MIRION

CSP Family

# **HANDHELD** HEALTH PHYSICS **PROBES AND INSTRUMENTS**

MIRION TECHNOLOGIES

# The Mirion CSP™ (Mirion Canberra Smart Probes) family offers a fully integrated solution for handheld health physics.

## Maximize Efficiency and Reduce Total Cost of Ownership

Mirion offers dose rate and survey meters for a wide range of users and probes to suit many applications. Generally, health physics users like to invest in one particular instrument so training and expertise can be maximized.

All Mirion CSP probes can be “hot-plugged” to any Mirion survey meter without the need to power down or re-calibrate the instrument. CSP probes are self-contained, encompassing all necessary measurement components (high voltage, amplifier, discriminator and signal processing). Therefore each probe is separately calibrated and set up to match a dedicated application, and all probes are compatible with any CSP survey meter without any further specific setup required.


*CSP and CSPS™ (Canberra Smart Probes Software) shown with the Colibri® and RDS-31™ survey meter*

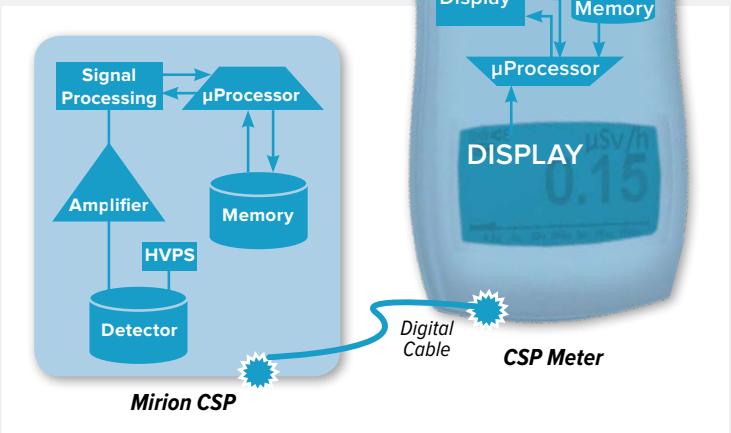
The innovative electronic design embedded within PMT based CSP probe drives extremely efficient power consumption that is approximately ten times lower than that of conventional probes. This design supports direct connection to a laptop USB port for daily checks and/or calibration, using CSP software which enables the host instrument to remain in use.

The CSP Family offers digital communication and therefore no critical measurement component relies on cable quality.

CSP probes can easily be used in third party systems via the CSP-PL™ programming library that simplifies development and reduces time to its completion.

# CSP meters and probes deliver significant benefits.

- More instruments are available in the field
- Considerably less calibration and set-up time
- 100% compatibility with all CSP compatible instruments
- Reduced total cost of ownership and daily workload
- Reduced need for paper and log books
- Improved accuracy of data transcription




# Handheld Health Physics CSP Family

## Mirion CSP Probes

- A complete range of self controlled smart probes
- A variety of versatile instruments, battery powered and easy to carry
- A choice of communication modules to suit a wide range of applications
- Calibration and setup software to manage probe and instrument quality

**BACK AND FORTH** SMART

### Real-time measurement display on meters and computers

*Colibri*® Meter

Radiagem™ Meter

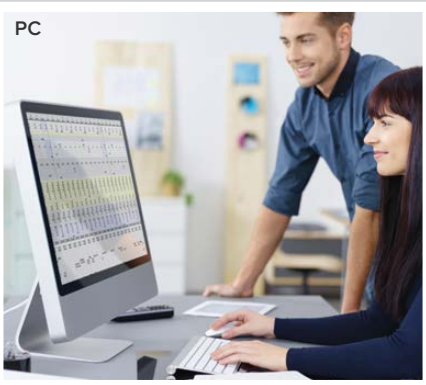
RDS-31™ Meter

*AVIOR*®-2 / MIP-2™ Meter

**Optimized application support**

with CSP-PL and CSP-COM™ modules

- CSP probe is a fully integrated sub-system taking and transmitting data in real time to the host instrument
- All key device components (high voltage, amplifier, discriminator and signal processing) are located in the probe
- Each probe stores all calibration related settings and all data-logging points
- Full interchangeability without recalibration enables increased uptime of instruments in the field, thereby maximizing the investment



