



MEASUREMENT SOLUTIONS FOR NUCLEAR FACILITIES

Our product offering for nuclear power plants, fuel cycle facilities,
and research centers working with ionizing radiation.

Supporting your energy

Standard and tailored measurement solutions for all stages of the nuclear facilities' life-cycle.

THE SMART CHOICE IN NUCLEAR MEASUREMENT

With internationally renowned nuclear expertise, NUVIA is a key partner for organisations that place safety and regulatory requirements at the top of their priorities. We support our clients throughout the entire life-cycle of their nuclear facility. Through our dedicated NUVIA Tech Instruments brand, we offer a large range of radiation detection and measurement solutions.

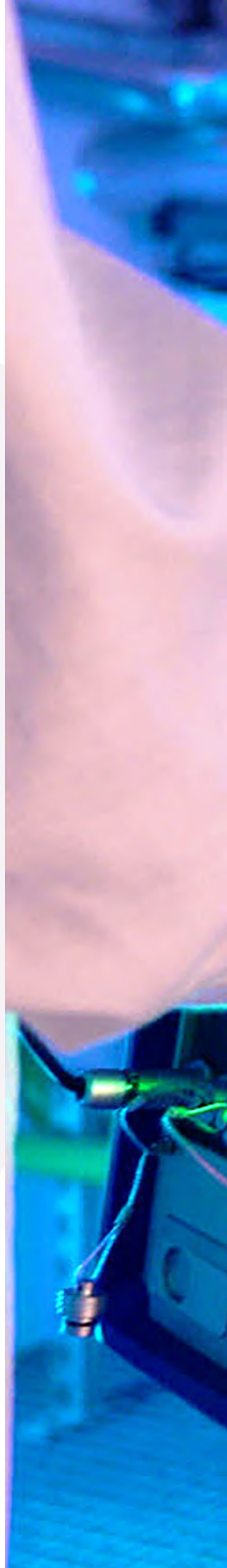
From modeling to implementation, NUVIA Tech Instruments uses exclusive know-how and state-of-the art technologies in its monitoring systems dedicated to the major fields of application:

- **Radiation protection**
- **Waste characterization and volume reduction**
- **Environmental monitoring**

+100

NUVIA Tech offers more than 100 products and solutions to nuclear operators and stakeholders.

Those fields are particularly relevant to nuclear facilities such as nuclear power plants, fuel cycle facilities, research centers working with ionizing radiation, and waste treatment plants.





Gamma camera NuVISION, jointly developed with CEA-Leti, combines several functions in one device. It can localize hotspots from a distance, identify the corresponding radionuclides and estimate the dose-rate contribution of every hotspot separately.

More on page 9.

From modeling to commissioning, we master the entire value chain so that we can offer reliable and innovative solutions.

Modeling

Assistance with identifying requirements, numerical modeling, any type of photon and neutron performance simulation calculations.

Design

Preliminary studies, detailed or implementation studies, choice of equipment including sensors, mechanics, automation, control command, sizing, sensor type.

Manufacturing

Custom manufacturing in our workshops of organic and inorganic scintillators, conveyors and structural equipment; treatment of material, machined and welded parts, metal structures, lead or steel shields and collimators, and low background shielding made of modular concrete bricks.

Automation and control-command

Assembly of pneumatic components and control-command, system design and state of the art documentation processing, 3D design, electronic projection, PLC programming, development of control-command specific software, visualisation and data collection.

Software development

Strong experience in acquisition systems and analysis of nuclear measurements, expertise across many areas of development (such as embedded applications, databases, protocols for data acquisition).

Qualification

Specifying procedures, verification and qualification of performance from QCT modelling of the system and measurements with radioactive sources.

Commissioning

Specifying appropriate factory and on-site test procedures, unit testing and factory calibration with radioactive sources, undertaking testing following factory or on-site assembly.



Available in many user-friendly options, CoMo is the industry adopted equipment for measuring surface contamination.

More on page 10-11.



1 Radiation Protection

Hot Spot Localisation

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RADIATION PROTECTION



Related Products:

NuVISION

CoMo Series

Portal Series

HFC Series

LAUMO

DRAMON

FMS, FMK

Floor Monitor

Probes & Accessories

WIMP Series

SCINTO

DoIMo

NuGUARDS

NuFLIGHTER

ALMO

NUVIATech Instruments continues to build on decades of experience in the nuclear installations providing health physics services and logistics support. Our experts are therefore familiar with the very needs of the operators and radiation protection teams. Keeping health and safety of the stakeholders in focus, all our products meet and exceed industry guidelines for radiation protection. Our offering includes equipment packed with the latest innovative technology such as

our gamma imaging system and a drone with on board detectors for remote surveys. The user-friendly automated wipe-test counter provides a fast assessment of large numbers of potentially contaminated samples. Based on your needs, our experienced team is here to help you find the smart solution for your project.



HOT SPOT LOCALISATION

GAMMA IMAGING SYSTEMS

NuVISION, our gamma ray imager, enables the user to localize and identify hotspots, such as areas of contamination, blockages and leakages, as well as monitoring processes. The integrated dose rate measurement gives an estimation of the contribution of every single hotspot to the total dose rate. This facilitates risk analysis, process planning and work assessment – e.g. controlling the effectiveness of a cleaning process or the placement of a shielding. The NuVISION combines two complementary imaging techniques – coded mask and Compton imaging. This makes NuVISION a powerful instrument that will not miss any gamma hotspot and assures the accuracy of locating the sources.

