



HOMELAND SECURITY

RADIATION DETECTION AND MONITORING
TECHNOLOGIES FOR NUCLEAR SECURITY

Supporting your energy

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WHY NUCLEAR SECURITY

The purpose of nuclear security is to **prevent, detect and respond** to criminal or intentional unauthorized acts involving nuclear material, other radioactive material and associated facilities.

Nuclear security involves the use of **radiation detection instrumentation** employed in the following areas:

- Nuclear security of materials and facilities, mainly in connection with the physical **protection of radioactive sources** and nuclear material.
- Nuclear security of **material outside of regulatory control**, mainly in connection with controls at points of entry/exit (border monitoring), security for major public events and critical sites, and radiological crime scene management.
- In addition, nuclear security issues may be closely linked to **emergency response** activities, in which radiation detection instrumentation plays an important role.

This brochure describes the range of **radiation detection and monitoring instruments from NUVIA Tech Instruments** that are widely used in these fields and have been integrated into corresponding operational concepts and procedures, providing suitable tools – and covering the main functional requirements – for nuclear security and related areas.

ABOUT NUVIATECH INSTRUMENTS

NUVIATECH INSTRUMENTS OFFERS MORE THAN 100 STANDARD AND TAILORED PRODUCTS AND MEASUREMENT SOLUTIONS TO NUCLEAR OPERATORS AND STAKEHOLDERS. WE CAN SUPPLY BOTH COMPONENTS (DETECTORS, ANALYSERS AND SOFTWARE) AND COMPLETE MEASUREMENT SYSTEMS.

SECURING CRITICAL INFRASTRUCTURES



The IAEA report on incidents related to the trafficking or malicious use of radioactive material provides a reminder that the nuclear threat is real. Other reports show that malicious acts using Radiological Dispersal Devices (RDD) or “dirty bombs” have a fairly high probability of occurring and their impact would be devastating on both the population and infrastructures. The psychological impact in particular would be huge, and the cost of decontamination and lost activity could exceed tens of billions of euros.

Securing critical infrastructure is therefore paramount and deploying a complete detection architecture is the best way to mitigate these risks. Nuclear instrumentation plays a major role in securing large hubs like airports, train and subway stations, and industrial infrastructures.

The NUVIATech team has considered the following requirements when designing its cutting-edge products:

- Checking entry and exit of personnel, vehicles and goods
- Real-time response and alarming
- Connectivity to supervision system
- Surveying large areas
- Sensitivity to detect small radiation activities or shielded sources
- Avoiding false alarming due to nuclear medicine treatments

RECOMMENDED PRODUCTS AND SOLUTIONS

PGIS discreet source search and identification

RADSCOUT field and mobile spectrometry surveillance Radiolotope IDentification Device (RIID)

PORTAL L discreet source detection device for luggage check

PORTAL P highly reliable pedestrian monitoring portal

NuVISION one of the most innovative technology for crisis management

SIRIS immediate radiation detection for quick deployment

PORTAL V vehicle monitoring applications requiring the lowest possible alarm threshold

NuWATCH comprehensive early warning network for radiation monitoring and analysis

SAFEWATER drinking water monitoring system for fast and precise online monitoring of water contamination by beta or gamma radioactive substances

SCINTO mobile survey meter for security control of people and goods



Thanks to our partner Genetec, a leader in intelligent and innovative networked physical security products, the latest NuVISION gamma camera can be now connected to Genetec's Security Center. It provides a turn-key solution to monitor crowded areas within critical infrastructures. Scan the QR code for Genetec's website.

PROTECTING BORDERS



PORTAL V, the advanced modular radiation vehicle screening system, is designed for customs services, security checkpoints and cargo control in sensitive infrastructures. The system uses an industry-proven detector design, advanced mathematical algorithms and low-noise electronics. This combination of technologies provides a perfect solution for vehicle monitoring with very sensitive detection capabilities. In the Czech Republic, 5 airports have been equipped with the portal monitors for cargo, luggage, and pedestrians.



