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Complete Parallel Readout VME DAQ System

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In recent years, new high-speed bus standards like advanced/micro-TCA are adopted for new physics research projects. On the other hand, many of current DAQ systems are still based on legacy CAMAC/VME buses. RIKEN RIBF, that is a nuclear physics research facility generating unstable nuclei, is also using CAMAC and VME based DAQ system. The length of the beam line is over 100 meters, and several detector sets are installed at distant places. Since most of the detector sets produce a small size of data, CAMAC or VME buses are enough to handle data usually. Depending on experiments, some cases, higher data throughput is required. For example, CAEN V792/V1190 VME modules, the maximum data throughput is 160 Mbps. The module itself has enough speed. However, multiple modules are installed in the same VME crate due to the cost of VME controllers and VME crates. Consequently, the data acquisition performance is limited by the number of VME modules installed in the same VME create. Here, we have developed truly a low-cost VME controller to maximize the data throughput of the VME based DAQ system. This system allows us to mount individual VME controllers for all VME modules without any hardware modifications. Even VME modules are installed in the same VME crate, data readout is parallelized. In this contribution, we introduce the specification of the developed VME controller and the performance of the complete parallel readout VME DAQ system.

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