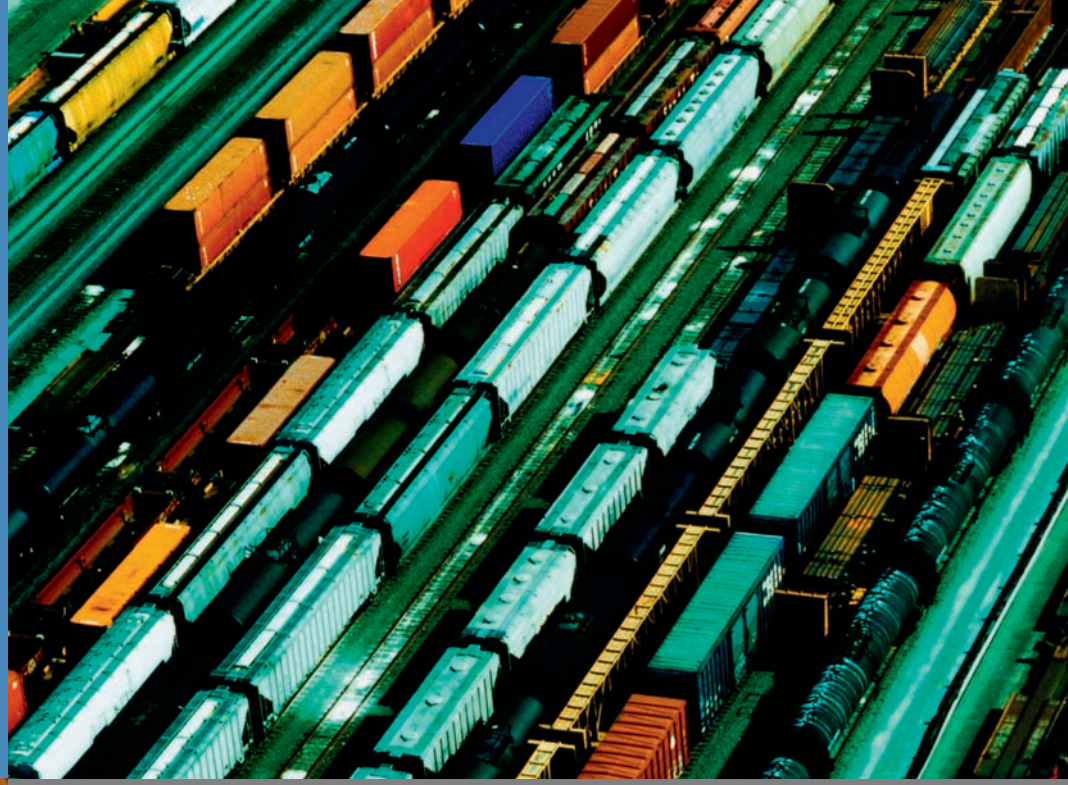


Smart Portal Solutions for the Interdiction of Illicit Radiological Materials

- Sense radiation
- Identify threats
- Eliminate risk

Part of Thermo Fisher Scientific

Thermo SCIENTIFIC

Terrorist efforts to disrupt the fabric of our society are an ever-present and increasing danger. The world's population demands protection against attempts to incite panic, to contaminate infrastructure such as buildings, or even to cause widespread injury and death among its civilian populations.

Protection against the threat posed by nuclear weapons and radiological material is a matter of paramount importance for national security. This drives the urgent need to tighten security at land borders, airports, and seaports. Critical infrastructures must also be protected against such threats.

The detection and identification of threat nuclear materials is a complex task. False alarm rates must be low if the flow of commerce is not to be disrupted. Systems must reliably distinguish between innocent and threat materials. Widely varying environmental conditions must be taken into account.

Successful solutions require the application of a deep understanding of the radiation physics involved. The solution must meet high standards of robust, reliable, and simple operation. An alarm must result in the immediate transmission of actionable information to the responsible authority.

Thermo Fisher Scientific has developed the capabilities and instruments to meet this challenge. We deliver high performance and cost effective solutions tailored to your requirements.

