

# Keysight Technologies

## Handheld Tools

For Electronic, Electrical and Industrial Process Testing



### Keysight handheld tools

- Remote link solution
- Thermal imager
- Insulation resistance tester
- Digital multimeters
- Digital oscilloscopes
- Clamp meters
- Multifunction calibrator / meter
- Capacitance / LCR meters

### Software and accessories

- Software
- Accessories compatible chart
- Optional accessories

## Keysight Handheld Test Tools

### Keysight Remote Link Solution

The remote link is Keysight Technologies, Inc. next generation wireless connectivity. With the new U1117A Infrared (IR)-to-*Bluetooth*<sup>®</sup> adapter and U1115A remote logging display, you can safely measure, view and log test measurements with an extended range of up to 100 meters. You can now log and monitor data on more display devices such as iOS / Android-based smart devices or on a Windows-based PC. By simply attaching the U1177A / U1117A IR-to-*Bluetooth* adapter to the IR port of a Keysight handheld meter, you'll get instant wireless *Bluetooth* connection setup.

#### Features

- Extended measurement distance of up to 100 meters
- View readings of up to four handheld meters simultaneously
- Compatible across all existing Keysight U1200 series handheld meters
- 60,000 points interval logging\*
- Download logged data to a PC via *Bluetooth* connection\*
- Micro USB external power port\*
- Indoor and outdoor viewing modes\*

\* U1115A



For the U1177A IR-to-*Bluetooth* adapter

### Specifications of the Keysight remote link solution

| Model No.               | U1177A   | U1117A   | U1115A  |
|-------------------------|--|--|---|
| <b>General</b>          |  |  |   |
| Operating temperature   | -20 to 55 °C, up to 80% at 40 °C RH  | -20 to 55 °C, up to 80% at 40 °C RH  | -20 to 55 °C, up to 80% at 40 °C RH   |
| Storage compliance      | -40 to 70 °C, up to 95% at 40 °C RH  | -40 to 70 °C, up to 95% at 40 °C RH  | -40 to 70 °C, up to 95% at 40 °C RH   |
| Power consumption       | Maximum 130 mVA for two 1.5 V AAA batteries  | Maximum 561 mVA for two 1.5 V AAA batteries  | Maximum 1 VA for three AA batteries<br>Maximum 5 V +10%, 250 mA for external power<br>Auto Power Off mode, current consumption 3 mA     |
| Battery type (included) | 2 x AAA alkaline   | 2 x AAA alkaline   | 3 x AA alkaline   |
| Battery life            | 30 hours   | 20 hours   | 20 hours  |
| Dimension (H x W x D)   | 39.0 x 71.0 x 37.0 mm  | 39.0 x 71.0 x 37.0 mm  | 92.0 x 107.9 x 33.5 mm  |
| Weight                  | 60 g   | 60 g   | <238 g  |
| Warranty                | Three months   | Three months   | One year  |
| <i>Bluetooth</i>        | <i>Bluetooth</i> Version 2.1 + EDR compliant, SPP profile, Class 2 device (with 10 meters connection range)  | <i>Bluetooth</i> Version 2.1 + EDR compliant, SPP profile, Class 1 device (with approximately 100 meters connection range)                           | <i>Bluetooth</i> Version 2.1 + EDR compliant, SPP profile, Class 1 device (with approximately 100 meters connection range)              |
| <b>Compatibility</b>    |  |  |   |
| Device                  | Keysight U1200 Series handheld meters, Keysight U1450A/60A Series insulation resistance tester <sup>1</sup> , Keysight U1115A remote logging display | Keysight U1200 Series handheld meters, Keysight U1450A/60A Series Insulation Resistance Tester <sup>1</sup> , Keysight U1115A remote logging display | Keysight U1200 Series handheld meters, Keysight U1117A IR-to- <i>Bluetooth</i> adapter, Keysight U1177A IR-to- <i>Bluetooth</i> adapter |
| PC software             | Keysight handheld meter logger   | Keysight handheld meter logger   | Keysight handheld meter logger  |
| Mobile application      | Keysight mobile meter, Keysight mobile logger, Keysight insulation tester  | Keysight mobile meter, Keysight mobile logger, Keysight insulation tester  | N/A   |
| Other devices           | iPhone, iPad, iPod touch, Android smartphone/tablet, Windows-based PC (with <i>Bluetooth</i> enabled)  | iPhone, iPad, iPod touch, Android smartphone/tablet, Windows-based PC (with <i>Bluetooth</i> enabled)  | Windows-based PC (with <i>Bluetooth</i> enabled)  |

1. U1117A and U1177A IR-to-*Bluetooth* adapter is compatible with the U1450A/U1460A Series to establish wireless connectivity on a PC or iOS/Android smart devices. U1115A is not compatible with the U1450A/U1460A Series.

For complete specifications, please refer to data sheet 5991-4298EN.

Web link [www.keysight.com/find/hhgowireless](http://www.keysight.com/find/hhgowireless)

## Thermal Imager

### U5850 series True/R thermal imagers

Detect abnormalities sooner with higher resolution thermal images within the camera. The U5850 series True/R thermal imagers give you an in-camera fine resolution of 320x240 pixels from a 160x120 pixels detector. Our solution provides clearer, sharper thermal images so problems can be detected faster. Now you can easily capture, save and monitor temperature changes overtime with a good 0.07 °C thermal sensitivity. What's more, you can capture more images without straining your hands with the ergonomically designed True/R thermal imager.

#### Features

- Identify abnormalities faster with four times more in-camera fine resolution
- Monitor temperature changes through image logging and temperature trending capabilities
- Ability to focus on objects as close as 10 cm away
- Compact, lightweight, ergonomic
- High temperature range (up to 1200 °C)
- Easy-to-use customizable color palette
- Configurable quick access buttons to easily change settings with one hand
- Long product warranty - 3 years



U5855A True/R thermal imagers  
ECN 2015 Impact Award Winner  
Cooling and Thermal management

### Specifications of the U5850A True/R thermal imager

| Parameter                               | U5855A  | Specification<br>U5856A  | U5857A   |
|---|---|--|--|
| <b>Basic Performance</b>                |   |  |  |
| Temperature measurement range           | -20 ~ 350 °C  | -20 ~ 650 °C   | -20 ~ 1200 °C  |
| Range 1                                 | -20 to 120 °C   | -20 to 120 °C  | -20 to 120 °C  |
| Range 2                                 | 0 to 350 °C   | 23 to 650 °C <sup>1</sup>  | 0 to 350 °C  |
| Range 3                                 | N/A   | N/A  | 250 to 1200 °C <sup>2</sup>  |
| <b>Thermal sensitivity</b>              |   |  |  |
| Range 1                                 | 0.07 °C (at 30 °C)  | 0.07°C (at 30°C)   | 0.07°C (at 30°C)   |
| Range 2                                 | 0.1 °C (at 30 °C)   | 0.5°C (at 30°C)  | 0.1°C (at 30°C)  |
| Range 3                                 | N/A   | N/A  | 0.5°C (at 250°C)   |
| Accuracy <sup>3</sup>                   |   | ±2 °C or ±2% (whichever is greater)<br>At 0 ~ 40 °C ambient temperature                    |  |
| Detector type                           |   | Uncooled Focal Plane Array (α-Si)  |  |
| Detector resolution                     |   | 160 x 120 pixels   |  |
| Fine resolution (in-camera)             |   | 320 x 240 (IR pixels) ★  |  |
| Spectral range                          |   | 8 to 14 μm   |  |
| Frame rate                              |   | 9 Hz   |  |
| Field of view (FOV)                     |   | 28° (H) × 21° (V)  |  |
| Spatial resolution (IFOV)               |   | 3.1 mrad; 2.1, with fine resolution  |  |
| Focal distance                          |   | 10 cm to infinity ★  |  |
| Focus mechanism                         |   | Manual focus   |  |
| <b>Image Processing and Enhancement</b> |   |  |  |
| Correction parameters                   | Emissivity <ε>, reflected temperature <RT>, object distance <OD>, ambient temperature <AT>, relative humidity <Hum>, transmission <τ> |  |  |
| Emissivity correction                   | 0.1 to 1.0<br>Predefined emissivity table   |  |  |
| Digital zoom                            | Zoom ratio: 4× continuous ★   |  |  |
| Color palette                           | Rainbow, Iron, Hot Iron, Iris, Grayscale, Inverted Grayscale, Custom  | Rainbow, Lava, Iron, Hot Iron, Iris, Olive, Medical, Grayscale, Inverted Grayscale, Custom | Rainbow, Lava, Iron, Hot Iron, Iris, Olive, Medical, Grayscale, Inverted Grayscale, Custom |
| Camera mode                             | IR image, visible image, picture in picture, blend  |  |  |

1. Lower limit temperature at 0°C, Guaranteed lower temperature at 23°C.

2. Lower limit temperature at 0°C, Guaranteed lower temperature at 250°C

3. Minimum distance with accuracy, 10 cm to 50 cm: ±4 °C or ±4%

★ represents key specifications/features. For complete specifications, please refer to data sheet 5991-4297EN

## Specifications of the U5850A TrueIR thermal imager (continued)

| <b>Measurements and alarm</b>       |   |
|-------------------------------------|---|
| Measurements                        | Center spot, 3x moveable spots, max/min tracking, delta temperature, 3x moveable boxes (with min/max/avg)   |
| Color alarm                         | High/low temperature in all areas   |
| Alarm zones                         | Above/below/inside/outside  |
| Background                          | Hot white/Hot black   |
| <b>Supplemental characteristics</b> |   |
| Storage device                      | Supports up to 32 GB SDHC memory card with class 4 and above  |
| Image format                        |   |
| IR image                            | Radiometric JPEG  |
| Visible image                       | JPEG  |
| Image logging                       | Logs IR, visible or fusion images at a defined interval (7 to 3600 seconds)   |
| State storage memory                | Three user-configurable stored states   |
| Tagging/annotation                  | 3 photo tags, note tag, note tag from template (downloadable from the Keysight Web site)  |
| I/O                                 | USB 2.0 mass storage  |
|                                     | NTSC/PAL via video RCA cable  |
| Language                            | English, French, German, Italian, Japanese, Korean, Portuguese, Russian, Spanish, Simplified Chinese, Traditional Chinese   |
| Built-in quick start tutorial       | Available   |
| <b>Product characteristics</b>      |   |
| Power supply                        |   |
| Power adapter                       | Line voltage range: 50/60 Hz, 100 – 240 VAC (Auto/Universal voltage), 1.2 A<br>MAINS supply voltage fluctuations not to exceed ±10% of the nominal voltage<br>Output voltage: 12 VDC, 3 A<br>Installation Category I (Isolated ELV supply source – connected to MAINS through an AC/DC power adapter) |
| Battery                             | Li-Ion rechargeable battery, 7.4 VDC, 2500 mAh<br>Operating time: 4 hours   |
| Display                             | 3.5" TFT  |
| Visible camera                      | 3.1 MP  |
| Built-in LED torch                  | Available   |
| lim                                 | Class 2   |
| Warm-up time                        | 2 minutes   |
| <b>Operating environment</b>        |   |
| Temperature                         | -15 °C to 50 °C   |
| Humidity                            | 50% RH to 95% RH at 40 °C   |
| <b>Storage compliance</b>           |   |
| Temperature                         | -40 °C to 70 °C   |
| Humidity                            | 95% RH at 40 °C   |
| Altitude                            | Up to 2000 m  |
| Pollution degree                    | 2   |
| Safety compliance                   | Laser safety: IEC 60825-1/EN 60825-1 (Laser Class 2)<br>IEC 61010-1/EN 61010-1  |
| EMC compliance                      | IEC 61326-1/EN61326-1<br>CISPR11/EN55011, Group 1 Class A<br>Canada: ICES/NMB-001: Issue 4, June 2006<br>Australia/New Zealand: AS/NZS CISPR 11   |
| Shock                               | Tested to IEC 60068-2-27 Ed. 3.0  |
| Vibration                           | Tested to IEC 60068-2-6   |
| Tripod mount thread                 | ISO 1222:2010 Standard screw thread, 1/4 - 20 UNC   |
| Drop test                           | 2 m   |
| Protection class                    | 2   |
| IP rating                           | IP 54   |
| Dimension (W x H x D)               | 95 × 250 × 85 mm  |
| Weight                              | 0.746 kg (with battery)   |
| Warranty                            | Refer to <a href="http://www.keysight.com/go/warranty_terms">www.keysight.com/go/warranty_terms</a><br>3 years for the product, 3 months for the standard accessories unless otherwise specified  |
| Calibration cycle                   | 1 year  |

