Potential applications of MTCA in photon science

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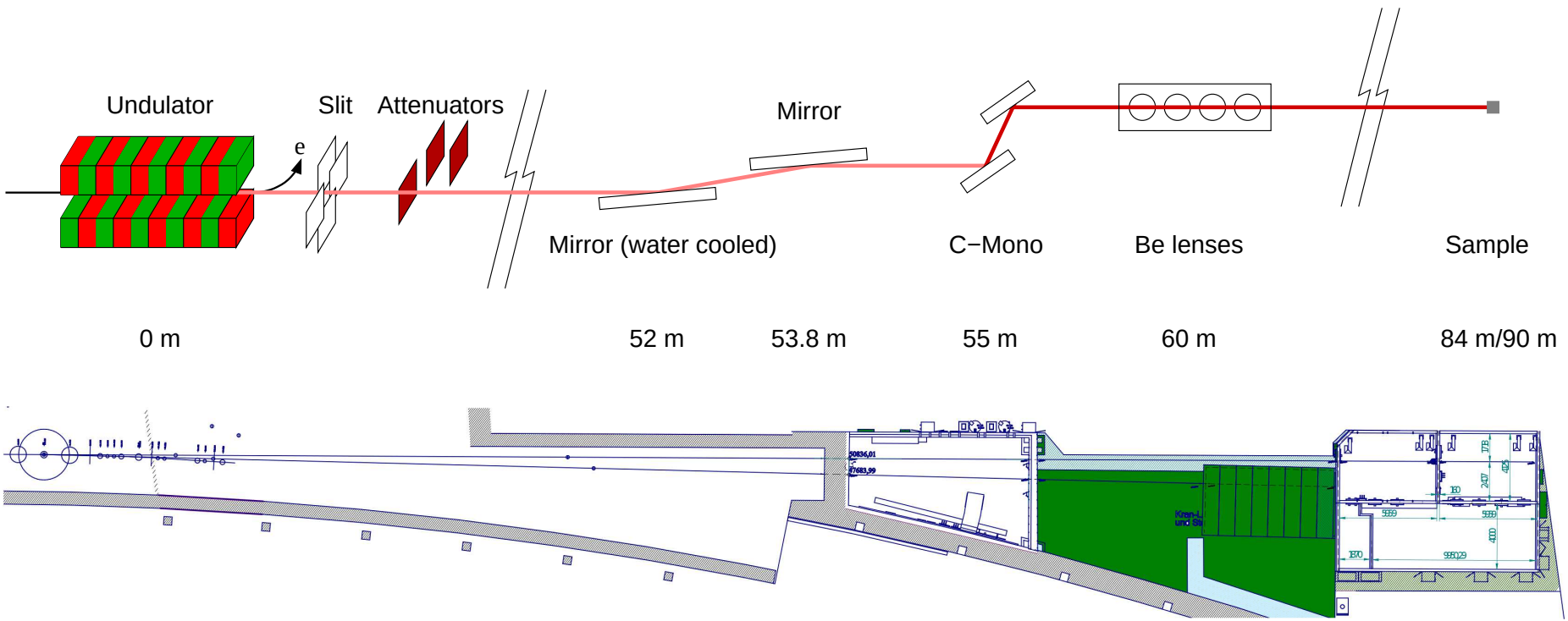
October 9, 2018

