Bandweaver

CASE STUDY

# Linear Heat Detection (LHD) solution for conveyor belts at cement production facility


## The Scenario

The prominent cement plant is owned by a globally recognised leader in the building materials industry. It is vital to maintain high standards of fire safety and after a number of incidents over recent years, it was decided a more preventative approach was necessary. As a result of these incidents, the insurance assessment indicated that the conveyor belts were a particular hazard and were upgraded from low risk to high risk.

## Client Requirements

The client required a linear heat detection system as part of a pilot project to monitor two inclined coal conveyor belts with a combined length of 177 metres at the cement plant. A focus on seamless integration into other IT and safety systems was also needed to enable the client to maintain coverage without downtime and to make use of existing infrastructure.

The key purpose of this pilot was to thoroughly verify the reliability of FireLaser in effectively detecting potential issues along the conveyor belts. By generating alarms if the temperature deviates from normal parameters, or rise too rapidly, an engineer can be alerted, and the issue be dealt with as a maintenance issue before a fire even begins. This would not only save time and cost from the incident itself, but also eliminate the need to alert the fire department.

Additionally, a crucial aspect of the project involved providing comprehensive training for the client's personnel to ensure proficient operation and utilisation of the FireLaser system.

## What Did We Do?

The FireLaser control unit was placed in a nearby rack cabinet for easy access. It operates independently, not connected to any computer or the customer's network during monitoring. Bandweaver personnel were informed that, for now, only the FireLaser relay output would integrate with the customer's PLC.


*Figure 1: FireLaser cabinet*

The FireFiber AT cable was configured with FireLaser's single-channel model. Rather than utilise a redundant loop, the cable was physically looped along either side of the conveyor, covering the trough rollers on the conveyor's top side. Positioned close to the trough roller bearing, the cable installation is shown below.

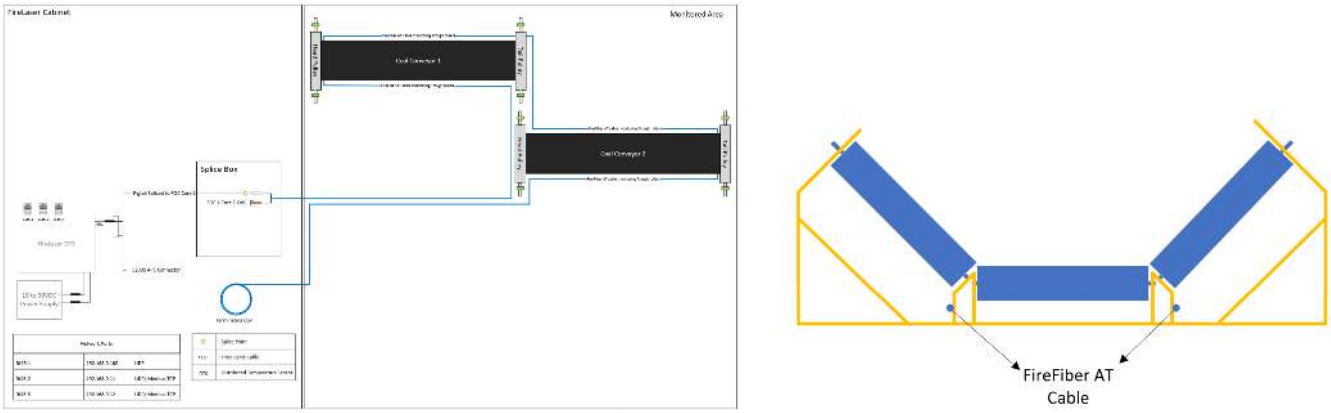


*Figure 2: FireFiber AT cable layout along conveyor*

*Figure 3: FireFiber AT cable monitoring trough rollers*

Bandweaver explained the needed splicing for the FireFiber AT cable, and the installer successfully spliced the E2000 pigtail to it. After connecting the spliced pigtails to the FireLaser control unit, Bandweaver verified in the DTSCM2 software that raw data and temperature traces were satisfactory, confirming good fusion splicing and cable condition post-installation.

