Test of the FERS electronics for muEDM beamtime

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FERS A5202



- System for readout of large detector arrays.
- Until 64 channels for each board.
- The board could be used alone (connected directly to pc) or different solution for large multiplicity (from 16 to 128 boards) with support units.
- Different acquisition types (spectroscopy, timing, counting).
 For timing mode
- Independent channels
- Timing resolution ~250 ps RMS
- Possibility of external trigger

JANUS 5200 software

| 😻 Janus File FWupgrade GUI Mode Help | | | | | – 🗆 × |
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| FERS-5200 | | JANUS Ver. 5202 - Rel 3.2.4 - 22/08/2023 | | () CAEN | |
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| Start Run Mode | ASYNC ~ | | OutputFiles | | |
| Stop Run Mode | MANUAL ~ | | Data File Path | DataFiles | Browse |
| Event Building Mode | DISABLED ~ | | ToA/ToT Unit | ns v | |
| Tstamp Coinc Window | 100 ns | | Event List (Binary) | $\overline{\mathbf{v}}$ | |
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| Preset Counts | 1000 | | Sync List (Ascii) | v | |
| Job First Run | 1 | | Run Info | v | |
| Job Last Run | 5 | | PHA Histo ToA Histo | | |
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| Reset Job | | | | | |
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- Software JANUS 5200 from CAEN to use the board directly from a GUI on a windows or Linux PC
- With JANUS it is possible to set the different type of acquisition, trigger parameters, etc.
- The acquisition produced two types of files (binary, ascii).

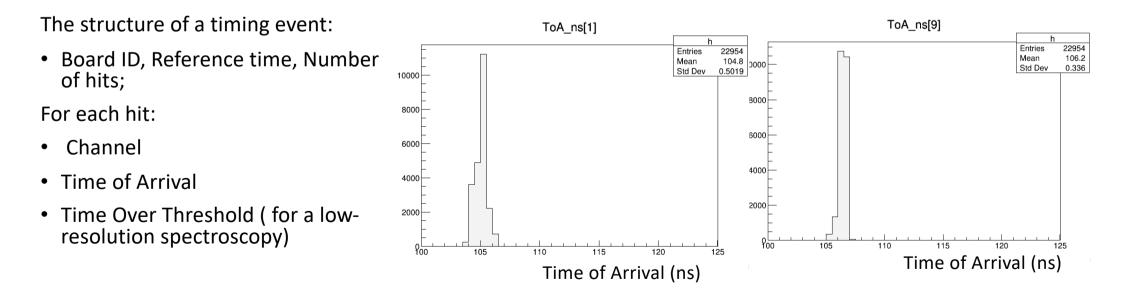
Preliminary tests

We have a A5202 board in Pisa (provided by INFN colleagues). Using Janus:

- we test the different procedures described by user manual to check the correct functioning of the board.
- FPGA can create a tunable and periodic signal that can be sent to channels to test board. We used a signal of 100 Hz to test different acquisition mode, and particularly the timing mode.
- Janus produced binary and ascii files for each test.

Preliminary test: readout software

- We developed a macro in C/C++ to read the acquired binary file.
- The macro produces un output root file with a tree.
- The tree is filled with run and each event information.
- The macro has been developed to read each type of acquisition mode.
- We checked the macro comparing with ascii file produced by JANUS.



Future plan

- Test with external pulser to simulate signals.
- Optimization of macro to find problems or bugs.
- Test with a real signal from HAMAMATSU SiPM.
- Sharing of macro when a common muEDM repository will be available.