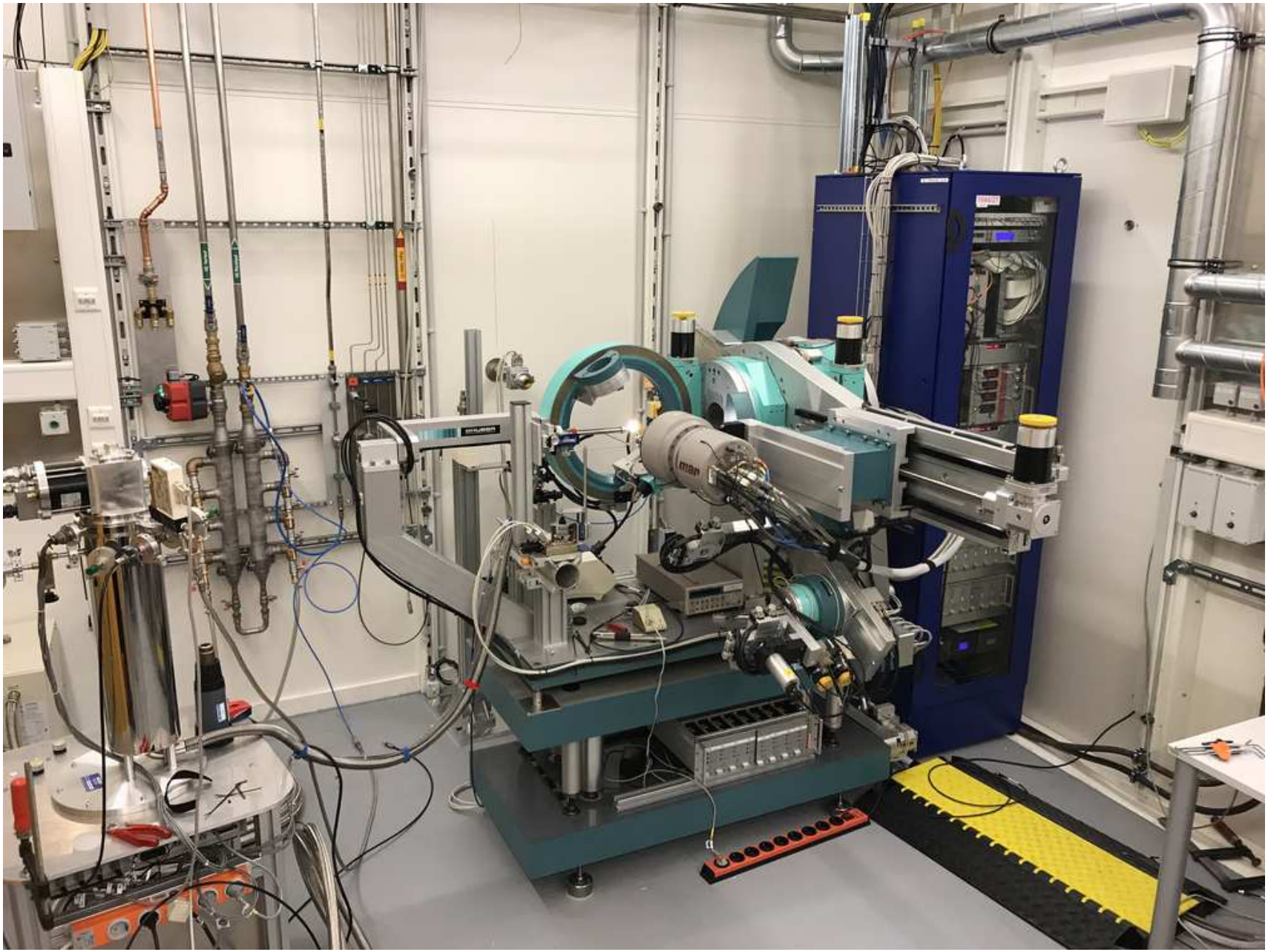
Beamline P24

- Chemical crystallography beamline, PETRA extension
- 2 Experimental stations at 84m and 90m
- Optical elements at 55 $\pm$ 5m

