

# EZSurv<sup>™</sup> Post-Processing FieldGenius Data

October 10<sup>th</sup> 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**





#### **FieldGenius Trajectories**

- Trajectories are created when a rover file (GNSS observations) is combined with base station data (covering the rover file time span). <u>Trajectory may or</u> <u>may not include survey points. A trajectory is a typical RTK run.</u>
- EZSurv<sup>™</sup>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 <u>many survey points</u>





#### To be done only once, if required

## **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<sup>™</sup>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)

#### Options Updates Format Network Base Orbits General Plan View Time Combinations Data Files Limits Baselines Minimum overlap minutes Maximum distance to match base stations 75.0 km Desired number of base stations per static Trajectorie: • % Minimum overlag 35 Maximum distance to match base stations km PPP minutes Static -58 • er minimum time snar minutes OK Cancel Help



To be done only once

#### **FieldGenius Reference System**

- When FiledGenius is used to collect RTK positions, <u>and you want to control your RTK positions with</u> <u>EZSurv</u><sup>™</sup>, 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<sup>™</sup>. *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 <u>IT HAS TO</u> <u>BE SET BEFORE IMPORTING YOUR DATA –</u> 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



#### To be done only once

## **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).

Options X
Base   Orbits   Updates   Format   Loop   Network   General   Plan View   Time   Combinations   Data Files   Limits   File Handling
✓ Create Backup ✓ Status Bar
Automatically create subfolder when saving project
Settings Give a warning when creating new sites manually
Default view(s) when starting projects Project Manager
Units
Measure Metric 💌
OK Cancel Help



To be done only once

#### **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.



#### **Collecting GNSS data with FieldGenius**

#### 4 different «Use Cases»

#	Base Station	Rover
1	Private Base: GNSS data recorded on SD card without FieldGenius (*.dat file)	*.raw and *.dat files recorded with FieldGenius for the rover
2	Private Base: A set of *.raw and *.dat recorded with FieldGenius specifically for the Base	*.raw and *.dat files recorded with FieldGenius for the rover
3*	Private Base: One *.raw file for both unit (Base and Rover) each receiver	). That will generates specific *dat files on
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

Rnuar



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



This «use case» is typically used when users are working only in PP



- 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).





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

File Edit View Analysis Tools Window Observations Help ' | X 🖆 🖬 Q 🛽 £٦ X 🖻 🖪 🗅 🚅 • 🖬 🖾 🔯 🗹 💕 📖 🖄 All data items File 🗆 🦳 New Project Baselines <del>6</del>1 Obser Orbits Rovers 📋 Sites View/Project Manager Trajectories

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



3 <u>Private Base:</u> 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 😒

File Edit View Analysis Tools Window Observations Help <u>ک</u> R 👩 🕺 🖻 🖷 🔍 | Light 🗅 🚅 - 🔛 2 🔽 🖬 💹 🖄 8 All data items File 🗆 🧰 New Project Baselines 🗋 Loops 📋 Orbits 🛅 Sites View/Project Manager Trajectories

