

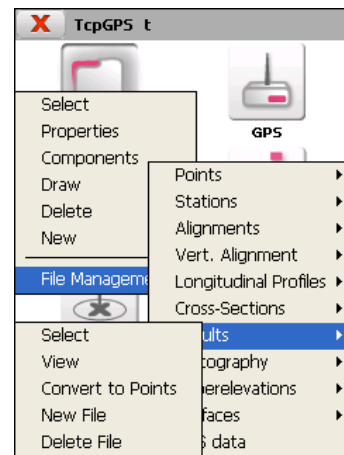
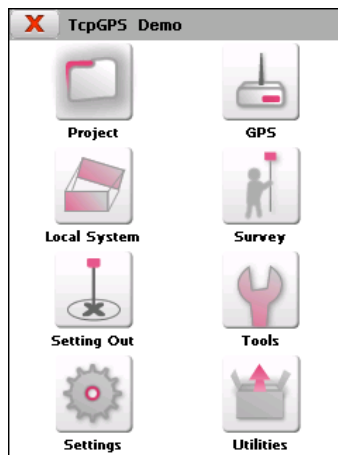
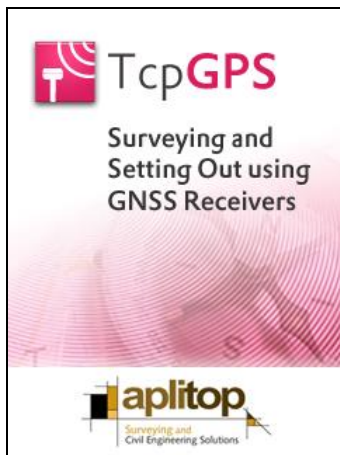


# TcpGPS

## Surveying and Setting Out using GNSS Receivers

### Introduction

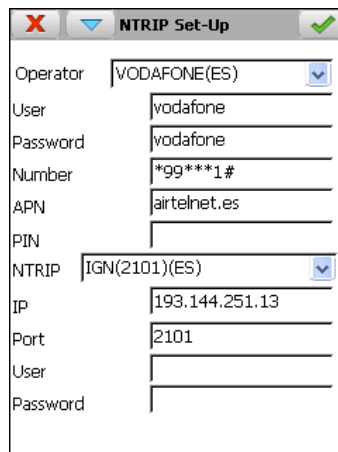
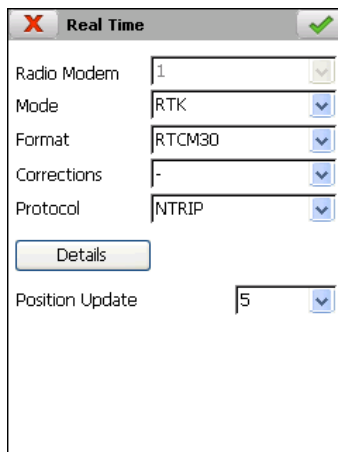
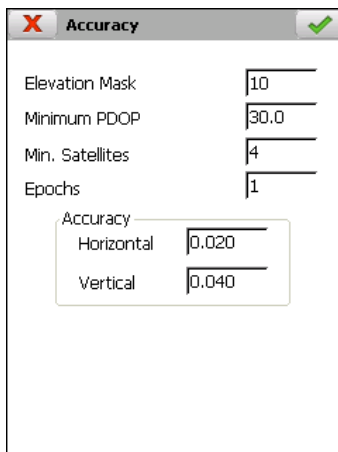
This application, installed in a mobile device, allows the user to survey and stake out topographic data using a broad range of GNSS receivers, integrated or connected through serial cable or Bluetooth. Also it allows user to connect with virtual reference station through GPRS/3G. The program provides many options for traditional surveys and setting out, and for all kind of linear works projects as well.