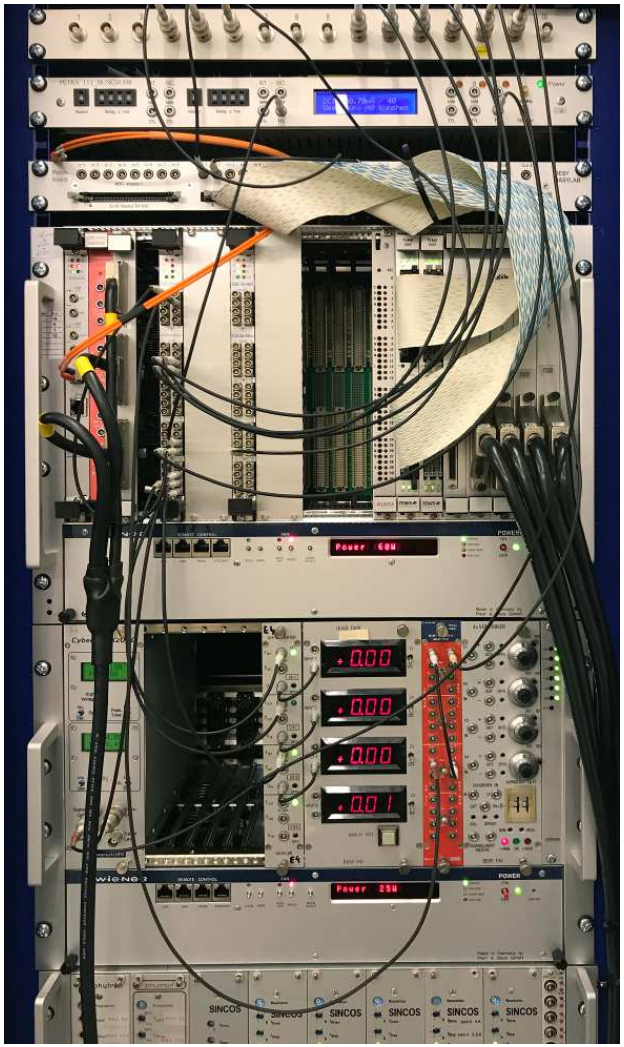


P24 under construction (in early 2017)

