73 Series
Spectrophotometer PC Software

JENWAY

Operating Manual

Bibby Scientific

REV A/06-10

Contents

Contents 3

SECTION 1 - INSTALLATION 5

SECTION 2 – GETTING STARTED 8

2.1 Connection 8
2.2 Login 10
2.3 Register 11

SECTION 3 – PHOTOMETRICS 12

3.1 Settings 13
3.1.1 Batch name 13
3.1.2 Setting the wavelength 14
3.1.3 Setting the resolution 14
3.1.4 Auto Logging 15
3.2 CALIBRATION 15
3.3 SAMPLE MEASUREMENT 16

SECTION 4 – Concentration 18

4.1 Settings 19
4.1.1 Batch name 20
4.1.2 Setting the wavelength 20
4.1.3 Setting the resolution 21
4.1.4 Selecting concentration units 21
4.1.5 Entering a factor 22
4.1.6 Entering a standard 22
4.1.7 Auto Logging 23
4.2 CALIBRATION AND SAMPLE MEASUREMENT 23
4.2.1 Calibration and sample measurement using a factor 23
4.2.2 Calibration and sample measurement using a standard 25

SECTION 5 – SPECTRUM 28

5.1 Settings 29
5.1.1 Sample name 30
5.1.2 Setting start and end wavelengths 31
5.1.3 Setting the scan interval 31
5.1.4 Setting the resolution 32
5.1.5 Selecting operating mode 32
5.1.6 Auto Logging 33
5.2 CALIBRATION 33
5.3 SAMPLE MEASUREMENT 34
5.4 POST MEASUREMENT TOOLS 35
5.4.1 Peaks and Valleys threshold level 35
5.4.2 Peaks and Valleys Table 36
5.4.3 Spectral points analysis 37

SECTION 6 - QUANTITATION 38

6.1 Settings 40
6.1.1 Sample name 41
6.1.2 Setting the wavelength 42

6.1.3 Selecting concentration units 42
6.1.4 Setting the resolution 43
6.1.5 Operating mode 43
6.1.6 Selecting number of standards 44
6.1.7 Selecting the curve fit 44
6.1.8 Auto Logging 45
6.2 CREATE CURVE 45
6.2.1 Measuring Standards 46
6.3 CALIBRATION 47
6.4 SAMPLE MEASUREMENT 48

SECTION 7 – Time Scan Kinetics 50

7.1 Settings 51
7.1.1 Sample name 52
7.1.2 Setting the wavelength 53
7.1.3 Selecting kinetics run time 53
7.1.4 Selecting time interval 54
7.1.5 Setting the resolution 54
7.1.6 Selecting concentration units 55
7.1.7 Operating mode 55
7.1.8 Setting lag time or start on level 56
7.1.9 Auto Logging 57
7.2 CALIBRATION 57
7.3 SAMPLE MEASUREMENT 58
7.4 POST MEASUREMENT TOOLS 59

SECTION 8 - SAVING AND OPENING METHODS 60

8.1 Saving method parameters 60
8.2 Opening method parameters 60

SECTION 9 – SAVING AND OPENING RESULTS 61

9.1 Saving results 61
9.2 Opening results 61

SECTION 10 – Exporting to Excel 62

SECTION 11 – PRINTING 62

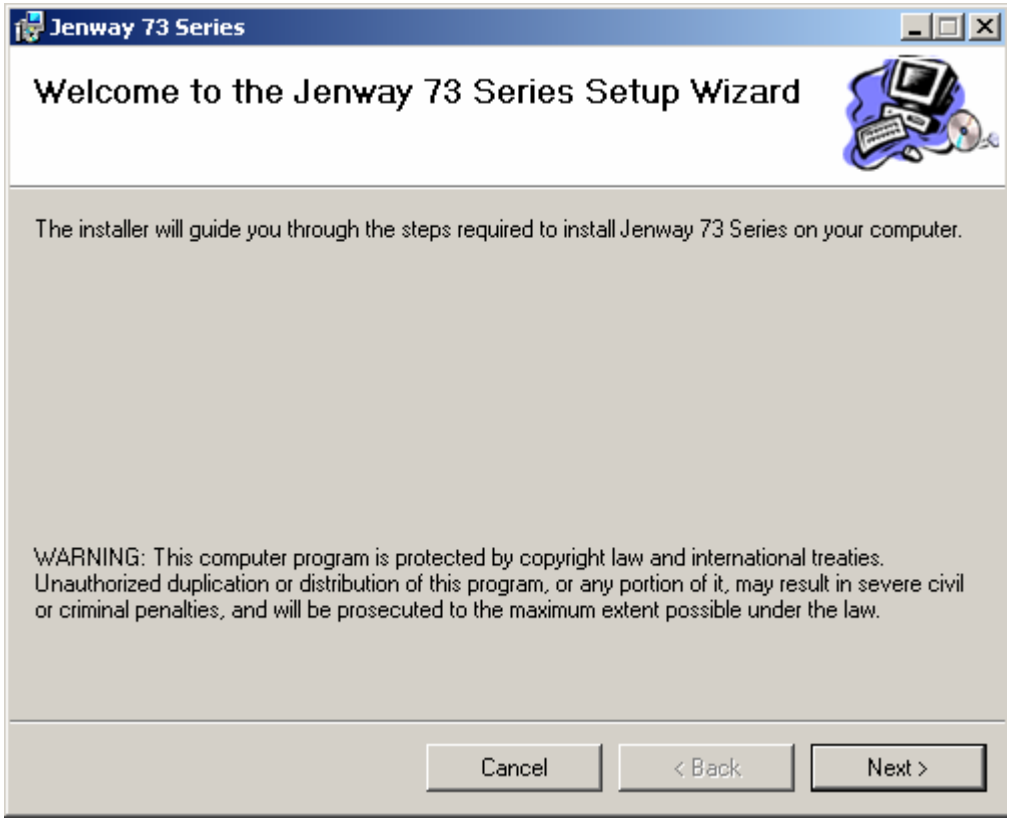
SECTION 12 – ACCESSORIES 64

12.1 Automatic 8 cell turret 64
12.2 Sipper pump 64
12.3 Peltier 66
12.4 Combined peltier and sipper pump 67

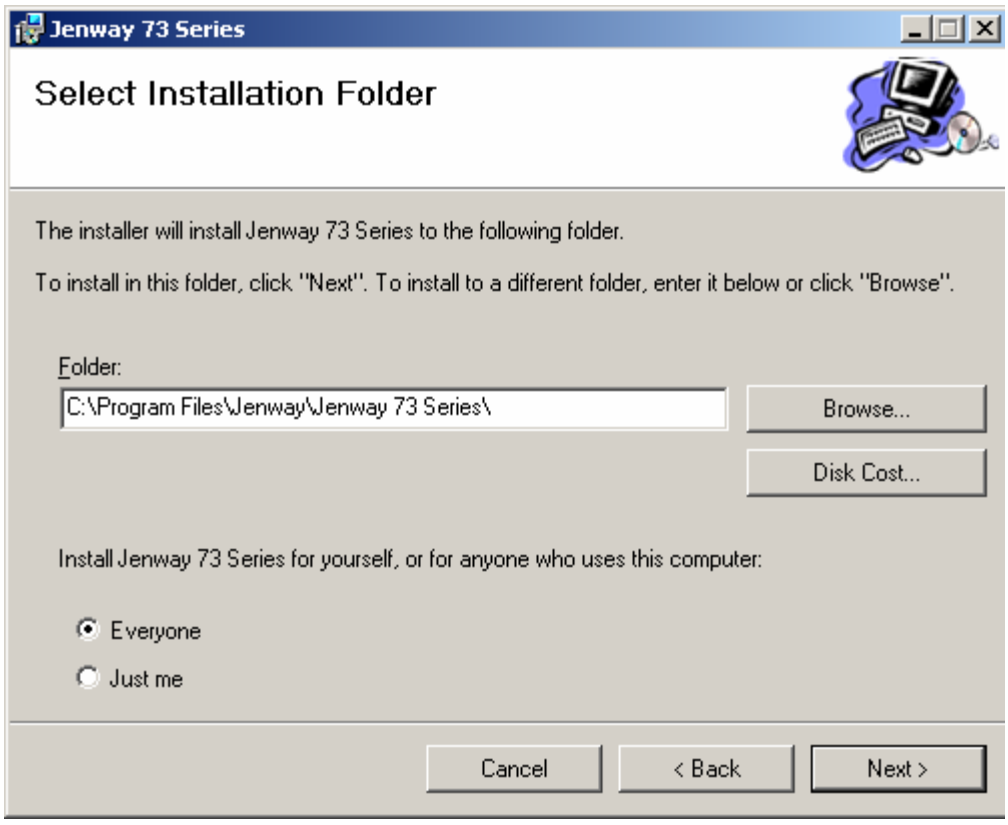
SECTION 1 - INSTALLATION

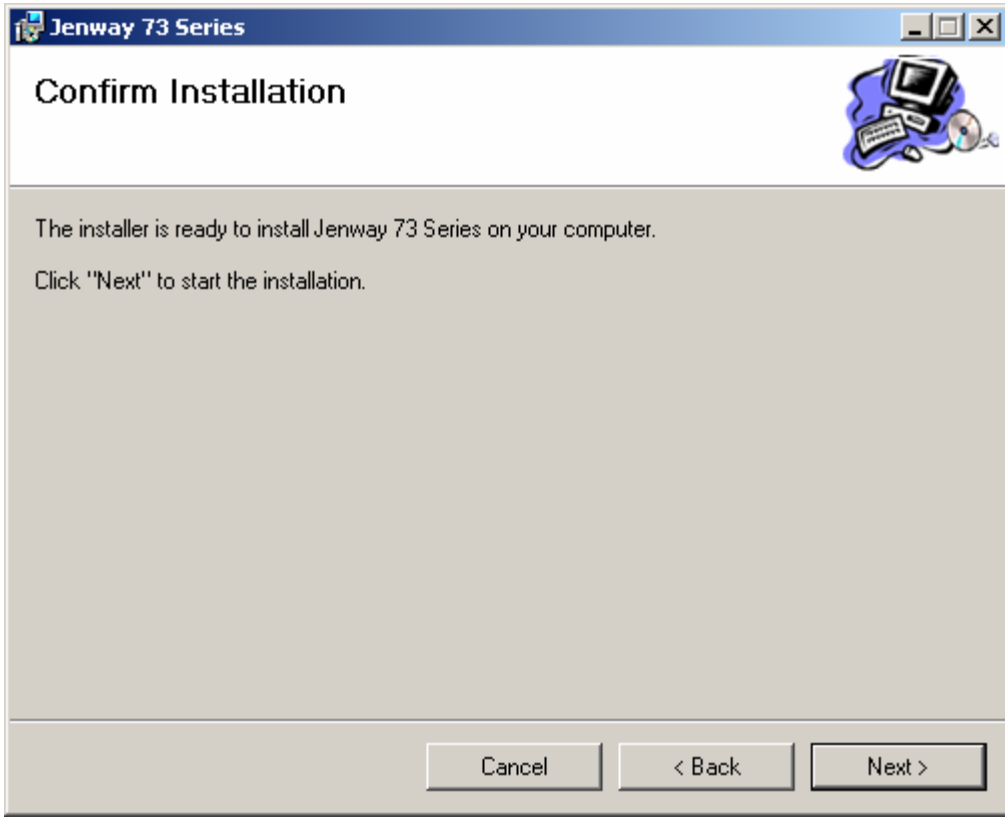
Insert the Jenway 73 Series software installation CD. The CD should auto run, if not open My Computer, open CD drive and double click on the Jenway 73 series software icon.

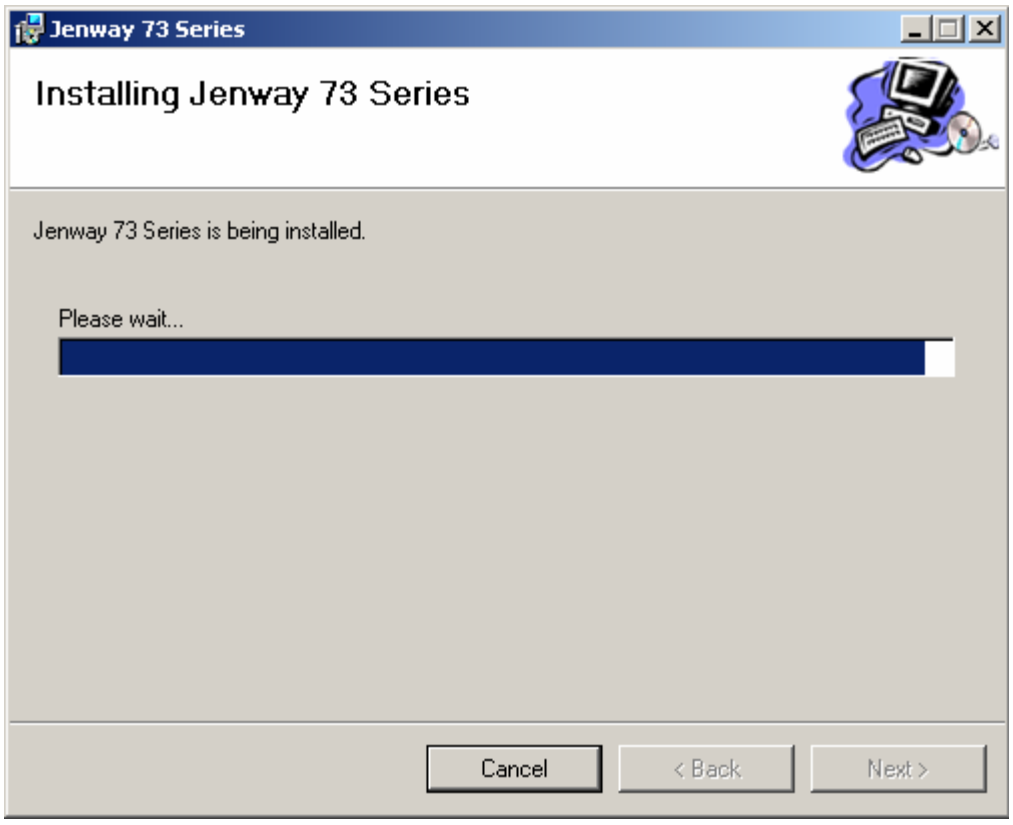
The Setup Wizard will open.



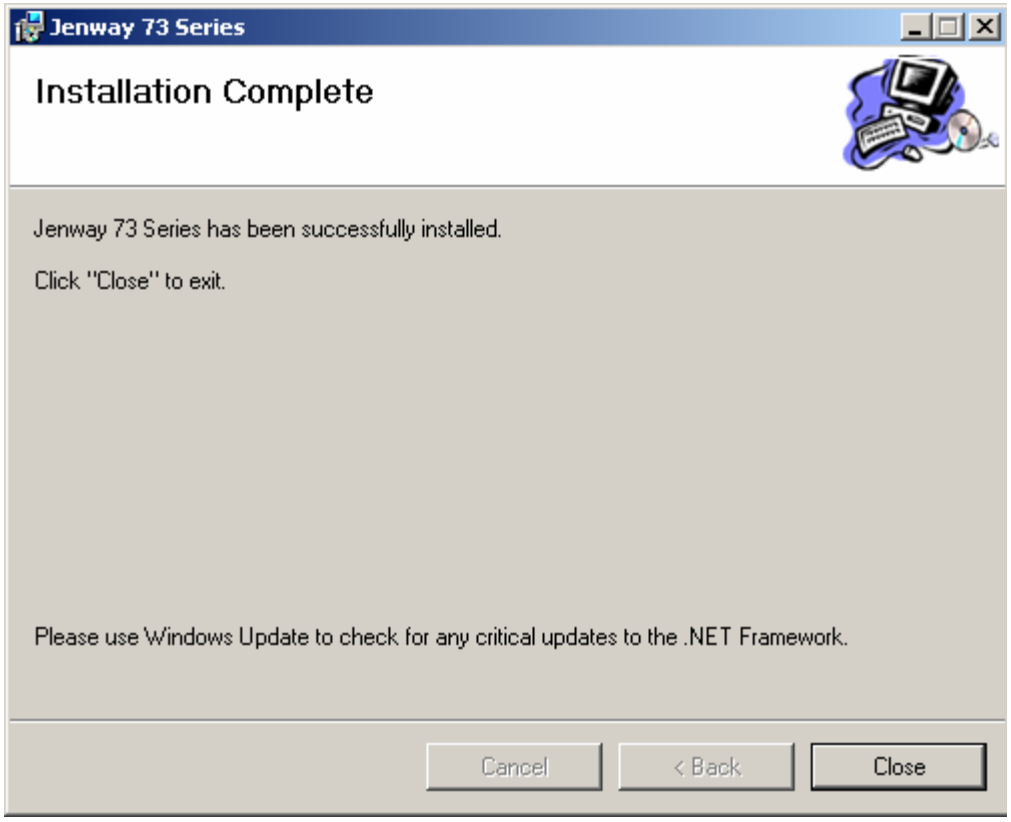
Follow the instructions to install the software in the required location.


Jenway 73 Series
Select Installation Folder
The installer will install Jenway 73 Series to the following folder.
To install in this folder, click "Next". To install to a different folder, enter it below or click "Browse".
Folder:
C:\Program Files\Jenway\Jenway 73 Series\
Browse...
Disk Cost...
Install Jenway 73 Series for yourself, or for anyone who uses this computer:
Everyone
Just me
Cancel
< Back
Next >


Jenway 73 Series
Confirm Installation
The installer is ready to install Jenway 73 Series on your computer.
Click "Next" to start the installation.
Cancel
< Back
Next >



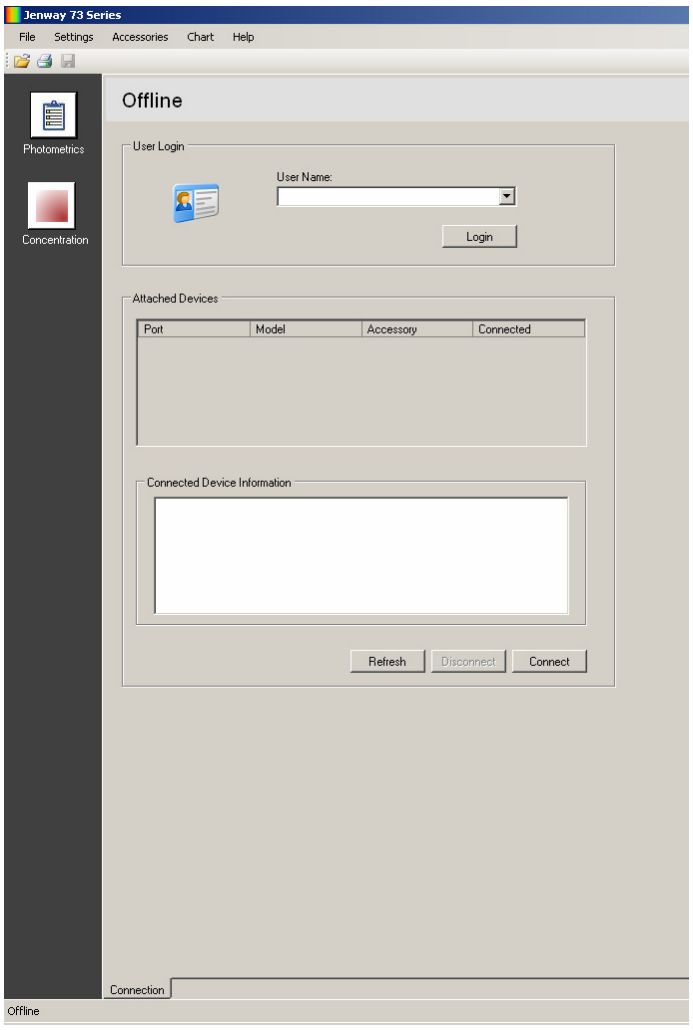
Once the software is installed click Close and the software installation is complete.



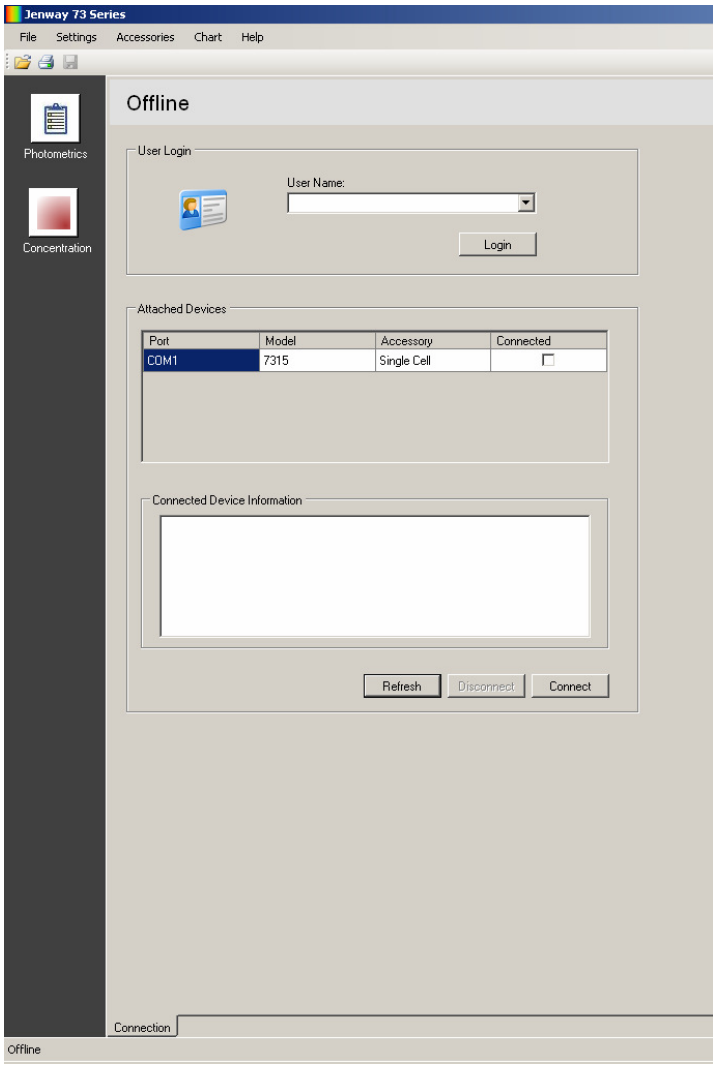
SECTION 2 – GETTING STARTED

2.1 Connection

Ensure that the PC and the spectrophotometer are connected via the interface cable, open the 73 series software.



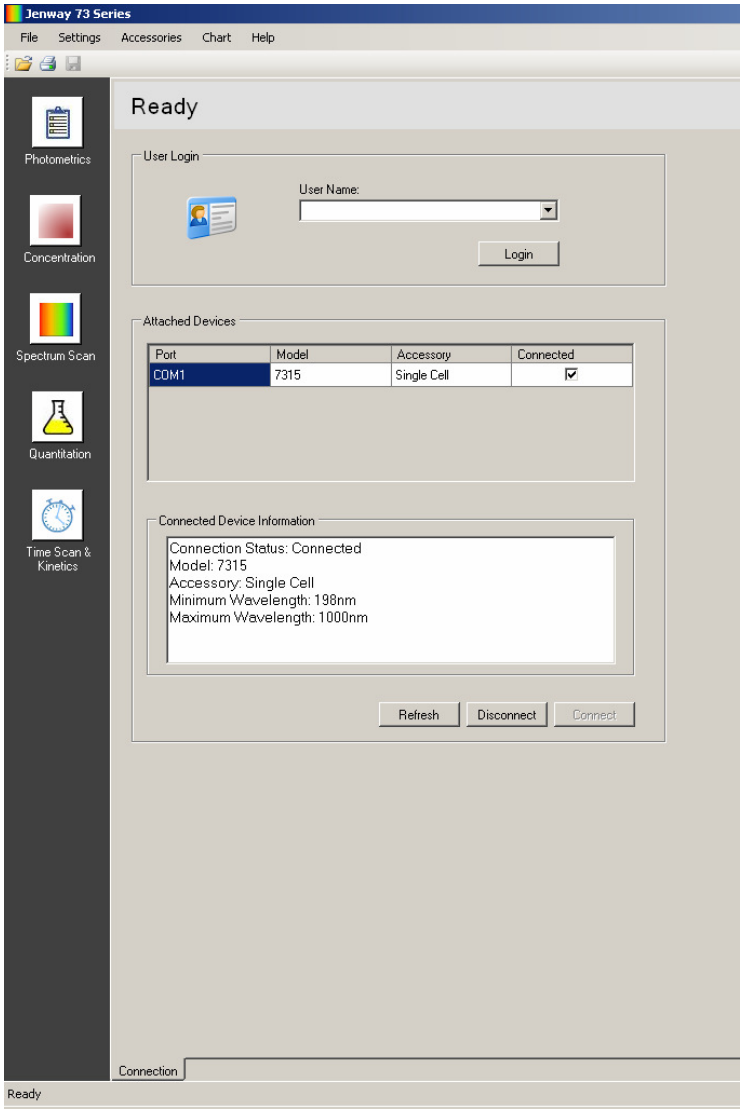
If there is no instrument connected this screen will be shown.



When an instrument is connected this screen will be shown.

Click on Connect to open communication between the PC and the spectrophotometer. If the PC software doesn't find an attached device ensure that the spectrophotometer is switched on and click Refresh.

When the PC is communicating with the spectrophotometer the spectrophotometer screen will display the following icon:

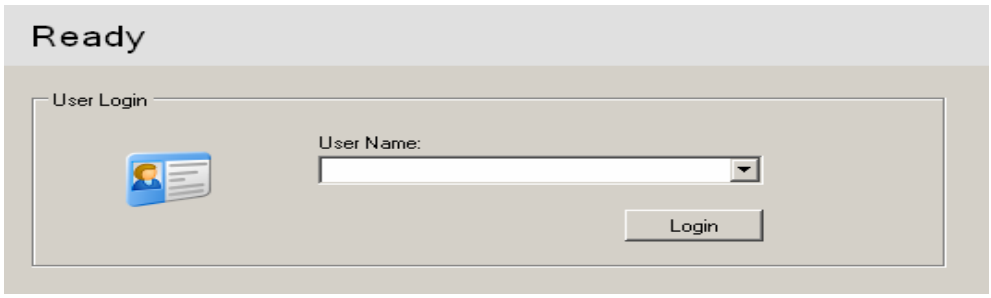


The model number, accessory fitted and wavelength range of the spectrophotometer will be shown in the device information box. If the PC is connected to a 7300 or 7305 model only the photometrics and concentration measurement mode icons will be shown on the toolbar down the left-hand side of the screen. If the PC is connected to a 7310 or 7315 model all five measurement mode icons will be shown on the toolbar down the left-hand side of the screen.

