

DESIGN AND DEVELOPMENT OF A PSO TUNED PI CONTROLLER FOR THE MANAGEMENT OF A FLY BACK CONVERTER

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ABSTRACT

A fly back converter is a DC to DC converter with galvanic isolation between the source and the load sides. The coupling between the source and the load is done with a step down transformer. The major circuit components include a power electronic switch and a diode which are non linear in nature. In practice the coupling transformer may also have non linearity. Therefore when it is required to design a PI controller for the fly back converter it becomes difficult to tune the PI controller. In this work the Particle Swarm Optimisation (PSO) based tuning technique has been adopted and the performance of the PI controller tuned with the PSO based tuning is compared against the performance of the PI controller tuned with the Zeigler Nicholas tuning technique. The entire design procedure has been carried out in the MATLAB SIMULINK simulation environment. An experimental verification setup was constructed to validate the proposed idea in real time.

KEYWORDS: Fly Back Converter, PI Controller, Zeigler Nicholas Method of Tuning the PI Controller, Particle Swarm Optimization (PSO), PSO Based Tuning of PI Controller & Stability Analysis of Systems.

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