

# Operational **M**anual

*UUVmate User's Manual*

SP8001 PC Control Software



Metertech Inc.  
Version 1.08

# Contents

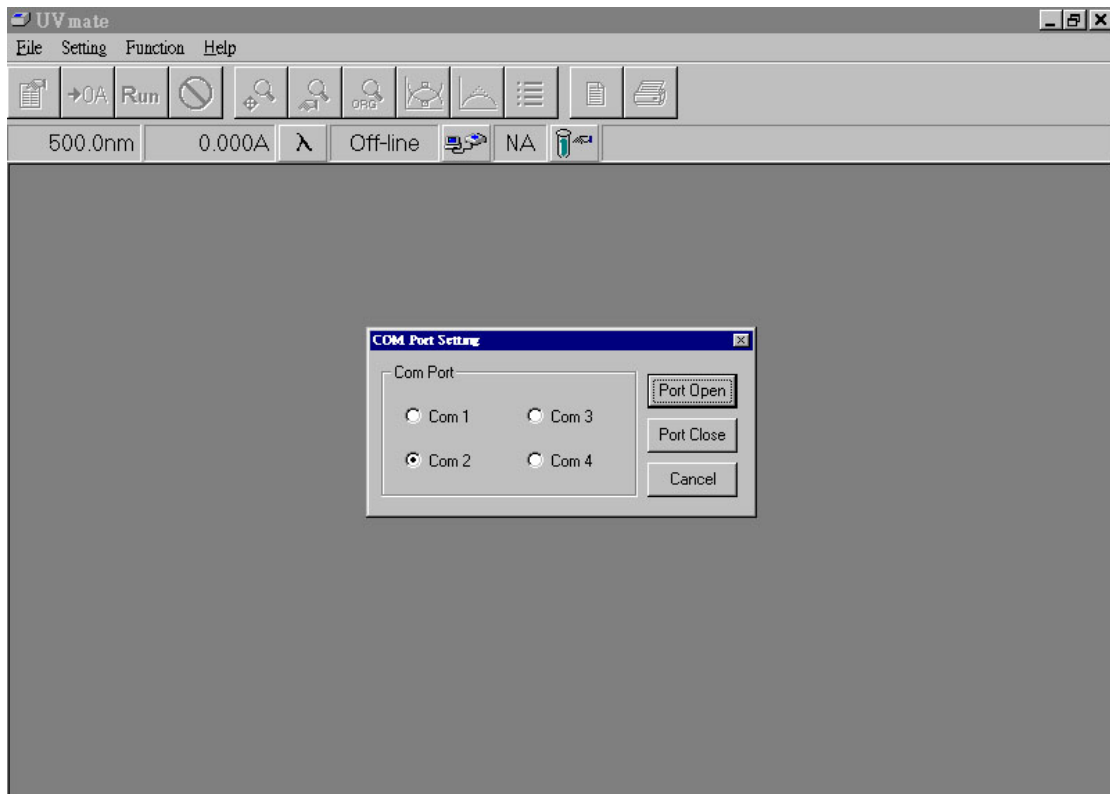
Chapter 1	Installation	-----	1
Chapter 2	Start Connection	-----	1
Chapter 3	Function <b>Lambda</b>	-----	5
Chapter 4	Setup of Accessories	-----	6
Chapter 5	Function <b>Photometry</b>	-----	8
Chapter 6	Function <b>Spectrum</b>	-----	13
Chapter 7	Function <b>Timescan</b>	-----	22
Chapter 8	Function <b>Kinetic</b>	-----	27
Chapter 9	Function <b>Quantitative</b>	-----	32
Chapter 10	Function <b>System Setup</b>	-----	37
Chapter 11	Function <b>Applications-DNA_RNA</b>	-----	42
Chapter 12	Function <b>Applications-Protein Analysis</b>	-----	45
Chapter 13	Other Functions	-----	48
Appendix A	UV mate Installation and Operation	-----	50
Appendix B	Setting of USB Serial Port	-----	52

## **Chapter 1      Installation**

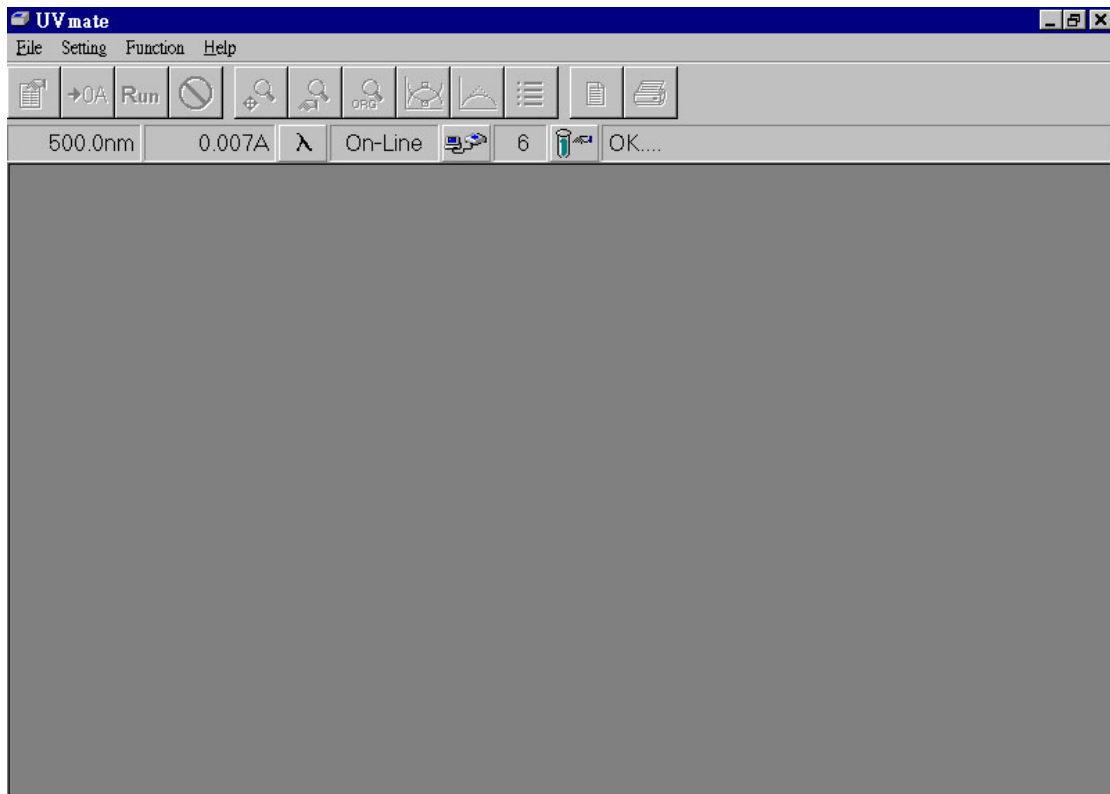
1. System requirements:
  - IBM compatible with CPU Pentium-100 or above, equipped with CD-ROM
  - Microsoft Windows 98(SE) or XP
  - 16M RAM and 20Mbytes hard disk space for installing UVmate program
  - Display card supporting 800X600 resolution, 16bit high color, or above
  - Mouse, keyboard, RS-232 serial com port (usually COM2), and a 9-pin connection line (one male and one female with all pins wired)
2. From CD ROM, select Setup.exe in UVmate directory and execute it (skip this step if it has been done before).
3. Follow instructions to go through installation. Usually all files will be installed under directory 'C:\programfiles\UVmate' and the executable file is UVmate.exe. Several file folders will be created for storing data files. There are sample files in each folder so that UVmate can be run without connection to physical instrument.

## **Chapter 2      Start Connection**

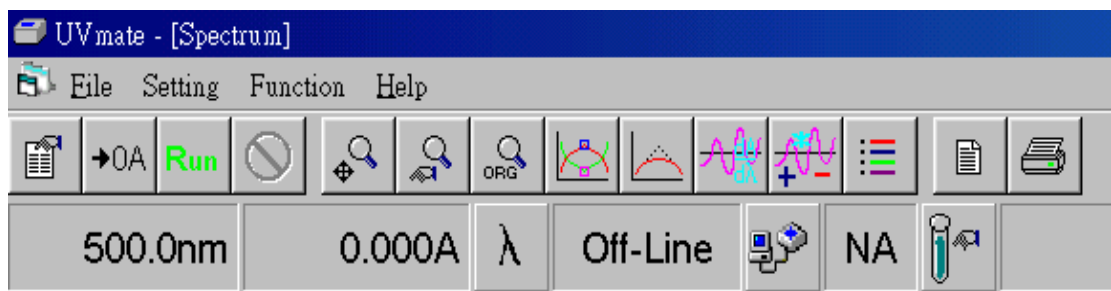
1. Turn on the power of SP-8001 instrument. After 30 seconds, the LCD monitor of instrument will show message 'Waiting for connecting ...', which means that the instrument has completed the power-on procedure and is waiting for connection with PC.
2. In the Program files under 'Start' menu of windows, there is a short-cut named UVmate under 'Metertech'. Click it and UVmate.exe can be executed.



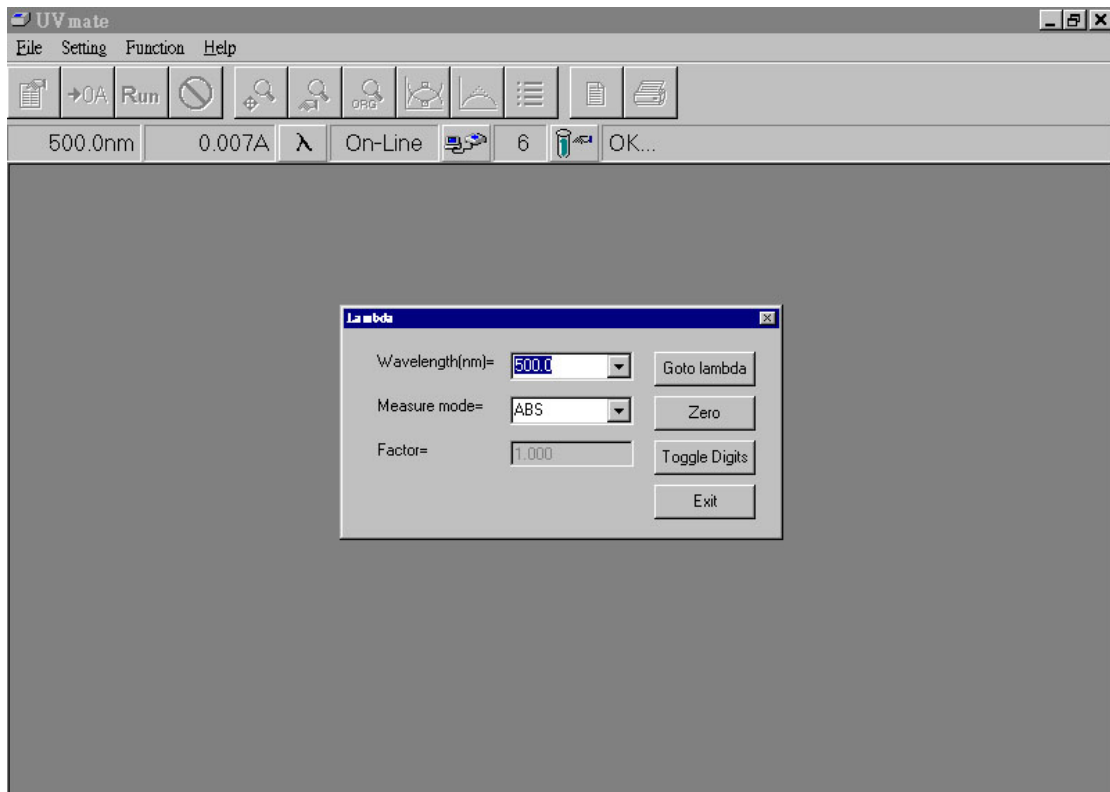
3. After the program executed, a dialog box 'COM Port Setting' will show up. The default setting is COM2 and user can select whichever is suitable in real circumstances. Before connection, the followings should be checked:
  - a. The RS-232 connection line should be connected between PC and SP-8001. The connection line should have 9-pin connectors with all pins wired.
  - b. SP-8001 should be in the condition for waiting connection. Messages 'Version 1.3 for PC' and 'Waiting for connecting ...' should be shown on the monitor. If there is no message, which means not in the connection mode, please turn off the power of SP-8001. Hold on the ESC key and turn on the power of SP-8001 again; release the ESC key after hearing two beep sounds. It will switch SP-8001 into connection mode. It also switches SP-8001 into the single mode.
  - c. The default settings for COM Port are: Baud rate=57600, 8 bits transfer, no parity check, and 1 stop bit (in short, 57600,8,N,1).



4. Press 'Port Open' button and the status bar will change 'Off-Line' into 'On-Line'. It represents a successful connection.
5. After successful connection, the status bar will show the current wavelength and the reading of SP-8001. Data from SP-8001 is transferred into PC continuously. User can see 'OK' showing in the status bar and '...' keeps running during connection between instrument and PC.
6. If the connection is not successful, the status bar remains in 'Off-line' and this program will be running as a demo version. It can only read Sample files under such condition.

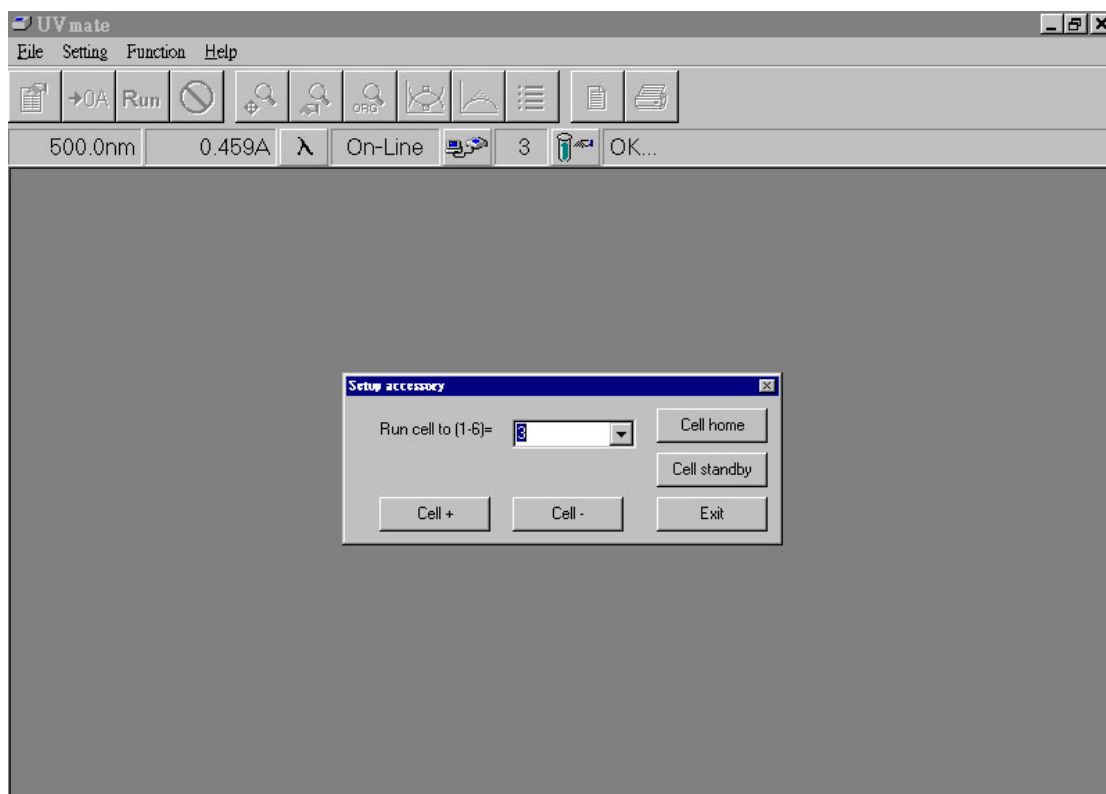


7. The window of software shows, from the above, program title, menu bar, toolbar, status bar, and the rest of area for datum. Some explanations are as follows:
- 'File' of menu bar has options for 'Open parameter file', 'Open data file', 'Save parameter file', 'Save data file', 'Report preview', 'Report print', 'Export to Excel', and 'Exit'.
  - 'Setting' of menu bar has 'Com port ...' for opening dialog box of communication port.
  - 'Function' of menu bar has different functions for selection: Photometry, Spectrum, Time scan, Kinetic, Quantitative, Applications, and System. In option 'Applications', there are listed sub functions for various applications. In option 'System', there are sub functions: 'Property Setup', 'Verify Bandwidth' for activating function in verifying 656.1nm, and 'Temperature Monitor' for activating monitor function in temperature changing.
  - 'Help' of menu bar has 'About' for introduction of this program.
  - Icons in toolbar, from left to right, are: 'Parameter setup', 'Zero/Baseline', 'Data reading', 'Stop data reading', 'Auto zoom data' for auto scaling datum, 'Zoom in/out data', 'Original data' for restoring original data scale, 'Peak/valley search', 'Data smoothing', 'Data derivative', 'Data manipulation', 'Color setup' for assigning color for different data segment, 'Report preview', and 'Report print'.
  - Fields in status bar, from left to right, are 'Present wavelength', 'Present data' for current reading, 'Lambda parameter setup', 'Connecting status', 'Com port setup', 'Accessory status', 'Accessory setup' for opening dialog box for setting up accessories, and 'Present status' for the instrument.




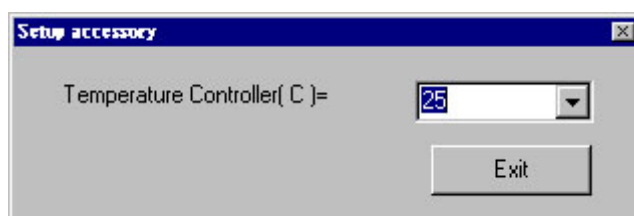
### Chapter 3      Function Lambda

1. Press the  $\lambda$  button in the status bar, a window for function Lambda will show in the screen. Some explanations of this function are as follows.
2. Field 'Wavelength(nm)= ' is used for key in the desired value of wavelength. The input value of wavelength will be recorded in the current wavelength field in order to pick up rapidly by using mouse.
3. Field 'Measure mode=' is for selecting the proper unit during measurement and this field can not accept input from keyboard.
4. Field 'Factor=' will be enabled (turning into white) for accepting key-in value when 'Factor\*ABS' is chosen in 'Measure mode' field.
5. The 'Goto lambda' button will accept the key-in value in 'Wavelength' field and will run the instrument to the desired position.
6. The 'Zero' button will force the instrument to perform the zeroing function.
7. The 'Toggle digits' button will switch digit numbers for the current measurement; for example, 0.012A→0.0124A.
8. The 'Exit' button will close the Lambda function.
9. After close the Lambda function, the status bar will still show the current wavelength and the corresponding reading in a real-time manner.

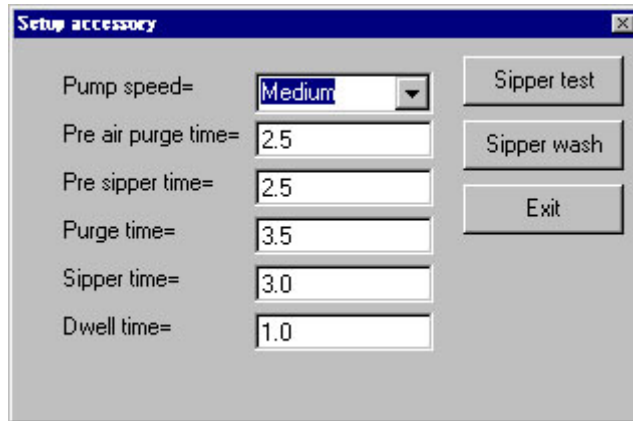


## Chapter 4 Setup of Accessories

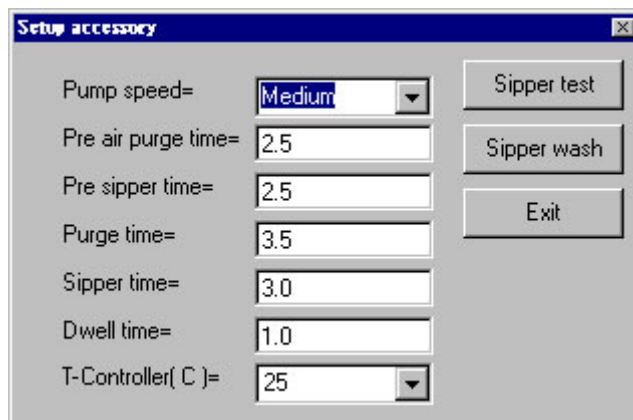
1. Press button  in the status bar, a window for Setup accessory will show in the screen if the instrument is equipped with extra accessory (Multi Cell, Sipper, or Temperature Controller, etc). Some explanations of functions in this window are as follows.
2. The above dialog box will show up if a Multi cell is present. Select directly in field 'Run cell to [1-6]=' and the Multi cell will go to the required position. Pressing 'Cell+' button will make the Multi cell moving one cell forward while pressing 'Cell-' button backward. Pressing 'Cell home' button will make the Multi cell back to Cell 1 while pressing 'Cell standby' button to Cell 6 in order to load cells by user.
3. The above dialog box will show up if a Temperature controller is present. Select



directly in field 'Temperature Controller(C)=' and the desired temperature will be set by instrument. Selecting 'None' means no temperature control. Be aware that direct value key-in is an invalid movement.



