



Southern Innovation



Technology Briefing Document

The accurate and timely measurement of radiation is essential in many industries for the non-invasive characterisation of materials. Despite significant advances in radiation detector technology, many detectors remain constrained by pulse processing electronics and software.

Southern Innovation's SITORO® digital pulse processing technology provides a quantum leap in the efficiency of radiation detectors. Our technology enables real-time pulse processing at unprecedented levels of speed and accuracy, eliminating many challenges faced by conventional digital pulse processors.

Southern Innovation's SITORO® pulse processing technology has wide application, including: materials analysis; baggage and freight security screening and logistics; borehole logging for resource exploration; mineral processing; medical imaging; and pathology.



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SITORO® Accelerated Analysis

Detection and measurement of radiation is used extensively for non-invasive material characterisation in a range of industries. However, many practical applications are severely limited by pulse pile-up within the detector. Pulse pile-up, which occurs when multiple radiation events arrive within the temporal resolving time of the detector, degrades the fidelity of subsequent material analysis.

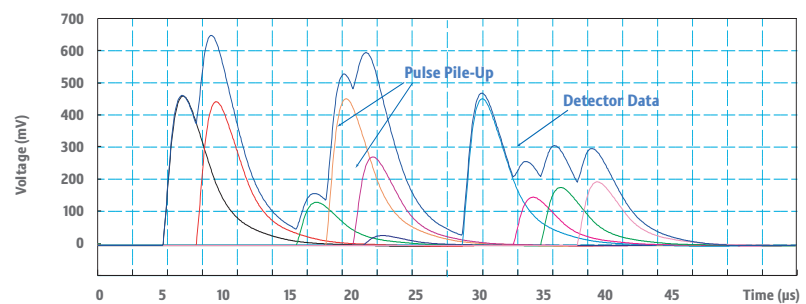


Figure 1: Pulse pile-up in the detector output. The signal is composed of multiple individual pulses which pile-up on top of each other making it difficult to determine the energy of an individual event.

Southern Innovation's patented SITORO® digital pulse processing technology implements advanced non-linear signal processing algorithms to decode pulse pile-up in real-time. Conventional pulse processors discard pile-up events, sacrificing detector data and limiting speed and accuracy of analysis. By decoding rather than discarding pile-up events, SITORO® dramatically improves measurement efficiency and accuracy.

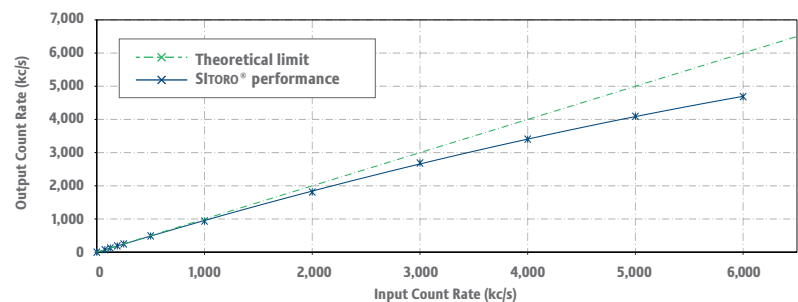


Figure 2: Cutting Edge Throughput – OCR vs ICR.

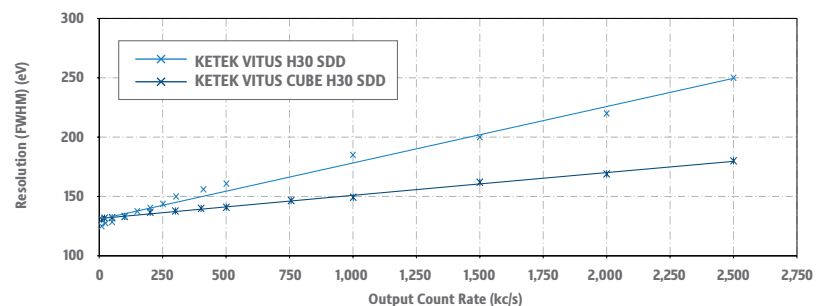


Figure 3: Exceptional Resolution at Phenomenal Throughput.



Key benefits of SITORO® digital pulse processing include:

- » faster analysis - exceptional throughput at very high input count rates
- » accurate analysis - outstanding energy resolution at high count rates
- » cutting-edge light element analysis
- » very low dead time even at high count rates
- » excellent timing resolution < 1 ns
- » excellent pulse pair resolution < 50 ns

FalconX Digital Pulse Processor

...the FalconX digital pulse processor delivers analysis in a fraction of the time...

Our licensing partner, XIA, has worked closely with Southern Innovation to implement our SITORO® pulse processing technology into their range of FalconX digital pulse processors, a new generation of processing technology that can deliver analysis in a fraction of the time.



FalconX7



FalconX4



FalconX8

Key benefits of XIA's FalconX processor include:

- » compatible out of the box with virtually all detectors
- » light, compact and highly portable
- » intuitive software interface
- » simple setup and auto-calibration
- » list mode operation as an option
- » supports advanced digitiser mode, working as a digital oscilloscope
- » supports time-binned spectra based upon synchronised input signal
- » Gigabit Ethernet



About Southern Innovation:

Southern Innovation develops, markets and licenses patented digital pulse processing algorithms for the rapid, accurate detection and measurement of radiation. The company was born out of research to review suitable technologies for the accurate and rapid detection of legacy landmines. Southern Innovation's multi-award winning SITORO® technology provides a quantum leap in the efficiency of radiation detectors, with wide application in areas such as: materials analysis; baggage and freight security screening and logistics; borehole logging for resource exploration; mineral processing; medical imaging; and pathology.

Partnering Opportunities:

Southern Innovation is committed to developing the application of our digital pulse processing technology across a variety of industries and products. Southern Innovation has the expertise and capability to develop turnkey solutions including 1000s of channels of processing in bespoke hardware configurations. We are receptive to a range of commercial relationships including: joint product development; distribution agreements; and intellectual property licensing.

Figures: Customised SITORO® processing solutions.



Southern Innovation is receptive to a range of potential commercial relationships...

Contact Southern Innovation:

You can find information on Southern Innovation's technology and products, as well as the latest news, at www.southerninnovation.com.

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