Keysight U1281A/ U1282A Handheld Digital Multimeter

Quick Start Guide

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Safety Notices

CAUTION

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

WARNING

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

EMC Information

The U1281A/U1282A is EMC-certified in compliance with IEC 61326-1/EN 61326-1, CISPR11/EN55011 Group 1 Class A, ICES/NMB-001, and AS/NZS CISPR 11.

Safety Information

The U1281A/U1282A is safety-certified in compliance with IEC/EN 61010-1, IEC/EN 61010-2-030, IEC/EN 61010-2-033, CAN/CSA-C22.2 No. 61010-1, CAN/CSA-C22.2 No. 61010-2-030, CAN/CSA-C22.2 No. 61010-2-033, UL Std. No. 61010-1, UL Std. No. 61010-2-030 and UL Std. No. 61010-2-033. Use with standard or compatible test probes.

Safety symbols

⎓	Direct current (DC)
∿	Alternating current (AC)
⚠	Caution, risk of danger (refer to this manual for specific Warning or Caution information)
⏚	Earth (ground) terminal
▣	Equipment protected throughout by double insulation or reinforced insulation
CAT III 1000 V	Category III 1000 V overvoltage protection
CAT IV 600 V	Category IV 600 V overvoltage protection

For further safety information details, refer to the *Keysight U1281A/U1282A Handheld Digital Multimeter User's Guide*.

Standard Shipped Items

Verify that you have received the following items with the shipment of your U1281A/U1282A multimeters:

✔ Test probes

✔ Infrared (IR)-to-USB cable

✔ AA batteries (4x)

✔ Certificate of Calibration

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

NOTE
– The descriptions and instructions in this guide apply to the U1281A and U1282A Handheld Digital Multimeters.

– The model U1282A appears in all illustrations.

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

NOTE
Your multimeter is capable of receiving remote commands and performing remote data logging. To use these features, you will need either an IR-to-USB cable (included in the shipment) or an IR-to-*Bluetooth*® adapter (U1117A, purchased separately), and the Keysight Handheld Meter Logger Software (downloadable from www.keysight.com/find/hhmeterlogger).

For more information on the remote commands, refer to the *U1281A/U1282A Programming Guide*.

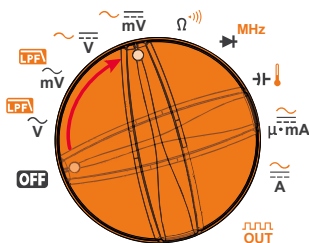# Install or Change the Batteries

The multimeter is powered by four 1.5 V AA batteries (included in the shipment).

Before installing or changing the batteries, pull from a corner and stretch the orange rubber holster to remove it.
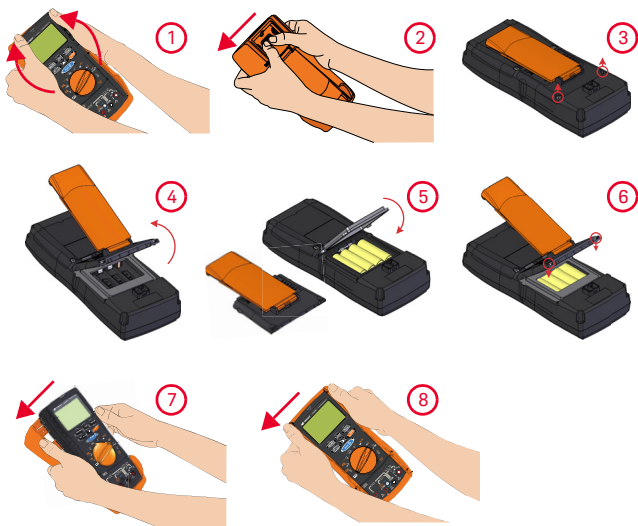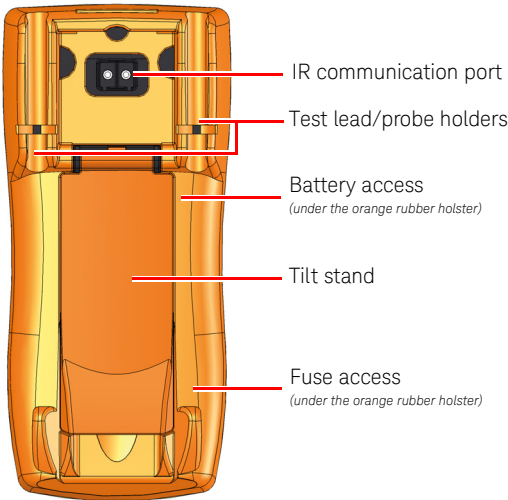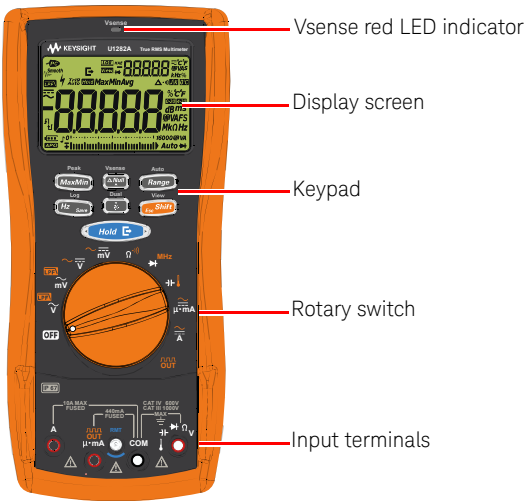

