The 3540 mΩ HiTESTER is a high performance low resistance tester that includes a comparator function essential for component sorting, fast 16-times-per-second sampling, temperature compensation and auto-ranging, and a choice of interfaces to meet your measurement needs. The standard 3540 is the economical version without external control interfaces, making it the no-fuss solution for manual testing. For more advanced system integration capabilities, select Model 3540-01 for a built-in BCD output interface providing for external control, Model 3540-02 to output measurement results to a printer, and Model 3540-03 to add PC compatibility via a built-in RS-232C interface.
Internal Comparator with Fast 100-ms Response

**Features**
- Comparator function stores up to seven tables
- Dual comparator modes: Hi-Lo compares upper and lower limits, and REF-% compares a range and standard value
- Fast response of about 100 ms (measuring pure resistance: actual response depends on material under test)
- Temperature compensation function measures temperature and calculates value relative to copper at 20°C/68°F
- 4-terminal method eliminates the effects of leads and contact resistance
- Auto-ranging function
- Dual power system: batteries or AC adapter
- BCD, printer interface and RS-232C interface options in -01, -02 and -03 suffix versions, respectively

**Main Buttons**

1. Range Select, Auto-Range On/Off
2. Hold (also controllable by external trigger and EOC, besides displaying hold)
3. Temperature compensation On/Off or temperature display
4. Button lock
5. Comparator Table Select (Up to 7 states can be memorized)
6. Comparator Mode Select (Hi-Lo or REF-%)
7. Comparator Value Set (Upper/Lower limits or standard value/range settings)
8. Beeper Mode Select (HL, IN, OFF)
9. Comparator On/Off
10. Sampling Speed Select (Fast: 16 times/s, or Slow: 4 times/s)

*All display segments shown lit for purposes of illustration.

**Comparator Function**
The comparator includes a Hi-Lo mode for setting upper and lower limits, and a REF-% mode for setting a standard value and range. Up to seven tables can be memorized, each storing a measurement range, comparator mode and comparator values.

**Hi-Lo Comparator**

Example display with FAST sampling, measurement value 30.00 mΩ, temperature compensation on, table no. 1, upper limit 30.10 and lower limit 29.90, and beeper mode HL.

**REF-% Comparator**

Example display with FAST sampling, 100.0% deviation of display from standard value (displayed deviation = measured value / standard value × 100%), temperature compensation function on, table no. 7, standard value is 30.00, range is ±10.0%, and beeper mode IN.

**3540**
The basic version includes the essential functions: eliminating external interfaces to keep the price low. Comparator results are displayed by LED and beeper. Jacks are provided on the rear panel for the temperature probe (for temperature compensation), and for the AC adapter.

**Temperature Measurement Display**

Temperature Probe Jack  AC Adapter Jack
Ideal Interface for System Integration

### 3540-01

This version is equipped with a digital interface providing BCD output of comparator results and external control capability, as well as the essential functions of the 3540. Along with BCD output, the range, comparator tables, EOC and power can be externally controlled, ideal for system applications.

**Timing Chart Example**

The following chart shows the timing relationships between comparator results using the hold function and BCD output at the external connector.

**CC ERR**

1. Trigger 1
2. Trigger 2
3. Trigger 3

**EOC**

1. Measurement 1
2. Measurement 2

**Hi IN Lo**

1. Previous Judgment
2. Judgment 1
3. Judgment 2

**BCD DP**

1. Previous Measurement
2. Measurement 1
3. Measurement 2

**FAST**

- 1: 40 ms
- 2: 60 ms

**SLOW**

- 1: 70 ms
- 2: 230 ms

At Hold time, the EOC is retained until the next trigger to facilitate sequencing. Display and output are retained until the next EOC is taken.

CC ERR input enhances test reliability with various materials under test:

1. (Setting time) after checking, the delay until measured power is stable before triggering. Setting time depends on material under test (value is relative to pure resistance).

2. (Measuring) raising EOC accepts BCD and comparator results, so the desired data is captured.

### 3540-02

This version is equipped with a printer interface. The printer connector is provided along with the external I/O terminals of the -01 version, allowing printing by external request. The optional model 9203 DIGITAL PRINTER provides interval printing, statistical processing of maximum, minimum, average, standard deviation, histograms and graph printing. A standard printer with Centronics interface can also be connected.

