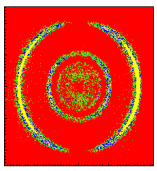
The fADC8 fast sampling ADC unit



RoentDek
Handels GmbH

Supersonic Gas Jets
Detection Techniques
Data Acquisition Systems
Multifragment Imaging Systems

The **RoentDek fADC8** is a product series of fast sampling 10 bit ADC modules with 1.25 to 5 GS/s sampling rate per channel in a stand-alone crate with I/O to a standard PC via USB or Fast Ethernet. Depending on the **fADC8** version and the number of ADC modules (up to three interlinked units with up to 8 channels each) a wide application range can be covered. Due to an on-board TDC and very elaborate memory structure with **zero-suppression** functionality and single pulse trace recognition it is an ideal tool especially for applications with single or multiple AC pulse signal tracking/analysis, for example in advanced read-out of single particle counting detectors.

A special firmware is optimized for the signal analysis of the **RoentDek DLD** and **HEX** delay-line detectors with micro-channel plates. The main application is advanced multi-hit recovery with the **HEX80/100/120** detectors (up to three in coincidence) at high event rate throughput. For this application the **CFD8b/TDC8HP** modules are replaced by the **fADC8** unit, ideally in combination with a **MixA8** for improved system flexibility.

Figures: ***RoentDek fADC8*** *module (here* ***fADC8/10-2****) with two 10 bit ADC units, e.g. for readout of up to two* ***RoentDek HEX****anode detectors (here with SMA inputs. LEMO 00 option is also available).*

Fast signal analysis: width, amplitude, shape

In contrast to conventional ADCs which measure a voltage only in one point the **fADC8** samples the **complete signal trace** similar to a digital oscilloscope. With this information the software can not only analyse the amplitude but also the integral/width/shape of a signal.

Comparison to the fADC4: (link to the fADC4 description sheet)

Form factor:
The **fADC4** is a PCIe-card (with 4 ADC-channels and one TDC-channel) which can be placed directly into a PC or into a PCIe-crate.
The **fADC8** is a VME-module with 8 ADC-channels and one TDC-channel. The VME crate can be read out via USB or "optical link"

Summary of features:

- Input range: -1V to +1V (fixed), 50 Ohm impedance, bandwidth > 1GHz (Lemo00 inputs) optional up to 2.5 GHz with SMA inputs).

- On-board *Zero-Suppression Functionality* for selective read-out of pulse traces with high signal transfer rates. No dead time between pulses. No dead time between trigger groups.

- Includes 19" crate with I/O interface for up to three linked fADC8/10 single units

- On-board memory: 2 GB per fADC8/10 single unit (extendable)

- I/O interfaces: a) USB2.0 (standard, approx. 25 Mbytes/s, depending on the PC)*
b) PCIe-optical link (approx. 100Mbytes/s)

- External trigger input includes one TDC channel for generation of timestamp information

- VETO-input: Enables fast gating of signal acquisition

- Channel configurations: Each 8 channel ADC module can be individually addressed as 8x1.25GS/s 4x2.5GS/s, 2x5GS/s, 4x1.25GS/s plus 2x2.5GS/s, 4x1.25GS/s plus 1x5GS/s or 2x2.5GS/s plus 1x5GS/s. Additionally, an optional signal splitter allows a mixed mode 1x2.5GS/s plus 6x1.25Gs.

Included software: read-out of pulse-traces to PC RAM and harddrive

Drivers: WinXP (32), Vista (32/64 bit), Win7 (32/64bit), Linux (32bit)

Free firmware upgrades

PC not included.

Figure: ***RoentDek fADC8*** *module with auxiliary* ***MIXA8*** *module (here with SMA inputs. LEMO 00 option is also available)*

* please inquire for alternative I/O interfaces

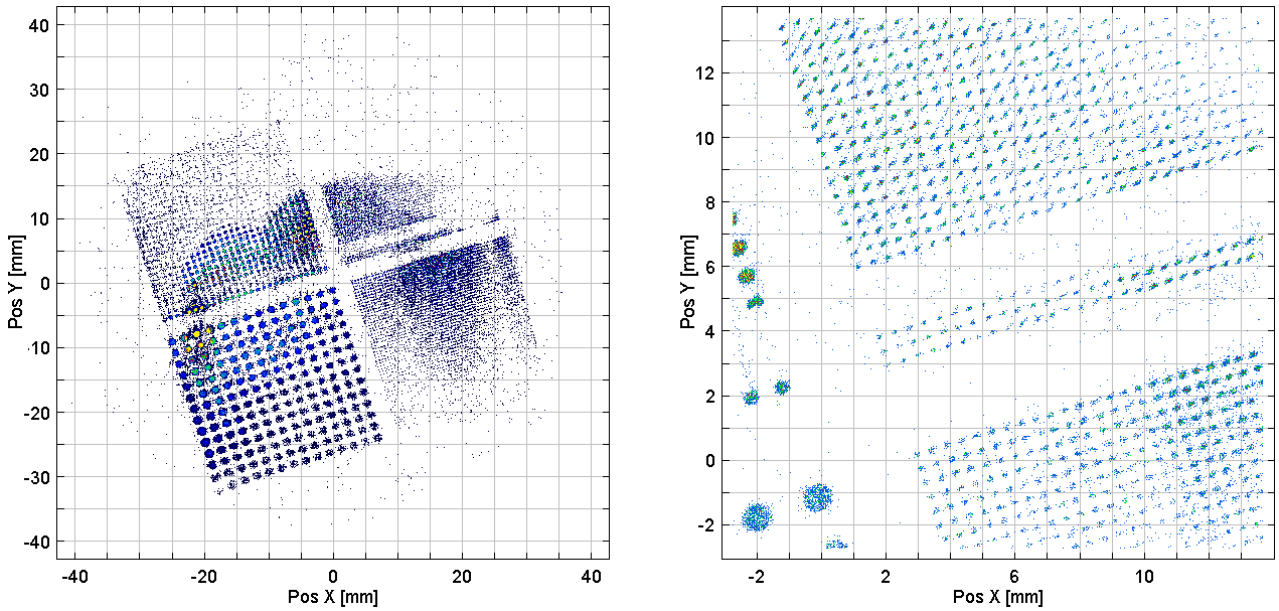


Figure: Position picture acquired with a **RoentDek** *HEX75-detector. Fast Xenon ions are projected through a pin hole mask. The position resolution in this plot is better than 100 µm FWHM (data acquired at 2.5Gs/s, 1.25Gs/s typically result in 130 µm).*
(data acquired by: Prof. Paulus, Institut für Optik und Quantenelektronik, Universität Jena, Germany)