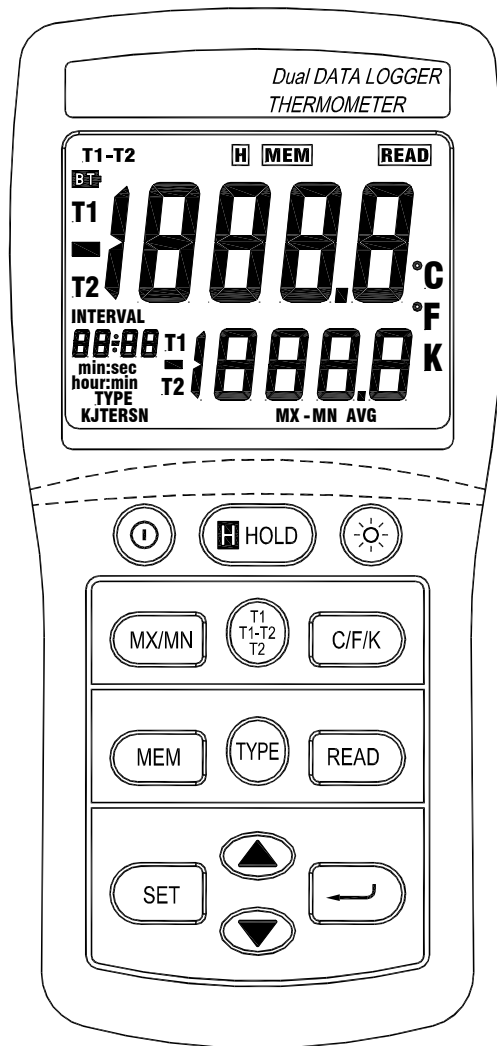# Instruction Manual

RS-1316

Dual Data Logger Thermometer

EN FR IT DE ES

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1. INTRODUCTION

This instrument is a digital thermometer for use with any J, K, T, E, N, R or S type thermocouple as a temperature sensor.

Temperature indication follows the international temperature scale of 1990. (ITS-90)

❑ Read the following information carefully before attempting to operate or service the meter. When servicing, use only specified replacement parts.

Environment conditions

① Altitude up to 2000 meters
② Relative humidity: 80% max.
③ Operating ambient temperature: 0 to 50°C (32 to 122°F)

U.S. Pat. No. 446,135

Safety symbols

$C\epsilon$ Complies with EMC Directive 89/336/EEC

2. SPECIFICATIONS

2-1 Electrical specifications

Measurement range:

J - type: -150.0 to +1090.0°C (-200.0 to +1994.0°F)

K - type: -150.0 to +1370.0°C (-200.0 to +1999.9°F)

T - type: -150.0 to +400.0°C (-200.0 to +752.0°F)

E - type: -150.0 to +870.0°C (-200.0 to +1598.0°F)

N - type: -150.0 to +1300.0°C (-200.0 to +1999.9°F)

R - type: 2.0 to +1767.0°C (+35 to +1999.9°F)

S - type: 2.0 to +1767.0°C (+35 to +1999.9°F)

Display effective resolution:

J, K, T, E and N type: 0.1°C /°F /K

R and S type: 1.0°C / °F /K (0.1°C / °F /K only for reference)

Measurement accuracy:

J, K, T, E and N type: $\pm$[0.05% of reading +0.5°C (0.9°F)]
[Below -100°C (-148°F): add 0.15% of reading for J, K, E and N; and 0.45% of reading for T]

R and S type: $\pm$[0.05% of reading +2°C (4°F)]

NOTE

This basic accuracy specification does not include the error of the temperature probe. Please refer to the temperature probe accuracy specification for additional details.

Temperature coefficient:

0.01% of reading +0.03°C per °C (0.06°F per °F)

Outside the specified +18°C to 28°C (+64°F to 82°F) range; [Below -100°C (-148°F): add 0.04% of reading for J, K, E and N type and 0.08% of reading for T type]

Maximum differential common-mode voltage: 1V (Maximum voltage difference between T1 and T2).

