



2024

PRODUCT
CATALOGUE

About Us



Celebrating 30+ Years Of Successful Innovative Product Development In The Railway Industry!

MRD Rail Technologies specialises in the design and manufacture of condition monitoring products.

The MRD team have passion and expertise for developing innovative products and solutions that change the way the railway industry monitors and assesses the condition of their assets. Our products make it simple for railway operators to remotely monitor the condition of their assets and obtain the information they need to make timely maintenance decisions based on condition.

We solve industry challenges using our engineering expertise to design, package and manufacture product solutions in-house. This gives us a lot of freedom to be creative and innovate, while controlling cost, quality and lead times.

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Condition Monitoring

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Ground Fault Monitoring

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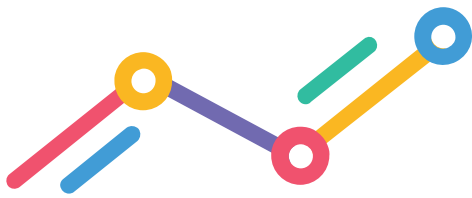
The future of CONDITION MONITORING begins here...

Introducing
**THE FUTURE OF
CONDITION MONITORING**



TrackSense

Powered by MRD Rail Technologies



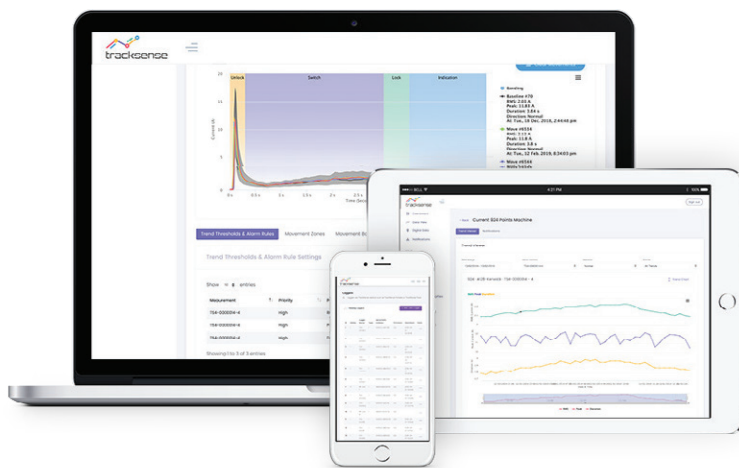
tracksense

The TrackSense System is the future of Remote Condition Monitoring; using modular expansion units with industry standard sensors along with a powerful cloud server to store and analyse your data makes TrackSense a cost effective solution to asset maintenance management that you can really rely on.

TrackSense Modular Hardware

TrackSense was designed with you and your organisation in mind. The DIN mounted backbone design allows you to expand, upgrade and replace modules cheaply, quickly and easily; usually even without any system downtime.

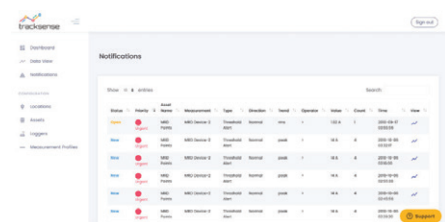
Using industry standard 4-20mA sensors, TrackSense can monitor key performance data for any Rail Asset, including:



TrackSense Cloud Platform

The TrackSense Cloud enables you to oversee the real-time health and predicted degradation of all the assets in your network from anywhere.

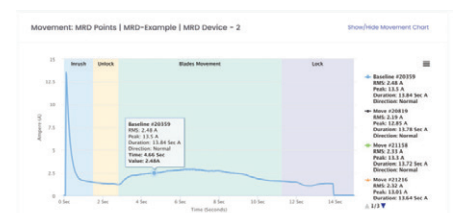
Using industry leading data analysis, TrackSense gives you deep insights, instant alerts and advanced predictions, allowing you to improve the efficiency of your railway network's maintenance.



TrackSense Cloud gives you oversight of your system's health/performance from anywhere



Asset trend view for predictive alerts and monitoring gradual performance degradation



View and compare individual movement's signatures for analytics, alerts and fault finding





The Future Of Condition Monitoring

Logger Module

The TrackSense Logger Module is the core of the TrackSense system. It collects data from all of the connected expansion modules, stores it on an on-board buffer to protect your data from power/network outages and securely uploads it all to the TrackSense Cloud server when possible.

General Data

| | |
|------------------------|--------------------------------|
| Dimensions (W x H x D) | 22.5 × 107 × 95mm |
| Weight | 0.25kg |
| Operating Temperature | -25 to 70°C |
| IP rating | IP40 |
| Supply Voltage | 24V DC |
| Supply Current | 80mA |
| Storage | 16GB SD Card |
| Ethernet | RJ-45, 10 Mbit/s or 100 Mbit/s |
| RS-485 | MODBUS RTU |



TS-LOG

Analog Module

The TrackSense Analog Module expands the TrackSense system, allowing for up to 6 additional 4-20mA analog sensor inputs per module.

