

eKLMReadout: A new TARGET_DAC daughtercard

By

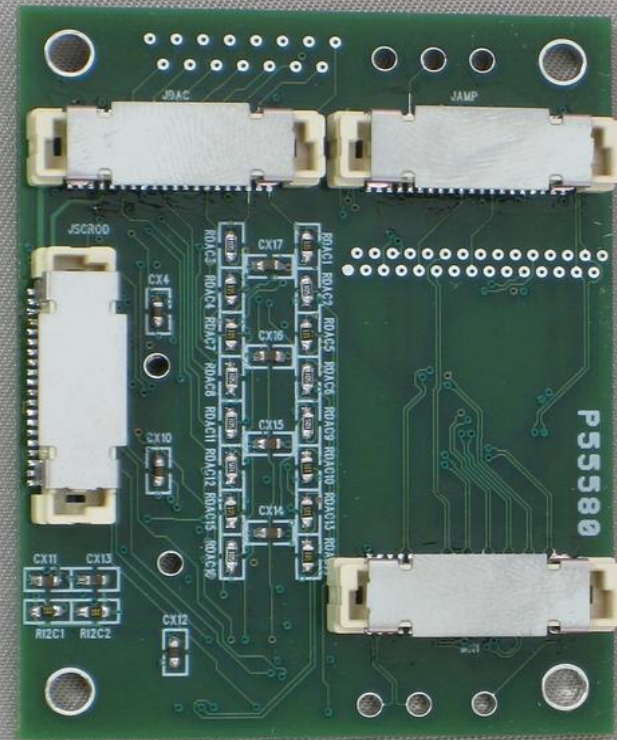
Adam Goss

Xiaowen Shi

Motivation

- DAC_MON and TARGET DC daughtercards were combined and upgraded.
- It is an inexpensive way to instrument large arrays of photo detectors.
- It is a self triggering chip that helps filter, digitize, and store information.

