

# **PARTNER ROBOT USING PROGRAMMABLE LOGIC CONTROLLER (PLC)**

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This project is presented in partial fulfillment for the award of the  
Bachelor of Electrical Engineering (Honors)  
**UNIVERSITI TEKNOLOGI MARA**

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## **ACKNOWLEDGEMENT**

All praise to Allah, The Most Beneficent and The Most Merciful. Thee do I worship and Thee do I beseech help. Thank you to Allah Almighty for granting me patience and confidence in completing this project.

First of all, I would like to address my heartiest thanks and appreciation to my supervisor Puan Roshidah Bt Sam for her kindness, valuable guidance, comments and ideas towards the success of this project.

My most sincere and heartfelt gratitude also goes to Dr.Maliki,Encik Hezri Fazalul Rahiman, the laboratory technicians and others who gave me valuable information and assistance in completing this project. Not forgetting, my friends Halim Samuri,Shahmanuddin Ibrahim and Mohd Syakirin who has taught and guided me with their comments and ideas towards the completion of this project.

This success is also dedicated to my whole family especially my parents who had given me support, help and pray for my success. Last but not least is my gratitude to friends and seniors for their moral support and help.

## ABSTRACT

This main purpose of this project is to fulfill the requirement to complete the degree courses 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 is to implement the Partner Robot using Programmable Logic controller (PLC). The system designed is used to control the home appliances besides providing a good servant robot service at home.

The program which controlled the system is written in ladder diagram. This program is entered to the PLC CPU using the window programming software called CX-Programmer.

The other features of partner robot system such as proximity sensor that design to stop the robot immediately for safety first purpose, the wide range of Light Detector Resistance(LDR) gripper sensor that can grips the objects with special limit switch design to controls the pressure when gripping the glass and delicate well the objects. The robot also is design to stop and reset all the operation when the overflow current appears.

The partner robot is operating in low dc voltage 24Vdc and the battery also can be charge and last longer more than normal battery.

The used of PLC not only as a software control but with advancement in controller technology, it is also used as a drives, motion and process control with a single, integrated control system.

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# CHAPTER 1

## INTRODUCTION

### 1.1 Partner Robot Using PLC Controller

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.

There are personal robots, advanced toys for the hobbyist, which are already commercially available, but of little practical use in household robots. Even though experts seem to disagree on the feasibility of the all-around household robots, some mutants of this species are already about to invade the private home. On the other hand, there are highly specialized, sophisticated robots, which are used for security tasks or as is the case here, for performing services for the disabled.

A partner robot system is designed to serve bedridden patients by performing simple services such as operating electrical appliances or bringing objects to the patient's bedside according to the patient's request. The partner robot, is not supposed to apply any medical treatment to the patient. The workplace of such a robot would be usually confined to one room, either in a hospital or in the patient's home. This definition is important, since the constant presence of the patient as a supervisor for the robot's activities greatly facilitates the design of the robot in general and of the robot's mobile base in particular.

The robot is design by construction of the body structure and good material to perform in any conditions place. For the controlling system, OMRON SYSMAC CPM2A micro programmable logic controller has been used to control the movement of the partner robot. The micro Programmable Logic Controller (PLC) is choosing to control the robot to be more intelligent and easy to redesign or reprogram the command if needed. The program controls the PLC so that when an input signal from an input device turns ON the appropriate response is made. The response normally involves turning ON an output signal to some sort of output device. The PLC historically originates in relay based control systems.

However PLC also required computer capabilities and accuracy to achieve the great deal more flexibility and reliability. Others benefits of the robot also used to drives, motion and process control with a single integrated control system. The other features of partner robot system such as proximity sensor that design to stop for safety first purpose, height and low limit switch to achieve the serving purpose and the wide range of gripper that can grips up to 100mm diameter of the objects. The robot also comes with automatic stop function if any overflow current appears.