

# User Manual

 **DIGI-SENSE®**

**Stick-Style Water-Resistant  
Infrared Thermometer with  
8:1 Distance-to-Sight Ratio**

with NIST-Traceable Calibration

**Model 20250-09**



THE STANDARD IN PRECISION MEASUREMENT

## **Introduction**

The Digi-Sense Stick-Style Infrared Thermometer (Model 20250-09) with 8 to 1 distance-to-sight ratio offers fast response and high accuracy at the touch of a button. The built-in laser pointer increases target accuracy while the convenient push button and backlight LCD combine for ergonomic handheld operation. Unit features a dust- and water-resistant IP54 rating. Infrared thermometers can be used to safely measure the temperature of objects that are hard or improper to be measured by traditional contact thermometers. The instrument is fully tested and calibrated to NIST-traceable standards. Careful use of this meter will provide years of reliable service.

## **Unpacking**

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

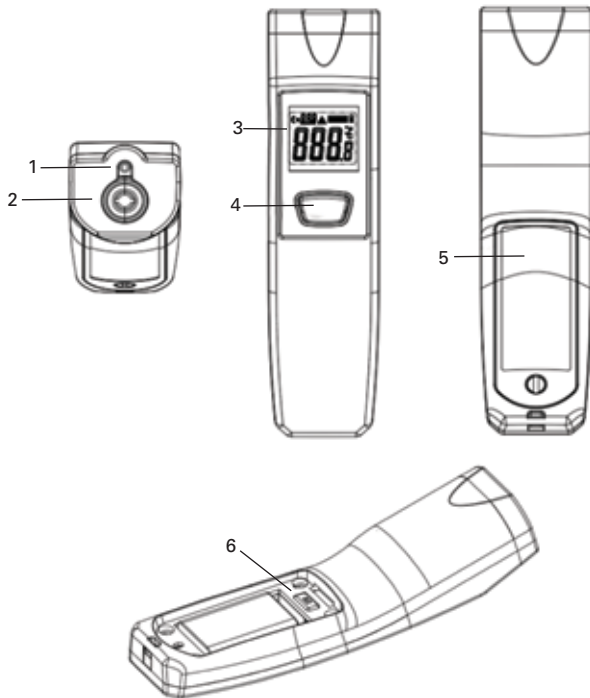
1. Meter
2. One 9 V battery
3. User manual
4. NIST-traceable calibration report with data

## **Key Features**

- 8:1 Distance-to-sight ratio
- 2% basic accuracy
- Precise noncontact IR measurements
- Laser sighting
- Fixed emissivity (0.95)
- User-selectable °F or °C temperature units
- Automatic data Hold
- Backlight LCD
- Automatic power-off to conserve battery life

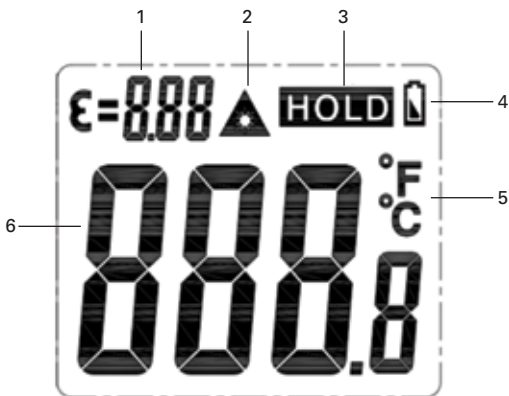
## Meter Description

1. Laser pointer beam
2. IR sensor
3. LCD
4. MEASURE button
5. Battery cover
6. °F/°C switch



## Display Layout

1. Emissivity value
2. Laser pointer indicator
3. Data HOLD icon
4. Low-battery indicator
5. °F and °C temperature icons
6. Temperature readout



## **How it Works**

Infrared thermometers measure the surface temperature of an object. The unit's optics sense emitted, reflected, and transmitted energy, which is collected and focused onto a detector. The unit's electronics translate the information into a temperature reading which is displayed on the unit. The laser is used for aiming purposes only.

### **Field of View**

Make sure that the target is larger than the unit's spot size. The smaller the target, the closer you should be to it. When accuracy is critical, make sure the target is at least twice as large as the spot size.

### **Distance and Spot Size**

As the distance (D) from the object increases, the spot size (S) of the area measured by the unit becomes larger.

### **Locating a Hot Spot**

To find a hot spot, aim the thermometer outside the area of interest, then scan across with an up-and-down motion until you locate the hot spot.

## Emissivity

Emissivity is a term used to describe the energy-emitting characteristics of materials. Most (90% of typical applications) organic materials and painted or oxidized surfaces have an emissivity of 0.95 (fixed in the unit). Inaccurate readings will result from measuring shiny or polished metal surfaces. To compensate, cover the surface to be measured with black tape or flat black paint. Allow time for the tape to reach the same temperature as the material underneath it. Measure the temperature of the tape or painted surface. (Refer to table below.)

