

# AUTOMATIC CAR WASHING SYSTEM USING MICROCONTROLLER

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**ABSTRACT** - This paper presents the proposal and development of a programmed sensor-based carwash system. The system provides quick, convenient, and efficient washing services. The main steps involving in the car wash system consists of car peripheral planning, adjustment of nozzles based on car peripherals, and smearing various washing practices. In the initial step, object planning is achieved using a suitable sensor system. Subsequently, data acquired from sensors is processed and the relevant information regarding the car periphery is stored. Lastly, the status of the nozzles is adjusted (at a suitable position/angles) based on the car peripheral planning. Once the nozzles are adjusted to appropriate angles, the washing process is initiated that includes foam spray, water spray, and drying. In this paper, the simulation model of the proposed followed by the development of a small-scale hardware prototype. With the information merged in the design, the developed system is capable to clean off considerably the exterior dimensions of objects for efficient washing method

**Key Words:** car wash, car peripheral planning, atmega16, ultra-sonic sensors

## 1. INTRODUCTION

Automatic Car-Washing is controlled using the electro-mechanical system as shown. A proto-type model is executed in our project. Automatic washing was started way long before in the 1930s. Overtime, many apprising's were done on it in the previous method car was to be lifted to wash downside. We are using angular jet spraying using nozzles at a suitable position which helps cleaning downside more easily the full mechanism includes the rolling of the car and moving it on a conveyor belt in a forward direction in steps. At transitional steps, the car cleaning is done with water in real form and soap water is allowed to fall on the car under wash. Care is taken for not allowing the water to fall on the fabrication. also suspended front roll able brushes are installed to clean the upper side neatly at the end the car is again allowed to move forward for drying. Belt Returns for loading a new car

## 2. MICROCONTROLLER

Atmega16 is a controller that can power most of the machines very straightforwardly. The atmega16 is just

doing precisely what the human software engineer instructed them to do. atmega16 can without much of a stretch run numerous machines. At the point when running a microcontroller program, a visual operation can be seen on the screen. A microcontroller system can be tried, approved, and remedied sparing an exceptionally important time. With wired hand-off sort boards, any project change requires time for the rewiring of boards and gadgets The programs are written can be confirmed and tartan before closing putting in place and it can be modified at any time without alarming any physical changes ATmega16 is an 8-bit high presentation microcontroller it belongs to Atmel's Mega AVR family. It's a 40-pin microcontroller based on enhanced Reduced Instruction Set Computing architecture with many powerful commands. It has a programmable flash memory of 16KB, static RAM of 1 KB, EEPROM of 512 Bytes. The resolution cycle of flash memory and EEPROM is 10,000 and 100,000, correspondingly. Most of the commands execute in one machine cycle. It can work on an extreme frequency of 16MHz

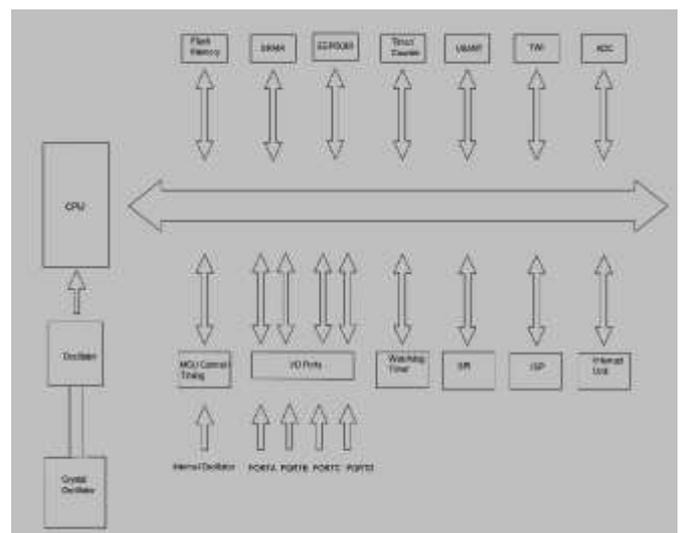


Figure -1: Atmega16 Architecture

### 3. HARDWARE IMPLEMENTATION

Hardware design is organized into units

- Washing process unit
- Delivery unit
- Passive Treatment unit
- Drying unit.



