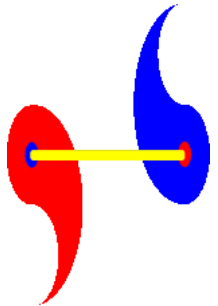
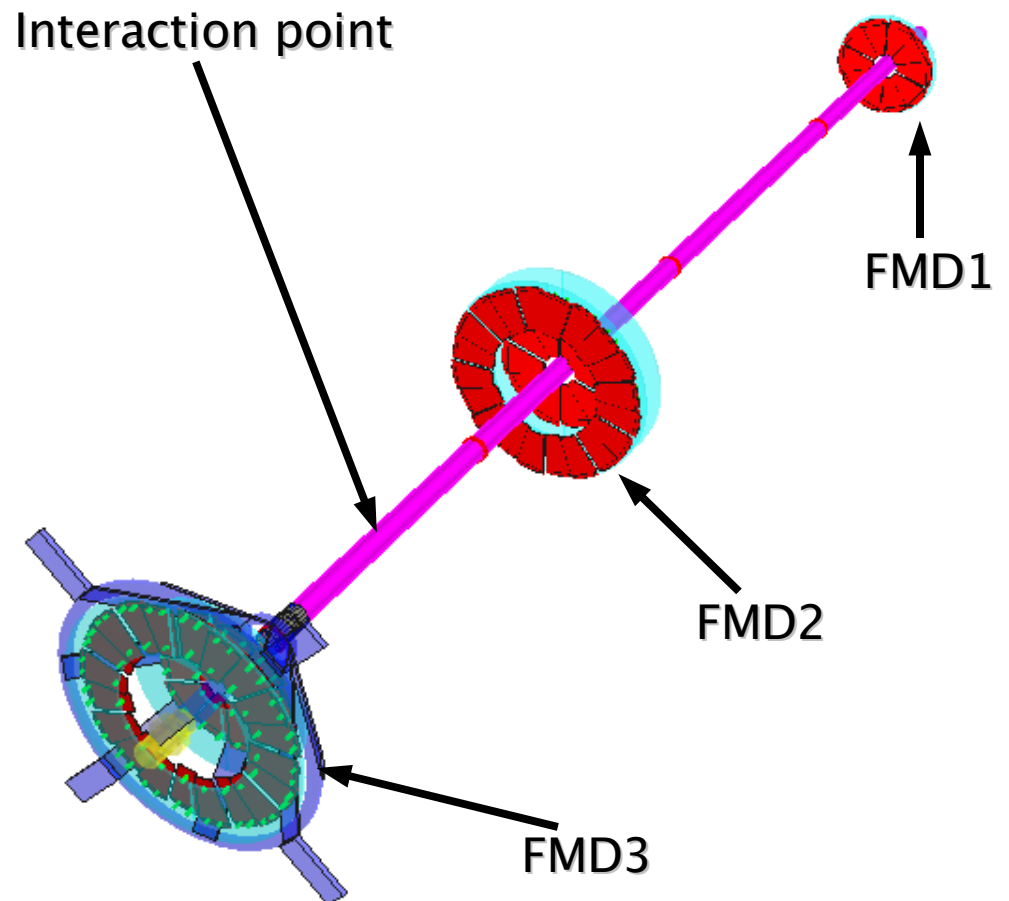


# DCS workshop July 2007



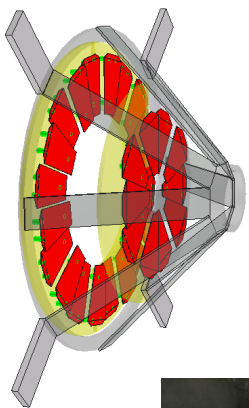
## Overview

- Installed detectors
- FMD3 commissioning
- FSM Hierarchy
- LV+HV FSMs
- FEE FSMs
- Databases
- Summary

