



Linear Heat Detection System in a Cold Storage Room

Tee Yih Jia Food hub, Singapore

Project Overview

A world-leading food manufacturer in Singapore was building a state-of-the-art Food Hub spanning 40,000 m². For this advanced facility, capable of moving up to 300 pallets per hour, they sought a reliable, false alarm-free, and fast fire detection system to protect their food stock, equipment, and personnel from fire incidents.

After many considerations, they chose a fiber optic Linear Heat Detection (fiber optic LHD) system for their largest cold storage center facility in Singapore. This facility includes two cold rooms and one ambient temperature dry store. This project has featured a rack-clad high bay warehouse with an Automated Storage and Retrieval System (ASRS). A key challenge of this facility is that it spans more than 100,000 pallets of frozen storage racks, with a height of 45 meters.

Solution

AP Sensing collaborated with a local partner to deploy 10 units of long range (10 km and 8 km) Distributed Temperature Sensing (DTS) units, each with 2 channels that are linked in a loop - meaning that it can prevent cable redundancy.

The racked and mounted DTS units are installed in various locations in the facility, including the fire pump room and Fire Command Center.

The Fire Certified fiber optic sensor cable (with an operating temperature of -40 °C to +85 °C), was perfect for the job, as it easily fits along the racks



Background

- The cold storage facility is an essential and largest food storage in Singapore
- Precise, sensitive, and early fire detection needed to protect cold storerooms and dry storerooms



Solution & Benefits

- 10 DTS devices with thousands of meters of sensor cable include a Central Monitoring System
- Complete, 24/7 monitoring coverage along cold storage racks, providing alerts and hotspot locations within 1 m
- Seamless and full integration with end-client Operation Center

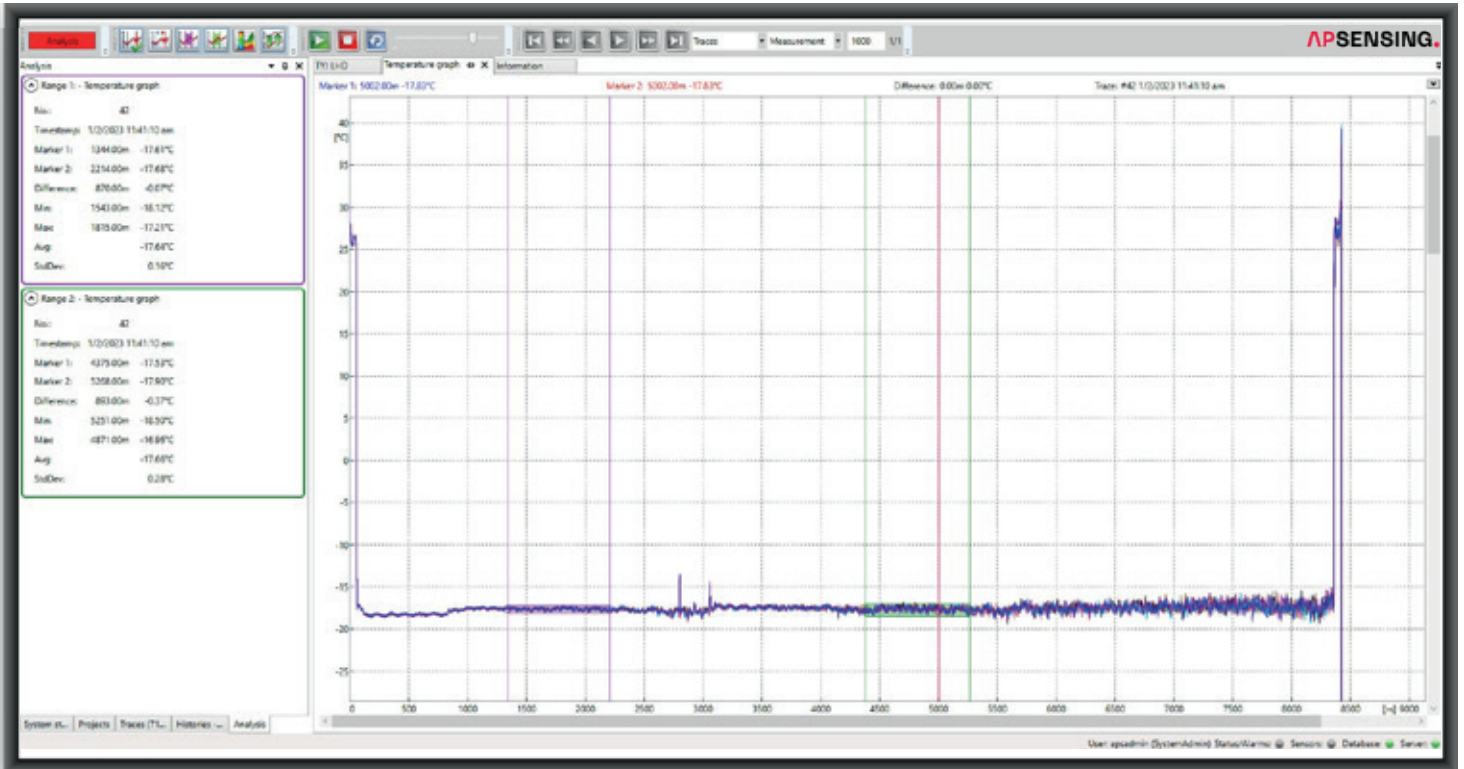


Figure 1: Temperature Profile of Cold storerooms

using cable ties. AP Sensing’s SmartVision Graphic User Interface (GUI) system was able to integrate the information and monitor 10 DTS units on a single platform.

Our DTS solution is configured with 44 relay contact signals for alarm zones from each DTS to the fire alarm panel. Inside the cold rooms, there are three racks, each with an average of 22 tiers. For this project, an AP Sensing Project Engineer configured over 700 zones.