1. Minimum distance with accuracy, 10 cm to 50 cm: ±4 °C or ±4%  
For complete specifications, please refer to data sheet 5991-4297EN

## Web link

[www.keysight.com/find/truelRimager](http://www.keysight.com/find/truelRimager)

## Insulation resistance testers

### U1450A/U1460A Series insulation resistance tester

Accomplish more in a day's work with the Keysight U1450A/U1460A Series insulation resistance tester. You can now perform tests remotely using a Windows-based PC or iOS/Android smart devices by simply adding *Bluetooth* connectivity to these handhelds. Also, get your works done efficiently with the error-free automated report generation using the complimentary reporting software. These handhelds are certified to IP 67, robust tools built to withstand drops of up to three meters (10 feet) with the wide operating temperature range of  $-40^{\circ}\text{C}$  to  $55^{\circ}\text{C}$ , letting you make measurements with confidence even in extreme harsh environments. What's more, with the U1453A and U1461A you can test unique applications with the adjustable test voltages range of 10 V to 1.1 kV.

### Features

- Wireless insulation resistance testing via PC and smart phone/tablet applications
- Automatic test report generation
- 50 V / 100 V / 250 V / 500 V / 1000 V test voltages
- Measure up to 260 G $\Omega$
- Timed / PI / DAR test
- Adjustable test output voltage from 10 V to 1.1 kV<sup>1</sup>
- 4.5-digit DMM with OLED display, basic<sup>2</sup> and full featured<sup>3</sup>
- IP 67 certified, three meters (10 feet) drop proof
- CAT III 1000 V / CAT IV 600 V

1. U1453A/U1461A
2. U1453A
3. U1461A



### Specifications of the U1450A/U1460A Series insulation resistance testers

| Series   | U1450 Series                 |                                      |                              | U1460 Series                         |                                      |
|--|------------------------------|--------------------------------------|------------------------------|--------------------------------------|--------------------------------------|
| Model No.  | U1451A                       | U1452A                               | U1452AT                      | U1453A                               | U1461A                               |
| Display type   | LCD                          | LCD                                  | LCD                          | OLED ★                               | OLED ★                               |
| Basic Features   |                              |                                      |                              |                                      |                                      |
| Insulation test voltage range                          | 250 V, 500 V, 1,000 V        | 50 V, 100 V, 250 V, 500 V, 1,000 V ★ | 50 V, 100 V                  | 50 V, 100 V, 250 V, 500 V, 1,000 V ★ | 50 V, 100 V, 250 V, 500 V, 1,000 V ★ |
| Insulation resistance range                            | 66 G $\Omega$                | 260 G $\Omega$                       | 66 G $\Omega$                | 260 G $\Omega$                       | 260 G $\Omega$                       |
| Earth bond resistance measurement                      | 60 $\Omega$ to 60 K $\Omega$ | 60 $\Omega$ to 60 K $\Omega$         | 60 $\Omega$ to 60 K $\Omega$ | 6 $\Omega$ to 60 K $\Omega$ ★        | 6 $\Omega$ to 60 K $\Omega$ ★        |
| Timed, PI, DAR   | Timed only                   | √                                    | √                            | √                                    | √                                    |
| Adjustable insulation test voltages                    | N/A                          | N/A                                  | N/A                          | 10 V to 1.1 KV                       | 10 V to 1.1 KV                       |
| Live circuit test inhibit (30 V, 50 V, 75 V)           | √                            | √                                    | √                            | √                                    | √                                    |
| Calculate cable length by capacitance                  | √                            | √                                    | √                            | √                                    | √                                    |
| Automatic discharge for capacitive circuits under test | √                            | √                                    | √                            | √                                    | √                                    |

★ represents key specifications/features. For complete specifications, please refer to data sheet 5991-4290EN

Specifications of the U1450A/U1460A insulation resistance testers (*continued*)

| Series  | U1450 Series                                       |  |  | U1460 Series   |   |
|---|--|--|--|--|---|
| Model No.   | U1451A   | U1452A   | U1452AT  | U1453A   | U1461A  |
| <b>Data Management</b>                            |  |  |  |  |   |
| Remote testing and report generation <sup>1</sup> | √ ★  | √ ★  | √ ★  | √ ★  | √ ★   |
| <b>Digital Multimeter (DMM) Features</b>          |  |  |  |  |   |
| DMM display resolution (counts)                   | 6,600  | 6,600  | 6,600  | 66,000 <sup>2</sup> / 6,600                                    | 66,000 <sup>2</sup> / 6,600   |
| AC specification                                  | Calibrated for sine wave                           | Calibrated for sine wave                           | Calibrated for sine wave                           | True RMS   | True RMS ★  |
| Measurements                                      | AC/DC voltage, resistance, continuity, capacitance | AC/DC voltage, resistance, continuity, capacitance | AC/DC voltage, resistance, continuity, capacitance | AC/DC voltage, resistance, continuity, capacitance, diode test | AC/DC voltage (V, mV), AC/DC current (μA, mA), resistance, continuity, capacitance, diode test, temperature |
| <b>DMM Special Features</b>                       |  |  |  |  |   |
| Low pass filter (LPF)                             | N/A  | N/A  | N/A  | N/A  | √   |
| Non-contact AC voltage detection (Vsense)         | N/A  | N/A  | N/A  | N/A  | √   |
| <b>General</b>                                    |  |  |  |  |   |
| IP rating   | IP 67 ★  | IP 67 ★  | IP 67 ★  | IP 67 ★  | IP 67 ★   |
| Drop test   | 3 meters (10 ft) ★                                 | 3 meters (10 ft) ★                                 | 3 meters (10 ft) ★                                 | 3 meters (10 ft) ★   | 3 meters (10 ft) ★  |
| 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                      | CAT III 1000 V / CAT IV 600 V                                  | CAT III 1000 V / CAT IV 600 V   |
| Operating temperature                             | -20 to +55 °C                                      | -20 to +55 °C                                      | -20 to +55 °C                                      | -40 to +55 °C ★  | -40 to +55 °C ★   |
| Battery life                                      | 270 hours  | 270 hours  | 270 hours  | 160 hours  | 160 hours   |
| Battery warranty                                  | 3 years  | 3 years  | 3 years  | 3 years  | 3 years   |

1. Requires the Keysight Handheld Logger software for Windows PC, or the Keysight Insulation Tester app for iOS/Android smart devices

2. User selectable display resolution in MENU default is 6,600 counts

★ represents key specifications/features. For complete specifications, please refer to data sheet 5991-4290EN

### Web link

[www.keysight.com/find/insulationtesters](http://www.keysight.com/find/insulationtesters)

## Digital multimeters

From electronics troubleshooting to installation and maintenance of machinery, Keysight handheld digital multimeters (DMMS) are designed to withstand the harsh working conditions and improve safety. Each DMM is compatible with the U1177A/U1117A Infrared (IR)-to-Bluetooth adapter that offers wireless remote connectivity solution. Our range of handheld DMMs are also equipped with smart features to help you quickly detect problems and obtain accurate measurements.

| Recommended for             | Electrical, HVAC and utilities |                    |                             | Installation and maintenance of machinery, electrical systems |  | Electronics troubleshooting    |   |                | Industrial                     |  |                |         |
|-----------------------------|--------------------------------|--------------------|-----------------------------|---|--|--------------------------------|---|----------------|--------------------------------|--|----------------|---------|
| Series                      | U1230 Series                   |                    |                             | U1240 Series  |  | U1250 Series                   |   |                | U1270 Series                   |  |                |         |
| Model no.                   | U1231A                         | U1232A             | U1233A                      | U1241B  | U1242B   | U1251B                         | U1252B  | U1253B         | U1271A                         | U1272A   | U1273A         | U1273AX |
| Display                     |                                |                    |                             |   |  |                                |   |                |                                |  |                |         |
| Display resolution (counts) | 6,000                          |                    |                             | 10,000  |  | 50,000                         |   |                | 30,000                         |  |                |         |
| Dual display                | N/A                            |                    |                             | N/A   |  | Yes                            |   |                | Yes                            |  |                |         |
| Analog bar-graph            | Yes                            |                    |                             | Yes   |  | Yes                            |   |                | Yes                            |  |                |         |
| Back-light                  | Yes                            |                    |                             | Yes ★<br>(two intensity levels)                               |  | Yes                            |   | OLED display ★ | Yes                            |  | OLED display ★ |         |
| <b>Basic Features</b>       |                                |                    |                             |   |  |                                |   |                |                                |  |                |         |
| AC bandwidth                | 1 kHz                          |                    |                             | 2 kHz   |  | 30 kHz                         | 100 kHz   |                | 20 kHz                         | 100 kHz  |                |         |
| True RMS                    | AC                             |                    |                             | AC  |  | AC                             | AC + DC   |                | AC                             | AC + DC  |                |         |
| Auto/manual ranging         | Yes                            |                    |                             | Yes   |  | Yes                            |   |                | Yes                            |  |                |         |
| <b>Measurements</b>         |                                |                    |                             |   |  |                                |   |                |                                |  |                |         |
| Voltage AC/DC: range        | 600 mV to 600 V                |                    |                             | 1 V to 1000 V   |  | 50 mV to 1000 V                |   |                | 300 mV to 1000 V               | 30 mV to 1000 V  |                |         |
| Current AC/DC: range        | N/A                            | 60 $\mu$ A to 10 A |                             | 1 mA to 10 A ★  |  | 500 $\mu$ A to 10 A            |   |                | 300 $\mu$ A to 10 A            |  |                |         |
| Resistance: range           | 600 $\Omega$ to 60 M $\Omega$  |                    |                             | 1 k $\Omega$ to 100 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 99.99 kHz          |                    |                             | 100 Hz to 1000 kHz  |  | 99.999 Hz to 999.99 kHz        |   |                | 99.999 Hz to 999.99 kHz        |  |                |         |
| Capacitance: range          | 1000 nF to 10 mF               |                    |                             | 1 $\mu$ F to 10 mF  |  | 10 nF to 100 mF                |   |                | 10 nF to 10 mF                 |  |                |         |
| Temperature: type, range    | N/A                            |                    | K: -40 to 1372 $^{\circ}$ C | K: -40 to 1000 $^{\circ}$ C                                   | K: -40 to 1000 $^{\circ}$ C<br>J: -40 to 1000 $^{\circ}$ C | K: -200 to 1372 $^{\circ}$ C   | K: -200 to 1372 $^{\circ}$ C<br>J: -210 to 1200 $^{\circ}$ C" |                | K: -200 to 1372 $^{\circ}$ C   | K: -200 to 1372 $^{\circ}$ C<br>J: -210 to 1200 $^{\circ}$ C |                |         |
| Continuity with beeper      | Yes                            |                    |                             | Yes   |  | Yes                            |   |                | Yes                            |  |                |         |
| Diode test                  | Yes                            |                    |                             | Yes   |  | Yes                            |   |                | Yes                            |  |                |         |
| <b>Data Management</b>      |                                |                    |                             |   |  |                                |   |                |                                |  |                |         |
| Min/max recording           | Yes                            |                    |                             | Yes   |  | Yes                            |   |                | Yes                            |  |                |         |
| Display hold                | Yes                            |                    |                             | Yes   |  | Yes                            |   |                | Yes                            |  |                |         |
| Peak hold                   | Yes                            |                    |                             | N/A   |  | Yes                            |   |                | Yes                            |  |                |         |
| Manual datalogging          | N/A                            |                    |                             | N/A   | Yes  | Yes                            |   |                | Yes                            |  |                |         |
| Null                        | Yes                            |                    |                             | Yes   |  | Yes                            |   |                | Yes                            |  |                |         |
| Connectivity                | IR-USB / Bluetooth             |                    |                             | IR-USB / Bluetooth  |  | IR-USB / Bluetooth             |   |                | IR-USB / Bluetooth             |  |                |         |
| % scale of 4-20 mA          | N/A                            |                    |                             | Yes   |  | Yes                            |   |                | Yes                            |  |                |         |

