



# Review Paper on Automatic Car Washing System Using PLC

AISSMS INSTITUTE OF INFORMATION TECHNOLOGY, PUNE

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**Abstract :** With the developing velocity of life, the interest to perform errands at a higher rate is being laid out as well. In the cutting-edge world, innovation has connected every town, city, and nation with others through methods for powerful. This has in the long run prompted a monstrous increment in the quantity of vehicles. To clean these vehicles there is a need for an appropriate washing framework. Time is merchandise that should be overseen successfully and proficiently altogether to amplify efficiency. So this undertaking is produced to lessen an ideal opportunity to clean vehicles. In this programmed auto washing venture we utilize a transport line on which clients stop the auto. When we press a switch transport line begins moving. The clock is set on the transport line at better places for auto recognition. At the point when the amateur the auto, it stops the transport line and begins a valve at the same time through water on auto comparably at various levels when an auto is identified it will utilize brushes, cleanser, and drier to clean the auto.

**keywords -** PLC, Proximity sensors, DC motors, On/off buttons, Pumps for water supply, Drying Fan.

## I.INTRODUCTION

### INTRODUCTION

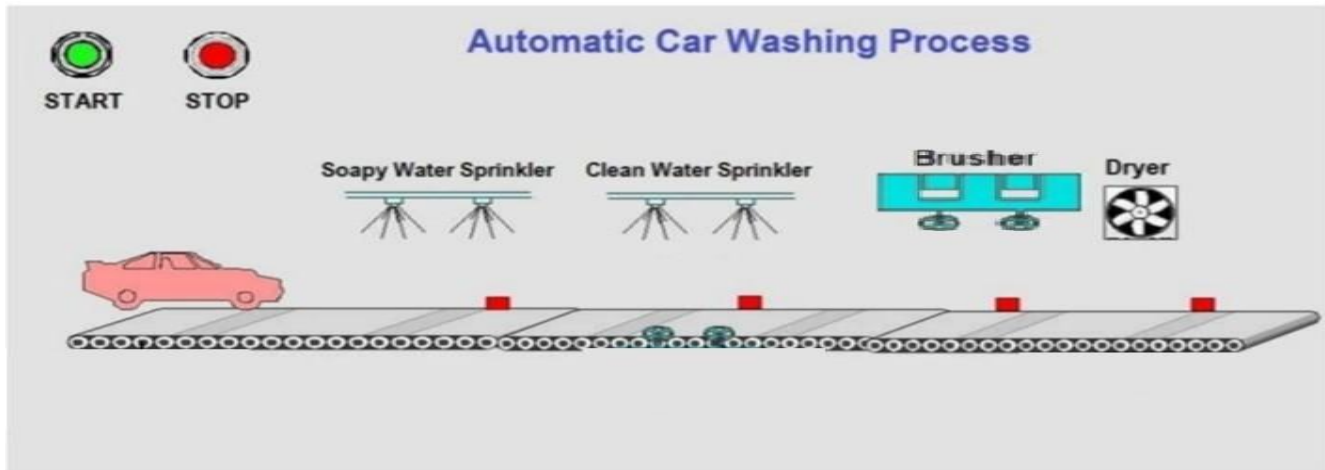
A vehicle washing system is a simple technique of preventive maintenance or keeping the exterior of the vehicle clean. To prevent rust, oxidation and reduce the occurrence of fine scratches, the exterior of a vehicle must be kept clean. This system helps clean the vehicle automatically with the help of a Programmable Logic Controller (PLC). This process is done in two steps namely washing and cleaning. Washing also involves three processes where the clean water is sprayed over the vehicle initially then the detergent water is sprayed and again, the normal water is sprayed. This is then followed by cleaning. In the cleaning process, the wetness in the vehicle is wiped using cotton brushes which is a specialized computer for control and operation of the process which functions using a programmable memory to store many instructions and execute functions including timing, counting, on/off control, etc.

### NEED OF THE STUDY.

The carwash will generally start cleaning with pre-soaks applied through special arches. They may apply a lower pH (mild acid) followed by a higher pH (mild alkali), or the order may be reversed depending on the chemical suppliers and formula used. Chemical formulas and concentrations will also vary based on seasonal dirt and film on vehicles, as well as exterior temperature, and other factors. Chemical dilution and application work in combination with removal systems based on either high-pressure water, friction, or a combination of both.

