DiscoveRAD

The most efficient Radionuclide Identifying Device (RID)

CAEN SyS

Systems & Spectroscopy Division

The Challenge

The identification of radioactive material in the shortest possible time with high confidence, even for SNM, Special Nuclear Materials, is essential in scenarios such as terrorist threats through RDD's (Radioactive Dispersal Device), nuclear accidents, nuclear transports, nuclear safeguards, and nuclear security operations.

CAEN has realized three innovative products, qualified them with key customers and obtained NATO stock numbers:

- **DiscoveRAD,** a high efficiency radionuclide identifier (RID)
- **SNIPER-GN,** a backpack instrument for the identification of gamma and neutron sources. The only instrument capable of simultaneously identifying the kind of neutron emitters including (n-alpha) sources in the presence of masking and shielding scenarios and determining the enrichment of Pu-239 and U-235.
- **GAMON-Mobile**, an instrument for highly efficient measurements in vehicles, boats or as a quickly deployable portal. It can cover a wide range of application scenarios with a very simple user interface for all levels of operators.

Dr. Massimo Morichi

International Qualified Radioprotection and Nuclear Measurements Expert

DiscoveRAD Applications

Made for the mission

The stabilization of the **DiscoveRAD** does not require any built-in source or LED.

The novel patented stabilization is based on the measurement of the photon noise charge and compensates gain shifts and temperature effects immediately and automatically. The main advantages of this new method are:

- No internal radioactive stabilization source is “blinding” the instrument.
- No buggy LED light emitter can compromise the stabilization.
- Superior stability in every situation.

The consistent performance of the **DiscoveRAD** under all conditions and environments, while maintaining the highest accuracy in the results, reduces false positives and expedites decision-making in the field.

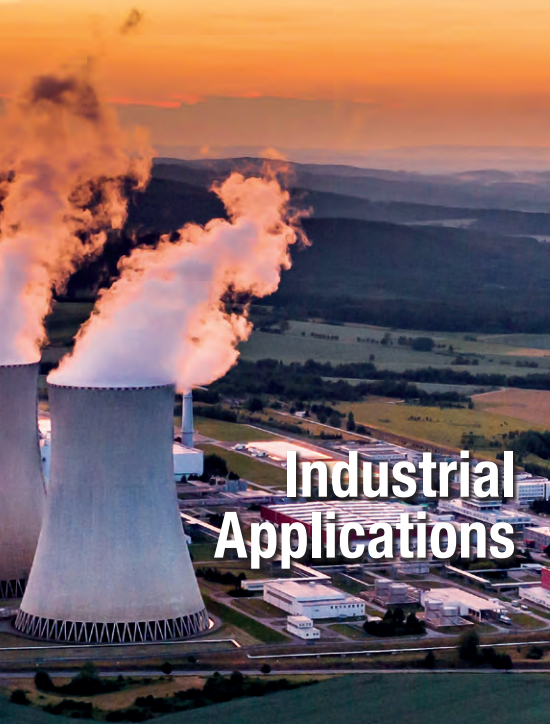
The wide energy range from 10 keV_{ee} to 100 MeV_{ee} and the dose rate capability of 100 mSv/h are indispensable when it comes to field operations dealing with unknown threats.

Highly sophisticated analog and digital electronics make it possible for the first time to measure a wide gamma dose rate range and neutrons with a single BGO detector. Small radiation levels can be detected earlier, quicker and with higher accuracy than by other comparable handhelds. Strong radiation sources are measured and identified at high input rates.

