SENSONIC
a KAYNES company

Enabling better decisions.

TRACK CONDITION MONITORING

2026

TRACK CONDITION MONITORING

The Sensonic Track Condition Monitoring Application (TCM) aids track maintainers in targeted predictive and preventive track maintenance.

TCM provides track maintainers with information on the evolution of track vibration. This empowers them to monitor the changing condition of the track and helps them with:

- Optimising track maintenance budgets
- Condition-based maintenance
- Assessing the efficacy of track maintenance and repair interventions
- Improved overall track health
- Higher operational safety and availability

To achieve this, TCM continuously monitors the complete track by means of Fibre Optic Sensing (FOS). The vibration data from every train is collected by the Sensonic sensing unit and analysed by algorithms to generate a digital SonicTwin® of the route. Periodic reports contain heatmaps showing the evolution of track vibration over time via a Sonic Track Index (STI). A high STI is a reliable indicator of degraded track conditions at that location.

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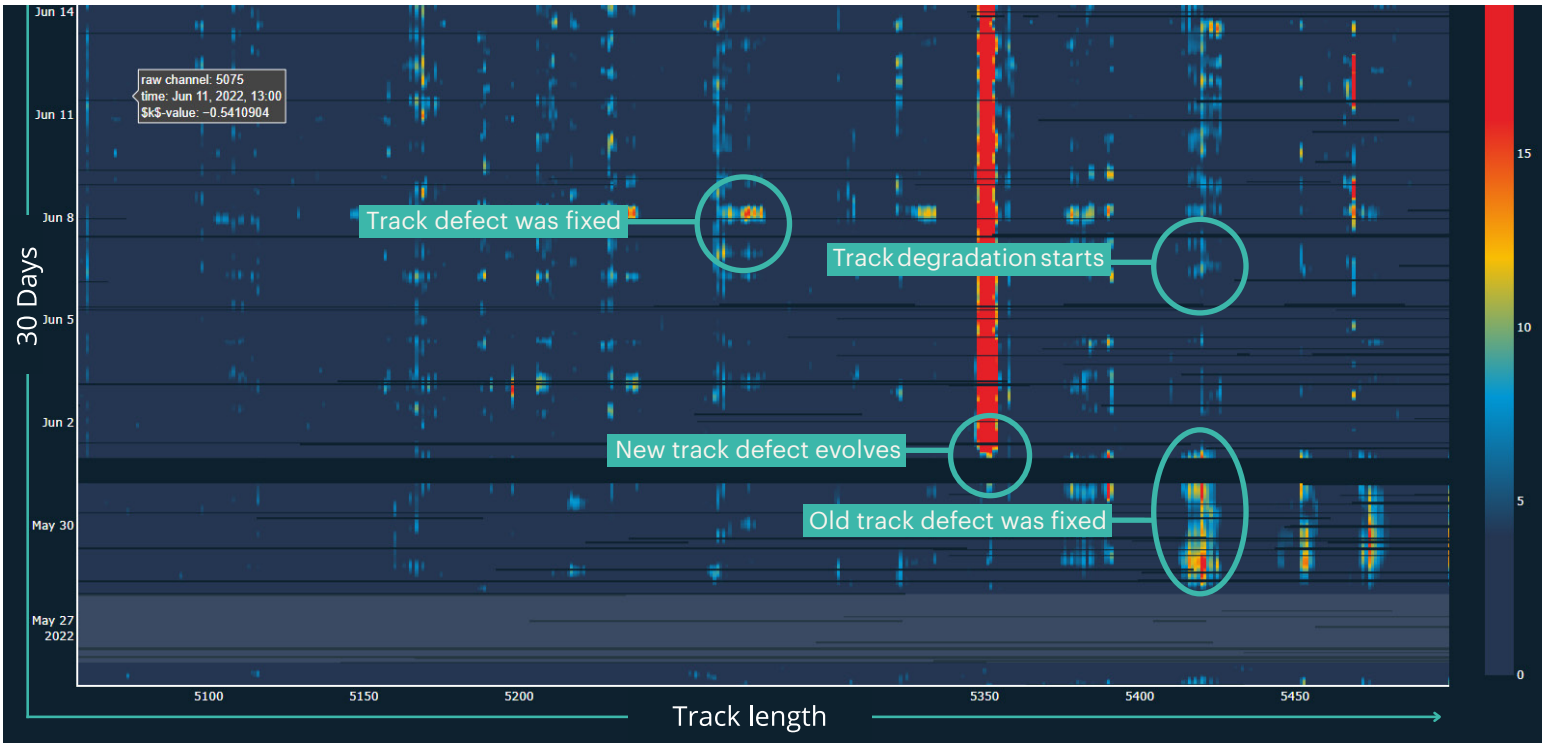
VIBRATION-BASED INSIGHTS FOR **TRACK MAINTENANCE**

