

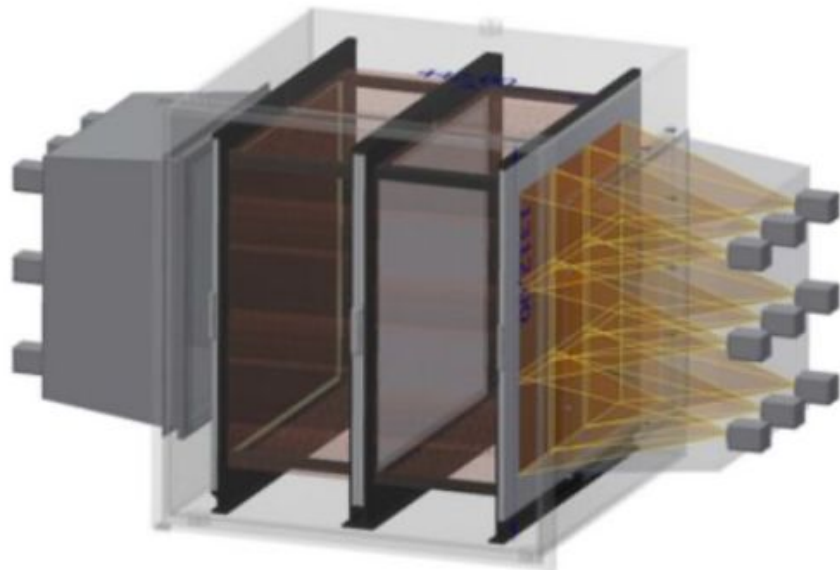
CygnosDAQ report

Sept. 17th, 2020

DAQ meeting report

- Meeting every Wednesday 16:00 Rome time:
 - <https://agenda.infn.it/category/1149/>
 - Google Meet link room: <https://meet.google.com/rri-ivwo-heg>
 - Share folders for material, ideas, reports:
https://drive.google.com/drive/folders/1PFlnkz3uSkQ_3XQ-Eya-OP4MKO2ckuj

Detector overview



System composition:

- The detector is composed of 18 readout regions, each equipped with 1 sCMOS sensor and 4 Photomultipliers.
- TOTAL: 18 sCMOS sensors and 72 Photomultipliers.

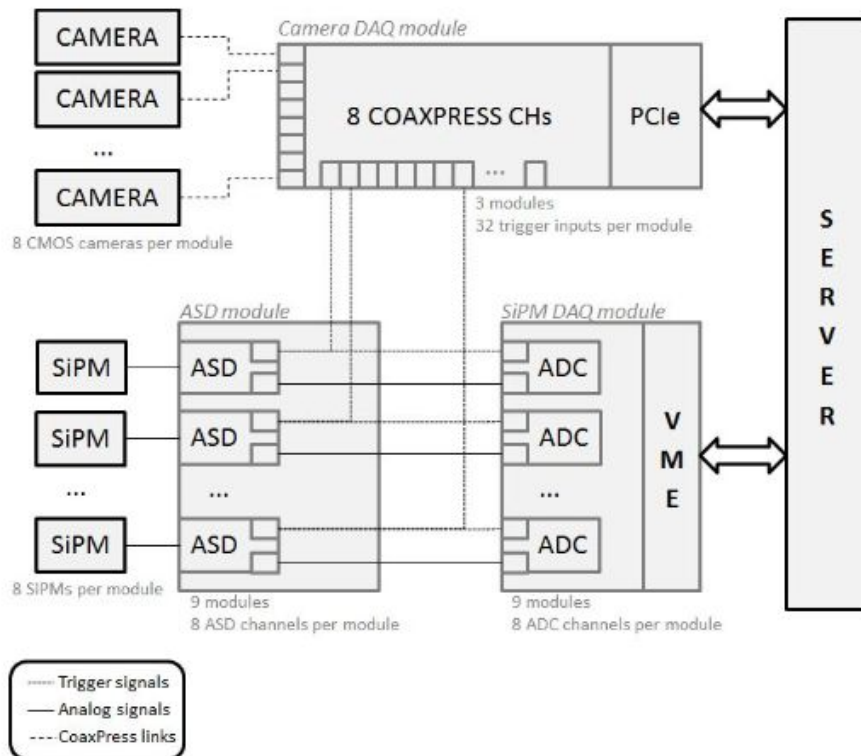
Components definition:

- sCMOS sensor (ORCA Fusion)
- PMT model (? H3695-10, H10721-4, others)
- GEM readout needed ?

Important characteristics:

- Max. image acq. rate = 10 Hz

DAQ proposal



Defined issues:

- PM acquisition electronics - custom solution
 - CBPF (has started development)
- Camera readout - commercial solution
 - UFJF-CBPF (components being defined)

Open issues:

- Amplifier module needed?
 - Depends on PM amplitude range and signal duration
 - ROMA1 - UFJF (under study)
- Image-based trigger - custom GPU server
 - Depends on compatibility with software algorithms
 - UFJF - ROMA1 (under study)
- GEM readout needed?
 - ROMA1 - LNF
- Hardware integration
 - Trigger, Time and Control signal distribution
 - Deadtime, Busy signal distribution
 - Event building
- Software integration
 - Framework: MIDAS preferred (experienced manpower; dedicated and easy to integrate slow-control electronics is available); decision to be taken soon to order appropriate electronics.
 - ROMA1

