

# Trimble Monitoring

SEMI-AUTOMATED  
MONITORING SOFTWARE

Survey automation  
you can rely on



Semi-automated (campaign-based or periodic) monitoring projects require repetitive and accurate measurements to analyze trends and movement patterns for structural and natural objects. Because semi-automated projects require less frequent measurements, and are usually in lower risk environments than fully automated monitoring projects, there are several Trimble software options.

Trimble semi-automated monitoring software automates repetitive processes such as data collection, reporting and analysis. Through elimination of tedious set up procedures, monitoring professionals can reduce errors and have confidence in the quality of deliverables across a variety of project types.

Find out more at:  
[monitoring.trimble.com](https://monitoring.trimble.com)



# Trimble Semi-Automated Monitoring Software

While every project has unique specifications, three consistent evaluation components—to determine whether automated or semi-automated software is necessary—are an assessment of **monitoring frequency requirements**, **structural behavior** and **project risk**.

The following software solutions offer features that are ideal for semi-automated monitoring project demands:



## Trimble Access Monitoring

- Trimble® Access™ Monitoring software automates a collection of repeated total station measurements, reducing time in the field and increasing the reliability of monitoring target measurements.
- The software guides surveyors through a step-by-step process that speeds up setup, data collection and reporting. Reuse setup information on return visits to significantly reduce field time.
- Trimble Access Monitoring is ideal for the occasional monitoring job, or for periodic monitoring jobs, where a permanent monitoring program is not required.



## Trimble 4D Control Access Edition

- Trimble 4D Control™ (T4D) Access software edition processes, stores and analyzes measurements from total station data.
- For semi-automated monitoring with robotic total stations, data is collected periodically and reporting and analysis is automated in the website application.
- Data is compiled into customizable reports, ensuring timely project deliverables.

T4D Access preserves data with an upgrade to T4D Advanced—for automated monitoring—if project requirements expand.



## Trimble Business Center Monitoring

- Trimble Business Center software simplifies management of the control network data with full 3D network adjustment of all monitoring data, including optical.
- The software allows users to perform adjustments to ensure a robust control network of different total station setups for future monitoring campaigns after the initial data has been collected.
- Surveyors can process, manage and create reports on manual monitoring projects using survey data.



# Semi-Automated Monitoring Industry Solutions

With the support of Trimble Access Monitoring, T4D Access, and Trimble Business Center Monitoring software, industry professionals can set alarms, collect data, analyze measurements and create reports from data collected in the field.

Within the following four industries, the Trimble semi-automated monitoring software offers the critical support necessary to manage the accuracy of data collection, processing and generation of timely project deliverables.



## Transportation & Infrastructure

Track stability and health are critical factors to monitoring throughout the lifetime of a railway to ensure the safety of the public and cargo.

Semi-automated monitoring systems assist surveyors and construction professionals in efficiently capturing data on the cant, twist, horizontal and vertical movements of a rail track, which informs stakeholders of potential risks.



## Buildings & Structures

Monitoring systems are crucial for buildings, which are subject to vibration, ground movement, extreme weather conditions and construction activities.

From the excavation to the final foundation erection, monitoring data provides insight to project owners and operators of structural and foundation conditions ensuring safety of public and workers.



## Dams & Mining

Slope stability monitoring installations are essential for safe and efficient mining operations. The detection of the onset of slope movements, the rate of movement and the associated rate

of increase of the movement is required so that potential slope failure indicators may be identified.

Structures such as dams can exhibit small amounts of movement over the course of months or years and seasonal changes. Survey crews often time monitoring these behaviors once per season/year to capture this moment, providing dam operators with data for informed decision making.



## Landslides & Natural Hazards

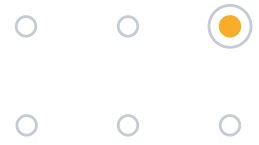
Natural hazards such as landslides, volcanoes and floodplains can pose risks to surrounding communities and infrastructure. A detailed monitoring scheme is necessary to ensure that trends can be detected in a timely manner, allowing stakeholders to know when to place strict safety and risk mitigation measures in place.



## Transitioning to Automated Monitoring Software

When project requirements require more frequent measurements, reporting, or alarming, an upgrade from a semi-automated to automated software system may be necessary. Often this occurs when site conditions change (weather, construction, etc.) or movement trends are detected. Some things to keep in mind:

- Inconsistent conditions require more frequent measurement schemes in a specific area on site, which is when an automated system would be more cost-effective and address the new project requirements.
- If project scope expands, users may upgrade from T4D Access to T4D Advanced, which is a fully automated monitoring software and includes functionality for automated data collection, processing and storage.
- Users can retain their previous semi-automated data in this transition, providing a seamless connection between automated and semi-automated monitoring data.
- T4D Advanced expands on the T4D Access edition by enabling full capabilities of the T4D platform for automated monitoring with all geospatial and geotechnical sensors.
- With the addition of the Settop M1 total station controller, users can automate your data capture, processing, analysis, alarming, and reporting.



# Trimble Monitoring

Semi-Automated Monitoring Software

## Trimble Access Monitoring

Field data collection software for campaign monitoring

### Benefits

- Reduces measurement time in the field from automated round collection
- Simplified in-field reporting
- Seamless transfer of site setups and/or round measurements to TBC and T4D in the office

### Features

- Time-based auto total station measurements
- Define movement thresholds and generate warnings
- Direct data analysis and reporting in the field
- Site setup for automated monitoring with T4D Control

## Trimble 4D Control Access

Streamlined reporting, analysis and alarming of monitoring data

### Benefits

- Streamlines workflow for semi-automated total station data collection
- Automates reporting, analysis and visualizations that can be shared with any stakeholders
- Preserves data if expanded project requirements require upgrade to T4D Advanced, the software application suitable to fully automated projects

### Features

- Management and storage of monitoring total station data
- Automatic measurement corrections and full 3D network adjustment
- Comprehensive analysis and visualization of measured monitoring data
- Conditional and configurable alarming and reporting

## Trimble Business Center Monitoring

Field to finish monitoring with confidence

### Benefits

- Use survey CAD, network adjustment and manual input to define monitoring project before setting foot on site
- Increase confidence in final monitoring network configuration

### Features

- Pre-analysis and monitoring network definition
- Network adjustments and control point set up
- Simple reporting and analysis for campaign monitoring data from geospatial sensors

## Next Steps:

Contact the Trimble Monitoring team for a demonstration of the semi-automated monitoring applications:

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