MIRION
TECHNOLOGIES

# Health Physics and Radiation Safety Instrument

Precise Protection for Confident Operations

# Protect What's Next.™

## Advancing Radiation Safety.

At Mirion Technologies, we partner with industry leaders to advance radiation safety and empower the next wave of critical innovation. From detection and measurement to monitoring and analysis, we empower innovators across industries with radiation safety technologies that operate with the highest levels of precision. We partner with our customers to build solutions that deliver complete confidence in safe operations and harness the transformative power of safe radiation to move our world forward.

# Precise Protection for Confident Operations

**For the field of Health Physics**, we specialize in the design, development and production of equipment, solutions and services to provide personnel protection in any site or facility utilizing radioactive materials.

## FEATURED PRODUCTS

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| CSPevo® Probe Family | IC3™ Portable Ion Chamber Survey Meter | RDS-32™ Survey Meter |

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| AccuRad™ PRD Personal Radiation Detector | Argos™-3/-5 Whole Body Contamination Monitors | iCAM™ Mobile Alpha Beta Particulate Monitor |

# Vital™

**POWERED BY** MIRION

- Notifications
- Devices
- Maps
- Audit Logging
- User Authentication
- Device Communications
- Roles

## Maps



The Maps application within Vital Supervision provides users with an intuitive way to navigate and see the location of instruments sitewide — for visibility of status and physical location of instruments across a site.

## Device Details



Users can quickly access the Devices feature from any screen within Vital Supervision to inspect alarming devices, review devices and access controls, and analyze and optimize data.

## Alarm & Event Notification



Via the Notifications feature, Vital Supervision surfaces instrument alarms, alerts or faults with clarity to drive immediate action.

For each new event, authorized users can identify the source instrument, event state, event priority, and length of time the alarm has been active.

# Vital™ Supervision

## Centralized, Simplified Supervisory Software for Radiological Instrumentation

A comprehensive supervisory solution designed to enhance the monitoring and management of radiological instrumentation, Vital Supervision simplifies the collection and analysis of data from a wide variety of instruments, ensuring safety and efficiency.

**LEARN MORE:**
**MIRION.COM/VITAL**

## Powering Integrated Operations for Nuclear Energy and Beyond

The Vital Platform aims to simplify workflows, reduce redundancies, and enhance productivity for industry stalwarts and start-ups alike.

Easy access to data is key for critical decision-making. In real-time response situations and daily operations, you need solutions that inform smart, quick action.

The Vital Platform serves as a single connected ecosystem for radiation safety instruments and software. It's designed to break down information silos, surface critical insights, integrate seamlessly, and scale with ease.

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# Electronic Dosimetry

## The key component of an effective dose measurement program is the dosimeter itself.

While passive dosimetry ultimately provides a worker's dose of record, electronic dosimeters serve a complimentary role. They provide workers with real-time, precise updates and alarms, ensuring proactive awareness of their current radiological conditions. Mirion electronic dosimeters and accessories provide a stable platform for an effective radiation protection program and monitoring of workers' radiation exposure.

✔ 30+ years of industry experience

✔ Implemented in more than 90% of applicable North American utilities

✔ Innovation driven by user feedback

✔ Technically advanced, user-friendly design

### ACCESSORIES

Mirion supplements our flagship electronic dosimeter line with a variety of useful tools that utilize advanced functionality to take advantage of our powerful dosimeters. These accessories can be as simple as dosimeter readers that interface with configuration software to manage settings, troubleshoot faults, and capture historical data. They can also be as complex as an automated calibrator that enables rapid setup of large populations in short order. Mirion dosimeter accessories help leverage the electronic dosimeter into a broadly useful asset, able to be quickly configured, assigned, and deployed.

### DMC 3000™ DOSIMETER

With continuous improvement and technical innovation, the DMC 3000 dosimeter represents the culmination of over 30 years of industry expertise. The DMC 3000 device is a highly advanced electronic dosimeter that accurately measures X-ray and gamma exposure across a wide range of energies. The modular design allows for expanded capabilities such as enabling measurement of beta or neutron exposure, extremely low dose rates, and even wireless data transmission as a teledosimeter.

DMC 3000 Electronic Dosimeter with LTx module dedicated to Location and Telemetry

### ADD-ON MODULES

Location Telemetry Module (LTx)

Enhanced Telemetry Module (eTx)

Neutron Telemetry Module (NTx)

Neutron Module Hp10

Beta Module

Bluetooth® Low Energy Module

# Dosimeters

## DMC 3000™ Personal Electronic Dosimeter

**The DMC 3000** dosimeter features a unique, high contrast and back-lit LCD display, enhanced alarms (audible, visual, and vibration alerting), high EMI and RF Immunity and long battery life.



Connects to Vital Supervision

### FEATURES

**NUCLEAR**
- Display Units: mSv, µSv, or mrem
- Measurement Range (Dose): 0.01 mrem (0.1 µSv) to 1000 rem (10 Sv)
- Measurement Range (Dose Rate): 0.01 mrem/h (0.1 µSv/h) to 1000 rem/h (10 Sv/h)
- Energy Range (X-ray and Gamma): 15 keV to 10 MeV
- Energy Response: ± 20% (typically 10% from 16 keV to 10 MeV)

**ELECTRICAL**
- Power Supply: Standard AAA (LR03) 1.5 V alkaline battery
- Battery Life: 1 year battery life with normal use* * 0.1% of the time in alarm

**OPERATIONAL**
- Display: Large LCD with high quality white back-lighting eight alpha-numeric digit display
- Audible Alarm: Loud speaker (>85 db)
- Visual: Super bright forward facing alarm LED along with alarm and information LEDs on top
- Vibrating alarm
- Temperature range: 14 °F to 122 °F (-10 °C to 50 °C)
- Waterproof IP67
- Shock, vibration and drop resistant (1.5 meters on concrete)

**MECHANICAL**
- Dimensions: 3.4 x 2.2 x 0.8 in. (86 x 56 x 21 mm) without clip
- Weight (alkaline battery and clip): < 2.9 oz (84 g)



## DMC 3000 Bluetooth® Module
## Connectivity Module for DMC 3000 Dosimeter

Designed to enable connectivity and enhance user safety, the Bluetooth module allows for the pairing of the DMC 3000 dosimeter to other devices and the transmission of dosimeter data to a telemetry network.

With the introduction of the Bluetooth module, Mirion Technologies is also pleased to release the MirionWatch™ device for improved alarm reporting and ConnectStudio™ software for efficient network management.
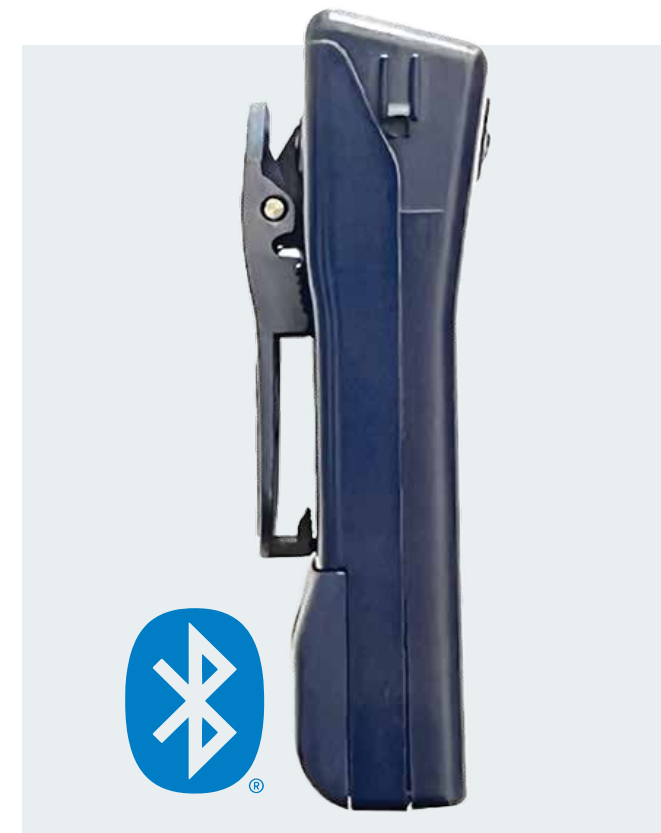


## ConnectStudio™ Connectivity Management Software

ConnectStudio software helps strengthen exposure monitoring and supervision by enabling connectivity of the new DMC 3000 dosimeter with Bluetooth module, MirionWatch device, and the related ecosystem.

With ConnectStudio software, users can supervise paired dosimeters within a short-range telemetry network. An intuitive operational display supports local action based on telemetry feedback. In addition, ConnectStudio software can serve as a gateway to Mirion WRM network for a remote supervision through AWM radio.
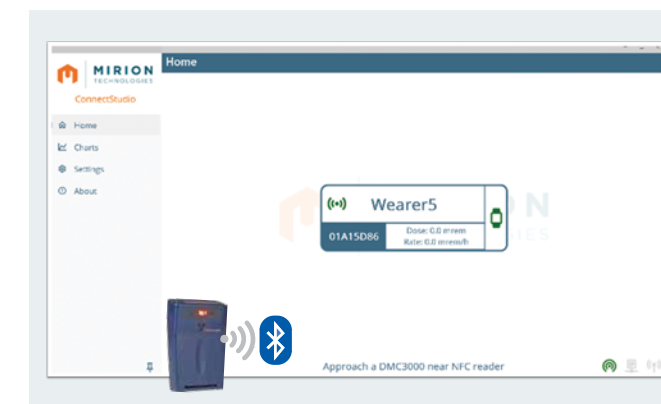


Quick and easy check of dosimetry information at glance

## MirionWatch™ Device for DMC 3000™ Bluetooth® Module

The MirionWatch device strengthens alarm alerting and reporting for personnel working in challenging environments.

Paired with the DMC 3000 dosimeter via our newly-released Bluetooth module, the MirionWatch device provides a wristband-based vibrational alert when an alarm threshold is met, acting as a reinforcement of the primary dosimeter alert. The vibrational alert is easily felt by the user, and an intuitive interface on the MirionWatch device displays alert details.

The MirionWatch device can fully integrate with the Mirion connected ecosystem (software and reader), offering a complete user experience.



## DMCUser™ Electronic Dosimeters Management and Maintenance Software

DMCUser is the companion software to support operational electronic dosimetry management and maintenance in commercial nuclear, defense, homeland security and medical applications.

It allows full customization, configuration, maintenance and diagnostic of any dosimeters belonging to the DMC product line.

DMCUser software is compatible with a wide range of Mirion products as an integrated platform.



DMCUser Companion for DMC 3000

## Additional DMC 3000 Dosimeter Add-On Modules



◈ Connects to Vital Supervision



◈ Connects to Vital Supervision



◈ Connects to Vital Supervision

### Location Telemetry Module (LTx)

Part of the Orion™ RTLS ecosystem, the purpose of the Location Telemetry (LTx) Module is to provide an additional real-time location feature and to transmit worker data (worker information, gamma radiological data and setpoints) to WRM Telemetry Systems.

### Enhanced Telemetry Module (eTx)

The eTx is the latest state-of-the-art telemetry module for DMC 3000 dosimeter. This enhanced module is able to transmit worker's data (worker information, gamma radiological data and setpoints) to WRM3™ Telemetry System components.

### Neutron Telemetry Module (NTx)

Neutron Telemetry Module provides an additional Neutron measurement and transmits worker's data (worker information, gamma and neutron radiological data and setpoints) to a WRM Telemetry System.





### Neutron Module Hp10

The Neutron Module combines with the DMC 3000 dosimeter to measure Neutron radiation at a wide range of energy levels.

### Beta Module

The Beta Module combines with the DMC 3000 dosimeter to measure the Hp(0.07) shallow dose radiation at a wide range of energy levels.

# Dosimeter Accessories

## Hands-Free Dosimeter Readers



LDM 320W™ Dosimeter Reader (Wall Mount version)



LDM 320D™ Dosimeter Reader (Desktop version)

### LDM 320W™ and LDM 320D™ Hands-Free Dosimeter Reader

The LDM 320W and LDM 320D readers operates using software packages installed on the computer (PC) and communicates with the DMC 3000 and SOR families in hands-free data exchange mode.

### FEATURES

**OPERATIONAL**
- Visual: Two-color electroluminescent diode for different indications
- Compatible with packages: DosiCare™, DosiFFR™, DMCUser™ and LDM 3000SW software
- Nominal Range:
  – DMC 2000 / SOR units: 9.8 in. (25 cm) max
  – DMC 3000 unit: 1.9 in. (5 cm) max

**ELECTRICAL**
- Power Supply: Self powered through USB port

**MECHANICAL**
- Compatible with the DMC 2000 and SOR families, iPAM-Tx as well as the DMC 3000 dosimeter
- Operating Temperature: 0 °C to 50 °C (32 °F to 122 °F)
- Storage Temperature: -10 °C to 60 °C (14 °F to 140 °F)
- Humidity: 90% HR (without condensation)

### Integrated Dosimetry and Contamination Systems

Mirion Technologies is pleased to offer integration of contamination monitors with our personal dosimetry solutions for a holistic approach to identify sources or areas of potential contamination at Radiologically Controlled Area (RCA) exits. Sirius™ and Argos™ personnel contamination monitors can be equipped with the LDM 320W/LDM 320D dosimeter reader to easily insert and read the DMC 3000 dosimeter while using the contamination monitor.



**LEARN MORE:**



## Dosimeter Calibrators

### IRD 2000/3000 Irradiator for Electronic Dosimeter Calibrations and Response Checking

The IRD 3000™ unit is a bench-top calibrator used for calibrating and calibration checking the DMC 3000 and SOR electronic dosimeters against a NIST traceable standard and to ensure ANSI compliance. The IRD 3000 unit, combined with a PC running the DosiCal software and a PC printer will automatically generate a calibration report for each dosimeter.



### FEATURES

**NUCLEAR**
- Delivers a dose rate of approximately 300 mRem/h (3 mSv/h) within the shielded compartment
- Radiation Source - [137]Cs, 0.37 GBq (10 mCi) shielded source, very low external radiation at < 0.25 mR/h (2.5 µSv/h)

**OPERATIONAL**
- Can calibrate up to three dosimeters at a time
- Automated measurement acquisition

## Access Control

### RWP Swing Gate

The RWP Smart Swing Gate is a lighter model from our turnstile Smart Safety checkpoint line of products. It is designed for areas with minimal space and as part of an area posting (e.g., high radiation boundary). The three-inch wheels allow for easy transportation, even over grated areas.



### FEATURES

**OPERATIONAL**
- Worker places their dosimeter in contact with the reader
- If RWP information is verified, the green entry light illuminates, and Swing Gate unlatches
- A worker removes the dosimeter from the reader and enters the area
- When exiting the area, the worker pulls the manual exit latch on the back of the gate

**MECHANICAL**
- 36 x 23 x 36 in. (L x W x H) (with computer arm swung in)
- Weight approximately 70 lb

**ELECTRICAL**
- 110 V ac/60 Hz
- Fused circuit on the 110 V main line and the 24 V internal circuit
- Electrical gate lock
- Capacitive touchscreen for use with gloves
- Integrated industrial computer with LDM 320 reader

## Dosimeter Accessories
continued

## Access Control



### Passive Entry Turnstile

The Passive Entry Turnstile provides a dosimeter checkpoint permits the workers to proceed and access the area if their dosimeter is turned on.

#### FEATURES

**OPERATIONAL**
- Visual: LED indicator lights

**ELECTRICAL**
- 110 V ac/50 Hz, 240 V ac/ 60 Hz switching

**MECHANICAL**
- Dimensions: 36 x 27 x 67 in. (91.4 x 68.5 x 170.2 cm)
  – Passage Space: 18 in. (45.7 cm)
  – Turnstile Arm: 1.25 in. diameter (3.17 cm)
- Weight: 130 lb (58.95 kg)
- Compatible with all DMC 2000/3000 and SOR Electronic Dosimeters
- Types: Right hand or left hand
- Fail safe and fail lock mechanical controls
- Portable size also available

### RWP Turnstile Smart Safety Checkpoint

The RWP Smart Turnstile provides a dosimeter checkpoint that permits the workers to proceed and access the area if their dosimeter is turned on and they are on the correct RWP.

#### FEATURES

**OPERATIONAL**
- Display: Touch screen tablet computer for visual verification/acknowledgement by access personnel. Remote (Desktop) configuration if the Turnstile is on a PC network
- Visual: LED indicator lights (Amber and Green)

**ELECTRICAL**
- Power Supply: DC Fan
  – Four outlet surge protector
- 110 V ac/50 Hz, 240 V ac/ 60 Hz switching
- Outputs: +5 V; +24 V; +15 V; -15 V (not used for this application)

**MECHANICAL**
- Portable Dimensions: 21 x 27 x 38 in. (53.3 x 68.6 x 96.5 cm)
- Full Size Dimensions: 36 x 27 x 39 in. (91.4 x 68.5 x 99.1 cm)
  – Passage Space: 18 in. (45.7 cm)
  – Turnstile Arm: 1.25 in. diameter (3.17 cm)
- Weight: 140 lb (63.5 kg)
- Types: Right hand or left hand
- Fail safe and fail lock mechanical controls

## LDM 3200™ RCA Entry/Exit Reader

LDM 3200 unit is an Electronic Dosimeter self issue reader used to enter and exit radiological controlled areas. Compatible with HIS-20 WACS, DosiServ software. The unit is equipped with a multilingual touchscreen. At the area entry, the LDM 3200 unit allows the worker to fill in the data requested by the dosimetry system and to activate the dosimeter. At the area exit, the reader acquires the dosimeter data and transfers it to the dosimetry system. It is compatible with all Mirion dosimetry systems and can be used with all LDM readers. It offers the capability to adapt to a site-specific badge reader or NFC reader.

#### FEATURES

**OPERATIONAL**
- Display: 10.1 in. touchscreen
- Windows 7 system
- Dosimeter sleeve compatible with DMC 2000 and DMC 3000 modules

**ELECTRICAL**
- 100-240 V ac~ 4 A 50-60 Hz (0.5 A - 220 V ac) or 9-36 V dc (5A - 12 V dc) (optional)

**MECHANICAL**
- Dimensions: 20.7 x 16 x 6.50 in. (525 x 405 x 165 mm)
- Weight: 29.8 lb (< 13.5 Kg)
- Desktop or Wall mountable



## LDM 1000™ RCA Entry/Exit Reader

The LDM 1000 reader is dedicated to the control access of radiological areas. At the entrance of the controlled area, the LDM 1000 allows the user to fill in the data required by the dosimetry system and to activate the dosimeter. At the exit of the controlled area, the reader acquires dosimeter data and transfers it automatically to the dosimetry system.

#### FEATURES

**OPERATIONAL**
- DosiServ and DosiCare software compatible for access control mode

**ELECTRICAL**
- Power supply 110 – 230 V ac
- Input voltage range: from 85 V to 264 V ac
- Input voltage frequency: 50 or 60 Hz
- Minimum recommended wire section: 0.75 mm²
- Voltage regulator: 2 A

**MECHANICAL**
- Compatible with DMC 2000, DMC 3000, SOR/R modules
- LDM 1000i:
  – 315 x 216 x 104 mm (H x W x D)
  – Weight: 2.1 kg
- LDM 1000i:
  – 315 x 216 x 122 mm (H x W x D)
  – Weight: 4.2 kg

# Telemetry

## The AWM™ Adaptive Wireless Monitor represents a paradigm shift in Mirion's approach to wireless remote monitoring.

In the past, wireless monitoring required an array of different devices under the same family umbrella that each performed overlapping, but specific, roles. In contrast, the AWM unit is a single device that fulfills many roles. The instrument can serve as a base transceiver or a repeater, it features a color display for monitoring status and configuration, and it connects to the site LAN via any number of interface options including USB, network connection, or WiFi. The AWM device eliminates complexity in establishing and maintaining a wireless monitoring system and allows RP personnel to focus their efforts on the data being gathered and interpreted, rather than setup of the system.

The AWM unit brings together Mirion's wide range of products, enabling wireless functionality across the board – whether covering personnel on a job, monitoring areas, receiving air samples and survey data, or making the data available to multiple departments through the site LAN.

The Adaptive Wireless Monitor (AWM) has touch-screen user interface which allows setup in the field using one-touch configuration

✔ Deployed throughout the industry for over 20 years

✔ Helps reduce RP personnel radiation exposure during job coverage

✔ Ensures consistent information for all decision makers

✔ Unparalleled reception range and system flexibility

**Input**

**Output**

## AWM™ Adaptive Wireless Monitor

**The AWM monitor is a dynamic technology that represents an all-in-one solution for teledosimetry.** This compact system can be deployed as a base station, repeater, EXT, active dive repeater, etc.; which minimizes the different types of inventory that must be maintained. It connects to software via RS-232, USB, Ethernet or WiFi. Complete with an onscreen configuration for user defined needs and also the ability to be powered by PoE.

### FEATURES

**OPERATIONAL**
- Display: On-screen configuration
- WRM2, WiFi, Bluetooth, and GPS enabled
- Power over Ethernet
- WRM2 Radio 900 MHz or 2.4 GHz frequency

**ELECTRICAL**
- Battery Life: > 24 hr battery backup

**MECHANICAL**
- Dimensions: 7.1 x 4.1 x 2.25 in. (180 x 104 x 57 mm)
- Adaptable to interface with a wide range of radiation monitors



## Active Dive Antenna for Teledosimetry Data Transmission

**The revolutionary Active Dive Antenna** has built on the functionality of the original Dive System by providing its own WRM2 radio within the antenna paddle. The Active system doesn't just transfer the WRM2 signal through the cable, it provides a POWERED BROADCAST of the signal – easily overcoming any loss potential. The Active Dive System is ideal for higher frequencies and longer cable lengths. Each diver's teledosimetry data is broadcast on their own "closed loop" which means RP personnel can monitor multiple divers simultaneously without experiencing interfering crosstalk between the divers.

### FEATURES

**OPERATIONAL**
- WRM2 Radio 900 MHz or 2.4 GHz frequency
- Compatible with WRM2 Base Stations, MeshRepeaters, etc.
- Eliminates Crosstalk Interference with multiple divers simultaneously in the water

**ELECTRICAL**
- Antenna power is provided by the AWM (typically DC)

**MECHANICAL**
- Housing:
  – Waterproof (AMP-type) cable
  – Waterproof Antenna up to 100 ft depth
- Up to 400 ft (91.4 m) standard AMP cable
- Externally connected to diver – does not breach dry dive suit



**Connects to Vital Supervision**

## DRM-3000™ Data Radiation Monitoring System

Area monitoring device used for multiple applications including refueling, waste processing, calibration, medical isotope production, and radiation sterilizations. Supports one internal and three external detectors.

### FEATURES

**NUCLEAR**
- Detector: Supports one internal and three external detectors

**OPERATIONAL**
- Display: 7 in. HD display
- PU Mainboard:
  – ARM Cortex
  – A7 core - GUI and communication

**ELECTRICAL**
- Power Supply: 110 V ac to 14 V dc 2 A
- PoE (Power over Ethernet): 14 V dc
- Battery Capacity: 24 hr with routine use

**MECHANICAL**
- Housing: High impact plastic (ABS-PC) with aluminum back cover
- Dimensions: 9 x 3 x 10 in. (230 x 76 x 252 mm)
- Weight: 3.75 lb (1.70 kg)
- Mounting: Wall or tabletop mounted
- Weather proof IP-65, CE Certified

**ALERT INDICATORS**
- Standard Built-in Buzzer: 80 dB at 30 cm
- High Volume Buzzer (optional): 100 dB at 30 cm
- Color Coded Background: Based on threshold levels
- Upper Multicolored LED: White, Green, Yellow, Red, Purple, Blue and Light Blue colors



EcoGamma-g fixed

EcoGamma-g portable

**Connects to Vital Supervision**

## EcoGamma™-g Environmental Gamma Radiation Monitor

The EcoGamma-g monitor logs all data including dose rates, detector status, count rates, alarms, and faults. The monitor is an advanced, dual detector, environmental gamma radiation monitor designed to operate in the most extreme conditions with unsurpassed accuracy, range and stability.

### FEATURES

**NUCLEAR**
- 10 nSv/hr (1.0 µR/hr) to 10 Sv/hr (1000 R/hr). Linearity ±10% referenced to Cesium-137
- Evaluated to 100 Sv/hr (10 000 R/hr)
- Two Geiger Mueller Detectors
  – Crossover on increasing dose rate: 500 mR/h (5 mSv/hr)
  – Crossover on decreasing dose rate: 300 mR/h (3 mSv/hr)

**OPERATIONAL**
- Operating temperature range: -40 °C to +60 °C (-40 °F to +140 °F)
- Operating humidity: 0 to 100%

**ELECTRICAL**
- Power over Ethernet (PoE) 1.25 watts
- Power over USB 0.5 watts

**MECHANICAL**
- Construction: Cylindrical Aluminum, IP67 enclosure
- Threaded mounting base
- Size: 467.86 mm (18.42 in.) length; 76.2 mm (3.0 in.) diameter
- EMC: Tested to IEC 61010-1:2001 (Second Edition) / EN 61010-1:2001
- Weight: 1.1 kg (2.4 lb)

**ALERT INDICATORS**
- Dual color LED

## AMP-50™ Low Range GM Tube-Based Ratemeter and Area Monitor

**The AMP-50** unit provides real-time remote radiological monitoring of moderate dose rates. It can utilize an optional WRM2 EXT Transmitter for telemetry monitoring. Local readout of handheld meter allows for use as a portable survey instrument.

## AMP-100™ High Range GM Tube-Based Ratemeter and Area Monitor

**The AMP-100** unit provides real-time remote radiological monitoring of high dose rates. It can utilize an optional WRM2 EXT Transmitter for telemetry monitoring. Local readout of handheld meter allows for use as a portable survey instrument.