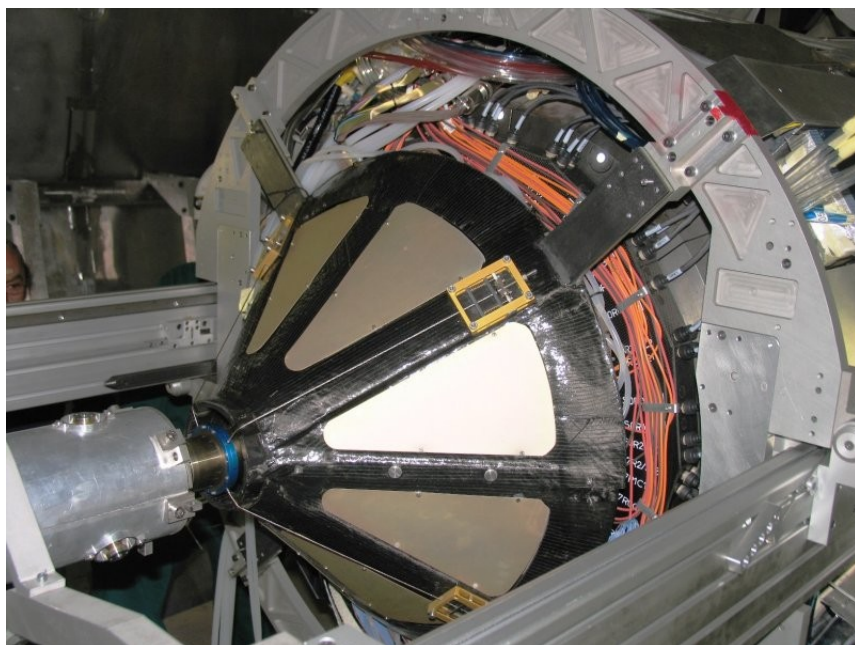


Christian Holm Christensen

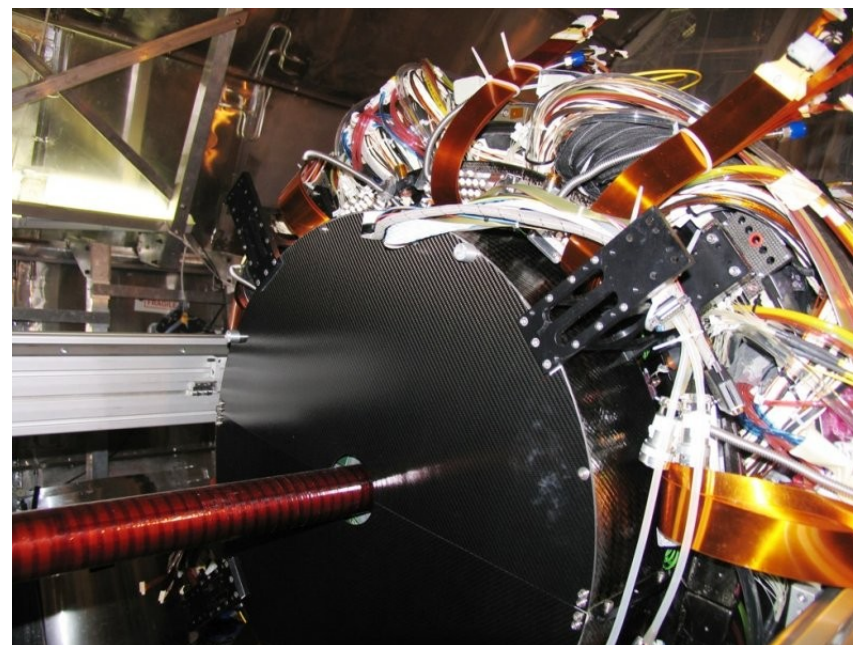
30/06/07



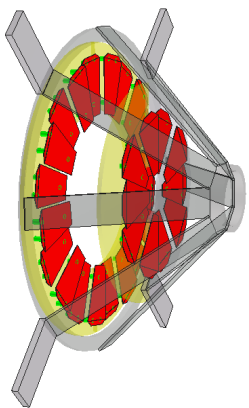
# Installed detectors



FMD3 installed mid April 2007. Subsequent commissioning.



FMD2 installed end of June.



