



Annual Users' Conference

**ADVANCING RADIATION SAFETY.
EMPOWERING PROGRESS.**

M Resort, Henderson, NV | June 15 – June 18



MIRION
TECHNOLOGIES

*Advancing Radiation Safety.
Empowering Progress.*

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LIGHTLink[®] Technology:

Elevating HP/RP Performance

James Parkin / Ralph Bose

*Business Line VP Health Physics, Defense & Security and Imaging /
Product Manager – Contamination & Clearance Monitors*

Mirion Connect | Annual Users' Conference 2026

Henderson, NV

**Scan QR code to log your
attendance for today's
(Thursday, June 18th)
breakout session**



Agenda

- *About Select Mirion C&C Monitors*
- *Gas-Flow and Thin Plastic Scintillation Detectors Recap*
- *Fibre Detector Technology Recap*
- *LightLink™ Detector Technology Recap*
- *Example Recap: CSPevo Handheld Contamination Probe*
- *Example: Argos™ Evo Whole Body Contamination Monitor*

Mirion Technologies (Canberra CA) Ltd. – Concord



- Centre of Excellence for several examples in the Mirion Contamination & Clearance (C&C) product line
- Located in Concord, Ontario, Canada for over 3 decades
- Two Buildings totaling ~38,500 ft² (~3580 m²)



Argos™-3/-5



Argos™-3 Modular



Sirius™-5



Sirius™-5 Compact



Sirius™ Core



GEM™-5



FastTrack-Vehicle™



FastTrack-Vehicle™ XL



HandFoot-Fibre™



Cronos®



Argos™ Evo



Gas Flow and Thin Plastic Scintillation Detectors Recap



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LFP & TPS Detector Technology

Low Flow Proportional (LFP) Detectors

- α/β monitoring with discrimination, best efficiency and Minimum Detectable Activity for the **shortest count times overall**
- Exceptional detection capability resulting from patented triple zone detector design
- A variety of gas mixtures can be used (P-5, P-7.5, P-10*, Ar/CO₂ etc.)
- Uniform response across detector face

Thin Plastic Scintillation (TPS) Detectors

- Gas-free - no cost or worry associated with handling gas
- α/β , β/γ or β monitoring with discrimination
- Reduced count time even in high γ background environment compared to other gasless detectors.
- In addition: TPS-BG detectors feature unique β/γ anti-coincidence processing → outstanding β measurement performance in elevated gamma backgrounds – see [Application Note: "The Advantages of the TPS-BG-579 Detector Anti-Coincidence Processing"](#)

Gas-Flow
Triple Zone detector

Triple
Zone



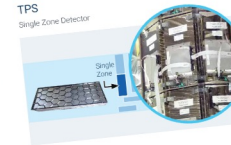
The Advantages of the TPS-BG-579 Detector Anti-Coincidence Processing

Application Note

Introduction

TPS-BG-579 plastic scintillation detectors are unique gas-free detectors with beta and gamma measurement capability. There are separate beta and gamma measurement channels for each detector. Additionally, the beta channels have anticoincidence properties with the gamma channels, which significantly improves the sensitivity of the beta channel to an elevated background. This feature allows you to reduce your count times in elevated gamma backgrounds, allowing you to process personnel quickly.

TPS
Single Zone Detector



What is Anti-Coincidence

One of the main features of the TPS-BG-579 is the Anti-Coincidence Processing. This unique feature provides outstanding β measurement performance in elevated γ backgrounds. If the γ channel is triggered at the same time as the β channel, the β count is rejected. This reduces the count time and increases the throughput of personnel monitoring. This is always enabled within the detectors through electronics and firmware.

The chart attached shows that the TPS-BG-579 has improved MDA with anti-coincidence compared to without anti-coincidence and the TPS-BG-579.

