Running the FEi4 at Testbeam - Notes by Andy Blue

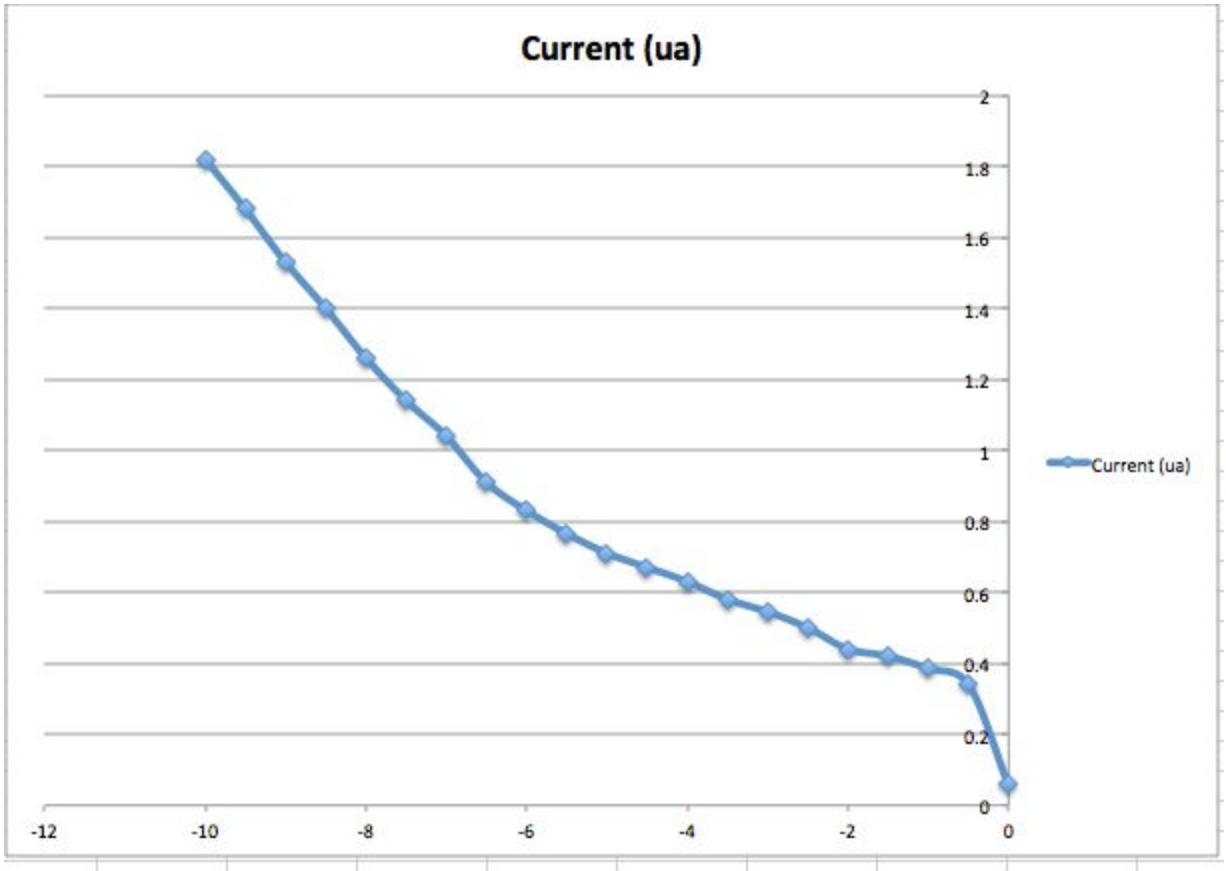
Background

We will be using an FEi4 for timing and triggering reasons. There are 2 possible modes of operation

1) As normal dut, recording information
2) As a feedthrough to the trigger (via a lemo to the TLU)

