

# Low Voltage GUI Development

March 3<sup>rd</sup> 2023

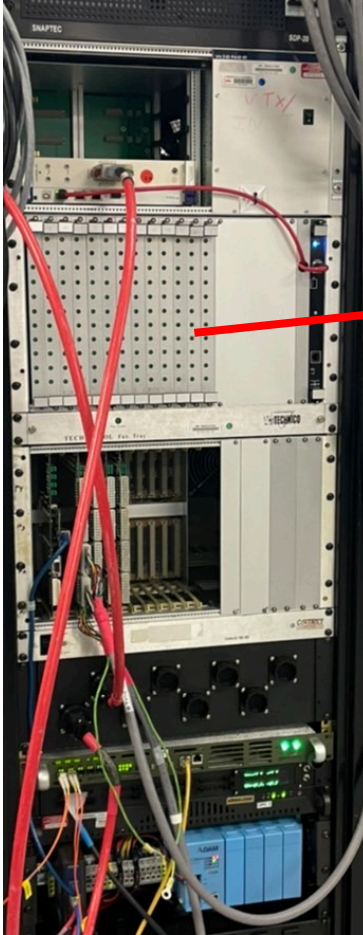
Mai WATANABE, Maya SHIMOMURA

Nara Women's University

# Power supply (LV) for INTT

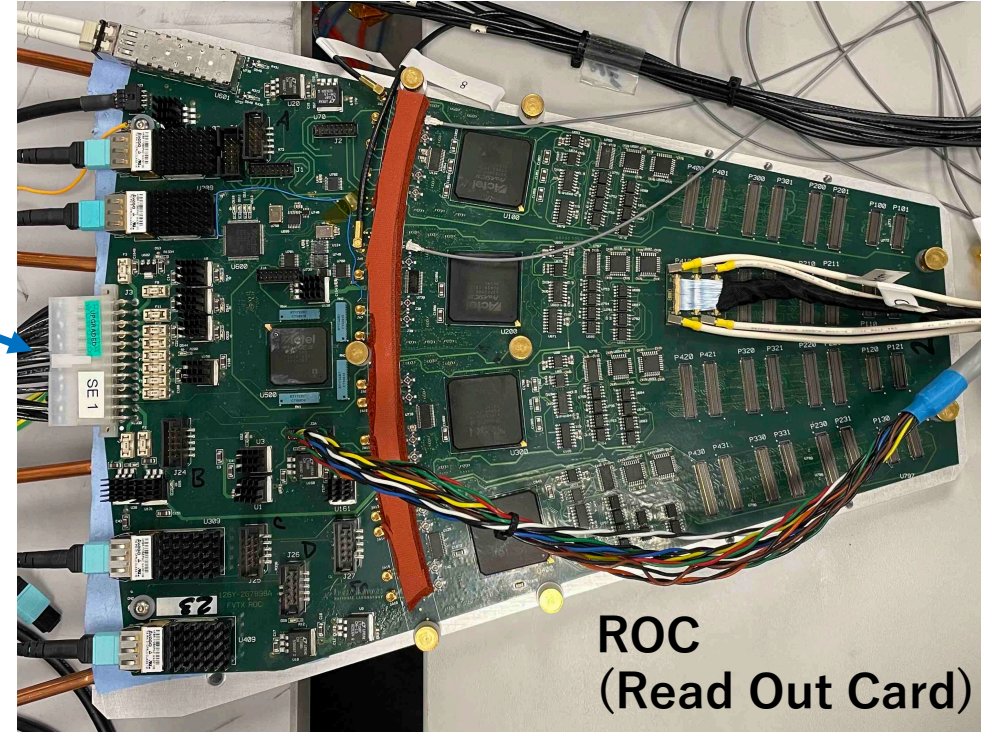
Rack @Silicon Lab  
(BNL 510C)

More info : [https://wiki.sphenix.bnl.gov/index.php/INTT\\_LV\\_system](https://wiki.sphenix.bnl.gov/index.php/INTT_LV_system)



**“LV distribution module”**  
LV for ROC and LV filter board

- The two racks are ready in 1008.
- 2W1 → 2<sup>nd</sup> floor West South
  - 2W3 → 2<sup>nd</sup> floor West North
  - (don't touch 2W2)



**ROC**  
(Read Out Card)

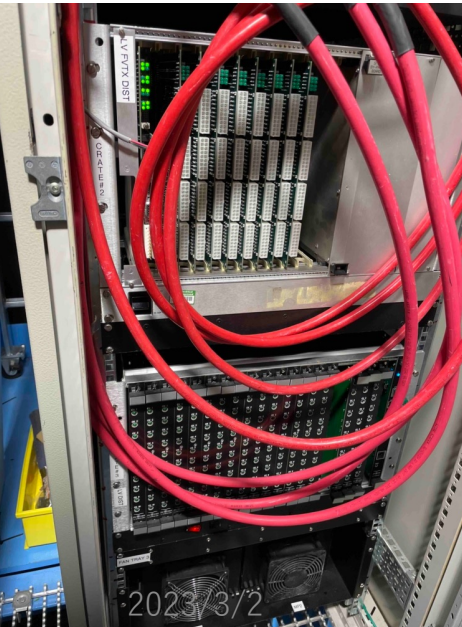
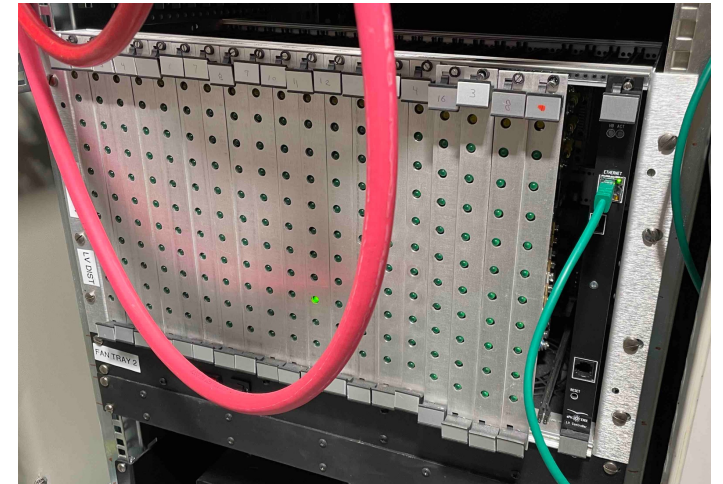
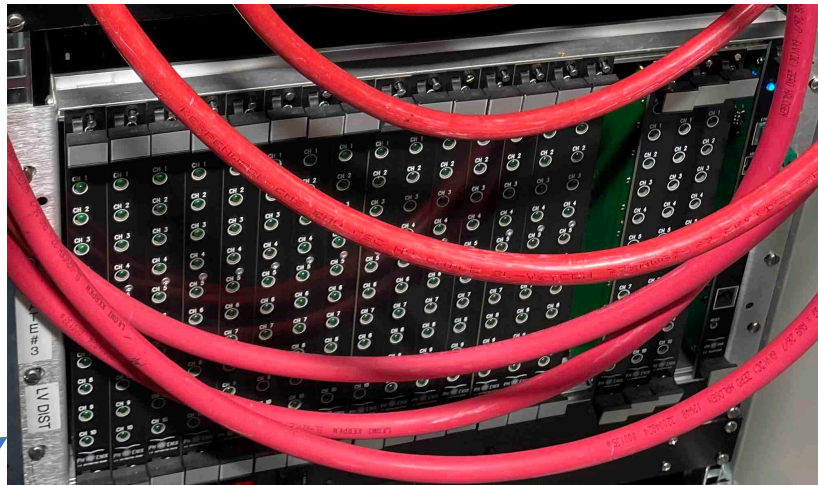
# LV slots in racks at 1008

