

Advanced Datalogging Sound Meter

850013 Instruction Manual

Advanced Datalogging Sound Meter - 850013

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INTRODUCTION

The Sper Scientific Advanced Datalogging Sound Meter (Model 850013) uses a single range of 30 to 130 dB. This dynamic range eliminates the need to manually select and change ranges, alleviating the problem of lost data associated with range changes in auto-ranging models. All test parameters are simultaneously displayed on a large, bright backlit display that features 0.1 dB resolution and a bar graph. Data can be stored in the meter or directly saved on a computer through the PC interface.

This meter measures sound in decibels (dB). Although it is used for a wide variety of other measurements in science and engineering, the decibel is most commonly recognized as a measure of the intensity of a sound wave. The decibel is a unit of power ratio with the number of units equal to a constant times the logarithm to the base 10 of two sources of intensity.

FEATURES

- Meets or exceeds all other specs for an IEC 61672:2013 Class 2 and ANSI S1.4:2014 Type 2 meters
- Large, backlit LCD with bar graph
- Datalogger capacity of 31,000 records
- Manual reading recording memory (99 data points)
- LCD recording readout (99 memories capacity)
- PC connection
- A/C frequency rating scale
- Fast/slow time weighting scale
- Minimum/maximum
- Over/under alarms
- AC/DC recorder output
- Auto power off

MATERIALS SUPPLIED

- Meter
- USB cable
- Windscreen
- Calibration tool
- Recorder output plug
- 4 AA batteries
- Instruction manual
- Hard carrying case

POWER SUPPLY

The meter is powered by 4 AA 1.5V batteries or an AC adapter. When using the AC adapter, insert the adapter plug into the DC9V connector on the bottom of the meter.

Note...

When the AC adapter is connected, the meter will supply power from the adapter rather than the batteries.

When using batteries as the power source, periodically check the battery indicator on the top left of the screen to determine the battery capacity.

When the battery power is almost empty, the empty battery symbol will disappear from the LCD. Press MEM or REC. "Lo Bat" appears on the LCD. If the meter is in recording mode, it will stop recording.

For battery replacement, see page 8.

LCD DISPLAY



- | | |
|-------------------------------|------------------------------------|
| 1. Battery Capacity Indicator | 9. Frequency Weighting Indicator |
| 2. Auto Power Off Indicator | 10. Over-Range Signal Indicator |
| 3. Minimum/Maximum Indicator | 11. Memory Full |
| 4. Time Weighting Indicator | 12. Recording Datalogger Indicator |
| 5. Level Range Indicator | 13. Under-range Signal Indicator |
| 6. Manual Store Indicator | 14. Level Reading |
| 7. Memory Address | 15. Date |
| 8. Recall Indicator | 16. Time |

PANEL DESCRIPTION

1. Recall Button
2. Record Button
3. Clock Button
4. Backlight Button
5. Microphone - ½ inch Electret Condenser microphone
6. Power Button
7. Press to increase or decrease the value
8. Tripod Mounting Thread (on back)
9. Memory Button
10. Min/Max Button
11. Interval Button
12. Fast/Slow Button
13. Battery compartment (on back)
14. A/C - Sets frequency rating to A or C scale.
15. CAL potentiometer
Calibration control for level calibration adjustment.
16. External DC 9V power supply jack
Connect the AC adapter.
17. AC/DC signal output jack
Connect the AC/DC output.
18. PC connection - The PC jack signal output is a 9600 bps N 8 1 serial interface. Use the accessory USB cable to connect to the PC.

(15-18 located on bottom of meter)



SETUP MODE

Setting the Clock

This meter includes a clock that records the date and time along with measured data.

1. Press and hold **CLOCK** for longer than 2 seconds.
2. Press **▲** or **▼** to adjust the number, press **CLOCK** to adjust the next item.
3. The setting adjustment order is year→ month→ day→ hour→ minute→ second. Press **CLOCK** to complete adjustment. To cancel a setup process, press **POWER**.

Note...

An internal (rechargeable) backup battery runs the clock when the meter is turned **OFF**. The backup battery is recharged by the main batteries. The clock will run for 30 minutes on the backup battery alone. If the meter will not be in use for an extended period (one month or longer), remove the main batteries to prevent possible damage due to battery fluid leakage. After reinstalling the batteries, set the date and time.

CALIBRATION

The meter has been factory calibrated. Annual calibration is recommended for best results.

