Southern Innovation

SITORO®
ACCELERATED ANALYSIS

Technology Briefing Document

The accurate and timely measurement of radiation is essential in many industries for the non-invasive characterisation of materials.

Southern Innovation's SITORO® digital pulse processing technology provides a quantum leap in the efficiency of radiation detectors. After more than 10 years of research and development our technology has now been productised and enables real-time pulse processing at unprecedented levels of speed and accuracy.

Southern Innovation's SITORO® pulse processing technology has wide application in time-critical areas including: airport baggage screening; oil exploration, mineral analysis; non destructive testing; advanced material design; and the early detection and staging of cancer.

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Technology Briefing Document

SItoro® Accelerated Analysis

...by decoding rather than discarding pile-up very little data is rejected resulting in a dramatic increase in measurement efficiency.

Detection and measurement of radiation is used extensively for non-invasive material characterization 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.

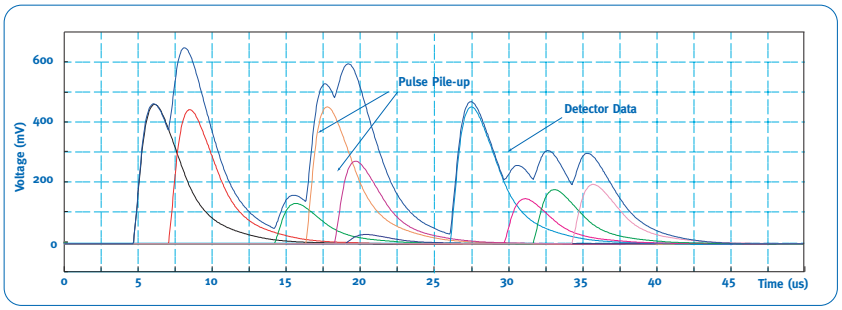

Figure 1: Pulse pile-up in the detector output. The signal is composed of multiple individual pulses which pile-up on top of each other making it difficult to determine the energy of an individual event.

Southern Innovation's patented SItoro® digital pulse processing technology implements advanced non-linear signal processing algorithms to decode pulse pile-up in real-time. By decoding rather than discarding pile-up events, very little data is rejected, resulting in a dramatic increase in measurement efficiency.

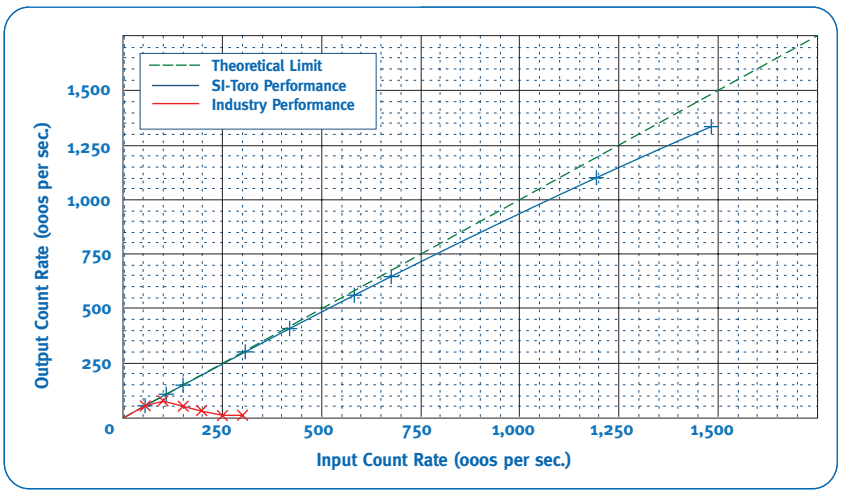

Figure 2: The performance of the SItoro® pulse pile-up recovery technology. Up to an input count rate of 1.5 Million input counts per second throughput (the percentage of counts accurately detected) remains above 90%. This represents a 20-fold improvement over industry state-of-the-art.

Key benefits of SITORO® digital pulse processing include:

- faster analysis - exceptional throughput at very high input count rates;
- accurate analysis - operate at high count rates without traditional resolution loss; and
- excellent event separation - see events separated by less than 50 nanoseconds.

FalconX Digital Pulse Processor

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

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

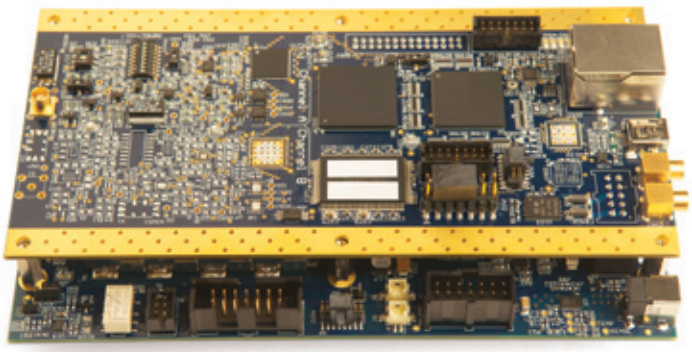

Figure 3: XIA's FalconX digital pulse processor board incorporating Southern Innovation's SITORO® pulse pile-up recovery technology.

Key benefits of XIA's FalconX processor include:

- real time implementation of SITORO® digital pulse processing technology;
- support for a range of pulsed reset or resistive feedback preamplifiers;
- a high speed USB 2 interface supporting 40 MB/s peak transfer;
- a wide analogue bandwidth of 50 MHz supports rise times of ‹ 10ns; and
- excellent timing resolution: events stamped with resolution ‹ 5ns.

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 airport baggage screening, oil exploration, mineral analysis and the early detection of cancer.

Partnering Opportunities:

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

Southern Innovation is committed to developing the application of our digital pulse processing technology across a range of industries and products. We are receptive to a range of commercial relationships including: joint product development; distribution agreements; and intellectual property licensing. For more information please contact:

Brendan Allman
Business Development Manager, Southern Innovation
729 Nicholson Street, Carlton North, Victoria 3054, Australia
Ph: +61 (0)3 9387 0338
Mobile: +61 (0)4 0199 8771
Fax: +61 (0)3 9387 0339
email: brendan.allman@southerninnovation.com
web: www.southerninnovation.com