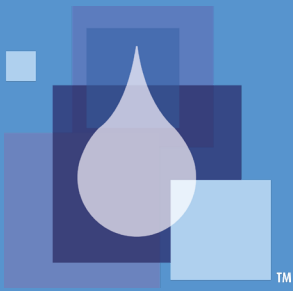


OPAL-100 Series Portable Analysis System



OndaVia

The OndaVia Raman Spectrometer with OndaVia Raman Controller (ORC) Software packages is intended to provide an initial determination and to be used as an information resource or tool. It is not an absolute or conclusive identification of unknown substances. Results provided by the OndaVia Raman Spectrometer and associated Software should be verified using other appropriate laboratory techniques. OndaVia neither makes recommendations nor assumes any liability for how the information is used.

The Raman Spectrometer has a high energy laser that may burn some samples and targets. It is the user's responsibility to verify that the Spectrometer will not damage the sample or target. OndaVia makes no recommendations nor does it assume any liability for how the information is used or any damage it may cause.

The Raman Spectrometer includes the software that allows the user to adjust the laser power settings. These settings are approximate, and may change over time and with repeated use. OndaVia makes no warranties or representations as to the accuracy or stability of the laser settings. For precise determinations, a laser power meter should be used. With our spectrometry technology, no reference beam is used and the Spectrometer is not intended for absolute or relative quantification of substances without required analysis kits.

Use of the Spectrometer is at the user's own risk.

Chemical Safety Statement: The chemicals used in this measurement process can be dangerous to the user and surroundings if inappropriately used. Exercise caution and use appropriate personal protective equipment to protect yourself and your environment.

Disposal Statement: Dispose of chemicals in accordance with the guidelines of your local, state, or federal authority

General Information

In no event will the manufacturer be liable for direct, indirect, special, incidental or consequential damages resulting from any defect or omission in this manual. The manufacturer reserves the right to make changes in this manual and the products it describes at any time, without notice or obligation. Revised editions are found on the manufacturer's website.

Safety Information

NOTICE
OndaVia, Inc. is not responsible for any damages due to misapplication or misuse of this product including, without limitation, direct, incidental and consequential damages, and disclaims such damages to the full extent permitted under applicable law. The user is solely responsible to identify critical application risks and install appropriate mechanisms to protect processes during a possible equipment malfunction.

Please read this entire manual before unpacking, setting up or operating this equipment. Pay attention to all danger and caution statements. Failure to do so could result in serious injury to the operator or damage to the equipment.









Make sure that the protection provided by this equipment is not impaired. Do not use or install this equipment in any manner other than that specified in this manual.

Use of hazard information

DANGER
Indicates a potentially or imminently hazardous situation which, if not avoided, will result in death or serious injury.
WARNING
Indicates a potentially or imminently hazardous situation which, if not avoided, could result in death or serious injury.
CAUTION
Indicates a potentially hazardous situation that may result in minor or moderate injury.
NOTICE
Indicates a situation which, if not avoided, may cause damage to the instrument. Information that requires special emphasis.

Precautionary Labels

Read all labels and tags attached to the instrument. Personal injury or damage to the instrument could occur if not observed. A symbol on the instrument is referenced in the manual with a precautionary statement.

	This is the safety alert symbol. Obey all safety messages that follow this symbol to avoid potential injury. If on the instrument, refer to the instruction manual for operation or safety information.
	This symbol indicates the need for protective eye wear.
	This symbol identifies a risk of chemical harm and indicates that only individuals qualified and trained to work with chemicals should handle chemicals or perform maintenance on chemical delivery systems associated with the equipment.
	This symbol indicates that a risk of electrical shock and/or electrocution exists.
	This symbol indicates that the marked item can be hot and should not be touched without care.
	This symbol indicates that a risk of fire is present.
	This symbol identifies the presence of a strong corrosive or other hazardous substance and a risk of chemical harm. Only individuals qualified and trained to work with chemicals should handle chemicals or perform maintenance on chemical delivery systems associated with the equipment.
	Electrical equipment marked with this symbol may not be disposed of in European domestic or public disposal systems. Return old or end-of-life equipment to the manufacturer for disposal at no charge to the user.

