

# **PREDICT AND PROTECT**

## **SIGNAL POWER FAULT DETECTION SYSTEMS**

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**Electrical Safety Solutions for Signal Systems  
and Trainside Power Installations**

- ▶ **Reduce asset downtime and penalty charges**
- ▶ **Improve planned predictive maintenance**
- ▶ **Save time by quickly identifying the location of power faults**

## ELECTRICAL SAFETY SOLUTIONS

Rail operators frequently experience faults in the electrical power system that are caused by faulty connections, rodent damage, breaks in insulation, fire and cable theft. These faults may cause earth leakage from the power supply which if left undetected or addressed may lead to signal failure considerably compromising the uptime availability of the rail network. Ultimately this results in lengthy train delays, wasted engineer time and significant financial penalties for the operators.

In close consultation with Network Rail Bender has developed an approved range of electrical safety equipment which detects problems early and immediately informs rail personnel of defects.

Developing faults located in the system are identified in real time and notification is provided directly into intelligent infrastructure via GSM modem technology.

### Rail Signalling (RS3) integrated insulation monitoring and earth fault location system

The Rail Signalling (RS3) integrated insulation monitoring and earth fault location equipment provides proven protection for railway electrical systems and equipment up to AC650V.

Developed for relay rooms and line-side locations, the RS3 system builds on the impressive track record of equipment approved by Network Rail for use across the UK.

It is the first system to incorporate as standard GSM-enabled data loggers equipped for real time direct communication with the Intelligent Infrastructure. It also delivers enhanced reliability and simplified installation and commissioning.

The RS3 system's ability to immediately identify the location of the fault means maintenance teams can respond more rapidly, enhancing safety and reducing downtime costs.

Faults in the power system arise from a variety of causes such as damaged cables, faulty connections, breaks in insulation, and rodent damage. Where these faults lead to earth leakage from the power supply they are immediately detected by the equipment.

The RS3 system continually monitors insulation values to show real time status of the power system. When the insulation value (IR) drops the system records the fault and puts a test current signal or pulse into the system. This is pulled to earth at the point where a fault exists.

Bender's portable earth fault location system can be used to precisely locate feeder earth faults line side, allowing the repair process to be carried out more quickly,

RS3 units are supplied in a self-contained cabinet, tested and ready for easy 'plug and play' installation and commissioning alongside existing power infrastructure systems up to AC650V. The RS3 can also be supplied on a chassis plate for third party switchboard installation.

#### Features:

- ▶ Integrated insulation monitoring and earth fault location equipment provides proven protection for railway electrical systems and equipment
- ▶ Incorporates GSM-enabled data logger equipped for real time direct communication with the Intelligent Infrastructure
- ▶ Immediately identifies earth leakage faults in the power system arising from damaged cables, faulty connections, breaks in insulation, and rodent damage
- ▶ Portable earth fault location system pinpoints location for maintenance teams
- ▶ Delivers enhanced reliability and simplified installation and commissioning
- ▶ Facilitates planned maintenance interventions
- ▶ Dual adjustable insulation alarms – early warning and earth fault
- ▶ Supplied in self-contained windowed cabinet, tested and ready for 'plug and play' installation and commissioning
- ▶ Standardised for use across Network Rail installations
- ▶ Integral automatic and manual test facility



RS3

**INCREASED ELECTRICAL SAFETY**

**IMPROVED SYSTEM RELIABILITY**

## RS/PELI portable insulation monitor

The RS-PELI portable insulation monitoring unit is designed to be used trackside to measure and analyse specific sections of the power network to prioritise installation programmes.

The RS/PELI is self-powered through connection to the trackside signal electrical network and delivers live monitoring of the system status to immediately indicate if there is an earth fault and the status of the insulation.

The RS/PELI portable unit can also be used to provide independent verification of the installed RS system performance.

### Features:

- ▶ Enables trackside insulation monitoring
- ▶ Self-powered through connection to the trackside signal electrical network
- ▶ Delivers live monitoring of specific sections of the power network to immediately indicate if there is an earth fault and the status of the insulation
- ▶ Provides maintenance teams with independent verification of installed RS system performance.



RS/PELI



RS/IMD425

## RS/IMD425 Insulation Monitoring System single feeder cable systems

The RS/IMD425 provides insulation monitoring and earth fault detection for trackside signal power systems up to AC 300V. The unit provides engineering teams with vital insulation resistance data that enables planned maintenance at an early stage of system deterioration, avoiding unplanned shutdowns and optimising track availability.

It is primarily installed on lower voltage isolated power supplies -typically AC 230v- using single feeder cables but is also suitable for AC/DC 12/24/50 and 120V. The device offers continuous insulation monitoring of the power system to earth with an adjustable alarm. Each unit incorporates as standard a GSM-enabled data logger equipped for real time direct communication with the Intelligent Infrastructure.

The unit is supplied fully factory tested in a wall-mounted panel with a lockable windowed door.