Turn On the Multimeter

Turn the rotary switch from the **OFF** position to any other position to begin making measurements.

The Multimeter at a Glance

Vsense red LED indicator

Display screen

Keypad

Rotary switch

Input terminals

IR communication port

Test lead/probe holders

Battery access
(under the orange rubber holster)

Tilt stand

Fuse access
(under the orange rubber holster)

Using the Rotary Switch

Legend	Measurement function	Model	
		U1281A	U1282A
LPF $\sim$ **V**	AC V/AC V with Low Pass Filter (LPF)[a]	✔	✔
LPF $\sim$ **mV**	AC mV/AC mV with LPF[a]	✔	✔
$\sim$ $\overline{\overline{V}}$	DC/AC/AC+DC V	✔	✔
$\sim$ $\overline{\overline{mV}}$	DC/AC/AC+DC mV	✔	✔
Ω •)))	Resistance/Continuity	✔	✔
⊸▸⊢ **MHz**	Diode/Frequency counter[a]	✔	✔
⊣⊢	Capacitance/Temperature	✔	✔
μ•**mA**	DC µA/mA/AC µA/mA/AC+DC µA/mA	✔	✔
$\overline{\overline{A}}$	DC A/AC A/AC+DC A	✔	✔
OUT	Square wave mode[a]	–	✔

[a]   For U1282A only.

> **WARNING**
>
> Remove the test leads from the measuring source or target before changing the rotary switch position.
>
> Refer to the *U1281A/U1282A User's Guide* for a complete list and description of all rotary switch labels.
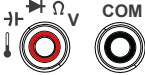
Using the Keypad
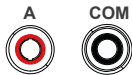
Legend	Key response when pressed for:	
	Less than 1 second	**More than 1 second**
Peak MaxMin	– Starts the Max/Min/Avg recording – Switches between the Max/Min/Avg recording modes	– Stops the Max/Min/Avg recording – Starts and stops the Peak recording
Vsense △ Null	Sets the Null/Relative mode	Enables and disables the non-contact voltage detection – Vsense[a]
Auto Range	Sets a manual range	Enables autoranging
Log Hz Save	Enables the frequency test mode for current or voltage measurements	Starts and stops data logging
Dual ☀	Turns the backlight on/off	Activates and deactivates the dual display mode (if supported by the measurement)
View Esc Shift	Switches between the regular and shifted (icons printed in orange) functions	Enters the Log Review menu
Hold ↵	– Freezes the present reading in the display (TrigHold mode) – Automatically freezes the present reading when certain conditions are met (AutoHold mode; when enabled from the multimeter's Setup mode) – Exits the AutoHold mode – Stores a record of the measured signal and exports it via the multimeter's optical communication port	Exits the TrigHold mode

[a] For the U1282A only

Using the Input Terminals

WARNING	To avoid damaging this device, do not exceed the input limit.

Rotary position	Input terminals	Overload protection
LPF $\sim$ **V**		1000 Vrms
LPF $\sim$ **mV**		
$\sim \overline{\underline{}}$ **V**	$\dashv\vdash$ ⊶ Ω **V** **COM**	
$\sim \overline{\overline{}}$ **mV**		
$\Omega^{\cdot))}$		1000 Vrms for short circuit <0.3 A
⊶ **MHz**		
$\dashv\vdash$		
$\sim \overline{\overline{}}$ **μ·mA**	**μ·mA** **COM**	440 mA/1000 V, fast-acting fuse
$\sim \overline{\overline{}}$ **A**	**A** **COM**	11 A/1000 V, fast-acting fuse
OUT		
	RMT	

This input terminal is for use with the Remote Switch Probe (purchased separately). The button on the probe emulates the (**Hold** ⇥) button on the multimeter by default.

