



Abstract

The most common applied control system today are PLC which will precisely control fluid level in a Hydraulic System This will enhance capability of my Course in Hydraulics and prepare students in Mechatronic field. (PLC) or programmable controller is a digital computer used for automation in electromechanical processes, such as control of machinery on factory assembly lines, or lighting fixtures. PLCs are used in many industries and machines. Unlike general-purpose The subject invention pertains to facilitating communication between industrial computers, the PLC is designed for multiple inputs and output arrangements, extended temperature ranges, Pressure, flow rate, level control immunity to electrical noise, and resistance to vibration and impact. Programs to control machine operation are typically stored in battery-backed or non-volatile memory. A PLC is an example of a real time system since output results must be produced in response to input conditions within abounded time.

Research Objectives

1. Students learn about the available components and can quickly create a schematic of systems to be controlled
2. The use of PLC in Hydraulic help students with decision making and problem solving students find pleasure in PLC based laboratory exercises
3. Introducing PLC controller in a Hydraulic System
3. Using a simulator
5. Programing the PLC
6. Study the flow rate
 $Q = V / T$ gal/minute
7. Calculate Pump displacement
 $\text{Displacement} = \text{Flow rate} \times 231 / \text{RPM}$

Methodology

In this the method of learning, students are provided all the information needed to understand during three class room lessons on Hydraulic level, controlled by the PLC.

