ScienceCube

Wireless 3-axis Magnetic Field (WL108MG)

User Guide

Rev. WL108MG-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 Science Cube wireless magnetic field sensor can measure the strength of the magnetic field.

The wireless magnetic field sensor measures the strength of the magnetic field in front of the sensor. You can perform experiments to prove the strength of the magnetic field in solenoid coils and Helmholtz coils, Fleming's and Lorenz's laws, and easily change the X, Y, and Z-axis measurement ranges (50G, 2,000G).

In addition, there is a display window on the sensor so that the measured value can be checked immediately and it can be measured by remotely connecting to a smart device or PC wirelessly or wired without an interface.

Composition

The ScienceCube wireless magnetic field sensor *consists of the following.*

- Wireless magnetic field sensor (WL108MG)
- USB-A/C cable
- Booklet

Feature

- The magnetic field can be measured from the measuring part (rod part).
- The measurement direction is converted to X, Y, and Z axes, and the range can be changed to 50G and 500G. The change method is changed every time the power button is pressed while the sensor power is on, and the changed information is displayed on the LCD screen.
  Ex) 50G Y → Measured in the Y-axis direction in the range of 50G
- Up to 4 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.

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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

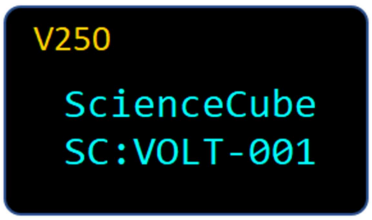
change and calibration, etc.

④ Sensing part : Contains sensors that detect 3-axis magnetic field and is protected with a black POM.

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	■■	Sensor with flip function rotates the screen 180 degrees so text is clearly visible.
	Long click	■■■■■	Turns off.

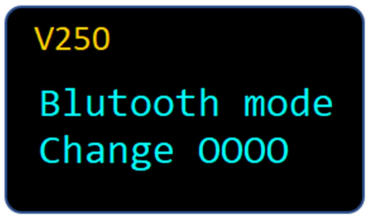
Start screen



V250 : Displays the sensor's firmware version.

SC: xxxx-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

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

Experiment method

Science Cube wireless magnetic field sensor can measure the strength of the magnetic field in the following ways.

1. Prepare to make an electromagnet using a ferrimagnet.
2. Run Science# and connect the wireless magnetic field sensor via Bluetooth.
3. Set the experiment setting to [Manual collection]-[Bar chart].
4. Press [Start] and measure the magnetic strength
5. Click [End] to end data collection or to automatically end.
6. Look at the graph and compare the size of the force.

**Please refer to the Science # content for detailed experiment information

Specifications

Item	Description
Range	±50 G, ±2,000 G
Resolution	50 G : 0.01G 2,000 G : 1 G
Sampling Time	Max. 100Hz (0.01 sec.), (Typical 1Hz)
Condition	-20 ~ 60℃, ~85%RH
Wireless Connection	Bluetooth 5.0 or Classic 2.1
Wired Connection	USB-C
Battery	700mAh Li-Polymer rechargeable
Charging Time	within 2 hours
Operating Time	Approximately 12 hours after full charge (depending on usage conditions)

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.

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- The contents of this manual are provided for informational purposes only, and product specifications and functions may be changed without prior notice to improve performance.
- This product is designed for science education. No warranty is provided and no liability is assumed for errors in industrial testing or manufacturing process controls, medical analysis or controls, or commercial design applications.

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