## AMP-200™ Very High Range GM Tube-Based Ratemeter and Area Monitor

**The AMP-200** unit provides real-time remote radiological monitoring of very high dose rates. It can utilize an optional WRM2 EXT Transmitter for telemetry monitoring. Local readout of handheld meter allows for use as a portable survey instrument.

## AMP-300™ Very High Range Waterproof Gamma Detector

**The AMP-300**, or Area Monitor Probe, is a dose rate meter that has been designed specifically to be used in very high dose rate fields.

### FEATURES

**NUCLEAR**
- Detector: Energy compensated GM tube
- Detector Range:
  - AMP-50: (± 10%): 10 µR/h to 4 R/h (0.1 µSv/h to 40 mSv/h)
  - AMP-100: (± 10%): 0.005 R/h to 1000 R/h (0.05 mSv/h to 10 Sv/h)
  - AMP-200: (± 10%): 0.5 R/h to 15,000 R/h (5 mSv/h to 150 Sv/h)
  - AMP-300: (± 10%): 0.1 R/h to 30,000 R/h

**ELECTRICAL**
- Power Supply: 9 V (supplied by a 9 V battery located in the meter case)
  - Optional 9 V ac adapter available
- Battery Life: Approximately 50 hr of continuous use

**MECHANICAL**
- Housing: Waterproof
- AMP-50, AMP-100, AMP-200 Dimensions: 12 x 7.2 x 3.4 cm (4.72 x 2.83 x 1.34 in.) (H x W x D)
- AMP-300 Dimensions
  - Meter dimensions: 12 x 7.2 x 3.4 cm (4.72 x 2.83 x 1.34 in.) (H x W x D)
  - Detector Dimensions: 2.45 Dia. x 14.3 cm (0.96 Dia. x 5.71 in.)
  - Standard cable length: 25 ft (7.62 m)
  - Maximum cable length: 350 ft (107 m)





## RDS-32™ AM Area Radiation Monitor

**The RDS Area Monitor** is a simple, easy to deploy long-term battery powered area radiation monitor intended for any remote monitoring application where power is not available. The RDS AM unit provides all the features of the RDS-32 monitor (either GM or SD version) but in a mountable enclosure with battery power for up to two years of operation.

### FEATURES

**NUCLEAR**
- When monitoring high dose rates long term, you can connect the GMP-12SD or UW probes which have a lifetime dose expectancy up to approximately 90,000 Rad

**OPERATIONAL**
- Speaker holes and clear cover provide local alarm capabilities

**ELECTRICAL**
- Power Supply: Two 6 V, 45 Ah batteries along with the two AA batteries in the meter

**MECHANICAL**
- Housing: Custom enclosure with injection molded insert, both pieces UL 94-HB flame rated
- Dimensions: 3.8 x 7.3 x 10.5 in. (96.5 x 185.42 x 266.7 mm) (without mounting brackets)
- Weight: 6.4 lb (2.9 kg) (with meter and batteries)
- Multiple mounting options
- Ability to add an external probe to allow dual monitoring (such as Contact and General Area)

## RPD-AM™ Radiological Posting Display Area Monitor

**The RPD-AM unit is a self-contained gamma dose rate detection and display monitor.** It utilizes an internal mini WRM2 Base to pull wireless data from existing WRM monitors. Its large screen clearly displays ambient dose rates or dose information. It can be used with an internal detector (RDS-32 GM or SD) or it can be used with an internal mini WRM2 Base. It can also be connected to your network base station.

### FEATURES

**NUCLEAR**
- Measurement Range: Depends upon instrument used

**OPERATIONAL**
- Display:
  - Self-contained, dynamic display of ambient radiological conditions
  - Can also be setup to display a radiological posting that automatically changes based on the dose rates in the area
  - Can display rate or dose information from any transmitting device within range if deployed with a mini-base or connected to a network-base station
  - Displays dose rate information and transmits to existing WRM2 receivers

**ELECTRICAL**
- Power Supply: Included; will convert ac power to 5 V dc so all box connections are low voltage

**MECHANICAL**
- Housing: Made from ABS and is rated UL 94 for flammability. It is also RoHS and REACH compliant
- Dimensions: 15.28 x 11.34 x 4.84 in. (388 x 288 x 123 mm)
- View Area: 16 in.
- Weight: 13 lb

**PERFORMANCE CHARACTERISTICS**
- Intelx5-Z8350 (64-bit) CPU
- 4 GB DDR3L RAM
- 32 GB Memory eMMC (5.0)
- Windows 10 Pro (64-bit)

# Orion™ Real-Time Location System

**Bringing real-time location and radiation measurement data together in a seamless experience for nuclear power, industrial and research facilities.**

## SYSTEM COMPONENTS



### Orion Studio Software

Orion Studio is a client/server software solution that integrates the WRM radiological data (Dose, Dose Rate, Alarm Conditions, Airborne Concentration, flow rates, temperature, voltage, ppm/ppb, etc.) within 2D or 3D views. A customizable display layout can be prepared for specific areas of interest/focus to permit multiple operators to effectively cover individuals or work teams engaged in high-hazard tasks.

#### FEATURES
- Location tracking of dosimetry with real-time radiological data
- Location tracking of telemetry enabled radiological measurement instruments with real-time data
- Messaging to dosimeter, i.e., Contact RP or Leave Area
- Track other dose rate and area monitoring devices
- Asset and critical component location tracking
- Remote monitoring for area dose rate and other transmitting devices
- 2D and 3D Map Visualization of monitored areas
- Real-time geofencing/exclusion area monitoring
- Supports asset boundaries to alert removal from the monitored location
- Radiological data consolidation into dose rate heatmaps
- Virtual cross-boundary monitoring (counting in/out of areas)
- Supports location tracking and data visualization for Mirion and many other continuous air monitors
- Client/Server Deployment
- Operator ability to select specific regions of interest for visualization
- Operator ability to define specific areas or working groups to monitor
- Rapid identification of radiological alarm locations
- Visualization of specific teams or focus areas for job coverage
- IP Camera Support

### Orion Anchor

The Orion Real-Time Location System supports Critical Path activities by providing position data for compatible devices (e.g., Dosimeters and Asset Tags). Anchors are placed throughout the monitored area to capture and relay location data for visualization on a monitoring station. Installation is simple, using a daisy chain RJ45 configuration with Power Over Ethernet (PoE) connections. For temporary mounting installations, anchors have an available magnetic mount for rapid deployment and removal.

#### FEATURES
- Ultra-Wideband enabled RF communication
- PoE enabled functionalities
- IPv4 networking
- Daisy Chainable network connections for power and communications from one PoE+ port
- Available wall or ceiling mounts
- Energy consumption: 120 V, 60 Hz; 230 V, 50 Hz via -48 V dc PoE
- Frequency: 6.5 GHz nominal
- Weight: 0.8 kilograms with drip cover (0.4 without drip cover)
- Temperature range: -10 °C to 50 °C (14 °F to 122 °F)
- Shock, vibration and drop resistant



### Orion Asset Tag

Asset tags are a key component of the Orion system, allowing facilities to track the location of essential tools and equipment throughout a monitored facility. The tag transmits location data, eliminating challenges caused by lost equipment. Asset tags are rugged, watertight and offer a two-year battery life.

The Orion RTLS Asset Tag actively communicates by ultra-wideband to other integrated Orion products to track the location of equipment and assets. Asset Tags are associated with equipment names/ID in the Orion Studio Software and location tracking can be used to monitor last storage location or unauthorized movement.

#### FEATURES
- Rugged and watertight
- One-meter location accuracy
- Two-year battery life with AA alkaline batteries
- IP65 Rating (Immersion)
- Small form factor module: 4.25 x 1.60 in. (110 x 40 mm)
- Tri-color LED indicator for user-friendly status indication
- Versatile mounting of the asset tag for permanent installation
- Temperature range: -10 °C to 50 °C (14 °F to 122 °F)
- Storage: -20 °C to 71 °C (-4 °F to 160 °F)
- Shock, vibration and drop resistant

### Location Telemetry Module (LTx)

Orion RTLS enhances the established technology of the DMC 3000 dosimeter when fitted with an LTx module. The LTx module supports the transmission of WRM radiological information and location coordinates, tracking the wearer's location. The dosimeter, with the LTx module, communicates dose rate and location data with Orion Studio Software to facilitate real-time visualization.

#### FEATURES
- Allows direct connection to existing populations of DMC 3000 dosimeters (G3 Version 7.8.x or greater)
- Integrates directly with the dosimeter
- Workers do not need to wear separate cards or equipment for transmission of location tracking data
- Communicates with both Orion RTLS anchors and existing WRM systems
- Configurable for the WRM3 Protocol allowing it to transmit the DMC thresholds, wearer name, ID, RWP and task
- Omnidirectional Antenna for the Ultra-Wideband (UWB) Technology used for accurate tracking
- Transmits radiological information in pre-configured intervals to WRM receivers
- Independent module power supply: AAA battery
- Designed for ruggedness and durability
- Waterproof IP67 (1 m per 1 hour)

# Portable Radiation Measurement

Miron offers dose rate and survey meters for a wide range of users and probes to suit many applications.

✔ Multi-purpose meters meet a variety of applications

✔ Smart add-on probes allow flexible deployment

✔ Integrated wireless functionality across the product line

✔ Rugged, dependable, accurate, and easy to use

Generally, health physics users like to invest in one particular instrument so training and expertise can be maximized. Mirion offers handheld instruments for all levels of users, from the technician performing a specific task on site to the highly knowledgeable health physicist. These instruments are focused on particular applications and can be used either as handheld, semi fixed or fixed devices.

With the CSP™ Smart Probe approach, the instrument is selected to match the situation specifics, taking into account that any CSP probe will always be compatible.



SAB(G)-100

✔ More instruments are available in the field

✔ Considerably less calibration and set-up time

✔ 100% compatibility with all instruments

✔ Reduced total cost of ownership and daily workload

✔ Reduced need for paper and log books

✔ Improved accuracy of data transcription

## RDS-32™ Modular Radiation Survey Meter

**RDS-32 device is a multipurpose survey meter with internal detector and optional externally connected probe.** The RDS-32 meter is a complete solution that can be used for handheld surveillance, personal monitoring and as an area radiation monitor. Telemetry versions of the RDS-32 can connect to the Vital Supervision application.

**NUCLEAR**
- Display Units: rem(/h), Sv(/h)
- With External Detector: rem/h, Sv/h, cps, cpm, Bq, Bq/cm² and dpm
- Detectors: One energy-compensated GM tube, energy response according to ambient dose equivalent H*(10)
- Measurement Range (Dose rate): 0.05 µSv/h (5 µrem/h) to 100 mSv/h (10 rem/h)

**OPERATIONAL**
- Display: 128 x 64 pixel
- Keyboard: 4 navigation keys and a select key
- Flexible histogram functions
- Real-time clock function

**ELECTRICAL**
- Power Supply: Two AA size batteries (alkaline or NiMH)
- Battery Life: ~600 hr at normal background

**MECHANICAL**
- Housing: IP67 Waterproof
- Dimensions: 3.93 x 2.63 x 1.29 in. (100 x 67 x 33 mm)
- **Weight:** RDS-32: 0.35 lb without batteries (160 g), with batteries (210 g), 0.46 lb RDS-32 iTx: 170 g (0.37 lb) without batteries, 220 g (0.49 lb) with batteries

⬤ **Connects to Vital Supervision**

**Integrates with CSPevo Probes**

## RDS-32 WR Wide Range Module Radiation Survey Meter

**RDS-32 Wide Range device is a multipurpose survey meter with internal detector survey meter with dual detectors (GM and SD) and optional externally connected probe.** The RDS-32 WR unit is a complete solution that can be used for handheld surveillance, personal monitoring and as an area radiation monitor.

**NUCLEAR**
- Display Units: rem(/h), Sv(/h)
- With External Detector: rem/h, Sv/h, cps, cpm, Bq, Bq/cm² and dpm
- Detectors: One energy-compensated GM tube and one Silicon Pin diode energy response according to ambient dose equivalent H*(10)
- Measurement Range (Dose rate): 0.05 µSv/h (5 µrem/h) to 10 Sv/h (1000 rem/h)

**OPERATIONAL**
- Keyboard: Four navigation keys and a select key
- Flexible histogram function
- Real-time clock function

**ELECTRICAL**
- Power Supply: Two AA size batteries (alkaline or NiMH)
- Battery Life: ~600 hr at normal background

**MECHANICAL**
- Housing: IP67 Waterproof
- Dimensions: 3.93 x 2.63 x 1.29 in. (100 x 67 x 33 mm)
- **Weight:** RDS-32 WR: 195 g (0.43 lb) without batteries RDS-32iTx WR: 205 g (0.45 lb) without batteries, 255 g (0.56 lb) with batteries

⬤ **Connects to Vital Supervision**

**RDS-32** Download the Mirion apps to connect your **RDS-32™ meter and AccuRad™ PRD** to SpirVIEW Mobile™ Supervisory Software and the RadResponder Network

App Store | Google Play

# Portable Survey Meters

## RDS-30™ Radiation Survey Meter

**The RDS-30 device is a digital handheld dose rate meter designed for a wide range of gamma and X-ray radiation surveillance applications.** The RDS-30 unit is simple-to-use, compact, lightweight and waterproof with reliable and accurate performance and a friendly user interface.

### FEATURES

**NUCLEAR**
- Measurement Range (Dose): from 1 µrem to 100 rem (0.01 µSv to 1 Sv)
- Measurement Range (Dose rate): from 1 µrem/h to 10 rem/h (0.01 µSv/h to 100 mSv/h)

**ELECTRICAL**
- Power Supply: Two alkaline batteries IEC LR6/AA size (recommended)
- Battery Life: > 2000 hr at normal background with alkaline cells

**MECHANICAL**
- Housing: IP67 Waterproof

## RDS-80™ Contamination Survey Meter

**The RDS-80 Surface Contamination Meter** is a versatile contamination detector which has been designed for a wide range of applications in different fields of radiation protection in nuclear industry, rescue and other operations, involving a possibility for abnormal contamination levels.

### FEATURES

**NUCLEAR**
- Measurement Range: Surface contamination 1 to 100 000 cps, 0.01 to 1 000 000 Bq/cm$^2$ or 1 to 1 000 000 DPM
- Surface activity (Bq/cm$^2$) display configurable for different isotopes

**ELECTRICAL**
- Power Supply: Two alkaline batteries IEC LR6/AA size (recommended)
- Battery Life: > 2000 hr at normal background with alkaline cells

**MECHANICAL**
- Housing: IP67 Waterproof

**NEW**

## IC3™ Portable Ion Chamber Survey Meter

The IC3 survey meter provides exceptional capabilities when measuring gamma, beta, and X-ray radiation for ensuring radiological compliance for nuclear power plants, government agencies, radiopharmacies, and other radiation-sensitive environments. It accurately measures both dose and rate information helping radiation protection professionals to ensure worker safety and minimize dose to the general public.

### FEATURES

**Nuclear**
- Measuring Range: 1 µSv/h to 1 Sv/h (0.1 mR/h to 100 R/h)
- Accuracy (137Cs): ±10% of reading within measuring range
- Gamma Energy Dependence: Better than ±20% from 20 keV to 3 MeV
- Beta Energy Dependence: Better than ±20% from 200 keV

- Angular Dependence (137Cs): Less than ±30% (for ±90° of front direction)
- Ion Chamber Volume: 350 cm³
- Response Time:
  – 3 sec for readings above 1 mR/h
  – 5 sec for auto-ranging (Low to High Range)

**Mechanical**
- Data Logging: Stores up to 200 data records
- Casing: High-impact ABS
- Data Connection: USB (calibration, config, firmware, data); optional 900 MHz or 2.4 GHz RF (WRM2/WiFi)

## AccuRad™ PRD Personal Radiation Detector

The AccuRad PRD is a discreet yet robust gamma radiation detecting PRD designed for law enforcement, fire rescue, and other emergency responders to detect and interdict nuclear and radioactive materials. It also provides dose measurement and alarming capabilities for event response. It is available in two versions: Hp(10) and H*(10). The new AccuRad H*(10) PRD version builds on the Hp(10) version PRD and dosimeter functionality to also measure ambient dose equivalent rates from public areas to restricted or hazardous areas.

**Personal Radiation Detector (PRD):** Provides early warnings of hazardous radiation levels. Search capabilities guide responders and radiation protection specialists to locate and address radiation sources swiftly to mitigate potential dangers.

**Dosimeter Functionality:** When body-worn, the device continuously provides dose rates, dose measurements and can precautionarily trigger an alarm when exceeding a safety threshold. This allows responders to monitor their radiation exposure throughout missions and supports informed decision-making and adherence to safety protocols.

**Low Dose Rate Survey Meter:** Used in public areas as a low dose rate survey meter, the AccuRad PRD H*(10) helps responders assess safe exposure limits in public areas and efficiently establishment safe zones to safeguard the public from radiation exposure. (H*(10) version)

**Micro Rem meter:** Used in the vicinity of nuclear facilities, this device acts as a tissue-equivalent survey meter measuring up to 10 MeV. (H*(10) version)

### FEATURES

**NUCLEAR**
- CsI(Tl) scintillation detector with temperature compensated SiPM for interdiction missions and public safety
- Silicon diode for integrated dose and high and low dose rate measurements to ensure proper health and safety in emergency response situations

**ELECTRICAL**
- Two AA batteries for more than 900 hours of continuous operation
- Tool-less battery cover

**MECHANICAL**
- Innovative heavy-duty bi-material construction
- Compliance:
  – H*(10): IEC 62401:2017, IEC 60846-1:2009, IEC 60846-2:2015
  – Hp(10): ANSI N42.32-2016, ANSI N42.20-2003, ANSI N42.17A (+/-10 % accuracy)

## AccuRad™ PRD-SIM Kit

The AccuRad PRD-SIM Kit is a sourceless training kit for the AccuRad PRD. Train for realistic radiation or nuclear detection and response, without the burden and hazards of real radioactive sources.

### FEATURES

- Search trend
- Directional radar
- Low-High-Danger dose rates
- Audible, Visual, and Vibration alarming

## Portable Survey Meters
continued



NEW

### TELE-GMP™ Telescopic Pole for Radiation Surveys

The TELE-GMP pole, combined with a GMP-12™ series probe and the RDS-32™ Survey Meter, is an advanced telescoping radiation survey tool for confident operations in high exposure or hard-to-reach areas.

#### FEATURES

- Lightweight, easy to carry on shoulder with strap
- Extended reach with carbon fiber strength
- Versatile RDS-32 survey meter integration
- Detachable GMP-12 Probe
- Telemetry applications
- Highly accurate radiation readings
- Minimal training needed
- Simplified calibration and cal-check routines

#### NUCLEAR

- Radiation detected gamma and X-rays, according to ambient dose equivalent H*(10) with GMP-12 probe
- For radiological characteristics and detailed specifications refer to GMP-12 probe and RDS-32 meter data sheets
- Display is provided by the RDS-32 meter
- Simultaneous, separate dose rate from probe and meter
- Display units Sv (/h), rem(/h)

#### MECHANICAL

- Carbon fiber pole
- Pole dimensions (extend to needed length)
  - Fully retracted 1.13 m (3.7 ft) / With probe 1.29 m (4.2 ft)
  - Fully extended with probe 4.43 m (14.5 ft)
- Weight
  - Pole without meter/probe/case 1.8 kg (3.97 lb)
  - With RDS-32 and GMP-12GSD 2.25 kg (4.96 lb)
- Temperature range (e.g. with GMP-12GSD and RDS-32)
  - Operation -25 °C to +50 °C (-13 °F to 122 °F)
  - Storage -40 °C to +70 °C (-40 °F to 158 °F)
- Ikelite connector for external probe
- Binder connector for the meter
- IP54
- Power supplied by the RDS-32 meter
- Battery life more than 72 hours with alarm features on

### Tele-STTC-2™ Wide Range Gamma Telescopic Probe

The compact size, exceptionally lightweight, and easy-to-deploy mechanism of the Tele-STTC-2 probe makes this an ideal tool for measurement of areas that are difficult to access or require remote measurement high exposure areas.

#### FEATURES

- Telescopic pole with H*(10) ambient gamma dose equivalent rate measurement probe
- Gamma dose rate measurement up to 10 Sv/h (1000 rem/h)
- Energy-compensated Geiger Mueller detector
- Remote measurement up to 4.09 m (13.4 ft)
- Compact size when folded
- Extremely lightweight and rugged
- Integrated cable for meter
- Calibrated via a personal computer (PC) which enables the direct generation of electronic format calibration data. Eliminates the need for paper and transcription errors





INTEGRATES WITH CSPevo PROBES

AVIOR-2 Hand/Foot configuration

### AVIOR®-2 Desktop Dose-Rate and Survey Meter

**The AVIOR-2 unit is a versatile alarm desktop, portable or wall mounted dose-rate and survey meter** for the contamination control and dose-rate assessment.

#### FEATURES

##### NUCLEAR

- Units Displayed (depending on probe): c/s, $Bq_{eq}$, $Bq_{eq}/cm^2$, Sv/h, $Sv_{eq}/h$, rem/h, cpm; dpm and dpm/100cm²
- Alarm Threshold:
  - CSP probe 10 values for each unit to display, stored in probe memory. Each value is editable via PC setup CSPS™ software or directly on AVIOR-2 unit
- Response Time
  - As fast as 1/4 s for bargraph display depending on probe, on a semi-logarithmic scale
  - 1 s for smoothed digital readout display

##### ELECTRICAL

- Built-in rechargeable Li-ion battery pack
- Battery Life with Backlight: (Maximum/turned off): 31/70 hr one SAB-100 unit connected, 29/60 hr with SA-100 and SB-100 units connected
- Built-in charger
- Universal Mains power input, 100 - 240 V ac, 50/60 Hz. Rear-panel IEC-type connector. Cordset included
- Display of remaining charge with battery pictogram

##### MECHANICAL

- Housing: Molded rugged Polycarbonate
- Dimensions: 7.2 x 4.1 x 4.1 in. (184 x 105 x 105 mm) (L x W x H)
- Weight: 33.5 oz (950 g), battery included
- Connector for External Probes: S 104 A066 137+ Fisher socket (CSP probe)

# Contamination and Dose-rate Survey Probes

## External RDS-31/32 Gamma Probes



INTEGRATES WITH TELE-GMP™ POLE





INTEGRATES WITH TELE-GMP™ POLE

### GMP-12SD™ External Gamma Probe

The GMP-12SD probe is used as an externally connected detector to the RDS-31/32 family of multipurpose meters and intended for long-term monitoring of high dose rate applications.

#### FEATURES

**NUCLEAR**
- Detector: Silicone PIN diode
- Measurement Range (Dose rate): 1 mrem/h (10 µSv/h) to 1000 rem/h (10 Sv/h)
- This probe does not have internal memory to allow a high amount of absorbed dose (90 krem (900 Sv) total exposure)
- While not a smart probe the calibration for this probe can be uploaded to allow use on the meter

**MECHANICAL**
- Housing: IP67 Waterproof
- Dimensions:
  - Length: 6.9 in. (177 mm)
  - Cylinder diameter: 1.37 in. (35 mm)
- Weight: 0.88 lb (400 g)

### GMP-12UW™ External Gamma Probe

The GMP-12UW probe is used as an externally connected detector to the RDS-31/32 family of multipurpose meters and intended for long-term monitoring of high dose rate applications. It is the same detector as the GMP-12SD except it has a weighted cap and is rated for underwater applications.

#### FEATURES

**NUCLEAR**
- Detector: Silicone PIN diode
- Measurement Range (Dose rate): 1 mrem/h (10 µSv/h) to 1000 rem/h (10 Sv/h)
- This probe does not have internal memory to allow a high amount of absorbed dose (90 krem (900 Sv) total exposure)
- While not a smart probe the calibration for this probe can be uploaded to allow use on the meter

**MECHANICAL**
- Housing: IP68 Waterproof (tested to 3 Atmospheres)
- Dimensions:
  - Length: 7.2 in. (185 mm)
  - Cylinder diameter: 1.37 in. (35 mm)
- Weight: 0.99 lb (450 g) with submersing weight

### GMP-12GSD™ External Wide Range Gamma Probe

The GMP-12GSD probe is intended for monitoring gamma and X-ray radiation. It has been designed to fulfill both the civil defense and industrial applications requirements. GMP-12GSD unit is a "smart" probe, having an internal high voltage generator and non-volatile memory for calibration coefficients and probe identification data.

#### FEATURES

**NUCLEAR**
- Detector: GM Tube and Silicone PIN Diode
- Measurement Range (Dose rate): 10 µrem/h (0.1 µSv/h) to 1000 rem/h (10 Sv/h)

**MECHANICAL**
- Housing: IP67 Waterproof
- Dimensions:
  - Length: 8.2 in. (208 mm)
  - Cylinder diameter: 1.37 in. (35 mm)
- Weight: 0.49 lb (220 g)

## External RDS-31/32 Alpha/Beta/Gamma Probe







### GMP-25™ External Alpha/Beta/Gamma Probe

The GMP-25 unit is a Smart Frisker probe, used as an externally connected detector to the RDS-32 family of multipurpose meters. It is intended for routine alpha/beta/gamma contamination monitoring.

#### FEATURES

**NUCLEAR**
- Detector: GM tube 7313
- This is a Smart Probe which allows the Efficiency to be stored in the memory to allow any probe to be used by any RDS-32 meter. Also with the efficiency stored in the probe, the meter reads out in activity (dpm) not count rate

**MECHANICAL**
- Housing: Durable ABS/polycarbonate
- Dimensions:
  - Length: 14.8 in. (375 mm)
  - Width: 2.75 in. (70 mm)
- Weight: 1.08 lb (490 g)

### Telepole II™ Telescopic Radiation Survey Meter

The Telepole II wide-range telescopic survey meter has a measuring range of between 0.05 mR/h to 1000 R/h, and reaches to 11 feet when fully extended. With a backlit color display and an integrated LED in the detector head, the Telepole II unit makes it easier than ever to survey components in dark or dimly lit areas.

