

# Slow-control preparations for CDC & ECL

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# Detector Initialization

(Detector slow control)

- ▶ Before reading good sensible data, the sub-detector FEs need to be initialized or configured, also referred as detector slow control (SLC).
  - ▶ Setting thresholds, readout window sizes, taking pedestals, etc.
- ▶ SLC also includes detector monitoring – humidity, temperatures, voltages, etc.
- ▶ *Happens through the readout board (PCIe40), which interacts with the FEE over the same **B2L** (or optical link).*
- ▶ **CDC & ECL**
  - ▶ Both subdetectors use **daq\_slc** library for detector initialization, monitoring and archiving.

# Need for changes in SLC libraries

Specifically for CDC & ECL

- ▶ COPPER board → connects to a max. of 4 frontends (through HSLBs)
- ▶ New PCIe40 board → connects to a max. of 48 frontends
- ▶ COPPER & HSLB library functions need to be replaced with those in PCIe40 software library
- ▶ New NSM nodes need to be incorporated in the existing NSM network
- ▶ Additionally, we want to keep support for the COPPER boards in **daq\_slc**, at least for some time after the DAQ upgrade is complete
  - ▶ This helps to quickly switch back to COPPER boards in case an unknown issue/bug surfaces with the upgraded setup
  - ▶ Also, having everything in the same library allows us to distribute it to all ROPCs and other servers downstream, irrespective of the choice of readout board

# Current state of SLC for CDC & ECL

- ▶ All necessary modifications in slow-control functions for CDC and ECL have already been made and thoroughly tested at KEK

● - Completed ● - Ongoing ● - To do

	CDC	ECL
DAQ SLC	●	●
Config & DB files	●	●
NSM variables & EPICS PVs	●	●
CSS RC GUI	●	●
DAQ restart entries	●	●
For ROPCs, HLTs, & STOREs	●	●
TTD entries	●	●
Header files & DB tables (ttdb, namedb, maskdb)	●	●
DAQ	●	●
Local run	●	●
Global run	●	●
High-rate tests	●	●
Long-term stability	●	●
Unpackers	●	●
CDC, ECL, & ECLTRG	●	●
DQM plots for COSMICs	●	●

# Hardware changes made in E-Hut

- 3 new ROPCs for ECL (***recl1***, ***recl2***, ***recl3***)
- 7 new ROPCs for CDC (***rcdc1***, ***rcdc2***, ..., ***rcdc7***)
- All members of ***cdc/ec1*** and ***daq*** groups can login to these machines from ***bdaq***
- Other necessary equipment for DAQ upgrade has also been setup in E-hut
  - 1 PCIe40 board/ROPC
  - 25G ethernet cards
  - Patch panels near COPPER crates for easy connection to the PCIe40 boards
  - Necessary optical fibers

# Software changes

- ▶ PCIe40 firmware and software aims at keeping most software functionalities of COPPER boards intact.
- ▶ To avoid confusion though, the low-level COPPER commands like, ***reghs, readhs, staths***, etc. have been renamed for PCIe40. Any script using these commands need to be updated for it to work with PCIe40.
- ▶ The following software repository have been changed:
  - ▶ **daq\_slc**
  - ▶ **daq\_restart**
  - ▶ **daq\_rc\_gui**
  - ▶ **DAQ software** (part of basf2)
  - ▶ Unpacker module (part of basf2), offline standalone unpacker (if exists!)
  - ▶ Any other monitoring/initialization/configuration codes/scripts based on these...

# New SLC Commands

## PCIe40 equivalents

- ▶ The basic register read/write function now has a different syntax:

**reghs -[a...d] fee32 [addr] [value] → pcie40\_regconfig --ch [0...47] --fee32 -r/w [addr] [value]**

- ▶ *Note:* **pcie40\_regconfig** can also be used to read/write registers on PCIe40.
- ▶ **pcie40\_regconfig** does not support N-times read/write, like **reghsx** did, but you can loop.
- ▶ A sequence of addr, value pairs with a single call to **pcie40\_regconfig** is also not supported but again you can loop.
- ▶ **pcie40\_regconfig** also doesn't support writing registers to multiple channels (or FEEs) at the same time in a single call (work in progress).
- ▶ Other equivalent commands:

**staths -[a...d] → pcie40\_statlink --ch [0...47] --fee**

**readhs -[#events] -[a...d] [file] → pcie40\_dmahighrate --mode <MODE> --file <FILENAME> --nEvents <#EVTS>**

- ▶ **MODE (required)** can either be 0, 1, 2, or 3:  
0 for data, or 1 for internal generator, or 2 for writing all data to a file, or 3 for writing only FEE data to file.
- ▶ No equivalent of **tesths** exists for PCIe40. B2Links are established automatically.

