Advanced Visible Light SD Card Datalogger

850005

Instruction Manual

SPER SCIENTIFIC

Environmental Measurement Instruments

Advanced Visible Light SD Card Datalogger 850005

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TABLE OF CONTENTS

INTRODUCTION

The Sper Scientific Advanced Visible Light SD Card Datalogger (Model 850005) is an intelligent meter that reads light in Lux or Foot Candles and functions as a Type K/J thermocouple thermometer. A special mode enables compensation for the differences in tungsten, fluorescent, mercury and day light insuring highly accurate readings under different types of light.

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 light measurement, time and date.

FEATURES

- Functions as a light meter and Type K/J thermometer
- Lux or Foot Candles unit selection
- Compensates for different types of light sources
- Auto or manual logging to SD memory card
- Photo sensor spectrum meets CIE
- Zero adjustment
- Direct upload of preformatted data to Excel
- Detachable probe for measuring flexibility
- Internal clock and calendar
- Touch-tone
- Tripod mounting screw
- Built-in tabletop stand
- Maximum and minimum
- Hold function
- Low battery indicator
- Backlight

MATERIALS SUPPLIED

- Meter
- Sensor
- SD Card
- 6 AA Batteries
- Instruction Manual
- Soft 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 battery replacement instructions. Plug the adaptor into the power port labelled “DC 9V,” located on the side of the meter.

METER COMPONENTS & KEYPAD

1. Type K/J Thermocouple Socket
2. Light Sensor Input Socket
3. LCD Screen
4. Hold/Exit Button
5. Record Button
6. ▼ Button
7. Reset
8. CD 9V Adapter Input Socket
9. SD Card Socket
10. Light Source/▲ Button
11. Power/Backlight
12. Light Sensor
    (sensor cover not pictured)
13. Set/Time Button
14. Log/Enter Button

SETUP MODE

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

DATE…...Set date and time
SP-T…….Sampling time interval
POFF……Auto Power Off
BEEP…..…Touch-Tone on/off
DEC……..Set SD card decimal Type
SD-F…….Format.SD memory
T-CF…....Select °C or °F temperature scales
TYPE ..…Select Type K or J thermocouples

1. Press **POWER** to turn the meter on.
2. Press **SET** for 2 seconds to enter Setup Mode.
3. Press **SET** repeatedly to cycle through the setup functions.

Note…

The meter will return to Normal Mode after a few seconds of inactivity. Or, press **HOLD** at any time to exit setup mode.

Date and Time

1. Enter the clock function from Setup Mode (as described above). "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.)

Sampling Time

The sampling time is the time interval between data point recordings. To adjust the sampling time:

1. Enter the sampling time function from Setup Mode (see page 5). “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.

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 5). “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 5). “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
3. Tones will be audible each time a button is pushed or a data point is saved.

Decimal Type

Although the decimal is commonly expressed as the “.” symbol (i.e., 20.6 or 1000.53), some (European) countries use a “,” symbol to represent the decimal (i.e., 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 5). “dEC” appears on the LCD.
2. Press ▲ or ▼ to select Basic (.) or Euro (,). Press ENTER to save the selection.

SD Memory Card Format

New SD cards should be formatted to work with your meter. Formatting the SD card will erase any previous memory on the card. Enter the SD memory card format function from Setup Mode (see page 5). “SD F” appears on the LCD.

1. 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, “SURE” will appear on the LCD, press **ENTER** again and the meter will format the SD card.

Temperature Units

1. Enter the temperature units function from Setup Mode (see page 5). “T-CF” appears on the LCD.
2. Press ▲ or ▼ to select C (degrees Celsius) or F (degrees Fahrenheit). Press **ENTER** to save the selection.

Thermometer Type K/J

When using the meter for the first time, the meter will default to K type thermocouple. To change thermocouple Types:

1. Enter the thermometer type function from Setup Mode (see page 5). “TYPE” appears on the LCD.
2. Press ▲ or ▼ to select K or J. Press **ENTER** to save the selection.

MEASUREMENT PROCEDURES

Turning the Unit On/Off

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

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.
   Light Meter: “LIGHT” appears on the LCD.
   Type K/J thermometer: “TYPE” appears on the LCD.

Note…

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

Light Meter

1. Plug the probe plug into the probe input socket.
2. Press **POWER** to turn the meter on.
3. Remove the sensor cover from the light sensor.
4. Press and hold **FUNC** to select light mode.
5. While holding the sensor handle, point the light sensor directly toward (facing) the light source.

Note…

This meter measures light in Lux or Foot Candles (Ft-cd). To change the light unit, press and hold the up arrow. Release when the desired unit appears on the LCD.

Select the lighting type by pressing the **SOURCE** button repeatedly to scroll through the following options: Tungsten, Fluorescent, Day Light and Mercury. The meter will return to the last used option whenever the power is turned back on. For LED or other types of lighting, use the Tungsten mode.

Zero Adjustment

During light measurement, if the display does not show a value of 0 when the sensor cover is placed on the light sensor, zero adjustment is needed:

1. With the sensor cover on, press ▲and ▼simultaneously for longer than 3 seconds. A value of 0 will appear on the LCD.
2. Remove the sensor cover to resume normal measurement.

