Dual Independent Footwear Tester Installation, Operation and Maintenance

Made in the United States of America

Figure 1. EMIT Dual Independent Footwear Tester and Dual Foot Plate

Description

The EMIT Dual Independent Footwear Tester is a 6-state touch tester designed for fast and frequent testing of ESD personnel footwear. This tester can be used to verify that the ESD footwear resistance circuit is within the proper limits. By depressing the test button once, the Dual Independent Footwear Tester tests the resistance path limits of both worn ESD footwear independently within three seconds. It can be setup to test a 100 kilohms (10E5) - 1 megohm (10E6) circuit (foot grounders) or a 10 megohms (10E7) - 1 gigohm (10E9) circuit (dissipative shoes).

This unit can be used as one of the tools to fulfill the ANSI/ESD S20.20 Section 6.1.3.2 Compliance Verification Plan. "Verification should include routine checks of the Technical Requirements of the Plan." The Dual Independent Footwear Tester incorporates a unique dual test circuit design which improves test accuracy.

ESD TR1.0-01-01 section 1.0 Introduction
"Since people are one of the greatest sources of static electricity and ESD, proper grounding is paramount."

ESD SP9.2 APPENDIX B - Foot Grounder Usage Guidance
"Compliance verification should be performed prior to each use (daily, shift change, etc.). The accumulation of insulative materials may increase the foot grounder system resistance. If foot grounders are worn outside the ESD protected area testing for functionality before re-entry to the ESD protected area should be considered."

The EMIT Dual Independent Footwear Tester is available in two models:

Model	Voltage	Power Adapter
50404	120 VAC	USA
50412	N/A	Sold separately, see web site

Packaging

1 Dual Independent Footwear Tester
1 Dual Foot Plate
1 Power Adapter †† (50404 only)
1 Stereo Plug to Stereo Plug Cord
1 Banana Plug to Ring Terminal Cord
1 Certificate of Calibration

Installation

The resistance limits for footwear tests is controlled by the DIP switches located on the left-side of the tester (see Figure 2). See the following tables for the DIP switch settings and their corresponding test values.

FOOTWEAR RESISTANCE
DIP switches 1 and 2 control the "HIGH" test limit.

Switch 1	Switch 2	HIGH Limit Resistance
ON	ON	10 Megohms (1 x 10^7)
OFF	OFF	35 Megohms (3.5 x 10^7)*
ON	OFF	100 Megohms (1 x 10^8)
OFF	ON	1 Gigohm†

DIP switches 3 and 4 control the "LOW" test limit.

Switch 3	Switch 4	LOW Limit Resistance
ON	OFF	100 Kilohms (1 x 10^5)
OFF	ON	1 Megohm (1 x 10^6)*

* Default Setting

† NOTE: At 1 Gigohm high limit resistance, a dirty foot plate could result in a false pass. Be sure to keep the foot plate clean, particularly when using this setting. Not suitable for relative humidity greater than 50%.

†† NOTE: This unit must be used with the correct power adapter - a steady 12V adapter with positive center, 0.5 amp, 3.5mm phone plug. Many 220V power adapters are not regulated, so you will see 15 to 18 VDC at the tip. Our adapters regulate the output to almost exactly 12VDC.

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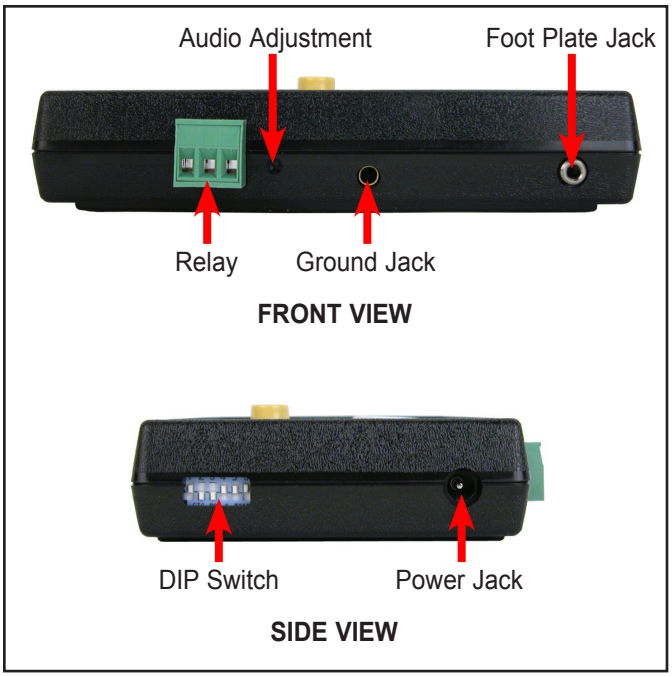

Figure 2. Dual Independent Footwear Tester side views

INSTALLING THE TESTER AND FOOTPLATE
Mount the tester at the desired location using the four mounting holes in the corners of the yellow mounting plate. Set the foot plate below the tester. Insert one end of the Stereo Plug to Stereo Plug cord into the stereo jack located at the bottom of the tester (see Figure 2). Insert the other end of the cord into the stereo jack at the back of the foot plate. Use the cable guide on the bottom of the foot plate to route the cord out the side of the foot plate (see Figure 3).

