



# EZSurv™ QA Control with GNSS Analyser

October 10<sup>th</sup> 2012

2012 - Training documents

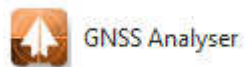


## What are Quality Control (QC) Tools

- Quality Control Tools could be a *set of functionalities* or *specific modules* to analyse data and/or results coming from your GNSS receiver in order to assess your final positions.
- EZSurv™ offers QC tools that covers the most important tasks when doing GNSS surveys:
  - ✓ Plan your survey
  - ✓ Verify your Base Station Provider reliability
  - ✓ Analyse your raw GNSS data
  - ✓ Validate RTK versus PP positions

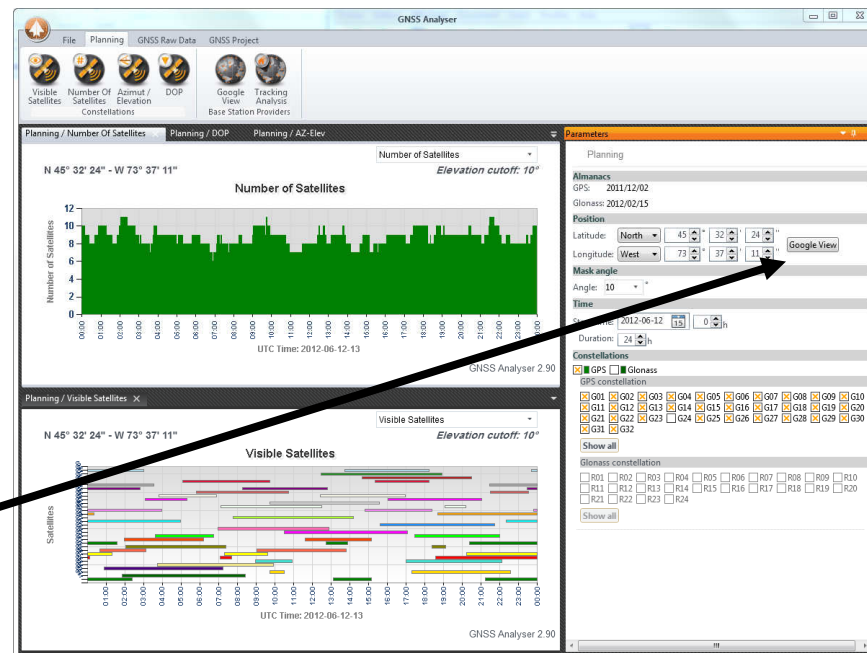


## Planning Tools - Satellite Visibility



- Number of satellites
- Visible satellites
- DOP plots
- Azimut/Élevation
- Almanac auto dowload
- GPS&Glonass

The planning location can be picked on Google Earth

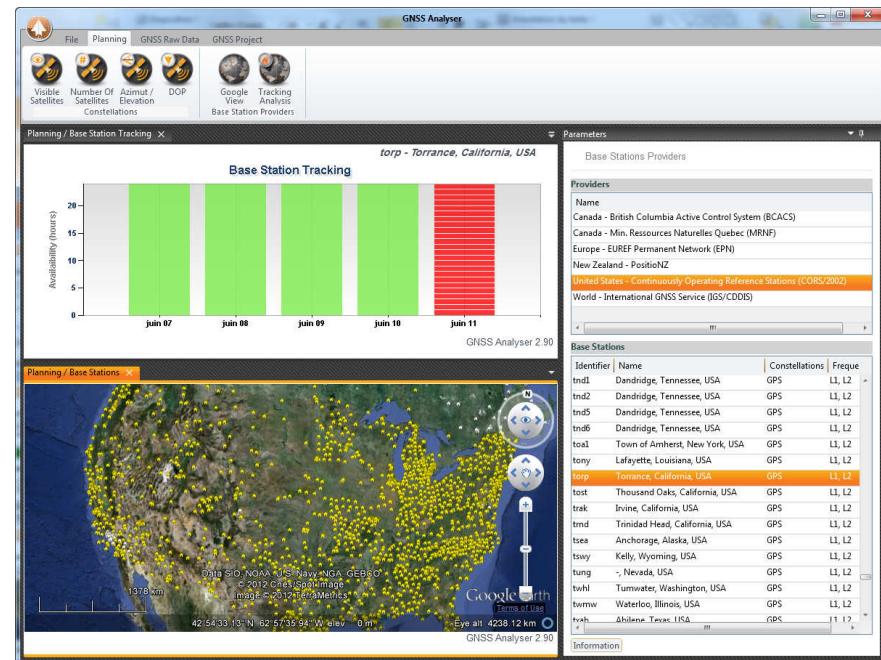




## Planning Tools – Base Station Provider

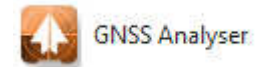


- Display Base Station list (from EZSurv™ selection)
- Display Base Station location on Google View
- Display tracking data for every station

