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Case Study | UK

Headbolt Lane to Rainford Project

Background

The project aimed to extend Merseyrail services from Kirkby Station to a new station at Headbolt Lane, shifting the terminus for Northern services from Kirkby to Headbolt Lane. Currently, Kirkby Station functions as an interchange between Merseyrail and Northern services. Upon completion of the project, Kirkby will become a through station for Merseyrail trains, enhancing connectivity and improving the integration of the local transport network.

As part of the project, there was a requirement to feed indications from Headbolt Lane to Rainford, a distance of 7 km. Frauscher's technology was introduced to support the data transmission requirements of this project.

Challenges

The project's challenge was transmitting the indication information from Headbolt Lane to Rainford. The initial solution proposed was to install 7 km of troughing and run new cables to carry the indications. This would have required extensive access planning to facilitate the work. Given the highly compressed project schedule, planning additional access and time for these works would have been extremely difficult.

Another challenge was that multiple indications needed to be transmitted safely between Headbolt Lane and Rainford. The options considered were a Frauscher data transmission solution, Time Division Multiplex TDM, or running cables between the two locations. The latter option would have involved laying 7 km of new troughing and 7 km of cable and addressing various civil engineering issues, significantly extending the project timeline and adding risk to the final commissioning stages.

Solution

Opting for the Frauscher system eliminated the need for new cable installation, as the indications were transmitted via the existing FTNx telecoms network.

The indications that needed to be transmitted were status indications of the Track Circuit (Interrupter), Arrival and Departure (Interrupter), and TPWS indication (OSS). To meet the SIL4 requirement, the QUAD safety mode was configured. A QUAD input configuration reads a single input multiple times using four physically separated inputs, ensuring it meets SIL4 safety standards. This also meant that no external monitoring was required to evaluate the inputs.

The integration of the Frauscher Diagnostic System FDS additionally provided access to real-time indication status and a historical data log, further enhancing system monitoring and reliability.
For the project team, the Frauscher system enabled most of the work to be conducted off-site, with installation completed during the final commissioning stages.

The key solutions were:

- **Elimination of new cable installation** by utilising the existing FTNx telecoms network.
- **Vital transmission** meets SIL4 requirements without the need for external monitoring.
- **Off-site work**, minimising on-site disruptions and compressing the timeline for the final commissioning.

Benefits

Frauscher Data Transmission System had numerous advantages to the Headbolt lane to Rainford project. Here are some of the key benefits:

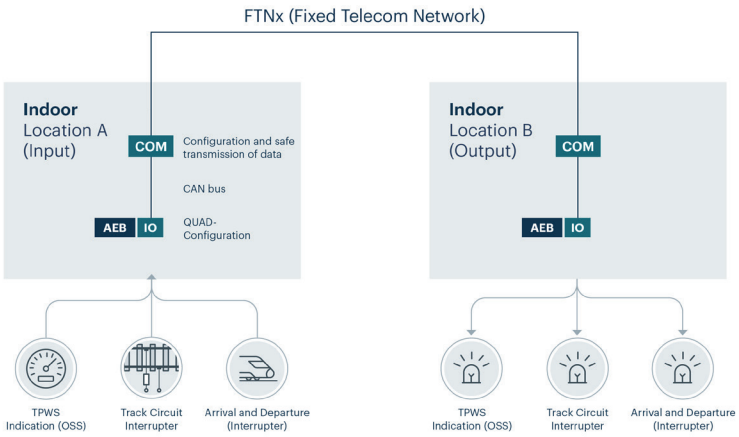
Cost-effectiveness: The Frauscher system was chosen due to its competitive cost. It reduces the overall project expenses by eliminating the need to lay new cables and infrastructure.

Minimised on-site activity: By enabling off-site work, the system reduced the need for extensive on-site operations, helping to minimise disruptions during construction and simplifying project management.

Accelerated timeline: The solution significantly shortened the project timeline by avoiding the lengthy process of installing 7 km of new troughing and cables, which would have required additional access planning and time.

Reduced risk: With fewer civil engineering works and less on-site activity, the risk of delays and complications, particularly during the final commissioning stages, was significantly reduced.

Reputable solution: Frauscher's system had been successfully used in previous projects, offering reliability and a proven track record, which influenced the client's decision to adopt it for this project.



Key Facts

Operator	Network Rail	**Country**	United Kingdom
Partner	Trackwork Ltd	**Segment**	Mainline
Scope of supply	Data Transmission and FDS	**Application**	Data Transmission
Scope of project	Transmission of indications	**Project start**	July 2023

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