





Agilent U1401B Handheld Multi-Function Calibrator/Meter

Quick Start Guide



The following items are included with your multimeter:

- ✓ Silicone test leads  , 19 mm probes  , alligator clips  , and yellow test lead for mA simulation 
- ✓ Printed Quick Start Guide
- ✓ Eight rechargeable 1.2 V Ni-MH AA battery
- ✓ Power cord and external AC power adapter
- ✓ Certificate of Calibration

If anything is missing or damaged, please contact the nearest Agilent Sales Office.

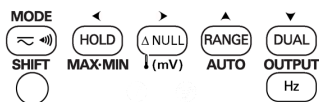
For more detailed information, please refer to the *Agilent U1401B Handheld Multi-Function Calibrator/Meter User's and Service Guide* on Agilent Web site (www.agilent.com/find/handheld-tools).

WARNING

Ensure the terminal connections are correct for that particular measurement selection before starting any measurement. To avoid damage to the device, do not exceed the input limit.



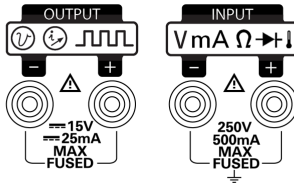
Functions and Features



Action	Steps
Selects AC, DC, or AC+DC measurement	Press MODE
Toggles peak hold mode on and off	Press and hold HOLD for > 1 s
Freezes the measured value	With data hold mode enabled, press HOLD . Press and hold HOLD for > 1 s to exit.
Enters or exits the refresh hold mode	With refresh hold mode enabled, press HOLD
Enters or exits the dynamic recording mode	Press and hold HOLD for > 1 s
Offsets the measured value	Press Δ NULL
Selects the measurement range	Press RANGE
Turns on autorange	Press and hold RANGE for > 1 s
Turns on dual display	Press DUAL
Turns on the frequency measurement function	Press Hz
Enables the shifted functions of the keypad	Press SHIFT
Toggles the backlight on or off	Press and hold SHIFT for > 1 s
Selects output mode and range for voltage and current output	With rotary switch at or , and with SHIFT mode enabled, press MODE
Selects parameter adjustments for square wave output	With rotary switch at , and with SHIFT mode enabled, press MODE
Selects a digit or the polarity to be adjusted	With SHIFT mode enabled, press ◀ or ▶
Adjusts a digit or the polarity	With SHIFT mode enabled, press ▲ or ▼
Toggles the output state on and off	With SHIFT mode enabled, press OUTPUT

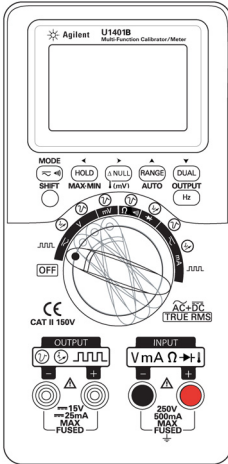
Input/Output Terminals and Overload Protection

The output terminals are protected with DC 30 V overload protection. The overload protection limits of the input terminals are shown in the table below



Functions	Overload Protection
AC/DC voltage measurement	250 Vrms
Resistance measurement and continuity test	
Temperature measurement	
AC/DC current measurement	250 V/630 mA, fast-acting fuse

Performing Voltage Measurements



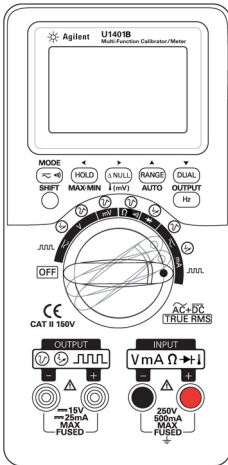
Measuring AC voltage

- 1 Set the rotary switch to \sim V or mV. Press $\left(\sim \right)$ to select AC.
- 2 Connect the red (+) and black (-) test leads to the **INPUT** terminals.
- 3 Probe the test points and read the display.
- 4 Press **DUAL** to display dual measurements.

