OnPOZ

Precision Positioning

Getting Started
EZSurv™ for GIS applications

© 2012 Effigis. All rights reserved.

Summary

Information

- Why post-processing ?
- Compatible data collection software
- Basic post-processing concepts

Actions TO DO ONCE

- Install and license
- Default settings
- Configure Mapping System
- Configure Options

Actions TO DO AT EVERY JOB

- Post-process data
- Analyze data
- Export GIS Features

For detailed information, refer to the User Guide under **Start > All Programs > Effigis > EZSurv Documentation**.

Why post-processing ?

- To improve the GNSS receiver accuracy.
- To obtain reliable results.
- To easily resolve the reference system alignment. By referencing your survey to a known Base Station (accurate coordinates), all your collected GIS features will automatically be referenced to the Base Station Geodetic Reference System. There is no other transformation to perform.

Compatible data collection software

GIS data, properly recorded using the following field software can be post-processed with **EZSurv™**.

GNSS Driver for ArcPad

ArcPad

OnPOZ

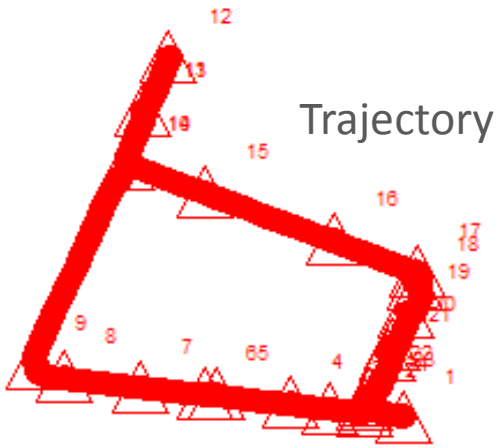
EZTag CE™

Basic post-processing concepts

In order to improve the accuracy and reliability of your GIS data with post-processing, GNSS data recorded at a reference point called **Base** Station is required. The accuracy of the positioning depends on the distance Rover-Base and the quality of the field data. Many Base Stations are available on the Internet.

EZSurv™ post-processes **trajectories**.

A **Trajectory** is created when a rover file (with raw GNSS data) is combined with a Base Station file (covering the rover file time span). GIS points, lines and polygons are automatically extracted from the trajectory positions.



Install and license

Prior to install **EZSurv™**, remove the previous version of all OnPOZ products. Two different versions cannot be installed on a same computer.

- Download your **EZSurv™** installation package and run **Setup.exe** to install it. Follow the instructions, if necessary, refer to the **User Guide** delivered with the install.

- Start **EZSurv™** application from the Windows **Start** menu, select **All Programs**, then **Effigis > EZSurv**.

- When starting the application for the first time, your license file will be updated directly from Internet. If you are not connected to Internet, you will be asked to load your license file at data import (ask your vendor to get it).

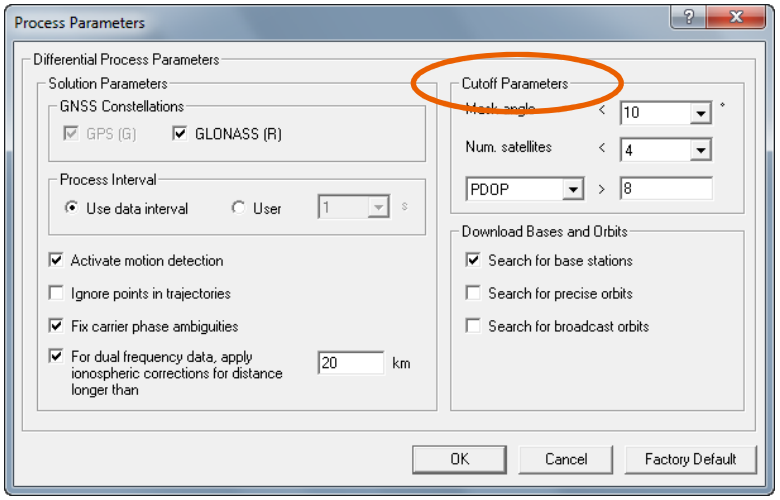
If required, set the language under **Start > All Programs > Effigis > EZSurv Language Selector**.

Default settings

When projects are closed, you can set defaults for all future projects.