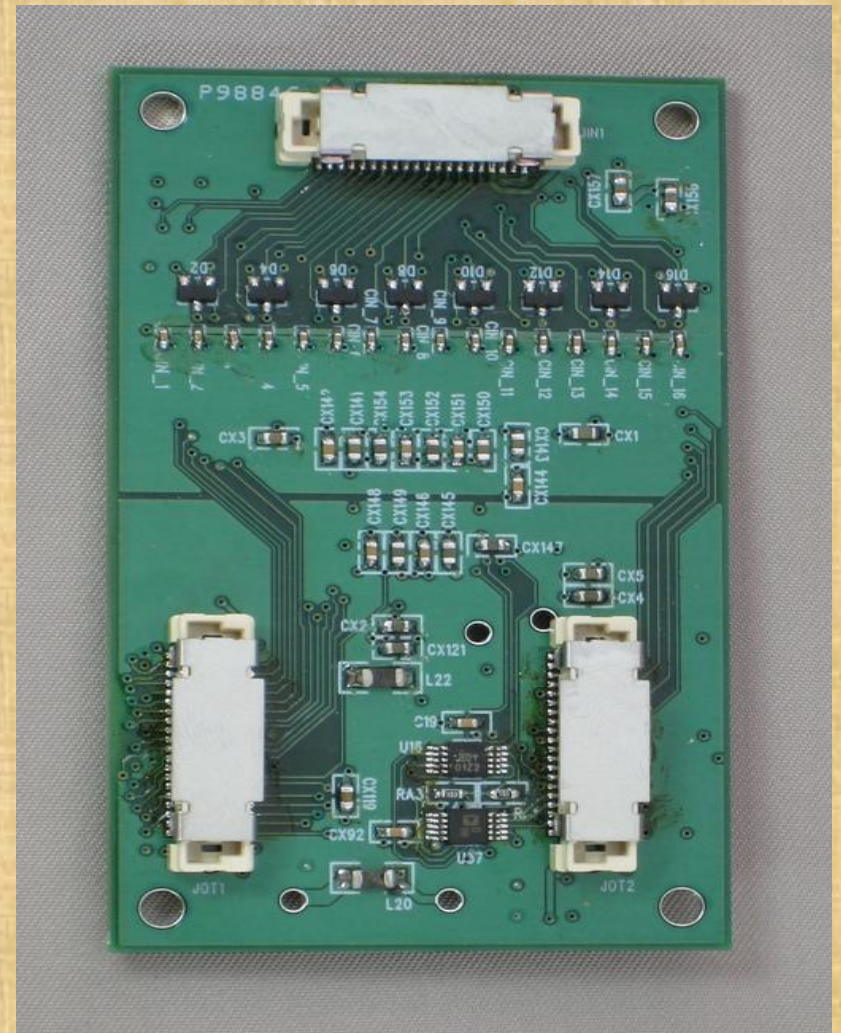
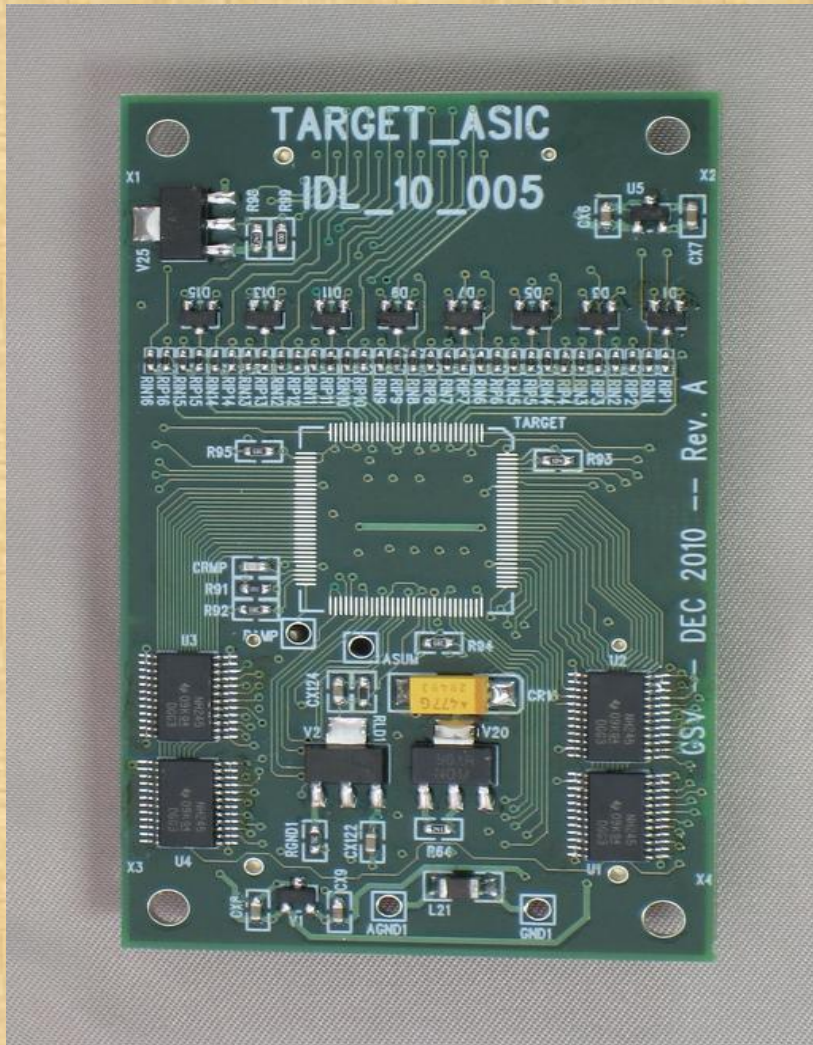
Old Boards