General Data

| | |
|------------------------|-------------------------|
| Dimensions (W x H x D) | 22.5 × 107 × 95mm |
| Weight | 0.25kg |
| Operating Temperature | -25 to 70°C |
| IP rating | IP40 |
| Supply Voltage | 24V DC |
| Supply Current | 40mA + 50mA per Channel |



TS-ANA

Digital Module

The TrackSense Digital Module expands the TrackSense system, allowing for up to 12 additional digital sensor inputs per module.

General Data

| | |
|------------------------|-------------------|
| Dimensions (W x H x D) | 22.5 × 107 × 95mm |
| Weight | 0.25kg |
| Operating Temperature | -25 to 70°C |
| IP rating | IP40 |
| Supply Voltage | 24V DC |
| Supply Current | 100mA |



TS-DIG



TrackSense

Earth Insulation Monitor

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The Future Of Condition Monitoring

Earth Leakage Detector Module

The TrackSense Earth Insulation Monitor Module expands the TrackSense system, allowing it to monitor the insulation between your floating IT system and earth.

General Data

| | |
|-------------------------|-------------------|
| Dimensions (W x H x D) | 22.5 x 107 x 95mm |
| Weight | 0.25kg |
| Operating Temperature | -25 to 70°C |
| IP rating | IP40 |
| Earth Leakage Detection | 0-999KΩ |
| Busbar Isolation | 2kV |
| Busbar Rated Voltage | 650V AC/DC |



TS-ELD

Modem Module

The TrackSense Modem provides your Condition Monitoring installation with a secure connection to the TrackSense Cloud Server, allowing for easy data collection, analysis and reporting from remote locations which don't have pre-existing internet infrastructure.

General Data

| | |
|------------------------|--|
| Dimensions (W x H x D) | 22.5 x 107 x 95mm |
| Weight | 0.25kg |
| Operating Temperature | -25 to 70°C |
| IP rating | IP40 |
| Supply Voltage | 24V DC |
| Supply Current | 275mA |
| 4G Bands | FDD: B1 (2100), B3 (1800), B5 (850), B7 (2600), B8 (900), B20 (800) TDD: B38 (2600), B40 (2300), B41 (2500) |
| Category | LTE Cat.4 |



TS-MOD

EarthSense

The EarthSense insulation monitor has been designed to monitor insulation resistance in unearthed IT systems where high reliability of the supply is required, such as railway, industrial, marine and power applications.



Low-Cost Monitoring Of Power Feeds In Unearthed IT Systems

The EarthSense insulation monitor serves as an early warning system by providing notifications when the impedance between an active phase conductor and earth has dropped below user customisable warning and alarm thresholds. Advanced notification of faults allows time and cost-efficient deployment of service personnel, reducing the likelihood of equipment failure or damage.

Features

- Sunlight readable LCD display
- Modbus Protocol on RS485
- Scheduled self-test function
- Monitoring of AC or DC busbars
- Remote test and reset

Benefits

- Remote monitoring of earth insulation on IT systems
- Allows early detection and removal of faults before problems occur
- Small footprint



EarthSense

Earth Insulation Monitor

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Part Numbers

| | |
|--|--------|
| EarthSense Monitor (Universal AC Supply) | ESMI-A |
| EarthSense Monitor (DC Supply) | ESMI-B |

Technical Specifications

Supply Circuit

| | | |
|------------------------|----------|--------------|
| Nominal supply voltage | Option A | 85 - 264V AC |
| | Option B | 9 - 36V DC |
| Frequency range AC | | 50 - 60Hz |

Measuring Circuit

| | | |
|--|--------------------------------|--|
| Operating Mode | continuous operation | |
| Measuring principle | adaptive square wave injection | |
| Nominal system voltage | 0 - 650V AC / 0 - 650V DC | |
| Maximum allowed system voltage | 750V AC / 750V DC | |
| Nominal Frequency | DC or 15 - 400Hz | |
| System leakage capacitance | ≤ 300uF | |
| Response value (Alarm 1) | 1 - 200KΩ | |
| Response value (Alarm 2) | 1 - 200KΩ | |
| Relative uncertainty 1 - 50KΩ / 50 - 200KΩ | +1 KΩ / ±10% | |
| Internal impedance at 50Hz | ≥ 141KΩ | |
| Internal DC resistance | ≥ 141KΩ | |
| Measuring voltage | ±24V | |
| Measuring current | 0.17mA | |
| Response time (0.5 x Ran and Ce = 1uF) | ≤ 10s | |

Input Circuit

| | | |
|--------------------------------------|---------------------|--|
| Control input (voltage free) | remote test / reset | |
| Maximum current in control input | 1mA | |
| Maximum cable length | 10m - 100pF/m | |
| No-load voltage at the control input | 3.3V DC | |

Output Circuit (Relay)

| | | |
|--|----------------------------------|----|
| Relay configuration | 2 x SPCO | |
| Operating principle | open or closed circuit principle | |
| Rated voltage | 250V AC / 30V DC | |
| Minimum contact rating | 1mA at AC/DC ≥ 10V | |
| Contact data (IEC 60947-5-1) | AC12 at 230V | 4A |
| | AC15 at 230V | 3A |
| | DC12 at 24V | 4A |
| | DC13 at 24V | 2A |
| Electrical endurance, number of cycles | 10000 | |

