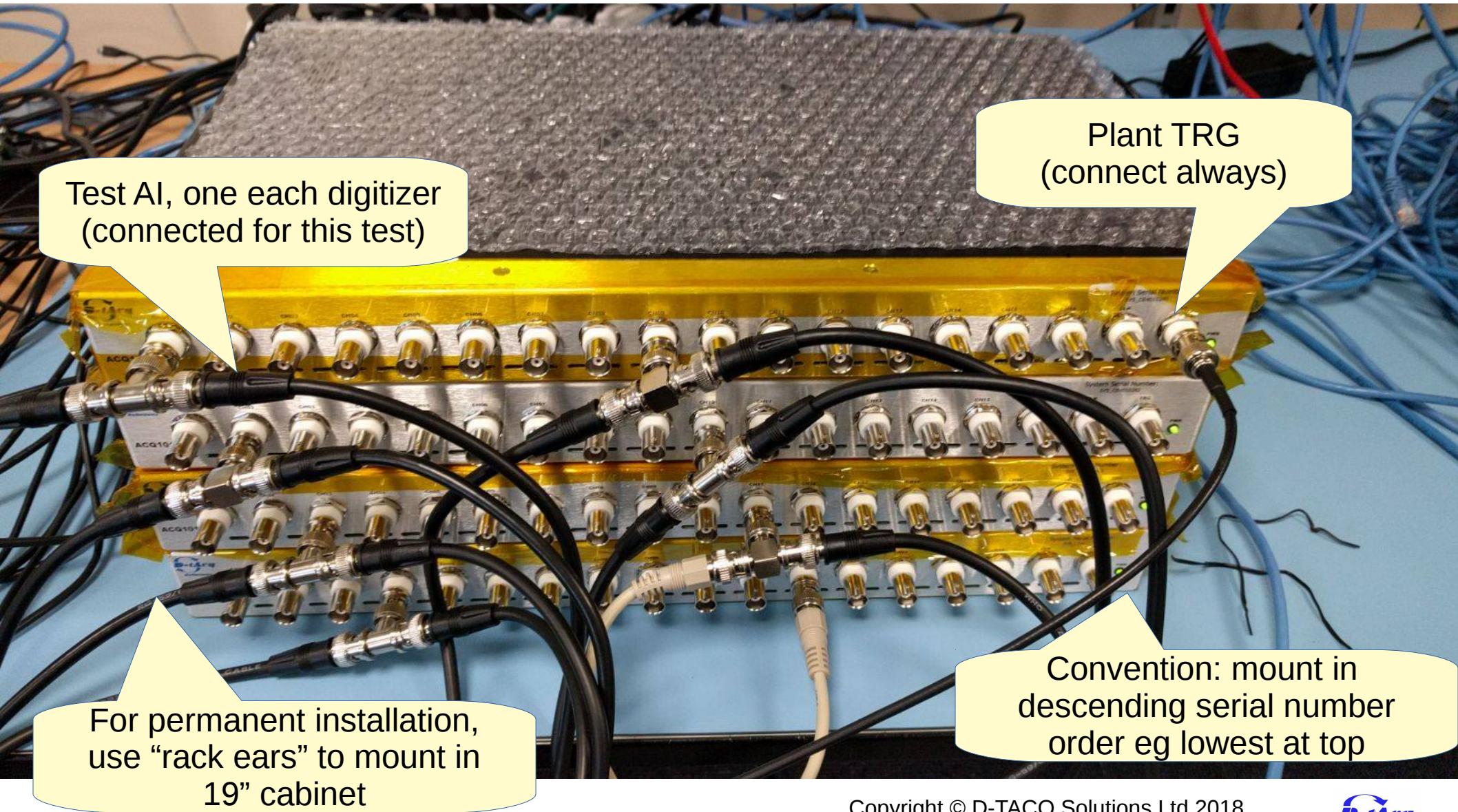
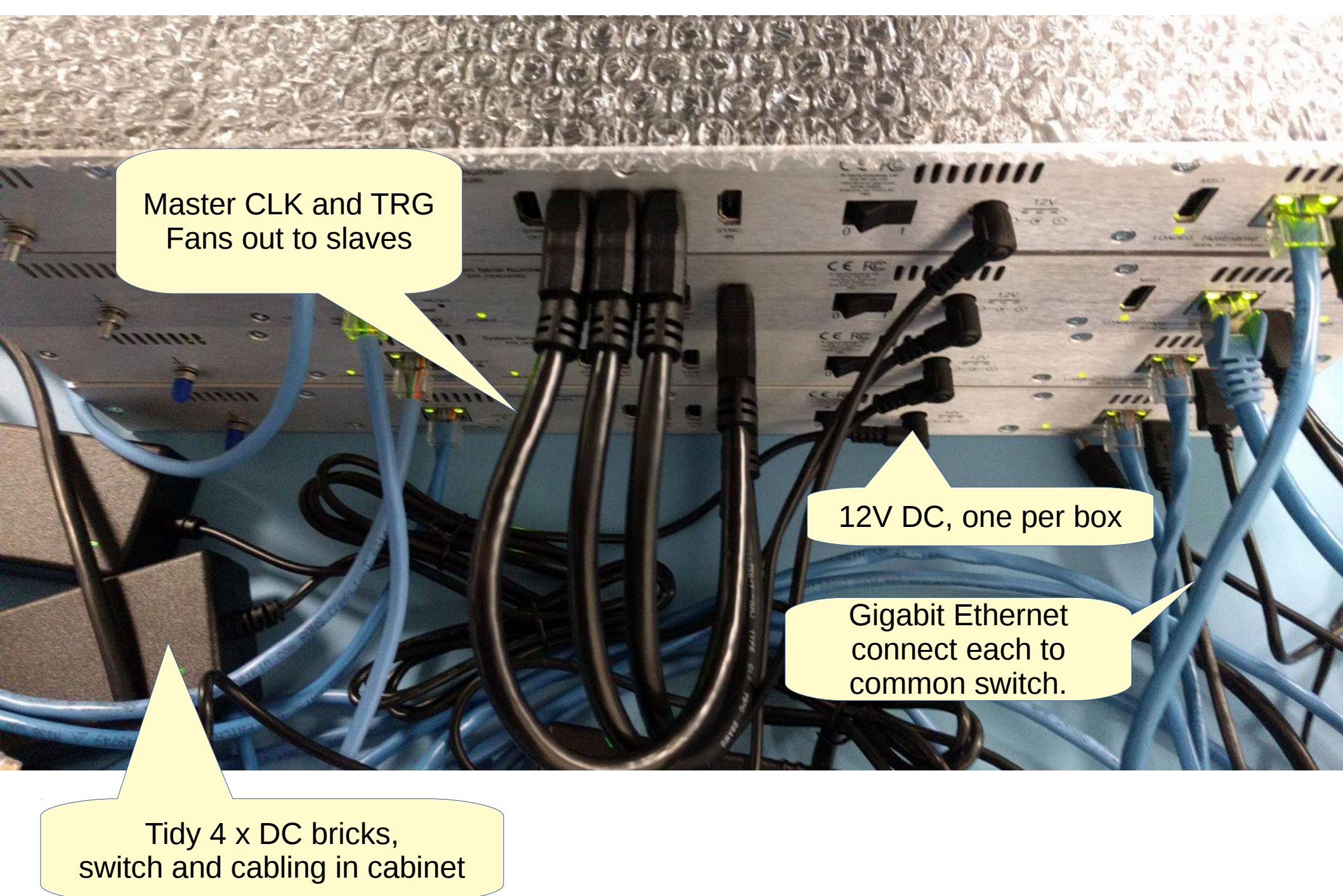


