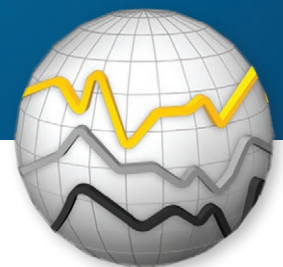# Trimble 4D Control

MONITORING SOFTWARE

MARCH 2021

AUTOMATED MOVEMENT DETECTION WITH CONFIDENCE

T4D CONTROL ENABLES AUTOMATED MOVEMENT DETECTION WITH CONFIDENCE FOR SURVEYING AND CONSTRUCTION PROFESSIONALS SUPPORTING INFORMED DECISIONS ABOUT INFRASTRUCTURE.

The main benefits of the T4D platform at its core are:

Sensor Management and Data Integration:
Connect, control, and configure your sensors. Trimble® 4D Control™ (T4D) software enables automated integration of geospatial and geotechnical data in one platform.

Geodetic Processing and Adjustment:
T4D is the only software that combines GNSS, total station and geotech with geodetic processing in a single environment allowing for highly accurate processing.

Comprehensive Analysis and Visualization:
T4D provides a complete tool set for visualizing data and combining inputs to generate meaningful analysis to develop key insights. This provides flexibility and power to support informed decision making on monitoring projects.

Conditional Alarming and Reporting:
T4D enables you to receive timely updates and share mission critical warnings and deliverables with project members within moments of a triggered alarm. Schedule critical updates and reports to any number of project members providing transparency on project movement.

Flexible licensing options for every project type

▶ Every monitoring project is different, requiring adaptive techniques for installing and deploying an automated movement detection system. T4D offers flexible licensing to handle any project length and size. Choose from a one or twelve month subscription or perpetual license.

Automated or manual monitoring, there's a tool for you

▶ T4D can handle any monitoring project whether it requires real-time alarming or manual project reporting. In an automated setup no user interaction is required after installation and setup. Data automatically flows from all connected sensors and in case of movement detection, users are immediately notified via SMS or email. For manual (also known as campaign monitoring) applications, T4D provides total station processing and adjustment modules that can manually or automatically import raw measurements to report on displacements across the network.

Start monitoring now with simplified deployment and installation

▶ Deploy automated monitoring systems on-site using local servers or simplify deployment and reduce IT complexity and infrastructure using cloud-based hosting of T4D through Microsoft® Azure. This capability is especially beneficial for short projects where the cost of physical servers is substantially higher than the cloud-based server. Microsoft Azure SQL database ensures that the installation process of T4D Server is identical to a physical installation.

On-site support, training, and installation so you don't have to worry

▶ Trimble's worldwide technical support team is available to support you throughout the project from installation to training. Schedule an on-site installation and training session with a knowledgeable Trimble Monitoring technician.

SENSOR MANAGEMENT AND DATA INTEGRATION

T4D ENABLES AUTOMATED INTEGRATION OF GEOSPATIAL AND GEOTECHNICAL DATA IN ONE PLATFORM.

▶ Integrate geodetic sensors such as total station, GNSS, and level with geotechnical sensors like inclinometers, tiltmeters, weathers and more, in one platform

▶ Integrate geotechnical sensors using file-based upload or stream directly from a Worldsensing or Senceive Gateway

▶ Enhance data analysis by incorporating environment sensors such as weather stations and THP devices

▶ Visualize movement in context of the project site using background maps and imagery

PROJECT EXAMPLE

NAME: Victoria Dam, Sri Lanka

GOAL: Monitor movement in the tallen concrete curvature dam in Sri Lanka for structural analysis and failure prediction.

TRIMBLE ADVANTAGE: Increased data confidence and reporting by combining new and existing site sensors in one platform — T4D; including GNSS, total station, level, and geotechnical for alarming and analysis.
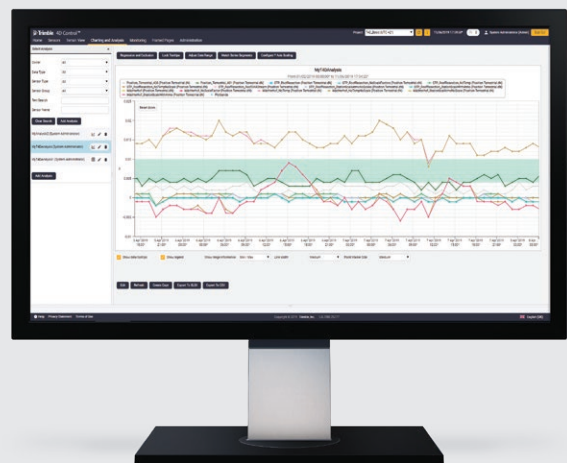
GEODETIC PROCESSING AND ADJUSTMENT

T4D IS THE ONLY SOFTWARE THAT COMBINES GNSS, TOTAL STATION, AND GEOTECHNICAL SENSORS WITH GEODETIC PROCESSING IN A SINGLE ENVIRONMENT ALLOWING FOR ACCURATE PROCESSING AND CONFIDENCE IN THE RESULTS.