BENEFITS

- Small and light portable device that can work in high-dose environments
- No cable needed, fully independent and autonomous for a reduced operator dose uptake
- Real-time imaging
- Specifically designed for a use in NPP's and nuclear facilities
- Combines sharp image quality and a 360° field of view
- Capable of identifying radionuclides

APPLICATIONS

- Dose reduction (ALARA)
- Environmental monitoring
- Decommissioning (mapping to plan works and identifying hazards)
- Waste characterisation
- Emergency response



NuVISION



NuVISION has been developed in cooperation with the CEA-Leti and leverages their strong expertise in CZT gamma imagers.

CONTAMINATION MONITORING

HAND-HELD CONTAMINATION MONITORS

The **CoMo** series offers the most advanced instruments in the field of surface contamination monitors. The innovative thin-layer plastic scintillation detector technology is completely gas free and both α - and β/γ - sensitive. Designed for easy maintenance, users can easily make simple repairs to the instruments such as replacing detector foils themselves.

BENEFITS

- Gas-free device that drives the cost down
- One-hand instrument, lightweight device
- User friendly and intuitive to use
- Large graphic display
- Variety of optional external detectors add versatility
- Multi-purpose device for variety of applications

OPTIONS

The CoMo-series offers a wide range of options including an integrated Geiger-Müller detector for additional dose rate measurement, a larger 300 cm² version instead of the standard 170 cm², and a pure gamma measurement version. The numerous accessories available for all versions of the CoMo make the CoMo series a very flexible contamination monitoring system. (See page 17 for Probes and Accessories).

APPLICATIONS

- Handheld use for fast checking at change barriers and check points
- Large floor surface areas can be covered when used with our floor bogey
- Active wall station for CoMo allows time controlled measurement
- Wipe test station allows more accurate measurements of wipes prior to removal from controlled areas
- External detectors extended capability to dose rate or additional contamination measurements



CoMo 170

Locations with a high background radiation, such as certain areas of nuclear power plants, prohibit the use of most contamination measurement devices, while at the same time the risk of having contaminated surfaces is increased. This challenging task is where the newly developed **NuCoMo-100** excels. With the NuCoMo-100, β -contamination can be detected in a background of up to $100\mu\text{Sv/h}$. The user-friendly, hand-held device allows to mitigate the risk of dispersing radioactivity significantly.

NuCoMo-100 BENEFITS

- Detects β -contamination in a high γ -background
- Clear optical display via LED band
- Control of the measurement distance to the surface



NuCoMo-100

CONTAMINATION MONITORING

CONTAMINATION MONITORING PORTALS

Contamination of personnel can occur in Radiologically Controlled Areas (RCA), as such the entry and exit from these areas should be equipped with monitors that can detect any contaminated people, goods or objects. We offer several types of portal monitors including mobile, installed, and modular.

BENEFITS

- High sensitivity plastic scintillation detectors
- Modular systems enable various configurations
- Fully-automated screening process
- Visual and audible alarm
- Easily decontaminated
- High throughput
- User-friendly software

APPLICATIONS

- Entrances and exits of Radiologically Controlled Areas (RCA)
- Detection of illicit transportation of nuclear materials
- Emergency response situations where quick deployment of monitoring system is essential
- Pedestrian or vehicle contamination control

Name	Modular	Mobile	Fixed	Emergency situations	Pedestrians	Vehicle	Neutron detection (optional)	High dose-rate
PORTAL M 	✓	✓		✓	✓			✓
PORTAL P 	✓		✓	✓	✓		✓	
PORTAL D 	✓	✓		✓	✓	✓	✓	
PORTAL S 	✓		✓		✓			
PORTAL V 			✓			✓	✓	

HAND-FOOT-CLOTHING CONTAMINATION MONITORS

With more than 20 years of experience and a worldwide clientele, our **HFC** product line has established itself as one of the most versatile, widely available on the market. The close cooperation with our customers has been transferred into modern, practical and user-friendly instruments.

BENEFITS

- Innovative detector technology based on thin-layer plastic scintillation detectors
- Gas-free equipment
- Low operating and maintenance costs
- Operator-friendly user interface with large-area colour display
- Ergonomic housing design with stainless-steel cover

OPTIONS

Our HFC models can be upgraded with several options and individually adapted to meet clients' requirements. For example: the number and the positioning of the hand detectors, the size of the foot detectors, the inclusion of a transponder system or an additional head detector.



BaseLine
Standard model.



SlimLine
Integrated detectors to save space.



CrossLine
Walk-through monitor.



EcoLine
Compact and powerful solution.



TrendLine
Elegant light model for public areas.



HeadLine
Additional head detectors.

CONTAMINATION MONITORING

LAUNDRY MONITORS

The **LAUMO** series offers various configurations for checking the protective clothing worn in nuclear facilities for contaminations. All of our laundry monitors use large area plastic scintillation detectors, which allow to discriminate between α - and β/γ -radiation, are highly sensitive and completely gas free.

BENEFITS

- Robust, stainless-steel housing designed for daily use and protection of the integrated measurement electronics
- Modern and user-friendly design for an easy access to the detector units, facilitating repairs of damaged detector foils by the operators themselves
- All LAUMO devices have user-defined detection thresholds for which the system adjusts the conveyor / rail speed or by locking the drawers for the required measurement time



LAUMO-R
Designed to measure overalls worn as protective clothing.



LAUMO-D
Equipped with two drawers each with nine plastic scintillation detectors.



