Measuring Deadtime with 2 Ets and a simple Client

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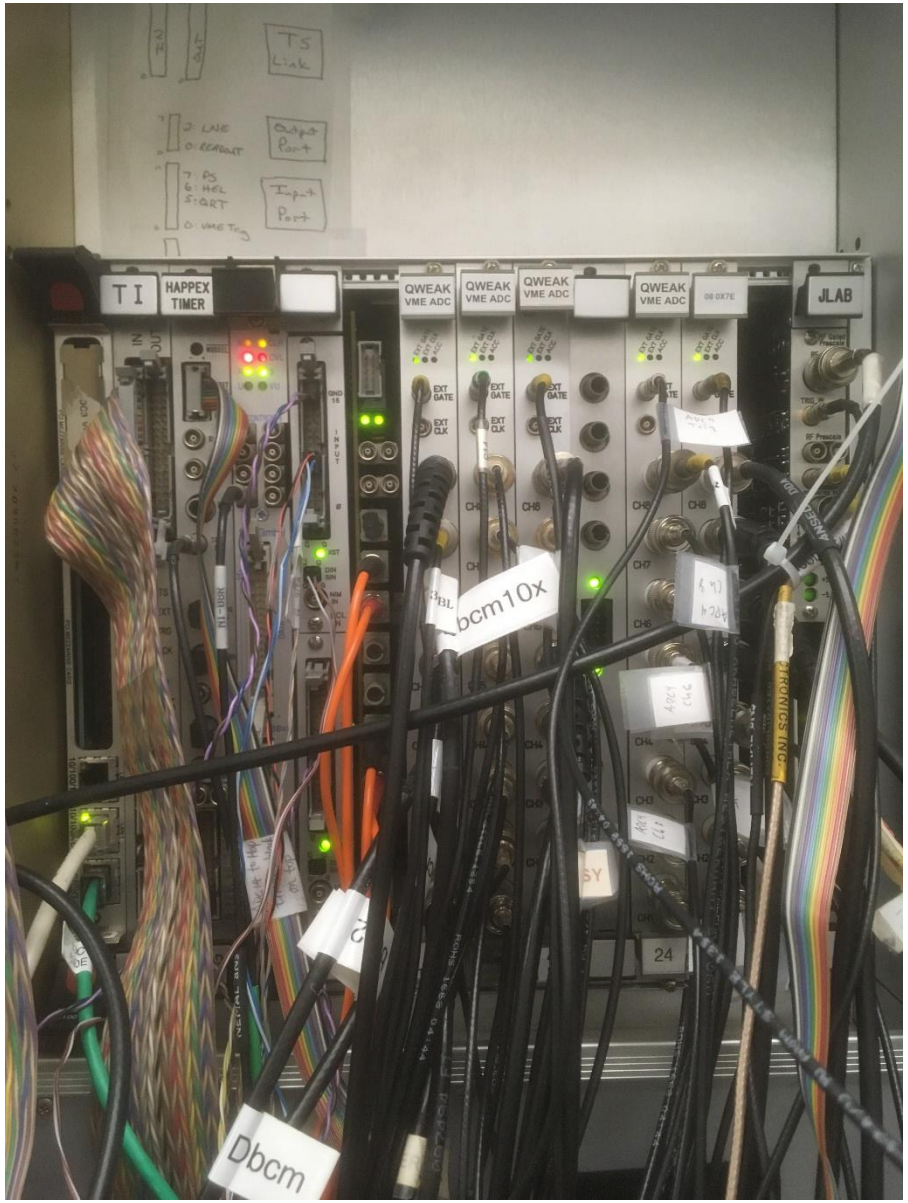
Added Helicity Timing Board to CH Parity DAQ