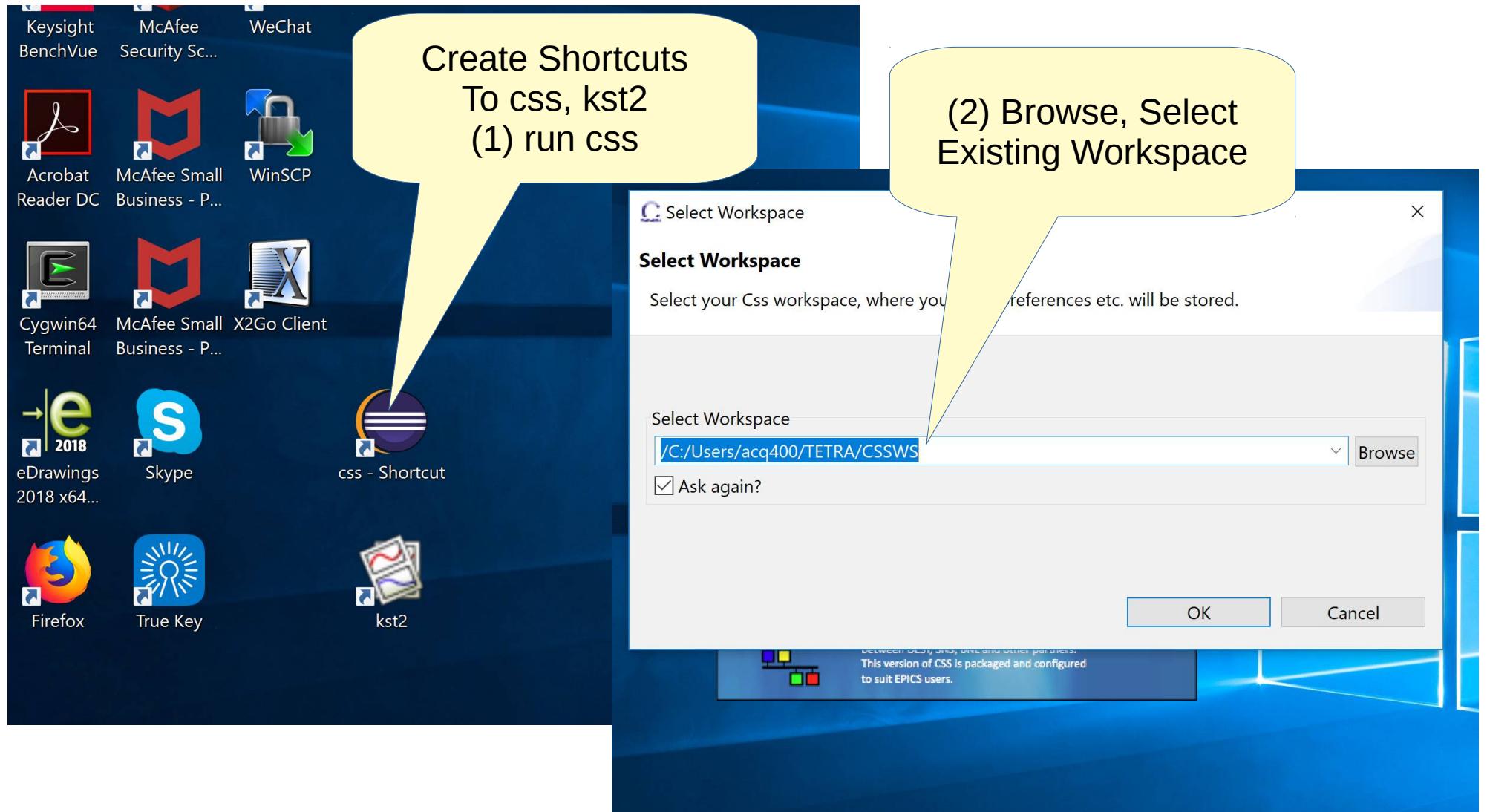
64 CH Simultaneous ADC

80MSPS/Channel, 14 bit, 12M samples

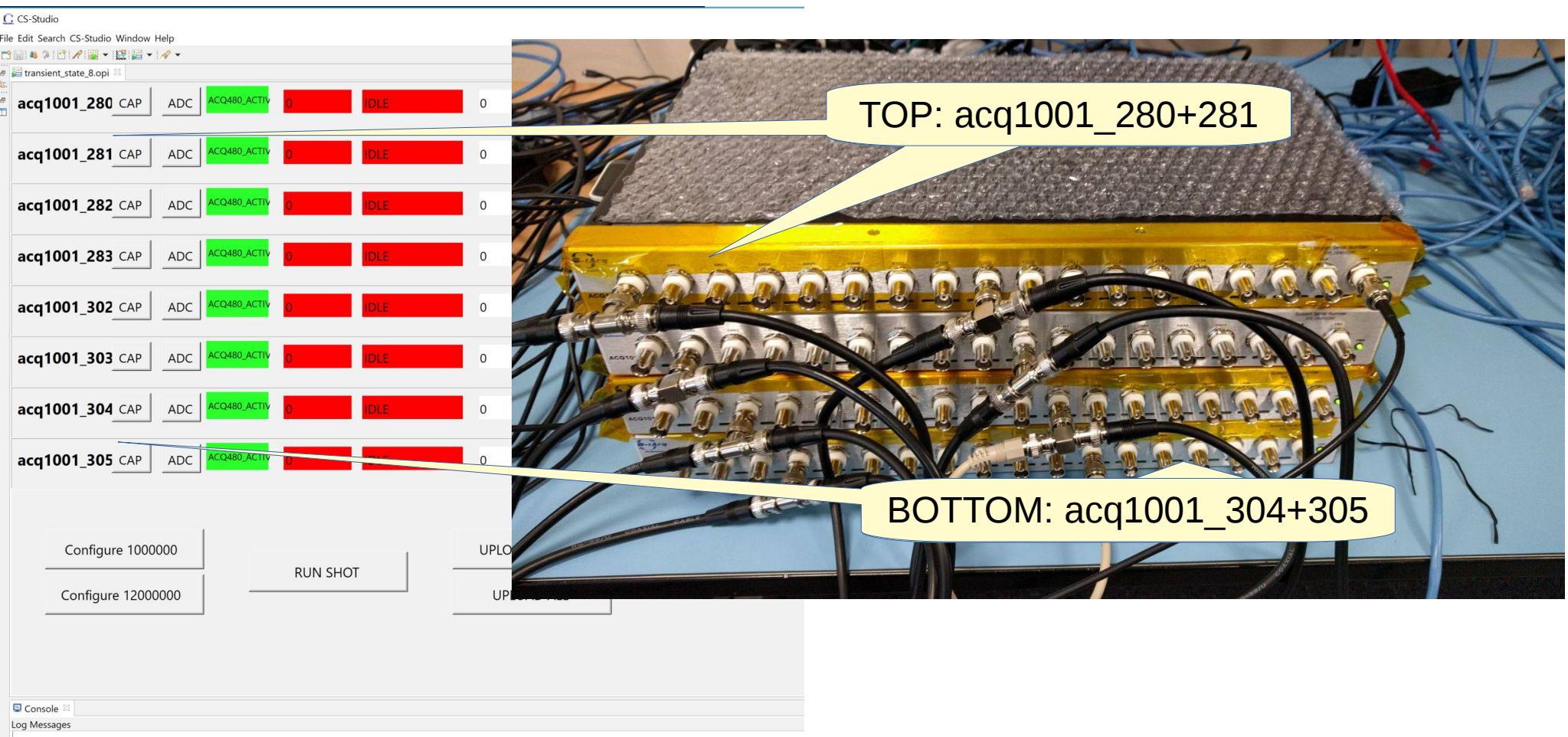


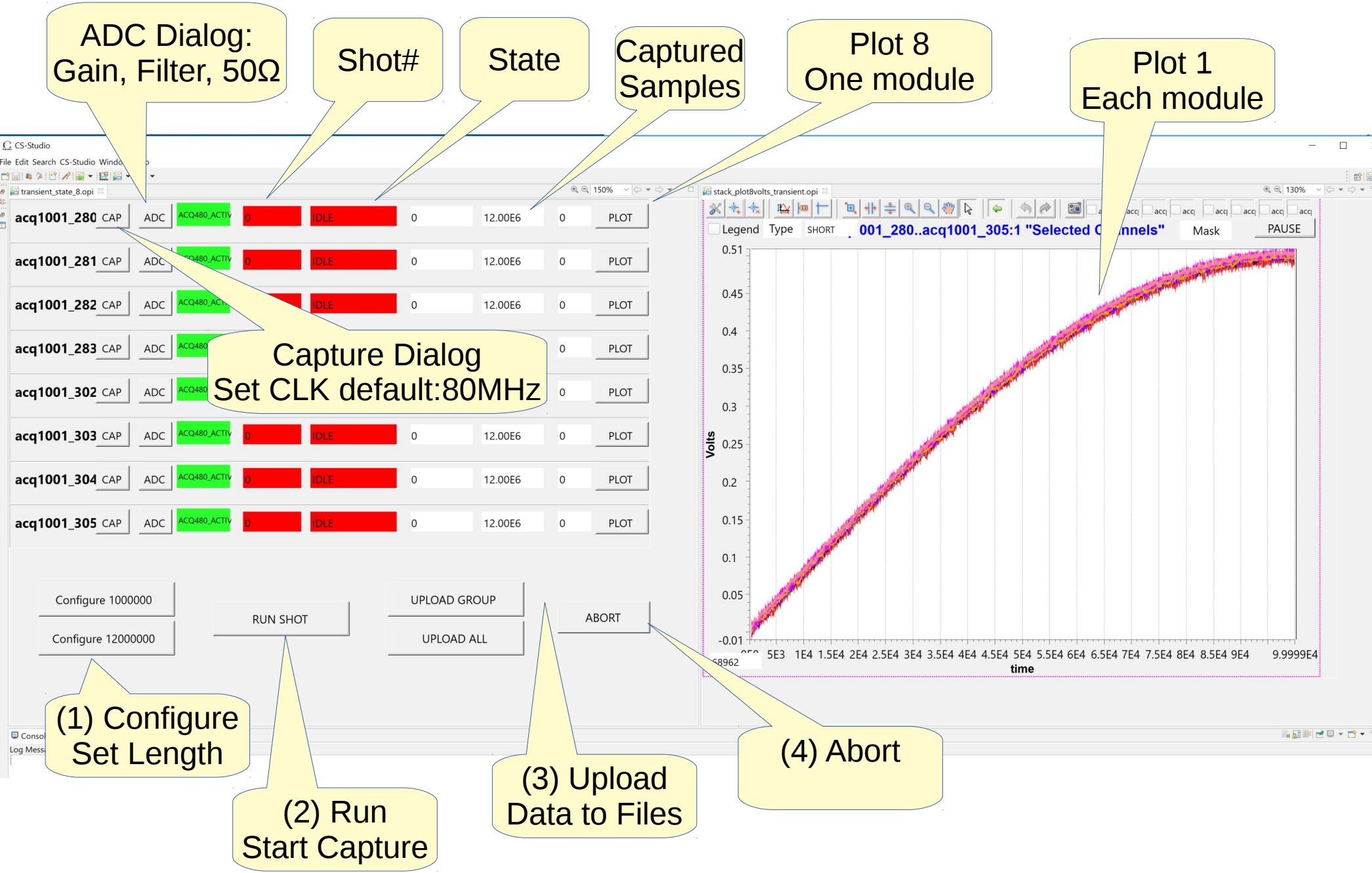


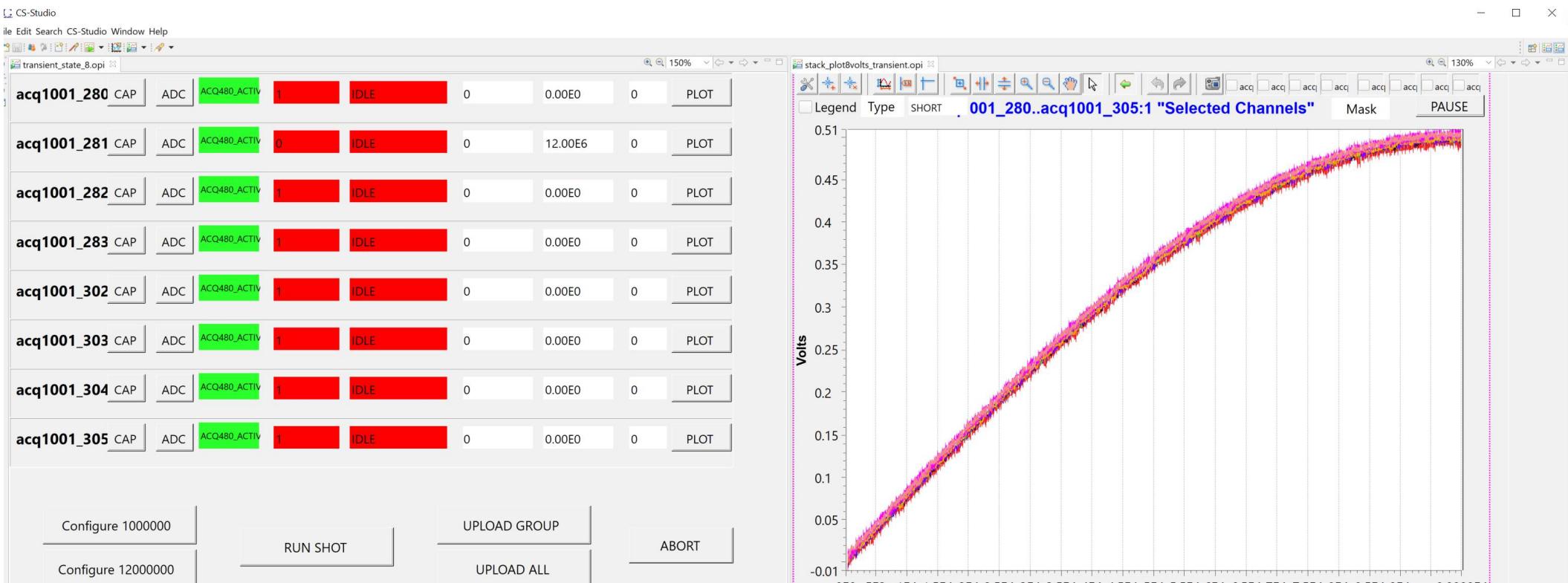
64ch fast ADC UG



Physical Stack Matches UI:







