System Specifications

The MDS-L+ system comes standard with the detector box, with MAPTRACK installation disk and 2 license(s), Detector to Notebook cable and Detector charger(both AC and DC). Options available for the standard MDS-L+ system include extra licenses for MAPTRACK software for simultaneous mission transmission or fleet management and a large neutron detector. All models also function with any standard probe from the FH40G series of digital survey meters. The fully approved and tested military model, MDS-MIL, complete with Mil-Geo maps is also available and carries a NATO stock number.

Detection

Scintillation Detector
- 5 liter volume
- 1 nSv/h to 20 µSv/h (0.1 µR/h - mR/h) measurement range
- 50 keV energy threshold
- 20,000 cps/µSv/h to ^{137}Cs sensitivity
- Able to detect 2 µSv/h (0.2 µR/h) increase above background (See scintillator performance specifications)

Proportional Detector
- 10 nSv/h to 1 Sv/h (1µR/ to 10 R/h) measurement range
- 36 keV to 1.3 MeV energy response

Neutron Detector (optional)
- Model FHT 752E, He^3 detector filled to 10 atmospheres
- 10 cps/µS/h for ^{252}Cf sensitivity

Maximum Detectors Channels
- 2 gamma or 1 gamma & 1 neutron

GPS
- 6 channel

Built-in Audible Alarm
- Notebook annunciation

Detector Package
Size
- 40 x 60 x 35 cm (15.7" x 23.6" x 13.8")

Weight
- 15.0 kg (33.1 lb)

Carry Case
- Zargus military grade, NATO approved

Operating Temperature
- 0 to 50 °C (32 to 122 °F)

Humidity
- 5 - 95 % Non-condensing

Power
- 12 VDC, 8 hours on supplied battery (detector package only)

Notebook
- Pentium III class running Windows™ 2000 or XP

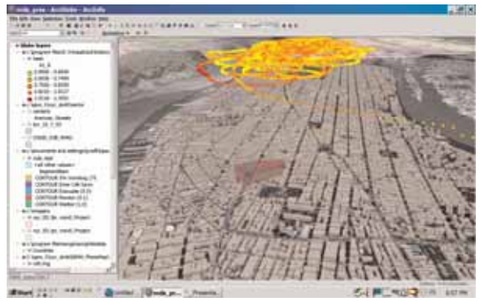
Scintillator Detector Performance Specifications

Ability to detect ^{137}Cs

Speed	Altitude	Source Strength
120 km/h	650 m	1 Ci
160 km/h	120 m	100 mCi
120 km/h	100 m	10 mCi

Options
- Optional Notebook PC

MDS with integrated ArcView/ArcGIS:



The MAPTRACK software, included with the MDS, provides a real-time data feed into any standard version of ESRI 's ArcView/ ArcGIS software (ArcView 3.3, ArcGIS versions 8 and 9). MAPTRACK and any version of ArcView can be used separately or simultaneously. Custom applications, using ArcEngine, are also available upon special request. Because Thermo Fisher Scientific is an ESRI Business Partner, we can guarantee the state-of-the-art, highest standard in all our ESRI GIS integrated products.

Using the MDS with ArcView/ ArcGIS allows the user full GIS capabilities:
- Ability to search, locate, and measure hidden sources of radiation in real-time
- Display radiological data overlaid on top of street maps and/or satellite imagery
- Simultaneously log information with time, data, and GPS stamp in tabular format.
- Compatibility with standard hazard response tools such as HPAC, CAMEO, and ALOHA , allowing the user to create hazard models in ArcView or import them into ArcView and instantaneously confirm or deny the hazard model, while surveying/searching an area
- Rapidly create response plans on scene, with real time data feeds to allow changes as they are needed

MDS Use in Helicopters

Literature Code LITMDS 0407

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Mobile Detection System (MDS)

MDS
MAPTRACK Mapping Software
Integrated ArcView/ ArcGIS

Mobile Detection System (MDS)

Introduction

In our present day world, rogue nuclear materials pose a threat to the safety and health of our communities. When purposefully cloaked under the veil of secrecy by terrorists, these materials may threaten society as we know it today.

