Instruction manual

VWR® V-3000PC Spectrophotometer

EU cat. no 634-6040

Version 02 Issue 10/2021

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Table of Contents

Part 1: Spectrophotometer 1

- Safety Information 1
- Package Contents 2
- Unpacking 2
- Installation 2
- Symbols and Conventions 3
- Specifications 3
- Overview 4
- Description of Buttons and Switches 5
- Operational Keys 6
- Getting Started 8
- Important Guidelines 9
- General Operating Instructions 10
- Operation 12
- Troubleshooting 35
- Repair and Maintenance 36
- Accessories and Spare Parts 42
- Technical Service 43
- Warranty 44
- Equipment Disposal 45

Part 2： Software 46

- Functions 46
- Installation 48
- Introduction 51
- Operation 56
- Appendix 1 76

Part 1: Spectrophotometer

Safety Information

Please follow the guidelines below, and read this manual in its entirety to ensure safe operation of the unit.

VWR recommends against the use of UV-3100PC Spectrophotometer.



- Do not open the device.
- Disconnect the device from the mains supply before carrying out maintenance work or changing the fuses.
- The inside of the device is a high-voltage area Danger!
- Do not use the device if it is damaged, especially if the main power cable is in any way damaged or defective.
- Repairs may only be carried out by the service technicians from your local VWR office and authorized contractual partners.
- The device must be connected to a power outlet that has a protective ground connection.
- If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.



- Do not allow any liquid to enter into the device.
- Do not operate the device in a hazardous location or potentially explosive environment.

Package Contents

Description	Quantity
Spectrophotometer	1PC
Glass Cuvette	4PCS
USB Disk	1PC
Power Cord (Euro Plug)	1PC
Power Cord (UK Plug)	1PC
Power Cord (CH Plug)	1PC
USB Cable	1PC
CD-ROM	1PC
Quick Manual	1PC
Instruction Manual	1PC
Dust Cover	1PC

Unpacking

Open the package, according to carefully check the packaging packing list items, if found inside the packaging are missing or damaged items please contact your local VWR office and authorized contractual partners.

Installation

Placement

Place the instrument on the stable table carefully.

Install printer (Optional)

Check to confirm instrument power switch is turned off, connect the printer's data cable to the Instrument's parallel port.

Link the power cord

Check to confirm instrument power switch is turned off, the power cord plug into two separate power interface and power supply socket apparatus.

Symbols and Conventions

The following chart is an illustrated glossary of the symbols that are used in this manual.

	**CAUTION** This symbol indicates a potential risk and alerts you to proceed with caution
	**CAUTION** This symbol indicates the presence of high voltage and warns the user to proceed with caution
	**CAUTION** This symbol indicates risks associated with hot surfaces

Specifications

Optical System	Single Beam
Wavelength Range	320-1100nm
Band Width	4nm
Stray Light	≤0.05%T @ 360nm
Photometric Range	0 to 200%T,-0.3 to 3.0A, 0 to 9999C
Wavelength Accuracy	±0.5nm
Photometric Accuracy	±0.5%T or ±0.005A@1A
Baseline	0.002A (320 to 1000nm)
Stability	0.002A/h @ 500nm

Memory	32K(internal), Unlimited(USB Disk)
Language	English, French, German, Spanish
Display	320×240 Dots Matrix LCD
Interface	USB, Parallel
Measuring Procedure	Photometry, Quantitation, Wavelength Scan, Kinetics, DNA/Protein, Multi-wavelength
Power Supply	AC 110/220V, 50/60Hz
Dimension	490×360×240mm
Weight	12kg
Work Environment	15 to 35℃, 15 to 70% relative humidity
Store Environment	-10 to 50℃, 15 to 70% relative humidity

This instrument is compliant to the European Directives on
Low Voltage Directive 2014/35/EU
Electromagnetic compatibility 2014/30/EU
Restriction on use of Hazardous Substances RoHS 2011/65/EU
and theirs amandements.

Overview

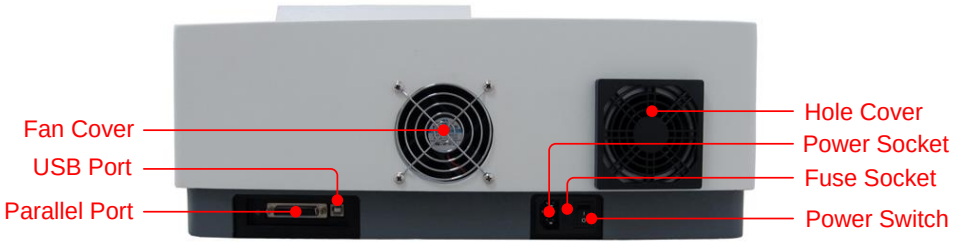
V-3000PC Spectrophotometer used in Chemistry, Pharmaceuticals, Biochemical, Metallurgy, Light Industry, Textile, Material, Environments, Medical, Education and some other fields for Quality Control laboratories.

Description of Buttons and Switches

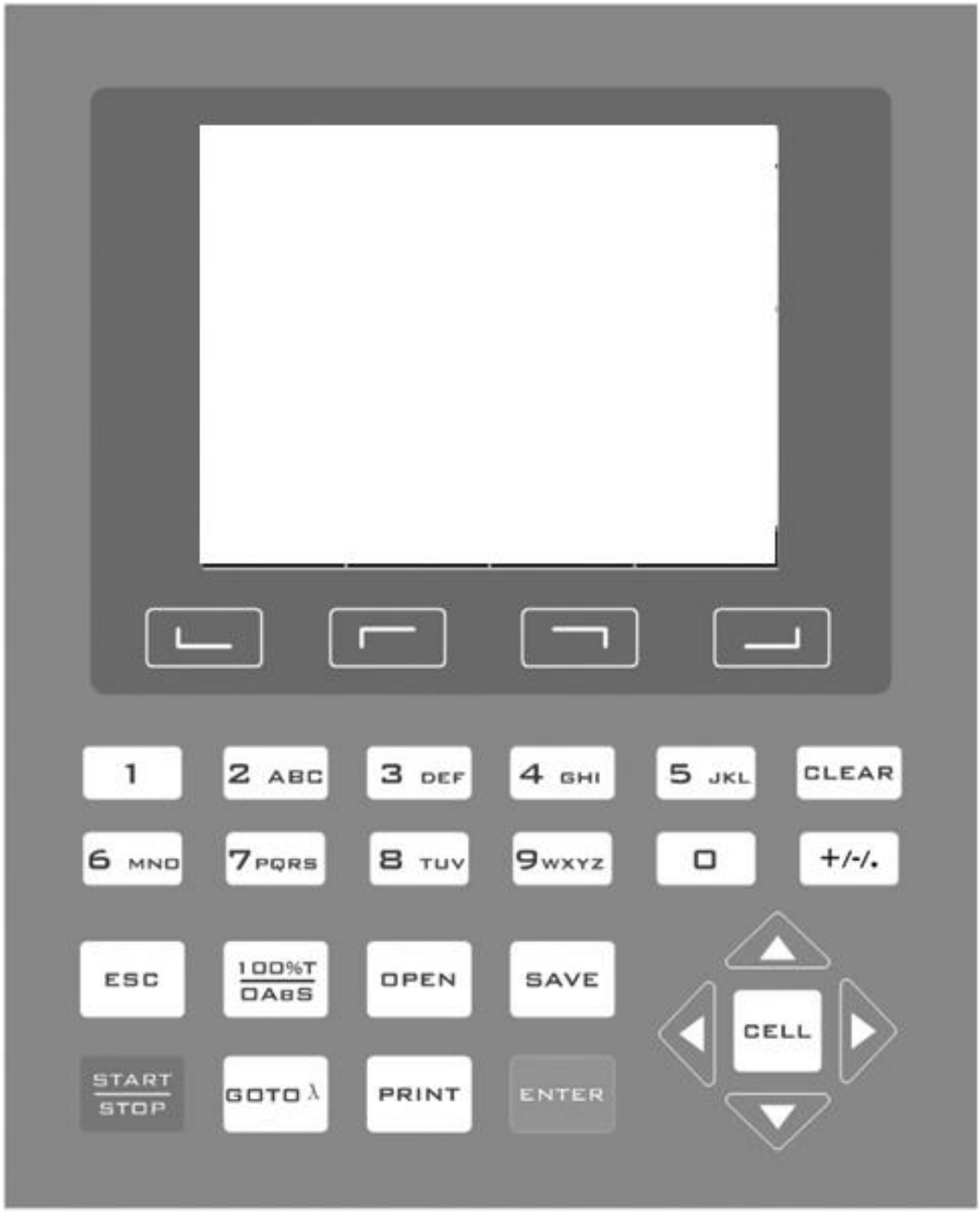
Front View

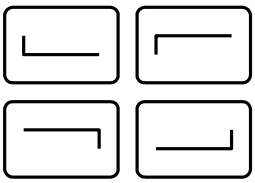
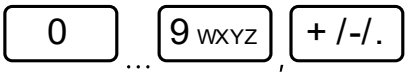
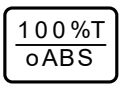


Rear View



Operational Keys



Key	Functions
	Function Keys: Functions on-screen prompts
	Numeric Keys: Enter numbers and letters
	CLEAR Key: Delete the input value or stored data
	ESC Key: Return to previous Interface
	100%T/0Abs Key: Blank
	OPEN Key: Open files stored in internal memory
	SAVE Key: Save files to internal memory
	START/STOP Key: Start/Stop testing
	GOTO λ Key: Set wavelength

PRINT

PRINT Key: Print measuring result

ENTER

ENTER Key: Confirm operation

CELL

CELL Key: Select/Deselect Auto-cell Holder

, RIGHT, LEFT Keys: Search peak/valley and set X scale

, UP, DOWN Keys: Scroll menu/data and set Y scale

Getting Started

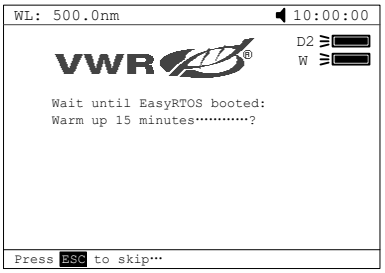
The following chart describes the basic operation of the instrument.

Turn On and Self-check

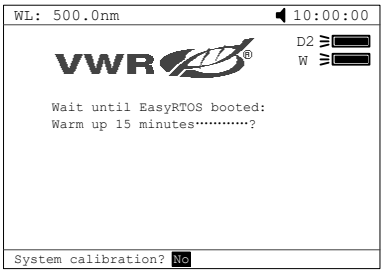
Switch on the power. Then the instrument begins to self-check and 15 minutes' warm up. Self-check includes the following steps:

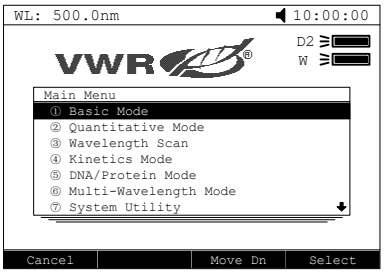


Turn on lamps →RAM Check→ Start RTOS kernel→ Initialize Comm. Port → Initialize Printer → Initialize AD → System position → Warm up.



After warm up, the instrument will ask the user to re-calibrate the system. Users can decide if they need to re-calibrate the system or not. After this step, the instrument can work normally.





Important Guidelines

- Reagents and dilution buffers can cause cauterization and other damage to health.
- Samples (nucleic acids, proteins, bacteria cultures) can be infectious and cause serious damage to health.
- During sample preparation, measuring procedures and maintenance and

cleaning work, observe all local laboratory safety precautions (e.g. wear protective clothing and gloves, use of disinfectant) regarding the handling of sample material.

- Dispose of measuring solutions and cleaning and disinfectant materials in accordance with the relevant local laboratory regulations.

General Operating Instructions

Select Application

Main menu, press numeric keys or use the key ▲, ▼ to choose corresponding menu, then press ENTER to enter into.

Set Wavelength

Press GOTO λ to set wavelength, use numeric keys to input the values, press ENTER to confirm and go to the point you set, then do blank automatically.

Set Parameters

In different application, press function key to set parameters, press ▲, ▼ to choose or input the values by numeric keys, press ENTER to enter into, press ESC to return.

Set Auto-cell Holder

Press CELL to active the auto cell holder and press the numeric key (1-8)to make corresponding cell position at the light path. Press CELL again to inactive the auto cell holder.

Delete the Input Value

Press ◀ to delete a character, press CLEAR to delete all the characters.

Delete the Test Results and Stored data

Press CLEAR to delete the test result or stored data. If the USB Disk was installed, the data will delete in the USB Disk, or the data will delete in the internal memory.

Blank

Put the Reference in the light path, press 100%T/oABS to do blank.

Measure Samples

Put the samples in the light path, press START/STOP to measure.

Print the Test Results

Press PRINT to print the test results.

Store the Test Results

Press SAVE to store the test results, input the file name by numeric keys and press ENTER to save. If the USB Disk was installed, the data will save in the USB Disk, or the data will save in the internal memory.

Load the Stored File

In the test interface, press [OPEN] to go into file selecting interface, press ▲, ▼ to choose the file you want, press [ENTER] to open. If the USB Disk was installed, the data will open from the USB Disk, or the data will open from the internal memory.

Operation

Self-check

Remove all the blocks in the light path and close the lid of the compartment; Switch on the power supply to begin the self-test.

Warm up

After self-test, the instrument goes into pre-warm state. For accurate test, at least 30 minutes of warm up is required.

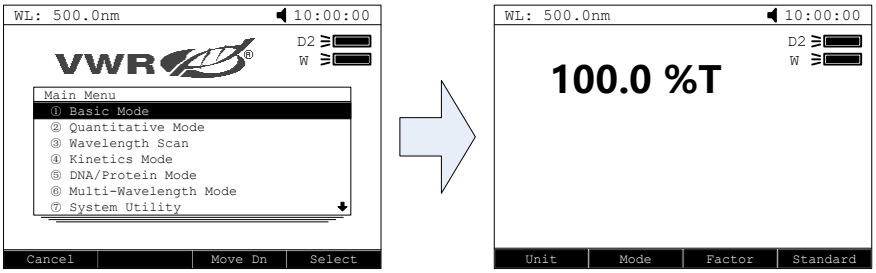
Check the cuvettes

The cuvettes must be clear and there's no remains of the samples on the surface of it. Only Silicon (Quartz) cuvettes are permitted to be used in the range of UV area.

Basic Mode

1. Enter into Basic Mode

Main menu, press numeric key [1] or ▲, ▼ to choose "Basic Mode", then press [ENTER] to go into.



2. Set Photometric Mode

Press [ ] to set photometric mode. Press ▲, ▼ to choose "Abs.", "T%" or "Conc./Factor" and press [ENTER] to confirm. If users choose "Abs." or "T%", please go to step 5 directly.

3. Set Concentration Unit

Press [ ] to set concentration unit. Press ▲, ▼ to choose unit followed with [ENTER] pressed to confirm. You can also choose "other" to input the self defined unit.

4. Set "Factor" or "Standard"

Two methods are under your choice:

Method 1: Input Factor F

Press [ ] to set F. Input the value of F by numeric keypad, press [ENTER] to confirm. Then the F value would display on the screen.

Method 2: Standards Mark

Put the reference sample in the light path and calibrate 100%T/0Abs; Put the standard sample in the light path, press [ ] to start the mark. Input the concentration value of the standard and press [ENTER] to confirm, then it displays on the screen.

5. Set Wavelength

Press [GOTO λ] to set wavelength, input the value by the numeric keypad followed with [ENTER] pressed to confirm.

6. Blank

Put the Reference in the light path and press [100%T oABS] to do blank.

7. Measurement samples

Put the sample to be measured in the light path, then the result displays on the screen automatically.