We plan to run in mode 1) to start, and possiblly in mode 2) given time

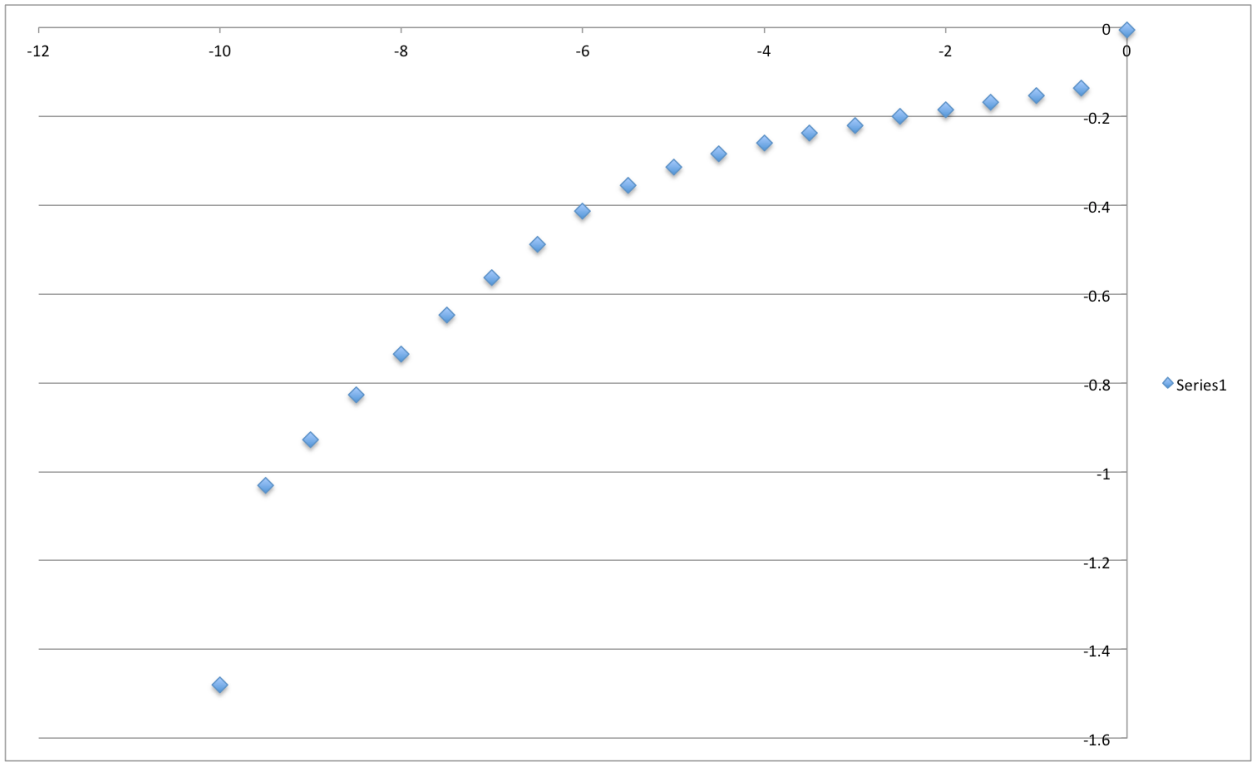
The Fei4 in use is attached to a 3D detector. The noticeable difference will be it will need less HV to operate. A quick I-V (mostly dark) suggest **-10V** to be a reasonable operating voltage



I-V : In the light

I-V in the dark:

V	I
0	-0.006
-0.5	-0.137
-1	-0.154
-1.5	-0.169
-2	-0.185
-2.5	-0.2
-3	-0.221
-3.5	-0.238
-4	-0.26
-4.5	-0.284
-5	-0.314
-5.5	-0.356
-6	-0.414
-6.5	-0.488
-7	-0.563
-7.5	-0.648
-8	-0.735
-8.5	-0.827
-9	-0.927
-9.5	-1.03
-10	-1.48



Operating the Fei4

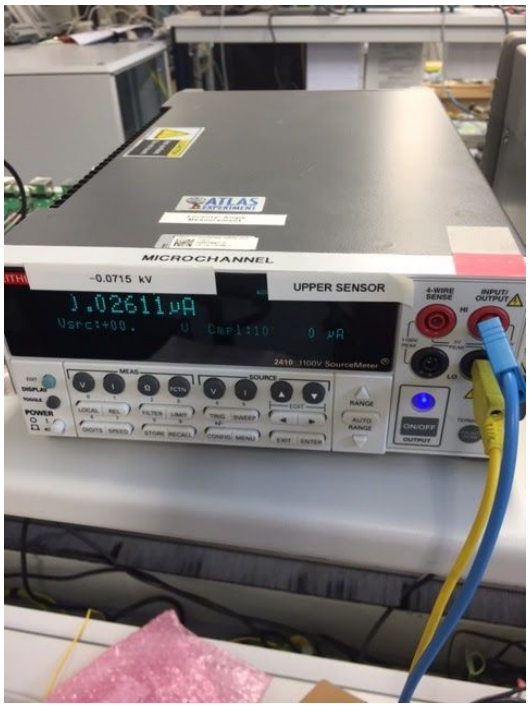
For this testbeam we will be using USBpix as the readout hardware, and STControl as the software (ultimately controlled by EUDAQ)

