Industrial SCADA software enriched with MATLAB/Simulink functionality applied to the AMB system

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Abstract. The M2F (MATLAB-to-FIX) interface integrates a standard MATLAB/Simulink environment with a HMI/SCADA Windows based iFIX industrial monitoring and controlling system. The M2F transfers the functionality of MATLAB/Simulink application to the iFIX software. The AMB (active magnetic bearing) system consists of the rotor suspended in two magnetic bearings. It is controlled from the standard PC. Input and output signals are pre-processed in the RT-DAC4 board via XILINX FPGA chip. The PID control algorithm, FFT analysis and fault diagnosis is implemented in MATLAB/Simulink. All operations are executed in real-time with sampling frequencies greater than 2kHz. iFIX package is used to monitor the system behaviour (rotor positions, signals analysis) and for PID parameters tuning. The synopsis screens for AMB system and experimental results are presented.

Keywords: *AMB, real-time control and monitoring, PID, FFT, FPGA.*