Radioactive materials are widely used in industry, medicine, and science. These commodities are routinely transported through states and territories and represent a potential and real public health threat if misused. This proliferation of radioactive material can result in both harm caused by negligence and intentional criminal use, such as the construction of a nuclear explosive device.

Strengthening nuclear security is an essential and challenging task for the forces protecting national border crossings, whether on land, sea, or air. The constant international flow of passengers, goods, and cargo across major hubs, including ports, airports and borders, needs to be maintained, while careful and efficient checks to combat the smuggling of radioactive materials are required.

To this end, the NUVIATech Instruments team designed all detection and measurement systems to minimize any disruption to the constant movement across borders by keeping in mind the highest technological standards and easy deployment.

Through the innovative technology and design, our products help:

- Detect the illicit movement of dangerous nuclear material
- Confirm the presence of unauthorized or illicit radioactive material by triggering an alarm and the proper response from the authorities
- Identify the nature of the material during a secondary check

RECOMMENDED PRODUCTS AND SOLUTIONS

PGIS discreet source search and identification

NuVISION one of the most innovative technology for crisis management

RADREFLEX efficient and simple to use hand-held device for agents to prevent smuggling of drugs, weapons, and explosives.

PORTAL V vehicle monitoring applications requiring the lowest possible alarm threshold

SECURING MAJOR PUBLIC EVENTS



When distributed as a network over a stadium, NuGBall sensors provide a real-time map of the premises and identify the presence of radioactive sources in real time. This disruptive technology avoids labor-intensive and manual checks of the area.

Major public events, such as international sporting events and political and economic gatherings, represent a potential arena for a large-scale public hazard with disastrous consequences, particularly if nuclear material is involved. Adding nuclear security measures to the standard security architecture for the organization of a major public event is a complex task that requires coordination prior to and during the event.

The challenges to consider are as follows:

- High level of synergy with national authorities to share information on any illicit movement of radioactive material
- Monitoring (in real time) a large number of people in a short time with as little disruption as possible and in a very large scope
- Distinguishing between events triggered by a malicious act and people who have undergone a nuclear medicine examination or therapy.
- Efficient training of the frontline intervention forces in using radiation detection instruments

RECOMMENDED PRODUCTS AND SOLUTIONS

AIRIS designed for airborne radiation measurement based on gamma spectroscopy

DRONE G a state-of-the-art technology for light airborne monitoring

SCINTO mobile survey meter for security control of people and goods

DOLMO a powerful dose-rate meter that can be routinely combined with numerous external detectors

RADSCOUT field and mobile spectrometry surveillance Radiolotope Identification Device (RIID)