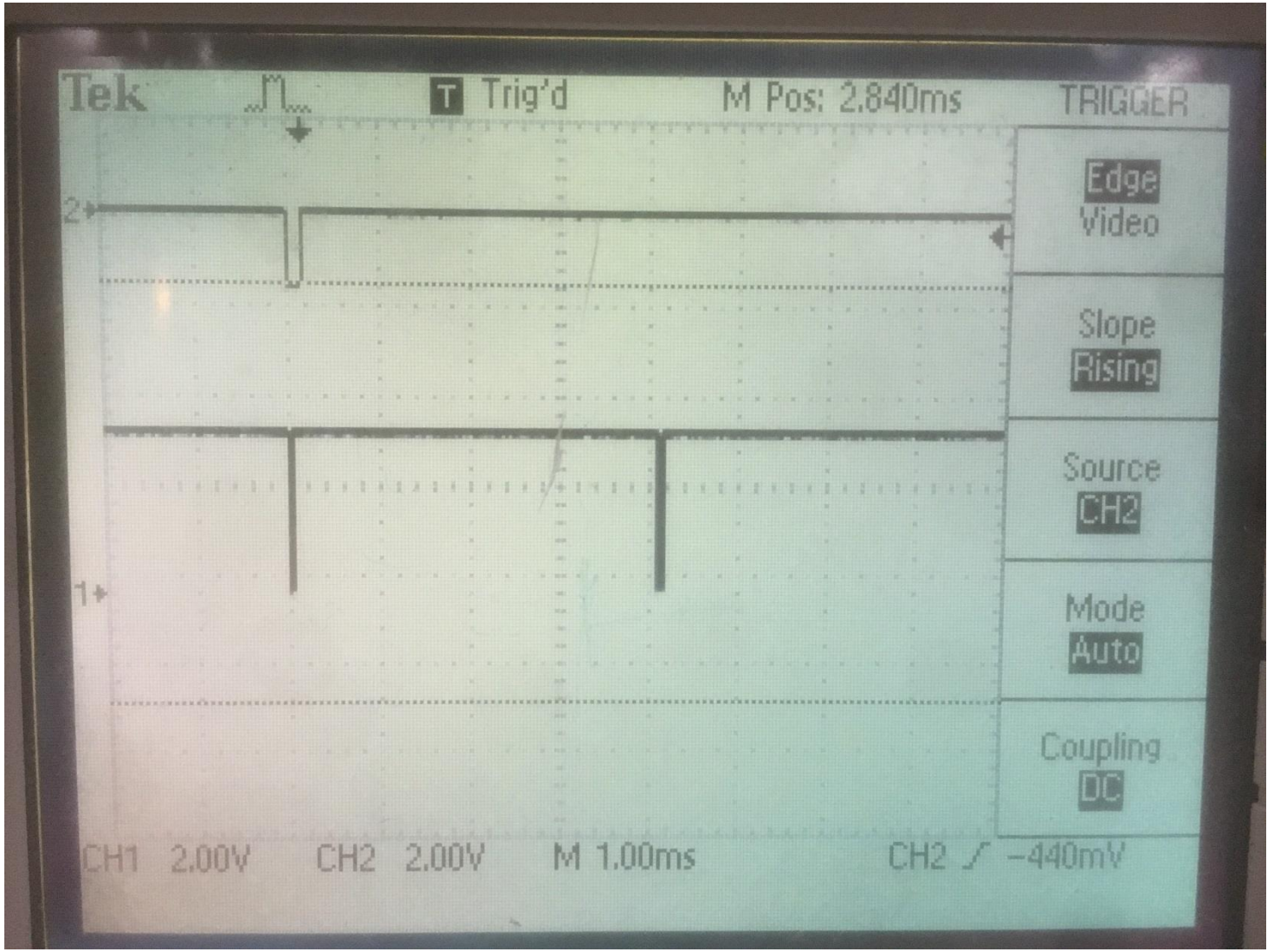
- 6th from the left board – optical outs
  - Top to bottom:
  - QRT
  - MPS
  - HEL
  - Pair Sync
- Helicity Users Guide .pdf is somewhat inaccurate wrt VXWorks commands.
- Can adjust sequence type (pairs, quartets, and octets)
- Can adjust T_stable, T_settle, and Helicity delay (in units of HEL flips)
- Also added a (not in use) optical->NIM board into slot 10



