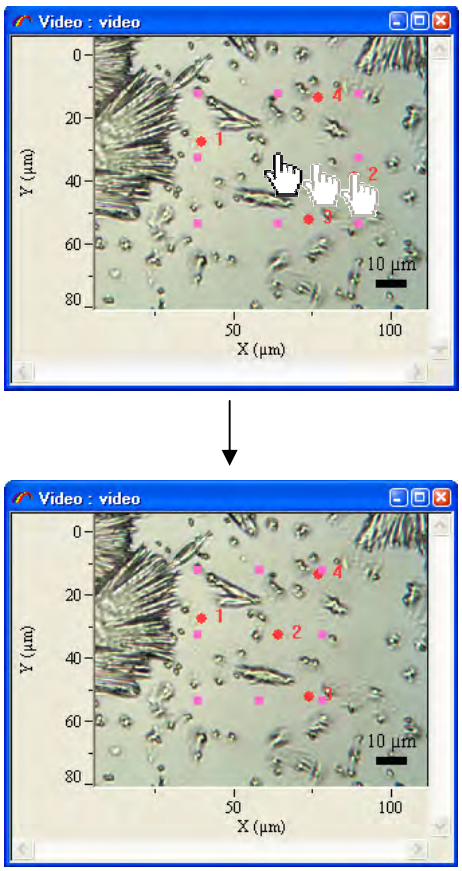
Left click and drag with the Move/Delete Points cursor to move the existing multipoint position to a new position.



To clear all existing points and set point 1 at the center of the video image do one of the following:

- Click on the "Center Cursors" icon in the Icon bar– see 4.4.3, page 92.

- Right click and select "Center cursor".

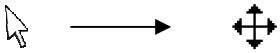
Note that the automated multipoint acquisition is started by using the Mapping Acquisition icon – see section 4.5.4, page 96. The data is acquired as a multidimensional spectral array, with the standard SpIm, Point and Map windows.

Available for: *Video*

5.18. Hor Line Mapping

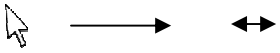
Activates the Horizontal Line Mapping cursor, allowing a horizontal line for line mapping to be defined on the active video image.

When this icon is active, and the mouse is hovered over the line, the cursor changes to the Shift Hor Line cursor.



Left click and drag with the Shift Hor Line cursor to move the line to the desired position on the video image.

When this icon is active, and the mouse is hovered over the line drag points (at each end of the line), the cursor changes to the Adjust Hor Line cursor.



Left click and drag with the Adjust Hor Line cursor to make the line longer or shorter.

To clear the existing line, and create a new default line at the center of the video image do one of the following:

- Click on the “Center Cursors” icon in the Icon bar– see 4.4.3, page 92.

- Right click and select “Center cursor”.

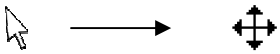
The Shift Hor Line and Adjust Hor Line cursors should be used in conjunction with the Mapping Properties dialog window - see section 4.5.5, page 97.

Available for: *Video*

5.19. Rectangular Mapping

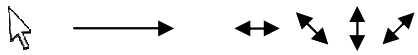
Activates the Rectangular Mapping cursor, allowing a rectangular area for mapping to be defined on the active video image.

When this icon is active, and the mouse is hovered over the existing rectangle, the cursor changes to the Shift Rectangle cursor.



Left click and drag with the Shift Rectangle cursor to move the line to the desired position on the video image.

When this icon is active, and the mouse is hovered over the rectangle drag points, the cursor changes to the Adjust Rectangle cursor.



Left click and drag with the Adjust Rectangle cursor to adjust the rectangle size.

To clear the existing rectangle and create a new default rectangle at the center of the video image do one of the following:

- Click on the "Center Cursors" icon in the Icon bar– see 4.4.3, page 92.

- Right click and select "Center cursor".

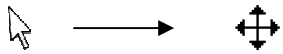
The Shift Rectangle and Adjust Rectangle cursors should be used in conjunction with the Mapping Properties dialog window - see section 4.5.5, page 97.

Available for: *Video*

5.20. Line Mapping

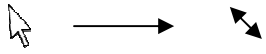
Activates the Line Mapping cursor, allowing a line for line mapping to be defined on the active video image.

When this icon is active, and the mouse is hovered over the line, the cursor changes to the Shift Line cursor.



Left click and drag with the Shift Line cursor to move the line to the desired position on the video image.

When this icon is active, and the mouse is hovered over the line drag points (at each end of the line), the cursor changes to the Adjust Line cursor.



Left click and drag with the Adjust Line cursor to make the line longer or shorter, or to rotate the line about the opposite drag point.

To clear the existing line and create a new default line at the center of the video image do one of the following:

- Click on the “Center Cursors” icon in the Icon bar– see 4.4.3, page 92.

- Right click and select “Center cursor”.

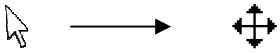
The Shift Line and Adjust Line cursors should be used in conjunction with the Mapping Properties dialog window - see section 4.5.5, page 97.

Available for: *Video*

5.21. Circle Mapping

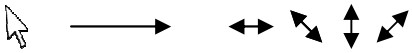
Activates the Circle Mapping cursor, allowing a circle for mapping to be defined on the active video image.

When this icon is active, and the mouse is hovered over the line, the cursor changes to the Shift Circle cursor.



Left click and drag with the Shift Circle cursor to move the line to the desired position on the video image.

When this icon is active, and the mouse is hovered over the circle area drag points (at each edge of the circle area), the cursor changes to the Adjust Circle cursor.



Left click and drag with the Adjust Circle cursor to adjust the circle size.

To clear the existing circle and create a new default circle at the center of the video image do one of the following:

- Click on the “Center Cursors” icon in the Icon bar– see 4.4.3, page 92.

- Right click and select “Center cursor”.

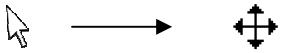
The Shift Circle and Adjust Circle cursors should be used in conjunction with the Mapping Properties dialog window - see section 4.5.5, page 97.

Available for: *Video*

5.22. Ver Line Mapping

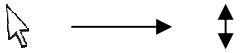
Activates the Vertical Line Mapping cursor, allowing a vertical line for line mapping to be defined on the active video image.

When this icon is active, and the mouse is hovered over the line, the cursor changes to the Shift Ver Line cursor.



Left click and drag with the Shift Ver Line cursor to move the line to the desired position on the video image.

When this icon is active, and the mouse is hovered over the line drag points (at each end of the line), the cursor changes to the Adjust Ver Line cursor.



Left click and drag with the Adjust Ver Line cursor to make the line longer or shorter.

To clear the existing line, and create a new default line at the center of the video image do one of the following:

- Click on the “Center Cursors” icon in the Icon bar– see 4.4.3, page 92.

- Right click and select “Center cursor”.

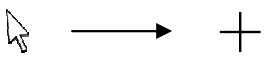
The Shift Ver Line and Adjust Ver Line cursors should be used in conjunction with the Mapping Properties dialog window - see section 4.5.5, page 97.

Available for: *Video*

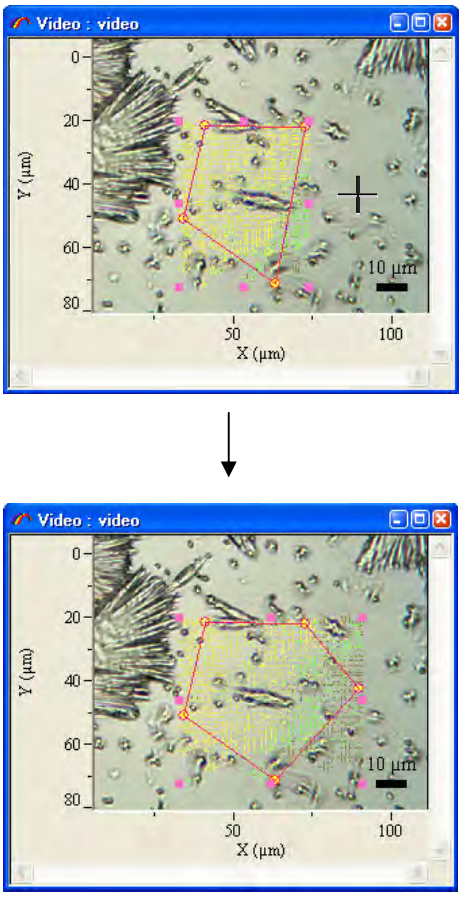
5.23. Polygon Mapping

Activates the Polygon Mapping cursor, allowing a polygon for mapping to be defined on the active video image.