PORTAL P highly reliable pedestrian monitoring portal

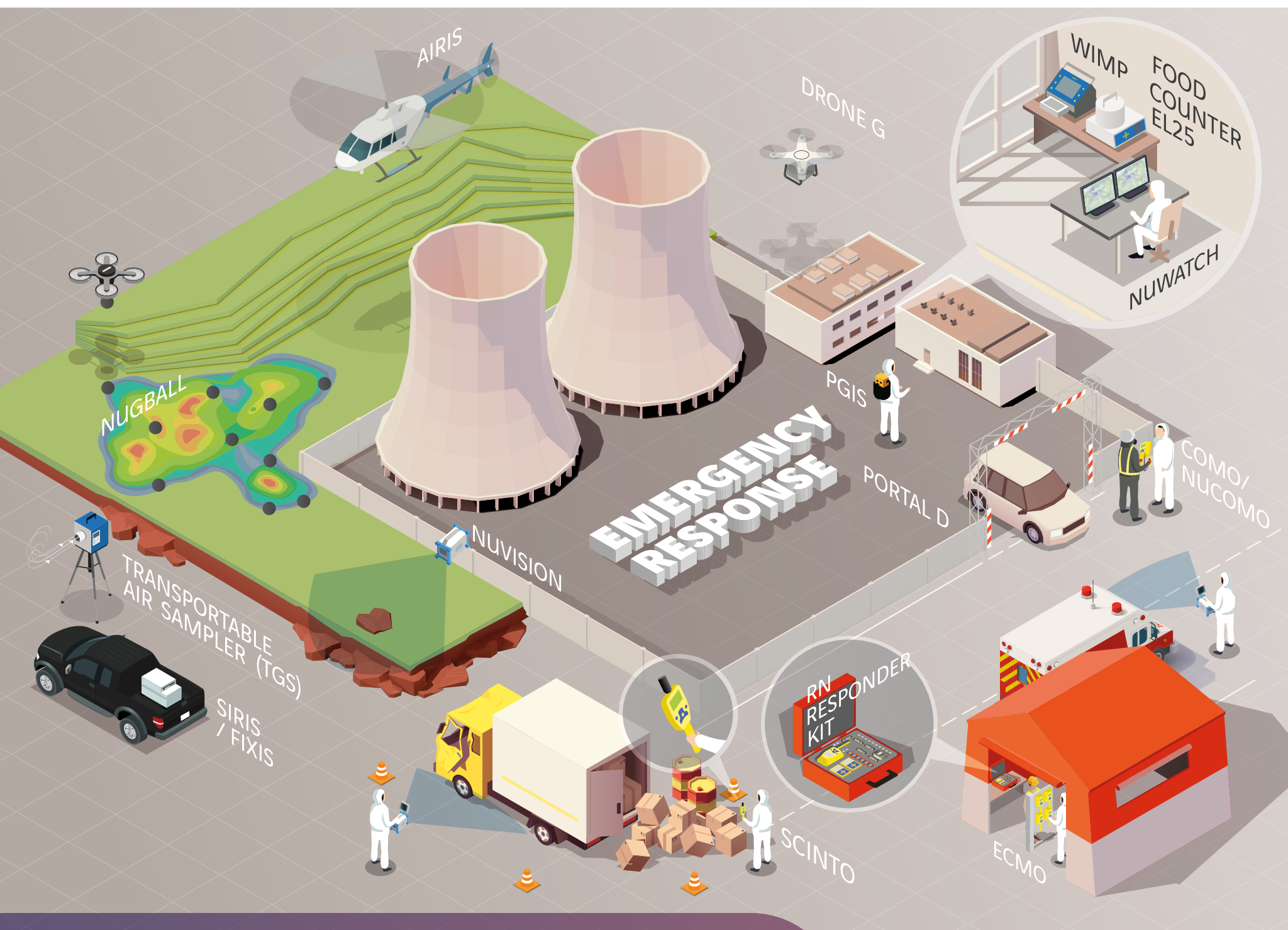
NUGBALL shock-proof and waterproof sensor applied to dose rate measurement and gamma spectrometry acquisition

NUVISION one of the most innovative technology for crisis management

ECMO a system solution for civil protection and disaster assistance in emergency centers

RN RESPONDER KIT first responder kit in emergency situations to facilitate detection and measurement activities in areas difficult to access

EMERGENCY RESPONSE



NuWATCH is a comprehensive early warning network for continuous radiation monitoring and analysis. Multiple sensors are connected to one central software that can display a real-time map of radiological conditions and warns if unusual situation occurs. Scan this QR code to learn more about NuWATCH and check the real-time gamma dose rates.

Despite extremely rare occurrence of emergencies, we must be prepared for all kinds of accidental or deliberate situations involving the release of radioactivity. According to the World Health Organization, radiation emergencies include:

- Nuclear emergencies, such as the explosion of a nuclear weapon
- Dirty bombs
- Radiological exposure devices
- Nuclear power plant accidents
- Transportation accidents involving radiation
- Occupational accidents, such as over-exposure to radiation in health-care facilities.

