Hitachi U-2001 UV/Vis Spectrometer
Updated November 14, 2017

Instrument instructions can be found at:
http://academic.bowdoin.edu/chemistry/resources/instructions.shtml

If you have any problems with the instrument or would like to get trained, please contact
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1. Protocol

    a. **Read instructions carefully before using instrument**. Reading the bold sentences in each category will tell you what you need to know to run the instrument.
        i. Bullets are under the bold sentences when more detail is required.
        ii. At the end of the instructions is a frequently asked questions/troubleshooting section.

2. Startup Procedure

    a. **Verify the Communications Card is inserted in the slot on front of the instrument** (lower left corner).
    b. **Turn on instrument.**
    c. **Turn on computer and login** (use your Bowdoin account).
        i. First time users only.
            1. Create a folder to store your data.
                a. Open Windows Explorer.
                    i. (Start > All Programs > Accessories > Windows Explorers).
                b. Go to Desktop > My Computer > Local Disk C:\User Data
                c. Create a data folder.
                    i. Click once on the data folder to highlight it.
                    ii. Go to (File > New > Folder).
                    iii. Type in your name or initials to name that folder.
            2. Configure a network printer and set it as default
                a. Make sure you are connected to the Bowdoin network.
                b. Go to Start > Devices and Printers, click "Add a Printer", click "Add a network, wireless or Bluetooth Printer", click "The printer that I want wasn't listed." and click Next.
                c. Type in the printer you would like to add and then click Next.
                    i. i.e. \\bradbury\dahlia
                d. Click OK.
                e. Set printer as default.
                    i. Start > Printers and Faxes.
                    ii. Right click on printer you just added.
                    iii. In the menu, select "Set as Default Printer".

d. **Open UV Solutions** (if it doesn't automatically open) (Start > All Programs > Hitachi Applications > UV Solutions 2.0).

e. **Wait until initialization is done before proceeding to next step.**

3. Create/Edit Method

a. **Adjust parameters** (Edit > Method), or click the "**Method**" button.

Note: After adjusting the parameters, you might get a message that says "As a result of the selected instrument parameters, the data listing values have been changed to the following…" Ignore this message and click "**OK**".

   i. **General Tab**

1. For Measurement select "**Wavelength Scan**".
2. Enter operator name.
3. If you want to input information for more than one sample, check the "**Use Sample Table**" box.
4. Add comments if necessary.
5. The "**Load**" button is for loading a previously saved method. The "**Save**" button is for saving the conditions that were just changed, but it will overwrite existing conditions. The "**Save A**s" button will have you create a new method file name. c:/Program Files/UV Solutions/Methods.

   ii. **Instrument Tab**

1. Enter scan parameters.
2. Lamp Change: at this wavelength, changeover is automatically made between the D2 lamp which emits light in the UV region and the WI lamp which emits in the Visible and infrared region. Input Range: 325.0 to 370.0 nm
3. Slit width—select from 0.1 to 8.0 nm (cannot change this).
4. See the manual for more details on each parameter, pgs. 2-4 through 2-16.

   iii. **Monitor Tab**

1. Enter y-axis max/min values.
2. Make sure "Open data processing window after acquisition" is checked.
3. Check Overlay: Spectra can be overlaid in measurement window.

   iv. **Processing Tab**

1. Select the method of processing the data.
2. Peak Finding: **Rectangular** is the simplest method and the default.
3. Select the threshold and sensitivity for peak identification.

   v. **Report Tab**

1. Select the output choice and items for output which will be included on the report. "**Report**" is the most common. Selecting "Use Microsoft Excel" will transfer the data to an Excel worksheet.
2. Select the orientation—**Portrait** or **Landscape**. Choosing portrait will allow the selected report items to be printed.
3. Font style and size can be changed as well by clicking "**Select**".

