

# User Manual



## 3-in-1 Digital Multimeter with NIST-Traceable Calibration

### Model 20250-52



THE STANDARD IN PRECISION MEASUREMENT

## **Introduction**

The Digi-Sense 3-in-1 Digital Multimeter (Model 20250-52) is versatile yet easy to use—a must-have on your electrical tool belt. This pocket-sized multimeter safely measures common ranges of voltage, current, and resistance. For added convenience, it features noncontact voltage probes, built-in flashlight, and auto-ranging. The instrument is fully tested and calibrated to NIST-traceable standards. Careful use of this meter will provide years of reliable service.

## **Safety**

### **International Safety Symbols**



This symbol, adjacent to another symbol or terminal, indicates the user must refer to the manual for further information.



This symbol, adjacent to a terminal, indicates that, under normal use, hazardous voltages may be present



Double insulation

## Safety Precautions

1. Improper use of this meter can cause damage, shock, injury or death. Read and understand this user manual before operating the meter.
2. Make sure any covers or battery doors are properly closed and secured.
3. Always disconnect the test leads from any voltage source before replacing the battery or fuses.
4. Do not exceed the maximum rated input limits:

Input Limits	
Function	Maximum Input
V DC or V AC	600 V DC/AC
$\mu$ A, mA, AC/DC	200 mA / 500 V fast-acting, resettable fuse
Resistance, Diode, Continuity Test	600 V DC/AC

5. Use great care when making measurements if the voltages are greater than 25 VAC rms or 35 VDC. These voltages are considered a shock hazard.
6. Always discharge capacitors and remove power from the device under test before performing Resistance, Diode, or Continuity tests.
7. Remove the battery from the meter if the meter is to be stored for long periods.

## **Unpacking**

Check individual parts against the list of items below. If anything is missing or damaged, please contact your instrument supplier immediately.

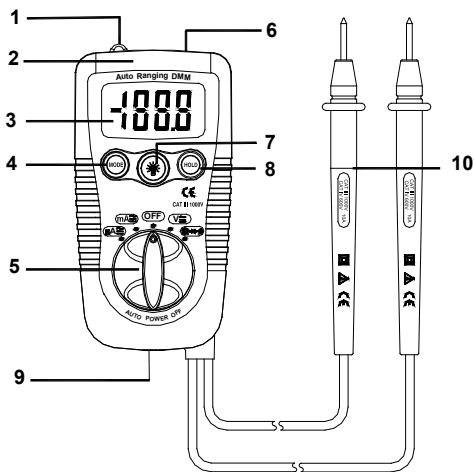
1. Meter
2. Test leads
3. Two AAA batteries
4. User manual
5. NIST-traceable calibration report with data

## **Key Features**

- 3½-digit (2000 count) LCD
- Built-in noncontact AC voltage detector
- Built-in flashlight for working in dark or tight spaces
- Double-molded housing with permanently attached leads
- CAT IV 600 V / CAT III 1000 V safety rating
- 200 mA / 500 V resettable fused current inputs
- Overload protection on all ranges
- Autoranging with auto power-off

## Meter Description

1. Noncontact AC voltage detector probe tip
2. Noncontact AC voltage indicator light
3. 3½ digit (2000 count) LCD
4. MODE button
5. Rotary function switch
6. Flashlight
7. Flashlight button
8. Data HOLD button
9. Battery cover
10. Test leads



## Setup and Operation

### AC/DC Voltage Measurements

**CAUTION:** Do not measure AC/DC voltages if a motor on the circuit is being switched ON or OFF. Large voltage surges may occur that can damage the meter.

1. Set the rotary function switch to the **V** position.
2. Press the MODE button to indicate "DC" or "AC" on the display.
3. Touch the black test probe tip to the negative side of the circuit and the red test probe tip to the positive side of the circuit.
4. Read the voltage measurement in the display.


### AC/DC Current Measurements

1. Set the rotary function switch to the **μA** or **mA** position.
  - a. For current measurements up to 2000  $\mu\text{A}$  DC/AC, set the function switch to the **mA** position.
2. Press the MODE button to indicate "DC" or "AC" on the display.
3. Remove power from the circuit under test, then open up the circuit at the point where you wish to measure current.
4. Touch the black test probe tip to the negative side of the circuit and the red test probe tip to the positive side of the circuit.
5. Apply power to the circuit.
6. Read the current measurement in the display.



**Note:** 0.2 A / 500 V fast-acting resettable fuse current inputs and Overload protection on mA,  $\mu$ A ranges.  
No replacement required.

## Resistance Measurements

**WARNING:** To avoid electric shock, disconnect power to the unit under test and discharge all capacitors before taking any resistance measurements. Remove the batteries and unplug the line cords.



1. Set the rotary function switch to the  $\Omega$   position.
2. Press the MODE button to indicate  $\Omega$  (AUTO) on the display.
3. Touch the test probe tips across the circuit or part under test. It is best to disconnect one side of the part under test so the rest of the circuit will not interfere with the resistance reading.
4. Read the resistance measurement in the display.

