SUPER-FRS DAQ workshop
MUSIC

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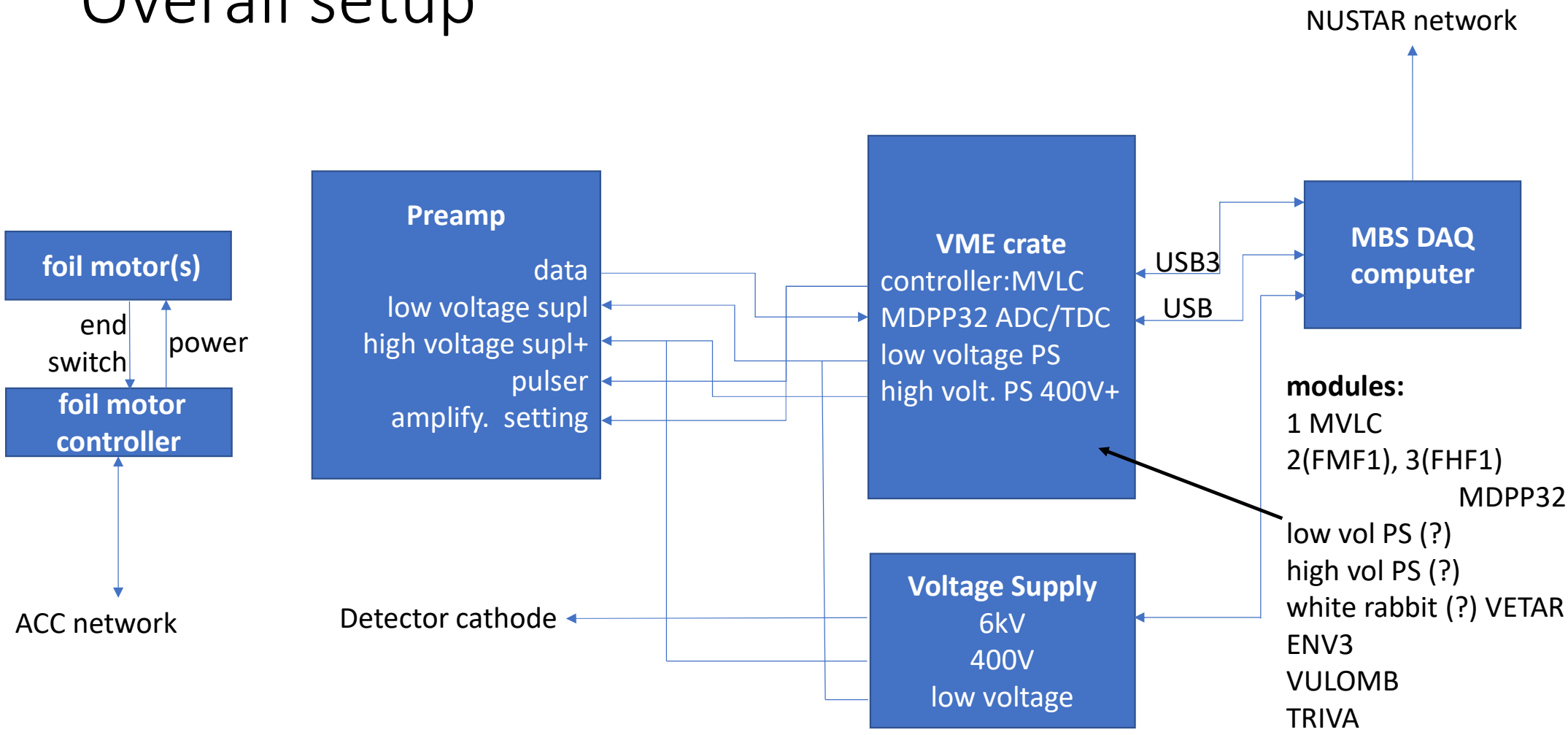
Overall setup



MUSIC detector signals

- Control
  - control preamplifier, via NUSTAR network
    - amplification level
    - pulser signals

    both signals are supplied by the VME crate controller and can be set via MBS commands, integration in SFRS device control still needed
  - control stripper foil motors via Acc. network
    - communication via acc network
    - FESA classes are written (Cosylab) and first tests are made
      - these classes can access all needed commands on the motor controller
      - Integration into SFRS device control still needed, to realise a move in/out with necessary checks
      - Connection to ELSA to inform main control room about status still needs to be made

Trigger

- We expect a trigger signal as input to MUSIC
  - a self trigger is possible for commissioning
  - MUSIC will select a window
    - readout will then start some 1µs before the trigger signal (buffer on the ADC)
    - readout will be in the order of 8µs to get the full drift time
  - MDPP module has an
    - ADC section, which will provide a signal height corresponding to the amount of charge on the pad
    - TDC (CF) will provide the time of the signal
  - The system is multi-hit capable, that means during an event several hits per channel can be read out.

Signal Readout

- Setup of the MVLC (crate controller)
  - we are currently setting the MVLC using the MESYTEC provided software
  - It is possible to Send and receive commands/info to the controller via MBS
  - A script needs to be written, that can do the setup
  - Potentially one might want a user interface to control the setup (rather than editing the script by hand)
- Timing information:
  - So far we are undecided whether we will use
    - DAQ Bus to connect all devices (ToF, position, MUSIC,…) of one focal plane
    - Each system is receiving an independent white rabbit time stamp

    I prefer the bus, and I would encourage to get a formal decision on this point asap.

Physical Position of the systems

- Readout cable routing:
  - The readout cables go from the dome via a mobile cable handler leading the cable to the top of the big diagnostic chamber.
  - from there they need to go to the VME crate
  - cable charakteristics:
    - We are using shielded bipolar cables.
    - There are a total of 96 channels for FHF1 and 64 channels for FMF1
    - We tested the cables up to 8m length
      - This would require the VME crate to be in the tunnel!
    - We should determine the shortest possible route to the VME crate outside the tunnel
      - With the upgraded pre-amplifier we can then try to test the cables (or find other cable types), which would allow us to place the VME crate outside of the tunnel.

Physical Position of the systems

- Foil motor controller small (ca 15cm x 10cm x 10cm).
  - We know that we can transport the power over 8m.
  - If possible we would like to position the controller outside of the tunnel
    - we still need to do tests with longer cables

Final thoughts

- July 25 run issues:
  - version of VETRA firmware introduced synchronisation issues
    - needs to be looked into by EEL
  - Some issues with compatibility between DRASI and MBS versions of lmd files
    - Do we have a clear definition on the format of mdl.