sPHENIX INTT - calibration database PSQL

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National Central University

2022/11/4

From sheet to PSQL (2 weeks ago)

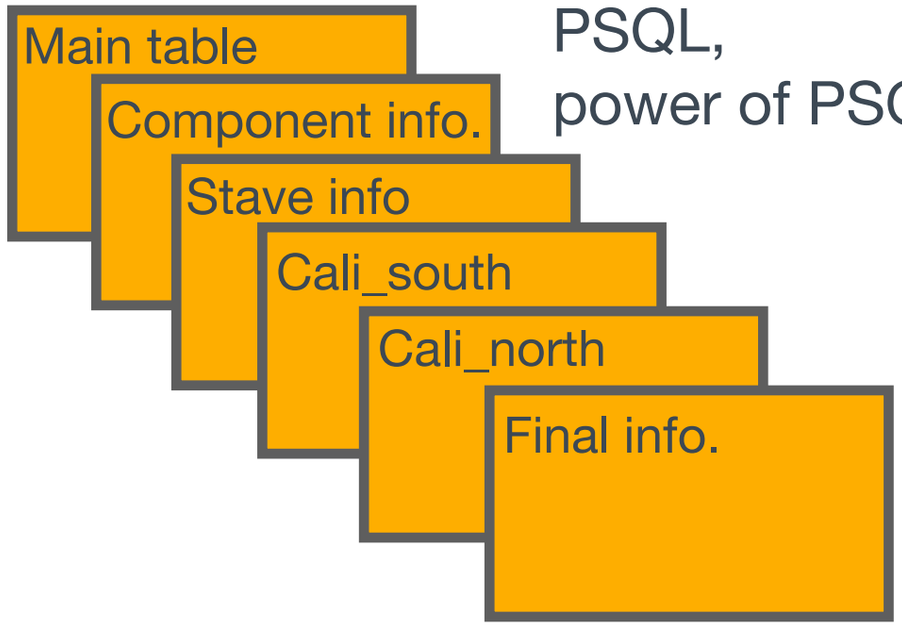
4 tables to save the calibration-test information of barrel.

B0L0 | B0L1 | B1L0 | B1L1

B0L0			Hardware Componenents			Calibration Test								Survey, Cooling, and Grounding						Final		
						South				North												
	ID	Ladder Position	Ladder Name	HDI South/North	BEX South/North	Current SA/SB [nA]	TA/TB [Celsius]	File Name	Status	Current SA/SB [nA]	TA/TB [Celsius]	File Name	Status	Survey Status	GND Wire Stave	Glue TC Connector	Cooling Test	Silver Epoxy	Grounding Confirmed	Conversion Cable S/N	Pulse Test	Barrel Status
1	EAST	B0L000	PB1-L008	201/202	028/025	400/200	22.6/23.0	20220822-1822,5	1	355/400	23.5/22.6	20220823-1253,6	1	1	1	1	1	1	1			
2		B0L001	PB1-L005	038/039	026/023	407/359	23.1/22.9	20220818-1643,8	1	360/410	22.7/22.3	20220823-1326,6	1	1	1	1	1	1	1			
3		B0L002	PB1-L031	281/288	004/003	402/340	23.0/23.0	20220818-1628,8	1	342/358	22.3/22.0	20220823-1410,8	1	1	1	1	1	1	1			
4		B0L003	PB1-L013	217/218	018/019	400/310	22.7/34.2	20220812-1709,8	1	274/299	22.5/22.0	20220811-1127,8	1	1	1	1	1	1	1			
5		B0L004	PB1-L027	279/280	022/005	400/370	22.6/22.3	20220822-1607,8	1	404/376	21.3/21.3	20220823-1452,8	1	1	1	1	1	1	1			
6		B0L005	PB1-L009	199/200	024/021	391/364	22.3/21.9	20220822-1720,6	1	419/358	23.1/22.6	20220823-1538,8	1	1	1	1	1	1	1			
7	WEST	B0L006	PB1-L034	302/307	016/017	354/313	23.6/-7.2	20220812-1825,8	1	221/276	22.5/22.0	20220811-1251,8	1	1	1	1	1	1	1			
8		B0L007	PB1-L020	282/283	014/015	391/370	22.7/22.3	20220812-1736,8	1	92/240	22.7/22.1	20220811-1229,8	1	1	1	1	1	1	1			
9		B0L008	PB1-L017	213/214	010/011	391/376	22.5/22.1	20220812-1722,8	1	411/299	22.6/21.7	20220811-1143,8	1	1	1	1	1	1	1			
10		B0L009	PB1-L010	197/198	006/007	368/347	23.4/23.0	20220818-1710,8	1	387/350	23.4/22.8	20220823-1426,8	1	1	1	1	1	1	1			
11		B0L010	PB1-L006	040/206	008/009	393/369	21.3/21.5	20220812-1703,8	1	276/249	23.2/22.6	20220811-1103,8	1	1	1	1	1	1	1			
12		B0L011	PB1-L021	284/285	012/013	374/381	23.1/22.9	20220816-1634,8	1	369/297	23.1/22.4	20220811-1035,8	1	1	1	1	1	1	1			

Google spreadsheet

- Ladder info.
- Component info.
- Cali_south
- Cali_north
- Stave info.
- Final info.



PSQL,
power of PSQL : relation

From sheet to PSQL (update)

4 tables to save the calibration-test information of barrel.