#### FEATURES

**NUCLEAR**
- Detector: Energy Compensated GM tubes
- Measurement Range – External Detector: 0.05 mR/h (0.5 Sv/h) to 1000 R/h (10 Sv/h) automatic switching between the two GM tubes at 1500 mR/h (ascending dose rate) and 400 mR/h (descending dose rate)
- Measurement Range – Internal Detector: 0.05 mR/h (0.5 Sv/h) to 1500 mR/h

**MECHANICAL**
- Carbon fiber pole
- Pole Length:
  - Collapsed: 3 ft 11 in. (120 cm)
  - Extended: 13 ft (400 cm)
- Weight: 4.3 lb (1.95 kg)

### RDS-32™ Radiation Monitoring Alarm Box

The RDS-32 Alarm Monitor is intended for stationary or fixed installation in premises where people may be exposed to ionizing radiation.

#### FEATURES

**NUCLEAR**
- Radiation detected: gamma and X-rays, 48keV...3MeV.Alpha & Beta radiation with external probes
- Detectors: one energy-compensated GM tube, energy response according to ambient dose equivalent H*(10)
- Dose rate measurement range: 0.01 µSv/h...0.1 Sv/h or 1 µrem/h...10 rem/h
- Dose measurement range: 0.01 µSv...10 Sv or 1 µrem...1000 rem
- Resolution: three significant digits or 0.01 µSv/h on dose rate and 0.01 µSv on dose ( 1 µrem/h on dose rate and 1 µrem on dose)

**MECHANICAL**
- Casing EPDM and Polyurethane, IP 65/ IK 08/07
- Transparent cover for meter's display and alarm
- Size: 6.3 x 5.3 x 6.5 in (160 x 134 x 166 mm)
- Temperature:
- -25 °C...+60 °C (-40 °F to 140 °F), operating temperature
- -40 °C...+70 °C (-40°F to 158°F), storage temperature

Contamination and
Dose-rate Survey Probes
continued

**NEW**

## CSPevo®
### POWERED BY LIGHTLink™

### Introducing the CSPevo Product Family:
### The Next Evolution in Portable Radiation Detection and Measurement

The new CSPevo product family, powered by the new Mirion LightLink™ technology, offers a revolutionary radiation detector technology set to redefine the standards in radiation detection across a diverse range of applications. The first product offering, the AB-100™ Module, enhances field operations with inter-compatibility for seamless integration and a design that ensures quick readiness.

An evolution of the Canberra Smart Probes (CSP™) product family, the CSPevo family ensures backwards compatibility with existing CSP products.

| **ADVANCED LIGHT COLLECTION** | **BETTER THAN 85%** | **SYSTEM COMPATIBILITY** | **ERGONOMIC, LIGHTWEIGHT** |
|---|---|---|---|
| Powered by LightLink technology | Detection homogeneity | Supports enhanced versatility | For ease of use |

## A Technology Revolution for a User Evolution

### Learn more about this revolutionary technology

Powered by Mirion's revolutionary new LightLink technology, the CSPevo family significantly evolves portable radiation measurement — offering robustness, versatility and enhanced light collection.

### AB-100™ Detection Module

The AB-100 module, part of the CSPevo® family, offers a lightweight, ergonomic design that reduces user fatigue and enhances ease of use, making it ideal for reliable frisking and smear counting. Its robust construction minimizes maintenance, while improved detection homogeneity ensures accurate results. It integrates with Mirion smart probes and the RDS-32™ survey meter for flexibility in various applications.

**NEW**

#### FEATURES
- **LightLink Technology:** Enhances light collection and robustness and reduces risk of breakage
- **Detection Homogeneity:** Over 85% detection homogeneity ensures reliable and consistent results
- **USB-C Compatibility:** Facilitates connectivity with third-party systems and calibration software
- **Improved Ergonomics:** Lightweight and comfortable design for prolonged use without discomfort
- **Broad Integration Options:** Flexible integration with legacy CSP meters and RDS-32 survey meter
- **One-Handed Operation Capability:** For seamless functionality when the other hand is occupied and/or in challenging environments

### Flexible Handle Options

Three different handles are available for the AB-100 detection module, enabling the adaptation of the probe for different applications and environmental conditions. Each handle is secured to the AB-100 detection module with one screw and can be tightened without a specific tool.

### RDS-I-HANDLE:
### For One-Hand Operations

The RDS-I-HANDLE connects to the RDS-32 meter wirelessly. When paired with the AB-100 module, it is perfect for one-hand operations. The RDS-32 meter attaches to the handle and releases manually.

### CSP-C-HANDLE & RDS-C-HANDLE:
### For Hard-to-Reach Areas

The CSP-C-HANDLE and RDS-C-HANDLE enable traditional use of the AB-100 detection module with field-deployed meters. The coil cable, with either RDS or CSP connector, allows the probe to access hard-to-reach areas while monitoring the meter display.

## Contamination and Dose-rate Survey Probes
continued

### CSP™ Smart Contamination Probes

Our probes offer handheld instruments for all levels of users, from the technician performing a specific task on site to the highly knowledgeable health physicist. These instruments are focused on particular applications and can be used either as handheld, semi fixed or fixed devices. With CSP Smart approach, the instrument is selected to match the situation specifics, taking into account that any CSP probe will always be compatible with the RDS-32, AVIOR meters, etc.

### CSP PROBE RANGE

| SABG-15+™ GM Pancake | SPAB-15™ PIPS® Detector | SB-32™ Plastic Scintillator | SVLD™ Energy Compensated CsI(Tl) | SA-32™ ZnS Scintillator 32 cm$^2$ | SA-100™ ZnS Scintillator 100 cm$^2$ |
|---|---|---|---|---|---|
| Multipurpose 15 cm$^2$ contamination probe | Alpha / beta discrimination in high gamma background (15 cm$^2$) | 32 cm$^2$ beta contamination check in high gamma background | Very low H*(10) dose equivalent rate probe for public working area checks | Personal alpha contamination probe | Large area alpha contamination check |
| α β γ | α β | β | γ | α | α |

| SB-100™ Plastic Scintillator 100 cm$^2$ | SAB(G)-100™ Plastic/Zn-S Phoswich 100 cm$^2$ | SAB-32™ Plastic/ZnS Phoswich | SG-1R™ NaI(Tl) Scintillator 1" x 1" | SG-2R™ NaI(Tl) Scintillator 2" x 2" | SX-2R™ NaI(Tl) Scintillator 1.5" x 3 mm |
|---|---|---|---|---|---|
| Large area beta contamination check | Alpha/beta discrimination on large contamination area and personal frisking | Alpha/Beta discrimination for personal frisking | Low dose-rate and gamma contamination probe | Very low dose-rate and gamma contamination probe | Low energy gamma and alpha contamination check in humid environment |
| β | α β | α β | γ | γ | α, X, γ |

| SN-S™ Moderated Helium 3 Tube | STTC™ Energy compensated G-M Detector | SN-D-2™ Moderated Helium 3 Tube |
|---|---|---|
| Neutron presence detection | Wide range H*(10) dose rate equivalent to ICRP-60 | Neutron dose equivalent rate |
| η | γ | η |

### CSP Probes – Alpha Only





### SA-32™ CSP Alpha Contamination Probe

**FEATURES**

**NUCLEAR**
- Display Units: Depending on survey meter (c/s, Bq, Bq/cm$^2$ with SI CSP instrument and CPM, DPM, DPM/100 cm$^2$ with American CSP instruments)
- Emitters: Alpha
- Detector: ZnS(Ag) coating on 3 mm thick neutral plastic material
  – Detection area: 32 cm$^2$ (total diameter = 70 mm, sensitive diameter = 64 mm)
  – Adhered aluminium/Mylar film on detector entrance surface, thickness: 1.8 µm
  – Protection grid transparency: 89%
- Measurement Range: 0 to 10 000 c/s, 0 to 600 kcpm. Activity equivalent range depends on calibration emitter. Conversion coefficient is factory set with $^{239}$Pu
- Dead Time: 50 µs
- Energy Range: Alpha > 3 MeV
- Surface Detection Uniformity: better than 50% of the highest efficiency point
- Gamma Sensitivity ($^{137}$cs): < 0.0001 c/s/µSv/h
- Neutron Sensitivity ($^{252}$Cf): < 0.002 c/s/µSv/h
- Background:
  – Ambient ≤100 nSv/h (10 µR/h): < 0.01 c/s (<0.6 cpm)
  – Beta influence ($^{90}$Sr-$^{90}$Y): < 0.01%

**MECHANICAL**
- Housing: Painted aluminum
- Protection Grid: Stainless steel
- Dimensions: Length (with connector) x diameter (detector) x diameter (body): 225 x 85 x 55 mm (8.8 x 3.3 x 2.2 in.)
- Weight: 24 oz (678 g) without cable

### SA-100™ Alpha Probe

**FEATURES**

**NUCLEAR**
- Display Units: Depending on survey meter (c/s, Bq, Bq/cm$^2$ with IS units survey meters and CPM, DPM, DPM/100 cm$^2$ with US units survey meters)
- Emitters: Alpha
- Detector: ZnS(Ag) adhered to 0.25 mm thick neutral plastic material
  – Detection area: 102 cm$^2$ (68 x 150 mm)
  – Removable aluminized Mylar entrance window on metallic frame, thickness: 6 µm
  – Protection grid transparency: 80%
- Measurement Range: 0 to 10000 c/s, 0 to 600 kcpm. Activity equivalent range depends on calibration emitter. Conversion coefficient is factory set with $^{239}$Pu
- Dead Time: 50 µs
- Energy Range: Alpha > 3 MeV
- Background: Ambient ≤100 nSv/h (10 µR/h): < 0.01 c/s (<0.6 cpm)
- Sunlight Effect: No effect up to 80000 lux.
- Cross Talk: Beta to Alpha ($^{90}$Sr-$^{90}$Y) < 0.01%

**MECHANICAL**
- Housing: Painted aluminum
- Dimensions: Length (with connector) x width (detector) x height (detector): 12.3 x 3.7 x 3.3 in. (313 x 94 x 84 mm)
- Weight: 23.6 oz (670 g) without cable

Contamination and
Dose-rate Survey Probes
continued

## CSP Probes – Beta Only



### SB-32™ Beta Probe

#### FEATURES

**NUCLEAR**
- Display Units: Depending on survey meter (c/s, Bq, Bq/cm$^2$ with SI CSP instrument and CPM, DPM, DPM/100cm$^2$ with American CSP instruments)
- Emitters: Beta
- Detector: Plastic scintillator of 0.25 mm thickness
  - Detection area: 32 cm$^2$ (total diameter = 70 mm, sensitive diameter = 64mm)
  - Aluminium window made of two layers of 12 µm placed on detector entrance surface, total thickness: 24 µm
  - Protection grid transparency: 89%
- Measurement Range: 0 to 10,000 c/s, 0 to 600 kcpm. Activity equivalent range depends on calibration emitter. Conversion coefficient is factory set with $^{60}$Co.
- Dead Time: 2 µs
- Energy Range: Beta > 150 keV
- Gamma Sensitivity $^{137}$cs: 1.7 c/s per µGy/h (1.0 kcpm per mR/h)
- Background:
  - Ambient ≤100 nGy/h (10 µR/h): <3 c/s (<180 cpm).
  - Alpha influence ($^{239}$Pu): < 1%

**MECHANICAL**
- Housing: Painted aluminum
- Dimensions: Length (with connector) x diameter (detector) x diameter (body): 225 x 85 x 55 mm (8.8 x 3.3 x 2.2 in.)
- Weight: 678 g (24 oz) without cable

### SB-100™ Beta Probe

#### FEATURES

**NUCLEAR**
- Display Units: Depending on survey meter (c/s, Bq, Bq/cm$^2$ or CPM, DPM, DPM/100 cm$^2$)
- Emitters: Beta
- Detector: 0.25 mm thick plastic scintillation detector adhered to 3 mm thick neutral plastic material (PMMA)
  - Detection area: 102 cm$^2$ (68 x 150 mm)
  - Removable entrance window:
    - SB-100/A: aluminized Mylar window on metallic frame, thickness: 6 µm
    - SB-100/B: aluminum window on metallic frame, thickness: 24 µm
  - Protection grid transparency: 80%
- Measurement Range: 0 to 10000 c/s, 0 to 600 kcpm. Activity equivalent range depends on calibration emitter. Conversion coefficient is factory set with $^{60}$Co
- Dead Time: 50 µs
- Energy Range: SB-100/A: Beta > 50 keV, SB-100/B: Beta > 150 keV
- Gamma Sensitivity $^{137}$cs: < 25 c/s per µGy/h (15 kcpm per mR/h)
- Background:
  - Ambient ≤100 nSv/h (10 µR/h): < 4 c/s (< 24 cpm)
  - Alpha influence ($^{239}$Pu): SB-100/B < 1%, SB-100/A >33%

**MECHANICAL**
- Housing: Painted aluminum
- Dimensions: Length (with connector) x width (detector) x height: 12.3 x 3.7 x 3.3 in. (313 x 94 x 84 mm)
- Weight: 24 oz (670 g) without cable

## CSP Smart Contamination Probes



### SABG-15+™ Alpha/Beta/Gamma Probe

#### FEATURES

**NUCLEAR**
- Unit to Display: Depending on survey meter (c/s,Bq, Bq/cm$^2$ with IS units version survey meter and CPM, DPM, DPM/100 cm$^2$ with US version survey meter)
- Emitters: Alpha, beta and gamma
- Detector: Geiger-Mueller with halogen quench thin mica end window 1.8 to 2.0 mg/cm$^2$
  - Detection area: 15.5 cm$^2$
  - Protection grid transparency: 76%
- Measurement Range: 1 to 9999 c/s, 60 to 600 000 CPM (display: 0.1 to 9999 c/s, 0.1 CPM to 600 kCPM)
- Activity equivalent range depends on calibration emitter. Conversion coefficient is factory set with $^{60}$Co
- Gamma Sensitivity for $^{137}$Cs: 6.4 c/s per µGy/h (3840 CPM per mR/h)
- Dead Time: Detector = 50 µs, Probe = 50 µs
- Energy: Alpha > 2.6 MeV, Beta > 30 keV, Gamma > 5 keV

**MECHANICAL**
- Housing: ABS polycarbonate molded
- Dimensions: Length (with connector) x diameter (detector) x diameter (body): 8.1 x 2.8 x 1.7 in. (205 x 70 x 42 mm)
- Weight: 10.9 oz (310 g) without cable

### SPAB-15™ Alpha/Beta Probe

#### FEATURES

**NUCLEAR**
- Unit to Display: Depending on survey meter (c/s, Bq, Bq/cm$^2$ or CPM, DPM, DPM/100 cm$^2$)
- Emitters: Alpha and beta
- Detector: Silicon 1700 mm$^2$ PIPS® detector
  - Detection area: 15 cm$^2$
  - Protection grid transparency: 75%
- Measurement Range: 0 to 10 000 c/s, 0 to 600 kcpm. Activity equivalent range depends on calibration emitter. Conversion coefficients are factory set with $^{239}$Pu for alpha channel and with $^{60}$Co for beta channel
- Dead Time: 8 µs with digital saturation at 10 000 c/s
- Energy Range: Beta > 100 keV, Alpha > 3 MeV
- Gamma Sensitivity for $^{137}$Cs: 8 c/s per µGy/h (4800 cpm per mR/h)
- Background: Ambient ≤100 nSv/h (10 µR/h): Alpha < 0.01 c/s (< 0.6 cpm), Beta < 0.8 c/s (< 48 cpm)
- Cross Talk: Alpha to Beta ($^{239}$Pu) < 3%, Beta to Alpha ($^{90}$Sr-$^{90}$Y) = < 0.1%

**MECHANICAL**
- Housing: ABS polycarbonate molded
- Dimensions: Length (with connector) x diameter (detector) x diameter (body): 6.7 x 2.6 x 1.5 in. (170 x 66 x 38 mm)
- Weight: 9.9 oz (280 g) with protective cap and without cable

## Contamination and Dose-rate Survey Probes

continued



### SAB-32™ Alpha/Beta Probe

#### FEATURES

**NUCLEAR**

- Unit to Display: Depending on survey meter (c/s, Bq, Bq/cm$^2$ with SI CSP instrument and CPM, DPM, DPM/100 cm$^2$ with American CSP instruments)
- Emitters: Alpha and beta
- Detector: ZnS(Ag) adhered to 0.25 mm thick plastic scintillation material
  - Detection area: 32 cm$^2$ (total diameter = 70 mm, sensitive diameter = 64mm)
  - Mylar window made of two layers of 3 µm placed on detector entrance surface, total thickness: 6 µm
  - Protection grid transparency: 89%
- Measurement Range: 0 to 10,000 c/s, 0 to 600 kcpm. Activity equivalent range depends on calibration emitter. Conversion coefficient is factory set with $^{60}$Co for beta and $^{239}$Pu for alpha.
- Dead Time: 2 µs
- Energy Range: Beta > 150 keV, Alpha > 3 MeV.
- Gamma Sensitivity for $^{137}$Cs: Beta < 10 c/s/µSv/h; Alpha < 0.005 c/s/µSv/h
- Background: Ambient ≤100 nSv/h (10 µR/h): Alpha < 0.01 c/s (< 0.6 cpm), Beta < 1 c/s (< 60 cpm)

**MECHANICAL**

- Housing: Painted aluminum
- Dimensions: Length (with connector) x diameter (detector) x diameter (body): 225 x 85 x 55 mm (8.8 x 3.3 x 2.2 in.)
- Weight: 24 oz (680 g) without cable



### SAB-250™ Alpha/Beta Probe

#### FEATURES

**NUCLEAR**

- Unit to Display: Depending on survey meter - c/s, Bq, Bq/cm$^2$, cpm, dpm, dpm/100xcm$^2$
- Emitters: Alpha and beta
- Detector: ZnS(Ag) adhered to 0.25 mm thick plastic scintillation material
  - Detection area: 240 cm$^2$
  - Removable aluminized Mylar entrance window on metallic frame, thickness: 6 µm
  - Protection grid transparency: 83%
- Measurement Range: 0 to 7 000 c/s, 0 to 420 kcpm. Activity equivalent range depends on calibration emitter. Conversion coefficient is factory set with $^{60}$Co for beta and $^{239}$Pu for alpha.
- Dead Time: < 20 µs
- Energy Range: Beta > 150 keV, Alpha > 3 MeV.
- Gamma Sensitivity for $^{137}$Cs: Beta < 70 c/s per µGy/h; Alpha < 0.3 c/s per µGy/h
- Background: Ambient < 100 nGy/h (10 µR/h): Alpha < 0.01 c/s (< 0.6 cpm), Beta < 35 c/s (< 600 cpm)

**MECHANICAL**

- Housing: stainless steel
- Dimensions: 360 x 150 x 125 mm (14.2 x 5.9 x 4.9 in)
- Weight: < 1.2 kg (2.6 lb) without cable



### SAB-100™ Alpha/Beta Probe

#### FEATURES

**NUCLEAR**

- Unit to Display: Depending on survey meter (c/s, Bq, Bq/cm$^2$ or CPM, DPM, DPM/100 cm$^2$)
- Emitters: Alpha and beta
- Detector: ZnS(Ag) adhered to 0.5 mm thick plastic scintillation material
  - Detection area: 102 cm$^2$ (68 x 150 mm)
  - Removable aluminized Mylar entrance window on metallic frame, thickness: 6 µm
  - Protection grid transparency: 80%
- Measurement Range: 0 to 10000 c/s, 0 to 600 kcpm. Activity equivalent range depends on calibration emitter. Conversion coefficients are factory set with $^{239}$Pu for alpha channel and with $^{60}$Co for beta channel
- Dead Time: 50 µs
- Energy Range: Beta > 150 keV, Alpha > 3 MeV.
- Gamma Sensitivity for $^{137}$Cs: < 35 c/s per µGy/h
- Background: Ambient ≤ 100 nSv/h (10 µR/h): Alpha < 0.05 c/s (< 3.0 cpm), Beta < 6.0 c/s (< 360 cpm)
  - Sunlight effect: No effect up to 80000 lux.
  - Cross Talk: Alpha to Beta ($^{239}$Pu) < 15%, Beta to Alpha ($^{90}$Sr-$^{90}$Y) < 0.1%

**MECHANICAL**

- Housing: Painted aluminum
- Dimensions: Length (with connector) x width (detector) x height (detector): 12.3 x 3.7 x 3.3 in. (313 x 94 x 84 mm)
- Weight: 24 oz (670 g) without cable



### SABG-100™ Alpha/Beta/Gamma Probe

#### FEATURES

**NUCLEAR**

- Unit to Display: Depending on survey meter (c/s, Bq, Bq/cm$^2$ or CPM, DPM, DPM/100 cm$^2$)
- Emitters: Alpha and beta-gamma
- Detector: ZnS(Ag) adhered to 1.5 mm thick plastic scintillation material
  - Detection area: 102 cm$^2$ (68 x 150 mm)
  - Removable aluminized Mylar entrance window on metallic frame: 6 µm thick
  - Protection grid transparency: 80%
- Measurement Range: 0 to 10 000 c/s, 0 to 600 kcpm. Activity equivalent range depends on calibration emitter. Conversion coefficients are factory set with $^{239}$Pu for alpha channel and with $^{60}$Co for beta channel
- Dead Time: 8 µs
- Energy Range: Beta >150 keV, Alpha >3 MeV, Gamma >100 keV
- Gamma Sensitivity in Dose Rate for $^{137}$Cs: ≥65 c/s per µGy/h (39 kcpm per mR/h)
- Gamma Sensitivity in Activity: Sealed source positioned at 20 mm from the protection grid:

| Radionuclide | Gamma sensitivity in c/s per kBq |
|---|---|
| $^{137}$Cs | 2.7 |
| $^{60}$Co | 9.0 |
| $^{57}$Co | 1.4 |
| $^{241}$Am | 0.01 |

- Background: Ambient ≤100 nSv/h (10 µR/h): Alpha < 0.05 c/s (< 3.0 cpm), Beta < 10.0 c/s (< 600 cpm)
  - Sunlight effect: No effect up to 80 000 lux.
  - Cross Talk: Alpha to Beta ($^{239}$Pu) < 15%, Beta to Alpha ($^{90}$Sr-$^{90}$Y) < 0.1%

**MECHANICAL**

- Housing: Painted aluminum
- Dimensions: Length (with connector) x width (detector) x height: 12.3 x 3.7 x 3.3 in. (313 x 94 x 84 mm)
- Weight: 24 oz (670 g) without cable

## Contamination and Dose-rate Survey Probes

continued



The use of this probe with SAB-250 probe is a one Hand/One Foot system connected to the AVIOR-2 meter



Easy-Count unit can be used with the RDS-32 meter

### SABP-525™ Foot Alpha/Beta Probe

#### FEATURES

**NUCLEAR**
- Unit to Display: Depending on survey meter (c/s, Bq, Bq/cm² (depending on survey meter)
- Emitters: Alpha and beta
- Detector: Plastic scintillator 0.25 mm thick, covered by ZnS(Ag) for Alpha detection, mounted on a PMMA support 35 mm thick
    – Detection area: 525 cm²
    – Mylar window made of three layers of aluminized Mylar 0.4-0.45 mg/cm²
    – Protection grid transparency:
        • Internal protective thin grid 0.25 mm thick: 80 %.
        • External protective grid 3 mm thick: 91 %
- Measurement Range: 0 to 7 000 c/s, 0 to 420 kcpm. Activity equivalent range depends on calibration emitter. Conversion coefficients are factory set with $^{239}$Pu for alpha channel and with $^{60}$Co for beta channel. for beta and for alpha.
- Dead Time: < 20 µs
- Energy Range: Alpha > 3 MeV, Beta > 150 KeV
- Gamma Sensitivity for $^{137}$Cs: Alpha: < 0.3 c/s per µGy/h, Beta: < 150 c/s per µGy/h
- Background: Ambient ≤100 nSv/h (10 µR/h): Alpha < 0.1 c/s (< 6.0 cpm); Beta <20 c/s (<1200 cpm))

**MECHANICAL**
- Housing: Painted aluminum
- Dimensions: Length x width x height: 485 x 220 x 215 mm (19 x 8.6 x 8.5 in.).
- Weight: < 10 kg (22 lb) without cable

### EASY-COUNT™ Field Smear/Filter Counter

#### FEATURES

**NUCLEAR**
- Unit to Display: Depending on survey meter - CPM, DPM, DPM/100 cm², c /s, Bq$_{eq}$, Bq$_{eq}$ /cm²
- Emitters: Alpha and beta
- Detector: Silicon 1700 mm² PIPS detector
    – Detection area: 17 cm²
- Measurement Range: 0 to 10 000 c/s, 0 to 600 kcpm. Activity equivalent range depends on calibration emitter. Conversion coefficients are factory set with $^{239}$Pu for Alpha channel and with $^{60}$Co for Beta channel.
- Dead Time: 8 µs with digital saturation at 10 000 c/s
- Energy Range: Beta > 100 keV, Alpha > 3 MeV
- Gamma Sensitivity for $^{137}$Cs: 8 c /s per µGy/h (4800 cpm per mR /h)
- Background: Ambient ≤100 nSv/h (10 µR/h): Alpha <0.01 c/s (<0.6 cpm), Beta <0.8 c/s (<48 cpm)

**MECHANICAL**
- Housing: aluminium
- Dimensions: 23.4 x 17,8 x 33.7 cm (9.2 x 7.0 x 13.3 in.)
- Weight: 2.1 kg (4.62 lb) without meter

### SVHD(/W)™ Smart Very High Dose Probe

The SVHD(/W) probe delivers exceptional dose rate measurement capabilities — optimized for safe, precise navigation through challenging environments, ensuring reliable performance in nuclear decommissioning and underwater applications.

