

Overview

Multicolour indicator

Colour corresponds to the sensor channel on the computer screen and flashes when logging

Single button operation

Press once to start logging
Press again to mark events
Press & hold to stop logging

Light sensor

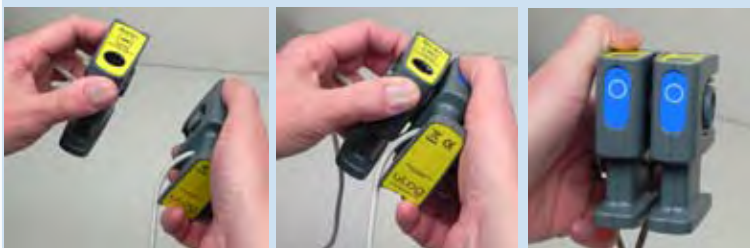
Range from 0 to 100,000 LUX
Software offers different scales

Locking bay

Locks to other uLog sensors



•Sensors can lock together



•Fit direct to stand



•Cable storage



Easy USB sensing and datalogging

Getting started with uLog

- 1 **Insert the CD and install SensorLab**
(see last page for more information)



- 2 **Run SensorLab and plug your uLog sensor into a free USB port**
You should see live readings from your sensor on the screen



- 3 **Press the uLog button to start logging**
You should see a graph recording your live readings

- 4 **To mark an event, press the button again**
You will add a small arrow marker at the top of the graph

- 5 **To stop logging, press and hold the button**
Your graph will show the complete set of data



Congratulations, you have recorded your first sensor data using uLog!

More with SensorLab

You can use SensorLab to do much more than display live readings and a graph. Just hover the pointer over any icon to see what it does. Full details of all SensorLab functions are in the comprehensive user guide on the CD - here are a few of the extra features you can explore:

- **Change range or calibration of a sensor:** Click the icon above the gauge when you start
- **Change logging type: SensorLab defaults to automatic logging**
- **Switch a sensor display on or off:** Click on gauge display or when graphing click on tick
- **Zoom in on a graph:** Draw a box around where you wish to zoom or click Magnifier icon
- **Take precise readings from graph:** Click on graph & position cursor with mouse or arrows
- **Label different points on the graph:** Click **IA** icon or Graph / Annotate
- **Change SensorLab complexity level:** Click level icon bottom right of screen to increment
- **Find information about the experiment:** Click on the *i* icon
- **To print graph:** Click on the Printer icon or select menu File / Print menu
- **Save SensorLab file onto your computer:** Click Disc icon or use File / Save As menu
- **Export data in a different format for use in another program or share:** File / Export menu

Using multiple uLog sensors

You can connect several uLog adapters and sensors to the same computer for multi channel logging on the same graph. The multicolour LED on each uLog will show which sensor is displayed on which channel (especially useful if using several sensors of the same type). Note that the number of uLog sensors you can use is dependant on the computers processing power, number of USB ports available and the USB power available (particularly limited on smaller computers). Use a high quality **powered** USB hub to increase both number of USB ports and power capacity. You can move uLog sensors further away from the computer by using a USB extension cable.

Other SensorLab functions

As well as graphs, SensorLab can also display data from some sensors in different ways.

Oscilloscope: Some analogue sensors which respond quickly (such as sound, light, voltage) can be also displayed as a live oscilloscope waveform on your computer screen - to view the output of a sensor as a waveform click the oscilloscope icon on the home screen. You can also store and transfer the screen data onto the normal graph for later analysis.

Setup: The setup icon on the home screen (cog wheel) enables you to change the types of logging. You can also select Timing from this option to use with sensors such as Light Gates etc. Full details of the scope & all SensorLab functions are in the comprehensive user guide on the CD.

Selecting an alternative scale

The uLog Light sensor measures visible light in the range of 0-100,000 Lux

This is a very wide span of light intensity but using SensorLab you can select the most appropriate range for your application; mid range should suit most regular interior light levels, high range for bright sunlight and a low range for measuring very low levels of light.

To change ranges run SensorLab, plug in the uLog light sensor and click on the arrow above the sensor to select which scale is required. (Note that you may see small variations when changing between ranges due to manufacturing tolerances - this is normal & applies to most instruments).

The uLog light sensor is based on a silicon device which is normally sensitive to infrared light, but the sensor has an integral filter which filters out most infrared to give a light response very similar to the human eye. As well as measuring the relatively slow changes of ambient light, the uLog light sensor has a fast response and so can capture very fast changes in light level as one of the experiment ideas below shows.

Ideas for experiments

The uLog Light sensor can be used for a variety of experiments from simple light levels and environmental monitoring to fast scope capture of fluorescent tubes.

The sensor can monitor reflected sunlight using a piece of white card or paper.

Remember if monitoring sunlight never to look directly at the sun or other sources of bright light - ensure you carry out a risk assessment appropriate to your application and the people doing it.

Monitoring environmental light levels

By simply connecting the uLog light sensor and running the software, you can record ambient light levels monitored over a period of time, eg 24 hours or over a weekend. This can give rise to an interesting graph which can be used for further environmental discussion about how light levels change. For example, you could monitor the light levels in the same room in different seasons during the year to see what happens between each one. You can also record outside light levels by pointing the sensor through a window - it is not waterproof so never leave outside.

Capturing light using Fast logging

When your eyes look at the light coming from a fluorescent lamp the level appears to be constant but the light is actually flickering on and off, though too fast for the human eye to see. Using the uLog light sensor and the fast triggered function of SensorLab the actual light from a fluorescent lamp can be seen.

