Wireless Air Quality Sensor
PS-3226

Introduction

The Wireless Air Quality Sensor is designed to measure a variety of quantities associated with the air in its vicinity, including temperature, humidity, and the concentration of various gases and particulate substances. A fan inside the sensor pulls air in through the holes on the top surface of the sensor. This air is then run through a variety of sensing instruments before being expelled through the exhaust holes. (See below.) Measurements from the sensor can be read, displayed, and analyzed using PASCO Capstone or SPARKvue software.

> 🖉 **NOTE:** *Always* keep the air intake and exhaust holes clear and unblocked while the sensor is operating.
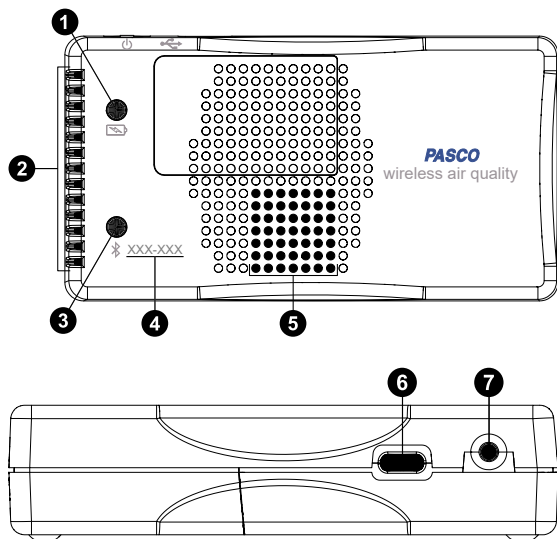
Components

Included components:

- Wireless Air Quality Sensor
- USB-C cable

Required software:

- PASCO Capstone or SPARKvue data collection software

Features

1 Battery Status LED

Indicates the charging status of the sensor's battery.

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

2 Air exhaust holes

Air will exit the sensor here after passing through the internal sensing elements.

3 Bluetooth Status LED

Indicates the status of the sensor's Bluetooth connection.

LED	Status
Red blink	Ready to pair
Green blink	Paired
Yellow blink	Remotely logging data

See the PASCO Capstone or SPARKvue help site for information on remote data logging.

> 🖉 **NOTE:** The Bluetooth Status LED is disabled while the sensor is connected to a computer via USB.

4 Device ID

Use to identify the sensor when connecting via Bluetooth.

5 Air intake holes

Air is pulled into the sensor through here to be passed through the internal sensing elements.

6 USB-C port

Use to connect the sensor to a USB charger via the included USB-C cable. You can also use the port and cable to connect the sensor to a computing device without Bluetooth. (This connection method is not supported by iOS.)

7 ON/OFF button

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

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.

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 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.

Ozone sensor warm-up

Like many professional gas phase sensors, the ozone sensor requires start-up time before it can obtain stable measurements. At the beginning of the day, before using the ozone sensor, turn the device on and begin measuring for 20 minutes. Readings will remain stable for up to two hours between uses. Once the sensor is warmed up, you can zero the sensor to determine actual response values. Alternatively, if a warm-up time is not possible, you may obtain approximate measurements by subtracting the baseline value from the sensor reading.

Set up the software

⬚ **SPARKvue**

Connecting the sensor to a tablet or computer via Bluetooth:

1. Turn on the Wireless Air Quality 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 device which matches the device 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 USB-C cable from the USB-C 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 Air Quality 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**, click the device which matches the device 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 USB-C cable from the USB-C 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.

Quick Start Experiment

PASCO Capstone and SPARKvue also offer a Quick Start Experiment called "**Monitoring Air Quality**", which is available from the **Quick Start Experiments** column of the Sensor Data screen (⬚ SPARKvue) or from the main experiment window (◆ PASCO Capstone). When selected, this experiment automatically creates a set of digits displays monitoring each of the seven measurements of the Wireless Air Quality Sensor, as well as a graph display measuring Volatile Organic Compounds versus time.

> ✏ **NOTE:** SPARKvue can only show up to six displays at a time on a single experiment page. Therefore, the Relative Humidity digits display and the Volatile Organic Compounds graph display are located on a second page. To view this page, click the right arrow button at the top of the Experiment Screen.

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Measurements

The Wireless Air Quality Sensor measures the following quantities:

- **Temperature:** The ambient temperature of the air passing through the sensor. Measured in degrees Celsius (°C).

- **Relative Humidity:** The amount of water vapor in the air, in proportion to the maximum amount possible at the current temperature. Measured as a percentage.

- **O3 NOx:** The combined concentration of ozone and nitrous oxide in the air. Measured in parts per billion (ppb).

- **Volatile Organic Compounds:** The combined concentration of various carbon-based gases or evaporated solvents to which the human nose is sensitive, including paint solvents, unburned fuels, and glue. This measurement is a VOC index based on ethanol in clean air on a 0 to 1000 ppm scale. Since the instrument can vary in its response rate to other organic gases, this measurement is *not* necessarily a ppm indication of any other single organic gas being sensed.

- **Particulate Matter (1 µm):** The total density of ultrafine particles, such as soot or tobacco smoke, in the air passing through the sensor. Measured in micrograms per cubic meter ($\mu g/m^3$).

- **Particulate Matter (2.5 µm):** The total density of fine particles, such as oil smoke or haze, in the air passing through the sensor. Measured in micrograms per cubic meter ($\mu g/m^3$).

- **Particulate Matter (10 µm):** The total density of coarse particles, such as wind-blown dust, in the air passing through the sensor. Measured in micrograms per cubic meter ($\mu g/m^3$).

Replace the battery

The battery compartment is located on the back of the sensor, as shown below. If the battery needs to be replaced, you can do so using the 3.7V 1000mAh Replacement Lithium Battery (PS-3295). To install the new battery:

1. Use a Philips screwdriver to remove the screws from the battery door, then remove the door.

2. Unplug the old battery from the battery connector and remove the battery from the compartment.

3. Plug the replacement battery into the connector. Make sure the battery is properly positioned inside the compartment.

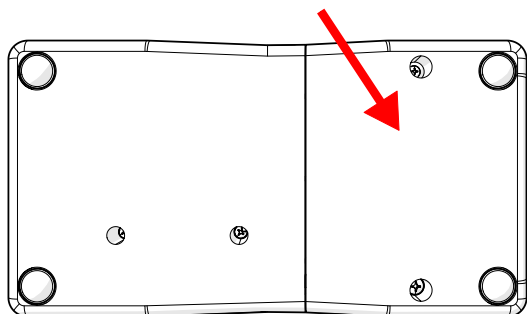4. Place the battery door back in place and secure it with the screws.

Figure 1: Location of battery door.

After replacing the battery, make sure to dispose of the old battery properly per your local laws and regulations.

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-3226 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-3226.

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

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.

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