Charge Sensor

PS-2132

Zero button

Sensor Specifications:

Sensor Range:	$\pm\ 0.1\ \mu C$ or ± 10 V
Resolution:	500 μV, 5.0 pC
Input Resistance:	10^{12} ohms
Input Capacitance:	0.01 μF $\pm$ 5%
Input Cable:	0.9 m length, shielded
Maximum Input Voltage:	$\pm$150 volts dc, continuous

The PS-2132 Charge Sensor measures charge (in Coulombs) and voltage (in volts).
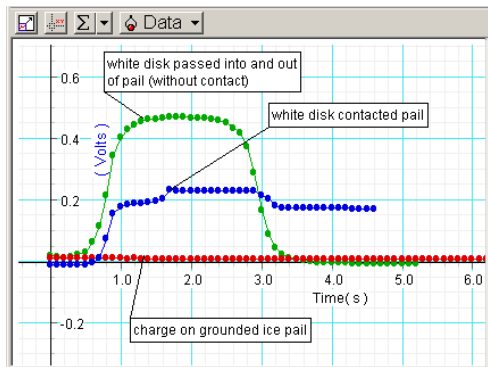
Additional Equipment Needed

- PASPORT™ USB interface [USB Link (PS-2100), **Xplorer** (PS-2000), or a Power-Link (PS-2001)]
- EZscreen or DataStudio® software (version 1.7.2 or later)

Equipment Setup

1. Connect the PASPORT interface to a USB port on your computer or to a USB hub.
2. Connect the input cable to the receptacle on the Charge Sensor.
3. Connect the 9-pin connector on the Charge Sensor to a PASPORT interface.
4. The software launches when it detects a PASPORT sensor. Select a choice from the PASPORTAL window.

Induction vs. Contact Charges with Charge Producers and a Faraday Ice Pail

DataStudio/DS Lite Task	Procedure
Record the charge:	On the main toolbar, click the **Start** button (► Start).
View the charge reading:	From the Data list, drag the **Charge icon** (˙Q₋) to an open display.
Change measurement units:	Click on the **Setup** button (═ Setup) to open the setup window. Click on the Maximize button and scroll to the Charge Sensor options. Click to place a check in the box next to the desired units (Coulombs or volts).
Rescale to fit the data:	On the display, click the **Scale-to-Fit** button (🔲).

Equipment required: Charge Sensor (PS-2132), Charge Producers (ES-9057B), Faraday Ice Pail (ES-9042A)

1. Place the Charge Sensor and Faraday Ice Pail on a non-conductive surface.
2. Connect the Charge Sensor to a PASPORT interface.
3. Connect the black lead of the Charge Sensor to the outer shield of the Faraday Ice Pail and the red lead to the inner ice pail.
4. Click the **Start** button to take a reading of the voltage across the ice pail. Zero the sensor by pressing the **Zero** button.
5. Rub the faces of the Charge Producers together.
6. Take a data run for each of the following cases: a) Pass the white disk in and out of the inner pail, without touching the disk to the pail. b) Contact the bottom of the pail with the white disk, then remove it without touching the pail. c) Repeat steps 6a and 6b with the blue disk.
7. For each case, explain what causes the change in charge measurements.

Collecting Data with the Charge Sensor

1. Connect the input cable to the receptacle on the Charge Sensor.
2. Connect the Charge Sensor to a PASPORT interface (USB Link, Xplorer, etc.)
3. Connect the black lead to the ground or negative source and the red lead to the charged source.
4. If necessary, click the **Zero** button to zero the sensor and/or remove any residual charge.
5. In your software or Xplorer, click the **Start** button to collect data. (To stop data collection, click the **Stop** button.)