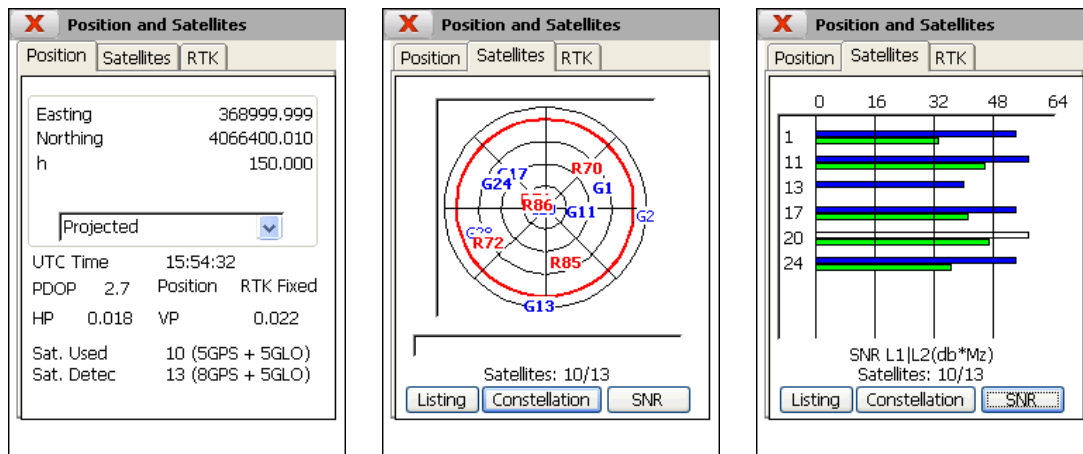
### Receiver Control

The most important parameters of the receivers can be configured without the need for any additional software. It includes predefined configurations for the different models, so that the device is both simple to use and powerful. The user may specify the mode for the operation (RTK, NTRIP, postprocess) or establish personalised work styles.

These styles allow the user to specify the properties of the antenna that is to be used, the configuration of the radio or phone, the real time protocol and advanced options such as the GLONASS constellation and specific enhancements for each brand. Among other parameters, the user may also control the number of epochs, the precisions required, the valid position modes and the recording for post-processing.



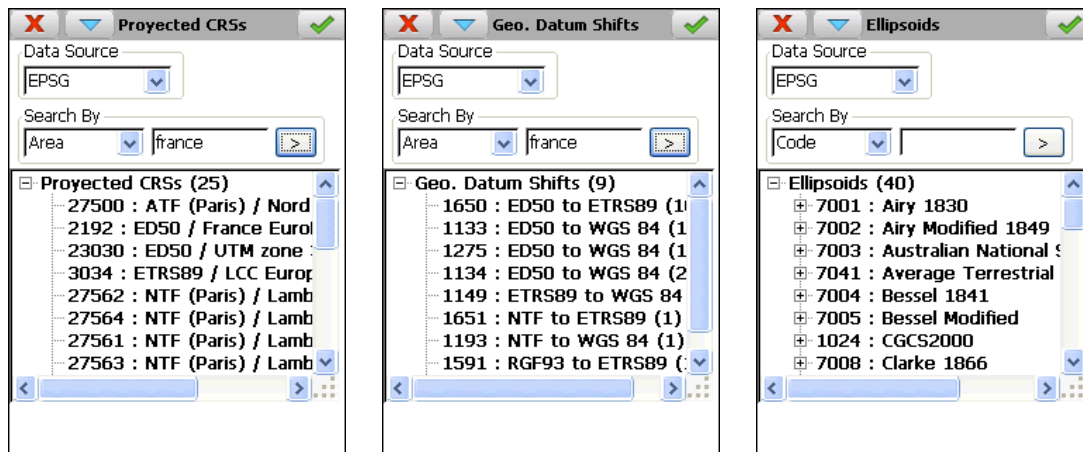
The screen provides all of the information regarding the quality of the position, the estimated horizontal and vertical precision, the number of satellites detected and used, the state of the batteries and memory, correction reception indicator, etc.



In addition, the user may obtain detailed information regarding the user's current position with geographic or projected coordinates, and real time graphs of the constellation of satellites, signal/noise diagram and information regarding the quality of the data link, the distance to the base, the percentage of resolved ambiguities, etc.

