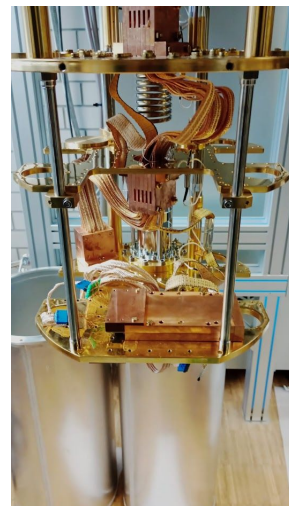
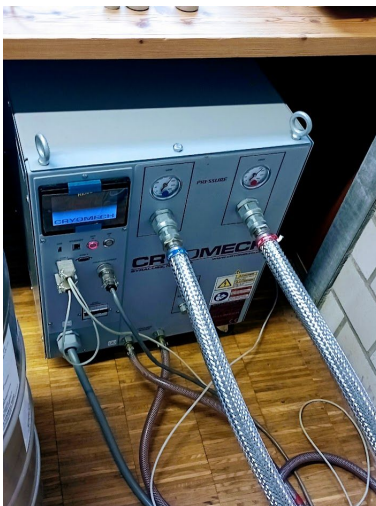


MMC + muX readout in 2023 and other stuff

Conclusions from 29.4.2023 discussion @ KIP

Frederik Wauters

Johannes Gutenberg University Mainz

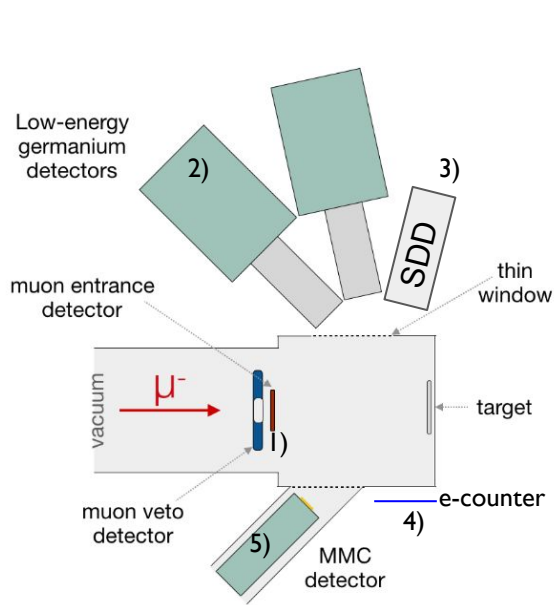


MMC readout integration

Short term goal: Get the spectra we need from 2023 test run. Minimum is MMC Energy versus μ time.

Long term goal: Integrated DAQ for reliable and long term running in PIE I.

- Combined data stream, combined online analysis
- Integrated in MIDAS so we have easy remote access, slow control logging, ...



More details in my [Paris presentation](#)

See [this](#) repo for:

- Source code → lib
- API examples (C++ & Python)
- Documentation



Outside → PSI

- SSH access via a *hop* server, need PSI computing account
- No VNC / remote desktop
- Direct MIDAS web server access with a single login

Further IT restrictions at PSI

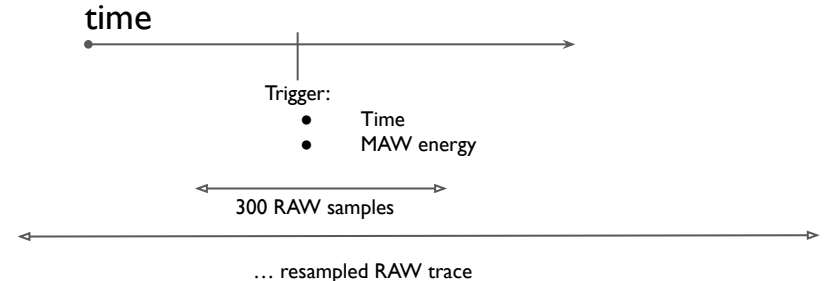
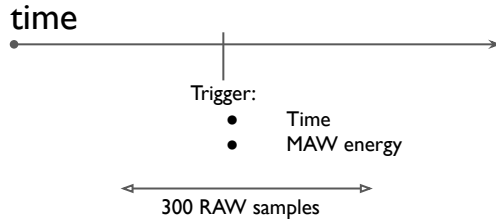
- Wifi is eduroam (not intranet)
- Every ethernet device needs to be registered (on beforehand)
- Many ports are closed (even Whatsapp)
- ...

