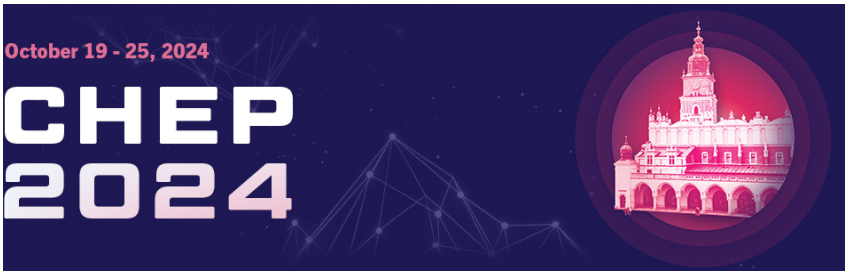

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Integrating IPbus ALFRED into the ALICE-FIT setup

The official data collection for the RUN3 of the Large Hadron Collider (LHC) at CERN in Geneva commenced on July 5, 2022, following approximately three and a half years of maintenance, upgrades, and commissioning. Among the many enhancements to ALICE (A Large Ion Collider Experiment) is the new Fast Interaction Trigger (FIT) detector. Constant improvements to FIT's hardware, firmware, and software will enable progressively better performance. Between November 2024 and March 2025, during the Year-End Technical Stop (YETS), an update to the communication path between the Front-End Electronics (FEE) and the Detector Control System (DCS) is planned. This update will introduce a new approach based on the ALFRED (ALICE Low-Level Front-End Device) software, supported by the central DCS ALICE system. To address the challenge of integrating custom electronics with distributed control systems, this paper describes a novel extension of the Front-End Device (FRED) framework, which can interface bespoke electronics with standard SCADA (Supervisory Control and Data Acquisition) systems using IPbus. This framework can be applied to all detectors utilizing IPbus communication.

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