The two racks for INTT in 1008.

- 2W1 → 2<sup>nd</sup> floor West South
- 2W3 → 2<sup>nd</sup> floor West North
- (don't touch 2W2)

Rack 2W1

Rack 2W3

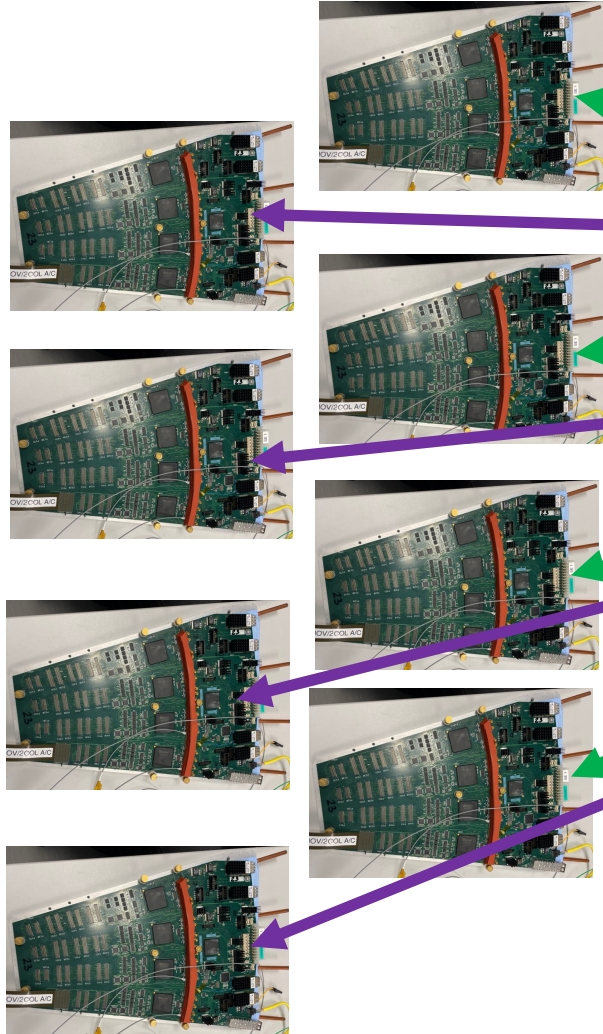


There are enough LV slots in each rack.



