

INNOVATION AT WORK

Connecting Visionaries in Radiation Safety, Science and Industry

Conrad Orlando Resort, FL – July 28th – August 1st



Utilizing Automation and Robotics for Efficient D&D Solutions

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Mirion Connect | Annual Users' Conference 2025 Orlando, Florida



Agenda

- D&D Overview
- SPOT Robot
- Flyability Drone
- RoboCount 2020 Robotic NDA System
- Continuous Spectroscopic Monitoring
- X-ray Tomography with Gamma Spectroscopy
- Advanced ISOCS Automation
- SPOT Demo



D&D Overview









Full Spectrum of D&D Solutions







- Dosimetry
- Survey Meters
- Portal/ Exit Monitors
- Floor Monitors
- Clearance Monitors
- Rad Tolerant Cameras
- Gamma Imaging
- Vehicle Monitors
- Lab Equipment (Gamma, Alpha, Alpha/Beta)
- Waste
 Characterization
- Neutron Systems
- Services

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SPOT Robot





BD SPOT ROBOT w/ MIRION PAYLOAD



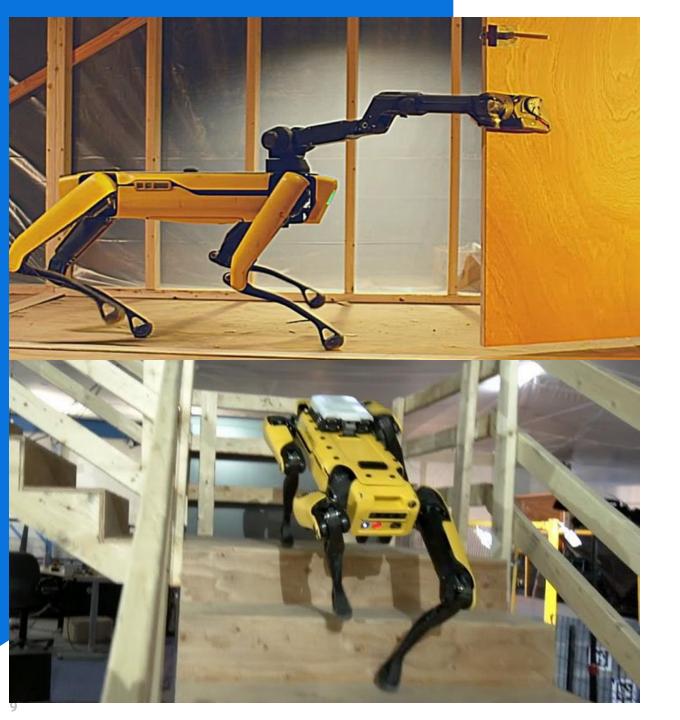


SPOT HIGHLIGHTS

- Boston Dynamics SPOT
- Mirion and Third Party Payloads
- RADeCO Expertise
 - Outfit, Install, Training, Support
- What are you trying to achieve?
- Inspection and survey tool for safety/ALARA concerns, remote access, and to mitigate personnel usage
- Uses for inspection emergency response, routine surveys, hot cells, and more
- NPPs, US DOE, Fed Agencies, Bomb Squads, HAZMAT teams, and more







