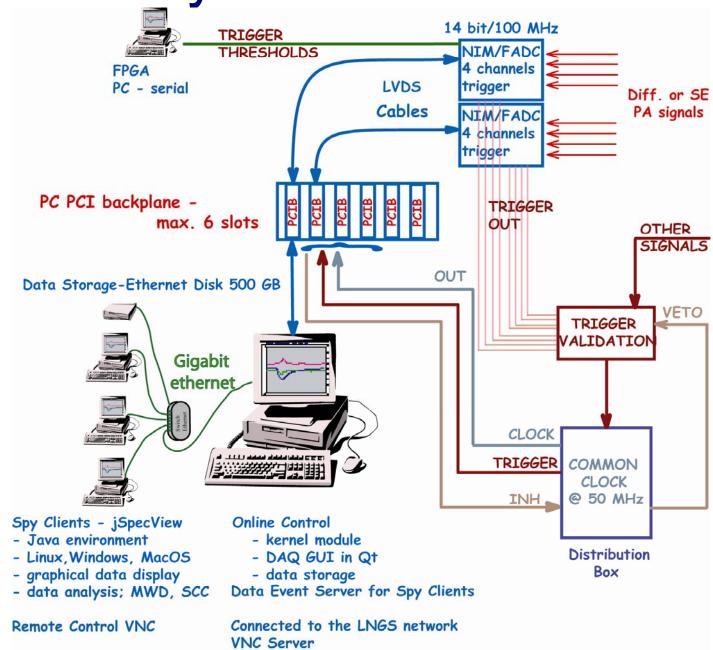
GeDDAQ and Online Control

Status Report

INFN Padova INFN & University Milano

Calin A. Ur

General Layout



New Features

- DMA readout from PCI

- updated core PCI \rightarrow PCI transfer at 32bit/66MHz

 \rightarrow max.output rate > 60 MB/s (calibrations) – limited by the HD write speed

- counters: 64 bit clock counter @ 100 MHz / NIM module 32 bit trigger counter

system running test measurements

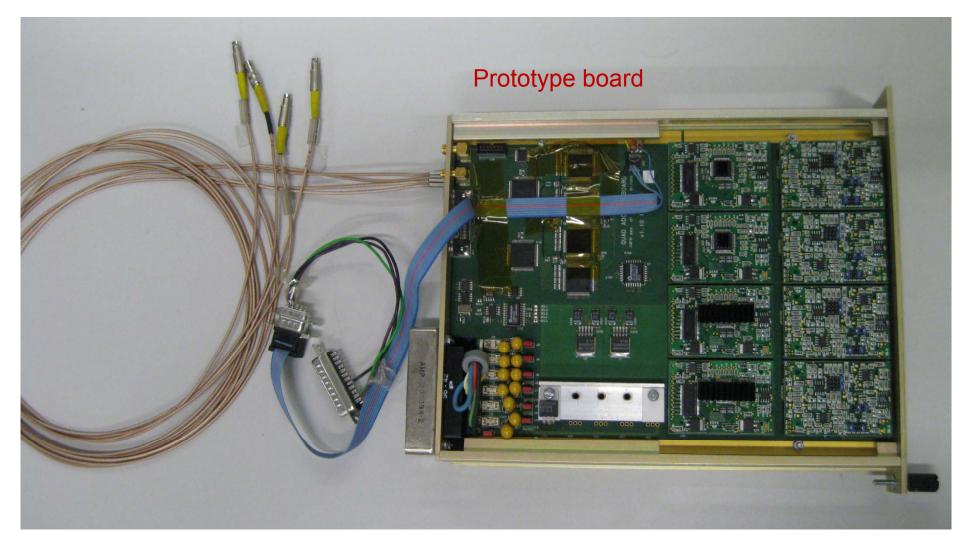
- synchronization of data transfer when several boards work together (FPGA)

 \rightarrow 1 master PCI board – produces the irq request

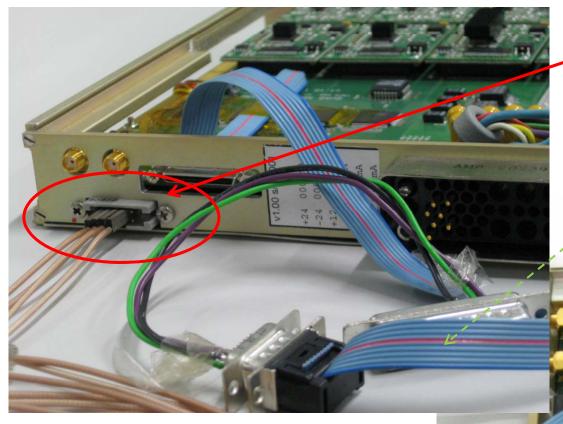
 \rightarrow slave PCI boards – notify the master board when transfer is finished

