THE LHCB SILICON TRACKER AND ITS CONTROL SYSTEM: FROM SCRATCH TOWARDS STABLE OPERATION

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Abstract

The LHCb Silicon Tracker (ST) at the LHC at CERN is ready for operation. It constitutes a crucial part in tracking the particle trajectories and consists of two silicon microstrip detectors, the Tracker Turicensis (TT) and the Inner Tracker (IT). The Detector Control System (DCS) is based on the multi-platform PVSS SCADA and has been tested and developed during the commissioning phase. A common software was implemented and developed for both sub-detectors. The DCS has to deal with more than 2000 readout chips and monitors ∼1170 environmental parameters. A hierarchical control system based on finite state machines allows distributed control of the detector equipment. An operator is able to centrally control the power supplies, to program the readout electronics and to monitor online the status of all the hardware. For commissioning it is flexible enough to allow for missing hardware at all levels. It features active monitoring of temperatures, humidity and power status and can take automatic actions on warnings or alarms. To guarantee safe operation of the Silicon Tracker a completely independent, redundant, hardware-based system is used for the 'vital' alarms.

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