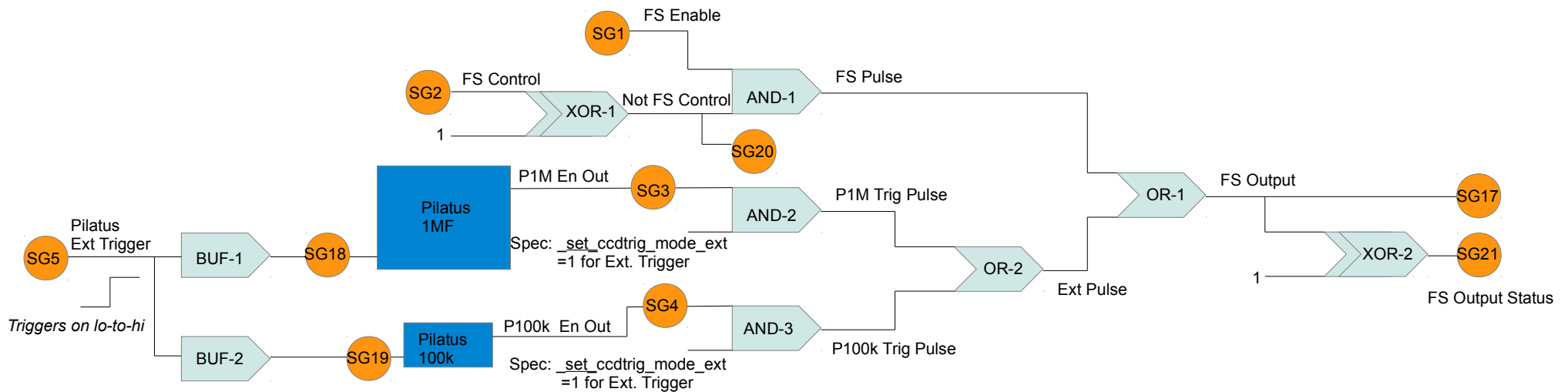


# Dual Trigger Pilatus

- Commissioned simultaneous GISAXS (with Pilatus 1M at 2.2 m) and GIWAXS (with Pilatus 100k at 0.2m) for user Sharenko, 2012.11.06-12, for thermal annealing.
- Issues remaining:
  - “Elapsed time” does not exactly match input exposure time.
  - Gridftp sometimes does not copy
  - Fast shutter control signal must be inverted.

