Raman Mapping and 3-D Graphing User Guide

Mapping

- To set up a mapping measurement, follow the same procedures for starting up the instrument and running the health check as described in the *Standard Operating Procedure through step 9.*

- Go to Measurement → New → Map Acquisition The "Map Points" dialog box will appear. This dialog consists of a toolbar at the top, an Area Properties section and an Image Source section (see figure 1 below).
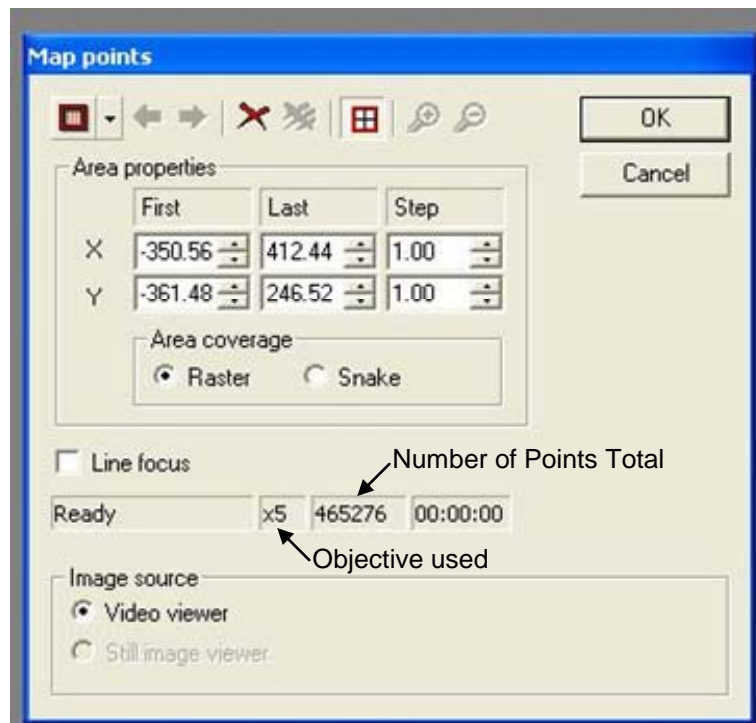

Figure 1. "Map Points" Dialog box

     1. Under the Image Source section, ensure that "Video Viewer" is selected.
     2. In the top tool bar, left click once on the leftmost icon to display a drop-down menu. Using this menu, you may select the shape of the area you wish to map.
        Note: The term "filled" in the menu indicates that the instrument will scan points both on the border of the shape and inside the shape. For a shape that does not specify "filled", only the outline of the shape will be scanned.
     3. When you have selected your shape, then move the mouse to the video viewing section of the screen and draw the shape on the image by left clicking on the mouse, holding, and dragging to make the shape the direction and dimensions that you want.
        Note: If you are unsatisfied with the placement or size of the shape, you may remove it and try again by clicking the "X" icon in the top toolbar of the "Map Points" dialog box.

4. In the "Area Properties" section of the dialog box, you now have the option, if you wish, to manually change the first and last points in the X and Y direction and to select the step size.

5. *The step size is the distance in both the X and Y directions that the instrument will move before running each subsequent scan.* Depending on the size of the area being scanned, it is highly advisable to change the step size in the X and Y directions.

Note: The units for the step size are not specified in the dialog box, but they are microns.

Note 2: Between the "Area Properties" section and the "Image Source" section, there is an information section that will indicate the number of points in the scan. (See figure 1) The information in Table 1 may be used as a guide for setting up mapping runs.

Table 1. Run time information based on Area and Step Size.

Time (hours)	Area (microns)	Step Size (microns)
2	50x50	5
7	50x50	2.5
11	50x50	2
28	100x100	2.5
7	100x100	5

6. In the Area Properties section is a smaller sub section labeled "Area Coverage" with two check boxes. Here you can choose the direction that the scan takes place-- "Raster" means the scan will move across the area to be mapped from left to right and top to bottom. "Snake" means that the scan will move across the area to be mapped from left to right on the first line, drop to the next line and then move right to left, etc in a snake-like or s-shaped pattern. "Raster" is the default and the most commonly used method.

7. When you are satisfied with the parameters, click "OK" and the "Map Measurement Setup" dialog box will automatically appear. You may now set up the parameters for the spectral acquisition as described from *section 9.1 of the Standard Operating Procedure* on.

Mapping Analysis

1. After you have finished the map acquisition, open the map data file by going to File → Open or File → Open in a New Window, or by clicking on the Open icon in the toolbar.

2. In the Navigator window (see figure 2 below) click on the Data tab and make sure that the data file you wish to analyze is highlighted.

3. Go to Analysis → Mapping Review and the "Map Selection" dialog box will appear. Select the type of map you wish to create. Then click on the "Create..." button.

Note: The most common type of map is the "Intensity at a Point". This map allows you to select a given wavenumber and generate a map that displays the relative intensity

of that peak at each point. This is the kind of map that will be used as an example for this guide, however, the setup for the other types of maps is very similar.
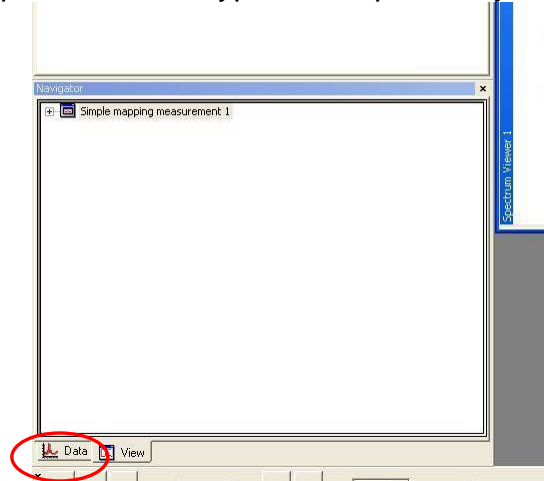

Figure 2. Location of "Data" tab.

4. After hitting "Create", a dialog box will appear. You may use the mouse to left click (once) on the vertical black line and drag it to any point in the spectrum. If necessary, you can zoom in on an area as you would normally. When you have selected the desired point, click on the "Create New Map" icon (second from the bottom on the right-hand side).

5. You will return to the "Map Selection" dialog box automatically. To view the map you have created, click "View"

      5a. While viewing the map, you can click on any point to display the complete spectrum at that point (Bottom right), the Intensity at selected wavenumber compared to other points in the same Y-line (Upper right) and the Intensity at selected wavenumber compared to other points in the same X-line (Bottom left).
      5b. You may save this data by going to File → Save As
      5c. You may save the view on the screen by going to File → Save View As

Generation of 3-D graphs

1. After you have finished the map acquisition, open the map data file by going to File → Open or File → Open in a New Window, or by clicking on the Open icon in the toolbar.

2. Click on the "+" sign next to your raw data file to expand the folder. (Same as you would do in the navigator window during a normal acquisition.

3. Click on the "+" sign next to the Collected Data. This should display each acquisition in the map.

4. Click on the "Collected Data" text, then right-click once to display a pop-up menu. From this menu, select "View original data in 3-D". This will create a 3-D graph containing multiple spectra in the right-hand window.

5. You can adjust the size of this graph by re-sizing the top and bottom edges of the window pane. You may rotate the map to change the angle by left clicking (once) and holding the mouse button while you move the mouse.

6. To save the graph, go to File → Save View As