

H27659

Light Level SensorMeter

NFU 573

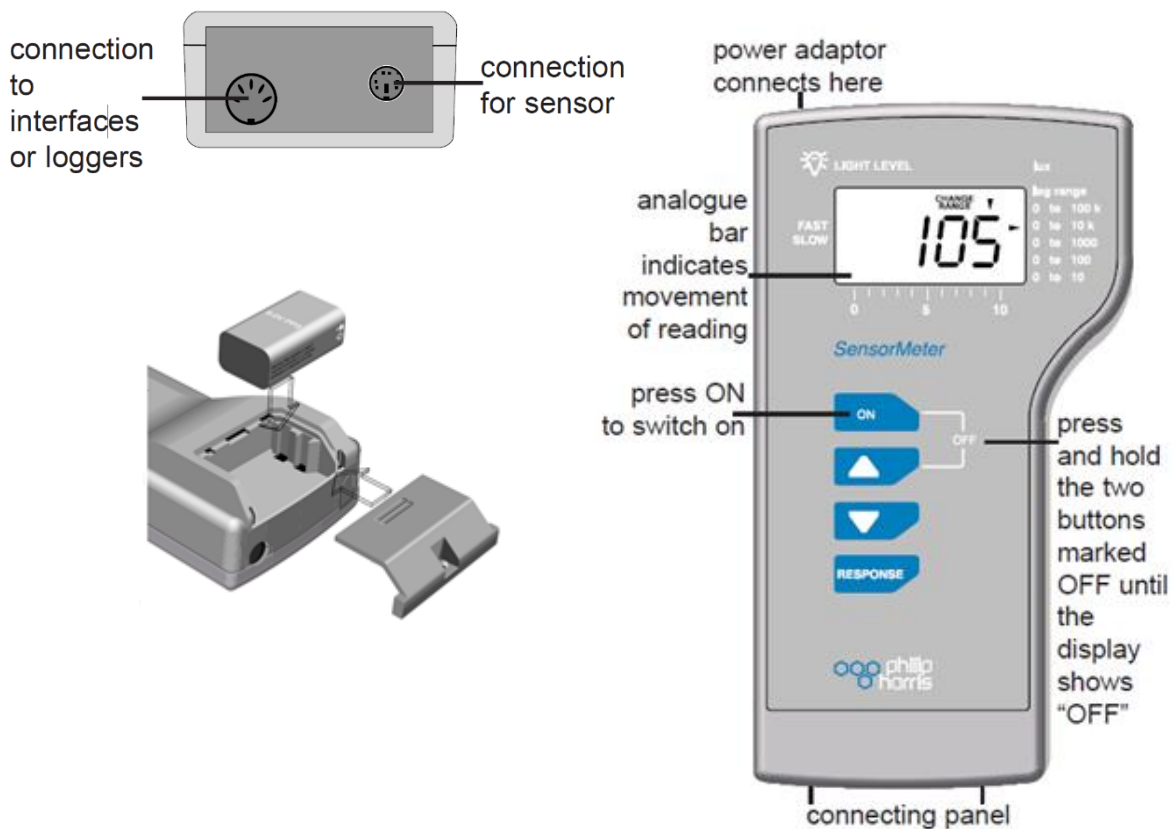


Introduction

The Light Level SensorMeter is designed to be both a sensor and a meter. It measures light levels from bright moonlight to full sunlight and allows computer recording of levels. Six ranges are provided, one of which covers the entire measurement range in a logarithmic manner.

To use the SensorMeter fit an MN1604 (Manganese Alkaline PP3) battery in the compartment provided OR connect the SM Power adaptor. Connect the light probe to the probe input on the right hand side of the connecting panel and press ON.

The arrow keys allow you to select the other ranges and the RESPONSE key selects FAST or SLOW response on the linear ranges only.



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SensorMeter as a meter

Use the up and down arrows to select the appropriate range. The RESPONSE button determines how quickly the reading is updated as the count rate changes.

When a reading is too low for accuracy and a more sensitive range is available the Change Range Down indicator will suggest that you change range.

Similarly when the reading is approaching the range maximum and a less sensitive range is available the display will suggest a change to the higher range.

SensorMeter as a sensor

Connect the sensor to DL plus using the 5 pin DIN-DIN connecting lead, with the SensorMeter on and select the range you require before using DISPLAY NOW or RECORD.

Do not change range once you have started logging.

If you change range while using DISPLAY NOW, press ESC and DISPLAY NOW again to recognise the new range.

SensorMeters may be used with the Universal Interface and Datadisc family software or e.Log II and e.Log Vision software. The sensor type will be recognised and the software will present a choice of ranges. First Sense and First Control will recognise SensorMeters but give a general 0-100 reading.

The response button will also affect the sensor output. It is likely that a slow setting will be required for the 0 to 50 range, but a fast setting may be more appropriate for a higher count rate.

When the linear ranges are selected, an option to vary the response time of the circuit is available. Use the RESPONSE button to select FAST or SLOW. The difference in response speed will not be seen on the display but will effect computer recordings made at fast logging rates. Select SLOW unless you want the 100Hz varying output of fluorescent lighting to be recorded.

Use the logarithmic range for most investigations unless you are sure that light level will keep within fairly narrow limits. (e.g. to use the 1000 lux range for datalogging, the light level would have to stay within the range approx. 10 to 1000 lux.)

