



OCEANHDX RAMAN

Quick Start Guide

The HDX Raman is an Ocean HDX spectrometer that is designed for 785 nm Raman applications. The High Definition optics of the HDX give great peak symmetry, very good resolution, and a high dynamic range in a compact, affordable, and sensitive bench that excels in most Raman measurements. With the locking Ethernet connector, the HDX Raman can be easily networked and controlled from different locations in the lab and beyond. The HDX Raman also boasts an extended range providing more fingerprint data.

Parts Included

- (1) Ocean HDX Raman Spectrometer
 - OCEAN-HDX-RAMAN7: 785 nm Raman with 25 μm slit
 - or
 - OCEAN-HDX-RAMAN7-HT: High-throughput 785 nm Raman with 50 μm slit
- 25W 5VDC Wall Mount Power Supply with interchangeable power blades
- USB Cable with USB A Male and USB C Male ends

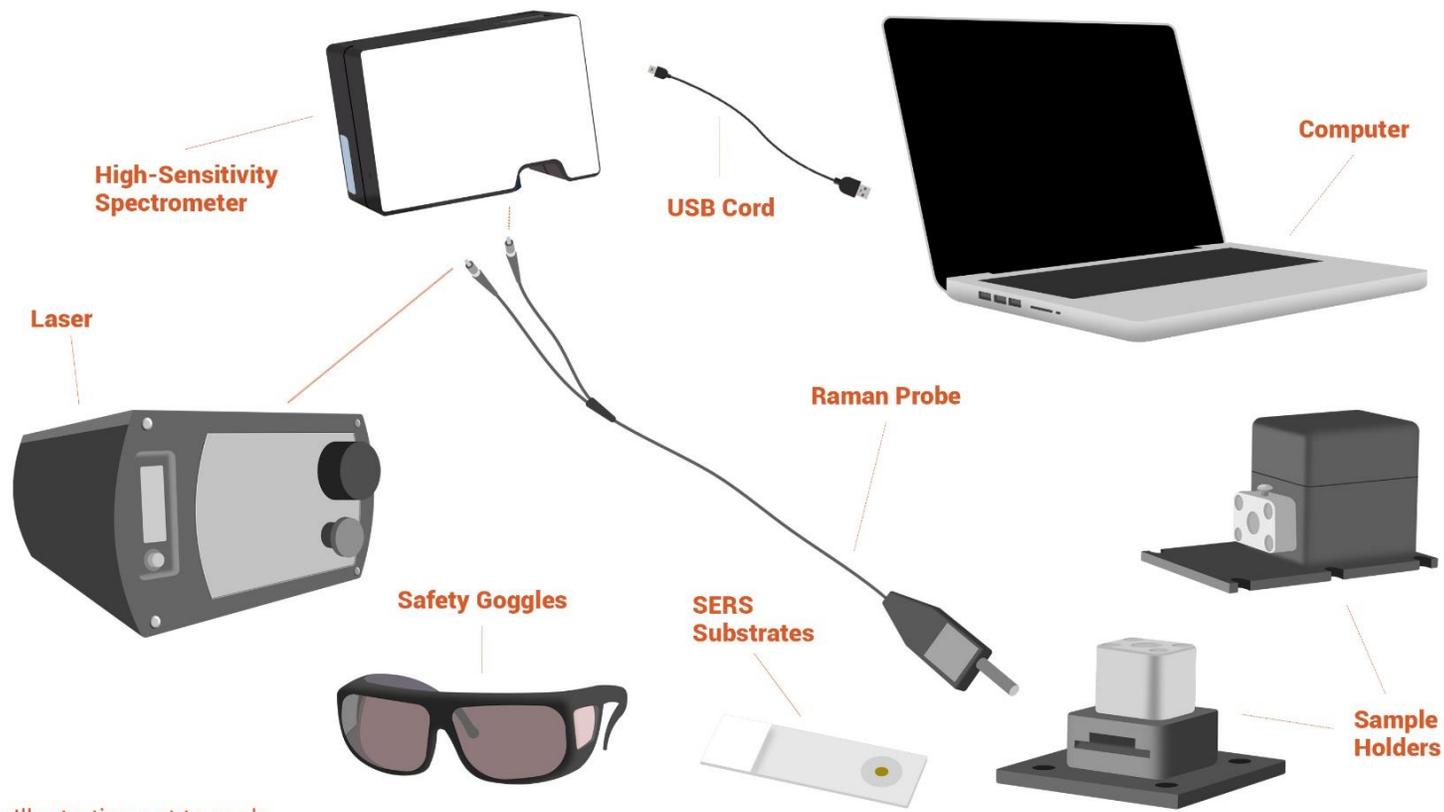
Specifications

For complete HDX specifications, please see the Ocean HDX User's Manual at www.OceanInsight.com.

