

## Data Acquisition Tools

**LabPro®**

### Vernier Lab Pro

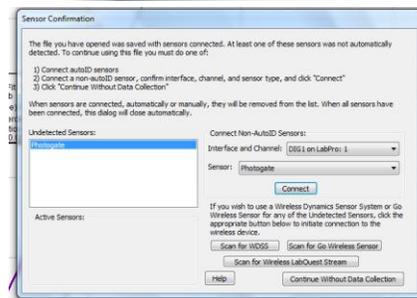
<https://www.vernier.com/products/interfaces/labpro/>

The Vernier LabPro interface is a 12-bit Analog-to-digital converter which can sample at 50,000 measurements per second. It can store 12 kilo Words of data or transfer data to Windows and Mac computers or Texas Instrument graphing calculators.



To operate it:

- i) Ensure that the unit is plugged in AC power. On boot you will hear a little song, have lights flash on top of the unit and then have a green Power light on the front;
- ii) Ensure that the LabPro is connected to the PC via USB.
- iii) If you start any version of the Logger Pro software and see the Sensor Confirmation screen, then the connection between PC and LabPro is working. If the Sensor Confirmation screen is faded and will not respond, the software does not detect the presence of any Vernier devices and will not function.

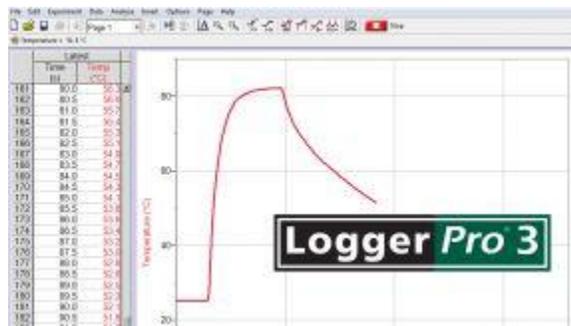


### Vernier Software: Logger Pro

<https://www.vernier.com/products/software/lp/>

Vernier Logger Pro is a data collection and analysis package.

Here are some notes on how we use it in our courses.



- i) For every experiment which uses the LabPro device there is a custom Logger Pro file. A list of files and associated experiment are in the appendix of this document.
- ii) Each file has columns for data and, if necessary, a graph already created. To collect fresh data, press the green Collect button.
- iii) One can export the data in various file formats. It is also easy to copy from the columns directly into a spreadsheet, such as Excel or Google Sheets.
- iv) In some experiments we will use the tools from Logger Pro. Under the Analysis section one can find mathematical tools such as fitting to a graphed line and others.
- v) To interact with the graph, Right Click for options.

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## Photogates

<https://www.vernier.com/products/sensors/vpg-btd/>



A photogate is a combination of an LED and a photodiode light detector.  
To use one:

- i) Ensure that electrical connection to the photogate and connector going to the Lab Pro are undamaged.
- ii) Connect the white connector to one of the Dig/Sonic inputs on the Lab Pro unit.
- iii) Start the Logger Pro version for your experiment. The Lab Pro should automatically detect the photogate and ask you if the Channel assignment is correct.
- iv) If the Logger Pro does not detect your photogate:
  - \* is this the correct experiment? Each Logger Pro version expects certain sensors and will, at best, give bad data with the incorrect sensors;
  - \* Check the electrical connections to the photogate and Lab Pro. Re-start the Logger Pro software after "wiggling";
  - \* Combinations of re-booting the Lab Pro (remove power, wait, restore power), re-starting the Logger Pro software, re-making the USB connection and re-booting the PC have helped in the past.

## Additional Sensors

For the Ideal Gas Law lab we use a Vernier Gas Pressure Sensor (GPS)  
<https://www.vernier.com/products/sensors/pressure-sensors/gps-bta/>



Sometimes, we substitute for the Gas Pressure Sensor with a Go-Direct Gas Pressure Sensor  
<https://www.vernier.com/products/sensors/pressure-sensors/gdx-gp/>



## Adapter cables

Some sensors require extender or adapter cables to reach the LabPro unit. These connections can become damaged and interfere with the sensor operation. If you have problem with a sensor, try removing (temporarily) the extender cable. If your cable has an adapter such as the one to the right, try changing the adapter.

