

Development of Digital Control System for Current and Temperature Control of an Electrolyser

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Abstract

The electrolyser lab process used for the treatment of black liquor, the liquid effluent from pulp industry, needs to be controlled for the efficient performance, and for the parametric study and mathematical modeling of the process for scale up. The main parameters that need to be controlled are current through the electrolyser and the temperature of the anode chamber which are both critical for the operation of the process. The main objective of this research had been to develop a complete digital control system for the current and temperature control of the electrolyser, and a data acquisition system to automate the experiments. Most of the necessary hardware and software drivers were developed locally, and the digital control and signal processing algorithms were implemented in real time on a personal computer equipped with an interface card. The control system parameters were successfully tuned online to achieve reasonable performance for various control requirements.