SuccessStory

HIMatrix® for Electronic Level Crossing

Project overview

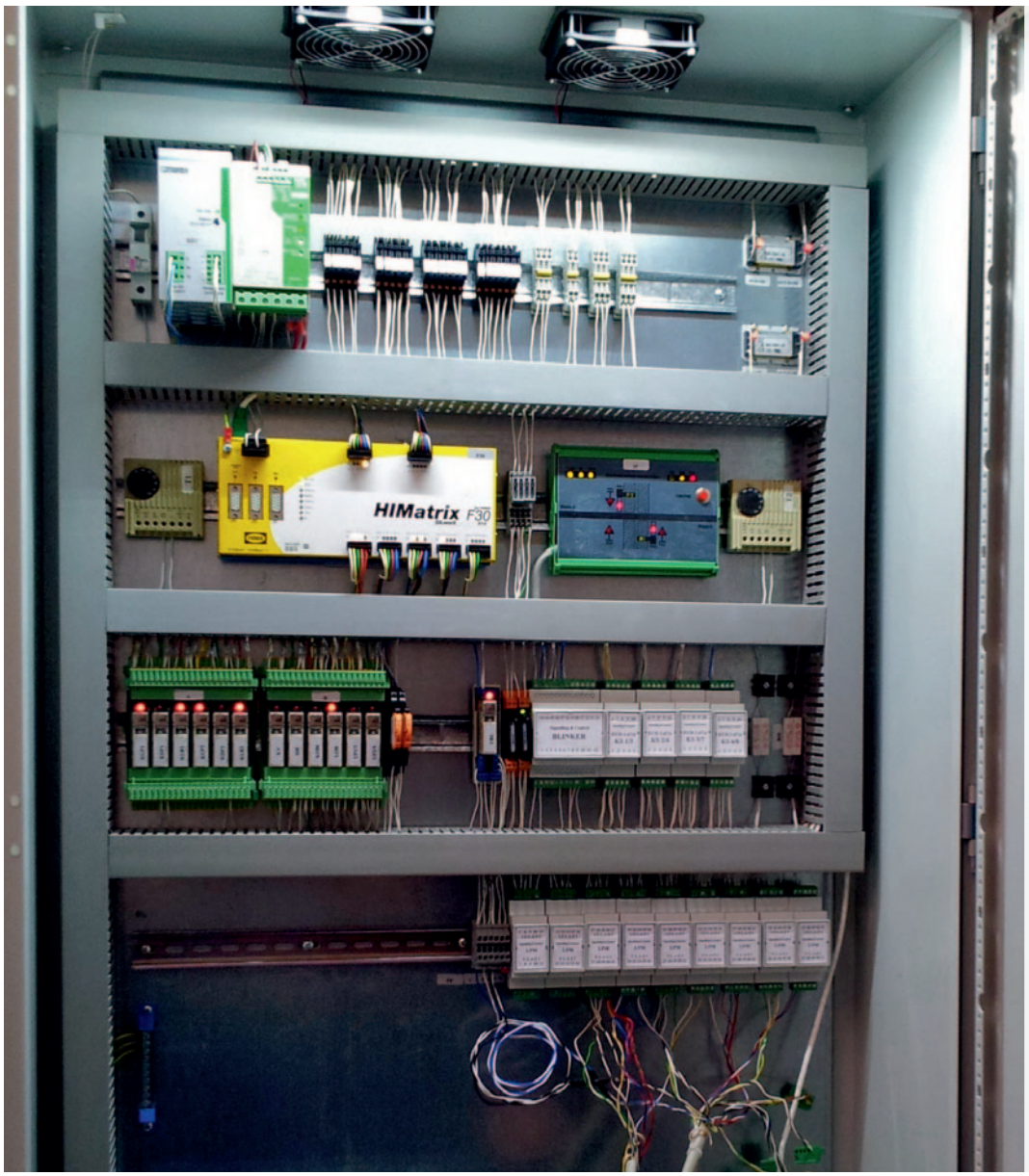
Industry
- Railway signaling

Application
- Electronic level crossing (ELC)