LAUMO-C
Measures all kinds of clothing.

OBJECT MONITORS

The **DRAMON** is a high-sensitive radiation control system designed to measure small objects, such as folders, masks, gloves, helmets, tools before they can be released from controlled areas. A UPS system can be supplied for operating the Dramon in remote locations.

BENEFITS

- Fast and reliable contamination control assured by two plastic scintillation detectors above and below the drawer
- A low detection limit thanks to the lead shielding of 7-10 mm and automatic background correction

APPLICATIONS

- At check points and change barriers for controlled areas
- During decommissioning activities



DRAMON

RELEASE COUNTERS

Various release counter systems of our product line can be used to release material from the controlled area or to control and administer temporarily stored waste. Our product line includes measuring chambers of various configurations, sizes and shielding thicknesses, combined with up to 10 high-sensitive NaI(Tl)-scintillation detectors for γ -measurement or thin-layer plastic-scintillation detectors for β/γ - measurements.

BENEFITS

- Release measurements are much cheaper alternative to disposal costs
- Easy, fast and secure way to check for contamination
- Modular & customizable systems
- The application-specific software is easy to operate and allows nuclide -and object-related calibrations.
- Safety features for secure handling and protection of the operators

APPLICATIONS

- Radiologically Controlled Areas (RCA)



FMK



FMS

CONTAMINATION MONITORING

FLOOR MONITORS

The versatility of our CoMo-series allows for multiple uses of this highly practical device - besides its hand-held function, the device can also be integrated into the floor bogey and used for a contamination surveys of large floor surfaces. By combining up to three **CoMo 170s** or **CoMo 300s** in one floor bogey, we have an easy-to use tool for a floor contamination monitoring.

BENEFITS

- A multiple purpose tool that can fulfil several functions (a hand-held device can be easily employed in a floor bogey for larger area scanning)
- Easy to assemble
- Leverage the CoMo technology

APPLICATIONS

For scanning floor areas for surface contamination for routine surveys, in case of spills or incidents and any other situations where floor scanning is needed.



CoMo Floor Bogey

The **LARS** (Large Area Radiation Scanner) system is designed for surveying large areas (e.g. transshipment areas) for the presence of radioactive contamination rapidly and safely. The system can be equipped with two or four high sensitive plastic scintillation detectors.

BENEFITS

- Some parameters can be adjusted on the handle of the scanner
- The maximum walking speed is calculated based on the efficiency
- A user-friendly way to reliably check large areas quickly and efficiently
- The stainless-steel and PE housing is very robust and well suited for outdoor use
- Easy to manoeuvre thanks to pneumatic tires

APPLICATIONS

For routine scanning of large floor areas for surface contamination or an emergency scan in case of spills or incidents.



LARS

PROBES AND ACCESSORIES

A number of our flagship products can be coupled with additional probes and accessories. The following probes and accessories can be combined with the **CoMo** and **DolMo** devices.

BENEFITS

- Extension of capability for our contamination and dose rate monitors
- Enable monitoring in areas with difficult access
- The smart accessories and probes are recognized by the instruments and the displayed data adjust automatically (e.g. the measuring unit).
- Cost effective alternative to buying additional instruments for additional capabilities

APPLICATIONS

- Measuring pipes of various diameters, corners, narrow spaces with limited access
- Checking protective masks and respirators for contamination
- Searching for hot spots



INDIRECT CONTAMINATION MONITORING

WIPE TEST COUNTERS

Releasing tools, equipment and assets from controlled areas, performing routine surveys or monitoring of used fuel shipments requires often time-consuming measurements, which can result in dozens or even hundreds of wipe tests to be analysed each day. We have designed our wipe-test counters with this premise in mind. The **WIMP series** is scalable, from single wipe-test and mobile counters, to automated systems.

BENEFITS

- Innovative gas-free plastic-scintillation detectors
- Ergonomic and maintenance-friendly design
- Easy to access the detectors
- User-friendly devices

APPLICATIONS

- Indirect measurement for high background radiation areas
- Assessment of large number of samples in a short time period
- In remote areas with a limited availability of large equipment (mobile version)

SINGLE



WIMP 220

220 mm filter diameter or screening filter.
Other sizes available upon request.

