

New Trends in Radiological Sensors

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Nu Scientific

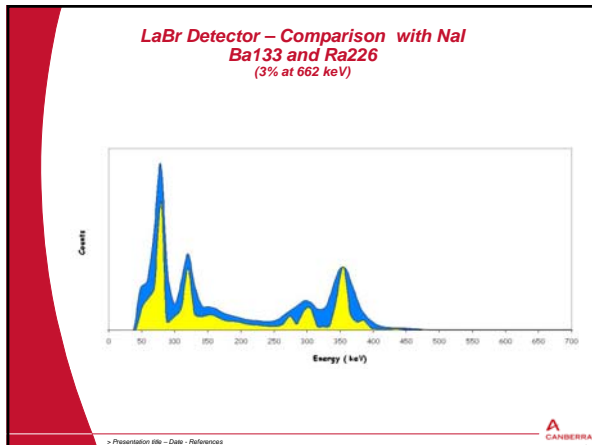
- ▶ Inspector-1000 with LaBr
- ▶ Falcon-5000 with HPGe
- ▶ First Responders equipment
- ▶ Building Protection

▶ Presentation file - Date - References

Main problems to overcome


- ▶ False Positives
- ▶ Easy to use
- ▶ Clear information and straightforward responses
- ▶ Accuracy of equipment in all situations
- ▶ Safe to use
- ▶ Cost effective

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**InSpector 1000
Detector Technology**

- ▶ 1.5"x 1.5" LaBr Gamma Detector
 - ♦ Higher Resolution than NaI
 - ♦ More Accurate Nuclide ID
 - ♦ Fewer False Positives
 - ♦ Stabilized Probe
 - ♦ Basic and expert modes

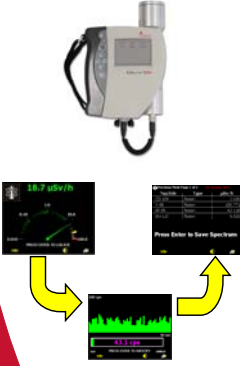


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InSpector 1000
NaI or LaBr based Radiation Identifier



**Locate and Identify
Basic Mode**

- ▶ Detachable NaI or LaBr detector
 - ♦ Unique, new LED stabilized probe retains energy stability from -10°C to 50°C
- ▶ Optional neutron detector
- ▶ Bright, color graphic touch screen display
- ▶ 12 hour battery life
- ▶ Advanced spectral analysis processing



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LaBr Now Available


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InSpector 1000 Detector Technology

- ▶ **Patented Stabilization Scheme**
 - Identify and quantify at a moment's notice regardless of the temperature (patent °C pending). Typical stability is $\pm 2\%$, range is $-20\text{ }^{\circ}\text{C}$ to $+50\text{ }^{\circ}\text{C}$
 - No radioactive source required for calibrations with Canberra's new sourceless stabilized probe.
 - More usable with its new easy-to-use user's interface, five minute training with one button.
 - Neutron probe option to detect both gamma and neutrons simultaneously.

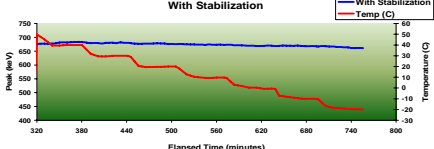


US Patents 7,005,646B1 and 7,049,598

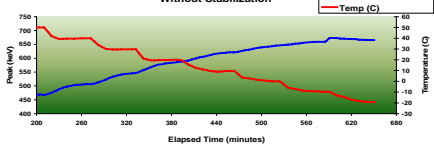


Expected Performance: Stabilized LaBr


With Stabilization



Without Stabilization



- ▶ Stabilized NaI performance (shown): $\pm 2\%$ over $-20\text{ }^{\circ}\text{C}$ to $+50\text{ }^{\circ}\text{C}$ range
- ▶ Similar performance is expected for stabilized LaBr



