SureFix™ RTK
Super Robust RTK Positioning

Overview

This document provides a brief overview of Hemisphere GNSS' SureFix feature.

What Is SureFix?

RTK (real-time kinematic) positioning is one of the most popular positioning techniques in the GNSS industry. GNSS data is transmitted from a nearby GNSS reference station located on a known point to an end user via internet or radio connection. This reference station data is used by the end user's receiver to remove error sources common to both the reference and the user's receivers. This technique can provide positioning accuracies down to centimeter-level under ideal conditions.

As this technique has grown in popularity, the need to verify the reported position to ensure that the results are accurate has also grown. Users now expect that the positions reported by the receiver are reliable even in tough environments such as near buildings or under tree canopy, without significantly reducing availability in clean environments.
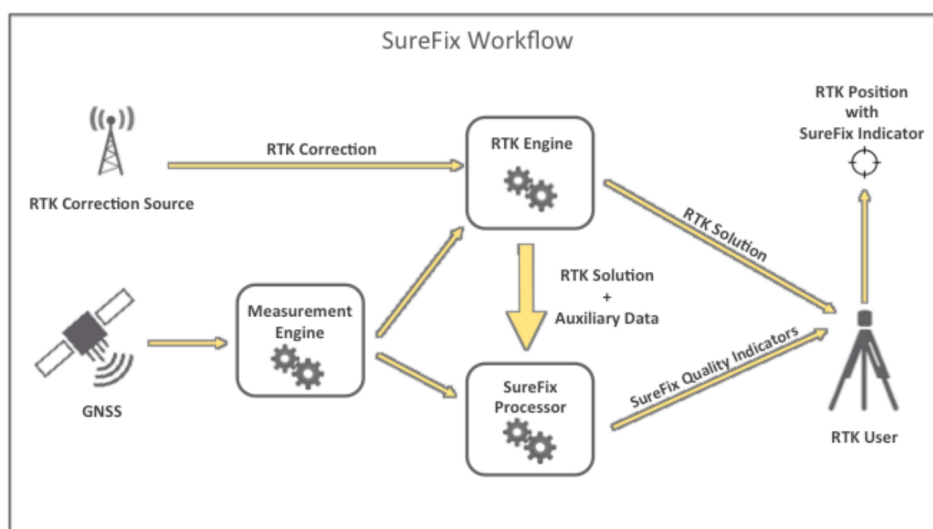

Figure 1 – Description of SureFix feature

Figure 2 – Example of a challenging environment for RTK

Receivers have always provided some quality indicators to the user, but these are typically nominal values that do not take into consideration un-modeled errors such as multipath and residual atmospheric effects; causing those quality indicators to be optimistic, and in some cases report "fixed" solutions even when the true accuracy is less than expected.

This has been a concern in the surveying industry, which has led to Hemisphere GNSS creating SureFix.

How Does It Work?

The SureFix processor takes several inputs including the RTK solution and auxiliary data from the RTK and *Measurement Engines*. Based on these parameters, the SureFix processor performs statistical analysis to determine the true quality of the current RTK solution. The results are then output as the SureFix *Quality Indicators* along with the RTK solution.

Figure 3 shows an example of the SureFix certified positions. SureFix is designed to ensure a very low rate of false fixes. As the solution begins to drift, the SureFix engine is able to identify this and will mark these solutions as not certified.
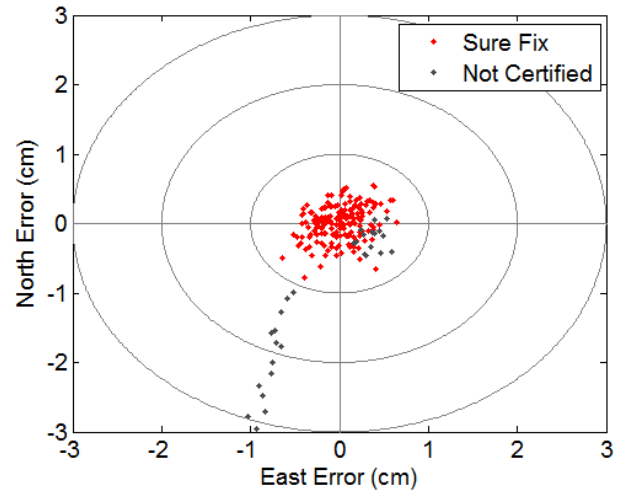

Figure 3 – Example of SureFix feature in action

Summary

SureFix is ideal for users who use GNSS in harsh environments and want to ensure they do not suffer from incorrect fixes. By using additional quality control checks associated with the measurements and RTK engines, SureFix provides surveyors the extra confidence as they carry out their work.