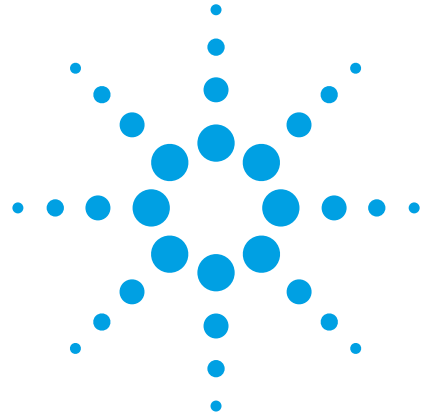


# Agilent Handheld Tools

For Electronic, Electrical and Industrial Process Testing



- Digital multimeters
- Digital oscilloscopes
- Clamp meters
- Multifunction calibrator meter
- LCR meters
- Capacitance meters



**Agilent Technologies**



## Retool Your Expectations

For more than 70 years, Agilent has been creating innovative measurement solutions. In recent years, we've been applying our tradition of innovation to handheld tools for electrical and electronics testing. Today, these tools are ready for the real-world conditions you face every day—and many offer unique functions such as:

- Clear readouts from a high contrast OLED display
- Continuity checks with feedback via audible alerts and flashing displays
- Low-light troubleshooting in cramped, dark spaces with a built-in flashlight
- Accurate ground-resistance measurements that minimize false readings
- Data logging and optional transfer to a PC

We're always looking for ways to simplify your day-to-day work. As we continue to develop innovative handhelds, you may start to feel like we do: It's a good time to retool your expectations.

# Digital Multimeters

Whatever your applications are, Agilent's handheld digital multimeters are up to the task. From electronics troubleshooting to installation and maintenance of machinery, our handheld DMMs are designed to withstand the harsh working conditions and improve safety. Our range of handheld DMMs are also equipped with smart features to help you quickly detect problems and obtain accurate measurements.

Recommended for	Installation and maintenance of power distribution and supplies			Electrical, HVAC and utilities			Installation and maintenance of machinery, electrical systems		Electronics troubleshooting			Industrial	
	Model no.	U1211A	U1212A	U1213A	U1231A	U1232A	U1233A	U1241B	U1242B	U1251B	U1252B	U1253B	U1271A

## Display

Display resolution (counts)	4,000	4,000	4,000	6,000	6,000	6,000	10,000	10,000	50,000	50,000	50,000	30,000	30,000
Dual display	Yes	Yes	Yes	N/A	N/A	N/A	N/A	N/A	Yes	Yes	Yes	Yes	Yes
Analog bar-graph	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Back-light	Yes	Yes	Yes	Yes	Yes	Yes	Yes (two intensity levels)	Yes (two intensity levels)	Yes	Yes	OLED display	Yes	Yes

## Basic features

AC bandwidth	400 Hz	400 Hz	2 kHz	1 kHz	1 kHz	1 kHz	2 kHz	2 kHz	30 kHz	100 kHz	100 kHz	20 kHz	100 kHz
True RMS	AC	AC	AC + DC	AC	AC	AC	AC	AC	AC	AC + DC	AC + DC	AC	AC + DC
Auto manual/ranging	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

## Measurements

Voltage AC/DC: Range	400 V to 1000 V	400 V to 1000 V	4 V to 1000 V	600 mV to 600 V	600 mV to 600 V	600 mV to 600 V	1 V to 1000 V	1 V to 1000 V	50 mV to 1000 V	50 mV to 1000 V	50 mV to 1000 V	300 mV to 1000 V	30 mV to 1000 V
Current AC/DC: Range	ACI: 40 A to 1000 A	40 A to 1000 A	40 A to 1000 A	N/A	60 $\mu$ A to 10 A	60 $\mu$ A to 10 A	1 mA to 10 A	1 mA to 10 A	500 $\mu$ A to 10 A	500 $\mu$ A to 10 A	500 $\mu$ A to 10 A	300 $\mu$ A to 10 A	300 $\mu$ A to 10 A
Resistance: Range	400 $\Omega$ to 4 k $\Omega$	400 $\Omega$ to 4 k $\Omega$	400 $\Omega$ to 40 M $\Omega$	600 $\Omega$ to 60 M $\Omega$	600 $\Omega$ to 60 M $\Omega$	600 $\Omega$ to 60 M $\Omega$	1 k $\Omega$ to 100 M $\Omega$	1 k $\Omega$ to 100 M $\Omega$	500 $\Omega$ to 500 M $\Omega$	500 $\Omega$ to 500 M $\Omega$	500 $\Omega$ to 500 M $\Omega$	300 $\Omega$ to 100 M $\Omega$	30 $\Omega$ to 300 M $\Omega$
Frequency: Range	99.99 Hz to 999.9 kHz	99.99 Hz to 999.9 kHz	99.99 Hz to 999.9 kHz	99.99 Hz to 99.99 kHz	99.99 Hz to 99.99 kHz	99.99 Hz to 99.99 kHz	100 Hz to 1000 kHz	100 Hz to 1000 kHz	99.999 Hz to 999.99 kHz	99.999 Hz to 999.99 kHz	99.999 Hz to 999.99 kHz	99.999 Hz to 999.99 kHz	99.999 Hz to 999.99 kHz
Capacitance: Range	400 $\mu$ F to 4000 $\mu$ F	400 $\mu$ F to 4000 $\mu$ F	4 $\mu$ F to 4000 $\mu$ F	1000 nF to 10 mF	1000 nF to 10 mF	1000 nF to 10 mF	1 $\mu$ F to 10 mF	1 $\mu$ F to 10 mF	10 nF to 100 mF	10 nF to 100 mF	10 nF to 100 mF	10 nF to 10 mF	10 nF to 10 mF
Temperature: Type, range	N/A	K: -200 to 1372 $^{\circ}$ C	K: -200 to 1372 $^{\circ}$ C	N/A	N/A	K: -40 to 1372 $^{\circ}$ C	K: -40 to 1000 $^{\circ}$ C	K: -40 to 1000 $^{\circ}$ C J: -40 to 1000 $^{\circ}$ C	K: -200 to 1372 $^{\circ}$ C	K: -200 to 1372 $^{\circ}$ C J: -210 to 1200 $^{\circ}$ C	K: -200 to 1372 $^{\circ}$ C J: -210 to 1200 $^{\circ}$ C	K: -200 to 1372 $^{\circ}$ C	K: -200 to 1372 $^{\circ}$ C J: -200 to 1200 $^{\circ}$ C

# Digital Multimeters *Continued*

Recommended for	Installation and maintenance of power distribution and supplies			Electrical, HVAC and utilities			Installation and maintenance of machinery, electrical systems		Electronics troubleshooting			Industrial	
	Model no.	U1211A	U1212A	U1213A	U1231A	U1232A	U1233A	U1241B	U1242B	U1251B	U1252B	U1253B	U1271A

## Measurements

Continuity with beeper	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Diode test	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

## Data management

Min/max recording	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Display hold	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Peak hold	Yes	Yes	Yes	Yes	Yes	Yes	N/A	N/A	Yes	Yes	Yes	Yes	Yes
Manual datalogging	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Yes	Yes	Yes	Yes	Yes	Yes
Null	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
PC connectivity	N/A	N/A	N/A	IR-USB	IR-USB	IR-USB	N/A	N/A	IR-USB	IR-USB	IR-USB	IR-USB	IR-USB
% scale of 4-20 mA	N/A	N/A	N/A	N/A	N/A	N/A	Yes	Yes	Yes	Yes	Yes	Yes	Yes

## General

Operating temperature	-10 to 50 °C, 0 to 80% R.H	-10 to 50 °C, 0 to 80% R.H	-10 to 50 °C, 0 to 80% R.H	-10 to 55 °C, 0% to 80% RH	-10 to 55 °C, 0% to 80% RH	-10 to 55 °C, 0% to 80% RH	-10 to 55 °C, 0 to 80% R.H	-10 to 55 °C, 0 to 80% R.H	-20 to 55 °C, 0 to 80% R.H	-20 to 55 °C, 0 to 80% R.H	-20 to 55 °C, 0 to 80% R.H	-20 to 55 °C, 0 to 80% R.H	-20 to 55 °C, 0 to 80% R.H
Measurement category	CAT III 1000 V/ CAT IV 600 V	CAT III 1000 V/ CAT IV 600 V	CAT III 1000 V/ CAT IV 600 V	CAT III 600 V	CAT III 600 V	CAT III 600 V	CAT III 1000 V/ CAT IV 600 V	CAT III 1000 V/ CAT IV 600 V	CAT III 1000 V/ CAT IV 600 V	CAT III 1000 V/ CAT IV 600 V	CAT III 1000 V/ CAT IV 600 V	CAT III 1000 V/ CAT IV 600 V	CAT III 1000 V/ CAT IV 600 V
Battery type (included)	9 V	9 V	9 V	4 x 1.5 V	4 x 1.5 V	4 x 1.5 V	4 x AAA	4 x AAA	9 V	7.2 V (rechargeable)	7.2 V (rechargeable)	4 x AAA	4 x AAA
Battery life	60 hours	60 hours	60 hours	500 hours	500 hours	500 hours	300 hours	300 hours	72 hours	36 hours	8 hours	300 hours	300 hours
Dimensions (H x W x D)	273.0 x 106.0 x 43.0 mm	260.0 x 106.0 x 43.0 mm	260.0 x 106.0 x 43.0 mm	169.0 x 86.0 x 52.0 mm	169.0 x 86.0 x 52.0 mm	169.0 x 86.0 x 52.0 mm	193.8 x 92.2 x 58.0 mm	193.8 x 92.2 x 58.0 mm	203.5 x 94.4 x 59.0 mm	203.5 x 94.4 x 59.0 mm	203.5 x 94.4 x 59.0 mm	207.0 x 92.0 x 59.0 mm	207.0 x 92.0 x 59.0 mm
Advanced functions	Clamp Opening of 52 mm /2"	Clamp Opening of 52 mm /2"	Clamp Opening of 52 mm /2"	Built-in flashlight, continuity alert with flashing backlight, Z <sub>Low</sub>	Built-in flashlight, continuity alert with flashing backlight, Z <sub>Low</sub>	Built-in flashlight, non-contact voltage detector with Vsense, continuity alert with flashing backlight, Z <sub>Low</sub>	Switch counter	Switch counter, harmonic ratio, dual and differential temperature measurements	N/A	20 MHz frequency counter, programmable square wave generator	Organic LED display, 20 MHz frequency counter, programmable square wave generator	Low pass filter, AC and/or DC voltage check	Low pass filter, low impedance mode, offset compensation

# U1230 Series – Handheld Digital Multimeters

Whether it is dark, noisy or even dangerous, the U1230 Series Handheld digital multimeter keeps you equipped with features that anticipate worst-case scenarios. The ergonomic shaped handheld allows you to single-handedly illuminate the test area with a built-in flashlight while selecting measurement functions using the rotary dial. Vsense performs non-contact voltage detection while continuity detection is made easy with the audible beeper alert and flashing backlight display. With the U1230 Series, you work better in the conditions you are in.



