Agilent
4338B Milliohm Meter
10 μΩ to 100 kΩ

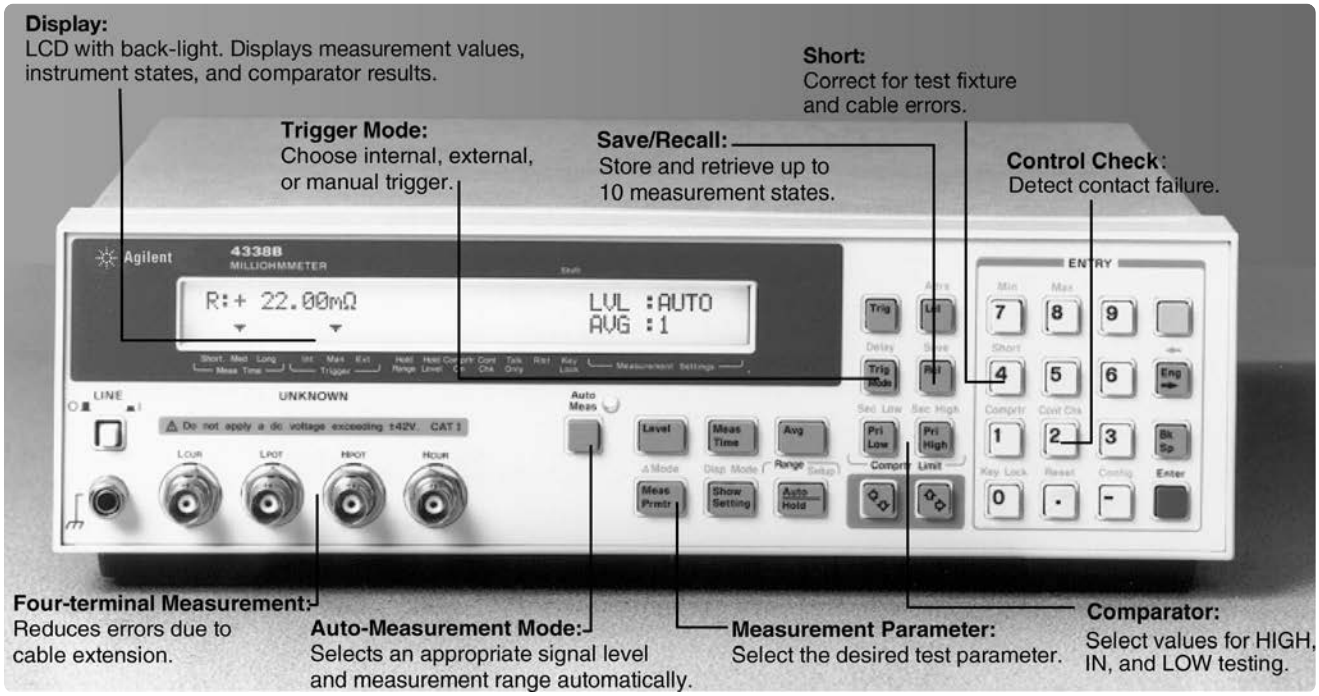
Technical Overview

Introduction

Ideal for precise measurements of extremely low resistances using an ac test signal, the Agilent Technologies 4338B suits bench-top applications that require flexible testing and reliable results. The milliohm meter satisfies system throughput demands for fast, high-quality measurements.

Agilent Technologies

The Agilent 4338B



Satisfy Your Needs for ...

