

Multi-Ground Continuous Monitor Installation, Operation and Maintenance



Figure 1. EMIT [50570](#) Multi-Ground Continuous Monitor

Description

The EMIT Multi-Ground Continuous Monitor is a continuous monitor designed to verify that a worksurface, shelving, or equipment is connected to ground which depending upon the value of a company's ESD sensitive items should be a continuous task. The Multi-Ground Continuous Monitor can individually monitor eight ESD protective elements. If there is an interruption in the connection to ground, the Multi-Ground Continuous Monitor will provide both a visual and audible alarm. ESD protective elements are to be periodically checked, but a failure between checks may expose ESD sensitive products to damage from electrostatic discharge. The entire amount of products produced after passing a periodic check and the failure being detected could be suspect.

Per ESD Handbook TR20.20 section 5.3.9.3.1 Worksurface Ground Monitoring "Some continuous monitors can monitor worksurface ground connections. A test signal is passed through the worksurface and ground connections. Discontinuity or over limit resistance changes cause the monitor to alarm. Worksurface monitors test the electrical connection between the monitor, the worksurface, and the ground point. The monitor however, will not detect insulative contamination on the worksurface and alternative test methods such as those outlined in ESD S 4.1 can be used to isolate this problem."

Per ESD TR 12-01 Section 3.2 Equipment "Wrist strap monitor may also monitor equipment ground connections in a manner similar to worksurfaces."

Packaging

- 1 Multi-Ground Continuous Monitor
- 1 Interchangeable Plug Power Supply
- 1 Multi-Ground Hub Kit
- 1 Right Angle Ground Wire, 12' Long
- 1 Ground Wire with Ring Terminal, 10' Long
- 2 Mounting Screws
- 1 Certificate of Calibration

Features and Components

STATUS LEDs

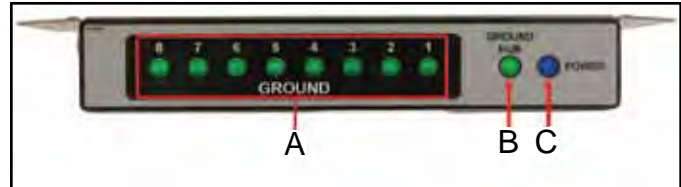


Figure 2. Front view LEDs

A. Ground Status LEDs 1-8:

LED Color	Status
Green	Circuit is within set limit
Red	Circuit is greater than set limit
Off	Desired circuit is set to OFF

B. Ground Hub LED:

LED Color	Status
Green	Terminal GND-H is less than 1.5 ohms from Ground Reference
Red	Terminal GND-H is greater than 2 ohms from Ground Reference

C. Power LED:

LED Color	Status
Green	Circuit is within set limit
Red	Circuit is greater than set limit
Off	Desired circuit is set to OFF

CONNECTIONS

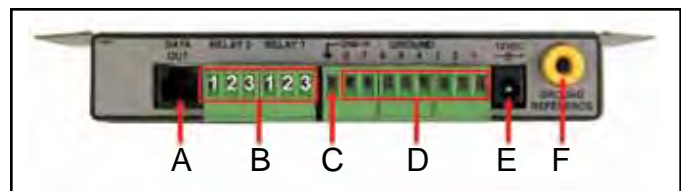


Figure 3. Multi-Ground Continuous Monitor connections

A. Data Out: Contact manufacturer for output details.

B. Relay Terminals: Can be used to output to a light tower or Programmable Logic Controller.

Terminals 1 & 2 = normally open
 Terminals 2 & 3 = normally closed
 1 A@ 30 VDC (Rating)

- C. **GND-H:** Monitors the Multi-Ground Hub.
- D. **Ground Terminals:** Monitors a combination of 8 worksurfaces, tools, carts, and accessories.
- E. **12 VDC Power Jack:** Connect the power adapter here.
- F. **Ground Reference:** Connect to electrical ground.

FUNCTION LEDS

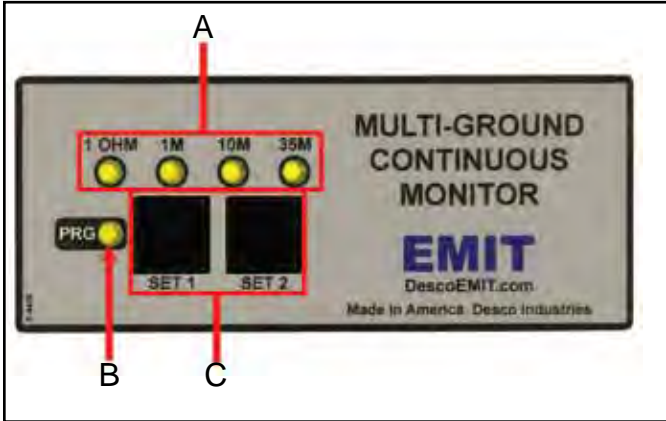


Figure 4. Multi-Ground Continuous Monitor controls and LEDS

- A. **Resistance Range LEDs:** Indicates the selected resistance at which you would like to test.
- B. **Program LED:** Will illuminate when the monitor is ready to be calibrated or programmed. When the LED is off, the monitor is in standby mode / normal operation.
- C. **Set Buttons:** Used to calibrate and program the monitor.

