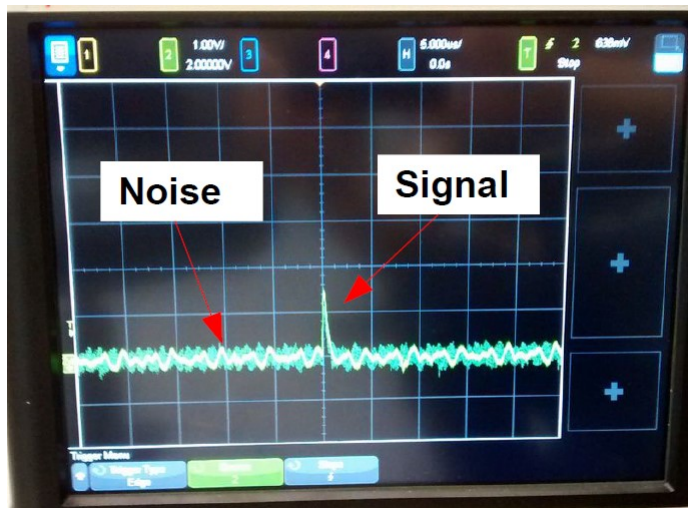
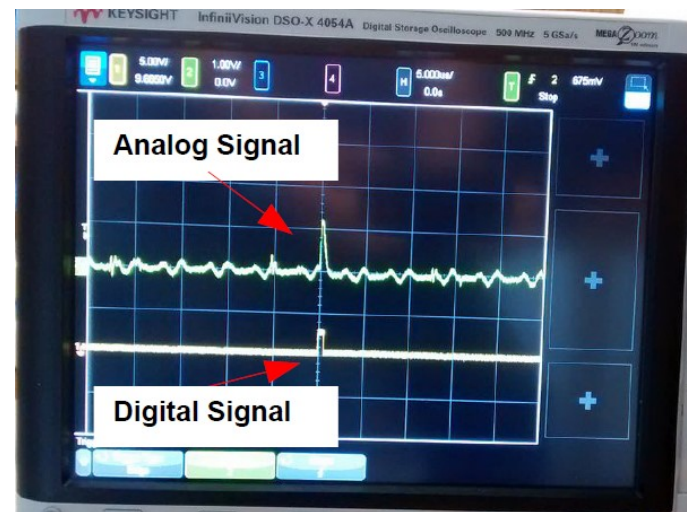


