SIMULATION OF PLC BASED CAR PARKING SYSTEM

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ABSTRACT

In this work, a system which will be use In multilevel parking this system will show the driver exact place to park at the entry point of parking in the screen outside of the parking Also it counts the total number of car parking is available and show it to the display outside of the parking so it will help the driver to park vehicle At the entrance will see the spot number which is empty so driver will park car at that particular spot so it saves the time of the driver to find the spot and park the vehicle this project is based on "INDUSTRIAL AUTOMATION TECHNOLOGY software is DELTA_IA_PLC_WPL_V 2 50 _ 20201119 1

1. INTRODUCTION

Vehicle ownership is at high percentage in the world today, parking has become a contradictory and perplexing anomalous for many people (Asiyanbola & 2012 The problems of parking are an everyday occurrence whether at churches/mosques, bus stations and shopping malls Current parking design practices are unproductive and often ineffective at solving parking problems The objective is to develop an Car Parking System based on PLC using proximity sensors, Light Dependant Resistor (and solar panels for power consumptions The Car Parking System simply uses the input module from proximity Sensors and LDRs to provide it to the Programmable Logic Controller to ensure easy, reliable and effective car parking management. A Research Paper on Automotive parking systems based on parking Scene recognition 2017 By Shidian Ma, Haobin Jiang, Mu Han, Ju Xie, and Chenxu L Provides following merits and demerits Merits Research on automatic parking systems based on ultrasonic sensors was developed Demerits Only the sensors with less power technology were found. A research paper on Visual methods so that we can detect available parking

slots in 2018 By Jian Yu Chen, Chih Ming Hsu* Provides following merits and demerits Merits Automatic parking systems designate target positions using a free space based approach that involves the use of ultrasonic sensors Demerits Ultrasonic sensors are not flexible to implement.

2. COMPONENTS

1.PLC
2.PROXIMITYSENSIORS
3.DCMOTOR
4.LADDERDIAGRAM
5.BATTERY
6.TIMER
7.COUNTER
8.PUSHBUTTON

3. PROGRAMMABLE LOGIC CONTROLLER(PLC)

Delta DVP14SS2 8 inputs 6 outputs PLC
Plc is an industrial digital Computer which has been Ruggedized and adapted For the control of manufacturing processes. Such As assembly lines, or robotic devices, or any activity that requires high reliability. Control and ease of programming And process fault diagnosis.

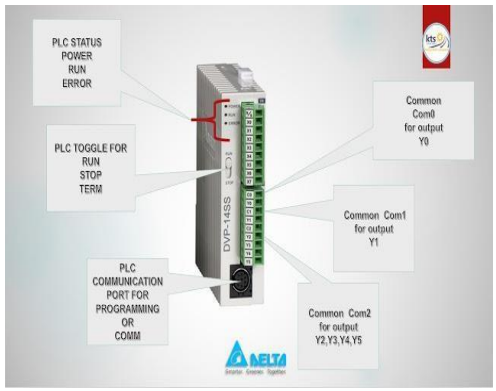


Figure 1. **Programmable Logic Controller**

No of inputs (Analog) Analog):8
No of outputs(Analog) Analog):6
Temperature: 50 55
Rated power supply :100-240 VAC

PROXIMITY SENSOR
A proximity sensor is a sensor able to detect the presence of nearby objects without
any physical contact A proximity sensor often emits an electromagnetic field or a beam of electromagnetic Radiation(infrared, for instance), and looks for changes in
The field or return signal

BATTERY
A container consisting of one or more cells, in which chemical energy is converted into
electricity and used as a source of power.

TIMER

A timer is a PLC instruction measuring the amount of time elapsed following an event Timer instructions come in two basic types on delay timers and off delay timers Both “on delay” and “off delay” timer instructions have single inputs triggering the timed function.

COUNTER

A counter is a PLC instruction that either increments (counts up) or decrements (counts down) an integer number value when prompted by the transition of a bit from 0 to 1 (“ to “ Counter instructions come in three basic types down counters and up/down counters.

PUSH BUTTON

ELCOM Push button on/off switch PBS 2 GREEN

ELCOM Push button switch in a Round head type, momentary/ ON OFF type as per requirement.