1. Prepare for calibration by setting up the meter as follows:
 - Frequency scale: A
 - Time weighting: FAST
 - Measurement mode: Disable Min/Max function.
 - Level range: 30 to 130 dB
2. Fully insert the microphone housing into an acoustical calibrator with a ½ inch insertion hole such as a Sper Scientific 850016.
3. Switch the calibrator to emit 94.0 dB. Turn the calibrator on. Using the calibration tool, adjust the CAL potentiometer on the meter until the LCD displays 94.0 dB.

MEASUREMENT PROCEDURES

1. Press **POWER** to turn the meter on.
2. Select the desired response time and frequency weighting.

Note...

If the sound source consists of short bursts or sudden changes in sound level, set the response time to FAST. To measure typical sound level, use the SLOW setting.

3. Hold the meter in a comfortable position or attach to a tripod and point the microphone towards the noise source. The sound pressure level reading will appear on the LCD.

Maximum and Minimum

1. With the meter turned **ON**, press **MIN/MAX**. “MAX” and the maximum value appear on the LCD. The LCD will continuously update and display as new maximum values are reached.
2. Press **MIN/MAX** again. “MIN” and the minimum value appear on the LCD. The LCD will continuously update and display as new minimum values are reached.
3. Press **MIN/MAX** again. The maximum and minimum indicators will blink simultaneously to indicate that the meter is recording maximum and minimum values. The current value displays on the LCD. To view the maximum and minimum values obtained during recording (since Step 1 in the Maximum/Minimum instructions), press **MIN/MAX** to view the maximum and press **MIN/MAX** again to view the minimum.
4. To exit this mode and clear all maximum and minimum values, press and hold **MIN/MAX** until “MAX MIN” disappears from the display.

Note...

Maximum and minimum values cannot be saved after exiting the Maximum/Minimum Mode.

Datalogging

The data storage method can be set to auto or manual.

Auto Datalogging

To set the interval time:

1. Press **INTV**. “Int” and a seconds display appear on the LCD.
2. Set the recording interval in minutes and seconds by pressing **▲** or **▼** to adjust the number. The maximum setting is 1 minute. The minimum setting is 1 second (“00:01”).
3. Press **INTV** to save and return to Normal Mode or press **POWER** to cancel.
4. Press **REC** to start recording the measurements. The values are stored in the meter’s memory. Press **REC** again to stop recording.

Note...

While the meter is recording, most of the meter’s buttons (such as **RECALL**, **MEM**, **INTV**, **A/C**, **FAST/SLOW**) will not function. Setting adjustments should be made before recording. When the maximum of 31,000 records are stored in the memory, “FULL” appears on the LCD.

Clearing Auto-Stored Data

1. Press and hold **POWER** to turn the meter **OFF**.
2. Press and hold **REC**. While still holding **REC**, press and release **POWER**. “CLr” appears on the LCD. The LCD displays “SURE 5, 4, 3, 2, 1, 0.” (The meter allows 5 seconds to abort the operation by releasing **REC**.) Continue holding **REC** until the meter returns to Normal Mode. The memory is now cleared.

Manually Storing Data

1. Press **MEM** to store up to 99 data point using manual storage.

Reading Manually-Stored Data

1. Press **RECALL**. “READ” appears on the LCD.
2. Press **▲** or **▼** to select the data set. The data will display on the LCD. If there are no data in a data set, “MEM00” appears on the LCD. Press **RECALL** to exit Recall Mode.

Clearing Manually-Stored Data

1. Press and hold **RECALL**. While still holding **RECALL**, press and release **POWER**. “CLr” appears on the LCD. The LCD displays “SURE 5, 4, 3, 2, 1, 0.” (The meter allows 5 seconds to abort the operation by releasing **RECALL**.) Continue holding **RECALL** until the meter returns to Normal Mode. The memory is now cleared.

BATTERY REPLACEMENT

1. Remove the screw at the top of the battery cover and lift the cover off the meter.
2. Insert 4 AA batteries, ensuring correct polarity.
3. Replace the battery cover and tighten the screw to secure.

Note...

This meter can use AA rechargeable batteries. A separate charger must be provided for rechargeable batteries because the meter is not designed to recharge batteries.

MAINTENANCE

The following actions will keep the meter in good working condition and ensure correct measurement technique:

- Wind blowing across the microphone may cause additional noise and affect the reading. When taking measurements in a windy environment, the windscreen must be used to prevent interference.