Laser Safety Warnings

Caution: Use of controls or adjustments or performance of procedures other than those described in this manual may result in hazardous laser radiation exposure.

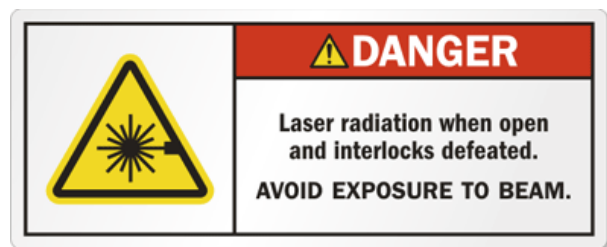
This class 3B (IIIb) laser device and up to 100 mW of 785 nm (NIR) laser light may be emitted during data acquisition. Only personnel trained in laser safety protocols should be allowed to use this instrument.



The aperture warning label indicates where laser radiation may be emitted from the instrument.



The instrument is interlocked to prevent accidental exposure to laser radiation. Internal maintenance or repair must be performed by OndaVia or agents authorized by OndaVia.



Hardware Installation

Install the software (see below) on the computer before connecting the hardware.

The instrument has a mini-USB port and a 5V, 2.5A barrel power jack connector on the back. Connect the power supply, pushing firmly to insert the plug. Then connect the USB cable to the PC. Switch the power to On to begin operation.

Software Installation

Complete the following steps to install the OndaVia Raman Controller on your PC.

Download the latest software version from <https://www.ondavia.com/software/latest> for your instrument. Double click on the downloaded file. If supplied as a compressed folder, this action will open a Windows folder displaying the contents. Select **Extract All** from the menu. This process will extract the files to a new Windows folder. Open the new folder and double click the `OndaVia Raman Controller.msi` file.

For initial installation, run the software. Click OK for any error messages. An option will appear to search for a spectrometer. Select Yes and follow the prompts. Exit the software. This process will create the appropriate folders.

Restart the software. An error message indicating that calibration is required. Select OK. Then proceed in the software to perform the calibration procedure.

Acquiring Data

Acquiring data requires an appropriate Analyte File for the test kit used. Obtain the Analyte File from OndaVia. Select **Settings>Contaminants>Manage Analytes**, which will open a Windows folder. Save the Analyte File in this folder.