Innovation

The AP Sensing fiber optic LHD solution utilizes a passive fiber optic cable as a distributed temperature sensor, measuring thousands of temperature points in real-time. The sensor cables used are lightweight and easy to install, even in a largescale warehouse facility with multiple racks and storage systems. The Ø 4 mm sensor cable is robust, as it is resistant to environmental conditions and requires minimal maintenance.

The AP Sensing fiber optic LHD system provides multilevel coverage, as well as a unique and flexible alarm zoning concept.

Fast & Reliable detection

The AP Sensing fiber optic LHD solution is a fiber optic sensor cable and fully tested control instrument that measures the given temperature profile in seconds. All information can be accessed through dry contacts or level communication. It is easy to integrate with other systems without having any problems when using SmartVision Software.

AP Sensing’s fiber optic LHD is the most robust and dependable system in today’s market as it has extensive certifications (EN54-22 (VdS), UL521, FM, ATEX, IECEx, SIL2) and a 33-year MTBF.

It provides peace of mind for any company, giving them the ability to test cables without impacting regular operations. This is achieved through our simple configuration and ease of repair process (in the event of cable breakage).

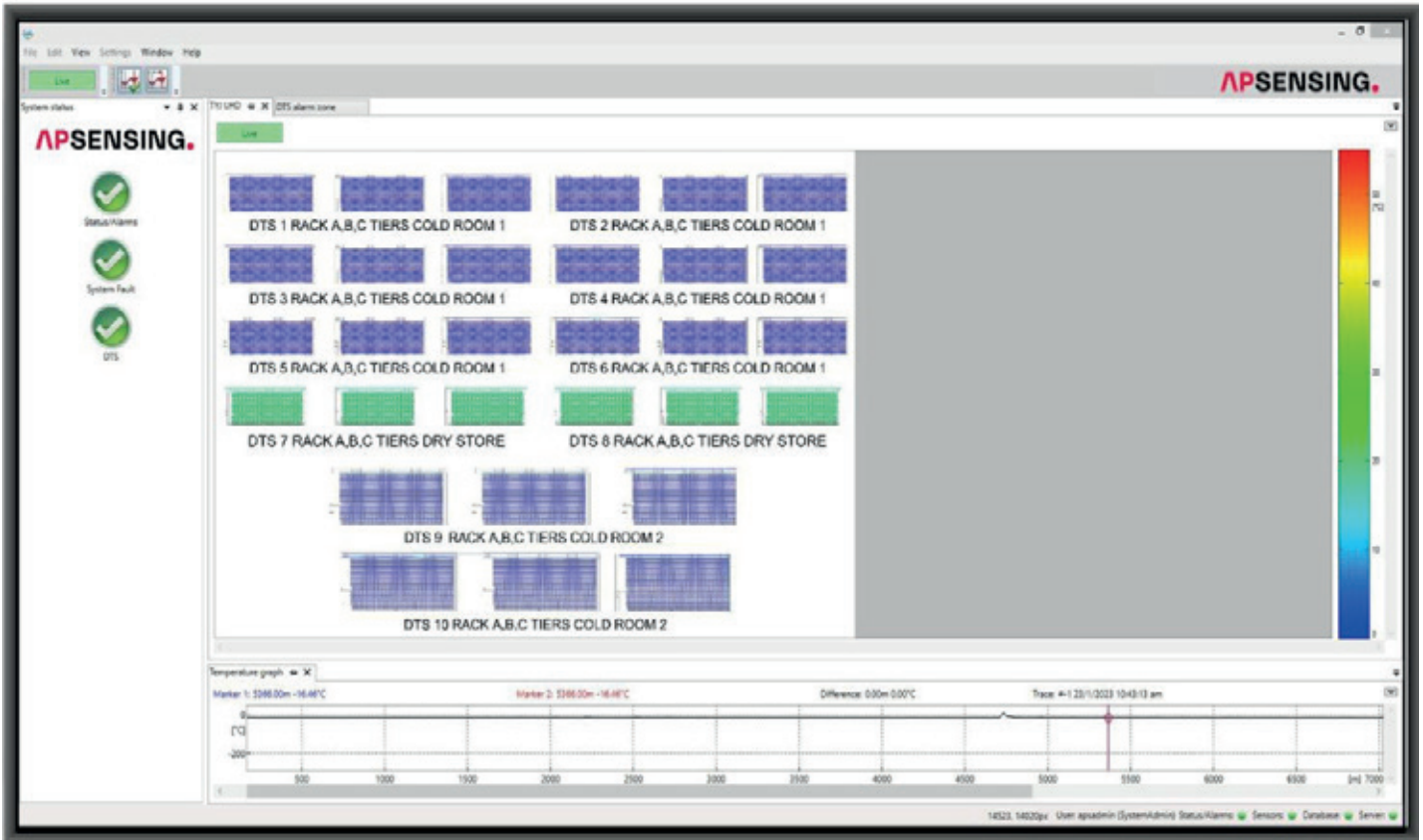


Figure 2: SmartVision AssetView Graphical Views

With the growing popularity of fiber optic Linear Heat Detection (LHD) systems being used in cold storage and ASRS, it is no surprise that this technology has been increasingly adopted for use in additional cold storage facilities across Asia. AP Sensing’s fiber optic LHD is a reliable and maintenance free system. Our sensor cable has even gone through the rigorous IEC60331-25 test (750 °C throughout 2 hours), in which the cable must still be able to monitor temperature.

Conclusion

With on-site training and local support available, the customer chooses AP Sensing for our exceptional reliability and expertise in fire detection as well as our ability to provide accurate measurements under even the most severe circumstances.

