

D5 RIID

The World's Smallest
and Lightest RIID with
the Ultimate Detection
Performance



D5 RIID

The D5 RIID offers world-leading, high-performance radioisotope identification capability in a detector which is small and lightweight enough to operate with one hand.

Its ergonomic and ruggedized design make it the ultimate device for nuclear security and military applications.



D5 RIID

- Instant identification of isotopes
- High sensitivity
- Isotope ID of distant sources 50x better than ANSI standard
- Ultra-low false alarm rate
- High accuracy dose rate measurement
- Greater than 24 hours battery life
- Easy to use < 10 minutes training
- Seamless integration into customer networks
- Ruggedized for use in the harshest environments

BORDER AND HOMELAND SECURITY

The D5 RIID's small size and weight along with high sensitivity make it ideal for prolonged one-handed security screening operations, as well as discreet monitoring within airports and other critical infrastructures.

The accurate isotope ID performance enables efficient adjudication of radiation alarms, to help minimise disruption while giving reliable information for operational decision making.

The stored files can be easily sent to third party experts for Reachback and adjudication.

MILITARY

As the smallest and lightest all-in-one RIID, the D5 RIID is designed to be used on extended adjudication missions.

The detector resolution and advanced algorithm enables rapid identification of potential radioactive threats.

This allows accurate in-field adjudication of Special Nuclear Materials (SNM), even when heavily masked during tactical response missions.



A photograph of an industrial facility, likely a refinery or chemical plant, featuring large, complex piping systems with various valves and flanges. The scene is dimly lit with a blueish tint, emphasizing the metallic structures and the intricate network of pipes.

INDUSTRIAL

The D5 RIID is also ideal for expert users with responsibility for responding to radiation incidents and making informed decisions. The isotope ID accuracy, as well as the high spectral quality enables accurate isotope identification and classification even in mixed source environments.

Identifying Sources from Further Away

The D5 RIID has unparalleled performance when detecting and identifying isotopes at very low dose levels, meaning that radioactivity will never be missed. Identification of distant sources is 50 times better than the default global standard of performance criteria for these hand-held instruments: ANSI N42.34. This means measurements can be carried out faster, from further away and operator safety is ensured, as they are at a lower risk of higher dose rates.

Resolution

The D5 RIID is a medium resolution (3.5%) device, which ensures higher quality Reachback spectral data when compared with low resolution devices. Any spectral peaks are more clearly defined, thereby allowing for simpler, quicker, and more accurate decision making at the times when it is most needed.

The World's Smallest and Lightest RIID

The D5 RIID is only 660g, compared with legacy instruments often weighing more than 2kg. Measuring 187 x 80 x 70mm, the D5 RIID is light and unobtrusive enough to be both belt and body worn. It is also ideal for prolonged one-handed operation and is easily usable by someone wearing full PPE.



SENSOR NETWORKING

The D5 RIID can interface with or be integrated into existing systems, including smartphones, to enable Reachback capability. Spectral results with enhanced resolution obtained in the field can be transmitted immediately to an offsite laboratory for secondary adjudication.

The D5 RIID can also link to a network of hubs and sensors to give a real-time overview of a radiological threat. Critically, the connectivity and sensitivity of the D5 RIID allows the building of customised national or local systems using the same sensor.

Ruggedized for Use in the Harshest Environments

The D5 RIID is ruggedized to withstand harsh and challenging environments. It has an operational range of -20°C to +50°C and functions regardless of humidity, temperature shock, being dropped or submerged in water.

Battery Life

As missions get longer, the endurance of portable RIIDs is critical. The D5 RIID's enhanced battery life – in excess of 24 hours – is achieved via a dual system. The device combines an internal rechargeable battery with a set of replaceable AA-sized batteries allowing for speed in field replacement, without the need for any additional tools and while wearing PPE. Either option can be used in isolation, or the two systems can be used in unison, giving longer battery life without the need for an additional battery pack.

