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Title:

PLC Based Multi Motor Speed Controller

Abstract:

Fast advances in digital system have given designers the possibility of implementing controllers using Programmable Logic Controller (PLC). three phase induction motors have been used widely in automation processes and electromechanical drives due to lower cost, negligible maintenance and its rugged construction. In general, several control methods are existed to drive or run 3-ph induction motors with the aid of Variable Frequency Drives VFDs under commonly known mode of operation named constant V/F. In this project, the Proportional-Integral (PI) controller, which is embedded within the Programmable Logic Controller used in has been utilized to be a part of the complete control system to implement a prototype of a speed controller for each 3 - ph induction motor. For more reliable operation, a Programmable Logic Controller used as a main control unit which monitors the operation of induction motors through a feedback mechanism that uses incremental encoders, and makes decisions based on a specific logic program, and controls the Variable Frequency Drives where its output is supplied to induction motors. In this study, master/slave technique has been adopted in creation of PLC algorithm because; the PLC has an important role that solves the problems behind synchronization such as the sudden changes in speed and load. The serial communications RS485 and digital to analog converter have been used for the purpose of data transmission between the PLC and VFDs. The experimental and simulated results have been obtained by testing the proposed system under different operating conditions. This proposed system is designed to reduce the cost as much as possible and takes care two important issues, the first one is speed control of multi axis induction motors and the second is the displacement adjustment within an acceptable value and time.