Environmental Data

| | | |
|---|---------------------------|--------------|
| Ambient temperature ranges | operation | -20 to +60°C |
| | storage | -30 to +80°C |
| | transport | -30 to +80°C |
| Climatic category (IEC/EN 60721-3-3) | 3K5 (no ice, no cond.) | |
| Damp heat, cyclic (IEC/EN 60068-2-30) | 6x24h cycle, 70°C, 95% RH | |
| Vibration, sinusoidal (IEC/EN 60255-21-1) | Class 2 | |
| Shock, half-sine (IEC/EN 60255-21-2) | Class 2 | |

Insulation Data

| | |
|---|------------------|
| Rated insulation voltage (IEC/EN 60664-1) | 600V |
| Rated impulse voltage (IEC/EN 60664-1) | 6kV |
| Pollution degree (IEC/EN 60664-1) | III |
| Test Voltage (IEC 61010-1) | 2.32KV, 50Hz, 2s |

Approvals & Compliances

| | |
|-------------------------------------|------------------------------|
| Product standard | EN/EC 61557-8, IEC 60947-5-1 |
| Other standards | EN 50121-4 |
| Low Voltage Directive | 2014/35/EU |
| Electromagnetic Compatibility (EMC) | 2006/95/EC |

Electromagnetic Compatibility

| |
|---|
| Interference immunity to IEC/EN 61000-6-1, IEC/EN 61000-6-2, IEC/EN 61326-2-4 |
| Radiated, radio-frequency, electromagnetic field IEC/EN 61000-4-3 Level 3, 10 V/m (1 GHz) / 3 V/m (2 GHz) / 1 V/m (2.7 GHz) |
| Surge IEC/EN 61000-4-5 Level 3, installation class 3, supply circuit and measuring circuit 1 kV L-L, 2 kV L-earth |
| Conducted disturbances, induced by radio-frequency fields IEC/EN 61000-4-6 Level 3, 10 V |
| Voltage dips, short interruptions and voltage variations IEC/EN 61000-4-11 Level 3 |
| Electrostatic discharge IEC/EN 61000-4-2 Level 3, 6 kV 18 kV |
| Electrical fast transient/burst IEC/EN 61000-4-4 Level 3, 2 kV / 5 kHz |
| Harmonics IEC/EN 61000-4-13 Level 3 |
| Interference emission IEC/EN 61000-6-3, IEC/EN 61000-6-4 |
| High-frequency radiated IEC/CISPR 22, EN 55022 Class B |
| High-frequency conducted IEC/CISPR 22, EN 55022 Class B |

General Data

| | |
|---------------------------------------|----------------|
| Mean Time Before Failure | 200,000 hrs |
| Duty time | 100% |
| Dimensions (W x H x D) | 36 x 90 x 60mm |
| Weight | 0.250kg |
| Mounting | DIN |
| Degree of protection housing/terminal | IP30 / IP20 |

Earth Leakage Detector (ELD)

The interlocking circuits in railway signalling are often supplied from a battery in which neither of the poles are connected to earth. In the event of a single fault there is no danger, however, two or more faults occurring at the same time could create a dangerous situation. Therefore, it is vitally important to supervise the battery supply continuously to prevent this from happening.

Cables which run in parallel with AC electrified railways are subjected to induced voltages. If an earth leakage occurs in the cable, these voltages can disturb devices which are connected to both cables. When earth faults occur in both supply and return wires yet another hazardous condition is created.

These faults can be detected reliably with MRD's ELD.



Reliable Earth Leakage Detection

Despite all of the safety built into our electrical rail systems, failures can and do occur.

By providing constant monitoring and instant notifications of threshold breaches, MRD's Earth Leakage Detector (ELD) significantly reduces the likelihood of failure or accidents due to earth leakage faults.

Features

- Monitors AC and DC busbars
- Auto detects busbar voltage
- Fail-safe or non-fail-safe contact operation
- Operation and alarm LEDs
- Manual test and reset buttons
- Adjustable sensitivity and delay
- Displays fault level in KQ
- Displays fault time
- DIN rail or panel mounting
- RS-485 communications

Benefits

- Compact size
- Remote interrogation via RS-485
- Remote test and reset
- Remove faults before problems occur
- Low cost



ELD

Earth Leakage Detector

MRD Rail Technologies Pty Ltd

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Part Numbers

| | |
|-----------------------------|-------------------|
| AC Supply Version | ELDAC/DC-AUTO-110 |
| DC Supply Version | ELDAC/DC-AUTO-12 |
| Q-Style Panel Mount Bracket | ELDAC/DC-AUTO-PMB |

Technical Specifications

General Data

| | |
|------------------------------------|-----------------------------|
| Connection Type | 4mm screw terminal |
| Mounting | DIN rail or screw mount |
| Panel Mounting | Q-Style panel mount bracket |
| Dimensions (H x W x D) | 75 x 100 x 110mm |
| Weight | 0.4kg |
| BUS/GND Isolation Resistance | >185 K Ω |
| Operating Temperature | -20 to 60°C |
| Storage Temperature | -20 to 80°C |
| Climate Class According to IEC 721 | 3K5 without condensation |