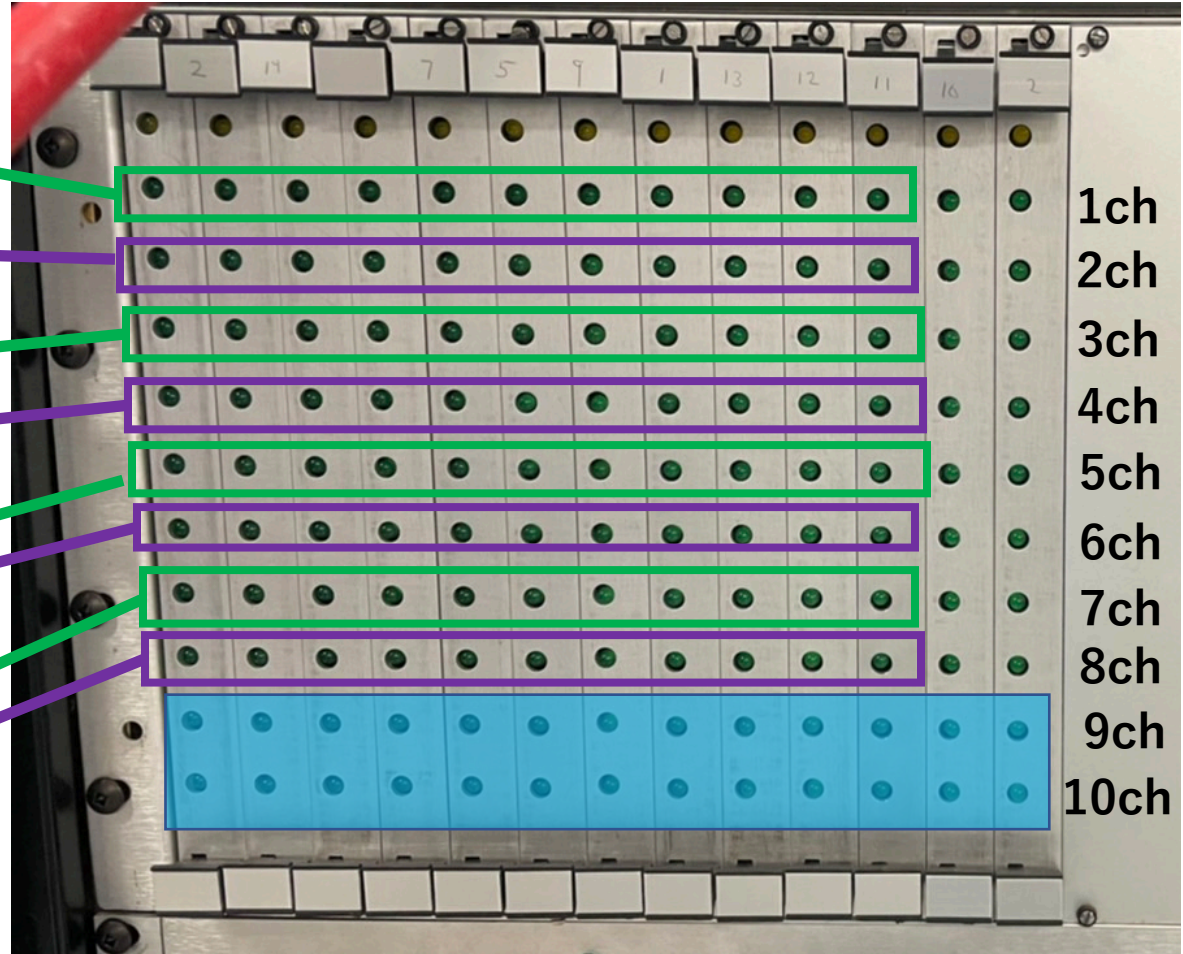
# LV Configure

8 ROCs



2023/3/2

To 1 ROC



LV GUI

# The GUI “LV2 2W1” and “LV 2W3”

*Mai made these ROC by ROC GUIs, Alarms and Detail GUIs.*

ROC by ROC GUI

INTT LV and Thermistors - Main Window

Current Time: 03/02/2023 05:00 午後

Logged In: sPHENIX

2W1 Unipolar

LV 2 2W1

2W3 Unipolar

LV 2W3

2W1 FVTX

2W3 FVTX

North Thermistors

South Thermistors

ROC1

ROC1

ROC2

ROC3

ROC4

ROC5

ROC6

ROC7

ROC8

1

2

3

4

5

6

7

8

9

10

11

ALL ON

ALL OFF

Detail

1

2

3

4

5

6

7

8

9

10

11

ALL ON

ALL OFF

Detail

1

2

3

4

5

6

7

8

9

10

11

ALL ON

ALL OFF

Detail

1

2

3

4

5

6

7

8

9

10

11

ALL ON

ALL OFF

Detail

1

2

3

4

5

6

7

8

9

10

11

ALL ON

ALL OFF

Detail

1

2

3

4

5

6

7

8

9

10

11

ALL ON

ALL OFF

Detail

1

2

3

4

5

6

7

8

9

10

11

ALL ON

ALL OFF

Detail

1

2

3

4

5

6

7

8

9

10

11

ALL ON

ALL OFF

Detail

ALL ON

ALL OFF

	Active Time	Display Path	Current State	Priority	Event Id	Label
<input type="checkbox"/>	2023/02/28 14:49	VESDA/Urgent_Fault/Alarm	Active, Unacknowledged	Critical	11ae632f-2f3...	Urgent_Fault
<input type="checkbox"/>	2023/02/23 8:35	UPS/Ancillary/Ancillary_PS...	Active, Unacknowledged	High	bbeaff81-c77...	PSU0 DC Oper...
<input type="checkbox"/>	2023/02/28 12:38	Access_Controls/Mode_8o...	Active, Unacknowledged	High	74c4b2e9-77...	Mode 8_17 De...
<input type="checkbox"/>	2023/03/01 12:38	Gas_Mix/Gas_Mixing_Hous...	Active, Unacknowledged	High	6c6bfef9-457...	KDR1 Detected
<input type="checkbox"/>	2023/03/02 13:40	3B1 above normal op temp.	Active, Unacknowledged	High	80c42196-07...	Above normal...
<input type="checkbox"/>	2023/02/27 11:02	UPS in battery operation.	Active, Unacknowledged	Low	460becec-a6...	Battery mode
<input type="checkbox"/>	2023/02/28 14:49	VESDA/Action/Alarm	Active, Unacknowledged	Low	01a8ec3b-bb...	Action
<input type="checkbox"/>	2023/03/01 7:51	Access_Controls/_8X_Plu...	Active, Unacknowledged	Low	f8c15bf5-1ae...	8X Plug Door ...
<input type="checkbox"/>	2023/02/28 16:35	DP_Panel/Program: 480_B	Active, Unacknowledged	Diagnostic	0077af1c-9e...	Back Room (R...

2023/3/2

2023/02/28 16:35

DP\_Panel/Program: 480\_B

Active, Unacknowledged

Diagnostic

0077af1c-9e...

Back Room (R...

2023/3/2

2023/02/28 16:35

DP\_Panel/Program: 480\_B

Active, Unacknowledged

Diagnostic

0077af1c-9e...

Back Room (R...

