PADME DCS and ADC commissioning

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PADME General meeting

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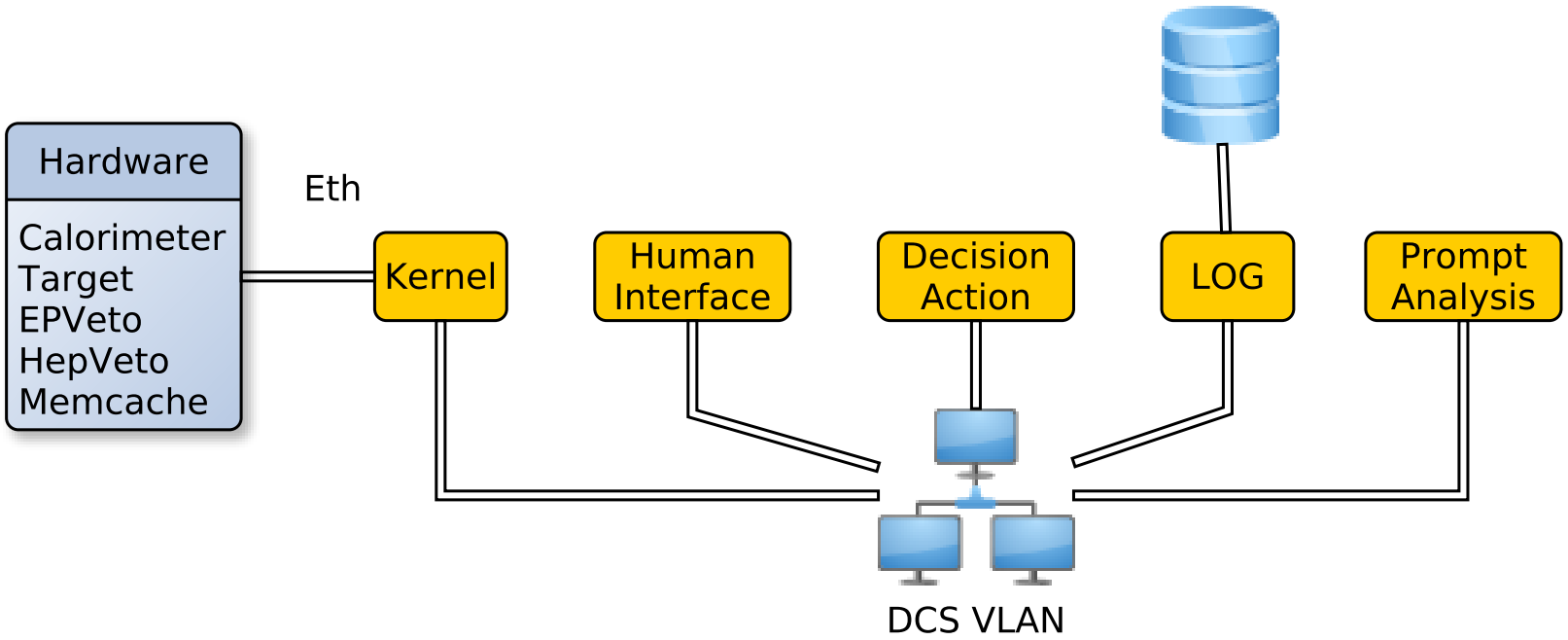
Outline

DCS Purpose

- Controls the hardware
- Monitors parameters
- Takes immediate actions
  - Sends notifications for problems
  - Restarts the run if changes of parameters are detected
  - This is not meant to act as an Interlock

DCS Architecture – Modules



DCS Prompt Analysis

- Run lite version of PadmeFW
- Verify time alignments
- Verify Noise floors
- Verify light yield
- Hit rates

DCS Loggers

- Autonomous program
- Monitors the values on DCS Info Service
- Filters the data using predefined criteria
- Logs everything in a DB

