effigis

EZSurv™
Post-Processing FieldGenius Data

October 10th 2012

2012 - Training documents

EZSurv™and FieldGenius

- FieldGenius (5.0 and higher) generates different data files including GNSS observation files (on the receiver SD card) along with an text file (FieldGenius *.**raw** file). The Post-Processor requires these two files to calculate post-processed positions.

- **GNSS Observations** files, as recorded by FieldGenius includes all required GNSS data for post-processing (observations and orbits).

- _**EZSurv™updates the text file (*.raw) with post-processed positions**_. If you use the "Fill RTK failures" option, only "non-FIXED" positions will be updated.
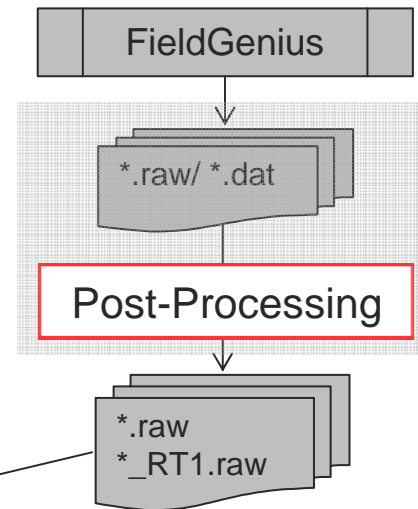
EZSurv™and FieldGenius

Real-time scenario

FieldGenius

↓

*.raw

Post-process scenario

FieldGenius

↓

*.raw/ *.dat

↓

Post-Processing

↓

*.raw
*_RT1.raw
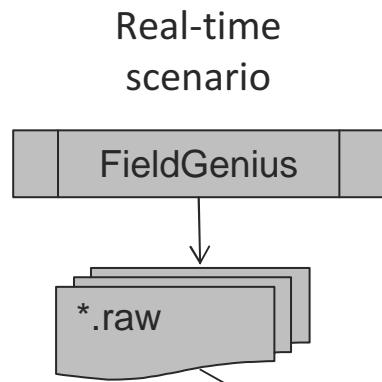
Post-Processing is a simple step inserted into the data flow.

Post-Processing simply rewrites the **raw** file with corrected positions

FieldGenius Trajectories

- Trajectories are created when a rover file (GNSS observations) is combined with base station data (covering the rover file time span). ***Trajectory may or may not include survey points. A trajectory is a typical RTK run.***

- EZSurv™can automatically creates and post-process trajectories with the submitted GNSS data files. The match between rover files and Base Station data is automatically done.

*A typical FieldGenius file includes __many survey points__*

Trajectory (or RTK Survey)
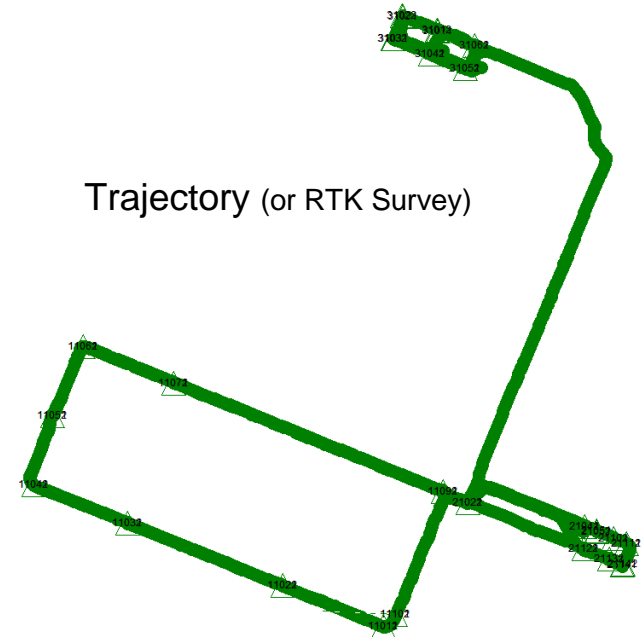
Configuring Base Station Providers

- Select **Options...** from the **Tools** menu.

- Select the **Base** tab. Click **Add...** to add a Base Station provider. Select a provider from the list and click **OK**.

