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User Manual

⟨D⟩ DIGI-SENSE.

Dual-Input Data Logging Thermometers

with NIST-Traceable Calibration

Thermocouple Meter, Type J/K/T Input
Model 20250-92

Thermistor Meter
Model 20250-94

RTD Meter
Model 20250-96

CE

THE STANDARD IN PRECISION MEASUREMENT

Introduction

The Digi-Sense Dual-Input Thermometers with Data Logging (20250-92, -94, -96) offer fast response and high accuracy. Advanced features include data logging, USB interface, relative time clock, offset compensation, temperature differential, data Hold, Max/Min/Avg readings, and auto power-off. The instrument is fully tested and calibrated to NIST-traceable standards. Careful use of this meter will provide years of reliable service.

Unpacking

Carefully unpack the instrument and accessories from shipping package. Check individual parts against the list of items below. If anything is missing or damaged, please contact your instrument supplier immediately.
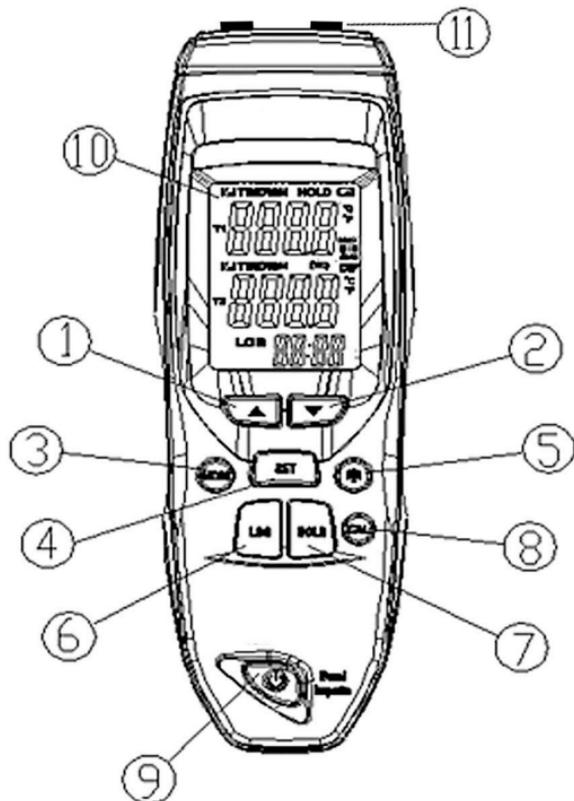
1. Meter
2. USB cable
3. Software
4. Soft carrying case
5. Lanyard
6. One 9 volt battery
7. User manual
8. NIST-traceable calibration report with data

Key Features

• Large backlit display shows any combination of T1, T2, T1–T2; plus Max, Min, and Avg readings

• Relative time clock on Max/Min/Avg provides a time reference for major events

• Electronic Offset function allows compensation of probe errors to maximize overall accuracy

• USB interface

• Data logging capacity of 16,000 sampling points

• User-selectable readout in °C or °F

• Automatic power-off (sleep) mode conserves battery life

• Dual sensor inputs; accept a wide variety of probes

Meter Description

1. Up (▲) button
2. Down (▼) button
3. MODE (Max/Min/Avg/Dif) button
4. SET button
5. Backlight button
6. LOG (data logging) button
7. Data HOLD button
8. CAL (offset/calibration) button
9. Power on/off button
10. LCD
11. Temperature sensor inputs (2)

Display Layout

1. Hold icon
2. Low-battery indicator
3. MAX icon
4. MIN icon
5. AVG icon
6. DIF icon
7. User-selectable temperature units (°C or °F)
8. Low alarm icon
9. High alarm icon
10. Real-time clock
11. Data logging icon
12. T2 temperature value
13. T2 input icon
14. T2 input type (J, K, T; 20250-92 only)
15. T1 temperature value
16. T1 input icon
17. T1 input type (J, K, T; 20250-92 only)

5
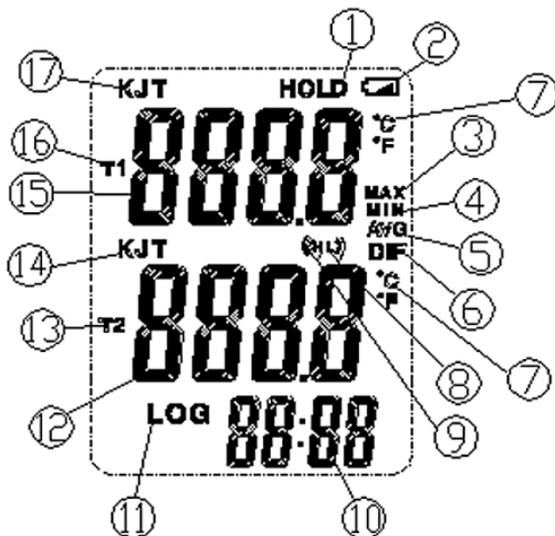
Setup and Operation

Measuring Temperatures

1. Plug the probe(s) into the T1 or T2 input connector(s). Make sure that the polarity is correct.

2. Press **power on/off** button to turn on the thermometer. After one second the thermometer displays the first reading. The screen will display the current measured value and the maximum temperature.