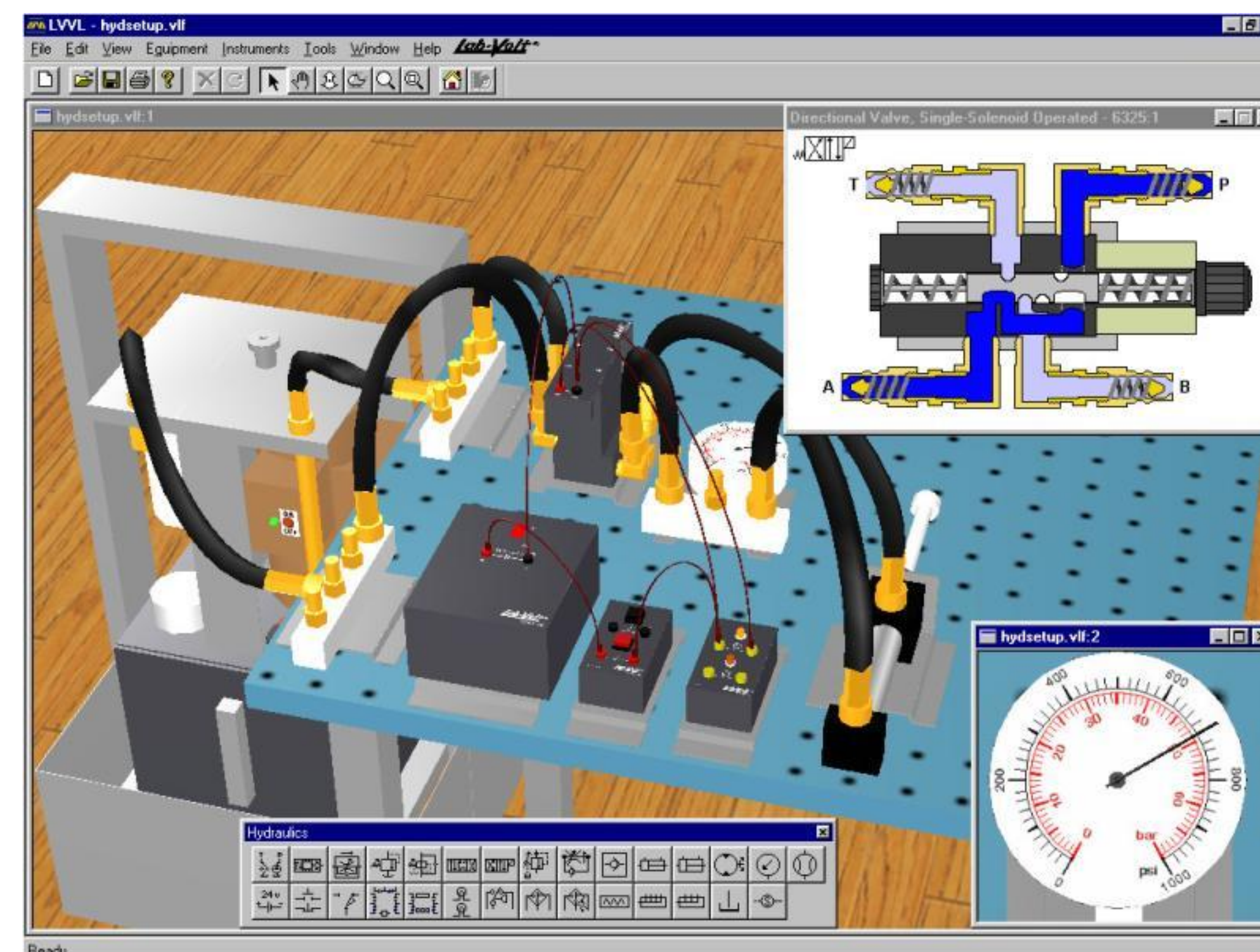
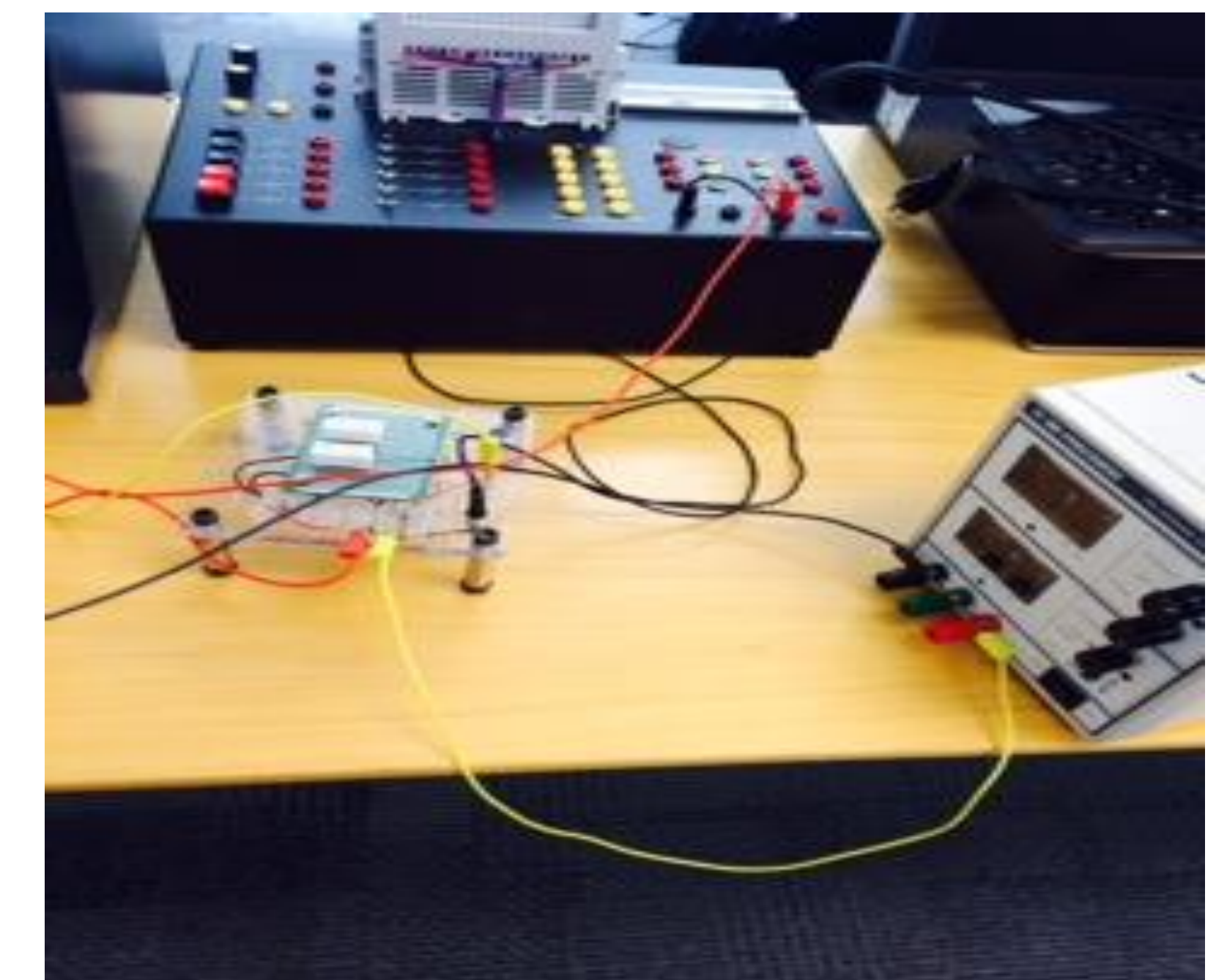
The students design electro-hydraulic circuit integrated with PLC, simulate and then construct the hardware and software. Throughout this process instructor serves as guide, manager who provides students ideas, advise and support. A step by step laboratory approach is adopted.

In the first lesson students will be familiarized with Hydraulic Physical Properties and different electromechanical components will be introduced such as different types of valves integrated with Solenoids. PLC input and output parameters and other logical functions will be applied.

In the second Lesson different electromechanical Symbols of components will be introduced and students are shown how to build electromechanical circuits and PLC.

In the third lesson Students will Simulate the Logical Circuit on the computer. Debug the process and put the Level Control circuit in action free of any glitches .

Finally Students are required to Implement Level Control with PLC by Physically building the The Hardware and software. Students Learning outcomes will be evaluated by pre-test and post-test. The lab activity will also generate the failure and success of this research project



Lab Volt Simulator

Results and Conclusions

My goal in this research project is to introduce PLC to my students in Hydraulic Course this single activity in the course will help students to apply and control electro-Mechanical and hydraulic function by PLC in advance class of Hydraulics.

References

- Lab Volt Training systems
<https://www.labvolt.com/search/?q=PLC>
 Electrical Motor control by Gary J Rockis and Glen A. Manzur
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