Frauscher

Modern Signalling Architectures with Wayside Object Controllers

Traditional centralised railway systems frequently struggle with scalability, which makes any upgrades complex and costly, often causing significant downtime that affects the entire network. Modern wayside object controllers (WOCs) with EULYNX interface help to overcome these issues and present a wide array of benefits for the operator.

In modern railway signalling architectures with WOCs, the interlocking can be placed in a central location or even the cloud, while the control of various objects, including track sections or points remains locally. WOCs control field elements by acting as a central link between the field element and the interlocking. The shift to a decentralised architecture made possible by WOCs creates greater efficiency and allows for easier scalability, presenting the operator with increased flexibility and cost savings.

The Role of WOCs with EULYNX Interface

In signalling technology, WOCs control and monitor systems installed on track and serve as the essential intermediaries between field elements and the interlocking systems. Field elements can be objects such as track sections, point machines or any generic IO used within the signalling system. By managing and passing on essential data and commands from the interlocking system, WOCs are able to effectively control the field elements and provide status updates, as well as collect and transmit diagnostic data. In the example of a turnout, a WOC is responsible for the continuous monitoring and controlling of one or multiple associated point machines. It receives positioning instructions from the interlocking and activates the electrical supply to the motor. Additionally, the WOC evaluates the position switch of the point machine.

There are various key requirements that WOCs must be able to fulfil, such as upholding the highest standards in terms of safety and security, providing a wide range of connectivity options and a common user experience, as well as a high degree of modularity. Moreover, thanks to WOCs with standardised interfaces such as EULYNX, the different life-cycles of the signalling components and field elements are effectively decoupled which further reduces costs in case of upgrades to the system. By adhering to EULYNX standards, object controllers ensure compatibility and interoperability between railway systems from different manufacturers. For WOCs to function, they must be able to connect

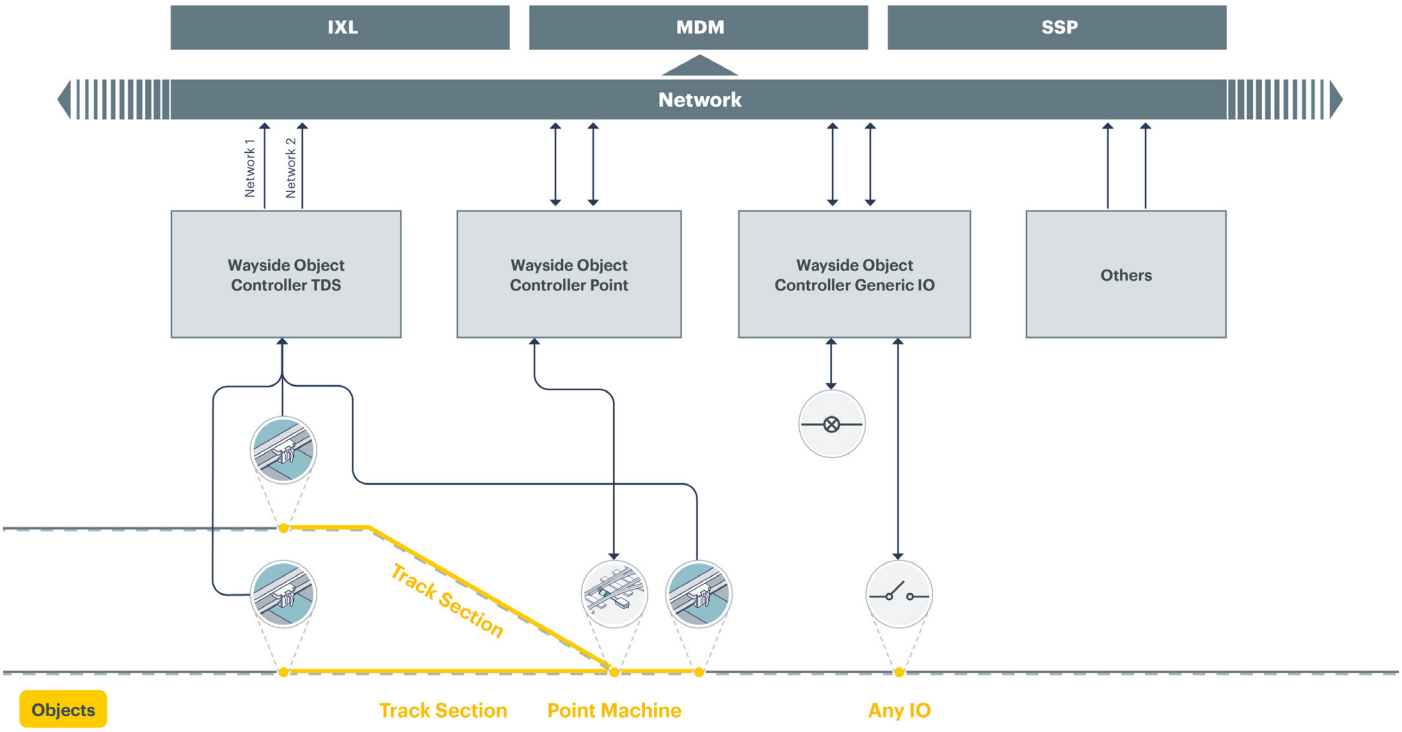

Figure 1: Signalling architecture with standardised WOCs

to a network, in order to communicate with both the interlocking system and a centralised data management system. This network connection, via a standardised interface enables real-time data transmission and control of field elements.

The EULYNX architecture comprises the following interfaces, which are used for standardised data exchange between wayside objects and interlocking:

- SCI (Standard Communication Interface): This interface handles the transmission of commands and messages. Safety-relevant information such as the status of track sections (free or occupied) and reset commands are communicated through the RaSTA (Rail Safe Transport Application) protocol.
- SDI (Standard Diagnostic Interface): This interface is dedicated to diagnostic data. Using an OPC-UA server, it provides detailed diagnostic information about the wayside objects and components. This allows for real-time monitoring and analysis, helping to quickly identify and resolve issues.
- SMI (Standard Maintenance Interface): The SMI enables maintenance tasks to be executed. Including configuration updates, software and patches and ensures that maintenance activities can be performed efficiently and securely.
- SSI (Standard Security Interface): This interface focuses on security-related tasks. It supports certificate, key, and authentication management as well as security logging by being connected to a security service platform.

Conclusion

Modern signalling architectures incorporating WOCs with a EULYNX interface represent a significant advancement over traditional railway systems. By adhering to the EULYNX standard, these systems achieve high levels of safety, security and interoperability. In conclusion, the utilisation of modern WOCs allows railways to future proof their signalling systems by ensuring compatibility with new technological advancements.

For more information visit our **website** or **contact** us.

FRAUSCHER

FRAUSCHER

Frauscher Advanced Counter FAdC®

Reliable, flexible axle counting solution with EULYNX interface.

Benefits

- Standardised interoperability with higher-ranking systems
- Simple, flexible integration in existing systems
- Reduction of lifecycle costs
- Highest safety and security standards
- Successful implementation in practice

www.frauscher.com