

Teaching materials

Guide notes 1. Introduction to the Test-Bed

MISCE project

Mechatronics for Improving and Standardizing Competences in Engineering



Competence: Automation Technology

Workgroup: University of Cagliari

University of Cassino and Southern Lazio



© 2025 MISCE Consortium. Licensed under CC Attribution-ShareAlike 4.0 International
(<https://creativecommons.org/licenses/by-sa/4.0/>)



Cofinanciado por
la Unión Europea

Mechatronics for Improving and Standardizing Competences in Engineering, MISCE

Competence:

Automation Technology

Document:

Guide notes 1.
Introduction to the
Platform

This document corresponds to the introduction lecture, presenting the experimental platform, for the competence 'Automation Technology' using the 'Test-Bed_n.5'

Version: 2.0

Date: May 25th, 2025

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



Index of contents

1	Platform overview.....	2
2	Software description.....	3
2.1	Operation mode 1: Push Button 1.....	6
2.2	Operation mode 2: Change the velocity.....	7

Index of figures

Figure 1.	Experimental platform overview	2
Figure 2.	Mounting phase: a) Actuation ; b) PLC.....	2
Figure 3.	First step view of the Test-Bed_n.5	3
Figure 4.	Second step view of the Test-Bed_n.5	3
Figure 5.	Third step view of the Test-Bed_n.5	4
Figure 6.	Fourth step view of the Test-Bed_n.5.....	4
Figure 7.	Zoom-in of figure 1 of the Test-Bed_n.5 of the Ladder software.	5
Figure 8.	Subsystem of Test-Bed_n.5.	6
Figure 9.	Zoom-in for changing the velocity of Test-Bed_n.5.....	7



1 Platform overview

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

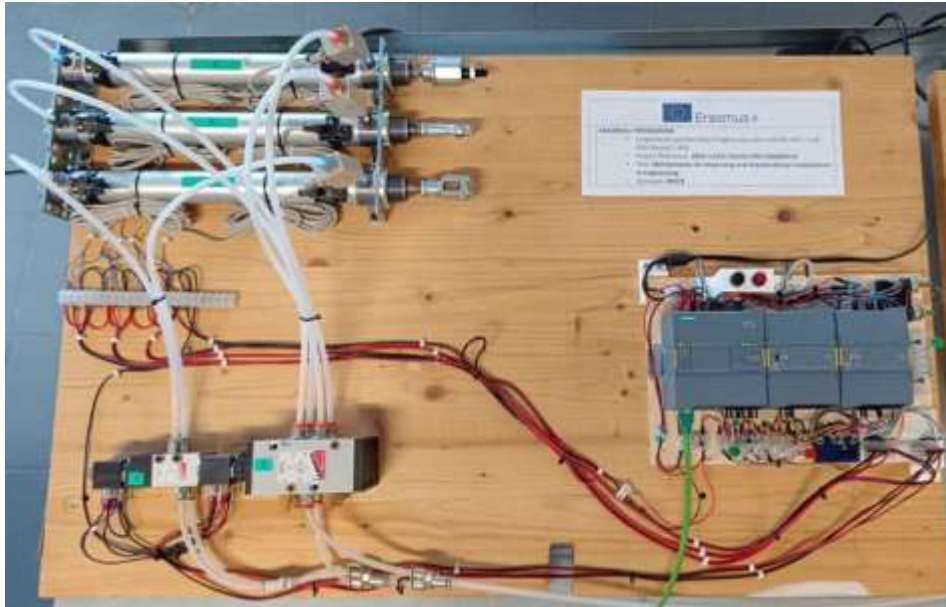
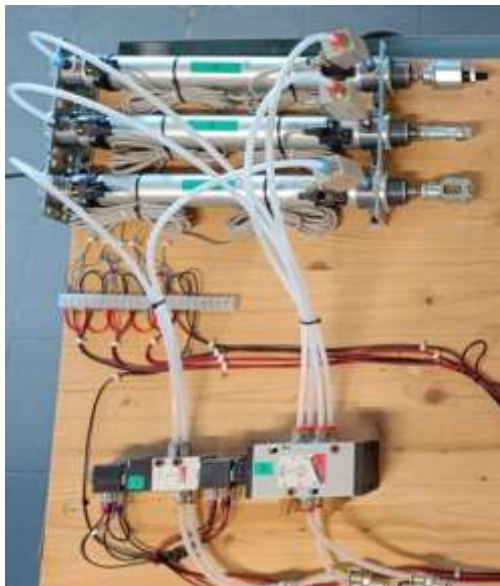
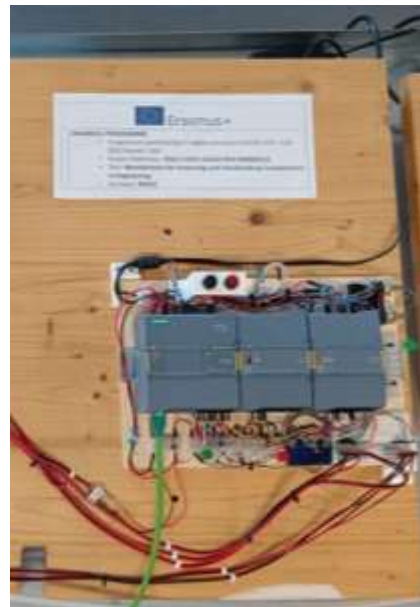


