

# MONITORING RAILWAY INFRASTRUCTURE SECURITY

## A SENSONIC SOLUTION



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# MONITORING RAIL INFRASTRUCTURE SECURITY

The Sensonic Security Application supports railway operators and security managers in protecting critical railway infrastructure components:

- Prevent disruptions to railway operations
- Maintain safety of railway assets and passengers
- Prevent damage or loss of railway property

The Sensonic Solution monitors entire routes for activities that may pose a threat to security. These include human footsteps, ground digging, fence climbing, or cable tampering. This information helps railway personnel respond to imminent danger. It also enables railway security officers to build intelligence over time regarding trends and patterns of suspicious activities along the railway network.

## VIBRATION-BASED INSIGHTS FOR SECURITY SURVEILLANCE

- 24x7 Surveillance of railway environment using Fiber-Optic Sensing
- Increased visibility of potential threat vectors along the railway
- Quick notification of various suspicious activities
- Build security intelligence based on activity patterns and trends

# SYSTEM IMPLEMENTATION



## INFORMED DECISIONS TO BETTER UTILISE **SECURITY RESOURCES**

### **DECREASE COMPLEXITY**

- One system to monitor multiple suspicious activities
- Minimum hardware requirement
- One system monitors up to 80 km of network

### **INCREASE EFFICIENCY**

- Direct security measures in a targeted way
- Prevent incidents by preemptive action
- Reduce danger, damage, and downtime

### **MAXIMUM SAFETY**

- Minimise on-track time for security staff
- Maximise safety for train operations

## THREE STEPS TOWARDS **HIGHER SECURITY**



### **1. IDENTIFY SUSPICIOUS ACTIVITIES**

Human walking, ground digging, cable tampering, fence climbing



### **2. CREATE RISK-PROFILE**

Threat determined using combination of different activities : Type, duration, time and place of activity



### **3. NOTIFICATION**

Available via email and websocket for external systems for review by security personnel



**SENSONIC SECURITY APPLICATIONS**  
 DETECTING VARIOUS SUSPICIOUS ACTIVITIES



**CABLE TAMPERING DETECTION**

- Copper cable theft is a problem for railway operators and is often associated with fibre damage caused by careless digging.
- Identify theft risk to mission-critical copper cables along railway network
- In the event of cable damage, the solution provides the location of the damage/intrusion



**IDENTIFYING GROUND DIGGING ACTIVITIES**

- Manual digging activities near rail tracks indicate potential risk to railway assets
- Immediately locate damages to fiber-optic cables



**DETECTING PEOPLE ON OR CLOSE TO TRACK**

- The high sensitivity of the Sensonic Solution enables the detection of minimal vibration energies emanating from people moving near the fibre.
- “Walking” can be classified as a minimal to a severe threat, depending on where and when it is detected.
- In the event of cable damage, the solution provides the location of the damage/intrusion



**FENCE CLIMBING**

- Detect possible attempts to climb fences along the railway tracks
- In the event of cable damage, the solution provides the location of the damage/intrusion

Threat criticality profile is generated based on location, duration, and combination of activities.