High-quality testing

- Remove parasitics with error correction
- Achieve consistent results with 0.4% basic accuracy
- Verify test connections with contact check function
- Stabilize data with selectable measurement times and averaging
- Eliminate trigger timing errors with trigger delay

Operating versatility

- Select from 5 impedance parameters
- Pick from 7 probes, test fixtures, and accessories
- Configure the instrument quickly with Save/Recall
- Reduce test complexity with auto-measurement function

Fast test throughput

- Get 34 ms/measurement speed
- Perform Pass/Fail testing with comparator function
- Operate remotely via the GPIB interface
- Use the built-in handler interface

Key Parameters and Specifications

Test frequency:
1 kHz

Impedance parameter sets:
R, |Z|-θ, R-L, R-X

Basic accuracy:
0.4%

Test current levels:
1 µA, 10 µA, 100 µA, 1 mA, 10 mA

Error correction:
Short compensation

Display digits:
3, 4, or 5 digits (selectable)

Save/recall:
10 instrument states

Interfaces:
GPIB and handler interface

Satisfy your need for high-quality testing

- Resolve data to 5 digits
- Make precise measurements with 0.4% basic accuracy
- Eliminate impedance calculations; select the parameter you need: R, |Z|, θ, L, X
- Verify DUT performance under simulated operating conditions
- Perform dry contact testing with minimal test signal (≤ 20 mV)
- Obtain high-confidence testing with contact check function

Test electromechanical devices

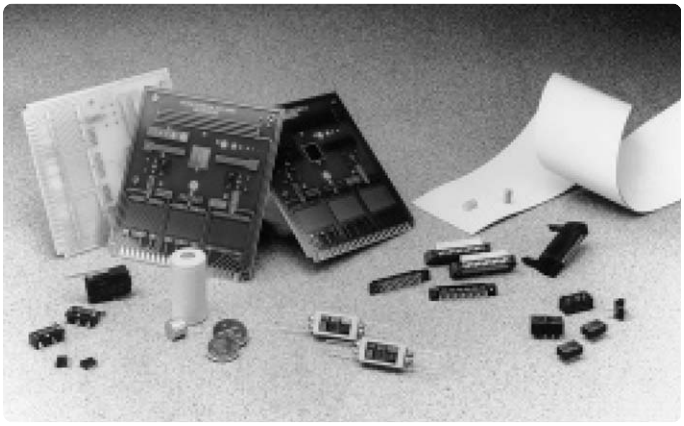
- Perform dry contact testing with low-level test signals
- Select from a variety of probes and test fixtures to fit your application
- Resolve measurements to 10 μΩ
- Test switches, cables, connectors, relays, and pc board traces

Evaluate battery internal resistance

- Protect your investment with voltage protection on terminals (Max. 42 Vdc)
- Perform non-invasive testing with no effects on charge/discharge cycles
- Avoid polarization effects with an ac test signal

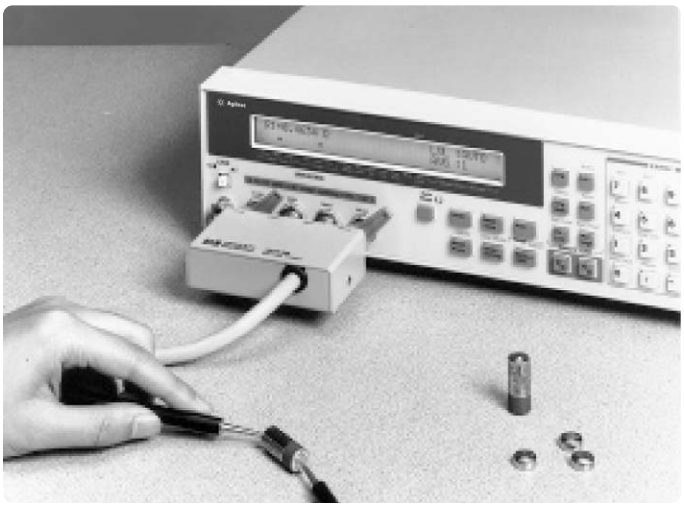
System features for automation in manufacturing

- Maximize accuracy with error correction
- Automate testing with GPIB interface for computer control
- Reduce ground-loops with isolated handler interface
- Continue testing after ac power loss with non-volatile memory
- Perform pass/fail testing with comparator function (HIGH, IN, LOW)



Make precise ultra-low resistance measurements with the 4338B.