AC Supply Voltage (AC Version)

| | |
|------------------------|--------------|
| Supply Voltage | 85 - 264V AC |
| Frequency Range | 50 - 60 Hz |
| Max. Power Consumption | 3W |

DC Supply Voltage (DC Version)

| | |
|------------------------|------------|
| Supply Voltage | 9 - 36V DC |
| Max. Power Consumption | 3W |

Monitoring Voltage Range

| | |
|-------------------|-------------|
| DC Busbar Voltage | 9 - 150V DC |
| AC Busbar Voltage | 0 - 650V AC |

Protection Class

| | |
|-----------------------|---|
| Internal Components | IP30 |
| Terminals | IP02 |
| Housing | Self extinguishing polycarbonate |
| Fault Contact Ratings | 0.6A 125V AC 0.6A 110V DC 2.0A 30V DC |
| Trip Delay Range | Adjustable 2 sec - 10 sec |
| Trip Point | Adjustable 10 K Ω - 200 K Ω |

Approvals & Compliances

| | |
|---------------------------------|--------------------------------|
| Network Rail | Certificate Number PA05/05184 |
| ARTC | Approval Number 08-08-10-078 |
| MTM | Cert. Number 01-1201-0005_F_TA |
| V Line | Approval Number VLP-134 |
| QR National | Certificate Number C0098 |
| Rail Infrastructure Corporation | Approval Number Q03/0404 |

EarthLogger

EarthLogger provides comprehensive monitoring and logging of insulation resistance for unearthed IT systems, capable of handling up to four separate AC or DC busbar feeds at the same time. It facilitates long-distance, extended-time observation and management of electrical supply components, offering capabilities to observe, forecast, and avert possible issues. This enhances preventive measures, decreasing the chances of equipment malfunction.



4 Channel Remote Earth Insulation Logging

EarthLogger monitors and logs insulation resistance in unearthed IT systems of up to four independent AC or DC busbar feeds simultaneously. As an RCM device, EarthLogger enables off-site long-term trending and supervision of your power supply assets; allowing you to monitor, predict and prevent potential problems, reducing the likelihood of equipment failure or damage. Historical data can be viewed from anywhere via the embedded web server. No remote server required! Cables which run in parallel with AC electrified railways are subjected to induced voltages. If an earth leakage occurs in the cable, these voltages can disturb devices which are connected to both cables. When earth faults occur in both supply and return wires yet another hazardous condition is created. These faults can be detected reliably with MRD's ELD.

Features

- 4 Channels, AC or DC 0-650V RMS
- Trend View via embedded web server
- Logs insulation resistance and busbar voltage
- Sunlight readable OLED display
- Remote test and reset
- Scheduled self-test function
- GSM/GPRS modem and Ethernet port
- Email, SMS notifications
- SNMP Traps

Benefits

- Remote monitoring and logging of insulation resistance
- Allows detection and removal of faults before problems occur
- Data available in easy to interpret graphical format
- Identify the time and cause of fault using logs
- 4 Channels in one compact device



EarthLogger

4 Channel Earth Insulation Logger

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Part Numbers

4-CH EarthLogger

EL - 4

Technical Specifications

General Data

| | |
|------------------------|-------------------------|
| Connection | 4mm screw terminal |
| Mounting Type | DIN rail or screw mount |
| Dimensions (H x W x D) | 75 x 150 x 110mm |
| Weight | 0.7kg |
| Operating Temperature | -25 to 70°C |

AC Supply Voltage

| | |
|-----------------|---------------|
| Supply Voltage | 100 - 240V AC |
| Frequency Range | 50 - 60 Hz |

DC Supply Voltage

| | |
|----------------|---------------|
| Supply Voltage | 120 - 370V DC |
|----------------|---------------|

Control Circuits

Control Inputs - Voltage Free

Remote reset

Output Circuits

Alarm Outputs

2 x Relays (SPDT)

Monitoring Voltage Range

| | |
|-------------------|-------------|
| AC Busbar Voltage | 0 - 650V AC |
| DC Busbar Voltage | 0 - 300V DC |

Approval & Compliances

ARTC

S 05-1508-173

RelayDoc

To provide you with an instant analysis of the state of condition of your assets, RelayDoc tests key performance indicators of your relays against the manufacturer's specification, such as:

- Coil Resistance
- Contact Resistance
- Contact Configuration
- Switch Time
- Operate and Release Voltage and Current



Know The Condition Of Your Relays

RelayDoc makes testing your relays easy. Simply plug in a relay and press test. No training required! RelayDoc tests all of the important parameters of a relay against the manufacturer's specification. All tests and reports are viewable instantly on the touch screen and uploaded to the cloud server where they're hosted permanently for you.