8. Print the Test Results

Press [PRINT] to print the Test Results.

```
Basic Mode Test Report

Wavelength:    500.0nm
Result:        0.000 Abs
Date & Time:  mm-dd-yyyy, hh:mm:ss

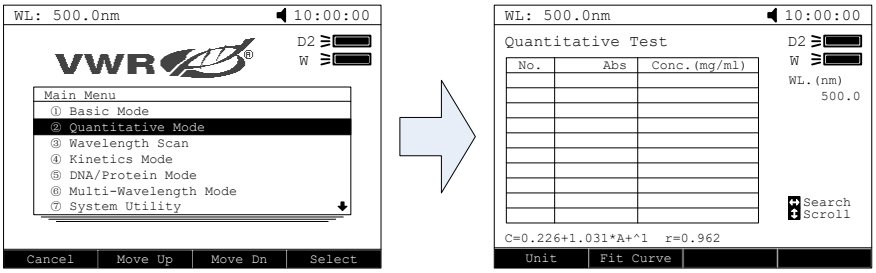
Model:         V-3000PC
SN:            UEFXXXXXXX
Version:       A1.176
VWR International bvba.
```

Quantitative Mode

1. Enter into Quantitative Mode

Main menu, press [2 ABC] or press ▲, ▼ to choose "Quantitative Mode" followed

with ENTER pressed to confirm.

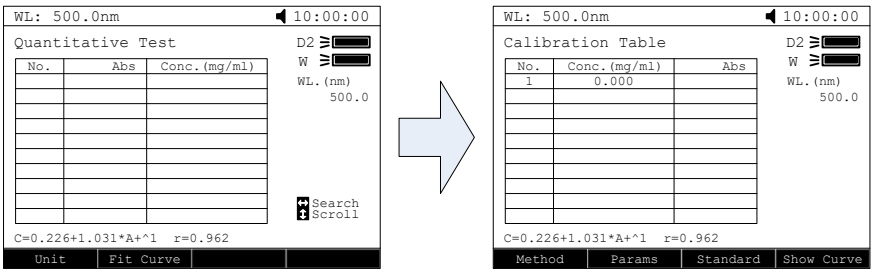


2. Set Unit

Press ⌙ to set concentration unit, press ▲, ▼ to choose and press ENTER to confirm.

3. Set up Standard Curve or load the stored curves

Press ⌐ to go into set up interface, 2 methods are under your choice.



Set up Standard Curve:

Method 1: Input Regression Equation

1) **Set Fit Curve Method.** Press ⌙ to set Fit method, use ▲, ▼ to choose the method and press ENTER to confirm.

2) **Set Wavelength.** Press GOTO λ to set wavelength. Use ▲, ▼ to choose measure method, then press ENTER to confirm. Input the wavelength value you need and press ENTER to confirm.

3) **Input the Factor of the Regression Equation.** Press ⌐ and input the factors, press ENTER to confirm.

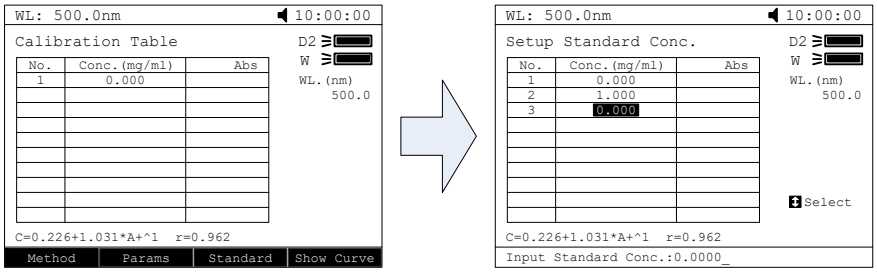
Method 2: Use Standard Samples

1) **Set Fit Method.** Press ⌙ to set fit method, press ▲, ▼ to choose fit method, then press ENTER to confirm.

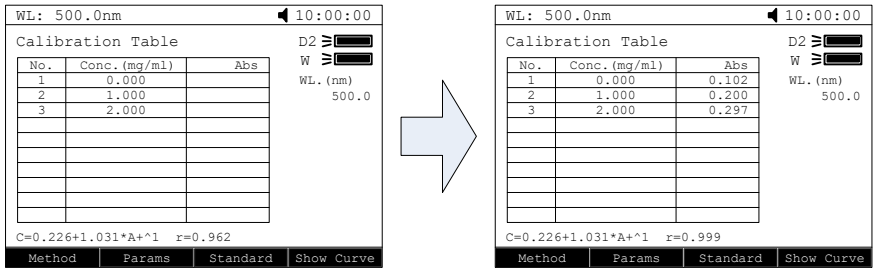
2) **Set Wavelength.** Press GOTO λ to go into wavelength setting interface, press ▲, ▼ to select measure method and press ENTER to confirm. Input the value of the wavelength and press ENTER to confirm.

3) **Blank.** Put the Reference Sample in the light path and press 100%T/oABS to do blank.

4) **Setup Standard Samples.** Press ¬ to setup standard, input the concentrations of corresponding standard samples according the indication and press ENTER to confirm. Users can use ▲, ▼ to choose the value you just input and press CLEAR to delete, then input a new value, press ENTER to confirm. Press ESC to cancel after all the input.

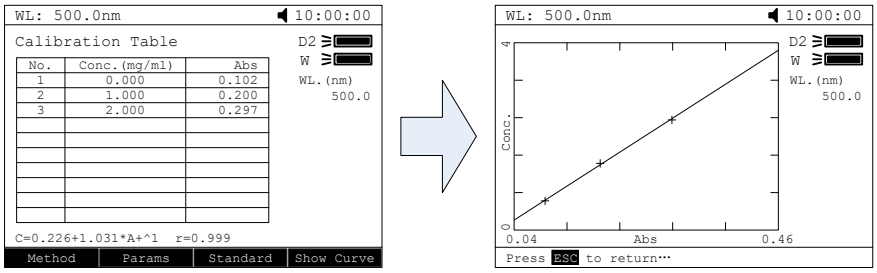


5) **Calibrate Standard Samples.** Put the corresponding standard samples in the light path as the screen indicates and press START STOP to measure. Then the Abs. value would appear in the corresponding table.



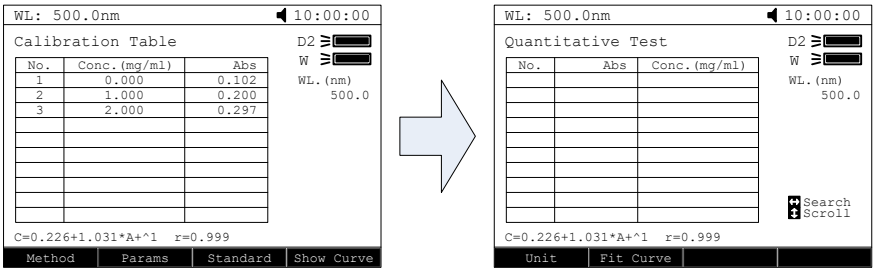
Load the Stored Curves

In the "Calibration Table" interface, press OPEN to go into files select interface. Use ▲, ▼ to select the curve you need and press ENTER to load. Users can press ↵ to view the curve, press ESC to cancel.



4. Return the sample measurement interface

In the "Calibration Table" interface, press ESC to return the Quantitative Test interface.

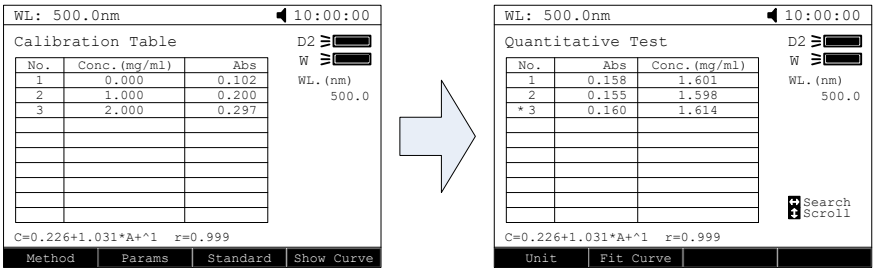


5. Blank

Put the Reference Sample in the light path, press 100%T/0ABS to do blank.

6. Measure Samples

Place the sample to be tested in the light path, press START/STOP to measure. Then the test result will display in the data sheet. Repeat this step to finish measuring all the samples.



7. Print the Test Results

Press PRINT to print the Test Results.

Quantitative Test Report

File Name: Abc
Date & Time: mm-dd-yyyy, hh:mm:ss

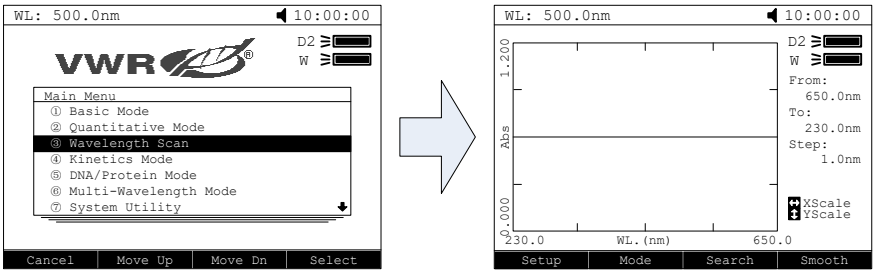
No.	500.0nm	Abs(eff)	C(mg/L)
1	0.212	0.212	0.212
2	0.210	0.210	0.210
3	0.209	0.209	0.209

Fitting Params:
C=1.000*A^1
r=1.000
Model: V-3000PC
SN: UEFXXXXXXX
Version: A1.176
VWR International bvba.

Wavelength Scan

1. Enter into Wavelength Scan

Main menu, press numeric key 3 DEF or ▲, ▼ to choose "Wavelength Scan" and press ENTER to enter.



2. Parameters Setup

Press ⌙ to set parameters, set "Scan From" , "scan to", "scan step" and "scan speed",

press ENTER to confirm.

3. Set Photometric Mode

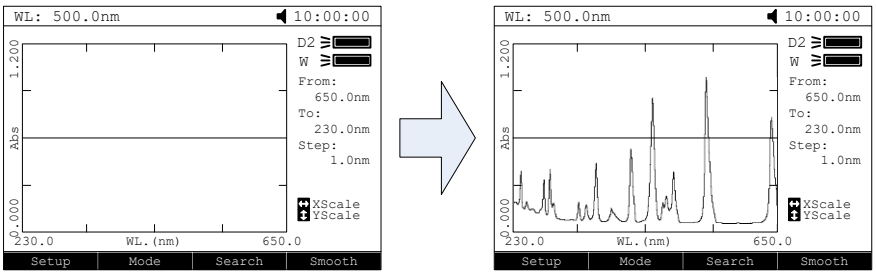
Press ⌐ to set photometric mode，choose "T%", "Abs." or "E" and press ENTER to confirm.

4. Scan Baseline

Put Reference Sample in the light path, press 100%T/oABS to scan the baseline, press ESC to cancel.

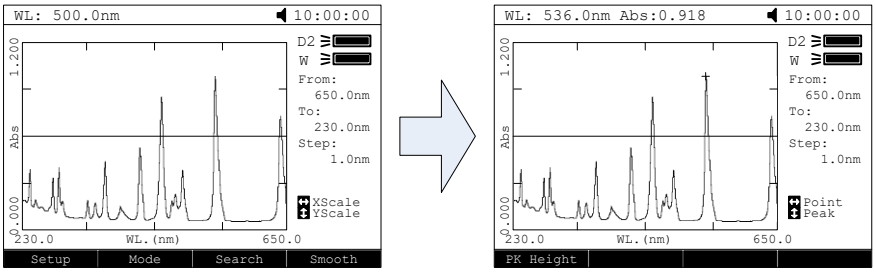
5. Scan Samples

Put the samples in the light path，press START/STOP to scan the sample, press ESC to cancel.



6. Search Peaks

After scanned, press ⌐ to go into peak search mode. Press ⌙ to set peak height, input the peak height and press ENTER to confirm. Press ◀,▶ to display the value of every wavelength point. Press ▲, ▼ to display the value of every peak.



7. Smooth the Curve

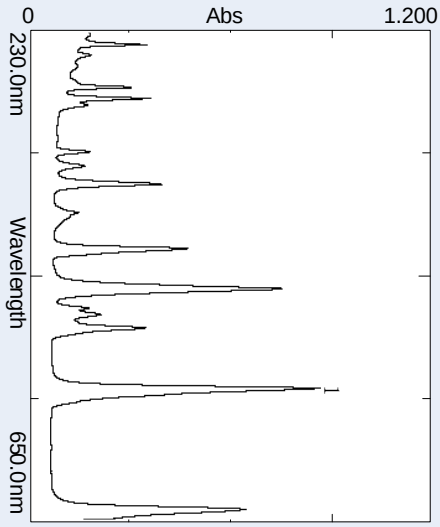
After scanned, if there are many burrs on it, press  to smooth the curve.

8. Print the Test Results

After scanned, press  to print the Test Results.

Wavelength Scan Test Report
File Name: Abc
Date & Time: mm-dd-yyyy, hh:mm:ss

Scan From: 680.0nm
Scan From: 230.0nm
Scan Step: 1.0nm
Peak Height: 0.030Abs
Model: V-3000PC
SN: UEFXXXXXXX
Version: A1.176
VWR International bvba.



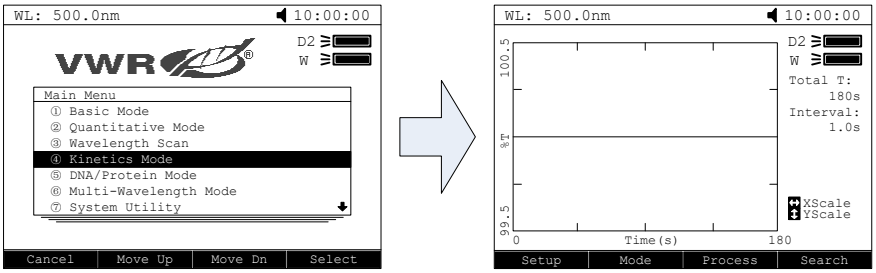
Peak list

No.	Wavelength(nm)	Abs	T%
1	536.0	0.918	12.1

Kinetics

1. Enter into Kinetics

Main menu, press [4 GHI] or ▲, ▼ to select "Kinetics Mode" and press [ENTER] to confirm.



2. Setup Parameters

Press [⌐] to set parameters, input the corresponding values of "Total Time", "Delay Time" and "Time Intervals" according the screen indicates. Press [ENTER] to confirm.

3. Set Photometric Mode

Press [¬] to set photometric mode, choose "T%" or "Abs." and press [ENTER] to confirm.

4. Set Wavelength

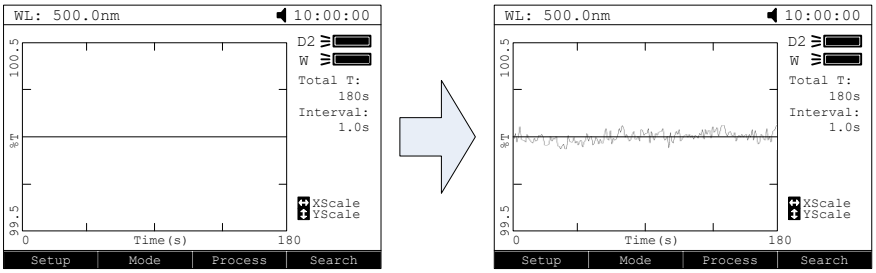
Press [GOTO ∧] to set wavelength, input the value of the wavelength by numeric keypad and press [ENTER] to confirm.

5. Blank

Put the Reference Sample in the light path, press [100%T / oABS] to do blank.

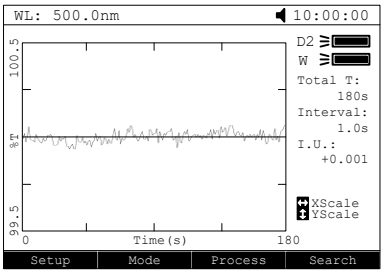
6. Measure Samples

Put the sample in the light path and press [START / STOP] to begin the test, press [ESC] to cancel.



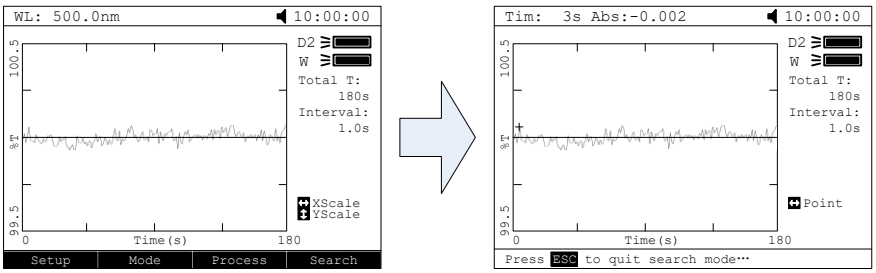
7. Calculate Response Rate

After time scanned, if users want to calculate the response rate of some period, you can press  to go into "Process" interface. Input the values of "Begin Time", "End Time" and "Factor" separately and press  to confirm. Then the value of "I.U." would display on the screen.



