Hot Wire Anemometer SD Card Datalogger

850024

Instruction Manual

SPER
SCIENTIFIC

Environmental Measurement Instruments

Hot Wire Anemometer SD Card Datalogger 850024

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INTRODUCTION

The Sper Scientific Hot Wire Anemometer SD Card Datalogger (Model 850024) is an extremely accurate meter with fast response times that reads air temperature and velocity, and functions as a Type K/J thermocouple thermometer.

This meter features a real time SD memory card datalogger. Standard, portable SD memory cards provide unlimited data storage and upload pre-formatted data directly to Excel, eliminating the need for cables or software. Each data set includes temperature, time and date.

FEATURES

- Reads air velocity and temperature and functions as a Type K/J thermometer
- Telescopic Hot Wire Probe provides high accuracy in high and low velocities
- SD memory card datalogger
- Manual datalogger option
- Fast response time for air temperature
- Highly accurate microcomputer circuit
- Direct upload of data to Excel
- Telescopic probe for measuring flexibility
- Internal clock and calendar
- Touch-tone
- Tripod mounting screw
- Built-in tabletop stand
- Maximum and minimum
- Hold function
- Auto-power-off
- Low battery indicator
- Backlight

MATERIALS SUPPLIED

• Meter

• Telescopic Hot Wire Probe

• SD Card

• 6 AA Batteries

• Instruction Manual

• Hard Carrying Case

POWER SUPPLY

This meter can be powered by six AA (1.5 V, UM3) batteries or an optional 9 Volt DC adapter. See page 22 for battery replacement instructions.

Plug the adaptor into the power port labeled "DC 9V," located on the side of the meter.

Note…
When using the adapter to run the meter, the meter will remain permanently on and the **POWER** button will be disabled.

KEYPAD

LCD
Display

FUNCTION/
HOLD/NEXT

REC/ENTER/
UNIT

POWER
(ESC,
Backlight)

SET (▼,
TIME
CHECK)

LOGGER (▲,
SAMPLING
TIME
CHECK)
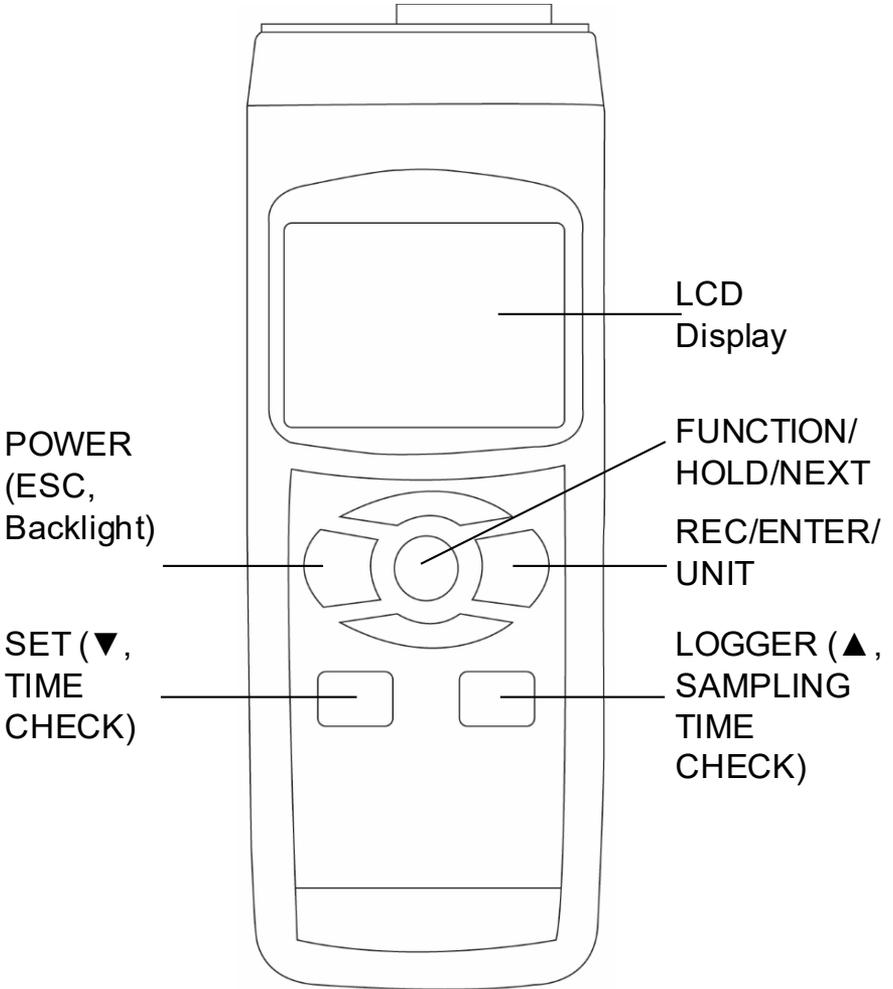
METER COMPONENTS