Connect the sensor and start SensorLab.

Click on 'Setup' and select the 'Fast with trigger' option.

Click 'Next' and then select a low light range.

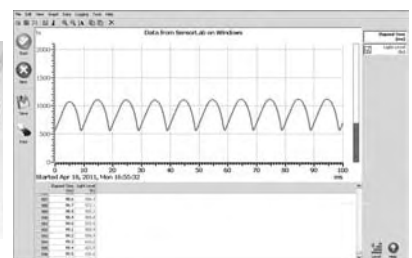
Click 'Next' and then select the duration of 0.1 seconds.

Place your finger over the sensor pointing it at the lamp.

Click 'Next' then when ready click 'Start'.

Release your finger and note the graph produced.

If no readings are recorded, then there is probably not enough light getting to the sensor to trigger the software and so you may need to position the sensor closer to the lamp. The graph shown above was for a fluorescent lamp at a distance of 1.5 metres. You can adjust the settings to suit the lamp being used if readings are still difficult to obtain.



Further experiment ideas can be found on the CD supplied or from www.logitworld.com

States of matter	
Subject: Chemistry	
Essence: Temperature sensor	
Aim: To record any change in temperature of ice during the change of state.	
Overview: This classic challenging experiment presents quite a challenge as to the position of the temperature sensor within the ice is melting. This problem can be used to show that no change in temperature is observed at the melting and boiling point of crystalline solids.	
Equipment required: Logit! Logger Temperature sensor Beaker Stirring bar Clamp stand	
Health: Children should be supervised at all times. Children should be warned not to put their hands near the flame from the Bunsen burner. Beaker must be kept on a heat-resistant surface to avoid damage to the table. The Bunsen burner should be used with care. Beaker must be kept on a heat-resistant surface to avoid damage to the table. The Bunsen burner should be used with care.	
Setup: 1. Clamp the logging cable into the clamp stand and secure the temperature probe. 2. Fill the sensor cable around the back of the beaker stand to prevent leakage. 3. Plug the temperature probe into the logger.	
Note: The investigation is best completed using the Logger's remote logging facility. Results can then be downloaded to a computer. A computer can be used to control the logging software which also enables the investigation to be repeated and downloaded to a computer.	

Endothermic Reactions	
Subject: Chemistry	
Essence: Temperature	
Aim: To show the difference between a chemical or physical change and to also show a reaction has taken place.	
Overview: There are a few reactions in Chemistry where energy is absorbed from the surroundings during the reaction. When this happens, the temperature of the reacting substances and/or surroundings will decrease. This experiment is also a simple test of reaction enthalpy that you can use in the laboratory or at home.	
Equipment required: Logit! Logger Temperature sensor Small amount of anhydrous calcium chloride Small amount of anhydrous calcium chloride Small amount of anhydrous calcium chloride	
Health: Using water makes it safe to use. The water is not hot. Water temperature should be 10°C or below. Water should be used in a beaker. Please do not touch the hot water. Please do not touch the hot water.	
Setup: 1. Connect the temperature sensor to the logger. 2. Plug the sensor into the logger. 3. Plug the sensor into the logger.	
Note: On the picture you can see a piece of aluminium foil with the 'uLog-Sensor' attached to it. This allows for the use of small amounts of water and also allows for the use of a small amount of water in the reaction. You can use a small amount of water and a small amount of aluminium foil with the 'uLog-Sensor' attached to it. This allows for the use of small amounts of water and also allows for the use of a small amount of water in the reaction. You can use a small amount of water and a small amount of aluminium foil with the 'uLog-Sensor' attached to it.	

Soil temperature analysis	
Subject: Biology/Environmental studies	
Essence: Soil temperature sensor, SmartEye sensor	
Aim: To find how soil depth affects temperature.	
Overview: Soil temperature is affected by the intensity of radiation from solar radiation from the sun. As a result, the temperature of soil close to the surface can fluctuate during the day and night. At greater levels the temperature remains fairly constant. This unique procedure describes how you can use the logging temperature sensor with Logger to monitor the temperature of soil at various depths and also monitoring the light levels during the day. This should allow you to see how the temperature of soil can be used for environmental studies and to also perform any important calculations to be used for temperature in an important factor in plant growth and water use in the soil.	
Equipment required: Logit! Logger Temperature sensor SmartEye sensor	
Health: Children should be supervised at all times. No use of open flames or Bunsen burner. Beaker must be kept on a heat-resistant surface to avoid damage to the table. The Bunsen burner should be used with care. Beaker must be kept on a heat-resistant surface to avoid damage to the table. The Bunsen burner should be used with care.	
Setup: 1. Dig a hole into the ground to a depth of about 10cm. (Digging how many different depths you want to monitor). 2. Plug the sensor into the logger. 3. Plug the sensor into the logger.	
Note: When digging the hole, remember to also use the sensor to adjust to the temperature of the soil. This is especially important if you are monitoring soil during winter as the sensor could have been brought outside from a warm classroom. If any holes are made and the sensor is ready when the temperature is lower than 10°C, remember the soil will be disturbed the more accurate the experiment. The depth can range from 2.0 to 30.0 cm or more. It is necessary to dig a hole to find the depth at which the temperature remains fairly constant. This will be the best time to use the sensor. Results will show there is a clear immediate heating from solar radiation.	