B0L0 | B0L1 | B1L0 | B1L1

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						South				North												
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2		B0L001	PB1-L005	038/039	026/023	407/359	23.1/22.9	20220818-1643,8	1	360/410	22.7/22.3	20220823-1326,6	1	1	1	1	1	1	1			
3		B0L002	PB1-L031	281/288	004/003	402/340	23.0/23.0	20220818-1628,8	1	342/358	22.3/22.0	20220823-1410,8	1	1	1	1	1	1	1			
4		B0L003	PB1-L013	217/218	018/019	400/310	22.7/34.2	20220812-1709,8	1	274/299	22.5/22.0	20220811-1127,8	1	1	1	1	1	1	1			
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6		B0L005	PB1-L009	199/200	024/021	391/364	22.3/21.9	20220822-1720,6	1	419/358	23.1/22.6	20220823-1538,8	1	1	1	1	1	1	1			
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8		B0L007	PB1-L020	282/283	014/015	391/370	22.7/22.3	20220812-1736,8	1	92/240	22.7/22.1	20220811-1229,8	1	1	1	1	1	1	1			
9		B0L008	PB1-L017	213/214	010/011	391/376	22.5/22.1	20220812-1722,8	1	411/299	22.6/21.7	20220811-1143,8	1	1	1	1	1	1	1			
10		B0L009	PB1-L010	197/198	006/007	368/347	23.4/23.0	20220818-1710,8	1	387/350	23.4/22.8	20220823-1426,8	1	1	1	1	1	1	1			
11		B0L010	PB1-L006	040/206	008/009	393/369	21.3/21.5	20220812-1703,8	1	276/249	23.2/22.6	20220811-1103,8	1	1	1	1	1	1	1			
12		B0L011	PB1-L021	284/285	012/013	374/381	23.1/22.9	20220816-1634,8	1	369/297	23.1/22.4	20220811-1035,8	1	1	1	1	1	1	1			

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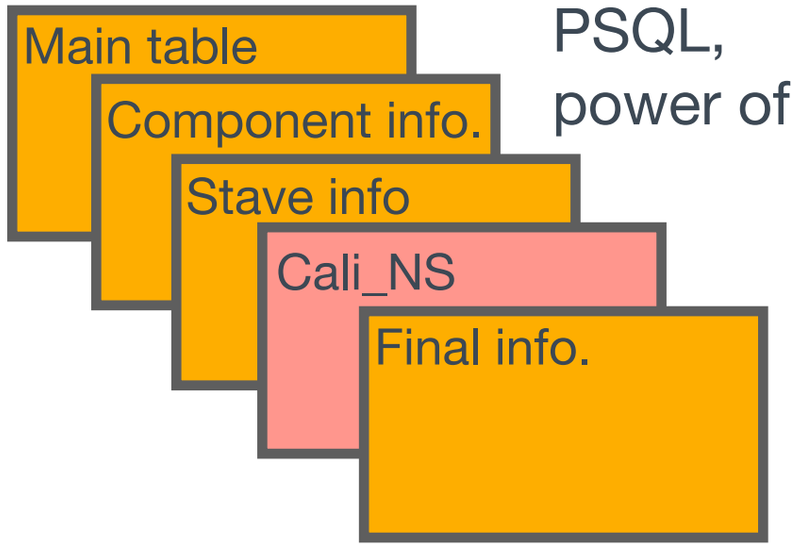


PSQL,
power of PSQL : relation

Combine north and south

Practice status - table list

In PSQL

Update

Location of psql server : my mac (for practice)

Schema	Name	Type	Owner
public	cali_info	table	chengweishi
public	cali_info_id_seq	sequence	chengweishi
public	component_info	table	chengweishi
public	component_info_id_seq	sequence	chengweishi
public	main_table	table	chengweishi
public	main_table_id_seq	sequence	chengweishi
public	stave_info	table	chengweishi
public	stave_info_id_seq	sequence	chengweishi

The information is separated into four tables

Practice status - contents of tables

In PSQL

Two weeks ago

Calibration result - south

```
intt_calibration_db_test=# select * from cali_south_info;
 id | calibration_south_current_a | calibration_south_current_b | calibration_south_ta | calibration_south_tb | calibration_south_file_name | calibration_south_moduleid | calibration_south_status
----+-----------------------------+-----------------------------+----------------------+----------------------+-----------------------------+----------------------------+--------------------------
  1 |                       359.0 |                       341.0 |                 22.8 |                 22.6 | 20220826-1249               |                          8 |                        1
  2 |                       387.0 |                       361.0 |                 21.9 |                 21.6 | 20220822-1750               |                          8 |                        1
  3 |                       410.0 |                       362.0 |                 22.2 |                 22.1 | 20220816-1741               |                          8 |                        1
  4 |                       200.0 |                       370.0 |                 23.1 |                 -5.2 | 20220822-1843               |                          8 |                        1
  5 |                       297.0 |                       291.0 |                 23.3 |                -17.6 | 20220817-1526               |                          8 |                        1
  6 |                       407.0 |                       362.0 |                 22.6 |                 22.3 | 20220818-1813               |                          8 |                        1
  7 |                       370.0 |                       279.0 |                 22.8 |                 22.5 | 20220822-1540               |                          8 |                        1
  8 |                       382.0 |                       385.0 |                 22.8 |                 22.6 | 20220822-1718               |                          6 |                        1
  9 |                       373.0 |                       354.0 |                 23.5 |                 23.2 | 20220812-1851               |                          8 |                        1
 10 |                       395.0 |                       365.0 |                 22.3 |                 22.2 | 20220812-1808               |                          8 |                        1
 11 |                       394.0 |                       271.0 |                 23.3 |                  4.2 | 20220810-1348               |                          8 |                        1
 12 |                       394.0 |                       371.0 |                 23.3 |                -13.8 | 20220811-1048               |                          8 |                        1
 13 |                       374.0 |                       385.0 |                 23.3 |                 -7.5 | 20220812-1111               |                          8 |                        1
 14 |                        13.0 |                       342.0 |                 23.1 |                 22.9 | 20220826-1737               |                          8 |                        1
 15 |                       383.0 |                       395.0 |                 23.2 |                 22.8 | 20220816-1620               |                          8 |                        1
 16 |                       358.0 |                       376.0 |                 23.5 |                 23.8 | 20220816-1613               |                          8 |                        1
(16 rows)
```

Column list :

1. Current_A
2. Current_B
3. Temp_A
4. Temp_B
5. File_name
6. Module_id
7. Stauts

Practice status - contents of tables

In PSQL

Timestamp from PSQL

Automatically generated when adding one row

Update

Array

Array

Column list :

