BÄR BAHNSICHERUNG
SMART SOLUTIONS FOR SAFE RAIL TRAFFIC

FACT SHEET

EUROLOCKING

The electronic interlocking connects simply and safely.

General informations

With EUROLOCKING, BÄR Bahnsicherung AG has developed an electronic interlocking which is freely scalable in size. EUROLOCKING can be used on standard and narrow-gauge railways as well as mountain and urban railways. The system design enables to implement either centralized or decentralized architectures. Based on the generic system architecture, tailor-made solutions can be designed and implemented.

The widespread use of industry standard products (commercial off-the-shelf - COTS), which are manufactured in large quantities, offers cost advantages and improved quality compared to small series or single-part production. In addition, the dependence on suppliers is significantly reduced, which leads to improved readiness to deliver at lower lifecycle costs.

EUROLOCKING Interlockings can be easily adapted to changing conditions. The hardware is modular and can be expanded almost at will. Changes to the software as well as later adaptations to the system can be realised at low cost.

EUROLOCKING is based on a central interlocking computer from HIMA, Paul Hildebrandt GmbH, the leading supplier of high-security programmable logic controllers (PLCs) in Europe, controlling and protecting the equipment of the world's largest companies in the oil and gas, chemical, pharmaceutical and power generation industries.

Operating modes

- Automatic remote operation
- Local automatic operation
- Manual remote operation
- Local manual operation
- Shunting operation

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EUROLOCKING - The electronic interlocking
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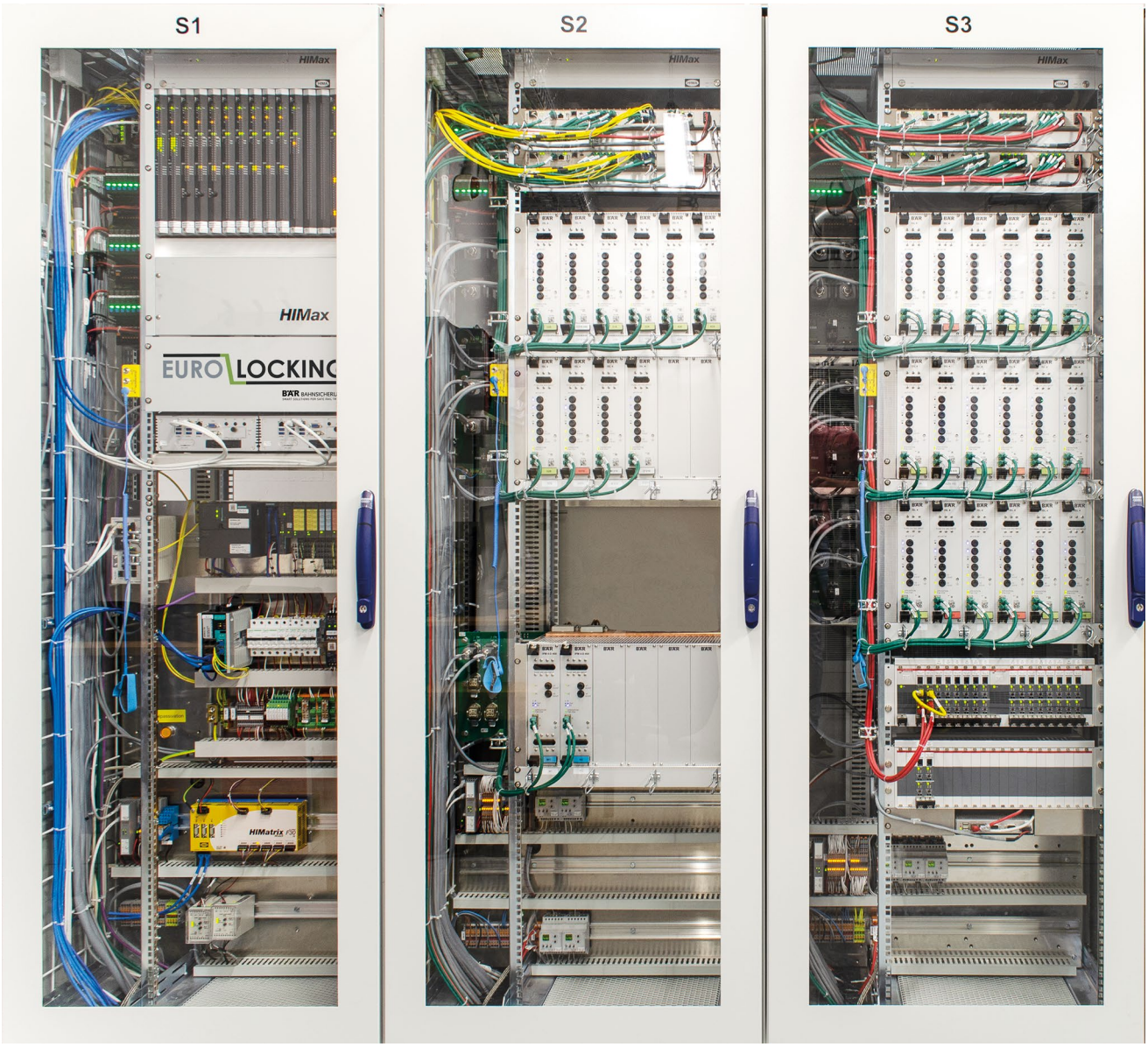
EUROLOCKING



