

# Status on ECL Trigger Slow Control



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## [Overview]

- ECL Trigger Slow Control System

## [Status]

- GUI monitoring program
- Upload/Download FAM Energy threshold parameter to database
- ECLTRG library update: Set FAM Energy/Time calibration parameter TC by TC
- VNC server setting

## [Summary & Plan]

# Overview

## 1. User Module Part

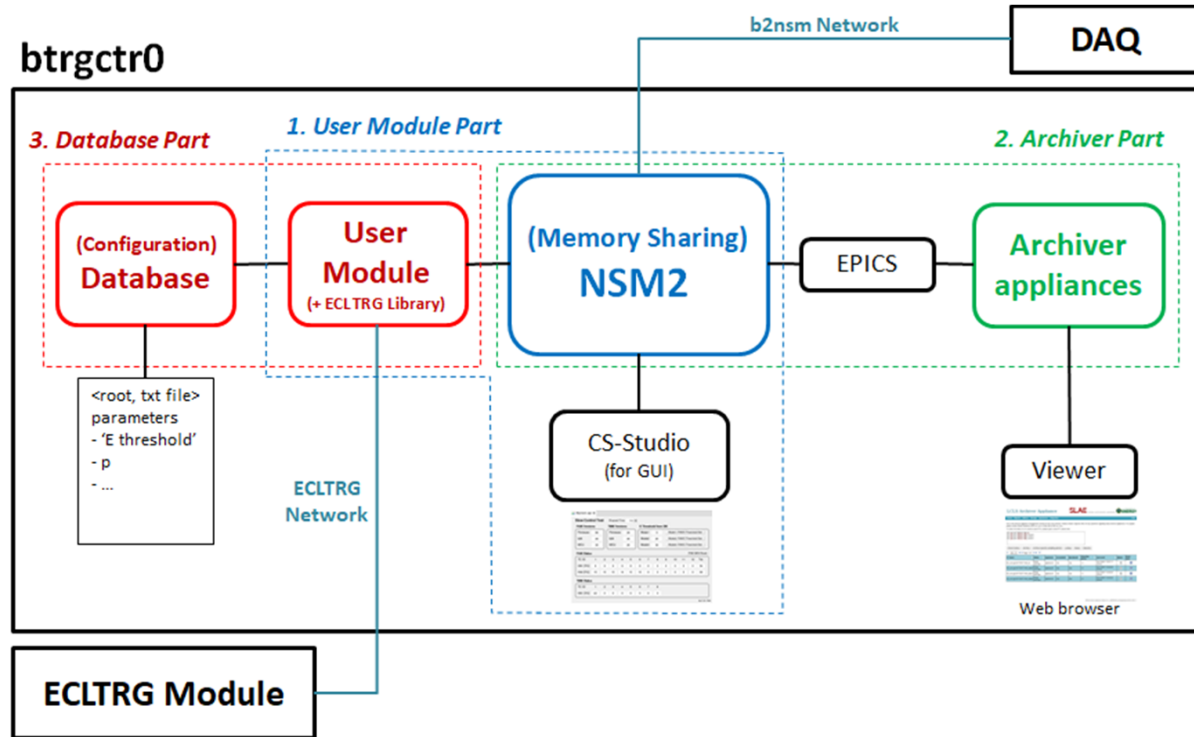
- **GUI** based monitoring module.
- ECL Trigger library is included.
- Connected to Database server

## 2. Archiver Part

- Connection between Archiver and **NSM** through EPICS is well established.
- Now, our data can be stored in archiver and plot of which seen on web browser(firefox).

## 3. Database Part

- 'PostgreSQL' based database.
- Successfully Connected Database server.



### Slow Control Test

Elapsed Time  [s]

**FAM Version**      **TMM Versior**      **E Threshold from DB** (A)

Firmware	0	Firmware	0	Mode1	5	Mode1: FAM E Threshold Set	
b2tt	0	b2tt	0	Mode2	20	Mode2: FAM E Threshold Set	
MCU	0	MCU	0	Mode3	4095	Mode2: FAM E Threshold Set	

**FAM Status** FAM GEN Reset

TC ID	1	2	3	4	5	6	7	8	9	10	11	12	Tot.
rate [Hz]	0	0	0	0	0	0	0	0	0	0	0	0	0
max [Hz]	0	0	0	0	0	0	0	0	0	0	0	0	0