Chemical substances, while they are industrial strength, are not used in harmful concentrations since car washes are designed not to harm a vehicle's components or finish. The customer next encounters tire and wheel nozzles, which the industry calls CTAs (Chemical Tire Applicators). These will apply specialized formulations, which remove brake dust and build-up from the surface of the wheels and tires. The next arch will often be wraparounds, usually made of a soft cloth or closed-cell foam material. These wraparounds should rub the front bumper and, after washing the sides, will follow across the rear of the

## II. RESEARCH METHODOLOGY



### SYSTEM LAYOUT

#### III. Theoretical framework

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### SYSTEM DESIGN



#### IV. Statistical tools and econometric models

After the mutter or top brushes, the car may pass through a second set of wraparounds. This may also be where high-pressure water streams are used to clean difficult-to-reach parts of the vehicle. The car generally passes over an undercarriage wash and/or has high-pressure nozzles pointed at it from various positions. Next may be a tire spinner, high-pressure nozzles angled specifically to clean wheels and tires. After the several wash stations the vehicle may go through triple formers, usually red, Blue, and yellow, although colors can be customized with higher-end chemical suppliers. The triple foam process includes special cleaners as well as some protective paint sealant. Protectants vary by manufacturer. Near the rinse is where a tire shining machine is often installed, which is designed to apply silicone tire dressing to the tires. This application makes the tires look good (new and glossy) and preserves the rubber. Next, the vehicle is treated with a drying agent and a final rinse. Many car washes utilize a "spot-free" rinse of soft water that has been filtered of chlorine and sent through semi-permeable membranes to produce highly purified water that will not leave spots. After using spot-free water, the vehicle is finished with forced air drying, in some cases utilizing heat to produce a very dry car.

##### Brushing-

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#### V. Model for CAPM

Older automatic washes—a majority of which were built before 1980—used to use brushes with soft nylon bristles, which tended to leave a nylon deposit in the shape of a bristle, called brush marks, on the vehicle's paint. Many brushes in the US are now either cloth (which is not harmful to a car's finish, as long as it is flushed with plenty of water to remove the grit from previous washes), or a closed cell foam brush, which does not hold dirt or water, thus is far less likely to harm any painted finish, and can provide a gentle polishing effect to leave the paint much shinier. To avoid paint marking issues, "touchless" or "no-touch" car washes were developed. This means the car is washed with high water pressure instead of brushes. There is no contact with friction so the chance of any damage is less. However, the actual cleaning, or removal of the film from the paint, is nearly impossible with no-touch systems. At "full-service" car washes, the exterior of the car is washed mechanically with conveyor equipment, or in some cases by hand, with attendants available to dry the car manually and to clean the interior (normally consisting of cleaning the windows, wiping the front and side dishes, and vacuuming the carpet and upholstery). Many full-service car washes also provide "detailing" services, which may include polishing and waxing the car's exterior by hand or machine, shampooing and steaming interiors, and other services to provide thorough cleaning and protection to the car.

#### VI. Comparison of the Models

1. CAR ENTRY SENSOR TRIGGERS THE PROCESS AND TURNS THE BELT ON TO MOVE THE CAR.
2. SOAPY WATER SPRINKLER TURNS ON WHEN THE STAGE 1 SENSOR DETECTS THE CAR AND DOES THE PROCESS FOR A CERTAIN TIME.
3. CLEAN WATER SPRINKLER TURNS ON WHEN STAGE 2 SENSORS DETECT THE CAR AND DO THE PROCESS FOR A CERTAIN TIME.
4. BRUSHER TURNS ON WHEN STAGE 3 SENSORS DETECT THE CAR AND DO THE PROCESS FOR A CERTAIN TIME.
5. DRYER FAN TURNS ON WHEN STAGE 4 SENSORS DETECT THE CAR AND DO THE PROCESS FOR A CERTAIN TIME.
6. PROGRAM DID IN RS LOGIX 500 PLC SOFTWARE.
7. PROGRAM DOWNLOAD IN ALLEN BRADLEY MICROLOGIX 1400

#### VII. Working of system Input- sensor:

When the car comes on-sensor, the sensor sense and conveyor starts moving with the help of the motor until it will reach the next sensor section. As the car reached to next section the entry gate starts to open for 2sec.

