CASE STUDY

INDUSTRIAL SHIELDS

IMPLEMENTATION OF AN ACADEMIC AUTOMATION MODEL

On this case study, we will build a demo consisting in the automatization of some sensors and actuators using an Arduino based PLC. We will program it with the Open Source Arduino IDE.

SUMMARY

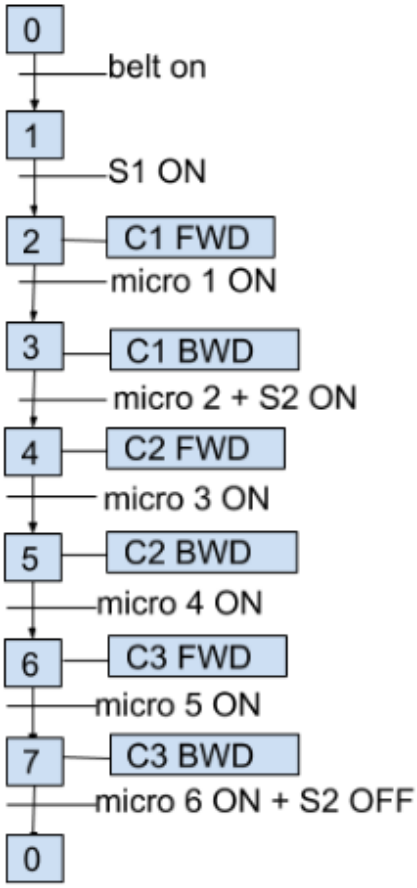
Why did we think of this application?
The main reason is because it is very interesting to show to the students that there is another alternative, apart from the big brands of PLCs that work with programming languages.

Our PLC is based on an Arduino board which controls different kinds of inputs/outputs using a micro-controller, for example, Analogic, Digital and PWM.

The software is called Arduino IDE; it is totally free and easy to use and its language of programming is C (lineal code).

We would also like to say that using our PLCs, you can communicate them with your PC Panel (HMI) by USB, and with other devices by Ethernet, Wifi, GPRS, Lora and Modbus.

CASE STUDY



GOAL

After reading this case study, you will be able to build an academic model and show to your students a new and intelligent way to automate everything you want to, and you will also have some ideas to create new projects.
This model consists in a labelling line of boxes.

CONCLUSION (HARDWARE)

The Industrial Shields' equipment has to control 3 cylinders (Ci), 2 capacitive sensors (S1 and S2), 6 micro inductive sensors (each cylinder has 2 of them) (micro i) and a conveyer belt, using the following sequence:

- The conveyer belt starts moving.
- First sensor (S1) checks if there is a box on the belt.
- The box is placed on the conveyer belt by the first cilinder (the box passes throw micro 1 and turns it ON) (C1).
- The cilinder (C1) is raised until the box is detected by micro 2.
- If S2 is ON, then C2 is moved until the box is detected by micro 3 in order to put the label.
- C2 is moved up until micro 4 detects the box,
- C3 is moved until its detection by micro 5. This cilinder takes the box out of the labelling area.
- Finally, C3 goes back until it is detected by micro 6.

You can see the GRAFCET of the sequence on the adjacent picture.

We need to connect both kinds of sensors to the digital inputs of the PLC.

The cylinders are moved with compressed air, so we need 3 electrovalves which are controlled by digital outputs of the PLC.

The conveyer belt is moved by an engine which is also controlled by a digital output of the PLC.

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