Four circle diffractometer in EH2



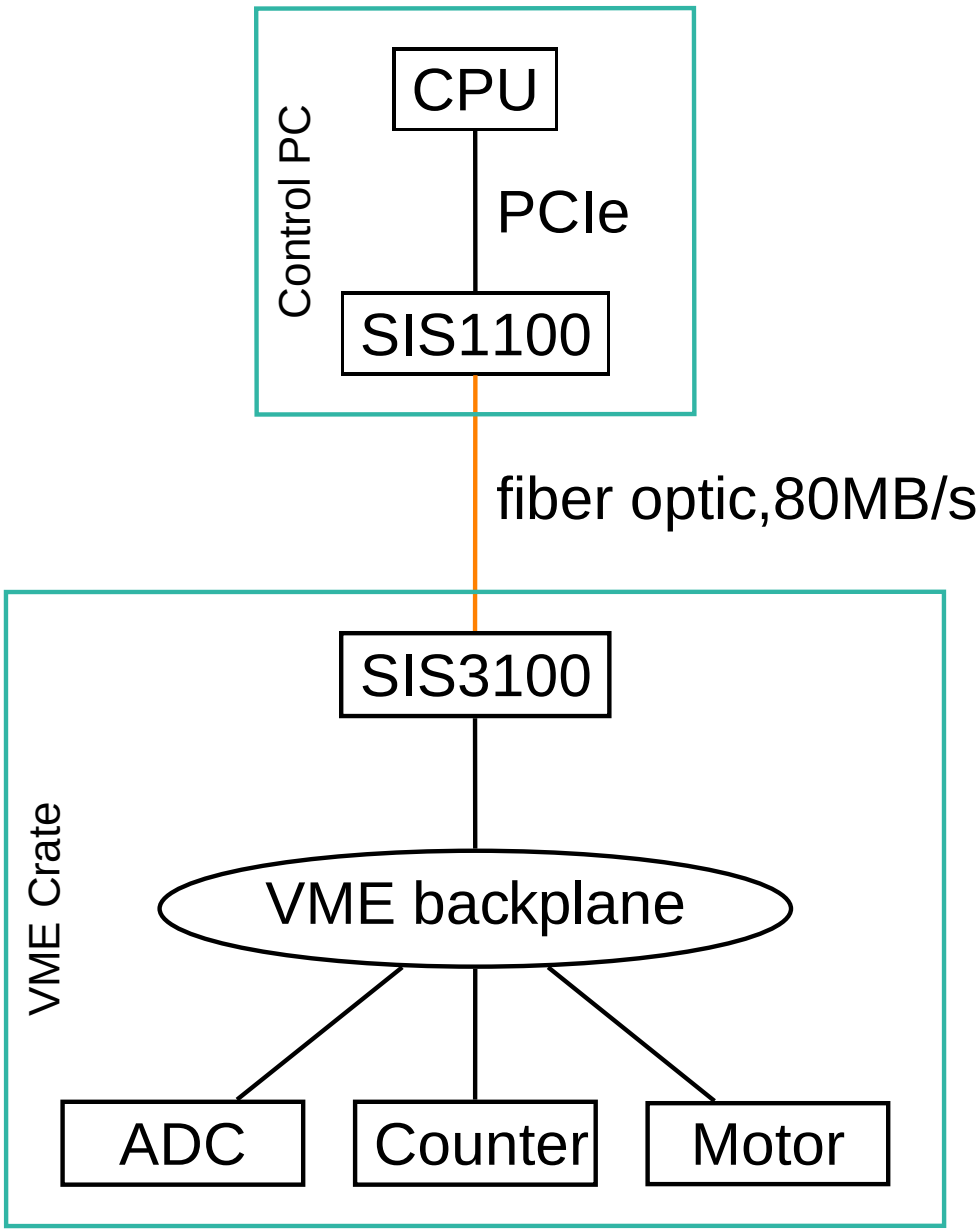
Control electronics

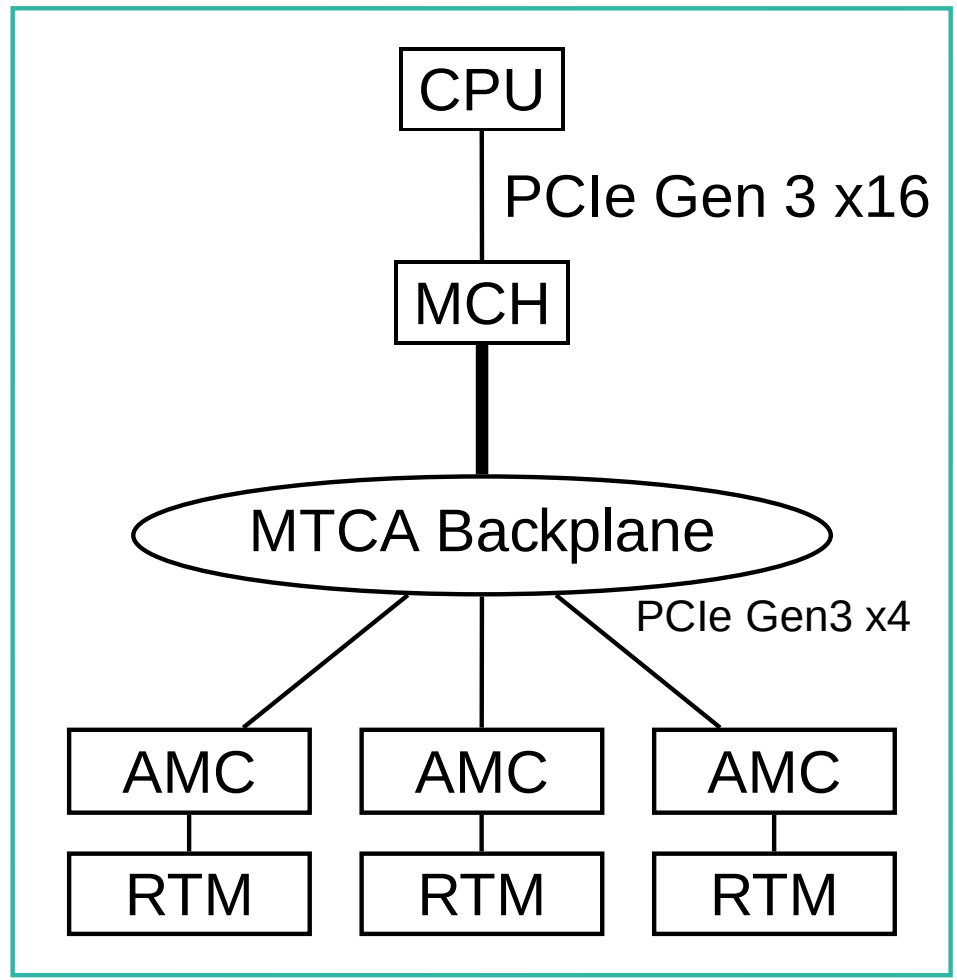


Mostly VME or NIM modules:
Counter, Timer, GPIO, ADC, DAC,
HV supplies, filter amplifiers, discriminators
and lots of motor controllers