COMMUNICATION

Custom application

CSP-PL

CSP-COM wired or wireless communication modules

## 15 cm²

**SABG-15+™** GM Pancake

*Multi-purpose contamination probe*

**SPAB-15™** *PIPS*® Detector

*Alpha-Beta discrimination in high Gamma background*

α β γ | α/β

## 20 cm²

**SA-20-2™** ZnS Scintillator

**SB-20™** Plastic Scintillator

*Contamination check in high Gamma background*

α or β

## 32 cm²

**SA-32™** ZnS Scintillator

**SB-32™** Plastic Scintillator

**SAB-32™** Plastic/ZnS Phoswich

*Personal Alpha or Beta contamination probe*

α or β or α/β

## Gamma Scintillator

**SG-1R™** NaI(Tl) Scintillator 1" x 1"

*Low dose-rate and Gamma contamination probe*

**SG-2R™** NaI(Tl) Scintillator 2" x 2"

*Very low dose-rate and Gamma contamination probe*

**SX-2R™** NaI(Tl) Scintillator 1.5" x 3mm

*Low energy Gamma and Alpha contamination check in humid environment*

γ | γ | α x γ

## 100 cm²

**SA-100™** ZnS Scintillator

*Large area Alpha contamination check*

**SB-100™** Plastic Scintillator

*Large area Beta contamination check*

**SAB(G)-100™** Plastic/ZnS Phoswich

*Alpha/Beta discrimination on large contamination area and personal frisking*

α | β | α/β (γ)

## Neutron

**SN-S™** Moderated Helium 3 Tube

*Neutron presence detection*

**SN-D™** Moderated Helium 3 Tube

*Neutron dose equivalent rate*

η rate | η dose

## Large Area

**SAB-250™** 250 cm² Plastic/ ZnS Phoswich

*Large area Alpha Beta frisking or hand contamination check*

**SABP-525™** 525 cm² Plastic/ ZnS Phoswich

*Alpha Beta contamination on foot*

**SABS-579™** 579 cm² Plastic/ ZnS Phoswich

*Alpha Beta contamination on floor*

α β

## Dose Equivalent Rate

**SVLD™** Energy Compensated CsI(Tl)

*Very low H*(10) dose equivalent rate probe for public working area checks*

**STTC™** Energy compensated G-M Detector

**TELE-STTC™**

*Wide range H*(10) dose rate equivalent to ICRP-60*

**SVHD™** Silicon diode

*Very high dose rate probe for fuel control*

γ

# DOSE-RATE AND SURVEY METERS

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


## Radiagem™ 2000 Meter

**Highlights:**

- Measurement of H*(10) ambient dose equivalent rate up to 100 mSv/h
- Easy-to-read and backlit analog bar graph and digital display
- Visual and audible alarms on dose rate and integrated dose equivalent
- External probes for remote measurements, dose rate and surface contamination
- Date stamped data-logging (1000 points in probe memory and 1000 points in Radiagem memory)
- Scaler/timer mode in data-logging
- Lightweight, waterproof and easy to decontaminate
- Rugged and easy to use


## *AVIOR*®-2 and MIP-2™ Digital Desktop or wall mounted Frisker/Integrator

**Highlights:**

- Rugged and simple to use with dedicated buttons
- Scaler/timer to improve MDA (compatible with Easy-Count™ instrument)
- Back-up built-in rechargeable battery for up to 70 hours
- Dual probe inputs (MIP-2 unit is compatible with previous Nardeux probes with second connector)
- Dual Alpha/Beta display for each input (up to four channel displayed simultaneously)
- Manual or automatic background deduction
- Specific hand/foot mode with body detection

RDS-31™ series is compatible with Mirion CSP probes (see compatibility matrix). However, legacy RDS-31 probes may be available.

They are only compatible with RDS-31 meters, including specific systems (See dedicated specification sheets for more details).



