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# Control software for the CBM readout chain

Pierre-Alain Loizeau

GSI, Darmstadt, Germany

1. CBM
2. CBM readout, general view
3. CBM new readout system
4. DPB Firmware
5. CBM software
6. Status

## 1. CBM

- ⇒ Fixed-target heavy-ion experiment at FAIR
- ⇒ Ions up to Au at energies up to 11 AGeV (SIS100)

### Physics goals (among others):

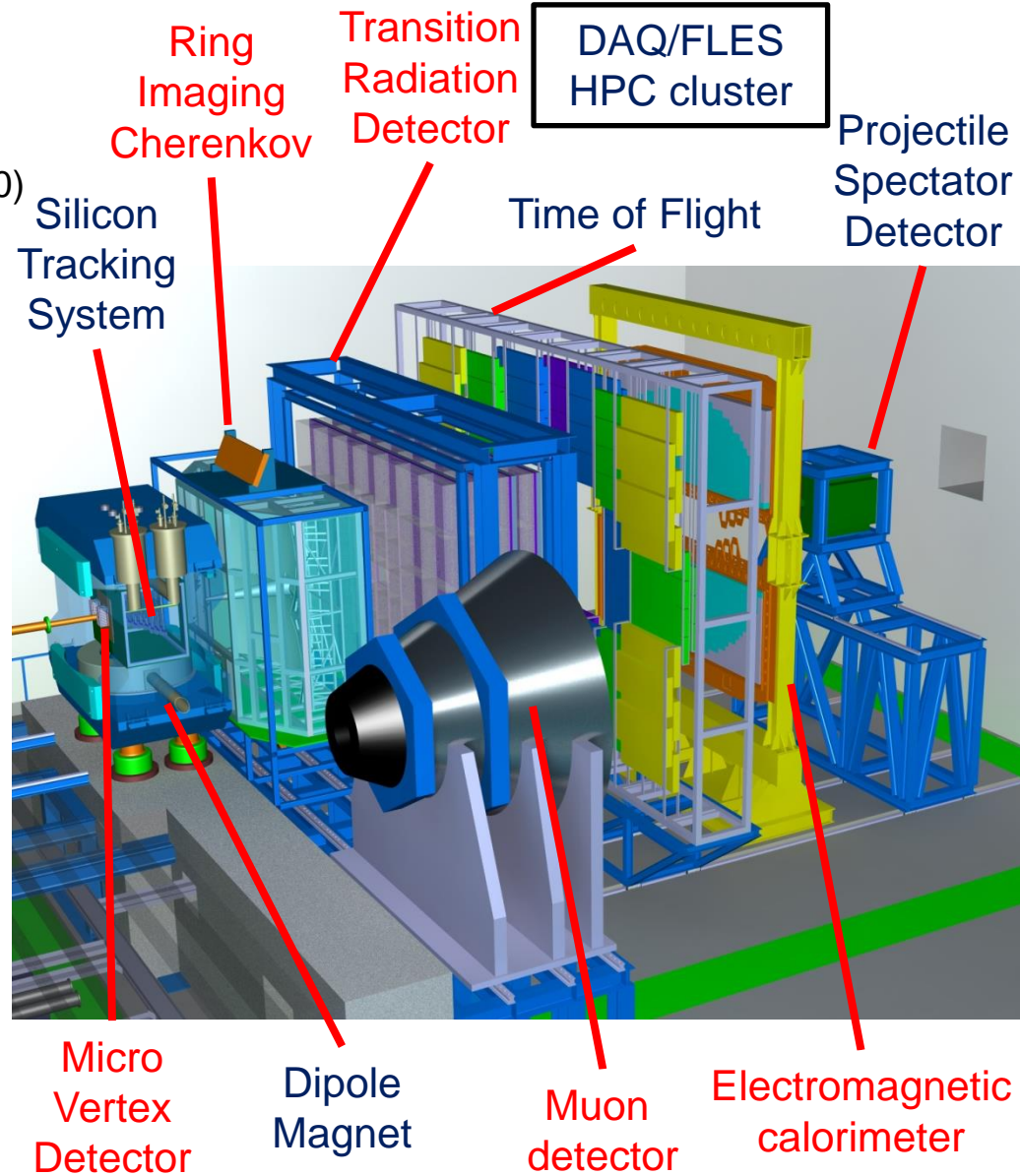
- In-medium properties of hadrons
- Charm production
- Strange and multi-strange objects
- ⇒ High statistics, rare and/or sometimes complex observables to identify