##### Pre-Wash Section:-

As the car reaches the pre-wash chamber, shampoo waterfalls on the car by opening the valve. The valve will remain on for 5 sec. After 5sec. valve will close automatically. Again c starts moving until it will reach the next sensor section (Brushing section).



**Brushing Section:-**

As the stops vertical brushes start brushing the car for 10sec. and stop. Again starts moving until it will reach the next sensor section (Clean wash section)

**Final Wash Section:-**

The valve gets open for 5 sec. and get closed. Again starts moving until it will reach the next IR sensor section (Drying)

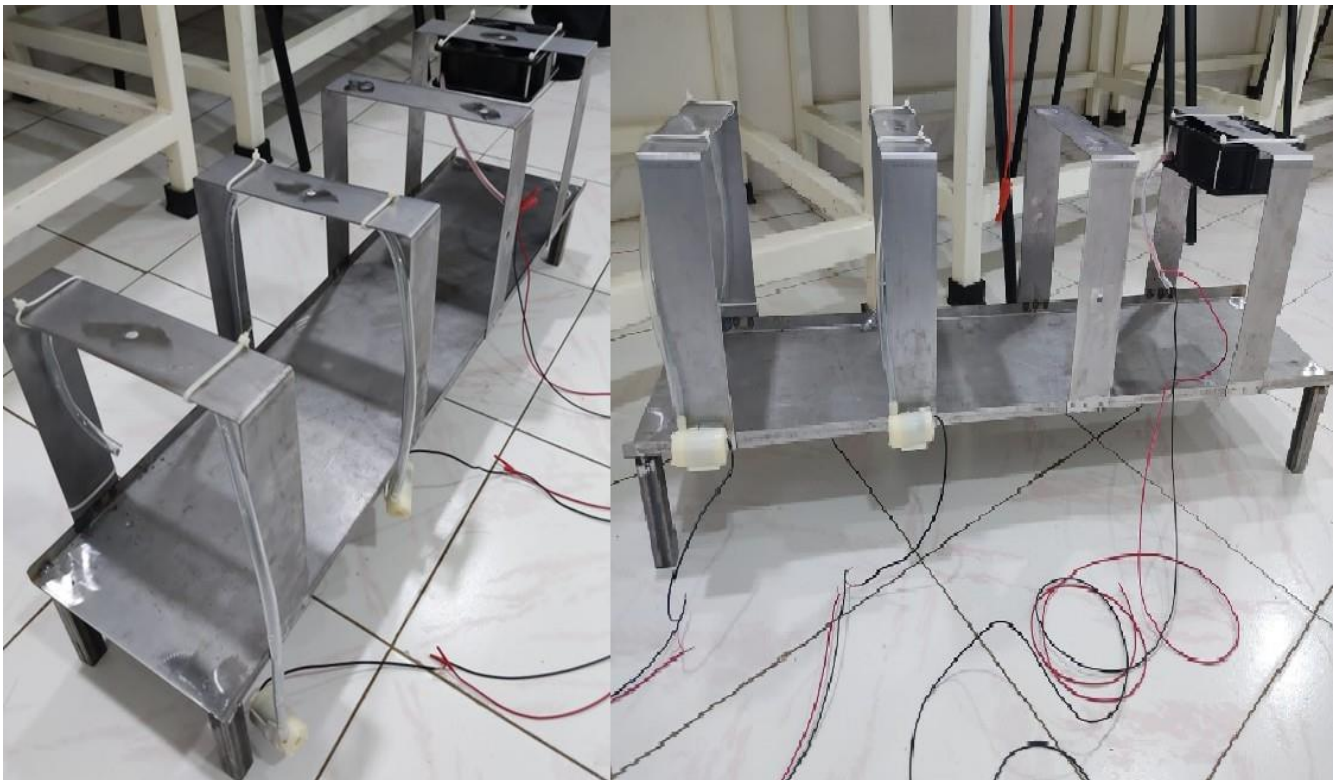
**Dryer:-**

Start dryer for 10 sec. & stop.

**Exit:-**

After the drying stage completion open the exit gate with the help of the motor (M6) for 2 sec. and stop. Again conveyor starts moving until it will reach the next sensor section. Close the gate.