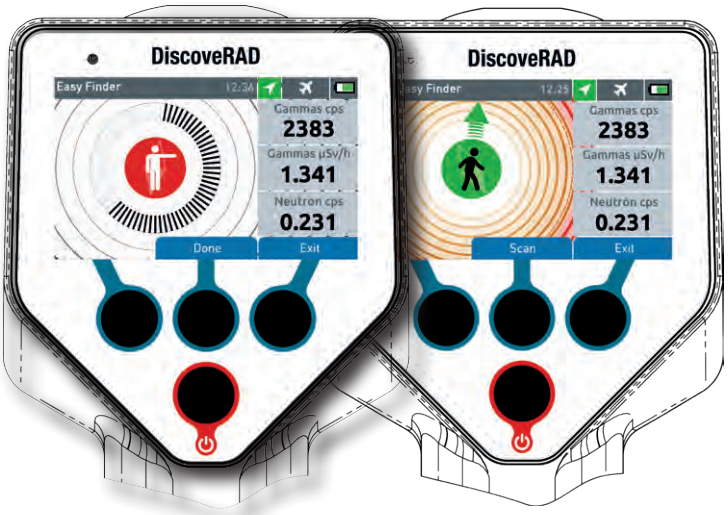
The DiscoveRAD in night mode allows working in total darkness without blinding the user.

CBRN Applications

Civil Applications

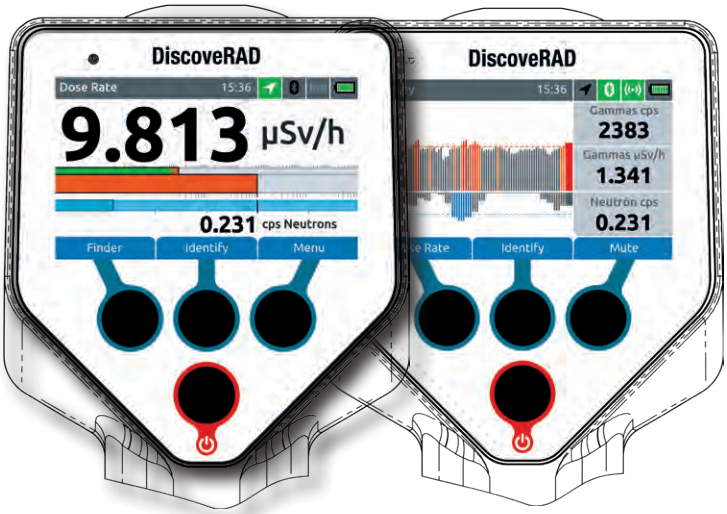


Industrial Applications



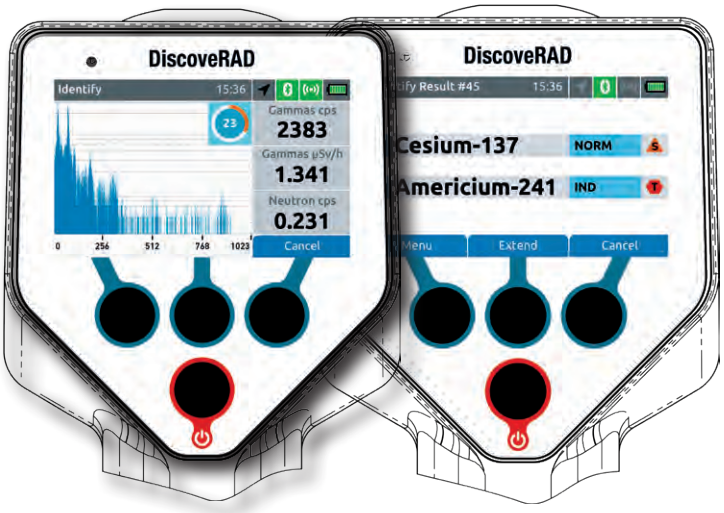
Easy Finder while scanning

Easy Finder with direction



Dose rate mode

Finder mode



Identification mode

Identification results

DiscoveRAD Overview

The Solution

Radionuclide Identification Devices (RIDs) are instruments designed to determine the identity of radioactive materials by analyzing the energy of the emitted gamma rays.

Law enforcement, customs, and other agencies are using RIDs as part of a national strategy to stop the illicit trafficking of radioactive material. When radiation sources are detected by screening devices such as radiation portal monitors or radiation pagers, RIDs are used to analyze the nature of the radioactive source and determine if it presents a high-level threat.

