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Framework Upgrade of The Detector Control System for JUNO

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The detector control system (DCS) of Daya Bay Reactor Neutrino Experiment was developed to support the running neutrino-oscillation experiment. The experiment has been taking data for almost 3 years and making steady progress. And the first results have already been released. The Jiangmen Underground Neutrino Observatory (JUNO) is the second phase of the reactor neutrino experiment. The detector of the experiment was designed as a 20k ton LS with a Inner diameter of 34.5 meters casting material acrylic ball shape. Due to the gigantic shape of the detector there are approximate 10k monitoring point of temperature and humidity. There are about 20k channels of high voltage of array PMT, electric crates as well as the power monitoring points. Since most of the software of DCS were developed on the framework based on windows, which is limited by operation system upgrade and commercial software the framework migration and upgrade are need for DCS of JUNO. The paper will introduce the new framework of DCS based on EPICS(Experimental Physics and Industrial Control System) under Linux. The implementation of the IOCs of the high-voltage crate and modules, stream device drivers, and the embedded temperature firmware will be presented. The software and hardware realization and the remote control method will be presented. As well as the development of the remote monitoring and control system interface by CSS (Control System Studio). The upgrade framework can be widely used in devices with the same hardware and software interfaces.

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