Installation (See Figure 6)

- I. Remove the monitor from the carton and inspect for damage.
- II. Determine the mounting location of the Multi-Ground Continuous Monitor. It is normally installed under a bench top toward the front edge of a workstation where the LEDs are clearly visible.
- III. Install the monitor using the flanges and provided screws (see Figure 5).



Figure 5. Mounting the Multi-Ground Continuous Monitor

- IV. Insert the banana plug of the included right angle ground wire into the banana jack labeled "GROUND REFERENCE" on the monitor.

V. Insert the other end of the ground wire to electrical ground. The included ring terminal may be used for this connection.

VI. Install the included Multi-Ground Hub Kit near the monitor. Visit Desco.com and see Drawing 09837 for installation instructions.

VII. Attach the ring terminal end of the included 10' long ground wire to the Multi-Ground Hub.

VIII. Insert the tinned wire end of the same ground wire into the terminal labeled "GND-H" on the monitor.

CONNECTING ITEMS TO THE MONITOR

The Multi-Ground Continuous Monitor can be set to monitor the resistance of worksurfaces, tools, carts, and accessories using the test ranges of 1 ohm, 1 megohm, 10 megohms, and 35 megohms. It can monitor a combination of 8 items. The following procedure requires items that are not included with the Multi-Ground Continuous Monitor. Use terminals 1-8 on the back of the monitor to connect the item to be monitored to the Multi-Ground Continuous Monitor. One ground wire must be connected to the monitor and the item to be monitored. Another ground wire must be connected to the item to be monitored and the Muti-Ground Hub (see Figure 6).

CONNECTING TO THE RELAY TERMINALS

The Multi-Ground Continuous Monitor can output its test results to a light fixture or programmable logic controller (PLC) using the terminals labeled as "RELAY 1" and "RELAY 2." Refer to Figure 6 and the following information to connect light towers or programmable logic controllers to the Multi-Ground Continuous Monitor.

Terminals 1 & 2 = normally open
 Terminals 2 & 3 = normally closed
 1 A@ 30 VDC (Rating)

Operation

SETTING TEST RANGES

Hold down the SET 1 and SET 2 buttons until the monitor beeps. The GROUND 1 LED on the face of the monitor will begin to blink indicating that its settings are being modified. The PRG LED will illuminate to indicate that the monitor is in Programming Mode. The test range is set if its corresponding LED is illuminated. Use the SET 2 button to cycle through the test ranges. If you would like to turn the ground channel off, press SET 2 until none of the resistance range LEDs are illuminated. The LED for the selected channel will illuminate red.

