

ABSTRACT

IMPLEMENTATION OF NETWORKED CONTROL SYSTEM DC MOTOR WITH PI CONTROL METHOD USING OPC SERVER-CLIENT

Part of the internet network circle is called the networked control system (NCS). Network control began to be applied to many industries. Many advantages are available in the use of NCS such as monitoring, maintenance, security, and remote control so as to improve work efficiency. OPC communication protocols are widely used in industry to connect many equipment.

In this research, a networked control system was designed using OPC server-client. To see the effect of NCS on the system output, a DC motor is used as a plant and the rotation speed as the output. The OPC server will be connected to the OMRON CPH PLC which is the interface of the DC motor and rotary encoder. The OPC client uses the Matlab-Simulink application as a controller and uses the PI control method.

The results of the tests is the delay time on the network can increase overshoot on the system using the PI control method. At a greater delay time it can result in an unstable system and oscillating output. The result of DC motor speed response with the highest delay time is 30K data packet delivery delay and $K_p = 0,2$ and $K_i = 0,7$, has Rise Time = 1.8s, Peak Time = 1.8s, Maximum Overshoot = 36%, Settling Time = 2.9s. In overcoming this reduction in the PI constant can stabilize the system but slow down the rise time and settling time.

Keyword : *Networked Control System, PLC OMRON CPH, Motor DC, OPC Server-Client, PI.*