innoRIID
RADIOISOTOPE IDENTIFICATION DEVICES
AMETEK®

RADEAGLE (RE)

## NEXT GENERATION RADIO-ISOTOPE IDENTIFICATION DEVICE

The last decade has seen several novel technologies for spectrum analysis driven mostly by the revolving requirements of both nuclear security and safety. With the RADEAGLE exploiting the latest break-through research results in the field of nuclear detection and nuclide analysis innoRIID provides you a scientific high-tech instrument far beyond the state-of-the-art.

FACING THE THREATS OF TOMORROW

- Police and Fire Brigades
- Nuclear Safeguards
- Steel and Scrap Industry
- Nuclear Medicine
- Customs and Border Patrol
- Defence Agencies and Military
- Scientific Institutions

SPECTROSCOPIC PRECISION - MADE IN GERMANY

innoRIID has a solution for these customers: the RADEAGLE, a handheld spectrometer and mobile, autonomous nuclear laboratory developed by engineers comprising over thirty years of professional experience in the radiation detection business.
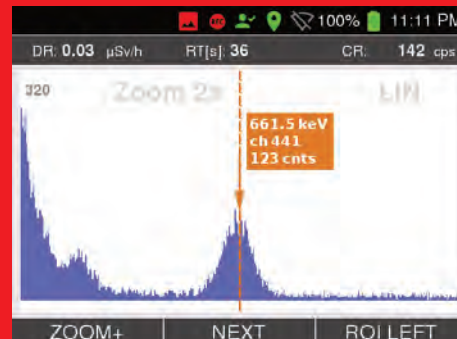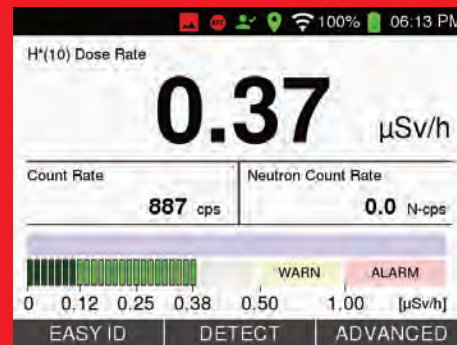
SUPERIOR ALGORITHM TO PERFORM MASKED AND SHIELDED SOURCES IDENTIFICATION

The RE uses a latest generation nuclide identification algorithm based on a multi-agent system approach. Each nuclide is found with a dedicated technique, combining straightforward template matching with latest machine learning solutions. Bayesian decision trees and mixture density neural networks are used for SNM identification in challenging masking scenarios. The ensures unrivaled speed and and accuracy in the identification of over 60 different nuclides.

ADVANCED FEATURES

- Wi-Fi and Bluetooth
- Compatible with RADsync (iOS and Android)
- Integrated web interface
- 3-button control
- Expert mode
- Ergonomic handle, perfect to use with gloves
- IP 65 protection class
- GPS (Optional)

TECHNICAL SPECIFICATIONS

PHYSICAL

Dimensions	248 mm x 115 mm x 152 mm (9.8" x 4.5" x 6.0")
Display	640 x 480, 89 mm (3.5") Transflective Color TFT
Batteries	Rechargeable AA NiMH battery pack, auxiliary battery case for AA NiMH or alkaline
Operational Run Time	>8 hours with standard battery pack (>16h with extension battery pack)

