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Design of a general purpose scalable DAQ system

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In nuclear detection and high energy physics experimentations, large amount of detectors are widely used, proposing great challenges to the data acquisition (DAQ) system in timing, trigger and high speed data transmission. A new general purpose DAQ system with high integration and scalability is being designed. Multiple boards are connected serially via bidirectional optical links at the line rate of 4.8 Gbps, which transmit trigger, data and control signals simultaneously. With the employment of GBT protocol, fixed latency can be achieved between the boards. The propagation delay along the serial link is computed automatically in the FPGA reaching the accuracy of nanosecond level in preliminary tests. The whole system is given high flexibility and universality under the design concept of separating general-used hardware from application specified parts. Each node is consisted of a carrier board and up to four dedicated mezzanine cards. Until now, the DAQ system with 12-bit 80MHz ADCs (64 channels on one board) has been developed and tested.

Minioral

No

Description

system

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