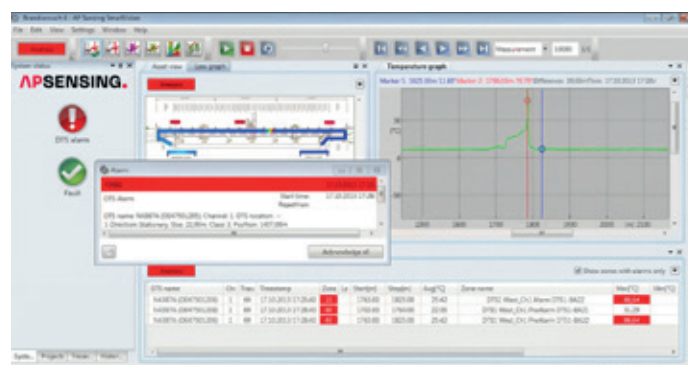# APSENSING.

Fire Detection in Road and Rail Tunnels

The Challenge

Traffic tunnels are valuable infrastructure in society today, and particularly important to protect from fire, as the risks are higher and fighting fires in road or rail tunnels is challenging. Tunnel fires present the possibility of devastating consequences and millions of dollars of economic losses. Yet, monitoring these are often a challenge Tunnels are large and cover a long range, sometimes stretching many kilometers. The environment can also be hostile hot, humid, and filled with dust and sand particles. Nowadays, tunnels are often equipped with suppression and other automatic fire protection systems. Fast and accurate detection is needed to avoid fatalities; while information about the fire itself is essential for rescuing people trapped within the tunnel. Fire information is difficult to obtain in a smoke-filled tunnel that is impermeable by light.

The Innovation

The AP Sensing fiber optic Linear Heat Detection solution addresses all these challenges when monitoring road or rail tunnels. It utilizes a passive fiber optical cable as a distributed temperature sensor – very light and easy to install. The sensor cable withstands severe conditions and delivers fast heat detection, while also having the industry's lowest false alarm rate.

Thousands of temperatures along the tunnel are measured in real time, pinpointing any hotspot or fire with complete accuracy. AP Sensing's unique sensor cable design allows temperature measurement up to 1000°C, enabling the system to not only detect but also monitor fire development by providing vital information about fire size and spread. With our comprehensive asset visualization software SmartVision, all information is available at a glance and rendered for further processing by SCADA.

SmartVision asset visualization during a fire test

APSENSING.

Fast & Adaptable Detection

The AP Sensing Linear Heat Detection solution consists of a fiber optical sensor cable and a fully tested control instrument that measures a complete temperature profile along the tunnel within seconds. As an addressable linear heat detector, multiple project-specific fire zones are mapped to the control instrument. A variety of alarm parameters (rate of rise, maximum, adaptive) can be programmed to each fire zone. This solution delivers fast detection while minimizing false alarms.

Pre- and main alarms can be programmed per fire zone to initiate automatic countermeasures. In the event of a fire, our linear heat detection system provides immediate information regarding fire location, size, and spread. All information is available through dry contacts and high level communication e. g. Modbus protocol.

Reliable & Cost-Effective

Our linear heat detection solution is thoroughly tested, with the most complete set of certifications on the market (UL, FM, ATEX, IECEx, SIL) and a 35-year MTBF. It is robust and has passed highly demanding type tests. The sensor cables are proofed against IEC 60331 25 for high temperatures, ensuring the system can withstand the demands of fire monitoring.

The sensor cable is passive, robust, immune to EMI, resistant to dirt and dust, and does not require maintenance. In the case of a break, the cable is easily spliced reducing the off time of the tunnel. Regulation stipulates testing of the fire protection system in certain intervals; testing of AP Sensing's LHD system is simple, time saving, and doesn't require closing the tunnel Heating a few meters of sensor cable in an accessible area is sufficient to test the entire system.

made in Germany | c UL us LISTED | SIL✓ IEC 61508 / IEC 61511 | ⟨Ex⟩ | VdS | FM APPROVED | 🌱 Passion for Plants. For every unit sold, AP Sensing plants 100 trees.

Why AP Sensing?

- Industry leading linear heat detection technology with fast response times, excellent accuracy and low maintenance.
- All product variations are fully certified and in compliance with internationally recognized standards.
- In controlled fire tests, our system has proven to detect fires of all sizes 30% faster than prescribed

by fire detection guidelines.
- Our experience and proven deployment in all regions in the world our project reference list is extensive and comprehensive.
- Range of certified sensor cables to fit every need.
- Easy system integration through flexible protocols and interfaces.
- World class service, support and training.

THINKING AHEAD