



Model 935 (portable) Surveillance & Measurement System



SAM 935 Portable Surveillance and Measurement System

Features

- ▶ Completely portable spectroscopy system with integrated MCA
- ▶ Accurately identifies multiple radionuclides concurrently within 1 second (real time)
- ▶ Continuum (including backscatter) is tooled out for I.D. at or below ambient background
- ▶ Special Nuclear Material (SNM) detection (enhanced with neutron detector option)
- ▶ Isotope specific and total dose rate display
- ▶ Nuclide library of more than 100 isotopes
- ▶ Enables user to modify isotope energy lines
- ▶ Integrated analysis for identification and calculation of dose rate
- ▶ Multiple trigger lists for distinct isotopic applications (counter-terrorism, environmental, medical, industrial, customized, etc.)
- ▶ Background subtraction performed every second for enhanced sensitivity

The portable SAM 935 radiation Surveillance and Measurement system was developed to ensure that technical users, as well as non-technical users, would find it simple to operate, yet highly versatile. The three modes of operation are intuitive and easy to interpret. The system is complete and eliminates the need for an external computer for operation or analysis.

Upon power-up the instrument automatically indicates identified isotopes, their category (medical, industrial, Special Nuclear Material, or custom categories) and calculates isotope specific dose rate. Calibration of the SAM 935 is initiated by simply pressing one of the unit's four soft-key controls with a Cs137 source present.

The SAM 935 utilizes advanced gamma-spectroscopy technology and a proprietary Quadratic Compression Algorithm (QCC) within the system's firmware to accurately and reliably identify isotopes within 1 second. This technique insures minimal false alarms and confidence levels above 97% even when users are detecting and identifying weak sources below background levels of intensity.

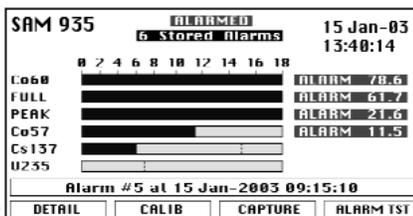
The SAM 935 has a unique feature that tools out continuum including Compton and Bremsstrahlung. This algorithm enables users to identify low energy peaks in the presence of intense high energy isotopes and x-ray backscatter. The SAM 935 time slice technology coupled with its continuous background subtraction enables the instrument to monitor moving vehicles, cargo, RDD (dirty bombs), environmental samples, as well as buildings and portals.

Equipped with the SAM 935, the users are able to ID and measure the intensity of isotopes, determine risk scenarios and enact appropriate standard operating procedures immediately.

Applications

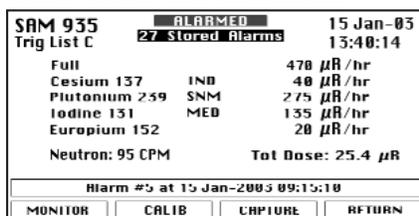
- ▶ Emergency Response
- ▶ Law Enforcement
- ▶ Border Security
- ▶ HAZMAT
- ▶ Industrial
- ▶ Medical
- ▶ Radiation Safety
- ▶ Portal Monitoring
- ▶ Passenger and Freight Monitoring
- ▶ Non-proliferation Enforcement
- ▶ Health Physics
- ▶ Environmental Waste Monitoring

Monitor Mode



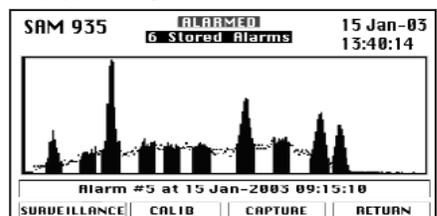
Shows detected isotope intensity as sigma (standard deviations) above background.

Real Time Surveillance



"Easy Mode" operation is automatic. Continuously displays identified isotopes, category, isotope specific dose rate and neutron count.

Detail-MCA



Live spectrum being acquired is displayed and updated each second. MCA performs analysis on present or stored alarms and prepares a multipage report for printing or email.

**BNC**

Model 935 Specifications

Features

Functions

Nuclide identification, spectrum analysis, dose rate (rem/Sv) calculation, total dose, audible search tool.

Integrated Electronics

Digital Multi-Channel Analyzer, spectroscopy amplifier, power supply

Internal Gamma Detector (standard)

1.5" x 2" NaI detector with integral HV supply
HV control from 0 - 1200 V, but actual operating voltage is automatically determined by the detector characteristics

Internal Neutron Detector (optional)

He-3 proportional detector with polyethylene (UHMW) moderator
Gas Volume: 10.4 cc
Gas Pressure: 20 atm
Integral HV supply and shaping amplifier
Integral upper and lower level discriminators and logic output for Neutron recognition

External Gamma Detector (optional)

2" x 2" NaI detector with integral HV supply
3" x 3" NaI detector with integral HV supply
Detector cables available: 3 ft. - 100 ft.
Custom NaI Detector

Physical Dimensions

Weight: 5 lbs. with 1.5" x 2" NaI and batteries

Dimensions: 12" W x 8 5/8" H x 2" D

Protection: Water resistant & dust tight

System Specifications

Energy Range

18 keV - 3 MeV

Amplifier

Type: Pseudo-Gaussian

Shaping: Bipolar

Coarse Gain: 1x, 2x, 4x, 8x

Fine Gain: 1.000 to 2.550 in steps of approximately 0.0006

Temp Operating Range

-20 c to +50 c

ADC

Type: Base Converter 14-bit Successive Approximation

Conversion Modes: Linear - 256, 512, 1024 Channels

QCC - 256, 512 Channels (U.S. Patent 5,608,222)

LLD: 0 to 105% of full scale digitally adjustable in .1% intervals

ULD: 0 to 105% of full scale digitally adjustable in .1% intervals

Zero: -5 % to + 5% of full scale, digitally adjustable

Special Features

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.

Customizability

Modifications of isotopes and their associated energy lines can be added, deleted, or changed in the field with no computer needed.

128 Customizable Isotopes in the library

400 Customizable Energy Lines

Trigger Lists

Multiple trigger lists for different field applications (Anti-Terrorism, Environmental, Medical)

Ease of use

Password Lockout Mode for non-technical personnel

Hands-free operation

Calibration

Automatic Coarse Calibration with Cs137

Automatic Fine Energy Calibration with EU152

Dose Rate Calibration

Controller

Display: 240 X 128 high contrast black-and-white FSTN graphics with CCFL backlight Monochrome LCD, 10 1/2 x 5 1/2 cm

I/O: DB9M RS-232 port for printer or computer connection

Clock: Battery-backed-up clock calendar

Controls: 10-key custom keypad utilizing software programmable function keys

Alarm: Audio/Visual: Gamma - Red LED
Neutron - Yellow LED

Batteries and Accessories

Power: NiMH; Internal battery pack; external factory-supplied dual mode supply/charger, 12w; Continuous 110V Operation Available, 8 hr. battery life

Accessories

External battery charger, AC car adapter, ruggedized Pelican case, Quantitative Analysis Software, Printer, Rubber Boot for extreme ruggedness, Tantalum Shield, Check Sources.

Berkeley Nucleonics Corporation 

3060 Kerner Blvd., #2, San Rafael, California 94901 Tel: 415-453-9955 Fax: 415-453-9956 www.berkeleynucleonics.com