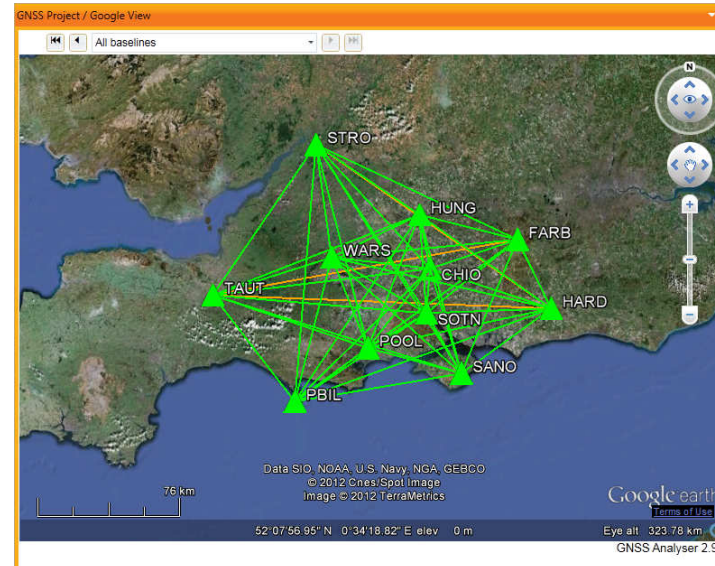
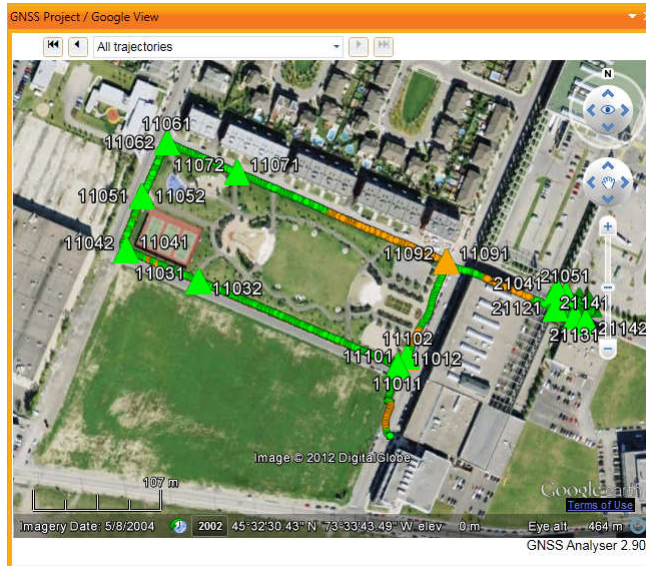




## QC Tools – Base Station Provider



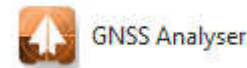
You can display in Google View your survey (if you do not have an Internet connection you can display your survey in a quick view (without background))





