ABSTRACT

The need for a more effective and efficient control system in the industrial 4.0 era is increasing, bearing in mind that the number of plants to be controlled is increasing and has an increasingly complex structure. One type of controller that is widely used today is the PID (Proportional Integral Differential) controller because this controller is simple and relatively easy to apply. In this study, a control system design was designed for DC motor speed using the PID system. System design is realized in several stages of integrated system blocks to achieve a PID adaptive control system.

The research contribution to this research includes the implementation of dual design PID. Controller architecture that aims to improve system performance by reducing errors and saving electricity Energy in the system. This controller architecture uses real-time error and delay to adjust the load of the controller, which results in better performance in terms of reducing errors and saving electricity. The efficiency of the dual design PID controller is also considered and compared with the PID controllers that use the overshoot tuning technique developed by CHR. This research activity is a demonstration of the dual-design controller's ability to effectively reduce errors and save electric energy in experimental systems and case studies. This finding promises a solution to improve system performance through the use of a Dual Design PID Controller, thus achieving or occurring tight spatial oscillation.

From this research what is desired is to design a control system for a DC motor with a rise time value of 0.9 seconds, to design a DC motor control system with an error value of 2% and to be able to compare the performance of the results of an adaptive PID control system with conventional PID