Electronics &Integration: status

Michela Greco-INFN TORINO& UNITO 8 febbraio 2021



Off detector electronics >ancillaries

GEMROC BES-III Fast Control system FANOUT (FCF) GEMROC BES-III Fast Control system Local FANOUT (FCLF)



FCF: a modified GEMROC module which connects to the CLK, L1, L1_CHK, FULL signals from the BES-III Fast Control System Fanout

FCLF: LOW COST, not programmable, fanout modules which connects to the CLK, L1, L1_CHK, FULL signals from FCF

Off detector electronics> Fast Control system FANOUT



Off detector electronics> Fast Control system Local FANOUT





Status: FCS_BKPLN_IFC, FCS_BKPLN, FCS_PORT, and XCVR delivered

Operations@IHEP



Keep Layer 1 and 2 ON at nominal values and acquire data

Shifts to Monitor the CGEM-IT while running 5 experts for HV/LV operations About 10 shifters, 1st trigger award





Integration Plans > hardware interlock

| HARDWARE INTERLOCK SYSTEM | | | | | | |
|---------------------------|---------|---------------|--|--|--|--|
| system | status | action | | | | |
| gas | failure | inhibit HV | | | | |
| cooling | failure | inhibit HV/LV | | | | |
| power | failure | inhibit HV/LV | | | | |
| slow control | failure | inhibit HV/LV | | | | |
| interlock | failure | inhibit HV/LV | | | | |





DAQ integration

The Chinese colleagues suggested to improve the tests using a more complex setup.



+5% -->Milestone

Quick guide for a simulated triggers noise acquisition (with double threshold)

Preliminary: about voltages and currents

- · You can read the IVT (current, voltages and temperature) FEB values using the GEMROCs
- Good ranges of values are:
- Analog Voltage: between 3.2 and 3.8 V
- Digital Voltage: bet ween 3.1 and 3.4 V
- Analog current: between 570 and 700 mA before configuration, between 700 and 780 mA after configuration
- Digital current: between 270 and 300 mA before configuration, between 310 and 360 mA after configuration

TIGERs configuration

- · Perform a TD scan and set a stable TD value
- · Perform the threshold scan and set the threshold value in every channel
- Example of global configuration (play attention at the parameters in the red boxes)

- Checked the IVT parameters
- / Did TD scan and set the TD value
- Did the threshold scan(done) and set the threshold value in every channel(doing)

Next step:

Read back global configuration, channel configuration and ROC configuration Check them if they are the same value with those in the red box. Then take data.

| | | | | 1 | |
|---|-------|---------|---|------|---|
| GEMBOC | T | GER | | | |
| GEMBIOC 9 | -1 | - | 60 | | |
| Road configu | ratio | n v | trite configuration | w | Ite configuration to all TIGERs on this GEMROC Write configuration to all TIGER |
| | Daie | i Tu kw | d | Deal | i To loved |
| earternas. | 0 | 0 | wasterp | 26 | 26 |
| TDCVtanN | 0 | 0 | TP_Vical_rel | 23 | 23 |
| TDCVranP | 29 | 29 | Www_integ_diff | 39 | 39 |
| Acorb"April | 55 | 55 | المر وقد | 1 | 1 |
| DiscFE_lbim | 50 | 30 | FE_TFErable | 0 | 0 |
| EkseFE_PpreH | 0 | 0 | DataChON | 0 | 10 |
| AWconp_global | 19 | 19 | TACrefrenhPeriod | 9 | 2 |
| TDCcompVcas | 0 | 0 | T&CretrestEnable | 1 | 1 |
| TDCHd_cs | 15 | 15 | CounterPeriod | 2 | 1 |
| DiscVcasN | 15 | 15 | CounterEnable | | |
| IntegMb3 | | 40 | StopRampEnable | | |
| LA ITAI | | | RCkEnable | | |
| Vczes Vth | - | | TDCCRdw | 2 | |
| TACILSE | ~ | -22 | VotoMade | | |
| ThComeVala | 0 | | On DebugHode | 0 | 19 |
| wref tates | | | Tationic | 0 | 2 |
| in a start and | 0 | | 1.000 | 2 | 2 |
| and | 24 | 24 | The second se | 0 | 2 |
| or vea | 4 | 4 | Tatlinies | 1 | |
| Shaperlevis | 0 | 0 | | | |
| Seve Los | 4 | | | | |



Cooling system: maintenance











+10% -->Milestone

Integration plans>





✓ 3 planar GEMS & ancillariesback to Italy

test beam at MAINZ

Noise studies> Ferrara lab





w/o HV shielding



w HV shielding



1 planar chamber with 2 TIGER +1 TIGER

10

Cosmic rays setup> Ferrara lab





The local modular fanout is used to provide FCS signals (clock and trigger) to the 2 GEMROC modules used in the setup

Planar setup clusters visualization

| Run | | Subrun | | Count | | |
|-----|-----|--------|-----|-------|-----|--|
| 52 | × • | 31 | × • | 64 | × . | |





Cluster charge [fC]

Integration Plans > 2021

| GENNAIO-MARZO | Maintenance L1+L2 Accensione L3 a Pechino | |
|--------------------------------|---|--|
| MARZO-APRILE | Rimozione struttura temporanea di sostegno Miglioramento setup per run cosmici | |
| APRILE-GIUGNO GIUGNO-AGOSTO | Setup L1+L2+L3 in operazione Commissioning | |

AGOSTO-DICEMBRE Run cosmici test BESIII-SC/DAQ per CGEM-IT