★ represents key specifications/features

## Digital multimeters (continued)

| Recommend- ed for       | Electrical, HVAC and utilities   |  |  | Installation and maintenance of machinery, electrical systems |  | Electronics troubleshooting   |   |   | Industrial                                    |  |                           |         |
|-------------------------|--|--|--|---|--|-------------------------------|---|---|---|--|---------------------------|---------|
| Series                  | U1230 Series   |  |  | U1240 Series  |  | U1250 Series                  |   |   | U1270 Series                                  |  |                           |         |
| Model no.               | U1231A   | U1232A   | U1233A   | U1241B  | U1242B   | U1251B                        | U1252B  | U1253B  | U1271A  | U1272A   | U1273A                    | U1273AX |
| <b>General</b>          |  |  |  |   |  |                               |   |   |   |  |                           |         |
| Operating temperature   | -10 to 55 °C, 0% to 80% RH   |  |  | -10 to 55 °C, 0 to 80% RH                                     |  | -20 to 55 °C, 0 to 80% RH     |   |   | -20 to 55 °C, 0 to 80% RH                     |  | -40 to 55 °C, 0 to 80% RH |         |
| Altitude                | 2000 m   |  |  | 2000 m  |  | 2000 m                        |   |   | 3000 m  |  |                           |         |
| Measurement category    | 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                 |  |                           |         |
| Battery type (included) | 4 x AAA alkaline   |  |  | 4 x AAA alkaline  |  | 9 V                           | 8.4 V (recharge-able)                                     |   | 4 x AAA alkaline                              |  | 4 x AAA lithium           |         |
| Battery life            | 500 hours  |  |  | 300 hours   |  | 72 hours                      | 36 hours  | 8 hours   | 300 hours                                     | 30-60 hours  | 50-100 hours              |         |
| Dimensions (H x W x D)  | 169.0 x 86.0 x 52.0 mm   |  |  | 193.8 x 92.2 x 58.0 mm  |  | 203.5 x 94.4 x 59.0 mm        |   |   | 207.0 x 92.0 x 59.0 mm                        |  |                           |         |
| Advanced functions      | Built-in flashlight, continuity alert with flashing backlight, $Z_{low}$ ★ | Built-in flashlight, continuity alert with flashing backlight, $Z_{low}$ ★ | Built-in flashlight, non-contact voltage detector with Vsense, continuity alert with flashing backlight, $Z_{low}$ ★ | Switch counter ★  | Switch counter, harmonic ratio, dual and differential temperature measurements ★ | N/A                           | 20 MHz frequency counter, program- mable wave generator ★ | Organic LED display, 20 MHz frequency counter, program- mable square wave generator ★ | Low pass filter, AC and/or DC voltage check ★ | Low pass filter, low impedance mode, offset compensation ★ |                           |         |

★ represents key specifications/features

### 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
- Bluetooth wireless connectivity (with optional U1177A / U1117A Infrared (IR)-to-Bluetooth adapter)





## 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                 |
| Current AC                               | Range     |                               | 60 $\mu$ A to 10 A            | 60 $\mu$ A to 10 A            |
|  | Accuracy  | N/A                           | 1.5% + 3 cnts                 | 1.5% + 3 cnts                 |
|  | Bandwidth |                               | 45 to 500 Hz                  | 45 to 500 Hz                  |
| Resistance                               | Range     | 600 $\Omega$ to 60 M $\Omega$ | 600 $\Omega$ to 60 M $\Omega$ | 600 $\Omega$ to 60 M $\Omega$ |
|  | Accuracy  | 0.9% + 3 cnts                 | 0.9% + 3 cnts                 | 0.9% + 3 cnts                 |
| Frequency                                | Range     | 99.99 Hz to 99.99 kHz         | 99.99 Hz to 99.99 kHz         | 99.99 Hz to 99.99 kHz         |
|  | Accuracy  | 0.1% + 2 cnts                 | 0.1% + 2 cnts                 | 0.1% + 2 cnts                 |
| Capacitance                              | Range     | 1000 nF to 10 mF              | 1000 nF to 10 mF              | 1000 nF to 10 mF              |
|  | Accuracy  | 1.9% + 2 cnts                 | 1.9% + 2 cnts                 | 1.9% + 2 cnts                 |
| Temperature                              | Range     | N/A                           | N/A                           | -40 to 1372 $^{\circ}$ C      |
|  | Accuracy  |                               |                               | 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                           |
| Connectivity                             |           | IR-USB/ <i>Bluetooth</i>      | IR-USB/ <i>Bluetooth</i>      | IR-USB/ <i>Bluetooth</i>      |
| % scale of 4-20 mA                       |           | N/A                           | N/A                           | N/A                           |
| <b>Special Features</b>                  |           |                               |                               |                               |
| Built-in flashlight                      |           | 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 61010-1:2001 compliance           |           | Yes                           | Yes                           | Yes                           |
| CSA C22.2 No. 61010-1:2004 compliance    |           | Yes                           | Yes                           | Yes                           |

★ represents key specifications/features. For complete specifications, please refer to data sheet 5990-7550EN

## Specifications of the U1230 Series digital multimeters (*continued*)

|                        | U1231A                     | U1232A                     | U1233A                     |
|------------------------|----------------------------|----------------------------|----------------------------|
| <b>General</b>         |                            |                            |                            |
| Operating temperature  | -10 to 55 °C, 0% to 80% RH | -10 to 55 °C, 0% to 80% RH | -10 to 55 °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           |

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

### Web link

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

### How to?

Select a Handheld DMM that is Right for You

<http://literature.cdn.keysight.com/litweb/pdf/5990-5197EN.pdf>

Think Safety When Selecting a Handheld Multimeter

<http://literature.cdn.keysight.com/litweb/pdf/5990-4578EN.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 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
- *Bluetooth* wireless connectivity  
(with optional U1177A / U1117A Infrared (IR)-to-*Bluetooth* adapter)



## Specifications of the U1240 Series digital multimeters

|                                       | U1241B                       | 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 range                     | 1000 nF to 10 mF             | 1000 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                                       |
| % scale of 4–20 mA                    | Yes                          | Yes                                       |
| Harmonic ratio                        | N/A                          | Yes ★                                     |
| Switch counter                        | Yes ★                        | Yes ★                                     |
| <b>Data Management</b>                |                              |   |
| Min/max/avg recording                 | Yes                          | Yes                                       |
| Data hold                             | Yes                          | Yes                                       |
| Null                                  | Yes                          | Yes                                       |
| Connectivity                          | IR-USB/ <i>Bluetooth</i>     | IR-USB/ <i>Bluetooth</i>                  |
| 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

### Web link

[www.keysight.com/find/handheldm](http://www.keysight.com/find/handheldm)

### How to ?

Detect Harmonics in AC signals

<http://literature.cdn.keysight.com/litweb/pdf/5989-7687EN.pdf>

Select a Handheld DMM that is Right for You

<http://literature.cdn.keysight.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 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
  - *Bluetooth* wireless connectivity (with optional U1177A / U1117A Infrared (IR)-to-*Bluetooth* adapter)
- \* with 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

## Specifications of the U1250 Series digital multimeters

|                        | U1251B                        | U1252B                          | 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            | 10nF to 100 mF                | 10nF to 100 mF★                 | 10nF 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                             |
| % scale of 4–20 mA     | Yes                           | Yes                             | Yes                             |
| dB                     | Yes                           | Yes                             | Yes                             |
| Frequency counter      | N/A                           | Yes★                            | Yes★                            |
| Smoothing function     | N/A                           | N/A                             | Yes★                            |

★ represents key specifications/features. For complete specifications, please refer to data sheet 5989-5509EN

Specifications of the U1250 Series digital multimeters *continued*

|  | U1251B                                       | U1252B                                       | U1253B  |
|--|--|--|---|
| <b>Signal Generation</b>   |  |  |   |
| Square-wave generator  | N/A  | 0.5 Hz to 4.8 kHz,<br>selectable Hz and % ★  | 0.5 Hz to 4.8 kHz,<br>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   |
| Connectivity   | IR-USB/ <i>Bluetooth</i>                     | IR-USB/ <i>Bluetooth</i>                     | IR-USB/ <i>Bluetooth</i>                      |
| Data logging<br>(requires IR-to-USB cable<br>U1173A for connection<br>to PC) | Internal: 100 manual,<br>200 interval points | Internal: 100 manual,<br>200 interval points | Internal: 100 manual,<br>1000 interval points |
| <b>Safety and Regulatory</b>   |  |  |   |
| Over-voltage safety<br>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<br>compliance  | Yes  | Yes  | Yes   |
| CSA C22.2 No. 61010-<br>1:2004 compliance                                    | Yes  | Yes  | Yes   |
| <b>General</b>   |  |  |   |
| Operating temperature  | -20 to 55 °C                                 | -20 to 55 °C                                 | -20 to 55 °C                                  |
| Battery (included)   | Alkaline 9 V                                 | 8.4 V Ni-MH rechargeable                     | 8.4 V Ni-MH rechargeable                      |
| Battery life   | 70 hours                                     | 30 hours                                     | 7 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

**Web link**

[www.keysight.com/find/handheldm](http://www.keysight.com/find/handheldm)

**How to ?**

Get the Best Out of the U1250 Series Handheld DMM

<http://literature.cdn.keysight.com/litweb/pdf/5989-7937EN.pdf>

Think Safety When Selecting a Handheld Multimeter

<http://literature.cdn.keysight.com/litweb/pdf/5990-4578EN.pdf>

Select a Handheld DMM That is Right for You

<http://literature.cdn.keysight.com/litweb/pdf/5990-5197EN.pdf>

## U1270 Series handheld digital multimeters

The U1273AX, the latest addition to the U1270 Series is capable of operating down to  $-40^{\circ}\text{C}$  in temperature. Even in extremely cold conditions, the U1273AX handheld DMM delivers immediate and accurate results—no warm-up time required.

All models are ergonomically-built providing useful functions such as  $Z_{\text{LOW}}$ , which eliminates stray voltages, and Smart Ohm that minimizes false readings from residual voltage induced by leakage current. All of this is designed into a case that fulfills the needs of today's industrial handheld users.

