



Bridges

TRIMBLE MONITORING SOLUTIONS

SOLUTIONS FOR SAFE CONNECTIONS

The Role of Monitoring

Monitoring installations are crucial for the safe operation of bridges.

It is important to detect movements, vibrations, structural changes and responses of bridges to the environmental conditions in order to identify potential failure modes.

Monitoring provides the information needed to support a safe transportation environment by continuously verifying the ability of bridges to perform their intended function, whilst subject to operational aging and degradation.

The Focus of Monitoring

The performance of bridge decks, piers, cables and related components under variable dynamic loads and aggressive climatic conditions can be monitored by the system.

Long term changes in the modal signature of the bridge are useful to detect the effects of slow aging, deterioration and impact assessment.

In a world of aging infrastructure and increasing maintenance requirements, a monitoring system will improve safety and reduce operational costs by optimizing the maintenance cycle.

Trimble 4D Control

Trimble® 4D Control™ software is the key element of the Trimble Monitoring system. The modular design facilitates an industry specific solution capturing data from GNSS, optical, geotechnical, vibrational and metrological sensors.

The data is processed using advanced, state-of-the-art algorithms and presented in a powerful, yet user friendly Web Interface. It provides a variety of visualization and analysis tools to identify potential failure scenarios.

Data from accelerometers and strain gauges may be combined with data from atmospheric and displacement sensors to display and analyze the oscillation, torsion and vibrational characteristics of the bridge.

Frequency domain analysis using Fast Fourier Transforms can be performed to determine changes in the physical characteristics of the bridge due to aging or sudden impact.

Significant events such as deck impact, cable maintenance and severe weather conditions may be logged and displayed on the charts.

Boolean comparators are used to integrate data from GNSS, optical, geotechnical, vibrational and atmospheric sensors to create complex alarm conditions.

Alarm notifications are issued by email and SMS to selected recipients and the system may also activate audible and visual alarms.

Designed for Demanding Environments

The Trimble Bridge Monitoring Solution is designed specifically for the structural, mechanical, modal and survey monitoring analyst.

Intricate data from multiple sensor types is converted into meaningful information from which informed decisions can be made with confidence.

The solution accommodates a smooth transition from periodic monitoring surveys using Trimble Access™ software and Trimble 4D Lite software into complex automated systems using Trimble 4D Control software.

Key Features

- ▶ Automated, real-time monitoring system
- ▶ Periodic deformation surveys
- ▶ Vibration response monitoring
- ▶ Condition assessment monitoring





TRIMBLE 4D CONTROL MONITORING SOFTWARE

A powerful monitoring software that integrates GNSS, optical and geotechnical sensors to collect and manage data, provide computation and analysis, visualization and mapping and alerts and alarms.

TRIMBLE 4D LITE SOFTWARE

A cloud-based web application designed with the same advanced web interface and back-end stability as Trimble 4D Control, with the advantage that this is available for the analysis of any form of data time series.

TRIMBLE S7, S9 TOTAL STATIONS

Advanced total stations that combine Trimble FineLock™ technology with long-range, distance measurement to provide fast and precise monitoring measurements.

TRIMBLE NETR9® TI-M GNSS RECEIVER

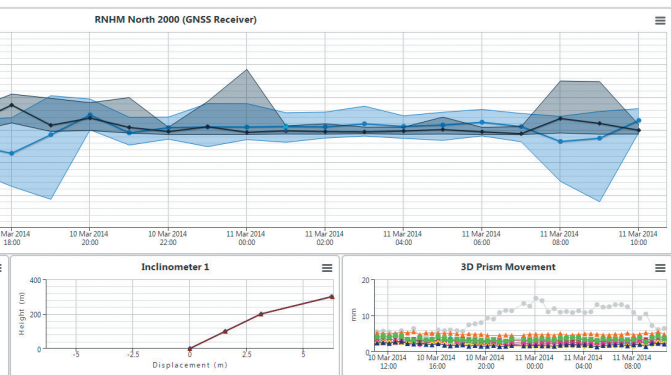
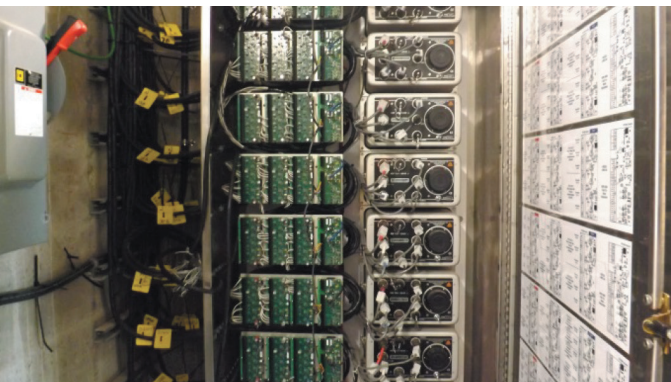
A full-feature, top-of-the-line receiver with an industry-leading 440 channels for unrivaled GNSS multiple constellations tracking performance intended for monitoring applications.

TRIMBLE ACCESS MONITORING APP

A monitoring module to guide surveyors through a step-by-step process that speeds up setup, data collection, reporting, and return visits to the same monitoring projects.

TRIMBLE REF TEK STRONG MOTION ACCELEROMETERS

Powerful devices that measure the acceleration of motion of structures as well as subsurface monitoring of the ground.



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