

Electronics Engineering Lab



Introduction and Functional Overview

The Electronics Engineering Lab is based on the NI Analog Discovery Studio Max platform. The software is developed in the NI LabVIEW graphical programming environment. All hands-on experiments are conducted on the «Electronics Engineering» board. The circuits to be assembled are presented on respective front panels of each hands-on experiment, as well as in courseware manual. Corresponding sections of the manual are included in lab software so that a student may refresh his memory on appropriate theoretical materials without interrupting practical work on the lab. Experimental results of the lab may be exported and saved in MS Excel format including student name, date, time, and circuit studied.

Features

- 22 exercises on Electronics Engineering
- Menu-driven navigation through the labs
- Student registration
- Interactive representation of circuits in each hands-on experiment
- Step-by-step instructions for students
- Interactive study guide for each experiment
- Preassembled board with electronic components
- Representation of experimental results on the screen (graphs, scope signals, numeric indicators)
- Export of results in MS Excel format

Hardware & Software

- NI ADSM platform
- «Electronics Engineering» board for NI ADSM with a set of connector wires
- Lab software
- User manual

List of Exercises

DC Circuits

1. Ohm's law
2. Kirchhoff's circuit laws
3. Series connection of resistors
4. Parallel connection of resistors
5. Mixed (series and parallel) connection of resistors
6. DC voltage source
7. DC current source

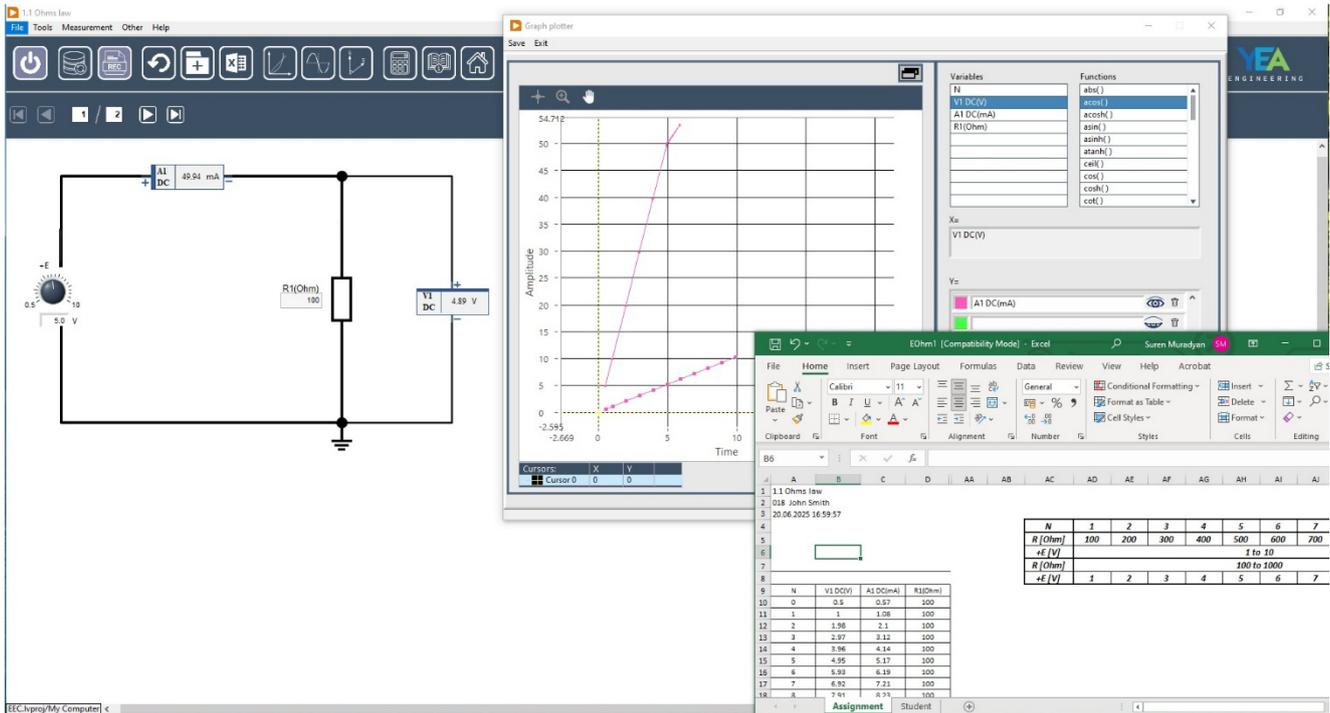
AC Circuits

8. AC circuit with active resistance
9. AC circuit with active and inductive reactance connected in series
10. AC circuit with active and capacitive reactance's connected in series
11. AC circuit with active, inductive and capacitive reactance connected in series
12. Series connection of capacitors
13. Parallel connection of capacitors
14. Series connection of inductors
15. Parallel connection of inductors
16. Resonance in series RLC circuits
17. Parallel resonance in AC circuits
18. Inductively coupled coils
19. Single-phase transformer

