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Data acquisition system of the TPC/MPD detector of the NICA project

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The data acquisition system contains 1488 Front-End Cards (FEC) grouped into 24 groups of 62 pcs. in each. Each FEC has an individual full-duplex few gigabit communication channel with Readout and Control Unit (RCU). The RCU manages each FEC within the group, collects data and then transmits it via a high-speed optical channel. Every 4 optical channels are connected to a Local Data Concentrator (LDC) server computer via a Data Concentrator Unit (DCU) card. Each of the 6 DCU controls four RCUs, receives data from them and stores it into the LDC's memory via the PCIe interface. The data acquisition system is operating with raw TPC event of size of 40 MB containing information up to 2000 tracks at central collision and trigger rate of up to 7 kHz in zero suppression mode. Overall structure of the system and rich functionality realized in its main parts is described in the report.

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