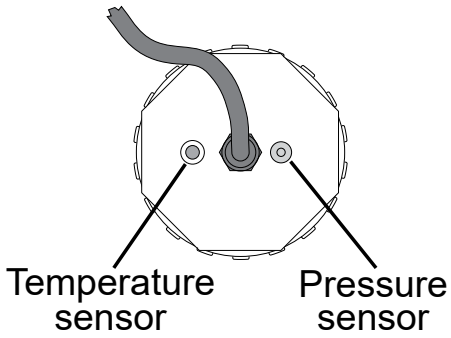
PASPORT Thermocline Sensor

PS-2151

Introduction

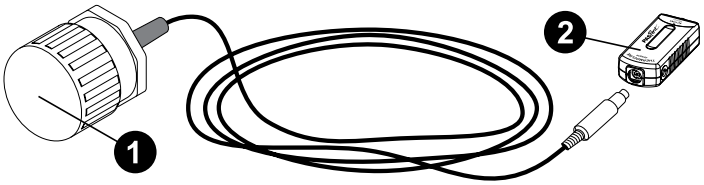
The PASPORT Thermocline Sensor allows students to study the relationship between depth and temperature in a body of water. The sensor head has two sensor built into a watertight housing: a depth sensor and a temperature sensor. The sensor has a 10 m cable with a connector that plugs into the amplifier box, which in turn is designed to plug into a PASPORT interface.



The depth sensor is a gauge-type pressure sensor with a stainless steel housing and a stainless steel diaphragm. The entire sensor head is designed to resist the corrosive effects of salt water.

Components

Included components:



1. Sensor head with 10 m cable
2. Sensor amplifier

Required equipment:

- PASCO Capstone or SPARKvue data collection software
- PASPORT interface, such as the SPARKlink Air (PS-2011) or the 550 Universal Interface (UI-5001)

> **NOTE:** Wireless PASPORT interfaces other than the SPARKlink Air are not recommended for use with the Thermocline Sensor, as the sensor is likely drain the battery quickly.

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

Operation

Hardware setup

1. Connect the cable attached to the Thermocline Sensor head to the sensor amplifier box.
2. Plug the sensor amplifier into a PASPORT port on your chosen interface.
3. Connect your interface to PASCO Capstone or SPARKvue. For more information on doing so, see the manual for the interface and the PASCO Capstone or SPARKvue online help. The software will automatically detect and recognize the Thermocline Sensor.
4. Create a display to measure depth, temperature, or both.

Usage

Begin data collection, then lower the sensor head into water. The temperature sensor takes a few seconds to respond to changes in temperature, so lower the sensor head slowly. For the most accurate measurement of temperature at a particular depth, hold the sensor still and wait until the reading has stabilized. You can also leave the sensor head in the water and record the changes in depth and temperature over time.

Calibration

The Thermocline Sensor is factory tested and calibrated, so manual calibration is not usually necessary. The depth-sensing element is calibrated for use in either fresh water or saltwater, and you can select either of these calibrations in the software. In SPARKvue, the measurements for both calibrations are visible from the start. In PASCO Capstone, the saltwater calibration measurement, "Depth (Saltwater) (m)", is hidden by default and must be made visible in the **Data Summary** tool. (For more information on doing this, see the PASCO Capstone online help.)

The reference pressure for the depth sensor is sealed into the PVC fitting. This reference pressure is the barometric pressure at the time and location that the sensor was built. If the local barometric pressure is different from the reference pressure, then a small offset error will occur where the depth reported by the sensor at the surface of the water will not be zero. In most cases this error is only a few centimeters and can be ignored in experiments. To remove the error, you can define a calculation in SPARKvue or PASCO Capstone to subtract the offset (as measured at the surface of the water) and use the calculation value instead of the raw data. See the online help for your chosen software for instructions on creating a calculation.

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-2151 to view the specifications and explore accessories. You can also download experiment files and support documents from the product page.

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

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.