

ADVANCED GAMMA SPECTROMETRY EQUIPMENT FOR REAL-TIME ENVIRONMENTAL RADIOACTIVITY MONITORING OF ATMOSPHERIC AEROSOLS WITH SCIENTIFIC AND TECHNICAL REMOTE SUPPORT

Suitable for regional networks, for routine
environmental radiological surveillance and for
emergency early warning and response



UNIVERSITAT
ROVIRA I VIRGILI



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<https://www.livra.urv.cat/en/services/equipment/aerosols/>

Scientific technology with university warranty

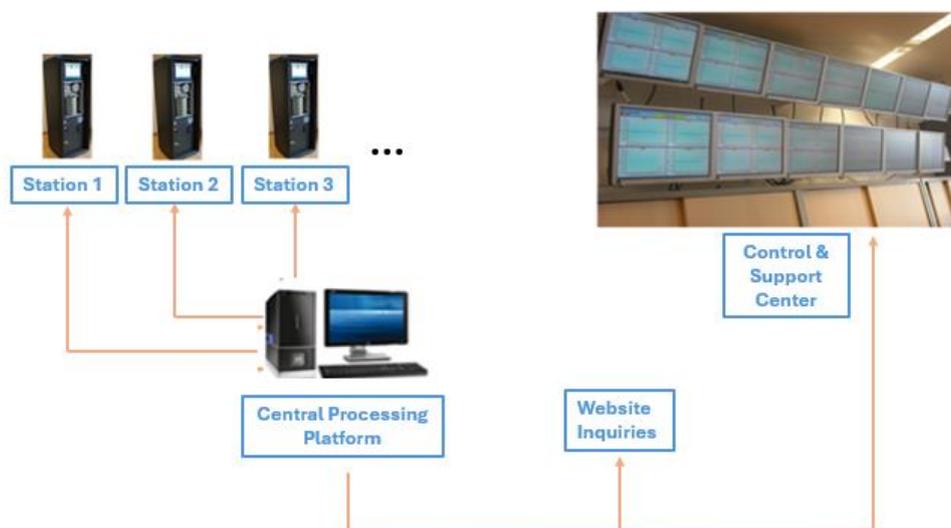
In an increasingly demanding international environment regarding radiation safety, having an effective, autonomous, and scientifically proven system for monitoring atmospheric air has become a strategic necessity. To address this need, the Rovira Virgili University (URV) has developed a networked measuring device that combines technical precision, scientific innovation, and operational ease. This device offers a comprehensive solution for monitoring environmental radioactive aerosols in atmospheric air.

The system is designed to ensure continuous, real-time monitoring of radioactivity in the air. The combination of high-resolution gamma spectrometry, state-of-the-art sensors, and specifically developed analytical software allows not only the detection of gamma-emitting isotopes at very low levels (mBq/m^3 or $\mu\text{Bq/m}^3$), but also the precise identification of their origin and evolution.

Whether in nuclear or industrial environments, or as part of national early warning networks and emergency networks, this system flexibly adapts to each client's specific needs.

Strategic applications

- National early warning networks: detect cross-border emissions or incidents at nearby nuclear facilities with high precision in advance notice.
- Nuclear power plant environmental monitoring.
- Industrial site monitoring: control of emissions of natural uranium or other emitters in the nuclear fuel cycle facilities.
- Authorities and responsible bodies can receive early warnings following an initial radiological release, allowing them to take action before a critical emergency situation develops, and thus anticipate, prepare appropriately, and make decisions with greater lead time.
- With mobile stations.



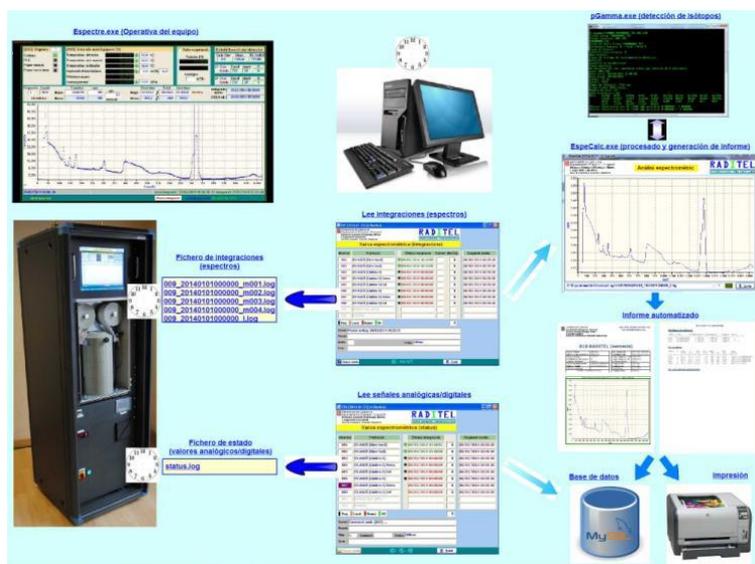
Remote technical oversight and continued support

