# Model 940 Radioactive Isotope Identification Device
# Surveillance and Measurement (SAM)



**Features:**

- Completely portable isotope identification system in one hand
- Indentification of multiple radionuclides concurrently within one second
- Special Nuclear Material (SNM) detection, enhanced with integrated neutron detection option
- Spectra and user settings transfer easily to PC through CompactFlash card, Ethernet, or USB adapter
- Operates for over 6 hours on standard AA batteries

**Applications:**

Emergency Response, Law Enforcement, Homeland Security, Undercover Surveillance, HAZMAT, Industrial, Medical, Radiation Safety, Passenger and Freight Monitoring, Non-proliferation Enforcement, Health Physics, Environmental Waste Monitoring, Unattended/Remote Monitoring

Model 940

# Radioactive Isotope Identification Device (RIID)

## The SAM 940

New radioactive isotope identification instruments from Berkeley Nucleonics Corporation (BNC) offer specialized options for use in the health physics, law enforcement and homeland security industries. The SAM Defender (standard resolution) and SAM Revealer (high resolution) are portable radiation identification systems developed to provide simple operation for the first responder who needs to react quickly, as well as detailed analyses for the sophisticated technical user. Several modes of operation give all users the information they need right at their fingertips.

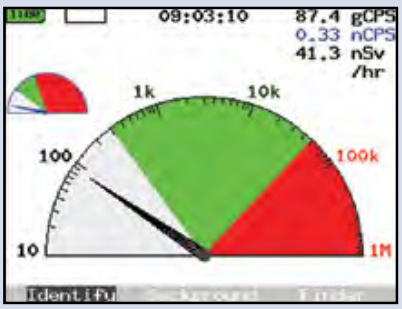
## Detector Options:

The SAM systems offer several detector choices:

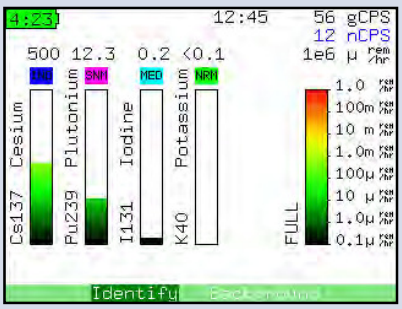
**Sodium Iodide:** For isotope identification, good efficiency and optimum price/performance, the Sodium Iodide option (NaI) gives users fast and accurate identification at an excellent value. The NaI option utilizes advanced algorithms to discriminate peaks and identify sources in real time.

**Cerium Bromide**: For the professionsal spectroscopist, an optional CeBr detector is available for the SAM system. This new material offers the end users a typical resolution of 4.5% at 662 KeV and ensures the spectroscopic reports have unparalleled analytical capability.

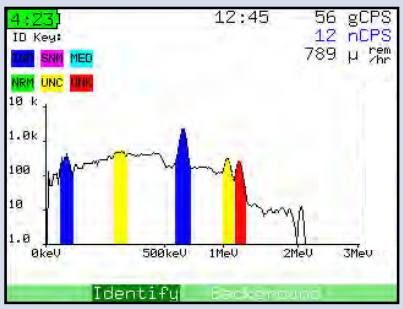
**Lithium:** For Sensitive Nuclear Material detection or safeguarding of WGPu, the Lithium ( $^{6}$LiI) option for the SAM system allows users to alarm on neutrons and perform a variety of coincidence checks, comparing peak analysis with the presence of neutron radiation.




Quickly determines location of materials and where to collect data for further analysis.




Continuously displays detected isotopes, class, and dose rate for multiple source identification.




Color coded peaks depict source category, intensity, and stored data.

