

Keysight U1273A/U1273AX Handheld Digital Multimeter

Quick Start Guide

NOTICE: This document contains references to Agilent Technologies. Agilent's former Test and Measurement business has become Keysight Technologies. For more information, go to **www.keysight.com**.



U1273A/U1273AX Handheld Digital Multimeter



Verify that you received the following items in the shipment of your multimeter:

- ✓ One pair of red and black test leads
- ✓ One pair of 4 mm test probes
- ✓ One K-type thermocouple lead kit
- ✓ Four 1.5 V AAA alkaline batteries (for U1273A) or lithium batteries (for U1273AX)
- ✓ Printed copies of the Certificate of Calibration (CoC) and the U1273A/U1273AX Quick Start Guide (this manual)

If any item is missing or damaged, keep the shipping materials and contact the nearest Keysight Sales Office.

NOTE

The descriptions and instructions in this guide apply to the U1273A/U1273AX handheld digital multimeter.

All related documents and software are available for download at www.keysight.com/find/hhTechLib.

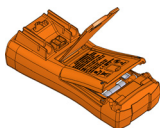
U1273A/U1273AX Handheld Digital Multimeter

Install the Batteries

Install the Batteries

Your multimeter is powered by four 1.5 V AAA batteries (included with the shipment).

- 1 Turn the rotary switch to OFF and remove the test leads from the terminals.
- 2 Lift the tilt stand and loosen the screws with a suitable Phillips screwdriver.
- 3 Remove the battery cover and observe the polarity markings.
- 4 Insert the batteries and replace the battery cover and screws.



Turn On the Multimeter

To power ON your multimeter, turn the rotary switch from the OFF position to any other position.



NOTE

Your multimeter is capable of remote data logging. To use this feature, you will need an IR-USB cable (U1173A, purchased separately) and the Keysight GUI Data Logger Software (downloadable from www.keysight.com/find/hhTechLib).

Auto Dim

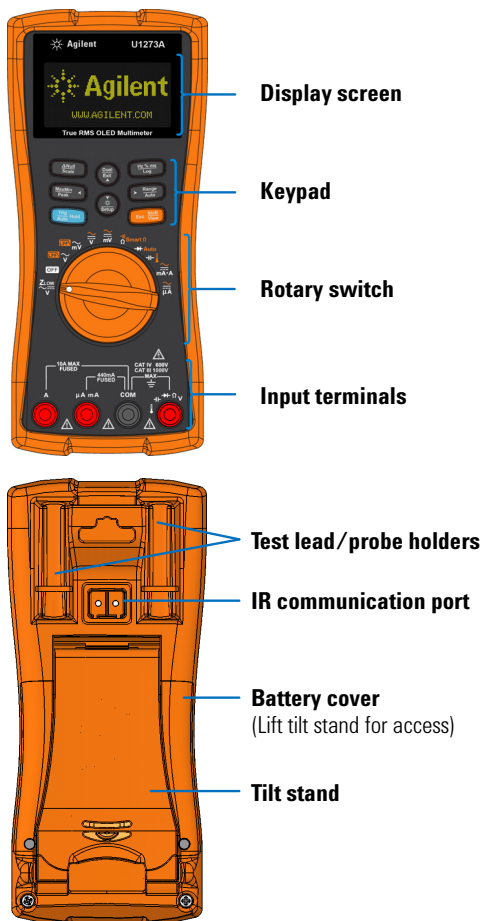
By default, the multimeter's Auto Dim function is enabled. The multimeter's backlight will dim automatically after 90 seconds of inactivity. Press any button to cancel this effect and reset the Auto Dim timer.

You may change how the multimeter's backlight behavior through the Setup menu. Refer to the *User's Guide* for further instructions.

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The Multimeter at a Glance

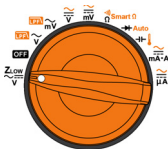
The Multimeter at a Glance



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Understanding the Rotary Switch

Understanding the Rotary Switch











NOTE

Press **Shift** to switch between the **primary** and **shifted** functions shown on the rotary switch.