MMC readout integration

KIP MMC versus muX Readout



User for Muon counter, HPGe, SDD, ...	Used for 32 MMC channels
Up to four 16 channel 250 MHz VME ADC modules (sis3316)	Up to Three (?) 16 channel 125 MHz table top ADC modules (sis33316)
Common Clock and time reset (via VME backplane) every run cycle (minutes). RO via VME controller.	Each modules individually controlled (Ethernet). Time is reset once and it just runs.
Each (unipolar) channel triggers indepently	Bipolar trigger, if one channel triggers → record all of them
MIDAS integrated, unpacking the data in a separate program	Stand alone program, unpacking of the data and saved to ZIP file



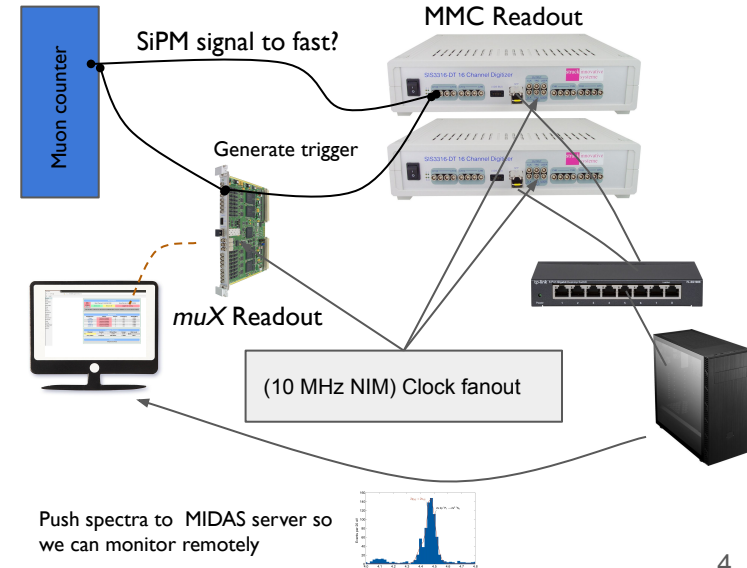
MMC readout integration

Setup: Need access to KIP DAQ machines

- Control software for cryostat and SQUID tuning
- Need *scope mode* access to the KIP Readout
 - ⇒ VNC or remote desktop access from control room
(TODO: work on PSI intranet?) **will to work to outside**

Tier I: The MMC knows about the muon

- μ counter signal get's split and fed into the KIP DAQ
 - Analogue or digital (From Discriminator, or generated from muX module)
 - Might need to be stretched
- We could add some other detectors
- Run on the same clock



MMC readout integration

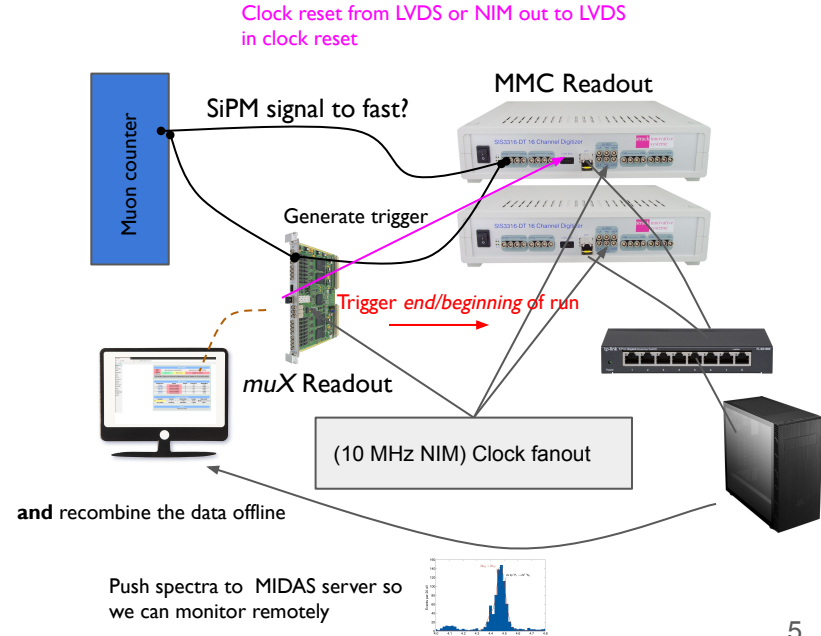
Setup: Need access to KIP DAQ machines

- Control software for cryostat and SQUID tuning
- Need *scope mode* access to the KIP Readout
 - ⇒ VNC or remote desktop access from control room
 - (TODO: work on PSI intranet?) **will to work to outside**