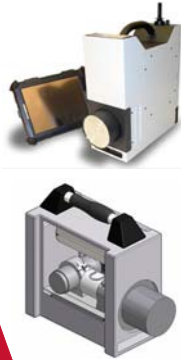
The standard Inspector The Ruggedized Inspector 1000 and soon a new addition





Available end of 2006



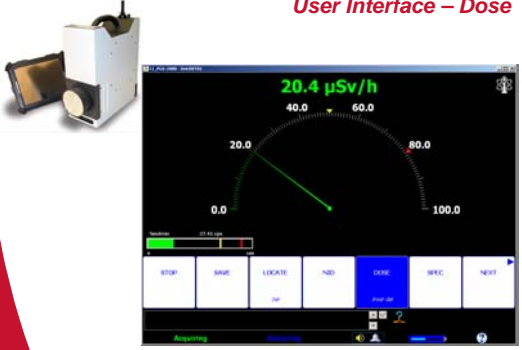
HPGe Based Nuclide Identifier System




- ▶ Fewer false positives
- ▶ More accurate results
- ▶ 20 % HPGe detector
- ▶ Time Tested Genie 2000 Algorithms
- ▶ Windows Tablet PC with High Resolution Display
- ▶ Wireless communication supports Cover/ Remote Applications
- ▶ Wired Connection supports secure (no Wireless allowed)
- ▶ Electric Pulse Tube Cooler
- ▶ Built in GPS
- ▶ Email Data Transfer to Control Center for Expert Review



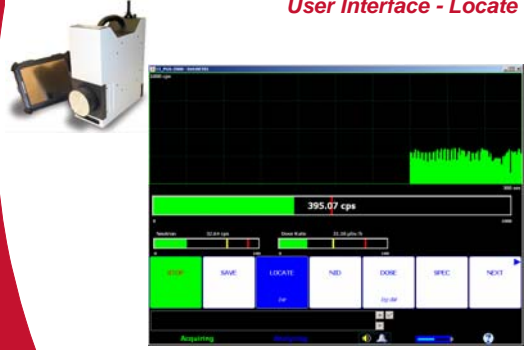
HPGe Based Nuclide Identifier User Interface – Dose




20.4 $\mu\text{Sv/h}$



HPGe Based Nuclide Identifier User Interface - Locate



395.07 cps



HPGe Based Nuclide Identifier User Interface - Spectrum

HPGe Based Nuclide Identifier User Interface - Spectrum

STOP SAVE LOCATE NID DOSE SEFC NEXT

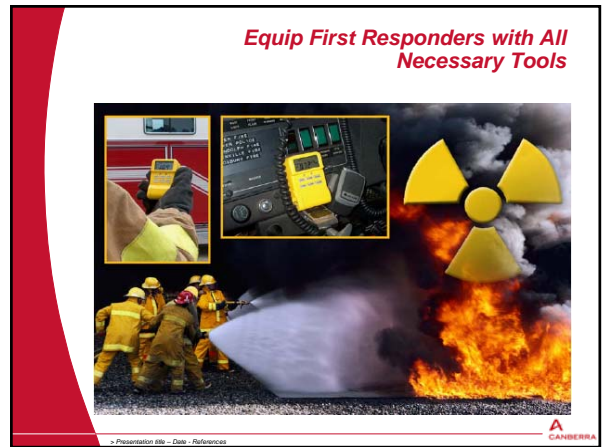
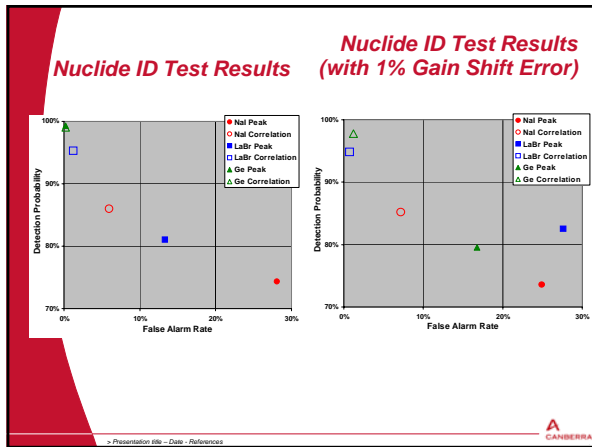
CANBERRA