Safety Alerts and Warnings

Hazardous voltage indication

The multimeter will display the hazardous voltage (⚡) symbol as an early precaution when the measured voltage is:

Measurement	DC		AC
V (mV)	≥ +30 V or +OL	≤ –30 V or –OL	≥ 30 V or OL

This symbol will also be displayed when the input signal exceeds the limitation of measuring circuit as frequency dependence.

Hazardous current indication

The multimeter will display the hazardous current (⚡) symbol as an early precaution when the measured current has reached the maximum fuse rating as follows:

Measurement	DC		AC
A	≥ +11 A or +OL	≤ –11 A or –OL	≥ 11 A or OL
µA/mA	≥ 440 mA or +OL	≤ –440 mA or –OL	≥ 440 mA or OL

CAUTION	If your measuring current is > 10 A ~ 19.999 A, you will need to lower the current within a 30-second time limitation to avoid blowing the multimeter's fuse.

Input Warning

The multimeter emits a continuous beep and the red LED indicator lights up when:

– the test lead is inserted into the **A** or **μ•mA** input terminal but the rotary switch is not set to the correct current position. The secondary display will show $A\text{-}Err$ or $\mu AErr$ until the test lead is removed. The beeping will stop automatically after 5 seconds even if the test lead is not removed.
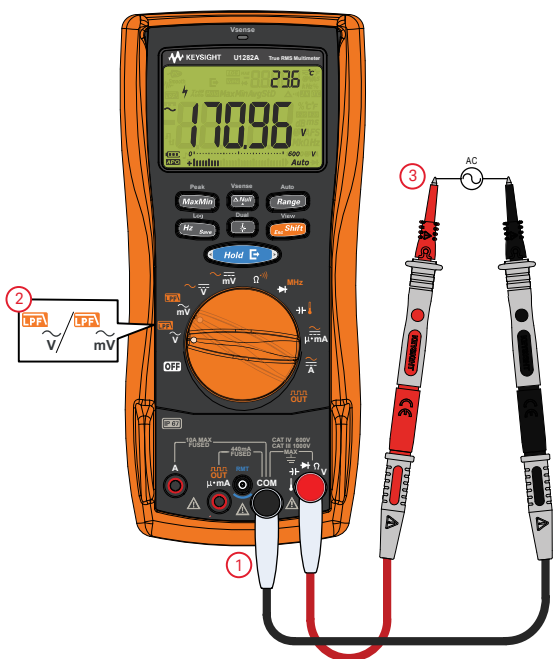

– the rotary switch is set to the current measurement position but no lead is inserted into its respective input terminal. The secondary display will show $LEAd$ and the warning alert will stop after approximately 3 seconds.
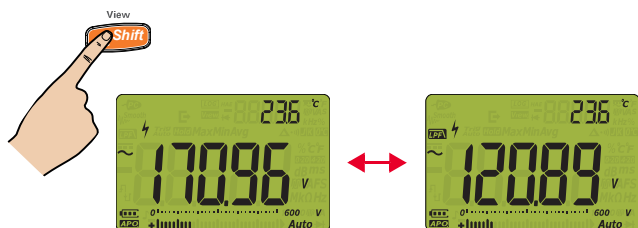
Voltage Measurements

Measuring AC voltage

## Using the AC low-pass filter (LPF)

WARNING To avoid possible electric shock or personal injury, ensure that you are aware of the voltage level without the LPF enabled. There may be a possible presence of hazardous voltage, and voltages measured with the LPF enabled may be greater than indicated. For your safety, take note of the **LPF** symbol. Disable the LPF when you have completed your measurement.

NOTE The LPF can improve measurement performance on composite sine waves that are typically generated by inverters and variable frequency motor drives.

