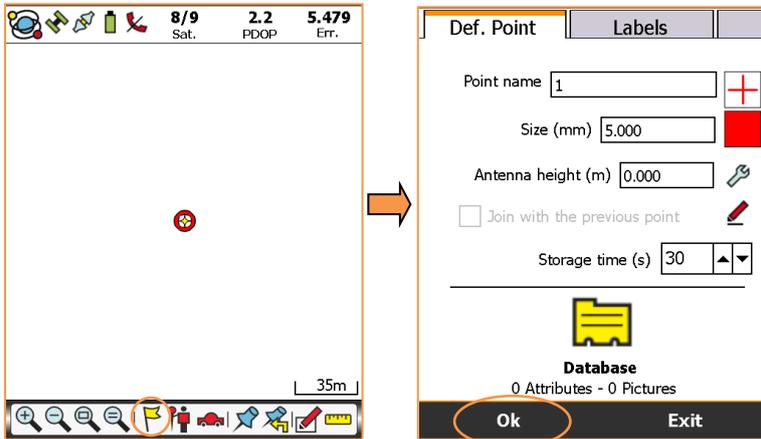
See [GPS settings – Coordinate system, pag. 13](#) to set the reference system.

Step 2: Save the first GPS point of the outline

Tap the **Log point feature** icon.

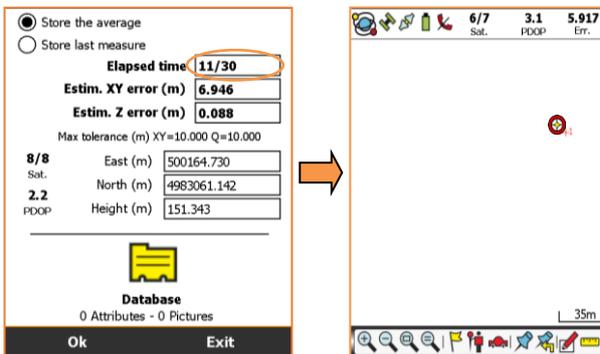
Enter the point name (if you want to change the numerical order), define the graphic features, the antenna height (if you use external antenna) and the length of the measurement cycle (Storage time).

Tap **OK** to start the measure.



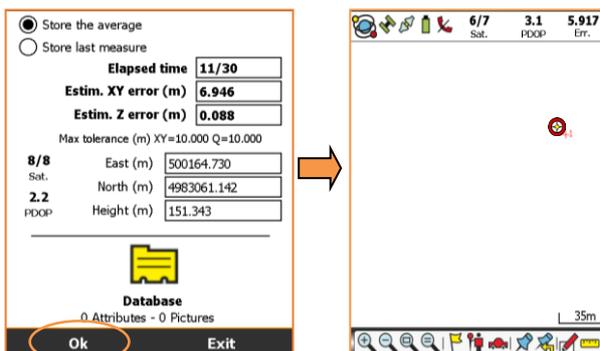
Automatic mode:

At the end of the measurement cycle (elapsed time=storage time) the GPS point feature is automatically stored.



Manual mode:

At any moment tap **OK** to save the GPS point without wait the end of the measurement cycle.



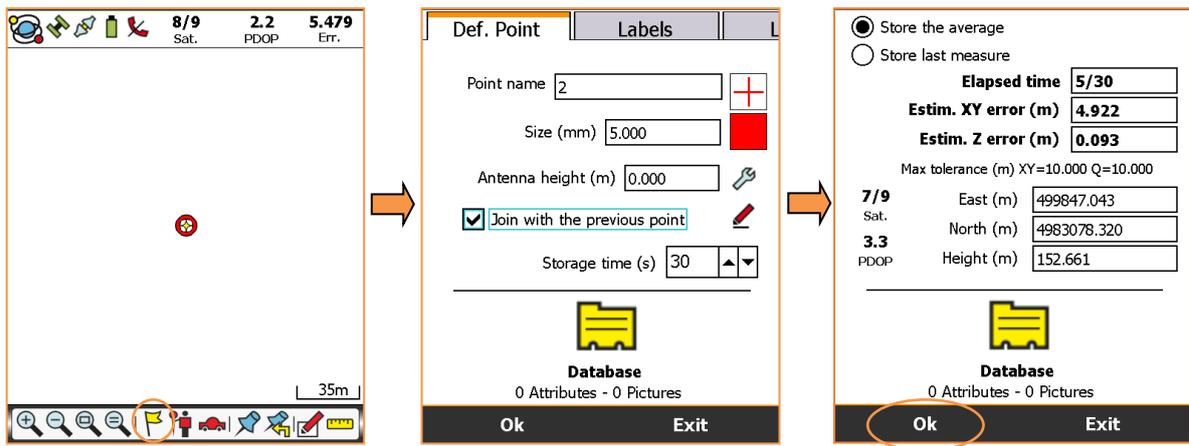
Step 3: Save the remaining GPS points using the option “Join with the previous point”

Tap the **Log point feature** icon to save the second GPS point of the contour.