- Type the user name and password if required *(commercial providers)*.

- Click **Properties...** to view the information about the selected base station provider *(You can have info for every single base station of the provider)*.
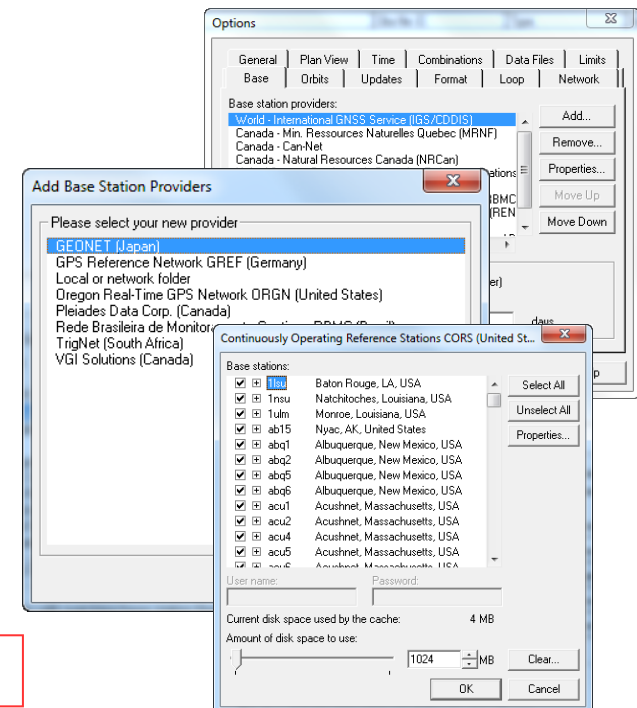
See «Base Station Setting» Training Module for more details

Configuring Trajectory Parameters

- EZSurv™generates automatically all trajectories using field metadata («start and end time» of each observation file, as well as their status, static or kinematic)

- Select the **Combinations** tab from the **Tools > Options**. In the **Trajectories** section, set the percentage of data coverage of your rover by the Base (typically we look for 100%)

- Also make sure that **Maximum distance** option is checked and input a proper distance tolerance (*maximum distance between your rover and the Base*)

6
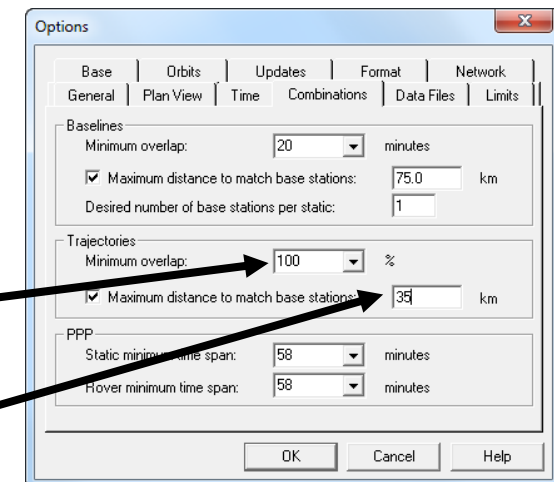
To be done only once

FieldGenius Reference System

- When FiledGenius is used to collect RTK positions, ***and you want to control your RTK positions with EZSurv™***, you have to set the same reference system in the PP software as the one used by the RTK infrastructure.

- This is important when you want to QA your positions with EZSurv™. ***If you are using your receiver in AUTONOMOUS mode, the synchronization between reference systems is no longer an issue.***

- For example, in the USA, most of the RTK infrastructure are broadcasting corrections with respect to NAD83 (CORS96 epoch 2002).