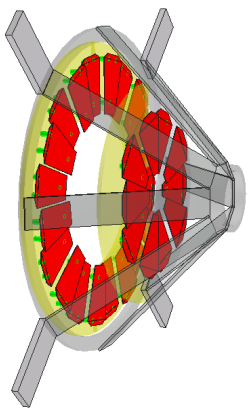
# FMD3 Commissioning



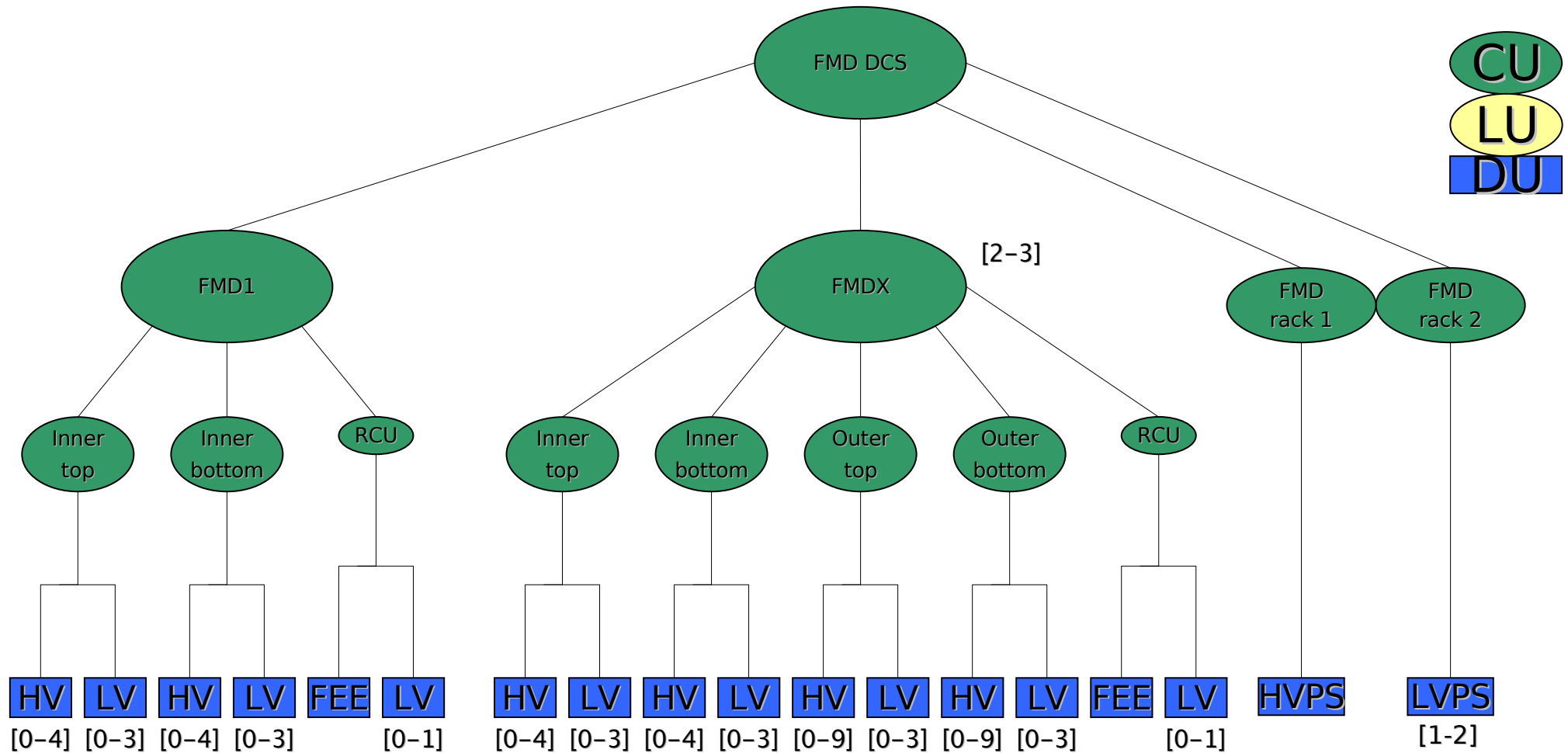
Systems exercised:

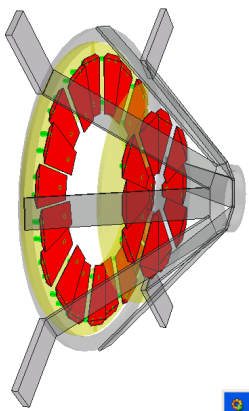
- Trigger (from TPC partition, no busy-box)
- DAQ
- `High'-voltage ( $\sim 130\text{V}$ ) control. Not via PVSS project.
- Lab low-voltage power supplies, since no CAEN modules available.
- FEE control via dedicated `expert' control.



