

LabVIEW and LabPro Workshop
November 6-8, 2003
at Mt. San Antonio College
Walnut, CA (near Los Angeles)

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Recent microcomputer-based laboratory (MBL) tools coupled with an activity-based physics approach provides a better method of teaching physics by enabling the teaching/learning process to build on students' direct experiences in the physics classroom/laboratory or studio. The Vernier Software & Technology LabPro interface with various sensors and associated software has been used extensively in MBLs to collect data or to control digital or analog lines.

The LabPro is a small handheld computer dedicated to the task of data collection and control of output lines. It contains a microprocessor that can communicate with a host calculator or computer. By using a command set, the host computer can customize the parameters of the data collection or control to suit specific applications. The LabPro has six interface ports for data collection. Four ports are used to collect analog data from sensors such as temperature, force, etc. and two ports are used to collect digital data from such sensors as motion detectors, radiation monitors, and rotary motion sensors. In addition, the LabPro may also be used to control 8 digital output lines and one analog output line.

LabPro has the capability of being programmed so that it can be used in new situations. Programming of the LabPro consists of sending a series of commands to configure the desired operation. A powerful software tool from National Instruments called LabVIEW can be used to program the LabPro for specific tasks. These special programs are called Virtual Instruments (VIs) that employ the power of LabVIEW's data acquisition and control as well as other features such as web publishing. LabVIEW is used extensively in research and industry that makes this workshop appropriate for teachers and their students.

This hands-on workshop will provide participants with an introduction to some of the basics of LabVIEW. This includes the LabVIEW environment, features, dataflow programming, and state machine architecture so that participants can create simple applications that acquire, process, display, and store real-world data using the LabPro and sensors. The workshop will also include Real Time (RT) Analog mode, Non-Real Time (NRT) Analog mode, Photogates, Motion, Rotary and Analog, Digital Output and the Digital Control Unit (DCU), Analog Out, and Non-Auto ID Sensors. Participants will gain experience in using and modifying existing VIs for the LabPro and then get a chance to learn how to develop their own VI. This workshop is hosted by Martin Mason who will share what he has been developing connecting LabVIEW and LabPro for his students.