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Slow control system of CEE-TPC

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The Time Project Chamber (TPC) serves as the core detector of the CEE spectrometer, which accurately measures dE/dx, momentum information, and charged particle tracks in the final state of large angularly separated reaction products of nuclear reactions at the Cooling Storage Ring External-target Experiment (CEE) at the Heavy Ion Research Facility in Lanzhou (HIRFL). It is used to investigate scientific questions related to the phase structure of low-temperature, high-density nuclear matter and the asymmetric equation of state of high-density, low temperature nuclear matter. A slow control system (SCS) was designed and implemented using the Experimental Physics and Industrial Control System (EPICS) software toolkit to monitor and control the TPC's operation, front-end electronics and environmental conditions in real time in order to achieve precise position and time measurements with this detector. Approximately 6000 control and monitoring information exchanges have been implemented through the process variables (PVs) in this architecture. In this paper, we describe the design of the SCS, its hardware and software components, commissioning and operation, as well as its performance.

Footnotes

Funding Agency

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Yes

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