



Rail Monitoring

The Challenge

The continued demand for improved quality of service and higher train capacity on existing rail networks requires new solutions for a cost-effective, reliable and safe train service. Trains must be closely monitored, actively controlled and ideally run with full automation by an intelligent traffic management system (TMS).

A TMS assists in realizing higher train densities, enabling high service availability, saving energy through optimized brake/accelerate cycles, and allowing precise and automated customer information. This requires a safe, reliable train tracking system that can deliver the exact location and speed of every train in the rail network at any time.

To avoid delays and unscheduled disruptions, rolling stock and rail infrastructure must be monitored closely for an early indication of defects, which allows preventive and scheduled maintenance. Asset integrity monitoring is mandatory for safe operation; lost carts or cartloads and objects or persons on tracks must be identified. Lastly, the system should detect and deliver alarms for intrusion, vandalism and cable theft, catenary flashovers, fires or overheated cables in ducts. AP Sensing's train monitoring solution assists operators in successfully managing and mitigating these challenges.

The Innovation

AP Sensing's solution for rail monitoring offers a ground-breaking combination of Distributed Acoustic Sensing (DAS) technologies and Distributed Temperature Sensing (DTS) when needed, utilizing standard telecom fiber optic cables already installed along the tracks for communication purposes. With DAS technology, AP Sensing can detect, locate and classify multiple acoustic events in real time. These events include train position, speed and integrity, defects like flat wheels or broken tracks, objects or persons on the tracks, or cable theft. With an additional DTS, one can detect and locate overheated electrical cables or even fires in cable ducts. Each control can cover up to 100 km of sensor fiber from a single location.



Fiber optic cable in duct along the tracks

World-Class Systems

Acoustic measurements are collected with our world-class, phase-based DAS system. The unique 2P Squared technology features stable signal linearity and high sensitivity over long distances. Smart algorithms detect, locate and automatically classify multiple events in real time.

AP Sensing's monitoring solution also includes an ultra-modern, high performance Raman DTS system. It captures temperature events very accurately over long distances, unaffected by cable strain that typically causes misinterpretations for other DTS technologies. Consequently, the DTS is an effective tool for monitoring fires or overheated electrical cables in ducts.

The powerful, integrational SmartVision management software completes our AP Sensing monitoring solution, which can easily be integrated into a train management or security system.

Reliable & Efficient

AP Sensing's comprehensive rail monitoring solution provides important data needed to run high-capacity train services with reliability, safety and cost-efficiency. Train tracking expands operational capacity by increasing the train density. Quality of service and energy efficiency are improved by managing or even automating train operation. At the same time, trains and tracks are comprehensively monitored for early indication of defects, allowing for preventative and scheduled maintenance. Integrity of trains and rail infrastructure is observed by detecting lost carriages, objects on the tracks, cable theft, fires, overheating or catenary flashovers.

The use of already-existing fiber optic infrastructure, together with extremely long-range evaluation units, make AP Sensing's rail monitoring solution very cost-effective.



Sensor cable installation



Why Choose AP Sensing?

- Industry-leading monitoring solution comprising DAS, DTS and SmartVision that offers excellent performance
- Best measurement results due to unique technologies such as 2P Squared and code correlation
- Long range, high linearity and sensitivity by phase-based DAS
- Industrial quality supported by a complete set of type tests and certifications in compliance

- with internationally recognized standards
- Project management, commissioning, and post-sales service; world-class support for project planning, design and installation
- Our experience, network of regional partners and experts, and proven deployment in all regions in the world



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