- DACmon DC top

- DACmon DC bottom

Old Boards



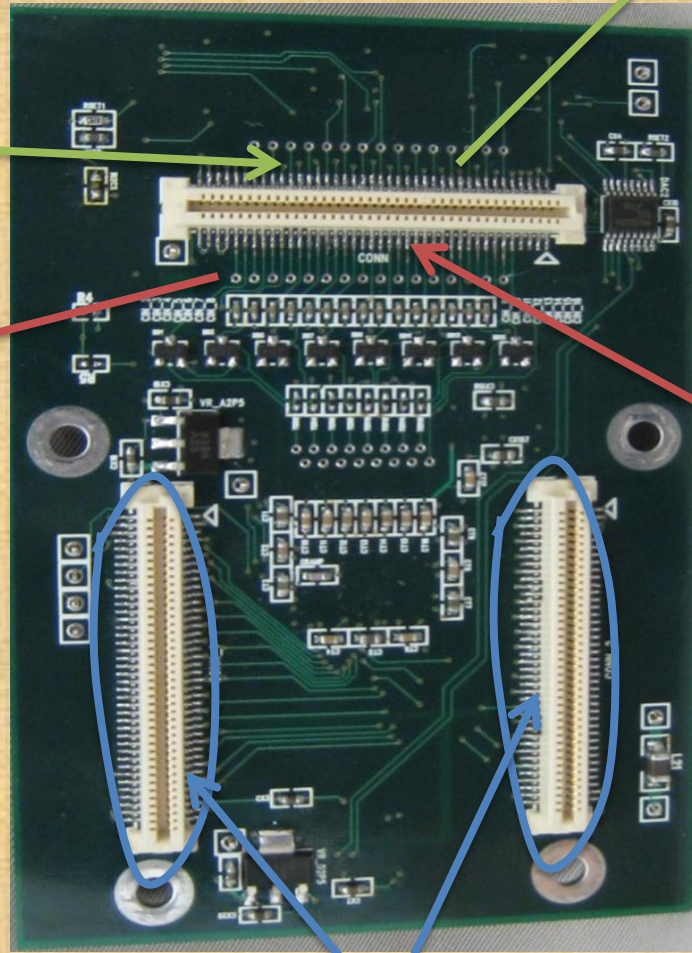
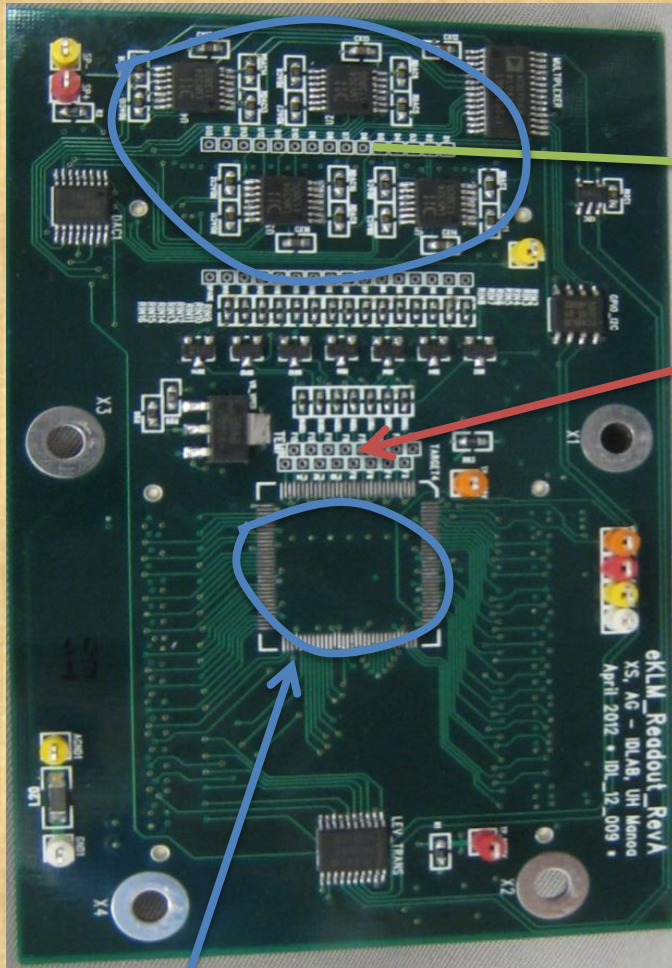
- TARGET_ASIC top

- TARGET_ASIC bottom

eKLMreadout Board

DACs

DAC output signals



15-channel analog signals

TARGET4

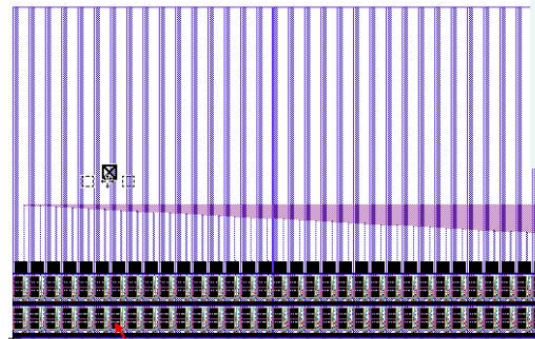
Digital signals from/to FPGA

Upgrades and Changes

- Due to a large number of configurable registers inside the new TARGET4, the new board uses less components than the last two.
- The new board reduces the length of the analog signal traces.
- DAC_MON and TARGET DC boards were combined into one board, the new board.
- Input and output plugs now have 80 pins. This allows the board to be plugged into the Universal Eval. board for easy testing and programming.
- Test points are now easier to access.

