

# RavenSRS tips and tricks

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## 1 Cards, APV and cables

- check connection of the grounding pins connected to APV adapter card (Minimize the noise)
- check the APV white connector is perfectly connected with the adapter card.
- check that the back part of the HV card is touching the APV card.
- be careful about the connection to the MM.
- check the flat cables to connect master and slaves are properly connected.
- try to use shorter HDMI cables and then try to use all the HDMI cables of same length (for PLL value of the APV it is important).

## 2 ADC cards and FEC

- only first four HDMI connectors are working (max 8 APV)
- for connecting the transceiver use J11 not J10
- the trigger out can be use to check the rate of internal trigger.
- When do power cycling please wait until the last GREEN LED is completely off before turning back on the SRS system.

## 3 srsSC2.vi

### 3.1 Use:

- remember to initialize
- remember to change the PLL value on "APV Hybrids" tab, to select the right value (which usually depends on the cable length) checking the height of the peaks in the RavenDAQ
- the values to be changed on the "Application" tab are:
  - **bclk\_mode:** 3 (internal trigger, internal generated peaks), 4 (external trigger, external physics signals), 0 (internal trigger, external physics signals)

- **bclk\_trgburst:** the  $n$  that you insert gives you  $(n + 1) \times 3$  timestamps (3=12, 4=15, max 8=27)
  - **bclk\_freq:** the dead-time in case of bclk\_mode=4 and frequency of the trigger in case of bclk\_mode=3=0
  - **bclk\_tgrdelay:** the delay from the external trigger and the trigger for the APVs in number of clock (1=25ns, 40000=1ms, 400=10 $\mu$ s)
  - **bclk\_rosync:** delay for the synchronization of the ADC window on the signal (**do not touch if there is not a good reason**, like very small trigger delay ( $< 300 = 7.5\mu$ s) and similar)
  - **evbld\_chenable:** hexadecimal number to activate the needed APV (1=first master, 2=first slave, 3=first master and first slave, F=4 APV, FF=8 APV, etc (for other info check the SRS manual))
  - **evbld\_dataleight:** data-length of the jumbo packets in unit of word(=2 bytes) (2000word=4000byte, max 4000word=8000byte) limited at 9000byte by the Ethernet card
- remember "WRITE" the values of the "Application" tab and click "ON" on the Read Out Control

### 3.2 Problems:

If the "Reqlid Error" is red means that there are some errors with the connection with the FEC, so try in the order to:

- redo the initialization
- check the cables
- restart the FEC
- try a ping on 10.0.0.2, if the FEC answer
- restart LabView
- restart the pc
- boh, no idea.

## 4 RavenDAQ

### 4.1 Initialization:

- check the settings of the DAQ before starting the program, in particular:
  - Number of timestamp
  - Number of APV
- start the program with the start button of LabView
- check the arriving of the data with the Raw Data viewer and check that the data from all the expected APV are present
- if it is necessary to check the data of one particular APV, it is possible using the latency scan mode with the "Min" set at 0, in this way the DAQ is showing all the data arriving from the selected APV

### 4.2 Latency scan

- Check the detector, the source and the analog signal
- Initialize the SRS and the DAQ as explained before
- Use the "Latency scan" tab
- Select the "Min" value as a threshold for the arriving "physical signal" (usually 2100 is OK)
- Once used a triggered source check if in the "Latency scan" tab there are some refresh in the graph:
  - **if not**, the data collection is not synchronized because the "good events" do not fall in the timeframe, so you need to try to change the **bclk\_tgrdelay** in the SlowControl to move the signals inside the timeframe
  - **if yes**, check the positions of the peaks, if it is not in the requested position (wrong timestamp) the signal can be moved using **bclk\_tgrdelay** as before
  - **if yes and the positions of the peaks are in the right timestamp** the system is synchronized and ready for the acquisition

### 4.3 Acquisition without DAQ triggering/zero suppression

- Check the detector, the source and the analog signal
- Initialize the SRS and the DAQ as explained before
- Use the "Saving data" tab
- Select the folder and the name of the file and save the data (it will save **EVERYTHING** arriving from the SRS, one for each trigger arrived to the SRS)

**NB: saving a file with the same name means rewrite the one saved before**

### 4.4 Acquisition with DAQ triggering/zero suppression

- Check the detector, the source and the analog signal
- Initialize the SRS and the DAQ as explained before
- Use the "First analysis" tab
- Click on the first analysis button and select the desired APV
- Collect some pedestal events (about 3k-5k) using the pedestal tab, by clicking "pedestal acquisition" to start and to stop
- On the "Spectrum" tab, click on "Spectrum acquisition" to collect the physics data above the threshold set with the field "Sigma cut" in unit of sigma and selecting the peaks which are not in the first or last "head and tail" timestamp
- If is possible to select also the event coming from only one pad of the detector using the "target pad field"
- Activating the Hit Map tab enable the map of the hits detected (maximi of the peaks) using the selected mapping file (same working principle and file of the RavenCode mapping)
- The data which pass over the threshold of the First Analysis system can be stored using the suitable field in the "Hit Map" tab, which works as the "Data saving"

**NB: saving a file with the same name means rewrite the one saved before**