Radiological emergency personnel, firefighters, and other responders also use RIDs for situational awareness during radiological emergencies.

DiscoveRad is a portable RID with an extensive radionuclide library, fully compliant with ANSI standards for the RID category. **DiscoveRad** can continuously scan and identify radiological threats in real time even in mixed source environments with a high level of confidence.

DiscoveRAD
is the most efficient RID for gamma and neutron measurements ***conceived so far!***

- Detects and identifies nuclides in mixed, shielded and heavily masked configurations including Special Nuclear Material
- Spectra view and analysis with data storage for Reachback
- Small, lightweight (< 1,25 Kg, <2,7 lbs)
- Underwater operation to 10 meters (IP68)
- User Interface with day and night view
- High accuracy dose measurement
- Finder mode with directionality
- Spectrometry at up to 1 million cps between 10 KeV to 10 MeV
- Replaceable batteries
- Three buttons operation
- Multiple modes of configuration
- Operation from remote PC with full view of the screens
- N42.42 data format
- Superior efficiency with rugged non-hygroscopic BGO detector

1:1
SCALE

INTEGRATED WIFI AND GPS ANTENNAS

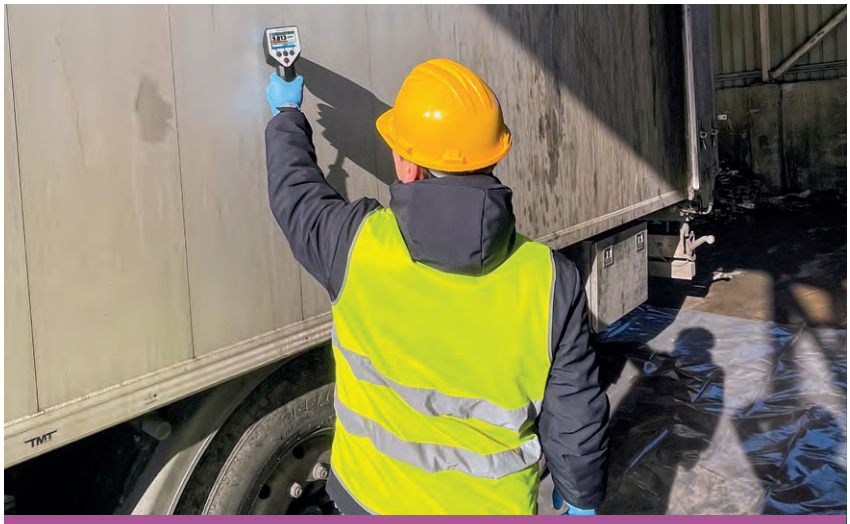
SINGLE BGO DETECTOR FOR GAMMAS AND NEUTRONS

BATTERY REPLACEABLE WITHOUT TOOLS

DiscoveRAD Overview

CBRN Applications

Civil Applications



Industrial Applications

The **DiscoveRAD** is an ultra-compact, rugged, sensitive Radionuclide Identifying Device (RID). It provides superior usability by offering a wider energy range, higher throughput, and better stability in a wearable handheld.

For the first time, a 2”x 1” size BGO detector is combined with high precision, high-speed digital electronics in an ergonomic lightweight enclosure. The novel design features a water-tight aluminum housing and is small enough to be worn on a belt.