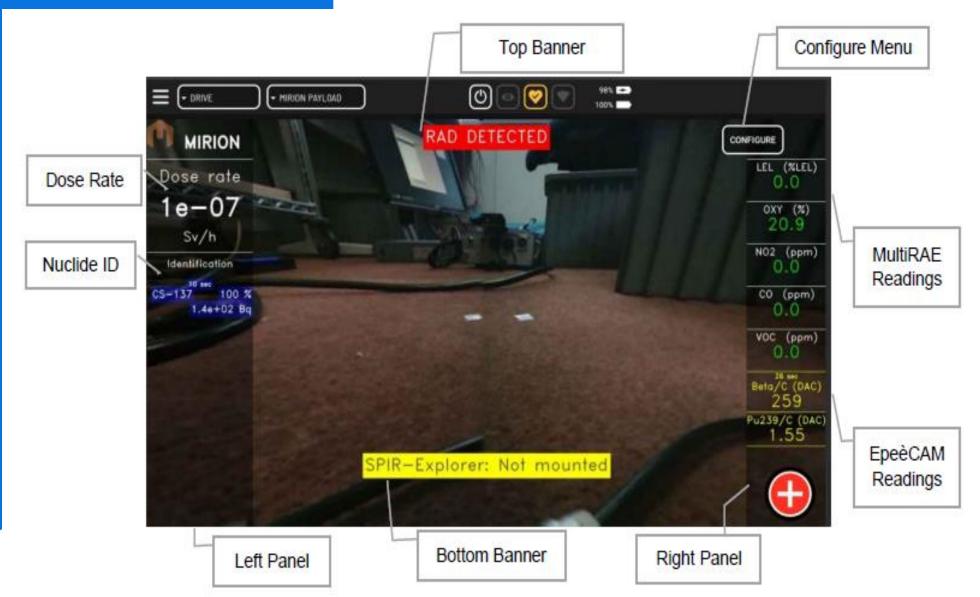
CAPABILITES

- Walk up stairs, optional arm for grabbing
- LIDAR
- PTZ inspection camera
- Detection options include handheld (RDS-32, Accurad), SPIR Explorer (LaBr or NaI), and uGe – HPGe SPECTROSCOPY
- Optional additional sensors (chem, bio, 4 gas, etc)
- Autonomous missions
- Mapping/ Configuration software available











FLYABILITY DRONE



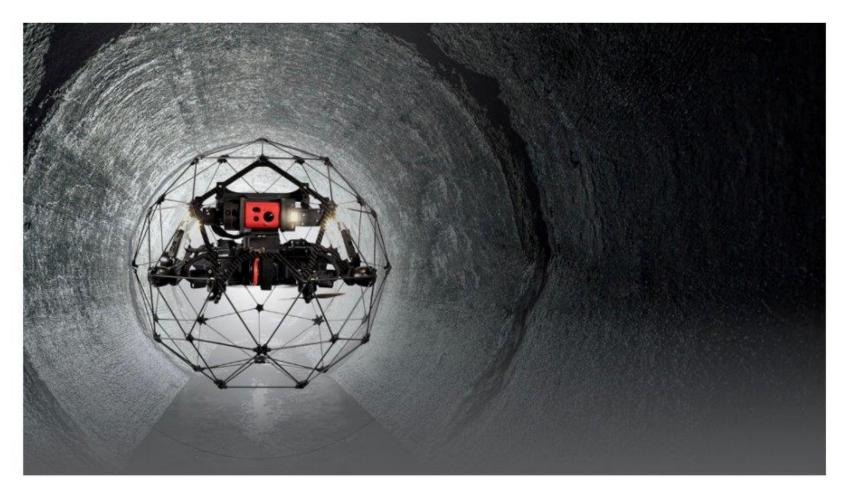


FLYABILITY

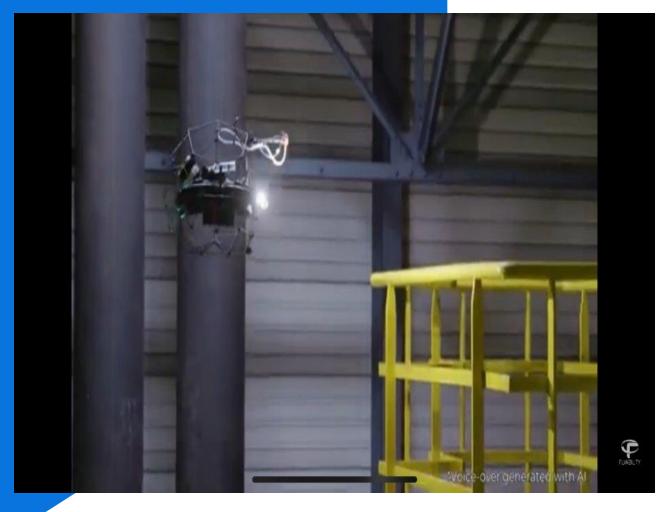
ELIOS 3



w/ RDS-32







- Mapping and Inspection Indoor Drone
- Survey Capabilities with RDS-32
- LIDAR, 3-D Mapping (cm accurate GPS)
- 4K camera w/ 180 degree FOV
- Collision Avoidance
- Around 12.5 minute max flight time