Console

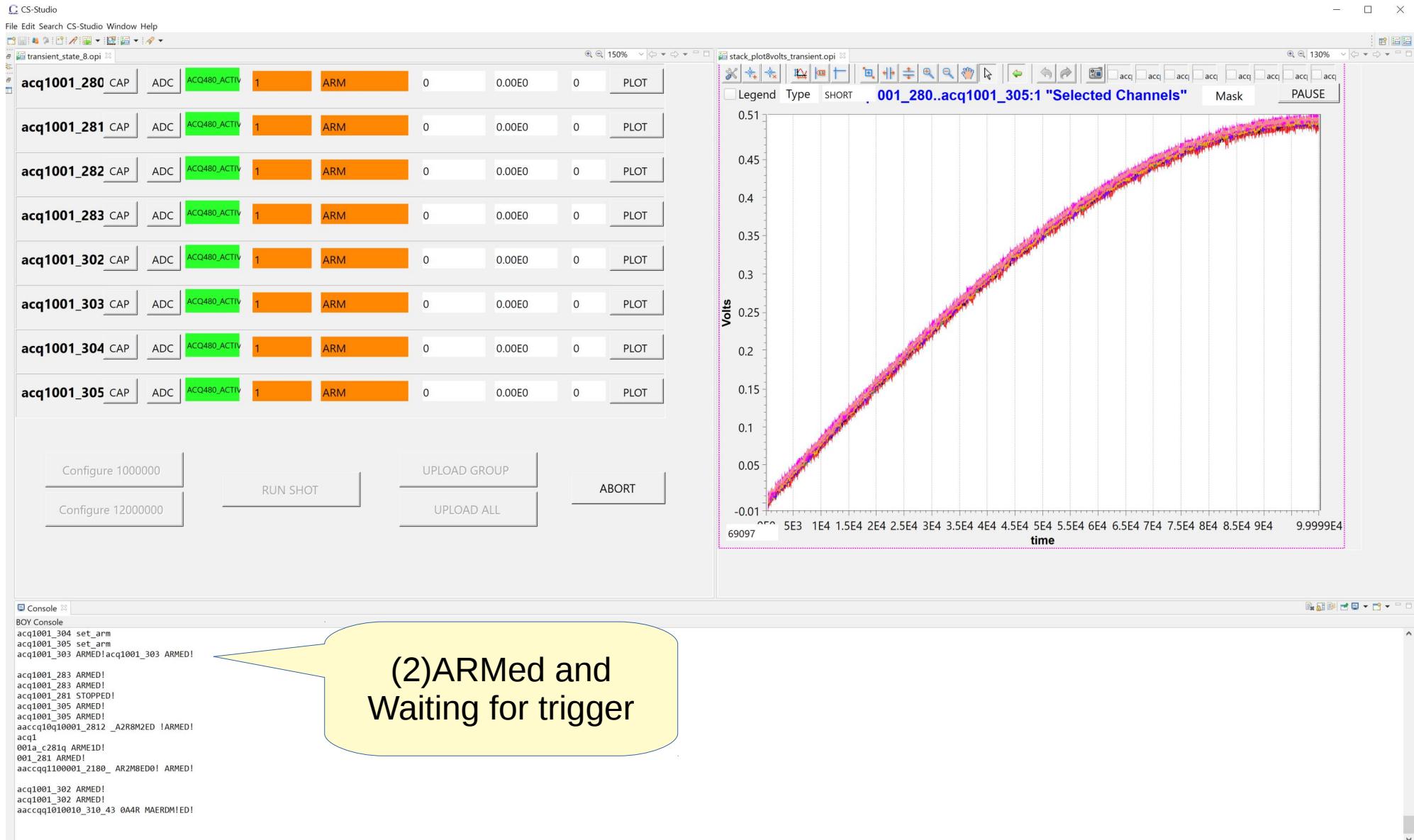
BOY Console

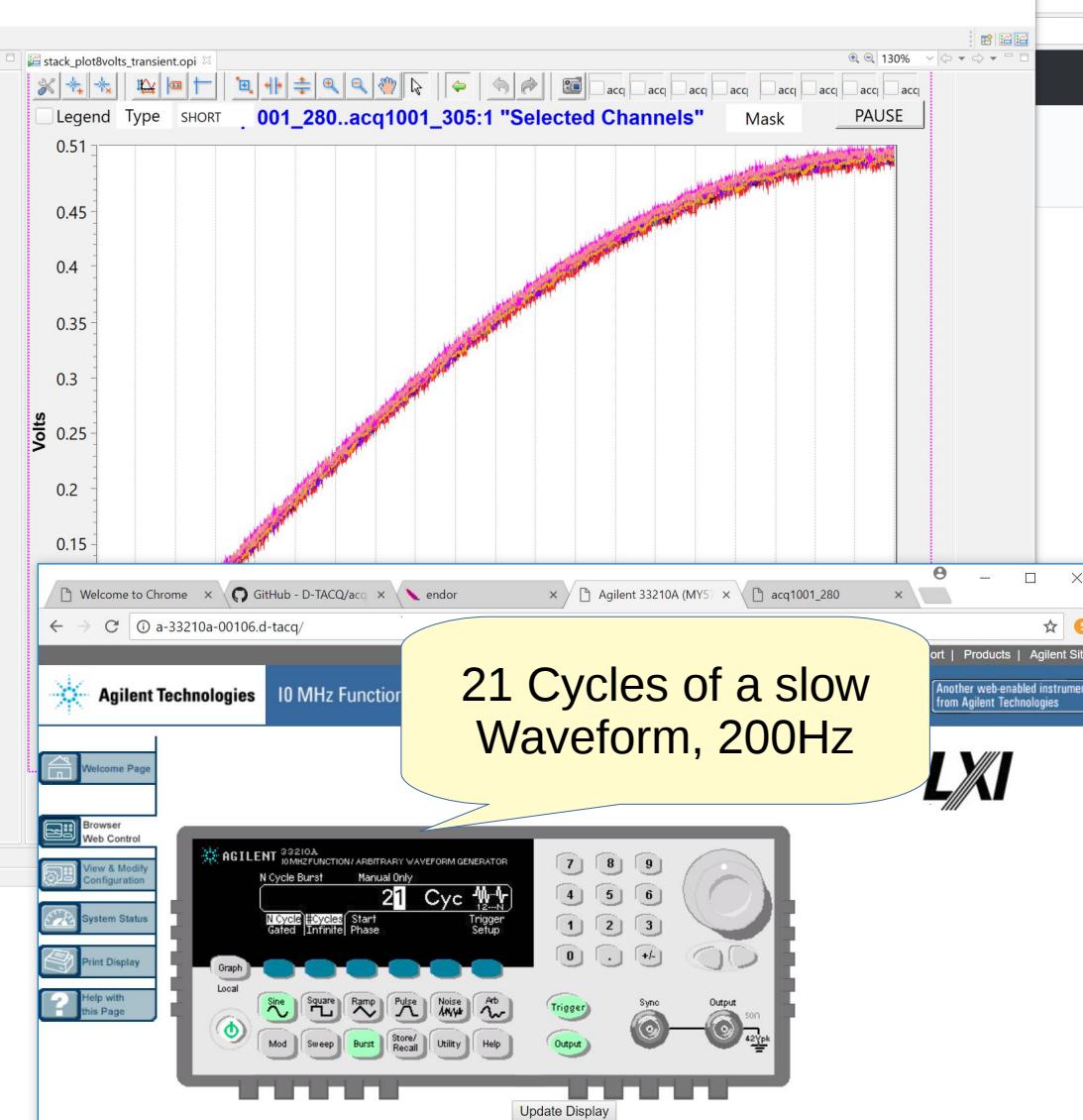
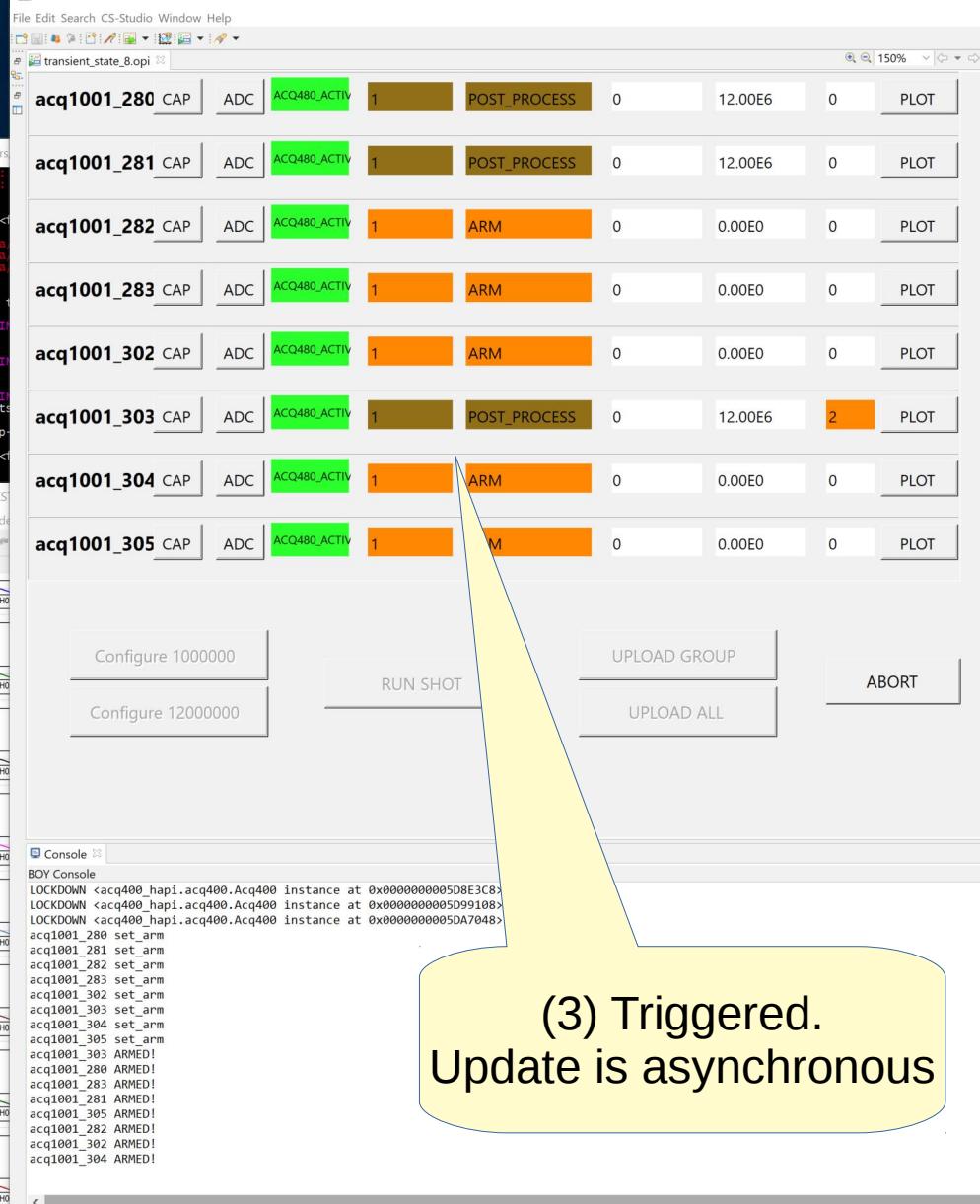
```

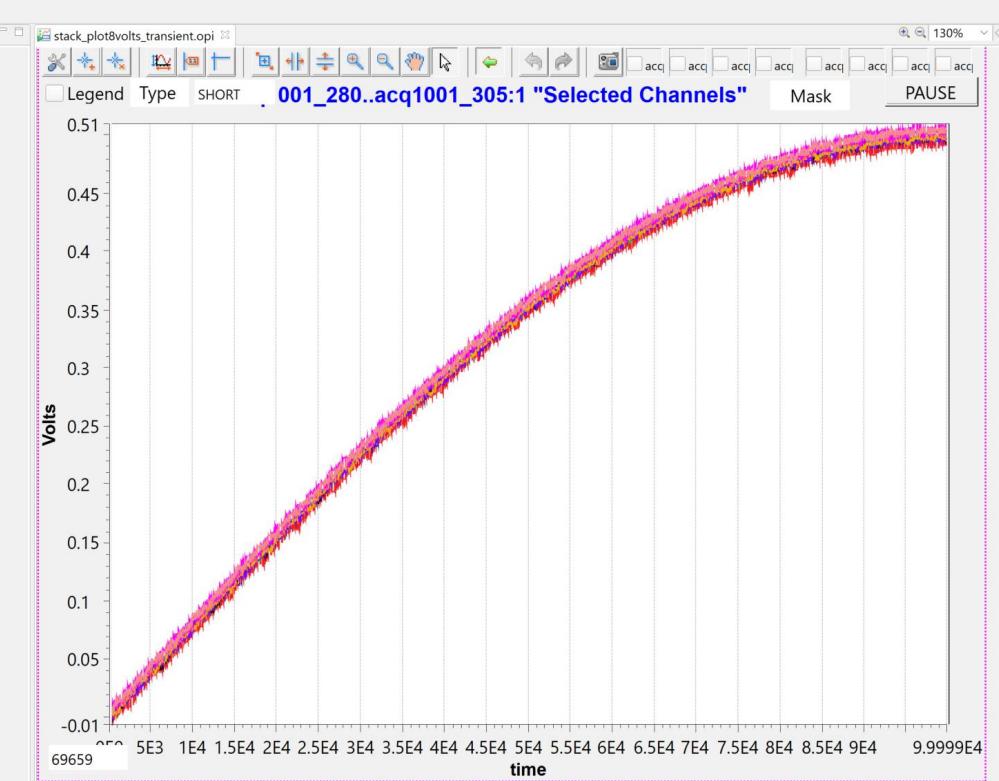
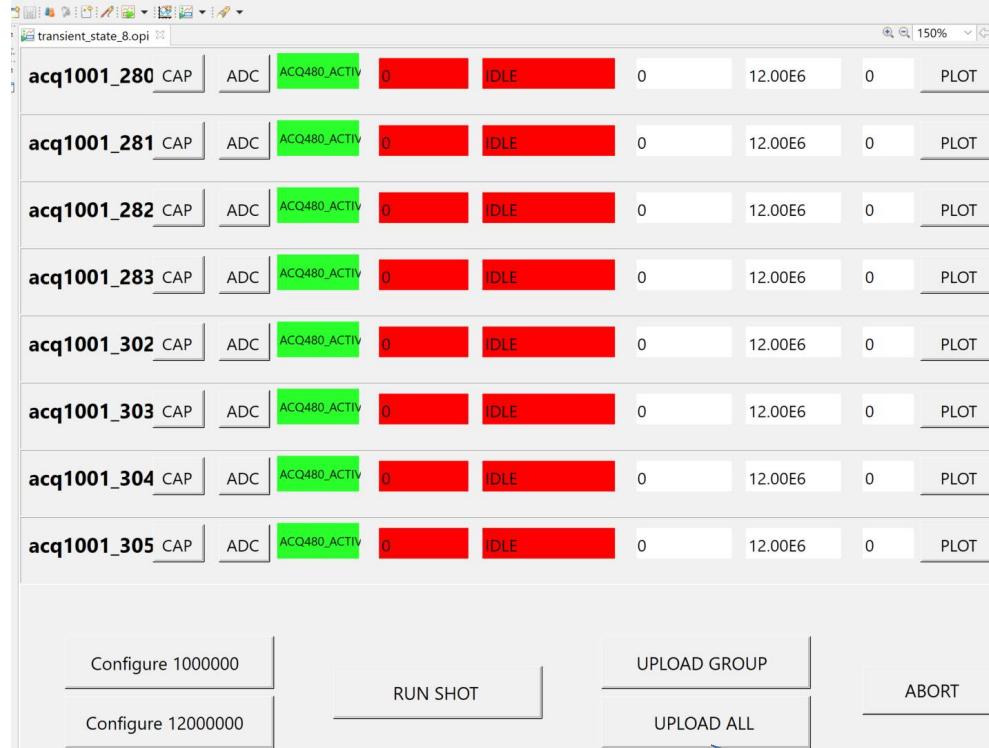
Siteclient(acq1001_282, 4220) >acq1014_select_clk_src=int 80000000
Siteclient(acq1001_282, 4220) <
uut:acq1001_282
Siteclient(acq1001_283, 4220) >set_abort=1
Siteclient(acq1001_283, 4220) <
Siteclient(acq1001_283, 4220) >transient=PRE=0 POST=1000000 SOFT_TRIGGER=0
Siteclient(acq1001_283, 4220) <
Siteclient(acq1001_283, 4220) >acq1014_select_trg_src=ext post rising
Siteclient(acq1001_283, 4220) <
Siteclient(acq1001_283, 4220) >acq1014_select_clk_src=int 80000000
Siteclient(acq1001_283, 4220) <
uut:acq1001_302
Siteclient(acq1001_302, 4220) >set_abort=1
Siteclient(acq1001_302, 4220) <
Siteclient(acq1001_302, 4220) >transient=PRE=0 POST=1000000 SOFT_TRIGGER=0
Siteclient(acq1001_302, 4220) <
Siteclient(acq1001_302, 4220) >acq1014_select_trg_src=ext post rising
Siteclient(acq1001_302, 4220) <
Siteclient(acq1001_302, 4220) >acq1014_select_clk_src=int 80000000