In all of the above cases, certain steps need to be taken to screen people and equipment, and monitor the contaminated environment, potentially including food or water sources. The NUVIA Tech Instruments portfolio offers highly reliable solutions for monitoring contamination on people and premises, screening a large number of people for possible contamination and/or performing surveys over large areas and monitoring developments in real time.

RECOMMENDED PRODUCTS AND SOLUTIONS

AIRIS designed for airborne radiation measurement based on gamma spectroscopy

DRONE G a state-of-the-art technology for light airborne monitoring

SCINTO mobile survey meter for security control of people and goods

NUGBALL shock-proof and waterproof sensor applied to dose rate measurement and gamma spectrometry acquisition

PGIS discreet source search and identification

TRANSPORTABLE AIR SAMPLER portable ambient air sampling system that can capture and subsequently analyze radioactive aerosols

NUWATCH comprehensive & scalable early warning network for radiation monitoring and analysis

COMO/NUCOMO a hand-held contamination monitoring device for areas with a high background radiation

NUVISION one of the most innovative technology for crisis management

SIRIS an efficient system for radiation monitoring where quick-deployment is paramount

PORTAL D emergency deployable modular radiation screening system suitable for inspecting people and vehicles

WIMP a portable smear test counter designed to check tools, measuring instruments, and other items used in a controlled area

FOOD COUNTER EL25 reliable and affordable foodstuff counter for screening of food and drink contamination in case of radiation accidents

TRAINING OF FIRST RESPONDERS



Strengthening nuclear security requires a high level of coordination and preparedness from frontline officers. To ensure an effective response in a radiation emergency situation, professionals conduct extensive hands-on preparatory exercises with special training tools to correctly assess radiological risks, secure premises, and prevent the additional spread of contamination. Thanks to the design and development of training tools, these tasks can be performed in a safe environment and ensure a perfect response and organization once in the field under real-life conditions.

NUVIATech Instruments thereby contributes to the preparedness of emergency responders by:

- Providing training tools
- Ensuring product training
- Designing and supplying specific kits and solutions to understand the fundamentals of radiation detection and the right skills for performing radiation checks

RECOMMENDED PRODUCTS AND SOLUTIONS

DOLMO SIM a powerful dose-rate meter that can be routinely combined with numerous external detectors

COMO SIM an industry recognized range of surface contamination monitors designed for a variety of applications

NUSEARCH WALL / NUSEARCH DRAWER a set of interactive tools for a safe and a creative way to train emergency personnel

EDUCATION KIT a versatile set of detectors designed for gaining insights on detection and measuring of radiation sources



In Germany, local civil defense emergency teams are prepared for potential radiological and nuclear threats. Our hands-on training modules are adapted to exercise scenarios that can occur in real life: accidents during transportation of dangerous goods, finding and disposal of the contaminated material at metal scrapyards and waste incineration plants.

PRODUCTS AND SOLUTIONS

AIRIS

AIRIS is designed for airborne radiation measurement based on gamma spectroscopy. The system can be installed on fixed-wing and helicopter platforms.

Main purpose :

- Airborne radiation measurements with real-time data transfer to the ground level.

Main benefits:

- The data acquisition system provides internal data synchronization and real-time calculation procedures with precise positioning.



COMO

An industry recognized range of surface contamination monitors used for a variety of applications.

Main purpose:

- An easy to use handheld device for manual screening of both alpha and beta/gamma contamination.

Main benefits:

- Gas free, competitively priced device
- One-hand instrument with an intuitive use
- Variety of optional external detectors add to its versatility



DOLMO

A powerful dose-rate meter that can be routinely combined with numerous external detectors and accessories for a full range of contamination and dose rate measurements for emergency situations.

Main purpose :

- Reliable real-time emergency monitoring of medium size areas.

