

# Conductivity Sensor

PS-2116A



## Sensor Specifications

<b>Sensor Ranges:</b>	0–1000 $\mu\text{S}/\text{cm}$
	0–10,000 $\mu\text{S}/\text{cm}$
	0–100,000 $\mu\text{S}/\text{cm}$
<b>Accuracy:</b>	$\pm 10\%$ of full scale for all ranges
<b>Resolution:</b>	0.1% or better
<b>Maximum Sample Rate:</b>	20 samples per second
<b>Default Sample Rate:</b>	2 samples per second
<b>Operating Temperature:</b>	0–50°C

## Conductivity Quick Start

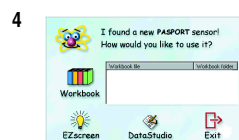
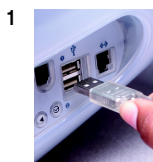
The PS-2116A Conductivity Sensor measures the conductivity of ionic and non-ionic molecules of aqueous solutions.

### Additional Equipment Needed

- PASPORT™ interface (USB Link, **Xplorer**, PowerLink, etc.)
- EZscreen or DataStudio® software (version 1.6 or later)

### Equipment Setup

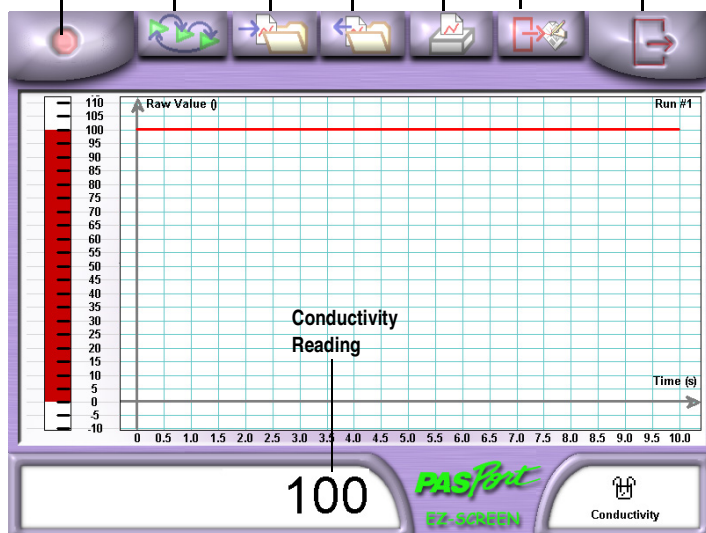
- Connect the PASPORT interface to a USB port on your computer or to a USB hub.
- Connect the Conductivity Sensor probe to the sensor box.
- Connect the sensor to a PASPORT interface.
- The software launches when it detects a PASPORT sensor. From the PASPORTAL screen, select a point of entry.



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Click the Start Button to Record Data    Toggle Data Runs    Save Data    Open Data    Print Graph    Exit to DataStudio    Quit EZscreen



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## Conductivity Activity

To take a measurement of the conductivity of tap water:

- Click **EZscreen** in the PASPORTAL window.
- Place the probe in tap water.
- Click the **Start** button to record data.

EZscreen Task:	Procedure:
<b>Record data:</b>	Click the <b>Start</b> button on the top of the screen. You can record data for up to two hours.
<b>Scale to fit the data:</b>	Double-click the Graph to scale the data.
<b>Export data to DataStudio:</b>	Click the <b>Exit to DataStudio</b> button.

# Setup and Calibration

## DataStudio Calibration

**Equipment required:** PASPORT Conductivity Sensor (PS-2116A), standard solution (with conductivity value close to the test sample), DataStudio software

**Perform a single-point calibration using the DataStudio software:**

1. In the PASPORT Setup window, click the **Calibrate** button next to the  $\mu\text{S}/\text{cm}$  units.
2. Enter the known conductivity value of the standard solution in the text box.
3. Place the Conductivity Sensor in the standard sample.
4. Click the **Set** button.
5. Click the **OK** button.

## PASPORT Xplorer Calibration

**Equipment required:** PASPORT Conductivity Sensor (PS-2116A), standard solution (with conductivity value close to the test sample), PASPORT Xplorer

1. Turn on the **Xplorer** and plug in a sensor.
2. Press the **Display** button until the calibrate screen appears.
3. Press the **Check** button.
4. Press the **Tab** button to move through the digits.
5. Use the **Plus (+)** or **Minus (-)** buttons to change the digit value until the display matches the value of the selected standard sample.
6. Place the Conductivity Sensor in the standard sample.
7. Press the **Check** button.

## Conductivity Information

The Conductivity Sensor is extremely sensitive. A reading  $25 \mu\text{S}/\text{cm}$  for a sample of pure water is well within tolerances. Pure water is difficult to find in a typical classroom setting. Over time, the container itself can contaminate samples. To make meaningful judgements based on conductivity readings, it is essential to understand the scale and range of this measurement.

### Conductivity Values for Common Aqueous Solutions at 25°C

Solution	Value
Ultra-Pure Water	0.05-0.75 $\mu\text{S}/\text{cm}$
Drinking Water	50-1500 $\mu\text{S}/\text{cm}$
Ocean Water	53,000 $\mu\text{S}/\text{cm}$

### Relationship between Conductivity and Total Dissolved Solids (TDS)

As a rule of thumb, for estimating TDS in parts per million, divide the conductivity measurement by 2:

$$\text{TDS}(\text{ppm}) = \frac{\text{Conductivity}((\mu\text{S})/(\text{cm}))}{2}$$

For more information on how temperature influences conductivity, see PASCO's web site ([www.pasco.com](http://www.pasco.com)).

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## Range Selection

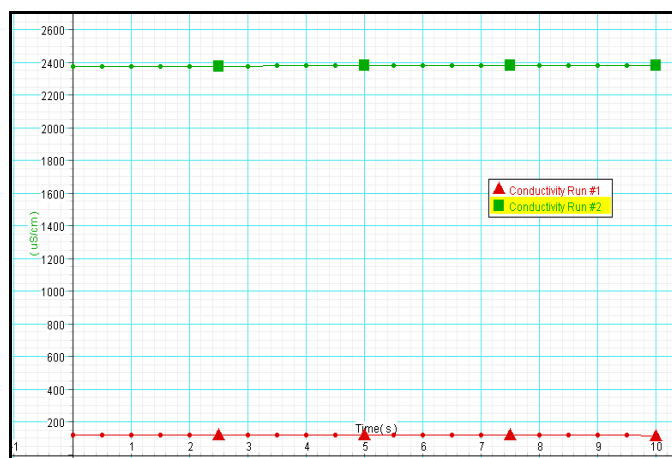
To select a range, press one of the three buttons on the sensor. The button of the selected range illuminates steadily.

To help you choose the appropriate range, the sensor continuously monitors conductivity (even if data is not being recorded) and detects when the conductivity input is too high for the selected range. When this occurs, the button for the next higher range flashes. Press the flashing button to select the proper range.

## DataStudio Activity

In this activity, you will take measurements of the conductivity of tap water and "polluted" water.

1. Select **DataStudio** from the PASPORTAL Window.
2. Place the probe in the tap water.
3. Click the **Start** button to record conductivity data (Run #1).
4. Click the **Stop** button to end Run#1.
5. Rinse the probe with distilled or deionized water.
6. Place the probe in the "polluted" water.
7. Click the **Start** button to record conductivity data (Run#2).
8. Click the **Stop** button to end Run#2.



Conductivity in Tap Water (Run#1) vs. Polluted Water (Run#2)