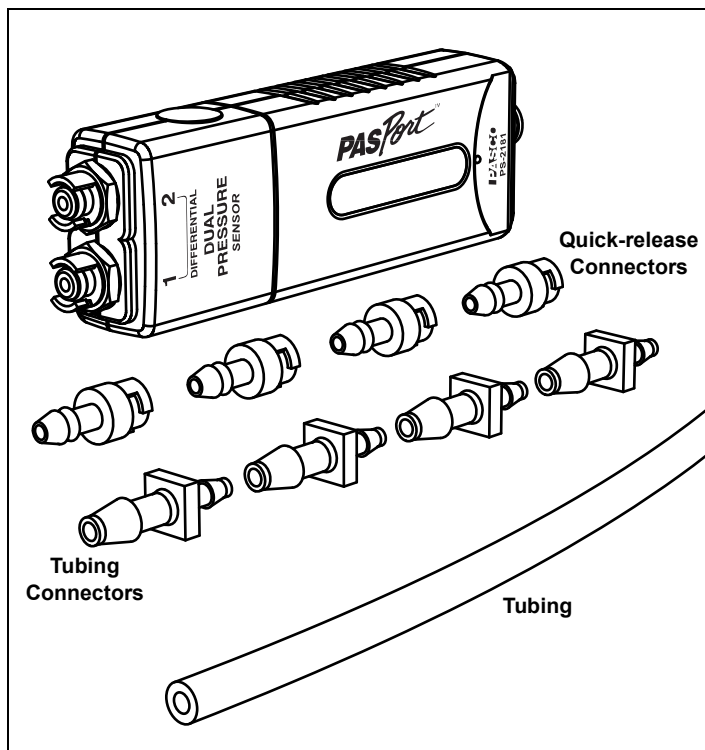


# Dual Pressure Sensor

PS-2181



## Quick Start

1. Connect the Dual Pressure Sensor to your PASPORT interface.
2. If you are using a computer, connect the PASPORT interface to it and start the PASCO Data Collection Software.
3. Use the included tubing and quick-release connectors to connect a device to one or both of the sensor's pressure ports.
4. Press or click the Start button to begin recording data.

## Introduction

The Dual Pressure Sensor is capable of reading up to two absolute pressures, one differential pressure, or one gauge pressure. Dynamic variable over-sampling automatically reduces measurement noise at low sampling rates. Sample rates up to 1000 Hz make studies of both transient and steady-state pressure possible. The sensor measures pressure in units of kilopascal (kPa), newtons per square meter ( $N/m^2$ ), and pounds per square inch (psi).

## Setup

### Types of Pressure Measurements

To measure pressure in an apparatus, connect one or both of the pressure ports using the included tubing and connectors. The way that you connect the Dual Pressure Sensor depends on whether you will measure absolute pressure, differential pressure, or gauge pressure.

**Absolute Pressure** The sensor can measure up to two absolute pressures simultaneously. One connection is required for each measurement, and either of the pressure ports may be used.

**Differential Pressure** The sensor measures differential pressure by determining the pressure difference between ports 1 and 2. Differential Pressure is positive when the pressure in port 1 is higher than port 2. (See

### Included Equipment

- Dual Pressure Sensor (PS-2181)
- Quick-release Connectors (4 pieces)
- Tubing Connectors (4 pieces)
- Polyurethane Tubing (length 2.4 m)

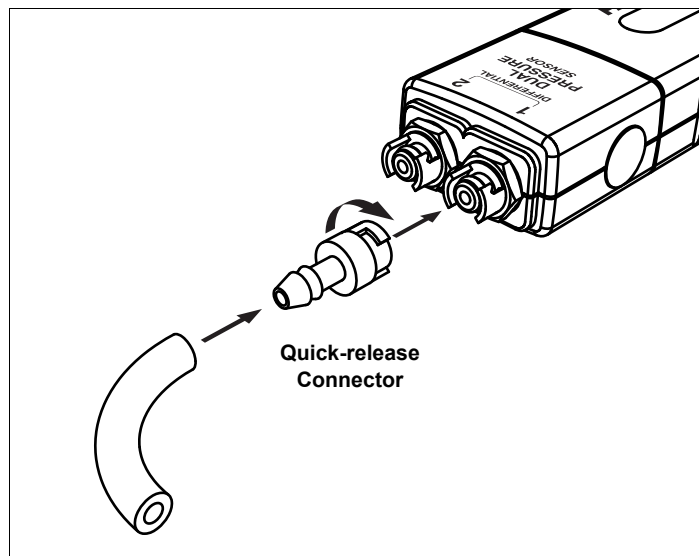
### Required Equipment

- PASPORT Interface and Data Collection Software  
(See PASCO Catalog or [www.pasco.com](http://www.pasco.com))

“Software Setup” on page 2 for instructions on making this measurement available.)