4. BLOCK DIAGRAM FOR PLC CAR PARKINGSYSTEM

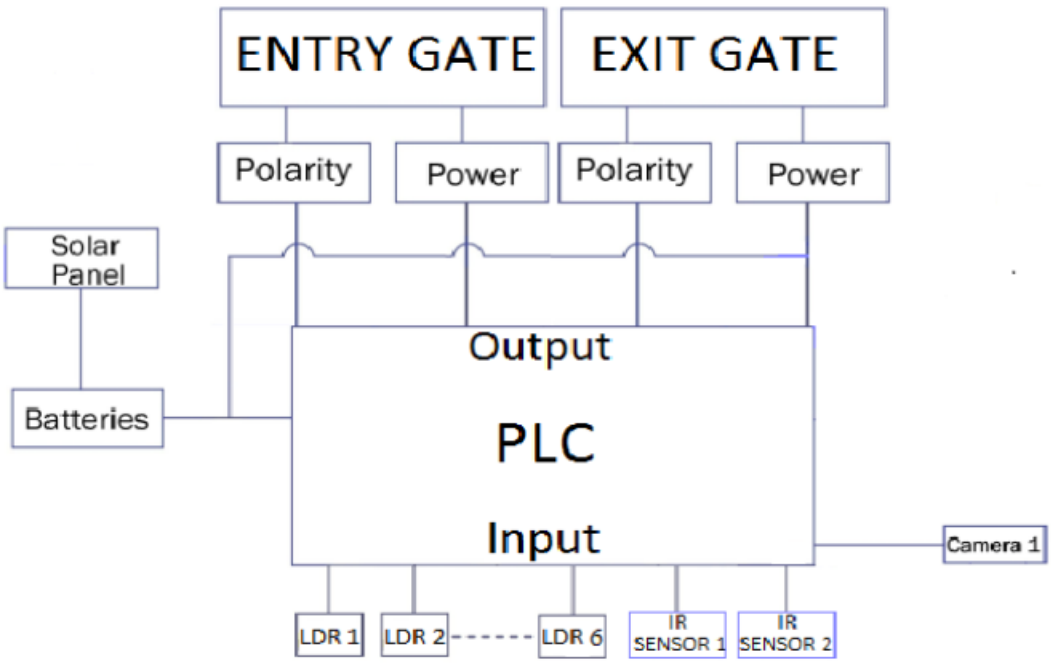


Figure 2. **Block Diagram for PLC Car Parking system**