3. If no probe is plugged into the selected input or the probe is not connected properly, the display shows "- - - -". If the temperature being measured is outside the meter's valid range, the display shows "OL" (overload).

Thermocouple Input Function (20250-92 only)

1. Press **SET** button to enter setup mode.

2. Toggle through the setup options until the T1 or T2 input icon starts to flash.

3. Use the **Up (▲)** and **Down (▼)** buttons to select the desired thermocouple input type J, K, or T.

4. Press the **SET** button again to exit.

Backlight Function

1. The backlight is automatically set to come on for 30 seconds when the meter is powered on.

2. Press **Backlight** button to turn on for 5 minutes without activity.

3. Press **Backlight** button again to turn off the backlight prior to the 5 minutes elapsing.

Temperature Units Function

1. Press **SET** button to enter setup mode.

2. Toggle through the setup options until the temperature unit of measure icon starts to flash.

3. Use the **Up (▲)** and **Down (▼)** buttons to select the desired the temperature unit of measure °C/°F.

4. Press the **SET** button again to save setting and exit mode.

Hold Function

1. Press the **HOLD** button to freeze the readings on the display. The display shows the HOLD icon.

2. Press the **HOLD** button again to turn off the Hold function.

3. The Hold function does not freeze the Max or Min function or stop the meter from updating.

Max/Min Function

1. Press **MODE** button to enter the mode function.

2. Toggle through the mode options by pressing the **MODE** button to select the MAX or MIN icon on the display.

3. The T1 and T2 temperature values will display the maximum (Max) or minimum (Min) readings.

4. To exit, toggle through the Mode options until the mode types disappears.

5. Simultaneously press the **Up (▲)** and **Down (▼)** buttons to recalculate the stored maximum and minimum values in the meter.

Average (AVG) Function

1. Two probes must be inserted into channels T1 and T2 for this function to work.

2. Press the **MODE** button to enter the mode function.

3. Toggle through the mode options by pressing the **MODE** button to select the AVG icon on the display.

4. The T1 temperature value will display real-time readings.

5. The T2 temperature value will display the real-time average temperature between channels T1 and T2.

6. To exit, toggle through the Mode options until the mode types disappears.

Differential (DIF) Function

1. Two probes must be inserted into channels T1 and T2 for this function to work.

2. Press the **MODE** button to enter the mode function.

3. Toggle through the mode options by pressing the **MODE** button to select the DIF icon on the display.

4. The T1 temperature value will display real-time readings.

5. The T2 temperature value will display the real-time differential temperature between channels T1 and T2.

6. To exit, toggle through the Mode options until the mode types disappears.

Offset/Calibration Function

Using the Offset to Adjust for Probe Errors

Use the offset/calibration option to adjust the meter's readings to compensate for the errors of a specific sensor. The allowable adjustment range is ±9.0°F or ±5.0°C.

1. Plug the probe into the meter's input connector.

2. Place the probe in a known, stable temperature environment (such as an ice bath).

3. Allow the readings to stabilize.

4. Adjust the offset until the primary reading matches the calibration temperature.

Adjusting the Offset

The primary display shows the temperature plus the offset and the secondary display shows the offset.