Measuring DC voltage
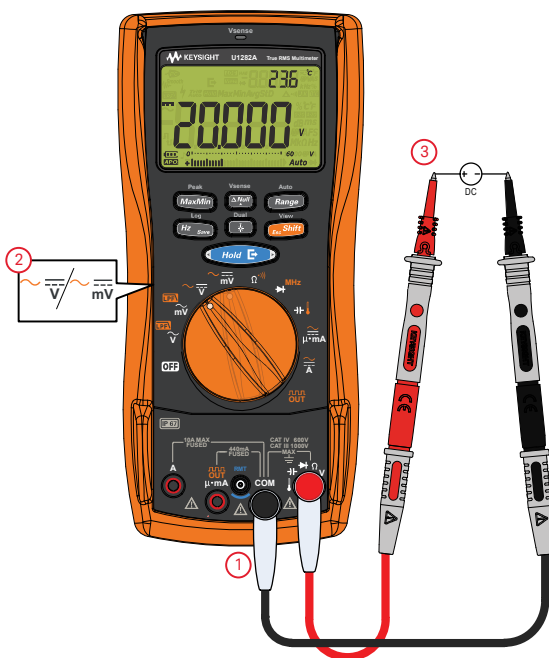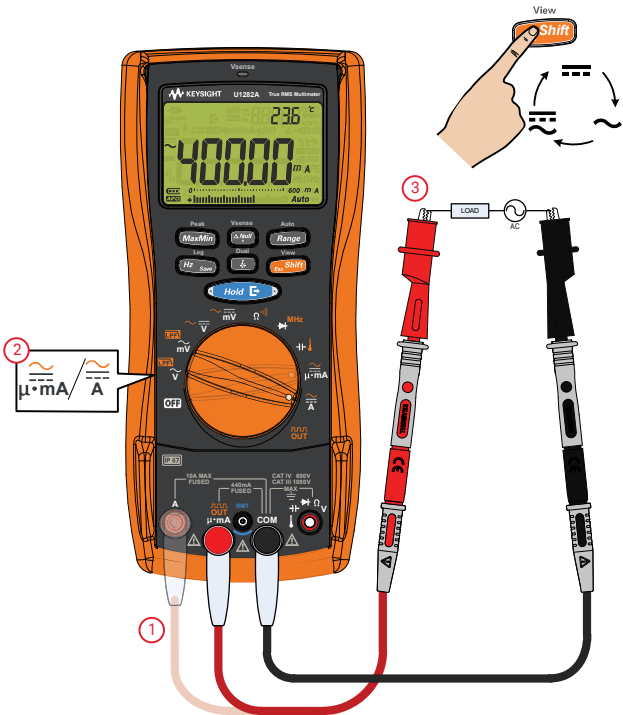
Current Measurement
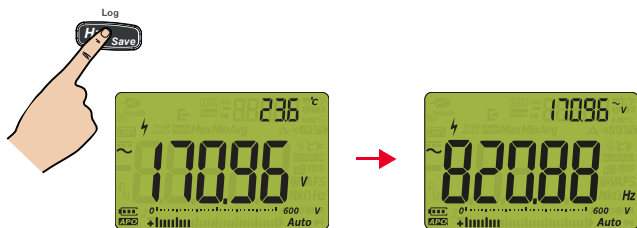
Measuring AC/DC current

WARNING Never attempt an in-circuit current measurement where the open-circuit potential to earth is greater than 1000 V.
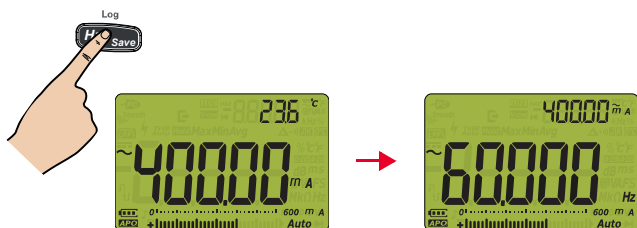
CAUTION Current can be measured up to 440 mA (maximum) continuously. You can measure current more than 440 mA and up to 600 mA for 20 hours maximum.
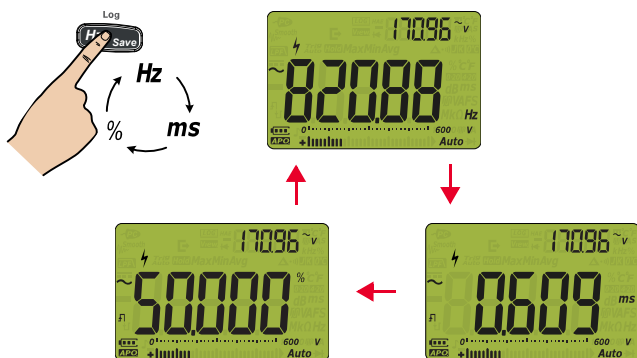
Measuring voltage frequency


