

Advanced Datalogging Thermometer

800008

Instruction Manual

Advanced Datalogging Thermometer - 800008

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INTRODUCTION

Your digital thermometer accurately measures temperature in Centigrade or Fahrenheit from -200°C to 1370°C (-328°F to 2498°F). It conforms to the National Bureau of Standards and IEC584 temperature and voltage tables for K-type thermocouple probes.

Features include a data hold function, maximum and minimum value recording, memory and clock functions, and a low battery indicator. An RS232 interface allows the unit to communicate with a computer.

Applications include HVAC, lab work, environmental work, process control, and the food industry.

PANEL DESCRIPTION

- 1. K Type temperature sensor input connector
- 2. LCD Display
- 3. Power Button
- 4. Relative Readout Button
- 5. Record Button
- 6. Tripod Connector (on back)
- 7. Battery Cover (on back)
- 8. Min/Max Button
- 9. Hold Button
- 10. °C/°F Button
- 11. Offset Calibration Screw
- 12. Digital Output Connector
- 13. AC Power Adaptor Connector



MEASUREMENT PROCEDURE

Setting the Clock

1. Press the green on/off button and **MAX/MIN** button simultaneously, release.
2. The meter will show **SEL**.
3. Press the **CLOCK** button to select the year, month, day, hour and minute (in that order).
4. To set the year, month, day, hour and minute, press the ▲ button to increase the number and the ▼ button to decrease the number.
5. Press the **CLOCK** button again to exit clock setup.
6. To cancel the setup process at any time, press the power button to turn the meter off.

Taking Measurements

1. Press the **POWER** button to turn the unit on. The amount of available memory space will be displayed.
2. Plug the thermocouple plug into the meter.
3. The meter will default to the temperature scale last used. Press the °C/°F button to change the temperature scale, if necessary.
4. Begin taking temperature readings.
5. Press the **HOLD** button to freeze the temperature reading. H will be displayed.

Note...

When the data hold function is active, the **REL**, **MAX/MIN**, and °C/°F buttons will be disabled. If you press these buttons, two beeps will sound.

6. To resume measurement, press the HOLD button again.
7. To cancel setup process at any time without saving the changes, press the power button to turn the meter off.

Recording Data

Each time you use the **REC** button to record data, a data set will be stored in the memory. Up to 16241 records can be stored.

1. Press the **REC** button to begin recording data.
2. To stop recording data, press the **REC** button again.

Clearing Data from Memory

1. With the meter turned off, press and hold both the **POWER** button and the **REC** button for at least 2 seconds.
2. Release the power button, then release the **REC** button. **CLR** will be displayed.

Relative Operation

When the meter is in relative operation mode the **°C/°F** button will be disabled. Two beeps will sound when the **REL** button is pressed.

1. Press the **REL** button. The meter will now store the current reading. The difference between the stored data and the new reading will be displayed.
2. When you have finished, press the **REL** button again to exit relative operation mode.
3. To resume measurement, press the **HOLD** button again.

Setting the Recording Interval for Datalogging

1. With the meter turned off, press and hold the **MAX/MIN** button.
2. Press the **POWER** button to turn the meter on. Release the buttons.
3. Press the **HOLD** button to select minutes and seconds.
4. To set minutes and seconds, press the **▲** button to increase the number and the **▼** button to decrease the number.

CALIBRATION

Ice Point Calibration

Rinse container, gloves and tools with pure distilled water. Using shaved ice made from pure distilled water, fill container and add distilled water. The ice bath is ready when there is no ice floating and no excess water on the surface. Stir the ice bath to cool the water. Immerse the probe for 2 minutes. Without removing the probe from the ice bath, use the calibration screw to adjust the thermometer to 0°C/32°F.

AUTOMATIC SHUTOFF

If the meter is not used for 30 minutes, it will shut off automatically. To disable automatic shutoff:

1. With the meter turned off, press and hold down the HOLD button.
2. Press the **POWER** button to turn the meter on. Release the buttons. Two beeps will sound to indicate that automatic shutoff is disabled.
3. The automatic shutoff feature will reactivate the next time the unit is turned on.