SVHD(/W) is available in two configurations designed for specific applications:
- SVHD/W for spent fuel inspection in pools: IP68 rated, waterproof up to 8 atmospheres in borated water.
- SVHD for dismantling and decommissioning tasks: IP64 rated with a small diameter of 11 mm to facilitate passage through shield plugs.

#### FEATURES

**Nuclear**
- Unit to Display: Sv/h, Sv or rem/h, rem (depending on connected meter); H*(10) ambient gamma dose rate equivalent (ICRP60)
- Emitter: Gamma
- Detector: Energy-compensated silicon diode
- Energy Range: −29% to +67% for gamma from 65 keV to 1.3 MeV (0° to ±45° per IEC 60846)
- Sensitivity: 22 c/s per mSv/h (137Cs) or 45 µSv/h/c/s
- Measurement Range: 1 mSv/h to 1000 Sv/h (100 mrem/h to 100,000 rem/h)
- Max Integrated Dose: 5 kSv (500 krem)
- Alarm Setpoints: 10 values per unit; stored in probe memory; configurable via CSPS or PC

**Mechanical**
- Detector Head:
    – SVHD/W: 117 mm (4.6 in) long, 17 mm (0.67 in) diameter, 60 g (2.12 oz)
    – SVHD: 101 mm (4 in) long, 11 mm (0.43 in) diameter, 40 g (1.4 oz)
- CSP Electronic Box: 98 × 64 × 38 mm (3.86 × 2.52 × 1.5 in)

**NEW**

Contamination and
Dose-rate Survey Probes

continued

## CSP Smart Contamination and Dose Equivalent Rate Probes

Each probe has a very specific design to match both the environmental parameters (fuel pool monitoring in water, remote dose-rate monitoring, public area monitoring) and the user protection requirement (distance from the measurement point). TTC-based probes feature Mirion's unique Time-To-Count design that offers a wide measurement range, a long detector live time and excellent measurement linearity with no fold-over effect. CSP dose-rate probes cover very low to very high dose-rates with sufficient overlap. All probes utilize energy compensated detectors and meet the latest ICRP requirements.

## CONTAMINATION CSP PROBES

### SX-2R™ X-Ray Probe

#### FEATURES
**NUCLEAR**
- Display Units: Depending on survey meter (c/s, Bq, Bq/cm$^2$ or CPM, DPM, DPM/100 cm$^2$)
- Emitters: X-ray and low energy Gamma
- Detector: NaI(Tl) 1.5 in. (38 mm) dia x 3 mm
  - Detection area: 8 cm$^2$
  - Beryllium entrance window 37 mg/cm$^2$, thickness: 0.2 mm
- Measurement Range: 0 to 10 000 c/s, 0 to 600 kcpm. Activity equivalent range depends on calibration emitter. Conversion coefficient is factory set with $^{129}$I
- Dead Time: 50 µs
- Energy Range: 5 keV to 200 keV
- Gamma Sensitivity for $^{137}$Cs: 160 c/s per µGy/h (96 kcpm per mR/h)
- Background: Ambient ≤100 nSv/h (10 µR/h): <12 c/s (< 720 cpm)

**MECHANICAL**
- Housing: Painted aluminum
- Dimensions: Length (with connector) x diameter: 8.9 x 2.3 in. (225 x 59 mm)
- Weight: 21 oz (590 g) without cable

### SG-1R™ Gamma Probe

#### FEATURES
**NUCLEAR**
- Unit to Display: Depending on survey meter (c/s, Sv$_{eq}$, Sv$_{eq}$/h or CPS, R, R/h)
- Emitters: Gamma and X
- Detector: NaI(Tl) scintillator 1" x 1"
- Measurement Range: 0 to 200 µSv/h (0 to 20 mR/h); 0 to 55 kc/s (0 to 3300 kcpm)
- Energy Range: 40 keV to 1.5 MeV
- Gamma Sensitivity for $^{137}$Cs: 291 c/s per µGy/h (174.6 kcpm per mR/h)
- Dead Time: 50 µs
- Background: Ambient ≤100 nSv/h (10 µR/h): 25 c/s – 1500 CPM

**MECHANICAL**
- Housing: Painted aluminum
- Dimensions: Length (with connector) x diameter: 9.2 x 2.2 in. maximum (233 x 55 mm)
- Weight: 18 oz (520 g) without cable

### SG-2R™ Gamma Probe

#### FEATURES
**NUCLEAR**
- Unit to Display: Depending on survey meter (c/s, Sv$_{eq}$, Sv$_{eq}$/h or CPS, R, R/h)
- Emitters: Gamma and X
- Detector: NaI(Tl) scintillator 2" x 2"
- Measurement Range: 0 to 50 µSv/h (0 to 5 mR/h); 0 to 90 kc/s (0 to 5400 kcpm)
- Energy Range: 40 keV to 1.5 MeV
- Gamma Sensitivity for $^{137}$Cs: 1501 c/s per µGy/h (900.6 kcpm per mR/h)
- Dead Time: 50 µs
- Background: Ambient ≤100 nSv/h (10 µR/h): 120 c/s – 7200 CPM

**MECHANICAL**
- Housing: Painted aluminum
- Dimensions: Length (with connector) x diameter: 10.4 x 2.6 in. (263 x 66 mm maximum)
- Weight: 35 oz (1000 g) without cable

### SN-S™ Neutron Search Probe

#### FEATURES
**NUCLEAR**
- Display Units: CPS
- Display Range: 0.0 cps to 20 Kcps
- Emitters: Neutron
- Detector: PEHD Moderated $^3$He detector
- MDA: $^{252}$Cf neutron source of 20 000 n/s at 25 cm is detected in 2 s 950 times out of 1000, with 0.03 cps background
- Measurement Range: 0 cps to 20 Kcps
- Energy Range: 0.025 eV to 4 MeV
- Sensitivity:
  - 1.6 cps per µSv/h ($^{252}$Cf). i.e. 2.1 c/s per n.cm$^{-2}$.s$^{-1}$ ($^{252}$Cf at one meter distance from the source)
  - 2.3 cps per µSv/h ($^{252}$Cf).  i.e. 2.7 cps per n.cm$^{-2}$.s$^{-1}$ ($^{252}$Cf at two meters distance from the source)

**MECHANICAL**
- Probe Housing: Aluminium and PEHD
- Length: 13.54 in. (340 mm)
- Diameter: 0.98 in. (85 mm)
- Weight: 2.93 lb (1.33 kg)

Contamination and
Dose-rate Survey Probes
continued

## DOSE EQUIVALENT RATE CSP PROBES



### STTC™ Wide Range Gamma Probe

**FEATURES**

**NUCLEAR**
- Display Units: Sv/h, Sv or rem, rem/h depending on meter connected; H*(10) ambient gamma dose equivalent rate (according to ICRP60)
- Emitters: Gamma
- Detector: Energy Compensated Geiger Mueller
- Sensitivity: 0.74 c/s for μSv/h ($^{137}$Cs)
- Measurement Range: 0.1 μSv/h to 10 Sv/h (10 μrem/h to 1000 rem/h)
- IEC Approved Range: 0.7 μSv/h to 10 Sv/h (70 μrem/h to 1000 rem/h)
- IEC Energy Range: Gamma 36 keV to 1.5 MeV
- Background: Ambient < 0.1 μGy/h (10 μR/h), 0.10 c/s
- Maximum Integrated Dose: Approximately 500 Sv

**MECHANICAL**
- Housing: Aluminum
- Dimensions (without connector): 6.38 in. x 1.77 in. (162 x 45 mm) (L x D)
- Weight (STTC): 0.3 lb (130 g), without cable
- STTC/W variation with IP68 rating to 25 meters. It includes a 20 meter cable on a reel and a ballast.



SVHD(/W) probe

### SVLD™ Very Low Dose Rate Probe

**FEATURES**

**NUCLEAR**
- Display Units: Sv/h, Sv or rem/h, rem depending on meter connected, H*(10) ambient gamma doserate equivalent according to ICRP60
- Emitters: Gamma
- Detector: Energy compensated CsI(Tl) scintillator
- Sensitivity: 70 c/s per μSv/h ($^{137}$Cs)
- Measurement Range: 10 nSv/h to 1 mSv/h (1 μrem/h to 100 mrem/h)
- IEC Approved Range: 100 nSv/h to 1 mSv/h (10 μrem/h to 100 mrem/h)
- IEC Energy Range: Within ±40% for Gamma from 59 keV to 1.5 MeV
- Background: Ambient ≤100 nGy/h (10 μR/h): <5 c/s (<300 cpm), typical = 3 c/s

**MECHANICAL**
- Housing: Machined Delrin
- Dimensions: Length (with connector) x width x height: 4.11 x 3.14 x 1 in. (104.4 x 80 x 26 mm)
- Connector: Lockable waterproof Fisher type
- Weight: 6.24 oz (177 g) without cable



### SN-D-2™ Neutron Dose Probe

**FEATURES**

**NUCLEAR**
- Display Units: Sv/h, Sv, rem/h, rem
- Emitters: Neutron
- Detector: $^3$He filled tube 16NH8NC (8 atm) with 1 mm Cadmium wrap and 200 mm PEHD moderating sphere
- Sensitivity: 0.3 c/s per μSv/h (Cf-252)
- Measurement Range: 10 nSv/h to 1 mSv/h (1 μrem/h to 100 mrem/h)
- Energy Range: 0.025 eV to 15 MeV within IEC61005-2014 tolerances
- Dead Time: < 8 μs
- Gamma Sensitivity: Gamma Rejection > 103
- Background: Ambient ≤ 100 nGy/h (10 μR/h): < 0.05 c/s (< 3.0 cpm)

**MECHANICAL**
- Housing: Painted aluminium
- Dimensions: Sphere dia x height (without survey meter): 200 x 330 mm (7.9 x 13 in)
- Weight: < 5.9 kg (12.6 lb) without meter

# Contamination and Clearance

## OBJECT MONITORS

A nuclear facility is not unlike any other industrial environment, where routine work takes place on a regular basis, including tools, paperwork, and computers coming in and out of a Radiologically Controlled Area (RCA). The screening process often involves the painstaking task of checking the object with a handheld survey instrument, ultimately causing the worker delays exiting the area. An automated tool and object monitor can expedite this process by providing a fast, accurate screening, allowing those instruments that do not test positive to bypass the more labor-intensive frisking process with survey meters.

## PERSONNEL MONITORS

Ensuring that personnel exiting an RCA are clear of any radioactive contamination is one of the primary goals of any contamination monitoring program. Due to the sheer number of workers coming and going, personnel movement is one of the easiest means to spread contamination from inside a controlled area to the general public. Contamination screening is also a key step in ensuring that workers' radiological exposure and possible health effects are kept to a minimum. While detection accuracy is a key concern, rapid worker throughput is also critical to avoid excessive wait times and the temptation for workers to skip steps just to get home sooner.

Argos
Whole Body
Contamination
Monitors

## WASTE MONITORS

Waste monitors provide a method of quickly processing large containers or items and identifying any radioactive material that may be present before off-site release. Process knowledge or laboratory analysis of the isotopic inventory of a particular waste stream can be utilized to provide scaling factors for pure alpha and beta emitting nuclides which cannot be measured directly.

## VEHICLE MONITORS

A nuclear facility is obligated to ensure that there is no uncontrolled release of radioactive material to the general public, including radiological contamination due to vehicles and cargo containers that pass into and out of the plant on a regular basis. Any vehicles exiting the Protected Area need to be quickly and effectively screened for the presence of radioactive materials or contamination before leaving the facility.

FastTrack-Vehicle
(FTV) monitors

# Personnel Monitors

## Argos™ Family Whole Body Surface Contamination Monitors

Argos monitors are available in gas-flow Alpha/Beta; gasless Beta, Alpha/Beta; or Beta/Gamma versions as part of our TPS family and with 18 or 25 detectors. The detectors may be upgraded (gas to TPS or TPS to gas) in the Argos-3/5 systems manufactured since February 2008.

### COMMON FEATURES

- Contoured monitor design reduces body-to-detector distance to one inch on the average person
- Minimal gaps between detectors for smaller dead zones
- Virtual detector sum zones for enhanced coverage

- Common software platform simplifies training and support
- Efficient, front access, space-saving design minimizes overall clearance requirements and simplifies maintenance

- Built-in computer with Windows embedded operating system and LAN/USB capability for easy system management
- Solid state drive for improved reliability
- Compliant with IEC61098 Standard requirements



**Automatic Ultraviolet C (UVC) Disinfection Option for Argos-3/-5 Whole Body Contamination Monitors**

**Argos-3/5 Gas Detector**

**Argos-3/5 TPS Detector**

### Gas-Flow versus TPS

**Gas-Flow**
Triple Zone detector

Triple Zone

#### GAS-FLOW SYSTEM BENEFITS

- The best efficiency and Minimum Detectable Activity for the shortest count times
- Exceptional detection capability resulting from patented* triple zone detector design
- A variety of gas mixtures can be used, including: P-5, P-7.5, P-10 and $Ar/CO_2$
- Uniform response across detector face

  * Patent US 7,470,913 B1 High Efficiency and High Homogeneity Large-Area Gas-Filled Detectors

**TPS**
Single Zone detector

Single Zone

#### TPS SYSTEM BENEFITS

- Gas-free - no cost or worry associated with handling gas
- $\alpha/\beta$, $\beta/\gamma$ or $\beta$ monitoring with discrimination between radiation types
- Reduced count time even in high $\gamma$ background environment compared to other gasless detectors

## Argos™-5 Monitor

**Argos-5 Configuration**
**25** Detectors



**Argos™-5AB Gas-Flow**
Whole Body Contamination Monitors for $\alpha/\beta$ Detection

**Argos™-5PB Gasless**
Whole Body Contamination Monitors for $\beta$ Detection

**Argos™-5PBG Gasless**
Whole Body Contamination Monitors for $\beta/\gamma$ Detection

**Argos™-5PAB Gasless**
Whole Body Contamination Monitors for $\alpha/\beta$ Detection

### GAS-FLOW SYSTEM MODEL

- **7061780** Argos-5AB, 2-Step Whole Body Monitor
  - Twenty-five (25) triple-zone Model LFP-579, 579 cm², low flow proportional detectors
  - Dual channels for simultaneous and independent alpha and beta counting and alarm levels

### GASLESS (TPS FAMILY) MODELS

- **818001** Argos-5PB, 2-Step Whole Body Monitor
  - Twenty-five (25) Model TPS-B-579 TPS Plastic Scintillator detectors, 579 cm²
- **Argos-5PBG\***, 2-Step Whole Body Monitor
  - Twenty-five (25) Model TPS-BG-579 TPS Plastic Scintillator detectors, 579 cm²
- **Argos-5PAB**, 2-Step Whole Body Monitor
  - Twenty-five (25) Model TPS-AB-579 TPS Plastic Scintillator detectors, 579 cm²

  \* — Requires CURTAINPB Front Curtain Lead Kit

## Argos™-3 Monitor

**Argos-3 Configuration**
**18** Detectors



**Argos™-3AB Gas-Flow**
Whole Body Contamination Monitors for $\alpha/\beta$ Detection

**Argos™-3PB Gasless**
Whole Body Contamination Monitors for $\beta$ Detection

**Argos™-3PBG Gasless**
Whole Body Contamination Monitors for $\beta/\gamma$ Detection

**Argos™-3PAB Gasless**
Whole Body Contamination Monitors for $\alpha/\beta$ Detection

### GAS-FLOW SYSTEM MODEL

- **7062322** Argos-3AB, 2-Step Whole Body Monitor
  - Eighteen (18) triple-zone Model LFP-579, 579 cm², low flow proportional detectors
  - Dual channels for simultaneous and independent alpha and beta counting and alarm levels

### GASLESS (TPS FAMILY) MODELS

- **7062324** Argos-3PB, 2-Step Whole Body Monitor
  - Eighteen (18) Model TPS-B-579 Thin Plastic Scintillator detectors, 579 cm²
- **Argos-3PBG\***, 2-Step Whole Body Monitor
  - Eighteen (18) Model TPS-BG-579 Thin Plastic Scintillator detectors, 579 cm²
- **Argos-3PAB**, 2-Step Whole Body Monitor
  - Eighteen (18) Model TPS-AB-579 Thin Plastic Scintillator detectors, 579 cm²

### INTEGRATED DOSIMETRY & CONTAMINATION SYSTEMS

Learn how the Argos and Sirius systems work with Mirion personal dosimetry solutions for a holistic approach to identify sources or areas of potential contamination at Radiologically Controlled Area (RCA) exits.

## Personnel Monitors
continued



Argos-3 Compact Monitor

**NEW**



Argos-3 Modular Monitor

### Argos™-3 Compact & Modular Body Contamination Monitors

The Argos-3 Compact and Argos-3 Modular Monitors offer reliable contamination control in radiologically controlled areas. The Compact model, with its space-saving design and optional casters, is perfect for size-constrained locations and temporary checkpoints, while the Modular model provides customizable configurations for diverse facility needs. The new Argos-3 Modular monitor is designed for mobility, enabling quick assembly or disassembly into subcomponents for easy transport and storage. Assembly takes only about 15 minutes.

#### AVAILABLE IN SEVEN VERSIONS

- **Argos-3AB Compact or Modular** is equipped with our most advanced LFP-579 gas flow detectors optimized for the best possible alpha and beta response.
- **Argos-3PB Compact or Modular** is equipped with TPS-B-579 thin plastic scintillation detectors for measurement of beta contamination with no need for a gas-supply.
- **Argos-3PAB Compact or Modular** is equipped with TPS-AB-579 thin plastic scintillation detectors with state-of-the-art gas-free alpha and beta detection capability (with discrimination).
- **Argos-3PBG Compact or Modular** is equipped with TPS-BG-579 plastic scintillation detectors featuring a unique gas-free beta and gamma detection capability (with discrimination).

These monitors include 15 (Compact) and 19 (Modular) detectors by default, arranged to minimize dead space and provide optimal contour geometry and coverage for body, head, legs, arms, hands and feet of the occupant. The Compact model can be upgraded in the field with additional detectors (up to 24 in total), while the Modular model offers customizable configurations and can be equipped with up to 24 detectors initially. Both models use a sophisticated "fast following" background trending and release-limit algorithm for optimal performance in stable or varying radiation fields.

#### FEATURES

**OPERATIONAL**
- 8" touch screen display (detachable in Modular monitor)
- Featuring the identical comprehensive monitor software platform used on the other Argos-3/5, Sirius™-5, Cronos®-1/4/11 and GEM™-5 contamination monitors

**OPTIONS**
- ID readers
- Additional detectors (up to a total of 24)
- Frisker
- Local database support
- Top of shoe detector (gamma)
- Keyboard Options

**MECHANICAL**
- Dimensions:
  - Compact: 78.2 x 218.5 x 84.5 cm (30.8 x 86 x 33,3 in.)
  - Modular: 78.8 x 203.0 x 61.0 cm (31.0 x 79.9 x 24.0 in.)
- Weight (depending on configuration):
  - Compact: ~ 180-220 kg (400-485 lb)
  - Modular: ~ 120 kg (260 lb)
- Optional casters/wheels (Compact); optional transportation case(s) (Modular)

### GEM™-5 Gamma Exit Monitor

**Mirion's highly sensitive GEM-5 gamma exit monitor provides power plants and nuclear facilities the very latest gamma detection capability to monitor pedestrians leaving areas of potential radioactive contamination.** Operation of the monitor is straightforward and reliability is assured with both audible and visual aids to support monitoring activities. The easy to view color LCD screen provides visual cues and readily displays contaminated areas. Additionally, users are guided through the monitor with a voice annunciator, which provides clear voice prompts necessary for dependable unassisted operation during normal conditions. Access to the installed computer is through a single convenient panel on the front of the monitor. The computer includes built-in USB and LAN ports, and is located inside a lockable door. The GEM-5 monitor is rugged, reliable and extremely easy to use.

#### FEATURES

**DIMENSIONS**
- Cabinet:
  - Exterior: 88.4 x 35 x 30 in. (224.8 x 88.9 x 76.2 cm) (H§ x W x D)
  - Portal Opening: 80.9 x 24 x 30 in. (205.4 x 61.0 x 76.2 cm) (H x W x D)
- Model Weight:
  - Weight Without Lead Installed: 995 lb (452.5 kg)
  - Weight With One Layer Of Side Detector Lead Shielding Installed: 2145 lb (975 kg)
  - Weight With Two Layers Of Side Detector Lead Shielding Installed: 3295 lb (1497.5 kg)

**ENVIRONMENTAL**
- Temperature Range:
  - Operating Temperature (meets IEC61098): 0 to 40 °C (32 to 104 °F)
  - Storage: 0 to 50 °C (32 to 122 °F)
- Relative Humidity:
  - Operating Temperature (per IEC61098): ≤85% non-condensing at 35 °C (95 °F) maximum
  - Storage: ≤95% non-condensing
- Power Requirements:
  - 220 V ac/50 Hz/ 1.0 A or 110 V ac/60 Hz/2.0 A mains ~10 ft (3 m) IEC standard cable (supplied; specify voltage and any special cable requirements on order; contact local Mirion affiliate for further information)

**POWER CONSUMPTION**
- Standard: 110 VA and With Door /Barrier Option: 200 VA (If installed)

**CERTIFICATIONS**
- IEC 61098 compliant
- ISO 11929:2010 compliant





Widths available up to 100 cm

## Personnel Monitors
continued

### HandFoot-Fibre™ XL Hand, Foot, Clothing Monitor (Gas-less)

**The HandFoot-Fibre XL unit is used in circumstances which do not require a full body monitor.** It is well-suited for mobile contamination screening inside controlled areas or in temporary controlled areas. The monitor is based on state-of-the-art Mirion BetaFibre™ detectors which feature an outstanding measurement sensitivity and uniformity – for a fast and reliable measurement process even in conditions with high, fluctuating background. A medical version that has a higher sensitivity to lower energy isotopes is also available.

#### FEATURES

**NUCLEAR**
- Detectors: Eight scintillation fiber
- Short measurement time

**OPERATIONAL**
- Display: Touch screen for configuration and data display
- Audio and visual alarms

**MECHANICAL**
- Housing: Wheels for easy transport
- Dimensions:
  - Height: 65.4 in. (1660 mm)
  - Width: 18.2 in. (478 mm)
  - Depth: 29.5 in. (750 mm)
- Weight: 125.7 lb (57 kg)
- 100% gas-free
- Detachable probe, e.g., for monitoring of clothes

### HandFoot-Fibre™ XL A+ Hand, Foot, Clothing with Alpha Monitor

**The HandFoot-Fibre XL A+ unit is the next evolutionary step of the proven HFF XL.** Utilizing slightly different detectors than the original fiber detectors. Mirion has now made it possible to not only detect beta but alpha radiation in a gasless monitor while still providing short count times. This monitor is ideal for those locations where alpha detection is required but use of a gas bottle is not an option.

#### FEATURES

**NUCLEAR**
- Detectors: Eight scintillation fiber
- Short measurement times
- Alpha / Beta discrimination

**OPERATIONAL**
- Display: Touch screen for configuration and data display
- Audio and visual alarms

**MECHANICAL**
- Housing: Wheels for easy transport
- Dimensions:
  - Height: 65.4 in. (1660 mm)
  - Width: 18.2 in. (478 mm)
  - Depth: 29.5 in. (750 mm)
- Weight: 125.7 lb (57 kg)
- 100% gas-free
- Detachable probe, e.g., for monitoring of clothes

### Sirius™-5 Compact Hand, Cuff and Foot Surface Contamination Monitor

**NEW**

**The Sirius-5 Compact monitor provides thorough and reliable detection of external contamination on the hands and feet of personnel working in nuclear environments.** Depending on your monitoring needs, Sirius monitors are designed to use either plastic scintillator (TPS) gasless detectors or patented* gas flow proportional detectors (LFP-579). The Sirius-5 Compact Hand, Cuff and Foot monitor meets the need for a robust, industrial-strength contamination control product. It is designed for the high-throughput, demanding applications found in the nuclear industry – nuclear power plants, fuel cycle facilities, nuclear waste facilities and D&D operations.

α β **Sirius-5AB Compact hand/cuff/foot monitor for alpha/beta contamination:**
- Six (6) large area low flow gas proportional LFP-579 detectors
- 1 step process for hands

β **Sirius-5PB Compact hand/cuff/foot monitor for beta contamination:**
- Six (6) large area gasless TPS detectors
- 1 step process for hands

β γ **Sirius-5PBG Compact hand/cuff/foot monitor for beta/gamma contamination:**
- Six (6) large area gasless TPS detectors
- 1 step process for hands

α β **Sirius-5PAB Compact hand/cuff/foot monitor for alpha/beta contamination:**
- Six (6) large area gasless TPS detectors
- 1 step process for hands

#### FEATURES

**MECHANICAL**
- Cabinet:
  - Steel with rugged powder coat finish for column and top, stainless steel base and foot pan cover provide for ease of decontamination and minimum maintenance
  - Dimensions for any of the Sirius-5 models is approximately: 33.5 x 70.6 x 36.2 in. ( 78.0 x 179.3 x 91.9 cm) (W x H x D)
  - Approximate weights are (with no options installed)

- Model Weight:
  - Sirius-5AB 275.0 lb (125.0 kg)
  - Sirius-5PB/PAB/PBG 298.8 lb (135.8 kg)

**ENVIRONMENTAL**
- Temperature Range:
  - Operating Temperature (meets IEC 61098): 0-40 °C (32-104 °F)
  - Storage: 0-50 °C (32-122 °F)
- Relative Humidity:
  - Operating (per IEC 61098): ≤85% non-condensing at 35 °C (95 °F) maximum
  - Storage: ≤95% non-condensing

- Power Requirements:
  - 220 V ac/50 Hz/1.0 A or 110 V ac/60 Hz/2.0 A mains ~10 ft (3 m). IEC standard cable (supplied; other cables are available; specify special cable requirements; contact local Mirion affiliate) for further information

**POWER CONSUMPTION**
- 110 VA

**CERTIFICATIONS**
- IEC 61098 compliant
- ISO 11929:2010 compliant

\* Patent US 7,470,913 B1 High Efficiency and High Homogeneity Large-Area Gas-Filled Detectors

# Object Monitors

## Cronos® Gamma Object/Tool Contamination Monitors

**The Cronos-1PBG Beta/Gamma Object/Tool Monitor** is an extremely sensitive instrument to detect beta and gamma emitting radioactive contamination on small objects such as notebooks, keys, tools, hard hats, and other items which can be placed in the counting chamber. Short count times and high efficiency make the Cronos-1PBG monitor, the ideal tool for the implementation of the "Empty Pocket" policy in your facility.



