XDAQ Supervisors

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PixelSupervisor

- **Initialising**
  - Detects sub-supervisors like PixelFECSupervisors, PixelFEDSupervisors, PixelTTCSupervisors and PixelLTCSupervisors that have been loaded into the XDAQ framework.
- **Configuring**
  - Receives a Global Key from the PixelSupervisorGUI (will be Run Control).
  - Loads appropriate configuration files into local objects.
  - Instructs PixelFEC/FED/TTCSupervisors to advance to their Configuration states and load their configuration objects from files.
- **Running**
  - Instructs PixelFEC/FED/TTCSupervisors to advance to their Running states.
  - Finds what type of Run (Physics/Calibration) it is. If it is a Calibration Run, finds what type of calibration it is.
  - If it is a Baseline Calibration with Test-DACs, it simply sends a SOAP message to the PixelFEDSupervisor to carry it out.
  - If it is an Address Level Calibration with Test-DACs, it simply sends a SOAP message to the PixelFEDSupervisor to carry it out.
  - If it is a Baseline Calibration with Pixel Data,
    - Instructs concerned PixelFECSupervisors to ClrCal all pixels.
    - Instructs PixelTTCSupervisor to issue a trigger.
    - Instructs PixelFEDSupervisor to collect Black levels and compute their mean and moments.
    - Instructs PixelFEDSupervisor to adjust the FED Optical Receiver Input and Channel Offset DACs settings to bring the Black to a central value. Repeat previous two steps till satisfactory.

PixelSupervisor continued...

- If it is an Address Level Calibration
  - Instructs the PixelFECSupervisors to ClrCal all concerned ROCs.
  - Instructs the PixelFECSupervisors to fire ROCs as specified in their configuration objects.
  - Instructs the TTCSupervisor to issue multiple CalSync triggers
  - Instructs the PixelFEDSupervisor to catch address level information on FIFO 1 transparent mode and come up with recommended ROC and TBM address levels.
- If it is a Pixel Alive / Gain Calibration / S-Curve Calibration:
  - Instructs the PixelFECSupervisors to ClrCal all concerned ROCs
  - Instructs the PixelFECSupervisors to fire pixels according to their configuration objects
  - Instructs the PixelTTCSupervisor to issue triggers as in the configuration object
  - Instructs the PixelFEDSupervisor to read data out from SpyFIFO 3 into a file.
- If it is a Clock Phase Calibration
  - Instructs PixelFECSupervisors to ClrCal all concerned ROCs
  - Loops over all 32 delay+phase*2 settings and instructs PixelFEDSupervisors to set them.
  - Instructs PixelTTCSupervisor to issue CalSync triggers
  - Instructs PixelFEDSupervisor to write transparent mode data from FIFO 1 into a file
  - These files are inspected by hand!
- **Halting**
  - Instructs PixelFEC/FED/TTCSupervisors to enter their Halted states.
- **Pausing**
  - Instructs PixelFEC/FED/TTCSupervisors to enter their Paused states.
- **Resuming**
  - Instructs PixelFEC/FED/TTCSupervisors to enter their Running states.

PixelFEDSupervisor

- **Configuring**
  - Initialises PixelFEDInterface objects, one for every FED in the crate.
  - Receives a Global Key from the PixelSupervisor.
  - Loads appropriate configuration files into local objects.
  - Starts up the RU Builder
- **Running**
  - Allows all low level commands to carried out.
- **Paused**
  - Disallows all low level commands to carried out
- **Halted**
  - Disallows all low level commands to carried out
  - Destroys all local objects
- **Read FIFO**
  - Reads FED Spy FIFOs 1, 2 or 3 in Normal or Transparent mode as specified and ships them to the screen, a file or the RU Builder.
- **Reset FED:** Resets the specified FED and reloads its firmware
- **Reload Firmware** of the specified FED
- **Fill Test DAC** with a given pulse train
- **Issue VME Trigger**
- **Set Control and Mode Registers**
- **Set Phases and Delays**
- Perform a **Baseline Calibration with Test DACs**
- Perform an **Address Level Calibration with Test DACs**
- Collect data and set FED settings for **Baseline Calibration with Pixel Data**
- Collect data and recommend **Address Levels with Pixel Data**
- Has its own GUI that allows the user to issue some low level instructions if in the correct state.

