

Thermo Scientific Matrix Mobile ARIS



Mobile Radiation Detection System

Thermo Scientific Matrix Mobile ARIS Mobile Radiation Detection System

- *Detect low level threats*
- *Reduce need for operator expertise*
- *Identify isotope spectrum*
- *Leverage intelligence gathering*
- *Minimize false alarms*

The Thermo Scientific Matrix Mobile ARIS detection system—the advanced, intelligent solution for radiation patrol and isotope identification—offers real-time, mobile, and sensitive radiation detection and surveying. False alarms are minimized with natural background rejection, while system integration is maximized with the premier real-time monitoring and analysis software, ViewPoint™ Enterprise. Coupled with the power of ARIS, the system is without parallel. Offering intelligent hardware/ software integration, we bring a new level of efficiency to mobile radiation survey and detection.

Integrated Solution

The Matrix Mobile ARIS detection system is an advanced integrated solution for radiation survey, patrol, and isotope identification. Mounted in a standard SUV, boat, or other vehicle, the system leverages the power of patented Natural Background Rejection technology and the proprietary ARIS Advanced Radioisotope Identification System with Thermo Scientific ViewPoint Enterprise software. As an integral part of this software system, the ViewPoint Survey Client makes it possible to easily survey an area, determining the background radiation contour. The survey data, correlated with GPS mapping coordinates, is saved for comparison with readings taken during periodic patrols.



The Thermo Scientific Matrix Mobile ARIS allows for unobtrusive surveillance. The system can be mounted into an SUV, boat, or other vehicle.



Patrol Mode and Isotope ID

During patrols, the system uses GPS to compare gamma and neutron levels at each location with the stored survey contour. When dose readings are above user-selected levels, the system triggers an alarm to notify the operator.

When an alarm occurs, the operator can initiate the ARIS Advanced Radioisotope Identification System. Isotopes identified by ARIS are tagged with links to stored isotope information profiles. This enhances the field operator's ability to identify threats and take appropriate actions.

The power of ARIS means that no gamma spectroscopy expertise is required from the operator.

The addition of RadReachBack™ allows the system to stay in constant data communication with a mobile base or central command facility.

Reducing False Alarms

By providing the means to store city or area-wide radiological contours, ViewPoint Survey helps to reduce false alarms. Background profiles (area contours) can be established for control areas in advance of public events or emergency incidents, reducing the likelihood that costly mobilizations will be triggered by false positives. During patrols, current conditions are compared with the stored contours, triggering alarms only when conditions are significantly different from normal. When combined with the ARIS Isotope ID system, this also enhances real time response precision in the event of hazardous conditions.

Thermo Scientific Natural Background Rejection, or NBR, technology further reduces the risk of false positives by greatly suppressing signals from Naturally-Occurring Radioactive Materials (NORM), such as rock formations, radon, and building material.



The 7-liter gamma probes, employed on both the left and right side of the system, use NBR technology to enhance sensitivity and reduce false positives.

