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Controlling DAQ Electronics using a SCADA Framework

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LHCb is one of the 4 experiments at the LHC accelerator at CERN. During the upgrade phase of the experiment, several new electronic boards and Front End chips that perform the data acquisition for the experiment will be added by the different sub-detectors. These new devices will be controlled and monitored via a system composed of GigaBit Transceiver (GBT) chips that manage the bi-directional slow control traffic to the Slow Control Adapter(s) (SCA) chips. The SCA chips provide several user buses to interface the new electronics devices. These devices will need to be integrated in the Experiment Control System (ECS) that drives LHCb. A set of tools was developed that provide an easy integration of the control and monitoring of the devices in the ECS. A server (GbtServ) provides the low level communication layer with the devices via the several user buses in the SCA chip and exposes an interface for control to the experiment SCADA (WinCC OA), the fwGbt component provides the interface between the SCADA and the GbtServ and the fwHw component is a tool that allows the abstraction of the devices models into the ECS. Using XML or the Graphical User Interfaces files describing the structure and registers of the devices it creates the necessary model of the hardware as a data structure in the SCADA. It allows then the control and monitoring of the defined registers using their name, without the need to know the details of the hardware behind. The fwHw tool also provides the facility of defining and applying recipes - named sets of configurations which can be used to easily configure the hardware according to specific needs.

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