Features

- Tests AC and DC relays
- Capacitive touchscreen
- 5" colour TFT display
- Code-pin detection
- LAN & USB
- Cloud database
- Wall mountable
- Barcode reader compatible

Benefits

- Fast and reliable automated relay testing
- Simple to use with no training required
- Stand-alone operation - no computer necessary
- Data is recorded and stored internally
- Displays test results in a simple pass/fail format
- Web server allows for easy remote data access
- Test reports can be transferred to an external USB
- Automatic relay type detection using code-pins
- Asset monitoring and preventative maintenance



RelayDoc

Automatic Relay Tester

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Part Numbers

RelayDoc RD-BR930

Technical Specifications

General Data

| | |
|------------------------|--------------------------------|
| Mounting | Mounting holes on rear of case |
| Dimensions (W x H x D) | 280 x 180 x 120mm |
| Weight | 2.7kg |
| Operating Temperature | -20 to 60°C |
| IP rating | IP65 |

Test Range

| | |
|--------------|--|
| Coil voltage | 0 - 110V DC |
| Coil current | 0 - 500mA |
| Coil type | Single, Dual (Twin), Latch and Current |
| Contacts | Up to 16 contacts testable |

Relay Test Parameters

| | |
|---|--|
| Contact configuration check | |
| Max coil power | |
| Operate and Release voltage and current | |
| Coil resistance: | 0 - 5K, Tolerance +/-1% Resolution 1R |
| Contact resistance range: | 0 - 500R, Tolerance +/-1% Resolution 0.001R |
| Contact switch time: | +/-0.01 sec Resolution 0.001s |
| Clean current: | 100 - 3000mA, Tolerance +/-1% Resolution 10mA |
| Coil voltage: | 0 - 50V, Tolerance +/-1%, Resolution 0.1V |

Approvals & Compliances

| | |
|--------------|-------------------|
| EN 50121 | Report No. 160804 |
| Network Rail | UKPA 05/07 703 |
| ARTC | S 09-1609-194 |

Portable RelayDoc

The Portable RelayDoc is a portable relay testing system designed to assess the condition of your relays with ease and accuracy. Including an Android tablet preloaded with our RelayDoc app featuring a simple pass-or-fail test format, the RelayDoc is the perfect tool for your on-site maintenance needs.

Test reports are generated automatically and stored internally where they are then available for on-screen viewing and analysis.



On-The-Go Relay Testing

Now available in a portable version, RelayDoc makes on-the-go relay testing painless. Simply plug in a relay and press test. RelayDoc automatically performs numerous tests on your relays using key performance indicators to provide you with an instant state of condition report to help you find faults, and repair them quickly and easily.

Features

- Portable, anti-shock carry case
- Tests PN150, PN250, B1, B2 and BR930 relay types
- Automatic relay-type detection using code-pins
- Simple user interface and test functionality in Android application
- Tablet provided with each unit
- Remote data access via web server
- LAN & USB
- Barcode reader compatible
- Displays test results in a simple pass/fail format

Benefits

- Fast and reliable asset monitoring
- Targeted maintenance management
- Remote access to recorded data
- No training required



Portable RelayDoc

Portable Relay Tester

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Part Numbers

| | |
|------------------------|--------------|
| Portable RelayDoc | PRD |
| Test Base BR930 Relays | PRD-TB-BR930 |
| Test Base PN150 Relays | PRD-TB-PN150 |
| Test Base PN250 Relays | PRD-TB-PN250 |
| Test Base B1 Relays | RP-TB-B1 |
| Test Base B2 Relays | RP-TB-B2 |

Technical Specifications

General Data

| | |
|------------------------|-------------------|
| Dimensions (W x H x D) | 300 x 304 x 194mm |
| Weight | 5.4kg |
| Operating Temperature | -20 to 60°C |

Test Range

| | |
|--------------|--|
| Coil voltage | 0 - 110V DC |
| Coil current | 0 - 500mA |
| Coil type | Single, Dual (Twin), Latch and Current |
| Contacts | Up to 32 contacts testable |

Relay Test Parameters

| | |
|---|--|
| Contact configuration check | |
| Max coil power | |
| Operate and Release voltage and current | |
| Coil resistance: | 0 - 5K, Tolerance +/-1% Resolution 1R |
| Contact resistance range: | 0 - 500R, Tolerance +/-1% Resolution 0.001R |
| Contact switch time: | +/-0.01 sec Resolution 0.001s |
| Clean current: | 100 - 3000mA, Tolerance +/-1% Resolution 10mA |
| Coil voltage: | 0 - 50V, Tolerance +/-1%, Resolution 0.1V |

RelayPro

RelayPro gives you a durable, mobile test kit for BR930, PN150, PN250, B1 and B2 relay types. Operating through the RelayPro software on a laptop or computer, RelayPro gives you the ability to change both operation values and specification parameters on the fly, making it simple and easy to manually test your relays however you need to.



Relay Testing Made Easy

RelayPro is a portable automatic relay tester that performs rapid testing and analysis of a relay's condition based on the manufacturer's specification. MRD's RelayPro identifies Pass/Fail status of relays automatically. Test results are displayed clearly in table and graphical format and PDF Reports are exported for easy record keeping.