1. Time stamp
2. NS
3. File_name
4. Module_id
5. Current_AB
6. Temp_AB
7. Stauts

id	cali_time	cali_ns	cali_file	cali_moduleid	cali_current_ab	cali_tab	cali_status
1	2022-10-15 13:20:02.179766+08	S	20220826-1249	8	{359.0,341.0}	{22.8,22.6}	1
2	2022-10-15 13:20:02.697493+08	S	20220822-1750	8	{387.0,361.0}	{21.9,21.6}	1
3	2022-10-15 13:20:03.213547+08	S	20220816-1741	8	{410.0,362.0}	{22.2,22.1}	1
4	2022-10-15 13:20:03.730174+08	S	20220822-1843	8	{200.0,370.0}	{23.1,-5.2}	1
5	2022-10-15 13:20:04.242695+08	S	20220817-1526	8	{297.0,291.0}	{23.3,-17.6}	1
6	2022-10-15 13:20:04.760349+08	S	20220818-1813	8	{407.0,362.0}	{22.6,22.3}	1
7	2022-10-15 13:20:05.278094+08	S	20220822-1540	8	{370.0,279.0}	{22.8,22.5}	1
8	2022-10-15 13:20:05.794517+08	S	20220822-1718	6	{382.0,385.0}	{22.8,22.6}	1
9	2022-10-15 13:20:06.310845+08	S	20220812-1851	8	{373.0,354.0}	{23.5,23.2}	1
10	2022-10-15 13:20:06.823064+08	S	20220812-1808	8	{395.0,365.0}	{22.3,22.2}	1
11	2022-10-15 13:20:07.33645+08	S	20220810-1348	8	{394.0,271.0}	{23.3,4.2}	1
12	2022-10-15 13:20:07.850276+08	S	20220811-1048	8	{394.0,371.0}	{23.3,-13.8}	1
13	2022-10-15 13:20:08.362987+08	S	20220812-1111	8	{374.0,385.0}	{23.3,-7.5}	1
14	2022-10-15 13:20:08.875475+08	S	20220826-1737	8	{13.0,342.0}	{23.1,22.9}	1
15	2022-10-15 13:20:09.389347+08	S	20220816-1620	8	{383.0,395.0}	{23.2,22.8}	1
16	2022-10-15 13:20:09.903607+08	S	20220816-1613	8	{358.0,376.0}	{23.5,23.8}	1
17	2022-10-15 13:20:10.416657+08	N	20220826-1249	8	{359.0,341.0}	{22.8,22.6}	1
18	2022-10-15 13:20:10.930309+08	N	20220823-1352	8	{396.0,360.0}	{22.6,22.0}	1
19	2022-10-15 13:20:11.443042+08	N	20220823-1357	8	{380.0,230.0}	{22.0,22.9}	1
20	2022-10-15 13:20:11.958374+08	N	20220823-1416	8	{400.0,350.0}	{21.4,21.5}	1
21	2022-10-15 13:20:12.475772+08	N	20220823-1438	8	{391.0,362.0}	{23.6,38.1}	1
22	2022-10-15 13:20:12.997905+08	N	20220823-1506	8	{407.0,30.0}	{23.3,22.6}	1
23	2022-10-15 13:20:13.515525+08	N	20220823-1527	8	{407.0,376.0}	{22.9,22.2}	1
24	2022-10-15 13:20:14.026474+08	N	20220823-1520	8	{362.0,350.0}	{22.7,22.2}	1
25	2022-10-15 13:20:14.54108+08	N	20220810-1809	8	{299.0,295.0}	{23.2,22.6}	1
26	2022-10-15 13:20:15.050966+08	N	20220810-1800	8	{410.0,292.0}	{23.3,22.7}	1
27	2022-10-15 13:20:15.566179+08	N	20220810-1656	6	{416.0,301.0}	{21.0,-14.8}	1
28	2022-10-15 13:20:16.08308+08	N	20220810-1638	6	{427.0,297.0}	{23.3,-13.8}	1
29	2022-10-15 13:20:16.599947+08	N	20220810-1718	6	{416.0,299.0}	{23.2,-16.6}	1
30	2022-10-15 13:20:17.112634+08	N	20220810-1732	6	{290.0,297.0}	{23.1,22.3}	1
31	2022-10-15 13:20:17.625494+08	N	20220810-1824	8	{-402.0,-262.0}	{23.3,-10.6}	1
32	2022-10-15 13:20:18.137982+08	N	20220810-1834	8	{257.0,260.0}	{23.1,22.1}	1

(32 rows)

Timezone

Practice status - contents of tables

In PSQL

Update

Main table

Array

id	barrel_id	ladder_position	ladder_name	component_id	stave_id	cali_id
1	EAST	B1L000	PB2-L016	1	1	{1,17}
2	EAST	B1L001	PB2-L020	2	2	{2,18}
3	EAST	B1L002	PB2-L034	3	3	{3,19}
4	EAST	B1L003	PB2-L049	4	4	{4,20}
5	EAST	B1L004	PB2-L045	5	5	{5,21}
6	EAST	B1L005	PB2-L001	6	6	{6,22}
7	EAST	B1L006	PB2-L018	7	7	{7,23}
8	EAST	B1L007	PB2-L026	8	8	{8,24}
9	WEST	B1L008	PB2-L027	9	9	{9,25}
10	WEST	B1L009	PB2-L011	10	10	{10,26}
11	WEST	B1L010	PB2-L031	11	11	{11,27}
12	WEST	B1L011	PB2-L008	12	12	{12,28}
13	WEST	B1L012	PB2-L009	13	13	{13,29}
14	WEST	B1L013	PB2-L038	14	14	{14,30}
15	WEST	B1L014	PB2-L032	15	15	{15,31}
16	WEST	B1L015	PB2-L030	16	16	{16,32}

(16 rows)

Foreign keys

Foreign key (kind of)

The length of the cali_id is flexible :
B1L000 : {1,17}
B1L001 : {2,18,33}
B1L002 : {3,19,34,35,36,37}

Practice status - contents of tables

In PSQL

Call the relations by using the inner join command.

```
SELECT * FROM main_table JOIN cali_info ON main_table.cali_id = cali_info.id WHERE ladder_position = 'B1L005' ;
```

