



## A GENERIC TIMING SOFTWARE FOR FAST PULSED MAGNET SYSTEMS AT CERN

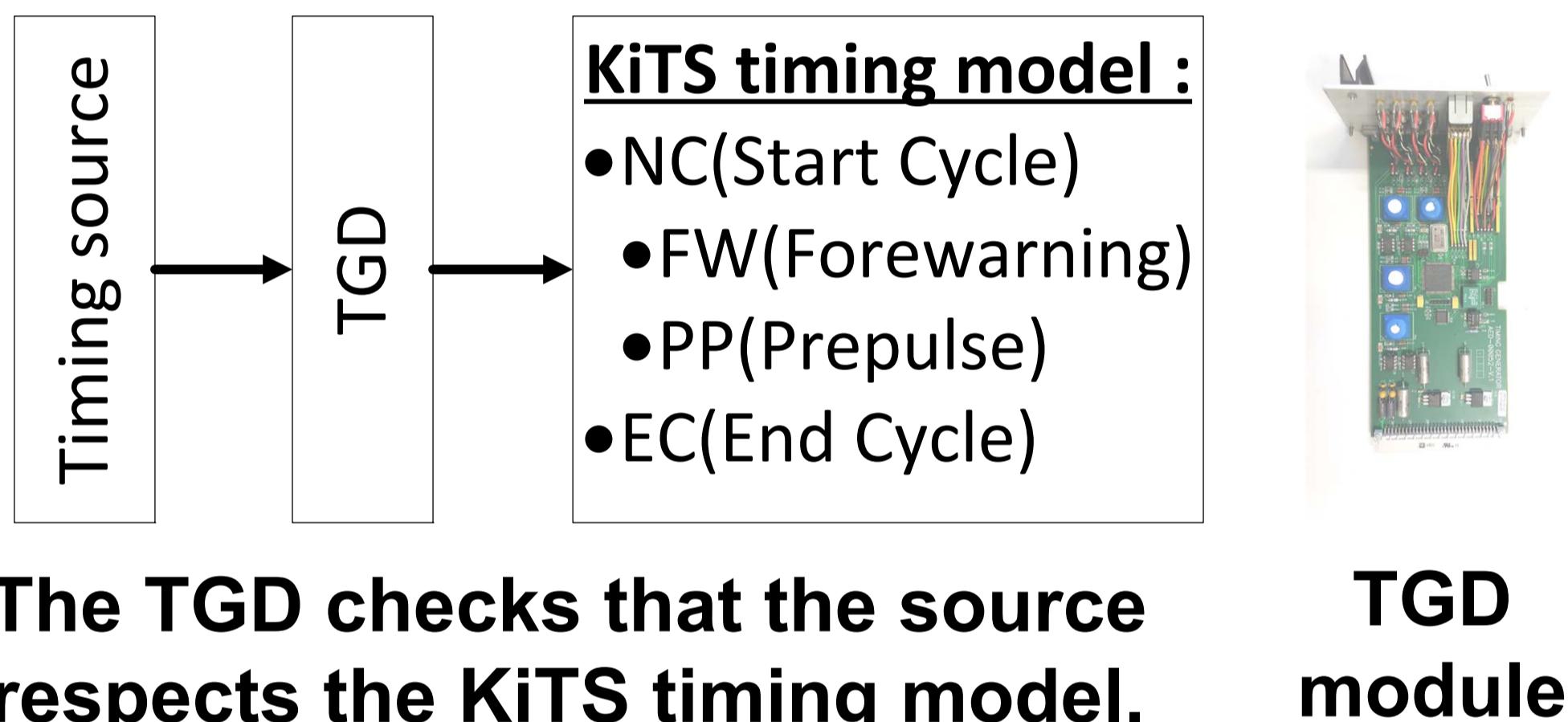
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