ENVIRONMENTAL MONITORING

peo DETECTION

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Partner Else Nuclear

ELSE NUCLEAR S.r.l. is an Italian OEM company specializing in advanced radiation-detection and environmental-monitoring systems for nuclear safety, industry and research.

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SP2 – SINGLE-SPHERE NEUTRON SPECTROMETER

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Radiation Detection › Environmental Monitoring

GSU – GAMMA SPECTROMETRY UNIT WITH NaI(Tl)

The GSU gamma spectrometry units employ a 3″x3″ NaI(Tl) crystal coupled to a photosensitive detector (either PMT or SiPM) and an MCA. The detector is installed in a 5 cm thick lead shielding well, with additional inner layers of tin and copper for enhanced background reduction.

GSU is designed to perform gamma spectrometry analyses of small samples, such as foundry casting samples, air particulate filters, environmental samples (rocks, soil, biological samples), positioned in sample holders which can be tailored to meet specific measurement requirements, or Marinelli beakers.

The User can manage the system through the proprietary ELSE NUCLEAR GSU system software, calculating the specific activity and the Minimum Detectable Concentration (MDC) of the sample expressed in Bq/kg, Bq/l, Bq/m^3, etc. The built-in background subtraction subroutine improves the MDC without increasing the measurement time. The software includes fully-customisable isotope libraries as well as User-settable isotope-specific activity alarm thresholds, available through password-protected functions.

The GSU-NORM is a special version of system specifically conceived to perform Naturally Occurring Radioactive Material (NORM) analysis of environmental samples, such as rocks, sediments or soils. Through its MCA and its dedicated software, the GSU-NORM system allows determining the specific activity of NORM isotopes, i.e. K-40, Th-232 and U-238, expressed in Bq/g, %K, ppm eU and ppm eTh.

The sample holders are custom-made supports that fit directly on the detector’s head, used to hold casting samples, test sources or other similar objects.

The Marinelli beakers are used to contain geological samples or other similar materials. Several volumes are available, from 250 ml up to 1 l, with different geometrical features.

Each GSU system includes efficiency curves and coefficients implemented in the analysis software, calculated through Monte Carlo simulations for each specific configuration, acquisition chain and measurement geometry. The simulations are always validated through experimental tests performed with reference radioactive sources.

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SP2 – SINGLE-SPHERE NEUTRON SPECTROMETER

The single-sphere neutron spectrometer SP2 is a unique device that allows performing active neutron spectrometry measurements by employing a single instrument instead of the usual multi-sphere BSS.

SP2 is characterized by the same high sensitivity and precision as BSS in determining the neutron flux over the entire energy range, while removing any reproducibility uncertainty. When employed with the on-line unfolding tool, SP2 can also perform real time measurements.

SP2 is equipped with 32 active ^{6}LiF-covered Silicon neutron detectors installed over six concentric layers inside the moderating assembly, so that they reproduce the spectrometric performance of a six-sphere BSS. The signals are acquired by the built-in electronics and can be either analysed on-line by the built-in unfolding algorithm, or saved as raw data for off-line analysis.

SP2 can be used in a great number of activities in scientific research: homeland security, cargo inspections, calibration laboratories, characterization of stray radiation fields for radiation protection purposes, periodical quality check of the neutron stray radiation field, all applications involving the need of a fast and precise measurement of the neutron spectrum.

A SP2 LITE version is also available, featuring a lighter build and a narrower energy range, suitable for all the applications that do not require to detect neutrons with energy above 20 MeV.

The response function of the device, calculated via Monte Carlo simulations, is available for either on-line and off-line analysis. The response function and unfolding algorithm have been validated after thoroughly testing with reference radioactive sources.

SP2 is the ideal device for performing active neutron spectrum measurements in every radiation environment, including mixed stray radiation fields, workplaces characterized by high gamma background and reference calibration laboratories.

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Radiation Detection › Environmental Monitoring

LUPIN BF3

LUPIN BF3 is an environmental monitoring unit for neutron H*(10) measurements, with unique excellent performance for neutron detection in pulsed fields.

The rem counter is composed of:

- BF_3 proportional counter
- Cylindrical moderating assembly
- Built-in power supply, signal management and control electronics

The electronics processes the signal coming from the detector and elaborates the instantaneous H*(10) rate value every second.

If required, the radiation sensitive electronics can be housed in a separate rack. An accessory IP54 version is also available

Data are sent to the connected SATURN ratemeter acquisition and control unit, which locally displays the instantaneous H*(10) rate and the integrated values and compares them to the pre-set alarm thresholds.

A LUPIN BF3 LITE version is also available, featuring a lighter build and a narrower energy range, suitable for all the applications that do not require to detect neutrons with energy above 20 MeV.

Papers published in international scientific journals:

- M. Caresana, M. Ferrarini, G.P. Manessi, M. Silari and V. Varoli, LUPIN, a new instrument for pulsed neutron fields, Nuclear Instruments and Methods in Physics Research Section A 712 (2013) 15-26.
- M. Caresana, C. Cassell, M. Ferrarini, E. Hohmann, G.P. Manessi, S. Mayer, M. Silari and V. Varoli, A new version of the LUPIN detector: improvements and latest experimental verification, Review of Scientific Instruments 85 (2014) 065102.

SATURN I, SATURN II

The SATURN ratemeter is a compact acquisition and control unit, designed for managing and processing signals from any ELSE NUCLEAR connected detector.

- SATURN I: standard wall-mounted version
- SATURN II: wall-mounting version compliant with “Good Manufacturing Practice” requirements (no external cable or connectors)

All the ratemeter versions feature local function buttons with status LEDs, internal acoustic buzzer and a relay connector, used to manage external alarm columns or interlocks.

The SATURN ratemeter continuously acquires and processes the data coming from the connected detector, and compares results with user-defined alarm thresholds.

Two user-selected measurements can be displayed at the same time on the display, such as instantaneous or average count rate, dose rate, activity concentration, counts, dose or activity integrated values.

The user interface is accessible through an external keyboard, which allows local interaction with the full range of parameters (advanced setting is password protected). Measurements, thresholds and operating parameters are stored into an internal, non-volatile memory.

The ratemeter can communicate to and be remotely managed by a host PC through an Ethernet or RS485 network.

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Radiation Detection › Environmental Monitoring

SATURN 5702

SATURN 5702 is a mobile station equipped with two detectors for gamma and neutron dose rate monitoring. The station includes:

- Ion-chamber-based gamma radiation monitoring unit: ICP-T or ICP-T-PF
- Neutron rem counter for pulsed fields: LUPIN BF3

The detectors and the electronics are housed in a trolley-mounted mechanical structure. The height of the trolley can be customized according to the customer needs, for example to centre the detectors with the beam line height.

Each detector can be removed from the trolley to be employed remotely, up to 20 m. An ALU alarm column is mounted on the top, providing luminous and acoustic warning signals related to the status of the mobile station (good functioning, pre-alarm and alarm). SATURN 5702 stations can also manage external devices through 4 sets of relay contacts.

The detectors are connected via external cables to a standard 19” electronics rack equipped with two dedicated SATURN ratemeter units (rack version). Each ratemeter features a display, 3 function keys with status LEDs, and a connector for TOUCHKEY2 external keyboard.

SATURN 5702 can be connected to a remote host PC running a data management software (5700 sMON) through ETH or RS485/422 connection.

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Radiation Detection › **Environmental Monitoring**

NAUSICAA IC-T, ICP-T

NAUSICAA is an ion-chamber-based gamma radiation monitoring unit, available in two versions:

- IC-T for environmental measurements (9 decades electrometer)
- IC-T-PF for pulsed field measurements (7 decades electrometer)

Both versions include an ion chamber detector, an electrometer and a CPU-based acquisition and control unit.

The display visualises the dose rate value and status messages, while a built-in buzzer and coloured LEDs provide additional status indications.

The alarm thresholds, the operational parameters and the measurement data are saved in the internal memory. The user can set the parameters through the external keyboard or 5700 sMON software (if provided).

The standard NAUSICAA configuration, suitable for indoor use, is composed by a 3U 63HP table box housing the electronics modules, and the ion chamber directly installed on top of it. Wall mounting accessory and trolley kit are also available, as well as an IP54 enclosure.

It is possible to connect one or more units to a host PC (running 5700 sMON software) through Ethernet or serial communication.

The ICP-T detector is identical to NAUSICAA, but it does not include the CPU, being connected to and managed by a SATURN ratemeter.

The DISCOVERY IC-T unit is a special version of NAUSICAA, assembled in a IP65 housing, designed to operate outdoor; data can be transmitted through a wireless connection or downloaded through a dedicated utility.

Radiation Detection › **Environmental Monitoring**

GM-1, MERCURY

According to the measurement requirements, different versions of Geiger-Müller detectors are available:

- GM-1: single-Geiger detector (up to 1 mSv/h)
- MERCURY: double-Geiger detector (up to 1 Sv/h)

All models employ energy-compensated tubes, lodged in high-protection aluminium cylinders, together with a built-in HV board.

MERCURY detectors are equipped with 2 Geiger-Müller tubes to reach a wider measurement range. An internal electronics automatically switches to the suitable GM tube according to the count rate level.

Both the GM-1 and the MERCURY detectors are connected to and managed by a SATURN ratemeter, which provides power supply, signal processing and data visualization. Each detector-ratemeter couple forms a monitoring unit, which can be connected in a network to a central host PC running 5700 sMON management software.

Among the special versions and accessories available, we mention in particular:

- Stand-alone version of GM detectors for direct connection to PC
- IP65 housing for MERCURY for outdoor installations
- PS-ZB accessory for MERCURY, providing battery-operated power supply and ZigBee Wireless communication, and ZB-TC receiver connected to the ratemeter to acquire the data
- GPS locator for PS-ZB

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Radiation Detection › Environmental Monitoring

NAUSICAA 2IC

The NAUSICAA 2IC system is designed to quantify the beta activity in air or gas streams, due to the presence of tritium or other noble gases, while compensating for the environmental gamma background.

NAUSICAA 2IC can be used in activities involving air sampling from rooms, stacks, hoods, or other effluent passages, process piping, glove boxes, and similar.