More information on USBPix and STControl can be found here

http://icwiki.physik.uni-bonn.de/twiki/bin/view/Systems/UsbPix

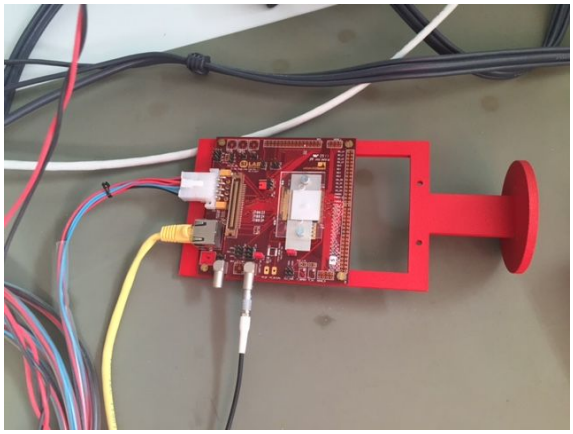
Power Supplies

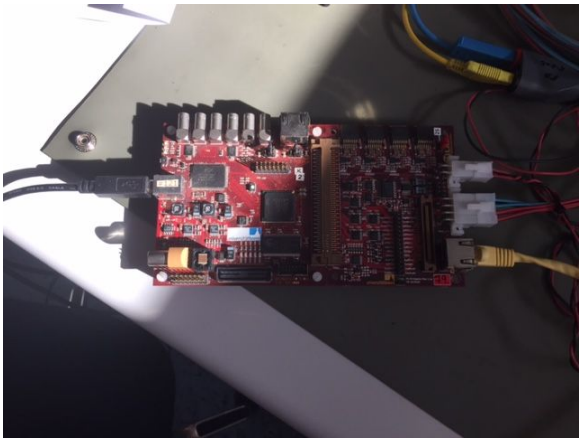
We need to supply 2 Low voltages (Analog and Digital) for the chip
These can be both **2V**, and when working should pull about 600mA of current
The High Voltage needs **NEGATIVE 10V**
The power supplies are cabled as in the pictures below



Left: HV; Right LV

Connections between the single chip card and the usbpix are as in the photos below





STControl

Open stcontol.exe

File->open cfg file.
Choose /config.3200e10TOT

Choose ‘Initialize in dcs objects’….

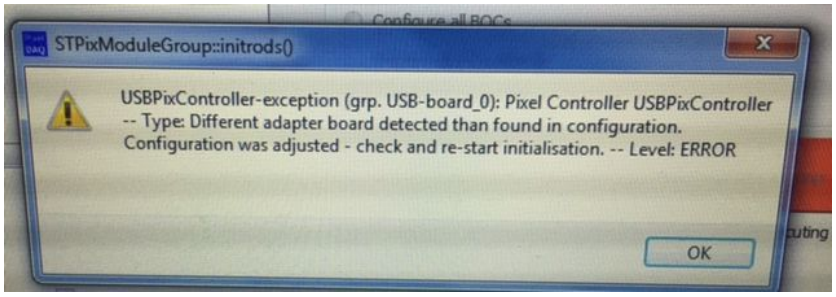
Ignore the warning,. Related to not having Keithley attached by GPIB for HV control
Switch on voltages on gui

Sanity check: go to pixscan (right panel)
Choose digital scan and make a root file to save histograms to
Should return a map of 200 hits

Error

Installed v5.2. Worked and tuned to 3200e and 8 TOT.
Compiled v5.3 necessary for eudaq integration. Doesn’t work. Attached error message

Looks like an update to the trunk for compilation is necessary to run the adapter board we have



Email from Tobias says we need to solder wires on the back of i/o boards to enable i2c control

Did this and we can now start new configs.However crashed when doing long scans, So manage to tune with a fast gdac and fast tdac and saved this as a config (workingtdac.cfg.root)

This “should” be enough for it to operate as a timestamp and position info

So working version is in

c://usbpix_svb_5.3/stcontrol_eudaq.exe

config file is in c://usbpix_svb_5.3//bin/workingtdac.cfg.root