4. The above dialog box will show up if a peristaltic pump 'Sipper' is present. Field 'Pump speed=' is to set up speed in Sipper. Field 'Pre air purge time=' is to set up time for pre air purge in Sipper. Field 'Air purge time=' is to set up time for air purge in Sipper. Field 'Sipper time=' is to set up sipping time for samples. Field 'Dwell time=' is to set up time for sample staying in the Sipper. The 'Sipper test' button is for testing if all setup values are correct. The 'Sipper wash' button is for washing the chamber of Sipper and the washing time is set as 15 seconds.



5. The above dialog box will show up if both Sipper and Temperature Controller (TC) are present. Operations are similar to those in Sipper but adding a field 'T-Controller(C)=' for temperature control.

The field 'Accessory status' on the status bar will show messages accordingly:

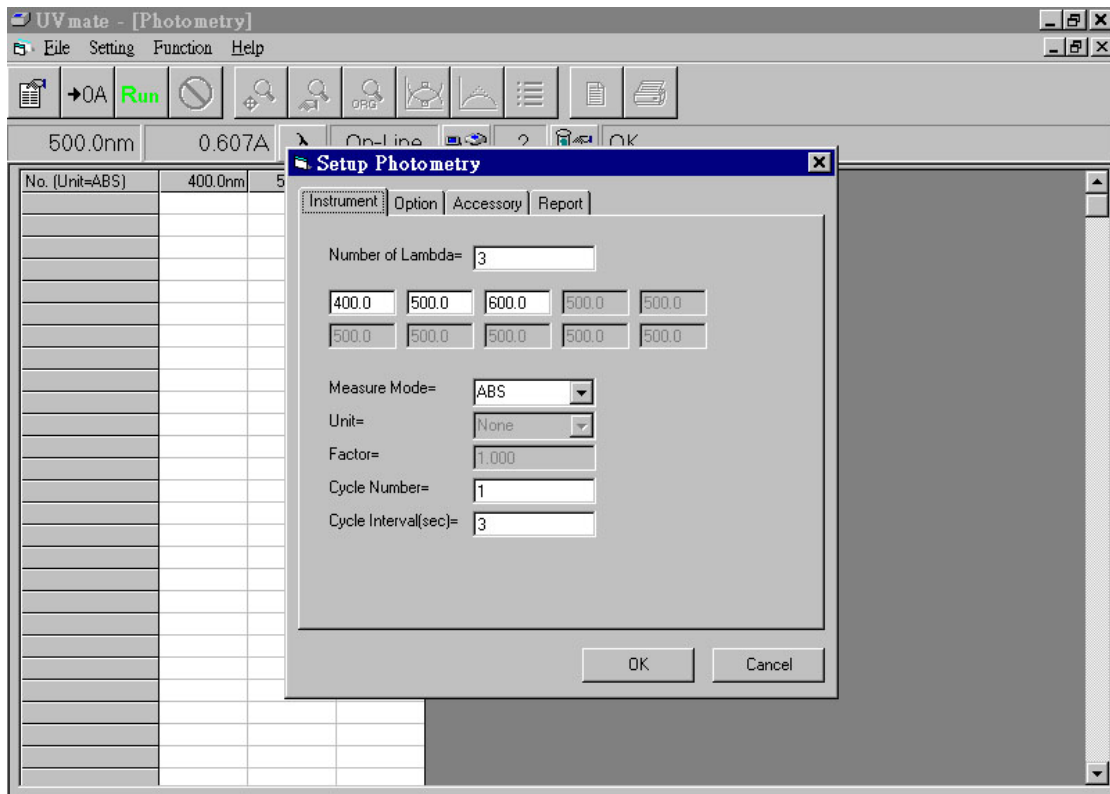
Single cell: NA in the field as for no accessory available (single cell only)

Singer cell + TC: current temperature; for example, T=25C.

Multi cell: current position of cell holder; for example, 5.

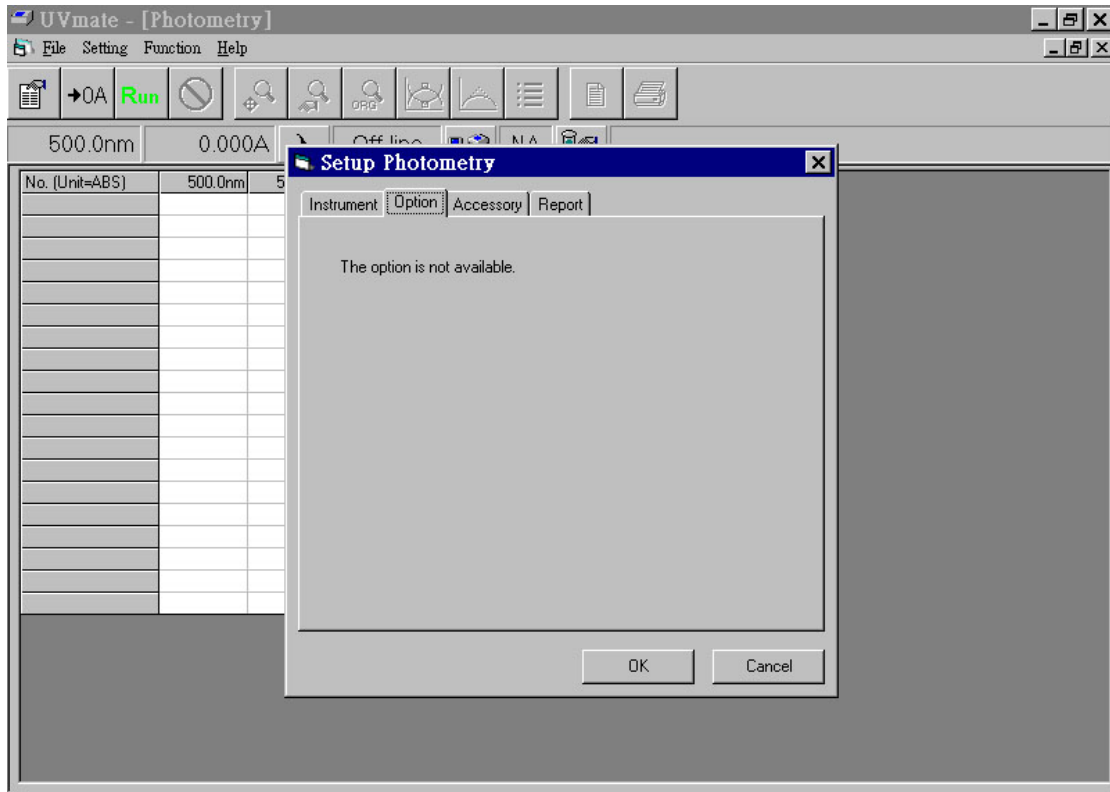
Sipper: Sipper in the field.

Sipper + TC: Sipper and current temperature; for example, Sipper-T=25C.

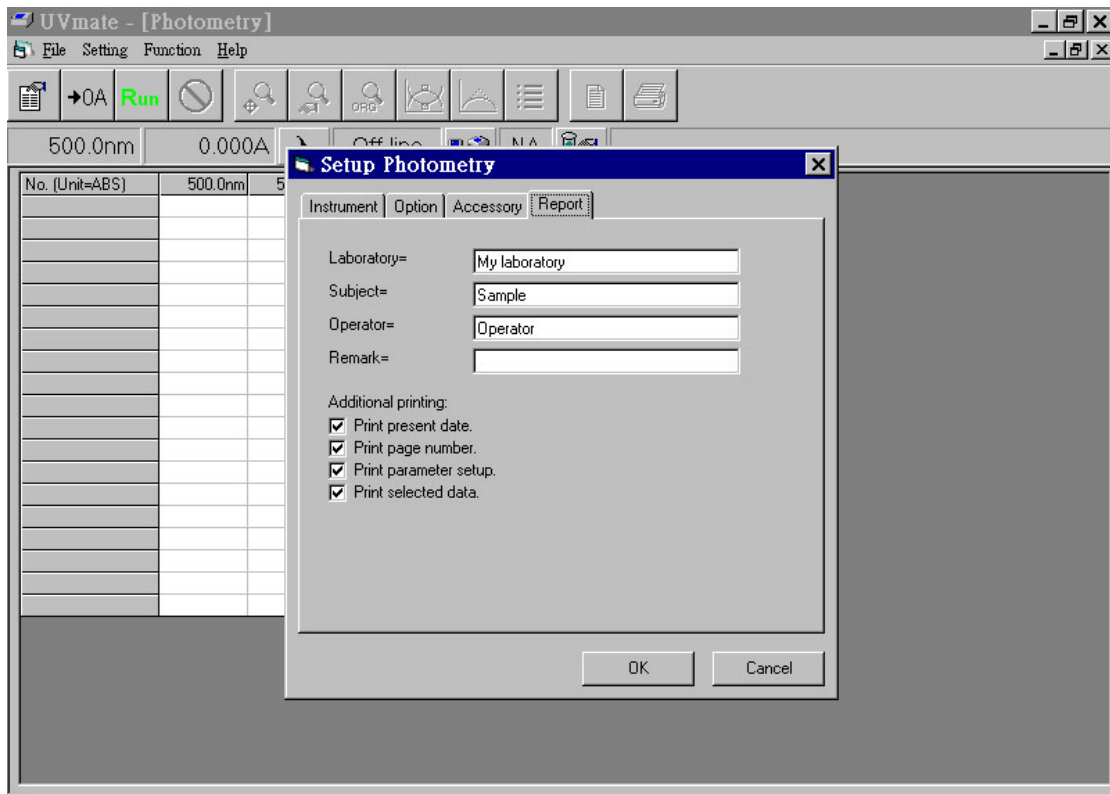


## Chapter 5 Function Photometry

1. Choose 'Photometry' from 'Function' of menu bar and a screen for function Photometry will show up. A dialog box of 'Setup Photometry' also shows up. Press 'OK' after setting to execute the program according to new parameters. Or press 'Cancel' to cancel settings and the program runs according to old parameters. There are four tabs for setting in this screen: Instrument, Option, Accessory, and Report.
  - a. Tab 'Instrument' refers to basic parameters of this function. More details are described below:
    - 'Number of Lambda' represents the desired number of wavelength for measurement.
    - Input the desired wavelength according to 'Number of Lambda'.
    - In 'Measure Mode', there are three choices: ABS, %T, or Factor\*ABS.
    - In 'Unit', user can select the unit. It is functional only when Measure Mode= Factor\*ABS.
    - In 'Factor', user can key in the value of factor. It is functional only when Measure Mode= Factor\*ABS.
    - 'Cycle Number' sets up total number of cycle for measurement.
    - 'Cycle interval (sec)' defines the interval of time every cycle.




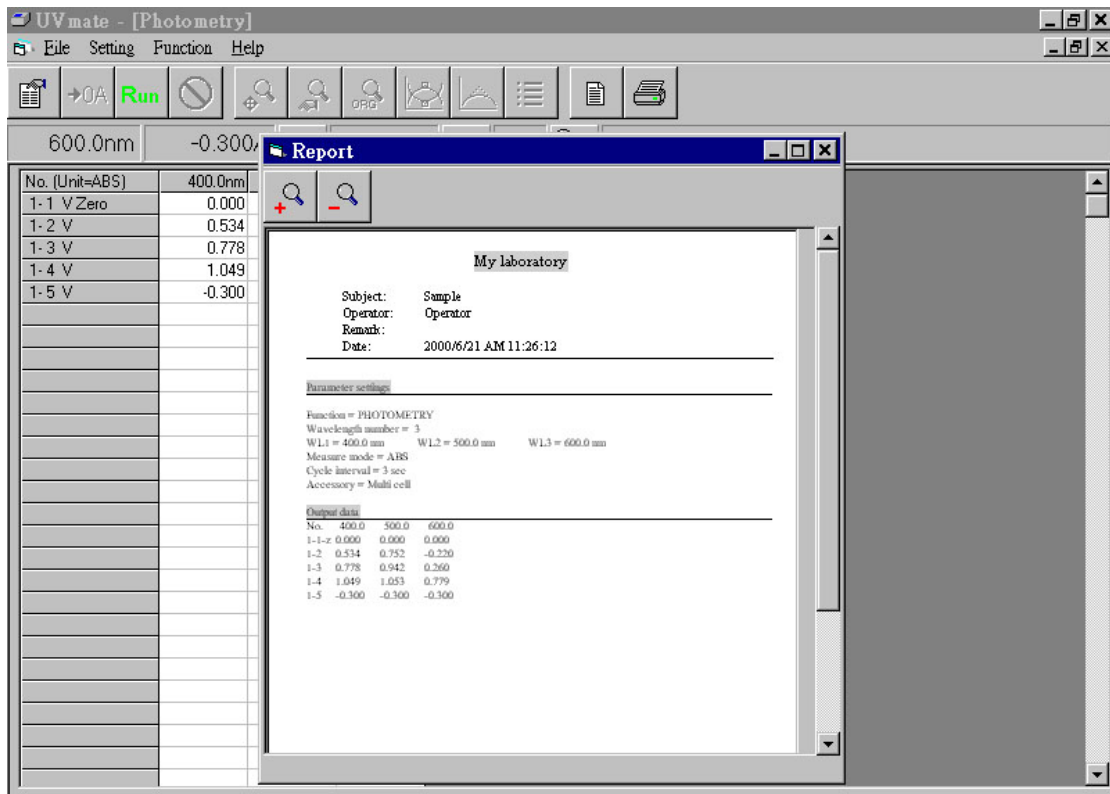
- b. Tab 'Option' is not available for this function.
- c. Tab 'Accessory' shows 'The accessory is not available' when only Single cell is used. When other accessories exist, this field will show messages according to screen of 'Setup accessory'.







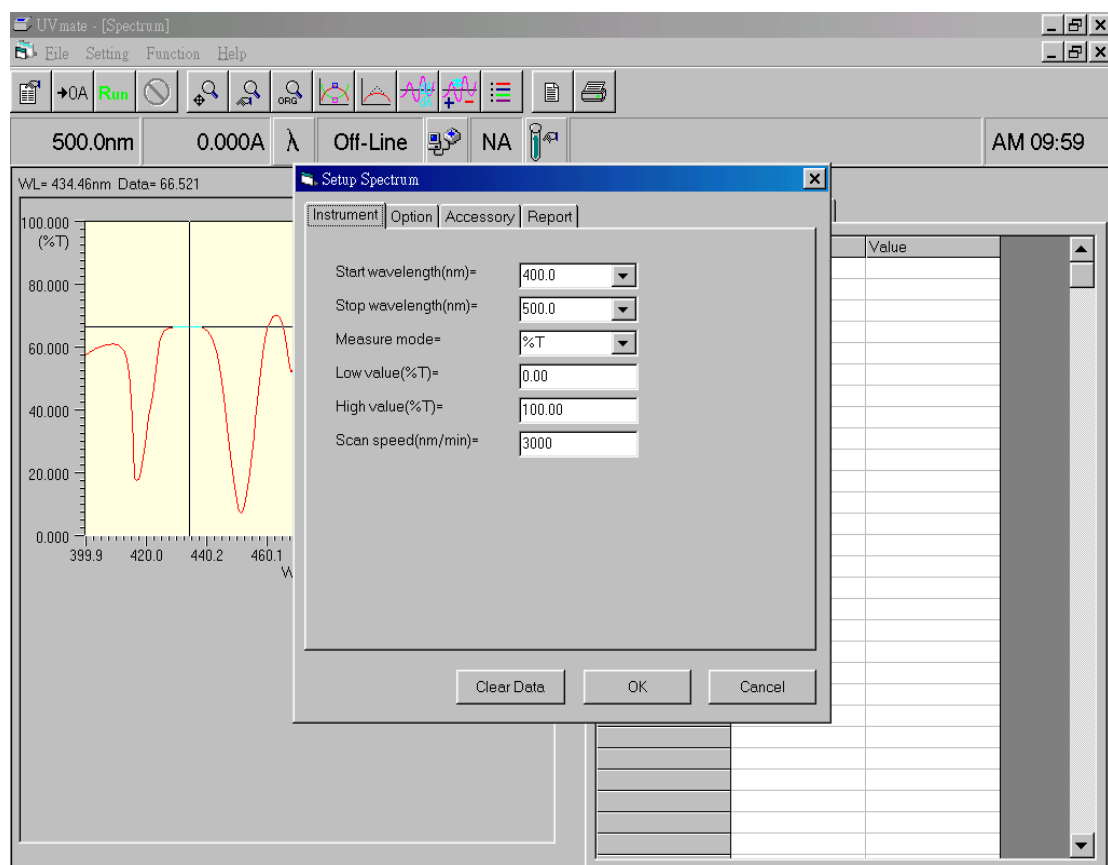
- d. Tab 'Report' is to set up options for printing reports in this function.
- 'Laboratory' is for input of user's company or name of laboratory.
  - 'Subject' is for input of the subject of this experiment.
  - 'Operator' is for input of user's name or comprehensive code.
  - 'Remark' is for input of relative remarks.
  - 'Print present date' will print the current date in computer.
  - 'Print page number' will print the page number for each page.
  - 'Print parameter setup' will print all settings for parameters.
  - 'Print selected data' will print selected data of readings (marked with 'v').

No. (Unit=ABS)	400.0nm	500.0nm	600.0nm
1-1 v Zero	0.000	0.000	0.000
1-2 v	0.534	0.752	-0.220
1-3 v	0.778	0.942	0.260
1-4 v	1.049	1.053	0.779
1-5 v	-0.300	-0.300	-0.300

- After setting up parameters for function Photometry, press icon  toolbar and program will start to read and to record data accordingly. Symbol 'v' after serial numbers in table means that the data will be printed in report. If user doesn't want the data in the report, please click left button of mouse in that field and the symbol will change into 'x'.

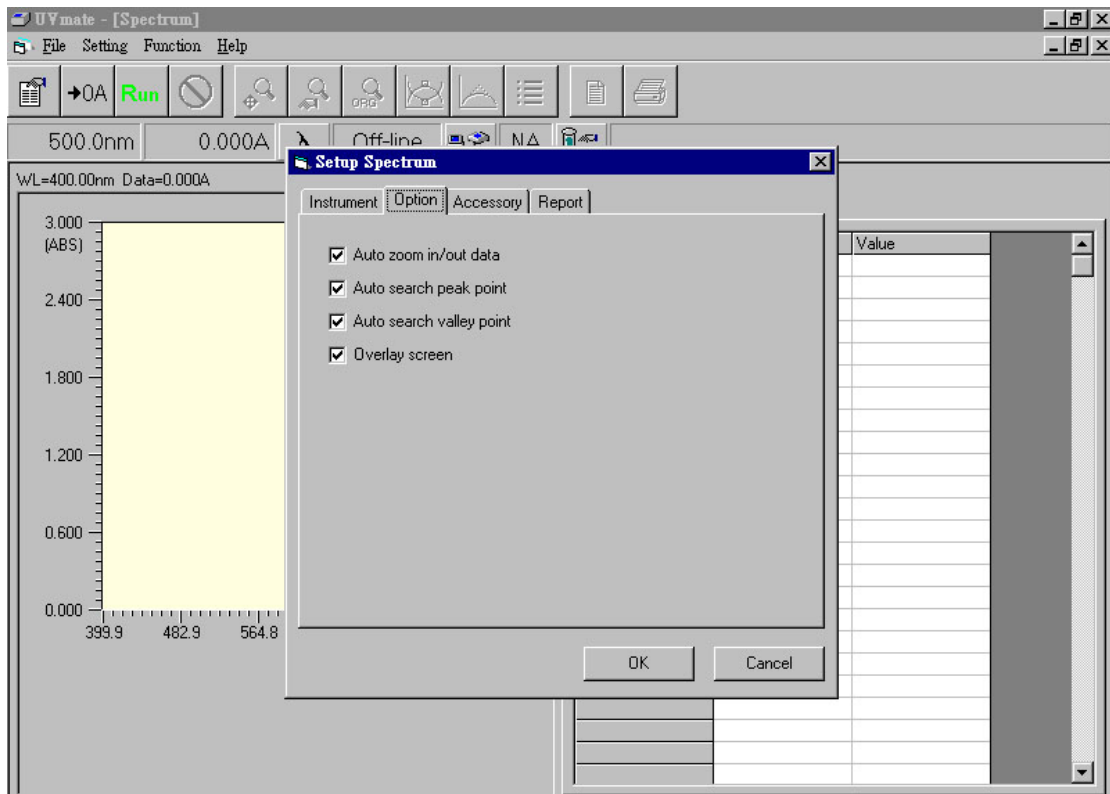


- Press icon  in the toolbar and user can preview the report for printing. In the screen, icon  can zoom in the report and icon  can zoom out the report.
- In the toolbar, press icon  to execute function of printing the report. During the printing process, the default printer will be selected by system. If there is no printer in the system, an error message will show up.
- The contents of report for Photometry include report headers, settings of parameters, and selected measurements.