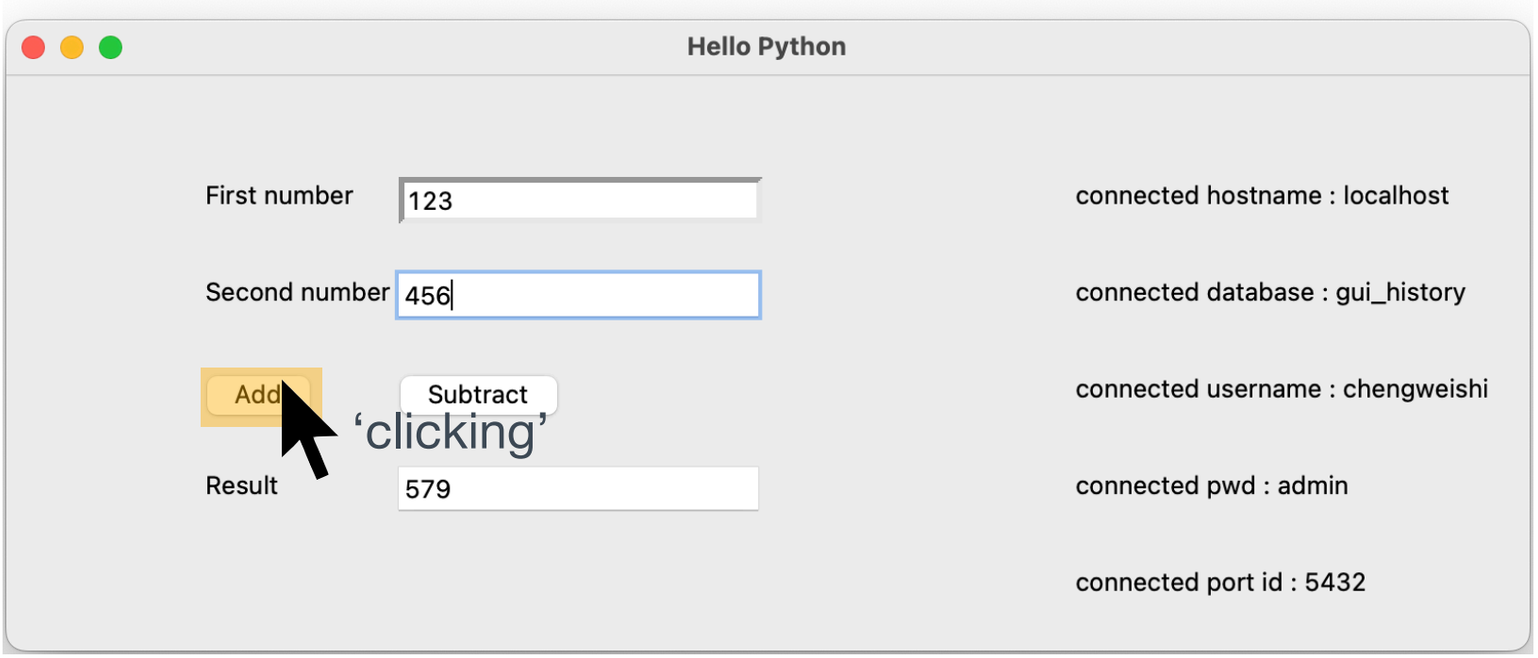
```
intt_calibration_db_test=# select * from main_table join cali_info on main_table.cali_id[1] = cali_info.id where ladder_position = 'B1L005';
 id | barrel_id | ladder_position | ladder_name | component_id | stave_id | cali_south_id | cali_north_id | cali_id | id |          cali_time          | cali_ns |   cali_file   | cali_moduleid | cali_current_ab |  cali_tab   | cali_status
----+-----------+-----------------+-------------+--------------+----------+---------------+---------------+---------+----+-----------------------------+---------+---------------+---------------+-----------------+-------------+-------------
  6 | EAST      | B1L005          | PB2-L001    |            6 |        6 |             6 |             6 | {6,22}  |  6 | 2022-10-15 13:20:04.760349+08 | S       | 20220818-1813 |             8 | {407.0,362.0}   | {22.6,22.3} |           1
(1 row)
```

Main table

Calibration table

Expert GUI - record action

Just for function test, python GUI package : ‘tkinter’




```
 id |           timestamp           |    key    |      note
----+-------------------------------+-----------+-----------------
  1 | 2022-10-16 04:10:37.073437+08 | 35        | I am here
  2 | 2022-10-16 04:20:45.405491+08 | add       | 3 + 4 = 7
  3 | 2022-10-16 04:20:53.539524+08 | substract | 3 - 4 = -1
  4 | 2022-10-16 04:20:55.215083+08 | substract | 3 - 4 = -1
  5 | 2022-10-16 05:13:48.058423+08 | add       | 123 + 456 = 579
(5 rows)
```

Size of this table

```
gui_history=# sel
 pg_size_pretty
----------------
 7901 kB
(1 row)
```

Automatically save the action information when doing the action (clicking the button).

It’s feasible to implement this function in the expert GUI. Do we need it ?

id	action	note	
1	set	dac0 : 15	
2	global run		
3	set	dac0 : 16	
4	global run		
5	set	dac0 : 17	
6	global run		
7	set	dac0 : 18	
8	global run		
9	set	dac0 : 19	
	global run		

First though of the slow control database

Slow control setting (DAC setting & LVDS setting as example)

Main setting, distributes to all of the chips

	DAC0	DAC1	DAC2	DAC3	DAC4	DAC5	DAC6	DAC7	LVDS
	15	30	60	90	120	150	180	210	3

• • •

Special cases

	EW	barrel	NS	chip	DAC0	DAC1	DAC2	DAC3	DAC4	DAC5	DAC6	DAC7	LVDS
1	EAST	B1L112	N	4									127
2	WEST	B0L001	S	10	25								

(Add timestamp and runID ?)

⋮

Mask (bad ?) channel

	EW	barrel	NS	chip	channel
1	EAST	B1L112	N	4	127
2	WEST	B0L001	S	10	0

(Add timestamp and runID ?)