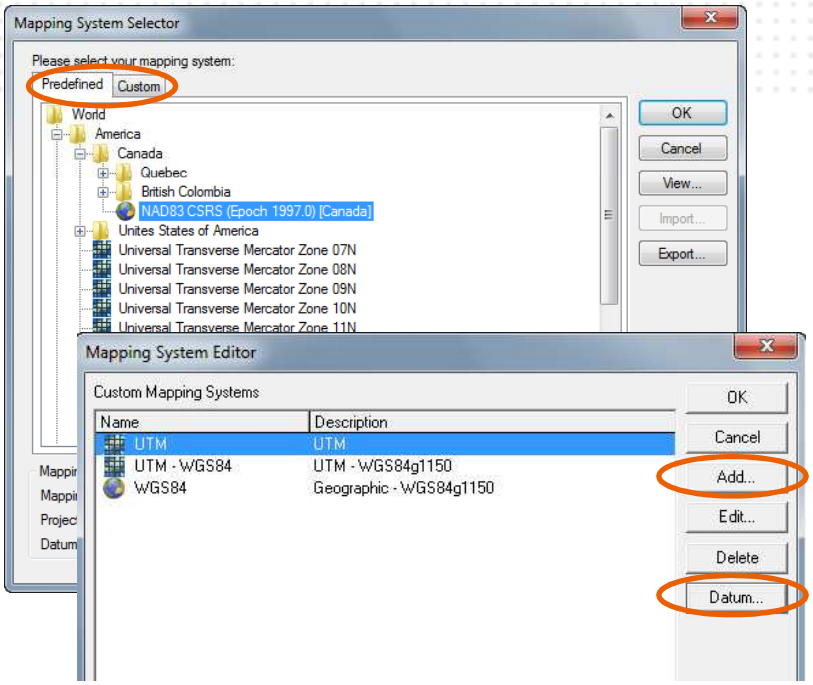
- **Close** the current project from the **File** main menu**.**
- From the **Edit Default** main menu, make sure to leave the **Processing Mode** at **Differential Positioning.** It is the most accurate mode if you have access to base station data.
- From the **Edit Default** main menu, set the default **Process Parameters**. According to your specifications, set your own process parameters (**Cutoff Parameters**) and click **OK** to save your settings.

Typically, the Factory Default values are correct for your needs.



Configure Mapping System

Users of **GNSS Driver** for ArcPad can use ESRI map projection kit instead of **EZSurv™** projection kit. **EZSurv™** will automatically use ESRI projection kit if ArcGIS is installed on the PC. Otherwise, users must configure the Mapping System.



- Select a mapping system to display your results. You can select it from a list of **Predefined** mapping systems found under **Tools > Mapping Systems > Selector…**
- If your mapping system is not in the list, you can create a **Custom** one using **Tools > Mapping Systems > Editor…** You may need to create a **Datum** prior to **Add** a mapping system. Once your mapping system is created, you can select it with **Tools > Mapping Systems > Selector…** use the **Custom** tab.

Configure Options

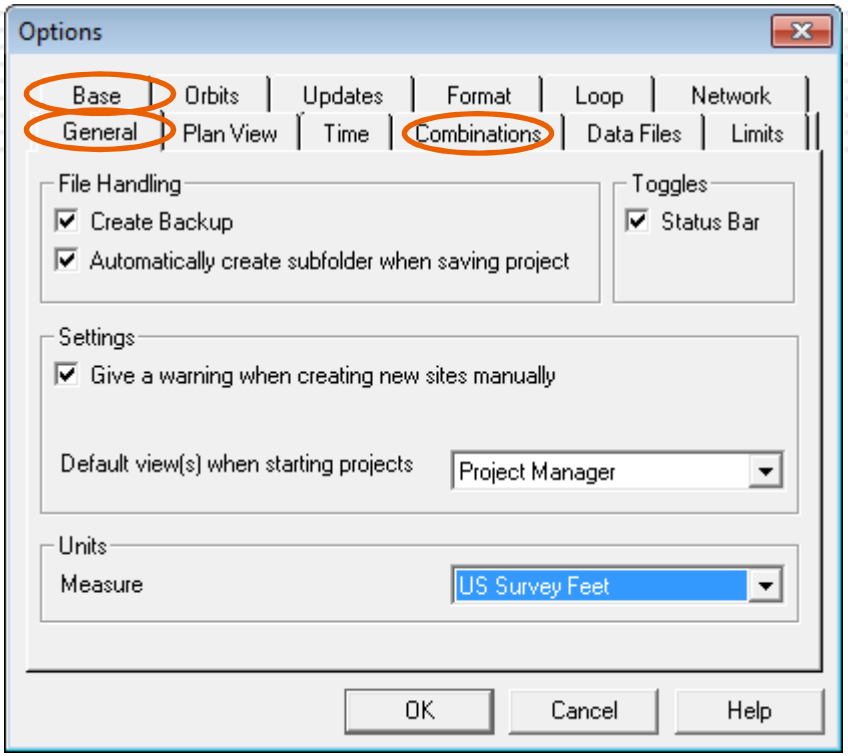
The options are kept from one project to another based on your last modifications. You access the Options through **Tools > Options**.