2.2 Login

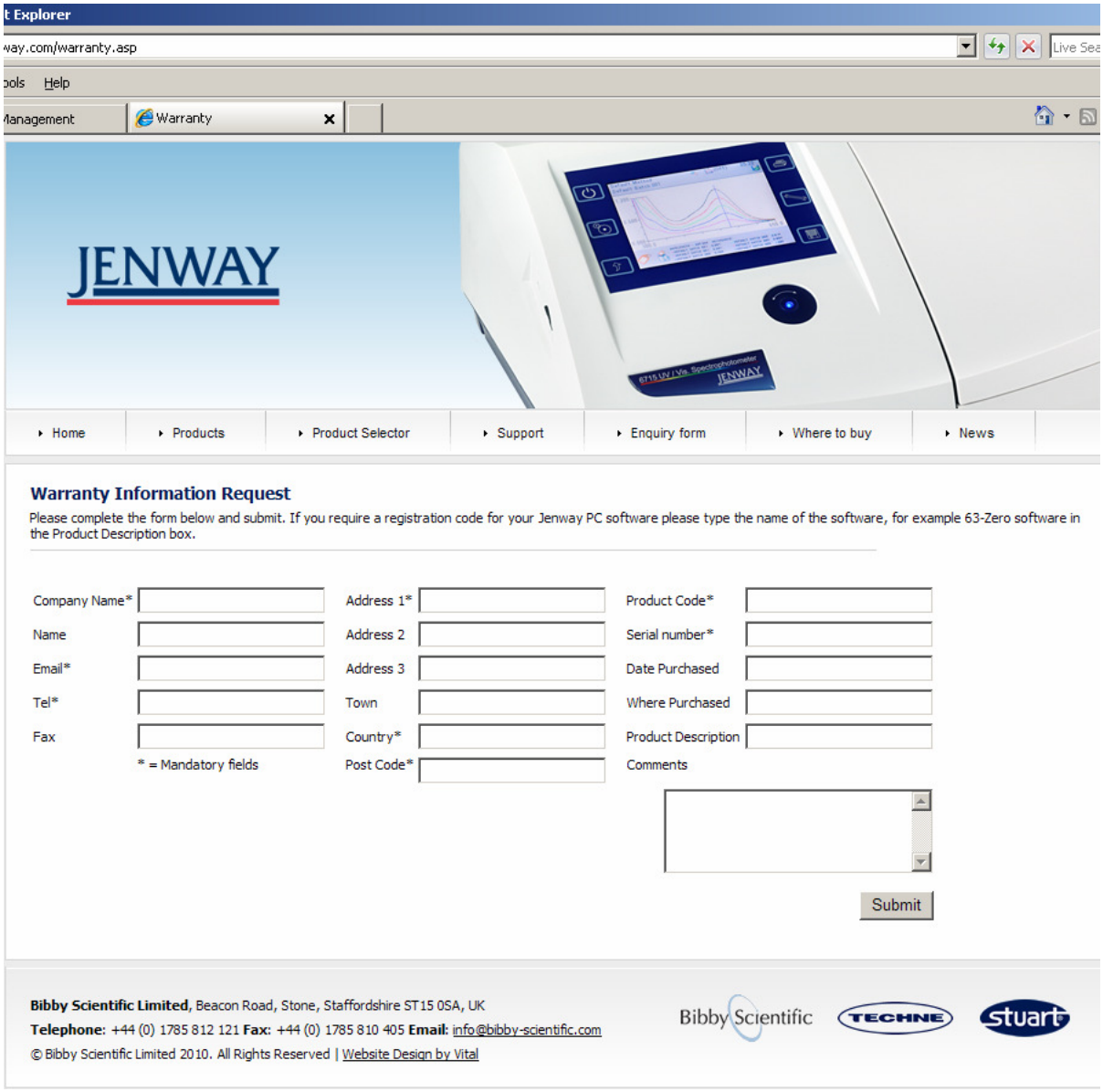
It is possible to use the PC software without entering a username, however there will not be a user ID displayed on printouts.

To login type the required user name in the text box below user name, or select a previously entered name from the drop down box. Click Login to save the user name.



2.3 Register

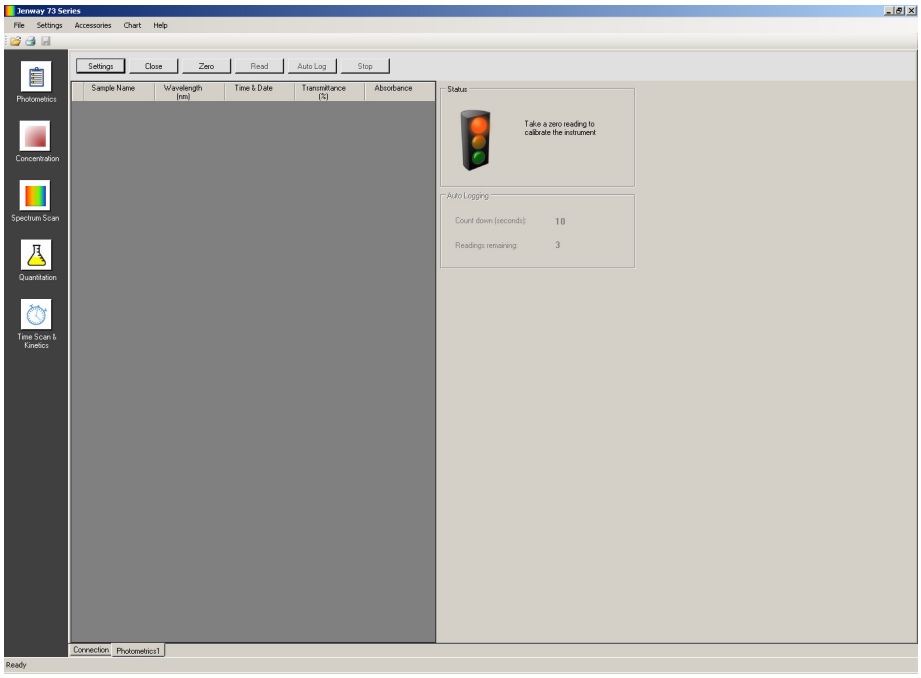
Register your software/instrument by clicking on Help on the toolbar at the top of the screen. Click on Register and if the computer is connected to the internet this link will take you directly to the warranty registration page on Jenway.com.



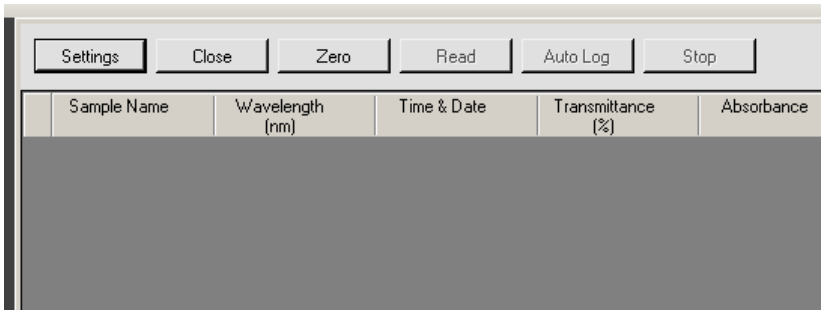
Complete the warranty registration to receive the three year spectrophotometer warranty.

SECTION 3 – PHOTOMETRICS

To open the photometrics measurement mode click on the photometrics icon on the toolbar down the left-hand side of the screen.



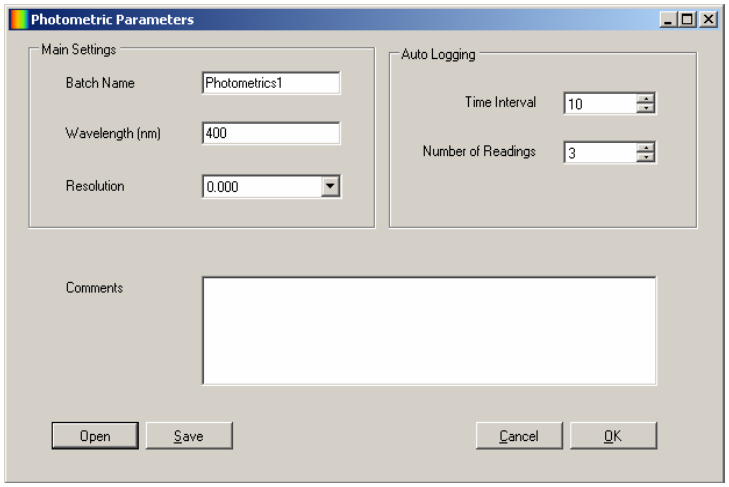
The toolbar at the top on the tab contains all the commands for this measurement mode.



The active buttons are in bold; the deactivated buttons are greyed out.

3.1 Settings

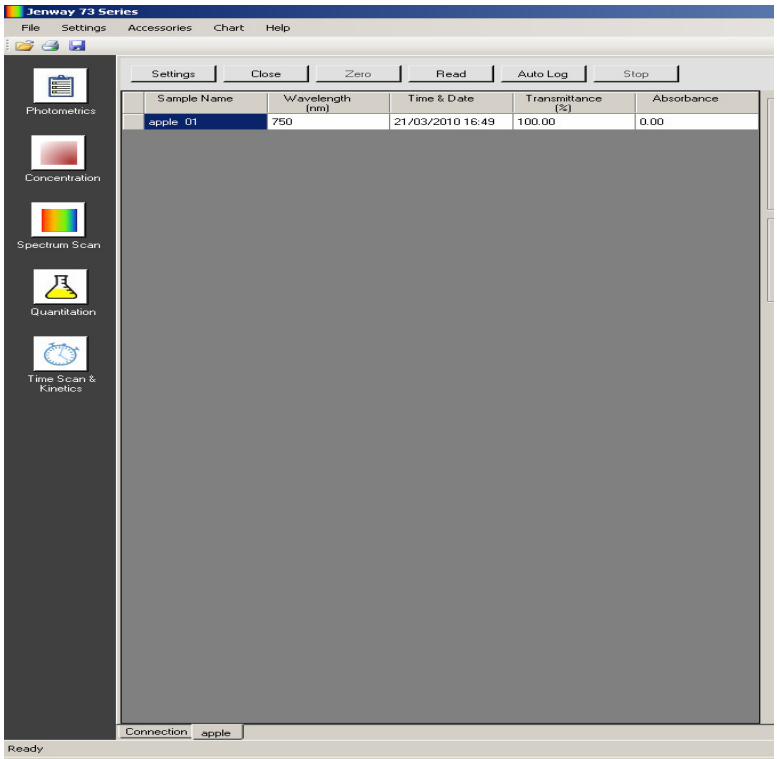
To set the measurement parameters click on the Settings button.



This screen allows the batch name, wavelength and resolution to be set. If Auto Logging is required the parameters can be set in this screen. Comments can be entered which will be included on the result printouts.

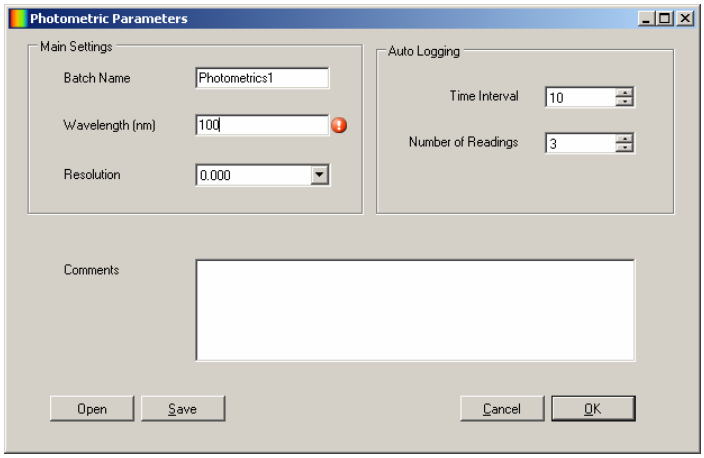
Once the required measurement parameters have been entered click on the OK button to accept and continue with calibration and sample measurement. To exit the settings without saving any measurement parameters click on the Cancel button. To save the measurement parameters for future use click on the Save button. To load previously saved measurement parameters click the Open button. For more details on saving and opening method parameters refer to section 8.

3.1.1 Batch name



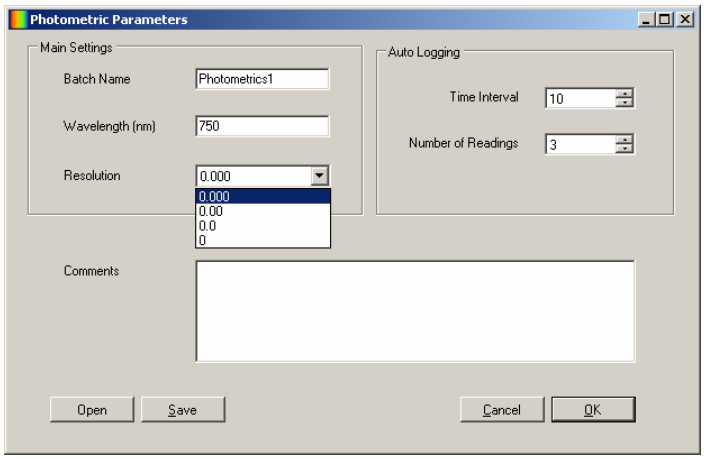
The batch name entered here will be reflected on the name tab at the bottom of the screen and under sample name in the results table once results have been generated.

3.1.2 Setting the wavelength



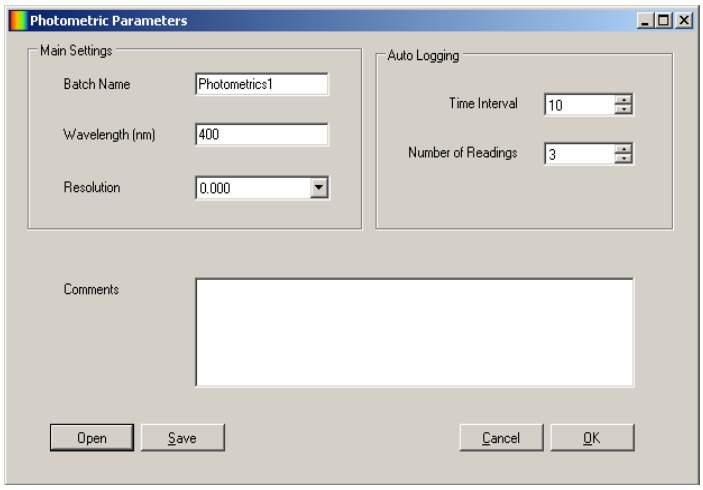
To select the wavelength that the zero calibration and sample measurements will be performed at type the wavelength into the text box. If a value entered is outside of the range of the spectrophotometer an error icon will be displayed and this must be corrected before the settings screen can be exited. Only numeric values can be entered.

3.1.3 Setting the resolution



The resolution of the absorbance and % transmittance reported is selectable between 0, 0.0, 0.00 or 0.000. Click on the arrow on the drop down box to select the resolution required.

3.1.4 Auto Logging



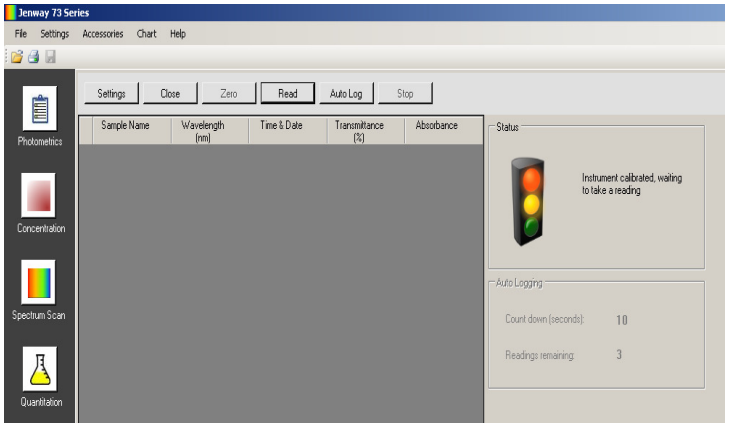
Auto logging allows repeat measurements of the same sample to be performed with a set time interval between each measurement. Use the arrow icons to increase or decrease the time interval between sample measurements and use the arrow icons to select the number of readings required. If auto logging is not required the values do not need to be adjusted in this screen.

3.2 CALIBRATION

Once the settings have been entered the zero calibration should be performed.

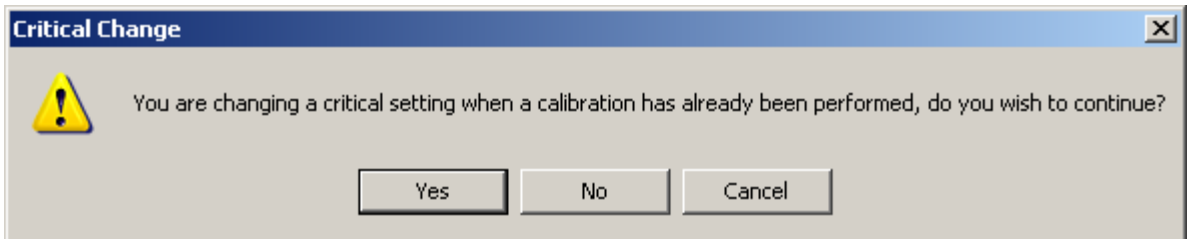
Insert the cuvette containing the blank sample into the sample chamber and close the instrument lid.

Click on the Zero button; this sets the instrument to zero absorbance and 100% transmittance.



Once a calibration is complete the Read and Auto Log buttons are activated.

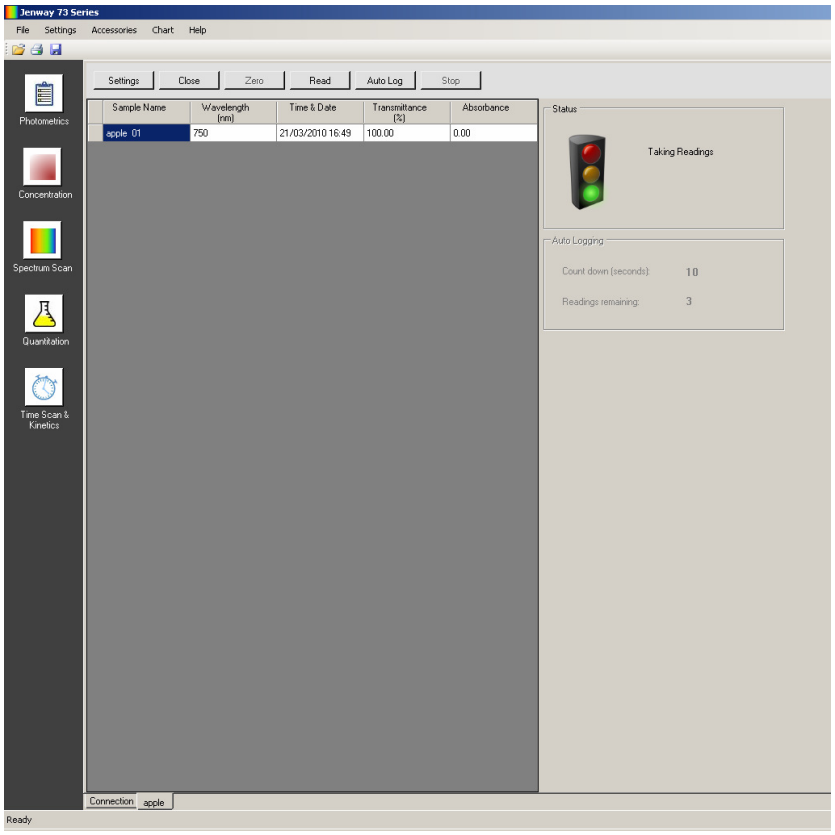
If the settings menu is re-entered following the zero calibration it is possible to change the wavelength. However a warning will be displayed to warn that critical settings are being changed after the zero calibration has been performed.



To continue click Yes, to cancel click No or Cancel.

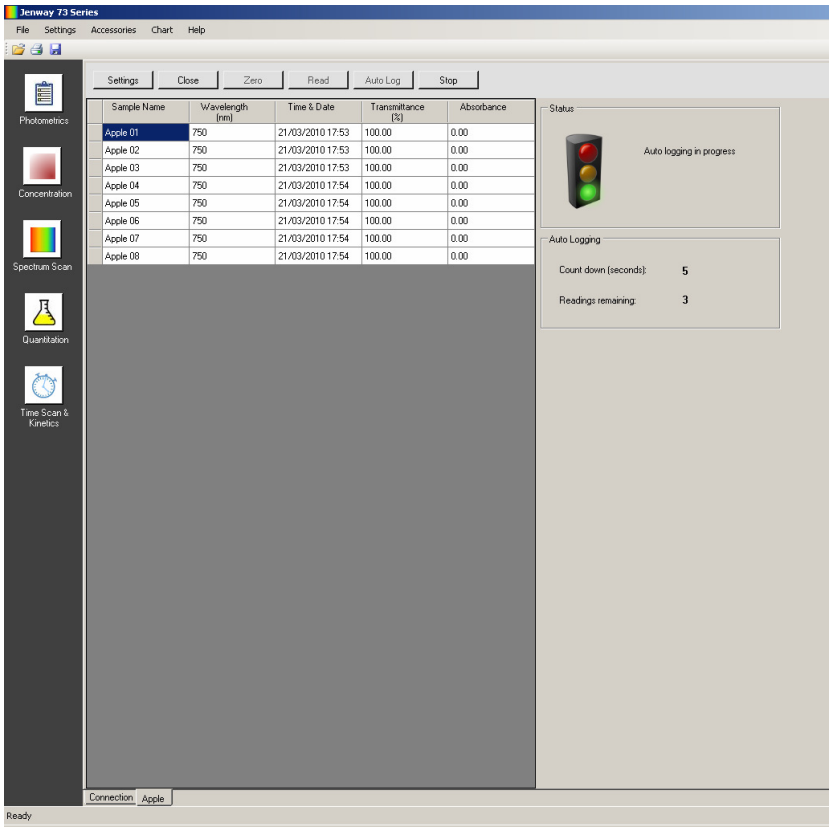
If the wavelength is changed then the zero calibration must be performed again at the new wavelength, before a sample can be measured. Alternatively a new photometrics tab can be opened and the required settings can be entered.

3.3 SAMPLE MEASUREMENT



Insert the cuvette containing the sample into the sample chamber and close the instrument lid.

Click on the Read button; the instrument performs the measurement and result is displayed on the screen.



If the same sample needs to be measured more than once click on the Auto Log button.

The instrument will perform the required number of readings with the specified time interval between each measurement as set in the Settings screen.

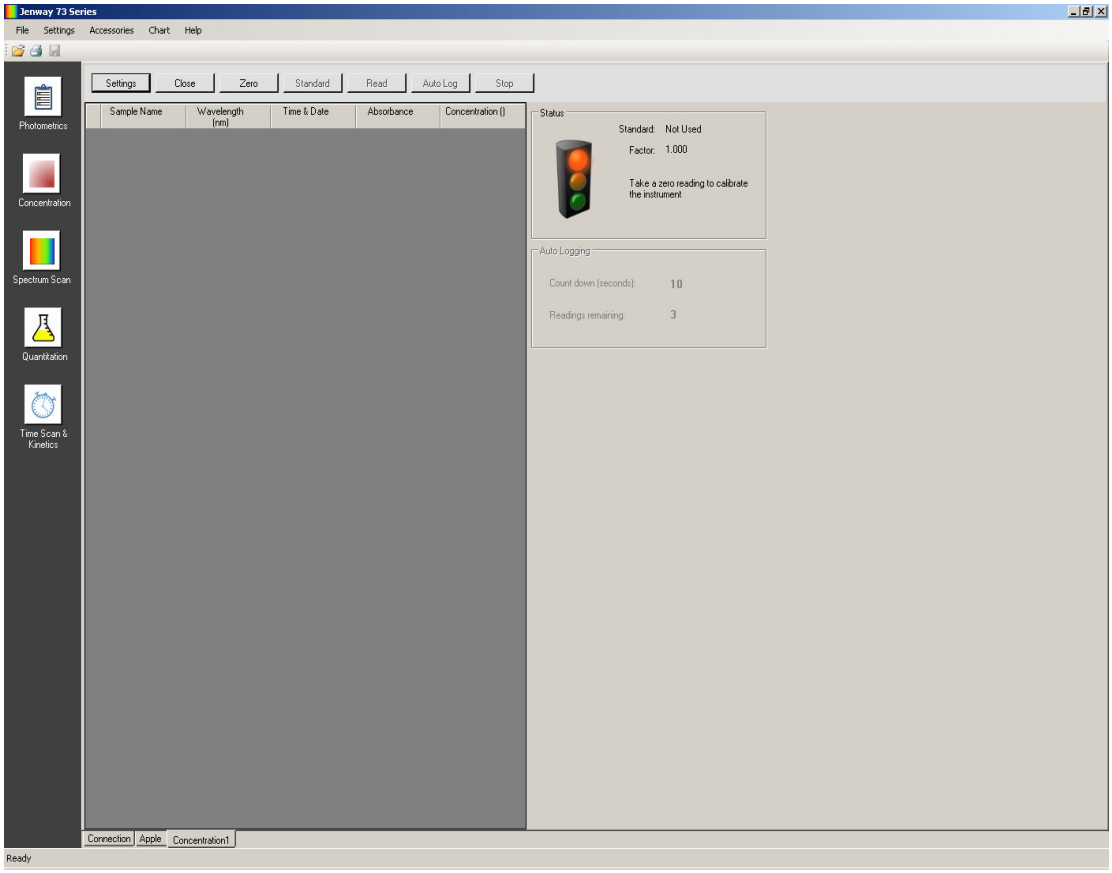
The results will be displayed on the screen. The batch name entered in the settings screen will have 01, 02 etc after the name, to signify the order in which the results were generated.

Auto logging can be stopped before all the measurements have been completed by clicking on the Stop button. To recommence auto logging click on the Auto Log button again.

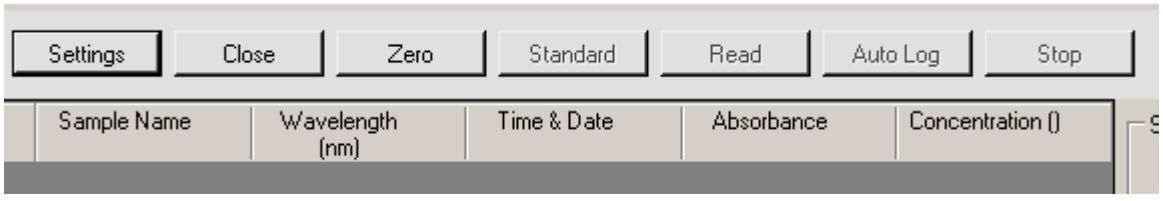
If the settings menu is re-entered following sample measurement it is not possible to change the wavelength. A new photometrics tab can be opened and the new wavelength can be entered.

SECTION 4 – Concentration

To open the concentration measurement mode click on the concentration icon on the toolbar down the left-hand side of the screen.



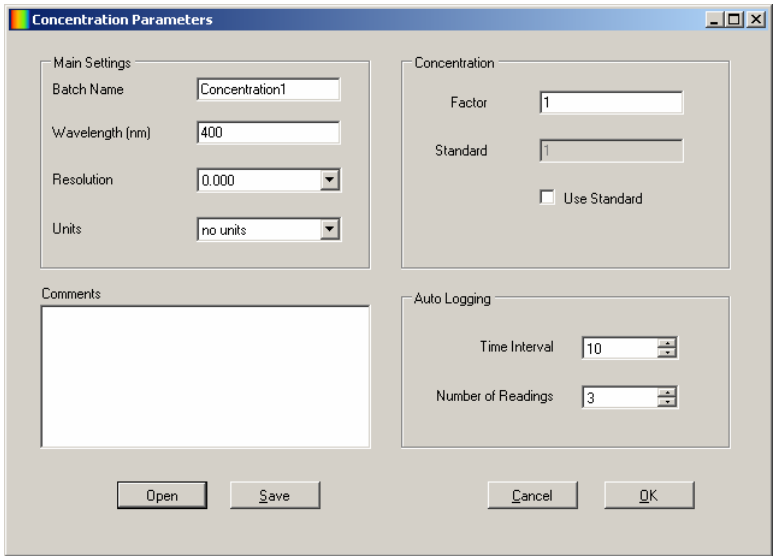
The toolbar at the top on the tab contains all the commands for this measurement mode.