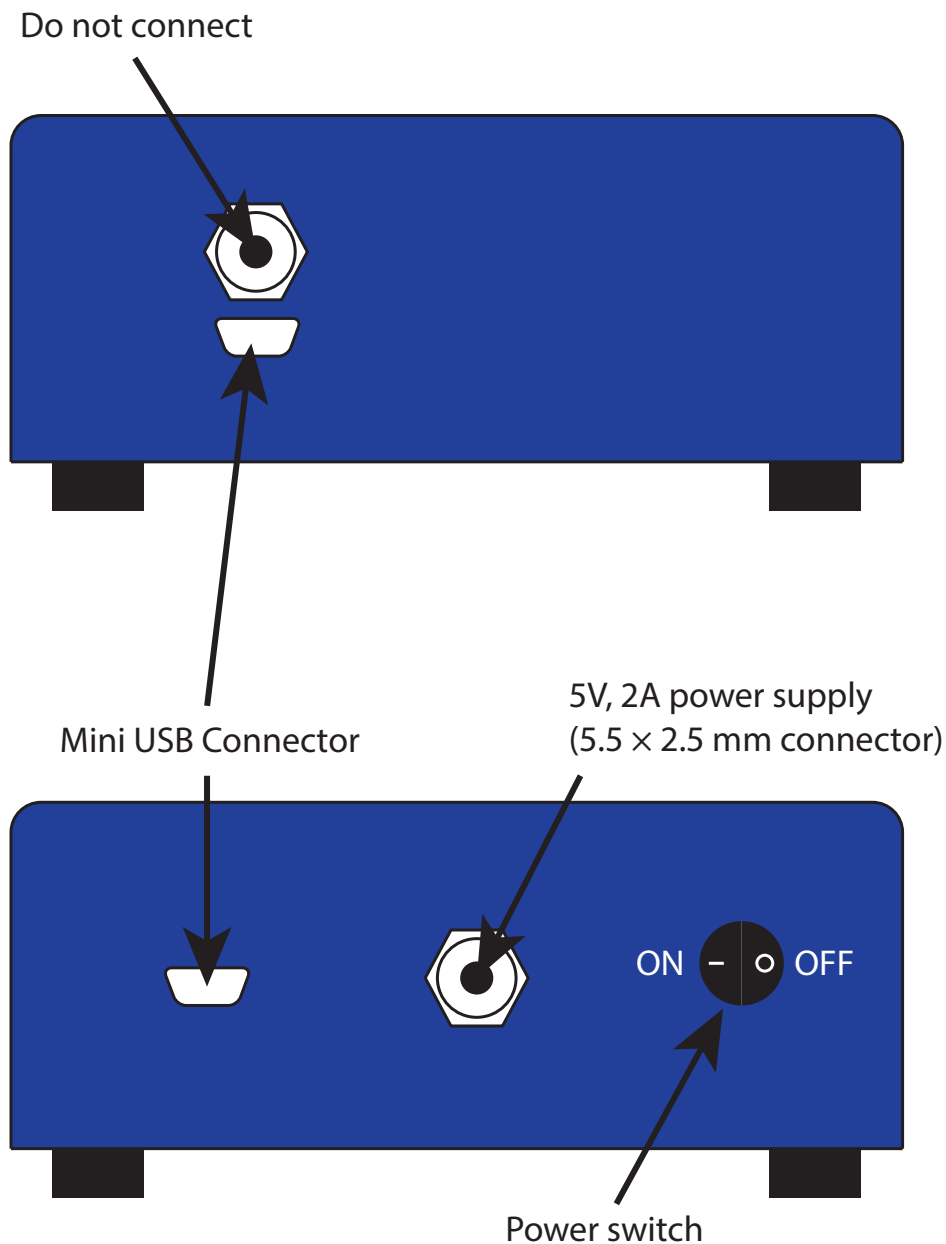
The ORC software generates manuals for each analysis method. Once an Analyte is selected from the Contaminants menu, a menu option titled Manuals will appear. Select the desired manual, which will open a PDF with analysis instructions.

During analysis, click Start Data Collection. At the end of data collection, the average will be reported. If any values indicate **"FAIL"** restart the process from the beginning and check the method and/or instructions provided with each cartridge.

Once the analysis is complete, a report will be generated in a folder which can be found by using **Windows Explorer** under the following: **PC>Documents>OndaVia>Sample Name + time and date stamp**.

Hardware Calibration

The OndaVia Analysis System contains a linear detector array upon which the spectral data is projected. It is possible during shipping, rough handling, or temperature variations for the detector array to move slightly. Given that each pixel on the array measures a few microns in size, a small change in alignment can lead to incorrect readings. We recommend performing the hardware calibration once a month and every time after the machine is transported.



The calibration procedure aligns the detector using known material. The preferred substrate is an OndaVia Calibration Tube.

To perform a hardware calibration:

- Obtain a Calibration Tube. Insert the tube into the instrument.
- Choose **Settings>Spectrometer** in the menu.
- In the dialog that appears, press the Calibrate button to open the Calibration dialog.
- Click Take Spectrum to obtain a spectrum of the calibration tube. The spectrum should be similar to the inset image to the right of the collected data.

The software should automatically detect the calibration peaks if Autocalibration is selected. However, it is possible to override the process manually. The spectral display region has a button at the upper right that opens a spectrum displaying a typical polystyrene spectrum. The spectrometer requires four values for calibration, the pixel number for the peaks indicated in this spectrum (620.9, 1001.4, 1450.5, and 1602.3 cm^{-1}). For each peak, enter the pixel number in the text boxes below the spectrum, starting with the lowest value first. Clicking and drawing a box around an area of interest provides zoom to better determine the desired peaks' pixel number. Zoom is reversed by clicking the circle with a dash symbol located at the lower left corner of the scrolling bar. The software will attempt to fit each peak to determine the optimal value.

Once all four values are entered, click OK. The new calibration values will be used for analysis. Upon exit, the software will store the necessary values within the instrument and the configuration files.