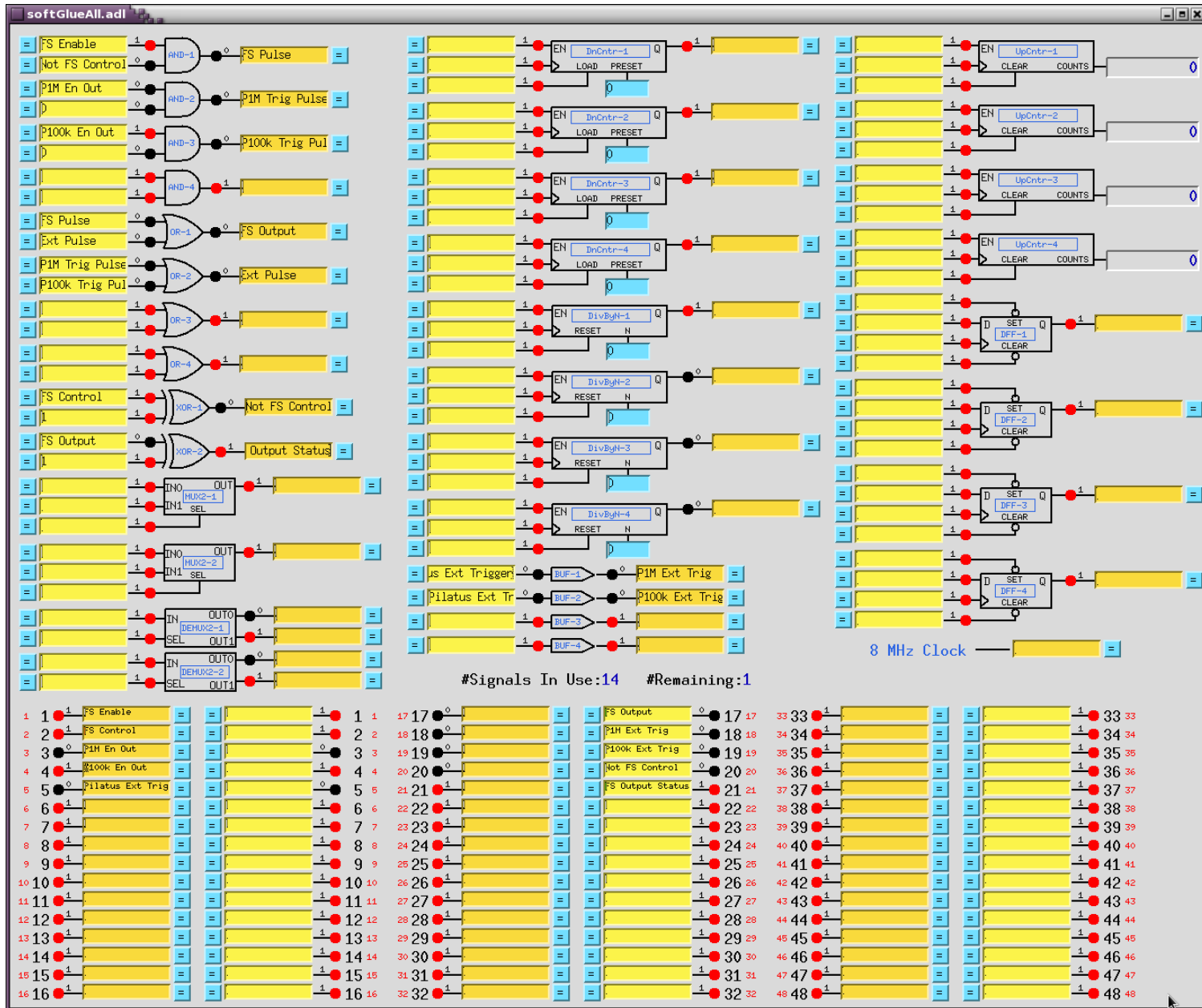
# Fast Shutter Logic



**SGX** = connection JX on SoftGlue breakout board

This logic circuit implemented in Soft Glue by the macro `softGlueDualTriggerSetup` defined in `~/local_macros/pil2exp.mac`

# Screenshot: Soft Glue



# Screenshot: Shutter Closed

IpUnidig\_all.adl

IP-Unidig (8idg:Unidig1) Less

Ch#	Input	Output	Scan (in)	More	Desc.
0	1	Low High	I/O Intr		KIA S1 filter 1 status
1	1	Low High	I/O Intr		KIA S1 filter 1 control
2	1	Low High	I/O Intr		KIA S1 filter 2 status
3	1	Low High	I/O Intr		KIA S1 filter 2 control
4	1	Low High	I/O Intr		KIA S1 filter 3 status
5	1	Low High	I/O Intr		KIA S1 filter 3 control
6	1	Low High	I/O Intr		KIA S1 filter 4 status
7	1	Low High	I/O Intr		KIA S1 filter 4 control
8	1	Low High	I/O Intr		Unused
9	1	Low High	.1 second		Fast Shutter Enable
10	1	Low High	.1 second		Pilatus 1MF enable out
11	0	Low High	.1 second		Pilatus Ext Trigger
12	0	Low High	.1 second		Fast Shutter Status
13	1	Open  lose	.1 second		Fast Shutter Control
14	1	Low High	I/O Intr		KIA S2 filter 1 status
15	1	Low High	I/O Intr		KIA S2 filter 1 control
16	1	Low High	I/O Intr		KIA S2 filter 2 status
17	1	Low High	I/O Intr		KIA S2 filter 2 control
18	1	Low High	I/O Intr		KIA S2 filter 3 status
19	1	Low High	I/O Intr		KIA S2 filter 3 control
20	1	Low High	I/O Intr		KIA S2 filter 4 status
21	1	Low High	I/O Intr		KIA S2 filter 4 control
22	1	Low High	.1 second		
23	1	Low High	.1 second		FS Status

longin rec: 0xffe7ff longout rec: 0x0

IpUnidig\_more

8idg:Unidig1Bi9

High ●

.1 second

Fast\_Shutter.adl

FAST S1 8idg:

Open  
Closed

Shutter Closed

Unidig

IpUnidig\_more

8idg:Unidig1Bi23

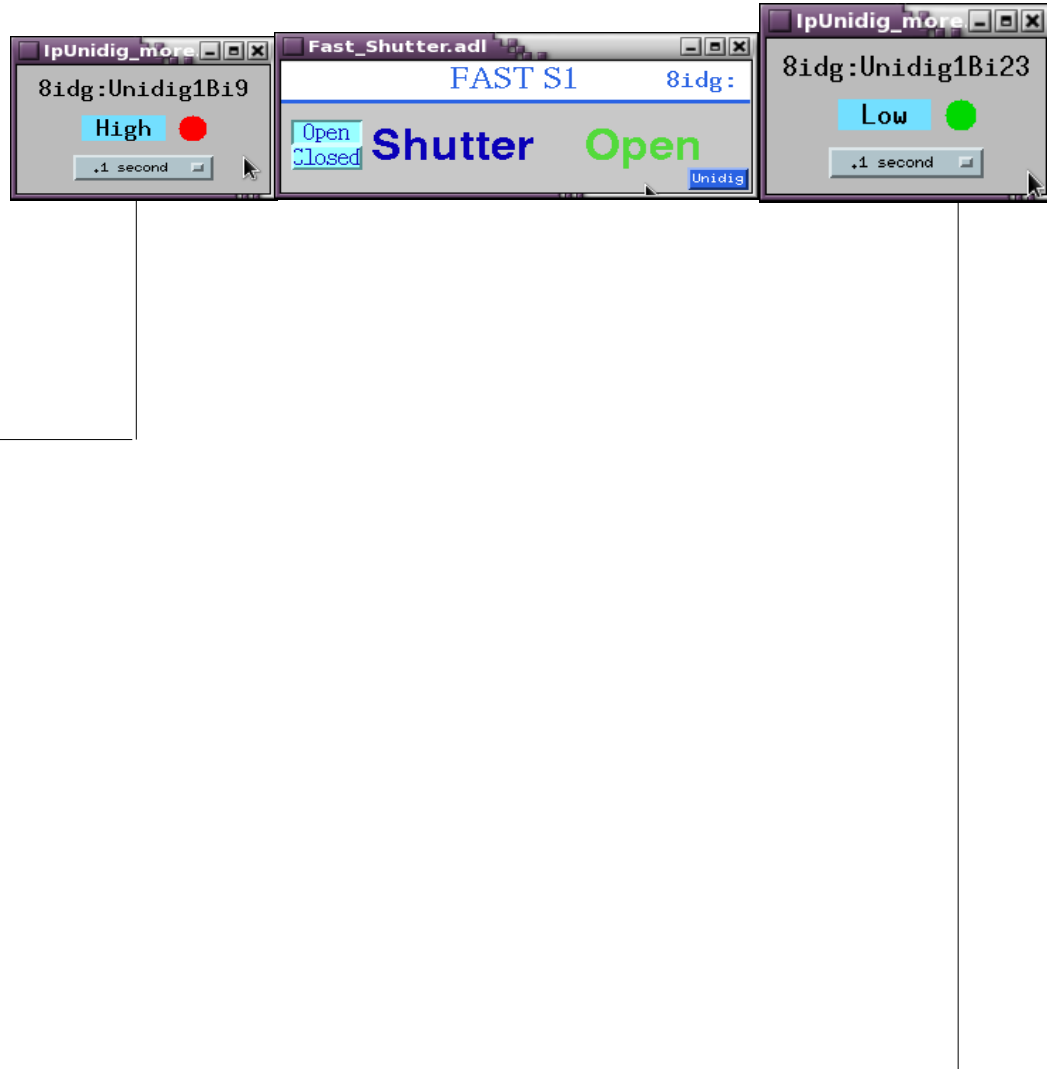
High ●

.1 second

# Screenshot: Shutter Open

Ch#	Input	Output	Scan (in)	More	Desc.
0	1	Low High	I/O Intr		XIA S1 filter 1 status
1	1	Low High	I/O Intr		XIA S1 filter 1 control
2	1	Low High	I/O Intr		XIA S1 filter 2 status
3	1	Low High	I/O Intr		XIA S1 filter 2 control
4	1	Low High	I/O Intr		XIA S1 filter 3 status
5	1	Low High	I/O Intr		XIA S1 filter 3 control
6	1	Low High	I/O Intr		XIA S1 filter 4 status
7	1	Low High	I/O Intr		XIA S1 filter 4 control
8	1	Low High	I/O Intr		Unused
9	1	Low High	.1 second		Fast Shutter Enable
10	1	Low High	.1 second		Pilatus 1MF enable out
11	0	Low High	.1 second		Pilatus Ext Trigger
12	1	Low High	.1 second		Fast Shutter Status
13	0	Open losed	.1 second		Fast Shutter Control
14	1	Low High	I/O Intr		XIA S2 filter 1 status
15	1	Low High	I/O Intr		XIA S2 filter 1 control
16	1	Low High	I/O Intr		XIA S2 filter 2 status
17	1	Low High	I/O Intr		XIA S2 filter 2 control
18	1	Low High	I/O Intr		XIA S2 filter 3 status
19	1	Low High	I/O Intr		XIA S2 filter 3 control
20	1	Low High	I/O Intr		XIA S2 filter 4 status
21	1	Low High	I/O Intr		XIA S2 filter 4 control
22	1	Low High	.1 second		
23	0	Low High	.1 second		FS Status

longin rec: 0x7fd7ff    longout rec: 0x0



# Connections

softGlue			Signal
J1			Unidig J10
J2			Unidig J14
J3	GSA1:18	GSC1:6	P1M EN OUT
J4	GSA1:9	GSB1:17	P100k EN OUT
J5			Unidig J12
J17	GSA1:3	GSB1:11	Fast Shutter TTLin
J18	GSA1:22	GSC1:10	P1M EXT IN
J19	GSA1:10	GSb1:18	P100k EXT IN
J20			Unidig J13
J21			Unidig J24