Main benefits:

- Lightweight device with an ergonomic design
- Advanced options available for specialists or basic operation
- IP65 classified



DOLMO SIM / COMO SIM

Specifically developed systems, based on DOLMO and COMO to serve as a safe training tool for first responders.

Main purpose :

- Reliable and safe simulation of contamination detection and dose rate measurements in emergency situations.

Main benefits:

- Light weight devices with ergonomic design
- Safe and reliable - simulation of radioactive sources embedded within the system avoids using the real sources



DRONE-G

A state-of-the-art technology for light airborne monitoring using UAV devices as carriers to quickly and safely monitor large areas for potential contamination.

Main purpose :

- Reliable real-time emergency monitoring of medium size areas.

Main benefits:

- Modular system adaptable to multiple radiation situations
- Less costly than a helicopter monitoring, quicker and easier than pedestrian monitoring
- Real-time data processing and transmission to the ground level



ECMO

A system solution for civil protection and disaster assistance in emergency centers

Main purpose :

- Detector array of mobile contamination monitors type CoMo-170 ZS for easy and safe contamination monitorings.

Main benefits:

- The ECMo device is easily and quickly set up and running in a few minutes
- The measuring technology is largely maintenance-free and can be packed, stored and transported in an aluminum box, for example



PRODUCTS AND SOLUTIONS

EDUCATION KIT

The EDUCATION KIT is a versatile set of detectors designed for gaining insights on detection and measuring radiation sources.

Main purpose:

- Its purpose is to introduce trainees to the detection of different types of radiation. The kit concept allows a deeper understanding of the physical processes of radiation detection, but also the technical aspects of dosimetry.

Main benefits:

- Laboratory exercises are included and are tailored to various levels of experience
- Modular system allows multiple usage
- Fast and easy set-up
- Training with real sources



FOOD COUNTER EL 25

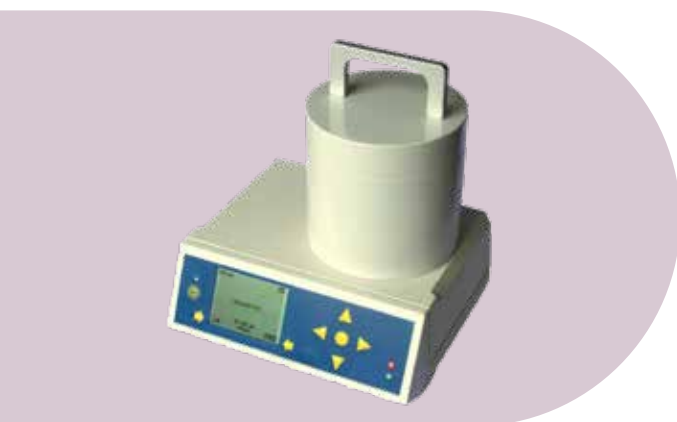
Reliable and affordable foodstuff counter for screening of food and drink contamination in case of radiation accidents.

Main purpose:

- Practical transportable measuring instrument for potential contamination of solid and liquid food

Main benefits:

- Cost effective and easy to use and transport
- Rose to the occasion after the Fukushima incident



FIXIS

FIXIS is a mobile radiation monitoring system mounted into vehicles and mobile laboratories to measure a wide range of radiation intensities..

Main purpose:

- The system provides continuous radiation measurement synchronised with GPS timing and position.

Main benefits:

- Direct measurement of radionuclide concentration and real-time radionuclide identification
- Directional detection sensitivity
- Advanced software for data visualisation, system settings and sophisticated mapping capabilities



NUCOMO-100

A hand-held contamination monitoring device for areas with a high background radiation.

Main purpose:

- An industry recognized equipment, CoMo, has been developed to specifically fit for detection of beta-contamination in a high gamma-background and thus mitigate the risk of dispersing radioactivity significantly.

Main benefits:

- Easy to use device with a clear optical LED display
- Control of the measurement distance to the surface



NUGBALL

A shock-proof and waterproof sensor applied to dose rate measurement and gamma spectrometry acquisition.