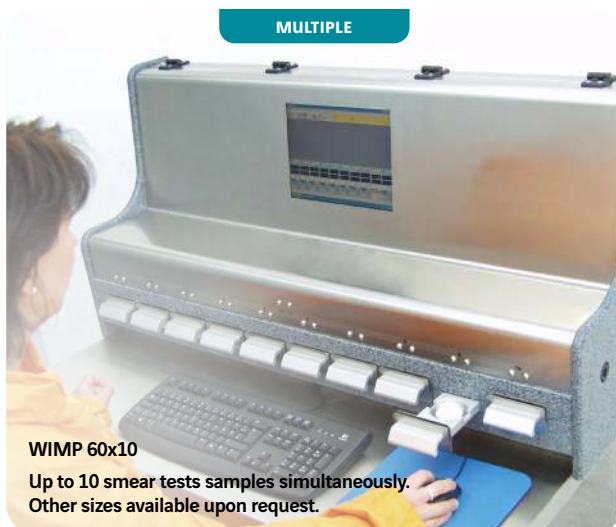
MOBILE



WIMP 60M

Ideal for a quick assessment of crucial measurements in remote locations

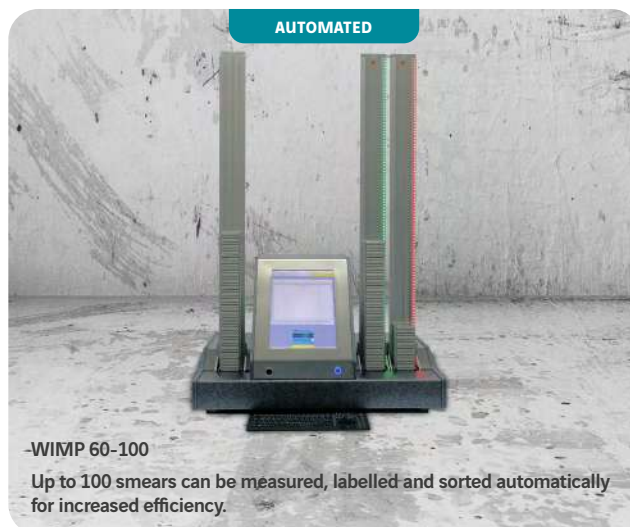
MULTIPLE



WIMP 60x10

Up to 10 smear tests samples simultaneously.
Other sizes available upon request.

AUTOMATED



WIMP 60-100

Up to 100 smears can be measured, labelled and sorted automatically for increased efficiency.

DOSE RATE MEASUREMENT

SURVEY METERS

The **SCINTO** is a mobile dose rate meter with a NaI(Tl) scintillation detector for very high sensitivity measurements. It is the ideal tool for a rapid localisation of the origin of a contamination and performing highly accurate local dose rate measurements (Cs-137 equivalent).

BENEFITS

- High-sensitivity measurements
- Rapid location of the hotspot
- Excellent accuracy
- Easy-to use and practical transportable device

APPLICATIONS

- General radiation protection purposes
- Location of orphan sources (e.g. in emergency situations)

OPTIONS

SCINTO Telescope

Designed to facilitate measuring in locations that are difficult to access or to reduce the dose uptake for the operator. A special version of the SCINTO where the detector is located on the end of a telescopic extension is available. The SCINTO Telescope has numerous applications including locating the contamination sources, checking waste containers, scanning large vans, or monitoring tight spaces such as under or in between fixed installations.

SCINTO Accessories

Besides choosing between three different SCINTO versions with different NaI(Tl) detectors, it is also possible to extend the measuring capability by connecting external probes, such as the two large area plastic scintillation detectors (170 or 300 cm²)



DOSE RATE MEASUREMENT

SURVEY METERS

The **DolMo** is a powerful dose rate meter on its own, while its compatibility with the numerous external detectors and accessories results in an allrounder that offers the full range of contamination and dose rate measurements.

BENEFITS

- Lightweight device with an ergonomic design
- Long battery life
- IP65 classified making it perfectly suited for every environment
- User-friendly control offers user configurable operator modes
- Flexible device with a reduced but secure operation for normal workers or advanced options for radiation protection specialists

APPLICATIONS

- Construction/decommissioning sites
- Measuring the ambient dose rate in order to detect leakages or the presence of dangerous materials (different sensitivities and ranges available)
- Routine surveys and emergency situations
- Special tasks when combined with flat detector, corner or pipe detector and any other additional accessories from the chapter Probes and Accessories



DEPLOYABLE GAMMA MONITOR

NuGUARDS allows fast and remote investigation, monitoring and mapping, without any cables or construction work. Deploy your network sensors on-site, measure dose rates or acquire the gamma spectrum of an area and communicate data in real-time to the control and processing station.

BENEFITS

- Secure and safe, remote measurements
- Dose rate measurement
- Gamma spectrometry acquisition
- Set contained in a transport case
- Quick and easy deployment
- Real-time iterative measures
- Mapping with measured and interpolated values
- Differential mapping
- Remotely controllable settings

APPLICATIONS

Area gamma monitor for work areas



GAMMA MONITOR MOBILE

NuFLIGHTER - Dose rate measurement without constraints: NuFLIGHTER enables easy and quick aerial investigations. Mountable on any kind of drone, NuFLIGHTER embeds on lightweight UAVs like DJI Mavic Air. It's fully integrated with the DJI Go app, allowing the pilot to control the radiological measurement as well as the actual drone, within the same interface.

BENEFITS

- Real-time measurement
- Lightweight module can be embedded on any kind of drone
- GPS positioning of each measurement (outdoor)
- Safe measurement for the operator
- Plug and play system
- Measurement system fully integrated to the drone piloting software (through a dedicated application)
- Scaffold-free ALARA measurement at heights

APPLICATIONS

- Aerial radiological survey
- Indoor aerial radiological measurement



NuFLIGHTER

ALARM MONITOR

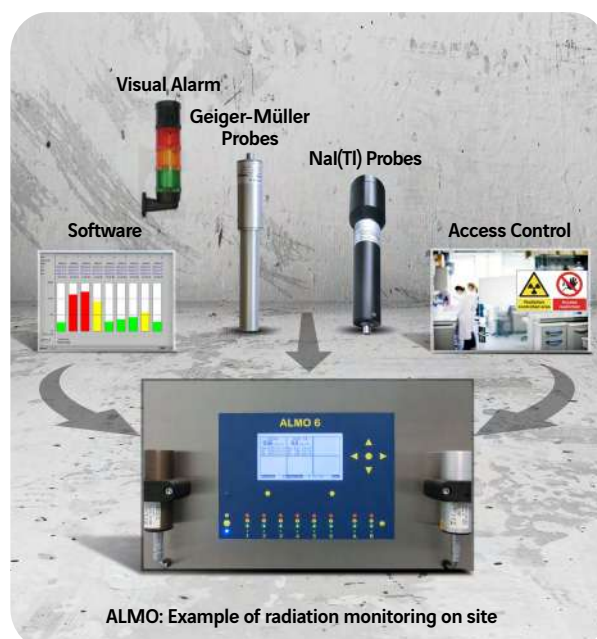
The **ALMO** system is designed for permanent radiation monitoring on nuclear sites. One, three or six detection units can be connected to a single system, providing great flexibility.