Input protection: 20V maximum input voltage on any combination of input connectors.

Manual data-memory capacity: 98 sets.

Continuity data-logging capacity: 4100 sets.

2-2 General specifications

Power supply: Qty. 6 AAA batteries.

Battery life: approx. 80 hours.

Auto power-off: 30 minutes. (If no key is pressed).

Low battery indication: The (**BT**) symbol is displayed when the battery voltage drops below the operating voltage.

Measurement rate: Once per 1.5 seconds.

Weight: 235 gms (8.29 oz)

Dimension: 150x72x35 mm
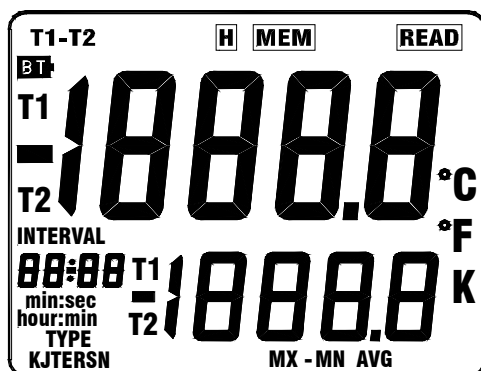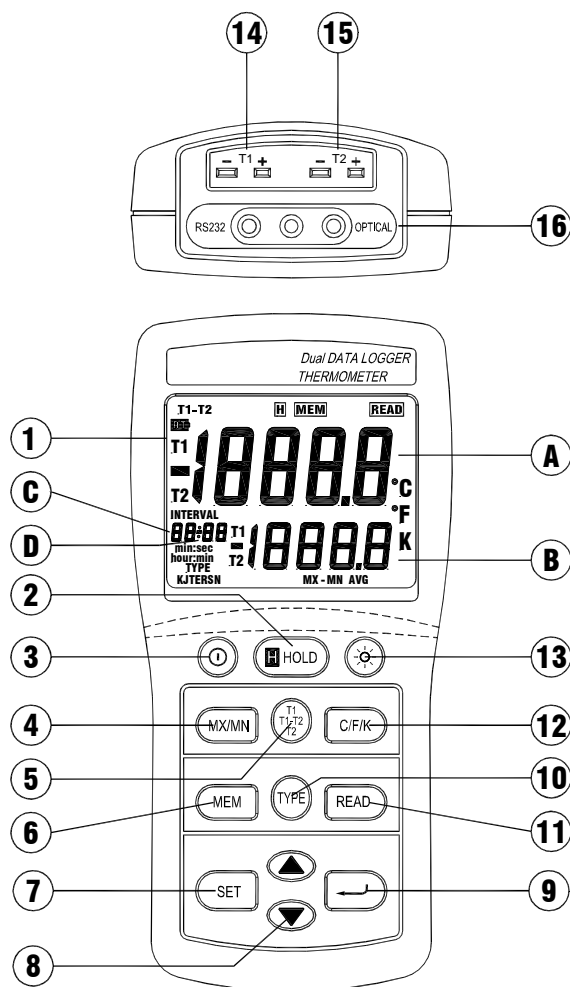
Operating temperature: 0 to 50°C (32 to 122°F)

Operating Humidity: Below 80% RH

Storage temperature: -10 to 60°C, 14 to 140°F

Storage humidity: Below 70% RH

Supplied accessories: Qty. 6 AAA Batteries, instruction manual, CD software, and Optical RS-232 to USB cable.

3. FRONT PANEL DESCRIPTION

(1). LCD display:

A. Main display: T1, T2 or T1-T2 reading.

B. Secondary display: T1 or T2 reading and MAX, MIN, AVG reading.

C. Time display: Time display (100-hour clock) shows elapsed time when MAX, MIN or AVG is on.

D. Auto power-off mark (:).

(2). H HOLD key: Press H HOLD key to freeze or unfreeze the display reading.

(3). ⏻ Power key: Press ⏻ key to turn the meter on or off.

