



Escola Tècnica Superior d'Enginyeries
Industrial i Aeronàutica de Terrassa

UNIVERSITAT POLITÈCNICA DE CATALUNYA

Project of Monitoring The Wind Tunnel of the ETSEIAT's Aerospace Engineering Laboratory (Hardware)

Technical Sheet

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The ETSEIAT's wind tunnel monitoring project, is the result of a Software project and a Hardware project and has followed some technical orientations.

1. Project localization

The monitoring of the wind tunnel will be in ETSEIAT University, Colom street 11, 08222 Terrassa. In the aerospace engineering laboratory.

2. Scope

In this project there will be developed:

- Familiarize with ETSEIAT's aerospace engineering laboratory's wind tunnel and its actual working method.
- Check and list the available components
- Create a connection interface between Arduino board and any computer for data sending and acquisition.
- Control of the Altivar 31 variable speed drive.
- Check and list the available components
- Produce or purchase the base support for all the circuits (for example a PCB)
- Integrate the NTC temperature sensor and the pressure sensor to the general system to modify air velocity from acquired data.
- Properly program the Arduino microcontroller board.
- Automatically measure and process all data from testing.
- Test the whole system by doing experimental tests.
- Calibrate the sensors
- Resume and list de economical budget
- Write a report with the results

3. Basic Requirements

There exist some basic requirements for the project:

- Allow students and laboratory technicians to pre-program wind tunnel tests with different velocity ranges.
- The total budget of the system must be affordable for ETSEIAT, which is a public university.
- As much as it is possible the already existing hardware in aerospace engineering laboratory has to be used.
- All results from sample's testing must be trustworthy and accurate.
- The system must be robust and shouldn't induce any error during experimental tests.
- The Arduino Board and its additional hardware must be a suitable substitute for the actual potentiometer, allowing total control in an easier and more defined way.
- The Hardware must be placed in a board (trying to use the smallest wiring amount as possible) that as much as is possible it shall be produced at the University.

4. Regulations

There is not specific regulations for this project, as long as the production and implementations required are only design for the specific tunnel of ETSEIAT, and cannot be reproduced in other ambits and places, as long as the requirements of each wind tunnel can strongly differ. Moreover this laboratory isn't a certificatory one, and it doesn't need to be strict with the current regulations.