BENEFITS

- Easy to use thanks to the microprocessor-based control unit
- Ergonomic housing for desktop use or alternatively as a built-in unit in the cladding of installations or walls
- Additional software for continuous dose rate analysis, including data storage
- 3 different models available with 1, 3 or 6 detector inputs

APPLICATIONS

- Work place and facility monitoring
- System monitoring (e.g. in isotope production)
- Monitoring and selection of sorting boxes for radioactive waste
- Warehouse or waste storage monitoring



ALMO: Example of radiation monitoring on site



WASTE CHARACTERIZATION AND VOLUME REDUCTION



Related Products:

GAMS Series

MASTAB

GEM

MUM & SuperMUM

Radioactive waste management requires planned and systematic approach to ensure appropriate protection of workers, environment, and installations.

Proper waste characterization processes additionally reduce cost to the operator and provide confidence in the entire system of waste management life cycle, with special emphasis on waste conditioning, storage and disposal. NUVIA Tech Instruments has developed a

deep understanding of the waste assay processes and offers a range of products for measurement and characterization of contaminated materials generated during the nuclear facility operations.



WASTE MEASUREMENT

WASTE ASSAY SYSTEM






The **GAMS series** has been designed for characterization of low, medium and high activity wastes stored in drums from 20 l to 200 l. In configurations from compact to full automated these systems are capable of characterizing the radionuclide composition and measuring their activities. The assay systems are manufactured according to nuclear industry standards and safety regulations. Besides GAMS, the fully automated low-level waste assay system SuperMUM can be used for free release measurements. The measured values (gamma spectrometric profile of the waste material) can be used for radionuclide content declarations, as well as being able to identify hotspots for further treatment of characterized materials or packages (identifying, quantifying and sorting radioactive waste).

BENEFITS

- Fulfills nuclear industry standards and safety regulation ISO 14850 and EN 60204-1
- Automatic feeder system
- Barcode identification including wireless barcode reader and barcode labels printer

APPLICATIONS

- Gamma spectrometric measurement of waste
- Decommissioning of nuclear facilities
- Free release measurement

	GAMS 1	GAMS 2	GAMS 3	GAMS 4	SuperMUM
					
HpGe detector	1	1	1	3	4
Automatic			✓	✓	✓
Mobile	✓				
Turnstyle		✓	✓		
Medium/High activity			✓	✓	
Free release				✓	✓

WASTE MEASUREMENT

SORTING TABLE

MASTAB, a manual sorting table for assessment of different wastes and materials into non-active and low activity waste. The system is divided in three parts: the center part contains a detector (large volume plastic scintillator) and control unit, the left side for the contaminated or active waste, and the right side for the non-active waste.

BENEFITS

- Cost effective
- Ergonomic

APPLICATIONS

For manual sorting of material and potentially contaminated waste



SOIL SORTING

GEM is a gross gamma system capable of real-time assay of excavated materials and offering a cost-effective solution compared to standard soil-sorter system. Each bucket requires a few seconds to complete a measurement depending on detection requirements. Once completed, a colored light is automatically illuminated on the unit to indicate the correct waste stream for the load. Approximately 350 tons of material can be measured and segregated each day.

BENEFITS

- Battery operated
- Heavy duty frame
- Large volume of material can be sorted in a short time span
- Cost-effective

APPLICATIONS

- The gamma excavation monitor is used for land remediation purposes
- Material segregation
- Waste content declaration



FREE RELEASE MONITORS

The **MUM** and **SuperMUM** are advanced fully automated low-level waste assay systems based on four high performance HPGe detectors for low-activity radioactive waste characterization and free release measurements of waste containers. The system capabilities are enhanced with especially designed shielding blocks. SuperMUM is designed to measure large quantities of metal radioactive waste primarily but it is easily adjustable and can be calibrated to measure other types of radioactive waste generated in nuclear facilities.

BENEFITS

- Reduction of generated waste
- Shielding blocks ensure low-background environment in the measurement cavity
- Automated waste container handling
- Automatic weighing of waste containers
- Easy operation

APPLICATIONS

NPP waste monitoring and characterization





ENVIRONMENTAL RADIATION MONITORING



Related Products:

Groundhog
Drone-G System
PGIS
ASC
ENA UW
Safewater
NuWATCH
EGS
MORA ISO
MORA VAN
NuDET EGM
RAMS
NuSOFT RADIS
NuSOFT DORMIS

NUVIATech offers environmental monitoring networks that conduct radiological surveys and are currently deployed in many locations worldwide. The calibrated measuring instruments can be either mobile or in a fixed location. They measure air contamination levels or radionuclide concentration in environmental media (such as water, soil, crops, milk) in the vicinity of nuclear sites or at locations across the country. Levels of radioacti-

vity are compared to safety standards and the system can automatically trigger an alert if pre-set thresholds are reached, enabling appropriate countermeasures to be deployed if required.