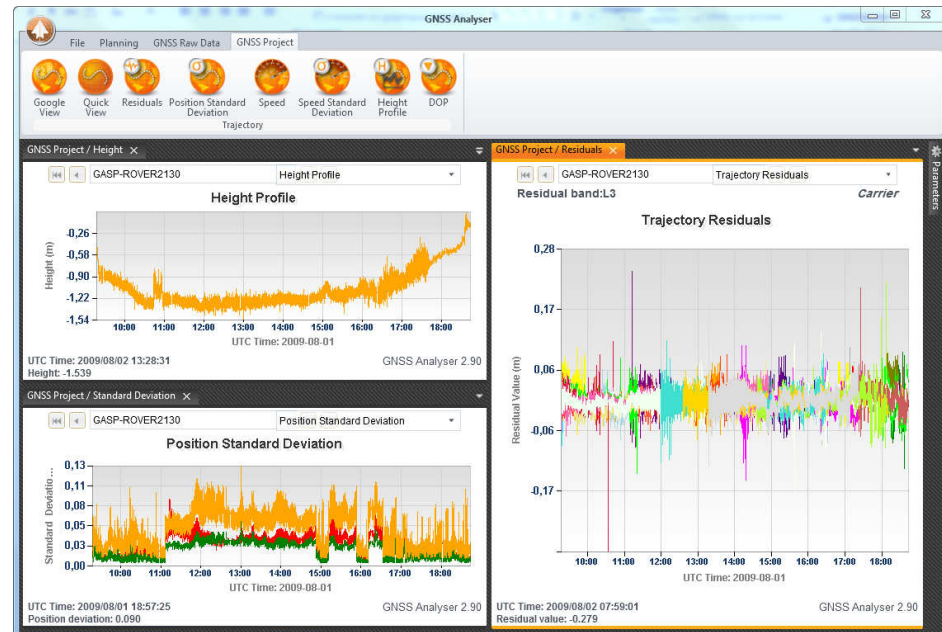


## QC Tools – Results Analysis



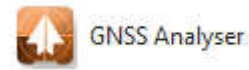
For a specific Survey, you can display the following parameters:

- Observation residuals
- Position std
- Speed (trajectory)
- Speed std (trajectory)
- Height profile (trajectory)
- Positions DOP



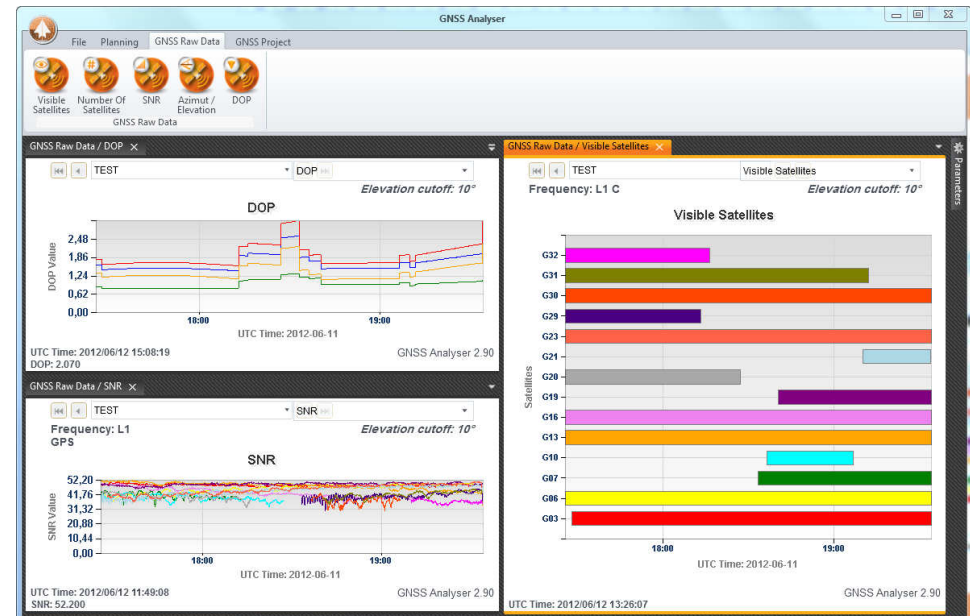


## QC Tools – Results Analysis



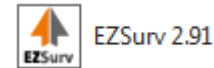
For a Specific GNSS Raw data file, you can inspect:

- Satellite visibility
- Number of satellite in View
- DOP parameters
- Azimut/Élevation
- SNR analysis

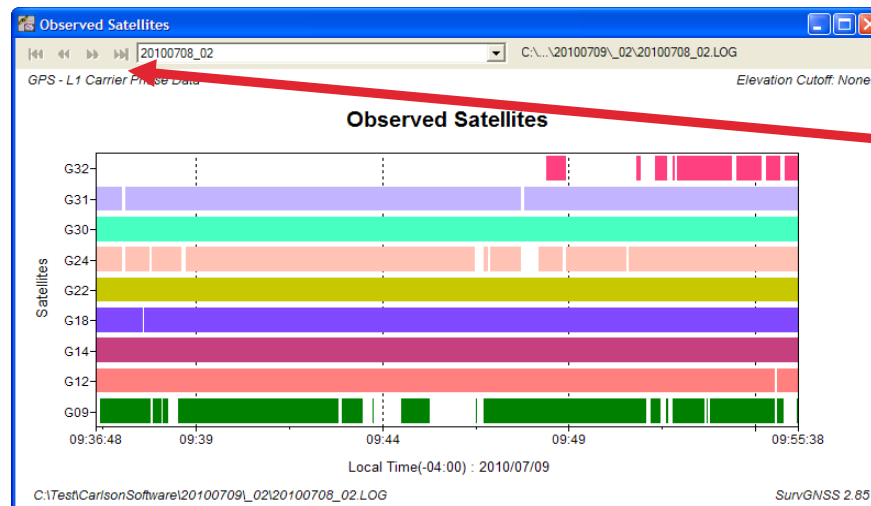




## QC Tools – Results Analysis



When your data is imported, you can verify its raw data tracking quality using **Analysis > Raw Observations > Observed Satellites**.



