

User manual

Student application

When you start the application, a window opens to select the exercise /Izbor laboratorijske vezbe/ (Figure 1) that the student wants to do.

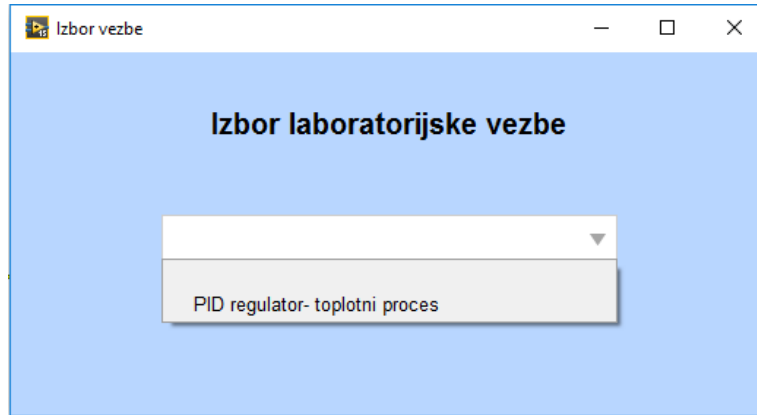


Figure 1

I. Student information

The back of the scaffold binds that the student data entry check (Figure 2) is running. This information must also be entered correctly by the student in order for the professor to have an insight into which student is doing the exercise.

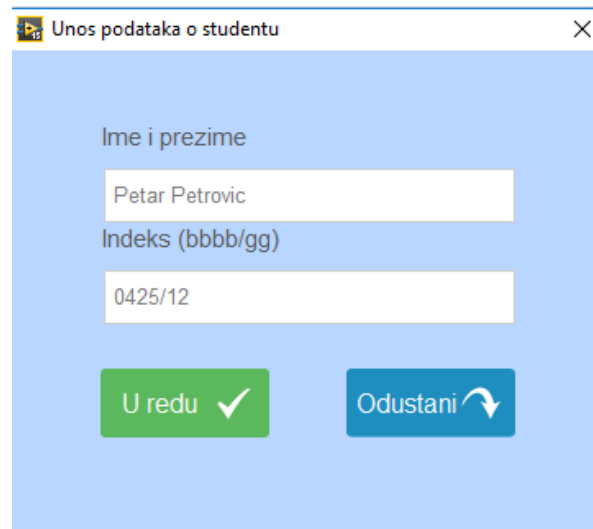


Figure 2

When the student has finished filling in the data, clicking on the "OK" /U redu/ button opens the exercise window, while clicking on the "Cancel" /Odustani/ button returns to the exercise selection window.

I. Main Exercise Design Program

When the student opened the window for the selected exercise (Figure 3.0), for now, the only exercise the PID controller of the thermal process, the first thing to do is to send a request to the professor for permission to operate the laboratory exercise, ie. connecting to the hardware itself.

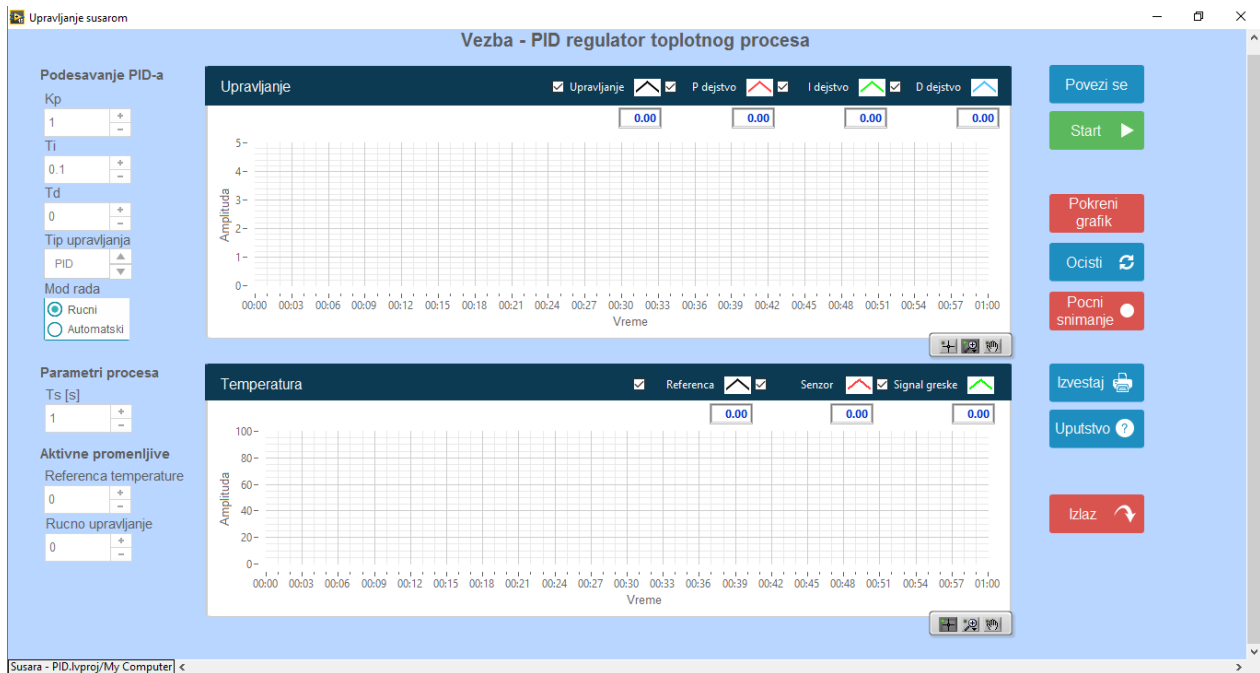


Figure 3.0

Connecting to hardware:

In order to connect the student to the hardware, it is necessary to send a request to the professor by clicking on the "Connect"/**Povezi se**/ button.



