Teaching materials
Guide notes 0. Introduction to the Platform

MISCE project

Mechatronics for Improving and Standardizing Competences in Engineering

Competence: Control Engineering

Workgroup: Universidad de Castilla-La Mancha
Universitat Politècnica de València

This document corresponds to the introduction lecture, presenting the experimental platform, for the competence ‘Wind Energy’ using the ‘DC-motor control platform’

Version: 1.0

Date: October 5th, 2023

Visit https://misceproject.eu/ for more information.

Index of contents

Index of figures

1 Platform overview

The final aspect of the experimental platform is shown in Figure 1.

Figure 1. Experimental platform overview

The main functional elements to understand the basic operation mode of the experimental platform are the following ones:

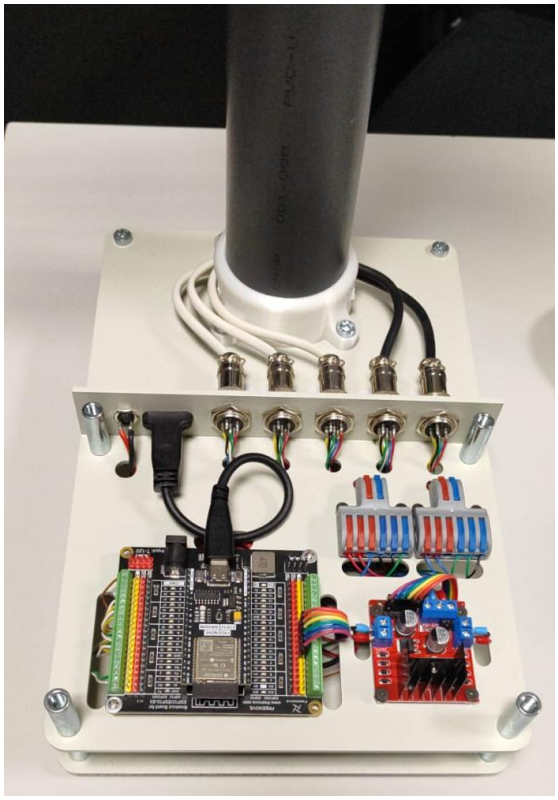

Figure 2. Control panel & connectors

To connect the platform to the computer the USB-port shall be used with the power supply (12Vcc) enable.

2 App description

When launching the app for managing the platform a two layers interface will appear (see Figure 1).

