AN AUTOMATIC SORTING WORKSTATION BY USING ROBOTIC ARM

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ABSTRACT

The main purpose of this project is to fulfil the requirement to complete the degree course in Electrical Engineering. Its objective is to develop problem solving, analysis, synthesis and evaluation skills in the field of Electrical Engineering.

The aim of this project was to implement the sorting workstation by using the Programmable Logic Controller (PLC) as the main controller and combined the Robotic Arm as the manipulator. The workstation sorted the valid product in 3 positions. The valid products were only in one range of colour regarding to the reflection light of the surface of products tested.

The program which controlled the system was written in ladder diagram. This program is entered to the PLC CPU using the window programming software called SISWIN version 3.4. The robotic arm has been programmed by using the Robot Programming language (PRL) into the Robotica Control Software (RSC) which is produce by EDUBOT. The super dual fibre optic sensor (E3X_MDA11) has been used in products colour recognition.

The results that were obtained through this project showed that the proposed technique is excellent and create flexible, good supervision and high safety working condition.

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CHAPTER 1

INTRODUCTION

1.1 An Automatic Sorting Workstation by Using Robotic Arm

Base on the topic, this thesis are consist of three keywords that are automatic, robotic and sorting. These three words have been compiled to create the simple system which is An Automatic Sorting Workstation by Using Robotic Arm.

Automatic means working itself with little or no direct human control in achieve cost saving, quality, reliability, efficiency and high safety working condition [1]. For the controlling system, OMRON SYSMAC CPM2A micro programmable logic controller has been used to control the movement of this workstation. The micro Programmable Logic Controller (PLC) was choosing to control the robot to be more intelligent and easy to redesign or reprogram the command if needed.

Robotics is the science of designing and building suitable for real-life application in automated manufacturing and other non manufacturing environments. Robot are the means of performing multifarious activities for man's welfare in the most planner and integrated manner, maintaining their own flexibility to do any work, effecting enhanced productivity, guaranteeing quality, assuring reliability and ensuring safety to the worker. Robotic in this project have been powered by using the Robotica Control Software (RCS) which written in robot programming language (RPL) [2]. This program manages the movement of the robot to the specific location needed in range of their working area.

Sorting was the tasks that given in this project. This system will sort the products by considering colour recognition. The colours have been set by using the Super Dual Fibre Sensors (E3X-MDA11).

The others simple task were the indication and switching systems. It consists of push start button, push stop button, push pause button, push emergency button, limit