### Requirements:

- High statistics
- High precision
- Non trivial event selection possible

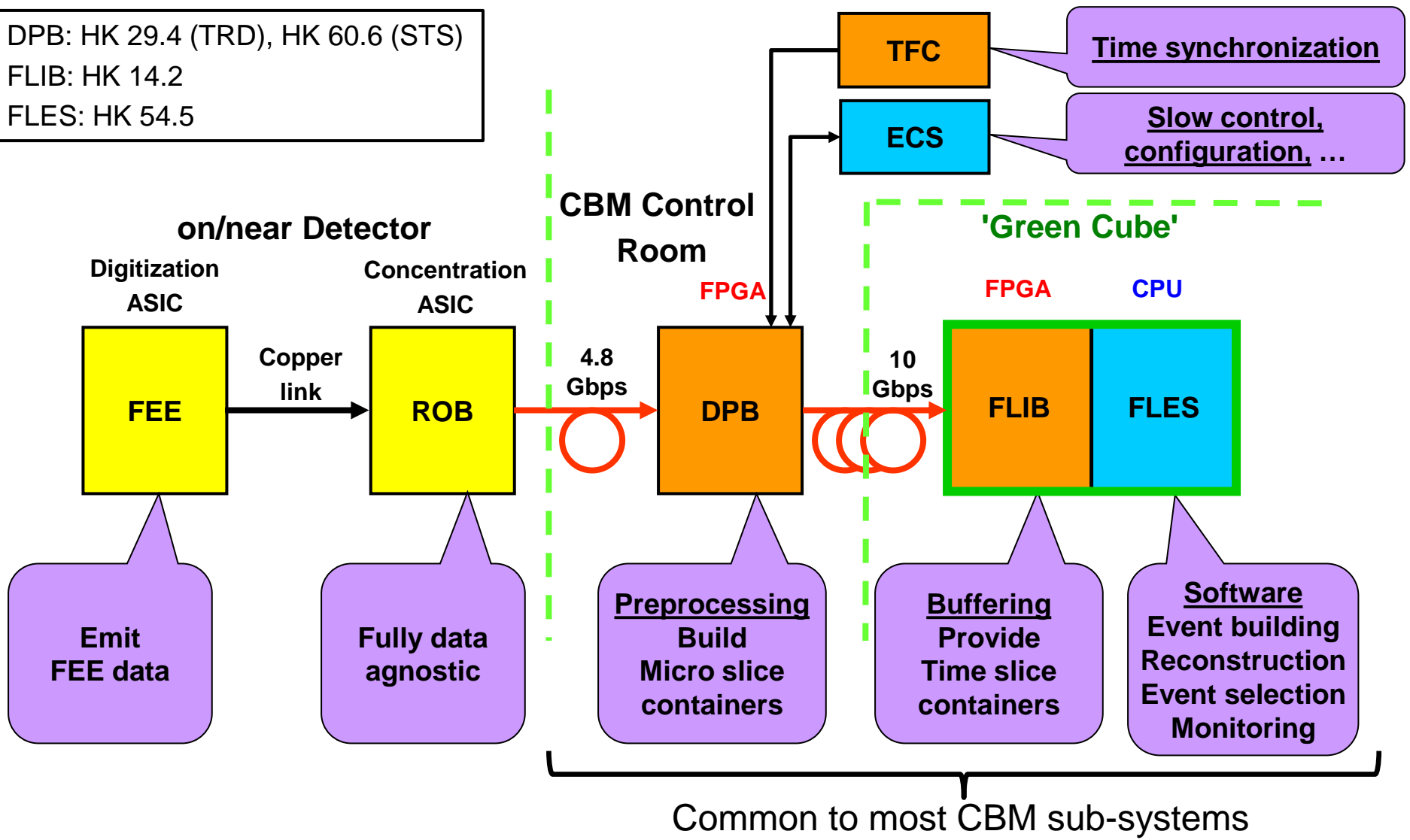
### Specifications:

- Up to  $10^7$  Au+Au collisions/sec
- ~ 1000 charged particles/collision
- “Free-streaming” readout and time-based data processing
- Online building & selection of events

