X–ray Instrumentation Associates

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Corporate Capabilities

All digital spectrometers are not created equal

The introduction of digital signal processor (DSP) technology has revolutionized the field of X-ray and gamma-ray spectroscopy, and X-ray Instrumentation Associates (XIA) has been at the forefront of this revolution since the beginning.

For nearly a decade XIA has pioneered the use of DSP and field-programmable-gate-array (FPGA) technologies working in concert to produce the fastest and most powerful spectrometers on the market. In our patented core technology, a reconfigurable FPGA carries out the brute-force work of FIR shaping and pileup detection, reducing the digitized raw detector signal to a few user-defined metrics per detected event, and thus freeing the DSP to carry out various high-level post-processing functions to produce spectra of unmatched quality without affecting throughput.

CORE COMPETENCIES:

- Patented digital spectrometer core combines FPGA and DSP technologies.
- Standard and customized solutions can handle nearly any spectroscopy-related data acquisition task in real time.
- Rapid integration with virtually any existing radiation detector and preamplifier.
- Scaleable systems provide solutions ranging from battery-powered handhelds to multi-element systems in laboratory or industrial environments.
- High precision waveform digitization and pulse shape analysis.

Standard spectrometer models

XIA offers a full range of spectrometers, separated into two categories:
The **Digital X-ray Processor (DXP)** series is used by researchers and companies worldwide for XRF, EDX, and XAFS materials analysis.
The **Digital γ-ray processor (DGF)** series is used for general γ-ray spectroscopy, coincidence spectroscopy and for instrumenting entire nuclear physics experiments.

Both series are available in three form factors:

- Single-channel benchtop spectrometers for top performance.
- Compact independent or integrated multi-channel spectrometer systems for multi-element detectors, including segmented HPGe-detectors.
- Miniaturized autonomous single-channel spectrometers for low power, hand-held, and embedded applications.

Solutions tailored to the application

For modest NRE charges XIA can readily modify its standard products to meet individual or OEM applications. Our hardware can be adapted to fit specific size, shape, temperature range, I/O protocol and power requirements if required. However, most adaptations require only firmware or software changes, since all signal processing is accomplished digitally in our spectrometers. This flexibility reduces cost and time to market; and, as your needs evolve, so too can the software. For instance, we can adapt the on-board software to integrate auxiliary control signals, to customize trigger and coincidence decisions, and to calculate derived quantities on-line. The built-in pulse shape analysis capability has been used for 3D position reconstruction in coaxial segmented HPGe-detectors, for n/γ discrimination in NE213 and for α/p/γ particle identification using CsI(Tl). Finally, if you have a problem whose solution requires a really unusual combination of capabilities, we can design a completely customized solution that will cost effectively provide world class performance.

Please contact us at sales@xia.com.