



South Western Railway | UK

Bringing reliability to Britain's island railway

/ TRAIN DETECTION SYSTEM

Frauscher supported the Isle of Wight modernisation with decentralised axle counting architecture specifically designed for DC third-rail operation and harsh sea-island conditions. The resilient Frauscher Advanced Counter FAdC® and Frauscher Wheel Sensor RSR123 enable increased train frequency with minimal maintenance for 1.5 million annual passengers, future-proofing sustainable rail operations.

Background

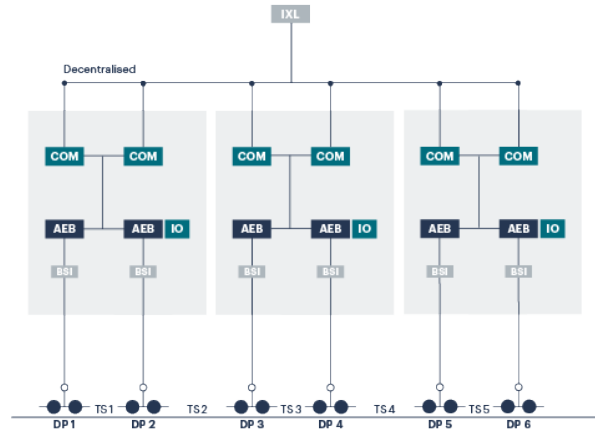
The railway line on the Isle of Wight is unique amongst Britain's regional rail networks. The 8.5-mile (13.7-kilometre) standard gauge "Island Line" serves England's second-most populous island and is its only regularly used railway line. In 2020 and 2021, the line underwent comprehensive modernisation through £26 million worth of improvements. The project's primary objectives were to increase train frequency and enhance passenger comfort for up to 1.5 million annual passengers.

To achieve these goals, control, command, and signalling infrastructure required significant enhancement. The decision was made to implement axle counters for train detection. This presented unique technical challenges, as the design needed to account for specific line conditions including low tunnels and a DC third-rail system. The modernisation represented a strong signal for the

Operator	South Western Railway
Partner	OSL Global
Country	United Kingdom
Segment	Mainline
Application	Track vacancy detection
Year	2020
Scope of Service	Axle counting, project support including configuration writing
Products	FAdC®, RSR123

future of the island's regional rail transport. At its peak in the mid-20th century, the Isle of Wight had been served by more than 55 miles (88.5 kilometres) of railway lines. Today, the Island Line connects to the Isle of Wight Steam Railway, a well-known steam-operated heritage railway.

Beyond signalling improvements, the modernisation programme encompassed track upgrades (including construction of a new passing loop at Brading), station enhancements, and rolling stock renewal. The project replaced older, small-profile trains originally designed for deep-level "Tube" lines from 1938, which had been running on the island since 1989. Five two-car trains were refurbished and modernised with upgraded interiors, wheelchair spaces, free Wi-Fi, and electric sockets. Station platforms along the line were raised to improve accessibility.



A decentralised architecture was chosen for the Isle of Wight

Solution

/ Axle counting solution

A Frauscher axle counting solution was chosen for future-proof train detection on the line. It uses the Frauscher Advanced Counter FAdC® and the Frauscher Wheel Sensor RSR123 with bull head and a flat-bottom rail claw. Frauscher UK, with extensive experience in deploying axle counting technology on DC third-rail lines, became involved in the project from autumn 2020. The team supported the design process of a decentralised flexible architecture for train detection on the Island Line, bringing in-depth product knowledge to address the line's specific requirements.

/ Decentralised architecture: flexible and economical

The decentralised architecture operates from a higher-level system, with clusters of detection points positioned along the line. These can be connected via Ethernet with no additional requirement for relays, IO boxes, or complex wiring. This approach delivers several advantages:

- More economical cabling
- Freely selectable locations for the axle counting logic
- Communication between individual interlocking clusters via existing or new network infrastructures

/ Frauscher Wheel Sensor RSR123

The RSR123 offers a high level of viability – optimal for use in a sea island climate. The wheel sensor is highly resistant to harsh conditions like floods and rain as well as to electromagnetic interferences. For the Isle of Wight project, this resilience was particularly important due to the possible proximity of the wheel sensor to the power rail. The RSR123 is based on the patented V.Mix Technology and combines various inductive methods. Frauscher delivered a reliable solution that precisely matched the customer's requirements. The highly available system has proved resilient to harsh weather conditions and requires minimal maintenance.



Frauscher Wheel Sensor RSR123

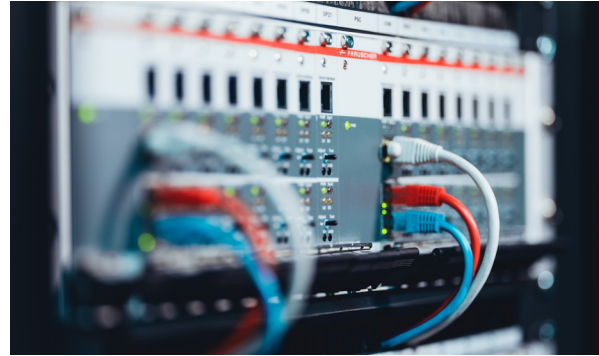
/ Partner collaboration

The system was installed and integrated by OSL Global, an engineering firm from Crewe. This marked Frauscher's first project collaboration with OSL. The axle counting experts provided the partner with comprehensive technical training throughout the implementation.

/ Comprehensive support: from design to commissioning

Frauscher not only delivered the axle counting system, but also supported the project in all steps from design to installation to successful commissioning. This included the integration of axle counting technology in a relay-based interlocking system: The FAdC® board racks delivered by Frauscher with components pre-assembled, were equipped with extension boards IO-EXB. These provide fail-safe output of clear/occupied indications and directional information for track sections by means of voltage-free relay contacts.

The axle counting technology and services from Frauscher have made an important contribution to the Island Line's future, supporting sustainable, flexible, and reliable operation.



Frauscher Advanced Counter FAdC



IO-EXB



Customer Statement

During the development of the Isle of Wight resignalling scheme, I advised the project team that the population of Frauscher axle counters on the mainline had brought many benefits, especially in reliability and recommended they implemented them on their project. Following the commissioning, I have been proved right as they are performing exceptionally well. Knowing the Frauscher team are available to answer any technical queries, gives me confidence and I look forward to a trouble free system on the Island Line.

Ronnie Bignell
Head of Signalling - Wessex | Network Rail



Benefits

Frauscher's axle counting solution delivers significant operational and economic advantages for the Island Line. The main benefits are:



Economical cabling

The decentralised architecture eliminates the need for relays, IO boxes, and complex wiring. Clusters of detection points can be connected via Ethernet. This delivers more economical cabling and freely selectable locations for the axle counting logic. Communication between individual interlocking clusters operates via existing or new network infrastructures.



Weather resilience

The RSR123 is optimal for use in a sea-island climate. The wheel sensor is highly resistant to harsh conditions such as floods and rain, as well as to electromagnetic interference. This was particularly important for the Isle of Wight project due to the possible proximity of the wheel sensor to the power rail. The RSR123 is based on the patented V.Mix Technology.



Flexible architecture

The system provides freely selectable locations for axle counting logic with communication between individual interlocking clusters via existing or new network infrastructures.



Minimal maintenance

The highly available system proved to be resilient to harsh weather conditions and requires minimal maintenance.



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www.frauscher.com/en/contact



Further references are available via the following link: www.frauscher.com/en/references

