ABSTRACT

IMPLEMENTATION OF DOUBLE CONTROLLER ON TWIN TANK USING PI CASCADE CONTROL

Control of a system to set water level is a very important activity. In existing water level control system, some problem still occurs, such as waste of water, equipment failure and work accidents, due to inappropriate water level control. Therefore, to reduce these problems, it's necessary to develop on existing water level control system, so the system can work more optimally.

Implementation of double controller on twin tank using PI Cascade control is one solution to answer these problems. PI Cascade algorithms is used to control the movement of motorized valve on the water channel between two tanks to adjust main tank water level with setpoint.

Tests and analyzes result in this final project has HC-SR04 ultrasonic sensors readings with average error 0,332 cm and standard deviation 0,029 cm without disturbance, and average error 0.829 cm and standard deviation 0,361 cm with disturbace. System respone of single tank system, with result rise time 218 second, 0,0634 evershoot, and error steady state 0,8 cm without disturbance, and rise time 285 second, overshoot 0,026 and error steady state 0,7 cm with disturbance. System respone of twin tank system, with result rise time 443 second, overshoot 0,0255, and error steady state 0,1 cm without disturbance, and rise time 307 second, overshoot 0,0188 cm, and error steady state 0,1 cm with disturbance.

Keywords: control system, water level, PI cascade control, setpoint.