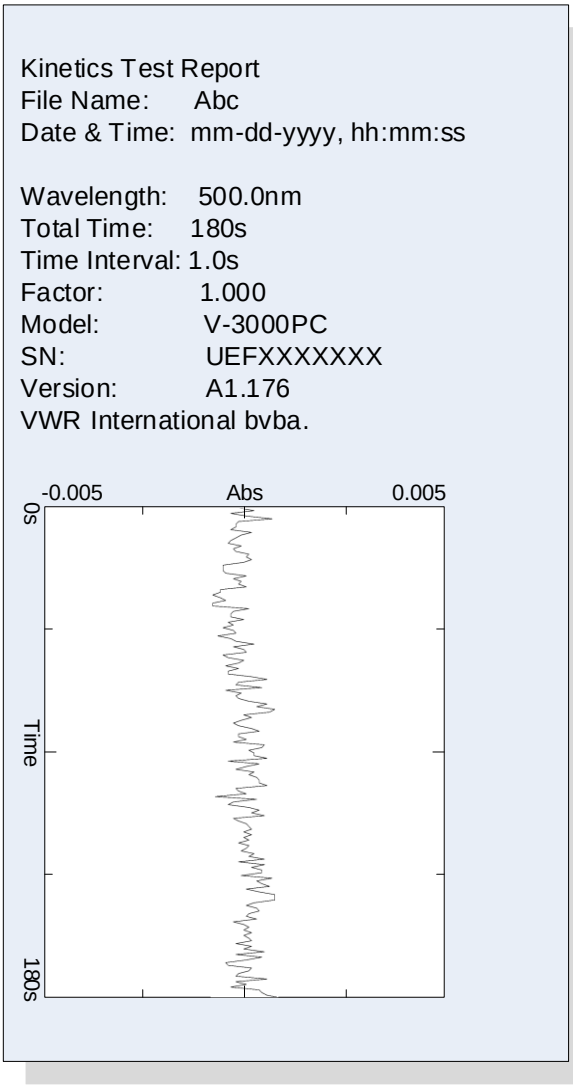
8. Search Peaks

After scan finished, press  to go into search mode. Press  to search the value of every point.



9. Print the Test Results

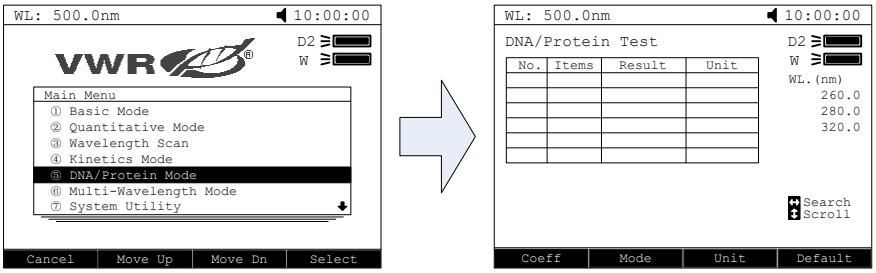
Press PRINT to print the Test Results.



DNA/Protein Mode

1. Enter into DNA/Protein Mode

Main menu, press 5 JKL or ▲,▼ to choose "DNA/Protein Mode" and press ENTER to confirm.



2. Setup Parameters

Press [ ] to set coefficients, input all the values of f1 to f4 by numeric keypad according the indication and press [ENTER] to confirm.

3. Choose Measure Method

Press [ ] to set method. Press [▲], [▼] to choose "Absorbance Difference 1" or "Absorbance Difference 2" followed with [ENTER] pressed to confirm. If users don't want to measure reference, use [▲], [▼] to choose "No" followed with [ENTER] pressed to confirm the choice.

4. Set Concentration Unit

Press [ ] to set concentration unit. Use [▲], [▼] to select unit and press [ENTER] to confirm.

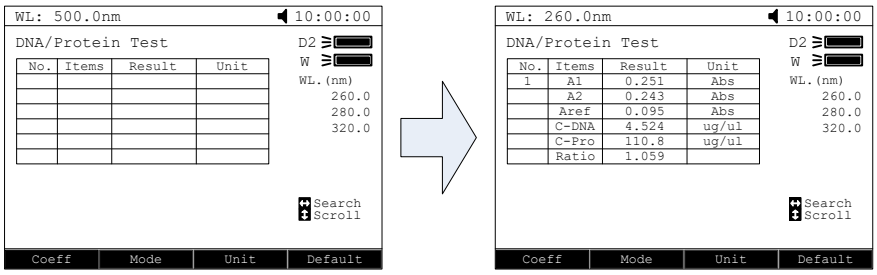
5. Blank

Place the Reference Sample in the light path, press [100%T / oABS] to do blank.

6. Measure Samples

Put sample to be test in the light path, press [START / STOP] to measure. The result will display

in the data sheet.



7. Print the Test Results

Press [PRINT] to print the Test Results.

DNA / Protein Test Report

File Name: Abc
Date & Time: mm-dd-yyyy, hh:mm:ss

Sample---1
260.0nm 0.251Abs
280.0nm 0.243Abs
320.0nm 0.095Abs
C-DNA 4.524ug/mL
C-Pro 110.8ug/mL
Ratio 1.059

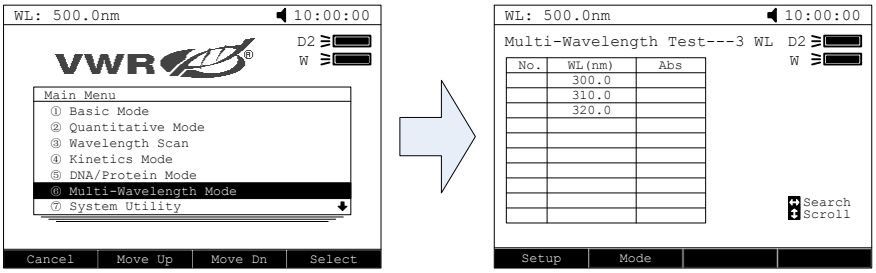
Unit: ug/mL
Model: V-3000PC
SN: UEFXXXXXXX
Version: A1.176
VWR International bvba.

Multi Wavelength Mode

1. Enter into Multi Wavelength Measurement

Main Menu, press [6 MNO] or ▲,▼ to choose "Multi Wavelength Measurement" and

then press ENTER to go into multi wavelength measurement interface.



2. Setup Wavelength

Press ⌴ to go into wavelength setting interface，input all the wavelength value one by one by the numeric keypad. Press ENTER to confirm, press ESC to return.

3. Set Photometric Mode

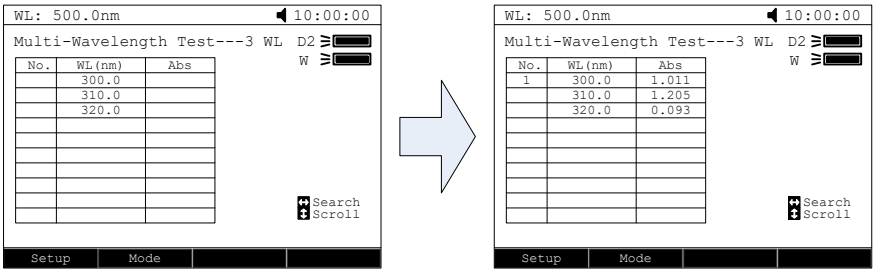
Press ⌐ to set the photometric mode， use ▲, ▼ to select "Abs. " or "T%" mode, press ENTER to confirm.

4. Blank

Place the Reference Sample in the light path， press 100%T/oABS to do blank.

5. Measure Samples

Place the sample to be test in the light path，press START/STOP to measure, the test result will display in the data table.



6. Print the Test Results

Press [PRINT] to print the Test Results.

Multi-Wavelength Test Report

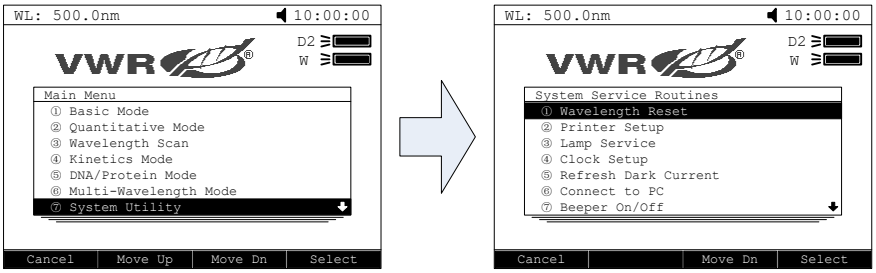
File Name: Abc
Date & Time: mm-dd-yyyy, hh:mm:ss

Sample---1
500.0nm 0.251Abs
510.0nm 0.243Abs

Unit: Abs
Model: V-3000PC
SN: UEFXXXXXXX
Version: A1.176
VWR International bvba.

System Utility

Main menu, press [7 PQRS] or use ▲, ▼ to select "System Utility" and press [ENTER] to confirm.

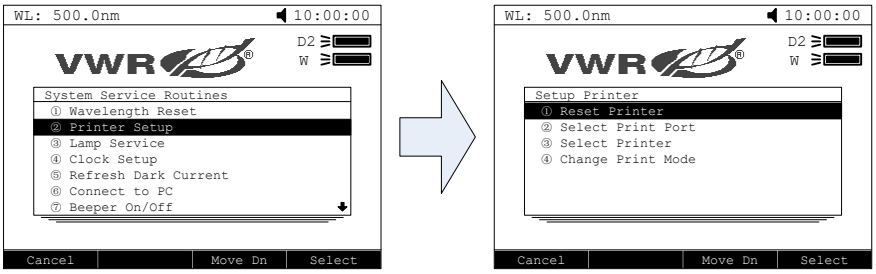


Wavelength Reset

Press [1] or use ▲, ▼ to choose "Wavelength Reset" then press [ENTER] to begin the calibration. During the course, opening the lid of the compartment is prohibited.

Printer Setup

Press [2 ABC] or ▲, ▼ to select "Printer Setup" then press [ENTER] to confirm.



- **Reset Printer**

  Press [1] or use ▲, ▼ to choose "Reset Printer" and press [ENTER] to confirm. Then the printer will resume the initial condition.

- **Select print port**

  Press [2 ABC] or use ▲, ▼ to choose "Select print port" and press [ENTER] to confirm. Use ▲, ▼ to choose "LPT" or "Comm." and then press [ENTER] to confirm.

- **Select Printer**

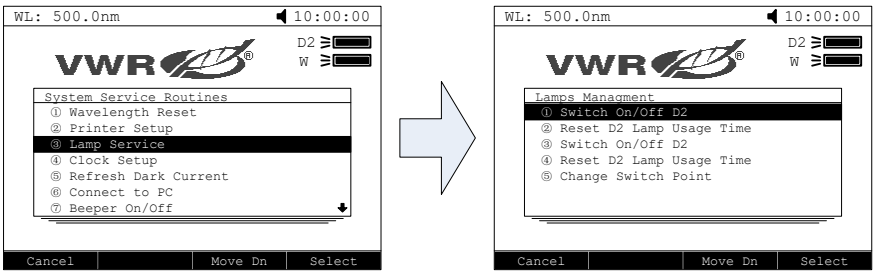
  Press 3 DEF or use ▲, ▼ to choose "Select printer" and press ENTER to confirm. Use ▲, ▼ to select the printer's model and then press ENTER to confirm.

- **Change Print Mode**

  Press 4 GHI or use ▲, ▼ to choose "Change print mode" and press ENTER to confirm. Two modes are under your choice, one is "Print Data Sheet", the other is "print the display interface".

Lamp Service

Press 3 DEF or use ▲, ▼ to choose "Lamp Service", press ENTER to go into "lamps management" interface.



- **Switch On/Off D2 lamp**

  Press 1 or ▲, ▼ to choose "Switch On/Off D2 lamp" then press ENTER to switch on or switch off the D2 lamp.

- **Reset the usage time of D2 lamp**

  Press 2 ABC or use ▲, ▼ to choose "Reset D2 lamp usage time" and

press [ENTER]. Then users can find the D2 lamp's usage time and the system will ask if you are sure to reset the usage time. Press ▲, ▼ to choose "Yes" and then press [ENTER] to confirm. The system will record the usage time from zero.

- **Switch On/Off W lamp**

  Press [3 DEF] or use ▲, ▼ to choose "Reset W lamp usage time" and press [ENTER]. Then users can find the W lamp's usage time and the system will ask you if are sure to reset the usage time.

- **Reset the W lamp usage time**

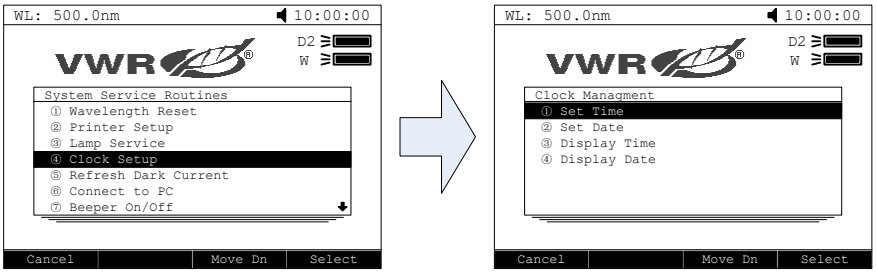
  Press [4 GHI] or use ▲, ▼ to choose "Reset W lamp usage time" and press [ENTER]. Then users can find the W lamp's usage time and the system will ask if you are sure to reset the usage time. Press ▲, ▼ to choose "Yes" and then press [ENTER] to confirm. The system will record the usage time from zero.

- **Change Switch point**

  Press [5 JKL] or use ▲, ▼ to choose "Change Switch point" and press [ENTER] to confirm. Input the wavelength point value(325—375nm)and press [ENTER] to confirm.

Clock Setup

Press [4 GHI] or use ▲, ▼ to choose "Clock Setup", then press [ENTER] to go into "Clock Management" Interface.



- **Set Time**

  Press [1] or ▲,▼ to choose "Set Time" and press [ENTER] to confirm.

  Input the time (Hour, Minute, Second) by numeric keypad, press [ENTER] to confirm and return automatically.

- **Set Date**

  Press [2 ABC] or use ▲,▼ to choose "Set Date" and press [ENTER] to confirm.

  Input the Date(Year, Month, Day) by numeric keypad, press [ENTER] to confirm and return automatically.

- **Display Time**

  Press [3 DEF] or use ▲,▼ to choose "Display Time" and press [ENTER] to confirm. Then the time will display on the Right Top corner.

- **Display Date**

  Press [4 GHI] or use ▲,▼ to choose "Display Date" and press [ENTER] to confirm. Then the Date will display on the Right Top corner.

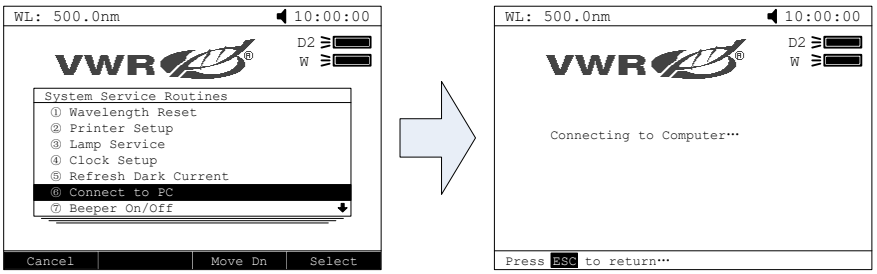
Refresh Dark Current

Press 5 JKL or use ▲, ▼ to choose "Refresh Dark Current" and press ENTER to confirm. Then the system begins to refresh Dark Current.

Note: During the course, open the lid of the compartment is prohibited.

Connect to PC

Press 6 MNO or use ▲, ▼ to choose "Connect to PC", and press ENTER to go into waiting interface. When the instrument was connected to PC, it displays "Controlled by PC".



Beeper on/off

Press 7 PQRS or use ▲, ▼ to choose "Beeper on/off" and press ENTER to switch on or switch off the beeper.

Language Selection

Press 8 TUV or use ▲, ▼ to choose "Language Selection" and press ENTER to go into language selection interface，press ▲, ▼ to choose language (English, French, German, Spanish) and press ENTER to confirm. Then the interface will change into the language you just select.