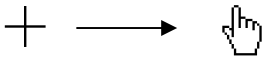
When this icon is active, and the mouse is hovered over the video image the cursor will change to the Add Polygon Points cursor.



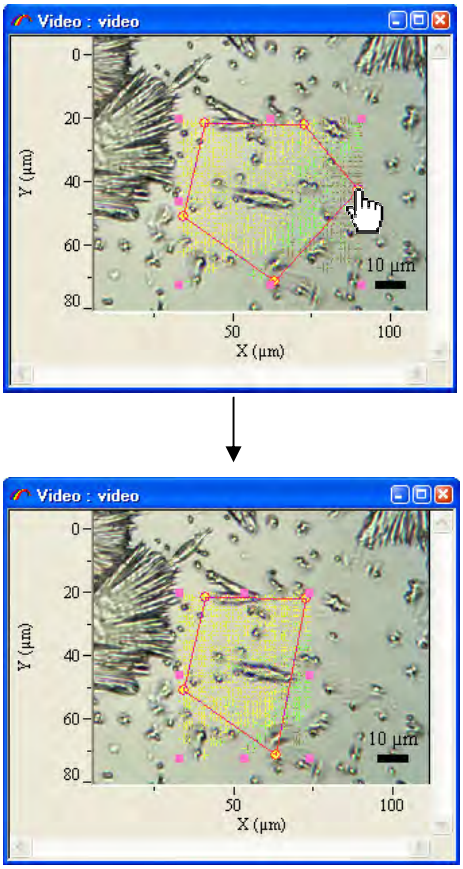
Left click with the Add Polygon Points cursor to add a polygon definition point to the video image.



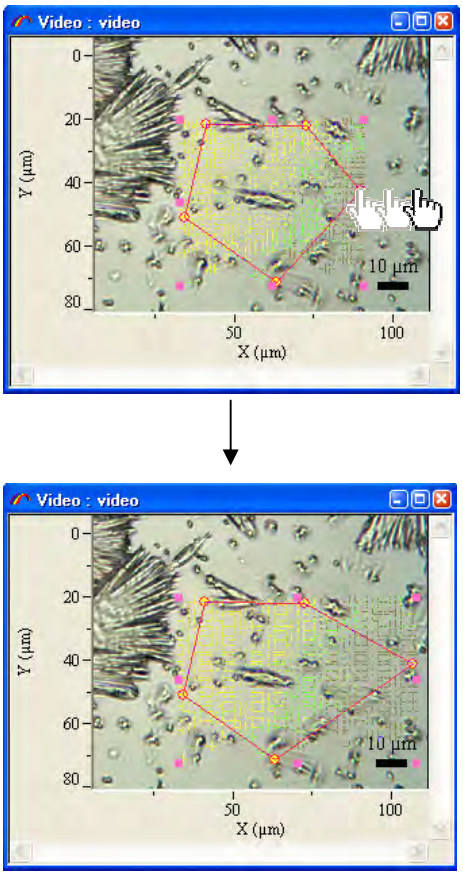
When the Add Polygon Points cursor is active, and the mouse is hovered over an existing polygon definition point, the cursor changes to the Move/Delete Polygon Points cursor.



Left click with the Move/Delete Polgyon Points cursor to delete the existing polygon definition point.



Left click and drag with the Move/Delete Polygon Points cursor to move the existing polygon definition point to a new position.



To clear all existing polygon definition points, and set a single point at the center of the video image do one of the following:

- Click on the "Center Cursors" icon in the Icon bar– see 4.4.3, page 92.

- Right click and select "Center cursor".

Note that the polygon shape is created by locating nearest neighbours to each polygon definition point. Slight adjustment of polygon definition points may be required to obtain the desired polygon mapping shape.

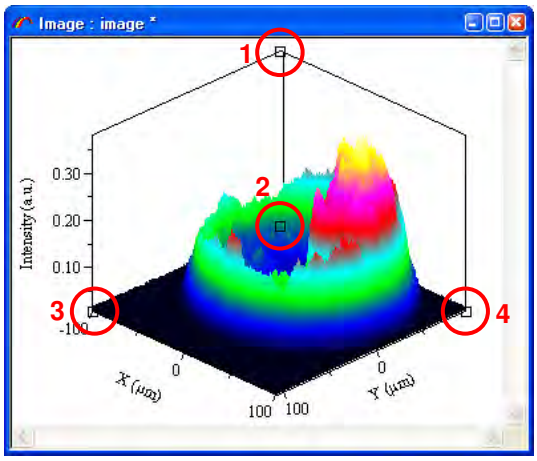
The Add Polygon Points and Move/Delete Polygon Points cursors should be used in conjunction with the Mapping Properties dialog window - see section 4.5.5, page 97.

Available for: *Video*

5.24. Axes3D

Activates axis drag points on a 3D image, allowing its position, shape and perspective to be modified.

When this icon is active, four drag points are activated on the 3D image.



Left click and drag the drag points to adjust the position, shape and perspective of the image:

Drag Point 1
Dragging up/down adjusts the size of the vertical (intensity) axis.

Dragging left/right skews the image about its center point, keeping the left hand side and right hand side vertical axes static.

Drag Point 2
Dragging up/down/left/right adjusts the image position within the display window.

Drag Point 3
Dragging up/down/left/right skews the image, keeping the back and right hand side vertical axes static.

Drag Point 4
Dragging up/down/left/right skews the image, keeping the back and left hand side vertical axes static.

To restore the 3D image to its default display, right click and select Axes, and then click on **[Re-center image]** – see section 8.8.2, page 215.

Available for: Video, SpIm, Map, Score (when displayed in 3D mode)

6. Data Bar

The Data bar located on the right hand side of the LabSpec 5 graphical user interface (GUI) allows individual data objects (e.g., spectra, images, multidimensional spectral arrays) to be selected from a group of open objects. In addition, the Data bar allows control of quick window formatting tools.

This is an active toolbar, and the number of data object selector radio tags (see section 6.3, page 198) will automatically update according to number of open objects in the currently selected window.

Quick Select: Single or Multiple data view

Quick graph settings

Selector radio tags for each open data object

6.1. Quick Select: Single or Multiple Data View

The Single and Multiple Data Graph icons allow fast selection of overlay mode for the active window.

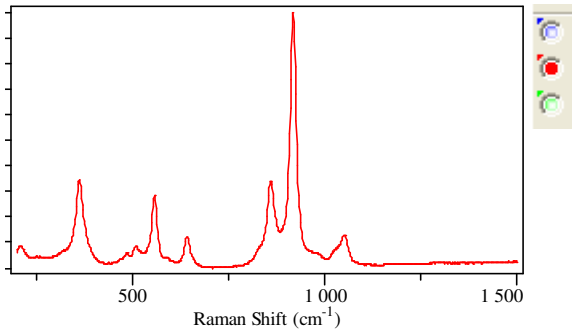
Note that when clicked an icon will be locked down. Only one icon can be active and locked down at a time.

The overlay mode can also be set using the Format and Scale dialog window – see section 8.1, page 204.

6.1.1. Single Data Graph

When the Single Data Graph icon is active and locked, only the active data object will be displayed in the window. For example, if there are three spectra open, only the active spectrum will be displayed. Selecting a different spectrum using the Data bar (see section 6.3, page 198) will cause the selected spectrum to be displayed.

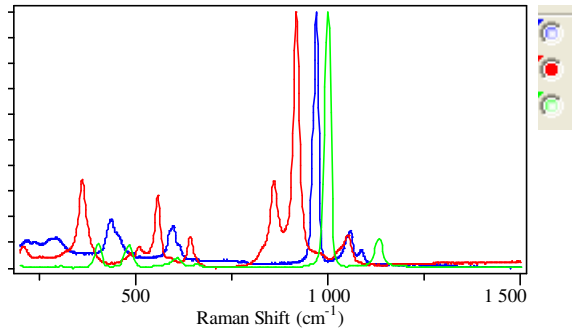
In the example shown right, there are three open spectra, but only the active spectrum (——) is displayed.