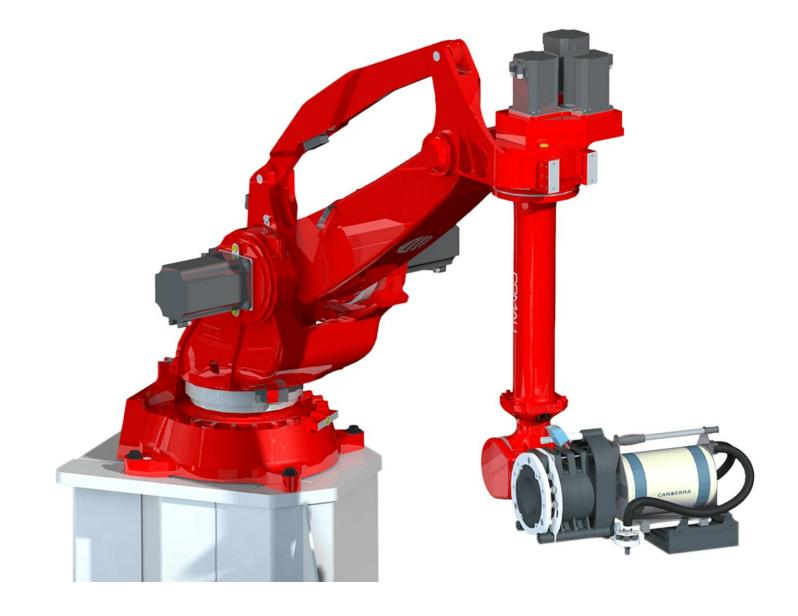


RoboCount 2020 Robotic NDA System

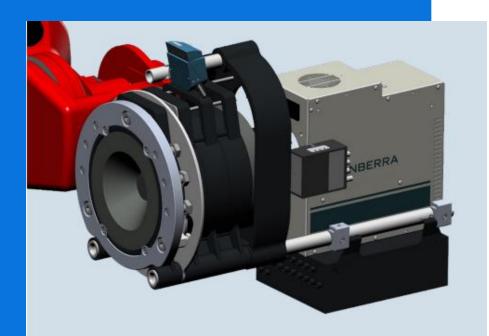




RoboCount 2020
Robotic NonDestructive Assay
System











WHY ROBOCOUNT?

- Existing use case for 6 Axis Arms
- Multiple specialized systems vs one versatile system

WHAT IS ROBOCOUNT?

- Overengineered robotic arm
- Around 500 lb payload (rotator 5500 lbs)
- Virtually any detector with custom collimation
- Automatic LN fill or electronic cooling

HOW DOES IT WORK?

- Automation selects collimators and distance based on measured detectors dead time, dose rate, type of sample (drum, overpack, etc), and type of assay
- Push button operation with software

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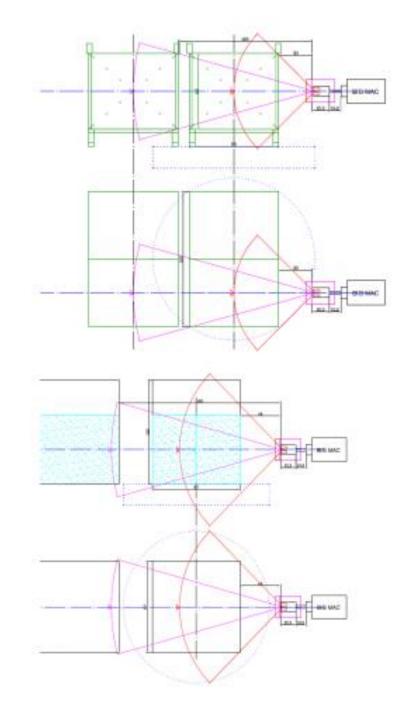


FLEXAIBILITY, SAFETY, and OPTIONS

- Reports can be edited
- Data review possible
- Safety light curtain
- Optional bar code reader, camera, painter, smear samples attachment, unattended QA
- 3 detectors and FOV lead shielding for low clearance Matrix density correction of transmission tomography via transmission source robotic module
- Multiple samples per batch Automatic indeed/ outfeed conveyers, pallet truck, or fork lift



Actual measurement performance depends on detector size, assay time, measurement geometry, etc. Measurement geometries for crates (90° cylindrical collimator, 30 cm detector -WP distance; (30° cylindrical collimator, 120 cm detector -WP distance) and FIBCs (90° collimator, 40 cm detector -WP distance; (30° collimator, 160 cm detector - WP distance), respectively, are depicted below