Specifications

- **COTS** hardware (**c**ommercial **o**ff-**t**he-**s**helf), which has proven itself in the process industry with the highest safety and security requirements for years
- Guaranteed useful life of at least 25 years
- CENELEC SIL 4 approved system
- SIL 4 Object Controller for signals and points
- Serial SIL 4 interfaces for external systems such as track vacancy detection devices
- Standardized interface to level crossings according to Swiss specifications
- Conventional wiring oft he field equipment; no electronic devices where not necessary
- Various communication interfaces to train management and remote control systems
- High availability oft he entire system
- Easy replacement of all assemblies (hot plug & play)
- Minimal maintenance requirement

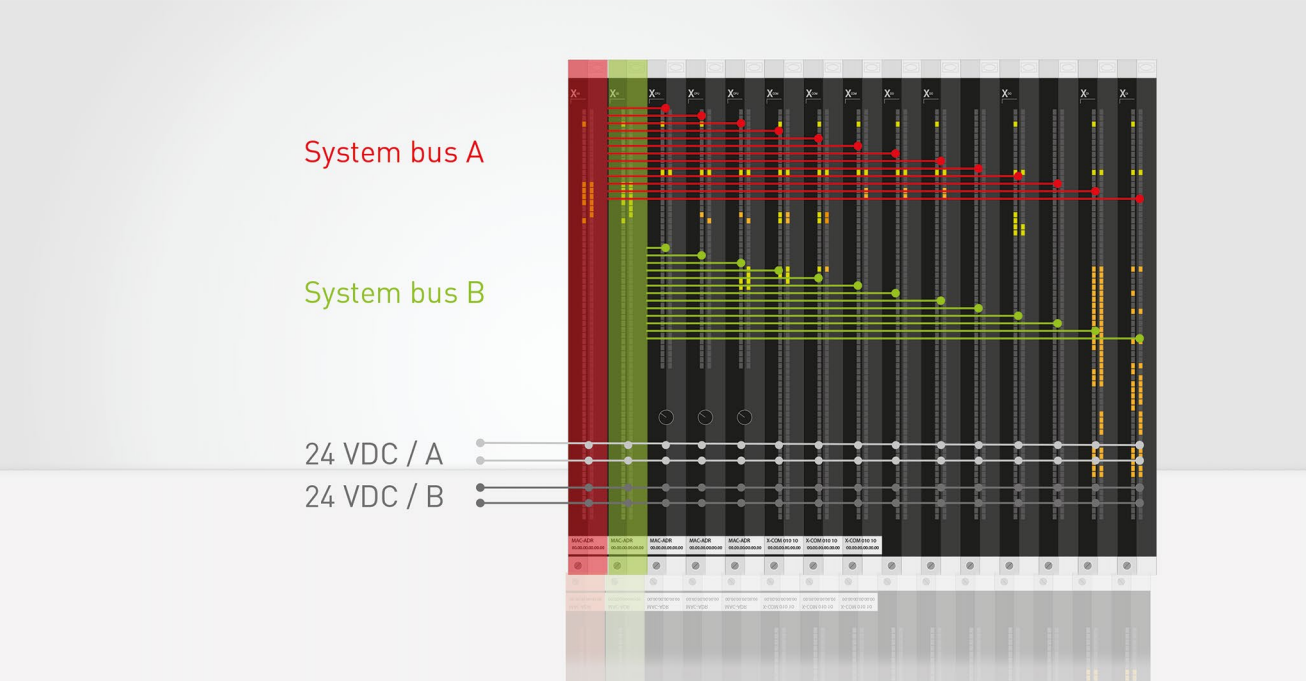
Central Processing Unit (CPU)

The HIMax PLC is equipped with powerful redundant computers. This leads to very fast system response times. A defective CPU can be replaced during full operation without causing any safety issues or operational restrictions.

Fast internal safety bus

Each of the two system bus modules manages one of the two internal safety-related system buses (SafeEthernet). The two system buses are redundant. Each system bus connects all modules and base carriers.
All safetyrelated data is transmitted via these two internal system buses using a safety protocol.

Communication



External communication

The HIMax SIL 4 platform has several bus connections which can be selected as required enabling customer-specific product requirements to be met to optimally integrate the interlocking into existing infrastructure. The following system buses have been implemented and are available out-of-the-box for product and system connections.	
• FSE (Frauscher Safe Ethernet) SIL 4 • FSE-FSX (Frauscher Safe Ethernet eXtendend) SIL 4	• PROFIsafe SIL 3 • MODBUS

Functionality

System with dwarf signals	System without dwarf signals
• Dwarf signals • Secured shunting routes • Storage for both, train routes as well as shunting routes • Automatic signal operation • Partial cancelation of routes • Special functions such as detour routes or residual route cancelation can be implemented easily and cost-effectively according to customer requirements	• Shunting travels • Storage fort rain routes • Automatic signal operation • Partial cancelation of routes
EUROLOCKING can be built with or without dwarf signals (with or without shunting routes).	

