

Railway Switch Room Panel Temperature Monitoring, Using Distributed Temperature Sensing (DTS)

Introduction:

Railway switch room panels house critical electrical components that ensure the safe and efficient operation of railway systems. Monitoring the temperature within these panels is crucial to prevent overheating, mitigate potential fire risks, and ensure the reliability of the entire railway network. This application note outlines the utilization of **Distributed Temperature Sensing (DTS)** technology for continuous and precise temperature monitoring in railway switch room panels.

DTS Technology:

DTS technology offers a non-intrusive and highly accurate solution for monitoring temperature over extended distances. It operates on the principle of back-scattering, where a laser pulse is sent through an optical fibre, and temperature-induced variations in the fibre's molecular vibrations provide real-time temperature measurements along its entire length. This technology is well-suited for monitoring extensive railway switch room panel setups with a single optical fibre.



Advantages for Railway Switch Room Panels:

High Spatial Resolution: **DTS** provides temperature readings at multiple points along the optical fibre with meter-scale spatial resolution, enabling the identification of localized hotspots.

Real-Time Monitoring: The continuous nature of **DTS** enables real-time temperature monitoring, ensuring prompt response to any temperature anomalies or changes.

Remote Sensing: The optical fibre can be easily routed through cable trays or conduit systems, allowing remote sensing of temperatures even in hard-to-reach areas within the panel.

Non-Intrusive Installation: The non-intrusive nature of **DTS** installation eliminates the need for additional sensors, minimizing disruption to railway operations during deployment.

Early Warning System: Deviations from normal temperature profiles can trigger alarms and alerts, facilitating preventive maintenance and reducing the risk of equipment failure or fire incidents.

Implementation Steps:

Fiber Installation: A single optical fibre is strategically routed through the switch room panel to cover critical components and potential hotspots.

Data Acquisition: The **DTS** system continuously sends laser pulses through the optical fibre, collecting temperature data points along its length.

Data Analysis: The collected temperature data is analysed in real-time. Deviations from predefined temperature thresholds trigger alerts or notifications.

Integration: The temperature data can be integrated into the railway's central monitoring system for comprehensive oversight of switch room panel conditions.

Conclusion:

Distributed Temperature Sensing offers a reliable and efficient solution for monitoring temperature within railway switch room panels. The technology's ability to provide accurate, continuous, and remote temperature measurements empowers railway operators to proactively manage switch room panel conditions, enhance safety, and ensure the smooth operation of railway systems.

For more information and guidance on implementing **DTS** for railway switch room panel temperature monitoring, please contact sales@ttspl.co.in.



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