2023/3/2

2023/02/28 16:35

DP\_Panel/Program: 480\_B

Active, Unacknowledged

Diagnostic

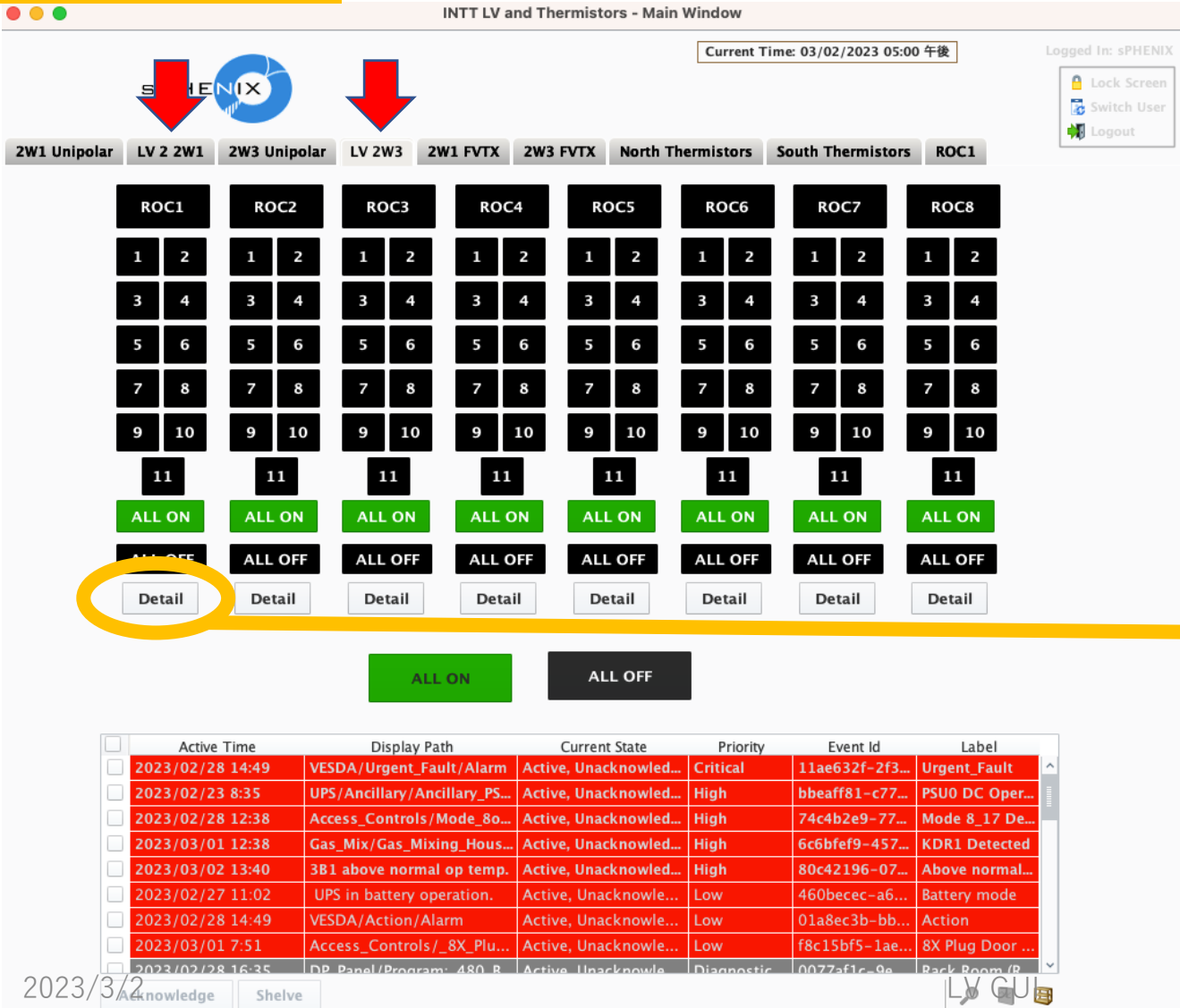
0077af1c-9e...

Back Room (R...

# The GUI “LV2 2W1” and “LV 2W3”

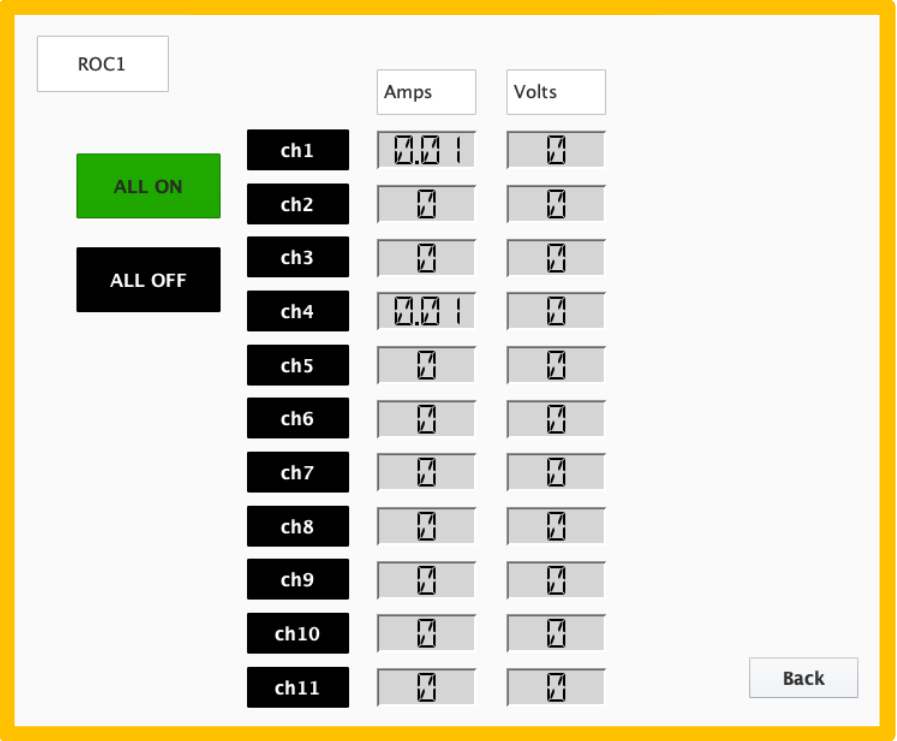
*Mai made these ROC by ROC GUIs and Detail GUIs.*

## ROC by ROC GUI



When you click “Detail”, the detail GUI of each ROC comes up. You can see the reading currents and voltages at each channel.

## Detail GUI



# The GUI “LV2 2W1” and “LV 2W3”

*Mai made these ROC by ROC GUIs, Alarms and Detail GUIs.*

## ROC by ROC GUI

- The GUI designs are finalized.
- We are still working on the scripts for each switches to improve their behavior.

