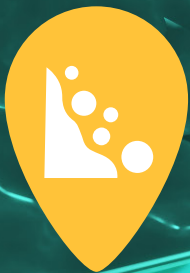


# LANDSLIDE & ROCKFALL MONITORING

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# LANDSLIDE & ROCKFALL MONITORING

Our natural hazard detection system warns railways in near-real-time of landslides or rockfalls along their rail routes. This supports operators to take action where a rockfall or landslip has been detected to:

- Avoid accidents
- Maintain safety of railway passengers and staff
- Prevent further damage to railway infrastructure and rollingstock
- Precisely locate the issue

Our landslide and rockfall detection works by monitoring vibrations along entire railway routes to listen for characteristic vibrations caused by falling rocks or moving earth. It uses an optical fibre running alongside the track to detect vibrations providing protection along the entire fibre route.

## THREE STEPS TO AVOID RAILWAY LANDSLIDE AND ROCKFALL ACCIDENT



### IDENTIFY

Real-time detection of landslides or rockfalls



### ALERT

Receive notification and precise location



### ACT

Appropriate response initiated





## THE CASE FOR CHANGE

Alternative landslide and rockfall detection solutions often rely on many discrete point sensors that sense only very local disturbances and require power and communications at every location, a significant challenge in remote areas. Traditional cable and wire systems are prone to failure and require manual reset by people on site. Due to the installation and operation challenges, difficult choices must often be made on which areas of track to protect with these techniques.

Sensonic provides an improved modern alternative. We use fiber optic cable to provide continuous landslide and rockfall protection for long lengths of track. The system resolves the location of landslide and rockfall detections quickly and accurately allowing action to be taken and accidents prevented.



# IN ACTION



## A MOUNTING NEED FOR CHANGE

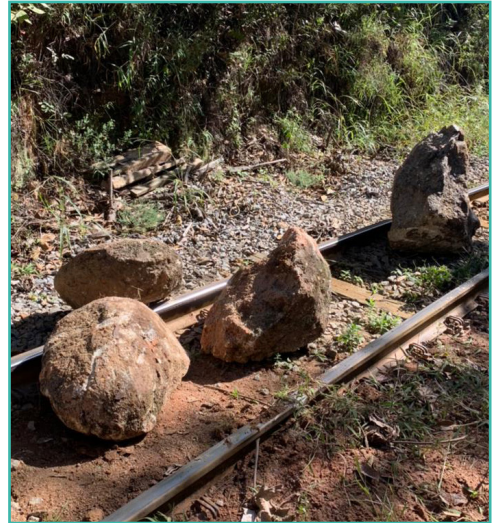
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As extreme weather events increase, landslides and rock falls become more common. Disruption, cost, and impact of these natural hazards increase vastly if a train encounters obstructed track. Detecting rockfalls and landslides as they occur is therefore of growing importance to railway safety and operations.



# THE LANDSLIDE LANDSCAPE

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Traditional rockfall and landslide detection systems come in two categories:

- Discrete, often numerous, point sensors that detect disturbances in their localised area and
- Wire-break or cable disconnection system which activate by object movements breaking a wire or cable.

Sensonic provides an improved modern third option. We use fiber optic sensing to provide continuous landslide and rockfall monitoring of entire rail routes. The system monitors for the characteristic vibrations caused by landslide and rockfall together with their location in real-time. When detected, alerts are issued allowing action to be taken and accidents avoided.

Discrete sensor systems monitoring their locale, require power and communications for each installed sensor. In remote areas, this limits their practicality to small regions where experience shows hazards regularly occur.

Cable and wire systems are often prone to false trips and failure, requiring a manual reset and repair by people in often inaccessible areas and remote locations.

In contrast, Sensonic fiber optic solution requires no power or communication integration to remote locations, nor resetting after activation. 80km of route protection is available from a single sensing unit allowing easy implementation combined with comprehensive coverage.



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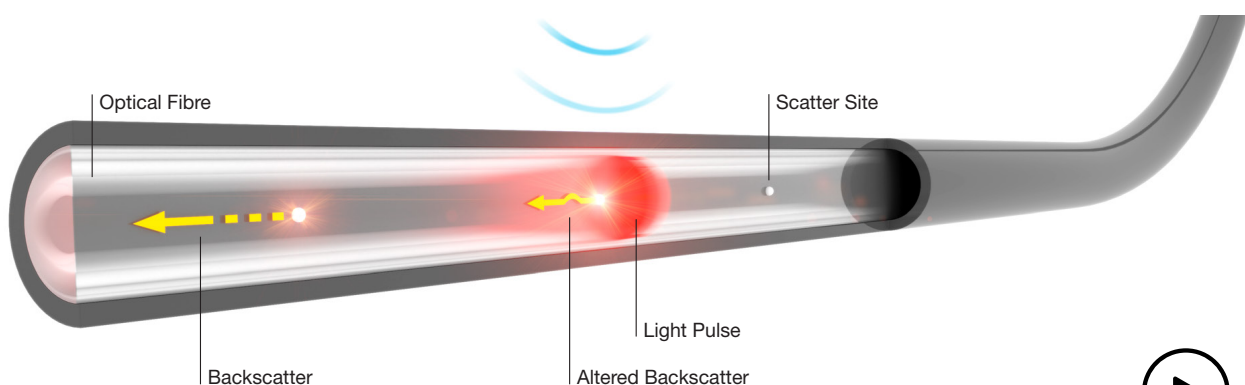
# TECHNOLOGY

Sensonic pioneers new technologies, making it possible to monitor your entire railway network. From the vibration along your network, we create a digital SonicTwin® and derive highly valuable, actionable information that will take your operations to the next level.