```

(1) Configure
Set Length Please
WAIT for completion



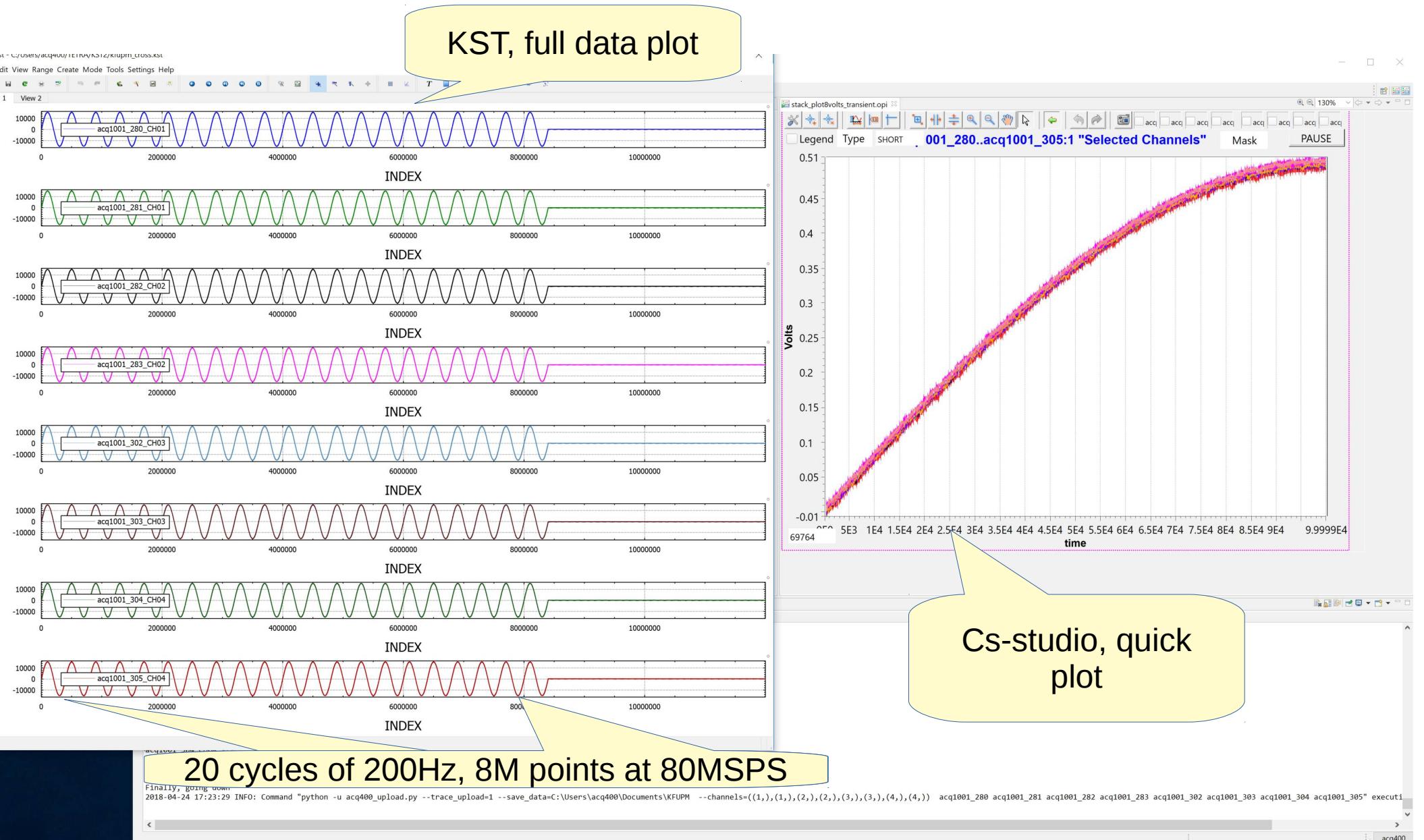


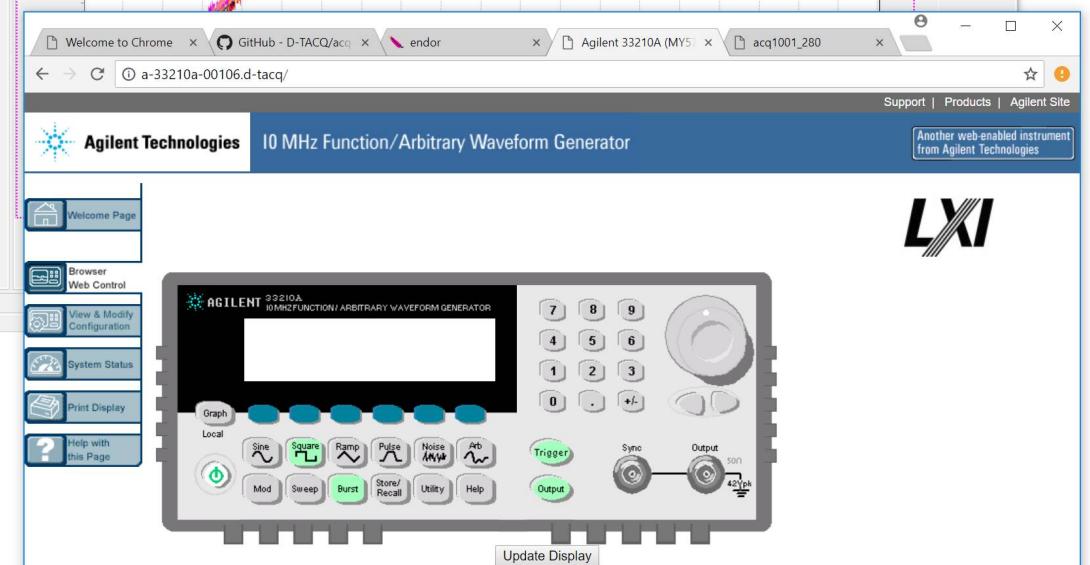
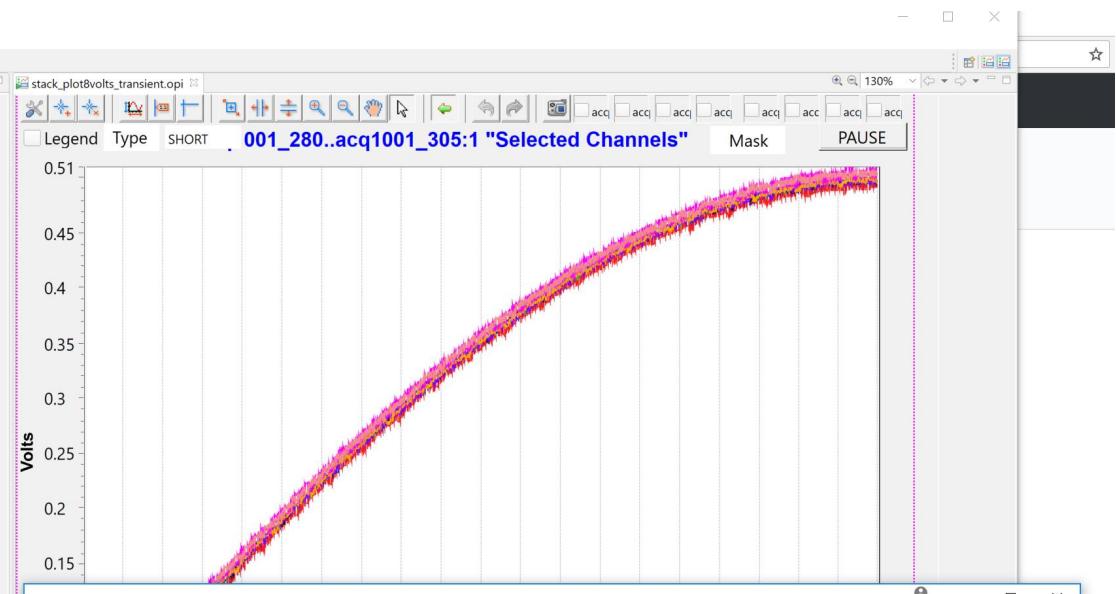
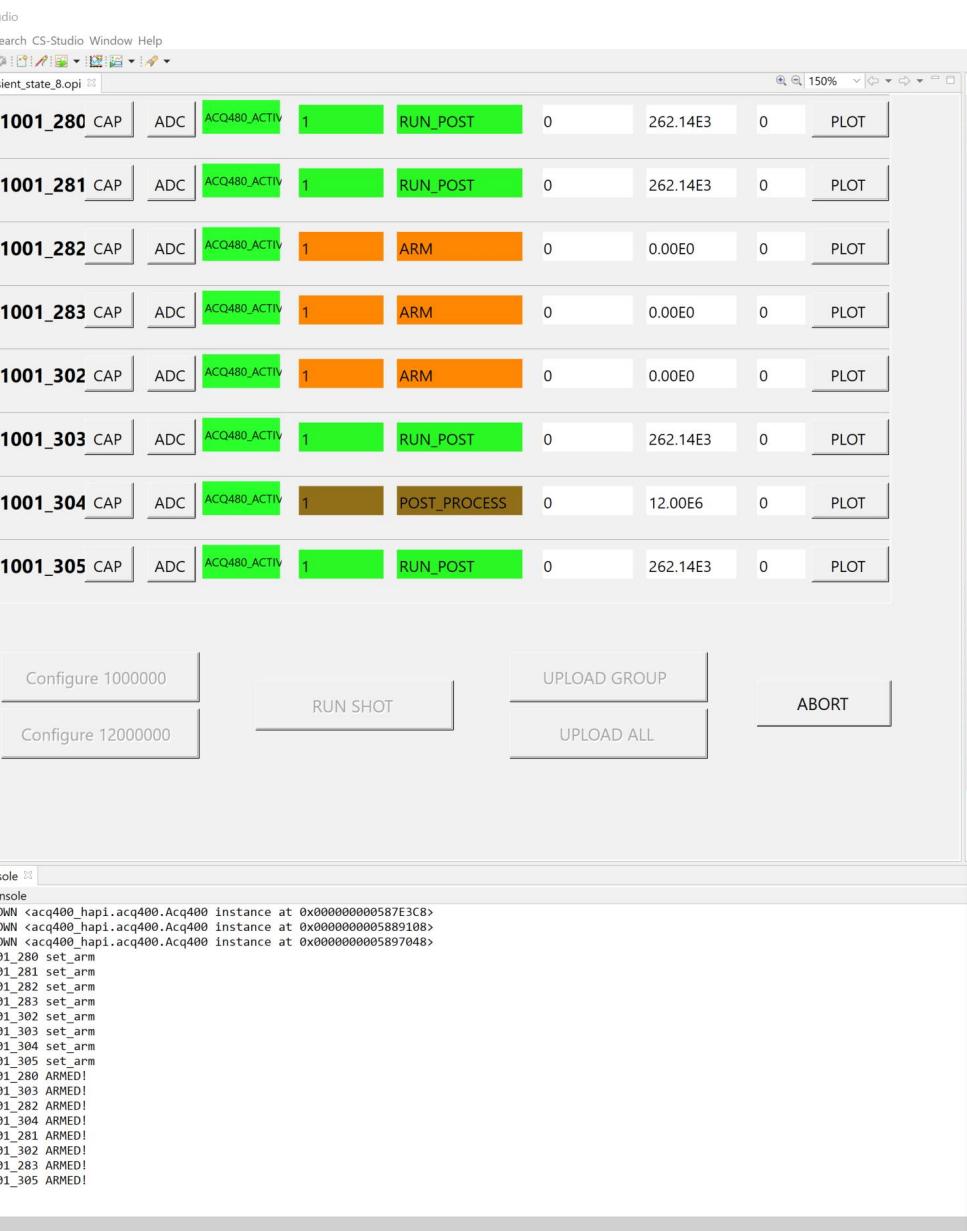


(4) Uploading
Please wait completion

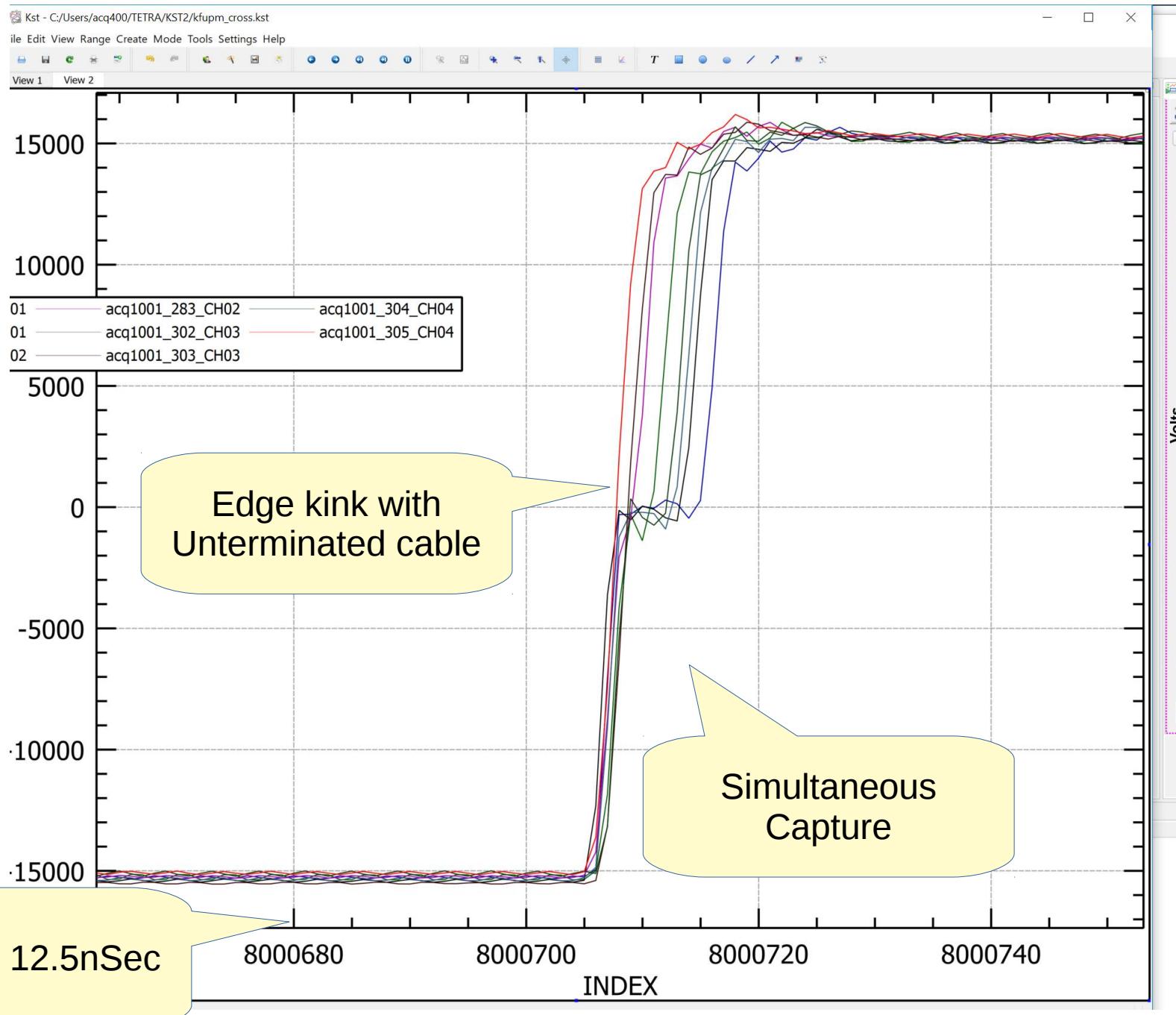
Console

```
BOY Console
Finally, going down
2018-04-24 17:22:47 INFO: Command "python -u acq1014_caploop.py --shots=1 --trg=ext acq1001_280 acq1001_281 acq1001_282 acq1001_283 acq1001_302 acq1001_303 acq1001_304 acq1001_305" executing finished with exit code: OK
, (4,), (4,)) acq1001_280 acq1001_281 acq1001_282 acq1001_283 acq1001_302 acq1001_303 acq1001_304 acq1001_305
state:0
acq1001_280 CH01 start..
acq1001_280 CH01 complete.. 0.968 s 24.78 MB/s
acq1001_281 CH01 start..
acq1001_281 CH01 complete.. 1.298 s 18.50 MB/s
acq1001_282 CH02 start..
acq1001_282 CH02 complete.. 1.801 s 13.33 MB/s
acq1001_283 CH02 start..
acq1001_283 CH02 complete.. 1.340 s 17.92 MB/s
acq1001_302 CH03 start..
acq1001_302 CH03 complete.. 1.250 s 19.20 MB/s
acq1001_303 CH03 start..
acq1001_303 CH03 complete.. 1.193 s 20.12 MB/s
acq1001_304 CH04 start..
acq1001_304 CH04 complete.. 1.231 s 19.50 MB/s
acq1001_305 CH04 start..
```





