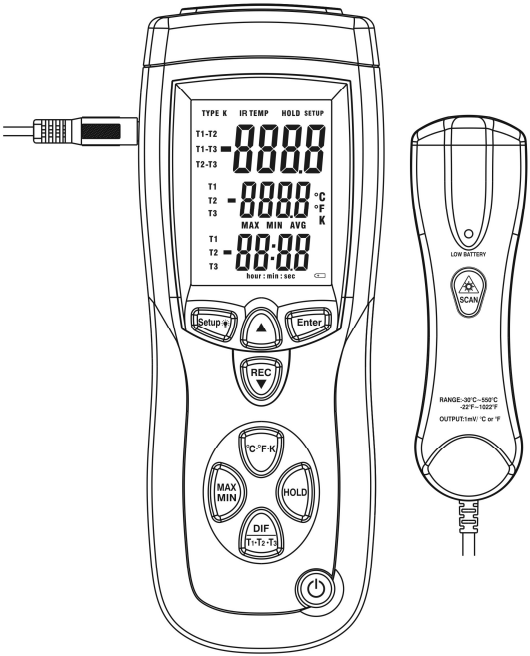
OPERATION MANUAL
Professional Thermocouple Thermometers



The (three input) offers fast response and laboratory accuracy. This data logging thermometer is suitable for most temperature measurement and data logging applications. These thermometers work with two K-type thermocouples and one IR temperature probe as temperature sensors, and it offered 0.1 °C / 0.1°F resolution. It internal memory can keep up to 18,000 records per channel. It uses USB interface to perform bi-directional communication with PC.

Features

1. Large backlit display shows any combination of T1, T2, T3, T1-T2 , T1-T3, T2-T3,plus MAX, MIN, AVG.
2. Relative time clock on MAX MIN and AVG provides a time reference for major events.
3. Electronic Offset function allows compensation of thermocouple errors to maximize overall accuracy.
4. Readout in °C, °F, or Kelvin (K).
5. USB interface, USB to UART Bridge Controller.
6. 18,000 records data logger per channel.
7. Auto Power Off mode (**Sleep mode**) increases battery life.

Specification

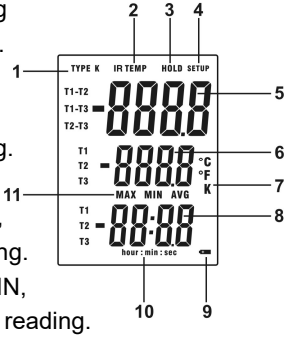
General Specifications		
Operating Temperature		0 °C to □50 °C (4 °F to □122 °F) **Noncondensing**
Storage Temperature		□10 °C to □50 °C (14 °F to □122 °F)
Temperature Range:		
K type thermocouples		-200 °C to 1372 °C (-328 °F to 2501 °F)
IR Temperature		-30 °C to 550 °C (-22 °F to1022 °F)
Temperature accuracy		
T1, T2 Above –100 °C (-148 °F)		± [0.15%rgd+1°C(1.8 °F)]
T1, T2 Blow –100 °C (-148 °F)		± [0.5%rgd+2 °C(3.6 °F)]
T1-T2		± [0.5%rgd+1^{0}C(1.8 ^{0}F)]
T3	T3 Above-10 °C(14 °F)	± [2.0%rgd+2°C(3.6°F)]
	T 3Blow -10 °C(14 °F)	± 5 °C(9.0°F)
T1-T3	T3 Above-10 °C(14 °F)	± [2.0%rgd+3°C(5.4°F)]
	T3 Blow -10 °C(14 °F)	± 6 °C(11°F)
T2-T3	T3 Above-10 °C(14 °F)	± [2.0%rgd+3°C(5.4°F)]
	T3 Blow -10 °C(14 °F)	± 6 °C(11°F)
Display Resolution		0.1°C / °F/ K <1000, 1°C / °F /K >□1000

Button

1. Press  to turn the thermometer on or off.
2. Press  to step through the maximum, minimum, and average readings. When readings, shows the maximum, minimum, and average of the logged readings. To exit the **MAN/MIX/AVG** mode, press the  button for 3 seconds to return to normal operation.
3. Press  to switch between Celsius (°C), Fahrenheit (° F), and Kelvin (K).
4. Press  to freeze or unfreeze the displayed readings.
5. Press  to toggle showing the T1, T2, T3 and T1-T2 ,T1-T2,T2-T3 (differential temperature measurement) in the primary , secondary and tertiary display.
6. Press  button to turn on the backlight. Press it again to turn off the backlight. Press  button for 5 seconds to start or exit Setup. (See "Changing Setup Options.")
7. Press  to scroll to the Setup option you want to change. Press  to increase the displayed setting.

8. Press REC to start recording and press again to stop recording .if enter a Setup option .scroll to the Setup option you want to change. Press REC to decrease the displayed setting.
9. Press Enter to enter a Setup option. Press Enter again to store the displayed setting in memory.

Display Elements



1. Thermocouple type. Flashing when the meter is recording.
2. IR temperature . Flashing when the meter recording.
3. Freeze the displayed reading.
4. Entering or Exiting Setup.
5. Primary Display: T1, T2, T3 , T1-T2,T1-T3,or T2-T3 reading.
6. Secondary Display: MAX, MIN, AVG, or offset, T1, T2 or T3 reading.
7. The temperature units. .
8. Tertiary Display :The elapsed time or T1, T2, T3 reading.
9. Low battery. Replace the batteries.
10. **min : sec** or **hour : min** Display..
11. **MAX, MIN, AVG** display.