INTT LV and Thermistors - Main Window

Current Time: 03/02/2023 05:00 午後

Logged In: sPHENIX

2W1 Unipolar LV 2 2W1 2W3 Unipolar LV 2W3 2W1 FVTX 2W3 FVTX North Thermistors South Thermistors ROC1

ROC1 ROC2 ROC3 ROC4 ROC5 ROC6 ROC7 ROC8

1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2

3 4 3 4 3 4 3 4 3 4 3 4 3 4 3 4

5 6 5 6 5 6 5 6 5 6 5 6 5 6 5 6

7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8

9 10 9 10 9 10 9 10 9 10 9 10 9 10 9 10

11 11 11 11 11 11 11 11

ALL ON ALL ON ALL ON ALL ON ALL ON ALL ON ALL ON ALL ON

ALL OFF ALL OFF ALL OFF ALL OFF ALL OFF ALL OFF ALL OFF ALL OFF

Detail Detail Detail Detail Detail Detail Detail Detail

ALL ON ALL OFF

Active Time	Display Path	Current State	Priority	Event Id	Label
2023/02/28 14:49	VESDA/Urgent_Fault/Alarm	Active, Unacknowledged	Critical	11ae632f-2f3...	Urgent_Fault
2023/02/23 8:35	UPS/Ancillary/Ancillary_PS...	Active, Unacknowledged	High	bbeaff81-c77...	PSU0 DC Oper...
2023/02/28 12:38	Access_Controls/Mode_8o...	Active, Unacknowledged	High	74c4b2e9-77...	Mode 8_17 De...
2023/03/01 12:38	Gas_Mix/Gas_Mixing_Hous...	Active, Unacknowledged	High	6c6bfef9-457...	KDR1 Detected
2023/03/02 13:40	3B1 above normal op temp.	Active, Unacknowledged	High	80c42196-07...	Above normal...
2023/02/27 11:02	UPS in battery operation.	Active, Unacknowledged	Low	460becec-a6...	Battery mode
2023/02/28 14:49	VESDA/Action/Alarm	Active, Unacknowledged	Low	01a8ec3b-bb...	Action
2023/03/01 7:51	Access_Controls/_8X_Plu...	Active, Unacknowledged	Low	f8c15bf5-1ae...	8X Plug Door ...
2023/02/28 16:35	DP_Panel/Program: 480_B	Active, Unacknowledged	Diagnostic	0077af1c-9e...	Back Room (R...

2023/3/2

ACKNOWLEDGE SHelve

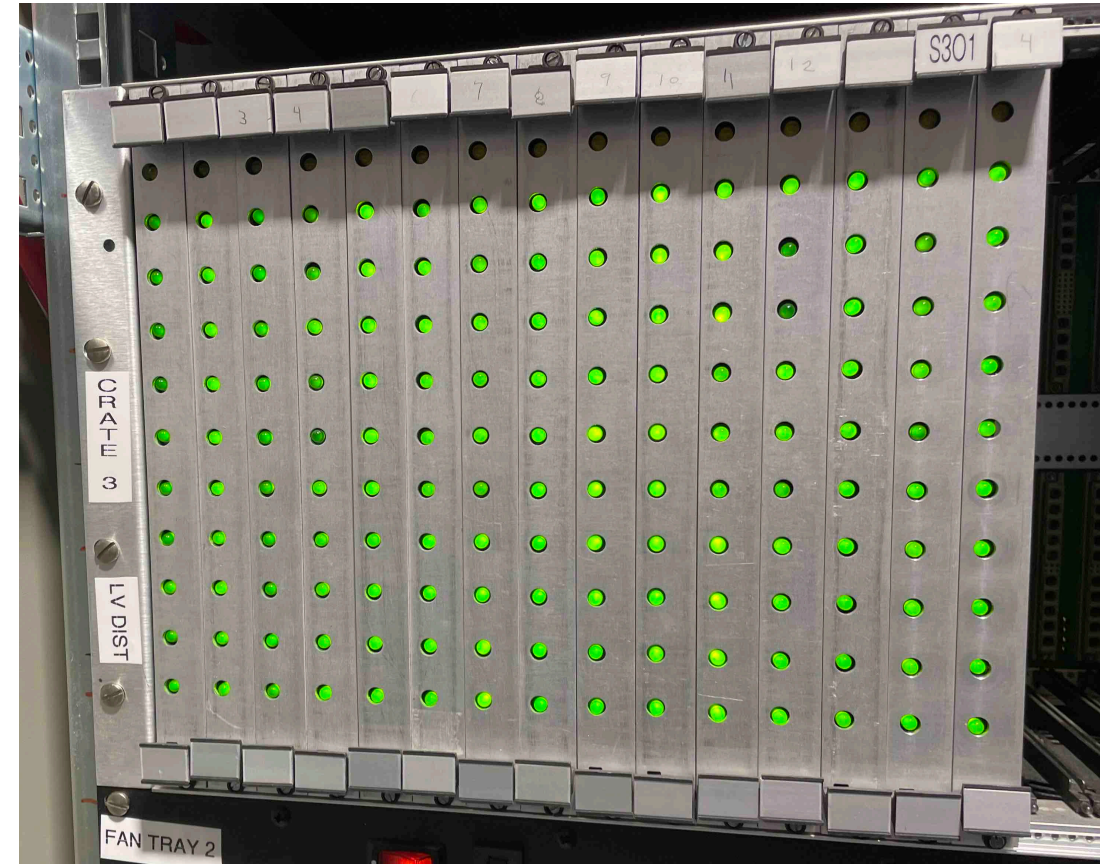
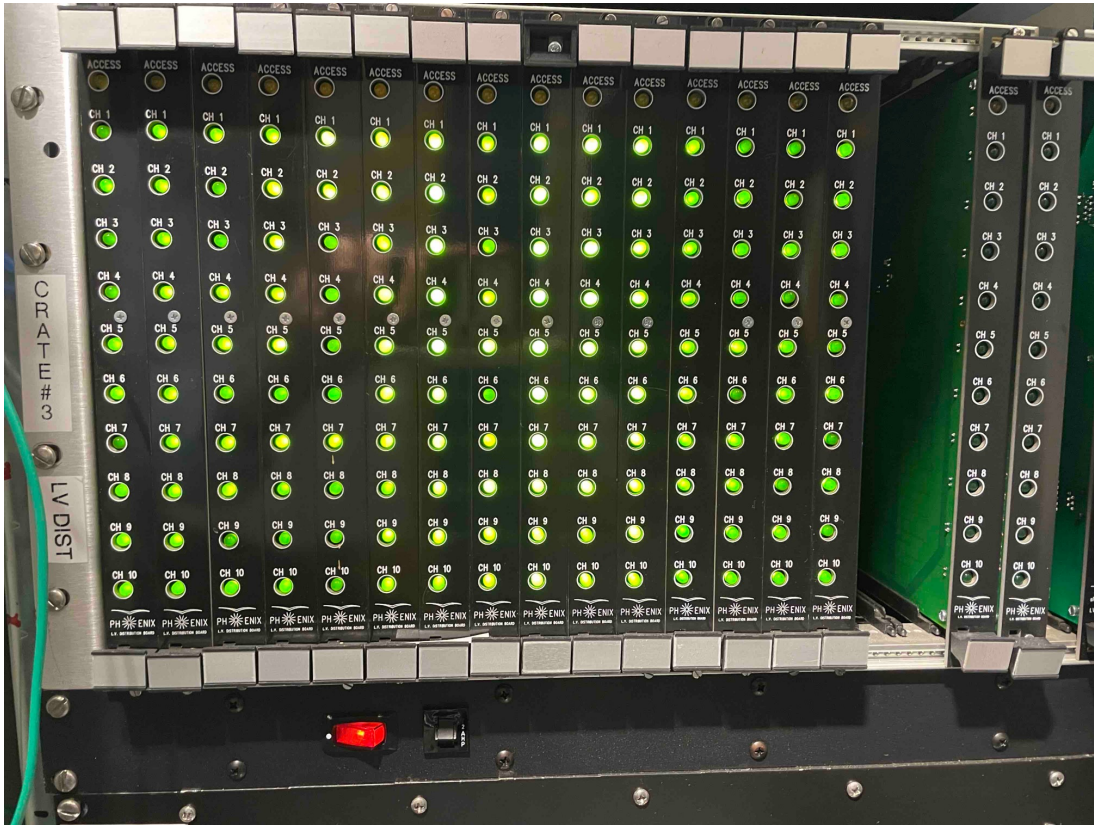
LV GUI