One of the system's greatest added benefits is the possibility of accessing a Remote Scientific and Technical Oversight program offered directly by Rovira Virgili University to clients. This support includes:

- Continuous remote review of all operating parameters
- Remote adjustments and calibrations.
- Daily evaluation of data by experts from an external and independent scientific body.
- Issuance of automatic reports with scientific interpretation.
- Ongoing support during the start-up phase.
- Online training for network operators.
- Reports from University specialists for special issues

26 parameters and operating actions are remotely controlled, and those that differ from the nominal values can be corrected and adjusted.

This oversight ensures that the network remains in optimal operation from day one and that local staff receive progressive training with ongoing support. In practice, it is a permanent technical audit endorsed by a university institution with more than 15 years of experience in environmental monitoring.



Some examples of the networks designed and installed by the Rovira Virgili University are: Regional network of Catalonia in Spain, Initial country network of Paraguay, Ascó nuclear power plant network in Spain, Country network of Uruguay, Vandellòs nuclear power plant network in Spain, the Argentine Nuclear Power Operator (NASA) network, Argentina's Regulatory Agency (ARN) network, the Argentina's National Energy Atomic Commission network, Laguna Verde nuclear power plant network in Mexico and Nuclear Regulatory Agency network in Mexico.

For more information or to schedule a technical demonstration, please contact our support team.

MAIN FEATURES OF THE MEASURING EQUIPMENT

1. High-tech equipment with scientific basis developed by the University.
2. Analyses gamma emitters in aerosols present in the air.
3. Lanthanum Bromide or Strontium Iodide scintillation crystal technology.
4. Fully autonomous operation, continuous 24/7 and real-time.
5. Requires very little maintenance (the filter can last more than three years).
6. Radon monitoring based on continuous analysis of its gamma-emitting progeny.
7. Determines the activity concentration for each radionuclide detected.
8. Gamma spectrometry analytical code developed specifically for the equipment.
9. Customer definable natural, fission, and activation isotope libraries.
10. Possibility of outputting result files in ANSI/IEEE N42.42 format.
11. Automatic stabilization of spectra against temperature and other events.
12. No artificial radioactive isotope sources are required for calibration.
13. Normal integration cycles range from 10 minutes to 24 hours and up to 5 days.
14. Detection levels (MDAC) for Cs-137, up to the values shown, assuming constant concentration throughout the entire measurement period:
 - With 5-day measurements: 0.002 Bq/m³ (LaBr) and 0.0008 Bq/m³ (Srl)
 - With 60 h measurements: 0.00015 Bq/m³ (LaBr) and 0.00006 Bq/m³ (Srl)
 - With 24 h measurements: 0.0002 Bq/m³ (LaBr) and 0.0001 Bq/m³ (Srl)
 - Sensitivities of the same order of magnitude for I-131, Co-60, Cs-134, etc.
15. Continuous monitoring of transients by the internal sentinel every 10 minutes.
16. Graphic report on the temporal evolution of the number of detected counts.
17. Remotely adjustable air sampling pump with a flow rate of up to 12 m³/hour.
18. Vortex flowmeter without mechanical elements.
19. Graphic report of flow behaviour during the measurement cycle.
20. Sampling on a fixed filter with an automatic changeover system.
21. Analytical enclosure with optimized shielding with 5 cm of lead.
22. Optimized shielding with inner layers of tin and copper to reduce background X-rays.
23. Equipment integrated in an industrial rack (60x60x170 cm), approx. weight: 300 kg.
24. Remote-adjustable high-voltage power supply.
25. 15" display for local viewing of data, parameters and maintenance.
26. Multiple temperature reading and control and automatic heat evacuation.
27. Circuit pressure monitoring that detects leaks or filter malfunctions.
28. Electrical system 220 volts-50 Hz with automatically recovery differential protection.
29. Network-integrable with other equipment, even with different measurements.
30. Remote control that allows the equipment to be completely reprogrammed remotely.
31. Definition of different levels of warning, alert and alarm according to the measure.
32. Remote IT manager on a network basis for technical control.
33. Remote network computer manager for data management and representation.
34. Database generator, report printer manager.
35. Customized issuance of technical data and operating reports.
36. Technical and radiological events are immediately reported to the controller.



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