# Examples of FE register access

8

regs

```
[purwar@b3ropc02 Scripts]$ pcie40_regconfig --ch 1 --fee32 -r 0x15  
reg0015 = 00000e74
```

```
[purwar@b3ropc02 Scripts]$ pcie40_regconfig --ch 1 --fee32 -w 0x15 0xe10 (always in hex)  
Write 0x00000e10 to register 0x0015
```

```
[purwar@b3ropc02 Scripts]$ pcie40_regconfig --ch 1 --fee32 -r 0x15  
reg0015 = 00000e10
```

staths

---

```
[purwar@b3ropc02 Scripts]$ pcie40_statlink --ch 1 --fee  
statlink version 3 (20210107) / PCIE40 firmware version 15.2  
memory: OK | ttd: UP | ttd clk: UP | run=: 245 | trg: 0 | trg type: 15  
PLLs:LOCKED | B2L:READY (rx:111 tx:11) | DMA:FREE ( 253693.4kB)  
CDC serial 129 version 67  
(01) b2l=UP (gbt=UP rx=UP tx=UP rxsta=READY txsta=READY mask=UNMASK)  
(01) event=280603112 total=-1660774.9kB (avg=-5.9186B last=38 max=194 B)  
(01) full=0 feecrcerr=242 check=NG rxrcrcerr=4319, check=0  
(01) no b2link error
```



# Changes in CDC naming conventions

## Affects **only CDC**

- Changes have been made in naming conventions for NSM variables, database entries, EPICS PVs (or aliases) in **daq\_slc**.
- Idea is to get rid of COPPER and HSLB references from the names to avoid PCIe40 to COPPER mapping everywhere.

Reference	Current setup (COPPER/HSLB)	Upgraded setup (with PCIe40)
DB entries	cdc:fee:CPR20XX:y:suppress:	cdc:I:fee:PCIE40LINKJJ:suppress:
NSM variables	CPR20XX@cdc[j]:tem	PCIE40LINKJJ@cdc[i]:tem
EPICS PVs	CDC:CPR20XX:FEE:Y:Tem:F	CDC:I:FEE:JJ:Tem:F
	XX: {00..75} Y: {A..D}, y: {a..d} j: {0..3}	I: {1..7} JJ: {0..43} i: {0..299}

# Mapping from CDC COPPERs to PCIe40s

## Current System

COPPER IDs	# B2Links
2001-2009	36
2010-2017	32
2018-2025	32
2026-2034	36
2035-2042	32
2043-2050	32
2051-2059	35
2060-2067	32
2068-2075	32
<b>75 CPRs</b>	<b>299</b>

## New System

ROPC	PCIE40LINK Nodes	# B2Links	COPPER/HSLB
rcdc1	0-42	43	2001a - 2011c
rcdc2	0-42	43	2011d - 2022b
rcdc3	0-42	43	2022c - 2033a
rcdc4	0-42	43	2033b - 2043d
rcdc5	0-42	43	2044a - 2054c
rcdc6	0-42 (5)	42	2054d - 2065b
rcdc7	0-41	42	2065c - 2075d
<b>TOTAL</b>	<b>7 PCIe40s/ROPCs</b>	<b>299</b>	

# Mapping from ECL COPPERs to PCIe40s

## Current System

COPPER IDs	# B2Links
5001-5009	18
5010-5018	18
6001-6008, cpr13001	17
<b>27 CPRs</b>	<b>53</b>

## New System

ROPC	PCIE40LINK Nodes	# B2Links	COPPER/HSLB
rec1	0-17	18	5001a – 5009b
rec2	0-17	18	5010a - 5018b
rec3	0-16	17	6001a – 6008b, cpr13001
<b>TOTAL</b>	<b>3 PCIe40s/ROPCs</b>	<b>53</b>	

# daq\_restart

- ▶ Necessary modifications in **daq\_restart** (**restart.sh** script) have already been made for:
  - ▶ 7 new CDC ROPCs: (**rcdc** → **rcdc1, rcdc2, ..., rcdc7**) and,
  - ▶ 3 new ECL ROPCs: (**recl** → **recl1, recl2, recl3**)

```
restart.sh rcdc start/stop
```

```
restart.sh recl start/stop
```

- ▶ Necessary modifications for assigned HLT worker nodes and store server for local runs have also been made.