NAUSICAA 2IC is composed of:

- two identical, cylindrical, 10 litres, stainless-steel ion chambers
- a pneumatic sampling system
- an electrometer to amplify and manage the (typically very weak) ionisation current
- a local control unit with display and software

Ambient air is sampled in the upper chamber, while the lower one is sealed and filled with clean reference air. Ionizations occurring in the upper chamber are due to both environmental gamma background and beta contamination, whereas inside the lower chambers only gamma background interactions occur. The two chambers are provided with an opposite-polarity HV: the resulting output current is thus the difference of the two single outputs, i.e. the net beta contamination of the sampled air, expressed in activity concentration. An accessory equipment for filtering and drying the sampled air helps limiting as much as possible any spurious signals.

The NAUSICAA 2IC control unit manages data acquisition, processing and visualization. A touch-screen display allows parameters' setting and data visualization. A built-in acoustic and luminous alarm column provides proper warnings in case of alarm or malfunctioning.

NAUSICAA 2IC can be connected to a host PC through RS485 or ETH connection for remote data visualization.

With a 600 V value each camera can generate currents up to 10^{-8} A, with a saturation error < 20%.

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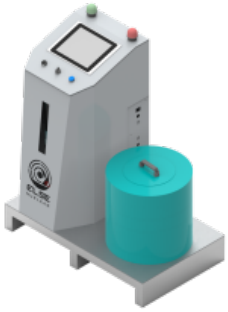
MISTRAL XM



MISTRAL XM is a system designed to sample and monitor the gamma activity concentration resulting from air activation, in Marinelli geometry.

In particular, MISTRAL XM Rooms is designed for free air monitoring, whereas MISTRAL XM Stack is used to monitor the air expelled from a chimney or a stack. In both cases, “X” indicates the number of sampling points: up to 5 (Rooms) or 1 (Stack).

The system is composed of:

- acquisition and processing unit: APU
- sampling and detection unit: SDU-XM

The APU is the main user interface with the system, and it consists in a command and control console including: a panel PC, the system electronics, a control flow meter for the pump, and an array of electrovalves (if needed). The SDU-XM includes the NaI(Tl) detector with MCA, a lead shielding well, and a pump for air sampling. The system also manages the expulsion of the monitored air.

The Stack version includes a flow rate meter (STACK-DFM), to calculate the specific activity of the expelled air volume.

The software installed on the PC displays in real time the measurement, controls the system status, and allows to set the operative parameters, such as the alarm thresholds. The user can define specific regions of interest (ROIs) and thus determine the specific activity (Bq/g) of the sampled air.

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HERMES

HERMES systems are rugged, portable units for radiation detection, designed and tailored for a wide range of operational scenarios such as gamma and neutron detection, dose rate measurement, gamma spectroscopy and more. HERMES systems are suited for emergency response activities, as they are mounted inside robust and high-IP technical cases, which can be handheld or vehicle-mounted.

The HERMES product line includes customisable configurations, such as:

- HERMES NAI or CSI, with NaI(Tl) or CsI(Tl) detector and MCA to perform gamma spectrometry
- HERMES GMT or PLA, with Geiger-Muller or plastic detector for high-sensitivity gamma monitoring
- HERMES NEU, with ^{10}BZnS neutron detector and plastic moderator for artificial neutron source detection
- HERMES SENTINEL, combining NaI(Tl), GM tubes and neutron detector for comprehensive radiation surveillance

HERMES units support remote operation via LAN or Wi-Fi through a smartphone or a tablet. According to the configuration, the proprietary software provides real-time dose rate data, nuclide identification, alarms, and interactive heat mapping. Scan results, GPS coordinates and events are automatically logged into the local memory for off-line processing.

HERMES units incorporate advanced gain stabilization, dead time correction, and automatic energy calibration based exclusively on natural background radiation (no source needed to calibrate).

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Radiation Detection › Environmental Monitoring

FOOMON

FOOMON is a portable fully-integrated instrument specifically conceived for screening of I-131, Cs-134 and Cs-137 accumulated in food samples. Its “on-the-field” design allows deploying the device in any kind of situation, such as routine campaigns or emergency procedures.

The whole device is self-contained in a portable high-IP-grade technical case, for an overall weight < 25 kg. The food samples are to be placed in 500 ml Marinelli beakers, which then are lodged inside a 1 cm thick lead shielding well upon the detector’s end cap. The complete setup and deployment of the system requires less than 5 minutes.

The User can manage FOOMON through the user-friendly control and analysis software installed on the embedded panel PC, automatically calculating the specific activity and the Minimum Detectable Concentration (MDC) of the sample (in Bq/kg). Data are stored locally and can be analysed and downloaded with dedicated software routines.

The measured activity concentration is compared with isotope-specific and food-group-specific alarms. In the case of an alarm, the measurement output is clearly labelled and the alarm status is clearly displayed on the software, which also activates the acoustic alarm.

The counts-to-activity-concentration conversion coefficients are calculated by means of dedicated Monte Carlo calculations.

The MDC achievable in 1 minute, with an average indoor background (150 nSv/h), is as low as about 150 Bq/kg for Cs-137 and Cs-134, and about 90 Bq/kg for I-131. Under the same conditions, MDC as low as about 30 Bq/kg for I-131, and about 40 Bq/kg for Cs-134 and Cs-137, can be achieved in about 10 minutes.

If enabled, the automatic background subtraction subroutine allows further lowering MDC and measurement uncertainty without increasing the counting time.

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Radiation Detection › Environmental Monitoring

THYMON

THYMON is a compact NaI(Tl)-based detector specifically conceived to fast, yet reliably, measure I-131 contamination in thyroid. Its compactness, ruggedness, light-weight, together with its simple and intuitive built-in software interface, make the device perfectly suited for emergency screening applications. The instrument can be used either hand-held or hands-free. The instrument is composed by three main subparts:

- Detector probe: a 1.5” x 1.5” collimated NaI(Tl) crystal coupled to a SiPM matrix and extremely compact readout electronics and MCA
- Extendable support: designed as both table-top and standalone, providing the possibility of hands-free operation
- Control tablet: IP65 water- and dust-proof 8” capacitive screen, wired-connected to the probe

The mechanics of the probe is specifically conceived to ensure the best alignment between the probe and the thyroid, guaranteeing excellent crystal-to-thyroid alignment, and reducing positioning uncertainties.

The control and analysis software installed on the control tablet is designed to be simple and intuitive, yet advanced and comprehensive. This is accomplished by combining a simple and intuitive interface with advanced calculation routines, which run automatically as the measurement start, without the need of operator intervention.

Data are stored locally on the tablet internal memory, and can be analysed and downloaded with dedicated software routines.

The automatic I-131 activity calculation is given for pre-defined age groups: 1 yo, 5 yo, 10 yo, 15 yo (Adult Female), Adult Male. Counts-to-activity conversion coefficients are calculated by dedicated Monte Carlo simulations based on detailed detector and thyroid numerical models. The simulations are always validated for the specific system through experimental tests performed with reference radioactive sources.

The activity is compared to 2 User-defined threshold levels, each defined per each age group, following the two Action Levels logic.

MDA as low as about 100 Bq can be achieved in 2 min screenings. The MDA can be further lowered by enabling the background subtraction option.

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HERMES GSU

HERMES GSU is a portable gamma spectrometry system designed for rapid and precise in-field analysis of environmental samples. As part of the HERMES product line, it features a rugged, modular, and self-contained design housed in a high IP-rated technical case, ensuring durability and reliability in demanding conditions.

HERMES GSU quantifies isotope activity concentrations based on a rich built-in, yet fully-editable, isotope library. Its portability and autonomous operation make it ideal for both routine monitoring and emergency response scenarios.

Samples can be directly collected from the field, placed in 500 ml Marinelli beakers, and inserted into the built-in 1 cm lead-shielded well, minimizing background radiation for immediate, on-the-spot, low MDC analysis, and enhancing measurement accuracy and sensitivity. The system automatically calculates activity concentrations, making it a powerful tool for in-situ, laboratory-grade measurements.

HERMES GSU features advanced routines for gain stabilization, dead time correction, and automatic energy calibration (relying on natural background only, thus not requiring any radioactive reference source).

Efficiency calibration curves are generated using validated Monte Carlo simulations. Predefined efficiency curves are available for different sample matrices, including soil, water, and foodstuffs, across various densities. Custom calibration curves can be provided upon request.

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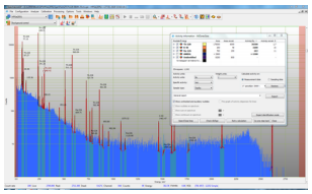
Partner BSI

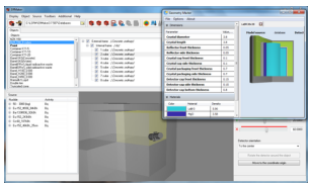
Baltic Scientific Instruments (BSI) is an OEM manufacturer based in Riga, Latvia, dedicated to the development and production of advanced spectrometric and detection equipment. With decades of experience and roots in the former Research Institute for Radioisotope Apparatus (RNIIRP), BSI provides cutting-edge technologies for nuclear power, environmental monitoring, security, medicine, and scientific research.
The company specializes in HPGe, Si, CdZnTe/CdTe, and scintillation detector systems, known for their accuracy, stability, and performance in demanding analytical environments.
Through continuous innovation, strict quality assurance (ISO 9001:2015), and strong international collaboration, BSI supports customers worldwide in achieving precise and reliable radiation measurement and analysis.