Refresh System Baseline

Press 9 WXYZ or use ▲, ▼ to choose "Refresh System Baseline" and press ENTER to confirm. Then the system will scan the baseline. During this course, opening the lid of the compartment is prohibited.

Deleted Entire Saved Files

Use ▲, ▼ to choose "Deleted Entire Saved Files" and press ENTER to confirm. Then the system ask you "Delete entire files, are you sure?", use ▲, ▼ to choose "Yes" , then all the files in the RAM will be deleted.

Restore Default Settings.

Use ▲, ▼ to choose "Restore Default Settings" and press ENTER to Confirm, then the system will restore the initialization.

Troubleshooting

Review the information in the table below to troubleshoot operating problems.

Problem	Cause	Solution
Power on, no response	Power cord connection is not reliable	Improve connectivity
	Fuse burning	Replace fuse
Measurement uncertainty	Warm up is not enough	Warm up more time
	Glass cuvettes used in UV Range	Use quartz cuvettes
	Sample is not Stable	Improve the sample
	The concentration of sample is too high	Diluted sample
	Power Supply Voltage Low or	Improve the Power Supply

	not Stable	
	Lamp damage or lamp life maturity	Replace lamp
Dark Current Error when self-check	The lid of the compartment is open during self-check	Close the lid, restart
System Calibrate Failed	Something block the Light path	Remove it, calibrate again
Power on, back light is OK, but nothing display on the screen or display is not clear	Display Contrast problem	Adjust the contrast potentiometer
Measurements inaccurate	Cuvettes were contaminated	Clean cuvettes
	Samples were contaminated	Improve samples
	Worse matching of the cuvettes	Improve the matching of the cuvettes
	Dark current error	Resample dark current

Repair and Maintenance

Daily Maintain

Check the compartment

After measurement, the cuvettes with sample solutions should be taken out of the compartment in time. Or the volatilization of the solution would make the mirror go moldy. Users must pay more attention to the corrosive sample and liquid easy to volatilize. Any solution remains in the compartment should be wipe off immediately.

Surface Clean

The cover of the instrument is with paint. Please use wet towel to wipe off the drips on the surface immediately. Organic solution is forbidden to be used to clean the cover.

Please wipe off the dirt on the cover timely.

Clean the cuvettes

After every test or after a solution change, the cuvettes should be cleaned carefully, or the remains on the surface would cause measuring error.

Check Lamp

In "Wavelength Scan" mode, set the test parameters as follow:

Scan From:500nm

Scan To: 200nm

Scan Step: 1nm

Press Numeric Key "6", enter the amplifier of ADC as "0", and press key "Enter" to start scanning energy. After finished scan, press the function key "Search", then press key "<",">" to browse the energy value point to point. Check the energy of the wavelength 500nm and 200nm, check the energy, you need replace W lamp as following two cases:

Energy＜20 from 500~320nm W lamp is damaged

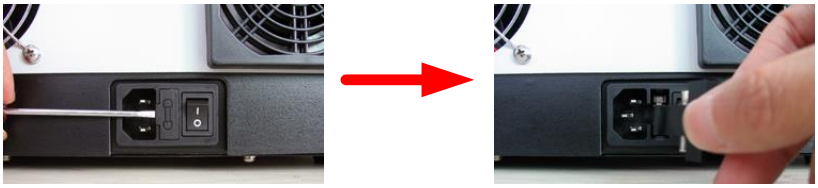
Energy＜5000 at 500nm W lamp energy is too low

Spare Parts Replacement

Replace the fuse

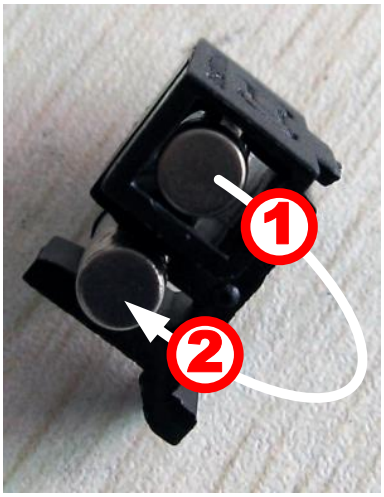
 **Danger! Be sure to switch off the power and unplug the socket before replacement!**

1. **Tools preparation**
   Prepare a 3×75 Flat Blade screwdriver.
2. **Switch Off the power supply**
   Switch off the power supply, and unplug the socket.
3. **Take out the Fuse Seat**
   Take out the fuse seat by the screwdriver.



4. **Replace a new fuse**

   Pick out the spare fuse (3.15A/250V) and replace it to the working position.



5. **Reset the fuse seat**

   Replace the fuse seat in the power socket.

6. **Switch on the power**

   Plug the socket and switch on the power.

Replace lamps

Hot！Wait 20 minutes before open the lamp chamber after power off to avoid scald!

1. **Tools preparation**

   Prepare a 6×150mm Cross Blade screwdriver and a pair of glove.

2. **Power Off**

   Switch off the power supply and unplug the socket.

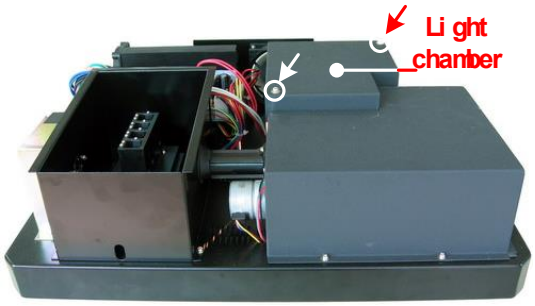
3. **Open the cover**

Unscrew the 4 screws indicated(Each side with 2 screws)and remove the cover.



4. **Open the cover of the light chamber**

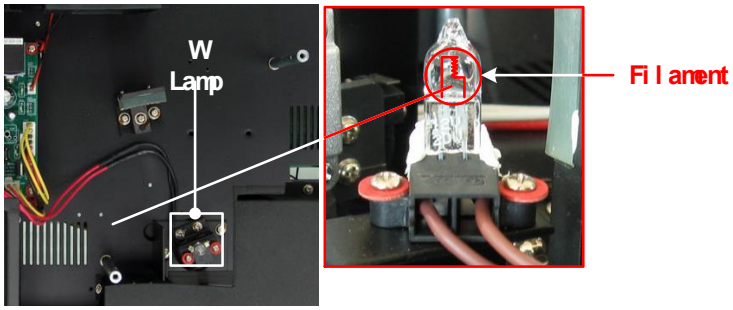
Unscrew the 2 screws on the light chamber cover and remove it.



5. **Replace W lamp**

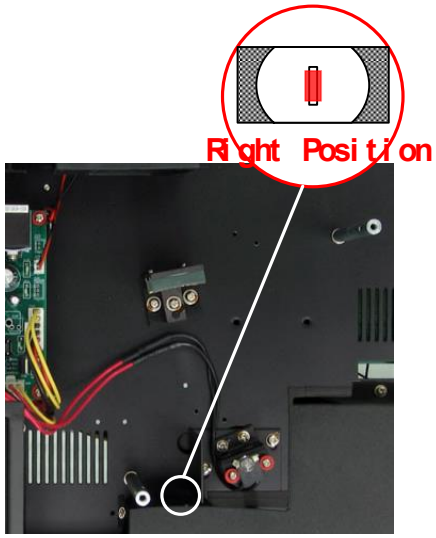
The Tungsten lamp is equipped with a blue-grey silicon coating by manufacturer. This coating is only a transport safety device. It can be removed with the first exchange of lamp.

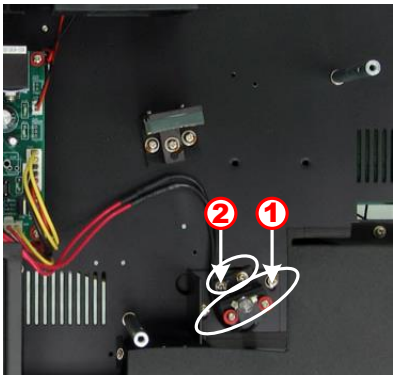
Pull out the defected W lamp and draw on the cotton glove. Insert the new W lamp as deep as possible on the lamp seat. Be sure to keep the filament in the same direction as the old one face.



6. **Adjust the position of the W lamp**

Switch on the power. Observe the entrance facular, and it should in the center of the entrance hole. If the facular deviate to Left or Right, then loosen the No.1 screws and move the lamp seat to Left or Right until it focus on the center of the slot. Then fix the screws. If the facular deviate to Up and Down, then loosen the No.2 screws and move the lamp seat Up and Down until the facular focus on the center of the slot. Then fix the No. 2 screws again.





7. **Finish**

Reset the cover of the light chamber and fix the screws. Reset the cover of the instrument and fix the screws. Recover the Pole in the compartment, then the course finished.

Replace the Battery

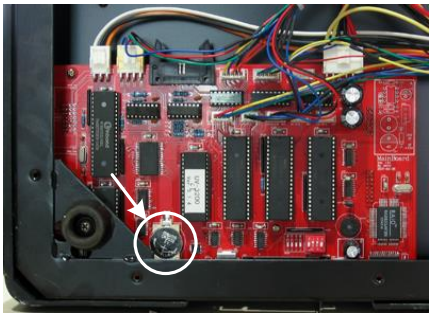
Be sure to switch off the power supply and unplug the socket before open the Bottom Cover!

1. **Prepare the tools**
   Prepare a 6×150mm Cross Blade Screwdriver.
2. **Switch off the power supply**
   Switch off the power supply and unplug the socket
3. **Open the Bottom cover plate**
   Unscrew all the screws indicated then remove the bottom plate.



4. **Replace the Battery**

   Pick out the old battery and replace a new one.



5. **Finish**

   Recover the bottom plate and fix all the screws, then the course finishes.

Accessories and Spare Parts

Description	Quantity	Cat. No.
CELL HOLDER, 4-CELL, 10MM	1PC	634-6003
CELL HOLDER, 4-CELL,10 TO 50MM	1PC	634-6004
CELL HOLDER, 4-CELL, 10 TO 100MM	1PC	634-6005
CELL HOLDER, FOR CYLINDRICAL CELL	1PC	634-6006

CELL HOLDER, WATER-JACKETED, 1 CELL, 10MM	1PC	634-6007
CELL HOLDER FOR MICRO CELLS,BEAM HEIGHT:15MM	1PC	634-0687
CELL HOLDER FOR TEST TUBES	1PC	634-6009
CELL HOLDER,8-POSITION AUTO CELL CHANGER	1PC	634-6010
CELL HOLDER, SOLID SAMPLE	1PC	634-6011
CELL HOLDER, WATER-JACKED, 4 CELL, 10MM	1PC	634-6012
CUVETTE, SQUARE.GLASS,10MM	4PCS	634-6013
CUVETTE, SQUARE.GLASS,20MM	2PCS	634-6014
CUVETTE, SQUARE.GLASS,30MM	2PCS	634-6015
CUVETTE, SQUARE.GLASS,50MM	2PCS	634-6016
CUVETTE, SQUARE.GLASS,100MM	1PC	634-6017
FLOW CELL, 5 MM, GLASS, BEAM HEIGHT:15MM	1PC	634-0690
FLOW CELL, 10 MM, GLASS, BEAM HEIGHT:15MM	1PC	634-0691
FLOW CELL, 20 MM, GLASS, BEAM HEIGHT:15MM	1PC	634-0692
FLOW CELL, 30 MM, GLASS, BEAM HEIGHT:15MM	1PC	634-0693
PELTIER UNIT, BEAM HEIGHT:15MM	1PC	634-0698
SIPPER UNIT WITHOUT TEMP. CONTROL, BEAM HEIGHT:15MM	1PC	634-0699
SIPPER UNIT WITH PELTIER TEMP. CONTROL, BEAM HEIGHT:15MM	1PC	634-0763
LAMP, HALOGEN, 12V20W	1PC	634-6037
LAMP, DEUTERIUM	1PC	634-6038
PRINTER, THERMAL PRINTER	1PC	634-6039
THERMAL PAPER	1PC	634-6043
FUSE, 3.15A/250V	1PC	634-0651
BATTERY, 3V, CR2032	1PC	634-0653

Technical Service

Web Resources

Visit the VWR's website at **www.vwr.com** for:

• Complete technical service contact information

• Access to VWR's Online Catalogue, and information about accessories and related products

• Additional product information and special offers

Contact us For information or technical assistance contact your local VWR representative or visit. **www.vwr.com**.

Warranty

VWR International warrants that this product will be free from defects in material and workmanship for a period of two (2) years from date of delivery except the lamps. Lamps have a warranty of 1000 h lamp usage time or 6 months max. If a defect is present, VWR will, at its option, repair, replace, or refund the purchase price of this product at no charge to you, provided it is returned during the warranty period. This warranty does not apply if the product has been damaged by accident, abuse, misuse, or misapplication, or from ordinary wear and tear.

For your protection, items being returned must be insured against possible damage or loss. This warranty shall be limited to the replacement of defective products. IT IS EXPRESSLY AGREED THAT THIS WARRANTY WILL BE IN LIEU OF ALL WARRANTIES OF FITNESS AND IN LIEU OF THE WARRANTY OF MERCHANTABILITY.

Equipment Disposal



This equipment is marked with the crossed out wheeled bin symbol to indicate that this equipment must not be disposed of with unsorted waste.

Instead it's your responsibility to correctly dispose of your equipment at lifecycle -end by handling it over to an authorized facility for separate collection and recycling. It's also your responsibility to decontaminate the equipment in case of biological, chemical and/or radiological contamination, so as to protect from health hazards the persons involved in the disposal and recycling of the equipment.

For more information about where you can drop off your waste of equipment, please contact your local dealer from whom you originally purchased this equipment.

By doing so, you will help to conserve natural and environmental resources and you will ensure that your equipment is recycled in a manner that protects human health.

Thank you!

Part 2 : Software

Functions

This section introduces the functions of the UV-Vis Analyst.

Main Functions

Single wavelength photometric measurement

- Go to a desired wavelength quickly and conveniently.
- Photometric value display mode can be changed (%Transmittance or Absorbance).

Fixed Points Measurement

Multi-wavelength Photometric Measurement

- Up to 20 wavelength points can be set up.
- Results will be grouped into a table format automatically.

Concentration Measurement

- 2 methods to set up the regression curve.
  Up to 20 standards to set up the regression curve. The UV-Vis Analyst will calculate the working curve using a linear equation that fits the data. Enter factor values to generate regression curve.
- 3 methods for curve fit.
  Linear fit, Quadratic fit and Cubic fit.

Wavelength Scanning

- Allow user to set scan step (0.1, 0.2, 0.5, 1.0 and 5.0nm).
- Spectrum display mode can be changed (Wavelength-%Transmittance or Wavelength-Absorbance).
- Peaks and valleys will be automatically detected after scanning (User can define the peak threshold).
- Powerful spectrum processing functions are provided.

Time Scanning

- Allow user to set scan Interval (0.5, 1.0, 2.0, 5.0, 10, 30 and 60s).
- Spectrum display mode can be changed (Time-%Transmittance or Time-Absorbance).
- Peaks and valleys will be automatically detected after scanning (User can define the peak threshold).
- Powerful spectrum processing functions are provided.

DNA/Protein Measurement

- Wavelength points and ratios can be set up.
- Results will be grouped into a table format automatically.

Spectrum Processing Function

Trace a Spectrum
The cursor can be moved to a desired point in the spectrum displayed on the screen and the photometric data at this point is displayed.

Automatic Peak Detection
After a scanning is complete, peaks and valleys can be automatically detected and listed in a table format. They will also be labeled on the spectrum.

Scale Expansion
Simultaneous expansion of the X and Y axes are provided with the "Zoom" function. Display range can also be changed though the "Display Setup" function.

Differentiation
You can calculate and display the first through to the fourth derivative spectrum for a given spectrum. Derivative spectrum is useful for enhancing spectrum data that are not readily apparent in an absorbance spectrum.

Calculate Spectrum
You can calculate addition, subtraction, multiplication and division between two spectrum with the resulting data displayed on the screen.

System Check and Calibration Function

Instrument Validity Check
Up to 10 wavelength points can be set up in the instrument validity mode. Two methods can be selected (Photometric Validity measurement and Wavelength Validity measurement) and tolerance can be entered. Results will be grouped into a table format automatically.

