



Continuous Bus Duct Temperature Monitoring at Nestlé Plant

Sanand, Gujarat, India

Project Overview

At Nestlé's highly automated production facility in Sanand, Gujarat, uninterrupted electrical power is essential. As part of their plant digitization initiative, Nestlé partnered with their bus duct supplier, C&S Electric, to implement AP Sensing's Distributed Temperature Sensing (DTS) solution. The goal: real-time thermal monitoring and predictive maintenance to prevent downtime and ensure safety.

Nestlé needed a system that could pinpoint thermal anomalies down to individual bus bar joints and integrate smoothly with the existing Siemens SCADA environment.

The Challenge

Nestlé required a solution to monitor critical power infrastructure in real time, helping avoid outages that could halt production. Any interruption due to undetected hot spots in the bus ducts would result in operational downtime and financial impact.

The need was for a monitoring system that supports predictive maintenance and ensures plant safety and uptime as part of their digitization roadmap. The monitoring system needs to resolve any detected hotspots to individual bus bar joints and integrate with SCADA.

For this project, Nestlé collaborated with C&S Electric, their supplier of low voltage bus duct systems. C&S Electric is a long-established manufacturer and exporter of industrial switchgear and power busbar products. Founded over 50 years ago, the company reported 2024 revenues of around USD 200 million. As a domestic market leader, it ensures IEC 61439 compliance across its LV bus duct portfolio.



Background

- New Nestlé facility in India focused on highly automated food and beverage production
- Continuous power supply is critical to avoid production losses
- Plant digitization initiative required real-time thermal monitoring of bus ducts



Solution & Benefits

- Installed a DTS instrument with four open-loop sensor cable runs
- Real-time detection of hotspots enables predictive maintenance
- Seamless SCADA integration ensures full system visibility and reliability



Figure 1: Bus Ducts at Nestlé Plant in Sanand, Gujarat, India

Drawing on its global deployment experience, the company identified environmental factors such as moisture, dust, and mechanical vibration that can affect performance and cause overheating. Through continuous monitoring, C&S Electric helps end clients like Nestlé maintain long-term system safety and reliability.

Installation and commissioning of the monitoring system were carried out by ICE Asia Pvt. Ltd., based in Mumbai, India.

The Solution

AP Sensing supplied a Distributed Temperature Sensing (DTS) system with a measurement range of 4 kilometers and four channels. Each channel monitors a dedicated section of the entire bus duct, with sensor cable lines each up to approx. 800 m long and spatial resolution configured at one meter throughout.

To verify the accuracy of the installation, temperature readings at multiple joint zones were cross-checked using a Fluke IR thermometer. The values reported by the DTS aligned well with the independent measurements, confirming the system's precision. In addition, the DTS controller was configured to communicate with the Siemens SCADA system at Nestlé via Modbus TCP/IP. IP address mapping and data transfer were tested end-to-end, including alarm and distance information.

Operators from the engineering team participated in an on-site training session conducted in English and Hindi, ensuring that the system could be independently operated and maintained moving forward.

Results & Benefits

- Real-time thermal monitoring of critical bus ducts
- Accurate zone-level temperature data with 1-meter spatial resolution
- Predictive maintenance capabilities to prevent failures or hot spots
- Verified reliability through multi-point cross-checking
- SCADA integration for control room visualization

The solution plays a key role in maintaining plant uptime and supporting the high level of automation required in production of quality food and beverages.

„Combining efforts to deliver cutting-edge design and technologies is critical to realizing manufacturing plant digitalization,” said Mr. Prithipal Singh Teji, Vice President of Sales & Marketing at C&S Electric. „This collaboration with AP Sensing allows us to offer real-time, permanent bus duct temperature monitoring that supports both safety and operational efficiency.”

Conclusion

Nestlé selected AP Sensing's solution through their bus duct supplier, C&S Electric. Our DFOS technology provided seamless integration, proven reliability, and compatibility with existing control systems. Strong regional support and performance in critical monitoring made us the preferred partner.

Following success at the Sanand facility, Nestlé is now deploying the same solution at its Karnataka site in India.