Use only “ALL ON” or “ALL OFF” which turn on or off all 8 ROCs together respectively.

\* We also need to tune the alarm values.



# Turn on test for the all LV slots together.



- ALL ON!
- Ready for ROC readout test.

2023/3/2

LV GUI



There are the GUI “2W1 Unipolar” and “2W3 Unipolar” which line up just same as the physical slot layout.

INTT LV and Thermistors - Main Window

Current Time: 03/02/2023 04:40 午後

Logged In: sPHENIX

Lock Screen  
Switch User  
Logout

2W1 Unipolar LV 2 2W1 **2W3 Unipolar** LV 2W3 2W1 FVTX 2W3 FVTX North Thermistors South Thermistors ROC1

INTT 2W3 Unipolar LV Dist

Slot 1	Slot 2	Slot 3	Slot 4	Slot 5	Slot 6	Slot 7	Slot 8	Slot 9	Slot 10	Slot 11	Slot 12	Slot 13	Slot 14	Slot 15	
Volts	Amps	Volts	Amps	Volts	Amps	Volts	Amps	Volts	Amps	Volts	Amps	Volts	Amps	Volts	Amps
CH0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CH1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CH2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CH3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CH4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CH5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CH6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CH7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CH8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CH9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
All On	All Off	All On	All Off	All On	All Off	All On	All Off	All On	All Off	All On	All Off	All On	All Off	All On	All Off

Crate Status

Interlocks: 0

Occupancy: 7FFF

In this GUI, you can only use “All On(Off)” which turn on(off) all LV channel at the slot.

There are the GUI “2W1 Unipolar” and “2W3 Unipolar” which line up just same as the physical slot layout.

INTT LV and Thermistors - Main Window

↓

2W1 UnipolarLV 2 2W12W3 UnipolarLV 2W32W1 FVTX2W3 FVTXNorth ThermistorsSouth ThermistorsROC1