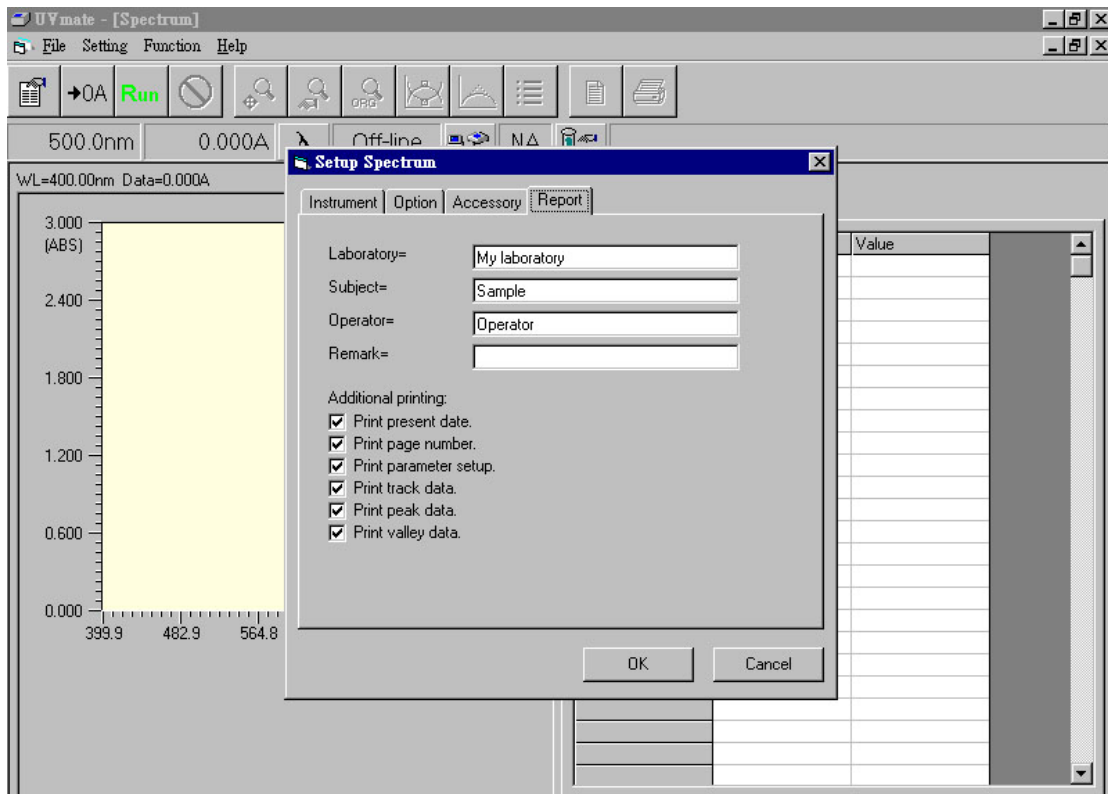


## Chapter 6 Function Spectrum

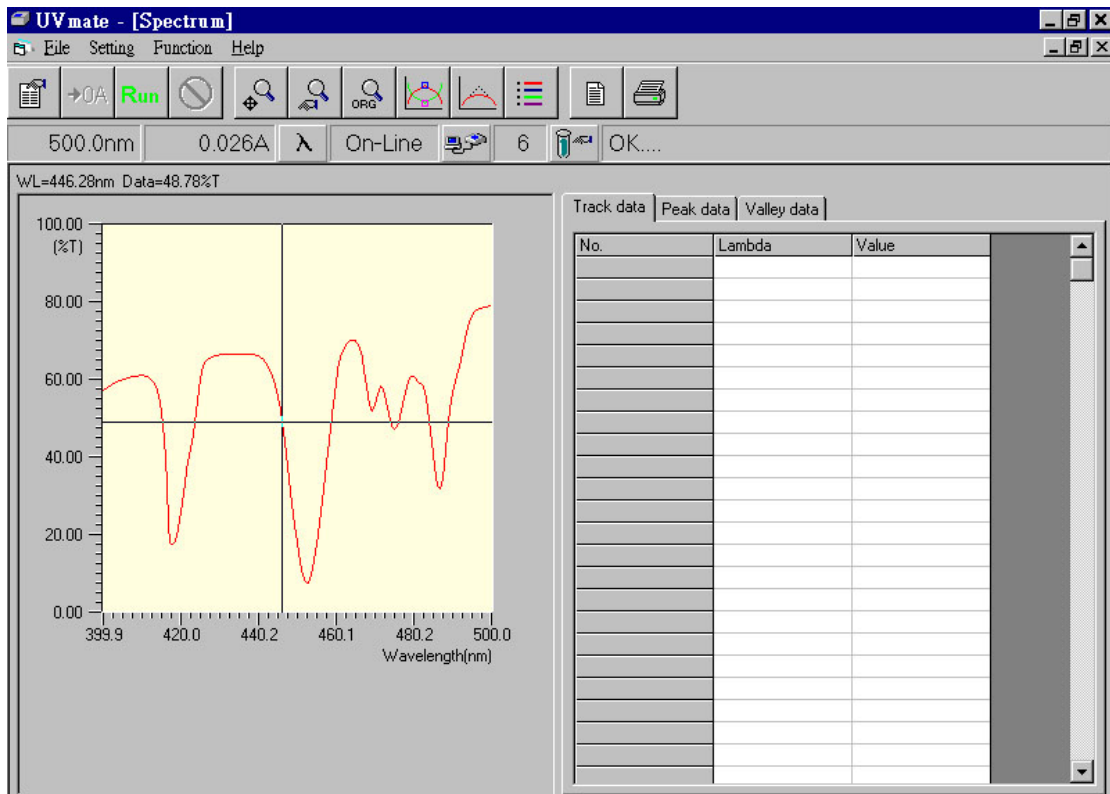
1. Choose 'Spectrum' from 'Function' of menu bar and a screen for function Spectrum will show up. A dialog box of 'Setup Spectrum' also shows up. Press 'OK' after setting to execute the program according to new parameters. Or press 'Cancel' to cancel settings and the program runs according to old parameters. There are four tabs for setting in this screen: Instrument, Option, Accessory, and Report.
  - a. Tab 'Instrument' refers to basic parameters of this function. More details are described below:
    - 'Start Wavelength(nm)' represents the start wavelength for measurement.
    - 'Stop Wavelength(nm)' represents the stop wavelength for measurement.
    - In 'Measure Mode', there are two choices: ABS, and %T.
    - In 'Low Value(%T)', user can set up the low value in scale of graph and the unit will change depending on 'Measure mode'.
    - In 'High Value(%T)', user can set up the high value in scale of graph and the unit will change depending on 'Measure mode'.
    - 'Scan Speed(nm/min)' represents the speed in scan.




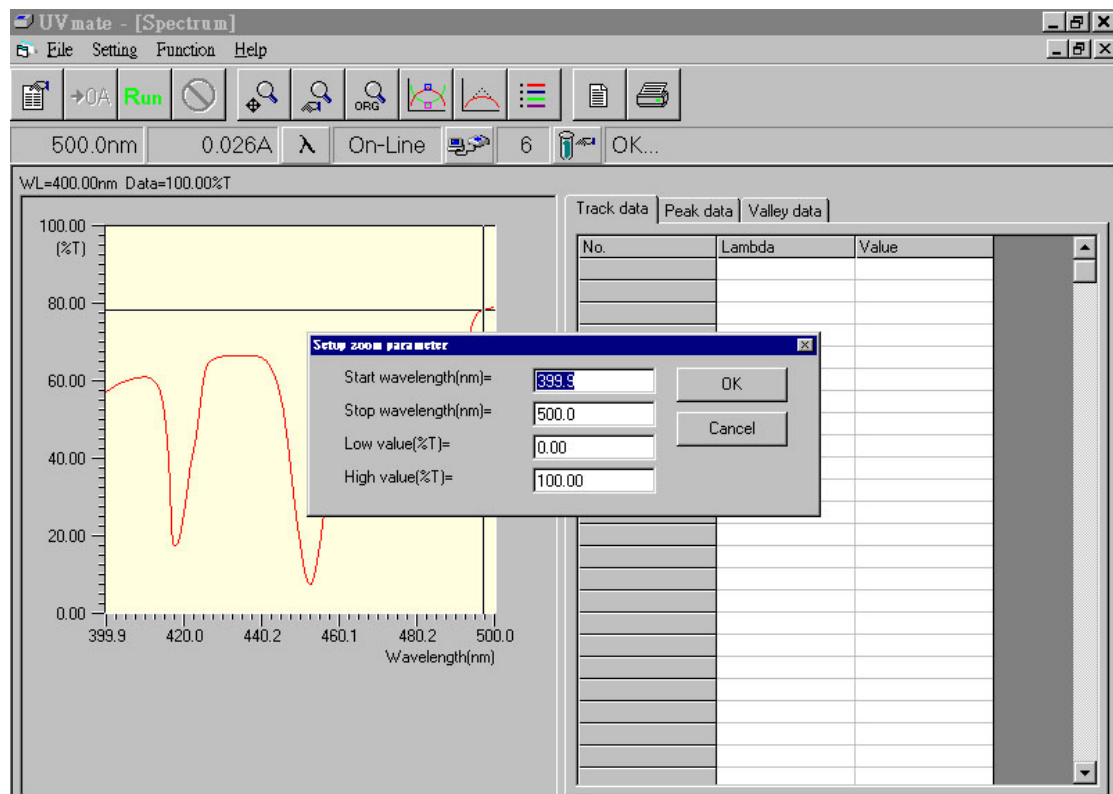
- b. Tab 'Option' refers to special options. Details are described below.
- 'Auto zoom in/out data' will zoom datum to fit in the optimal scale automatically after reading data.
  - 'Auto search peak point' will search for 'Peak' automatically after reading data.
  - 'Auto search valley point' will search for 'Valley' automatically after reading data.
  - 'Overlay screen' will not clear previous readings when doing multiple scan.
- c. Tab 'Accessory' shows 'The accessory is not available' when only Single cell is used. When other accessories exist, this field will show messages according to screen of 'Setup accessory'.





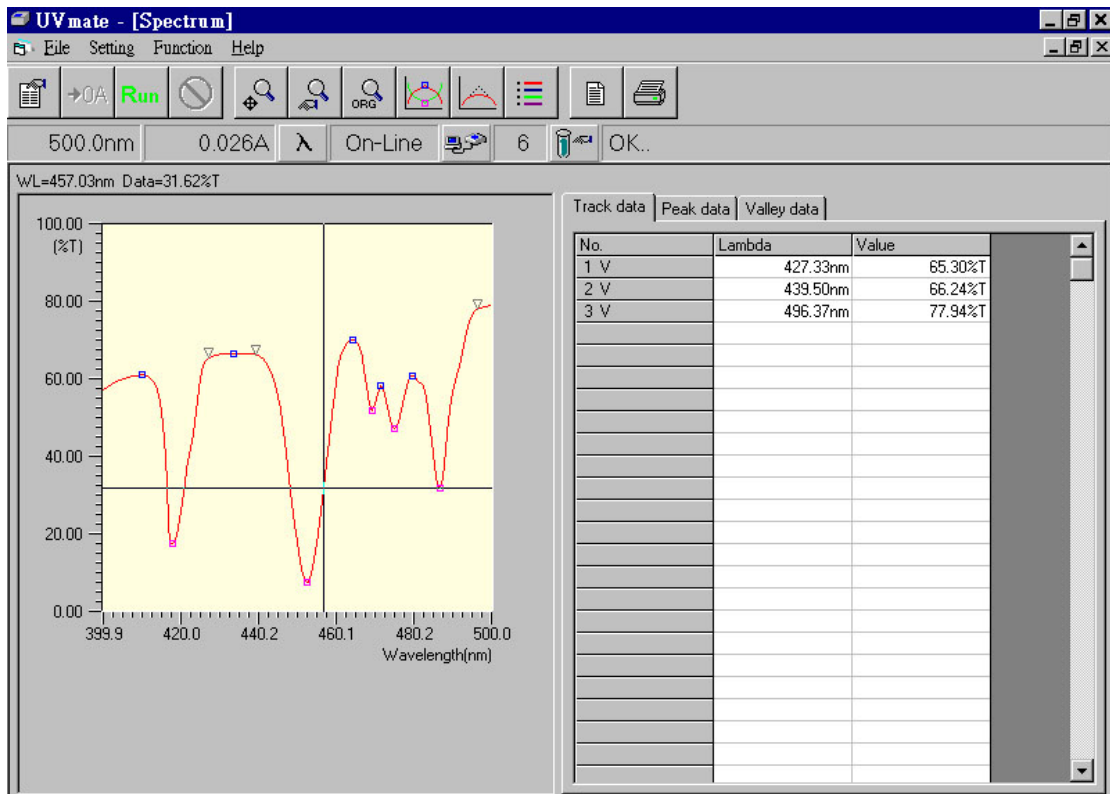
- d. Tab 'Report' is to set up options for printing reports in this function.
- 'Laboratory' is for input of user's company or name of laboratory.
  - 'Subject' is for input of the subject of this experiment.
  - 'Operator' is for input of user's name or comprehensive code.
  - 'Remark' is for input of relative remarks.
  - 'Print present date' will print the current date in computer.
  - 'Print page number' will print the page number for each page.
  - 'Print parameter setup' will print all settings for parameters.
  - 'Print track data' will print selected data in track (marked with 'v').
  - 'Print peak data' will print selected data of peaks (marked with 'v').
  - 'Print valley data' will print selected data of valleys (marked with 'v').





2. After setting up parameters for function Spectrum, press icon  in the toolbar and program will start reading datum and will show those in a graph. After readings, user can select desired area in graph by holding down left button of mouse, moving the mouse, and then releasing the left button. The selected area of graph will be zoomed in automatically.
3. Moving mouse to any position in the graph and then hitting right button of the mouse, this can record data of that point to the field 'Track data'. Every record will be numbered accordingly.

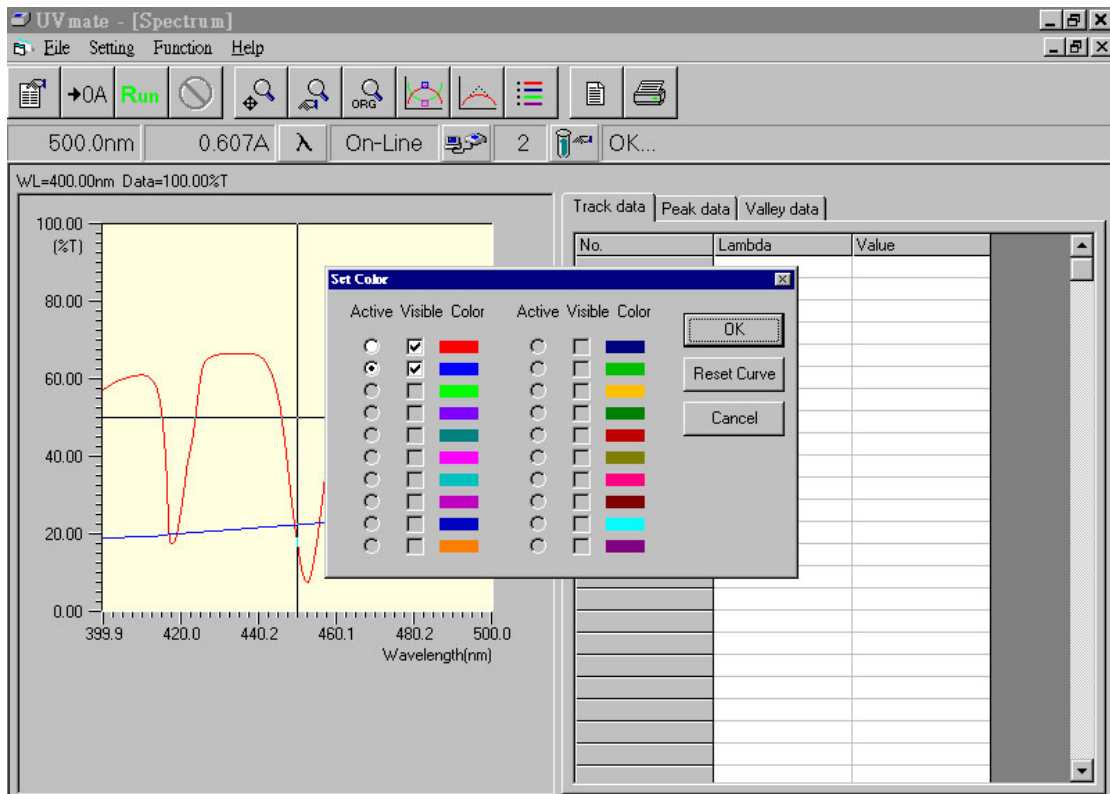



4. Press icon  in the toolbar and user can manually zoom in or out data according to parameter setting. This function can perform precise work in zoom.
5. Press icon  in the toolbar and user can restore all data to the original scale.

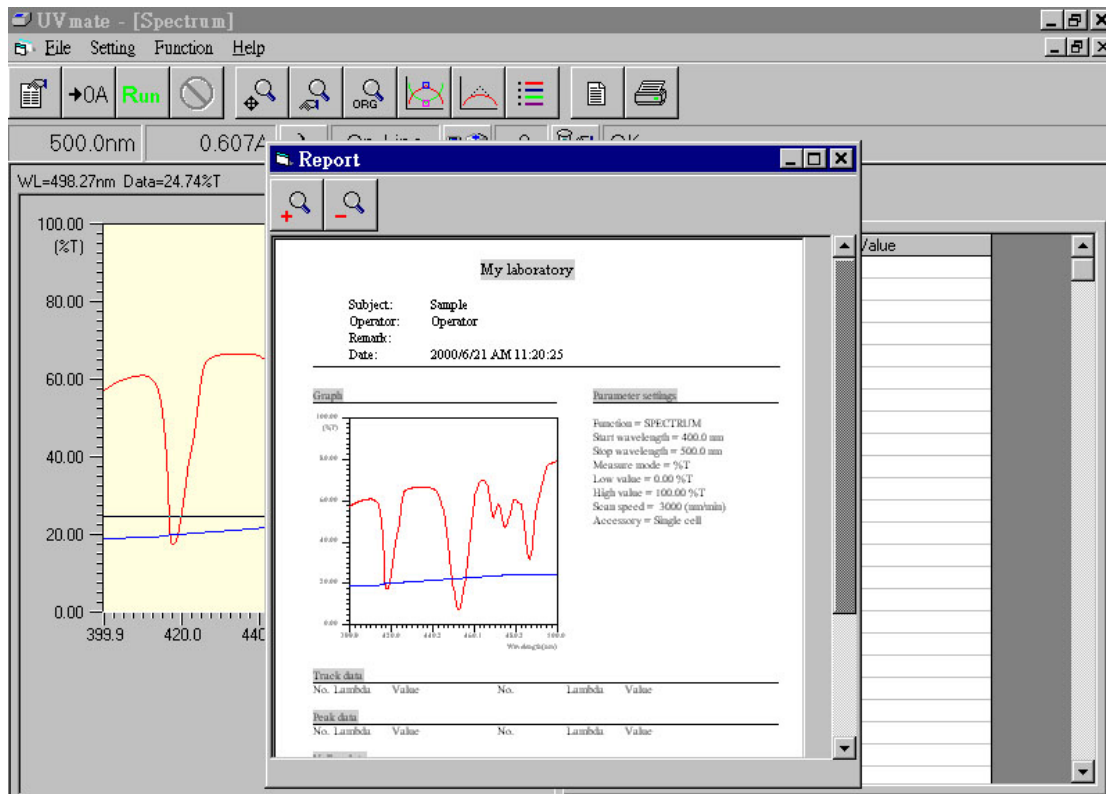



6. In the toolbar, press icon  execute function for searching Peaks and Valleys automatically. All details of searching results will be recorded in the data area to the right.



7. In the toolbar, press icon  to execute function for smoothing data. There are three ways for smoothing data - Smooth low, Smooth middle, and Smooth high. The difference between those three ways is the total number of data points used for calculation.




