



Audible warning system for level crossings

The X-Alert System, a collaboration between Dymniq and Eaton, is a low cost overlay solution for reducing risk and improving safety at passive user worked and footpath level crossings by electronically detecting oncoming trains and providing an alert at the crossing. It has been designed to mitigate against many of the contributing factors that have been associated with fatalities.

The system comprises a central crossing control unit with adjustable audible warning device located at the crossing and remote radar train detection units located close to the existing whistle board signs or approximately 400 meters either side of the crossing.

On detection of an oncoming train the train detection unit informs the central control unit, which in turn activates an audible warning at the crossing in the form of a simulated train horn.

The system can be used on single and dual track lines and is fully independent of the existing railway infrastructure simplifying the end to end ordering and installation processes.

The units are generally installed >3 meters from the track and mounted on drop down poles eliminating the need for ladders during installation and maintenance.

The mounting poles are anchored with ground screws eliminating the need for concrete and digging.

The units are solar powered and wireless, communicating with each other via a secure and resilient multi band/channel radio link. Communication with the management centre is via a GSM modem built into the central crossing control unit.

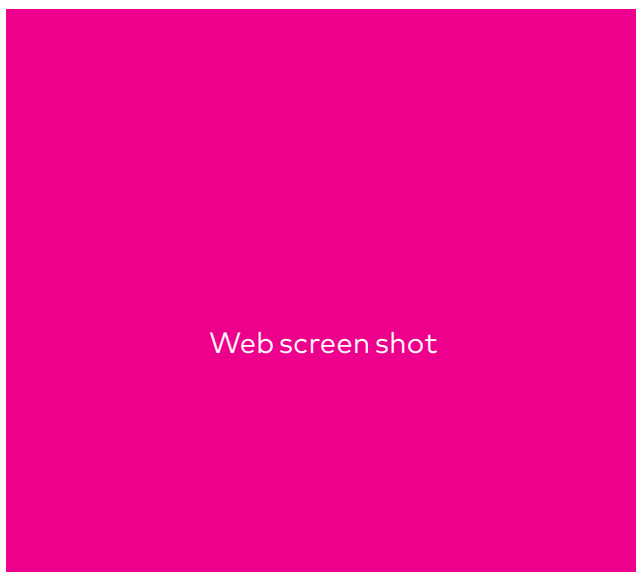
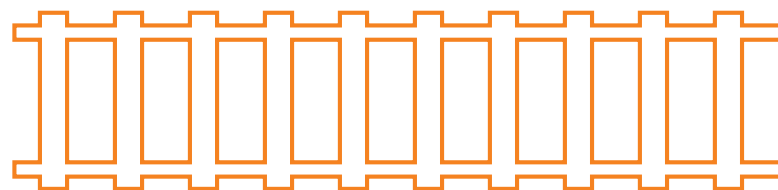
The radars are mechanically fixed and locked into position to prevent movement. They also have built in orientation detection and alarms to ensure the highest levels of system integrity at all times.

A sophisticated self-monitoring system will shut the system down in a controlled fashion if a fault is detected, activate an audible warning at the crossing and, report the fault to the operations centre.

The system has an embedded web page to simplify control and monitoring.