Main purpose :

- A highly efficient network of sensors can be dropped at a distance to preserve operator's safety.

Main benefits:

- Data is analyzed and presented in the form of maps, with an iterative process
- Easy and intuitive to use, with NuSYSOft enables operators to quickly understand a situation and monitor its development.
- Additional features available:



NUSEARCH WALL & NUSEARCH DRAWER

The NuSEARCH product line introduces a set of interactive tools for a safe and a creative way to train personnel in locating and identifying radioactive sources.

Main purpose:

- This highly flexible and safe device is designed for replicating complex measurement tasks with a wide range of α -, β -, and γ contamination measurements.

Main benefits:

- More than 200 positions of sources possible
- NuSEARCH Drawer is a robust tool designed for challenging measurement scenarios, with nearly 100 possible configurations of sources.



PRODUCTS AND SOLUTIONS

NUVISION

A compact portable spectrometric gamma camera based on CZT semiconducting detectors and coded aperture AND Compton imaging capabilities.

Main purpose:

- Portable and sensitive system that enables not only to detect but also to measure a dose rate, localize the source and identify the radioisotope in a real-time speed.

Main benefits:

- Light-weight and user-friendly device.
- Real-time imaging
- Combines sharp image quality and 360° field of view



NUWATCH

A comprehensive early warning network for radiation monitoring and analysis based on a multiple sensors distributed over a medium to large area.

Main purpose:

- The NuWATCH solution is specifically designed to warn about significant deviations from averages caused by radionuclides, so that efficient countermeasures can be rapidly deployed.

Main benefits:

- Scalable network coverage adapted to any size of geographical area, from a single installation to national monitoring network
- Continuous and autonomous real-time monitoring and analysis
- Wide dose rate range measurements, from 10nSv/h to 10Sv/h



PGIS

The Portable Gamma spectrometer Information System is designed for field and mobile gamma spectroscopy surveillance and can be either carried by hand or worn as a backpack.

Main purpose:

- Discreet source search and identification

Main benefits:

- Real-time calculation of the concentration of the selected radionuclide identification according to ANSI 42
- Survey navigation and data transmission via GSM channel
- System enables synchronized multimedia data comments as a photo, video or text.



PORTAL D

Emergency deployable modular radiation screening system suitable for inspecting people and vehicles.

Main purpose:

- Lightweight modular system designed for a quick deployment in emergency situations.

Main benefits:

- Modular system enabling multiple uses, adaptable to vehicle and pedestrian screening
- Easy to fully decontaminate
- Power supply from various independent sources



PORTAL L

The system is designed for screening luggage moving on a conveyor belt and is used for gamma and neutron detection.

Main purpose:

- Rapid detection of radioactive contamination of goods and products, potentially harmful sources hidden in cargo.

Main benefits:

- Optical sensors detect the presence of luggage and automatically trigger its screening
- If thresholds are reached, radiation alarms are triggered and sent to a central database for rapid intervention.
- Fast deployment (within 90 s after startup)
- Indoor and outdoor installation is available (temperature range: -10°C to 50°C)



PORTAL M

Light-weight, easy deployable screening of people and objects that can be quickly assembled in emergency situations.

Main purpose:

- In emergency situations, a fast and secure way to screen a large number of people for radioactive contamination needs to be available and installed on the spot. The Portal-M is specifically designed for these situations.

Main benefits:

- Robust and extremely fast to assemble without using any tools
- The thresholds can be programmed so that children and adults can be recognized
- Portal-M is further customizable and can be fitted with additional options.



PRODUCTS AND SOLUTIONS

PORTAL P

A compact modular emergency radiation screening system for pedestrians with rapid deployment.

