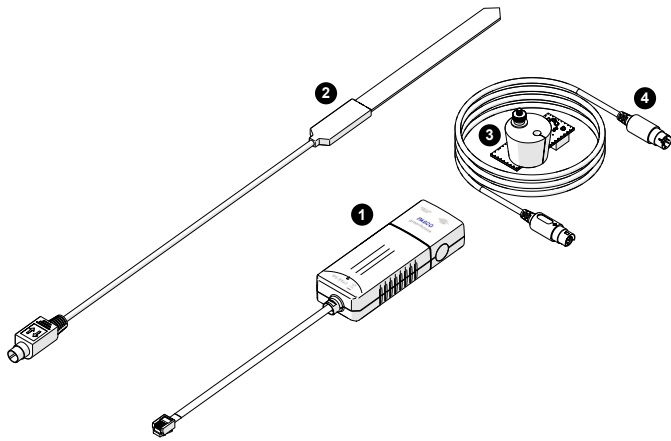


# Greenhouse Sensor

PS-3322

## What's included

**1 Greenhouse Sensor interface**

The interface includes two ports for connecting the soil moisture probe and the Greenhouse sensor module. Use the plug to connect the interface to the **Sensor** port on the //control.Node.

**2 Soil moisture probe**

The probe connects to the **MOISTURE** port on the Greenhouse sensor interface.

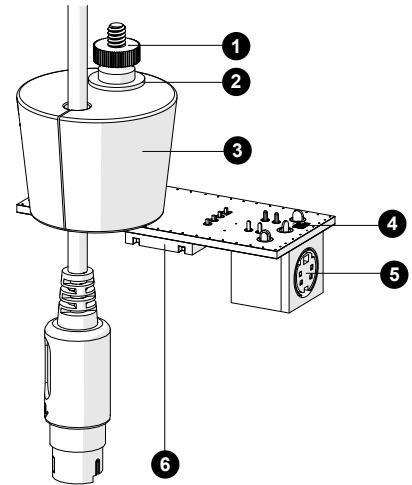
**3 Greenhouse Sensor module**

This module includes a temperature, humidity, and light sensor. Use the stopper to attach the module to the lid of an EcoChamber (ME-6667).

**4 Sensor module cable**

Use the cable to connect the Greenhouse Sensor module to the **LIGHT HUMIDITY TEMP** port on the Greenhouse Sensor interface.

## Greenhouse Sensor module parts

**1 Thumbscrew****2 Washer****3 Stopper****4 Light sensor****5 Sensor port****6 Humidity and temperature sensor**

## Getting started

### Required equipment

- //control.Node (PS-3232)
- EcoChamber (ME-6667)

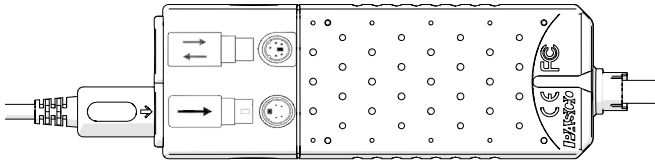
### Set up the sensor module

1. Insert the sensor module cable into the hole on the sensor module stopper as shown in the **Greenhouse Sensor module parts** section.

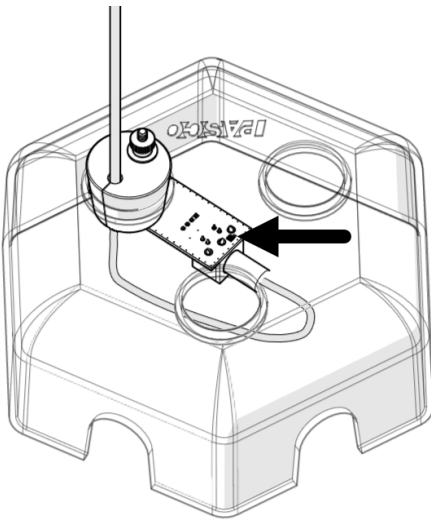
**Tip:** Insert a popsicle stick into the hole to help with creating a gap in the stopper hole.

2. Connect one end of the sensor module cable to the Greenhouse Sensor module. Connect the other end of the cable to the **LIGHT HUMIDITY TEMP** port on the Greenhouse sensor interface.

**Note:** Make sure that the arrow on the plug lines up with the image of the arrow on the interface.



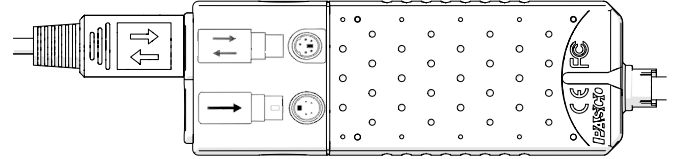
3. Remove the thumbscrew, washer, and stopper from the module.
4. Insert the board through the *top* of one of the holes on the EcoChamber lid then plug the hole with the stopper.
5. Insert the screw into the stopper then place the washer and thumbscrew on the screw attach the stopper to the board.
6. Rotate the board so that the light sensor is positioned near the center of the lid.