HPGe Based Nuclide Identifier User Interface - NID

HPGe Based Nuclide Identifier User Interface - NID

STOP SAVE LOCATE NID DOSE SEFC NEXT

CANBERRA



Emergency Response Solution: Equip Responders to Protect Themselves and the Public

Emergency Response Hand-Held Equipment

Rapidly Deployable Radiation Monitors

Mobile Vehicle to Detect Radiation

- ▶ Equip first responders to detect radiation and respond to events
- ▶ Detection equipment for protecting the health and safety of first responders and population during an emergency.
- ▶ Transmit system data to operations center.

CANBERRA

UltraRadac Personal Radiation Monitor

Hand-Held Radiation Detectors

- ▶ Security personnel and rescue personnel could be provided with hand-held devices
- ▶ Military specifications; very rugged

Wireless data transmission

capability enables authorities to analyze the situation by reading radiation levels from multiple locations simultaneously

Example Deployments

- ▶ Victorian Dept of Human Services
- ▶ Victorian Country Fire Authority
- ▶ South Australian Police (SAPOL)
- ▶ ARPANSA Emergency Response Unit
- ▶ Emergency responders in 50 states (000,s)
- ▶ U.S. military (thousands of units)
- ▶ Allied military forces (thousands of units)
- ▶ U.S. Park Police (50 units)
- ▶ U.S. Capitol Police (50 units)

CANBERRA

InSpector™ 1000 1.1

The InSpector 1000 offers the full power of Canberra's time-tested spectrum processing algorithms – minimizing false positive identifications while improving sensitivity for low level, shielded and mixed sources, or sources "hidden" by natural or legitimate radioactive materials. The InSpector 1000 provides a flexible application-specific response by accommodating different detector/probe sizes and technologies.

- Monitor
- Locate
- Identify and Quantify

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Inspector 1000

Material Source Identification

- ▶ Inspector 1000 and similar equipment can identify type of contaminant
- ▶ Enables authorities to take appropriate action based on nature of radioactive material

Example Deployments

- ▶ ANSTO Safety Division
- ▶ Westmead Hospital Nuclear Medicine
- ▶ New York City Fire Department
- ▶ Orphan radioactive source recovery in 10+ countries for U.S. DOE
- ▶ IAEA
- ▶ SINGAPORE Emergency response
- ▶ Customs Departments
- ▶ Emergency Response Units

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MiniSentry Support Evacuation

Radiation Contamination Screening

- ▶ Rapidly deployable radiological screening portals for immediate transport to location of radiological event
- ▶ All pedestrians in the vicinity can be screened
- ▶ Deployment time is 10 minutes
- ▶ Could be pre-positioned at area hospitals for screening following a radiological event

Example Deployments

- ▶ Emergency Response Groups
- ▶ Nuclear Medicine Departments
- ▶ Canadian Homeland Security
- ▶ Minnesota Department of Homeland Security
- ▶ Greensboro, North Carolina Emergency Responders

Figure 2.3 Typical Display

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Radiagem 2000 Portable Survey meter & SMART Probes

Many other SMART Probes available

Example Deployments

- ARPANSA
- South Australian EPA
- Orphan Source Project (+10 Asian Countries)
- ANSTO Safety Division

→ Presentation file – Date – References

RadPatrol Protection System: A Dedicated System to Protect Buildings and Other Targets Against Radiological Attack

GP119 Detector

GP119 Detector Mounted on Building

HVAC – Exhaust HVAC – Air Supply

Lobby

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