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Trigger Selection System for CBM-TOF Super Module Quality Evaluation

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The Compressed Baryonic Matter-Time of Flight (CBM-TOF) wall uses high performance of Multi-gap Resistive Plate Chambers (MRPC) assembled in Super module (SM) detectors to identify charged particles with high channel density and high measurement precision at the Compressed Baryonic Matter (CBM) experiment. During the mass production, the quality of each SM should be evaluated. For the convenience of testing and analyzing the MRPCs, a conventional frontend triggered mode is adopted for the evaluation system. In this triggered system, a global trigger signal should be generated to select the effective data from the raw hit data buffer. In this paper, a hierarchical trigger selection system for quality evaluation of the CBM-TOF SM detector is presented. In the first state, the Time-to-Digital Converter (TDC) draws effective hit information from the detectors, and then transfers them to the TDC readout motherboard (TRM). Where the hits collected from TDC are further processed in to generate sub-trigger information. In the second state, TRMs transfers all the sub-trigger information to trigger module (TM) allocated in a PXI 6U crate through optical links. With a proper selection algorithm, a global trigger signal is finally generated, which is then distributed synchronously to each front digitizer channel for trigger match. Test results confirm the function of the trigger selection system and indicate that it can works well.

Minioral

No

Description

Trigger

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