Added Helicity Timing Board to CH Parity DAQ

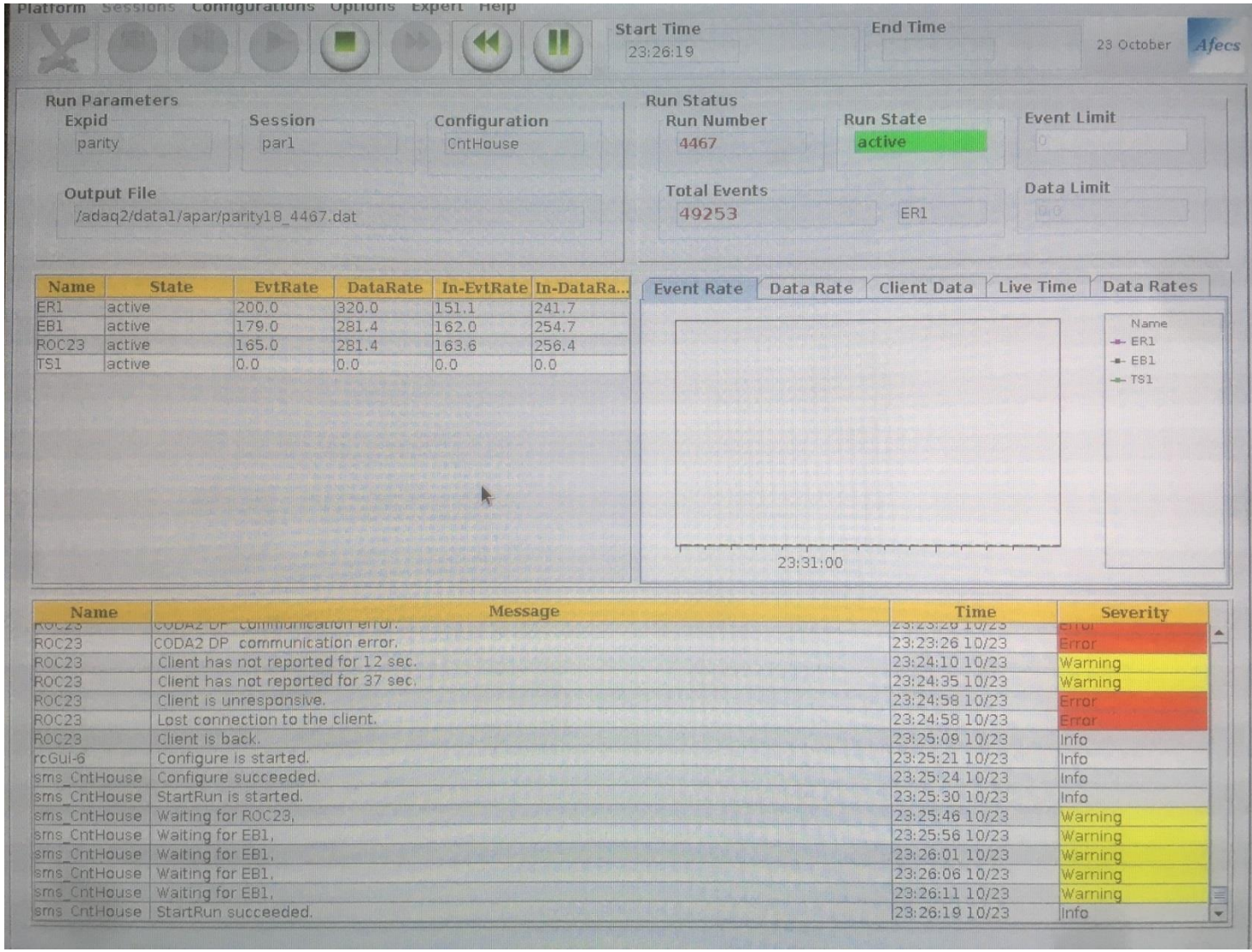
- Trial and error with a scope gives useful information

- Shown is a 240Hz configuration (50 us T_settle unresolvable with shown scale)
  - Top signal is QRT
  - Bottom signal (triggered on) is MPS
  - Some issue with NIM/TTL exists where NIM MPS signal has a strange wave to it



Checking 2 ET system for Deadtime

- How much deadtime is introduced by running 2 ETs?
  - one 32 bit collecting data
  - one 64 bit reading from it via network connection
  - Apply a simple ETclient “analyzer” to test the deadtime as a function of helicity flip rate in the new helicity control board
  - Change HAPTB and Qweak ramp delay and integration time settings in vxworks bootscripts
  - Scan over available helicity flip rates (in quartet mode)