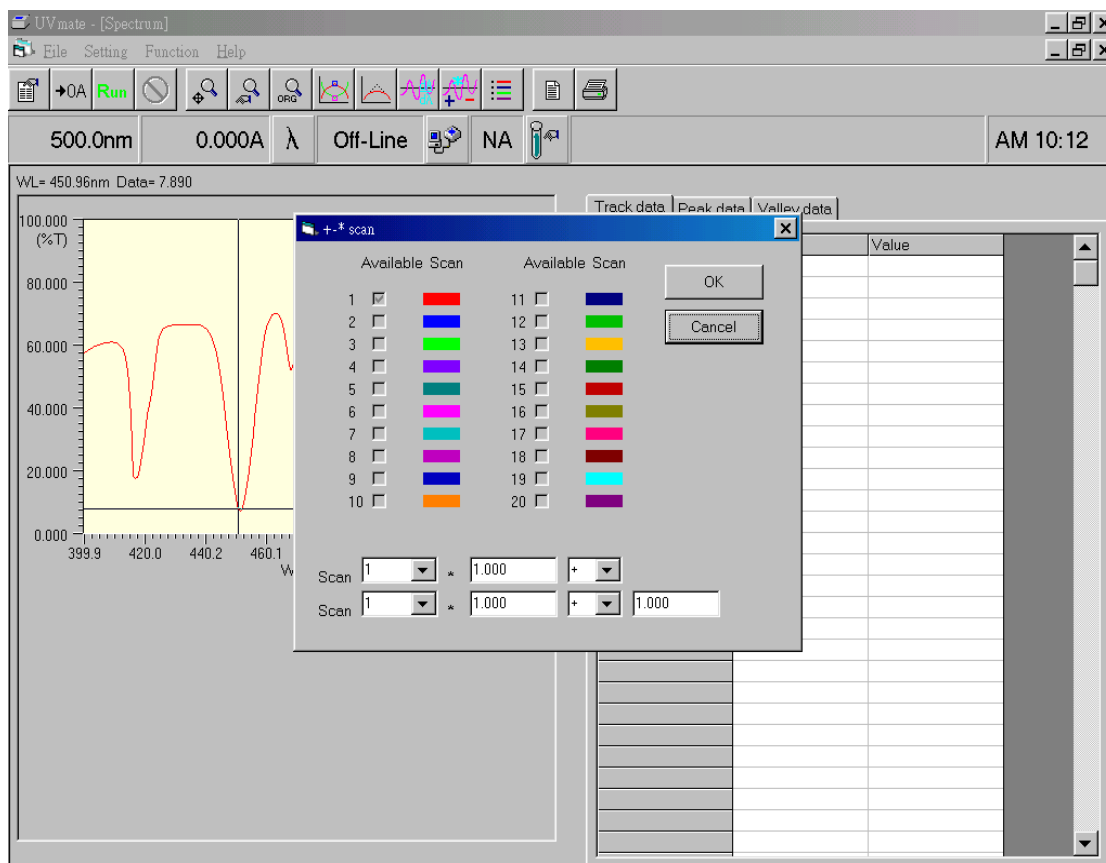
- Press icon  in the toolbar and a dialog box of Set color will show up. In the box, all scanned data segments will be shown. For those to be shown in the graph, mark 'v' in the 'Visible' option for each segment. If special treatment is needed for specific data segment, mark '•' in the 'Active' option field. Such that, when performing functions like Zoom, Peak/Valley, or Track and so on, it will take the 'Active' segment as the base. If there are too many data segments, press 'Reset Curve' button to reset the numbering system.




9. Press icon  in the toolbar and user can preview the report for printing. In the

screen, icon  can zoom in the report and icon  can zoom out the report.


10. In the toolbar, press icon  to execute function for taking derivative for data. First to third derivative can be calculated and the derived spectrum will be displayed in a separate figure right beneath the original figure.

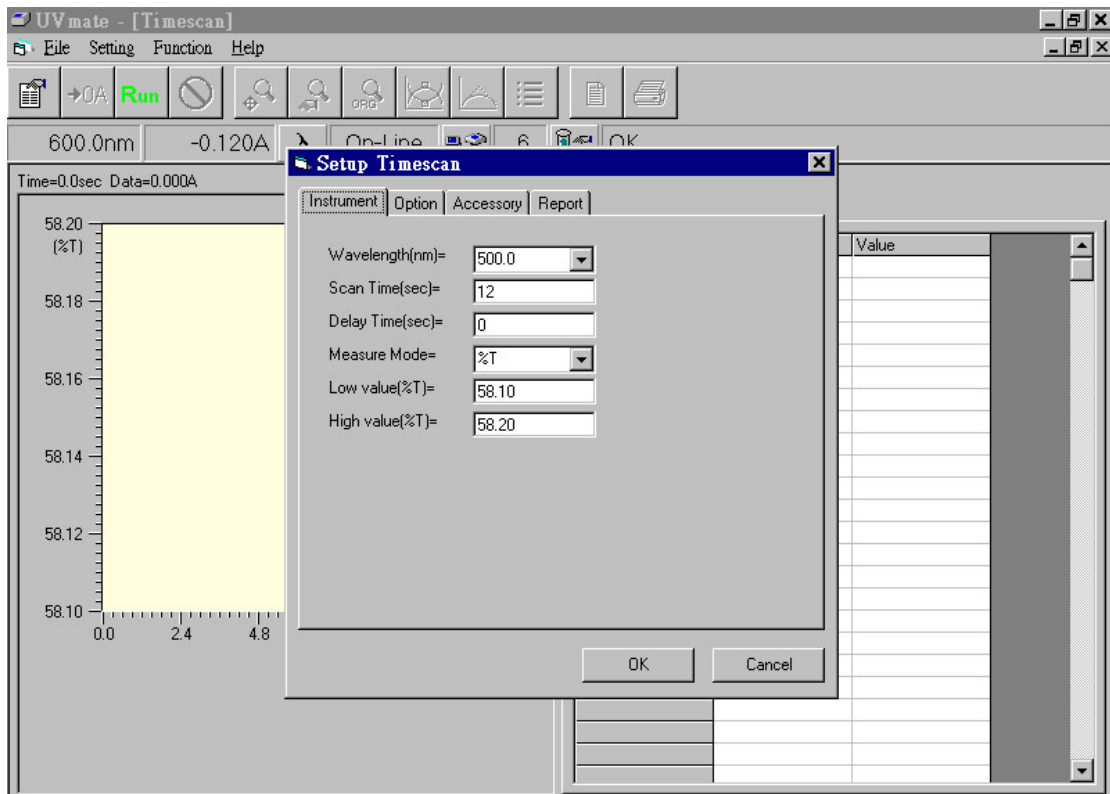


11. Press icon  in the toolbar and a dialog box for spectrum manipulation will show up. Users can manipulate existing spectra to get new spectrum. In the box, all spectra will be identified by pre-determined colors (up to 20 spectra). Those spectra can be added, subtracted, or multiplied through the equation:

$$\text{New scan} = (\text{Scan I} \times C1) + /-/* (\text{Scan J} \times C2) + /-/* C3$$

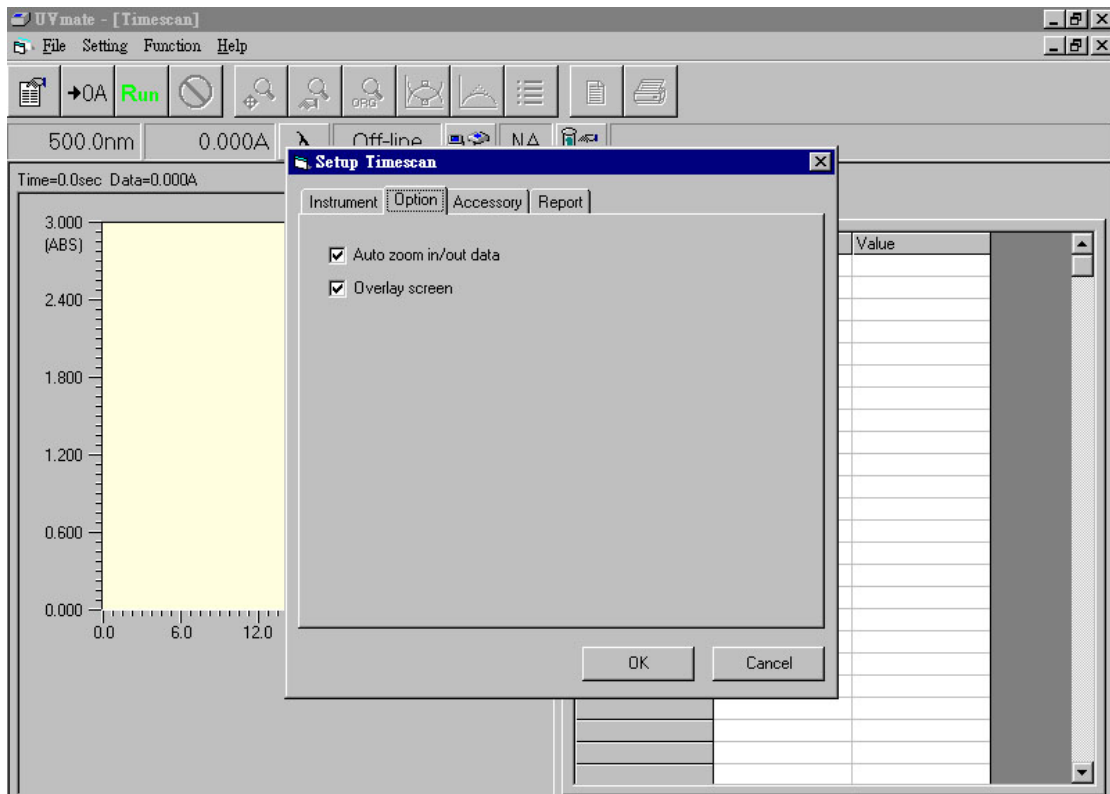
where Scan I and Scan J are known spectrum data, C1 and C2 are corresponding coefficients for Scan I and Scan J, separately. And C3 is an additional factor for the new spectrum.

12. In the toolbar, press icon  to execute function of printing the report. During the printing process, the default printer will be selected by system. If there is no printer in the system, an error message will show up.
13. The contents of report for Spectrum include report headers, graphs, settings of parameters, and tables for Track data, Peak data, and Valley data.

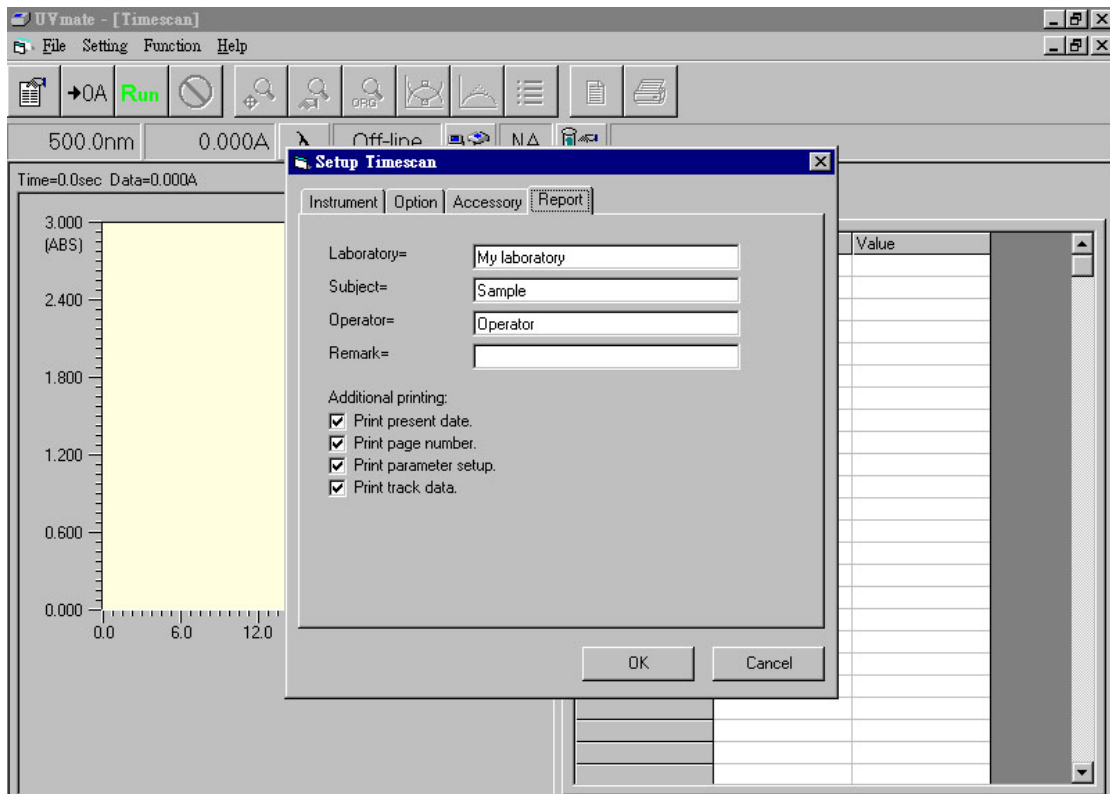


## Chapter 7      Function **Timescan**

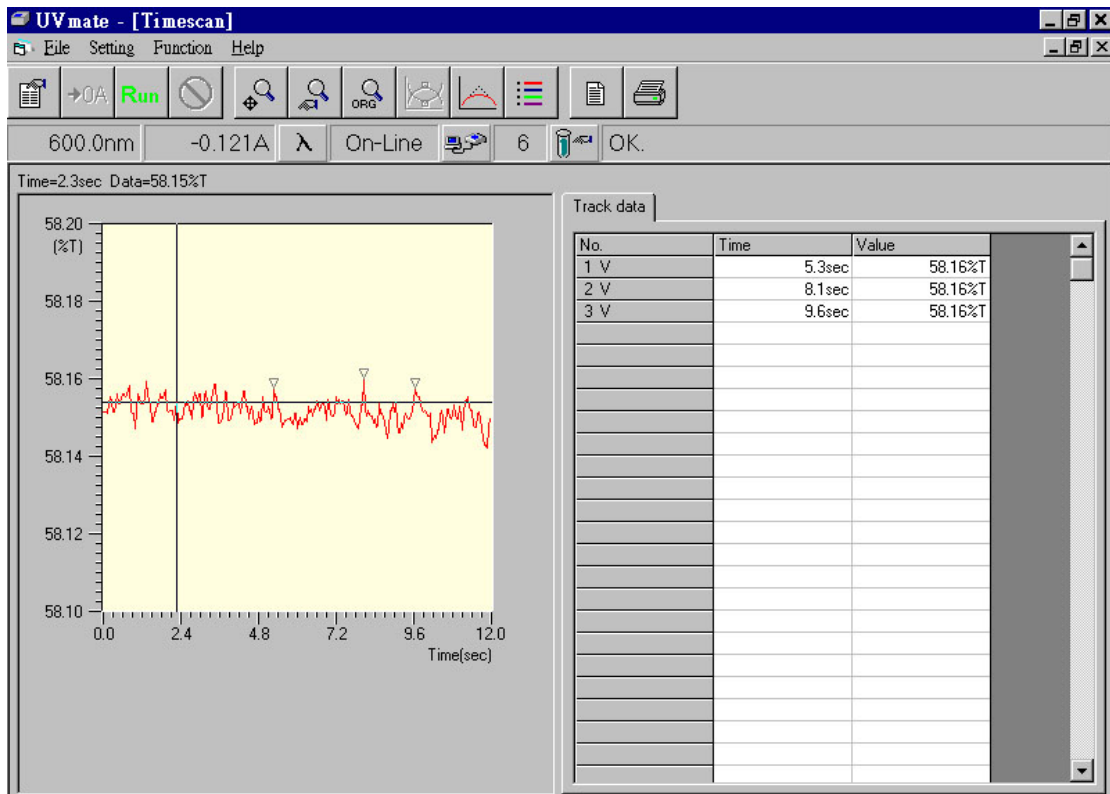
1. Choose 'Timescan' from 'Function' of menu bar and a screen for function Timescan will show up. A dialog box of 'Setup Timescan' also shows up. Press 'OK' after setting to execute the program according to new parameters. Or press 'Cancel' to cancel settings and the program runs according to old parameters. There are four tabs for setting in this screen: Instrument, Option, Accessory, and Report.
  - a. Tab 'Instrument' refers to basic parameters of this function. More details are described below:
    - 'Wavelength(nm)' represents the wavelength for measurement.
    - 'Scan Time(sec)' represents the time needed for measurement.
    - 'Delay Time(sec)' represents the delay time before taking readings.
    - In 'Measure Mode', there are two choices: ABS, and %T.
    - In 'Low Value(%T)', user can set up the low value in scale of graph and the unit will change depending on 'Measure Mode'.
    - In 'High Value(%T)', user can set up the high value in scale of graph and the unit will change depending on 'Measure Mode'.




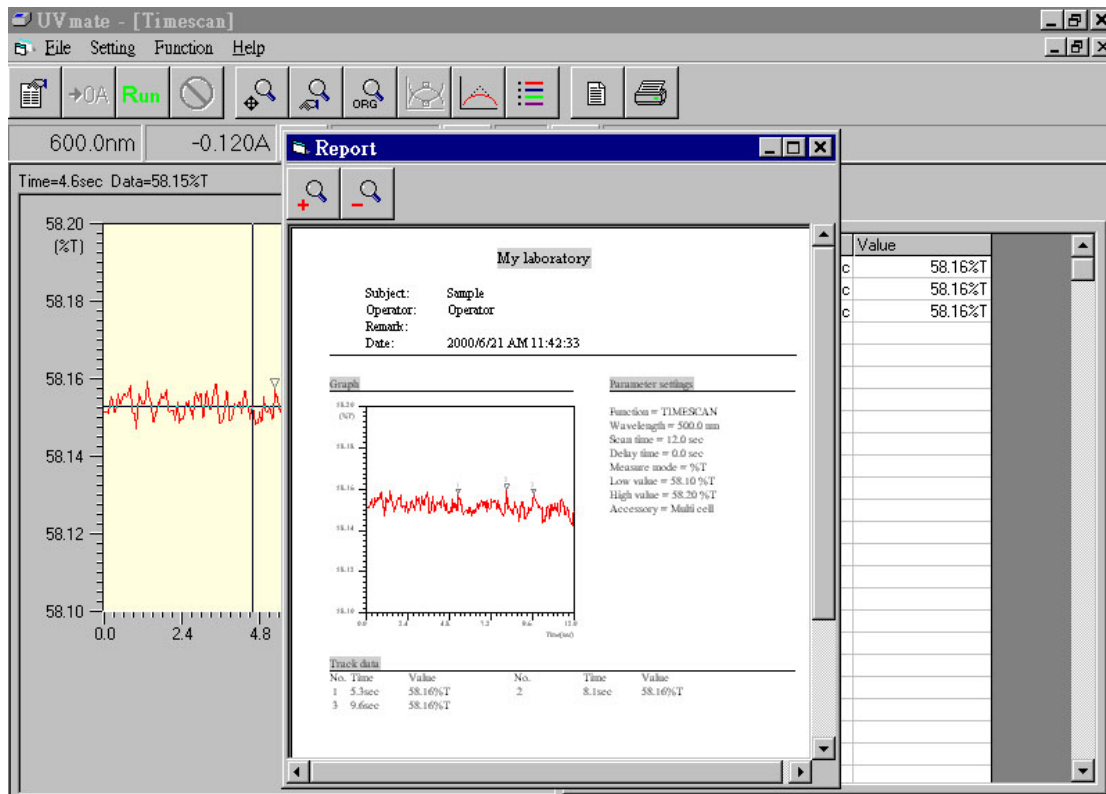
- b. Tab 'Option' refers to special options. Details are described below.
  - 'Auto zoom in/out data' will zoom datum to fit in the optimal scale automatically after reading data.
  - 'Overlay screen' will not clear previous readings when doing multiple scan.
- c. Tab 'Accessory' shows 'The accessory is not available' when only Single cell is used. When other accessories exist, this field will show messages according to screen of 'Setup accessory'.