## RDS-31™ Wearable and Robust Survey Meter

**Highlights:**

- Dose-rate equivalent up to 100 mSv/h (10 rem/h)
- Dual simultaneous Alpha/Beta display with Gamma dose rate
- Scaler/timer to improve MDA (compatible with Easy-Count instrument)
- Rugged and waterproof
- Clip and vibrator for hands-free use
- Very long battery life up to 1000 hours
- Connection to external CSP probes
- Contacts for external power with cradle for charging NIHM batteries


## RDS-31iTx™ and RDS-31iTxSD™ Telemetry Survey Meter

**Highlights:**

- Dose-rate equivalent up to 100 mSv/h (10 rem/h) with (iTx) and up to 10 Sv/h (1000 rem/h) with (iTxSD)
- Telemetry via WRM2™ communication: 2.4 GHz ISM for Europe and 900 MHz ISM for USA
- Dual simultaneous Alpha/Beta display with Gamma dose rate
- Scaler/timer to improve MDA
- Rugged and waterproof
- Clip and vibrator for hands-free use
- Very long battery life up to 1000 hours
- Connection to external CSP probes
- Contacts for external power with cradle for charging NiHM batteries


## RDS-31 dedicated probes

*GMP-25™ External Gamma Probe*

- Used for measuring alpha, beta, gamma and X-ray radiation

*GMP-12SD™ External Gamma Probe*

- Gamma probe with silicon diode for high dose rate measuring applications

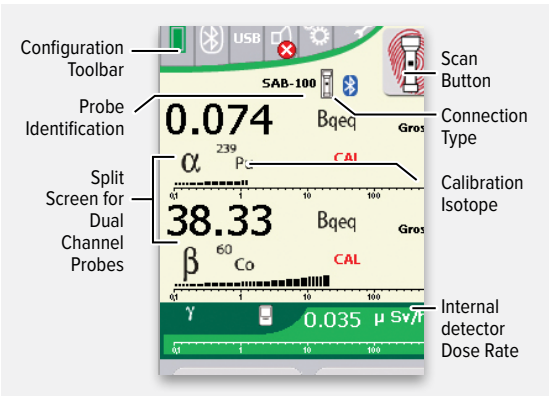
*GMP-12GSD™ External Wide Range Gamma Probe*

- Gamma probe with GM Tube and silicon diode for wide dose rate measuring applications

*GMP-12UW™ External Gamma Probe*

- Underwater gamma probe with silicon diode for high dose rate measuring applications in water