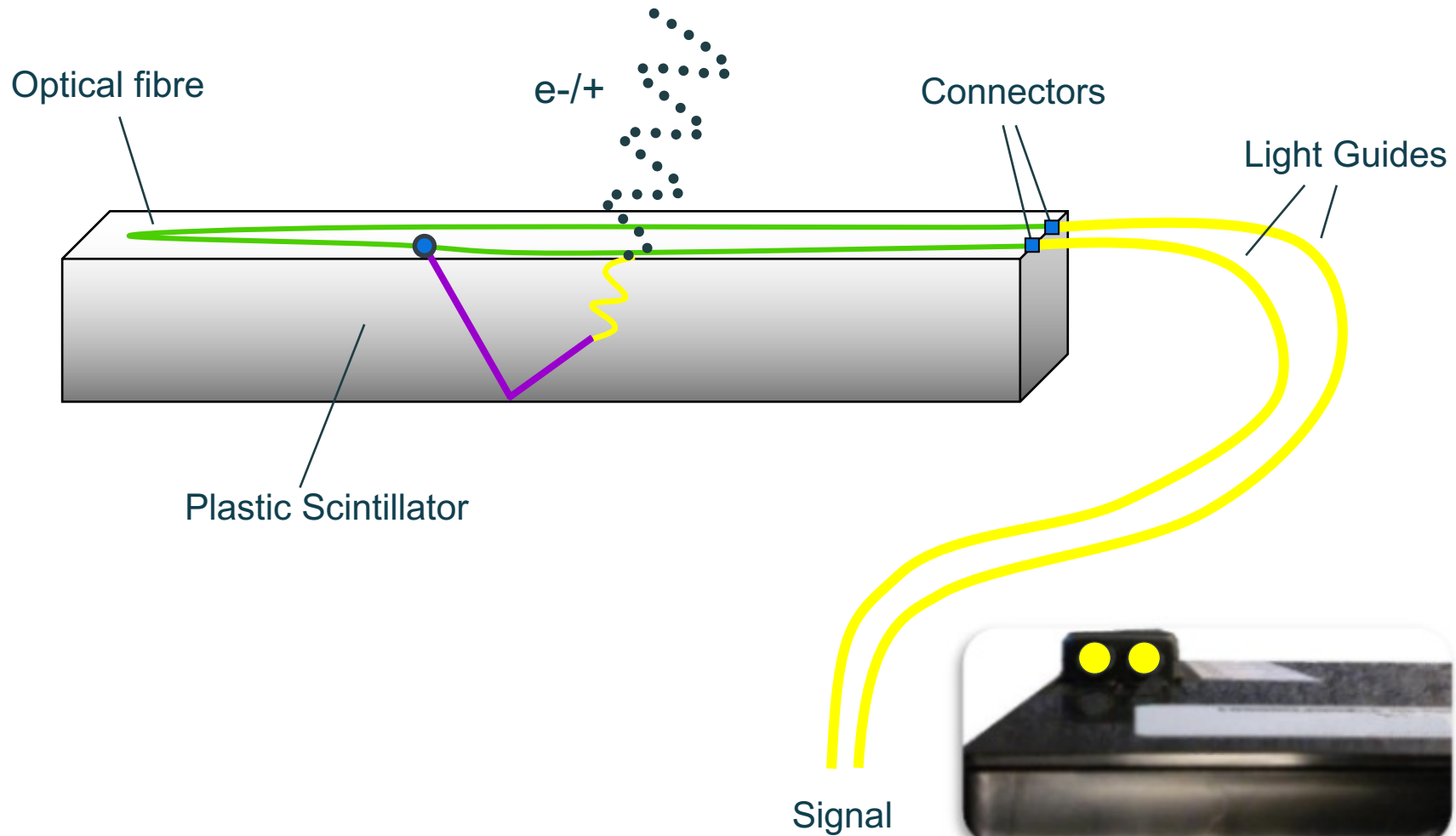
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Fibre Detector Technology Recap



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Fibre Detector Technology



Fibre Detector Technology

Advantages of Mirion Fibre Detector Technology

- *Many detectors can be connected to a single multi-channel photomultiplier*
- *Various detector types for alpha, beta, gamma and/or neutron radiation available.*
- *Excellent measurement homogeneity over the entire detector area*
- *Very low sensitivity to background radiation*
- *Minimized dead zones, only 5 mm dead zone per detector edge*
- *Especially durable and robust*
- *No electronical pieces close to detector*
- *Quick and easy exchange of detector*
- *Various sizes and dimensions possible*



LightLink® Technology Recap



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POWERED BY ***LIGHTLink***[®]



- *Next-Generation Detector Technology*
- *Reliable & Robust*
- *Hyper Accurate*
- *Easily Integrated*

Overview

COMBINING EXPERTISE & NEW TECHNOLOGY

- *Revolutionary Advancement in Radiation Detection*
- *Enhancing Radiation Detection across Diverse Applications*
- *Incorporating Improved Light Collection, Robust Silicon Photomultipliers & Latest in Readout Electronics*

Enhancing Radiation Detection

- *More Compact Detector assembly*
- *Robust Silicon Photomultipliers*
- *Removal of High Voltage Components*
- *Elimination of Light Decay*
- *Superior Light Collection efficiency*



Enhanced Ergonomics



Greater Robustness & Longevity



Extended In-Use Time



Reduced Down-Time



Hyper-Accurate & Sensitive



Enhanced Ergonomics

- *Reduced Weight/Volume of Hand-Held Products*
- *Additional capabilities for Handling*
- *Simplified Integration into 3rd Party Systems*
- *Easier Shielding*
- *Reduced Dead Zones*



Extended In-Use Time

- *Improved Signal to Background Ratio*
 - ✓ *Reduced Measurement Time*
- *Faster Light Decay Post-Servicing increasing Up-Time*
- *Improved concept of operations for handheld applications*



Robustness & Longevity

- *Less Susceptible to Breakage*
- *Reduced Downtime due to Repair*
- *State of the Art Electronics*
- *No Dark Room Requirement for Servicing*
- *Wide range of environmental use*



Hyper Accurate & Sensitive

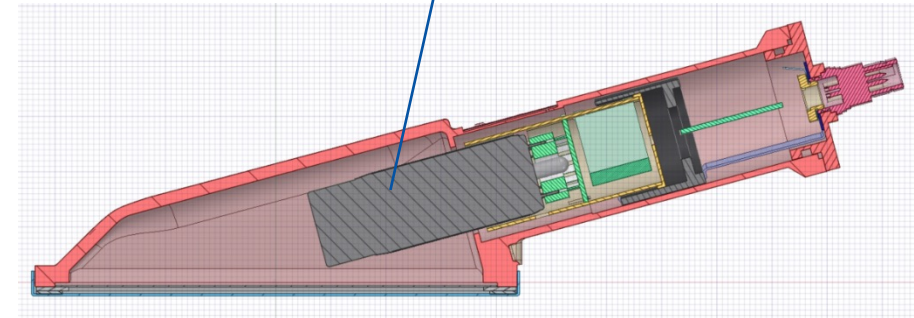
- *High Tolerance to Microphonics / Vibrations*
- *Homogeneous Response Across Detector Surface*
- *No Sensitivity to Magnetic Fields*
- *Excellent Minimum Detectable Activity*