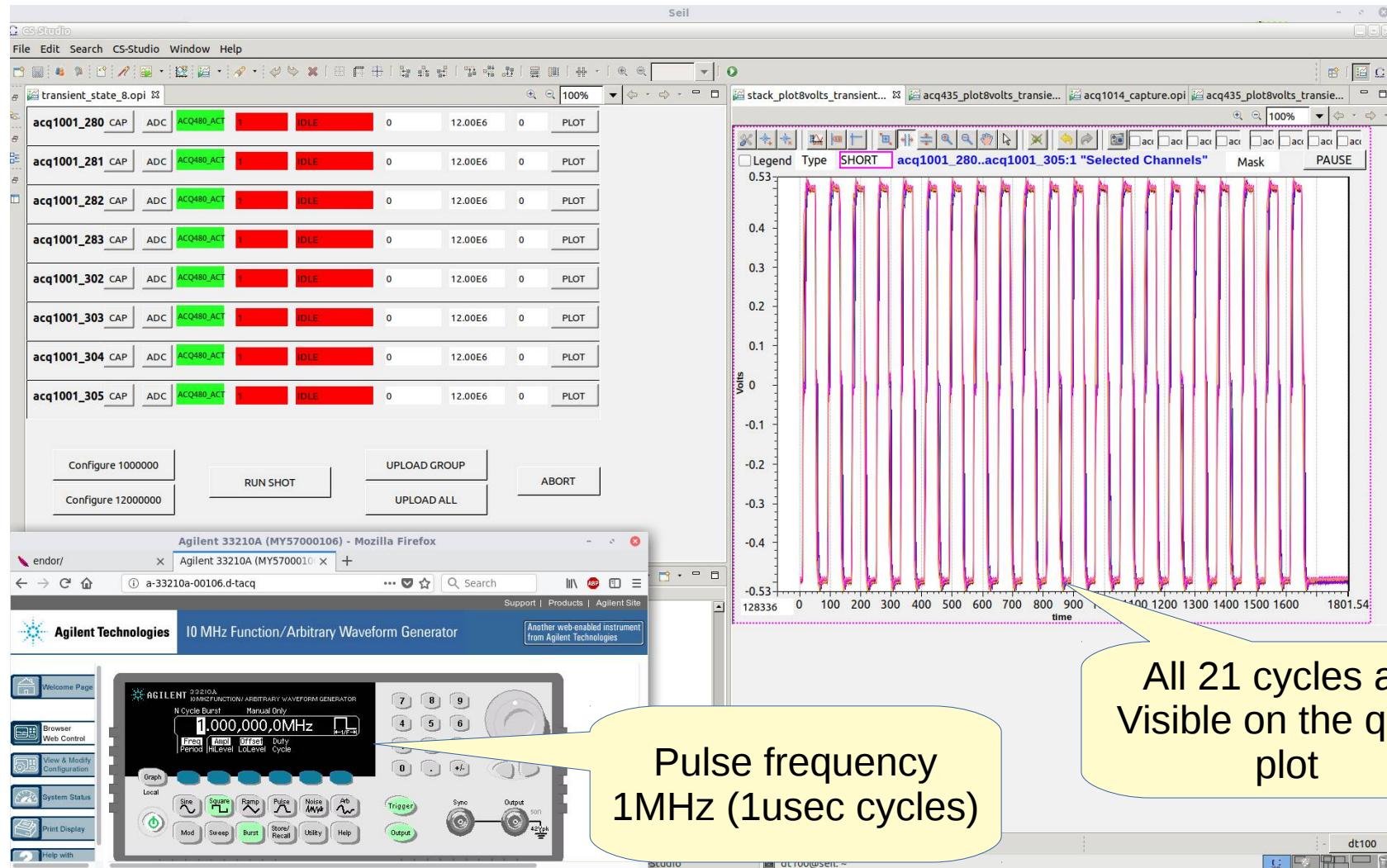




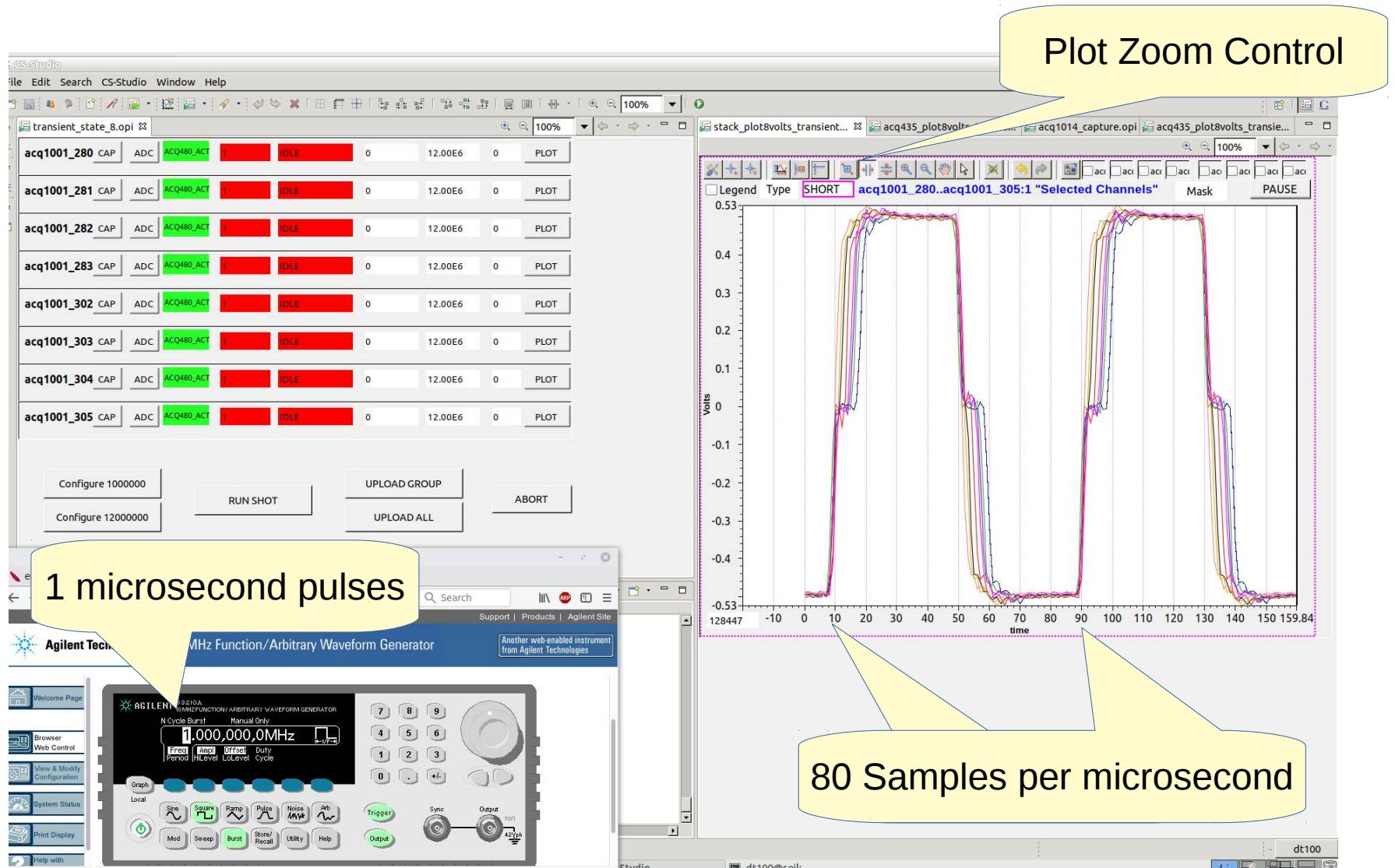
	Name	Date modified	Type	Size
	acq1001_280_CH01	24/04/2018 13:52	File	23,438 KB
	acq1001_281_CH01	24/04/2018 13:52	File	23,438 KB
	acq1001_282_CH02	24/04/2018 13:52	File	23,438 KB
	acq1001_283_CH02	24/04/2018 13:52	File	23,438 KB
	acq1001_302_CH03	24/04/2018 13:52	File	23,438 KB
	acq1001_303_CH03	24/04/2018 13:52	File	23,438 KB
	acq1001_304_CH04	24/04/2018 13:52	File	23,438 KB
	acq1001_305_CH04	24/04/2018 13:52	File	23,438 KB
	format	24/04/2018 13:52	File	1 KB

Stored data,
One file per channel.
Binary int16.

Samples at 80MSPS/channel

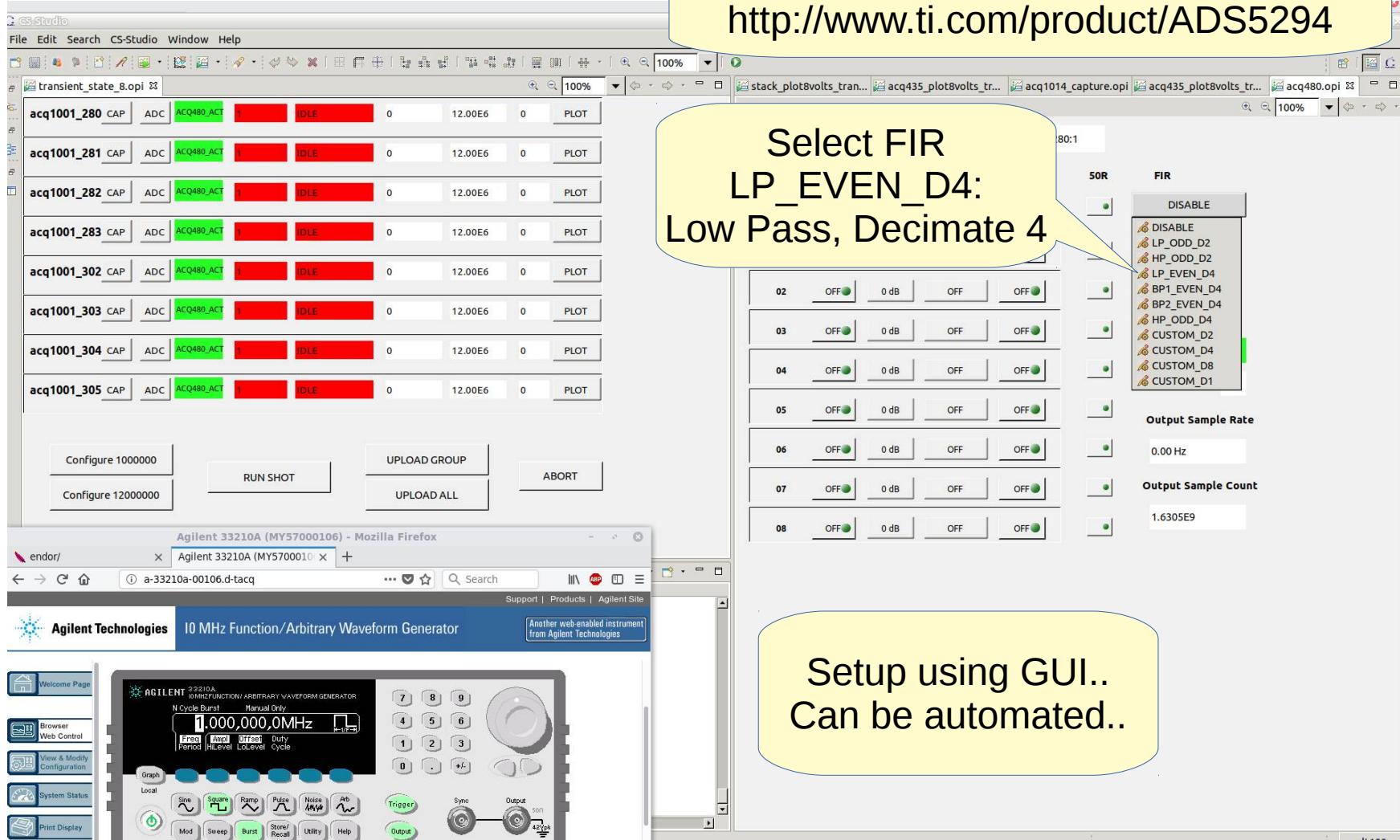


Samples at 80MSPS/channel (2)

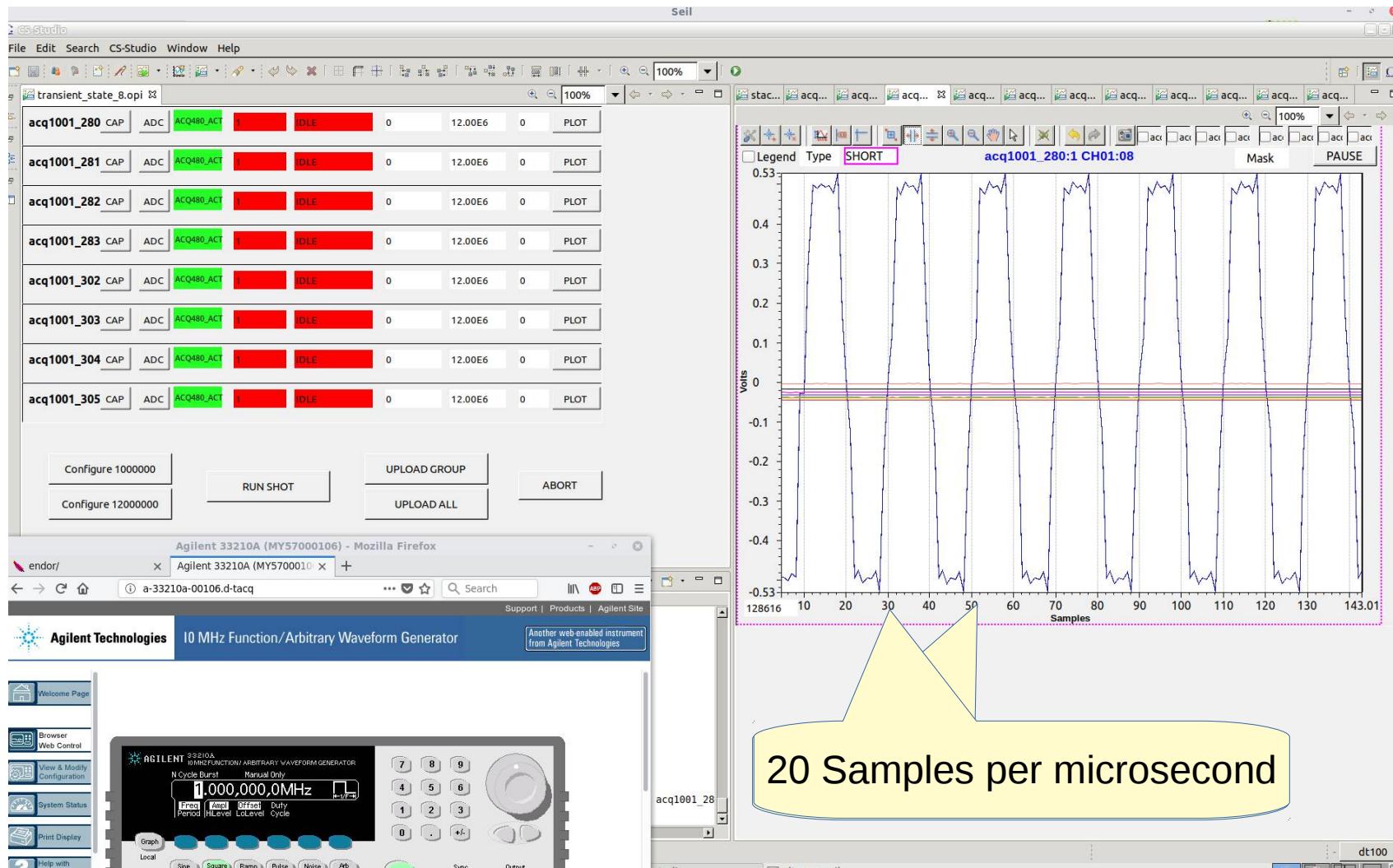


ADC has filtering built in

ADC: has gain and filters:
<http://www.ti.com/product/ADS5294>



Capture with Filter set. 80M/4 = 20MSPS, LP filtered..



