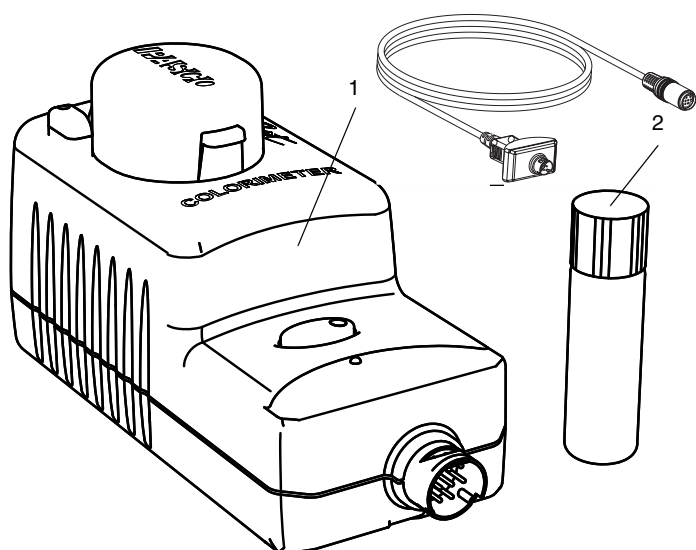


Colorimeter

PS-2121



Included Parts

1. Colorimeter
2. Cuvettes with caps, 5 pieces
 - Cuvette labels (not pictured)
 - Storage box (not pictured)
 - PASport Extension Cable

Additional Part Required

- PASPORT interface or datalogger

Quick Start

1. Connect the Colorimeter to your PASPORT interface (may require PASport Extension Cable).
2. If you are using a computer, connect the PASPORT interface to it and start DataStudio.
3. Fill a cuvette with a solution.
4. Put the cuvette in the Colorimeter and close the lid.
5. Press or click the start button to begin recording data.

Introduction

The Colorimeter measures the absorbance and transmittance of different colors of light through solutions. These measurements can be used to determine a solution's concentration.

Set-up

Connecting the Colorimeter to an Interface

1. Connect the Colorimeter's plug to any port of a PASPORT interface or datalogger. Optionally, use a PASPORT extension cable (514-07281) between the interface and the Colorimeter.
2. If you are using a computer, connect the PASPORT interface to it and start DataStudio.

Collecting Data

1. Fill a cuvette with a solution and screw on the cap. See "Sample Preparation" below.
2. Put the cuvette in the Colorimeter and close the lid.
3. Ensure that the Colorimeter is horizontal.
4. Press or click the start button to begin recording data.

Measurements

The Colorimeter makes eight measurements: absorbance and transmittance of red, orange, green, and blue light. Select any of these measurements in software or on the interface.

Sample Rate

By default, the sensor collects 1 sample per second. It can collect data as fast as 5 samples per second. Change the sample rate in software or on the datalogger.

Calibration

Calibration is not always required, but is recommended for better accuracy. Calibration is stored in the Colorimeter; when you

unplug the sensor and reconnect it, the sensor retains the last calibration.

1. Fill a cuvette with distilled water (or other solvent representing a concentration of zero) and screw on the lid. See “Sample Preparation” below.
2. Put the cuvette in the Colorimeter and close the lid.
3. Press the **Calibration** button on the sensor. A light in the button illuminates to indicate that calibration is in progress.
4. Wait for the light to turn off and then remove the sample.

After calibration, the transmittance of the calibration sample should read 100% for all colors.

Sample Preparation

1. Fill the cuvette with at least 6 ml of sample.
2. Screw the cap on securely.
3. Handle the cuvette by the cap and wipe the glass clean with a non-abrasive tissue. Avoid touching the glass.
4. Gently rock the cuvette to distribute the solute molecules equally throughout the solution. Do not shake the cuvette or allow air bubbles to enter the solution.

