CAEN SyS

CAEN Spectroscopy Division

SPECTROSCOPIC RADIATION MEASUREMENT AND UHF RFID TAGGING HANDHELD INSTRUMENT

RADHAND 600 PRO

MAIN FEATURES

- Spectroscopic radiation measurement and UHF RFID tagging combined in a single instrument
- High dose rate capability with a single detector
- Rugged IP65 rated case
- Easy system integration and remote operation and configuration with standard web browser
- Embedded UHF RFID reader for storage of information in selected rad tolerant UHF RFID tags
- Embedded 1D-2D barcode scanner for backward compatibility with previous tagging systems
- Embedded camera and voice notes for unambiguous description of the measured items

DESCRIPTION

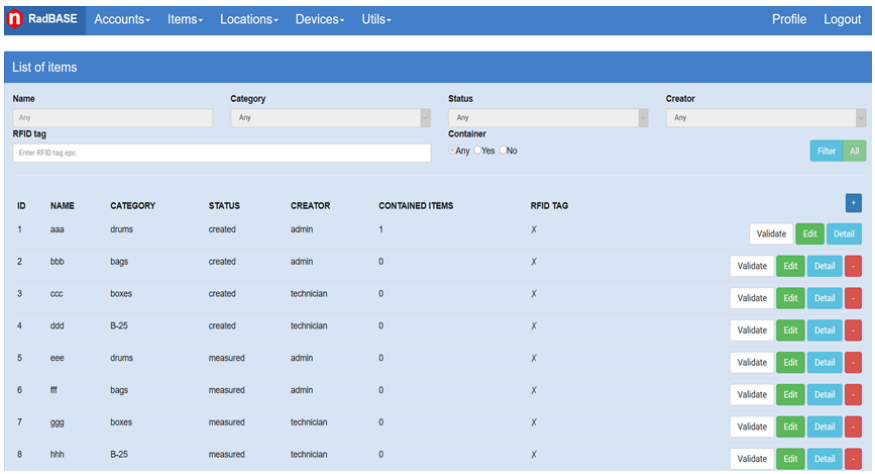
RadHAND 600 PRO is a novel handheld instrument able to combine, for the first time, state-of-the-art spectroscopic radiation measurements with scintillation detectors and UHF RFID technology for easy tracking of the measured items.

Specifically designed for operating in applications such as Nuclear Power Plants, Decommissioning & Dismantling, Nuclear Fuel Cycle, Nuclear Waste Management and Radioprotection, the **RadHAND 600 PRO** helps the operator to fully characterize and track objects, surfaces, radioactive waste bags, drums, large boxes and any type of item that could be produced and measured in these activities.

Being part of the CAENSYS **DigiWASTE** platform, the device can insert measured data and sample information into a central database and, at the same time, write the main information in the memory of selected rad tolerant RFID tags that are part the CAENSYS **RadRFID** family.

The **RadHAND 600 PRO** enables the operator to detect and identify the gamma and optionally neutron radiation on a specific item for waste analysis and radioprotection applications. As soon as the acquisition is completed, the device stores the data in its internal memory together with the object description and detailed sample information including an image and a operator voice note. It also writes the most important data into rad tolerant, UHF RFID tags able to sustain a radiaion dose up to 100 Gy. In addition, the tag's permanent ID allows for an easy and reliable identification of the tagged items, being objects, surfaces to be cleaned up, waste bags, boxes or drums.

All of the information can also be stored in a central management database that operators can access both locally with CAENSYS **RadREAD** devices or remotely via dedicated web service at any time.



Central Management Database containing all the information produced by the operators

OPERATING SCENARIOS

Waste Digitization

- Dose Rate meter
- Identification of radioactive sources, contaminated objects and hotspots for waste analysis and radioprotection in dismantling and decommissioning applications
- Possibility for quantitative analysis in predefined geometries
- UHF RFID tagging of the measured items and storage of most sensitive data in RFID tag
- Full description of measured items and transmission of data to remote database

Waste Storage

- Survey and tracking of waste until final disposal

Radiological Mapping

- Combination of radiometric measurements and GPS information for geo-referenced mapping

Radioprotection patrols

- Periodic control of spots and check points and update of measurements

Nuclear transportation

- Measurement and tracking of medical and industrial radioactive items from production site to end user

Large Surface Measurement

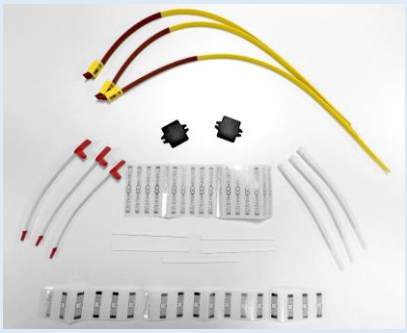
- Characterization of large surfaces and deployment of RFID tags according to user defined surface meshing

CAENSYS DIGIWASTE PLATFORM

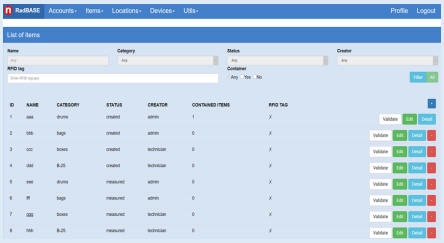
RadHAND 600 PRO: Spectroscopic radiation measurement and UHF RFID tagging handheld instrument