Measuring current frequency

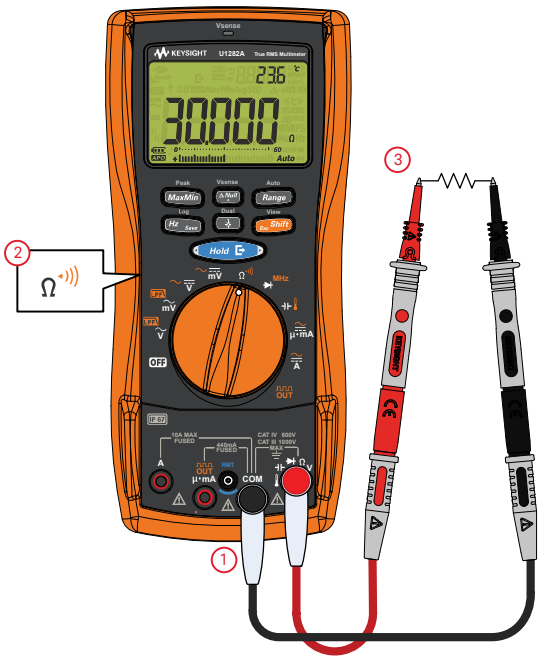## Measuring frequency/duty cycle/pulse width
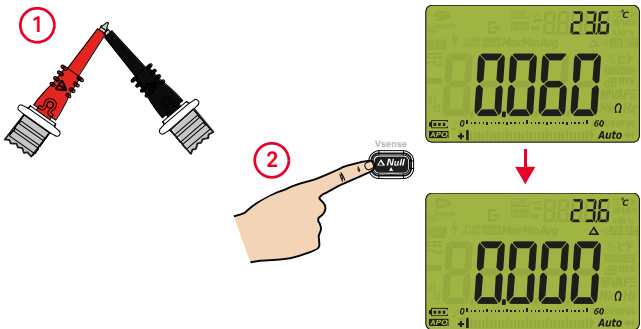
Frequency Counter (U1282A only)

WARNING

– Use the frequency counter for low voltage applications. Never use the frequency counter on AC power line systems.

– For input more than 3.6 Vpp, you are required to use the frequency measurement mode available under the current or voltage measurement instead of the frequency counter.

If the reading is zero or unstable, press **Range** to toggle between a **Hz** or **MHz** reading.
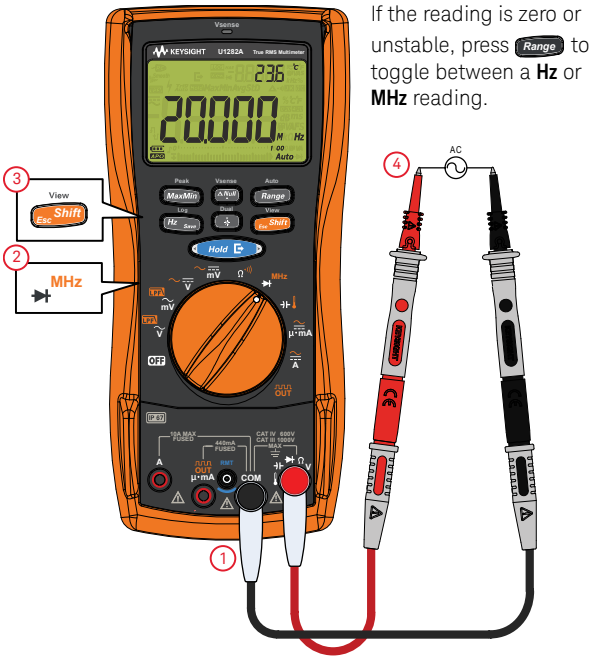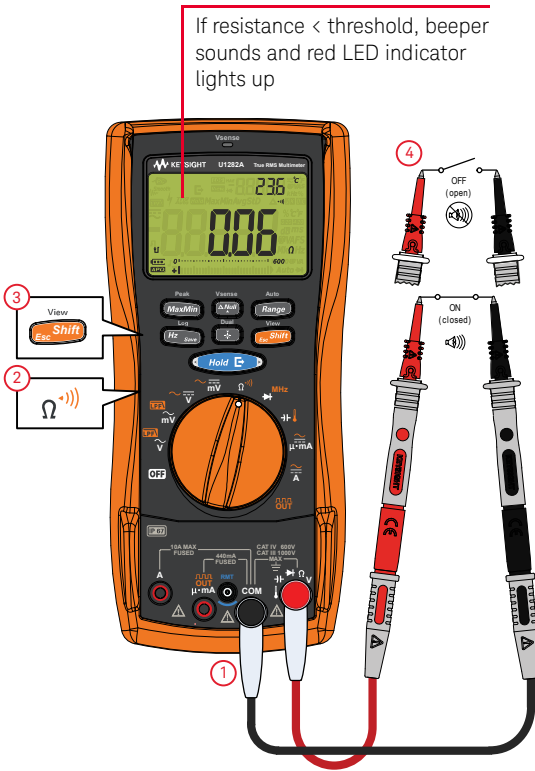
Resistance Measurement