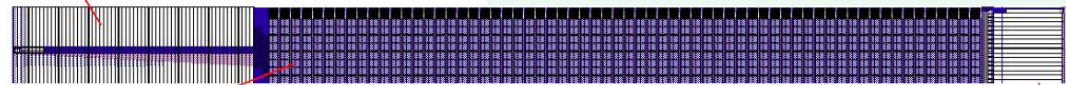
TARGET4

- Low power (<10mW/channel)
- Giga-sample per second recording
- Selective (windowed) readout
- 16,384 storage samples/channel



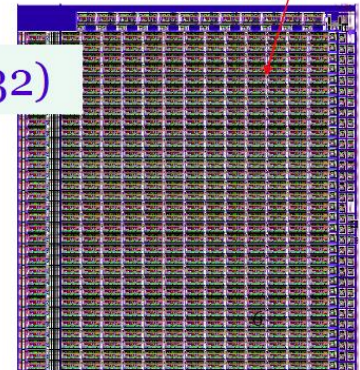
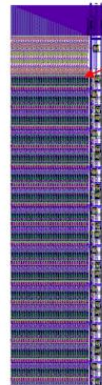
TARGET4 Single Channel

- Sampling: 64 (2x 32) separate transfer lanes
Recording in one set 32, transferring other (“ping-pong”)

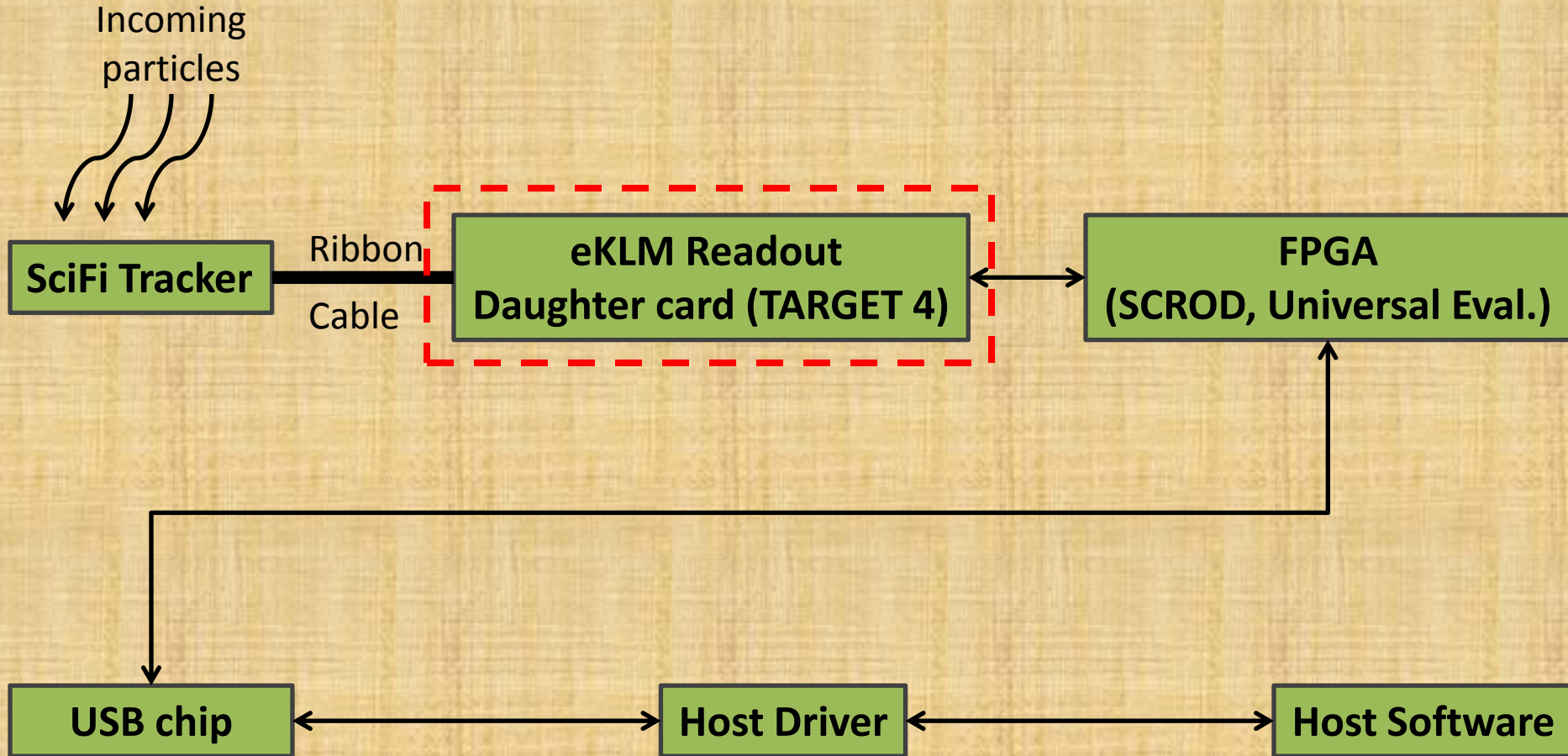


- Storage: 64 x 256 (256 = 8 * 32)

