PASPort™

Acceleration Sensor

PS-2119



LED button for changing the sensor response rate

Sensor Specifications:	
Sensor Range:	+/- 10 g
Accuracy:	+/- 1 % of full scale
Resolution:	0.010 g
Frequency Response:	6 Hz (slow), 25 Hz (fast)
Default Sample Rate:	10 samples/sec
Maximum Sample Rate:	500 samples/sec

Acceleration Quick Start

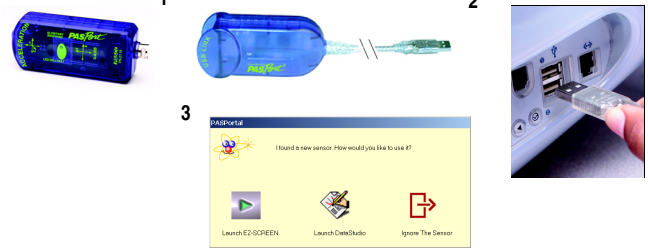
The PS-2119 Acceleration Sensor measures acceleration in three axes: x, y, and z.

Additional Equipment Needed

- USB Link (PS-2100) with USB-compatible computer or Xplorer (PS-2000) EZscreen or DataStudio® software (version 1.6.2 or later)

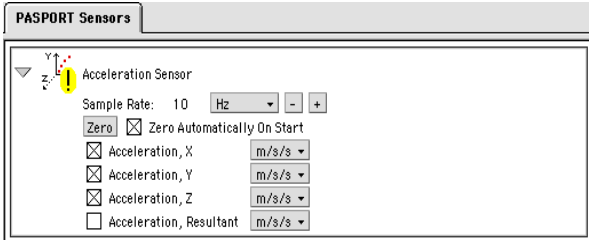
Equipment Setup

1. Connect the sensor to a USB Link or an Xplorer.
2. Connect the USB Link or Xplorer cable to a USB port on your computer or a USB hub.
3. The software launches when it detects a PASPORT™ sensor. Select **EZscreen** or **DataStudio**.



Using the PS-2119 Acceleration Sensor

The PASPORT™ PS-2119 Acceleration Sensor will automatically zero when you click the **Start** button in DataStudio. This allows students to place the sensor in their appropriate orientation for their experiment and measure acceleration from their frame of reference without having to manually zero the sensor. You can also disable this feature by deselecting the "Zero Automatically on Start" box, which is located in the PASPORT Setup window. The zero feature will affect all axes.



Additionally, the **Zero** button in the Setup window can be used to *manually zero* the sensor, if desired. To reverse the effect of zeroing the sensor, you must exit the current experiment and start a new experiment. (i.e. From the File menu, select "New Experiment.")

To display the z-axis acceleration, select "Acceleration, Z" in the setup window. The resultant acceleration is the magnitude of the vector sum for the x, y, and z accelerations.

Note: The response rate button on the sensor is used for experiments in which the acceleration changes quickly. Pressing the button illuminates the LED and enables the fast response mode. Pressing the button again returns to the slow response setting.

Acceleration Activity

EZscreen Activity

1. To take basic acceleration measurements in your classroom, click **EZscreen** in the PASPORTAL window.
2. In the lower right corner of the EZscreen, click the Acceleration Sensor icon to cycle through the different measurements.
3. Click the **Start** button once to begin taking measurements and again to stop.

DataStudio Activity-Acceleration on Incline

1. Using the PASPORT extension cable, plug the Acceleration Sensor into the USB Link or an Xplorer.
2. Mount the Acceleration Sensor to a Dynamics Cart, PAScar, or GOcar, using the included bracket.
3. Place the car on a Dynamics Track that has been inclined at some angle.
4. In EZscreen or DataStudio, click the **Start** button and allow the car to roll down the track.
5. When the car approaches the end of the track, click the **Stop** button. Have a lab partner at the end of the track ready to catch the car.
6. Repeat steps 3-5 two more times.
7. Looking at the acceleration-time graph, describe the acceleration of the car as it rolls down the track.
8. Average the acceleration values from the data runs and compare to the theoretical value for the angle you chose.
9. (Optional): Change the angle of the track and repeat the experiment to determine the effect of angle on the acceleration of the car.

Note: To measure the track angle, place an angle indicator in the top groove of the track. To order an angle indicator from PASCO, use part no. ME-9495.