### Features

- OLED display with 2000:1 contrast ratio and 160 degree viewing angle <sup>1,2</sup>
- 30,000 counts resolution
- Measure up to 1000 V AC and DC
- Measure up to 10 A (20 A for 30 s)
- Resistance, diode test, temperature, capacitance
- Low Impedance mode <sup>1,2,3</sup> and Low Pass Filter
- $-40$  to  $55^{\circ}\text{C}$  operating temperature <sup>2</sup>
- Up to 3000 m operating altitude
- Data logging to instrument and PC
- Water and dust resistance (IP 54)
- CAT III 1000 V / CAT IV 600 V safety rating
- Bluetooth wireless connectivity (with optional U1177A / U1117A Infrared (IR)-to-Bluetooth adapter)



1. U1273A
2. U1273AX
3. U1272A

## Specifications of the U1270 Series digital multimeters

|                       |           | U1271A                         | U1272A                        | U1273A                        | U1273AX                       |
|-----------------------|-----------|--------------------------------|-------------------------------|-------------------------------|-------------------------------|
| <b>Basic Features</b> |           |                                |                               |                               |                               |
| Display resolution    |           | 30,000                         | 30,000                        | 30,000                        | 30,000                        |
| Display type          |           | LCD                            | LCD                           | OLED                          | OLED                          |
| Auto/manual ranging   |           | Yes                            | Yes                           | Yes                           | Yes                           |
| Analog bar graph      |           | Yes                            | Yes                           | Yes                           | Yes                           |
| Backlight             |           | Yes                            | Yes                           | Yes                           | Yes                           |
| AC bandwidth          |           | 20 kHz                         | 100 kHz                       | 100 kHz                       | 100 kHz                       |
| True RMS              |           | AC                             | AC + DC                       | AC + DC                       | AC + DC                       |
| <b>Measurements</b>   |           |                                |                               |                               |                               |
| Voltage DC            | Range     | 300 mV to 1000 V               | 30 mV to 1000 V               | 30 mV to 1000 V               | 30 mV to 1000 V               |
|                       | Accuracy  | 0.05% + 2 cnts                 | 0.05% + 2 cnts                | 0.05% + 2 cnts                | 0.05% + 2 cnts                |
| Voltage AC            | Range     | 300 mV to 1000 V               | 30 mV to 1000 V               | 30 mV to 1000 V               | 30 mV to 1000 V               |
|                       | Accuracy  | 0.7% + 20 cnts                 | 0.6% + 20 cnts                | 0.6% + 20 cnts                | 0.6% + 20 cnts                |
|                       | Bandwidth | 45 Hz to 20 kHz                | 45 Hz to 100 kHz              | 45 Hz to 100 kHz              | 45 Hz to 100 kHz              |
| Current DC            | Range     | 300 $\mu\text{A}$ to 10 A      | 300 $\mu\text{A}$ to 10 A     | 300 $\mu\text{A}$ to 10 A     | 300 $\mu\text{A}$ to 10 A     |
|                       | Accuracy  | 0.2% + 5 cnts                  | 0.2% + 5 cnts                 | 0.2% + 5 cnts                 | 0.2% + 5 cnts                 |
| Current AC            | Range     | 300 $\mu\text{A}$ to 10 A      | 300 $\mu\text{A}$ to 10 A     | 300 $\mu\text{A}$ to 10 A     | 300 $\mu\text{A}$ to 10 A     |
|                       | Accuracy  | 0.9% + 25 cnts                 | 0.6% + 25 cnts                | 0.6% + 25 cnts                | 0.6% + 25 cnts                |
|                       | Bandwidth | 45 Hz to 2 kHz                 | 45 Hz to 2 kHz                | 45 Hz to 2 kHz                | 45 Hz to 2 kHz                |
| Resistance            | Range     | 300 $\Omega$ to 100 M $\Omega$ | 30 $\Omega$ to 300 M $\Omega$ | 30 $\Omega$ to 300 M $\Omega$ | 30 $\Omega$ to 300 M $\Omega$ |
|                       | Accuracy  | 0.2 % + 5 cnts                 | 0.2% + 5 cnts                 | 0.2% + 5 cnts                 | 0.2% + 5 cnts                 |
| Frequency             | Range     | 99.999 Hz to 999.99            | 99.999 Hz to 999.99           | 99.999 Hz to 999.99           | 99.999 Hz to 999.99           |
|                       | Accuracy  | kHz                            | kHz                           | kHz                           | kHz                           |
|                       |           | 0.005% + 5 cnts                | 0.005% + 5 cnts               | 0.005% + 5 cnts               | 0.005% + 5 cnts               |

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

Specifications of the U1270 Series digital multimeters (*continued*)

|                                       |          | U1271A                       | U1272A                          | U1273A                          | U1273AX                         |
|---------------------------------------|----------|------------------------------|---------------------------------|---------------------------------|---------------------------------|
| <b>Measurements</b> <i>continued</i>  |          |                              |                                 |                                 |                                 |
| Capacitance                           | Range    | 10 nF to 10 mF               | 10 nF to 10 mF                  | 10 nF to 10 mF                  | 10 nF to 10 mF                  |
|                                       | Accuracy | 1% + 2 cnts                  | 1% + 2 cnts                     | 1% + 2 cnts                     | 1% + 2 cnts                     |
| Temperature                           | Range    | K: -200 to 1372 °C           | K: -200 to 1372 °C              | K: -200 to 1372 °C              | K: -200 to 1372 °C              |
|                                       | Accuracy | 1% + 1 °C                    | J: -210 to 1200 °C<br>1% + 1 °C | J: -210 to 1200 °C<br>1% + 1 °C | J: -210 to 1200 °C<br>1% + 1 °C |
| Continuity with beeper                |          | Yes                          | Yes                             | Yes                             | Yes                             |
| Diode test                            |          | Yes                          | Yes                             | Yes                             | Yes                             |
| <b>Data Management</b>                |          |                              |                                 |                                 |                                 |
| Min/max recording                     |          | Yes                          | Yes                             | Yes                             | Yes                             |
| Display hold                          |          | Yes                          | Yes                             | Yes                             | Yes                             |
| Peak hold                             |          | Yes                          | Yes                             | Yes                             | Yes                             |
| Manual datalogging                    |          | Yes                          | Yes                             | Yes                             | Yes                             |
| Null                                  |          | Yes                          | Yes                             | Yes                             | Yes                             |
| Connectivity                          |          | IR-USB/ <i>Bluetooth</i>     | IR-USB/ <i>Bluetooth</i>        | IR-USB/ <i>Bluetooth</i>        | IR-USB/ <i>Bluetooth</i>        |
| % scale of 4-20 mA                    |          | Yes                          | Yes                             | Yes                             | Yes                             |
| <b>Special Features</b>               |          |                              |                                 |                                 |                                 |
| OLED display                          |          | –                            | –                               | Yes★                            | Yes★                            |
| Beep + visual alert                   |          | Yes                          | Yes                             | Yes                             | Yes                             |
| Low pass filter (LPF)                 |          | Yes★                         | Yes★                            | Yes★                            | Yes★                            |
| Z <sub>LOW</sub> - low impedance mode |          | N/A                          | Yes★                            | Yes★                            | Yes★                            |
| Smart Ω                               |          | N/A                          | Yes★                            | Yes★                            | Yes★                            |
| Qik-V                                 |          | Yes                          | N/A                             | N/A                             | 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    | 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                             | Yes                             |
| CSA C22.2 No. 61010-1:2004 compliance |          | Yes                          | Yes                             | Yes                             | Yes                             |
| <b>General</b>                        |          |                              |                                 |                                 |                                 |
| Operating temperature                 |          | -20 to 55 °C, 0 to 80% RH    | -20 to 55 °C, 0 to 80% RH       | -40 to 55 °C, 0 to 80% RH       | -40 to 55 °C, 0 to 80% RH★      |
| Altitude                              |          | 3000 m                       | 3000 m                          | 3000 m                          | 3000 m                          |
| Battery (included)                    |          | 4 x AAA alkaline             | 4 x AAA alkaline                | 4 x AAA lithium                 | 4 x AAA lithium                 |
| Battery life                          |          | 300 hours                    | 30-60 hours                     | 50-100 hours                    | 50-100 hours                    |
| Warranty                              |          | 3 years                      | 3 years                         | 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          | 207.0 x 92.0 x 59.0 mm          | 207.0 x 92.0 x 59.0 mm          |

★ represents key specifications/features For complete specifications, please refer to data sheet 5990-6425EN

### Web link

[www.keysight.com/find/handheldmm](http://www.keysight.com/find/handheldmm)  
[www.keysight.com/find/U1273AX](http://www.keysight.com/find/U1273AX)  
<http://wireless.keysight.com/videos/u1270/index.html>

### How to?

#### Test for Stray Voltage Using the U1272A

<http://literature.cdn.keysight.com/litweb/pdf/5990-6517EN.pdf>

#### Ground Resistance Measurement with Smart Ohm

<http://literature.cdn.keysight.com/litweb/pdf/5990-7323EN.pdf>

## Digital oscilloscopes

Our handheld scopes are designed to be used across a wide range of applications and troubleshooting tasks. Each model comes with different specifications to tailor to your needs, and are safety certified for safer measurements.

| Model No.                              | U1602B   | U1604B            | U1610A  | U1620A               |
|--|--|-------------------|---|----------------------|
| <b>Vertical System: Scope Channels</b> |  |                   |   |                      |
| Bandwidth (-3 dB)                      | 20 MHz   | 40 MHz            | 100 MHz   | 200 MHz              |
| DC vertical gain accuracy              | 5 mV/div to 20 mV/div: $\pm 5\%$ full scale<br>50 mV/div to 100 V/div: $\pm 3\%$ full scale  |                   | $\pm 4\%$ of full scale<br>Full scale is equivalent to 8 div  |                      |
| <b>Acquisition: Scope Channels</b>     |  |                   |   |                      |
| Maximum sample rate                    | 200 MSa/s interleave   |                   | 1 GSa/s interleave  | 2 GSa/s interleave   |
| Single channel operation               | 100 MSa/s each channel   |                   | 500 MSa/s each channel  | 1 GSa/s each channel |
| Dual channel operation                 |  |                   |   |                      |
| Vertical resolution                    | 8-bits   |                   | 8-bits  |                      |
| Maximum recording length               | 125 Kpts   |                   | 120 Kpts interleave   | 2 Mpts interleave    |
| Single channel operation               |  |                   | 60 Kpts each channel  | 1 Mpts each channel  |
| Dual channel operation                 |  |                   |   |                      |
| <b>Vertical System: Scope Channels</b> |  |                   |   |                      |
| Rise time                              | <17.5 ns   | <8.8 ns           | 3.50 ns typical   | 1.75 ns typical      |
| Maximum input                          | CAT III 300 Vrms (up to 400 Hz)<br>from terminal to ground   |                   | CAT III 600 Vrms (with 10:1 probe)<br>CAT III 300 Vrms (direct / 1:1 probe)   |                      |
| Bandwidth limit                        | N/A  |                   | 10 KHz and 20 MHz (selectable)  |                      |
| Channel-to-channel isolation           | N/A  |                   | Yes, CAT III 600 V Vrms   |                      |
| Probe attenuation factors              | 1x, 10x, 100x  |                   | 1x, 10x, 100x   |                      |
| <b>Horizontal System</b>               |  |                   |   |                      |
| Range                                  | 50 ns to 50 s/div  | 10 ns to 50 s/div | 5 ns/div to 50 s/div  | 2 ns/div to 50 s/div |
| Modes                                  | Main, XY, roll   |                   | Main, zoom, XY, roll  |                      |
| <b>Trigger System</b>                  |  |                   |   |                      |
| Sources                                | Channel 1 and Channel 2  |                   | Channel 1, Channel 2, External  |                      |
| Modes                                  | Auto, normal, single   |                   | Normal, Single, Auto  |                      |
| Types                                  | Edge, Pattern, Pulse Width, Video  |                   | Edge, Glitch, TV, Nth Edge, CAN, LIN  |                      |
| Auto measurements                      | Peak-to-peak, maximum, minimum, amplitude, top, base, +overshoot, -overshoot, preshoot, RMS, mean and one cycle mean, Frequency, period, +width, -width, and +duty cycle and -duty cycle on any channel. Rise time, fall time, delay and phase shift |                   | Delay, duty cycle (+/-), fall/rise time, frequency, period, phase shift, T-max,T-min, width (+/-), amplitude, average, base, crest, cycle mean, maximum,minimum, overshoot, peak-to-peak, preshoot, standard deviation, top, Vrms (AC/DC), active/apparent/reactive power, power factor |                      |
| Waveform math functions                | CH1 + CH2, CH1 - CH2, CH2 - CH1  |                   | CH1 + CH2, CH1 - CH2, CH2 - CH1, CH1 $\times$ CH2, CH1/CH2, CH2/CH1, d/dt (CH1),d/dt (CH2), $\int$ (CH1)dt, $\int$ (CH2)dt, FFT   |                      |
| <b>Digital Multimeter Measurement</b>  |  |                   |   |                      |
| Voltage AC/DC range                    | 600 mV to 600 V  |                   | 1000 mV to 1000 V   |                      |
| Resistance range                       | 600 $\Omega$ to 60 M $\Omega$  |                   | 1000 $\Omega$ to 100 M $\Omega$   |                      |
| Capacitance range                      | 60 nF to 300 $\mu$ F   |                   | 1000 nF to 10 mF  |                      |
| Diode range                            | 1 V  |                   | 1 V   |                      |
| Temperature range                      | 600 $^{\circ}$ C   |                   | -50 to 1000 $^{\circ}$ C  |                      |
| Frequency                              | N/A  |                   | 100 Hz to 1000 KHz  |                      |
| AC Current range                       | 60 A   |                   | N/A   |                      |
| <b>Measurement Characteristic</b>      |  |                   |   |                      |
| Resolution                             | 6,000 counts   |                   | 10,000 counts   |                      |
| Continuity                             | Beeper < 60 W in 600 W range   |                   | Continuous beep when resistance <10 $\Omega$  |                      |
| Datalogger                             | Yes  |                   | Yes   |                      |