Product offering

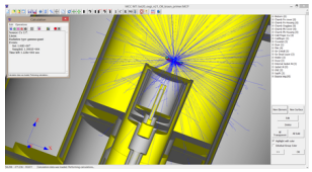
Gamma analysis software SpectraLineGP



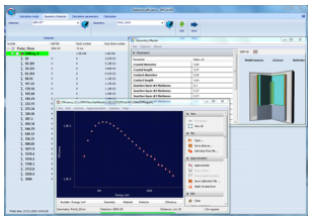
Calibration software EffMaker



Calibration software MCC-MT

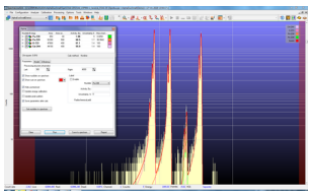


Nuclide Master Plus



Quality Assurance package

Alpha analysis software SpectraLineADA



AirTrack Aerosol Monitoring Station

AirTrack-i Iodine Monitoring Station

WaterTrack Online Water Monitoring Station

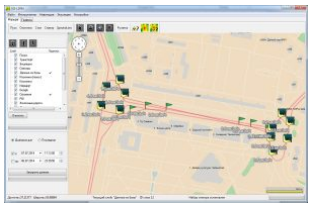
Spectrometer WaterSPEC

Spectrometer AirSPEC

Mobile Radiation Monitor GammaCART

Alpha analysis software AlphaPRO

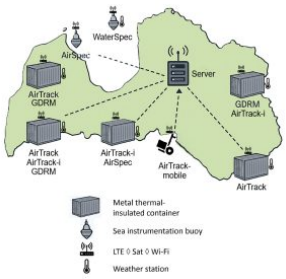
SpectraLineGIS software package



Gamma analysis software GammaPRO

Hybrid cooling for the HPGe detector Nicole

Radiation Analysis and Visualization Environment Network RAVEN software



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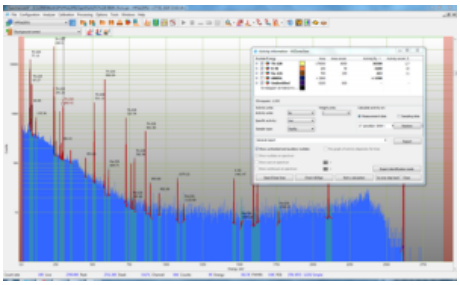
Radiation Detection › Environmental Monitoring

Gamma analysis software SpectraLineGP



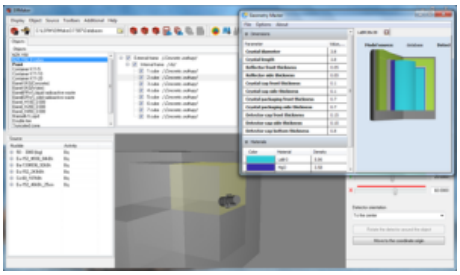
SpectraLineGP has been developed for spectrometry measurements and precision processing of gamma spectra. Spectra processing includes calibration, peaks parameters determination, nuclides identification, activities calculation and using the true-coincident factors for the gamma emission intensity correction. External programs can be used in SpectraLineGP as an additional instrument for user methods realization for solving of the specific spectrometric tasks.

Features

- algorithms of peaks search and multiplets separation;
- calibrations by energy, FWHM, peak pattern, detection efficiency, secondary peaks with quantitative and visual control;
- calculation of the peak parameters (position, half-width, area), with storing the results in a text file;
- different methods of activity calculation;
- storing the measured spectra and results of processing in the database in order to repeated analyze for convergence in accordance with the given criteria (the quality estimation);
- connection of an arbitrary number of measuring channels;
- independent control, start, stop, spectra storage and visualization in all measuring channels;
- additional stop conditions: on activity uncertainty values, peak area, peak area uncertainty, peak MDA, ROI integral count;
- account for cascade summation effect, correction to high count rates and accidental summation.

Radiation Detection › Environmental Monitoring

Calibration software EffMaker



EffMaker software package has been developed for calculation of detection efficiency and modeling of gamma-spectra in different measuring geometries using Monte-Carlo method. EffMaker can be used for measurements of objects activity by gamma-spectrometric methods when the spectrometer calibration can be hardly done by reference standards, e.g. for measurements of transport containers, packages with radioactive wastes, others wastes. Objects with arbitrary distribution of activity, which includes nonuniform distribution, can be modeled using this software package. So it can be used for analysis of how radionuclides distribution in the sample affects the activity measurements results. This function presents the promising way of EffMaker using for development and testing of software and methodological support.

Features

The response function is modeled for the detector to the increase of the calculations speed. This function is a set of spectra for monochromatic radiation in the prescribed range. The response function is transformed to the response matrix which takes into account number of channels of the spectrometer and its resolution. The gamma spectrum of the object (the physical spectrum of the source) in the point of the detector’s location is modeled independently. The detector spectrum of the source is obtained as a convolution of the physical spectrum with the detector’s response matrix.

A modeled object is a dissymmetric structure consisting of embedded cylinders, parallelepipeds, spheres. So objects with sophisticated parameters and arbitrary distribution of activity can be modeled: with surface (internal and external), volume distribution etc.

The built-in set of patterns in EffMaker simplifies the creation of complex geometrical objects with nonuniform activity distribution. The following patterns are included:

- a truncated cone, with one-layer or two-layer walls;
- an empty or filled tube, open sidelong test tube with internal or external surface contamination;
- cylinder, profile, top or bottom view, with one layer of the source;
- a box for the air tubes modeling with external contamination, activity can be distributed in internal or external layers;
- spherical objects with internal contamination like pipe closers
- angle bar and double tee with random orientation, with the contaminated surface;
- circular and rectangular plates.

The main functions:

- fine adjustment of relative position of the detector and the object, including the option of the detector placing inside the object;

- calculation of spectrum and detection efficiency for the selected geometry;
- batch calculation of detection efficiency for different detectors and objects;
- energy spectrum calculation using energy grid or by setting of activities of radionuclides taking into account the decay chain;
- radionuclides database on the basis of ENSDF compatible with Nuclide Master;
- the database of cross-sections of interaction of gamma rays with matter for setting of arbitrary material of the object;
- the database with models and calculation results;
- integration of calculation results with SpectraLine software package.

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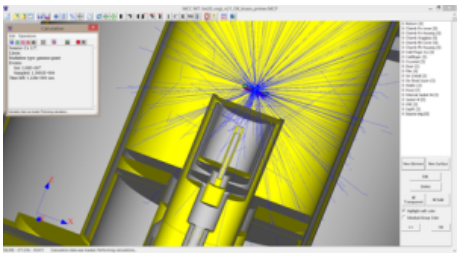
Radiation Detection › Environmental Monitoring

Calibration software MCC-MT



Application

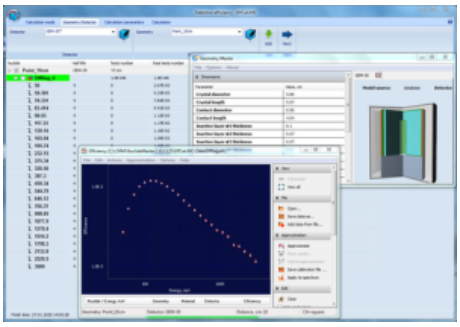
- Monte Carlo simulation spectra of gamma, beta and radiation;
- Characterization detectors and detection systems;
- Calibration of instruments used for ionizing radiation detection and measurements without using the hazardous ionizing radiation for human health;
- Obtaining clear picture of the internal processes of radiation transfer in order to optimize the design of the measuring devices and their protection;
- Acceleration, simplification and reduction in the cost of design and optimization of ionizing radiation detection systems;

Features

- High accuracy of calculations
- Detailed 3D-scene based on Open GL graphics technology providing maximum representation and visibility of modeling
- Availability of replenished database of sources and materials
- Possibility of creating the maximally complex measuring systems
- Forming multidetector systems and schemes of coincidence
- Display of the results in the form of an ideal and real spectrum
- Tracing and drawing trajectories of particles during calculation process
- Availability of the ready and test projects in the distributive package (HPGe, scintillation detectors, protective lead shielding, volumetric sources and samples, etc.)
- Accounting cascade summation (‘Full cascade’ source type)

Radiation Detection › Environmental Monitoring

Nuclide Master Plus



Application

Nuclide Master Plus is an extended version of Nuclide Master software. It is intended for calculation of detection efficiency, spectra and true coincidence factors.

Features

The calculation is based on Monte-Carlo method using parameters of the required nuclides from the library of evaluated nuclear structure data ENSDF (Evaluated Nuclear Structure Data File).

The calculations can be performed in point, cylindrical geometries and in Marinelly for different detectors types (semiconductor and scintillation) which are saved in database compatible with EffMaker software.

Functions:

- detectors and measurement geometries parameters setting and saving in database;
- lines and radionuclides lists creation;
- calculation of detection efficiency and correction factors for true coincidence using Monte-Carlo method;
- data filtering;
- creation and addition of correction factors for true coincidence library;
- data viewing and saving in detection efficiency library;
- batch processing possibility for several geometries and energy ranges.

If a file with correction factors is included into processing software SpectraLine, the true coincidence effect is corrected at the activity calculation.

Quality Assurance package

Gamma or Alpha analysis software SpectraLine can be extended with Quality Assurance package in order to provide monitoring of the spectrometer channel for the parameters of the full energy peak (position, FWHM and detection efficiency) for the specified energy and the background count rate.

The reference sample and the background are measured in semi-automatic mode for quality control. As the scenarios are used the measurement parameters can be flexibly adjusted and the monitoring results can be displayed depending on the date and time of the measurement start.

The control limits determined by the alarm and warning levels are displayed on the graph, so the parameters deviation from the specified intervals can be easily found.

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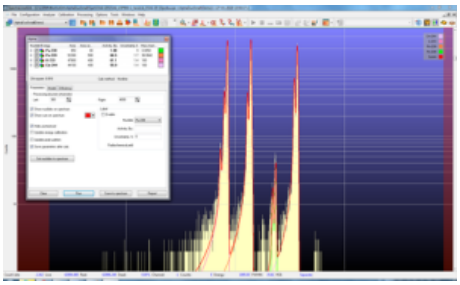
Radiation Detection › Environmental Monitoring

Alpha analysis software SpectraLineADA

The SpectraLineADA (Alpha Decay Analysis) software package has been developed for alpha-spectrometric analysis with spectrometers based on either semiconductor detectors or ionization chambers.



- processing of alpha-spectra of both «thin» and «thick» sources
- consideration of thin structure of alpha-spectra, parametrical description of the line shape
- consideration of the contribution of conversion electrons, which is required if the ratio of detectors parameters to the distance between source and detector is small
- registration efficiency calculation
- activity calculation by the inserted label. It allows to take into account the a priori information for results specification
- calculation of the radiochemical yield (radiochemical yield is calculated as the ratio between the amount of the nuclide material in the measured sample and the amount of this nuclide material, added to the probe)

The demonstration configuration and calibration scenario are included in SpectraLineADA installation package.