Orienting the Cuvette

To minimize reading variance due to differences or imperfections in the glass of the cuvette, do the following for each cuvette you plan to use.

1. Put a cuvette containing distilled water or other solution into the Colorimeter. Keep the lid of the Colorimeter open.
2. Put a piece of black cloth over your hand and the Colorimeter so that no light can enter the Colorimeter.
3. Start data collection in software or on the interface.
4. With your covered hand, rotate the cuvette while observing the transmittance reading. At the highest transmittance reading, stop rotating.
5. With the cuvette still in the Colorimeter, place one of the provided arrow labels on the cap with the arrow pointing toward the screw on the edge of the cuvette holder.

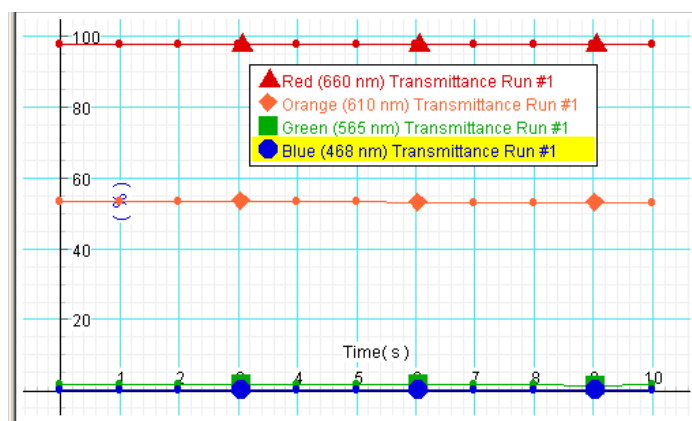
For subsequent measurements and calibrations, always place the cuvette in the Colorimeter with the arrow pointing toward the screw. Do not switch caps between cuvettes.

Activity: Transmittance and Absorbance of Different Colors

Equipment Required: Colorimeter, PASPORT interface, distilled water, red food coloring, and two cuvettes.

1. Connect the Colorimeter to the interface as described above (may require PASport Extension Cable).
2. Fill one cuvette with distilled water and screw the cap on securely.
3. Fill another cuvette with a solution of 2 drops of red food coloring in 6 ml of water. Screw on the cap, then gently rock the cuvette to mix the solution without creating bubbles.
4. Put the cuvette containing distilled water into the Colorimeter and close the lid.
5. Collect a short run of data.
6. Put the cuvette containing the colored solution into the Colorimeter and close the lid.
7. Collect another short run of data.

Compare the absorbance and transmittance of each color for each sample. Does the distilled water absorb or transmit one color more than the others? Which color does the red solution absorb most? Which color does it transmit most?



Sample data: transmittance of red, orange, green and blue light through a red solution.

Suggested Experiments

- Beer's Law: find the relationship between the concentration and the absorbance of a solution. Use this relationship to determine the concentration of an unknown sample.
- Reaction rate: measure changing absorbance over time as a chemical reaction occurs in the cuvette.

Specifications

Range	0% to 100% transmittance
Wavelengths	660 nm (red) 610 nm (orange) 565 nm (green) 468 nm (blue)
Accuracy	± 0.5% transmittance
Resolution	0.1% transmittance
Default sample rate	1 sample/s
Maximum sample rate	5 samples/s
Temperature range (for sensor and test sample)	5° C to 40° C (recommended)

Technical Support

For assistance with any PASCO product, contact PASCO at:

Address: PASCO scientific
10101 Foothills Blvd.
Roseville, CA 95747-7100

Phone: 916-786-3800 (worldwide)
800-772-8700 (U.S.)

Fax: 916-786-7565

Web: www.pasco.com

Email: support@pasco.com

For more information about the Colorimeter and the most up-to-date version of this Instruction Sheet, visit:

www.pasco.com/go?PS-2121

Limited Warranty For a description of the product warranty, see the PASCO catalog.

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