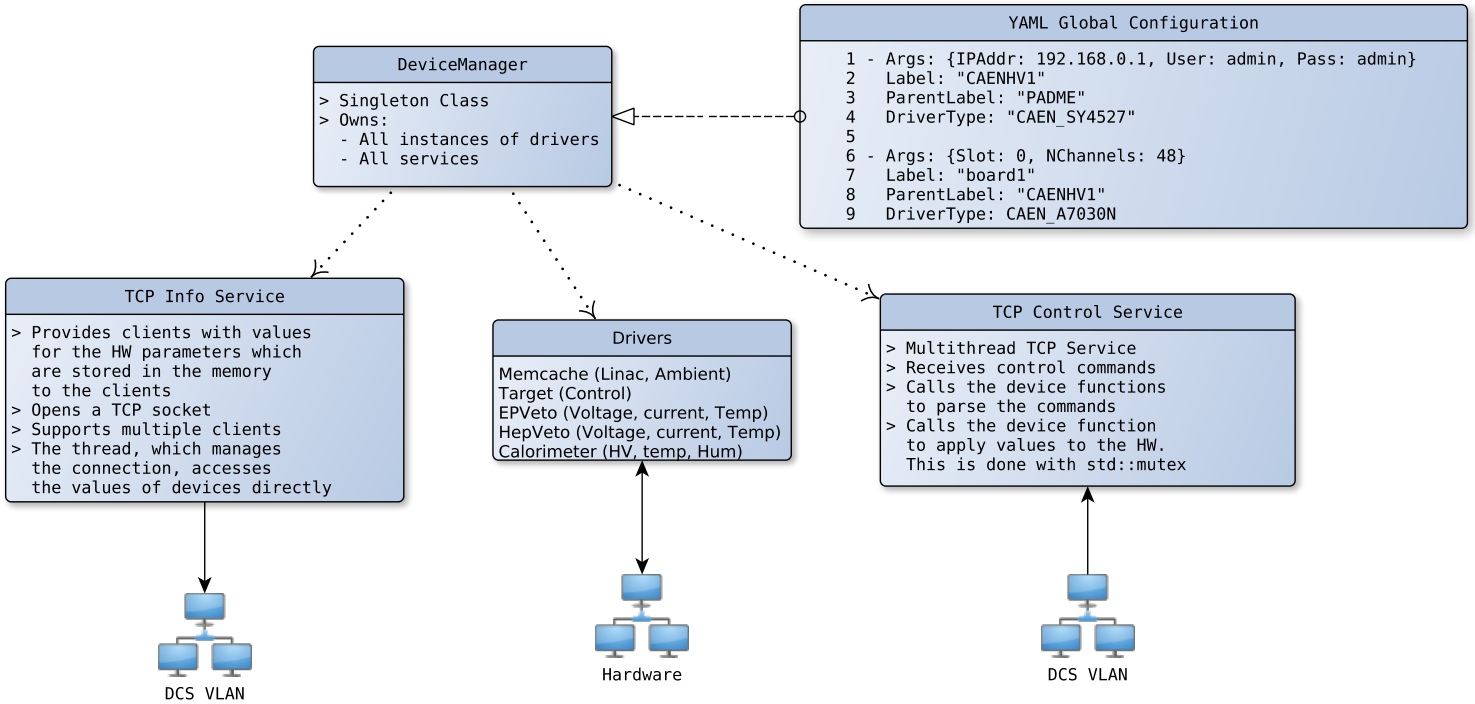
DCS Decision/Action

- Autonomous program
- Finds and diagnose the problems
- Sends notifications
- Restarts the run on change of conditions
- Some other intelligence if needed
- Very important if we plan to run without shifters