Continuous Spectroscopic Monitoring





The Data Analyst™

Continuous
Spectroscopic
Monitoring
Platform









Mirion's Data Analyst is an autonomous spectroscopic software package, continuously acquiring data, identifying nuclides, and storing the results. The software package comes embedded on an Industrial rated CPU running the Linux OS



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Detector and MCA



Data Analyst (Embedded Software)

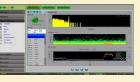


Autonomous Operation





DA Dashboard



DA Prospector



DA Touch Screen Console



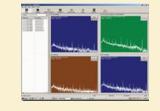
Horizon



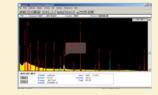
ReexaMiner



Apex-Gamma



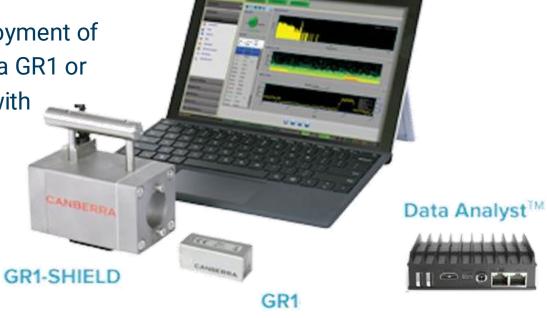
Genie





Example CSM Kit

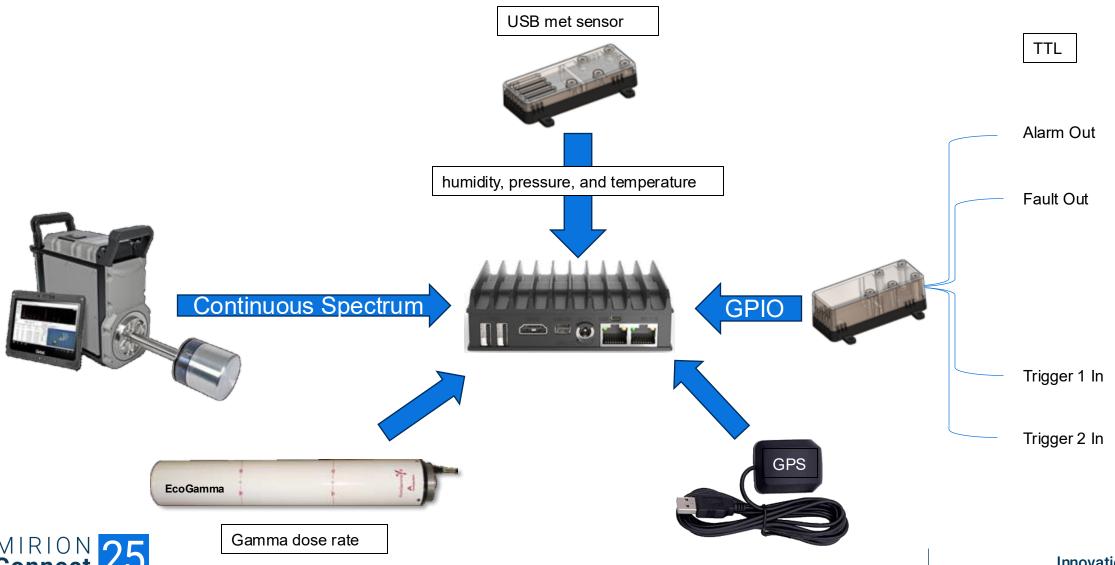
 Quick and Easy deployment of CSM platform using a GR1 or GR1+ CZT detector with collimator







