



RADIATION SOLUTIONS INC

RS-250 Gamma Stationary Monitoring System

Unique Features

- Gamma dose and dose rate monitoring
- Using 3x3" NaI detector
- Very wide dynamic range
- High performance digital spectrometer
- Central operation and data storage
- Generic and isotope specific data
- Multiple communication options
- Can be easily deployed in extreme climates
- Build-in GPS receiver
- Secure remote service and maintenance access
- Advanced data integration software
- Easy operator interface



Environmental monitoring



Critical infrastructure monitoring





► RS-250 Gamma Monitoring System

The RS-250 Monitoring system is designed to meet the demanding requirements of outdoor monitoring for low levels of gamma radiation in extreme climates. Various alarm levels can be set to alert operators to focus on alarming monitors in case of abnormal radiation levels.

The RS-250 operates as a **regional** or **local** network for the continuous monitoring of released nuclear material. It is equally effective as a:

- Perimeter network around a nuclear facility,
- Nation-wide network monitoring atmospheric nuclear fallout,
- High performance area monitor
- Safety guard against unauthorized presence of nuclear material at critical Infrastructures.

Flexible Deployment

The RS-250 technology offers great flexibility in deployment due to the large variety of communication and power options. The RS-250 utilizes advanced DSP / FPGA technology and software techniques that provide laboratory levels of spectral performance in harsh and extreme environments.

No Sources Required

The RS-250 Monitor uses an advanced multiple-peak gain stabilization on naturally occurring isotopes. This technique eliminates spectral drift caused by temperature variation without the need of an external calibration source.

The RS-250 Monitor is a self-contained gamma ray radiation monitoring and detection system with detectors typically fixed-installed on the supplied aluminum pole for good protection and stability.

The RS-250 controllers are usually installed in customer provided housing for better physical protection and ease of service. The controller can be adapted to fit inside the detector pod should special installation requirements demand this.





RS-250 Detector

The RS-250 detector uses a 3x3" NaI detector for best low-level measurement of Gamma dose and dose rate. This detector also offers a full gamma spectrum (0 – 3 MeV) to differentiate the source of radiation something not available from GM tube or Ion Chamber based detectors.

Due to the High Performance Digital Spectrometer called ADS, the RS-250 detector has a very large dynamic range of 6 decades covering 1 nGy/h to 1 mGy/h for Cs-137 for a single NaI detector. The ADS (Advanced Digital Spectrometer) has unparalleled performance for high count rates, high throughput and long term stability making it the corner stone of the RS-250 systems.



RS-250 Controller

The RS-250 Controller offers great flexibility in communication options to suit a large variety of operational demands. A built-in analogue phone modem, RS-232 serial connection or Ethernet

connections are available. The Ethernet connection can be used to connect the RS-250 Controller directly into a LAN, e.g. using DSL line or fiber converters. The Ethernet connection can also be used to connect to customer provided wireless devices such as Cell-Modems or directional Wifi.

The RS-250 Controller can be powered from a mains supply ranging from 98 – 240 Vac, 47 – 63 Hz. DC power options are also available for 12 Vdc and 24 Vdc which makes alternative power like solar or wind powered stations possible.

The RS-250 Controller has a built-in GPS receiver to ensure precise triggering and correct timestamp on all samples. The Controller integrates the one second samples from the ADS to any preferred integration time for example 5 minutes, 15 minutes or 1 hour. Preset criteria can be selected to exclude samples in the integration such as single samples with very high count rate. All one second raw samples are internally stored in the Controller for 24 hours and can be retrieved for special analysis.

For fail-safe operations, the RS-250 controller can be configured to automatically re-power the complete station if no communication to the DGS server has taken place within a preset time interval.



DGSAssist showing monitoring stations on Map.

RS-250 Software

An extensive software package is available to complete the RS-250 Monitoring System by bringing all data to a central place. RS-250 software called DGS Server integrates all data from individual stations into a central computer. The DGS Server can be installed on customer provided Windows operated computer(s) when required.

Operators can log-on to this central server using the RSI provided viewing software called DGSAssist. Detailed information on each Monitoring Station is then available to the operator. DGSAssist plots all Monitoring Station locations onto publicly available maps on Internet or onto customer provided specific digital map. By selecting a specific Monitoring Station, detailed information becomes available such as charts for;

- AirKerma,
- Ambient Dose Equivalent H*10,
- Isotope specific Dose Rate,
- Isotope Specific SNR.

For each measurement point the full Gamma spectrum is also available to the operator and can be exported in N42 format when needed.



Specifications

RS-250 Detector Unit

- Dose rate range
 - 1 nSv/h – 1mSv/h
- Detector type
 - Sodium Iodide (NaI)
- Detector volume
 - 21 in³ (3"x3")
- Detector resolution
 - Less than 7.5% @ 662 keV, typically 7.0% or better
- Spectrum stabilization
 - The spectrum is automatically stabilized at the station using naturally occurring isotopes
- MCA / spectrometer Type
 - High performance digital spectrometer using FPGA and DSP techniques
- Energy range
 - 15 keV to 3MeV + a cosmic channel > 3.5 MeV
- Energy resolution
 - 1024 channels with 3.0 keV per channel
- Count Rate
 - > 2,000,000 cps
- Differential non-linearity
 - < 0.2%
- Detector output
 - All outputs from detector module are digital
- Environmental
 - -40 °C to + 50 °C
- Dimension enclosure
 - 27.750" L x 7.890" Dia
704.9mm L x 200.4mm Dia
- Aluminium mounting pole
 - 76.00" L x 3.0" Dia
1930.4mm L x 76.2mm Dia



RS-250 Controller Unit

- Nuclide I.D. method
 - Template matching analysis
 - Nuclide libraries
 - The system uses a template library. Additional templates can be added to the library on request.
 - Nuclides included
 - Am-241, Ba-133, Cs-137, Co-57, Co-60, Cr-51, DU-238, Ga-67, Ge68, In-111, I-131, Ir-192, K-40, Mo-99, Na-22, Np-237, Pu-239, Ra-226, Sm-153, Tc-99, Ta-201, Th-228, Th-232, U-235
 - Communication type
 - TCP/IP is primary communication protocol and will interface with customer supplied analogue telephone, mobile telephone, radio, DSL, GSM, Satellite etc.
 - Multi connectivity
 - LAN, Remote Internet connection, Compatible with Digital cell modems
 - Environmental
 - -40 °C to + 50 °C
 - Electrical
 - 98 - 240 Vac 47 - 63 Hz or 12 Vdc / 24 Vdc on request
- ### RS-250 Software
- Central server
 - DGS server, RSI relay server
 - Utility software
 - DGSAssist for operators, DGS monitor for administrators
 - Expert software
 - RadAssist for set-up and maintenance



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Certified ISO9001:2008

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