

Using More Than One Reference Station

In the last newsletter, practical field procedures were described on how to use more than one reference station for an RTK survey.

This newsletter describes why a user may want to use more than one reference station and what would be the advantages.

Quality Control of Measurements

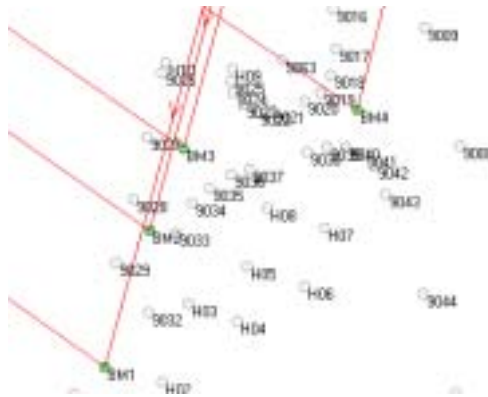
Using more than one reference station provides a very useful way to estimate and control the quality the points measured by the RTK rover.

The reference stations need to be set up such that the same area within which you need to work is covered by both reference stations. As described last week the radio channels of each of the references must be different.

By switching radio channels on the rover, it is then possible to obtain independent solutions from each of the reference stations. This is then a thorough check of the quality and reliability of the RTK solution.

It may be that not all points within a survey need to be measured more than once from each of the reference stations, but only specific “control” points within the survey. This technique was used for the RT Sample data which is included on all SKI-Pro CDs.

These control points should be measured with a solution obtained from each of the reference stations.



If the point is given the same Point ID when measured from each reference station, then an **average** co-ordinate is created for this point. It is then possible to see in the field the co-ordinate differences from each reference station and assess the quality of the different solutions for this point. All individual measurements of points using the same point ID can be chosen to be Used or not within the averaged point.



In some countries points have to be observed at least twice and independently. The use of two or more reference stations fulfils this requirement.

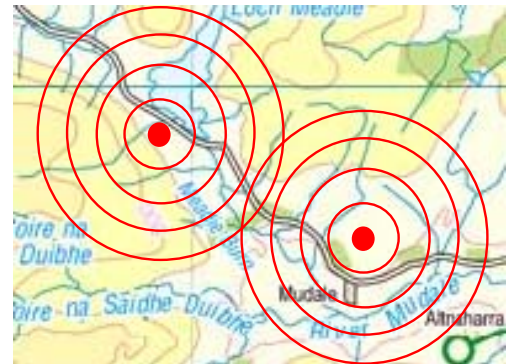
Covering Wider Areas

Using more than one reference also allows a much greater area to be surveyed without having to return to keep moving the same reference station.

Imagine you need to survey a large open cast mine or along a 30km stretch of road. With only one reference sta-

tion and “standard” radio modems it may be necessary to move the reference several times to cover the whole area needed to be surveyed. (You may of course be able to use GSM and then this problem would not occur!)

However using two or more references which are optimally positioned allows the whole survey area to be covered without moving reference stations.



Obviously it is necessary to allow a small overlap of the coverage from each reference station.

The cost of purchasing the second reference station will quickly be compensated by the time saved in having to keep moving just one reference station.

Remember

- Separate solutions obtained from different reference stations provides independent solutions for quality control.
- The creation of averaged points allows co-ordinate differences to be viewed and assessed.
- Using more than one reference station on a large project can save a lot of time compared to moving a single reference station.