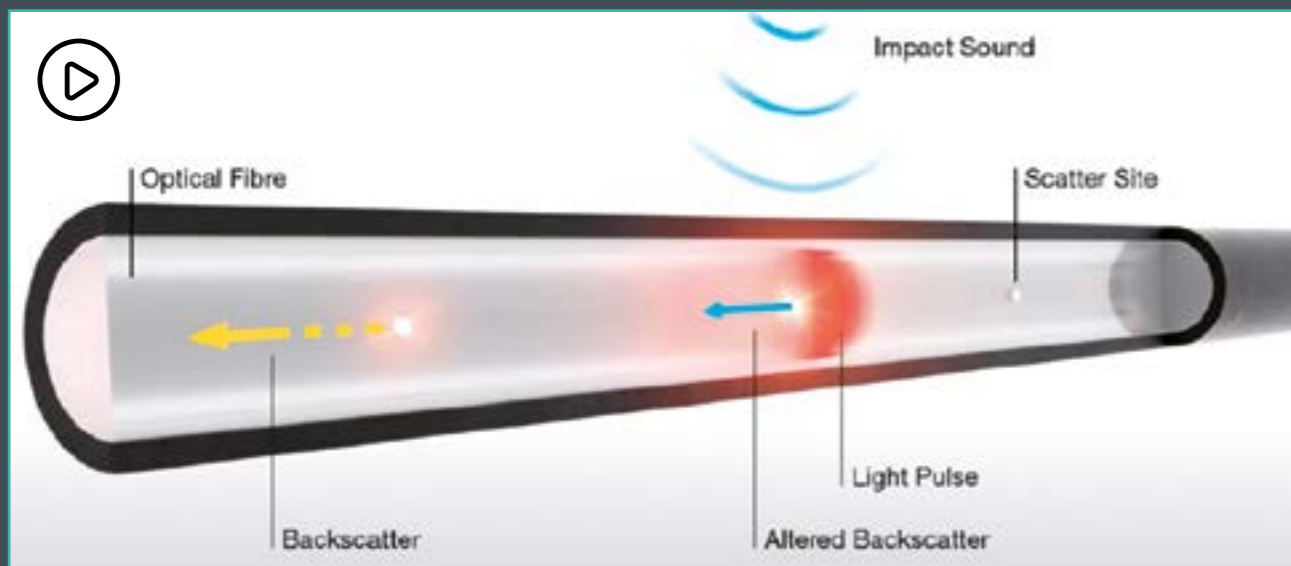
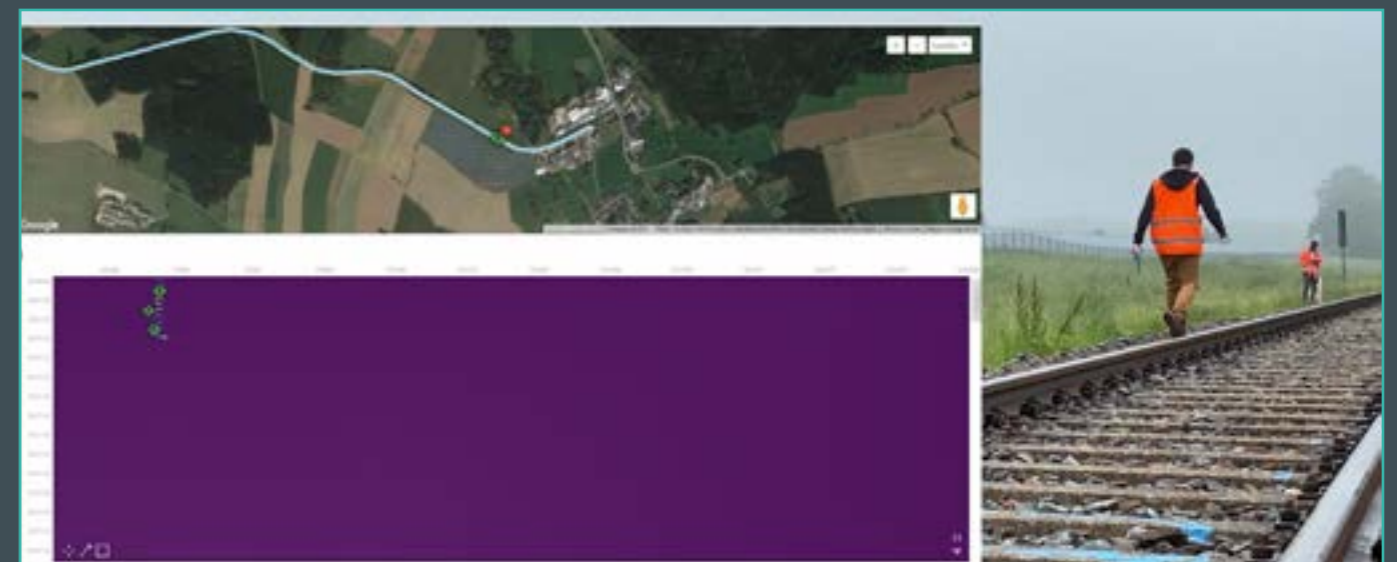
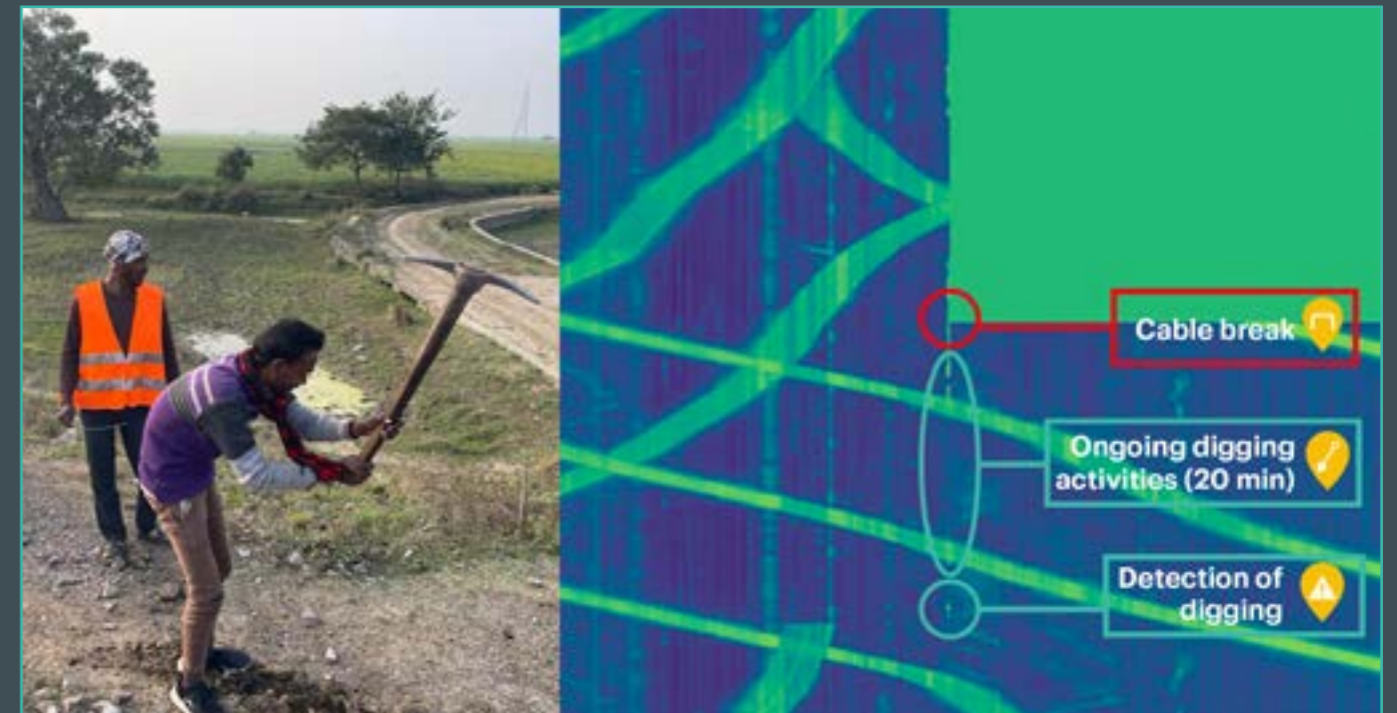
# TECHNOLOGY

Sensonic pioneers new technologies, making it possible to monitor your entire railway network at any given moment in time. From the vibration along your network, we create a digital twin and derive highly valuable, actionable information that will take your operations to the next level.

- Holistic 24/7 view of all changes in track condition and activities along your network
- Generate reports and forecasts by combining live data with historical data

The Sensonic Solution's capability to achieve this roots in the use of Fiber Optic Sensing (FOS).

- Turns existing fiber optic cables into a longitudinal acoustic sensor
- One edge device covers 80 km of track
- Detect any train without specific onboarding equipment
- Minimal investment and follow-up costs compared to pure on-board and other on-track solutions
- Simple and quick rollout: just power, internet and fiber optic cables are needed



# 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 or other events like landslides along the infrastructure, as well as footsteps from people. This holistic view revolutionises the way decisions can be made and takes railway operations to the next level.