RadREAD: Stand alone, ruggedized portable UHF RFID reader family

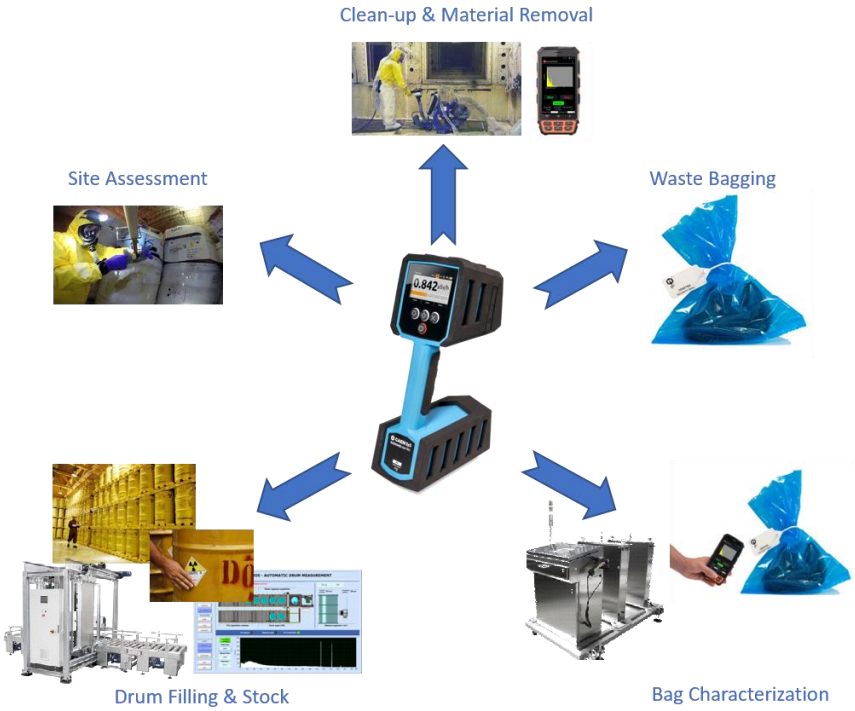
RadRFID: Rad tolerant UHF RFID tag family



RadBASE: Easily customizable management database framework



By analyzing the data stored in the database, it is easy to retrieve all the information and create on-the-fly reports, track and inventory the RFID-tagged items all along the operational process, assign specific instructions and tasks to specific operators, select and group waste containers according to their properties and measured activities, continuously monitor the waste and update the related data, issue early warnings in case of leaks, fully characterize a new site and create interactive mapping of the identified sources and much more.



RadHAND 600 PRO is designed to operate in all the steps of D&D and waste management processes

A suite of additional external probes able to be connected by **RadHAND 600 PRO** via USB will also be available. The probes include: CZT for high-resolution gamma spectroscopy, neutron detectors and ZnS for alpha/beta detection.

RadHAND 600 PRO mounted on tripod for fixed measurements can be remotely controlled via web interface

TECHNICAL SPECIFICATIONS

Detectors

- Gamma: 51 x 51 mm (2"x2") NaI(Tl)
- Gamma and neutron: 51 x 51 mm (2"x2") NaIL (NaI:Tl, Li) – coming soon

Radiation Measurement Performance

- Energy range (Gamma): 10 keV - 10 MeV (2"x2" NaI(Tl))
- Linearization: Real-time linearization of gamma energy
- Dose rate range (Cs-137): 10 nSv/h – 5 mSv/h (1 µrem/h – 0.5 rem/h) ± 30%
- Dose rate range ID Mode (Cs-137): 10 nSv/h – 180 µSv/h (1 µrem/h – 18 mrem/h)
- Dose rate overload range (Cs-137): 5 mSv/h – 50 mSv/h (0.5 – 5 rem/h)
- Maximum exposure rate: 50 mSv/h (5 rem/h)
- Stabilization: Sourceless gain stabilization (patent pending)
- Nuclide library: per customer requirements
- Library categories: SNM, IND, MED, NORM
- Typical resolution: 6.5 % FWHM at 662 keV with 2"x2" NaI(Tl) detector at 20 °C
- Maximum input count rate in identification mode (Cs-137): 300 kcps
- Gamma sensitivity (Cs-137): 1,850 cps/µSv/h

Physical

- Dimensions (W x L x H):
  310 x 168 x 108 mm³ (2"x2" NaI(Tl))
  335 x 175 x 117 mm³ (2"x2" NaIL(Tl)) – coming soon
- Weight: <2 kg (2"x2" NaI(Tl))
- Housing material: plastic

UHF RFID Reader

- Multi-Regional Support
- ETSI or FCC compliant versions
- EPC C1 G2, ISO 18000-6C Compliant
- Output power up to 500mW (27dBm)
- Read Range 1.5m (typical)

Barcode Scanner

- 1D-2D imager

Color Camera

- 5 Mpixel; 2592 x 1944 pixel; 8bit RGB colors
- Focusing range : 10 cm to infinity

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
- Tests according IEC 62706: Drop, vibration, mechanical shock, electrostatic discharge, radio frequency immunity, RFID ETSI EN 302 208 v. 1.4.1. (EU) FCC part 15.247 (US)

Battery

- Type: Secure Li-Ion battery pack
- Operation time: 8h in dose rate mode with dimmed back light and GPS switched off at 20°C

Display

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

Input/Output

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

Software

- Functions: dose rate, identification, RFID read/write, barcode read, record audio description, take color pictures
- Remote operation via web-interface
- File Formats: ANSI N42.42 compatible with third-party analysis software applications such as GADRAS, Cambio, or PeakEasy
- Internal Data Storage: 32 GB
- Data sharing: Synchronization with external database

Position

- GPS for outdoor positioning

RFID Tags

- CAENSYS RadRFID: Up 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

External Probes

- Connectable external probes: CZT for high resolution gamma spectroscopy, Neutron detectors, ZnS for alpha/beta – coming soon

Ordering Codes

WSRAD600PROA - RadHAND 600 PRO ETSI VERSION
WSRAD600PROB - RadHAND 600 PRO FCC VERSION

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