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Track more with less.

Case Study | CN

“One Belt One Road” initiative Serbia

Background

The Hungary-Serbia Railway is a representative project of China’s “One Belt One Road” (OBOR) initiative between China and CEE countries. The entire line spans from Belgrade in Serbia to Budapest in Hungary, featuring an electrified railroad for both passengers and goods, with a total length of 341,7 km.

Currently, Frauscher mainly participated in the Belgrade-Stara Pazova section, Stara Pazova-Novi Sad section, and Novi Sad-Subotica border section of Serbia. The first two sections (the section from Belgrade to Novi Sad) have been put into operation in March 2022, with a maximum operating speed of 200 km/h.

In cooperation with China Railway Signal & Communication Group (CRSC), Frauscher, as the axle counting supplier for the signalling system, had the opportunity to participate in this project. So far, CRSC and Frauscher have been cooperating for 15 years on various projects. For this project, the Frauscher Advanced Counter FAdC® was used alongside the Frauscher Wheel Sensor RSR123 and detailed technical support to CRSC was provided to help in applying for relevant certifications.

Project Requirement

This project represents the first time that Chinese rail equipment was used in line with the EU railway technical specification. To be utilised, it had to meet the Standard of the European train control system ETCS-L2 and the Certificate of Technical Specification for Interoperability (TSI).

Under this condition, the relevant authorities of China and Serbia needed to agree on the requirements related to technical standards during the construction of the project. For axle counting, the required standards and certifications differ from country to country. This is not only the first project requiring European technical standards for Chinese railway signalling enterprises, but also the first newly built railroad in Serbia for several years, which required both parties to invest considerable time and resources in technical clarification and related work to ensure the project is implemented smoothly.

In such a cross-continental cooperation, Frauscher’s role is more than a signal equipment supplier. As an Austrian brand in the Chinese market, Frauscher plays an indispensable role as a link between China and Europe in the process of aligning signalling technology standards.

Solutions

Detailed Communication and Consultation Services

Frauscher participated in the applications for TSI and the national Serbian approval.

TSI is an EU technical regulation on railroad products, which is a technical specification to eliminate obstacles to the development of transnational railroad transport between EU countries. It further improves the efficiency of railroad transport and constructs a Trans-European railroad transport network (TEN), achieving interconnection requirements. Any railroad products entering EU countries must have a TSI certification. Frauscher's solutions have been all TSI certificated as a leading international signalling equipment supplier.

In 2022, with Frauscher's active cooperation and assistance in communication, CRSC's trackside signalling system has been officially certified by Ricardo, an ISA organization, for TSI.

Despite the comprehensiveness of TSI, some technical aspects need to be approved by the project location when they are beyond the scope of TSI. The Frauscher Advanced Counter FAdC® was approved by the Serbian authorities many years ago and the approval was renewed in 2022.

During the preparation, application, and technical clarification of various European international requirements for certification materials, the Frauscher China team, Austrian headquarters, and CEE team worked closely together to support CRSC and the local operator as well as all other stakeholders involved in this project.

During the project, Frauscher conducted a customised product training in Belgrade for operators, employees as well as CRSC technical staff.

Frauscher gives training on-site.

Axle counters with high performance

Indoor Equipment

Frauscher Advanced Counter FAdC®

In cooperation with CRSC, the Frauscher Advanced Counter FAdC® with software interface is implemented into this project. The FAdC® supports traditional hardware interfaces or protocol-based software interfaces. Its software interface is able to communicate with higher-level interlocking systems via the safety protocols, such as EULYNX, Frauscher Safe Ethernet FSE, as well as customised protocols (RSSP, FSFB, etc.).

Ethernet can be used as standard in most existing networks without additional hardware costs, which ensures very high-speed data transmission, up to real-time transmission.

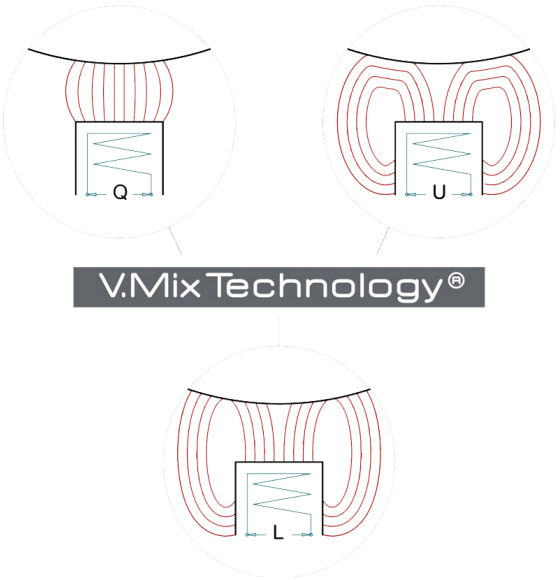
Frauscher Safe Ethernet FSE is chosen for this project as the data communication protocol. It is a railway-specific software protocol based on UDP/IP, satisfying the requirements by CENELEC SIL 4 and EN 50159 Category 2. It significantly speeds up the integration of new components in various projects, enabling a maximum of 512 bytes of application data to be transmitted per data package. Information of up to 40 counting heads or 80 track sections via just one communication board can be obtained, including resetting information and I/O information from the interlocking to the communication board.

In addition to all processes - from planning, engineering, and configuration, to diagnostics, maintenance and adjustment - being able to be supported by innovative software tools, FAdC® provides many benefits to customers with its flexible resets, sound diagnostic structure, and redundant system architecture.

Outdoor Equipment

The wheel sensor installed at the trackside of this project is Frauscher Wheel Sensor RSR123. Based on the patented V.Mix Technology®, the Wheel Sensor RSR123 combines different inductive sensing methods making it highly resistant to electromagnetic interferences caused by eddy current brakes or rail currents.

Frauscher Wheel Sensor RSR123



The V.Mix Technology®

This technology avoids the need to install electronic components directly on or near the track, for example in a connection box next to the track. It significantly reduces the possibility of damage to electronic components in the field, saves on routine maintenance costs and increases product life.

In addition, the pluggable cable of the Frauscher Wheel Sensor RSR123 makes it easier to install and replace. Together with the Frauscher Rail Claw SK150, the wheel sensors can be installed without drilling the rails, leading to a reduction in maintenance costs and worker time on track. As a result, the MTTR (Mean Time to Repair) parameter is reduced, and the overall availability of the equipment is improved.

Key Facts

Operator	JSC Serbian Railways	**Country**	Serbia
Application	Track Vacancy Detection	**Segment**	Urban & Mass Transit
Axle counting system	Frauscher Advanced Counter FAdC®	**Participated time**	Since 2019
Wheel Sensor	RSR123		