6.1.2. Multiple Data Graph

When the Multiple Data Graph icon is active and locked, all open data objects will be displayed in the window. For example, if there are three spectra open, all three will be displayed in an overlay mode in the window.

In the example shown right, there are three open spectra, all of which are displayed.

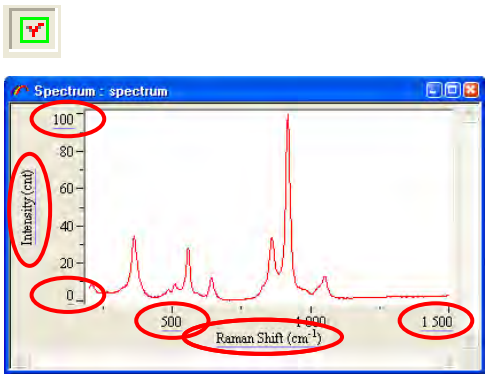


Note that the overlay mode (“Overlay”, “Tile”, “Stack”, “Projection” or “Trace”) used with the Multiple Data Graph icon will be the mode set in the Format and Scale dialog window (see section 8.1, page 204). To adjust the overlay mode right click and select “Format and Scale”, and select the desired mode from the “Mode” drop down box.

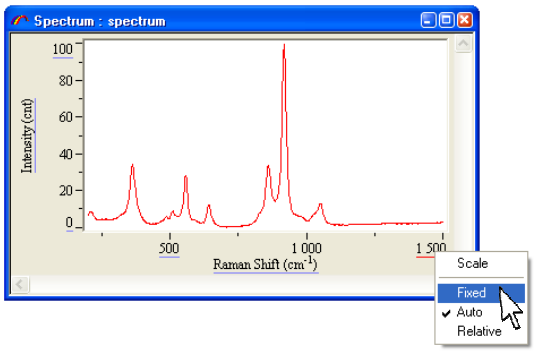
6.2. Fast Graph Settings

When the Fast Graph Settings icon is active and locked, the formatting of axis units and scaling can be quickly modified.

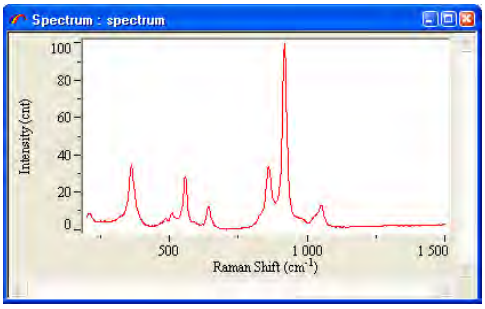
When Fast Graph Settings is active, the titles/units and maximum/minimum values on all visible axes are underlined.



Left click on an underlined item to modify its formatting, by selecting a format from the drop down list.



When Fast Graph Settings is inactive, the titles/units and minimum/maximum values on all visible axes are not underlined, and their formatting cannot be modified using a left click.



Complete formatting is possible using the Format and Scale dialog window – see section 8.1, page 204 for full information.

Note that the current status of the Fast Graph Settings (i.e., active or inactive) is also displayed in the right click menu, under “Fast Settings”. When the Fast Graph Settings is active, “Fast Settings” will be ticked.

6.3. Selector Radio Tags for Open Data Objects

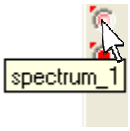
When multiple data objects (e.g., spectra, images, multidimensional spectral arrays) of a similar type are open within a single display window, the Data bar will display a selector radio tag for each object.

Each radio tag will be displayed in the same colour as the data object.

- An active object has a color-filled radio tag, as shown right.

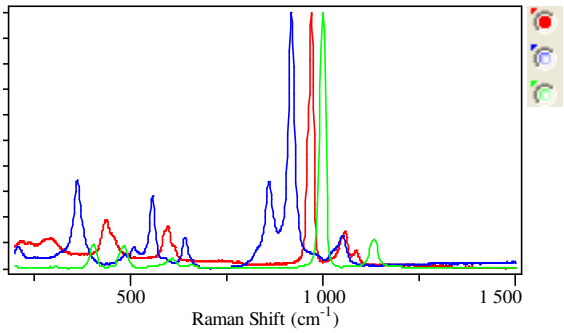
- An inactive object has a hollow radio tag, as shown right.

Hover the mouse cursor over a radio tag to see the data object name.



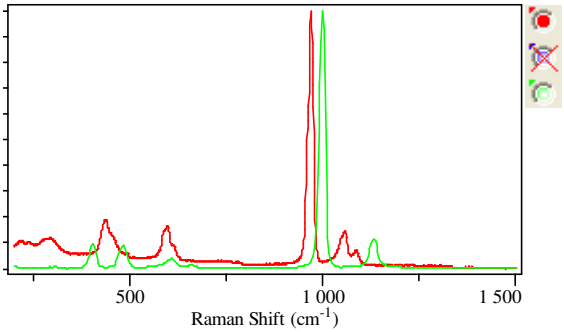
<CTRL>+Click on a radio tag to hide/show an individual object. If an object is hidden the radio tag will display a red cross.

- In the example shown right there are three open spectra, all of which are displayed.



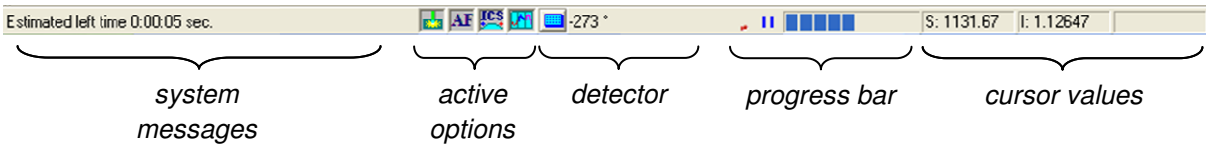
- In the example shown right there are three open spectra, but one (——) has been hidden using <CTRL>+Click and is not displayed.

  The spectrum can be shown again by <CTRL>+Clicking on its radio tag.



7. Status Bar

The Status bar displays information about system status (e.g., progress of an acquisition), active options (e.g., intensity correction, or extended range settings), and cursor values.



7.1. System Messages

System messages show information relevant to the current operation. Typical examples include the estimated time remaining until completion of a measurement, current status/operation of the autocalibration routine, or current status/operation of the spectrometer.

7.2. Active Options

The Active Options icons indicate whether certain data acquisition options are active – typically these are options which have a significant effect on the measurement.

Photo-bleaching On

When Photo-bleaching is active (i.e., the photo-bleaching time is >0s) the Photo-bleaching On icon is displayed.

For more information about Photo-bleaching and how to turn it on and off, please see section 3.5.4.4, page 35).

Autofocus On

When Autofocus is active the Autofocus On icon is displayed.

For more information about Autofocus and how to turn it on and off, please see section 3.5.4.8, page 39).

Intensity Correction On

When Intensity Correction is active the Intensity Correction On icon is displayed.

For more information about Intensity Correction and how to turn it on and off, please see section 3.5.4.14, page 43.

Extended Range On

When an Extended Range measurement is active (i.e., the extended range function is set to either Multiwindow or Autoscanning) the Extended Range On icon is displayed.

For more information about Extended Range acquisition and how to turn it on and off, please see section 3.5.6, page 49.

7.3. Detector

The Detector display shows the detector temperature (in degrees celsius, °C), and (on systems equipped with multiple detectors) can be used to switch from one detector to another.

7.3.1. Detector Temperature

The detector icon is colored according to the temperature status of the active detector, relative to the temperature set in the "Detector" dialog window (see section 3.5.7, page 57).

- Actual temperature is between set temperature and 5°C above the set temperature; detector can be used.

- Actual temperature is between 5°C and 10°C above the set temperature.

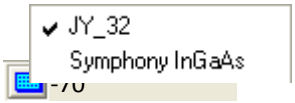
  Detector can be used, but data acquired in this state may exhibit slightly reduced quality (signal to noise).

- Actual temperature is greater than 10°C above the set temperature; it is recommended that the detector is not used.