## Diode Test

1. Set the rotary function switch to the  $\Omega$   position.
2. Press the MODE button to indicate  on the display.
3. Touch the test probes to the diode under test. Forward voltage will typically indicate 0.400 to 0.700 V. Reverse voltage will indicate "OL". Shorted devices will indicate near 0 V and an open device will indicate "OL" in both polarities.

## Continuity Check

**WARNING:** To avoid electric shock, never measure continuity on circuits or wires that have voltage on them.

1. Set the rotary function switch to the  $\Omega$   position.
2. Press the MODE button to indicate  on the display.
3. Touch the test probe tips to the circuit or wire you wish to check.
4. If the resistance is less than approximately 150  $\Omega$ , the audible signal will sound. If the circuit is open, the display will indicate "OL".

## Noncontact AC Voltage Measurements

**WARNING:** Risk of Electrocution. Before use, always test the Voltage Detector on a known live circuit to verify proper operation.

1. Touch the probe tip to the hot conductor or insert into the hot side of the electrical outlet.
2. If AC voltage is present, the detector light will illuminate.

**Note:** The conductors in electrical cord sets are often twisted. For best results, rub the probe tip along a length of the cord to assure placing the tip in close proximity to the live conductor.

**Note:** The detector is designed with high sensitivity. Static electricity or other sources of energy may randomly trip the sensor. This is normal operation.



### Data HOLD Button

The data HOLD function allows the meter to “freeze” a measurement for later reference.

1. Press the **HOLD** button to “freeze” the display; the “HOLD” indicator will appear on the LCD.
2. Press the **HOLD** button to return to normal operation.

### Flashlight Button

Press and hold the **Flashlight** button to turn the flashlight on. Release the button to turn the flashlight off.

### Automatic Power-Off

To conserve battery life, the meter automatically turns off after 15 minutes of nonuse.

## Specifications

Function	Range	Accuracy
DC Voltage	200 mV	$\pm(0.5\% \text{ rdg} + 3\text{d})$
	2.000, 20.00, 200.0, 600 V	$\pm(1.2\% \text{ rdg} + 3\text{d})$
AC Voltage, 40–400 Hz	2.000, 20.00 V	$\pm(1.0\% \text{ rdg} + 8\text{d})$
	200.0, 600 V	$\pm(2.3\% \text{ rdg} + 10\text{d})$
DC Current	200.0, 2000 $\mu\text{A}$	$\pm(2.0\% \text{ rdg} + 8\text{d})$
	20.00, 200.0 mA	
AC Current	200.0, 2000 $\mu\text{A}$	$\pm(2.5\% \text{ rdg} + 10\text{d})$
	20.00, 200.0 mA	
Resistance	200.0 $\Omega$	$\pm(0.8\% \text{ rdg} + 5\text{d})$
	2.000, 20.00, 200.0 k $\Omega$	$\pm(1.2\% \text{ rdg} + 5\text{d})$
	2.000 M $\Omega$	$\pm(5.0\% \text{ rdg} + 5\text{d})$
	20.00 M $\Omega$	$\pm(10.0\% \text{ rdg} + 5\text{d})$

<b>Max input voltage</b>	600 V AC/DC
<b>Diode test</b>	Current 1 mA max, open circuit voltage of 1.5 V typical
<b>Continuity check</b>	Audible signal if resistance is <150 $\Omega$
<b>Display</b>	2000 count, 3½ digit LCD
<b>Overrange indication</b>	LCD displays "OL"
<b>Polarity</b>	Minus (–) sign for negative polarity
<b>Low-battery</b>	LCD displays "BAT"
<b>Input impedance</b>	>7.5 M $\Omega$ (VDC and VAC)
<b>ACV bandwidth</b>	50 Hz to 400 Hz
<b>Auto power-off</b>	15 minutes (approximately)

<b>Power</b>	Two AAA 1.5 V batteries
<b>Operating temperature</b>	32 to 104°F (0 to 40°C)
<b>Storage temperature</b>	14 to 122°F (–10 to 50°C)
<b>Weight</b>	5.1 oz (145 g)
<b>Dimensions</b>	4" x 2 $\frac{3}{16}$ " x 1 $\frac{5}{16}$ " (10.4 x 5.5 x 3.3 cm)
<b>Standards</b>	IEC1010 CAT III, 1000 V Pollution degree II, CE marked

## **Maintenance, Recalibration, and Repair**

### **Cleaning and Storage**

- The meter should be cleaned with a damp cloth and mild detergent when necessary. Do not use solvents or abrasives.
- Store the meter in an area with moderate temperature and humidity.

### **Battery Replacement**

1. Loosen the screw and remove the bottom cover.
2. Replace old batteries with two 1.5 V AAA alkaline batteries.
3. Replace the bottom cover and secure the screw.

**WARNING:** To avoid electric shock, do not operate the meter until the battery cover is in place and fastened securely.

**It is recommended that Digi-Sense products are calibrated annually** to ensure proper function and accurate measurements; however, your quality system or regulatory body may require more frequent calibrations.

To schedule your recalibration, please contact InnoCal, an ISO 17025 calibration laboratory accredited by A2LA.

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