## Digital oscilloscopes (continued)

| Model No.             | U1602B                                | U1604B | U1610A  | U1620A |
|-----------------------|---------------------------------------|--------|---|--------|
| <b>General</b>        |                                       |        |   |        |
| Display               | 4.5-inch diagonal color               |        | 5.7-inch VGA TFT Color LCD (sunlight viewable)  |        |
| Resolution            | 320 x 240 pixels                      |        | 640 x 480 pixels  |        |
| IP rating             | N/A                                   |        | IP41  |        |
| Save/recall           | Up to 10 setups and traces            |        | 10 setups and waveforms can be saved and recalled internally                              |        |
| Battery type          | Ni-MH rechargeable battery pack 7.2 V |        | Li-Ion rechargeable battery pack, 10.8 V  |        |
| Battery life          | 4 hours                               |        | 3 hours   |        |
| I/O                   | USB 2.0 full speed client             |        | USB 2.0 full speed host/client port   |        |
| Dimension (H x W x D) | 241 x 138 x 66 mm                     |        | 183 x 270 x 65 mm   |        |
| Weight                | 1.5 kg                                |        | <2.5 kg   |        |
| UI language           | 10 selectable languages               |        | 10 selectable languages   |        |
| Advanced functions    | CSTN LCD screen                       |        | 3 viewing modes (indoor, outdoor, night-vision),<br>VGA TFT LCD screen, dual windows zoom |        |

## 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

## Specifications of the U1600 Series digital oscilloscopes

|   | U1602B   | U1604B   |
|---|--|--|
| <b>Display</b>  |  |  |
| General   | 4.5-inch color LCD ★                               | 4.5-inch 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   |  |  |
| Single channel operation  | 200 MSa/s interleave ★                             | 200 MSa/s interleave ★                             |
| Dual channel operation  | 100 MSa/s each channel ★                           | 100 MSa/s each channel ★                           |
| Maximum recording length  |  |  |
| Single channel operation  | 125 Kpts ★   | 125 Kpts ★   |
| Dual channel operation  |  |  |
| 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 range   | 60nF to 3000 $\mu$ F                               | 60nF to 3000 $\mu$ 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) | Internal: 250 points<br>To PC: virtually unlimited | Internal: 250 points<br>To PC: virtually unlimited |
| Time span   | 150 seconds to 20 days (auto range)                | 150 seconds to 20 days (auto range)                |

★ represents key specifications/features. For complete specifications, please refer to data sheet 5989-5576EN

## Specifications of the U1600 Series digital oscilloscopes (*continued*)

|                                       | U1602B   | 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                                   | USB 2.0 full-speed client for data transfers to PC<br>USB 2.0 full-speed host for data transfers to USB flash drive (Option 001) | USB 2.0 full-speed client for data transfers to PC<br>USB 2.0 full-speed host for data transfers to USB flash drive (Option 001) |
| 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  |

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

### Web link

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

### How to ?

Perform Metal Scrap Sorting Machine Installation with U1600A Series

<http://literature.cdn.keysight.com/litweb/pdf/5989-9786EN.pdf>

## U1610A/U1620A handheld digital oscilloscopes

Keysight's U1610A/U1620A is the world's first handheld oscilloscope with a VGA display. With a bandwidth of 100/200 MHz, the handheld oscilloscope offers a floating measurement capability with two CAT III 600 V isolated channels. With up to 2 GSa/s sampling rate and 2 Mpts memory depth, it captures more waveforms from signals such as pulse width modulated circuit, in-rush, transient, and motor start up sequences. The benchtop-like display and dual window zoom function allow you to easily identify problem areas and zoom in for more detailed analysis. Now, you can view signals in detail and detect glitches easily.



### Features

- 100/200 MHz bandwidth with two isolated channels
- 5.7-inch VGA TFT LCD display with 3 selectable viewing modes (indoor, outdoor and night vision)
- Up to 2 Mpts memory depth and 2 GSa/s sampling rate allows detailed analysis of captured glitches
- 10,000-count resolution on DMM display
- Channel-to-channel isolation with CAT III 600 V safety ratings
- Data logging capability and USB connectivity
- Up to 10 selectable languages on the User Interface (UI)

## Specifications of the U1610A/U1620A digital oscilloscope

|                           | U1610A  | U1620A  |
|---------------------------|---|---|
| <b>Display</b>            |   |   |
| General                   | 5.7-inch colour VGA TFT LCD ★   | 5.7-inch colour VGA TFT LCD ★   |
| Counts (DMM function)     | 10,000  | 10,000  |
| <b>Scope</b>              |   |   |
| Channels                  | 2   | 2   |
| Bandwidth (-3 dB)         | 100 MHz   | 200 MHz   |
| Maximum sampling rate     |   |   |
| Single channel operation  | 1 GSa/s interleave  | 2 GSa/s interleave  |
| Dual channel operation    | 500 MSa/s each channel  | 1 GSa/s each channel  |
| Maximum recording length  |   |   |
| Single channel operation  | 120 Kpts interleave   | 2 Mpts interleave   |
| Dual channel operation    | 60 Kpts each channel  | 1 Mpts each channel   |
| Cursor and zoom functions | Yes   | Yes   |
| Waveform math             | CH1 + CH2, CH1 - CH2, CH2 - CH1,<br>CH1 × CH2, CH1/CH2, CH2/CH1, d/dt (CH1),<br>d/dt (CH2), ∫(CH1)dt, ∫(CH2)dt, FFT | CH1 + CH2, CH1 - CH2, CH2 - CH1,<br>CH1 × CH2, CH1/CH2, CH2/CH1, d/dt (CH1),<br>d/dt (CH2), ∫(CH1)dt, ∫(CH2)dt, FFT |
| FFT                       | Yes   | Yes   |
| Automatic measurements    | Up to 24 measurements   | Up to 24 measurements   |
| Coupling                  | DC, AC  | DC, AC  |
| Input impedance           | 1 MΩ ± 1% ≈ 22 pF ± 3 Pf  | 1 MΩ ± 1% ≈ 22 pF ± 3 Pf  |
| Range                     | 5 ns/div to 50 s/div  | 2 ns/div to 50 s/div  |
| Resolution                | 8-bits  | 8-bits  |
| Rise time                 | 3.50 ns typical   | 1.75 ns typical   |
| Trigger types             | Edge, Glitch, TV, Nth Edge, CAN, LIN  | Edge, Glitch, TV, Nth Edge, CAN, LIN  |
| Trigger modes             | Normal, Single, Auto  | Normal, Single, Auto  |
| Internal scope storage    | 10 setups and waveforms<br>can be saved and recalled internally   | 10 setups and waveforms<br>can be saved and recalled internally   |
| <b>DMM</b>                |   |   |
| True RMS                  | Yes   | Yes   |
| Voltage AC/DC             | 1000.0 mV to 1000.0 V   | 1000.0 mV to 1000.0 V   |
| Current AC/DC             | 40 A/400 A <sup>1</sup>   | 40 A/400 A <sup>1</sup>   |
| Resistance                | 1000.00 Ω to 100.00 MΩ  | 1000.00 Ω to 100.00 MΩ  |
| Capacitance               | 1000.0 nF to 10.000 mF  | 1000.0 nF to 10.000 mF  |
| Temperature               | -40 to 1000 °C  | -40 to 1000 °C  |
| Continuity with beeper    | Yes   | Yes   |
| Diode test                | 1 V   | 1 V   |

1. Use U1583B for current measurement

★ represents key specifications/features For complete specifications, please refer to data sheet 5990-9523EN

Specifications of the U1610A/U1620A digital oscilloscope (*continued*)

|   | U1610A  | U1620A  |
|---|---|---|
| <b>Data Logger</b>  |   |   |
| Min/max/avg recording   | Yes   | Yes   |
| Data logging (requires bundled USB 2.0 full-speed cable for connection to PC) | Yes   | Yes   |
| Time span   | 8 days  | 8 days  |
| <b>Safety and Regulatory</b>  |   |   |
| Over-voltage safety protection  | CAT III 600 Vrms <sup>1</sup>                                     | CAT III 600 Vrms <sup>1</sup>                                     |
| EN/IEC 61010-1:2001 compliance  | Yes   | Yes   |
| CSA C22.2 No. 61010-1:2004 compliance   | Yes   | Yes   |
| IP rating   | IP 41   | IP 41   |
| <b>General</b>  |   |   |
| Operating temperature   | 0 to 50 °C (with battery only)<br>0 to 40 °C (with power adapter) | 0 to 50 °C (with battery only)<br>0 to 40 °C (with power adapter) |
| Battery (included)  | Yes   | Yes   |
| Weight  | <2.5 kgs  | <2.5 kgs  |
| Battery life  | 3 hours   | 3 hours   |
| I/O   | USB 2.0 full speed host/client port                               | USB 2.0 full speed host/client port                               |
| Warranty  | 3 years   | 3 years   |
| Dimensions (H x W x D)  | 183 x 270 x 65 mm   | 183 x 270 x 65 mm   |
| <b>Special Features</b>   |   |   |
| Indoor, outdoor, night vision mode  | Yes ★   | Yes ★   |
| UI language   | 10 selectable languages ★   | 10 selectable languages ★   |

1. 10:1 probe for CAT III 600 V

★ represents key specifications/features. For complete specifications, please refer to data sheet 5990-9523EN

## Web Link

[www.keysight.com/find/U1600](http://www.keysight.com/find/U1600)

## Clamp meters

Our clamp meters are designed to address the toughest electrical challenges without compromising on safety. Certified with safety ratings and equipped with a wealth of features – you are now ready to make measurements with more confidence.

