DL DAQ/SlowCtrl

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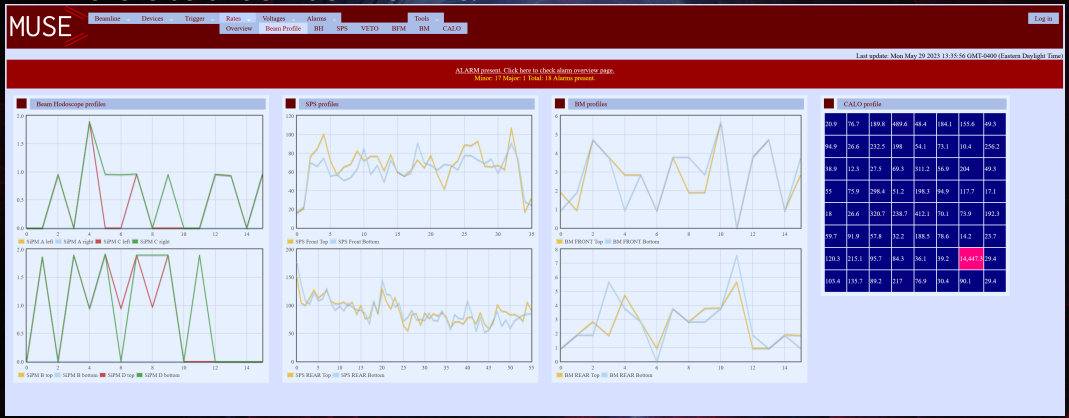
Slow Ctrl

Suggestion: Use system we employed in OLYMPUS and MUSE

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



Who controls what and how?

- GEM HV $\rightarrow$ 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 μs
- Can have 3-4 events "in flight", but need minimum deadtime between triggers (3 uS)

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 Triumf?
- What's the interface to the trigger?