Many Contamination Probes use PMTs*

- *Problem with PMT**

- ✗ *Breaks when dropped*
- ✗ *Requires earth magnetic protection (adding weight)*
- ✗ *Light collection*
 - *Big enclosure*
 - *Mediocre surface detection homogeneity*
- ✗ *Waiting time after entrance window replacement*
 - *Light decay to avoid burning the PMT – up to few hours*
- ✗ *Microphonics*
- ✗ *Drives handle use (no real choice!)*
- ✗ *Difficult to integrate in systems*
 - *Mechanical arrangement*
 - *Shielding*

PMT → Fragile Glass Tube

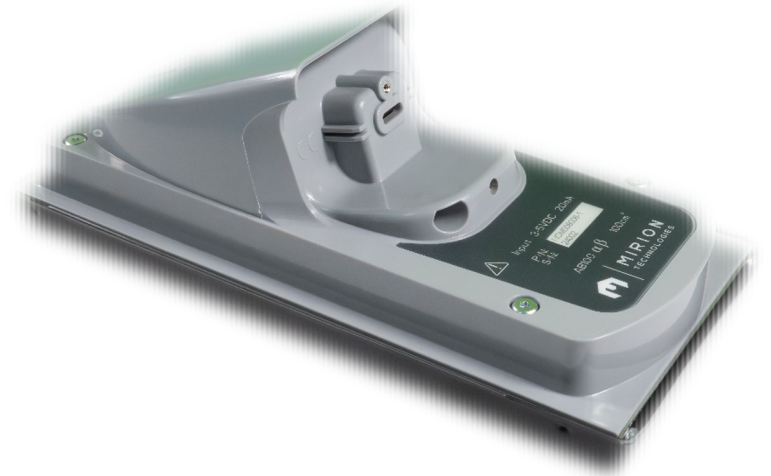


(*) *PhotoMultiplier Tubes*

MIRION Solution: CSPevo

- Integration of **LIGHTLink™** in replacement to PMT*
 - ✓ More durable in the field (Drop Proof)
 - ✓ No additional protection material needed
 - ✓ More efficient light collection
 - flat enclosure
 - Improved surface detection homogeneity
 - ✓ Entrance window replacement does not require more than 10 min before going back to operation
 - Quicker available in the field
 - ✓ No microphonics
 - ✓ Handle is designed with no constraint other than ergonomics
 - ✓ Detection module is easy to integrate into system
 - Mosaic arrangement with minimal dead area
 - Optimized shielding volume

POWERED BY
LIGHTLink®





➤ **A 100 cm² detector**

- Fragile PMT is replaced by LIGHTLink®
 - Detection area homogeneity is improved up to 85%
 - Minimized dead area with protection grid
 - Handle is designed to serve as a handle
 - ✓ No more a consequence of PMT placement
- Detector alone can be used into third party system
 - USB-C connection
 - ✓ Data transfer to host system
 - ✓ Calibration with CSPS

➤ **A set of handles to adapt to meter usage and leverage installed base**

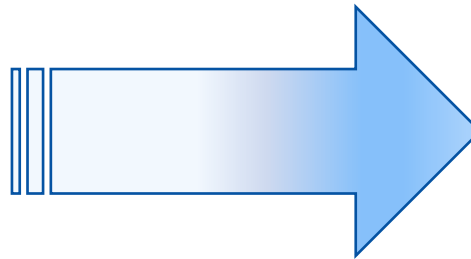
- CSPevo® is 100% compatible with CSP meter already in the field
 - No need to upgrade meter firmware
- RDS-32 based one hand configuration
 - No cable needed

FROM SAB-100 to AB-100 CSPevo



- Economical solution

- SAB-100 required additional cable
- Handle now includes the cable



One Hand Operational System

- **CSPevo®** with RDS-32
 - *No cable needed*



One Hand Operational System

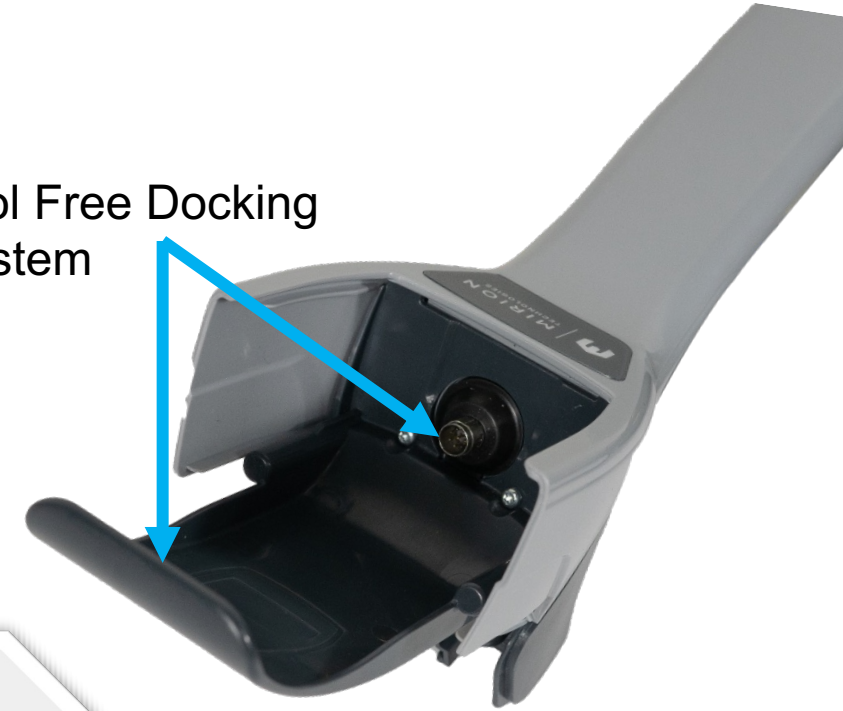
- **CSPevo®** for RDS-32
 - One screw to lock handle on the detector
 - RDS-32 simply slides into the handle