- Wilkinson (32x1):
32 conv/channel

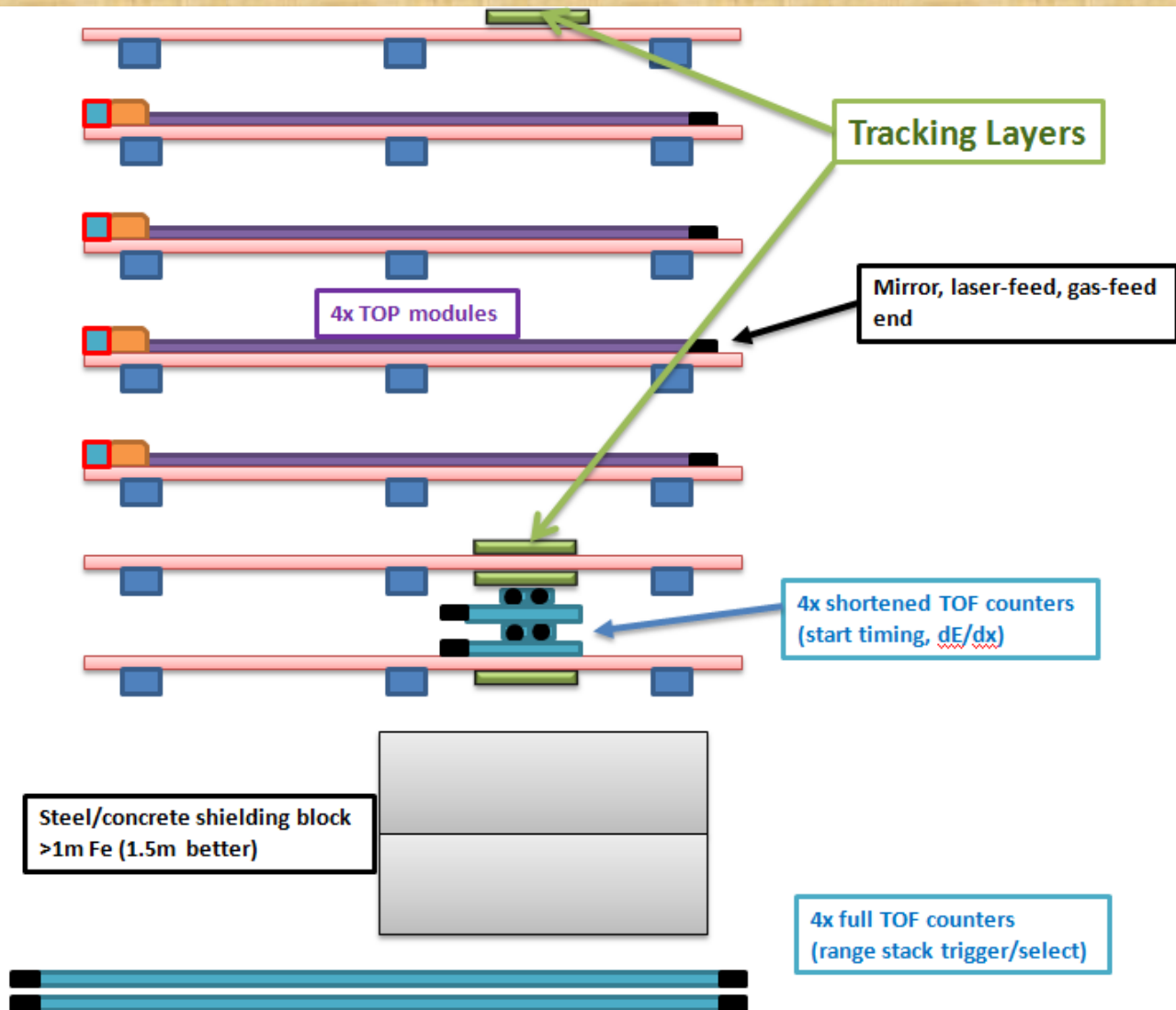


System Diagram

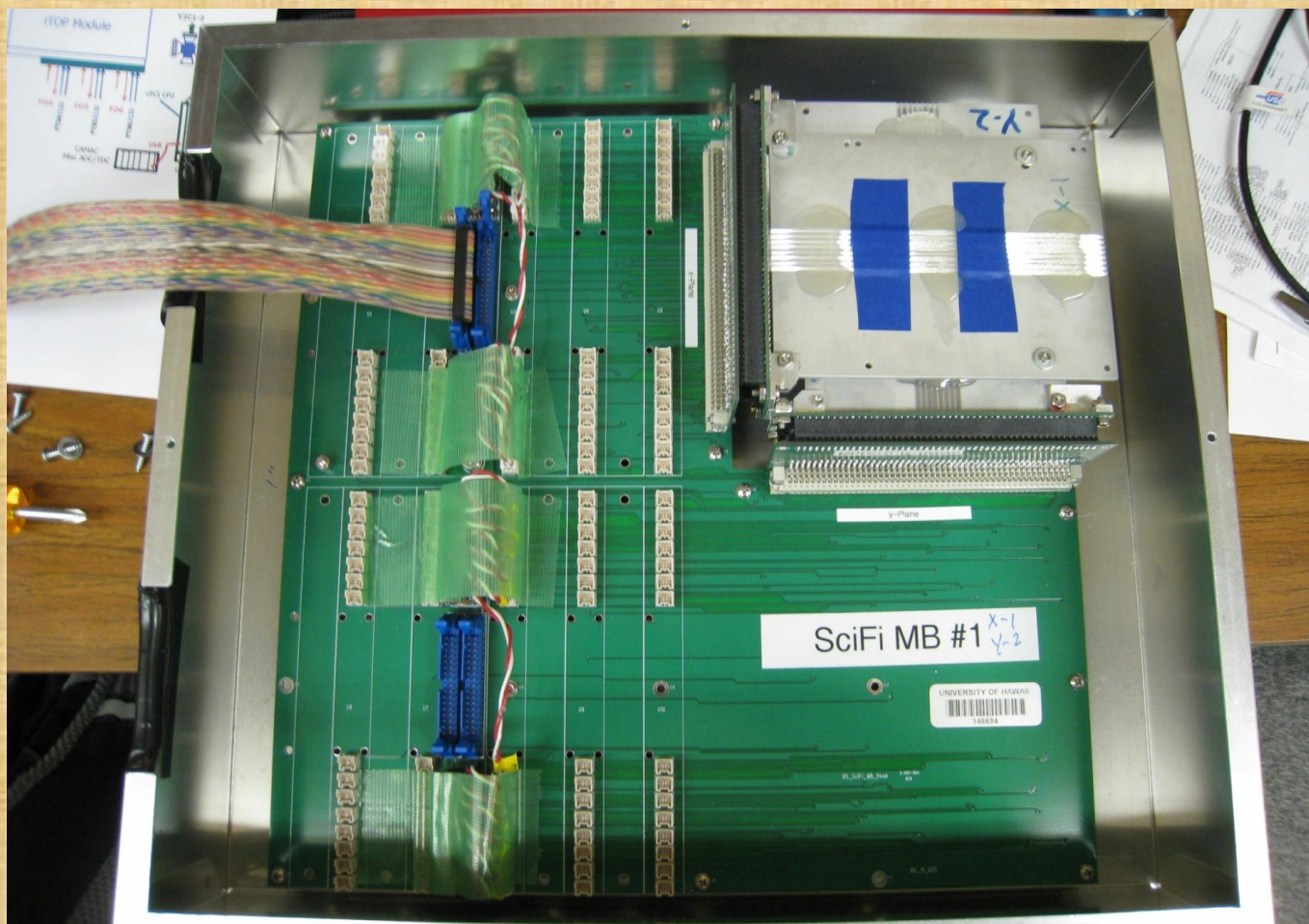


Range Stack

Side View