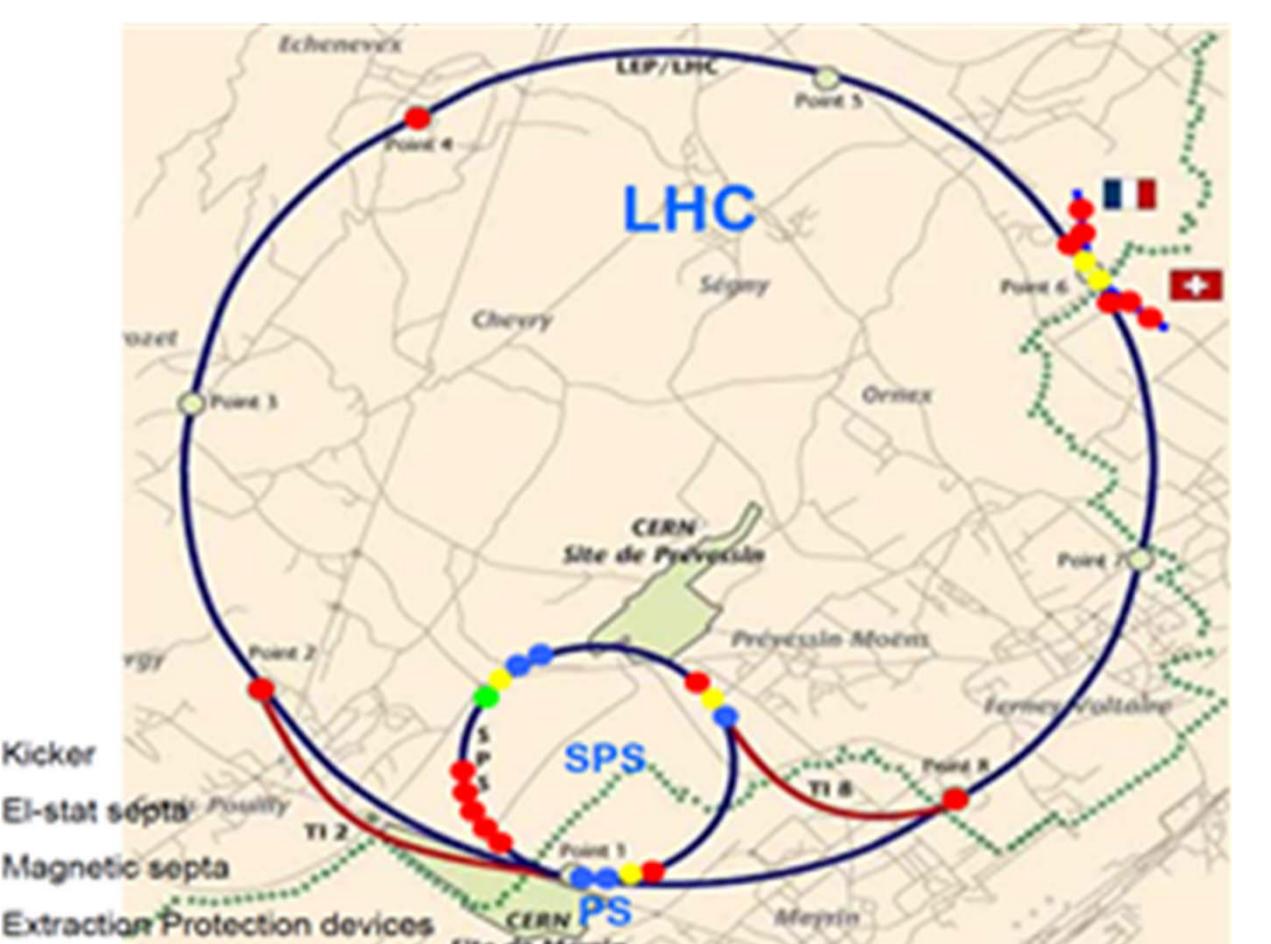
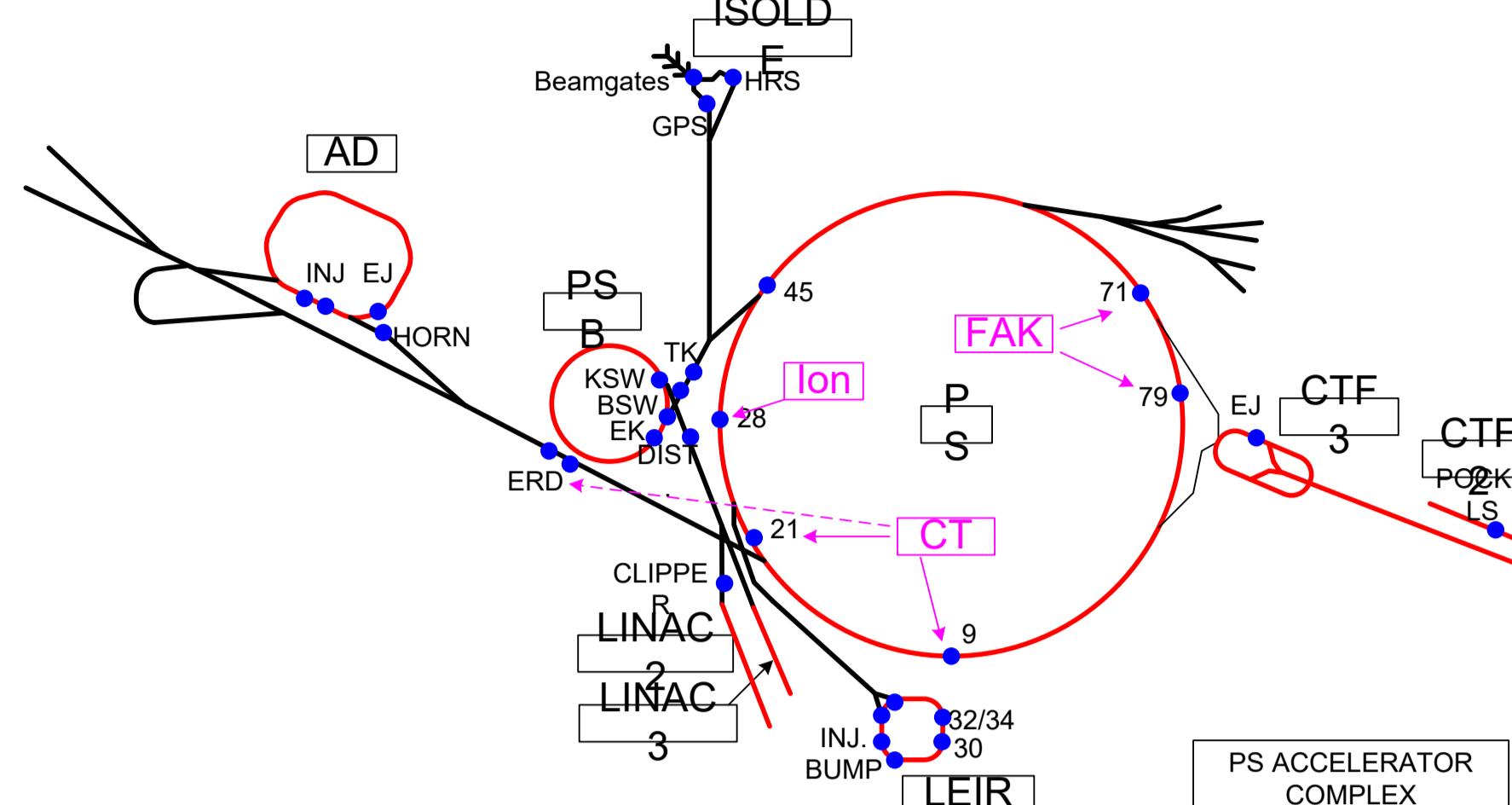
### ABSTRACT