⋮

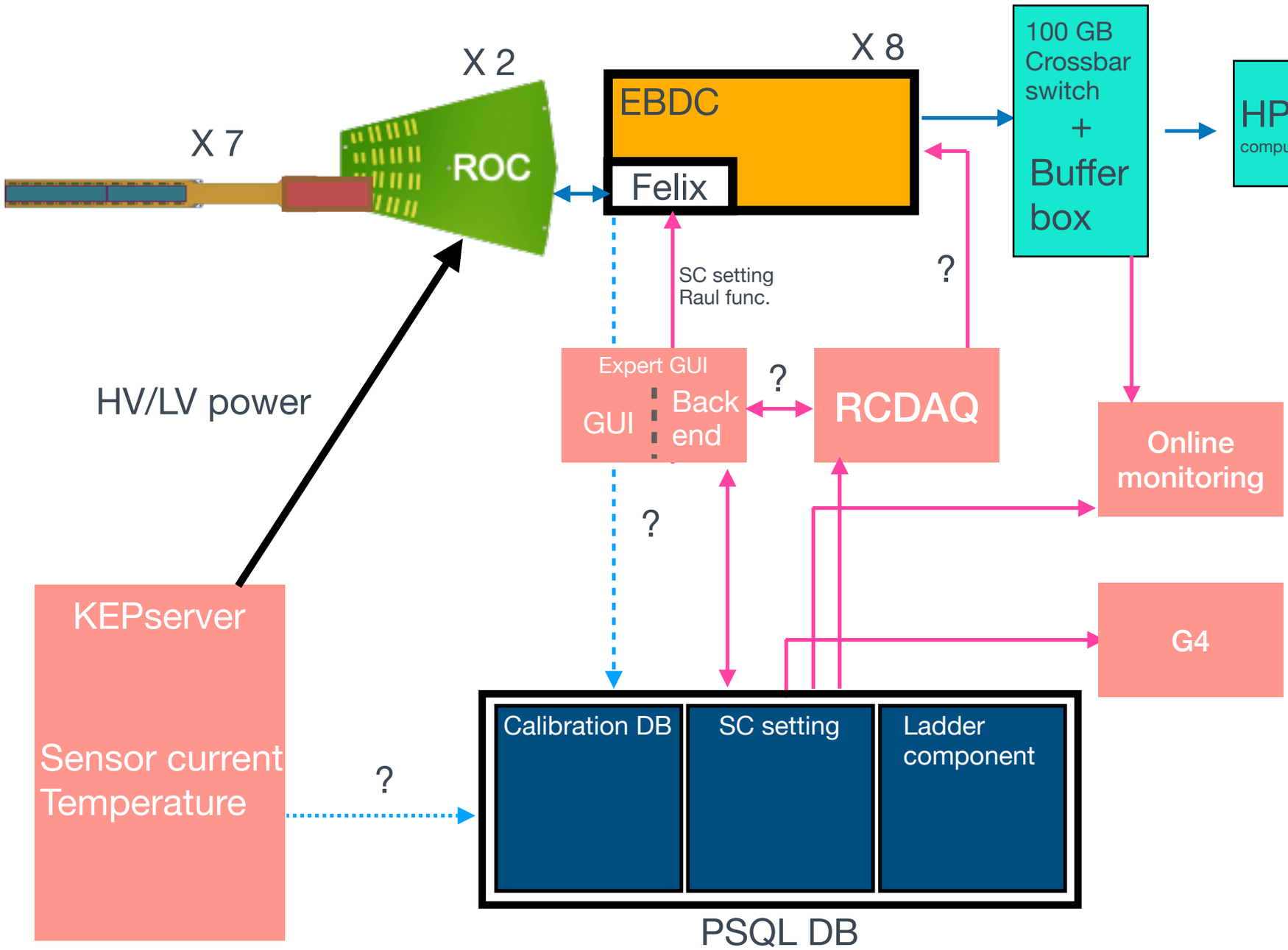
Plan of FPHX power

- Three controller boards, only one can work now. It can control up to 3 voltage supply boards now. (eventually it should control 8 boards.)
- We need at least two.
- Step 1 : We have to investigate them (IP address, etc.), how to make them work.
- Step 2 : Migrate the controlling script from Perl script to sPHENIX standard system. (OPC3 -> KEPserver via protocol ?)
- Step 3 : the GUI development.

- We need a way to measure the output voltage from the board.
  - Efficient, easy and remotely → Raspberry Pi + ADC module.
  - Computer from NCU → INTT gateway → Raspberry Pi.
  - Itaru wants us to send one set to BNL.

The picture of INTT software (DAQ part)

INTT will have 8 Felix boards in total. 4 Felix boards for each side (North/South).
1 Felix connects to 2 ROCs, each ROC connects to 7 ladders. (4 * 2 * 7 = 56)



CW's original thought

Calibration	Expert GUI ?
Slow control	Expert GUI/RCDaq ?
HV/LV	KEP Server
DAQ	RCdaq, but how ?

