

ORTEC[®]

Detective-MRVS

Mobile Radiation Verification System



Radiation Detection/Isotope Identification/Source
Detection and Location/GPS Mapping/Networking

AMETEK[®]
ADVANCED MEASUREMENT TECHNOLOGY

Detective-MRVS

The Detective-MRVS Mobile Radiation Verification System provides long range stand-off detection and/or perimeter protection against radiological hazards. Mounted on a vehicle or boat, the system detects hidden threats in containers, buildings, vehicles, or in vessels approaching a harbor. The Detective-MRVS can detect the presence of these materials, direct the user to the source of gamma radiation, and then quickly analyze and identify the types of isotopes present. This technology is suitable for military marine interceptors, police vehicles or vessels, emergency first responders, and private vehicles or vessels deployed in security support of industry. The Detective-MRVS system has evolved into a single case rapid deployment module that can be installed in a vehicle, vessel or applied as a rapid deployment device.



The Detective-MRVS Features:

- Long Range Radiation Detection
- Gamma Radiation Direction Finder
- Modular Gamma/Neutron Sensors
- Integrated GPS and Compass for Mapping and Position Locating
- Isotope Identification
- Time Series raw counts graphical display
- Event Archive
- Easy-to-use Graphical User Interface
- Wireless Network Option

Long Range Radiation Detection

The Detective-MRVS utilizes detector units with large surface area and high efficiency to provide exceptional long distance detection capabilities.

Gamma Radiation Directional Finder

Using specialized detector positioning, the Detective-MRVS provides a precise estimation of the direction of the gamma radiation source.

Isotope Identification

The Detective-MRVS utilizes the advanced Radiation Threat Identification System (RTIS) identification algorithms for determining the specific threat(s) present.

Neutron Detection

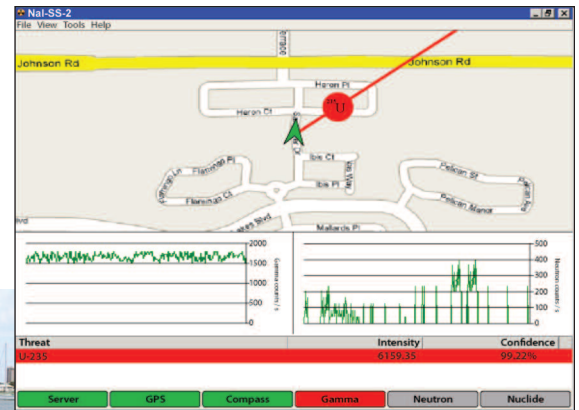
The critical issue of diminishing helium-3 resources has been solved with a proprietary neutron detector technology based on lithium-6 that provides superior neutron detection.

Event Archive

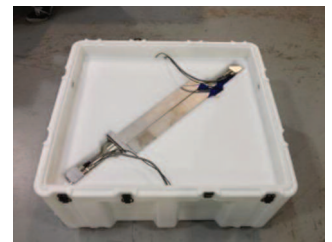
Provides local data archive for post analysis forensics.

Reach Back to Operations

Supports wireless network transport technologies for exporting collected data to the designated center of operations.



⁶LiF Neutron 360[®]



Two Layers of Gamma Radiation Directional Finder



Detective-MRVS

Easy-to-use Graphical User Interface

Graphically displays your location, a vector in the direction of any detected sources, and details about identified materials.

Position Mapping

User interface displays a map derived from GPS data, overlaying a vector in the source direction.

Source Triangulation

Multiple Detective-MRVS stations can communicate with an operations center to triangulate the location of the threat and display its position and GPS coordinates on the screen.

Radiation Direction Finder Dome (RDF)

The Radiation Directional Finder (RDF) provides gamma radiation detection, isotope identification, and source direction location. The RDF dome houses the gamma detectors, a Sensor Electronics Module (SEM), and a compass module.

The Directional finder is comprised of two gamma detectors that have been "sandwiched" together. Two of these sandwiched detector sets are then fitted together at a 90 degree angle to each other to form a single gamma radiation direction finder.

Proven Technology – Early Design

The Detective-MRVS is based on the proven Radiation Threat Identification System (RTIS), which has been designated as a Qualified Anti-Terrorist Technology (QATT) by the United States Department of Homeland Security. This technology has been verified at multiple national government laboratories.

