

# DAQ Configuration Values in Data Stream

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# Motivation

- FADC integral values will sum over N samples
  - *Only integral is written out*
- Event by event pedestal measurements will be made by either summing (or averaging) over  $N_{\text{ped}}$  samples
- In order to subtract the pedestal from the integral, it must be scaled by  $N/N_{\text{ped}}$  (or N)
- Other configuration parameters may also be needed in order to interpret the data:
  - F1TDC bin size*
  - FADC125 pedestal scaling factor*
  - ...

# Possible Solutions

1. Write critical values to data stream
2. Read from configuration DB
  - No current plans to make available to offline
  - Not currently being filled
3. Read from configuration files that are copied to tape along with raw data
  - Must always keep the correct set of config. files with data file

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## **With 2 and 3:**

- We add an additional external resource requirement in addition to CCDB and HDDS.
- Require additional facility to query/parse the external resource AND keep track of run numbers associated with each value
- Run risk that settings on board may not be what is in file

# Format of DAQ config. parameter EVIO bank

0x55 = config. parameters bank

N1 = number of parameters in section 1

param1 = 16bit parameter identifier. High 8bits are module type. Low 8bits are parameter type.

- Multiple sections allow some modules to use different settings from others.
- Most ROCs should output only a single section.

uint32 EVIO bank (0x1)

bank length

0x55 | 0x1 | m

N1 | slot\_mask

param1 | val1

param2 | val2

...

paramN1 | valN1

N2 | slot\_mask

param1 | val1

...

paramN2 | valN2

...

Nm | slot\_mask

param1 | val1

...

paramNm | valNm

m = number of sections

which slots the parameters in this section apply to

val1 = 16bit parameter value

- Format allows us to write a minimum number of values, but expand or change as needed.
- Special runs could output much more information if needed for debugging.

# Data Volume

	# crates	#params	#bytes/ crate	#bytes/ event
FADC125	14	3	20	280
FADC250	26	3	20	520
F1TDC	10	3	16	160
CAEN1290	1	1	12	12
<b>TOTAL</b>				<b>972 bytes/ DAQ event</b>

- Current EVIO event size from simulation is 19.4 kB\*
  - 972 bytes = 4.9% increase
- If reduce FADC from 3 to 1 parameter, size reduces to 652 bytes/DAQ event (=3.3%)
- If running in multi-event block mode with 10 events/block, bytes per event reduced by factor of 10 (=0.5%)