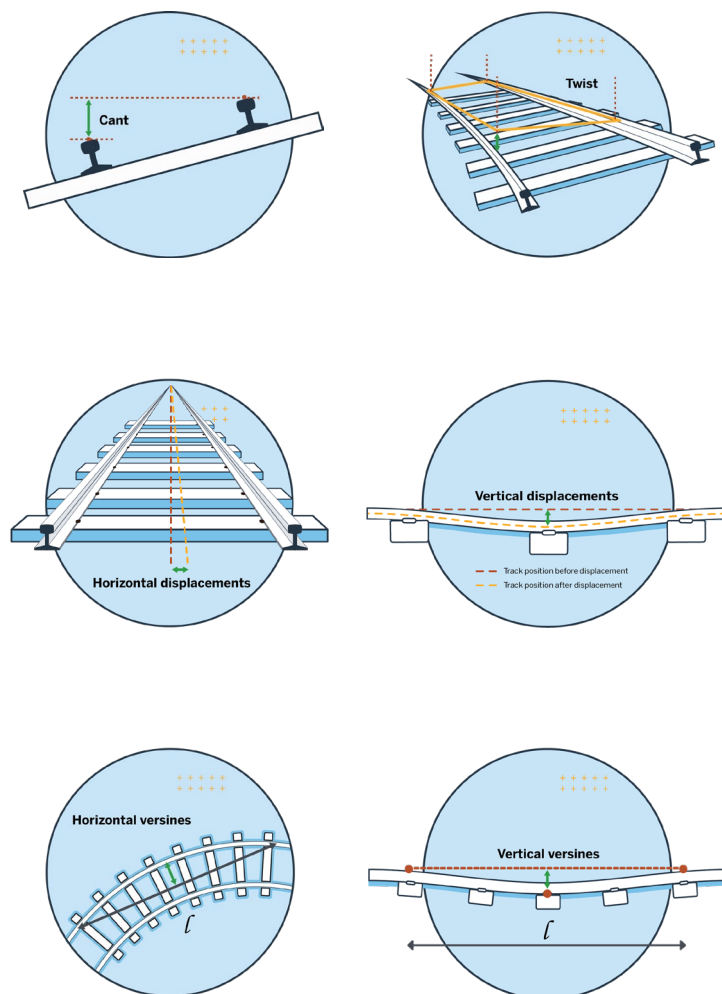




Automated Rail Monitoring for Real-Time Analysis & Safety

Rail monitoring is one of the critical components to ensure safe and continuous rail traffic. It is an activity that plays a crucial role in support of rail line operator safety during construction projects on or close to existing railroad tracks. Frequent rail monitoring can also help identify track changes caused by activities such as tectonic movement, heat waves, and other environmental conditions.

Trimble® 4D Control™ (T4D) software introduces the T4D Rail module, the first add-on module to the platform. The module offers a versatile rail monitoring solution that meets the industry's demanding requirements for accuracy and efficiency. Using the module within a Trimble product ecosystem will significantly simplify the integration of fieldwork results and eliminate a significant amount of the office work required to detect movement with confidence.