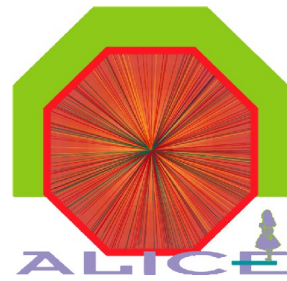


# Finite State Machine Hierarchy

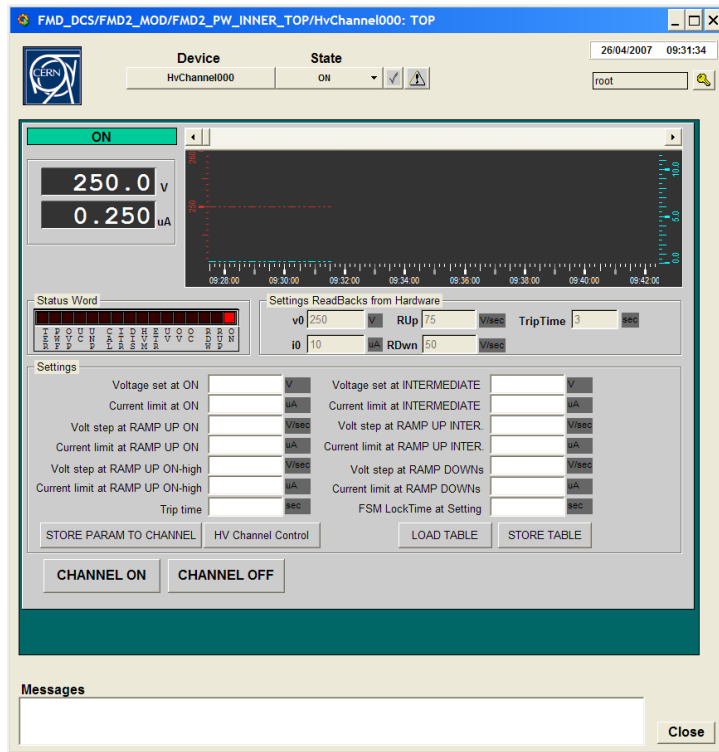




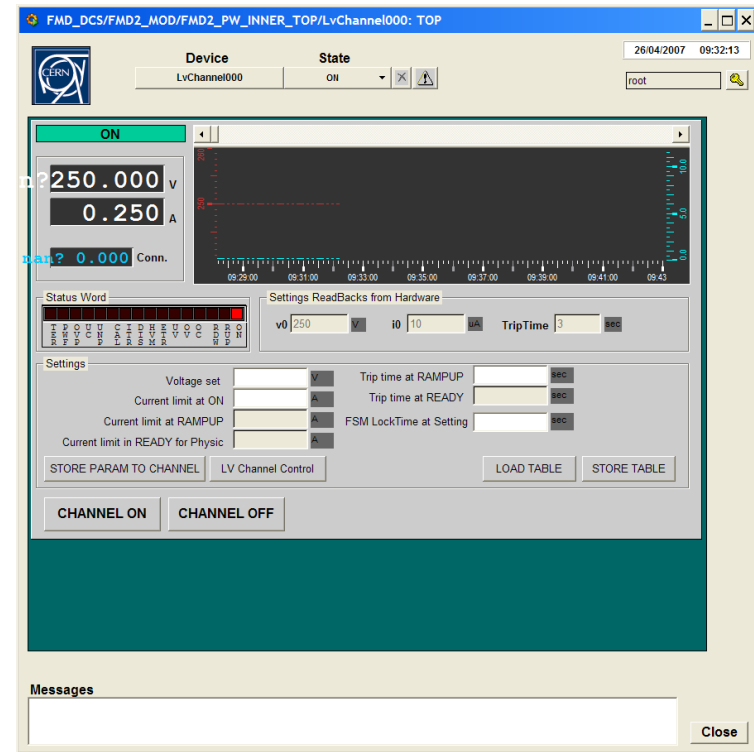
# LV & HV Finite State Machine



High-Voltage channel

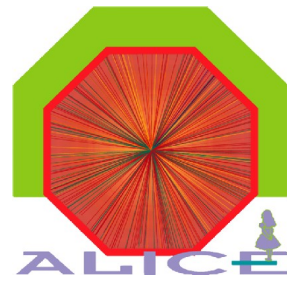


Low-Voltage channel