Features

- Tests up to 110V Coil Relays
- Graphical user interface displays test results in bar graph and table format
- Generates comprehensive test report
- Contact cleaner controlled current burst removes oxidisation layer
- Multiple relay types supported
- Case, reference modules and 1 x BR930 test base included
- English/Chinese language options

Benefits

- Know the condition of your relays
- Reduced maintenance costs
- Simple to operate
- Asset monitoring and preventative maintenance
- Fault finding



RelayPro

Relay Tester

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Part Numbers

| | |
|----------------------------------|-------------|
| RelayPro Automated Relay Tester: | RelayPro |
| Test Base BR930 Relays | RP-TB-BR930 |
| Test Base PN150 Relays | RP-TB-PN150 |
| Test Base PN250 Relays | RP-TB-PN250 |
| Test Base NS1 Relays | RP-TB-NS1 |

Technical Specifications

General Data

| | |
|------------------------|------------------|
| Dimensions (W x H x D) | 255 x 80 x 260mm |
| Weight | 2.2kg |
| Operating Temperature | -20 to 60°C |
| IP rating | IP65 |

Test Range

| | |
|--------------|--|
| Coil voltage | 0 - 110V DC |
| Coil current | 0 - 500mA |
| Coil type | Single, Dual (Twin), Latch and Current |
| Contacts | Up to 20 contacts testable |

Relay Test Parameters

| | |
|---|--|
| Contact configuration check | |
| Max coil power | |
| Operate and Release voltage and current | |
| Coil resistance: | 0 - 5K, Tolerance +/-1% Resolution 1R |
| Contact resistance range: | 0 - 500R, Tolerance +/-1% Resolution 0.001R |
| Contact switch time: | +/-0.01 sec Resolution 0.001s |
| Clean current: | 100 - 3000mA, Tolerance +/-1% Resolution 10mA |
| Coil voltage: | 0 - 50V, Tolerance +/-1%, Resolution 0.1V |

Approvals & Compliance

| | |
|--------------|----------------------------------|
| Network Rail | Certificate Number PA05/05766 |
| ARTC | Certificate Number S 09-1330-134 |

LP AWS

The equipment in the track consists of a protective ramp preceding a Permanent Inductor (AWS3) and an Electro Inductor (AWS1). The Permanent Inductor has its North Pole uppermost and this magnetic field by itself gives a "caution" indication to the driver. The Electro Inductor (AWS1), when energised, has its South Pole uppermost and this South Pole following the North Pole of the permanent inductor gives a "Clear" indication to the driver.

On bi-directional lines, special permanent inductors called Suppressor Inductors (AWS2) may be used to prevent a train receiving AWS indications at a signal for the opposite direction to which the train is travelling. These inductors have a permanent inductor and, in addition, a suppressing coil which, when energised, diverts the magnetic flux, suppressing any indication to the train.



Safety in All Conditions

The Automatic Warning System (AWS) is provided primarily to aid drivers in observing the fixed signals, particularly under adverse weather conditions. Used in conjunction with the on-board MagSense unit, the AWS helps to provide drivers with a secondary audible alert to confirm their primary visual observations of the fixed signals.

Features

- Low profile design suitable for installation on Slab Track/Sleepers
- High strength enclosure machined from solid aluminium block
- Replaceable vibration mounts
- UV stable cable sheath
- Watertight
- Water-proof sealant
- Powder coated
- Corrosion protected

Benefits

- No ballast removal required
- No post-production modifications required
- Low maintenance costs



LP AWS

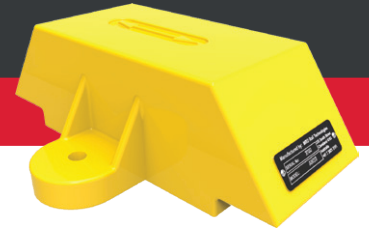
Automatic Warning System

MRD Rail Technologies Pty Ltd

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Part Numbers

| | |
|---------------------------------|---------|
| Low Profile Electro Inductor | AWS1-LP |
| Low Profile Suppressor Inductor | AWS2-LP |
| Permanent Magnet | AWS3 |

Technical Specifications

Operating Values

AWS1 Electro Inductor

| | |
|-------------------------|------------------|
| Nominal Coil Resistance | 27Ω ± 10% @ 26°C |
| Nominal DC Current | 888mA ± 10% |
| Nominal Volts | 24V DC |
| Minimum Volts | 22V DC |
| Maximum Volts | 28V DC |

AWS2 Suppressor Inductor

| | |
|-------------------------|------------------|
| Nominal Coil Resistance | 17Ω ± 10% @ 26°C |
| Nominal DC Current | 1410mA ± 10% |
| Nominal Volts | 24V DC |
| Minimum Volts | 22V DC |
| Maximum Volts | 28V DC |