Tier 2: The MMC knows about **which** muon

- μ counter signal get's split and fed into the KIP DAQ
 - Analogue or digital (From Discriminator, or generated from muX module)
 - Might need to be stretched
- We could add some other detectors
- Run on the same clock
- Synch clock reset and *run* cycle

Not 100% necessary, still would do it



MMC readout integration

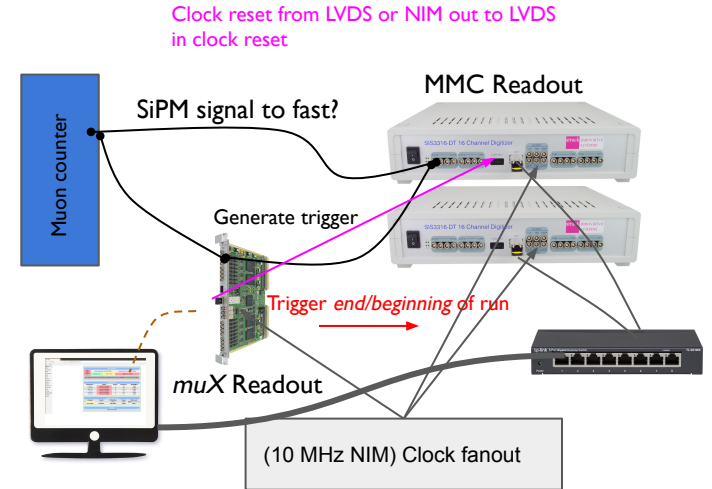
Setup: Need access to KIP DAQ machines

- Control software for cryostat and SQUID tuning
- Need *scope mode* access to the KIP Readout
 - ⇒ VNC or remote desktop access from control room
(TODO: work on PSI intranet?) **will to work to outside**

Tier 3: The MMC knows about **which** muon and is RO by **(one?)** MIDAS frontend

Not really needed

- μ counter signal get's split and fed into the KIP DAQ
 - Analogue or digital (From Discriminator, or generated from muX module)
 - Might need to be stretched
- We could add some other detectors
- Run on the same clock
- Synch clock reset and *run* cycle
- Wrap KIP MMC RO program in a Midas Frontend **or** integrate KIP RO in our MIDAS frontend (so it should handle combined VME and ethernet communication to sis3316 modues!)



MMC readout integration

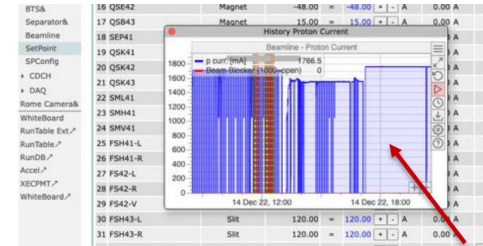
Setup: Need access to KIP DAQ machines

- Control software for cryostat and SQUID tuning
- Need *scope mode* access to the KIP Readout
 - ⇒ VNC or remote desktop access from control room
(TODO: work on PSI intranet?) **will to work to outside**

Slow control monitoring:

Both the KIP cryostat control and the MMC slow control has critical parameters which need to be visible at all times for the experts:

- Write locally to a text file (already done ?)
- Push with script to our MIDAS online database
- Or**
- Have a small Midas FE and connect to our experiment. Grab new entries in the local logging files



MMC readout integration

Conclusions

- Tier 1 (or 2 ?) ,Tier 3 bit of project.
- Cesar has interest getting into this. Merits offline discussion.

Other points

DAQ:

- ❑ Get PSI [digital user office](#) (access and guesthouse) and computing accounts (for remote access) before the run
- ❑ Register PC (and other devices?) for the PSI network
- ❑ Educate us on the critical parameters. We can setup e.g. alarms
- ❑ ...

Other:

- ❑ When to arrive the the detector. KIP wish is about ~20 day before the run. *muX* is running then, so we should be around. (reminder on the [schedule](#))
- ❑ We want to do a cool down test at PSI. Where? Front of the hall?
- ❑ Services (e.g. 5 kW cooling water) available for this cool down test (in the area and and at the test stand?)
- ❑ Unloading and craning situation?
 - ⇒ KIP needs to visit PSI soonish. Week 19 would not be bad (*muX* setup time).
- ❑ Warming up before craning needs time. If we do not want to lose time we need to talk to the next group.
 - ❑ Talk to this guy <https://www.nklabs.com/ara-knaian>
- ❑ We have to look at the total window budget (target chamber and the MMC detector)
- ❑ We have to start psi dupsoon with the [customs procedures](#). 2 options:
 - ❑ Carnet ATA (easy for PSI, quite some work for Heidelberg)
 - ❑ Temporary import (less work for us, need some PSI support)