

ADC/MCA Module With PC Interface (RS232/RS485/USB/Ethernet)

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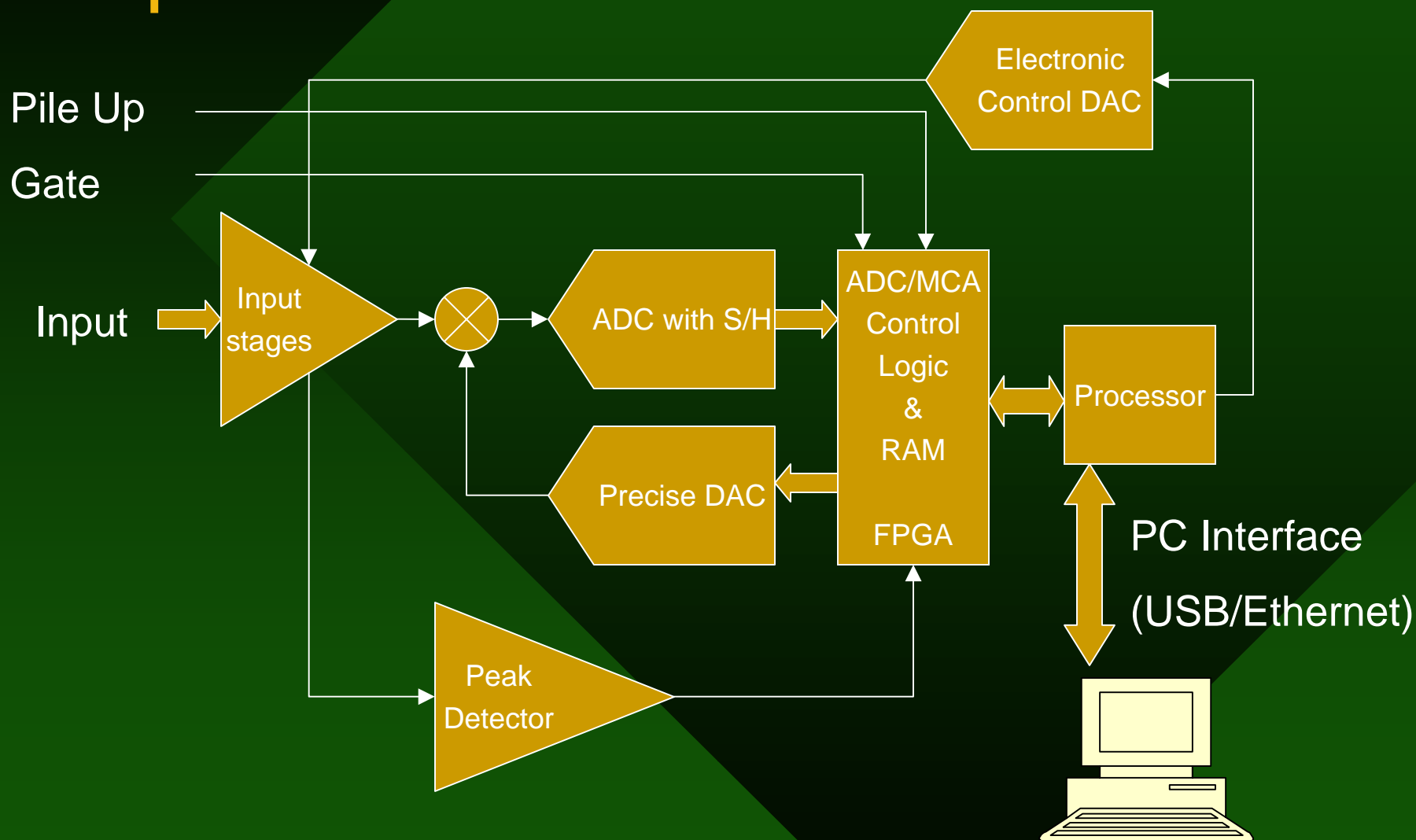
The Goal

- Building a combination of fast ADC with low differential non-linearity (DNL) and multi-channel analyzer.
- Compact size.
- Operate multiple ADC/MCA modules by one computer.
- Remote operation and management over TCP/IP.