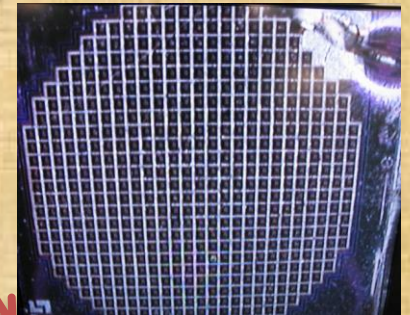
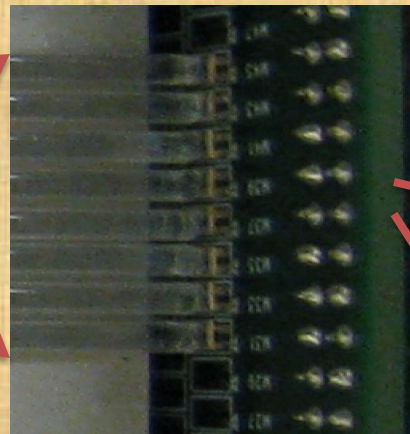
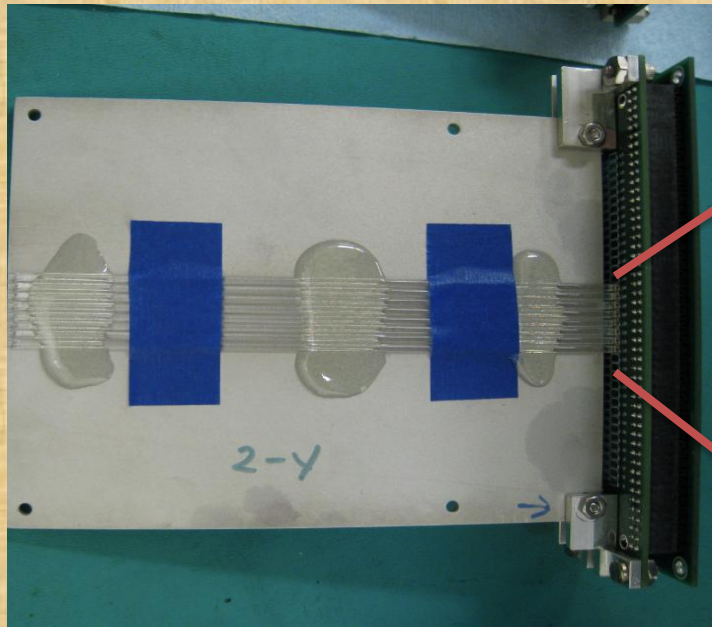
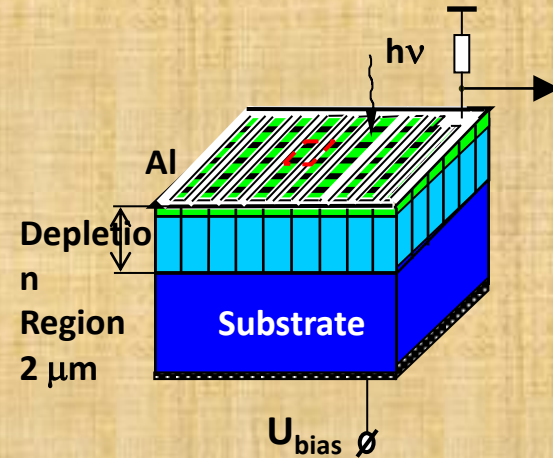


