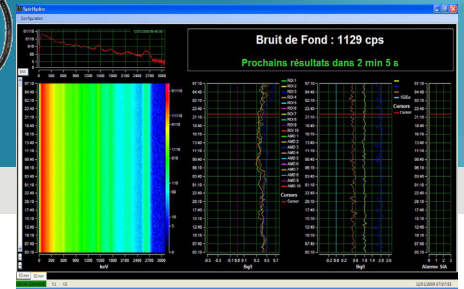




SPIR-Env

Air/Water monitoring by gamma spectrometry



Nuclear
Power



Homeland
Security
& Defense



Industrial and
Manufacturing



Healthcare



Labs and
Education

OVERVIEW

SPIR-Env is a compact and robust system monitoring air and water radiological pollution using gamma spectrometry.

The system can be used to measure the contamination of sea water or rivers or the sewage from nuclear power plants, hospitals, and industry. It can also be used to evaluate the contamination of the air by noble gas and particulates in the context of environmental monitoring, or for radioactive fallout measurements.

The SPIR-Env system provides continuously and in a fully automated way, the dose rate, count rates in regions of interests (ROI), the identification and quantification of nuclides. It gives the results in Bq/l in water, Bq/m² on the ground, or Bq/m³ in the air, for each nuclide.

The software can display the information locally or remotely.

KEY FEATURES

- Much below background sensitive
- Tolerant to changing background
- Simultaneous long and short integration time
- Ambient and underwater measurement
- Waterproof up to 100 m
- Automated operation
- Compact and robust system
- Embedded GPS
- Embedded 3G Transmission
- Remote supervision software

VERSIONS:

- PEEK or PEHD probe
- CeBr3 or NaI detector
- Probe cable 10 m, 30 m or 100 m

DESCRIPTION

The SPiR-Env system is made of a waterproof probe and a processing unit. The probe contains a scintillator and a spectrometer module. It is connected to an acquisition box performing the spectrum processing, the local storage and the data transmission.



OPERATION MODE

Fully automatic operation: connect the probe to the acquisition module, connect it to a power supply and press the ON / OFF button.

PRINCIPLE OF OPERATION

The SIA/Identpro algorithm provides a multiple ROIs analysis plus an iterative process that progressively eliminates low confidence level candidates. The quantification is then based on the net area estimation of the main peak of the intended isotopes. The two steps process avoids false positive by first checking the presence of the intended isotope, and so makes the device very robust in particular to variation of the natural isotopes concentration within the sampled material. Issues like interferences between Radium daughter and Cesium are solved.

	Detection/Identification	Quantification
Medical	18F, 51Cr, 67Ga, 99Mo, 103Pd, 111In, 123I, 125I, 131I, 133Xe, 153Sm, 201Tl	18F, 51Cr, 67Ga, 111In, 123I, 131I, 153Sm, 201Tl
NORM	40K, 226Ra + daughters, 232Th + daughters	40K, 226Ra + daughters, 232Th + daughters
Industrial	22Na, 57Co, 54Mn, 60Co, 75Se, 133Ba, 137Cs, 152Eu, 154Eu, 166Ho, 192Ir, 207Bi, 228Th (232U), 241Am	22Na, 54Mn, 57Co, 60Co, 133Ba, 137Cs, 241Am
SNM	U, LEU, HEU, 233U, HBPu, MBPu, LBPu, 241Pu, 237Np	
Nuclear accident	131I, 132I, 133I, 133Xe, 134Cs, 137Cs	131I, 134Cs, 137Cs

PERFORMANCE EXAMPLE

Cs-137 identification limit is lower than 1 Bq/l in the water and lower than 500 Bq/m² on the ground for 1 hour integration time.

FUNCTIONAL FEATURES

- **SPiR-Acq acquisition box:**
 - ON/OFF buttons and indicators
 - Embedded GPS
 - Embedded Modem: GPRS, 3G
 - Connectors: DC, Probe, LAN, USB
 - Connector Type: MIL-DTL 38999
 - IP index: IP67
 - Temperature: -20°C to +50°C
 - Power supply: DC 10-32V, 23W
 - Dimensions: 300 mm x 234 mm x 120 mm
 - Weight: 6.5 Kg
 - Remote control: via LAN or Internet
 - Remote transmission protocol: FTP
- Operation without SPiR-Acq is possible (Probe connected)

Probe	3 x 3" NaI(Tl)	1.5 x 1.5" CeBr3
- Cs-137 typical resolution	7.5%	4.5%
- Energy range	30keV to 3 MeV, 1024 channels	
- Temperature	-20°C to +50°C	
- Background in the water	15 cps	5 cps
- Energy stabilization	In natural background, tolerates artificial radionuclides. ±1% accuracy over temperature range.	

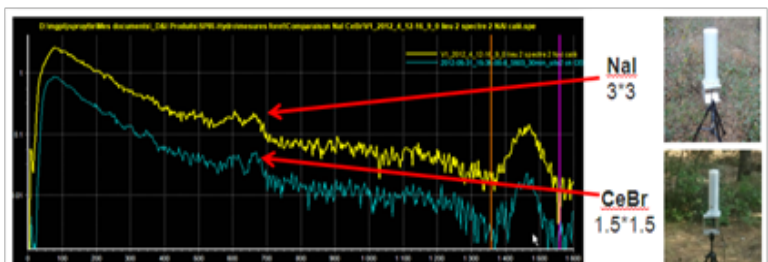
Probe housing

- Material	PEEK or PEHD	
- Probe/overall Diameter	114 / 149 mm	88 / 129 mm
- Length w/o connector (mm)	460 mm	393 mm
- PEHD/PEEK weight	4.2 / 4.8 kg	2.3 kg

*PEEK should be used in aggressive environment

Cable

- Underwater grade cable: 10 m, 30 m or 100 m
- over-protection of the connector (Shellfish...)



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