At CERN, fast pulsed magnet (kicker) systems are used to inject, extract, dump and excite beams. Depending on their operational functionalities and as a result of the evolution of controls solutions over time, the timing controls of these systems are based on different hardware architectures that result in a large disparity of software solutions. A Kicker Timing Software (KiTS), based on a modular hardware and software architecture, has been developed with the objective to increase the homogeneity of fast and slow timing control for fast pulsed magnet systems. The KiTS uses a hardware abstraction layer and a configurable software model implemented within the Front-End Software Architecture (FESA) framework. It has been successfully deployed in the control systems of the LHC and SPS injection kickers, the SPS extraction kickers and the SPS tune measurement kickers.

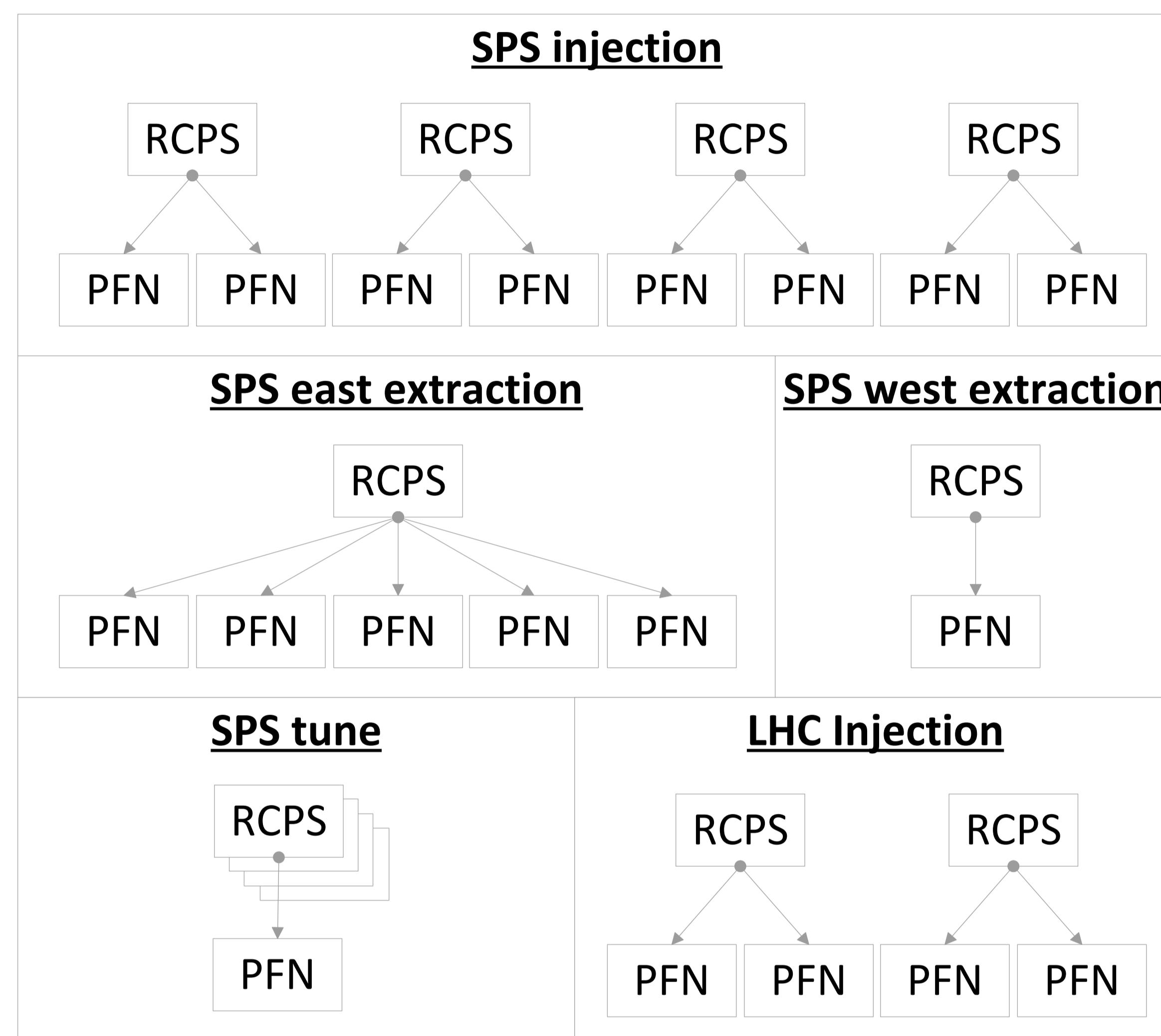
### Timing abstraction



### Kickers at CERN



Many dedicated fast control software requiring a huge maintenance time cost.