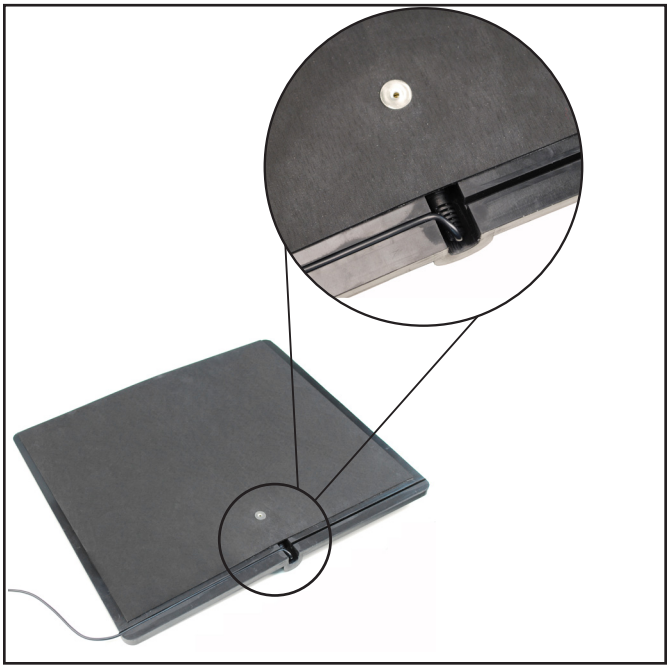

Figure 3. Recessed jack with cable route guide to prevent unintentional disconnect

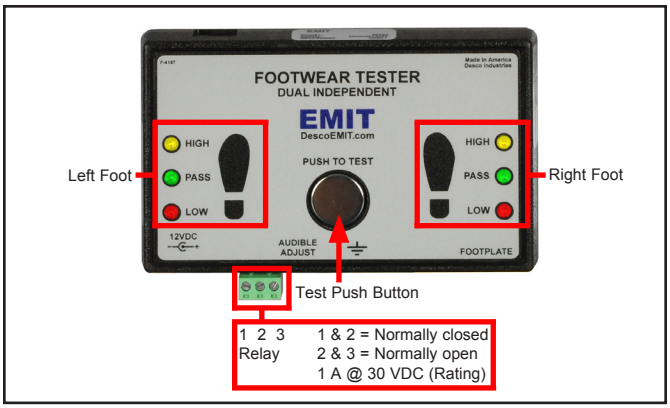

Figure 4. Dual Independent Footwear Tester features and components

Insert the banana plug end of the Banana Plug to Ring Terminal cord into the ground jack located at the bottom of the tester (see Figure 2). Connect the ring terminal end of the cord to Earth ground. This connection will remove any static charge from the user before the test. **NOTE: Failure to correctly ground the tester may result in damage not covered under warranty.**

Insert the power supply plug into the power jack located on the left-side of the tester (see Figure 2). Plug the power supply into an appropriate power outlet.

RELAY TERMINAL
A relay with both "normally open" and "normally closed" contacts is included for your convenience. Going from left to right, the terminal block on the bottom of the tester has terminals for "normally closed," "common," and "normally open" (see Figure 4). The relay can be used for opening an electric lock to an ESD sensitive area. The maximum contact rating is: 1A@30VDC.

Operation

Upon power up, the alarm will sound and all of the LEDs for the activated tests will be illuminated. The tester is now ready for use.

Pushing the test button on the front panel starts the test. During the test all LEDs will turn off to indicate that a test is in progress. The test button must remain depressed until the test results are displayed. Depending on the configuration of the tester, the test could require up to three (3) seconds. The resistance is checked from the test button to the corresponding foot plate for each foot.

The LED(s) will turn off while the test is in progress. The test results for each foot and wrist strap will then be displayed for approximately three (3) seconds. If all tests result in a "PASS" condition, the internal relay will activate.

If any of the test results fail "HIGH" or "LOW," an audible alarm will sound. The LED(s) indicating the failed test will be displayed for approximately three (3) seconds, and the internal relay will not activate.

Calibration

The Dual Independent Footwear Tester is calibrated to standards traceable to NIST. Frequency of recalibratrion should be based on the critical nature of those ESD sensitive items handled and the risk of failure for the ESD protective equipment and materials. In general, we recommend that calibration be performed annually.

The accuracy of the Dual Independent Footwear Tester is specified as:

- ±10% for < 1 Megohm range
- ±10% for 1 Megohm and higher resistance ranges
- ±20% for 1 Gigohm Range

A periodic check (once every 6 to 12 months) using a precision resistance box should be performed to verify proper operation.

The EMIT 50424 Limit Comparator is available for the convenient period testing of the Dual Independent Footwear Tester .

The Limit Comparator allows the customer to perform NIST traceable calibration on the Dual Independent Footwear Tester. The Limit Comparator can be used on the floor shop within a few minutes virtually eliminating downtime, verifiying that the Dual Independent Footwear Tester is operating within tolerances.

See TB-6581 for more information.

Figure 5. EMIT 50424 Limit Comparator

Specifications

Operating Voltage:
12 VDC

Test Switch Voltage:
5 VDC @ open circuit

Wrist Strap and Footwear Test Voltage:
12 VDC @ open circuit

Test Current:
Limited by resistors and varies on the test range setting (100 kilohms - 1 gigohm)

Relay Contact Rating:
1 A @ 30 VDC max

Temperature Range:
41°F - 104°F (5°C - 40°C)

Operating Conditions:
Indoor use only at altitudes less than 6500 ft. (2 km)
Maximum relative humidity of 80% up to 88°F (31°C) decreasing linearly to 50% @ 104°F (40°C)
Maximum relative humidity of 50% at 1 Gigohm setting

Pollution Degree:
2 per IEC 644

Limited Warranty, Warranty Exclusions, Limit of Liability and RMA Request Instructions

See EMIT's Warranty - http://emit.descoindustries.com/Warranty.aspx

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