



**Technical data sheet # TST20E**

**Art. MULTIMEG**

**SURFACE RESISTANCE – TEMPERATURE – HUMIDITY METER**

**meets IEC 61340-5-1**



## GENERAL

Humidity and temperature affect resistivity therefore they must be periodically tested. Generally speaking, a higher grade of RH, or a higher temperature, will increase the ESD features of a specific material, while a colder and dry environment will increase the danger of static accumulation.

MULTIMEG is designed to test resistance, resistivity, humidity and temperature of any conductive, antistatic or static dissipative surfaces in accordance with the IEC 61340-5-1, ESDA 2020, Military, and EIA test procedures.

MULTIMEG is handy, self contained, lightweight and easy to read.

## FEATURES

- Easy to read digital display
- Measures resistivity/resistance to  $10^3$ - $10^{12}$  ohms
- Measures relative humidity-10% to 90% RH
- Measures temperature: 0°C to 37°C 10v/100v dual test voltage ranges
- Automatic zeroing and power off 120v or 220v AC and 9v DC alkaline or nickel cadmium
- Meets ANSI/EOS/ESD Standard 11.11
- CE Approved

The MULTIMEG complete accessory range can include:

- Two 5lb. 2.5" probes with handles and rubber soft bottom
- Two 3" parallel surface resistivity probes on the back.
- Concentric ring probe available (on request)
- Foam lined carrying case

## HOW TO OPERATE

**Resistivity** Place the MULTIMEG on the material to be tested, select the proper voltage test between 10 and 100V, press the test button until the reading comes on the LCD display. The readings of RH and temperature will show on the display too. All readings will disappear within 45 seconds after the reading.

**Resistance** Same procedure as above. Only insert the remote electrodes in the meter with the relative coil cord. Use alligator clip for the RTG measurement (Resistance To Ground). Ensure a good electrical contact between the electrodes and the surface. Connect one cord termination to ground outlet to test resistance to ground.

## OPERATION INSTRUCTIONS

### Operation:

Before testing, please make sure that surfaces to be tested are clean and free of contaminants.

### Parallel Probe Resistivity Method

The parallel resistivity probe method, complies with EOS/ESD-S11.11-1993. It is used to give fast electrical resistivity measurements on flat homogeneous materials. It may be used on multilayered materials, but this should be noted along with the temperature and Humidity value on the data report.

- A. Place the meter on the requested surface to be tested.
- B. Move switch to desired test voltage position, either 10 or 100 volts.
- C. Press and hold the test button with approximately 5 pounds of applied force. After the meter has had time to measure the resistivity, humidity and temperature these values will be displayed on the LCD screen. This will happen in approximately 15 seconds.

The resistivity reading will be in ohms per square inch, temperature in centigrade, and relative humidity in percent.

The meter will keep updating the display while the button is held down and will continue to display the last test reading for approximately 45 seconds after the button is released.

### Concentric Ring Probe Resistivity Method

(Concentric Ring Probe is an optional part)

Insert both coils using the monaural plugs into the 3.5mm meter jacks. Attach the banana plug coil cord terminations to the concentric ring probe.

Place the probe on the surface to be tested. Press the test button and wait 15 seconds. The correct temperature and humidity will be displayed on the LCD screen. The resistivity value displayed must be multiplied by a factor of ten to achieve the actual test value. These values will read in Ohms/square. e.g.  $3.5 \times 10^4$  ohms/square (displayed value).

Actual resistivity value will be  $3.5 \times 10^5$  ohms/square.

### Resistance POINT TO POINT (RTT)

This procedure which complies with EOS/ESD S4.1 measures resistance between two points independent of a ground point. Procedures vary regarding sample preparation, Probe preparation and spacing of the 5 pound probes. Select and read the correct test Procedure for the desired measurement.

- A. Connect the monaural plug ends of the test leads into the 3.5mm jacks of the meter. Connect the banana plugs of the test coil cords into the 2.5 inch disc ends of the 5 pound probes.
- B. Place both probes on the material according to test procedures.
- C. Move switch to desired test voltage position, either 10 or 100 V.
- D. Press and hold the test button until power is applied to the meter and a value is Displayed. Keep the button depressed with sufficient force until the electrical resistance. Relative humidity and temperature readings are displayed on the meter screen.

### Surface-to-Ground Resistance Measurement (RTG)

This procedure measures the surface resistance between a ground point on the material surface and specific positions on the material being tested.

- A. Meter set-up: with both test leads connected to the meter, attach the alligator clip to one lead and the other to the 2.5" disc end of one 5 pound probe.
- B. Attach the alligator clip to a known ground point. Position the probe on the surface to be tested in accordance with the desired test procedure.
- C. Press the test button until the resistivity, humidity and temperature test values are displayed on the LCD screen. These readings will conform to: EIA, ESDA 2020, ANSI, IEC-93 CECC and ASTM test procedures. When performing test, especially with high resistance materials, be sure the test lead wires do not touch or overlap and that your hands are not in contact with the probes or wires during the actual testing of the materials. This will ensure accurate readings.

## SPECIFICATIONS

Accuracy for 10 volt scale	Accuracy for 100 volt scale
$10e3-10e4 \pm 9\% @ RH < 90\%$	$10e6-10e8 \pm 5\% @ RH < 90\%$
$10e4-10e8 \pm 5\% @ RH < 90\%$	$10e9-10e10 \pm 9\% @ RH < 60\%$
$10e8-10e9 \pm 9\% @ RH < 90\%$	$10e10-10e11 \pm 15\% @ RH < 50\%$
$10e9-10e10 \pm 25\% @ RH < 60\%$	$10e11-10e12 \pm 25\% @ RH < 40\%$

### MULTIMEG PERIODIC CALIBRATION PROCEDURE

- 1. Take (1%)  $10^{**3}$  -  $10^{**12}$  Ohm value resistors (or decade box), high accuracy relative humidity hygrometer and a high accuracy thermometer.
- 2. The resistors, hygrometer, and thermometer should be **NIST (or equivalent) calibrated** with a certificate of traceability.
- 3. Open meter being careful not to disturb or break the two wires connecting the power button to the circuit board.

4. Observe on the right lower side of the meter printed circuit board **3 calibration pots**.
5. Allow the meter to equilibrate and normalize in the environment for **2 hours** before testing.
6. Using the supplied coil cords attach the alligator clips to the banana plug ends of the cords.
7. Insert the 3.5mm ends into the meter jacks.
8. Attach the ends of the resistors to the ends of the alligator clips (or connect properly to the decade box).
9. Pots: the top one is for humidity; the middle one is for resistivity; the bottom one is for temperature. Adjustment is done with a small screwdriver. Clockwise is to increase the value, counter clockwise is to decrease the value.
10. Press the power button and compare the resistor value, humidity, and temperature to the parameter to be calibrated.
11. Release the power button and slowly turn the correct adjustment pot.
12. Re-press the power button and observe the LCD screen.
13. Re-press and adjust the pot if necessary.
14. Close case and tighten the 4 screws.
15. Press the power button to verify that the meter is working.

*The datas shown above are intended only as general indication of the standard production values. The do not refer to specific production lots. The document has no legal value.*

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