LAND CONTAMINATION MAPPING

GROUND SURVEY

NUVIA offers a full range of services for both the characterisation and remediation of land.

Groundhog™ – Provides a range of radiation monitoring tools and services that encompass all gamma emitting contamination that can be detected in the field. Used as a portable or vehicle mounted system, Groundhog contains NaI(Tl) detectors coupled to an advanced gamma radiation spectrometer mounted in carbon fiber composite cases to reduce weight and improve the transmission of low- energy photons (these products are offered as a service within UK).

BENEFITS

- Detector and spectrometer are connected to an Ultra-Mobile PC carried by the operator or fitted to the vehicle
- The vehicle versions measure all type of radioactive contamination with plastic scintillation probes
- Use of database and Geographic Information System (GIS) to provide high-quality analysis and presentations
- Automatic recording of all measurement data

APPLICATIONS

- Characterisation and remediation of land
- Remediation strategies based on in-situ selective sentencing of waste

Groundhog Fusion



Groundhog Insight



Groundhog Evolution2 and Synergy

LAND CONTAMINATION MAPPING

AERIAL SURVEY

The **DRONES-G** systems represent a state-of-the-art technology for light airborne radiation monitoring using UAVs (unmanned aerial vehicle). The system offers excellent performance for environmental radiation inspection and emergency monitoring. Measured data is transmitted in real time to the ground station equipped with DRONIC software providing an immediate overview of the radiation situation in the territory the UAV is operating in. The main advantage of the DRONES G radiation monitoring is the flexibility of use and wide range of applications.

BENEFITS

- Designed for independent operation - suitable for any drone (with adapted payload and autonomy)
- Real-time data processing and transmission to the ground station
- Single interface for the drone control and data acquisition and visualization
- Less costly than helicopter monitoring, quicker and easier than pedestrian monitoring
- Easily programmable path to survey the area in a systematic way

APPLICATIONS

- Survey of medium size areas to search for potential contamination, orphan radioactive sources or for operations in areas with hazardous dose rate levels
- Surveying areas that are not easily accessible by foot or other means of transportation
- Ambient air sampling on filters for subsequent analyses of radioactive material and radionuclide identification
- Emergency response



Drones-G

MODULES

BASE MODULE

The efficient light-weight Base Module is designed with an integrated laser, altimeter, RF Data Link module, GM detector, and SD memory card and GPS can be added as well. Thanks to its design, several modules can be attached at the same time.



HIGH RESOLUTION MODULE

Based on specific needs of a client, this module can be equipped with detectors such as LaBr or CeBr to provide accurate gamma spectroscopy measurements.



HIGH SENSITIVITY MODULE

Plastic Detector Module provides excellent sensitivity around 500 cps @ 100 nGy/h on natural background. The energy range is 50 keV to 3 MeV.



GPS

All data from detector modules of DRONES-G system is processed on board (by the Base Module) in real-time and is synchronized with GPS time and position. Data is transferred through a wireless connection to the ground control unit (Laptop) and optionally stored locally on the memory card.



GAMMA SPECTROSCOPY MODULE

The basic DRONES-G gamma spectroscopy unit has two sizes of the detector: 2x2" and 3x3" NaI(Tl) detector. The included software DRONIC provides a real-time overview of the gamma spectrum in several display methods, while a post-processing software performs more detailed assessment.



NEUTRON DETECTION MODULE

The Neutron Detector Module is designed for a sensitive monitoring of thermal neutrons. The core part is a neutron detector based on $^6\text{LiF/ZnS(Ag)}$ and does not require to use expensive He^3 tubes..



AIR SAMPLER

A special module of DRONES-G System is the Air Sampler Module that monitors particle or chemical contamination in the air. The air samples can be evaluated by using different types of filters, such as synthetic fiber, plastic, or paper filters. Thanks to its lightweight (0.7 kg), this module is easily used in combination with detection modules.



RF MODULE

The RF Data Link Module is mounted on the ground station module and allows for a communication between the DRONES-G and a PC on the ground.



LAND CONTAMINATION MAPPING

GAMMA SPECTROMETER

The Portable Gamma Spectrometer Information System (**PGIS**) is designed for field and mobile gamma spectroscopy surveillance and can be either hand carried or worn as a backpack. The system provides the user with real-time calculation of the concentration of the selected radionuclide according to ANSI 42, survey navigation and isotope identification (RIID). System enables synchronized multimedia data comments as a photo, video or text.

BENEFITS

- Light-weight, portable and user-friendly device
- Real dose calculation from spectra
- Recording of full spectra as a function of time (waterfall)
- Automatic calibration system

APPLICATIONS

The instrument is designed for portable or backpack application of radiation detection and monitoring in a variety of environments:

- Health physics
- Land remediation
- Emergency response



PGIS

LABORATORY ANALYSIS

AUTOMATIC SAMPLER CHANGER

The Automatic Sample Changer (**ASC-100**) has been developed for use in HPGe high-resolution gamma ray spectroscopy labs. The system is designed for the processing and evaluation of samples to quantify the gamma radionuclides in large numbers of samples, long term measurements, highly radioactive samples or for radiological emergencies.

BENEFITS

- Fully automatic
- Easily accessible sample storage with tray for samples
- Remote access and status information messages
- Easy decontamination of inner cavity of the shielding box
- Long-term maintenance-free operation
- Modular system

APPLICATIONS

- Measurement of food samples
- Environmental samples (soil, vegetation, wood, coal)
- Construction material measurement



ASC-100

EARLY WARNING NETWORK

WATER MONITORING

The **ENA UW** premium series of spectrometric probes are specifically designed for underwater measurements. The probes provide excellent sensitivity and spectrometric resolution. They are suitable for multiple applications such as industrial monitoring, during decommissioning projects, during reactor defueling, around storage ponds, or for environmental monitoring of contaminated natural water sources.

