

## MGFL100 Battery Ground Fault Locator



- Alarms when the real fault is identified
- Direct measurement of resistance and stray capacitance
- Direct measurement of fault current and leakage current
- Adjustable current and voltage limits
- Powered off AC or internal battery
- Locates faults up to 400 kΩ
- Locate faults on AC or DC systems
- Operates on systems up to 600 V

### DESCRIPTION

The MGFL100 locates ground faults on ungrounded DC and AC systems, DC battery systems, as well as protected IT networks.

The MGFL100 alarms when the real fault is found, while automatically distinguishing between real fault current and reactive current drawn by stray system capacitance.

### DC GROUND FAULTS

The MGFL100 measures the ground fault resistance, the system capacitance, the real fault current, and the reactive leakage current. It also locates high impedance ground faults due to water ingress, as well as ground faults on systems with high leakage current. The MGFL100 makes locating the ground fault fast and easy by alarming when the circuit with a real ground fault is located. No complicated tuning out of noise or capacitance is required. Easily trace the fault with the lightweight transmitter and receiver. Set both password protected voltage and current limits to ensure you never put too much current in your system.

### AC GROUND FAULTS

Specially protected IT networks, such as those found in hospitals, are designed in such a way that any contact with a voltage carrying line is harmless; in the event of a short to earth, protection reduces current flow to zero.

Important control, signal and supply systems, such as those for railway installations, power plants or other industrial facilities, are designed to be potential-free and are monitored by earth fault indicators in order to ensure safe and uninterrupted operation.

Short-to-ground faults in IT networks, control lines or, for example, signal lines in railways are referred to as earth faults.

While a single earth fault will not disrupt the service, a second earth fault carries a high risk of partial or complete installation breakdown. For this reason, any earth fault must be located and repaired as fast as possible. The MGFL100 allows tracing of these faults by directly coupling to the line. This can be done either off line or on line using a coupling filter.

### FEATURES AND BENEFITS

- Direct measurement of: (No Tuning)
  - Fault resistance
  - Fault current
  - Leakage capacitance
  - Leakage current
- Alarms on circuit with a real ground fault.
- Fused leads (ARC flash safety)
- Adjustable current and voltage limits (No breaker tripping)
- Save and Recall of measurement (Always have a reference)
- Locate faults on AC or DC systems (Versatile)

### APPLICATIONS

- Ungrounded (DC) Battery Strings
  - Substations
  - Railway
- (AC) IT Networks
  - Hospitals
  - Railways
  - Maritime
- Industrial Facilities

## MGFL100

### Battery Ground Fault Locator

- **Direct measurement:** The MGFL100 transmitter measures the total fault resistance and leakage capacitance before you start tracing. This allows you to not only see the actual resistive value of the fault, but also determine if there will be phantom shorts due to leakage current.
- The receiver directly measures the resistive fault current and the leakage current. The MGFL100 will provide a visual, as well as an audible alarm when a real ground fault is located. It will not alarm on circuits that draw leakage current due to capacitance. You will be easily able to see which circuits have the real resistive fault. This will prevent you from chasing phantoms. There is no tuning required, and the measurements are done automatically.
- **Fused leads:** The transmitter leads are fused at the connectors for safety. ARC flash is always a concern when connecting to a battery string. The battery string is a DC system. There is no zero crossing to dampen an ARC flash on a DC system. The fused leads will open to prevent a hazard from arising. The fused leads will keep a mistake from becoming a disaster.
- **Adjustable current and voltage limits:** Set both voltage and current limits. This ensures that neither the voltage nor the current will exceed circuit limits. These limits are password protected, so they cannot be accidentally changed. This ensures there is no accidental breaker tripping.
- The transmitter can be powered off of AC or Battery power. This allows for fault locating in any location.
- The MGFL100 will identify the side of the string with the ground fault. No need to use a DMM.
- The MGFL100 outputs a 5.12Hz AC signal for tracing of the fault.
- This allows for operation on noisy systems. The AC output will not trip DC breakers like a DC pulsed output can. The low frequency output allows for operation on low frequency 16.67Hz systems.
- Locate faults on AC or DC systems. The MGFL100 will locate faults on ungrounded DC systems, (this includes high resistance center grounds) or IT grounded AC systems (with the use of an optional IT isolation filter). The receiver will also trace AC line current on any type of system.

#### SPECIFICATIONS

##### Input Power

##### AC / Adapter

|        |              |
|--------|--------------|
| Input  | 90 – 264 VAC |
| Output | 18 VDC       |

##### Battery

##### Type Lithium Ion

|      |                                            |
|------|--------------------------------------------|
| Life | 4 Hours / External Recharge Time < 8 Hours |
|------|--------------------------------------------|

##### Transmitter Output Voltage and Current

|       |            |
|-------|------------|
| Range | 0 to 50V   |
| Range | 0 to 160mA |

##### Transmitter Voltage Measurement

|          |                    |
|----------|--------------------|
| Range    | 0 to 50V           |
| Accuracy | ±5% reading ±2 LSD |

##### Transmitter Current Measurement

|          |                    |
|----------|--------------------|
| Range    | 0 to 160mA         |
| Accuracy | ±5% reading ±2 LSD |

##### Transmitter Resistance Measurement

|          |                            |
|----------|----------------------------|
| Range    | 0 to 400KΩ                 |
| Accuracy | (±10 ± 280 x RC) % ± 1 LSD |

##### Transmitter Capacitance Measurement

|          |                               |
|----------|-------------------------------|
| Range    | 0 to 19.99µf                  |
| Accuracy | ±20% ± (.0027 / R) fd ± 1 LSD |