(4). MX/MN key:

① Press "MX/MN" key to step through the maximum, minimum and average readings.

② Press "MX/MN" key for 2 seconds to exit MX/MN mode.

(5). T1/T2/T1-T2 key: Press T1/T2/T1-T2 key to toggle between T1, T2 or T1-T2 in the main or secondary display.

(6). MEM key:

① Press the "MEM" key once to store a single set of logged data in memory.

② Press the "MEM" key for 2 seconds to enter continuous data-logging mode. Press again to exit this mode.

(7). SET key: Press the "SET" key for 2 seconds then release it to enter to interval time setting for continuous data-logging mode.

(8). ▲ ▼ Key:

① Press ▲ or ▼ key to increase or decrease the data-logging interval time setting.

② Press ▲ or ▼ key to increase or decrease the READ mode memory location.

(9). ↵ key:

① Press "↵" key to store interval time setting.

② Press "↵" key to toggle between the "hour:min" and "min:sec" elapsed time in the MX/MN mode.

(10). TYPE key: Press "TYPE" key to select the thermocouple type (K, J, E, T, R, S or N).

(11). READ key: Press "READ" key to show manual memory logged readings. Press again to exit this mode.

(12). C/F/K key: Press C/F/K key to select Celsius (°C), Fahrenheit (°F) or Kelvin (K) temperature scale.

(13). ❋ key: Press backlight key to turn the backlight on and off. The backlight turns off after 13 seconds automatically.

(14). T1 input: Thermocouple T1 input.

(15). T2 input: Thermocouple T2 input.

(16). RS232 to USB optical interface jack.

# 4. OPERATION INSTRUCTIONS

WARNING
- To avoid electrical shock or personal injury, do not apply more than 20Vrms, between the thermocouples (s), or between any thermocouple and earth ground.
- If voltage on the measurement surfaces result in potentials more than 1V between the two thermocouples, then measurement errors may occur.
  If the potential differences are anticipated between the thermocouples, use electrically insulated thermocouples.

4-1 Temperature measurement

① Press " ⏻ " key to turn on the thermometer.

② Plug the thermocouple (s) into the thermocouple input(s) as required. If no thermocouple is plugged into the selected input or the thermocouple is "open circuit", the appropriate display will show "- - - -.-".

③ Press the "C/F/K" key to select the desired temperature scale.

④ Press "TYPE" key to select the thermocouple type required.

⑤ Press "T1/T2/T1-T2" key to determine which of the T1, T2, and T1-T2 reading appear in the main display or secondary display.

⑥ To measure the temperature, touch the probe sensor on the object whose temperature is to be measured.

⑦ Read the temperature on the display. The display shows "OL" (overload) when the temperature being measured is outside the valid measurement range of the meter.

4-2 MAX, MIN and AVG operation

① Press "MX/MN" key to enter to MX/MN mode and to step through the maximum (MAX), minimum (MIN) or the true average (AVG is a true 9.7 hours recording average) mode. The auto power-off function will be automatically disabled.

② Press "↵" key for 2 seconds to toggle the elapsed time display between "hour:min" and "min:sec" on the LCD display.

The elapsed time since entering reading mode, or the time at which the MAX, MIN or AVG value occurred will appear on the time display.