## Features

- Built-in LED flashlight to illuminate test area
- Flashing backlight as additional visual alert during continuity tests in noisy areas
- Vsense performs non-contact voltage detection
- Data logging capability (stores up to 10 readings)
- IR-to-USB connectivity to transfer data to PC for record

## Applications with U1230 Series Handheld Digital Multimeters

In an electrical or industrial work setting, making measurements during power failures or in a poorly lit environment can be a common occurrence.

Working in a dark environment can be cumbersome; you may need to carry multiple test tools- and a flashlight. This is why the U1230 Series is well-designed with a set of features that enable electricians to work better in these environments.

The U1230 Series now comes with a built-in flashlight, allowing electricians to single-handedly illuminate the test area while troubleshooting circuits in cramped

or dark areas. The flashlight is also easily activated with a one push button, allowing measurements and troubleshooting tasks to be performed more efficiently.

The U1230 Series also performs continuity test with a unique combination of beeper alert and flashing backlight display. The flashing backlight display serves as an additional visual alert to the electrician, when performing measurement in a noisy or dim place. Both of these alerts occur simultaneously making them hard-to-miss, thus allowing continuity tests to be performed quicker and easier.

Performing electrical measurements in a poorly lit or noisy environment can be potentially hazardous. The U1233A handheld digital multimeter comes with Vsense which performs non-contact detection of live voltages. With Vsense, electricians can now perform their tasks more safely by avoiding hot or live voltages. Upon the detection of live voltages, it simultaneously produces a unique combination of two alerts; audible beep alert and blinking LED light.

## Specifications of the U1230 Series Digital Multimeters

		U1231A	U1232A	U1233A
<b>Basic features</b>				
Display resolution		6,000	6,000	6,000
Auto/manual ranging		Yes	Yes	Yes
Analog bar graph		Yes	Yes	Yes
Backlight		Yes	Yes	Yes
AC bandwidth		45 Hz to 1 kHz	45 Hz to 1 kHz	45 Hz to 1 kHz
True RMS		Yes	Yes	Yes
<b>Measurements</b>				
Voltage DC	Range	600 mV to 600 V	600 mV to 600 V	600 mV to 600 V
	Accuracy	0.5% + 2 cnts	0.5% + 2 cnts	0.5% + 2 cnts
Voltage AC	Range	600 mV to 600 V	600 mV to 600 V	600 mV to 600 V
	Accuracy	1.0% + 3 cnts	1.0% + 3 cnts	1.0% + 3 cnts
	Bandwidth	45 Hz to 1 kHz	45 Hz to 1 kHz	45 Hz to 1 kHz
Current DC	Range	N/A	60 $\mu$ A to 10 A	60 $\mu$ A to 10 A
	Accuracy		1.0% + 2 cnts	1.0% + 2 cnts

# Specifications of the U1230 Series Digital Multimeters *Continued*

		U1231A	U1232A	U1233A
<b>Measurements</b> <i>Continued</i>				
Current AC	Range Accuracy Bandwidth	N/A	60 $\mu$ A to 10 A 1.5% + 3 cnts 45 to 500 Hz	60 $\mu$ A to 10 A 1.5% + 3 cnts 45 to 500 Hz
Resistance	Range Accuracy	600 $\Omega$ to 60 M $\Omega$ 0.9% + 3 cnts	600 $\Omega$ to 60 M $\Omega$ 0.9% + 3 cnts	600 $\Omega$ to 60 M $\Omega$ 0.9% + 3 cnts
Frequency	Range Accuracy	99.99 Hz to 99.99 kHz 0.1% + 2 cnts	99.99 Hz to 99.99 kHz 0.1% + 2 cnts	99.99 Hz to 99.99 kHz 0.1% + 2 cnts
Capacitance	Range Accuracy	1000 nF to 10 mF 1.9% + 2 cnts	1000 nF to 10 mF 1.9% + 2 cnts	1000 nF to 10 mF 1.9% + 2 cnts
Temperature	Range Accuracy	N/A	N/A	-40 to 1372 $^{\circ}$ C 1% + 1 $^{\circ}$ C
Diode test		Yes	Yes	Yes
<b>Data management</b>				
Min/max recording		Yes	Yes	Yes
Trigger hold		Yes	Yes	Yes
Auto hold		Yes	Yes	Yes
Manual datalogging		N/A	N/A	N/A
Null		Yes	Yes	Yes
PC-Connectivity		IR-USB	IR-USB	IR-USB
% scale of 4-20 mA		N/A	N/A	N/A
<b>Special features</b>				
Built-in flash light		Yes ★	Yes ★	Yes ★
Beep + backlight alert for continuity		Yes ★	Yes ★	Yes ★
Vsense for non-contact voltage detection		N/A	N/A	Yes ★
Z <sub>LOW</sub> - low impedance mode		Yes	Yes	Yes
<b>Safety and regulatory</b>				
IP rating		IP 42	IP 42	IP 42
Over-voltage safety protection		CAT III 600 V	CAT III 600 V	CAT III 600 V
EN/IEC 610101-1:2001 compliance		Yes	Yes	Yes
CSA C22.2 No. 61010-1:2004 compliance		Yes	Yes	Yes
<b>General</b>				
Operating temperature		-10 to 55 $^{\circ}$ C, 0% to 80% RH	-10 to 55 $^{\circ}$ C, 0% to 80% RH	-10 to 55 $^{\circ}$ C, 0% to 80% RH
Battery (included)		4 x 1.5 V Alkaline battery	4 x 1.5 V Alkaline battery	4 x 1.5 V Alkaline battery
Battery life		500 hours	500 hours	500 hours
Warranty		3 years	3 years	3 years
Dimensions (H x W x D)		169 x 86 x 52 mm	169 x 86 x 52 mm	169 x 86 x 52 mm

★ represents key specifications/feature

For complete specifications, please refer to data sheet 5990-7550EN

## Recommended Accessories



U1168A Standard test lead kit



U1173A IR-to-USB cable



U1171A Magnetic hanging kit

## Web link

[www.agilent.com/find/U1230DMM](http://www.agilent.com/find/U1230DMM)



## How to?

Select a Handheld DMM that is Right for You

<http://cp.literature.agilent.com/litweb/pdf/5990-5197EN.pdf>

Think Safety When Selecting a Handheld Multimeter

<http://cp.literature.agilent.com/litweb/pdf/5990-4578EN.pdf>

# U1270 Series – Handheld Digital Multimeters

Water and dust resistant. Grip-friendly and feature-packed. That's what you get with an Agilent U1270 series handheld DMM. Designed especially to fulfill the needs of industrial handheld users today, Agilent has reinvented the industrial handheld DMM to provide:

## Features

- Feature sets that meet traditional industrial requirements and improve productivity such as low impedance mode, low pass filter, offset compensation
- Both visual and audible continuity indication in noisy environments
- Dust and water resistant casing (certified to IP 54)
- Easy access to fuse for simplified maintenance
- Easy connectivity to PC and internal memory for data logging
- Better grip
- Large knob and buttons



# Applications with U1270 Series Handheld Digital Multimeters

## Key functions

### Low Pass Filter (LPF)

In alternating current (AC) electric motor related applications such as the temperature control system in chiller rooms or conveyor drives, the efficiency of the motor is very important to reduce operating costs and improve productivity. Therefore, technicians need to perform routine servicing and repairs on the motors and variable-frequency drive (VFD). The VFD is especially important

as it controls the rotational speed of the electric motor by regulating the frequency of the electrical power supplied to the motor.

Sometimes, a maintenance check on the motor and VFD reveals that the actual output voltage and frequency from the VFD differs from the readings on the VFD display. This shows that the VFD might be

faulty and may therefore need replacement or repair. The difference in voltage readings could also be contributed by harmonics produced by the output of the VFD. This problem must be addressed quickly because if this situation prolongs, the motor may overheat and eventually fail, causing downtime.

It is difficult to identify the root cause of this error using a typical wide bandwidth handheld digital multimeter (DMM). A handheld multimeter with a built-in low pass filter would help technicians to quickly determine if the problem is contributed by unwanted high frequency components generated by the VFD. The Agilent U1270 Series handheld DMMs offer a 1 kHz low pass filter to provide accurate VFD output measurement. This function eliminates unwanted high frequency noise signals and components generated by the VFD. Therefore, a technician would be able to reduce troubleshooting time and ultimately reduce system downtime.



*Comparison of voltage output from industrial motor VFD without and with Low Pass Filter functionality.*

### Low impedance mode ( $Z_{LOW}$ )

Electrical conduit is commonly found in buildings, from manufacturing plants to residential homes. It provides enclosed conductors protection from moisture, chemical vapors and impact. The use of electrical conduit simplifies wiring changes as existing conductors can be withdrawn and new conductors installed with little disruption along the path of the conduit.

Although convenient and safe, unused wires can sometimes run parallel with energized wiring. This may induce capacitive coupling between these wires, causing an undesirable transfer of energy from the energized wiring to the unused wiring. This complicates installation or maintenance of electrical wiring as voltage may be detected on the unused wiring. This is known as 'stray voltage'. This causes complications for technicians, who would have to spend time troubleshooting or isolating wires in order to determine the source of the voltage.

Multimeters with a low impedance mode are able to identify the presence of stray voltages in non-energized wiring. The low impedance mode eliminates false readings by providing a load to the circuit during voltage testing.

The Agilent U1272A is a dual impedance digital multimeter, offering both high and low impedance modes. The DMM's high impedance function can be used in most electrical measurements in the industrial environment because it will not load the circuit under test. Switching to the low impedance mode allows the U1272A to perform accurate measurements on circuits that may contain stray voltages. This eliminates the need of an additional low impedance multimeter, such as a solenoid tester. If this mode is used when real voltage is present, the Agilent U1272A has a built-in positive temperature coefficient (PTC) thermistor as an overcurrent protection element.

### Smart $\Omega$

In integrated circuit (IC) manufacturing plants, ground continuity measurements on workstations are important to ensure that electrostatic discharge (ESD) is minimized. As electronic components become further miniaturized, these components are more sensitive to ESD. In order to maintain a workstation, the common ground point for continuity to earth or electrical ground should be checked periodically.

During this continuity check, leakage current may be found flowing through the common ground conductor to earth ground. This leakage current causes inaccurate ground continuity measurement.

The Agilent U1272A handheld digital multimeter (DMM) allows you to read the leakage current with its Smart  $\Omega$  function. With the U1272A's dual display and 30 Ohms range, you can obtain accurate resistance measurement and read leakage current simultaneously.

