Agilent 34401A Multimeter
Uncompromising Performance for Benchtop and System Testing

Product Overview

- Measure up to 1000 volts with 6½ digits resolution
- 0.0015% basic dcV accuracy (24 hour)
- 0.06% basic acV accuracy (1 year)
- 3Hz to 300kHz ac bandwidth
- 1000 readings/sec. direct to GPIB

Superior performance

The Agilent Technologies 34401A multimeter gives you the performance you need for fast, accurate bench and system testing. The 34401A provides a combination of resolution, accuracy and speed that rivals DMMs costing many times more. 6½-digits of resolution, 0.0015% basic 24-hr dcV accuracy and 1,000 readings/sec direct to GPIB assure you of results that are accurate, fast, and repeatable.

Use it on your benchtop

The 34401A was designed with your bench needs in mind. Functions commonly associated with bench operation, like continuity and diode test, are built in. A Null feature allows you to remove lead resistance and other fixed offsets in your measurements. Other capabilities like min/max/avg readouts and direct dB and dBm measurements make checkout with the 34401A faster and easier.

The 34401A gives you the ability to store up to 512 readings in internal memory. For trouble-shooting, a reading hold feature lets you concentrate on placing your test leads without having to constantly glance at the display.

Use it for systems testing

For systems use, the 34401A gives you faster bus throughput than any other DMM in its class. The 34401A can send up to 1,000 readings/sec directly across GPIB in user-friendly ASCII format.

You also get both GPIB and RS-232 interfaces as standard features. Voltmeter Complete and External Trigger signals are provided so you can synchronize to other instruments in your test system. In addition, a TTL output indicates Pass/Fail results when limit testing is used.

To ensure both forward and backward compatibility, the 34401A includes three command languages (SCPI, Agilent 3478A and Fluke 8840A /42A), so you don’t have to rewrite your existing test software. An optional rack mount kit is available.

Easy to use

Commonly accessed attributes, such as functions, ranges, and resolution are selected with a single button press.

Advanced features are available using menu functions that let you optimize the 34401A for your applications.

The included Agilent IntuiLink software allows you to put your captured data to work easily, using PC applications such as Microsoft Excel® or Word® to analyze, interpret, display, print, and document the data you get from the 34401A. You can specify the meter setup and take a single reading or log data to the Excel spreadsheet in specified time intervals. Programmers can use ActiveX components to control the DMM using SCPI commands. To find out more about IntuiLink, visit www.agilent.com/find/intuilink

1-year Warranty

With your 34401A, you get full documentation, a high-quality test lead set, calibration certificate with test data, and a 1-year warranty, all for one low price.
### Accuracy Specifications ± (% of reading + % of range)\(^{(1)}\)