BENEFITS

- Optional size of NaI(Tl) scintillation crystal
- Integrated MCB3 analyzer
- Excellent sensitivity
- Easy deployment
- High accuracy
- Fresh or salt water

APPLICATIONS

- Industrial applications
- Environmental monitoring
- Long term water monitoring
- Short term wells monitoring



The **Safewater** drinking water and effluent monitoring system is designed for fast and accurate online monitoring of potential drinking water contamination by beta or gamma radioactive substances. The system can operate autonomously in a continuous mode with real-time data transmitting to the central monitoring station. If measured gamma or beta radiations exceed critical limits, a visual alarm is triggered, and a notification is automatically sent to the supervising authority.

BENEFITS

- Rapid response to water contamination
- Real-time data processing and immediate alert notification by text message or e-mail
- Water leakage detection
- Interface to water sampler system

APPLICATIONS

- Operative beta and gamma radiation monitoring of drinking water or effluent
- Warning against rising levels of radioactivity in natural and man-made water reservoirs



EARLY WARNING NETWORK

RADIATION MONITORING NETWORK

NuWATCH is a comprehensive early warning network for radiation monitoring and analysis based on multiple sensors distributed over a medium to large area. This network of detectors connected to the RADIS software can display a near real-time map of the radiological conditions. NuWATCH solution is specifically designed to warn about important deviations from averages caused by radionuclides, so that efficient countermeasures can be used.



ASC-100



ENA UW



RAMS



DRONE-G



NUWATCH

AIR SAMPLING

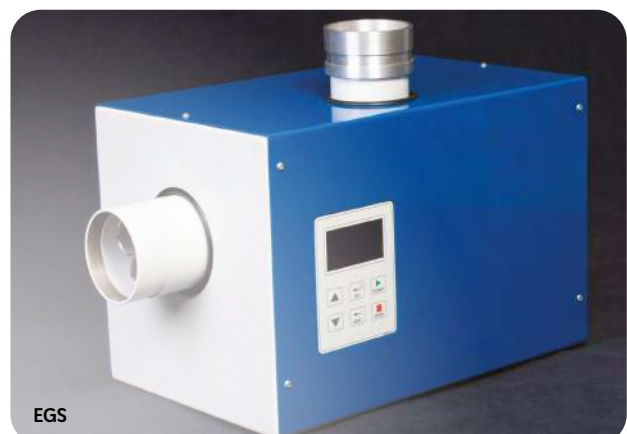
EGS is a high-volume air sampling system used for capturing radioactive aerosols, emissions, dust and other air pollutants contained in the air. Sampled air passes through removable filters that are subsequently analyzed in a laboratory to evaluate volume activities of captured particles. This state-of-the-air sampler is easy to operate and can be incorporated into various automated sampling systems. The system is designed to be remotely controlled including setting the parameters and data collection.

BENEFITS

- Continuous or pre-defined sampling interval or air volume
- Adaptable for various filter types
- Remote control

APPLICATIONS

- Air sampling for radioactive material concentration measurements at nuclear sites
- Sampling system for collecting air in ventilation stacks for aerosol evaluation
- Outdoor sampling systems / monitoring station for subsequent air analyses



EGS

MOBILE LABS

The **MORA ISO** laboratory is built in a standard ISO 1C type container and is designed for long-term deployment in the field. In addition to radiological and nuclear measuring systems, it can be equipped with chemical and biological measuring instrumentation for wider detection capability. The configuration of laboratory and instrumentation is client specific.

BENEFITS

- Quantitative and qualitative in-situ analysis of gamma radiation in solid and liquid samples, including smears and aerosols
- Total alpha and beta activity measurement of solid and liquid samples including smears and aerosols
- Radiation monitoring
- Neutron radiation monitoring
- Surface alpha, beta and/or beta & gamma contamination measurement
- Radiotoxicity assessment

APPLICATIONS

- Emergency radiation situation monitoring
- Radiation monitoring



MORA ISO

The **MORA VAN** is a custom-made mobile radiometric laboratory built in a van. It is designed for radiation emergency situations and other environmental and security scenarios. The laboratory is primarily used for gamma and neutron radiation measurements and is equipped with gamma high sensitive and high dose level detectors, spectroscopy systems for radionuclide identification, and a neutron detector for neutron radiation measurement. With other optional instrumentation like a weather sensor, a monitor for surface contamination or a tool kit for air, water and soil sampling it is a very versatile asset.

BENEFITS

- Ability to integrate other radiation detection modules and auxiliary devices
- Direct measurement of radionuclide concentration and excellent real-time radionuclide identification
- Wide range of gamma radiation measurements
- Directional measurement for effective localization of contamination or illicit/ lost radioactive sources
- Advanced software for data visualization, system settings and sophisticated mapping capabilities

APPLICATIONS

- Radiation and nuclear protection
- Deployment at nuclear and radiological incidents
- Environmental monitoring
- Detection of lost or uncontrolled radioactive sources
- Radiation reconnaissance in industrial zones
- Monitoring in the vicinity of nuclear facilities

EARLY WARNING NETWORK

DOSE RATE MONITORING PROBES

The **NuDET EGM** probes based on Geiger-Müller detectors are able to operate over a wide variety of measurement ranges. They are designed for ambient radiation monitoring for radiation sources in the environment or monitoring for radiation safety at nuclear power plants. They provide real-time measurement. Being both resistant to harsh environments and a waterproof housing, the NuDET EGM can safely and accurately measure in any environmental and radiological conditions.