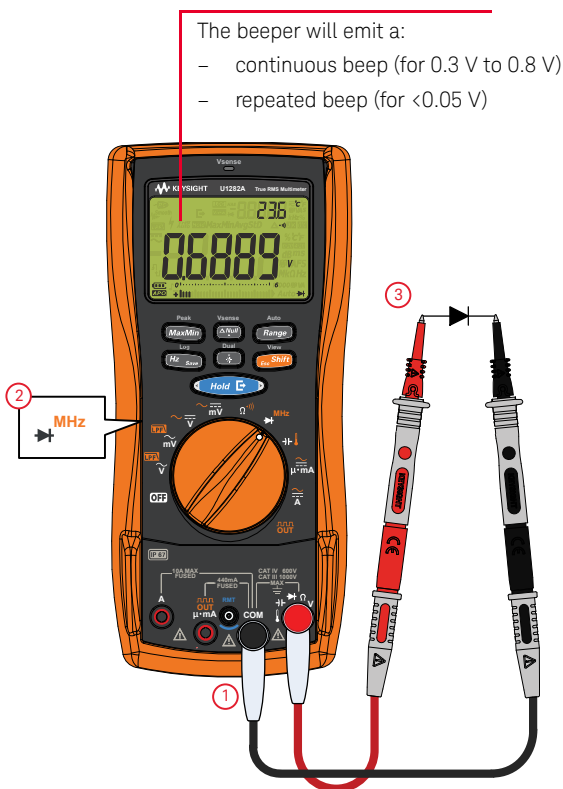Removing test lead resistance

Continuity Tests

CAUTION To avoid possible damage to the multimeter or to the equipment under test, disconnect circuit power and discharge all high-voltage capacitors before measuring continuity. Use the DC voltage function to confirm that the capacitor is fully discharged.
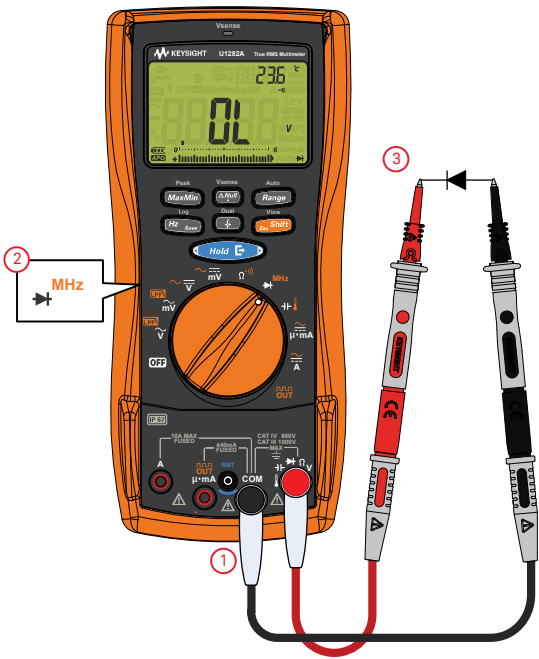
If resistance < threshold, beeper sounds and red LED indicator lights up

Diode Tests

Forward bias

The beeper will emit a:

– continuous beep (for 0.3 V to 0.8 V)

– repeated beep (for <0.05 V)
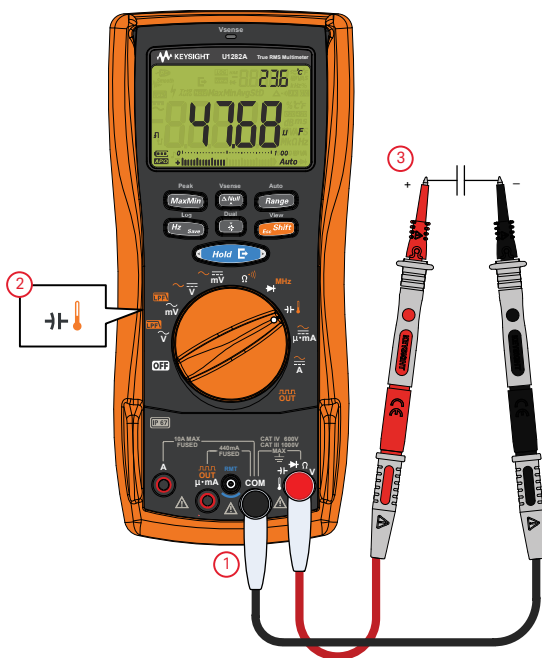
Reverse bias

