

# JRA3 DAQ system

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- Overall system status
- Individual component status
- Administrative issues
- Summary

# DAQ system overview

**(Detector Unit : ASICs)**

**DIF** : Detector InterFace connects generic DAQ and services

**LDA** : Link/Data Aggregator fans out/in DIFs and drives links to ODR

**ODR** : Off-Detector Receiver is PC interface

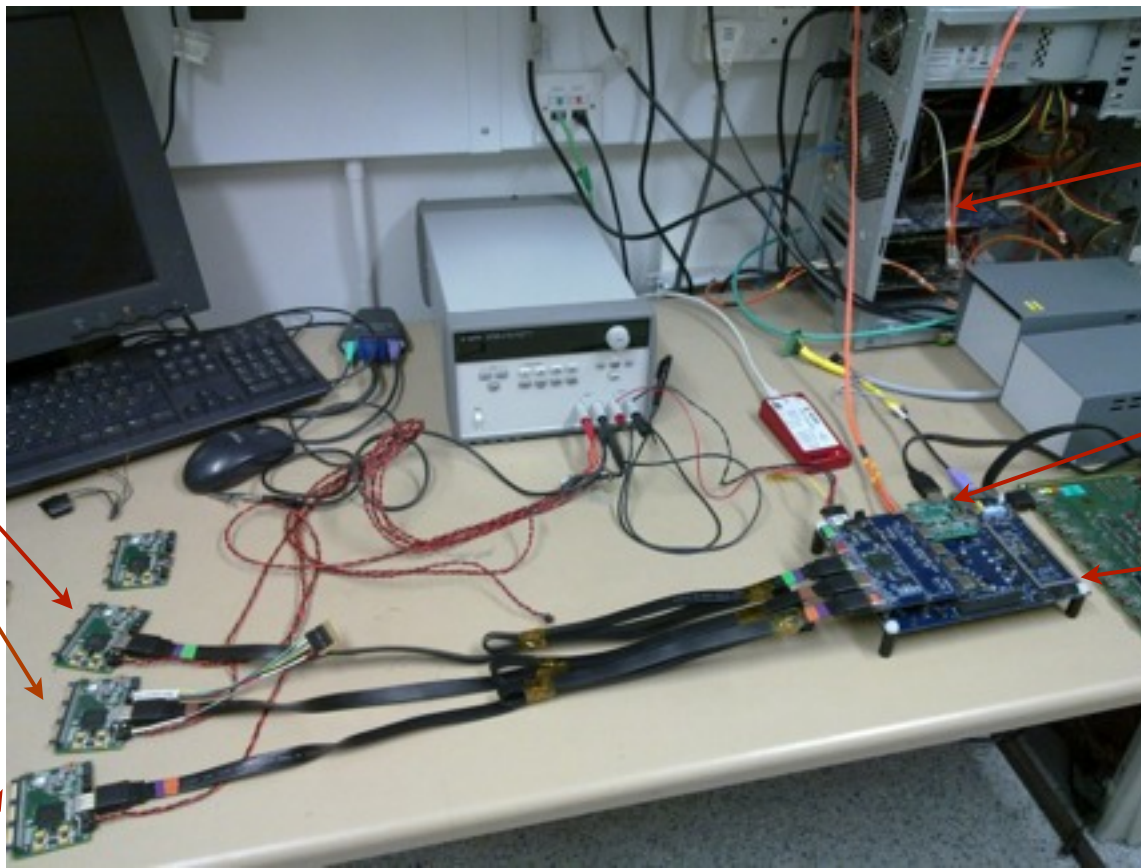
**CCC** : Clock and Control Card fans out to ODRs (or LDAs)

DIFs

ODR+DAQ PC

CCC

LDA



# Overall status

Summary of hardware status :