| Recommended for             | Installation and maintenance of power distribution and supplies |                              |                               | Commercial or residential electrical installation and maintenance |   |  |        |
|-----------------------------|---|------------------------------|-------------------------------|---|---|--|--------|
| Series                      | U1210 Series  |                              |                               | U1190 Series  |   |  |        |
| Model No.                   | U1211A  | U1212A                       | U1213A                        | U1191A  | U1192A  | U1193A   | U1194A |
| <b>Display</b>              |   |                              |                               |   |   |  |        |
| Display resolution (counts) | 4,000   |                              |                               | 6,000   |   |  |        |
| Dual display                | Yes   |                              |                               | No  |   |  |        |
| Analog bar-graph            | Yes   |                              |                               | No  |   |  |        |
| Back-light                  | Yes   |                              |                               | Yes   |   |  |        |
| <b>Basic Features</b>       |   |                              |                               |   |   |  |        |
| AC bandwidth                | 400 Hz  |                              | 2 kHz                         | 500 Hz  |   |  |        |
| RMS Method                  | True RMS AC   | AC                           | AC + DC                       | Average responding  |   | True RMS   |        |
| Auto/manual ranging         | Yes   |                              |                               | Auto ranging only   |   |  |        |
| <b>Measurements</b>         |   |                              |                               |   |   |  |        |
| Voltage AC/DC: range        | 4 to 1000 V   |                              |                               | 600 V   | 60 to 600 V   |  |        |
| Current AC/DC: range        | ACI: 40 to 1000 A ★   | 40 to 1000 A ★               |                               | ACI: 400 A  | ACI: 60 to 400 A  | ACI: 60 $\mu$ A to 600 A<br>DCI: 60 $\mu$ A to 600 A |        |
| Resistance: range           | 400 $\Omega$ to 4 k $\Omega$                                    |                              | 400 $\Omega$ to 40 M $\Omega$ | 600 $\Omega$ to 60 k $\Omega$                                     |   |  |        |
| Frequency: range            | 99.99 Hz to 999.9 kHz   |                              |                               | N/A   | 99.99 Hz to 99.99 kHz   |  |        |
| Capacitance: range          | 400 to 4000 $\mu$ F   |                              | 4 to 4000 $\mu$ F             | N/A   | 600 $\mu$ F to 6 mF   |  |        |
| Temperature: type, range    | N/A   | K: -200 to 1372 $^{\circ}$ C |                               | N/A   |   | K: -40 to 1200 $^{\circ}$ 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   |                              |                               | N/A   |   |  |        |
| Null                        | Yes   |                              |                               | Yes   |   |  |        |
| Connectivity                | Bluetooth   |                              |                               | N/A   |   |  |        |
| <b>General</b>              |   |                              |                               |   |   |  |        |
| Operating temperature       | -10 to 50 $^{\circ}$ C, 0 to 80% RH                             |                              |                               | -10 to 50 $^{\circ}$ C, 0 to 80% RH                               |   |  |        |
| Measurement category        | CAT III 1000 V / CAT IV 600 V                                   |                              |                               | CAT III 600 V / CAT IV 300 V                                      |   |  |        |
| Battery type (included)     | 9 V   |                              |                               | 1.5 V   |   |  |        |
| Battery life                | 60 hours  |                              |                               | 200 hours   |   |  |        |
| Dimensions (H x W x D)      | 273.0 x 106.0 x 43.0 mm   |                              |                               | 225.0 x 77.1 x 38.6 mm  |   |  |        |
| Clamp opening               | 52 mm / 2 inches  |                              |                               | 31 mm   |   | 37 mm  |        |
| Advanced functions          | Auto power off  |                              |                               | Wire separator, Auto power off ★                                  | Wire separator, built-in flashlight, Vsense, Auto power off ★ |  |        |

★ represents key specifications/features

## U1190 Series clamp meters

Keysight's U1190 Series clamp meters are packed with a wealth of features to help you work more efficiently and more safely. Housed in robust cases, each model comes with an innovative wire separator that helps you isolate and measure individual wires in a bundle. The built-in LED flashlight illuminates your test area and Vsense performs non-contact voltage detection. The clamp meters are also certified with both CAT III 600 V and CAT IV 300 V ratings to cover wider measurement categories.

### Features

- Unique wire separator to separate wires from a bundle
- Vsense to perform non-contact voltage detection<sup>1</sup>
- Built-in LED flashlight to illuminate test area<sup>1</sup>
- Current measurement up to 600 A<sup>2</sup>
- Digital multimeter (DMM) with Resistance, Capacitance<sup>1</sup>, DCV, ACV, DC $\mu$ A<sup>3</sup>, AC $\mu$ A<sup>3</sup>, Continuity and Diode test measurements
- CAT III 600 V / CAT IV 300 V safety ratings

1. Only for U1192A, U1193A and U1194A
2. Only for U1193A and U1194A
3. Only for U1194A

### Specifications of the U1190 Series clamp meters

|                          | U1191A                       | U1192A                        | U1193A                        | U1194A                        |
|--------------------------|------------------------------|-------------------------------|-------------------------------|-------------------------------|
| <b>Basic Features</b>    |                              |                               |                               |                               |
| Counts                   | 6,000                        | 6,000                         | 6,000                         | 6,000                         |
| RMS method               | Average Responding           | Average Responding            | True RMS                      | True RMS                      |
| <b>Measurement Range</b> |                              |                               |                               |                               |
| DC voltage               | 600 V                        | 60 to 600 V                   | 60 to 600 V                   | 60 to 600 V                   |
| AC voltage               | 600 V                        | 60 to 600 V                   | 60 to 600 V                   | 60 to 600 V                   |
| DC A current             | N/A                          | N/A                           | N/A                           | 60 to 600 A                   |
| DC $\mu$ A current       | N/A                          | N/A                           | N/A                           | 60 to 600 $\mu$ A             |
| AC current               | 400 A                        | 40 to 600 A                   | 60 to 600 A                   | 60 to 600 A                   |
| AC $\mu$ A current       | N/A                          | N/A                           | N/A                           | 60 to 600 $\mu$ A             |
| Resistance               | 600 $\Omega$ to 6 k $\Omega$ | 600 $\Omega$ to 60 k $\Omega$ | 600 $\Omega$ to 60 k $\Omega$ | 600 $\Omega$ to 60 k $\Omega$ |
| Capacitance              | N/A                          | 600 $\mu$ F to 6 mF           | 600 $\mu$ F to 6 mF           | 600 $\mu$ F to 6 mF           |
| Diode                    | 1.5 V                        | 1.5 V                         | 1.5 V                         | 1.5 V                         |
| Continuity               | 600 $\Omega$                 | 600 $\Omega$                  | 600 $\Omega$                  | 600 $\Omega$                  |
| Temperature              | N/A                          | N/A                           | N/A                           | K-type: -40 °C to 1200 °C     |
| Frequency                | N/A                          | 99.99 Hz to 99.99 kHz         | 99.99 Hz to 99.99 kHz         | 99.99 Hz to 99.99 kHz         |
| <b>Data Management</b>   |                              |                               |                               |                               |
| Data hold                | Yes                          | Yes                           | Yes                           | Yes                           |
| Null                     | Yes                          | Yes                           | Yes                           | Yes                           |
| MAX/MIN/AVG              | Yes                          | Yes                           | Yes                           | Yes                           |
| Auto/Range               | Yes                          | Yes                           | Yes                           | Yes                           |
| <b>Other Features</b>    |                              |                               |                               |                               |
| Backlight                | Yes                          | Yes                           | Yes                           | Yes                           |
| Auto power OFF           | Yes                          | Yes                           | Yes                           | Yes                           |
| Wire separator           | Yes ★                        | Yes ★                         | Yes ★                         | Yes ★                         |
| Built-in flashlight      | No                           | Yes ★                         | Yes ★                         | Yes ★                         |
| Vsense                   | No                           | Yes ★                         | Yes ★                         | Yes ★                         |

★ represents key specifications/features. For complete specifications, please refer to data sheet 5990-8646EN



## Specifications of the U1190 Series clamp meters (continued)

|                                       | U1191A                          | U1192A                          | U1193A                          | U1194A                          |
|---------------------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|
| <b>Safety and Regulatory</b>          |                                 |                                 |                                 |                                 |
| Over-voltage safety protection        | CAT III 600 V /<br>CAT IV 300 V | CAT III 600 V /<br>CAT IV 300 V | CAT III 600 V /<br>CAT IV 300 V | CAT III 600 V /<br>CAT IV 300 V |
| EN/IEC 61010-1, CE,<br>CSA compliance | Yes                             | Yes                             | Yes                             | Yes                             |
| <b>General</b>                        |                                 |                                 |                                 |                                 |
| Operating temperature                 | -10 to 50 °C,<br>0 to 80% RH    | -10 to 50 °C,<br>0 to 80% RH    | -10 to 50 °C,<br>0 to 80% RH    | -10 to 50 °C,<br>0 to 80% RH    |
| Battery (included)                    | 1.5 V                           | 1.5 V                           | 1.5 V                           | 1.5 V                           |
| Battery life                          | 200 hours                       | 200 hours                       | 200 hours                       | 200 hours                       |
| Warranty                              | 3 years                         | 3 years                         | 3 years                         | 3 years                         |
| Dimensions (H x W x D)                | 225.0 x 77.1 x 38.6 mm          | 225.0 x 77.1 x 38.6 mm          | 238.0 x 77.1 x 38.6 mm          | 238.0 x 77.1 x 38.6 mm          |
| Clamp opening                         | 31 mm                           | 31 mm                           | 37 mm                           | 37 mm                           |
| Clamping diameter                     | 27 mm                           | 27 mm                           | 35 mm                           | 35 mm                           |

For complete specifications, please refer to data sheet 5990-8646EN

### Web link

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

[www.keysight.com/find/U1190clamp](http://www.keysight.com/find/U1190clamp)

## U1210 Series handheld clamp meters

Measurements of electrical distribution cables can be challenging and risky. For cables up to two inches in diameter, the Keysight 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
- Bluetooth wireless connectivity (optional U1177A Infrared (IR)-to-Bluetooth Adapter required)





## 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 range                      | 400 to 1000 V (0.5%)        | 400 to 1000 V (0.5%)        | 4 to 1000 V (0.2%)          |
| Voltage AC range                      | 400 to 1000 V (1.0%)        | 400 to 1000 V (1.0%)        | 4 to 1000 V (1.0%)          |
| Current DC range                      | N/A                         | 40 to 1000 A (1.5%)         | 40 to 1000 A (1.5%)         |
| Current AC range                      | 40 to 1000 A (1.0%) ★       | 40 to 1000 A (2.0%) ★       | 40 to 1000 A (2.0%) ★       |
| Resistance range                      | 400 Ω to 4 kΩ (0.5%)        | 400 Ω to 4 kΩ (0.5%) ★      | 400 Ω to 4 MΩ (0.3%) ★      |
| Capacitance range                     | 400 to 4000 μF (2.0%)       | 400 to 4000 μF (2.0%)       | 4 to 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                         |
| <b>Data Management</b>                |                             |                             |                             |
| Data hold                             | Yes                         | Yes                         | Yes                         |
| Null                                  | Yes                         | Yes                         | Yes                         |
| MAX/MIN/AVG                           | Yes                         | Yes                         | Yes                         |
| Peak hold                             | Yes                         | Yes                         | Yes                         |
| Connectivity                          | <i>Bluetooth</i>            | <i>Bluetooth</i>            | <i>Bluetooth</i>            |
| <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     |

