RADMAN™
ENHANCED
ACCURATE
CHARACTERIZATION

WMG

REACh ™
Powered by RADMAN™

A Leap Forward

The REACh™ System signifies an advancement in the way low-level waste is characterized and classified. By directly measuring gamma dose rates and gamma emitting activity of radionuclides, the REACh™ System can provide rapid and precise characterization results. This is made possible through a fully integrated system involving the REACh™ Detector and the RADMAN™ industry standard radwaste management platform. The detection of hard-to-detect (e.g., H-3, C-14, Tc-99, TRUs, etc.) radionuclides is achieved by utilizing waste stream specific scaling factors from the RADMAN™ database, thus enabling comprehensive characterization and classification in a single straightforward process.

The Challenge

Overly conservative results can significantly increase the costs associated with packaging, transporting, and disposing of the waste. Current methods for characterizing low-level radioactive waste rely on rough approximations that often lead to overly conservative results. To reduce cost and determine disposition alternatives, more accurate methods are necessary. When dose-to-curie conversion techniques are utilized and hard-to-detect radionuclides are estimated using scaling factors relative to Co-60 or Cs-137, underestimating the short-lived gamma emitters results in an overestimation of the hard-to-detect radionuclides, as well as Co-60 and Cs-137, since the majority of the dose rate is attributable to these two radionuclides. Reliable and efficient real-time radionuclide concentration data is crucial during the processing of nuclear waste at commercial power plants.

Our Solution

The REACh™ Detector system is the solution that has been developed to provide a fast, accurate In-Situ Characterization as compared to what is currently available.

This solution has been designed to save the user time with instantaneous readings, thus minimizing dose with an ALARA conscious solution, and minimizes potential human errors with the integration of both software and hardware.

2" x 2" NaI(Tl) REACh™ Detector Technical Specification

Detector Physical Characteristics
- Dimensions (W x L x H): 310 x168 x108 mm
- Weight: <2 kg (< 4.5 lb)
- Housing Material: Plastic

Radiation Measurement Performance
- Energy range (Gamma): 10 keV - 10 MeV
- Linearization: Real-Time linearization of gamma energy
- Dose rate range: (1 µrem/h - 0.5 rem/h) ± 30%
- Dose rate range ID Mode: (1 µrem/h - 18 mrem/h)
- Dose rate overload range: (0.5 - 5 rem/h)
- Maximum Exposure Rate: (5 rem/h)
- Stabilization: Sourceless gain stabilization (patent pending)
- Identification: Detection and nuclide identification performance exceeds all requirements of ANSI N42.34
- Nuclide library: per customer requirements
- Library categories: SNM, IND, MED, NORM
- Typical resolution: 6.5 % FWHM at 662 keV at 20 °C
- Maximum input count rate in identification mode: 300 kcps (Cs-137)

UHF RFID Reader
- Multi-Regional Support
- ETSI or FCC compliant versions
- EPC C1 G2, ISO 18000-6C Compliant
- Output power up to S00mW (27dBm)
- Read range 1.5m (typical)

Barcode Scanner
- 1D-2D Imager

Color Camera
- 5M pixel; 2592 x 1994 pixel; 8bit RGB colors

Display
- Type: Blanview TFT-LCD
- Size: 69 mm x 41 mm (2.72" x 1.61")
- Resolution: 800 pixels x 480 pixels

Battery
- Type: Secure Li- Ion battery pack
- General Operation time: 8hr in dose rate mode with dimmed back light

Environmental
- Operating temperature: -10 °C to 45 °C (14 °F to 113 °F)
- Relative humidity 85% at 20°C and non-condensing conditions
- Protection rating: at least IP65

Input/Output
- USB 2.0; micro-AB socket
- Bluetooth Class 4.0
- WLAN WiFi 802.11 g/n

Software
- Functions: dose rate, identification and measurement of activity by nuclide, RFID read/write, barcode scanning, record audio description, take color pictures
- Remote operation via web interface
- Connect and synchronize with remote database/cloud services
- ANSI N42.42 compatible XML output, fully integrates with RADMAN™ Software Suite
- Internal Data Storage: 32 GB

Position
- GPS for outdoor positioning

RFID Tags
- RadRFID: up to 100 Gy rad tolerant UHF RFID tag family

Accessories
- Rugged carrying case
- Lanyard carrying strap
- USB charger
- Micro-B socket USB cable
- Spare battery
- Tripod for fixed measurements
- Collimation kit