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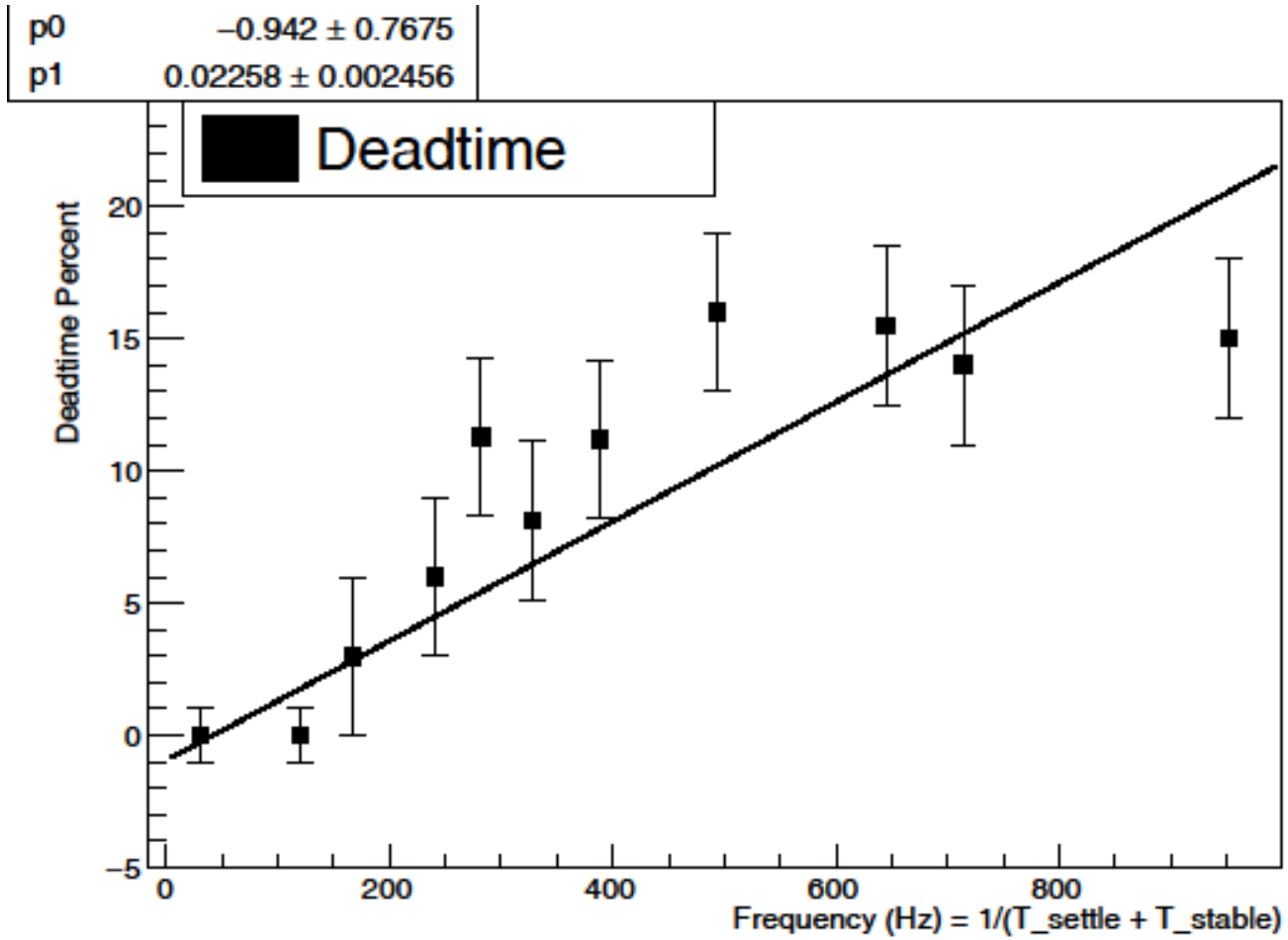
  - 166.6 -> 240Hz seems to transition



