

RayMon[®]

Rapid in-the-field spectral analysis with the RayMon high-performance handheld spectrometer and its set of interchangeable probes



RayMon

Your complete kit for detecting and analysing radionuclides in the field



Cover all bases with Kromek's high-performance RayMon handheld spectrometer and interchangeable probes: CZT, NaI and Alpha Beta.



Portable ■ Easy to Deploy ■ Simple to use

Highly portable and lightweight, the RayMon brings previously expensive and lengthy, lab-based spectral analysis into the field. With its easy-to-use interface, experts and less-experienced users alike can collect and analyse the results they need in situ with speed and precision .



Applications include:

- Health physics ■ Nuclear installation monitoring ■ Nuclear accident response
- Security screening undertaken by customs, police, fire and rescue services
- Military ■ Decommissioning ■ Site surveys ■ Civil Defence ■ Customs
- First responders ■ Homeland Security ■ Identification of orphan sources
- Treaty and non-proliferation compliance ■ Nuclear research
- Combatting illegal radioactive traffic

RayMon

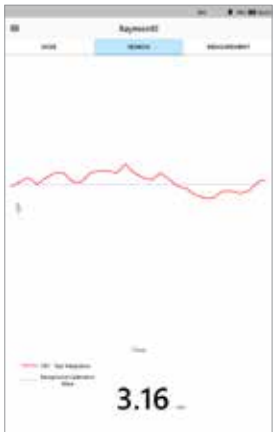
Highly portable and lightweight, the RayMon brings previously expensive and lengthy, lab-based spectral analysis into the field. With its easy-to-use interface, experts and less-experienced users alike can collect and analyse the results they need in situ with speed and precision.

Measurements

The RayMon’s preinstalled software contains a library of 94 radionuclides, allowing advanced Gamma analysis and radioisotope classification for a wide range of sources. Custom radionuclides can also be added to the RayMon’s library.

Key information such as counts per second can be viewed quickly on the Dose Screen in real-time. either numerically or visually as a gauge.

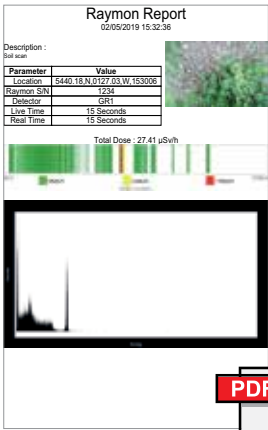
In Search Mode, clear visual graphs indicate when count rate is on the rise, directing the user to the location of the source.



Exporting Data and Sharing Reports

All reports and data files on the RayMon can either be exported via USB or shared via email. Everything is in one place; the shared PDF report has all the data files attached to the document.

More detailed analysis is possible by accessing the even broader radionuclide library available within Kromek’s desktop PC gamma spectroscopy software, MultiSpect™ Analysis (MSA). Simply open the exported spectraldata.spe file within the PDF report into MSA.



Key Features:

- Highly portable, compact and ruggedized
- Rapid spectral analysis in situ
- Available with Kromek's high resolution CZT Probe, highly sensitive NaI Probe and Alpha Beta Probe for the ultimate flexibility in in-field operations
- Pre-loaded library of 94 radionuclides for analysis of a wide range of sources, with option to add custom nuclides for specific applications
- Outputs a variety of reports with date/time, probe type, device serial number, photo, GPS positioning, radiation spectra and isotope identification*
- Measurements can be saved as .spe, .n42 and IEC1455 file formats, compatible with Mirion Technology's Genie™ software
- Sources quickly located with Search mode
- Dynamic search and alarm capability
- Dose measurements and count data clearly displayed
- Feature locking with PIN codes
- High-performance spectroscopy presented on a simple-to-use interface, for use by experts and beginners alike

**isotope ID is provided only for the CZT probe and if this setting is turned on*

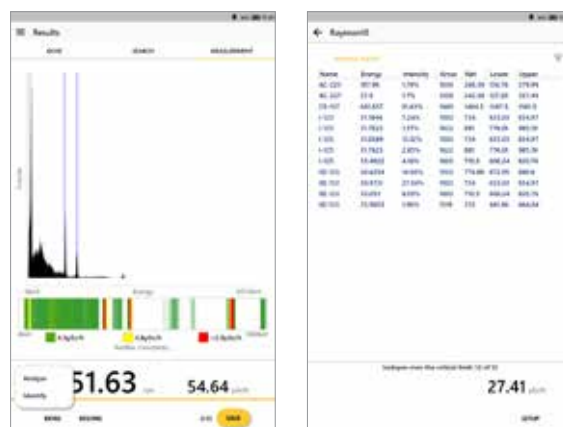


Spectrum analysis for advanced users

The RayMon makes reporting easy, even for beginners and new users.

