

Car Parking Controller

Implementation Document

PROJECT MEMBERS

20L-1161 Muhammad Shaheer

20L-1130 Zain-Ul-Abideen

Project Demand:

A Parking plaza needs to automate its car parking functionality. The parking plaza has 4 floors i.e. Basement, Ground Floor, First Floor and Second floor each having a capacity 10 cars. When a car comes in, the controller should tell the user about status of each floor i.e. “*Space Available*” or “*Full*”. User can choose a floor and a slot in that floor to park his car. If a floor is full, the controller will lock the entrance door of the floor and car cannot enter that floor. You have to implement the Car Parking Controller. Also, your system should display the cars parked on each floor.

Input Signals:

Car In/Out

Floor to park the car

Slot in selected floor

Output Signals:

Status of Floors

Door Locks

Parked Cars

INDEX

1. Dependencies and Prerequisites.
2. Hardware Requirements
3. Introduction to Interface.

- Main Interface

- Custom Component

4. How to Use

1. Hardware Requirements:

Main Interface:

44 LEDs

50 Switches

44 Ground connections

4 Custom made components

Custom Component:

13 Input ports

11 Output ports

10 D flip flops

2 (5-AND) gates

1 (2-AND) gate

Wire connections

2. Dependencies and Prerequisites

The project has been developed and tested on Logic Works 5 running on a Windows 10 Professional x64 operating system. Operation on other operating systems may vary. The latest version of the program can be downloaded at <https://archive.org/details/LogicWorks5.7z>

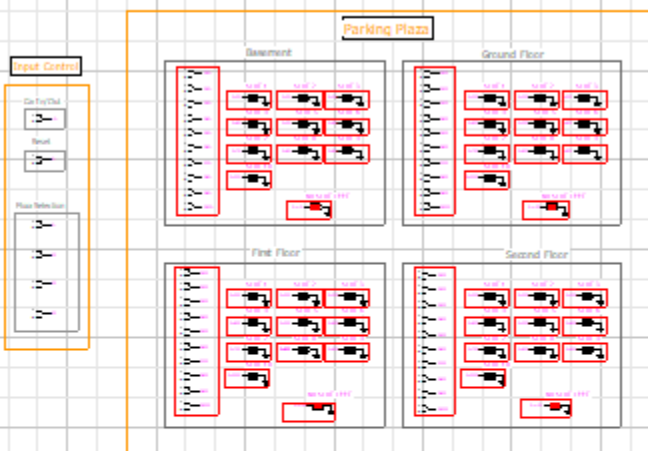
The project has no further dependencies.

3. Introduction to Interface

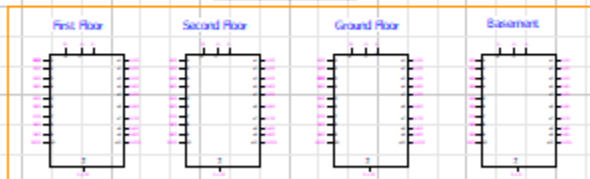
The (.cct) file must be loaded in Logic Works 5.

3.1 Main Interface

Car Parking Controller



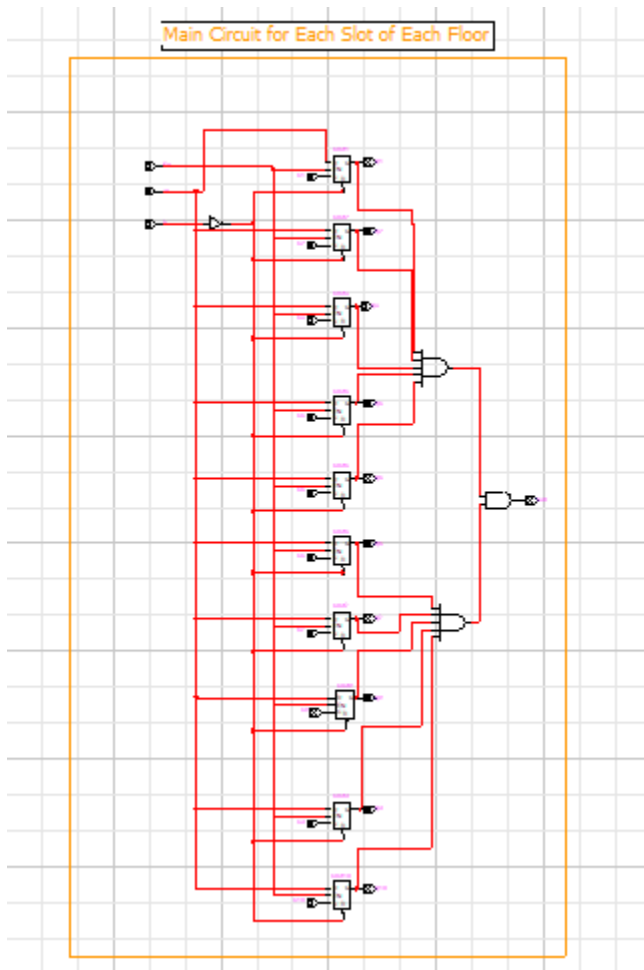
Components of Circuit



Designed and Implemented By:

M. Shaheer(20L-1161)
Zain ul Abideen(20L-1130)

3.2 Custom Component



3. How to Use

To use the parking controller, you need to follow the following steps.

1. Firstly, cycle the reset switch [Reset] in the input control from 0 to 1 and then again to 0. This resets the controller to initial default settings. This needs to be done every time when all the slots in all the floors are filled.
2. On the top of the Control Input, the Car In/Out switch controls whether a car is going in or is moving out. So, if a Car is going in turn the switch to one and vice versa.
3. Now, From the floor selector, select the floor in which you want to park your car. On the right side of the selector are the slot selector of respective floors select the slot you want to park in and your car is parked.

4. The Black LEDs show the slots of cars and when they are turned on it means that they are filled, when all the slots are filled a red LED turns on indicating that all the slots are filled and you have to select some other floor.
5. After all the floors are filled, toggle the Reset switch once and the circuit comes to its initial state.

The Logic of the Custom Component

A D flip flop is attached to the Floor input as the Enable input and the D is attached to the Car In/Out switch, while the clock is attached to the slot number according to the flip flop number, the clear input is attached to the reset button and the output Q is attached to the output port that is connected to the LED.

All the outputs of all the flip flops are attached to AND gate and the result is attached to the full LED that indicates that the floor is full.

We have made our custom component taking help from a YouTube video whose link is attached below,

<https://www.youtube.com/watch?v=uUQ77H9t1q8>