The active buttons are in bold; the deactivated buttons are greyed out.

4.1 Settings

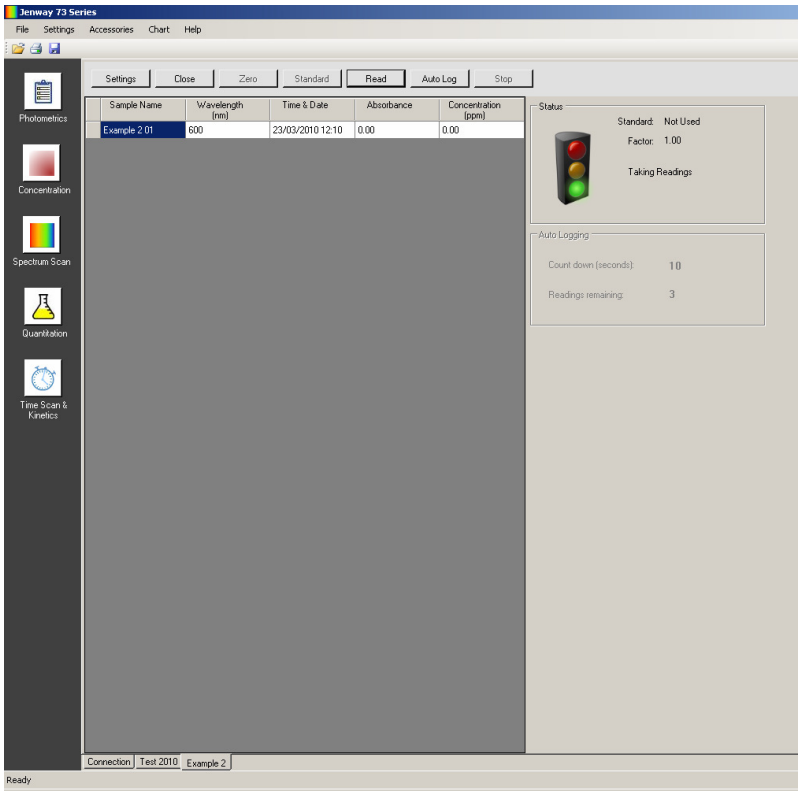
To set the measurement parameters click on the Settings button.



This screen allows the batch name, wavelength, resolution, concentration units, factor and standard values and to be set. If auto logging is required the parameters can be set in this screen. Comments can be entered which will be included on the result printouts.

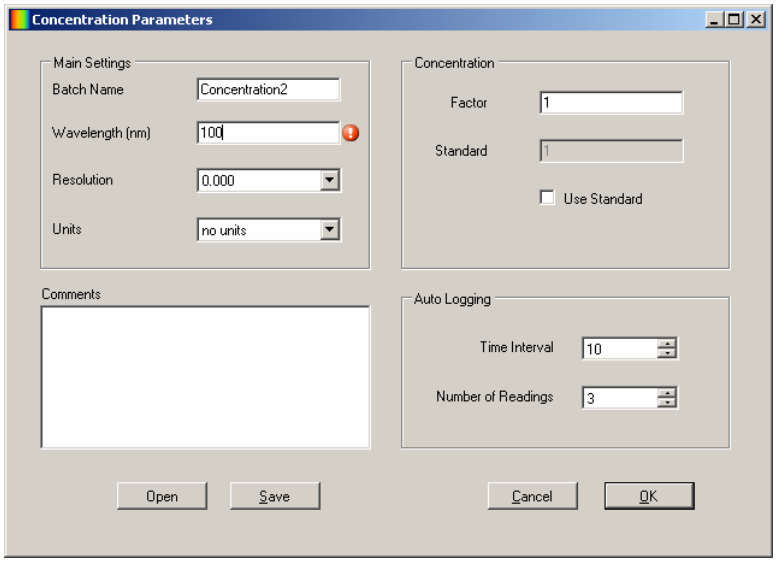
Once the required measurement parameters have been entered click on the OK button to accept and continue with calibration and sample measurement. To exit the settings without saving any measurement parameters click on the Cancel button. To save the measurement parameters for future use click on the Save button. To load previously saved measurement parameters click the Open button. For more details on saving and opening method parameters refer to section 8.

4.1.1 Batch name



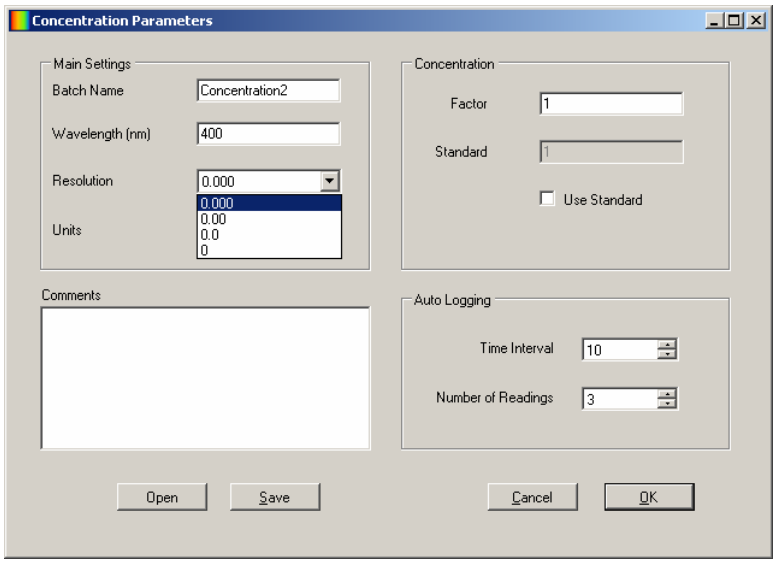
The batch name entered here will be reflected on the name tab at the bottom of the screen and under sample name in the results table once results have been generated.

4.1.2 Setting the wavelength



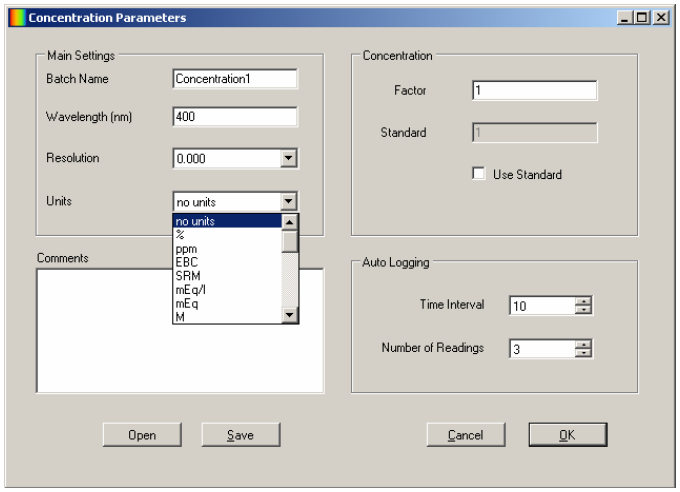
To select the wavelength that the zero calibration and sample measurements will be performed at type the wavelength into the text box. If a value entered is outside of the range of the spectrophotometer an error icon will be displayed and this must be corrected before the settings screen can be exited. Only numeric values can be entered.

4.1.3 Setting the resolution



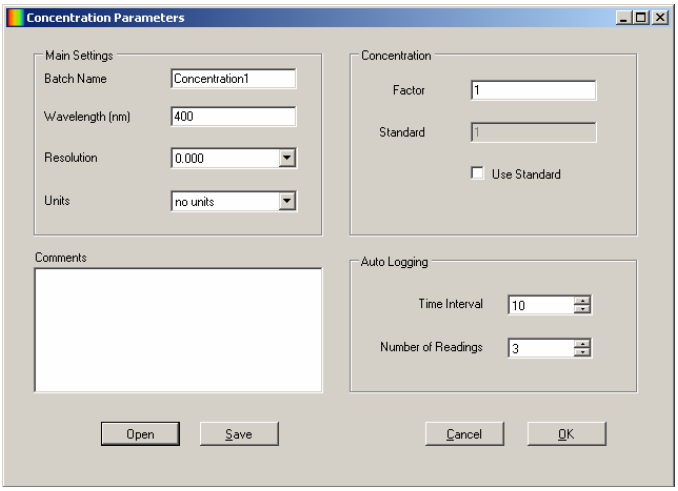
The resolution of the absorbance and % transmittance reported is selectable between 0, 0.0, 0.00 or 0.000. Click on the arrow on the drop down box to select the resolution required.

4.1.4 Selecting concentration units



The units of concentration can be selected from a number of options: no units, %, ppm, EBC, SRM, mEq/l, mEq, M, mM, µM, nM, U, U/l, U/ml, g/l, mg/l, µg/l, ng/l, g/dl, mg/dl, µg/dl, mg/ml, µg/ml, ng/ml, µg/µl, ng/µl, mol/l, mmol/l. Click on the arrow on the drop down box to select the units required.

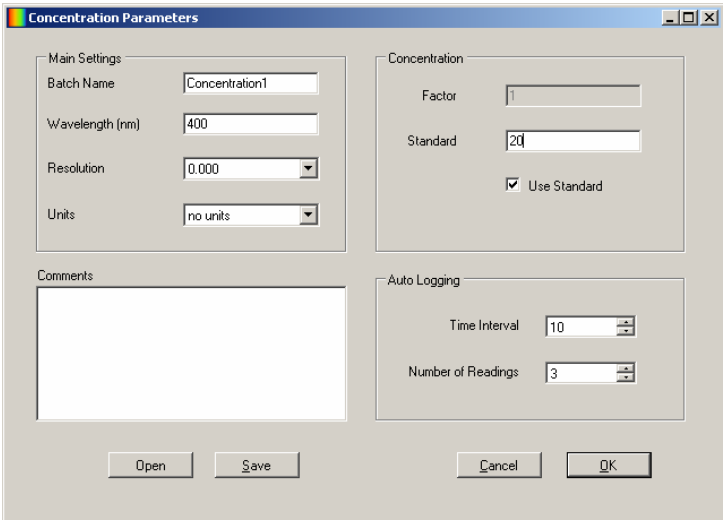
4.1.5 Entering a factor



To select the factor to be used type the factor value into the text box. Factor values of 0.001 to 10,000 can be entered. If the value entered is outside of the range an error icon will be displayed and this must be corrected before the settings screen can be exited.

If the factor is not known the value entered should be 1 and a standard should be measured in order to calculate the factor.

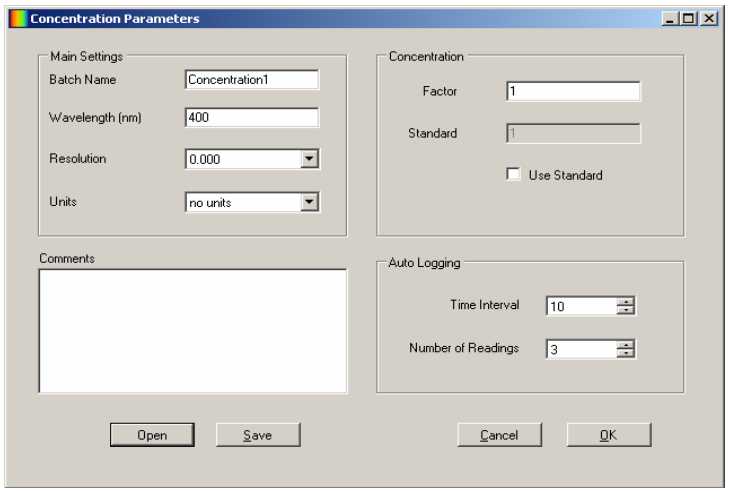
4.1.6 Entering a standard



To select the standard to be used put a tick in the box adjacent to use standard and type the standard value into the text box. Standard values from 0.001 to 1000 can be entered. If the value entered is outside of the range an error icon will be displayed and this must be corrected before the settings screen can be exited.

If the factor is known there is no need to use a standard and the standard value entered should be 1.

4.1.7 Auto Logging



Auto logging allows repeat measurements of the same sample to be performed with a set time interval between each measurement. Use the arrow icons to increase or decrease the time interval between sample measurements and use the arrow icons to select the number of readings required. If auto logging is not required the values do not need to be adjusted in this screen.

4.2 CALIBRATION AND SAMPLE MEASUREMENT

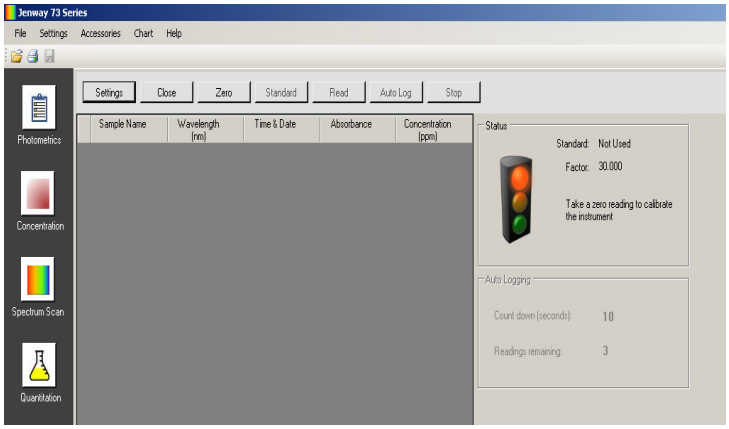
In the concentration measurement mode calibrations against a standard or a factor can be performed following a zero calibration. If the factor is not known calibration against a known standard is performed in order to calculate the factor. However if the factor is known there is no need to calibrate using a standard. The calibrations must be performed at the same wavelength at which the sample will be measured.

4.2.1 Calibration and sample measurement using a factor

Once the settings have been entered the zero calibration should be performed.

Insert the cuvette containing the blank sample into the sample chamber and close the instrument lid.

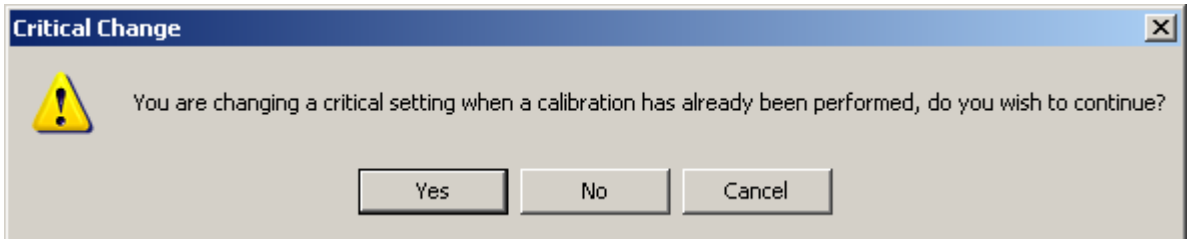
Click on the Zero button; this sets the instrument to zero absorbance.



Once a calibration is complete the Read and Auto Log buttons are activated. If the settings menu is re-entered following the zero calibration it is not possible to change the wavelength. If the wavelength needs to be adjusted another tab should be opened.

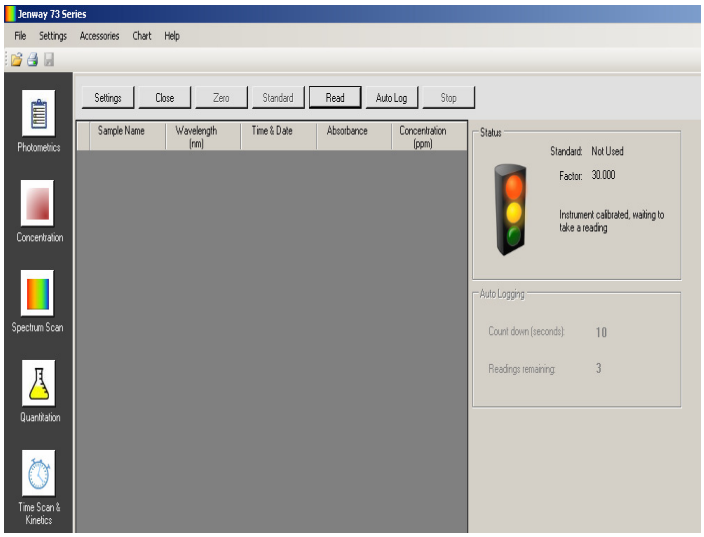
If the settings menu is re-entered following the zero calibration it is possible to change the

wavelength. However a warning will be displayed to warn that critical settings are being changed after the zero calibration has been performed.

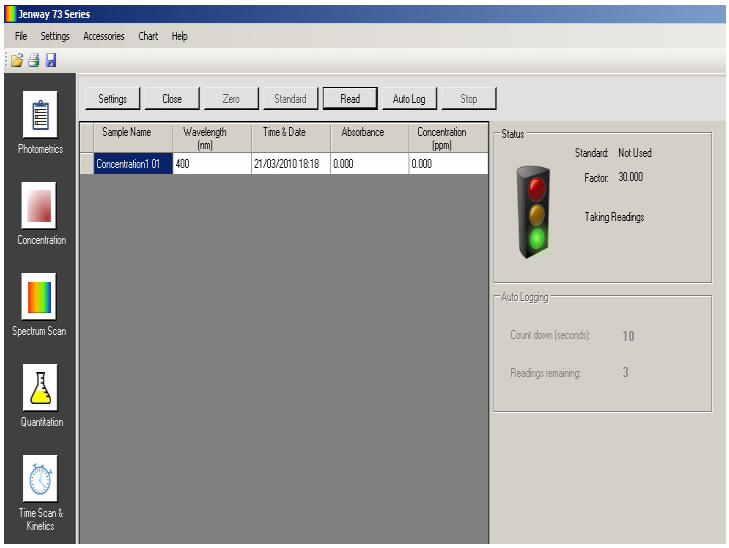


To continue click Yes, to cancel click No or Cancel.

If the wavelength is changed then the zero calibration must be performed again at the new wavelength, before a sample can be measured. Alternatively a new concentration tab can be opened and the required settings can be entered.



The calibration status will show the zero calibration has been performed and the unit is ready to measure the sample.



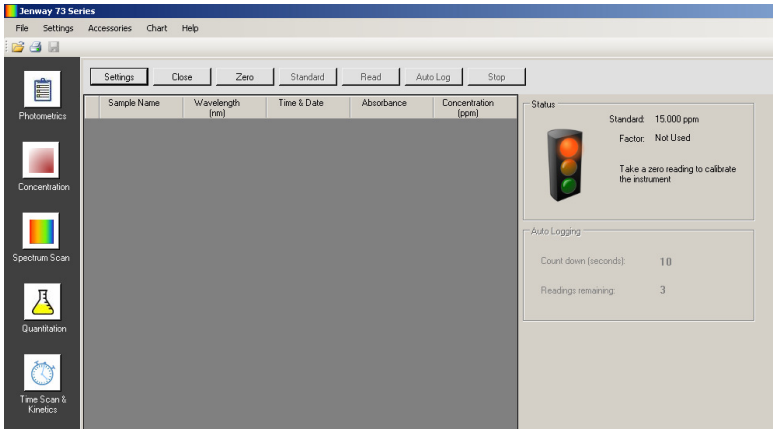
Insert the cuvette containing the sample into the sample chamber and close the instrument lid.

Click on the Read button; the instrument performs the measurement and result is displayed on the screen.

If the same sample needs to be measured more than once click on the Auto Log button. The instrument will perform the required number of readings with the specified time interval between each measurement. The results will be displayed on the screen. The batch name entered in the settings screen will have 01, 02 etc after the name, to signify the order in which the results were generated. auto logging can be stopped before all the measurements have been completed by clicking on the Stop button. To recommence auto logging click the Auto Log button again.

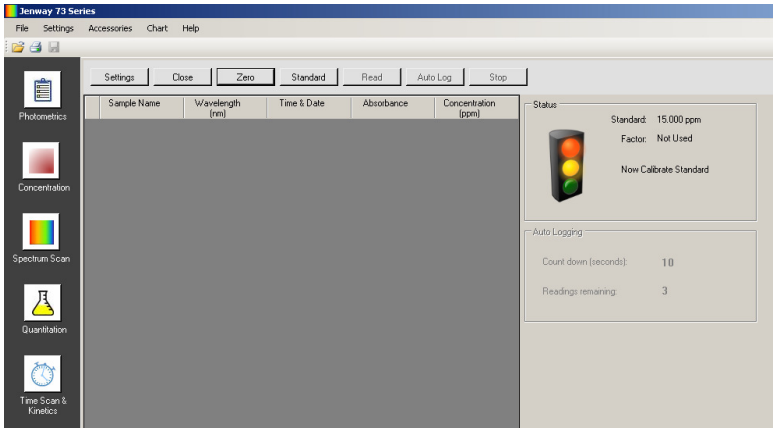
If the settings menu is re-entered following the sample measurement it is not possible to change the wavelength. Alternatively a new concentration tab can be opened and the required settings can be entered.

4.2.2 Calibration and sample measurement using a standard

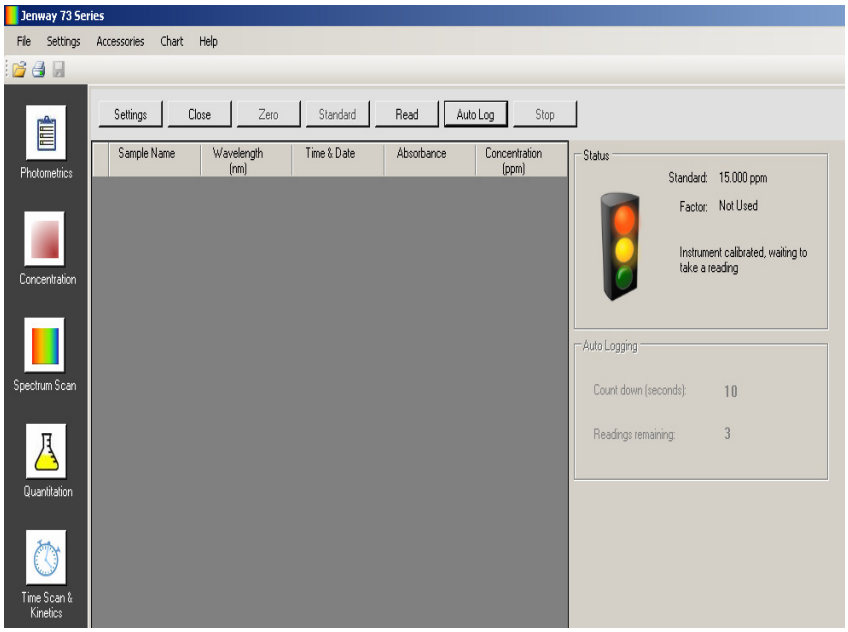


Once the settings have been entered the zero calibration should be performed.

Insert the cuvette containing the blank sample into the sample chamber and close the instrument lid. Click on the Zero button; this sets the instrument to zero absorbance.

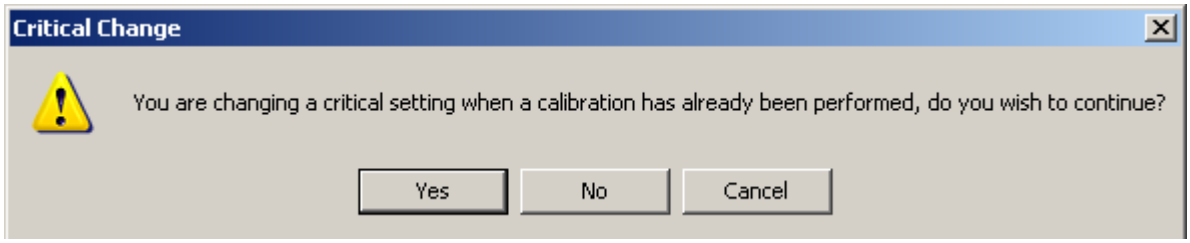


The calibration status will show the zero calibration has been performed and the unit is ready to measure the Standard. The standard button is now active. Insert the cuvette containing the standard sample into sample chamber and close the instrument lid.



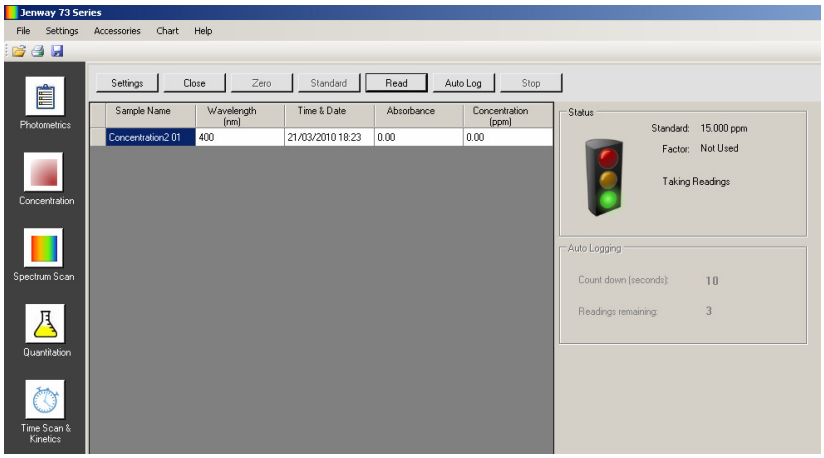
Click on the Standard button. The instrument will take a reading and calibrate to the standard concentration. Once the calibration is complete the Read and Auto Log buttons are active and the sample can be measured.

If the settings menu is re-entered following the standard calibration it is possible to change the wavelength. However a warning will be displayed to warn that critical settings are being changed after the zero calibration has been performed.



To continue click Yes, to cancel click No or Cancel.

If the wavelength is changed then the zero and standard calibration must be performed again at the new wavelength, before a sample can be measured. Alternatively a new concentration tab can be opened and the required settings can be entered.



Insert the cuvette containing the sample into the sample chamber and close the instrument lid.