Legend	Description
$Z_{LOW} V$	Z_{LOW} (low input impedance) AC/DC V for eliminating ghost voltages
OFF	Off
LPA V	AC V AC V with Low Pass Filter
LPA mV	AC mV AC mV with Low Pass Filter
V	DC V AC V or AC+DC V
mV	DC mV AC mV or AC+DC mV
Ω Smart Ω	Resistance Continuity or Smart Ω (offset compensation)
\rightarrow Auto	Diode Auto-diode
\rightarrow \downarrow	Capacitance Temperature
$mA \cdot A$	DC mA (or A) AC mA (or A) or AC+DC mA (or A)
μA	DC μA AC μA or AC+DC μA

Understanding the Keypad



Legend	Key response when pressed for:	
	Less than 1 second	More than 1 second
	Sets the Null/Relative mode.	Sets the Scale mode for the specified ratio and unit display.
	Starts the MaxMin recording.	Starts and stops the Peak recording.
	Freezes the present reading in the display.	Automatically freezes the present reading once the reading is stable.
	Switches between available dual-combination displays.	Exits the Hold, Null, MaxMin, Peak, frequency test, and dual display modes.
	Increases the OLED brightness incrementally when LOW, MEDIUM, or HIGH setting is selected.	Enters and exits the multimeter's Setup menu.
	Switches between frequency, pulse width, and duty cycle measurements.	Starts and stops the Data Logging.
	Sets a manual range and disables autoranging.	Enables auto-ranging.
	Switches between the primary and shifted functions.	Enters and exits the Log Review menu.

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Understanding the Input Terminals

Understanding the Input Terminals

WARNING

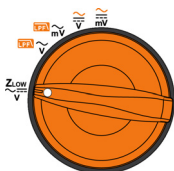
Ensure that the terminal connections are correct for that particular measurement function before starting any measurement. To avoid damage to the device, do not exceed the input limit.

Rotary position	Input terminals	Overload protection
		1000 Vrms
		1000 Vrms for short circuit <0.3 A
		11 A/1000 V fast-acting fuse
		440 mA/1000 V fast-acting fuse

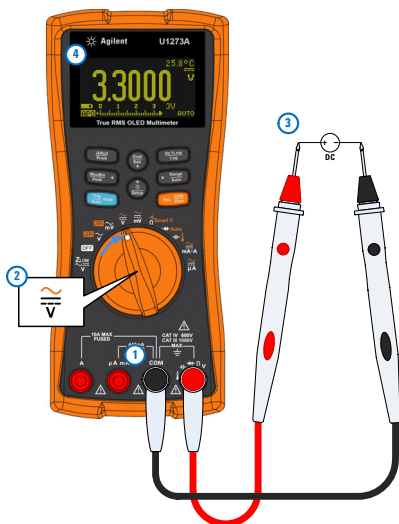
Performing Measurements and Tests

Voltage measurements

The figure below highlights the primary functions allowing voltage measurements in your multimeter.







Set up your multimeter as shown in the figure below to perform voltage measurements. When measuring DC voltage from a mixed signal in DC measurement mode, ensure that the Filter (**PF**) is enabled.





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Performing Measurements and Tests

- 1 Press  for more than 1 second to enter the multimeter's setup menu.
- 2 Browse to **Menu 6 > Filter**, and press  to edit the value.
- 3 Press  or  to enable the Filter.
Refer to the table below for the respective firmware versions.

Version 1.64 or older	Version 1.95 or newer
on	DC


- 4 Press  to save your changes.
- 5 Press and hold  until the multimeter restarts and returns to normal operation. Turn the multimeter to DC Voltage mode to verify that the LPF symbol is turned on.

CAUTION

To avoid possible electric shock or personal injury, enable the Filter (**LPF**) to verify the presence of hazardous DC voltages. Displayed DC voltages can be influenced by high frequency AC components and must be filtered to assure an accurate reading.

