



# Standardised Serial Interface for Train Detection

With the advancements in the field of serial communication, railway operators are moving from closed system architectures to open systems in order to reduce the complexity and the cost of their infrastructure.

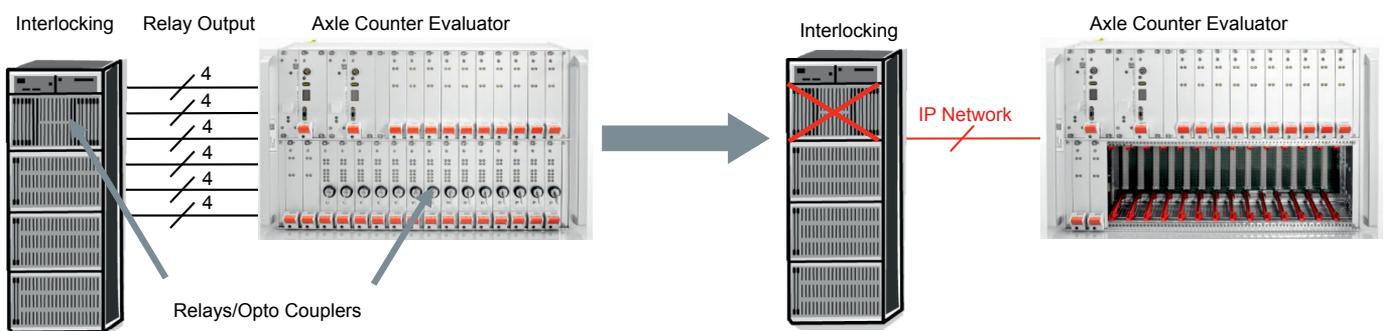
To achieve this, an IP-based interface in accordance with EN 50159 via closed and open networks has been selected as the best choice for the interface between the interlocking and the electronic train detection (see figure below).

By implementing this interface, the Thales axle counter system Az LM is at the forefront of the industry giving it the ability to interface with interlocking systems of any third party supplier.

Standard IP-based protocol between interlocking and Thales axle counter system Az LM is currently in use in the networks of Finnish Transport Agency, German Railways, LDz (Latvia), PKP (Poland), Swiss Railways, SZ (Slovenia), ZRS and ZFBiH (Bosnia and Herzegovina).

### Advantages of IP interface interlocking – train detection

- Reduction of complexity, less relay interfaces required
- Standard open interface to electronic interlocking systems of different suppliers
- Centralised and distributed architecture for axle counter systems
- Can be configured as 2-out-of-2 or 2-out-of-3 system with redundant and non-redundant outdoor equipment



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## Advantages of SAHARA Protocol: Safe, Highly Available and RedundAnt

- Proven in use
- Generic protocol stack according to EN 50159
- Offers all services for a safe and highly available communication via redundant physical channels
- The multi layer concept ensures reliable standardised transmission with independent safety protocols
- Vital protocol standard

Thales supports two standardisation streams in Europe, the Swiss and NEUPRO activities. They complement each other and are moving faster than other standardisation streams:

### SWISS

The joint interface standardisation activity of industry and railways for the Swiss railway network.

### NEUPRO

The joint interface standardisation activity of industry and railways for the German railway network.

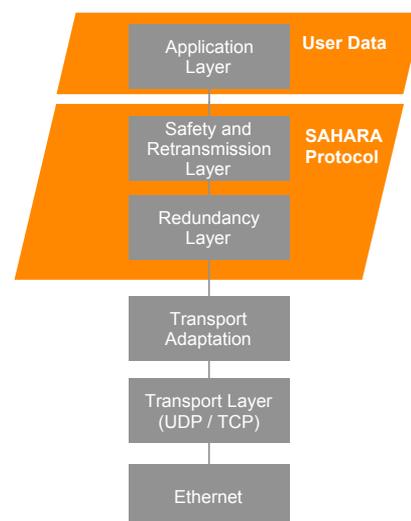
The joint specification work results will now be implemented in practice. Apart from DB Netz AG the signalling industry involved in the NEUPRO activity are Alstom Transport, Ansaldo STS, Bombardier Transportation, Funkwerk, Pintsch Bamag, Scheidt&Bachmann, Siemens and Thales.

At present, Thales has initiated the migration of the serial interface of its axle counter system Az LM towards the standard SAHARA protocol targeted by leading railways and suppliers in this field.

The NEUPRO working group defines the SAHARA protocol standard for all signalling interfaces, including electronic train detection. Information and standards pertaining SAHARA will be held by the NEUPRO participants.

Any other IP protocol between interlocking-axle and counter systems can be implemented easily due to the flexibility of the modular axle counter system Az LM.

Both the 2-out-of-2 as well as 2-out-of-3 axle counter systems can be used with the IP connection to interlockings, with or without redundant physical channels between interlocking and axle counter system.



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