

Wireless Thermocouple

PS-4256

Introduction

The Wireless Thermocouple is used to measure temperatures in the range of -200°C to 1400°C . The sensor consists of a temperature probe and a sensor box which processes the data from this probe. The Wireless Thermocouple is compatible with PASCO's data collection software, which can be used to display and analyze collected data. In addition, the OLED display on the sensor box allows you to perform measurements without connecting the device to the software.

Equipment

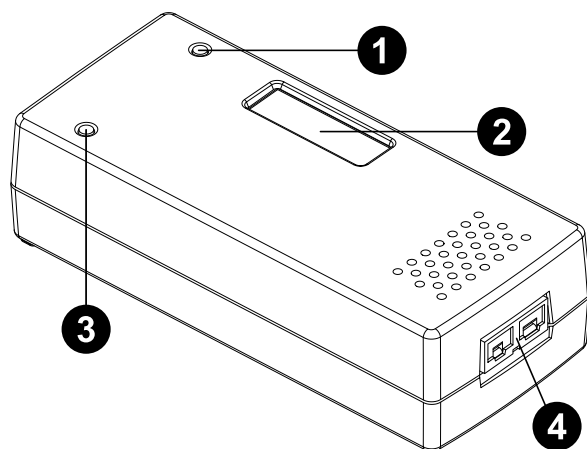
Included equipment:

- Sensor box
- Temperature probe
- USB-C cable

Recommended equipment:

- PASCO Capstone, SPARKvue, or Chemvue
- Round Base with Rod (ME-8270)
- Three-Finger Clamp (SE-9445)
- Calorimetry Cups, 2-Pack (TD-8872)

Features



1 Bluetooth Status LED

Indicates the status of the sensor's Bluetooth connection.

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

For more information about remote data logging, see the SPARKvue or Capstone online help. (Remote data logging is not available in Chemvue.)

2 OLED display

Displays the temperature measurement in degrees Celsius ($^{\circ}\text{C}$), degrees Fahrenheit ($^{\circ}\text{F}$), or Kelvin (K), refreshing at a constant rate of 2 Hz.

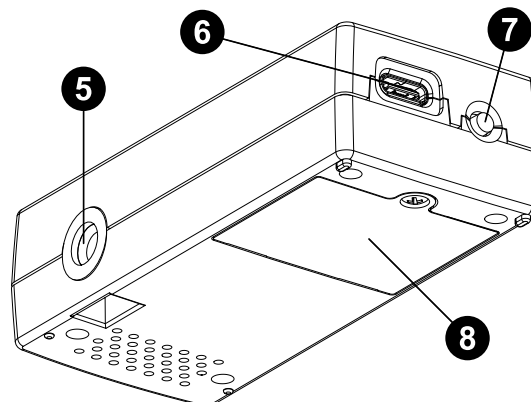
3 Battery Status LED

Indicates the charging status of the sensor's rechargeable battery.

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

4 Probe connection port

Use to connect the sensor box to the temperature probe.



5 Mounting hole

Use to mount the sensor to a $\frac{1}{4}$ -20 threaded mounting rod.

6 USB-C port

Use to connect the sensor to a standard USB charger. You can also use the port and cable to connect the sensor to the data collection software without the use of Bluetooth. (Note that this connection method is not available on iOS.)

7 Power button

Press and briefly hold to turn the sensor on or off. Press twice in quick succession to toggle the units of the OLED display's temperature measurement.

8 Battery door

Use to replace the sensor's rechargeable battery when necessary. (See **Battery replacement**.)

Initial step: Charge the battery

Charge the battery by connecting the USB-C 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, PASCO Capstone, or Chemvue software. If you're not sure which to use, visit [pasco.com/products/guides/software-comparison](https://www.pasco.com/products/guides/software-comparison).

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 [pasco.com/downloads](https://www.pasco.com/downloads) or search for **SPARKvue** or **Chemvue** 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

 **Chemvue:** See the download page.

Check for a firmware update

SPARKvue

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



3. From the list of available devices, select the sensor that matches the device ID printed on your sensor.
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.