The device contains a detailed library of the emission lines from 94 radionuclides that can be configured by the user to give focus to the radionuclide(s) of interest.

Spectral peaks can be interpreted with ease, with the emission lines passing a statistical critical limit test clearly highlighted. Emission peak parameters are also calculated and presented on screen as part of the on-device analysis, further quickening the analysis process.



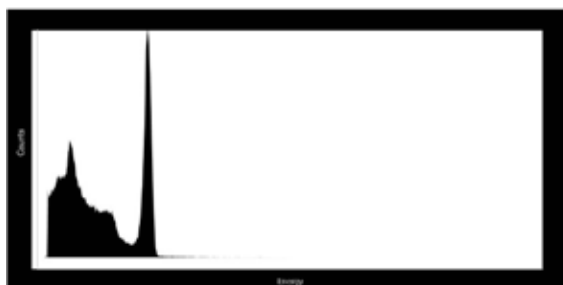
Nal Probe

When you need to collect count data in low dose environments, simply plug Kromek's Nal Probe into the RayMon, and get started. The high sensitivity and efficiency of the 2" x 2" Sodium Iodide (Nal) crystal ensures even the weakest sources can be detected.

The incorporation of silicon photomultiplier technology gives the device it's small form factor and makes the Nal Probe ideal for taking measurements in restrictive areas.

With a resolution of $<7.5\%$ at 662 keV, the Nal Probe produces defined spectral peaks for reliable spectral analysis on the RayMon. Further confidence in the data and analysis is ensured with temperature compensation, ensuring a consistent performance throughout the operable temperature range. The smart probe stores calibration and all other relevant data on the device.

The probe also includes a high dose sensor to ensure measurements continue to be taken when the Nal probe becomes saturated with counts.



The Nal Probe produces defined spectral peaks for reliable spectral analysis on the RayMon





Key Features:

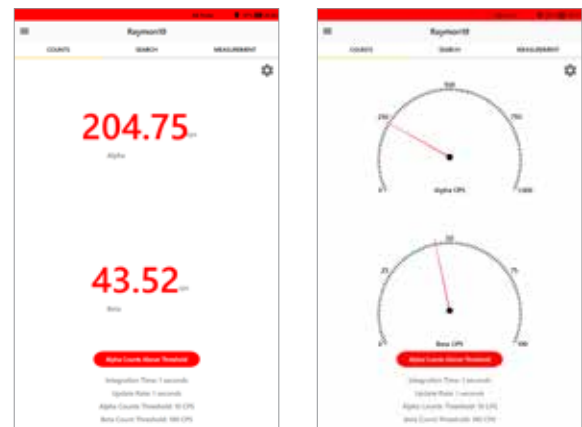
- 2"x2" Sodium Iodide crystal
- Quick large-area data capture
- High sensitivity
- Small form factor for easy data collection in tight spots
- Temperature compensation
- Resolution of <7.5% at 662 keV
- Energy calibrations retained on the probe
- Dose and counts measurements
- Smart Probe: calibration and detector information stored directly on the device
- Spectra data exports compatible with Mirion Technology's Genie™ software for legacy users

Alpha Beta Probe

Use Kromek's Alpha Beta Probe with the RayMon when searching for contamination in a target area and instantly see readings on screen

The compact lightweight build of the probe means the device can be used in one hand, the RayMon in the other, comfortably, for extended amounts of time.

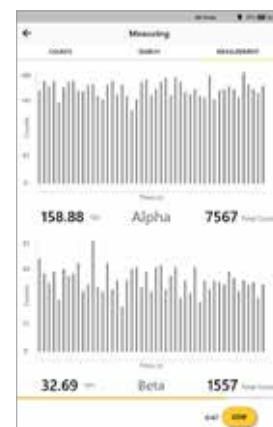
The smart probe is able to store detector and calibration information on the device.



CPS data is clearly displayed on the RayMon screen, either numerically or visually as a gauge, depending on the needs of the user.

Key Features:

- Durable, lightweight and flexible in its application
- Small form factor to easily fit in into any scanning location
- The removeable standoff ensures the detector face is not contaminated during scans
- Versatility in data displayed for application
- Smart Probe: calibration and detector information stored directly on the device



The measurement screen allows the user to view count data for Alpha and Beta radiation as a bar chart meaning changes in count rate can be easily visualised.