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

★ represents key specifications/features

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

### Web link

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

### How to ?

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

<http://literature.cdn.keysight.com/litweb/pdf/5990-5192EN.pdf>

## Multi-function calibrator/meter

### 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 Keysight 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 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



### Specifications of the U1401B multi-function calibrator/meter

| U1401B                                       |  |
|--|--|
| <b>Display</b>                               |  |
| Dual display                                 | Yes                                      |
| Counts                                       | 50,000                                   |
| Backlight                                    | Yes                                      |
| <b>Source</b>                                |  |
| Voltage                                      | ± 15 V                                   |
| Current                                      | ± 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 MΩ                                    |
| Frequency                                    | 200 kHz                                  |
| Temperature                                  | 1372 °C, K-type thermocouple             |
| Continuity with beeper                       | Yes                                      |
| Diode test                                   | Yes                                      |
| % scale of 0–20 mA, 4–20 mA                  | Yes                                      |
| Simultaneous operation with SOURCE function  | Yes ★                                    |

★ represents key specifications/features. For complete specifications, please refer to data sheet 5990-3459EN

## Specifications of the U1401B multi-function calibrator/meter *continued*

| <b>U1401B</b>  |                          |
|--|--------------------------|
| <b>Data Management</b>   |                          |
| Min/max/avg recording  | Yes                      |
| Peak recording   | Yes                      |
| Data hold  | Yes                      |
| Data logging to PC<br>(requires IR-to-USB cable U5481B 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   |

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

### Web link

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

### How to ?

Easily Perform Process Control Calibration U1401A

<http://literature.cdn.keysight.com/litweb/pdf/5990-3932EN.pdf>

## Capacitance/LCR meters

### U1700 Series handheld capacitance/LCR meters

Keysight'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



CE

## 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 range  | 1000 pF to 199.99 mF   | 200 pF to 20 mF                | 20 pF to 20 mF                   | 20 pF to 20 mF                              |
| Inductance range   | N/A  | 200 $\mu$ H to 2000 H          | 20 $\mu$ H to 2000 H             | 20 $\mu$ H to 2000 H                        |
| Resistance range   | N/A  | 2 $\Omega$ to 200 M $\Omega$   | 2 $\Omega$ to 200 M $\Omega$     | 2 $\Omega$ to 200 M $\Omega$                |
| Dissipation factor (DF)  | N/A  | Yes                            | Yes                              | Yes   |
| Quality factor (QF)  | N/A  | Yes                            | Yes                              | Yes   |
| Phase angle ( $\theta$ ) 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 ★<br>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,<br>1 kHz, 10 kHz | 100 Hz, 120 Hz, ★<br>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<br>(requires IR-to-USB cable<br>U5481A for connection to<br>PC) | Yes  | Yes                            | Yes                              | Yes   |
| <b>Safety and Regulatory</b>   |  |                                |                                  |   |
| EN/IEC 61010-1:2001<br>compliance  | Yes  | Yes                            | Yes                              | Yes   |
| <b>General</b>   |  |                                |                                  |   |
| Operating temperature  | 0 to 50 °C   | -10 to 55 °C, 0 to 80%<br>R.H. | -10 to 55 °C, 0 to 80%<br>R.H.   | -10 to 55 °C, 0 to 80%<br>R.H.              |
| Battery (included)   | Alkaline 9 V<br>AC power adapter and<br>cord available as option | 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

### Web link

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

## Software and Accessories

### Software

Accomplish more in a day's work with Keysight Handheld Tools using Keysight's free handheld PC software and mobile applications. Together with Keysight's Remote Link Solution, you can perform remote measurements, data logging and monitoring activities on Windows-based PC or iOS/Android-based devices.

#### Keysight Mobile Meter application

##### Key Features

Perform measurements with Keysight U1200 Series using iOS/Android-based devices

- Log and monitor up to three measurements simultaneously without the need to be physically present
- Make measurements from a safe distance
- Eliminates the need to walk back and forth between measurement points
- Save money, time and achieve higher work productivity



iOS



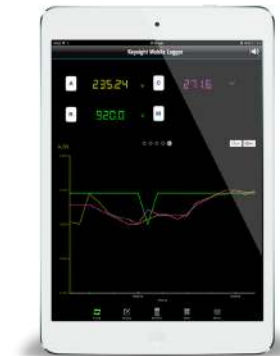
Android

#### Keysight Mobile Logger application

##### Key Features

Perform measurements with Keysight U1200 Series using iOS/Android-based devices

- Capture data streams or plot trending graphs
- Used for analysis to identify intermittent behavior or detect drifts
- Email functions, Short Message Service (SMS), pan and zoom function via iOS/Android device's touch screen
- Create mathematical functions and plot the trend



iOS



Android

Keysight Mobile Meter and Keysight Mobile Logger for iOS and Android can be downloaded from any of the following location.

- Keysight Website: [www.keysight.com/find/hhmeterapp](http://www.keysight.com/find/hhmeterapp)
- Google Play: <https://market.android.com>

– App Store: <https://itunes.apple.com>

## Keysight Insulation Tester application

### Key Features

Perform measurements and generate report with U1450A/U1460A Series using iOS/Android-based devices

- Acquire and analyze insulation resistance data from a distance
- Eliminates manual data entry errors for report generation
- Fastest way to generate accurate test reports
- Log data and provide trending graphs to identify intermittent problems (multimeter functionality)
- Saves money, time and achieve higher work productivity

Keysight Insulation Tester application for iOS and Android can be downloaded from any of the following location.

- Keysight Website: [www.keysight.com/find/insulationtester-app](http://www.keysight.com/find/insulationtester-app)
- Google Play: <https://market.android.com>
- App Store: <https://itunes.apple.com>



Remote testing and report generation interface



Data logging interface

## Keysight Handheld Meter Logger software

### Key Features

Perform measurements with U1210 Series, U1230 Series, U1240 Series\*, U1250 Series, U1270 Series, and U1450A/U1460A\*\* using Windows-based PC

- Connect up to 10 handheld meters – 5x IR-to-Bluetooth Adapter (U1177A, U1117A) and 5x IR-USB Cable (U1173B)
- Meter view (live measurements) and Logger view (graph with zoom and pan) mode
- Manage multi-session data logging within the software and export the data to other software (Microsoft Excel)

- \* For the U1240 Series, you also need to purchase the U1179A IR Connectivity Bracket to enable IR connectivity
- \*\* Only allows one connection at a time

Keysight Handheld Meter Logger software for PC can be downloaded from <http://www.keysight.com/find/hhmeterlogger>



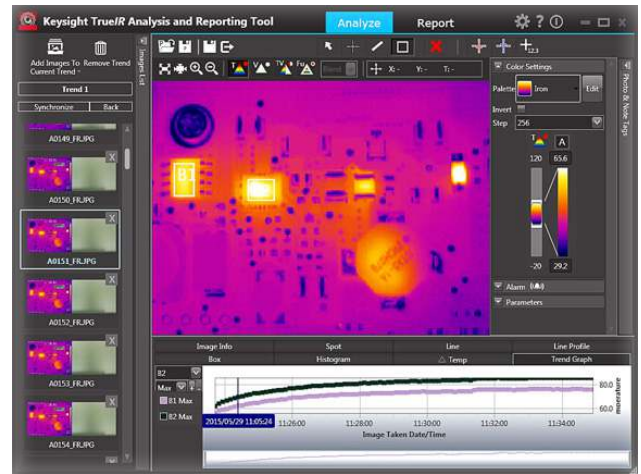
Keysight Handheld Meter Logger software interface on PC

## True/IR Analysis and Reporting Tool

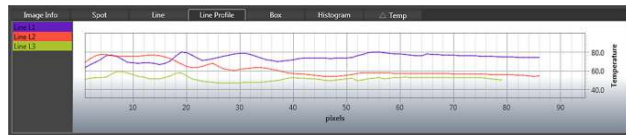
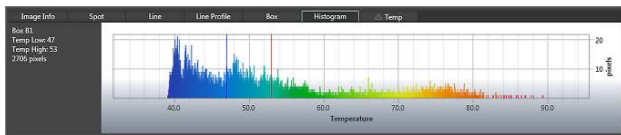
Import, analyze, edit and present your thermal images to your clients swiftly with True/IR Analysis and Reporting Tool. With this PC software, you could change color settings and corrective parameters, add color alarm, or pick and choose any of the six measurement analysis tools or diagrams to help you present findings to your customer clearly. Also, generate reports quickly with the help of ready templates and then customize them accordingly based on your clients' requirements.

### Key Features

- Change color settings, corrective parameters like ambient temperature, atmospheric temperature and local emissivity of spot, box or line.
- Supports synchronization of IR images for temperature trending analysis.
- Create custom color palettes that is suitable for your applications.
- Set color alarm
- Choose between six measurement analysis tools or diagrams like spot, line, line profile, box, histogram and delta temperature.
- Capable of displaying thermal image, visual image, thermal-visual side-by-side, or fusion images as well as its associated photo or note tags
- Generate reports in Microsoft Words or PDF, based on available templates
- Eleven local languages to choose from - English, Spanish, Italian, French, German, Portuguese, simplified Chinese, traditional Chinese, Japanese, Korean and Russian



True/IR Analysis and Reporting Tool with trending capability

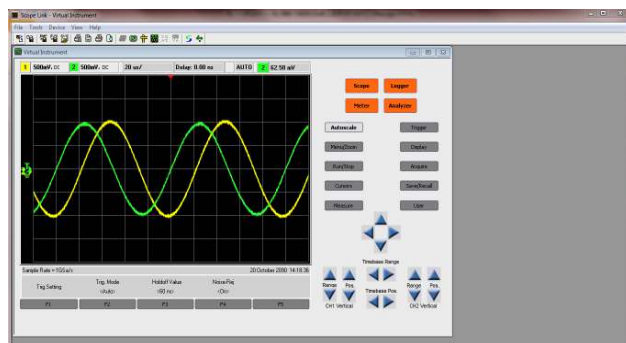


Sample of measurements analysis diagrams

True/IR Analysis and Reporting Tool is downloadable for free from [www.keysight.com/find/TrueIR\\_ART](http://www.keysight.com/find/TrueIR_ART)

## Scope Link software

The Scope Link software allows users to remotely access U1610A and U1620A handheld oscilloscope from a PC via USB connection to monitor or log data on a real-time basis. With its incorporated feature, the software allows users to create a test report based on the saved waveform.