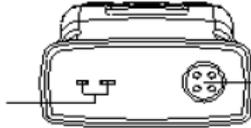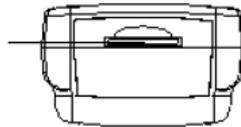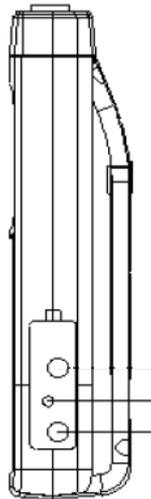**Top of Meter**

Type K/J
Thermometer
Socket

Anemometer Probe
Input Socket

Bottom of Meter

SD Card
Socket

Side of Meter
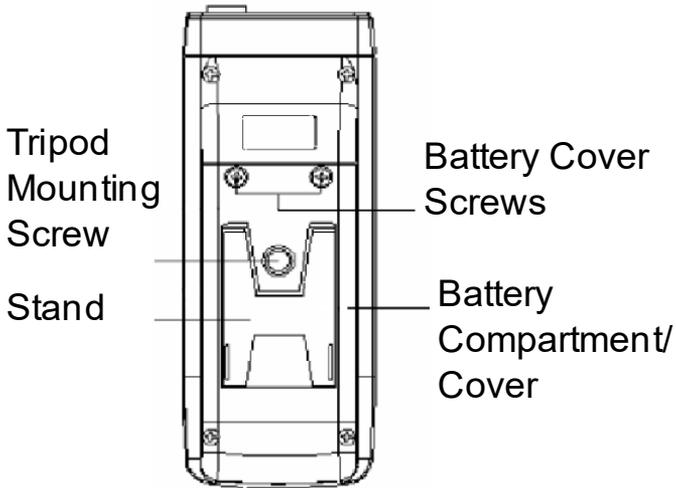
RESET

DC 9V Adapter
Input Socket

METER COMPONENTS

Back of Meter

Tripod Mounting Screw

Battery Cover Screws

Stand

Battery Compartment/ Cover

Probe

Sensing Head

Telescope Probe

Probe Plug
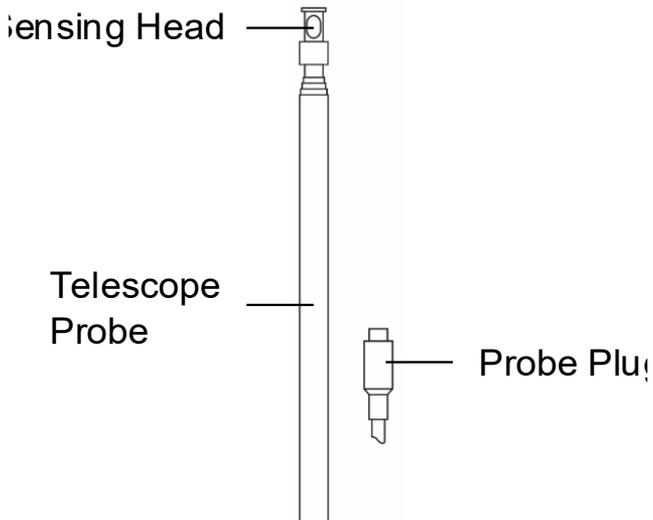
SETUP MODE

The advanced Setup Mode allows you to customize the following meter preferences and defaults:

• Real Time Clock

• Decimal Type

• Auto Power Off

• Touch-Tone

• Thermometer Type K/J

• Temperature Units

• Sampling Time

• SD Memory Card Format

Note…
The setup functions can be performed under any parameter but not while utilizing the datalogger function. Once selections are saved, the meter will default to the selected preferences when the meter is turned **off** and **on** again. Once a selection is saved, the meter automatically advances to the next setup function (i.e., after setting the real time clock, the meter will automatically enter the decimal type setup function).

1. Press **POWER** to turn the meter **on**.
2. Press **SET** for 2 seconds or longer to enter Setup Mode.
3. Press **ENTER** to cycle through the setup functions. Then press **ENTER** again.

Note…
Press **ESC** to exit Setup Mode. The meter will return to Normal Mode. **Real Time Clock**

SETUP MODE

Real Time Clock

1. Enter the clock function from Setup Mode (see page 10). "dAtE" appears on the LCD.

2. Press **ENTER**. The year will appear on the LCD.

3. Press ▲ or ▼ to adjust the value. Press **ENTER** to save the value.

4. Repeat Step 3 to adjust the month, date, hour, minute and second.

Note…
This procedure adjusts the meter's internal clock. The internal clock will function when the meter is turned **off** but only when the batteries have adequate power (not with low battery power.)

Decimal Type

Although the decimal is commonly expressed as the "." symbol (such as 20.6 or 1000.53), some (European) countries use a "," symbol to represent the decimal (such as 20,6 or 1000,53). The meter defaults to the period symbol. To adjust:

1. Enter the decimal type function from Setup Mode (see page 10). "dEC" appears on the LCD.

2. Press ▲ or ▼ to select Basic (.) or Euro (,). Press **ENTER** to save the selection.

SETUP MODE

Auto Power Off

The meter automatically turns **off** after 10 minutes of inactivity, however this function can be disabled.

1. Enter the auto power off function from Setup Mode (see page 10). "PoFF" appears on the LCD.

2. Press ▲ or ▼ to select yes (auto power off enabled) or no (auto power off disabled). Press **ENTER** to save the selection.

Touch-Tone

1. Enter the touch-tone function from Setup Mode (see page 10). "bEEP" appears on the LCD.

2. Press ▲ or ▼ to select yes (touch-tone enabled) or no (touch-tone disabled). Press **ENTER** to save the selection.

Thermometer Type K/J

1. Enter the thermometer type function from Setup Mode (see page 10). "tYPE" appears on the LCD.

2. Press ▲ or ▼ to select K or J. Press **ENTER** to save the selection.

Temperature Units

1. Enter the temperature units function from Setup Mode (see page 10). "t-CF" appears on the LCD.

2. Press ▲ or ▼ to select C (degrees Celcius) or F (degrees Fahrenheit). Press **ENTER** to save the selection.

SETUP MODE

Sampling Time

The sampling time is the time allotted between successive measurements. To adjust the sampling time (in seconds):

1. Enter the sampling time function from Setup Mode (see page 10). "SP-t" appears on the LCD.

2. Press ▲ or ▼ to adjust the value (0, 1, 2, 5, 10, 30, 60, 120, 300, 600, 800, 1800, 3600 seconds). Press **ENTER** to save the value.

SD Memory Card Format

Enabling this function will format the SD memory card to work specifically with your meter. Formatting the SD card will erase any previous memory on the card. New SD cards should be formatted to work with your meter.

