

Geiger Muller Counter

DT116



The Geiger Muller Counter can be connected to the Nova5000, MultiLogPRO or TriLink data loggers.

The Geiger Muller Counter has a built-in Geiger Muller tube, sensitive to alpha, beta and gamma radiation and is designed especially for automatic measurements of radioactive radiation.

The Geiger Muller Counter is supplied with a mounting rod and a protective cap. The Geiger Muller Counter's range is between 0 and 4096 Bq (**Becquerel**) and it is equipped with a power indicator and a buzzer, which emits an audible signal with each pulse that is recorded.

Typical Experiments

- Demonstrating the random nature of radioactive radiation
- Measuring Activity vs. Distance of a radioactive source
- Investigating the affect of different absorbers on radiation

How it Works

The Geiger Muller Counter is equipped with a built-in GM tube and integral power supply. This will allow direct connection to the input of the data logger that will also provide the required 5 V operation voltage.

The Geiger Muller Counter is equipped with a power indicator, indicating that an operational voltage is supplied to the unit - a yellow LED. Furthermore, the unit is also equipped with a buzzer emitting an audible signal as each pulse is recorded.

The tube's window is made of a very thin and delicate material, which is easily destroyed. For this very reason, it has been equipped with a protective cap, which may be left on in most cases, except when measuring Alpha radiation. The cap is provided with a venting hole to avoid creating a vacuum when removing the cap, or

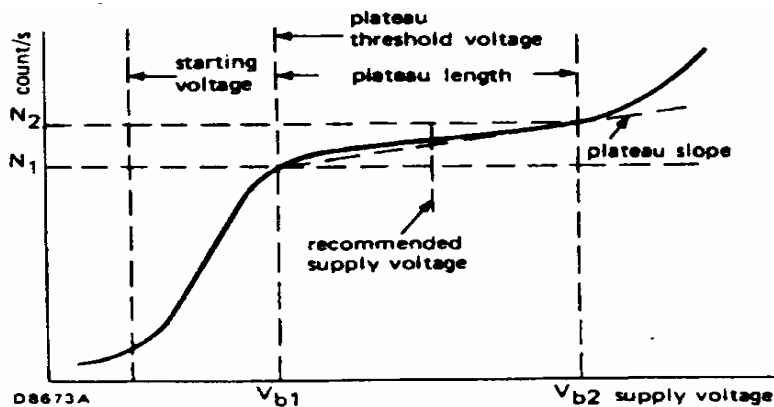
the reverse, when positioning the cap again. *It is of the utmost importance that the venting hole is uncovered when mounting or removing the cap.*

Sensor Specification

Range:	0 – 4096 Bq
Resolution (12-bit):	1 Bq
Sensitivity:	Alpha, beta, gamma
Window Thickness:	1.5 to 2.0 mg/cm ²
Window Material:	Mica
Gas Filling:	Neon, Argon and Halogen
Dead Time, at Recommended Supply Voltage:	90 μs
Plateau Threshold Voltage (Vb1):	450 V
Plateau Length (Vb2-Vb1):	150 V
Recommended Supply Voltage:	500 V
Data Logger Input Type:	Digital

Plateau:

The Plateau is the part of the diagram where the number of counts per second is (almost) independent of the voltage.





Technical Notes

- The protective cap may be left on in most cases, except when measuring Alpha radiation.
- It is of the utmost importance that the venting hole is uncovered when mounting or removing the cap.
- The Geiger Muller Counter has to be connected only to the data logger's digital inputs, which are the first or the second input for the MultiLogPRO or TriLink and all the Nova5000's inputs..
- The Geiger Muller Counter cannot be automatically identified by the data logger, so the data logger must be in *8-inputs* mode.

Calibration

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

Using the Geiger Muller Counter with the Nova5000 and MultiLab Software

1. Launch the MultiLab CE software.
2. Connect the Geiger Muller Counter to the Nova5000's sensor input starting from I/O-1.
3. Click **Setup** on the main toolbar.
4. Uncheck the **Auto Detect Sensors** checkbox.
5. Select *GM counter 4096 Bq* from the drop-down menu next to the sensor input.
6. Click the **Rate** tab and select the data logger's sampling rate.
7. Click the **Sample** tab and select the number of samples to be collected.
8. Click **OK**.
9. Click **Run** on the main toolbar to start the measurement.

Using the Geiger Muller Counter with the MultiLogPRO or TriLink and MultiLab Software

1. Set the MultiLogPRO or TriLink to *8-inputs* mode.
2. Connect the Geiger Muller Counter to the MultiLogPRO or TriLink digital sensor inputs (I/O-1 or I/O-2).
3. Click **Setup** on the main toolbar.
4. Select *GM counter 4095 Bq* from the drop-down menu next to the sensor input.

5. Click **Setup** on the main toolbar and program the data logger's sample rate and select the number of samples. Click **Run** on the main toolbar to start the measurement.

An Example of using the Geiger Muller Counter

Radioactivity activity and the distance from the radioactive source

In this experiment, we check the relationship between radioactivity and the distance between a radioactive source and the Geiger Muller sensor.

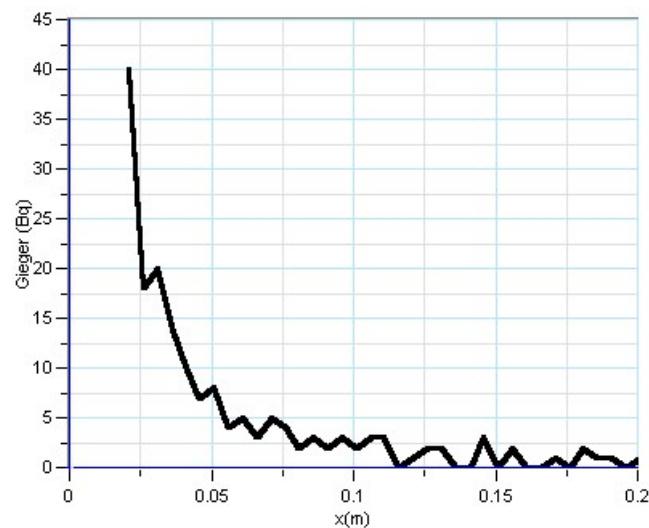


Figure 1: Activity vs. distance

Technical Support

Please contact Fourier technical support as follows:

Web: http://www.fourier-sys.com/support_support.html

Email: support@fourier-sys.com

Consult the FAQs before contacting technical support:

http://www.fourier-sys.com/support_faq.html

Copyright and Warranty

All standard Fourier Systems sensors carry a one-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.