摘 要

在科技领域，自动化控制行业伴随时代的进步蓬勃发展，控制强度控制规模控制难度都不断增加，由此诞生了控制系统及各种控制器件，可编程控制器（Programmble Logic Controller）就是其中重要的一种，依赖于 PLC 对系统进行编程再利用变频器控制控制执行器，再用组态软件编写的界面进行监控，已经是最为常见的一种系统构建手段。

在本次设计中，通过利用西门子 300 PLC 和变频器、传感器、水泵等硬件搭建了液位控制系统，并通过 Step7 软件对 PLC 控制程序进行编程，基于变速积分 PID 理论设计了梯形图，通过 WinCC 组态全局设计了监控界面，监控了系统的主要变量实现了对系统的实时监控。完成了从传感器检测到 PLC 运算再到控制变频器对水泵进行流量控制从而控制液位的系统设计和部分仿真调试。

关键词：液位控制；可编程控制器 PLC；WinCC 组态软件；变速积分 PID

Abstract

In the field of science and technology, the automation control industry is booming with the progress of the times, and the difficulty of control intensity control scale control is increasing. The requirements for control technology have been repeatedly improved, resulting in the birth of control systems and various control devices. Programmable Logic Controller is One of the important ones is to rely on the PLC to program the system, then use the inverter to control and control the actuator and monitor and control using the interface described in the configuration software..

In this design, I built a liquid level control system by using Siemens 300 PLC and inverter, sensor, A PLC control program was programmed via a water pump or other Step7 hardware and software to design a ladder diagram based on the integral variable speed PID theory. The monitoring interface is designed worldwide by the configuration of WinCC to monitor the main system variables and to carry out real-time monitoring of the system.. Completed the system design and part of the simulation and debugging from the sensor detection to the PLC operation to the control of the inverter to control the flow of the pump to control the liquid level.

Keywords： liquid level control; programmable controller PLC; WinCC configuration software; variable speed integral PID

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