



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

- Real-time, instant Detection, Measurement and Identification
- Wide dose rate range: from natural background to high accident levels
- Light and robust
- Simple and fully automated use
- Light weight means smaller drone or longer flight time
- 1000 times more sensitive than most of the GM-based sensors for drones
- Extrapolation of the measurements at ground level
- Count rate per radionuclide

DESCRIPTION

The package includes SpirMOBILE software for visualization and mapping of the dose rates (including extrapolated at ground level), nuclide identification, and count rate for each nuclide. SpirMOBILE has the capability to draw maps with interdiction/hazardous areas.

SpirMOBILE works on a remote/ground computer when the drone or robot includes a compliant radio communication system providing a robust and no-loss link. This feature is available on several industrial drones. For other drones or robots, the SKIDER(tm) communication system may be used.

Alternatively, when real-time visualization is not needed, the SpirMOBILE system can be installed on an embedded computer/tablet with USB connection to the SPIR-Explorer sensor and to a GPS.

SpirVIEW Mobile (option) displays allows efficient situational awareness thanks to its capability to do data fusion from several devices on the same map: swarm of drones, combination with helicopter/car/pedestrian measurements (SPIR-Ident Mobile, SPIR-Pack, SPIR-Ace).



RADIOLOGICAL PERFORMANCE

- **Detectors**
 - NaI(Tl) dia 32 mm*51 mm or LaBr3(Eu) dia 25 mm*32 mm
 - + 2 GM tubes (mid and high range)
- **Energy range:** from 20 keV to 3 MeV
- **Dose rate measurement range:** 0,001 $\mu\text{Sv/h}$ to 10 Sv/h (0,1 $\mu\text{R/h}$ to 1000 R/h)
- **Detection capability:** better than 0,1 $\mu\text{Sv/h}$ (10 $\mu\text{R/h}$) increase in 2s
- **Real-time nuclide identification:** better than 0,5 $\mu\text{Sv/h}$ (50 $\mu\text{R/h}$)
- **Spectrometry:** 1024 channels
- **Acquisition rate:** 0,5 second
- **Spectroscopy range:** up to 100 $\mu\text{SV/h}$ (10 mR/h)



Drone landing on a platform and equipped with a SPIR-Explorer detector

SPIR-IDENT SUITE SOFTWARE

Software to be installed on a remote computer. Provides real time processing including ground dose rate calculation and nuclide identification, display, mapping, and data storage.

Includes:

- SpirMOBILE
- SpirMOBILE Replay



SPIR-Explorer Sensor mounted on an AERACCESS drone

ELECTRICAL CHARACTERISTICS

- **Supply voltage:** typical 4,5 to 18 V
- **Power consumption:** ≤ 1 W
- **Data I/O:** 230 kbps (RS232C link in logical level, 3,3 V)
- **Connector:** miniature cylindrical connector

ENVIRONMENTAL CHARACTERISTICS

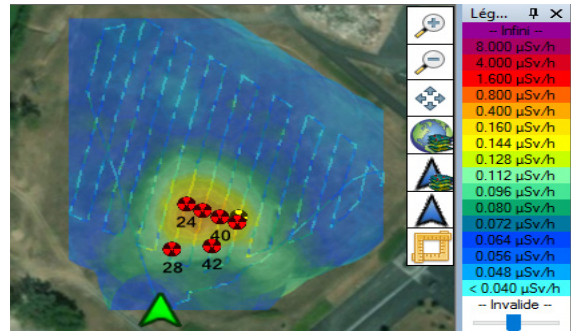
- **Temperature Range:**
 - operation from -20 °C to 50 °C
 - operates accurately under temperature shock
- **Humidity:** 93% HR at 30 °C
- **Protection level:** IP65

MECHANICAL CHARACTERISTICS

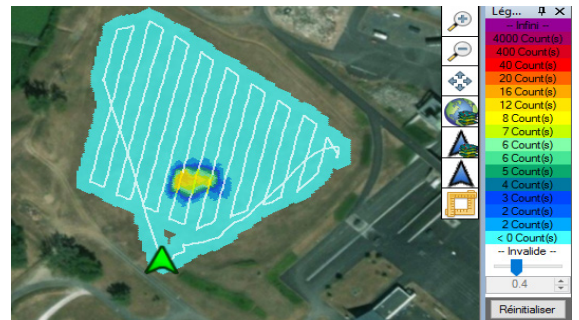
- **Dimensions:** 250 mm (L) x 132 mm (W) x 81 mm (H)
- **Mounting:** 4 x M5
- **Mass (cable not connected):**
 - NaI(Tl): 840 g
 - LaBr3(Eu): 740 g

INTEGRATION

- **Compatible drones:**
 - Mirion Radknight (Americas)
 - AREACCESS Q800X
- **Compatible radio communication system:** Smart Robotics Systems SKIDER



Dose rate map



Cs-137 count rate map



SPIR-Explorer Sensor in operation