LEVEL CROSSING SYSTEMS

SELLA CONTROLS

SAFE AND SECURE

...delivering safety PLC technology to provide integrated level crossing control...

The concept of safe computer control systems is not new, and a number of techniques have been developed over the years in a number of safety related industries, including railway signalling. The safety PLC concept has been standardised for nearly 20 years and is now a mature product.

Safety PLCs are governed by common standards such as EN 61508 and 61131, while ISO 13849 describes the methodologies and architectures for achieving different safety levels, defined using Categories (CAT) and Performance Levels (PL), and EN 62061 relates these to SIL levels.

The HIMatrix safety PLC meets the highest CAT 4 PL and SIL 3 safety levels used in process and machine safety, but these industries seldom use SIL 4. HIMA, in partnership with proven signalling designers can adapt its range of safety PLC to meet the SIL 4 rating required for railway signalling systems, proving conformance to the rail standards EN50128 and EN50129.

The HIMA safety PLC system has an established pedigree throughout Europe for signalling applications. These include SIL 4 interlocking applications and Level Crossing Control.

In the UK, SELLA CONTROLS has implemented HIMA HIMatrix PLC in many SIL 2 applications on London Underground including ASDO/CSDE and ETCDS Systems and more recently in SIL3 traction power applications in Ireland.

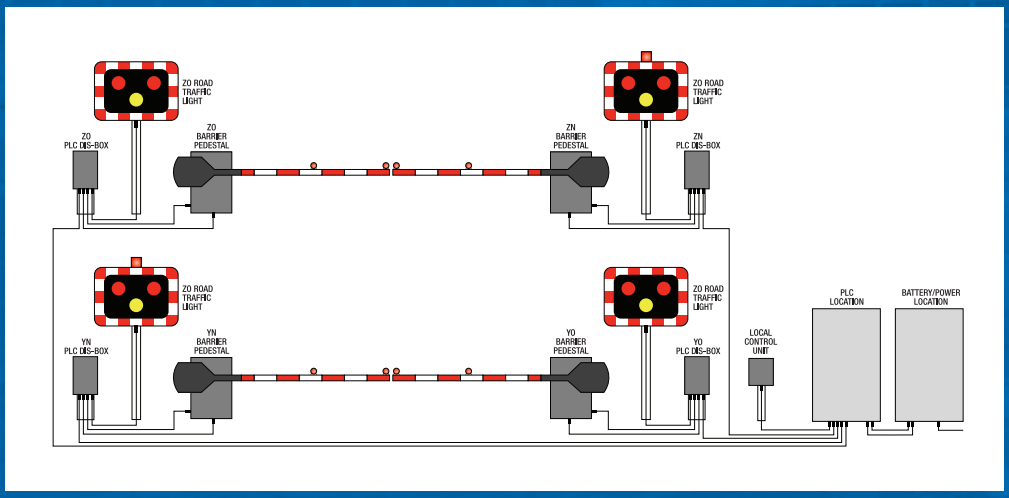
The HIMatrix system has a number of logic controllers and I/O modules.

With their compact size and configurable communications architecture, the HIMatrix is highly flexible and adaptable, and can be customised to a number of control system environments where both safety and reliability are critical.

The compact nature of the HIMA safety PLC range provides a reduced footprint for the level crossing controller. Traditional installations are provided within remote equipment buildings (REB) that are large and require significant civils installation works. The TRACKLINK® Level Crossing Controller is designed to fit within a standard location case presenting a reduced size and installation cost.

Working alongside specialist signalling designers, SELLA CONTROLS provide systems integration expertise when delivering solutions. These skills include the integration of 3rd party infrastructure such as train detection, barrier control and object detection systems used on railways.

This ensures the solution offered is a truly open system application allowing level crossing renewals to be completed using any combination of infrastructure components available to the supply chain.



SIL 4 Safety PLC Control

Level Crossing Control is enabled via the design and integration of COTS based safety PLC and integration with 3rd party equipment.

Control is provided using traditional hardwired I/O and train detection technologies such as Axle Counters.

A suite of extensive safety certified software tools allow interfacing to new and existing signalling infrastructure. These are provided within the HIMA SILWorX© software used to provide the programming and configuration of function block logic to deliver the control features of a level crossing.