BENEFITS

- High measurement accuracy
- Modular system allowing up to three GM tubes for wide measurement range
- Rugged construction, airtight housing and waterproof connectors
- Open and easy-to-use data transfer protocol
- Automated and optimized switching between detector tubes

APPLICATIONS

- Environmental monitoring
- Ring monitoring around NPP.



DOSE RATE MONITORS

The **RAMS** is an autonomous radiation monitoring station designed for ambient radiation monitoring in a place of its deployment. Several stations can create a monitoring network to provide a real-time measurement of radioactivity in a vicinity of nuclear facilities. Each monitoring station can be equipped with a solar panel for autonomous operation in the field without necessity to provide external power supply. Measured data from each station is transferred via internet (Ethernet, GPRS, 3G, or satellite) to the central server for further processing.

BENEFITS

- Complete solution for various outdoor monitoring tasks
- Proven ruggedized construction and technology
- Power supply from various independent sources (solar panel, battery, mains, diesel generator)
- Powerful software for data processing and visualization
- Optional connection of various measuring probes

APPLICATIONS

Radiation monitoring network around nuclear facilities



RADIATION MONITORING SOFTWARE

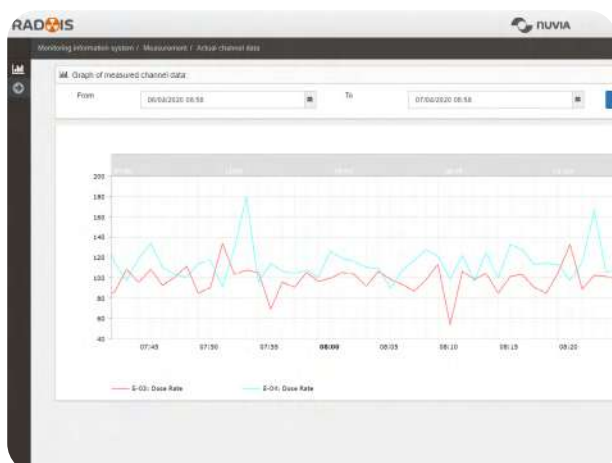
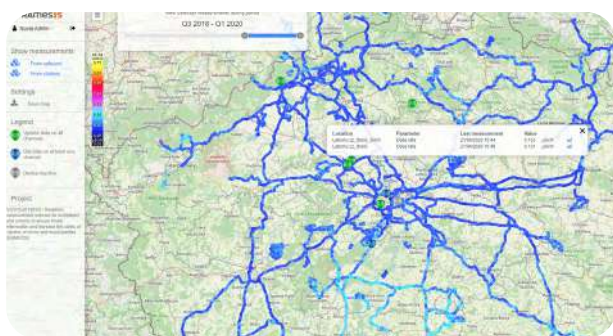
NuSOFT RADIS is a flexible monitoring network solution for collecting, measuring, and publishing radiation monitoring data. From a single building to a large network covering industrial sites and environment NuSOFT RADIS is designed to scale with the required coverage.

SENSORS

Air samplers, mobile and permanent networks of probes and detectors placed in and around a building. Additional sensors can be linked (e.g. humidity, temperature, quality of air, etc).

MAIN PURPOSE

Control of alarm thresholds, transmitting alarm alerts (SMS, email), providing real-time radiation conditions in and around a building via a single interface.



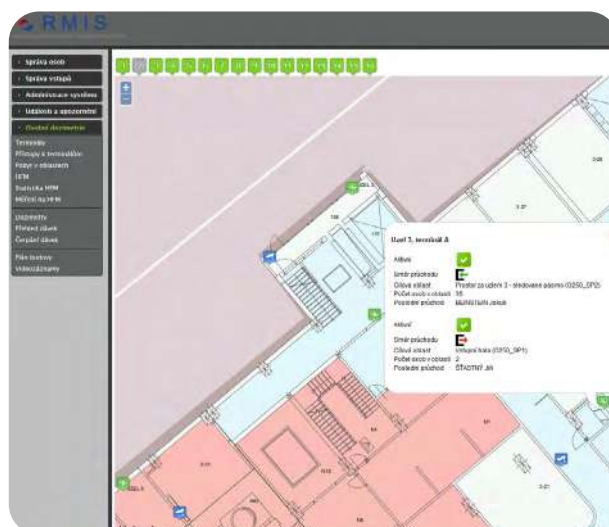
NuSOFT DORMIS is a flexible information package that provides authorised personnel with a single control station detailing all the radiation workers accessing controlled zones. One central database concentrates data from all building monitoring infrastructure. The system provides a centralised display of all sensors to enhance the safety and control of operating personnel.

BENEFITS

- Automated prohibition of access to unauthorised personnel to or from the controlled zones (e.g. contaminated workers, people without a dosimeter, expired medical permission, threshold for annual dose intake)
- Overall supervision with all connected sensors
- Additional sensors can be connected to the system, e.g. air quality, temperature
- Protection of persons working in the sensitive areas within the monitored installation

APPLICATIONS

Control of entry points to and from restricted areas at any nuclear site, radiochemical laboratories, or radwaste facilities.





NUVIATech Instruments

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