SciFi(Scintillating Fiber) Tracker



SciFi Tracker

- MPPC(Multi-Pixel Photon Counter)

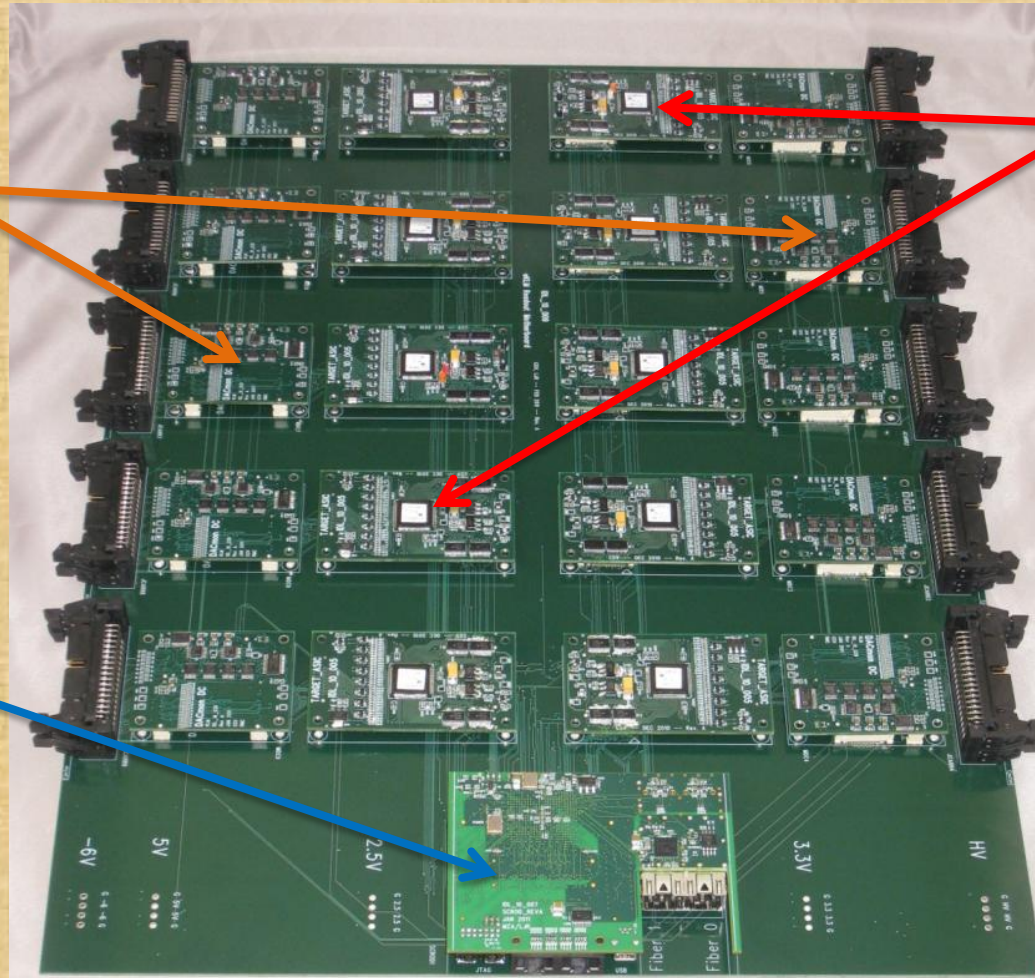
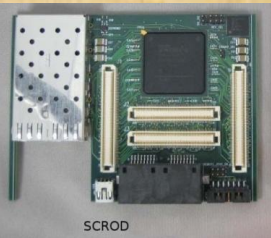