You must visit the 3 following tabs to better control your process:

- **General** to set unit of measure (Feet or metric).
- **Base** (explained page 9).
- **Combination** (explained page 10).

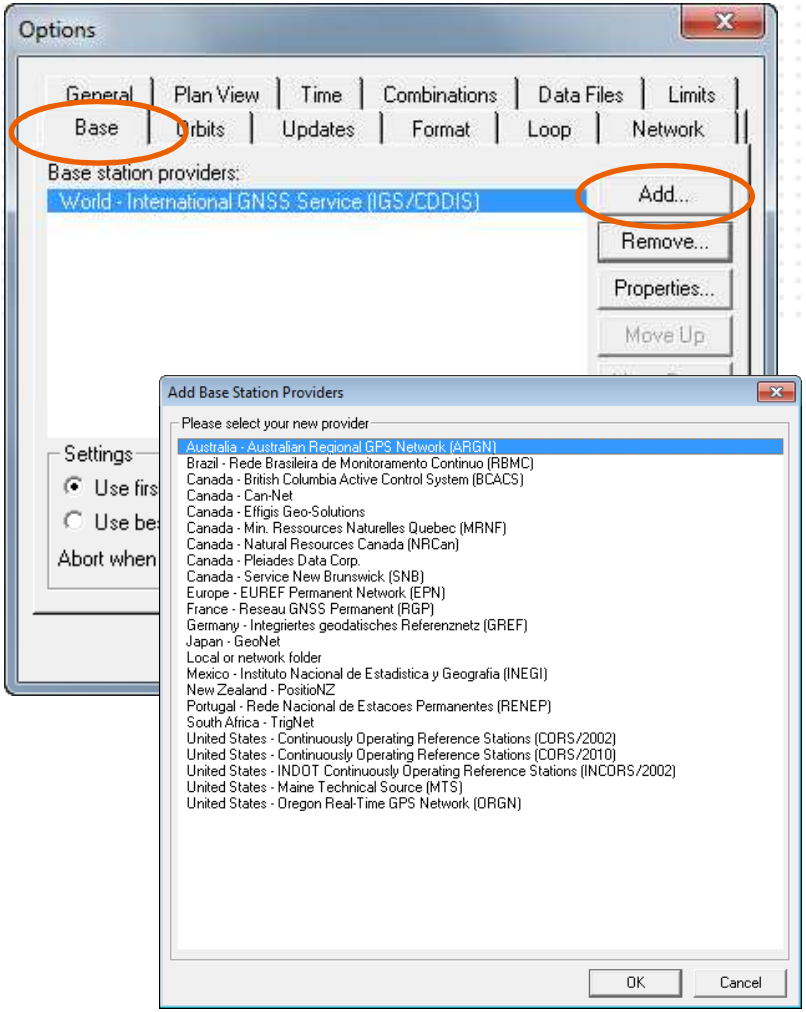
Moreover, you can visit the tabs:

- **Updates** to check or uncheck the Automatic updates (download mapping and Base station providers upgrades).
- **Plan View** to customize its layout.
- **Time** to set the time scale.



