Quick Reference How-To Guide for the Olis DW-2000 & DW-2

Turning on the Olis DW-2000/DW-2

1 Turn on the main power switch at the power strip.
2 Ensure that the control box and appropriate lamp(s) are on.
3 Turn on the computer and open GlobalWorks program.
4 Choose **Data Collection** and select the appropriate icon.
5 Click **Open**.
6 The spectrophotometer will initialize and calibrate.

Changing modes of detection

➤ Choose from the following in the **Operational Modes** tab under **Data Reduction Modes**:

Absorbance: Reports sample and reference signals as log(ref/sam)

Transmittance: Reports sample and reference signals as sam/ref

% Transmittance: Reports sam/ref as a %.

Reflectance: Reports sam/ref for reflective samples

Single beam: Reports sample and reference signals

Raw signals: Reports sample and references signals before dark signal is subtracted.

*In addition, the instrument can be switched between **Dual Beam Mode** and **Split Beam Mode**. In **Dual Beam Mode**, the reference beam wavelength differs from that of the sample beam (Determined by monochromator 1 and 2 wavelengths) and travels through the sample. In **Split Beam Mode**, light of one wavelength (determined by monochromator 1) is passed through both the sample and reference cuvettes.*

Adjusting the detector sensitivity

➤ In all modes of detection, the slit width can be adjusted by clicking on the **Slit width** value in the **Live Display** tab.

➤ In all modes except **Single beam** and **Raw signals**, the photomultiplier tube (PMT) high volts (HV) changes as the light intensity changes. Since light intensity changes with wavelength, the PMT HV will change during a scan.

➤ In the **Single beam** and **Raw signal** modes, the **Slits** and **PMT HV** values are adjusted by the user.

Collecting a scan

1 Open the **Operational Modes** tab and set the **Data Collection Mode** to **Scan**.
2 Ensure that the proper data reduction mode is selected (ie. **Absorbance**, **Transmittance**, etc.).
3 Go to **Live Display** tab.
4 In the **Dual beam** mode, change **Wavelength** scan range of the scanning monochromator (click on the number to highlight). *The other monochromator will remain fixed.*

5 Enter the desired **Number of Increments** to be collected and the number of **Reads per datum** (The higher this number, the better the signal to noise ratio, but the longer the scan will take).
6 Click on the **Collect Data** button to begin scan.

Collecting repeated scans

1 Under the **Repeated Scans** tab, change **Number of Scans** to the desired number.
2 Select **Manual** or **Auto** in the **Scan Method** box. *Scans can be made automatically as a function of time, or manually. In **Auto** mode, the time selected is the total time to complete all scans. **Manual** scans are started by hitting the spacebar.*
3 Ensure that **Time Units** are correct. *These can be changed in the **Operational Modes** tab.*
4 All repeated scan data will be saved as a single, 3-D data set.

Taking an assay

1 Under the **Operational Modes** tab, set the **Collection Mode** to **Assay**.
2 Enter **Total Assay Time** in the **Live Display** tab.
3 Enter desired assay wavelengnth in **Current Wavelength**.
4 Enter **Number of Increments to Collect** and **Integration Time**.
5 To subtract an offset from the data, click on the **Zero Instrument** button.
   Alternatively, the beam intensities can be adjusted with the knobs on the top of the instrument. Turn the appropriate knob, split or dual) until the zero absorbance of 100% transmittance value has been achieved.
6 To begin the assay, click on the **Collect Data** button and press spacebar when prompted.

Collecting stopped-flow absorbance data

1 Ensure that the absorbance lamp (front lamp if there are two) is on.
2 Ensure that stopped-flow accessory is in position and that gas pressure is at 75-90 psi.
4 Attach two luer-lock disposable syringes (‹ 10 mL) to the ports above the flow valves and fill them with your desired reagents. We recommend that you degas buffers as well to reduce the probability of bubbles entering the flow system.
5 Attach a syringe (or tubing) to the waste port.
6 Beam splitter should be in sample chamber and reflecting to reference (blue) PMT. Red PMT should be in end of sample chamber.

7 Move the fill valves to the "Fill" position and carefully draw back stopped-flow syringes to fill without drawing in bubbles. Any bubbles can be removed by drawing in and out a few times. Move the fill valves back to the "flow" position. Ensure that the PMTs are active in the **Parameters** tab.

8 **Data Collection Mode** should be set to **Stopped-flow** in the **Operational Modes** tab.

9 **Data Reduction Mode** should be set to **Absorbance** in the **Operational Modes** tab.

10 Adjust the slit width in the **Live Display** tab and open the appropriate shutters.

11 Enter live mode by clicking the **Live Mode** button.

12 Enter the appropriate **Data Collection Time**, **RC Time Constant**, and whether or not pre-triger data will be shown in the **Live Display** tab.

12 If a baseline offset is desired, click on **Zero Baseline**. This will subtract the current intensity from all subsequent measurements.

13 Ensure that green ready light on the control box is on. If not, move valves to flow position and ensure the block makes contact with the syringes.

14 Press the **Collect Data** button in the **Live Display** tab to begin data collection. If the valves are not in their proper positions, the program will not collect data and will indicate which valves are improper. If the instrument is ready, pressing the spacebar will initiate the flow and data collection.

Fitting 2-D data set

1 Click on dataset to be fit.

2 If you desire to fit only a portion of this data, select **Create Data Subset** in the **Tools** menu. When prompted, enter the range of the dataset you wish to fit. Click on new dataset to select it.

3 Select **2-D Fits** under the **Fits** menu and select the desired model to fit the data. *If you would like a data fitting model added to the software, please contact Olis.*

Fitting a 3-D data set

➤ There is a tutorial under the **Help** menu which describes SVD data processing and fitting.