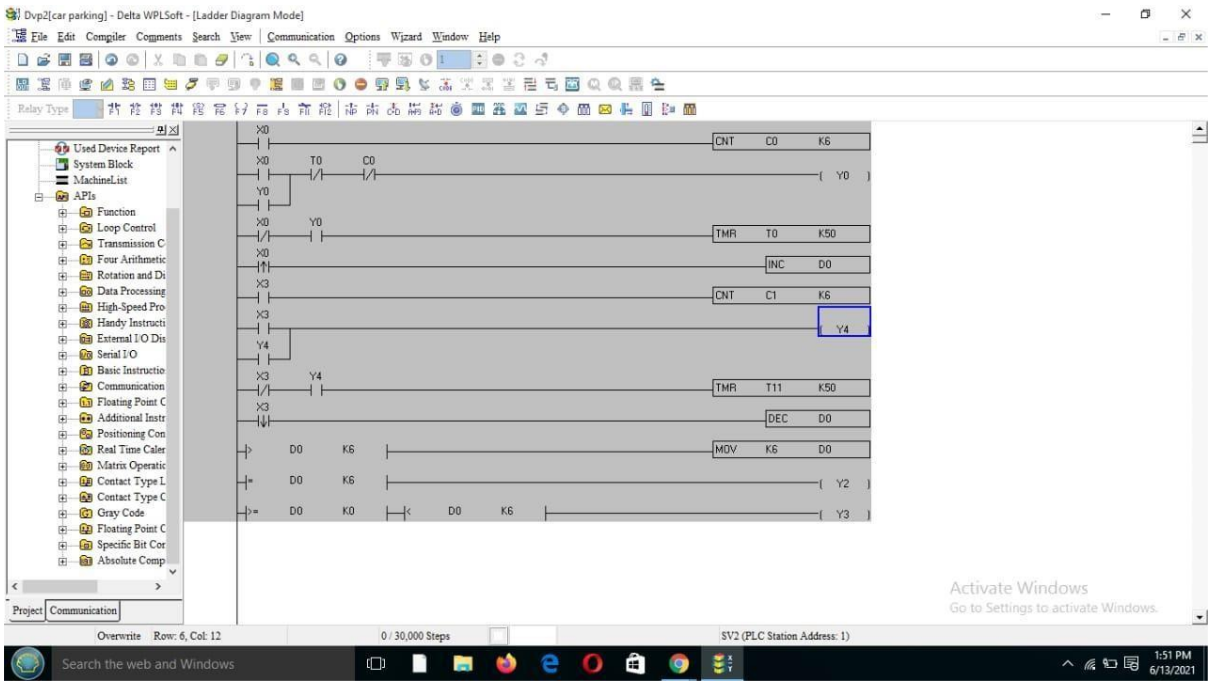
Picture for during parking

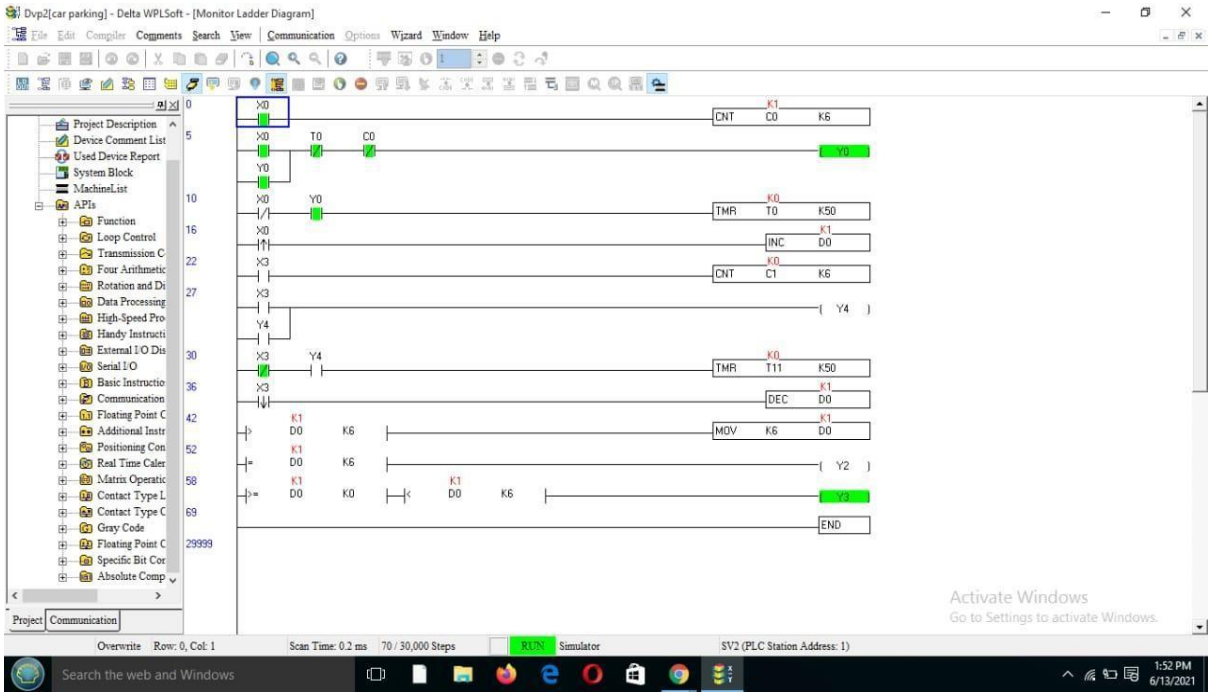
Figure 3. During Parking

Picture for after parking.