1. Enter the SD memory card format function from Setup Mode (see page 10). "Sd F" appears on the LCD.

2. Press ▲ or ▼ to select yes (format the SD memory card) or no (do not format the SD memory card). Press **ENTER** to confirm your selection. If selecting yes, "YES Enter" will appear on the LCD, press **ENTER** again and the meter will format the SD card.

MEASUREMENT PROCEDURES

Turning the Unit On/Off

1. Press **POWER** to turn the meter on.

2. Press and hold **POWER** for 2 seconds to turn the meter **off**.

Selecting the Function

1. Press and hold **FUNC** to cycle through the options listed below. Release **FUNC** when you reach the desired function.

• Air velocity/temperature: "An" appears on the LCD.

• Type K/J thermometer: "tP" appears on the LCD.

Note…
The meter will default to the last function setting used when it is turned **off** and **on** again.

Selecting the Air Velocity Unit

1. To select the air velocity unit, press and hold **UNIT**. The meter will cycle through m/S, Km/h, mph, Knot, FPM in sequence.

2. Release **UNIT** when the desired unit appears on the LCD.

Note…
To change the temperature unit, see page 12.

MEASUREMENT PROCEDURES

Air Velocity and Air Temperature

When the probe is not used, the sensor cover should be in the up position.

Probe Handle

Direction mark

Air velocity sensor

Sensor cover slides down when using the probe.

1. Press **POWER** to turn the meter **on**.

2. Plug the anemometer probe plug into the anemometer probe input socket.

3. Press and hold **FUNC** to cycle through the options until "An" appears on the LCD. Release the **FUNC** button.

4. Hold the probe handle and point the directional mark on the probe head toward the air flow. The air velocity value appears on the upper display and the air temperature value appears on the lower display.

Note….
Do not use fingers or any tools to touch the air velocity sensor, as it could damage the unit and void the warranty.

Point the white dot indicator on the probe head toward the air flow.

MEASUREMENT PROCEDURES

Type K/J Thermometer

1. Press **POWER** to turn the meter on.

2. Press and hold **FUNC** to cycle through the options until "tP" appears on the LCD. Release the **FUNC** button.

3. The anemometer probe must be disconnected from the meter to obtain accurate Type K/J readings.

4. Plug a thermocouple temperature probe (type K or J) into the type K/J thermometer socket. The LCD will display the measurement value from the temperature probe.

5. "K" or "J" appear on the LCD to indicate the type of thermometer.

Note…
When using the meter for the first time, the meter will default to K type thermocouple. See page 12 for instructions on selecting the thermocouple type.

Hold Function

1. When measuring any parameter, press **HOLD** to freeze the reading on the display. "HOLD" will appear on the LCD.

2. Press **HOLD** again to release the hold function. "HOLD" will disappear from the LCD.

MEASUREMENT PROCEDURES

Maximum and Minimum

To record maximum and minimum readings:

1. When measuring any parameter, press **REC** to begin recording the maximum and minimum values. "REC" appears on the LCD.

2. Press **REC**. The maximum value and "REC MAX" will appear on the LCD.

3. Press **REC**. The minimum value and "REC MIN" will appear on the LCD.

4. To delete the maximum or minimum value, press **HOLD**. "REC" appears on the LCD and the meter will begin recording the maximum and minimum values again.

5. To exit the min/max function, press and hold **REC** for 2 seconds or longer. The meter will return to Normal Mode.

Note…
The meter cannot be turned **off** from the memory record function. Exit the function, then press and hold **POWER** to turn the meter **off**.

MEASUREMENT PROCEDURES

Backlight

The backlight turns on automatically when the meter is turned **on**.

Press ☼ to turn the backlight **off**.

Press ☼ to turn the backlight **on**.

View Real Time Clock

To view the time function during normal measurement (not during datalogging):

Press **TIME CHECK**. The time information (Year, Month/ Date, Hour/Minute) will appear on the lower display of the LCD.

View Sampling Time

To view the sampling time function during normal measurement (not during datalogging):

Press **SAMPLING CHECK**. The sampling time (in seconds) will appear on the lower display of the LCD.