Type K/J Thermocouple Thermometer

1. Plug a thermocouple temperature probe (type K or J) into the thermometer socket.
2. Press **POWER** to turn the meter on.
3. Press and hold **FUNC** to select Temperature mode.
4. The thermocouple temperature measurement will appear on the LCD along with “K” or “J” to indicate the thermocouple type selected in the set-up mode. (See page X).

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.

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. Press **REC**. again to continue updating maximum and minimum values. “
5. To exit the min/max function, press and hold **REC** for 2 seconds. The meter will return to Normal Mode.

Note…

Record function overrides the power-off and the meter cannot be turned off until you exit the record function.

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 Time and Date

During normal measurement (not during datalogging): Press TIME and the time, date and sampling time interval will be displayed.

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 7).
3. Set the clock if using the meter for the first time (see page 5).

Auto Datalogging

1. Set the sampling time to ≥ 1 second. Refer to page 6.
2. Press **LOG** for at least 3 seconds.
3. LOGGER will appear on the top of the LCD and "SAVE" will flash as each sample is recorded.
4. To pause datalogging, press **LOG**. The meter will temporarily stop recording and "SAVE" will stop flashing on the LCD. Press **LOG** again to resume datalogging.
5. To finish datalogging press **LOG** for ≥2 seconds.. "LOGGER" will disappear from the LCD to indicate that datalogging has ended.
6. To enable/disable an audible tone each time data is saved see the touch-tone feature on page 6.

Manual Datalogging

1. Set the sampling time to 0 seconds. Refer to page 6.
2. Press **LOG** FOR >3 seconds. "LOGGER" will appear on the LCD.
3. Press **LOG** again each time you wish to record a reading. "LOGGER" will flash on the LCD and the tone will sound while as each reading, data and time information are saved to memory. The position (location) number of your data set will appear on the top of the LCD and will be recorded on the SD card. Press ▲ or ▼ to change the position number (from 1 to 99) then press **ENTER** to confirm.
4. To finish datalogging, press LOG for at least 2 seconds. "LOGGER" will disappear from the LCD to indicate that datalogging has ended.

SD Card Data Structure

1. The first time a SD card is used in this meter, a folder LXA01 will be generated.
2. If the datalogger is being used for the first time, a new file LXA01001.XLS will be generated under the route LXA01\. After exiting the datalogger and executing the function again, the data is saved to the LXA01001.XLS file until the data reach 30,000 data columns. A new file will then be generated (i.e., LXA01002.XLS).
3. The folder LXA01\ will hold 99 files. A new route (i.e., LXA02\) will be generated when exceeding 99 files.
4. The file's route structure:

LXA01\

LXA01001.XLS

LXA01002.XLS

……

LXA01099.XLS

LXA02\

LXA02001.XLS

LXA02002.XLS

……

LXA02099.XLS

LXAXX\

……

……

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 and hold **POWER** for 2 seconds 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, 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.

SPECIFICATIONS

Circuit	Custom one-chip of microprocessor LSI circuit
Display	Backlit LCD size: 52 mm x 38 mm.
Measurement Units	Light: Lux or Foot Candle Type K/J Thermometer: °C or °F
Light Sensor	Photo diode and color correction filter, spectrum designed to meet CIE
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 or optional AC adapter.
Power Current Drain	Normal Operation (without use of the datalogger or backlight): Approximately DC 6.5 mA Approximately DC 30 mA with datalogger in operation (backlight is off): Power consumption will increase by approximately 16 mA.with the backlight on.
Dimensions	7" × 2¾" × 1¾" (178 × 70 × 44 mm)
Weight	1 lb. (0.45 kg)

SPECIFICATIONS

The following specifications were obtained with a standard parallel light tungsten lamp of 2856 K temperature in an ambient temperature of 23 ± 5°C:

Light

Unit	Range	Maximum In-Range Display
Lux (Auto Range)	2,000 Lux	0 to 1,999 Lux
	20,000 Lux	1,800 to 19,990 Lux
	100,000 Lux	18,000 to 99,900 Lux
Foot Candles (Auto Range)	200 Ft-cd	0 to 186 Ft-cd
	2,000 Ft-cd	167 to 1,860 Ft-cd
	10,000 Ft-cd	1,670 to 9,290.7 Ft-cd

Range	Resolution	Accuracy
2,000 Lux	1 Lux	± (4% reading + 2 dgt)
20,000 Lux	10 Lux	
100,000 Lux	100 Lux	
200 Ft-cd	0.1 Ft-cd	
2,000 Ft-cd	1 Ft-cd	± (4% reading + 2 Ft-cd)
10,000 Ft-cd	10 Ft-cd	± (4% reading + 20 Ft-cd)

Type K/J Thermometer

Sensor Type	Range	Resolution	Accuracy
Type K	-50.0 to 1300°C -50.1 to -100°C	0.1°C	± (0.4% reading + 0.5°C) ± (0.4% reading + 1°C)
	-58.0 to 2372°F -58.1 to -148°F	0.1°F	± (0.4% reading + 1°F) ± (0.4% reading + 1.8°F)
Type J	-50.0 to 1200°C -50.1 to -100°C	0.1°C	± (0.4% reading + 0.5°C) ± (0.4% reading + 1°C)
	-58.0 to 2192°F -58.1 to -148°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 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.

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