← Back to partner

Radiation Detection › Environmental Monitoring

AirTrack Aerosol Monitoring Station

The Aerosol Monitoring Station is a breakthrough in autonomous radiation surveillance, utilizing silicone, high purity germanium or scintillation detectors for alpha, beta, and gamma monitoring in the air. With unparalleled precision, this cutting-edge system ensures swift and accurate detection of radioactive aerosols. Operating autonomously, it offers real-time data, making it ideal for industrial, research, or emergency scenarios. The advantages of high purity germanium and scintillation detectors make this station a reliable guardian, providing continuous and precise radiation monitoring to safeguard diverse environments.

MAIN OPERATING FUNCTIONS

- acquiring alpha-beta and gamma spectra in real-time;
- calculating activity of radionuclides on the filter [Bq] and concentration of radionuclides in the air [Bq/m3];
- indication of the concentration of Radon in the ambient air and automatic compensation its progenies;
- two programmable thresholds (notification and alarm) for radiological events in each measurement chain (alpha, beta and gamma emitters);
- automatic filter replacement depending on its contamination degree, integrity damage, or after measurement time;
- automatic control of filter condition, including measurement of differences in the air pressure Δp at the inlet and outlet of the filter;
- measurement of the flow rate of the incoming air;
- data transfer via LAN, USB and 4G interfaces in the ANSI 42.42/EURDEP format to the end-user;
- control of all AirTrack operations from a remote computer.

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Radiation Detection › Environmental Monitoring

AirTrack-i Iodine Monitoring Station

The Aerosol Monitoring Station, tailored for gamma radiation monitoring in the air, is a specialized tool designed for in-depth analysis of airborne iodine. Utilizing the advantages of a scintillation detector, specifically SrI, and employing unique filters crafted for iodine analysis, this autonomous system ensures unparalleled accuracy. Ideal for situations requiring precise detection, such as nuclear incidents, the station stands as a reliable guardian, providing real-time data for swift response and safeguarding against potential threats associated with airborne iodine.

Features

MAIN OPERATING FUNCTIONS

- acquiring gamma spectra in real-time;
- measuring the activity of I-131 on the filter [Bq] and calculating the concentration of I-131 in the air [Bq/m3];
- automatic filter replacement depending on its contamination degree, integrity damage, or after the expiration of the specified measurement time;
- automatic control of filter condition, including measurement of differences in the air pressure Δp at the inlet and outlet of the filter;
- measurement of the flow rate of the incoming air;
- ambient air temperature measurement;
- two programmable thresholds (notification and alarm) for radiological events;
- audio and color alarm signals about operation modes and exceeding threshold values;
- data transfer via LAN, USB and 4G interfaces in the ANSI 42.42/EURDEP format to the end-user;
- control of all AirTrack operations from a remote computer.

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Radiation Detection › Environmental Monitoring

WaterTrack Online Water Monitoring Station

WaterTrack Online Water Monitoring Station is designed for continuous monitoring of the specific activity content of Cs-137 and/or other radioactive elements in Bq/l in running water. Utilizing a high-sensitivity scintillator, it enables real-time detection and quantification of radioactive elements in liquids. The system is ideal for environmental surveillance, industrial discharge monitoring, and water treatment facilities, offering low detection limits and precise measurements. Its robust design ensures consistent performance in diverse conditions, while user-friendly interfaces simplify operation and data analysis.

Features

- Sealed metal cabinet with pipes for connecting to the water supply system, including a stainless steel tank with a capacity >15 liters;
- 5 cm lead shield installed around the tank;
- Ø2×2” scintillation detector SrI2(Eu) with <3.5% energy resolution installed inside the tank with (NaI(Tl), CeBr3 – optionally);
- 4096 channels MCA for gamma spectrometry;
- Evaluation of measurement results according to ISO 11929;
- Automatic stabilization of gamma spectrometric channel by K-40 peak;
- Continuous self-testing procedures with an alarm signal and messages.

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Radiation Detection › Environmental Monitoring

Spectrometer WaterSPEC

Application

WaterSPEC is designed for indoor or outdoor use in aquatic environments. The waterproof housing has IP68 degree of protection: dust-tight (full protection against dust and other particulates) and protected against extended immersion in water to a maximum depth of 2 meters.

Features

- online gamma spectrum acquisition and readout;
- ambient equivalent dose rate H*(10) calculation [mkSv/h];
- automatic radionuclide identification;
- radionuclide concentration indication [Bq/m3];
- operation and settings control via GammaSPEC software;
- data transfer via RS-485 interface;

WaterSpec is a monoblock unit, comprising scintillation crystal, photoelectronic multiplier, HV converter, amplifier, multichannel pulses analyzer and processor unit.

WaterSpec measurement system is autonomous, automated and provides calculation of the ambient equivalent dose rate H*(10) in real time, as well as identification of the most common natural and artificial gamma radionuclides. The results of the identification and dose rate are then transmitted to the upper-level computer via exchange protocol.

WaterSpec has automatic stabilization of the spectrometry channels by means of tracking the position of the K-40 1460.8 keV full energy peak provided by the potassium salt located in the cartridge near scintillation crystal.

WaterSpec is designed for indoor or outdoor use in aquatic environments. The waterproof housing has IP68 degree of protection: dust-tight (full protection against dust and other particulates) and protected against extended immersion in water to a maximum depth of 2 meters.

Radiation Detection › Environmental Monitoring

Spectrometer AirSPEC

Application

Scintillation gamma-ray spectrometer AirSPEC is intended for measuring scintillation spectra and also for determination of activities and specific activities of radionuclides in prepared and natural samples in 2π and 4π geometries. Spectrometer can be used for radiation monitoring and various tasks like definition of specific effective activity of naturally occurring radionuclides (NORM) in building materials (granite, crushed stone, gravel, etc.), raw materials, products, waste industrial production and rocks without sampling. In addition, AirSPEC is applicable for measurement of surface activity of the radionuclide 137Cs (and other), mass fraction of NORM in rocks and resins the conditions of their natural occurrence on a surface, in boreholes and in warehouses and transport containers. Moreover, AirSPEC can analyze surface contamination of soil, as well as prospecting and exploration of mineral deposits. The spectrometer can be used for operating in laboratory and in the field conditions.

Features

- online gamma spectrum acquisition and readout;
- ambient equivalent dose rate H*(10) calculation [mkSv/h];
- automatic radionuclide identification;
- radionuclide concentration indication [Bq/m3];
- operation and settings control via GammaSPEC software;
- data transfer via RS-485 interface.

AirSPEC is a monoblock unit, comprising scintillation crystal, photoelectronic multiplier, HV converter, amplifier, multichannel pulses analyzer and processor unit.

AirSPEC measurement system is autonomous, automated and provides calculation of the ambient equivalent dose rate H*(10) in real time, as well as identification of the most common natural and artificial gamma radionuclides. The results of the identification and dose rate are then transmitted to the upper-level computer via exchange protocol.

AirSPEC has automatic stabilization of the spectrometry channels by means of tracking the position of the K-40 1460.8 keV full energy peak provided by the potassium salt located in the cartridge near scintillation crystal.

AirSPEC provides an additional feature of thermostabilizing housing to provide a wider range of operating temperatures. The housing provides both high degree of thermal insulation and automatic control and active adjustment of the temperature inside the device. The IP67 degree of protection allows to use AirSpec in severe weather conditions.

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Radiation Detection › Environmental Monitoring

Mobile Radiation Monitor GammaCART

Application

Mobile spectrometric system Mobile Radiation Monitor is designed to measure gamma radiation energy distribution, identify gamma emitting radionuclides, as well as calculate specific and surface activity of gamma emitting radionuclides under conditions of their natural occurrence and at nuclear industry premises. In addition, the system can be used for radiation monitoring, e.g., for examination of large areas, searching lost or stolen gamma radiation sources, study of radionuclide precipitation near radiation hazardous sites without preliminary sampling.

COMPLETE SET

- Electric vehicle as a mobile platform
- Gamma radiation spectrometer containing:
  - Gamma radiation detector(s);
  - Multichannel channel analyzer Polynom;
- Thermostabilization system (for NaI(Tl) or LaBr3(Ce) detectors) containing:
  - Thermostabilizing housing with a built-in heat exchanger
  - Cooling and heating system box;
  - Hoses for circulation of the cooling liquid;
- Navigation system including a external antenna;
- Shockproof toughbook operable in harsh conditions;
- Router with antenna which provides connection between the analyzer, navigation system and toughbook;
- Fixation and positioning system for the detection units;
- Charger for the electric vehicle.

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Radiation Detection › Environmental Monitoring

Alpha analysis software AlphaPRO

The program AlphaPRO is the continuation of the program GammaPRO with some limitations, but focuses on the tasks of alpha spectrometry. AlphaPRO employs different algorithms for determining activity in samples (ROI-method with overdetermined matrix, individual peaks analysis method, superposition method). For the analysis of high resolution spectra (spectra received on semiconductor spectrometers) there separate tools (search peaks, Gaussian approximation, identification, plotting efficiency curves, etc.).

Application

The software is intended to control the alpha spectrometer Amber and analyze the alpha spectra acquired using SIID alpha detectors.

Features

- supported Amber models: Amber-2, 4, 8, 12.
- visualization of spectra and spectrum acquisition progress;
- peak search and fit by Gaussian;
- identification of radionuclides;
- Energy, FWHM and peak shape calibration;
- calculation of efficiency curves and sensitivities;
- calculation of activity by peak method;
- calculation of activity by matrix (ROI) method;
- calculation of MDA according ISO 11929;
- simple and easy to use report editor;
- library of radionuclides and library editor;
- mathematical operations (sum, subtraction, normalization etc);
- batch spectra processing;
- simple and easy to use report editor;
- library of radionuclides and library editor;
- quality assurance control;
- database MS Access which provides transfer and storage of measurement results in a database;
- log which provides automatic registration and storage of measurement and quality assurance results;
- support for the main spectrum formats: SPE, N42, CNF, CHN, SPC, ASW, TXT etc.

