



Nuclear Physics



Labs and Education



Environmental  
monitoring



## KEY FEATURES

- ◆ All-in-one detector, electronics and MCA for **Gamma Spectroscopy**
- ◆ Based on a **SiPM** area up to nearly 1.5 inch<sup>2</sup>
- ◆ 20-80 V Integrated High Voltage for SiPM biasing
- ◆ OEM electronics or tube-like detector assembly
- ◆ Assembly with **CsI scintillator**:
  - 24x24x30 mm<sup>3</sup> (approx. 1x1x1.2 inch<sup>3</sup>)
  - 30x30x30 mm<sup>3</sup> (approx. 1.2x1.2x1.2 inch<sup>3</sup>)
- ◆ Resolution @ 662 keV < 6 % with 18x18x30 mm<sup>3</sup> CsI(Tl) crystal
- ◆ Other assembly option available on request: NaI, BGO, LYSO, LaBr3 or any other compatible scintillator
- ◆ Demountable tube-like mechanics to easily change crystal
- ◆ Ethernet connectivity
- ◆ Web-based interface with spectrum analysis tools
- ◆ Compact form factor
  - Ø 60 mm, h 90 mm (OEM)
  - Ø 60 mm, h 135 mm (ASSEMBLY)

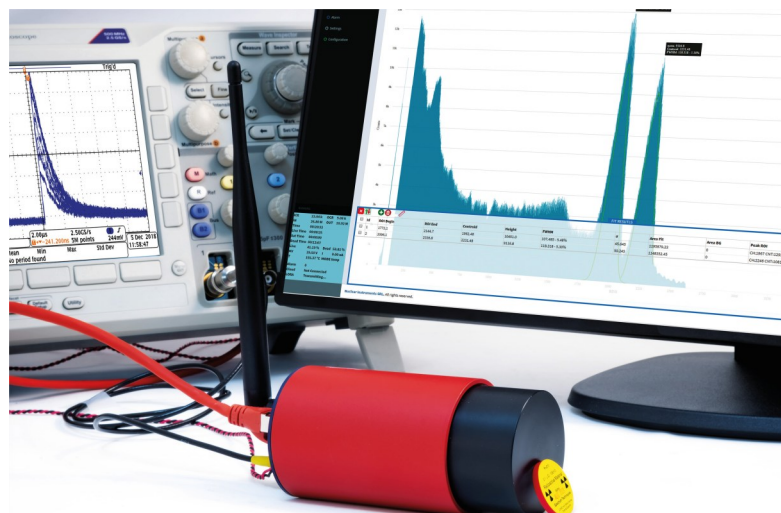
## DESCRIPTION

The i-Spector Digital is a fully-integrated, tube-like **Gamma Spectrometer** designed to deliver complete, high-resolution gamma spectroscopy in a compact and **portable form factor**. Purpose-built for users who demand the performance of a full MCA chain: detector, preamplifier, shaper, and multichannel analyzer, in a single self-contained unit! It brings laboratory-grade spectroscopy capabilities to any environment, from the bench to the field.

The i-Spector Digital is based on a **SiPM** area (24x24 or 30x30 mm<sup>2</sup>), optionally coupled to a suitable scintillation crystal, and integrates a high-bandwidth preamplifier stage, a shaper, a temperature-compensated HV power supply for SiPM biasing, and a full-featured MCA based on an 80 MSps 12-bit ADC with digital charge integration algorithm, all in one tube-like unit. The output includes an analog amplified signal and a 4k-channel energy spectrum computed entirely onboard, with no external processing required.

The i-Spector Digital can be connected through Ethernet and controlled through a **Web Interface**, to configure and monitor the device, with the possibility to access the energy spectrum, process it online, and perform energy calibration and peak Gaussian fitting.

Multiple i-Spector Digital units can be simultaneously connected and controlled from a single PC via Ethernet, using simple HTTP requests and JSON vectors, making it straightforward to scale up to multi-detector configurations.