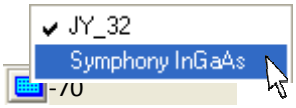
  Note that use of a detector at high temperature will not damage it, but data acquired in this state will exhibit significantly reduced quality (signal to noise).

7.3.2. Switching Detector

On systems equipped with multiple detectors, click on the detector icon to view a list of available detectors. The currently active detector is indicated with a tick.



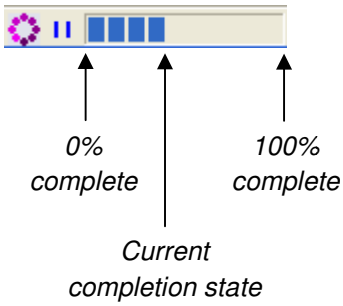
To switch detector, select the desired detector from the list of available detectors. Note that a detector initialization message may be displayed when the detector is switched.



7.4. Progress Bar

The Progress Bar indicates whether a hardware/software process is active, and displays the approximate progress of an active process. It is also possible to temporarily pause a process using the Progress Bar "Pause" icon.

When a process is active, the Progress Bar displays a moving circle icon, and blue bars which indicate the current progress.



Left click on the "Pause" icon to pause the current process. The process will continue until the current section of the process is completed, and it will then pause. The "Pause" icon will change into the "Start" icon.

Left click on the "Start" icon to re-start a paused process. The "Start" icon will change into the "Pause" icon.

When no process is active, the Progress Bar is empty.

7.5. Cursor Values

The Cursor Value display shows a range of information depending on the type of cursor which is active – e.g., the X and Y axis positions of the cursors, the spectrum/profile/image intensity at the cursor position, width between two cursors, and approximate peak width.

The following symbols are used to identify information displayed in the Cursor Value display.

- S – spectral (X axis) position in a spectrum. The units will be those selected in Options > Unit (see section 3.4.1, page 22), typically Raman shift (cm^{-1}) or wavelength (nm).
- I – intensity. The units for spectra and cursor generated profiles/maps will be those selected in Options > Unit (see section 3.4.1, page 22), typically counts (cnt) or counts per second (cnt/s). The units for video images will be arbitrary units (a.u.).
- X, Y, Z – spatial position in a profile or image. The units will be micrometers (µm).
- P – spectral (X axis) width between a paired set of map analysis cursors. The units will be those selected in Options > Unit (see section 3.4.1, page 22), typically Raman shift (cm^{-1}) or wavelength (nm).
- W – approximate peak width as indicated by the Peak cursor. The units will be those selected in Options > Unit (see section 3.4.1, page 22), typically Raman shift (cm^{-1}) or wavelength (nm).

8. Right Click Menus

Right mouse clicking on the data windows will display a menu, which typically will allow access to additional dialog windows, provides shortcuts to other functions within LabSpec 5, or provides information about the current configuration.

The right click menu is active, and its appearance and content will update according to the currently selected window. For example, the options appearing for a Spectrum window will differ from those appearing for a video image.

At the end of each function's description, a list of windows where the function is available in the right click menu is given. The possible windows are as follows:

Spectrum
The spectrum display window for individual spectra acquired using the real time display (RTD) acquisition (/) and spectrum acquisition (/) modes.

Video
The video display window for optical images acquired with the integrated microscope camera(s).

SpIm
The overlay of all spectra within a multidimensional spectral array.

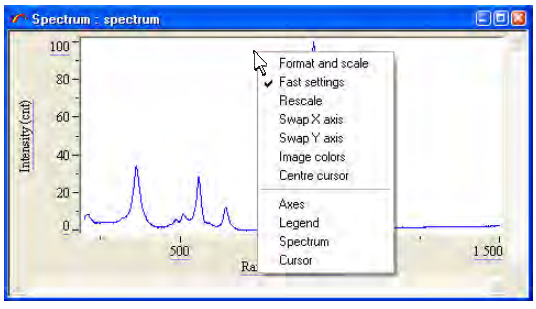
Point
The spectrum at the current cursor position within a multidimensional spectral array.

Map
The cursor intensity profile/image display created from a multidimensional spectral array.

Score
The score profile/image created by DCLS modelling of a multidimensional spectral array

Model
The reference component spectra used for DCLS modelling of a multidimensional spectral array.

To display the right click menu, right click anywhere within the active window. Left click on a menu item to open a new dialog window, or run the function.

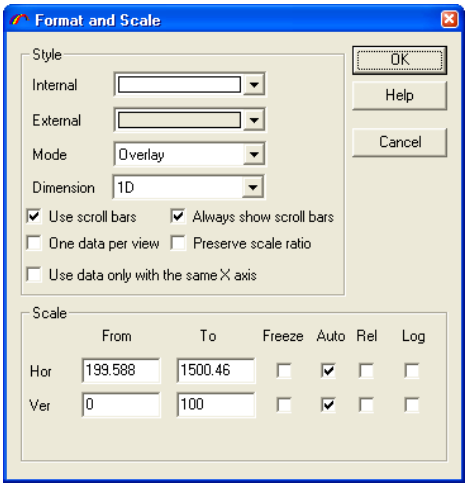


Note that setting a function in a right click menu dialog window will only set that function for the active window. It is possible to have different settings for different windows. For example, a Spectrum and Point window can have different format and scale settings, by applying different settings through the Format and Scale dialog window for each window.

8.1. Format and Scale

The Format and Scale dialog window allows control over the window display format, and the data scaling within the window.

Note that depending on the data window selected, the Format and Scale dialog window may slightly differ from that shown below.



Available for: Spectrum, Video, SpIm, Point, Map, Score, Model

8.1.1. Style

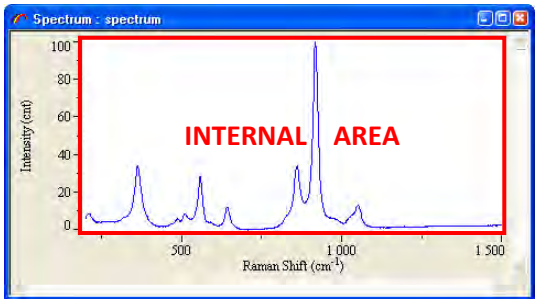
The Style section of the Format and Scale dialog window allows control over the appearance of the data window, and how data is displayed within it.

Internal

Select the internal area color and fill option from the "Internal" color drop down box.

Note that when a data window is copied as an image, it will be copied with the default internal white background.

The internal area is shaded in the image shown right.

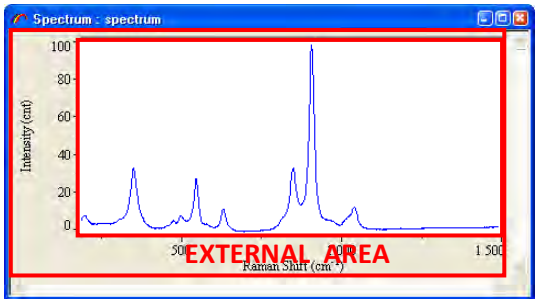


External

Select the external area color and fill option from the "External" color drop down box.

Note that when a data window is copied as an image, it will be copied with the default external white background.

The external area is shaded in the image shown right.

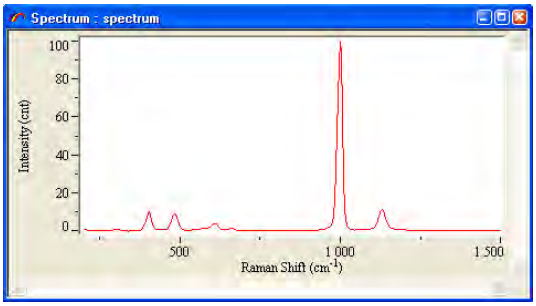


Mode

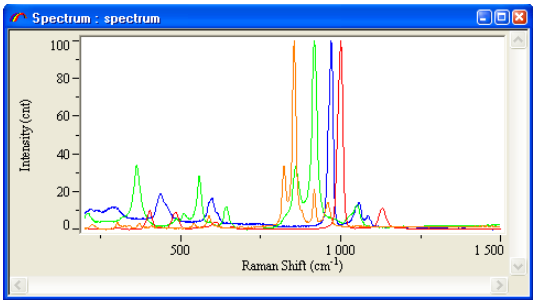
Select the overlay mode for data objects (e.g., spectra, images, multidimensional spectral arrays) from the "Mode" drop down box.