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Capacitance Measurement

CAUTION To avoid possible damage to the multimeter or to the equipment under test, disconnect circuit power and discharge all high-voltage capacitors before measuring capacitance. Use the DC voltage function to confirm that the capacitor is fully discharged.

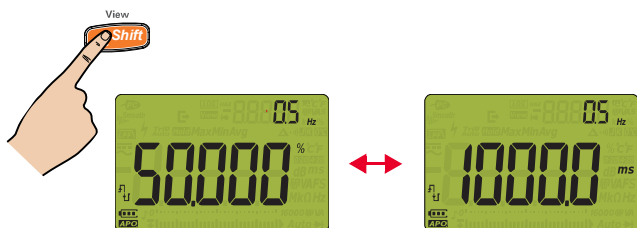# Temperature Measurement

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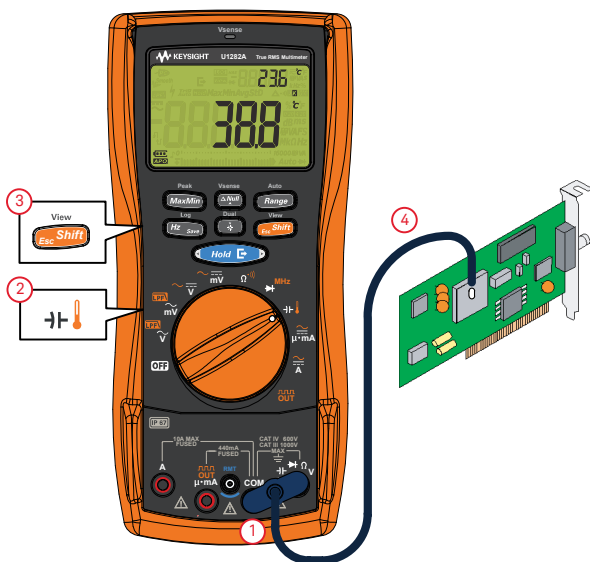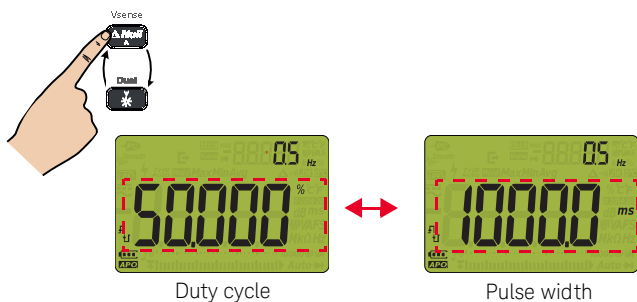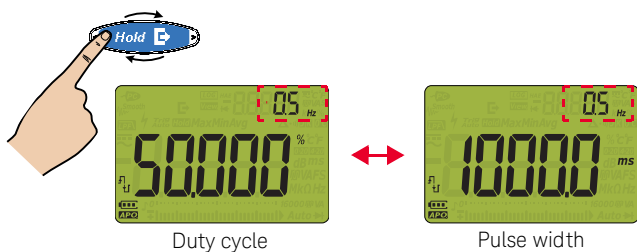
Square Wave Output