Status and Plans

Manitoba/QWAD

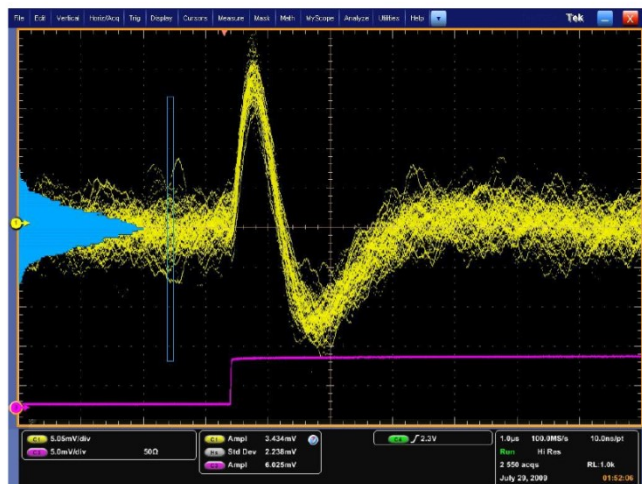


Detector signal after amplification

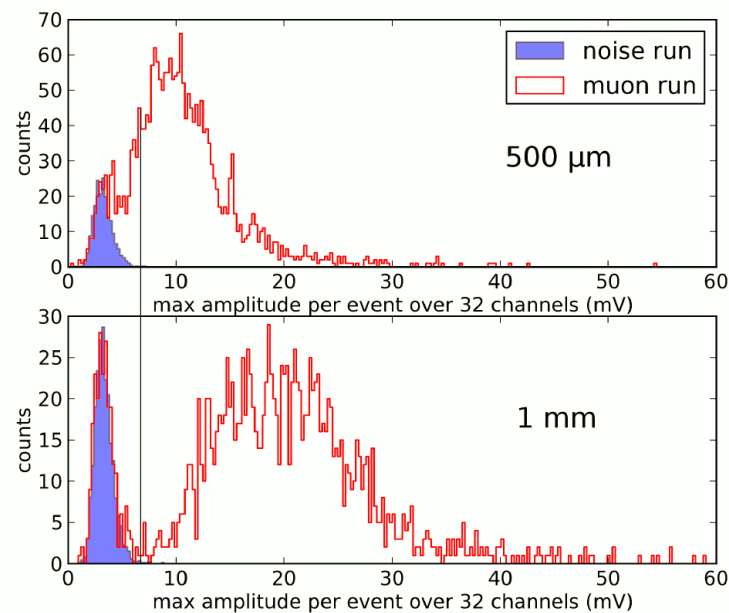


Detector signal (amp) and QWAD output

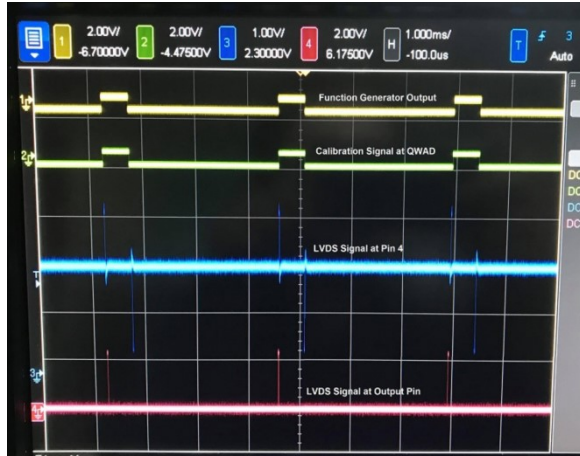
Clermont/French



Calibration signal (100 pF)
after amplification



Manitoba Tests



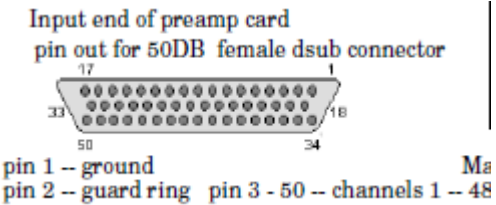
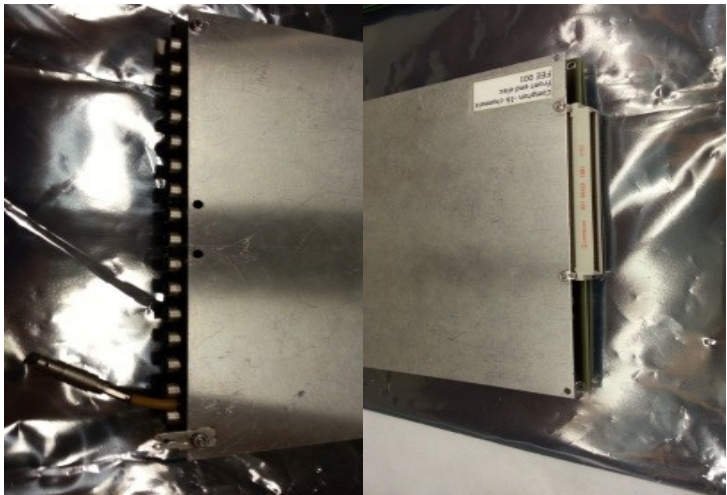
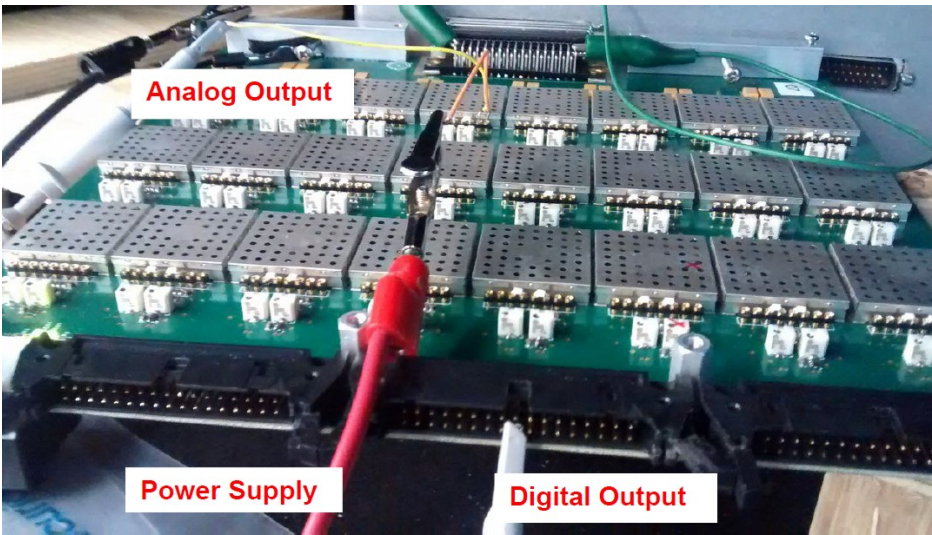
Calibration signal tests with QWAD and V1495

Expect 20 counts per hit, sent bursts with 20 hits and see the LVDS signal in the V1495

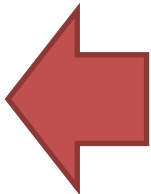
Can't specify a gate width



How much of this is custom?