Dark Current Check
You can resample the dark current of the instrument.

Spectrum Bandwidth Check
A special scan for checking spectrum Bandwidth and it will calculate the spectrum Bandwidth value automatically.

Energy of Light Sources Check
It allows scan the energy of light sources with a fixed gain (0-7).

Reset Wavelength
It affords to relocate the 656.1nm.

Installation

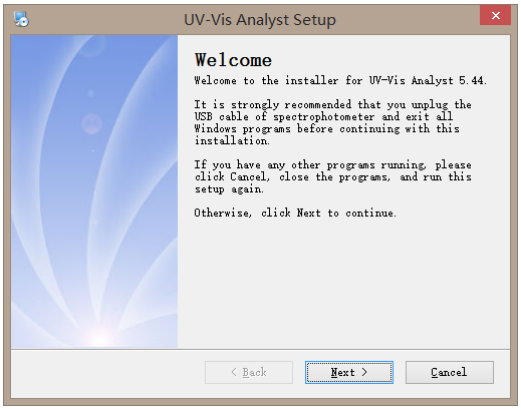
This section introduces how to setup the UV-Vis Analyst to PC.

PC System Requirements

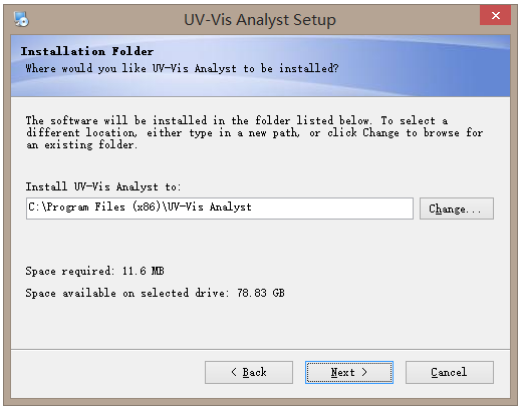
- Pentium or above PC;
- CD-ROM;
- USB Ports.
- 512MB Memory(1GB or Above is strongly recommended);
- 50MB or above hard disc Space;
- Microsoft Windows XP/Vista/7/8.

Install UV-Vis Analyst

1. Put UV-Vis Analyst disc in the CD-ROM;
2. Double Click to open the CD-ROM, and then, double click **Setup.exe** which is under the root directory of CD to start installation , click **Next**;



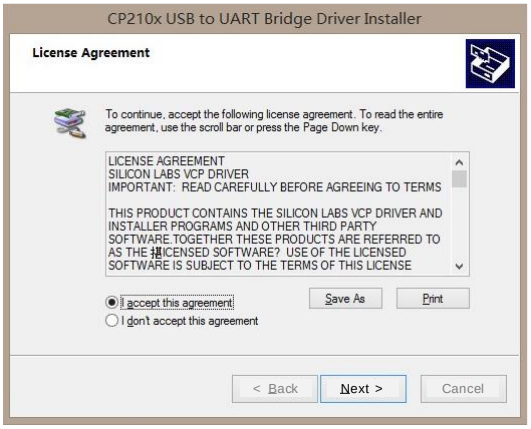
3. Choose install path, then click **Next** to copy files to PC;



4. After finished copy all files of UV-Vis Analyst, it will start install the USB Drive. Click **Next**;



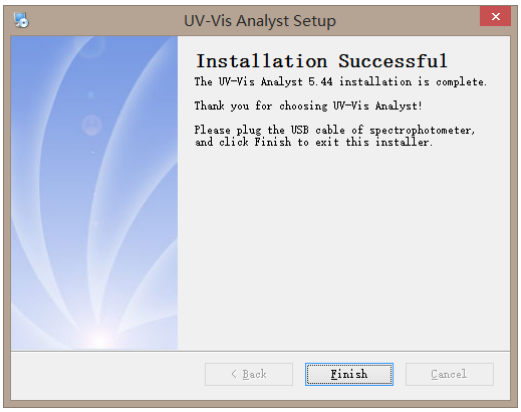
5. Select "I accept this agreement". Click **Next** to copy files to PC;



6. Click **Finish** to finish install USB Drive;



7. Click **Finish** to finish all the setup.



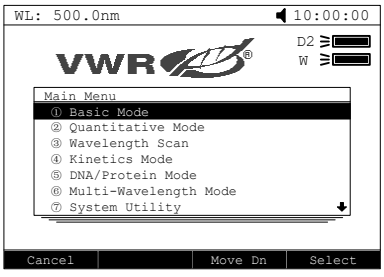
Uninstall UV-Vis Analyst

Start→All Programs →UV-Vis Analyst→Uninstall **UV-Vis Analyst** to remove.

Run UV-Vis Analyst

Before you run UV-Vis Analyst, please check these things as follow:

- ***Computer has connected to spectrophotometer by using the USB cable;***
- ***Spectrophotometer is on main interface.***



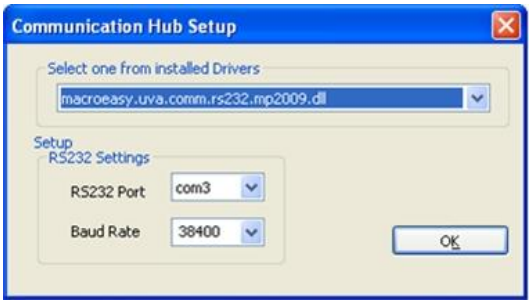
There are two ways to start the UV-Vis Analyst:

- Double-click shortcut icon  on the desktop.

- Start→All Programs→UV-Vis Analyst→**UV-Vis Analyst**.

Set up Communication Port

Start the **UV-Vis Analyst**, on the **UV-Photometer** menu, click **Comm. Port Setup** appears the following box, select the Comm. Port and Baud Rate (38400), and click **OK**.

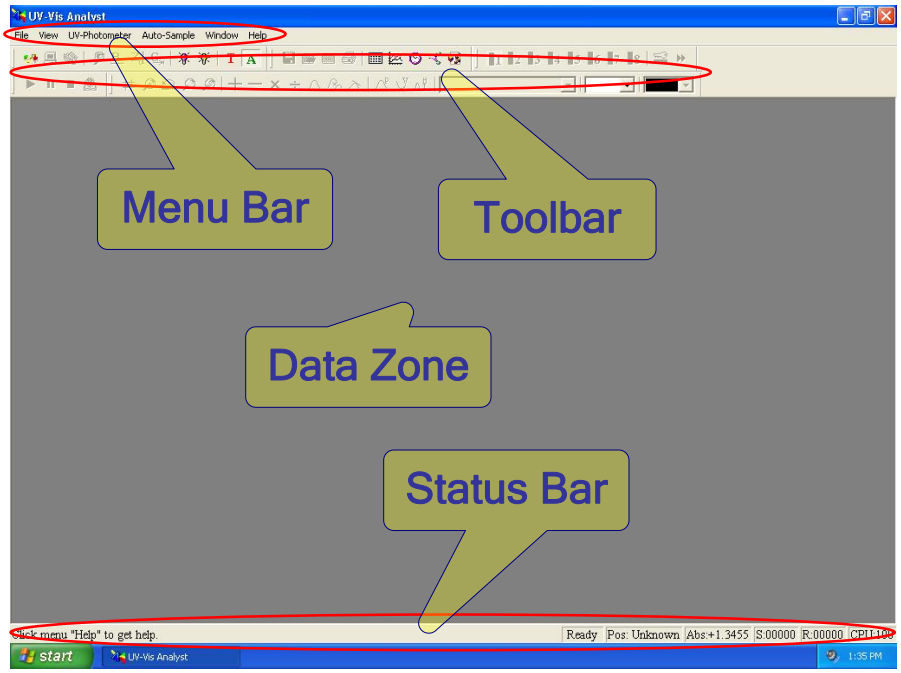


Introduction

We will introduce the UV-Vis Analyst in this chapter.

Main Interface

This is the main interface after start.



Menus Bar and Tools Bar

Menu bar and **Toolbar** are both provided in the software offering you two ways to select a desired function.

- On the menu bar, use your keypad or mouse to select the desired function.
- Almost all the functions listed in the menu bar can be reached by clicking a corresponding button in the toolbar.

Main Menu	Sub Menu	Tool	Function
File	New		New a Fixed Points Measurement
			New a Wavelength Scan
			New a Time Scan Measurement
			New a DNA/Protein Measurement
			New a Instrument Validity
	Open…		Open a spectrum/data file
	Close		Close current measurement
	Save		Save current measurement
	Save As…		Save current measurement as a
	Open file from		Open a file saved in instrument
	Export		Export data or method
	Print…		Print test report
	Print Setup…		Setup printer
	Exit		Exit UV-Vis analyst
View	Status Bar		Display/Hide status bar

	Status of		Display status of
	Status font		Setup font of status bar
	Customize		Define the information of display
	Peaks		Mark peak value
	Valleys		Mark valley value
	Magnify		Magnify the area selected
	Restore		Restore the default parameters
	Search		Search peak/valley one by one
UV-Photometer	Link		Connect to the Instrument
	Reset		Reset parameters of instrument
	Escape		Stop current measurement
	View dark Current		Retest the dark current
	Set Amplifier		Reset amplifier
	Locate 656.1nm		Relocate 656.1nm
	Calibrate System		Scan system baseline
	Automatic Blank		Do blank
	Slit Bandwidth *		Set slit bandwidth (0.5, 1, 2, 4, 5)
	Set Unit		Set unit

	Turn on/off W lamp		Turn on/off W lamp
	Turn on/off D2		Turn on/off D2 lamp
	D2/W Switch Point		Set switch point of D2/W
	Comm. Port Setup		Setup comm. port
	Change Password		Set/Change login password
Auto-sample	Locate Cell **		Locate cell (1-8) to light path
	Setup Multicell **		Setup Multicell
	Autorun **		Measure multi samples
Scan	Start		Start a measurement
	Stop		Stop a measurement
	Service		Measure spectrum and scan
Settings	Display Range		Setup scan display parameters
	Peak Height		Define peak/valley threshold
Compute	Add		Add two spectrum
	Sub		Subtract one spectrum from
	Multiply		Multiply two spectrum
	Divide		Divide one spectrum from another
	Moving Window		Smooth a spectrum with the

	Savitzky-Golay		Smooth a spectrum with the
	Derivate		Derivative of a spectrum
	Resample		Resample a spectrum
Window	New Window		New a measurement window as
	Cascade		Multi windows display in a
	Tile		Multi windows display in a tile
	Arrange Icons		Arrange all icons minimized
	Split		Split display area
Help	About UV-Vis		Display the information about the
			Setup measurement parameters
			Modify a measurement result
			Delete results selected
			Set and Goto one wavelength
			Display Instrument CPU
			Delete current Spectrum
			Display result as mode %T
			Display result as mode Abs
			Undo Scale

Note: ** Only for the model with Variable Slit*
*** Only for the model with 8-Cell Auto Charger*

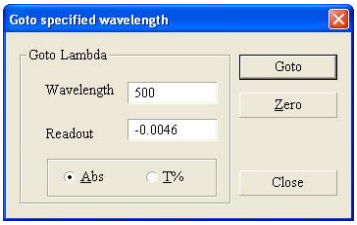
Operation

This chapter introduces how to use UV-Vis Analyst.

Single Wavelength Photometric Measurement

The UV-Vis Analyst provides a convenient method to measure photometric value at a fixed wavelength.

1. Click  on the toolbar, appears **Goto specified wavelength**.



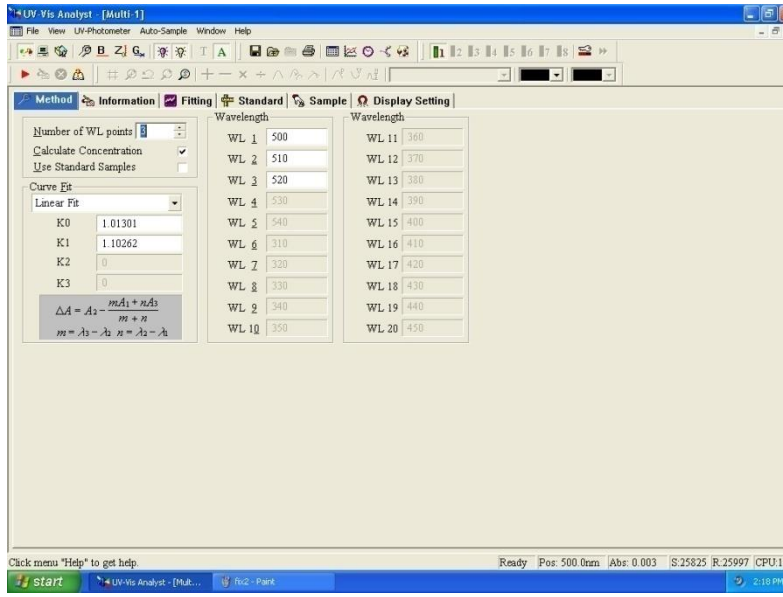
2. Key in the desired wavelength position, click **Goto**. The minimum wavelength step is 0.1nm in a range from 190-1100nm.
3. Place a reference in the sample compartment, click **Zero**.
4. Place a sample in the sample compartment. The wavelength position and photometric value will be displayed in the **Readout** box.

Fixed Point Measurement

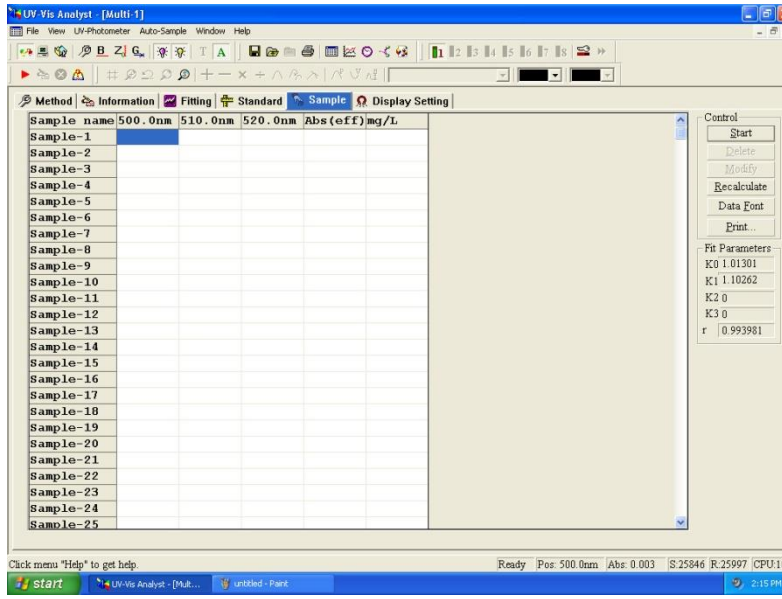
This UV-Vis Analyst performs fixed wavelength measurement at 1-20 points and how to analyze unknown compounds against calibration standards.

Multi-wavelength Photometric Measurement

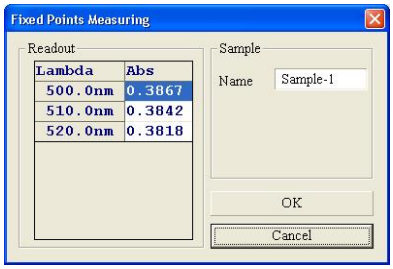
1. Click  on the toolbar, appears follow form.



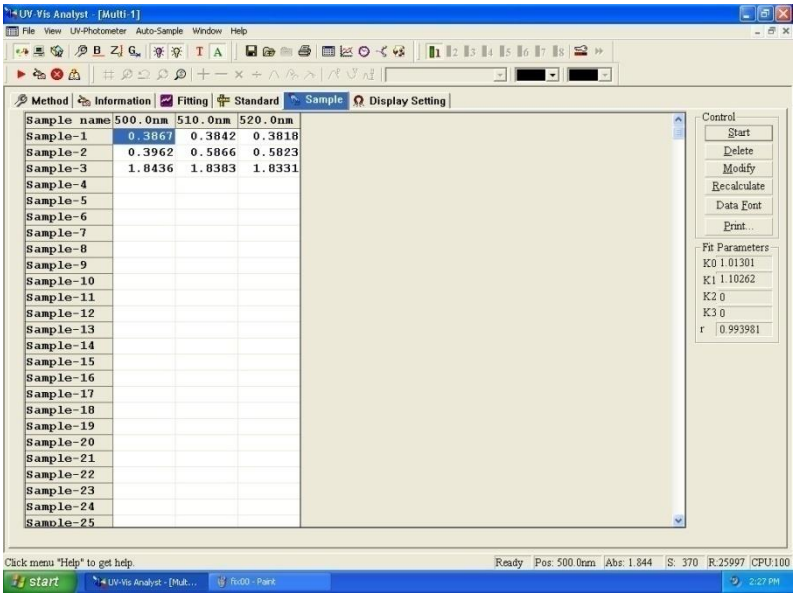
2. Click the **Method** tab.
3. Type the number of wavelength points in the **Number of WL Points** box, or click the **up/down** arrows next to the box set the wavelength points. Leave the two boxes **Calculate Concentration** and **Use Standard Samples**.
4. Key in the wavelength in the **Wavelength** box.
5. Place a reference in the sample compartment. Click  to do blank.
6. Click the **Sample** tab. It will display the following. The control menu contains six buttons: **Start**, **Delete**, **Modify**, **Recalculate**, **Data Font and Print**.