The key features and benefits of the TRACKLINK® Level Crossing Controller are:

- **Proven Safety PLC Technologies**
- **Certified to SIL4 (CENELEC Standards)**
- **Scalable I/O Configurations**
- **SafeEthernet Interface**
- **FSE Protocol Implementation**
- **-25°C to +70°C Operating Range**
- **3rd Party Interfaces (TCP/UDP, RS485, RS232, CAN)**
- **Flexible Compact Design**
- **Reduced Installation Cost**
- **Central or Distributed Architectures**

Train Detection, Control & Monitoring

Using COTS based technology provides the Level Crossing Controller with an open systems platform for integration with 3rd party equipment.

This ensures the end client has a wide supply chain option for procuring the components for the crossing.

The Level Crossing Controller can be integrated with any type of barrier, light array and object detection.

Train detection can be derived from traditional signalling fringe interfacing or via modern axle counter equipment.

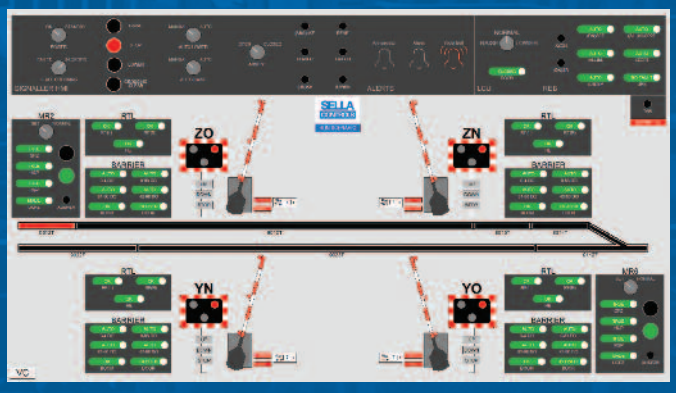
The Level Crossing Controller has a fully certified FSE protocol implementation providing integration to the Frauscher suite of products and is compatible with existing Network Rail approved Dataloggers.

Computer based Automatic Testing (XCATS®)

Using a COTS based technology integrated with intelligent I/O, SELLA CONTROLS has developed XCATS®. XCATS® is a Computer based automatic test system for Level Crossing installations.

It is a fully configurable tool that can be used by IRSE licenced testers to complete in factory and on site Signalling Principles Testing.

Using software tools and a flexible user interface, the XCATS® system can be adapted to suit any size or type of Level Crossing installation. It can be supplied with traditional keyboard mouse control or an integrated HMI.



TECHNOLOGY

SELLA CONTROLS, in partnership with signalling designers has developed a COTS based Safety PLC solution for the provision of Level Crossing Control and the replacement of Simple Relay Interlocking Applications. Its solution architecture is based on a modern design using industry standard practices and the proven HIMatrix safety product suite.

SIL4 COTS Safety PLC Solution

The use of industry proven safety PLC technologies as a solution for railway signalling applications has been assessed as the next logical step.

Traditional relay based level crossing control and relay interlocking applications can now be replaced using intelligent PLC.

As a result, railway administrations are able to deliver compact and cost effective solutions for integration into their existing rail infrastructure. A traditional relay based interlocking requires a large installation foot print, increasing the overall cost of a renewal.

Using a safety PLC reduces the physical size of the installation thus reducing the overall renewal cost. With the benefit of PLC intelligence, the solution provides increased functionality and system performance.

Embedded software tools provided with the safety PLC simplifies the design and testing. These significant design tools formalise the design process helping to further reduce costs. Specialist software within the PLC utilises function block logic. This type of programming presents logic in a format easily suited and understood by signalling engineers.

Assurance & Integration

To support the introduction of technology, SELLA CONTROLS worked alongside its delivery partner AMEY RAIL to support and assist the production of a Generic Application Safety Case (GASC). This covered all of the aspects required to introduce the HIMatrix Safety PLC into the UK signalling market.

In addition to this, a Specific Application Safety Case (SASC) has been produced covering the requirements to provide a solution in a Network Rail Level Crossing application.

Software has been developed using standard function blocks to provide the logic functions. The solution aslo includes assurance of specific interfaces to approved Network Rail signalling asset data loggers. For train detection, SELLA CONTROLS has introduced a Frauscher FSE protocol to facilitate integration to their axle counting systems.

The solution has been design to be flexible and fully scalable to be able to deliver solutions for all types of Level Crossing applications. Safety PLC solutions include:

- Miniature Stop Light (MSL)
- Manual Barrier Crossing (MBC)
- Manual Controlled Barrier Crossing with Obstacle Detection (MCB-OD)
- Automatic Level Crossing (ALC)

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