QWAD



French electronics

FET

Add FET as close to the detector as possible

Amplify the signal before it leaves the can

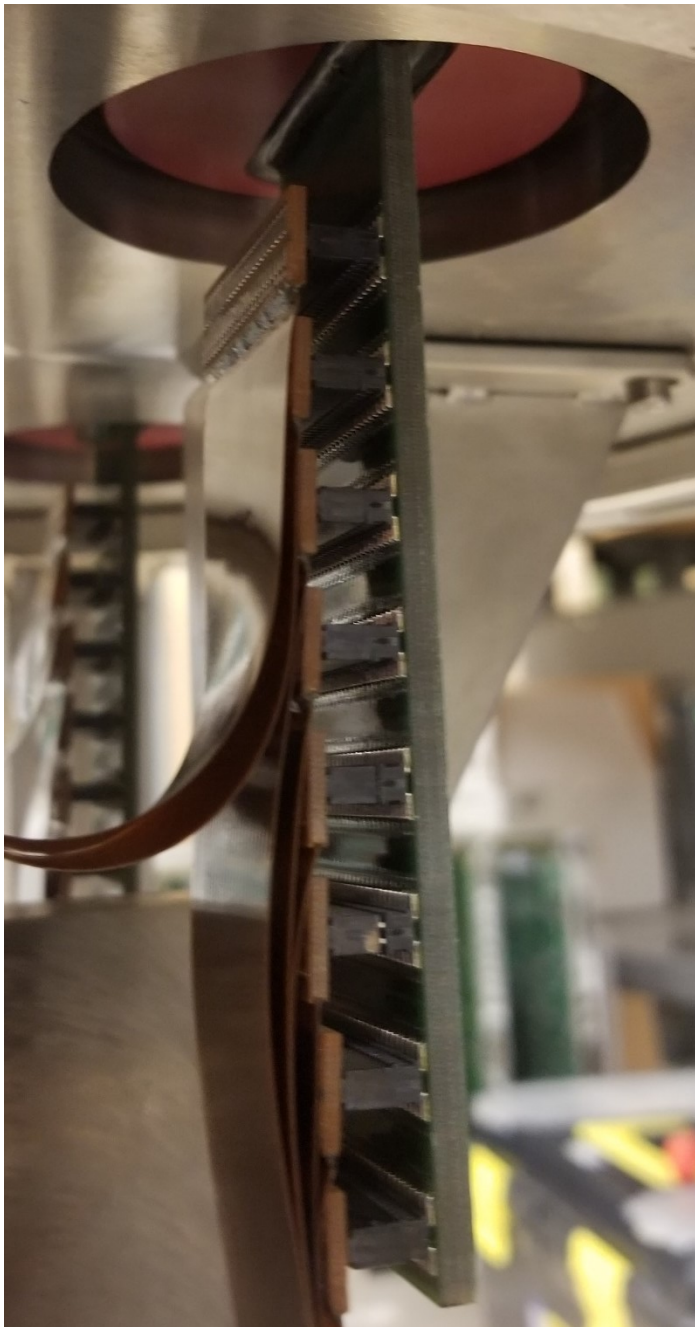
- in vacuum – so need to worry about heat

Heat sink glue:

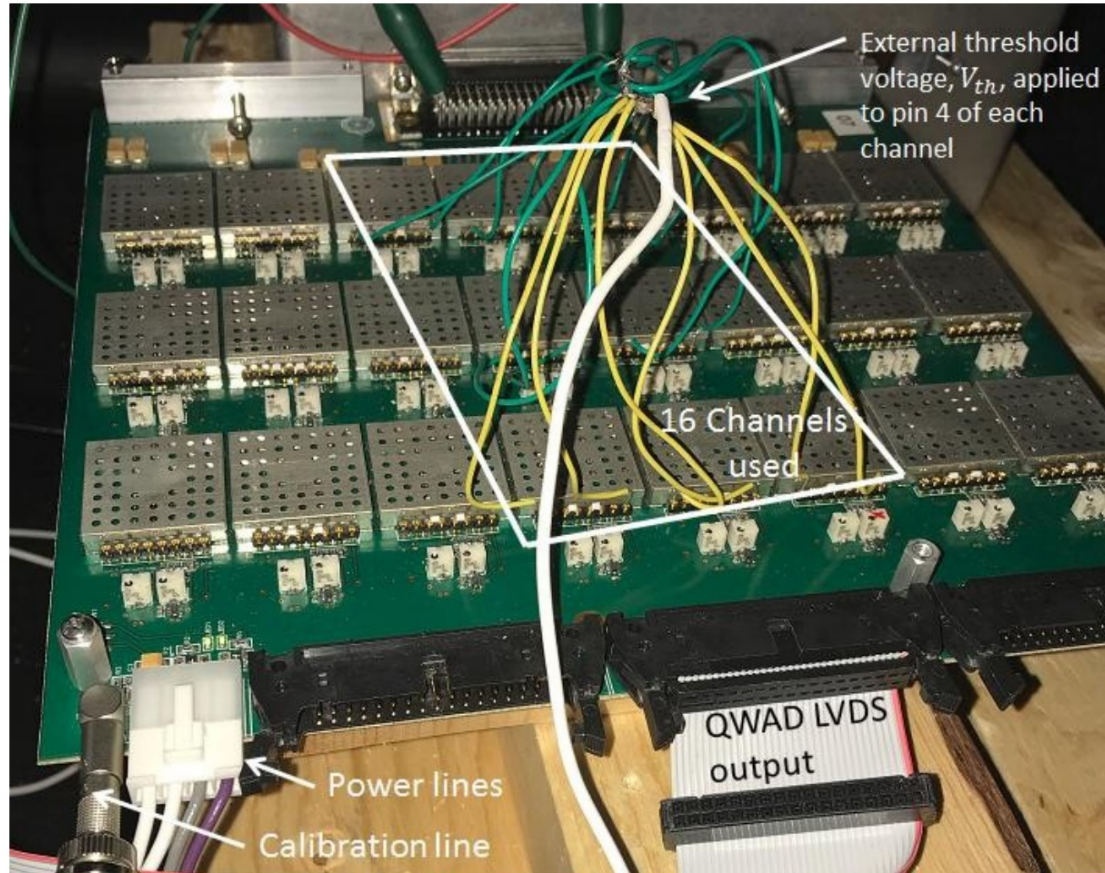
<https://www.masterbond.com/tds/ep37-3flfao>

Key Features

- Convenient handling
- Excellent flowability
- High flexibility
- Thermally conductive and electrically insulative
- NASA low outgassing approved
- Withstands 1,000 hours 85°C/85% RH



QWAD



Previous tests:

- QWAD threshold adjustable range < noise range (0.4 V)

Solution:

- external power supply at pin 4
- increase V difference in the comparator

External threshold $V = +3.69$ V

- appropriate for calibration signal of amplitude 3 V

Power lines:

- P6V0 = +5 V
- N6V0 = -5 V

The central 16 channels of the QWAD were used for testing

QWAD LVDS output was connected to board A of the V1495 module

Possibilities for testing during PREX/CREX

Detector	Electronics	“crates”	Feed-through	cables	Top flange	Can	Usefulness
Si strip	fr						None. Doesn't work.
Si strip	Fet+fr						pre-amplify signal
Si strip	QWAD	New					Demonstrate need for new
Si strip	Fet+QWAD	New					feedthrough/cables?
Si strip	QWAD	New	New				
Si strip	QWAD	New	New	New			
Si strip	QWAD	New	New	New	New	New?	
Di strip	QWAD	New	New	New	New	New?	
HVMAP	other	New	New	New	New	New?	
		\$2k	\$2k	Expensive?	\$3k	\$4k	

Fet board	\$2k (labor not included)
QWAD	\$5k each?
Si strip	\$4k
Di strip	\$10k?
HVMAP+elec	??

People are concerned about the status of the polarimetry in Hall A because the electron detector doesn't work

- They don't just want to hear that we will have a new one for MOLLER
- They want to have some confidence that we know what we are doing
- Don't waste this opportunity to test something

Plans

- Measure analog signal from detector if possible
- Use LCR to measure the capacitance of detector, cables, bus board, etc.
- Program our FPGA to do the time-over-threshold cuts with the QWAD so we can do cosmic runs
- Consider getting a modified QWAD that could work with both Silicon and Diamond (maybe with a switch on the board?)
- Try to get a diamond strip prototype
- Plan for a test during PREX/CREX
 - Design FET for both Fr electronics and QWAD?
 - New top crate for QWAD

Questions

- Is the feedthrough custom?
 - G10 board glued in?
 - Why not just cables with strain relief?
- What is the size of the analog signal directly from Si strip detector?
 - 17 mV signal w/ 25 mV threshold in Hall A (before Fr. electronics)
 - ~3x bigger per micron per MIP
- What is the characteristic time?
- How does the “feed-through board” connect to the “crates”?