7. Place a sample in the sample compartment. Click **Start** or  to run a new measurement. The display will change to the following. Key in the sample name in the **Name** box.



8. Click **OK**. The photometric data for sample will be listed in the **Sample** table.
9. Repeat steps 7-8 to measure all samples.



Concentration Measurement

Set Up Linear Regression Curve

There are two methods available to set up the linear regression curve. You can use standards to set up the regression curve or just key in the parameters manually. Use the following steps to select the method you wish to use.

1. Click  on the toolbar.
2. Click the **Method** tab.
3. Enter the number of wavelength points in the **Number of Points** box, or click the **up/down** arrow next to this box. With 2 wavelengths, the absorbance at the second reference wavelength is subtracted from the first to correct for background absorbance. With 3 wavelengths, the baseline between the first and third wavelengths is calculated and its value at the second wavelength is subtracted from the absorbance at the second wavelength to give the peak height.
4. Key in the wavelengths in the **Wavelength** boxes.
5. Tick the **Calculate Concentration** check box to activate concentration calculation.
6. Set up the linear regression curve.

   Method 1: Set up the linear regression curve with prepared standards.

   *(1) Tick the **Use Standard Samples** check box.*

(2) *Place the reference into the sample holder. Click*  *to do blank.*

(3) *Click the* ***Standard*** *tab.*

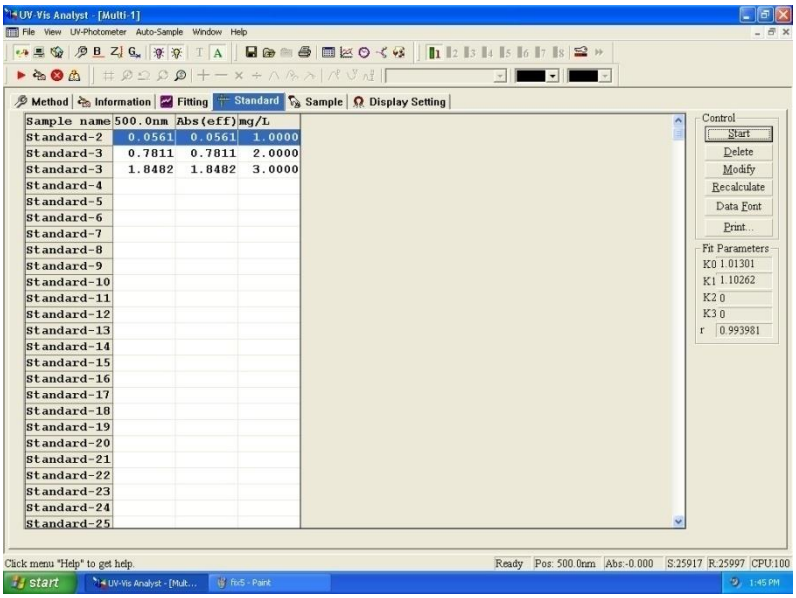
(4) *Place Standard 1 in the sample compartment. Click* ***Start*** *to run a measurement.*

(5) *Key in the concentration value of Standard 1 in the* ***Conc.*** *box.*

(6) *Key in the sample name for the standard in the* ***Name*** *box.*

(7) *Click* ***OK****. The photometric data, ΔA and concentration will be shown in the standard table.*

(8) *Repeat steps 4-7 to measure all the prepared standards.*



(9) *Click* ***down*** *arrow in* ***Curve Fit*** *box to select curve fit method.*

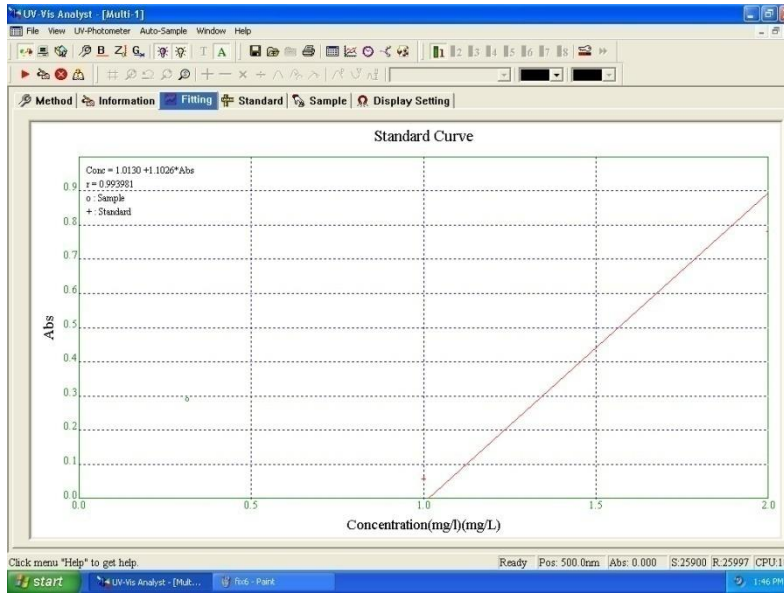
Method 2: Input the factor of the linear regression curve.

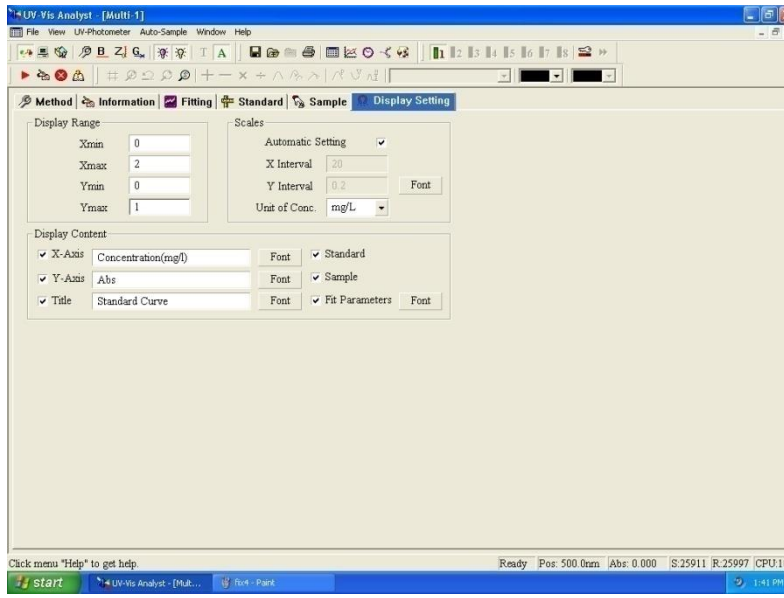
(1) *Leave the* ***Use Standard Samples*** *check box.*

(2) *Click* ***down*** *arrow in* ***Curve Fit*** *box to select curve fit method.*

(3) *Input the factor of the linear regression curve.*

7. Click **Fitting** tab to view the ***linear regression curve***. Click **Display Setting** tab to set the display parameters and unit of concentration.

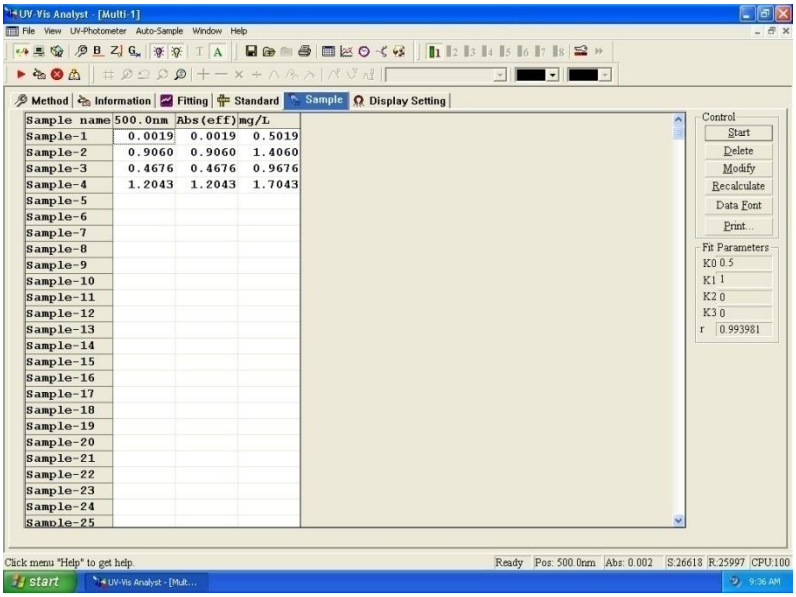




Measure Concentration by Using The Linear Regression Curve

The following procedure shows how to measure concentration of samples.

1. Set up linear regression curve or click  to open a file of linear regression curve (*.QUA).
2. Place reference into the sample holder. Click  to do blank.
3. Click the **Sample** tab.
4. Place Sample 1 into the sample holder.
5. Click **Start** to run a measurement.
6. UV-Vis Application Software will display the photometric value of Sample 1 at the fixed wavelength positions automatically. Type the sample name in the **Name** box. The default is **Sample-1**.
7. Click **OK**. The photometric result for Sample-1 will be listed in the sample data. Delta Abs. and concentration value of Sample-1 will also be displayed in columns 3 and 4.
8. Repeat steps 4-7 to measure remaining samples.

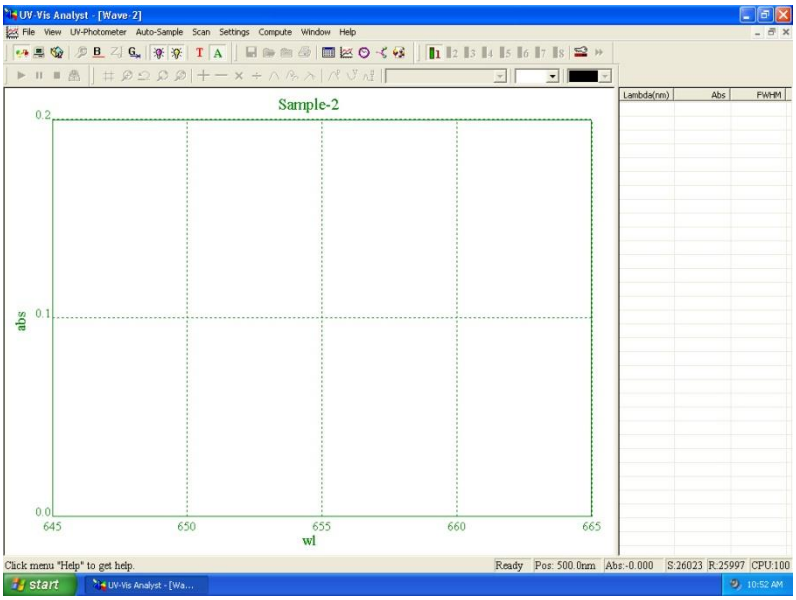


Wavelength Scanning

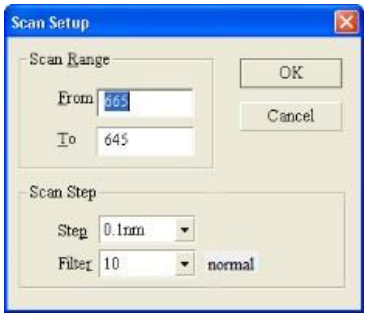
This chapter describes how to collect a spectrum while using Wavelength Scan function.

Scan Sample

1. Click  on the toolbar to new a sample scan measurement, appears the following form.

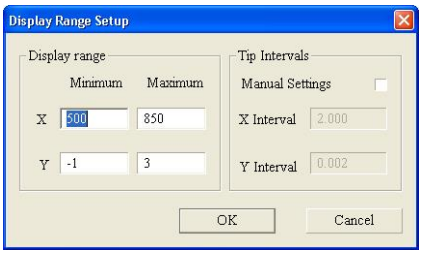


2. Click  on the toolbar, appears the following form. Input start wavelength in **From** box (range: 190-1100nm), end wavelength in **To** box (range: 190-1100nm), select scan interval (0.1, 0.2, 0.5, 1.0, 2.0 or 5.0nm) and Filter times (1, 3, 5, 10 or 30), click **OK**.



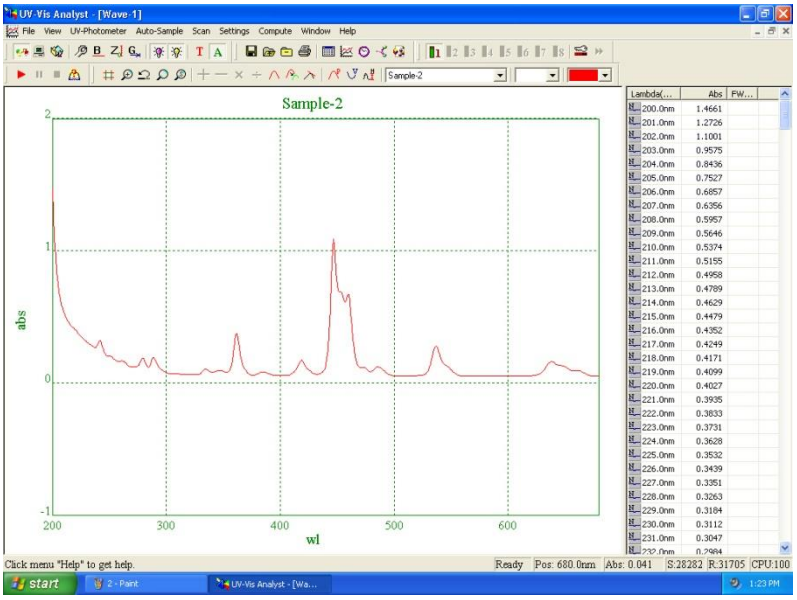
3. Click  on the toolbar to select %Transmittance mode or click  to select Absorbance mode.

4. Click  on the toolbar to set display parameters.



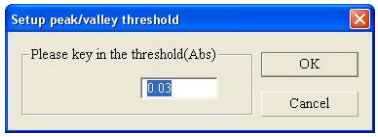
5. Place reference into the sample holder. Click  to scan baseline.

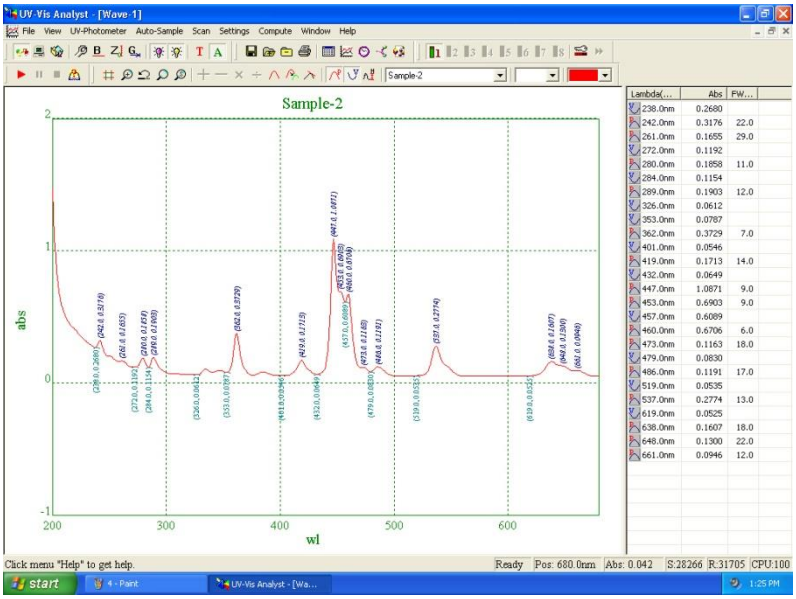
6. Place sample into the sample holder. Click  to scan sample, the real time spectrum will be displayed. Click  to cancel while scanning.