SPECTOSCOPIC PERFORMANCE

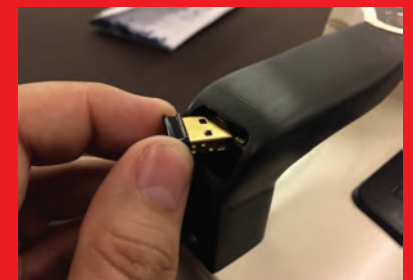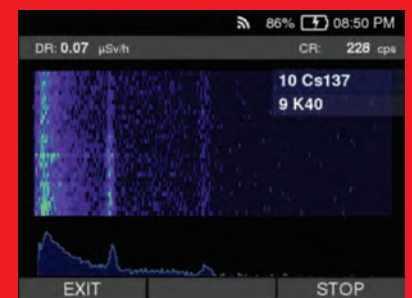|	
Energy Range/MCA	11 keV to 3 MeV / 2048 channels
Calibration Source	Natural background. No internal source required. Optional: ^{137}Cs source
Nuclide Library	Default Isotopes: ^{241}Am, Beta+, ^{133}Ba, ^{207}Bi, ^{109}Cd, ^{252}Cf (requires neutron detection), ^{57}Co, ^{60}Co, ^{51}Cr, ^{134}Cs, ^{137}Cs, ^{152}Eu, ^{67}Ga, ^{68}Ga, ^{123}I, ^{125}I, ^{131}I, ^{111}In, ^{192}Ir, ^{40}K, ^{54}Mn, ^{99}Mo, ^{22}Na, ^{237}Np, ^{226}Ra, ^{75}Se, ^{90}Sr, ^{99m}Tc, ^{232}Th, ^{201}Tl, ^{131m}Xe, ^{133}Xe, ^{133m}Xe, ^{135}Xe, ^{176}Lu, ^{177}Lu, ^{95}Zr, ^{125}Sb, ^{132}Te, ^{95}Nb, ^{132}I, ^{228}Ac, ^{140}Ba, ^{154}Eu, ^{155}Eu, ^{147}Nd, ^{115}Cd, ^{115m}Cd, ^{103}Ru, ^{144}Pr, ^{140}La, ^{141}Ce, ^{75}Se Uranium: ^{233}U, ^{235}U and ^{238}U in different enrichment ratios, including depleted uranium Plutonium: ^{238}Pu, ^{239}Pu in reactor-grade and weapon grade compositions including ^{240}Pu, ^{241}Pu
Nuclide Categories	Special nuclear material (SNM) Naturally occurring radiation (NORM) Industrial emitter (IND) Medical source (MED)

ENVIRONMENTAL CONDITIONS

Operating Temperature	–20 °C to +50 °C (–4 °F to +122 °F)
Relative Humidity	10% – 90%, non-condensing
Protection Rating	IP65, submersible to 15 meter for models 3SGA and 3SGA-N

COMPUTATIONAL

Memory	>16 GB (1,000,000 spectra)
CPU Speed	1 GHz
File Formats	ANSI N42.42, SPE (IAEA)
Connectivity	USB, WiFi, GPS (optional)
Operating System	Microsoft Windows (XP, Vista, 7, 8, 10), MAC OS X Yosemite, Linux (tested for Ubuntu)

VARIANTS

Model	Detector Type	Detector Dimensions	PMT	GM	He3	Resolution @ 662 keV ^{137}Cs at ambient room temp	Sensitivity cps/µSv/h @ 662 keV ^{137}Cs	Dose Rate Range Detector µSv/h	Dose Rate Range GM, up to Sv/h	Weight (g)
RADEAGLE-3SG	NaI(Tl)	76.2x25.4 mm (3x1 in)	3"	x		≤7.2%	>2500	0.01–200	1	2620
RADEAGLE-3SG-N	NaI(Tl)	76.2x25.4 mm (3x1 in)	3"	x	x	≤7.2%	>2500	0.01–200	1	2720
RADEAGLE-3SGA	NaI(Tl)	76.2x25.4 mm (3x1 in)	3"	x		≤7.2%	>2500	0.01–200	1	2620
RADEAGLE-3SGA-N	NaI(Tl)	76.2x25.4 mm (3x1 in)	3"	x	x	≤7.2%	>2500	0.01–200	1	2720
RADEAGLE-2CG	CeBr3	50.8x25.4 mm (2x1 in)	3"	x		≤4.0%	>1600	0.01–300	1	2200
RADEAGLE-2CG-N	CeBr3	50.8x25.4 mm (2x1 in)	3"	x	x	≤4.0%	>1600	0.01–300	1	2620
RADEAGLE-2LG	LaBr3(Sr, Ce)	50.8x25.4 mm (2x1 in) with 2" PMT	3"	x		≤3.0%	>1600	0.01–300	1	2250
RADEAGLE-2LG-N	LaBr3(Sr, Ce)	50.8x25.4 mm (2x1 in) with 2" PMT	3"	x	x	≤3.0%	>1600	0.01–300	1	2250