Wireless Optical Dissolved Oxygen Sensor

PS-3246

Introduction

The Wireless Optical Dissolved Oxygen Sensor measures the concentration and saturation percentage of dissolved oxygen molecules in aqueous solutions. It also simultaneously measures temperature and oxygen gas concentration. The probe is waterproof to a depth equal to the length of the connective cable. The probe includes an O-ring, which can be adjusted to hold the sensor at a fixed depth when the probe is inserted into certain compatible apparatuses, such as the Photosynthesis Chamber (PS-3251) or the Electrode Support (PS-3505).

Equipment

Included items:



- 1 Wireless Optical Dissolved Oxygen Sensor
- 2 Probe
- **3** O-ring
- Transparent rubber boot with sponge
- 5 Micro USB cable

Required software:

• PASCO Capstone or SPARKvue data collection software

Sensor features



1 Device ID

Use to identify the sensor when connecting via Bluetooth.

2 Bluetooth Status LED

Indicates the status of the sensor's Bluetooth connection.

Bluetooth LED	Status
Red blink	Ready to pair
Green blink	Connected
Yellow blink	Logging data

For information on remote data logging, see the PASCO Capstone or SPARKvue online help. Note that this LED is connected to a computer via the micro USB cable.

3 Probe port

Connect the probe to this port when collecting data.

4 Micro USB port

To charge the battery, use the micro USB cable to connect the sensor to a USB wall charger via this port. Can also be used to send measurement data to the data collection software without Bluetooth when connected to a computer or mobile device via the cable. (This connection method is not supported by iOS.)

5 Power button

Press to turn the sensor on. Press and briefly hold to turn the sensor off.

6 Battery Status LED

Indicates the battery level and charging status.

Battery LED	Status
Red blink	Low power
Yellow ON	Charging
Green ON	Fully charged

Getting started

Charge the battery

The sensor should be charged before being used for the first time. 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 <u>pasco.com/products/guides/</u> <u>software-comparison</u>.

A browser-based version of SPARKvue is available for free on all platforms. We offer a free trial of SPARKvue and Capstone for Windows and Mac. To get the software, go to <u>pasco.com/downloads</u> 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** is 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** ^{eme} 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

SPARKvue

Connecting the sensor to a tablet or computer via Bluetooth:

- 1. Turn on the Wireless Optical Dissolved Oxygen 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.

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.
- 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. When you are ready, click **Start** to begin collecting data.

PASCO Capstone

Connecting the sensor to a computer via Bluetooth:

- 1. Turn on the Wireless Optical Dissolved Oxygen Sensor. Check to make sure the Bluetooth Status LED is blinking red.
- 2. Open PASCO Capstone, then click **Hardware Setup** ^[14] 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** ^{ima} to check the connection status of the sensor.
- 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** k icon in the **Displays** palette to create a new blank graph display.
- In the graph display, click the <Select Measurement> box on the y-axis and select an appropriate measurement from the list. The xaxis will automatically adjust to measure time.
- 3. When you are ready, click **Record (**) to begin collecting data.

Collecting data

Taking measurements

Once the sensor is connected to PASCO Capstone or SPARKvue, use the previous instructions to create a display measuring **DO**₂ **Concentration**. Remove the rubber boot to uncover the sensor cap. Place the probe into a water sample to a depth of at least one inch. (For best temperature compensation, fully immerse the stainless steel portion of the probe.) When you are ready, begin collecting data.

Measure oxygen gas concentration in air

The Wireless Optical Dissolved Oxygen Sensor was specifically designed to be used in water. However, reasonably good qualitative results may be obtained in air. Oxygen gas concentration in air is calculated by taking the DO_2 Saturation value from the sensor and multiplying it by 20.9%, which is the assumed partial pressure



contribution of O_2 in air. The best accuracy will be achieved in high humidity environments. Long-term measurements in dry air are not recommended, as this will dry out the probe sensor tip.

(!) **IMPORTANT:** Do NOT use the probe in environments where flammable, caustic, or corrosive gases are present.

To use the sensor in air, follow the same instructions for using the sensor in water, but select O_2 Gas Concentration as the measurement instead of DO₂ Concentration.

Calibration

The Wireless Optical Dissolved Oxygen Sensor is calibrated at the factory and does not need to be recalibrated under most circumstances. However, if needed, the sensor can be calibrated using one or two standards of known dissolved O_2 concentration. For more information on calibration, see the PASCO Capstone or SPARKvue online help.

Care and maintenance

The sensor cap will degrade over time with use. However, the working life of the sensor can be extended by keeping the cap clean and properly stored between uses.

Storage

Do not allow the sensor cap to dry out. When storing the sensor, moisten the sponge inside the rubber boot with distilled water, then cover the sensor cap with the boot. Gently push the rubber boot against the end of the probe to ensure that the sponge is in contact with the sensor cap. Do not store the probe in water, as doing so can cause algae growth on the probe.

Cleaning

To clean the sensor cap, rinse it with clean water and dry it with a lint-free cloth. A mild detergent may be used if necessary. *Do not* use alcohols or other organic solvents that may deteriorate the sensing layer.

Sensor cap replacement

If the probe is no longer responsive, the sensor cap may need to be replaced. The cap should also be replaced if it becomes cracked, scratched, or otherwise damaged. A Replacement Cap (PS-3250) can be purchased from PASCO. Contact Technical Support to determine whether a replacement sensor cap is needed.



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: <u>help.pasco.com/sparkvue</u>

left PASCO Capstone

Software: Help > PASCO Capstone Help

Online: help.pasco.com/capstone

PASCO®

Specifications and accessories

Visit the product page at <u>pasco.com/product/PS-3246</u> 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 <u>pasco.com/freelabs/PS-3246</u>.

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
Se Phone	1-800-772-8700 x1004 (USA) +1 916 462 8384 (outside USA)
⊠ _{Email}	support@pasco.com

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.