BATTERY REPLACEMENT

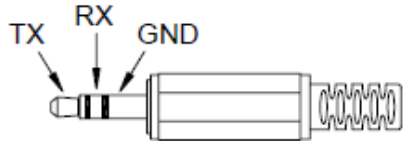
The low battery indicator appears when the battery needs replacement. Insert a fresh 9V battery.

PC CONNECTION

The Digital Output is a 9600bps N 81 serial interface.

The RX is a 5V normal high input port.

The TX is 5V normal high output port.



The command of Digital Output is listed below:

RS232 Command	Function	Remarks
K(ASC 4BH)	Ask for model No.	Return 4 bytes
A(ASC 41H)	Inquire all encoded data	Return electrode 10 byte
H(ASC 48H)	Hold button	
M(ASC 4DH)	Max/Min button	
N(ASC 3EH)	Exit Max/Min mode	
R(ASC 52H)	REL button	
C(ASC 43H)	°C/°F button	
U(ASC 55H)	Dump all memory of therm.	Return 32768 bytes
P(ASC 50H)	Load recorded data	

Command K:	Return 4 bytes. For example, when sending command “K” to meter, it will return “3”, “0”, “5”, ASCII(13).
Command U:	Return 32768 bytes.
Command P:	Instead of returning all 32768 bytes, it only returns recorded data.
Command H:	Equivalent to one pushing on the HOLD button and no message is returned.
Command M:	Equivalent to one pushing on the MAX/MIN button and no message is returned.
Command N:	Equivalent to one pushing and hold the MAX/MIN button for two seconds to exit MAX/MIN mode.
Command R:	Equivalent to one pushing on the REL button and no message is returned.
Command C:	Equivalent to one pushing on the °C/°F button and no message is returned.

Command A:

1st BYTE:

The first byte is the start byte, its value is 2.

2nd BYTE:

bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0
°C/°F	Low Bat	Hold	REL	Min/Max		REC	

bit 0: 1→recording mode, 0→not recording

bit 2 bit 1

- 0 0 →normal mode
- 0 1 →MAXIMUM mode
- 1 0 →MINIMUM mode
- 1 1 →calculate MAX/MIN in background mode.

bit3: no use.

bit4: 1→REL

bit5: 1→ HOLD, 0→not HOLD

bit6: 1→LOW BATTERY , 0→BATTERY NORMAL

bit7: 1→°C 0→°F

3rd BYTE:

bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0
Auto Power Off	Memory Full				Resolution	Sign	OL

bit0: 1→main window value is OL, 0→not OL

bit1: 1→main window value is minus, 0→main window value is plus.

bit2: 1→4th byte and 5th byte represent ##### , 0→4th byte and 5th byte represent ###.#

bit6: 1→Memory is full. 0→Memory is not full.

bit7: 1→Auto power off enabled. 0→Auto power off disabled.

4th BYTE:	first two BCD code of main window value.
5th BYTE:	last two BCD code of main window value
6th BYTE:	BCD code of month.
7th BYTE:	BCD code of day.
8th BYTE:	BCD code of hours.
9th BYTE:	BCD code of minute.
10th BYTE:	End byte, its value is 3, 1st and 10th are used to check frame error.

Setup ThermoLog (Thermo DataLogger)— RS232 interface software:

The ThermoLog package contains:

- Two 3.5" diskettes
- Custom designed RS232 cable for THERMOLOG.

System Required:

- Windows 95 or Windows 98 or Windows NT 4.0 above.

Minimum Hardware Required:

- 486-100 MHz PC compatible, 16 MB RAM; At least 5 MB hard disk space available to install THERMOLOG program. Recommended display resolution is 800X600.

Software Download:

With technology upgrading, some computers no longer have a disc drive for you to install the software that comes with your meter. You can download the software that came with your meter directly. Go to the www.sperdirect.com/software.htm and find your meter or search for you meter (**800008**) and download from product page.

Note...