- Before importing your FieldGenius data, set your Mapping Systems with the proper datum – ***IT HAS TO BE SET BEFORE IMPORTING YOUR DATA –*** EZSurv™is using these datum parameters to properly convert FieldGenius positions into WGS84 *(see the «Mapping Systems» training Module).*
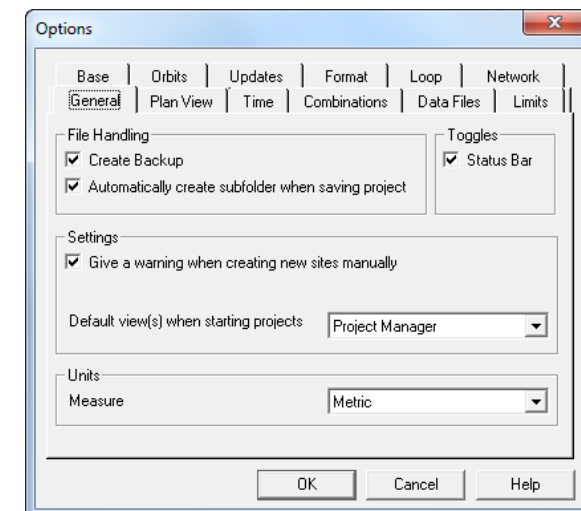
This is important only if RTK infrastructure is used

Configuring Unit of Measure

- Usually, this has to be done once if the user always uses the same reference system.

- Select the **General** tab from the **Tools > Options**. In the *Units* section, select your unit of measure (International Feet, Metric or US Survey Feet).

Configuring the Process Parameters

See the «Default Parameters» training Module to properly set your process parameters:

- Processing mode (make sure it is differential)

- Constellation (GPS or GPS&GLONASS)

- Process interval (typically use the data interval)

- Ambiguity fixing mode

- Base Station search

- Precise orbits

- Etc.

9

Collecting GNSS data with FieldGenius

4 different «Use Cases»

#	Base Station	Rover
1	<u>Private Base</u>: GNSS data recorded on SD card without FieldGenius (*.dat file)	*.raw and *.dat files recorded with FieldGenius for the rover
2	<u>Private Base</u>: A set of *.raw and *.dat recorded with FieldGenius specifically for the Base	*.raw and *.dat files recorded with FieldGenius for the rover
3*	<u>**Private Base:**</u> **One *.raw file for both unit (Base and Rover). That will generates specific *dat files on each receiver**	
4	RTK infrastructure (network, VRS, etc), no Base Station data recorded by the user	*.raw and *.dat files recorded with FieldGenius for the rover

The «Use Case» #3 allows to use only one data collector. He sets the Base with FieldGenius, then he sets its rover, do its data collection, stops the rover, and then go back to the Base and stop it with Field Genius.

Description of «Use Case» # 3

- Set your Base Station using FieldGenius:
  - ☐ select your coordinate system (mapping/datum),
  - ☐ start recording GNSS observations as well as a raw file (ex.:Base09092011)
  - ☐ input your base coordinate / create a point

- Set your rover with FieldGenius
  - ☐ Create a new project file (not the same as the base, ex.: ROVER09092011)
  - ☐ Conduct your survey
  - ☐ Stop your survey (project raw file raw)

- At the end of your survey, go back to your Base and properly close the Base file

- Transfer Base and Rover files to your PC for post processing (including GNSS observations recorded on the SD card)

See FieldGenius manual for complete setting of a Base and a Rover

Description of «Use Case» # 4

- Set your rover with FieldGenius
  - ❑ Create a new project file (ex.: ROVER09092011)
  - ❑ If available, get corrections data (using a network, VRS or other)
  - ❑ Conduct your survey
  - ❑ Stop your survey (project raw file raw)

- Transfer your FieldGenius files to your PC for post processing (including GNSS observations recorded on the SD card)

- In the Post-Processor, set your Base Station Provider

- If you were working in RTK, before importing your data, make sure to properly set Mapping Systems/datum in order to avoid bias in the RTK-PP coordinate comparison

See FieldGenius manual for complete setting of a Rover

Importing your data - Use Case # 1

1	**Private Base**: GNSS data recorded on SD card without FieldGenius (*.dat file)	**Rover:** *.raw and *.dat files recorded with FieldGenius for the rover