Scope Link software is downloadable for free from [www.keysight.com/find/scopelink](http://www.keysight.com/find/scopelink)

Scope Link software GUI





Accessories compatibility chart (continued)

| Ordering number  | Description                          | Thermal imager         | Insulation resistance tester |                 | Clamp meters             |                    | Digital Multimeter |              |              |        |        |              |              |        | Digital Oscilloscope |        | Multi-function Calibrator / Meter | Capacitance / LCR meters |
|--|--------------------------------------|------------------------|------------------------------|-----------------|--------------------------|--------------------|--------------------|--------------|--------------|--------|--------|--------------|--------------|--------|----------------------|--------|-----------------------------------|--------------------------|
|  |                                      | U5850 series           | U1450 Series                 | U1460 Series    | U1190 Series             | U1210 Series       | U1230 Series       | U1200 Series |              |        |        | U1250 Series | U1270 Series |        | U1600 Series         | U1401B | U1700 Series                      |                          |
|  |                                      | U5855A, U5856A, U5857A | U1451A / 52A / 52AT          | U1453A / U1461A | U1191A / 92A / 93A / 94A | U1211A / 12A / 13A | U1231A / 32A / 33A | U1240 Series | U1240 Series | U1251B | U1252B | U1253B       | U1271A       | U1272A | U1273A               |        | U1273AX                           | U1602B / 04B             |
| <b>Probes / adapters / leads for temperature measurement</b> |                                      |                        |                              |                 |                          |                    |                    |              |              |        |        |              |              |        |                      |        |                                   |                          |
| U1179A   | IR connectivity bracket              |                        |                              |                 |                          |                    |                    | ▪            | ▪            |        |        |              |              |        |                      |        |                                   |                          |
| U1181A   | Immersion temperature probe          |                        | ▪<br>(U1461A)                | ▪<br>(U1194A)   | ▪<br>(U1212A / 13A)      | ▪<br>(U1233A)      | ▪                  | ▪            | ▪            | ▪      | ▪      | ▪            | ▪            | ▪      | ▪                    | ▪      |                                   |                          |
| U1182A   | Industrial surface temperature probe |                        | ▪<br>(U1461A)                | ▪<br>(U1194A)   | ▪<br>(U1212A / 13A)      | ▪<br>(U1233A)      | ▪                  | ▪            | ▪            | ▪      | ▪      | ▪            | ▪            | ▪      | ▪                    | ▪      |                                   |                          |
| U1183A   | Air temperature probe                |                        | ▪<br>(U1461A)                | ▪<br>(U1194A)   | ▪<br>(U1212A / 13A)      | ▪<br>(U1233A)      | ▪                  | ▪            | ▪            | ▪      | ▪      | ▪            | ▪            | ▪      | ▪                    | ▪      |                                   |                          |
| U1184A   | Temperature probe adapter            |                        | ▪<br>(U1461A)                | ▪<br>(U1194A)   | ▪<br>(U1212A / 13A)      | ▪<br>(U1233A)      | ▪                  | ▪            | ▪            | ▪      | ▪      | ▪            | ▪            | ▪      | ▪                    |        |                                   |                          |
| U1185A   | J-type thermocouple and adapter      |                        | ▪<br>(U1461A)                |                 |                          |                    |                    | ▪            |              | ▪      | ▪      |              | ▪            | ▪      | ▪                    |        |                                   |                          |
| U1186A   | K-type thermocouple and adapter      |                        | ▪<br>(U1461A)                | ▪<br>(U1194A)   | ▪<br>(U1212A / 13A)      | ▪<br>(U1233A)      | ▪                  | ▪            | ▪            | ▪      | ▪      | ▪            | ▪            | ▪      | ▪                    | ▪      |                                   | ▪                        |
| U1586B   | Temperature module                   |                        | ▪<br>(U1461A)                |                 |                          | ▪<br>(U1233A)      |                    |              |              |        |        |              |              |        |                      | ▪      | ▪                                 |                          |
| <b>Probes / clips for scope-only functions</b>               |                                      |                        |                              |                 |                          |                    |                    |              |              |        |        |              |              |        |                      |        |                                   |                          |
| U1554A   | Hook clip for probe tip              |                        |                              |                 |                          |                    |                    |              |              |        |        |              |              |        |                      | ▪      | ▪                                 |                          |
| U1560A   | Scope probe x 1 CAT III 300 V        |                        |                              |                 |                          |                    |                    |              |              |        |        |              |              |        |                      | ▪      | ▪                                 |                          |
| U1561A   | Scope probe x 10 CAT III 600 V       |                        |                              |                 |                          |                    |                    |              |              |        |        |              |              |        |                      | ▪      | ▪                                 |                          |
| U1562A   | Scope probe x 100 CAT III 600 V      |                        |                              |                 |                          |                    |                    |              |              |        |        |              |              |        |                      | ▪      | ▪                                 |                          |
| <b>Carrying case / hanging kit</b>                           |                                      |                        |                              |                 |                          |                    |                    |              |              |        |        |              |              |        |                      |        |                                   |                          |
| U1171A   | Magnetic hanging kit                 |                        |                              |                 |                          |                    | ▪                  | ▪            | ▪            | ▪      | ▪      | ▪            | ▪            | ▪      | ▪                    |        |                                   |                          |
| U1172A   | Transit case (aluminium-clad)        |                        |                              |                 |                          |                    | ▪                  | ▪            | ▪            | ▪      | ▪      | ▪            | ▪            | ▪      | ▪                    |        |                                   |                          |
| U1174A   | Soft carrying case                   |                        |                              |                 |                          |                    | ▪                  | ▪            | ▪            | ▪      | ▪      | ▪            | ▪            | ▪      | ▪                    |        |                                   | ▪                        |
| U1175A   | Soft carrying case                   |                        |                              |                 |                          | ▪                  |                    |              |              |        |        |              |              |        |                      |        |                                   |                          |
| U1178A   | Soft carrying case                   |                        |                              |                 | ▪                        |                    |                    |              |              |        |        |              |              |        |                      |        |                                   |                          |
| U1590A   | Soft carrying case (PVC leather)     |                        |                              |                 |                          |                    |                    |              |              |        |        |              |              |        |                      | ▪      |                                   |                          |



## Optional accessories



### U1115A Remote logging display

- Comes with soft carrying case and USB-to-micro USB cable
- Operated by three 1.5 V AA batteries
- For use with U1177A/U1117A Infrared (IR)-to-Bluetooth adapter
- Compatible with Keysight U1200 Series handheld meters



### U1117A Infrared (IR)-to-Bluetooth adapter

- Dimension (H x W x D): 39 x 71 x 37 mm
- Operated by two 1.5 V AAA batteries
- Compatible with U1210 Series clamp meters, U1450A/60A Series, and all handheld DMMs



### U1161A Extended test lead kit

- Extended 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
- Medium-sized alligator clips: CAT III 1000 V, CAT IV 600 V, 15 A
- 4-mm banana plugs: CAT II 600 V, 15 A



### U1162A Alligator clips

- One pair of insulated alligator clips (red and black). Recommended for use with Keysight standard test leads. Rated CAT III 1000 V, CAT IV 600 V, 15 A



### U1163A SMT grabbers

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



### U1168A Standard test lead kit

- Test leads: CAT III 1000 V, CAT IV 600 V, 15 A
- Test probe (19-mm tips): CAT II 1000 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, CAT IV 600 V, 15 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



### U1169A Test probe leads

- Test leads: CAT III 1000 V, CAT IV 600 V, 15 A
- Test probe (19-mm tips): CAT II 1000 V, 15 A
- Test probe (4-mm tips): CAT III 1000 V, CAT IV 600 V, 15 A
- (highly recommended for CAT IV environment)



### 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



### U1173B IR-to-USB cable

- For remote control and data logging to PC
- Max. baud rate: 19,200 bits per second
- Compatible with Keysight U1200 Series handheld meters and U1450A/60A Series



### 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 inches



### U1175A Carrying case

- Ideal for the U1210 Series 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



### U1177A Infrared (IR)-to-Bluetooth adapter

- Dimension (H x W x D): 71 x 39 x 37 mm
- Operated by two 1.5 V AAA batteries
- Compatible with Keysight U1200 Series handheld meters and U1450A/60A Series



### U1178A Soft carrying case

- Ideal for the U1190 Series handheld clamp meters
- Dimensions (H x W x D): 245 x 120 x 50 mm



### U1179A IR connectivity bracket

- Compatible only with the U1240 Series handheld digital multimeters
- Enables wireless remote connectivity when paired with the U1177A or to a PC with U1173B



### 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

## Optional accessories (continued)



- 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



- 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 Scope probe x1 CAT III 300 V**
- Include ground alligator clip and hook clip, rated CAT III 300 V



- U1561A Scope probe x10 CAT III 600 V**
- Include ground alligator clip and hook clip, rated CAT III 600 V



- U1562A Scope probe x100 CAT III 600 V**
- Include 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 U1602/04B handheld oscilloscopes



- U1571A Ni-MH battery pack**
- 4500 mA, 7.2 V
  - For use with U1602/04B handheld oscilloscopes



- U1572A Li-Ion battery pack**
- 4800mAh, 10.8V
  - Compatible with U1610A/20A handheld oscilloscope



- U1573A Desktop charger & Li-Ion battery pack**
- 4,800 mAh, 10.8 V
  - For use with U1610A/20A handheld oscilloscope



- U1574A AC/DC adapter**
- Include AC power cord based on country
  - For use with U1610A/20A handheld oscilloscope



- U1575A Desktop charger**
- 2-output 3 A battery charger
  - Dimension (H x W x D): 2.30 x 4.89 x 6.89 inches
  - For use with U1610A/20A handheld oscilloscope



- U1577A USB 2.0 Cable (Type-A Plug to Type-A Plug)**
- For remote control and data logging to PC



- U1580A DMM terminal test lead set**
- 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
  - Alligator clips: CAT III 1000 V, CAT IV 600 V, 15 A



- 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 handheld DMMs and oscilloscopes



- 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 inches
  - PVC leather material
  - Ideal for the U1602/04B handheld oscilloscope



- U1591A Soft carrying case**
- Dimension (H x W x D): 12.6 x 15.7 x 3.9 inches
  - Soft carrying case with backpack and shoulder strap
  - Ideal for the U1610/20A handheld oscilloscope

## Optional accessories (continued)



U1593A Protective rubber sleeve

- For use with U1450A/60A Series insulation resistance tester
- Snap-on holster absorbs shocks and protects the tester



U1594A Hard carrying case

- Dimension (H x W x D): 13.8 x 11.4 x 3.9 inches
- Hard carrying with two compartments
- Ideal for carrying the U1450A/60A Series insulation resistance tester with accessories



U1731P Combo kit

- Includes one U1731C handheld and four accessories:
- U5491A soft carrying case
  - U5481B IR-USB cable
  - U1780A AC adapter
  - U1782B SMD tweezer



U1732P Combo kit

- Includes one U1732C handheld and four accessories:
- U5491A soft carrying case
  - U5481B IR-USB cable
  - U1780A AC adapter
  - U1782B SMD tweezer



U1733P Combo kit

- Includes one U1733C handheld and four accessories:
- U5491A soft carrying case
  - U5481B IR-USB cable
  - U1780A AC adapter
  - U1782B 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



U1782B SMD tweezer

- Measurement Accuracy for Capacitance (Tweezers Open) <math><0.7\text{pF}</math>, Resistance (Tweezers Short) <math><0.5\Omega</math>, Inductance (Tweezers Short) <math><1.2\mu\text{H}</math>
- Guard ends to be connected to guard terminals of meter for better noise immunity



U5402A Yellow test lead for mA simulation

- For use with handheld multifunction calibrator/meter



U5481B 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 U1401B multifunction calibrator/meter



U5491A Carrying case

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



U5751A AC power adapter (with power cord)

- For use with TrueIR thermal imager
- Bundled with regional power cord



U5752A Rechargeable Li-Ion battery

- Compatible with TrueIR thermal imager
- Each battery lasts ~4 hours with each charge



U5753A External battery charger (2-bay)

- For charging of U5752A rechargeable Li-Ion battery
- Allows simultaneous charging of up to two batteries



U5761A Video RCA to RCA interface cable, 2 m

- Video RCA to RCA interface cable for external video output
- Length: 2 meters



U5762A USB Standard-A to Mini Type-B interface cable, 1 m

- USB standard-A to mini type-B interface cable for data transfer
- Length: 1 meter



U5771A Rugged hard carrying case

- High quality, water and dust proof
- Dimension (H x W x D): 377.15 x 430.8 x 168.0 mm
- Able to hold a unit TrueIR thermal imager, with compartments for two battery pack, an external battery charger, two SD cards, power adapter and accessories



U5772A Adjustable hand strap

- Compatible with TrueIR thermal imager for better grip
- Easily adjustable for right-handed or left-handed use



U5403A Remote switch probe

- For use with U1450A/60A Series insulation resistance tester
- Probe with remote switch
- CAT III 1000 V, CAT IV 600 V rated, 15 A

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