T4D RAIL HIGHLIGHTS

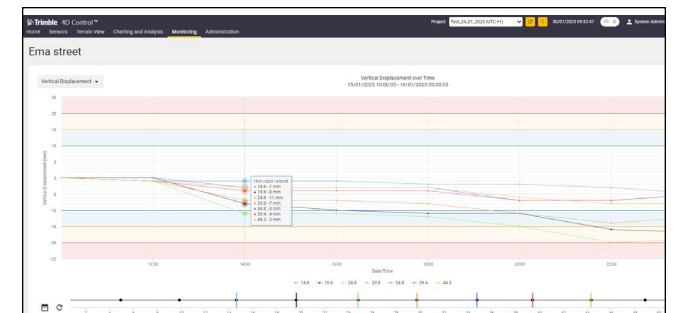
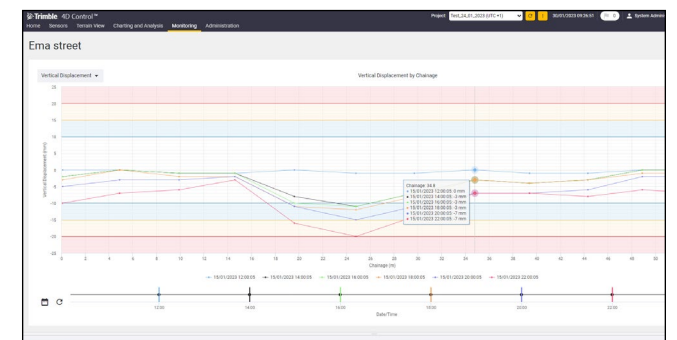
- ▶ One module for both automated and semi-automated rail monitoring
- ▶ Seamless integration of accurate track as-builts collected with the Trimble GEDO measurement system or Trimble Access™ Track Gauge Survey app
- ▶ Automated rail track geometry monitoring based on measurements to permanently installed prisms
- ▶ Automatic pre-configuration of the rail section
 - No need for manual input
 - Less error prone
- ▶ Automatic calculation, charting, and alarming on all track geometry parameters

The new T4D Rail module simplifies this process and makes it possible to take advantage of a connected Trimble ecosystem, making fieldwork more efficient and accurate. Users can leverage alternative rail as-built survey methods — the **Trimble GEDO measurement system** or the **track measuring bar** paired with the **Trimble Access Track Gauge Survey app** — that are simple and sophisticated. T4D Rail seamlessly integrates with these as-built methods to create a comprehensive monitoring system.

A rail as-built survey captures the original state of an existing track and is used to relate any detected movement of permanently installed prisms to changes in the rail track geometry. These changes will be quantified by several rail track parameters, such as cant, twist, versines, and displacements.

There are two different ways to visualize the data for all automatically calculated rail track geometry parameters on a chart — across epochs or chainages. The first way helps to quickly notice at which points in time unwanted movement began. The second way helps to signal which sections of the track are concerning.

Another benefit of the T4D Rail module is the ability to export data into Excel. An organized spreadsheet can be exported with all the required rail track geometry parameters specified by many rail authorities.



The screenshot shows a table titled "Ema street" with columns for CHAINAGE [m], SEVERITY, TWIST [mm], VERTICAL DISPLACEMENT [mm], HORIZONTAL DISPLACEMENT [mm], VERTICAL VERSINE [mm], and HORIZONTAL VERSINE [mm]. The table contains data for various chainage points, with severity levels indicated by colored dots (green, yellow, orange, red).

CHAINAGE [m]	SEVERITY	TWIST [mm]	VERTICAL DISPLACEMENT [mm]	HORIZONTAL DISPLACEMENT [mm]	VERTICAL VERSINE [mm]	HORIZONTAL VERSINE [mm]
0.0	Green	0	0	0	0	0
5.0	Green	0	0	0	0	0
10.0	Green	0	0	0	0	0
15.0	Green	0	0	0	0	0
20.0	Green	0	0	0	0	0
25.0	Green	0	0	0	0	0
30.0	Green	0	0	0	0	0
35.0	Green	0	0	0	0	0
40.0	Green	0	0	0	0	0
45.0	Green	0	0	0	0	0
50.0	Green	0	0	0	0	0
55.0	Green	0	0	0	0	0
60.0	Green	0	0	0	0	0
65.0	Green	0	0	0	0	0
70.0	Green	0	0	0	0	0
75.0	Green	0	0	0	0	0
80.0	Green	0	0	0	0	0
85.0	Green	0	0	0	0	0
90.0	Green	0	0	0	0	0
95.0	Green	0	0	0	0	0
100.0	Green	0	0	0	0	0



The T4D Rail module expands business opportunities by reducing crew field time and simplifying calculations, which minimizes the learning curve that goes along with sophisticated rail monitoring processes. Whether you are collecting manual measurements on a monthly basis or automatically every few minutes, the T4D Rail module will support companies' preferred monitoring schedule. Additional flexibility is delivered through several customizable as-built survey options, charting types, and threshold and alarm settings.

LEARN MORE | [MONITORING.TRIMBLE.COM](https://monitoring.trimble.com)