Figure 1. Experimental platform overview

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



a)



b)

Figure 2. Mounting phase: a) Actuation ; b) PLC

The Test Bed can be operated in a different way.



2 Software description

When launching the software for operating with the platform the image will appear (see Figure 3).

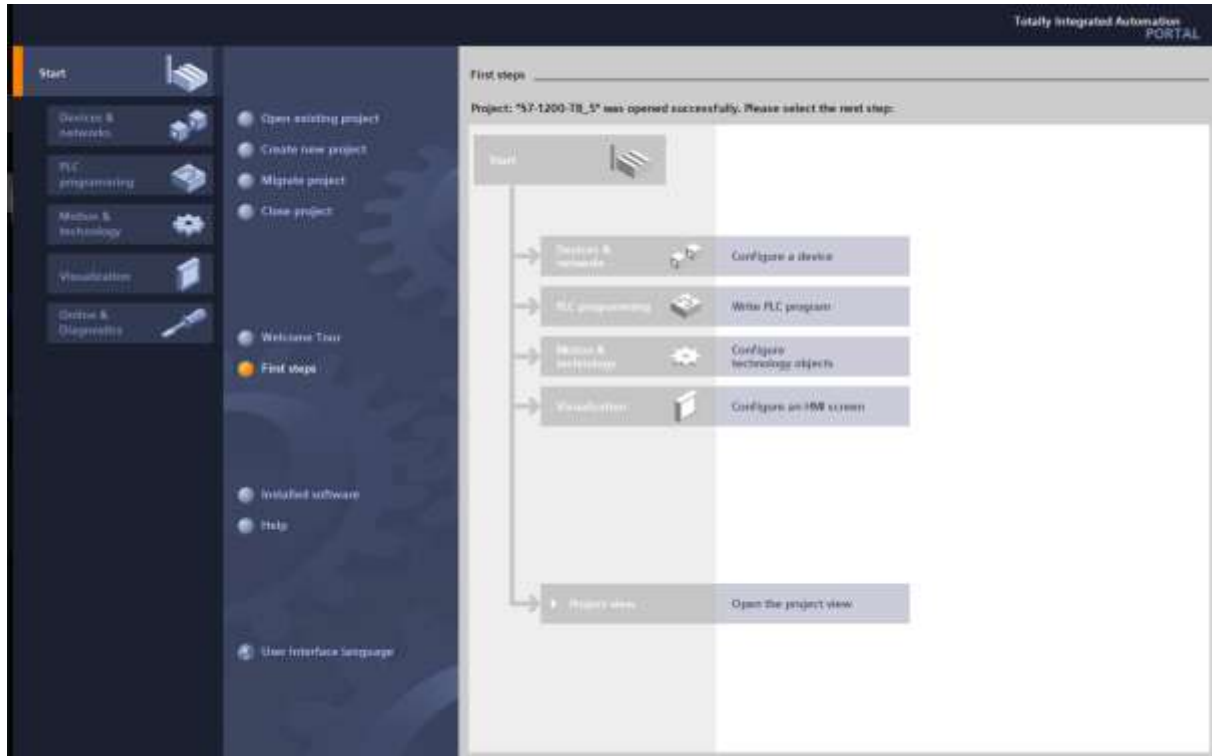


Figure 3. First step view of the Test-Bed_n.5

At this point, click on “open existing project”, and after, click on “Project View”.

