SENSONIC

Enabling better decisions.

TRACK CONDITION MONITORING

A SENSONIC SOLUTION

2023

TRACK CONDITION MONITORING

VIBRATION-BASED INSIGHTS FOR **TRACK MAINTENANCE**

- Preventive & predictive maintenance
- Targeted maintenance leading to efficient allocation of maintenance resources
- Targeted track renewals & repairs
- Tighter control of track parameters in context of high speed traffic

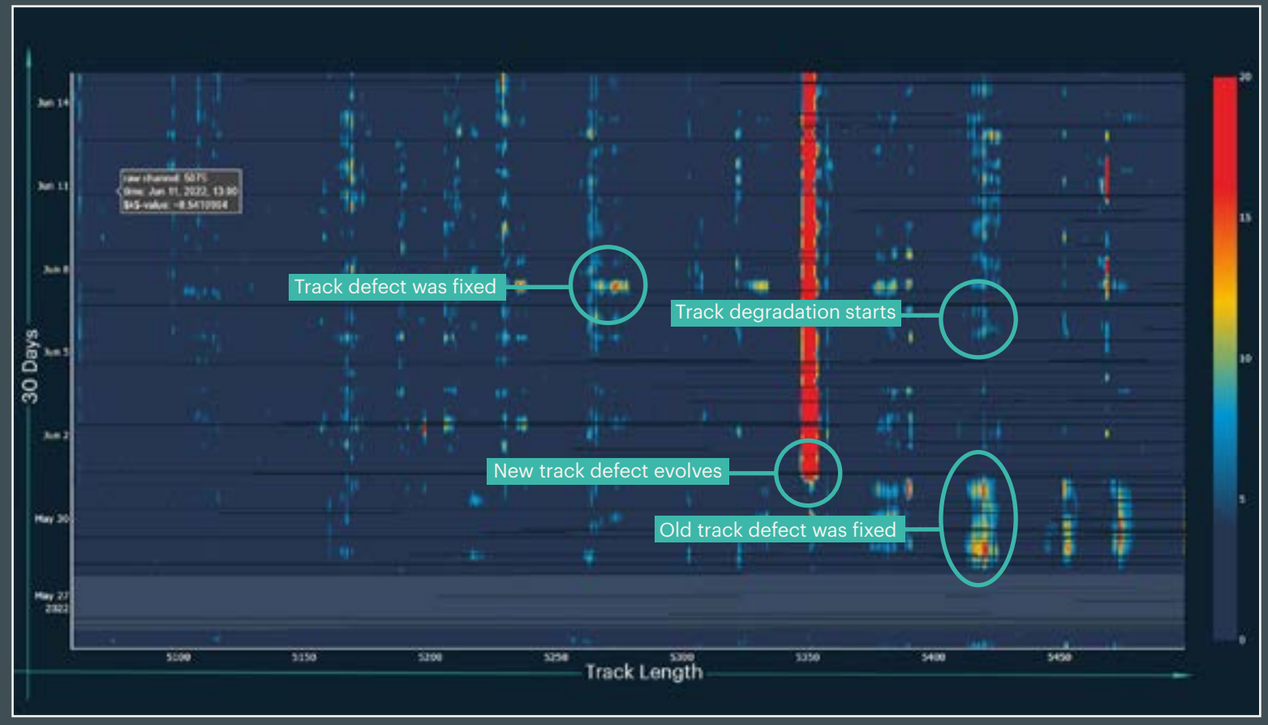
The Sensonic Track Condition Monitoring Application (TCM) aids track maintainers in targeted predictive and preventive track maintenance.

TCM provides track maintainers with information on the evolution of track vibration. This empowers them to determine the 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) - using just one single dark fiber of a fiber optical cable. The vibration data is collected by the Sensonic Edge Device and analysed by algorithms. Holistic information on the condition of tracks is provided through periodic reports. These reports contain heatmaps showing the evolution of track vibration over a certain period. The heatmap information is based on the Sonic Track Index (STI), a reliable indicator that highlights degraded locations.

SONIC TRACK INDEX **HEATMAP**



IMPROVE EFFICIENCY OF **TRACK MAINTENANCE**

MAINTENANCE COSTS

- Target inspection and maintenance towards vibration hotspots
- Assess efficacy of track repair intervention
  Facilitate better supply chain planning
- 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

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DERIVE ACTIONABLE **INFORMATION**