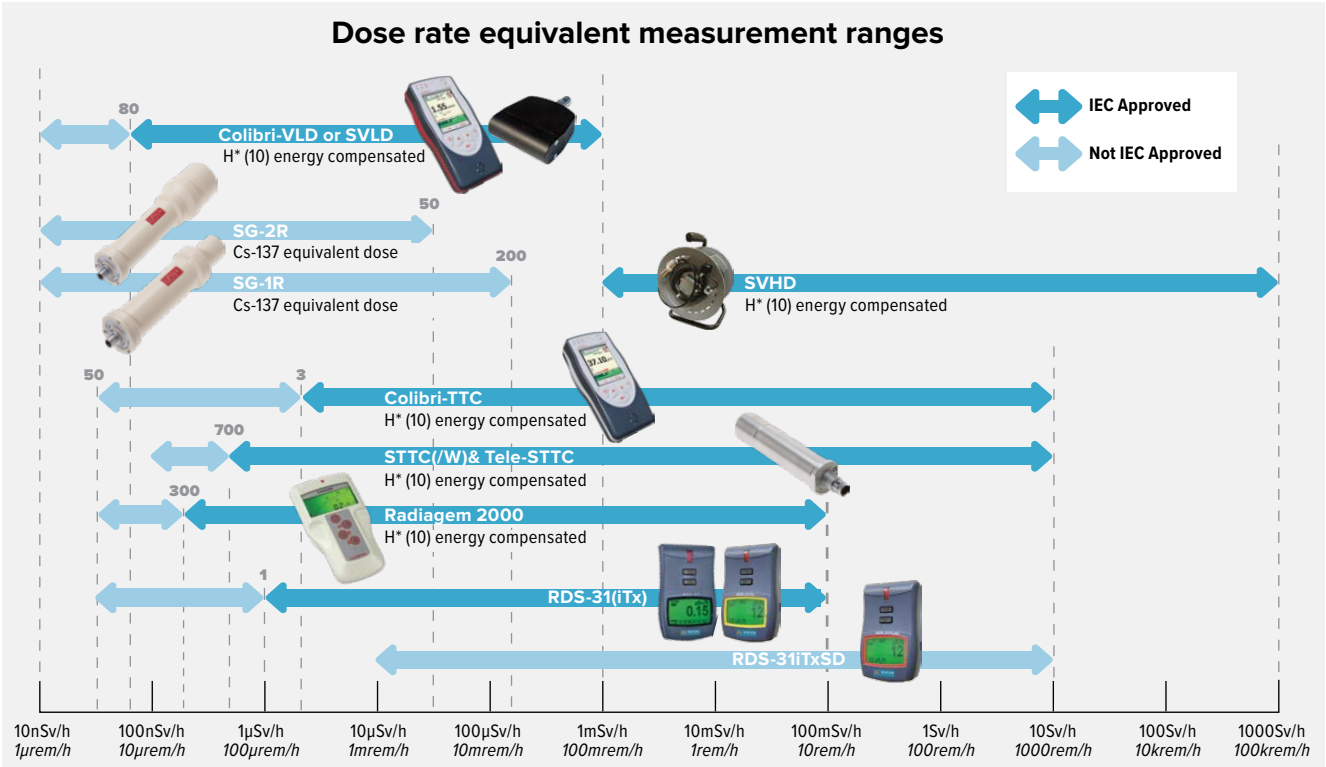
# DOSE-RATE AND SURVEY METERS


## *Colibri*® Handheld Communication ALARA Platform

**Highlights:**

- Embedded dose detector: VLD for low dose-rate (Red) or TTC for wide range (Grey)
- Mapping application with GPS or barcode reader
- Wired and/or wireless connection for up to eight probes
- Dual simultaneous Alpha and Beta reading with SAB probes



# SAMPLE COUNTER

Measuring samples in the field requires lightweight instruments with capability to improve MDA via background deduction and integration over time (scaler-timer). CSP probe detectors and electronics become a sample holder with embedded smartness to making it a plug-and-play solution when connected to the CSP meter. Data management capabilities are therefore dependent on the instrument used. It can be the *Colibri*, the RDS-31, the *AVIOR*-2 unit or any PC with an application developed with the CSP-PL programing library.

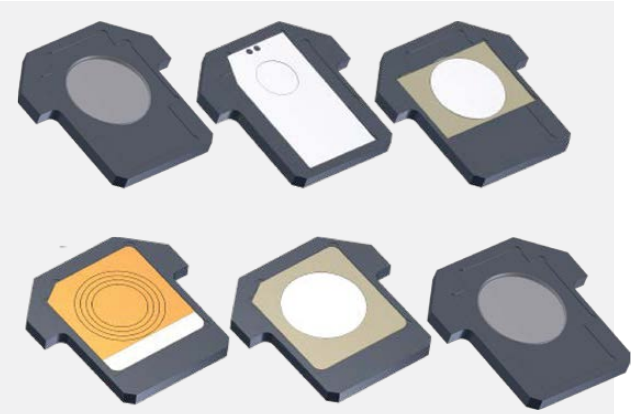

*Easy-Count with Colibri units*


*Easy-Count with RDS-31 units*

## Easy-Count™ Field Discrimination Alpha/Beta Smear/Filter Counter

**Highlights:**

- 17 $cm^2$ Silicon *PIPS* detector based counter with very good $\alpha/\beta$ discrimination
- Lightweight - no lead shielding
- Excellent MDA
- High efficiency with improved sample to detector distance
- Rotary drawer with reverso sample holder for various shapes and sizes
- Compatible with *Colibri*, *AVIOR*-2 and RDS-31 meters (specific instrument holder)



*Reverso sample holder with various filters/planchet*

# CONTAMINATION PROBES

Each contamination probe has been designed for a specific measurement task. All probes are compatible with all CSP instruments using the same cable or communication module, without the need for any specific setup.

Detection area and probe shape can vary to better support site specific configurations such as areas with difficult or complex access (glove boxes) or to improve frisking situations (personal and/or object).