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Radiation Detection › Environmental Monitoring

SpectraLineGIS software package

Application

SpectraLineGIS software package is intended for radiation monitoring of territories with gamma-spectrometers and dosimetry sensors, for determination of the radionuclides present, and for mapping results to contamination maps of the territories. The contamination maps can be created using the software: the functions of collecting, analyzing and storing of the gridded pollution information are supported. The user can emulate the pollution from certain activities using the spectra database and identify the source location on the basis of the spectrum supported by SpectraLine.

Features

The Integrated Geographic Information System (GIS) is developed on the basis of DataGIS components and provides the following functionality:

- Creation of maps by importing from MIF and MP formats using a specific application
- Displaying and visualization of the selected thematic map layers
- Varying the map scaling
- Searching for objects on the map
- Display of contamination data according to the color settings and thresholds

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Radiation Detection › Environmental Monitoring

Gamma analysis software GammaPRO

The software is intended to

- Control the spectrometric multichannel analyzer;
- Analyze the spectra acquired using scintillation and semiconductor gamma and beta detectors;
- Work with spectra modeled by the Monte Carlo simulation.

The matrix method enables automatic calculation of activity of a sample provided its radionuclide composition is known. The method is used for routine measurements of food, building materials, water and other substances subject for permanent radiological control.
The superposition method is mainly used for control of correctness of activity calculations in case of hard-to-analyse (multiple peak) low-resolution spectra (acquired by scintillation detectors). Such a tool enables visual estimate of the degree of similarity between an acquired and calculated spectrum. Additionally, calculation data can be adjusted until the spectra completely coincide.
The Software features an integrated system for report generation which provides automatic creation of measurement results. The settings for report generation can be adjusted by user.

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Radiation Detection › Environmental Monitoring

Hybrid cooling for the HPGe detector Nicole

The NICOLE hybrid cooling system combines liquid nitrogen and electro-mechanical cooling. The merge of this two cooling systems provide detection unit non-stop operation for months without having liquid nitrogen to refill.

The NICOLE hybrid cooling system comprises Stirling-cycle cryocooler, cryocooler controller, Dewar vessel, pressure sensor and indicator, liquid nitrogen sensor and level monitor.

Application

Nicole hybrid cooling system for the HPGe detector allows you to keep your detector cold without filling with Liquid Nitrogen for months and years.

Features

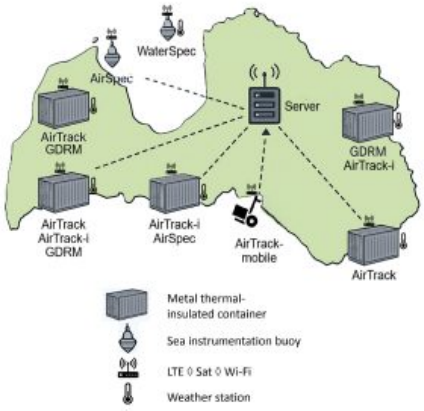
One of the biggest advantages of Nicole hybrid cooling system is that it is extremely easy to perform maintenance and service. The user is given USB interface to get access to all parameters of the system. Majority of main parameters are displayed of the LCD display. And I case of maintenance, repair or replacement of the cooler is needed, it takes only 15 minutes to dismantle the cooling unit. It means the user can continue measurements by only using liquid nitrogen. It can be extremely important when routine measurements can’t be terminated.

Radiation Analysis and Visualization Environment Network RAVEN software

Application

The Radiation Analysis and Visualization Environment Network RAVEN software package was developed for the following purposes:

- Comprehensive environmental radiation surveillance at multiple monitoring points
- Visual tools for data analysis and rapid operator response
- Centralized storage of measurements and technical data for quality assurance



Features

- Multi-layered network: stationary, mobile, and laboratory stations;
- Real-time monitoring with intervals based on air and water radiation levels;
- Using a map of any area: site, city, region, country;

The software package is built on several blocks, like:

- Main dashboard with general information,
- A map with location of all Stations and key current values,
- Measurement results is a block with displays detailed flow of data from each Station,
- Summary report.

The current status of each monitor at every measurement station can be tracked in the Dashboard. The Dashboard does not display measurement results; only technical data related to each Monitor. This allows the operator to maintain a comprehensive overview and respond promptly if any monitor requires attention (filters are running low or a measurement has stopped due to a malfunction).

Measurement results for each monitor are available in a dedicated window, presented in tabular format in compliance with ISO 11929. The measurement result window also provides access to monitor technical parameters and the alpha/beta or gamma radiation spectra. The radiation spectrum registered by each monitor can be accessed at any time. This option helps assess detector’s performance and, together with valid technical parameters, supports quality assurance of the measurement results.

The software generates a summary report for a chosen alpha/beta/gamma radionuclide concentration in one table, presenting all monitors measuring this radionuclide. Ambient dose equivalent rate values are also shown in a table format: both from GDRM and (if presented) AirSpec/WaterSpec/WaterTrack multifunctional spectrometers.

All measurement results are stored in a database and can be displayed for any selected time period Data can be averaged over 1, 3, 6, 12, or 24 hours, or by month. The operator can add multiple blocks for display as time series charts or tables. The resulting report can be downloaded as a DOC or PDF files.

The Software has two access levels: operator and administrator. The administrator mode provides full access to all functions, while the operator mode is limited to monitoring only.
The Software provides a station maintenance history, automatically logs all changes made by the administrator to the station configuration, and records all messages from the monitors.

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Partner Bertin Instruments

Bertin Instruments is a global provider of advanced radiation detection and environmental monitoring solutions, specializing in handheld monitors, personal electronic dosimeters, environmental monitoring systems, and waste & recycling management technologies. Their instruments are designed to meet the rigorous demands of nuclear facilities, emergency response teams, and environmental agencies.

Product offering

GammaTRACER Spider Autonomous Gamma Monitor for Emergencies – Saphymo

AlphaGUARD-Radon Monitor – Bertin Instruments

ShortLINK Short-Range Environmental Radiation Monitoring Network – Bertin/ Saphymo

GammaTRACER Autonomous Radiation Monitoring Probe – Saphymo

BAB E Air Monitoring Beacon

SkyLINK Wide-Range Environmental Radiation Monitoring Network – Bertin/ Saphymo

AlphaE – Bertin Instruments

SpectroTRACER Environmental Radiation Monitor – Saphymo

Skydose Dosimetry System – Bertin Instruments

Coriolis RECON – Bertin Instruments

Coriolis Micro – Bertin Instruments

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Radiation Detection › Environmental Monitoring

GammaTRACER Spider Autonomous Gamma Monitor for Emergencies – Saphymo

The GammaTRACER Spider Autonomous Gamma Monitor (Saphymo) has been designed to cover the needs of first responders in an emergency scenario. Based on the proven GammaTRACER design, the probe provides reliably the measurement of the gamma dose rate and wireless data transmission to the crisis center by means of SkyLINK radio or Iridium satellite modem.

GammaTRACER Spider Autonomous Gamma Monitor for Emergencies features:

- built-in battery for up to 5 years operation
- innovative self-erecting design, very fast deployment
- ultra compact design
- emergency proof communication options
- SkyLINK radio modem (up to 100 km/60 mi)
- satellite modem (Iridium)
- hermetically sealed weatherproof housing
- wide measurement range: 20 nSv/h up to 10 Sv/h
- can be used to quickly enhance density of existing monitoring networks

GammaTRACER Spider demo

Radiation Detection › Environmental Monitoring

AlphaGUARD-Radon Monitor – Bertin Instruments

Overview:

The complete product line provides all accessories for radon in air, water, soil, building materials, progeny, thoron and calibration equipment to perform air, water, soil, exhalation measurements. The collected data can be linked to the DataVIEW software, allowing data download and storage as well as professional data analysis and reporting. With AlphaGUARD, bring your Radon Lab everywhere.

AlphaGUARD incorporates a pulse-counting ionization chamber (alpha spectroscopy).

Based on optimal chamber geometry and intelligent signal evaluation, this radon monitor is suitable for continuous monitoring of radon concentrations between 2 – 2 000 000 Bq/m³.

The DSP (Digital Signal Processing) technology provides highly effective differentiation ability between “real” radon data and all kinds of artefacts.

Features:

- 0.62 L pulsed ionization chamber
- Measuring range of 2 to 2,000,000 Bq/m³,
- Instrument calibrator error of 3%
- Storage capacity of up to 60,000 measurement points
- Storage of:
  - 400 days at 10 min measuring cycle
  - 2,500 days at 60 min measuring cycle
- Battery life of 10 days (40 days with external battery)
- 329 mm x 355 mm x 123 mm and weighs 6,2 kg (13,7 lbs)

Your Radon Lab – Everywhere:

- AquaKIT
- Soil gas Probe
- AlphaPM
- AlphaPUMP / LabPUMP
- Emanation / Calibration Container
- Exhalation Box
- On line Radon in water monitoring
- Valve Selector

Benefits:

- Quality at the highest level
- Long-term stable calibration factor (guaranteed 5 years)
- Calibration traceable to different national standards (PTB, NIST, NPL)
- Inbuilt quality assurance system for permanent validation of system operation and data
- Fast transient response

- DataVIEW PRO software
- Automatic background correction
- No sensitivity to high air humidity

Reasons to choose ALPHAGUARD – RADON MONITOR:

- Reference instrument with high sensitivity
- Calibration stability guaranteed for 5 years
- High performance for versatile applications
- Maintenance-free operation

Gallery:






AlphaGUARD - Your Radon lab everywhere
https://youtu.be/oJaaYf9-PbI

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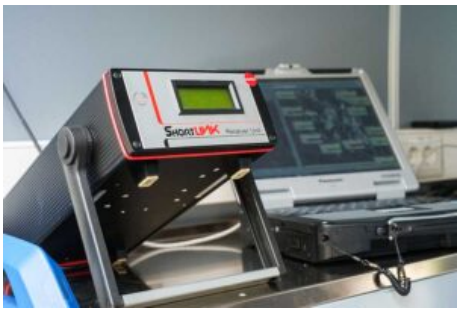
Radiation Detection › Environmental Monitoring

ShortLINK Short-Range Environmental Radiation Monitoring Network – Bertin/ Saphymo



The ShortLINK Wireless Communication System is a short-range, fully autonomous and private wireless network. You can use this system to transmit online data from connected low-power sensors or instruments to a central station. Unlike public cellular communication system standards (like GSM), this system is not dependant on the existence of an area covering cellular infrastructure. ShortLINK is generally installed in combination with a radiological network, like GammaTRACER and DataExpert supervision software.

