

DL DAQ/SlowCtrl

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Slow Ctrl

Suggestion: Use system we employed in OLYMPUS and MUSE

- » EPICS based
- » PSQL database + python datapump + flask web gui
- » Data also streamed into DAQ

MUSE

Beamline Devices Trigger Rates Voltages Alarms Tools
Overview Beam Profile BH SPS VETO BFM BM CALO

Log in

Last update: Mon May 29 2023 13:35:56 GMT+0400 (Eastern Daylight Time)

ALARM present. [Click here to check alarm overview page.](#)
Minor: 17 Major: 1 Total: 18 Alarms present.

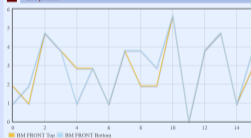
Beam Hodoscope profiles



SPS profiles



BM profiles



CALO profile

| | | | | | | | |
|-------|-------|-------|-------|-------|-------|--------|-------|
| 20.9 | 76.7 | 189.8 | 489.6 | 48.4 | 184.1 | 155.6 | 49.3 |
| 84.9 | 26.6 | 232.5 | 198 | 54.1 | 73.1 | 10.4 | 256.2 |
| 18.9 | 12.3 | 27.5 | 69.3 | 311.2 | 36.9 | 204 | 49.3 |
| 55 | 75.9 | 296.4 | 51.2 | 198.3 | 84.9 | 117.7 | 17.1 |
| 18 | 26.6 | 320.7 | 238.7 | 412.1 | 70.1 | 73.9 | 192.3 |
| 59.7 | 91.9 | 57.8 | 12.2 | 188.5 | 78.6 | 14.2 | 23.7 |
| 120.3 | 215.1 | 95.7 | 84.3 | 36.1 | 39.2 | 14,447 | 29.4 |
| 103.4 | 135.7 | 89.2 | 217 | 76.9 | 30.4 | 90.1 | 29.4 |

Who controls what and how?

- » GEM HV → Code exists
- » SiPM power. What interface?
- » Vacuum?
- » Spectrometer power?
- » Hall probe
- » What TRIUMF data do we want to mirror?

GEM DAQ

- » Components: $8+5=13$ APV cards per plane max.
- » MPD4 digitizer: up to 15 APV cards per MPD
- » Standard readout via VME
- » Can do 1, 3 or 6 frames
 - » 3 frames gives us some time resolution, probably good to reduce multi-hit confusion
 - » run 6 frames regularly. More data, but better.

Data rates

- » More development with MUSE turned out event builder on FPGA is a bottleneck
- » Managed to hide latency by interleaving readout and event building.
- » Currently ca. 6 kHz max. 70 MByte/s on VME bus, 35 MByte/s on Network (for 4 APVs)
- » I.e. 144 kAPVFrames/s
- » Barely dominated by EB – this will likely not get worse with more APVs/MPD
- » But VME bandwidth not far behind.

What can we do with that?

- » Assume one crate, 5+5 APVs, 6 frames
 - » Double arm: 600 Hz
 - » Single arm: 1.2 kHz
- » We might get a factor of 2 with better firmware.

Busy / synchronization

Need to distribute trigger to MPD4

- » Must have fixed latency $< 4 \mu s$
- » Can have 3-4 events "in flight", but need minimum deadtime between triggers (3 μs)

Fully locked or free running?

- » No timestamping on MPD4! How do we sync?

Hardware?

- » What do we have?
 - » VME computers? How many?
- » What do we need?
 - » Small server – I will buy
 - » Buy in US and ship from SBU, or ship directly to Triumph?
- » What's the interface to the trigger?