	OCEAN-HDX-RAMAN7	OCEAN-HDX-RAMAN7-HT
Slit Size	25 μm	50 μm
Optical Resolution	Midpoint of Shift: 9 cm^{-1} Maximum: 13 cm^{-1}	Midpoint of Shift: 12 cm^{-1} Maximum: 17 cm^{-1}
Raman Shift Range	150 - 3400 cm^{-1}	
Raman Excitation Wavelength	785 nm	

Setup

Prior to setting up for a Raman measurement, you first must configure your Ocean HDX spectrometer in OceanView. For instructions, please reference the Ocean HDX User's Manual at www.OceanInsight.com.



*Illustration not to scale

COMPONENTS YOU WILL NEED

HDX Raman: Your HDX Raman will come preinstalled with either a 25 or 50 μ m slit and will be configured for 785 nm Raman measurements. It will include the power cable and USB cable for computer connection.

Computer: The Ocean HDX can be run from a computer with the included USB cable or even over a network using a locking ethernet cable.

Raman Probe: Not just any fiber will do! Raman probes consist of a fiber bundle to route excitation light from the laser to the sample and collect Raman scattered light. Ocean Insight has a variety of probes with deep 785 nm laser line filtering at www.OceanInsight.com.

Sample Holder: Ocean Insight has a variety of Raman sample holders for liquid, SERS, and other samples. Raman sample holders help keep the laser focused in the right position, can block out ambient light, and provide a stable base for highly repeatable measurements. See which options suit you best at www.OceanInsight.com.

SERS: Surface Enhanced Raman Spectroscopy is a technique to magnify the Raman signal of a material. Available in either liquid or paper substrate forms, Ocean Insight's SERS will amplify your Raman signal. Our complete line of SERS offerings can be found at www.OceanInsight.com.

Safety Goggles: Whenever working with lasers, please take caution and protect your eyes and the eyes of those around you.

Laser: The Ocean HDX Raman is tailored for a 785 nm laser excitation. For Ocean's laser options, please visit www.OceanInsight.com.

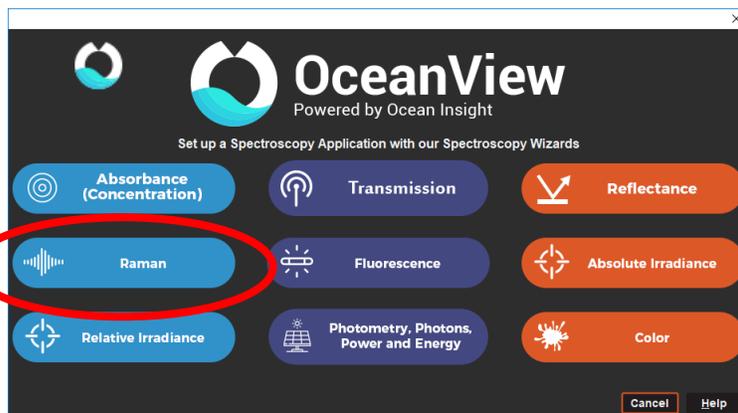
Setting up for Raman

1. **Install OceanView** to ensure necessary drivers are loaded before connecting hardware.
2. **Connect hardware components** as outlined above, including:
 - **Connect the Raman probe** fiber legs to the appropriate device (spectrometer or laser) following the included labels.
 - *Ensure threading is tight for optical stability*
 - *Ensure keyed-connector on laser is properly fitted (rotate to lock-in)*
 - **Mount the probe** into the sample holder, securing with a setscrew
 - **Power the laser** by turning the safety key in back of the unit
 - *If the red display does not turn on, turn the red 'emergency-shutoff' knob*
 - **Connect the HDX Raman** to power and the computer using the provided cables
3. When you start OceanView, a Welcome screen appears. Select **Spectroscopy Application Wizard** to navigate to the Spectroscopy Wizards. If OceanView is already running, you can access the Spectroscopy Wizards by clicking the Create New Spectroscopy Application icon in the upper left corner of the software window or via the **File | Create new spectroscopy application** menu item.

4. Select the **Raman** wizard and OceanView will walk you through the steps required to setup your HDX Raman for your measurements.

5. Select **Active Acquisition** in the dialog box that opens and click **Next**.

6. Set your acquisition parameters in the next dialog box and click **Next**. Additional information on the acquisition



parameters can be found in the Glossary available on the Ocean Insight website. Note that the **Boxcar width** should be kept as low as possible to ensure the highest resolution for the Raman measurements. Values above 0 will apply some smoothing to the data degrading optical resolution.