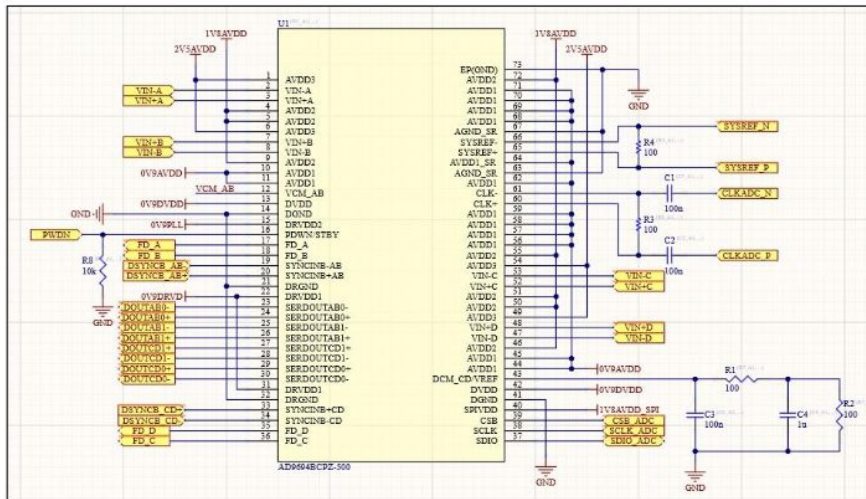
- **SiPM readout:**

- ❑ Survey and selection of technologies/devices: ADC, FPGA, μ C. **DONE**
- ❑ Drawing electrical schematics (see next slide): analog input circuit, ADC connections, microcontroller circuit. **DONE**
- ❑ Drawing electrical schematics: FPGA circuit. **NEXT**

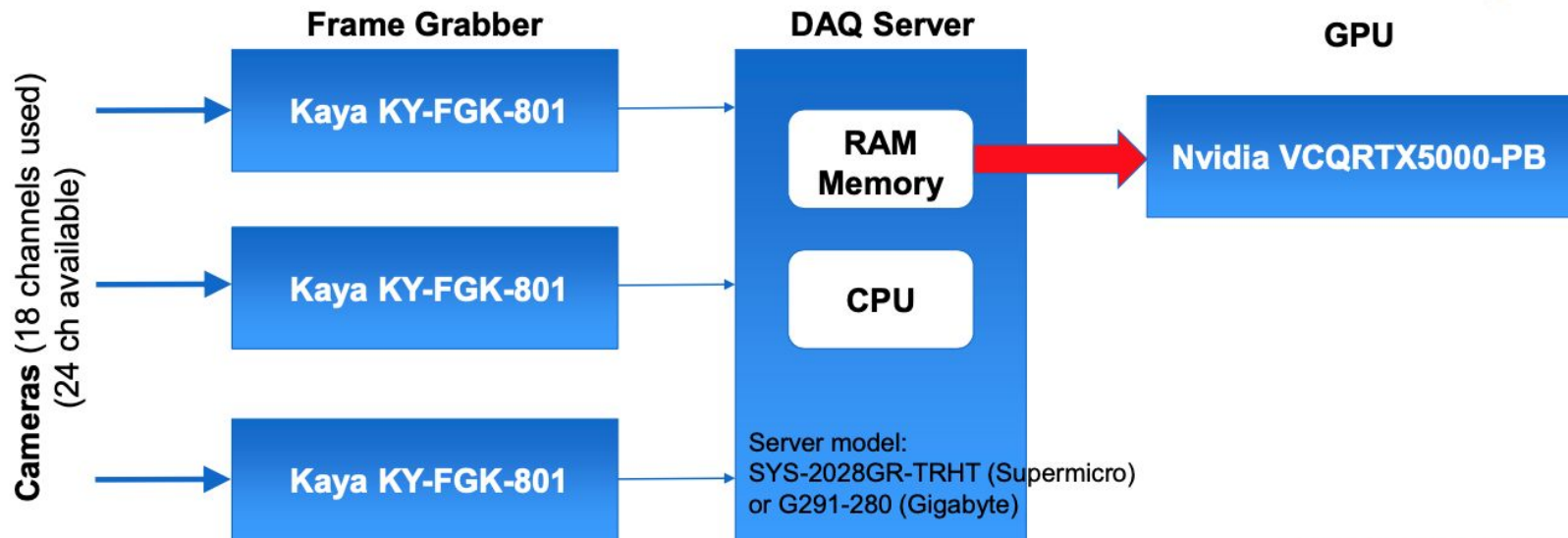
- **Camera readout:**

- ❑ Survey and selection of technologies/models (frame grabber, GPU, DAQ server). **DONE**
- ❑ Survey of storage solutions for physics data (images/waveforms). **DOING**
- ❑ Studying the best option of GPU based on programming issues and performance (Amaro, Igor, Tiago). **DOING**

SiPM digitizer schematics



Camera readout system



** Estimated prices*

Item	Device	Manufacturer	Model	Vendor contact	Qty	Unit Price (USD)	Total Price (USD)
1	Frame Grabber	Kaya	Komodo KY-FGK-801		3	\$1.750,00	\$5.250,00
2	Server	Supermicro	SYS-2028GR- TRHT		1	\$3.942,00	\$3.942,00
3	GPU	NVidia	VCQRTX5000-PB		1	\$2.199,99	\$2.199,99
						TOTAL	\$11.391,99