Smoothing a scan

1 Highlight the data set in the **Experiment** window.

2 Left click to highlight the data and then right click on the data.

3 Select **Digital Filter** in **Data Processing** menu.

4 Select the appropriate (5-25 point) smooth.

Smoothing a 3D dataset using SVD

1 Click on the desired dataset in the **Experiment** window.

2 Click on **SVD** to generate the SVD eigenvectors.

3 Choose **Reconstruct 3D from SVD Data**.

Changing the axis scale on a data set

1 Select desired data set

2 Right-click on graph

3 Select scale and enter desired values.

Changing the axis titles on a dataset

1 Left click on a dataset to highlight it.

2 Choose **Edit Dataset** under the **Edit** menu.

3 Change axis title and units. *Axis values can be changed by clicking **Edit Axis Data**, changing axis values, and clicking **Save Axis Data**.*

4 Click **Post Data to GlobalWorks**.

Deleting a slice from a dataset

1 Left click on a dataset to highlight it.

2 Choose **Edit Dataset** under the **Edit** menu.

3 Click on **Edit Axis Data** of the axis of the slice to remove.

4 Left click axis points or drag mouse to select multiple points.

5 Right click and select **Remove Axis Points** under **Axis Options**.

6 Click on **Save Axis Da**

7 Click **Post Data to GlobalWorks**.

Viewing more than one set of data

1 Open all desired sets of data.

2 Select a dataset to be viewed (Move between data sets in the **Experiments** window on the right).

3 Select **Copy Slice** under **Edit** menu.

4 Select second data set to view.

5 Select **Paste Slice** under **Edit** menu

➤ To hide a slice from view (and from the printer), select it and select **Hide Slice** under the **View** menu.

➤ To switch between hidden slices and viewed slices, select **Swap Hidden/Unhidden Slices** under **View** menu.

Assigning a baseline

1 Highlight the desired data set in the experiment window,

2 Left click on the data to select it and then right click on the data and select Assign as Baseline. *The baseline will continue to be applied until the wavelength range, number of data points, or Assign baseline checkbox have been changed.*

Doing math on a dataset

1 In the **Experiment** window, select a dataset by clicking on it.

2 Right click on the dataset and choose **Select**.

3 Repeat this procedure for any datasets to be included in the mathematical operation.

4 Right click on the dataset again and choose the desired mathematical operation under the **Data Processing** menu. *These options are also available under the **Tools** menu.*

5 The new mathematically manipulated dataset will be generated in the **Experiment** window.

Naming a dataset

1 Double click on the **Name** property in the **Properties** window.

2 Enter a name for the dataset.

3 Press enter to assign the name. *This name will remain with the dataset and is distinct from the file name.*

Saving a dataset

1 Click on the desired dataset in the **Experiment** window.

2 Add any comments, and change the dataset name if desired.

3 Choose **Save Dataset** or **Save dataset as...** under the **File** menu. *Choose an appropriate directory and file name.*

Saving an experiment

1 Click on the desired experiment in the **Experiment** window.

2 Choose **Save Experiment** under the **File** menu.

3 The program will prompt for file names for each data set in the experiment. *When the experiment is reopened all the accompanying datasets will be opened.*

Printing a data set as a report

1 Select chart by clicking on dataset.

2 Select **Print Preview** under **File** menu and choose **Color** or **Black and White**.

3 Click on **Print**.

Pasting a dataset into Microsoft Word

1 Select chart by clicking on dataset.

2 Select **Send Chart to Clipboard** under **Chart** tab.

3 Open Microsoft Word document.

4 Choose **Paste Special** under **Edit** menu.

5 Double click on graph to edit it using Microsoft Draw.

Exporting a 2-D data set

1 Select a data set to be exported.

2 Right click on the chart and select **Save as Ascii**.

3 Enter the filename when prompted.

➤ Alternatively, data can be exported directly into Excel by selecting **Export to Excel** under the right-click menu.

Turning off the DW-2000 and DW-2

1 Exit the GlobalWorks software by selecting **Exit** under the **File** menu.

2 Exit Windows and turn off main power switch.

Building a 3-D dataset

1 Collect individual 2-D traces to be included in 3-D dataset.

2 Click on dataset.

3 Choose **Edit Dataset** under **Edit** menu.

4 Change Y axis title and units to new axis.

5 Repeat for each trace to be included. *Cut and paste may be used.*

6 Select all datasets to be included by right clicking each in the **Experiment** window and choosing **Select**.

7 Right click on a dataset in the **Experiment** window, choose **Build 3-D from 2-D** under **Data Processes**.

8 Select all datasets to be included by right clicking each in the **Experiment** window and choosing **Select**.

9 Click on the new dataset, choose **Edit Dataset** under the **Edit** menu.

10 Choose **Edit Axis Dat**a, enter new values and click **Save Axis Data**.

11 Click **Post Data to GlobalWorks**.

Deleting a slice from a dataset

1 Left click on a dataset to highlight it.

2 Choose **Edit Dataset** under the **Edit** menu.

3 Click on **Edit Axis Data** of the axis of the slice to remove.

4 Left click axis points or drag mouse to select multiple points.

5 Right click and select **Remove Axis Points** under **Axis Options**.

6 Click on **Save Axis Data**.

7 Click **Post Data to GlobalWorks**.

Changing the axis titles on a dataset

1 Left click on a dataset to highlight it.

2 Choose **Edit Dataset** under the **Edit** menu.

3 Change axis title and units. *Axis values can be changed by clicking **Edit Axis Data**, changing axis values, and clicking **Save Axis Data**.*

4 Click **Post Data to GlobalWorks**.