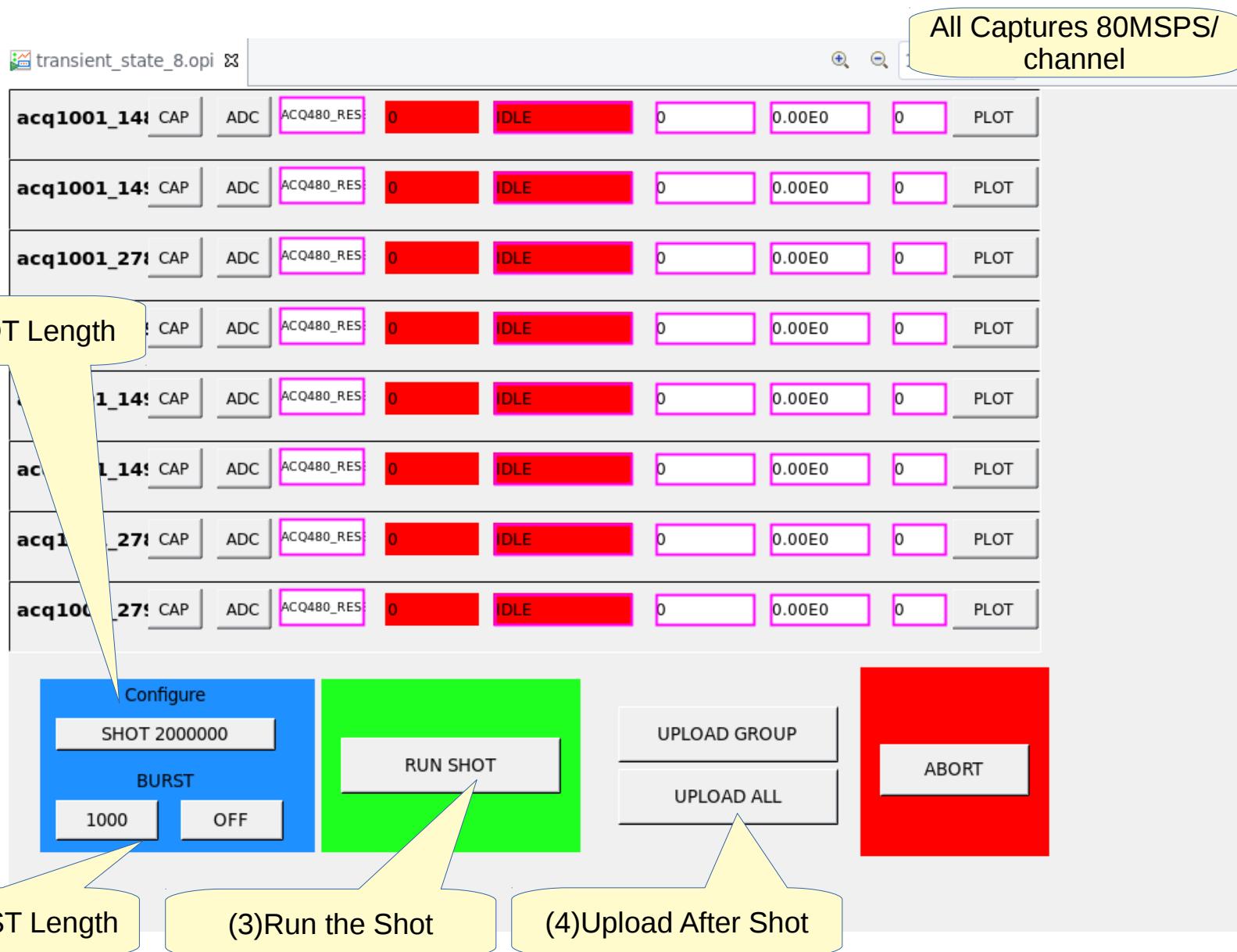
Copyright © D-TACQ Solutions Ltd 2018



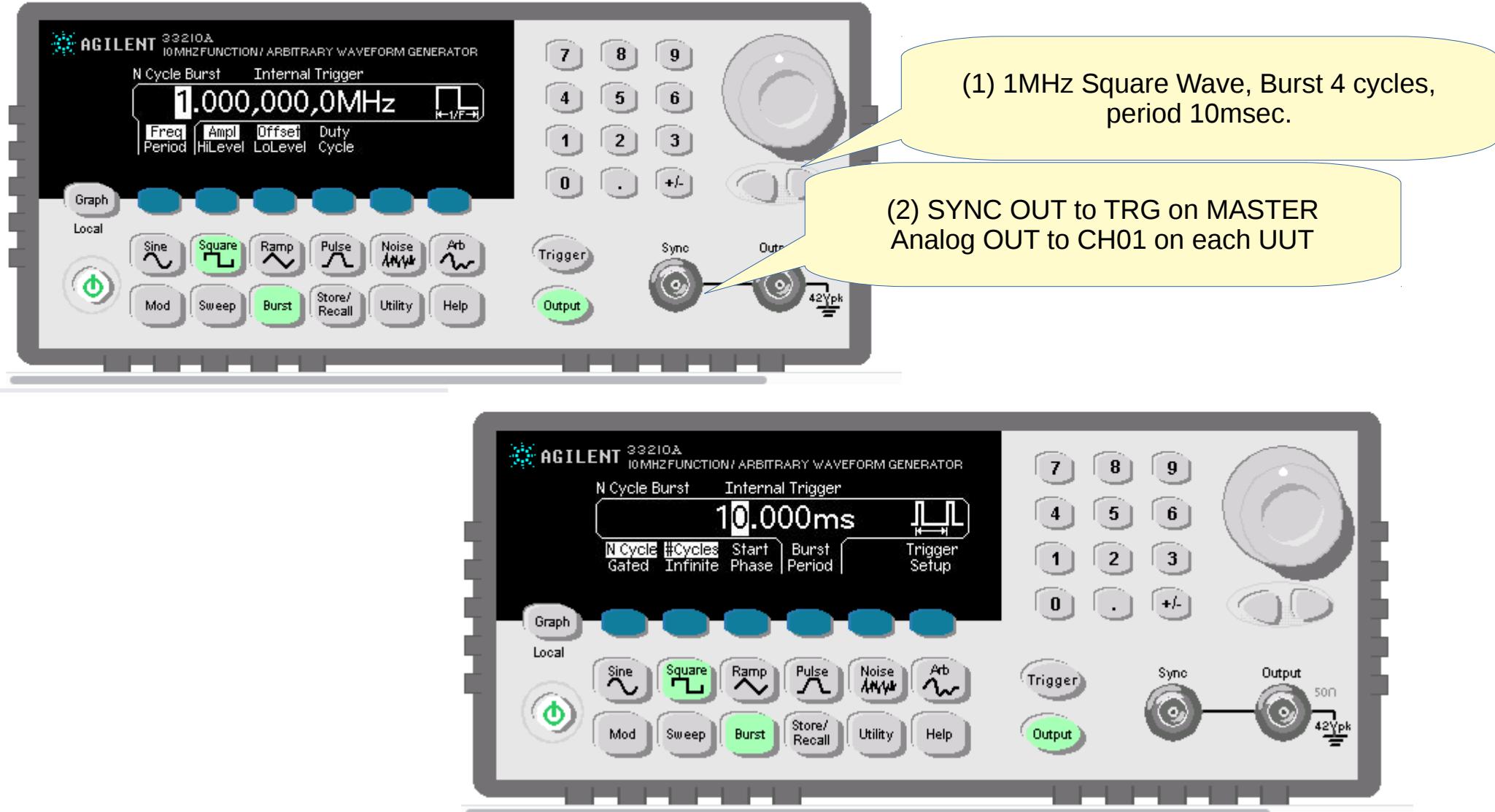
Burst Mode

- Operating mode described to Dr Stewart, April 2018.
- Transmitter will fire a pulse at a high rate eg 100Hz.
- The transmitter pulse will trigger one short capture per pulse.
- The Digitizer captures a data set with eg 1M samples, comprising many eg 1000 short pulses each 1000 samples
- The captured data is arranged in a stack plot.

Burst Mode: UI



Test Signal



- (3) In a production system, connect the TRG signal to one channel eg CH01 to use as a timing reference for exact reconstruction post-shot

Monitor Command Dialog..

The screenshot displays two main windows:

- transient_state_8.opi**: A grid of 8 acquisition modules. Each module has a status bar with "IDLE" and a value of "0.00E0". Buttons for "PLOT" and "ACQ480_RES" are visible. Below the grid are four buttons: "Configure", "SHOT 2000000", "RUN SHOT" (highlighted in green), "UPLOAD GROUP", "UPLOAD ALL", and "ABORT".
- stack_plot8volts_transient.opi**: A waveform generator control panel. It shows a graph with a single horizontal line at 0.00E0. The Y-axis is labeled "Volts" with a scale from 0.1 to 1.0. On the left, there's a sidebar with links like "Welcome Page", "Browser Web Control", "View & Modify Configuration", "System Status", "Print Display", and "Help with this Page". The main panel features a digital display showing "10.000ms" and various control knobs and buttons for waveform selection (Sine, Square, Ramp, Pulse, Noise, Arb) and trigger setup.

Console

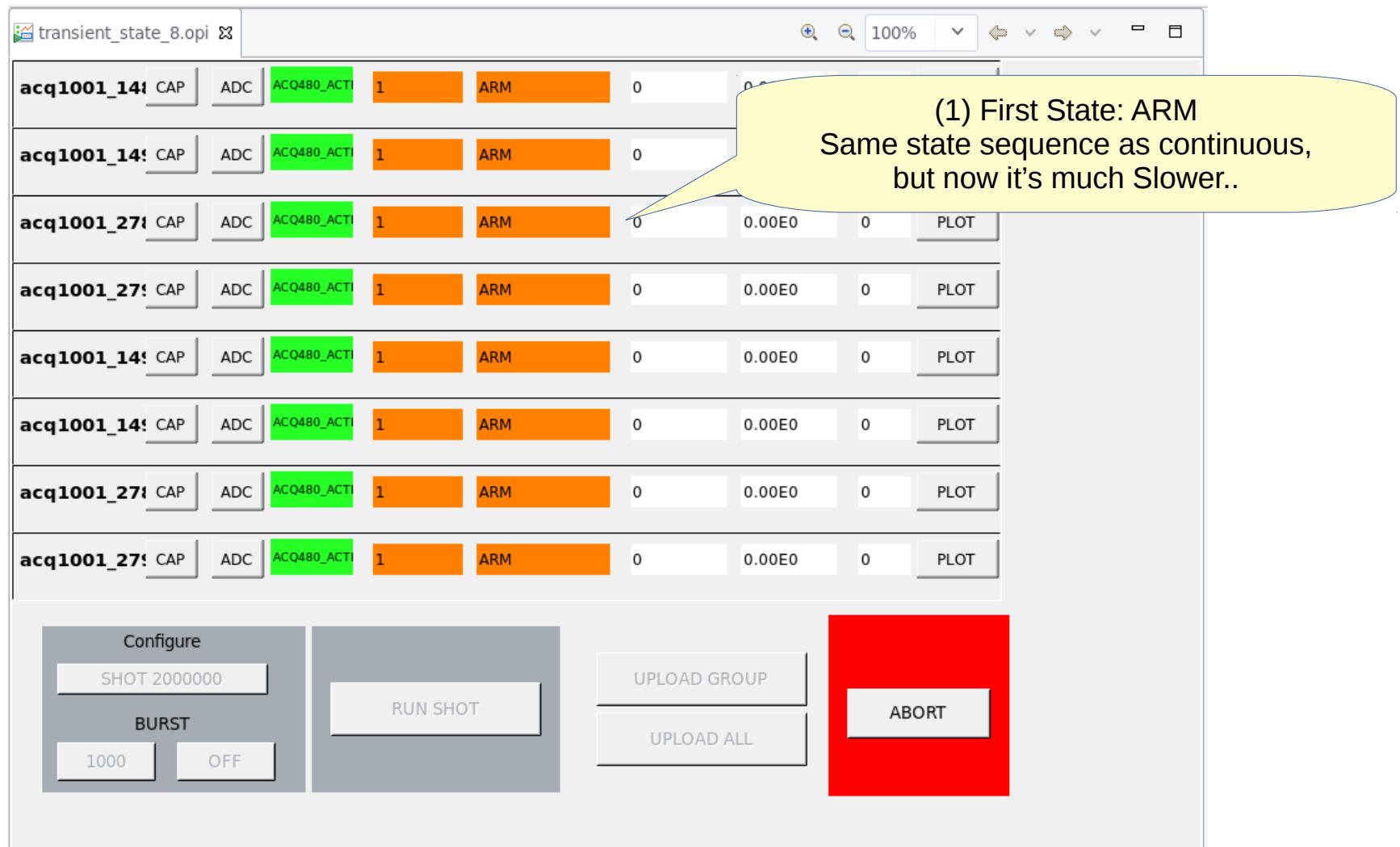
```

BOY Console
2018-10-01 15:42:35 INFO: Execute Command: python -u user_apps/acq1014/acq1014_configure_transient.py --post=2000000 --trg=ext acq1001_148 acq1001_149 acq1001_278 acq1001_279 acq1001_149 acq1001_149 acq1001_278 acq1001_279
uut:acq1001_148
SiteClient(acq1001_148, 4220) >set_abort=1
SiteClient(acq1001_148, 4220) <
siteclient(acq1001_148, 4220) >transient=PRE=0 POST=2000000 SOFT_TRIGGER=0
SiteClient(acq1001_148, 4220) <
SiteClient(acq1001_148, 4220) >acq1014_select_trg_src=ext post rising
SiteClient(acq1001_148, 4220) <
siteclient(acq1001_148, 4220) >acq1014_select_clk_src=int 80000000
SiteClient(acq1001_148, 4220) <
uut:acq1001_149
SiteClient(acq1001_149, 4220) >set_abort=1
SiteClient(acq1001_149, 4220) <
siteclient(acq1001_149, 4220) >transient=PRE=0 POST=2000000 SOFT_TRIGGER=0
SiteClient(acq1001_149, 4220) <
SiteClient(acq1001_149, 4220) >acq1014_select_trg_src=ext post rising
SiteClient(acq1001_149, 4220) <
siteclient(acq1001_149, 4220) >acq1014 select clk src=int 80000000

```

(1) Each button press initiates an action script. Wait for this to complete BEFOR taking next action

On pressing Run Shot



Shot is running..

