Modular Signalling System

Network Rail

FAdC® and RSR123

Country
United Kingdom

Segment
Main Lines

Application
Train detection

Project start
2011

CASE STUDY | EN

Requirement

In early 2011, Siemens Rail Automation (formerly Invensys Rail) got the contract to modernise all the signalling for the 55 km, double track line of railway between Crewe and Shrewsbury in England. This project covered seven level crossings and two complex intersections. It was really important to select a suitable, safe axle counting system which met the requirements of the modular system.

Solution

For this project, Siemens opted for the FAdC, the latest generation axle counting system and for the wheel sensors RSR123. A total of 79 wheel sensors and 19 external cabinets were installed along the 55 km of track.

Benefit

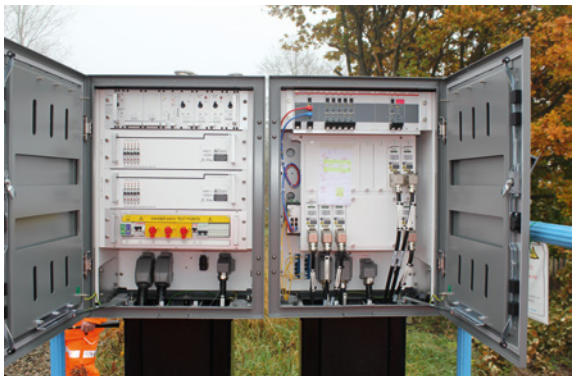
The new axle counting system FAdC perfectly meets all the requirements of the modular signalling system. Due to its functional modularity and simple scalability, combined with a vital Ethernet interface to the interlocking, the FAdC system offers Siemens an extremely high level of flexibility at the same time as minimising hardware requirements.

Project details

In early 2011, after several years of engineering development with Network Rail, Siemens were awarded a contract for the delivery of their newly developed „Modular Signalling System“.

Decentral Object Controllers

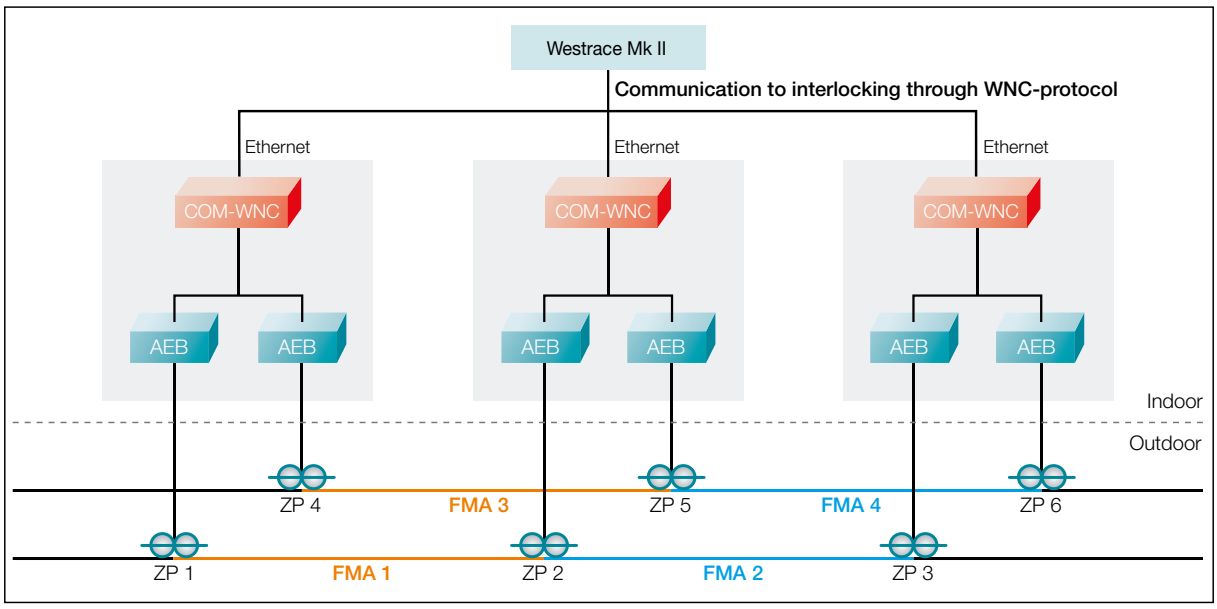
The Modular Signalling System does not use conventional locational cabinets. These systems are a new concept which involve the decentralising of the signalling equipment. Devices known as Object Controllers (OC) are placed in predesigned areas along the track. These OC´s house the processor modules which provide the interface between the Westrace Mk II interlocking system and the trackside equipment such as point machines, signalling and axle counting systems. Each OC contains common components resulting in more efficient installation, commissioning, and maintenance procedures because of the standardization of the parts.