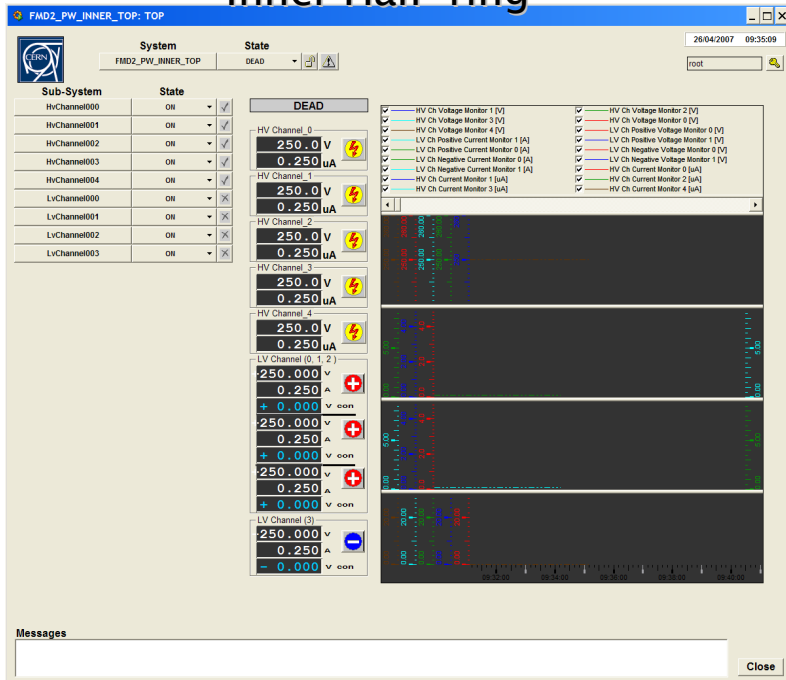


- Done: main controls + monitors
- To do:
  - Database: store & restore values for HV/LV settings
  - Include DCS: Access Controls, Titles, Standard panels

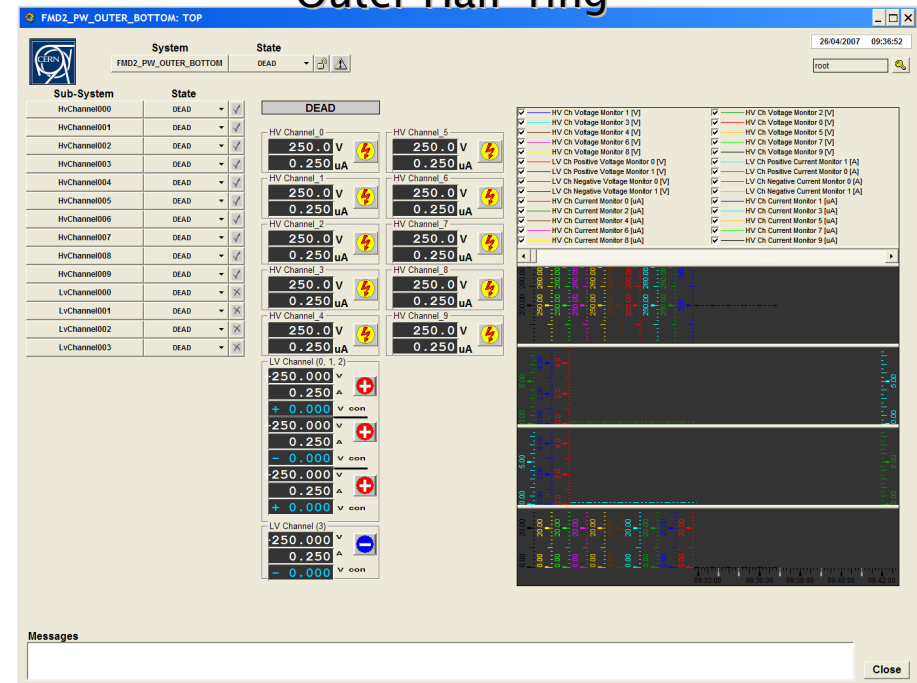
# LV & HV Half-ring Finite State Machine