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



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





## **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**.

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Projectio	n Templat	te   Univer	rsa	l Transverse	Mercator, Au	tomatic	(UI	M-A)			
Datum		NAD83	-	Canadian Spa	tial Referenc	e System	L				
es											
es 											
es 		 I			_Position		1	Stand	lard dev	iation_	
es  Site	Code	   Solution	1	X	_PositionY	EllHgt		Stand X	lard dev. Y	iation_ Hgt	
es  Site	Code	   Solution		X (m)	_PositionY (m)	EllHgt (m)	   	Stand X (m)	lard dev Y (m)	iation_ Hgt (m)	
es Site  11011(01)	Code	   Solution       FIXED	       -+-	(m)	Position  (m) 5044237.510	EllHgt (m) 15.450	     	X 	lard dev Y (m) 0.010	iation_ Hgt (m) 0.028	
es  Site  11011(01) 11012(01)	Code	   Solution     FIXED   FIXED	           	X (m) 612044.808 612044.847	Position Y (m) 5044237.510 5044237.481	EllHgt (m) 15.450 15.431	       	X (m) 0.009 0.009	lard dev Y (m) 0.010 0.011	iation_ Hgt (m) 0.028 0.027	
es Site 11011(01) 11012(01) 11031(01)	Code	   Solution     FIXED   FIXED   FIXED	           	X (m) 612044.808 612044.847 611876.196	Position (m) 5044237.510 5044237.481 5044305.555	EllHgt (m) 15.450 15.431 16.078	         	X (m) 0.009 0.009 0.005	lard dev. Y (m) 0.010 0.011 0.006	iation_ Hgt (m) 0.028 0.027 0.015	_
es  Site  11011 (01) 11012 (01) 11031 (01) 11032 (01)	Code	Solution     FIXED   FIXED   FIXED   FIXED	             	X (m) 612044.808 612044.847 611876.196 611876.196	Position Y (m) 5044237.510 5044237.481 5044305.555 5044305.558	EllHgt (m) 15.450 15.431 16.078 16.085	           	X (m) 0.009 0.009 0.005 0.008	iard dev. Y (m) 0.010 0.011 0.006 0.011	iation_ Hgt (m) 0.028 0.027 0.015 0.026	_
es  Site  11011 (01) 11012 (01) 11032 (01) 11032 (01) 11041 (01)	Code	Solution     FIXED   FIXED   FIXED   FIXED   FIXED   FIXED	             	(m) 612044.808 612044.847 611876.196 611814.867	Position Y (m) 5044237.510 5044237.481 5044305.558 5044305.480	EllHgt (m) 15.450 15.431 16.078 16.085 16.364			ard dev. Y (m) 0.010 0.011 0.006 0.011 0.013	iation_ Hgt (m) 0.028 0.027 0.015 0.026 0.030	_
es Site 11011 (01) 11012 (01) 11031 (01) 11032 (01) 11041 (01) 11042 (01)	Code	   Solution     FIXED   FIXED   FIXED   FIXED   FIXED		X (m) 612044.808 612044.847 611876.196 611876.196 611814.853	Position Y (m) 5044237.510 5044237.481 5044305.555 5044305.538 5044330.482	EllHgt (m) 15.450 15.431 16.078 16.085 16.364 16.321		X (m) 0.009 0.009 0.005 0.008 0.010 0.007	lard dev. Y (m) 0.010 0.011 0.006 0.011 0.013 0.010	iation_ Hgt (m) 0.028 0.027 0.015 0.026 0.030 0.030 0.023	_



#### **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</u> <u>sure your base station data is available. Some providers are</u> <u>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.

   	Rover	Distance (km)	   	Nu Total	mber of Solved	epochs % Solved		Total	Fixed	Number Float	of si PSR	tes Failed	Unproc	   
	RTK_MTL	5.8	-+-	2258	2257	99.96	-+-	23	23	0	0	0	0	-1

- Close the **Process Summary** windows, select **Save as** from the **File** menu,EZSurv<sup>™</sup> 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<sup>™</sup> 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**.

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F7	SUTU 2 91	COORI	JIN.	AILS	2.											
	5417 2.51															
	Project			1	c:\user	s\d	enis\documen	its\presentati	on\2012\	pen	tax\dat	a\rtk_mt	tl_1\ezs	urv	/rtk_mtl.5	SPF
	Geoid Model			1	<none></none>											
8	Mapping Sys	tem		1	UTM NAE	830	srs Automati	.c								
	Projection :	Templa	ate	1	Univers	al	Transverse M	fercator, Auto	omatic (U	TM-	A)					
	Datum			1	NAD83 -	Ca	nadian Spati	al Reference	System							
i	tes from Tra	iector	rie	-												
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L	tes from Tra	jecto:  Code	rie     	s Sol	lution		X (m)	Position Y (m)	EllHgt (m)	   	_Stand X (m)	ard dev: Y (m)	iation_ Hgt (m)		From	
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	tes from Tra Site ( 11011(01) 11012(01) 11031(01)	jector Code	rie         	Sol L1 L1 L1	(fixed) (fixed) (fixed)		X (m) 612044.808 612044.844 611876.194	Position Y (m) 5044237.513 5044237.472 5044305.556	EllHgt (m) 15.465 15.430 16.082		X (m) 0.005 0.005 0.004	ard dev: Y (m) 0.006 0.006 0.005	iation_ Hgt (m) 0.015 0.012 0.011	+ + + + + + + + + + + + + + + + + + + +	From montreal montreal montreal	
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#### **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.