Internal Trigger

- implemented in the Xilinx FPGA's on the NIM boards



Internal Trigger



10 pin multiple connector 4 x 2 TTL out signals 2 x serial prog. thresholds

100

Internal Trigger

- simple algorithm dual delay line
 - triangular filter
 - signal offset removal
 - independent of the signal height
 - low energy threshold
- threshold programmed from PC or specialized FPGA via serial line
- individual output trigger signals TTL

Advantages

- eliminates the need of splitting the signals from the Ge detectors
- simplifies the trigger electronics needed for starting the DAQ

Online Control

DAQ Control – running on Linux OS

- setup the DAQ configuration
- manage the communication between PC and PCI cards
 - (load/unload kernel module)
- save data on disk
- monitor the acquisition rates and acquisition time

Graphical viewer and analysis program - jSpecView

- platform independent (Java) online/offline
- manipulation of digital waves digital filters
- building and saving of histograms
- setting gates and building histograms with conditions
- standard spectra operations (calibration, fit, integral, ...)
- oscilloscope function
- generating and viewing of 2-D matrices

kernel module linux 2.4

- handles the interrupts from PCI cards
- transfers the data from PCI cards
- minimal data manipulation
- pipes the data into a character device

· user program

- takes the data from the character device
- saves only the channels selected by the user
- writes the data on HD

graphical user interface

- developed in Qt 3
- controls module loading and data manipulation
- start/stop of the acquisition

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- load/unload the kernel module
- select the channels to be acquired
- buffer size when data are written on disk
- define the position of the leading edge
- enable/desable debug ramp

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- logging the performed operations

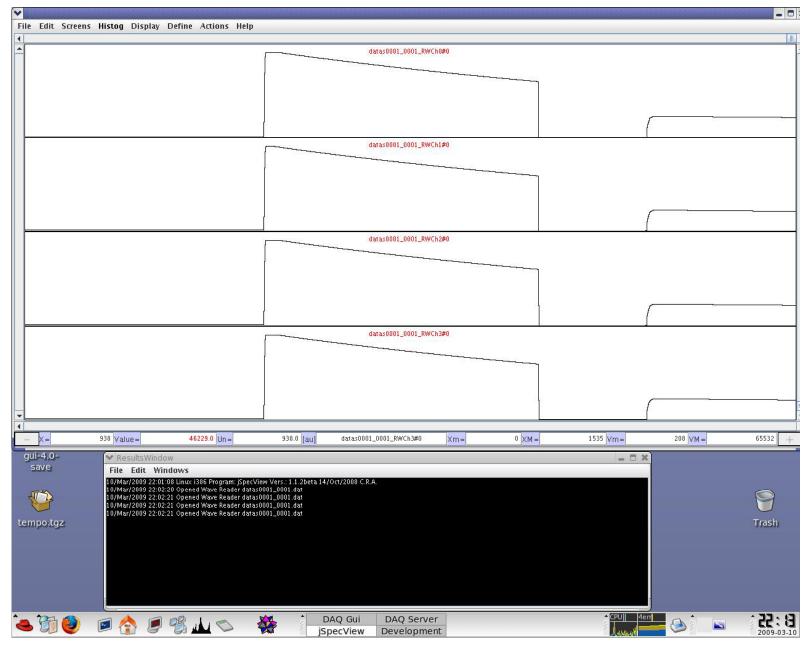
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 run comments
 - presets

