Clas12 MVT readout electronics for the forward tagger detectors

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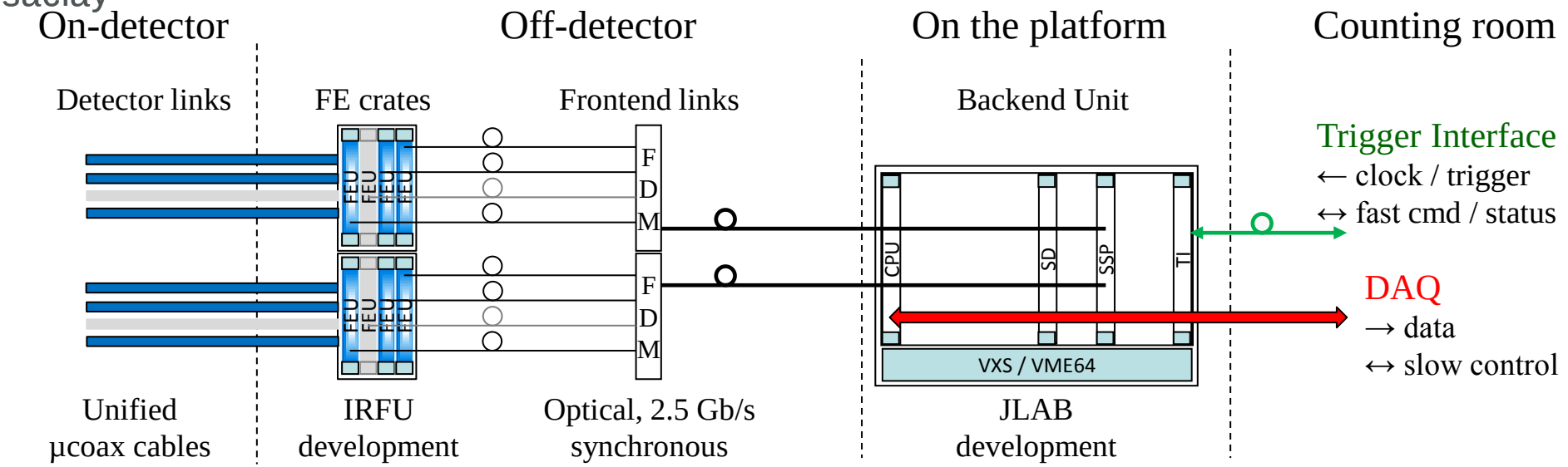
- Outlook
  - → Organization of the readout electronics
  - → Status & planning

Readout electronics





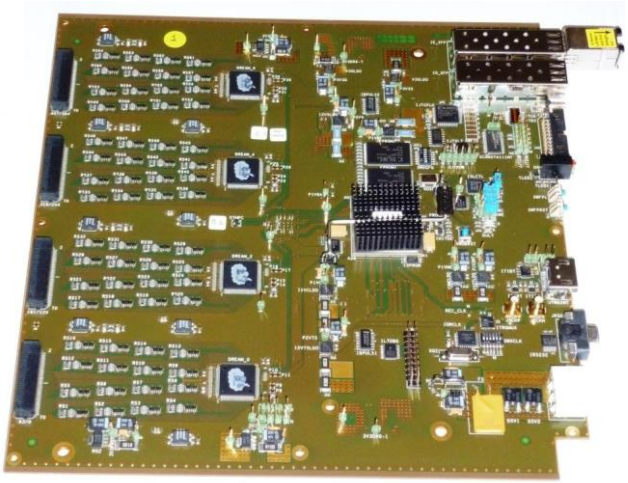


- **Frontend**
  - → ~4 K channels
  - → 64 64-channel µcoax cables
  - → 8 512-channel frontend units
  - → 1 2-FEU and 2 3-FEU crates
- **Backend**
  - → 1 Sub-System Processor (SSP)
    - Up to 32 frontend links
  - → 200 Mbyte/s backplane bandwidth
  - → 1 or 10 GB Ethernet DAQ link

