

Detector control system for the AFP detector in ATLAS experiment at CERN

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The ATLAS Forward Proton (AFP) detector upgrade project consists of two forward detectors located at 205 m and 217 m on each side of the ATLAS experiment. The aim is to measure momenta and angles of diffractively scattered protons. In 2016 two detector stations on one side of the ATLAS interaction point have been installed and are being commissioned.

The detector infrastructure and necessary services were installed and are being supervised by the Detector Control System (DCS), which is responsible for the coherent and safe operation of the detector.

Based on radiation conditions in the tunnel, easy access and maintainability during the collider activity, it was decided to locate only the necessary hardware close to detector stations. The second stage of the low voltage powering system, based on the radiation hard voltage regulators giving accurate voltage levels individually for each sensor, and optical converter module are placed at 212m, in between of both stations, while the vortex coolers are close to each station.

All other equipment is located in the ATLAS underground counting room (USA15), at about 330 m distance to the stations.

A large variety of used equipment represents a considerable challenge for the AFP DCS design. Industrial Supervisory Control and Data Acquisition (SCADA) product Siemens WinCCOA together with the CERN Joint Control Project (JCOP) framework and standard industrial and custom developed server applications and protocols are used for reading, processing, monitoring and archiving of detector parameters. Graphical user interfaces allow for overall detector operation and visualization of the detector status. Parameters, important for detector safety, are used for alert generation and interlock mechanisms.

The actual status of the AFP DCS and first experience gained during commissioning and tests of the detector is described in this contribution.

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Primary Keyword (Mandatory)

Control systems

Secondary Keyword (Optional)

Monitoring

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