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PLC BASED VERTICAL CAR PARKING SYSTEM

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ABSTRACT

The first aim of this project is design and develops plc based vertical car parking; this system will be Automatic Park the car vertically.

The driver park the car in passage and it was automatically rotate .This paper demonstrates prototype developed of vertical car parking using PLC.PLC is the mostly used controller as it is easy to operate and control task according to the program which is already fixed. In today scenario where maximum people used cars, the biggest question arises if car parking is safe or not. In addition to users to park the care's safely and the without facing the problem and safe parking. . Therefore, the concept of smart car parking is appropriate enough to make the city smart at an initial level.

Keywords: Vertical Car Parking, Control System, PLC, Sensor Rotary Encode.

I. INTRODUCTION

In this project we have developed automated vertical car parking with the help of PLC. The parking is automated in the sense that there's no need of any human effort.

We got motivation from the people who face problems in finding vacant places in a large car parking area. Some people enter in the wrong row and then they reverse their car and face problems to do so. They waste their time for such kind of unnecessary efforts. Also they sometimes get irritated when they don't get a suitable place for their car.

Vertical car parking is proper use of less space of the car parking and more car parked in the working space. In this project PLC is used to controlling the operation of the car parking. PLC is control, provides real time data and detects the faults. So parking operation is organized safely. In this project provides the design, installation and working of the vertical car parking. In this parking system plc, sensor and relay work together for so vehicle parked smoothly. Vertical car parking is system is environment friendly and it reduced the number of parking lots. This project is durable and its assembly is cheap.

In summary of PLC based vertical car parking is can solved big city parking problem. By using smart technology, we can make cities cleaner grinner and easier to live in everyone.

II. METHODOLOGY

This research was carried out based on the steps as explained in the research procedure flow chart which can be seen in Figure 1. System design includes electronics by drawing details and the layout of the components of the mechanical and electronic systems being built. The design of electronic systems includes the need for a power supply source and a device that functions as an automatic control system.

A single-phase main power supply in the form of an alternating voltage of 220 Volt is used to supply the inverter and PLC. The main power supply is current limited by a miniature circuit breaker (MCB) device with a capacity of 6 Ampere so that when there is a problem with the circuit or electronic device, the MCB will cut the mains electric current. The Allen Bradley Micrologix 1200 plc device will be used. PLC device work on the 24Volt dc voltage which functions as the canter for automatic control of the vertical car parking system. PLC has several main functions, including the CPU or Central processing unit as the control canter and as a programming connection that is connected to the computer. The input function in the form of a button and rotary encoder is a command to be processed on the CPU. The output function is the result of the input response that has been processed on the CPU in the form of a voltage signal that is sent to the relay then gives an order to the inverter to drive the dc motor.

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On the PLC device there is a power supply in the form of a direct voltage that is 24 Volt DC with a capacity of 2 Ampere. 24 Volt DC voltage is used to carry out the functions of the PLC input and output devices. 24 Volt direct voltage power supply is also used as a pulse signal generator in rotary encoder devices.

The incremental type rotary encoder device functions as a position sensor where the rotary encoder can generate pulse signals. The pulse signal generated from the rotary encoder is useful for controlling and determining the angle of rotation of the induction motor. The pulse signal is connected to a PLC which can calculate so that the motor rotation angle can be determined so that the slot position and motor rotation can be adjusted.

A laptop or computer is used to be able to integrate all devices into a single automatic system. A computer or laptop is used to create programs for later upload to the PLC. A computer or laptop can also function as a monitoring device for working devices.

III. MODELING AND ANALYSIS

Figure 1: Vertical Car Parking.

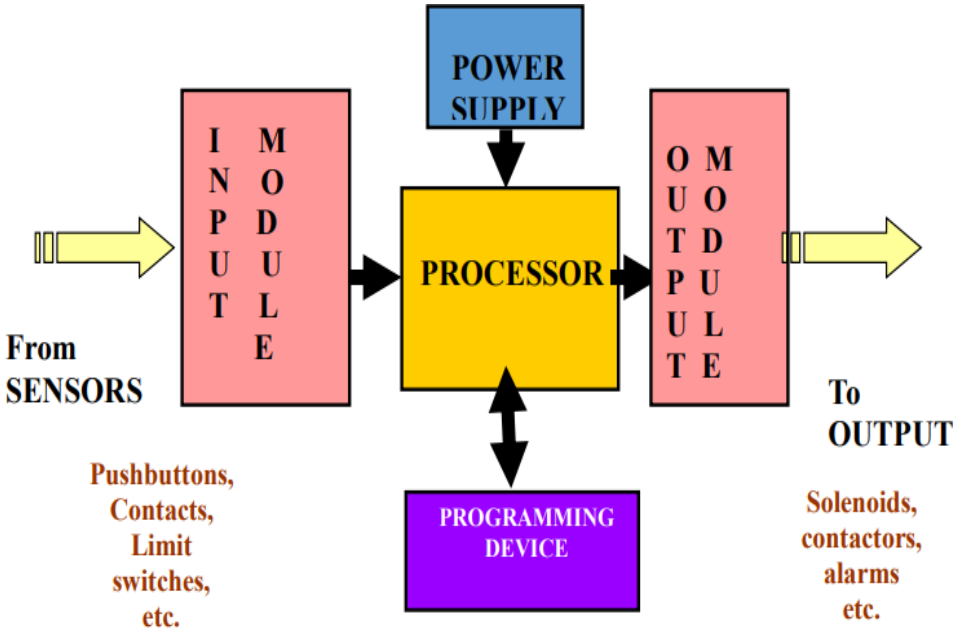

Figure 2: Block Diagram

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IV. RESULTS AND DISCUSSION

Testing of electronic system design includes measuring the voltage and electric current used for consumption of an electric motor as a driving force. In addition, testing of the electronic system is carried out by testing the accuracy of the command of the tool with the actual carried out by the system. This test wants to show that the rotary encoder device has a function to read the position of the motor rotation angle and can be controlled by the PLC. Here is a test table for the control.

V. CONCLUSION

Vertical Car Parking model has been designed; all the parts in it were manufactured and assembled and tested successfully. Analysis of the model has been done and developed with the scaling of 1:9 for life size model Such as SUV's like Fortune. As the life cycle model involves proper design and advanced methods are to be used to meet the requirements of the customers.

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