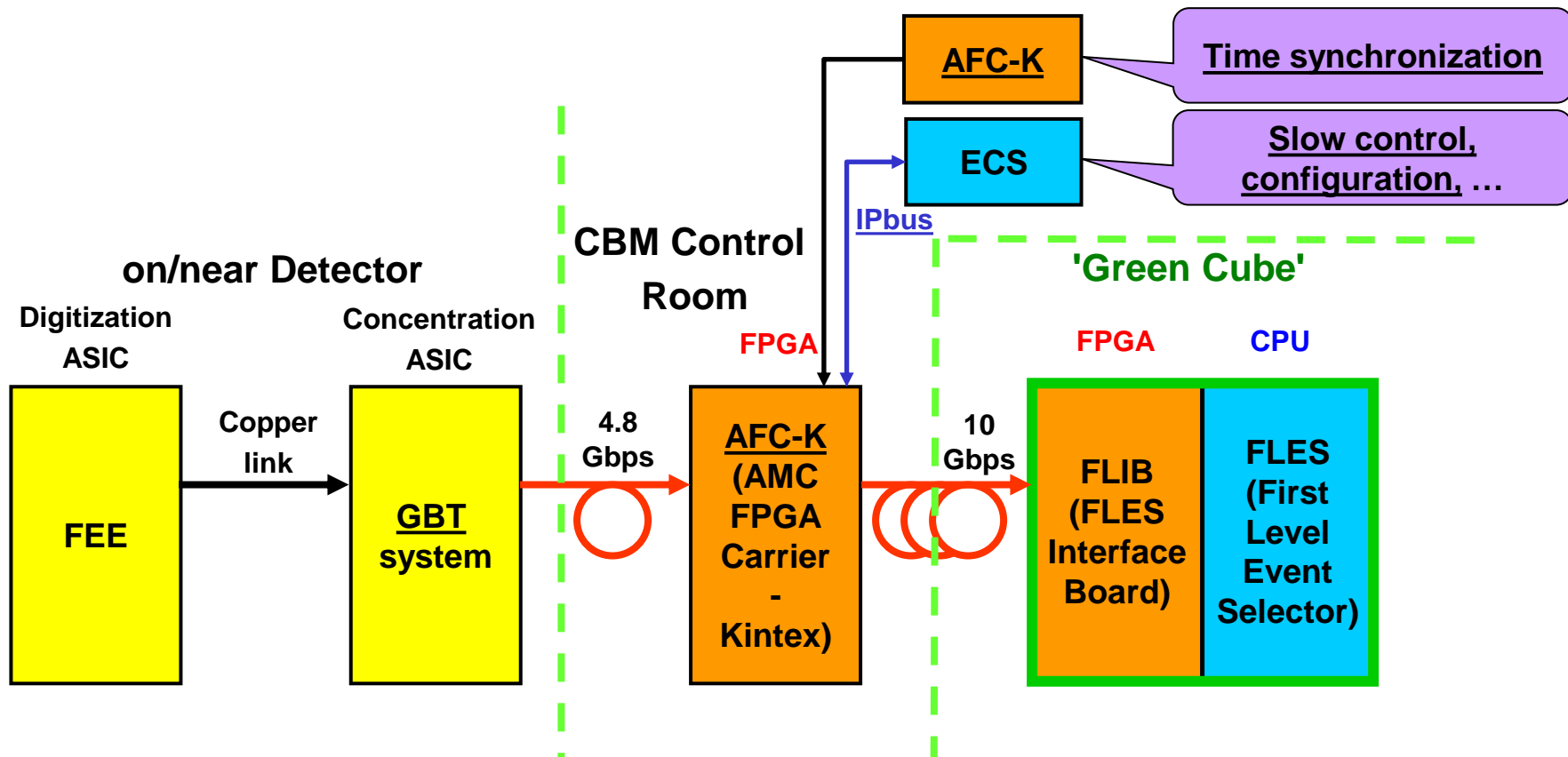


## 2. CBM readout, general view