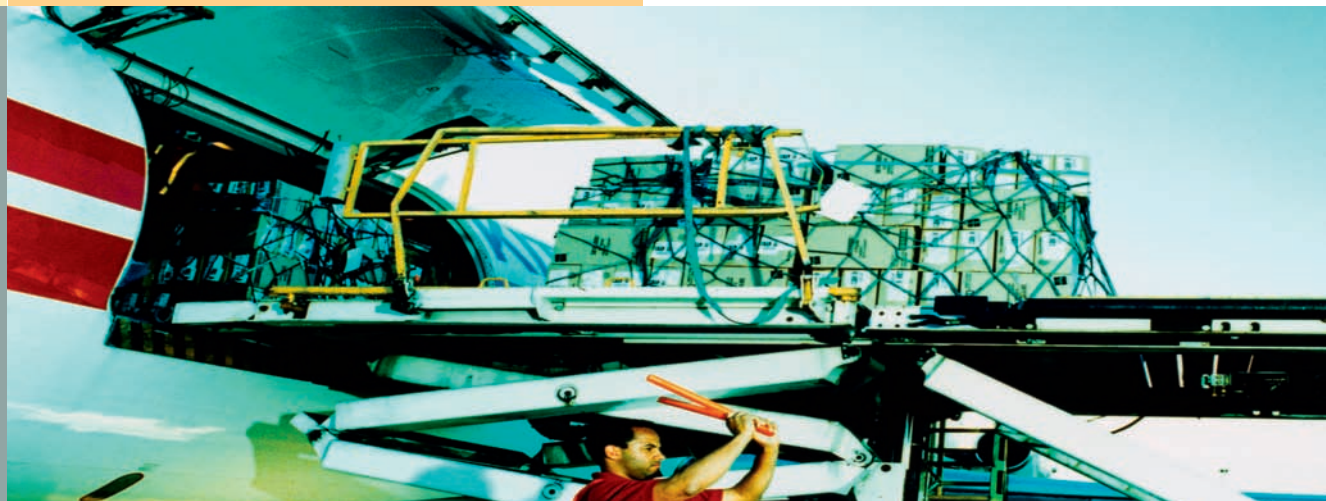
Experience that Counts

Thermo Fisher Scientific delivers solutions that meet specific requirements and which deliver excellent results even under the most challenging of environmental conditions.

For more than 50 years, both government authorities and private industry have entrusted us with their security monitoring needs. Our installed solutions range from individual portal monitors for monitoring orphan sources to extensive networked systems incorporating different types of instrumentation that fuse complex data into simple, actionable information. We have installed over 3500 portal monitors throughout the world.

Our team of physicists and engineers continues to develop instrumentation that drives superior and relevant performance. Our customers frequently turn to us for consultation support in developing operational concepts to meet their needs. Our trusted solutions are embraced by security monitoring professionals throughout the world.

Thermo Fisher Scientific – solutions that you can trust.



Safety-Guard Series I (SGS I)

Solutions for small cargo, light vehicles, and pedestrians

The SGS I provides a solution that satisfies the requirements for small package and pedestrian monitoring systems. The system houses both gamma and optional neutron detectors providing excellent detection performance. The use of energy windowing software provides the SGS I with capability to distinguish between innocent and threat materials.

In a competitive evaluation, two of the world's leading overnight package shipping companies selected the SGS I to meet their requirements. The SGS I conveyor system is deployed where the packages are sorted and loaded into the freight container. As a final check, the freight container is scanned by a second SGS I portal monitor immediately prior to loading on the aircraft.

The compact size and ease of use of the SGS I provide an excellent fit for the requirements of pedestrian monitoring.

The success of the SGS I is driven by application relevant design. Unlike traditional approaches, Thermo Fisher Scientific uses premium high performance detection components that enhance the detection performance. These are deployed in a robust and easy to use instrument. For daily use, the operator need only observe the alarm and system condition status provided by the simple light tower (red/green/yellow) and associated audio signals.

RadSPEC™

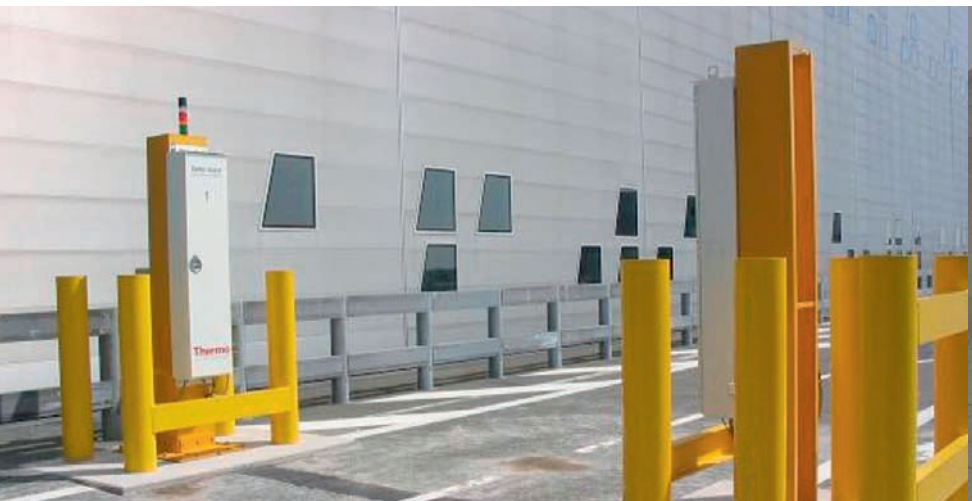
Rapid deployment solutions for covert pedestrian/ baggage radioisotope monitoring and identification