# Specifications of the U1270 Series Digital Multimeters

		U1271A	U1272A
<b>Basic features</b>			
Display resolution		30,000	30,000
Auto/manual ranging		Yes	Yes
Analog bar graph		Yes	Yes
Backlight		Yes	Yes
AC bandwidth		20 kHz	100 kHz
True RMS		AC	AC + DC
<b>Measurements</b>			
Voltage DC	Range Accuracy	300 mV to 1000 V 0.05% + 2 cnts	30 mV to 1000 V ★ 0.05% + 2 cnts
Voltage AC	Range Accuracy Bandwidth	300 mV to 1000 V 0.7% + 20 cnts 45 Hz to 20 kHz	30 mV to 1000 V ★ 0.6% + 20 cnts 45 Hz to 100 kHz
Current DC	Range Accuracy	300 $\mu$ A to 10 A 0.2% + 5 cnts	300 $\mu$ A to 10 A ★ 0.2% + 5 cnts
Current AC	Range Accuracy Bandwidth	300 $\mu$ A to 10 A 0.9% + 25 cnts 45 Hz to 2 kHz	300 $\mu$ A to 10 A 0.6% + 25 cnts 45 Hz to 2 kHz
Resistance	Range Accuracy	300 $\Omega$ to 100 M $\Omega$ 0.2% + 5 cnts	30 $\Omega$ to 300 M $\Omega$ ★ 0.2% + 5 cnts
Frequency	Range Accuracy	99.999 Hz to 999.99 kHz 0.005% + 5 cnts	99.999 Hz to 999.99 kHz 0.005% + 5 cnts
Capacitance	Range Accuracy	10 nF to 10 mF 1% + 2 cnts	10 nF to 10 mF 1% + 2 cnts
Temperature	Range Accuracy	K: -200 to 1372 $^{\circ}$ C 1% + 1 $^{\circ}$ C	K: -200 to 1372 $^{\circ}$ C J: -200 to 1200 $^{\circ}$ C 1% + 1 $^{\circ}$ C
Continuity with beeper		Yes	Yes
Diode test		Yes	Yes
<b>Data management</b>			
Min/max recording		Yes	Yes
Display hold		Yes	Yes
Peak hold		Yes	Yes
Manual datalogging		Yes	Yes
Null		Yes	Yes
PC connectivity		IR-USB	IR-USB
% scale of 4-20 mA		Yes	Yes

★ represents key specifications/feature

# Specifications of the U1270 Series Digital Multimeters *Continued*

	U1271A	U1272A
<b>Special features</b> ★		
Beep + backlight alert	Yes	Yes
Low pass filter (LPF)	Yes	Yes
Z <sub>LOW</sub> - low impedance mode	N/A	Yes
Smart Ω	N/A	Yes
Qik-V	Yes	N/A
<b>Safety and regulatory</b>		
Over-voltage safety protection	CAT III 1000 V, CAT IV 600 V	CAT III 1000 V, CAT IV 600 V
EN/IEC 61010-1:2001 compliance	Yes	Yes
CSA C22.2 No. 61010-1:2004 compliance	Yes	Yes
<b>General</b>		
Operating temperature	-20 to 55 °C, 0 to 80% R.H	-20 to 55 °C, 0 to 80% R.H
Battery (included)	4 x AAA	4 x AAA
Battery life	300 hours	300 hours
Warranty	3 years	3 years
Dimensions (H x W x D)	207.0 x 92.0 x 59.0 mm	207.0 x 92.0 x 59.0 mm

★ represents key specifications/feature

For complete specifications, please refer to data sheet 5990-6425EN

## Recommended Accessories



U1171A Magnetic hanging kit



U1174A Soft carrying case



U1173A IR-to-USB cable



U1180A Thermocouple adapter/lead kit

### Web link

[www.agilent.com/find/handhelddmm](http://www.agilent.com/find/handhelddmm)

<http://wireless.agilent.com/videos/u1270/index.html>



### How to?

Test for Stray Voltage Using the U1272A

<http://cp.literature.agilent.com/litweb/pdf/5990-6517EN.pdf>

Ground Resistance Measurement with Smart Ohm

<http://cp.literature.agilent.com/litweb/pdf/5990-7323EN.pdf>

# U1240 Series - Handheld Digital Multimeters

Installation and maintenance of machinery, electrical systems and more often require numerous quick checks and fixes, sometimes under hazardous conditions. Whether you need to quickly inspect power supplies for harmonics, detect glitches in switch systems or monitor differential temperature, the U1240 Series of handheld digital multimeters (DMMs) is up to the task. With all you need in one portable instrument, you can travel light and finish the day's work with ease. Plus, you'll be glad to know it's easy to own one, even with the DMM's rich capabilities.

## Features

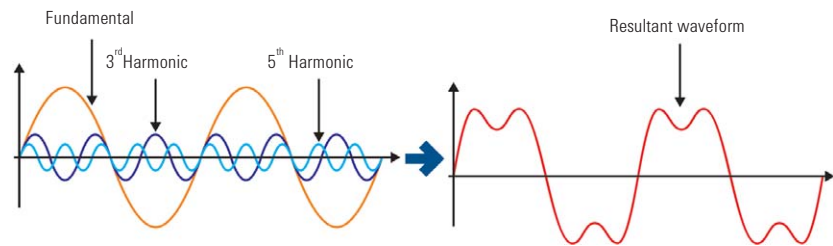
- Low micro-amp and high Mega-ohm ranges
- Switch/Relay counter for glitch detection
- Harmonic ratio measurement in AC supplies
- Dual and differential temperature measurements
- Data logging to instrument on the go



## Applications with U1240 Series Handheld Digital Multimeters

### Harmonic ratio measurement for maintenance of facilities, motors, generators and transformers

Any periodic waveform other than an absolutely pure sine wave has some amount of harmonic content. If these unwanted multiples of the fundamental frequency become too large, they have unwanted side effects: overheating that shortens the lifespan of motors, generators and transformers; premature tripping of circuit breakers; and blown fuses.



*When harmonics are present, the shape of an original sinusoidal waveform becomes distorted, producing a non-zero harmonic ratio.*



Regular maintenance with an accurate, dependable DMM ensures early detection of harmonics in the AC supply. One of the quickest ways to detect and gauge the percentage of distortion due to harmonics is to measure the harmonic ratio of the incoming AC voltage.




The U1240 Series offers a fast one-button check with its harmonic ratio function. The ratio percentage helps you decide if further analysis of the power source is necessary with an oscilloscope or a spectrum analyzer.



**Harmonic ratio**

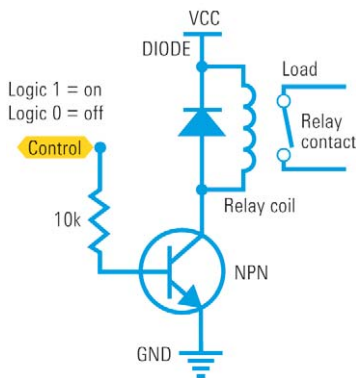
$$\frac{V_{rms} - V_{avg}}{V_{rms}} \times 100\%$$

Arrows point from  $V_{rms}$  and  $V_{avg}$  in the equation to their respective labels below.

Measuring circuit	RMS-calculating converter calculates heating value	Multiplies rectified average by 1.1
Response to sine wave 	Correct	Correct
Response to square wave 	Correct	10% high
Response to distorted wave 	Correct	Up to 50% low

## Switch counter for detection of glitches on switch and relay systems

Careful maintenance of the switches and relays used in facilities and machinery helps ensure that they're operating as expected in their OPEN or CLOSED settings. You can check their performance with just one button using the U1240 Series' switch counter function. This function detects intermittent OPEN or CLOSED occurrences across relay/switch contacts in the reversed setting. The total count indicates the extent of relay/switch faults and determines if further troubleshooting is necessary.

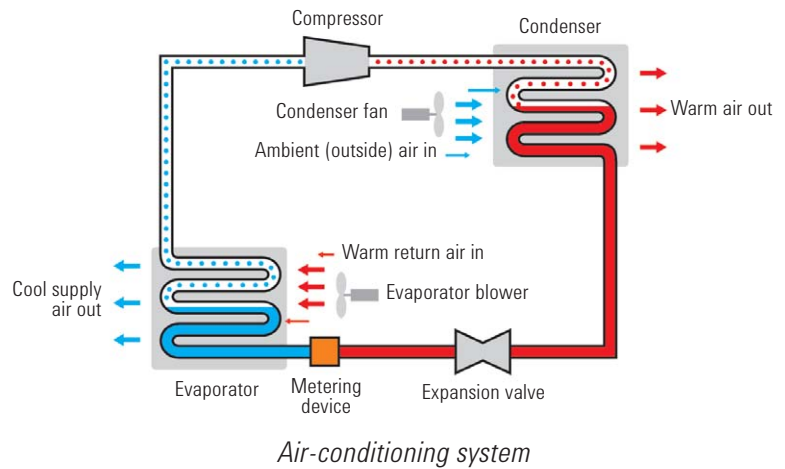
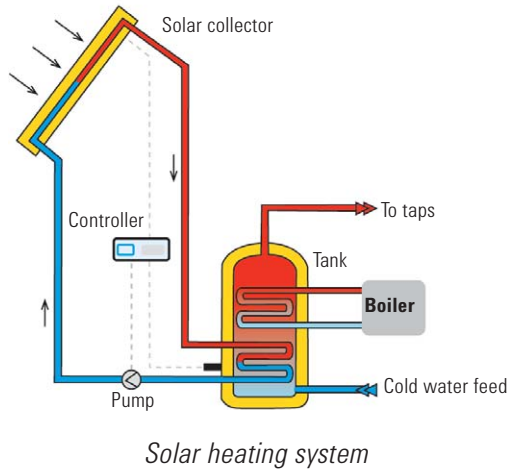


## Dual and differential temperature for efficient testing of HVAC systems



Whether you're installing, maintaining or troubleshooting heating, ventilation and air-conditioning (HVAC) systems in cars, offices, factories, stores or homes, temperature measurements are crucial. For example, to ensure boiler temperature meets safety requirements, you'd have to measure boiler and air temperature simultaneously to get accurate real-time

readings. With a faulty air conditioning system, viewing the temperature difference between warm return air and cool supply air helps reveal the cooling behavior of the evaporator with respect to time. With the U1240 Series, you need just one instrument for convenient, efficient dual and differential temperature measurements.



