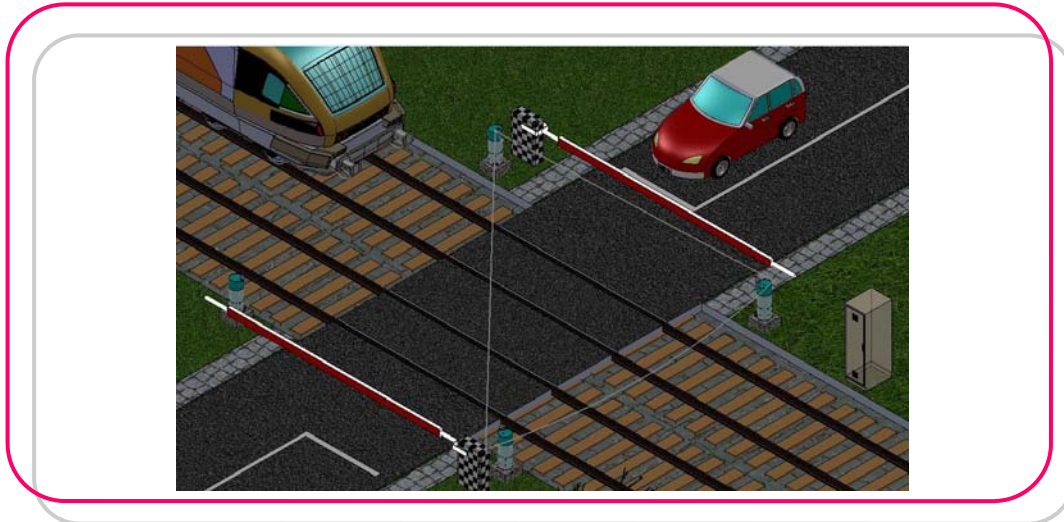# Level Crossing Protection « MIRA »

In the railroad sector the crossings where trains, cars and trucks are using the same infrastructure create hazardous risk for any safe railroad operation. These risks are normally arising from cars and trucks not respecting, the installed signals and or barriers. Such an ignorance is often leading to terrible accidents, which are not only resulting in serious train delays, bad reputation for the railway sector, but also in people getting seriously injured.

Progress Rail already addressed these risks in the past, with its own Level Crossing Protection solutions "CrossGuard". These proven in use versions are installed on various Level Crossings, in different countries and are SIL-4 certified.

Based on our experience from different customers and a big number of installations and also considering some new requirement changes, did Progress Rail decide to take the next step and developed the new version of Level Crossings Protection.

This new and improved version is including the best from CrossGuard version 1 and 2, various enhancements based on our experience and already the new mandatory requirements from the EU, which will be enforced in the future. Additionally we also include local requirements from several European countries, during the design and development process.

Based on all of these information available, we did carry out the development and also decided to give this new product a new name. This new Level Crossing Protection Product is called **« MIRA » (Multi Inspection Radar Appliance)**. With this new name we are also highlighting that this new Progress Rail product, is following our general product concept and philosophy to deliver modular products, which have the future already embedded.

**« MIRA »** is our new and best generation out of the Cross Guard product series. It is based on our new and EU railway regulation compliant microwave radar technology. Using this new technology we additionally did improve the product capability to be easy in installation and easy to maintain.

Consequently are we able to directly address various local customer requirements, while maintaining our flexibility to include even additional functions. As examples are to be listed the "no detection of pedestrians inside the protected area" and "the consideration or not-consideration of the lay-by area" (which can be protected) and all this only with the changing of the **« MIRA »** configuration without adaptations of the application software.

And as all of our products from this series, **« MIRA »** is based on a failsafe architecture to guarantee the maximum level of integrity for safety, which is SIL-4 in accordance to the CENELEC standards.

Functions of « MIRA »

1. Activation of the scan
2. I/O Managing
3. Sensors managing
4. Scanning of the protected area
5. Analysis
6. Intrusion detection
7. CCTV managing
8. Timing synchronization
9. Errors management
10. Diagnostic
11. Configuration
12. External communication management
13. Diagnostic communication management
14. Exclusion management
15. Heaters management
16. Additional Control Logic management
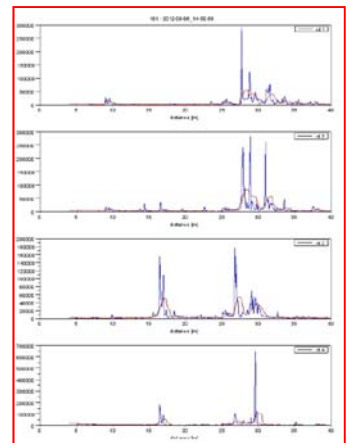
« MIRA » is designed as SIL-4 Level Crossing Protection Product according:

- CENELEC EN 50126
- CENELEC EN 50128
- CENELEC EN 50129
- CENELEC EN 50124-1

« MIRA » is easy to maintain:

- With an MTTR of:
  - ⇒ 20m for any fault in the sensor subsystem.
  - ⇒ 15m for any failure of any of the other electronic boards in the control logic.
- Less components required, no passive components

« MIRA » Components and Options:

- Control Logic
- Sensors
- Picture capturing system / CCTV (Option)

« MIRA » Brief descriptions

- Configuration
  This is possible using either the Control Logic or by the serial diagnostic communication channel. The « MIRA » system configuration can only be changed using a special software tool. Within this tool a safe protocol is implemented to secure operations on the system configuration.
- Diagnostics
  The self diagnostics is performed by the Control
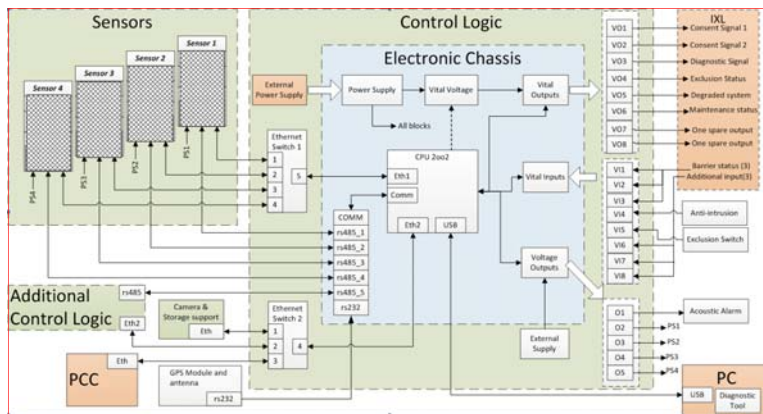
Logic and includes all of « MIRA » components. These diagnostic events are stored , with the related timing information. The diagnostic events can be retrieved both by the diagnostic serial channel or by the external serial channel.

- Error management
  This function is also performed by the Control Logic and includes all of « MIRA » components. These error events are stored with the related timing information. The error events can be retrieved both by the diagnostic serial channel or by the external serial channel.

Technical Data of « MIRA » Sensors

Features	Value
Supply Voltage (Vin)	24V DC ±5%
Communication Channel	Ethernet e rs485
Output Power	10mW
Antenna gain	25dBm
Frequency Band	1GHz
Resolution	0.15m
Max distance	40m
Opening Angle	25° - horizontal level 6° - vertical level

Technical Data of « MIRA » Control Logic

Features	Value
Supply Voltage (Vin)	110-230Vac +10% ¸ -15%
Frequency	50Hz ± 2%
Consumption	< 100 VA
Variation of the Supply Voltage	70% V DC in 100ms 40% V DC in 10ms
Number of Output Channels	6 outputs fail-safe @ 48V DC ± 3% - Max. 0,05A 1 output as Relay Output (NO/NC selectable)
Number of Input Channels	6 neutral safety relay contact

Installation concept « MIRA »

Detection Areas of the « MIRA » Sensors
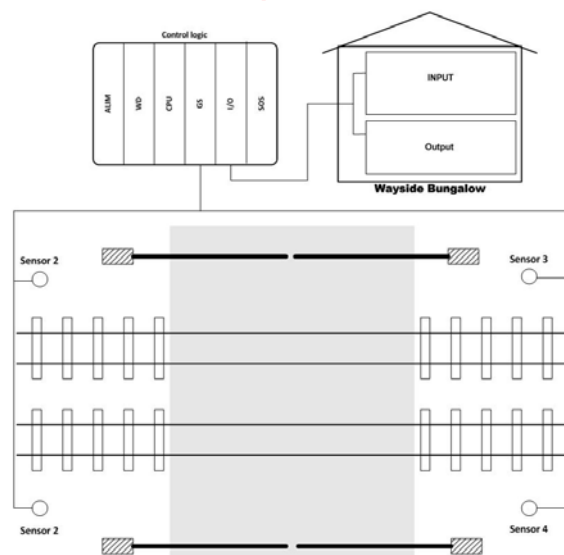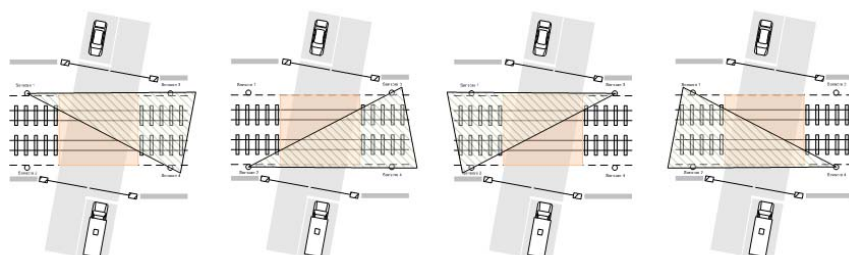
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