## Coordinate Systems

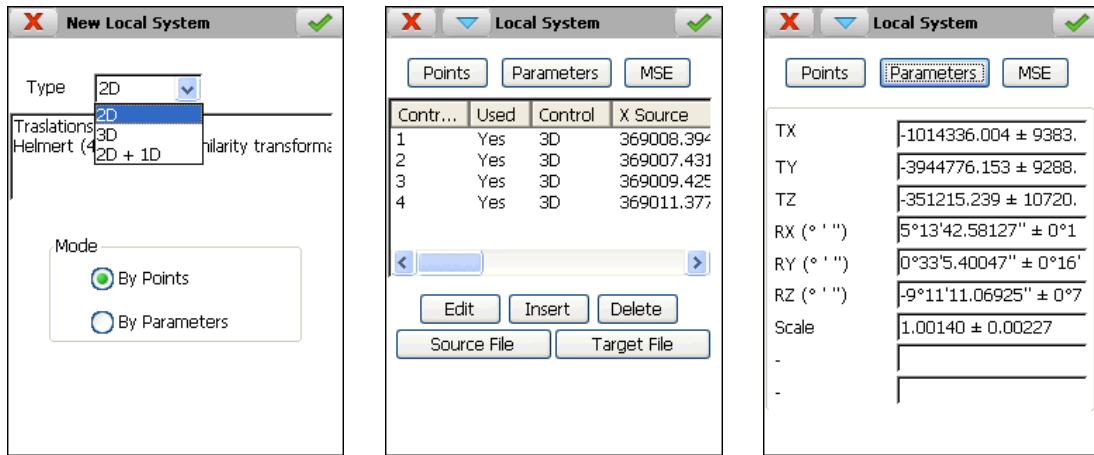
The program includes a new geodesy module based on the PROJ.4 cartographic projection library and the world geodetic database published by OGP (The International Association of Oil & Gas producers, formerly EPSG). The program allows user to work in any part of the world with several projection systems, such as UTM, Transverse Mercator, Lambert Conic Conformal (1 and 2 parallel), etc.



Also, the program allows the user to create personalized coordinate systems of different dimensions (2D, 3D and 2D + 1D) from pairs of coordinates or from transformation parameters, or entering manually the transformation parameters from a project adjustment report. It also allows creating a detailed report in HTML format.

It also includes the most used 3-parameter, 7-parameters, and NTV2 grid-based datum shifts, and more common geoids, and can easily add new elements.

The global and local coordinate reference systems are compatible with **TcpMDT**, so that can be defined in PC and transferred to the mobile device or vice versa.

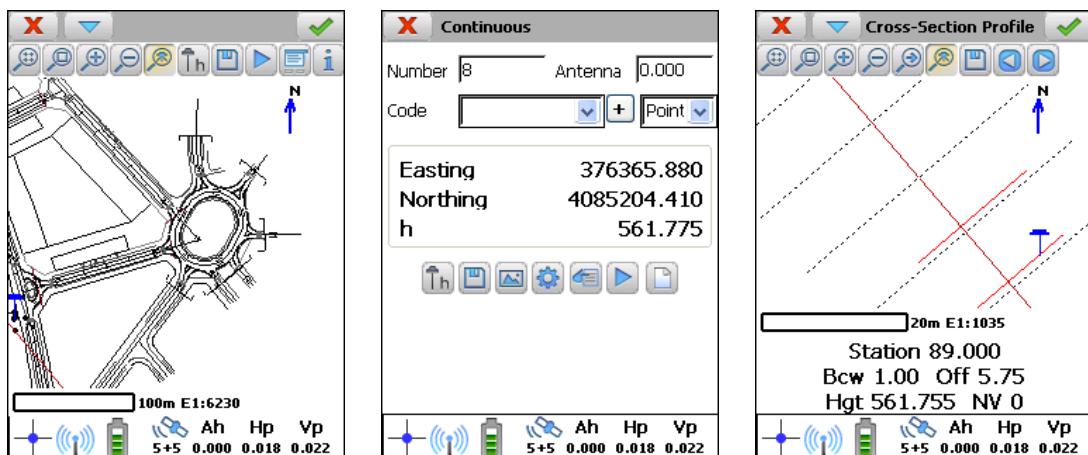


## Surveys

The application has various modalities for surveying using GNSS receivers: manual point-by-point, continuous through distance, time or height difference, longitudinal profile, cross sections, static and kinematic. In each point, the user may indicate the height of the antenna and the code, and can control the quality of the position obtained, the deviations and the position modes.