Auto List Peaks and Valleys

Click  on the toolbar to set the peak/Valley threshold (range: 0 to 1.000, step: 0.001), Input the threshold value, click **OK**. Click  to list peaks and click  to list valleys.





Rescale

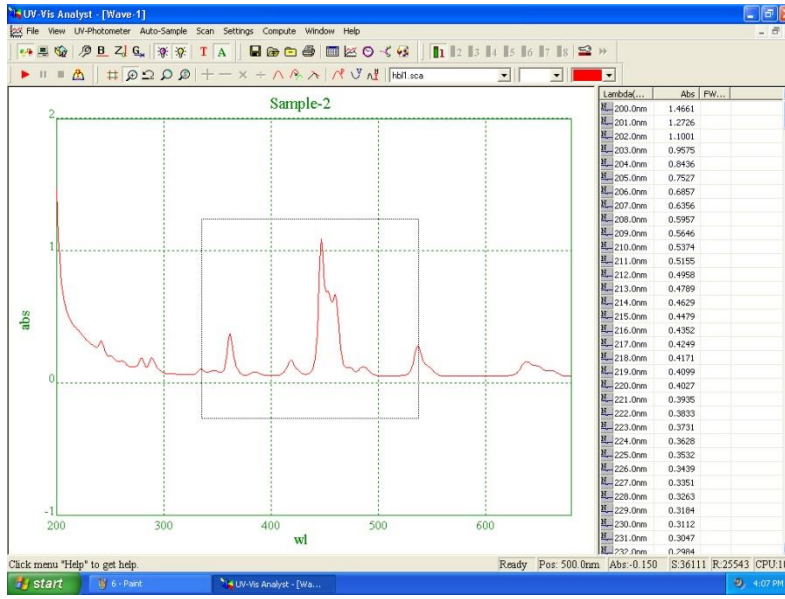
Click  on the toolbar to set the new parameters for display.

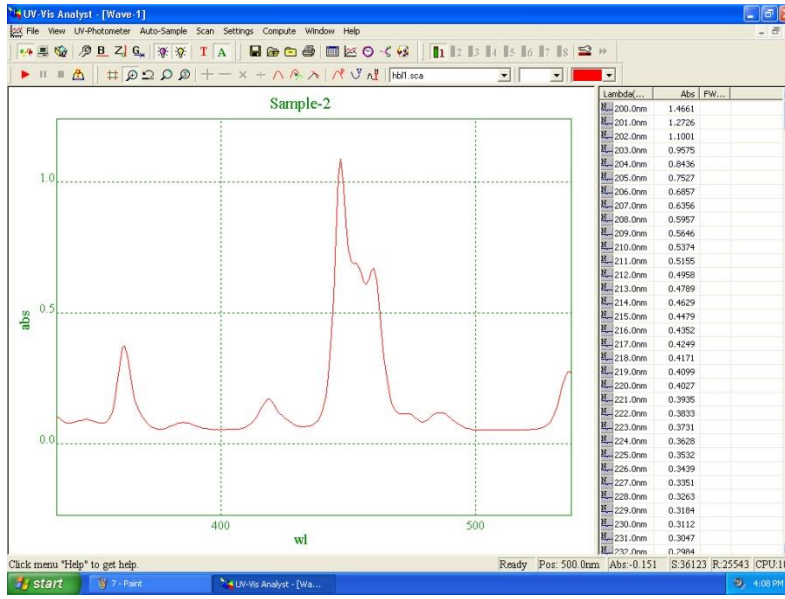
Original Scales

Click  on the toolbar to restore the default display settings.

Zoom Selected Area

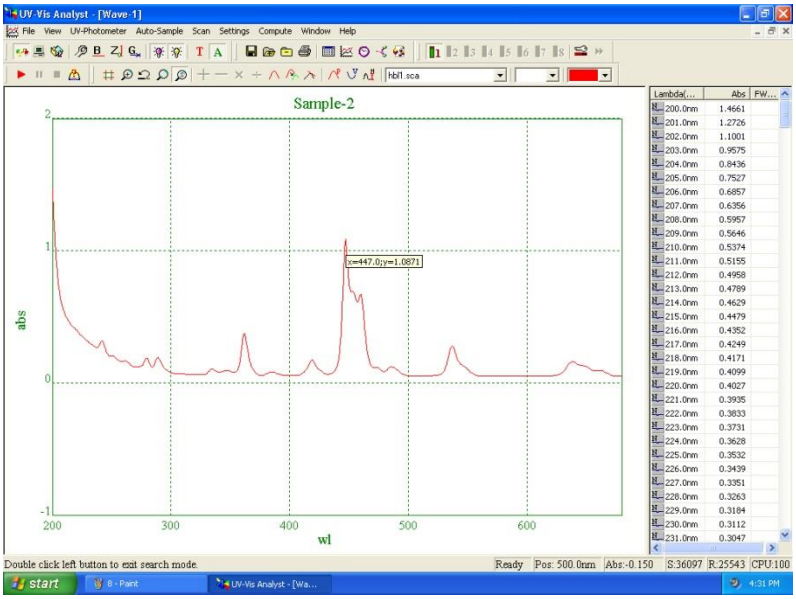
Click  on the toolbar to activate zoom function. Position the cursor in the upper-left corner of the area you want to select. Hold the left mouse button to drag the cursor to outline the spectrum area you want to enlarge. Release the mouse button. The part of the spectrum which is displayed within the outlined area will be enlarged. Click  to undo scale. To cancel zoom to click  again.





Trace a Spectrum

Click  on the toolbar, a crosshair cursor appears, move the cursor on the spectrum. Move the crosshair cursor left or right on the spectrum. The data in the cursor window indicate the X-axis and Y-axis values for the current cursor location. Click key "ESC" to release the crosshair cursor.



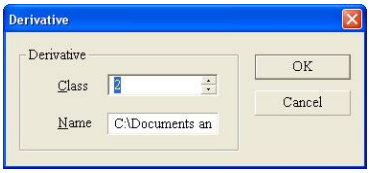
Select a Spectrum as Current

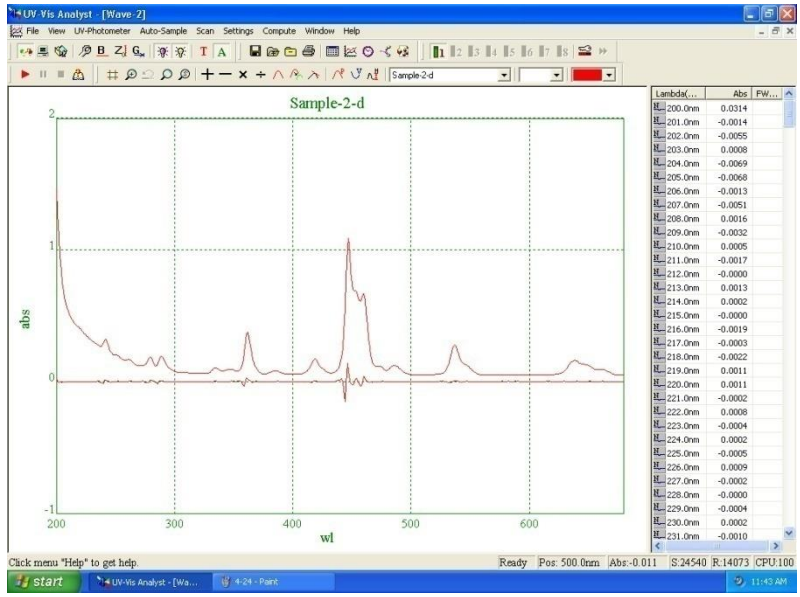
As UV-Vis Application Software can display several spectrum overlaid on the screen, you should specify the spectrum you wish to process. Click the **down** arrow on the toolbar. All spectrums will be listed in the pull-down menu. Click the spectrum you want to select. Its name will be listed in the Name Box and it will be referred to as **Current Spectrum**.



Derivative

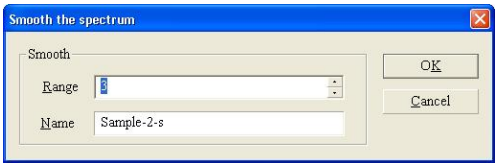
Click  on the toolbar. The following dialogue box appears. Key in the class of derivative (1-10, depending on whether 1st, 2nd, … 10th derivative is required) and type a name for the result spectrum, then click **OK**. The result spectrum will be displayed overlaid with the original one.

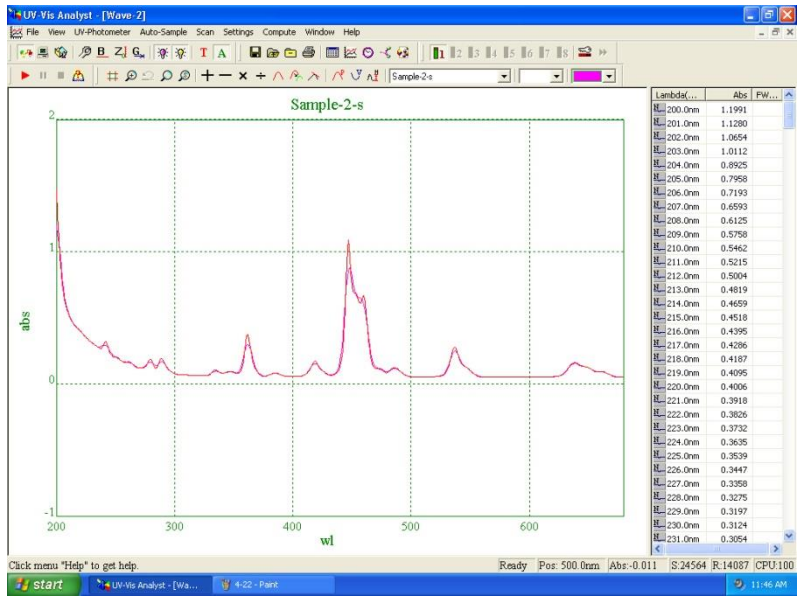




4.3.2.1 Moving Window Averaging

Click  on the toolbar. Appears following form. Click **up/down** arrow of the **Range** box to select range value, key a file name in the **Name** box, click **OK**. The result spectrum will be displayed overlaid with the original one.

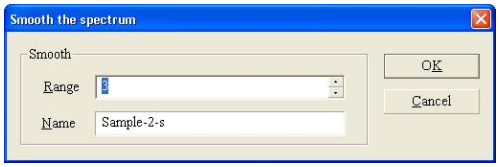


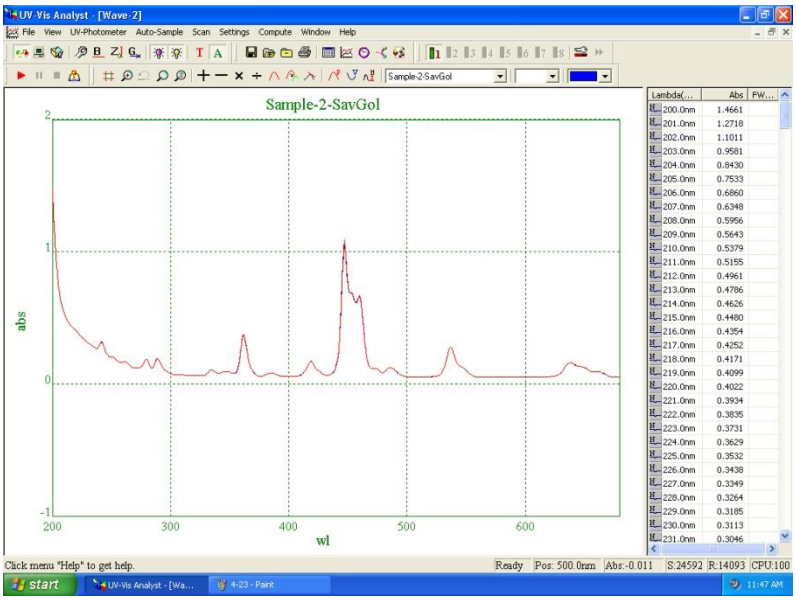


Savitzky-Golay Smoothing Filter

On the **Computer** menu, click **Savitzky-Golay Smoothing Filter**. Appears following form. Click

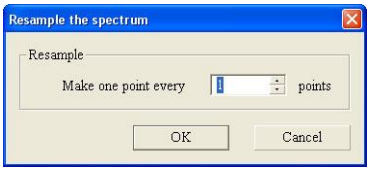
up/down arrow to select the parameters, key a file name in the Name of Result box, click **OK**. The result spectrum will be displayed overlaid with the original one.

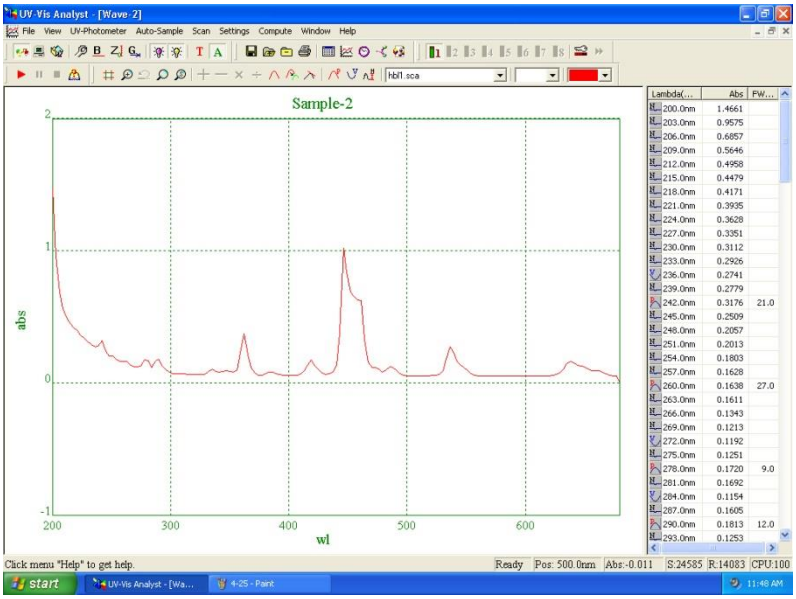




Resample

Click  on the toolbar. The following dialogue box will be displayed. Click **Up/Down** arrow to select Sample times. Click **OK**. The new spectrum displays.



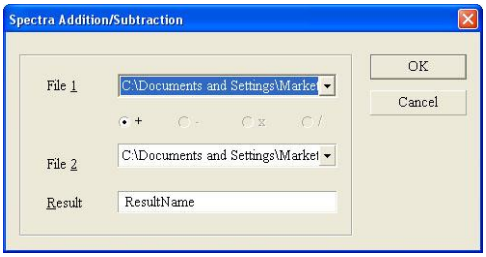


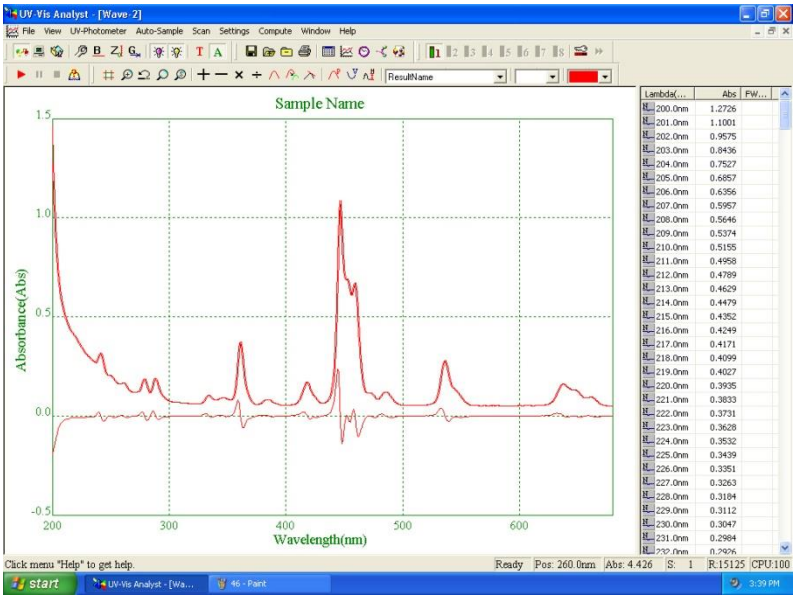
Spectrum Addition

Spectrum addition can assist in the development of artificial spectrum in multi-component mixtures.