##### Receiver Resistive Current Measurement

|          |                                    |
|----------|------------------------------------|
| Range    | 0 to 160 mA                        |
| Accuracy | ±5% of reading ± 0.01 x IC ± 2 LSD |

##### Receiver Capacitive Current Measurement

|                       |                                    |
|-----------------------|------------------------------------|
| Range                 | 0 to 160 mA                        |
| Accuracy at 5.12Hz    | ±5% of reading ± 0.01 x IR ± 2 LSD |
| Accuracy at 50 / 60Hz | +/-5% reading ± 2 LSD              |

##### Environmental

|                   |                                                   |
|-------------------|---------------------------------------------------|
| Operating         | 0° C to 50° C (32° F to 122° F)                   |
| Receiver          | -20° C to 60° C (-4° F to +140° F)                |
| Relative Humidity | 0-95% non-condensing                              |
| Altitude          | <2000m (600V CAT IV)<br>2000-4000m (600V CAT III) |

##### Case

IP51 Ruggedized plastic case

##### Display (Transmitter and Receiver)

LCD

##### Safety/EMC/Vibration

|                                                        |                                         |
|--------------------------------------------------------|-----------------------------------------|
| Meets the requirements of IEC61010-1, CE, CAT IV @ 600 |                                         |
| EMI                                                    | CISPR 11 Group 1 class A for emissions. |
| EMI                                                    | IEC 61326-1 Table A.1 for immunity.     |
| Vibration                                              | MIL-STD-810G                            |

##### Weight / Dimensions

|                        |                                                  |
|------------------------|--------------------------------------------------|
| Transmitter Dimensions | 36.1 x 30.5 x 19.5 cm<br>(14.2" x 12.0" x 7.65") |
| Receiver Dimensions    | 22.1 x 10.4 x 5.1 cm (8.7" x 4.1" x 2.0")        |
| Transmitter Weight     | 6.00 kg (13.2 lbs). (with batteries installed)   |
| Receiver Weight        | 1.00 kg (2.2 lbs) (with batteries installed)     |
| Receiver               | 0.66 lb (0.3 kg)                                 |

##### Compliance

IEC61010-1  
CE Certified, UKCA Certified

## MGFL100

### Battery Ground Fault Locator

| OPTIONAL ACCESSORIES                                                                |                                                                                                                                                                                                                                                                                                                                                                                    |           |
|-------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
|    | Active Mini CT – The Active Mini CT will fit around small conductors. The sliding latch allows it to easily fit in tight locations. Its flux gate technology will allow the CT to measure very low currents.                                                                                                                                                                       | 1013-424  |
|    | Capacitive Pick Up – Will allow identification of reactive leakage current due to stray capacitance during the fault tracing. When this pick up is used, the receiver will alarm on any line with a real fault anywhere in the tracing process. If this is not used, then the receiver needs to be connected to the transmitter in order to identify the line with the real fault. | 1011-354  |
|   | IT Filter – The IT filter is used on IT grounded systems. This filter is connected between the transmitter and the circuit in order to provide isolation between the transmitter and the circuit.                                                                                                                                                                                  | 1014-289  |
|  | Stand Alone Battery Charger – Allows rapid charging of transmitter batteries outside of the transmitter.                                                                                                                                                                                                                                                                           | 90037-318 |
|  | Magnetic Strap – Allows the receiver to be hung from ferrous metal surfaces.                                                                                                                                                                                                                                                                                                       | 1010-013  |
|  | Clip Strap – Allows the receiver to be hung from the lips of surfaces. Can be hung on lips of surfaces up to 6mm (¼") wide.                                                                                                                                                                                                                                                        | 1011-374  |
|  | Wide CT - The Wide CT will fit around cable bundles as wide as 10.8cm (4.25"). Avoiding the need to open the bundle.                                                                                                                                                                                                                                                               | 1014-472  |
|  | 9 Meter (30 Foot) sync cable. Needed in locations where the panel is not close to the battery string                                                                                                                                                                                                                                                                               | 1015-367  |

## MGFL100

### Battery Ground Fault Locator

#### ORDERING INFORMATION

| Item (Qty)                                                                                                                                                                            | Cat. No.  | Included Accessories cont.                               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|----------------------------------------------------------|
| MGFL100 "Includes MGFL100 Transmitter, Fused transmitter leads with different size clips, safety ground, AC Adapter, Receiver, 2" current clamp and receiver / transmitter sync cable | MGFL100   | Transmitter Safety Ground 1011-352<br>Carry Bag 2012-180 |
| <b>Included Accessories</b>                                                                                                                                                           |           | <b>Optional Accessories</b>                              |
| Transmitter                                                                                                                                                                           | 1011-259  | Magnetic Strap for receiver 1010-013                     |
| Receiver                                                                                                                                                                              | 1011-261  | Clip on Strap for receiver 1012-068                      |
| Fused Transmitter Leads                                                                                                                                                               | 1013-440  | Active CT 1013-424                                       |
| Transmitter AC Adapter                                                                                                                                                                | 1014-426  | Capacitive Pick Up 1011-354                              |
| Transmitter Rechargeable Batteries                                                                                                                                                    | 90028-218 | Wide CT 1014-472                                         |
| ICLAMP current sensor                                                                                                                                                                 | 1011-353  | IT Filter 1014-289                                       |
| Receiver 9V battery                                                                                                                                                                   | 23415     | Stand Alone Charger 90037-318                            |
| Sync Cable                                                                                                                                                                            | 1011-540  | 6m (20 ft) Transmitter Leads 1014-091                    |
|                                                                                                                                                                                       |           | 9m (30 ft) sync cable 1015-367                           |

**Megger**<sup>®</sup>