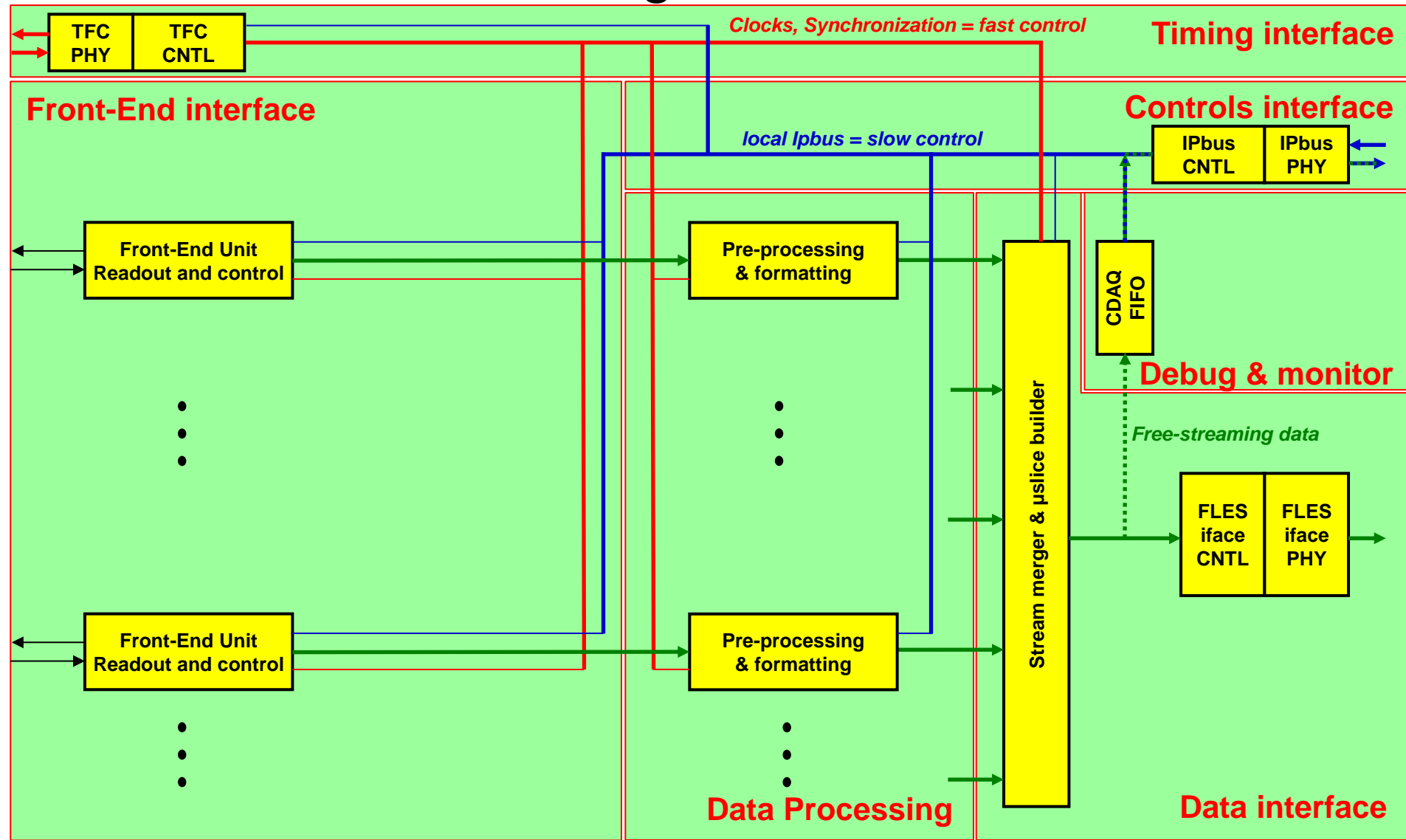
DPB: HK 29.4 (TRD), HK 60.6 (STS)  
 FLIB: HK 14.2  
 FLES: HK 54.5