A number of overlay modes are available:

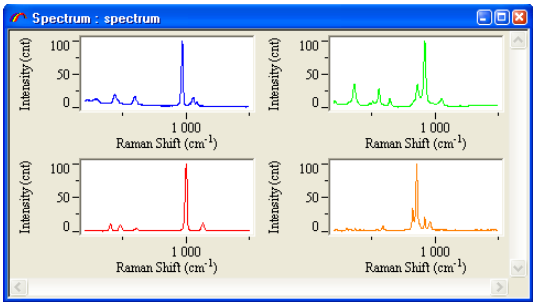
- Single – display only the currently active data object in the window.



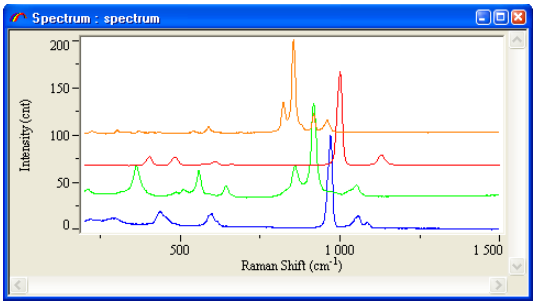
- Overlay – display all open data objects in the window.



- Tile – display all open data objects in separate tiled sections within the window.

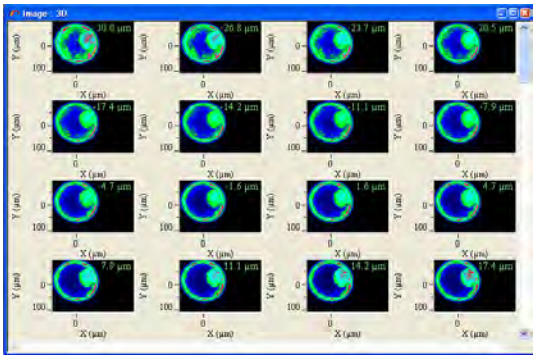


- Stack – display all open data objects in the window, offsetting each by a certain amount.



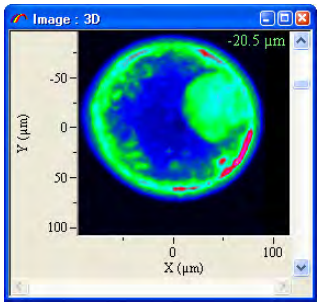
- Projection – displays a series of images corresponding to the open data object in separate tiled sections within the window.

  This mode is only available for multidimensional spectral arrays, and is intended for display of 3D data sets (e.g., XYZ datacubes).



- Trace - displays a single image from a multi-image single data object within the window. The scroll bar on the right hand side can be used to scroll through each image corresponding to the data object; the axis value for the image is displayed in the top right hand corner of the window.

  This mode is only available for multidimensional spectral arrays, and is intended for display of 3D data sets (e.g., XYZ datacubes).

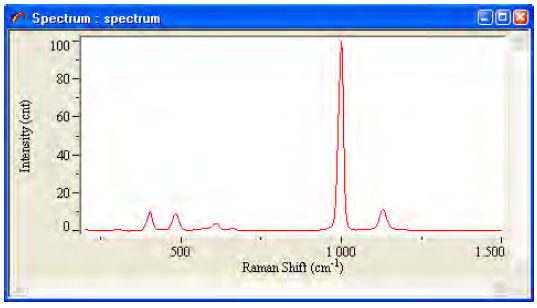


Dimension

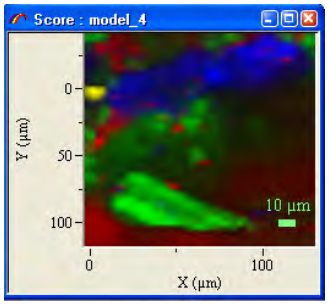
Select the display dimension from the "Dimension" drop down box. The number of dimensions used for data display refers to the number of non-intensity axes. For example, a simple spectrum is considered a 1D display, because it constitutes the intensity dimension plus one other dimension (the spectral axis, typically Raman shift or wavelength). A video image is considered a 2D display, because it constitutes the intensity dimension plus two spatial axes (X and Y).

Three display dimensions are available:

- 1D – simple 'graph' presentation, typically used for spectra (including Spectrum, SpIm, Point and Model windows).

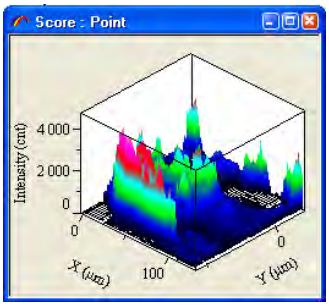


- 2D – simple image presentation, typically used for images (including video, map and score windows). Multiple images can be overlaid in this mode.



- 3D – for pseudo 3D representation of 2D data, where all three axes (intensity plus two spatial) are visible. Only a single image component can be displayed in this mode.

  Note that 3D images are configured using the right click menus Axes (see section 8.8.2, page 215) and 3Dimage (see section 8.18, page 224).



Use Scroll Bars

When "Use scroll bars" is ticked, scroll bars will be displayed if part of the data is off scale (e.g., not actually displayed in the data window).

Always Show Scroll Bars

When "Always show scroll bars" is ticked, the scroll bar display section of the data window will always be present, even if all data is displayed within the window. The scroll bar(s) will only become active if part of the data is off scale (e.g., not actually displayed in the data window).

One Data per View

When "One data per view" is ticked, each data object associated with the data window will always open into a new data window. In this case, it is not possible to overlay objects in a single window.

Preserve Scale Ratio

When "Preserve scale ratio" is ticked, the aspect ratio will be retained. Typically this function is used for image display only.

Use Data Only with Same X Axis

When "Use data only with same X axis" is ticked, only data objects which share the same X axis units will be opened within the window. Objects with other X axis units will be opened into a new data window. For example, if a spectrum with Raman shift (cm^{-1}) units is already open in a data window, when a spectrum with wavelength (nm) units is opened, a new data window will be created for it.

8.1.2. Scale

The Scale section of the Format and Scale dialog window allows control over the scaling of data within the data window.

Each available axis for the active data object is displayed in the "Scale" section, with a number of options for its scaling. Typical axes displayed here are:

- Hor – the X axis, typically the spectral axis for spectra, or the X (µm) axis for images.
- Ver – the Y axis, typically the intensity axis for spectra, or the Y (µm) axis for images.
- Intens – the intensity axis for images.

From and ***To***
Displays the start ("From") and stop ("To") axis values which will be displayed. These can be manually adjusted by typing in desired values and clicking **[OK]**.

Freeze
When "Freeze" is ticked the axis scaling is fixed, and will not be affected by scale normalization (see section 4.4.1, page 91), its right click shortcut "Rescale" or its keyboard shortcut <CTRL>+N.

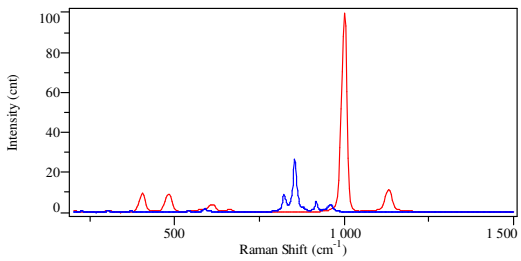
The axis scaling can also be fixed using the Fast Graph Settings and selecting "Fixed" for the axis (see section 6.2, page 197).

Auto
When "Auto" is ticked the axis will autoscale to display all data open in the data window.

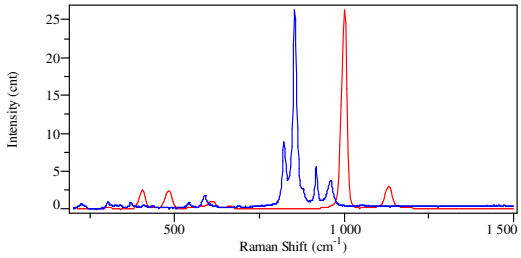
The axis scaling can also be set to autoscaling by using the Fast Graph Settings and selecting "Auto" for the axis (see section 6.2, page 197).