- Holistic 24/7 view of all entire routes
- Generate real-time alerts and monitor developing situations

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

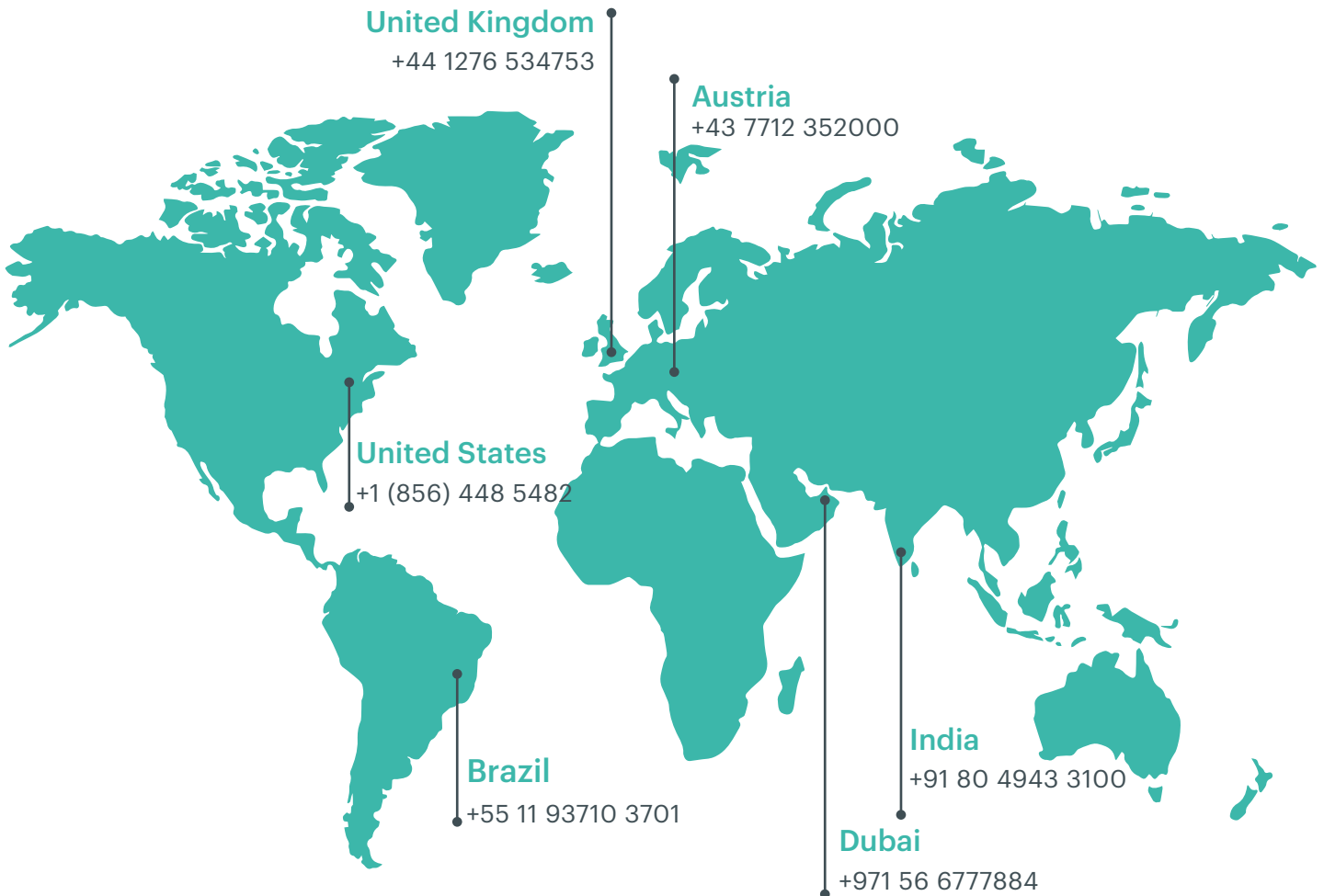
- Turns existing fiber optic cables into a multitude of vibration sensors along its length
- No plethora of new trackside sensors to install, power and maintain
- One Sensonic sensing unit can cover over 80km of track
- Simple and quick rollout: just power, internet and fiber optic cables are needed



# 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.





**SENSONIC**

