

# Phase 3 readiness: Software and Scripts

Felix J. Mueller

# Lab Framework

- The framework was already improved a lot during BEAST
- We decided to improve the frame work before phase 3
  - Follow the coding guidelines
  - Use the new abstraction layer with DHE class
  - Merge feature branches for lab setups and Beast into master
- Standard calibration scripts were modified
  - HS-link scan, Pedestal scan, Delay scan, Offset calibration (offset image)
  - Request for offset-delays, sample point, dcd adc and iv-curve
- Parallel processing is used in the measurement, analysis and upload of the data (except delay)
- Tested with lab setup at Munich and DHH setups at DESY, KEK
- GUI for calibration (CalibrationIOC) and data taking (elog\_server)

### PXD Calibration Control

#### CALIBRATION Status

##### DHC BUSY

H10 [Discor] [Green Circle]

H20 [Green Circle]

H30 [Discor] [Green Circle]

H40 [Discor] [Green Circle]

H50 [Discor] [Green Circle]

H60 [Discor] [Green Circle]

H70 [Discor] [Green Circle]

H80 [Discor] [Green Circle]

##### DHE BUSY

				Pedestal	Noise
H10	Inner Forward	[Discor] [Disconn]	Disconnected	[Discor] [Disconn]	[Discor] [Disconn]
	Inner Backward	[Green Circle] <input type="checkbox"/> H1021	Offsets Calibration of DHE H1021 complete.	[Green Circle]	[Grey]
H20	Outer Forward	[Green Circle] <input type="checkbox"/> H1031	Offsets Calibration of DHE H1031 complete.	[Green Circle]	[Grey]
	Outer Backward	[Discor] [Disconn]	Disconnected	[Discor] [Disconn]	[Discor] [Disconn]
H30		[Discor] [Disconn]	Disconnected	[Discor] [Disconn]	[Discor] [Disconn]
H40		[Discor] [Disconn]	Disconnected	[Discor] [Disconn]	[Discor] [Disconn]
H50		[Discor] [Disconn]	Disconnected	[Discor] [Disconn]	[Discor] [Disconn]
H60		[Discor] [Disconn]	Disconnected	[Discor] [Disconn]	[Discor] [Disconn]
H70		[Discor] [Disconn]	Disconnected	[Discor] [Disconn]	[Discor] [Disconn]
H80		[Discor] [Disconn]	Disconnected	[Discor] [Disconn]	[Discor] [Disconn]

Shifter View

**Advanced options**

- Skip pedestal upload
- Enable temperature measurement
- Create PV dump
- Skip Elog entry

**Pedestal Path**  
 [Disconnected]

**Run Number**  
 [Disconnected] [Disconnect]

Select IF    Select IB

Select OF    Select OB

**Calibration Actions**

Calibrate Pedestals    Calibrate Noise    Calibrate Delays    Calibrate Offset-Cal

**Calibration Server Status**

Calibration thread started for DHEs ['H1032', 'H1031', 'H1021']

# PXD DAQ Control

## DHC H10

status **Disconnected**  
path **Disconnected**  
control port **Disconnected**  
UDP port **Disconnected**  
data port **Disconnected**  
filename **Disconnected**

Exit Init Start Stop

## DHC H20

status CLOSED  
path  
control port 32769  
UDP port 6002  
data port 20250  
filename H20data.dat

Exit Init Start Stop

## DHC H30

status **Disconnected**  
path **Disconnected**  
control port **Disconnected**  
UDP port **Disconnected**  
data port **Disconnected**  
filename **Disconnected**

Exit Init Start Stop

## DHC H40

status **Disconnected**  
path **Disconnected**  
control port **Disconnected**  
UDP port **Disconnected**  
data port **Disconnected**  
filename **Disconnected**

Exit Init Start Stop

## All DHCs (combined)

status CLOSED  
path  
control port 32767  
UDP port -1  
data port 20248  
filename data.dat

Exit Init

Start Stop

- Follow RunControl
- Record Pedestals

RC status **Disconnected**

RC exp. number **Disconnected**

RC run number **Disconnected**

## DHC H50

status **Disconnected**  
path **Disconnected**  
control port **Disconnected**  
UDP port **Disconnected**  
data port **Disconnected**  
filename **Disconnected**

Exit Init Start Stop

## DHC H60

status **Disconnected**  
path **Disconnected**  
control port **Disconnected**  
UDP port **Disconnected**  
data port **Disconnected**  
filename **Disconnected**

Exit Init Start Stop

## DHC H70

status **Disconnected**  
path **Disconnected**  
control port **Disconnected**  
UDP port **Disconnected**  
data port **Disconnected**  
filename **Disconnected**

Exit Init Start Stop

## DHC H80

status **Disconnected**  
path **Disconnected**  
control port **Disconnected**  
UDP port **Disconnected**  
data port **Disconnected**  
filename **Disconnected**

Exit Init Start Stop

## Local Test Control

RC status **READY**

RC exp. number 2

RC run number 42

# Lab Framework - Problems

- Time for execution of calibration scripts at DESY with 4 modules and default settings
  - Pedestal scan ~ 2.5 minutes
  - Delay scan ~ 5 minutes
  - Offset calibration ~ 30 minutes
- Analysis of offset data for 20 modules is too much for BonndaqPC
  - Reduce parallelism (one process for every ASIC)
  - Reduce necessary CPU load for each analysis
- Largest problem is the parallel upload of pedestal and offset data
  - Parallelism needed because of long upload time
  - Pedestal upload takes too much CPU load
    - Florian and Michael are working on the problem
    - First implemented fix looks promising but more testing needed

# IOCs

- In general the IOCs work fine but problems have been seen only at KEK
- Felix mentioned problems with the utilityIOC, I fixed that yesterday
- Dhh-sequence IOC main problems:
  - Sometimes the sequence gets stuck at initializing JTAG, enabling DCDs, activating switcher outputs
  - Offsets are wrongly uploaded with dhh-sequence
    - We are trying to identify the problem
  - Verification of the switcher sequence does not seem to work properly
    - The switcher sequence is uploaded and read back for verification
    - If the check fails the switcher sequence is uploaded again
    - Apparently the switcher sequence is verified but is still not correct
      - Maybe a problem of the input data from DB?
      - Observed None values in PV dump and wrong offsets on/off values in PV readings
    - Severe problem since potentially harmful for switcher and DEPFET matrix
    - Unknown if same problem exist for gated mode sequence

# Alarm System

- We had a short meeting discussing the task
- Everybody should be aware of the alarm system
- For details <https://indico.mpp.mpg.de/event/6182/contribution/2/material/slides/0.pdf>
- Needs input from every expert and operator
- List of alarms:
  - <https://confluence.desy.de/display/BI/PXD+Alarms+in+CS-Studio>