**43 LITERS**

## Cronos®-1PBG Beta/Gamma Object/Tool Monitor

**The Cronos Gamma Object / Tool Monitors** are extremely sensitive instruments used to detect radioactivity from small articles such as notebooks, keys, tools, hard hats, and other miscellaneous objects to detecting gamma radiation in/on articles such as waste bags, tools, briefcases, hard hats, and other miscellaneous objects. Measurements which ensure that objects have no detectable radioactivity can result in significant cost savings in waste processing and/or storage.

### FEATURES

**NUCLEAR**
- Twelve 14.6 x 6.7 x 2.3 in. (37.2 x 17.0 x 5.8 cm) thin plastic scintillation (TPS-BG-579) detectors with built-in photomultiplier tubes.
- Total detector volume 23.4 L (0.83 cu.ft)

**OPERATIONAL**
- Display Screen: 10.4 in. (~264 mm) touch screen LCD display integrated in top of unit (second display kit optionally available for exit side)

**ELECTRICAL**
- 220 V ac / 50 Hz / 1.0 A or 110 V AC / 60 Hz / 2.0 A mains
- Maximum power consumption is 95 VA
- ~10 ft (3 m) IEC standard power cable supplied

**MECHANICAL**
- Unit with No Lead: 600 lb (272 kg)





| Cronos-1 Gamma Object/Tool Monitor | Cronos-4 Gamma Object/Tool Monitor | Cronos-11 Gamma Object/Tool Monitor |
|---|---|---|
| **43 LITERS** | **129 LITERS** | **345 LITERS** |

### FEATURES

| | | Cronos-1 Monitor | | Cronos-4 Monitor | Cronos-11 Monitor |
|---|---|---|---|---|---|
| **Radiological:** Time to reach MDA | Calculated count times for MDA = 83 Bq (5000 dpm) 80 nSv/h background, 1" lead shielding, $\alpha$ = 0.15% and 1-$\beta$ = 97.5% confidence intervals. | 6 Detector Configuration<br>For $^{137}$Cs: 24 seconds<br>For $^{60}$Co: 6 seconds | 4 Detector Configuration<br>For $^{137}$Cs: 35 seconds<br>For $^{60}$Co: 9 seconds | 6 Detector Configuration<br>For $^{137}$Cs: 48 seconds<br>For $^{60}$Co: 10 seconds | 6 Detector Configuration<br>For $^{137}$Cs: 130 seconds<br>For $^{60}$Co: 22 seconds |
| Detectors | | • For doors and main unit: six 38.7 x 33.2 x 5.1 cm (15 x 13 x 2 in.) plastic scintillators with built-in photomultiplier tubes.<br>• Detector volume for main unit detectors (four total) 25.5 L (0.90 cu. ft.).<br>• Detector volume for main unit and Optional door detectors (six total) 38.2 L (1.4 cu. ft). | | • For doors and main unit: six 45.7 x 45.7 x 5.1 cm (18 x 18 x 2 in.) plastic scintillators with built-in photomultiplier tubes.<br>• 65.1 L (2.3 cu. ft) total detector volume. | • For doors: two 61 x 61 x 5.1 cm (24 x 24 x 2 in.) plastic scintillators with built-in photomultiplier tubes.<br>• For main unit: four 61 x 74.9 x 5.1 cm (24 x 29.5 x 2 in.), plastic scintillators with built-in photomultiplier tubes.<br>• 130.5 L (4.6 cu. ft) total detector volume. |
| **Mechanical:** Internal Dimensions | Width x Depth x Height | 34.1 cm (13.4 in.) x 36.5 cm (14.4 in.) x 34.5 cm (13.6 in.) | | 46.5 cm (18.3 in.) x 57.9 cm (22.8 in.) x 47.8 cm (18.8 in.) | 63.5 cm (25.0 in.) x 87.2 cm (34.3 in.) x 62.4 cm (24.6 in.) |
| | Internal Volume | ~42.9 L (1.5 cu. ft) | | ~128.7 L (4.5 cu. ft) | ~345.5L (12.2 cu. ft) |
| | Overall Width | 60.0 cm (23.6 in.) | | 73.2 cm (28.8 in.) | 88.4 cm (34.8 in.) |
| | Overall Depth | 73.1 cm (28.8 in.) for body and door handles | | 95.2 cm (37.5 in.) for body and door handles | 124.4 cm (49.0 in.) for body and door handles |
| | Overall Height (Flush with bottom of casters or flush with bottom of the leveling feet) | With Standard Leveling Feet 96.3 cm (37.9 in.) | With Optional Casters 100.4 cm (39.5 in.) | 129.1 cm (50.8 in.) | 145.7 cm (57.4 in.) |
| | Door Thickness | 7.0 cm (2.7 in.) | | 7.0 cm (2.7 in.) | 7.0 cm (2.7 in.) |
| Weight | Unit with No Lead | 260 kg (573 lb) | | 445 kg (981 lb) | 563 kg (1241 lb) |
| | Lead (1 layer) | 416 kg (917 lb) | | 751 kg (1656 lb) | 1264 kg (2787 lb) |
| | Lead (2 layers) | 832 kg (1834 lb) | | 1503 kg (3314 lb) | 2529 kg (5575 lb) |
| | Total (with 1 layer of lead) | 683 kg (1506 lb) | | 1207 kg (2661 lb) | 1841 kg (4059 lb) |
| | Total (with 2 layers of lead) | 1099 kg (2423 lb) | | 1958 kg (4317 lb) | 3105 kg (6845 lb) |
| **Power Requirements:** | | 220 V ac/50 Hz/1 Amp or 110 V ac/60 Hz/2 Amp mains 3 m (~10 ft) IEC standard cable (supplied; specify and special cable requirements on order). | | | |
| **Certification:** | | IEC 61098 compliant and ISO 11929:2010 compliant. | | | |
| **Environmental:** Temperature | | Operating temperature range 0 to +45 °C (+32 to +113 °F). | | | |
| Humidity | | 85% non-condensing. | | | |

# Waste Monitors



## RTM662-300 Clearance Monitor (CGO-Smart™ LNC)

The RTM662-300 monitor is designed for clearance measurements of average sized items like waste bags, toolboxes or 100 liters drums. It consists of a measurement chamber with a manually operated swing door. Objects are detected and weighed by integrated scales and checked for gamma radiation by 6 state-of-the-art plastic scintillation detectors with spectroscopic read-out.

### FEATURES

**NUCLEAR**
- 6 large-volume plastic scintillation detectors – total active volume: 113.4 liters
- Spectrometric read-out with 256 channels
- Lower energy threshold: 80 keV
- Measurable activity range: 10 Bq to 1 000 000 Bq

**OPERATIONS**
- Embedded industrial PC

**ELECTRICAL**
- Operating voltage: 110-230 V, 50-60 Hz
- Nominal current : 5 / 3

**MECHANICAL**
- Housing: Double/single-sided, manual doors operation
- Automatic item detection by weight scale, still-camera in measuring chamber
  - 2- 10" color touchscreens, remote control station optional
  - Visual, audible contamination alarm

**Dimensions:**
- Chamber: 60.8 x 60.1 x 84 cm³ (307 L)
- Ext. chassis: 109.9 x 91.2 x 154.1 cm³ (95.0 x 89.9 x 154.1 cm without cladding, handles)
- Maximum Weight Scale: 150kg, 0.1 kg resolution10" touch screens
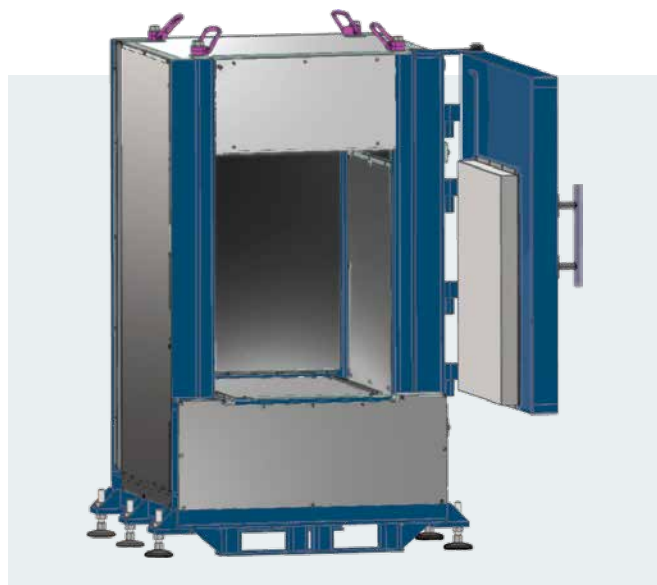


## RTM661/440™ Large Object Monitor

The RTM662-460 is an advanced clearance monitor for large objects like large waste bags, crates or drums. It consists of a measurement chamber with a manually operated swing door. Objects are detected and weighed by integrated scales and checked for gamma radiation by 6 state-of-the-art plastic scintillation detectors with spectroscopic read-out.

### FEATURES

**NUCLEAR**
- 6 large-volume plastic scintillation detectors – total active volume: 113.4 liters
- Spectrometric read-out, 256 channels
- Lower energy threshold: 80 keV
- Measurable activity range: 10 Bq to 1,000,000 Bq

**OPERATIONS**
- Automatic object detection by weight scale
- Optional software-controlled cameras
- Remote user interface with color screen, keyboard and pointing device
- Visual and audible contamination alarm
- Report and label printing, optional barcode reader, user-configurable PDF report generator

**ELECTRICAL**
- Operating voltage: 110-230 V, 50-60 Hz
- Nominal current 5 / 3 A

**MECHANICAL**
- Chamber: 70 x 70 x 95 cm³, 460 liters
- Ext. chassis dimensions: 115 x 158 x 235 cm³
- Built-in weight scale, maximum 500kg, 0.1 kg resolution
- 25 mm, 50 mm or 75 mm lead shielding, transportable by crane or forklift with shielding installed



## RTM662-460C Clearance Monitor

The RTM662-460C is an advanced clearance monitor for large objects including 200-liter drums or other large items like waste bags. It consists of a measurement chamber with motor-operated swing doors and automatic chain conveyor system. The measurement objects are weighed by integrated scales and checked for gamma radiation by 6 state-of-the-art plastic scintillation detectors with spectroscopic read-out.

### FEATURES

**NUCLEAR**
- 6 large-volume plastic scintillation detectors – total active volume: 113.4 liters
- Spectrometric read-out with 256 channels
- Lower energy threshold: 80 keV
- Measurable activity range: 10 Bq to 1,000,000 Bq

**OPERATIONAL**
- Single door with chain conveyor, motorized operation with PLC
- Up to 2 still cameras, triggered by position sensors
- Automatic object loading, integrated in measurement software, object detection by weight scale
- Remote user interface with color screen, keyboard and pointing device
- Visual and audible contamination alarm
- Report and label printing, optional barcode-reader, user-configurable PDF report generator

**MECHANICAL**
- Chamber: 70 x 70 x 95 cm³, 460 liters
- External dimensions: 115 x 158 x 235 cm³
- Conveyor: length 250 cm, max. object diameter 63 cm
- Built-in weight scale, maximum 500 kg, 0.1 kg resolution
- 50 to 75 mm lead shielding, in-field installation possible from the outside, transportable by crane or forklift with shielding installed
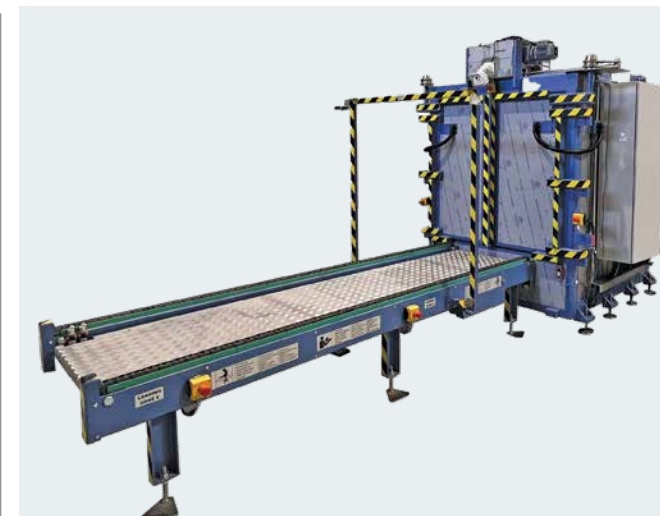


## RTM644-Smart™ Large Clearance Monitor

The RTM644-Smart is the most advanced clearance monitor and key monitoring equipment for every major clearance campaign — designed for measurements of large items like EPAL crates, 400- or 200-liter drums, palettes or big-bags with a measurement chamber size of 1870 liters. It consists of a measurement chamber with motor-operated swing doors and automatic chain conveyor system. The measurement objects are weighed by integrated scales and checked for gamma radiation by 24 state-of-the-art plastic scintillation detectors with spectroscopic read-out.

### FEATURES

**NUCLEAR**
- 24 large-volume plastic scintillation detectors – total active volume: 303 liters
- Spectrometric read-out with 256 channels
- Lower energy threshold: 80 keV
- Measurable activity range: 10 Bq to 1,000,000 Bq

**OPERATIONAL**
- Single/double doors, single/double chain conveyors, motorized operation with PLC
- Automatic object loading, integrated in measurement software, object detection by the weight scale
- Up to 2 still cameras, triggered by position sensors
- Remote user interface with color screen, keyboard and pointing device, single RJ45 cable connection
- Report and label printing, optional barcode-reader user-configurable PDF report generator

**MECHANICAL**
- Chamber: 138 x 112 x 121 cm³, 1870 liters
- Ext. chassis dimensions: 191 x 186 x 229 cm³
- Conveyor: default length 300 cm
- Built-in weight scale, maximum 1000kg, 0.1 kg resolution
- 50 or 75 mm lead shielding, transportable by crane with shielding installed

## Waste Monitors
continued



### RTM750™ Laundry and Small-Items Conveyor Monitor

**The RTM750 Conveyor Monitor** is a versatile contamination monitor capable of measuring material from clothing to scaffolding, and everything in between. With different detector types available, along with other options this monitor is designed to meet a multitude of applications.

#### FEATURES

**NUCLEAR**
- Detector:
  - Beta plastic
  - Gas proportional
  - Gamma scintillation
- High sensitivity

**OPERATIONAL**
- Display: Large LCD (touch screen optional)
- Automatic speed control
- Automatic background subtraction

**MECHANICAL**
- Housing: Optional cross conveyor for sorting
- Dimensions: 6.6 - 11.2 ft x 35.4 - 55.1 in. x 0.8 - 7.1 in. (2 - 3.4 m x 900 - 1400 mm x 20 - 180 mm)

**Other Versions:**
- RTM750BP (Gasless)
- RTM750G (Gamma)
- RTM750BG (Beta Gamma)
- RTM750BPG (Beta Gamma Gasless)
- RTM750B (Beta, P10)

# Vehicle Monitors

### FastTrack-Vehicle™ Vehicle Monitor

**The FastTrack-Vehicle unit is a unique monitor for the screening of trucks and vehicles.** It combines the FastTrack algorithm with large area, highly sensitive GammaFibre detectors. Through the use of specially developed filtering programs, the possibility of false alarms is reduced to almost zero making it the ideal choice for any location trying to screen trucks and vehicles.

#### FEATURES

**NUCLEAR**
- Detector: Six large volume gamma fibre detectors
- MDA: 70 kBq, Co-60 (distance of cabinets 4 m, speed up to 20 km/h)

**OPERATIONAL**
- Display: Touch screen operation
- Visual: Traffic light for vehicle control
- Infrared sensors for vehicle presence
- Camera system for vehicle and/or container identification
- Networkable

**MECHANICAL**
- Detector volume of 1.4 ft$^3$ (40 L)
- Modular design for ease of installation
- Remote operator console



### FastTrack-Vehicle™ XL Large Vehicle Monitor

The FastTrack-Vehicle XL monitor delivers a robust performance. Under similar circumstances a conventional gamma monitor would produce a false alarm, or even worse go into genuine alarm without actually being able to locate the vehicle or object carrying a source. The monitor combines the FastTrack technology with highly sensitive GammaFibre detectors and low energy response, making the FastTrack-Vehicle XL system a reliable partner for monitoring truckloads of vehicles in a very short time.

#### FEATURES

**NUCLEAR**
- Detectors: 2 x 6 GammaFibre
- Energy Range: 30 keV - 3 MeV
- MDA: 40 kBq, Co-60 (distance of cabinets 4 m, speed up to 20 km/h)
- Lead Shielding: 0.6 in. (15 mm)
- Optional neutron detection

**MECHANICAL**
- Dimensions: 96.6 x 99.8 x 10.3 in. (2453 x 2535 x 262 mm)
- Weight: 2 x 1146.4 lb (520 kg)
- False alarm prevention
- Automatic background subtraction for heavy loaded trucks also in high background
- Total Active Monitor Volume: 3.4 ft$^3$ (96 L)
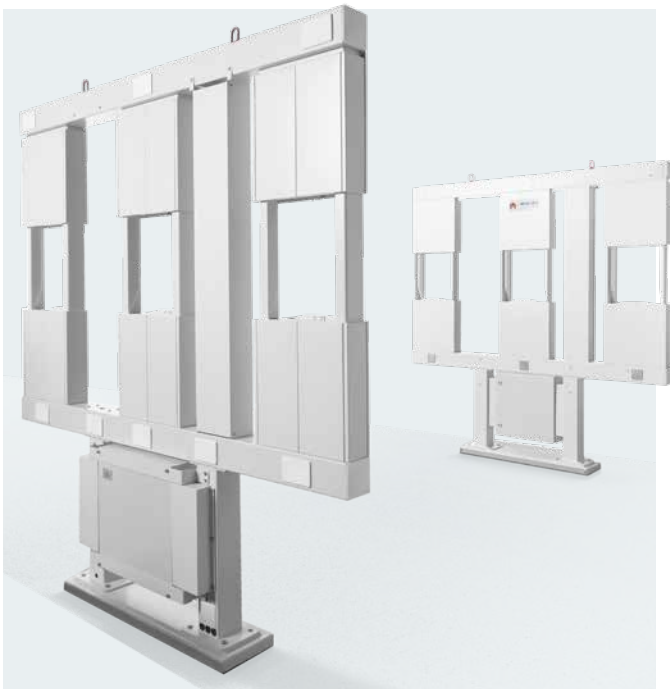
# Portal Monitors



## SPIR-Ident™ Portals Spectroscopic Radiation Portal Monitors (SRPM)

The SPIR-Ident Portals are spectroscopic radiation portal monitors (SRPM) with no false alarm and no nuisance alarm (medical, natural sources) thanks to the "Detection by Identification" concept. The portal will alarm only for real threats, and can provide distinct "Tolerated alarms" for medical/natural (NORM) sources. It's ideal for the security of nuclear facilities.

### TWO MODELS AVAILABLE

– The Pedestrian version stands on the floor and is ideally sized for monitoring pedestrians and small vehicles.

– The Module portal is a modular version to integrate on poles, walls or existing portal frames. It is suitable for all applications: discreetly monitoring pedestrians or inspecting luggage, mail, parcels, large vehicles, trucks, trains and cargo.

### FEATURES

- Highly sensitive Gamma (2 or 4 L NaI) and Neutron (BZnS) detection
- Pass-by occupancy sensor
- Audible and Visual Alert Indicators
- Network connectivity
- SpirVIEW Mobile™ Supervisory Software site security system

### DETECTION AND IDENTIFICATION PERFORMANCE

- Gamma spectroscopy:
  – Detector: 2-liter NaI(Tl)
  – Energy range: 25 keV to 3 MeV
  – Energy resolution at 662 keV: typ. 7.5%
  – Cs-137 sensitivity > 23 cps/nSv/h

- Neutron:
  – Optional, integrated in the pillar
  – >130 cps / (N/s/cm²) for Cf-252 at 1 m
  – Detects 12,000 N/s, Cf-252 at 1 m and 1.2 m/s
  – Optional, separate neutron modules connected to gamma modules

## SPIR-Ident™ Mobile Platform Airborne and Carborne Mobile Spectrometry

The SPIR-Ident Mobile Platform is an airborne and carborne system that combines advanced gamma detection and spectroscopy with optional neutron detection suited for vehicles, ships, helicopters and aircrafts.

### FEATURES

- Real-time mobile search and identification of radioactive and nuclear materials, with integrated mapping
- Detectors: Gamma (2 or 4 L NaI) and Neutron (BZnS), scalable volumes (2-4-8-16 L) to meet end-use applications
- Stackable case enclosures
- Water/temperature/ shock resistant, stackable enclosures
- Easily adaptive for Vehicle-Air-Marine use
- Instant configuration as a Pedestrian or Vehicle Portal Monitor
- Source-less Training Mode
- Integrated Flight or Mission Planning



### DETECTION AND IDENTIFICATION PERFORMANCE

- Gamma spectroscopy: NaI(Tl) and GM
  – Sensitivity per detector (Cs-137)
      2 L : > 23 cps per nSv/h
      4 L:  > 37 cps per nSv/h
  – Dose rate : 0.001 µSv/h to 9 999 µSv/h
  – Spectra: 1024 channels, from 25 keV to 3 MeV
  – Libraries of more than 75 nuclides

- Neutron: BZnS

# Training

## SIM-TEQ™ SYSTEM

The Simulation Control Center (SCC) is a Windows 10-based application designed to run on a tablet (10 inches or greater), allowing complete flexibility to the instructor. Setup is quick and easy and requires no calibration of either the instruments or the system. The SIM-Teq system instruments either respond automatically to TWR (Two Way Ranging) simulated sources or they can be directly (manually) controlled through the SCC. Instructors can remotely monitor readings and status updates of every device, as well as control or configure any device(s) during a specific session. SIM-Teq system is fully scalable: as new instruments are developed, the SCC application is conveniently updated.

## DMC 3000TD DEVICE

The DMC 3000TD device features all of the functions of an actually deployed DMC 3000 electronic dosimeter (including alarms, faults, and user interfaces) for extremely realistic training scenarios. It is fully configurable to match site RWP configurations, such as: rate alarm latching, time alarm, and threshold warnings. The DMC 3000TD unit even has the ability to attach dosimeter modules – such as the WRM2 Telemetry Module, to allow specific training of telemetry monitoring personnel. When paired with a Rad Tag, the DMC 3000TD device will auto-respond to the TWR simulator and mimic a dosimeter's behavior near simulated (non-radioactive) sources.

✔ Includes fully-functioning simulated instruments
✔ Full control over instrument response / functionality
✔ Direct response or automated response options
✔ Scalable application, to include future instruments

✔ Can be worn around neck or on belt
✔ Can be attached to modules for training
✔ Uses SCC to display measurements
✔ Used in conjunction with TWR Source

The SIM-Teq™ System is a wireless training network of simulated dosimeters, survey meters, and simulated (non-radioactive) sources managed and controlled by the Simulation Control Center (SCC) application.

## DMC 2000TD™ Electronic Dosimeter Training Device

**The DMC 2000TD unit is a fully functioning simulator of the DMC 2000S electronic dosimeter.** Designed to be an effective and realistic training device, it replicates all dosimeter functions, alarms, and fault displays. It can even be used with existing WRM2 transmitters and alarm modules, allowing training of remote monitoring personnel.

### FEATURES

**NUCLEAR**
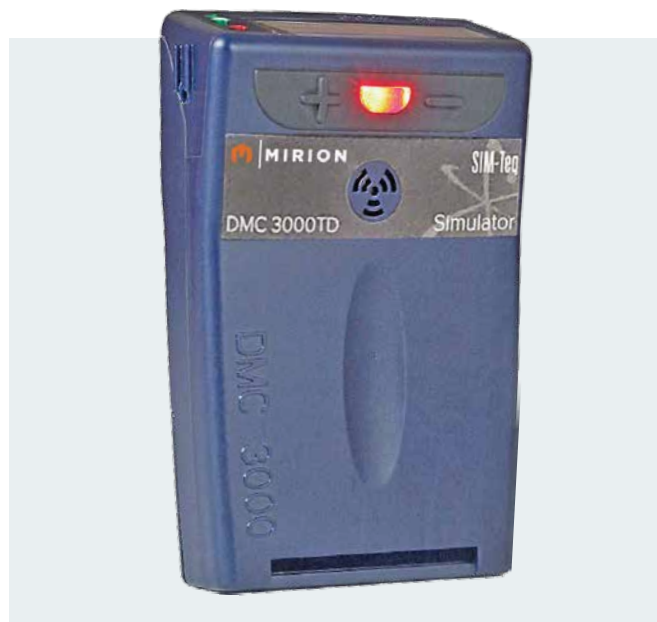- Range of Operation: ~100 ft line of sight

**OPERATIONAL**
- Audible Alarm: Same as DMC 2000S
- Wireless Communication: IEEE 802.15.4, 2.4 GHz, 18 mW

**ELECTRICAL**
- Battery: Renata CR 2450 lithium battery
- Battery Life: 8-30 hr, based on operating conditions

**MECHANICAL**
- Housing: Drop Resistant (1.5 meters on concrete)
- Dimensions: 3.4 x 21.0 x 1.1 in. (87 x 48 x 28 mm) max. without clip



## DMC 3000TD™ Electronic Dosimeter Training Device

**The DMC 3000TD unit is a fully functioning simulator of the DMC 3000 electronic dosimeter.** Designed to be an effective and realistic training device, it replicates all dosimeter functions, alarms, and fault displays. It can even be used with existing WRM2 transmitter modules, allowing training of remote monitoring personnel.