1. Hear the vibration

2. Record

3. Analyse the change

4. Report

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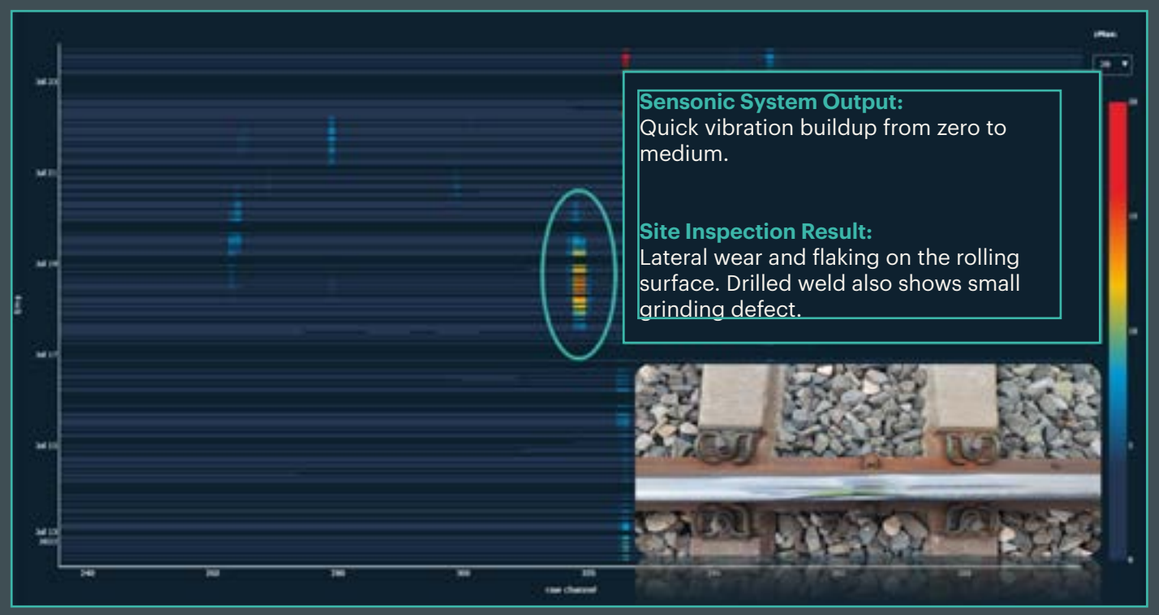
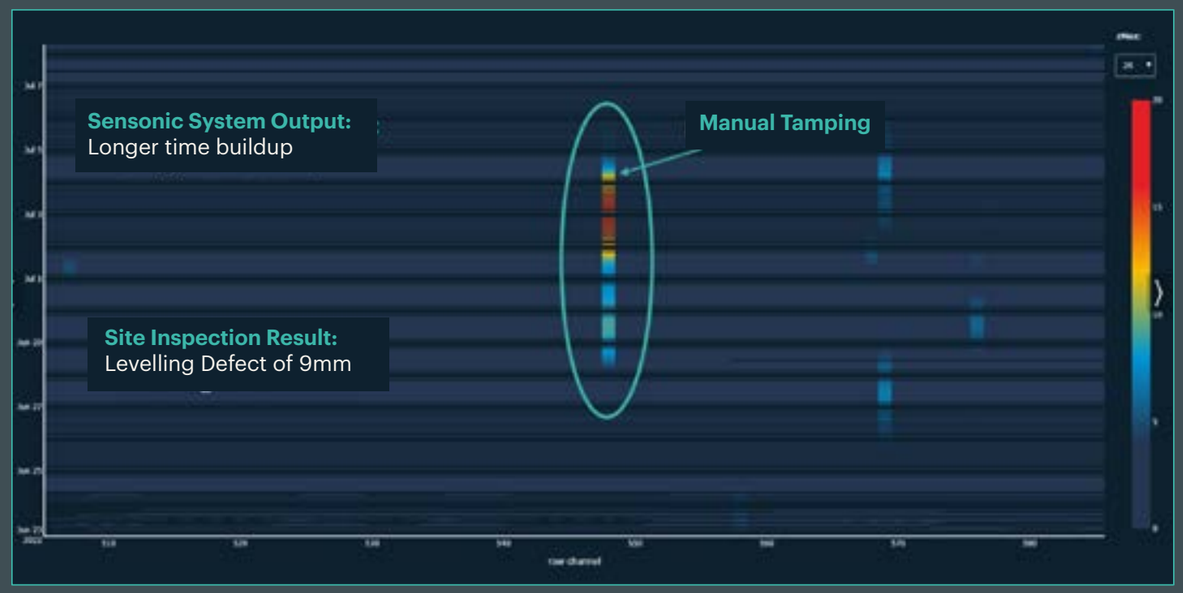
SONIC TRACK INDEX HEATMAPS
FINDINGS & EXAMPLES