Use the milliohm meter for electromechanical contact testing.



The 4338B is ideal for battery evaluation.

Agilent 4338B Specifications

Measurement accuracy

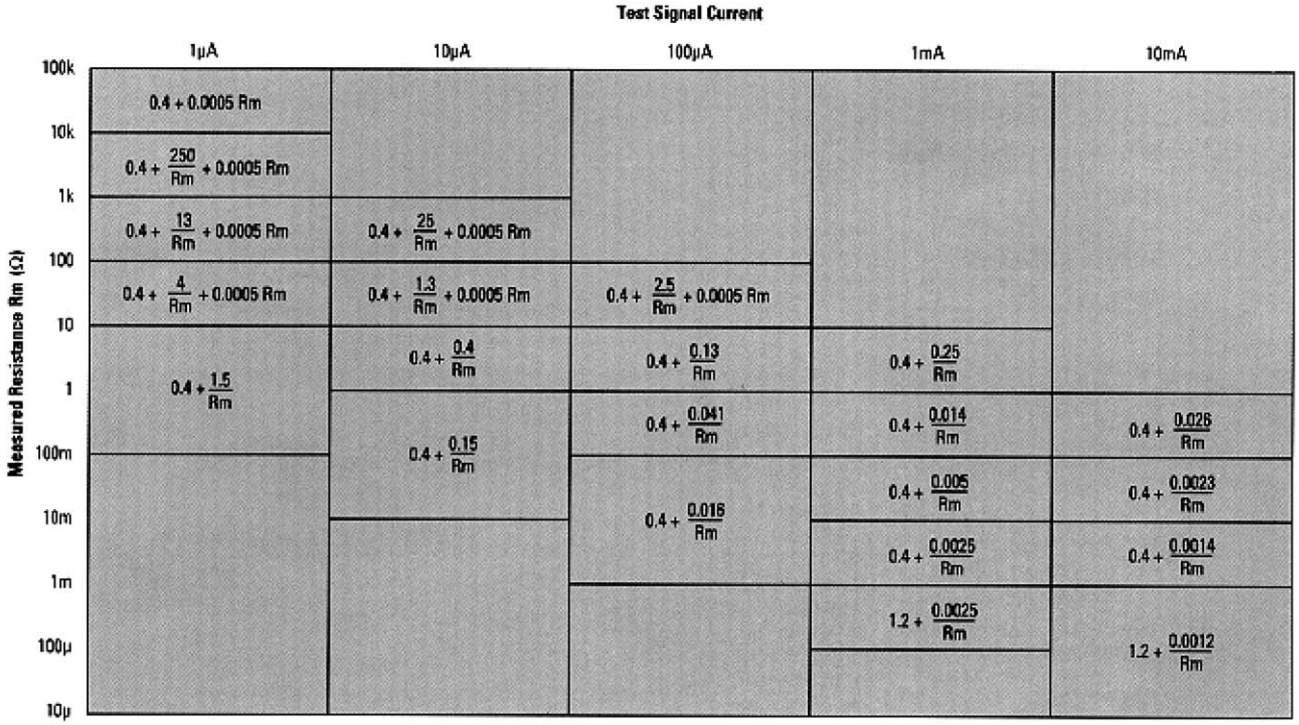


Table 1. Measurement accuracy (± % of reading)

Measurement conditions

The following test conditions apply for the data shown in Table 1:[1]

1. Warm-up time: ≥ 30 minutes
2. Ambient temperature: 23 °C ± 5 °C
3. Test cable length: 0 meter
4. Short error correction performed.
5. Measurement time: LONG

Measurement parameters/ranges

Parameter	Range
R	10 μΩ to 100 kΩ
X, |Z|	10 μΩ to 100 kΩ (typical)
L	10 nH to 10 H (typical)
θ	-180° to +180°