LPF during AC measurements:



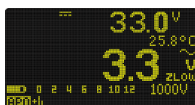
Press  while performing AC voltage measurements to pass the measured signal through a low pass filter.

- Passing the measured signal through a LPF help blocks unwanted voltages such as electronic noise.
- Use the LPF function to improve measurement on composite sine waves that are typically generated by inverters and variable frequency motor drives.

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Performing Measurements and Tests

Z_{LOW} measurements:



Rotate the rotary switch's position to Z_{LOW} to enable low impedance measurements.

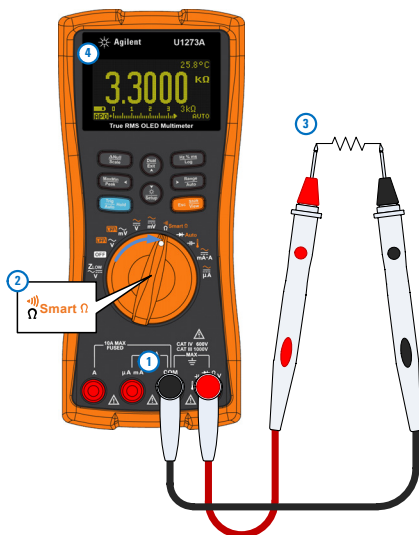
- Use the Z_{LOW} (low input impedance) function to remove ghost or induced voltages from your measurement.
- Z_{LOW} can remove ghost voltages from your measurements by dissipating the coupling voltage. Use Z_{LOW} to reduce the possibility of false readings in areas where the presence of ghost voltages are suspected.

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Performing Measurements and Tests

Resistance measurements

Set up your multimeter as shown in the figure below to perform resistance measurements.



Smart Ω measurements:



While performing resistance measurements, press **Exp** until **BiAS** is shown on the secondary display to enable the Smart Ω function.

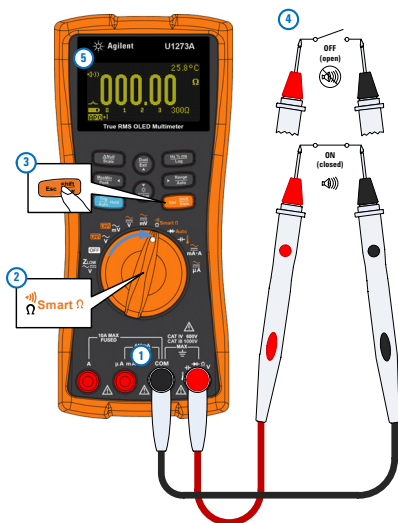
- Use the Smart Ω (offset compensation) function to measure resistors affected by DC offset or leakage current.
- Smart Ω removes unexpected DC voltages within the instrument, at the input, or at the circuit being measured, which will add error to resistance measurements. Press **Exp** to switch between the bias voltage (**BiAS**) display or leakage current (**LEAK**) display, calculated based on the bias voltage and corrected resistance value, on the secondary display.

Continuity tests

Set up your multimeter as shown in the figure below to perform continuity tests. Press **Esc** to switch to the continuity test function (Ω) is shown on the display).

The beeper will sound as a continuity indication. Press ON/OFF to switch between normal open ($\text{---}\uparrow\text{---}$) and normal close ($\text{---}\downarrow\text{---}$) contacts.

- **Normal open:** Circuit is normally open, the beeper will sound when a short is detected.
- **Normal close:** Circuit is normally closed, the beeper will sound when an open is detected.



NOTE

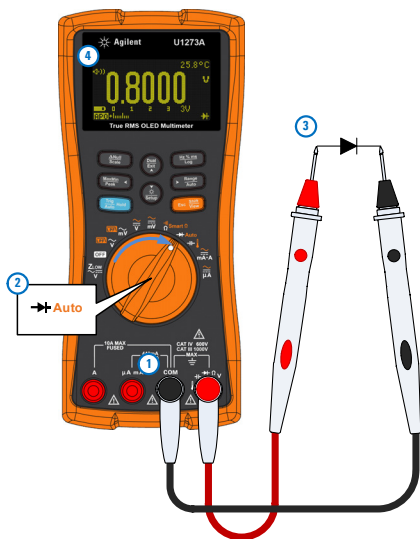
The continuity function detects intermittent shorts and opens lasting as short as 1 ms. A brief short or open causes the multimeter to emit a short beep.