Main purpose:

- Turnkey solution for various emergency situations

Main benefits:

- Modular system enabling multiple uses, adapted to pedestrian screening
- Easy to fully decontaminate
- Power supply from various independent sources (car battery/ battery/mains/diesel generator)



PORTAL V

Highly sensitive portal monitor developed for vehicle and cargo screening to prevent illicit movement of radioactive sources.

Main purpose:

- Thanks to innovative technologies and advanced algorithms, Portal V is an ideal system for radiation monitoring with very sensitive detection capabilities.

Main benefits:

- Modular system enabling various customized options, such as speed measurement, camera monitoring, barcode readers or ID card readers and more
- Fully automated screening process including alarms



RADREFLEX

A contraband detector for fast and secure way for screening of cavities within vehicles.

Main purpose :

- Efficient and simple to use hand-held device for agents to prevent smuggling of drugs, weapons, and explosives.

Main benefits :

- Easy-to use (only 5 function keys)
- Low activity radioactive source minimizes regulatory requirements
- Battery operated



RADSCOUT

Field and mobile spectrometry surveillance device primarily designed for gamma radiation detection and monitoring, deployable either in a portable or backpack configuration.

Main purpose :

- Efficient and robust source search and identification

Main benefits:

- Fast deployment – system stabilization within 2-3 minutes of cold startup
- Operator- friendly interface
- Real-time positioning GPS allows the operator to follow a survey grid or way-points on a map



RN RESPONDER KIT

Emergency responder task forces use the RN – first responder kit in emergency situations to facilitate detection and measurement activities in areas difficult to access.

Main purpose :

- Fully equipped handheld case containing devices for dose rate measurements, personal dosimetry, and contamination detection.

Main benefits:

- Easily transportable all-in-one case
- All emergency screenings can be performed even in remote locations difficult to access
- Includes CoMo-170 – the standard contamination monitor in German civil defense units



SAFEWATER

This drinking water monitoring system is designed for fast and precise online monitoring of potential drinking water contamination by beta or gamma radioactive substances.

Main purpose :

- Deployable in a grid to cover drinking water source surveillance as part of an early warning network to inform about potential contamination in a timely manner. Due to its real-time data processing, Safewater demonstrates its value in emergency.

Main benefits :

- An immediate text message or email alert in case of radiation contamination
- Dual monitoring of beta and gamma radiation



PRODUCTS AND SOLUTIONS

SCINTO

A mobile survey meter with an NAI scintillation detector for easy mobile monitoring of people, goods, or vehicles.

Main purpose :

- Identifying the precise location of radioactive material following a portal alarm

Main benefits :

- Low 25keV detection threshold
- Cps and dose rate (Cs-137) available
- Fast deployment (under 4 s)
- External probes and telescopic versions optionally available



WIMP

A portable smear test counter designed to check tools, measuring instruments, and other items used in a controlled area

Main purpose:

- An easy to use handheld device for manual screening of both alpha and beta/gamma contamination.

Main benefits:

- Gas free technology based on a thin-layer scintillation detector
- Simultaneous, selective α and β/γ measurements
- Easy to decontaminate
- Integrated calibration software



SIRIS

An efficient system for radiation monitoring where quick-deployment is paramount.

Main purpose :

- The system provides immediate radiation detection, directional radiation recognition, isotopes identification, real-time activity calculation of natural and human-made isotopes.

Main benefits :

- Equipped with built-in UPS that provides up to 4 hours of an independent operation
- Customizable notifications and crew safety alarms



TRANSPORTABLE AIR SAMPLER TGS

A portable ambient air sampling system can capture and subsequently analyze radioactive aerosols, emissions, dust and other air pollutants.

Main purpose:

- The TGS advanced concept is designed to capture radioactive aerosols on filters with adjustable flow rates ranging from 3.0 to 15.0 m³ /h.

Main benefits:

- Continuous or pre-defined sampling interval.
- User friendly operation and calibration.
- Flow rate and flow volume logging and measurement.



NUVIATeCH Instruments

The smart choice in nuclear measurement



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