

## NEULOG GEIGER COUNTER LOGGER SENSOR GUIDE



### NeuLog Geiger counter logger sensor NUL-247

The NeuLog Geiger sensor can be used for any science experiments or activities which utilize accurate radioactivity readings such as in the fields of: Physics, Chemistry, Biology and Environmental science.

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

The sensor can easily be reset to zero at any time.

Radioactivity is the spontaneous emission of radiation. This emission can occur from unstable atomic nuclei or as a consequence of a nuclear reaction. The most common types of radiation are alpha, beta and gamma. The NeuLog Geiger sensor measures all three types of radiation. The radioactivity of a sample can be measured by counting how many ionizing events occurred in a period of time or as rate (counts per second, for example).

Hundreds of possible experimental subjects that can be done with the NUL-247 sensor are: Radioactivity and distance, Lifetime measurements, Biological radioactive markers, measuring half-lives, Radiation shielding, etc.

The Geiger counter sensor uses the following units of measure:

- Counts: Total number of ionizing events.
- Counts/s: Number of ionizing events per second.
- Counts/m: Number of ionizing events per minute.
- $\mu\text{Sv/h}$ : Microsievert per hour.
- $\mu\text{R/h}$ : Microroentgen per hour.

### Reset to zero:

The Geiger counter sensor comes pre-calibrated however when starting a new experiment with the "counts" range, a reset option is available.

### To zero the sensor:

1. Connect the NUL-247 Geiger counter sensor to a computer/tablet/smart device following one of the guides below.
2. Open the NeuLog software.
3. When your sensor has been detected click on the Geiger sensor module box (on the left side of your screen)
4. Click on the Extra command button.
5. Click reset to zero your reading.
6. The "counts" value is now set to zero.
7. Alternatively, press on the sensor's push button for four seconds.

# NEULOG GEIGER COUNTER LOGGER SENSOR GUIDE



**Included with sensor:**

- NeuLog General Guide

Sensor specifications:			
Range and operation modes	ADC resolution	Resolution	Max sample rate (S/sec)
0-65,500 Counts	16 bit digital	1 Count	100
0-8000 Counts/s		1 Counts/s	
0-65,500 Counts/m		1 Counts/m	
0-300 $\mu$ Sv/h		1 $\mu$ Sv/h	
0-30,000 $\mu$ R/h		1 $\mu$ R/h	

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

**Sensor features:**

- Fully digital data.
- Rugged plastic ergonomic case.
- Geiger-Mueller tube
- Push button switch for Start/Stop experiments in off line mode.
- LED indicator of experiment status (blinks while collecting data).
- Pre-calibrated sensing equipment.

**Note:** NeuLog products are intended for educational use.

**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 ( $^{\circ}$ C,  $^{\circ}$ F, Lux, %, ppm, for example).

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

The Geiger counter logger sensor measures ionizing radiation on the basis of a Geiger-Mueller tube. It consists of a tube filled with a low pressure inert gas and electrodes with a potential difference between them. When ionizing radiation passes through the tube, some of the gas molecules are ionized. Electrodes are drawn to the anode and positively charged ions are drawn to the cathode. This results in a short intense pulse of current which passes from the negative electrode to the positive one.

The end of the tube consists of a mica window which is protected by a screen. It allows alpha particles, beta particles and gamma rays that do not penetrate the tube’s plastic case.

## NEULOG GEIGER COUNTER LOGGER SENSOR GUIDE



### Maintenance and storage:

- Never submerge the NeuLog plastic body in any liquid.
- Do not allow liquid into the Geiger counter sensor's body.
- After use, gently wipe away any foreign material from the Geiger counter sensor.
- Store in a box at room temperature out of direct sunlight.
- The Geiger counter sensor's tube is fragile, please handle it with care.

### Warranty:

We promise to deliver our sensor free of defects in materials and workmanship for a period of 3 years from the date of purchase. Our warranty 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.

W: [www.neulog.com](http://www.neulog.com)

E: [info@neulog.com](mailto:info@neulog.com)

A: 850 St Paul Street, Suite 15, Rochester, NY 14605

P: 1.866.553.8536

V2015.5