When launching the “project View” for operating with the platform the image will appear (see Figure 4).

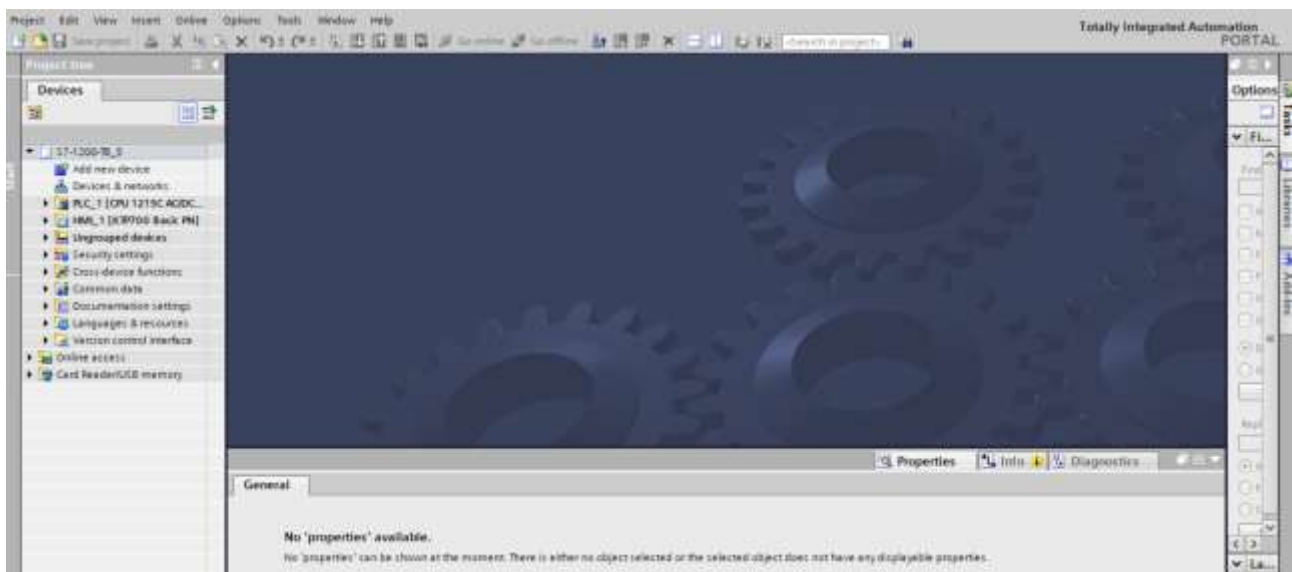


Figure 4. Second step view of the Test-Bed_n.5



At this point, click on “PLC_1”, click on “Program blocks” and after, click on “Main”. This image will appear:

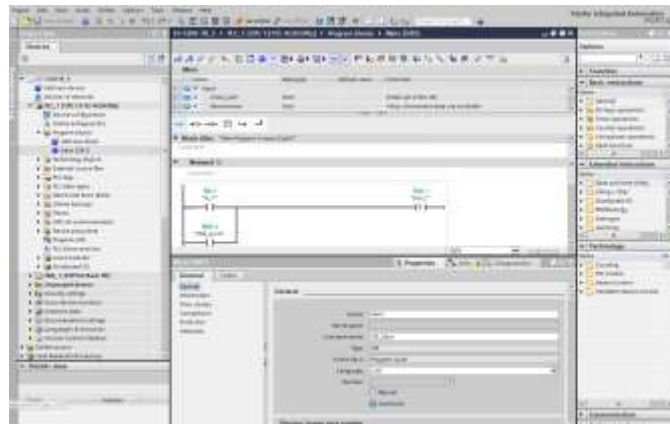


Figure 5. Third step view of the Test-Bed_n.5

At this point, click on “Accessible devices”, to connect the PC with the PLC, the following image will appear:

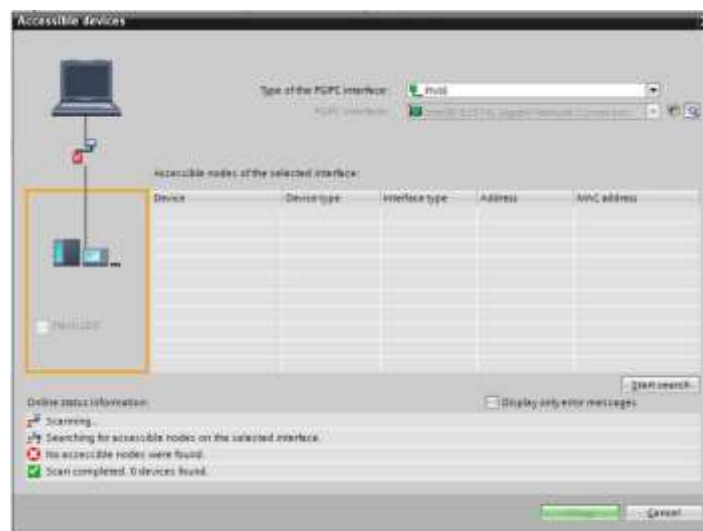





Figure 6. Fourth step view of the Test-Bed_n.5

Now click on “Start Search” and after, click on “Connect”. This image will appear:

At this point, click on “Download to Device”  in order to download the software on the PLC.

When the connection to the test-bed is established the connection state will change to “Connected”.

At any time, if the user want to exit to the connection, the “GO off-line”   button must be pushed.

Before to start the application is important to start the PLC, the button “Start CPU”  must be pushed. 



Referring to the image in figure 7, in first row (in the top) the input “%I0.6”, is used for indicate the physical Start, *pushbutton*, of the test Bed.

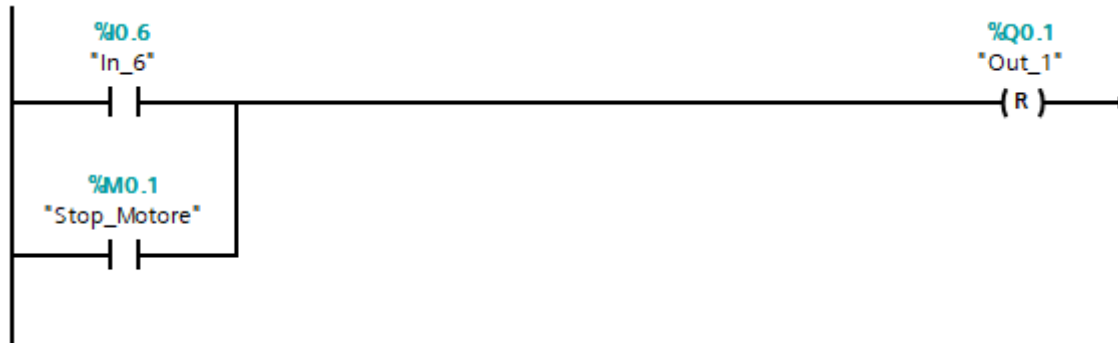


Figure 7. Zoom-in of figure 1 of the Test-Bed_n.5 of the Ladder software.

Additionally, the test Bed can be operated by:

- Physical button



2.1 Operation mode 1: Push Button 1

Some parameters of a can be selected by using the HMI (reported in figure.8-3).

In order to start the test-bed the button indicated with “red circle” in figure 8, must be pushed.

