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

Features
- One Hand / One Glove Operation
- Identification of multiple radionuclides concurrently within one second
- Special Nuclear Matereal (SNM) detection, enhanced with integrated neutron detection option
- Industry Leading Spectral Resolution
- Transfers spectra and user settings easily to PC through Compact Flash card, Ethernet, or USB adapter
- No Warm Up or Waiting Period
- Network Ready with ANSI N42.42 Data Transmission
- Highest Sensitivity and Response in Real Time
- Operates Accurately in High Background
- Auto Calibration and Stabilization with NORM

Applications
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 Resolver (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.

**Lanthanum Bromide:** For the professional spectroscopist, an optional LaBr detector is available for the SAM system. This new material offers the and users a typical resolution of 2.8% at 662 KeV and ensures the spectroscopic reports have unparalleled analytical capability.

**Lithium:** For Sensitive Nuclear Material detection or safeguarding of WGPu, the Lithium (\(^{6}Li\)) 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.

![Images of detector options](image)

- 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 progress 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 Ethernet 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 GPS (global positioning system), 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 Resolver will deliver the most advanced tools available in a portable isotope identifier.

**SAM 940 Features**

1. **High Performance Gamma/Neutron Detectors**  
   Choose from NaI, NaI, or LaBr 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, GPS integration, 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
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

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
<th>Resolution</th>
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<tbody>
<tr>
<td>940-2-G</td>
<td>SAM Defender</td>
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<tr>
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</tbody>
</table>

Specifications

Detector: Nal, "Lil, or optional LaBr

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" Nal 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)

Detachables Detectors: 2" x 2" or 3" x 3" Nal detector options, with or without Neutron detector

Integral HV bias supply and optional LaBr 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

Optional Modules: Serial GPS receiver for spectral report mapping, wireless communications

ADC: Type: Base converter 14-bit pipelined-flash

Conv. Modes: Linear 256, 512, 1024

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®

Essentially no limit to number of isotopes or lines

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