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FERS-5200: a distributed Front-End Readout System for multidetector arrays

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Modern physics experiments usually rely on big experimental setup where it is possible to find a wide variety of detectors: silicon microstrip trackers or other solid state detectors, plastic scintillator calorimeters, LAr cryostats readout by a Time Projection Chamber, spectrometers composed of several drift tubes and resistive plate chambers. Moreover, detector granularity and precision measurements are paramount all across the physics field and often hundreds or thousands of detector channels need to be read out. Nowadays, waveform digitizers and/or ASIC-based front-end cards are well-established readout electronics to build a reliable system hosting many readout channels.

The FERS-5200 is the new CAEN Front-End Readout System, answering the challenging requirement to provide flexibility and cost-effectiveness in the readout of large detector arrays. FERS-5200 is a distributed and easy-scalable platform integrating the whole readout chain of the experiment, from detector front-end to DAQ. It is based on compact ASIC-based front-end cards integrating A/D conversion and data processing, which can be ideally spread over a large detector volume without drawbacks on the readout performance. Synchronization, event building and DAQ is managed by a single Concentrator board, capable of sustaining thousands of readout channels.

Using the appropriate Front-End, the solution perfectly fits a wide range of detectors such as SiPMs, multi-anode PMTs, GEMs, Silicon detectors, Wire Chambers, Gas Tubes, etc, thus matching the requirements of different applications.

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