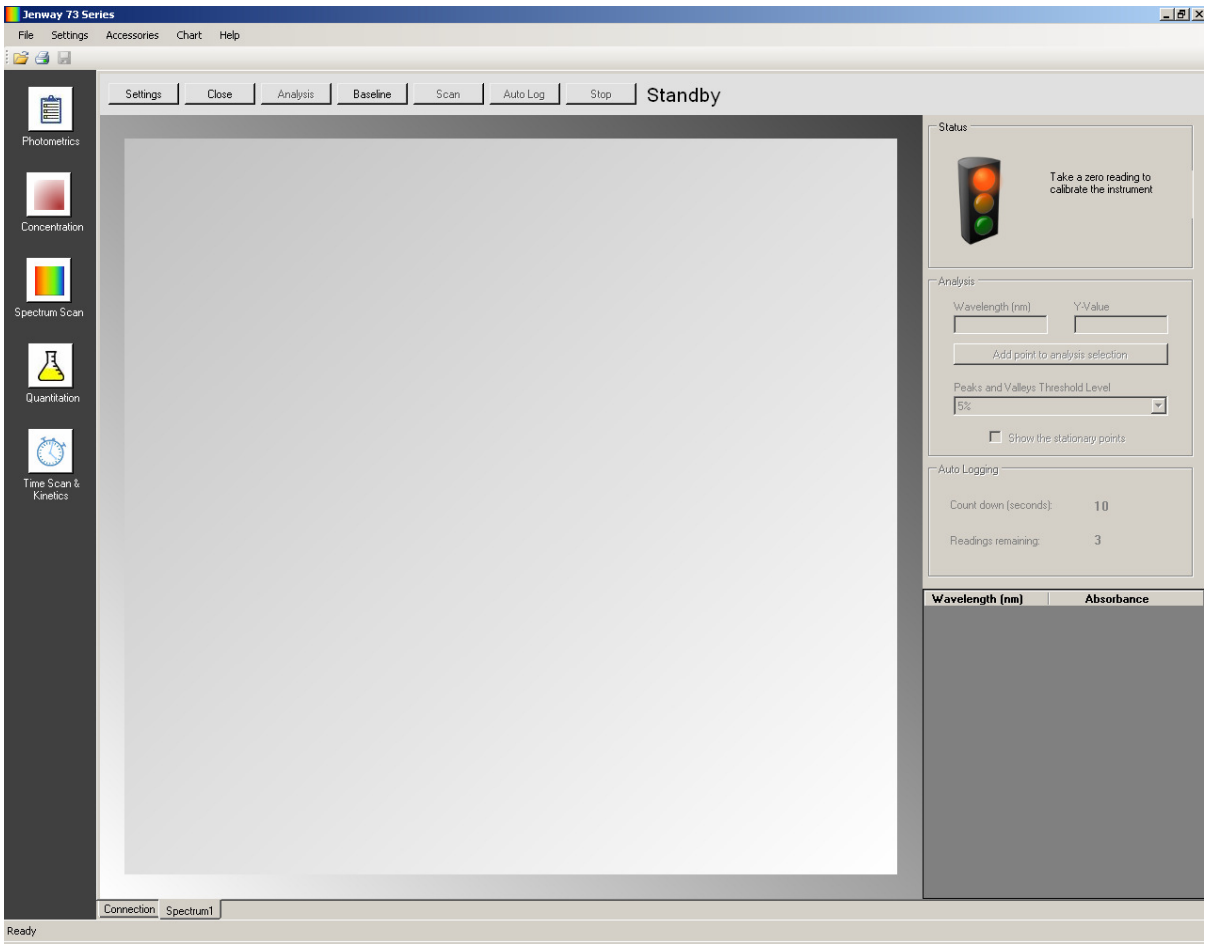
Click on the Read button; the instrument performs the measurement and result is displayed on the screen.

If the same sample needs to be measured more than once click on the Auto Log button. The instrument will perform the required number of readings with the specified time interval between each measurement. The results will be displayed on the screen. The batch name entered in the settings screen will have 01, 02 etc after the name, to signify the order in which the results were generated. auto logging can be stopped before all the measurements have been completed by clicking on the Stop button. To recommence auto logging click on the Auto Log button again.

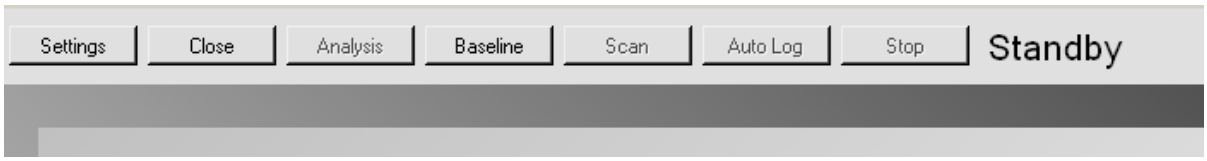
If the settings menu is re-entered following the sample measurement it is not possible to change the wavelength. Alternatively a new concentration tab can be opened and the required settings can be entered.

SECTION 5 – SPECTRUM

To open the spectrum measurement mode click on the spectrum icon on the toolbar down the left-hand side of the screen.



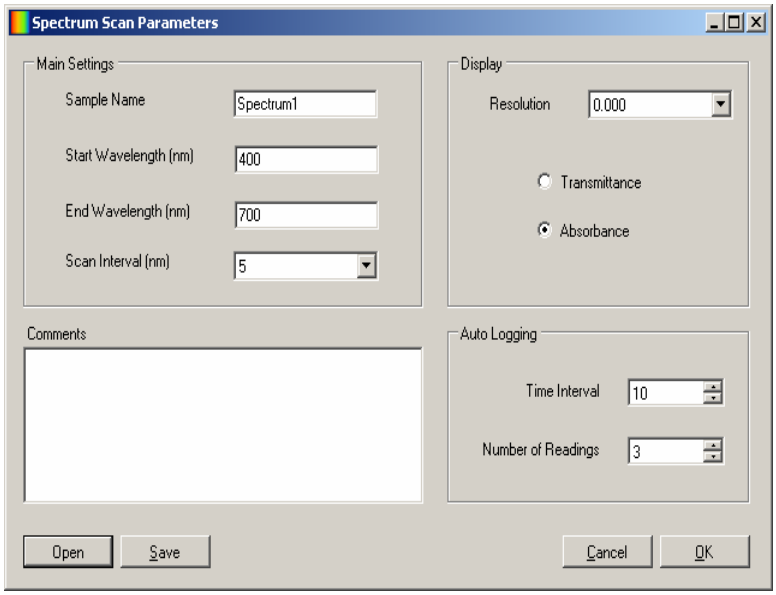
The toolbar at the top on the tab contains all the commands for this measurement mode.



The active buttons are in bold; the deactivated buttons are greyed out. The spectrum measurement mode also displays the status at the end of the toolbar.

5.1 Settings

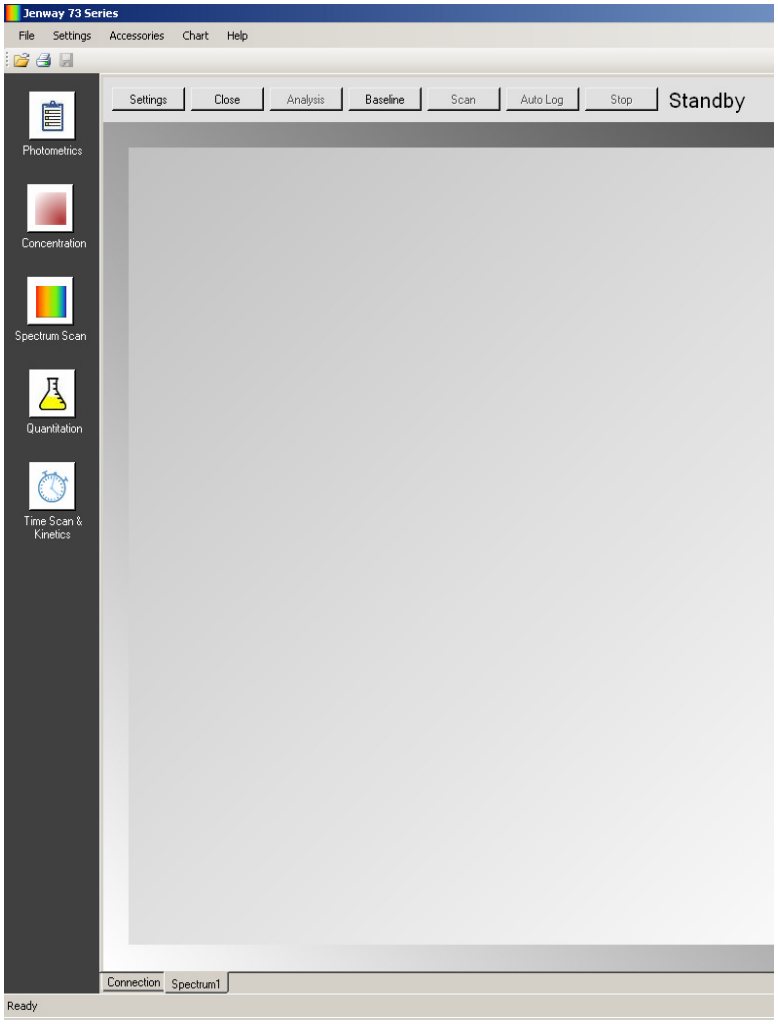
To set the measurement parameters click on the Settings button.



This screen allows the sample name, start and end wavelengths, scan interval, resolution, and operating mode to be set. If Auto Logging is required the parameters can be set in this screen. Comments can be entered which will be included on the result printouts.

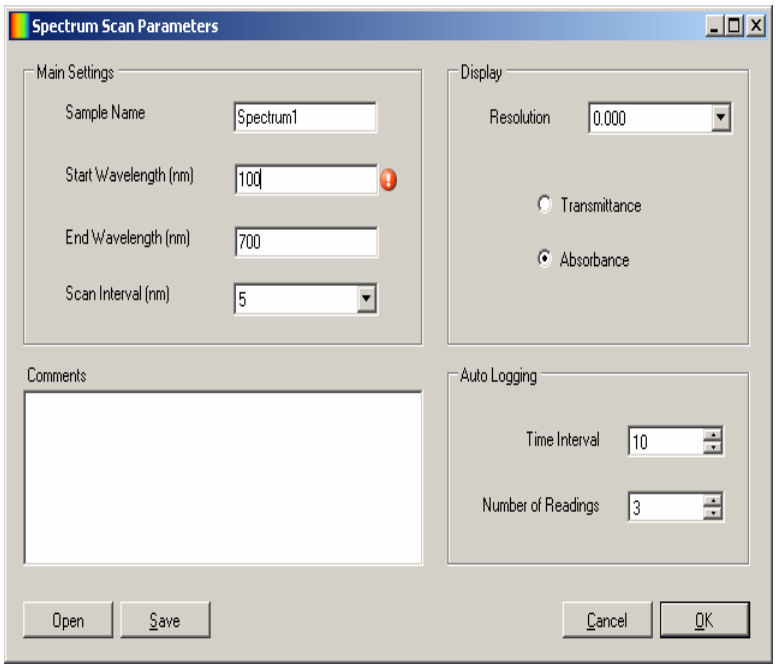
Once the required measurement parameters have been entered click on the OK button to accept and continue with calibration and sample measurement. To exit the settings without saving any measurement parameters click on the Cancel button. To save the measurement parameters for future use click on the Save button. To load previously saved measurement parameters click the Open button. For more details on saving and opening method parameters refer to section 8.

5.1.1 Sample name



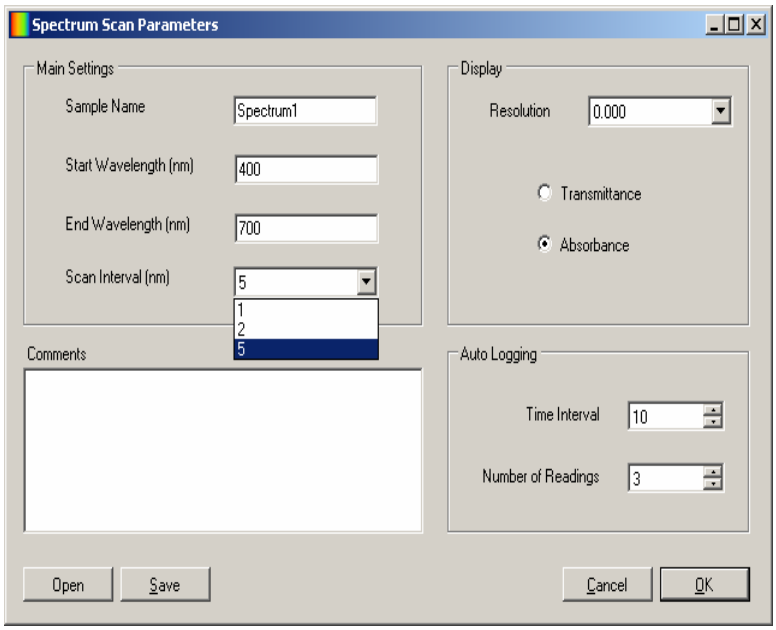
The sample name entered here will be reflected on the name tab at the bottom of the screen.

5.1.2 Setting start and end wavelengths



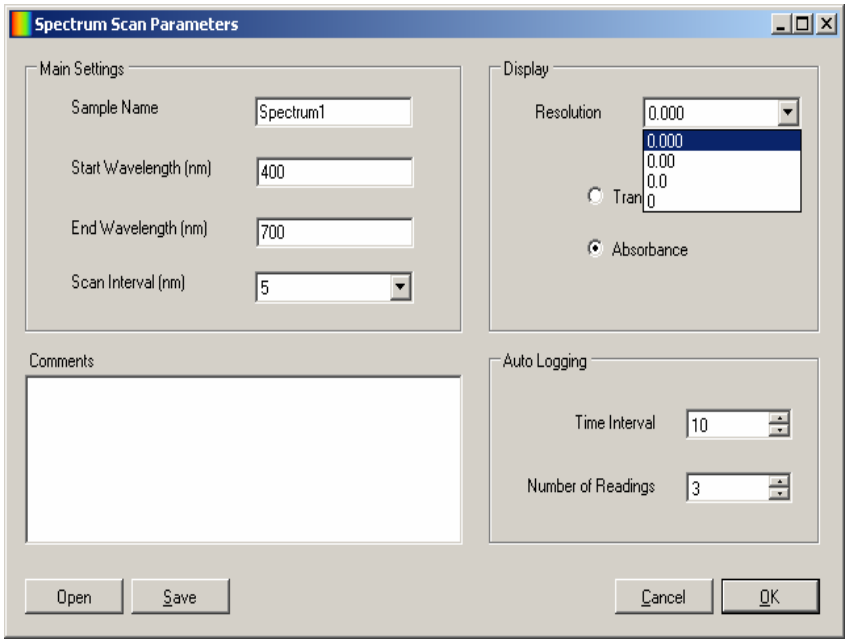
This function enables the start and end wavelengths of the spectrum scan to be set. To select the wavelength range that the baseline scan and sample scan will be performed across type the start and end wavelengths into the text boxes. If a value entered is outside of the range of the spectrophotometer an error icon will be displayed and this must be corrected before the settings screen can be exited. Only numeric values can be entered.

5.1.3 Setting the scan interval



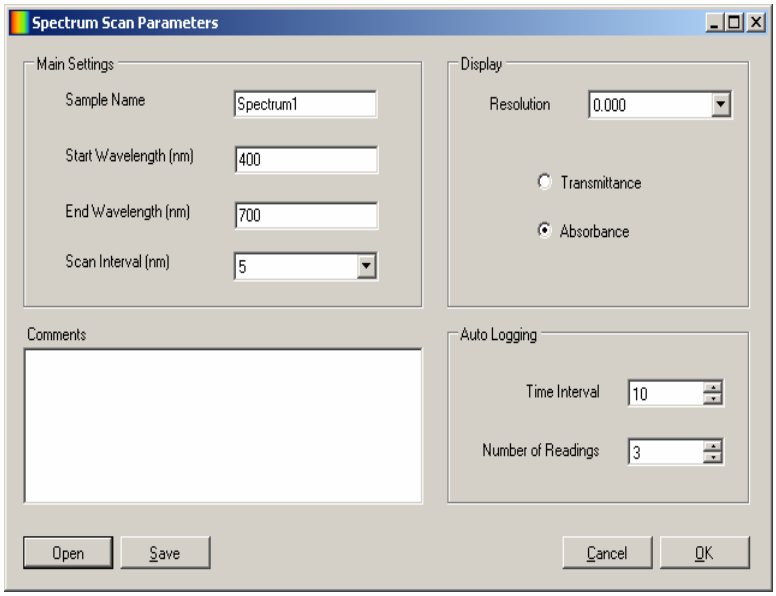
This function enables the interval between wavelengths measured in the spectrum scan to be set. The scan interval is selectable between 1, 2 or 5nm. Click on the arrow on the drop down box to select the scan interval required.

5.1.4 Setting the resolution



The resolution of the absorbance or % transmittance reported is selectable between 0, 0.0, 0.00 or 0.000. Click on the arrow on the drop down box to select the resolution required.

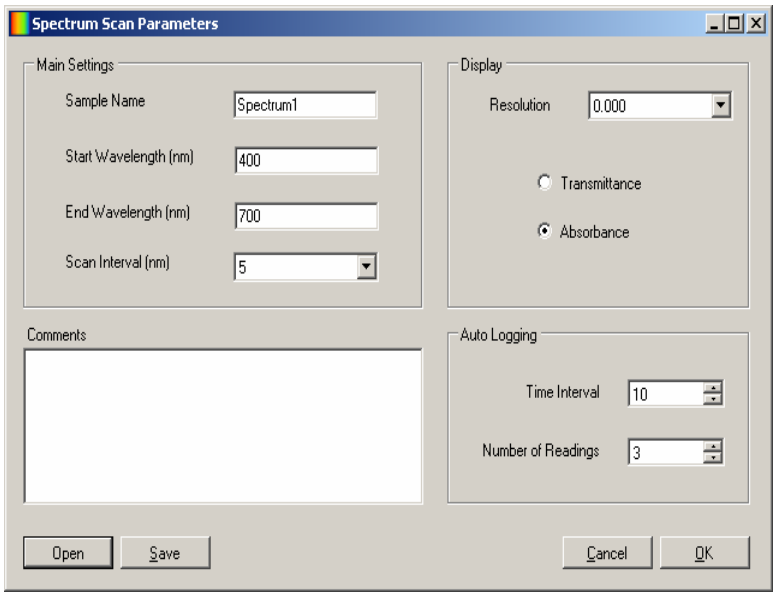
5.1.5 Selecting operating mode



The results displayed can be either absorbance or % transmittance. To select absorbance click in the circle adjacent to Absorbance; to select transmittance click in the circle adjacent to Transmittance.

After the spectrum scan is completed it is possible to go back and change the operating mode. This will automatically adjust the graph scale and the results table.

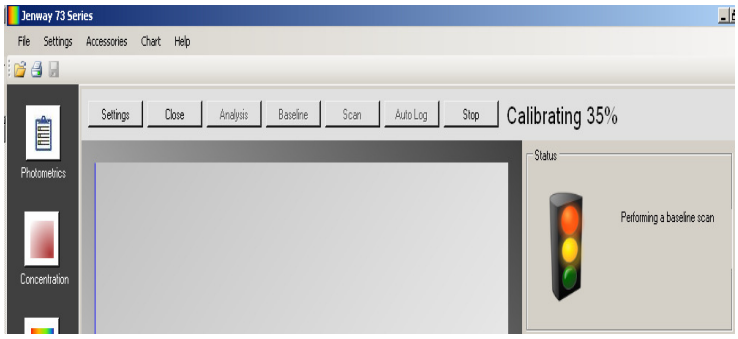
5.1.6 Auto Logging



Auto logging allows repeat measurements of the same sample to be performed with a set time interval between each measurement. Use the arrow icons to increase or decrease the time interval between sample measurements and use the arrow icons to select the number of readings required. If auto logging is not required the values do not need to be adjusted in this screen.

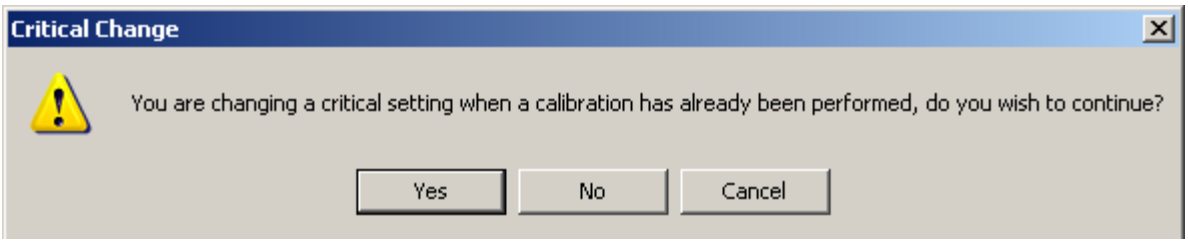
5.2 CALIBRATION

In the spectrum measurement mode the calibration is a baseline scan which is performed across the selected wavelength range at the selected scan interval. Insert a cuvette containing the blank solution into the sample chamber and close the instrument lid.



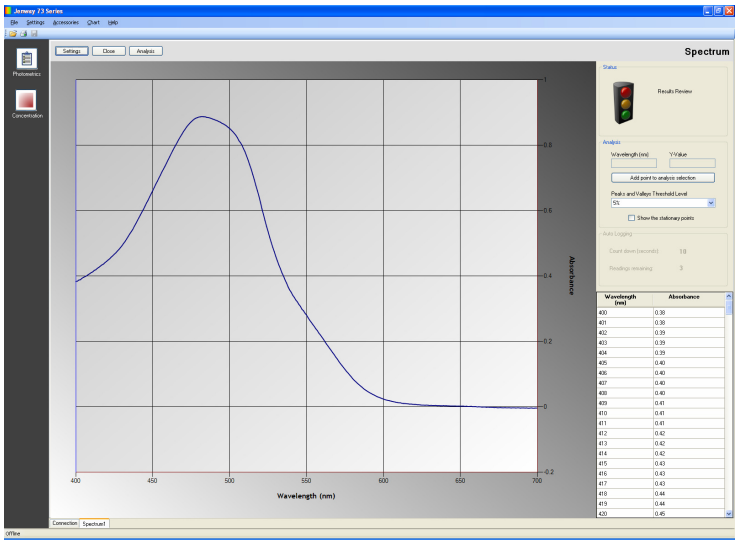
Click on the Baseline button to begin the baseline scan. The calibration status will show the progress of the baseline scan. Once the calibration is completed the Scan button becomes active and the sample can be measured.

If the settings menu is re-entered following the zero calibration it is possible to change the wavelength and scan interval. However a warning will be displayed to warn that critical settings are being changed after the baseline has already been performed.



At continue click Yes, to cancel click No or Cancel. If the wavelength is changed then the baseline must be performed again at the new wavelength and scan interval, before a sample can be measured. Alternatively a new spectrum tab can be opened and the required settings can be entered.

5.3 SAMPLE MEASUREMENT



Insert the cuvette containing the sample into the sample chamber and close the instrument lid.

Click on the Scan button; the instrument initiates the scan and the live spectrum scan is displayed on the screen. The results are also displayed in a table. To stop the scan before completion click on the Stop button. To restart the scan click on the Repeat button – the scan is restarted from the beginning.

If the same sample needs to be measured more than once click on the Auto Log button. The instrument will perform the required number of readings with the specified time interval between each measurement. Unlike with photometrics, concentration and quantitation the Auto Logged results will not be displayed on the same screen. For each repeat measurement required a new tab is automatically opened, displaying the new spectrum scan and results. Auto logging can be stopped before all the measurements have been completed by clicking on the Stop button. To recommence auto logging click on the auto log button again.

If the settings menu is re-entered following sample measurement it is not possible to change the start and end wavelengths or the scan interval. A new spectrum tab can be opened and the new wavelength can be entered.

Once the spectrum scan is complete the post analysis tools become active.

The spectrum measurement mode displays the result both graphically and in tabular format.

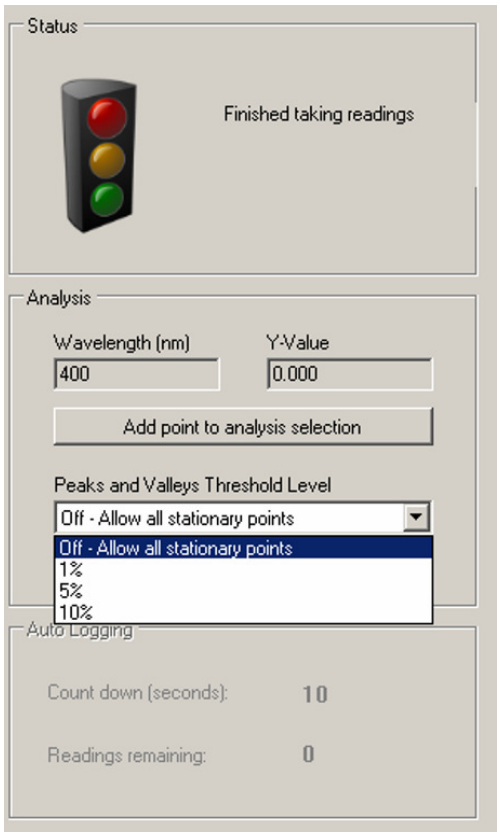
It is possible to zoom in on areas of interest on the graph by clicking on the graph and holding down the left mouse key then dragging the mouse over the required area.

To reset the chart to the original scale click on Chart on the toolbar at the top of the screen, then click on Reset. The chart will return to the original scale. The chart can also be copied or saved as an individual file to be used in reports etc by clicking on Chart on the toolbar at the top of the screen, then click on Copy or Save As Image.

5.4 POST MEASUREMENT TOOLS

The spectrum post measurement tools include peaks and valleys threshold, peaks and valleys table and spectral points analysis.

5.4.1 Peaks and Valleys threshold level



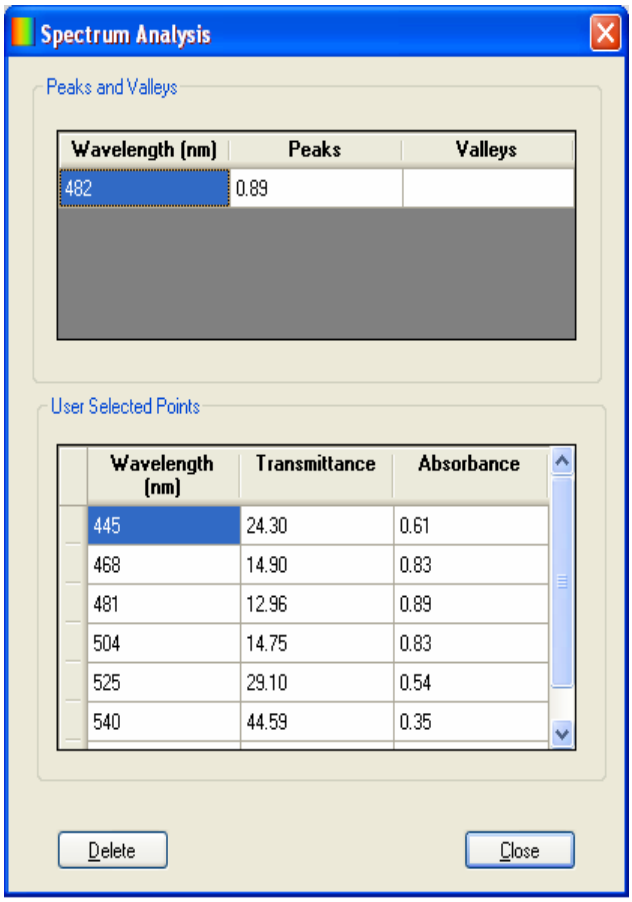
This function enables the peaks and valleys threshold to be set at 1, 5, 10% or turned off. If a 5% threshold is selected then only peaks and valleys above this threshold will be displayed in the peaks and valleys table. If the threshold is turned off then all peaks and valleys are shown in the peaks and valleys table.

Putting a tick in the box adjacent to Show the stationary points will label the peaks and valleys.

To select the peaks and valleys threshold click on the arrow on the drop down box and select the required threshold level.