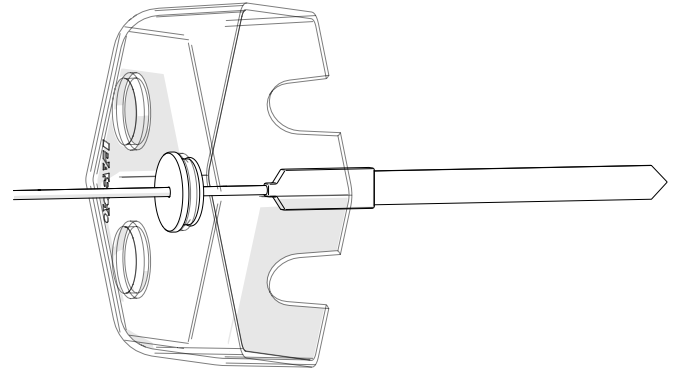
### Set up the soil moisture probe

1. Connect the soil moisture probe to the **MOISTURE** port on the Greenhouse sensor interface.

**Note:** Make sure that the arrows on the plug line up with the image of the arrows on the interface.



2. Insert the probe through the top of one of the holes on the lid.
3. Place a single, small hole stopper (included with the EcoChamber) around the probe cord.
4. Plug the hole with the stopper.



### Connect the //control.Node

1. Place the lid on the EcoChamber so that the sensors are inside the tank.
2. Connect the Greenhouse sensor interface to the **Sensor** port on the //control.Node.
3. Turn on the //control.Node and connect it to SPARKvue or PASCO Capstone software.

## Reading the measurements

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### Temperature and relative humidity

The bottom of the Greenhouse Sensor module board includes a combination temperature and humidity sensor. Temperature is measured on the Celsius, Fahrenheit, and Kelvin scales. Relative humidity is reported as a percentage representing the ratio of the partial pressure of water vapor to the saturated vapor pressure.

### Light

The top of the Greenhouse Sensor module board includes a light intensity sensor. The sensor needs to be positioned near the center of the EcoChamber lid to measure the light intensity provided by the PASCO Grow Light (PS-3347). Light intensity is reported as a relative percentage.

### Soil moisture

Soil moisture is measured in units of volumetric water content (VWC) percentage. Volumetric water content is the ratio of water volume per unit of soil volume. The sensor provides VWC measurements for three types of soil:

- **Clay**  
Use this measurement for soil that is smooth to the touch and easily compacted. This type of soil will be sticky and clump together when wet but crack as it dries.
- **Sand**  
Use this measurement for soil consisting of coarse and gritty particles.
- **Loam**  
Use this measurement for soil consisting of a mixture of sand, clay, and silt. Loam is often high in dark, composted material and is found in most commercial garden soils.

The entire probe must be covered in soil and it is best to maximize contact between the probe and the soil. Any air gaps or excessive soil compaction around the probe can affect the readings.

## Download an experiment

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Download one of several student-ready activities from the PASCO Experiment Library that use the Greenhouse Sensor. Experiments include editable student handouts and teacher notes. Go to [pasco.com/freelabs/PS-3322](https://www.pasco.com/freelabs/PS-3322) to access the files.

If you want to explore on your own, check out the SPARKvue and PASCO Capstone help guides to search for specific topics.

### SPARKvue

**Software:** Go to the **Main Menu**  then select **Help**.

**Online:** Go to [pasco.com/help/sparkvue](https://www.pasco.com/help/sparkvue).

### PASCO Capstone

**Software:** In the menu bar, click **Help** then select **PASCO Capstone Help**.

**Online:** Go to [pasco.com/help/capstone](https://www.pasco.com/help/capstone).

## Specifications and accessories

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Visit the product page at [pasco.com/product/PS-3322](https://www.pasco.com/product/PS-3322) to view the specifications and explore accessories. You can also find experiment files and support documents on the product page.

## Technical Support

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Need more help? Our knowledgeable and friendly Technical Support staff is ready to provide assistance with this or any other PASCO product.

|                       |   |
|-----------------------|---|
| Phone (USA)           | 1-800-772-8700 (Option 4)                                     |
| Phone (International) | +1 916 462 8384   |
| Online                | <a href="https://www.pasco.com/support">pasco.com/support</a> |

## Regulatory information

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### Warranty, Copyright, and Trademarks

#### Limited Warranty

For a description of the product warranty, see the Warranty and Returns page at [www.pasco.com/legal](https://www.pasco.com/legal).

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### Product end of life disposal instructions



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.

### 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.

### CE statement

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