



Case Study | FI

Kokkola-Ylivieska Signalling Project

Requirements

Extending the railway section between Kokkola and Ylivieska from a single to a double track section was one of the most comprehensive signalling system projects ever conducted in Finland. As it is one of the country's busiest lines, where trains reach up to 200 km/h, rebuilding of the existing and adding the second track had to be done without affecting regular train operation.

After the operator, Finnish Transport Infrastructure Agency, decided to implement a Mipro Interlocking based on COTS PLC, they investigated to find solutions that would interface with this system in an efficient and cost saving way.

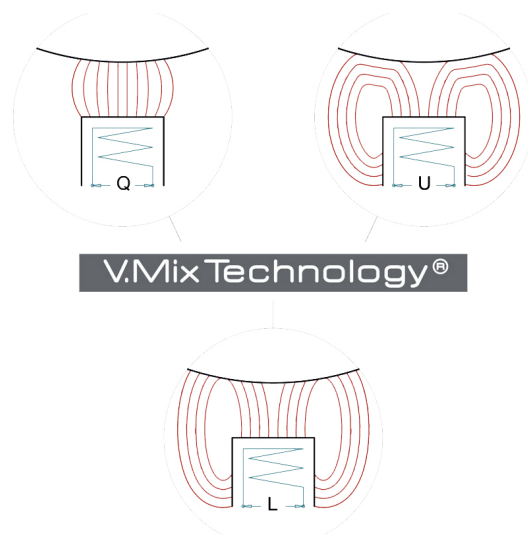
Additionally, the environmental conditions in Finland urged for outdoor equipment that is able to operate highly reliably and precise even when exposed to extreme cold and when covered with snow. Also, compatibility with 25 kV rail current had to be guaranteed. As main parts of the line run through very remote areas, minimum maintenance requirements became a main criteria as well.

Solution

The combination of Frauscher Wheel Sensors RSR123 with the Frauscher Advanced Counter FAdC provides an optimum solution in this setting. The RSR123 has proven its reliability even under harshest environmental conditions all

over the globe. Thanks to the patented V.Mix Technology, which combines various inductive procedures, this sensor is highly robust against electromagnetic influences.

Furthermore, this technology allows to avoid the installation of electronics directly on or near the track, e.g. in the trackside connection box. This greatly reduces the likelihood of any electronic damages in the field resulting in very low maintenance and life cycle costs. Against that background, the RSR123-FAdC combination is predestined to detect high speed trains under the very demanding environment given at the Kokkola-Ylivieska line.





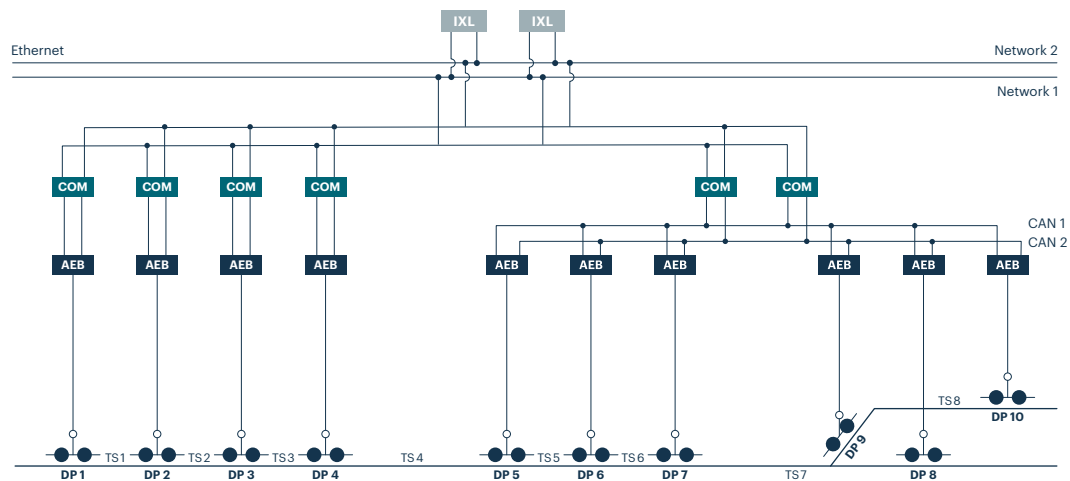
Project details

The FADc's ability to realise mixed architectures contributed to massive cost savings in terms of cabling requirements. At Ylivieska Station, a central architecture was established, where all indoor components of the axle counter are installed in one location.

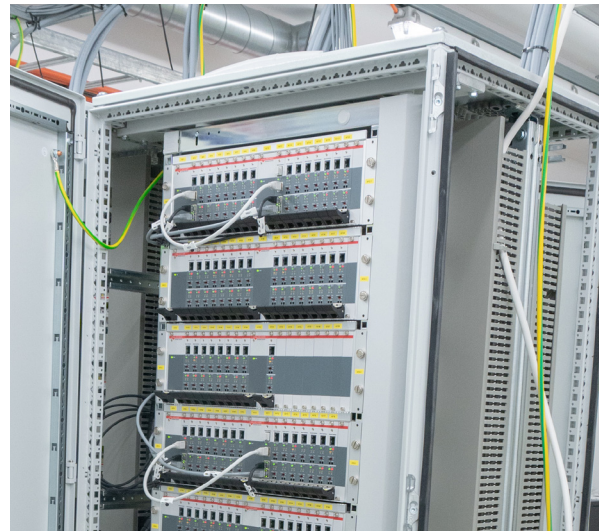
Here, redundancy of vital boards ensures maximum availability. Along the open line, a modular design was chosen. The FADc indoor equipment is located in numerous signaling shelters along the track. This results in minimum cabling due to short distances from the sensor to the evaluation board.

Internal communication of the FADc units was realised via a redundant IP Ethernet network. Communication with the interlocking is carried out via a redundant Ethernet network as well. Using the Frauscher Safe Ethernet FSE protocol significantly sped up the installation and reduced the whole project's costs additionally. The system provides the operator with maximum flexibility due to its open interfaces and configuration process, which was done by the customer based on a training.

Therefore, Mipro as signaling integrator was not dependent on any third parties for reconfiguring the FADc system during the numerous construction phases of this challenging project.



Redundant network



Frauscher Diagnostic System FDS

System status always on screen

With the Frauscher Diagnostic System FDS in use, the experts of the Finnish Transport Infrastructure Agency always have their system on screen. Remote access to valuable data allows for the planning and conduction of preventive and predictive maintenance work.

For the Kokkola-Ylivieska track section Mipro delivered its interlocking system that meets the highest safety

requirements according to the SIL4 Safety Integrity Level. In addition to the interlocking system Mipro's delivery included new combined-aspect signals and new Automatic Train Protection (ATP) control lines.

Mipro also attended to the open-line installations for the track section and implemented several system interfaces, for example to the traffic control system. The new interlocking system can be controlled locally or via the traffic control centres in Oulu or Seinäjoki.

Key Facts

Operator	Finnish Transport Infrastructure Agency	Project Timeline	2014: project start 2017: open line fully operational and commissioned 2019: Ylivieska station commissioned
Partner	Mipro	Scope of project	275 sensors on open line 75 sensors in Ylivieska station
Country	Finland	Axle Counter	FAdC, FSE
Segment	High Speed Lines	Wheel Sensor	Wheel Sensor RSR123
Application	Track vacancy detection	Scope of supply	Indoor and outdoor equipment were supplied by Frauscher, configuration was done by the customer. This ensures full flexibility throughout the project.