There is a button for switching to the graphic mode that shows the points along with their assigned numbers, spot heights or codes, as well as the parts joining the points, based on the codes database. Another icon may be used to change the desired precision and quality specifications quickly.

In devices with integrated camera, the pictures can be captured and related with stored points.



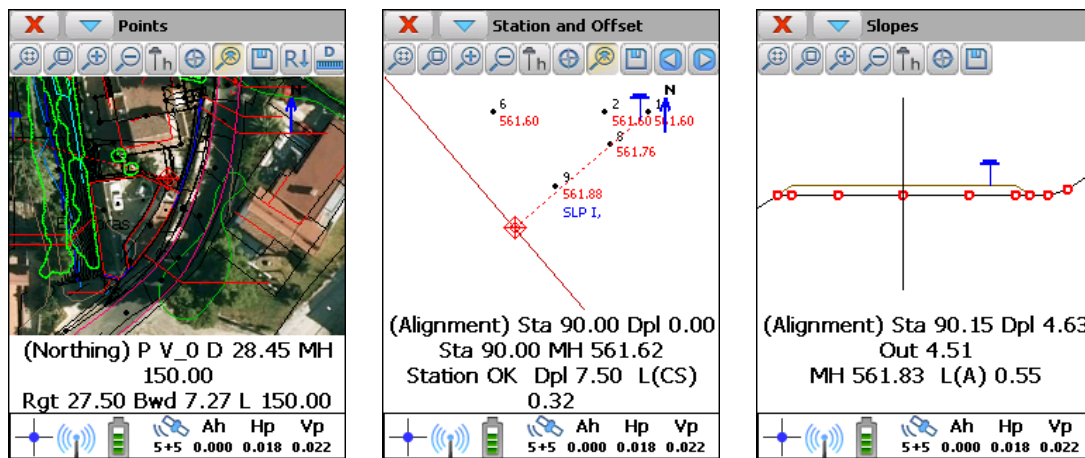
## Setting Out

The program provides numerous options for setting out the points, roads and geometric constructions with lines and circles. The dialogs clearly indicate the current position and the target position, indicating this position with respect to the North, a predefined base, the last recorded point, the sun or the movement.

The points that are to be staked out may be chosen from the station or point files, or the graphically designated points. There are also the options for setting out rectangular grids or applying the quincunx method.

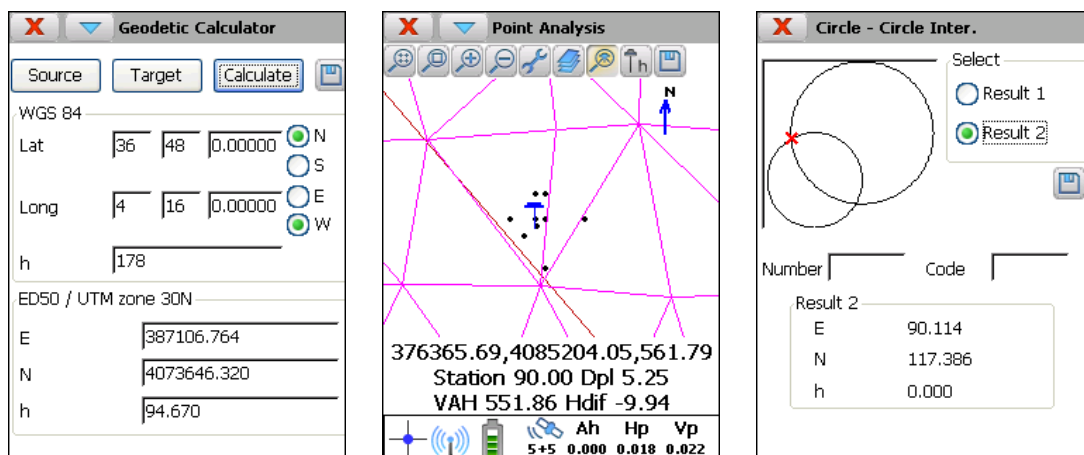
For setting out sections over alignment, there are different options for setting out the platforms, the heads and shoulders, the cross sections, station and code, station and displacement, etc. The screen shows precise information regarding the offset to the alignment and the profile, the height difference and the plan and front view graphs of the current profile.