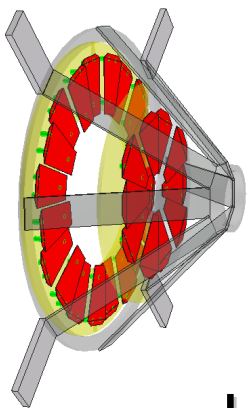
Inner Half-ring



Outer Half-ring



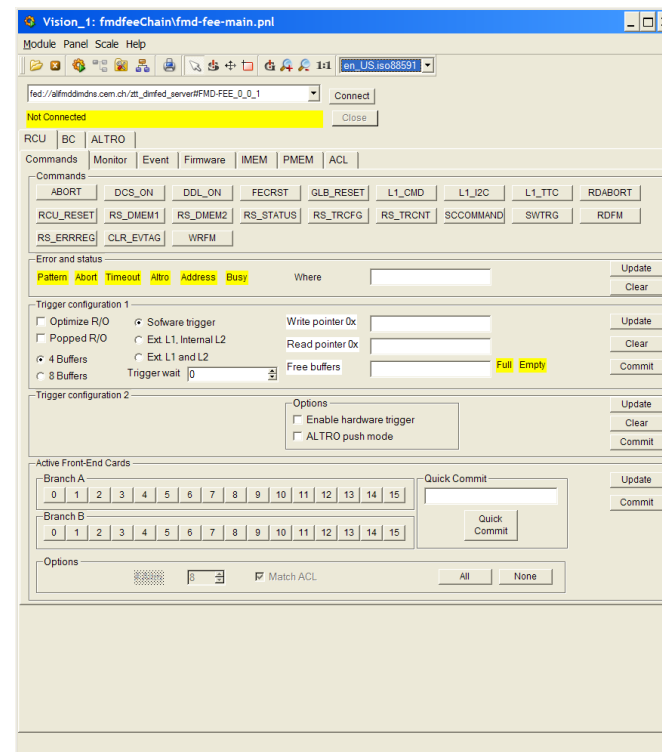
- Done: main controls & monitors
- To do:
  - Panels for FMDx and FMD\_DCS
  - Test w/real power supplies and fans
  - Include DCS: access control, titles, standard panels
  - Test FSM for all HV & LV modules w/real hardware



# FEE Finite State Machine



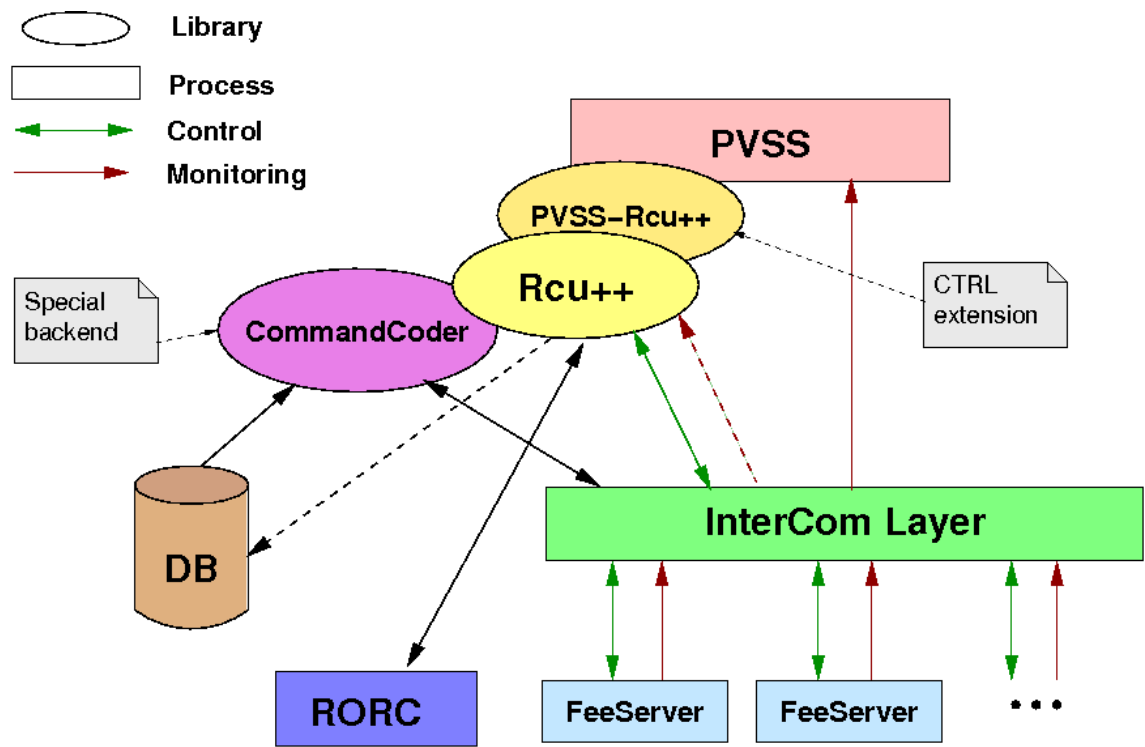
- Have:
  - Expert GUI based on PVSS COM extension.
- Need:
  - FSM & controls for RCU LV
  - FSM & controls for FEE configuration.
  - Monitor FEE (RCU) parameters (error/status, active FECs, state?)
  - Archive FEC parameters (temperature, voltages, currents, state?).
  - Maybe reuse TPC stuff.