Measuring DC voltage

- 1 Set the rotary switch to \sim V or mV. Press $\left(\sim \right)$ to select DC.
- 2 Connect the red (+) and black (-) test leads to the **INPUT** terminals.
- 3 Probe the test points and read the display.
- 4 Press **DUAL** to display dual measurements.

Performing Current Measurements



Measuring AC current

- 1 Set the rotary switch to \sim mA. Press \sim to select AC.
- 2 Connect the red (+) and black (-) test leads to the **INPUT** terminals.
- 3 Probe the test points in series with the circuit and read the display.

Measuring DC current

- 1 Set the rotary switch to \sim mA. Press \sim to select DC.
- 2 Connect the red (+) and black (-) test leads to the **INPUT** terminals.
- 3 Probe the test points in series with the circuit and read the display.

Percentage scale of DC mA measurement

With the rotary switch at \sim mA, another option selectable with the \sim key is the percentage scale of DC mA measurement.

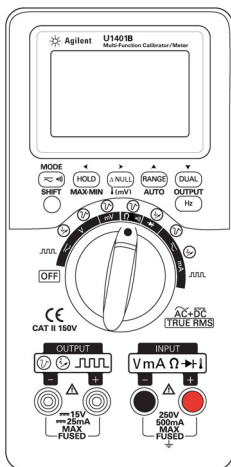
Frequency measurement


During AC/DC voltage or AC/DC current measurement, you can measure the signal frequency by pressing Hz at any time.

Performing Resistance Measurement and Continuity Test

CAUTION

Disconnect circuit power and discharge all high-voltage capacitors before measuring resistance to prevent possible damage to the instrument or the device under test.



- 1 Set the rotary switch to Ω (Ω).
- 2 Connect the red (+) and black (-) test leads to the **INPUT** terminals.
- 3 Probe the resistor (or shunt) leads and read the display.
- 4 To perform continuity test, press  to toggle the audible continuity function *on or off*.

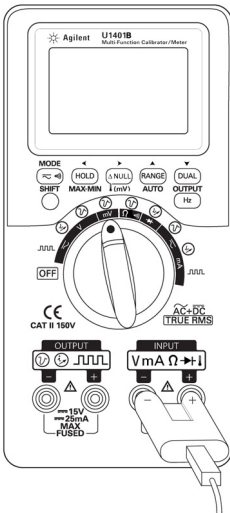
For continuity test, the instrument will beep if the resistance is less than the values indicated below:

Measurement range	Resistance threshold
500.00 Ω	10 Ω
5.0000 k Ω	100 Ω
50.000 k Ω	1 k Ω
500.00 k Ω	10 k Ω
5.0000 M Ω	100 k Ω
50.000 M Ω	1 M Ω

Performing Temperature Measurements

WARNING

- Before measuring the temperature of a circuit or device, disconnect its power.
- The bead type thermocouple probe is suitable for measuring temperature from $-40\text{ }^{\circ}\text{C}$ to $204\text{ }^{\circ}\text{C}$ in Teflon compatible environments. The probes may emit toxic gas above this temperature range.



- 1 Set the slide switch to the **M** position to disable the output.
- 2 Set the rotary switch to **mV**.
- 3 Press and hold Δ NULL for more than 1 second.
- 4 Plug the thermocouple probe (with adapter) into the **INPUT** terminals.
- 5 Touch the surface to be measured with the thermocouple probe and read the display.

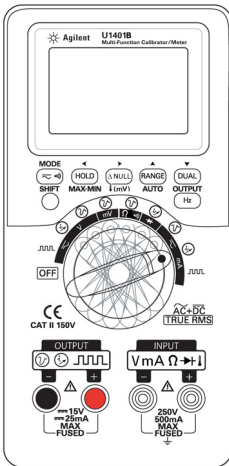
Best practices:

- Do not bend the thermocouple leads at sharp angles. Repeated bending may break the leads.
- Do not immerse the thermocouple probe in any liquid.
- Clean the surface to be measured and make sure that the probe is securely touching the surface.