Enter the point name (if you want to change the numerical order), define the graphic features, the antenna height (if you use external antenna) and the length of the measurement cycle (Storage time).

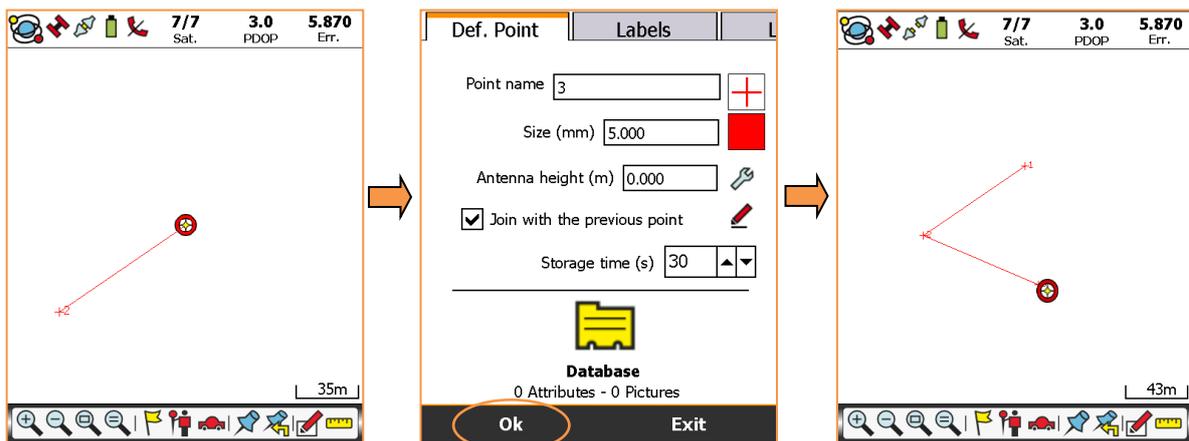
Turn on the flag **Join with the previous point**.

Tap **OK** to start the measure.



A line now joins the first and the second GPS point.

Continue with the storage of the third GPS point (repeat Step 3)



Step 4: Create an Area feature using the newly created boundary

From the third point on, you can create the element area.

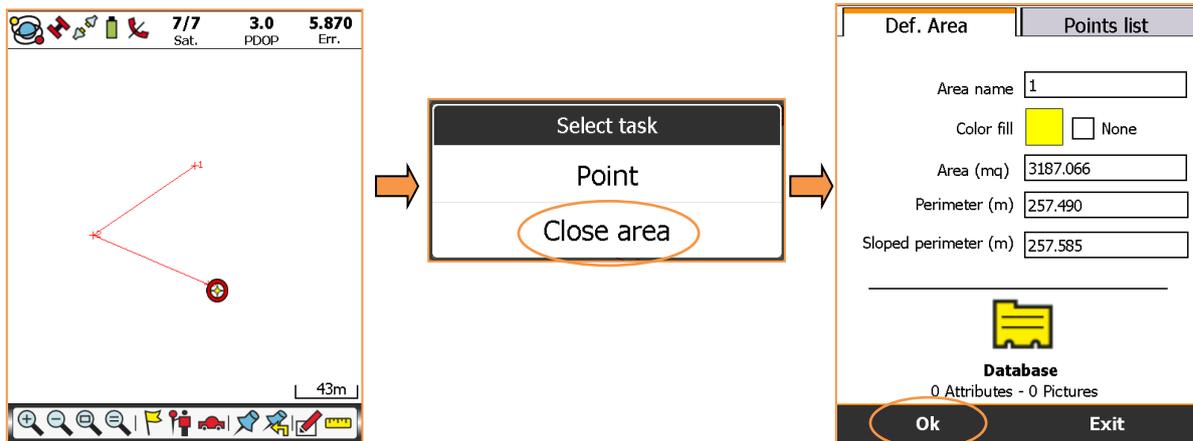
Tap the **Log point feature** icon.

GeoGIS asks if you want to store a new GPS point (Step 3) or close the area.

Tap **Close area**.

