

Andy Ray Developments

**PCSpectraLite
Reference Manual**

Andy Ray Developments

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This Reference Manual is intended only to assist the reader in the use of PCSpectraLite and, therefore, Andy Ray Developments shall not be liable for any loss or damage whatsoever arising from the use of any information or particulars in, or errors or omissions in, this Reference Manual.

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PCSpectraLite supplied with the Elliott Instruments CCDSPEC spectrometer has a single user licence and must not be copied or distributed.

A multi-user licence for Universities, Schools, etc is available from Andy Ray Developments.

Licence Terms - The PCS Image File Conversion Suite

PCSpectraLite uses the Andy Ray Developments PCS Image File Conversion Suite for reading and writing data files in the bmp format.

The PCS Image File Conversion Suite can be downloaded from the Andy Ray Developments website, <http://www.andyraydevelopments.co.uk>.

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The PCS Image File Conversion Suite uses the CFITSIO library of routines for reading and writing data files in the FITS (Flexible Image Transport System) data format.

The CFITSIO Copyright, Disclaimer and Gnu General Public License is included with the PCS Image File Conversion Suite. Alternatively, see <http://heasarc.gsfc.nasa.gov/fitsio/> and <http://www.gnu.org/licenses>

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Introduction to the PCSpectraLite Reference Manual

The original version of PCSpectraLite was written in 2003 by Intelligent Interfaces for analysing spectra from the Elliott Instruments TVSPEC spectrometer, now no longer available. It could analyse images of up to 2048 pixels wide by 2048 pixels high.

The latest version of PCSpectraLite was written by Andy Ray Developments for analysing spectra from the Elliott Instruments CCDSPEC spectrometer and can analyse images of up to 6144 pixels wide by 4096 pixels high.

PCSpectraLite is the 'lite' version of PCSpectra.

It can:

- load the image from a 24 bit colour bitmap bmp format file;

- save the image in a bmp format file;

- print the displayed image;

- close the image;

- show the X and Y co-ordinates, the Wavelength (if a SpecCal.txt file exists) and the Intensity of the image. Additionally, show the Greyscale value of the displayed image.

- display information about the image;

- change the size of the displayed image;

- invert the displayed image;

- define a region of interest for analysis using the mouse;

- display the Spectrum (X Axis Projection) of the region of interest of the image;

 - save the displayed Spectrum in a bmp format file or save the displayed Spectrum as data in a csv format file;

 - print the displayed Spectrum;

- display the Profile (Y Axis Projection) of the region of interest of the image;

 - save the displayed Profile in a bmp format file or save the displayed Profile as data in a csv format file;

 - print the displayed Profile;

- calculate and display the centroid and the number of pixels above the threshold value for the region of interest;

- set the data thresholds;

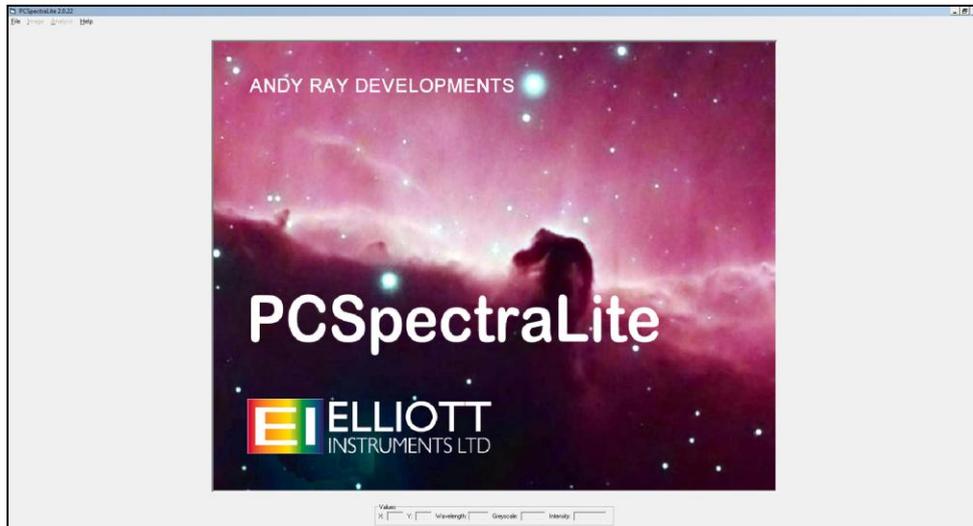
- display information about the program.

Installation

Open the PCSpectraLite folder and double click on setup.exe. This installs the software in the C:\Program Files\Andy Ray Developments\PCSpectraLite folder.

