Quick Reference How-To Guide for the Olis RSM 1000

Turning on the RSM 1000

1. Decide which lamp is to be used. If 150W or 450W lamp is to be used, turn on cooling box.
2. Make sure that computer and electronics are off.
3. Turn the power supply on. After 5-10 seconds press the ignite button and hold until lamp comes on.
4. Turn on the main power switch on the command console.
4. Turn on the computer and open GlobalWorks program.
5. Choose the **Data Collection** tab and press **RSM**.
6. The RSM will initialize and calibrate.

Collecting rapid scan stopped-flow absorbance data

1. Ensure that the absorbance lamp (front lamp if there are two) is on.
2. Check that gratings are appropriate for the application.
3. Ensure that stopped-flow accessory is in position and that gas pressure is at 75-90 psi.
4. Ensure that a 0.2 mm scan disk is being used.
5. Ensure that appropriate slits are in position (usually 0.6 mm in entrance slit and 0.12 mm in exit slit).
6. Beam splitter should be in sample chamber and reflecting to reference (blue) PMT. Red PMT should be in end of sample chamber.
7. **Data Collection Mode** should be set to **Absorbance** in the **Operational Modes** tab.
7. **Data Reduction Mode** should be set to **Rapid Scanning + SF** in the **Operational Modes** tab.
8. Ensure that **Grating Lines** in the **Live Display** tab is equal to that in the instrument.
9. Enter the appropriate **Data Collection Time** in the **Live Display** tab.
10. Ensure that **Average Mode** in the **Live Display** tab is appropriate for the data to be collected. The number of scans should be less than 5000.
11. Change center **RSM Wavelength** in the **Live Display** tab to the appropriate wavelength.
12. Enter **Live Mode** in **Live Display** tab to see real time scan.
13. Collect baseline with the **Apply Baseline** option in the **Live Display** tab if desired.
14. Apply RC filter if desired.
15. Fill reagent syringes with reagents using valves in fill position. Put all valves to flow.
16. 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.
17. Press the **Collect Data** button in the **Live Display** tab to begin data collection.

Collecting rapid scan stopped-flow fluorescence data

1. Ensure that the absorbance lamp (front lamp if there are two) is on.
2. Check that gratings are appropriate for the application. The useful wavelength range is determined by the blaze. A rule of thumb is a range of 2/3*Blaze to 3/2*Blaze.
3. Ensure that a 0.2 mm scan disk is being used.
4. Ensure that appropriate slits are in position (usually 1.24 mm).
5. Beam splitter should be in sample chamber and reflecting to reference (blue) PMT. Red PMT should be in end of sample chamber.
6. Ensure that stopped flow accessory is in position and that gas pressure is 75-90 psi.
7. **Data Collection Mode** should be set to **Absorbance** in the **Operational Modes** tab.
8. **Data Reduction Mode** should be set to **Rapid Scanning + SF** in the **Operational Modes** tab.
9. Ensure that **Grating Lines** in the **Live Display** tab is equal to that in the instrument.
10. Enter the appropriate **Data Collection Time** in the **Live Display** tab.
11. Ensure that **Average Mode** in the **Live Display** tab is appropriate for the data to be collected. The number of scans should be less than 5000.
11. Change **RSM Center Wavelength** in the **Live Display** tab to the appropriate wavelength.
12. Push buffer or solvent through the cell to flush it.
13. Enter **Live Mode** in the **Live Display** tab to see real time scan.
14. Collect baseline with the **Apply Baseline** option in the **Live Display** tab if desired.
15. Fill reagent syringes with reagents using valves in fill position. Put all valves to flow.
16. Ensure that green ready light on the control box is on. If not move valves to flow position and ensure that the block makes contact with the syringes.
17. Apply RC filter if desired.
18. Press the **Collect Data** button in the **Live Display** tab to begin data collection.