Figure -2: Brush assembly

Two control components are designed for regulating the conveyor belt machinery and car recognition system. The conveyor belt machinery is enabled by the driving wheel. The driven wheel follows the driving wheel. The conveyor belt is used to bring the car to be washed from the entrance point to the washing unit. Two solid-state relays are used to enable the motor sensor. Two sensors are implanted at the entry point of the conveyor belt and entry point of the washing unit. ATmega16 microcontroller is used to regulate this process. Another unit takes care of car movement on belt mechanism, activation of water sprinkler mechanism, angular washing from the downside, as side-by-side tank below conveyor is opened for collecting the water sending to passive water reclamation and treatment unit. Lastly, the dryer and dust particle removing mechanism. The car to be washed is moved further from the conveyor belt to get dried automatically. The sprinkler mechanism. The sprinkler turned on until the dust particle is fully cleaned. Then the dryer system is empowered into function. A functional delay of 500 sec is considered to keep the dryer on.

### 4. METHODOLOGY

1. Prewash
2. Soapwash
3. Cleaning with brush
4. Rinsing with clean water
5. Drying with air

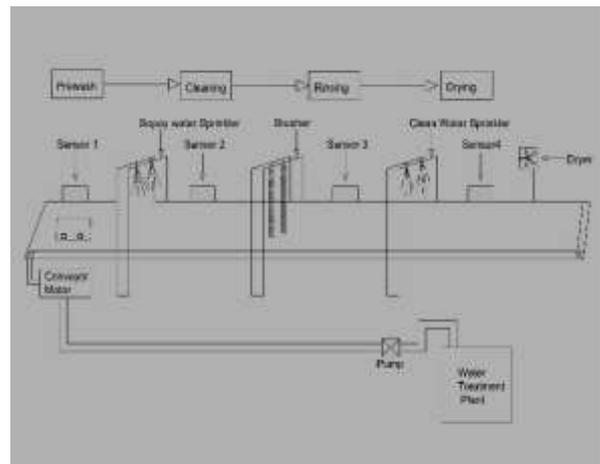


Figure -3: working block diagram



Figure -3.1: Proposed system

automatic car washing system consists of a passage through which the car will enter into the washing area, automatic car washing consists of five stages of cleaning the car when the car comes near the conveyor belt the first stage begins with the adjustment of the angular nozzle with the help of the sensor for the downside wash of the car while entering on the conveyor belt the first stage gets completed with cleaning the downside of the car. when the car gets on the conveyor belt the sensor detects the car and conveyor belt starts moving in the forward direction, as soon as the sensor to detect the car conveyor belt stop for the second stage of pre-wash. In the second stage, the prewash of the exterior body of the car takes place after the pre-wash. All the water used in the pre-wash is drained into a water storage tank which is fitted below the prototype model for the reuse of the water for gardening. In the second stage, the soap water solution is also spread on the exterior of the car. Then the third stage cleaning of the car is done with the help of the brushes. after the cleaning stage is completed then the conveyor belt will move in the forward direction towards the ranging stage where the clean water will be sprayed on the car to remove all the soap water solution. and in the last stage, the trying of the car is done and again the conveyor moves and the car will exit from there

## 5. TRIALING

This project mainly explains the automatic car washing system in using less water Washing downside without lifting the car positional or angular wash, as microcontroller used Full cleaning process and the operations. Using automation Technology information is sent to the car owner This paper also aims to prove the manpower and time resource reduction to wash the car. On Water contamination, the water recycling system is focused on the modern car washing system. This paper also focused to reduce the cost and to improve the operating frequency by implementing the atmega16. Angular Wheel Wash system below for precise wheel cleaning. Onboard air smooth Following Blowers.to dry out surface better Facilities of water reclamation in which used water is utilized for gardening purpose, Severe treatment facilities. In our project, we have to use a minimum amount of water when conservation techniques are used including the reclamation system. when no reclamation system is installed water use can be range from 15 GPV for a self-service car wash to a high of 85 GPV in a frictionless conveyor belt car wash for basic wash using equipment and optimal operating parameters for efficiency of water. For professional car washes using separate reclamation techniques, the range varies from 30 GPV for bay automatic to 70 GPV for frictionless conveyor belt. When reclamation system with full filtration has used the estimate, the range is from 8 GPV to 31 GPV (Gallon for a vehicle) Lesser gallon of water are used compared to other conventional methods

## 6. RESULT ASSESSMENT

In Automatic Car Washing System, we conduct all processes needed to clean the car by, all the programming of the atmega16 microcontroller. This washing process will be time-saving, cost-efficient, pollution-free. By using the above-mentioned process, we can clean the car up to a great extent

## 7. ADVANTAGES

- Decreased manpower.
- Proper and efficient spreading of foam and water.
- Easily operated systems
- Less time consumption in washing.
- wear and tear reduced
- Saves money
- Better cleaning operation than manual cleaning
- Does Not require any supervision
- Better repeatability

## 8. CONCLUSION

We can conclude that automation in any system provides better reliability, increase productivity and performance, this prototype ensures a reduction in water usage,

manpower, and leads to fully automated washing of car in less time

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