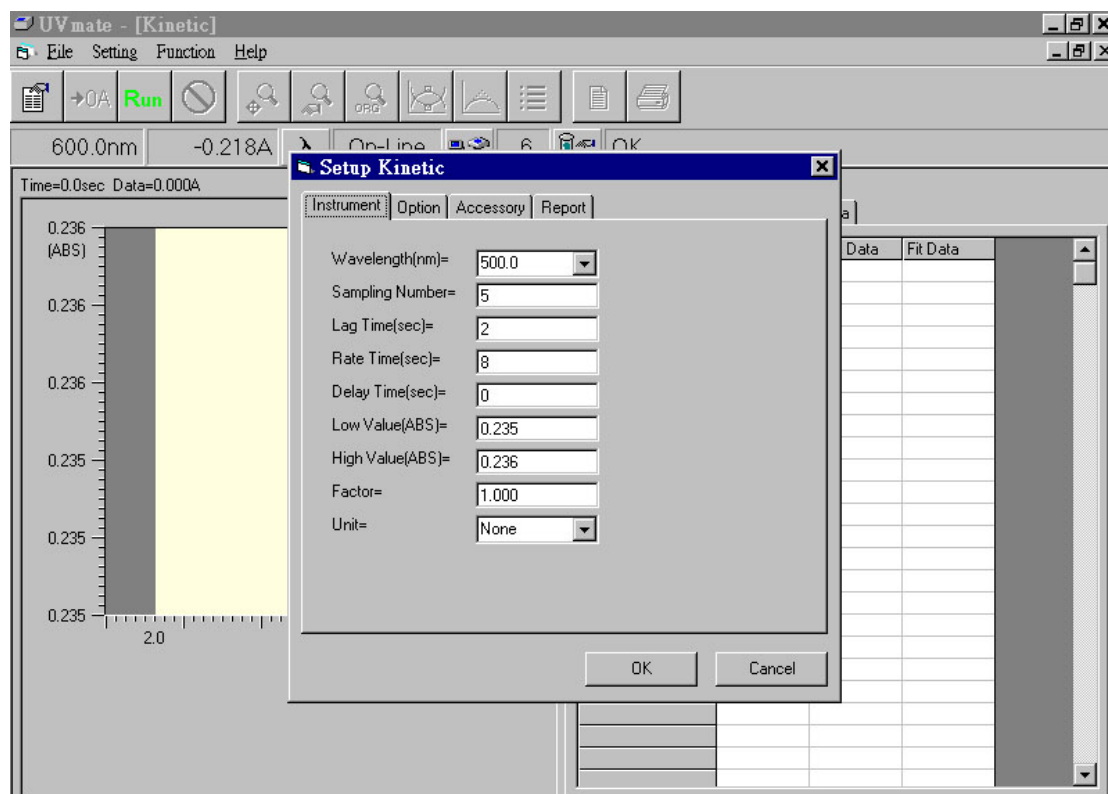
- d. Tab 'Report' is to set up options for printing reports in this function.
- 'Laboratory' is for input of user's company or name of laboratory.
  - 'Subject' is for input of the subject of this experiment.
  - 'Operator' is for input of user's name or comprehensive code.
  - 'Remark' is for input of relative remarks.
  - 'Print present date' will print the current date in computer.
  - 'Print page number' will print the page number for each page.
  - 'Print parameter setup' will print all settings for parameters.
  - 'Print track data' will print selected data in track (marked with 'v').



2. After setting up parameters for function Timescan, press icon  the toolbar and program will start reading datum and will show those in a graph. After readings, user can select desired area in graph by holding down left button of mouse, moving the mouse, and then releasing the left button. The selected area of graph will be zoomed in automatically.
3. Moving mouse to any position in the graph and then hitting right button of the mouse, this can record data of that point to field 'Track data'. Every record will be numbered accordingly.
4. In this function, operations for 'Zoom', 'Smooth', and 'Set color' are the same of those in function Spectrum.

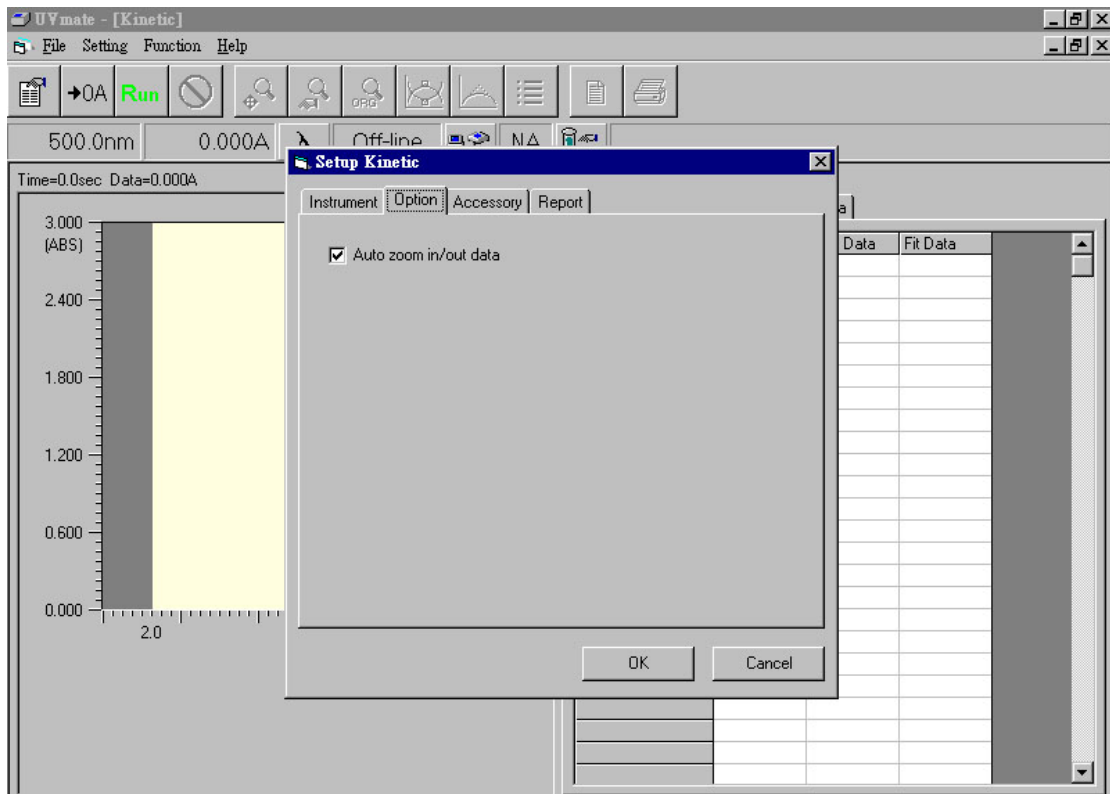


5. Press icon  in the toolbar and user can preview the report for printing. In the screen, icon  can zoom in the report and icon  can zoom out the report.
6. In the toolbar, press icon  to execute function of printing the report. During the printing process, the default printer will be selected by system. If there is no printer in the system, an error message will show up.
7. The contents of report for Timescan include report headers, graphs, settings of parameters, and table for Track data.

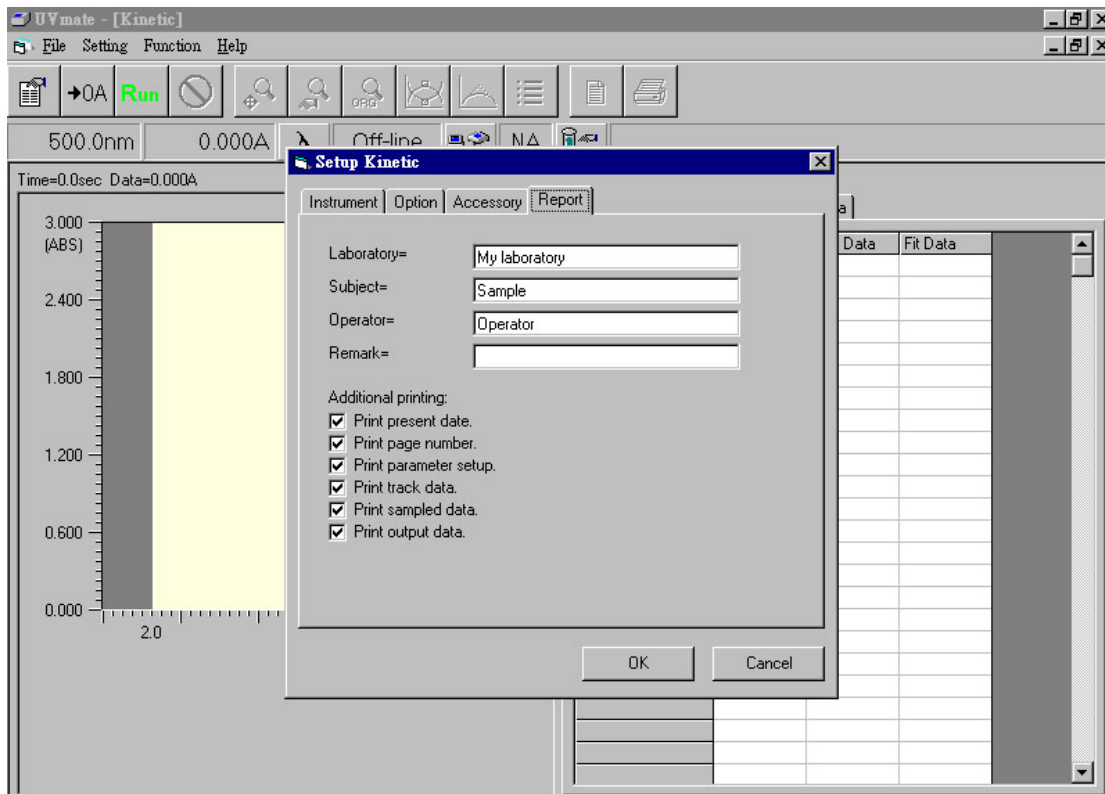


## Chapter 8 Function Kinetic

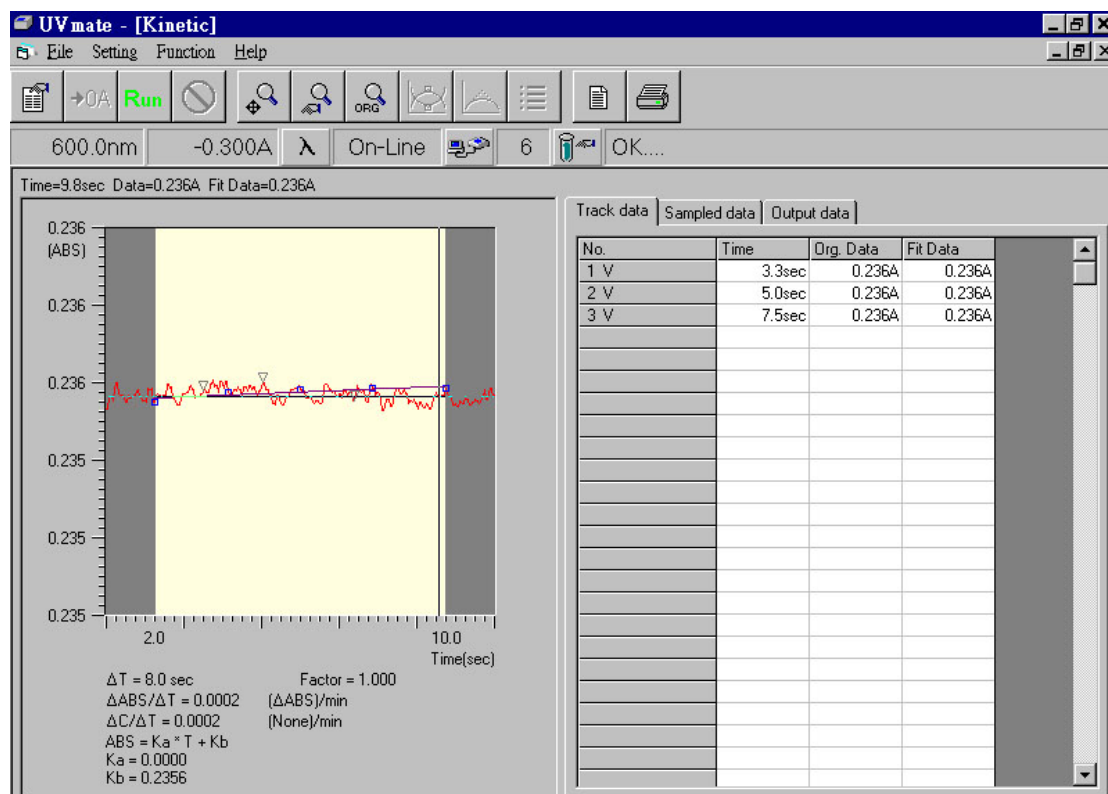
1. Choose 'Kinetic' from 'Function' of menu bar and a screen for function Kinetic will show up. A dialog box of 'Setup Kinetic' also shows up. Press 'OK' after setting to execute the program according to new parameters. Or press 'Cancel' to cancel settings and the program runs according to old parameters. There are four tabs for setting in this screen: Instrument, Option, Accessory, and Report.
  - a. Tab 'Instrument' refers to basic parameters of this function. More details are described below:
    - 'Wavelength(nm)' represents the wavelength for measurement.
    - 'Sampling Number' represents the number for samples.
    - 'Lag Time(sec)' represents the lag time needed in measurement.
    - 'Rate Time(sec)' represents the rate time needed in measurement.
    - 'Delay Time(sec)' represents the delay time before taking readings.
    - In 'Low Value(ABS)', user can set up the low value in scale of graph and the unit is ABS.
    - In 'High Value(ABS)', user can set up the high value in scale of graph and the unit is ABS.
    - In 'Factor', user can set up value for factor.
    - In 'Unit', user can select different unit as necessary.



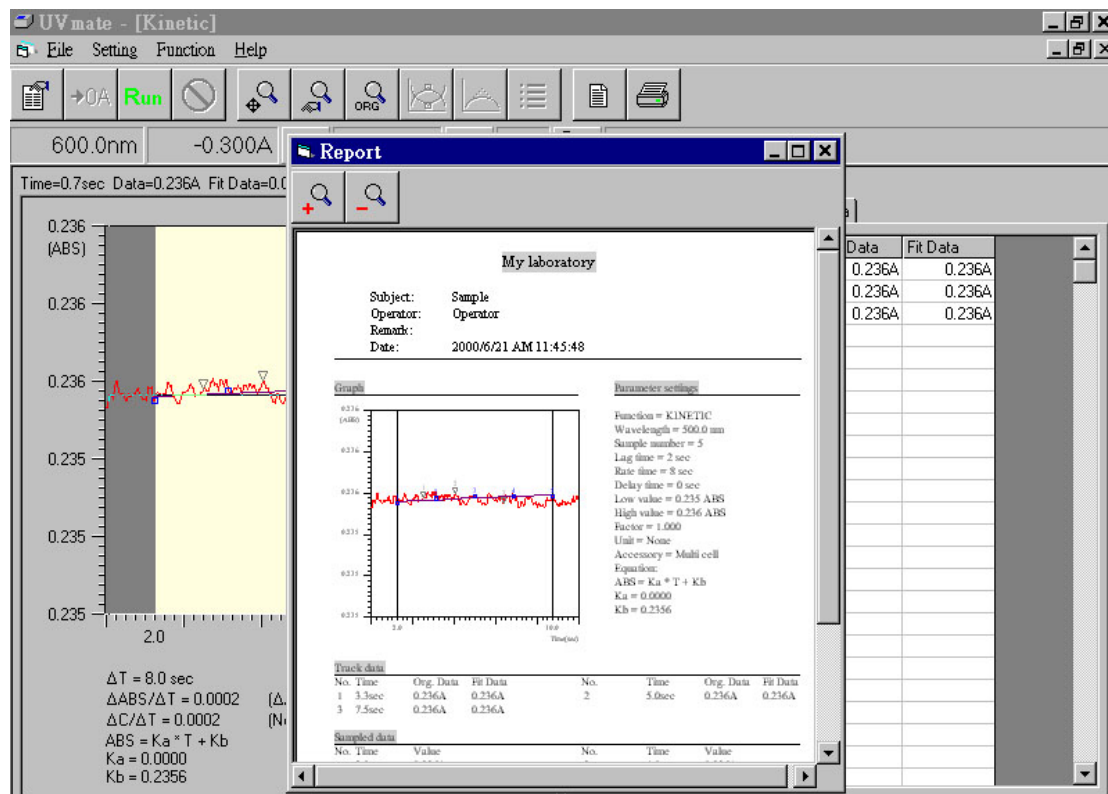
- b. Tab 'Option' refers to special options. Details are described below.
- 'Auto zoom in/out data' will zoom datum to fit in the optimal scale automatically after reading data.
- c. Tab 'Accessory' shows 'The accessory is not available' when only Single cell is used. When other accessories exist, this field will show messages according to screen of 'Setup accessory'.







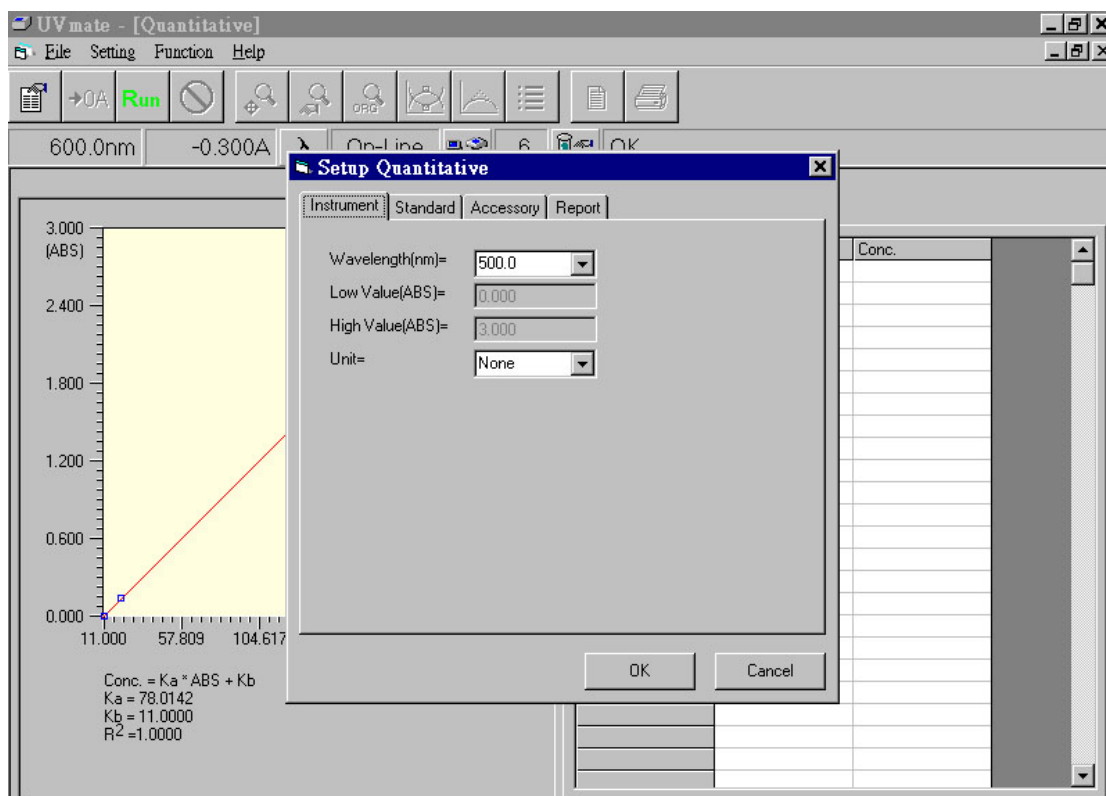
- d. Tab 'Report' is to set up options for printing reports in this function.
- 'Laboratory' is for input of user's company or name of laboratory.
  - 'Subject' is for input of the subject of this experiment.
  - 'Operator' is for input of user's name or comprehensive code.
  - 'Remark' is for input of relative remarks.
  - 'Print present date' will print the current date in computer.
  - 'Print page number' will print the page number for each page.
  - 'Print parameter setup' will print all settings for parameters.
  - 'Print track data' will print selected data in track (marked with 'v').
  - 'Print sampled data' will print selected data in samples (marked with 'v').
  - 'Print output data' will print selected data for output (marked with 'v').



2. After setting up parameters for function Kinetic, press icon **Run** the toolbar and program will start reading datum and will show those in a graph. After measurement, program will find data for Sampling point and will record in the field 'Sampled data' automatically. Note that those data in this area are always marked with 'v' and can not be altered partially for printing by user.
3. For every measurement, program will store data like Lambda, ABS0, ... etc. in the field of 'Output data'.
4. Moving mouse to any position in the graph and then hitting right button of the mouse, this can record data of that point to field 'Track data'. Every record will be numbered accordingly.

