General task : program for configuration file generation based on noise/calibration data for 8 boards

**1) Configuration files.**

Configuration are written in tree-like xml-file structure.

Examples of configuration structures are in fine\_config\_DM\_8boards\_template.tgz and fine\_config\_DM\_8boards\_THL\_B50\_G9X.tgz.

The top file (fine\_description.xml) include list of boards with id (equal to board ip) and reference to detailed configuration file.

Each board section refer to

* common configuration file pointed by tag “common”, In our case it is the same file for all boards. No changes is needed here
* 2 files for each VMM
  + file with general VMM info, tag <global> like “..../data/globals\_boardN\_vmmNN.json”. N is board number, and NN is VMM number. Gain, peak time, L0offset and threshold must be set in this file
  + file with individual channel flags , tag <channel>. No changes needed here

All file name must be given with full path name. By default this files are located in directory “data”

**Each VMM setting is defined in files pointed in Bboard/VMM configuration subsections with tag “global”, namely “..../data/globals\_boardN\_vmmNN.json”**

variable“sg” is gain,

|  |  |
| --- | --- |
| Sg value | Gain, mv/pc |
| 0 | 0.5 |
| 1 | 1 |
| 2 | 3 |
| 3 | 4.5 |
| 4 | 6 |
| 5 | 9 |

Variable “st” is peaking time:

|  |  |
| --- | --- |
| St value | Peaking time, ns |
| 0 | 200 |
| 1 | 100 |
| 2 | 50 |
| 3 | 24 |

Variable sdt\_daq: is threshold value in DAC units

variable L0offset: shift trigger vs signal in units ff 25ns

**Task 1**

Prepare configuration for given Name , gain, peaking time,L0offset and THL(in mV) equal for all VMM.

Please, remember that baseline and DAC → mV calibration is different for different VMM.

Input data: Name, gain (mV/pC), peaking time, L0ofset, threshold

THL calibration is given in “THL\_calib\_all.xlsx” file (may be converted to .txt if needed

file structure : board IP, VMM#, baseline, A ,B , A', B'

A and B coeff. May be used to convert DAC value to mV : Umv=A\*DAC +B

A' and B' for convertion Umv->DAC : DAC=A'\*Umv+B'

To calculate required threshold in DAQ: sdt\_dac=A’\*(baseline+threshold)+B'

configuration structure placed in directory NAME, top file fine\_description.xml and all reffered filed must by in NAME/data directory

Full paths in fine\_description.xml must be “/home/daq/Documents/NAME/data/....”,

**Task 2**

like task 1 but individual thresholds for all VMMs;

input data: NAME, “noise&setting\_file\_name”

example of noise&setting file is set.txt.

File format:

8 strings with gives noise level for each VMM in each board

*board\_id Noise\_VMM0 Noise\_VMM1 ….. NoiseVMM7 – gives noise RMS for all vmm*

then 4 strings with configuration parameters

gain 9

peak\_time 200

Delay 4054

sigma 6

To calculate desired threshold for each VMM : threshold=sigma\*RMS