einstein™

imagine • explore • learn

Geiger Muller Counter

Product Number: ENGEM116

Overview

Radioactive is either emitted as particles or waves. The Geiger Muller Counter can record radiation levels and plays an important role in studying electromagnetism and radioactivity.

The Geiger Muller Counter can be connected to all types of einstein™ data loggers

Typical experiments

Electricity & Magnetic Fields

- Demonstrating the random nature of radioactive radiation
- Measuring Activity vs. Distance of a radioactive source
- Investigating the effect of different materials on absorbing radiation

How it works

Some radioactive materials emit high-energy particles powerful enough to knock electrons away from individual atoms. When these electrons are knocked off these atoms become ions. This type of radiation is known as ionizing radiation. The Geiger Muller counter contains a tube filled with low pressure gas. When the tube comes into contact with ionizing radiation new ions are created in the tube. These ions create a current used to measuring the amount of radiation.

Sensor specification

Range:	0-∞ Count, Cpm, Cps
Resolution (12-bit):	1 count
Sensitivity:	Alpha, Beta, Gamma
Window Thickness	1.5 to 2.0 mg/cm2
Window Material:	Mica
Gas Filling:	Neon, Argon and Halogen
Dead Time, at Recommended	90 µs
Data Logger Input Type:	Digital

Data logging and analysis

MiLABEx

1. Take your einstein™ Tablet OR pair your einstein™ LabMate™ with your Android via Bluetooth
2. Connect the sensor to your LabMate or your Einstein Tablet.
3. Launch MiLABEx
4. Tap on LAB – start an Experiment
5. Go to Sensors
6. Tap on Generic Sensors and Tap on Geiger Muller sensor
7. Tap V to save the sensor selection
8. Tap V to save the sensors activation.
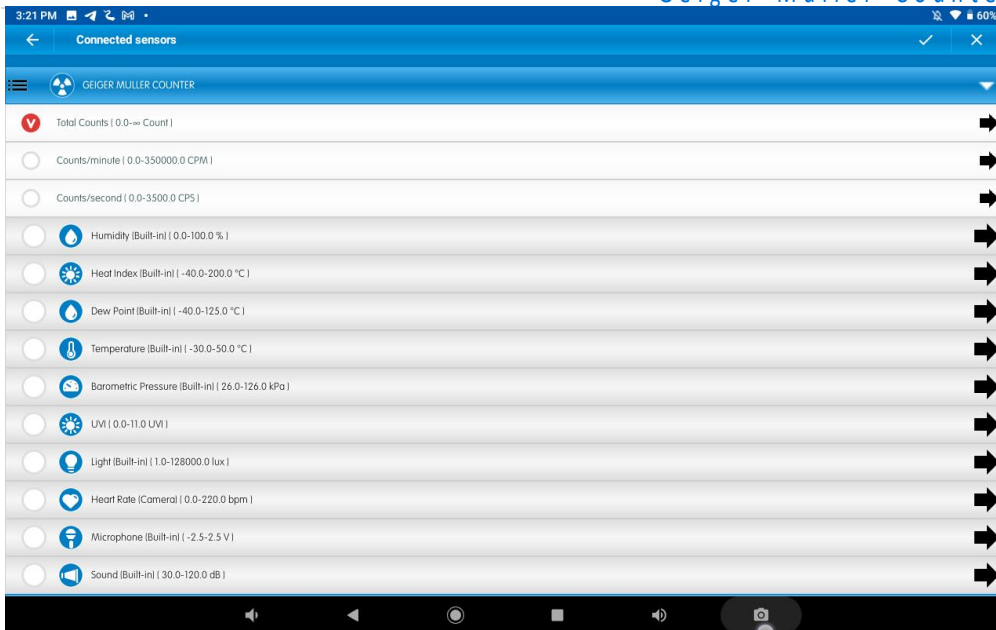
9. You are ready to Experiment

MiLABEx Desktop

1. Pair your einstein™ LabMate™ with your PC, MAC, or Linux machine via Bluetooth, or connect it via the USB cable (found in the einstein™ LabMate™ box)
2. Connect the sensor to the sensor ports sensor
3. Launch MiLABEx Desktop and then to LAB – Start an Experiment
4. Go to the full setup
5. Select Geiger Muller sensor in the empty text box
6. Select the sensor for logging
7. You are ready to Experiment

Calibration

The Geiger Muller Counter ships fully calibrated. No further calibration is needed.