- Do not store or operate the meter in high temperature or high humidity environments. See Specifications (page 15) for recommended operating environment ranges.
- Keep the microphone dry and avoid severe vibration.
- Remove the batteries and store the meter in a low humidity environment when not in use for an extended period of time.
- Repairs or services not covered in this manual should be performed by qualified personnel only. Please contact Sper Scientific to speak with a technician.
- Periodically wipe the meter with a dry cloth. Do NOT use abrasives or solvents on this meter.

TROUBLESHOOTING

1. Meter connected to PC serial port and turned on but still displays “NO CONNECTION”:

All serial ports may be occupied by other applications. Close other applications. If the problem is still not resolved, restart the computer and run the software again.

2. Saving the graph to a file that can be used in Excel:

When saving the graph to a file, the default file format is “*.ghf.” Select the file type as “*.csv” (Excel file format) and save. The file is ready to open in Excel.

3. Uninstalling the 850013 software:

Open the control panel on your PC and launch the Add/Remove programs application. Highlight 850013 and click the Add/Remove button. The 850013 folder and files will be removed from the PC.

4. Loading data failure:

Utilizing a notebook PC may cause a slow response.

5. Zooming in on the graph:

Press the left mouse button and drag the cursor to select the new graph boundaries. Release the mouse button.

6. Meter setup with real time sampling with FAST rate (i.e., 0.1 second), some sampling data may be lost:

This may be caused by slow response time of the PC.

PC CONNECTION

System Requirements

Windows 7 / 8 / 10

Minimum Hardware Requirements

PC or Notebook with Pentium 90 MHz or higher, 32 MB RAM; At least 50 MB hard disk space available to install the software. Recommended resolution of 800 x 600.

Software Download

You can now download the software that came with your meter directly on your computer.

1. Go to **www.sperdirect.com**.
2. Type in the meter number (**850013**) in search box.
3. Under **Description**, click **Software Download** and download from the product page.

Note...

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.

Installing the Software

Note...

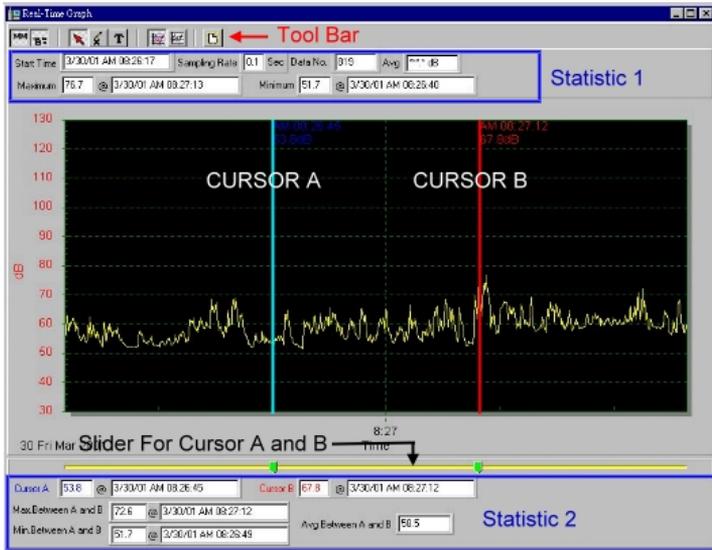
Different computer systems may require slightly different installation steps than those below.

1. Close all other applications before installing the software.
2. Open the **850013.zip** file.
3. Select **CP210x_VCP_Win2K_XP_S2K3.exe** and select **Extract all**.
4. Select **Destination and Extract Files**. Click **Extract**.
5. Select **Setup.exe** and this will open up **InstallAware Wizard for 850013**.
6. Click **Next**.
7. Select **Destination** of the location of software, then Click **Next**.
8. Select **Program Folder**, then Click **Next**.
9. After completing the **InstallAware Wizard for 850013**, Click **Next**.
10. Check **Box to Run 850013** now, then Click **Finish**.

Main Menu

File_Open	Retrieves files
File_Save	Saves the active window (the caption bar is highlighted)
File_Print	Prints the data in the active window (graph or list)
File_Printer setup	Selects printer
File_Exit	Terminates the software program
View_Control Panel	Opens the Panel Window to allow control of the meter via the button in Panel Window
View_Real Time Graph	Opens display to graph the current data
Real Time Data_Run	Starts collecting real time data
Real Time Data_Stop	Stops collecting real time data
Datalogger	Opens the Datalogger Window to allow loading of recorded data from the meter to the PC
Ouput to Graph	Graphing tabular data

Graph



Tool Bar



- Display or hide Statistic1



- Display or hide Statistic2



- Normal cursor



- When selected, the mouse cursor will become a cross sign when moving through the graph. Click on the graph to mark a cross sign on the graph.