**TMM Status**

TC ID	1	2	3	4	5	6	7	8
rate [Hz]	0	0	0	0	0	0	0	0

**FAM Ready Signal** by C.H. Kim

clock	0	●	gtxlink	0	●	FAM_ready_signal	0
NClkDwn	0	●	Ngtxlink	0	●		
b2tt	0	●	NpllckDwn	0	●		
Nb2ttDwn	0	●					

(A) Slow Contol User Module (GUI)

## LCLS Archiver Appliance



Home Reports Metrics Storage Appliances Integration Help

This is the archiver appliance management console for the LCLS archiver. Please contact Jingchen Zhou for any questions regarding these archiver appliances. For support, please contact Murali Shankar at 650 xxx xxxxx or Bob Hall at 650 xxx xxxxx.

To check the status of or to archive some PV's, please type in some PV names here.

```
B2_nsm:get:MYTEST:FAM_fw  
B2_nsm:get:MYTEST:FAM_rate[0]  
B2_nsm:get:MYTEST:FAM_rate[1]  
B2_nsm:get:MYTEST:FAM_rate[2]  
B2_nsm:get:MYTEST:FAM_rate[3]
```

(B)

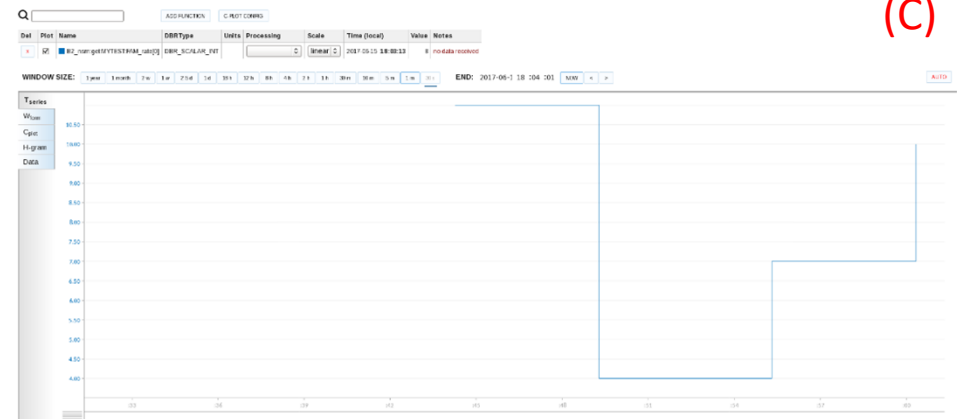
Check Status Archive Archive (specify sampling period) Lookup Pause Resume

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PV Name	Status	Appliance	Connected?	Monitored?	Sampling period	Last event	Details	Quick chart
B2_nsm:get:MYTEST:FAM_fw	Being archived	appliance0	true	true	1.0	Jun/15/2017 17:55:52 +09:00		
B2_nsm:get:MYTEST:FAM_rate[0]	Being archived	appliance0	true	true	1.0	Jun/15/2017 17:56:11 +09:00		
B2_nsm:get:MYTEST:FAM_rate[1]	Being archived	appliance0	true	true	1.0	Jun/15/2017 17:56:11 +09:00		
B2_nsm:get:MYTEST:FAM_rate[2]	Being archived	appliance0	true	true	1.0	Jun/15/2017 17:56:11 +09:00		
B2_nsm:get:MYTEST:FAM_rate[3]	Being archived	appliance0	true	true	1.0	Jun/15/2017 17:56:11 +09:00		



### EPICS Archive Viewer: <save>



(C)

Status

**Slow Control Test** Elapsed Time  [s]

FAM Version		TMM Versior		E Threshold from DB		
Firmware	<input type="text" value="0"/>	Firmware	<input type="text" value="0"/>	Mode1	<input type="text" value="5"/>	<input type="button" value="Mode1: FAM E Threshold Set"/>
b2tt	<input type="text" value="0"/>	b2tt	<input type="text" value="0"/>	Mode2	<input type="text" value="20"/>	<input type="button" value="Mode2: FAM E Threshold Set"/>
MCU	<input type="text" value="0"/>	MCU	<input type="text" value="0"/>	Mode3	<input type="text" value="4095"/>	<input type="button" value="Mode2: FAM E Threshold Set"/>