Low False Alarm Rate

While constantly scanning for threats and maintaining a high level of sensitivity, a low false alarm rate is essential. With a false alarm rate of just one in 24 hours, the D5 RIID consistently delivers accurate information without excess nuisance alarms.

D5 RIID Functions:

- Real time, instant isotope identification in Search Mode
- Ability to collect spectral data over a longer user-defined period in Confirmation Mode
- Save and view ANSI N42.42 files
- Extract ANSI N42.42 files for viewing on spectral software
- Send files directly from the field using either Kromek’s own file extraction tool or transfer directly to a PC or laptop
- Pinpoint the location of a source using the dynamic localisation mode

Sensitivity and Accuracy

The D5 RIID combines small form factor with powerful radiometric performance, greatly exceeding the performance of a 2” x 2” sodium iodide scintillator, which is the largest size conventional scintillator. With enhanced sensitivity and a medium resolution of 3.5%, the D5 RIID has an area efficiency which is 62% higher when compared with the conventional RIID. The high sensitivity of the device means that any source can be accurately detected, even very low activity sources.

An extensive built-in isotope library enables the D5 RIID to detect and identify mixed, shielded or heavily masked isotope configurations and confirm radionuclide identification across naturally occurring radioactive materials (NORM), industrial, medical, and special nuclear materials. It meets both ANSI N42.34 and the more demanding US Department of Homeland Security Domestic Nuclear Detection Office (DNDO) technical capability standards.

Isotope library far exceeds ANSI N42.34 and the more stringent DNDO TCS standard

Isotope	ANSI N42.34	DNDO TCS	D5 RIID	Category
Americium-241	✓	✓	✓	Industrial
Barium-133	✓	-	✓	Industrial
Caesium-137	✓	✓	✓	Industrial
Cobalt-57	✓	-	✓	Industrial
Cobalt-60	✓	✓	✓	Industrial
Europium-152	-	-	✓	Industrial
Fluorine-18	-	-	✓	Medical
Gallium-67	✓	✓	✓	Medical
Iodine-123	-	-	✓	Medical
Iodine-131	✓	✓	✓	Medical
Iridium-192	✓	✓	✓	Industrial
Lutetium-177	-	-	✓	Medical
Lutetium-177m	-	-	✓	Medical
Molybdenum-99	-	✓	✓	Medical
Neptunium-237	-	✓	✓	SNM
Plutonium-239	✓	✓	✓	SNM
Plutonium, reactor grade in various shielding	✓	✓	✓	SNM
Plutonium, weapons grade in various shielding	✓	✓	✓	SNM
Potassium-40	✓	-	✓	Norm
Radium-226	✓	✓	✓	Norm
Sodium-22	-	-	✓	Industrial
Technetium-99m	✓	✓	✓	Medical
Thallium-201	✓	✓	✓	Medical
Thorium-232	✓	✓	✓	Norm
Uranium-235	✓	✓	✓	SNM
Uranium-238	✓	✓	✓	SNM
Uranium, depleted in various shielding	✓	✓	✓	SNM
Uranium, highly enriched in various shielding	✓	✓	✓	SNM

Isotope ID performance excels for mixed, shielded and heavily masked cases

Detect Information from Gamma, Neutron, Alpha, and Beta Sources with One Device

Connection of the Kromek Alpha Beta Probe adds alpha and beta detection capability to the already powerful D5 RIID gamma and neutron performance. Simply connect the separate probe to the D5 RIID and instantly see alpha and beta readings.

Ergonomically designed to fit effortlessly into the palm of a hand, the Alpha Beta Probe can easily scan for alpha and beta particles. With the removeable standoff, the Alpha Beta Probe is protected from contamination during scanning.

D5 RIID Alpha Beta Modes:

- Search Mode: View all gamma, neutron, alpha and beta information in real time.
- Timer Mode: Determine the alpha and beta counts in a determined time period and compare the displayed value against the set threshold.

The D5 RIID's alpha and beta capability provides the option to view data as total counts or as net counts, thereby giving flexibility to account for background measurements.





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