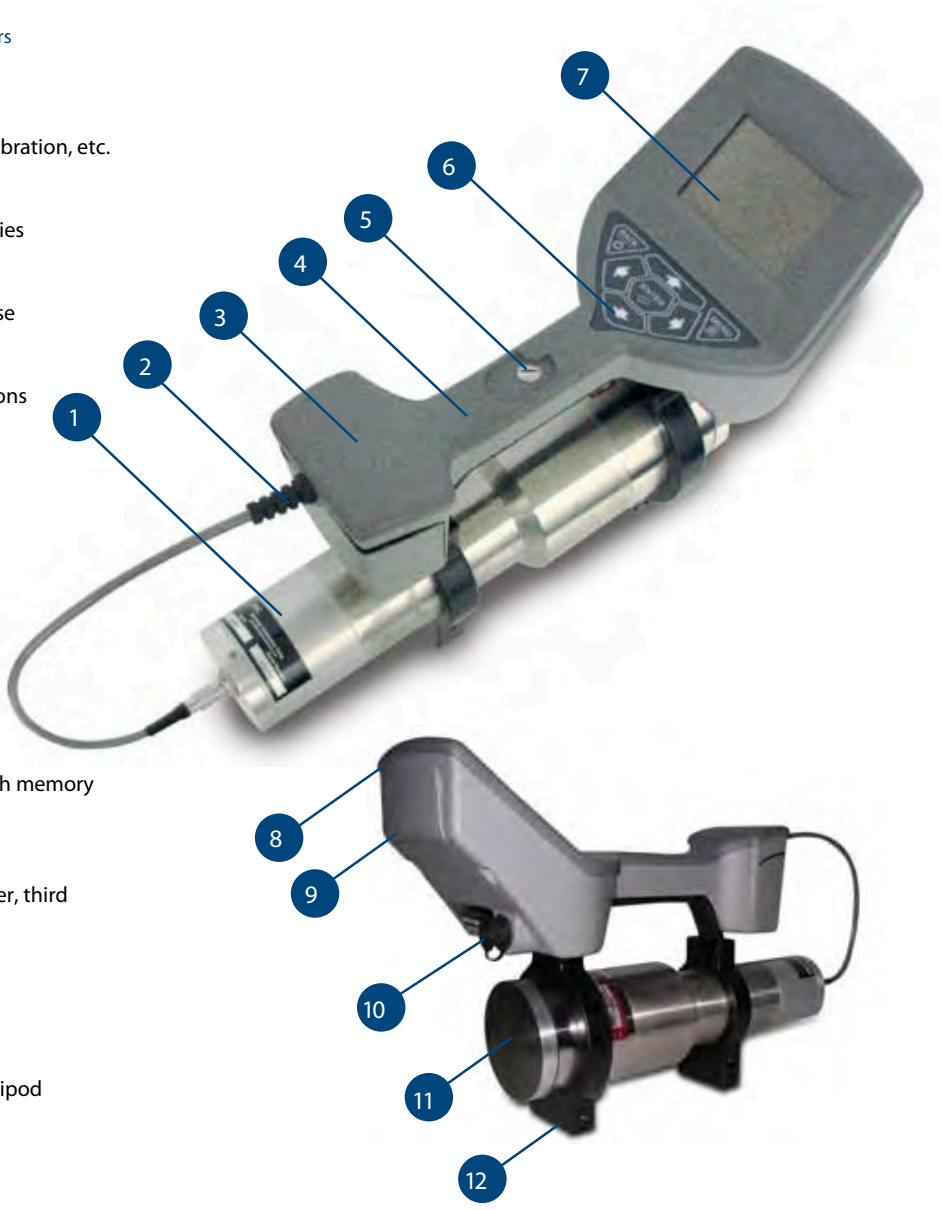
## First Isotope Identifier RIID Designed After ANSI 42.34

For years, the Surveillance and Measurement System (SAM) family of instruments has been synonymous with high overall performance in a portable isotope identifier. The earliest SAM model was the first real-time radiation area monitor capable of isotope identification in one second. A later model was the first device to give field operators the ability to identify sources on the move without having to stop and hold position while the instrument collected data. BNC continues its legacy of technical progression with the release of the Model 940 designed in response to ANSI 42.34 (American National Standard Performance Criteria for Hand-held Instruments for the Detection and Identification of Radionuclides).

The systems offer a variety of Gamma Detectors and an optional Neutron Detector. A convenient Ether net connection, CompactFlash card, USB adapter, or RS-232 ensure easy data storage, archive, or transfer. Spectral reporting is generated in XML compliant formats according to the ANSI N42.42 standard. An auxiliary port allows the use of application-specific third party hardware such as a Bluetooth data transmission, or wireless 802.11 / ZigBee protocol. The new compact, portable, and lightweight enclosure is ergonomically designed for single-hand operation which is ideal for downrange use or in hot zone environments. Whether your work involves emergency response, interdiction, or environmental clean-up, the new SAM Defender and SAM Revealer will deliver the most advanced tools available in a portable isotope identifier.

