

Wireless Melting Point Apparatus

PS-3239

Introduction

The Wireless Melting Point Apparatus allows students to observe the process of heating a sample under precisely controlled conditions. By connecting the apparatus to PASCO Capstone or SPARKvue via Bluetooth, students can select or create a specific heating process and observe the resultant behavior of the sample through a lens or camera. Using these observations, it is possible to determine the melting point and temperature range over which melting occurs. The apparatus is useful for experiments studying crystalline purity, or for allowing students to verify the nature of a compound they have created.

 **NOTE:** When first unpacking the Wireless Melting Point Apparatus, do not discard the packaging, as it provides convenient long-term storage for the components.

Components

Included equipment:

- Wireless Melting Point Apparatus
- Viewing eyepiece
- 110-220 V power supply
- 100× capillary melting point tubes
- Camera adapter

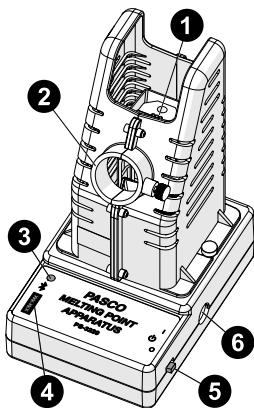
Required equipment:

- PASCO Capstone or SPARKvue data collection software

Recommended equipment:

- Melting Point Apparatus Eyepiece Camera (SE-6215)

Features:



1 Heating block

Insert capillary melting point tubes into the slots in the chamber for experiments.

2 Viewing port

Insert an eyepiece or an Eyepiece Camera into this slot to view the sample in detail. Includes a thumbscrew which can be used to secure or remove the eyepiece or camera.

3 Bluetooth Status LED

Blinks red to indicate that the device is ready to connect via Bluetooth. Blinks green to indicate that the device has successfully connected to the software. (Note that only temperature data is communicated via Bluetooth.)

4 Device ID

Use to identify the sensor when connecting via Bluetooth.

5 Power switch

Move to the position closer to the heating block to turn the sensor on. Move to its original position to turn the sensor off.

6 Power cable port

Connect the power cable here to power the device.

Get the software

You can use the apparatus with SPARKvue or PASCO Capstone software. If you're not sure which to use, visit [pasco.com/products/guides/software-comparison](https://www.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](https://www.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

Check for a firmware update

SPARKvue

1. Turn on power to the apparatus.
2. Open SPARKvue, then select **Sensor Data** on the Welcome Screen.



3. From the list of available devices, select the apparatus that matches your apparatus'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. Turn on power to the apparatus.
2. Open PASCO Capstone and click **Hardware Setup** from the Tools palette.



- From the list of available wireless devices, select the apparatus that matches your apparatus's device ID.
- A notification will appear if a firmware update is available. Click **Yes** to update the firmware.
- Close Capstone once the update is complete.

Set up the software

 **NOTE:** PASCO Capstone and SPARKvue feature a Quick Start Experiment called **Determining a Melting Point** which automatically creates an optimal display setup for the Melting Point Apparatus when selected. The instructions below detail how to instead create a display manually.

 **CAUTION:** Internal components may be hot! When inserting samples, avoid touching the metal surfaces inside the apparatus.

SPARKvue

- Start SPARKvue, then select **Sensor Data**.
- Insert an eyepiece into the viewing port on the apparatus, then insert your sample into one of the slots in the holding block.
- Connect the Wireless Melting Point Apparatus to the power supply via the power port, then connect the power supply to a standard wall outlet.
- Turn on the Melting Point Apparatus using the power switch.
- In the list of available wireless devices, select the apparatus with a device ID matching the ID printed on your sensor.
- Ensure that **Temperature** is selected in the **Select measurements for templates** column, then select any option in the list of available templates.
- From the Experiment Screen, select the **New Page** button, then select the **full page** option at the top of the list of layouts.
- From the available display options, select the **Melt Temperature** icon to create a Melt Temperature display.
- Click the **Profile** box and select an appropriate option for your experiment. The large box will show all the steps for your selected profile, and the graph on the right will show a plot of the projected temperature versus time graph for this profile.
- If desired, add additional steps to the profile or move or edit existing steps as necessary. (See **Setting up a profile**.)
- When you are ready, click **Start**  to begin collecting data. The Wireless Melting Point Apparatus will begin heating up according to the selected profile.
- As the sensor heats up, observe the samples through the eyepiece. Make note of when each sample visibly begins to melt.

 **NOTE:** If you wish to measure the current temperature of the sensor in real time, you can do so by switching back to the display page using the arrow buttons next to the page name.