- **_For the rover:_** Select **Observations > Import...** or simply drag and drop your **raw** file into the observations folder of the Post-Processor.
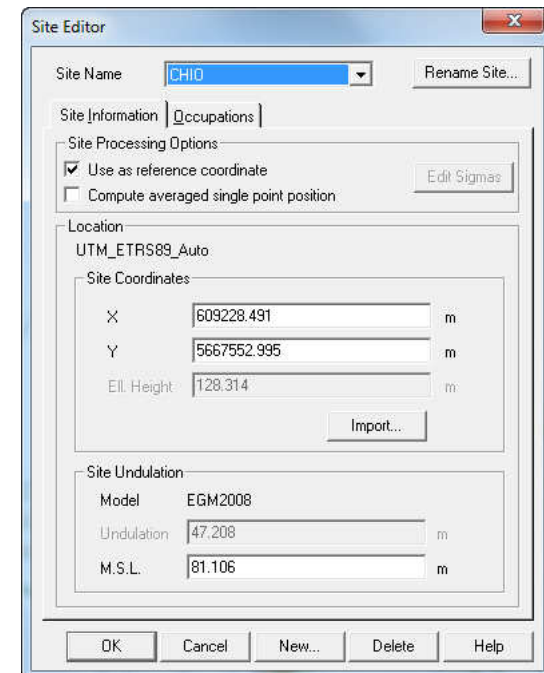
- **_For the Base:_** Select **Observations > Import...** or simply drag and drop your ***.dat** file into the observations folder of the Post-Processor

View/Project Manager
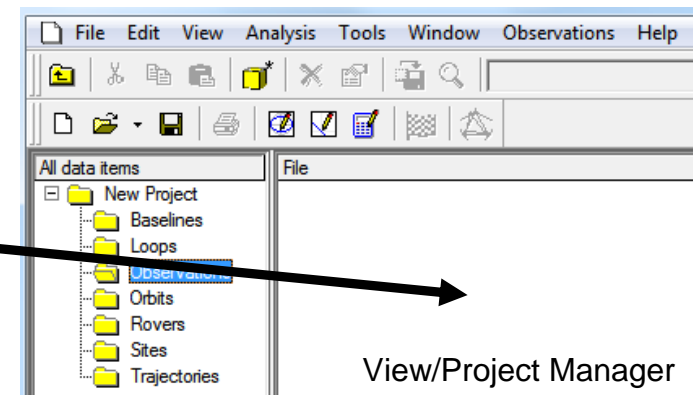
This «use case» is typically used when users are working only in PP

Importing your data - Use Case # 1

- In the **Project Manager** windows (Observation Folder), set your Base station file is set as a "Base" 🖥️ (select the "Base" status using the *right click* and select "base").

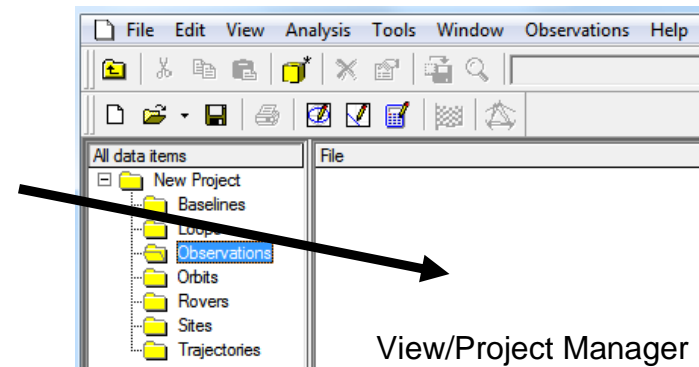- Go to the **Site Editor** using **Edit > Site**. Enter its coordinate (in proper mapping system/datum).

Importing your data - Use Case # 2

2	Private Base: A set of *.raw and *.dat recorded with FieldGenius specifically for the Base	Rover: *.raw and *.dat files recorded with FieldGenius for the rover

- ***For the rover:*** From the **Project Manager**, select **Observations > Import…** or simply drag and drop your *.**raw** file into the observations folder of the Post-Processor.