(1) Second State: RUN
Total number of samples increments..

acq1001_14!	CAP	ADC	ACQ480_ACT!	1	RUN_POST	0	1.31E6	0	PLOT
acq1001_14!	CAP	ADC	ACQ480_ACT!	1	RUN_POST	0	1.54E6	0	PLOT
acq1001_27!	CAP	ADC	ACQ480_ACT!	1	RUN_POST	0	1.54E6	0	PLOT
acq1001_27!	CAP	ADC	ACQ480_ACT!	1	RUN_POST	0	1.28E6	0	PLOT
acq1001_14!	CAP	ADC	ACQ480_ACT!	1	RUN_POST	0	1.54E6	0	PLOT
acq1001_14!	CAP	ADC	ACQ480_ACT!	1	RUN_POST	0	1.54E6	0	PLOT
acq1001_27!	CAP	ADC	ACQ480_ACT!	1	RUN_POST	0	1.54E6	0	PLOT
acq1001_27!	CAP	ADC	ACQ480_ACT!	1	RUN_POST	0	1.28E6	0	PLOT

Configure
SHOT 2000000
BURST
1000 OFF

RUN SHOT

UPLOAD GROUP
UPLOAD ALL

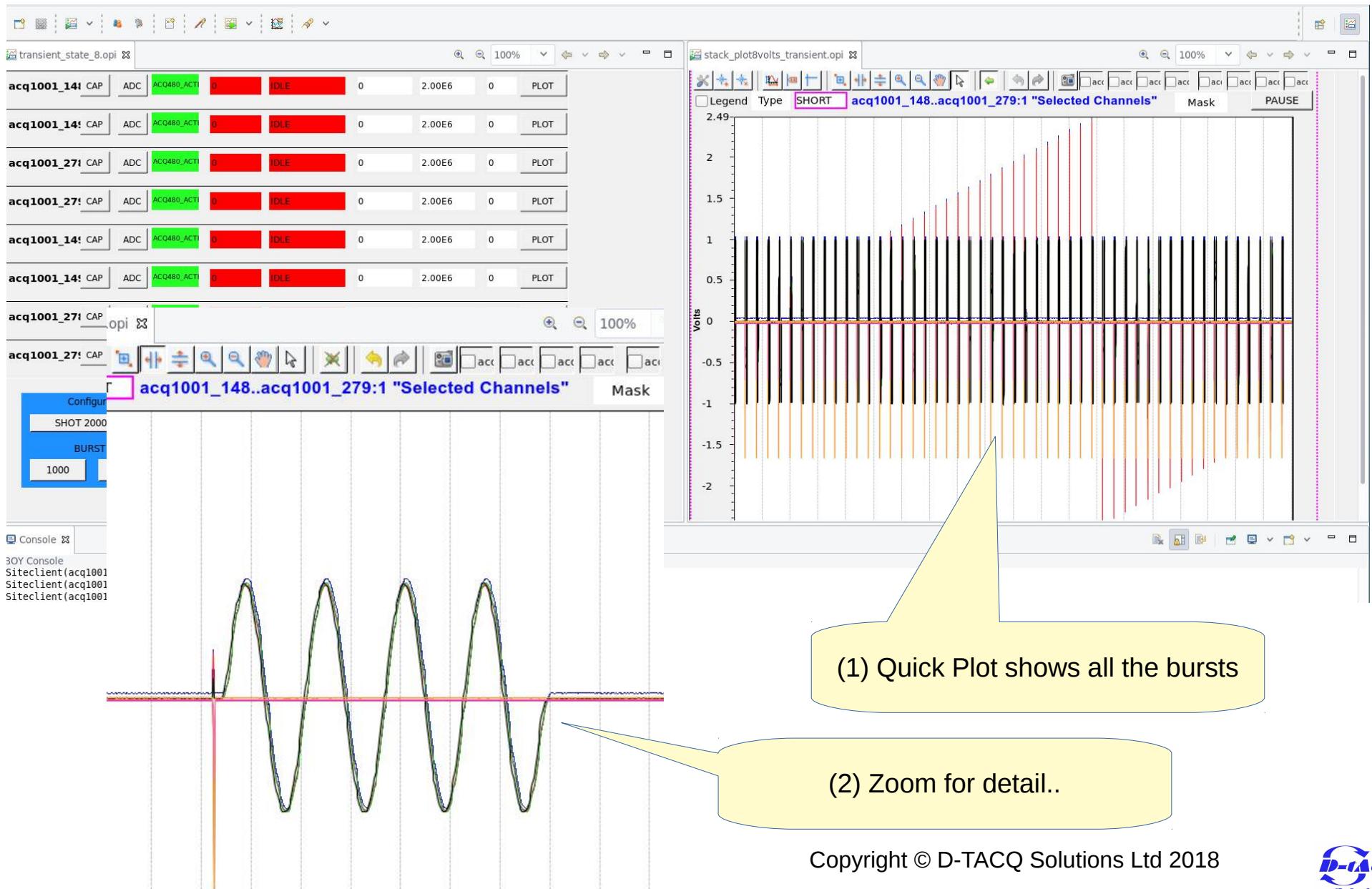
ABORT



Shot is finished



Burst Data plot on UI



Data Upload

```
[peter@andros acq400_hapi]$ source tetra_test
[peter@andros acq400_hapi]$ ./user_apps/acq400/acq400_upload.py --
trace_upload=1 --plot_data=0 --capture=-1 --save_data=./DATA/ $UUTS
acq1001_148 CH01 start..
acq1001_148 CH01 complete.. 0.123 s 32.59 MB/s
acq1001_148 CH02 start..
acq1001_148 CH02 complete.. 0.145 s 27.61 MB/s
acq1001_148 CH03 start..
acq1001_148 CH03 complete.. 0.176 s 22.71 MB/s
acq1001_148 CH04 start..
..
acq1001_279 CH07 start..
acq1001_279 CH07 complete.. 0.117 s 34.33 MB/s
acq1001_279 CH08 start..
acq1001_279 CH08 complete.. 0.101 s 39.49 MB/s
```

Data is visible here..

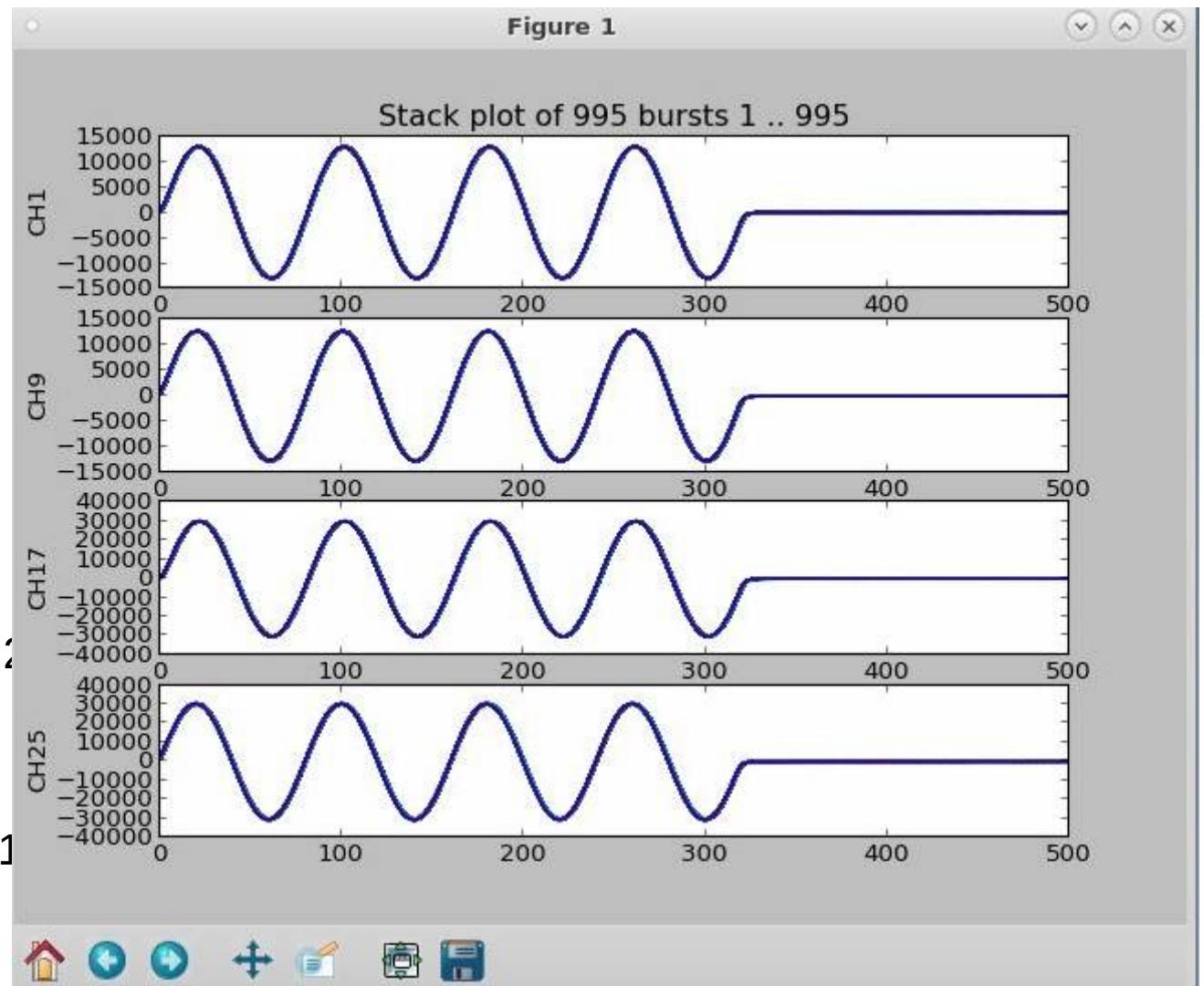
```
[peter@andros acq400_hapi]$ ls -l DATA
total 125060
-rw-r--r-. 1 peter d-tacq 4000000 Oct 1 16:03 acq1001_148_CH01
-rw-r--r-. 1 peter d-tacq 4000000 Oct 1 16:03 acq1001_148_CH02
-rw-r--r-. 1 peter d-tacq 4000000 Oct 1 16:03 acq1001_148_CH03
-rw-r--r-. 1 peter d-tacq 4000000 Oct 1 16:03 acq1001_148_CH04
-rw-r--r-. 1 peter d-tacq 4000000 Oct 1 16:03 acq1001_148_CH05
-rw-r--r-. 1 peter d-tacq 4000000 Oct 1 16:03 acq1001_148_CH06
-rw-r--r-. 1 peter d-tacq 4000000 Oct 1 16:03 acq1001_148_CH07
-rw-r--r-. 1 peter d-tacq 4000000 Oct 1 16:03 acq1001_148_CH08
-rw-r--r-. 1 peter d-tacq 4000000 Oct 1 16:03 acq1001_149_CH01
-rw-r--r-. 1 peter d-tacq 4000000 Oct 1 16:03 acq1001_149_CH02
-rw-r--r-. 1 peter d-tacq 4000000 Oct 1 16:03 acq1001_149_CH03
-rw-r--r-. 1 peter d-tacq 4000000 Oct 1 16:03 acq1001_149_CH04
-rw-r--r-. 1 peter d-tacq 4000000 Oct 1 16:03 acq1001_149_CH05
-rw-r--r-. 1 peter d-tacq 4000000 Oct 1 16:03 acq1001_149_CH06
-rw-r--r-. 1 peter d-tacq 4000000 Oct 1 16:03 acq1001_149_CH07
-rw-r--r-. 1 peter d-tacq 4000000 Oct 1 16:03 acq1001_149_CH08
-rw-r--r-. 1 peter d-tacq 4000000 Oct 1 16:03 acq1001_278_CH01
-rw-r--r-. 1 peter d-tacq 4000000 Oct 1 16:03 acq1001_278_CH02
-rw-r--r-. 1 peter d-tacq 4000000 Oct 1 16:03 acq1001_278_CH03
-rw-r--r-. 1 peter d-tacq 4000000 Oct 1 16:03 acq1001_278_CH04
-rw-r--r-. 1 peter d-tacq 4000000 Oct 1 16:03 acq1001_278_CH05
-rw-r--r-. 1 peter d-tacq 4000000 Oct 1 16:03 acq1001_278_CH06
-rw-r--r-. 1 peter d-tacq 4000000 Oct 1 16:03 acq1001_278_CH07
-rw-r--r-. 1 peter d-tacq 4000000 Oct 1 16:03 acq1001_278_CH08
-rw-r--r-. 1 peter d-tacq 4000000 Oct 1 16:03 acq1001_279_CH01
-rw-r--r-. 1 peter d-tacq 4000000 Oct 1 16:03 acq1001_279_CH02
-rw-r--r-. 1 peter d-tacq 4000000 Oct 1 16:03 acq1001_279_CH03
-rw-r--r-. 1 peter d-tacq 4000000 Oct 1 16:03 acq1001_279_CH04
-rw-r--r-. 1 peter d-tacq 4000000 Oct 1 16:04 acq1001_279_CH05
-rw-r--r-. 1 peter d-tacq 4000000 Oct 1 16:04 acq1001_279_CH06
-rw-r--r-. 1 peter d-tacq 4000000 Oct 1 16:04 acq1001_279_CH07
-rw-r--r-. 1 peter d-tacq 4000000 Oct 1 16:04 acq1001_279_CH08
-rw-r--r-. 1 peter d-tacq 800 Oct 1 16:04 format
```

(1) Raw binary data, int16's

2M samples/channel

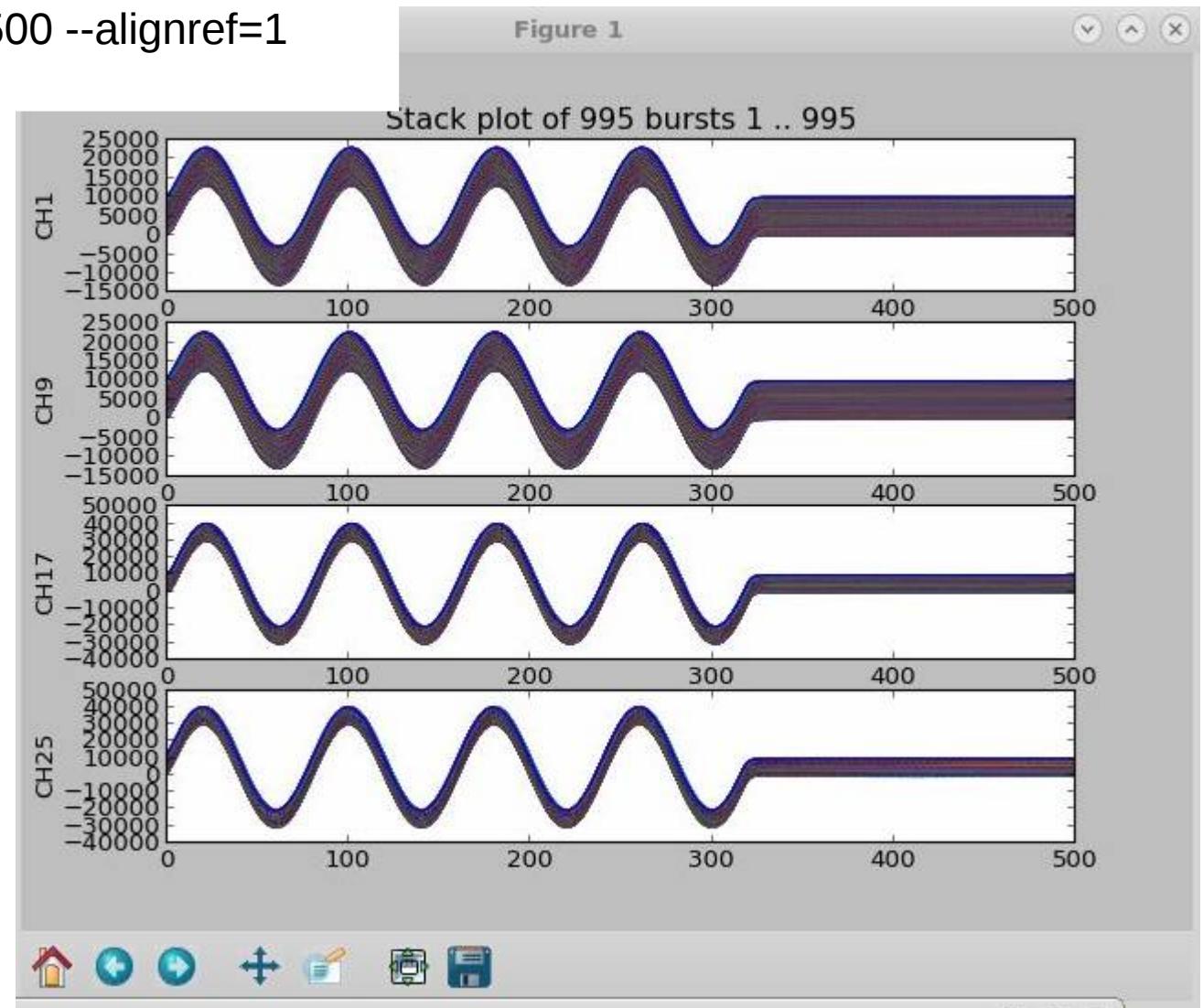
Stack Plot

```
python ./user_apps/analysis/stack_rtm_2D.py --stack_offset=0 \
--plotchan=1,9,17,25 --stack_offset=0 --burst_range=1,9999 --maxlen=500 --alignref=1
using data from ./DATA
scanning ES on ich 1
scanning ES on ich 9
scanning ES on ich 17
scanning ES on ich 25
esi lengths [999, 999, 999, 999]
scanning embedded counts..
ic 0 [10, 10, 10, 10]
ic 1 [1009, 1009, 1009, 1009]
ic 2 [2009, 2009, 2009, 2009]
ic 3 [3009, 3009, 3009, 3009]
ic 4 [4009, 4009, 4009, 4009]
scanned 4*998 counts, errors 0
get_esi returns nbursts 999 blen 2
('chx 01 3 dimension {}', 2032)
('chx 99 3 dimension {}', 2032)
[1, 9, 17, 25]
PLOT nchan 32 nburst 999 blen 1
```