5.4.2 Peaks and Valleys Table

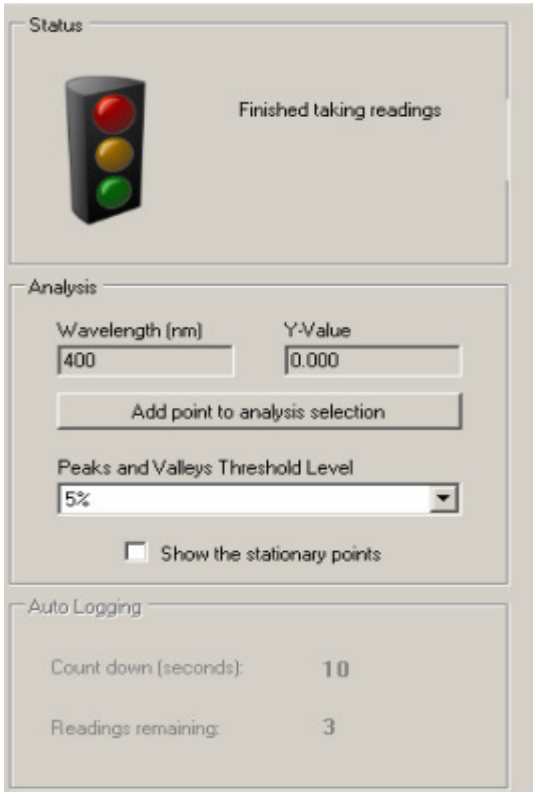
The peaks and valleys table can be viewed by clicking on the Analysis button on the toolbar at the top of the page tab.



The peaks and valleys displayed depend on the peaks and valley threshold level which has been set. Refer to section 5.4.1 for more details.

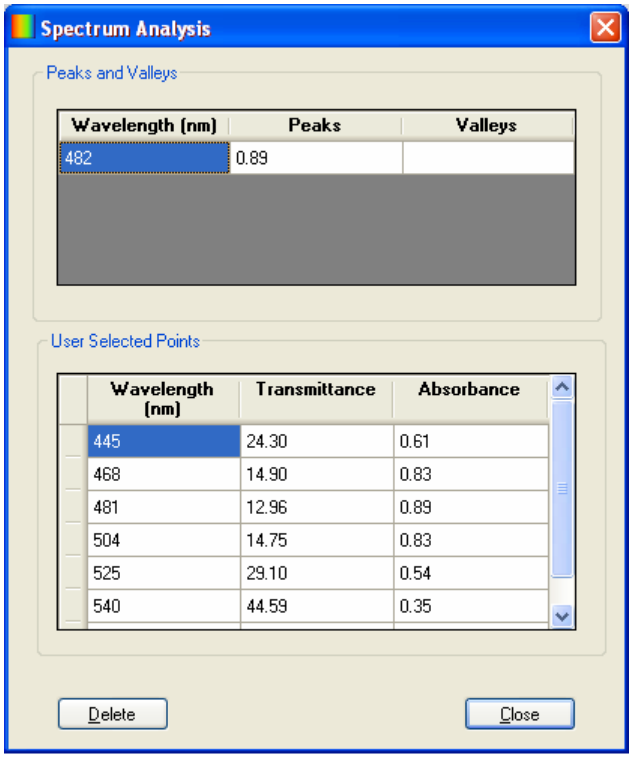
The information displayed here can be printed off. Refer to section 11 for more details on printing options.

5.4.3 Spectral points analysis



The analysis area on the right-hand side of the screen allows points of interest to be selected from the graph and added to the spectral points analysis table which can be printed off. By clicking on a point of interest on the graph the corresponding wavelength and either absorbance or % transmittance value is shown in the analysis area. By clicking on the Add point to analysis selection this adds the point to the table.

There is no limit on the number of points which can be added to the table.



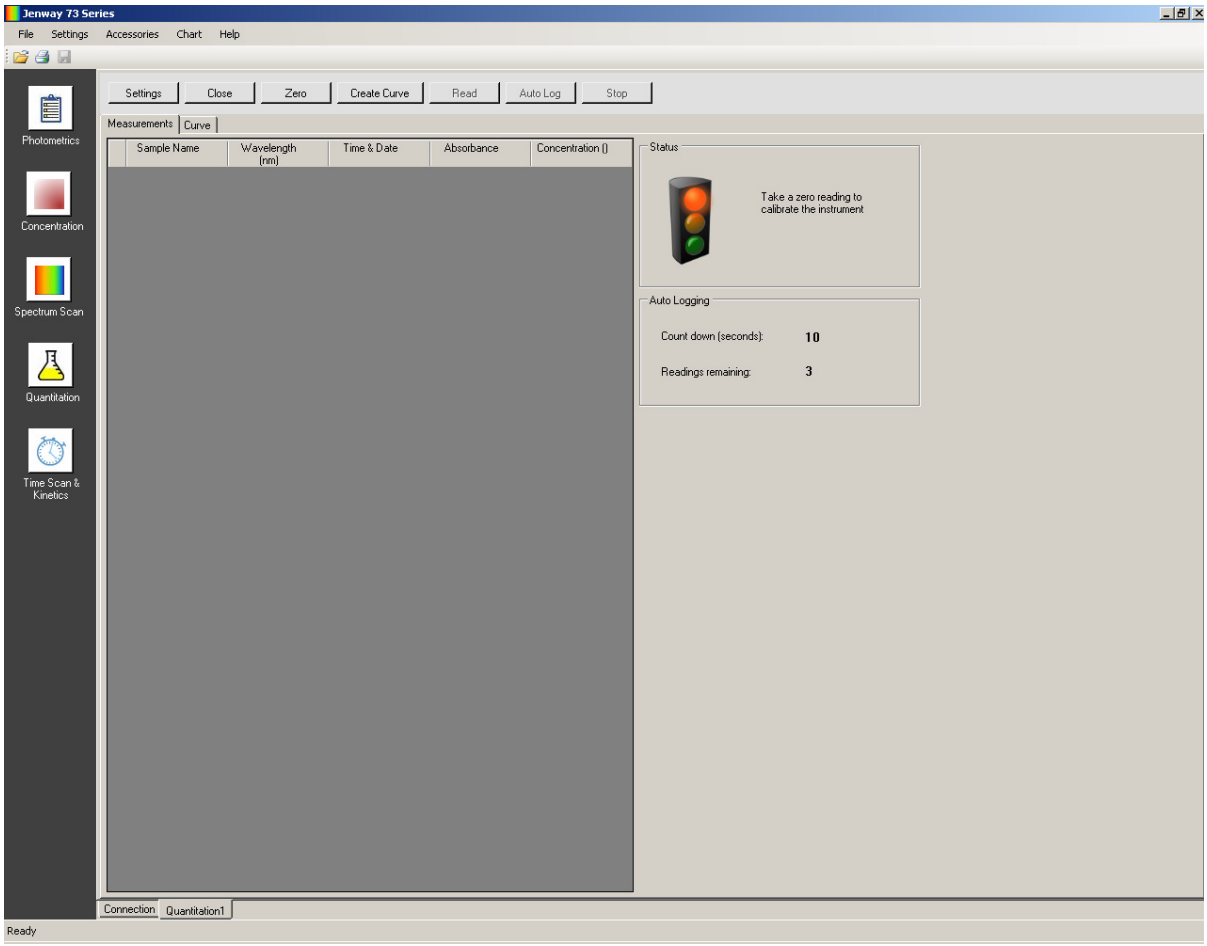
To view the points in the spectral points analysis table click on the Analysis button on the toolbar at the top of the page tab.

If a point has been selected in error highlight the point to be deleted. Click the Delete key to remove the point from the spectral points analysis table.

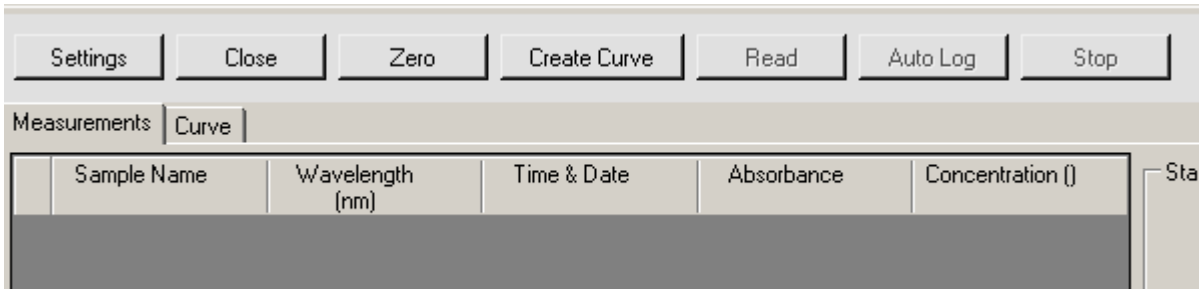
The information displayed here can be printed off. Refer to section 11 for more details on printing options.

SECTION 6 - QUANTITATION

To open the quantitation measurement mode click on the quantitation icon on the toolbar down the left-hand side of the screen.



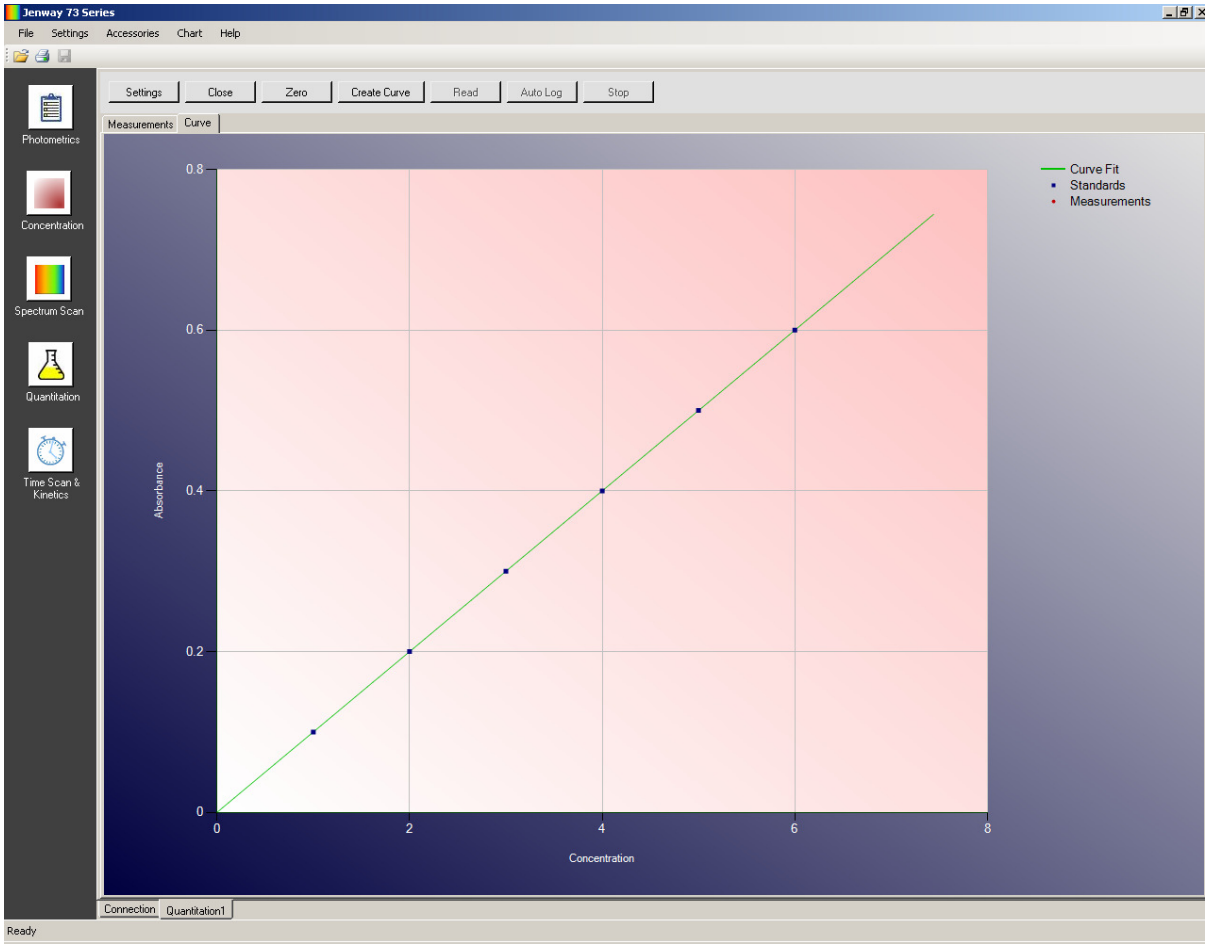
The toolbar at the top on the tab contains all the commands for this measurement mode.



The active buttons are in bold; the deactivated buttons are greyed out.

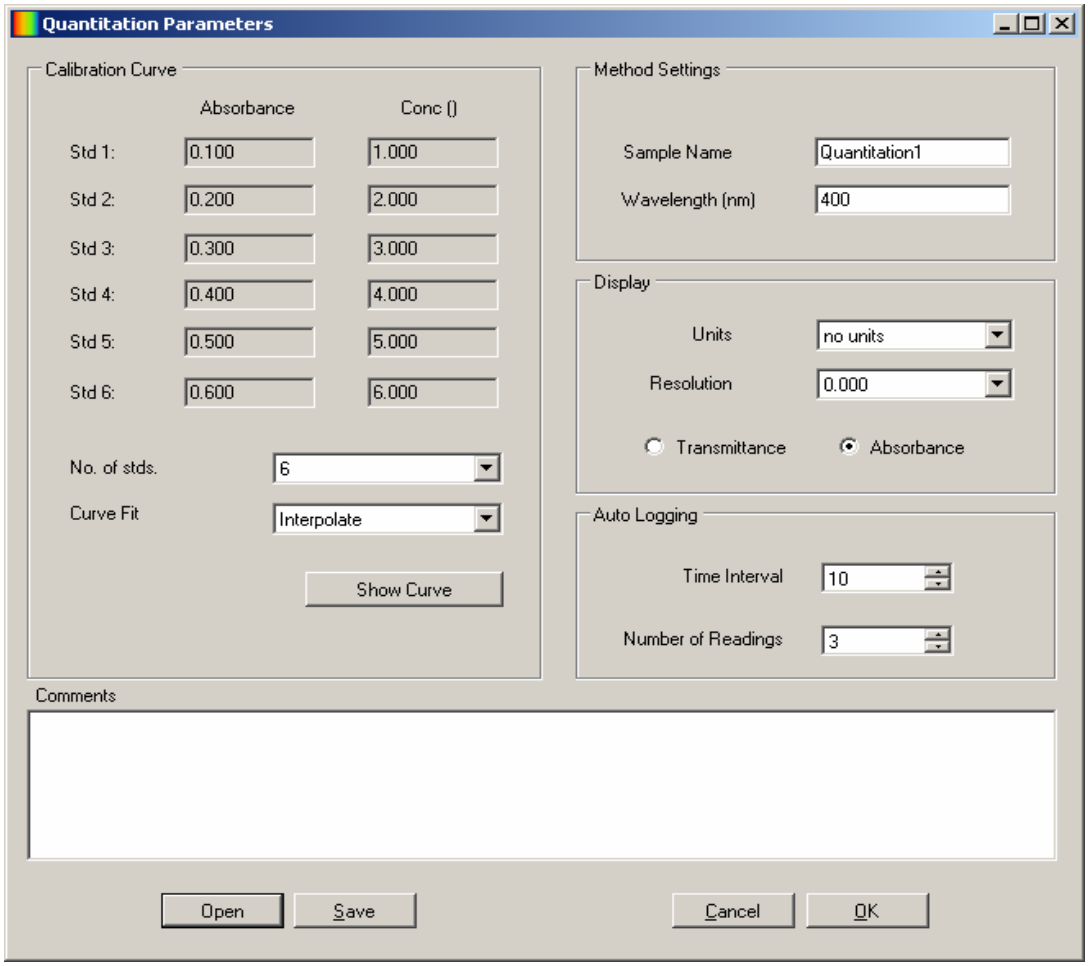
There are also two tabs in this screen, the measurement tab and the curve tab. The measurement

tab displays all the results, the curve tab displays the current standard curve.



6.1 Settings

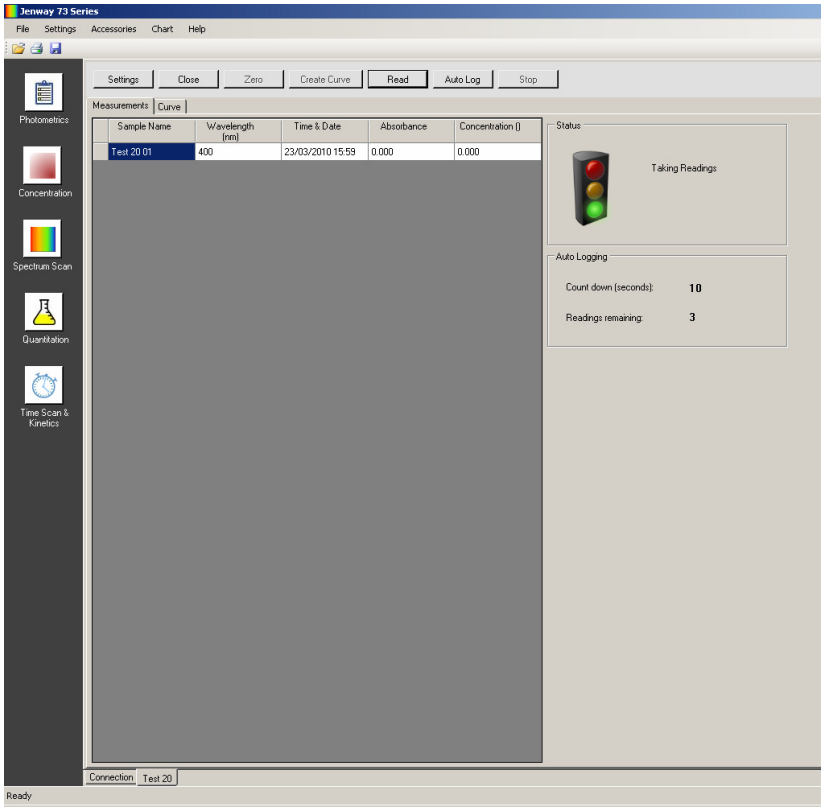
To set the measurement parameters click on the Settings button.



This screen allows the sample name, wavelength, concentration units resolution, operating mode, number of standards and curve fit to be set. If auto logging is required the parameters can be set in this screen. Comments can be entered which will be included on the result printouts. The standard curve can also be viewed by clicking the Show Curve button.

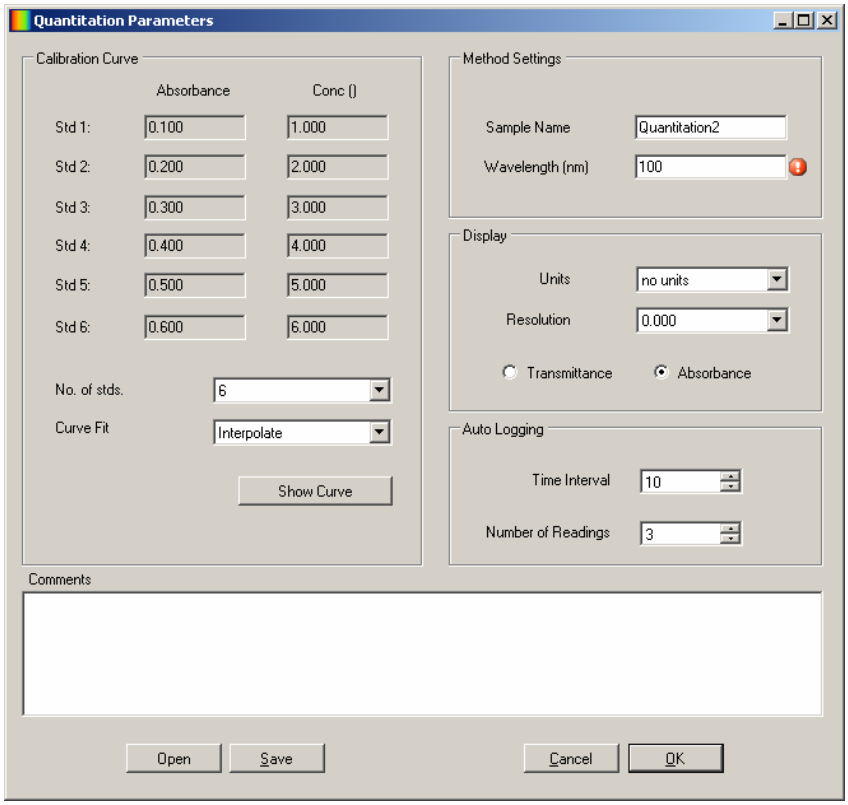
Once the required measurement parameters have been entered click on the OK button to accept and continue with calibration and sample measurement. To exit the settings without saving any measurement parameters click on the Cancel button. To save the measurement parameters for future use click on the Save button. To load previously saved measurement parameters click the Open button. For more details on saving and opening method parameters refer to section 8.

6.1.1 Sample name



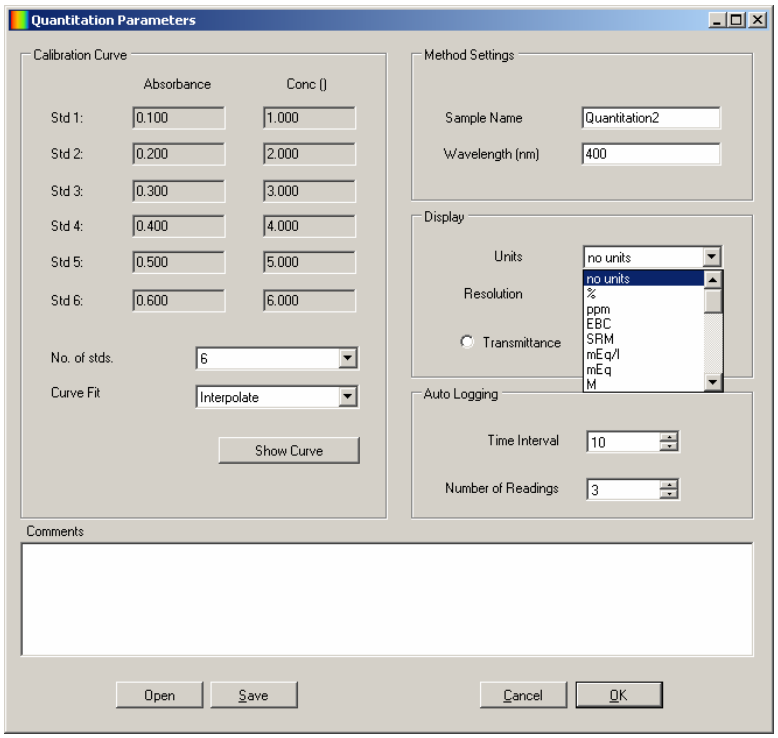
The sample name entered here will be reflected on the name tab at the bottom of the screen and under sample name in the results table once results have been generated.

6.1.2 Setting the wavelength



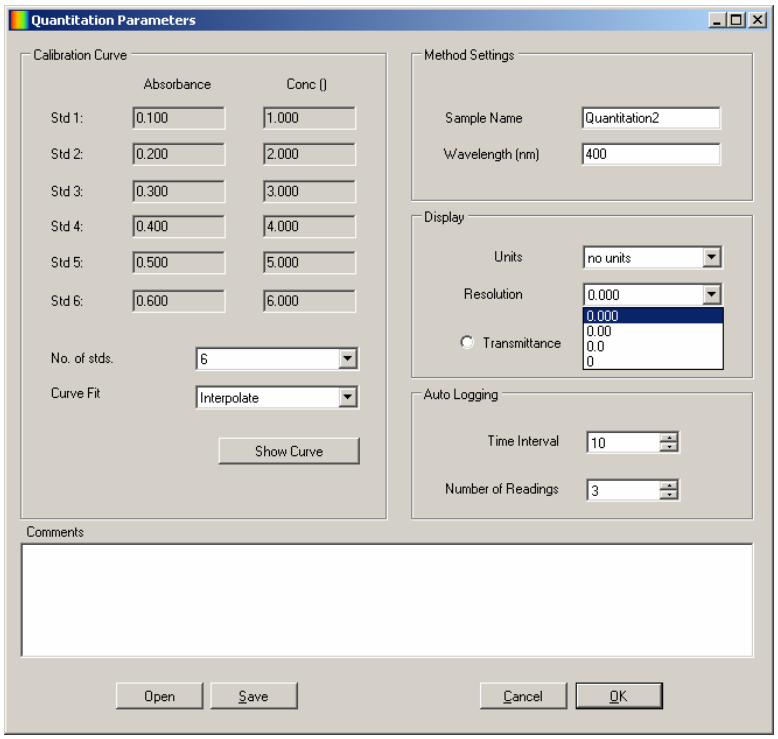
To select the wavelength that the zero calibration and sample measurements will be performed at type the wavelength into the text box. The wavelength selected should be the same wavelength that the standards were or will be measured at. If a value entered is outside of the range of the instrument an error icon will be displayed and this must be corrected before the settings screen can be exited. Only numeric values can be entered.

6.1.3 Selecting concentration units



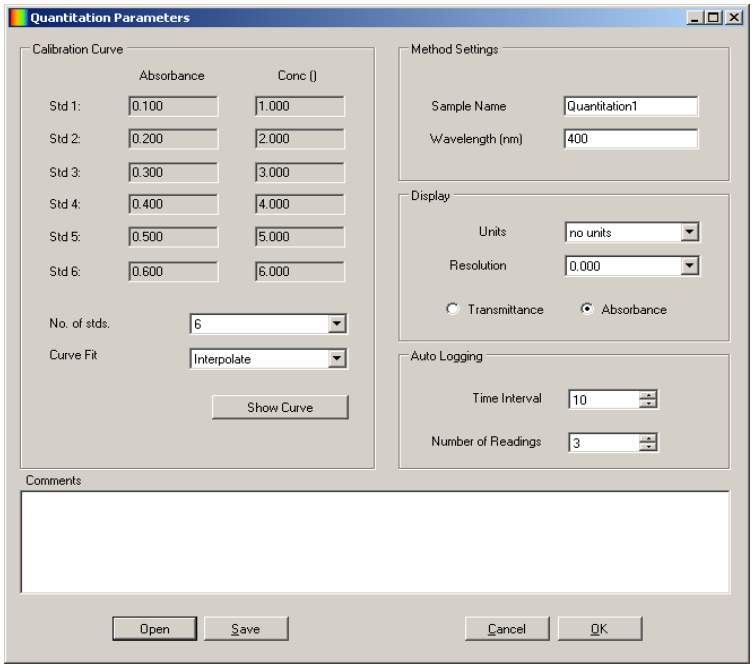
The units of concentration can be selected from a number of options: no units, %, ppm, EBC, SRM, mEq/l, mEq, M, mM, µM, nM, U, U/l, U/ml, g/l, mg/l, µg/l, ng/l, g/dl, mg/dl, µg/dl, mg/ml, µg/ml, ng/ml, µg/µl, ng/µl, mol/l, mmol/l. Click on the arrow on the drop down box to select the units required.

6.1.4 Setting the resolution



The resolution of the absorbance or % transmittance and concentration reported is selectable between 0, 0.0, 0.00 or 0.000. Click on the arrow on the drop down box to select the resolution required.