- ***For the Base:*** From the **Project Manager**, select select **Observations > Import…** or simply drag and drop your ***.raw** file into the observations folder of the Post-Processor
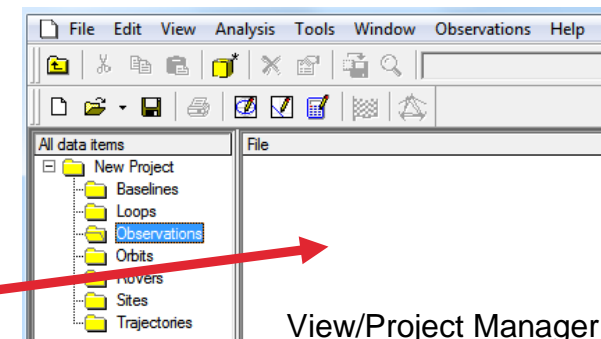

View/Project Manager

In this «Use Case», EZSurv™ will properly sets the Base coordinates (extracted form the *.raw file) as well as the file status to «Base»

15

Importing your data - Use Case # 3

3	Private Base: One *.raw file for both unit (Base and Rover). That will generates specific *dat files on each receiver

- From the **Project Manager**, select **Observations > Import…** or simply drag and drop your **raw** file into the observations folder of the Post-Processor.

- This should properly import all files related to your Base 🖥 and rover 🚙

View/Project Manager

In this «Use Case», EZSurv™ will properly sets the Base coordinates (extracted form the *.raw file) as well as the file status to «Base»

Importing your data - Use Case # 4

4	Base: RTK infrastructure (network, VRS, etc), there is nothing to do	Rover: *.raw and *.dat files recorded with FieldGenius for the rover

- *__For the rover:__* Select **Observations > Import...** or simply drag and drop your **raw** file into the observations folder of the Post-Processor.

- *__For the Base:__* you have to set a Base Station provider to get Base Station data to do your PP *(refer to Base Station Setting training module)*.

View/Project Manager
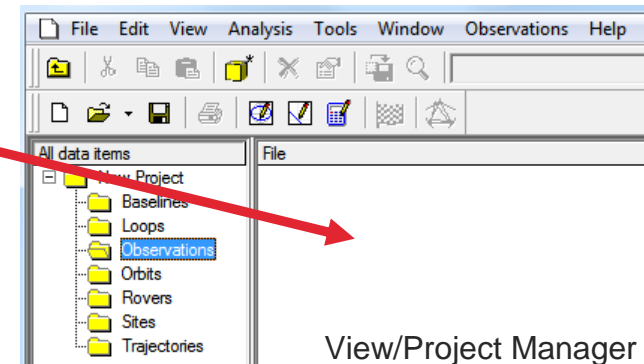
Processing RAW files – Field positions

When your ***.raw** file is imported into the **Observations** folder, you have access to a list of all your field positions in **Analysis > Survey Sites > Field Coordinates**.

Processing FieldGenius Data– Start Processing

Select **Process Auto...** from the **Tools** menu to start the GNSS post-processing (or press **F9** on the keyboard). The following steps are performed automatically:

> scan for base stations.
> merge base data (if required).
> define trajectories/baselines.
> post-process the data.

If you are using a Base Station provider, before processing, <u>make sure your base station data is available. Some providers are generating hourly files whereas others are using daily files!</u> See with your provider for the exact time of availability of their base station files on their FTP site.
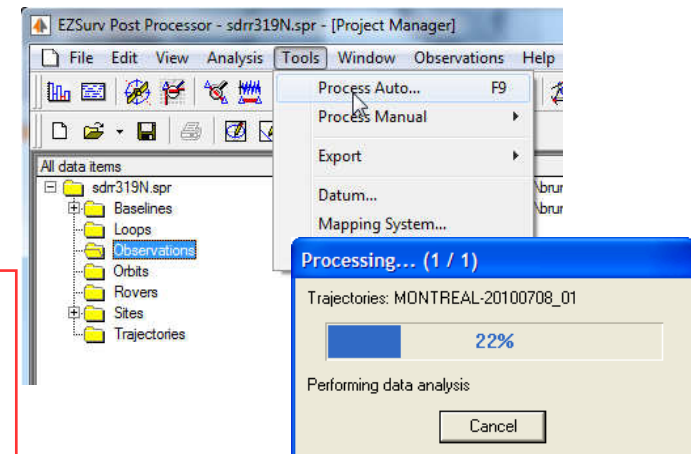
Processing RAW files – Updating RAW

