APPLICATION OVERVIEW

Trimble 3D Monitoring

SOLUTIONS FOR 3D MONITORING

Powerful 3D monitoring solutions integrated with Trimble 4D Control software.

The Trimble® R750 MON and Trimble GNSS Meter are powerful GNSS solutions, each offering unique functionalities that make them ideal for monitoring applications. However, every monitoring project is unique and should be approached individually to utilize the best components from the Trimble monitoring portfolio. In some cases, a combination of different components is the way to go. Regardless of the hardware used in the field, when combined with Trimble 4D Control™ (T4D), these solutions help to understand movement and make informed, timely decisions.

Learn about the most common applications where the R750 MON, GNSS Meter and Trimble total stations are best utilized.

Find out more at:
geospatial.trimble.com

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APPLICATION OVERVIEW

Trimble GNSS Meter in combination with T4D

Slope stability and tailings dams

The Trimble GNSS Meter is a great tool for slope monitoring in the mining industry due to survey-grade precision, affordability, and robust performance. It delivers accurate and reliable positioning data to fully understand movements in mine slopes. Combined with T4D, this solution enhances safety by providing early warnings of potential slope failures, allowing for timely interventions. Additionally, its cost-effectiveness makes it accessible for extensive deployment across large mining sites, ensuring comprehensive coverage and continuous monitoring without significant financial burden.

Landslides and subsidence

Landslides and subsidence often involve slow, gradual movements over extended periods, necessitating continuous and accurate monitoring. The Trimble GNSS Meter provides reliable positioning data to precisely track these movements and derive trends.

Understanding patterns is vital for ensuring safety and minimizing risks. When combined with T4D, this technology offers early warnings of potential landslide activations or excessive subsidence, enabling timely interventions and effective risk management.

Construction and settlement monitoring

Construction monitoring typically involves observing movement in critical infrastructure that is either part of the construction process or may be affected by ongoing construction works. Additionally, it is essential for settlement monitoring during building construction to ensure stability and safety. The Trimble GNSS Meter provides reliable positioning data, enabling accurate tracking of any movements or changes. This continuous monitoring is crucial for early detection of potential issues, ensuring timely interventions, and minimizing risks associated with construction activities.

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APPLICATION OVERVIEW

Trimble GNSS Meter in combination with T4D

Coastal monitoring

Due to the dynamic processes of ecosystems in coastal areas, understanding movement in regions such as ports, harbors, waterside facilities, oil and gas platforms—or the terrain itself—is crucial. The Trimble GNSS Meter, combined with T4D, provides valuable insights and builds an evidence base to understand how changes and movements impact coastal regions, aiming to protect communities, ecosystems, and resources.

Bridge monitoring

Whether it's a new bridge being monitored for its movement in the initial active years under pressure and varying weather conditions, or an older bridge awaiting renewal, understanding the movement of bridge infrastructure is crucial. For larger bridges, bridge towers are typically monitored using GNSS solutions. The advantage of using the GNSS Meter for bridge monitoring is its battery power, which eliminates the need for external power sources.

On the software side, data can be seamlessly integrated into T4D for visualization, automation of movement detection alarms, and generation of comprehensive monitoring reports. This provides a better understanding of how bridges behave over time.

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APPLICATION OVERVIEW

Trimble R750 MON in combination with T4D

Seismic areas and scientific structural monitoring

The Trimble R750 MON incorporates the latest industry-leading positioning technology from Trimble, offering high accuracy and versatile processing capabilities when combined with T4D. It supports both RTK, RTX, and post-processing workflows, achieving millimeter-level movement detection for long-term trend analysis with high reliability and safety factors. This makes the R750 MON an excellent choice for seismic areas and scientific structural monitoring. Its precision and robustness ensure accurate data collection even in challenging conditions, providing critical insights into structural behavior during and after seismic events.

Critical structure monitoring

The Trimble R750 MON is an excellent solution for critical structure monitoring due to its high frequency, durability, and high accuracy. Its technology enables precise data collection, essential for monitoring the health and stability of critical structures. High-frequency data sampling provides detailed insights into structural movements, allowing for timely detection of potential issues and ensuring the safety and integrity of the monitored structures such as dams, power plants, electrical grids etc.

Integrated survey control

An integrated survey approach is a great solution for applications where backsights are susceptible to movement, such as in mining projects, challenging dam monitoring environments, and similar scenarios. The Trimble R750 MON and an appropriate antenna can be combined with backsight point prisms, providing a stable reference frame for total station measurements, even if the backsights move. This approach not only increases the flexibility of Trimble monitoring solutions but also combines the benefits of both sensor types for a comprehensive monitoring strategy.