Hardware
HIMatrix:
- F30 014
- F3 DIO 8/8 014

Software
- SILworX®

Communication
- safe**ethernet**
- OPC server/OPC client



Source: Layout of the ELC cabinet for the typical application

Customer

Signalling & Control Ltd., Belgrade, Serbia

End Users
Serbian Railways JSC, Serbia
Macedonian Industrial Railways, Cement „USJE“ A.D. – Skopje, Macedonia

Fail-safe controller for the railway level crossing system

HIMatrix safety systems represent a heart of the ELC – "Electronic Level Crossing" – Universal controller for a worldwide use, which provides traffic security on the railway level crossings and has the safety integrity level SIL 4 in accordance with CENELEC standards.

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The solution for both railways was an ELC, a modular and scalable universal controlling and monitoring system based on the HIMatrix safety system. Meeting SIL 4, in accordance with CENELEC railway standards, the ELC is appropriate for all types of level crossings – on the open line, on the line with automatic block and in the station area.

Modules produced by HIMA and Signalling & Control were used. Together they form the simple and low-cost hardware structure of the ELC, contributing to maintainability, high reliability and safety.

ELC systems by Signalling & Control Ltd. are developed to be generally applicable. Differences requested by railway authorities are typically covered by application software. If complexity of the application requires additional inputs and outputs, additional HIMatrix F3 modules are used. With this flexibility all known level crossing applications can be covered. SILworX software from HIMA was used for programming the HIMatrix system. If special functions are required (for example AD conversion etc.) other safety modules (produced by HIMA) can be used, retaining the safety integrity level of the system.

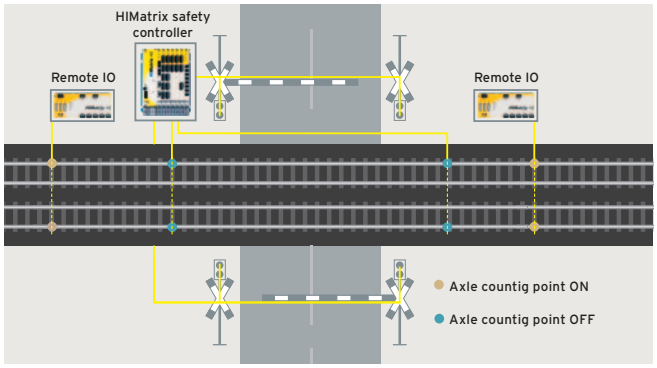
Both railways benefit from a service, diagnostic and event recording system that gives a precise description of the types and locations of failures. The analysis of regular events also helps detect trends that can lead the railways to carry out preventive maintenance, circumventing disruptions or faults.

The system is tested and verified in accordance with the traditional safety analysis methods. In addition, the calculation of the probability of unsafe failures confirms compliance with the Safety Integrity Level - SIL 4 in accordance with CENELEC standards.

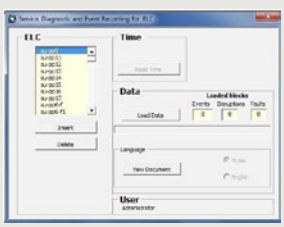
ELC has Acceptance for the Use Certificate for Serbian Railways (SIL4 compliance in accordance with CENELEC railway standards: EN50126, EN50128, EN50129 and EN50159) issued by the authorized governmental institution – Directorate of Railways of Republic of Serbia.

Advantages of HIMA solution

- TÜV certified up to SIL 4 (CENELEC)
- Commercial off-the-shelf equipment with integrated and certified high level of safety and high reliability
- Lower investment costs
- High flexibility and easy implementation
- Efficient programming (SILworX), due to validated function blocks and support of conventional leader logic diagrams
- OPC server/client support allows easy and low-cost non-vital communication



Safe railway crossing with HIMatrix safety system



S&D and ER for ELC

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