

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



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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.3

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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: Soft button on HMI	7
2.3	Operation mode 5: Changing the parameters	8
2.4	Operation mode 3: Button on VIRTUAL HMI.....	9
2.5	Operation mode 4: Button on WEB Server	10

Index of figures

Figure 1.	Experimental platform overview	2
Figure 2.	Zoom-in: a) Remote I/O; b) HMI.....	2
Figure 3.	First step view of the Test-Bed_n.3	3
Figure 4.	Second step view of the Test-Bed_n.3	3
Figure 5.	Third step view of the Test-Bed_n.3	4
Figure 6.	Fourth step view of the Test-Bed_n.3	4
Figure 7.	Zoom-in of figure 1 of the Test-Bed_n.3 of the Ladder software.	5
Figure 8.	Subsystem of Test-Bed_n.3.	6
Figure 9.	Subsystem of Test-Bed_n.3	7
Figure 10.	Recipe page and an example of “Operation mode with six phases”	8
Figure 11.	Zoom -in of the of Test-Bed_n.1 reported in fugure.1.....	9
Figure 12.	Test-Bed_n.1 and zoom -in of the of WEB Server (n.5) of figure.1.	10



1 Platform overview

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

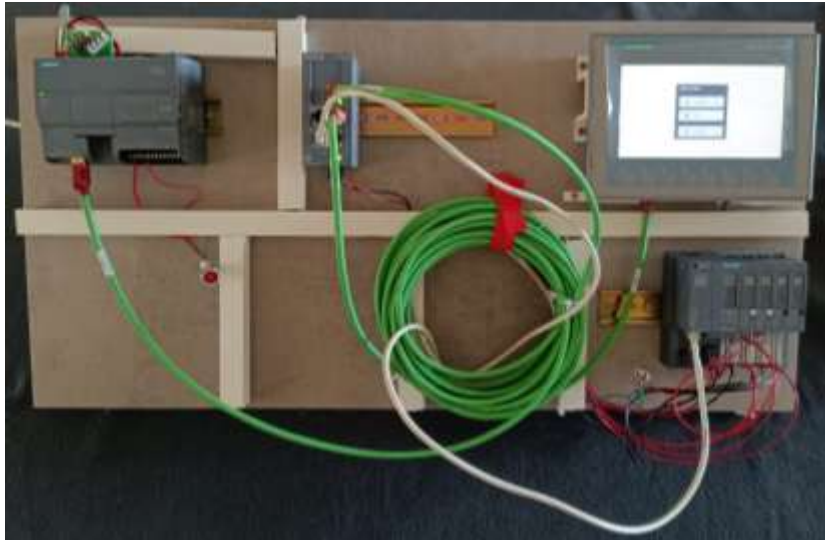


Figure 1. Experimental platform overview

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



a)



b)

Figure 2. Zoom-in: a) Remote I/O; b) HMI

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).

