

Amberg Technologies AG

Amberg TrackControl – Seamless Monitoring of Railway Tracks



Digital methods and instruments offer opportunities for innovation in both railway and tunnel applications.

TrackControl is a ground-breaking solution developed by Amberg that allows users to monitor railway tracks.

The latest sensor generation of Amberg TrackControl is even quicker to install thanks to flexible plug connections and innovative magnet fastening. The system monitors all safety-relevant track parameters such as twist, vertical versine and settlement deformations in one-minute intervals – regardless of the weather conditions.

When monitoring railway tracks, reliable data delivery is of the utmost priority. There is a particularly high need for safety at construction sites that cross under railway lines or are very close to populated areas. In the event of damage, major impairments to freight and passenger traffic can occur and human lives can be put at risk.

1.1. The Visual, Geodetic Way Versus the Digital, Geotechnical Approach

Because of this safety requirement, tracks are automatically monitored during the construction period. In the past, these tracks were monitored with geodetic – in other words sight-based – means. Depending on the hazard pattern, the measurements were either carried out periodically or via permanently installed monitoring systems. It was found that automatic monitoring systems with optical methods sometimes react unreliably and with delays to notifications about limit values being exceeded in the event of difficult meteorological conditions such as fog, rain or snow. Obstacles on the tracks, such as stationary trains, also impair data quality.

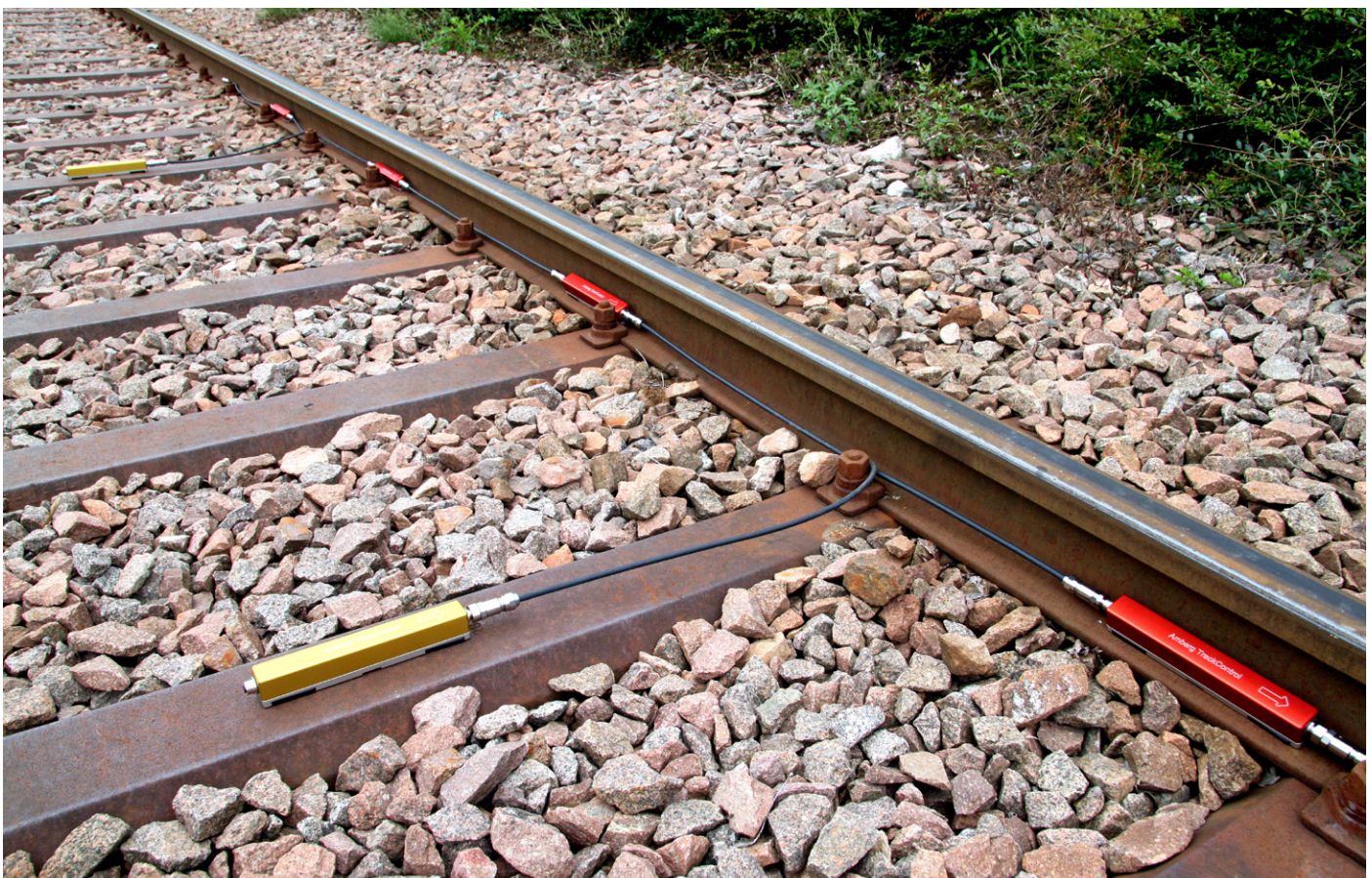
Amberg TrackControl uses a geotechnical approach. In order to guarantee safety and the normal operation of construction projects near tracks, Amberg has developed a system that is independent of atmospheric disturbances. Amberg TrackControl is the safe and reliable monitoring solution for railway systems. It monitors the safety-relevant track parameters such as superelevation, twist, vertical versine and settlement in a measuring interval of one minute. The main components of the geotechnical system are inclination sensors, which monitor deformations on tracks and catenary masts. Amberg TrackControl comprises 48 longitudinal and 12 transverse sensors per module as well as four optional two-axis sensors for the monitoring of mast inclinations. Each module can monitor one 56m track section. The basic module