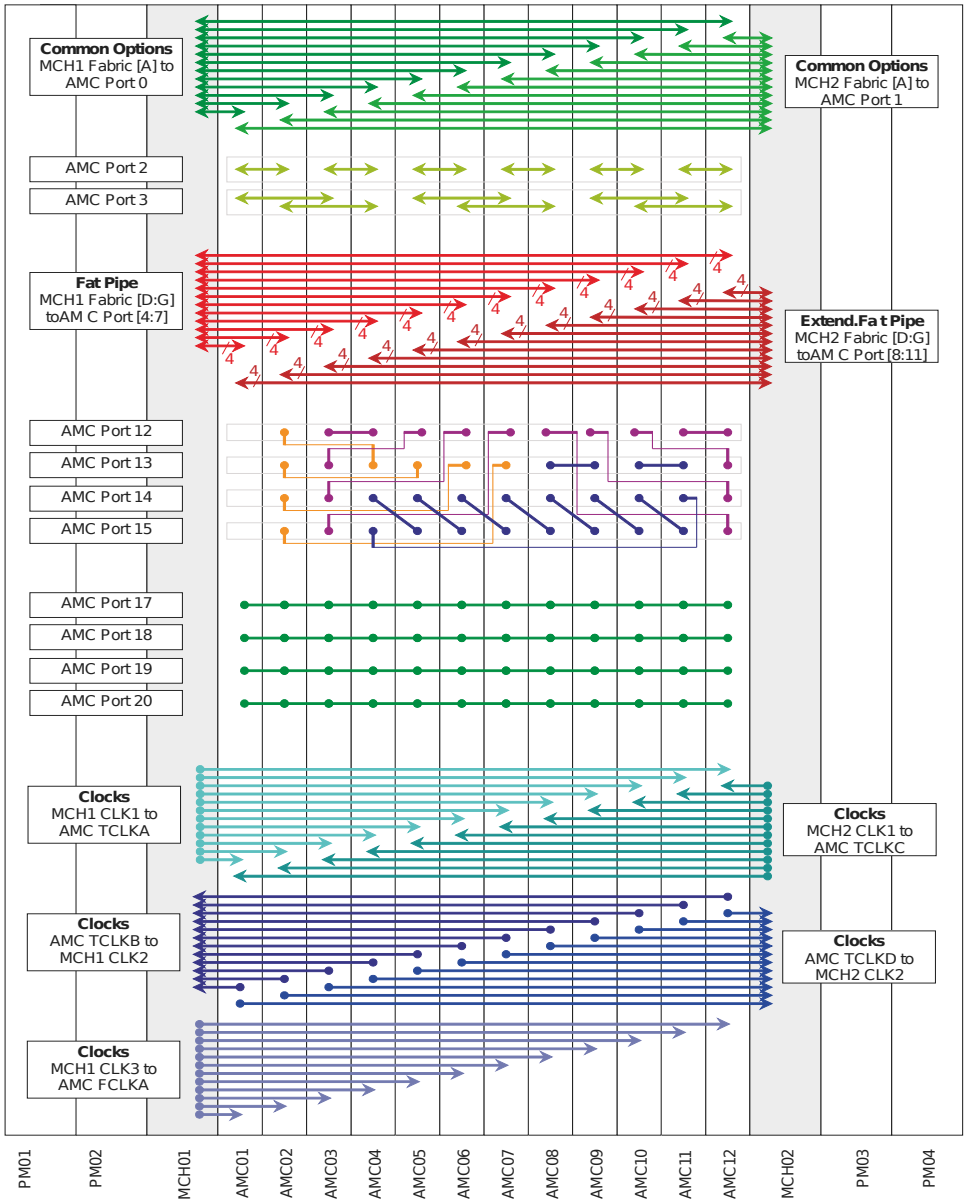
Current amplifiers:

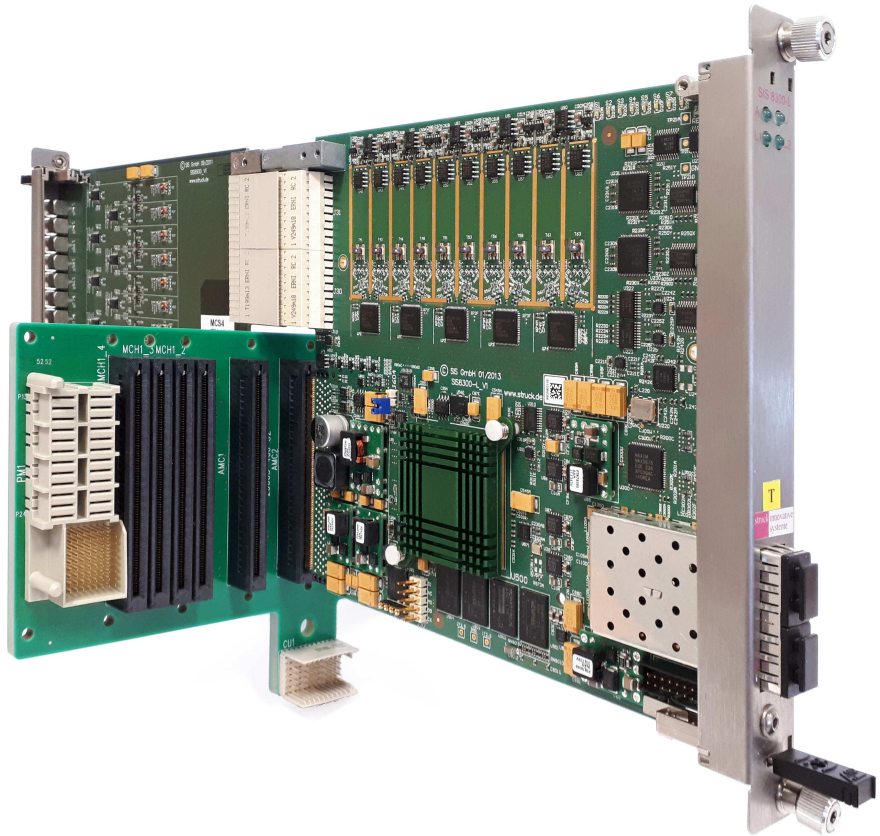
VME vs. MTCA.4


Control PC
CPU
PCIe
SIS1100
fiber optic,80MB/s
SIS3100
VME Crate
VME backplane
ADC
Counter
Motor