Experiment set up

Important Note

The Geiger Muller Counter contains a tube made of a very thin and delicate material, which is easily damaged; therefore, it is equipped with a protective cap. The cap should be left on except when measuring Alpha radiation. The cap contains a venting hole to avoid creating a vacuum when it is removed. When removing the cap or replacing it, make sure your fingers do not cover the venting hole.

An example of using the Geiger Muller Counter

Measuring radiation vs. distance

1. Connect the Geiger Muller Counter.
2. Locate a radioactive source in front of the counter, about 30cm away.
3. Click the Run button on the main toolbar of the Launcher View to start logging.
4. Gradually, bring the source closer and closer to the GM counter.
5. See expected results on figure 1.
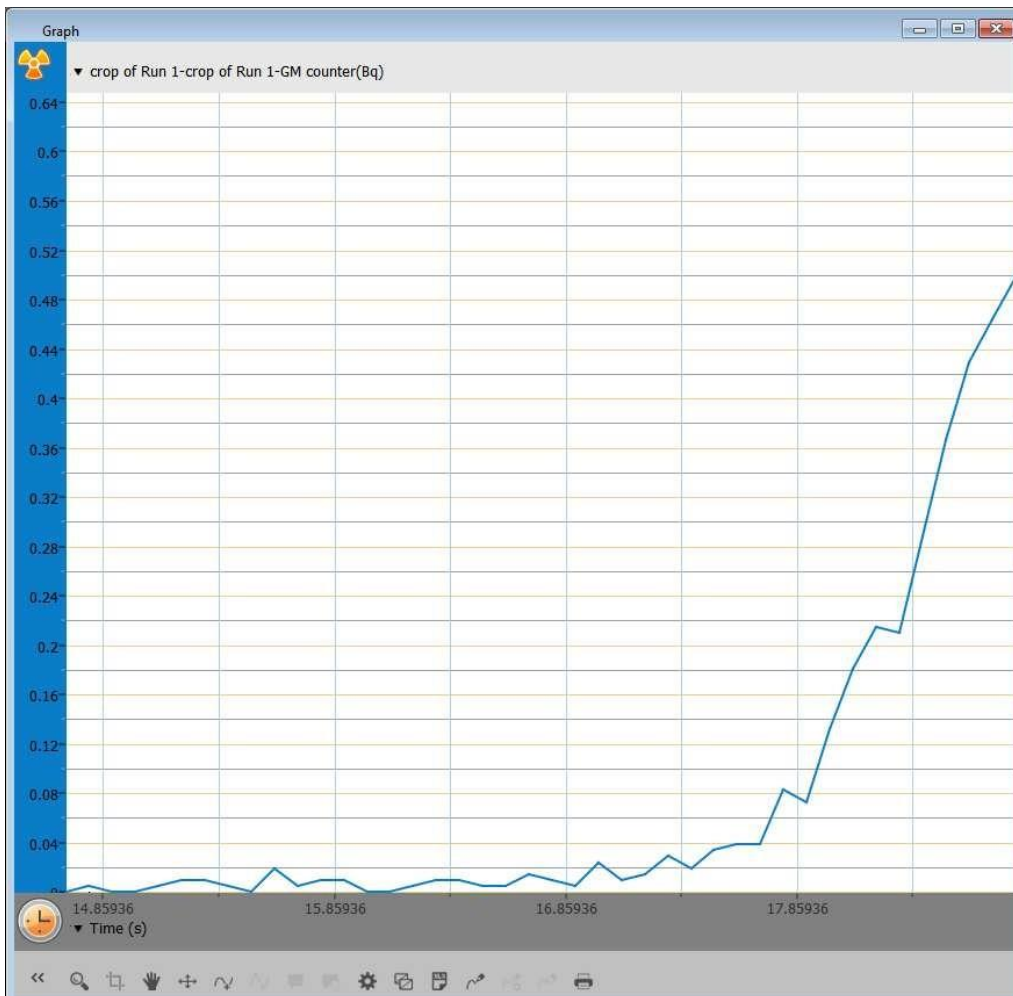
Technical support

For technical support, you can contact the Fourier Education's technical support team at: Web: www.einsteinworld.com/support

Email: support@fourieredu.com

Copyright and Warranty

All standard Fourier Systems sensors carry a one (1) year warranty, which states that for a period of twelve months after the date of delivery to you, it will be substantially free from significant defects in materials and workmanship.
This warranty does not cover breakage of the product caused by misuse or abuse.
This warranty does not cover Fourier Systems consumables such as electrodes, batteries, EKG stickers, cuvettes and storage solutions or buffers.