

Using Logger Pro with Vernier Motion Sensors (Momentum Lab)

Leveling the Dynamics Track:

- Attach the feet to the ends of your track.
- Level your track: Collide one cart into another, stationary cart of the same mass. If the first cart is stationary after the collision, the track is level.
- Place the motion sensors on either end of the track
- Plug the motion sensors into the Labquest. Plug the Labquest into the laptop.

Configuring the Motion Detector:

Set the Sensitivity switch on the Motion Detector to the short-range distance setting (the car).



Opening Logger Pro:

- Open the Start Menu on your desktop and select All Programs.
- Scroll down to select Vernier Software -> Logger Pro 3.8.5.



Configuring Logger Pro:

- To get a velocity graph, click on the y - axis and select velocity from the menu.
- To get a second graph, do Insert -> Graph. Then click on the axes to change it to velocity.
- Page -> Auto Arrange to fit the graphs on the page.
- You must set up Logger Pro so that the motion sensors have **opposite positive** directions, since they will be facing each other in this experiment. To make the second sensor have negative velocity, go to Data -> Column Options -> Velocity2. Change the Equation from positive to negative.

-derivative("Position 2", "Time")

- To make sure the x-axes of the two graphs always line up, select both graphs (use Shift-Click on the second graph). Then select Page-> Group Graphs (X-axis).

Running Logger Pro:

- Logger Pro has a graphical interface similar to the LabQuest. Click on the  arrow to Start or Stop collecting data.
- Click on each graph and select Analyze -> Autoscale or the Autoscale button .
- Move the cursor over the graph to see the x/y coordinates.
- Click and drag on the x or y axis to stretch it out.
- The default data collection is 5 seconds. To change it, select "Experiment -> Data Collection..." and change the Length.

Analyzing your graph in Logger Pro:

- To make a comment box with a line, Insert -> Text Annotation. Click on the end of the line (you'll get a pointing finger) to move the line. Click on the box end of the line to move the box.

Copy the graphs into a Google Doc for your lab writeup. *One writeup per group.* One way to do this:

Edit -> Select All. Copy the graphs.

Open Paint. Paste the graph into Paint.

Save the graph in a file on your desktop. (JPG is a good file type.)

In Google docs, choose Insert > Image and browse for the saved file.

Name your graphs with the Scenario # right away! They will all look the same to you later.

When you're finished:

- Exit Logger Pro. Don't save files on the computer. Don't save changes.
- Shut down the laptop.

DO NOT SAVE ANY WORK IN LOGGER PRO!