### FEATURES

**NUCLEAR**
- Range of Operation: ~100 ft line of sight

**OPERATIONAL**
- Alarming speaker with level of 85 dB (A) typical (> 90 dB (C) peak) at 30 cm (11.8 in.), frequency < 4800 Hz
- Wireless Communication: IEEE 802.15.4, 2.4 GHz, 18 mW

**ELECTRICAL**
- Battery: One AAA battery
- Battery Life: 8-30 hr, based on operating conditions

**MECHANICAL**
- Housing: Drop Resistant (1.5 meters on concrete)
- Dimensions: 3.4 x 2.3 x 0.8 in. (87 x 60 x 21 mm) max. without clip



## SCC/Dongle Simulation Control Center and Wireless Communication Dongle

**The Simulation Control Center (SCC)** is a Windows 10 application that uses a USB Dongle to remotely communicate with all models supported in the SIM-Teq product line of training devices. This intuitive application allows the direct control and configuration of each training device including; radiation levels, alarms, faults, dose and dose rate, etc. SCC provides a remote view of the measurements displayed on the controlled instrument.

### FEATURES

- Display: Full screen and intuitive user interface
- Requirements: Any Windows 10 tablet (10 in. or larger display) or PC with a free USB port (recommended Microsoft Surface Pro tablet)

### TWR "Mini" Source Two Way Ranging "Live" Source of Radiation

Two Way Ranging technology continually measures distance from simulator instrument to adjust rate and dose automatically. Sources are small and easy to conceal.

No complicated setup - place source, turn on and start exercise. Select from custom combinations of isotopes for RID capable SIM-Teq training instruments. Configure dose rate "activity" at 1 foot. Deploy multiple sources and train with multiple devices simultaneously. Swap between automatic response to TWR sources to manual control with SCC.

#### FEATURES

- **NEW** Configurable Isotopic mix of up to 5 isotopes from ANSI N42.34-2021 library Simulated point source of radiation – omni directional
- **NEW** Configurable neutron output in neutrons per second
- Automatic detection of source by instrument/ Rad Tag
- Dynamic response of simulator instrument to source based on $1/r^2$

- Select output from (10) customizable pre-configurations via pushbutton or SCC
- Background only output option
- Quick deployment in indoor or outdoor setting
- 100' range of detection
- Configurable gamma source activity 26µCi to 26,000Ci Cs-137 source

### Rad Tag "Mini" TWR "Live" Source to DMC Training Device Interface

Two Way Ranging (TWR) simulation technology continually measures distance from Rad Tag to source and calculates dose rate using 1/r2 principle. No instructor control required after dosimeter pairing.

Dosimeter readings are displayed automatically on the Simulation Control Center (SCC). Instructor can swap between auto-response of dosimeter to TWR sources and manual control using the SCC. Exercises can have one or more Rad Tag / dosimeter pairings.

#### FEATURES

- Wireless pairing of Rad Tag to any SIM-Teq dosimeter
- Automatic detection of TWR "Live" Source
- Continual input of dose rate measurements to training dosimeter and SCC

- 100' range of detection
- Small and easy to wear – about the size of a TLD badge
- LED battery charge indication

### GMP-25TD™ Contamination Probe Training Device

Simulates features and functions of the Mirion GMP-25 External Pancake Probe when connected to SIM-Teq RDS-31TD device.

#### FEATURES

- Realistic response based on source/detector geometry
- Factory configurable simulated contamination type ($\alpha$, $\beta$, $\alpha+\beta$) and level (up to 50,000 cps and greater for saturation demonstration)
- Use with any SIM-Teq RFID contamination source(s) OR respond to TWR source or control manually with SCC application

#### Train Your Radworkers To:

- Use proper frisking speed and probe-to-surface distance
- Observe elevated contamination levels on the meter
- Hear audible click rate as radiation levels change
- Assess if contamination has spread by using multiple contamination sources placed throughout an area
- Recognize elevated background interference and effects on performance when used with SIM-Teq TWR "live" source

# Emergency Response and Preparedness

## RADIATION BOUNDARY MONITOR DETECTION

An emerging area of interest in nuclear power emergency planning is the routine monitoring of site boundaries. Mirion's RBM™ Radiological Boundary Monitor is just such an instrument. Delineating a secure, measurable perimeter around the facility with alarm capabilities and remote data transmission, a network of RBM units alerts plant personnel in the event of any sort of radiological event or accident. These units can be housed in environmentally secure enclosures and equipped with long-lasting batteries or solar power, ensuring that they can be operated and monitored even from areas along a facility's perimeter that are typically difficult to access for survey purposes or emergency alerts.

The RBM unit is completely self-contained in a NEMA certified case, with its own solar power system.

The RBM detectors are located on a swiveling panel for easy access to the unit's back-up battery and micro-controller.

The detection panel can accommodate the RDS-32 unit's various extension probes to meet a variety of measurement needs.

- ✔ Rapidly deployable, self-contained kits
- ✔ Multiple instrument types (exposure, survey, etc.)
- ✔ Routine monitoring of site boundary with alerts
- ✔ Remote connectivity enables continuous awareness

## Short Term Area Monitor Kit

The Short-term Area Monitor allows quick deployment for a few months (in outages, for example) – with regular (four seconds) WRM2 transmission – in a rugged package.

### FEATURES

**ELECTRICAL**
- Power Supply:
  - The RDS-32iTx survey meter Short Term Area Monitor Kit uses twelve AA batteries. Image displays four AA battery pack, with additional batteries below the foam
  - The DMC 3000 dosimeter uses a AAA battery, with two D-cell batteries that connect via an external adapter to the Telemetry Module
- Battery Life: Provides three to four months of four second transmission

**MECHANICAL**
- Housing: Pelican TM case (for use in harsh environments) features a clear front for increased worker awareness if used for an Alarming Area Monitor
- Integrated WRM transmitter – no additional parts needed



## RDS-32 Response Kit Self-Contained Emergency Survey Kit

This kit provides multiple survey meters in an "all-in-one" package. Detection is provided by Mirion's versatile RDS-31 meter, along with an array of external probes to underwater deployment and beta smear frisking capability.

### FEATURES

**MECHANICAL**
- Housing: All materials are self-contained in a rugged, environment-proof Pelican TM case
- Underwater (GMP-12UW) probe(s) included for use in harsh environments

- Two complete sets are provided for simultaneous dose rate detection and smear counting
- Smart probes allow any meter to be connected to any probe on the fly – just plug in and go!



## DMC 3000 Response Kit Self-Contained Emergency Electronic Dosimetry Kit

This kit provides the ability to deploy a small population of electronic dosimeters from a field position (that is, without requirements for network and database connectivity). The included DMCUser Electronic Dosimeters Management and Maintenance Software assigns Mirion's flagship DMC 3000 dosimeter(s) to specific personnel, applies pre-set configuration parameters (alarm thresholds, etc.), and logs personnel exposure upon conclusion of the response. The kit also includes a touch screen computer to enable quick response to changing field conditions and data trending over longer deployments.

### FEATURES

**OPERATIONAL**
- Display: Touch screen handheld computer
- DMCUser Electronic Dosimeters Management and Maintenance software included
- The software's data export function allows after-the-fact recording of personnel dose or analysis of team-based performance, etc.

**MECHANICAL**
- Housing: Complete system is self-contained in a rugged, environment-proof Pelican case
- Includes ten DMC 3000 electronic dosimeters and an LDM-320D dosimeter reader



## RBM™ Radiation Boundary Monitor

Radiation Boundary Monitors are flexible, easy to operate systems that feature our RDS-32 handheld survey meters, they provide the valuable coverage needed to ensure comprehensive data collection around a nuclear facility.

Able to be fitted with a variety of power sources, from solar to battery to AC, and able to be networked with WRM2 radios and monitored using Mirion's TeleView 3000 software, the Mirion Radiation Boundary Monitors provide a powerful tool for keeping up with the changing requirements for site boundary monitoring.

### FEATURES

**DRM-2 Model**
- Operating Temperature: -9 °C to 50 °C (15 °F to 122 °F)
- Storage Temperature: -20 °C to 60 °C (-5 °F to 140 °F)
- Relative Humidity: 10% to 95%
- Dose Rate Measurement Range: 0.05 mR/h to 999 R/h (0.5 µSv/h to 9.99 Sv/h)

**RDS-31 Model**
- Operating Temperature: -25 °C to 60 °C (-13 °F to 140 °F)
- Storage Temperature: -40 °C to 70 °C (-40 °F to 158 °F)
- Relative Humidity: Up to 85% at 35 °C (95 °F)
- Fulfills the RF-immunity levels of applicable standard
- Dose Rate Measurement Range (GM): 1 µrem/h to 10 rem/h (0.01 µSv/h to 0.1 Sv/h) or
- Dose Rate Measurement Range (SD): 1 mem/h to 1000 rem/h (10 µSv/h to 10 Sv/h)

## SPIR-Ace™ Radionuclide Identification Device (RIID) with quantitative assessment capability

The SPIR-Ace unit is a versatile Radio Isotope Identification Device (RIID) addressing all applications requiring efficient detection and identification of radiological threats in security applications, including civil defense, border security and customs.

### FEATURES

**NUCLEAR**
- NaI(Tl) version: dia 1.4 in. dia x 2 in. (35 mm x 51 mm)
- LaBr$_3$ (Ce) version: dia 1 in. dia x 1.34 in. (25.4 mm x 34 mm)
- Energy compensated GM tube for high gamma dose rate
- Optional neutron detector: moderated 6LiZnS: Ag scintillator
- Optional external alpha/beta GMP-25™ contamination probe

**ELECTRICAL**
- Li-ion rechargeable, built-in charger, replaceable
- Battery life: 8.5 hours (up to 15 hours with screen off most of the time)
- Charge time: 5 hours (device turned off) with regular 2.1 A/5 V USB adapter

**OPERATIONAL**
- Operating temperature range:
- NaI: -20 °C to +55 °C (-4 °F to +131 °F)
- LaBr$_3$: -20 °C to +50 °C (-4 °F to +122 °F)
- Humidity: 93% relative humidity at 40 °C
- Water and dust: IP65

**MECHANICAL**
- Weight: maximum (NaI and LiZnS detectors) 1.45 kg (2.2 lb)
- Dimensions: 8.1 x 6.2 x 2.2 in. (206 x 153 x 57 mm)



## SPIR-Explorer™ Sensor Light Weight Wide Range Radiological Detection and Identification Sensor

The SPIR-Explorer sensor is a lightweight radiation detector designed to be mounted on a UAV/Drone or UGV/Robot for a wide range of applications where radiation detection, measurement, and nuclide identification is needed. This includes environmental surveys, military reconnaissance, Radiological Dispersal or Exposure Device (RDD or RED) detection, hospitals/ industry fire hazards, nuclear power plant emergency response.

### FEATURES

**NUCLEAR**
- Detectors:
  - Same as SPIR-Ace unit for the NaI and LaBr$_3$ NaI(Tl) dia 32 mm* 51 mm or LaBr$_3$(Eu) dia 25 mm* 32 mm
  - + 2 GM tubes (mid and high range)
- Measurement Range: 0,001 µSv/h to 10 Sv/h (0.1 µR/h to 1000 R/h)
- Energy Range: from 20 keV to 3 MeV

**OPERATIONAL**
- Display: No display
- Serial communications: Supplied with SPIR-Ident

Suite software (SpirVIEW Mobile™ software) typically installed on a laptop (USB/Serial cable) or remotely behind a wireless transmission+localization system.

**ELECTRICAL**
- Supply Voltage: typical 4.5 to 18 V
- Power consumption: ≤ 1 W

**MECHANICAL**
- Dimensions: 250 mm (L) x 132 mm (W) x 81 mm (H)
- Temperature Range: operation from -20 °C to 50 °C. Operates accurately under temperature shock
- Humidity: 93% HR at 30 °C



## SPIR-Pack™ Man-portable Detection and Identification

Mirion's SPIR-Pack backpack is ideal for all applications requiring the efficient detection and identification of radiological and nuclear threats. These applications provide the protection for large public events, as well as readiness for radiological/nuclear interdiction.

### FEATURES

**NUCLEAR**
- Detectors: NaI(Tl) detector: 2 in. diameter x 4 in. length (51 mm diameter x 102 mm length)
- Gamma sensitivity to Cs-137: 3500 cps/(µSv/h) or 35 cps/(µR/h)
- Energy Range:
  - 25 keV to 3 MeV (gamma)
  - 0.0025 eV to 15 MeV (neutron)

**SMARTPHONE FEATURES**
- Android smartphone, GPS, Bluetooth® technology, Wi-Fi, cellular communications
- Data available: real-time measurements and alarms, using industry-standard file formats (spe, n42, csv)
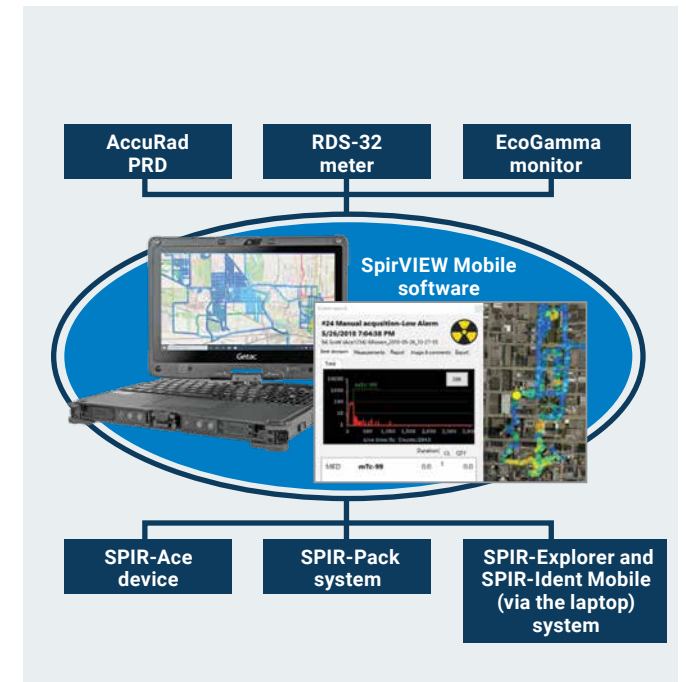
**ELECTRICAL**
- Li-ion rechargeable, 5300 mAh, 3.7 V, built-in charger
- Backpack battery life: G and GN lightweight: 24 h; GN: 13 h

**MECHANICAL**
- G and GN lightweight: 30.3 x 25 x 46 cm (11.9 x 10 x 18.1 in.)
- GN (sensitive): 11.4 x 7.9 x 20.3 in. (29 x 20 x 51.5 cm)

**ENVIRONMENT**
- Operating temperature range: -20 °C to +50 °C (-4 °F to 122 °F)
- Operating humidity: 93% at 40 °C (104 °F)



## SpirVIEW Mobile™ Situational Awareness Software

The SpirVIEW Mobile software is designed for organizations and agencies responsible for monitoring and preventing nuclear and radiological terrorist threat. The SpirVIEW Mobile system manages monitoring of large scale events such as sport venues, conferences, conventions, critical infrastructure and more, providing area safety.

### FEATURES
- Real-time radiological situational awareness
- Data fusion: pedestrians, ground vehicles, aircraft, marine vessels, UAVs, rovers, robotics
- Secured no-loss data transfer and storage
- Facilitate communication with the field and the regulatory authorities
- Remote alarm confirmation (Reachback)
- Data server hosted by the user's organization (physical or cloud-based)



Connect your **RDS-32™ meter** to SpirVIEW Mobile™ Supervisory Software and the RadResponder Network with our app*.

# Airborne Radiation Monitoring

## ABPM 203M MONITOR

A self-contained, mobile unit able to be easily and quickly deployed into any area as conditions require, the ABPM 203M™ unit is an airborne radiation contamination monitor measuring both alpha and beta particulates with up-to-the-minute tracking of the radiological conditions in the air. The ABPM monitor features on-board identification and optional subtraction of Radon progeny, and includes a second gamma only detector to allow usage in virtually any level of radiological background. Capable of being configured with WRM2 wireless technology, the ABPM unit's data can then be transmitted back to a central control area where it can be interpreted and used to inform operational decisions without any of the typical delays caused by cumbersome deployment, longer-term readings, or communication breakdowns.

**Connects to Vital Supervision**

✔ Rapidly deployable, self-contained kits

✔ Multiple instrument types (exposure, survey, etc.)

✔ Routine monitoring of site boundary with alerts

✔ Remote connectivity enables continuous awareness

Automatic moving filter head can be located up to 30 ft away

LPDU displays live time data (alpha, beta, background dose rates, and flow rate) along with audible and light signaling

🔶 Connects to Vital Supervision



🔶 Connects to Vital Supervision





Moving Filter
Head for iCAM

🔶 Connects to Vital Supervision

## ABPM 203M™ Mobile Alpha Beta Particulate Monitor

The ABPM 203M monitor forms part of the RAMSYS™ product line. The detector is small and lightweight and allows this monitor to function locally next to the respiratory tract of workers. A dual silicon detector performs the gamma compensation and a radial fin grid limits the scattering of the alpha particles (static compensation) which facilitates the compensation of the radon and thoron solid progenies by the processing algorithms (dynamic compensation). Operating costs are minimized through unattended operation, by the use of continuous filter and the on-line spectroscopy capability. All these features make the ABPM 203M unit an efficient diversified and cost effective tool.

### FEATURES

**NUCLEAR**
- Measurement Range:
  - Alpha $2.7 \cdot 10^{-13}$ to $10^{-4}$ µCi/cc
  - Beta $2.7 \cdot 10^{-11}$ to $10^{-4}$ µCi/cc

**OPERATIONAL**
- Display: Alphanumeric; measurement, status...
- Visual: Two lights (Red and Yellow)
- Audible Alarm: Buzzer 90 dBA at 39.3 in. (1 m)

**ELECTRICAL**
- Power Supply: 230 V ac – 50 Hz or 120 V ac – 60 Hz

**MECHANICAL**
- Dimensions: 50 x 14.2 x 12 in. (1270 x 360 x 303 mm)
- Weight: ~57 lb (~26 kg)

**Other Version:**
- ABPM 203P model

## NGM 209M™ Mobile Low Range Noble Gas Monitor

The NGM 209M monitor from the RAMSYS product line has been developed to sample air in discharge stacks or ventilation ducts. The dual silicon diode detector integrated in a $4\pi/1.18$ in. ($4\pi/3$ cm) lead shielded sample volume guarantees high reliability of the measurements. The first silicon diode detects the beta/gamma radiation from sample volume and the gamma ambient radiation (background). The second one detects gamma radiation from the sample volume and the gamma ambient radiation. This allows noble gas beta measurement with dynamic gamma compensation by the processing algorithms.

### FEATURES

**NUCLEAR**
- Detector: Dual large area silicon
- Measurement Range: $10^{-6}$ to $2.7 \cdot 10^{-1}$ µCi/cc

**OPERATIONAL**
- Display: Alphanumeric; measurement, status...
- Visual: Three lights (Red, Yellow and Green)
- Audible Alarm: Buzzer 90 dBA at 39.3 in. (1 m)

**ELECTRICAL**
- Power Supply: 230 V ac – 50 Hz or 120 V ac – 60 Hz

**MECHANICAL**
- Dimensions: 50 x 14.2 x 12 in. (1270 x 360 x 303 mm)
- Weight: ~66 lb (~30 kg)

## IM 201M™ Mobile Iodine Monitor

The IM 201M monitor forms part of the RAMSYS product line. It has been developed to continuously measure the gamma volumetric activity of radioactive iodine sample, in both molecular and organic forms (methyl iodine), contained in air drawn from stacks, ventilation ducts or working areas. An NaI scintillation detector faces the activated charcoal cartridge in which radioactive iodine is trapped. The proximity of the detector and the cartridge, enclosed with a $4\pi/2$ in. ($4\pi/5$ cm) lead shielding, serves to optimize detection efficiency. A radioactive [241]Am source built into the NaI crystal allows compensation of temperature and aging related drifts. The spectrometry capability, based on a 1024 channel spectrum analysis allows radio iodine isotope localization.

### FEATURES

**NUCLEAR**
- Detector: 1 ¼" x 1" NaI(Tl) scintillator + PMT
- Measurement Range: $10^{-10}$ to $10^{-4}$ µCi/cc

**OPERATIONAL**
- Display: Alphanumeric; measurement, status...
- Visual: Three lights (Red, Yellow and Green)
- Audible Alarm: Buzzer 90 dBA at 39.3 in. (1 m)
- 1024 channel spectrum analysis

**ELECTRICAL**
- Power Supply: 50 Hz or 120 V ac – 60 Hz

**MECHANICAL**
- Dimensions: 55.4 x 20.5 x 27.6 in. (1406 x 520 x 700 mm)
- Weight: ~441 lb (~200 kg)

## iCAM™ Mobile Alpha Beta Particulate Monitor

The iCAM intelligent alpha beta continuous air monitor forms part of the CAMSYS™ product line. It provides robust and reliable monitoring of airborne alpha and beta particulate activity in the workplace. It acts as a simple alarming monitor for operators, while measuring airborne activities in real time with the sophistication required to provide low false alarm rates and high protection levels. At the same time it provides automated facilities which assist supervisors to conduct detailed setup and operational overview.

### FEATURES

**NUCLEAR**
- Detector: PIPS large area silicon; dual PIPS detector assembly in option
- Measurement Range: In excess of 500 kBq (13.5 µCi) of combined alpha and beta activity deposited on the filter

**OPERATIONAL**
- Airflow Measurement: Electronic mass flowmeter, of range 15 to 60 L/min. (0.5 to 2.1 ft$^3$/min.)
- Typical Indicated Flow Rate: 37 L/min. (1.3 ft$^3$/min.), controlled by the optional manual flow control valve
- Low and high flow rate limits adjusted by user differential filter pressure alarm 50 mm Hg (25 in WG)

**ELECTRICAL**
- AC Mains Frequency: 47-63 Hz
- Voltage: 100-240 V (± 10%)
- Power Consumption: 46 VA

**MECHANICAL**
- Dimensions: 9.6 x 21 x 6.7 in. (245 x 535 x 170 mm)
- Weight: 26 lb (12 kg) without vacuum pump

# WebiSmarts System



## DPU-3 Area Monitor

The DPU3 is the latest addition to the renowned MediSmarts Area and Stack Monitoring System. Combining the same respected reliability which has made MediSmarts a world leader, with the latest state-of-the-art technology, the DPU3 brings the 21st century into your laboratory. The plastic (IP65) cased data processing unit is capable of supporting one internal and three external detectors.

### FEATURES

**NUCLEAR**
- Measuring Range: 0.1 uSv/h to 10 Sv/h (0.01 mR/h to 1,000 R/h)
- Sensitivity: 17 cps/mR/h, 0.3 cps/mR/h
- Energy Range: 50 keV to 1.3 MeV
- Accuracy: ±10% over the full measuring range

**OPERATIONAL**
- Display: 7-inch HD Color Display

**ELECTRICAL**
- External power adapter 110 V ac/220 V ac to 12 V dc, PoE through Ethernet cable and optional battery backup (9 hours)

**MECHANICAL**
- Material: High-impact plastic (ABS-PC) with aluminum rear cover
- Dimensions: 230 x 76 x 252 mm (9 x 3 x 10 in.) (L x W x H)
- Weight: 1.7 kg (3.75 lb)
- Environmental: Weather proof IP65, CE Certified

## Coincidence Stack Exhaust Monitoring

The PM-11 Coincidence System comprises of a combination of two detectors operating in unison to confirm any release of radioactive material. Automating the process to confirm only true releases of radioactive material are reported! The Coincidence Exhaust Stack System is designed to be installed on existing MediSmarts Systems as an upgrade and will be included into the WebiSmarts System as the standard Effluent Detector.

Our standard PM-11M detector is enhanced with a plastic beta detector capable of detecting the presence of positrons/beta emissions from the exhaust stack thus providing a trigger (Yes/No) to the WebiSmarts Software.
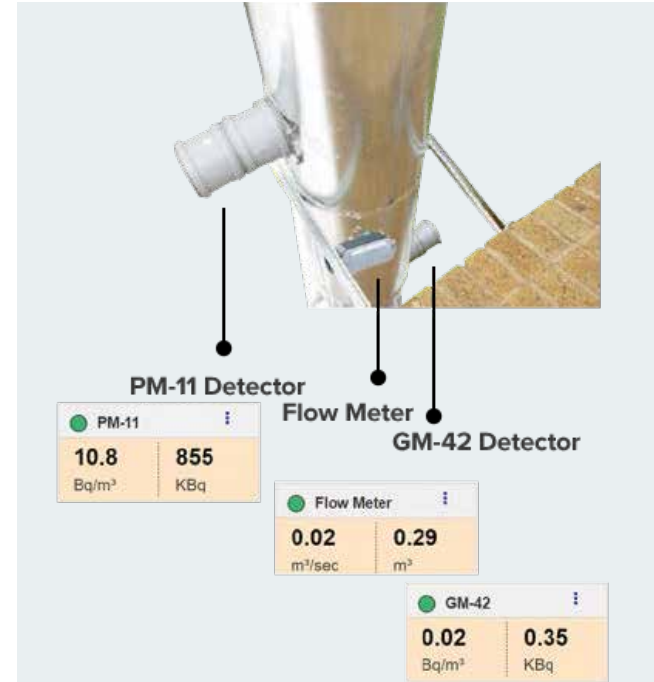
## Stack & Area Monitoring

Stack monitoring provides a site with the ability to determine the amount of radioactive material release from the ventilation exhaust of the facility producing the isotopes. The PM-11M detector is the main component along with a flow meter to know the volume of the air being released. Because the PM-11M detector is very sensitive, a separate higher range dose rate probe can be added in case the PM-11M unit is over ranged. In addition, there is a new option to add a beta component to the PM-11M detector to allow coincidence counting.