DCS Human Interface

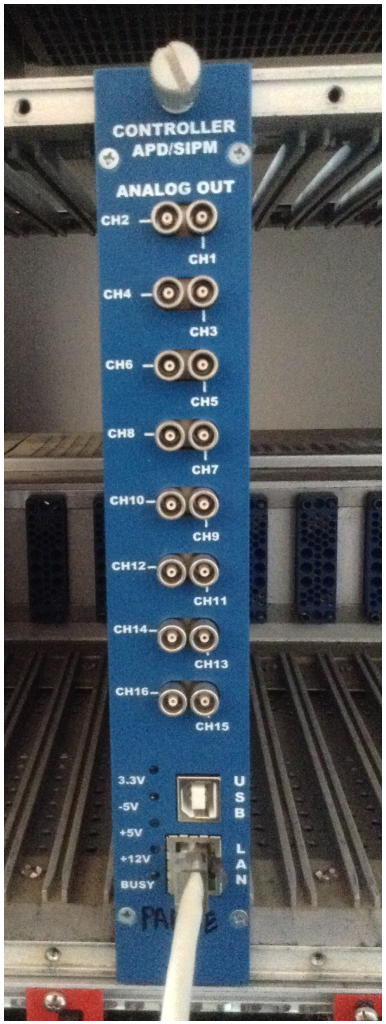
- Autonomous GUI
- Listens to the DCS Info Service and visualises the conditions
- Ability to look into Logs
- Some other intelligence if needed
- Multiple monitor programs and only one controlling should be able to run simultaneously

DCS Kernel



- Maintains connections with HW
- Monitors the HW parameters
- Sets parameters to the HW
- Talks with other modules

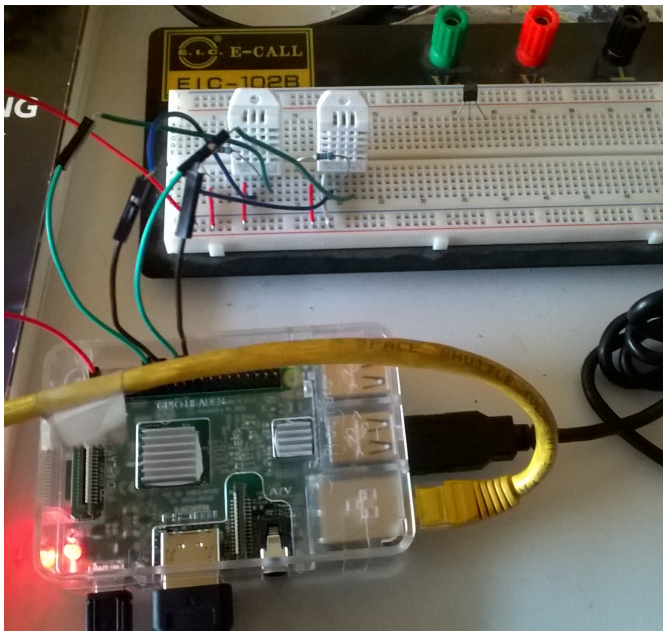
E/P/Hep –Veto Corradi's NIM Module



- Controls Voltage
- Monitors Voltage, Current, Temperature
- Web interface only
- We can implement our communication interface
- C code on the chip, still don't have it
- Mu2e people have modified the firmware