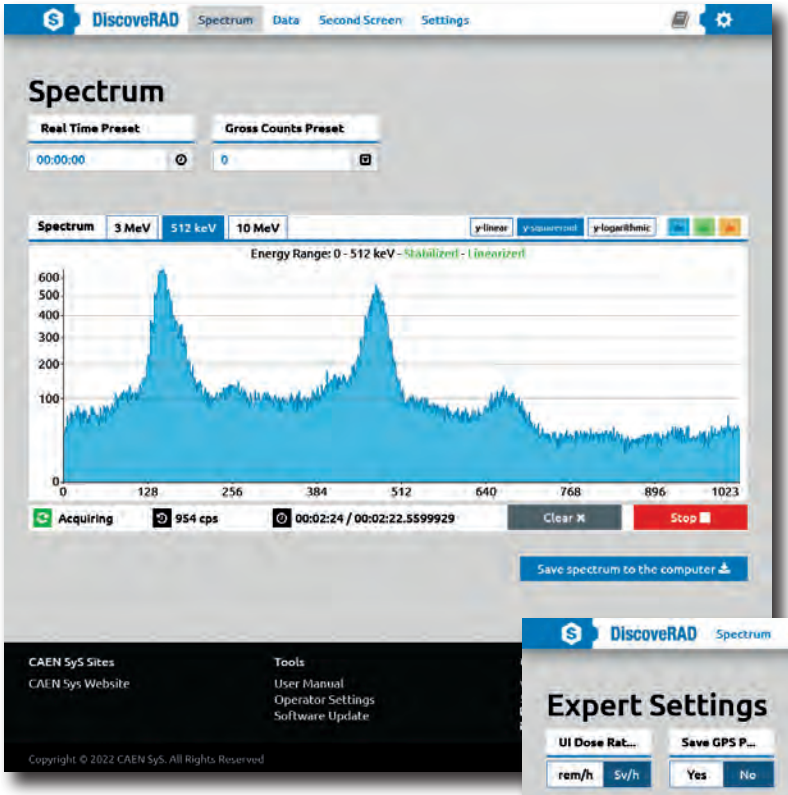
Dimensions:
235 mm x 88 mm x 92 mm
(9.3“ x 3.5“ x 3.6“)

Weight:
1,250 g (2.7 lbs)

It‘s not over, when you are back

All measurements are saved on the instrument (25 GB user storage capacity) and can easily be transferred without special software.

Its multiple interfaces and the built-in web interface allow easy and flexible reach-back operation. The interface also provides for secure remote maintenance and remote operation of the instrument.



The acquisition of a spectrum with the web interface

The password protected area for the expert settings

DiscoveRAD Summary

Summary

- Superior efficiency with a 2“ x 1“ BGO ($Bi_4Ge_3O_{12}$) detector
- The non-hygroscopic BGO detector improves the overall ruggedness
- Novel quantum source-less gain stabilization (pat. US 9,864,076)
- High dose rate capability and neutron measurement with a single detector (pat. pend.)
- Identification at up to 1 million cps
- Directional radiation detection
- Watertight up to 10 meters (33 feet) - IP68 rated
- Universal API and easy system integration by HTTP REST interface
- N42.42 data format for one touch reach-back via mobile app
- Remote operation and configuration with web-browser or mobile app

CAEN SyS in a nutshell

CAEN SyS, the new Systems & Spectroscopy Division of CAEN SpA, is a worldwide leader in development of Radiation Measurements Systems and Spectroscopy Solutions, engaged with high performance operations involving Nuclear Facilities, Measurements Laboratories, Security and Safeguards Applications.

CAEN SyS Systems & Spectroscopy Division is built upon CAEN traditions of teamwork and partnership.

The CAEN Network Companies is a cluster of Companies with excellence know-how. Decades of collaboration and co-development with very large international research projects have maximized CAEN SyS capability to translate customer's needs and expectations into cost-effective and reliable solutions.

CAEN SyS enormously benefits from its foundational relationship with CAEN, a world leader in designing multi-input electronics for a wide range of radiation detectors, and nowadays is involved in several leading-edge R&D collaborative projects, to continue expanding and developing expertise in high-level electronic design, and to extend competence and skills into complementary and relevant applications for the benefit of the community.

CAEN SyS is committed to delivering exceptional nuclear measurement instrumentation, expertise and technical support, offering radiation detection instrumentation and integrated turn-key solutions with added value and operational benefit for customers, enhancing safety and security through nuclear measurements in the SECURITY, SAFETY and LABORATORIES areas.

For more information visit: www.caensys.com

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