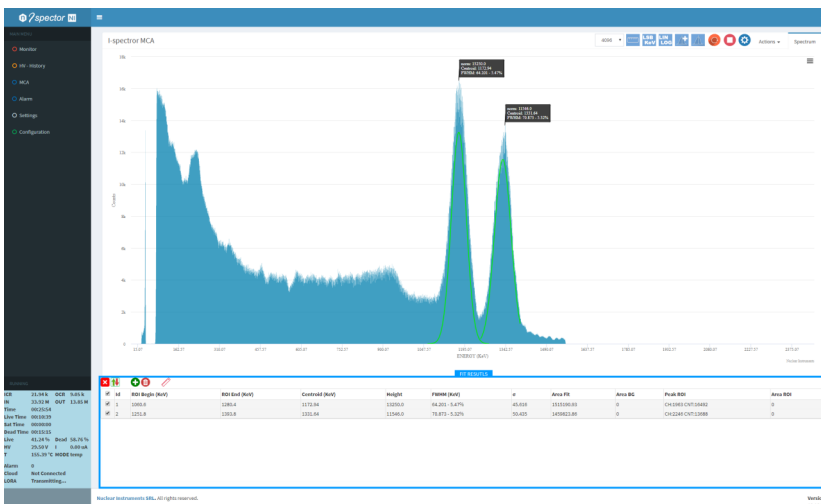
*i-Spector Digital in assembly version is used as a complete readout system to acquire a <sup>60</sup>Co spectrum*

## Web Interface

The i-Spector Digital comes with a dedicated web-based graphical interface, accessible directly from any modern browser, that lets the user **configure the module and immediately visualize the acquired energy spectrum**. No software installation required.

The spectrum view features a fully interactive plot with **analysis tools**: cursors and ROIs can be placed on any peak of interest to perform real-time Gaussian fitting with automatic calculation of centroid, FWHM, counts, and other key statistics. Linear background estimation and energy calibration, using linear or higher-order fit models, are available directly from the interface.

An internal circular memory buffer continuously stores up to one hour of voltage, current, and sensor temperature data, available for download at any time via the web interface.



## SDK

For users who need deeper integration, the I-Spector Digital offers a fully documented SDK based on JSON data and standard HTTP POST, compatible with every modern programming language and operating system (Windows/MacOs/Linux/Android/iOS). Whether building automated workflows, custom dashboards, or multi-sensor acquisition systems, the SDK provides complete programmatic access to all device features.

## TECHNICAL SPECIFICATIONS

Supply Voltage	8-13V (12 V typ.)
Power consumption	3W max.
Preamplifier bandwidth	>1GHz
Preamplifier gain	x 5
Shaping time	180 ns
Output signal	- 4 ... +4 V , 170 mA
SiPM area	up to 30x30 mm <sup>2</sup> (nearly 1.5 in <sup>3</sup> )
SiPM Manufacturer	Hamamatsu
SiPM Model	S14160-6050HS
HV Power supply	20-80 V (10mA)
HV accuracy	1 mV
Thermal feedback	0.01°C - 1mV
MCA nr. of channels	4096
Connectivity	Ethernet
Working Temperature	-20 ... +50°C
OEM Size	Ø 60 mm (2.40 in.) h 90 mm (3.55 in.)
Assembly Size	Ø 60 mm (2.40 in.) h 135 mm (5.32 in.)
Weight	OEM: 150g (5.3 oz.) ASSEMBLY: 500g (17.6 oz.) with 18x18x30 mm <sup>3</sup> CsI crystal

## Performances with CsI(Tl) crystal

Energy Range	30 keV to 3 MeV
Energy Resolution (FWHM)	<6 % @ 662 keV (=5.5% with T < 28°C)
Max input rate	100 kpcs without resolution degradation
MCA res. @ 100 kpcs	<0.2%
Non-linearity	<0.1%

## Ordering Option

Ordering code	Description
WS2570EXOAAA	S2570E i-Spector Digital 1" (24x24 mm <sup>2</sup> ) - OEM
WS2570FXOAAA	S2570F i-Spector Digital 30x30 mm <sup>2</sup> - OEM
WS2570EXAAAA	S2570E i-Spector Digital 1" (24x24 mm <sup>2</sup> ) - CsI ASSEMBLY
WS2570FXAAAA	S2570F i-Spector Digital 30x30 mm <sup>2</sup> - CsI ASSEMBLY

