

Monitoring GNSS Infrastructure Network Dynamics



Trimble has introduced an application for monitoring the dynamics of Global Navigation Satellite System (GNSS) infrastructure networks: Trimble Integrity Manager software. In a GNSS network, movement of a reference antenna results in reduced data integrity. Antennas can shift for a variety of reasons such as tectonics, weather or simple human error. With Trimble Integrity Manager, network operators will know immediately if movement has occurred and whether action is needed.

The software provides a constant assessment of a network's quality with detailed reports, analysis and alarms to monitor the position of network antennas, giving operators key insight into the health of their network.

Trimble Integrity Manager software provides three core functions that enable network operators to precisely identify how motion is affecting network performance.

- **Detection** - Trimble Integrity Manager software observes network conditions in real time to detect rapid and track long-term motion.
- **Alarms** - With configurable alerting options, Trimble Integrity Manager notifies network operators or administrators of significant events so no time is lost when serious integrity issues arise.
- **Measurement** - Trimble Integrity Manager software provides precise measurements before, during and after events occur.

The Trimble Integrity Manager software suite provides operators with the information they need to respond quickly and effectively to motion-related events. Four complementary motion engines work together to provide a wide range of detection and measurement capacity. To address a variety of operational needs, users can configure Trimble Integrity Manager to ensure that the information they need is available quickly. With adjustable data filtering, users tailor alarming to meet their requirements.

Engines

The Rapid Motion Engine detects abrupt position changes of 3 cm or more per second such as earthquakes or landslides. Measuring takes place every second.

The Network Motion Engine uses neighboring reference stations to identify changes to network geometry and provide operators with tools to determine if and when action is needed.

The most rapid form of motion detection is provided by calculating RTK at the server. Baselines between reference stations up to 35 kilometers are computed at a 1 second rate.

Providing the highest level of accuracy, post-processing is very valuable in measuring long-term drift and assessing cyclical or seasonal movement.