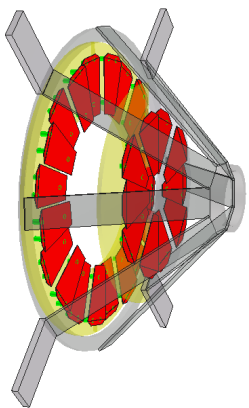
# FEE Control/Monitoring Architecture



- PVSS send high-level commands to InterCom Layer (ICL)
- ICL uses CommandCoder for configurations
- ICL forwards monitoring from FeeServer
- Rcu++ encodes/decodes requests/results.





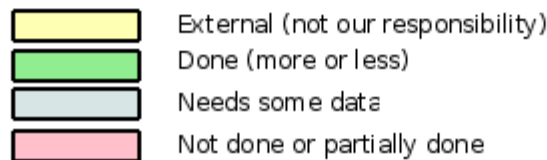
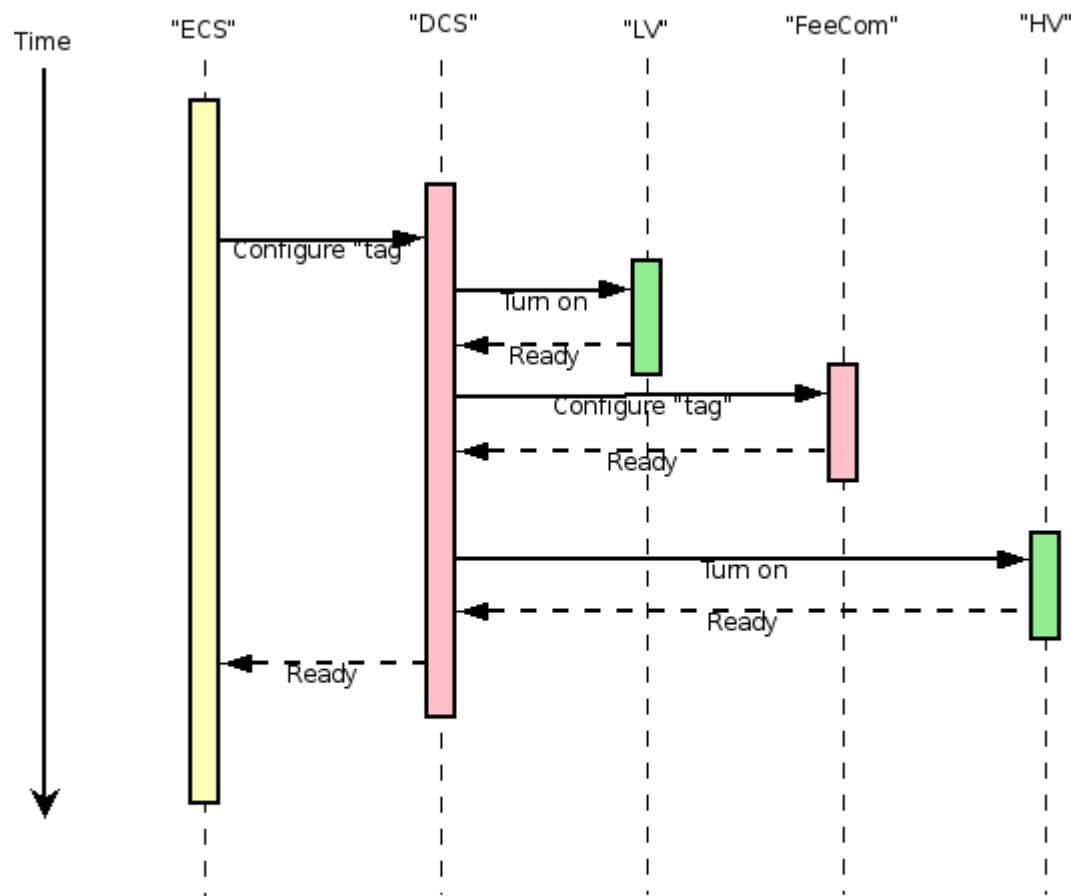


