

## NEULOG GSR LOGGER SENSOR GUIDE



### NeuLog galvanic skin response logger sensor NUL-217

The NeuLog GSR sensor can be used for any science experiment which utilizes the natural galvanic skin response (skin conductance) in the fields of Biology, Physiology, Psychology, etc.

Galvanic skin response or skin conductance is a measurement of changes in the skin's conductivity due to stimulus, whether it is a picture, smell, sound, touch, etc. Sweat glands are controlled by the sympathetic nervous system which release small amounts of sweat when a stimulus is sensed. This is how the GSR sensor can relate psycho-activity to sweat gland activity.

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-217 sensor are: physiological and psychological relationships and responses to stimuli, human biological demonstrations, lie detection, and many more.

The GSR sensor's measurement units are:

- Micro Siemens ( $\mu\text{S}$ ): A unit measuring electrical conductance.
- Arbitrary analog units (Arb): An arbitrary unit to demonstrate waves, frequencies, and periods.

### Connecting to the GSR sensor:

The GSR sensor needs to form a strong connection to the skin in order to work properly. For better results, the skin should be clean and wet. Attached are two probes with Velcro finger connectors. While conducting experiments, remain as still as possible.

1. Clean the bases of two fingers on the same hand with alcohol and wet them a little with water.
2. Wrap the Velcro connectors around the two bases of the fingers, securing as tightly as possible without causing discomfort.
3. For best results, ensure the flat metal piece on each Velcro connector is located on the underside of each finger.
4. Attach both the white and the black snap connectors (located on the end of the wire) to the Velcro finger connector by snapping to the exposed metal nub.

**Note:** It does not matter which connector is attached to which finger.

5. You are now properly connected to the GSR sensor.

### Included with the sensor:

- NeuLog General Guide
- GSR probes attached by means of durable rubber-coated wires
- Two white Velcro finger connectors

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Sensor specifications		
	$\mu\text{S}$	Arbitrary analog units
Range and operation modes	0 to 10	0 to 65,279
ADC resolution	16 bit	
Resolution	10 nS	1
Max sample rate (S/sec)	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 in off line mode
- LED indicator of experiment status (blinks while collecting data)
- Pre-calibrated sensing equipment
- GSR probes connected to the sensor's body by means of durable rubber-coated wires.

**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 GSR sensor's page, choose "Products" on the main menu and then "GSR logger sensor".
- In order to access the GSR sensor's experiments, Choose "Example Labs"
  - Emotional Stress Measurement (B-37)

### 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 GSR sensor uses an internal very high impedance differential operational amplifier to convert micro changes in the skins resistance and conductivity into measurable voltage. This voltage is sampled by the sensor's controller.

When a stimulus is sensed, the sympathetic nervous system reacts causing many physiological changes including releasing miniscule amounts of sweat from sweat glands. These small changes of the skin's moisture change the skin and tissue conductance, which is measured by the sensor.

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Experiments may be designed with a 12-15 second interval between stimuli. A response (a peak) can be detected between 0.8-4 seconds after the stimulus.

### Maintenance and storage:

- Never submerge the NeuLog plastic body in any liquid.
- Do not allow liquid into either the GSR sensor or probes.
- Wash hands prior to use for best results.
- After use, gently wipe away any foreign material from the GSR sensor.
- Store in a box at room temperature out of direct sunlight.

### 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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