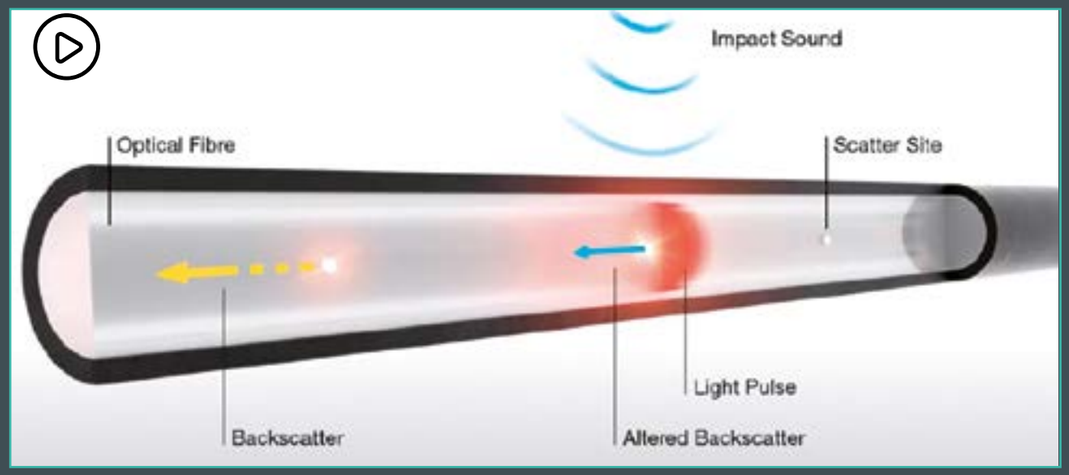
TECHNOLOGY

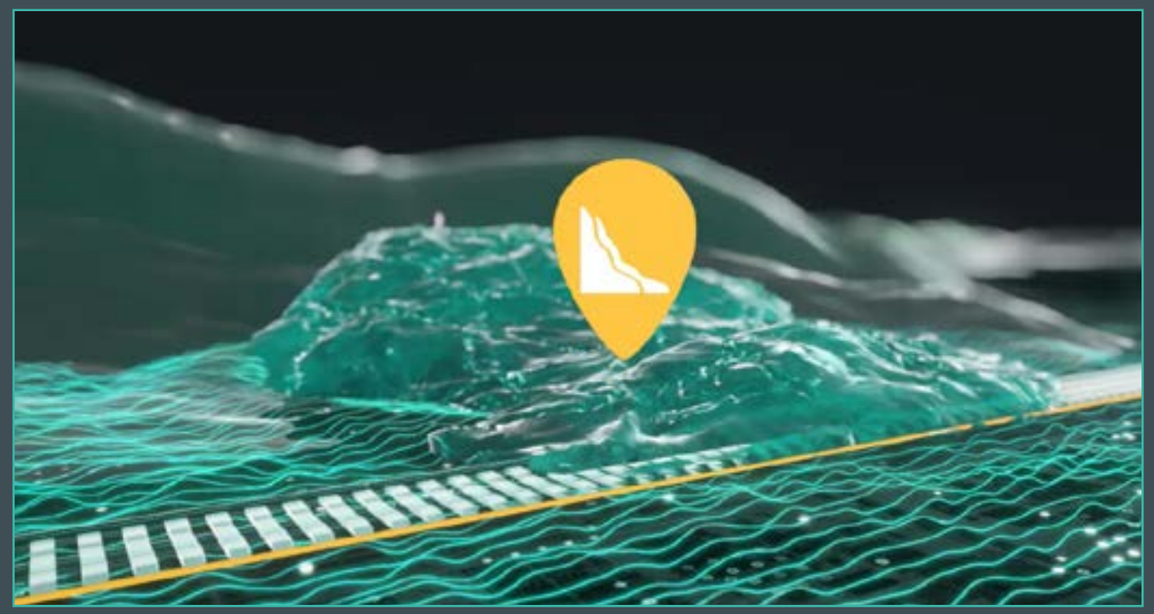
Sensonic pioneers new technologies, making it possible to monitor your entire railway network at any given moment in time. Therefore, the TCM Application

- is based on Fiber Optic Sensing
- continuously monitors the vibrational changes against a given reference
- along the track of the monitored route
- on a 24x7 basis for every traversing train

Applying FOS for Track Condition Monitoring is especially beneficial:

- Minimal investment and follow-up costs
- Use existing fiber optical cables as acoustic sensor
- No onboarding equipment on trains
- Easy installation
- Non-intrusive
- Improved Maintenance Efficiency and Track Health





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GLOBAL OFFICES

6 HUBS | OVER 100 EMPLOYEES

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WHO ARE WE?

Revolutionising how better decisions are made.

Sensonic is a deep-tech company with locations in Austria, the United Kingdom, the USA, the Arab Emirates, Brazil and India. The Sensonic Solution enables its users to monitor entire track and fibre optic networks at any given time. As a basis, a digital twin of all vibrations occurring along these networks is created using fiber optic sensing. From this, Sensonic derives valuable information, using intelligent algorithms trained by latest AI and machine learning approaches. Thus, a previously unattainable depth of insights is provided on various topics, such as track condition, the movement of track vehicles or other events like landslides along the infrastructure, as well as footsteps from people or animals. This holistic view revolutionises the way decisions can be made and takes railway operations to the next level.

Learn more on the Track Condition Monitoring Solution by clicking here.