▶ Robust coordinate system management and survey data processing

▶ Combined and integrated network adjustment

▶ Total station round management and automatic environmental corrections

▶ Multiple GNSS RTK engine and static baseline processing

PROJECT EXAMPLE

NAME: Landslide monitoring in Kostanjek

GOAL: Real-time transmission, processing, and analysis of GNSS movement data using real-time and post-processed engines for in depth analysis of movement trends and creating accurate landslide forecast models.

TRIMBLE ADVANTAGE: Accurate, ongoing measurement using multiple GNSS processing and adjustment engines to analyze slope movements.
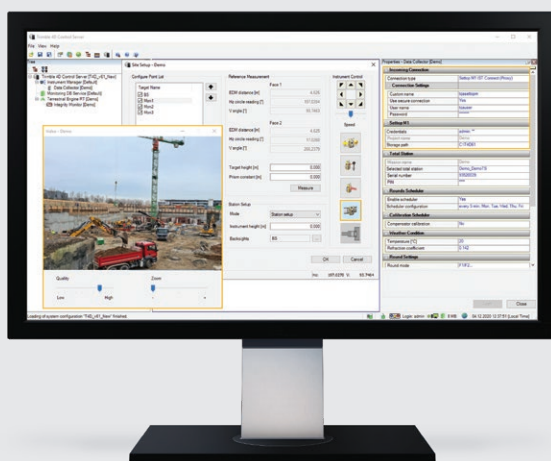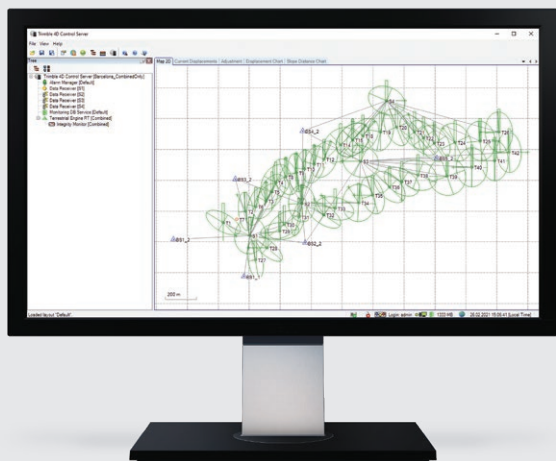
COMPREHENSIVE ANALYSIS AND VISUALIZATION

VISUALIZE DATA AND COMBINE INPUTS FOR MEANINGFUL ANALYSIS
TO GAIN KEY INSIGHTS TO PROJECT MOVEMENT.

▶ Multiple visualization options using a variety of chart and report methods

▶ Create comprehensive analysis and reporting for displacement measurements, velocities, and inverse velocities alongside environmental variables such as temperature and pressure

▶ View movement data in context of multiple map base layers using Google Maps, Microsoft Bing, and WMS

▶ Live data updates for analysis and visualization methods

PROJECT EXAMPLE

NAME: Mae Moh Coal Mine

GOAL: Monitoring slope stability to analyze and predict failures to ensure mine safety.

TRIMBLE ADVANTAGE: Generated comprehensive reports and analysis that provided informed decision making for slope failure prediction using inverse velocity analysis.
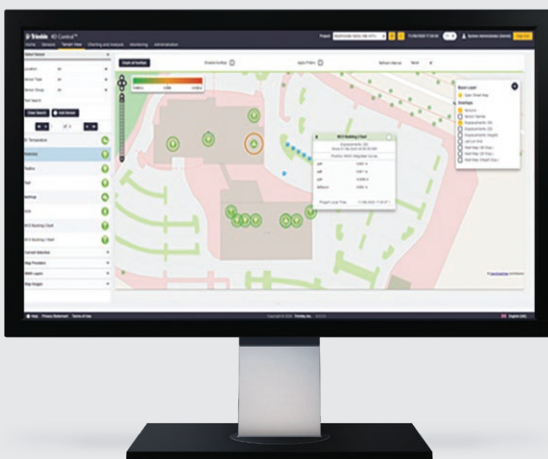
CONDITIONAL ALARMING AND REPORTING

T4D ALLOWS FOR TIMELY UPDATES AND SHARING MISSION CRITICAL WARNINGS AND DELIVERABLES WITH ANY PROJECT MEMBER.

