

A response time reduction for DC motor controller using SISO technique

ABSTRACT

In an industrial controller, over five decades there are many attempts had been proposed to improve a method of tuning proportional gains of PID controller. Where in the review there is a very little attention have been paid to use satisfactory tuning to get maximum performance. This paper proposes an alternative solution to maximize optimization for a controller-based DC motor. The novel methodology relies on merge proper tuning with optimization using SISO-Optimization technique-based tune). The comparative study has been done by utilizing classical tuning methods Z N, SIMC, CHR, and AMIGO, to obtain suitable tuning to be joined with . The proposed PID controller was examined in term of response time characteristics. This strategy provides a superior reduction in peak overshoot Pos , dead time t_d , rise time t_r , settling time t_s , and peak time t_p , that could be utilized to improve the responses of a DC motor controller. Based on comparison results, it was founded that a CHR based SISO_optimization playing a superior role over others in term of Pos 0%, t_d 0.1811 μ sec., t_r 17.2 μ sec, t_s 30.7 μ sec, t_p 80 μ sec, and the number of iterations iter No 9. Ultimately, this work overcome the majority of previous work that related with this approach.

Keyword: CHR; OBT; PID; Response time; SISO