If you want to know more about Bertin data transmission systems, take a look at our partner's website!

SHORTLINK WIRELESS COMMUNICATION SYSTEM FEATURES AND BENEFITS

- Very low power consumption
- Operating distance up to 5 km (3 mi)
- Turnkey installation
- Long-term maintenance-free operation
- Can withstand temperatures from -40°C to 60°C (-40°F to 140°F)

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GammaTRACER Autonomous Radiation Monitoring Probe – Saphymo

The GammaTracer Autonomous Radiation Monitoring Probe from Bertin is designed to continuously measure, record, and transmit the environmental gamma dose rate. The probes continuously measure the gamma radiation dose.

Worldwide, there are more than 4.000 GammaTRACERs in operation.

The probes also offer a new dimension in wireless data collection. This is possible because the probes are equipped with a radio module, so you can use them with SkyLINK and ShortLINK for wireless data collection. GammaTRACER can store up to 12.800 data sets, depending on the probe type and measurement cycle.

The probe is available in four types: Basic, Wide, High and XL2.

UNLIMITED AUTONOMY

The GammaTRACER is an autonomous radiation monitoring probe. The monitor's batteries allow maintenance-free, non-stop operation for up to five years, and with an extended battery pack, it will even last up to ten years! This is possible because of the energy-saving chip technology.

But, if you choose the internal solar panel, the autonomy can be unlimited!

They can also resist extreme climatic and environmental conditions because the probes are independent of any physical connections.

GAMMATRACER TYPES

GammaTRACER covers a broad range of radiation monitoring applications because there are multiple types available. The probes are deployable for multiple applications, for example nationwide monitoring, perimeter monitoring, and monitoring for nuclear facilities. The probes are not only suitable for routine, but also for emergency applications.

BASIC

The GammaTRACER Basic has a dose rate measurement range of 20 nSv/h to 10 mSv/h and an energy range of 45keV to 3MeV.

WIDE

The GammaTRACER Wide has a dose rate measurement range of 20 nSv/h to 10 Sv/h and just like the BASIC, also an energy range of 45 keV to 3 MeV.

HIGH

The GammaTRACER High has a dose rate measurement range of 1 mSv/h to 10 Sv/h and an energy range of 80 keV to 4,4 MeV.

XL2

The GammaTRACER XL2 has a dose rate measurement range of 10 nSv/h to 10 Sv/h and an energy range of 45 keV to 2 MeV. The XL2 type also has fast a response mode of 1 second.

ADDITIONAL OPTIONS

Even though the four GammaTRACE options already have a lot of features, there are also options you can choose from. All types can operate in temperatures ranging from -20°C (-4°F) to 50°C (122°F), but you can also choose for the option of -40°C (-40°F) to 60°C (140°F). Furthermore, you can choose additional sensors (rain, wind and weather), power supply by solar panels or a seismic qualified version.

BENEFITS & FEATURES

- Measures x-radiation and gamma radiation
- Measurement cycle, adjustable from 1 second to 120 minutes
- Battery lifetime up to ten years or even unlimited with solar panels
- Can store up to 12.800 data sets
- Type apporval in several countries
- Maintanance-free
- Non-stop operation
- Easy to install

If you want to read more about GammaTRACER, take a look at our partner’s website!

https://youtu.be/59D0HZs64zw

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If you have any questions…

Contact PEO!

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Radiation Detection › Environmental Monitoring

BAB E Air Monitoring Beacon

The BAB-E fixed beacon is used for continuous monitoring of artificial Alpha and Beta aerosols, in Gamma environments as well as in the presence of natural Radon descendants. It has a double cover that allows it to withstand the most extreme climatic conditions for uninterrupted use outdoors (territorial surveillance, nuclear infrastructures, etc.). The data collected by the BAB-E can be accessed remotely and in real time on the DataEXPERT supervision software.

Features

- Can be used in controlled areas with high gamma background
- Compensation of radon progenies
- Use of standard sources for efficiency controls
- Ruggedized, can be used on dismantling and purification sites
- Available as stationary or mobile version
- Can be connected to a central monitoring network and trigger a general alarm

Technology

- The radioactive dust is deposited by air suction on a filter paper placed in the BAB beacons.
- The suction flow rate is about 5 m3/h (it depends on dustiness and type of filter paper).
- The flow rate is calculated from the depression measured between the filter and the pump. This allows to detect any tear or dust clogging.
- Placed one centimeter above the sample, the detection system is based on two 300 µm thick silicon diodes with a surface of 360 mm2.
- The analog signal from the two diodes is amplified by a preamplifier with an output range of about 30mV/MeV.
- An amplifier increases the signal amplitude to 0.7V/MeV, and the signal is then used to produce the energy spectrum via an amplitude analyzer that encodes information to 512 channels.

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Radiation Detection › Environmental Monitoring

SkyLINK Wide-Range Environmental Radiation Monitoring Network – Bertin/ Saphymo

The SkyLINK Wireless Communication System is a wide-range, fully autonomous and private wireless network. You can use this system to transmit online data from connected low-power sensors or instruments to a central station. Unlike public cellular communication system standards (like GSM), this system is not dependant on the existence of an area covering cellular infrastructure. The system generally includes a radiological network like GammaTRACER probes and the DataExpert supervision software.

For more information about Bertin Data Transmission systems, take a look at our partner's website!

The system structure allows its use in every situations, even in the most accidental ones (private wireless communication network and easy-to-install autonomous probes).

SKYLINK WIRELESS COMMUNICATION SYSTEM FEATURES

- Very low power consumption
- Operating distance up to 100 km (60 mi)
- Private network, so no regular transmission fees
- Easy interface to external instruments or host processors
- Turnkey system installation
- Long-term maintenance-free operation

https://youtu.be/59D0HZs64zw

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Radiation Detection › Environmental Monitoring

AlphaE – Bertin Instruments

AlphaE is an electronic handheld device for fast and time-resolved radon monitoring in buildings, outdoors and mines. Typically, 80 % of the final result is achieved after 2 hours (faster response for higher values). Due to its ultra-lightweight design and sophisticated features, AlphaE is highly suitable also for surveying the personal radon exposure and dose at workplaces.

The AlphaE’s favourable price-performance ratio makes it also interesting for service companies engaged in radon assessment and mitigation as well as for users in private homes.
Up to 6 months battery life allows long-term measurement without mains power. Permanent operations via mains supply are possible via USB port.

Advantages AlphaE

- ultra-lightweight design
- sophisticated features
- wide measuring range for professional use
- up to 6 months autonomy
- suitable software included

Download the datasheet or contact our product specialist.

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SpectroTRACER Environmental Radiation Monitor – Saphymo

SpectroTRACER is a continuous environmental radiation monitor for spectroscopy to measure very low gamma contamination (water: SpectroTRACER AQUA).

The SpectroTRACER produces a spectroscopic analysis of the detected nuclides identification. The SpectroTRACER is used for the measurement of radioactivity when a standard gamma dose rate monitor is not efficient enough and when it is necessary to discover the nature of the gamma radiation.

SpectroTRACER Environmental Monitor features:

- working temperature: -20 ° C to + 50 ° C. / option: -30 ° C to + 60 ° C
- max. 100 meters under water (SpectroTRACER -AQUA)
- IP68 certified
- relative humidity: 100%
- integrated sensors for temperature and humidity

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Radiation Detection › Environmental Monitoring

Skydose Dosimetry System – Bertin Instruments

Skydose is an operational dosimetry system, designed to measure & monitor, in real time, the ambient dose level received by response teams in high exposure areas.

The operational dosimetry system Skydose consists in eight Saphydose γi RT teledosimeters, one Personal Digital Assistant (PDA), one Easydose configuration software, one Saphyr portable reader, as well as one to three RT-ZB05 routers.

The Skydose system is part of an ongoing approach based on the reduction of both collective and individual doses, in compliance with the ALARA principle (As Low As Reasonably Achievable). By optimizing the exposition to ionizing radiation, it aims at improving the operators' conditions of intervention, who will thus be able to focus safely on the objectives of their mission.The Skydose system only takes a **few minutes to install**. Thanks to the PDA, it ensures the in-field monitoring of an eight-person team equipped with Saphydose γi RT teledosimeters using mesh networking.
Flexible & robust, the Skydose system can reliably cover an entire infrastructure (a nuclear power plant, for example), thanks to one or more RT-ZB05 dedicated routers.
Fast & easy to deploy, the Skydose system can be used by operators, first-responders & non-specialists, inside & outside the risk areas.

Features

- easy and quick setting even by non-specialized staff
- automatic network synchronization
- suitable for indoor and outdoor use including reactor buildings
- suitable for emergency situations (sturdy – high dose and dose rate range)
- real-time hotspots detection to reduce the mission dose received by workers
- compliant with use in nuclear facilities (CEI 61526)
- low maintenance costs
- real-time, remote & simultaneous monitoring of the Saphydose γi RT dosimeters, for the team to react immediately in case of emergency
- the Skydose system can be installed and configured in a few minutes, and be safely stored in a ruggedized pelicase – several systems can operate simultaneously, without interference

Specifications

- detector: 2 energy-compensated silicon diodes
- energy range: **from 50 keV. to 7 MeV!**
- dose rate measurement range: 0.5 µSv. to 9,999.99 mSv
- dose measurement range: 1 µSv. to 9,999.99 mSv
- alarms: sound & visual
- battery lifetime in operation: 4,000 hours
- radio range: 300 m

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Radiation Detection › Environmental Monitoring

Coriolis RECON – Bertin Instruments

The Coriolis RECON is a portable, light and ruggedized bio-air sampler for biological warfare agents detection, dedicated to CBRN teams or first responders, with quick deployment in case of an event with biological attack suspicion. The Coriolis RECON have been designed to collect large concentrations of aerosols in the breathable range of 0.5 to 10 µm with an air flow rate at 600L/min, thus being more representative of the environment than traditional bio-aerosol samplers.
Thanks to its ability to collect bio-aerosol particles into liquid format, this system can be used with rapid identification techniques for biological agents (immunoassay, PCR, etc.) to provide an early warning of aerosolized biological warfare agents.

