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Readout method based on PCIe over optical fiber for CBM-TOF super module quality evaluation

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The Compressed Baryonic Matter (CBM) experiment will investigate the QCD phase diagram at high net baryon densities and moderate temperatures. CBM Time of Flight (TOF) system is composed of super modules containing high performance Multi-gap Resistive Plate Chambers (MRPCs). During the mass production, each super module assembled with MRPCs needs quality evaluation, which includes time measurement and data readout. Read out electronics encounter the challenge of reading data from a super module at a speed of about 6 Gbps. In this paper, a read out method based on PCIe over optical fiber is proposed for CBM-TOF super module quality evaluation. The digitized data from super module will be concentrated at the front-end electronics, and then be transmitted to a PCIe switch module (PSM) over optical fiber using PCIe protocol. The PSM is directly plugged into the motherboard via gold fingers at the backend data acquisition server. With this readout method, a high-speed transmission rate can be reached. Furthermore, a PSM can receives data from several super modules simultaneously, which is important to improve the evaluation efficiency. This readout method simplifies the architecture of readout electronics and supports long distance transmission between frontend and backend.

Minioral

No

Description

readout scheme

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