

SCT DAQ

Bruce Gallop

RAL

+ many others

What we need to do

- Get ready for run 2
 - Expanded ROD DAQ
 - 90 to 128 RODs for high trigger and high pileup
 - Run smoothly
 - Monitor and mitigate/recover from potential errors
 - Calibration

Barrel fibres remapping

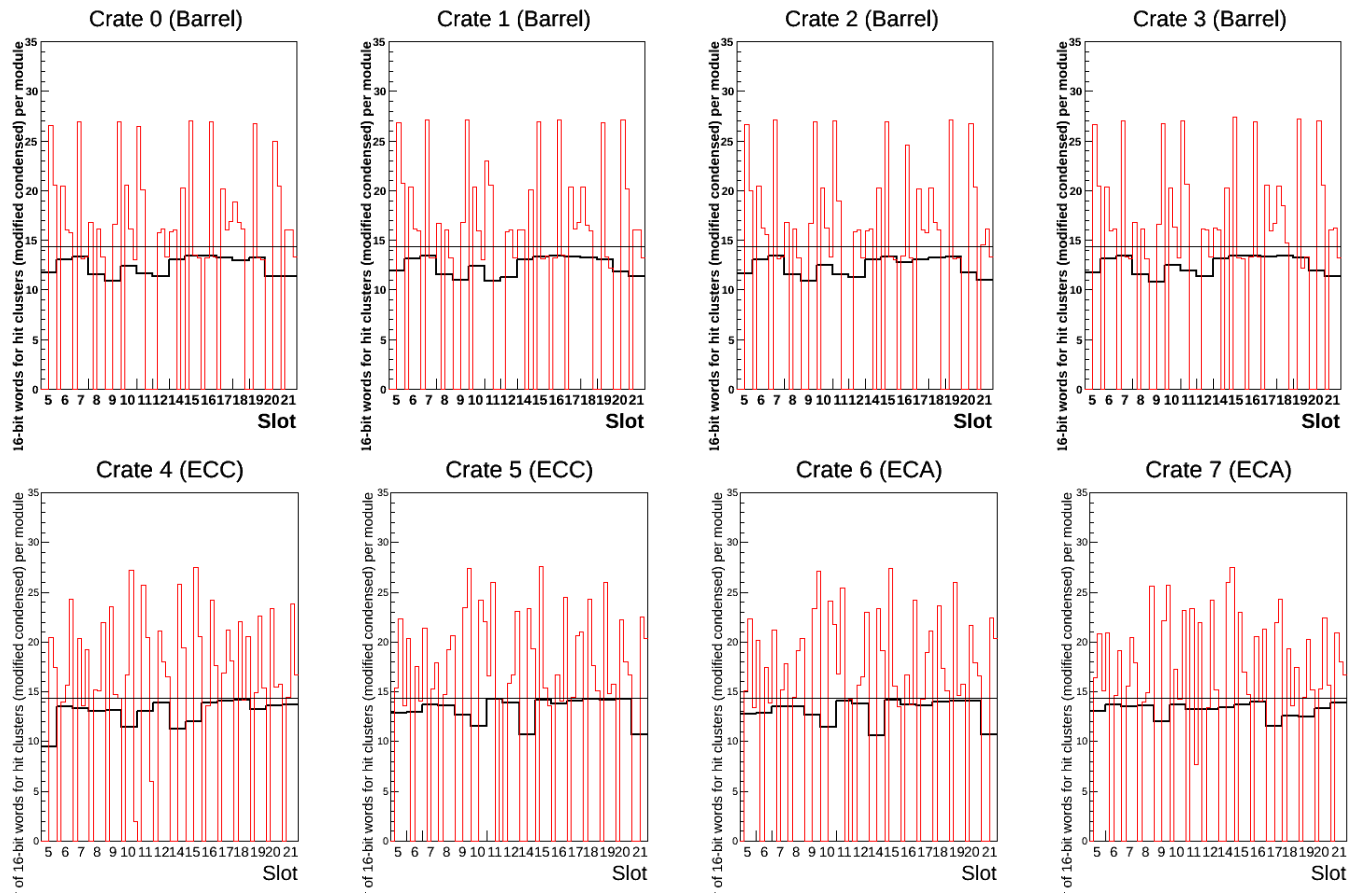
- Remap TxS to RODs to even out load
- Installed in crates
- Cross check mappings using PIN currents
- Bad pin in crate 3 (previously unused)
 - Replace crate
- Minimal movement (keep tower mapping)
- Mapping to ROS is flexible
 - Originally proposed 3 ROSs per half (11 per ROS)
 - Could use ROD crate -> ROS (16 per ROS)

Endcap fibre mappings

- Barrel was straight forward
 - 4 barrels -> 4 different link occupancies
- Endcap more difficult
 - Wide variety of types with different occupancies
- ROS gen-III
 - 16 rather than 12 links per PC
- Keep current ROD crate to ROS mapping
 - Don't have to force quadrants into thirds
 - Keep quadrants in half crates

Predicted ROD data rates

14.4 words per module = limit for 90% occupancy at 100kHz



“External” Software

- SLC5 to SLC6 migration
 - Complete in Point1
 - Nearly there in SR1 (“mon” machines this week)
 - Also web server and DB server
- tdaq-05-03-00
 - Stricter run control state machine
 - Barriers -> sub-states
 - Fixes due to java, new gcc etc.
- Mixed 32/64bit (SBCs can only be 32bit)
- Will C++11 gain us anything?

Hardware

- New Tx plugins
 - Install in one crate initially
 - Addition to software for new firmware
- FPGA FE simulator
 - Off-the-shelf FPGA dev board
 - Connect to ROD via passive mezzanine
 - Pretend to be 48 modules in beam conditions
 - Cross-check of updated ROD firmware

Module recovery

- Protection against SEUs
 - If error from module, resend configuration
 - Every ½ hour send configuration to all modules
- Currently done by GUI, which won't be needed
- New process proposed to do this
 - Also tidy up interaction with ECR

Configuration

- ATLAS Conditions move to new COOL instance
- This is where we store DAQ configuration
 - CoraCool
- Now an integrated alternative
 - COOL vector payload
- Take opportunity to change schema
 - Preliminary version done
 - Decide whether to make further improvements
 - Database normalisation

Training

- Common ID shifts
 - Need to do everything from previous SCT shifts ++
 - With shorter training
- Continue to streamline user interface
- Predict what problems might occur
- Having representative system in SR1 useful
 - Physics mode running is difficult to simulate

Summary

- Good progress
 - New RODs and BOCs
 - Draft of new configuration schema
 - Fibre mappings
- Still plenty to do
 - Module recovery
 - ROD online monitoring
 - Calibration updates
 - Streamlining