Rel
When "Rel" is ticked all data open in the data window will be displayed with identical minimum and maximum intensities. The scale values displayed for the axis will correspond to the active data object.

The data shown right are displayed with normal scaling.



The data shown right are displayed with relative scaling. The active spectrum is ——.



The axis scaling can also be set to relative scaling by using the Fast Graph Settings and selecting "Relative" for the axis (see section 6.2, page 197).

Log
When “Log” is ticked the axis will be displayed with logarithmic scaling rather than linear scaling.

8.2. Fast Settings

When “Fast settings” is ticked, the Fast Graph Settings are active (see section 6.2, page 197).

Left click on “Fast settings” to tick (activate) or untick (deactivate) this function.

Available for: Spectrum, Video, SpIm, Point, Map, Score, Model

8.3. Rescale

Left click on “Rescale” to rescale the active window so that all data is visible. In normal operation all axes are affected, but note that an axis with scaling set to “Fixed” will not be rescaled. To rescale an axis ensure that “Freeze” or “Fixed” scaling is turned off (see section 8.1, page 204).

This function can also be activated with the Scale Normalization icon (see section 4.4.1, page 91) or with the <CTRL>+N keyboard shortcut.

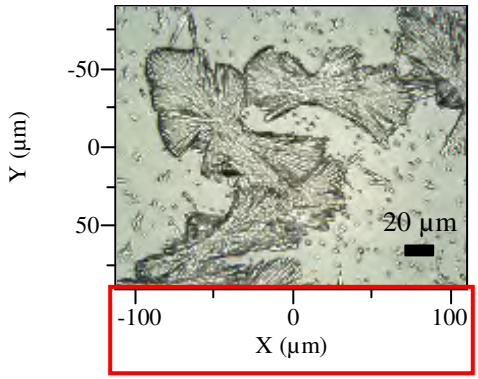
Available for: Spectrum, Video, SpIm, Point, Map, Score, Model

8.4. Swap X axis

Click on “Swap X axis” to reverse the X axis display.

CAUTION: WHEN AN XY MOTORIZED SAMPLE STAGE IS PRESENT, THE AXIS DISPLAY FOR VIDEO IMAGES SHOULD ALWAYS BE LEFT IN THE DEFAULT CONFIGURATION TO ENSURE CORRECT MAPPING AND EXTENDED VIDEO IMAGING ACQUISITION.

THE X AXIS SHOULD HAVE UNITS RUNNING FROM NEGATIVE ON THE LEFT HAND SIDE, THROUGH TO POSITIVE ON THE RIGHT HAND SIDE, AS DISPLAYED RIGHT.



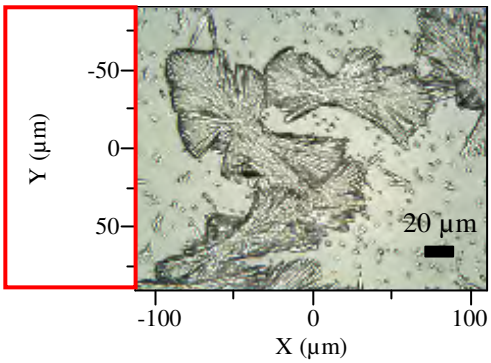
Available for: Spectrum, Video, SpIm, Point, Map, Score, Model

8.5. Swap Y axis

Click on “Swap Y axis” to reverse the Y axis display.

CAUTION: WHEN AN XY MOTORIZED SAMPLE STAGE IS PRESENT, THE AXIS DISPLAY FOR VIDEO IMAGES SHOULD ALWAYS BE LEFT IN THE DEFAULT CONFIGURATION TO ENSURE CORRECT MAPPING AND EXTENDED VIDEO IMAGING ACQUISITION.

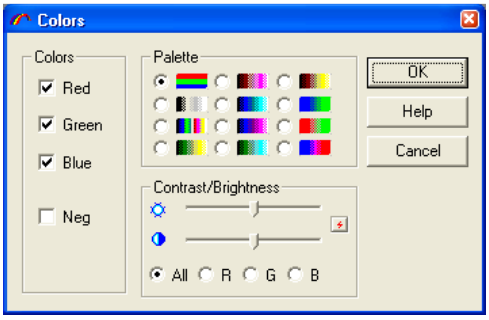
THE Y AXIS SHOULD HAVE UNITS RUNNING FROM NEGATIVE AT THE TOP, THROUGH TO POSITIVE AT THE BOTTOM, AS DISPLAYED RIGHT.



Available for: Spectrum, Video, SpIm, Point, Map, Score, Model

8.6. Image Colors

The Colors dialog window allows control of the color palettes used for image rendition, and adjustment of image brightness and contrast.



Available for: Spectrum, Video, SpIm, Point, Map, Score, Model

8.6.1. Colors

LabSpec 5 uses an RGB palette for its image rendition – by default, red (R), green (G) and blue (B) components are used to create the colored images displayed.

When a color "Red", "Green" or "Blue" is ticked, it will be used to create the colored images. For correct color rendering of images based on the selected color palette (see section 8.6.2, page 211) ensure that all three colors ("Red", "Green" and "Blue") are ticked.

When "Neg" is ticked, the negative image will be displayed for the selected color palette.

8.6.2. Palette

Available color palettes are listed in this section. Left click on one of the palette radio buttons ( ) to select the palette.

There are two types of palette:

- True color – with this palette each color component is displayed in its true color. 

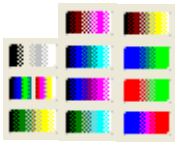
  In the case of a video image, the three components (red, green and blue) are displayed in their individual colors to yield a composite colored image.

  In the case of a map image created from a multidimensional spectral array the cursor intensity image corresponds to the cursor color. For example, the image generated using the red map analysis cursor will be displayed in a one color red scale.

  In the case of a score image created from a multidimensional spectral array the score image corresponds to the reference component spectrum displayed in the Model window. For example, the score image for a red spectrum in the Model window will be displayed in a one color red scale.

  This palette should be used for video images, and map/score images where multiple components are overlaid.

- False color – with one of these palettes, image pixels are displayed in different colors depending on their intensity.

  These palettes are useful when an image has regions of both high and low intensity, which can be hard to visualize with a traditional true color palette.

  These palettes should only be used for representation of a single component (e.g., a single cursor intensity map image, or a single score image).

8.6.3. Contrast and Brightness

Left click and drag the "Brightness" slider to adjust the brightness for the image display.

Left click and drag the "Contrast" slider to adjust the contrast for the image display.

If {All} is selected ( ), the brightness and contrast adjustments will affect the complete RGB palette.

If one of {R}, {G} or {B} is selected ( ), the brightness and contrast adjustments will only affect the selected component (R, red; G, green; B, blue) of the RGB palette.

Click on the Contrast and Brightness Initialization icon to reset the brightness and contrast settings to their default values. Note that this operation needs to be done individually for {All}, {R}, {G} and {B}.

8.7. Center Cursor

Left click on "Center cursor" to center the active cursor(s) in the active window.

This function is useful when cursors are not visible in a window, because their position lies outside the range of the window. Right click and select "Center cursor" and the cursor(s) will be immediately visible in the center of the window.

This function can also be activated with the Center Cursors icon (see section 4.4.3, page 92).

Available for: Spectrum, Video, SpIm, Point, Map, Score, Model

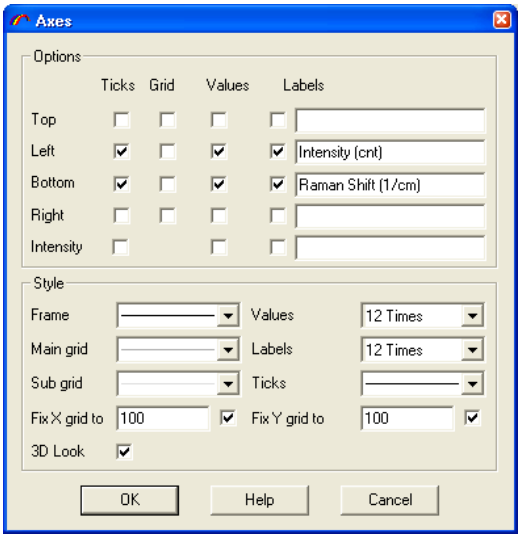
8.8. Axes

The Axes dialog window allows control over what axes are displayed, and how they are displayed within the data window.

