

题目：立体仓库控制系统设计

摘 要

在经济飞速增长的二十一世纪，随着全球经济复苏，各行各业都焕发了生机，在交通越来越发达、科技越来越先进、生活水平越来越高的背景下，人们的物质需求也发生了改变，要求变得越来越高，同时也引发列如物流行业等契合人民生活需求的行业的迅速发展。在物流速度越来越快，物流数量越来越多的同时也暴露出了在一些亟待改进的地方。列如，快递的运输、转存等问题。优化仓库的智能存储与合理对仓库进行规划能够有效地提高物流行业的运输效率以及降低物流存储的成本。因此，开发全新的、更为先进的立体仓储系统对于物流行业的发展来说十分重要。本文主要讲述的就是立体仓库智能控制系统。

本文主要对立体化仓库控制的原理及其可行性进行了分析，在经过对任务书的仔细学习和对现有的立体化仓库控制方案的了解的基础之上。对自动化立体仓库系统进行了设计，主要是依托可编程控制器 PLC、传感器或者程序来进行自动判定、利用伺服驱动器来接 PLC 发出的高速脉冲，然后将信号转换，再控制伺服电机、中间继电器和启动装置来实现信息的传递和对堆垛机的自动取料、放料入库以及取料出库进行控制，最终达到精确、迅速、具有自动化的立体仓库控制系统。

本系统是主要选用 S7-200 系列 ST30 型号的 PLC 对电机进行控制，使之实现按照程序设定进行行走与升降，对物体进行抓取和搬运入库，完成自动化的操作。具有货物的运输与分配、堆垛机定位控制以及出入库控制等功能。

PLC 立体化仓库 智能化 伺服电机

关键词：PLC；立体化仓库；智能化；伺服电机

Abstract

In the 21st century, with the rapid economic growth, with the global economic recovery, all walks of life are full of vitality. Under the background of more and more developed transportation, more and more advanced technology, and higher living standards, people's material demand has also changed, and the requirements have become higher and higher. At the same time, it has also led to the rapid development of industries such as logistics industry that meet people's living needs. At the same , more and more logistics are exposed in some areas that need to be improved. For example, the transportation and transfer of express delivery. Optimizing the intelligent storage of the warehouse and planning the warehouse reasonably can effectively improve the transportation efficiency of the logistics industry and reduce the cost of logistics storage. Therefore, the development of new and more advanced three-dimensional warehouse.

This paper mainly analyzes the principle and feasibility of three-dimensional warehouse control, based on the careful study of the task book and the understanding of the existing three-dimensional warehouse control scheme. The automatic warehouse system is designed, which mainly relies on PLC, sensor or program to make automatic judgment, uses servo driver to receive high-speed pulse sent by PLC, then converts the signal, and controls servo motor, intermediate relay and start device to realize information transmission, automatic reclaiming, discharging, warehousing and reclaiming of stacker The storehouse is controlled to achieve a precise, rapid and automatic three-dimensional storehouse control system.

This system mainly uses S7-200 series ST30 PLC to control the motor, so that it can walk and lift according to the program settings, grab and carry objects into the warehouse, and complete the automatic operation. It has the functions of goods transportation and distribution, stacker positioning control and in and out control.

PLC three-dimensional warehouse intelligent servo motor.

Key Words: PLC ; three-dimensional warehouse ; intelligent ; servo motor

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