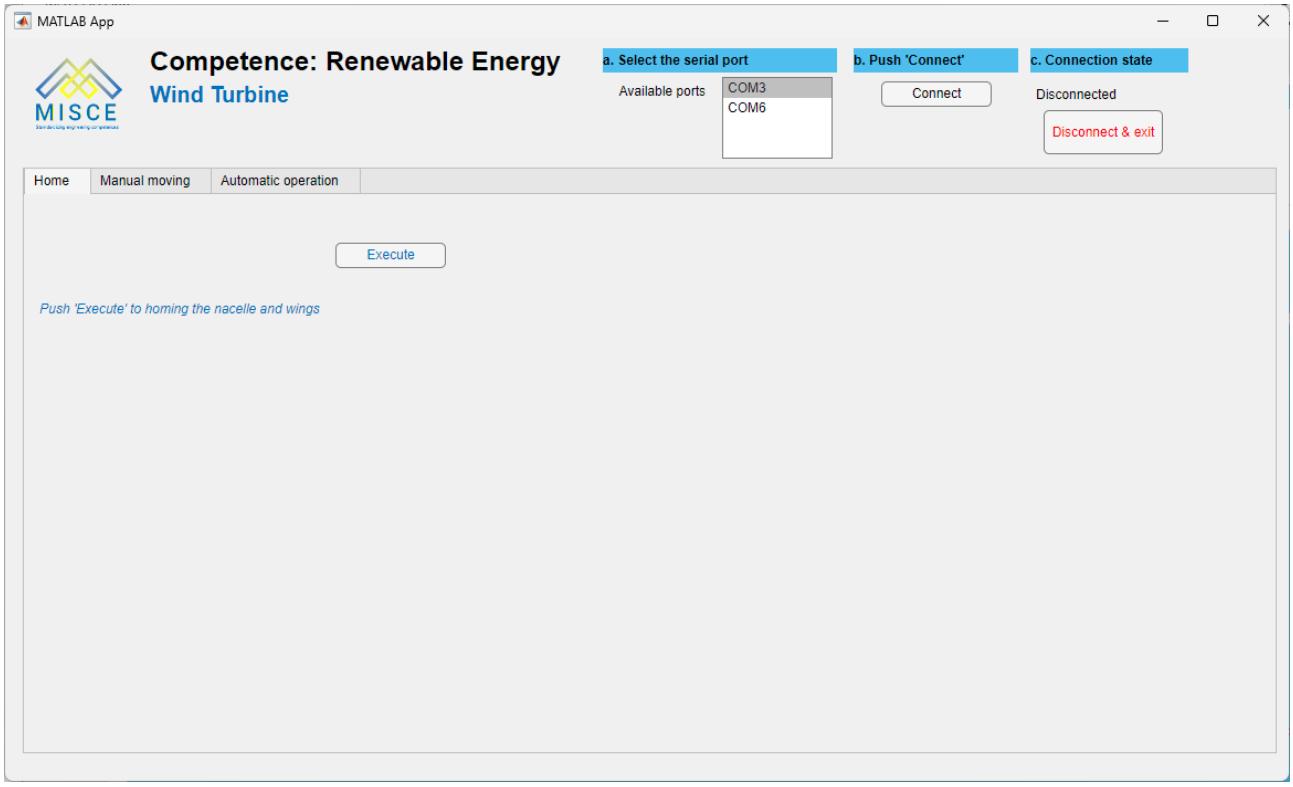

Figure 3. Overall view of the Wind Turbine app

The layer in the top is used to connect the app with the experimental platform. The proper serial port must be selected and click on ‘connect’. When the connection to the platform is established the connection state will change to ‘connected’.

At any time, if user want to exit to the application, the ‘Disconnect & exit’ bottom must be pushed.

Layer B (in the bottom) has 3 tabs which correspond to 3 different operation modes that are detailed in the following sections.

2.1 Operation mode 1: Home

The experimental platform requires to be homed before manual or automated operations.

Procedure:

1. Click on ‘Home’ button.

Result:

The nacelle will rotate until reaching the home orientation and the angle of attack of the wings will also change to be at the initial position.

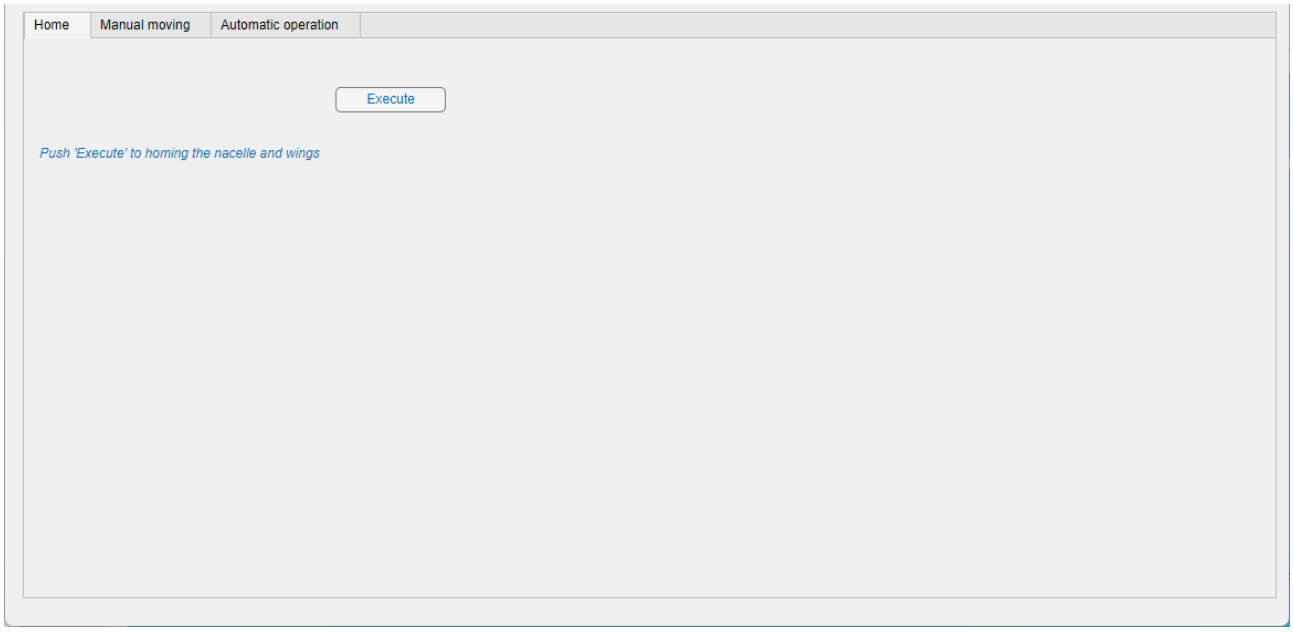

Figure 4. Operation mode 1: Home

2.2 Operation mode 2: Manual moving

The screenshot of this operation mode is shown in Figure 5.