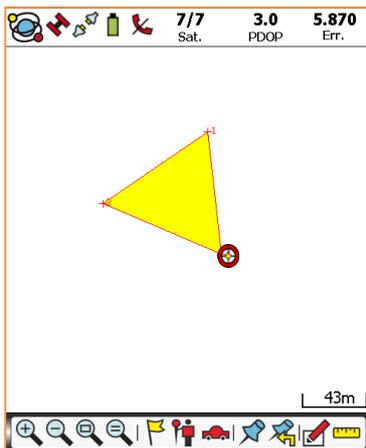
GeoGIS displays the features of the area element.

Tap **OK** to save the newly created area.



The operation creates a boundary joining the point 3 and 1 with a line.

The area feature has been created.



Tutorial 4: Calculation of area by linking points

The following example will illustrate the operational steps to perform an area calculation, with the manual linking of GPS points.

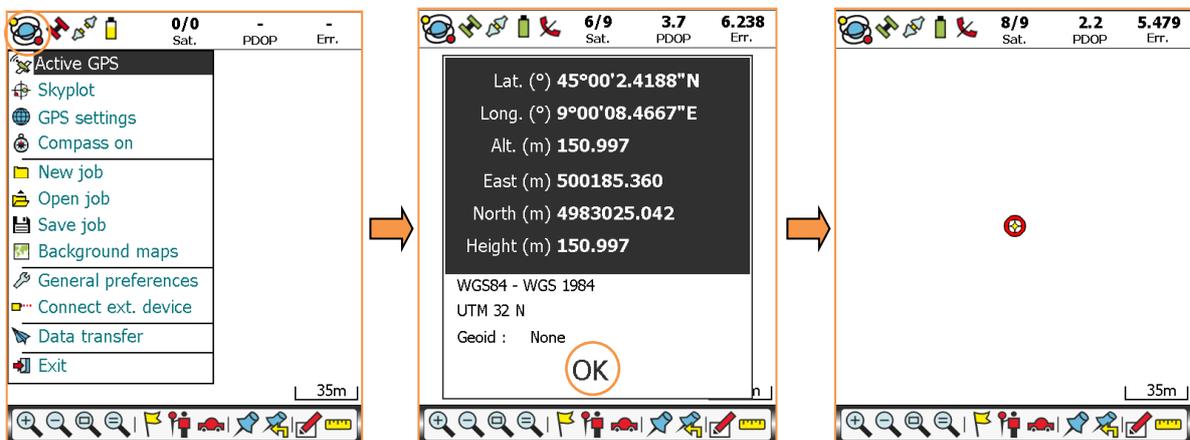
1. Connect the GNSS receiver and wait for the fix of at least 4 satellites
2. Save GPS points
3. Link GPS points with lines
4. Create an Area feature using the newly created boundary

Note – To create a closed outline there is required at least three points.

Step 1: Connect the GNSS receiver and wait for the fix of at least 4 satellites

From GeoGis main menu, tap **Active GPS** and wait for the time required to fix the satellites (minimum of 4 satellites).

See [GPS settings – GPS manager, pag. 13](#) for the correct setting of the GNSS receiver.



Once connected, GeoGis shows the GPS coordinates table with the geographic and cartographic coordinates of the current GPS position and information about Datum and map projection.

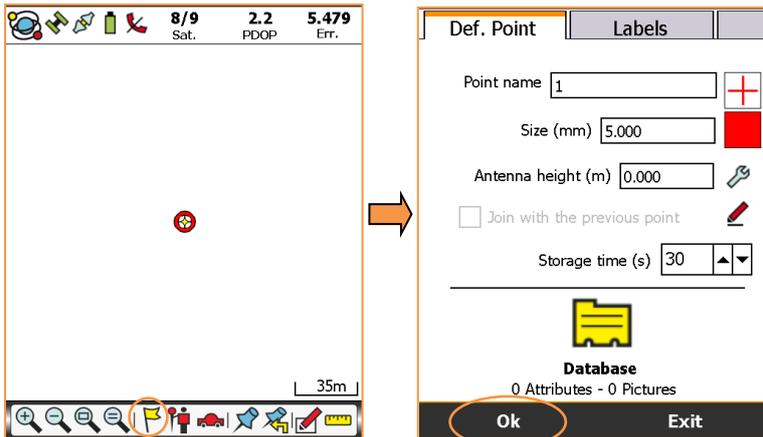
Tap **OK** to go back to the map display.

See [GPS settings – Coordinate system, pag.13](#) to set the reference system.