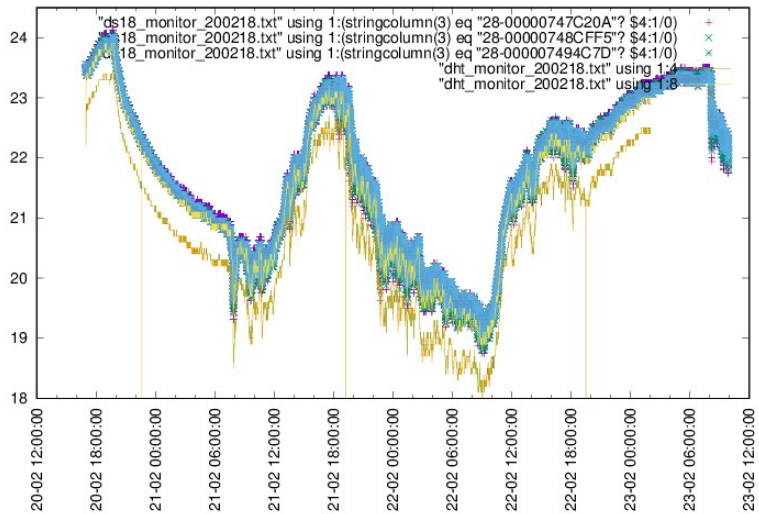
Channel	Enable	HV		Enab'd	Volt	Iapd [uA]	Temp [C]	Status
	☐							
ch1	☑	68.6	V		68.6	52.0	34.1	Ok
ch2	☑	68.6	V		68.6	52.0	34.4	Ok
ch3	☑	68.6	V		68.7	52.0	34.0	Ok
ch4	☑	68.6	V		68.3	59.0	33.4	Ok

Calorimeter

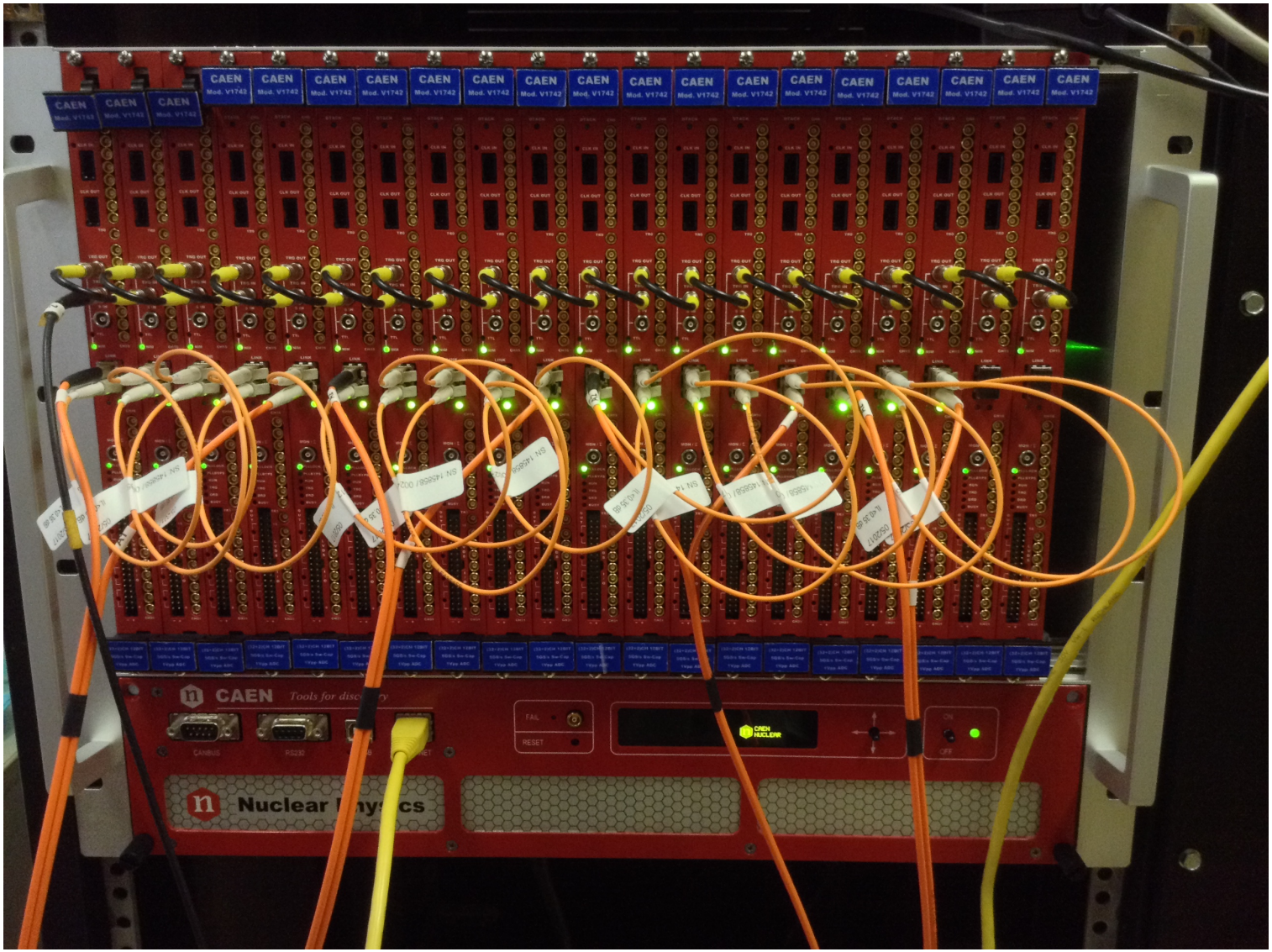



```
 Thu Jan 18 15:12:53 2018  23  23.6  33.40  25 24.2  34.00  - length =  59
2018-01-18T15:12:53+0100  [INFO]  kernel/VDeviceDriver.cc:94  (OnCycle)  PADME/PADMEAMB
2018-01-18T15:12:54+0100  [INFO]  kernel/VDeviceDriver.cc:65  (Update)  PADME/PADMEAMB
2018-01-18T15:12:54+0100  [INFO]  kernel/VDeviceDriver.cc:69  (Update)  PADME/PADMEAMB    Inside while
 *  6
 sending data to server
 server says  Thu Jan 18 15:12:56 2018  23  23.6  33.30  25 24.2  34.00  - length =  59
2018-01-18T15:12:56+0100  [INFO]  kernel/VDeviceDriver.cc:94  (OnCycle)  PADME/PADMEAMB
2018-01-18T15:12:57+0100  [INFO]  kernel/VDeviceDriver.cc:94  (OnCycle)  HVDumper
2018-01-18T15:12:57+0100  [INFO]  kernel/VDeviceDriver.cc:65  (Update)  PADME/PADMEAMB
 sending data to server
 server says 2018-01-18T15:12:58+0100  [INFO]  kernel/VDeviceDriver.cc:65  (Update)  HVDumper
 Thu Jan 18 15:12:59 2018  23  23.6  33.30  25 24.2  33.90  - length =  59
2018-01-18T15:12:59+0100  [INFO]  kernel/VDeviceDriver.cc:94  (OnCycle)  PADME/PADMEAMB
2018-01-18T15:13:00+0100  [INFO]  kernel/VDeviceDriver.cc:65  (Update)  PADME/PADMEAMB
```

