LabVIEW RT FPGA System Optimization and Integration of Data Analysis Module for Enhanced DAC Control Performance

Abstract

This work upgrades a LabVIEW Real-Time FPGA-based instrumentation system and achieving hardware optimization through strategic consolidation from a three-card to a two-card FPGA configuration while enhancing software capabilities with an integration of a data analysis module. The LabVIEW RT based DAC software is already developed and working fine which needs some modification in control strategies to improve the performance of the system and reliable operation. The three cards are used for various interlocks and control to take high speed control action of failsafe shutdown sequence. The existing system has peer to peer communication between two cards so back plane is involved in processing the data which creates bottleneck while taking action as per operational needs. Based on the modifications in the interlock and signal reduction the dependent RT module need to update. Same way the user interface would be updated accordingly. The robust and cost-effective control solution needs to be integrated with existing infrastructure while providing superior operational performance. The data analysis module needs to be upgraded as per experimental requirements based on modification of the existing environment.

Academic Project Requirements:

1) Required No. of student(s) for academic project: 1

2) Name of course with branch/discipline: M.E./M.Tech Electronics and Instrumentation Engineering

3) Academic Project duration:

(a) Total academic project duration: 52 Weeks
(b) Student's presence at IPR for academic project work: 5 Full working Days per week

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