

Wireless Voltage Sensor

PS-3211A

Introduction

The Wireless Voltage Sensor is a combination wireless and USB sensor that connects to a computer or tablet device via Bluetooth, and can also connect to a computer via the included USB cable. The sensor measures voltage in the range between -30 volts (V) and +30 V. The sensor features built-in overload protection.

NOTE: The maximum voltage range of the sensor can be changed in PASCO Capstone or SPARKvue to a range of -5 V to +5 V, allowing for greater precision of measurements. For more information, see the SPARKvue and Capstone online help.

PASCO Capstone or SPARKvue display and analyze the measurements from the sensor. The sensor also supports remote data logging for long-term experiments.

The sensor is designed to optimize the battery usage time. Since each sensor has a unique device ID number, more than one can be connected to a computer or tablet at the same time.

Components

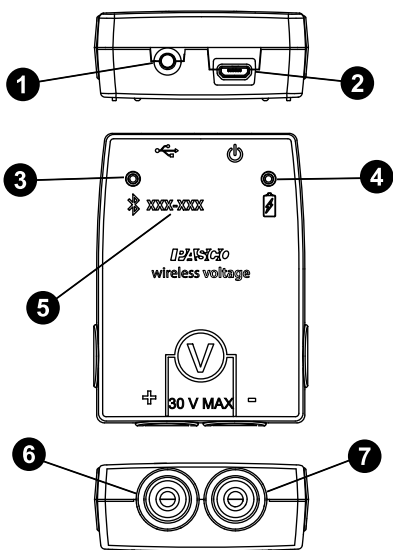
Included equipment:

- Wireless Voltage Sensor (PS-3211A)
- Micro USB cable (1 m)
- Test leads, shrouded (red and black)

Required software:

- PASCO Capstone or SPARKvue data collection software

Features



1 ON/OFF button

Press to turn the sensor on. Press and briefly hold to turn the sensor off. To preserve battery, the sensor is designed to turn itself off automatically after several minutes of inactivity if not connected.

2 Micro USB port

Use with the included micro USB cable to connect the sensor to a USB charger. The port and cable can also be used to directly connect the sensor to a computer without the use of Bluetooth. This connection method is not supported by iOS.

3 Bluetooth Status LED

Indicates the status of the sensor's Bluetooth connection.

| LED | Status |
|--------------|-----------------------|
| Red blink | Ready to pair |
| Green blink | Connected |
| Yellow blink | Remotely logging data |

For information on remote data logging, see the PASCO Capstone or SPARKvue online help.

NOTE: The Bluetooth Status LED is disabled when the sensor is connected to a computer via USB.

4 Battery Status LED

Indicates the battery level and charging status of the sensor.

| Battery LED | Status |
|-------------|---------------|
| Red blink | Low battery |
| Yellow ON | Charging |
| Green ON | Fully charged |

5 Device ID number

Use to identify the sensor when connecting via Bluetooth.

6 Red test lead jack

Connect the red test lead from this port to a point of higher potential in the circuit.

7 Black test lead jack

Connect the black test lead from this port to a point of lower potential in the circuit.

Initial step: Charge the battery

Charge the battery by connecting the micro USB port to any standard USB charger. The Battery Status LED is solid yellow while charging. When fully charged, the LED changes to solid green.



Get the software


You can use the sensor with SPARKvue or PASCO Capstone software. If you're not sure which to use, visit [pasco.com/products/guides/software-comparison](https://www.pasco.com/products/guides/software-comparison).

SPARKvue is available as a free app for Chromebook, iOS, and Android devices. We offer a free trial of SPARKvue and Capstone for

Windows and Mac. To get the software, go to [pasco.com/downloads](https://www.pasco.com/downloads) or search for **SPARKvue** in your device's app store.

If you have installed the software previously, check that you have the latest update:

 **SPARKvue:** Main Menu  > Check for Updates

 **PASCO Capstone:** Help > Check for Updates

Check for a firmware update

SPARKvue

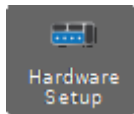
1. Press the power button until the LEDs turn on.
2. Open SPARKvue, then select **Sensor Data** on the Welcome Screen.



3. From the list of available devices, select the sensor that matches your sensor's device ID.
4. A notification will appear if a firmware update is available. Click **Yes** to update the firmware.
5. Close SPARKvue once the update is complete.

PASCO Capstone

1. Press the power button until the LEDs turn on.
2. Open PASCO Capstone and click **Hardware Setup** from the Tools palette.



3. From the list of available wireless devices, select the sensor that matches your sensor's device ID.
4. A notification will appear if a firmware update is available. Click **Yes** to update the firmware.
5. Close Capstone once the update is complete.

Set up the software

Connect the test leads to the sensor

- Connect the boot-shaped shrouded end of the red test lead to the red test lead jack on the sensor.
- Connect the boot-shaped shrouded end of the black test lead to the black test lead jack on the sensor.

Connect the sensor for measurement

Voltage is measured from one point to another point. A common use of the sensor is to measure the voltage "across" a component in a circuit. The sensor should be connected in parallel to the circuit, **not** in series as part of the circuit.

For example, in Figure 1, the alligator clip of a red shrouded test lead is connected to one end of a light bulb that is in a circuit with a battery. The alligator clip of the black test lead is connected to the other end of the light bulb. The Wireless Voltage Sensor will measure the "voltage

drop" across the bulb. The red test lead should be connected to the side closer to the high potential source, and the black test lead should be connected to the side closer to the low potential source, as shown in Figure 2.

