

# A new concept analog system to readout multi-channel fast photodetectors

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A new concept design of an analog card for reading out multi-channel photosensors is presented. The basic idea is to build a versatile, high bandwidth device that can be used for collecting, for amplifying and for summing individual photo-detector channels in a full configurable way. Key point is to make programmable analog sums of any analog channel sub-sample. This allows for selection of readout regions of interest of the analog signal pattern before digital conversion. A first prototype developed with high bandwidth IC components and switches was designed and produced in the Pisa INFN labs. This prototype produces one output signal which is the analog sum of up to 64 input signals. Input signal equalization or weighting is possible with a programmable gain in the first amplification stage before analog sum. The output signal amplification can be also adjusted to match the dynamical range of any external digitizer. Full device configuration is done with a custom GUI. The most tests performed with the prototype were planned to verify that no signal distortion was introduced in terms of pulse shape and time jitter for all possible system configurations. Preliminary results are very encouraging, and they represent a proof of feasibility of the project. Future developments include the design of an ASIC device of a card revised version suitable for practical applications in research or industrial contexts.

## Collaboration

## Role of Submitter

I am the presenter

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