## Specifications of the U1240 Series Digital Multimeters

	U1241A/U1241B	U1242A/U1242B
<b>Display</b>		
Counts	10,000 ★	10,000 ★
Analog bar graph	Yes	Yes
Backlight	Dual-intensity ★	Dual-intensity ★
<b>Back features</b>		
True RMS	AC	AC
Basic DCV accuracy	0.09%	0.09%
Auto/manual ranging	Yes	Yes
<b>Measurements</b>		
Voltage AC/DC	1000 V	1000 V
Current AC/DC	10 A (down to microamps) ★	10 A (down to microamps) ★
Resistance	100 MΩ	100 MΩ
Frequency	200 kHz	200 kHz
Capacitance	0.1 nF to 10 mF ★	0.1 nF to 10 mF ★
Temperature	1000 °C, K-type thermocouple	1000 °C, K-type thermocouple, T1/T2/T1-T2 ★
Continuity with beeper	Yes	Yes
Diode test	Yes	Yes
4-20 mA % scale	Yes	Yes
Harmonic ratio	N/A	Yes ★
Switch countert	Yes ★	Yes ★

★ represents key specifications/features

# Specifications of the U1240 Series Digital Multimeters *Continued*

	U1241A/U1241B	U1242A/U1242B
<b>Data management</b>		
Min/Max/Avg recording	Yes	Yes
Data hold	Yes	Yes
Null	Yes	Yes
Data logging	N/A	100 manual, 200 interval points
<b>Safety and regulatory</b>		
Over-voltage safety protection	CAT III 1000 V/CAT IV 600 V	CAT III 1000 V/CAT IV 600 V
EN/IEC 61010-1:2001 compliance	Yes	Yes
CSA C22.2 No. 61010-1:2004 compliance	Yes	Yes
<b>General</b>		
Operating temperature	-10 to 55 °C	-10 to 55 °C
Battery (included)	4 x AAA	4 x AAA
Battery life	300 hours	300 hours
Warranty	3 years	3 years
Dimensions (H x W x D)	193.8 x 92.2 x 58.0 mm	193.8 x 92.2 x 58.0 mm ★

★ represents key specifications/features

For complete specifications, please refer to data sheet 5989-7040EN

## Recommended Accessories



U1162A Alligator clips



U1583B AC current clamp



U1174A Soft carrying case



U1171A Magnetic hanging kit



U1186A K-type thermocouple and adapter

### Web link

[www.agilent.com/find/handhelddmm](http://www.agilent.com/find/handhelddmm)



### How to ?

Detect Harmonics in AC signals

<http://cp.literature.agilent.com/litweb/pdf/5989-7687EN.pdf>

Select a Handheld DMM that is Right for You

<http://cp.literature.agilent.com/litweb/pdf/5990-5197EN.pdf>

# U1250 Series - Handheld Digital Multimeters

The process of isolating faults is always unpredictable—so it's good to be equipped with a versatile DMM that simplifies analysis, accelerates glitch detection and makes it easier to probe hard-to-reach points. The U1250 Series gets even better with the U1253A/U1253B DMM and its razor-sharp OLED display: You'll get crystal-clear readings indoors, even in dark, off-angle situations. Optimize electronics troubleshooting with the accuracy, capabilities, and accessories you need to get started in no time.

## Features

- High contrast ratio of 2000:1 and wide viewing angle of 160°\*
- 50,000 counts high resolution and up to 0.025% low error rate
- Built-in square-wave generator and frequency counter
- Includes all essential accessories for electronics troubleshooting
- Smoothing function to stabilize erratic readings\*
- Data logging to instrument and PC

\* with U1253A/U1253B



*A testament to innovation and credibility, 2006*



*Best Value Portable Test Equipment, 2006*



*General-purpose instruments category, 2009*



*Category Winner, EC&M Product of the Year competition, 2009*

# Applications with the U1250 Series Handheld Digital Multimeters

## Automated data logging to PC for long, continuous measurements

Qualification and troubleshooting of a device-under-test (DUT) often require long periods of testing, over either different temperatures or parameter settings. A common test would be voltage measurements at room, hot and cold temperatures. In such cases, it's more convenient and efficient to automate recording of measurements while you perform other tasks that are at hand. It's even better if you can

record as many data points as required without worrying about the storage capacity of the measuring equipment.

Whatever your measurements, the U1250 Series lets you make easy automated data logging with virtually unlimited saves to PC—so you can be assured that faults are recorded dependably and analyzed sooner.



## Event logging setup in minutes—with bundled GUI data-logging software

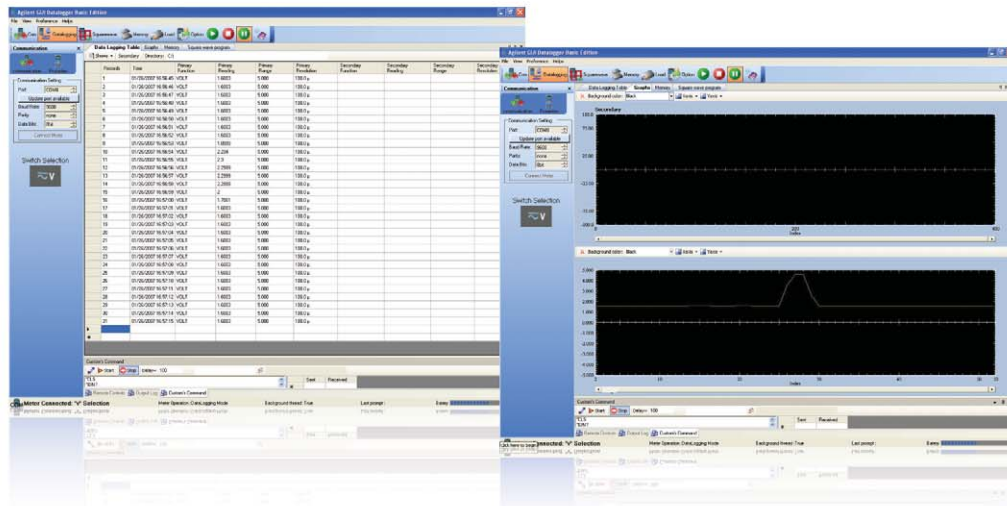
- 1 Connect the optional U1173A IR-USB cable to your U1250 Series DMM and PC



- 2 Open up the GUI data-logging interface

- 3 Click on 

- 4 Click on  and then  to start data logging



Data viewable in both graphical and tabular formats



### What others say

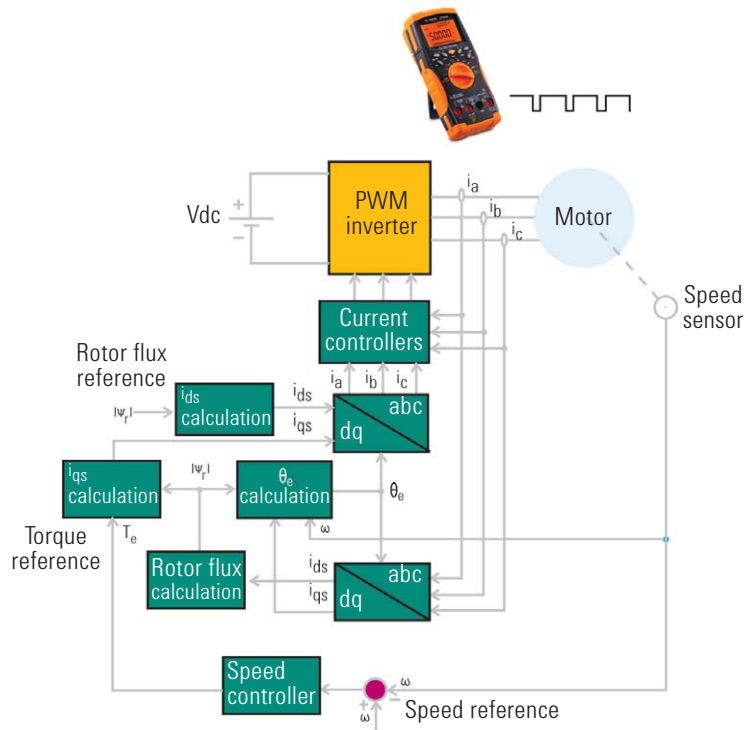
*"I can view rapidly changing readings easily with the U1252A's speedy update rate. Its stable voltage/current/resistance readings offer accurate results, particularly for microvolt measurements of load cells."*

**James G. DuPuy, Service Engineer, Brechbuler Scales Inc. manufacturer of industrial weighing systems and scales**

## Built-in square-wave generator for designing and troubleshooting motor drivers

In the motor-driver circuit shown, a signal from the pulse-width modulation (PWM) inverter drives the motor and is fed back to the speed controller circuit. In design and troubleshooting applications, these pulses are generated externally—usually with a function generator or pulse generator—and injected into the circuit to simulate actual pulses from the inverter.

With the U1250 Series, you can easily configure the square-wave output of the U1252A/U1252B to generate simple PWM signals—conveniently in one portable, lightweight instrument.



### What others say

*"We used square-wave output from the DMM for operational checks of digital circuits around an FPGA to verify the power source of a satellite tracking device and the reception signal from GPS. The U1252A makes our job easier by providing multiple measurements and very accurate results."*

**Hashiguchi, Engineer, ELM Inc., Japan – developer of satellite tracking and other system devices**

## Specifications of the U1250 Series Digital Multimeters

	U1251A/U1251B	U1252A/U1252B	U1253A/U1253B
<b>Display</b>			
Organic LED	N/A	N/A	Yes ★
Dual display	Yes	Yes	Yes
Counts	50,000 (both displays) ★	50,000 (both displays) ★	50,000 (both displays) ★
Analog bar graph	Yes	Yes	Yes
Backlight	Yes	Yes	N/A
<b>Basic features</b>			
True RMS	AC	AC+DC	AC+DC
Basic DCV accuracy	0.03%	0.025%	0.025%
Auto/Manual ranging	Yes	Yes	Yes
<b>Measurements</b>			
Voltage AC/DC	1000 V	1000 V	1000 V
Current AC/DC	10 A	10 A	10 A
Resistance	50 MΩ	500 MΩ	500 MΩ
Frequency	1 MHz	20 MHz	20 MHz
Capacitance	0.001 nF to 100 mF	0.001 nF to 100 mF ★	0.001 nF to 100 mF ★
Temperature	1372 °C, K-type thermocouple ★	1372 °C, J/K-type thermocouple ★	1372 °C, J/K-type thermocouple ★
Continuity with beeper	Yes	Yes	Yes
Diode test	Yes	Yes	Yes
4-20 mA % scale	Yes	Yes	Yes
dB	Yes	Yes	Yes
Frequency counter	N/A	Yes ★	Yes ★
Smoothing function	N/A	N/A	Yes ★

★ represents key specifications/features

# Specifications of the U1250 Series Digital Multimeters *Continued*

	U1251A/U1251B	U1252A/U1252B	U1253A/U1253B
<b>Signal generation</b>			
Square-wave generator	N/A	0.5 Hz to 4.8 kHz, selectable Hz and % ★	0.5 Hz to 4.8 kHz, selectable Hz and % ★
<b>Data management</b>			
Min/Max/Avg recording	Yes	Yes	Yes
Peak recording	Yes	Yes	Yes
Data hold	Yes	Yes	Yes
Null	Yes	Yes	Yes
Data logging (requires IR-to-USB cable U1173A for connection to PC)	<b>Internal:</b> 100 manual, 200 interval points <b>To PC:</b> virtually unlimited ★	<b>Internal:</b> 100 manual, 200 interval points <b>To PC:</b> virtually unlimited ★	<b>Internal:</b> 100 manual, 1000 interval points <b>To PC:</b> virtually unlimited ★
<b>Safety and regulatory</b>			
Over-voltage safety protection	CAT III 1000 V/CAT IV 600 V	CAT III 1000 V/CAT IV 600 V	CAT III 1000 V/CAT IV 600 V
EN/IEC 61010-1:2001 compliance	Yes	Yes	Yes
CSA C22.2 No. 61010-1:2004 compliance	Yes	Yes	Yes
<b>General</b>			
Operating temperature	-20 to 50 °C	-20 to 50 °C	-20 to 50 °C
Battery (included)	Alkaline 9 V	7.2 V Ni-MH rechargeable ★	7.2 V Ni-MH rechargeable ★
Battery life	72 hours	36 hours	8 hours
I/O	IR-USB	IR-USB	IR-USB
Warranty	3 years	3 years	3 years
Dimensions (H x W x D)	203.5 x 94.4 x 59.0 mm	203.5 x 94.4 x 59.0 mm	203.5 x 94.4 x 59.0 mm