**Printing Examples**

- **Statistical Processing**
  - Histogram
  - Graph Printing

### 3540-03

This model is equipped with an RS-232C interface, through which all features of the instrument other than the power supply can be controlled remotely. Measurement data can also be output through the interface for processing by various applications, increasing the scope of data utility.

**RS-232C Specifications**

- **Transfer method**: Synchronous transfer, full duplex.
- **Transfer rate**: 19200
- **Data format**: 8 data bits, no parity, 1 stop bit
- **Handshaking**: No support for X flow or hardware flow control
- **Delimiter**: CR or CR+LF during receive, CR+LF during send
- **Connection cable**: D-sub 9-pin female connector, reverse connection
### 3540 Specifications

**Temperature Compensation**
- Standard Temperature: 20°C/68°F, Temperature Modulus: 3930 ppm/C° wire

**Function:**
- Comparator: Selectable Hi-Lo or REF-%
- Comparator results are indicated by LED and beeper
- Up to 7 table memories (external table selection only with selectable from HI/IN/OFF)
- External output (open collector: versions -01, -02 and -03 only)

**External Interface:**
- Centronics interface (versions -02 only), RS-232C interface (-03 only)

**Measurement Ranges**

**Resistance Measurement:** (sample rate: SLOW, add 3 digits to the following digit tolerances)

<table>
<thead>
<tr>
<th>Range</th>
<th>30 mΩ</th>
<th>300 mΩ</th>
<th>3 Ω</th>
<th>30 Ω</th>
<th>300 Ω</th>
<th>3 kΩ</th>
<th>30 kΩ</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resolution</td>
<td>10 μΩ</td>
<td>100 μΩ</td>
<td>1 mΩ</td>
<td>10 mΩ</td>
<td>100 mΩ</td>
<td>1 Ω</td>
<td>1 Ω</td>
</tr>
<tr>
<td>Measuring Current</td>
<td>100 mA</td>
<td>100 mA</td>
<td>1 mΩ</td>
<td>10 mΩ</td>
<td>100 mΩ</td>
<td>1 Ω</td>
<td>1 Ω</td>
</tr>
<tr>
<td>Maximum Applied Voltage</td>
<td>3.5 mV</td>
<td>35 mV</td>
<td>3.5 mV</td>
<td>350 mV</td>
<td>35 mV</td>
<td>350 mV</td>
<td>350 mV</td>
</tr>
<tr>
<td>Accuracy</td>
<td>±0.1%/rdg. ±0.1%/rdg.</td>
<td>±0.1%/rdg. ±0.1%/rdg.</td>
<td>±0.1%/rdg. ±0.1%/rdg.</td>
<td>±0.1%/rdg. ±0.1%/rdg.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Temperature Modulus</td>
<td>(±0.02%/rdg. ±0.5%/rdg.)/°C (1.8°F)</td>
<td>(±0.02%/rdg. ±0.5%/rdg.)/°C (1.8°F)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Open-Terminal Voltage</td>
<td>4.0 V max.</td>
<td>4.0 V max.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Overvoltage Protection:**
- Operating temperature range: 0 to 40°C (32°F to 104°F), less than 85% rh
- Storage temperature range: -10 to 50°C (14°F to 122°F), less than 85% rh

**Power Supply:**
- AA-size Alkaline batteries: type LR6 x 6 pcs, or
- AA-size Manganese batteries: type R6P x 6 pcs, or
- Model 9445 AC ADAPTER (9 V DC, 1.4 A)

**Operating Time:**
- w/LR6 batteries: approx. 7 h (30 and 300 mΩ ranges)
- approx. 18 h (other ranges)

**Booster option:**
- w/R6P batteries: approx. 1.5 h (30 and 300 mΩ ranges)
- approx. 6 h (other ranges)

**Maximum Rated Power:**
- 5 V A

**Dimensions:**
- 215W × 61H × 213D mm (8.5” W × 2.4” H × 8.4” D)

**Mass:**
- 3540 - Approx. 900 g (2.1 lbs), 3540-01 - Approx. 1 kg (35.3 oz.)

**Accessories:**
- 9267-10 CLIP TYPE LEADS (1), 9451 TEMPERATURE PROBE (1), Ferrite Clamp (2), External Connector Socket (*Ver.-01 only), HIROSE ELECTRIC INC. 37-pin plug / type FDCD-37P

**Conforming Standards:**
- Safety: EN61010-1:1993
- Overvoltage category II (expected overvoltage 330V)

**Pollution degree:** 2

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