**Gauge Pressure** Gauge pressure is a special case of differential pressure in which port 2 is left unconnected. The sensor measures the pressure difference between port 1 (connected to the apparatus) and port 2 (left open to the atmosphere).

## Sensor Setup



1. Cut a piece (or pieces) of tubing to the desired length.
2. Insert a quick-release connector into each piece of tubing.
3. Connect each piece of tubing to the sensor by inserting the quick-release connector into one of the pressure ports and twisting clockwise.
4. Connect the free ends of the tubing to the apparatus using connectors supplied with the apparatus or the tubing connectors include with the Dual Pressure Sensor.

You can use the included tubing connectors to connect to a 5 mm ( $\frac{3}{16}$  inch) hole in a rubber stopper.

5. Connect the sensor to your PASPORT interface. Connect the interface to your computer.

### CAUTION:

- The sensor was not designed for use in liquids,

## Software Help

NOTE: See the SPARKvue Help or PASCO Capstone Help for information about collecting, displaying, and analyzing data.

In SPARKvue, select the HELP button in any screen including the Home Screen.

In PASCO Capstone, select PASCO Capstone Help from the Help menu, or press F1.

## Software Setup

In PASCO Capstone, set up a data display (such as a Digits or Graph display). Click one of the display templates in the workbook page, or double-click an icon in the “Displays” palette to open a data display. Use the “Select Measurement” menus to select the measurement for the display.

In the SPARKvue Home Screen, select one of the measurements to open a Graph display of that measurement versus time.

Click “Record” in Capstone or touch the “Start” button in SPARKvue to begin recording data.

## One-point and Two-point Calibrations

Though it is usually not necessary, a one-point or two-point calibration can be performed on any of the measurements to make them more accurate. To do so, you must have a very accurate, independent means of measuring pressure such as a barometer. For step-by-step instructions refer to the documentation for the PASCO software.

## Over-sampling

The Dual Pressure Sensor uses dynamic variable over-sampling to reduce noise, produce smoother data, and improve the measurement resolution. This effect is especially noticeable when very small pressure changes or differences are measured. The degree of dynamic variable over-sampling that takes place within the sensor depends on the sample rate. To maximize the over-sampling, set the sample rate as low as possible for a given application. Maximum over-sampling occurs at sample rates of 1 Hz or slower.

## Specifications

<b>Range</b>	Absolute pressure: 20 to 200 kPa Differential pressure: -180 kPa to +180 kPa
<b>Resolution</b>	0.01 kPa at 10 Hz
<b>Repeatability</b>	1 kPa
<b>Units of Measure</b>	kPa, N/m <sup>2</sup> , psi
<b>Max. Sample Rate</b>	1000 Hz
<b>Included tubing</b>	Material: polyurethane Inside diameter: 3.2 mm ( $\frac{1}{8}$ inch) Length: 2.4 m (8 feet)

## Technical Support

For assistance with any PASCO product, contact PASCO at:

Address: PASCO scientific  
10101 Foothills Blvd.  
Roseville, CA 95747-7100

Phone: 916-462-8384 (worldwide)  
800-772-8700 (U.S.)

Web: [www.pasco.com](http://www.pasco.com)

Email: [support@pasco.com](mailto:support@pasco.com)

### Limited Warranty

For a description of the product warranty, see the PASCO catalog.

### Copyright

The PASCO scientific *Instruction Sheet* is copyrighted with all rights reserved. Permission is granted to non-profit educational institutions for reproduction of any part of this manual, providing the reproductions are used only in their laboratories and classrooms, and are not sold for profit. Reproduction under any other circumstances, without the written consent of PASCO scientific, is prohibited. Revised 06/2018.

### Trademarks

PASCO, PASCO scientific, PASPORT, PASCO Capstone, and SPARKvue are trademarks or registered trademarks of PASCO scientific, in the United States and/or in other countries. All other brands, products, or service names are or may be trademarks or service marks of, and are used to identify, products or services of, their respective owners. For more information visit [www.pasco.com/legal](http://www.pasco.com/legal).

### Product End of Life Disposal Instructions:

This electronic product is subject to disposal and recycling regulations that vary by country and region. It is your responsibility to recycle your electronic equipment per your local environmental laws and regulations to ensure that it will be recycled in a manner that protects human health and the environment. To find out where you can drop off your waste equipment for recycling, please contact your local waste recycle/disposal service, or the place where you purchased the product.

The European Union WEEE (Waste Electronic and Electrical Equipment) symbol (to the right) and on the product or its packaging indicates that this product must not be disposed of in a standard waste container.