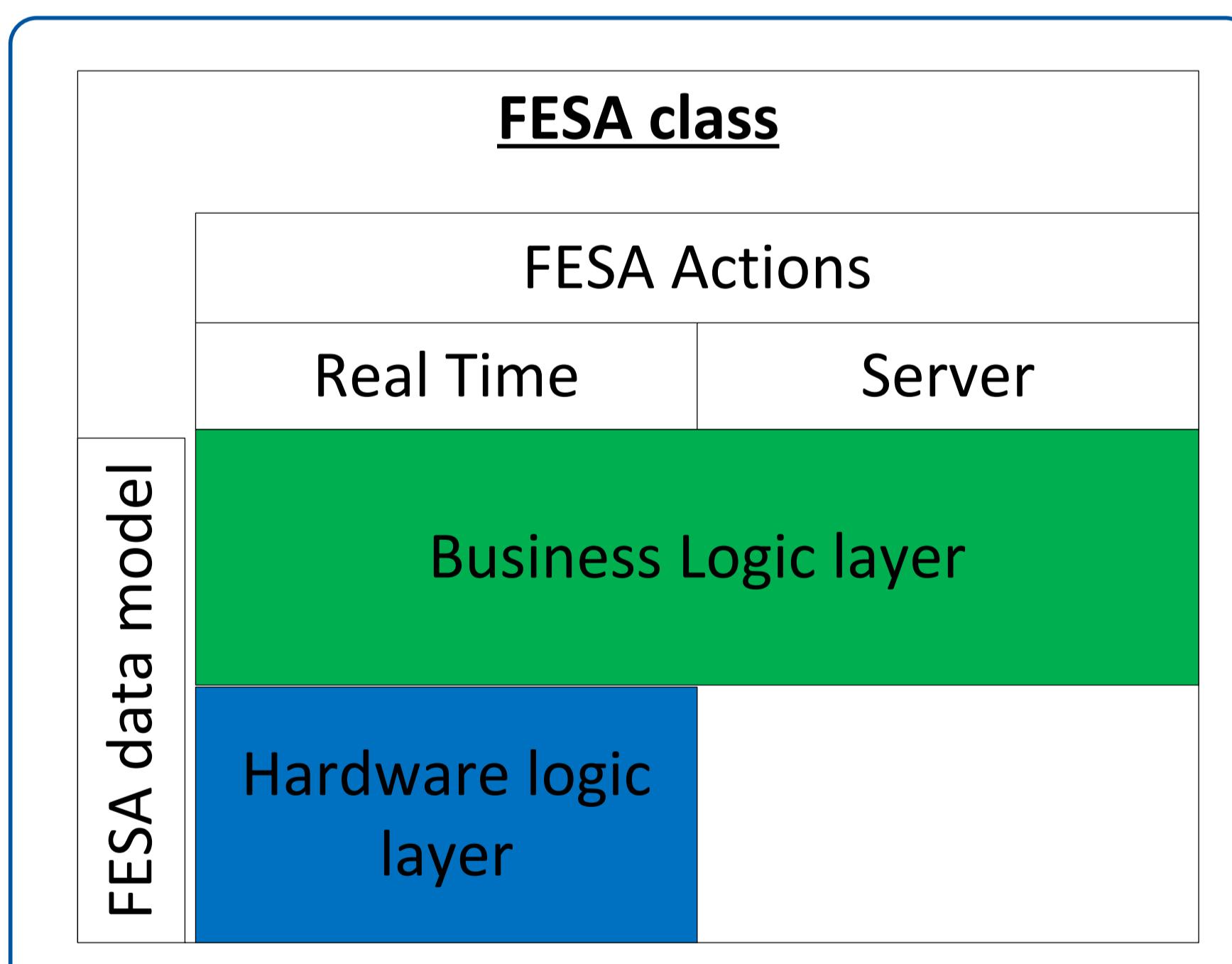
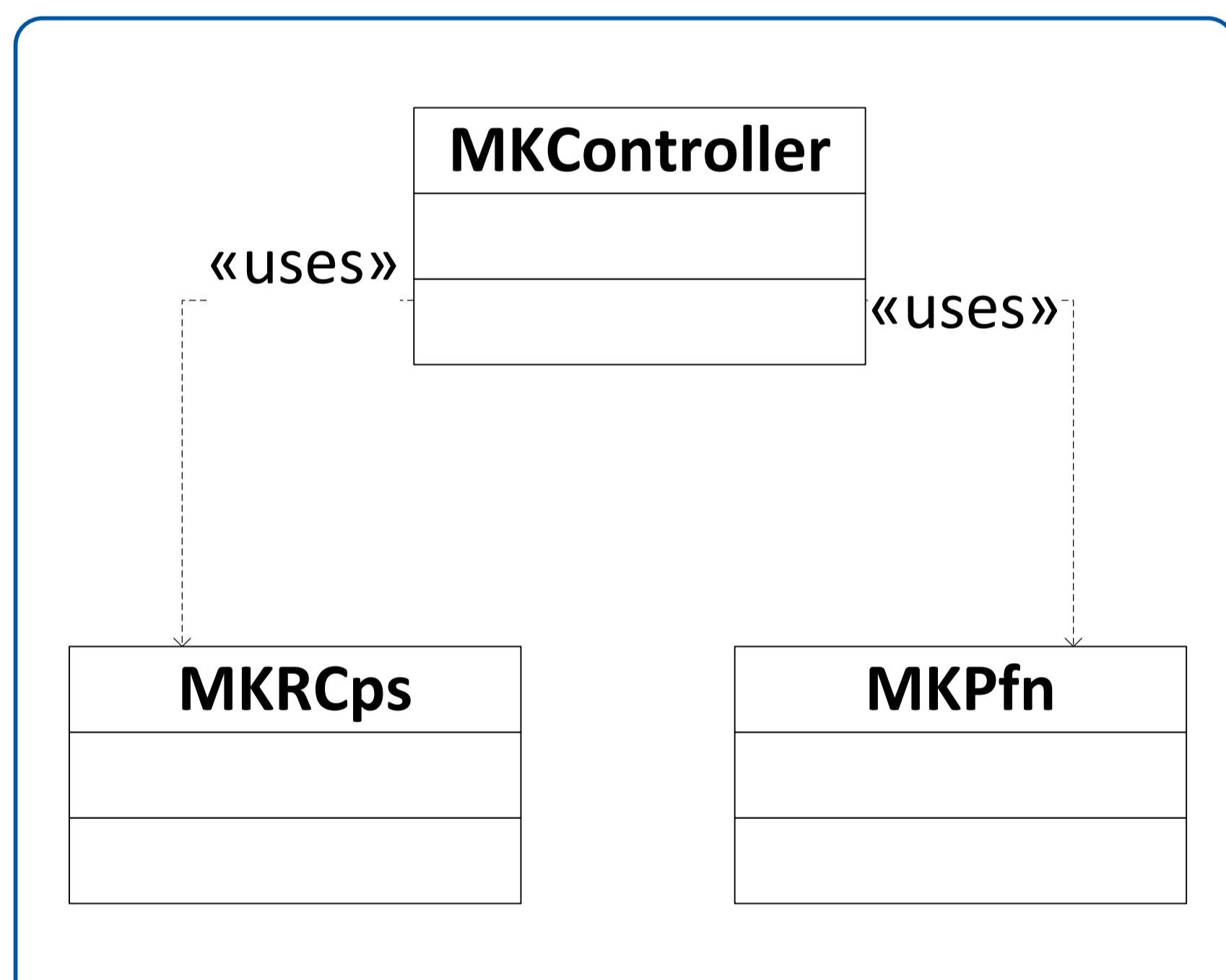
- DAC**
- TSVME403
  - VSS
  - VMOD12A2
  - VMOD12A4