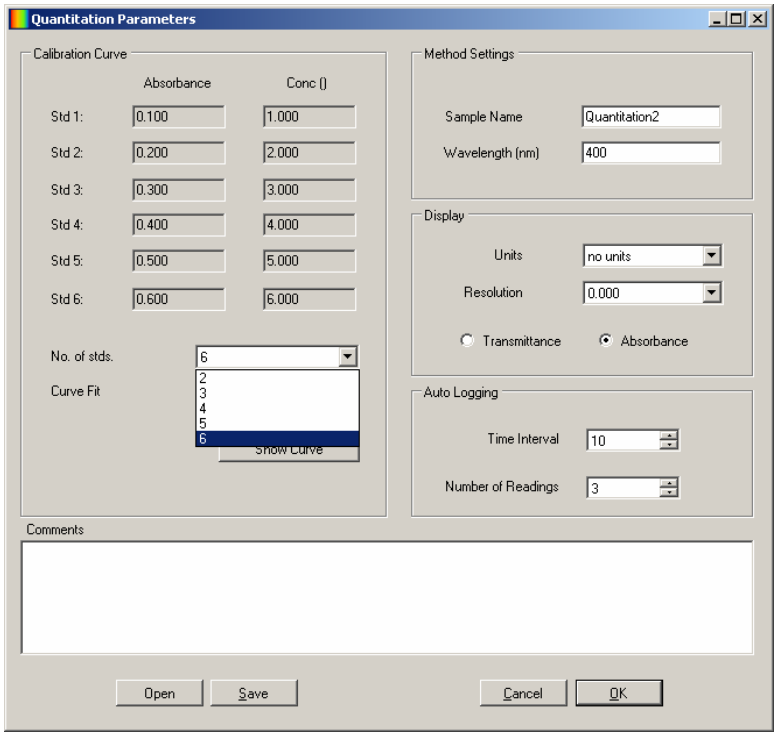
6.1.5 Operating mode



The results displayed can be either absorbance or % transmittance. To select absorbance click in the circle adjacent to Absorbance; to select transmittance click in the circle adjacent to Transmittance.

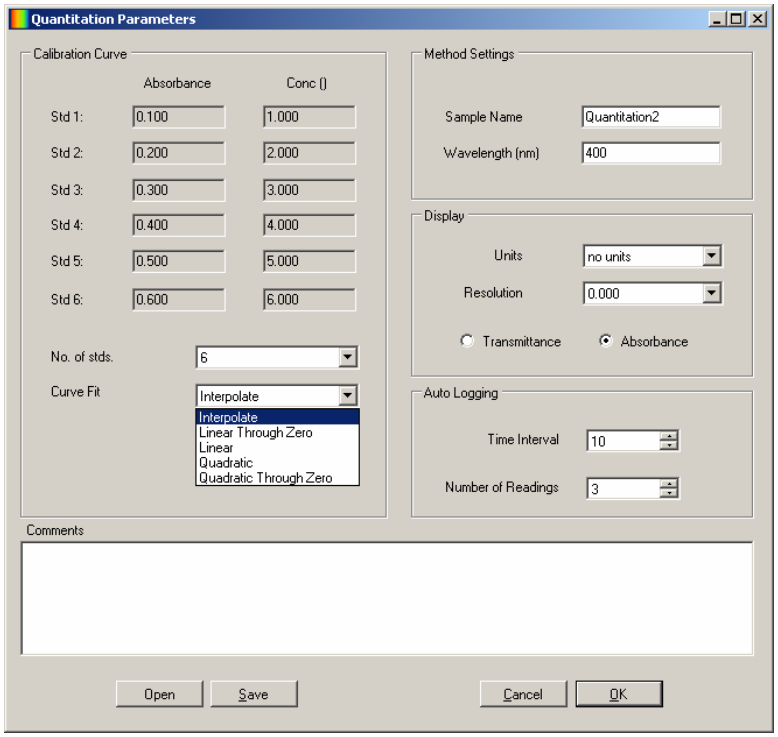
Following sample measurement it is possible to go back and change the operating mode. This will automatically change the results displayed in the table.

6.1.6 Selecting number of standards



The number of standards used to create a standard curve can be changed from 2 to 6 standards. To select the required number of standards used click on the arrow box on the drop down box and select either 2, 3, 4, 5 and 6. If there is only one standard available the concentration measurement mode should be used.

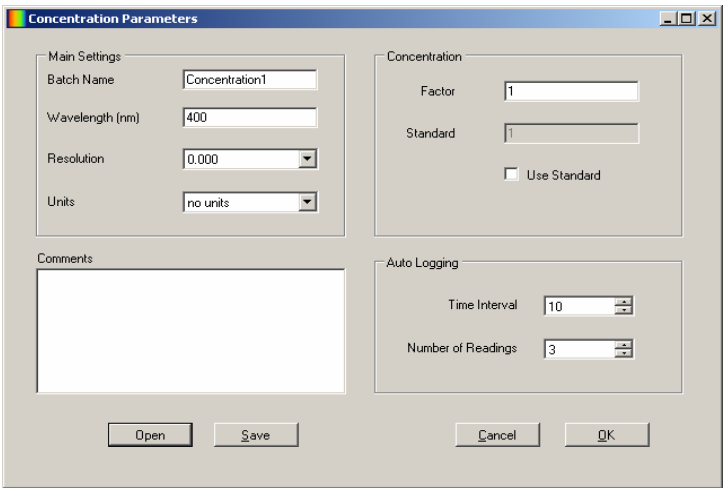
6.1.7 Selecting the curve fit



The curve fit algorithm is selectable between linear, linear through zero, quadratic, quadratic through zero and interpolate. Click on the arrow on the drop down box to select the best curve fit for the standards.

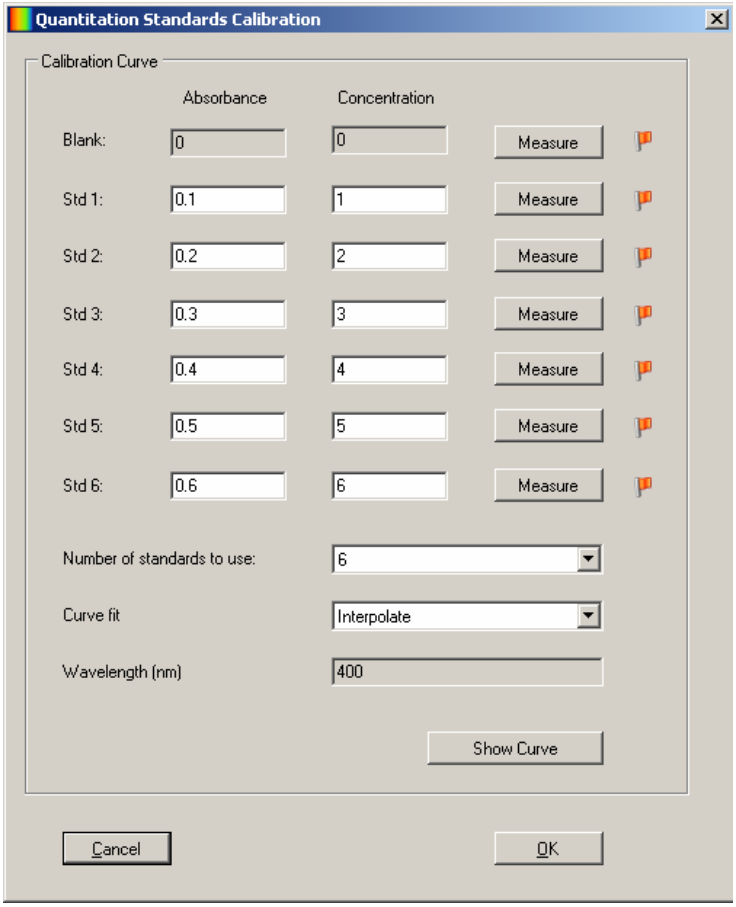
To view the curve fit click on Show Curve. The curve fit can also be adjusted in this screen.

6.1.8 Auto Logging



Auto logging allows repeat measurements of the same sample to be performed with a set time interval between each measurement. Use the arrow icons to increase or decrease the time interval between sample measurements and use the arrow icons to select the number of readings required. If auto logging is not required the values do not need to be adjusted in this screen.

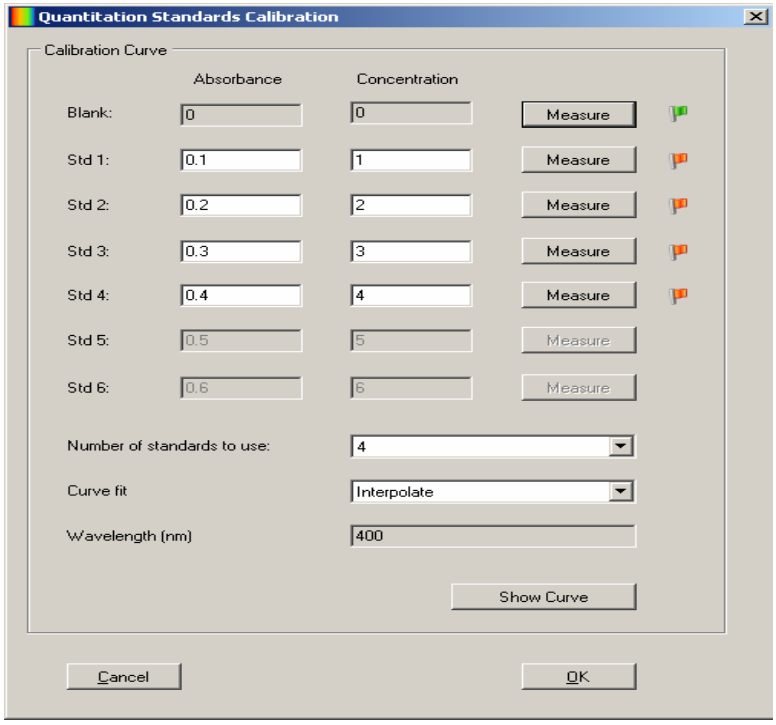
6.2 CREATE CURVE



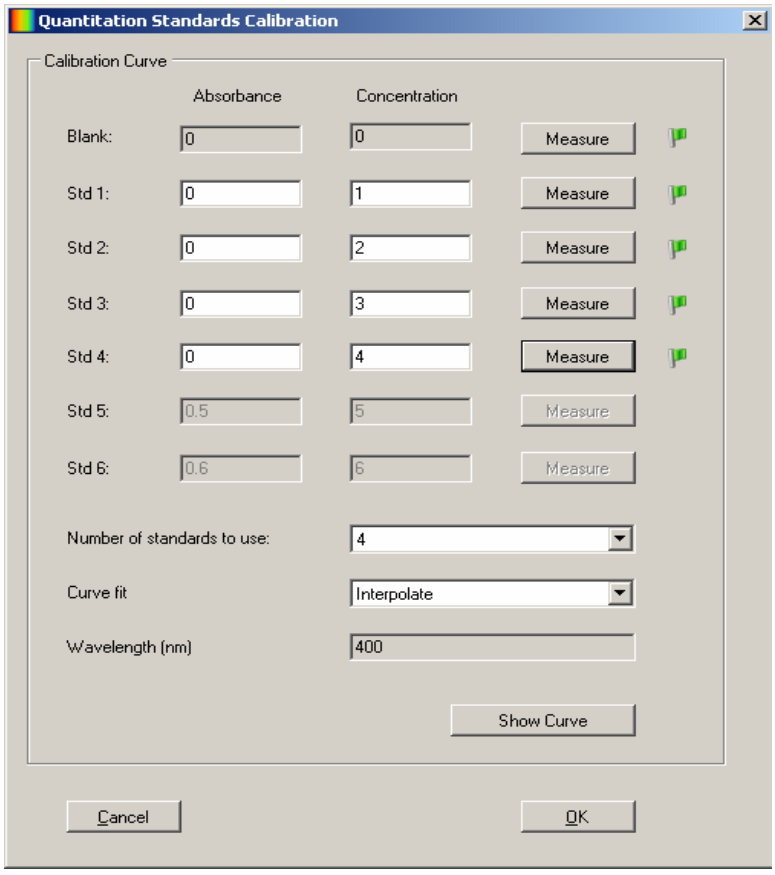
To create a new quantitation curve first select the wavelength, in the Settings screen, that the standards and unknown samples are to be measured at. Click on Create Curve on the toolbar at the top of the page tab.

Select the number of standards which are going to be measured and enter the concentration values of these standards. If the absorbance values of the standards are known these can also be entered.

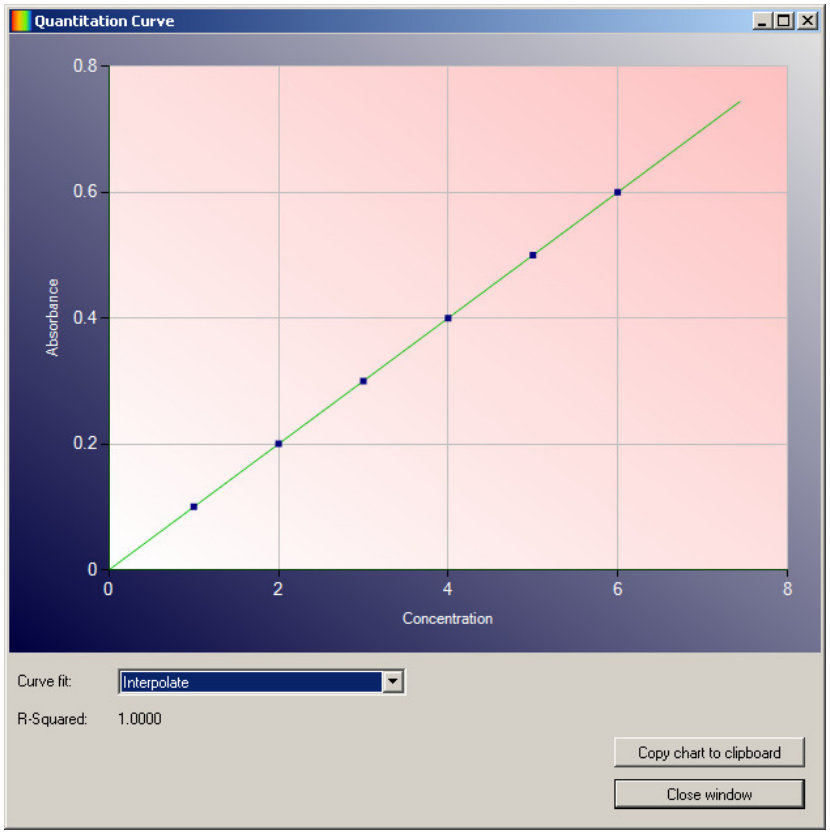
6.2.1 Measuring Standards



Insert the cuvette containing the blank sample into the sample chamber and close the instrument lid. Click on Measure adjacent to the Blank. The instrument will perform a zero calibration. When the calibration is complete the red flag turns green.



Insert the cuvette containing the first standard to be measured into the sample chamber and close the instrument lid. Click on Measure adjacent to Std 1. When the measurement is complete the red flag turns green. Repeat this process until all the standards have been measured.



Once the standards have been measured click on Show Curve to view the quantitation curve. The curve fit can be adjusted in this screen. Click on Close window to return to the create curve screen.

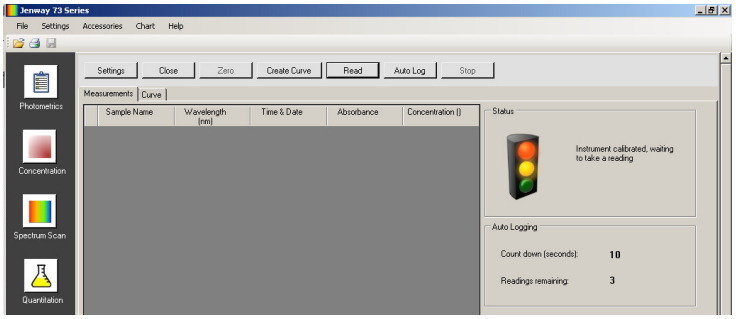
Click on OK to save and return to the measurement mode.

6.3 CALIBRATION

Once the settings have been entered and if required a new quantitation curve has been created, the zero calibration should be performed.

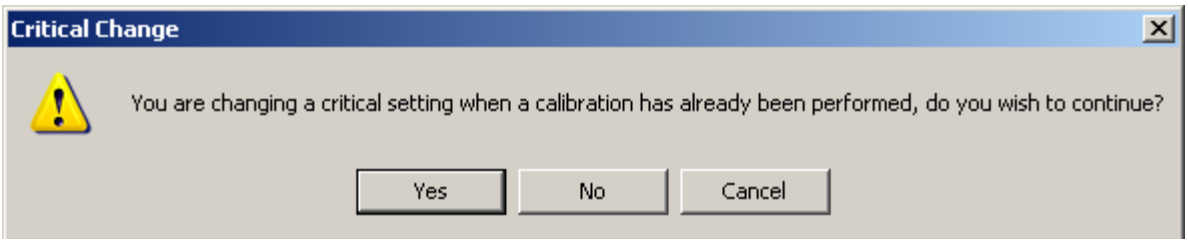
Insert the cuvette containing the blank sample into the sample chamber and close the instrument lid.

Click on the Zero button; this sets the instrument to zero absorbance and 100% transmittance.



Once a calibration is complete the Read and Auto Log buttons are activated.

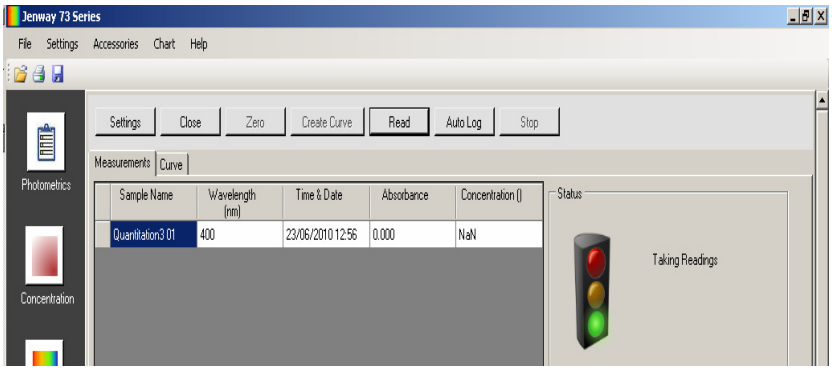
If the settings menu is re-entered following the zero calibration it is possible to change the wavelength. However a warning will be displayed to warn that critical settings are being changed after the zero calibration has been performed and a quantitation curve has been created.



To continue click Yes, to cancel click No or Cancel.

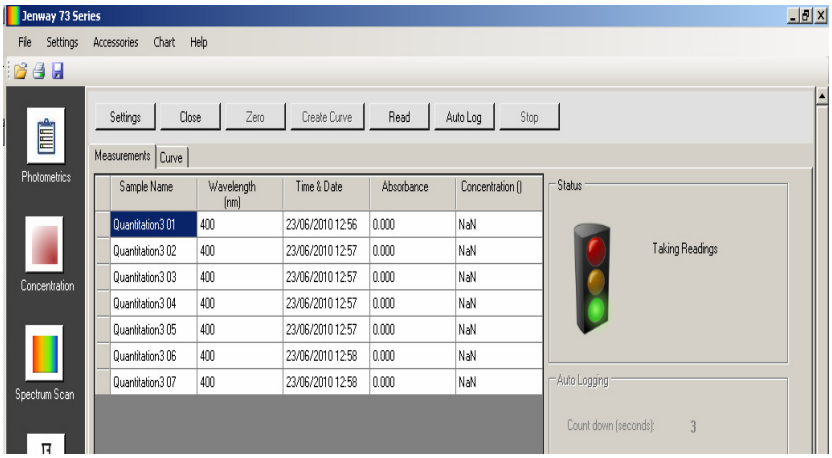
If the wavelength is changed then the zero calibration must be performed again before a sample can be measured. The standard samples should also be re-measured at the new wavelength. Alternatively a new quantitation tab can be opened and the required settings can be entered and a new quantitation curve can be created.

6.4 SAMPLE MEASUREMENT



Insert the cuvette containing the unknown sample into the sample chamber and close the instrument lid.

Click on the Read button; the instrument performs the measurement and result is displayed on the screen.



If the same sample needs to be measured more than once click on the Auto Log button.

The instrument will perform the required number of readings with the specified time interval between each measurement as set in the Settings screen.

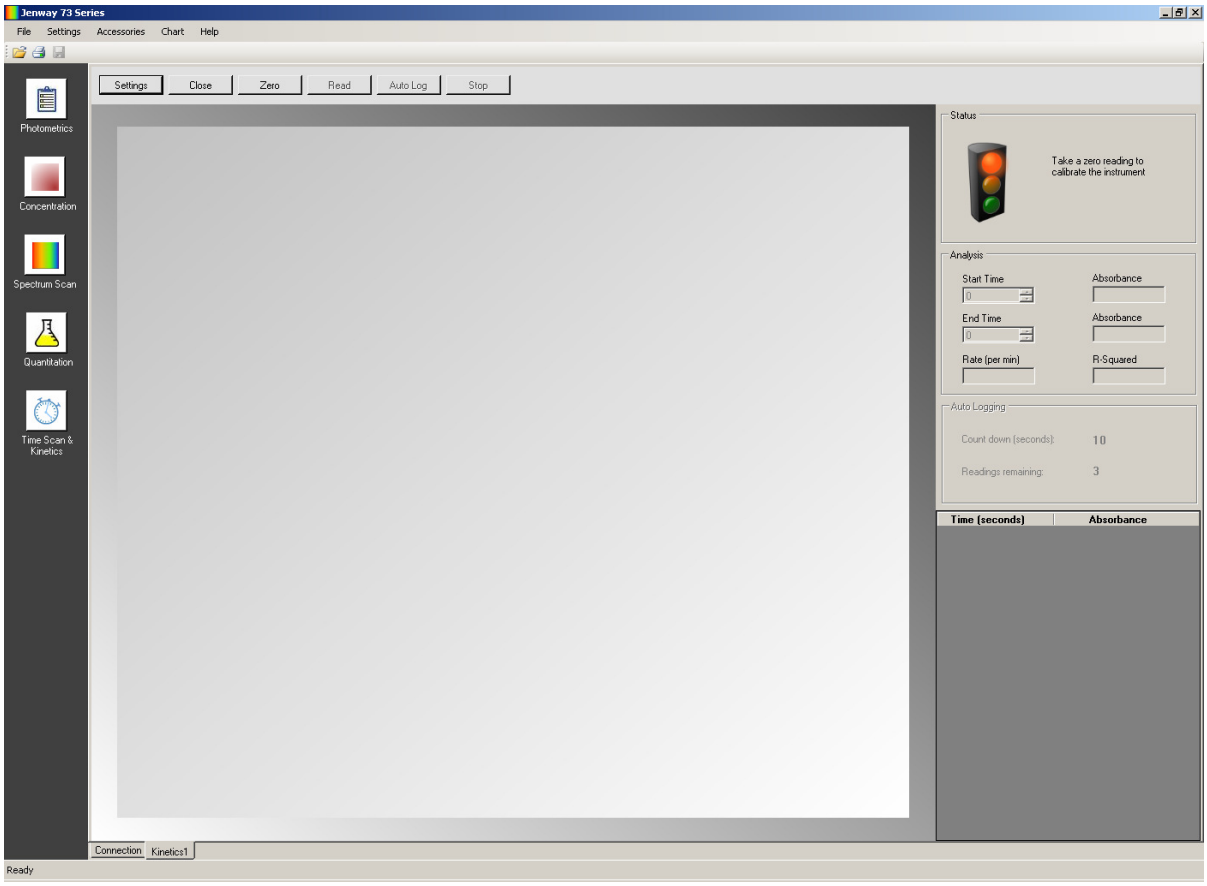
The results will be displayed on the screen. The batch name entered in the settings screen will have 01, 02 etc after the name, to signify the order in which the results were generated.

Auto logging can be stopped before all the measurements have been completed by clicking on the Stop button. To recommence auto logging click on the Auto Log button again.

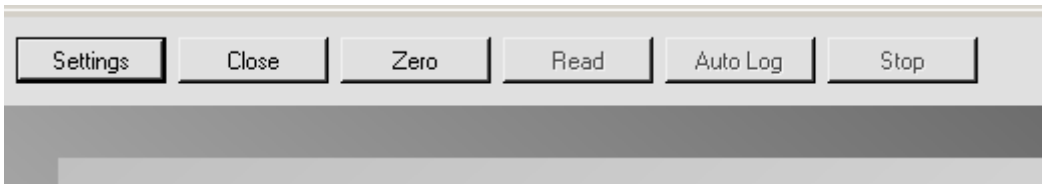
If the settings menu is re-entered following sample measurement it is not possible to change the wavelength. A new quantitation tab can be opened and the new wavelength can be entered.

SECTION 7 – Time Scan Kinetics

To open the time scan kinetics measurement mode click on the time scan kinetics icon on the toolbar down the left-hand side of the screen.



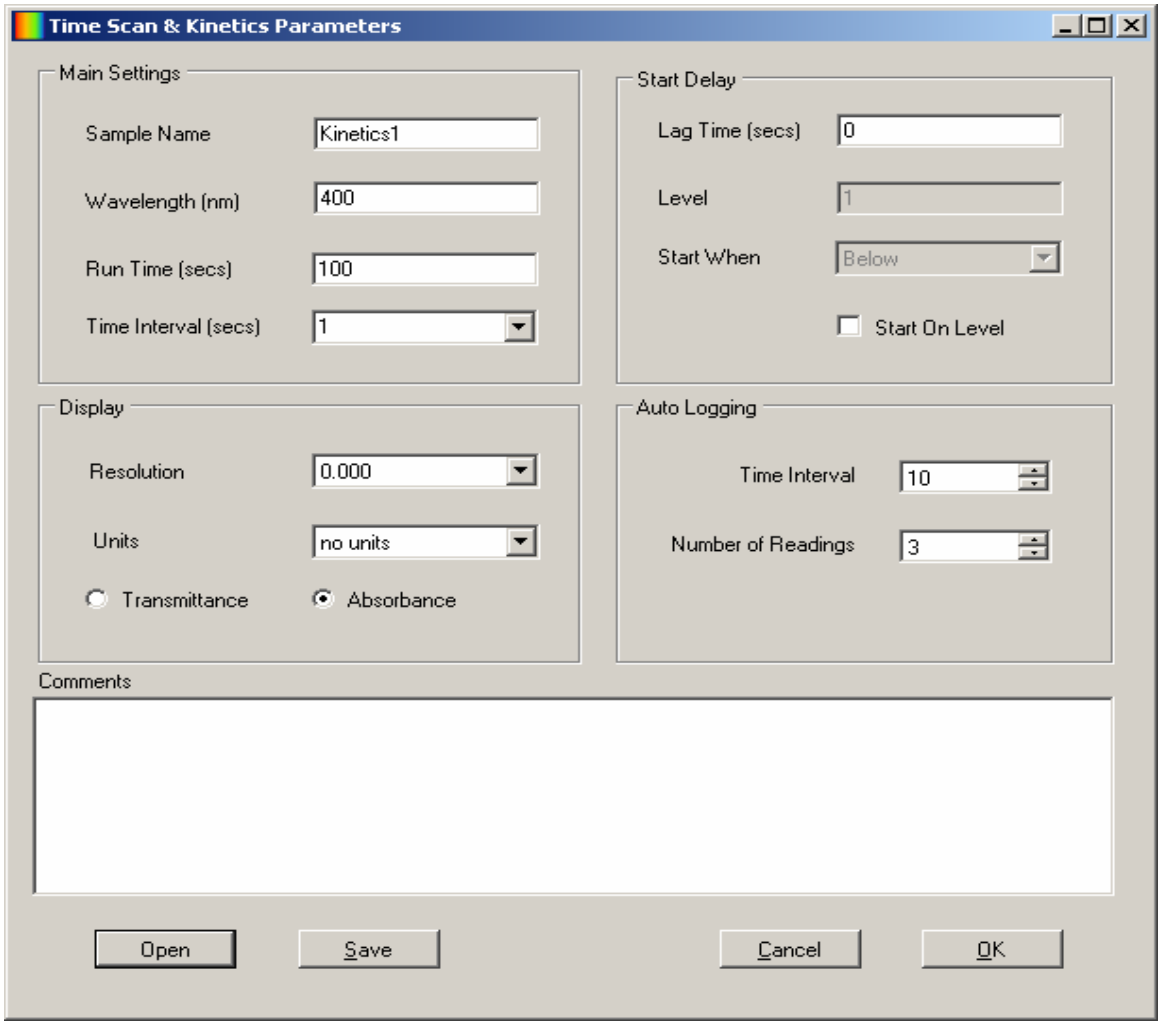
The toolbar at the top on the tab contains all the commands for this measurement mode.