*SABG-15+*

## SABG-15+™ Alpha/Beta/Gamma Frisking Probe

**Highlights:**

- 15 cm² Alpha, Beta, Gamma frisker probe
- Connects directly or via cable to CSP instrument
- Internal pancake GM detector can be changed out easily - not soldered in place

*SPAB-15*

## SPAB-15™ Discrimination Alpha/Beta Probe

**Highlights:**

- 15 cm² *PIPS* detector Alpha/Beta discriminating contamination probe
- *PIPS* detector technology delivers minimal cross talk between Alpha and Beta and reduced Gamma background sensitivity
- Significantly better MDAs than similar probes on the market
- Ruggedized detector face appropriate for challenging environments

## SABP-525™ Alpha/Beta Foot Probe

**Highlights:**

- Alpha/Beta surface contamination measurement on foot
- ZnS(Ag) 525 cm² Phoswitch detector
- Very small footprint
- Similar detector to whole body contamination monitors
- Robust protection grid for better durability in an industrial environment
- Dedicated mechanical structure to ensure proper foot positioning
- Embedded presence sensor to switch between background and personal measurement

*SABP-525*

- Only one CSP cable for measurement and presence sensor
- Easy-to-change Mylar window protection on frame
- Adapts to *AVIOR*-2 hand/foot systems

## SABS-579™ Alpha/Beta Floor Monitory Probe

**Highlights:**

- Alpha/Beta surface contamination measurement on floors
- ZnS(Ag) 579 cm² Phoswitch detector
- Excellent discrimination with minimized Alpha influence into Beta channel
- Very easy to move and carry
- Easy-to-change Mylar window protection on frame
- Adapts to *Colibri*, RDS-31 and Radiagem units with dedicated but interchangeable holder

*SABS-579*

## SA-20-2™, SA-32™ and SA-100™ Alpha Only Probe

**Highlights:**

- 20, 32 or 100 cm² ZnS scintillator
- Appropriate for most Alpha contamination situations from glove boxes to personal frisking
- Very low sensitivity to Gamma and Neutron background
- Easy-to-change Mylar window protection


## SB-20™, SB-32™ and SB-100™ Beta Only Probe

**Highlights:**

- 20, 32 or 100 cm² plastic scintillator
- Appropriate for most Beta contamination situations from small objects to personal frisking
- Mylar, Alpha transparent (SB-100/A probe) or aluminum Alpha stopper (SB-100/B probe) window material


## SAB-32™, SAB-100™, SABG-100™ and SAB-250™ Alpha/Beta (Gamma) Probe

**Highlights:**

- 32, 100 or 250 cm² plastic/ZnS Phoswich, SABG-100 probe is more sensitive to Gamma
- One of the lowest crosstalk on the market minimizing the Beta influence to Alpha counting
- Supports simultaneous Alpha and Beta contamination check with single measurement


# CONTAMINATION & 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 the unique Mirion Time-To-Count design that offers a wide measurement range, a long detector life 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 dose probes utilize energy compensated detectors and meet the latest ICRP requirements.

## Contamination Probes


SX-2R

### SX-2R™ Low-energy X-Ray Probe

**Highlights:**

- For low energies of 5 keV and above
- Able to detect Alpha contamination in high humidity conditions
- Energy button to reduce high energies influence
- Very directional probe to locate origin of contamination


SG-1R

SG-2R

### SG-1R™ and SG-2R™ Gamma Probe

**Highlights:**

- 1" x 1" or 2" x 2" NaI(Tl) scintillator probe
- Displays either count-rate or dose-rate equivalent to Cs-137
- Energy button to reduce low energies and confirm high energy presence

SN-D

### SN-D™ Neutron Detection Probe

**Highlights:**

- Neutron dose-rate measurement from Thermal (0.025 eV) neutron to 15 MeV
- Lightest neutron probe on the market
- Ready to use in the field with embedded handle and meter cradle
- Ideal instrument for both ambient dose rate measurements in reactor building and spent fuel transportation control prior to departure


SN-S

### SN-S™ Neutron Detection Probe

**Highlights:**

- Lightweight neutron solution
- Compliant with IAEA and ANSI N42.34 neutron detection requirements
- No microphonics false reading
- Ideal for detection of fissile material smuggling

# Dose Equivalent Rate Probes


## STTC and STTC-W Wide Range Probe

**Highlights:**

- Wide range Gamma dose rate from background up to 10 Sv/h (1000 R/h) with one detector only
- Time-to-Count technology delivers prolonged detector life
- STTC-W waterproof version with 20 meter (65 feet) cable on a reel


## Tele-STTC™ Wide Range Gamma Telescopic Probe

**Highlights:**

- Wide range Gamma dose rate from background up to 10 Sv/h (1000 R/h) with one detector only
- Time-to-Count technology delivers prolonged detector life
- All extension up to 4.09 meters with available cradles for Radiagem, RDS-31 or *Colibri* units
- Lightweight carbon fiber pole with variable segments locking mechanism


