

**A Report On Industrial Automation in
Car Washing System
IoT ESE-2
Harshvardhan Sunil Solankure
10/05/2023**

Introduction:

Industrial automation is the control of machinery and processes used in various industries by autonomous systems through the use of technologies like robotics and computer software. Industries implement automation to increase productivity and reduce costs related to employees, their benefits and other associated expenses, while increasing precision and flexibility. With the Industrial Revolution came mechanization, which brought cheaper and more plentiful goods. Generally, the mechanical processes in industries were faster and produced greater quantities of goods but still required skilled workers. Not only did machines require operators but when errors occurred, they would waste materials, cause production issues and even damage equipment.

Problem statement:

Integrating IoT and automation in car washes will reduce failures and equipment losses. These systems allow business owners and operators to be notified of temperature deviations in order to take the necessary precautions before damage occurs.

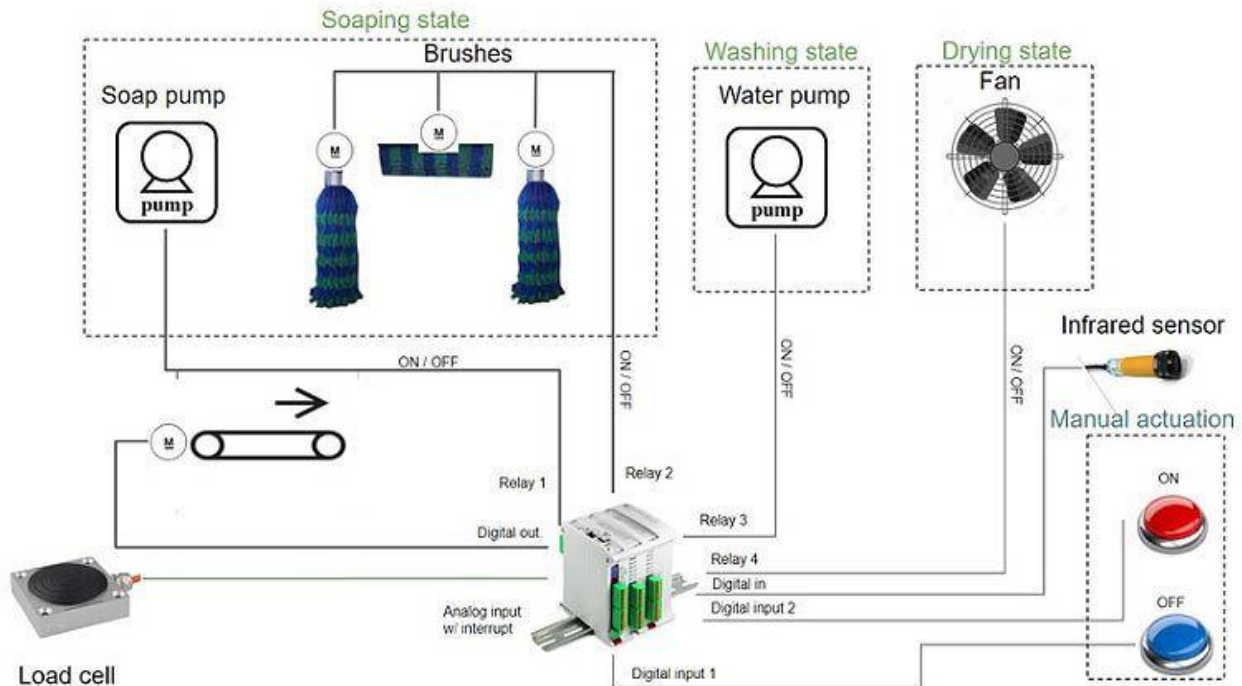
In this use case, an automatic car wash process is implemented. For this purpose, an industrial Arduino of the M-Duino family has been used as well as a set of sensors and actuators which are described below.

When a car enters the hall, a certain sequence has to be followed automatically. Its steps are:

- 1) Soaping
- 2) Washing
- 3) Drying

Car washing is a simple activity done in order to keep the exterior of the car clean. It is mostly done manually in automobile garages or service centres of automobile companies. This manual way of car cleaning means higher consumption of water, manpower and time. . The automatic car washing system explained in this case study minimises the use of water and the manpower requirement as well To auto detect the car , load cells can be used as well as any other sensors as Infrared Sensor. Soaping, washing and drying runs for a certain amount of time: a delay time must be generated for these outputs become mandatory, so three different timers are used. The use of motion sensors to detect when the vehicle reaches each phase could be used too.

Architecture diagram



Advantages

- ❖ *Easy And Instant Access*
- ❖ *Customized User Requirements*
- ❖ *Quick Response*
- ❖ *Multiple Services Requests At Once*

Conclusion

In this industrial automation, an engine is activated at the beginning of the circuit, when the load cell detects a weight similar to that of a vehicle. This engine activates the motor that controls the conveyor and starts counting the soap, washing and drying timers. For the soaping, the programmable logic controller acts on the soap dosing pump. Once the time is completed, the washing pump is activated. Simultaneously, a relay that controls the three motors of each brush is activated to scrub the car with soap.

Finally, when the third timer (the drying one) is activated, the fans are started up.