PixelFEDSupervisor

http://ppdnwpixelsoft.fnal.gov:1973/urn:xdaq-application:lid=70/

XDAQ **Pixel Front End Driver Supervisor**

Version: 3.0
Date: Thu, 11 Jan 2007 14:14:53 GMT

Halted

Finite State Machine

Current State Halted	FED Address Map Filename FED Configuration Filename			
Configure	Halt	Pause	Resume	Start

Low Level Commands

Reload Firmware

ReloadFirmware

Channel Offset

Channel	Capacitor Adjust	Input Offset	Output Offset	Offset DAC
1	0	0	0	

ChannelOffsets

Control and Mode Registers

Control Registers

Transparent Mode (•) Disable ( ) Enable
Transparent Gate Start by ( ) L1A (•) VME or EFT (OPTO Module)
Use simulated test-DAC (•) Disable ( ) Enable
Event number generated by ( ) TTC (•) VME
L1A triggers from TTCrx (•) Disable ( ) Enable
EFT Signals from the OPTO Module (•) Disable ( ) Enable
TTSReady (•) Disable ( ) Enable
TTSError (•) Disable ( ) Enable
OUTofSYN (•) Disable ( ) Enable

Mode Registers

S-Link ( ) Disable (•) Enable
Write Spy Memory ( ) Disable (•) Enable
S-Link (•) Let it be, or ( ) Reset

SetControlRegister

Reading FIFO

Read

- Spy FIFO 1 ( )
- Spy FIFO 2 Normal Mode ( )
- Spy FIFO 3 Normal Mode (•)

Ship Spy FIFO data to

- Screen (•)
- RUBuilder ( )
- File ( )

ReadFIFO

Enable FIFO 3

EnableFIFO3

Clock Phases and Delays

Channel 1 Phase 0 Delay 0 SetPhasesDelays

PixelFECSupervisor

- **Configuring**
  - Initialises PixelFECInterface objects, one for every FEC in the crate.
  - Receives a Global Key from the PixelSupervisor.
  - Loads appropriate configuration files into local objects.
- **Running**
  - Allows all low level commands to carried out.
- **Paused**
  - Disallows all low level commands to carried out
- **Halted**
  - Disallows all low level commands to carried out
  - Destroys all local objects
- **TBM Command:** Allows us to program a TBM
- **Prog DAC:** Allows us to program the various DACs on a specified ROC
- **Prog Pix:** Allows us to program pixels on a specified ROC
- **Cal Pix:** Allows us to send calibration signals to pixels on a specified ROC
- **Clr Cal:** Clears all calibration signals on a given ROC
- **Calib Running:** Loops through all pixel patterns in PixelFECSupervisor's calibration object and fires them up.
- Has its own GUI that allows the user to issue some low level instructions if in the correct state.

PixelFECSupervisor

XDAQ

Pixel Front End Controller Supervisor

Version: 3.0
Date: Thu, 11 Jan 2007 14:07:41 GMT

Halted

Finite State Machine

Current State Halted	FEC Base Address: Global Key:			
Configure	Halt	Pause	Resume	Start

Low Level Commands

TBM Command

mFEC: 1 mFEC Channel: A TBM Channel: A
Hub Address: 0 Port Address: 0 Offset: 0
Data Byte: Direction: Up
TBMCommand

Program DAC

mFEC: 1 mFEC Channel: A
Hub Address: 0 Port Address: 0
ROC Id: 0
DAC Address: Vdd DAC
Value:
Prog_DAC

Program Pixel

mFEC: 1 mFEC Channel: A
Hub Address: 0 Port Address: 0
ROC Id: 0
Pixel Column: 0 Pixel Row: 0
Pixel: Enable Trim (0-15): 0
Prog_Pix

Calibrate Pixel

mFEC: 1 mFEC Channel: A
Hub Address: 0 Port Address: 0
ROC Id: 0
Pixel Column: 0 Pixel Row: 0
Calibrate with: Sensor Bumps
Cal_Pix

Clear Calibration

mFEC: 1 mFEC Channel: A
Hub Address: 0 Port Address: 0
ROC Id: 0
ClrCal