**BLOCK LAYOUT OF ACTUAL SYSTEM: -**



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1. Output interfacing circuit diagram with PLC:-

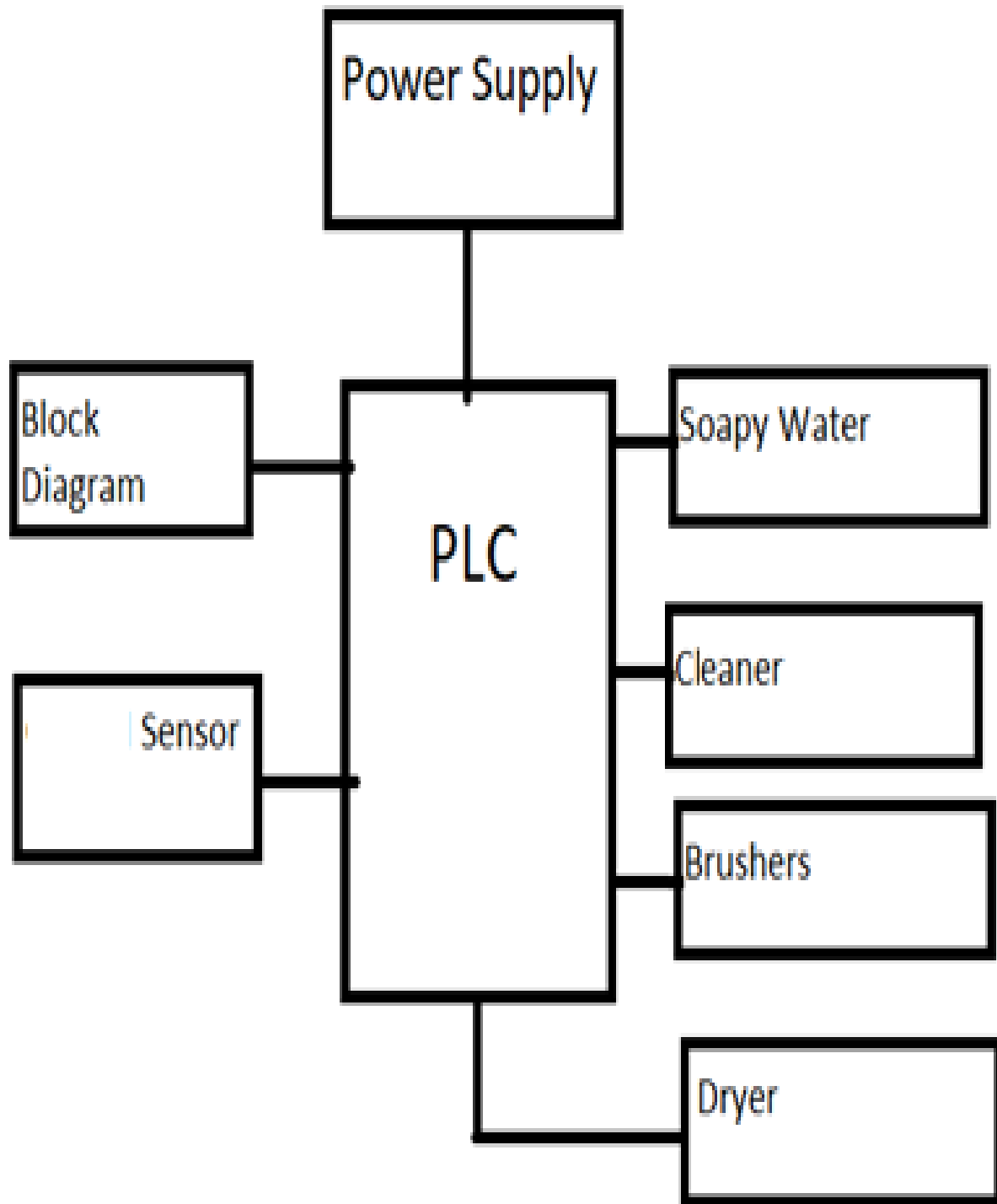
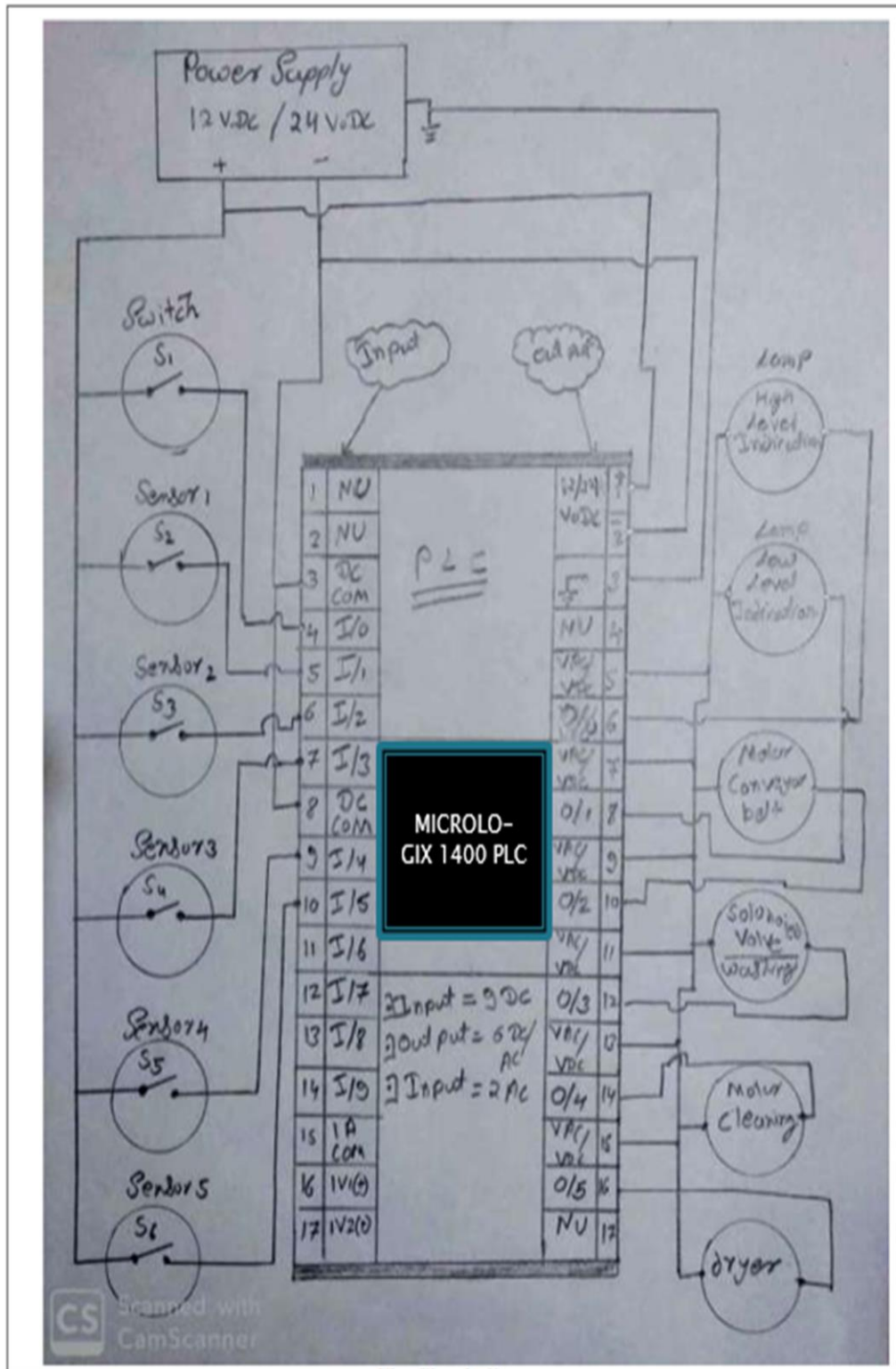
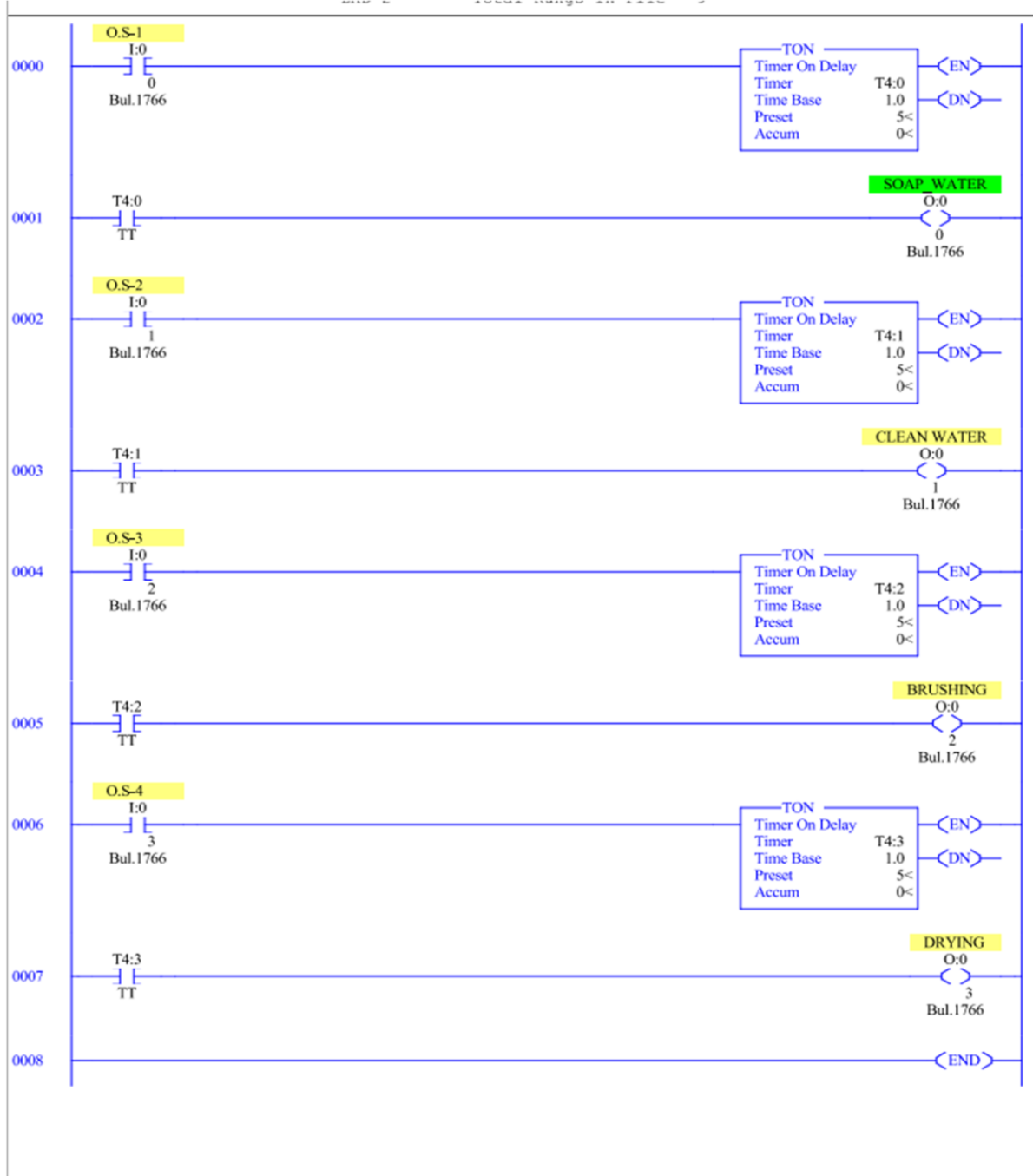


Fig. Block Diagram of car washing system using PLC

## 1.1 Circuit diagram



## 1.2 Ladder Program-



## VIII.RESULTS AND DISCUSSION

Vehicle washing automatically is a high-quality end product. Hence, it will be easy and capable to clean multiple vehicles at a time. Additionally, with less manpower requirement, time, and less pollution, it can be introduced to potential customers.

## IX. ACKNOWLEDGMENT

While writing an Article on “Automatic car washing system using PLC ”. We are grateful to. We also take this opportunity to express our sincere gratitude to all the staff of the instrumentation Dept. for their support and cooperation, without which, the task would have been much more daunting. We will also like to express our thanks and respects to our parents as well as to other family members and friends whose encouragement was the main source of our energy behind this work.

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