Experimental Identification of process parameters using Relay feedback with state space approach

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**Abstract:**

In the present work, identification of process parameters using relay feedback approach with state space approach has been carried-out experimentally. A single symmetric relay test has been performed on the real time systems like Temperature and Liquid Level control systems both Interacting and non-Interacting in nature. These systems are modeled as First order with time delay (FOPTD) and Second order with Time delay (SOPTD). The two key parameters namely ultimate gain and ultimate period have been obtained from single relay feedback test and sustained oscillations have been used in the state space method to realize the other parameters of the process. Experimentally obtained results from relay feedback test were validated with the simulation results and the error between the actual process and the identified process has been traced out. Efficiency of the proposed method is compared to other methods in the literature and found them to be in good agreement. For the experimentally obtained transfer function models, a simple PID controller has been designed both in servo changes as well as load changes and comparative study was made.

*Key words:* Relay Feedback, symmetrical relay, FOPTD, SOPTD, Identification, PID Controller, state space method.

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