# New CDC RC GUI

Console RCControlMain.opi RC SVD RC CDC

**RC\_CDC** Run # : 10 CDC@RC:cosmic:2...

**READY**

STORE\_RCDC **READY**

RC\_HLT\_RCDC **READY**

CDC **READY**

TTD\_CDC **READY**

START

ABORT

BOOT

**FTSW #200 ERROR** resettt statit

Trigger type  Run start at 2022-06-25 04:36:55

Trigger limit  Run time 28[sec]

Dummy rate  [Hz] Trigger in 1000.6 [Hz]

Max time  [us] Trigger out 0.0 [Hz]

Max trig  Input count 28093

Output count 0

**STORE\_RCDC READY**

Run type   eb2rx  input

Event rate [kHz]  Event size [kB]

Event counter

Flow rate [MB/s]  File size [MB]

# of files

**CDC** Run # : 10

**READY**

RCDC1 **READY**

RCDC2 **READY**

RCDC3 **READY**

RCDC4 **READY**

RCDC5 **READY**

RCDC6 **READY**

RCDC7 **READY**

START

ABORT

BOOT

**RC\_HLT\_RCDC** Run # : 0

**READY**

HLTIN\_RCDC **READY**

HLTOUT\_RCDC **READY**

EB1\_RCDC **READY**

HLTWK13\_RCDC **READY**

HLTWK14\_RCDC **READY**

DQM\_RCDC **READY**

START

ABORT

BOOT

**Load & Apply Mask**

**Save & Apply Mask**

rcdc1	rcdc2	rcdc3	rcdc4	rcdc5	rcdc6	rcdc7
Hostname						
<input checked="" type="checkbox"/> rcdc1	<b>READY</b>	<b>NOTREADY</b>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Belle2link-channel						
020 - 00	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
047 - 04	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
046 - 08	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
027 - 12	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
026 - 16	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
007 - 20	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
006 - 24	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
039 - 28	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
038 - 32	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
019 - 36	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
018 - 40	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
120 - 01	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
091 - 05	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
090 - 09	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
153 - 13	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
152 - 17	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
119 - 21	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
118 - 25	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
089 - 29	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
088 - 33	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
151 - 37	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
150 - 41	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
276 - 02	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
231 - 06	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
230 - 10	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
189 - 14	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
188 - 18	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
161 - 22	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
160 - 26	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
159 - 30	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
158 - 34	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
157 - 38	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
156 - 42	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
200 - 03	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
291 - 07	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
290 - 11	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
243 - 15	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
242 - 19	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
199 - 23	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
198 - 27	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
289 - 31	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
288 - 35	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
287 - 39	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Some tips ( Updated on Feb. 18, 2022 )

- \* How to program PCIe40 firmware
- Push "Program PCIe40" and wait until the progress-bar reaches "f"
- Mask was set as before program PCIe40, refresh OPI to confirm.
- \* Mask/unmask channels
- Update channel checkboxes and push "Save & apply Mask".
- \* Load and apply the last saved mask setting
- Push "Load & Apply Mask" and then checkboxes should be updated
- Refresh OPI to confirm the update.

# Info in the new RC GUIs

ROPC RC State

RC\_CDC Run #: 10 CDC@RC:cosmic:2... CDC Run #: 10 RCDc1 READY

rcdc1 rcdc2 rcdc3 rcdc4 rcdc5 rcdc6 rcdc7

rcdc1	rcdc2	rcdc3	rcdc4	rcdc5	rcdc6	rcdc7
READY	READY	READY	READY	READY	READY	READY
SIARI	RC_HLT_RCDC	CDC	RCDC1	READY		
ABOH1	TTD_CDC					
BOOT						
FTSW #200	ERROR					
Trigger ty	Run start					
Trigger li	Run tim					
Dummy rate	Trigger in					
Max time	Trigger out					
Max trig	Input count					
	Output count					
STORE_RCDC	READY					
Run type	cdc					
Event rate [kHz]	Event size [kB]					
Flow rate [MB/s]	Event counter					
	File size [MB]					
	# of files					