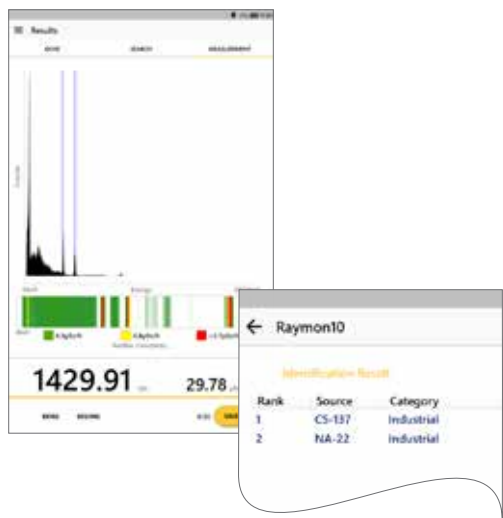
Applications Include:

- Health physics ■ Nuclear accident response
- Decommissioning ■ Site surveys ■ Civil Defence
- Customs ■ First responders ■ Nuclear research
- Identification of orphan sources
- Homeland Security

CZT Probe

Using Kromek’s high resolution CZT Probe with the RayMon is the obvious choice when precise analysis is paramount.

The high resolution of <2.5% at 662 keV of the 1cm³ CZT crystal housed in the probe produces clearly defined spectral peaks for an unambiguous interpretation of radionuclides present, even when faced with mixed or shielded sources. An additional 0.5cm³ CZT option is also available for high activity environments.



Once a spectrum has been recorded, automated radionuclide identification can be performed against a library of commonly encountered radionuclides to ANSI N42.48 standards (see table opposite).

The ID of any unknown radionuclides can be determined from the spectral analysis data produced for that spectrum.

With its small form factor, operation at room temperature without the need for cooling, and direct conversion, Kromek’s CZT Probe is a cost-effective and field-friendly alternative to HPGe detectors.



Unique RadBar™ technology included for spectral dose visualisation, simplifying the process of categorising major dose contributors

Key Features:

- 1cm³ CZT crystal
- Quickly detect, measure and accurately identify Gamma-emitting radionuclides
- High resolution radioactive isotope identification and spectral analysis
- Automated radionuclide ID for ANSI N42.48 *
- Dose and counts measurements
- Unique RadBar™ technology included for spectral dose visualisation, simplifying the process of categorising major dose contributors
- Small form factor for data collection and analysis in difficult to access areas
- Spectral data exports are compatible with Kromek's desktop spectroscopy software, MultiSpect® Analysis
- Spectra data exports compatible with Mirion Technology's Genie™ software for legacy users.

Applications Include:

- Nuclear installation monitoring
- Nuclear accident response
- Decommissioning ■ Site surveys
- Identification of orphan sources
- Nuclear research
- Combatting illegal radioactive traffic

Category	Nuclides Included
Industrial	Co-57 [†] , Co-60 [†] , Ba-133 [†] , Cs-137 [†] , Ir-192 [†] , Tl-204, Ra-226, Am-241 [†] , Cs-134, Cs-134 (M), Eu-152 [†] , Na-22 [†]
Medical	Ga-67 [†] , Cr-51, Se-75, Sr-89, Mo-99, Tc-99m [†] , In-111, I-123 [†] , I-125, I-131 [†] , Sm-153, Tl-201 [†] , Xe-133
NORM	K-40 [†] , Ra-224, Ra-226 [†] , Ac-228, Th-234, Th-228, Th-230, Th-232 [†] , Th-232 ^D , Rn-220, Po-216, Pb-212, Pa-234, Pa-234m, U-234, U-238, U-238 ^D , Rn-218, Rn-222, Bi-210, Bi-212, Bi-214, Po-214, Tl-206, Tl-208, Tl-210, Pb-210, Pb-214, Po-210, Po-218, Hg-206
Special	U-233, U-235 [†] , Np-237, Pu-239 [†] , Pu-240, O-19, Ar-41, Kr-87, Kr-88, Ac-225, Ac-227, At-215, At-217, Bi-211, Bi-213, Bi-215, Fr-221, Fr-223, Pa-231, Pa-233, Pb-211, Po-211, Po-213, Po-215, Ra-223, Rn-219, Th-227, Th-229, Th-231, Tl-207, Tl-209, Xe-133M, Xe-135M, Xe-138, I-134
Other	Mn-54, Zn-65, U-232

^D in equilibrium with daughter products [†] included in automatic radionuclide identification

*Only Dose and count are displayed directly on the screen of the RayMon during a scan. Isotope ID and spectral analysis can be found after by going into menu.