Configure Options – Base Tab

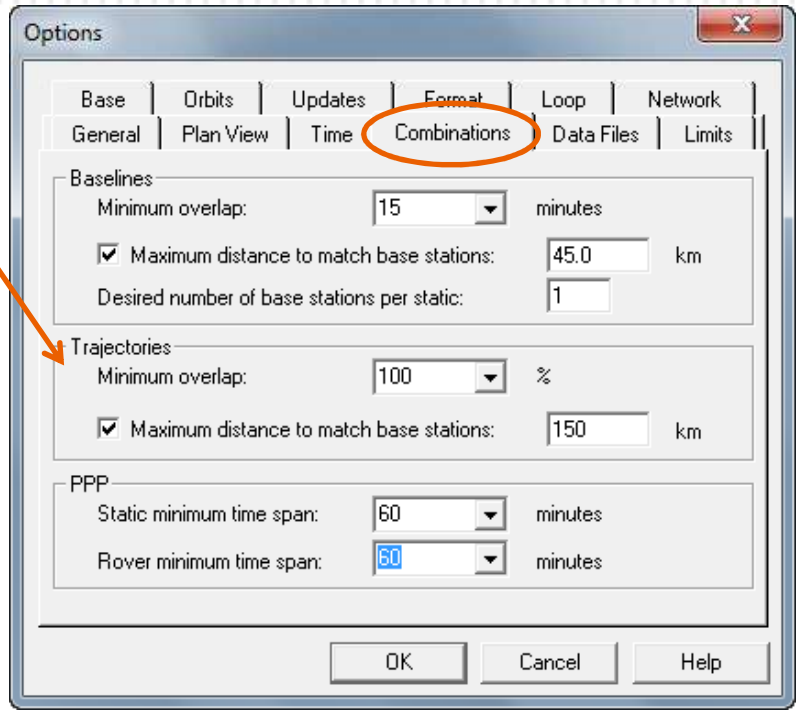
- Base networks are located worldwide. They are operated by public or private agencies (may required a subscription - user/password). **EZSurv™** has access to a lot of networks (CORS, IGS/CDDIS, etc.).
- Users must select the Base Providers that covers their area with **Tools > Options… > Base** tab **> Add**. If there is no Base Station Provider in your area, you have to set your own Base. If you have access to an unlisted Base Station Provider, let us know: onpozsupport@effigis.com
- The software finds automatically which base station fits best your field data and transfers the required files on your PC.



Configure Options – Combination tab

The accuracy of the positioning depends on the distance between the Base Station and the survey area (Rover). Using your field data, the processor generates automatically a trajectory (Base-Rover) for each rover file imported in the project. The Base Station are selected according to the distance threshold set under **Tools > Options… > Combinations**.

Input a maximum Base-Rover distance to create Trajectories. Moreover, the Base Station file time span should completely overlap the Rover file time span (otherwise some data of the Rover file will not be post-processed).

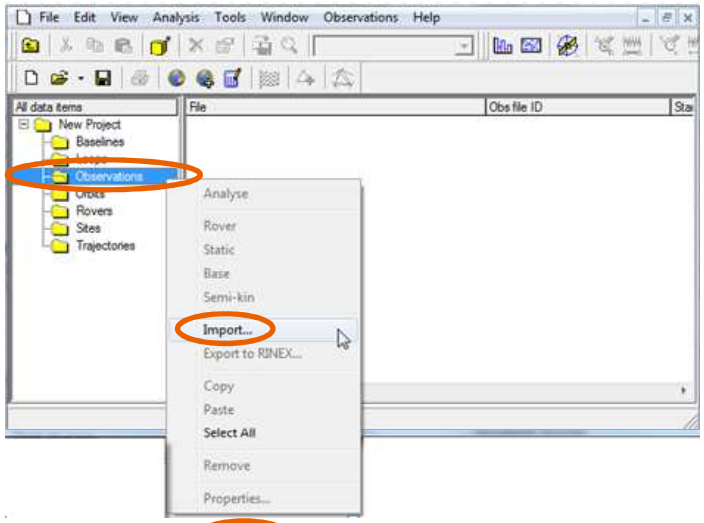


For GIS, typical tolerance should be set between 100-300 km. 100% overlap is also a typical requirement.

