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ALICE Fast Interaction Trigger Detector Control System for the LHC RUN3

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The new hybrid Fast Interaction Trigger (FIT) system of the forward detectors has become an essential part of the ALICE experiment since the start of Run 3 in 2022. FIT comprises three subsystems –FT0, FV0 and FDD using Cherenkov radiation and scintillations for charged particle detection. FIT determines the event plane and centrality and provides high-precision collision time for particle identification with the time-of-flight detector. Thanks to the advanced front-end electronics, FIT serves as the primary ALICE trigger. It generates vertex and centrality triggers at the shortest latency (LM0), allows the estimation of luminosity and beam-induced background in various collision systems.

Despite differences in particle detection technologies, all FIT sensors use similar hardware. This homology allowed us to develop a unified Detector Control System (DCS) design for all three subsystems. The DCS is the primary tool for control, monitoring and hardware safety assurance. It allows detectors to be configured and calibrated automatically by connecting with signals from available ALICE subsystems. In the case of FIT, DCS also delivers luminosity and background estimation for experiment coordination.

This talk is devoted to the design and implementation of FIT DCS, which is one of the crucial elements contributing to the smooth operation and good performance of ALICE over the first three years of Run 3.

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