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The monitoring board for the calibration system of the g-2 experiment

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The new *Muon g-2 Experiment (E-989)* at Fermilab will measure the muon's anomalous magnetic moment, a=(g-2)/2, to an unprecedented precision of 0.14 parts per million (ppm). Data collection is expected to begin in early 2017. To achieve a statistical uncertainty of 0.1 ppm, the new experiment will benefit from upgrades of detectors, electronics and data acquisition at a much higher data rate. Continuous monitoring and state-of-art calibration are required in order to follow the detector response which can vary on both the millisecond time scale and the longer scale of many hours. To this aim a calibration system, made by laser source and light distribution system, will provide short light pulses directly into each cristal of the 24 calorimeters intended to measure energy and arrival time of the decay positrons. Each calorimeter is constituted by a matrix of 6x9 PbF2 cristals where each cristal is read by a Silicon Photomultiplier. The light feed by the laser into the distribution system is monitored along its transmission path, from the source up to the delivery point. The monitoring is performed by either Pin Diodes or Photomultipliers. An electronic board has been specifically designed to provide to these detectors bias voltages or high voltage, to stabilize the gain with respect to environmental parameter variation, to process the output signals, and finally to perform the data readout. The architecture of this monitoring board as well as the performance of a preliminary implementation are presented here.

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