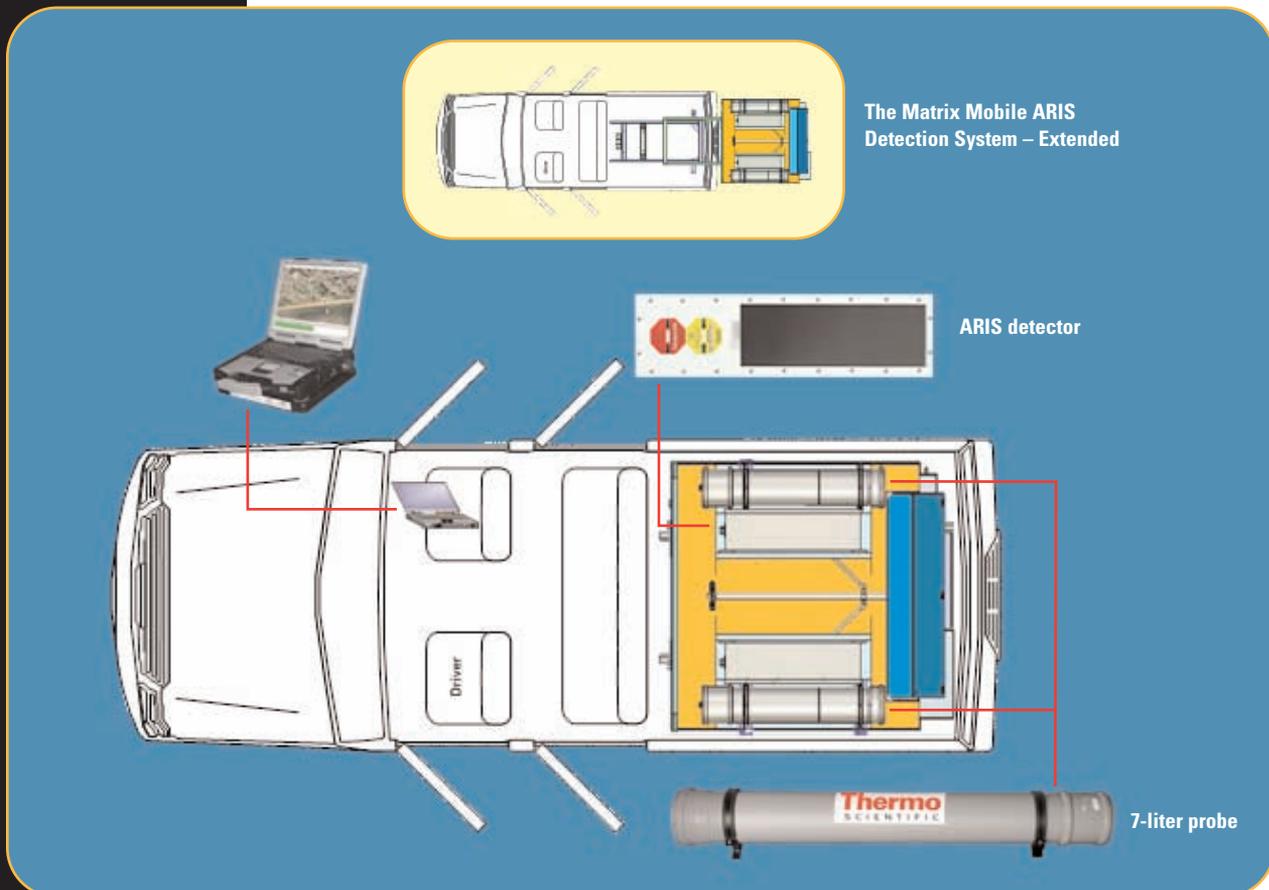
Thermo Scientific Matrix Mobile ARIS

Components of the System

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The Matrix Mobile ARIS Detection System consists of three primary component groups:

- **Gamma and Neutron Probes**
The seven-liter Gamma Probes use NBR technology to enhance sensitivity and reduce false positives.
- **ARIS Radioisotope Identification System**
- **Rugged Laptop running ViewPoint Enterprise / Survey Client**



The Matrix Mobile ARIS Detection System

By suppressing background radiation measurements, NBR increases sensitivity to artificial sources of concern, reducing the likelihood of false triggering while at the same time lowering alarm thresholds. Using two gamma probes permits left-side/right-side source determination, speeding up the process of locating sources when an alarm is triggered. The He-3 Neutron Probe offers enhanced sensitivity for locating neutron sources.

The proprietary ARIS system allows an operator to identify isotopes present when an alarm occurs. The system can also be used for continuous stationary monitoring. In either case, the advanced design of the detector, electronics, and isotope identification algorithms ensures that the operator does not require gamma spectroscopy expertise to identify sources of concern. The system not only IDs the sources present, but provides convenient linked profiles for each identified radioisotope.

The unique Thermo Scientific ViewPoint platform provides system integration, operator interface, and data storage. This premier data monitoring and analysis tool, enhanced with the easy-to-use Survey Client for contour surveys, offers unprecedented intelligence and system performance.

How the System Works

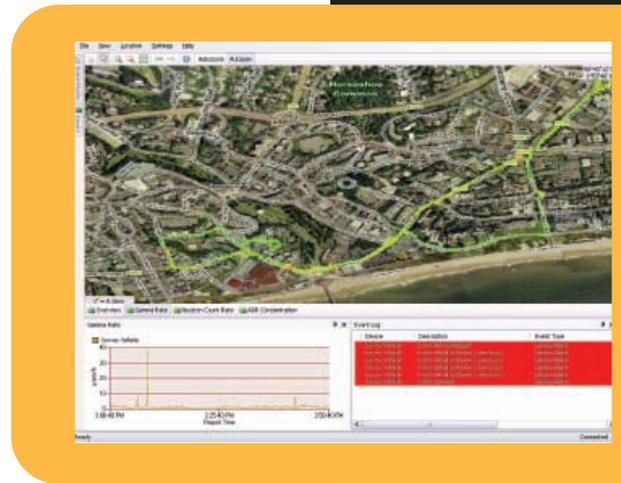
During patrols, when an alarm occurs, ViewPoint immediately notifies the operator with a popup dialog, plays a sound file, and identifies the alarm source and location. The operator is then presented with a choice: initiate an ARIS Isotope Identification; or, ignore the alarm and continue the patrol.

