

## Abstract

An HMI interface was generated which controls the process in a manual or automated way for the cleaning of the containers where the milk is stored, using the appropriate liquids to obtain a good cleaning.

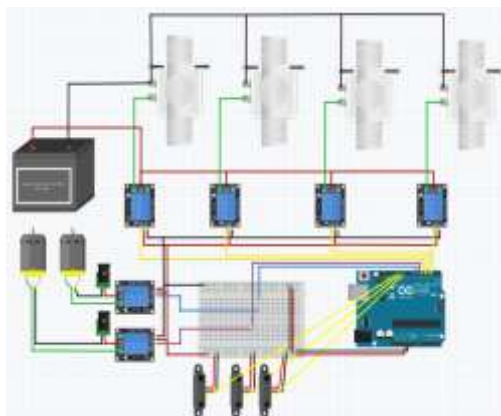
## Introduction

Cleaning is such an essential factor in food and/or industrial processes that it should be considered as an essential step in the production process. Inadequate cleaning can affect an entire batch and directly influence the quality of the final product.



Figure 1

## Materials and methods



- 4 Solenoid valves
- 1 Atmega328P
- 2 ½ HP pumps
- 6 Relay
- 3 Level Sensors
- 12V 5A power supply

Figure 2

## References

- [1] Estación de limpieza automatizada - Todos los fabricantes de dispositivos médicos - Vídeos. (2021). Retrieved 14 April 2021, from <https://www.medicaexpo.es/fabricante-medical/estacion-limpieza-automatizada-44682.html>
- [2] Electromechanical systems, electric machines, and applied mechatronics.

## Results

The process of cleaning storage containers, packaging, etc. was automated.

Reduced cleaning time and production costs.

The germs or bacteria that can be stored in any container were considerably reduced, since there is no direct contact by the operators in the cleaning process.



Figure 3

HMI interface, with which we monitor and control the cleaning process, the process could be controlled either manually or automated.



Figure 4

## Conclusions

This project can be implemented in various areas thanks to the programming that is fully functional at an industrial level, as for example it can be implemented in water purification plants, in the home for cleaning cisterns or tanks, due to the easy manipulation of the input variables through the HMI interface generated in LabView.

## Future of research

Implement the code developed along with the design and features of the project in an industry that performs recurring processes.

Perform the implementation for remote monitoring and control of the process through a WIFI module such as NI myRIO.

## Acknowledgments

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