**FAM Status**

TC ID	1	2	3	4	5	6	7	8	9	10	11	12	Tot.
rate [Hz]	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>
max [Hz]	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>

**TMM Status**

TC ID	1	2	3	4	5	6	7	8
rate [Hz]	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>

by C.H. Kim

**FAM Ready Signal**

clock	<input type="text" value="0"/>	<input checked="" type="radio"/>	gtxlink	<input type="text" value="0"/>	<input checked="" type="radio"/>	FAM_ready_signal	<input type="text" value="0"/>
NClkDwn	<input type="text" value="0"/>	<input checked="" type="radio"/>	Ngtxlink	<input type="text" value="0"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	
b2tt	<input type="text" value="0"/>	<input checked="" type="radio"/>	NpillokDwn	<input type="text" value="0"/>	<input checked="" type="radio"/>		
Nb2ttDwn	<input type="text" value="0"/>	<input checked="" type="radio"/>					

- Version check panel
  - **FAM and TMM**
- E threshold panel
- Hit rate panel
  - **FAM and TMM**
- ECLTRG ready signal panel
  - **FAM**

- upload E-threshold parameters to database server.
- download E-threshold parameters from database server.

mk\_db.20170612.conf

```
1 # name of configuration entry
2 config : ecltrg_par:001
3
4 # Energy Threshold
5 famdata.Energy_Threshold_fam1: 20
6 famdata.Energy_Threshold_fam2: 20
7 famdata.Energy_Threshold_fam3: 20
8 famdata.Energy_Threshold_fam4: 20
9 famdata.Energy_Threshold_fam5: 20
10 famdata.Energy_Threshold_fam6: 20
11 famdata.Energy_Threshold_fam7: 20
12 famdata.Energy_Threshold_fam8: 20
13 famdata.Energy_Threshold_fam9: 20
14 famdata.Energy_Threshold_fam10: 20
15 famdata.Energy_Threshold_fam11: 20
16 famdata.Energy_Threshold_fam12: 20
17 famdata.Energy_Threshold_fam13: 20
18 famdata.Energy_Threshold_fam14: 20
19 famdata.Energy_Threshold_fam15: 20
20 famdata.Energy_Threshold_fam16: 20
21 famdata.Energy_Threshold_fam17: 20
22 famdata.Energy_Threshold_fam18: 20
23 famdata.Energy_Threshold_fam19: 20
24 famdata.Energy_Threshold_fam20: 20
25 famdata.Energy_Threshold_fam21: 20
26 famdata.Energy_Threshold_fam22: 20
27 famdata.Energy_Threshold_fam23: 20
28 famdata.Energy_Threshold_fam24: 20
29 famdata.Energy_Threshold_fam25: 20
```

```
$ daqdbcreate mk_db.20170612.conf ecltrg_parameter
```

```
$ daqdbtable
```

```
[chkim@btrgctr0:~$] daqdbtable
bklhv cdc.fee.cpr2001.b.suppress.041.conf klm02.conf phystrig svd konno klm_log ss_hv ss_hv
hv klm_test samplehv_top_hv_test mydb daq cdchv cdc daq mydb4 mydb2 mydb3 runrecord runclt
est_yh_log mydb_log ecltrg_parameter runrecord tmp runcltest:yh trg ss_db runcltest_yh hv y
hstesthv ss_db_log ecl_top_trg_log mydb1 top_log klm ecl
```

```
$ daqdblist
```

```
[chkim@btrgctr0:~$] daqdblist ecltrg_parameter
ecltrg par:001
```

- configuration database file(.conf) is made



## ▪ E-threshold parameter function

- It is possible to set E-threshold parameters on FAMs channel by channel(TC by TC).
- FAMwriteChTHR function is used to make E Threshold parameter function.

```

679 //-----
680 // channel threshold
681 //-----
682 void FAM::FAMwriteChTHR(int ch, int value){
683
684     unsigned char wdat[2];
685
686     wdat[0] = value & 0xFF;
687     wdat[1] = (value >> 8) & 0xFF;
688     FAMwriteFPGA(ch, 2, 0x10, wdat);
689 }
    
```