An alarm is triggered by ViewPoint from three possible sources:

- Measurements that exceed user-specified thresholds
- User-selected instrument alarms
- Sigma (standard deviation) alarms

Alarm thresholds can be determined and specified before patrols by analyzing survey data. This data is generated by driving the survey area with the Matrix Mobile ARIS Detection System. During a survey, probe and instrument data is continuously correlated with GPS mapping coordinates and saved, creating a baseline. Data from multiple surveys can be combined to create comprehensive area contours.

In the ViewPoint Survey Client, the survey area is divided into a grid of selectable-sized squares. If desired, each grid square can be shown in a color that represents the average data value for the area. In addition, a “breadcrumb trail” of data points shows the locations where survey readings were taken.



The ViewPoint webmapping client provides real-time tracking over a map or satellite image.

Thermo Scientific Matrix Mobile ARIS

Nothing is Out of Reach

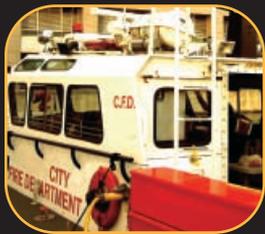
RadReachBack

The Thermo Scientific RadReachBack communications system can be easily integrated with the Matrix Mobile ARIS to provide continuous, real-time data communications with a command center, expert analysis facility, or next-level response personnel. This allows ARIS vehicle operators to benefit from technical analysis, provided by experts viewing data acquired in real time, and also facilitates response coordination of multiple vehicles, response teams, and agencies, as the situation dictates. RadReachBack can be implemented in a flexible variety of ways, depending on requirements and available resources. For example, with the addition of the PDT-100 Satellite Antenna, real-time satellite data communication is possible. Other possibilities include GSM Modem, 900 Mhz Mobile, and Mesh Networking.

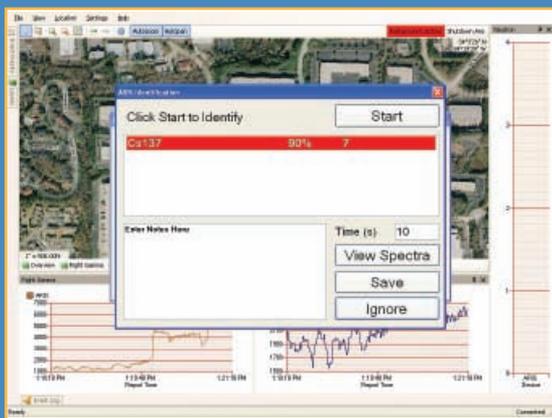
Nothing is Out of Reach

The superior speed, sensitivity, and flexibility of the Matrix Mobile ARIS System are underscored by the following:

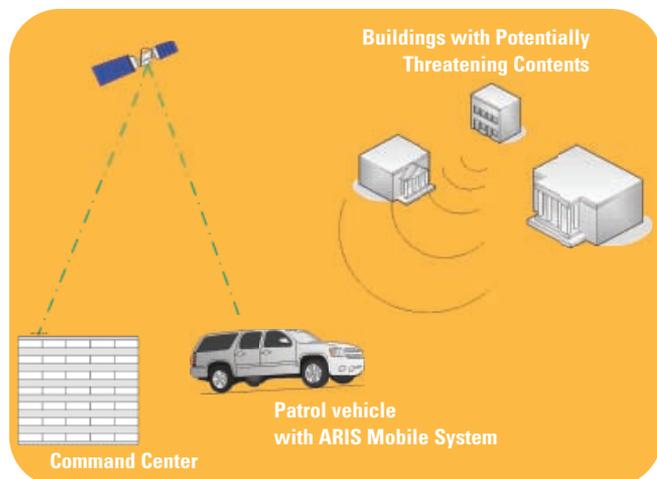
- No requirement for operator expertise in gamma spectroscopy
- Errors reduced; freeing operators from constant monitoring
- Accurate and comprehensive background contours saved during surveys
- Increased incident response accuracy resulting from determination of alarm conditions before events occur
- Reduced need for operator interpretation during alarm events
- Fewer false alarms and missed events
- Unparalleled flexibility, from basic systems to the most comprehensive, from portal monitoring to mobile
- Advanced technology—NBR, ARIS, RadReachBack, and ViewPoint—integrated to produce a fast, mobile, and intelligent system
- Nothing is out of reach



Matrix Mobile ARIS Detection System Mounted on Patrol Boat with Command Center RadReachBack