- The **Process Summary** is displayed once the GNSS post-processing is completed.

```
--------------------------------------------------------------------------------
|                          |____Number of epochs___|  |_____Number of sites_____|
| Rover     Distance      | Total   Solved  % Solved |  | Total  Fixed  Float  PSR  Failed  Unproc |
|           (km)          |                          |  |                                  |
|--------------------------+--------------------------+------------------------------------|
| RTK_MTL        5.8      | 2258    2257    99.96    |  |  23     23     0     0     0      0  |
--------------------------------------------------------------------------------
```
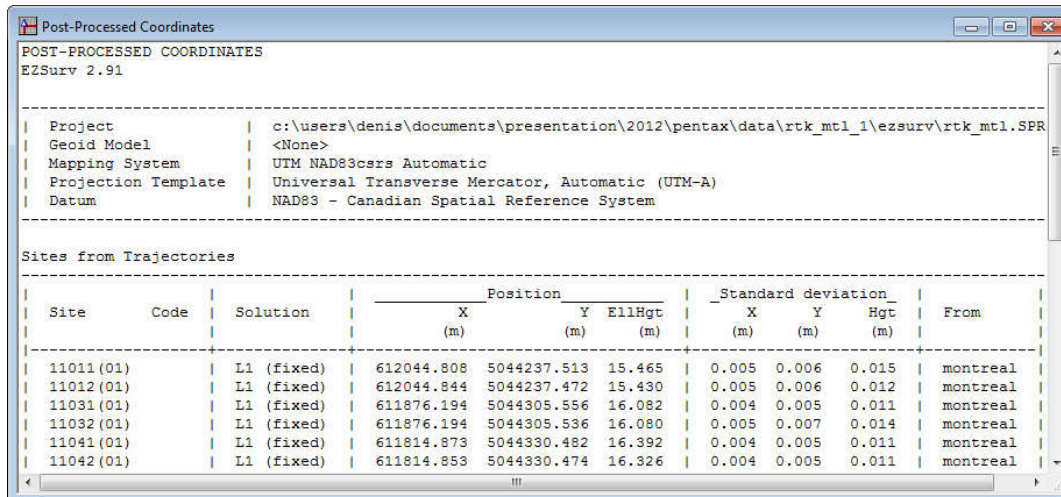
- Close the **Process Summary** windows, select **Save as** from the **File** menu, EZSurv™ will propose you a project file name and a folder, then click **Save**.

- Also, when you import your original ***.raw** file, the Post-Processor save a copy of the original with a suffix _RT1.raw.

When you save your Post-Processor project, EZSurv™ automatically updates your *.raw file with post-processed positions.

Processing RAW files – PP positions

After post-processing, you have access to a list of all your positions in
Analysis > Survey Sites > Post-Processed Coordinates.

Processing RAW files / PP-RTK comparison

- You can verify that your "post-processing reference system" is well aligned with your "RTK reference system", by comparing RTK and post-processed positions. This is a good QA control tools

- RTK Fixed positions should fall within few centimeters from post-processed Fixed positions.


```
Trajectory Site Comparison - MONTREAL-RTK_MTL
|◄◄  ◄◄  ►►  ►►|  MONTREAL-RTK_MTL                    ▼     Last Processed                ▼

SITE COMPARISON
```

Site	Solution	Position X (m)	Y (m)	EllHgt (m)	Standard deviation X (m)	Y (m)	Hgt (m)	Difference DX (m)	DY (m)	DH (m)
11101(01)	FIXED	612052.684	5044245.056	15.376	0.006	0.006	0.015			
	L1 (fixed)	612052.689	5044245.051	15.389	0.005	0.005	0.013	0.005	-0.005	0.013
11011(01)	FIXED	612044.808	5044237.510	15.450	0.009	0.010	0.028			
	L1 (fixed)	612044.808	5044237.513	15.465	0.005	0.006	0.015	-0.000	0.003	0.015
11031(01)	FIXED	611876.196	5044305.555	16.078	0.005	0.006	0.015			
	L1 (fixed)	611876.194	5044305.556	16.082	0.004	0.005	0.011	-0.003	0.001	0.004
11041(01)	FIXED	611814.867	5044330.480	16.364	0.010	0.013	0.030			
	L1 (fixed)	611814.873	5044330.482	16.392	0.004	0.005	0.011	0.006	0.001	0.028
11051(01)	FIXED	611826.975	5044376.024	16.300	0.009	0.012	0.028			
	L1 (fixed)	611826.982	5044376.030	16.331	0.004	0.006	0.012	0.007	0.007	0.031

Useful for QA control

# Processing FieldGenius Data– Back to the data flow

- At this point in time, you are back, with your corrected/updated ***.raw** file, to your usual data flow.