One Screw Only



Tool Free Docking System



One Hand

One Probe

One System



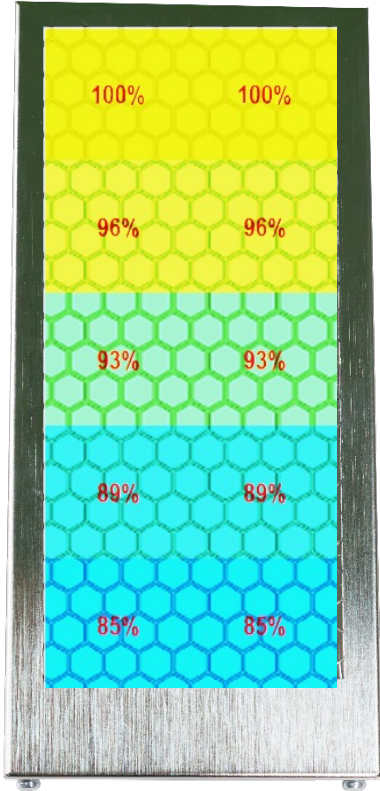
USB Connectivity

- USB-C connector
 - COTS* cable
 - Handle to Detector connection
 - Detector to PC
 - Calibration and setup with CSPS software
 - Integration into third party systems



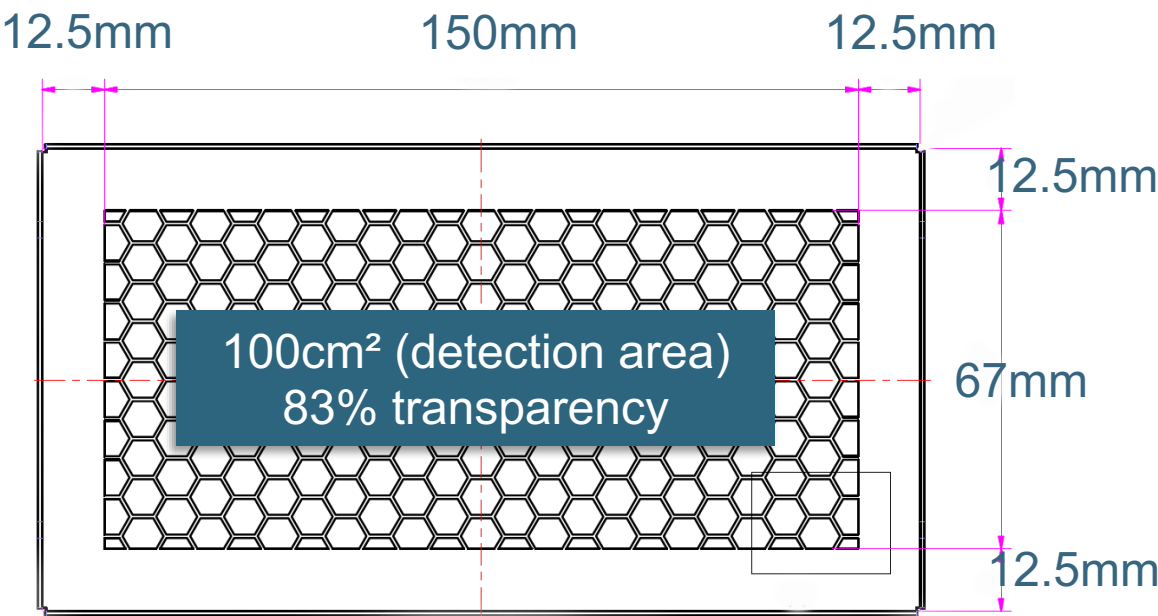
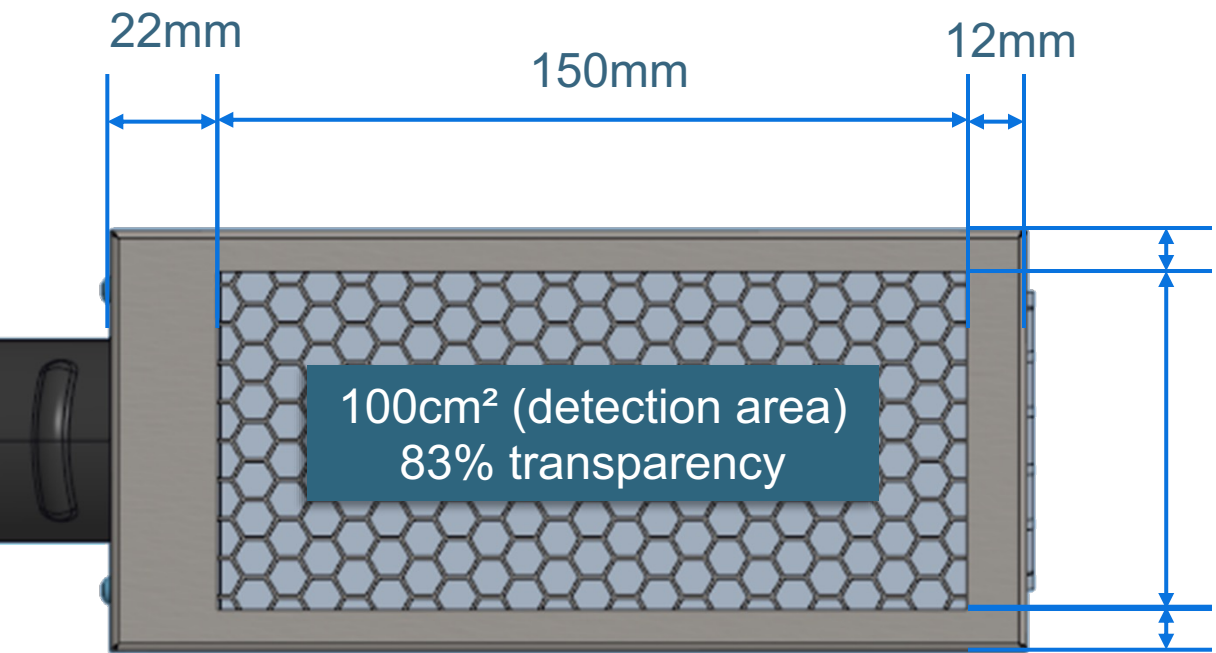
(*) Commercial Off The Shelf