## SVLD™ Very Low Dose Probe

**Highlights:**

- Offers maximum sensitivity in a compact size for quicker detection
- Accurately measures background level and does not saturate before 1 mSv/h (100 mrem/h)
- Ideal for public area control and smuggling detection
- Direct connection to CSP instrument (cable not mandatory), except with RDS-31


## SVHD™ Very High Dose Gamma Probe

**Highlights:**

- Dose-rate equivalent up to 1000 Sv/h (100 000 rem/h)
- Waterproof with 50 meter cable on a reel
- High cumulative dose capability up to 5 kSv with remote electronics
- Very small diameter probe (10 mm / 0.39 in.) to fit D&D applications

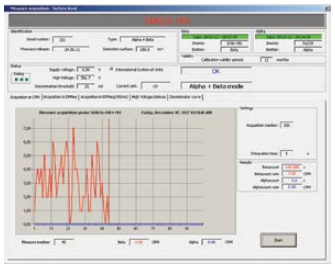
# CSP ACCESSORIES

CSP accessories have been developed to simplify daily Health Physics duties depending on application specifics. We have accessories ranging from a simple handle to support one-handed usage to a sophisticated wireless communication module to control acquisition from a remote and safe position. Some accessories are dedicated to a specific instrument and others are compatible across the entire range.

## CSPS™ Calibration and Setup Software for CSP Probes and Instruments

**Highlights:**

- Checks all probes and instruments operational parameters with direct connection to computer
- Manages all logged data points in instruments and probes
- Upgrades firmware of CSP meters and probes
- Automatic calibration wizard can be tuned to match user's exisiting radioactive sources and proceed to CSP calibration



## CSP-COM™ CSP Network Interfaces

**Highlights:**

- Enhances CSP probe connectivity by adding Bluetooth®, Wi-Fi, Ethernet, interfaces
- Allows unattended remote measurement and monitoring with CSP probes
- Models available for hard-wired or wireless connections

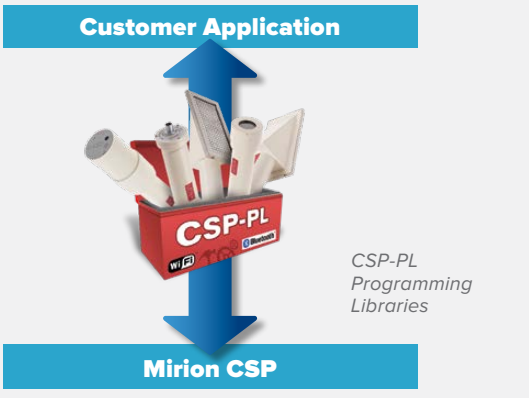
*CSP-COM digital wireless and wired versions shown*

*The Bluetooth® word mark and logos are registered trademarks owned by Bluetooth SIG, Inc.*

## CSP-PL™ CSP Communication Software

**Highlights:**

- Windows based software development kit that allows for integration of CSP probes with a customer's own software application
- Combined with CSP-COM network interfaces, the CSP-PL Programming Libraries allow the user to create a network of CSP probes and to monitor their outputs via computer




*CSP-PL Programming Libraries*

## CSP-HANDLE for One Meter and One CSP Probe

**Highlights:**

- Converts one meter (*Colibri*, RDS-31 or Radiagem unit with and one probe (S-100, SG, SN, S-32 or S-20 unit) into a one hand operational measurement tool
- Very compact and durable

## *AVIOR*-2 Hand and/or Foot Systems

A specific Hand/Foot measurement mode offers the ability to control the Alpha and Beta contamination on hand and/or foot at the same time. It is an ergonomic and affordable solution when available footprint does not provide sufficient space for traditional Hand/Foot bigger monitors. Various systems configuration are available to support site requirements (wall mounting self-standing, etc.)

*AVIOR-2H*

*AVIOR-2H/H-S*

## Carrying Cases

Mirion offers a variety of standard carrying cases (with foam cut to fit products) or carrying bags to cover most applications and probe/instrument configurations. Do not hesitate to contact us for any specific request.

*Custom case configurations*

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