- If there is a need for, the original copy of the ***.raw** file is saved with a suffix _RT1.raw in the same directory.

*.raw
*.dat

Post-Processor

*.raw
*_RT1.raw

Usual user
data flow
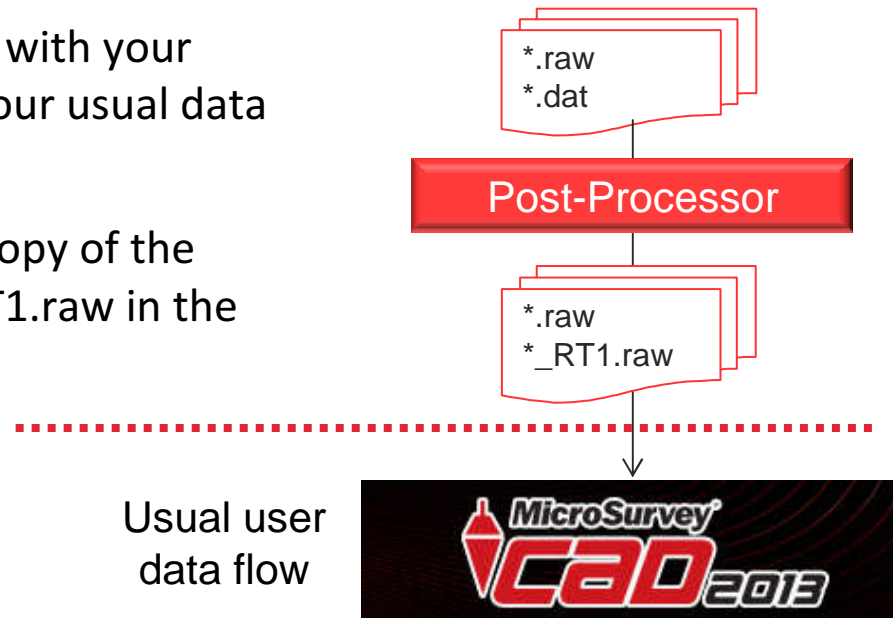
Site Coordinates- Export

- Site Coordinates can be exported using the Post-Processor in different ASCII formats:

  ❑ ASCII geographic

  ❑ ASCII Mapping

  ❑ DXF

- It could also be exported in a custom CSV format

- The export is access through **Tools > Export > Sites...** (you select the site(s) to be exported, select your format and click OK)
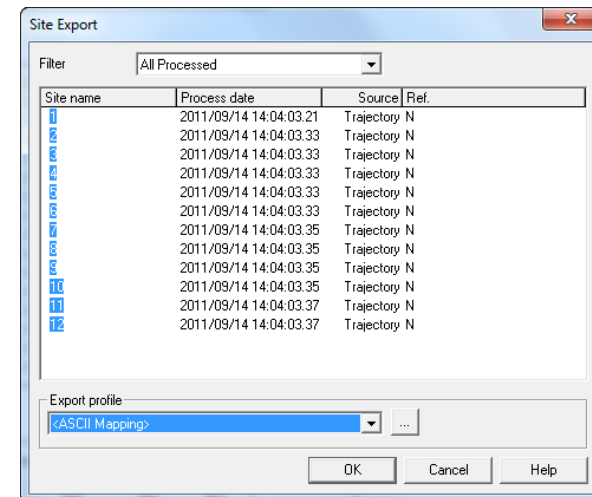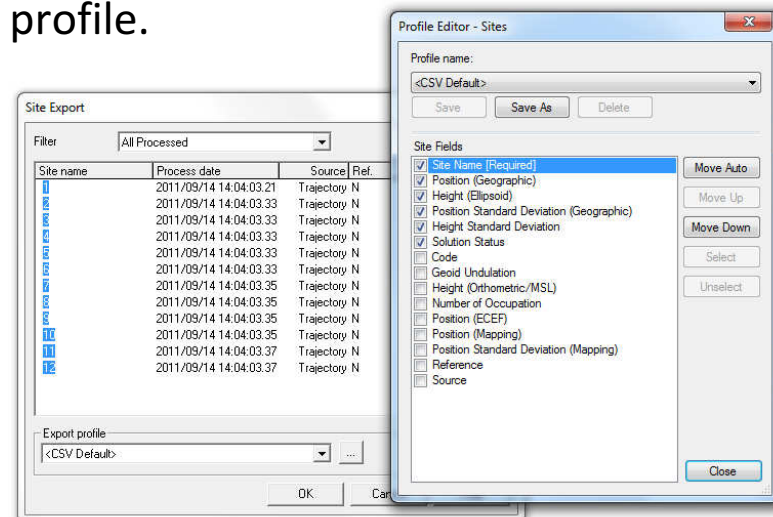
Site Coordinates– CSV Export