Figure 4. After Car Parking

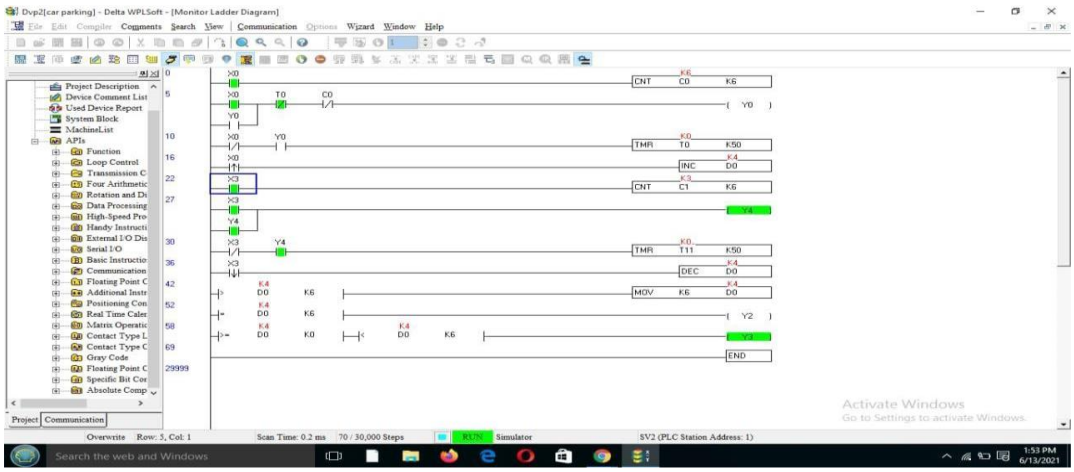
5. LADDERDIAGRAMS


Dvp2[car parking] - Delta WPLSoft - [Ladder Diagram Mode]
File Edit Compiler Comments Search View Communication Options Wizard Window Help
Used Device Report
System Block
MachineList
APIs
Function
Loop Control
Transmission C
Four Arithmetic
Rotation and Di
Data Processing
High-Speed Pro
Handy Instructi
External I/O Dis
Serial I/O
Basic Instructio
Communication
Floating Point C
Additional Instr
Positioning Con
Real Time Caler
Matrix Operatic
Contact Type L
Contact Type C
Gray Code
Floating Point C
Specific Bit Cor
Absolute Comp
Project
Communication
X0 CNT C0 K6
X0 T0 C0 Y0
Y0
X0 Y0 TMR T0 K50
X0 INC D0
X3 CNT C1 K6
X3 Y4
Y4
X3 Y4 TMR T11 K50
X3 DEC D0
D0 K6 MOV K6 D0
D0 K6 Y2
D0 K0 D0 K6 Y3
Activate Windows
Go to Settings to activate Windows.
Overwrite Row: 6, Col: 12
0 / 30,000 Steps
SV2 (PLC Station Address: 1)
Search the web and Windows
1:51 PM
6/13/2021


Dvp2[car parking] - Delta WPLSoft - [Monitor Ladder Diagram]
File Edit Compiler Comments Search View Communication Options Wizard Window Help
Project Description
Device Comment List
Used Device Report
System Block
MachineList
APIs
Function
Loop Control
Transmission C
Four Arithmetic
Rotation and Di
Data Processing
High-Speed Pro
Handy Instructi
External I/O Dis
Serial I/O
Basic Instructio
Communication
Floating Point C
Additional Instr
Positioning Con
Real Time Caler
Matrix Operatic
Contact Type L
Contact Type C
Gray Code
Floating Point C
Specific Bit Cor
Absolute Comp
Project
Communication
X0 CNT C0 K6
X0 T0 C0 Y0
Y0
X0 Y0 TMR T0 K50
X0 INC D0
X3 CNT C1 K6
X3 Y4
Y4
X3 Y4 TMR T11 K50
X3 DEC D0
D0 K6 MOV K6 D0
D0 K6 Y2
D0 K0 D0 K6 Y3
END
Activate Windows
Go to Settings to activate Windows.
Overwrite Row: 0, Col: 1
Scan Time: 0.2 ms
70 / 30,000 Steps
RUN
Simulator
SV2 (PLC Station Address: 1)
Search the web and Windows
1:52 PM
6/13/2021

Description

X0 is sensor1 Y0 is entry gate If sensor is on counter will be on then start the counting and enter gate will open then incrementing the cars upto6cars.



Discription:-x3 is sensor2 Y4 i s exit gate. If sensor2 is on counter will be on then start the counting and also exit gate will open then decrementing the cars upto empty.

Conclusion

This system was successfully implemented using DELTA_IA_PLC_WPL_V2.50_SW_20201119-1. Well use of land area Parking space monitoring, Saves time, Saves fuel, Driver less parking and Less traffic.

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