Keysight U1273A/ U1273AX Handheld Digital Multimeter

Quick Start Guide

Contacting Keysight

(worldwide contact information for repair and service)

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 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 symbols

⏚	Earth (ground) terminal
▣	Equipment protected throughout by double insulation or reinforced insulation
⚡	Caution, risk of electric shock
⚠	Caution, risk of danger (refer to this 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.

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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.

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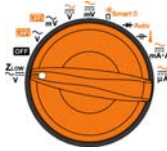
You may change how the multimeter's backlight behavior through the Setup menu. Refer to the *User's Guide* for further instructions.

The Multimeter at a Glance

Display screen

Keypad

Rotary switch

Input terminals

Test lead/probe holders

IR communication port

Battery cover
(Lift tilt stand for access)

Tilt stand
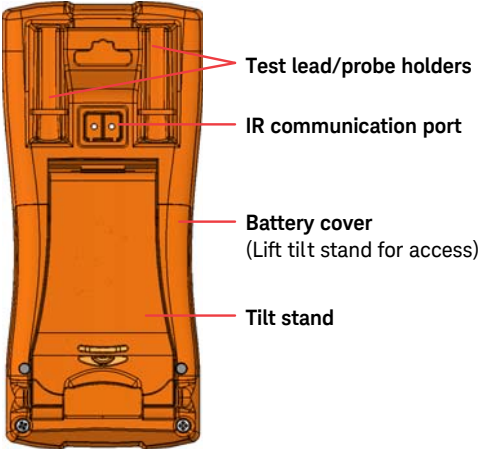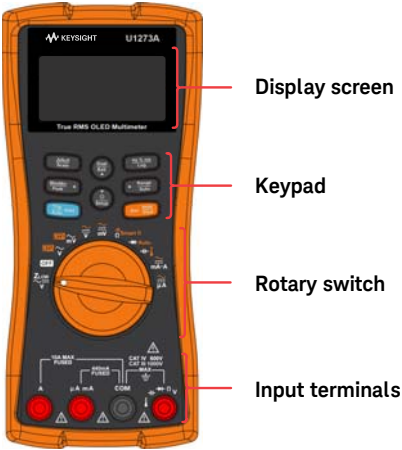
Understanding the Rotary Switch

NOTE	Press [shift/view] to switch between the **primary** and **shifted** functions shown on the rotary switch.

Legend	Description
Z_{LOW} $\underset{V}{\sim}$	Z_{LOW} (low input impedance) AC/DC V for eliminating ghost voltages
OFF	Off
LPF $\underset{V}{\sim}$	AC V
	AC V with Low Pass Filter
LPF $\underset{mV}{\sim}$	AC mV
	AC mV with Low Pass Filter
$\underset{V}{\cong}$	DC V
	AC V or AC+DC V
$\underset{mV}{\cong}$	DC mV
	AC mV or AC+DC mV
$\underset{\Omega}{\text{Smart }\Omega}$	Resistance
	Continuity or Smart Ω (offset compensation)
→I Auto	Diode
	Auto-diode
→I	Capacitance
	Temperature
$\underset{mA \cdot A}{\cong}$	DC mA (or A)
	AC mA (or A) or AC+DC mA (or A)
$\underset{\mu A}{\cong}$	DC μA
	AC μA or AC+DC μA
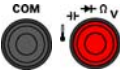
Understanding the Keypad

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

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
🔲 $\widetilde{\text{V}}$		1000 Vrms
$\overset{\approx}{\underset{\text{V}}{}}$		
$\underset{\text{V}}{\overset{\text{Z}_{\text{LOW}}}{\sim}}$		
🔲 $\widetilde{\text{mV}}$		1000 Vrms for short circuit <0.3 A
$\overset{\approx}{\underset{\text{mV}}{}}$		
Smart Ω		
▶▌Auto		
⊣⊦🌡		
$\overset{\approx}{\underset{\text{mA·A}}{}}$		11 A/1000 V fast-acting fuse
$\overset{\approx}{\underset{\text{µA}}{}}$ or $\overset{\approx}{\underset{\text{mA·A}}{}}$		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.
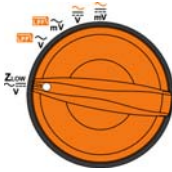
Set up your multimeter as shown in the figure below to perform voltage measurements. When measuring DC voltage from a mixed signal in DC measurement mode, ensure that the Filter (LPF) is enabled.