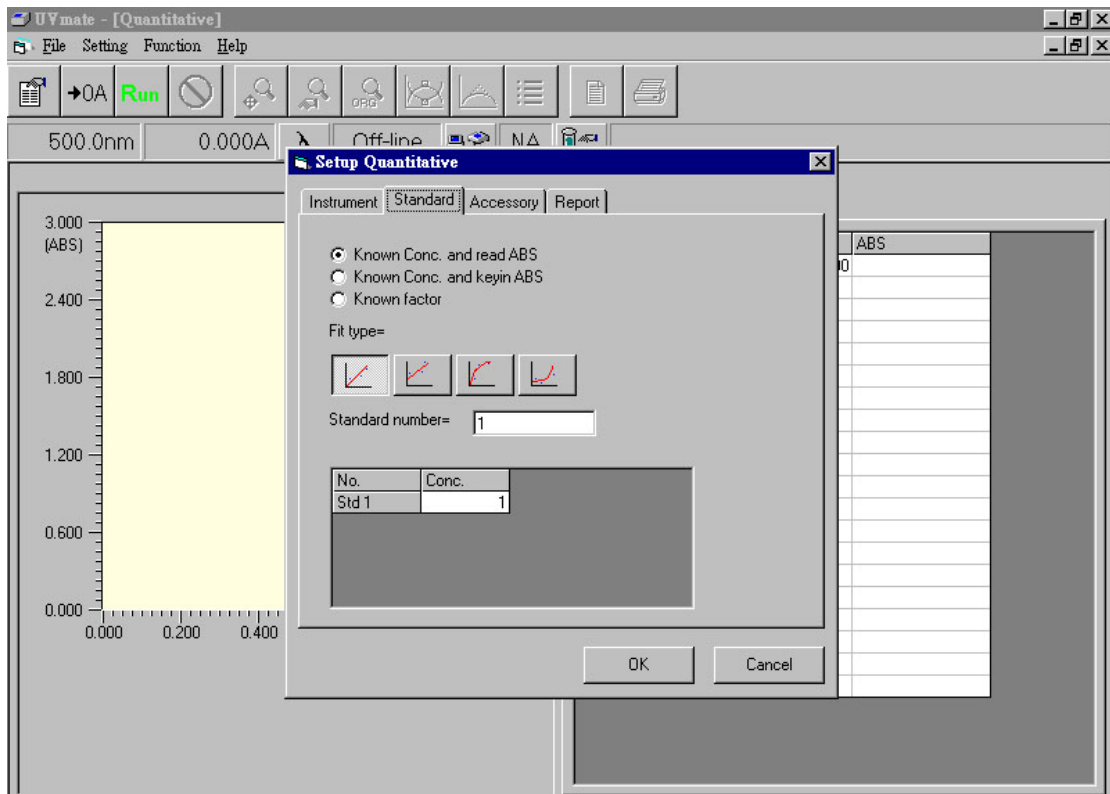


- Press icon  in the toolbar and user can preview the report for printing. In the screen, icon  can zoom in the report and icon  can zoom out the report.
- In the toolbar, press icon  to execute function of printing the report. During the printing process, the default printer will be selected by system. If there is no printer in the system, an error message will show up.
- The contents of report for Kinetic include report headers, graphs, settings of parameters, and tables for Track data, Sampled data, and Output data.

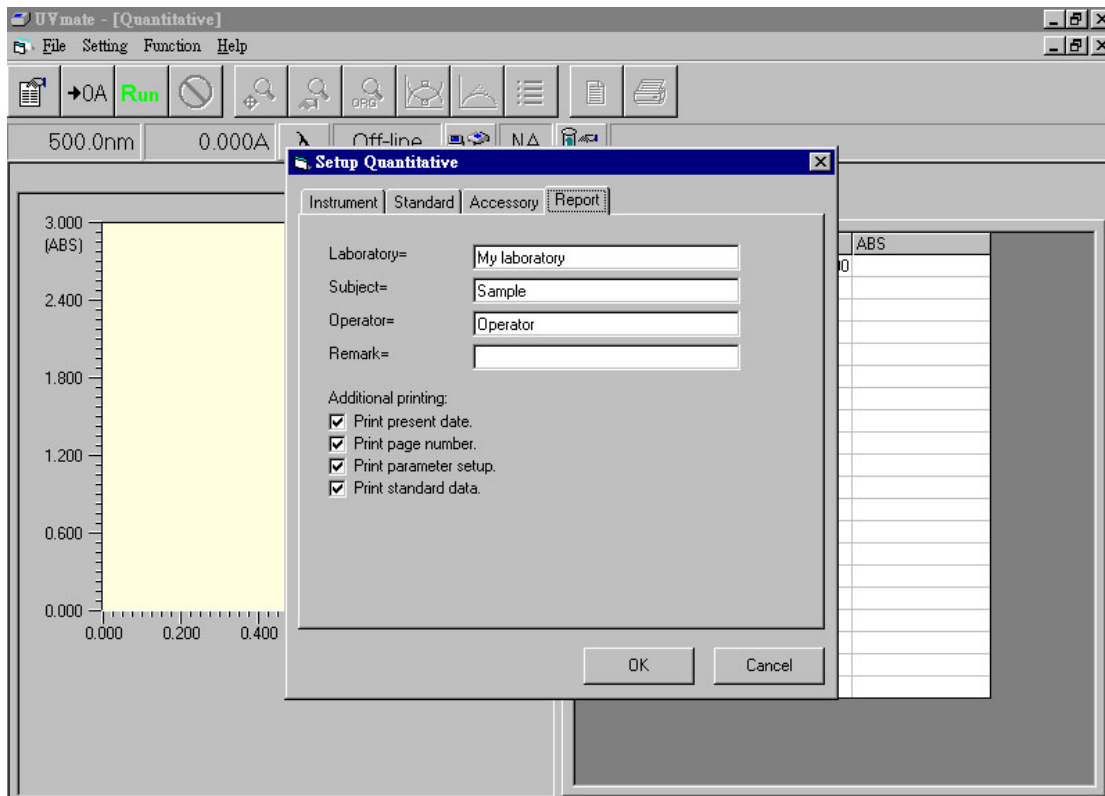


## Chapter 9 Function Quantitative

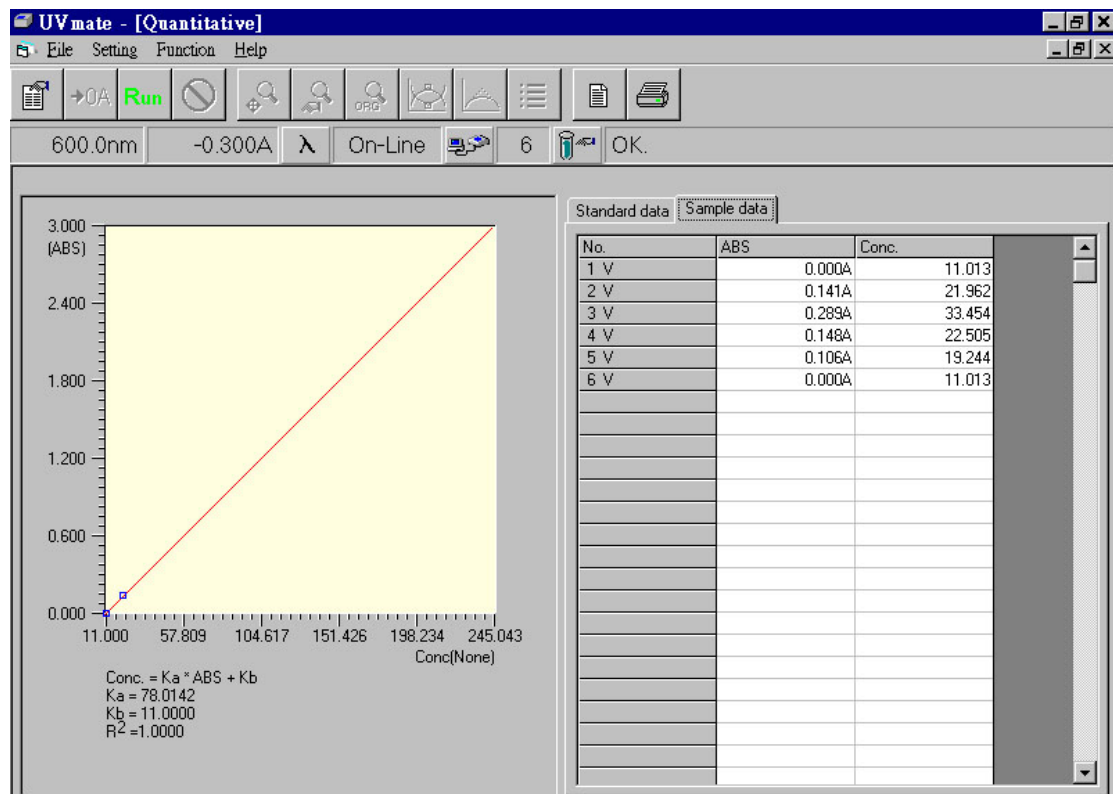
1. Choose 'Quantitative' from 'Function' of menu bar and a screen for function Quantitative will show up. A dialog box of 'Setup Quantitative' also shows up. Press 'OK' after setting to execute the program according to new parameters. Or press 'Cancel' to cancel settings and the program runs according to old parameters. There are four tabs for setting in this screen: Instrument, Standard, Accessory, and Report.
  - a. Tab 'Instrument' refers to basic parameters of this function. More details are described below:
    - 'Wavelength(nm)' represents the wavelength for measurement.
    - In 'Low Value(ABS)', user can set up the low value in scale of graph and the unit is ABS.
    - In 'High Value(ABS)', user can set up the high value in scale of graph and the unit is ABS.
    - In 'Unit', user can select different unit as necessary.




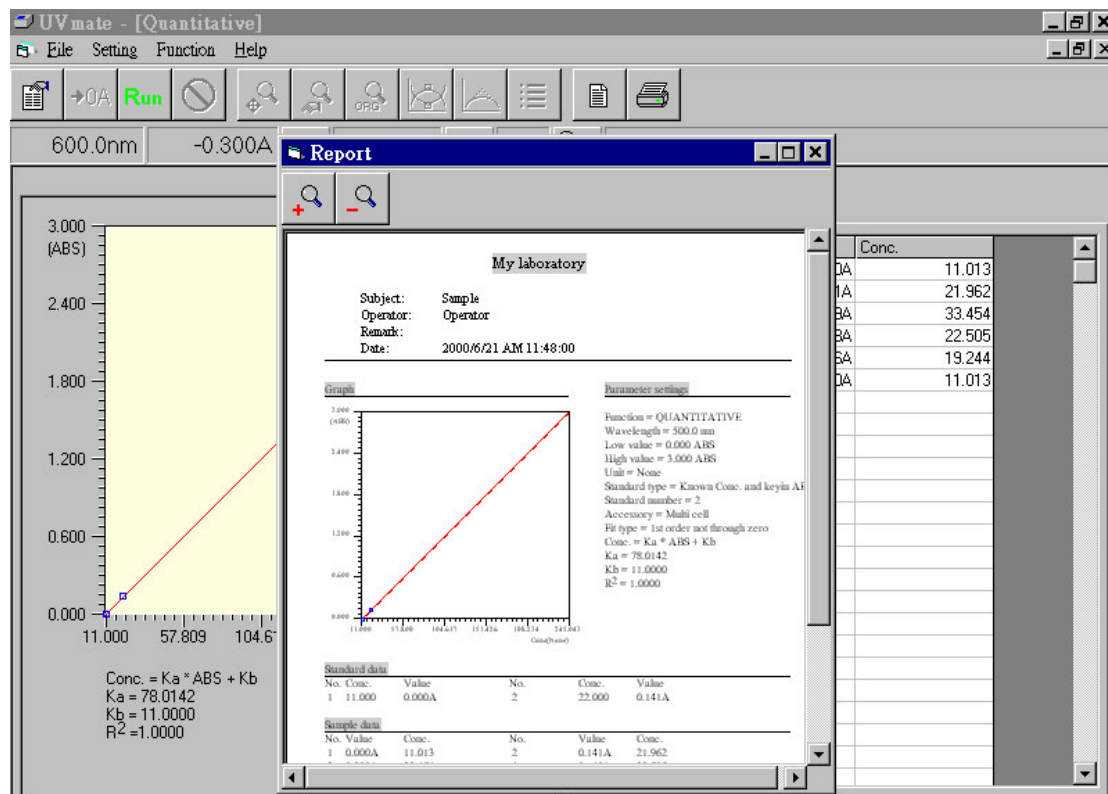
- b. Tab 'Standard' refers to options for setting up standard. Details are described below.
- Three standard types for user to choose: 'Known Conc. and read ABS' for known concentrations with unknown ABS for measurement, 'Known Conc. and keyin ABS' for known concentrations with user-decided ABS to key-in, and 'Known factor' for known factor.
  - Four fit types for user to choose; from left to right, 1<sup>st</sup> order equation passing origin, 1<sup>st</sup> order equation without passing origin, 2<sup>nd</sup> order equation passing origin, and 2<sup>nd</sup> order equation without passing origin.
  - 'Standard number' is for user to input number of standards.
  - Followed by the above three selections, user will key in proper values for standards.
- c. Tab 'Accessory' shows 'The accessory is not available' when only Single cell is used. When other accessories exist, this field will show messages according to screen of 'Setup accessory'.







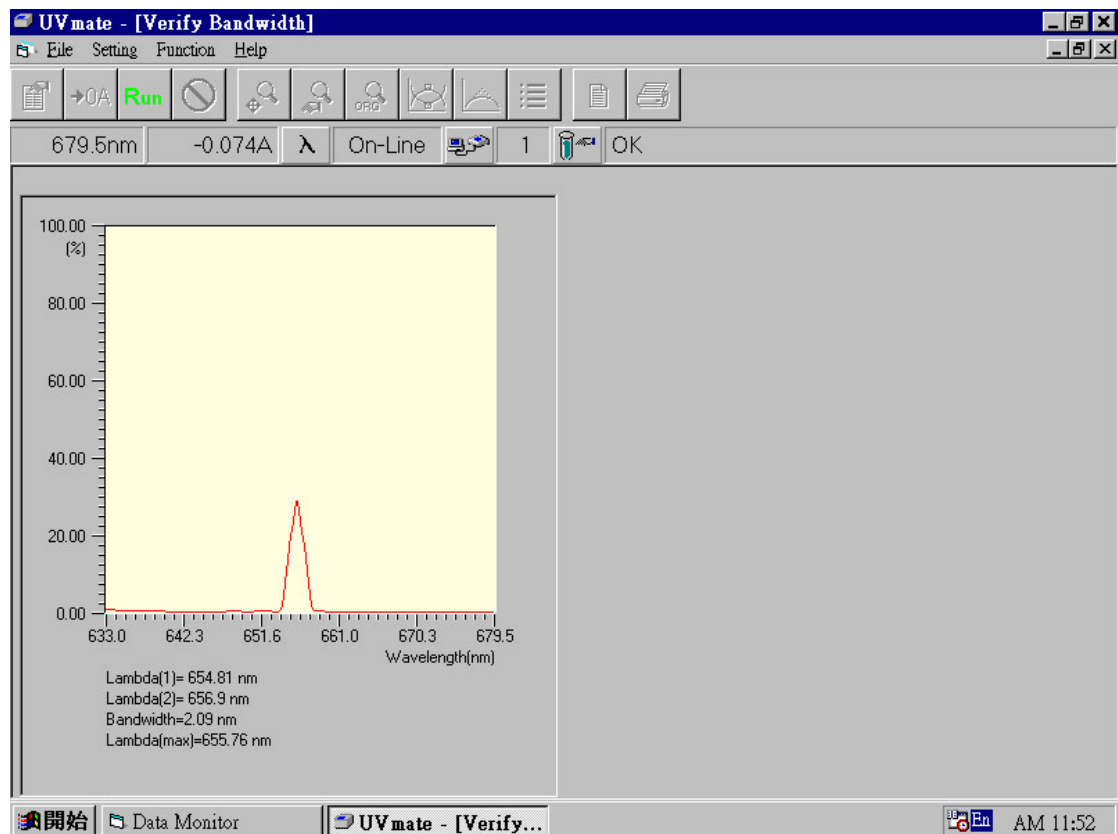
- d. Tab 'Report' is to set up options for printing reports in this function.
- 'Laboratory' is for input of user's company or name of laboratory.
  - 'Subject' is for input of the subject of this experiment.
  - 'Operator' is for input of user's name or comprehensive code.
  - 'Remark' is for input of relative remarks.
  - 'Print present date' will print the current date in computer.
  - 'Print page number' will print the page number for each page.
  - 'Print parameter setup' will print all settings for parameters.
  - 'Print standard data' will print selected data of standards (marked with 'v').



- After setting up parameters for function Quantitative, press icon  in the toolbar to run the function. If standard type 'Known conc. and read ABS' is selected, it will start to measure standards and set up the standard table. Otherwise, it can start to measure samples.
- Data of standards will be in field 'Standard data'. Note that those data in this area are always marked with 'v' and can not be altered partially for printing by user.
- For every measurement, program will store data in field 'Sample data'.

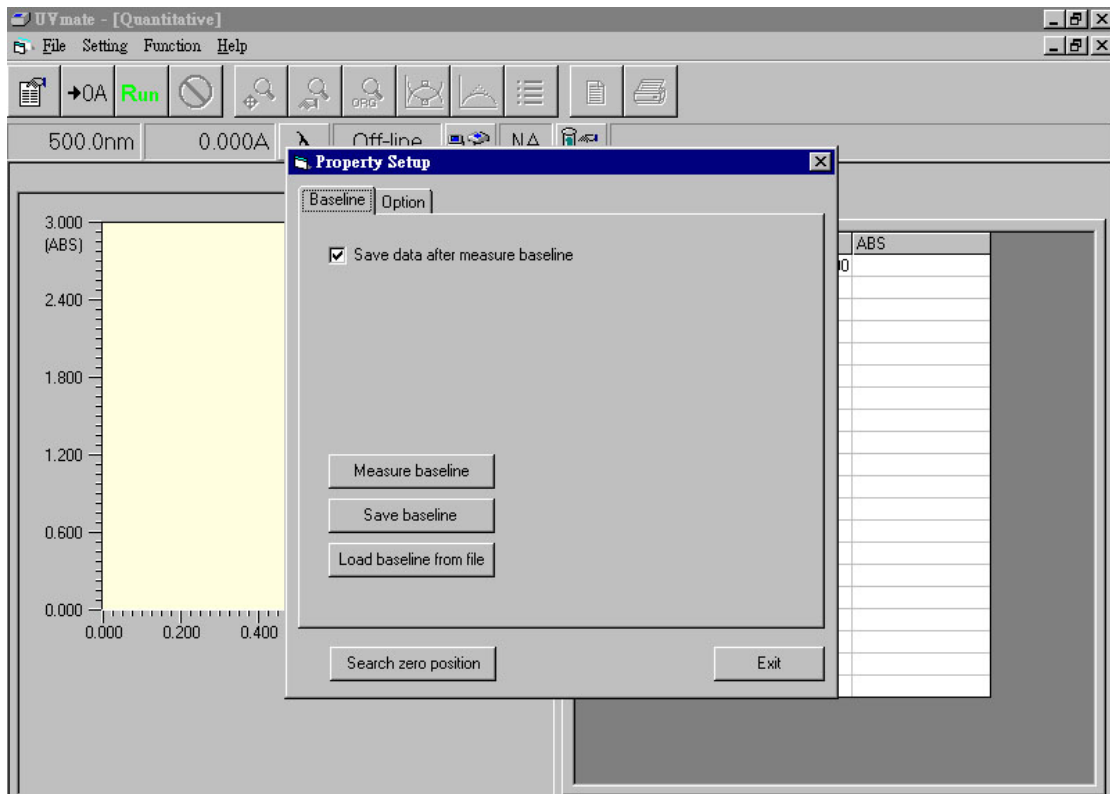


- Press icon  in the toolbar and user can preview the report for printing. In the screen, icon  can zoom in the report and icon  can zoom out the report.
- In the toolbar, press icon  to execute function of printing the report. During the printing process, the default printer will be selected by system. If there is no printer in the system, an error message will show up.
- The contents of report for Quantitative include report headers, graphs, settings of parameters, and tables for Standard data and Sampled data.