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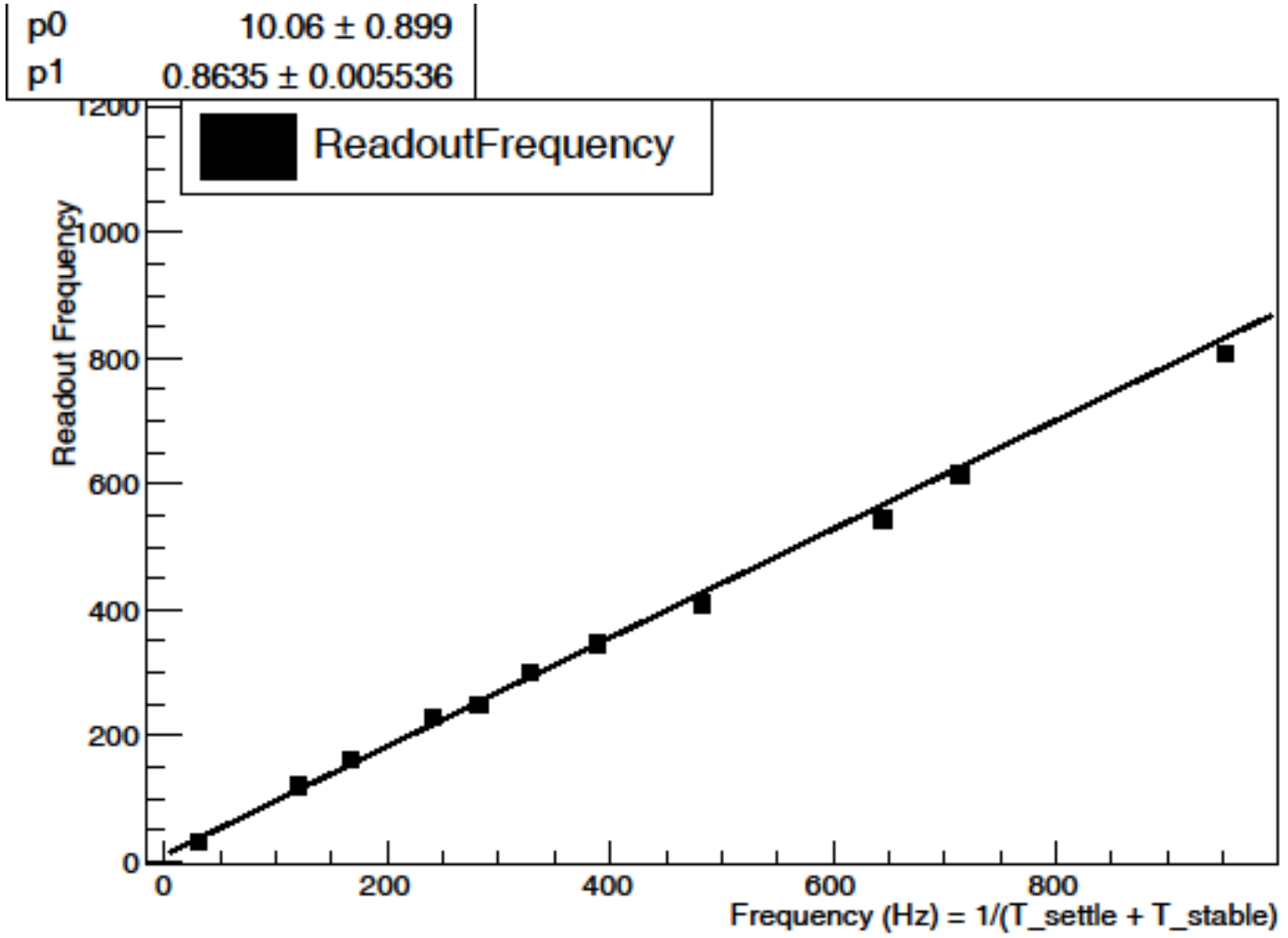

Checking 2 ET system for Deadtime

- Interestingly – with no “analysis” step in the executable we get ~no deadtime:

- Also, “ROC23 EvtRate” and “EB1 or ER1 In-EvtRate” entries in RC Gui-6 seem to correlate with Scope frequency readout/calculation and ETClient effective deadtime rate respectively
- DAQ otherwise works fine at 30 Hz (injector sourced helicity)