

MiSO LC

Reliable and highly available level crossing system



The MiSO LC level crossing system provides a reliable functionality in the **harshest conditions**. It is a highly available, modular level crossing solution that is adaptable to various environments and customer-specific requirements. It is designed for the most demanding conditions and for a broad range of applications.

MiSO LC is ideal for primary and secondary lines, industry lines and marshalling yards. It provides open interfaces to utilise existing and any other external level crossing equipment.

The reliability of the MiSO LC system has been proven in approximately 100 installations in public railways since 1995.

FEATURES:

- Modularity for flexible system structure and functionality
- Open interfaces to allow the use of existing equipment
- Integrated or stand-alone solutions according to customer needs
- Total solutions with flexible and cost-effective installations
- Effective remote and local diagnostics to ensure high availability
- Reliability and quality based on the SIL4 approved platform

MiSO LC - RELIABLE AND HIGHLY AVAILABLE LEVEL CROSSING SYSTEM



MODULARITY PROVIDES FLEXIBILITY IN SYSTEM STRUCTURE AND FUNCTIONALITY

MiSO LC provides a modular and highly scalable system structure for both hardware and software. It can therefore be flexibly adapted to various requirements and applications. Software configuration is based on the track geometry and can be easily modified in the event of alterations and extensions. Hardware configuration is fully modular which allows easy extensions to be made when needed.

MiSO LC controls and monitors train signals and road signals, barriers and lights, and warning bells for road traffic. It provides level crossing control for one track or several tracks and for a varying number of signals, barriers and lights according to needs. The road signals to be controlled can be based on traditional bulb technology or modern LED technology. MiSO LC supports various barrier constructions, including full, half and double barriers.

This innovative system allows the use of various techniques for line vacancy detection. It starts and stops warnings on the basis of alarms that can be initiated by track circuits, axle counting, local control or via remote control from the train. Moreover, any other technique in use, such as ultra sound or inductive detection, can initiate the alarm.

OPEN INTERFACES ALLOW THE USE OF EXISTING EQUIPMENT

The MiSO LC system is provided with open interfaces. It is capable of utilising existing level crossing equipment and thus allows effective level crossing modernisations in any environment. MiSO LC is connectable to various types of equipment whether they are determined by national requirements or by the application.

Open interfaces also enable the use of various techniques for line vacancy detection. In addition, interfaces with auxiliary components originating from harbour ports and vehicle identification devices, for example, can be implemented in MiSO LC. The system can also be connected to traffic lights and synchronised with their function.



MiSO LC PROVIDES AN INTEGRATED OR A STAND-ALONE SOLUTION AS PER CUSTOMER NEEDS

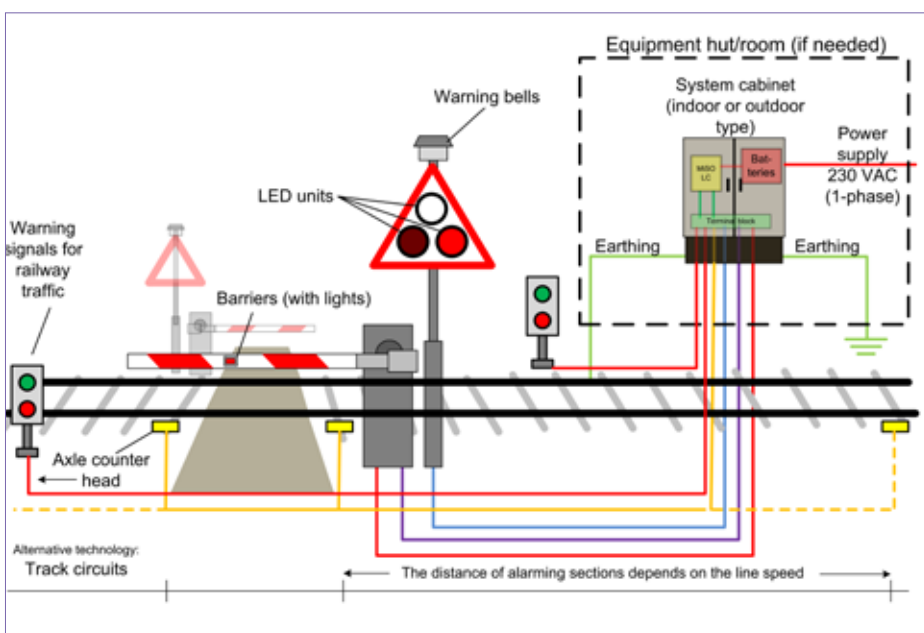
MiSO LC can be implemented as a stand-alone system or it can be integrated into the MiSO TCS interlocking system. When integrated into MiSO TCS, all fault indications and level crossing status data are transmitted through the interlocking system.

For the stand-alone solution, MiSO LC provides a communication interface to transfer safety critical information on train routes and barrier positions from and to the interlocking system. If necessary, fault indications can be directed to other destinations – to maintenance laptops and emergency centres, for example.

TOTAL SOLUTIONS WITH FLEXIBLE AND COST-EFFECTIVE INSTALLATION OPTIONS

Mipro provides total solutions for the control of level crossings. The MiSO LC solution covers – besides technology and equipment – design, commissioning and subsequent maintenance. When designing and implementing MiSO LC system solutions, we always take international and national standards fully into account.

MiSO LC system technology is based on a SIL4 certified (TÜV Süd) system platform, reliable electronics and field-proven connection principles. It includes all devices and components required to control a level crossing, such as back-up power supplies, manual remote and local control switches, barrier machine controllers and LED signal controllers.



MiSO LC software components can be installed in a separate field cabinet located next to the level crossing, for example.

Existing facilities can be used for installations. The components are then furnished in a rack and located in applicable facilities on the trackside or marshalling yard.

MiSO LC is connectable to various types of equipment whether they are determined by national requirements or by the application. The picture shows an example installation and equipment configuration.

EFFECTIVE REMOTE AND LOCAL DIAGNOSTICS TO ENSURE HIGH AVAILABILITY

MISO LC provides versatile remote diagnostics to facilitate system maintenance and thus ensure high availability. It is capable of utilising several wireless data transmission protocols, such as 3G, @450 and GSM-R, to transmit critical information and diagnostic data.

MISO LC transmits failure data, including failure type and urgency level, directly to maintenance personnel: to their phones or user interfaces. Failure alarms are also transmitted to traffic controllers' user interfaces and indicated on-site. On-site alarms are visible on the failure display located in the field cabinet or any location where the equipment is installed.

RELIABILITY AND QUALITY BASED ON A SIL4 APPROVED PLATFORM

MISO LC is designed for demanding conditions. Hardware has a robust, solid construction and components have been tested in extreme conditions.

The MISO LC system is approved by the Finnish Transport Agency. It conforms to CENELEC standards EN 50126, EN 50128 and EN 50129 on Safety Integrity Level SIL4. It also meets the requirements of the Safety Management System which means that general and branch-specific safety automation standards are fulfilled in system development work and project implementation.

MIPRO

PROVEN RAILWAY SAFETY EXPERTISE

Mipro is a Finnish railway system specialist with over 20 years of experience in developing and supplying interlocking and traffic control solutions. Our systems are based on railway safety standards, close co-operation with end users, and proven expertise provided by our designers and engineers. The outcome is a flexible MISO system family that fulfils customer needs and the highest safety requirements.

MIPRO OY
Kunnanmäki 9
FI-50600 Mikkeli, Finland

Telephone: +358 15 200 11
Fax: +358 15 200 1333
www.mipro.fi