For area monitoring equipment, the WebiSmarts DPU-3 meter allows the connection to several different probes:
- GM tube-based dose rate probes
- Ion Chamber dose rate probes
- Neutron probes
- Scintillation spectroscopy probes
- Contamination probes

### STACK MONITORING:
- PM-11 Highly Sensitive 2x2 NaI and beta module Detector
- Wide Range NEMA rated Flow Meter

### AREA MONITORING:
- Area Monitor IC-10 Ion Chamber
- Area Gamma GM-41 Detector (High Range)
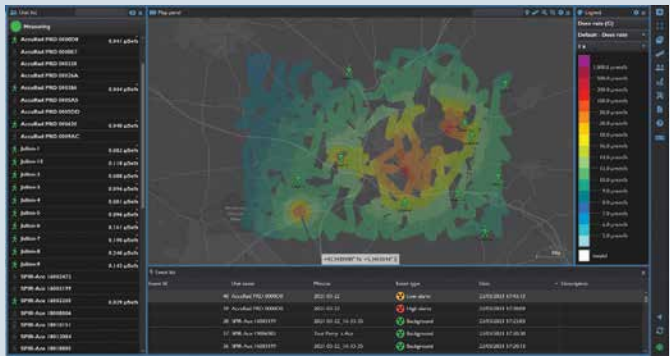- Area Gamma GM-42 Detector (Low Range)

## WebiSmarts Software

WebiSmarts is a web-based software package which receives online radiation data from DPU-3 Area Monitors strategically installed throughout the facility.

Users can access maps showing radiation levels on color-coded points, presenting a detailed yet concise radiological map. WebiMissions Software is a derivative of the WebiSmarts Software package and is a cost-effective tool used to collect, store, display and report of effluent emissions from your site.

### FEATURES
- Web-based software
- Isotope identification of effluent
- Supports over 20 maps
- Supports both existing and new data processing units
- New DPU-3 Monitor supports four detectors
- Map, points and historical data stored in a Server and accessed via a browser
- New Stack Monitor provides indication of effluent in the stack with isotope identification
- Flexible system configurations to meet your facility's exact requirements
- Factory calibration of all detectors
- Area Monitoring
  - Simultaneous Display of Dose + Dose Rate
  - Quick access to multiple graphs

# Software

## SpirVIEW Mobile™ Situational Awareness Software

The SpirVIEW Mobile software is designed for organizations and agencies responsible for monitoring and preventing nuclear and radiological terrorist threat. The SpirVIEW Mobile system manages monitoring of large scale events such as sport venues, conferences, conventions, critical infrastructure and more, providing area safety.

### FEATURES

- Real-time radiological situational awareness
- Data fusion: pedestrians, ground vehicles, aircraft, marine vessels, UAVs, rovers, robotics
- Secured no-loss data transfer and storage
- Facilitate communication with the field and the regulatory authorities
- Remote alarm confirmation (Reachback)
- Data hosted by the organization
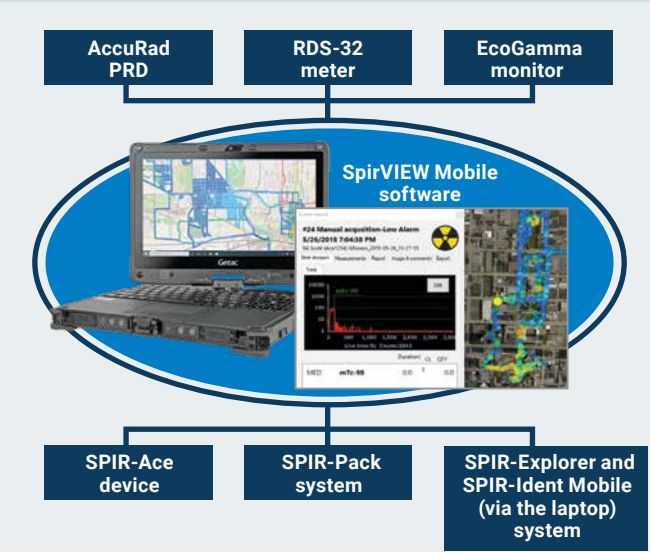


Download the Mirion apps to connect your **RDS-32™ meter and AccuRad™ PRD** to SpirVIEW Mobile™ Supervisory Software and the RadResponder Network
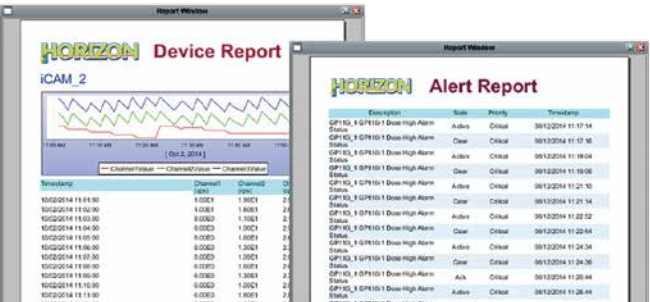


SpirVIEW Mobile multi-screen use.

## RPD™ Radiological Posting Display Software

The RPD Software is a hardware and software solution providing the ability to display area monitor data real time on a large screen display. It was developed using the previous software, the Large Format Device Display as a base and still supports all of the original functionality. In addition, new screens were developed to be used as a Posting Display. A set of four screens can change the appearance of the resultant display based on the dose rate found in the area being monitored.

### FEATURES

- Dynamic display of ambient radiological conditions
- Display up to four instruments at one time
- Can be setup to display radiological posting that will automatically change based on the dose rates in the area
- Network or directly connect devices
- Quick and easy setup, designed for all WRM2 devices

## Horizon® Supervisory System Software

Horizon system is a real-time data acquisition and control system that provides supervisory oversight of your radiological instruments.

### FEATURES

- Comprehensive supervision for your radiological instrument network
- Built-in support for the Mirion Environmental and Radiation Monitoring Systems as well as Personnel/Object Contamination Monitors
- Flexible client configuration allows creation of situational and navigation screens specific to your site
- Robust, platform neutral SCADA tools provide advanced graphic controls for visualizing your data
- Instrument screens are tailored for each device ensuring access to monitor setpoint and operation information
- Fully integrated design tool and reporting function

## HIS-20™ Health Physics Information Record Keeping System

HIS-20 system is a complete Health Physics Information package that is designed to incorporate the latest requirements as specified by regulating agencies. It is designed to minimize or eliminate the amount of customization necessary to meet site-specific requirements. The database allows the site's HIS-20 manager to choose functional parameters and to set up lookup tables specific to site operations.

### FEATURES

- Set the application up to work the way your site operates through setup/lookup tables and site parameters
- User customizable with shortcuts to favorites, dashboards queries and other setup tables
- Robust security implementation
- Tracks individual exposure
- Generates Radiation Work Permits

- Performs Access Control manually or through the Windows Access Control Station software
- Ties Survey to RWPs to calculate intake data
- Flexible interface to external systems (imports demographic data, training data, TLDs or OSLDs, PADS, and more

## DosiFFR™ First Responder's Dosimetry Management System Software

Designed specifically for the rapid-deployment needs of First Responders, DosiFFR software is an application that tracks the issuance of electronic dosimeters to personnel, applies the appropriate configuration settings (alarm thresholds, etc.), and logs the dosimetry data from a given use.

### FEATURES

- Designed for in-field use (self-contained)
- Can be configured for civil or military applications
- Manages individuals, dosimeters, and exposure data

- Data can be exported to an external reporting system
- SQL-based (free version) for easy implementation
- Dosimeter parameters can be pre-grouped into profiles
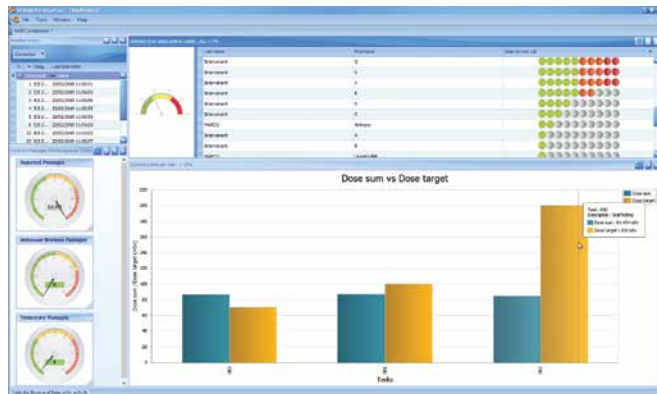




## DosiServ™ Dose Management Software

The DosiServ software is an individual and collective dosimetry management software used for managing all the data related to the workers in controlled areas. It also collects the data recorded by the electronic dosimeters by using the dosimetry readers.

### FEATURES

- Real-time self access with threshold customization
- Tasks and group of tasks management
- Radiation work permit management
- Areas, sub-areas and group of areas management
- Worker and company access criteria customization

- Worker data customization
- Official dose calculation customization for various legislation compliance Neutron electronic dosimeter compliance
- Health physics equipments management
- Automatic dose recovery after network failure

# Software for Contamination Monitors

## CeMoSys™ 2.0 Central Monitoring System Software



CeMoSys system is a central monitoring software platform for the display and administration of connected Mirion contamination and clearance monitoring systems and a facility network. CeMoSys 2.0 is compatible with all Mirion Contamination and Clearance monitors, including Argos-3/-5, GEM-5, Cronos-1/-4/-11, Sirius-5 systems.

### FEATURES

- Monitor status overview for most Mirion Contamination and Clearance monitor families
- Measurement results and details on remote desktops
- Management of System Check protocols
- Overview of current measurement parameters on monitors
- Data backup for measurement results, parameter and system check protocols for all monitor families on site

## Dashboard™ Web-based Monitor Overview Interface
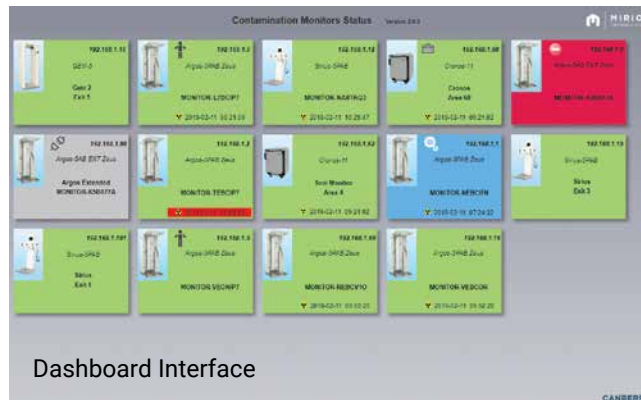

Dashboard Interface

- Included for the following equipment:
  – Argos-3/-5 Whole Body Contamination Monitors
  – Sirius-5 Hand and Foot Monitors
  – GEM-5 Gamma Exit Monitors
  – Cronos Gamma Object/Tool Monitors
- Provides color-coded status overview of all networked contamination monitors on one screen
- Access via Internet Explorer or Firefox from any PC linked to the monitor network (Ethernet or WiFi) without any proprietary program or interface
- Contamination monitors can be selected from Dashboard system to inquire the details, and to change the parameters remotely through the WebRemote interface
- Included with Version 9.0x of Monitor Software or greater


WebRemote Interface

**Color-coded status:**
- **Green** – operational
- **Red** – out of service
- **Magenta** – contaminated
- **Gray** – maintenance mode
- **Black** – offline

## WebRemote® Contamination Monitor Interface

- Included for the following equipment:
  – Argos-3/-5 Whole Body Contamination Monitors
  – Sirius-5 Hand and Foot Monitors
  – GEM-5 Gamma Exit Monitors
  – Cronos Gamma Object/Tool Monitors
- Provides intuitive user interface to monitor results, change parameters and view status of monitors with the system's touch screen or from anywhere in the facility using a desktop or a tablet PC
- Offers graphical selection of detectors for setup and calibration
- Any contaminated regions can easily be identified by the user
- Included with Version 9.0x of Monitor Software or greater

# Mirion Technologies Services

## A Service Partner that Delivers

Experience the benefit of a partnership that prioritizes your operational success and grows with you. At Mirion Technologies, we value strong, ongoing customer relationships, providing personalized services to meet your evolving needs.

**300+**
Service Experts
& Engineers

**100+**
Annual Training
Classes

**GLOBAL EXPERTISE SPANNING:**

- Commercial Nuclear Power Plants
- Decommissioning sites
- National Laboratories
- Department of Energy Facilities
- Defense and Security
- Nuclear Fuels and Enrichment Facilities
- Nuclear Science Higher Education
- Research Laboratories
- Radioisotope Production Facilities
- And more

**ENSURING PEAK PERFORMANCE WITH CUSTOMIZED EXPERTISE**

Designed to enhance your operational efficiency, safety, and reliability, our comprehensive services include implementation guidance, training, maintenance and calibration, and customized consulting. Our skilled engineers are with you from initial setup to ongoing operations, guaranteeing efficient performance of your systems.

**DIVERSE EXPERTISE**

From nuclear power plants and count rooms to software companies, academia, and commercial and government laboratories, Mirion Technologies Services team proficiencies include:

- Routine system management
- Procedure writing
- Programming
- Data review
- Installation
- Calibration services
- System audits
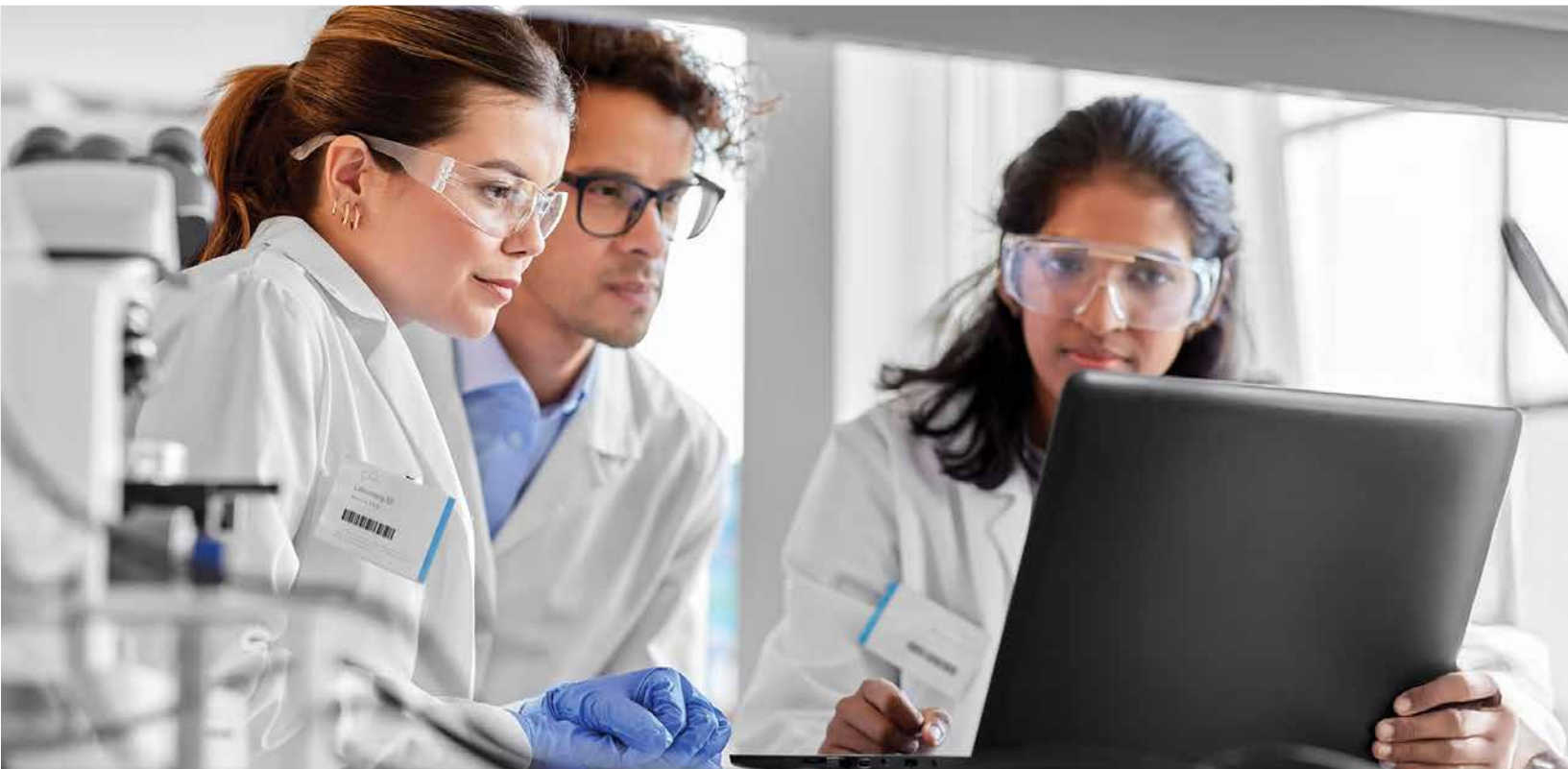
Get
Started

Build
Knowledge

Maximize
Operations

Optimize
Performance

**IMPLEMENTATION GUIDANCE**

Our team supports safe and accurate installation of new equipment, ensuring that all systems are optimized to meet your business needs and security standards. Our partnership thrives by combining our expertise with your unique application needs.

**TRAINING**

Our comprehensive training programs empower you to make the most of your tools. More than 100 training classes are held annually in multiple languages and can take place in-person at your facility or a Mirion facility, or virtually in real-time or self-led.

**MAINTENANCE & CALIBRATION**

From the outset, Mirion teams collaborate with you to install and calibrate your equipment and software and support repair and spare parts to help maintain peak performance with minimal downtime.

**CONSULTATION & CUSTOMIZATION**

With a focus on proactive engagement, we offer on-site and remote assistance. Our approach draws on rich industry expertise and factory-trained specialist support engineers skilled in turning versatile solutions into highly tailored, site-specific applications.

# Get Started



## IMPLEMENTATION GUIDANCE

Implement new solutions that work for your unique setup quickly and confidently, with Mirion as your partner. Whether on-site or remotely, our extensively trained and knowledgeable team is equipped to support you through every aspect of the setup process.

### WHAT YOU CAN EXPECT: SYSTEM INSTALLATION

Our team of qualified professionals supports safe and accurate installation of new equipment, including thorough examination of initial data outputs. We can advise on database management and system backup and work with your IT team to ensure successful software installation.



### APPLICATION SETUP ASSISTANCE

Bridge the gap from standard configuration to a system tailored for you. We provide customized support including:

- QA file setup and nuclide library creation to optimize your analysis,
- ISOCS Geometry file creation for more accurate, efficient calibrations,
- Standard Operating Procedure writing/modification to incorporate new equipment, and more.

### INSTALLATION QUALIFICATION/OPERATIONAL QUALIFICATION (IQ/OQ)

Specific to radioisotope producers, we provide an extensive documented evaluation of instrument performance to specifications, executed by a Mirion Technologies Field Service Engineer, to ensure compliance with Good Manufacturing Practices.

# Build Knowledge



## TRAINING

Enhance your expertise in radiation detection and measurement with tailored training solutions designed to fit your learning style and professional needs.

### EMPLOYEE ONBOARDING & KNOWLEDGE ADVANCEMENT

Leverage our course tracks to onboard new employees or advance knowledge of employees looking to expand their expertise. Test your team's knowledge with proficiency exams and monitor advancement through our progress tracking. Earn continuing education credits for maintaining professional degrees.

### EXPERT INSTRUCTION

Learn from the best. Our instructors are seasoned experts in their fields, ready to guide you through each course with clarity and enthusiasm.

### INTERACTIVE SESSIONS

Gain hands-on experience with software and instruments installed and configured with realistic data in a risk-free learning environment.

Available in multiple languages, our courses blend lectures, practical exercises, and interactive sessions to provide a thorough understanding of radiation detection and measurement principles targeted to your specific application.

**Join us to advance your career, and strengthen your team's knowledge, with Mirion's expertly designed training programs, where practical knowledge meets advanced technology.**

| Your Facility | Mirion Facility | Virtual Class | Self-led Virtual |

# Maximize Operations





# Consultation & Customization



## MAINTENANCE & CALIBRATION

Unplanned downtime disrupts your operations. We are dedicated to keeping your systems running smoothly, helping you plan for the future, and facilitating continuous improvement through hands-on collaboration and personalized support.

## OPTIMIZE PERFORMANCE

Mirion Consulting and Customization services optimize your operational capabilities. From the start, we seek to understand your needs to guide our collaborative efforts to seamlessly integrate Mirion equipment into your processes.

### MAINTENANCE & IN-HOUSE CALIBRATION

Protect your investment with regular on-site preventative maintenance and performance verifications visits. In-house calibration services, whole-body calibrations, and extended warranties keep your systems in peak condition. Our expert team performs calibrations in compliance with consensus standards such as ANSI, ASTM and internationally recognized standards, including ISO and IEC.

### SPARE PARTS SERVICE

Spare Parts Services ensures you have the parts you need, when you need them. Choose to keep spares on-site or have them quickly shipped from us, allowing you to maintain and repair your systems without delay.

### SUPPORT CONTRACTS AND WARRANTIES

The Mirion Technologies Customer Support Agreement (CSA) provides a range of plans tailored to your unique need — including installed equipment and software support, monitoring and preparing for mission critical activities, and consulting, training, and other professional services. Let us work with you to design the optimal combination of support elements.

### INTRODUCTORY CUSTOMER SUPPORT AGREEMENT

For new product acquisitions only, the iCSA provides essential services like installation and familiarization, plus State of Health verifications and many benefits of the On-Site CSA support functions.

### EXTENDED WARRANTY CSA

Our simplest form of support, the Extended Warranty CSA offers return-to-factory repairs for our full line of products.

### SITE CUSTOMER SUPPORT AGREEMENT

The Site CSA provides the personnel and parts necessary for on-site preventative maintenance, troubleshooting, and repair, supplemented by return-to-factory repairs if needed.

### TAILORED SERVICES TO YOUR UNIQUE NEEDS

With a focus on proactive engagement, we offer on-site and remote assistance based on your needs. Our approach draws on rich industry expertise and factory-trained specialist support engineers skilled in turning versatile solutions into highly tailored, site-specific applications.

### LEVERAGE OUR DIVERSE EXPERTISE

Our expert technical architects will assess your requirements and create purpose-built, proactive, strategic solutions that integrate seamlessly into your operations. Leverage our expertise to enhance your operations and achieve even greater success.

Proficiencies include:
- Routine system management
- Procedure writing
- Programming
- Data review
- Installation
- Calibration services
- System audits
- And more

### TESTING FOR OPTIMIZED PERFORMANCE

To ensure your operations are seamless and efficient, we provide performance testing programs crafted to fit your timeframes and demands, with flexible scheduling for on-site or remote assistance.

## Mirion Technologies Community

Did you know the Mirion Technologies customer portal includes technical papers, instructions, and knowledge articles? Plus, track support cases, access software licensing, and connect with other users. Email techsupport@mirion.com to get started.

### CONNECT WITH COLLEAGUES

Join our user's meetings to engage with the latest technologies, enhance your skills through hands-on training and participate in accredited programs and industry forums. We host an annual Mirion Connect users meeting in the U.S. as well as additional regional meetings globally.

### GET EXPERTISE & SUPPORT, WORLDWIDE

**Americas**
techsupport@mirion.com
1-800-255-6370

**BeNeLux**
service.cbns@mirion.com

**France**
hotline-fr@mirion.com
+04-90-59-60-60
France (Lingolsheim)
lgh-service@mirion.com

**Germany**
service-de@mirion.com
+49-6142-7382-290

**Japan**
jp-support@mirion.com
+03-5835-5404

**UK**
uktechsupport@mirion.com
+44-123-583-8300

### ALL OTHER REGIONS

**Please use the contact form to get in touch and we'll direct your request to the appropriate team.**

# Empowering Progress Across Continents

Mirion Technologies combines innovative radiation safety technologies with unrivaled expertise, cultivated over decades of collaboration with reactor manufacturers and operators, nuclear fuel facilities, regulators, national labs (such as the U.S. DOE), nuclear institutes, universities, and national military/security organizations worldwide.

Trust us to provide the solutions and support you need to safeguard your valuable assets and ensure a secure and sustainable future.

