High Rise App

The Trimble® High Rise App is intended to monitor high rise structures during construction using GNSS and inclination sensors. Integrated processing of GNSS, total station and inclination data delivers precise and reliable coordinates on demand. This is essential for stake-out jobs on structures subject to tilt such as towers, port and naval infrastructure and high rise structures.

The Role of Monitoring

Monitoring installations are crucial for structures which are subject to vibration, ground movement, extreme weather conditions and construction activities in order to identify potential failure modes.

The growth in the number of tall structures and MRT projects requiring the construction of tunnels beneath structures results in an increased demand for structural health deformation monitoring. Lateral movement, inclination, fracturing, heaving, settlement and fatigue resulting from activities such as tunneling, excavation, piling and drilling may be tracked by the monitoring system.

Traditionally, surveying on a high rise structure is done with a total station. The total station periodically references to fixed reference points with known coordinates on the structure to record measurements and features of the structure.

Challenges

The precision of the survey depends on the precision of your reference points. Therefore points on ground-level are selected for which absolute consistency of the position can be guaranteed.

- Difficulties using fixed ground-level reference points include:
- Densely built-up surroundings
- Visibility problems because distance to ground-level reference points increases continuously

During construction, structures lose their exact vertical alignment due to various factors that might include:

- Crane loads
- Wind loads
- Solar effects
- Concrete shrinkage

Trimble High Rise App

A stake out of design point coordinates requires the consideration of factors affecting the dynamics of a high rise structure.

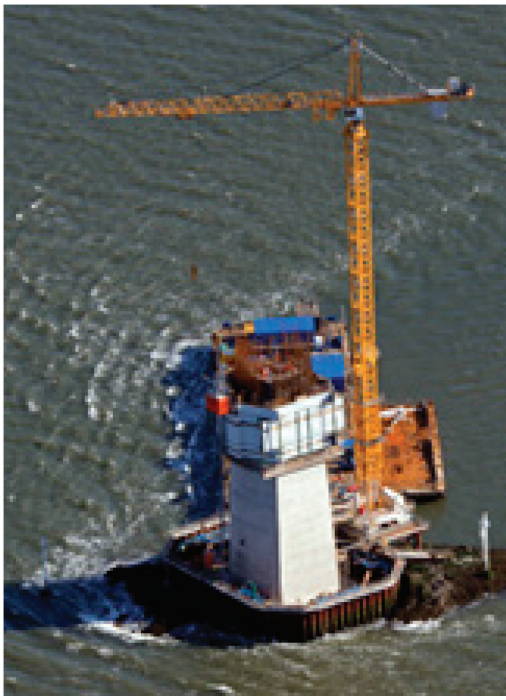
To set up a total station on top of a high rise structure, the precise coordinates of combined GNSS and prism targets delivered by the High Rise App are used as fixed reference points. The reference coordinates are monitored in real-time by sophisticated GNSS engines built within the Trimble 4D Control™ monitoring software.

Furthermore, information of inclinometer sensors is used to automatically apply dynamic effects during the Total Station setup.

The automatic tilt offset correction and an integrated adjustment of GNSS and terrestrial observations guarantee high-precision stake outs.

Key Features

- Integrated total station/GNSS coordinate adjustment
- Automated tilt correction
- Automated data synchronisation between the Trimble 4D Control and Trimble Access software
- High-precision stake out for high rise construction
- Permanent real-time monitoring of reference coordinates



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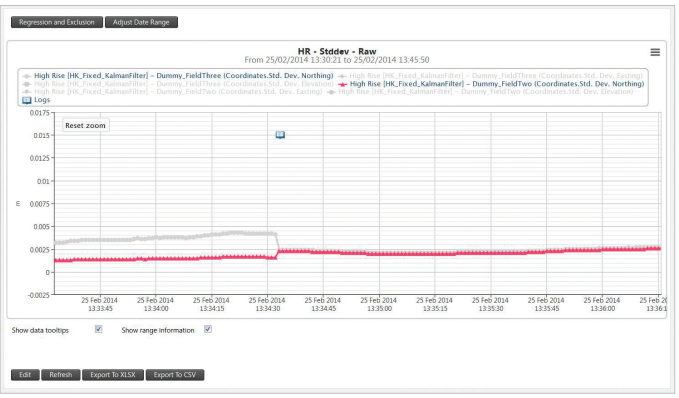

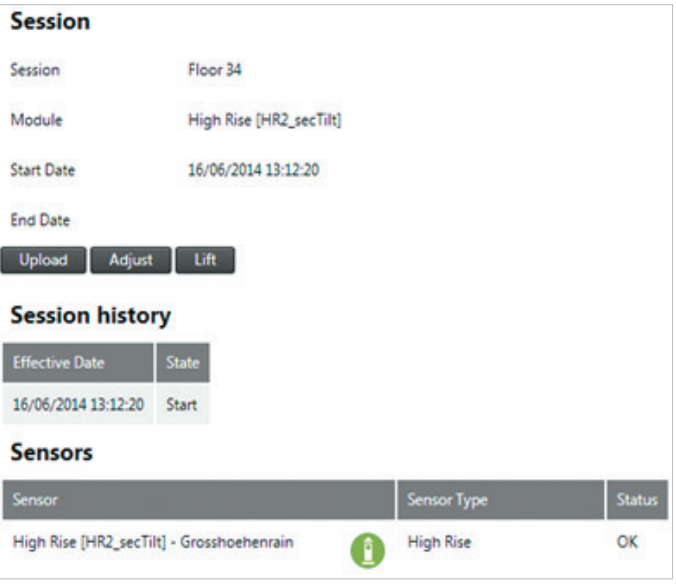

WORKFLOW

The High Rise App uploads current coordinates from the Trimble 4D Control server and makes them directly available on site using the Trimble Access™ software, running on a Trimble field controller.

This automatic workflow is also supported by the online data management system Trimble Connected Community.

TRIMBLE 4D CONTROL WEB

Within the Trimble 4D Control Web module, the High Rise application provides advanced charts and analysis and comes with an integrated alarming functionality of coordinates, displacements and results from external inclination sensors.

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