Object Controller for FAdC (right side)

The communication between the OC´s happens through fast Ethernet connection over fully duplicated fibre optic lines. The decentralisation as well as the usage of fibre optic cables instead of copper cables decreases the initial project costs and overall life-cycle-costs significantly. The solution enables signallers to control greater areas of tracks and therefore reduce operator costs.

The Network Rail contract was viewed by Siemens as being of huge importance as it



was the first modular system to be commissioned by Network Rail. Successful design, installation and operation of the modular system would result in further modular projects being awarded to Siemens. Therefore they paid particular attention on choosing a suitable and technically proven axle counting system with the necessary software interface which should be compatible to Siemens´ WNC protocol already in use for many other interfaces.

Network Rail

FAdC with software interface

As the Frauscher Axle Counting System FAdC perfectly fulfilled all the needs Siemens was looking for, they decided to go for this system. The FAdC states the latest state-of-the-art technology in axle counting. Thanks to its software interface the configuration is extremely simple and flexible, and allows an uncomplicated adaptation for the needs of the decentralised architecture. For the 55 kilometer length of track a total of 79 Frauscher Wheel Sensors RSR123 and 19 communication boards COM-WNC, along with all supporting evaluation equipment was designed for the project.

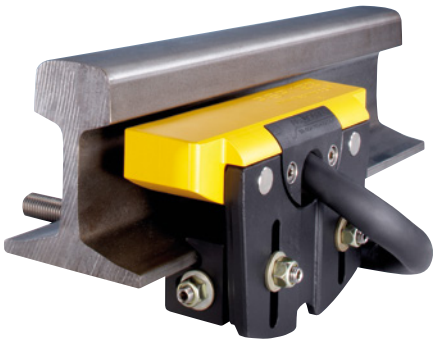
FAdC with WNC - software protocol

WNC - customer specific protocol

The communication between the interlocking and the decentralised trackside equipment is most efficient if both are using the same „language“. Because the interlocking system uses the Siemens WNC protocol it was necessary that the axle counting system uses the same one. With the COM-WNC communication board Frauscher offers a solution which garantuees an optimum data exchange between the two systems. In addition, the new axle counting system does not need I/O hardware and therefore makes extensive wiring obsolete.

Plugable cables

The usage of plug-coupled connections and the standardisation of key elements allows it to execute major parts of verification & validation processes completely off-site. This in turn reduces the commissioning activity to the confirmation that trackside objects are correctly operated by the interlocking.



RSR123 with rail claw - mounted on rail profile

RSR123 + Rail claw

Frauscher wheel sensors always come togehter with rail claws. These rail claws can be adapted flexibly to almost any rail profile. Advantages of these products are that no drilling on the rail is required, flexible positioning, and simple as well as rapid assembly or disassembly is easily possible. The rail claws together with the plugable cables of the wheel sensor RSR123 lowers the time on track to an absolute minimum.

Operator	Network Rail
Client	Siemens
Scope of Supply	Trial, Components, Installation and Commissioning
Scope of Project	79 counting heads, 19 on-site object oontrollers
Axle Counting System	FAdC with AEB and COM-WNC
Wheel Sensor	RSR123