Approvals & Compliances

LP AWS Type 1/2

Queensland Rail Doc No. C0125

AWS Type 3

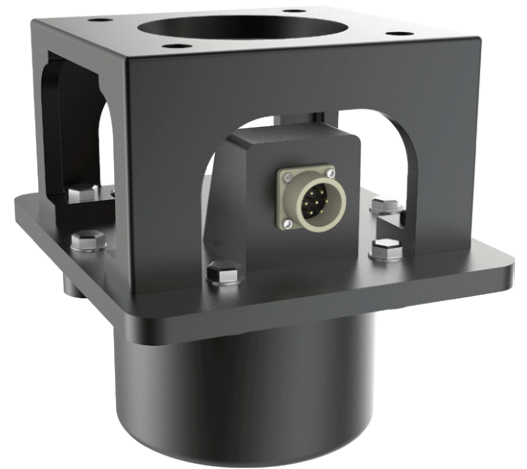
PTS SA Doc No. PTS-009

GENERAL DATA

| | |
|--------------------------------------|-------------------|
| LP AWS Type 1 Dimensions (H x W x D) | 132 × 445 x 768mm |
| LP AWS Type 1 Weight | 43kg |
| LP AWS Type 2 Dimensions (H x W x D) | 132 × 445 x 768mm |
| LP AWS Type 2 Weight | 53kg |
| LP AWS Type 3 Dimensions (H x W x D) | 106 × 273 × 328mm |
| LP AWS Type 3 Weight | 20kg |

MagSense

MRD's MagSense track magnet receiver has been designed for maximum reliability in order to detect track magnets used in Station Protection, Automatic Power Control and Automatic Warning Systems. The detector's operation is easily configured and calibrated to latch at the specified field strengths using the provided calibration software. There is no need to open the enclosure to adjust pots. The mode of operation can also be customised to suit specific customer requirements.



Reliable Track Magnet Detection

MRD's MagSense track magnet receiver has been designed for maximum reliability in order to detect track magnets used in Station Protection, Automatic Power Control and Automatic Warning Systems.

Features

- Robust industrial design to suit harsh environments
- Circuitry encapsulated in polyurethane potting compound
- Vibration and moisture resistant
- Plug connections for easy installation and maintenance
- Programmable trip point from 1 - 35 Gauss
- Retrofit option available
- EN50155 / IEC 61373 compliant

Benefits

- Reduced vehicle unavailability and lower maintenance costs
- Overhaul requirements are reduced with maintenance limited to functional testing only



MagSense

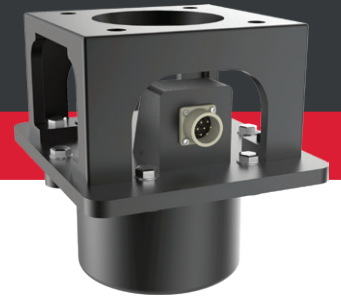
Track Magnet Detector

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Part Numbers

| | |
|---|-------------|
| Magsense Retrofit with Cannon Connector | MagSense-RC |
| Magsense Retrofit with Marachel Connector | MagSense-RM |
| MagSense New with Cannon Connector | MagSense-C |
| MagSense New with Marachel Connector | MagSense-M |

Technical Specifications

General Data

| | | |
|---------------------------|---|--|
| Casing | IP67 Protection, Anodised Aluminium Enclosure | |
| Dimensions (W x H x D) | 157 x 157 x 113mm | |
| Weight | 3kg | |
| Operating Temperature | -25 to 55°C (EN50155) | |
| Storage Temperature | -40 to 85°C | |
| Ambient Relative Humidity | 5 to 95% (non-condensing) | |

Power Circuit

| | |
|-------------|---------------|
| Input | 50 to 150V DC |
| Consumption | 10W |

Input Circuit

| | |
|-----------------|---------------|
| Reset Impedance | 90 KΩ |
| Reset Voltage | 45 to 150V DC |

Output Circuit

| | |
|-----------------|-----------------------------|
| Voltage | Within 5% of supply voltage |
| Maximum current | 80mA |

Sensitivity/Threshold

| | |
|--------------|------------------|
| North Preset | 22.5 ± 2.5 Gauss |
| South Preset | 17.5 ± 2.5 Gauss |

Approvals & Compliances

| | |
|-----------------------------|-------------|
| Transient and Surge Testing | EN50155 |
| Vibration and Shock | EN61373 |
| EMC | EN50121-3-2 |
| MTBF | On request |

Shunt Box

MRD's precision Shunt Box is designed to simulate track resistance in the testing and commissioning of track feed circuits. It is used to provide readings for the drop shunt, prevent shunt and pick-up shunt testing. Suitable for CSEE jeurmont, DC and AC tracks.



Quick, Precise And Easy Shunt Testing

MRD's precision Shunt Box is designed to simulate track resistance in the testing and commissioning of track feed circuits. It is used to provide readings for the drop shunt, prevent shunt and pick-up shunt testing. Suitable for CSEE jeurmont, DC and AC tracks.