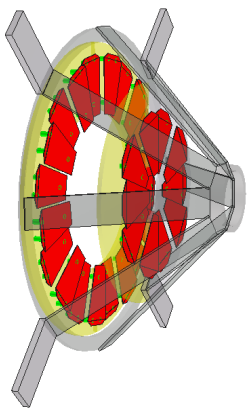
# Top-level Finite State Machine (configuring)



- Mostly implemented
- Need to take care of order (first LV, then FEE conf, and finally HV)
- Maybe need to move RCU up in hierarchy
- Collaboration with Alexander Kurepin (INR) on this.

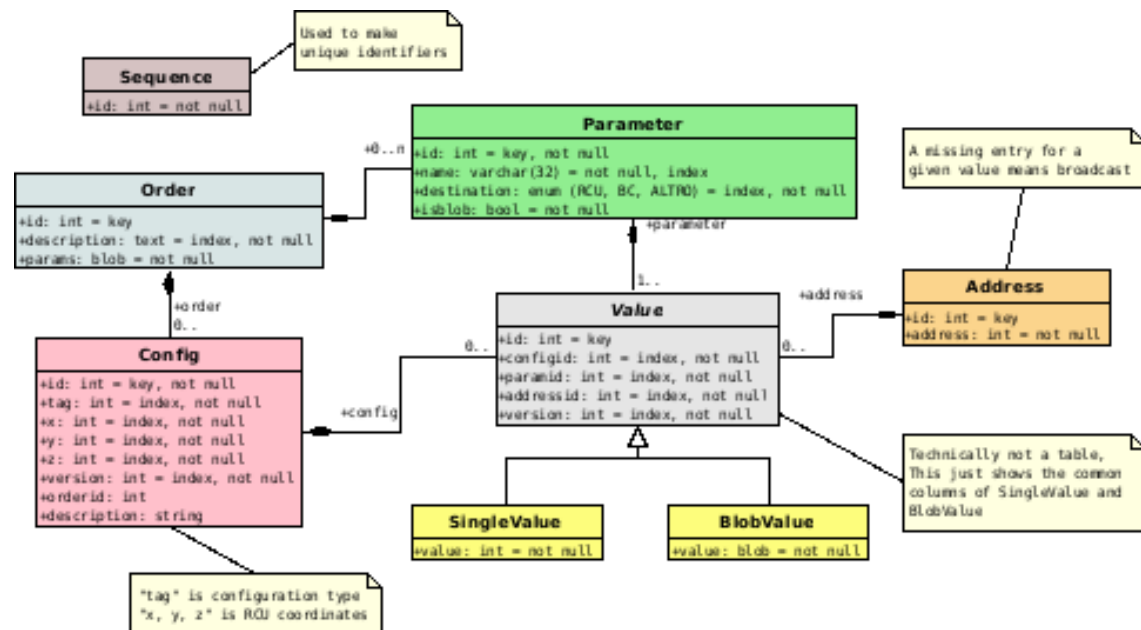
Configure FMD



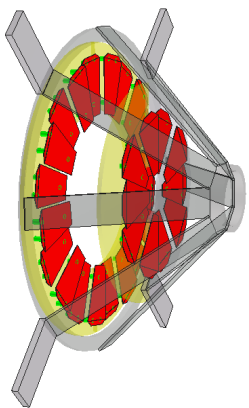


# Databases

- DB schema for FEE defined (need approval by IT)
  - Transparent access via RcuDB/RcuConf in both DCS and DAQ domain.
  - Store “tag” as datapoint – later used by DA/Offline SHUTTLE to retrieve settings.
  - Focus on size & referential safety (3<sup>rd</sup> normal form)
  - *Never* delete



- DB schema for LV/HV not clearly defined.



# Summary

## Implemented and tested

- Lower level finite state machines for LV & HV
- FEE access architecture

## To be done

- Test finite state machines for LV & HV w/real hardware – especially CAEN LV supplies.
- Implement finite state machine for FEE
- Implement monitoring of FEE
- Implement sub-detector finite state machine
- Get IT approval of FEE DB schema, and populate DB
- Formulate LV & HV schema
- Test/Implement rack access
- Integrate TPC cooling state into finite state machine
- DA for retrieving FEE settings for Offline