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.
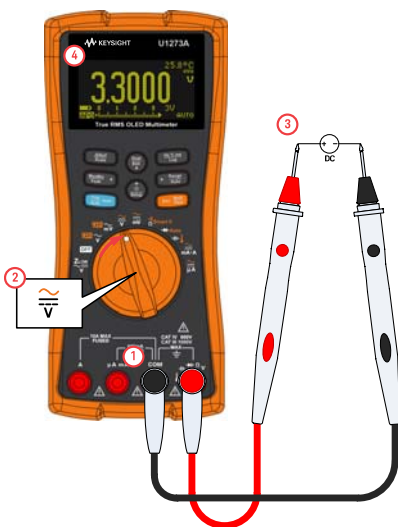Refer to the table below for the respective firmware versions.

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.

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 Esc Shift View 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.

Z_{LOW} measurements:

Rotate the rotary switch's position to $\frac{Z_{LOW}}{V}$ 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.

Resistance measurements

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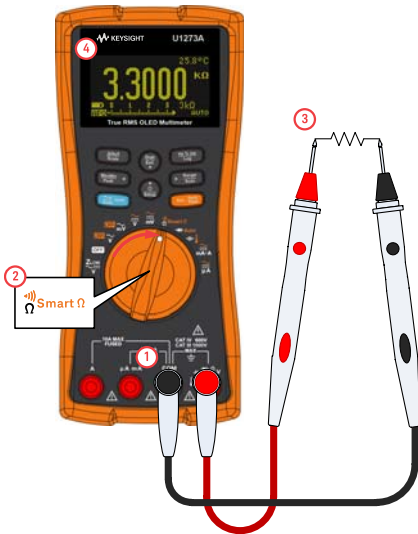
Smart Ω measurements:

While performing resistance measurements, press `Esc shift View` 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 ⊜ 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 ▭▭ to switch to the continuity test function (⎍⎍ is shown on the display).

The beeper will sound as a continuity indication. Press ⊜ to switch between normal open (⎍⎍⎍) and normal close (⎍⎍⎍) 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.
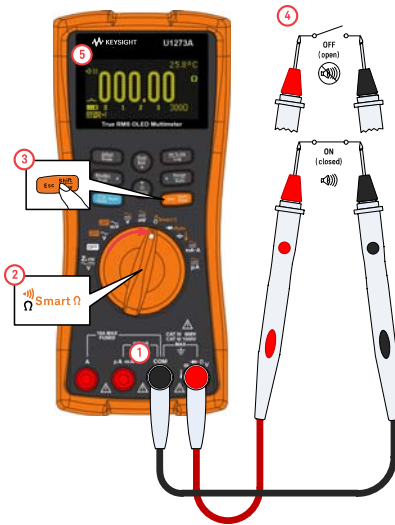
NOTE The continuity function detects intermittent shorts and opens lasting as short as 1 ms. A brief short or open causes the multimeter to emit a short beep.

Diode tests

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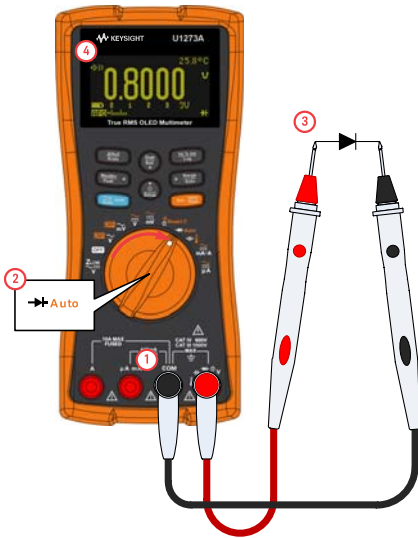
Auto-diode tests:

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.