Step 2: Save GPS points

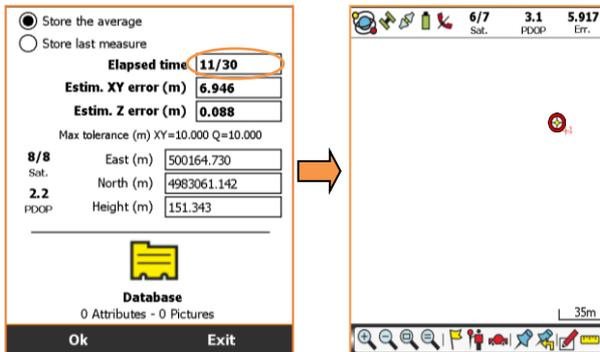
Tap the **Log point feature icon** to save the GPS points required for the area calculation (repeat Step 2 as many time as necessary).

Enter the point name (if you want to change the numerical order), define the graphic features, the antenna height (if you use external antenna) and the length of the measurement cycle (Storage time). Tap **OK** to start the measure.



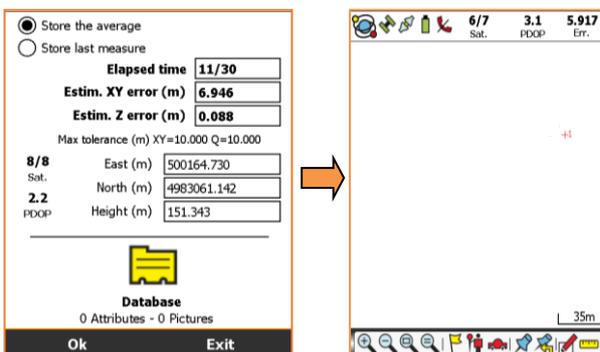
Automatic mode:

At the end of the measurement cycle (elapsed time=storage time) the GPS point feature is automatically stored.



Manual mode:

At any moment tap **OK** to save the GPS point without wait the end of the measurement cycle.



Step 3: Link GPS points with lines

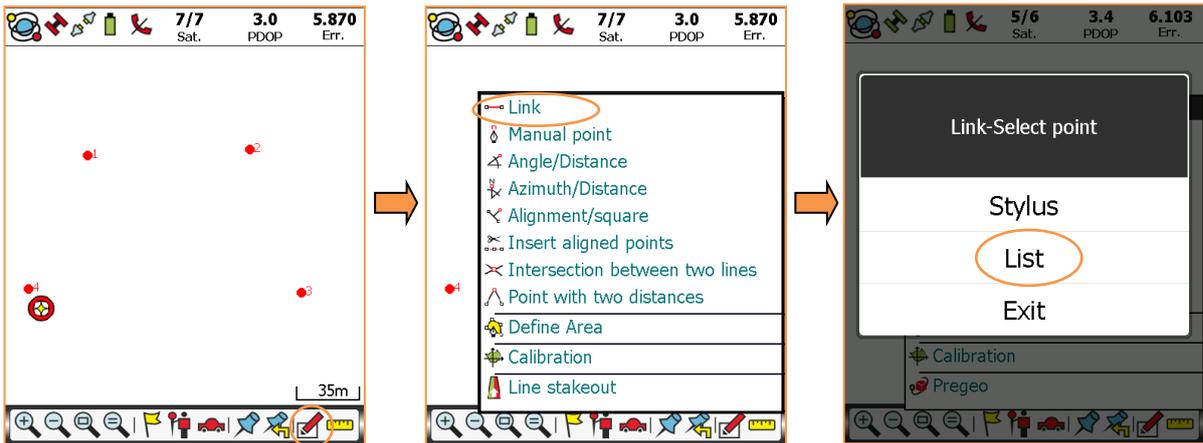
After saving the GPS points:

Tap the **Calculation functions icon**.

Tap the **Link** option.

GeoGis requires to select the linking points with the stylus or from the list.

Tap **List**.