The Solution

- Using Gatti correction proposed by C. Cottini, E.Gatti and V.Svelto in 1963.
- Involving modern technology.
 - Fast A/D and D/A converters.
 - Programmable logic devices.
 - “Smart” approach.

Implementation



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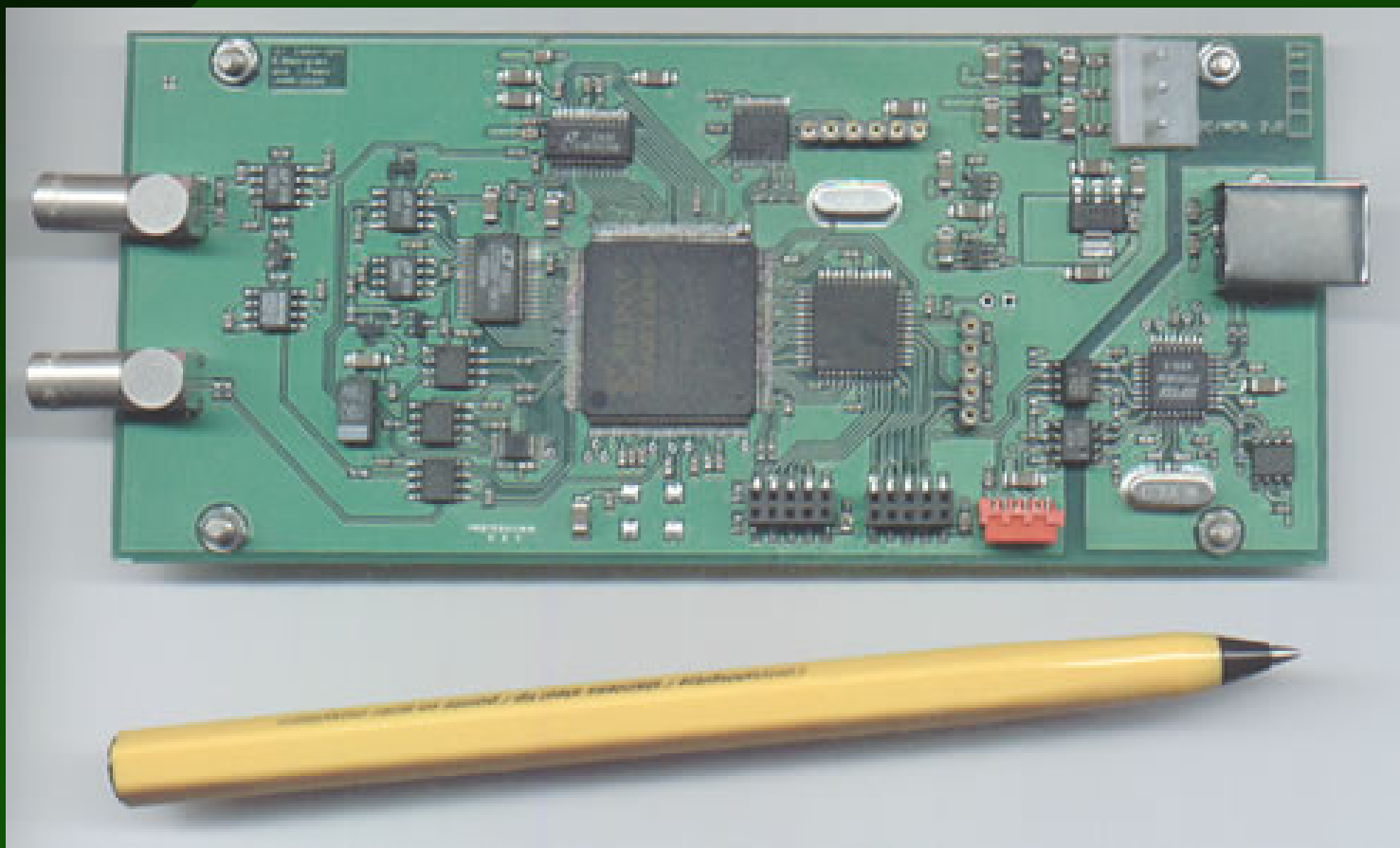
Main Points

- Precise peak detector used for accurate start of measurement process.
- Fixed dead time differential input ADC with S/H.
- Only one precise voltage reference source is used in order to minimize possible errors.
- Predefined spectra capture time (Live time).