can be supplemented with five further modules at the same measuring station, which enables the monitoring of an approximately 340m long area.

The twist, the vertical versine and the settlement depression are then derived from the measured values. All calculations and tests for exceeding limit values are carried out on site at the measuring centre. The data is then evaluated on the Amberg GEOvis 4.0 web platform, from which visualisations can be created for the end customer.

1.2. The Problem Solver for Challenging Projects

Amberg TrackControl has already proven itself in practice, for example in a large tunnel project in Rastatt. In the south of Germany, this tunnel passes under the existing



Deutsche Bahn high-speed line at a flat angle over a length of approx. 500 metres. Due to this angle and the small overlap, this project posed special challenges in terms of passenger safety and rail operations. In order to meet these requirements, Amberg installed a second geotechnical system for Deutsche Bahn in addition to the geodetic monitoring system. Amberg TrackControl is predestined for such tasks. The security systems reliably sounded the alarm when the railway line was lowered on 12 August 2017, which enabled the line to be closed quickly and prevented material damage and injuries to persons.



Another project illustrates the versatile application possibilities of Amberg TrackControl. Under a track field at Ingolstadt railway station, a sewer tunnel was built for Ingolstadt's public utility company using press pipe jacking. 21 of the tracks to be passed under concerned the freight station, the main loading station of the Audi works in Ingolstadt. Eight tracks concerned the Munich-Berlin high-speed line. A permanent monitoring system with tachymeters was unsuitable due to the difficult visibility conditions

with the many tracks and the trains parked on them. Amberg TrackControl proved to be the optimal solution in this case. In total, the station area was equipped with 550 sensors. The installation was completed in a very short time. Amberg TrackControl then delivered reliable results on cross slopes, twists and vertical versine. The alarm in the event of limit values being exceeded was forwarded directly to the dispatcher and the project management.

Amberg TrackControl is the innovative solution for track monitoring. The sophisticated sensor technology provides reliable data and is immune to weather influences. In addition, the system is quickly installed, even for large projects.

For further information, visit our [website](#).



“Amberg TrackControl minimises risks in infrastructure projects. The advantages in comparison to geodetic systems are obvious and the reliability is remarkable. No matter the weather, Amberg TrackControl works like a Swiss watch.”

**Michael Buri, Head of Geoengineering Unit,
Amberg Technologies AG**





Amberg TrackControl – The Seamless Monitoring of Your Railway Tracks

Amberg TrackControl is the ground-breaking solution for the monitoring of your railway tracks. Do you often face rain, fog and snow or are obstacles obstructing the line of sight for your geodetic monitoring system?

Regardless of the weather and sight conditions, TrackControl monitors all safety-relevant track parameters such as twist, vertical versine and settlement deformations once every minute.

The latest sensor generation of Amberg TrackControl is quickly installed thanks to flexible plug connections and innovative magnet fastening. It can be extended up to a total length of 340 meters.

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