44 55 55	MONTREAL-RTK	_MT	Ľ				-	Last Proce	essed				-
E COMPARIS	SON												
		10	20	Position		1	Stand	ard dev	iation	1	D	ifference	
Site	Solution	1	X	Y	EllHgt	1	X	Y	Hgt	1	DX	DY	DH
		1	(m)	(m)	(m)	1	(m)	(m)	(m)	1	(m)	(m)	(m)
11101(01)	FIXED	1	612052.684	5044245.056	15.376	i	0.006	0.006	0.015	i			
	L1 (fixed)	1	612052.689	5044245.051	15.389	1	0.005	0.005	0.013	1	0.005	-0.005	0.013
		1				1				1			
11011(01)	FIXED	1	612044.808	5044237.510	15.450	1	0.009	0.010	0.028	1			
	L1 (fixed)	1	612044.808	5044237.513	15.465	1	0.005	0.006	0.015	1	-0.000	0.003	0.015
		1				1				1			
11031(01)	FIXED	1	611876.196	5044305.555	16.078	1	0.005	0.006	0.015	1			
	L1 (fixed)	1	611876.194	5044305.556	16.082	1	0.004	0.005	0.011	1	-0.003	0.001	0.004
		1				1				1			
11041(01)	FIXED	1	611814.867	5044330.480	16.364	1	0.010	0.013	0.030	1			
	L1 (fixed)	1	611814.873	5044330.482	16.392	1	0.004	0.005	0.011	1	0.006	0.001	0.028
		1				1				1			
11051(01)	FIXED	1	611826.975	5044376.024	16.300	1	0.009	0.012	0.028	1			
	L1 (fixed)	1	611826.982	5044376.030	16.331	1	0.004	0.006	0.012	1	0.007	0.007	0.031
		1				1				1.			

Useful for QA control

![](_page_22_Picture_0.jpeg)

## **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.

![](_page_22_Figure_4.jpeg)

![](_page_23_Picture_0.jpeg)

#### **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)

ite Export			×
Filter A	II Processed	•	
Site name	Process date	Source Ref.	
1	2011/09/14 14:04:03.21	Trajectory N	
2	2011/09/14 14:04:03.33	Trajectory N	
E	2011/09/14 14:04:03.33	Trajectory N	
4	2011/09/14 14:04:03.33	Trajectory N	
E	2011/09/14 14:04:03.33	Trajectory N	
E	2011/09/14 14:04:03.33	Trajectory N	
2	2011/09/14 14:04:03.35	Trajectory N	
8	2011/09/14 14:04:03.35	Trajectory N	
Ε	2011/09/14 14:04:03.35	Trajectory N	
10	2011/09/14 14:04:03.35	Trajectory N	
11	2011/09/14 14:04:03.37	Trajectory N	
12	2011/09/14 14:04:03.37	Trajectory N	
- Export profile			
<ascii mapping=""></ascii>		<b>•</b>	
		OK Can	el Help

![](_page_24_Picture_0.jpeg)

## 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

![](_page_24_Picture_7.jpeg)

X

![](_page_25_Picture_0.jpeg)

#### Sites Coordinates- A Google View !

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

![](_page_25_Picture_3.jpeg)

File to be exported (your current file)

![](_page_25_Picture_5.jpeg)

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![](_page_26_Picture_0.jpeg)

#### **Processing FiledGenius Data in short**

- There is an easy compatibility between EZSurv<sup>™</sup> and FieldGenius filed data
- There are 4 different «Use Cases» that are compatible with EZSurv™
- The only issue is to properly set in EZSurv<sup>™</sup> 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 !