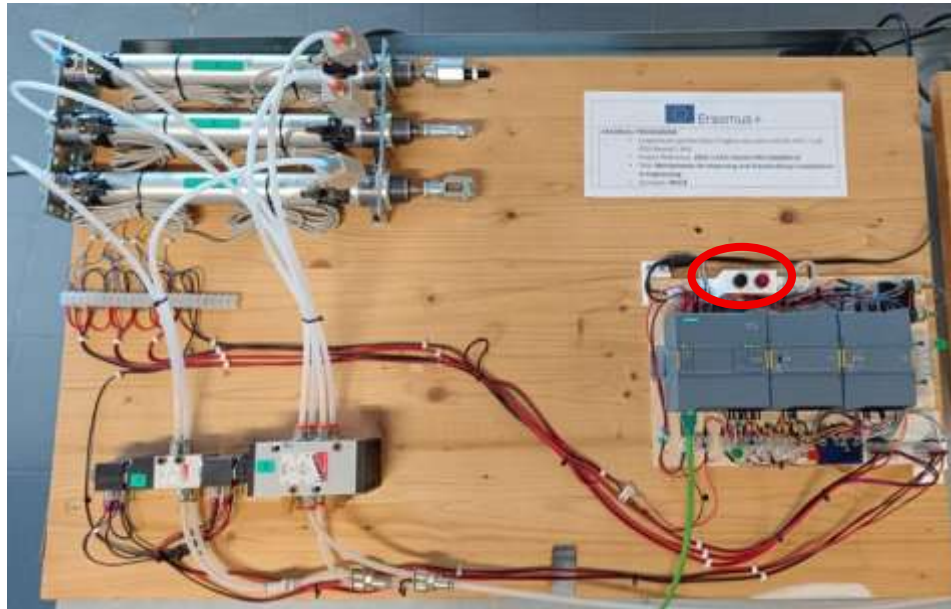


Figure 8. Subsystem of Test-Bed_n.5.

Procedure:

1. Click on button red indicated by the circle

Result:

The pneumatic cylinder will start the movement under the desired low of motion



2.2 Operation mode 2: Change the velocity

In order to start the test-bed the button named “START from HMI” in figure 9, must be pushed.

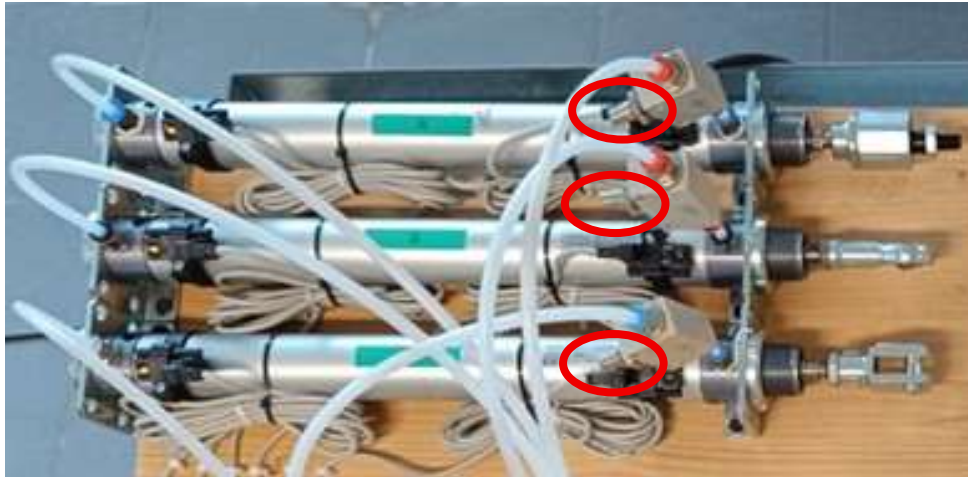


Figure 9. Zoom-in for changing the velocity of Test-Bed_n.5.

Procedure:

2. Driving the screw of the flow regulator.

Result:

The pneumatic cylinder will start the movement at different velocity