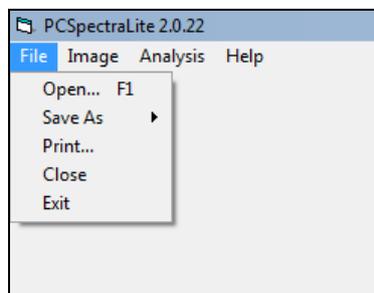
Using PCSpectraLite

Select Start->Programs->PCSpectraLite->PCSpectraLite



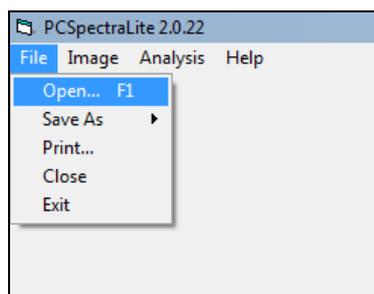
Note that any image that can be opened by Paint can be saved in 24 bit colour bitmap bmp file format and then be analysed using PCSpectraLite.

The File Menu



Loading the Image

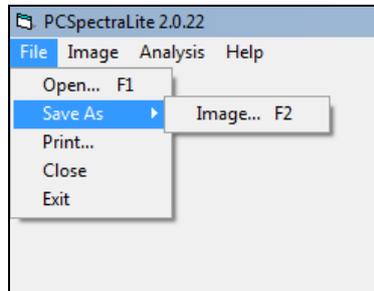
Select File->Open to use the standard Open dialogue to load the image from a bmp format file.



If a SpecCal.txt calibration text file is present in the same folder as the image file a pixel to wavelength calibration is carried out. The text file must contain the zero point and scale factor constants on one line separated by a comma. For example: 50.0, 0.6

Saving the Image

Select File->Save As->Image to use the standard Save As dialogue to save an image to a bmp format file.



Note that the displayed image is not the same as the image saved using File->Save As->Image. The displayed image includes the effect of inverting the display.

Printing the Displayed Image

Select File->Print

Closing the Image

Select File->Close to close the image and clear the display.

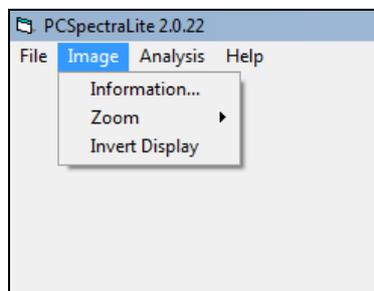
Exiting PCSpectraLite

Select File->Exit

Displaying Values

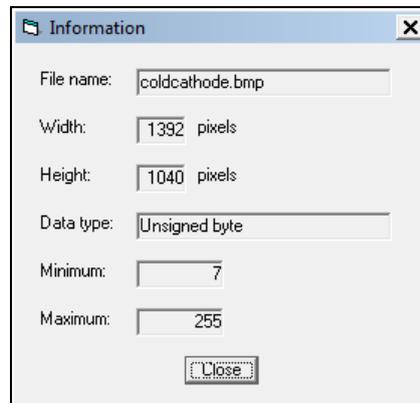
When the pointer moves over the display the X and Y co-ordinates, the Wavelength (if the SpecCal.txt file exists) and the Intensity of the image are shown. Additionally, the Greyscale value of the displayed image is shown.

The Image Menu



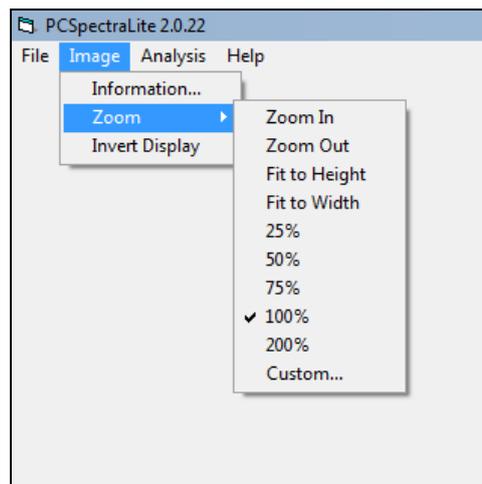
Displaying Information about the Image

Select Image->Information



Changing the Size of the Displayed Image

Select Image->Zoom->Zoom In, Zoom Out ... or Custom to change the size of the displayed image. The Fit to Width option is particularly useful for spectra.