### Features:

- ▶ Provides insulation monitoring and earth fault detection for trackside signal power systems single feeder cable systems up to AC 300V
- ▶ GSM-enabled data logger for real time direct communication with the Intelligent Infrastructure
- ▶ Integral K $\Omega$  insulation level text display
- ▶ Analogue K $\Omega$  signal output 0-20mA isolated for remote condition monitoring
- ▶ Dual adjustable alarms - early warning and earth fault
- ▶ Automatic adaption to system leakage capacitance
- ▶ Auto and manual test facility
- ▶ Automatic reset once earth fault is cleared

**REDUCED FINANCIAL PENALTIES**      **LOWER INSTALLATION TIME**

## RS/IMD 265 Insulation Monitoring System single feeder cable systems

The RS/IMD265 provides insulation monitoring and earth fault detection for trackside signal power systems up to AC 650V using single feeder cables. The unit provides engineering teams with vital insulation resistance data that enables planned maintenance at an early stage of system deterioration, avoiding unplanned shutdowns and optimising track availability.

The insulation monitor is designed for Network Rail relay room and line side location case installation and is supplied with a weather protection housing and insulated protective terminal cover over the upper terminals. Each unit incorporates as standard a GSM-enabled data logger equipped for real time direct communication with the Intelligent Infrastructure.

The unit offers continuous insulation monitoring of the power system to earth with an adjustable alarm and data available for remote transmission to the Intelligent Infrastructure.

### Features:

- ▶ Provides insulation monitoring and earth fault detection for trackside signal power single feeder cable systems up to AC 650V
- ▶ GSM-enabled data logger for real time direct communication with the Intelligent Infrastructure
- ▶ Integral  $K\Omega$  ohm insulation level text display
- ▶ Dual adjustable alarms - early warning and earth fault
- ▶ Automatic adaption to system leakage capacitance
- ▶ Auto and manual test facility



RS/IMD265



EDS3065

## Portable Earth Fault Location System EDS3065

The EDS3065 portable earth fault location system can be used to precisely locate feeder earth faults line side, allowing the repair process to be carried out more quickly, minimising disruption to rail traffic and reducing system downtime.

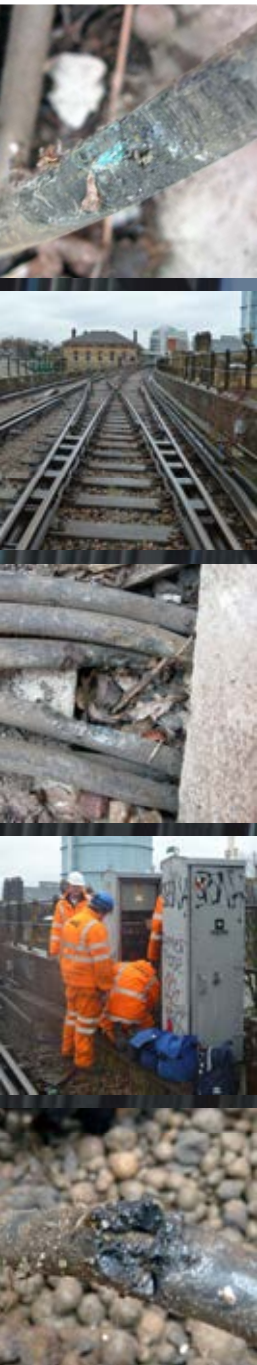
The handheld unit is designed to pinpoint a network earth fault to a specific cable or transformer by detecting the test signal from the RS3 system, and does not require the cable or transformer to be disconnected.

The unit simply clamps to the cable to carry out the evaluation enabling spot checks to discover whether a fault is present in addition to pinpointing faults identified in the vicinity.

### Features:

- ▶ Portable hand held earth fault location system for maintenance crews
- ▶ Precisely locates feeder earth faults line side by detecting the test signal from the RS3 system
- ▶ Does not require disconnection of cable or transformer
- ▶ Simple clamp connection to cabling for test process

**QUICKER FAULT LOCATION    REDUCE DOWNTIME**



Established over seventy years, Bender is a trusted and world renowned designer and manufacturer of innovative electrical safety products.

An approved supplier to Network Rail, Bender UK supplies quality, high performance electrical safety solutions for use in the UK's rail infrastructure in areas such as signal systems, trackside power installations and signal boxes.

Rail operators are responsible for ensuring the safety of the UK's rail networks and maximising the availability of thousands of miles of track every day. Electrical safety solutions developed by Bender deliver continuous monitoring of electrical systems and equipment for earth faults and insulation failure - immediately informing maintenance teams of potential problems which could result in train delays and significant financial penalties for the rail operators.

Continuous monitoring of the various power supply systems (an integral part of the track structure which guarantees electrical safety) is a key element in ensuring that operations run smoothly.

Bender UK has worked closely with Network Rail to develop electrical safety system solutions that are approved for use across the UK. The electrical safety solutions deliver continuous monitoring of railway electrical systems and equipment for earth faults and insulation failure - immediately informing maintenance teams about potential problems before critical operating issues arise.

Bender UK rail system protection capability also includes monitoring of rail switch points heating units and motors, and control voltage network monitoring for railway crossings.



# EARLY FAULT DETECTION

KEEPING YOUR NETWORK MOVING

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