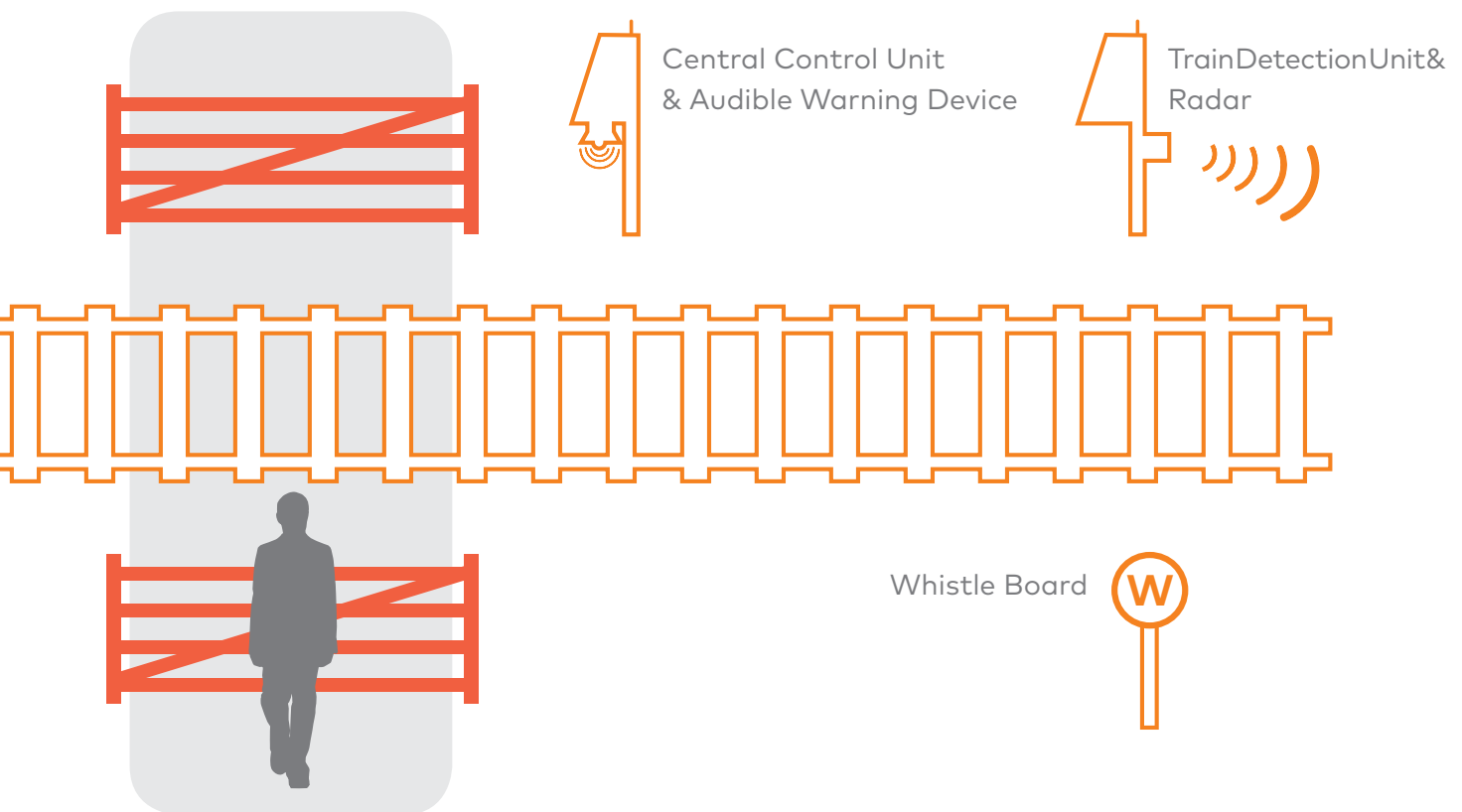


System Schematic



Features

- Reduces risk and improves safety
- Low cost overlay system
- Digital radar train detection
- Clear audible warning at crossing
- Single or dual track lines
- Known proven technologies
- High reliability
- Radar position lock and orientation detection
- IP66, tamper proof enclosure
- Off grid, solar powered, 5 days Li-ion battery backup
- Multi band/channel inter module radio communications
- GSM external communications
- Embedded web page.
- Event and error logs
- Remote control, monitoring and fault reporting
- Low maintenance and operating costs
- Independent of existing railway infrastructure or can be mounted on existing infrastructure if available and suitable
- Quick and simple to install
- Drop down mounting poles eliminating the need for ladders during installation and maintenance
- Mounting poles can be secured to the ground using backfilled cages or ground screws eliminating the need for concrete
- Could be expanded to include demand buttons and miniature stop / go lights if required.



Technical specification

Electrical

Radar

- Type FMCW digital radar
- Frequency K-Band 24 GHz
- Bandwidth 15 MHz
- Range Up to 140 metres
- Beam width 12°

Audible warning device

- Sound Two tone simulated train horn
- Sound level 80dB @ 5 metres

Inter module communications

- Frequencies 169, 433 or 868 MHz
- Range Up to 2 kilometres

External communications

- Type GSM

Power supply

- Input 12V solar or 12V ext
- Battery autonomy 5 days

Environmental

- Operating temperature range -10°C to +45°C with short excursions down to -20°C
- Ingress protection P66

Mechanical:

Central crossing unit

- Dimensions (mm), exc solar panel 520(h) x 310(w) x 400(d)
- Weight, exc solar panel 20.0 kg

Remote train detection unit

- Dimensions (mm), exc solar panel 520(h) x 310(w) x 400(d)
- Weight, exc solar panel 20.0 kg

30W solar panel

- Dimensions (mm) 545(h) x 430(w) x 25(d)
- Weight 3.0 kg

50W solar panel

- Dimensions (mm) 540(h) x 645(w) x 35(d)
- Weight 5.9 kg

80W solar panel

- Dimensions (mm) 540(h) x 1005(w) x 35(d)
- Weight 7.9 kg

Drop down pole

- Dimensions (mm) 3300(h)

Standards and certification

- RAMS EN 50126-1, 2
- Safety EN 50128
- Safety EN 50129
- Safety EN 50159
- Environmental EN 50125-3
- EMC EN 50121-1, 4
- CE Mark Europe



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