Substance	Thermal emissivity	Substance	Thermal emissivity
Asphalt	0.90 to 0.98	Cloth (black)	0.98
Concrete	0.94	Human skin	0.98
Cement	0.96	Lather	0.75 to 0.80
Sand	0.90	Charcoal (powder)	0.96
Earth	0.92 to 0.96	Lacquer	0.80 to 0.95
Water	0.92 to 0.96	Lacquer (matte)	0.97
Ice	0.96 to 0.98	Rubber (black)	0.94
Snow	0.83	Plastic	0.85 to 0.95
Glass	0.90 to 0.95	Timber	0.90
Ceramic	0.90 to 0.94	Paper	0.70 to 0.94
Marble	0.94	Chromium oxides	0.81
Plaster	0.80 to 0.90	Copper oxides	0.78
Mortar	0.89 to 0.91	Iron oxides	0.78 to 0.82
Brick	0.93 to 0.96	Textiles	0.90

## How it Works (continued)

### **Good Measuring Practices**

Holding the meter by its handle, point the IR sensor toward the object whose temperature is to be measured. The meter automatically compensates for temperature deviations from ambient temperature. Keep in mind that it will take up to 30 minutes for the IR sensor to stabilize if going from ambient temperatures to a much higher (or lower) temperature measurement.

### **Reminders**

- The unit is not recommended for measuring shiny or polished metal surfaces (stainless steel, aluminum, etc.). See **Emissivity** on page 7.
- The unit cannot measure through transparent surfaces such as glass. It will measure the surface temperature of the glass instead.
- Steam, dust, smoke, etc. can prevent accurate measurement by obstructing the unit's optics.



## **Setup and Operation**

1. To select the desired temperature units, open the battery cover and select °F or °C.
2. Hold the meter by its handle grip and point it toward the surface to be measured.
3. Push and hold the MEASURE button to turn the meter on and begin testing. The display will light if the battery is good. Replace the battery if the display does not light.
4. While measuring, the current temperature will appear on the LCD.
5. Release the MEASURE button to hold the reading.
6. **Note:** To conserve battery life, meter automatically powers down in 7 seconds once button is released.

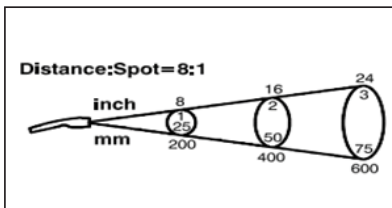
## **Specifications**

Temperature range	0 to 575°F (–18 to 302°C)
Resolution	0.1°F/C
Accuracy	±3.6°F (2°C) or ±2% of reading
Response time	Less than 150 ms
Emissivity	Fixed at 0.95
Distance-to-sight ratio (field of view)	D/S = Approximately 8:1 ratio (D = distance, S = spot)
Laser	Single Class 2 (II) laser
Spectral range	8 to 14 μm
Operating temperature	32 to 122°F (0 to 50°C)
Storage temperature	14 to 140°F (–10 to 60°C)
Dimensions	7" x 1¾" x 1½" (17.8 x 4.4 x 3.8 cm)
Power	One 9 V battery

## Field of View

The meter's field of view is 8:1, meaning that if the meter is 8 inches from the target, the diameter of the object under test must be

at least 1 inch. Other distances are shown in the diagram above. Make sure that the target is larger than the meter's spot size. The smaller the target, the closer you should be to it. When accuracy is critical, make sure the target is at least twice as large as the spot size.



## Safety

- Use extreme caution when laser beam is turned on.
- Do not let the laser beam enter your eye, another person's eye or the eye of an animal.
- Be careful not to let the laser beam on a reflective surface strike your eye.
- Do not allow the laser light beam to impinge on any gas which can explode.



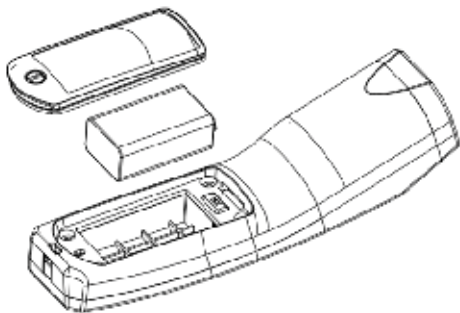
## **Maintenance, Recalibration, and Repair**

### **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**

If the battery power is insufficient, the **Low-battery** icon will appear on the LCD. Unscrew the battery cover and replace the 9 V battery. Rescrew the cover until it is securely closed.



## Maintenance, Recalibration, and Repair (continued)

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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**Phone:** 1-866-INNOCAL (1-866-466-6225)

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## For Product and Ordering Information, Contact:

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