



# NeuLog Sound Logger Sensor Guide NUL-212



## NeuLog sound logger sensor NUL-212

The NeuLog sound sensor can be used for any science experiment which involves either sound intensity or sound wave measurements such as in the fields of Physics, Mechanics, Biology, Environmental Science, Acoustics, etc.

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

Among hundreds of possible experimental subjects that can be studied with the NUL-212 sensor are: wave theory, sound pressure, sounds intensity, sound theory (pitches, frequencies, etc.), wave interference, and many more.

The sound sensor's measurement units are:

- Decibel (dB): A measurement unit that shows intensity (loudness of sound). This is a logarithmic unit.
- Arbitrary analog units (Arb): An arbitrary unit to demonstrate waves, frequencies and periods.

### Included with sensor

- NeuLog General Guide.

Sensor specifications		
	Sound level (dB)	Sound signal Arbitrary
Range and operation modes	40 to 110 dB	0-4096
ADC resolution	12 bit	
Accuracy	±2 dB	1
Resolution	0.1 dB	1
Max sample rate (S/sec)	100	100,000
Frequency range		0-20,000 Hz

**Experiment Duration:** 25 milliseconds to 31 days.

### Sensor's features

- Fully digital data.
- Rugged plastic ergonomic case.
- Pushbutton 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.

## 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 sound sensor's page, choose "Products" on the main menu and then "Sound logger sensor".
- In order to access the sound sensor's experiments, Choose "Example Labs":

Sound Isolation (P-29)

Sound waves (P-33)

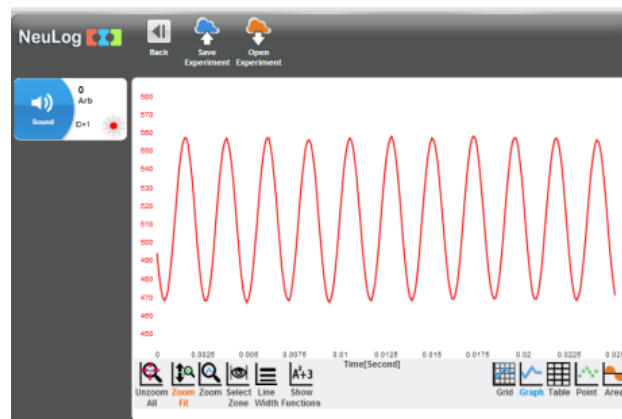
## Technical background

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 (for example: °C, °F, Lux, %, ppm).

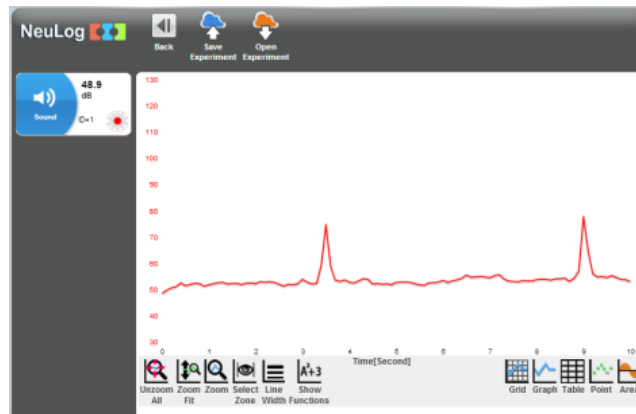
The sensor is pre-calibrated at the factory. The built-in software in the logger can be upgraded for free at any time using the provided firmware update.

The sound sensor uses an internal microphone with a series of circuits, filters, and amplifiers to best isolate a specific sound source. Sound waves enter through the hole at the top of the sensor's plastic body so you should point it directly towards the sound source for best readings.

At arbitrary mode, the wave is sampled and saved as it is in order to view its shape.



In dB mode, the wave is sampled and the average intensity (calculated by the sensor's controller) is converted into dB value.



This design of the sensor enables its use as two sensors: microphone and sound waves.

### Maintenance and storage

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

### Warranty

We promise to deliver our module free of defects in materials and workmanship for a period of 2 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 module will be repaired or replaced.

**Thank you for using NeuLog.**