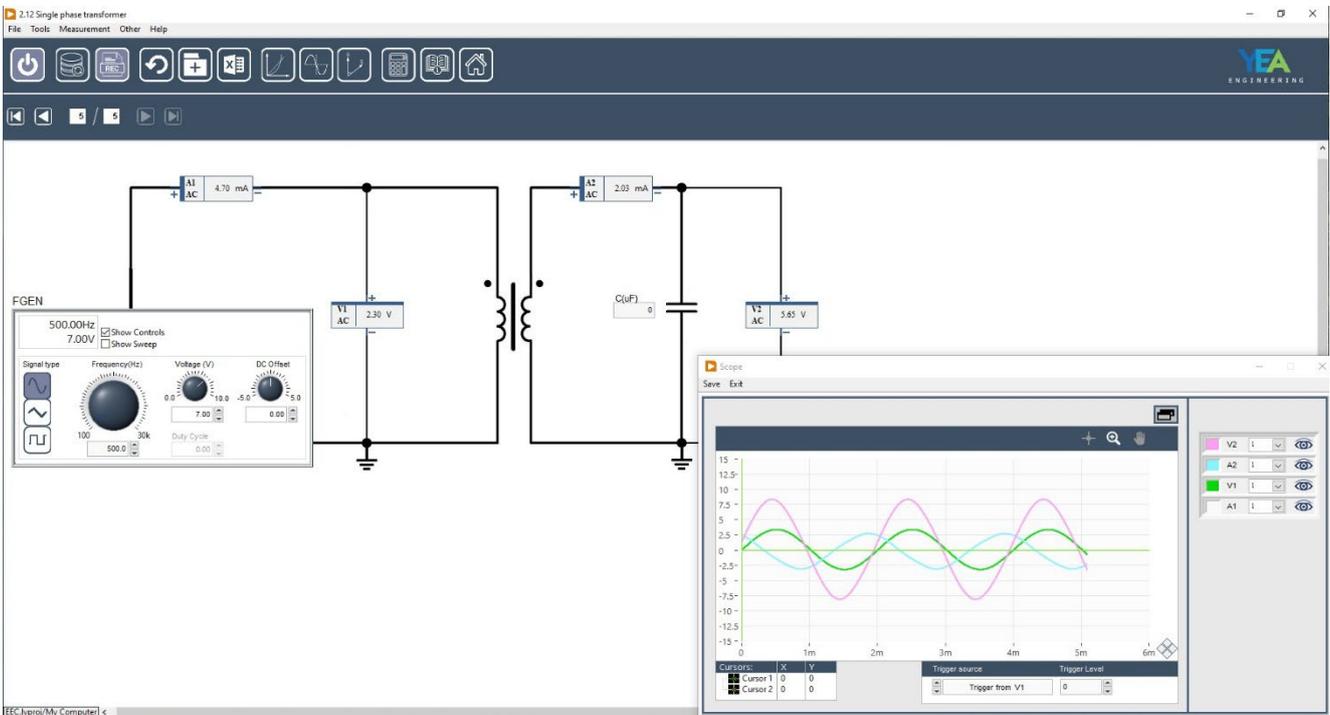
Transient Processes

20. Transient processes in linear RL circuits
21. Transient processes in linear RC circuits
22. Transient processes in linear RLC circuits