DATALOGGER

Preparing the Datalogger

1. Insert the SD card into the SD card socket on the bottom of the meter, ensuring that the front of the SD card faces the back of the meter.

2. Format the SD card as needed (see page 13).

3. Set the real time clock if using the meter for the first time (see page 11).

4. Set the decimal type if using the meter for the first time (see page 11).

Auto Datalogging

1. Set the sampling time to ≥ 1 second (see page 13).

2. Press **REC**. "REC" will appear on the LCD.

3. Press **LOGGER**. "REC" will flash on the LCD and the alarm will sound while the measurement data and time information are saved to memory.

4. To pause datalogging, press **LOGGER**. The meter will temporarily stop recording and "REC" will stop flashing on the LCD. Press **LOGGER** again to resume datalogging. "REC" will flash on the LCD.

5. To finish datalogging, press **LOGGER** to pause datalogging, then press **REC** for 2 seconds or longer. "REC" will disappear from the LCD to indicate that datalogging has ended.

DATALOGGER

Note…
To enable/disable the touch-tone feature see page 12.

Manual Datalogging

1. Set the sampling time to 0 seconds (see page 13).

2. Press **REC**. "REC" will appear on the LCD.

3. Press **LOGGER** each time you wish to record a reading. "REC" will flash on the LCD and the alarm will sound while the measurement data and time information are saved to memory. The position (location) number will appear on the bottom of the LCD and will also be recorded on the SD card.

Note…
To enable/disable the touch-tone feature see page 12. To change the position number, press ▼. The position number will flash on the LCD. Press ▲ or ▼ to set the position number (from 1 to 99). To indicate the position location, P x (x = 1 to 99) will appear on the lower display. After selecting the position number, press ENTER to confirm.

4. To finish datalogging, press **REC** for longer than 2 seconds. "REC" will disappear from the LCD to indicate that datalogging has ended.

DATALOGGER

SD Card Data Structure

1. The first time a SD card is used in this meter, a folder AMA01 will be generated.

2. If the datalogger is being used for the first time, a new file AMA01001.XLS will be generated under the route AMA01\. After exiting the datalogger and executing the function again, the data is saved to the AMA01001.XLS file until the data reach 30,000 data columns. A new file will then be generated (i.e., AMA01002.XLS).

3. The folder AMA01\ will hold 99 files. A new route (i.e., AMA02\) will be generated when exceeding 99 files.

4. The file's route structure:

AMA01\
      AMA01001.XLS
      AMA01002.XLS
      …………………
      AMA01099.XLS
AMA02\
      AMA02001.XLS
      AMA02002.XLS
      …………………
      AMA02099.XLS
AMAXX\
      …………………
      …………………

Note…
XX: Maximum value is 10.

BATTERY REPLACEMENT

This meter uses six AA (1.5 V, UM3) batteries. When the low battery indicator appears on the LCD, battery replacement is needed. After the icon appears on the LCD, in-spec measurement can still be made for several hours before becoming inaccurate.

1. Press **POWER** to turn the meter **off**.

2. Unscrew the battery cover and remove from the meter.

3. Remove the old batteries and replace with six new AA batteries, ensuring correct polarity.

4. Replace the battery cover. Tighten the screws on the battery cover to secure to the meter.

TROUBLESHOOTING

System Reset

If the meter is not functioning properly (i.e., the system is frozen and the keypad is non-operational), reset the meter:

1. Press **POWER** to turn the meter **on**.

2. Use a small tool (such as a disassembled paperclip or a pin) to press the **RESET** button (located on the right side of the meter under the protective black cover). Wait a few seconds for the meter to restart.