Click  on the toolbar. The following dialogue box will be displayed. Click the **down** arrow next to **File 1** to select a spectrum and define it as source 1. Select a spectrum for **File 2** in the same way. It will not allow you to select the same spectrum twice. Key in a name for the **Result** spectrum and click **OK**. The result spectrum will be displayed on the screen.

UV-Vis Analyst will only add, subtract, multiply and divide two spectrums that are already displayed on the screen. Before arithmetic processing, load or collect two spectrums from memory.

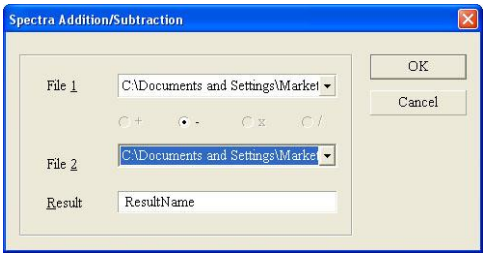


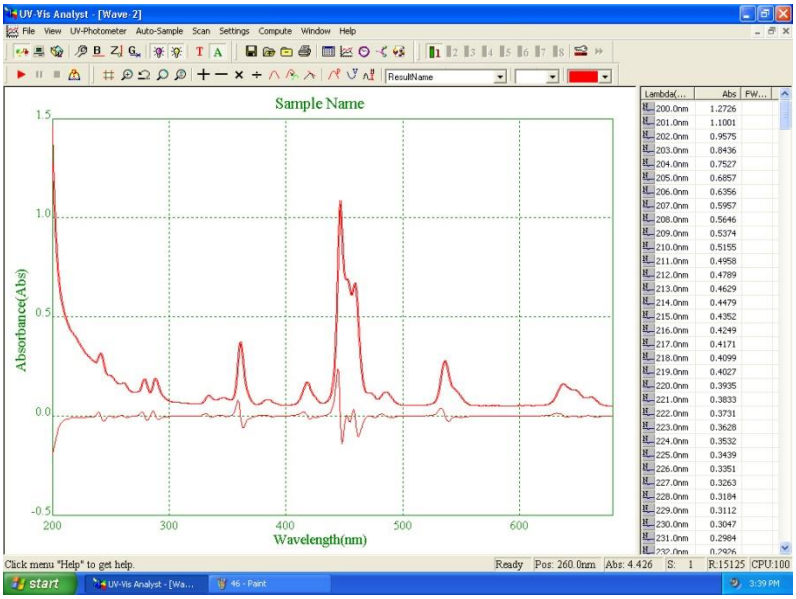


Spectrum Subtraction

Subtracting one spectrum from another has been a classical technique to offset spectrum interference from the spectrum of interest.

Click on the toolbar. The following dialogue box will be displayed. Click the **down** arrow next to **File 1** to select a spectrum and define it as source 1. Select a spectrum for **File 2** in the same way. It will not allow you to select the same spectrum twice. Key in a name for the **Result** spectrum and click **OK**. The result spectrum will be displayed on the screen.

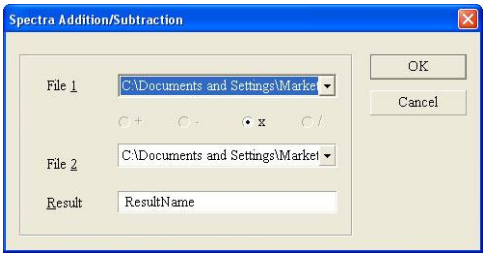


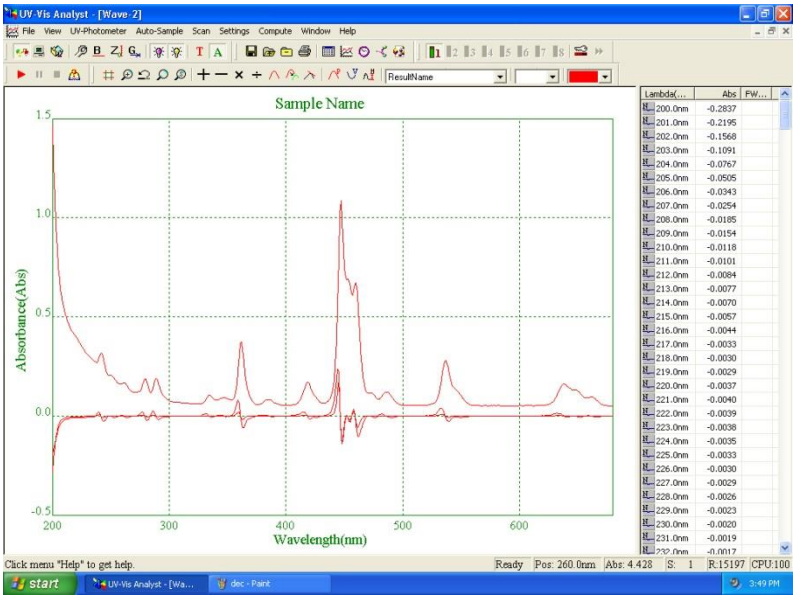


Spectrum Multiplication

Multiplying spectrum can assist in the development of artificial structure of spectrum in multi-component mixtures.

Click ✕ on the toolbar. The following dialogue box will be displayed. Click the **down** arrow next to **File 1** to select a spectrum and define it as source 1. Select a spectrum for **File 2** in the same way. It will not allow you to select the same spectrum twice. Key in a name for the **Result** spectrum and click **OK**. The result spectrum will be displayed on the screen.

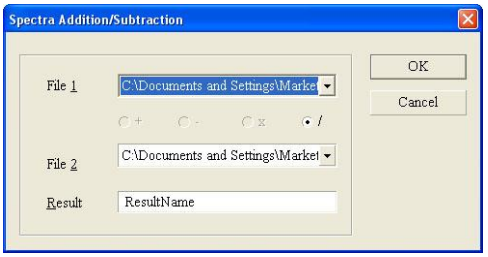


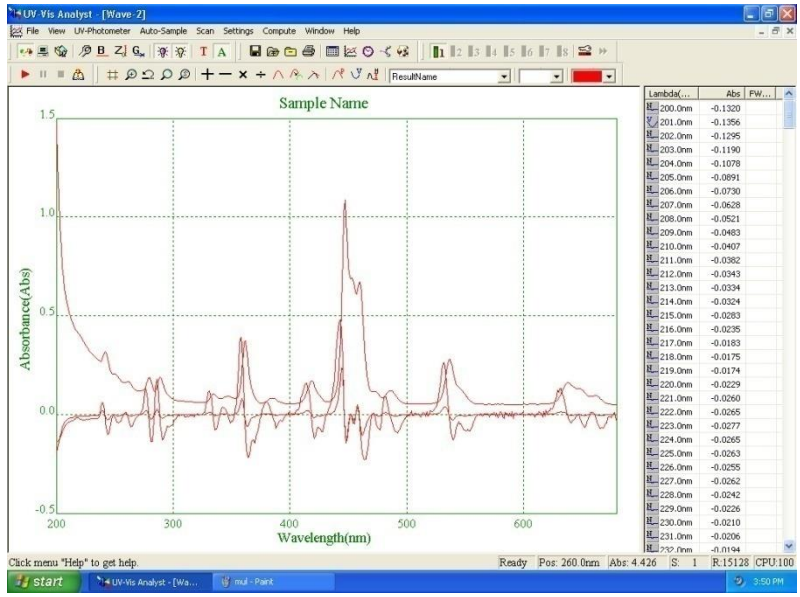


Spectrum Division

Dividing one spectrum from another has been a classical technique to offset spectrum interference from the spectrum of interest.

Click  on the toolbar. The following dialogue box will be displayed. Click the **down** arrow next to **File 1** to select a spectrum and define it as source 1. Select a spectrum for **File 2** in the same way. It will not allow you to select the same spectrum twice. Key in a name for the **Result** spectrum and click **OK**. The result spectrum will be displayed on the screen.



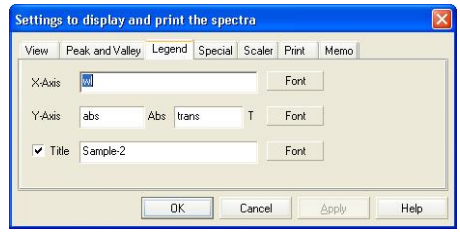


Unload a Spectrum

Select the spectrum you want to unload as the **Current Spectrum,** Click  on the toolbar to remove the spectrum from the display.

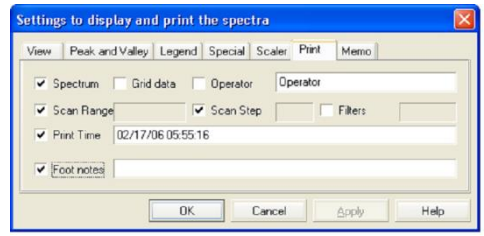
Define Display Information

Click  on the toolbar, appears the **Settings to display and print the spectra** form, click the **Legend** tab, type the information for display.



Edit Print Information

Click  on the toolbar, appears the **Settings to display and print the spectra** form, click the **Print** tab, type the information for print out.

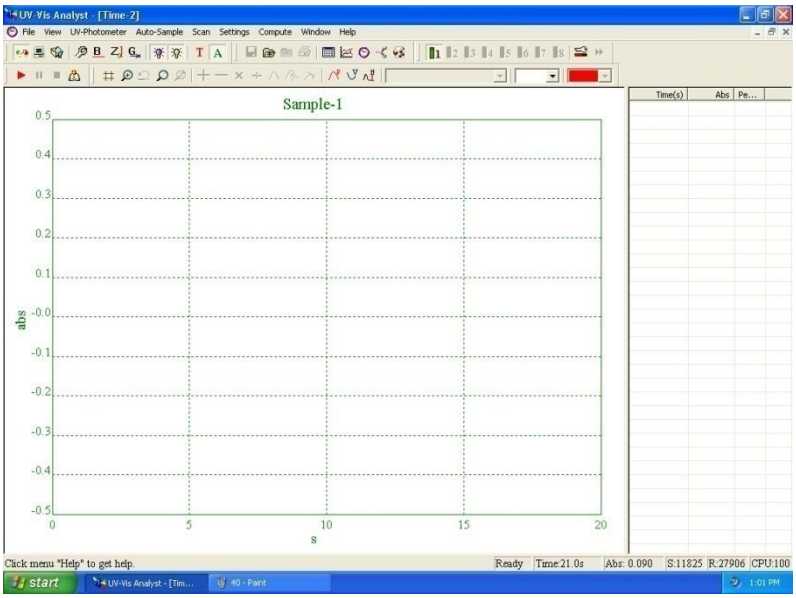


Time Scanning (Kinetic Analysis)

This chapter tells you how to obtain the absorbance or transmittance value for a sample as a function of time at a given wavelength.

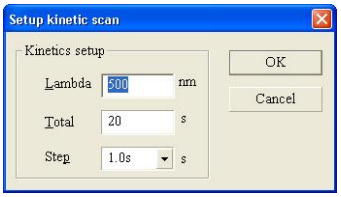
Scan Sample

1. Click  on the toolbar, the following dialog box will appear.

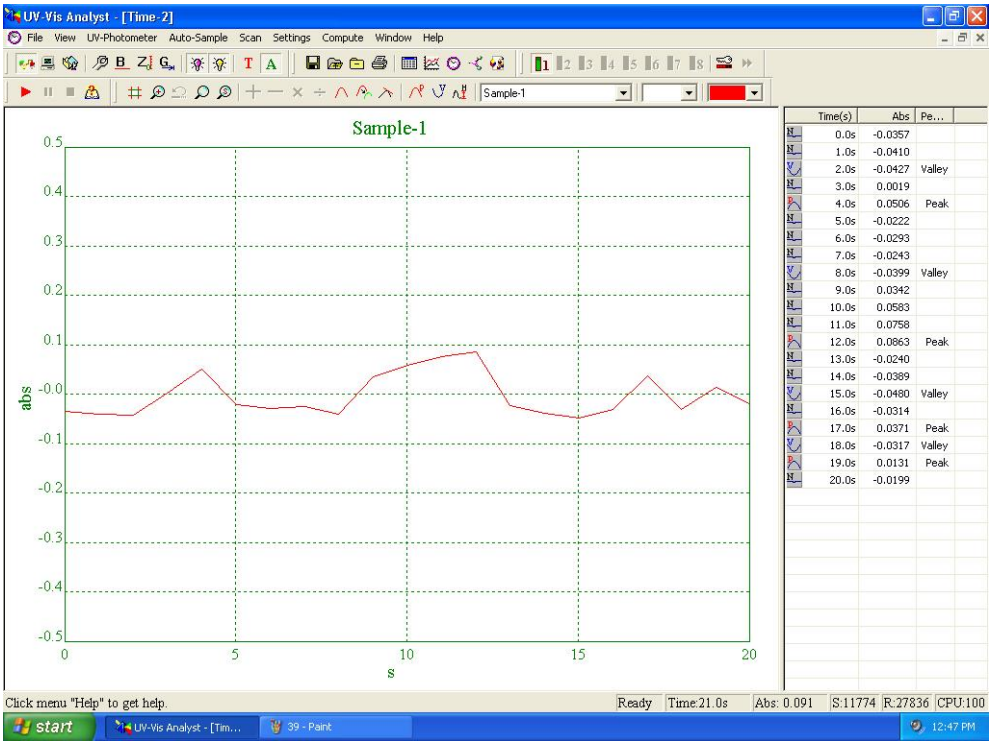


2. Click  on the toolbar to select the %transmittance mode or click  to select the absorbance mode.

3. Click  on the toolbar. A dialogue box will be displayed. Key in the wavelength, total time (in seconds) and scan step in the above dialog box. The wavelength range should be within 190 to 1100 nm. The upper limit for total time is 100000 seconds. Seven scan intervals can be selected from 0.5S, 1S, 2S, 5S, 10S, 30S and 60S. Click **OK**.

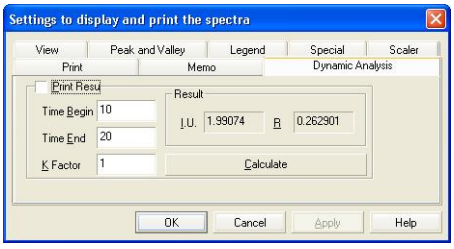


4. Place a reference in the sample holder. Click  on the toolbar.
5. Take out the blank in the sample holder, place a sample in it and close the cover.
6. Place a sample in the sample holder. Click  on the toolbar. The instrument will start scanning automatically. The graph will be displayed on the screen during time scanning. You can stop scanning by clicking  .



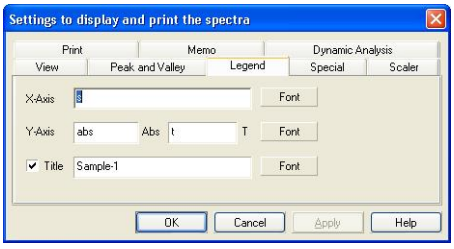
Calculate Rate

Click  on the toolbar, appears the **Settings to display and print the spectra** form, click the **Dynamic Analysis** tab, type the begin time in **Time Begin** box, type the end time in **Time End** box, and type the K factor in **K Factor** box, click **Calculate**, the result will be displayed.



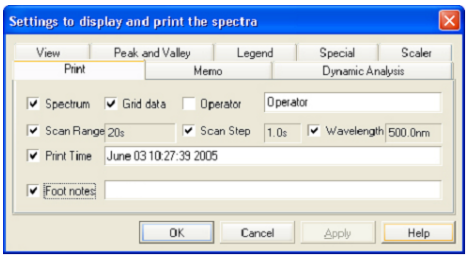
Define Display Information

Click  on the toolbar, appears the **Settings to display and print the spectra** form, click the **Legend** tab, type the information for display.



Edit Print Information

Click  on the toolbar, appears the **Settings to display and print the spectra** form, click the **Legend** tab, type the information for display.



Appendix 1

Methods of Quantitative Analysis

Single Wavelength Method: Abs.=A1

Double Wavelengths Method: Abs.=m*A1-n*A2

Three Wavelengths Method: Abs.=A1-(W1-W2)*(A2-A3)/(W2-W3)-A3

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