- ADC**
- TSVME403
  - VAR
  - VMOD12E16

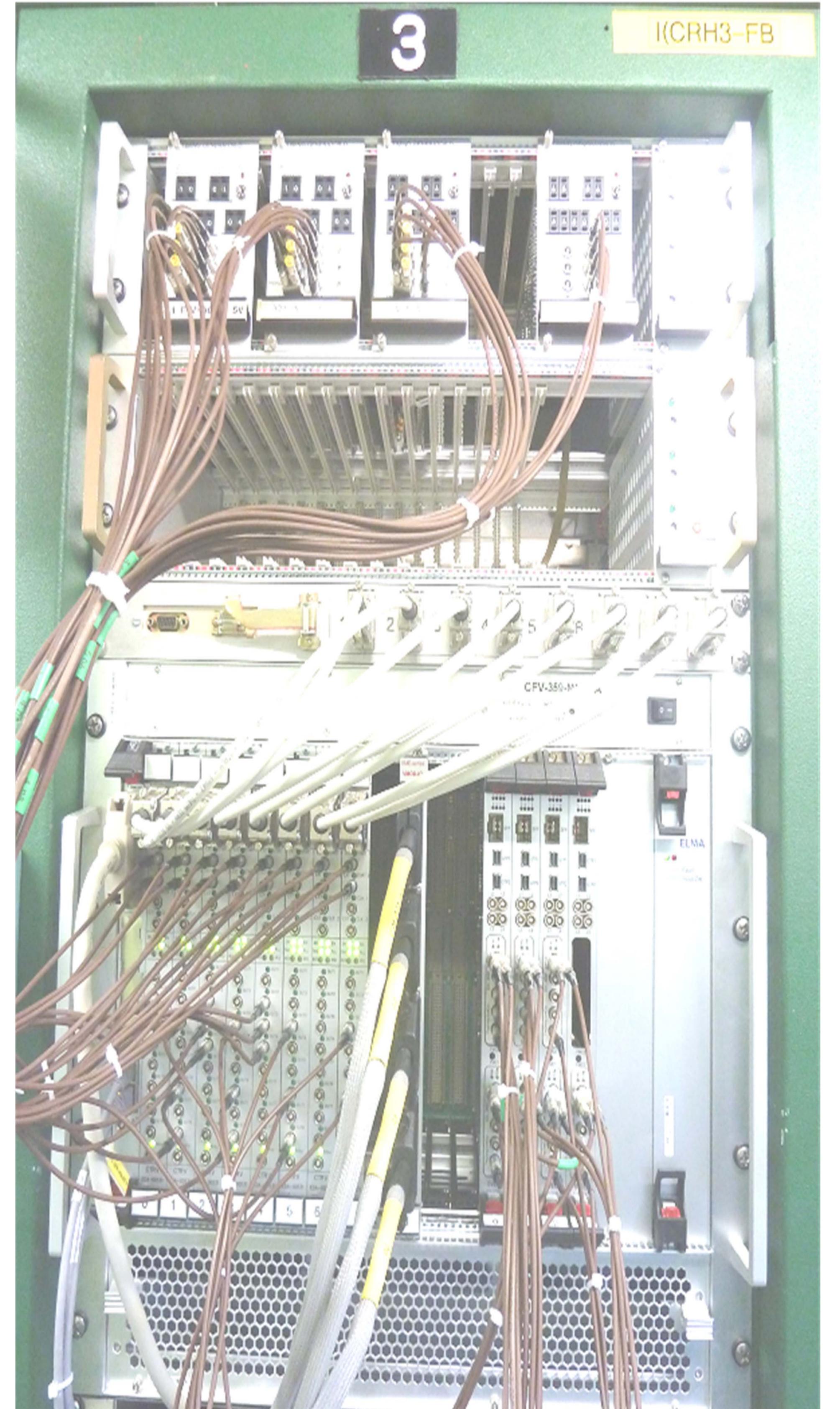
- DELAY**
- EPD
  - PPD
  - V850
  - CTR

Many types of fast control modules

### KiTS Software Architecture



### KiTS BFA example



### KiTS Deployment

- LHC**
- LHC Injection point 2 & point 8
- CPS**
- Continuous transfer
  - Stearcase : BFA9-21S, DFA254
  - Pedestal : BFA9P, BFA21P

- SPS**
- SPS Injection
  - SPS West extraction
  - SPS East extraction
  - SPS Tune H&V

- PBAR**
- AD Injection
  - AD Extraction
  - ELENA Injection
- HALL 867**
- LHC Injection