

Spectroscopic Personal Radiation Detectors PM1401MB / GNB

Spectroscopic gamma and gamma-neutron personal radiation detectors recommended for use by first responders, security guards and police forces. Their shockproof case especially designed for outdoor and harsh environment applications.

Features

Polimaster's PM1401MB gamma and PM1401GNB gamma-neutron Spectroscopic Personal Radiation Detectors (SPRDs) are designed to detect radioactive and nuclear materials as well as evaluate their danger to a general public by the isotope identification.

The instrument consists of two separate parts: the PM1401MB/PM1401GNB radiation detector equipped with a Bluetooth module and Polimaster proprietary PoliIdentify software which is used for data processing and radioisotope identification. The external computing device such as PDA, laptop, or PC can be used to run the PoliIdentify software. The communication between the radiation detector and the external computing device is being done via Bluetooth channel. Such configuration provides high flexibility and a number of benefits to the end-user. For example, the radiation detector part can be used as conventional stand alone personal radiation detector (PRD) that not only to lower the instrument's cost for beginners, but also give possibility to later upgrade the instrument with identification and networking capabilities. In addition, communication via Bluetooth allows user to be at a safe distance from the possible radiation sources while the PM1401MB/GNB is operating. This configuration prevents instrument's operator from unnecessary radiation exposure.

The PM1401MB/GNB SPRD models have following functions:

- Detect only gamma or both gamma and neutron radiation sources (PM1401MB and PM1401GNB respectively);
- Search for and locate the gamma or neutron radiation sources including nuclear weapon materials;
- Alert the user of the presence of a radiation source through audible, visual and vibrating alarms;
- Record and analyze gamma spectra as well as identify radionuclide composition.

In addition to on-site identification the SPRD models have networking capabilities giving the ability to transmit data via internet for off-site analysis and identification.

The summary of all additional features of SPRD models in respect to their basic precursor models PM1401MA and PM1401GNA is as follows:

- **Bluetooth Connectivity.** The instruments are equipped with Bluetooth transmitter and connect with a Bluetooth enabled computing device, including PDAs, laptops and desk-top computers. This provides the ability to transmit the gross counts and accumulated spectra to an external computing device. The Bluetooth function also allows user to be at a safe distance from the possible radiation sources while the SPRDs are operating to provide higher degree of user's protection from the radiation exposure by distance.
- **Isotope Identification Software PoliIdentify.** A suite of isotope identification software applications that can be installed on an external computing device such as PDA, laptop, or PC and allow immediate identification and category classification of the alarming isotope(s). Simultaneous identification of multiple isotopes is also possible. Identification software can be utilized in two operation modes: automatic mode for non-trained users and expert mode for advanced users.
- **Networking Software.** Real time data exchange between a user on-site and a remote Unified Command Center (UCC) can be provided by GSM communication. The networking software named [Nuclear Protection Network](#) (NPNET™) system is available to experts at UCC. Through the NPNET™, experts can obtain on-line information about dose rates, gamma scintillation spectra, detected and identified isotopes, GPS locations of the source, live mapping of the area, and monitoring of radiation levels for the whole area of surveillance.

Applications:

- [Networked Solutions](#)
- [Security and Police](#)

Specification



	PM1401MB	PM1401GNB
Detector		
gamma	CsI(Tl)	CsI(Tl)
neutron	x	He-3
Sensitivity		
for ¹³⁷ Cs, no less	100 (s ⁻¹)/(μSv/h) (1.0 (s ⁻¹)/(μR/h))	100 (s ⁻¹)/(μSv/h) (1.0 (s ⁻¹)/(μR/h))
for ²⁴¹ Am, no less	100 (s ⁻¹)/(μSv/h) (1.0 (s ⁻¹)/(μR/h))	200 (s ⁻¹)/(μSv/h) (2.0 (s ⁻¹)/(μR/h))
Energy range		
gamma	0.033 – 3.0 MeV	0.033 – 3.0 MeV
neutron		from thermal to 14.0 MeV
Dose Rate		
gamma	0.01 – 99.99 μSv/h (1 – 9999 μR/h)	0.01 – 99.99 μSv/h (1 – 9999 μR/h)
neutron	x	1 - 999 s ⁻¹
Dose	x	x
Accuracy (at ¹³⁷Cs)	±30% (in range 0.1 – 70 μSv/h (10 – 7000 μR/h))	±30% (in range 0.1 – 70 μSv/h (10 – 7000 μR/h))
Response time	0.25 s	0.25 s
Radionuclide identification		
Special nuclear materials (SNM)	²³³ U, ²³⁵ U, ²³⁷ Np, Pu	²³³ U, ²³⁵ U, ²³⁷ Np, Pu
Medical radionuclides	¹⁸ F, ⁶⁷ Ga, ⁵¹ Cr, ⁷⁵ Se, ⁸⁹ Sr, ⁹⁹ Mo, ^{99m} Tc, ¹⁰³ Pd, ¹¹¹ In, ¹²³ I, ¹³¹ I, ¹⁵³ Sm, ²⁰¹ Tl, ¹³³ Xe	¹⁸ F, ⁶⁷ Ga, ⁵¹ Cr, ⁷⁵ Se, ⁸⁹ Sr, ⁹⁹ Mo, ^{99m} Tc, ¹⁰³ Pd, ¹¹¹ In, ¹²³ I, ¹³¹ I, ¹⁵³ Sm, ²⁰¹ Tl, ¹³³ Xe
Naturally occurring radioactive materials (NORM)	⁴⁰ K, ²²⁶ Ra, ²³² Th and daughters, ²³⁸ U and daughters	⁴⁰ K, ²²⁶ Ra, ²³² Th and daughters, ²³⁸ U and daughters
Industrial radionuclides	⁵⁷ Co, ⁶⁰ Co, ¹³³ Ba, ¹³⁷ Cs, ¹⁹² Ir, ²²⁶ Ra, ²⁴¹ Am	⁵⁷ Co, ⁶⁰ Co, ¹³³ Ba, ¹³⁷ Cs, ¹⁹² Ir, ²²⁶ Ra, ²⁴¹ Am
Standards compliance	ITRAP/IAEA requirements, ANSI N42.32, ANSI N42.33 (1), ANSI N42.34, IEC 62401	ITRAP/IAEA requirements, ANSI N42.32, ANSI N42.33 (1), ANSI N42.34, IEC 62401
Alarm type	visual, audio, vibration	visual, audio, vibration
Data recording	1000	1000
Environmental protection	IP65	IP65
Drop test on concrete floor	1.5 m (4.9 ft)	1.5 m (4.9 ft)
Power supply	one AA battery	one AA battery
Battery life time	up to 1000 hours	up to 800 hours
Operating temperature	-30°C to 50°C (-22°F to 122°F)	-30°C to 50°C (-22°F to 122°F)
Size (without cover)	103 x 57 x 32 mm (4" x 2¼" x 1¼")	194 x 57 x 32 mm (7 5/8" x 2¼" x 1¼")
Weight		
(without cover)	270 g (9.52 oz)	430 g (15.2 oz)
(with cover)		
Low battery warning	LCD	LCD
Overload indication		
gamma	OL	OL
neutron	x	999
PC Communication	IRDA, Bluetooth	IRDA, Bluetooth