Procedure:

1. Click on 'Start' button.

Result:

Some manual handles will appear (see Figure 6), which allows to manually rotate the nacelle and the angle of attack of the wings. The wind speed, wind direction, rotating speed and power generation will be shown at any time.

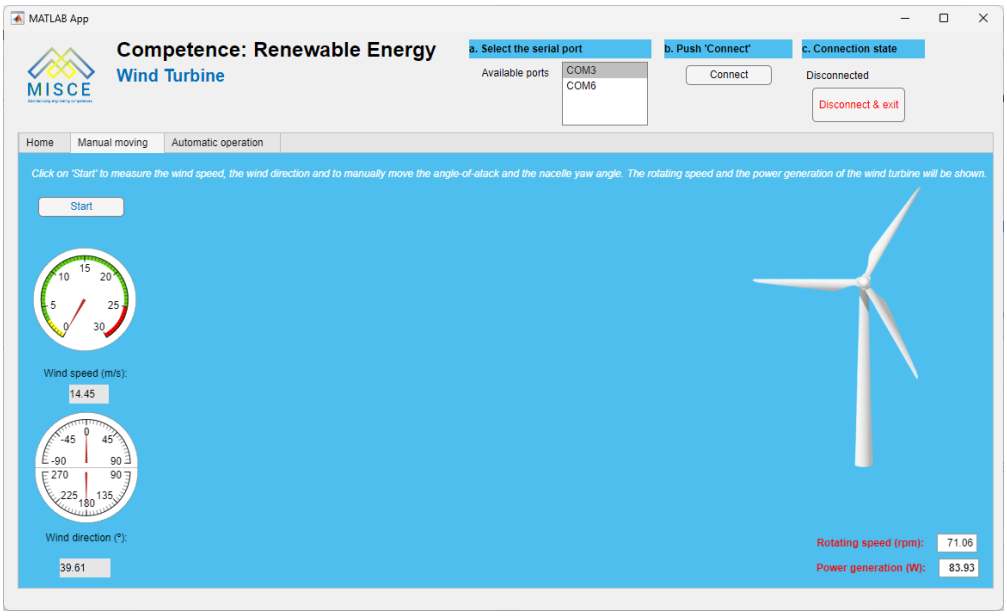

Figure 5. Operation mode 2: manual moving

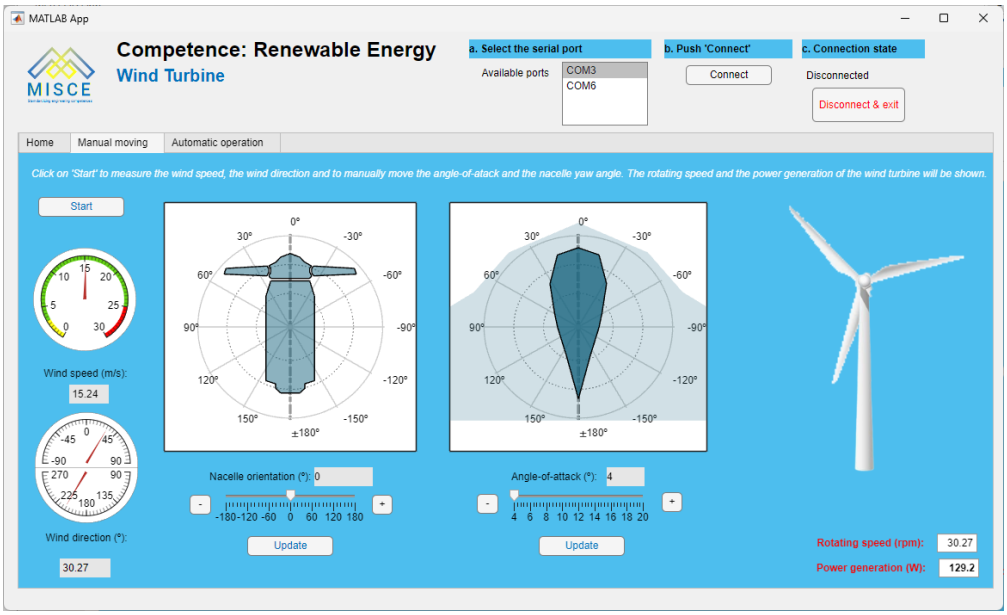

Figure 6. Operation mode 2: manual moving. Manual handles