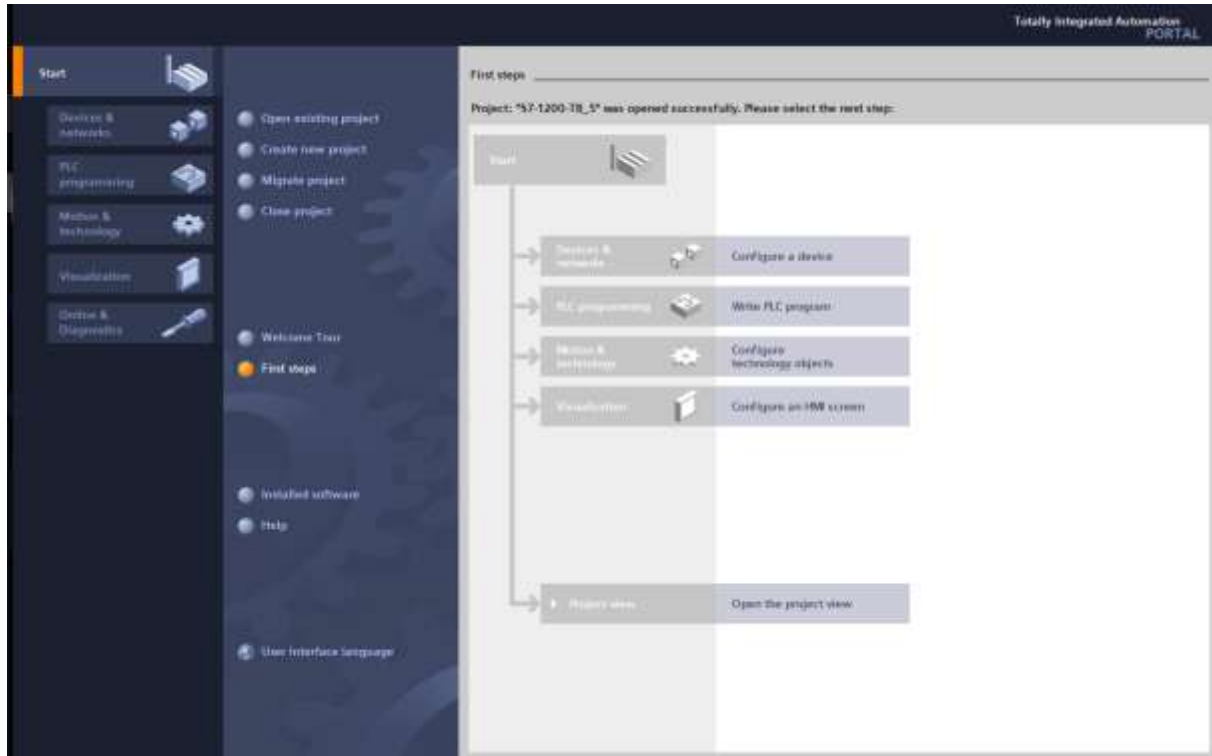


Figure 3. First step view of the Test-Bed_n.3

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).