Detection Area Homogeneity



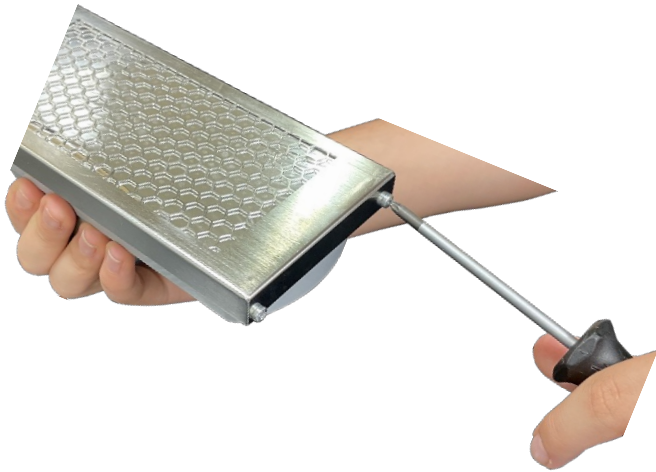
- Improved Beta detection homogeneity
 - Better than 85%
 - Referenced to IEC60325 method
 - ✓ Minimum requirement > 50%
 - Makes more consistent measurements in the field
 - Frisking or smear measurement
 - ✓ Less than 15% error regardless of position