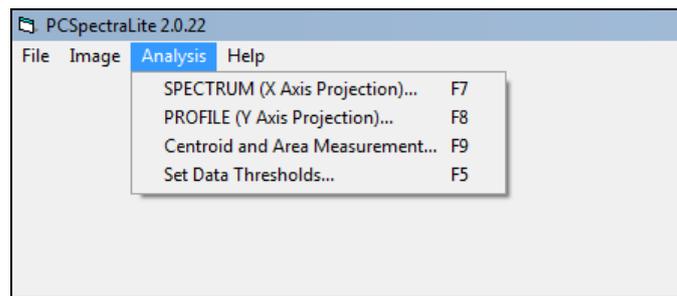
Inverting the Displayed Image

Select Image->Invert Display

Using the Mouse to Define the Region of Interest for Analysis

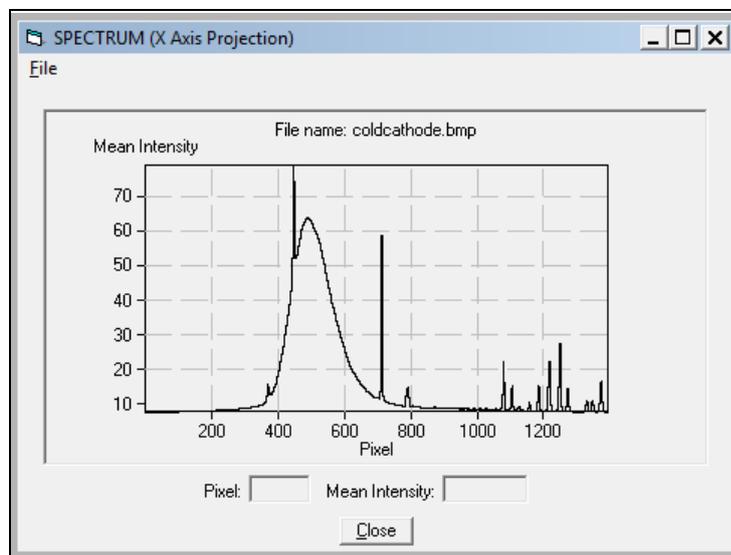
To define the region of interest depress the left hand mouse button in one corner of the region, move the pointer to the diagonally opposite corner and release the button. The region is marked by a blue rectangle.

The Analysis Menu



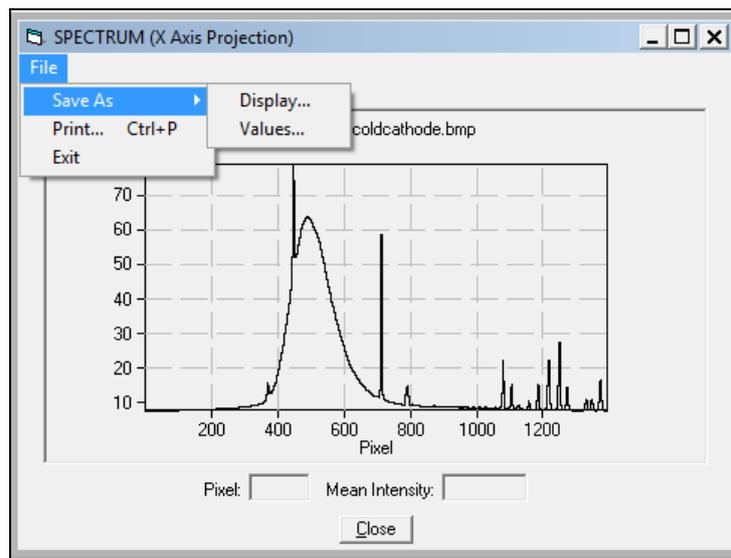
Displaying the SPECTRUM (X Axis Projection)

Select Analysis->SPECTRUM (X Axis Projection) to display the mean or sum of the intensity values over the height (Y) for each width (X) of the region of interest of the image.



The X co-ordinate (Wavelength or Pixel) and mean or sum of the intensity value are shown as the cursor is moved over the display.

Saving the SPECTRUM (X Axis Projection)



Select File->Save As->Display to use the standard Save As dialogue to save the displayed Spectrum in a bmp format file. The saved display can be used in reports.