RadSPEC is a highly configurable sensor network based on standard building blocks of spectroscopic gamma-ray, gamma-ray doserate, and neutron detectors. RadSPEC architecture simplifies the task of installing a covert system in existing infrastructure. It is ideal for applications such as airline passengers queuing at immigration or other choke points.

RadSPEC not only locates a source in pedestrian traffic, but also leverages its spectroscopic capability to deliver a detailed assessment of the type of radioactive material in the source.

RadSPEC's modular structure enables solutions that can be readily extended to cover even wide areas simply by increasing the number of detector modules in the network. The "plug and play" characteristic enhances the speed of deployment or expansion. This results in the ability to provide enhanced surveillance in response to an increase in the threat level.

RadSPEC's excellent performance results from over 20 years of development of detection units for deployment in both handheld and installed systems in very demanding environmental conditions. RadSPEC delivers laboratory quality performance even in difficult environmental conditions.



Truck , Train, Container, Plastic Portals

Safety-Guard Series II (SGS II)

Solutions for containerized cargo and larger vehicles

The SGSII accommodates more (up to eight), larger area detectors to provide detection coverage suitable for large Freight Containers, Freight Trucks, and Freight Trains. The detection system is based on detection modules providing scalable solutions to match the specific application.

A threat object is likely to be confined to a small portion of the total scanned area presented to the portal monitor during the transit of the vehicle. Therefore, the SGS II algorithm uses a sophisticated dwell timing technique to both locate the object and to enhance the signal-to-noise ratio by eliminating clutter background from the remainder of the load. The heavy shielding that is inherent in a large truck will vary and therefore cause widely varying backgrounds during the vehicle transit. The sophisticated algorithm deployed in the SGS II compensates for this effect. This improves system throughput by reducing the false alarm rate.

The SGS II also supports stationary monitoring when the vehicle will stop and "dwell" within the Portal Monitor. Our algorithm adjusts certain parameters that are vehicle speed dependent in order to enhance the calculation over a range of vehicle speeds.

The SGS II provides for external inputs, such as from a weighing platform, that provide additional data further reducing false alarm rates.

The weatherproof housings deployed provide rugged protection against the environment. A single cable connection over significant distances (up to 1 km) to the system control and reporting system simplifies integration at the user's site.

The system background is constantly monitored and the value used in the calculation is updated.

Alarm annunciation is achieved via warning lights and an audible alarm system. The alarm annunciation may be local or remote (or at multiple sites).

The SGS II provides a robust and scalable solution. The algorithm deployed has been well proven over a wide range of measurement conditions in a large number of systems throughout the world. The SGS II can be used with high confidence in daily use even at the busiest seaport.

Enhanced Performance Features

The Thermo Fisher Scientific difference starts with the deep knowledge of threat detection performance that results from the hundreds of thousands of measurements that our scientists have made. Our detection science team continuously studies detector technology and drives performance enhancements directly relevant to improved threat detection performance in the field. These enhancements are then verified at our state-of-the-art Portal Lifecycle Evaluation and Demonstration Systems (PLEADS) facility in Oakwood Village, Ohio. Thermo Fisher Scientific performance features include:

Superior Detection Performance for Am-241

Am-241 is regarded as an indicator of potential suspicious nuclear activity. However, its low gamma-ray energy and abundance make it difficult to detect. Our choices of high quality detector material and read out methods, proven in our PLEADS facility, result in the best possible detection performance for Am-241.

Optimum Sensitivity Poly Vinyl Toluene (PVT) Detectors used in SGS I and SGS II

Our studies and tests led us to choose a single high-gain Photomultiplier Tube (PMT) read out system coupled with very low noise electronics versus the multiple PMT choices made by others. This design results in optimum detection sensitivity.