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Performing Measurements and Tests


Diode tests

Set up your multimeter as shown in the figure below to perform diode tests.



Auto-diode tests:



Press  to use the auto diode function.

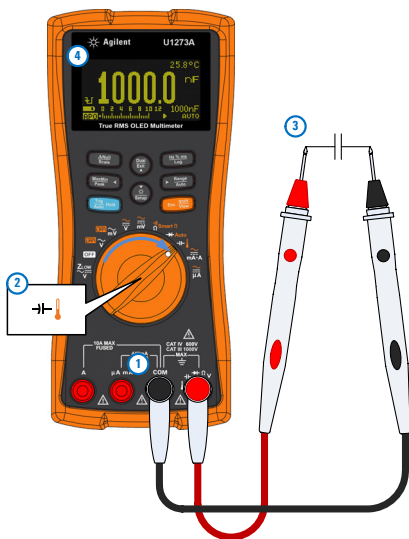
- The Auto-diode function tests both the forward bias and reverse bias directions of your diode simultaneously. The forward bias voltage is shown on the primary display and the reverse bias voltage is shown on the secondary display.
- **GOOD** is shown briefly on the secondary display along with a brief beep if the diode is found to be in good condition. If the diode is out of the thresholds, **NGOOD** is shown instead.

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Performing Measurements and Tests

Capacitance measurements

Set up your multimeter as shown in the figure below to perform capacitance measurements.



NOTE

⏏ is shown on the bottom left of the display when the capacitor is charging, and ⏏ is shown when the capacitor is discharging.

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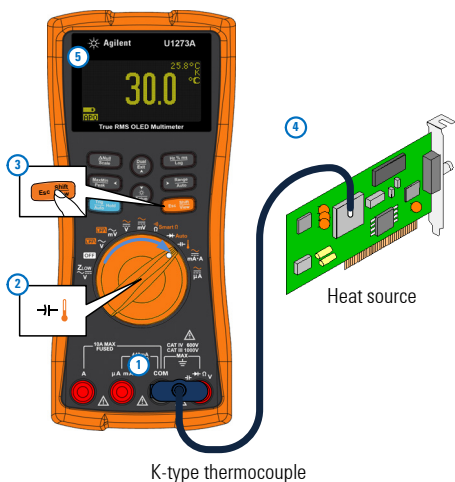
Performing Measurements and Tests

Temperature measurements

Set up your multimeter as shown in the figure below to perform temperature measurements. Press **Shift** **Temp** to switch to the temperature measurement function.

WARNING

Do not connect the thermocouple to electrically live circuits. Doing so will potentially cause fire or electric shock.



NOTE

The multimeter uses a type-K (default setting) temperature probe for measuring temperature.

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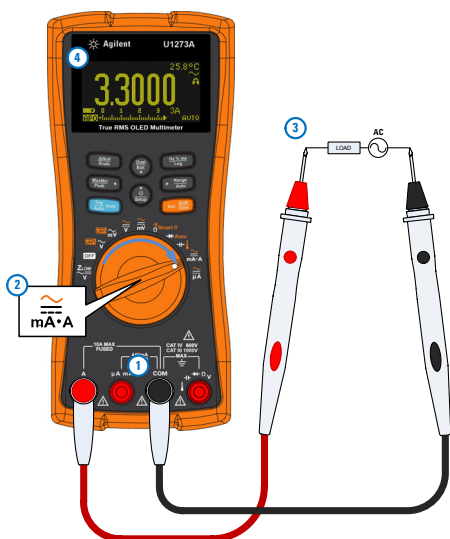
Performing Measurements and Tests

Current measurements

Set up your multimeter as shown in the figure below to perform current measurements. Press **FUNC** to switch between AC, DC, AC+DC, or % scale current measurements. When measuring DC current from a mixed signal in DC measurement mode, ensure that the Filter (**LF**) is enabled.