Introduction video

Advantages Coriolis RECON

- the most efficient concentration of biological warfare agent
- high air flow rate
- compatible with any downstream experiments for rapid identification
- bio surveillance with long time monitoring – up to 6 hours
- quick deployment in a military / first responder context

Download the datasheet or contact our product specialist.

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Radiation Detection › Environmental Monitoring

Coriolis Micro – Bertin Instruments

Coriolis µ is an innovative biological air sampler for bio-contamination assessment, mainly dedicated to air quality control and air quality monitoring in environmental and pollution research, pharmaceutical, food and veterinary industries, biomedical and health environment...
Based on a cyclonic technology, combined to a high air flow rate, Coriolis µ offers the most efficient particles collection in 10 minutes. The biological particles such as toxins, virus, bacteria, molds, pollens, spores are collected and concentrated in a liquid ready to be analyzed with microbiological and cellular and molecular biology methods.

Introduction video

Advantages Coriolis Micro

- the most efficient concentration of biological particles
- high air flow rate & long time monitoring option – up to 6 hours
- compatible with any downstream experiments – divisible samples for several analysis in parallel
- flexible liquid sample output
- no saturation of the collection media for charged environment

Download the datasheet or contact our product specialist.

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Partner Ludlum Measurements Inc.

Ludlum Measurements, Inc. is a trusted global provider of radiation detection and monitoring instruments, offering rugged, accurate solutions for personnel safety, environmental protection, and security screening. Since 1962, their equipment has been used worldwide in applications ranging from nuclear power and emergency response to border protection and critical infrastructure monitoring.

Product offering

Model 3101 Portable Tritium in Air Monitor

Model 334AB-G Alpha-Beta Particulate Monitor

Model 334A Alpha Air Monitor

Model 3100 Portable Tritium in Air Monitor

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Radiation Detection › Environmental Monitoring

Model 3101 Portable Tritium in Air Monitor

The Model 3101 Tritium in Air Monitor features ruggedized and flexible operation. It is powered by rechargeable internal NiMH batteries and/or an external +12 Vdc power supply. It features a maintenance-free diaphragm air pump to pull air through the 250 cc tritium chamber, and the air flow is measured internally with a mass-air flow sensor. A second 250 cc chamber is used to provide gamma compensation, allowing operation in higher gamma fields. Other internal sensors measure temperature and ambient pressure and provide compensation for these effects.

The heart of the tritium detection is the sealed electrometer chamber, using the latest low-noise electrometer chip. This electrometer can reliably measure the femtoamperes of current resulting from tritium within the chamber and does not require the user to adjust an offset or zero knob. The pixelated digital display provides feedback on the tritium concentration, as well as showing status on several important conditions: temperature, pressure, power, airflow, chamber bias, and alarm or failure status.

The Model 3101 is easy to use, having only a few simple controls, and can be used while wearing gloves. It has a large easy-to-read display with a backlight control for increasing contrast in low-light conditions. In addition to the tritium level, the display simultaneously shows the user the battery/power condition, the temperature, the pressure, the status condition, and the airflow through the chamber.

The Model 3101 is built for ruggedness and reliability. Two airflow pumps were tested and shown to last over 10,000 hours of continuous use. The Model 3101 shares many of the characteristics and design of the Model 3100, which was built and tested for the U.S. military. Testing was done in accordance with ANSI N42.30, MIL-STD-810G, MIL-STD-461G, MIL-STD-901D, and MIL-STD-1399-300B standards which test instrument operation under various conditions including temperature, blowing rain, salt fog, vibration, mechanical shock, RF susceptibility, and RF emissions. The commercial user of the Model 3101 benefits from this design and testing history.

Features

- No Zero Adjust Control Needed
- Easily Calibrated with ^{137}Cs Gamma Range

- Temperature and Altitude Compensation
- “Check Mode” Self-Test Feature Determines Instrument State of Health
- Digital Backlit Display with Status, Airflow Readout, and Diagnostic Information
- Internal Heater Element Purge Mode to Dry Ion Chamber
- Readout in $\mu Ci/m^3$ or MBq/m^3

Model 334AB-G Alpha-Beta Particulate Monitor

The Model 334AB-G (a replacement for the Model 334AB) is a lightweight, battery-powered, alpha-beta air monitor that can be used as a portable workplace monitor or a portable CAM (continuous air monitor) for emergency-response assessments. Its design provides workers with an early warning of an airborne release of alpha- or beta-emitting particulates. The instrument can monitor up to two alpha isotopes of interest simultaneously with beta monitoring.

The Model 334AB-G has an internal 7-LPM pump. (An external pump with a higher flow rate is available as an option.) The integrated LCD and touchscreen displays information on instrument status and readings during operation. The estimated dose of the isotope(s) of interest and the instrument status are displayed at all times. A visual/audio alarm stack also indicates instrument status. An ion-implanted silicon detector and 1024-channel multi-channel analyzer feed data to the embedded processor board to perform beta detection and alpha spectral analysis for radon background compensation.

Background Subtraction Using Peak Shape Fitting

State-of-the-art alpha peak fitting quantifies the alpha and beta counts from radon and thoron progeny. This technique uses the profiles of multiple alpha isotope peaks to create a composite curve which best fits the actual alpha spectrum. Because the individual radon peaks are independently determined, the beta background compensation is impervious to radon equilibrium changes and contributes to low probability of false alarms.

Guard Detector

An internal guard detector provides real-time beta compensation for changing gamma background levels. An adjustable gamma subtraction factor allows for correction of slight differences in beta and guard count rate in a fixed gamma field to produce proper energy response.

Sensitivity and Response Time

The Model 334AB-G's sensitivity varies primarily as a function of the window time. The longer Chronic Window has improved sensitivities over the shorter Acute Window time. Sensitivity is reported in Minimum Detectable Concentration (MDC) in Bq/m^3 (DAC) and Minimum Detectable Dose (MDD) in Bq-

h/m^3 (DAC-h).

Features

- Integrated LCD and Touch Screen Display
- Acute and Chronic Dose, Concentration, and Flow Logging Measurements
- Radon Compensation
- Built-In Gamma Guard Detector
- American or SI Units of Measurement
- 8-Hour Battery Life

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Radiation Detection › Environmental Monitoring

Model 334A Alpha Air Monitor

The Model 334A is a compact, lightweight, and portable alpha air monitor designed to function both as a workplace monitor and a Continuous Air Monitor (CAM) for measurements in emergency response situations. Its functionality is enhanced by its splash- and dust-proof enclosure with splash-proof electronics.

Spectral analysis is conducted via a 1024-channel analyzer that feeds data to the embedded processor. Factory configuration provides either special nuclear materials (SNM) or radon progeny measurements of potential alpha energy concentration (PAEC).

Measurements may be taken in both fast-responding (Acute) or high-sensitivity (Chronic) assessments, and report in English or SI units. The Model 334A stores acquired data in comma-separated-variable (.csv) format that is recognized by most spreadsheet and database software. Data may be saved in the instrument's internal memory, or alternately may be written to an SD card for later retrieval and review.

Independent determination of nuclide peaks means they are impervious to radon equilibrium changes, thereby contributing to low probabilities of error and false alarms. Precise fitting of the ^{218}Po tail results in excellent sensitivity.

This Model 334A features an integrated LCD and touch screen that displays information on instrument status and readings during operation. The estimated dose of the isotope(s) of interest and instrument status is displayed at all times. A window below may be switched from showing historical readings and battery status, or displaying the current spectrum.

Factory-configurable Radon Mode allows the instrument to monitor potential-alpha-energy-concentration (PAEC) of radon progeny.

Features

- Easy Setup and Use
- Integrated LCD and Touch Screen Display
- English or SI Units of Measurement
- Acute and Chronic Dose Modes
- Significantly Reduced False Alarms Using Peak Shape Fitting Capability
- 8-Hour Battery Life

- Radon Mode Option

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Radiation Detection › Environmental Monitoring

Model 3100 Portable Tritium in Air Monitor

The Model 3100 Tritium in Air Monitor features ruggedized and flexible operation. It may be powered by either 115 Vac, 50/60 Hz or by rechargeable internal NiMH batteries. It features a maintenance-free diaphragm air pump to pull air through the 250 cc tritium chamber, and the air flow is measured internally with a mass-air flow sensor. A second 250 cc chamber is used to provide gamma compensation, allowing operation in higher gamma fields. Other internal sensors measure temperature and ambient pressure and provide compensation for these effects.

Features

- No Zero Adjust Control Needed
- Easily Calibrated with ^{137}Cs Gamma Range
- Temperature and Altitude Compensation
- “Check Mode” Self-Test Feature Determines Instrument State of Health
- Digital Backlit Display with Status, Airflow Readout, and Diagnostic Information
- Purge Mode to Dry Ion Chamber
- Internal Chamber with Replaceable Desiccant
- Passed USA Military Tests Including: MIL-STD-810G, MIL-STD-461G, MIL-STD-901D, MIL-STD-1399-300B
- Readout in µCi/m^3 or MBq/m^3

The heart of the tritium detection is the sealed electrometer chamber, using the latest low-noise electrometer chip. This electrometer can reliably measure the femtoamperes of current resulting from tritium within the chamber and does not require the user to adjust an offset or zero knob. The pixelated digital display provides feedback on the tritium concentration, as well as showing status on several important conditions: temperature, pressure, power, airflow, chamber bias, and alarm or failure status.

The Model 3100 is easy to use, having only a few simple controls, and can be used while wearing gloves. A clear window allows the user to see the condition of the desiccant in the integrated desiccant chamber. A toggle switch allows the user to put the desiccant chamber in-line to the incoming air. The instrument comes in a rugged hard-shell commercial case with wall-mounting brackets. The Model 3100 has passed USA military testing for RF susceptibility and emission, shock and vibration, temperature and blowing rain, as well as other tests.

