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ID: 3713 An FPGA Based Controller for the MICE Target

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Abstract The MICE experiment uses a beam of low energy muons to test the feasibility of ionization cooling. This beam is derived parasitically from the ISIS accelerator at the Rutherford Appleton Laboratory. A target mechanism has been developed that rapidly inserts a small titanium target into the circulating proton beam immediately prior to extraction without unduly disturbing the primary ISIS beam. The original control electronics for the MICE target was based upon an 8-bit PIC. Although this system was fully functional it did not provide the necessary IO to permit full integration of the target electronics onto the MICE EPICS system. A three phase program was established to migrate both the target control and DAQ electronics from the original prototype onto a fully integrated FPGA system that is capable of interfacing with EPICS through a local PC. This paper discusses this upgrade program, the motivation behind it and the performance of the upgraded target controller.

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