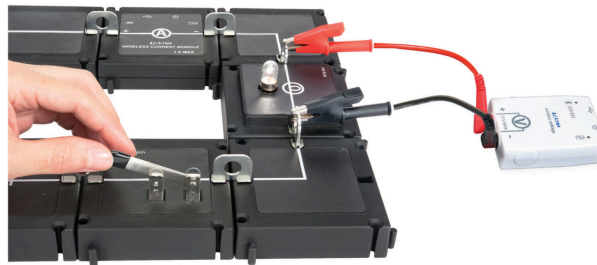


Figure 1: The Wireless Voltage Sensor connected in parallel to a circuit.

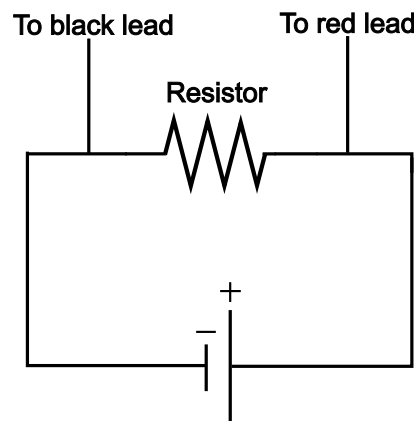


Figure 2: A simple circuit diagram, showing how the Wireless Voltage Sensor should be connected.

Set up the software

SPARKvue


Connecting the sensor to a tablet or computer via Bluetooth:

1. Turn on the Wireless Voltage Sensor. Check to make sure the Bluetooth Status LED is blinking red.
2. Open SPARKvue, then click **Sensor Data**.
3. From the list of available wireless devices on the left, select the sensor with a device ID matching the ID printed on your sensor.

Connecting the sensor to a computer via micro USB cable:


1. Open SPARKvue, then click **Sensor Data**.
2. Connect the provided micro USB cable from the micro USB port on the sensor to a USB port or powered USB hub connected to the computer. The sensor should automatically connect to SPARKvue.

Collecting data using SPARKvue:


1. Select the measurement you intend to record from the **Select measurements for templates** column by clicking the check box next to the relevant measurement's name.
2. Click **Graph** in the **Templates** column to open the Experiment Screen. The graph's axes will auto-populate with the selected measurement versus time.
3. Click **Start**  to begin collecting data.

PASCO Capstone



Connecting the sensor to a computer via Bluetooth:

1. Turn on the Wireless Voltage Sensor. Check to make sure the Bluetooth Status LED is blinking red.
2. Open PASCO Capstone, then click **Hardware Setup**  in the **Tools** palette.
3. From the list of **Available Wireless Devices**, select the sensor with a device ID matching the ID printed on your sensor.

Connecting the sensor to a computer via micro USB cable:

1. Open PASCO Capstone. If desired, click **Hardware Setup**  to check the connection status of the sensor.
2. Connect the provided micro USB cable from the micro USB port on the sensor to a USB port or powered USB hub connected to the computer. The sensor should automatically connect to Capstone.

Collecting data using Capstone:

1. Double-click the **Graph**  icon in the **Displays** palette to create a new blank graph display.
2. In the graph display, click the **<Select Measurement>** box on the y-axis and select an appropriate measurement from the list. The x-axis will automatically adjust to measure time.
3. Click **Record**  to begin collecting data.

Troubleshooting

- If the sensor loses Bluetooth connection and will not reconnect, try cycling the ON button. Press and briefly *hold* the button until the LEDs blink in sequence, then release the button.
- If the sensor stops communicating with the computer software or tablet application, try restarting the software or application. If the problem persists, press and *hold* the ON button for 10 seconds, then release the button and start the sensor in the usual way.
- If the above steps do not fix a connection problem, turn Bluetooth off and then back on for your computer or tablet, then retry.

Software help

The SPARKvue and PASCO Capstone Help provide information on how to use this product with the software. You can access the help from within the software or online.

SPARKvue

Software: Main Menu > Help

Online: help.pasco.com/sparkvue

PASCO Capstone

Software: Help > PASCO Capstone Help

Online: help.pasco.com/capstone

Specifications and accessories

Visit the product page at pasco.com/product/PS-3211A to view the specifications and explore accessories. You can also download experiment files and support documents from the product page.

Experiment files

Download one of several student-ready activities from the PASCO Experiment Library. Experiments include editable student handouts and teacher notes. Visit pasco.com/freelabs/PS-3211.

Technical support

Need more help? Our knowledgeable and friendly Technical Support staff is ready to answer your questions or walk you through any issues.

-  Chat pasco.com
-  Phone 1-800-772-8700 x1004 (USA)
+1 916 462 8384 (outside USA)
-  Email support@pasco.com

Replacement parts

Contact Technical Support for information about the following possible replacement parts:

- USB Cable, Micro-to-USB A
- Shrouded Test Leads (Red/Black)

Limited warranty

For a description of the product warranty, see the Warranty and Returns page at www.pasco.com/legal.

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Product end-of-life disposal



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 or disposal service, or the place where you purchased the product. The European Union WEEE (Waste Electronic and Electrical Equipment) symbol on the product or its packaging indicates that this product must not be disposed of in a standard waste container.

CE statement

This device has been tested and found to comply with the essential requirements and other relevant provisions of the applicable EU Directives.

FCC statement

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Battery disposal



Batteries contain chemicals that, if released, may affect the environment and human health. Batteries should be collected separately for recycling and recycled at a local hazardous material disposal location adhering to your country and local government regulations. To find out where you can drop off your waste battery for recycling, please contact your local waste disposal service, or the product representative. The battery used in this product is marked with the European Union symbol for waste batteries to indicate the need for the separate collection and recycling of batteries.