Nuclear Physics   *Labs and Education*   *Industrial*
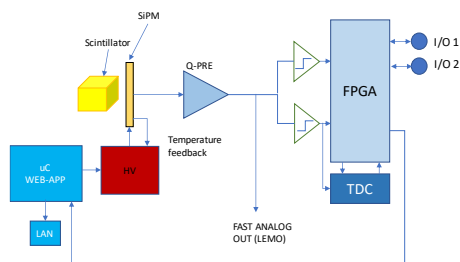
KEY FEATURES

- All-in-one detector and preamplification electronics for **Gamma Spectroscopy**

- Based on a **SiPM** area up to nearly 1.5 inch^2

- 20-80 V Integrated High Voltage for SiPM biasing

- **i-Spector PLUS** version with embedded timing unit for coincidence and ToF measurements among multiple devices

- OEM electronics or detector assembly

- Assembly with CsI scintillator:
  - 18x18x30 mm^3
  - 24x24x30 mm^3 (approx. 1x1x1.2 inch^3)
  - 30x30x30 mm^3 (approx. 1.2x1.2x 1.2 inch^3)

- Other assembly option available on request: NaI, BGO, LYSO, LaBr3 or any other compatible scintillator

- Demountable mechanics to easily change crystal

- Ethernet connection to PC

- Web-based configuration and monitor interface

- Compact form factor
  - Ø 60 mm, h 90 mm (OEM)
  - Ø 60 mm, h 135 mm (ASSEMBLY)

DESCRIPTION

The i-Spector is a fully-integrated tube designed to replace existing systems based on PMTs. This compact unit is based on a SiPM area (18×18, 24×24 or 30x30 mm^2) with preamplifier stage, integrated power supply for SiPM biasing with temperature feedback loop and a monitor for temperature, current and voltage. The i-Spector can be controlled through Ethernet. The output is a fast analog signal that can be digitized or processed with a common Digitizer, MCA or discriminator/TDC chains.

i-Spector is a solution dedicated to those users that need the versatility of a full compact single photodetection system for spectroscopy applications. Its profile makes it ideal to substitute PMTs in many physics experiments.
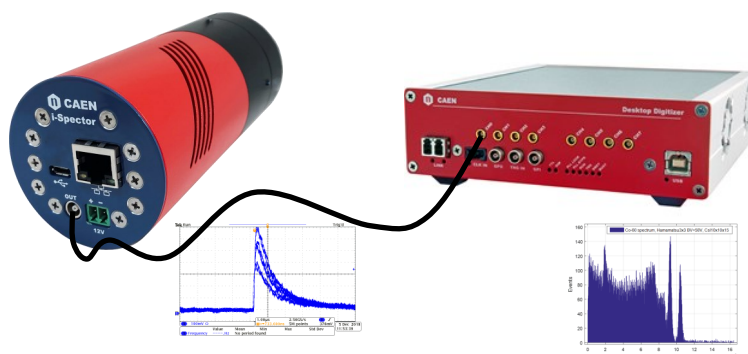
i-Spector PLUS integrates an additional **Timing Unit** that is able to correlate the detector signal with external signals. It is designed to perform event timestamping, ToF measurements (50 ps resolution with integrated TDC), coincidence between multiple i-Spector modules and photon counting.

A **web-based interface** is supplied with the i-Spector and i-Spector PLUS, providing status information, High Voltage control and communication setup functionalities. If the dynamic change of parameters and monitor is not required, the configuration could be stored in the internal flash and the module could be used as a **stand-alone unit**, without **any external interconnection except that the supply voltage, as a classical PMT.**

Multiple i-Spector tubes can be connected and controlled from a single PC. The API interface allows to control multiple devices using very simple http requests and JSON vectors.

i-Spector in assembly version, used as a PMT replacement, is connected to a CAEN DT5730 Digitizer to acquire a typical gamma spectrum.

Developed in collaboration with **Nuclear**Instruments

Web Interface

i-Spector can be easily controlled through its dedicated web graphical user interface, with no needs to install a dedicated software. The user can monitor the status of the module, configure the HV and connection parameters.

The homepage shows the status of the HV generator (voltage, current, enable and protection) and the SiPM temperature. The user can power on/off the HV and set the output voltage. It is possible to access to the secondaries pages: Monitor, History, Settings and Ethernet Configuration.

Thanks to the internal circular memory buffer, i-Spector module is able to store up to 1 hour of output data consisting in voltage, current and sensor temperature samples. The last 1-hour recording can then be downloaded by the web interface.

SDK

i-Spector can be integrated in a custom user application using the available SDK. All needed features are supported by the SDK in order to fully **automatize and control the system**. The SDK is based on JSON data exchanged using standard HTTP POST, supported by every modern programming language and operating systems (Win/MacOs/Linux/Android/iOS).

