Bandweaver

CASE STUDY

MADRID AIRPORT FIRE PROTECTION
Fiber Optic Linear Heat Detection (LHD)

THE SCENARIO

Madrid–Barajas Airport is the main international airport serving Madrid in Spain. It is the second-largest airport in Europe by physical size behind Paris–Charles de Gaulle Airport and in 2019, 61.8 million passengers travelled through Madrid–Barajas, making it the country's busiest airport as well as Europe's sixth busiest. The airport has five passenger terminals: T1, T2, T3, T4 and T4S and an extensive tunnel network connecting these terminals.

CLIENT REQUIREMENTS

In 2014, RENFE the train operator looked to implement a state-of-the-art fiber optic Linear Heat Detection system. The coverage was extensive and required 3 LHD systems at 3 different locations.

The client required the latest technologies in linear heat detection for fast and accurate alarming. Particularly, they required a system with smart zones and smart alarms, with the capability for rapid detection using rate of rise and deviation alarms.

WHAT DID WE DO?

Bandweaver worked with the customer to design, supply and install a fiber optic linear heat detection (LHD) system based on Bandweaver's FireLaser DTS system. Based on the customer requirements 3 x 2 km FireLaser systems were deployed and commissioned.

Figure 1 Example of FireLaser fiber optic linear heat detection controller

Based on the coverage required one of the systems had four optical channels and the remaining system was a single optical channel.

The FireLaser DTS linear heat detection system can utilise both smart zones and 3 different types of smart alarms (max, rate of rise and deviation). Each zone can be individually configured with both alarms and pre-alarms also possible.

The system architecture is such that when the FireLaser LHD system detects the fire, it triggers the respective programmable dry contact outputs for the specific zone in which the fire occurs. The customer also required additional communication of the key data over Modbus.

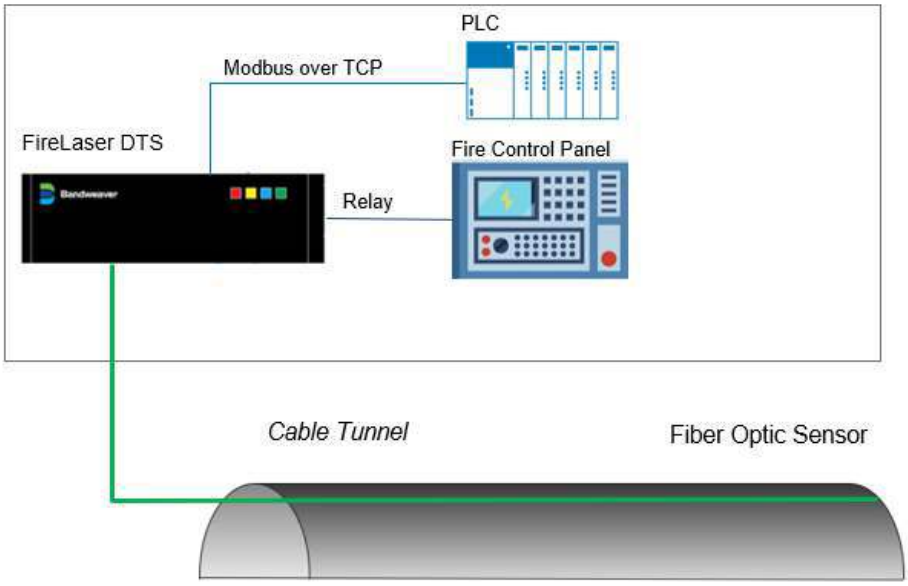

Figure 2 Example of system architecture

By utilising the Modbus functionality, the operator is able to obtain additional information including the precise location of the alarm event and also what is the maximum temperature in each of the defined zones. Zones for the Modbus output can be defined separately from the fire detection zones which enables the operator to integrate with other systems (e.g., the tunnel ventilation system).

BENEFITS TO THE CLIENT

When evaluating the system, the client reviewed several factors in making the choice to optimise cost and performance throughout the lifetime of the project. Below are the following benefits which helped persuade the client the fiber optic LHD systems were a superior choice to other technologies:

- **Low Cost of Ownership:** Fiber optic sensors are completely passive and are immune to EMC interference, not affected by dust or other environmental factors and are completely non-corrosive. Therefore, the lifetime of a fiber optic cable can be greater than 30 years, without any maintenance required.
- **High Reliability:** Another benefit of the passive, inert nature of fiber optics is that they are very reliable and so there is no downtime. In addition to the lower maintenance costs, they also provide a higher level of coverage which lowers the overall risk and improves protection levels.
- **Fully Certified to Internationally recognised standards**: The Bandweaver FireLaser DTS together with the sensing cable has been certified to EN54 part 22. This gives the customer the knowledge and security that the system has been designed and tested to the highest standards in the fire detection industry.
- **Complete Coverage:** Because the sensing cable was installed along the entire length of the tunnel, it means you have complete coverage. With the fiber optic LHD you can take measurements every 50cm, meaning there are no gaps between sensing points.
- **Early detection with Smart Alarms:** The smart alarms be configured to enable the system to detect much earlier than with conventional LHD systems thus minimising any damage to the assets.

ABOUT BANDWEAVER TECHNOLOGIES

Bandweaver has been providing advanced fiber optic monitoring sensors and integrated technologies since 2002. With an installed base of over 60,000km and 8,000 systems installed, our knowledge regarding the application of distributed temperature sensing technology and linear heat detection within the fire industry is second to none. We focus on the safe integration of FireLaser DTS technologies into clients' proprietary systems and Bandweaver and our partners provide exceptional systems design support, product support during installation and provide long term maintenance packages.

For further information please contact our global team at info@bandweaver.com