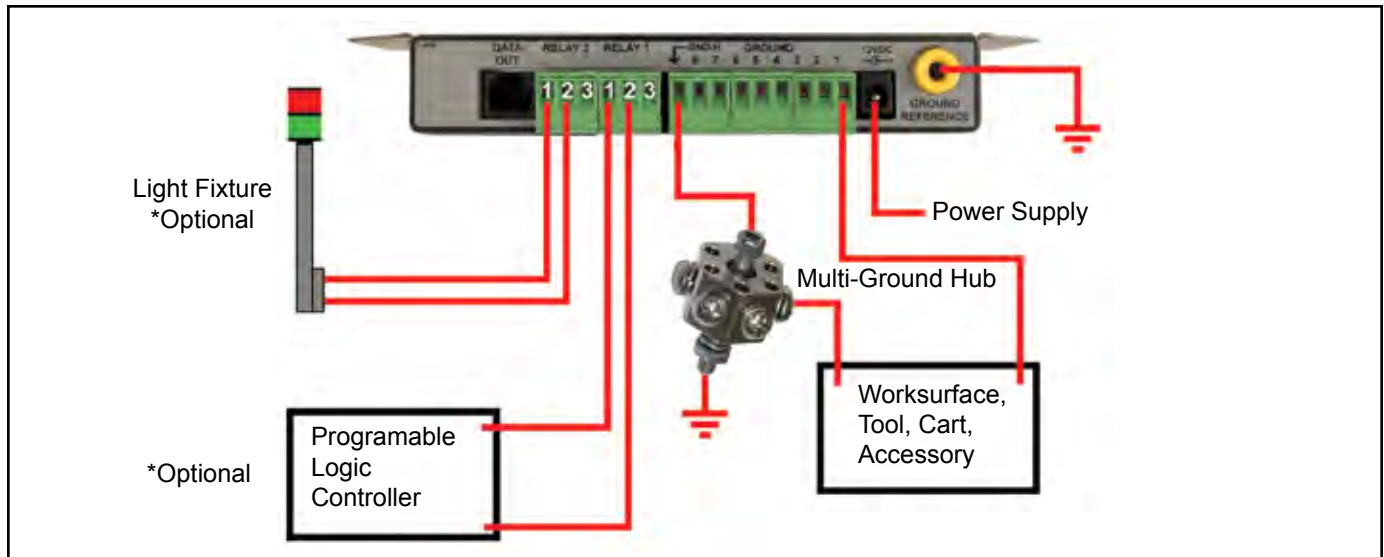


Figure 6. Installing the Multi-Ground Continuous Monitor

TURNING OFF THE AUDIBLE ALARM

If one of the monitored ground channels exceeds its resistance limit, the monitor's audible alarm can be momentarily turned off. This allows you to troubleshoot the problem without the annoyance of the audible alarm. To turn the audible alarm off, press and hold the SET 1 button for approximately 3 seconds during normal operation. To re-activate the audible alarm, press and hold the SET 1 button for approximately 3 seconds. The audible alarm will also re-activate itself once the failed ground channel reenters the resistance limit.

Calibration

CALIBRATION MODE

- I. Disconnect the power adapter from the monitor.
- II. Disconnect all connections from ground terminals 1-8 and relays 1 and 2. Do not disconnect the ground reference from the monitor.
- III. Hold down the SET 1 button and simultaneously power the monitor back up. Within approximately 2 seconds, the PRG LED will illuminate and the monitor will enter Calibration Mode.
- IV. The monitor will then calibrate itself to 1 ohm, 1 megohm, 10 megohms, and 35 megohms for each ground channel.
- V. If the monitor passes calibration, the POWER LED will illuminate blue.
- VI. If the monitor fails calibration, the POWER LED will not illuminate. In this case, follow the steps listed under SELF DIAGNOSTIC MODE.

SELF DIAGNOSTIC MODE

The following steps will help you determine which ground channel is out of calibration.

- I. Disconnect the power adapter from the monitor.
- II. Disconnect all connections from ground terminals 1-8 and relays 1 and 2. Do not disconnect the ground reference from the monitor.
- III. Hold down the SET 2 button and simultaneously power the monitor back up. Within approximately 2 seconds, the PRG LED will illuminate and the monitor will enter Failure Indication Mode.
- IV. The monitor will cycle through each resistance limit.
- V. The ground channel LEDs will then illuminate red or green. Green indicates that the limit is within calibration. Red indicates that the limit is out of calibration.
- VI. Disconnect then reconnect the power to the monitor to return to normal operation.

Specifications

Test Ranges ($\pm 10\%$)

Pass	Fail
≤ 1 Ohm	≥ 2 Ohms
≤ 1 Megohm	≥ 1.2 Megohms
≤ 10 Megohms	≥ 12 Megohms
≤ 35 Megohms	≥ 37 Megohms

The open circuit voltage from the monitor is 5 volts for all ranges except the 1 ohm range which is 1.25 volts.

Operating Voltage	110-240 VAC, 50/60 Hz
Operating Temperature	32°F - 104°F (0 - 40°C)
Monitor Dimensions	7.25" x 4.08" x 0.98" (18.4cm x 10.4cm x 2.5cm)
Monitor Weight	0.93 lbs (0.42 kg)

Limited Warranty

EMIT expressly warrants that for a period of five (5) years from the date of purchase an EMIT Multi-Ground Continuous Monitors will be free of defects in material (parts) and workmanship (labor). Within the warranty period, a credit for purchase of a replacement EMIT Multi-Ground Continuous Monitors, or, at EMIT's option, the Multi-Ground Continuous Monitors will be repaired or replaced free of charge. If product credit is issued, the amount will be calculated by multiplying the unused portion of the expected five year life times the original unit purchase price. Call our Customer Service Department at 909-664-9980 (Chino, CA) for a Return Material Authorization (RMA) and proper shipping instructions and address. Please include a copy of your original packing slip, invoice, or other proof of date of purchase. Any unit under warranty should be shipped prepaid to the EMIT factory. Warranty replacements will take approximately two weeks.

If your unit is out of warranty, call our Customer Service Department at 909-664-9980 (Chino, CA) for a Return Material Authorization (RMA) and proper shipping instructions and address. EMIT will quote repair charges necessary to bring your unit up to factory standards.

Warranty Exclusions

THE FOREGOING EXPRESS WARRANTY IS MADE IN LIEU OF ALL OTHER PRODUCT WARRANTIES, EXPRESSED AND IMPLIED, INCLUDING MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE WHICH ARE SPECIFICALLY DISCLAIMED. The express warranty will not apply to defects or damage due to accidents, neglect, misuse, alterations, operator error, or failure to properly maintain, clean or repair products.

Limit of Liability

In no event will EMIT or any seller be responsible or liable for any injury, loss or damage, direct or consequential, arising out of the use of or the inability to use the product. Before using, users shall determine the suitability of the product for their intended use, and users assume all risk and liability whatsoever in connection therewith.