The student can get three different answers:

- 1) If communication with the professorial application has not been made (Figure 3.1)

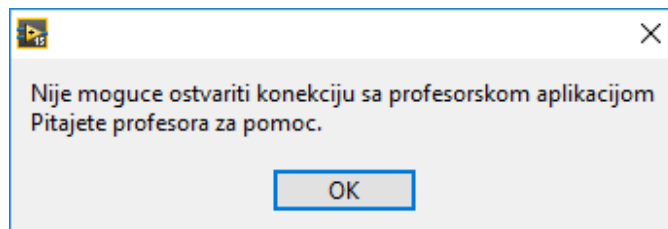


Figure 3.1

2) If the request is denied (Figure 3.2)

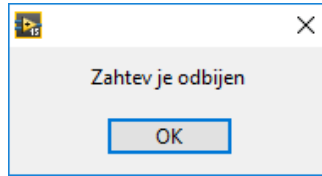


Figure 3.2

3) If the professor has confirmed to the student that he can connect to the hardware (Figure 3.3).

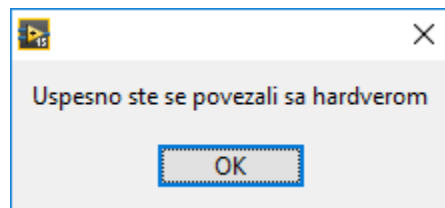


Figure 3.3

After successful connection, the student can start the exercise.

If a student wants to disconnect himself from the hardware, he can do so by pressing the "Unfold" /Raskaci se/ button.



Essential Functionalities:

Pressing the "Start" button starts the operation.

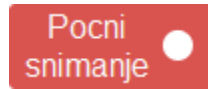
Pressing the "Stop" button stops the operation.



Pressing the Clear/Ocisti/ button deletes the previously displayed data on the chart.



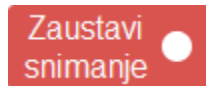
Pressing the "Start Recording" /Pocni snimanje/ button starts storing the experimenter's data. Management must be started in order for it to be recorded.



A window will open where you select the folder where your measurements will be stored.
The file contains:

- selection period, proportional effect, integral effect, differential effect respectively in the first file type, while in the continuation of the file in each selection period it prints one type in which the current control, temperature and control reference are also stored respectively.

Recording stops by pressing the "Stop Recording" /**Zaustavi snimanje**/ button

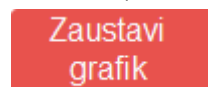
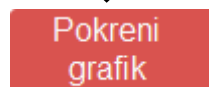


Pressing the "Report" /**Izvestaj**/ button generates a report in the selected folder.
The student data, selection periods, current PID controller parameters and selected graph display are sent to the report.

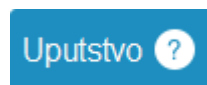


- By pressing the "Stop Graph" /**Zaustavi grafik**/ button, you can stop the graphs for easier viewing of the essential parts of the experiment. You can start the graph by clicking the "Run graph" /**Pokreni Grafik**/.

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- Pressing the "Manual" /**Uputstvo**/ button opens a document with instructions for using the application.



Student has the ability to adjust:

PID parameters, as well as the choice of control type and whether manual or automatic control will apply.

Podesavanje PID-a

Kp	1	+	-
Ti	0.1	+	-
Td	0	+	-
Tip upravljanja	PID		
Mod rada	<input checked="" type="radio"/> Rucni <input type="radio"/> Automatski		

Selection period

Parametri procesa

Ts [s]	1	+	-
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Temperature reference **Referenca temperature** / as well as manual control which is only applicable if manual mode **Rucno upravljanje** is selected in the parameters.



Aktivne promenljive

Referenca temperature

0	+
	-

Rucno upravljanje

0	+
	-

Graphic view of the experiment:

- The first graph shows the values related to control only where the control size can be seen, as well as the separate control components (proportional, integral and differential effects).
- The second graph shows the control reference, the sensor reading value and the error signal.

- There is a choice of which of the graphics will be displayed (checkbox-in front of each name)

II. Exiting Exercise

If the student has completed the exercise, it is necessary to disconnect from the hardware by pressing the "Unbind" button, then pressing the "Exit" / "Izlaz" button will exit the program and finish the exercise.



After completing the exercise, an exercise selection window opens (Figure 1) for the next student to begin their work

4) Exit the program

Exit from the program is screamed by shutting down the exercise selection window (Figure 1).