4. Collect Spectrum

Note: To control with PC, go to Tools/Instruments/Open Monitor

a. **Enter sample information** (Edit > Sample/Comments), or click on the "**Sample**" button in the Measurement Toolbar.

    i. Enter sample name.

    ii. Check "**Auto File**" and "**Auto JCAMP-DX file**".

    iii. Enter file name for spectrum and location where it will be stored (click Select button and browse to your folder—c:/Program Files/UV Solutions/Data/your folder).

    iv. If "**Use Sample Table**" was checked in the General Tab, then click on the "**Sample Table**" button and enter the sample name, comments, and file name where the data will be saved. Push "Insert" to add more samples. You will be prompted each time a new sample is ready to be analyzed. You can save your sample table by clicking "**Save As**" and finding the location to save it in— c:/Program Files/UV Solutions/Sample Table. It can be called up at a later date by clicking "**Load**".

b. **Verify sample compartment is empty.**

c. **Zero instrument** (Spectrophotometer > Zero).

d. **Collect baseline** (Spectrophotometer > Record Baseline), or the "**Baseline**" button

    i. Set a blank sample in the cell holder (front).

    ii. Select "User" for type of baseline, and then click "**OK**". This will perform a baseline with the settings you set in your method (scan range, scan speed, etc…).

e. **When baseline is complete, insert sample** (front) **and reference** (back)**.**

Note: Occasionally you will see a drop in absorbance during the run. If this happens, rerun the baseline and then collect a spectrum with the cells empty. If this spectrum is flat, rerun your sample.

f. **Measure sample** (Spectrophotometer > Start Series), or click "**Measure**" in the Measurement Toolbar. "**Stop**" can be clicked anytime to stop the measurement mid-way.

g. When scan is complete, the spectrum will open in a new window. If a **sample table** was used, a window will pop up showing the next sample that will be analyzed and whether or not you would like to continue with the analysis or skip the sample. Make the selection and then click "**Yes**". Another window will pop up that tells you to insert the sample and then click "**OK**".

h. Data will be saved upon completion of measurement. Data files can then be opened to view the spectra by clicking on **File**>**Open**, and the search for your folder which contains your data files. When a spectrum is open, go to **Edit**>**Properties** to adjust screen parameters.

5. Print Spectrum

a. **Preview report** (Data > Report), or click the "**Report**" button on the Data Processing Toolbar. This will show you a preview of the report that will be printed. It will include the spectrum or overlay of spectra, as well as the items that were selected to include in the report. Click "**Print**" to print the report.

b. **File>Print** will only print what is shown in the active field in the data processing window, which may only be the spectrum and not the data that goes with it. If you

want the data to print with the spectrum or overlaid spectra, you need to click on "**Report**".

6. Shutdown Procedure

    a. Remove your samples from the sample compartment.

    b. Click the red **X** in the top right-hand corner of the window or **File, Exit**.

    c. A window pops up to show "Close the lamps, then close the monitor window?" as being selected. Click on "**Yes**".

    d. Allow the lamps to cool down for ten minutes and then turn off the power switch on the instrument.

    e. Log off the computer or shut down if no other user will be using the instrument.

    f. Turn off the monitor.

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1. Write name and sample info on log sheet
2. Turn on instrument
3. Turn on computer and log-in
4. If first time user, make folder with your name in the folder---**c:\User Data**
5. Open **UV Solutions** (if it does not automatically open)
6. Adjust method under **Edit>Method**

    …notes on method

    a. If more than 1 sample click "**Use Sample Table**" on general tab
    b. Click "**Save**" when done editing
7. Enter sample info by clicking **Sample** on right side, if more than one sample, push **Insert** to add more.
8. **Zero** instrument, with no samples in it, by clicking **Spectrophotometer>Zero**
9. Put the blank in and collect the baseline (use "**User**" for type)
10. Insert sample (reference in the back, sample in the front) and **Measure**, repeat if multiple samples used

Shutdown

1. Remove samples
2. **File>Exit**
3. Close lamps then monitor window (fan will still be running to cool the lamps)
4. Let lamps cool for about 15 minutes, then power **OFF** the instrument, and then the computer