There are two Axes dialog windows, depending on the selected dimension (see section 8.1.1, page 204) of the data window. These two windows are discussed in turn below.

Available for: Spectrum, Video, SpIm, Point, Map, Score, Model

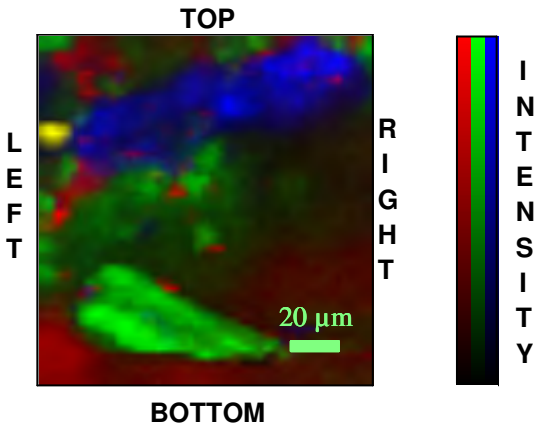
8.8.1. Axes Dialog Window for 1D and 2D Windows



8.8.1.1. Options

The five possible display axes are listed, with tick boxes to select whether ticks, grid lines, axis values and labels are shown.

The fives axes are indicated on the image shown right.



Ticks
When the "Ticks" box is ticked tick marks are displayed on the axis.

Grid
When the "Grid" box is ticked 'main' and 'sub' grid lines are displayed in the spectrum window. The spacing of the grid lines are automatically calculated by LabSpec 5, but can be manually assigned using the "Fix X grid to" and "Fix Y grid to" options in the Style section of the Axes dialog window (see section 8.8.1.2, page 214)

Values
When the "Values" box is ticked axis values are displayed along the axis.

Labels
When the "Labels" box is ticked the axis title and units are displayed adjacent to the axis. Custom labels can be used by typing in the desired axis label in the "Labels" text box.

To restore the default labels for an axis delete the text in the box.

8.8.1.2. Style

The Style section allows the formatting of the axis components (frame, ticks, grid lines, values and labels) to be set.

Frame
Select the line style for the axes frame using the "Frame" drop down box.

Main grid
Select the line style for the 'main' grid lines using the "Main grid" drop down box.

Sub grid
Select the line style for the 'sub' grid lines using the "Sub grid" drop down box.

Fix X grid to
When the "Fix X grid to" box is ticked the main grid lines for the X axis will be spaced at the interval displayed in the box. To adjust the spacing type the desired grid line spacing into the text box.

3D look
When the "3D look" box is ticked the axes frame is displayed in a "3D" style.

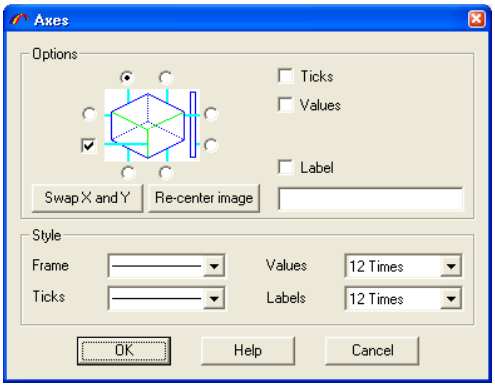
Values
Select the font style for the axis values from the "Values" drop down box.

Labels
Select the font style for the axis values from the "Labels" drop down box.

Ticks
Select the line style for the ticks using the "Ticks" drop down box.

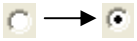
Fix Y grid to
When the "Fix Y grid to" box is ticked the main grid lines for the Y axis will be spaced at the interval displayed in the box. To adjust the spacing type the desired grid line spacing into the text box.

8.8.2. Axes dialog Window for 3D Windows



8.8.2.1. Options

The schematic in the Options section illustrates the seven available axes (six surrounding the 3D image, and one for intensity). Each axis is configured individually.

Select an axis by clicking the appropriate radio tag. 

When the tick box is ticked the three forward axes are displayed, in front of the 3D image.

Ticks
When the "Ticks" box is ticked tick marks are displayed on the axis.

Values
When the "Values" box is ticked axis values are displayed along the axis.

Labels
When the "Labels" box is ticked the axis title and units are displayed adjacent to the axis. Custom labels can be used by typing in the desired axis label in the "Labels" text box.

To restore the default labels for an axis delete the text in the box.

Swap X and Y
Click on **[Swap X and Y]** to reverse the positions of the X and Y axes in the 3D image display.

Re-center image
Click on **[Re-center image]** to return the image to its default position in the display window. This function is useful if the image position has been modified using the Axes3D icon – see section 5.24, page 193.

8.8.2.2. Style

The Style section allows the formatting of the axis components (frame, ticks, values and labels) to be set.

Frame
Select the line style for the axes frame using the "Frame" drop down box.

Ticks
Select the line style for the ticks using the “Ticks” drop down box.

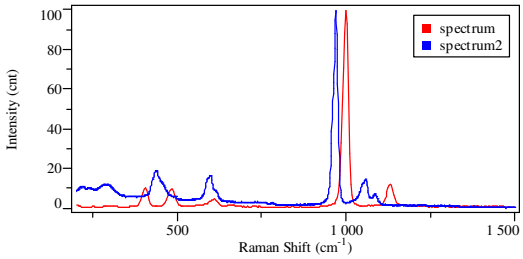
Values
Select the font style for the axis values from the “Values” drop down box.

Labels
Select the font style for the axis values from the “Labels” drop down box.

8.9. Legend

The Legend dialog window allows control of the legend display and formatting.

The legend is displayed for spectral windows, and shows the data object name and its display color.



Show
Tick the boxes for Single and Multi to activate the legend for single and overlay display modes respectively.

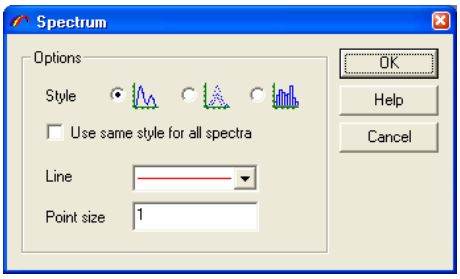
Frame
Select the line style for the legend frame using the “Frame” drop down box.

Text
Select the font style for the legend text from the “Text” drop down box.

Available for: Spectrum, SpIm, Point, Model

8.10. Spectrum

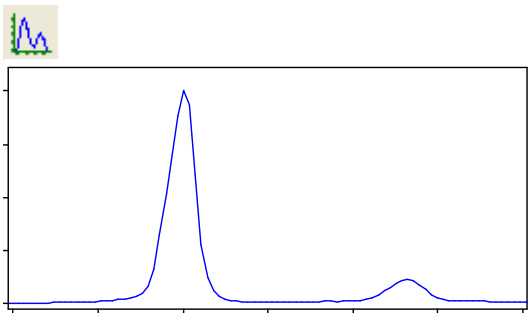
The Spectrum dialog window allows control of the spectrum display format.



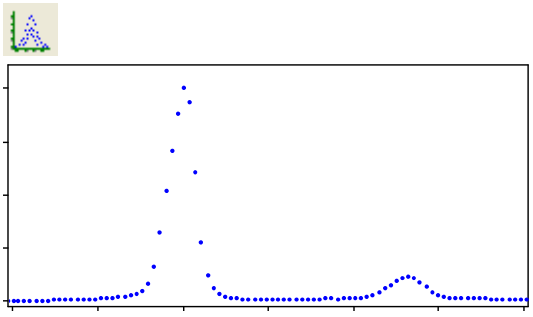
Style

Select the display style from the following options:

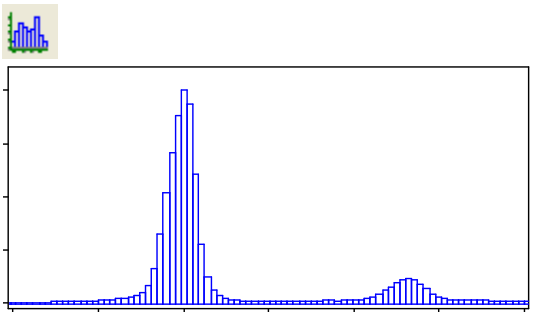
- Line



- Dot



- Bar



Use same style for all spectra
When "Use same style for all spectra" is ticked all spectra in the current window will share a common line style, based upon the current setting in the Spectrum dialog window.