In response to this ever present and clear danger, Thermo Fisher Scientific has designed a rugged, lightweight, modular radiation detection system that can easily be deployed in any type of moving vehicle to search for unusual or abnormal radioactivity. It can also be used to survey large contaminated areas, by air, to discover localized hot spots and map the event.

Thermo's Mobile Detection System (MDS) is comprised of a large volume, highly sensitive organic plastic scintillator detector, coupled to a global positioning based movable mapping system, that automatically tracks both the position and corresponding radiation measurement of the local background as the vehicle performs its mission. The data are stored to a .dbf file which can be easily exported to other programs or viewed later from the exclusive MAPTRACK PC program. MAPTRACK is a standalone software program that can load any type of standard commercial or military maps.

Due to its rugged modular construction, ease-of-use and relative light weight, the MDS is an ideal search and discovery tool that may be utilized by nearly anyone with very little training. Real-time data feeds into any version of ArcView GIS and allows a GIS analyst the option to use full GIS capabilities during the mission or later for analysis. Initiating the PC program on a notebook PC and activating the detector power switch are all that is required to get the system up and running. No hard wiring into the vehicle is necessary. The system contains a battery providing 8 hours of continuous use when fully charged, so it does not require external power from the vehicle. External power capability is present with both AC and DC adapters.

The MDS has been designed for civilian and military responders. It is the mobile detection solution for those who need fast, dependable threat assessment for tactical operations involving radiation, as well as proactive surveillance measures for searching out and locating stolen/lost radiation sources. The system is optimized to function as a reconnaissance system which will discover possible RDD components by air or ground. A clear evidentiary trail is provided by the .dbf file which logs time, date, GPS information and all four channels of radiation information.

The MDS has been successfully tested and adopted by the German military for use on their FOX reconnaissance vehicles. It currently has a NATO stock number and has passed military standards tests. The MDS has also successfully been deployed in helicopters, emergency vehicles and by secret service agencies. It is currently in use in governmental agencies and large metropolitan areas within the US.

The Thermo Fisher Scientific patented Natural Background Rejection (NBR) technology enables the detection system to accurately discriminate between naturally occurring radioactivity and nuclear materials of real concern. Allowing the user enhanced sensitivity and minimizing false alarms.

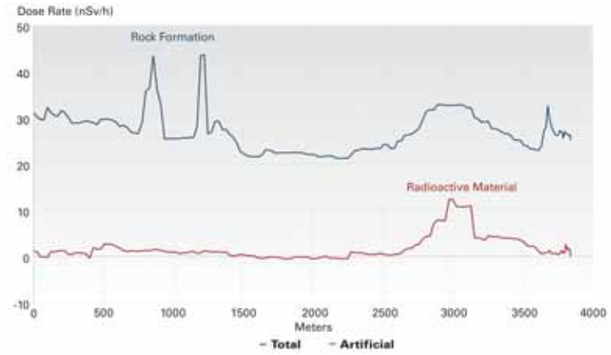
Experience That Counts

The Radiation Measurement & Security business is dedicated to providing optimum solutions for Homeland Security and First Responder applications. Our company has a 5 decade history of safeguarding governments and private industry alike. Our leadership position has been justifiably earned through the dedicated efforts of our staff of scientists, engineers and quality-oriented manufacturing personnel who have strived to provide systems offering the highest possible degree of reliability and safety.

The Right Technology- NBR

Detecting nuclear materials requires more than just dedication and hard work; it also requires the right technology. Thermo Fisher Scientific invented the well-known Natural Background Rejection (NBR) technology to address the complexity of searching for nuclear materials amidst varying background conditions. These background conditions are commonly encountered when monitoring moving vehicles and in challenging field conditions.

NBR technology creates reliable and real-time radiological threat assessment in a GO/ NO GO format which is user-friendly for both Hazmat and non-specialized response teams. NBR technology does not require special shielding to prevent damage from wide temperature ranges, vibrational shock or cosmic rays, unlike other detection technologies. Payload problems are non-existent and elaborate training is never an issue. NBR is field-ready, proven successful and easily deployable. NBR technology is currently in use in over 800 locations worldwide and continues to set industry standards for reliable threat detection.