2.3 Operation mode 3: Automatic operation

The screenshot of this operation mode is shown in Figure 7.

Procedure:

1. Click on 'Start' button.

Result:

The operation panel will appear. The nacelle will be automatically orientated to the wind direction and the angle of attack will be also configured.

Again, the wind speed, wind direction, rotating speed and power generation will be shown at any time.

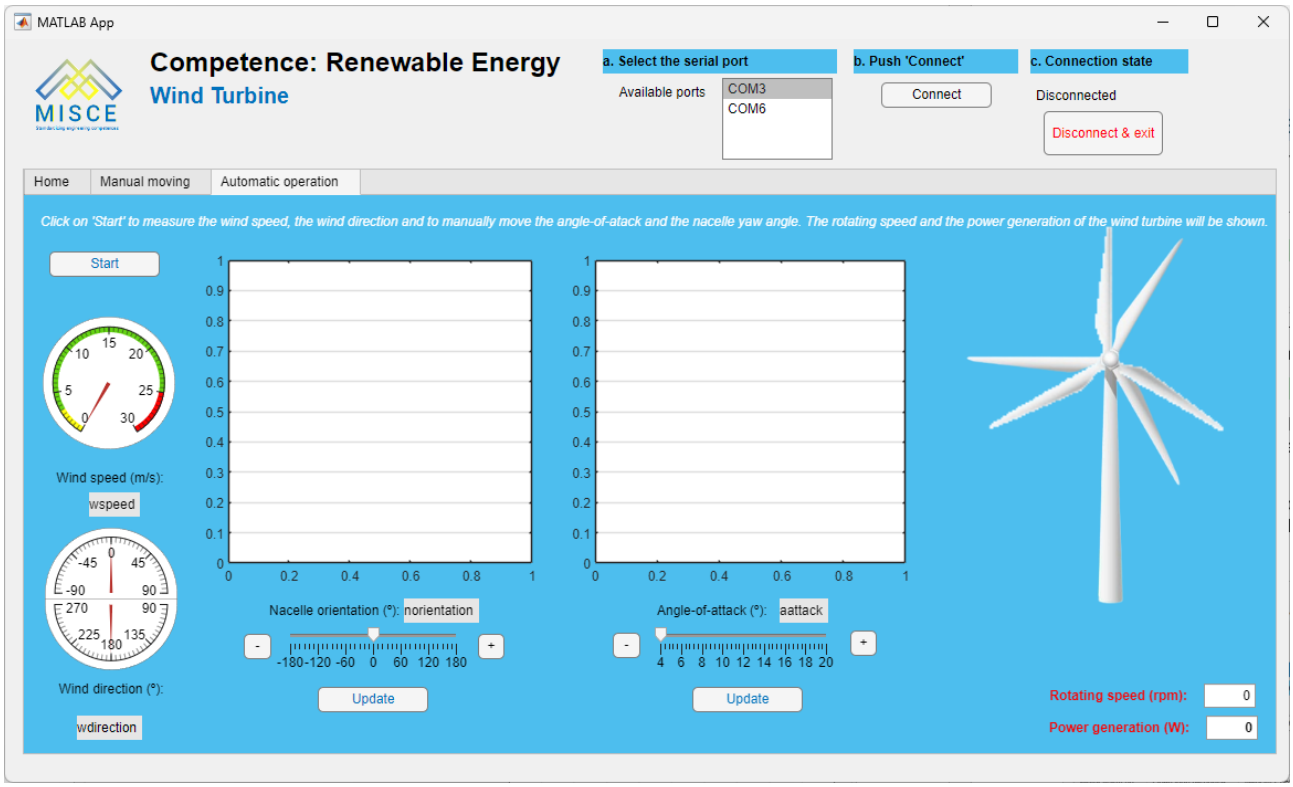

Figure 7. Operation mode 3: automatic operation