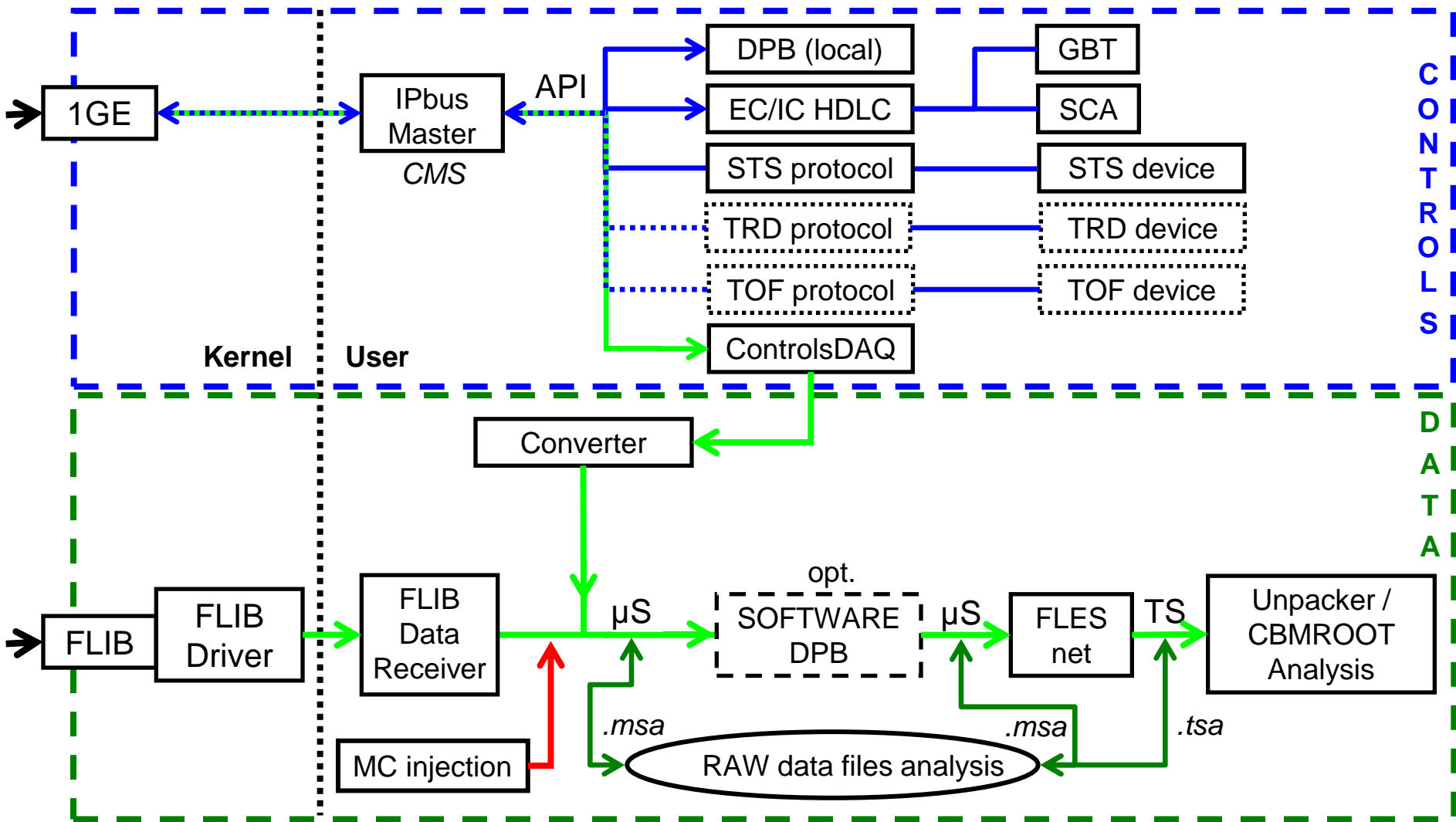
### 3. CBM new readout system



# 4. General Firmware organization

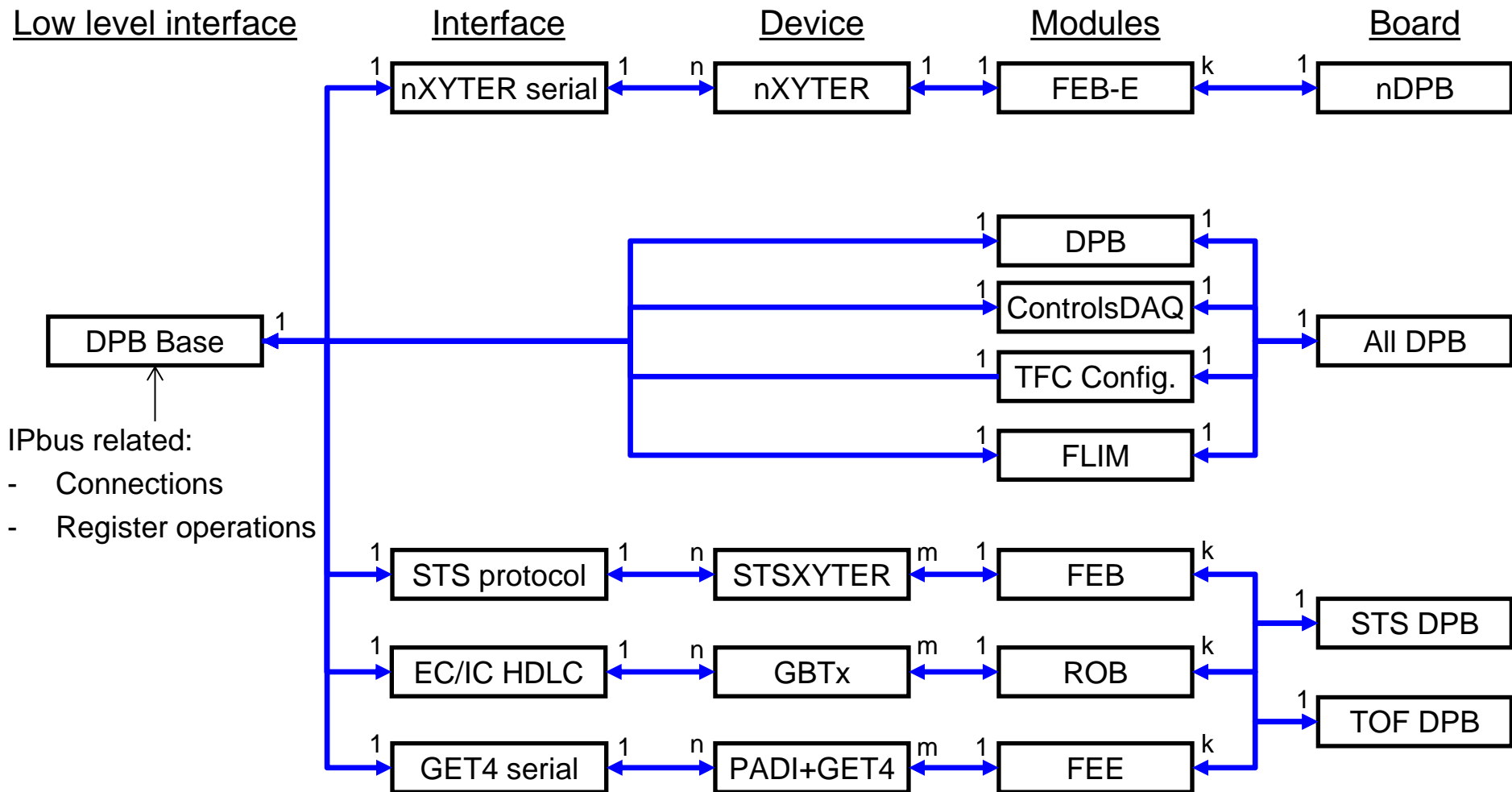


## 5.a CBM software general organization



## 5.b Control software

Low level interface





## 6. Status

First implementation and tests with previous STS prototype: nXYTER system



⇒ Base library implemented

⇒ Basic FEB communication OK

⇒ Basic FEB configuration OK

⇒ Next step is data readout through control path

⇒ Configuration/control of FLIM module readout in parallel to Firmware development

# Summary

- The readout chain for most CBM detectors will use the CERN GBT system and a Data Processing Board (DPB) based on an FPGA board
- Control done with IPbus
- Firmware blocks mirrored on control software side
- Implementation of control software started, progress in parallel to FW advances

# Outlook

- First tests with nXYTER FEE for CBM STS in coming weeks
- Later addition of the CBM TOF electronics: PADI and GET4
- Use in beamtime in Fall: COSY in Jülich and SPS at CERN
- In same period, first version of final STS electronics available for users
- Support for the other components in the chain in parallel to main electronics controls: Timing system, GBT system

Thank you for your attention!

GSI Darmstadt: D. Emschermann, J. Lehnert, P.-A. Loizeau, W. F. J. Müller

USTC/GSI: Junfeng Yang

AGH Krakow: R. Szczygieł, K. Kasiński *et al.*

WUT Warsaw: W. Zabołotny *et al.*

VECC Kolkata: J. Saini, S. Mandal *et al.*

IRI Frankfurt: J. Gebelein, S. Manz, A. Oancea, *et al.*

FIAS Frankfurt: J. de Cuveland, D. Hutter *et al.*