

CASE STUDY

Finnish expertise with reliable and cost-efficient COTS -solutions Kotka Kotolahti-Mussalo marshalling yard

The Kotolahti and Mussalo marshalling yards are of great importance for the management of freight traffic to the east side of Finland. Deliveries from the Kotka deep harbour go through the marshalling yard to the interconnection traffic trains, and the functionality and safety of operations are in key role when handling trains with the length of over a kilometre. Both marshalling yards are used for handling large amounts of dangerous deliveries.

A modern SIL4 level interlocking system

There were no signalling systems on the Kotolahti and Mussalo marshalling yards earlier and several points had to be turned manually. Mipro delivered interlocking systems with the highest SIL4 safety integrity level meeting the current regulations and standards. On the Kotolahti marshalling yard the system replaced the signalling equipment that included a point-operation equipment based on buttons and point vacancy detection. On the Mussalo marshalling yard there was no signalling equipment available.

The interlocking systems of the marshalling yards were provided with interfaces to the existing interlocking system of Kotka Hovinsaari marshalling yard and to the harbour private lines. The track vacancy detection was implemented by axle counting and point control by Mipro's own turnout controller.

Flexible and cost-efficient COTS -solutions

Mipro's interlocking system platform is based on COTS components and modern PLC technology. HIMA's HIMax -based interlocking system, together with Frauscher's axle counters and wheel sensors have proven to be an efficient solution in numerous occasions in the Finnish conditions. Thanks to the success in several projects before this, it was natural to continue the partnership also in the vast Kotolahti-Mussalo project.



Frauscher FAdC system together with wheel sensor RSR123 was used for track vacancy detection

Wheel sensor RSR123 has proved its robustness already in numerous projects in Finland and worldwide. Due to avoiding any further electronics on or nearby the track, the likelihood of electronic damages in the field is reduced dramatically. This makes it the optimal system for places of important freight traffic, like Kotolahti and Mussalo marshalling yards.

The FAdC system was an excellent match with the project requirements in Kotolahti-Mussalo. Due to its modularity the FAdC system can be easily used in projects of any size, as well as at centralised and decentralised architectures. In the Kotolahti-Mussalo project this was very advantageous as the indoor equipment could be split to different locations, which minimised the need for cabling. Due to its internal communication via Ethernet network, no doubling of wheel sensors was needed. The FAdC system's modularity also showed its strength during a later extension of the depot, where the required components could be added easily, without any costly modifications to the existing system or need for redundant hardware.



The interface between FAdC and Mipro's HIMax-based TCS-O interlocking was again realised by Frauscher's SIL4 Ethernet protocol FSE, which made installation very easy and saved considerable costs compared to traditional interfaces.

In total more than 150 Frauscher wheels sensors RSR123 are in successful and reliable operation, split over 3 segments.

Long life cycle support

Widely used COTS components ensure long life cycle for the entire system. Large volumes and a wide installed base minimise the risk of spare parts shortage or lack of knowledge during the system's long life cycle.

By using standard interfaces, system parts can be changed during the life cycle. New functionalities and interfaces can be added to the system during the long life cycle. For example, support for ETCS L2 interface to RBC can be added to the system afterwards.

