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# The protoDUNE Single Phase Detector Control System

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This paper presents the Detector Control System (DCS) that is being designed and implemented for the NP04 experiment at CERN. NP04, also known as protoDUNE Single Phase (SP), aims at validating the engineering processes and detector performance of a large LAr Time Projection Chamber in view of the DUNE experiment. The detector is under construction and will be operated on a tertiary beam of the CERN SPS accelerator starting in 2018.

After an overall description of the distributed control architecture that has been chosen for the control of this experiment, focus will be put on describing the software system design, based on the CERN control frameworks UNICOS and JCOP (built on top of WINCC OA), the hardware implementation, the deployment of the system into production and the integration of the detector subsystems and instrumentation into the overall NP04 DCS.

The challenging specifications of the SP detector, such as temperature reading accuracy, sensitivity to any electromagnetic noise of the SP detector electronics and the measures applied at the hardware layout level are also described. The knowledge acquired during the operation of the Anode Plane Assemblies (APA) sub-detector components within the NP Coldbox test facility is discussed and improvements are presented.

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