Log range

This covers the range of light levels from 1 to 100000 lux in a broadly logarithmic fashion. Each increase in reading of one unit corresponds to an approximately tenfold increase in light level. The eye's response is also logarithmic making this range appropriate for many general investigations.

Linear ranges

The other five ranges read light levels linearly from 0 to the range maximum. When using the linear ranges, bear in mind that the eye's response is logarithmic. A change in light level that is quite significant on a linear measurement range might be hardly detectable to the eye. Conversely it is easy for apparently small light level changes to take the reading on a linear range off scale or below the limit of accuracy.

The retractable shade

The probe handle has a retractable shade that can be used to restrict the angle of acceptance of the probe. For general light level readings this should normally be fully retracted. When the shade is pulled forward the light level reading in lux will be reduced and will cease to be meaningful unless the only significant illumination comes from the direction the probe is pointing. The shade is useful for comparative studies where the direction of illumination is important.

Sound output

The SensorMeter normally provides a sound output similar to that provided by other Geiger tube devices. This may be turned off if required by moving the switch which can be seen behind the grille, on the end of the SensorMeter under the display.

Probe sensitivity

The probe is based on a miniature Geiger Muller tube with a thin end window. It shows a good response to weak Alpha radiation such as that obtained from Americium 241.

The tube will give a lower count rate than larger tubes in the same experimental conditions due solely to its smaller capture cross-section of response. The protective cap provided with the probe will filter Alpha and Beta radiation and allow only Gamma radiation to be measured.

Battery Operation

Turn the SensorMeter over and open the batter compartment by sliding the cover backwards. Insert an MN1604 (6LR61 or PP3, Manganese Alkaline type or rechargeable) battery taking care to follow the polarity connections indicated in the compartment. Replace the cover. (For extra security an optional cover retention screw is provided in the battery compartment.) The SensorMeter will switch off after 50 minutes if the keypad is not used. If the computer connection is used the SensorMeter will remain on.

Mains Operation

Plug the System SM Power adaptor into a mains socket and plug the power jack plug into the connector on the back of the SensorMeter. The SensorMeter will remain on indefinitely.

Operation

To switch on the SensorMeter, press the ON button. The SensorMeter will switch on with the sound level range selected. To select other ranges press the ▲ or ▼ buttons as appropriate. To switch off press the ON and ▲ buttons together for a short period until OFF is displayed.

Technical Specification

Resolution, display	± 0.5% full scale
Resolution, computer output	± 0.2% full scale
Accuracy, linear ranges, display	± 15% full scale (with the shade retracted fully and measuring sunlight)
Accuracy, linear ranges, comp.	± 15% full scale

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Accuracy, logarithmic range	reading is within ± 0.3 of \log_{10} lux level over range 1 - 10000 lux
Battery life (MN1604)	80 hours
Spectral response	400-700nm with optional filter, 400-1000nm without filter (The filter restricts the angle of view of the probe and will thus reduce readings for general light levels.)
Response time	FAST approx. 50 μ s SLOW approx. 50ms
Angle of sensitivity	Readings are reduced to half at 65° off axis, shade retracted

Ratings and connections

Supply voltage	9V DC smoothed
Input connections	Power input for SM power adaptor Probe input for SM ultra violet irradiance probe only
Output connection	Computer output for Universal Interface or DL plus 5 pin DIN DIN or e.Log Sensor Adaptor* DIN mini DIN
Environmental conditions	Designed for operation in 10-90% humidity and temperatures from -10 to 50°C

Symbols Used



This is the SM light icon and it may appear in computer software that recognises this sensor



Probe input for Sound Level SensorMeter Probe



Computer interface output for DL plus, Universal Interface or e.LogII



Input connector for System SM Power adaptor

Cleaning

Use a damp cloth to wipe the outer surfaces of the SensorMeter.

Earthing

There is no need to earth the SensorMeter.

Maintenance

Apart from battery changing, no user maintenance is required. Opening the case will invalidate the warranty.

Warnings

For your safety, this product should be used in accordance with these instructions, otherwise the protection provided may be impaired.

Disposal of Waste Electrical and Electronic Equipment (WEEE)



Do not dispose of this product with household waste

- For the proper treatment, recovery and recycling please take this product to an appropriate collection point.
- If you are unsure where this is, contact your Local Authority
- By disposing of this product correctly you will be providing positive help to the environment.

Warranty, repairs and spare parts

The Ultraviolet SensorMeter is guaranteed for a period of one year from the date of delivery to the customer. This warranty does not apply to defects resulting from the action of a user such as misuse, improper wiring, any operations outside of its specification, improper maintenance or repair, or unauthorized modification.

Our liability is limited to repair or replacement of the product. Any failure during the warranty period should be referred to Customer Services.

In the event of a fault the SensorMeter should be referred to the Philip Harris recommended repair agent.

Please contact Customer Services or techsupport@philipharris.co.uk for advice

Supplier details

Philip Harris Education, 2 Gregory Street, Hyde, Cheshire SK14 4RH

Orders and Information Tel: 0845 120 4521

Fax: 0800 138 8881

Repairs Tel: 0845 120 3211

E-mail: techsupport@philipharris.co.uk

Website: www.philipharris.co.uk

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