<table>
<thead>
<tr>
<th>Function</th>
<th>Range(^{(2)})</th>
<th>Frequency, etc.</th>
<th>24 Hour (^{(2)}) 23°C ± 1°C</th>
<th>90 Day 23°C ± 5°C</th>
<th>1 Year 23°C ± 5°C</th>
<th>Temperature Coefficient 0°C – 18°C 28°C – 55°C</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>dc Voltage</strong></td>
<td>100.0000 mV</td>
<td>3 Hz - 5 Hz</td>
<td>1.00 + 0.03</td>
<td>1.00 + 0.04</td>
<td>1.00 + 0.04</td>
<td>0.100 + 0.004</td>
</tr>
<tr>
<td></td>
<td>1.000000 V</td>
<td>5 Hz - 10 Hz</td>
<td>0.35 + 0.03</td>
<td>0.35 + 0.04</td>
<td>0.35 + 0.04</td>
<td>0.035 + 0.004</td>
</tr>
<tr>
<td></td>
<td>10.00000 V</td>
<td>10 Hz - 20 kHz</td>
<td>0.04 + 0.03</td>
<td>0.05 + 0.04</td>
<td>0.06 + 0.04</td>
<td>0.005 + 0.004</td>
</tr>
<tr>
<td></td>
<td>100.0000 V</td>
<td>20 kHz - 50 kHz</td>
<td>0.10 + 0.05</td>
<td>0.11 + 0.05</td>
<td>0.12 + 0.04</td>
<td>0.011 + 0.005</td>
</tr>
<tr>
<td></td>
<td>1000.00 V</td>
<td>50 kHz - 100 kHz</td>
<td>0.55 + 0.08</td>
<td>0.60 + 0.08</td>
<td>0.60 + 0.08</td>
<td>0.060 + 0.008</td>
</tr>
<tr>
<td></td>
<td>100 kHz - 300 kHz</td>
<td></td>
<td>4.00 + 0.50</td>
<td>4.00 + 0.50</td>
<td>4.00 + 0.50</td>
<td>0.20 + 0.02</td>
</tr>
<tr>
<td><strong>True rms ac Voltage</strong></td>
<td>100.0000 mV</td>
<td>3 Hz - 5 Hz</td>
<td>1.00 + 0.02</td>
<td>1.00 + 0.03</td>
<td>1.00 + 0.03</td>
<td>0.100 + 0.003</td>
</tr>
<tr>
<td></td>
<td>1.000000 V</td>
<td>5 Hz - 10 Hz</td>
<td>0.35 + 0.02</td>
<td>0.35 + 0.03</td>
<td>0.35 + 0.03</td>
<td>0.035 + 0.003</td>
</tr>
<tr>
<td></td>
<td>750.000 V</td>
<td>10 Hz - 20 kHz</td>
<td>0.04 + 0.02</td>
<td>0.05 + 0.03</td>
<td>0.06 + 0.04</td>
<td>0.005 + 0.001</td>
</tr>
<tr>
<td><strong>Resistance</strong></td>
<td>100.0000 Ω</td>
<td>1 mA Current Source</td>
<td>0.0030 + 0.0030</td>
<td>0.008 + 0.004</td>
<td>0.0010 + 0.004</td>
<td>0.0005 + 0.0005</td>
</tr>
<tr>
<td></td>
<td>1.000000 kΩ</td>
<td>1 mA</td>
<td>0.0020 + 0.0005</td>
<td>0.008 + 0.001</td>
<td>0.0010 + 0.001</td>
<td>0.0005 + 0.0005</td>
</tr>
<tr>
<td></td>
<td>10.00000 kΩ</td>
<td>100 µA</td>
<td>0.0020 + 0.0005</td>
<td>0.008 + 0.001</td>
<td>0.0010 + 0.001</td>
<td>0.0005 + 0.0005</td>
</tr>
<tr>
<td></td>
<td>100.0000 MΩ</td>
<td>5.0 µA</td>
<td>0.002 + 0.001</td>
<td>0.008 + 0.001</td>
<td>0.0010 + 0.001</td>
<td>0.0005 + 0.0001</td>
</tr>
<tr>
<td></td>
<td>1000.000 MΩ</td>
<td>500 nA</td>
<td>0.015 + 0.001</td>
<td>0.020 + 0.001</td>
<td>0.040 + 0.001</td>
<td>0.030 + 0.004</td>
</tr>
<tr>
<td></td>
<td>1000.000 MΩ</td>
<td>500 nA</td>
<td>10MΩ</td>
<td>0.300 + 0.010</td>
<td>0.800 + 0.010</td>
<td>0.800 + 0.010</td>
</tr>
<tr>
<td><strong>dc Current</strong></td>
<td>10.00000 mA</td>
<td>&lt;0.1 V Burden Voltage</td>
<td>0.005 + 0.010</td>
<td>0.030 + 0.020</td>
<td>0.050 + 0.020</td>
<td>0.02 + 0.002</td>
</tr>
<tr>
<td></td>
<td>100.0000 mA</td>
<td>&lt;0.6 V</td>
<td>0.010 + 0.004</td>
<td>0.030 + 0.005</td>
<td>0.050 + 0.005</td>
<td>0.002 + 0.0005</td>
</tr>
<tr>
<td></td>
<td>1.000000 A</td>
<td>&lt;1 V</td>
<td>0.050 + 0.006</td>
<td>0.080 + 0.010</td>
<td>0.100 + 0.010</td>
<td>0.005 + 0.001</td>
</tr>
<tr>
<td></td>
<td>3.00000 A</td>
<td>&lt;2 V</td>
<td>0.100 + 0.020</td>
<td>0.120 + 0.020</td>
<td>0.120 + 0.020</td>
<td>0.005 + 0.002</td>
</tr>
<tr>
<td><strong>True rms ac Current</strong></td>
<td>1.000000 A</td>
<td>3 Hz - 5 Hz</td>
<td>1.00 + 0.04</td>
<td>1.00 + 0.04</td>
<td>1.00 + 0.04</td>
<td>0.100 + 0.006</td>
</tr>
<tr>
<td></td>
<td>5 Hz - 10 Hz</td>
<td>0.30 + 0.04</td>
<td>0.30 + 0.04</td>
<td>0.30 + 0.04</td>
<td>0.30 + 0.04</td>
<td>0.035 + 0.006</td>
</tr>
<tr>
<td></td>
<td>10 Hz - 5 kHz</td>
<td>0.10 + 0.04</td>
<td>0.10 + 0.04</td>
<td>0.10 + 0.04</td>
<td>0.10 + 0.04</td>
<td>0.015 + 0.006</td>
</tr>
<tr>
<td></td>
<td>3.00000 A</td>
<td>3 Hz - 5 Hz</td>
<td>1.10 + 0.06</td>
<td>1.10 + 0.06</td>
<td>1.10 + 0.06</td>
<td>0.100 + 0.006</td>
</tr>
<tr>
<td></td>
<td>5 Hz - 10 Hz</td>
<td>0.35 + 0.06</td>
<td>0.35 + 0.06</td>
<td>0.35 + 0.06</td>
<td>0.35 + 0.06</td>
<td>0.035 + 0.006</td>
</tr>
<tr>
<td></td>
<td>10 Hz - 5 kHz</td>
<td>0.15 + 0.06</td>
<td>0.15 + 0.06</td>
<td>0.15 + 0.06</td>
<td>0.15 + 0.06</td>
<td>0.015 + 0.006</td>
</tr>
<tr>
<td><strong>Frequency or Period</strong></td>
<td>100 mV</td>
<td>3 Hz - 5 Hz</td>
<td>0.10</td>
<td>0.10</td>
<td>0.10</td>
<td>0.005</td>
</tr>
<tr>
<td></td>
<td>5 Hz - 10 Hz</td>
<td>0.05</td>
<td>0.05</td>
<td>0.05</td>
<td>0.05</td>
<td>0.005</td>
</tr>
<tr>
<td></td>
<td>750 V</td>
<td>10 Hz - 40 Hz</td>
<td>0.03</td>
<td>0.03</td>
<td>0.03</td>
<td>0.001</td>
</tr>
<tr>
<td></td>
<td>40 Hz - 300 kHz</td>
<td></td>
<td>0.006</td>
<td>0.01</td>
<td>0.01</td>
<td>0.001</td>
</tr>
<tr>
<td><strong>Continuity</strong></td>
<td>1000.0Ω</td>
<td>1mA Test Current</td>
<td>0.002 + 0.010</td>
<td>0.008 + 0.020</td>
<td>0.010 + 0.020</td>
<td>0.001 + 0.002</td>
</tr>
<tr>
<td><strong>Diode Test</strong></td>
<td>1.0000V</td>
<td>1mA Test Current</td>
<td>0.002 + 0.010</td>
<td>0.008 + 0.020</td>
<td>0.010 + 0.020</td>
<td>0.001 + 0.002</td>
</tr>
</tbody>
</table>