If "Use same style for all spectra" is not ticked then the line style setting in the Spectrum dialog window is applied to the active spectrum only. In this mode it is possible to have multiple spectra displayed with different line styles.

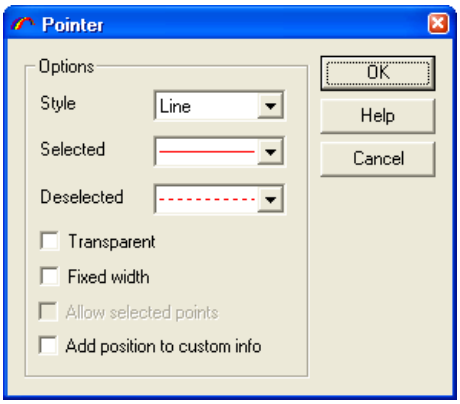
Line
Select the spectrum display color and (where appropriate) line style for the spectrum using the "Line" drop down box.

Point size
Select the point size for the "Dot" spectrum display. Note that the point color is set in the "Line" drop down box.

Available for: Spectrum, SpIm, Point, Model

8.11. Cursor

The Cursor dialog window allows control of the cursor behaviour and display format.



Style
Select the cursor style from the "Style" drop down box. The following cursor styles are available:

Spectrum, Model windows
- Line – single vertical line cursor, displaying the X axis position (S) of the cursor and the intensity (I) of the spectrum at the cursor position.
- Cross – cross hair cursor, displaying the X axis position (S) and Y axis position (I) of the cursor.
- Level – cross hair cursor which tracks the intensity of the spectrum, displaying the X axis position (S) and Y axis position (I) of the cursor. In this case, the Y axis position is equivalent to the spectrum intensity at the cursor position.
- Double – two vertical cursors, displaying the X axis position (S) of each cursor and the width between the two cursors (W).
- Peak – three linked vertical cursors, the central one locking to the maximum intensity pixel in a peak, and the outer two locking to the pixels closest to the full width at half maximum

height (FWHM) of the peak. The Peak cursor displays the X axis position (S), intensity (I) and approximate full width at half maximum height (W) of the peak at the cursor position.

Video, Map, Score windows

- Cross – cross hair cursor, displaying the X axis position (X) and Y axis position (Y) of the cursor, and pixel intensity (I) at the cursor position. For the Map and Score windows, the spectrum associated with the cursor position will be displayed in the Point window.
- Rect – rectangular cursor (resizeable by left clicking and dragging the drag points), displaying the X axis position (X) and Y axis position (Y) of the bottom, right hand corner of the rectangular cursor. For the Map and Score windows, the average spectrum from within the rectangle is displayed in the Point window.

Selected

Select the display formatting for the cursor when it is selected (i.e., active), using the Selected drop down box.

Deselected

Select the display formatting for the cursor when it is not selected (i.e., inactive), using the Deselected drop down box.

Transparent

When "Transparent" is ticked the cursor is displayed in a transparent mode, allowing features behind the cursor to be visualized.

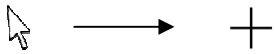
Fixed width

When "Fixed width" is ticked the width between "Double" cursors is fixed to its current value. In this mode, both cursors will move together when dragged by the mouse. To adjust the width of the "Double" cursors ensure that "Fixed width" is unticked.

Allow selected points

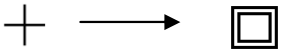
When "Allow selected points" is ticked multiple discrete points within a map or score profile/image can be selected.

When <CTRL> is held down the mouse cursor changes to the Select Point cursor.



<CTRL>+click to select a position in the map or score profile/image. Multiple positions can be simultaneously selected by clicking additional positions.

When <CTRL> is held down and the mouse cursor is hovered over an existing selected point, the mouse cursor changes to the Remove point cursor.



<CTRL>+click to delete an existing selected point.

The average spectrum from the selected points will be displayed in the Point window.

Add position to custom info
When “Add position to custom info” is ticked the cursor values are included within the Custom tab of the parameters information dialog window (see section 4.4.5, page 92).

Available for: *Spectrum, Video, Map, Score, Model*

8.12. Red Cursor

The Red Cursor dialog window allows control of the cursor behaviour and display format for the red (SpImRed) map analysis cursor (see section 5.2, page 165).

The Red Cursor dialog window is identical to the standard Cursor dialog window described above (see section 8.11, page 218).

The map analysis cursor should be operated in “Double” mode. It is advisable that the color is retained as red to avoid confusion.

Available for: *SpIm, Point*

8.13. Green Cursor

The Green Cursor dialog window allows control of the cursor behaviour and display format for the green (SpImGreen) map analysis cursor (see section 5.2, page 165).

The Green Cursor dialog window is identical to the standard Cursor dialog window described above (see section 8.11, page 218).

The map analysis cursor should be operated in “Double” mode. It is advisable that the color is retained as green to avoid confusion.

Available for: *SpIm, Point*

8.14. Blue Cursor

The Blue Cursor dialog window allows control of the cursor behaviour and display format for the blue (SpImBlue) map analysis cursor (see section 5.2, page 165).

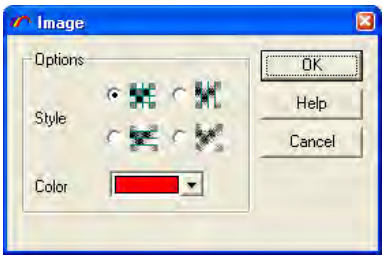
The Blue Cursor dialog window is identical to the standard Cursor dialog window described above (see section 8.11, page 218).

The map analysis cursor should be operated in “Double” mode. It is advisable that the color is retained as blue to avoid confusion.

Available for: *SpIm, Point*

8.15. Image

The Image dialog window allows the image color and smoothing options to be set.



Style

Select the smoothing interpolation style from the available options:

- No smoothing – image is displayed in raw pixelated form. 
- X smoothing – image is displayed with smoothing interpolation in the X dimension. 
- Y smoothing – image is displayed with smoothing interpolation in the Y dimension. 
- XY smoothing – image is displayed with smoothing interpolation in the X and Y dimensions. 

Color

Select the image display color for the active image component from the "Color" drop down box.

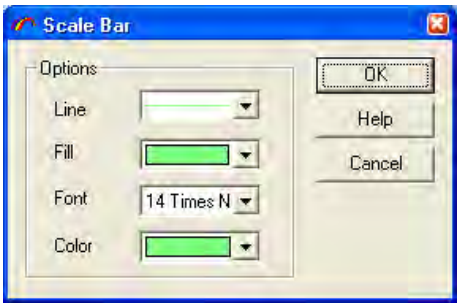
Note that the color selected is only displayed when the image is displayed in True Color mode – see section 8.6, page 210) for full information about image colors.

When the color is changed for a DCLS modelling score image the reference component spectrum display in the Model and Point windows will be automatically updated. Similarly, the score image color will be automatically updated if the reference component spectrum color is modified in the Model window.

Available for: Video, Map, Score

8.16. Scale Bar

The Scale Bar dialog window allows control of display formatting for the image scale bar.



Line
Select the line style from the "Line" drop down box for the line surrounding the scale bar.

Fill
Select the fill colour from the "Fill" drop down box for the scale bar.

Font
Select the font style from the "Font" drop down box for the scale display text. Note that the color of the text is set through the "Color" drop down box.

Color
Select the color from the "Color" drop down box for the scale display text.

Available for: Video, Map, Score

8.17. Imposition

The Imposition dialog window allows information from the multidimensional spectral array Map and Score windows to be superimposed on the active video camera image.

The display color is automatically assigned by LabSpec 5 to match the color of the object being superimposed.

To start the selected superimposition click **[OK]** and then activate a Map or Score window.