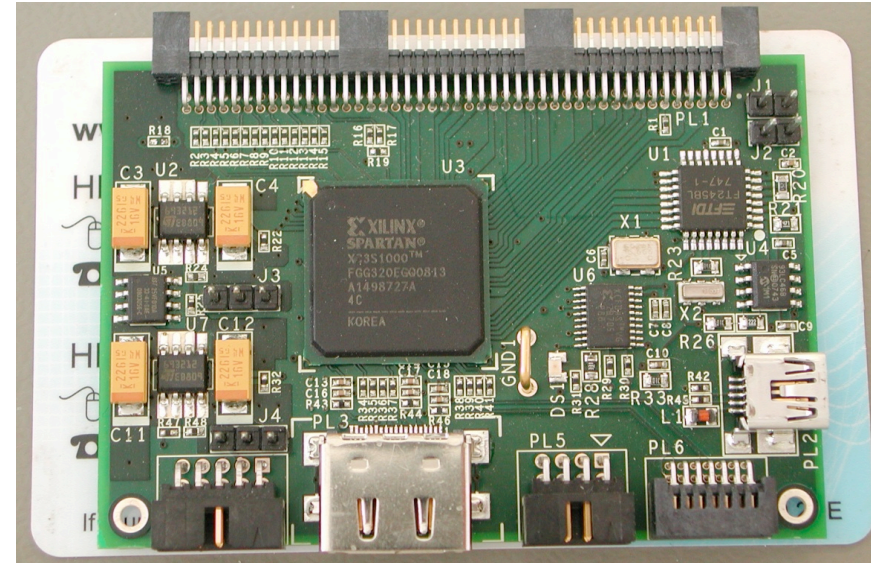
- 40 ECAL DIFs (22 ready, components for rest)
- 25 LDAs (ready bar to-be-repaired HDMI boards)
- 8 ODRs and 6 DAQ PCs (ready)
- 10 CCCs (ready) + 25 LDA add-ons (ready)
- HDMI cables : various tested and purchase soon

Complete very soon, missing items to come soon and not time-critical.

System chain established and being debugged.

# ECAL DIF

- The ECAL DIF has been developed by the Cambridge group; HCAL DIFs developed by other groups, but all within the DIF task force.
- Prototyped and to produce a full batch of 40.
- 22 new DIFs have been produced and being used in system tests at Cambridge (2), UCL (10), LLR (10).
- Can and will produce rest in coming months (not time-critical).



# CCC

- Overall status unchanged for a while
- Full complement of 10 boards with power supplies
- One in LLR and two in LAPP

## Recent work :

- CCC link to LDA has been done
- Board designed at UCL and built at Cambridge
- Produced 25 boards (one for each LDA), tested and ready for use (summer students)
- Capacitor changed on CCC; supplied with wrong value (summer students)

CCC + add-on in use (supplying a clock) in system tests





# LDA

- The LDA (from Enterpoint) consists of :
  - Mulldonoch2 baseboard;
  - add-on HDMI board to connect to 10 DIFs;
  - an add-on ethernet board to connect to an ODR;
  - a CCC add-on board.



