

CM 36 -DAQ report

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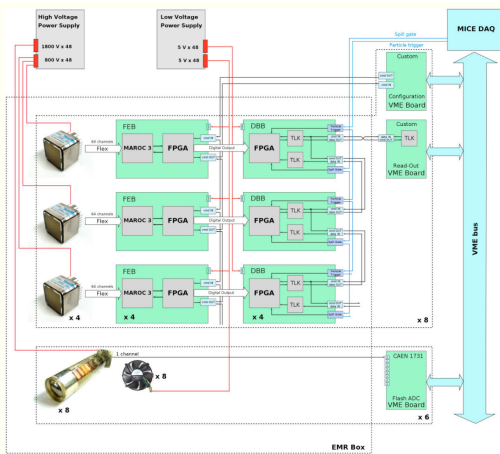
UNIGE - DPNC

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Contents:

- EMR DAQ - general description and status of the work;
- Tests of a single EMR DAQ unit using cosmics;
- Description of the DAQ system used for the EMR cosmic tests.

EMR DAQ



The EMR DAQ units consists of:

- 6 Front End Boards (FEB);
- 6 Digitizer Buffer Boards (DBB):
- 1 VME Configuration Board (VCB);
- 1 VME Readout Board (VRB).

In addition to this we have CAEN V1731 digitizer (VME board) for the signal of the single-anode PMTs.

VME Readout Board for EMR

Major components of the board:

- 1 Altera Cyclone II FPGA programmable chip;
- 2 VME Bus Interface;
- 3 4 RAM memory chips
IS61WV102416BLL (1M High-Speed Asynchronous CMOS Static RAM);
- 4 Ethernet ICs 0.6 to 1.5 Gbps Transceiver TLK 1501IRCP.

The board has to be able to:

- 1 Communicate (get orders) with the VME master through the VME bus.
- 2 Download the data accumulated in 6 daisy-chained DBBs at the end of the spill and store this data in the RAM.
- 3 Send the data to the VME master.

The firmware of the VRB is now 100% completed.

VME Configuration Board for EMR

Major components of the board:

- 1 Altera Cyclone II FPGA programmable chip;
- 2 VME Bus Interface;
- 3 Direct connection with the FPGA chip of the FEB.

The board has to be able to:

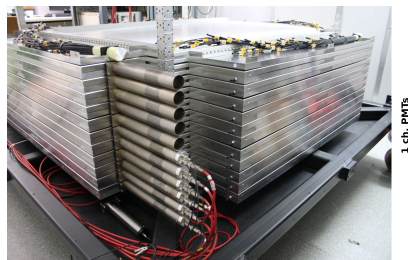
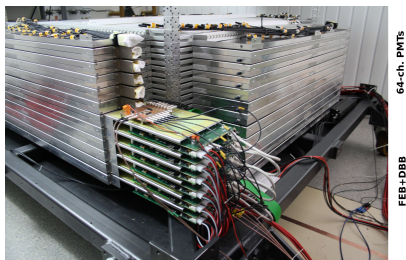
- 1 Configure the FEB.

Small modification of the original firmware was made in order to make possible to configure more than one FEB. Now one VCB is capable to configure up to 16 FEBs.

The firmware of the VCB is now 100% capable to do the job, however there is a lot of space for improvements here, including implementation of new features.

Tests of a single EMR DAQ unit using cosmics

The EMR readout code is now 100% completed.



One EMR DAQ unit was successfully tested with cosmics.
For more information see Ruslan's talk.

Description of the DAQ system used for the EMR cosmic tests

Design Requirements:

- Avoid using DATE (for simplicity).
- Avoid writing code that can not be used later in MAUS (because we are lazy). In order to do this the EMR Cosmic Test DAQ has to record directly into the Data Structure used in MAUS.
- Test a scheme that uses separate readout and event-building (because we want to improve our DAQ skills).

Description of the DAQ system used for the EMR cosmic tests

Implementation:

- At the end of the spill the readout process collects the data from the EMR DAQ equipments.
- This data is recorded in a binary file using structure very similar to the one used in DATE (just simplified).
- For the moment the files are recorded on the hard drive (slow), but it is possible to recorded directly to the RAM memory (very fast).
- The Event build process opens the binary file, fills the data into the MAUS data structure and then records into a ROOT file.
- After the end of the run the ROOT file is used to analyze the data.

Conclusions

- Development of the software (C++ and VHDL) for the EMR DAQ is completed.
- One EMR DAQ unit was successfully tested with cosmics.
- The first EMR data is now available.
- No significant progress in the development of the programmable logic fro the trigger.