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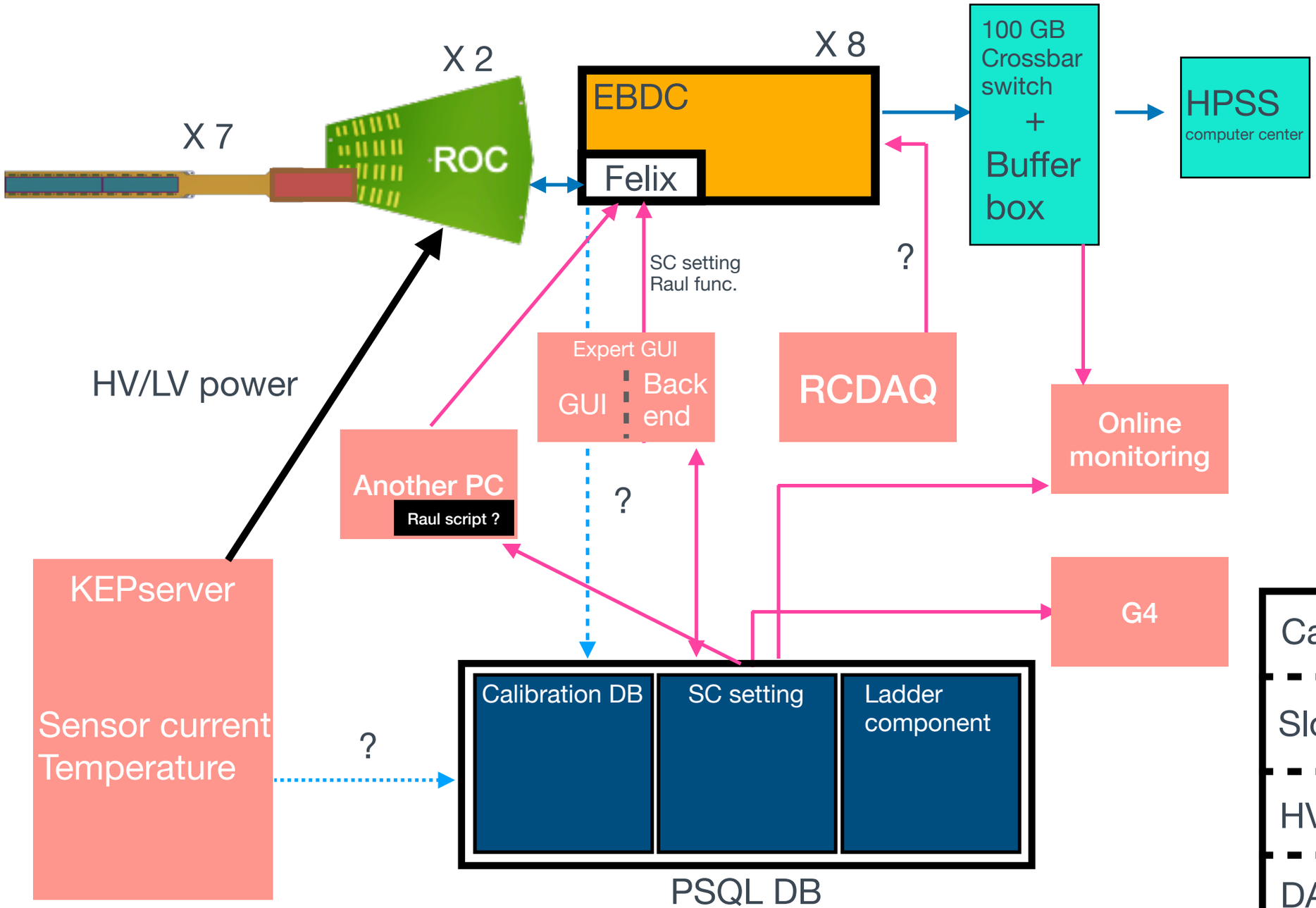
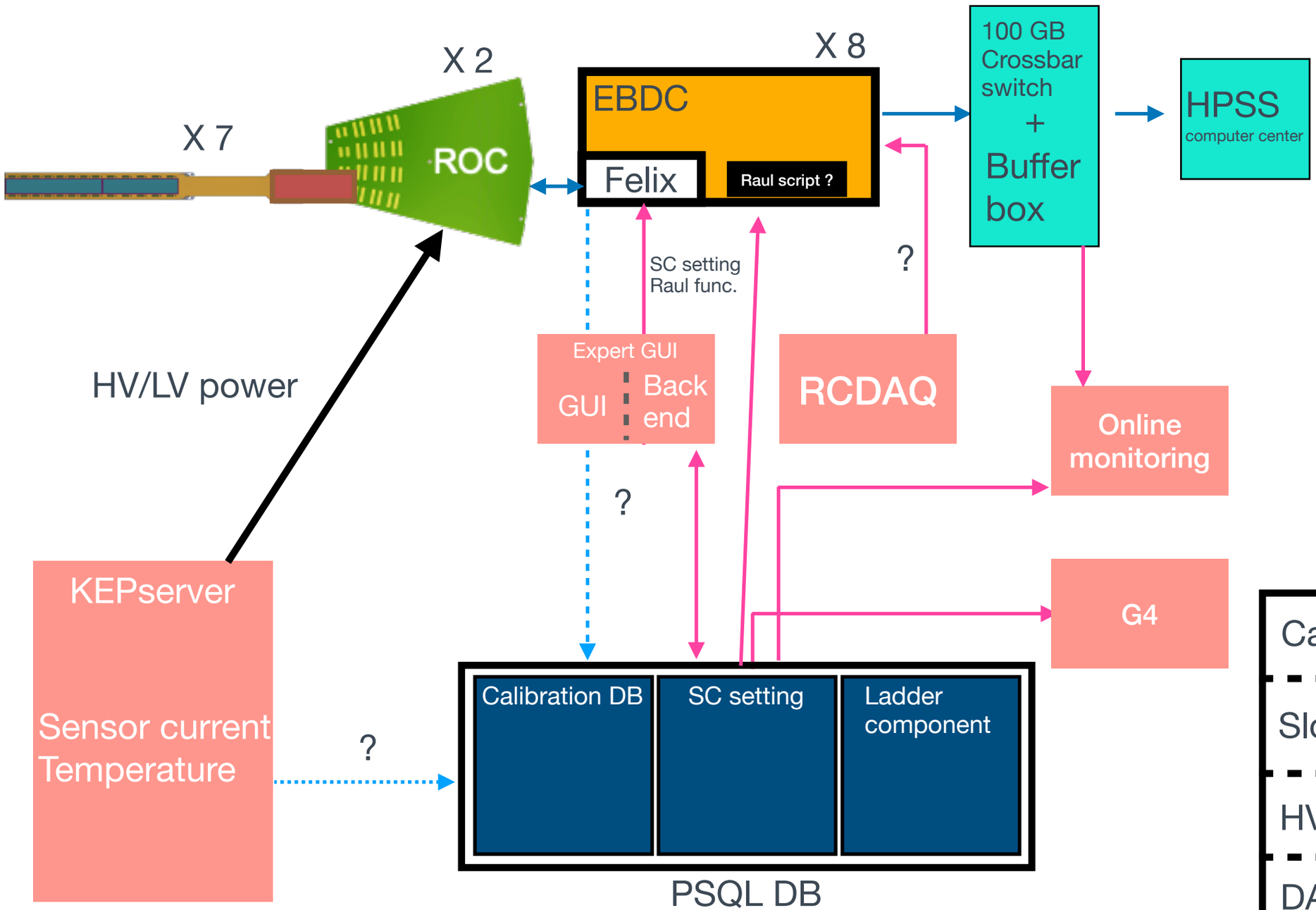


Takashi

Calibration	Expert GUI ?
Slow control	Expert GUI/RCDaq ?
HV/LV	KEP Server
DAQ	RCdaq, but how ?