An artificial voice system optionally directs the user to the target.



## Tools

The program provides the ability to calculate distances and areas between points, to calculate the coordinates of a point over the horizontal and vertical alignment, to analyse a point using a digital model, to find intersections between straight lines and/or circles, to use the geodesic calculator, to generate a grid of points, etc.

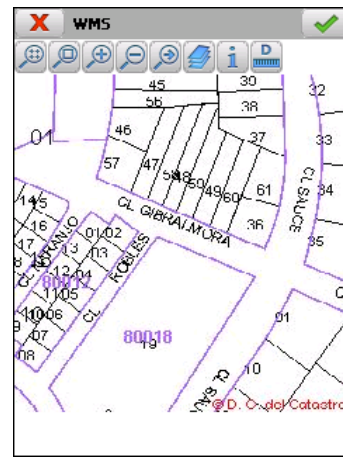
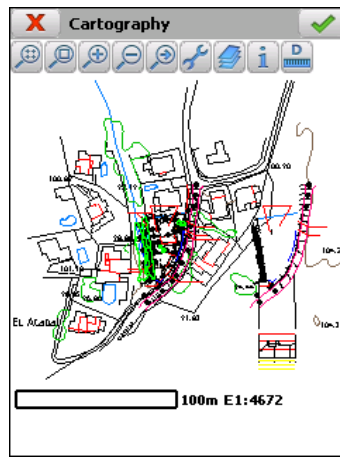


## File Management

The application works with ASCII files in a format that is compatible with **TCP – Digital Terrain Model**. All of the information exchanged between the PC and the mobile device is transmitted in a very simple manner using Microsoft ActiveSync/Windows Mobile Device Center.

Each project may contain files with stations, points, longitudinal profiles, cross sections, horizontal and vertical alignments, superelevations and surfaces.

Also cartography in DXF or Shape formats can be loaded, and georeferenced images in JPEG, ECW or JPEG2000. If Internet connection is available it's possible to add WMS services (Web Map Services) from data providers.



The programs includes file conversions from/to most used commercial formats, such as DXF, Shape, KML, LandXML, etc.

## System Requirements

### Supported Devices

PCs or tablets with Microsoft Windows XP, Vista, 7, 8, 8.1 or 10 operating system.

Mobile devices with ARM processor and Microsoft Windows CE 4+, Windows Mobile 4.2+, Windows Embedded Handheld 6.5 or Windows Embedded Compact 7 operating systems.

### Supported receivers<sup>1</sup>

Brand	Model
CHC	X91, i80
GeoMax	ZGP800, Zenith 10/20, Zenith 25 <sup>2</sup> /25 Pro <sup>2</sup> , Zenith 35
Javad	Maxor, Triumph-1, Alpha, Sigma, GISmore
Leica	SmartRover, GPS 900, GS14 <sup>2</sup> , GS10 <sup>2</sup> , GS15 <sup>2</sup> , Zeno 5, Zeno 20
Novatel	Propak-LB, Propak-G2
Prexiso	G4, G5
Sokkia	GRX1
Stonex	S9, S10
Thales	Z-Max, Z-FX, Scorpio
Topcon	Map-R, GB500, GB1000, Hiper+, HiperPro, GR-3, Legacy E, Legacy H, Hiper GD, Hiper GGD, GMS-2, GRS-1, Hiper II, GR-5, Hiper V
Trimble	4700, 4800, 5700, 5800, Rx

**Aplitop S.L.**  
 Sumatra,9 – Urb. El Atabal  
 E-29190 Málaga - Spain  
 Tel. No.: +34 95 2439771  
 Fax: +34 95 2431371  
 e-mail: [info@aplitop.com](mailto:info@aplitop.com)  
 Website: [www.aplitop.com](http://www.aplitop.com)



<sup>1</sup> Not all of the features of the application are available for all the devices and receivers. For an updated account of the certified receiver models and mobile devices, please visit the website. If you wish to evaluate the possibility of adapting the application to a specific receiver or mobile device, please contact our Technical Service.

<sup>2</sup> OWI license required