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Partner SDEC France

SDEC France is a specialized manufacturer of environmental monitoring and laboratory equipment, offering comprehensive solutions for waste and recycling management, environmental monitoring, and laboratory applications. With over 30 years of experience, the company designs and produces high-quality instruments to support professionals in environmental science, agronomy, and radiological safety.

Product offering

AM 3000 N – Air Sampler for Asbestos Diagnosis in Nuclear Environments – NF43-050 version 2021 , NF X43-269, NF EN ISO 13137

AM 3000 – Air Sampler for Asbestos Diagnosis – NF43-050 version 2021, NF X43-269, NF EN ISO 13137

Battery Operated Field Electric Vacuum Pump PAV 2000 : For soil sampling

AS 5000 Aerosol & Iodine Sampler – SDEC

AS 3000 AEROSOL & IODINE SAMPLER – SDEC

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Radiation Detection › **Environmental Monitoring**

AM 3000 N – Air Sampler for Asbestos Diagnosis in Nuclear Environments – NF43-050 version 2021 , NF X43-269, NF EN ISO 13137

- **AUTONOMOUS SAMPLING**: The AM 3000N ensures consistent and reliable air sampling without manual intervention.
- **HIGH PRECISION**: Equipped with a pump automatically regulated by a microcontroller and a mass flow meter for increased accuracy.
- **REMOTE CONTROL**: Controllable remotely via an infrared remote control for user convenience.
- **ROBUST & WATERPROOF**: Stackable device with an IP65 protection rating, resistant to harsh environments.
- **PROTECTION AGAINST NUCLEAR CONTAMINATION**: H13 white glass fiber THE filters at intake and exhaust to prevent contamination.
- **CERTIFIED COMPLIANCE**: Complies with NF43-050 version 2021, NF X43-269, NF EN ISO 13137 standards, ensuring reliability and adherence to standards.

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Radiation Detection › **Environmental Monitoring**

AM 3000 – Air Sampler for Asbestos Diagnosis – NF43-050 version 2021, NF X43-269, NF EN ISO 13137

- **AUTONOMOUS SAMPLING**: The AM 3000 is an autonomous air sampler, ensuring consistent and reliable sampling without manual intervention.
- **HIGH PRECISION**: Equipped with a pump whose flow rate is automatically regulated by a microcontroller and a mass flow meter.
- **REMOTE CONTROL**: Can be remotely operated using an infrared remote control, enhancing user convenience.
- **ROBUST & WATERPROOF**: The device is robust, stackable, and has an IP65 protection rating, ensuring its durability and resistance to environmental factors.
- **CERTIFIED COMPLIANCE**: Meets the strict requirements of NF43-050, NF X43-269, and NF EN ISO 13137 standards, ensuring its reliability and adherence to industrial norms.

Radiation Detection › **Environmental Monitoring**

Battery Operated Field Electric Vacuum Pump PAV 2000 : For soil sampling

- **RAPID VACUUM CREATION:** Achieves a vacuum of -750 mbar in less than 15 seconds, significantly speeding up soil sampling.
- **HIGH AUTONOMY & PORTABILITY:** Offers 5 hours of continuous operation with a lightweight and durable aluminum design for convenience in the field.
- **INTEGRATED SMART CHARGING SYSTEM:** Includes a maintenance-free 12V, 5A/hour battery with a smart charger for easy recharging.
- **PRECISION & PROTECTION:** Equipped with an accurate Bourdon-type manometer and a Gore-Tex filter to guard against water ingress.
- **COMPACT & EASY TO USE:** Compact dimensions (200mm x 130mm x 240mm) with a simple three-position operational switch.

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Radiation Detection › Environmental Monitoring

AS 5000 Aerosol & Iodine Sampler – SDEC

The AS 5000 Aerosol & Iodine Sampler (SDEC) is a stationary equipment made for the sampling of aerosols and airborne iodine at high flow on paper filters and cartridges. It is particularly adapted for continuous sampling in stacks according to ISO 2889 standard.

AS 5000 Aerosol & Iodine Sampler features:

- automatic air flow regulation up to 100 liters per minute (6 Nm3/h)
- mass flow-meter with pressure and temperature compensation : display of the air flow in Nm3
- sampling compartment and electrical separated
- detection of filter clogging or accidental leakages
- safety : sampling head access door with key lock, differential circuit breaker
- alarm report via relay output, (optional Ethernet output)
- sampling parameters settings and clogging level threshold protected by access code
- stationary installation (wall mount) or mobile installation on trolley

Read more about the AS 5000 Aerosol & Iodine Sampler on the SDEC website

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Radiation Detection › Environmental Monitoring

AS 3000 AEROSOL & IODINE SAMPLER – SDEC

The AS 3000 Aerosol & Iodine Sampler (SDEC) has been designed to make sampling of aerosols and iodine on filter papers and/or carbon cartridges. It has many technological innovations like the automatic regulation of air flow and the data report on USB key.

AS 3000 Aerosol & Iodine Sampler features:

- automatic regulation of air flow from 10 to 50 LPM
- diaphragm pump (no maintenance)
- compatible with all paper filters and cartridges
- automatic recognition of filter paper or cartridge per drive scanner option
- independent pump (easy dismantling in case of contamination)
- installation of the filter holder by quick system on horizontal or vertical axis
- operating on power supply or battery
- waterproof keyboard

Read more about the AS 3000 Aerosol & Iodine Sampler on the SDEC website

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Partner GEORADIS s.r.o.

Georadis s.r.o. is a specialized manufacturer of advanced radiation detection and monitoring instruments, offering a comprehensive suite of solutions for field and laboratory applications. Their product portfolio includes handheld monitors, portable isotope identifiers, environmental monitoring devices, and laboratory equipment, all designed to meet the rigorous demands of professionals in sectors such as environmental monitoring, industrial safety, and public security.

Product offering

GT-40 Gamma Ray Spectrometer

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Radiation Detection › Environmental Monitoring

GT-40 Gamma Ray Spectrometer

A multifunctional gamma ray spectrometer for rapid determination of activities of gamma emitters in field surveys or samplings. A wide range of applications in the field of monitoring heterogeneous substances, contamination of sites, buildings, objects, water and food. Application in geology in field surveys for raw material sources. Proven performance in harsh environment applications. Survey data is stored in the memory, including the GPS coordinates. Up to 6 different calibrations.

Properties

Portable digital gamma ray spectrometer with a built-in computer for complex analysis of the measured data. Bluetooth, Wi-Fi and GPS are an added advantage. Transreflective colour display.

Use

Applicable wherever it is necessary to quickly and accurately determine the activities/content of gamma emitters. Suitable for field survey measurements, but also to be incorporated into shielding.

Modification

The GT-40 series is provided with a NaI/Tl scintillator with a 3″ base diameter and 3″ height. A GT-40S model is also manufactured, which is fitted with either a NaI/Tl or BGO detector with a 2″ base diameter and 2″ height at the customer’s request. The GT-40S model has a built-in 1 cm thick Pb collimator. The collimator is easily removable.

Specification

Two basic working modes: Survey, for terrain scanning, and Assay, for determining concentrations of precalibrated radionuclides, i.e. components. Energy calibration of the analyzer is carried out continuously throughout the operating time, and only natural background sources are used for the set-up. Monitoring and analysis results are displayed on a color graphic display in a well-arranged manner. All acquired data is stored in the unit’s memory and can be exported to other devices via USB, Wi-Fi or Bluetooth. Field observations can be recorded and stored along with each measurement using a built-in voice recorder.

Alternatives – Options – Special applications

Alternative models for special applications have been designed. GT-40-B profits of BGO detector 3″ base diameter and 3″ height. GT-40 – L is a model with extended length of body for scanning of small spots on earth surface. Support for high precision external GPS, build in calibration and protocol for fast core logging.

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Partner Centronic Nuclear

Centronic is a UK-based leader in radiation detection technologies, offering a range of detectors tailored for environmental monitoring in nuclear and industrial settings. Their expertise spans over 70 years, providing reliable solutions for monitoring radiation levels in various environments.

Product offering

Alpha, Beta & Gamma Detectors – Centronic

Beta & Gamma Detectors – Centronic

Radiation Detection › Environmental Monitoring

Alpha, Beta & Gamma Detectors – Centronic

The Alpha, Beta & Gamma Detectors (Centronic) are used for the detection of radiation at low dose rates. This range of mica-window tubes is used for monitoring all types of radiation in a wide variety of environments.

Alpha, Beta & Gamma Detectors features:

- circuitry simple
- robust build
- available with compensating filter

Contact our product specialist or download the datasheet below.

Radiation Detection › Environmental Monitoring

Beta & Gamma Detectors – Centronic

The Beta & Gamma Detectors (Centronic) are used for the detection of radiation at low, intermediate and high dose rates. These types have a wide range of applications e.g. personal dosimetry, military and defence equipments.

Beta & Gamma Detectors features:

- robust construction
- simple circuitry

Contact our product specialist or download the datasheet below.

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Partner Ultra Electronics

Ultra Electronics acquired Lab Impex Systems on July 17th, 2014. This is a known specialized manufacturer in radiation detection solutions and services for use in the global nuclear industry. Founded in 1976, Laboratory Impex Systems Ltd (LIS) is a leader in designing, developing and manufacturing health physics and radiation protection measurement instrumentation focusing on stack monitoring.

Product offering

CMS Gamma – Lab Impex

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Radiation Detection › **Environmental Monitoring**

CMS Gamma – Lab Impex

The CMS Gamma (Lab Impex) is an advanced continuous monitoring station for the measurement of gamma radiation (dose-rate of activity) in the environment or workplace. The system provides essential, reliable information to personnel when radiation levels are above normal. The versatile unit can provide interlock control in hot areas such as fuel stores, caves, glove boxes and hot cells as required.

CMS Gamma features:

- installed, transportable or trolley mounted
- internal back up battery which enables full operation for up to 1 hour in the event of mains failure
- the detector arrangement can be installed at distances of up to 1000m (3,280ft) from the CMS station
- wide range of detectors available

Read more about the CMS Gamma on the Lab Impex website