★ represents key specifications/features

For complete specifications, please refer to data sheet 5989-5509EN

## Recommended Accessories



U1174A Soft carrying case



U1173A IR-to-USB cable



U1180A Thermocouple adapter/lead kit

### Web link

[www.agilent.com/find/handheldmhm](http://www.agilent.com/find/handheldmhm)



### How to ?

Get the Best Out of the U1250 Series Handheld DMM

<http://cp.literature.agilent.com/litweb/pdf/5989-7937EN.pdf>

Generate PWM Waveform Using U1252A DMM

<http://cp.literature.agilent.com/litweb/pdf/5989-6673EN.pdf>

Think Safety When Selecting a Handheld Multimeter

<http://cp.literature.agilent.com/litweb/pdf/5990-4578EN.pdf>

Select a Handheld DMM That is Right for You

<http://cp.literature.agilent.com/litweb/pdf/5990-5197EN.pdf>

## U1210 Series – Handheld Clamp Meters

Measurements of electrical distribution cables can be challenging and risky. For cables up to two inches in diameter, the Agilent U1210 Series handheld clamp meters enable high-current measurements without breaking the circuit. Unlike most clamp meters, they also include DMM capabilities—resistance, capacitance, frequency and temperature—to simplify troubleshooting during installation and maintenance. Best of all, they provide an extra layer of protection with CAT IV 600 V and CAT III 1000 V safety ratings.

### Features

- Large clamp opening of 52 mm or 2 inches
- High measurement capability of up to 1000 A for AC, DC or AC+DC
- CAT III 1000 V/CAT IV 600 V safety rating
- Includes full-featured DMM with resistance, capacitance, frequency and temperature functions
- High resolution measurements - measure current as low as 0.01 A
- Peak hold capability



## Applications with U1210 series Handheld Clamp Meters

### Large jaw opening and high-current measurement capability - for installation and maintenance of high-current distribution systems and cables



Current measurements at power distribution sites can be challenging as cables are usually large as they contain high current sources. The need of current measurement methods that are safe and easy add complexity to the task of acquiring accurate current data. Conventionally, a current conductor has to be disconnected to allow probe insertion and this is not only hazardous when high currents are involved, but not convenient as well.

With a two-inch (52 mm) jaw opening, the U1210 Series handheld clamp meters simplify current measurements for thick cables, without breaking the circuit. The clamp meters provide the ability to handle big currents, with current measurement capability of up to 1000 A (AC, DC, AC+DC). This series also enables high resolution measurements, with the ability to measure currents as low as 0.01 A. You are able to measure in-rush current as well with the clamp meters' peak hold feature.

The U1210 Series clamp meters offer dual-ranging mode – manual and auto, min/max recording capability and large dual display for additional accessibility when it comes to data collection or analysis.



*4-mm-tip probes*

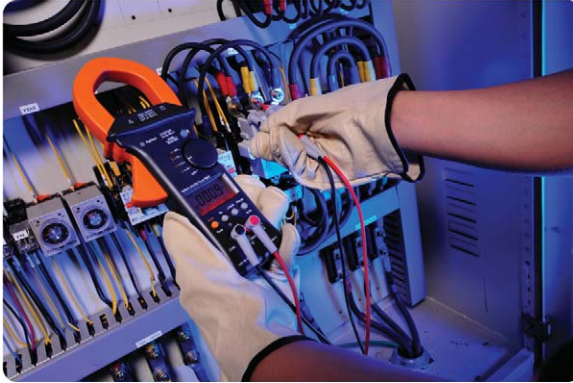
Each clamp meter provides an extra layer of protection with CAT IV 600 V and CAT III 1000 V safety ratings. When performing a measurement with the multimeter, test probes with 4-mm tips (which is bundled with each clamp meter) can be used to further prevent dangerous arc flash if the tips are inadvertently shorted together during probing.

## Full-featured digital multimeter functions – make more than just current measurements

The U1210 Series clamp meters are versatile handheld test tools that combine a current clamp with a digital multimeter (DMM).

The U1210 Series provides basic functions of a multimeter with wide measurement ranges to cater for a broad range of applications: ACA, DCV, ACV, OHM, audible continuity, capacitance, diode and frequency tests.

These meters also provide auto-ranging capability, built-in peak hold for in-rush current measurement, temperature and capacitance measurement capability, large backlight display and one-hand operation.



## Specifications of the U1210 Series Clamp Meters

	U1211A	U1212A	U1213A
<b>Display</b>			
Dual display	Yes	Yes	Yes
Counts	4000	4000	4000
Bar-graph	12 segments	12 segments	12 segments
Backlit	Yes	Yes	Yes
Auto power OFF	Yes	Yes	Yes
<b>Basic features</b>			
True RMS	AC	AC/DC	AC+DC
Auto/manual ranging	Yes	Yes	Yes
<b>Measurements</b>			
Voltage DC	0.1 V - 1000 V (0.5%)	0.1 V - 1000 V (0.5%)	1 mV - 1000 V (0.2%)
Voltage AC	0.1 V - 1000 V (1.0%)	0.1 V - 1000 V (1.0%)	1 mV - 1000 V (1.0%)
Current DC	N/A	0.01 A - 1000 A (1.5%) ★	0.01 A - 1000 A (1.5%) ★
Current AC	0.1 A - 1000 A (1.0%) ★	0.1 A - 1000 A (2.0%) ★	0.01 A - 1000 A (2.0%) ★
Resistance	4 kΩ (0.5%)	4 kΩ (0.5%)	40 MΩ (0.3%)
Capacitance	0.1 μF - 4000 μF (2.0%)	0.1 μF - 4000 μF (2.0%)	1 nF - 4000 μF (1.0%)
Diode	Yes	Yes	Yes
Temperature	N/A	K-type (-200 to 1372 °C)	K-type (-200 to 1372 °C)
Frequency	Yes	Yes	Yes
Duty cycle	N/A	N/A	Yes

Accuracy information shown in brackets is the best accuracy throughout the range.

★ represents key specifications/features

# Specifications of the U1210 Series Clamp Meters *Continued*

	U1211A	U1212A	U1213A
<b>Data management</b>			
Data hold	Yes	Yes	Yes
Null	Yes	Yes	Yes
MAX/MIN/AVG	Yes	Yes	Yes
Peak hold	Yes	Yes	Yes
<b>Safety and regulatory</b>			
Over-voltage safety protection	CAT III 1000 V/CAT IV 600 V	CAT III 1000 V/CAT IV 600 V	CAT III 1000 V/CAT IV 600 V
EN/IEC 61010-1:2001 compliance	Yes	Yes	Yes
CSA C22.2 No. 61010-1:2004 compliance	Yes	Yes	Yes
<b>General</b>			
Operating temperature	-10 to 50 °C	-10 to 50 °C	-10 to 50 °C
Clamp opening	2 inches ★	2 inches ★	2 inches ★
Battery (included)	Alkaline 9 V	Alkaline 9 V	Alkaline 9 V
Battery life	60 hours	60 hours	60 hours
Warranty	3 years	3 years	3 years
Dimensions (H x W x D)	273.0 x 106.0 x 43.0 mm	260.0 x 106.0 x 43.0 mm	260.0 x 106.0 x 43.0 mm

★ represents key specifications/features

For complete specifications, please refer to data sheet 5990-3459EN

## Recommended Accessories



U1168A Standard test lead kit



U1180A Thermocouple adapter/lead kit



U1175A Carrying case

### Web link

[www.agilent.com/find/clampmeter](http://www.agilent.com/find/clampmeter)



### How to ?

Troubleshoot Three-Phase AC Motors with U1210 Series Handheld Clamp Meters

<http://cp.literature.agilent.com/litweb/pdf/5990-5192EN.pdf>

# Digital Oscilloscopes

## U1600 Series - Handheld Digital Oscilloscopes

A scope with a color waveform display. A DMM for basic measurements. A data logger to record DMM readings to a PC. All three capabilities are in one instrument—the U1600 Series of handheld digital oscilloscopes. Designed to address the portability needs of various installation and maintenance applications, these scopes enable clear waveform viewing, easy waveform analysis and quick isolation of signal glitches. With high-performance features loaded into one robust package, mobile troubleshooting is a breeze.

### Features

- Built-in DMM and data logger
- Large 4.5-inch color display
- 200 MSa/s high sampling rate and deep memory
- Built-in Quick Help, available in multiple languages
- Data logging to instrument and PC
- Convenient data download to USB flash drive\*

\* with Option 001



No. 1 Product of the Year  
as voted by readers—2006

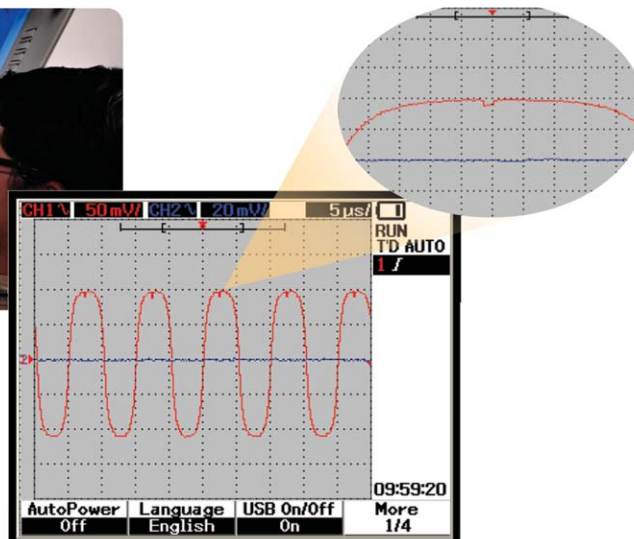
## Applications with the U1600 Series Handheld Digital Oscilloscopes

### Fast sampling, deep memory—so you won't miss a glitch

Whether a machine is down for repair or maintenance, returning it to service as quickly as possible is crucial. With the U1600 Series, you can carry a scope to the problem knowing you can make measurements without an AC outlet.

One common fault in the printed circuit board assembly (PCA) of such machines is glitches caused by factors ranging from component wear-and-tear to an unclean power source. Effectively capturing these glitches requires a scope with a high sampling rate and deep memory. The U1600 Series provides 20 MHz

and 40 MHz bandwidths with up to 200 MSa/s real-time sampling rate. With its deep memory, you can zoom in on a particular segment of a signal to view even the most subtle details. The scopes also offer advanced triggering types such as edge, pulse width, pattern and video to assist in quick isolation of critical events.

