

CGEM DAQ Status

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On-site data acquisition plan.

- ◆ Test and ensure that the L1/CHK/Trigger/FULL signals work correctly. ◦
 - ◆ Create environments for testing trigger signals
 - Using the ZDD crate and modules to provide trigger signals (completed).
 - Michela conducted the test. ◦
- ◆ Solve DC hardware interrupt and buffer protection issues.
- ◆ Implement a complete electronic configuration process.
- ◆ On-site data acquisition test with real trigger.

DC firmware updated

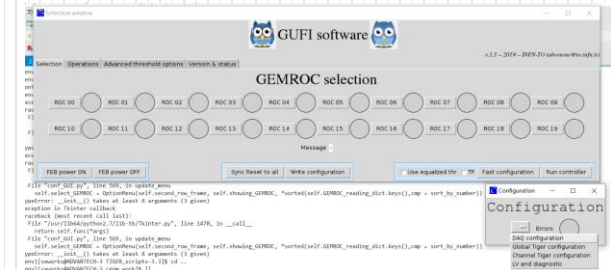
Pawel updated DC FIRMWARE last Wednesday.

I have tested with it preliminary, for single DC board , can run at 6KHz, 200hits/event , 9.5MB/s for more than 20 hours.

More tests will be done.

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DC 3 : data format right: my event id = 342369999, event size = 1648, event rate = 5827.505828, throughput=9603.729604 s
DC 3 : data format right: my event id = 342379999, event size = 1648, event rate = 5827.505828, throughput=9603.729604 s
DC 3 : data format right: my event id = 342389999, event size = 1648, event rate = 5827.505828, throughput=9603.729604 s
DC 3 : data format right: my event id = 342399999, event size = 1648, event rate = 5827.505828, throughput=9603.729604 s
DC 3 : data format right: my event id = 342409999, event size = 1648, event rate = 5770.340450, throughput=9509.521062 s
DC 3 : data format right: my event id = 342419999, event size = 1648, event rate = 5827.505828, throughput=9603.729604 s
DC 3 : data format right: my event id = 342429999, event size = 1648, event rate = 5827.505828, throughput=9603.729604 s
DC 3 : data format right: my event id = 342439999, event size = 1648, event rate = 5827.505828, throughput=9603.729604 s
DC 3 : data format right: my event id = 342449999, event size = 1648, event rate = 5827.505828, throughput=9603.729604 s
DC 3 : data format right: my event id = 342459999, event size = 1648, event rate = 5770.340450, throughput=9509.521062 s
DC 3 : data format right: my event id = 342469999, event size = 1648, event rate = 5827.505828, throughput=9603.729604 s
DC 3 : data format right: my event id = 342479999, event size = 1648, event rate = 5827.505828, throughput=9603.729604 s
DC 3 : data format right: my event id = 342489999, event size = 1648, event rate = 5827.505828, throughput=9603.729604 s
DC 3 : data format right: my event id = 342499999, event size = 1648, event rate = 5827.505828, throughput=9603.729604 s
DC 3 : data format right: my event id = 342509999, event size = 1648, event rate = 5770.340450, throughput=9509.521062 s
DC 3 : data format right: my event id = 342519999, event size = 1648, event rate = 5827.505828, throughput=9603.729604 s
DC 3 : data format right: my event id = 342529999, event size = 1648, event rate = 5827.505828, throughput=9603.729604 s
DC 3 : data format right: my event id = 342539999, event size = 1648, event rate = 5827.505828, throughput=9603.729604 s
DC 3 : data format right: my event id = 342549999, event size = 1648, event rate = 5827.505828, throughput=9603.729604 s
DC 3 : data format right: my event id = 342559999, event size = 1648, event rate = 5770.340450, throughput=9509.521062 s
DC 3 : data format right: my event id = 342569999, event size = 1648, event rate = 5827.505828, throughput=9603.729604 s
DC 3 : data format right: my event id = 342579999, event size = 1648, event rate = 5827.505828, throughput=9603.729604 s
DC 3 : data format right: my event id = 342589999, event size = 1648, event rate = 5827.505828, throughput=9603.729604 s
DC3: ERROR : byteRecv = 8, id=342597402 for 406 times!!!
6666019a DC 3 : data format right: my event id = 342599999, event size = 1648, event rate = 5827.505828, throughs
DC 3 : data format right: my event id = 342609999, event size = 1648, event rate = 5770.340450, throughput=9509.521062 s
DC 3 : data format right: my event id = 342619999, event size = 1648, event rate = 5827.505828, throughput=9603.729604 s
DC 3 : data format right: my event id = 342629999, event size = 1648, event rate = 5827.505828, throughput=9603.729604 s
DC 3 : data format right: my event id = 342639999, event size = 1648, event rate = 5827.505828, throughput=9603.729604 s
DC 3 : data format right: my event id = 342649999, event size = 1648, event rate = 5827.505828, throughput=9603.729604 s
DC 3 : data format right: my event id = 342659999, event size = 1648, event rate = 5770.340450, throughput=9509.521062 s
DC 3 : data format right: my event id = 342669999, event size = 1648, event rate = 5827.505828, throughput=9603.729604 s
DC 3 : data format right: my event id = 342679999, event size = 1648, event rate = 5827.505828, throughput=9603.729604 s
DC 3 : data format right: my event id = 342689999, event size = 1648, event rate = 5827.505828, throughput=9603.729604 s
DC 3 : data format right: my event id = 342699999, event size = 1648, event rate = 5827.505828, throughput=9603.729604 s
DC 3 : data format right: my event id = 342709999, event size = 1648, event rate = 5770.340450, throughput=9509.521062 s
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Combing of the FEE configuration process.



- Currently I have two documents and three source codes.
 - GUFi 2.3.2 source code
 - GUFi 3.3 source
 - [cgem daq 20240628\Simulated_triggers_noise_acq20201221_zengtx.odt](#)
 - [cgem daq 20240628\Threshold_scan_documentation.pdf](#)
 - Recently, Michela sent me a Python configuration code written by Angelo for porting to configure the fanout module.
- Porting the configuration code based on these is difficult to check and debug.
 - The configuration process is not clear enough: the electronic configuration process involves not only the main configuration functions but also processes implicit in various constructor functions.
 - It is unknown whether the GUFi version has been updated consistently, and the latest version of the source code needs to be reviewed.
 - There is also some information that is not in the source code:
 - In GUFi 2.3.2, there is no distinction made between commands for GEMROC LV and DAQ.
 - Different host IP addresses are required to access different GEMROCs. One address for 1-15, and another address for 16 and above.
 - Register readback checks are also not done by GUFi, and they need to be manually inspected.
- A clear description of the configuration process document is needed. I am currently working on organizing this. Italian support is also needed.
- Alternatively, we can directly use the latest version of GUFi for configuration.
 - This saves time.
 - However, for future maintenance, Italian support will be needed, and training will be required for the on-duty personnel for future operations.

Summary

- DC firmware is updated by Pawel, and the throughput of single board test can reach 9.5MB/s.
- Combing through the configuration document based on the code.

Next to do

- DC firmware is being updated by Pawel
 - One complete event per interrupt.
 - Buffer protection.
- After the update, Test with two DC boards in Hall 3 room 106.
- After the trigger signal test (L1/CHK/CLOCK/FULL) complete, data taking test in experiment hall with real trigger.
- Confirm and implement FEE configuration procedure.