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# Detector control and safety system for MIP Timing Detector

The Compact Muon Solenoid (CMS) experiment is one of four large experiments at the Large Hadron Collider (LHC) and significant upgrades are planned for all experiments and the accelerator facilities to get ready for the High Luminosity era (HL-LHC). As HL-LHC aims to significantly increase the collision rates, thus providing more data for particle physics experiments, upgrades to handle the increased data rates and radiation levels are needed.
One solution is the introduction of a new detector sub-system in CMS that would work as a timing layer with a time resolution on the order of tens of picoseconds, the MIP Timing Detector (MTD where MIP stands for Minimum Ionizing Particle). It will consist of a barrel timing layer (BTL) situated between the outer tracker and the electromagnetic calorimeter and endcap timing layer (ETL) situated just in front of the high granularity calorimeter.
As the control of MTD should be compatible with all detector systems at CMS, the MTD will be controlled and monitored using detector control system (DCS), designed using centrally approved tools: WINCC OA, JCOP framework and CMS-made components. The primary purpose of a DCS is to ensure the safe and efficient operation of the detector, monitor and collect data on its performance, and respond to any issues that may arise during operation.
This contribution will outline the development of the DCS for the MTD sub-system at CMS, with a particular focus on the current single-tray prototype system implemented for the BTL test-bench at the Tracker Integration Facility (TIF) at CERN. Additionally, the detector safety system (DSS) and the associated hardware interlock system will be discussed. Finally, the early design on the final DCS, including the design of the Final State Machine (FSM) and the hardware components will be discussed.

## Type of contribution

Poster

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