OPTIONAL ACCESSORIES

800044	Replacement PT 100 Probe
800060	Small Type K Immersion Thermometer Probe
800080	Small Type J Immersion Thermometer Probe
800061	Large Type K Immersion Thermometer Probe
800081	Large Type J Immersion Thermometer Probe
800062	High Temp Type K Immersion Thermometer Probe
800064	Small Type K Penetration Thermometer Probe
800065	Insertion Type K Penetration Thermometer Probe
800066	Large Type K Penetration Thermometer Probe
800086	Large Type J Penetration Thermometer Probe
800073	Type K Surface Thermometer Probe
800070	Type K Surface Thermometer Probe
800072	Type K Magnetic Surface Thermometer Probe
800076	Type K Ambient Thermometer Probe
800077	Type K Beaded Wire Probe
800097	Type J Beaded Wire Probe
840058	USB Power Cable
840059	4GB SD Card
840090	Water Resistant Instrument Pouch
840093	Field Tripod
840097	AC Adaptor

SPECIFICATIONS

General

Circuit	Custom one-chip of microprocessor LSI circuit
Display	LCD size: 52 mm x 38 mm Backlight function
Measurement Unit	Air Velocity: m/S (meters per second) Km/h (kilometers per hour) Ft/min (FPM, feet per minute) Knots (nautical miles per hour) Mile/h (mph, miles per hour)
	Air Temperature: °C, °F
	Type K/J Thermometer: °C, °F
Temperature Compensation	Automatic temperature compensation for the anemometer function and the type K/J thermometer
Sampling Time of Display	Approximately 1 second
Memory Card	SD card 1 GB to 16 GB
Operating Temperature	0 to 50°C
Operating Humidity	< 85% RH

Power Supply	Alkaline or heavy duty DC 1.5 V battery (UM3, AA) x 6 pieces
	DC 9V adapter input (AC/DC power adapter is optional)
Power Current	Normal Operation (without use of the datalogger or backlight): Approximately DC 30 mA
	Datalogger Operation (backlight is off): Approximately DC 50 mA
	If the backlight is on, the power consumption will increase by approximately 36 mA.
Dimensions	Meter: 203 x 76 x 38 mm 8 x 3 x 1 ½" Telescopic Hot Wire Probe: Round, 12 mm dia x 280 mm (min. length) Round, 12 mm dia x 940 mm (max. length)
Weight	515 g (1.13 lb)

SPECIFICATIONS

Air Velocity

Measurement	Range	Resolution	Accuracy
m/s	0.2 to 5.0 m/s	0.01 m/s	± (5% + a) reading
	5.1 to 25.0 m/s	0.1 m/s	
Km/h	0.70 to 18.0 Km/h	0.01 Km/h	
	18.0 to 72.0 Km/h	0.1 Km/h	
mph (Mile/h)	0.50 to 11.20 mph	0.01 mph	or
	11.2 to 44.7 mph	0.1 mph	
Knots	0.40 to 9.70 Knots	0.01 Knots	± (1% + a) full scale
	9.7 to 38.8 Knots	0.1 Knots	
FPM (Ft/min)	40 to 3940 ft/min	1 Ft/min	

Air Temperature

Range	0 to 50°C (32 to 122°F)
Resolution	0.1°C (0.1°F)
Accuracy	± 0.8°C (± 1.5°F)

SPECIFICATIONS

Type K/J Thermometer

Sensor Type	Range	Resolution	Accuracy
Type K	-50.0 to 1300.0°C -50.1 to -100.0°C	0.1°C	± (0.4% reading + 0.5°C) ± (0.4% reading + 1°C)
	-58.0 to 2372.0°F -58.1 to -148.0°F	0.1°F	± (0.4% reading + 1°F) ± (0.4% reading + 1.8°F)
Type J	-50.0 to 1100.0°C -50.1 to -100.0°C	0.1°C	± (0.4% reading + 0.5°C) ± (0.4% reading + 1°C)
	-58.0 to 2012.0°F -58.1 to -148.0°F	0.1°F	± (0.4% reading + 1°F) ± (0.4% reading + 1.8°F)

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

SPER SCIENTIFIC LTD
8281 E. Evans Rd., 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.sperscientific.com, or return your warranty card within 10 days of purchase.

Rev 4/11/2018