WARNING

Always use the proper function, range, and terminals for current measurements. Set the positive input terminal to the μA mA terminal for currents below 440 mA, and the A terminal for currents above 440 mA.



NOTE

For better accuracy when measuring low currents (up to μA), turn the rotary switch to the μA position.

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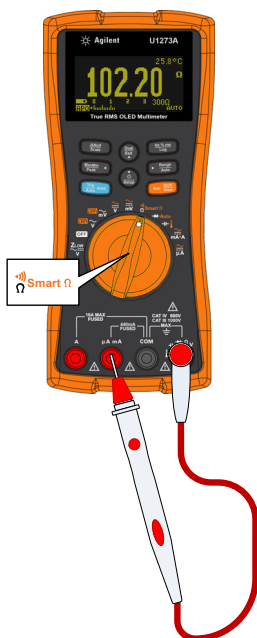
Check the Fuse

Check the Fuse

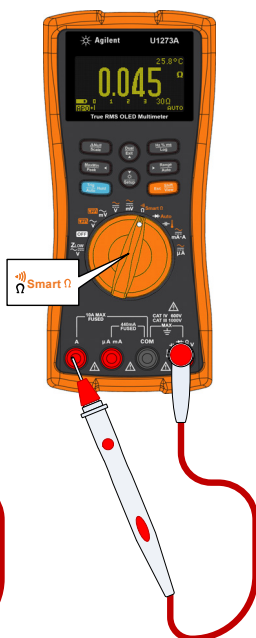
Follow the instructions below for a quick check on the fuses (Fuse 1 and Fuse 2) of your multimeter.

Fuse	Part number	Fuse rating	Displayed readings	
			Fuse healthy	Replace fuse
1	2110-1400	440 mA/1000 V	$\approx 102 \Omega$	OL
2	2110-1402	11 A/1000 V	$\approx 0.05 \Omega$	OL

To check Fuse 1



To check Fuse 2



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Check the Fuse

NOTE

- **To check Fuse 1:** Ensure that the probe tip is touching the *top half* metal contact inside the **$\mu\text{A mA}$** terminal.
- **To check Fuse 2:** Ensure that the probe tip is touching the *left half* metal contact inside the **A** terminal.

The multimeter will sound an input warning alert if the probe tip is in contact with any other sides of the **$\mu\text{A mA}$** or **A** terminal other than the sides specified in the instructions above.

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Check the Fuse

Contacting Keysight

To obtain service, warranty, or technical assistance, contact us at the following phone numbers:

- United States Call Center: 800-829-4444
- Canada Call Center: 877-894-4414
- China Call Center: 800-810-0189
- Europe Call Center: 31-20-547-2111
- Japan Call Center: (81) 426-56-7832

For other countries, contact your country's Keysight support organization. A list of contact information for other countries is available on the Keysight Web site: www.keysight.com/find/assist

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 and EMC Information

This meter is safety-certified in compliance with EN/IEC 61010-1:2001, ANSI/UL 61010-1:2004, and CAN/CSA-C22.2 No. 61010-1-04 for CAT III 1000 V/CAT IV 600 V pollution degree 2 environment. EMC is designed in compliance with IEC 61326-1:2005/EN 61326-1:2006. Use with standard or compatible test probes.

Safety Symbols

	Earth (ground) terminal
	Equipment protected throughout by double insulation or reinforced insulation
	Caution, risk of electric shock
	Caution, risk of danger (refer to the instrument manual for specific Warning or Caution information)
CAT III 1000 V	Category III 1000 V overvoltage protection
CAT IV 600 V	Category IV 600 V overvoltage protection

For further safety information details, refer to the *Keysight U1273A/U1273AX Handheld Digital Multimeter User's Guide*.

This information is subject to change without notice.
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