

# Warm electronics requirements.

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# Introduction

- From the last combined meeting it was concluded that the dynamic range would be between 1-2000 Photons.
- ADCs with 14 bits are under consideration.
- Expected S/N ratio important also for the design.  $S/N = 5$  enough but probably actual measurements with SiPMs arrays in Cold environment needed to define additional information.
- Bishu showed studies related with data rates as a function of the PE threshold. 2PE sounds as a reasonable threshold level
- In an update last week was presented that a 2PE threshold implies 130MB/s, just larger than the current data throughput limit.

Some important considerations that need answers (pointed out by Vishnu).

- You should count on a certain percentage of the devices failing. Failures could be non-responsive sensors, noisy sensors or shorted sensors. It would be highly desirable to make the design as robust as possible to these failure mode. For instance how to generate and distribute bias (e.g. a shorted SiPM can take down the whole chain). The reverse is also a concern; since devices are ganged dangerous single component failure points exist.
- I assume you will retain the FEBs capabilities to self-trigger etc.?
- What are the specs on baseline recovery and tail-cancellation? Could pose issues for small SiPM signals near large ones.
- Will there be a bias read-back?
- What monitoring/diagnostic tools can be expected (e.g. I-V curves etc.)?