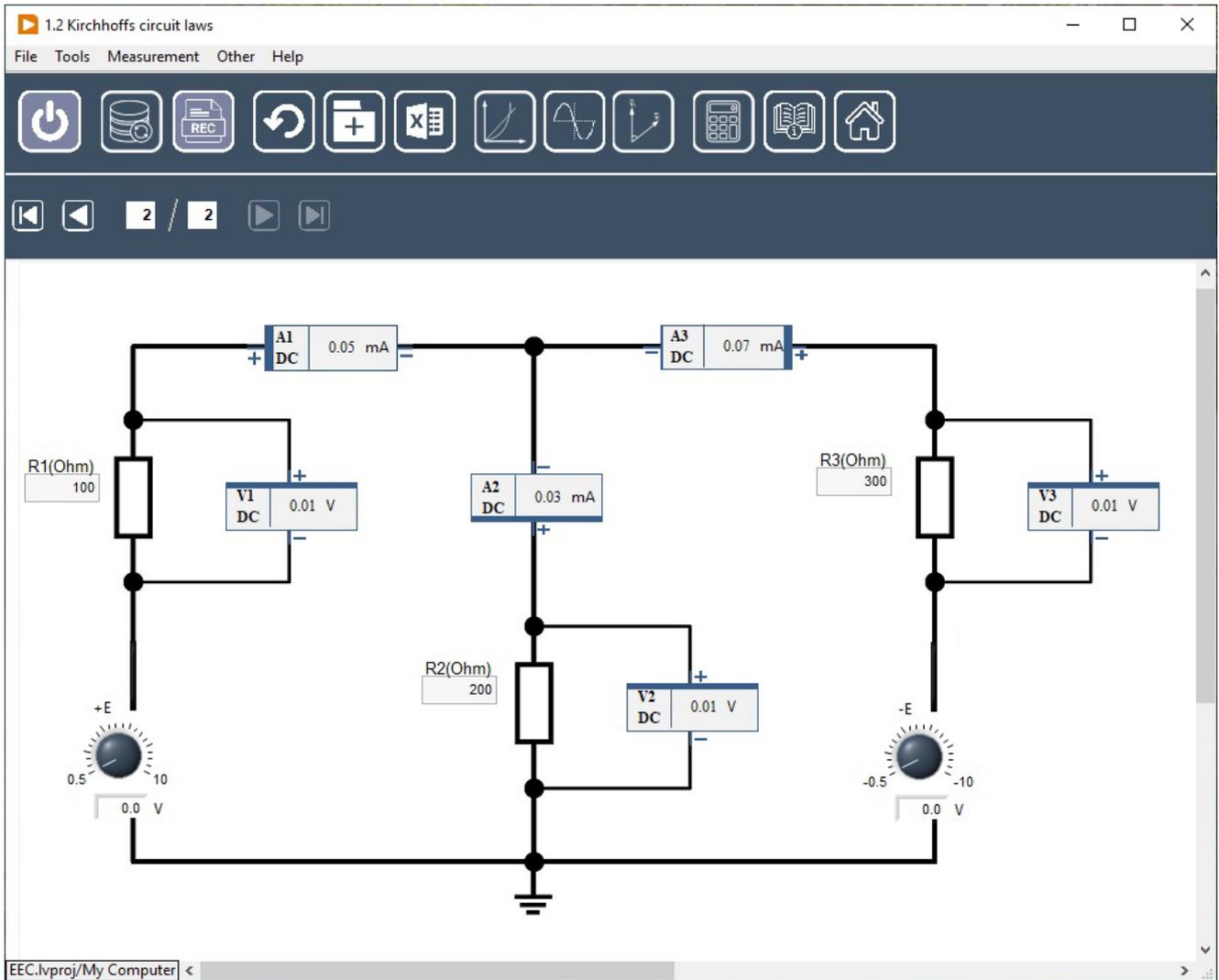
Examples of Exercise Demo



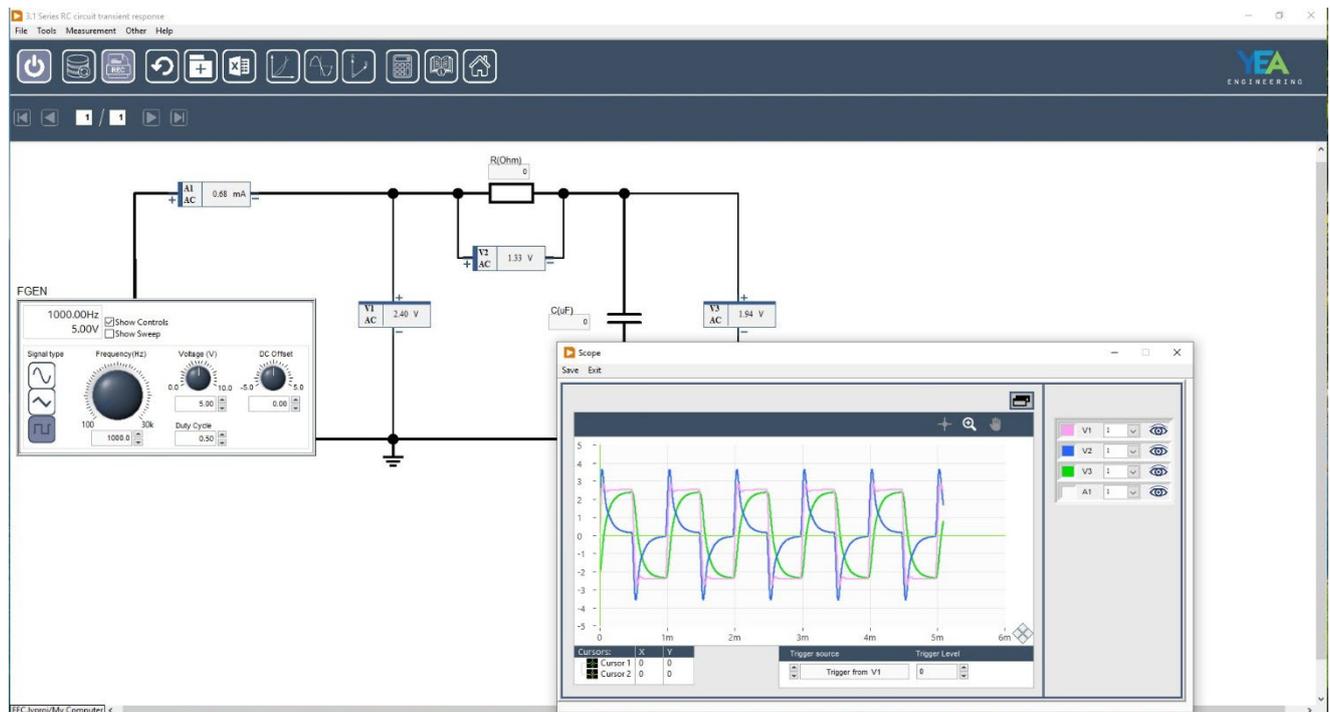
Ohm's law



Transformer



Kirchhoff's law



Transient response