Interfaces

Train Management System

EUROLOCKING can be operated by a train management system. There are various options to connect the different train management systems.

Field equipment

SIL 4 Object Controller enable the connection of point machines, derailing devices and LED signals. The state of each device (point machine, LED signal lamp, track vacancy detection device) is transmitted via two redundant channels. EUROLOCKING ensures, that in any case of malfunction, the system goes into a safe state. The field equipment is wired conventionally from the cable connection rack. For larger distances, interface cards can be installed in a separate technical room and connected to the interlocking via safeethernet using optical fibre. Virtually all commercially available level crossing systems can be connected to EUROLOCKING with its standardized interface module. Das Frauscher Achszählsystem FAdC wird mittels sicherer (SIL 4) Ethernetverbindung über das FSE Protokoll in EUROLOCKING eingebunden.

EUROLOCKING - The electronic interlocking
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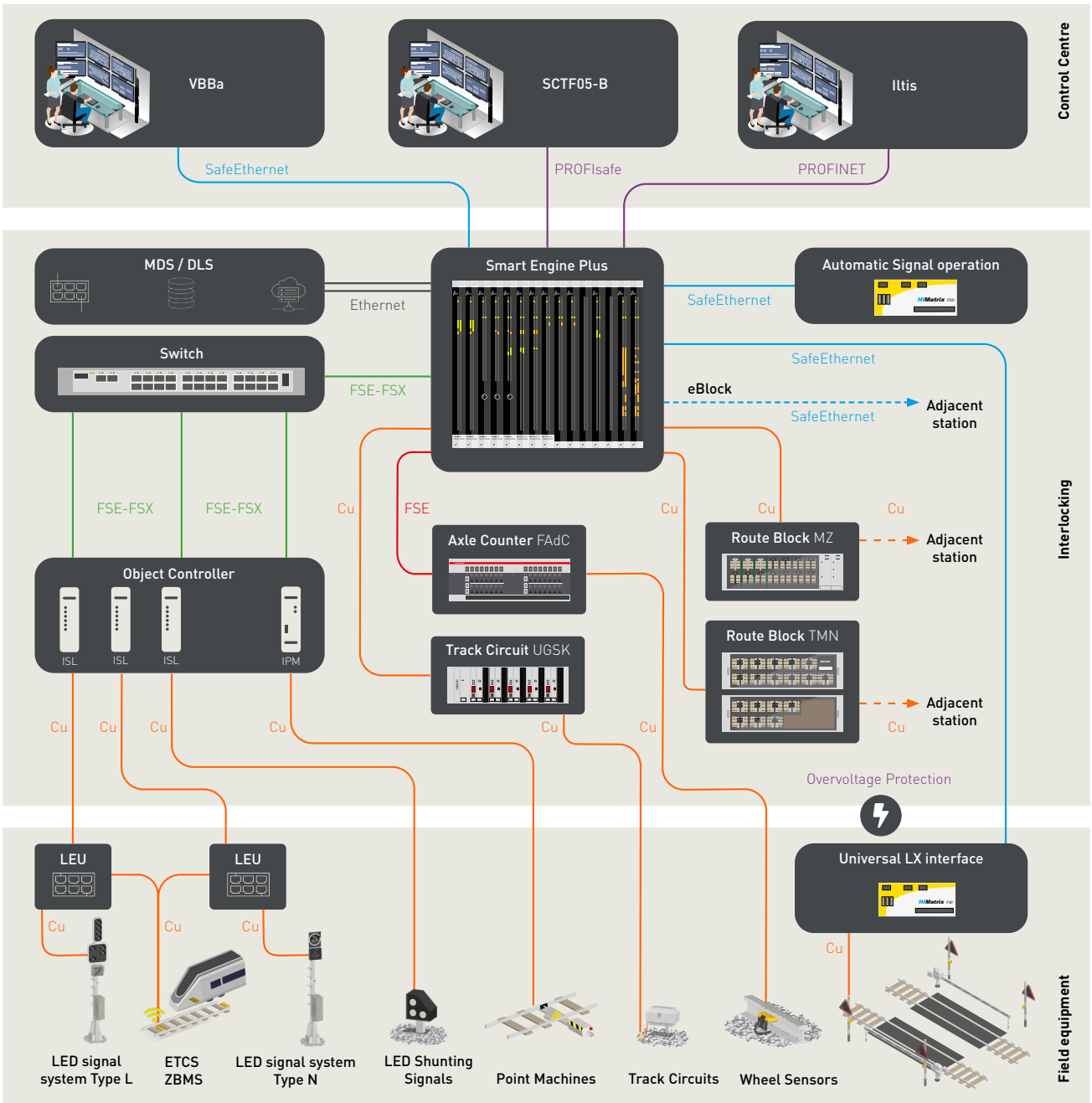
EUROLOCKING Architecture



Informationen

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