Current Time: 03/02/2023 04:40 午後

Logged In: sPHENIX  
 Lock Screen  
 Switch User  
 Logout

### INTT 2W3 Unipolar LV Dist

		Slot 1		Slot 2		Slot 3		Slot 4		Slot 5		Slot 6		Slot 7		Slot 8		Slot 9		Slot 10		Slot 11		Slot 12		Slot 13		Slot 14		Slot 15		
		Volts	Amps	Volts	Amps	Volts	Amps	Volts	Amps	Volts	Amps	Volts	Amps	Volts	Amps	Volts	Amps	Volts	Amps	Volts	Amps	Volts	Amps	Volts	Amps	Volts	Amps	Volts	Amps	Volts	Amps	
CH0	0.00	0.0:	CH0	0.00	0.0:	CH0	0.00	0.0:	CH0	0.00	0.0:	CH0	0.00	0.0:	CH0	0.00	0.0:	CH0	0.00	0.0:	CH0	0.00	0.0:	CH0	0.00	0.0:	CH0	0.00	0.0:	CH0	0.00	0.0:
CH1	0.00	0.0:	CH1	0.00	0.0:	CH1	0.00	0.0:	CH1	0.00	0.0:	CH1	0.00	0.0:	CH1	0.00	0.0:	CH1	0.00	0.0:	CH1	0.00	0.0:	CH1	0.00	0.0:	CH1	0.00	0.0:	CH1	0.00	0.0:
CH2	0.00	0.0:	CH2	0.00	0.0:	CH2	0.01	0.0:	CH2	0.00	0.0:	CH2	0.00	0.0:	CH2	0.00	0.0:	CH2	0.00	0.0:	CH2	0.00	0.0:	CH2	0.00	0.0:	CH2	0.00	0.0:	CH2	0.00	0.0:
CH3	0.00	0.0:	CH3	0.00	0.0:	CH3	0.00	0.0:	CH3	0.00	0.0:	CH3	0.00	0.0:	CH3	0.00	0.0:	CH3	0.00	0.0:	CH3	0.00	0.0:	CH3	0.00	0.0:	CH3	0.00	0.0:	CH3	0.00	0.0:
CH4	0.00	0.0:	CH4	0.00	0.0:	CH4	0.00	0.0:	CH4	0.00	0.0:	CH4	0.00	0.0:	CH4	0.00	0.0:	CH4	0.00	0.0:	CH4	0.00	0.0:	CH4	0.00	0.0:	CH4	0.00	0.0:	CH4	0.00	0.0:
CH5	0.00	0.0:	CH5	0.00	0.0:	CH5	0.00	0.0:	CH5	0.00	0.0:	CH5	0.00	0.0:	CH5	0.00	0.0:	CH5	0.00	0.0:	CH5	0.00	0.0:	CH5	0.00	0.0:	CH5	0.00	0.0:	CH5	0.00	0.0:
CH6	0.00	0.0:	CH6	0.00	0.0:	CH6	0.01	0.0:	CH6	0.00	0.0:	CH6	0.00	0.0:	CH6	0.00	0.0:	CH6	0.00	0.0:	CH6	0.00	0.0:	CH6	0.00	0.0:	CH6	0.00	0.0:	CH6	0.00	0.0:
CH7	0.00	0.0:	CH7	0.00	0.0:	CH7	0.01	0.0:	CH7	0.00	0.0:	CH7	0.00	0.0:	CH7	0.00	0.0:	CH7	0.00	0.0:	CH7	0.00	0.0:	CH7	0.00	0.0:	CH7	4.98	0.0:	CH7	0.00	0.0:
CH8	0.00	0.0:	CH8	0.00	0.0:	CH8	0.01	0.0:	CH8	0.00	0.0:	CH8	0.00	0.0:	CH8	0.00	0.0:	CH8	0.00	0.0:	CH8	0.00	0.0:	CH8	0.00	0.0:	CH8	0.00	0.0:	CH8	0.00	0.0:
CH9	0.00	0.0:	CH9	0.00	0.0:	CH9	0.01	0.0:	CH9	0.00	0.0:	CH9	0.00	0.0:	CH9	0.00	0.0:	CH9	0.00	0.0:	CH9	0.00	0.0:	CH9	0.00	0.0:	CH9	0.00	0.0:	CH9	0.00	0.0:
All On	All Off		All On	All Off		All On	All Off		All On	All Off		All On	All Off		All On	All Off		All On	All Off		All On	All Off		All On	All Off		All On	All Off		All On	All Off	

Crate Status

Interlocks

0

Occupancy

7FFF

**In this GUI, you can only use “All On(Off)” which turn on(off) all LV channel at the slot.**

There are the GUI “2W1 Unipolar” and “2W3 Unipolar” which line up just same as the physical slot layout.

Slot 1

	Volts	Amps
CH0	0.00	0.01
CH1	0.00	0.01
CH2	0.00	0.00
CH3	0.00	0.01
CH4	0.00	0.00
CH5	0.00	0.00
CH6	0.00	0.00
CH7	0.00	0.00
CH8	0.00	0.00
CH9	0.00	0.00

All On All Off

Crate Status

Interlocks 0

Occupancy 7FFF

Slot 9 Slot 10 Slot 11 Slot 12 Slot 13 Slot 14 Slot 15

Current Time: 03/02/2023 04:40 午後

Logged In: sPHENIX

Lock Screen

Switch User

Logout

In this GUI, you can only use “All On(Off)” which turn on(off) all LV channel at the slot.



# How to operate from your computer

## Procedures 1

(0) You need the setup to login to 1008 machines with public& private keys. See Martin's instruction if you have not done yet.

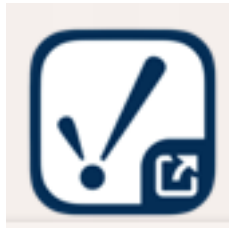
(1) Login to OPC0 as phnxrc user with port-forwarding.

```
~ % ssh -l phnxrc opc0.sphenix.bnl.gov -L 8088:localhost:8088
```

After entering your passphrase, you need to enter phnxrc password

```
phnxrc@opc0.sphenix.bnl.gov's password: 
```

