SPX LUX Sensor

for the LogIT Microsense® system

Instructions

Overview

The SPX LUX sensor has been designed to measure the wide range of 0 - 100,000 LUX. This enables it to measure from room lighting to bright sunlight.

Sensitivity

The SPX sensor is based on a special silicon photodiode which is sensitive to both visible light and infrared so a number of interesting experiments can be carried out. For example, the infrared range enables the output of an IR remote control or high power heating element to be seen and experiments can be made with different filter materials to block or pass through visible or IR light.

Range

Some software such as LogIT Lab and Datalogging Insight include alternative scale ranges to enable smaller changes of light at a low range to be more easily seen this is more useful for the much lower light levels of classrooms and labs. (Refer to the software used for details on how to change the range/scale of sensors & graphs).

Please note that the extra scale only magnifies the readings and cannot change the sensitivity of the sensor. Some electrical 'noise' (flickering readings) at the lowest end of the scale will be seen when zooming in. This is normal as all electronic systems have noise and represents only a small percentage of the full scale.

Specifications

Range:	0-100000 LUX
Resolution:	typically 63 LUX
Spectral response range:	400 - 1100 nm
Repeatability:	typically 10%

Care

The sensor is not water or weatherproof and should be protected from damp and hostile environments. Do not point it directly at the sun and take care not to scratch or break the delicate glass window.
Do not attempt to disassemble - there are no user serviceable parts inside.

Waste electrical and electronic products must not be disposed of with household waste.
Please recycle where facilities exist.
Check with your Local Authority or Retailer for recycling advice.

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Examples of use.

The Sun as a source of Heat and Light

Overview:
The Sun provides heat and light energy (amongst other forms of energy) that is vital for life on Earth. This resource shows how you can look at the relationship between the amount of light observed at a particular point and the associated air temperature as well as how the amount of light varies over a period of time.

Equipment required:
LogIT data logger (this example uses a Voyager)
1 SPX LUX light sensor
1 Temperature sensor
Large piece of paper or card
Clamp stand (Optional)

Hazards:
Students should be supervised at all times.
Do not allow pupils to look directly at the Sun - explain the dangers of doing so.
Ensure the datalogger cannot come into contact with water or damp.

Setup:
1. Find a secure and weather protected place for the datalogger. Avoid direct wind which could affect the result.
2. Plug the sensors into two channels of the datalogger.
3. Decide if you are going to log data either first thing in the morning or last thing in the afternoon.

Note: The photo shows the Voyager with the SPX LUX sensor plugged into channel 2 and the HiTemp sensor plugged into channel 1. The Voyager is mounted in a clamp stand or similar and then pointed towards a large sheet of white card or paper. This captures light from the sun more uniformly. Do not clamp the datalogger too hard.

Method:
1. Switch on the datalogger by pressing any button.
2. Start the datalogger logging by pressing the green button.
3. Leave the datalogger to log for a chosen length of time - at least 24 hours.
4. After the time period stop logging by pressing the red button or stopping the datalogging software if connected to a computer.
5. Upload the results to a computer and view the graph.

Hint: The best location for the datalogger is outside away from the effects of wind and damp. The datalogger should also be 90° to the path of the sun.

Results:
Did the temperature change?
Did the light level change?
Did the changes take place at the same time.
Was it a cloudy day - how can you tell when a cloud passed?

Going further:
Try the experiment on different days in the week.
Try the experiment at different times of the year e.g. Autumn, Spring, Summer and Winter.
How does the location of your country affect the results - think about positions above or below the Equator.

Additional experiments
Monitor the light levels in a greenhouse. How does the temperature vary with light?
Measure environment light levels during different seasons or during an eclipse.
How do light levels differ in different habitats? eg. A forest floor.

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