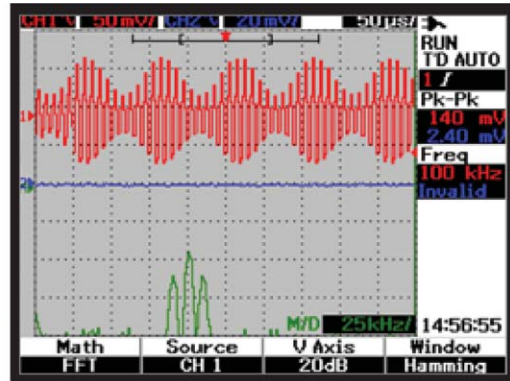


## Advanced FFT and waveform math follow wherever you go

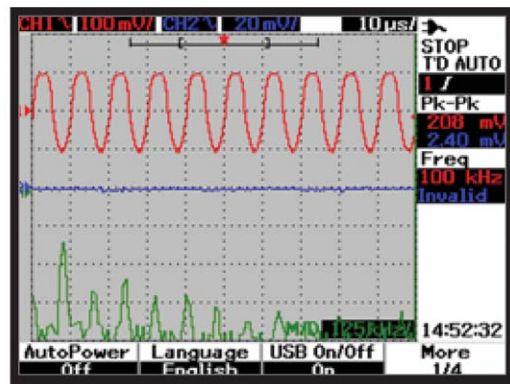
Time is especially precious on the manufacturing line. When a test system fails, quick troubleshooting and analysis is needed to get the line running again as soon as possible.

The portable, lightweight U1600 Series is more convenient than conventional benchtop oscilloscopes. Its small form adds versatility when measuring hard-to-reach points in the test system, and its large color LCD display enables clear viewing of waveforms.

Analysis of complex waveforms is easy with the U1600 Series' dual waveform math (DWM) and fast Fourier transform (FFT) functions. The FFT function provides a frequency-domain view of measurements in four windowing techniques: Rectangular, Hanning, Hamming and Blackman-Harris.



An FFT of the upper waveform reveals three spectral lines that represent the carrier frequency and its sidebands, enabling informative analysis of amplitude-modulated signals.



Although the sine-wave signal seems flawless in the time domain, doing an FFT reveals the presence of harmonic distortion, which is seen as integer-multiple spectral components in the frequency domain.

# Specifications of the U1600 Series Digital Oscilloscopes

	U1602A/U1602B	U1604A/U1604B
<b>Display</b>		
General	4.5" color LCD ★	4.5" color LCD ★
Counts (DMM function)	6000	6000
<b>Scope</b>		
Channels	2	2
Bandwidth (–3 dB)	DC to 20 MHz	DC to 40 MHz
Maximum sampling rate	100 MSa/s per channel (50 s/div to 250 ns/div) ★ 200 MSa/s single channel and interleaved (125 ns/div) ★	100 MSa/s per channel (50 s/div to 250 ns/div) ★ 200 MSa/s single channel and interleaved (125 ns/div) ★
Maximum recording length	11,100 points for U1602A and 125,000 points for U1602B, viewable on screen with zoom function ★	11,100 points for U1604A and 125,000 points for U1604B, viewable on screen with zoom function ★
Cursor and zoom functions	Yes	Yes
Waveform math	Yes	Yes
FFT	N/A	Rectangular, Hamming, Hanning, Blackman-Harris ★
Automatic measurements	Up to 22 measurements	Up to 22 measurements
Coupling	AC, DC, GND	AC, DC, GND
Input impedance	1 M $\Omega$    < 20 pF	1 M $\Omega$    < 20 pF
Range	50 ns to 50 s/div	10 ns to 50 s/div
Resolution	2 ns	400 ps
Rise time	< 17.5 ns	< 8.8 ns
Trigger types	Edge, Pattern, Pulse width, Video	Edge, Pattern, Pulse width, Video
Trigger modes	Auto, Normal, Single	Auto, Normal, Single
Internal scope storage	Up to 10 setups and traces	Up to 10 setups and traces
<b>DMM</b>		
True RMS	AC+DC	AC+DC
Voltage AC/DC	600 V	600 V
Current AC/DC	600 A	600 A
Resistance	60 M $\Omega$	60 M $\Omega$
Capacitance	0.01 nF to 300 $\mu$ F	0.01 nF to 300 $\mu$ F
Temperature	6000 °C, K-type thermocouple	6000 °C, K-type thermocouple
Continuity with beeper	Yes	Yes
Diode test	Yes	Yes
<b>Data logger</b>		
Min/Max/Avg recording	Yes	Yes
Data logging (requires bundled USB 2.0 full-speed cable for connection to PC)	<b>Internal:</b> 250 points <b>To PC:</b> virtually unlimited	<b>Internal:</b> 250 points <b>To PC:</b> virtually unlimited
Time span	150 seconds to 20 days (auto range)	150 seconds to 20 days (auto range)

★ represents key specifications/features

# Specifications of the U1600 Series Digital Oscilloscopes *Continued*

	U1602A/U1602B	U1604A/U1604B
<b>Safety and regulatory</b>		
Over-voltage safety protection	CAT III 300 V	CAT III 300 V
EN/IEC 61010-1:2001 compliance	Yes	Yes
CSA C22.2 No. 61010-1:2004 compliance	Yes	Yes
<b>General</b>		
Operating temperature	0 to 50 °C	0 to 50 °C
Battery (included)	Rechargeable Ni-MH	Rechargeable Ni-MH
Battery life	4 hours	4 hours
I/O	<ul style="list-style-type: none"> <li>• USB 2.0 full-speed client for data transfers to PC</li> <li>• USB 2.0 full-speed host for data transfers to USB flash drive (Option 001)</li> </ul>	<ul style="list-style-type: none"> <li>• USB 2.0 full-speed client for data transfers to PC</li> <li>• USB 2.0 full-speed host for data transfers to USB flash drive (Option 001)</li> </ul>
Warranty	3 years	3 years
Dimensions (H x W x D)	241.0 x 138.0 x 66.0 mm	241.0 x 138.0 x 66.0 mm

★ represents key specifications/features

For complete specifications, please refer to data sheet 5989-5576EN

## Recommended Accessories



U1590A Soft carrying case



U1561A 10:1 Scope probe



U1562A 100:1 Scope probe



U1580A DMM terminal test lead set



U1571A Ni-MH battery pack

### Web link

[www.agilent.com/find/handheldscope](http://www.agilent.com/find/handheldscope)



### How to ?

Perform Metal Scrap Sorting Machine Installation with U1600A Series

<http://cp.literature.agilent.com/litweb/pdf/5989-9786EN.pdf>

# Multi-function Calibrator/Meter

## U1401A/U1401B – Handheld Multi-function Calibrator/Meter

More often than not, the calibration of process control parts requires simultaneous measurements with a DMM. Carry two tools in one—and calibrate while you measure—with the Agilent U1401A/U1401B handheld multi-function calibrator/meter. Now you can travel light, whether you're doing calibration for validation, troubleshooting, or service and maintenance. Slip the robust U1401A/U1401B in its sturdy carrying case and you're ready to go.



### Features

- 50,000-count resolution on dual display
- Simultaneous source and measure capabilities
- Bipolar voltage and current, square-wave, auto scan and ramp outputs
- Full-span DMM measurement and recording functions
- Built-in charging capability

## Applications with the U1401A/U1401B Multi-Function Calibrator/Meter

### Simultaneous source and measure with just one tool

Commonly used in today's process control systems are signal conditioners and loop-powered isolators. These typically involve high-accuracy signals and demand periodic calibration to ensure optimum performance.

Calibration requires sourcing a known signal into the device and measuring its output. For instance, calibration of a loop-powered isolator with 4-20 mA input/output range involves accurately simulating a known mA signal into the isolator and measuring its corresponding mA output to ensure that it is performing well within its specifications. Being well-equipped means you need to carry both a calibrator and digital multimeter (DMM) as you go about your calibration tasks.

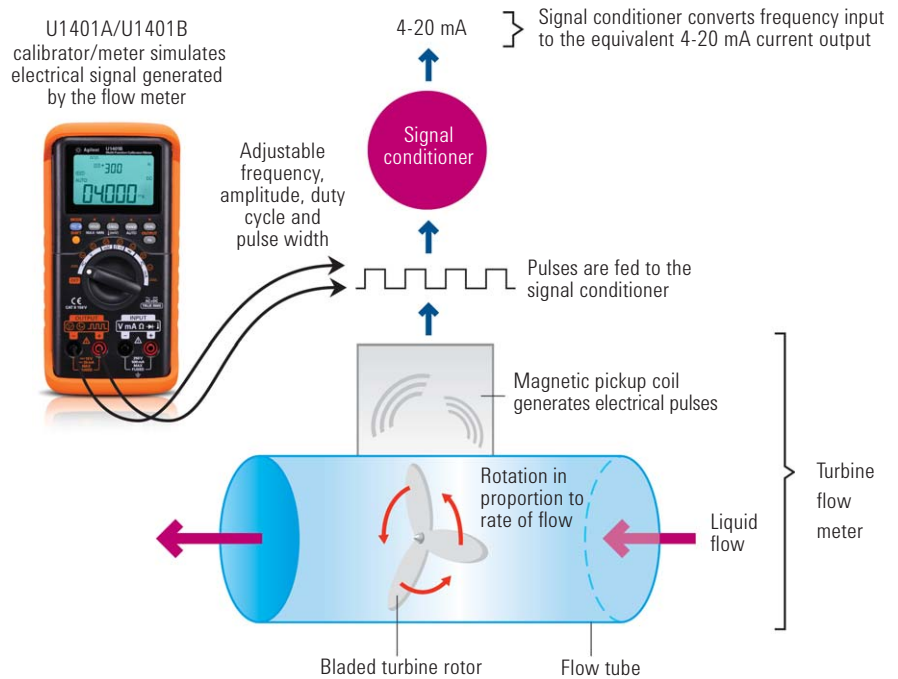
Not so with the U1401A/U1401B calibrator/meter. One tool equips you with both sourcing and measuring capabilities so you no longer need to carry a separate DMM when you're away from the bench.



## Built-in pulse signal generator for calibrating flow meter systems

Flow meters output pulses with frequencies that are proportional to the rate of flow of liquid that passes through its bladed turbine rotor. These pulses are then fed to a signal conditioner. Calibration of the signal conditioner requires injecting known pulse signals into it and checking that the resulting output is what it should be.

Right on site and with the U1401A/U1401B in hand, you can conveniently simulate the flow meter's output pulses into the signal conditioner, without needing a separate function generator.