Available Information from Measurement



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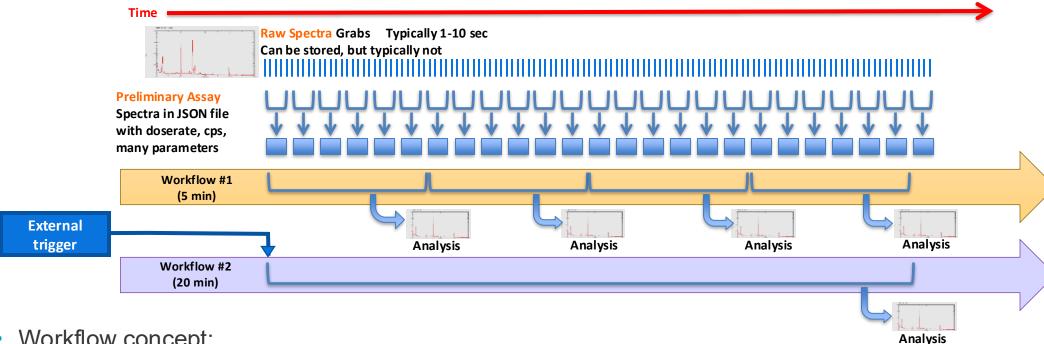
AEGIS AUTOMATED, INTEGRATED CONTINUOUS SPECTROSCOPIC MONITORING

Sample Source Network example **CONTINUOUS CIRCUIT MONITORING** PC with DA Dashboard Software **Autonomous Operation**

Lab at the

Annual Users' Conference

Data Analyst Key Features used in these Projects



- Workflow concept:
 - Each with own Count time, Libraries, Analysis parameters
- Multiple workflows can operate at the same time:
 - e.g. short sample, long sample, very long QC
- Continuous Spectroscopy Mode; Triggered Mode; or Both
- Alarm outputs: based upon nuclide-specific assay results



Process monitors:

- Generally Continuous Mode
- Short count workflow for quick response
- Long count workflow to detect low activity nuclides
- Longer count time for continuous QC assay

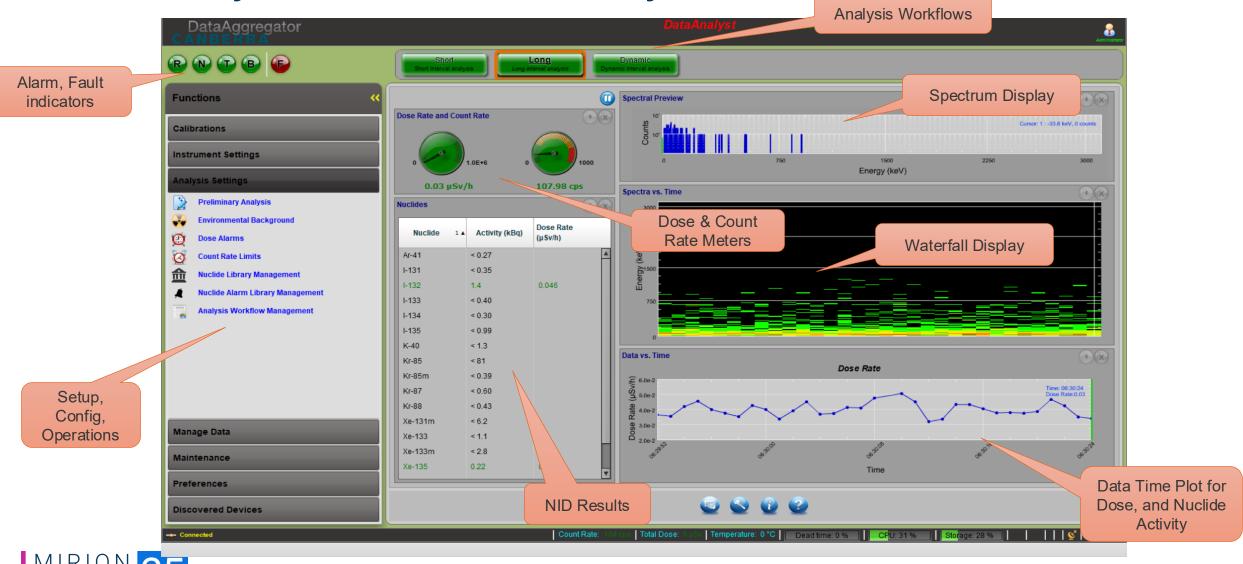
Sample assay systems

- Triggered for sample type 1
- Triggered for sample type 2
- Triggered for sample type n
- Continuous mode long count time for QC assay

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Data Analyst Dashboard Primary Screen



Annual Users' Conference

X-ray Tomography with Gamma Spectroscopy





THIS SECTION DELETED (Proprietary/Sensitive Info)





Advanced ISOCS Automation – Innovation for Work!!





THIS SECTION DELETED (Proprietary/Sensitive Info)





SPOT Demo





Thank you