oscilloscope

Scrolling between the pulse width/duty cycle

Setting the pulse width/duty cycle

Duty cycle

Pulse width

Duty cycle
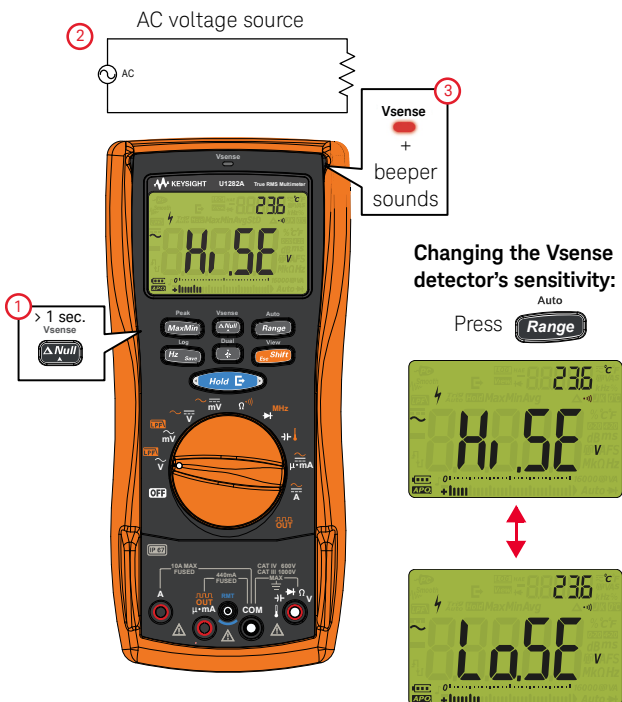
Pulse width

Non-Contact Voltage Detector (Vsense) (U1282A only)

WARNING
– Voltage could still be present even if there is no alert indication. Do not rely on the Vsense detector with shielded wires. Never touch live voltage or conductors without the necessary insulation protection, or power off the voltage source.

– The Vsense detector may be affected by differences in socket design, insulation thickness, and insulation type.

AC voltage source

Vsense
+
beeper
sounds

> 1 sec.
Vsense

Changing the Vsense detector's sensitivity:

Press **Range**

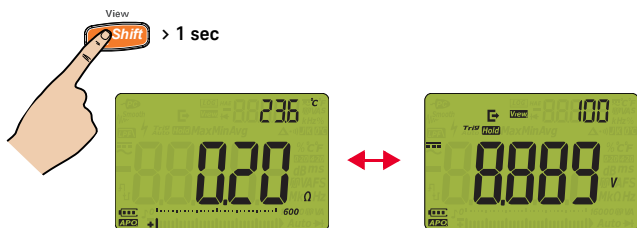# Measurement Data Recording and Review

Recording measurement data (manual log)
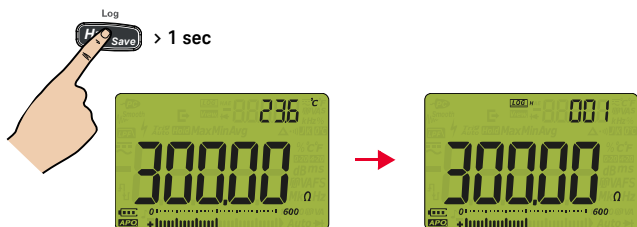
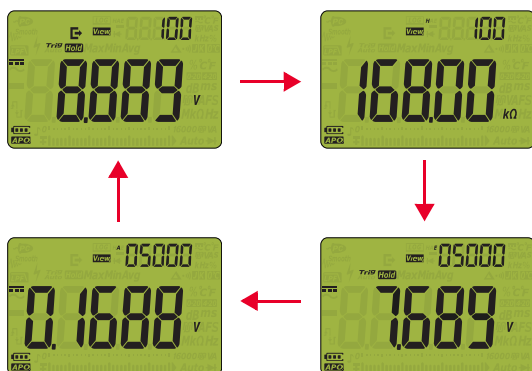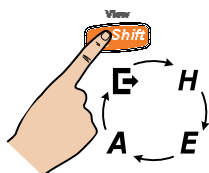**NOTE** Refer to the *U1281A/U1282A User's Guide* for other data recording options.
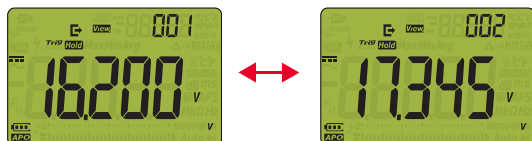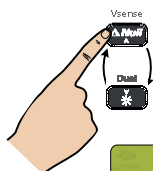
Viewing the recorded data
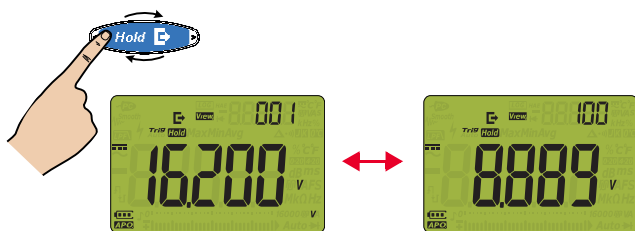
Scrolling through previously stored records

Viewing stored entries

Viewing next and previous stored entries

Viewing first and last stored entries

Clearing stored entries

Clear the last
stored entry

> 1 sec

Clear all
stored entries

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