

Integration of CBM readout controller into DABC framework

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New experiments at FAIR like CBM require new concepts of data acquisition systems, where instead of central trigger self-triggered electronics with time-stamped readout should be used. A first prototype of such a system was implemented in form of a CBM readout controller (ROC) board, which is designed to read time-stamped data from a front-end board equipped with nXYTER chips and transfer that data to a PC via optical link. As an alternative option, Ethernet can be used for data transfer. A software library (called KNUT) was developed, which allows to control the ROC and read the data. A data transfer protocol over UDP was implemented to achieve high data rates with high reliability. A ROOT interface of KNUT provides easy access to ROC.

DABC (Data Acquisition Backbone Core) is a general purpose software framework for building wide range of DAQ systems –from simple single-board readouts to complex, multi-node fast event building. Via a flexible plug-in architecture DABC provides the integration of different kinds of devices, transports, data formats and analysis algorithms.

To get ROC data into DABC, ROC-specific device and transport classes were implemented in DABC (based on KNUT library). In addition, combiner and time-calibrator modules were implemented to merge data in DABC from several ROCs.

The complete readout chain including three ROCs, UDP data transfer, DABC readout application and a monitoring GUI were tested in the first CBM test beam time in September 2008. For the next test beam in summer 2009 the usage of optical links and DABC event building is planned.

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