CPU
PCIe Gen 3 x16
MCH
MTCA Backplane
PCIe Gen3 x4
AMC
AMC
AMC
RTM
RTM
RTM

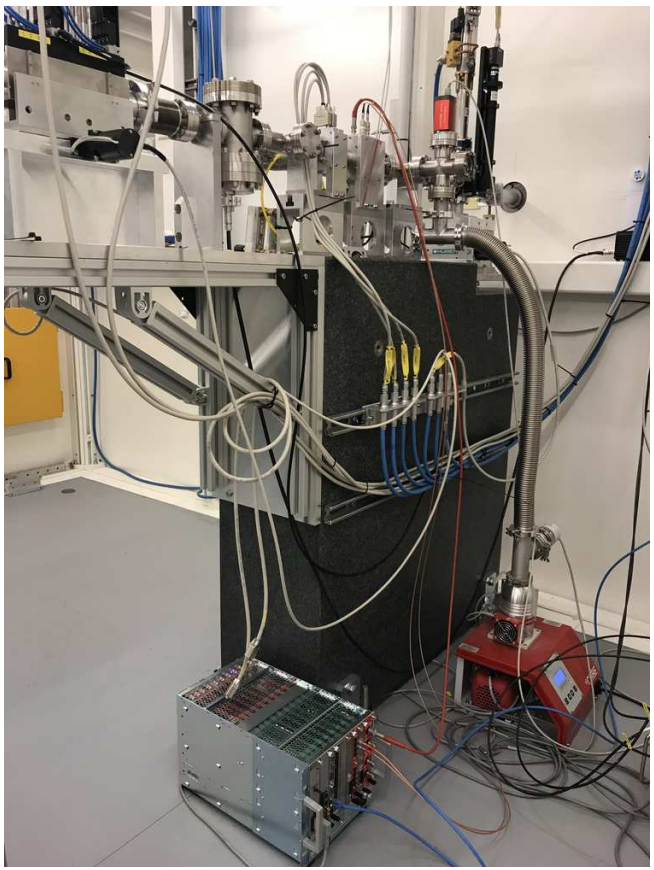
MTCA backplane





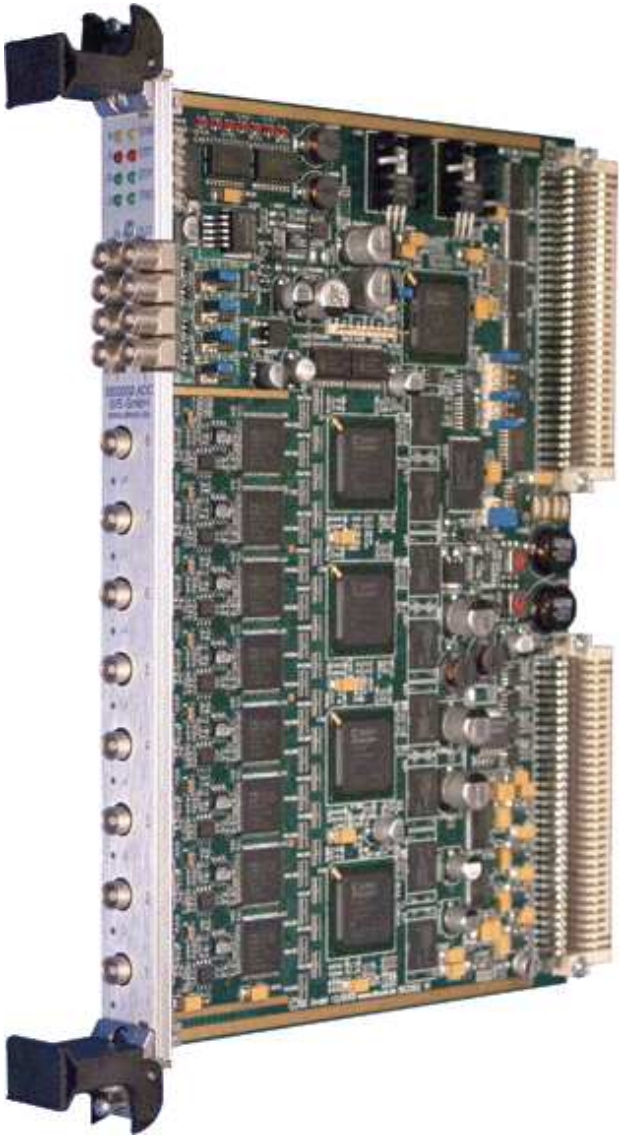
Beam position monitor

Old Keithley electronics and NIM HV supply has been replaced by CAENels PICO-8 and HV-Panda:



Advantage:
HV supply and current amplifier in the same crate

Struck SIS3302



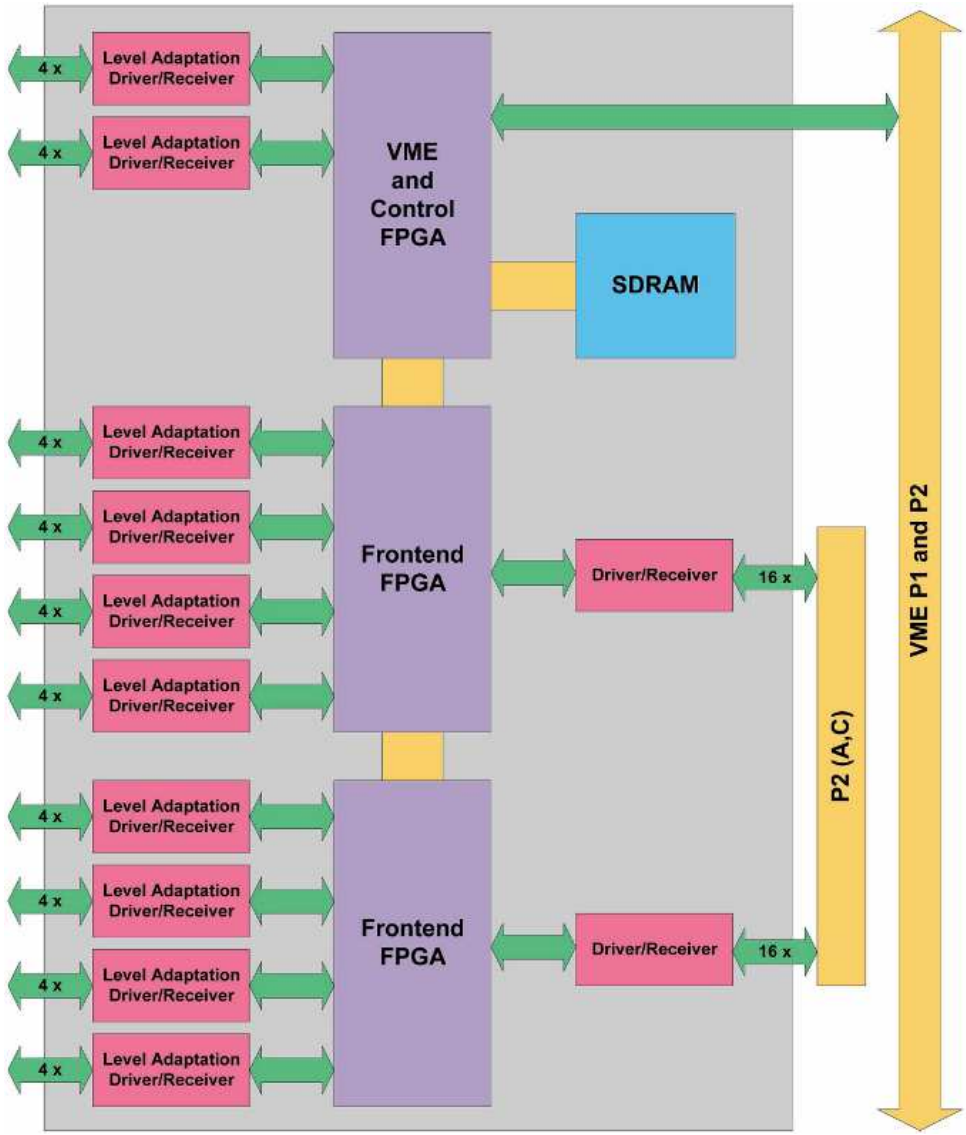
- VME module
- 4 or 8 channels, 16 bit 100MSPS
- General purpose ADC
- Spectroscopy firmware
  (energy dispersive detectors)
- Raw data histogramming
  (VFC replacement)
- Synchronization with other devices