Using the thermocouple (s)

1. Plug the thermocouple(s) into the T1or T2 input connector(s).
2. Press  to turn on the thermometer. After 1 second the thermometer displays the first reading. If no thermocouple is plugged into the selected input or the thermocouple is "open," the display shows **"- - - -**".
3. Press  and hold this button 3 second to turn off the Power.

Using the IR (Infrared Ray)

1. Plug the output of ***Infrared Ray measurement*** into the T3 (IR input) connector(s) of thermometer, "**T3 - - - -**" will show on screen. If the ***Infrared Ray measurement*** is not connected, "**T3 - - - -**" is not show on the screen.
2. Press the **"SCAN"** button of ***Infrared Ray measurement***, the temperature will show on the screen.

Changing Setup Options

Use Setup to change offset, sleep mode settings. The thermometer stores the settings in its memory.

Setup Options

Option	Menu item	Settings
Offset	T1,T2,T3	T1 or T2，T3 offset
Sample rate	rAt	sampling of recording
Time setting	tiE	Show the time or Set the time
Clear	CLR	Clear the memory operation
Sleep Mode	SLP	On (sleep mode on) or 0FF (sleep modeoff)

Entering or Exiting Setup

When the thermometer is in Setup mode, the display shows **SETUP.**

Press Setup button for 5 seconds start or exit Setup.

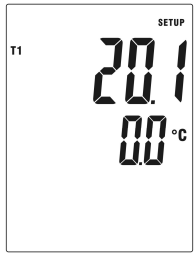
Changing a Setup Option

1. Press ▲ or REC ▼ to scroll to the setup option you want to change.
2. Press Enter to indicate that you want to change this setting.
3. Press ▲ or REC ▼ until the setting you want to use appears on the display.
4. Press Enter to store the new setting in memory.

Notes: Setup is disabled in **MIN MAX/AVG** or **REC** mode.

Offset

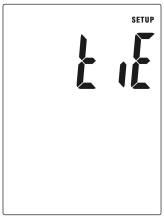
The primary display shows the temperature plus the offset and the secondary display shows the offset. You can store individual offsets for T1, T2 and T3.



Sample Rate

The tertiary display shows the sample rate of the temperature data recording. When the meter is power ,the default sample rate is 1 second.. The tertiary display show “ 0 0 0 1”. The order is minute---second. Press °C·°F·K to adjust the order. Press ▲ or REC ▼ until the setting you want to use appears on the display. Press Enter to store the new setting in memory.

Time Setting



1. Show the time**.** The primary display shows the year. The secondary display shows the month and the day, the tertiary display shows the hour and minute. (The display right shows the time 2007-3-30 16:25). If the time is not adjusted, press Enter directly to exit time setting.

2. Set the time. The adjust order is year--- month ----day---- hour --- minute. Press °C·°F·K to adjust the order. Press ▲ or REC ▼ until the setting you want to use appears on the display. If the time is adjusted, Press Enter to store the new setting in memory.

Erase Memory Operation

When one want to clear the memory, enter **CLR** setup operation, Press ▲ or REC ▼ until the display show "**SURE YES**", Press Enter , then clear the memory.

Auto Power Off mode

The thermometer enters sleep mode (default). That is to say, the meter will automatically shut off after 20 minutes if no button press occurs for 20 minutes. When the thermometer is in Setup mode, the display shows **SETUP.** Press ▲ or REC ▼ to scroll to the " **SLP** " page . Press Enter to indicate "**On**" or "**OFF**". Press ▲ or REC ▼ until the setting you want to use appears on the display. Press Enter to store the new setting in memory. **On** (sleep mode on)or **0FF** (sleep mode off).

Displaying Temperatures

1. Press °C-°F-K to select the correct temperature scale.
2. Hold or attach the thermocouple(s) to the measurement location. The temperature reading appears in the primary display.

Notes

The display shows **"- - - -"** when a thermocouple is not connected.

The display shows **OL** (overload) when the temperature being measured is outside the thermocouple's valid range.

Holding the Displayed Readings

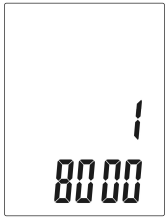
1. Press HOLD to freeze the readings on the display .The display shows **HOLD**.
2. Press DIF T1-T2-T3 to toggle showing the T1, T2, T3,T1-T2,T1-T3, or T2-T3 readings in the primary or secondary display.
3. Press HOLD again to turn off the HOLD function.

Viewing the MIN, MAX, and AVG Readings

1. Press MAX MIN to step through the maximum (MAX), minimum (MIN), or the average (AVG) readings. The elapsed time since entering MAX/ MIN/AVG mode, or the time at which the minimum or maximum occurred appears on the display.
2. Press MAX MIN button for 3 seconds to exit MAX/MIN/AVG mode.

Record Data

Press ⏻ to turn on the thermometer. After 1 second the thermometer displays the first reading (18000). The reading is the number of the thermometer that can record datas. When the memory is full, thermometer displays the first reading "FULL", please erase Memory



Press REC ▼ , the meter will start recording, REC ▼ and press again will stop recording.

Using the Offset to Adjust for Probe Errors

Use the offset option in Setup to adjust the thermometer's readings to compensate for the errors of a specific the thermocouple and IR temperature. The allowable adjustment range is ± 5.0°C or ± 9.0°F.

1. Plug the thermocouple into the input connector.
2. Place the thermocouple in a known, stable temperature environment (such as an ice dry well calibrator).
3. Allow the readings to stabilize.
4. In Setup change the offset until the primary reading matches the calibration temperature.("Changing Setup Options.")

Replacing the Batteries

1. Turn off the thermometer if necessary.
2. Loosen the screw and remove the battery door.
3. Replace 9V batteries.
4. Replace the battery door and tighten the screw.

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