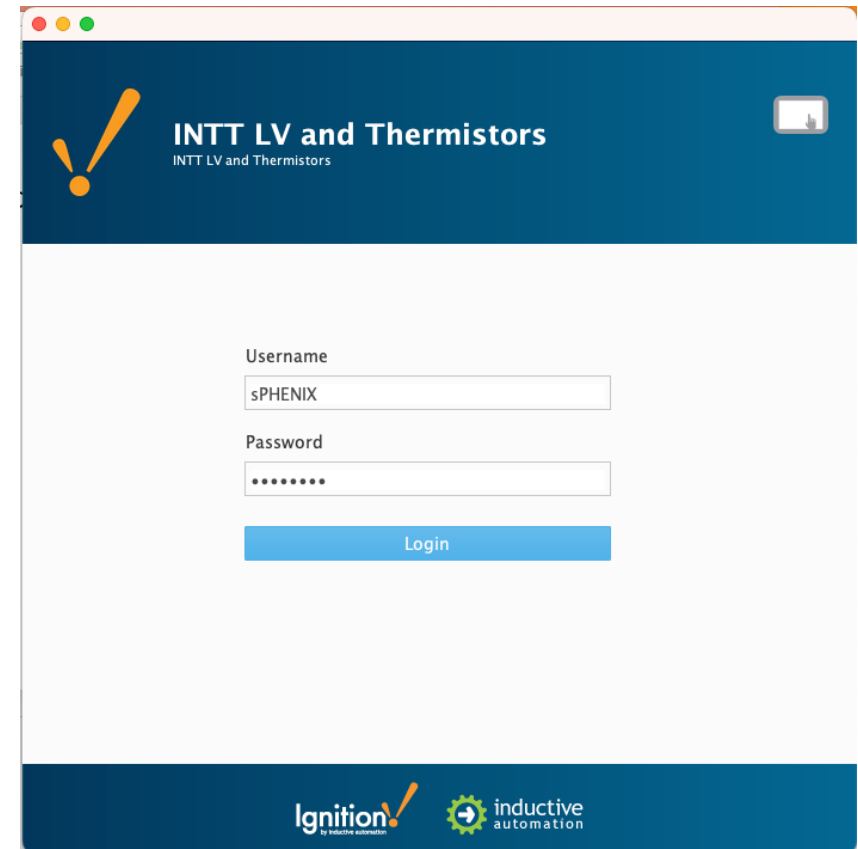
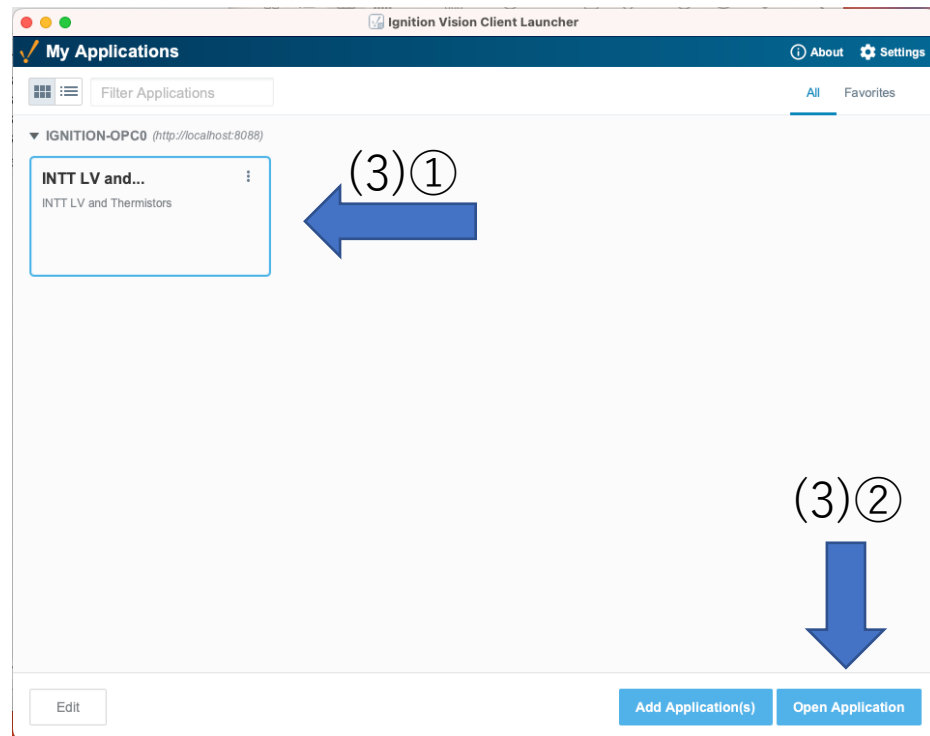
(2) Start Client Launcher. If you don't have it, you need to download.



# Procedures 2

(3)①Select “INTT LV and ...” and ②click “Open Application”

(4) Login as sPHENIX username



# You have the GUI at Client Launcher to operate LV.

INTT LV and Thermistors - Main Window

Current Time: 03/02/2023 05:00 午後

Logged In: sPHENIX

Lock Screen  
Switch User  
Logout

2W1 Unipolar LV 2 2W1 2W3 Unipolar LV 2W3 2W1 FVTX 2W3 FVTX North Thermistors South Thermistors ROC1

ROC1 ROC2 ROC3 ROC4 ROC5 ROC6 ROC7 ROC8

1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2

3 4 3 4 3 4 3 4 3 4 3 4 3 4 3 4

5 6 5 6 5 6 5 6 5 6 5 6 5 6 5 6

7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8

9 10 9 10 9 10 9 10 9 10 9 10 9 10 9 10

11 11 11 11 11 11 11 11

ALL ON ALL ON ALL ON ALL ON ALL ON ALL ON ALL ON ALL ON

ALL OFF ALL OFF ALL OFF ALL OFF ALL OFF ALL OFF ALL OFF ALL OFF

Detail Detail Detail Detail Detail Detail Detail Detail

ALL ON ALL OFF

	Active Time	Display Path	Current State	Priority	Event Id	Label
<input type="checkbox"/>	2023/02/28 14:49	VESDA/Urgent_Fault/Alarm	Active, Unacknowled...	Critical	11ae632f-2f3...	Urgent_Fault
<input type="checkbox"/>	2023/02/23 8:35	UPS/Ancillary/Ancillary_PS...	Active, Unacknowled...	High	bbeaff81-c77...	PSU0 DC Oper...
<input type="checkbox"/>	2023/02/28 12:38	Access_Controls/Mode_8o...	Active, Unacknowled...	High	74c4b2e9-77...	Mode 8_17 De...
<input type="checkbox"/>	2023/03/01 12:38	Gas_Mix/Gas_Mixing_Hous...	Active, Unacknowled...	High	6c6bfef9-457...	KDR1 Detected
<input type="checkbox"/>	2023/03/02 13:40	3B1 above normal op temp.	Active, Unacknowled...	High	80c42196-07...	Above normal...
<input type="checkbox"/>	2023/02/27 11:02	UPS in battery operation.	Active, Unacknowle...	Low	460becac-a6...	Battery mode
<input type="checkbox"/>	2023/02/28 14:49	VESDA/Action/Alarm	Active, Unacknowle...	Low	01a8ec3b-bb...	Action
<input type="checkbox"/>	2023/03/01 7:51	Access_Controls/_8X_Plu...	Active, Unacknowle...	Low	f8c15bf5-1ae...	8X Plug Door ...
<input type="checkbox"/>	2023/02/28 16:35	DP_Panel/Program: 480_B	Active, Unacknowle...	Diagnostic	0077af1c-9e...	Back Room / B

Acknowledge Shelve

LV GUI

- Use only all on(off) for now.
- Be careful when turning on/off the switch from anywhere other than 1008.



# Back Up

# Control Flow (Goal)