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(1) Specifications are for 1hr warm-up and 6½ digits. Slow ac filter.
(2) Relative to calibration standards.
(3) 20% over range on all ranges except 1000 Vdc and 750 Vac ranges.
(4) For sinewave input > 5% of range. For inputs from 1% to 5% of range and < 50 kHz, add 0.1% of range additional error.
(5) 750 V range limited to 100 kHz or 8 x 10^7 Volt-Hz.
(6) Typically 30% of reading error at 1 MHz.
(7) Specifications are for 4-wire ohms function or 2-wire ohms using Math Null. Without Math Null, add 0.2 1Ω additional error in 2-wire ohms function.
(8) Specifications are for the voltage measured at the input terminals only. 1mA test current is typical. Variation in the current source will create some variation in the voltage drop across a diode junction.
(9) Accuracy specifications are for 4-wire ohms function or 2-wire ohms using Math Null.
Measurement Characteristics

**dc Voltage**
- Measurement Method: Continuously Integrating Multi-slope III A-D Converter
- A-D Linearity: 0.0002% of reading + 0.0001% of range
- Input Resistance: 10 MΩ or 0.1 V, 1 V, 10 V ranges: Selectable >10,000 MΩ
  - 100 V, 1000 V ranges: 10 MΩ ± 1%
- Input Bias Current: < 30 pA at 25°C
- Input Protection: 1000 V all ranges
- dcV:dcV Ratio Accuracy: Vinput Accuracy + Vreference Accuracy