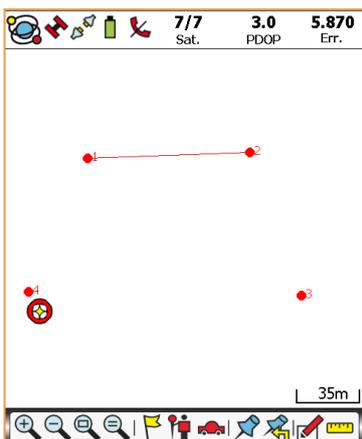
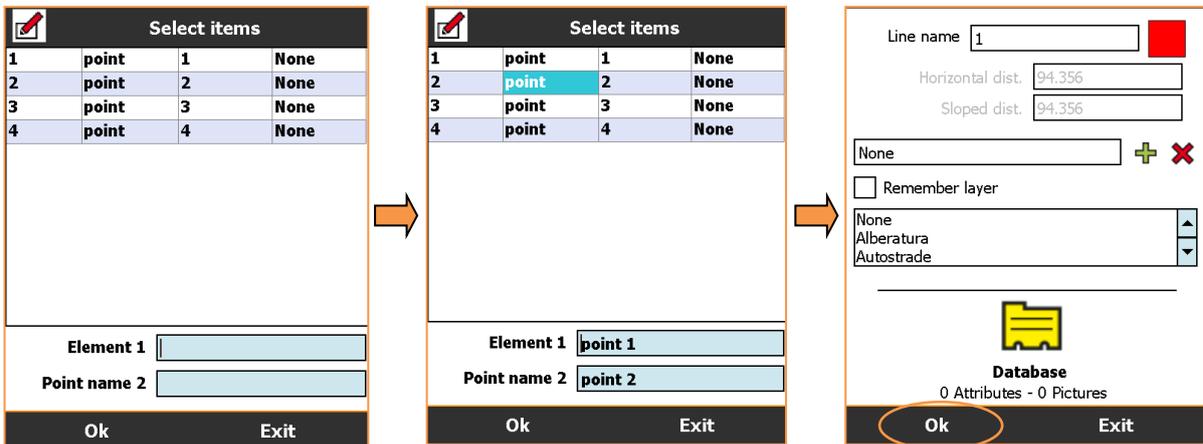


Select two linking points from the list.

Tap **OK**.

Define the line features or leave the default settings.

Tap **OK** to link the selected points.



Repeat Step 3 to link the remaining points and to create a closed boundary.

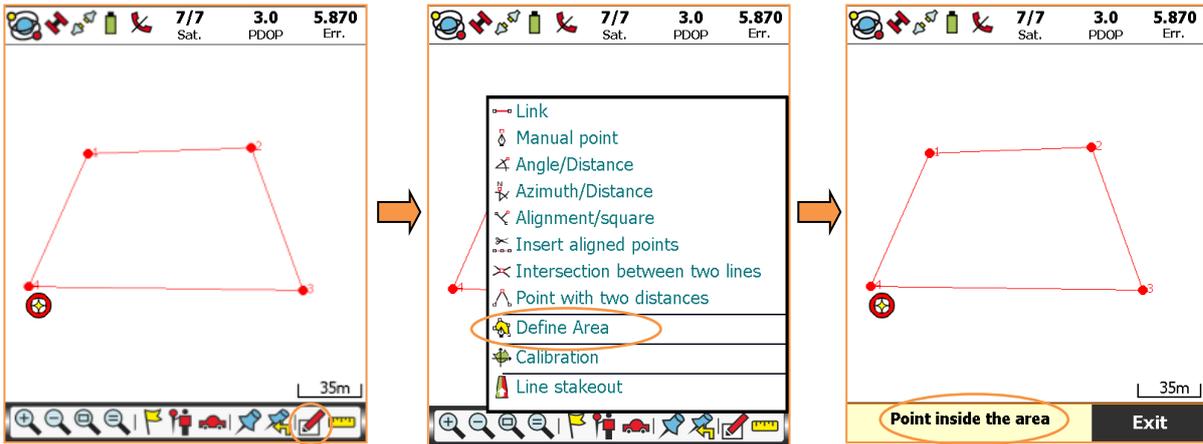
Step 4: Create an Area feature using the newly created boundary

After creating the boundary:

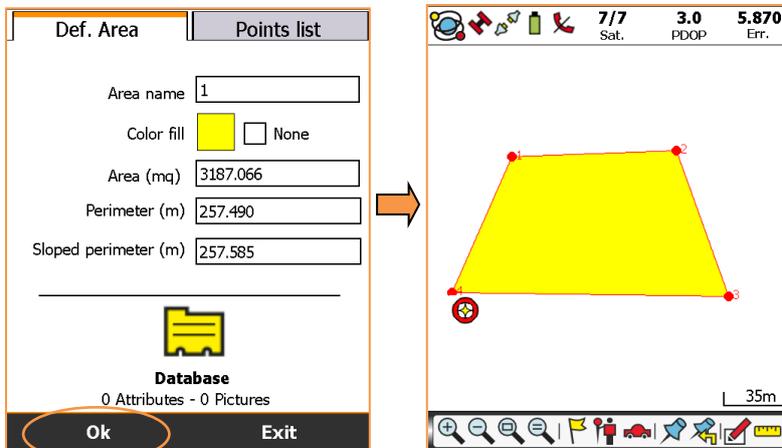
Tap the **Calculation functions icon**.

Tap the **Define Area** option.

With the stylus tap inside the closed boundary.



The Area feature has been created.



For more information, please refer to

STONEX EUROPE SRL

Website: www.stonexpositioning.com

Email: info@stonexpositioning.com