③ Press "T1/T2/T1-T2" key to toggle between present reading of the T1, T2 and T1-T2 on the main display. Press "MX/MN" key and the MAX, MIN and AVG reading of T1/T2/T1-T2 will appear on the secondary display.
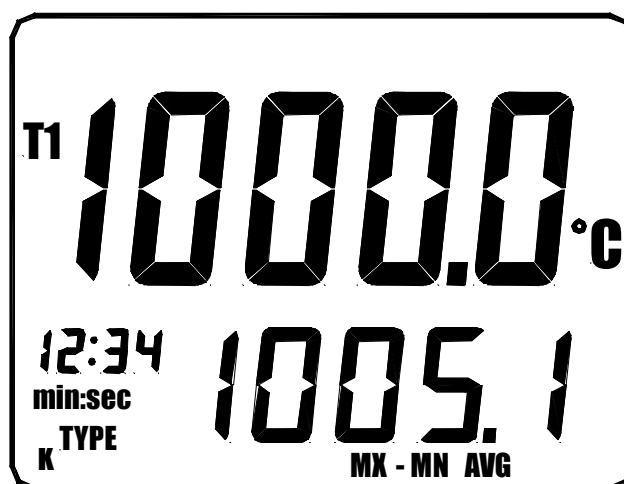
T1 present reading + T1 Maximum reading plus elapsed time + T1 Minimum reading plus elapsed time + T1 Averaging reading plus averaging time.
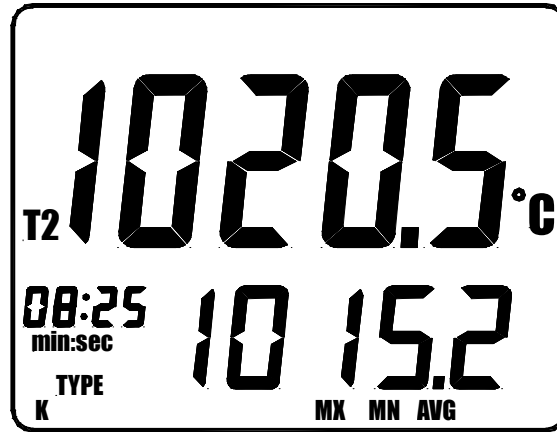
T2 present reading + T2 Maximum reading plus elapsed time + T2 Minimum reading plus elapsed time + T2 Averaging reading plus averaging time.
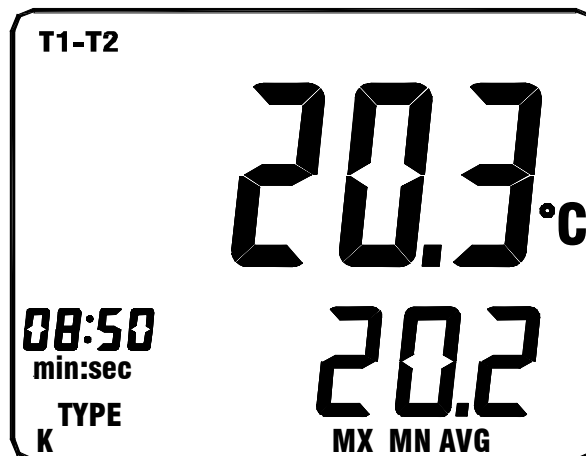

T1-T2 present reading + T1-T2 Maximum reading plus elapsed time + T1-T2 Minimum reading plus elapsed time + T1-T2 Averaging reading plus averaging time.

④ Press "MX/MN" key for 2 seconds to exit MX/MN mode.

In MX/MN mode, the "C/F/K" and "TYPE" keys are not active.

4-3 To erase the memory of the Datalogger

① Press " ⃝ " key to turn off the meter.

② Press and hold down the "MEM" key then press " ⃝ " key turn on the meter. The LCD display will show "CLr" and all data stored in memory will be cleared.
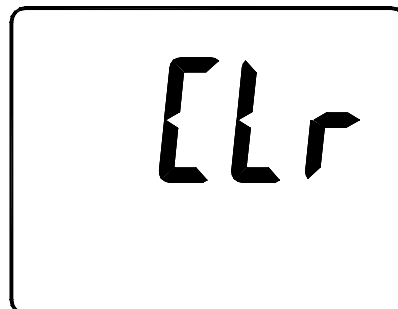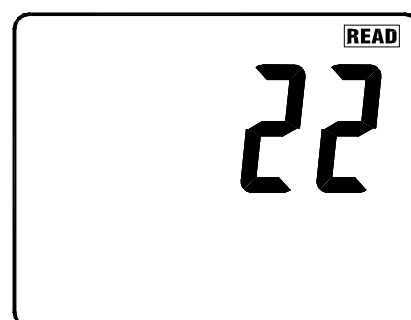
4-4 To Trigger "One by One Datalogging"