7. Configure your Raman measurement in the next dialog box.
 - **Store Background:** Click the light bulb to store your Background Spectrum. Choose the most meaningful background for your measurements.
 - For most Raman measurements the background is stored with the laser off
 - For certain SERS measurements the background is stored with the laser exciting the SERS substrate before analyte has been added
 - **Set Laser Wavelength:** Enter the laser wavelength in nm to display your x axis in Raman Shift (cm^{-1}). For the HDX Raman the laser wavelength should be set to 785 nm. Click **Apply** after you have entered the laser wavelength.
 - **Background Removal:** Click the **Apply Clean Peaks to Schematic** box if you want to automatically remove the background from your Raman spectrum. See the Tech Tip:

Making the Most of Your Raman Data, on the Ocean Insight website, for additional information on Clean Peaks and other tips for processing your Raman data.

- Click **Finish** and you are ready to acquire Raman spectra!

FAQ

The readings should start at 785 nm but I'm seeing the graph start at zero. Why is this, and what is the cm^{-1} I'm seeing?

Raman emission is a relative energy shift referenced to the laser wavelength, which was the last step of the Raman wizard. The cm^{-1} is referred to as Raman Shifts or Wavenumbers, and these will start at zero based on the reference laser. An interesting feature of Raman is that you will see very similar emissions from different wavelength systems (785 nm vs. 532 nm, for example) when converted to these wavenumbers, despite the actual wavelengths being quite different.

What laser power should I use?

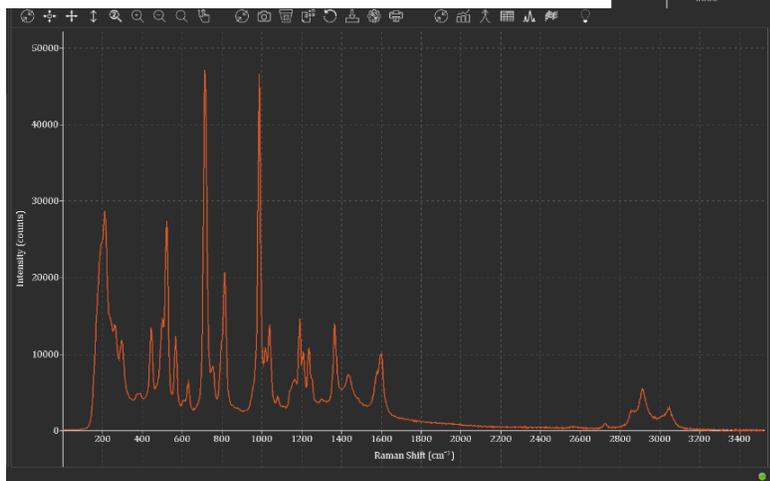
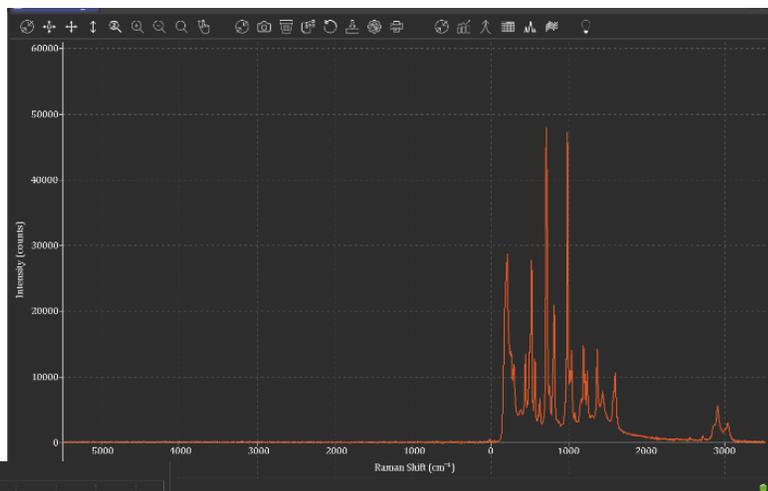
Laser power is application-dependent, so you may need some iterative tests to find the appropriate level. If there is a specific power you are trying to achieve, we recommend using a laser power meter at the probe output to determine the true power level. You can do this at multiple points to create a rough power correlation for your system.

The laser is on but I'm not seeing any output from the Raman probe.

There is a manual shutter on the business-end of the Raman probe. Ensure this is switched open.

Why are there negative Raman Shift values in the Raman spectrum? Or Why is my Raman spectrum shifted in the RamanShiftView?

If you are seeing a shifted spectrum caused by negative Raman Shift values in your RamanShiftView like those shown in the image on the right, please update your OceanView software to version 2.08 or higher. The newer software versions remove these negative values from the Graph display after you have run the Raman Wizard as shown in the screenshot below.



Unlock the Unknown

Ocean Insight exists to end guessing. We equip humanity with technology and data to make precisely informed decisions providing transformational clarity for human advancement in health, safety, and the environment.

Questions?

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