The picture of INTT software (DAQ part)

INTT will have 8 Felix boards in total. 4 Felix boards for each side (North/South).
1 Felix connects to 2 ROCs, each ROC connects to 7 ladders. (4 * 2 * 7 = 56)



Summary

- The format of the calibration table is updated. The number of the table is reduced by 1, and the time tamp is added.

- The function to record the action of Expert_GUI to the PSQL is feasible.

- To do :
  - Implement PSQL in the Felix-2 server, and test it.

Back up

PSQL with ROOT/C++

- It’s feasible, the root “TSQLServer” class is in root.
- Besides, other package supports the connection of C++ and PSQL

From sheet to PSQL - procedures

B0L0			Hardware Componenents			Calibration Test							
						South				North			
	ID	Ladder Position	Ladder Name	HDI South/North	BEX South/North	Current SA/SB [nA]	TA/TB [Celsius]	File Name	Status	Current SA/SB [nA]	TA/TB [Celsius]	File Name	Status
1	EAST	B0L000	PB1-L008	201/202	028/025	400/200	22.6/23.0	20220822-1822,5	1	355/400	23.5/22.6	20220823-1253,6	1
2		B0L001	PB1-L005	038/039	026/023	407/359	23.1/22.9	20220818-1643,8	1	360/410	22.7/22.3	20220823-1326,6	1
3		B0L002	PB1-L031	281/288	004/003	402/340	23.0/23.0	20220818-1628,8	1	342/358	22.3/22.0	20220823-1410,8	1
4		B0L003	PB1-L013	217/218	018/019	400/310	22.7/34.2	20220812-1709,8	1	274/299	22.5/22.0	20220811-1127,8	1
5		B0L004	PB1-L027	279/280	022/005	400/370	22.6/22.3	20220822-1607,8	1	404/376	21.3/21.3	20220823-1452,8	1
6		B0L005	PB1-L009	199/200	024/021	391/364	22.3/21.9	20220822-1720,6	1	419/358	23.1/22.6	20220823-1538,8	1
7	WEST	B0L006	PB1-L034	302/307	016/017	354/313	23.6/-7.2	20220812-1825,8	1	221/276	22.5/22.0	20220811-1251,8	1
8		B0L007	PB1-L020	282/283	014/015	391/370	22.7/22.3	20220812-1736,8	1	92/240	22.7/22.1	20220811-1229,8	1
9		B0L008	PB1-L017	213/214	010/011	391/376	22.5/22.1	20220812-1722,8	1	411/299	22.6/21.7	20220811-1143,8	1
10		B0L009	PB1-L010	197/198	006/007	368/347	23.4/23.0	20220818-1710,8	1	387/350	23.4/22.8	20220823-1426,8	1
11		B0L010	PB1-L006	040/206	008/009	393/369	21.3/21.5	20220812-1703,8	1	276/249	23.2/22.6	20220811-1103,8	1
12		B0L011	PB1-L021	284/285	012/013	374/381	23.1/22.9	20220816-1634,8	1	369/297	23.1/22.4	20220811-1035,8	1

Request the information via google sheet API.

Python → Re-organize the information → Fill the information to PSQL via the package psycopg2. → PSQL

Advantages :

1. All can be done in python
2. Easy to update

Practice status - contents of tables

In PSQL

Two weeks ago

Main table

id	barrel_id	ladder_position	ladder_name	component_id	stave_id	cali_south_id	cali_north_id
1	EAST	B1L000	PB2-L016	1	1	1	1
2	EAST	B1L001	PB2-L020	2	2	2	2
3	EAST	B1L002	PB2-L034	3	3	3	3
4	EAST	B1L003	PB2-L049	4	4	4	4
5	EAST	B1L004	PB2-L045	5	5	5	5
6	EAST	B1L005	PB2-L001	6	6	6	6
7	EAST	B1L006	PB2-L018	7	7	7	7
8	EAST	B1L007	PB2-L026	8	8	8	8
9	WEST	B1L008	PB2-L027	9	9	9	9
10	WEST	B1L009	PB2-L011	10	10	10	10
11	WEST	B1L010	PB2-L031	11	11	11	11
12	WEST	B1L011	PB2-L008	12	12	12	12
13	WEST	B1L012	PB2-L009	13	13	13	13
14	WEST	B1L013	PB2-L038	14	14	14	14
15	WEST	B1L014	PB2-L032	15	15	15	15
16	WEST	B1L015	PB2-L030	16	16	16	16

(16 rows)

Foreign keys

Practice status - contents of tables

In PSQL

Two weeks ago

Calibration result - south

```
intt_calibration_db_test=# select * from cali_south_info;
 id | calibration_south_current_a | calibration_south_current_b | calibration_south_ta | calibration_south_tb | calibration_south_file_name | calibration_south_moduleid | calibration_south_status
----+-----------------------------+-----------------------------+----------------------+----------------------+-----------------------------+----------------------------+--------------------------
  1 |                       359.0 |                       341.0 |                 22.8 |                 22.6 | 20220826-1249               |                          8 |                        1
  2 |                       387.0 |                       361.0 |                 21.9 |                 21.6 | 20220822-1750               |                          8 |                        1
  3 |                       410.0 |                       362.0 |                 22.2 |                 22.1 | 20220816-1741               |                          8 |                        1
  4 |                       200.0 |                       370.0 |                 23.1 |                 -5.2 | 20220822-1843               |                          8 |                        1
  5 |                       297.0 |                       291.0 |                 23.3 |                -17.6 | 20220817-1526               |                          8 |                        1
  6 |                       407.0 |                       362.0 |                 22.6 |                 22.3 | 20220818-1813               |                          8 |                        1
  7 |                       370.0 |                       279.0 |                 22.8 |                 22.5 | 20220822-1540               |                          8 |                        1
  8 |                       382.0 |                       385.0 |                 22.8 |                 22.6 | 20220822-1718               |                          6 |                        1
  9 |                       373.0 |                       354.0 |                 23.5 |                 23.2 | 20220812-1851               |                          8 |                        1
 10 |                       395.0 |                       365.0 |                 22.3 |                 22.2 | 20220812-1808               |                          8 |                        1
 11 |                       394.0 |                       271.0 |                 23.3 |                  4.2 | 20220810-1348               |                          8 |                        1
 12 |                       394.0 |                       371.0 |                 23.3 |                -13.8 | 20220811-1048               |                          8 |                        1
 13 |                       374.0 |                       385.0 |                 23.3 |                 -7.5 | 20220812-1111               |                          8 |                        1
 14 |                        13.0 |                       342.0 |                 23.1 |                 22.9 | 20220826-1737               |                          8 |                        1
 15 |                       383.0 |                       395.0 |                 23.2 |                 22.8 | 20220816-1620               |                          8 |                        1
 16 |                       358.0 |                       376.0 |                 23.5 |                 23.8 | 20220816-1613               |                          8 |                        1
(16 rows)
```

