ScienceCube

Wireless Galvanometer (WL109GV)

User Guide

Rev. WL109GV-12-2023

This product is to be used for educational purposes only. It is not appropriate for industrial, medical, research, or commercial applications.

KOREADIGITAL

The ScienceCube wireless Galvanometer can measure minute electrical currents.

The ScienceCube Wireless Galvanometer is a sensor that can measure minute currents and has better resolution than a wireless current sensor.
Galvanometer probes can detect currents weaker than ±12 mA. The usage range of the sensor may vary depending on each experiment, and the range can be changed to three levels: 0.12mA, 1.2mA, and 12mA. You can choose to change it yourself or have the sensor change it for you.
It is designed to measure smaller currents than a current sensor and can be used in a variety of experiments. A current sensor can be used when the current flowing through an electrical circuit is less than 12mA. A current sensor can be used in a variety of physics experiments.
You can measure by remotely connecting to a smart device or PC wirelessly or wired.

Suggested experiments

- Bioelectric current experiment.
- Faraday's law experiment.
- Oxidation and reduction of metal plates.

Composition

The ScienceCube wireless Galvanometer consists of the following.

- Wireless Galvanometer(WL109GV)
- USB-A/C cable
- Booklet

Feature

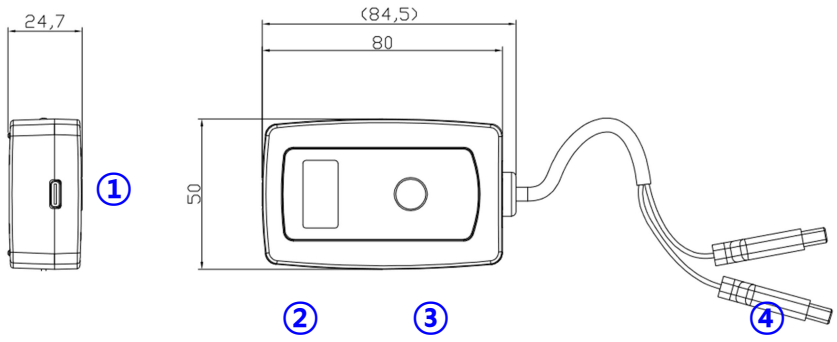
- Up to four Science Cube wireless sensors can be connected to a PC or smart device at the same time.
- It supports dual-mode Bluetooth, allowing you to connect not only smart devices but also desktop and laptop PCs to conduct experiments using the **Science#** application.
- It can be connected to a PC through a USB port and experiments can be performed using the **Science#** program.

GET IN ON Google Play

Download on the App Store

Function of wireless sensor

Structure



① USB port : Connect the sensor to a PC and use it for experiments or charging.

② OLED Display : Displays measured sensor values, sensor type, sensor ID, and remaining battery level.

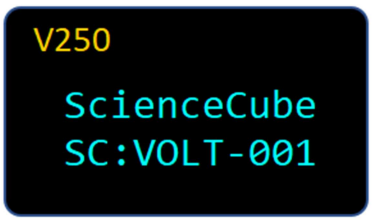
③ Power/Function Button : It has functions such as power ON/OFF, measurement sensor change and calibration, etc.

④ Sensing part : Using an alligator clip connected to the sensor.

Power/Function Button

Status	Turn	Action	Description
When the power is off	Click once	■	A short press turns the sensor on.
	Long click	■■■■■	A long press changes the mode and turns on the sensor.
When it's on	Click once	■	Change sensor type or range. (Multi-sensor or range sensor only)
	Double click	■■	1) Zero point setting (For sensors with zero point function) 2) A user calibration (if the sensor has a calibration function) is performed and **U0** or **UC** is displayed above the device.
	Long click	■■■■■	Turns off.

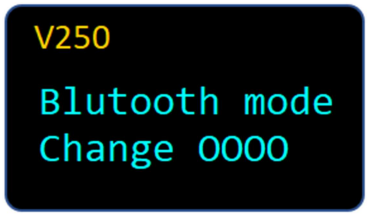
Start screen



V250 : Displays the sensor's firmware version.

SC:OOOO-001 : When you search for a Bluetooth device, the device name will be displayed. (Sensor name and 3-digit serial number)

Mode change



When you press and hold the power button and turn it on, the Bluetooth connection mode changes to **Mobile** or **PC** with the following message.

Measurement screen

①Connection mode	**Mobile** : Connecting Androidor iOS. **PC** : Connecting to Windows PC ※ A long press changes the mode and turns on the sensor.
②Sensor-ID	This is the sensor's unique number and is displayed along with the sensor name in the device name when connected via Bluetooth.
③Battery	Check the battery status, and when charging via USB, the display will change to charging.
④Value	1) Displays sensor measurement values and units in real time. 2) If **user calibration** is used, **U0** or **UC** will be displayed above the units. 3) For sensors with **multiple ranges**, the current range is displayed. 4) For **multiple sensors**, the values for each sensor type are displayed.

Features and Detail

Features

contents	Detailed description
Features	Measures micro-current Clip Red + Black - Connection Serial connection only for current measurement When zero point is set, the value is stored temporarily.
uses	Support all Bluetooth Classic, Low Energy Available in dedicated apps (Science#)

Detail

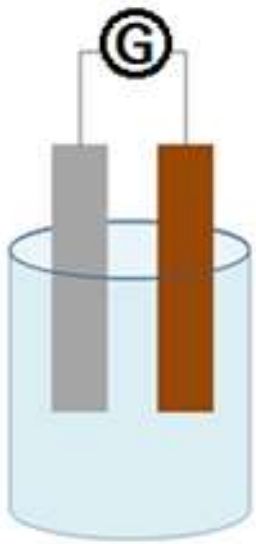
contents	Detailed description
Measurement	0.12/1.2/12 mA (3-level : manual or automatic change)
Resolution	0.001mA
Sampling Rate	Max.100 samples/second

contents	Detailed description
Interface	Windows PC (USB or Bluetooth) Android Device (Bluetooth)
Application	Science#
Operating Environment	-20 ~ 60℃, Max 85%RH
Connection	Bluetooth 5.0 or USB (Type-C)
Power	Li-Po Rechargeable Battery (700mAh) Approximately 14 hours available when the battery is fully charged.

Guide for science experiments

Experimental example: Oxidation-reduction of metal plate screen

Method



① Run Science# and connect the galvanometer sensor.

② Add 50mL of 0.1M hydrochloric acid to the beaker and connect the galvanometer sensor to the zinc plate and copper plate, respectively.

③ Experiment settings: [Automatic collection] [Line chart] [Data collection interval 20Hz] [Experiment time 5 minutes]

④ Click Start Experiment.

⑤ Repeat the above process using 0.5M hydrochloric acid and 1M hydrochloric acid.

Result

① Draw the direction of movement of electrons.

② Let's write down the parts where oxidation and reduction occurred.

③ Let's write down how the value of the galvanometer sensor changed over time and why the value changed so much.

CAUTION: Do not use the instrument beyond the measurement range or in conditions that exceed the short-term exposure limits. Prolonged exposure beyond the maximum permissible range can cause serious damage to the sensor.

Rev. WL109GV-12-2023

Contact us

TEL : +82-2-2109-8839

FAX : +82-2-2109-8881

www.sciencecube.com

Korea Digital Co., Ltd.

#804 Ace Twin Tower 273 Digital-ro Guro-gu Seoul 08381 Korea

www.koreadigital.com