If you have imported several files, navigate through each of them using the VCR control.

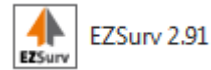
A discontinuity on a channel means a signal obstruction (cycle slip). A lot of discontinuities means a data set recorded in an obstructed environment.

*Using the right click, you can toggle between GPS and GLONASS tracking.*

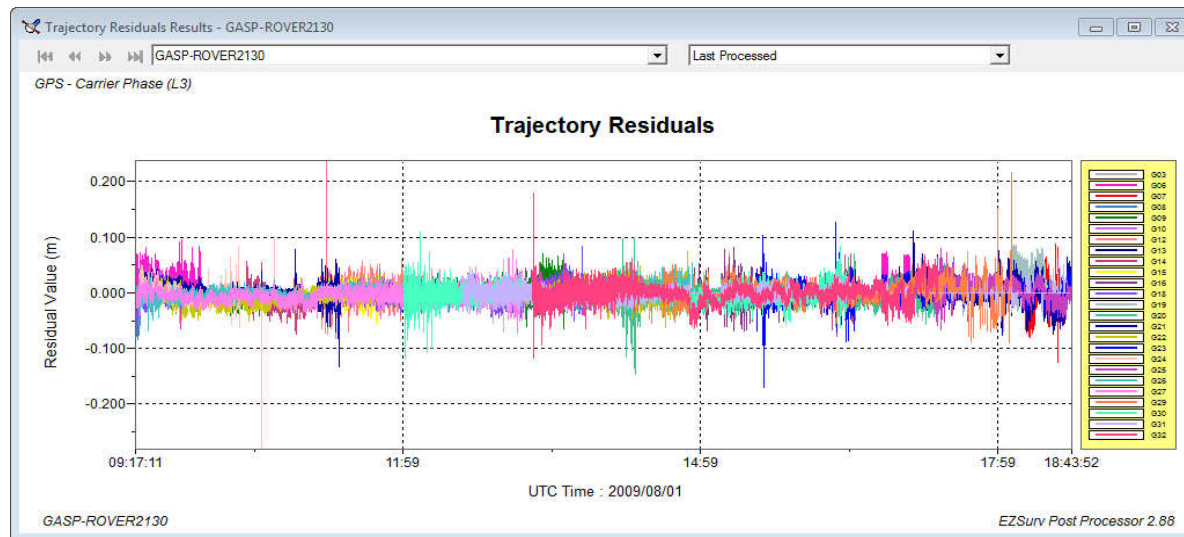




## QC Tools – Results Analysis



With a right click, you can switch to Code and Doppler residuals





## QC Tools – Results Analysis EZSurv 2.91

- When using FieldGenius (or SurvCE) you can compare RTK and PP results (*you must make sure that both set of positions are using the same Reference System*)
- RTK Fixed positions should fall within few centimeters from post-processed Fixed positions.

Trajectory Site Comparison - MONTREAL-RTK\_MTL

MONTREAL-RTK\_MTL | Last Processed

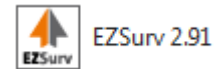
SITE COMPARISON

Site	Solution	Position			Standard deviation			Difference		
		X (m)	Y (m)	EllHgt (m)	X (m)	Y (m)	Hgt (m)	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





## QC Tools – Results Analysis



The following tools can also be used for QA:

- Loop closures to control figures or to compare common baselines (loop of 2 legs)
- Least-Squares Adjustment (some time it is better to analyze adjustment residuals than loop closures)
- Inverse Report (to compare with previous «line» information)
- Trajectory can be computed from different Base Station (and compared)
- In some circumstances PPP can be used as a QA tool (to establish control stations in remote areas)





## QC Tools/Analysis in Short

A GNSS Post-Processor is an ideal companion software for RTK users.

- It could be used to backup your RTK jobs (*if your local base failed or if you are at the edge of the radio link*)
- It allows you to double check your RTK positions to detect bad fixes (*compare PP and RTK positions*);
- It allows you to assess the quality of your receiver data (*when the position quality is not there, looking at the raw data may explain a lot of things*)
- For geodetic jobs, where baselines are required, a PP becomes a requirement along with Loop closures and Least-Squares tools.