## SAM 940 Features

1. High Performance Gamma/Neutron Detectors
   Choose from NaI, $^{6}$LiI, or CeBr options
2. IP56 Rated Enclosures & Cable Assembly
   Ideal for field environments, rain, dust, vibration, etc.
3. Battery Compartment
   Uses standard or rechargeable AA batteries
4. Handheld, Ergonomic Package
   Reduces fatigue during extended field use
5. Detector Retention Clip
   Hot-swap detectors for various applications
6. Workglove Friendly Soft-Keys
   With Tactile Feedback
   Ideal for operators wearing PPE
7. Ultra-Bright Transreflective
   32000-color Display
   Effective for outdoor, any-angle viewing
8. Light-Weight System
   4.5 lbs. with detector included
9. Water-Resistant I/O Panel
   Includes network ready connectivity, flash memory card, backup of ANSI compliant reports
10. Auxiliary Port
    Provides serial communication, AC power, third party applications
11. Temperature Stabilized Detector Circuitry
    With norm auto-calibration
12. Stable Base Unit
    Convenient for lab analysis or optional tripod mount for fixed geometry applications



# SAM 940 Specifications

## Essential Services

To address the complexity and benefits of using the SAM Handheld Isotope Identifier instruments, our team of health physicists and first responder trainers offer a variety of support services. From classroom exercises to onsite field testing, Berkeley Nucleonics has built an enhanced support architecture to give you application-specific solutions. We offer onsite and regional training programs, custom application development, and a robust reachback program that supports a range of radiation detection.

### MODEL SELECTOR

| | | | | |
|---|---|---|---|---|
| 940-2-G | SAM Defender | Isotope Identifier | 2x2 NaI | 7% Resolution |
| 940-2-GN | SAM Defender GN | Isotope Identifier w/ Neutron | 2x2 NaI, $^{6}$LiI | 7% Resolution |
| 940-3-G | SAM Defender | Isotope Identifier | 3x3 NaI | 7% Resolution |
| 940-3-GN | SAM Defender GN | Isotope Identifier w/Neutron | 3x3 NaI, $^{6}$LiI | 7% Resolution |
| 940-2C | SAM Revealer | High Resolution Isotope Identifier | 1.5 x 1.5 CeBr | 4.5% Resolution |

### SPECIFICATIONS

| | |
|---|---|
| Detector: | NaI, $^{6}$LiI, or optional CeBr |
| Integrated Electronics: | Digital signal-processing MCA |
| Energy Range: | 18 keV – 3 MeV |
| Controller Display: | 320 x 240 high brightness 32000-color 3.5″ transflective LCD display |
| Controller I/O: | 10/100 Ethernet port and CompactFlash reader with USB adapter |
| Power: | 8 standard AA batteries |
| Weight: | 4.5 lbs. with 2″ x 2″ NaI detector and batteries |
| Dimensions: | 12″ L x 4″ H x 5″ W (excluding detector) |
| Water/Dust Resistance: | IP56 |
| Temperature Range: | -20 to 50°C |
| Controls: | 7-key custom keypad with one-thumb operation |
| Alarm: | Visual (on screen) and Audio (internal speaker or optional headphones) |
| Detachable Detectors: | 2″ x 2″ or 3″ x 3″ NaI detector options, with or without Neutron detector<br>Integral HV bias supply and optional CeBr detector |
| Patented Technology: | Quadratic Compression Conversion (QCC) allows for identification of mixed isotopes in one second |
| Hysteresis: | Provides 97% I.D. confidence level in 2 seconds |
| ADC: | Type: Base converter 14-bit pipelined-flash<br>Conv. Modes: Linear 256, 512, 1024<br>QCC 256, 512 (U.S. Patent 5,608,222) |
| Calibration: | Automatic stabilization with temperature |
| Customization: | Modifications of isotopes and their associated energy lines, either in the field or using Microsoft Excel ®<br>Essentially no limit to number of isotopes or lines<br>Sound and language preferences can be changed |
| Library: | Standard N42.34 ANSI isotopes, ITRAP/IAEA list, medical, industrial, SNM, or user-defined lists |
| Functions: | Nuclide identification, spectrum analysis, dose rate calculation (rem/Sv), total dose, audible search tool, data logging |

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