Protection Grid



Protection Grid and Mylar®

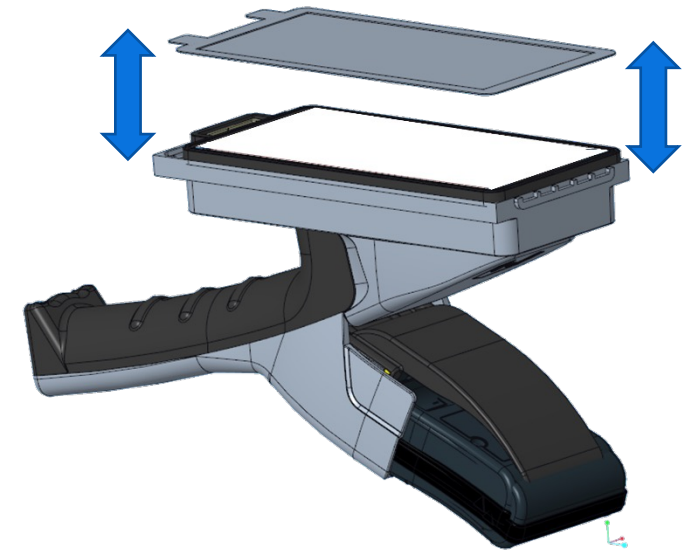
1 : Remove both screws



2 : Remove the grid



3 : Remove the Mylar® window



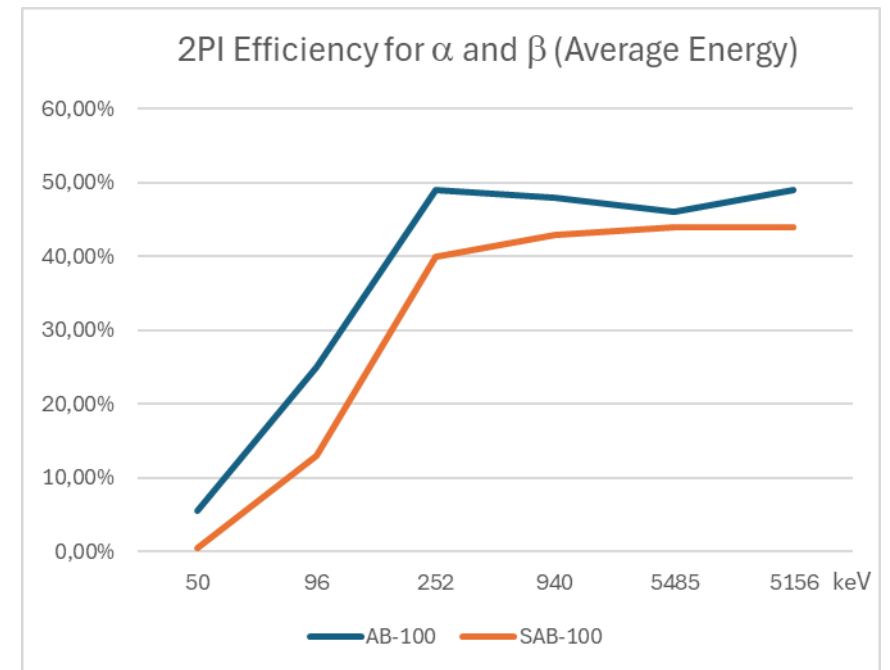
- ✓ Wait 10 minutes only after Mylar® replacement before going back to operation.
- ✗ Hours were required with PMT

- Mylar® on frame
 - No tool needed

AB-100 vs SAB-100



	AB-100 + RDS-I HANDLE	SAB-100
Weight	560 g (20 oz)	710 g (25 oz)
Beta Detection Homogeneity	> 85%	>50%
Alpha Detection Homogeneity	> 85%	>70%
Alpha Max Count-rate	10 KCPS - 600 KCPM	10 KCPS -600 KCPM
Beta Max Count-rate	100 KCPS - 6,000 KPM	
C-14 Efficiency (50 keV)	5,50%	0,50%
Co-60 efficiency (96 keV)	25%	13%
Cl-36 Efficiency (252 keV)	49%	40%
Sr/Y-90 (940 keV)	48%	43%
Am-241	46%	44%
Pu-239	49%	44%
Beta to Alpha Crosstalk	<0.1%	
Alpha to Beta Crosstalk	<5%	
Battery Life with RDS-32	180 hours	65 hours
Ingress Protection	IP53	IP20
Operational Voltage	+ 5V and +3.3V	+5V
Operating Temperature	-20°C to +50°C (-4 °F to 122 °F)	



Example:

Argos™ Evo Whole Body Contamination Monitor WBM



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Application

Whole body surface contamination monitoring at exit from radiological controlled areas (RCAs) and boundary zones in nuclear facilities (nuclear power plants, laboratories, radiopharma production, etc.) by screening the personnel for alpha, beta and/or gamma contamination.

Key Features

- Advanced Detection: Available with **21× β LIGHTLink® detectors (called “LL-B-579-S” detectors)**, **21× α/β LIGHTLink detectors (called “LL-AB-579-S” detectors)**, or 21× β/γ thin plastic scintillation detectors (called “TPS-BG-579” detectors).
- Radiological performance with LL-B-579-S LIGHTLink detectors overall superior to TwoStep-Exit™ II (TSE II).
→ **Faster measurement time and higher throughput.**
- Radiological performance with LL-B-579-S LIGHTLink detectors or LL-AB-579-S comparable to Argos™-3/-5 with TPS detectors.
Exceeds the requirements of IEC61098:2023 “Radiation protection instrumentation - Installed personnel surface contamination monitors”.



“Fully Loaded” with several Options



“Standard” with no Options

Application

Whole body surface contamination monitoring at exit from radiological controlled areas (RCAs) and boundary zones in nuclear facilities (nuclear power plants, laboratories, radiopharma production, etc.) by screening the personnel for alpha, beta and/or gamma contamination.

Key Features

- **Comprehensive software functionalities** based on improved Monitor Program software platform
- **Compact footprint:** ~89 cm x 89 cm (~35 in x 35 in)
- Common spare parts with many other Mirion Contamination Monitors.
- Large variety of options: gamma body detectors, moveable head detectors (automatic & manual), doors, barriers, small items box, dosimetry/card/barcode readers, etc. are available.



“Fully Loaded” with several Options



“Standard” with no Options

Standard *LIGHTLink*® detectors

- Revolutionary radiation detection technology
- Incorporating improved light collection, robust silicon photomultipliers & latest in readout electronics (including HV components) and connection with RJ45 patch cables rather than proprietary ribbon cables (computer to detectors is via USB to RS485 board with USB and RJ45 connectors)
- Superior radiological measurement performance for β radiation compared to TSE II resulting in shorter overall count times
- Particularly robust and without any high-voltage components
- Gas-free - no cost or worry associated with handling gas



“Fully Loaded” with several Options



“Standard” with no Options



Argos **Evo** with beta LIGHTLink® detectors of type LL-B-579-S:

Significantly better radiological performance compared to TSE II¹⁾.