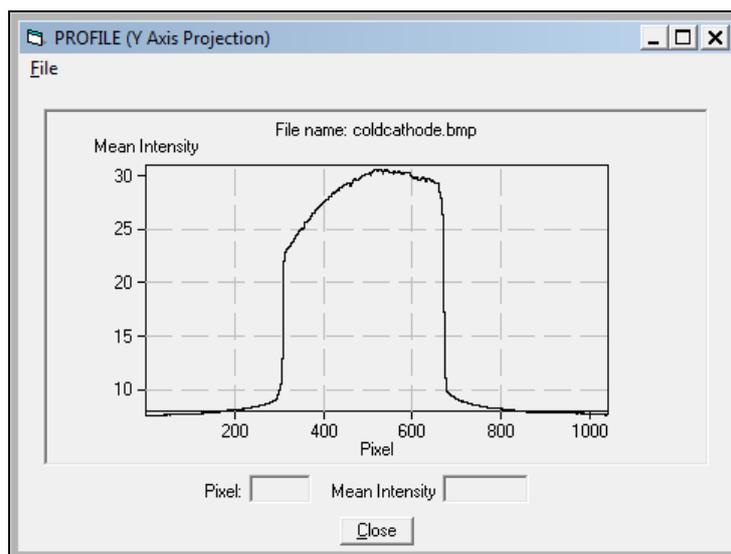
Select File->Save As->Values to use the standard Save As dialogue to save the displayed Spectrum as data in a csv format file. The saved data can be read into a spreadsheet

Printing the SPECTRUM (X Axis Projection)

Select File->Print

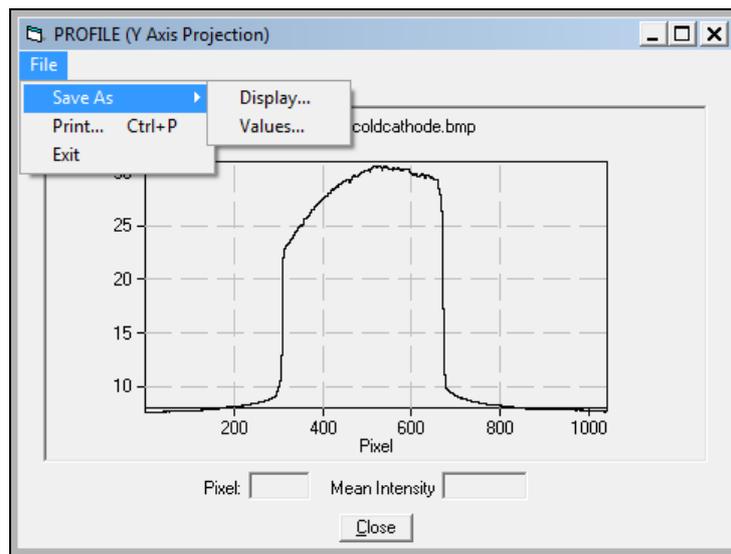
Displaying the PROFILE (Y Axis Projection)

Select Analysis->PROFILE (Y Axis Projection) displays the mean or sum of the intensity values over the width (X) for each height (Y) of the region of interest of the image.



The Y co-ordinate (Pixel) and mean or sum of the intensity values are shown as the cursor is moved over the display.

Saving the PROFILE (Y Axis Projection)



Select File->Save As->Display to use the standard Save As dialogue to save the displayed Profile in a bmp format file. The saved display can be used in reports.

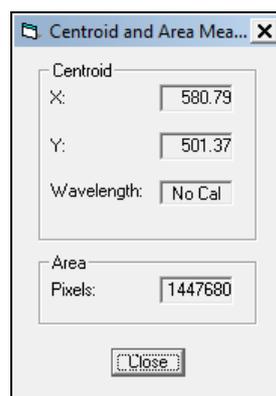
Select File->Save As->Values to use the standard Save As dialogue to save the displayed Profile as data in a csv format file. The saved data can be read into a spreadsheet.

Printing the PROFILE (Y Axis Projection)

Select File->Print

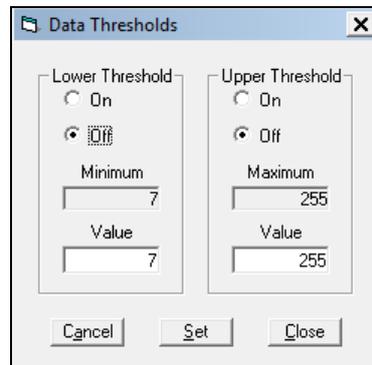
Displaying the Centroid and Area Measurement

Select Analysis->Centroid and Area Measurement to calculate and display the centroid and the number of pixels with intensities above the threshold value in the region of interest.



Setting the Data Thresholds

Select Analysis->Set Data Thresholds to set the data thresholds.



The lower threshold must be set to a value between the minimum and the upper threshold.

The upper threshold must be set to a value between the maximum and the lower threshold.

All pixels with intensity less than the lower threshold and all pixels with intensity greater than the upper threshold are excluded in subsequent analysis.

The Help Menu

Select Help->About to display information about PCSpectralLite

