Case Study | UK

Dean Forest Railway

Requirements

The Dean Forest Railway (DFR) operates a historical 7 km passenger service line running north from Lydney Junction to Parkend, in the Forest of Dean. The DFR are responsible for the maintenance and operation of the heritage service, which is carried out by an entirely volunteer workforce. Due to planned extensions of the line and an additional turnout being added at Parkend, an update of the existing train detection and signalling system was needed.

The train detection system had to be integrated into the mechanical interlocking that was also being restored to bring Parkend signal box back to life. Achieving the necessary ballast resistance to reliably operate track circuits would have involved relaying a large portion of track. This coupled with the ongoing maintenance requirement of additional track circuits was considered too time costly, given the volunteer workforce.

Alternatively, extending the original token system that is in operation in one section would have reduced the number of revenue generating services, further exacerbating the problem. Thus, a different method of track vacancy detection was necessary.

Solution

Based on positive experiences with this technology, DFR decided to go for an axle counter solution from Frauscher. To provide maximum flexibility and meet the variety of requirements defined, the Frauscher Advanced Counter FAdC was chosen.

On track, nine Frauscher Wheel Sensors RSR123 are now detecting all rail vehicles reliably. Using the system's ability of establishing individual architectures, the axle counter was collocated with the interlocking inside the existing signal box. Track vacancy detection data is provided to be electronically integrated into the mechanical interlocking. Additionally, Supervisor Track Sections STS and Counting Head Control CHC are providing maximum availability and system resilience. The Frauscher Diagnostic System FDS is being used to provide remote web access via a VPN.

The Frauscher Wheel Sensor RSR123 proved to reliable detect even the old steam train's wheel flanges highly reliably.

The FAdC interfaces with The Dean Forest Railway's infrastructure via relays.

Benefits

The benefit of a quick installation time was especially advantageous to the Dean Forest Railway. Frauscher UK employees assisted the volunteers of the heritage site to install and commission the FAdC and Wheel Sensors RSR123, which took a total of six days, including laying the cable.

This resulted in a minimum downtime of the site. The possibility of remote diagnostics ensures that a time related benefit is given during operation as well, as it can help off duty staff members to support their colleagues onsite and reduce ongoing maintenance costs. Data configuration and consistency of spare parts, allows for future remodelling and expansion work.

Project Details

Dean Forest Railway's closed environment meets Network Rail's infrastructure soon after Lydney Junction, which is its most southern point. Although not part of the mainline, as a fully operational heritage railway, high standards in terms of signalling and safety must be met. Thus, whilst maintaining a historical touch using traditional steam engines, rolling stock and lovingly restored stations, the "backstage area" of this unique railway line has undergone certain measures of modernisation.

Positive experiences

In order to meet the Office of Rail and Road (ORR) requirements, The Dean Forest Railway installed two new Schweizer Flex Level Crossing systems, complete with barriers, in September 2018. These incorporated the use of the Frauscher Wheel Sensor RSR123 and the Frauscher Axle Counting System ACS2000 to initiate the automatic barrier movements. In this installation, the RSR123 proved to be fully capable of detecting all the heritage rolling stock, and have been reliably operating the level crossings since commissioning.

Based on their positive experience in using this system, harnessing the RSR123 together with the Frauscher Advanced Counter FAdC was an obvious choice for DFR to extend their train detection system.

Flexible interfaces connecting with the past

Whilst operating on a modern level the whole system can be integrated into the existing infrastructure via relay interfaces. These relays are interfacing directly with the mechanical interlocking. On the other side, up-to-date software interface allow for the output of data via modern networks, providing the staff with remote diagnostic data.

"The investment made by the Dean Forest Railway allowed an earlier delivery of the signalling project at Parkend, considering the alternative option to install track circuits would have taken up to four years based on volunteer work. It also allowed us to improve the signalling at Middle Forge, which was controlled by a mechanical ground frame, and is now controlled electronically from Norchard Signal Box. Equipment supplied by Frauscher has been operational since November 2019 when it was installed. The possibility of leaving connections to the outside infrastructure to the last moment allowed the signalmen to familiarise themselves with the operation prior to going live", says Roger Phelps, Operational Manager at The Dean Forest Railway.
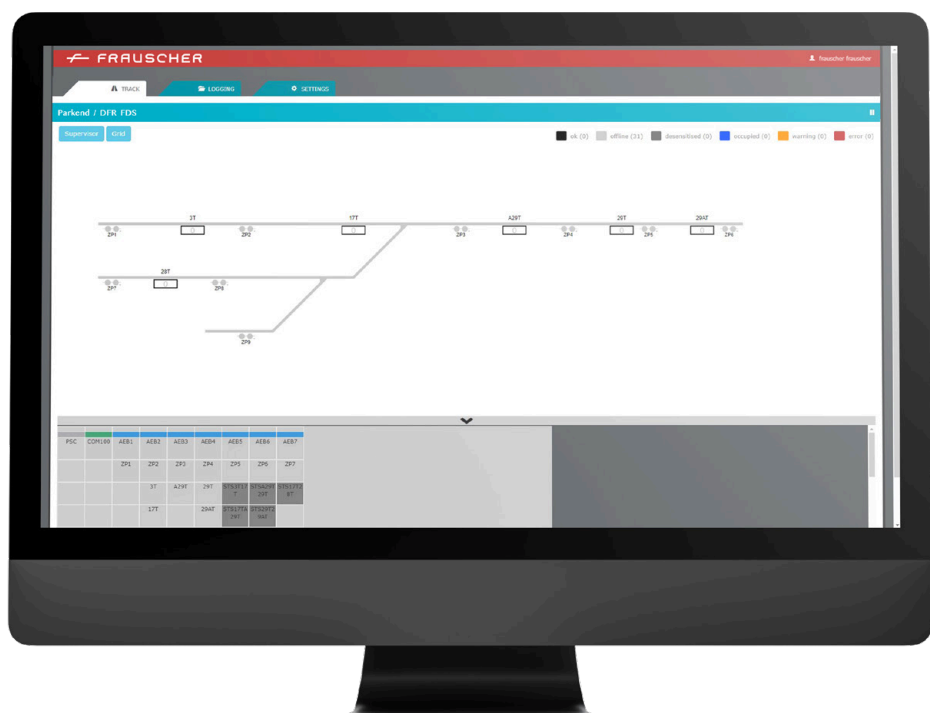
The Frauscher Diagnostic System FDS provides DFR's experts with remote access to real-time diagnostic data

Key Facts

Operator	Dean Forest Railway	Country	UK
Scope of supply	FAdC R2, RSR123, FDS	Application	Axle counting
Scope of project	Facilitating heritage rail expansion	Project start	November 2019