The active buttons are in bold; the deactivated buttons are greyed out.

7.1 Settings

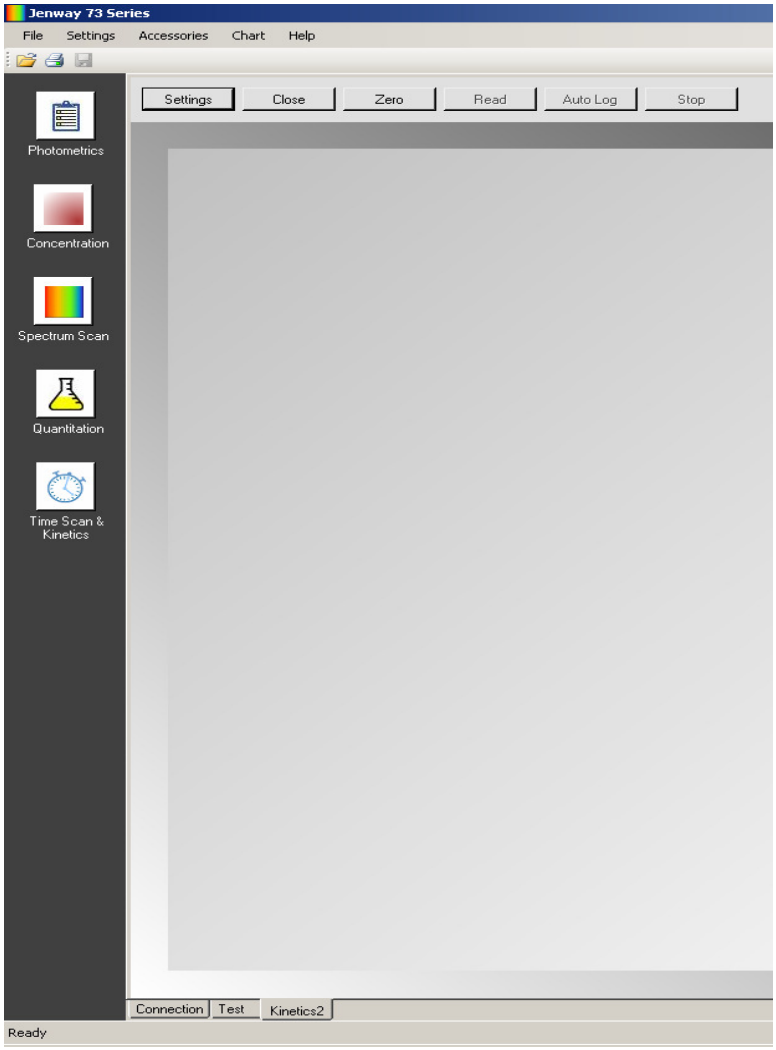
To set the measurement parameters click on the Settings button.



This screen allows the sample name, wavelength, kinetics run time, time interval, concentration units and resolution, operating mode, lag time, start on level to be set. If auto logging is required the parameters can be set in this screen. Comments can be entered which will be included on the result printouts. The standard curve can also be viewed by clicking the Show Curve button.

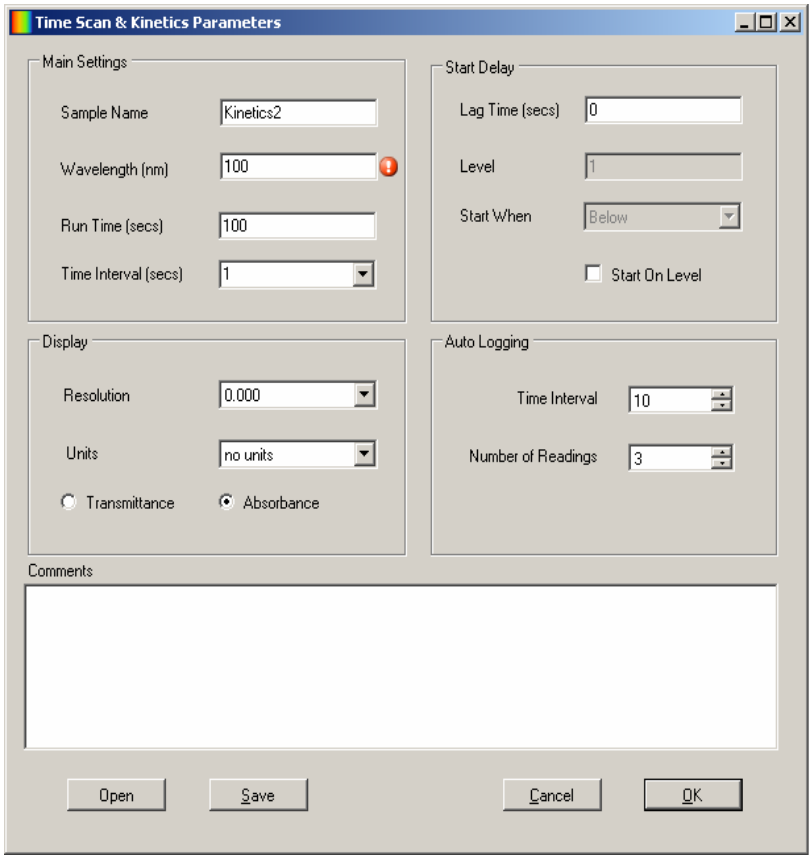
Once the required measurement parameters have been entered click on the OK button to accept and continue with calibration and sample measurement. To exit the settings without saving any measurement parameters click on the Cancel button. To save the measurement parameters for future use click on the Save button. To load previously saved measurement parameters click the Open button. For more details on saving and opening method parameters refer to section 8.

7.1.1 Sample name



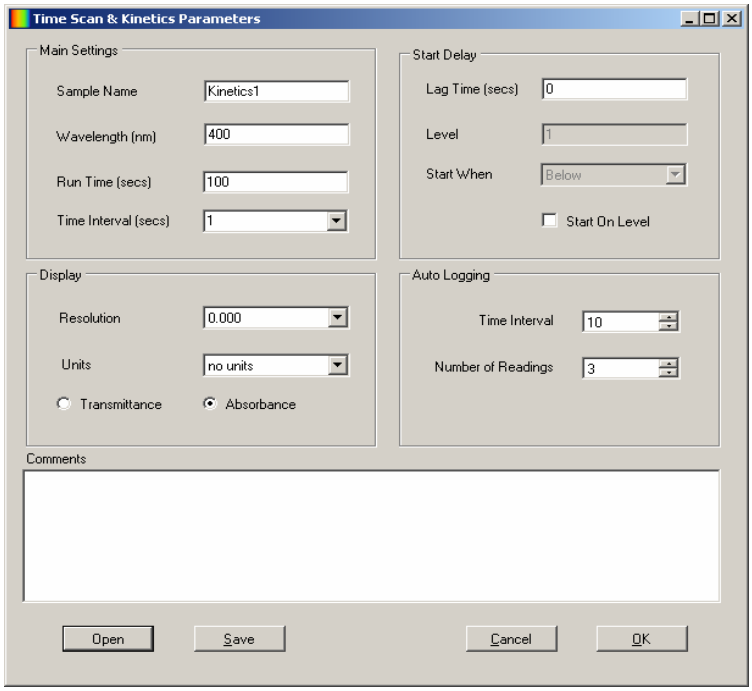
The sample name entered here will be reflected on the name tab at the bottom of the screen and under sample name in the results table once results have been generated.

7.1.2 Setting the wavelength



To select the wavelength that the zero calibration and sample measurements will be performed at type the wavelength into the text box. The wavelength selected should be the same wavelength that the standards were or will be measured at. If a value entered is outside of the range of the instrument an error icon will be displayed and this must be corrected before the settings screen can be exited. Only numeric values can be entered.

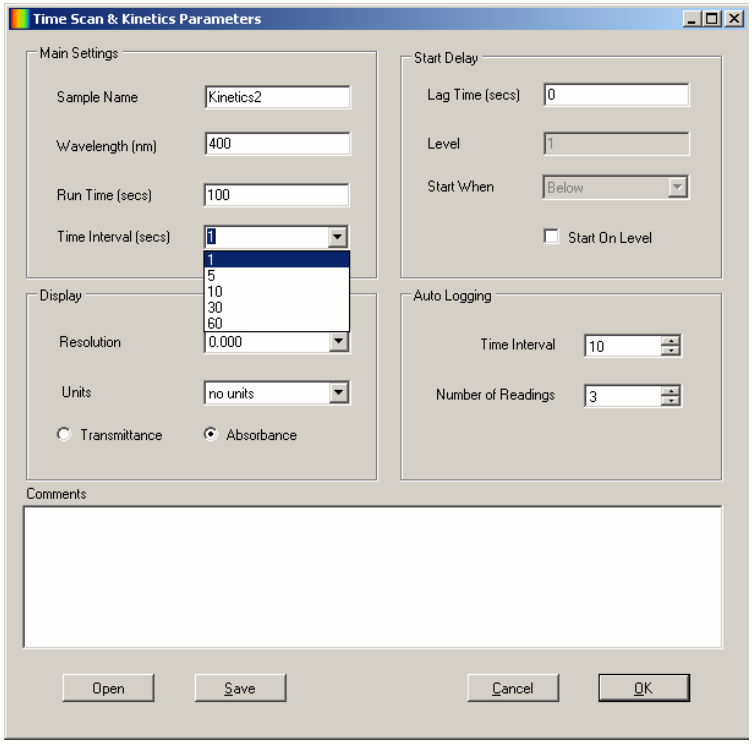
7.1.3 Selecting kinetics run time



To select the time for the kinetics run type the time in seconds into the text box.

Only numeric values can be entered.

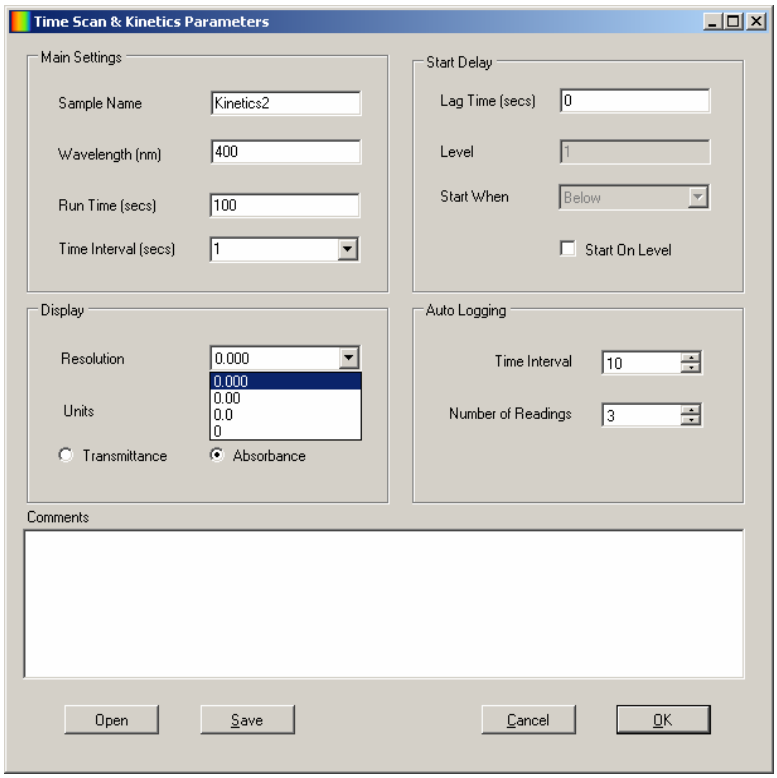
7.1.4 Selecting time interval



The time interval that the kinetics measurements are recorded at is selectable between 1, 5, 10, 30 or 60. Click on the arrow on the drop down box to select the time interval required.

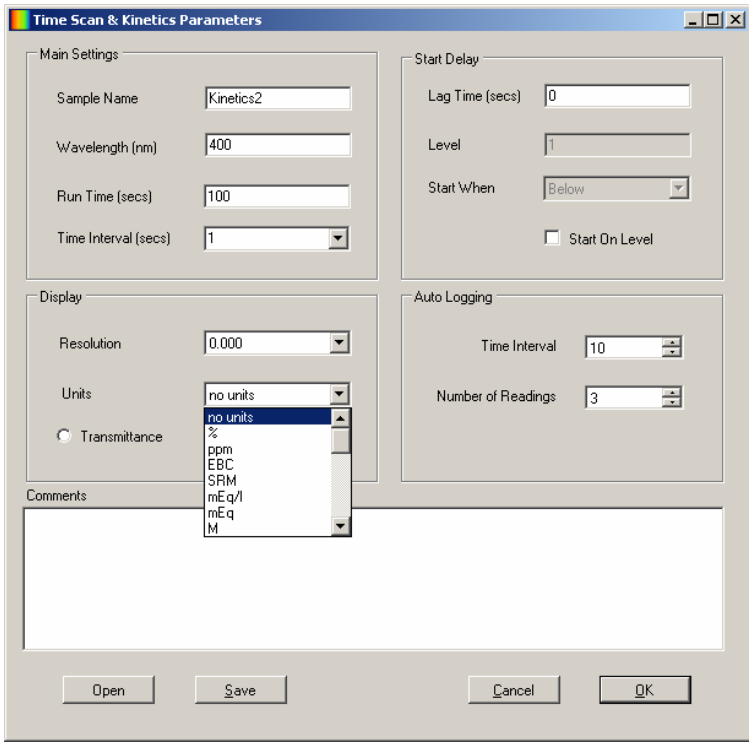
If 60 seconds is selected the instrument will only take a kinetics reading every 60 seconds.

7.1.5 Setting the resolution



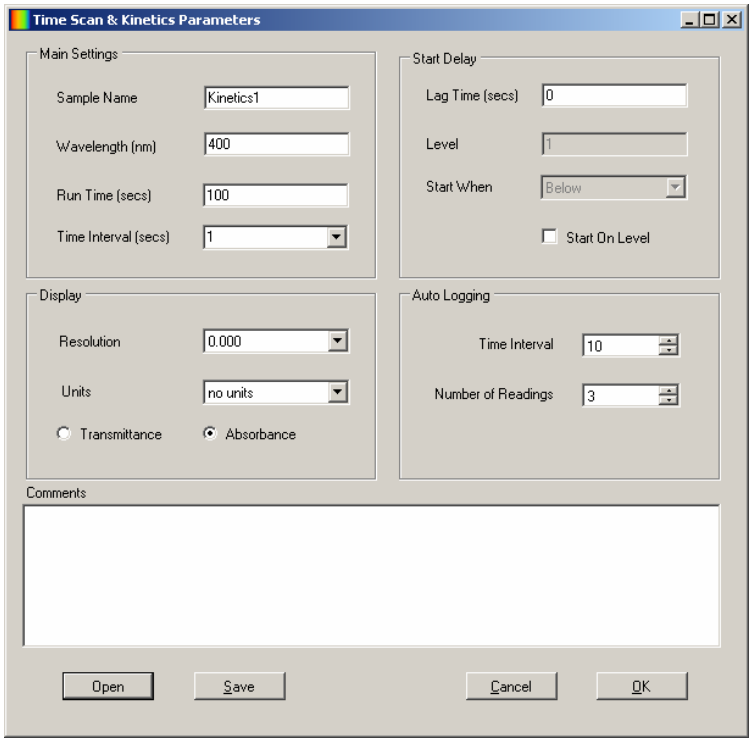
The resolution of the absorbance or % transmittance and concentration reported is selectable between 0, 0.0, 0.00 or 0.000. Click on the arrow on the drop down box to select the resolution required.

7.1.6 Selecting concentration units



The units of concentration can be selected from a number of options: no units, %, ppm, EBC, SRM, mEq/l, mEq, M, mM, µM, nM, U, U/l, U/ml, g/l, mg/l, µg/l, ng/l, g/dl, mg/dl, µg/dl, mg/ml, µg/ml, ng/ml, µg/µl, ng/µl, mol/l, mmol/l. Click on the arrow on the drop down box to select the units required.

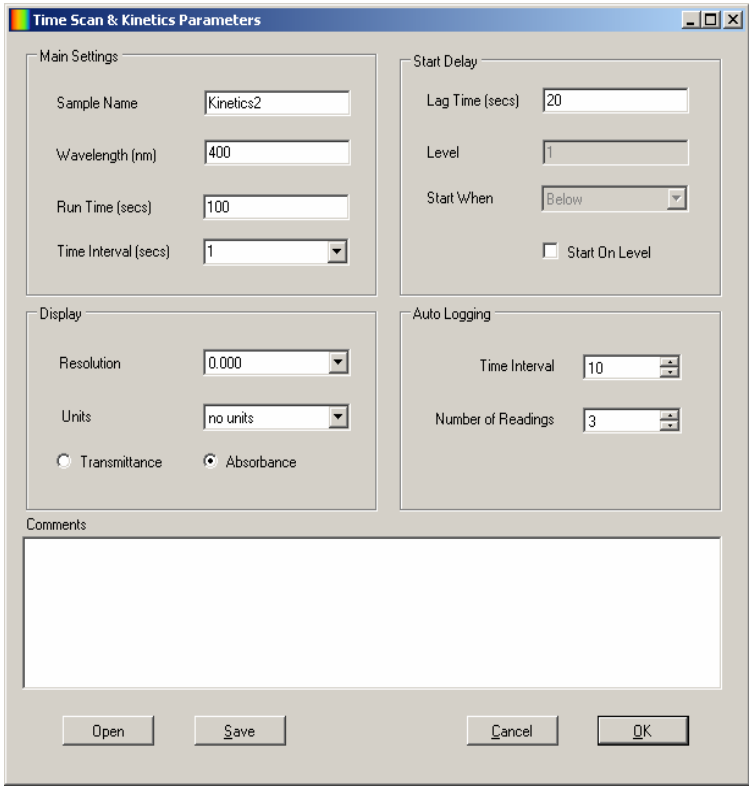
7.1.7 Operating mode



The results displayed can be either absorbance or % transmittance. To select absorbance click in the circle adjacent to Absorbance; to select transmittance click in the circle adjacent to Transmittance.

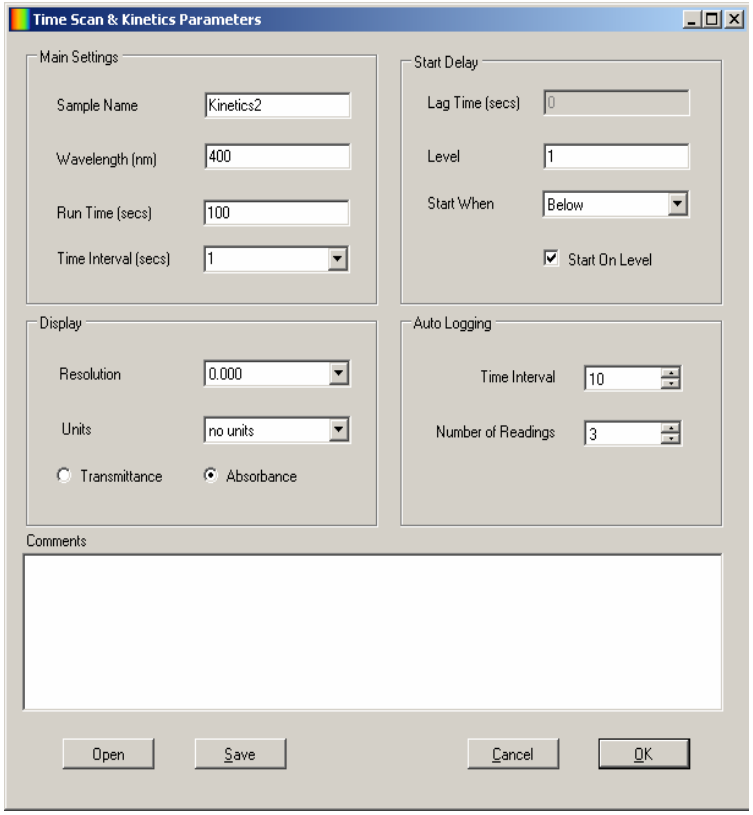
After the kinetics run is completed it is possible to go back and change the operating mode. This will automatically adjust the graph scale and the results table.

7.1.8 Setting lag time or start on level



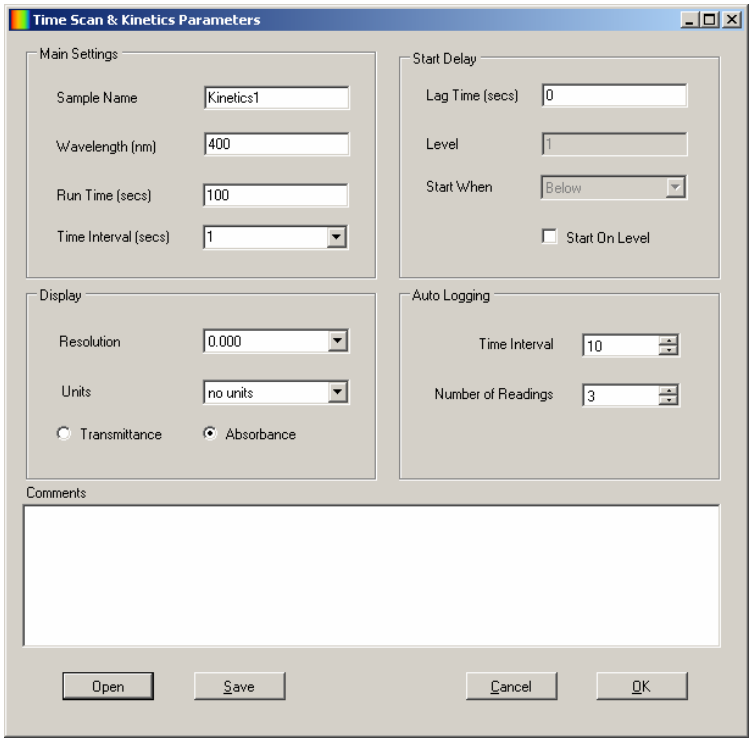
In this measurement mode it is possible to delay the commencement of the kinetics measurements by setting a lag time or a start on level. The lag time is the amount of time that the instrument will wait before starting the kinetics measurements. The start on level is the absorbance level that must be reached before commencing the kinetics measurements.

To select a lag time type the required time in seconds in the text box. Only numeric values up to 999 seconds can be entered.



To select a start on level put a tick the box adjacent to the Start On Level. Type the start absorbance or % transmittance value into the text box. Click on the arrow on the drop down box to select between starting above or below this value.

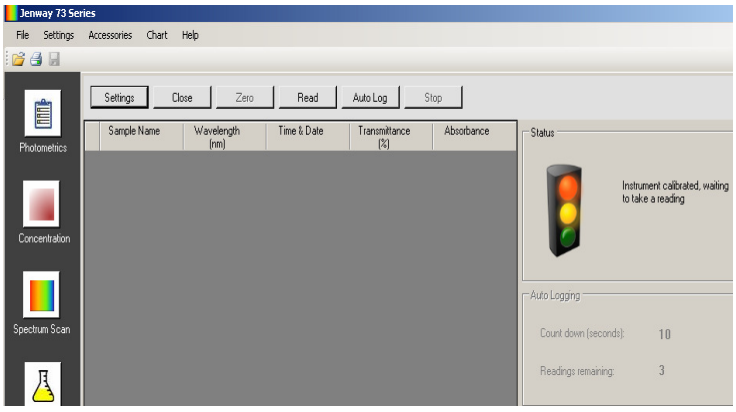
7.1.9 Auto Logging



Auto logging allows repeat measurements of the same sample to be performed with a set time interval between each measurement. Use the arrow icons to increase or decrease the time interval between sample measurements and use the arrow icons to select the number of readings required. If auto logging is not required the values do not need to be adjusted in this screen.

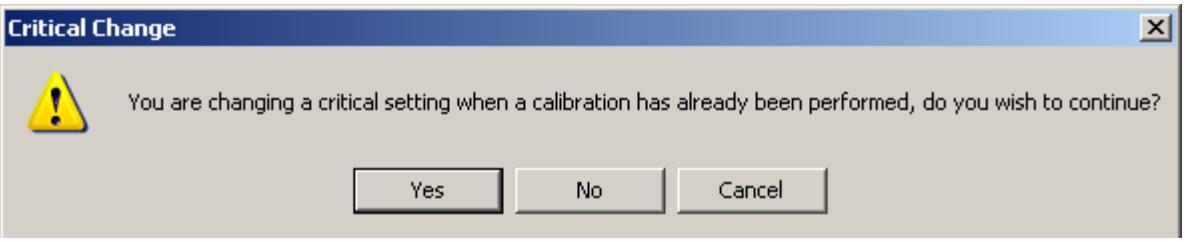
7.2 CALIBRATION

In the time scan kinetics mode the calibration is a zero calibration performed at the selected wavelength that the sample is going to be measured at. Insert a cuvette containing the blank solution into the sample chamber and close the instrument lid.



Click on the Zero button to perform the zero calibration. Once the calibration is completed the Read and Auto Log buttons become active and the sample can be measured. The calibration status will show that the instrument is calibrated.

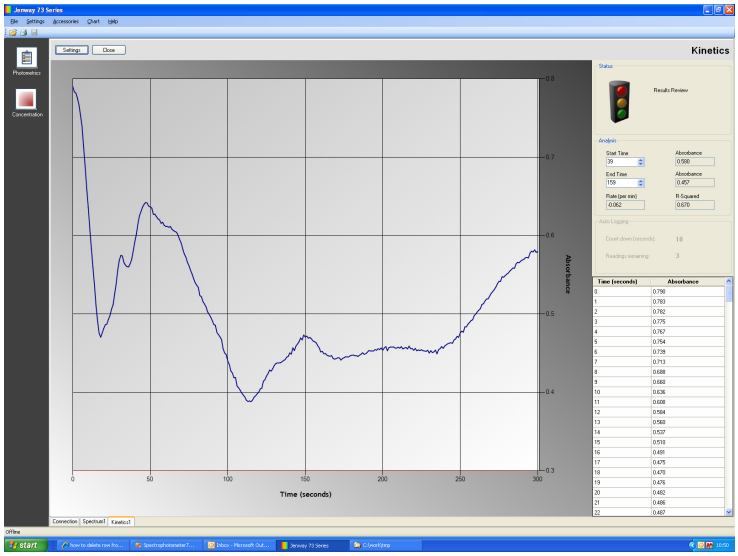
If the settings menu is re-entered following the zero calibration it is possible to change the wavelength. However a warning will be displayed to warn that critical settings are being changed after the zero calibration has been performed.



To continue click Yes, to cancel click No or Cancel.

If the wavelength is changed then the zero calibration must be performed again before a sample can be measured. Alternatively a new time scan & kinetics tab can be opened and the required settings can be entered.

7.3 SAMPLE MEASUREMENT



Insert the cuvette containing the sample into the sample chamber and close the instrument lid.

Click on the Scan button; the instrument initiates the scan and the live spectrum scan is displayed on the screen. The results are also plotted in a table. To stop the scan before completion click on the Stop button. To restart the scan click on the Repeat button – the scan is restarted from the beginning.