	1	2	3	4	5	6	7	8	9	10	11	12
FAM 101 :	2323	2323	2323	2323	2323	2323	2323	2323	2323	2323	2323	2323
FAM 102 :	2323	2323	2323	2323	2323	2323	2323	2323	2323	2323	2323	2323
FAM 103 :	2323	2323	2323	2323	2323	2323	2323	2323	2323	2323	2323	2323
FAM 104 :	2323	2323	2323	2323	2323	2323	2323	2323	2323	2323	2323	2323
FAM 105 :	2323	2323	2323	2323	2323	2323	2323	2323	2323	2323	2323	2323
FAM 106 :	2323	2323	2323	2323	2323	2323	2323	2323	2323	2323	2323	2323
FAM 107 :	2323	2323	2323	2323	2323	2323	2323	2323	2323	2323	2323	2323
FAM 108 :	2323	2323	2323	2323	2323	2323	2323	2323	2323	2323	2323	2323
FAM 109 :	2323	2323	2323	2323	2323	2323	2323	2323	2323	2323	2323	2323
FAM 110 :	2323	2323	2323	2323	2323	2323	2323	2323	2323	2323	2323	2323
FAM 111 :	2323	2323	2323	2323	2323	2323	2323	2323	2323	2323	2323	2323

## ▪ Time parameter function

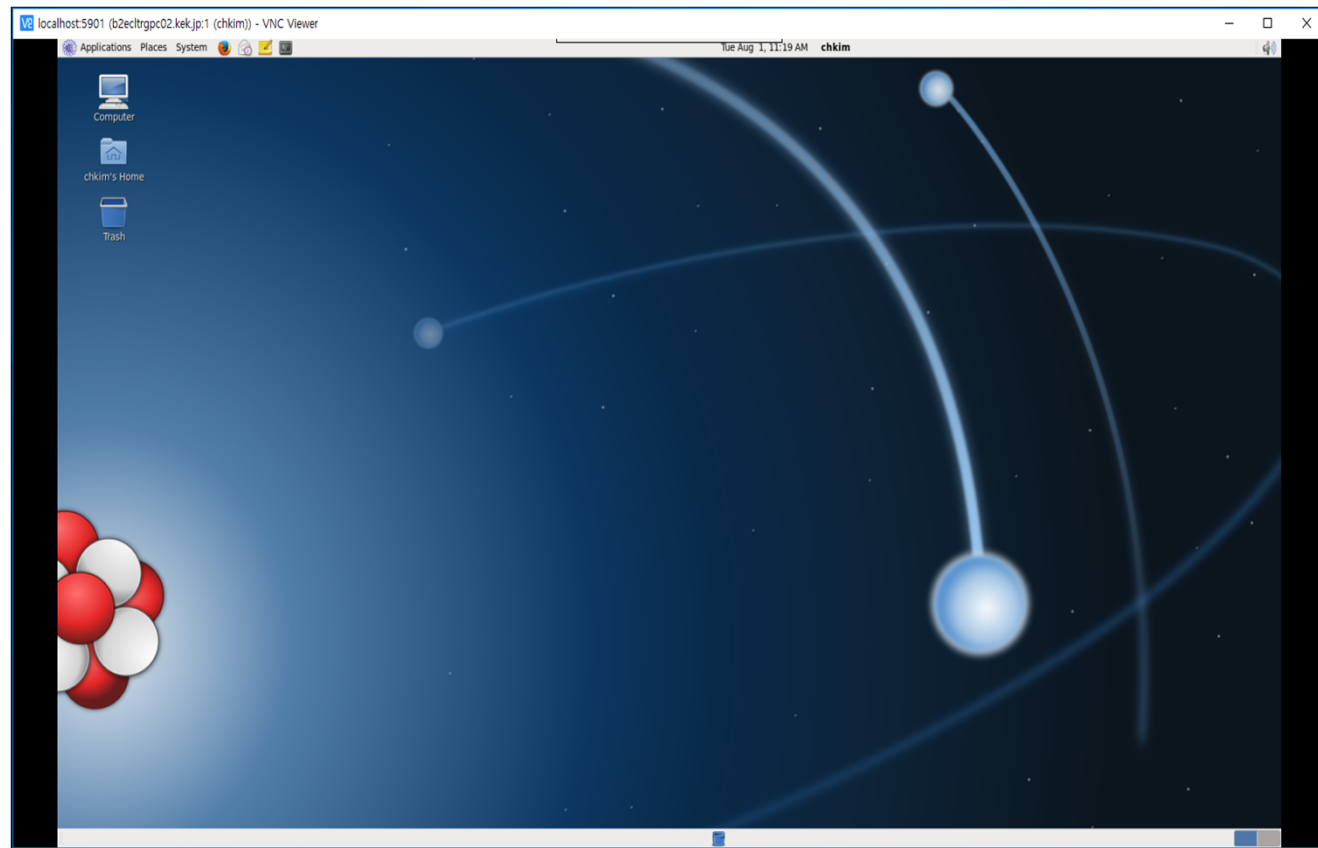
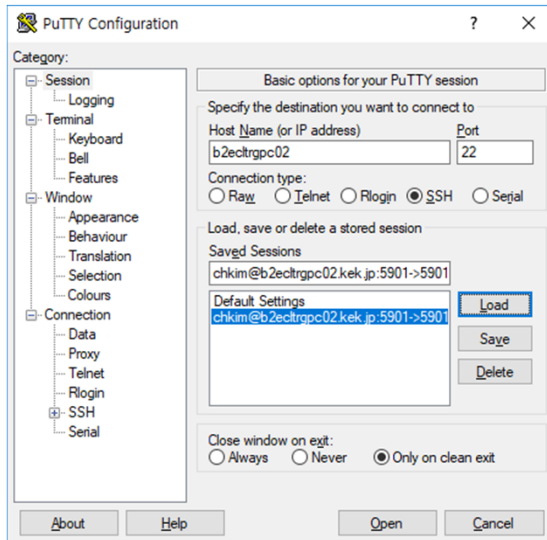
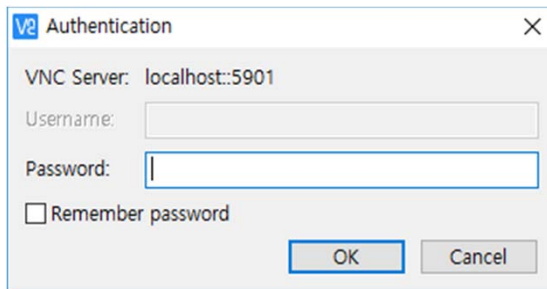
- It is possible to set time calibration parameters on FAMs channel by channel(TC by TC).
- FAMwriteTOff function is used to make time calibration parameter function.

```

555 //-----
556 // write time offset (10bit = 0-900, LSB=1ns)
557 // 10 bit is allocated, so the range is 0-1023ns
558 // but, because of imperfect firmware logic,
559 // input should be 0-900.
560 //-----
561 void FAM::FAMwriteTOff(int ch, int value){
562
563     unsigned char wdat[2];
564
565     if(value>900 || value<0) {
566         printf("WARNING!!! Input should be 0-900\n");
567     }else{
568         wdat[0] = value & 0xFF;
569         wdat[1] = (value >> 8) & 0xFF;
570         FAMwriteFPGA(ch, 2, 0x14, wdat);
571     }
572 }
    
```