**CORPORATE HQ (ATLANTA, GA)**    **MANUFACTURING SITES**    **SERVICE & SALES CENTERS**

EUROPE

AMERICAS

ASIA

**2,800 PEOPLE IN 12 COUNTRIES**
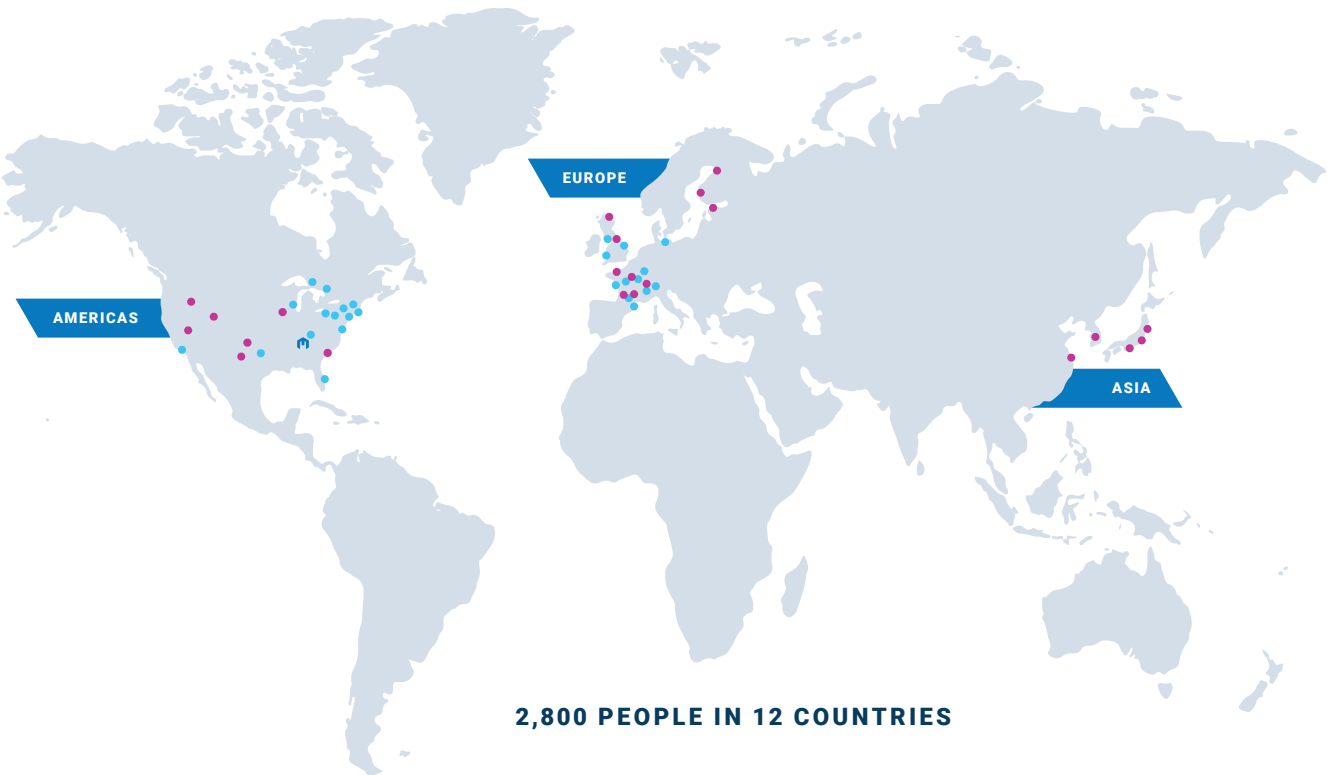
# Geiger Mueller Detectors

As an end user of Geiger Mueller detectors for over 60 years, we have successfully bridged the gap between technical conception, detector design and field application to achieve quality performance.

## PROVEN DETECTOR EXPERIENCE

Our outstanding line of Geiger Mueller detectors, including 2000 Series pancake detectors, offers quality and reliability. Our detectors meet and exceed customer needs in laboratory, military and harsh industrial environments.

Mirion Geiger Mueller detectors offer superior performance, reliability and long-term stability. Our extensive product line provides direct (or near equivalents) for industry-standard detectors, including all versions of pancake detectors and frisker probes.

## MANUFACTURING EXCELLENCE

Mirion's manufacturing operation has refined the development and production of GM detectors with state-of-the-art instrumentation and the finest equipment to monitor and control all manufacturing processes. Our attention to every detail ensures contamination-free assemblies. We use only the highest quality materials to fabricate critical
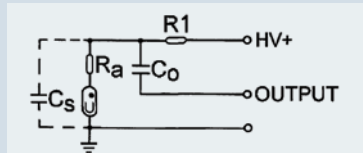
detector components. Our adherence to stringent design parameters and quality assurance ensures performance that meets or exceeds exacting commercial and military standards.

Mirion's growing detector division can offer substantial volume cost reductions for large orders.
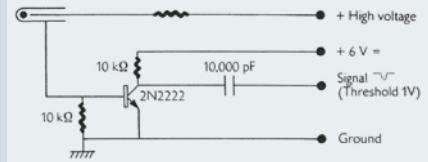
## TEST CIRCUITS

Use HV+, Ra and R1 from the chart.

Figure 1 - Anode Output



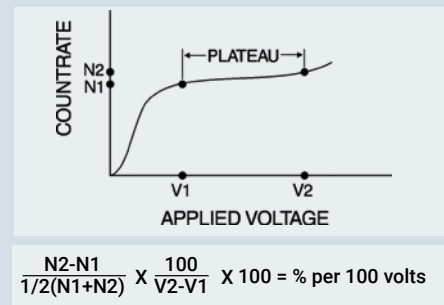Cs = Stray capacitance typically < 1 pF.
Co = High voltage blocking capacitor.

Figure 2 - Cathode Output



Temperature: +25 ºC (77 ºF)
Counting rate: 100 c.s$^{-1}$

## PLATEAU CALCULATIONS

Plateau slope is calculated using the formula below, and given in units of percent change per 100 V.



$$\frac{N2-N1}{1/2(N1+N2)} \times \frac{100}{V2-V1} \times 100 = \% \text{ per 100 volts}$$

## ALPHA PARTICLE DETECTION

The table below shows the initial energy required to penetrate a given mica window thickness. This assumes a negligible air gap between the source and the window. Note the range of alpha particles of various energies in air at atmospheric pressure.

| Mica Window | α Energy | α Range in Air |
|---|---|---|
| 1.0 mg/cm$^2$ | 1.9 MeV | 10 mm |
| 2.0 mg/cm$^2$ | 2.6 MeV | 15 mm |
| 3.0 mg/cm$^2$ | 3.6 MeV | 22 mm |
| 4.0 mg/cm$^2$ | 4.5 MeV | 29 mm |

## PRODUCT RELIABILITY

- The Mirion Geiger Mueller detector has been carefully researched and developed to provide a rugged, reliable, long-lasting means of monitoring nuclear radiation levels. These detectors offer guaranteed advantages, including manufacturing consistency, product reliability and competitive pricing. Many of our detector types are manufactured and tested to withstand rigorous shock and vibration per military standards.

- All Mirion GM detectors comply with our stringent quality assurance policies, consistent with ISO 9001.

## OUR WARRANTY

- Mirion warrants that its Geiger Mueller detectors will be free from defects in materials and workmanship for a period of one (1) year from the date of initial shipment.

## BETA PARTICLE DETECTION

The chart below shows the effects of mica window thickness (mg/cm$^2$) on beta particle absorption percentage.
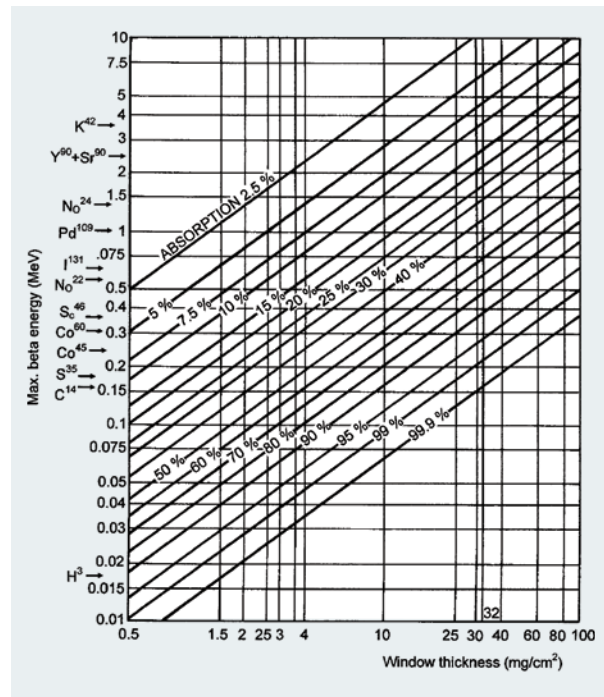


## DEAD TIME CORRECTION

GM detectors using conventional counting circuitry all exhibit counting losses due to the Dead Time factor. These factors cited in the Mirion detector data tables are based on the recommended operating voltages and test circuits. The chart below enables the user to estimate the counting losses due to the Dead Time factor at high count rates.



m = Measured Counting Rate (Counts per Second)
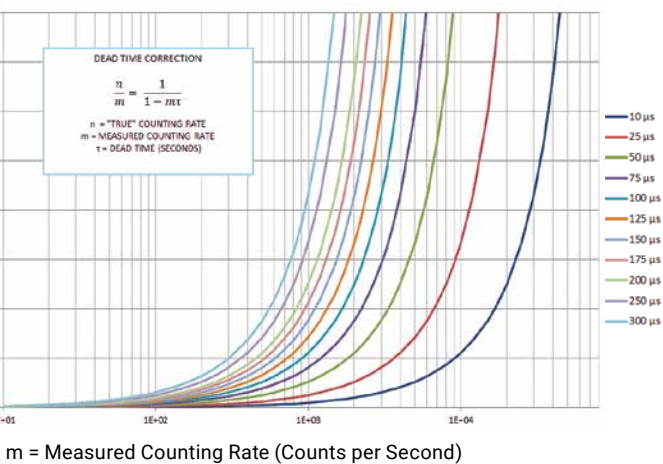
## Performance Data

### Pancake Detectors – For $\alpha, \beta, \gamma$ Applications

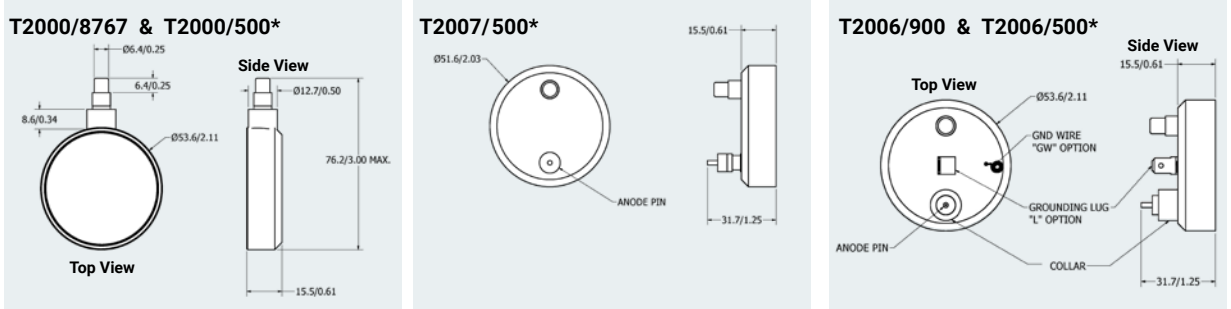| Characteristics | Detector Type | | | | |
|---|---|---|---|---|---|
| | T2000/8767 | T2000/500* | T2006/900 | T2006/500* | T2007/500* |
| Application | $\alpha, \beta, \gamma$ | | | | |
| Sensitivity*** $^{137}$CS cpm at 1 mR/h | 3500 | | | | |
| Window Area Density (mg/cm$^2$) | 1.8 – 2.0 | 1.8 – 2.0 | 2.0 – 2.2 | 2.0 – 2.2 | 2.0 – 2.2 |
| Window Effective Diameter (mm, in.) | 44.5, 1.75 | | | | |
| Recommended Operating Voltage | 900 | 500 | 900 | 500 | 500 |
| Plateau Length Volts min. | 850-1000 | 450-600 | 850-1000 | 450-600 | 450-600 |
| Plateau Slope (%/100 V max.) | 10 | | | | |
| Dead Time (µs max.) | 50 | | | | |
| Background (c/m)*** Shielding 2" Pb + 1/8" Al | 30 max. | | | | |
| Test Circuit | Figure 1 | | | | |
| Resistor, Ra (MW) | 3.3 | | | | |
| Resistor, R1 (MW) | 1.0 | | | | |
| Operating Temp (°C) | -20 to +55 | | | | |
| Cathode Material | Cr/Fe | | | | |
| Window Recess (mm, in.) | 1.6, 0.062 | | | | |

### Pancake Detectors:

**T2000/8767 & T2000/500***



**T2007/500***



**T2006/900 & T2006/500***



\* Alternate grounding options available.
\*\* Energy compensated versions available.
\*\*\*At recommended operating voltage.

### Mica End Window – For $\alpha, \beta, \gamma$ Applications

| Characteristics | Detector Type |
|---|---|
| | T2121** |
| Application | α, β, γ |
| Sensitivity*** $^{137}$CS cpm at 1 mR/h | 1700 |
| Window Area Density (mg/cm$^2$) | 1.8 – 2.0 |
| Window Effective Diameter (mm, in.) | 19.8, 0.78 |
| Recommended Operating Voltage | 500 |
| Plateau Length Volts min. | 450-650 |
| Plateau Slope (%/100 V max.) | 5 |
| Dead Time (µs max.) | 100 |
| Background (c/m)*** Shielding 2" Pb + 1/8" Al | 30 max. |
| Test Circuit | Figure 1 |
| Resistor, Ra (MW) | 3.3 |
| Resistor, R1 (MW) | 1.0 |
| Operating Temp (°C) | -40 to +75 |
| Cathode Material | Cr/Fe |
| Cathode Wall | 1.3, 0.050 |
| Window Recess (mm, in.) | 1.6, 0.062 |

### Mica End Window:

**Mil. Version
2121 M Window
2.8–3.4 mg /cm$^2$**



### Gamma Sensitive Miniature Detectors – For $\gamma$ Applications

| Characteristics | Detector Type | |
|---|---|---|
| | T2420** | T2121** |
| Application | γ | |
| Sensitivity*** $^{137}$CS cpm at 1 mR/h | 4.2 | 270 |
| Recommended Operating Voltage | 500 | 460 |
| Plateau Length Volts min. | 450-550 | 420-520 |
| Plateau Slope (%/100 V max.) | 35 | 30 |
| Dead Time (µs max.) | 20 | 60 |
| Background (c/m)*** Shielding 2" Pb + 1/8" Al | 6 max. | 25 max. |
| Test Circuit | Figure 2 | |
| Resistor, Ra (MW) | 4.7 | |
| Resistor, R1 (MW) | N/A | |
| Operating Temp (°C) | -51 to +71 | -20 to +60 |
| Cathode Material | Cr/Fe | |
| Cathode Wall | 360-400 mg/cm$^2$ | 280 mg/cm$^2$ |

### Gamma Sensitive Miniature Detectors:

**T2420**

To achieve maximum linear count rate, always solder Ra directly to the anode flying lead.



**T3G6500-1**
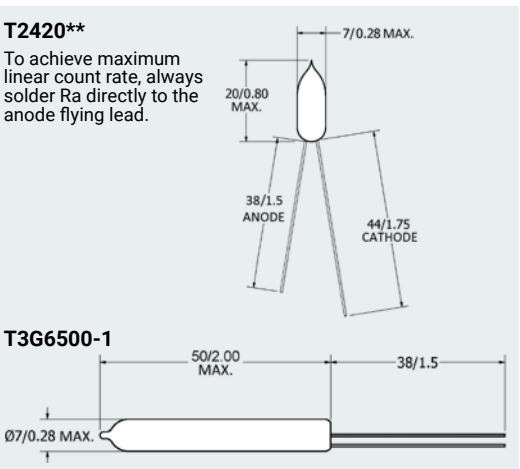
\*\* Energy compensated versions available.
\*\*\*At recommended operating voltage.

## Ordering Information

### Pancake Detectors

| Part Number | Notes |
|---|---|
| T2000/8767 | — |
| T2000/500 | — |
| T2000/500GW | T2000/500 with Ground Wire |
| T2006/500 | — |
| T2006/500-NC | T2006/500 without Anode Support Collar |
| T2006/500GW | T2006/500 with Ground Wire |
| T2006/500GW-NC | T2006/500GW without Anode Support Collar |
| T2006/500L | T2006/500 with Ground Lug |
| T2006/500L-NC | T2006/500L without Anode Support Collar |
| T2006/900 | — |
| T2007/500 | — |
| 7084948 | T2007/500 with Ground Wire with Solder Lug |

### End Window Detectors

| Part Number | Notes |
|---|---|
| T2121 | — |
| T2121M | Military Version, Mica Thickness: 2.8 -3.4 mg /cm$^2$ |
| D102130 | Energy Compensated T2121M, for RDS-110 |
| 9303666A | Energy Compensated T2121M, for ADM300 |
| 9335514A | Energy Compensated T2121M, for ADM300SI |
| T2121MG | T2121 with 0.0125" Metal Window |

### Miniature Detectors

| Part Number | Notes |
|---|---|
| T2420 | — |
| 9302553A | Energy Compensated T2420, for ADM300 |
| 7085395 | Energy Compensated T2420, for NASRAMS |
| 7086975 | Energy Compensated T2420, for Seawater Probe |
| D3085197-GRN | Energy Compensated T2420 in Green Housing |
| D3085197-YEL | Energy Compensated T2420 in Yellow Housing |
| D703386-01 | Energy Compensated T2420 in Gray Housing |
| T3G6500-1 | — |

# Characterization Services

Mirion offers a large range of on-site services from dose rate and gamma imaging surveys to complex gamma spectroscopy and neutron measurements. Some of our instruments and systems are available for lease.

### EXPERT SUPPORT FOR COMPLEX SYSTEMS

✔ Technical and feasibility studies to assist in waste management and D&D strategies, audit preparation and assistance, NDA system upgrade, system training.

### METHOD DEVELOPMENT

✔ Best approach and methodology to achieve the customer's objectives, best practice approach.

### MEASUREMENT PROCEDURES

✔ Operating instructions, documentation and training to provide QA approved methods for operators.

### SYSTEM CALIBRATION SERVICE

✔ Initial or Annual calibration for installed systems, system qualification and certification.

### ONSITE MEASUREMENT SERVICES AND CHARACTERIZATION REPORTS

✔ Large range of onsite services from dose rate and gamma imaging surveys to complex gamma spectroscopy and neutron measurements. Some of our instruments and systems are available for lease.

### ASSISTANCE TO SYSTEM OPERATIONS

✔ Enhancing the operation of your NDA systems with the support of our Experts, providing assay systems for measurement campaign.

### EXPERT DATA REVIEW

✔ Expert physics review of assay system results with QA and fingerprint reviews.



iPIX™ Gamma Camera

CSM-GR1™ Continuous Spectroscopic Monitor

GR1™ Compact CZT Spectrometer

## Gamma Spectroscopy Services

**High and/or low resolution spectroscopy measurements depending on application requirements. HPGe, NaI, LaBr, CZT etc., combined with ISOCS™ calibration in transportable or handheld configurations**

Sometimes wastes are generated by events – spills, accidents or various pieces of equipment and articles that may be contaminated. Where it is not convenient to transport the waste material to a fixed system (or as a prescreen before packaging for full assay and disposal), Mirion provides a service for in situ measurement. Combined with ISOCS In Situ Object-Counting this type of system offers transportability as well as the ability to identify and quantify nuclide activities in samples of unusual or large geometry.

## High-Level Radioactivity Measurements

A combination of measurement techniques and extended ISOCS applications have been used to solve challenging high-activity measurement situations. The GR1 CZT detector is ideal for these measurements, and as it has been ISOCS characterized can be used in a variety of measurement configurations.

Additionally, Gamma Camera Imaging can be used to provide critical information in real time on the source distribution (hot spots, layering) that can be incorporated into the ISOCS modeling.



6' Diameter

6' Tall

Large standoff distance: 25 to 50 ft
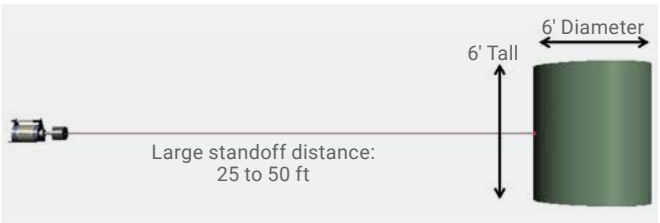
### High Dose Rate Resin-Loaded Poly Liners

An ISOCS system with a pinhole collimator is shown modeled to measure Ion Exchange Resins with contact dose rates in the range of 10 to 200 R/hr where traditional sampling did not provide adequate results.
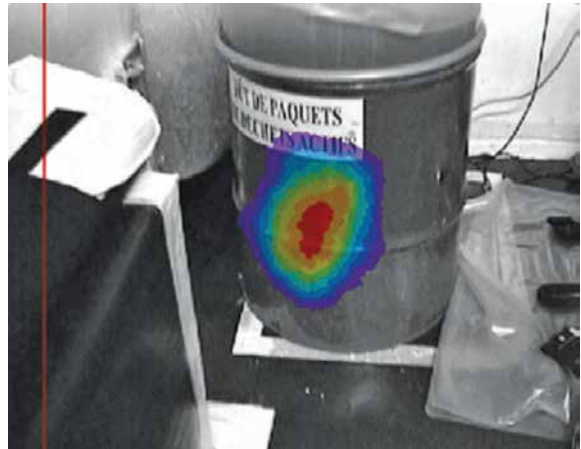
## On-site Services

Mirion offers a wide range of In situ measurement services for which our specialists bring any required assay equipment to the customer site for the duration of the project.

The service includes management of the full life cycle of such activities from the specification of the radiometric measurement solution through the analysis and reporting of the final results.

## Challenging Characterization Situations

**Our measurement services team can apply custom software tools to accomplish the following:**

1. **Improving accuracy –** By optimizing the determination of the efficiency calibration most consistent with the gamma-ray spectrum measured in the field.

2. **Measuring unusual structures/shapes –** By adapting the standard geometry composer to accommodate complex models like plated depositions.

3. **Integrating with waste assay –** By using custom scripts to integrate and automate the use of ISOCS calibration within our waste assay software.
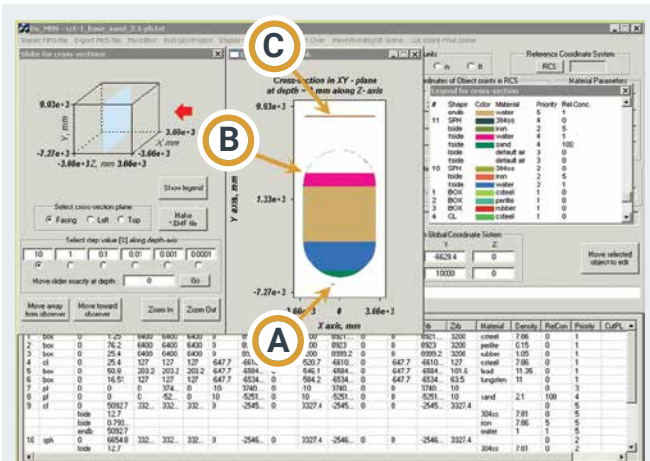


**Feature A** is the detector location in the basement

**Feature B** is the tank water level

**Feature C** is the detector location on the roof



## Structures and Components

Mirion has over twenty years of experience characterizing contamination of nuclear components using ISOCS software. Waste or in-process components such as pipes, tubes, scrap, ventilation systems, and small irregular objects can be characterized using this approach to evaluate the activity of these components for continued waste storage or disposal, without the need for radionuclide calibration sources. ISOCS software can be deployed along with the iPIX Gamma Imager to locate a hot spot in real time.



Cross-sectional view of the multi-layered pipe geometry showing detector angle needs to be shifted to capture the entire source (shown in yellow).



Interior of large diameter pipes

200 kg air compressor



Temporary change rooms

### Monte Carlo modeling for studies or calibrations

We support mathematical modeling using MCNP for a range of potential applications. This could include performance prediction and calibrations for detection systems, radiation safety analysis and design, and optimization of spent fuel management.

## Underwater Measurements

To obtain accurate quantitative results, our sealed, electrically cooled HPGe detector can be used in ponds and rivers.

The SMOPY system is used for underwater spent-fuel burn-up measurements in fuel pools. SMOPY system can also be used to characterize fuel rods. Our detectors can be mounted in a Remotely Operated Vehicle (ROV) to survey large underwater areas.
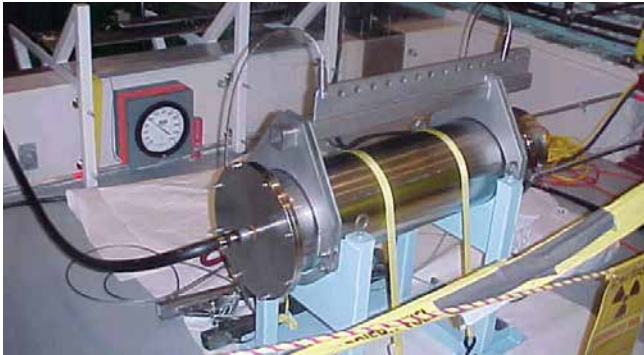


## Radiation Tolerant Cameras

CCTV monitoring of nuclear generating, reprocessing, waste management and research facilities is of vital importance during the decommissioning and dismantling phases.

Mirion radiation tolerant inspection and surveillance systems, whether permanently located within the plant or used in portable or temporary configuration are designed to survive the hostile environments frequently encountered.



Hyperion™ Compact Gen II Camera

RC720™ HD-RAD Camera System

RC911™ Dotcam-HR Camera

## Nuclear Holdup Measurements

**Measurement of radionuclide material inventory or holdup in plant systems, tanks or piping**



"Holdup Measurements" refers to the measurement of accumulations of nuclear material, most often uranium, in processing equipment such as pipes, tanks, pumps, calciners, filters, etc. They are integral measurements at uranium enrichment and fuel processing facilities. The main drivers for these measurements are Criticality Safety and Nuclear Material Accountability.

Mirion offers an alternative to the Generalized Geometry Holdup (GGH) approach using the ISOCS software to model a wide range of different source/detector geometries. Given that holdup campaigns are usually restricted to a small set of measurement geometries, site-specific and project-specific sets of ISOCS models could be developed for different customers. In addition to combining ISOCS software with the traditional NaI-based measurements, several viable alternatives, including CeBr detectors, HPGe detectors, CZT detectors, and the CdTe-based iPIX gamma camera can also be used.

## Waste Characterization

**Item sentencing (drum, container or item assays)**



Mirion has significant experience and expertise in non-destructive assays for waste measurement. Gamma assay, neutron assay, and combined gamma/neutron systems are available to measure containers ranging from non-packaged waste to vehicles. We offer a full range of measurement solutions to meet your site waste characterization needs.

The Measurement and Expertise Team can be deployed on site to provide a customized solution to fit your specific project.

# Protect What's Next™

## MIRION
### TECHNOLOGIES