Mec_Lab 4.0 - Mechatronics with App. IoT

Description

Mec_Lab 4.0 is a **Mechatronics IoT system** (Internet of Things), able to reproduce on a scale model some steps of an industrial production process.

The integrated **App. IoT** allows to send the **production data** to a **Cloud,** as well as some **enviromental** sizes (Temperature, humidity and air quality (**VOC**)) in the workplace.

The remotely access monitoring of the enviromental standards in the workplace allows to check and grant a healthy and safe place based on the current safety rules.

The prototype worked by the students atteding the 4th and 5th year of a vocational school for electronics, with their teachers as supervisors. has had a strong didactic interdisciplinary value. The project has been a sort of integration of their school work experience.

Thanks to **Mec_Lab 4.0** students can learn the basic concepts of **mechanics, pneumatics, electronics** and **programming**, besides, the App **IoT,** introduces the concept of **Industry 4.0** where the availabity of the production data in a Cloud is important and essential, since they could remotely access be consulted with a mobile device: a Tablet, Smartphone, etc.

- **MecLab 4.0** is made up of:
  - **Festo Manipulator**
    - *shift of half-processed pieces*
  - **Festo Conveyor Belt**
    - *Sideshift of pieces on the production line*
  - **Selector half-processed**
    - *Sorting according to the type of materials*
  - **Electronica programmable Control Unit**
    - programmable unit for the running of the sensors and actuators *as regards the mechanical and enviromental area*
  - **Wi-Fi Modules**
    - *Transmission of the production and enviromental data to the Cloud*

MecLab 4.0 through the electronic control unit presents three programming modes:

a) Mini PLC with a software Ladder
b) Festo FluidSim with the EasyPort interface (Programming and simulation)
c) Arduino Mega with the Shield level positioner (5v/24v - 24v/5v) (Software IDE)

The suggested model requires operating and programming with **Arduino Mega 2560**.