## Specifications of the U1401A/U1401B Multi-function Calibrator/Meter

	U1401A/U1401B
<b>Display</b>	
Dual display	Yes
Counts	50,000
Backlight	Yes
<b>Source</b>	
Voltage	$\pm 15$ V
Current	$\pm 25$ mA
Square-wave	0.5 Hz to 4.8 kHz, selectable Hz and % ★
Auto scan and ramp	Yes
Simultaneous operation with MEASURE function	Yes ★
<b>Measure</b>	
True RMS	AC+DC
Basic DCV accuracy	0.03% + 5 counts
Auto/Manual ranging	Yes
Voltage AC/DC	250 V
Current AC/DC	500 mA
Resistance	50 M $\Omega$
Frequency	200 kHz
Temperature	1372 °C, K-type thermocouple
Continuity with beeper	Yes
Diode test	Yes
4-20 mA, 0 to 20 mA % scale	Yes
Simultaneous operation with SOURCE function	Yes ★

★ represents key specifications/features

# Specifications of the U1401A/U1401B Multi-function Calibrator/Meter *Continued*

	U1401A/U1401B
<b>Data management</b>	
Min/Max/Avg recording	Yes
Peak recording	Yes
Data hold	Yes
Data logging to PC (requires IR-to-USB cable U5481A for connection to PC)	Yes
<b>Safety and regulatory</b>	
Over-voltage safety protection	CAT II 150 V
EN/IEC 61010-1:2001 compliance	Yes
CSA C22.2 No. 61010-1:2004 compliance	Yes
<b>General</b>	
Operating temperature	0 to 40 °C
Battery (included)	9.6 V Ni-MH rechargeable
Battery life	80 hours
I/O	IR-USB
Warranty	3 years
Dimensions (H x W x D)	192.0 x 90.0 x 54.0 mm

★ represents key specifications/features

For complete specifications, please refer to data sheet 5990-3459EN

## Recommended Accessories



U5481A IR-to-USB cable



U1186A K-type thermocouple and adapter



U1160A Standard test lead kit



U1181A Immersion temperature probe



U1182A Industrial surface temperature probe



U1183A Air temperature probe

### Web link

[www.agilent.com/find/handheld-calibrator-meter](http://www.agilent.com/find/handheld-calibrator-meter)



### How to ?

Easily Perform Process Control Calibration U1401A

<http://cp.literature.agilent.com/litweb/pdf/5990-3932EN.pdf>

# Capacitance/LCR meters

## U1700 Series – Handheld Capacitance/LCR meters

Agilent's U1730C Series handheld LCR meters allow you to measure at frequencies as high as 100 kHz—a capability typically found only in benchtop meters. Get measurements done faster using the one-touch automatic identification function button which displays component type and more detailed component analysis such as Z, ESR, and DCR. Ideal for testing on the go, these LCR meters operate on a battery that lasts up to 16 hours. With the U1730C Series that is built for your convenience, you can perform quick and basic LCR measurements at an affordable price.

### Features

- 20,000 counts resolution
- 0.2% basic accuracy
- Wide LCR ranges with three to five selectable test frequencies (up to 100 kHz for U1733C)
- Auto identification (Ai) automatically determines and displays component type and measurements
- Detailed component analysis with DCR, ESR, Z, D, Q, and  $\theta$  functions
- Battery life of 16 hours/AC-powered
- IR-to-USB connectivity for data logging to PC



## Applications with the U1700 Series Capacitance/LCR Meters

The U1730C Series handheld is a LCR meter with a wide range of test frequencies of up to 100 kHz. It also covers wide measurement parameters including Z, L, C, R, DCR, ESR as well as D, Q, and  $\theta$  for more detailed component analysis. These features make the U1730C Series ideal both in component evaluations on the production line and for fundamental impedance testing.

### SMD tweezer for testing surface-mount devices

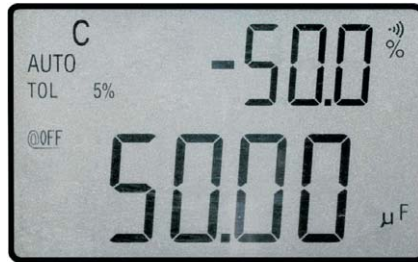
The optional U1782A SMD tweezer enables easy testing of surface-mount devices. The tweezer comes with three shrouded banana plugs and an extended reach of 770 mm. The U1700 Series guard terminal provides your measurements with better noise immunity and accurate readings.



## Tolerance and compare modes for quick component sorting

On the manufacturing floor, components may come in large batches for quick sorting to pre-defined specifications. Tolerance mode in the U1700 Series lets you zap through sorting of incoming capacitors, inductors or resistors to 1%, 5%, 10% or 20% tolerance of the specified reference value.

Additionally, compare mode in the U1701B capacitance meter allows easy memory save/recall of up to 25 High/Low limit settings for convenient Pass/Fail screening of capacitors. This means speedier testing due to reduced set-up time and risk of manual input errors.



Tolerance mode of 1%, 5%, 10% and 20% are available in capacitance and LCR models.



Compare mode in the U1701B reduces test set-up time for capacitor sorting.

## Specifications of the U1700 Series Capacitance/LCR Meters

	U1701B	U1731C	U1732C	U1733C
<b>Display</b>				
Dual display	Yes	Yes	Yes	Yes
Counts	11,000	20,000	20,000	20,000
Backlight	Yes	N/A	Yes	Yes
<b>Measurements</b>				
Capacitance	0.1 pF to 199.99 mF	200 pF to 20 mF	20 pF to 20 mF	20 pF to 20 mF
Inductance	N/A	200 µH to 2000 H	20 µH to 2000 H	20 µH to 2000 H
Resistance	N/A	2 Ω to 200 MΩ	2 Ω to 200 MΩ	2 Ω to 200 MΩ
Dissipation factor (DF)	N/A	Yes	Yes	Yes
Quality factor (QF)	N/A	Yes	Yes	Yes
Phase angle (θ) measurement	N/A	Yes	Yes	Yes
Tolerance mode	1%, 5%, 10%, 20% ★	1%, 5%, 10%, 20% ★	1%, 5%, 10%, 20% ★	1%, 5%, 10%, 20% ★
Compare mode	25 sets of non-volatile High/Low limit settings ★	N/A	N/A	N/A
Test method/frequency	DC charge/discharge	100 Hz, 120 Hz, 1 kHz	100 Hz, 120 Hz, 1 kHz, 10 kHz	100 Hz, 120 Hz, 1 kHz, 10 kHz, 100 kHz ★
<b>Data management</b>				
Min/Max/Avg recording	Yes	Yes	Yes	Yes
Data hold	Yes	Yes	Yes	Yes
Data logging to PC (requires IR-to-USB cable U5481A for connection to PC)	Yes	Yes	Yes	Yes

★ represents key specifications/features

# Specifications of the U1700 Series Capacitance/LCR Meters *Continued*

	U1701B	U1731C	U1732C	U1733C
<b>Safety and regulatory</b>				
EN/IEC 61010-1:2001 compliance	Yes	Yes	Yes	Yes
<b>General</b>				
Operating temperature	0 to 50 °C	-10 to 55 °C, 0 to 80% R.H.	-10 to 55 °C, 0 to 80% R.H.	-10 to 55 °C, 0 to 80% R.H.
Battery (included)	<ul style="list-style-type: none"> <li>Alkaline 9 V</li> <li>AC power adapter and cord available as option</li> </ul>	Yes	Yes	Yes
Battery life	80 hours	16 hours	16 hours	16 hours
I/O	IR-to-USB	IR-to-USB	IR-to-USB	IR-to-USB
Warranty	3 years	3 years	3 years	3 years
Dimensions (H x W x D)	184 x 87 x 41 mm	184 x 87 x 41 mm	184 x 87 x 41 mm	184 x 87 x 41 mm

★ represents key specifications/features

For complete specifications, please refer to data sheet 5990-7778EN

## Recommended Accessories



U1731P Combo kit



U1732P Combo Kit



U1733P Combo Kit



U1174A Soft carrying case



U5481A IR-to-USB cable



U1782A SMD tweezers



U1780A AC power adapter



U1781A Alligator clips

### Web link

[www.agilent.com/find/handheldlcr](http://www.agilent.com/find/handheldlcr)

# Accessories Compatibility Chart

Ordering number	Description	Handheld clamp meters	Handheld DMMs								Handheld scopes	Handheld calibrator/meter	Handheld capacitance/ LCR meters
		U1211A/ 12A/13A	U1231A/ 32A/33A	U1241A/ U1241B	U1242A/ U1242B	U1251A/ U1251B	U1252A/ U1252B	U1253A/ U1253B	U1271A	U1272A	U1602A/ 04A/ U1602B/ 04B	U1401A/ U1401B	U1701B/ U1731C/ 32C/33C
<b>Kits</b>													
U1160A	Standard test lead kit	✓	✓	✓	✓	✓	✓	✓	✓	✓	×	×	×
U1168A	Standard test lead kit	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	×
U1580A	DMM terminal test lead set	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	×
U1180A	Thermocouple adapter+lead kit	✓ (For U1212A/ 13A only)	×	×	✓	×	✓	✓	×	✓	×	×	×
<b>Probes/leads/clamp</b>													
U1162A	Alligator clips	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	×
U1163A	SMT grabbers	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	×
U1164A	Fine-tip test probes	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	×
U1165A	Silicone test leads (19mm)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	×
U1583B	AC current clamp	×	✓	✓	✓	✓	✓	✓	✓	✓	✓	×	×
U1781A	Alligator clip leads	×	×	×	×	×	×	×	×	×	×	×	✓
U1782A	SMD tweezer	×	×	×	×	×	×	×	×	×	×	×	✓
U5402A	Yellow test lead for mA simulation	×	×	×	×	×	×	×	×	×	×	✓	×
<b>Probes/leads for temperature measurement</b>													
U1181A	Immersion temperature probe	✓ (For U1212A/ 13A only)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	×
U1182A	Industrial surface temperature probe	✓ (For U1212A/ 13A only)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	×
U1183A	Air temperature probe	✓ (For U1212A/ 13A only)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	×
U1184A	Temperature probe adapter	✓ (For U1212A/ 13A only)	✓	✓	✓	✓	✓	✓	✓	✓	×	✓	×
U1185A	J-type thermocouple and adapter	×	×	×	✓	×	✓	✓	×	✓	×	×	×
U1186A	K-type thermocouple and adapter	✓ (For U1212A/ 13A only)	✓ (For U1233A only)	✓	✓	✓	✓	✓	✓	✓	✓	✓	×
U1586B	Temperature module	×	✓	×	×	×	×	×	×	×	✓	×	×

✓ = Compatible    × = Not Compatible

# Accessories Compatibility Chart *Continued*

Ordering number	Description	Handheld clamp meters	Handheld DMMs								Handheld scopes	Handheld calibrator/meter	Handheld capacitance/ LCR meters
		U1211A/ 12A/13A	U1231A/ 32A/ 33A	U1241A/ U1241B	U1242A/ U1242B	U1251A/ U1251B	U1252A/ U1252B	U1253A/ U1253B	U1271A	U1272A	U1602A/ 04A/ U1602B/ 04B	U1401A/ U1401B	U1701B/ U1731C/ 32C/33C
<b>Probes/clips for scope-only functions</b>													
U1176A	Probe clip light	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
U1554A	Hook clip for probe tip	×	✓	×	×	×	×	×	×	×	✓	×	×
U1560A	1:1 scope probe	×	✓	×	×	×	×	×	×	×	✓	×	×
U1561A	10:1 scope probe	×	✓	×	×	×	×	×	×	×	✓	×	×
U1562A	100:1 scope probe	×	✓	×	×	×	×	×	×	×	✓	×	×
<b>Carrying case/hanging kit</b>													
U1171A	Magnetic hanging kit	×	✓	✓	✓	✓	✓	✓	✓	✓	×	×	×
U1172A	Transit case (aluminium-clad)	×	✓	✓	✓	✓	✓	✓	✓	✓	×	×	×
U1174A	Soft carrying case	×	✓	✓	✓	✓	✓	✓	✓	✓	×	×	✓
U1175A	Soft carrying case	✓	×	×	×	×	×	×	×	×	×	×	×
U1590A	Soft carrying case (PVC leather)	×	×	×	×	×	×	×	×	×	✓	×	×
U5491A	Carrying case (PVC leather)	×	×	×	×	×	×	×	×	×	×	✓	×
<b>Power/cables</b>													
U1170A	Battery charger adapter	×	×	×	×	×	✓	✓	×	×	×	×	×
U1173A	IR-to-USB cable	×	✓	×	×	✓	✓	✓	✓	✓	×	×	×
U1570A	AC power adapter and cord	×	×	×	×	×	×	×	×	×	✓	×	×
U1571A	Ni-MH battery pack	×	×	×	×	×	×	×	×	×	✓	×	×
U1780A	AC power adapter and cord	×	×	×	×	×	×	×	×	×	×	×	✓
U5481A	IR-to-USB cable	×	×	×	×	×	×	×	×	×	×	×	✓

✓ = Compatible    × = Not Compatible

# Optional Accessories



## U1160A Standard test lead kit

Includes two test leads (red and black), two test probes, medium-sized alligator clips and 4-mm banana plugs.