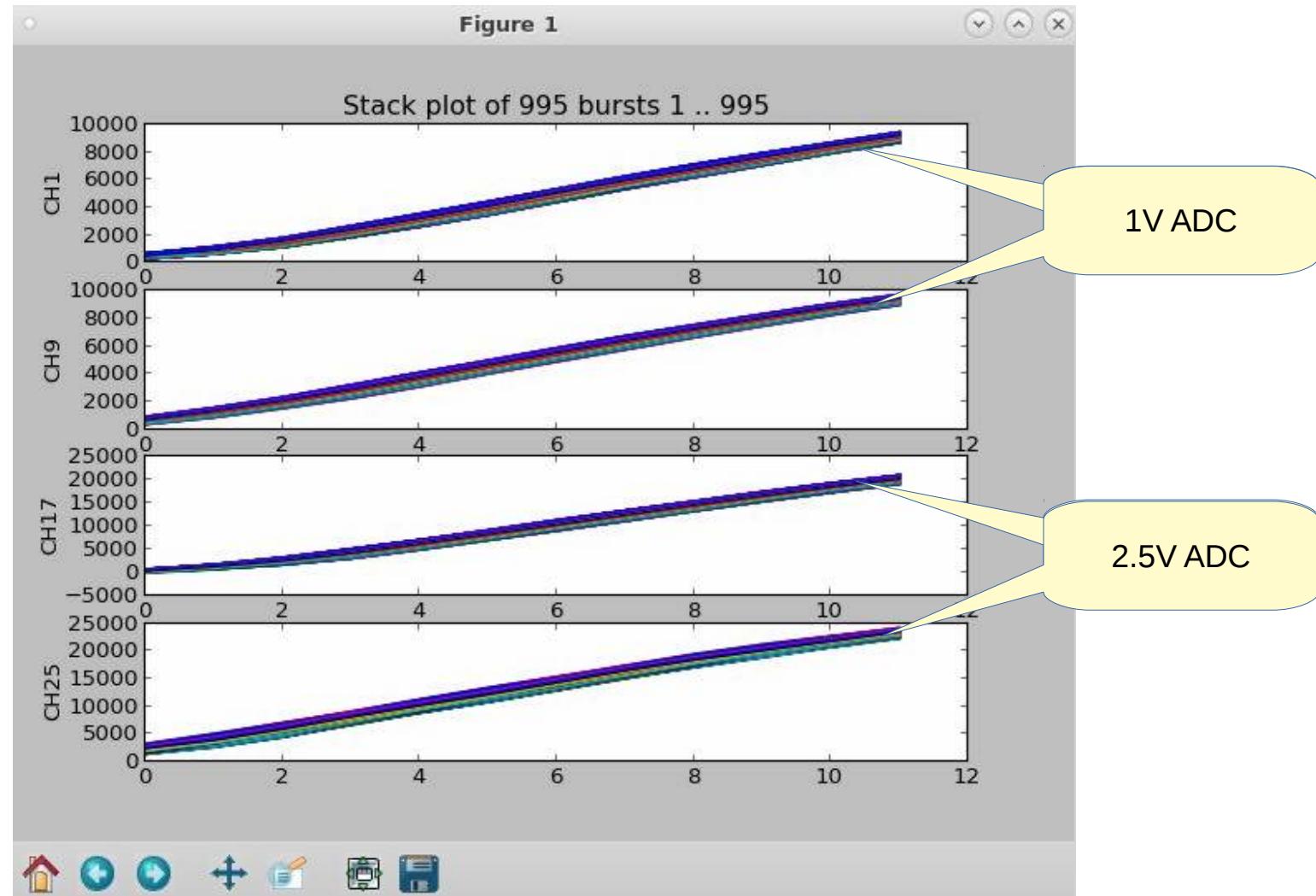
Emphasise the stacking

```
python ./user_apps/analysis/stack_rtm_2D.py \  
--plotchan=1,9,17,25 --stack_offset=10 \  
--burst_range=1,996 --maxlen=500 --alignref=1
```

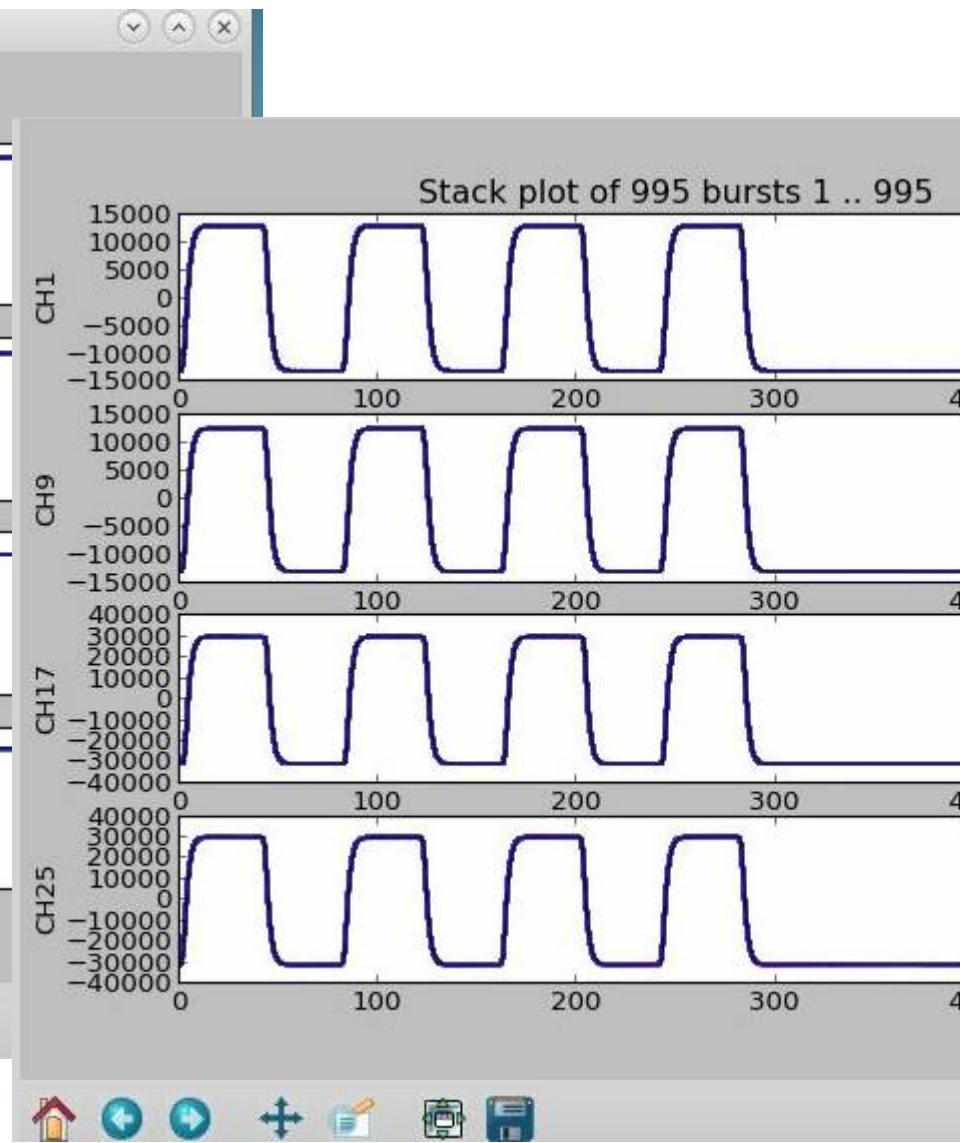
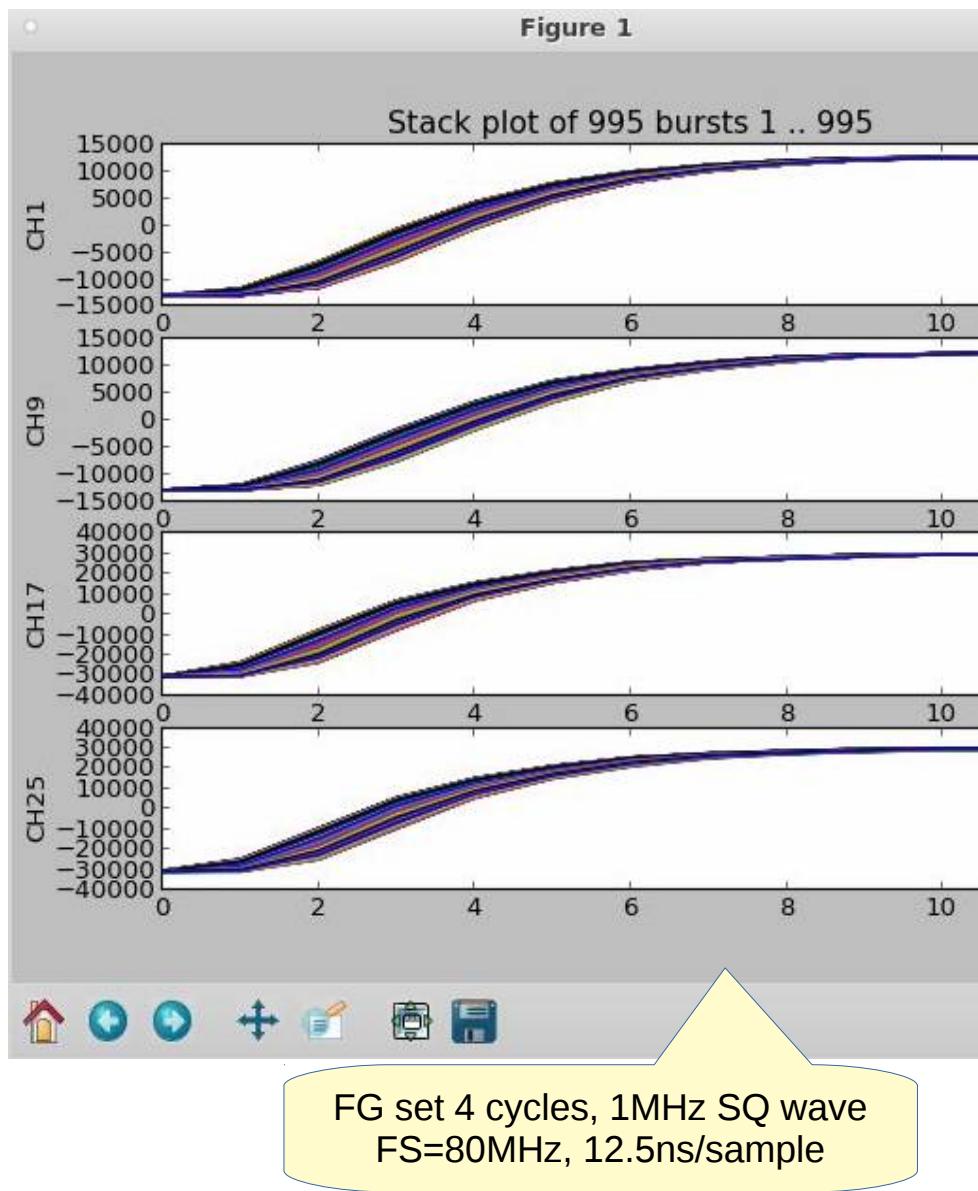


Show Simultaneity

```
python ./user_apps/analysis/stack_rtm_2D.py --stack_offset=0 \  
--plotchan=1,9,17,25 --stack_offset=0 --burst_range=1,996 --maxlen=12 --alignref=1
```



Show Simultaneity



Store Data, ready to load in eg Matlab

```
./user_apps/analysis/stack_rtm_2D.py --stack_offset=0 --plotchan=0 \
--stack_offset=10 --burst_range=1,996 --maxlen=500 --alignref=1 --
store_chan=COOKED
```

```
[peter@andros acq400_hapi]$ ls -l COOKED/
total 31104
```

```
-rw-r--r--. 1 peter d-tacq 995000 Oct  1 18:20 CH01.dat
-rw-r--r--. 1 peter d-tacq 995000 Oct  1 18:20 CH02.dat
-rw-r--r--. 1 peter d-tacq 995000 Oct  1 18:20 CH03.dat
-rw-r--r--. 1 peter d-tacq 995000 Oct  1 18:20 CH04.dat
-rw-r--r--. 1 peter d-tacq 995000 Oct  1 18:20 CH05.dat
-rw-r--r--. 1 peter d-tacq 995000 Oct  1 18:20 CH06.dat
-rw-r--r--. 1 peter d-tacq 995000 Oct  1 18:20 CH07.dat
-rw-r--r--. 1 peter d-tacq 995000 Oct  1 18:20 CH08.dat
```



1 File per channel, 995 bursts, 500 samples per burst
extracted and ready to load into any math tool..