rcdc1 rcdc2 rcdc3 rcdc4 rcdc5 rcdc6 rcdc7

Hostname TTD DMA DMA [kBytes] Size [Bytes] Rate [MB/s] Program PCIe40

rcdc1 **READY** **NOTREADY** [Green] [Green] [Green] 0 0 0.00 Program PCIe40

Belle2link-channel

Channel	(un)Mask	B2L Mask	B2L Status	FIFO Status	#Events
020 - 00	✓	✓	✓	✓	0
047 - 04	✓	✓	✓	✓	0
046 - 08	✓	✓	✓	✓	0
027 - 12	✓	✓	✓	✓	0
026 - 16	✓	✓	✓	✓	0
007 - 20	✓	✓	✓	✓	0
006 - 24	✓	✓	✓	✓	0
039 - 28	✓	✓	✓	✓	0
038 - 32	✓	✓	✓	✓	0
019 - 36	✓	✓	✓	✓	0
018 - 40	✓	✓	✓	✓	0
120 - 01	✓	✓	✓	✓	0
091 - 05	✓	✓	✓	✓	0
090 - 09	✓	✓	✓	✓	0
153 - 13	✓	✓	✓	✓	0
152 - 17	✓	✓	✓	✓	0
119 - 21	✓	✓	✓	✓	0
118 - 25	✓	✓	✓	✓	0
089 - 29	✓	✓	✓	✓	0
088 - 33	✓	✓	✓	✓	0
151 - 37	✓	✓	✓	✓	0
150 - 41	✓	✓	✓	✓	0
276 - 02	✓	✓	✓	✓	0
231 - 06	✓	✓	✓	✓	0
230 - 10	✓	✓	✓	✓	0
189 - 14	✓	✓	✓	✓	0
188 - 18	✓	✓	✓	✓	0
161 - 22	✓	✓	✓	✓	0
160 - 26	✓	✓	✓	✓	0
159 - 30	✓	✓	✓	✓	0
158 - 34	✓	✓	✓	✓	0
157 - 38	✓	✓	✓	✓	0
156 - 42	✓	✓	✓	✓	0
200 - 03	✓	✓	✓	✓	0
291 - 07	✓	✓	✓	✓	0
290 - 11	✓	✓	✓	✓	0
243 - 15	✓	✓	✓	✓	0
242 - 19	✓	✓	✓	✓	0
199 - 23	✓	✓	✓	✓	0
198 - 27	✓	✓	✓	✓	0
289 - 31	✓	✓	✓	✓	0
288 - 35	✓	✓	✓	✓	0
287 - 39	✓	✓	✓	✓	0

Program PCIe40

Include  
Exclude  
Load  
Abort

(un)Mask channel B2L Mask B2L Status FIFO Status #Events

# New ECL RC GUI

The screenshot displays the 'New ECL RC GUI' interface, which is divided into several functional panels:

- RC\_ECL Panel:** Shows 'Run # : 1692' with a 'RUNNING' status. It includes controls for 'STORE\_RECL', 'RC\_HLT\_RECL', 'ECL', and 'TTD\_ECL', all of which are also in a 'RUNNING' state. Buttons for 'STOP', 'ABORT', and 'BOOT' are present.
- ECL Panel:** Shows 'Run # : 1692' with a 'RUNNING' status. It includes controls for 'RECL1', 'RECL2', and 'RECL3', all in a 'RUNNING' state. Buttons for 'STOP', 'ABORT', and 'BOOT' are present.
- RC\_HLT\_RECL Panel:** Shows 'Run # : 1692' with a 'RUNNING' status. It includes controls for 'HLTIN\_RECL', 'HLTOUT\_RECL', 'EB1\_RECL', 'HLTWK12\_RECL', 'HLTWK13\_RECL', 'HLTWK14\_RECL', 'HLTWK15\_RECL', 'HLTWK16\_RECL', and 'DQM\_RECL', all in a 'RUNNING' state. Buttons for 'STOP', 'ABORT', and 'BOOT' are present.
- FTSW #64 Panel:** Shows 'RUNNING' status. It includes controls for 'Trigger type' (set to 'poisson'), 'Trigger limit' (-1), 'Dummy rate' (1000 Hz), 'Max time' (35143 us), 'Max trig' (12), 'Run start at' (2022-04-05 12:44), 'Run time' (332 sec), 'Trigger in' (1068.0 Hz), 'Trigger out' (1068.0 Hz), 'Input count' (335683), and 'Output count' (335682). Buttons for 'resettt' and 'stattt' are also visible.
- STORE\_RECL Panel:** Shows 'RUNNING' status. It includes controls for 'Run type' (set to 'ecl'), 'Event rate [kHz]' (0.96), 'Event size [kB]' (47), 'Event counter' (336746), 'Flow rate [MB/s]' (45.34), 'File size [MB]' (15185), and '# of files' (1). Buttons for 'eb2rx' and 'input' are also visible.
- Channel Status Panels:** Three panels show the status of channels 'recl1', 'recl2', and 'recl3'. Each panel includes a table of channel parameters (Hostname, TTD, DMA, DMA [kBytes], Size [Bytes], Rate [MB/s]) and a grid of checkboxes for channel selection (e.g., B01-00, B02-01, etc.). A 'Program PCIe40' progress bar is also shown for each channel.
- Control Buttons:** Two large buttons are located in the center: 'Load & Apply Mask' and 'Save & Apply Mask'.
- Help Text:** Below the control buttons, there is a section titled 'Some tips ( Updated on Feb. 18, 2022 )' with instructions on how to program PCIe40 firmware and how to mask/unmask channels.

**Some tips ( Updated on Feb. 18, 2022 )**

- \* How to program PCIe40 firmware
  - Push "Program PCIe40" and wait until the progress-bar reaches "5".
  - Mask was set as before program PCIe40, refresh OPI to confirm.
- \* Mask/unmask channels
  - Update channel checkboxes and push "Save & apply Mask".
- \* Load and apply the last saved mask setting
  - Push "Load & Apply Mask" and then checkboxes should be updated.
  - Refresh OPI to confirm the update.

**Thank you for your time and attention.**

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