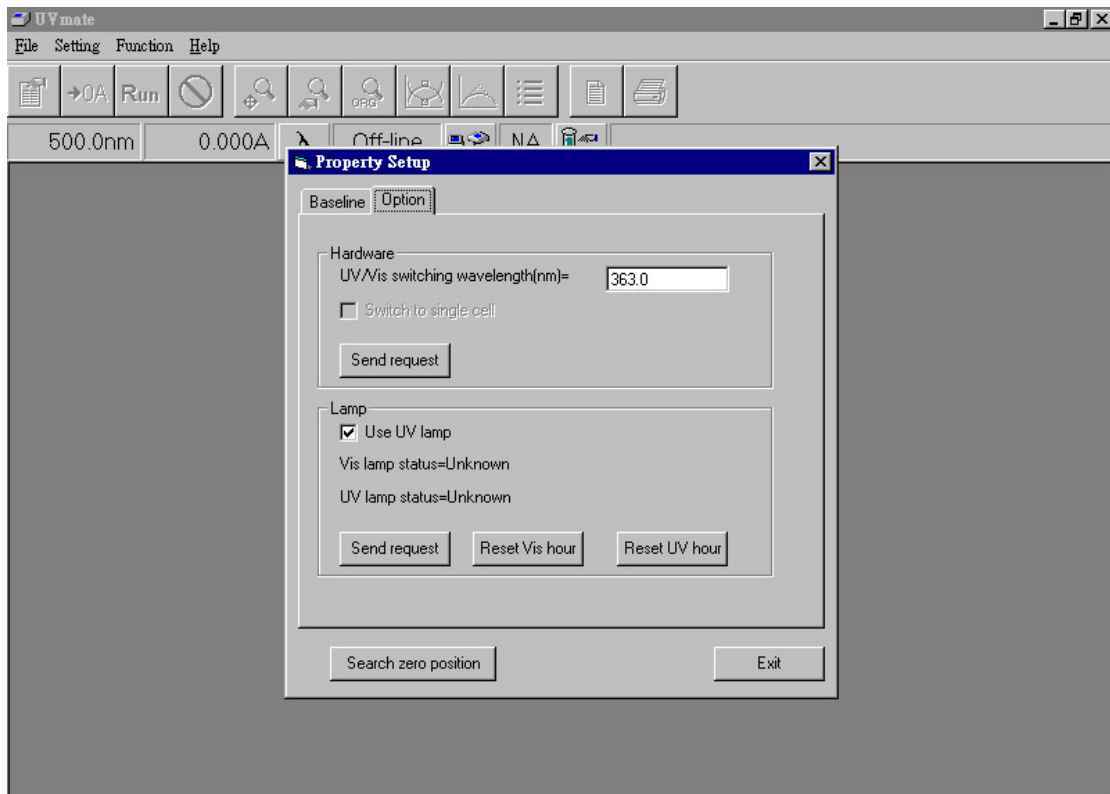


## Chapter 10 Function System Setup

1. Under 'System Setup' from 'Function' of menu bar, select 'Verify Bandwidth' and a function screen 'Verify Bandwidth' will show up.
2. In screen 'Verify Bandwidth', press icon **Run** the toolbar and this function will be executed. If the system is in the normal condition, the value of 'Bandwidth' should be  $2.0\text{nm} \pm 0.2\text{nm}$  and the value of 'Lambda(max)' should be  $656.1\text{nm} \pm 1\text{nm}$ .

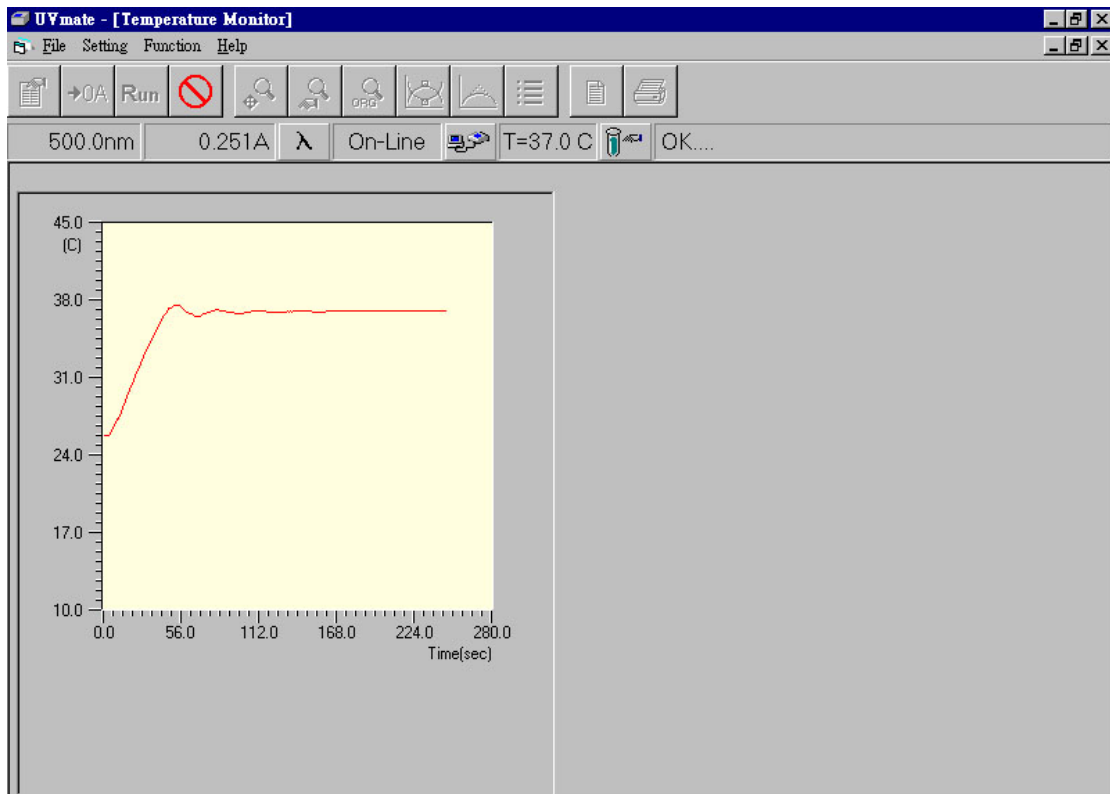



3. Under 'System Setup' from 'Function' of menu bar, select 'Property Setup' and a function screen 'Property Setup' will show up. There are two tabs for setting in this screen: Baseline and Option.
  - a. In tab 'Baseline', some explanations of this function are described below:
    - 'Save data after measure baseline' represents that data will be saved in file automatically after the measurement for Baseline.
    - Press 'Measure baseline' button and the instrument will perform measurement for Baseline. In order to get stable readings, turn on the instrument one hour before this measurement.
    - Press 'Save baseline' button and the current data of Baseline will be saved in file.
    - Press 'Load baseline from file' button and the data of Baseline in file will be read. It is useful to use this function when user can not get the correct Baseline in Spectrum function.
    - Press 'Search zero position' button and the instrument will run into the default position for optical mechanism. User can inspect a rectangular light spot in the space for cell holder.
    - Doing 'Search zero position' before 'Measure baseline' will make readings for baseline more stable.

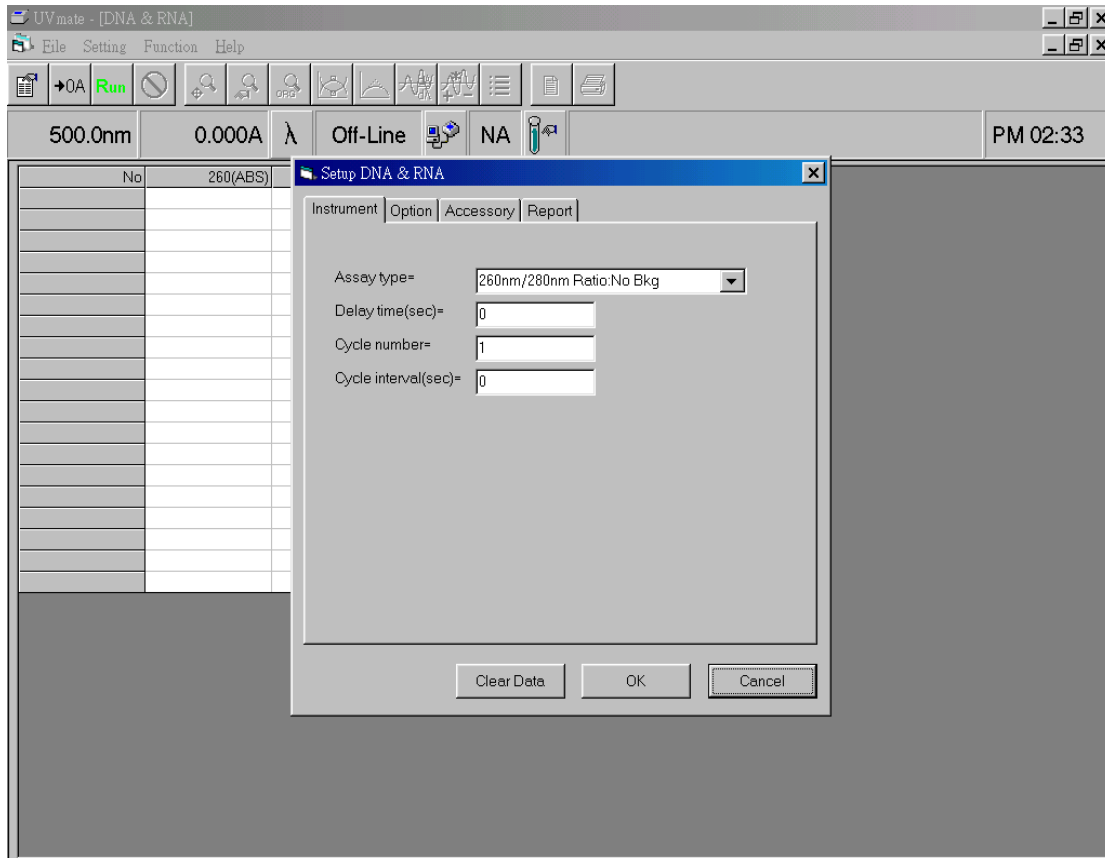


- b. In tab 'Option', some explanations of this function are described below:
- 'UV/Vis switching wavelength[nm]=' in 'Hardware' allows user to change the switching position for UV lamp and Tungsten lamp.
  - 'Switch to single cell' in 'Hardware' represents that the instrument conducts mode as in single cell when there is accessory; like Multi cell, Sipper, etc. The above requests will not be activated until 'Send request' is pressed.
  - 'Use UV lamp' in 'Lamp' is for user to choose the UV lamp of the instrument to be on or not. This request will not be activated until 'Send request' is pressed.
  - Message 'Visible lamp status = ...' in 'Lamp' represents the accumulated time being used of the current visible lamp.
  - Message 'UV lamp status = ...' in 'Lamp' represents the accumulated time being used of the current UV lamp.
  - Button 'Reset Vis hour' in 'Lamp' can set the accumulated time of the visible lamp as zero when changing the visible lamp.
  - Button 'Rest UV hour' in 'Lamp' can set the accumulated time of the UV lamp as zero when changing the UV lamp.

- When the dialog box of 'System Setup' activated, the usage time of lamps will be read once. If user wants to observe the usage time of lamps later, 'Send request' in 'Lamp' should be pressed again for a newly accumulated usage time.



4. Under 'System Setup' from 'Function' of menu bar, select 'Temperature Monitor' and a function screen 'Temperature Monitor' will show up. This function screen allows user to monitor how long it takes for the instrument to get the stable temperature when user changes the setting for temperature control.
5. In the screen, press icon  the toolbar and it will take records of temperature for about 280 seconds.



## Chapter 11 Function Applications – DNA\_RNA

1. Select 'DNA\_RNA' in 'Applications' and a function screen 'DNA & RNA' will show up. A dialog box of 'Setup DNA & RNA' also shows up. Press 'OK' after setting to execute the program according to new parameters. Or press 'Cancel' to cancel settings and the program runs according to old parameters. There are four tabs for setting in this screen: Instrument, Option, Accessory, and Report.
    - a. Tab 'Instrument' refers to basic parameters in this application. More details are described below:
      - In 'Assay type', there are five choices. They are:
        - 260nm/280nm Ratio:No Bkg
        - 260nm/280nm Ratio:Bkg=320nm
        - 230nm/260nm Ratio:Bkg=320nm
        - Warburg-Christian Concentration
        - General Ratio and Concentration
- In 'Warburg-Christian Concentration', the formula for calculating concentrations of 'Protein' and 'Nucleic Acid' are defined according to Warburg-Christian algorithms as shown in the screen.
- In 'General Ratio and Concentration', user can determine all necessary

values for wavelengths and coefficients to set up special formula for calculating concentrations of 'Protein' and 'Nucleic Acid'.

- 'Delay time(sec)' represents the delay time before taking readings.
- 'Cycle number' sets up total number of cycle for measurements.
- 'Cycle interval(sec)' defines the interval of time every cycle.

b. Tab 'Option' and 'Accessory' are not available in this application.

c. 'Report' is to set up options for printing reports in this application.






- 'Laboratory' is for input of user's company or name of laboratory.
- 'Subject' is for input of subject of this experiment.
- 'Operator' is for input of user's name or comprehensive code.
- 'Remark' is for input of relative remarks.
- 'Print present date' will print the current date in computer.
- 'Print page number' will print the page number for each page.
- 'Print parameter setup' will print all settings for parameters.
- 'Print selected data' will print selected data of readings (marked with 'v').

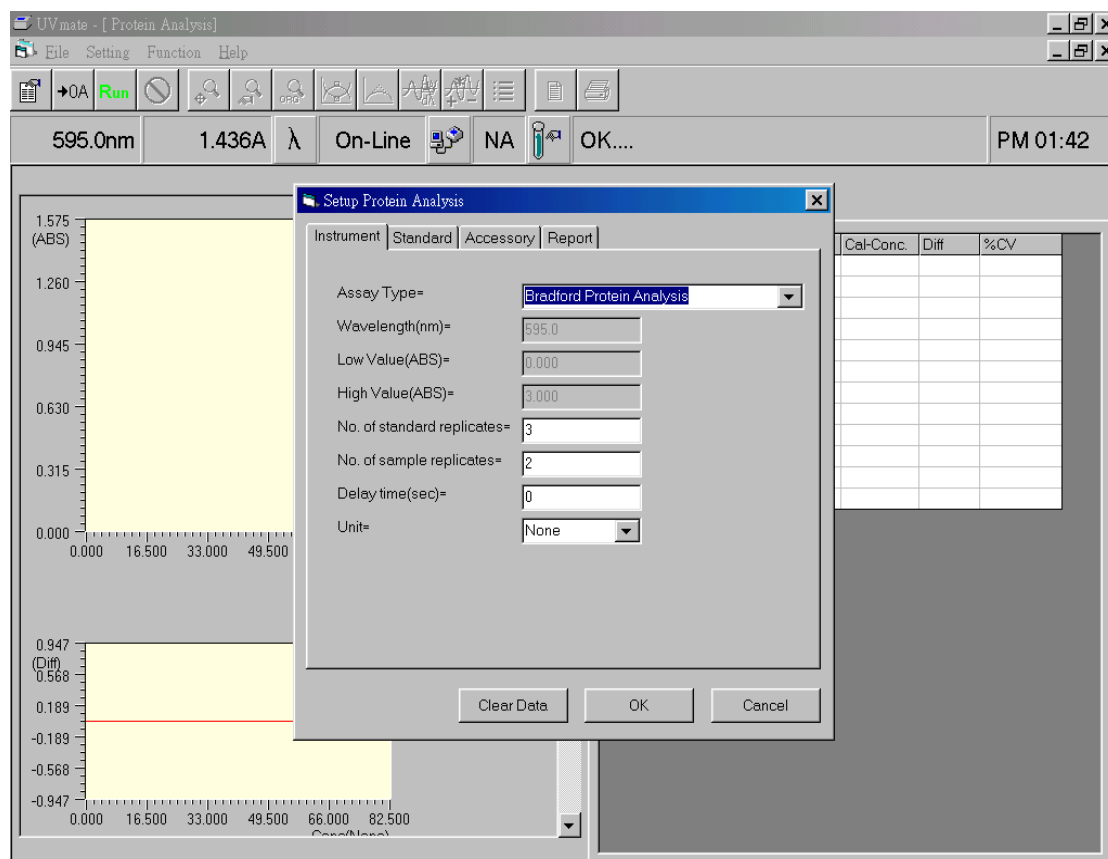
UVmate - [DNA & RNA]

File Setting Function Help

320.0nm 0.085A λ On-Line NA OK. AM 11:16

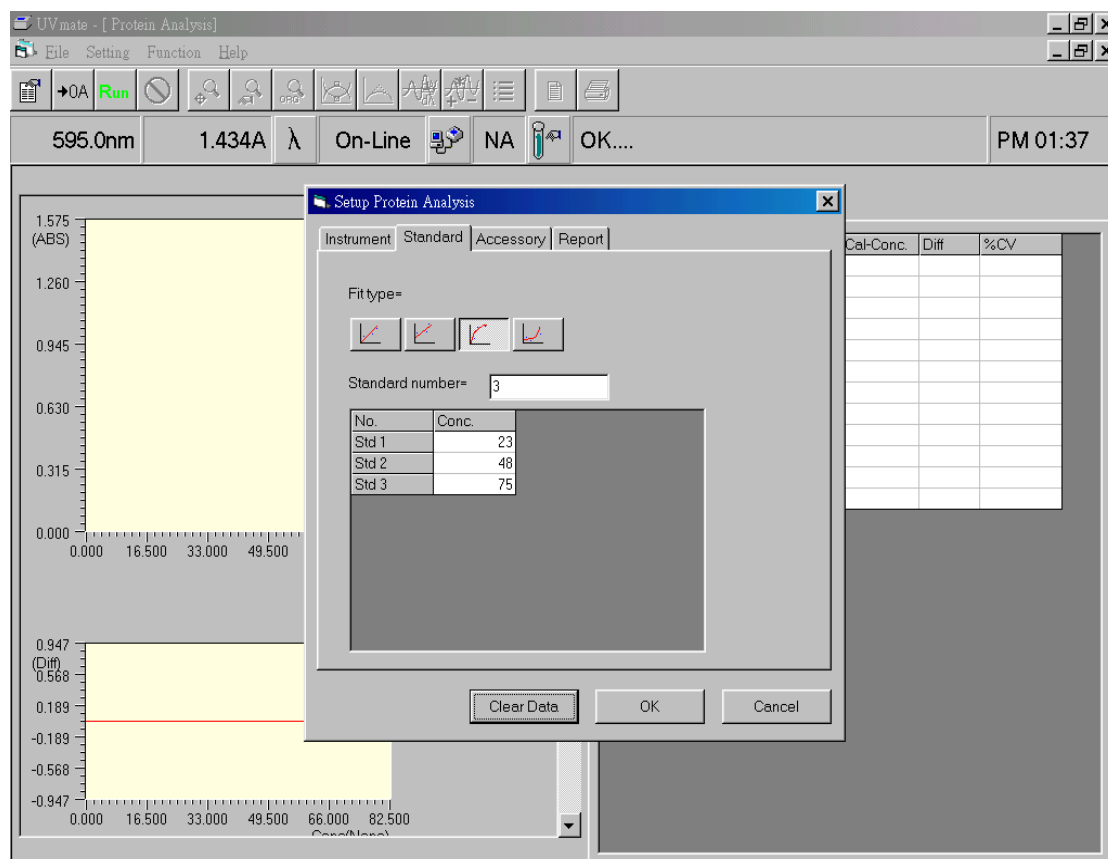
No	260(ABS)	280(ABS)	Bkg(ABS)	260/280	280/260
1 Z v	0.000	0.000	0.000		
2 v	0.419	0.267	0.085	1.8352	0.5449
3 v	0.419	0.271	0.085	1.7957	0.5569
4 v	0.418	0.267	0.085	1.8297	0.5465
5 v	0.418	0.266	0.085	1.8398	0.5435
6 v	0.418	0.267	0.085	1.8297	0.5465
7 v	0.418	0.267	0.085	1.8297	0.5465
8 Z v	0.000	0.000	0.000		
9 v	0.419	0.271	0.085	1.7957	0.5569
10 v	0.419	0.268	0.085	1.8251	0.5479
11 v	0.419	0.267	0.085	1.8352	0.5449

- After setting up parameters for application DNA\_RNA, press icon  in the toolbar and program will start reading datum. In the table, readings and results of calculation will show up accordingly. Symbol 'v' after serial numbers in table means that the data will be printed in report. If user doesn't want the data in the report, please click left button of mouse in that field and the symbol will change into 'x'.
- Press icon  in the toolbar and user can preview the report for printing. In the screen, icon  can zoom in the report and icon  can zoom out the report.
- In the toolbar, press icon  to execute function of printing the report. During the printing process, the default printer will be selected by system. If there is no printer in the system, an error message will show up.
- The contents of report for application DNA\_RNA include report headers, settings of parameters, and selected readings with results of calculation.