1. Press the **CAL** button for 3 seconds to enter user calibration T1 mode (alarm will sound).

2. Press the **Up** (▲) or **Down** (▼) buttons to adjust the offset by 0.1°. The max offset value is 5°.

3. Press the **CAL** button again for 3 seconds to enter user calibration T2 mode (alarm will sound).

4. Press the **Up** (▲) or **Down** (▼) buttons to adjust the offset by 0.1°. The max offset value is 5°.

5. Pressing the **CAL** button a third time will save the settings and return to normal measurement mode.

Alarm Function

1. The high and low alarm limits are set in the software only.

2. The meter must be connected to your PC via a USB cable.

3. Click on the Setup icon in the software to adjust the alarm limits for both T1 and T2 channels.

4. By clicking OK in the software setup window, the alarm limits are saved and downloaded to the meter.

5. To deactivate the alarm sound on the meter, press the **HOLD** button for one second, then press **Up** (▲) button.

6. To reactivate the alarm sound on the meter, press the **HOLD** button for one second, then press **Up** (▲) button.

7. The display will show a "Bell On" or "Bell Off" icon.

Data Logging Functions

Setting Sampling Rate

1. Press **SET** button to enter setup mode.

2. Toggle through the setup options until the LOG icon starts to flash.

3. The clock function will change to show the current data logging sampling rate.

4. To adjust the sampling rate, use the **Up** (▲) and **Down** (▼) buttons.

5. Sampling rate can be adjusted from 1 second to 60 minutes.

6. Press the **SET** button again to save setting and exit mode.

Data Logging

1. Press **LOG** button to start recording data based on the sampling rate set.

2. Pressing the **LOG** button a second time for 2 seconds will end the recording function.

3. The sampling rate cannot be changed during data recording.

4. When the sampling rate is set to 0 second or the memory is full, pressing the LOG button will not start the recording function. The LOG icon will flash on the display for half a second and then disappear.

5. If data is being recorded over 15 minutes without any other operation, the meter will enter sleep mode. Sleep mode does not affect the recording of data.

Clearing Memory

1. Press the **HOLD** button for 1 second, then press the **Down** (▼) button to delete all stored data.

2. The display will show "d dAtA CLR", and then return to normal measurement mode.

3. If the user presses the **HOLD** button for more than 4 seconds and then presses the **Down** (▼) button, the memory will not be cleared.

Auto Power-Off (APO) Mode

1. The meter's default mode is to automatically shut off after 15 minutes of non-use.

2. If data is being recorded over 15 minutes without any other operation, the meter will enter sleep mode. Sleep mode does not affect the recording of data.

Data Logging Functions (continued)

3. When data is being recorded, the recorded data is automatically saved before the shutdown.

Note: The USB port serves as an external power supply and for data transferring.

Recording/Data Logging Operation (Software)

1. First install software on PC following the setup wizard (see the following "Software Installation" section). Once software is successfully installed, the software icon shortcut will be automatically placed on your PC desktop.

2. Connect the meter to your PC via the supplied USB cable.

3. Power the meter on.

4. Open the installed Data Logger Software by double-clicking on the icon on your PC desktop.

5. On the menu bar, select the green download arrow to download the recorded data from the meter to the software.

6. In the Data Logger Setting menu, confirm the sampling rate, unit of measure, probe type (20250-92 only), and alarm limits, then select "OK".

7. See the Help icon within the software for detailed instructions on other software functions.

Software Installation

1. Insert the CD into the PC.

2. Double-click the set up.exe file to launch the software installation program.

3. Follow the installation wizard to complete the installation.

4. If the USB driver needs to be updated or driver error message is received, please go to the folder with driver on the CD to update the driver.

5. Upon successful installation of the software, the software icon shortcut will be automatically placed on your PC desktop.

Specifications

Range	Resolution	Accuracy
Thermocouple meter 20250-92		
Type J: −328 to 1832°F (−200 to 1000°C)	0.1°F (0.1°C) from −148 to 1832°F (−99.9 to 999.9°C); 1°F (1°C) outside range	±1 of reading + 1.8°F (1°C) below −148°F (−99.9°C); ±1 of reading + 0.9°F (0.5°C) above −148°F (−99.9°C)
Type K: −418 to 2501°F (−250 to 1372°C)		
Type T: −418 to 752°F (−250 to 400°C)		
Thermistor meter 20250-94		
−40 to 257°F (−40 to 125°C)	0.1°F (0.1°C)	±0.9°F (±0.5°C) from 32 to 158°F (0 to 70°C); ±2°F (1°C) outside range
RTD meter 20250-96		
−320 to 1562°F (−200 to 850°C)	0.1°F (0.1°C) from −148 to 1562°F (−99.9 to 850°C); 1°F (1°C) outside range	±1.5°F (0.8°C) from −148 to 392°F (−99.9 to 199.9°C); ±2°F (1°C) + 0.5% of reading outside range

Sampling rate: Three times every two seconds (default rate)

Auto power-off: Unit shuts off automatically after 15 minutes to preserve battery life

Operating temperature: 32 to 122°F (0 to 50°C)

Storage temperature: 14 to 122°F (−10 to 50°C)

Weight: 6.2 oz (177 g)

Dimensions: 7" x 2¼" x 1" (17.8 x 5.7 x 2.6 cm)

Power: One 9 volt battery

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 (refer to the operating and storage ranges in the specifications chart earlier in this manual).

Battery Replacement

When the battery power falls low, the **low-battery** icon will appear on the screen. Replace the one 9 volt battery by removing the screw holding the rear battery compartment cover to access the battery compartment. Ensure that the compartment cover is securely fastened when finished. **Note:** If you do not intend to use thermometer for a long time, remove the batteries.

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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