Main Points

- High precision DAC used to shift the measurement point on each event.
- 4-channel DAC used to control LLD, ULD and other parameters.
- Fully buffered spectra capture and transfer.
- Micro-controller manages the communication channel and handles the protocol.
- Optically isolated interface (RS232/485/USB).

The device

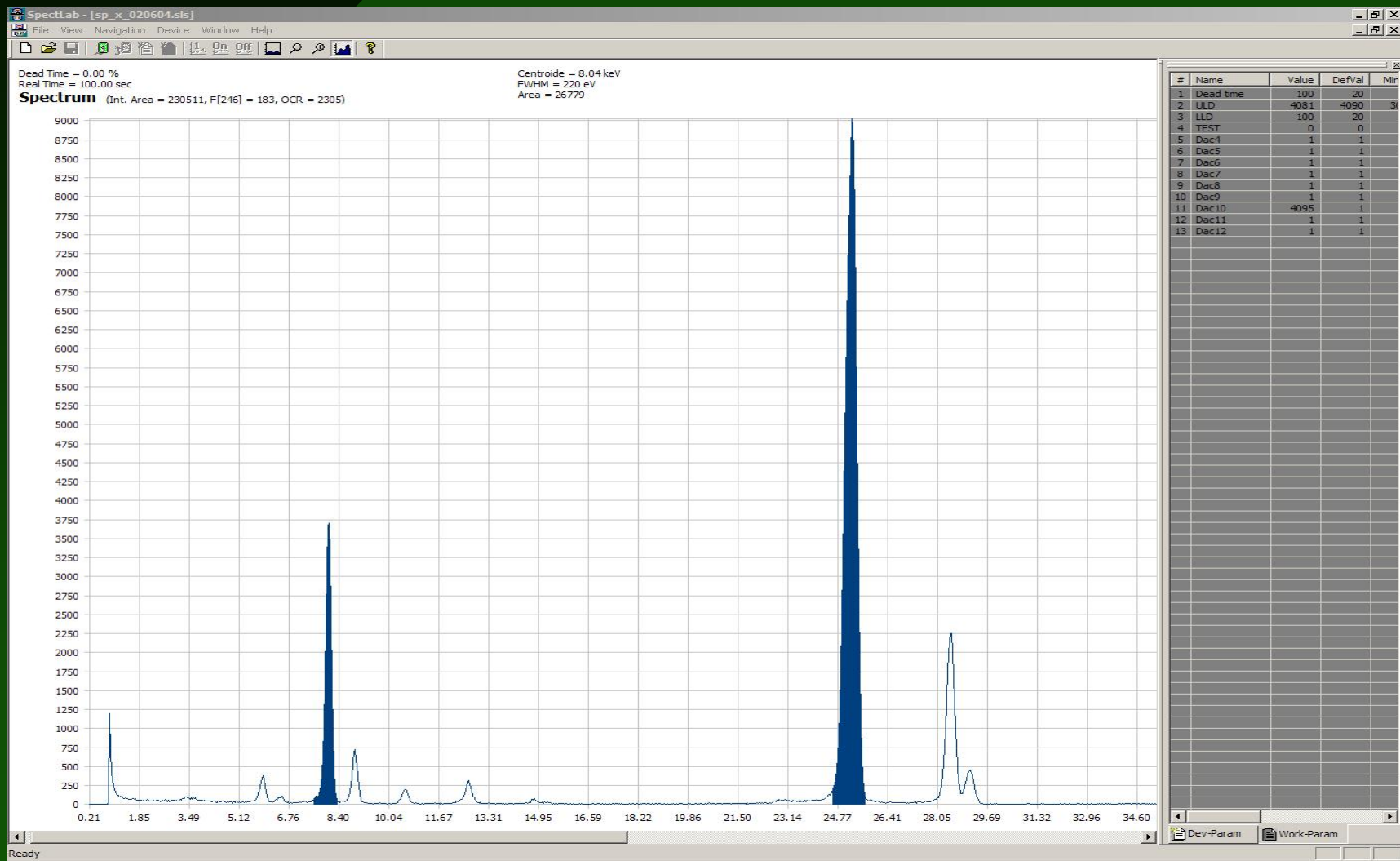


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Features and performance