Struck SIS8300-L

⇒ Talk by Jan Timm in next session!

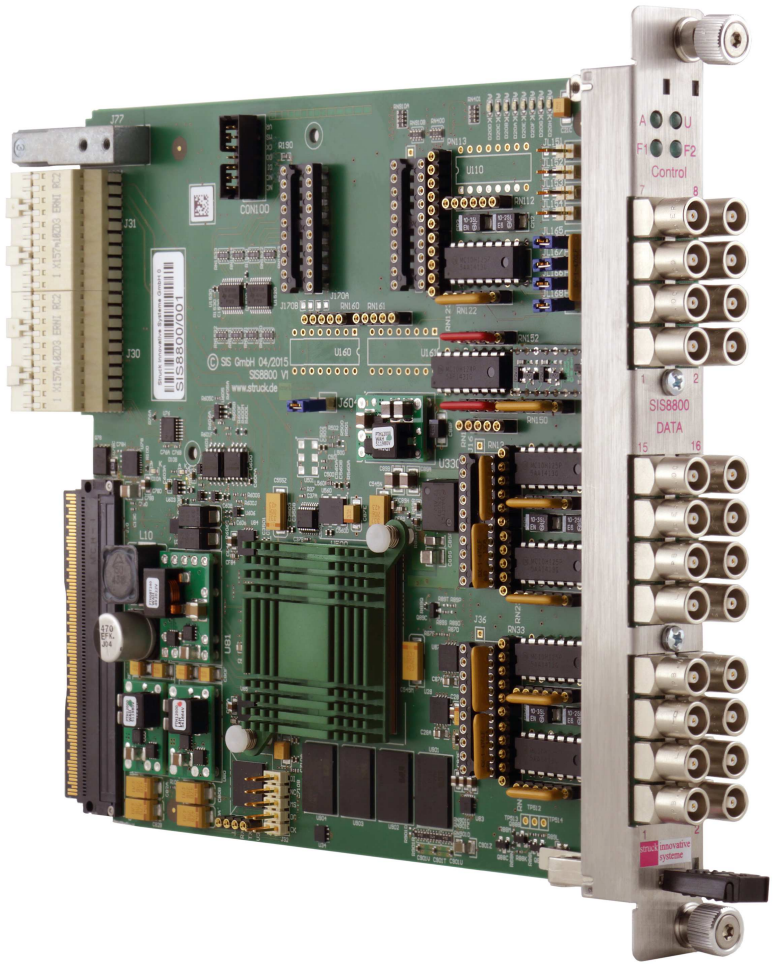
Counter: Struck SIS3820

- 32 channel, 32 bit counter
- Synchronization with motor controller:
  - Step signal
  - Quadrature encoder
- Sync. output for ADC
- Fast shutter control
- Continuous scans



Replacement: Struck SIS8800

- Similar features as SIS3820, but MTCA.4
- 16 channels on front panel
- 16 channels via RTM
- Synchronization with other devices via backplane



Multi axis motor controller

OMS MAXv

- 8 axis controller
- Stepper or servo motors
- Step/Direction output or analog output
- Encoder, limit switch input
- GPIO

No alternative for MTCA!