Quantitative Analysis with RayMon®

Features:



- Compatible with RayMon CZT and Nal probes
- Define and test against your own geometries, allowing users to test samples in their own containers*
- Rugged and easy to operate both in field and laboratory use
- CZT probe provides an ideal solution for activity analysis in complex spectra where normal detectors cannot be used
- Nal probe provides an ideal solution for activity analysis in low dose environments
- Can be used with distributed (soil, building material sample, food, liquid waste) and point source (air sampling filters, calibration sources) samples
- Unique file reporting technology allows isotope analysis to be tagged to photographs, notes and GPS coordinates
- Reports can be transmitted directly from the field for immediate response
- PDF reporting facility
- MSA Premium included. NB. this must not be installed on the tablet
- CZT probe custom beakers can be purchased as an optional extra with a predefined geometry allowing the user to analyse Cs134 and Cs137 without having to create their own efficiency curve in MultiSpect Analysis
- Facilitates import of simulated LabSOC/ISOC efficiency curves to support realistic nuclear and analytical scenarios

** Efficiency calibrations for custom geometries need to be set up in MultiSpect Analysis and then imported onto the RayMon tablet.*

*The Quant RayMon eliminates the need
for lab-based intrusive sampling
and radiochemical analysis
in order to determine
the classification of the material*

Applications include:

- Decommissioning
- Environmental Monitoring
- Waste Disposal



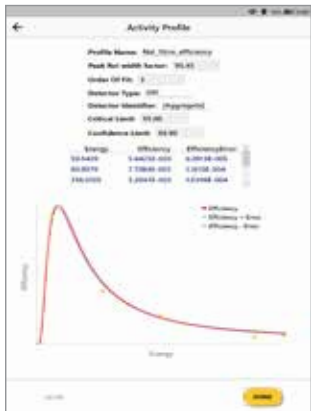
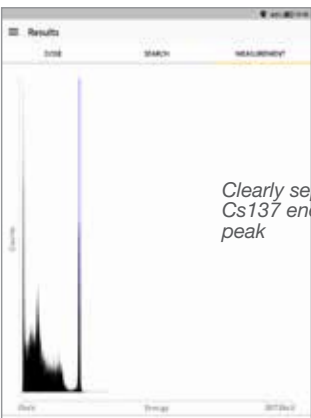
Quantitative Analysis with RayMon®

Quantitative activity analysis module provides a complete software package required for accurate measurement of radionuclides. The module is fully ruggedised for field use.

Accurate measurements of radionuclide activity can now be made in field with the RayMon using the Quant module.

RayMon’s advanced high resolution CZT detector allows quantitative analysis of isotopes which normally overlap in lower resolution instruments, while the NaI probe allows quantitative analysis of isotopes in low dose environments. Our multi-probe product options provide comprehensive packages for quantitative analysis of radionuclides in different environments/conditions.

The Qaunt RayMon’s unique capability allows rapid in-field analysis and sample classification, avoiding costly delays associated with laboratory or radiochemical analysis.



RayMon00

Source	Intensity %	Net Count	Activity (Bq)	Confidence (Bq)
AA4 (24)	0.00	10.00	0.000000	0.000000
Se-137	0.00	10.00	0.000000	0.000000
Co-60	0.00	10.00	0.000000	0.000000
CS-137	0.00	10.00	0.000000	0.000000
Bi-210	0.00	10.00	0.000000	0.000000

Reports

GPS /time / photo capability essential for in field communication and immediate reach back

RayMon Packages



Optional Extra Equipment

- Additional probes
- CZT Probe beaker(s)
- 12 VDC Vehicle charger cable
- Anti-glare premium screen protector
- Ultra-clear premium screen protector

RayMon

Every Kromek RayMon comes complete in its own heavy-duty weatherproofed and ruggedised Peli Case containing the following items as standard:

- Ruggedised handheld tablet
- RayMon detector probe(s)*
- Detachable USB cable(s)
- Wall charger with universal international plug adapters
- Accessory/storage pocket
- QR code directing user to online manuals
- Test certificates

**Probe type dependent on model purchased*

Quant RayMon

In addition to the standard package, a Quant RayMon model includes:

- RayMon’s Quantitative Analysis software package
- MultiSpect Analysis Premium Software Licence. For installation of MSA on computer. Do not install MSA onto the tablet

Model	1cm³ CZT Probe	Nal Probe	AB Probe	Quant Software	MultiSpect Premium
PBR-001A-FG	x	✓	x	x	x
PBR-002A-FG	✓	x	✓	x	x
PBR-003A-FG	x	✓	✓	x	x
PBR-004A-FG	✓	✓	x	x	x
PBR-005A-FG	✓	✓	✓	x	x
PBR-006A-FG	✓	x	x	x	x
QPBR-001A-FG	x	✓	x	✓	✓
QPBR-002A-FG	✓	x	✓	✓	✓
QPBR-003A-FG	x	✓	✓	✓	✓
QPBR-004A-FG	✓	✓	x	✓	✓
QPBR-005A-FG	✓	✓	✓	✓	✓
QPBR-006A-FG	✓	x	x	✓	✓



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