Pulse Picker EVR Calibrations

EVR Delays

These numbers represent the delay, in microseconds, between the leading edge of a 120Hz pulse and the leading edge of the trigger pulse sent to the pulse picker spindle in order to "catch" the next pulse.

Trigger width in all cases should be on the order of 1ms. The picker is falling-edge-triggered with a 12.9us debounce filter on the input.

Timing Measurements

Measured on 2014-07-09 with reflaser and photodiode in XCS, using `ioc/common/pulsepicker/R1.0.0` and firmware revision Ns=96.

- Flip-Flop mode: 8.6ms from pulse picker trigger to center open position. Open time is 4.4ms.
- Burst/Follower mode: 6.6ms from pulse picker trigger to first light (open); 4.9ms from pulse picker trigger to last light (close).

This means that nominal EVR delays are:

- Flip-Flop mode:
  - 0ns (or minimum TDES) for aggressive timing (very next FEL pulse)
  - 8000us for conservative timing (skip one FEL pulse, capture the one after that)
- Burst/Follower mode:
  - 0ns (or minimum TDES) for aggressive timing (very next FEL pulse)
  - 5000us for conservative timing (skip one FEL pulse, allow/block the one after that)

MEC

- Flip-Flop (nShots=1) (Closed-to-Closed): 8100
- Burst (Closed-to-Open): ?

XCS (last updated 2014-07-09)

- Flip-Flop (nShots=1) (Closed-to-Closed): ~~8100~~ ~~7500~~ 8000 (aggressive: 0)
- Burst (Closed-to-Open): 5000 (aggressive: 0)

Times dialed using reflaser2 and Thorlabs photodiode.