Post-process data (using a Base Provider)

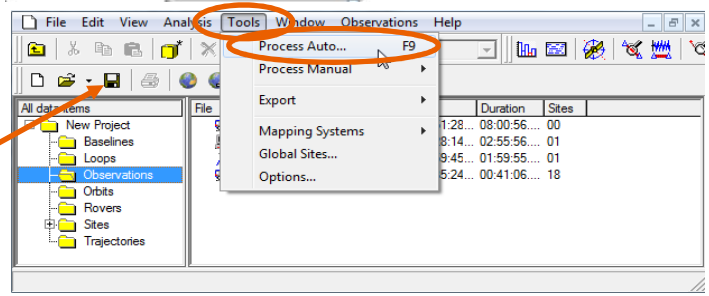
1 – IMPORT YOUR DATA

- Transfer your data files to the PC.
- Start **EZSurv™**, highlight the **Observations** folder, right click and **Import** your files (*.GPS).



2 – POST-PROCESS YOUR DATA

- Select **Process Auto…** from the **Tools** menu. The following tasks are performed:
  - ✓ Download and retrieve Base data
  - ✓ Merge Bases (if required)
  - ✓ Define Combinations (trajectories)
  - ✓ Process the Data
  - ✓ Display the Process Summary



3 – SAVE YOUR RESULTS

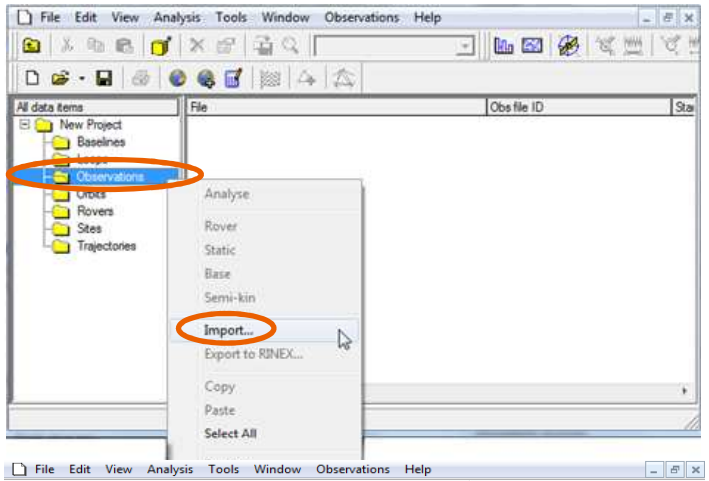
- Select **Save** from the **File** menu to update your files with post-processed positions.

When post-processing, the original files are copied with a ***_RT1.*** suffix.

Post-process data (using your own Base Station)

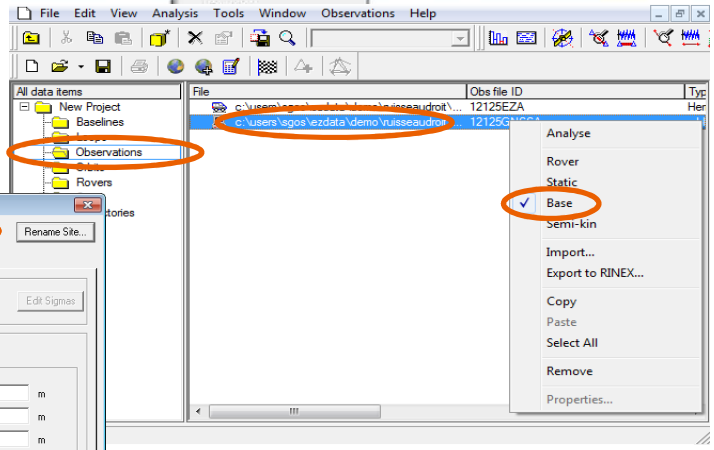
1 – IMPORT YOUR DATA

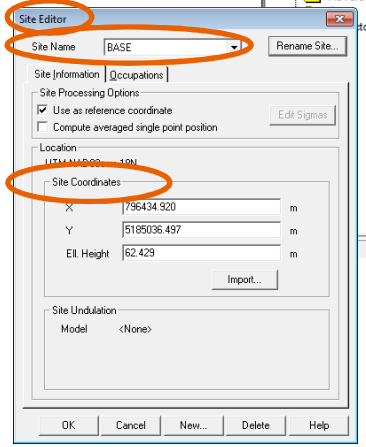
- Transfer your data files to the PC.
- Start **EZSurv™**, highlight the **Observations** folder, right click and **Import** your Rover files (*.GPS) and Base file (could be RINEX).



