

A Large Ion Collider Experiment (ALICE) Diffractive Detector Control System for RUN-II at the Large Hadron Collider

Authors : J. C. Cabanillas-Noris, M. I. Martínez-Hernández, I. León-Monzón

Abstract : The selection of diffractive events in the ALICE experiment during the first data taking period (RUN-I) of the Large Hadron Collider (LHC) was limited by the range over which rapidity gaps occur. It would be possible to achieve better measurements by expanding the range in which the production of particles can be detected. For this purpose, the ALICE Diffractive (AD0) detector has been installed and commissioned for the second phase (RUN-II). Any new detector should be able to take the data synchronously with all other detectors and be operated through the ALICE central systems. One of the key elements that must be developed for the AD0 detector is the Detector Control System (DCS). The DCS must be designed to operate safely and correctly this detector. Furthermore, the DCS must also provide optimum operating conditions for the acquisition and storage of physics data and ensure these are of the highest quality. The operation of AD0 implies the configuration of about 200 parameters, from electronics settings and power supply levels to the archiving of operating conditions data and the generation of safety alerts. It also includes the automation of procedures to get the AD0 detector ready for taking data in the appropriate conditions for the different run types in ALICE. The performance of AD0 detector depends on a certain number of parameters such as the nominal voltages for each photomultiplier tube (PMT), their threshold levels to accept or reject the incoming pulses, the definition of triggers, etc. All these parameters define the efficiency of AD0 and they have to be monitored and controlled through AD0 DCS. Finally, AD0 DCS provides the operator with multiple interfaces to execute these tasks. They are realized as operating panels and scripts running in the background. These features are implemented on a SCADA software platform as a distributed control system which integrates to the global control system of the ALICE experiment.

Keywords : AD0, ALICE, DCS, LHC

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