# Renesas Based Automatic Car Washing

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***Abstract-*** *Automation plays a very important role in modern era, where it will reduce cost, time and labour required. The process which is normally done by humans without the using any automation will result in increase in cost, time taken and labour required. In this modern world car is very important for human life, therefore the maintenance of car is an important work. In this project car will be washed automatically, having three important sections that is washing, cleaning and drying section.*

***Keywords-*** Renesas microcontroller, IR sensor relay, water pump, DC motor, conveyor belt, fan, L239D motor driver, LCD.

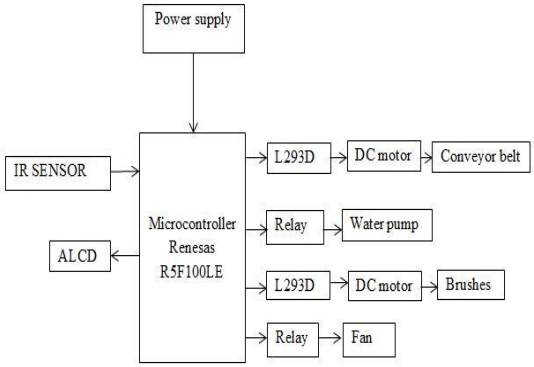
## I. INTRODUCTION

For the good looking and to maintain car surface clean, washing process is very important. Normally car wash will be done by manually in which this process will consume more time, cost of washing ,labour required and water for washing in order to save this all wastages car will be washed automatically.

This paper will explain the automatic car washing mainly by three stages.

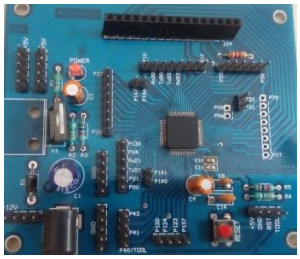
First section is of water washing section in which water will be sprinkled over a car surface second section is of cleaning by automated brushes which mainly remove dust and dirt and lastly drying section which mainly remove remaining water content over a surface with a aid fan .

## II. BLOCK DIAGRAM



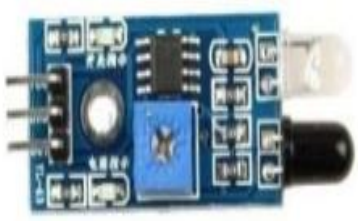

## III. BLOCK DIAGRAM DESCRIPTION

A. Renesas microcontroller (R5F100LE)



The controller used in this car washing is 64-pins, 11-ports R5F100LE microcontroller which is lead (Pb) free controller. Which Supports both flash memory programmingand on-chip debugging

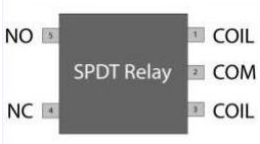
B. IR sensor



The IR sensor is used to detect the presence objects in which itconsists of IR LED and photodiode.IR LED will

emit IR radiation once these radiation falls over object the radiation will be reflected back to photodiode. If object is absent means were there will be no reflection of radiation back to photodiode.

C. Relay




It is an electromagnetic switch which is used to ON/OFF of some components in a circuit. Electromagnet plays a very important role in relay. SPDT relay is used in this paper.

D. DC motor

Mainly it converts electrical energy into mechanical energy. It is used in elevators, ships, automobile, etc…

The motor used is 12V dc motor one for rotating conveyor belt having 10RPM and another two for rotating brushes 500RPM each.

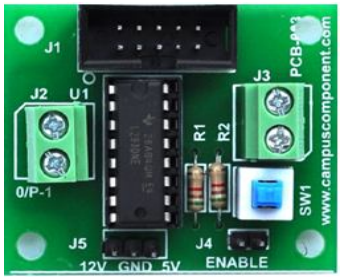
E. Conveyor

A conveyor is a material handling system in which any material such as automobile components, coal, iron ore etc… can be moved from one place to another easily. In this paper belt type of conveyor is used for movement of car from one section to another section.

F. Water pump

A pump is normally used to moves the liquid such as water, chemicals, slurries and also gases from one side to another side.

G. L293D

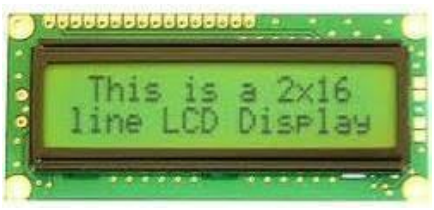



A L293D is used to control the two small dc motors in bidirectional way. This L293D motor driver will be controlled by the microcontroller.

H. FAN

A fan is an electromechanical device. Mainly it is used for cooling/drying purpose. In this automatic car washing process it is used in drying section so that car will be dried and finally car will be available for delivery.

I. LCD



Liquid crystal display (LCD) is a digital display widely used in computers monitors, watches, advertisement board, and calculators. LCD has more advantage over the CRT display hence LCD is widely used.in this paper it is used to indicate status of current process.

## IV. METHODOLOGY

The controller used in this system is Renesas R5F100LE microcontroller. IR sensor is used to detect the presence of the car on the conveyor belt. Once the sensor detect the presence of the car it will send signals to the microcontroller so that, it will directs the carto various sections of the processes. The initial section is washing area where there will be water sprinkling will takes place for few seconds so that car will be washed and furtherthe car will be moved to next section that is cleaning section in which the car will be cleaned with the help of automatedbrushes so that water content, dust and dirt particle will be wiped-out this process takes place for few seconds and finally the car will be moved to drying section in which car is dried by fan. The time delay for all these processessuch as water sprinkling, cleaning and drying will be programmed in microcontroller and according to this time delay the conveyor belt move and process will be done. Finally the car will be available for delivery. All these process status will be displayed on the LCD display correspondingly.

## V. CONCLUSION

This system of car washing will reduces the cost,labours, time taken and water usage. This system of car washing is pollution free, have long life of operation, user friendly and easy to install and operate.

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