

## NEULOG WIDE RANGE TEMPERATURE LOGGER SENSOR GUIDE



### NeuLog wide range temperature logger sensor NUL-234

The NeuLog wide range temperature sensor can be used for any science experiment which requires accurate temperature measurements such as in the fields of Physics, Chemistry, Biology, Environmental Science, etc.

The sensor comes pre-calibrated so you can start experimentation right out of the box using this guide.

Using the wide range temperature sensor over other temperature sensors has its advantages:

1. The sensor can accurately measure between 200°C and 1200°C – so it can be used in a direct flame.
2. It is extremely durable with a mesh metal wire coating.

Among hundreds of possible experimental subjects that can be studied with the NUL-233 sensor are: heat of combustion for different materials, metabolism, heat and energy transfer, material thermal conductance properties, and many more. **Sensor's Units:** Celsius: The SI (International System of Units) unit of temperature. Fahrenheit: The temperature measurement unit of the English System commonly used in the United States.

### Included with the sensor:

- NeuLog General Guide
- Temperature sensor flexible probe attached by a durable rubber-coated wire to the sensor's body.

### Sensor's specifications

	Celsius	Fahrenheit
<b>Range and operation modes</b>	-200°C to 1200°C	-328°F to 2192°F
<b>ADC resolution</b>	15 bit	
<b>Resolution</b>	0.1°C	0.2°F
<b>Max sample rate (S/sec)</b>	100	

**Experiment Duration:** 1 second to 31 days.

### Sensor's features:

- Fully digital data
  - Rugged plastic ergonomic case
  - Push button switch for Start/Stop experiments
  - LED indicator of experiment status
  - Flexible wide range temperature probe attached directly to the sensor's body by a durable metal-coated wire
- Note:** NeuLog products are intended for educational use.

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### Videos and experiment examples:

- Videos, literature and other probes can be found at [www.NeuLog.com](http://www.NeuLog.com).
- In order to access the wide range temperature sensor's page, choose "Products" on the main menu and then "Wide range temperature logger sensor".
- In order to access the wide range temperature sensor's experiments, choose "Example Labs":
  - Temperature of a Flame (C-32)

### Technical background:

The philosophy behind NeuLog's plug and play technology is based on each sensor's ability to store its own data due to an internal flash memory chip and micro-controller in each plastic NeuLog body. This technology allows the sensor to collect and then store the digital data in the correct scientific units ( $^{\circ}\text{C}$ ,  $^{\circ}\text{F}$ , Lux, %, ppm, for example).

The sensor is pre-calibrated at the factory. The built-in software in the logger can be upgraded for free at any time using the provided firmware update.

The wide range temperature sensor uses a thermocoupler to accurately measure temperatures from very cold ( $-200^{\circ}\text{C}$ ) to very hot ( $1200^{\circ}\text{C}$ ). Two wires of different compositions and thermal conductance properties are connected at the ends.

Because the metal wires have different properties, both heat and electricity are conducted at different rates. Using the Seebeck Effect, a voltage is created in the wires. Different voltages are produced at different temperatures. The voltage is directly measured and then converted into a very accurate temperature reading.

### Maintenance and storage:

- Never submerge the NeuLog plastic body in any liquid. Do not allow liquid into the wide range temperature sensor's body.
- After use, gently wipe away any foreign material from the wide range temperature sensor.
- Store in a box at room temperature out of direct sunlight.

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### Warranty:

We promise to deliver our sensor free of defects in materials and workmanship. The warranty is for a period of 3 years from the date of purchase and does not cover damage of the product caused by improper use, abuse, or incorrect storage. Sensors with a shelf life such as ion selective probes have a warranty of 1 year. Should you need to act upon the warranty, please contact your distributor. Your sensor will be repaired or replaced.

Thank you for using NeuLog!



Flexible, simple, fast, forward thinking.

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