Hardware Controllers for Data Acquisition with Usage in FPGA Implementation of Control Systems

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***Abstract*— This paper presents a method to design hardware interfaces for serial analog to digital (ADC) and digital to analog converters (DAC). Also, an architecture for hardware implementation of control systems based on these interfaces and handshake signals is proposed. The described hardware was implemented inside a Spartan-3E FPGA device, and a control system based on the deadbeat algorithm was implemented as a case study. The algorithm was applied to control the speed of a direct current (DC) motor. Simulation of the algorithm and experimental results prove the effectiveness of the hardware implementation.**

The main contribution is the method for design of control hardware implemented in FPGA, using high abstraction level software tools.

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