- Preventive & predictive maintenance
- Identify emerging faults quickly
- Combine current and historical performance to trend and forecast
- Optimise and prioritise maintenance activities

SONIC TRACK INDEX **HEATMAP**



IMPROVE EFFICIENCY OF **TRACK MAINTENANCE**

MAINTENANCE COSTS

- Target inspection and maintenance towards vibration hotspots
- Assess efficacy of track repair
- Reduce repair costs due to early identification

OPERATIONAL COSTS

- Maintain undisrupted train traffic
- Reduce costs for unavailable tracks

SAFETY

- Find defects not revealed in regular inspections
- Enhance track worker safety
- Increase safety by avoiding critical track defects

DERIVE ACTIONABLE **INFORMATION**

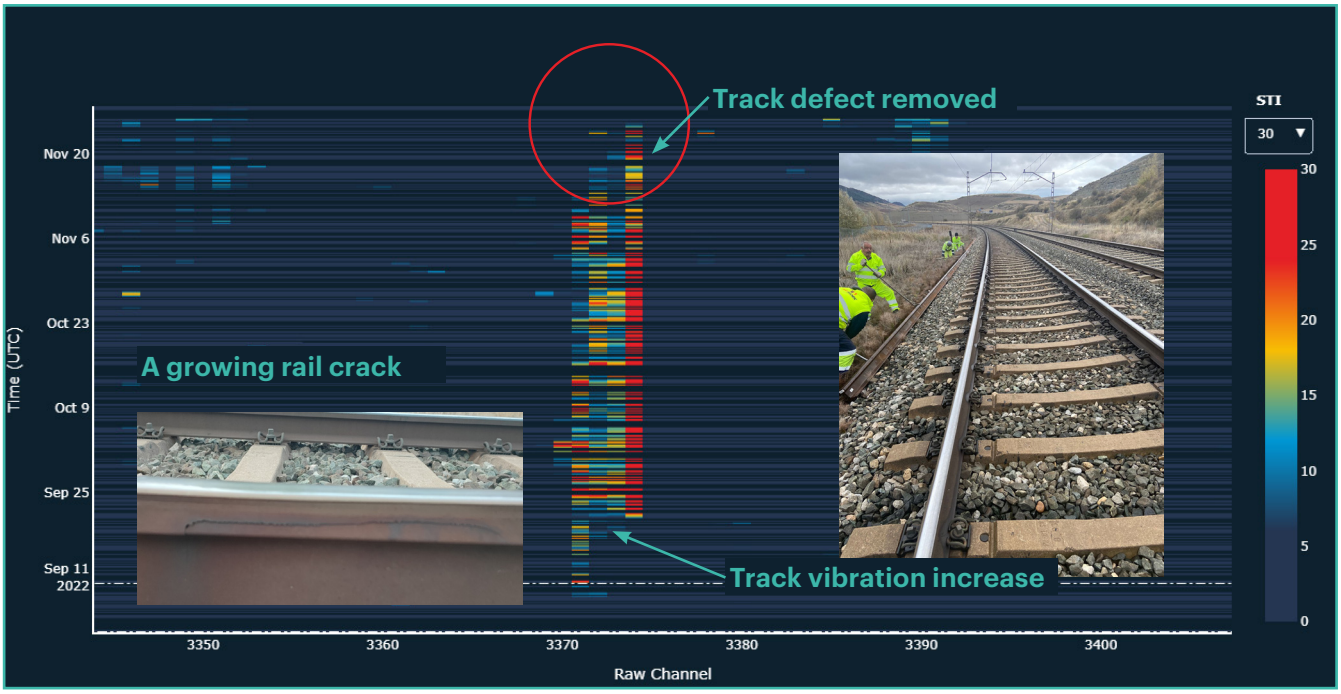
1. Hear the vibration

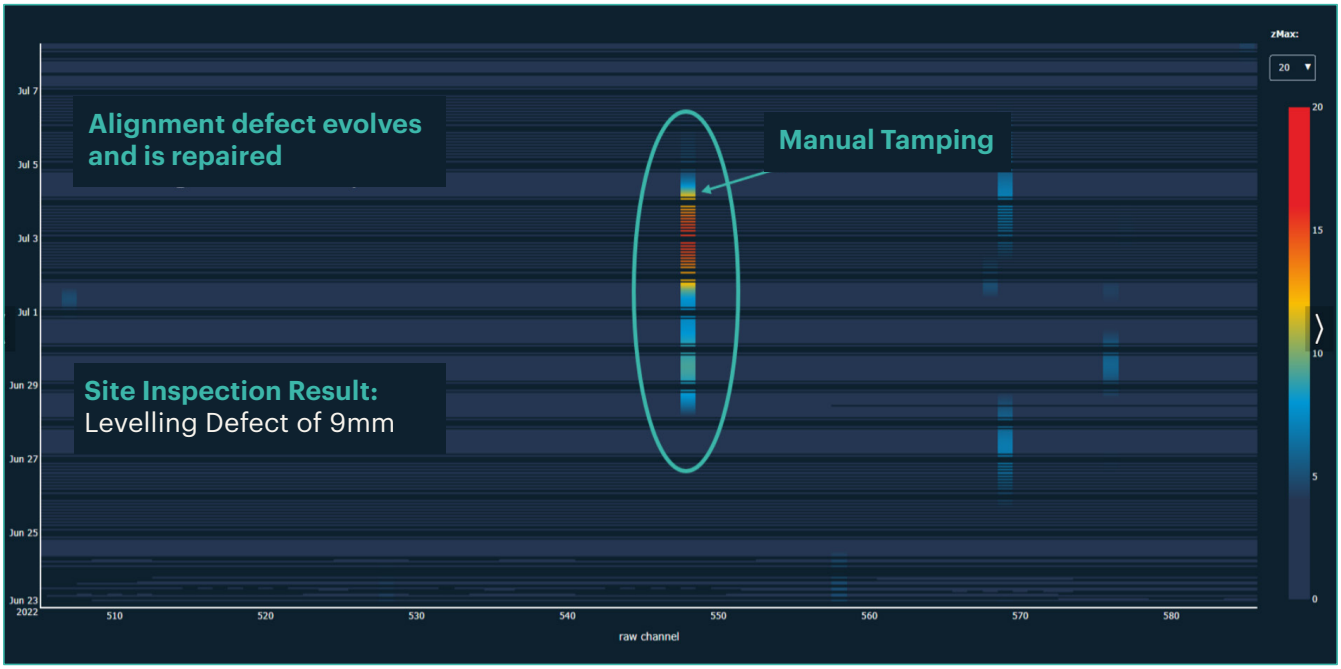
2. Record

3. Analyse the change

4. Report

SONIC TRACK INDEX HEATMAPS
FINDINGS & EXAMPLES





TECHNOLOGY

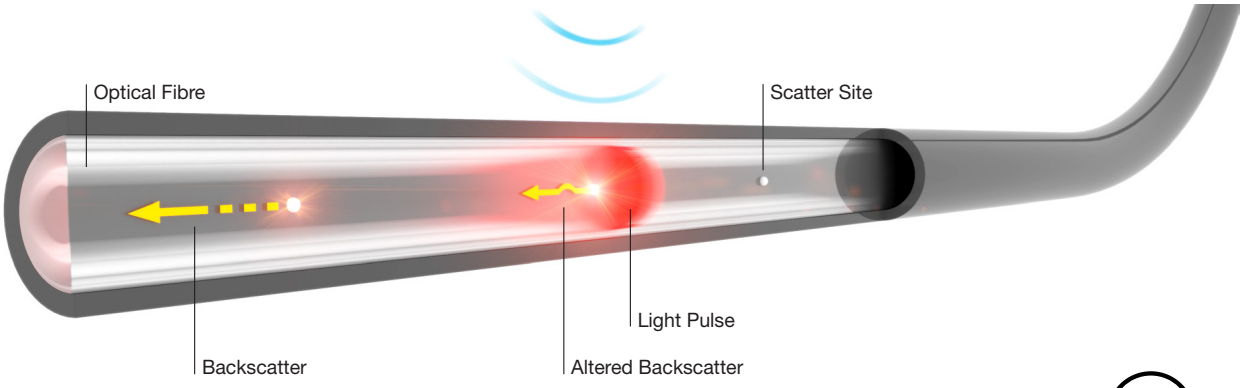
Sensonic pioneers new technologies, making it possible to monitor your entire railway network and derive valuable, actionable information that will take your operations to the next level.

Sensonic's capability to achieve this is rooted in the use of Fiber Optic Sensing (FOS).