Rapid Deployment Portable Modules

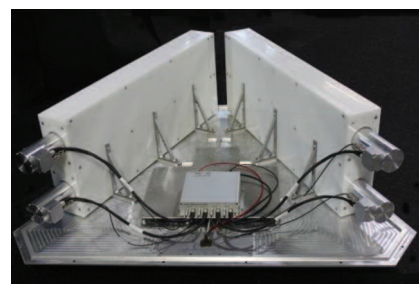
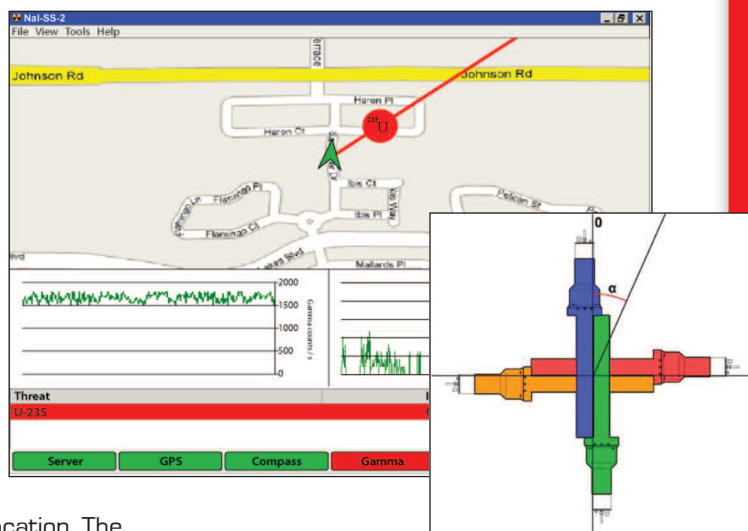
Supplementary radiation detection and identification stations (with an optional RDF dome) can be mounted on a truck bed or boat deck or else hidden in an SUV cargo area or ship's cabin. In addition, rapid deployment modules can be deployed independently in a "Drop-and-Go" fashion, as independent detection/identification stations wirelessly reporting to other Detective-MRVS units on the network with radiation information.

High Power Neutron Detector Module

The High Power Neutron module contains two 40x11x5 moderated enclosures, each containing two patented Li-6 based neutron detectors, which are configured at an angle to maximize coverage as the vehicle travels.

Marine Configuration

When deployed in a marine vessel, the Detective-MRVS system identifying radiological and fissile materials on a slow moving or stopped vessel, container, package, or cargo located in a port, a waterway, or on the high seas. The Detective-MRVS-marine user interface replaces the GPS road map with marine charts and graphically displays your location, a vector in the direction of any detected sources, and details about identified materials.



Detective-MRVS

Specifications

Large Radiation Direction Finder (RDF)	
Contents	Four gamma detectors, Sensor Electronics Module (SEM), Compass, GPS
Weight	100 lbs.
Gamma Detectors	2x4x16 in. (active area), NaI
Gamma Sensitivity	Detects 130 kbq of ¹³⁷ Cs at 2 m in normal background <25 µR/hr
Neutron Detector	
Contents	Two HDPE-moderated neutron detector modules, two neutron detectors each, one Sensor Electronics Module (SEM)
Weight	22 lbs.
Neutron Detectors	4x16 in. (active area) ⁶ Li-based scintillator
Neutron Sensitivity	≤2.5 neutron counts per second based on a neutron source activity of 2.1 kn/s with gamma sensitivity of 10 ⁻⁷ in a 20 mR/h gamma field
Rapid Deployment Housing	
External Dimensions	40x30x24 in. (LxWxD), not including dome
Overall System Weight	175 lbs., including detector modules
System	
GPS	12 channel parallel with WAAS
Built in Audible Alarm	Notebook annunciation
Environmental	-40 to +50°C; 0-100% humidity, may be used in wet environments (not submersible)
Power	12 V DC, or AC with converter. Battery backup system optional.
Server	Pentium V class notebook running Windows 7, Vista or XP (Toughbook standard)
Detectable Isotopes - Library additions available	
NORMs	⁴⁰ K, ²³² Th, ²³⁸ U
Medical Radionuclides	⁶⁷ Ga, ^{99m} Tc, ¹³¹ I, ²⁰¹ Tl
Industrial Radionuclides	⁵⁷ Co, ⁶⁰ Co, ¹³³ Ba, ¹³⁷ Cs, ¹⁹² Ir, ²²⁶ Ra, ²⁰⁴ Tl, ²⁴¹ Am
Special Nuclear Materials	²³³ U, ²³⁵ U, ²³⁷ Np, RGPu, WGPu

Ordering Information

DETECTIVE-MRVS-RDF	Detective-MRVS Dome System configured on a rugged rooftop support frame. Includes gamma detection, neutron detection, MRVS, portable computer, external GPS, and mounting hardware.
DETECTIVE-MRVS-RRDF	Detective-MRVS Dome System configured on a transportable, rugged support frame. Includes gamma detection, neutron detection, MRVS, portable computer, external GPS, and mounting hardware.
DETECTIVE-MRVS-RDPM	Detective-MRVS System installed in a single weather tight, transportable, rugged plastic enclosure. Includes gamma detection, neutron detection, MRVS, portable computer, external GPS, and mounting hardware.

Specifications subject to change
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