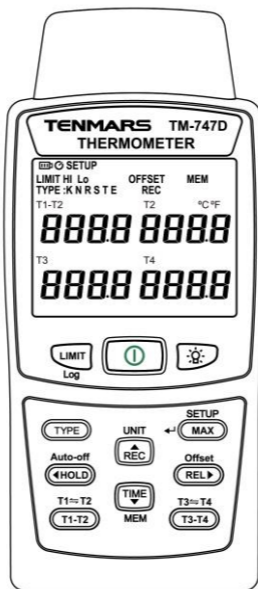


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TM-747/747D 4-Channel Thermometer User's Manual



HB2TM7470001

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1 Introduction

TM-747X series thermometers are K / J / T / E / R / S / N type thermocouple thermometers.

2 Accessories

- 1 Meter
- 1 User manual
- 6 1.5V AAA Carbon zinc battery
- 1 Carrying case
- 1 9V AC to DC adaptor (TM-747D)
- 1 USB cable (TM-747D)
- 1 Installation disk (TM-747D)

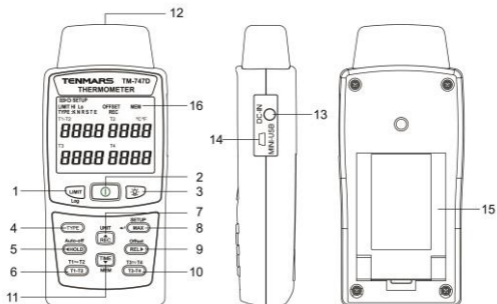
3 Safety Precaution

	Note! Please refer to this manual. Improper use may damage the meter and its components.
	Complies with European Directive.



- Do not operate in environments with flammable gas or humid environments.
- Operating altitude: up to 2000M.
- Operating environment: Indoor use; Pollution degree 2.
- Clean with soft cloth when dirty, such as glasses cloth. Do not clean with chemicals and other solvents.
- ◇ **Class B** – Equipment for use in all establishments other than domestic.
- ◇ **Group 1** – RF energy generated is needed for internal functioning.

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4 Meter Description




1. Alarm setup button / Auto record button (TM-747D)
2. Power button
3. Backlight button
4. K / J / T / E / R / S / N type switching/manually record button.
5. Hold button / Auto-shutdown button
6. Interchange button for "T1 - T2" vs. "T1 & T2"
7. Unit ° C / ° F / K switch button
8. Maximum value, Minimum value, Average value, elapsed time / Setup button
9. Relative value / offset value button
10. Interchange button for "T3 - T4" vs. "T3 & T4"
11. Time button / Read button
12. Thermocouple input terminal T1/T2 T3/T4
13. External power DC 9V input
14. USB data output jack
15. Battery cover and tilt stand
16. LCD display

	<ul style="list-style-type: none">● With DC-IN connected,  appears on the screen.● Without heat-sensing wire connected,  will appear on the screen.
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5 Operation

5.1 Power on or off


Press  button to turn on or turn off.

5.2 Turn on backlight

press  button to turn on or turn off the backlight.

* The backlight will automatically turn off after being lit for 15 seconds.

5.3 Alarm on or off


press  to turn "on" or "off" the alarm, followed by "LIMIT" appears on the LCD.

This LCD shows the status "on" or "off" of the alarm function. It is possible to set the upper and lower limit of the temperature range by yourself. When the temperature reading exceeds the range, the buzzer will alarm until the temperature back to the range or the alarm function turned off.

(For the limit range setup, please enter 5.17 Setup Function)

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5.4 Auto Recording

Press  and hold for ≥ 2 seconds to enable or disable the auto-recording function "LOG" (TM747D)


The LCD display will first show the number of logs for REC/MEM START mode and then switch back to temperature mode after 1 second.



The auto-recording is such if the current number is 3, it will be increased to X by 1 at each pressing. (the number of logs in TM-747D is up to 16800)


* Execute "LOG" to disable the auto-shutdown function. For recording for a long time, please connect the meter to an external power supply.

5.5 Thermocouple Type Selection (TYPE):

Press  to enable selection of different thermocouple types in a full cycle.



5.6 Manual Record


Press , followed by "REC" appears on the LCD, the log number of records will increase by +1 at each time, and one log will be recorded.

The manual records are up to 200 logs.




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
5.7 Unit Switch for °C, °F and K

Press  and hold for ≥ 2 seconds to switch the unit: Celsius ($^{\circ}\text{C}$), Fahrenheit ($^{\circ}\text{F}$), or Kelvin (K).


5.8 Data Hold

Press  to enable or disable the data hold function.


5.9 Disable Auto Power Off Function

Press  and hold for 2 seconds to enable or disable the auto power off function.