1 #	ID	FAM#	CHID	par
2 #				
3 #				
4	1	1	1	200
5	2	1	2	200
6	3	1	3	200
7	4	1	4	200
8	5	1	5	200
9	6	1	6	200
10	7	1	7	200
11	8	1	8	200
12	9	1	9	200
13	10	1	10	200
14	11	1	11	200
15	12	1	12	200

- Problem: GUI related job remotely(KEK ↔ Korea) is too slow.
- Solution: VNC server setting
  - With this setting, it is possible to control PC at Tsukuba hall at Hanyang Univ., Korea.



# Summary & Plan

- Hit rate display
  - **FAM and TMM**
  
- ECLTRG ready signal display
  - **FAM**
  
- Calibration parameters are uploaded to database server
  - **Code for Energy Calibration parameters is prepared.**
  
- ECLTRG Library is updated
  - **For writing FAM Energy/Time calibration parameter TC by TC**
  
- VNC server setting is done.
  - **For GUI related job remotely**

- Slow control setting for ETM
- ECLTRG Parameters are uploaded to database server
  - **Code for energy calibration parameters is prepared.**
  - **Code for time calibration parameters will be prepared.**
- Parameter preparation for monitoring(archiver)
- Parameter preparation for luminosity monitor
- ECLTRG initialization command (for parameter downloading; to FAM and TMM)
- ECLTRG system ready signal
  - **FAM ready signal is prepared.**
  - **TMM and ETM ready signal will be prepared.**