► Create complex real-time alarming conditions through scalable mathematical operations to notify any stakeholders of movement or system outages

► Combine any data type to generate alarms from velocity and inverse velocity calculations

► Define notification types via SMS or email method

► Schedule report intervals to notify operators of system status

► Generate custom views to simplify on-site conditions for stakeholders or public viewing
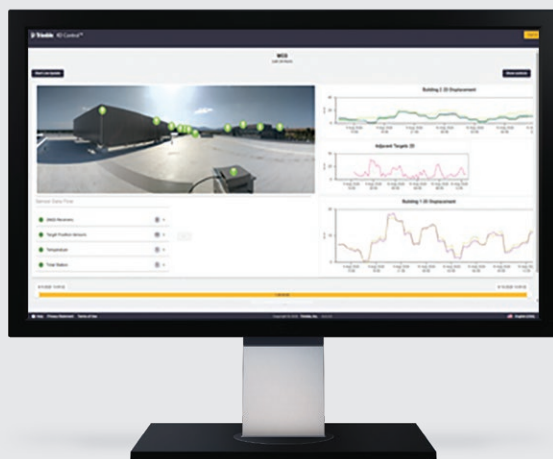
PROJECT EXAMPLE

NAME: Brisbane Skytower

GOAL: Monitor the real-time position of high-rise construction cranes to provide automatic alarming when entering airspace restricted areas.

TRIMBLE ADVANTAGE: Create complex conditions for notifying stakeholders with SMS, email, visual, and audible alarms for geodetic and geotechnical sensors

LEARNING RESOURCES

MONITORING DEMO SITES:

▶ Check out a live T4D automated monitoring system showing real-time data analysis on the Trimble Monitoring website. Want a live demonstration of T4D? Reach out to us to schedule an overview.

https://monitoring.trimble.com/demo-site

WEBSITE:

▶ The Trimble Monitoring website has a wealth of information such as customer projects, downloads, and support information. See a live automated monitoring system where T4D is being used to collect, process, and analyze multiple geodetic and geotechnical sensors in real-time.

https://monitoring.trimble.com

POWER HOURS:

▶ A live monthly session where a Trimble or industry expert showcases a workflow using Trimble Monitoring systems. All sessions are available afterwards and on-demand, for free:

https://geospatial.trimble.com/webinars/monitoring

YOUTUBE CHANNEL:

▶ Watch and learn as our team explains how a specific function works or what's new in the latest releases:

https://www.youtube.com/TrimbleMonitoring

TRIMBLE COMMUNITY PAGE:

▶ Join your fellow monitoring professionals and ask questions, showcase a project, and learn from peers in this open online forum:

https://bit.ly/TrimbleMonitoringCommunity

Trimble.

SYSTEM REQUIREMENTS

T4D Control runs on the latest versions of Windows® 10 operating system.

A software prerequisite for T4D Control is the latest version of Microsoft SQL Server.

For specific supported versions of Windows and Microsoft SQL Server refer to the latest T4D Release Notes **here.**

Supported Languages

Bulgarian	Japanese
Chinese (Simplified)	Russian
English	Spanish
French	Italian
German	

Category	Feature	Field	Intermediate	Advanced
Optical	Total station control, data processing, and integrity check	x	x	x
	Support for Settop M1 (no data loss) and external temperature sensor	x	x	x
	Automatic and scheduled compensator calibration	x	x	x
	Alarming (Total Station)	x	x	x
	Output of processed coordinates and stored time series of results	x	x	x
	Trimble VISION™ support	x	x	x
	Network adjustment (multiple total stations)		x	x
GNSS	Receiver control		x	x
	RTK processing (VRS and baseline) and post-processing		x	x
	Alarming (GNSS)		x	x
	Stored time series of processed results		x	x
Optical + GNSS	Real-time raw data routing and storage		x	x
	Combined processing and network adjustment		x	x
Web Application	Project and sensor management		x	x
	Account management			x
	Charts and scatter plots			x
	Map, custom, and composite views			x
	Comprehensive analysis capabilities			x
	Advanced alarming and reporting capabilities and scheduling			x
Geotechnical	Sensor agnostic file import			x
	Alarming (Geotech Sensors)			x
	Gateway-based sensor connection			x

For more information, link to the more comprehensive feature matrix **here.**

NEXT STEPS:

► Contact the Trimble Monitoring team for a demonstration of T4D by filling out the contact form here:

https://monitoring.trimble.com/contact

Contact your local Trimble Authorized Distribution Partner for more information

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