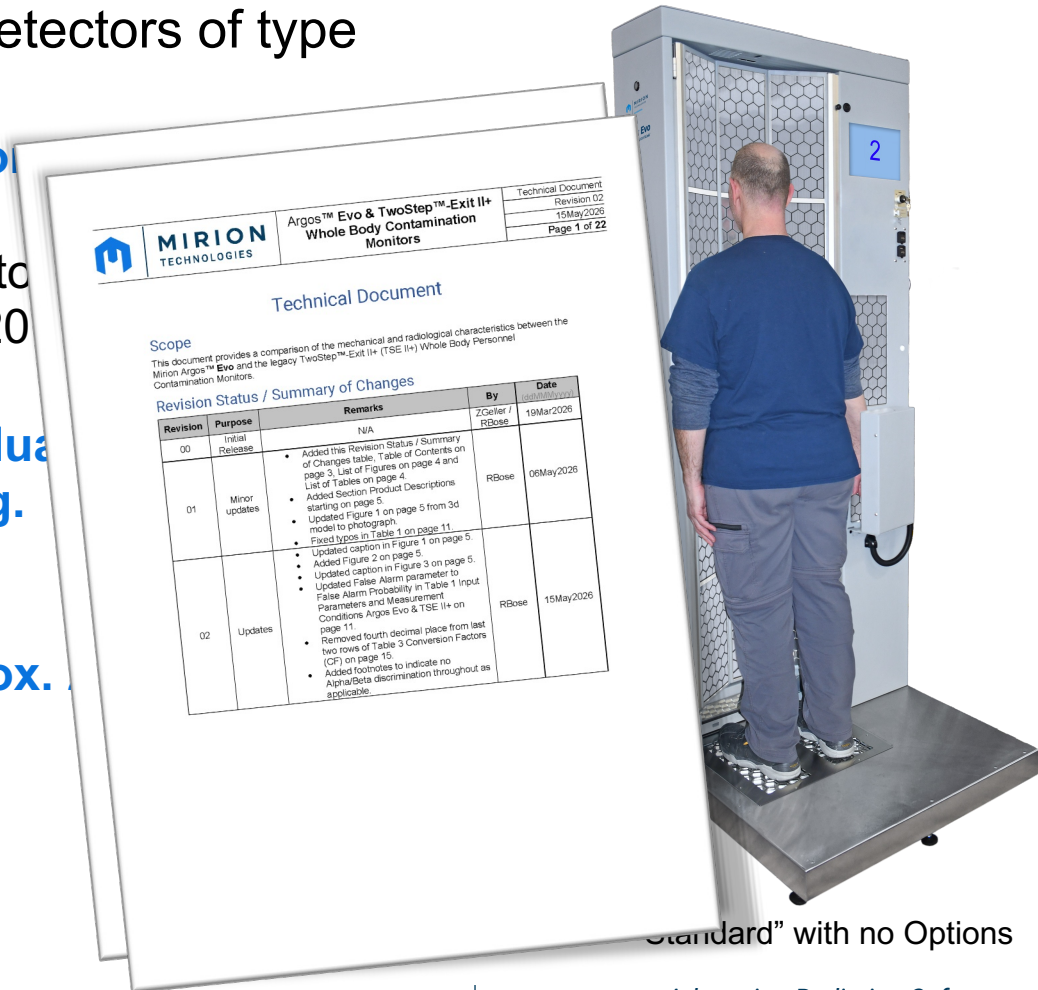
E.g. Co-60 2π efficiency for body detectors
Argos Evo: 31%, TSE II: approx. 10%-20%

Low background count-rate.

Argos **Evo** features by default **2 individual foot detectors with 2 step processing.**

→ mitigates that foot detectors are the limitation for overall measurement time.

→ reduces measurement time by **approx.**



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Argos™ Evo – LL-B-579-S Performance



Argos™ Evo
POWERED BY LIGHTLink®



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Typical Efficiency	LL-B-579-S detectors, on contact, with 0.25 mm thick fine mesh (body, head, legs, arm)	LL-B-579-S detectors, on contact, with 0.5 mm thick fine mesh (hand)	LL-B-579-S detectors, on contact, with foot grill, 0.25 mm thick fine mesh (feet)
Sr-90/Y-90 (β)	42 %	38 %	29 %
Cl-36 (β)	42 %	38 %	29 %
Cs-137 (β)	39 %	36 %	28 %
Co-60 (β)	31 %	30 %	23 %
Tc-99 (β)	21 %	19 %	15 %
C-14 (β)	8 %	8 %	5 %
U-238 (α)*	38 %	37 %	22 %
Am-241 (α)*	27 %	27 %	14 %
Pu-239 (α)*	24 %	23 %	10 %
U-235 (α)*	17 %	17 %	3 %

* Indicates no Alpha/Beta discrimination.

Typical 2π efficiency (in reference to radionuclide source emission rates), rounded to the nearest whole number (rounded up or down based on the decimal value), measured with a 10 cm × 10 cm planar source placed in the center of the detector and in contact with the detector mesh (and foot grill where applicable). Please contact Mirion for comparison with equipment specifying 4π efficiency.

Note, due to LIGHTLink® detectors generally having lower backgrounds, MDAs are typically comparable to TPS detectors – and in many cases even better – resulting in lower count times depending on the ambient background radiation...



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Argos™ Evo – LL-AB-579-S Performance



Argos™ Evo
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Typical Efficiency	LL-AB-579-S detectors, on contact, with 0.25 mm thick fine mesh (body, head, legs, arm)	L-AB-579-S detectors, on contact, with 0.5 mm thick fine mesh (hands)	LL-AB-579-S detectors, on contact, with foot grill, 0.25 mm thick fine mesh (feet)
Sr-90/Y-90 (B)	36%	31%	29%
Cl-36 (B)	37%	30%	25%
Cs-137 (B)	30%	27%	22%
Co-60 (B)	23%	19%	16%
Tc-99 (B)	14%	12%	12%
C-14 (B)	3%	3%	2%
Am-241 (α)	30%	26%	17%
Pu-239 (α)	27%	24%	15%
U-235 (α)	23%	21%	10%
U-238 (α)	15%	13%	4%

Typical 2π efficiency (in reference to radionuclide source emission rates), rounded to the nearest whole number (rounded up or down based on the decimal value), measured with a 10 cm × 10 cm planar source placed in the center of the detector and in contact with the detector mesh (and foot grill where applicable). Please contact Mirion for comparison with equipment specifying 4π efficiency.

