



BG500 Radiation Detector

The BG500 is a portable radiation detector that is easy to use and provides real-time feedback on nuclear radiation activity. A Teviso BG51 solid-state PIN diode sensor is used to detect beta radiation (electrons), gamma radiation (photons) and X-rays.

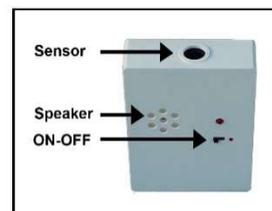
Applications

The BG500 radiation detector is recommended for the following applications, among others:

1. **Education** on nuclear physics: Measurement of the amount of ionising radiation emitted by radioactive materials. Experiments to study the properties of nuclear radiation.
2. **Medical**: Detection and measurement of the presence of radiation and radioactive material.
3. **Environmental monitoring**: Monitoring the environment for radioactive contamination, e.g. in soil, air and water.
4. **Personal radiation dosimetry**: Checking the radiation exposure of people working in radiation-relevant industries such as medical facilities, research laboratories and nuclear power plants.
5. **Safety Inspection**: Examination of persons and cargo for radioactive substances.
6. **Alerting**: Used by first responders and safety officers to monitor harmful radiation in real time.

BG500 Specifications

Measurement Range interpretation)	0.2 μ Sv/h to 1200 μ Sv/h (by acoustic 0.1 μ Sv/h to 100 mSv/h (using Signal Interface)
Pulse Rate vs. Radiation Rate	5 ppm (pulse per minute) \pm 15% for 1 μ Sv/h
Sensor Energy Response	70 keV to beyond 2 MeV
Power Supply	9 V Block-Battery
Supply Current	8 mA
Operating Time	150 hours with 9 V quality battery
Operating Temperature Range	-20°C to 50°C
Dimensions	W : 57mm L : 78mm H : 20mm
Weight	85g



- Included in the Shipment:
- 1 BG500 Radiation Detector (Battery included)
 - 1 PB40 Sensor Tester
 - 1 Operating Manual

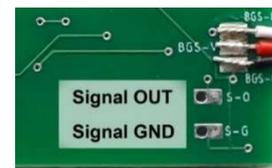
Turning the BG500 ON:

When the BG500 Detector is turned ON, one or two short beeps from the loudspeaker and one or two blinks of the LED light are indicating that the battery voltage is sufficient for reliable operation.



Functional Test:

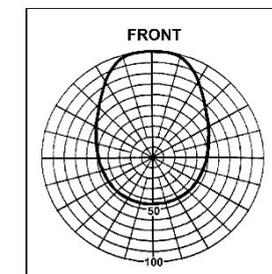
When the PB40 Sensor Tester is positioned on top of the sensor window, approx. five beeps pr second show normal function of the sensor if done in a radiation free environment. Even without using the sensor tester beeps in intervals of 1 to 2 minutes are produced by natural background radiation. Each beep indicates the transition of a photon or an electron through the intrinsic region of the PIN diode.



Connecting External Instruments:

External instruments such as pulse counters (to measure radiation rate) or microprocessors such as Arduino or Raspberry (to measure radiation dose) can be connected to the sensor terminals Signal Interface OUT/GND on the PC board of the BG500.

Pulse Amplitude	+5 V
Pulse Width	50 μ s to 200 μ s (LOW→HIGH→LOW)



Directional Response

Front: 100%, Back: 45%

Interpreting the Pulse Rate

Pulse Rate	Radiation Rate	Time of Exposure	Radiation Dose	Equivalent Effect on Human Health
1 per minute >	0,2 μ Sv/h >	1 year >	1.8 mSv >	Natural Background Radiation
1 per second >	12 μ Sv/h >	1 hour >	12 μ Sv >	One chest X-ray
10 per second >	120 μ Sv/h >	1 hour >	120 μ Sv >	10 hours flight at 8000m altitude
100 per second >	1,2 mSv/h >	4 days >	115 mSv >	Increased risk of cancer
100 per second >	1,2 mSv/h >	1 year >	10.5 Sv >	Fatal

Radiation Rate is the measure of radiation present in the environment. Radiation rate levels are reported in Sievert per hour (Sv/h).

Radiation Dose is the amount of radiation absorbed by the organism within a period of time. Radiation doses are reported in Sievert (Sv)

Facts about Radioactivity: teviso.com/en/publications.htm