Laboratory quality Spectroscopic Performance in the Field

We use advanced digital signal processing methods to provide perfectly linearized stabilized spectral outputs even in widely varying environmental conditions. These proven methods deliver consistent, laboratory-quality results in a challenging environment.

Unambiguous User Interface with Expert Capability

Our sophisticated analysis routines are driven through a user interface that delivers actionable information in a red light/green light format. When detailed expert analysis is required, the password protected Supervisory Computer can be immediately transformed into a powerful tool for the expert user.

Spectroscopic Portal Monitors

When detailed knowledge of the radioactive material is required

Thermo Scientific Spectroscopic Portal Monitors provide the best capability to resist the efforts of terrorists to mask a threat object with innocent material. This performance enables operating plans to be implemented which greatly reduce the need for additional labor and time intensive monitoring. This reduces the impact on the flow of commerce and therefore, drives faster throughput and lower cost of operations while maintaining tight security.

We offer two types of Spectroscopic Portal Monitor. The first is based on NaI(Tl) (Sodium Iodide) gamma-ray detection technology, while the second is based on HPGe (High-Purity Germanium). The NaI(Tl) unit is called the Advanced Radioisotope Identification System (models ARIS-512 and ARIS-1024) while the HPGe unit is known as the ARIS-H4, ARIS-H8, and ARIS-H24. In addition, a mobile unit for freight containers (Mobile Shuttle Carrier Detection System (MSCDS) that has a complement of both NaI(Tl) and HPGe detectors is available for use at seaports.

The ARIS (NaI(Tl) family offers the ability to differentiate between Naturally Occurring Radioactive Materials (NORM), Industrial, Medical, and Special Nuclear Material (SNM). The ARIS-H4/8/24 (HPGe) provides essentially unambiguous identification of all gamma-ray emitting nuclides and is extremely effective in defeating attempts to mask threat objects with innocent materials, such as NORM.

The ARIS family incorporates sophisticated algorithms optimized for the gamma-ray technology used (NaI(Tl) or HPGe). Our extensive experience gained in working on the US Government program to develop the Advanced Spectroscopic Portal (ASP) augments our extensive commercial experience.
A solution which delivers the highest capability to interdict terrorist efforts would incorporate the NaI (Tl) ARIS in the primary and the HPGe ARIS in the secondary scanning locations. The result is spectroscopic solutions that deliver superb performance and greatly strengthen the security of the border areas where they are deployed.

Thermo Scientific Total Solutions

Our experience provides us with detailed and relevant experience for the development of the optimum solution to meet the specific detection performance requirements and the operational plan for a particular facility. Our broad product range provides us with the ability to mix and match different technologies to deliver an optimum solution within budget constraints. In addition we have developed extensive command and control software which scales from small scale requirements up to large scale integrated systems incorporating many traffic lanes.

Thermo Scientific systems meet or exceed the ANSI N42.35 and ANSI N42.38 standard established for USA Homeland Security applications. Solutions for Borders and Ports can be augmented by our large range of portable instruments.

The approach to developing a powerful solution for your needs begins with a consulting process wherein a partnership relationship is established that extends through to the long-term support for the operating integrated system.

PLEADS (Portal Lifecycle Evaluation and Demonstration Systems) Facility and the Thermo Scientific Advanced Portals Team

Provides our Customers with:

- Confidence of Expert Support Based on an Extensive Database of Actual Measurements
- Systems Intercomparison for Specific Measurement Scenarios
- Rigorous Experimental Verification of Standards Compliance
- Realistic, Harsh Environment, Training Facility
- Next Generation Detector Technology Evaluation & Demonstration
- Lifecycle Data based on Actual Operating Systems

Our extensive investment in the Thermo Scientific PLEADS Facility is a commitment to providing our customers with gold standard data in an uncertain world. Experimental data supersedes typical data sets provided by conclusions extrapolated from small numbers of measurements made in an environment that is a poor representation of the actual application. Sources of uncertainty are experimentally studied and rigorously accounted for in statistical confidence tests.

The huge database provided by the PLEADS facility provides us with the ability to closely emulate an extremely broad range of measurement scenarios enabling confident support to an operator undergoing even an exhaustive audit process.

Our development program benefits from the database and our ability to rapidly experimentally verify the effect of algorithm enhancements.

Confident results assured by smart portal solutions.

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