TECHNICAL SPECIFICATIONS

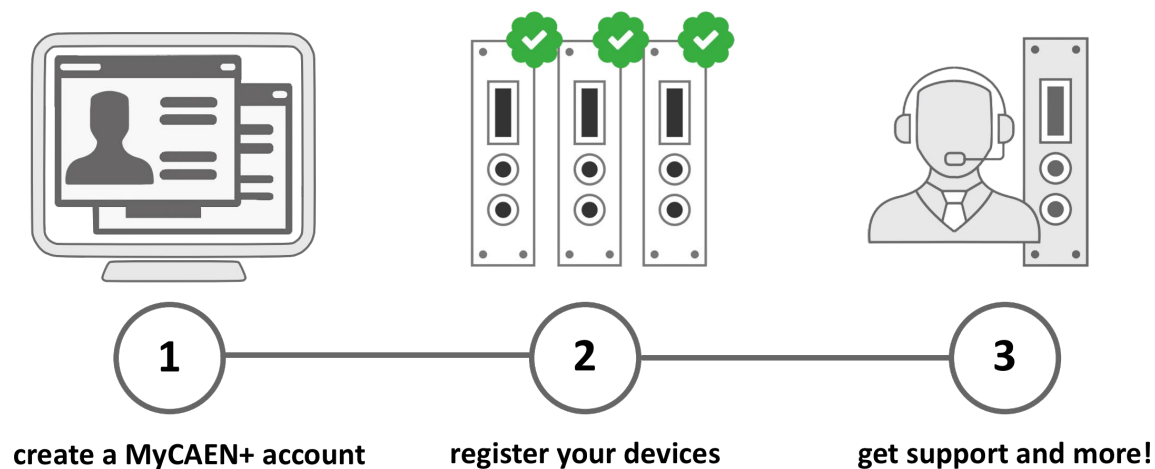|	
Supply Voltage	8-13V (12 V typ.)
Power consumption	3W max.
Preamplifier bandwidth	>1GHz
Preamplifier gain	x 5
Shaping time	180 ns
Output signal	- 4 ... +4 V , 170 mA
SiPM area	up to 30x30 mm^2 (nearly 1.5
SiPM Manufacturer	Hamamatsu
SiPM Model	S14160-60520HS
HV Power supply	20-80 V (10mA)
HV accuracy	1 mV
Thermal feedback accuracy	0,01°C - 1mV
Time resolution	50ps @ rate <20 kpcs 5 ns @ high rate
Connectivity	Ethernet 100 Mbps
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^3 CsI crystal

Ordering Option

Ordering code	Description
WS2560DXOAAA	S2560D i-Spector 18x18 mm^2 - OEM
WS2560EXOAAA	S2560E i-Spector 1" (24x24 mm^2) - OEM
WS2560FXOAAA	S2560F i-Spector 30x30 mm^2 - OEM
WS2560DXAAAA	S2560D i-Spector 18x18 mm^2 - CsI ASSEMBLY
WS2560EXAAAA	S2560E i-Spector 1" (24x24 mm^2) - CsI ASSEMBLY
WS2560FXAAAA	S2560F i-Spector 30x30 mm^2 - CsI ASSEMBLY
WS2560TDXOAA	S2560TD i-Spector PLUS 18x18 mm^2 - OEM - COMING SOON
WS2560TEXOAA	S2560TE i-Spector PLUS 1" (24x24 mm^2) - OEM- COMING SOON
WS2560TFXOAA	S2560TF i-Spector PLUS 30x30 mm^2 - OEM- COMING SOON
WS2560TDXAAA	S2560TD i-Spector PLUS 18x18 mm^2 - CsI ASSEMBLY- COMING SOON
WS2560TEXAAA	S2560TE i-Spector PLUS 1" (24x24 mm^2) - CsI ASSEMBLY- COMING SOON
WS2560TFXAAA	S2560TF i-Spector PLUS 30x30 mm^2 - CsI ASSEMBLY- COMING SOON

Register your device

Register your device to your **MyCAEN+** account and get access to our customer services, such as notification for new firmware or software upgrade, tracking service procedures or open a ticket for assistance. **MyCAEN+** accounts have a dedicated support service for their registered products. A set of basic information can be shared with the operator, speeding up the troubleshooting process and improving the efficiency of the support interactions.

MyCAEN+ dashboard is designed to offer you a direct access to all our after sales services. Registration is totally free, to create an account go to https://www.caen.it/become-mycaenplus-user and fill the registration form with your data.

1 create a MyCAEN+ account

2 register your devices

3 get support and more!

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