2 – CONFIGURE THE BASE STATION

- On the right side of the screen (**Observations** folder), highlight your Base file, right click and select **Base**.
- Open the **Site Editor** with **Edit > Site...** Select the Base Station with the **Site Name** dropdown. Input the Base **Site Coordinates** in the proper mapping system.

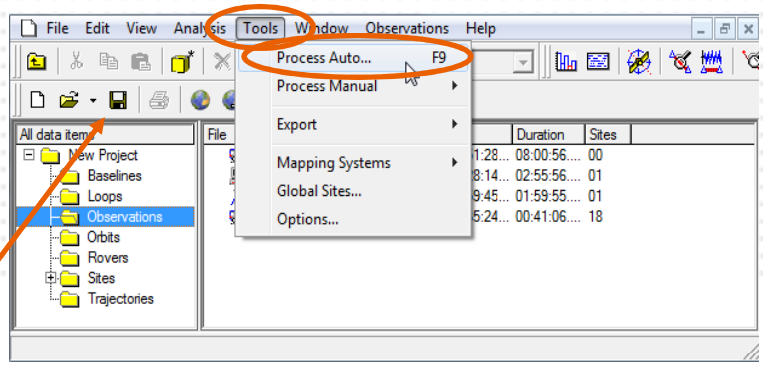




Post-process data (using your own Base Station)

3 – POST-PROCESS YOUR DATA

- Select **Process Auto…** from the **Tools** menu.
  The following tasks are performed:
  - ✓ Merge Bases (if required)
  - ✓ Define Combinations (trajectories)
  - ✓ Process the Data
  - ✓ Display the Process Summary



4 – SAVE YOUR RESULTS

- Select **Save** from the **File** menu to update your files with post-processed positions.

When post-processing, the original files are copied with a ***_RT1.*** suffix.

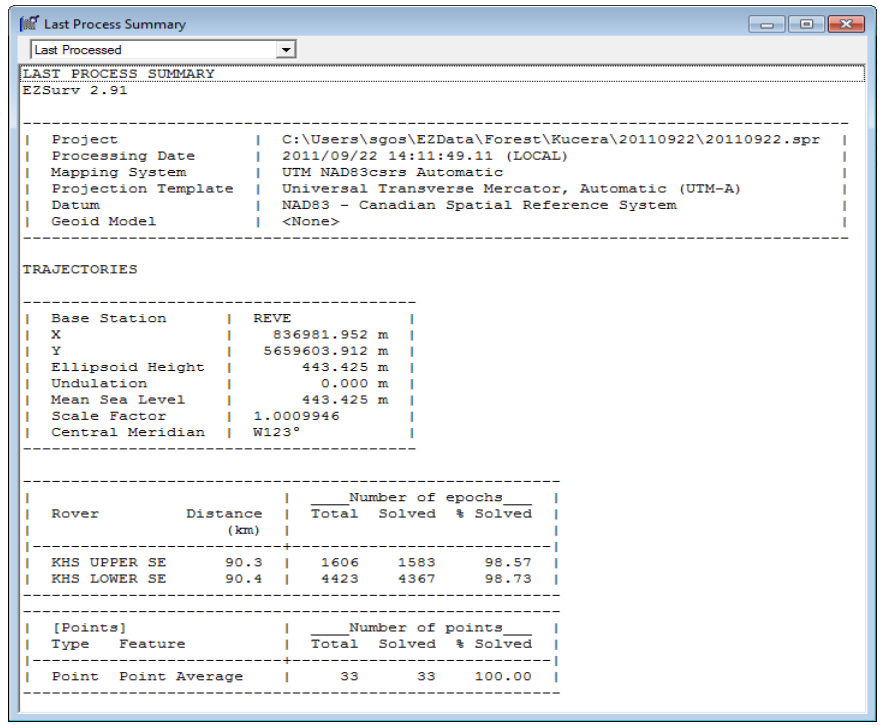
EZSurv™ for GIS – To do at every job

Analyze data

Analysis > Process Summary

The **Process Summary** is automatically displayed after post-processing. It provides the following information:

- Information on the project
- Information on the Base Station used
- List of rover files processed
- Features available in the data




```
LAST PROCESS SUMMARY
EZSurv 2.91

-----------------------------------------------------------------------------------------
|  Project                |  C:\Users\sgos\EZData\Forest\Kucera\20110922\20110922.spr  |
|  Processing Date        |  2011/09/22 14:11:49.11 (LOCAL)                            |
|  Mapping System         |  UTM NAD83csrs Automatic                                   |
|  Projection Template    |  Universal Transverse Mercator, Automatic (UTM-A)          |
|  Datum                  |  NAD83 - Canadian Spatial Reference System                 |
|  Geoid Model            |  <None>                                                    |
-----------------------------------------------------------------------------------------

TRAJECTORIES

-----------------------------------------
|  Base Station      |  REVE            |
|  X                 |    836981.952 m  |
|  Y                 |   5659603.912 m  |
|  Ellipsoid Height  |       443.425 m  |
|  Undulation        |         0.000 m  |
|  Mean Sea Level    |       443.425 m  |
|  Scale Factor      |  1.0009946       |
|  Central Meridian  |  W123°           |
-----------------------------------------

-------------------------------------------------------
|                          |  ____Number of epochs___  |
|  Rover          Distance |  Total  Solved  % Solved  |
|                    (km)  |                           |
|-----------------------------------------------------|
|  KHS UPPER SE      90.3  |   1606    1583     98.57  |
|  KHS LOWER SE      90.4  |   4423    4367     98.73  |
-------------------------------------------------------
-------------------------------------------------------
|  [Points]                |  ____Number of points___  |
|  Type   Feature          |  Total  Solved  % Solved  |
|-----------------------------------------------------|
|  Point  Point Average    |     33      33    100.00  |
-------------------------------------------------------
```

Select **Archive project** from the **File** menu to save your post-processing project into one file.

Analyze data

Analysis > GIS Feature Summary

You can view the features position along with their post-processed accuracy.

GIS Feature Summary

KHS LOWER SE | All | C:\...\EZData\Forest\Kucera\20110922\DATA1\khs lower sept 20.tag

KHS LOWER SE | C:\Users\sgos\EZData\Forest\Kucera\20110922\DATA1\khs lower sept 20.tag | EZTag CE 2.87.1260.00