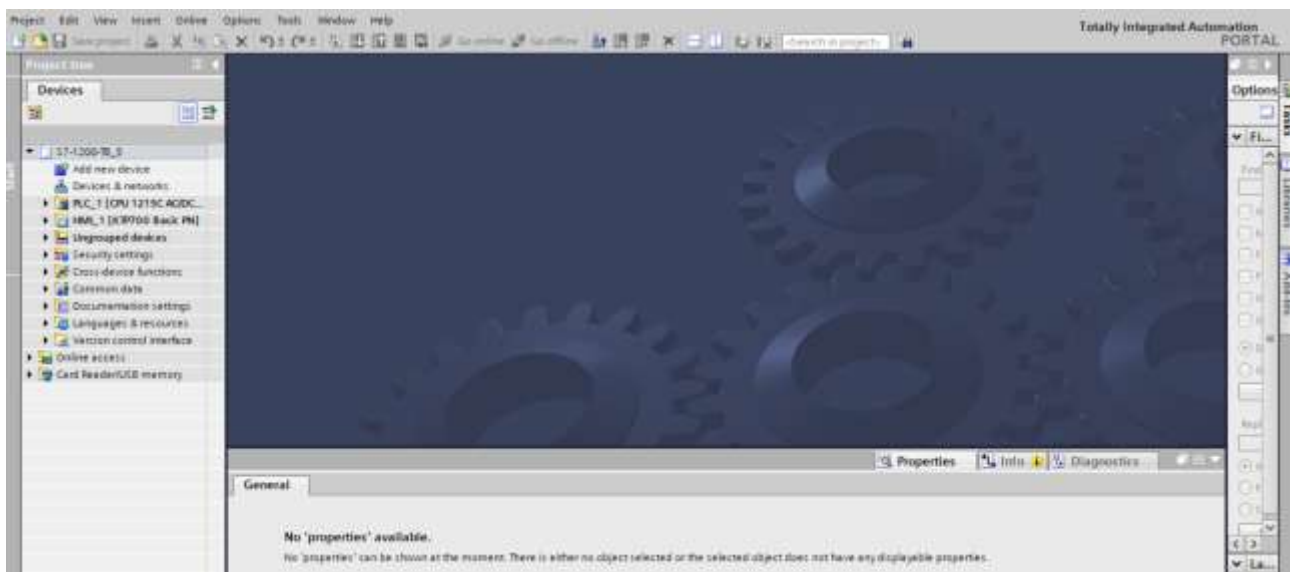


Figure 4. Second step view of the Test-Bed_n.3



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

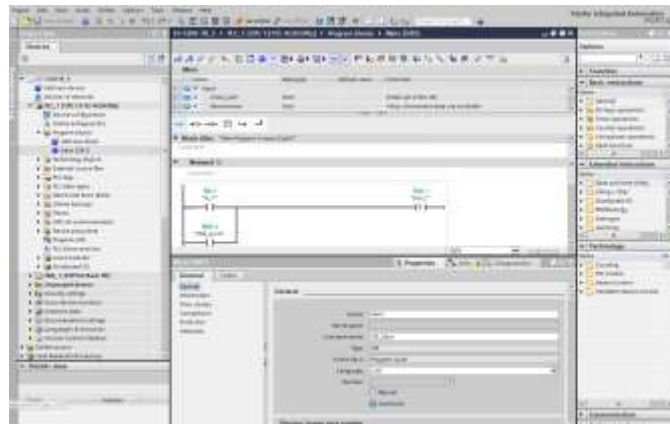


Figure 5. Third step view of the Test-Bed_n.3

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

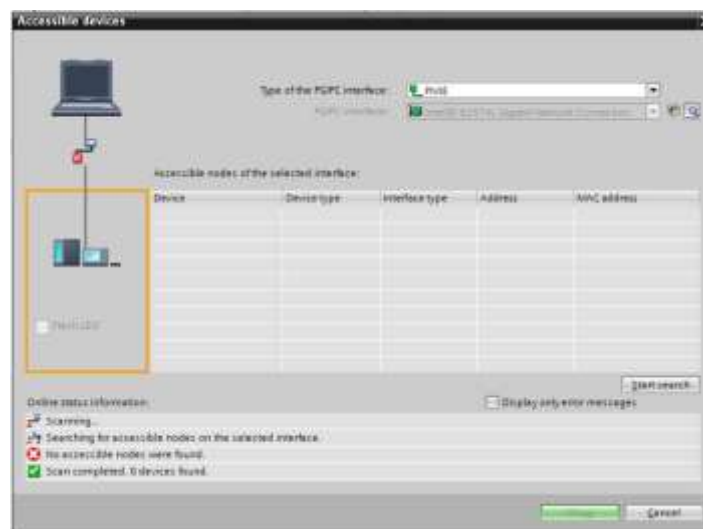






Figure 6. Fourth step view of the Test-Bed_n.3

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

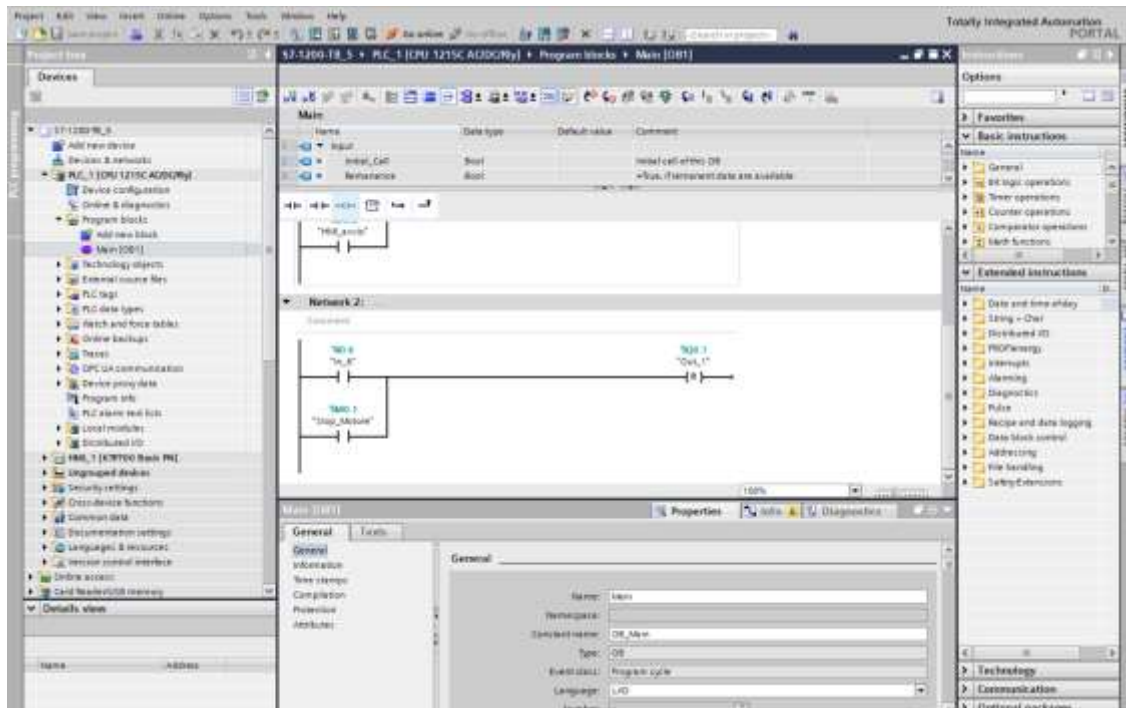


Figure 7. Zoom-in of figure 1 of the Test-Bed_n.3 of the Ladder software.

Additionally, the test Bed can be operated by:

- Physical button
- Physical HMI
- Virtual HMI
- Web-Server
- SCADA



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 “X” in figure 8, must be pushed.