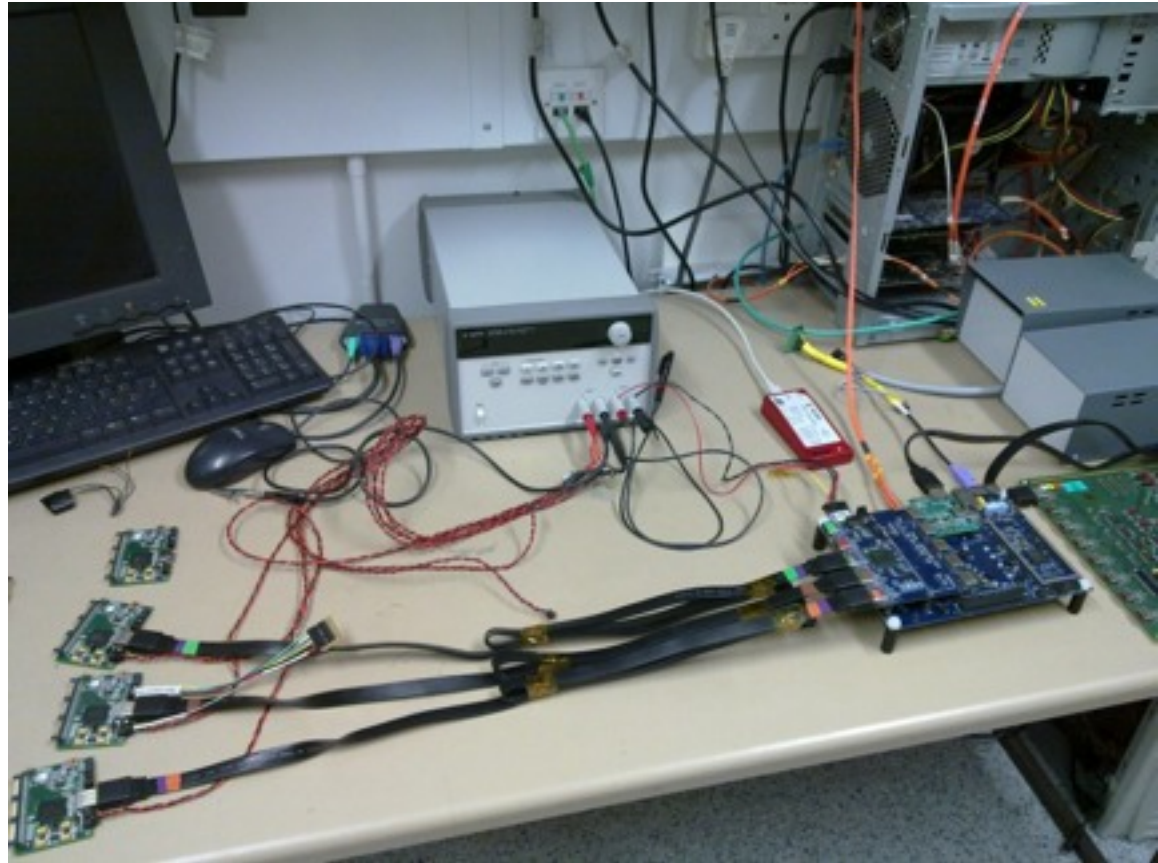
- Hardware status—recall all three (Enterpoint) boards had problems and needed re-design :
  - another came along with the production run; some HDMI connectors broke or broke the cable. Care needed on (un-)plugging; ease is cable dependent;
  - SAMTEC admitted fault in their connectors; 8 boards with manufacturer for repair;
  - decided to get a few more spares ...
  - added termination resistors on all HDMI boards at UCL (improves signalling and reduces FPGA power)
  - all boards apart from those in repair at UCL

# ODR and DAQ PC

- Basic functionality stable for a while and time-critical
- General tidying up of code ongoing
- Have 8 ODRs in-house along with 6 DAQ PCs :
  - one at LLR.
  - decided to include a network card so do not have to use fibre, which may initially be easier to use for some.

# System tests

- Systems available at UCL, LLR and now Cambridge
- Whole chain established : DAQ PC with ODR  $\Leftrightarrow$  LDA  $\Leftrightarrow$  DIF and CCC source
- Multiple ( $> 7$ ) links established
- Recent working day in LLR : working on reliability and bug fixes





# Administrative issues

- Still had quite a bit of money left over for this year : Valeria leaving, exchange rate, leave final hardware purchases until end.
- Hardware and travel basically used up.
- Salaries used for paying engineers on project.
- Should spend all by end of year.

## Summary

- Essentially have all hardware components in-house, in use by and available for calorimeter groups.
- Can send fast command and receive data packet back for whole chain.
- Have established links to multiple DIFs
- Work being documented, see CALICE [www](http://www.calice.org).
- Debugging and improvements before final hand over to calorimeter detector groups.