- When selected, the mouse cursor will become a "I" sign (text tool) when moving through the graph. Click on the graph to annotate.



- Color graph



- Monochrome graph

Graph Functions

- To select a rectangular area on the graph to zoom in for detail:

There are two vertical lines on the graph (CURSOR A and CURSOR B). Time and value display at the top and right side of each cursor. Move the mouse cursor over cursor A or B and click to drag the cursor to the left or right. Directly below cursors A and B is a slider. Alternatively, click and drag the slider to move cursor A or B. The statistic is located under the slider. The statistic displays start time, sampling rate, data number, and maximum and minimum in the graph. The statistic also displays the maximum, minimum, and average between cursors A and B; these data will update automatically as cursor A or B is moved.

- To customize the graph style:

Double click on the graph to open the option dialog. Right click the graph (real time graph is not allowed) to open the popup menu.

- To zoom in on the graph using the mouse:

Click the left mouse button and drag the cursor to select the new graph boundaries. Release the mouse button. To undo the zoom, right click on the graph. Select Undo Zoom from the popup menu.

Datalogger

Connect the meter to a PC. Select datalogger from the main menu of the software or click  from the tool bar to load the recorded data from the meter. A progress indicator will display the loading progress. If an error occurs, click datalogger again. After the data loads, the left side of the screen will show the number of data sets with detailed information for each data set, including start data, start time, recording rate and record numbers.

After loading the recorded data from the meter, the first data set will transfer to the graph and tabulate on the right side. Click any data set to graph that set. The right side of the screen displays the waveform graph and statistical information of the selected data set.

Recording Real Time Data in Waveform

1. Press **POWER** to turn the meter **on**.
2. Connect the meter to the PC's USB serial port with the USB cable.
3. Start the software program.
4. If the connection is successful, the same value will appear on the Panel Window and the meter. If the meter fails to connect with the PC, "No Connection" appears on the Panel Window.
5. When successfully connected to the PC, click the play icon to start recording real time data. A waveform appears on the Real Time Graph Window.
6. Click the stop icon to stop recording.

Saving Real Time Data to a File

1. Select the graph window to save to the PC and click on the graph window to make it active.
2. Select File_Save from the main menu or click the disk icon from the tool bar.
3. The save dialog window appears on the screen. Select the file name and file type to save.

Note...

There are three file type options: binary (*.ghf), text (*.txt) and Excel format (*.csv). Of the three file types, *.ghf files use much less disk space to save the data but the format can only be used with the 850013 software. Text files can be opened by 850013 and any other word processing program such as Word, Notepad, etc. Excel files can be opened by 850013 and Microsoft Excel.

Loading Recorded Data from the Meter's Memory and Saving to a File

1. Press **POWER** to turn the meter on.
2. Press **REC** to start recording data.
3. When finished recording, press **REC** to stop recording data.
4. Connect the meter to the PC's USB serial port with the USB cable.
5. Start the software program.
6. Select datalogger from the main menu or click  from the tool bar.
7. Refer to the datalogger section of this manual (page 13) for more information.

SPECIFICATIONS

Accuracy	± 1.0 dB (under reference conditions at 94 dB, 1 KHz)
Measurement range	30 to 130 dB
Frequency range	20 Hz to 8 KHz
Dynamic range	100 dB
Digital display	4 digits Resolution: 0.1 dB Display update: 0.5 seconds
Analog display	50 segment bar graph Resolution: 2 dB Display update: 50 mS
Frequency weighting	A/C
Time weighting	FAST (125 mS) SLOW (1 second)
Microphone	½" electret condenser
Alarm function	"OVER" indicates that the input is over the upper range limit "UNDER" indicates that the input is less than the lower range limit
Datalogging capacity	31,000 records
Operating temperature	0 to 40°C (32 to 104°F)
Operating RH%	10 to 90% RH
Operating Altitude	Up to 2,000 meters
Operating Temperature	-10 to 60°C (14 to 140°F)
Storage RH%	10 to 75% RH
AC/DC adapter	Voltage 9 VDC (8-10 VDC Max)
AC output	1 Vrms at FS (full scale)
DC output	10 mV/dB
Power supply	4 x AA batteries
Battery life	Approximately 30 hours (alkaline battery)
Power consumption	Approximately 0.3 W
Weight	15 oz (420 g)
Dimensions	10¾" x 3½" x 1½" (272 x 83 x 42 mm)

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.