1. Other test-condition data is available in the operation manual.

Measurement conditions and functions

Test frequency: 1 kHz ± 0.1%

AC test signal level (rms current): 1 µA, 10 µA, 100 µA, 1 mA, 10 mA

Maximum applied AC voltage: 20 mV peak

Maximum DC voltage to BNC terminals: 42 V

Ranging: Auto and hold

Maximum cable length: 2 meters

Trigger: Internal, manual, and external

Delay time: 0 to 9999 ms in 1-ms steps

Averaging: 1 to 256

Measurement time (typical):

Short	Medium	Long
34 ms	70 ms	900 ms

Other instrument functions

Math functions: Deviation (Δ) and percent deviation (%Δ).

Short error correction: Eliminates measurement errors due to parasitic impedances in cables and test fixtures.

Comparator: HIGH, IN, and LOW for primary and secondary parameters.

Continuous memory: All instrument settings are automatically saved for up to 72 hours when power is lost or the instrument is turned off.

Save/recall: 10 instrument states from non-volatile memory.

Contact check: Detects contact failure.

GPIB: Implementation of IEEE-488 for control and data.

Handler interface:
Negative logic and optically isolated;
output signals: HIGH/IN/LOW,
end-of-measurement, index, and alarm;
input signals are keylock and external trigger.

Physical characteristics

Power: 90-132 Vac or 198-264 Vac. 47-66 Hz. 45 VA typical.

Operating temperature: 0 °C to 45 °C

Dimensions: 320(W) x 100(H) x 300(D) mm

Weight: 4.5 kg

Test Fixtures/Accessories for the Agilent 4338B Milliohm Meter

16005-60011 Kelvin clip lead (large)
Cable length, 0.4 meter. Jaws mate with large terminal devices. One lead supplied only.

16006-60001 pin-type probe lead
Cable length, 0.4 meter. Spring-loaded probe tips for firm contact. Useful for manual contact measurements. One lead supplied only.

16005-60012 Kelvin IC clip lead (red clip)
16005-60014 Kelvin IC clip lead (black clip)
Cable length, 0.4 meter. Small contacts for devices with fine leads. One lead supplied only.

16007-60001 alligator clip lead (red clip)
16007-60002 alligator clip lead (black clip)
Alligator clip lead. Cable length, 0.4 meter. Each test lead has a separate alligator clip voltage and current terminal. One lead supplied only.

16143-60011 mating cable
Interface between test leads and 4338B. Cable length, 0.5 meter.

16338A test lead kit
Contains one each of the following: 16143-60011, 16005-60012/14, 16007-60001/2, carrying case. Contains two each of the following: 16005-60011 and 16006-60001.

Ordering information

Agilent 4338B milliohm meter
Furnished accessories:
Power cable
(Test fixtures are not furnished as standard.)

Manual options[1]
4338B-ABA U.S - English localization
4338B-ABJ Japan - Japanese localization
4338B-0BW Add service manual

Cabinet options
4338B-1CM Rack mount kit
4338B-1CN Front handle kit
(Rack flange handle kit is not compatible.)

Calibration certificate option
4338B-1A7 ISO 17025 compliant calibration

Test fixtures and accessories:

16005-60011 Kelvin clip lead (1 lead only)

16005-60012 Kelvin IC clip lead, red clip (1 lead only)

16005-60014 Kelvin IC clip lead, black clip (1 lead only)

16006-60001 pin-type probe lead (1 lead only)

16007-60001 alligator clip lead, red (1 lead only)

16007-60002 alligator clip lead, black (1 lead only)

16143-60011 mating cable
(Requires 2 leads)

16338A test lead kit.
Includes 16005-60011, 16005-60012/14, 16006-60001, 16007-60001/2 leads, 16143-60011 mating cable and carrying case.

1. Manual is not furnished as standard.

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