Status of frontend components

- 64-channel micro-coaxial cables
  - → Delivery of 100 2m long Forward cables expected by the end of January
    - Delayed by 2 month
  - → We need to start ASAP the production of Barrel (1.5m) and FwdTag (1m, ?) cables
    - Length & quantity to be fixed

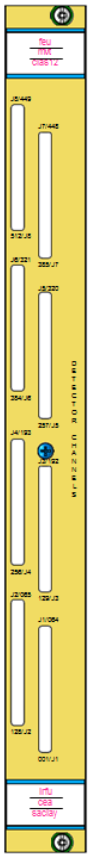
- Dream
  - → 360 version 1 ASIC-s received and tested
    - 100 have been used for FEU pre-series production
  - → 360 ASIC-s were expected by the end of the year
  - → 1000 more ASIC-s to be produced by April 2014

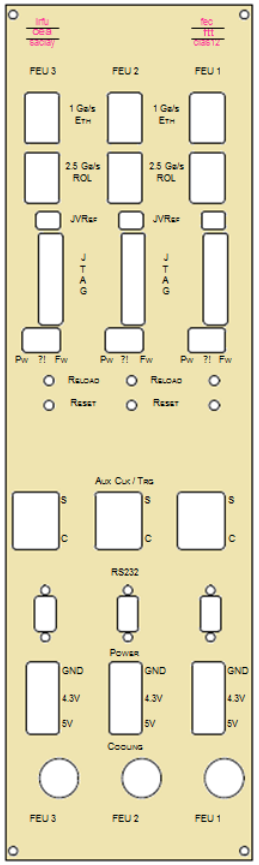


- FEU
  - → 12 pre-series boards were expected last week
    - All cabled and under various tests with manufacturer
    - Will be delivered during the first working week of 2015
  - → 8 non-protected and 4 protected FEU-s
    - Protected FEU-s are for Forward Tagger tests
  - → We plan to produce 50 FEU-s by May 2014

Status of frontend components

- Front-end crates
  - → Construction of 3- and 9-slot crates ongoing
    - Including cooling and LV distribution systems
    - FEU front faces and crate back cover with services outlets in preparation
  - → Almost all components in place





- Cooling
  - → Pressurized air cooling principle validated on prototype boards
    - During the 1.5T magnetic field tests
- JTag-based slow control
  - → Principles validated with the two FEU prototypes
    - Remote firmware upgrade, power, temperature monitoring
- Low voltage
  - → PL506 power used in the lab
    - 5m long power and sense cables
    - Interlock with fan based cooling
  - → Use the Wiener remote software control
    - To be integrated in the final slow control software

Status of backend components

- Backend crate at Saclay
  - → 1 SBC, 1 TI, 1 SD and 1 SSP
  - → SSP firmware adaptation ongoing
    - Tested with 2 FEU prototypes
      - → Slow trigger rate
      - → Synchronous trigger delivery and data reception
      - → Slow control request / response
  - → Standalone application using JLAB VME drivers & libraries to control SSP & TI
  - → Need to initiate the delivery of equipment for one more backend
- Software
  - → CODA installed on a Scientific Linux PC very recently
  - → Still in process of understanding how to write run control software

Questions to be answered

- Need forward tagger cables by September 2014
  - → How many: 60 + 5 spares could be enough?
  - → How long: 1m is OK? If longer, can we use 1.5m cables to be compatible with MVT Barrel?
- How many protected FEU-s do we need as spares @ JLAB?
  - → 8 are necessary for operation
  - → 4 or 5 can be used at JLAB test-bench
    - At least 4 is needed to test 1 Forward Tagger detector
- Need Forward Tagger backend
  - → Who negotiates and where to be delivered?
    - Reasonable delay well before October – to be delivered to Saclay
    - Long delay to close to October – directly to Genova
  - → MVT needs a second SSP and we will start to discuss its loan right now
    - The overall need of backend equipment will be reminded: 4 sets
      - → 1 set of MVT & 1 set of FwdTag @ JLAB
      - → 1 set of combined MVT / FwdTag test bench @ JLAB and 1 set for Saclay test bench
- What is the distance between frontend crates & service rack?
  - → LV, slow control PC, etc.