CSV export can be configured according to your needs. All parameters related to a site can be exported. Some parameters are required (like the site names). You can configure a CSV output and save it using a profile.
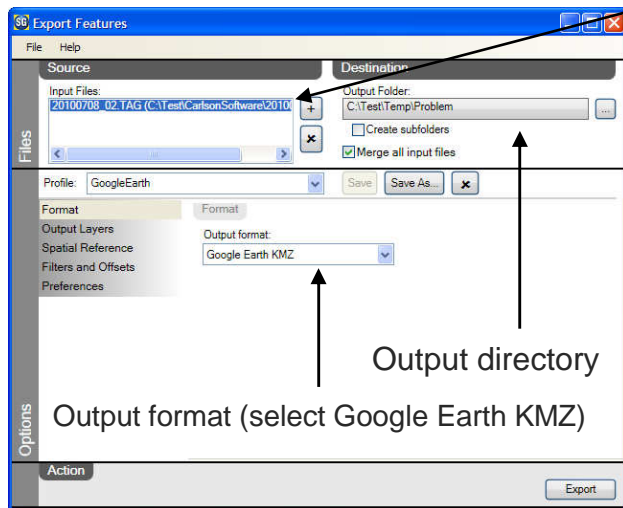
Tools > export > Sites…

- Click [...] on to access the Profile Editor
- Then select your parameters, order them using the «Move up» and «Move down»
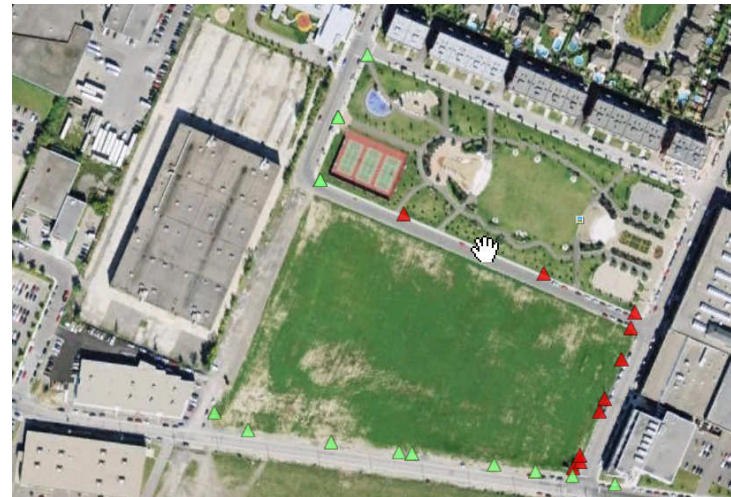- Save it under a specific name

Sites Coordinates– A Google View !

You can export your survey points in Google Earth format using **Tools > Export > Features**.

File to be exported (your current file)

Output directory

Output format (select Google Earth KMZ)

Processing FiledGenius Data in short

- There is an easy compatibility between EZSurv™ and FieldGenius filed data

- There are 4 different «Use Cases» that are compatible with EZSurv™

- The only issue is to properly set in EZSurv™ the same reference system as the one used by the RTK infrastructure (to be done once)

- Once properly setup, the processing is summarized as a simple *«drag and drop»* (of you filed data) followed by F9 !