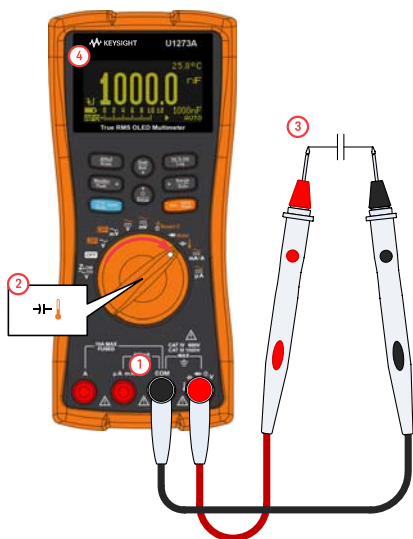– **GOOD** is shown briefly on the secondary display along with a brief beep if the diode is found to be in good condition. If the diode is out of the thresholds, **NGOOD** is shown instead.

Capacitance measurements

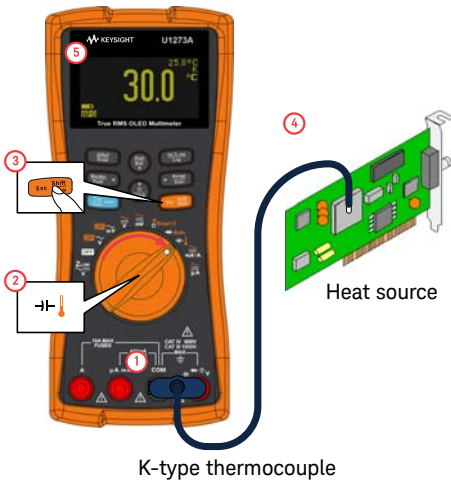Set up your multimeter as shown in the figure below to perform capacitance measurements.

NOTE   ⊣⊢ is shown on the bottom left of the display when the capacitor is charging, and ⊢⊣ is shown when the capacitor is discharging.

Temperature measurements

Set up your multimeter as shown in the figure below to perform temperature measurements. Press [Esc Shift View] 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.


Heat source

K-type thermocouple

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

Current measurements

Set up your multimeter as shown in the figure below to perform current measurements. Press [Slow Min Max Hold] 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 (**LPF**) 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.
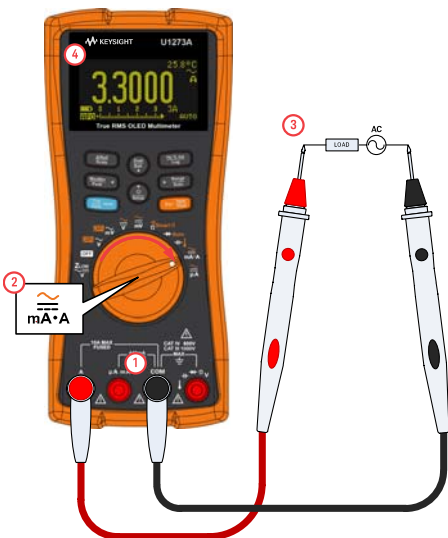
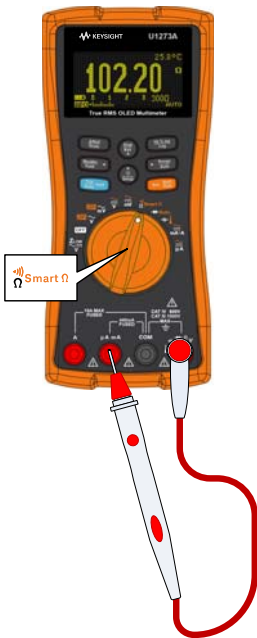**NOTE** For better accuracy when measuring low currents (up to μA), turn the rotary switch to the $\widetilde{\overline{\overline{\mu A}}}$ position.
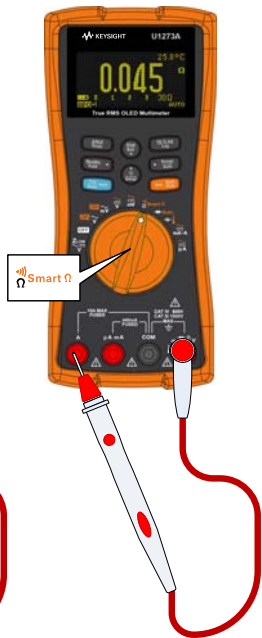
Check the Fuse

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	≈102 Ω	OL
2	2110-1402	11 A/1000 V	≈0.05 Ω	OL

To check Fuse 1	**To check Fuse 2**

NOTE	– **To check Fuse 1**: Ensure that the probe tip is touching the *top half* metal contact inside the **µA 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 **µA mA** or **A** terminal other than the sides specified in the instructions above.

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