Resistance System Set
PRS-801
Data Sheet

Portable, precision resistance measurement from $0.1$ to $2.0 \times 10^{14}$ ohms

The widest range portable constant voltage resistance instrument in today’s market, the PRS-801 is the choice of most ESD professionals. Why? Because the PRS-801 has an outstanding performance combination of measurement speed, wide range and accuracy. Its constant test voltage system is extremely stable and consistent with lab level, bench top instruments.

The PRS-801 is one of the fastest measurement instruments in today’s precision measurement market. Laboratory tests confirm the PRS-801 can measure from $0$ to $1.0 \times 10^{12}$ ohms in $2.5$ seconds. Thus, its specified electrification period (EP) is $8$ seconds in accordance with ANSI/ESD STM 11.11 Surface Resistance of Planar Materials. Furthermore, its EP is automatically adjusted to insure a stable measurement is displayed.
### Range
Resistance from 0.1 (1.0E-1)Ω to 200 Tera Ω (2.0E+14Ω). Maximum resistivity with ANSI/ESD STM S11.11 concentric ring 2.0E+15 Ω/square.

### Test Voltages

<table>
<thead>
<tr>
<th>Automatic Mode (Default):</th>
<th>0.01V to 10V Variable 1.0E-1 to 1.0E+4Ω</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant Voltage:</td>
<td>10V: ±&lt;0.2V 1.0E+4 to &lt;1.0E+6Ω</td>
</tr>
<tr>
<td></td>
<td>100V: ±&lt;2.0V 1.0E+6 to 2.0E+14Ω</td>
</tr>
<tr>
<td>Manual Mode:</td>
<td>0.01V to 10V Variable 1.0E-1 to &lt;1.0E+5Ω</td>
</tr>
<tr>
<td></td>
<td>10V: ±&lt;0.2V 1.0E+2 to 1.0E+9Ω</td>
</tr>
<tr>
<td></td>
<td>100V: ±&lt;2.0V 2.0E+5 to 2.0E+14Ω</td>
</tr>
</tbody>
</table>

### Accuracy

- Overall: ±<5% at ambient conditions (at 23°C and 30% Rh)
- Nominal Range Tolerances:
  - 1.0E-1 to 1.0E+1Ω: ±5% corrected for test lead resistance
  - 1.0E+1 to 1.0E+10Ω: ±2.0% with 10' test leads
  - 1.0E+11: ±5.0% with 10' test leads
  - 1.0E+12: ±12% with 10' test leads
  - 1.0E+13 to 2.0E+14Ω: <30% or ±0.25 decade with grounded, shielded leads

### Display

- Multi-function 2-5/8” x 1-5/8” Liquid Crystal Display with 1/2” digit height
- Displays 3-1/2 digits in Ω, or 1.0EXX in exponential format
- Ω Display indicators: Ω, KΩ, MΩ, GΩ and TΩ
- Includes 19-segment analog scale (1-10 with 0.5 indication) with x1, x10, & x100 multipliers
- Number of Data Points in Memory (0-80)
- Automatic Electrification Time (seconds), or time required to manually obtain steady state measurement
- Displays data HOLD, BATTERY status, MIN, MAX, AVG, REC and Test Voltage (<10, 10, or 10V)

### LED Indicators

- 14 color LEDs from <10E-3 to >10E+14Ω.
- Colors (red, green, yellow/orange or blank/OFF)

### Timer

- Time measurements in seconds up to 99 seconds (displayed on LCD)
- <4 ma @ 100V

### Resistance Range Select

- 2 Triangular Arrow Buttons: UP and DOWN.

### Test Volts

- Manual selection of <10, 10 or 100V in Manual mode.
- Automatic mode, discards the most recent Held Value
- Manual Mode:
  - Allows operator to select resistance decade, test voltage and electrification period (EP)
  - Automatic Manual:
    - Selects resistance decade, test voltage, and electrification period (EP)
  - Manual Mode:
    - Manual selection of <10, 10 or 100V in Manual mode.
- RESET:
  - Enters (saves) data into Memory Register, Clears HOLD and Display

### Accuracy

- ±<5% at ambient conditions (at 23°C and 30% Rh)
- Nominal Range Tolerances:
  - 1.0E-1 to 1.0E+1Ω: ±5% corrected for test lead resistance
  - 1.0E+1 to 1.0E+10Ω: ±2.0% with 10' test leads
  - 1.0E+11: ±5.0% with 10' test leads
  - 1.0E+12: ±12% with 10' test leads
  - 1.0E+13 to 2.0E+14Ω: <30% or ±0.25 decade with grounded, shielded leads

### Power

- Two 9-VDC alkaline batteries
- Nominal battery life 25 hours in Automatic
- Greater than 35 hours in Automatic Manual

### Dimensions

- 4.0” wide x 6.0” long x 2.0” deep

### Weight

- 22 ounces, with batteries

### ELECTRIFICATION

- Resistance Range Electrification Period
  - 0.1Ω to <1.0E+6Ω: <3.0 seconds
  - 1.0E+6Ω to <1.0E+12Ω: 8.0 seconds
  - 1.0E+12Ω and greater: 15.0 seconds
- Note: Electrification period varies based on conditions and material stability.

### USEFUL MODES OF OPERATIONS

### Auto Mode:

The instrument automatically selects and adjusts test voltage, resistance range, electrification period, then displays and Holds the measurement. The displayed measurement is the average of eight consecutive measurements, all within ±5% of each other. The measurement is “saved” in the Memory Register by pressing RESET. The instrument is now ready for the next measurement.

### Manual Mode:

- Allows operator to select resistance decade, test voltage and electrification period (EP)
- Same as Auto Mode with following exceptions:
  - Allows operator to select starting resistance decade
  - Always starts measurement from the last measurement value without resetting to zero. This extends battery life and speeds up measurement sequence.

### DATA LOG & CALCULATION

In RECORD mode, the PRS-801 stores up to 80 measurements, and on demand will calculate and display the Minimum, Maximum and Average measurements stored in the register. Using its RS-232 output and cable accessory, the PRS-801 will communicate with computer serial ports. The instrument is supplied with the new PROSTAT® Audit Program on a 3-1/2 inch disc, which contains spread sheet templates for recording ESD Audit Program Data in Excel® software. The PRS-801 computer output and Program disk are compatible with the Semtronics SCCN® ground monitoring system.

### USAGE RECOMMENDATION

- Designed for Intermittent use. Not intended for continuous use or production applications.