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A High Rate Readout System for a High-Efficiency Cosmic Ray Veto for the Mu2e Experiment (at WG6)

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The Mu2e Cosmic Ray Veto must veto cosmic-ray muons over a large area with an efficiency of 99.99% in the presence of high background rates. It consists of over 5000 scintillator extrusions with embedded wavelength-shifting fibers coupled to 2×2 mm2 silicon photomultipliers. A custom readout system consists of: (1) small circuit board, the Counter Mother Board, which provides a temperature sensor, flasher LEDs, and passive SiPM pulse shaping; (2) a Front End Board which digitizes, zero-suppresses, and stores signals from up to 64 Counter Mother Boards, provides bias to the SiPMs, pulses to the LEDs, and a measurement of the SiPM currents; and (3) a Readout Controller which collects data from the Front End Boards via Cat6 cables, which also deliver 48V power to the Front End Boards using power over ethernet. The Readout Controller serves as the interface between the Front End Boards and the DAQ. This poster provides an overview of this high rate readout system for the Mu2e Cosmic Ray Veto.

Attendance type

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