**True rms ac Voltage**
- Measurement Method: ac coupled True rms – measures the ac component of the input with up to 400 Vdc of bias on any range
- Crest Factor: Maximum of 5:1 at Full Scale
- Additional Crest Factor Errors (non-sinewave): Crest Factor 1–2: 0.05 % of reading
  - Crest Factor 2–3: 0.15 % of reading
  - Crest Factor 3–4: 0.30 % of reading
  - Crest Factor 4–5: 0.40 % of reading
- Input Impedance: 1 MΩ ± 2% in parallel with 100 pF
- Input Protection: 750 Vrms all ranges

**Resistance**
- Measurement Method: Selectable 4-wire or 2-wire Ohms. Current source referenced to LO input.
- Maximum Lead Resistance (4-wire): 10% of range per lead for 100Ω and 1kΩ ranges. 1kΩ per lead on all other ranges.
- Input Protection: 1000 V all ranges

**dc Current**
- Shunt Resistance: 5Ω for 10 mA, 100 mA; 0.1 Ω for 1 A, 3 A
- Input Protection: Externally accessible 3 A 250 V Fuse Internal 7 A 250 V Fuse

**Math Functions**
- NULL, Min/Max/Average, dBm, dB
- Limit Test (with TTL output)

**Standard Programming Languages**
- SCPI (IEEE-488.2), Agilent 3478A, Fluke 8840A/42A

**Accessories Included**
- Test Lead Kit with probe, alligator, and grabber attachments.

**General Specifications**
- Power Supply: 100 V/120 V/220 V/240 V ±10%
- Power Line Frequency: 45 Hz to 66 Hz and 360 Hz to 440 Hz Automatically sensed at power-on
- Power Consumption: 25 VA peak (10 W average)
- Operating Environment: Full accuracy for 0° C to 55° C
  - Full accuracy to 80% R.H. at 40° C
- Storage Environment: – 40° C to 70° C
- Weight: 3.6 kg (8.0 lbs)
- Safety: Designed to CSA, UL-1244, IEC-348
- RFI and ESD: MIL-461C, FTZ 1046, FCC
- Vibration and Shock: MIL-T-2880E, Type III, Class 5 (Sine Only)
- Warranty: 1 year

**Triggering and Memory**
- Reading HOLD Sensitivity: 10%, 1%, 0.1%, or 0.01% of range
- Samples/trigger: 1 to 50,000
- Trigger Delay: 0 to 3600 s; 10 µs step size
- External Trigger Delay: < 1 ms
- External Trigger Jitter: < 500 µs
- Memory: 512 readings

**System Speeds**
- Configuration Rates: 26/s to 50/s
- Autorange Rate (dc Volts): > 30/s
- ASCII readings to RS-232: 55/s
- ASCII readings to GPIB: 1000/s
- Maximum Internal Trig. Rate: 1000/s
- Max. Ext. Trig. Rate to Memory: 1000/s

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[1] For 1kΩ unbalance in LO lead.
[2] For power line frequency ± 0.1%.
[3] For power line frequency ± 1% use 40dB or ± 3% use 30dB.
[4] Reading speeds for 60Hz and (50Hz) operation.
[6] Speeds are for 4½ digits, Delay 0, Auto-zero and Display OFF.
Ordering Information
Agilent 34401A Multimeter

Accessories included
Test Lead Kit with probe, alligator, and grabber attachments, operating manual, service manual, calibration certificate, test report, and power cord.

Options
34401A-1CM
   Rack Mount Kit* (P/N 5062-3972)
34401A-OB0
   DMM without manuals
34401A-A6J
   ANSI Z540 compliant calibration

Manual options (please specify one)
34401A-ABA
   US English
34401A-ABD
   German
34401A-ABE
   Spanish
34401A-ABF
   French
34401A-ABJ
   Japanese
34401A-ABZ
   Italian
34401A-AB0
   Taiwan Chinese
34401A-AB1
   Korean
34401A-AB2
   Chinese
34401A-AKT
   Russian

Agilent Accessories
11059A Kelvin Probe Set
11060A Surface Mount Device (SMD) test probes
11062A Kelvin clip set
34131 Hard transit case
34161A Accessory pouch
34171A Input terminal connector (sold in pairs)
34172A Input calibration short (sold in pairs)
34330A 30 A current shunt
E2308A 5K thermistor probe

*For racking two side-by-side, order both items below:
   Lock link kit (P/N 5061-9694)
   Flange kit (P/N 5063-9212)

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