5.10 Relative Value Measurement

Press  to enter the relative:



Just use one thermocouple, the difference between two temperatures can be measured.

For example, measure the first temperature as 25°C , and then press  to show 0°C on the LCD. Again, measure the second temperature. If the second temperature is measured as 30°C , the LCD will show the difference value 5°C ($30-25=5^{\circ}\text{C}$).

Again, press  to disable the function.




The left shows the relative value, right shows the temperature value being measured.



press the  /  and hold to switch the display between "T1 & T2" and "T3 & T4".



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5.11 Offset Value

The user can set the offset value to compensate for the error due to the working thermocouple wire.

Press  and hold for ≥ 2 seconds to set the offset value in OFFSET mode.

b. Press  or  to increase or decrease the offset value by the scale of 0.1°C , $^{\circ}\text{F}$, or K. The setting range is $\pm 5^{\circ}\text{C}$, $\pm 5\text{K}$, or $\pm 9^{\circ}\text{F}$.

*If to set offset value of another channels, press  and  to switch and select between "T1

& T2" and "T3 & T4" for adjustment. Press  to save the setting value and exit the setting mode.

*If the value updated to be 0.1, "OFFSET" will continuously appear on the LCD. "OFFSET" will not disappear unless it is corrected back to 0.0.



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5.12 Change Display of T1-T2 vs. T1 & T2

- Press **T1-T2** to enable or disable T1 – T2 .

The value shown on the left shows the difference of T1 – T2, and the one shown on the right is the T1 value which is measured presently.



- Press and hold **T1-T2** for ≥ 2 seconds for the position change of T1 and T2.

5.13 Change Display of of T3-T4 vs. T3 & T4

- Press **T3-T4** to show the value of T3 - T4.

Again, press **T3-T4** to disable the function.


The value shown on the left presents the difference of T3-T4, the one shown on the right is the temperature measured through T3 channel.



- Press and hold **T3-T4** for 2 seconds for the position change of T4 and T3 on the right.


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5.14 Time Display

Press  for < 1 second to switch the three date-time modes: Year/Month/Day → Hour/Minute:Second → Cyclic display each term by second.




5.15 Read Record

Press  and hold for ≥ 2 seconds to read the records in "MEM" mode while LCD displays MEM CALL.

Press  or  to read the previous or next record.


The three items of time, number of logs and temperature data are displayed on the LCD and are auto-displayed cyclic by second.



*It is used in the "MEM CALL" mode. Press  to exit this mode.

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5.16 Maximum /Minimum/ Average Value

Press  repeatedly to select maximum, minimum and average value of measure data.

When MAX, MIN, and AVG are displayed at the same time, it represents the elapsed time of the measurement, and the present temperature T1 / T3.




5.17 Setup


Press  and hold for ≥ 2 seconds for SETUP:



Step1~ Step4

Step1. High/Low limit Value setting for alarm function (Limit):



Select Setup mode to the upper and lower limit of T1, T2, T3 and T4 (Setup Limit Hi \ Lo).

Press  to select and set the range (Hi & Lo) of T1, T2, T3, T4.

Press  to select the position to be modified. The position will be indicated to the next one by each press.

Press  or  to set the plus-minus sign and temperature.

The setting of the upper and the lower limits are based on the TYPE range measured; it may auto-identify whether it exceeds the limit. (The Setup function will fail if it exceeds the TYPE range which is set by the user.)

Press  and  to save the settings and proceed to Step 2.

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Step2. Set Record Intervals: (TM747D)

Press **HOLD** or **REL** to select hour, minute, and second. Press **REC** or **TIME** to adjust the record interval.



Press **SETUP** **MAX** to save the settings and proceed to Step 3.

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Step3. Time Setting:

Press **◀HOLD** or **REL▶** to select the year, month, day, hour, minute, and second.

Press **▲REC** or **TIME▼** adjust the time. Press and hold the button to enable speedy adjustment.



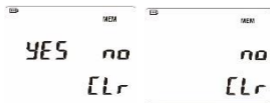
Press **←^{SETUP}MAX** to save the settings and proceed to Step 4.

Step4. Clear the record in the memory:

Press **◀HOLD** to clear, "YES" will flash.

Press **REL▶** to keep, "NO" will flash.

* Press **←^{SETUP}MAX** to save the settings, and complete all settings.



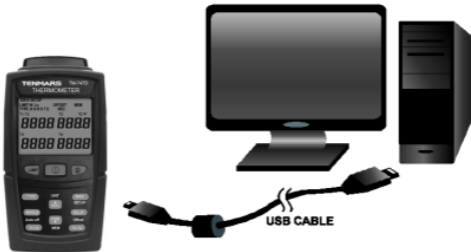
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6 Software Installation (TM-747D)

- Supported operating systems: XP/Windows7/Windows 8.1/Windows10
- Place the CD included with this meter into the CD/DVD-ROM drive of the PC to connect to and install the desktop program:

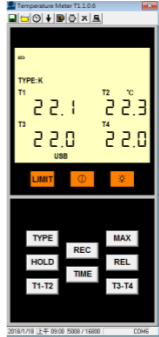


- As the desktop application installed completely, remove the disc from the CD/DVD ROM drive.
- Connect the USB cable included with this meter to the PC, as shown in the figure below.