The NBR technology utilizes an ingenious methodology to differentiate between nuclides of concern and any NORM conditions. These naturally occurring radioactive materials (NORM) or fluctuating background conditions that otherwise cause interference and loss of sensitivity.

While the NBR technology leads to less confusion within the system when sorting out a real source from naturally induced interferences, its true benefit is the lower alarm threshold it can achieve. This threshold can be reached while simultaneously not jeopardizing the false positives.

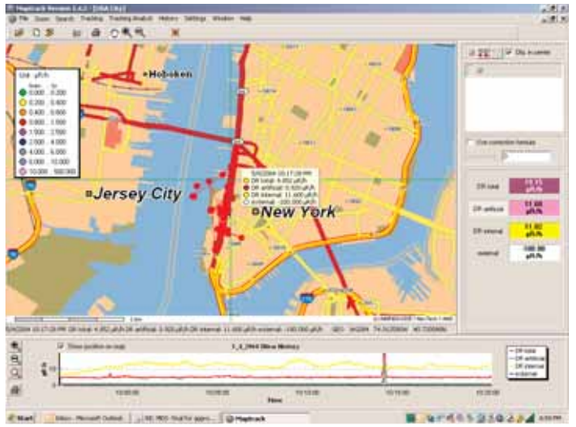
Simply put, NBR results in enhanced sensitivity and fewer alarms from non-threatening events. This translates into better personal protection, fewer interruptions and costly delays.

The graph depicts two simultaneous signals, both from an identical gamma-sensitive detector. The upper (blue) line represents the normal "gross" count channel as produced from a normal system using standard counting technologies. The lower (red) signal is generated by the NBR technology driven channel which ignores natural background influences.

As clearly illustrated, the upper gross counting channel is easily fooled by the high count rates exhibited by common rock material. The overall count rate increases but gives no indication to whether there is a corresponding threat associated with this elevated reading. The lower, NBR channel, remains undisturbed by these naturally occurring variations in background radiation, while still clearly and sharply detecting "artificial" or man-made radioactive materials sources intended to induce an alarm.

The NBR technology is a successful technique that has proven itself in many parts of the world. Features such as enhanced sensitivity, lowered innocent alarms and the ability to distinguish a truly threatening alarm from normal background fluctuations due to naturally occurring materials are what sets the NBR technology apart from the competition.

MDS Data in Maptrack



The exclusive MAPTRACK program is a global positioning based movable mapping system that automatically records radiation measurement data along the path of travel. It utilizes a 6 channel Global Positioning System (GPS) to closely track the exact coordinates. The MDS is sold with a GPS antenna. But MAPTRACK can accommodate any type of GPS if a particular type of GPS system is required.

MAPTRACK is a Windows™ PC compatible software program that can load any type of military or civilian map of the standard WGS84 projection. Maps are not included as part of the standard MDS package. Upon request, MAPTRACK may be adapted to work with the accepted or official mapping program in use by particular agencies. Specific maps can also be added to the system before purchase.

Several viewing windows are presented on the screen to facilitate the user defined interface. The upper window presents the map with the track of the vehicle displayed. Any of four channels of radiation measurements can be instantly displayed on the map by selecting the desired channel. The mapping scale is user-selectable offering a wide viewing range. Each window is also scalable so that the user can see any or all of the windows at one time.

The right window pane shows the measured values of each of the channels of radiation information (total doserate from the scintillator, the artificial component of gamma radiation, the dose rate from a second detector in the system, and a measurement from a fourth external probe that can be any of the standard or special order probes that work with our FH40G series meter). The lower window displays a real-time graph of the dose rate versus time, so that any fluctuations in readings can easily be seen in relative scale to one another. In the after-action, analysis phase of a mission, this x-t diagram can be used to locate events, by using the "show position on map" feature, which centers the cross hairs of the map at the exact location where a given measurement was taken. This makes it possible to easily locate an area of interest if it was not noticed by the user during the mission.