Collecting a conventional scan

1. Under the **Operational Modes** tab, set the **Collection Mode** to **Scan**.
2. Ensure that the proper **Data Reduction Mode** is selected (i.e., **Absorbance**, **Transmittance**, etc.).
3. Go to **Live Display** tab.
4. In **Dual Beam** mode, change wavelength scan range of

the desired scanning monochromator. *The other monochromator will remain fixed.*

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

Taking 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 **Assay Wavelength**.
4. Enter **Number of Points to Collect** and **Integration Time**.
5. To subtract an offset from the data, click on the **Zero Instrument** button.
6. To begin the assay, click on the **Collect Data** button and press spacebar when prompted.

Collecting stopped-flow absorbance data

1. Ensure that stopped-flow accessory is in position and that gas pressure is at 75-90 psi.
4. Attach a syringe (or tubing) to the waste port.
5. Move fill valves to "Fill" position and carefully draw back stopped-flow syringes to fill without drawing in bubbles.
6. Move the fill valves back to the "Flow" position.
7. Ensure that the correct PMTs are active in the **Parameters** tab.
8. **Data Collection Mode** should be set to **Stopped Flow** in the **Operational Modes** tab.
7. **Data Reduction Mode** should be set to **Absorbance** in the **Operational Modes** tab.
8. Press the **Live Mode** button to enter live mode.
9. In the **Live Display** tab, adjust the slit width and open the appropriate shutters.
9. Enter the appropriate **Data Collection Time**, **RC Time Constant** and whether or not pre-trigger data will be shown.
10. If a baseline offset is desired, click on **Zero Baseline**. This will subtract the current intensity from all subsequent measurements.
11. Ensure that all valves are in the flow position and that the syringes are in contact with the plunger block. The green "Ready" light on the electronics box should be on. If not, a red light will indicate a valve out of position.
12. Press **Collect Data** to begin 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 desired range. 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 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**.

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.*

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.

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.

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.

Smoothing a scan

1. In the **Experiment** window, select a dataset by clicking on it.
2. Right click on the desired dataset and choose **Select** from the pop up menu.
3. Right click on the dataset again and choose the **Smooth** option under **Data Processing** in the pop up menu.
4. Choose the degree of smoothing (3-25 points per average).
5. A new smoothed dataset will be generated in the **Experiment** window. The name will by default be "[original data file name]-smoothed."

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.

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.

Turning off the RSM 1000 instrument

1. Exit the GlobalWorks software by selecting **Exit** under the **File** menu.
2. Exit Windows and turn off main power switch.
3. Turn off power to lamp and allow cooling box to run for additional five minutes.

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**.

Collecting repeated scans as a function of a titrator script

1. In the Repeated Scans tab, set **Repeat Scans as a function of** to **Titrator Script**.
2. Follow instructions for calibration.
3. Load solution into titrator using the **Titrator Control Panel** to move syringes.
4. To edit a script file, click on **Edit Script**.
5. Select appropriate data collection parameters in the **Live Display** and **Operational Modes** tabs.
6. Click on **Collect Data** to begin Scans.

Taking repeated scans as a function of a temperature script

1. In the **Repeated Scans** tab, select the desired temperature script by entering or browsing to the correct file.
2. To edit a script file, click on **Edit Script** and change the number of scans, temperatures and integration times.
3. Check that the temperature controller is set to **On** in the **Temperature Control** tab.
4. In the Repeated Scans tab, set **Repeat Scans as a function of** to **Temperature Script**. *The **Number of Scans** value should change to be equal to the number of scans in the temperature script.*
5. Select appropriate data collection parameters in the **Live Display** and **Operational Modes** tabs.
6. Click on Collect Data to begin Scans.

Collecting repeated scans as a function of a titrator script

1. In the Repeated Scans tab, set **Repeat Scans as a function of** to **Titrator Script**.
2. Follow instructions for calibration.
3. Load solution into titrator using the **Titrator Control Panel** to move syringes.
4. To edit a script file, click on **Edit Script**.
5. Select appropriate data collection parameters in the **Live Display** and **Operational Modes** tabs.
6. Click on **Collect Data** to begin Scans.

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**.