Chemvue

1. Press the power button until the LEDs turn on.
2. Open Chemvue, then select the **Bluetooth**  button.
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 Chemvue once the update is complete.

Set up the hardware

To set up the Wireless Thermocouple for data collection, connect the temperature probe to the probe connection port on the sensor box. Note that the probe can only be inserted into the port in one orientation. When connecting the probe, make sure the positive prong is inserted into the left side of the port (when viewing the port head-on). The positive prong is indicated by its slightly narrower width and the + sign on its underside.

 **IMPORTANT:** When collecting data, only the tip of the temperature probe should be exposed to extreme temperatures. The sensor box is *not* designed to resist extremely hot or cold temperatures and should thus be kept away from flames or other extreme temperature sources.

Use the sensor without software

The OLED display on the sensor box displays the measurement from the temperature probe at all times, refreshing twice per second. This allows you to collect data without the use of software by observing the display. When you are ready to collect data, insert the tip of the temperature probe into the medium to be measured and observe the measurements on the OLED display.

By default, the OLED display measures temperature in units of degrees Celsius (°C). However, if desired, you can change the display units using the power button. Press the power button twice in quick succession to change the units from °C to degrees Fahrenheit (°F). From there, you can press the button twice more to change the units to Kelvin (K), and then twice more to return the units to °C. The display always cycles through the units in this order.

Use the sensor with software

SPARKvue

Connect the sensor to a tablet or computer via Bluetooth:

1. Turn on the Wireless Thermocouple. 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.

Connect the sensor to a computer via USB-C 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.

Collect data using SPARKvue:

1. Make sure the box for **Temperature** is checked in the **Select measurements for templates** column.
2. Select **Graph** in the **Templates** column to open the Experiment Screen. The graph's axes will auto-populate with temperature versus time.
3. Click **Start**  to begin collecting data.

PASCO Capstone

Connect the sensor to a computer via Bluetooth:

1. Turn on the Wireless Thermocouple. 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.

Connect the sensor to a computer via USB-C 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.

Collect 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 **Temperature** from the list. The x-axis will automatically adjust to measure time.
3. Click **Record**  to begin collecting data.

Chemvue

Connect the sensor to a computer via Bluetooth:

1. Turn on the Wireless Thermocouple. Check to make sure the Bluetooth Status LED is blinking red.
2. Open Chemvue, then click the **Bluetooth**  button at the top of the screen.
3. From the list of available wireless devices, click the device which matches the device ID printed on your sensor.

Connect the sensor to a computer via USB-C cable:

1. Open Chemvue. If desired, click the **Bluetooth**  button 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 Chemvue.

Collect data using Chemvue:

1. Open the **Graph**  display by selecting its icon from the navigation bar at the top of the page. The display will automatically be set to plot temperature versus time.
2. Click **Start**  to begin collecting data.

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 Wireless Sensor 300 mAh Replacement Battery (PS-3296). To install the new battery:

1. Use a small Phillips screwdriver to remove the screw 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 screw.

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

Software help

The SPARKvue, PASCO Capstone, and Chemvue 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

Chemvue

Software: Main Menu  > Help

Online: help.pasco.com/chemvue

Specifications and accessories

Visit the product page at pasco.com/product/PS-4256 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 student handouts and teacher notes. Visit pasco.com/freelabs/PS-4256.

Technical support

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

- 🌐 Web pasco.com/support
- 💬 Chat pasco.com
- ✉ Email support@pasco.com
- 📞 Phone 1-800-772-8700 x1004 (USA)
+1 916 462 8384 (outside USA)

Limited warranty

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

Copyright

This document is copyrighted with all rights reserved. Permission is granted to non-profit educational institutions for reproduction of any part of this manual, providing the reproductions are used only in their laboratories and classrooms, and are not sold for profit. Reproduction under any other circumstances, without the written consent of PASCO scientific, is prohibited.

Trademarks

PASCO and PASCO scientific are trademarks or registered trademarks of PASCO scientific, in the United States and in other countries. All other brands, products, or service names are or may be trademarks or service marks of, and are used to identify, products or services of, their respective owners. For more information visit www.pasco.com/legal.

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.