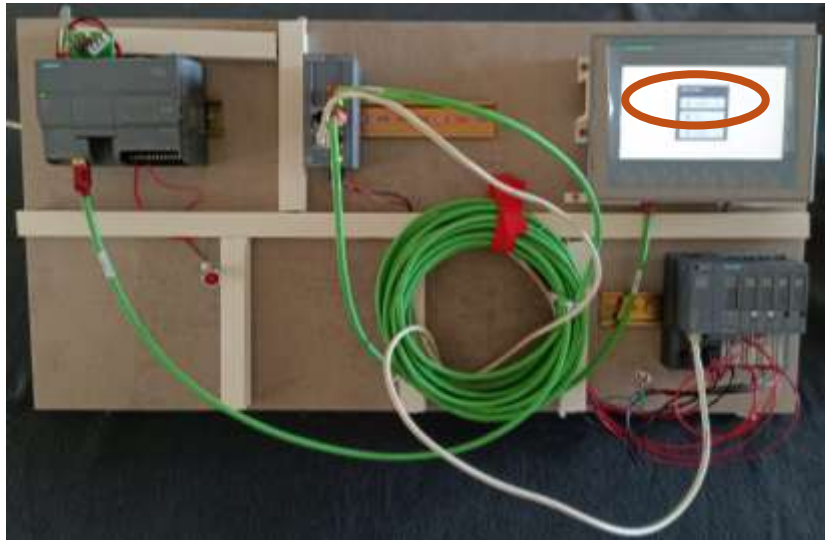


Figure 8. Subsystem of Test-Bed_n.3.

Procedure:

1. Click on “X” button.

Result:

The Led of the PLC will be activated on sequence



2.2 Operation mode 2: Soft button on HMI

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



Figure 9. Subsystem of Test-Bed_n.3

Procedure:

2. Click on “START from HMI” button.

Result:

The Led of the PLC will be activated on sequence



2.3 Operation mode 5: Changing the parameters

To modify the automatic cycle, is important to follow this sequence.

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

Procedure:

1. Click on 'F2' button.
2. Select the appropriate "Recipe", in order to define the sequence of the movement of the pneumatic cylinder.
3. Click "upload to PLC".
4. Click on "Start from HMI".

Result:

The pneumatic cylinder will start the movement (only simulated via LED behaviour), but with a different scheme/sequence.



Figure 10. Recipe page and an example of "Operation mode with six phases"



2.4 Operation mode 3: Button on VIRTUAL HMI

In order to start the test-bed the button named “START from HMI” in figure 10, must be pushed.



Figure 11. Zoom -in of the of Test-Bed_n.1 reported in ffigure.1.

Procedure:

3. Click on “START from HMI” button.

Result:

The pneumatic cylinder will start the movement (only simulated via LED behaviour), but with a different scheme/sequence.



2.5 Operation mode 4: Button on WEB Server

In order to start the test-bed the button named “START from HMI” in figure 11, must be pushed.

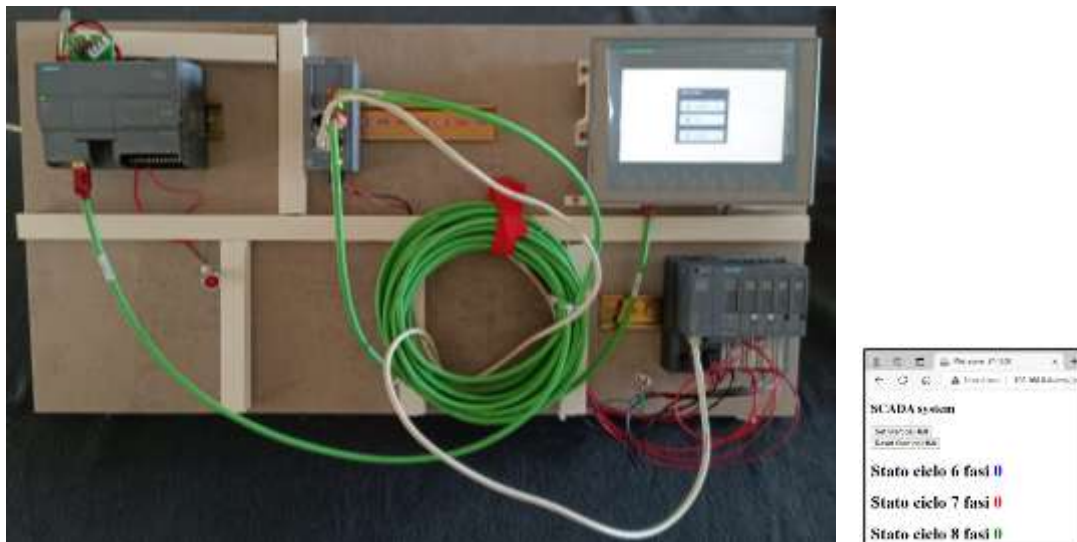


Figure 12. Test-Bed_n.1 and zoom -in of the of WEB Server (n.5) of figure.1.

Procedure:

4. Click on “Set START from HMI” button.

Result:

The pneumatic cylinder will start the movement (only simulated via LED behaviour), but with a different scheme/sequence.