- Note: 1. softGlue J1-16 are inputs, J17-30 are outputs.  
2. Unidig JX corresponds to channel X-1 on IpUnidig\_all.adl

# Macros

Defined in ~/local\_macros/pil2exp.mac:

- `_set_ccdtrig_mode_int` [0=P1M, 1= P100k]
- `_set_ccdtrig_mode_ext` [0=P1M, 1= P100k]
- `pil2exp` [gisaxs\_time giwaxs\_time]
- `shutter_enable`
- `shutter_disable`
- `softGlueDualTriggerSetup`
- `p100kout`
- `p100kin`

```
fourcGIS
File Edit View Search Terminal Help
1121.FOURCGIS> pil2exp 3 2
ccdwait done.

1122.FOURCGIS> pil2exp 2 3
ccdwait done.

1123.FOURCGIS>

* Exposure time set to: 3,0000000 sec.
* Exposure period set to: 3,0040000 sec
* Delay time set to: 0,0000000 sec
* N images set to: 1
* Exposures per frame set to: 1
* Exposure time set to: 3,0000000 sec.
* Exposure period set to: 3,0040000 sec
* Delay time set to: 0,0000000 sec
* N images set to: 1
* Exposures per frame set to: 1
* Building rate-corrected xor table
After rate correction, cutoff = 1179179 counts
Exposure time set to: 2,0000000 sec.
* Exposure period set to: 3,0040000 sec
* Delay time set to: 0,0000000 sec
* N images set to: 1
* Exposures per frame set to: 1
* Exposure time set to: 2,0000000 sec.
* Exposure period set to: 2,0040000 sec
* Delay time set to: 0,0000000 sec
* N images set to: 1
* Exposures per frame set to: 1
* Exposure time set to: 2,0000000 sec.
* Exposure period set to: 2,0040000 sec
* Delay time set to: 0,0000000 sec
* Preparing camera for exposure
Setting B**_M**_CHSEL PATTERN to 0xffff (hardware pattern: 0xffff)
Starting externally triggered exposure(s): 2012-Nov-08T11:10:32,252
* Ending exposure:          2012-Nov-08T11:10:32,519
Camera image was written:
/ramdisk/sharenko201211p/dualtest1s_068.tif
Elapsed time: 1,9837 seconds
* N images set to: 1
* Exposures per frame set to: 1
* Exposure time set to: 2,0000000 sec.
* Exposure period set to: 2,0040000 sec
* Delay time set to: 0,0000000 sec

* Exposures per frame set to: 1
* Exposure time set to: 2,0000000 sec.
* Exposure period set to: 2,0040000 sec
* Delay time set to: 0,0000000 sec
* N images set to: 1
* Exposures per frame set to: 1
* Building rate-corrected xor table
After rate correction, cutoff = 1097223 counts
Exposure time set to: 3,0000000 sec.
* Exposure period set to: 2,0040000 sec
* Delay time set to: 0,0000000 sec
* N images set to: 1
* Exposures per frame set to: 1
* Exposure time set to: 3,0000000 sec.
* Exposure period set to: 3,0040000 sec
* Delay time set to: 0,0000000 sec
* N images set to: 1
* Exposures per frame set to: 1
* Exposure time set to: 3,0000000 sec.
* Exposure period set to: 3,0040000 sec
* Delay time set to: 0,0000000 sec
* Preparing camera for exposure
Setting B**_M**_CHSEL PATTERN to 0xffff (hardware pattern: 0xffff)
Starting externally triggered exposure(s): 2012-Nov-08T11:10:32,298
Ending exposure:          2012-Nov-08T11:10:33,517
Camera image was written:
/home/det/mnt/8-idi-d/Pilatus_id/sharenko201211p100k/dualtest1w_062.tif
Elapsed time: 2,7962 seconds
* N images set to: 1
* Exposures per frame set to: 1
* Exposure time set to: 3,0000000 sec.
* Exposure period set to: 3,0040000 sec
* Delay time set to: 0,0000000 sec
```

What is Elapsed time?