Calibration result - north

```
intt_calibration_db_test=# select * from cali_north_info;
 id | calibration_north_current_a | calibration_north_current_b | calibration_north_ta | calibration_north_tb | calibration_north_file_name | calibration_north_moduleid | calibration_north_status
----+-----------------------------+-----------------------------+----------------------+----------------------+-----------------------------+----------------------------+--------------------------
  1 |                       359.0 |                       341.0 |                 22.8 |                 22.6 | 20220826-1249               |                          8 |                        1
  2 |                       396.0 |                       360.0 |                 22.6 |                 22.0 | 20220823-1352               |                          8 |                        1
  3 |                       380.0 |                       230.0 |                 22.0 |                 22.9 | 20220823-1357               |                          8 |                        1
  4 |                       400.0 |                       350.0 |                 21.4 |                 21.5 | 20220823-1416               |                          8 |                        1
  5 |                       391.0 |                       362.0 |                 23.6 |                 38.1 | 20220823-1438               |                          8 |                        1
  6 |                       407.0 |                        30.0 |                 23.3 |                 22.6 | 20220823-1506               |                          8 |                        1
  7 |                       407.0 |                       376.0 |                 22.9 |                 22.2 | 20220823-1527               |                          8 |                        1
  8 |                       362.0 |                       350.0 |                 22.7 |                 22.2 | 20220823-1520               |                          8 |                        1
  9 |                       299.0 |                       295.0 |                 23.2 |                 22.6 | 20220810-1809               |                          8 |                        1
 10 |                       410.0 |                       292.0 |                 23.3 |                 22.7 | 20220810-1800               |                          8 |                        1
 11 |                       416.0 |                       301.0 |                 21.0 |                -14.8 | 20220810-1656               |                          6 |                        1
 12 |                       427.0 |                       297.0 |                 23.3 |                -13.8 | 20220810-1638               |                          6 |                        1
 13 |                       416.0 |                       299.0 |                 23.2 |                -16.6 | 20220810-1718               |                          6 |                        1
 14 |                       290.0 |                       297.0 |                 23.1 |                 22.3 | 20220810-1732               |                          6 |                        1
 15 |                      -402.0 |                      -262.0 |                 23.3 |                -10.6 | 20220810-1824               |                          8 |                        1
 16 |                       257.0 |                       260.0 |                 23.1 |                 22.1 | 20220810-1834               |                          8 |                        1
```

Practice status - contents of tables

In PSQL

NO update

Stave information

```
intt_calibration_db_test=# select * from stave_info;
 id | stave_survey_status | stave_gnd_wire_stave | stave_glue_tc_connect | stave_cooling_test | stave_silver_epoxy | stave_grounding_confirmed
----+---------------------+----------------------+-----------------------+--------------------+--------------------+---------------------------
  1 |                   1 |                    1 |                     1 |                  1 |                  1 |                         1
  2 |                   1 |                    1 |                     1 |                  1 |                  1 |                         1
  3 |                   1 |                    1 |                     1 |                  1 |                  1 |                         1
  4 |                   1 |                    1 |                     1 |                  1 |                  1 |                         1
  5 |                   1 |                    1 |                     1 |                  1 |                  1 |                         1
  6 |                   1 |                    1 |                     1 |                  1 |                  1 |                         1
  7 |                   1 |                    1 |                     1 |                  1 |                  1 |                         1
  8 |                   1 |                    1 |                     1 |                  1 |                  1 |                         1
  9 |                   1 |                    1 |                     1 |                  1 |                  1 |                         1
 10 |                   1 |                    1 |                     1 |                  1 |                  1 |                         1
 11 |                   1 |                    1 |                     1 |                  1 |                  1 |                         1
 12 |                   1 |                    1 |                     1 |                  1 |                  1 |                         1
 13 |                   1 |                    1 |                     1 |                  1 |                  1 |                         1
 14 |                   1 |                    1 |                     1 |                  1 |                  1 |                         1
 15 |                   1 |                    1 |                     1 |                  1 |                  1 |                         1
 16 |                   1 |                    1 |                     1 |                  1 |                  1 |                         1
(16 rows)
```

Component information (HDI ID & BEC ID)

Coaxial cable ID in the future

```
intt_calibration_db_test=# select * from component_info;
 id | hdi_south | hdi_north | bex_south | bex_north
----+-----------+-----------+-----------+-----------
  1 | 242       | 243       | 67        | 70
  2 | 149       | 150       | 69        | 72
  3 | 310       | 311       | 71        | 74
  4 | 374       | 375       | 73        | 76
  5 | 366       | 367       | 75        | 78
  6 | 017       | 018       | 77        | 80
  7 | 194       | 195       | 79        | 82
  8 | 291       | 292       | 81        | 84
  9 | 293       | 294       | 51        | 54
 10 | 232       | 233       | 53        | 56
 11 | 187       | 188       | 55        | 58
 12 | 226       | 227       | 57        | 60
 13 | 228       | 229       | 59        | 62
 14 | 386       | 387       | 61        | 64
 15 | 303       | 304       | 63        | 66
 16 | 300       | 301       | 65        | 68
(16 rows)
```