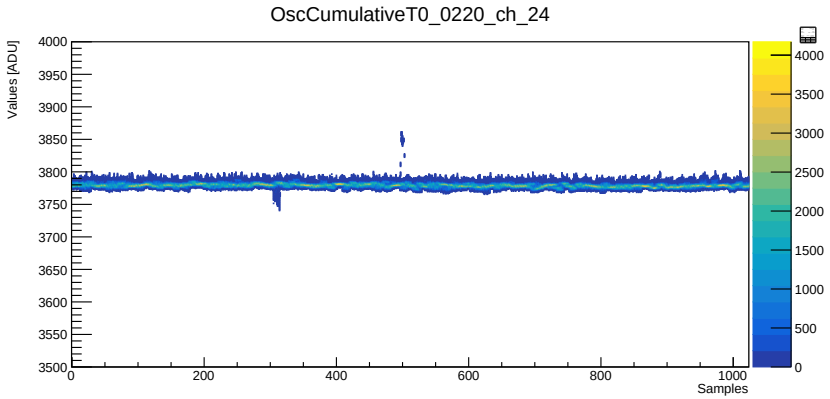
- HV — Controllable by DCS
- DHT22 tests by Fabio
- DCS module prototype by Fabio

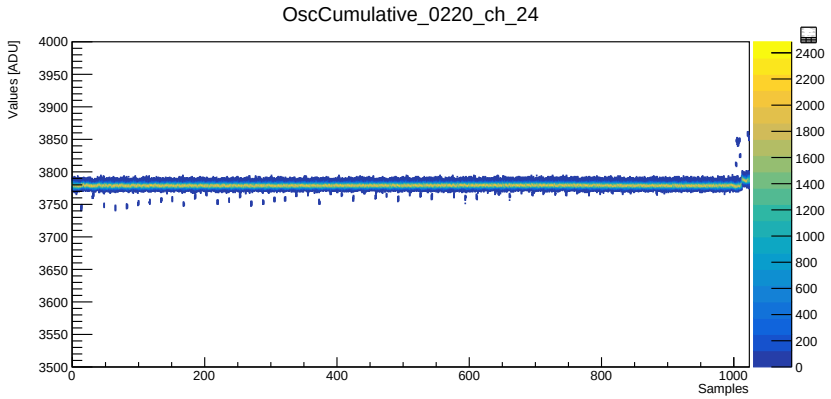


CAEN V1742 ADCs

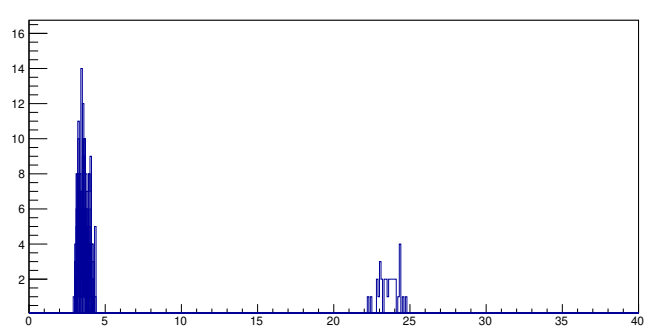


ADC V1742 Pedestal run 12.2017





- All digitizers tested one by one
- Gathered pedestal data
- One board diagnosed and fixed by CAEN
- Better understanding of pedestals



V1742 ADCs & TP commissioning

Three options for the commissioning:

- MAPMT with NDeGRA collaboration
- Using EPVeto
- Using Callorimeter

In general it would be better to have ADCs commissioning before the subsystem commissioning.

ADC V1742 & TP

Possibility is collaboration with NDeGRA

NDeGRA: Bulgarian project interested in using MAPMT with a non-segmented scintillator.

Pros:

- 256 channels together
- variable rate
- Men power
- interface board QSE<->MCX

Cons:

- The interface board is not yet done

ADC V1742 & TP with EPVeto

Pros:

- 200 channels together
- Veto commissioning

Cons:

- difficult to guarantee signal in most of the channels
- more difficult to build cosmic trigger

ADC V1742 & TP with the Calorimeter

Pros:

- 616 channels together
- Long cosmic run
- Helpful for commissioning

Cons:

- When the calorimeter is assembled we may want to have the ADC already tested

DCS summary – Kernel

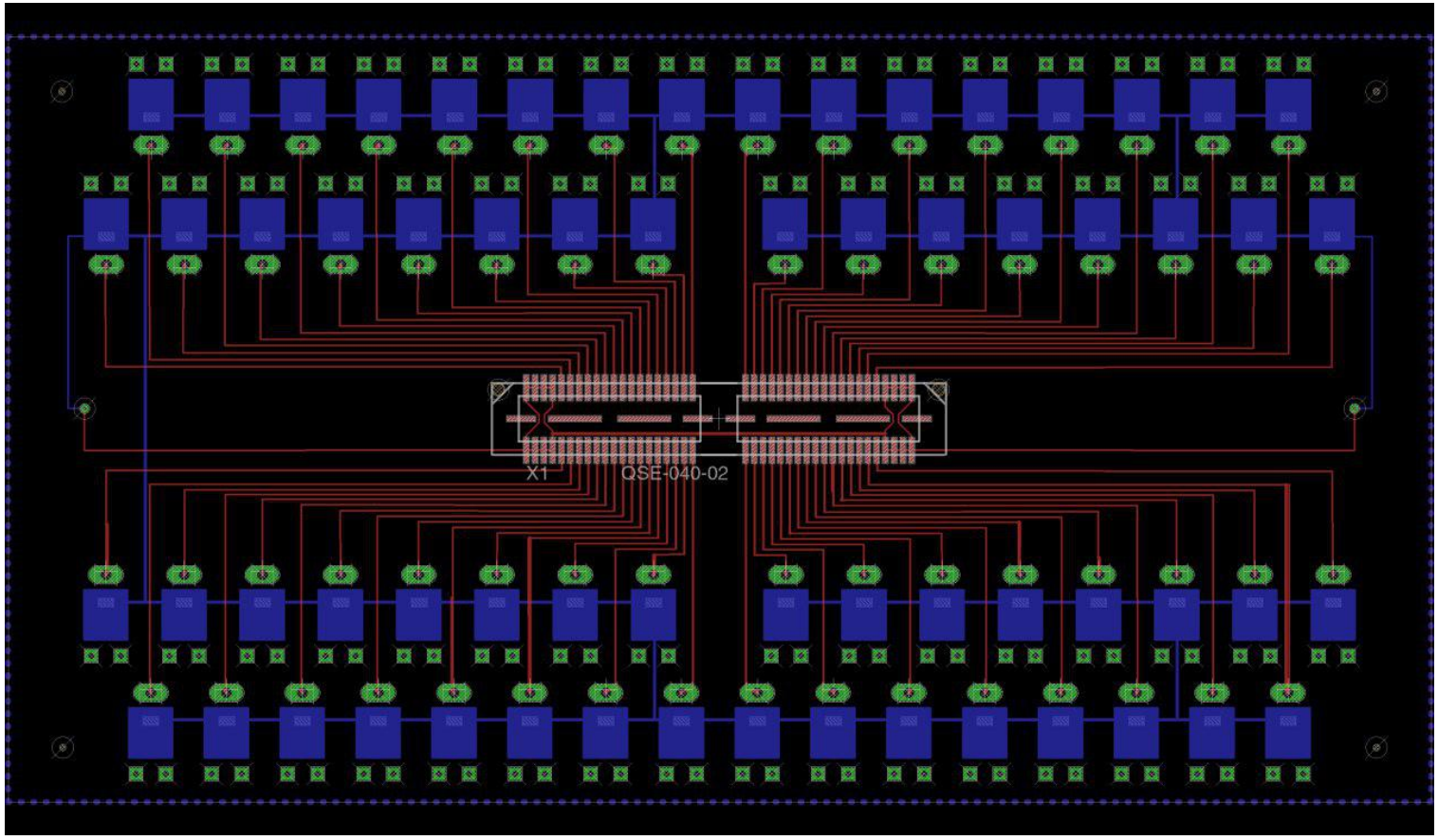
- Structure – developed
- Info service – developed
- Target - reports Federica Oliva (next talk)
- Machine and environment conditions - memcache
- E/P/Hep – Veto
  - Web interface at the moment
  - We can try to implement more meaningful protocol in case we succeed to obtain the code from Corradi
- Calorimeter
  - High Voltage driver – done
  - Temp sensors – started by Fabio

DCS summary – Modules

- Log – not started
- Prompt analysis – not started
- Decision/Action – not started
- Human interface – started by Franz

Spare slides

MAPMT PCB



- 4 QSE connectors
- 256 RG174 with MCX