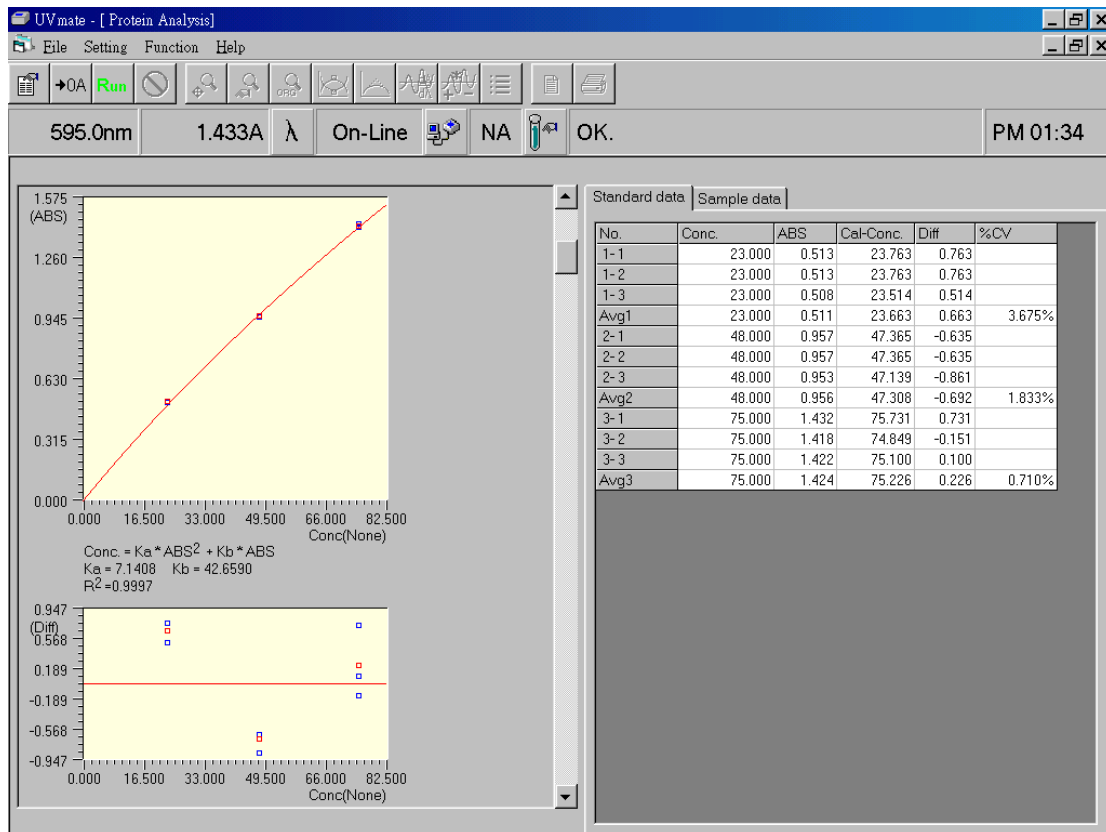
## Chapter 12 Function Applications-Protein Analysis


1. Select 'Protein Analysis' in 'Applications' and a function screen 'Protein Analysis' will show up. A dialog box of 'Setup Protein Analysis' also shows up. Press 'OK' after setting to execute the program according to new parameters. Or press 'Cancel' to cancel settings and the program runs according to old parameters. There are four tabs for setting in this screen: Instrument, Option, Accessory, and Report.
  - a. Tab 'Instrument' refers to basic parameters in this application. More details are described below:
    - In 'Assay type', there are seven choices:
      - Bradford Protein Analysis
      - Lowry Protein Analysis-High Sensitivity
      - Lowry Protein Analysis-Low Sensitivity
      - Biuret protein Analysis
      - Direct UV Method
      - Colloidal Gold
      - Bicinchoninate(BCA)
    - 'No of standard replicates' represents the standard solution number for

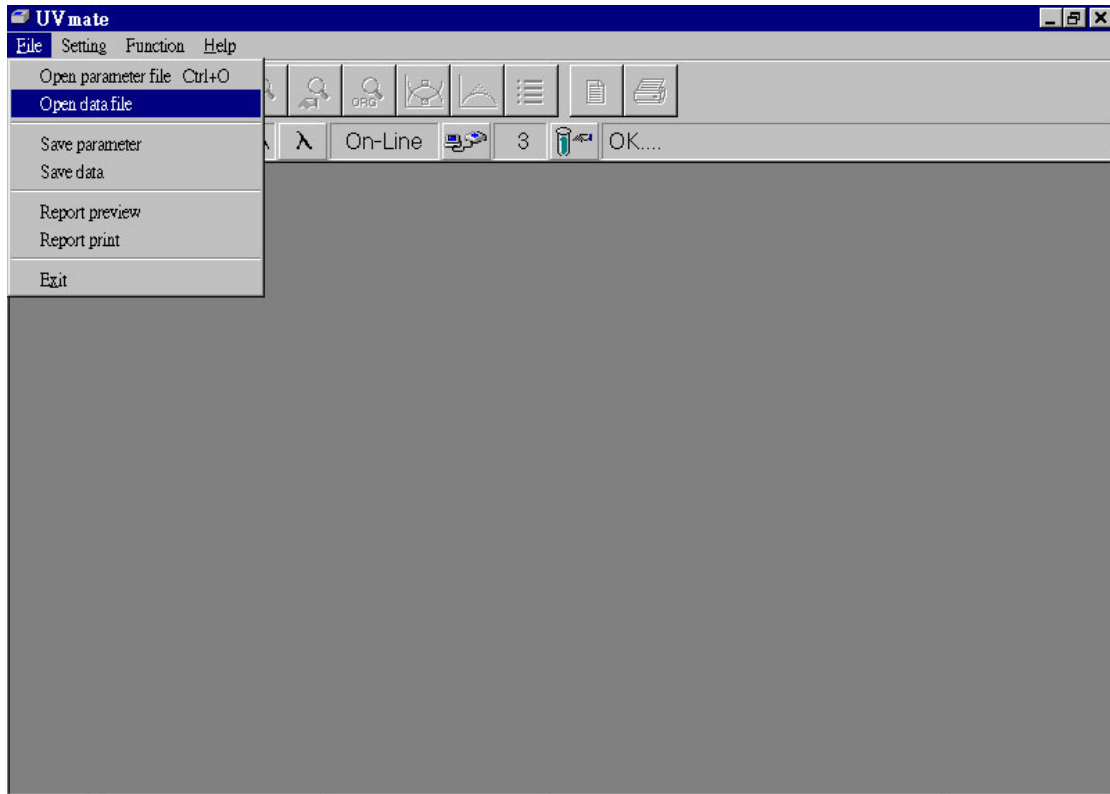


known concentration.

- 'No of sample replicates' represents the sample solution number for unknown concentration.
  - 'Delay time(sec)' represents the delay time before taking readings.
  - 'Unit' represents concentration unit applied, totally there are 15 units available.
- b. Tab 'Standard' is for setting up standard solution. Details are described below.
- Four fit types for user to choose; from left to right, 1<sup>st</sup> order equation passing origin, 1<sup>st</sup> order equation without passing origin, 2<sup>nd</sup> order equation passing origin, and 2<sup>nd</sup> order equation without passing origin.
  - 'Standard number' is for user to input number of standards.
  - Followed by above selections, user will key in proper values for standards.
- c. Tab 'Accessory' is not available in this application.
- d. Tab 'Report' is to set up options for printing reports in this application. Please follow explanations in previous chapter.

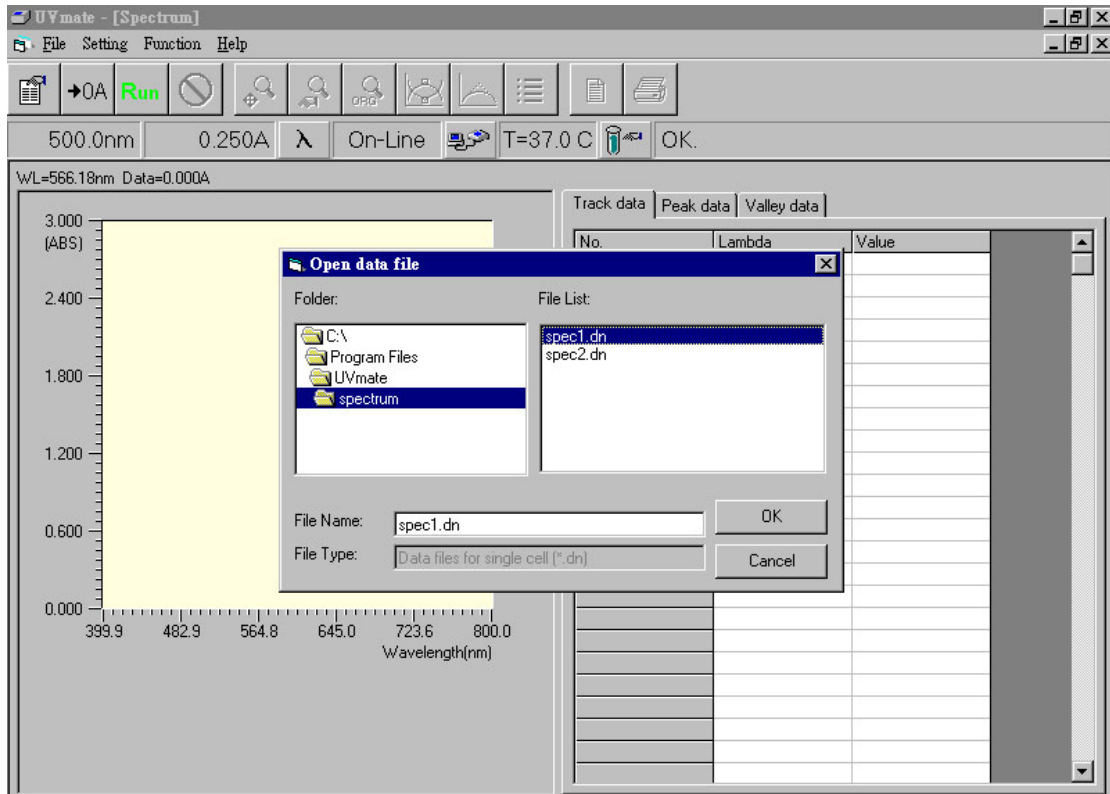


2. After setting up parameters for protein analysis, press icon  the toolbar and program will start reading standard. In the standard table, readings and results of calculation will show up accordingly.
3. Three types of calculations are done. They are concentration obtained from fitted equation(Cal-Conc), difference between Cal-Conc and input concentration(Diff), and coefficient of variance from Cal-Conc(CV) for standard replicates greater than 2.
4. Two colors in the drawings distinguish between individual data(blue) and average data(red).



## Chapter 13 Other Functions

1. Choose 'Open parameter file' from 'File' of menu bar and a dialog box of 'Open parameter file' shows up. User can select a parameter file in this screen. The file includes all setting values for a function in a specific experiment.
2. Choose 'Open data file' from 'File' of menu bar and a dialog box of 'Open data file' shows up. User can select the needed data file in this screen. The file includes all setting values for a function and data in a specific experiment.
3. Choose 'Save parameter file' from 'File' of menu bar and it will save all setting values for a function in the experiment.
4. Choose 'Save data file' from 'File' of menu bar and it will save all setting values and data in a file.



5. Open a file and the corresponding screen for the function will also be activated. If the file is damaged or incorrect, then the file won't be opened.
6. In 'File format': there are six different extension name described below:
  - '\*.pn' means parameter file for Single cell (or plus TC).
  - '\*.pm' means parameter file for Multi cell.
  - '\*.ps' means parameter file for Sipper (or plus TC).
  - '\*.dn' means data file for Single cell (or plus TC).
  - '\*.dm' means data file for Multi cell.
  - '\*.ds' means data file for Sipper (or plus TC).
7. Only those files matching the accessory with the instrument can be opened.
8. The exported Excel files (\*.xls) are stored in the same directory as above. Users must go into this directory to open it for further operation.

## **APPENDIX A**

### **- UV mate Installation and Operation -**

#### 1. PC system requirement

- CPU model need be newer than Pentium-100, equipped with CD driver.
- Microsoft Windows 98(SE) or XP.
- With minimum 12M RAM and 20Mbytes free space of hard disc drive.
- Video card capable supporting 800X600 pixels and 16 bit(Hi color) color resolution at least.
- Mouse, keypad, one serial communication port(COM 2) for RS232 and one 9-pin connector( one female end, one male end; all 9 pins on both ends are well soldered).

#### 2. About the CD-ROM

- There is one CD-ROM accompany with SP8001 machine for a PC control model you have already purchased.
- An executable program "UV mate", is written on CD-ROM. "UV mate" is the main execution program for PC control model and need be resided on PC hard disc.

#### 3. UV mate installation

- Select the installation program "Setup.exe" under the "UV mate" directory, and make execution.
- Please follow instructions to complete the installation work. A program "Uvmate.exe" will be generated under C:\program files\Uvmate directory. Also there is a data folder generated for data collection, and a few sample files are stored inside. They can be operated even PC is not online with SP8001 machine.

#### 4. Online operation

- Make sure 9-pin connector is plugged on the RS-232 output of SP8001 and COM 2 of PC.
- Switching a standard alone SP8001 machine to PC controlled machine(or vice versa) by pressing ESC key and powering on Sp8001, then releasing ESC key after hearing two beep sounds. On the bottom line of the LCD screen, you will find a change from "Version x.x" to "Version x.x for PC"( or vice versa). After around 30 seconds, a message " Waiting for connecting...." will be shown on the LCD display of SP8001. It tells the machine has finished initialization work and

waiting for PC online connection.

-Go to Program Files of Windows Xp or 98, you will find "Metertech" file. Click "Uv mate" under it, PC will start running "Uvmate.exe" program.

-There is a small window titled "COM PORT SETTING" on the main window.

The connecting port was preset at COM2. You can select any com port matching the one you connect your 9-pin connector on to.

-Click button "Port Open", a status message "Off-line" will change to "On-line".

This means PC is successfully in communication with SP8001.

5. Once PC is on-line with SP8001 machine, the system parameters in the SP8001 need be transferred and saved in PC by the following procedure. Go to "System Setup" from "Function" of menu bar and select "Property Setup". A function screen "Property Setup" will show up, then press "Measure baseline" button. After completing this measurement, press "Save baseline".

**For a SP8001 machine being first time connected to a PC, the above action is required. Without doing that, the UVmate can not get proper measurement.** The next time after powering on the same machine again, you do not need to repeat again unless you really want measure baseline.

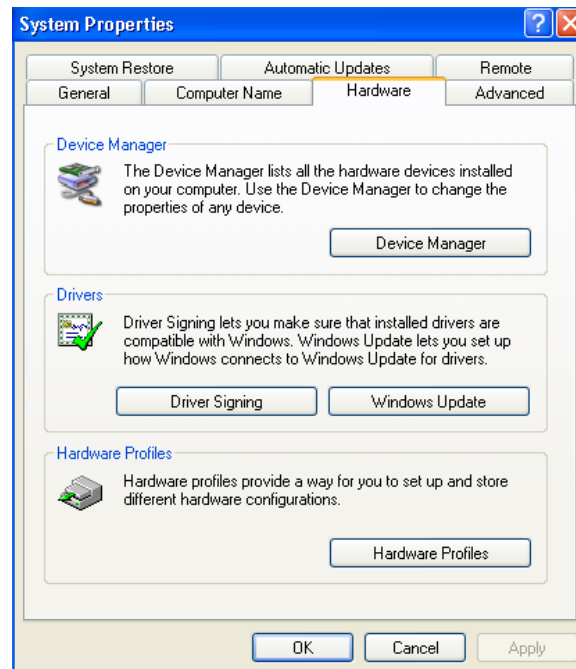
## APPENDIX B

### - Setting of USB Serial Port -

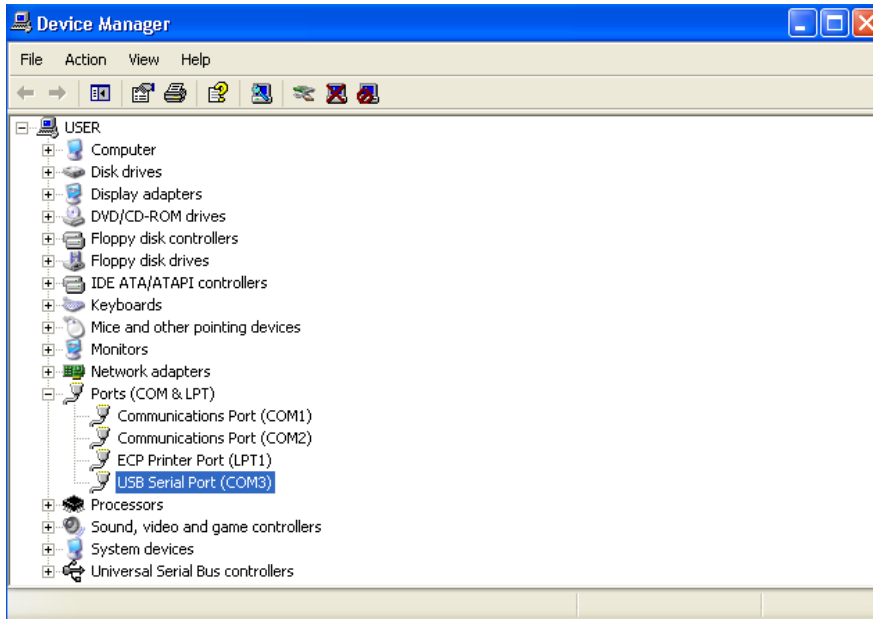
If your Windows(XP/98SE) PC has USB ports only, please install the attached USB to RS232 driver on PC. Connecting the USB to RS232 cable between PC and the machine, then power it up. Please set up your Windows(XP) computer as follow.

Under '**Systems Tasks**' of '**My Computer**' screen, press '**View system information**'. In System Properties, select icon '**Hardware**' and press button '**Device Manager**'(figure B-1).

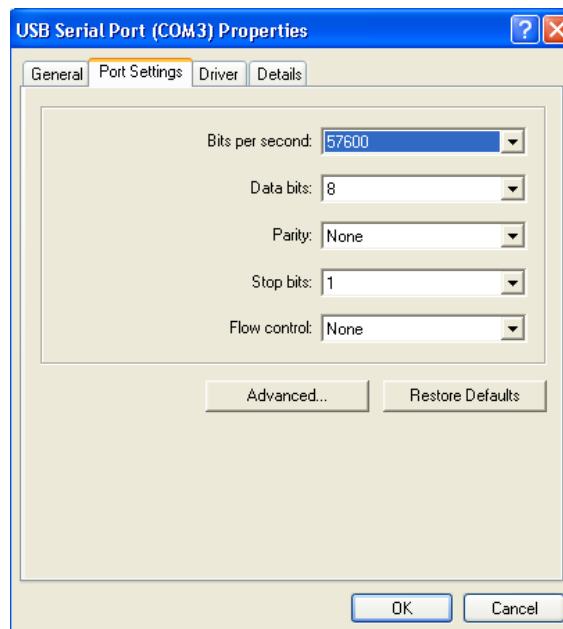
In Device Manager, double click '**USB Serial Port**'(figure B-2) to enter port setting(figure B-3). Please remember the com-port number for further use in appendix A. Fill in '**57600,8,None,1,None**' in those blanks. Press button '**Advanced..**' to enter advanced COM setting(figure B-4). USB transfer size is to be selected as max number(4096). Latency timer is to be smallest number(1)



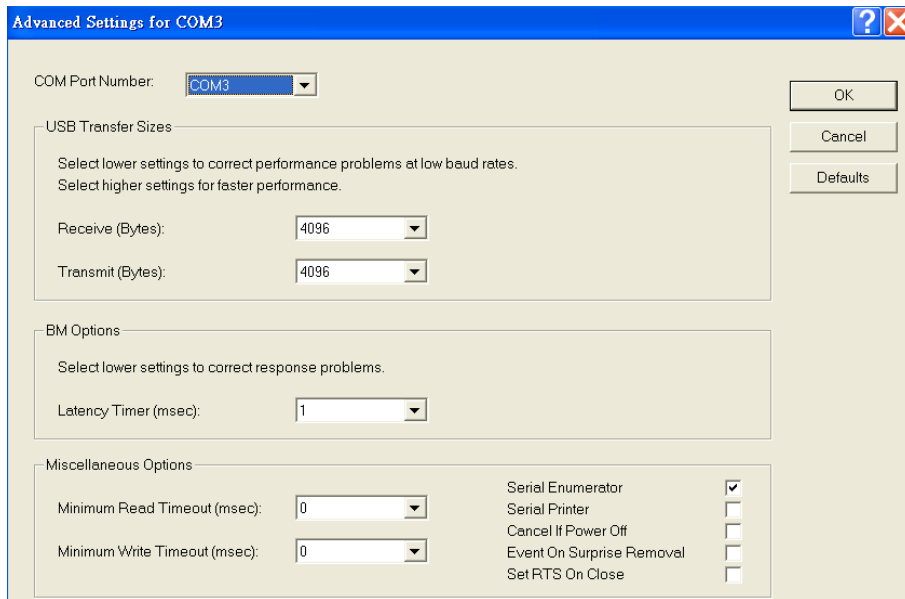
(Figure B-1)



(Figure B-2)



(Figure B-3)



(Figure B-4)