NOTE

The U1401B can generate and measure signals simultaneously. While the **(SHIFT)** mode is enabled, pressing **OUTPUT** disables the U1401B output by placing it in the standby mode (**(SBY)**). Pressing **OUTPUT** again toggles the output on (**(OUT)**).



Frequency and Frequency Counter Measurements



Constant voltage output

- 1 Set the rotary switch to any one of the  positions.
- 2 Press **SHIFT**. The **(SHIFT)** annunciator appears.
- 3 Press **MODE** to cycle through ± 1.5 V, ± 15 V, **(SCAN)** ± 1.5 V, **(SCAN)** ± 15 V,  ± 1.5 V, and  ± 15 V output modes.
- 4 Select ± 1.5 V or ± 15 V.
- 5 Press **OUTPUT** to output the signal.

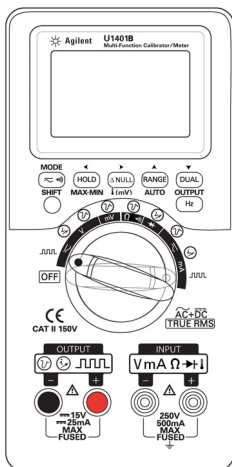
Constant current output


- 1 Set the rotary switch to any one of the  positions.
- 2 Press **SHIFT**. The **(SHIFT)** annunciator appears.
- 3 Press **MODE** to cycle through ± 25 mA, **(SCAN)** ± 25 mA, and  ± 25 mA output modes.
- 4 Select ± 25 mA.
- 5 Press **OUTPUT** to output the signal.

Autoscan and autoramp outputs

The voltage and current outputs can also be generated in predefined steps or ramp. Refer to the User's and Service Guide for the detailed procedures.

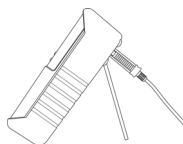
Square Wave Output



- 1 Set the rotary switch to .
- 2 Press **SHIFT**. The **SHIFT** annunciator appears.
- 3 Press **MODE** to cycle through the adjustment modes for frequency (Hz), duty cycle ($\%$), pulse width (ms), and amplitude (**Level**). Select a parameter to adjust.
- 4 Press \blacktriangle or \blacktriangledown to adjust the parameter value.
- 5 Press **OUTPUT** to output the square wave signal.

Tilt Stand

The instrument can be raised to a standing position by means of a tilt stand.



CAUTION

Degradation of some product specifications can occur in the presence of ambient electromagnetic (EM) fields and noise that are coupled to the powerline or I/O cables of the instrument. The instrument will self-recover and operate to all specifications when the source of ambient EM field and noise are removed or when the instrument is protected from the ambient EM field or when the instrument cabling is shielded from the ambient EM noise.

Safety Notices

CAUTION

A **CAUTION** notice denotes a hazard. It calls attention to an operating procedure, practice, or the like that, if not correctly performed or adhered to, could result in damage to the product or loss of important data. Do not proceed beyond a **CAUTION** notice until the indicated conditions are fully understood and met.

WARNING

A **WARNING** notice denotes a hazard. It calls attention to an operating procedure, practice, or the like that, if not correctly performed or adhered to, could result in personal injury or death. Do not proceed beyond a **WARNING** notice until the indicated conditions are fully understood and met.





Safety Information

This instrument is safety and EMC certified in compliance with:

- IEC 61010-1:2001/EN61010-1:2001 (2nd Edition)
- Canada: CAN/CSA-C22.2 No. 61010-1-04
- USA: ANSI/UL 61010-1:2004
- IEC61326-2-1:2005/EN61326-2-1:2006
- Canada: ICES/NMB-001:2004
- Australia/New Zealand: AS/NZS CISPR11:2004

Measurement Category II 150 V, Pollution Degree 2. Use with standard or compatible test probes.

Safety Symbols

	Earth (ground) terminal
	Double insulation
	Caution, risk of electric shock
	Caution, risk of danger
CAT II 150 V	Category II 150 V overvoltage protection

**For further safety information details, refer to the
Agilent U1401B Handheld Multi-Function Calibrator/Meter
User's and Service Guide.**

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