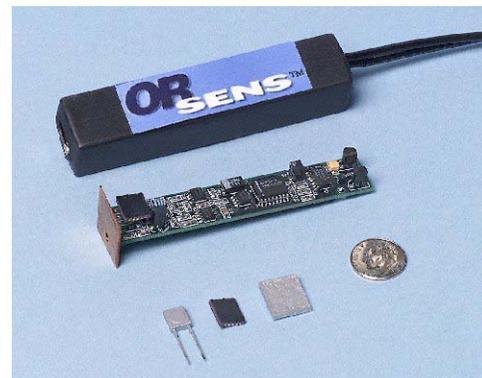




## Inexpensive Gamma-ray Detector

### Overview

The RADSiP™ II gamma-ray sensor is a small, inexpensive, virtually passive hardware system designed for individual-item monitoring of radioactive materials. The system provides a method for maintaining 24-hour surveillance of stored radioactive items and recording any gamma-ray change. The system can be retrofitted into existing storage configurations and operated in either a fixed or mobile mode. Applications include nonproliferation monitoring, spent fuel safeguards, and long-term monitoring of stored radioactive wastes.



### System Operation

RADSiP™ II sensors monitor the gamma-ray emission from special nuclear materials (SNMs). The sensors are affected by source (SNM) distance, collimation of the source, and the SNM container thickness and material. The count-rate is maximized by placing the sensors as close as possible to the source.

Main elements within the sensor unit are a Silicon-PIN photodiode, a low-noise preamplifier, and a pulse-shaping amplifier. Signal levels can be selected by a pulse height discriminator, lower-level adjustment for precise gamma-ray energy band monitoring of uranium-235. The Surface Mount Technology (SMT) circuit board is designed for use with either a silicon-PIN photodiode or a CdZnTe gamma-ray radiation detector ([RADTELL™ II](#)).

### Features

- Gamma-ray attribute measurement of each item in storage
- Selectable gamma-ray energy band from 20 keV to 100 keV
- Automatic indication of system problems
- Pulse height discrimination of unwanted noise
- Stable low-cost preamplifier-amplifier electronics

### *Point of Contact:*

Joe Williams  
Advanced Nuclear Measurements and Control  
Oak Ridge National Laboratory  
P.O. Box 2008  
Oak Ridge, TN 37831-6010  
Phone: 865-576-8285  
FAX: 865-576-8380  
E-mail: [williamsja@ornl.gov](mailto:williamsja@ornl.gov)