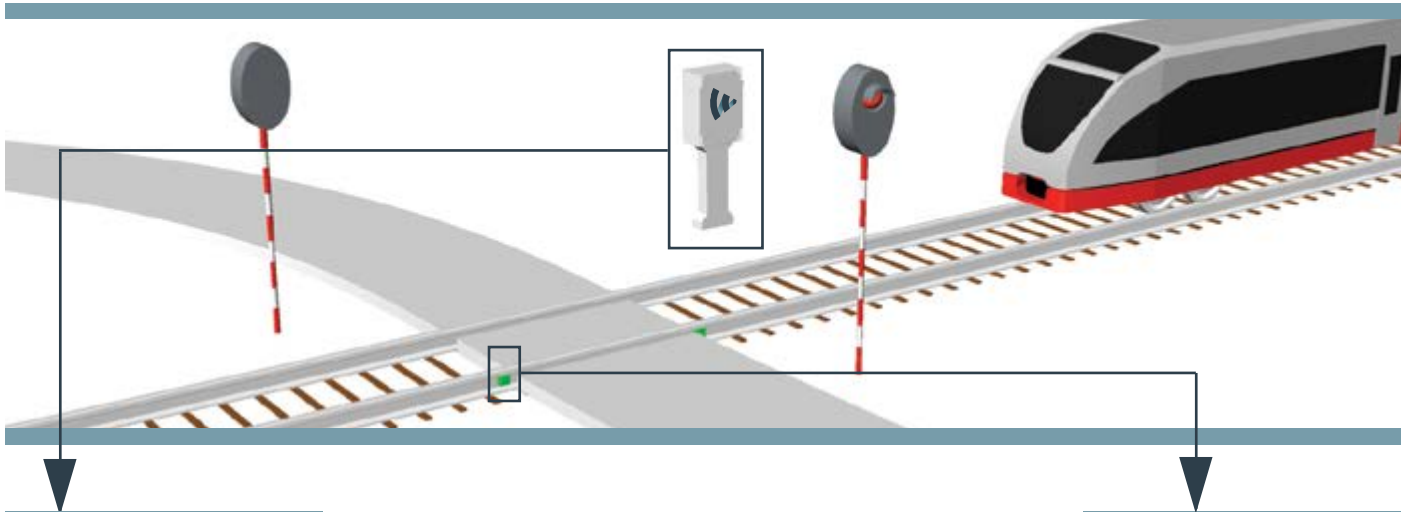


LEVEL CROSSING WARNING SYSTEM

Level Crossing Warning System (LCWS) is a SIL 2 certified product that detects approaching trains using acoustic technology.



Acoustic sensors mounted on the rails listen for the distinct soundwaves generated by approaching trains. The digital data is analysed by a nearby Control Unit, which activates the customer's preferred warning devices at the appropriate time.

All components of the system are installed at the level crossing, normally within 15 to 20 meters.



KEY BENEFITS

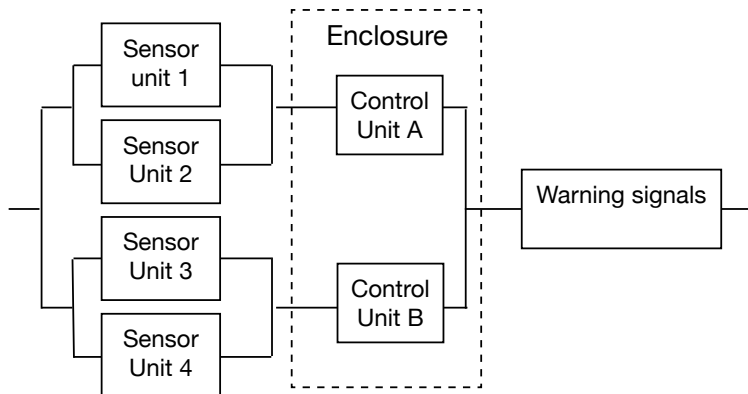
- ✓ SIL 2 certified by Lloyd's Register
- ✓ Reduced life cycle cost
- ✓ Rapid deployment – no cabling along the tracks
- ✓ Full system redundancy
- ✓ 24h battery backup
- ✓ Recordings of all train passes and system events can be downloaded remotely
- ✓ Fully autonomous operation
- ✓ Another train coming functionality for single and double track locations
- ✓ Fail safe state track locations

LEVEL CROSSING WARNING SYSTEM

The redundancy of the system is ensured by two separate Control Units each receiving data from two sensors per rail.

A schematic view of a single track system is shown in the figure on the right.

A single sensor is sufficient to initiate the warning sequence, and a Control Unit determines the direction of the train and identifies when the train has passed the crossing. The system contains Another Train Coming functionality for single and double track locations.



The LCWS is developed according to CENELEC EN50126, EN50128, EN50129, and IEC61508, and is certified to SIL 2 (Safety Integrity Level 2) by Lloyd's Register.



| FEATURES AND SPECIFICATIONS | | CONTROL UNIT | SENSOR UNIT |
|-----------------------------|--|---|----------------------------|
| Power | Input voltage | 85-264 VAC, 90-375 VDC | Driven by the Control Unit |
| | Input frequency | 47-63 Hz | |
| | Power factor | EN61000-3-2, class A | |
| | Input protection | Internal fuse T2A, 250 VAC fitted in line | |
| | Isolation | 3000 VAC Input to Output, 1500 VAC Input to Ground, 500 VAC Output to Ground | |
| | Battery backup | 24 hours | |
| EMC | | EN 50121-4 (2006) EN 301 511 / TS 151 010-1 V11.3.0 (2014-03) | EN 50121-4 (2006) |
| Environmental | Temperature operational | -40°C +65°C | -40°C +80°C |
| | Temperature installation & maintenance | -25°C +65°C | -25°C +65°C |
| | IP rating | 56 | 67 |
| | Humidity | 5 – 90% at 25°C, non-condensing | 0 – 100 % |
| Dimensions | Dimensions (LxWxH) | 650 x 350 x 1550 mm | 166.5 x 39 x 36 mm |
| | Weight | Without battery: 35 kg With battery: 50 kg | 2.1 kg pr. sensor |
| Communication | Mobile communication | 2G: 850, 900, 1800, 1900 MHz; GSM/GPRS/EDGE Class 12 3G: 800, 850, 900, 1.900, 2.100 MHz; UMTS/HSPA 3GPP Release 6, 7 DL 14.4Mbps, UL 5.7Mbps | N/A |
| | External output | 12V warning active low 12V warning active high 12V status | N/A |