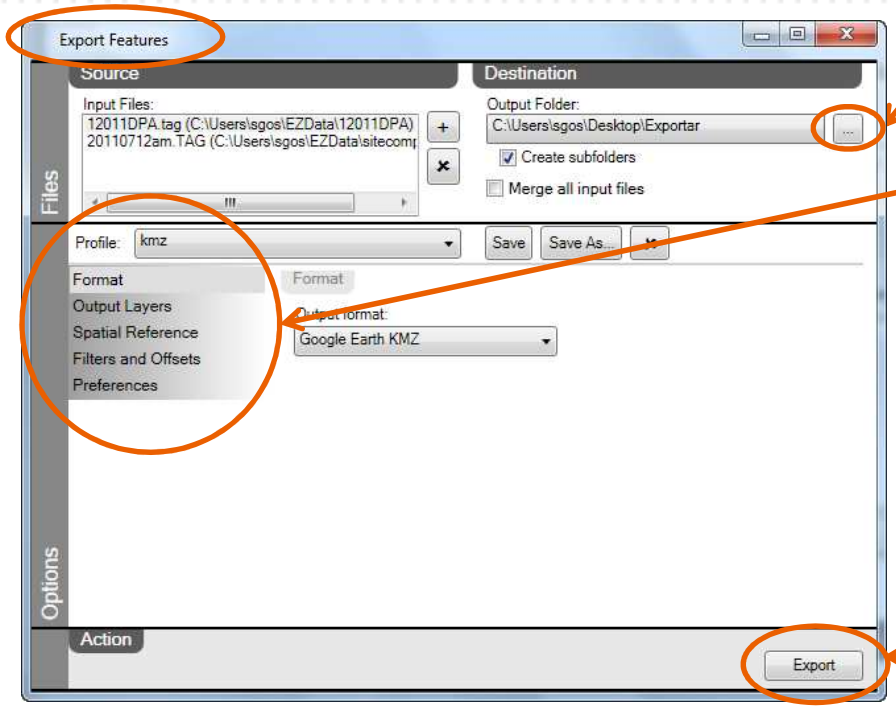
[Points] Feature	Label	Start time	Duration	Solution	Position X (m)	Position Y (m)	Position EllHgt (m)	Standard deviation X (m)	Standard deviation Y (m)	Standard deviation Hgt (m)
Point Average	0	2011/09/20 15:48:17	00:04:58	L1 (float)	918735.194	5698402.083	1009.143	0.241	0.091	0.119
Point Average	1	2011/09/20 15:53:59	00:04:58	L1 (float)	918718.573	5698425.734	1010.522	0.245	0.097	0.131
Point Average	2	2011/09/20 16:00:03	00:04:58	L1 (float)	918699.178	5698438.881	1008.306	0.248	0.107	0.141
Point Average	3	2011/09/20 16:05:41	00:04:58	L1 (float)	918687.362	5698431.647	1009.361	0.230	0.107	0.134
Point Average	4	2011/09/20 16:11:45	00:04:58	L1 (float)	918692.637	5698420.866	1009.696	0.213	0.094	0.127
Point Average	5	2011/09/20 16:18:05	00:04:58	L1 (float)	918710.396	5698402.556	1008.854	0.144	0.060	0.083
Point Average	6	2011/09/20 16:30:37	00:04:58	L1 (float)	918725.707	5698377.100	1007.781	0.235	0.093	0.142
Point Average	7	2011/09/20 16:36:33	00:04:58	L1 (float)	918745.701	5698355.015	1009.939	0.234	0.102	0.098
Point Average	8	2011/09/20 16:42:13	00:04:58	L1 (float)	918764.622	5698329.460	1008.535	0.187	0.077	0.099
Point Average	9	2011/09/20 16:48:27	00:04:58	L1 (float)	918788.116	5698293.022	1009.826	0.203	0.074	0.118
Point Average	10	2011/09/20 16:54:27	00:04:58	L1 (float)	918805.789	5698260.260	1009.258	0.152	0.050	0.073
Point Average	11	2011/09/20 17:01:37	00:05:00	L1 (float)	918814.684	5698257.834	1009.794	0.242	0.074	0.110
Point Average	12	2011/09/20 17:07:15	00:04:58	L1 (float)	918819.801	5698278.129	1008.034	0.454	0.205	0.199
Point Average	13	2011/09/20 17:13:17	00:04:58	L1 (float)	918811.234	5698290.995	1008.587	0.244	0.074	0.094
Point Average	14	2011/09/20 17:18:53	00:04:58	L1 (float)	918800.224	5698305.716	1008.338	0.387	0.179	0.144
Point Average	15	2011/09/20 17:25:07	00:04:58	L1 (float)	918773.111	5698341.578	1008.732	0.388	0.124	0.118
Point Average	16	2011/09/20 17:30:43	00:04:58	L1 (float)	918760.888	5698358.433	1008.911	0.383	0.113	0.100
Point Average	17	2011/09/20 17:36:19	00:04:58	L1 (float)	918750.681	5698375.470	1009.740	0.379	0.106	0.099
Point Average	18	2011/09/20 17:41:57	00:04:58	L1 (float)	918740.255	5698392.743	1008.998	0.440	0.251	0.319
Point Average	19	2011/09/20 17:48:13	00:04:58	L1 (float)	918716.163	5698412.248	1009.098	0.431	0.100	0.119
Point Average	20	2011/09/20 17:53:59	00:04:58	L1 (float)	918737.375	5698378.584	1009.392	0.423	0.091	0.106
Point Average	21	2011/09/20 17:59:43	00:04:58	L1 (float)	918758.986	5698346.004	1008.616	0.426	0.090	0.423
Point Average	22	2011/09/20 18:05:25	00:04:58	L1 (float)	918779.085	5698315.566	1009.748	0.389	0.087	0.254
Point Average	23	2011/09/20 18:11:15	00:04:58	L1 (float)	918804.052	5698282.323	1009.170	0.375	0.087	0.221

Total: 24 point feature(s) (24 processed)

The solution types **Pseudoranges (raw)**, **L1 (float)** and **L1 (fixed)** indicate a post-processed position.

Export GIS data

- If you used **GNSS Driver** for ArcPad, after processing, **EZSurv™** updates your SHP files when you save the project (as explained on page 11 and 13). Therefore, you can now use your SHP files directly in your GIS software.
- If you used **EZTag CE™**, export your post-processed features using a specific GIS format with **Tools > Export > Features**…



- Select the **Output folder**.
- Configure each export **Options** and **Save** your configurations in a **Profile** (next time you will export data, simply select your **Profile**).
- **Export** your data.