kromek®
detect image identify

D3M™

The ultra-low false alarm rate personal radiation detector

A high-performance combined gamma-neutron, Personal Radiation Detector that protects against the (accidental) exposure to nuclear materials.

Field proven design, the handheld D3M is easy to navigate and simple to understand and provides confirmation of exposure to threats.

D3M combined gamma-neutron Personal Radiation Detector (PRD) with superior sensitivity

Discrete, lightweight and wearable the D3M continually scans for threats while you get on with the job in hand

Applications

D3M – the go-to detection solution for nuclear industry professionals

- *Law Enforcement*
- *Fire Departments*
- *Customs and Border Patrol*
- *Military and civil defence*
- *Public security and event monitoring*
- *Nuclear industry*

The D3M is a combined gamma-neutron Personal Radiation Detector (PRD) with superior sensitivity. It continuously scans and monitors the environment for radiological threats and alerts the user when it detects a gamma and/or neutron radioactive source.

This rapid-response handheld PRD display screen shows:

- dose rate
- accumulated dose
- dose alarm
- gamma alarm
- neutron count
- neutron alarm

Better Detection

The D3M is a powerful combination of two of Kromek's award-winning leading technologies; the non-^{3}He compact thermal neutron detector and its world leading gamma detector.

Its superior detection capability is due to its large detector volume – I inch^{3} CsI(Tl) gamma detector. The D3M offers superior sensitivity at 500 cps/(µSv/h) for Cs-137 and has a maximum dose rate of 1 Sv/h @ 662keV.

The large detector volume together with the higher sensitivity means that it is better able to detect threats faster than standard PRDs and with minimal false alarms.

Ultra-Low False Alarm Rate

The D3M also comes with an industry-leading ultra-low false alarm rate; more than six times better than the ANSI standard which means less time wasted with nuisance false alarms that can occur with some basic PRDs. It also means the operator is more able to trust the information the device is giving them because when you get an alert it is more likely to be the real thing.

When there is an alarm, the D3M alerts the user via a combination of audible, visible and vibration alarms.

Detect Shielded Threats

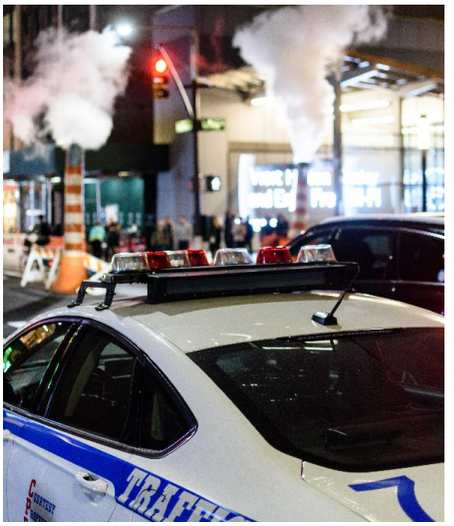
The powerful neutron detector improves the detection of shielded fissile or special nuclear materials (SNM).

Dose Data Analysis

The D3M can be connected to a computer via USB or Bluetooth for data extraction using Kromek's CIRIS software. An SD card within the D3M detector can store over 100,000 spectral data files. The data can also be used for dose reconstruction, showing dose over time and accumulated dose.

Field Proven Technology

The D3M developed from DARPA's (Defense Advanced Research Projects Agency) SIGMA Program as an extension of the D3S radiation detection device which has over 10,000 detectors currently deployed globally.



Networkable

The D3M is also compatible with DARPA's SIGMA Network when paired with a specialised app on an Android phone. Using SIGMA's web-based user interface, multiple units can be easily tracked displaying any threats in real-time in multiple locations on a map of a specific area from a remote and centralised location by trained experts in radionuclide identification.

Accessories

Ruggedized event cases provide more than just storage and protection for the D3M and charger units, they also enables rapid deployment.

Charging stations simplify the electrical power logistics of charging a fleet of devices from a control point.

Automated detection and ID with web-based command and control system

Standalone charger stations are available for operating from a central control point

Ruggedized go anywhere event case that enables rapid deployment

Americium-241*	Fluorine-18**	Neptunium-237	Strontium-90***
Antimony-124	Gallium-67*	Palladium-109	Technetium-99m*
Barium-133*	Gold-198	Plutonium-239*	Thallium-201*
Bromine-82	Indium-111	Plutonium, reactor grade in various shielding*	Thorium-232*
Caesium-134	Iodine-123	Plutonium, weapons grade in various shielding*	Tin-113
Caesium-137 in various shielding*	Iodine-131*	Potassium-40*	Uranium-235*
Californium-252****	Iridium-192 in various shielding*	Radium-226*	Uranium-238*
Chromium-51	Lutetium-177	Scandium-46	Uranium, depleted in various shielding*
Cobalt-57*	Lutetium-177m	Selenium-75	Uranium, highly enriched in various shielding*
Cobalt-60 in various shielding*	Manganese-54	Sodium-22	Yttrium-88
Europium-152	Molybdenum-99		

Notes:

**Mandatory radionuclides as defined in ANSI N42.34*

***Beta+ emitting radionuclide*

****Beta- emitting radionuclide*

*****Neutron emitting radionuclide*

Detector specification

Detector type	Gamma and Neutron detection
Gamma detector material	CsI(Tl)
Gamma detector volume	1 in^3 (16 cm^3)
Gamma energy range	30 keV to 3 MeV
Gamma sensitivity for Cs137	5 cps/µR/h (500 cps/µSv/h) Photo peak 1.2 cps/µR/h (120 cps/µSv/h)
Maximum throughput for gamma channel	30,000 cps
Dose rate	2.0 mR/h (20 µSv/h) at 662 keV (spectroscopic) 100 R/h (1 Sv/h) at 662 keV with high dose module
High dose sensor	Yes, Photodiode
Neutron detector material	Non-^{3}He
Neutron detector	9 cps in a 1 neutron per cm^2 field
Neutron detector gamma rejection	Better than 10^{-7}, meets ANSI N42.34 section 6.7
Maximum throughput for neutron channel	10,000 cps
False alarm rate	1 in 24 hours
Communications	Micro USB, Bluetooth®
Operational battery life	24 hours, increased to 36 hours with replaceable battery pack option
Operational temperature range	–20°C to 50°C, meets ANSI N42.32 section 7.1, 7.2, 7.5
Device size (excluding phone)	4.8” x 3.1” x 0.9” (122mm x 80mm x 23mm)
Device volume (excluding phone)	224 cm^3
Humidity	Up to 93% RH ANSI N42.32 section 7.3
Moisture/dust protection	IP65 as per ANSI N42.32 section 7.4
Weight	0.57 lbs (261 g)
Battery	1450mAh Lithium polymer
Screen Information	Monochrome 128x64 OLED Display
Charging	Charging via USB or inductive charging
Device status indicator	External LED
Geospatial positioning	GPS provided by smartphone when installed with suitable app, such as the SIGMA LE app.
Alarm sounder	Yes, ANSI N42.32 section
Alarm vibration	Yes, ANSI N42.32 section

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