PASCO Capstone

- Start Capstone, then select **Hardware Setup** from the **Tools** palette.
- Insert an eyepiece into the viewing port on the apparatus, then insert your sample into one of the slots in the holding block. Alternatively, you may use a Melting Point Apparatus Eyepiece Camera (SE-6215) if you have one. (See **Using the Eyepiece Camera**.)
- Connect the Wireless Melting Point Apparatus to the power supply via the power port, then connect the power supply to a standard wall outlet.
- Turn on the Melting Point Apparatus using the power switch.
- In the list of available wireless devices, select the apparatus with a device ID matching the ID printed on your sensor.
- Select **Melting Point** from the Tools palette.
- In the Melting Point tool, click on the box labeled **Profile** and select an option matching your sample from the list. The large box will show all the steps for your selected profile, and the graph below will show a plot of the projected temperature versus time graph for this profile.
- If desired, add or move steps within the profile or adjust the parameters of existing steps. If you are using an Eyepiece Camera, connect and configure it here. (See **Setting up a profile** and **Using the Eyepiece Camera**.)
- Once your profile is set up properly for your experiment, click the Melting Point icon in the Tools palette again to close the tool.
- Double-click the **Graph** icon in the **Displays** palette to create a graph display.
- On the y-axis of the graph, click the **<Select Measurement>** box and select **Temperature** from the list of options. The x-axis will automatically adjust to measure time.
- When you are ready, click **Record**  to begin collecting data. The Wireless Melting Point Apparatus will begin heating up according to the specified profile.
- As the sensor heats up, observe the samples through the eyepiece. Make note of when each sample visibly begins to melt.

Setting up a profile

Each profile consists of a series of steps which control the temperature of the heating block. PASCO Capstone and SPARKvue include various pre-programmed profiles designed for testing specific common classroom chemicals, as well as an option to create your own profile. These profiles can be edited in the following ways:

- To add a new step:** Click on the step immediately before the point where you wish to add a new step, then click **Add Step** and select an appropriate step from the list of options.
- To change the order of steps:** Click on the step you wish to move and click the **Up** or **Down** buttons to move that step up or down the list. Steps will be performed in the order specified by the list.
- To change the parameters of a step:** Select the step you wish to adjust and enter a new value into the **Temperature** or **Time** box. Note that not all types of step have parameters.

Using the Cool button

The Melt Temperature display (SPARKvue) and Melting Point tool (Capstone) feature a **Cool** button which can be turned on or off. While the Cool button is on, the cooling fan on the Wireless Melting Point Apparatus will turn on at full speed, reducing the temperature of the heating block. The fan and button will automatically turn off once the heating block cools to a temperature of about 40 °C.

Control the light level

The Melting Point tool in PASCO Capstone includes a **Light Level** slider to control the brightness of the light illuminating the heating block. Move the slider to the left to decrease the brightness or to the right to increase the brightness. Use the Light Level slider before and during the experiment to ensure the best viewing conditions for your sample.

 **NOTE:** Light level controls are not available in SPARKvue.

Calibration

The Wireless Melting Point Apparatus is factory calibrated and should not normally require calibration. However, if calibration is required, you can press **Calibrate** in the Melt Temperature display (SPARKvue) or Melting Point tool (Capstone) while the heating block is at room temperature. The apparatus will automatically calibrate itself to the current temperature. Note that the calibration process requires several minutes of stable temperature to complete; if there is temperature variation (such as due to drafts), the process may take much longer.

Using the Eyepiece Camera

The Melting Point Apparatus Eyepiece Camera (SE-6215) can be used to record close-up images of the sample at certain intervals. When using PASCO Capstone, these images can be displayed alongside the temperature reading, with each image matched to the corresponding temperature, allowing for a more accurate estimation of the timeframe during which melting occurs. More information on the Eyepiece Camera can be found in its associated manual, accessible from the Eyepiece Camera's product page.

 **NOTE:** The Eyepiece Camera is incompatible with SPARKvue.

After setting up a profile for the Wireless Melting Point Apparatus, as described in **Set up the software**, follow these steps to set up image capture alongside temperature measurement:

1. Connect the mini USB cable provided with the Eyepiece Camera from the camera to a USB port or powered USB hub on your computer. The camera should automatically be recognized by and connect to your computer. (This process may take several seconds or more to complete, depending on your computer model.)
2. Insert the narrow end of the camera adapter into the viewing port. Secure it in place with the thumbscrew on the viewing port.
3. Remove the storage cap from the Eyepiece Camera, then insert the camera into the wide end of the camera adapter and secure it in place with the thumbscrew on the adapter.
4. In the Melting Point tool, click the **Properties**  icon next to the default camera name to open the Properties menu.
5. Open the **Movie Recording** folder, click the box next to **Video Recording**, and select **MD100** from the dropdown list.

6. In the profile, create a **Start Image Capture** step at the point where you want the camera to begin recording images. This step should usually be placed directly before the final ramp step after holding near the expected melting point of the substance, as this will prevent unneeded images that would greatly increase the experiment's file size.
7. Select the Start Image Capture step, then enter a value in seconds (minimum 5) for the time between image captures into the **Image capture interval** text box.
8. Create a **Stop Image Capture** step at the point where you want the camera to stop recording images.
9. Double-click **Image** in the Displays palette to create a new image display alongside the graph display.
10. In the image display, select **Image Sequence**, then click the **<Select Measurement>** box and select **Melting Point Images** from the list.
11. Begin collecting data. The program will automatically record images at the specified sample rate during the selected range. If your image capture interval is greater than 5 seconds, the image display will show a live preview of the Eyepiece Camera.

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-3239 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 pasco.com/freelabs/PS-3239.

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.