- Turns existing fiber optic cables into a multitude of vibration sensors along its length
- Continuously monitors vibrational change against a digital SonicTwin® of the route
- Highlights changing vibration response to show changing infrastructure performance
- Captures infrastructure information from every passing train

Applying FOS for Track Condition Monitoring has many benefits:

- Minimal investment and follow-up costs
- Use existing fiber optical cables as acoustic sensor
- No onboard equipment on trains
- Easy installation and rapidly scalable
- Non-intrusive - no plethora of on-track sensors to install, power and maintain.
- Improved maintenance efficiency and track health



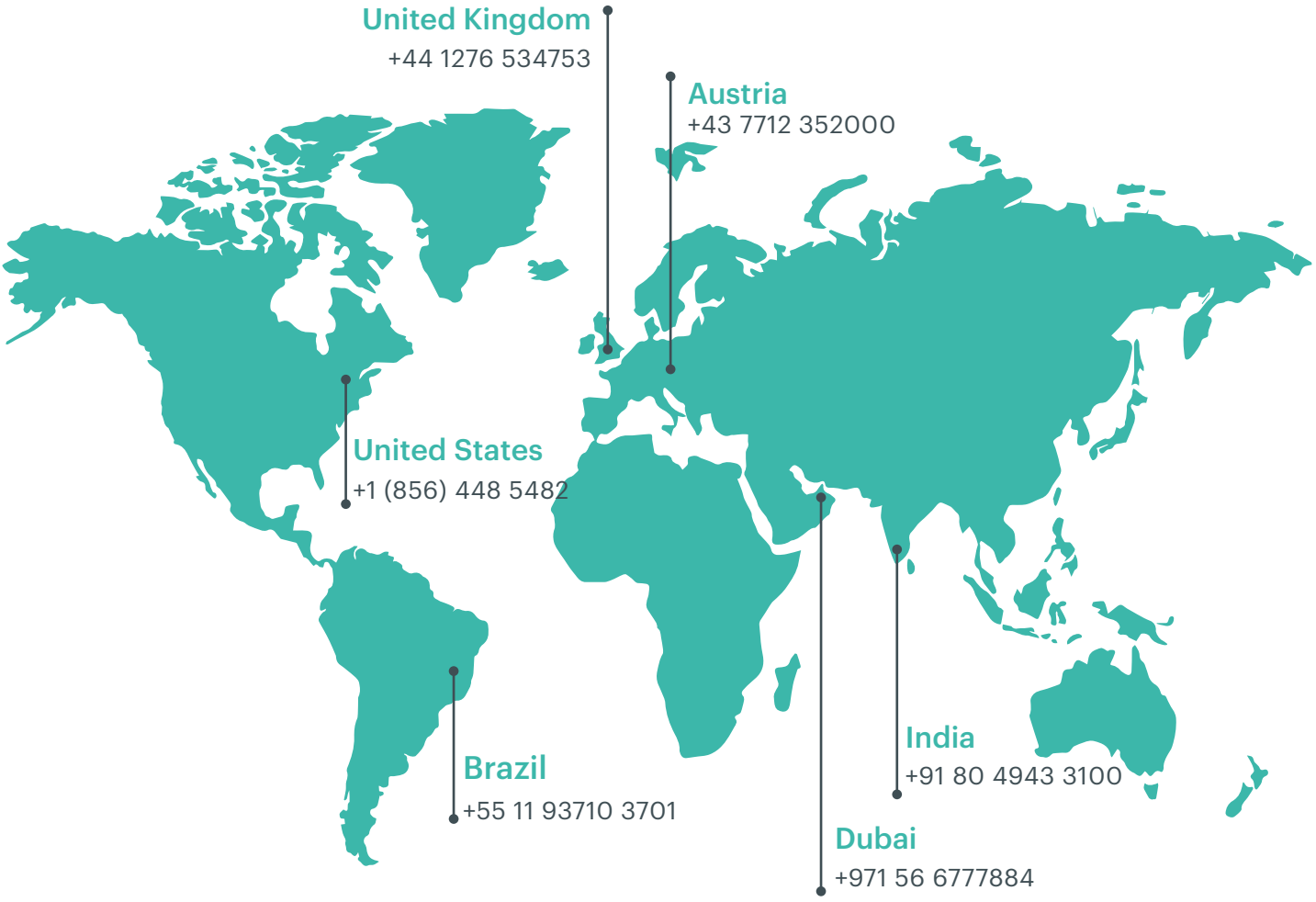
WATCH VIDEO

SENSONIC

WHO ARE WE?

Revolutionising how better decisions are made.

Sensonic is a deep-tech company with locations in India, Austria, the United Kingdom, the USA, the United Arab Emirates, and Brazil. We enable our clients to monitor entire track and fibre optic networks 24/7. We generate a digital SonicTwin® of vibrations along the network using fiber optic sensing. From this, we derive valuable information, using intelligent algorithms trained by latest AI and machine learning approaches. We reveal a previously unattainable depth of insight on various topics, such as track condition, security intrusion by people or animals and safety critical events like landslides or rock falls to avoid accidents. This holistic view revolutionises the way decisions can be made and allows railways to take operations to the next level.



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