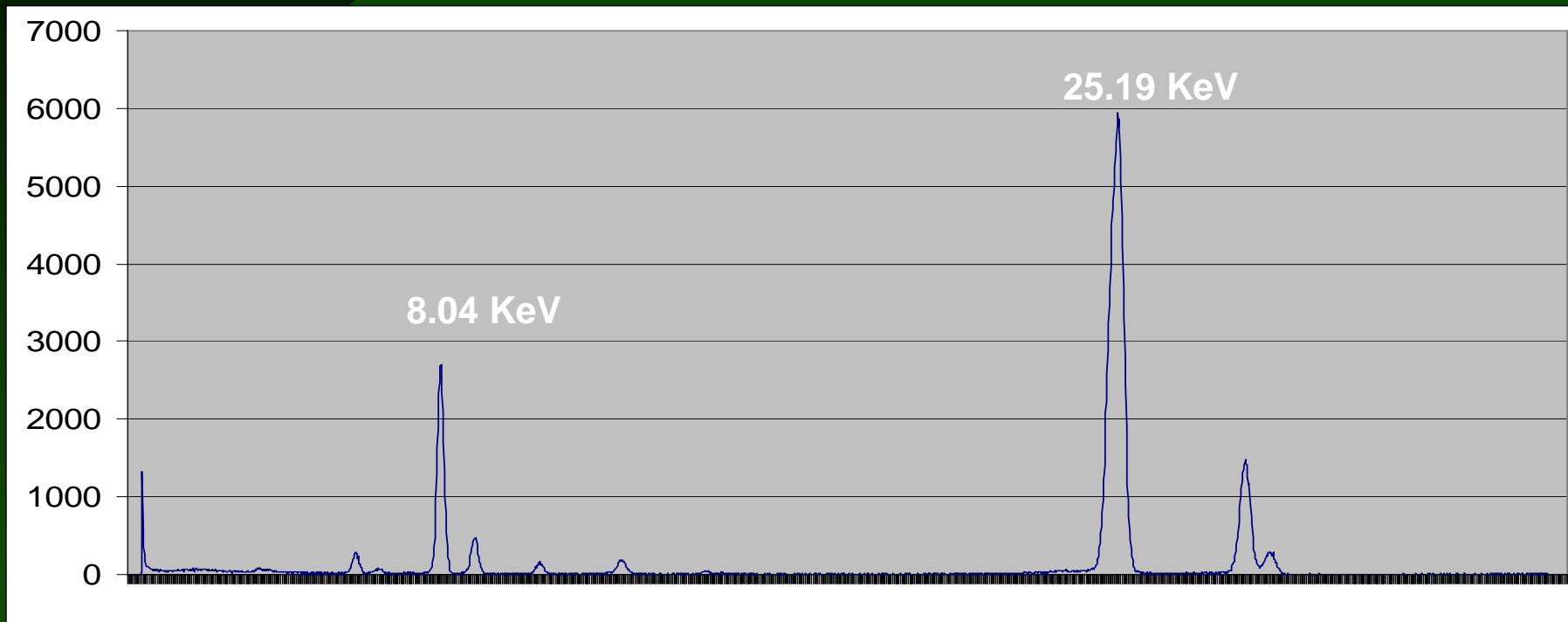
- Total processing time of 640ns.
- No added dead time for pulses with 125ns shaping time.
- 1k, 2k and 4k channel spectra captured.
- Digital control of LLD, ULD and other front-end parameters.

Software



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Sample results



Possible signal sources

- SDD detectors.
- NaI(Tl) scintillators.
- Conventional detectors.

Applications

- Fast on-line analysis.
- Analysis using high intensity sources.