Note, due to LIGHTLink® detectors generally having lower backgrounds, MDAs are typically comparable to TPS detectors – and in many cases even better – resulting in lower count times depending on the ambient background radiation...



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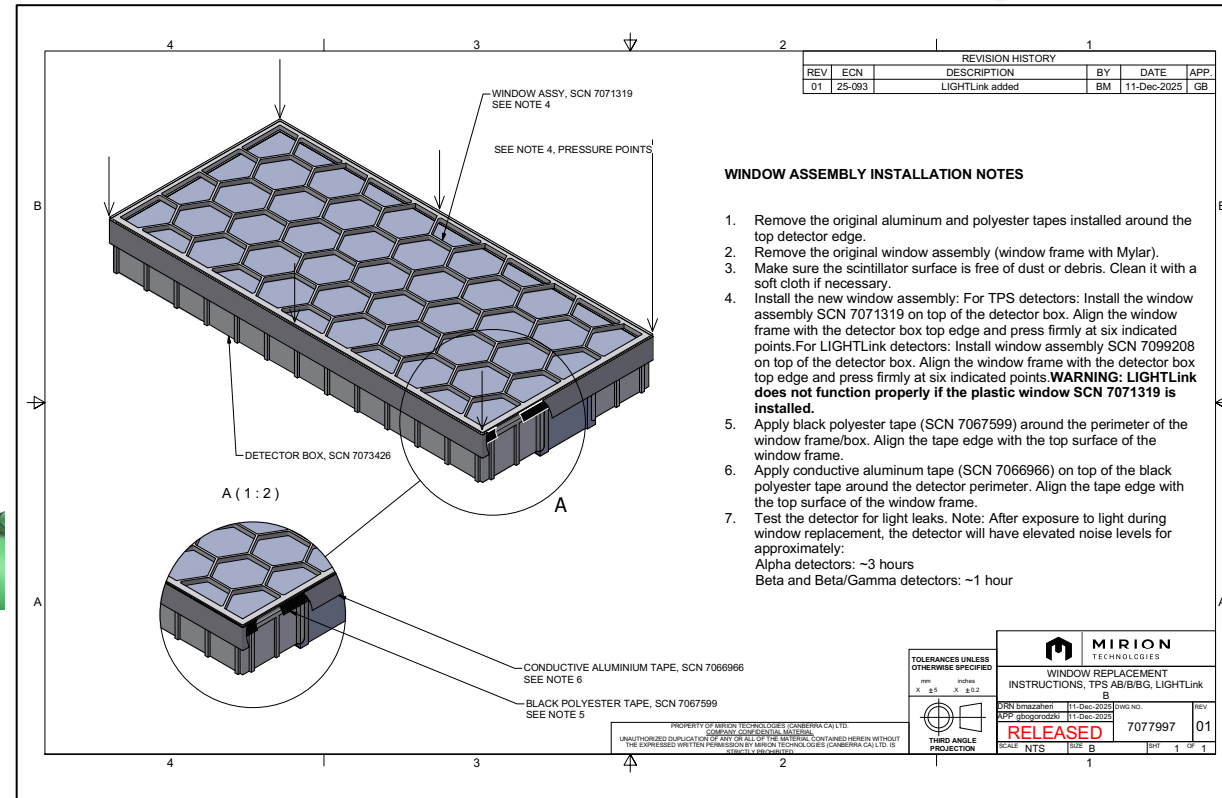
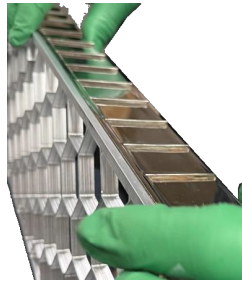
Argos™ Evo – LIGHTLink® Window Replacement



Argos™ **Evo**
POWERED BY LIGHTLink®



“Fully Loaded” with several Options



WINDOW REPLACEMENT KIT, TPS/LL DET. (SCN 7100877)

- Provides aluminum (silver-coloured) window assemblies
 - The aluminum window assemblies provide superior grounding and sealing
- Use Window Replacement Kit, TPS B/AB/BG Detectors instead if plastic (black-coloured) window assemblies are required.
- Includes:
 - 10× “Snap-On” Window Assembly (SCN 7099208)
 - 1× Roll of black polyester tape (SCN 7067599)



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Summary



- *Mirion has long-term experience with different technologies for detection of radioactive contamination*
- *Introducing LIGHTLink® as Cutting-Edge Technology from Mirion Technologies*
- *Enhancing a Wide Range of Products Ranging from Handheld Devices to Contamination Monitors*
- *Improving Industry Standards in Productivity & Reliability*
- *New Solution supporting your Health Physics daily duties*

Thank you



Survey for:

LIGHTLink® Technology: Elevating HP/RP Performance

<https://ahaslides.com/NBNKO>



*Please take a moment
to fill out a short survey
on this session.*

*Use the QR Code or link
at left...*