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APPLICATION OVERVIEW

Trimble total station in combination with T4D

Rail monitoring

Rail monitoring is a crucial process for maintaining the safety and reliability of rail operations. It plays a key role in supporting rail line operator safety during construction projects on or near existing tracks. Regular rail monitoring using total stations can also help detect track changes caused by factors such as tectonic movements, heat waves, and other environmental conditions.

Tunnel convergence monitoring

Accurate and reliable tunnel convergence monitoring is essential for ensuring safety, stability, and long-term performance of a tunnel. Total stations deliver the precision required to detect even the smallest deformations in a tunnel's cross-section, both during construction and throughout its operation.

Designed for robust performance in challenging conditions, Trimble total stations combine high precision and reliability, making them the ideal solution for monitoring the structural integrity of tunnels and ensuring safety across their lifecycle.

Safety-critical infrastructure

A total station is an excellent tool for monitoring safety-critical infrastructure, such as those vital systems and facilities whose disruption, degradation, or destruction can significantly impact public safety, economic stability, and social well-being. In scenarios where obtaining a GNSS signal is challenging but a clear line of sight is available, total stations provide a flexible solution. The ability to position prisms strategically allows for a deeper understanding of movement and structural behavior.

Captured data seamlessly integrates with T4D for real-time visualization, reporting and alerting, ensuring the continuous monitoring and safety of critical infrastructure.

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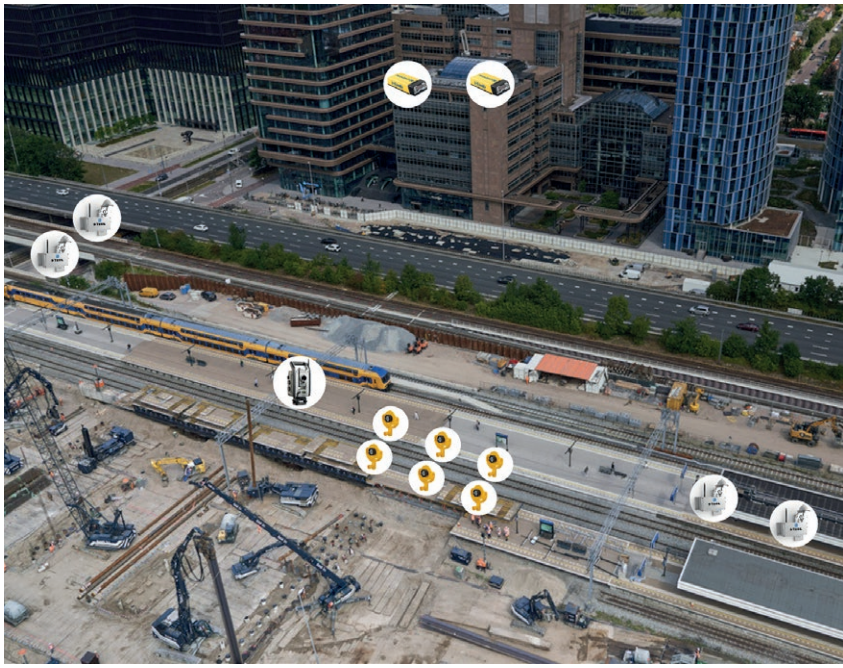
Combined solutions

A key advantage of the Trimble monitoring portfolio is its comprehensive range of products, designed to meet diverse monitoring requirements that vary from project to project.

Take a construction site in an urban setting as an example. Whether it's a building project, a new tunnel being built beneath the city, or a railway track renewal, construction activities can impact surrounding infrastructure, necessitating precise monitoring.

In the example on the image on the right, construction work can influence nearby rail infrastructure, requiring a monitoring system to understand movement effectively. A Trimble total station can be deployed to measure prisms installed along the track. This provides valuable insights into how groundworks are affecting track geometry, ensuring safe and efficient continuous operations.



Trimble GNSS Meters can be installed on the bridge, platform stations or nearby buildings to monitor potential movement. For safety-critical infrastructure, such as emergency services or healthcare facilities, the Trimble R750 MON is recommended due to its higher positioning rate, ensuring fast and precise data acquisition essential for critical applications. A range of geotechnical sensors can be seamlessly integrated in these monitoring setups for a holistic approach to structural analysis.

The standout advantage of Trimble monitoring systems lies in the streamlined data processing and visualization provided by T4D. As a centralized platform, T4D enables efficient data integration, visualization, reporting and alarming, ensuring safety and informed decision-making throughout the monitoring process.

Find out more at:
geospatial.trimble.com

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