① Press the "MEM" key once and one set of readings will be stored in memory. The LCD display shows " MEM " and a memory location number (01 to 98).
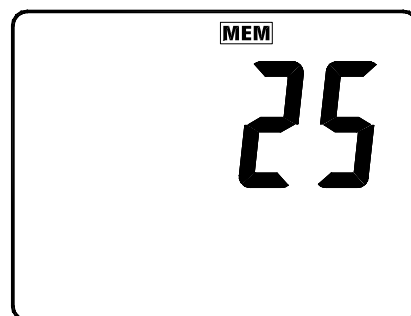
② Press "READ" key to enter the manual memory data mode. The LCD display will show " READ " and a memory location number.

③ Press "▲" or "▼" key to scroll through the logged readings.

④ Press " READ" key again to exit READ mode.

READ

125.8 °C
T2
T1 **123.2**
K TYPE
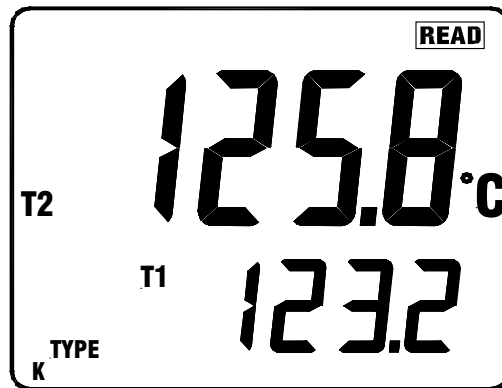
4-5 To Trigger continuous data-logging"

① To enter to logging interval time setting mode, press the "SET" key for 2 seconds then release it. The LCD display will show "INTERVAL", " MEM " and interval time.

② Press "▲" or "▼" key, until the display shows the required logging interval (3 to 255 seconds) and then press "↵ " key to select.

③ Press the "MEM" key for 2 seconds to start logging. The LCD display will show " MEM " and auto power-off function will be disabled. The " MEM " mark will flicker each time a set of data is stored into memory.

MEM

T1 **100.3** °C
100.1
K TYPE T2
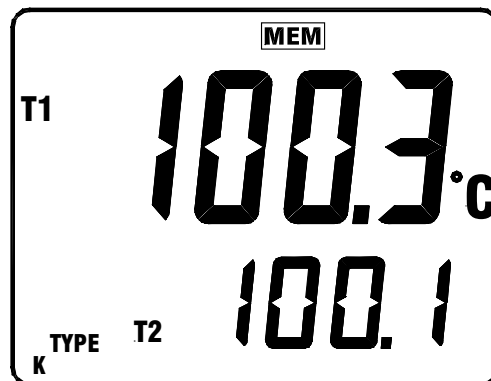
When the memory is full (4100 data sets), the "FULL" symbol will appear on the display and the meter will stop datalogging.

④ In the continuous data-logging mode, the MAX, MIN and AVG function can be used.

⑤ Press the "MEM" again to stop logging. The continuously logged data can only be read after it is downloaded to a PC. It cannot be read using the "READ" function to show the data the on display.

4-6 How to disable auto power-off function

The meter will automatically turn off if no key press occurs for 30 minutes.

① Press " ⏻ " key to turn off the meter.

② Press and hold down the "↲" key then press " ⏻ " key to turn on the meter and the auto power-off function will be disabled.

The time display auto power-off mark " **:** " will not be visible.

Auto power off mode is enabled each time you turn on the meter. It is automatically disabled in " MX/MN " and continuous data logging modes.

5. MAINTENANCE

5-1 Cleaning:

Periodically cleans the case with a damp cloth and mild detergent.

Do not use abrasives or solvents. Clean and dry as required.

5-2 Battery Replacement:

When the LCD display shows " **BT** ", the battery has insufficient power to support an accurate test. Replace the batteries with Qty. 6 AAA cells.

6. RECALIBRATION PROCEDURE

The thermometer should be calibrated once a year to ensure its continued accuracy. Contact RS Components for further details of calibration service. The address is given at the end of these instructions.