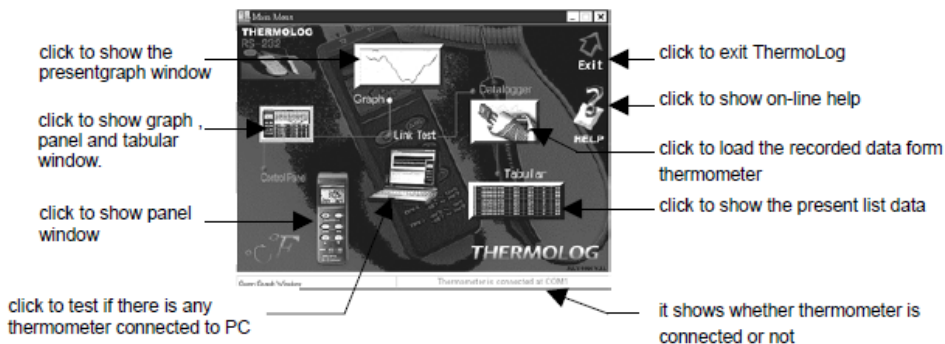
Some software may not be directly available to download due to it must be purchased. If you find that the software you need is not available, please contact our Customer Support at 480.948.4448 or email info@sperscientific.com for further assistance.

Install ThermoLog:

1. We recommend closing all other application before installing ThermoLog.
2. Insert setup CD.
3. Choose the Start button on the Taskbar and selct Run.
4. Type A:\SETUP and choose OK, then it will copy ThermoLog.exe and help file to your hard disk.

For other operating instructions, please refer to the online help whil executing ThermoLog.

Main Menu:



Link Test:

Open Link Test window to search for thermometer connected to PC. When you start the THERMOLINK, this window will display first and search for thermometer. The result will be shown in the text box.

Control Panel:

By opening the Control Panel Window, the user can control thermometer via the button in this window.

Datalogger:

By opening the DataLogger Window, the user can load the recorded data from the thermometer.

Tabular:

By opening the Tabular window, the present data from the thermometer will be listed in a scrolling table. These data can be stored as a file or the table can be copy to other software such as EXCEL for further analysis.

Graph:

Open Real-Time Graph window to show the present data in graph.

Exit:

Terminates THERMOLOG program.

Tray Icon:

When THERMOLOG is running, there will be an icon displayed on the Windows Taskbar area, you can click this icon then it will show a pop-up menu.

SPECIFICATIONS

Range	Resolution	Accuracy
-200°C to 200°C	0.1°C	±(0.2% reading + 1°C)
200°C to 400°C	1°C	±(0.5% reading + 1°C)
400°C to -1370°C	1°C	±(0.2% reading + 1°C)
-328°F to -200°F	1°F	±(0.5% reading + 2°F)
-200°F to 200°F	0.1°F	±(0.2% reading + 2°F)
200°F to 2498°F	1°F	±(0.3% reading + 2°F)
<p>Temperature Coefficient: For ambient temperatures from 0°C to 18°C and 28°C to 50°C, for each °C ambient below 18°C or above 28°C add the following tolerance into the accuracy spec: 0.01% of reading + 0.03°C (0.01% of reading + 0.06°F)</p>		
Probe Temp Range	-50 to 300°C (-58 to 572°)	

Numerical Display:	4 digital Liquid Crystal Display
Input Projection at Thermocouple Input:	60V DC or 24 Vrms AC
Operating Environment:	0°C to 50°C (32°F to 122°F); 0 to 80% RH
Storage Environment:	10°C to 60°C (14°F to 140°F); 0 to 80% RH
Storage Altitude	≤ 2000 meters
Power Requirement:	9 Volt Battery, NEDA 1604 or JIS 006P or IEC6F22
Battery Life:	Approx. 100 hrs. with alkaline battery
AC Adapter:	9V DC ±15% 100 mA
Dimensions	7¼" × 2½" × 1¼" (184 × 64 × 32 mm)
Weight	7.4 oz (210 g)

WARRANTY

Sper Scientific warrants this product against defects in materials and workmanship for a period of **five (5) years** from the date of purchase, and agrees to repair or replace any defective unit without charge. If your model has since been discontinued, an equivalent Sper Scientific product will be substituted if available. This warranty does not cover probes, batteries, battery leakage, or damage resulting from accident, tampering, misuse, or abuse of the product. Opening the meter to expose its electronics will break the waterproof seal and void the warranty.

To obtain warranty service, ship the unit postage prepaid to:

SPER SCIENTIFIC LTD.
8281 East Evans Road, Suite #103
Scottsdale, AZ 85260

The defective unit must be accompanied by a description of the problem and your return address. Register your product online at www.sperwarranty.com within 10 days of purchase.