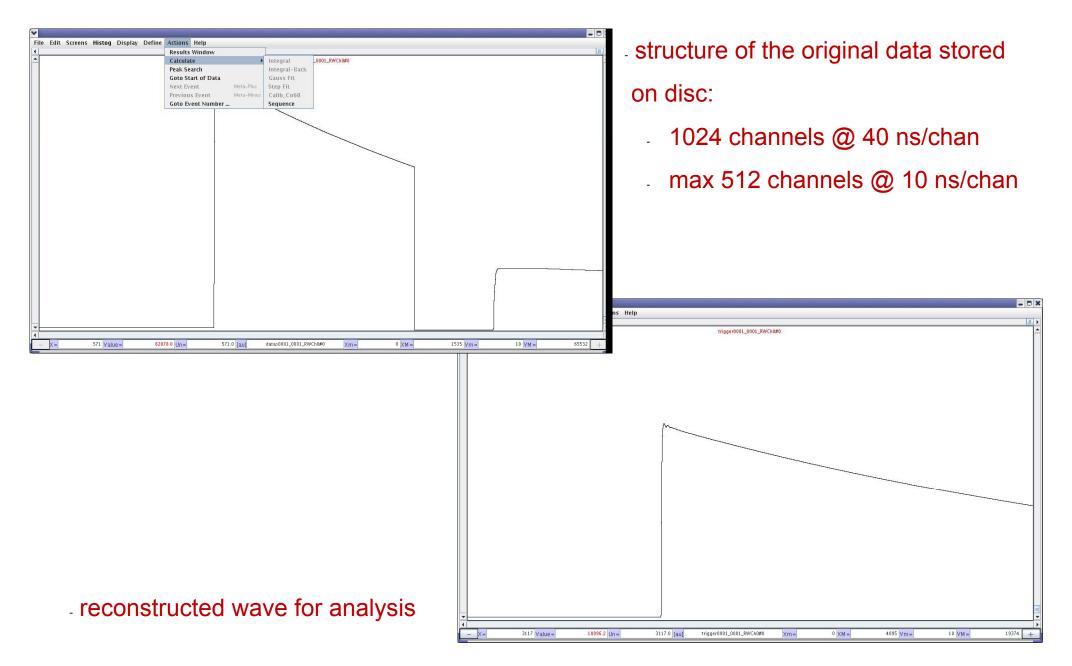
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data format

- configuration of the PCI memory bars



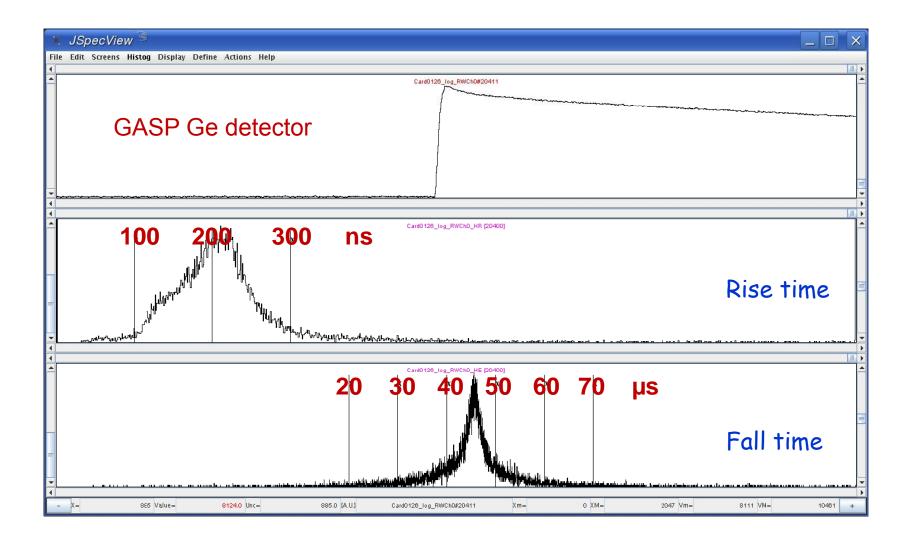


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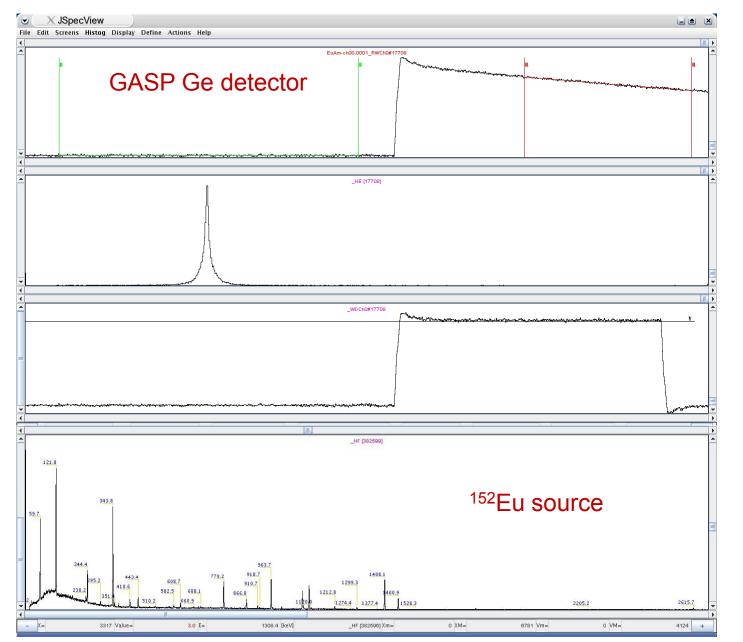
- operations with waves

