

## **A study of process identification, frequency response analysis and optimum proportional-integral tunings for an identified temperature control system**

### **ABSTRACT**

ABSTRACT Single loop feedback control is commonly used in many industrial applications due to low cost. However, it still deserved an optimum control for the good performance of the controlled process to avoid failures and shutdown of the plants. A good control should have a proper process identification to imply the process dynamic behavior. This paper presents the process identification, frequency response analysis and an optimal PI tuning of a single loop controlled system without involving the complicated stage in determining the best PI tunings for both the servo and regulatory control problems at a nominal point. In realizing the objective, a temperature control function of the Process Control Simulator is chosen. Process identification of the First Order Plus Dead Time is obtained through the developed algorithm. Meanwhile, frequency analysis and the optimal PI tunings are studied by using MATLAB simulation tools. It is found that the produced responses are varied by adjusting the compensator ratio where the optimal PI tunings for a stable and aggressive control is eventually determined.