Features

- High precision 5% tolerance resistors
- Resistance ranges from 0.05Ω - 9.95Ω in 0.05Ω increments
- Rated for 10W continuous current
- Quick range changes
- Make before break contacts
- High stability and low temperature co-efficient
- Non-inductive load suitable for high frequency track circuits

Benefits

- Makes testing and commissioning Track Circuits quick and easy
- 'Open Circuit' jumper allows for instant connection/disconnection
- Carry bag and 1.5m heavy duty crocodile clamps included
- Heavy duty enclosure



Shunt Box

Track Circuit Shunt Tester

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Part Numbers

| | |
|------------------------------------|-------------|
| Shunt Box with A-Clamp Style Clips | SB-100W-J-A |
| Shunt Box with G-Clamp Style Clips | SB-100W-J-G |

Technical Specifications

General Data

| | |
|------------------------|------------------|
| Dimensions (H x W x D) | 150 × 167 × 75mm |
| Weight | 2.5 kg |
| Operating Temperature | -25 to 60°C |

20K Shunt

MRD's precision shunts help to increase measurement accuracy by dampening low level noise and unwanted signals which would otherwise cause inaccurate readings. Shunts are useful when measuring leakage current to ground on isolated transformers, when testing and commissioning track circuits and any other application which relies on accurate electrical measurements.



Low Level Noise Reduction To Increase Measurement Accuracy

Shunts in a measurement circuit reduce load impedance, dampening low level noise and unwanted signals due to inductive/capacitive coupling which would otherwise cause inaccurate readings. Shunts are useful when measuring leakage current to ground on isolated transformers, during testing and commissioning of track circuits.

Features

- High precision resistor
- Safe, no touch design
- Great, long term stability
- Quick, easy connection

Benefits

- Reduced low level noise and signals
- High accuracy in measurements for testing and commissioning
- Lightweight, compact design



20K Shunt

Precision Measurement Resistor

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www.mrd.com.au



Part Numbers

20KQ Precision Shunt PS-20K

Technical Specifications

General Data

| | |
|------------------------|----------------------------|
| Enclosure | ABS, touch proof design |
| Contact Type | 4mm safety plug and socket |
| Contact Material | Brass/Nickel plated |
| Dimensions (W x H x D) | 50 x 60 x 20mm |
| Weight | 0.030kg |

Electrical Data

| | | |
|---------------------------------|-----------------------------|---------|
| Rated Voltage | 600V CAT II | |
| Resistor Tolerance | 1% | |
| Resistor Power Rating | 3W at 25°C | |
| Limiting Element Voltage | 245V | |
| Operating Temperature Range | -65 to 250°C | |
| Temperature Coefficient Maximum | +/- 20ppm/C (-65 to +250°C) | |
| No-Load Stability | +/- 25ppm/10,000 hours | |
| Full Load Stability | 10,000 hours | <50ppm |
| | 26,000 hours | <100ppm |

BellMega

By performing continuity testing simultaneously with insulation leakage resistance testing, BellMega saves you time and effort. Each BellMega unit boasts a large capacity onboard battery which provides up to 8 hours of operation time and comes with high quality, long length leads and a portable carry bag providing everything needed for efficient point to point wiring verification.



Simultaneous Insulation And Continuity Testing

BellMega is a continuity tester for point to point wiring verification that saves time by performing continuity and insulation leakage resistance testing simultaneously. It even provides earth leakage detection for the wiring being tested. The high voltage DC source is regulated to provide a stable reference for insulation breakdown resistance detection.

Features

- Calibrated to NATA lab standards
- Sturdy reliable construction
- 8 metre reach between probes
- High quality HCK Probes Quality electronic design
- Protected against live circuit (up to 350V pk)
- Self-test function

Benefits

- Portable
- Saves time by doing two tests in one process
- Rechargeable battery operated or plug pack supply
- Carry bag, lead set and battery charger included



BellMega

Insulation and Continuity Tester

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Part Numbers

| | |
|-----------------|------------|
| BellMega | BM-510 |
| Bag | BM-510-Bag |
| Lead Set | BM-510-LS |
| Battery Charger | BM-510-BC |

Electrical Data

| | |
|--|------------------------|
| Insulation leakage trip | 110M Ω |
| Insulation leakage trip response time | 250ms @ 100M/100pf |
| Insulation voltage | 500V DC + 10/-5% @ 10M |
| Insulation short circuit current | 1.5mA Max |
| Continuity threshold | 10 Ω |
| Continuity constant current | 10mA +/- 1mA |
| Continuity applied voltage | 5V DC +/- 2V (red=+) |
| Continuity response time | 400ms +/- 100ms |
| Live circuit tolerance | 250V AC/DC (350V Peak) |
| Low battery disable | 5.5V |
| Operating current (battery) | 75mA |
| Operation time (fully charged battery) | 8 Hours (Approx.) |
| Plug pack type | 9 - 24V @ 1A |
| Charge time | 3 Hours (Min) |
| Insulation sound frequency low | 1.7Khz +/- 100Hz |
| Continuity sound frequency high | 2.2Khz +/- 100Hz |
| Switch mode cycle frequency | 40 - 70Khz factory set |

Technical Specifications

General Data

| | |
|------------------------|------------------|
| Dimensions (H x W x D) | 184 x 116 x 90mm |
| Weight | 2.3kg |
| Operating Temperature | 0 to 60°C |



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