The team then did position mapping for the cable on the conveyor belt, zone division for the cable followed. The schematics below demonstrate the installation of the FireFiber AT cable on the conveyor:

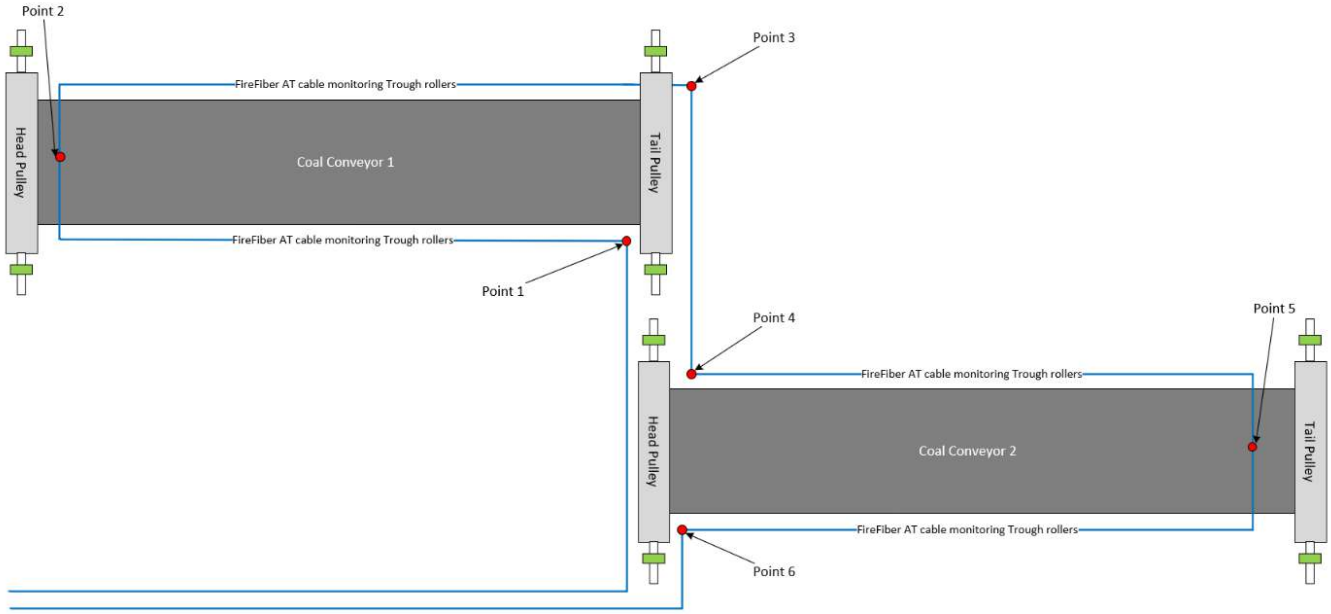


*Figure 4: Schematic For Position Mapping Points*

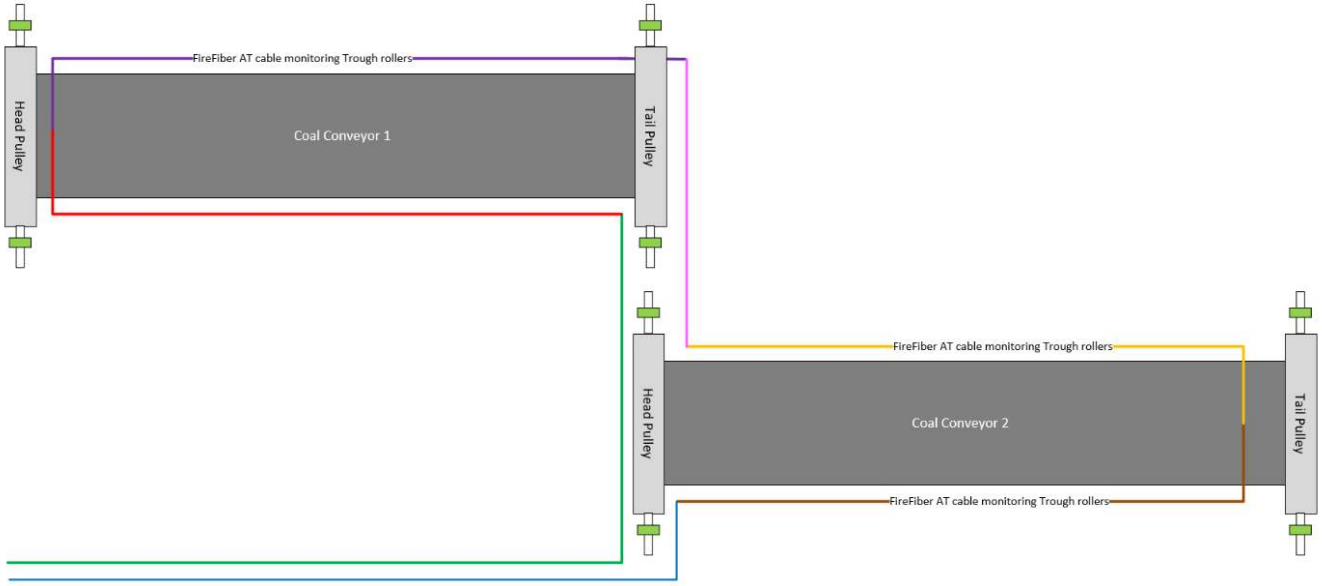


*Figure 5: Schematic For Zone Division*

To test the FireLaser system, a heat source was applied to the conveyor-installed cable to check the preliminary settings and alarm thresholds. Using specially designed heating coils, Bandweaver successfully triggered the FireLaser alarm during testing, ensuring the system's responsiveness and effectiveness.

## Benefits To the Client

The Bandweaver system complied with the operator's high specification requirements. Some of the key following benefits and advantages to the end user include:

- **Early detection of even a small fire:** Bandweaver LHD systems are approved to operate with a measurement time of 5 seconds which is considerably quicker than the alternatives. With the smart alarms (including rate of rise and deviation alarms), the system can detect fires at a very early level without risk of false alarms – alerting operators to act before an issue escalate and the fire department is required.
- **Complete Coverage:** The distributed nature of the fiber optic system provides measurements every 1m along the length of the cable providing complete and continuous coverage with no blind spots or gaps in the protection.
- **Reliable and robust system**: The system was configured in a loop configuration which means that there is a level of redundancy even if the cable is damaged. Also, it is not affected by any dust, particulates, or moisture in the air. For example, the electrically based system is affected adversely by moisture.
- **Low Cost of Ownership:** Fiber optic cables are completely passive and have no moving parts, they are non-corrosive and immune to electromagnetic interference and typically have lifetimes of more than 30 years and so carry a very low cost of ownership and no maintenance.

## About Bandweaver Technologies

With an installed base of over 60,000km and 8,000 systems installed worldwide, Bandweaver's vision is to be the first choice for integrated distributed fiber optic sensing solutions across the globe. Since 2002, Bandweaver has been committed to delivering reliable, innovative, client-centric, and value-added products and services, via a dedicated and talented team of people.

Bandweaver manufactures and distributes advanced fiber optic monitoring sensors and integrated technologies, enabling customers to monitor, secure and keep personnel and critical assets safe.

With quality and excellence as fundamental elements of Bandweaver's portfolio, the business is continuously developing its range of technologies, including Distributed Temperature Sensors (DTS), Distributed Acoustic Sensors (DAS) and integrated smart intelligent software solutions. Bandweaver provides solutions for Security, Fire, Power, and Pipelines.

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