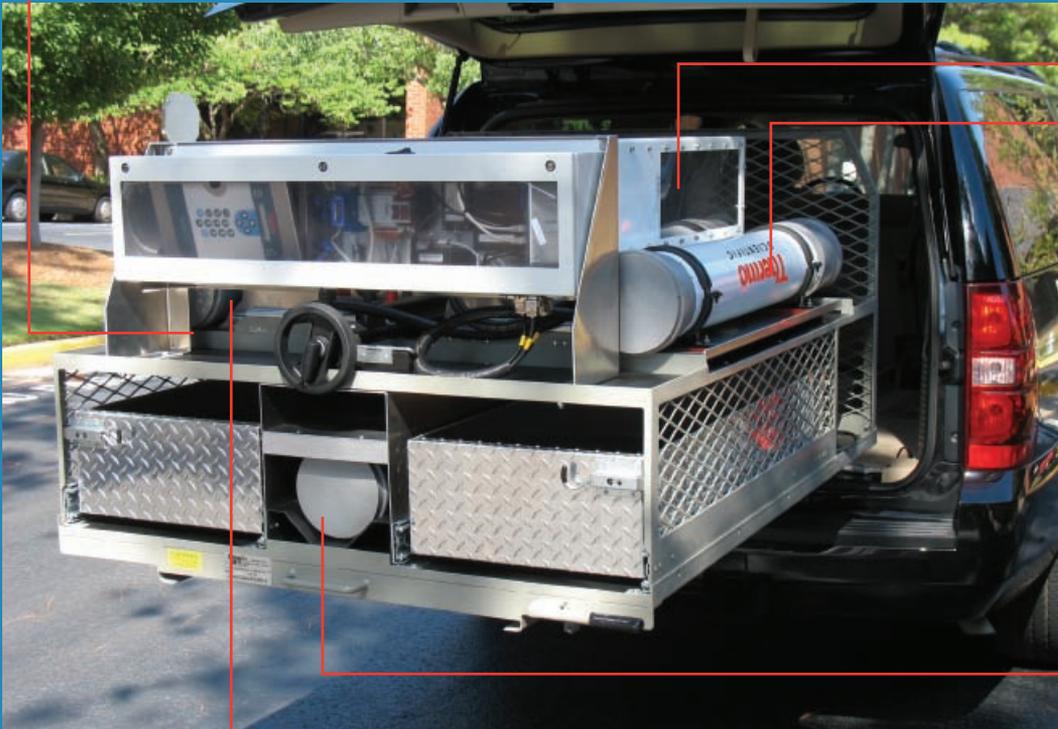


ViewPoint Enterprise / Survey Running on Laptop in Cabin



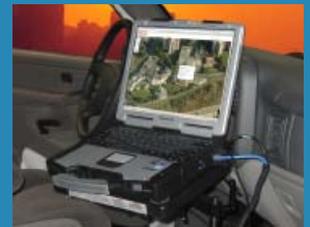
ARIS Mobile Detection System Mounted in SUV with Command Center RadReachBack

Left 7-liter NBR gamma probe



Right ARIS detector

Right 7-liter NBR gamma probe



Rugged laptop PC running ViewPoint Survey Client

Neutron Probe

Matrix MCU Electronics and controller

Matrix Mobile ARIS Detection System Mounted in Sport Utility Vehicle

Conclusion

Thermo Fisher Scientific is dedicated to providing top quality and efficient designs to serve the radiation detection community. With our extensive knowledge of radiation detection, hardware engineering, and systems integration, we work hard to maintain strong and growing partnerships in the radiation detection field. We offer reliable, flexible, and cost-effective solutions that anticipate the expanding future of emergency response applications.

RM&SI Business Headquarters
27 Forge Parkway
Franklin, MA 02038 USA
t 800-274-4212
f 508-520-2815

Roswell Office
200 Hembree Park Dr., Ste. R
Roswell, GA 30076 USA
t 770-521-4500
f 770-521-4535

Beenham Office
Bath Road Beenham Reading,
Berkshire RG7 5PR, UK
t +44 (0) 118 9712121
f +44 (0) 118 9712835

Singapore Office
11 Biopolis Way #12-07/08
Helios Building
Singapore 138662
t +011 65 68729724
f +011 65 64789505

Oakwood Office
One Thermo Fisher Way
Oakwood Village, OH 44146 USA
t 800-274-4212
f 508-520-2815

Erlangen Office
Frauenauracher Strasse 96
Erlangen 91056 Germany
t +49 9131 909-0
f +49 9131 909-205

Beijing Office
7th Floor, Tower West, Yonghe Plaza
No. 28 Andingem East Street
Beijing, 100007 China
t +86 10 8419 3588
f +86 10 8419 3581

www.thermo.com/solutions