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- operations with spectra



- rise time and fall time determination



 example of MWD to produce an energy spectrum

Leakage Current Monitor

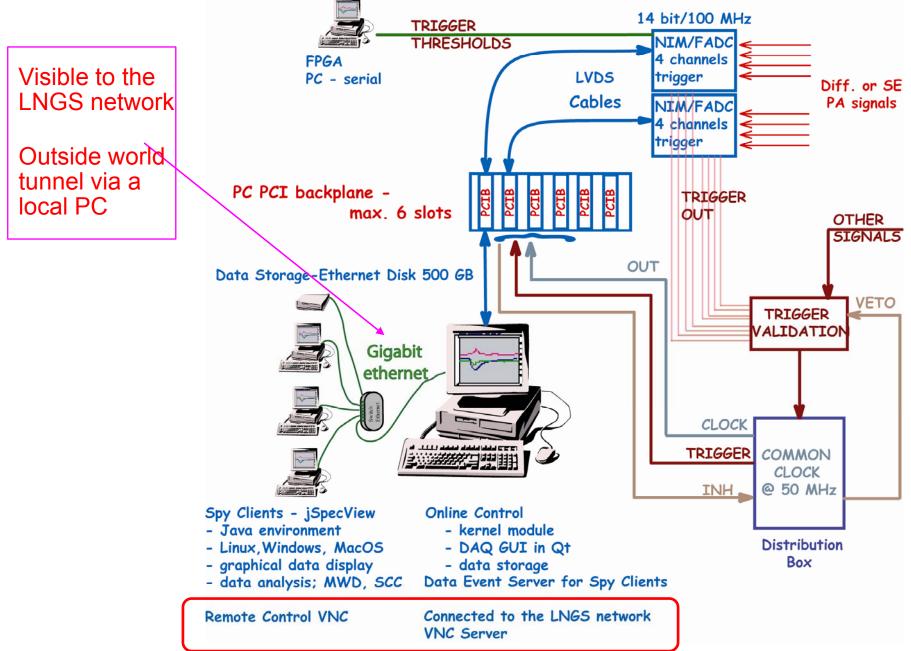
- continuously monitor the position of the baseline for all detectors
- quantify the baseline shift in pA

-trigger needed to record data

- produce periodically a train of TTL signals to be used as trigger
- identify these events by registering a signal on a supplementary acquisition channel
- data analyzed by a specialized program and the values passed to Slow Control (graphic, alarm)

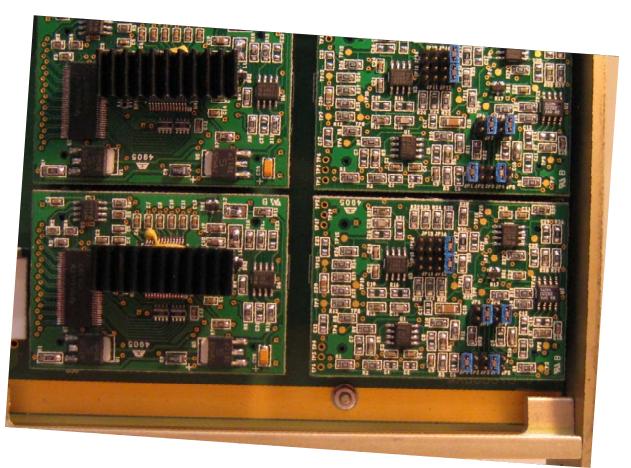
 \rightarrow CRON process (PC)

Remote Control



Work in Progress

- implement the hardware modification for the trigger
- thorough tests of the newly implemented features
- adjust the analog conditioning for the FE electronics



Collaborators

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- P. Cocconi INFN Legnaro