Old eKLM Readout Board

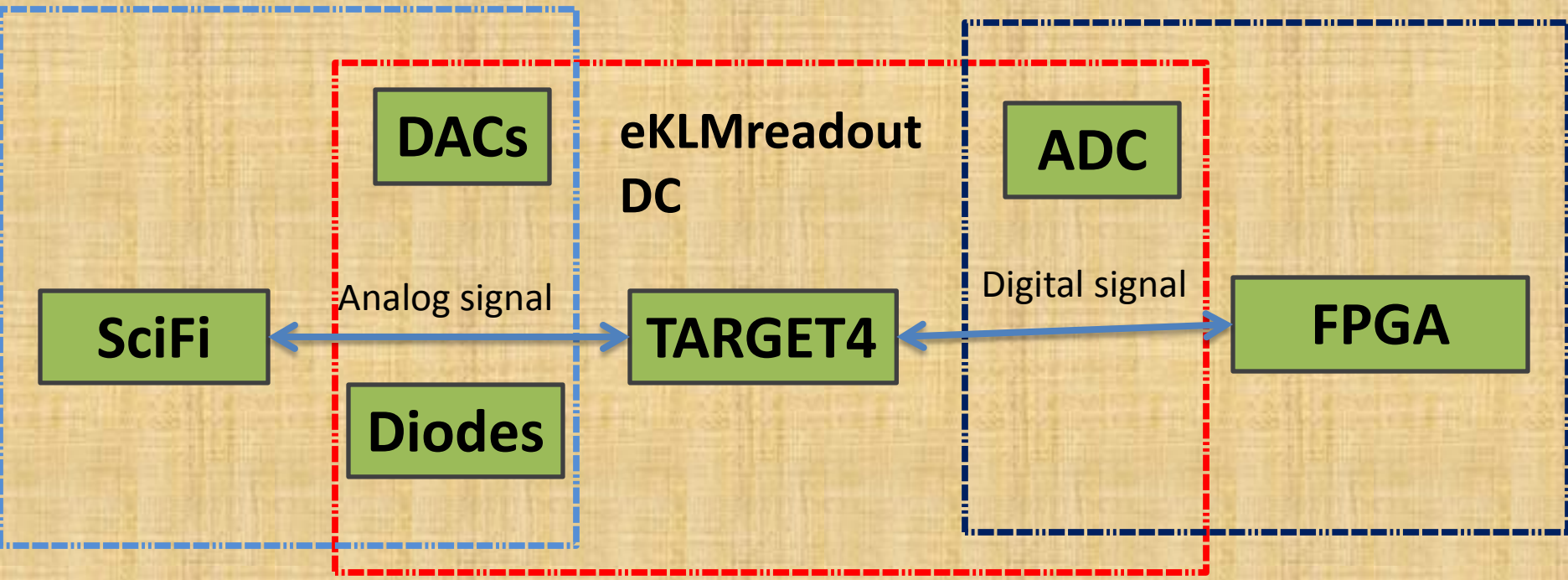
**DAC_MON
(10x)**

**TARGET DC
(10x – to merge
DACmon &
TARGET DC)**

SCROD



eKLMreadout DC Block Diagram



Board Specs

- The eKLM board's area is 3.8 inches by 2.5 inches and consists of four layers.
- 15 out of the Target 4's 16 channels are used in the eKLM.
- The board is compatible with Universal Eval. board.

Questions?