If the same sample needs to be measured more than once click on the Auto Log button. The instrument will perform the required number of readings with the specified time interval between each measurement. Unlike with photometrics, concentration and quantitation the auto logged results will not be displayed on the same screen. For each repeat measurement required a new tab is automatically opened displaying the new kinetics run and results. Auto logging can be stopped before all the measurements have been completed by clicking on the Stop button. To recommence Auto logging click on the Auto Log button again.

If the settings menu is re-entered following sample measurement it is not possible to change the wavelength, run time, time interval or start on level. A new time scan kinetics tab can be opened and the new settings can be entered.

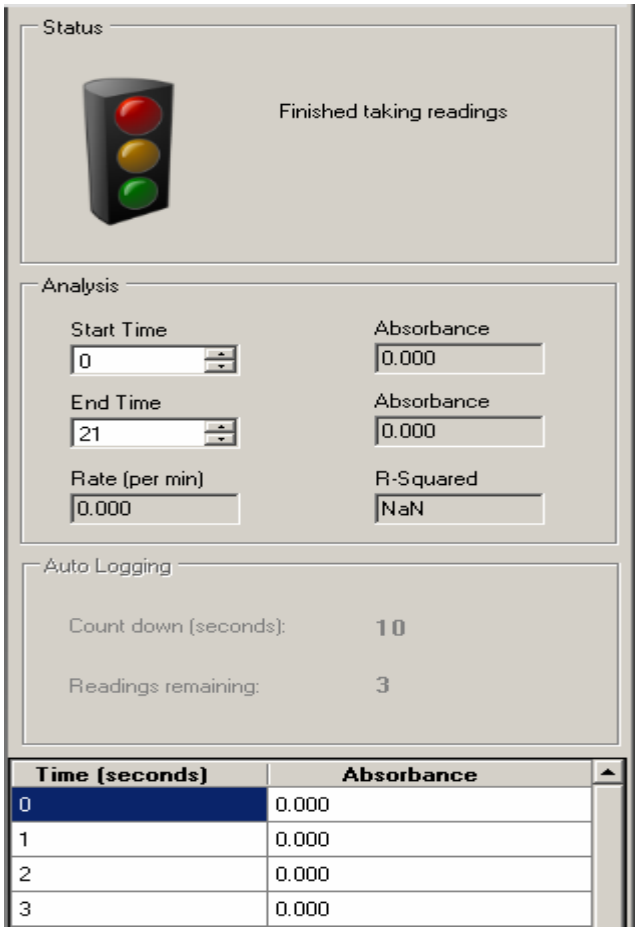
It is possible to zoom in on areas of interest on the graph by clicking on the graph and holding down the left mouse key then dragging the mouse over the required area.

To reset the chart to the original scale click on Chart on the toolbar at the top of the screen, then click on Reset. The chart will return to the original scale. The chart can also be copied or saved as an individual file to be used in reports etc by clicking on Chart on the toolbar at the top of the screen, then click on Copy or Save As Image.

Once the kinetics scan is complete the post analysis tools become active.

7.4 POST MEASUREMENT TOOLS

The kinetics post measurement tools include statistics on all or part of the kinetics run.



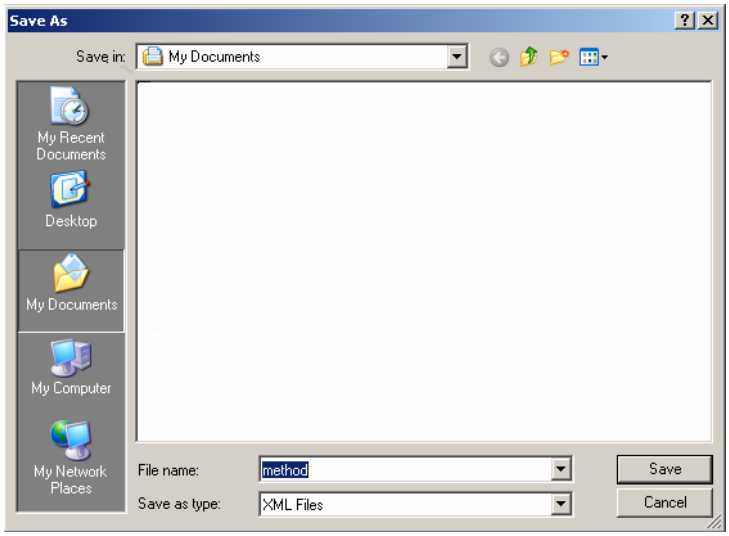
Using the analysis tab on the right-hand side of the screen it is possible to view the statics for all of the kinetics run or for a selected part of the kinetics run. To select the start time for analysis click the cursor in the start time box and then click on the start time on the graph, or use the arrow keys to select the required time, or type the value directly into the text box. Repeat this process for the required end time. The absorbance values (or % transmittance values depending on operating mode selected) will automatically update, as well as the absorbance rate per minute and the correlation coefficient. The absorbance values at the chosen start and end time will also be shown.

SECTION 8 - SAVING AND OPENING METHODS

In all of the measurement modes it is possible to save the method parameters. There is no limit on the number of methods which can be saved.

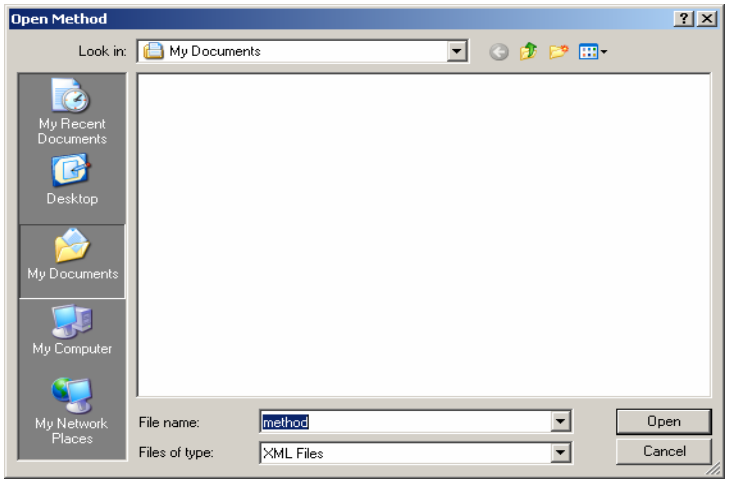
8.1 Saving method parameters

In any of the measurement modes click on the Settings button. Enter the required method parameters. To exit the settings menu without saving any measurement parameters click on the Cancel button. To save the measurement parameters for future use click on the Save button.



The method can be saved in any location. It is advised to use 'method' in the file name in order to easily differentiate between methods and results. Or alternatively create a separate folder for methods and results.

8.2 Opening method parameters



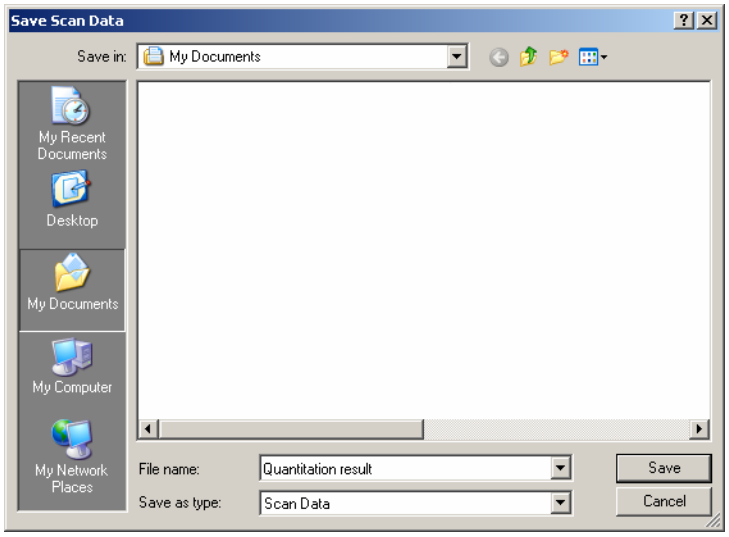
To load previously saved measurement parameters in the Settings menu click the Open button.

Select the required method to be opened and click Open. The saved method settings can now be edited or reused.

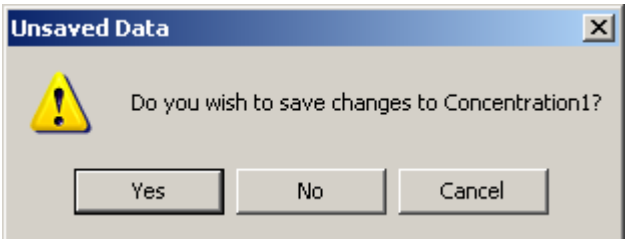
SECTION 9 – SAVING AND OPENING RESULTS

There is no limit on the number of results which can be saved.

9.1 Saving results

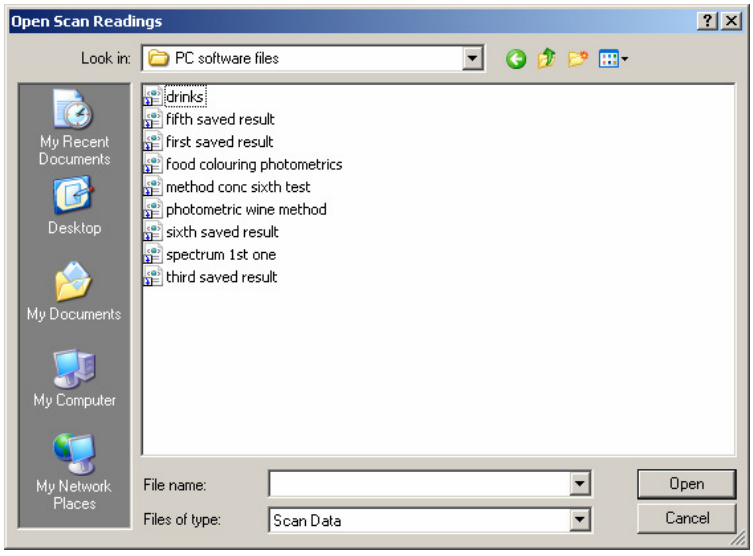


In any of the measurement modes to save a result click on the File button on the top toolbar. Click Save As. The result can be saved in any location. It is advised to use 'result' in the file name in order to easily differentiate between methods and results. Or alternatively create a separate folder for methods and results.



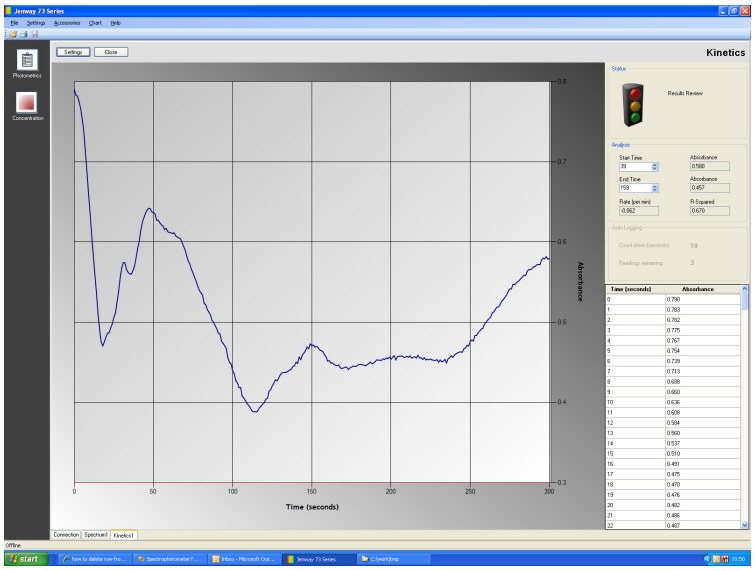
If a result has not been saved and the measurement mode is closed by either clicking on the cross box or the Close button a warning will be displayed to prompt saving.

9.2 Opening results



To load a previously saved result open the measurement mode which the result was created in. Click on the File button on the top toolbar and click on Open. Alternatively use the open file shortcut key in the measurement mode.

Select the required result to be opened and click Open.

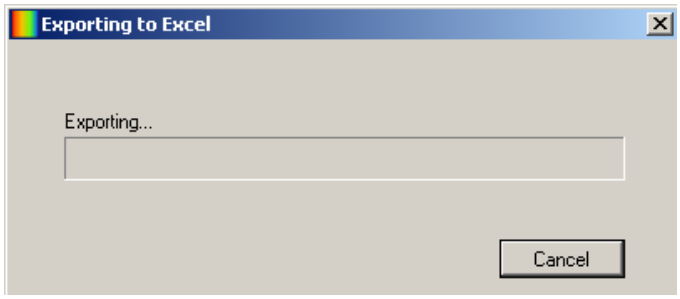


The saved result will be displayed.

Only the settings and post measurement tools will be active.

The Zero, Read and Auto Log buttons will not appear.

SECTION 10 – Exporting to Excel

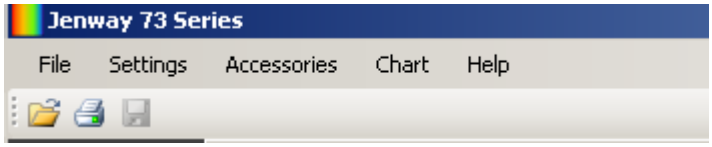


To export a result to Excel© in any measurement mode click on the File button on the top toolbar and click Export to Excel. A progress bar will be displayed to show data is being exported. An Excel spreadsheet will open with the exported results displayed.

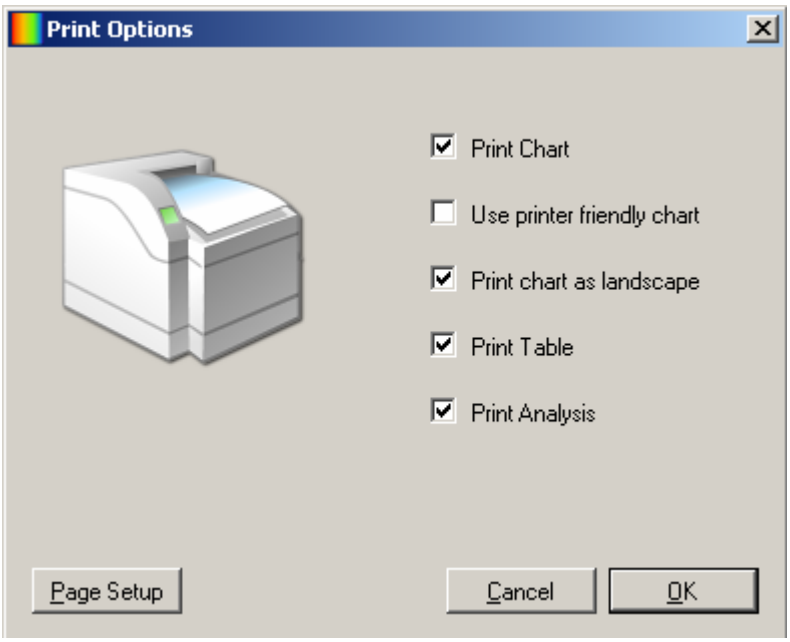
The data exported is specific to the measurement mode which the data was created in.

SECTION 11 – PRINTING

There are several printing options available depending on the measurement mode that the result has been created in.



To view the print options Click on the File button on the top toolbar and click Print Options.

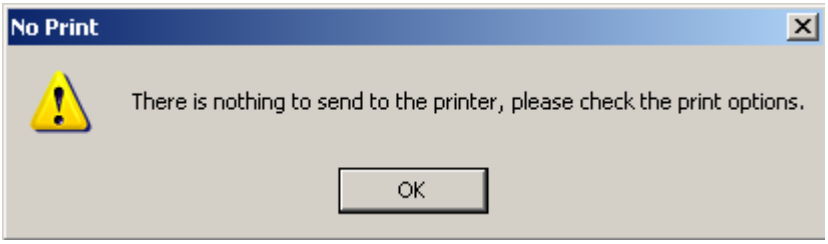


To select the required option put a tick in the box adjacent to the option. To remove an option un-tick the box adjacent to the option.

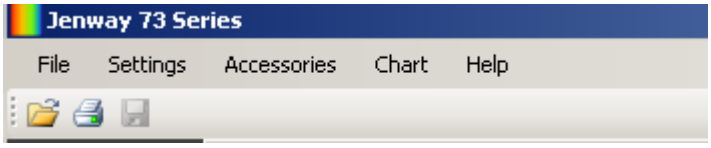
The page setup options allow the page orientation, margins and printer to be selected.

The print chart option enables the chart to be printed. The print table option enables the table of results to be printed. The print analysis option enables any analysis results to be printed.

If the print options are changed in one measurement mode this will be reflected for all the measurement modes.



Therefore when Print is selected if the chosen print options are not appropriate for that measurement mode a prompt will be displayed to check the print options.

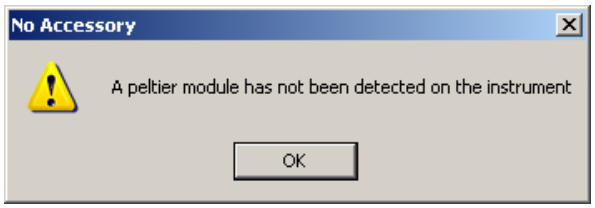


Once the required print options have been selected the result can be printed. To print the results click on the File button on the top toolbar and click on Print. Alternatively use the printer shortcut key.

SECTION 12 – ACCESSORIES

When the PC software is connected to the instrument it will communicate with the instrument to find out if there is an active accessory fitted. The automated 8 cell changer, sipper pump, peltier and combined peltier sipper pump can be controlled using the PC software.

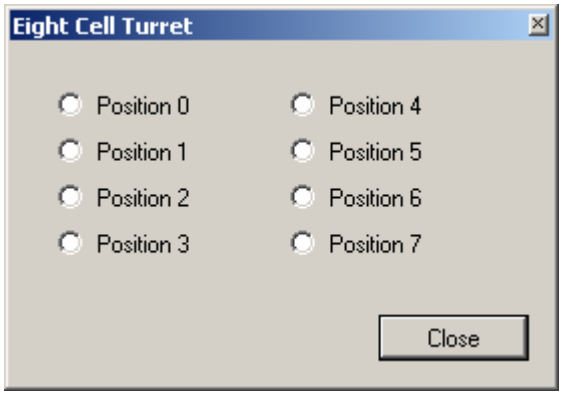
To open the control for the accessory click on the Accessories tab on the toolbar at the top of the screen and select the required accessory.



If an accessory is selected which isn't connected a warning sign will be shown.

12.1 Automatic 8 cell turret

Ensure that all the samples are loaded into the turret with a blank sample in position zero. Close the instrument lid and open the measurement mode that is required.

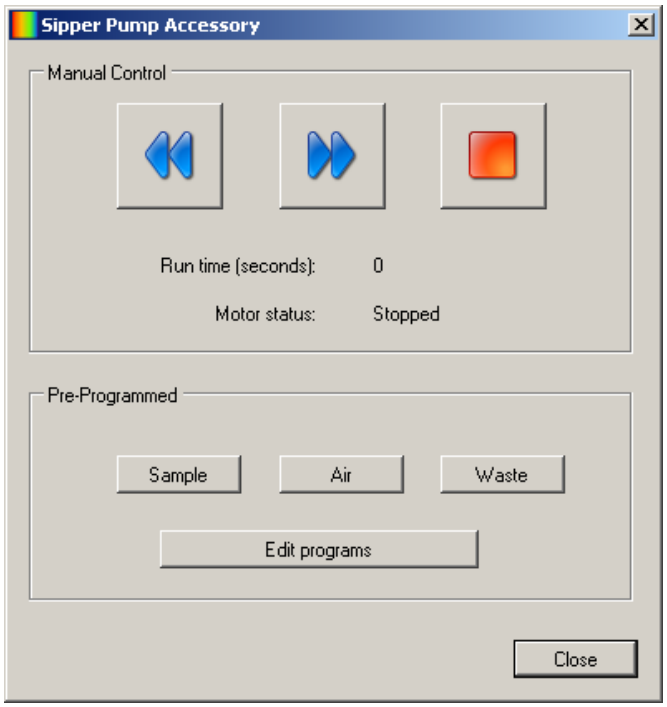


To open the control for the accessory click on the Accessories tab on the toolbar at the top of the screen and click on the 8 cell turret accessory. Click in the circle adjacent to the position which holds the sample to be measured. The turret will automatically move to that position. This control is a floating control so it can remain open and other commands can be sent to the instrument.

When all the samples have been measured click on the Close button.

12.2 Sipper pump

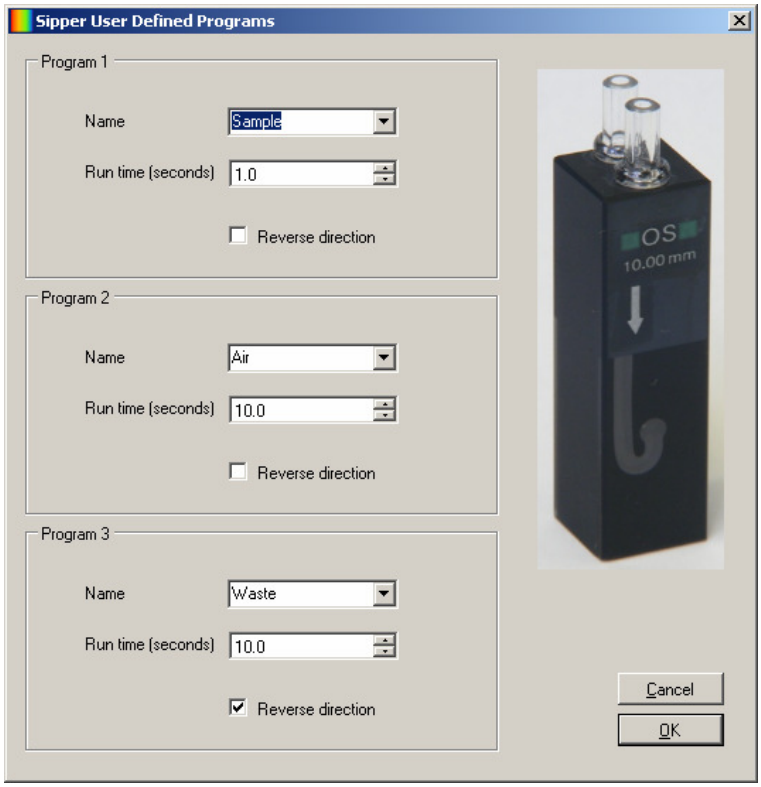
The sipper pump can be operated in manual or timed mode. In the timed mode there is a calibration sequence which must be programmed before use.



To open the control for the accessory click on the Accessories tab on the toolbar at the top of the screen and click Sipper accessory.

To operate in manual mode click the forwards or backwards button depending on the required sample flow direction. Click on the stop button to stop the sipper pump.

When the flow-through cuvette is full click Close as a sample measurement cannot be performed when the accessory control is open.



To operate in timed mode click on the Edit programs button.

This screen enables the sample take up time, air gap and sample disposal to be programmed.

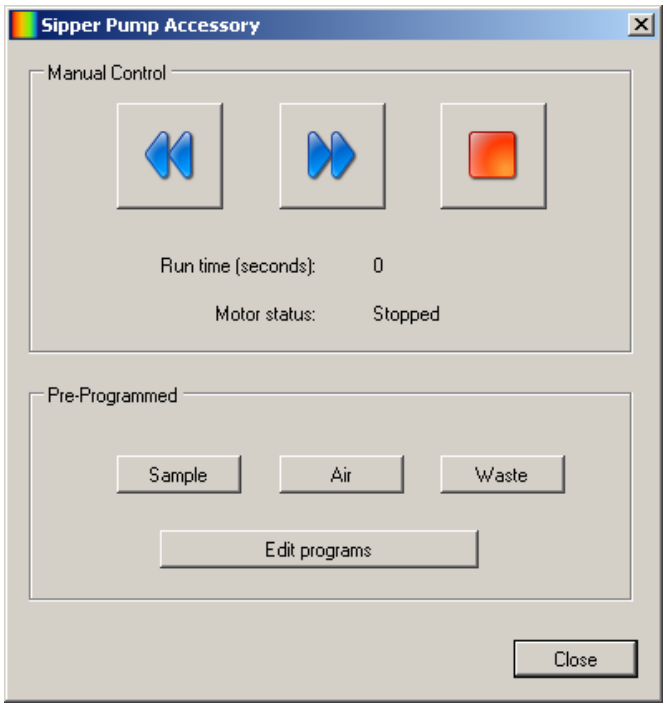
Program 1 is for the sample take up time. Type the required time in seconds in the text box or use the arrow keys. The pump direction can be reversed by putting a tick in the box adjacent to reverse direction.

Program 2 is for the air gap time. Type the required time in seconds in the text box or use the arrow keys. The pump direction can be reversed by putting a tick in the box adjacent to reverse direction.

Program 3 is for the sample disposal. The sample can be either be sent to waste or back to the sample container. Type the required time in seconds in the text box or use the arrow keys. If the

pump direction is reversed by putting a tick in the box adjacent to reverse direction this will send the sample back to the sample container.

When the required settings have been entered click on OK to save. Click on Cancel to return to the sipper pump accessory screen without saving any of the settings.

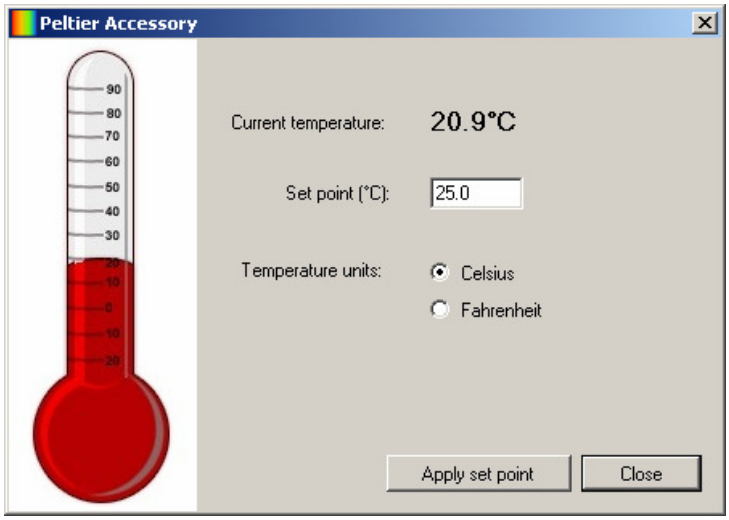


In the Pre-Programmed section clicking on the sample button will make the instrument follow the parameters set under program 1. Clicking on the air button will make the instrument follow the parameters set under program 2. Clicking on the waste button will make the instrument follow the parameters set under program 3. To stop any of these actions click on the stop button.

To exit the sipper pump control click Close. This control must be closed before measurements can be performed.

12.3 Peltier

The peltier accessory is used to heat sample.



To open the control for the accessory click on the Accessories tab on the toolbar at the top of the screen and click on the Peltier accessory.

Type the required set point into the text box and click on Apply set point. Depending on the current temperature the peltier will begin either heating or cooling.

The temperature units can be changed by clicking in the circle adjacent to Celsius or Fahrenheit.

Once the required temperature is reached click on the Close button to close the control. The peltier will remain at the set temperature until another temperature is entered.

12.4 Combined peltier and sipper pump

The parameters for the combined peltier sipper pump must be entered separately in the peltier and sipper pump accessory controls. For more details refer to sections 12.2 and 12.3.