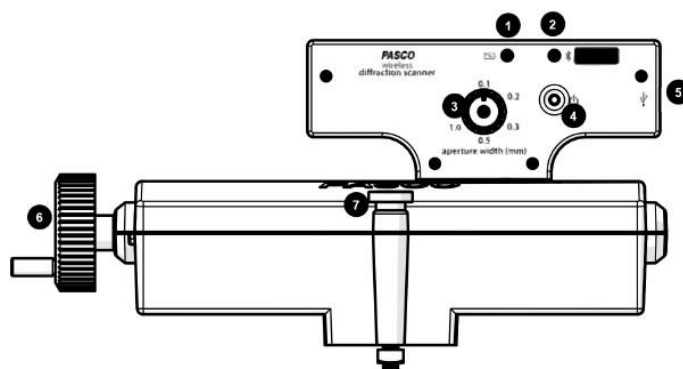
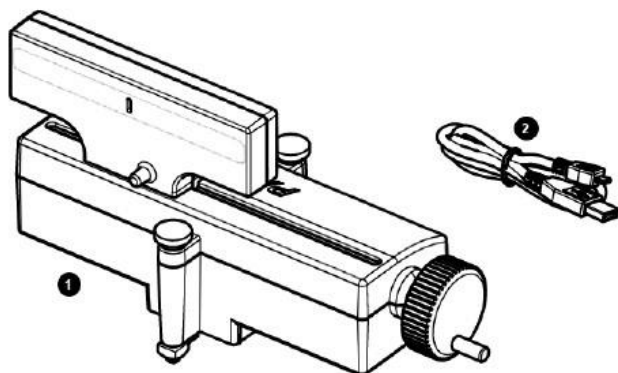


Wireless Diffraction Scanner (OS-8441)



Included Equipment

1 Wireless Diffraction Scanner

2 Micro USB cable

For connecting the accessory to a USB charger, or to a USB port of a computer.

Components

1 Battery status LED

Red blink	Battery needs to be recharged soon.
Green solid	Battery is fully charged.
Yellow solid	Battery is charging.

2 Bluetooth status LED

Red blink	Ready to be paired with software.
Green blink	Paired with software.
Yellow blink	Remotely logging data.

3 Aperture selection knob

Turn the knob to adjust the light sensor aperture width.

4 Power button

Press and hold to turn the power on or off. This button is also used to start and stop remotely logging data.

5 Micro USB port

For connecting the included USB cable to a charger or the USB port of a computer.

6 Crank

Turn to change the position of the diffraction scanner head.

7 Thumbscrew

For mounting the Diffraction Scanner to an optics track or an optics carriage.

Getting Started

Before using the device with students for the first time, perform the following tasks:

1. Change the battery.
2. Update your PASCO data collection software.
3. Update the firmware.

To charge the battery


1. Connect the micro USB cable to the micro USB port on the Diffraction Scanner. Connect the other end of the cable to a USB charger or port.
2. Allow the battery to charge for at least three hours. The battery status LED will turn green when fully charged.



Charging automatically stops when the battery is fully charged. The device can remain connected to a power source when fully charged without damaging the battery.

To update PASCO data collection software

1. Open the PASCO data collection software.
2. The software will display a message if an update is available. Follow the instructions on the screen. If you do not receive a message, the software is up to date.

You can also check for an update by doing the following:

 Go to the **Help** menu, then click **Check for Updates**.

 Select the menu icon  and select **Check for Updates**.

To update the firmware

The device contains firmware that controls how it functions. It is important to make sure that your device has the latest version of the firmware installed.

1. Connect the device to your software. It is recommended to use a USB connection, since this will result in a faster update.
2. The software will prompt you if a firmware update is available. Follow the instructions on the screen if prompted. If you do not receive a prompt, the firmware is up to date.

Connecting to Software

The device can be connected to software using USB or Bluetooth.

To connect using USB

1. Connect the device to a computer using the USB cable.
2. Open your PASCO software. The device automatically connects with the software.

To connect using Bluetooth



1. Press and hold the power button until the battery status LED turns on.
2. Open Capstone and click **Hardware Setup**.
3. From the list of available devices, select the wireless device that matches your device ID.



1. Press and hold the power button until the battery status LED turns on.
2. Open SPARKvue and select **Sensor Data**.
3. Under "Connected Devices", select the wireless device that matches your device ID.

Taking Measurements

The Wireless Diffraction Scanner combines a position sensor with a light sensor for scanning diffraction patterns. PASCO Capstone or SPARKvue are used to plot light intensity versus position of the diffraction pattern.



NOTE: It is also possible to set the Wireless Diffraction Scanner to remotely log data while not connected to the computer, allowing the stored data to be accessed later. For more information on data logging, see the PASCO Capstone and SPARKvue online help.

Light Intensity

The Diffraction Scanner contains a slit aperture centered on a white screen. The width of the aperture can be changed to control the spatial resolution and amount of light entering the light intensity sensor. Six apertures of different widths are installed on a wheel inside of the Diffraction Scanner casing (Figure 4). The approximate widths of the apertures are 0.1 mm, 0.2 mm, 0.3 mm, 0.5 mm, 1.0 mm, and 1.5 mm.

Change the aperture width by turning the aperture knob. Select a wider slit to allow more light into the sensor, or select a narrower slit to improve the spatial resolution.

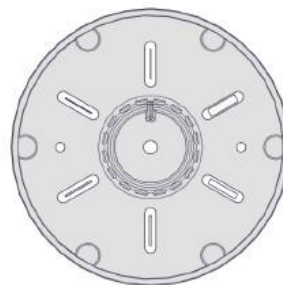


Figure 1. Aperture wheel inside the Diffraction Scanner casing.



NOTE: It is possible to adjust the sensitivity of the light sensor using Capstone. Upon connecting to the device, select the gear icon next to "Diffraction Intensity Sensor". This will open the Properties menu, which includes the option to set the sensor to High, Medium, or Low sensitivity.

Position

The light sensor is mounted on a track that can move laterally by turning the crank on the side of the Diffraction Scanner. The position is measured by a rotary encoder attached to the crank. To obtain the best data, turn the crank at a slow rate.

Product Specifications

Aperture Range	0.1 mm to 1.5 mm
Position Resolution	.01 mm
Battery	Rechargeable Lithium-Polymer 1000 mA
Connectivity	USB or Bluetooth® Low Energy
Scan Travel	155 mm