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- Execute the PC desktop software program: Double-click the left mouse button on the desktop program (Thermometer Meter) to execute the desktop program.



With USB cable connected to the PC, **USB** appears on the screen (TM-747D).

7 General Specifications

- Display: 4-channel and 4-digit LCD
- Unit: °C / °F / K
- Data hold (HOLD)
- Auto ranging
- Back light
- Auto power (default 15 min) and disable auto power off
- Maximum/minimum/mean value/measurement elapsed time
- Alarm function
- Overload display: "OL"
- Input limit: Maximum input 24V DC or AC
- Datalogging capacity 16,800 records. (TM-747D)
- Save interval: 1 second~24 hours.
- Low battery detection 
- Battery: 1.5V×6 (LR03 SIZE AAA 1.5V).
- Battery life: Approximately 100 hours.
- Operation temperature and humidity: 0°C to 50°C (32°F to 122°F), < 80%RH
- Storage temperature and humidity: 0°C to 50°C, relative humidity under 80%.
- Weight: Approximately 330 grams
- Dimensions: 168 (L) x 73 (W) x 35 (H) mm

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- The backlight will be continuously on if the meter is connected to the external power supply.
- **AC to DC Adaptor**

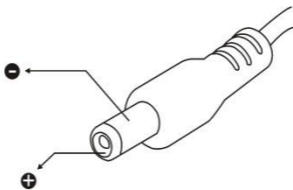
External AC 100~240V to DC 9V/0.5A adaptor. (Please pay attention to the polarity)

Voltage: DC9V(9.0 ~ 15.0 VDC MAX)

Current: $\geq 1000\text{mA}$ ◦

Plug: The pin in the center connects to the positive electrode and the outer case is negative electrode

Diameter: 5.5mm; internal diameter: 2.1mm.




8 Electrical Specifications:

Accuracy is specified for ambient temperatures between 18 to 28°C (64 to 82°F).

Range	TYPE-K : -200°C to +1372°C (-328°F to +2501°F) TYPE-J : -210°C to +1200°C (-346°F to +2192°F) TYPE-T : -250°C to +400°C (-418°F to +752°F) TYPE-E : -210°C to +1000°C (-346°F to +1832°F) TYPE-R / S : 0°C to +1767°C (+32°F to +3212°F) TYPE-N : -150°C to +1300°C (-238°F to +2372°F)	
Resolution	0.1	K / J / T / E / N ≤ 1000°C
	1	R / S K / J / T / E / N ≥ 1000°C
Accuracy	K/J/E/T/N Type:	
	±(0.05% rdg + 0.7°C / 1°F)	
	±(0.05% rdg + 0.7°C / 1°F)	
	Below-100 °C (-148 °F): K, J, T, E add 0.15% reading. N add 0.45% reading	
Accuracy	R/S Type:	
	±(0.05% rdg + 3°C / 5.4°F)	
Temperature coefficient	0.05%±0.07°C of reading/ °C (0.06°F/ °F) outside +18°C to 28°C (+64°F to +82°F) specified range	
Temperature scale	ITS-90	
The above specifications do not include accuracy of thermocouple.		

9 Maintenance or Repair

1. When the When “” symbol is displayed on the LCD, it means that there is insufficient power; please change the battery immediately in order to ensure its accuracy.
2. Do not place the meter in locations that have high temperature, humidity or that are exposed to direct sunlight.
3. Remember to turn off the power after usage; remove the battery if not used for a long period of time in order to prevent battery leakage and causing damages to internal components.
4. When the instrument failure, only by the authorized service provider or return the original repair.

10 Battery Replacement

1. Turn off the power.
2. Open the frame and battery cover at the back of the meter, remove the batteries.
3. Please insert a new AAA battery according to the polarities.
4. Put the battery cover and frame back in place.

11 End of Life Disposal



Note: This symbol indicates that the meter and its accessories must be separated and processed properly.

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Professional Electrical and Environment Test & Measurement Instruments:

LED light meter, Temperature & Humidity meter, Infrared Thermometer, Sound level meter, Light meter, EMF meter, UV Light meter, RF meter, Hot wire Anemometer, Co meter, Anemometer, Lan cable tester, Co2 meter, Solar power meter, Radiation meter, Clamp meter, Multimeter, Phase Rotation test, Digital Insulation tester

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