- Test probe leads: CAT II 1000 V, 15 A
- Alligator clips: CAT III 1000 V, 10 A
- Fine tip test probes: CAT 300 V, 3 A
- SMT grabber: CAT II 300 V, 3 A
- Mini grabber (black only): CAT II 300 V, 3 A



## U1162A Alligator clips

- One pair of insulated alligator clips (red and black). Recommended for use with Agilent standard test leads.
- Rated CAT III 1000 V, 10 A.



## U1163A SMT grabbers

- One pair of SMT grabbers (red and black). Recommended for use with Agilent standard test leads.
- Rated CAT II 300 V, 3 A.



## U1164A Fine-tip test probes

- One pair of fine-tip test probes (red and black). Recommended for use with Agilent standard test leads.
- Rated CAT II 300 V, 3 A.



## U1165A Silicone test leads

- Test probe lead (19 mm)
- Rated CAT II 1000 V



## U1168A Standard test lead kit

- Test leads: CAT III 1000 V, CAT IV 600 V, 15 A
- Test probe (4-mm tips): CAT III 1000 V, CAT IV 600 V, 15 A (highly recommended for CAT IV environment)
- Alligator Clips: Cat III 1000 V, 10 A
- Fine tip test probes: Cat II 300 V, 3 A
- SMT grabber: Cat II 300 V, 3 A
- Mini grabber (black only): Cat II 300 V, 3 A



## U1170A Battery charger adapter

- Includes AC power cord based on country
- For use with U1252A/U1253A DMMs



## U1171A Magnetic hanging kit

- For use with handheld DMMs



## U1172A Transit case

The robust casing to transport your DMM and accessories

- Aluminum-clad, black panel construction
- Dimension (H x W x D): 18 x 13 x 6"
- Weight: 4 kg



## U1173A IR-to-USB cable

- For remote control and data logging to PC
- Max. baud rate: 19,200 bits per second
- For use with U1250 series DMMs



## U1174A Soft carrying case

The convenient way to carry your DMM and essential accessories

- Dimension (H x W x D): 9 x 5 x 3"



## U1175A Carrying case

- Ideal for handheld clamp meters
- Dimension (H x W x D): 290 x 120 x 85 mm



## U1176A LED Probe Clip Light

- 3 inches in length
- To be clipped onto test probes to increase visibility
- Comes with one AAA battery



## U1180A Thermocouple adapter/lead kit

Includes thermocouple adapter, thermocouple bead J-type and thermocouple bead K-type.

- T/C adapter J/K-type
- T/C bead J-type: -20 to 200 °C
- T/C bead K-type: -20 to 200 °C



## U1181A Immersion temperature probe

- Type-K T/C for use in oil and other liquids
- Measurement range: -50 to 700 °C
- Includes adapter U1184A for connection to DMM
- Requires module U1186A for connection to scope



## U1182A Industrial surface temperature probe

- Type-K T/C for use on still surfaces
- Measurement range: -50 to 400 °C
- Includes adapter U1184A for connection to DMM
- Requires module U1186A for connection to scope



## U1183A Air temperature probe

- Type-K T/C for use in air and non-caustic gas
- Measurement range: -50 to 800 °C
- Includes adapter U1184A for connection to DMM
- Requires module U1186A for connection to scope



## U1184A Temperature probe adapter

- Mini-connector-to-banana-plug adapter for use with DMM

## Optional Accessories *Continued*



### U1185A J-type thermocouple and adapter

- T/C adapter J/K-type
- T/C bead J-type: -20 to 200 °C



### U1186A K-type thermocouple and adapter

- T/C adapter J/K-type
- T/C bead K-type: -20 to 200 °C



### U1554A Hook clip for probe tip

- Rated CAT II 1000 V, CAT III 600 V



### U1560A 1:1 Scope probe

- Includes ground alligator clip and hook clip.
- Rated CAT III 300 V



### U1561A 10:1 Scope probe

- Includes ground alligator clip and hook clip.
- Rated CAT III 600 V



### U1562A 100:1 Scope probe

- Includes ground alligator clip and hook clip.
- Rated CAT III 600 V



### U1570A AC power adapter

- Includes AC power cord based on country
- For use with U1600 series scopes



### U1571A Ni-MH battery pack

- 4500 mA, 7.2 V
- For use with U1600 series scopes



### U1580A DMM terminal test lead set

- Includes two DMM test leads (red and black), and three DMM alligator clips.
- Rated CAT III 1000 V



### U1583B AC current clamp

- Dual range: 40 A and 400 A
- Rated CAT III 600 V
- BNC-to-banana-plug adapter provided for use with DMMs



### U1586B Temperature module

- Measures -50 ~ 1000 °C
- K-type bead probe provided for use with DMMs



### U1590A Soft carrying case

- Dimension (H x W x D): 9.6 x 13.0 x 4.5"
- PVC leather material
- Ideal for handheld scopes or instruments of similar size



### U1731P Combo Kit

Includes one U1731 Series handheld and four accessories:

- U5491A soft carrying case
- U1173A IR-USB cable
- U1780A AC adaptor
- U1782A SMD tweezer



### U1732P Combo Kit

Includes one U1732 Series handheld and four accessories:

- U5491A soft carrying case
- U1173A IR-USB cable
- U1780A AC adaptor
- U1782A SMD tweezer



### U1733P Combo Kit

Includes one U1733 Series handheld and four accessories:

- U5491A soft carrying case
- U1173A IR-USB cable
- U1780A AC adaptor
- U1782A SMD tweezer



### U1780A AC power adapter

- Includes AC power cord based on country
- For use with U1700 series handheld capacitance/LCR meters



### U1781A Alligator clip leads

- For use with handheld capacitance and LCR meters



### U1782A SMD tweezer

- Tweezer for testing the capacitance/inductance/resistance of SMD components (C < 200  $\mu$ F, L < 20 mH, R < 10 M $\Omega$ )
- Guard ends for better noise immunity



### U5402A Yellow test lead for mA simulation

- For use with handheld multi-function calibrator/meter



### U5481A IR-to-USB cable

- For remote control and data logging to PC
- Max. baud rate: 19,200 bits per second
- For use with U1700 series handheld capacitance/LCR meters and U1401A multi-function calibrator/meter



### U5491A Carrying case

- Dimension (H x W x D): 8.9 x 12.2 x 3.1"
- PVC leather material
- Ideal for handheld multi-function calibrator/meter or instruments of similar size



For other technical literature, promotion information and online product demos, visit us at:



[www.agilent.com/find/clampmeter](http://www.agilent.com/find/clampmeter)



[www.agilent.com/find/handhelddmm](http://www.agilent.com/find/handhelddmm)



[www.agilent.com/find/handheldlcr](http://www.agilent.com/find/handheldlcr)



[www.agilent.com/find/handheld-calibrator-meter](http://www.agilent.com/find/handheld-calibrator-meter)



[www.agilent.com/find/handheldscope](http://www.agilent.com/find/handheldscope)



### Agilent Email Updates

[www.agilent.com/find/emailupdates](http://www.agilent.com/find/emailupdates)

Get the latest information on the products and applications you select.



[www.axistandard.org](http://www.axistandard.org)

AdvancedTCA® Extensions for Instrumentation and Test (AXIe) is an open standard that extends the AdvancedTCA® for general purpose and semiconductor test. Agilent is a founding member of the AXIe consortium.



[www.lxistandard.org](http://www.lxistandard.org)

LAN eXtensions for Instruments puts the power of Ethernet and the Web inside your test systems. Agilent is a founding member of the LXI consortium.



Agilent Advantage Services is committed to your success throughout your equipment's lifetime. We share measurement and service expertise to help you create the products that change our world. To keep you competitive, we continually invest in tools and processes that speed up calibration and repair, reduce your cost of ownership, and move us ahead of your development curve.

[www.agilent.com/find/advantageservices](http://www.agilent.com/find/advantageservices)



[www.agilent.com/quality](http://www.agilent.com/quality)



<http://www.pxisa.org>

PCI eXtensions for Instrumentation (PXI) modular instrumentation delivers a rugged, PC-based high-performance measurement and automation system.

### Agilent Channel Partners

[www.agilent.com/find/channelpartners](http://www.agilent.com/find/channelpartners)

Get the best of both worlds: Agilent's measurement expertise and product breadth, combined with channel partner convenience.

For more information on Agilent Technologies' products, applications or services, please contact your local Agilent office. The complete list is available at:

[www.agilent.com/find/contactus](http://www.agilent.com/find/contactus)

### Americas

Canada	(877) 894 4414
Brazil	(11) 4197 3500
Mexico	01800 5064 800
United States	(800) 829 4444

### Asia Pacific

Australia	1 800 629 485
China	800 810 0189
Hong Kong	800 938 693
India	1 800 112 929
Japan	0120 (421) 345
Korea	080 769 0800
Malaysia	1 800 888 848
Singapore	1 800 375 8100
Taiwan	0800 047 866
Other AP Countries	(65) 375 8100

### Europe & Middle East

Belgium	32 (0) 2 404 93 40
Denmark	45 70 13 15 15
Finland	358 (0) 10 855 2100
France	0825 010 700*
	*0.125 €/minute
Germany	49 (0) 7031 464 6333
Ireland	1890 924 204
Israel	972-3-9288-504/544
Italy	39 02 92 60 8484
Netherlands	31 (0) 20 547 2111
Spain	34 (91) 631 3300
Sweden	0200-88 22 55
United Kingdom	44 (0) 118 9276201

For other unlisted Countries:

[www.agilent.com/find/contactus](http://www.agilent.com/find/contactus)

Revised: October 14, 2010

Product specifications and descriptions in this document subject to change without notice.

© Agilent Technologies, Inc. 2011  
Printed in USA, May 12, 2011  
5989-7340EN

