

Sensonic

Securing the Future of Railways

Hearing Rail Security Challenges

Rail security threats such as trespass, cable theft, vehicle intrusion and sabotage lead to, at best, financial losses and disrupted operations. At worst, they lead to loss of life.

Ensuring the safety of staff, passengers, freight and public is essential. Our team at Sensonic have developed a revolutionary approach to rail security that overcomes the limited reach of traditional security techniques. Using Distributed Acoustic Sensing (DAS), we can transform railway fibre-optic infrastructure into an intelligent surveillance security network.

The Sense in Sound: Hearing the Unseen

Distributed Acoustic Sensing (DAS) is a technique to detect sound and ground vibrations via fibre optics. The technology uses light pulses and analyses the reflected light turning an optical fibre into a continuous acoustic sensor listening to entire rail routes. [Find more on how DAS technology works here.](#)

Each sensing device can monitor 80 kilometres (50 miles) of track, covering 1000 times the range of a standard CCTV camera. The covert nature of an often-hidden fibre, together with long range reach is why the technology already excels in both pipeline and international border surveillance.

Advanced algorithms, powered by AI and machine learning, analyse vibration data in real-time to find security threats.

Threat Types



Trespass: Algorithms recognise the characteristic vibrations from human footsteps. Tailored real-time alerts have precise location information to enable a swift and targeted response.



Cable Tampering and Theft: Vibrations from attempts to access or interfere with railway cables generate real-time alerts for operators to respond to, minimising financial and service losses.



Digging: Ground vibrations from both manual and mechanical digging near rail infrastructure are classified automatically. Timely alerts help prevent both intentional and accidental infrastructure damage.



Vehicle Intrusion: Auto accidents can turn into rail disasters. We detect the acoustic signatures of vehicle accidents on or near rail tracks allowing operations staff to take appropriate actions. [See more here.](#)



Airspace rules governing drone operations vary by country; however, automatic drone flights responding to cable theft alerts in urban rail environments have already been demonstrated.

Investing in a Secure Future for Railways

DAS technology provides a unique and intelligent solution for railway security. Its ability to detect security threats in real-time over vast lengths of rail infrastructure gives operations and security teams an immensely powerful tool at their disposal. When combined with other security technologies such as CCTV and drones, DAS offers unparalleled situational awareness. By using often pre-existing fibre infrastructure, Sensonic can deliver a cost-effective and rapidly scalable fibre-optic sensing solution. This enhances both railway safety and security benefits, protecting passengers, personnel and freight, together with minimising operational disruptions. Contact our Sensonic team to learn more about how listening to rail infrastructure makes sense and how DAS can revolutionise your railway insights.

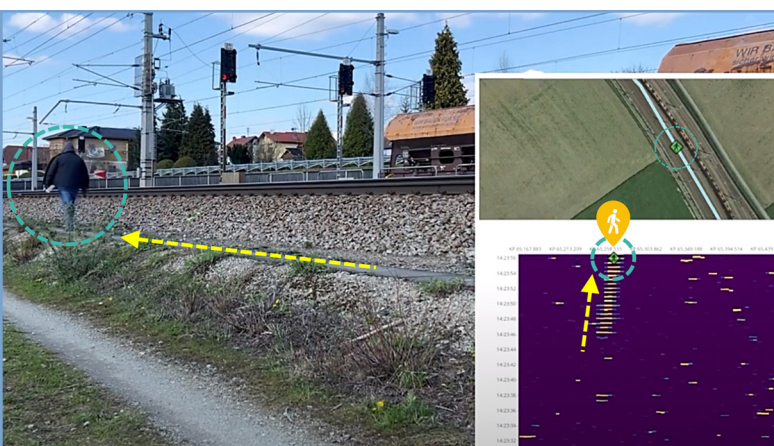
Email us [here](#).



Seeing the Bigger Picture

Knowing where, when and what security threats are present is vital for rail operations teams. Combining this DAS insight with other technologies can provide even greater benefits. We can integrate new or existing CCTV camera coverage into our DAS systems or trigger alerts in existing surveillance systems. This allows cameras to be both accessed and controlled near to located security threats. This allows remote visual confirmation, enhanced situational awareness and evidence recording.

Outside the range of CCTV cameras, our Sensonic team are going the extra mile too. We extend visual coverage by integrating DAS and drone capability through selected partners. Drones are particularly useful for rapid response in remote or difficult to access areas. As threats are accurately geolocated with the DAS system, manned or fully autonomous drones are dispatched to the incident location to gather more information via high-definition video. The use of thermal imaging allows threats to be monitored in complete darkness.



Detection, location and classification of security threats in real-time

Find threats fast with fiber.



TRESPASS



DIGGING



CABLE THEFT

