



SPECTROPHOTOMETER V-3000PC VIS

INSTRUCTION MANUAL

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10037-440

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Legal Address of Manufacturer

United States

VWR International, LLC

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Made in China

Table of Contents

Part1: Spectrophotometer

Safety Information	1
Package Contents.....	2
Unpacking	2
Installation.....	2
Intended Use.....	3
Symbols and Conventions.....	3
Specifications	3
Overview	4
Description of Buttons and Switches	4
Operational Keys	6
Getting Started	8
Important Guidelines	9
General Operating Instructions.....	10
Operation	12
Basic Mode.....	12
Quantitative Mode	14
Wavelength Scan	19
Kinetics.....	22
Multi Wavelength Mode	25
System Utility.....	27

Troubleshooting	33
Repair and Maintenance	34
Daily Maintain	34
Check Lamp	34
Spare Parts Replacement.....	34
Accessories and Spare Parts	40
Technical Service	41
Warranty	41
Equipment Disposal	41

Part2: Software

Functions	41
Main Functions	41
Spectrum Processing Function	42
System Check and Calibration Function	42
Installation.....	43
Introduction	46
Operation	51
Single Wavelength Photometric Measurement	51
Fixed Point Measurement.....	52
Wavelength Scanning.....	57
Time Scanning (Kinetic Analysis)	70
Appendix 1	73

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 SPECTROPHOTOMETER V-3000PC VIS.



- 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 (US 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.

Intended Use

SPECTROPHOTOMETER V-3000PC VIS used in Chemistry, Pharmaceuticals, Biochemical, metallurgy, Light Industry, Textile, Material, Environments, Medical, Education and some other fields. It is one of the most important instruments in Quality Control and an essential in normal laboratories.

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 110V, 60Hz, 100W
Dimension	490×360×240mm
Weight	12kg
Work Environment	15 to 35°C, 15 to 70% relative humidity
Store Environment	-10 to 50°C, 15 to 70% relative humidity

This instrument is compliant to the U.S. and Canada Directives on
UL 61010-1 Issued: 2012/05/11 Ed: 3
CSA-C22.2 No. 61010-1 Issued: 2012/05/11 Ed: 3
47CFR Part 15 (2011)
ANSI C63.4 (2009)

Overview

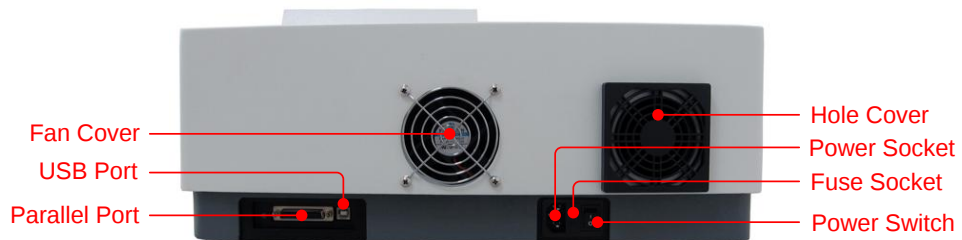
SPECTROPHOTOMETER V-3000PC VIS has the characters of wide range of wavelength, high sensitivity, powerful function, easy to use, simple structure and pretty figure. Besides these, the large LCD, High Precise A/D and easy to store RAM makes the instrument much more superior than other originals. It is widely used in Chemistry, Pharmaceuticals, Biochemical, metallurgy, Light Industry, Textile, Material, Environments, Medical, Education and some other fields. It is one of the most important instruments in Quality Control and an essential in normal laboratories.

Description of Buttons and Switches

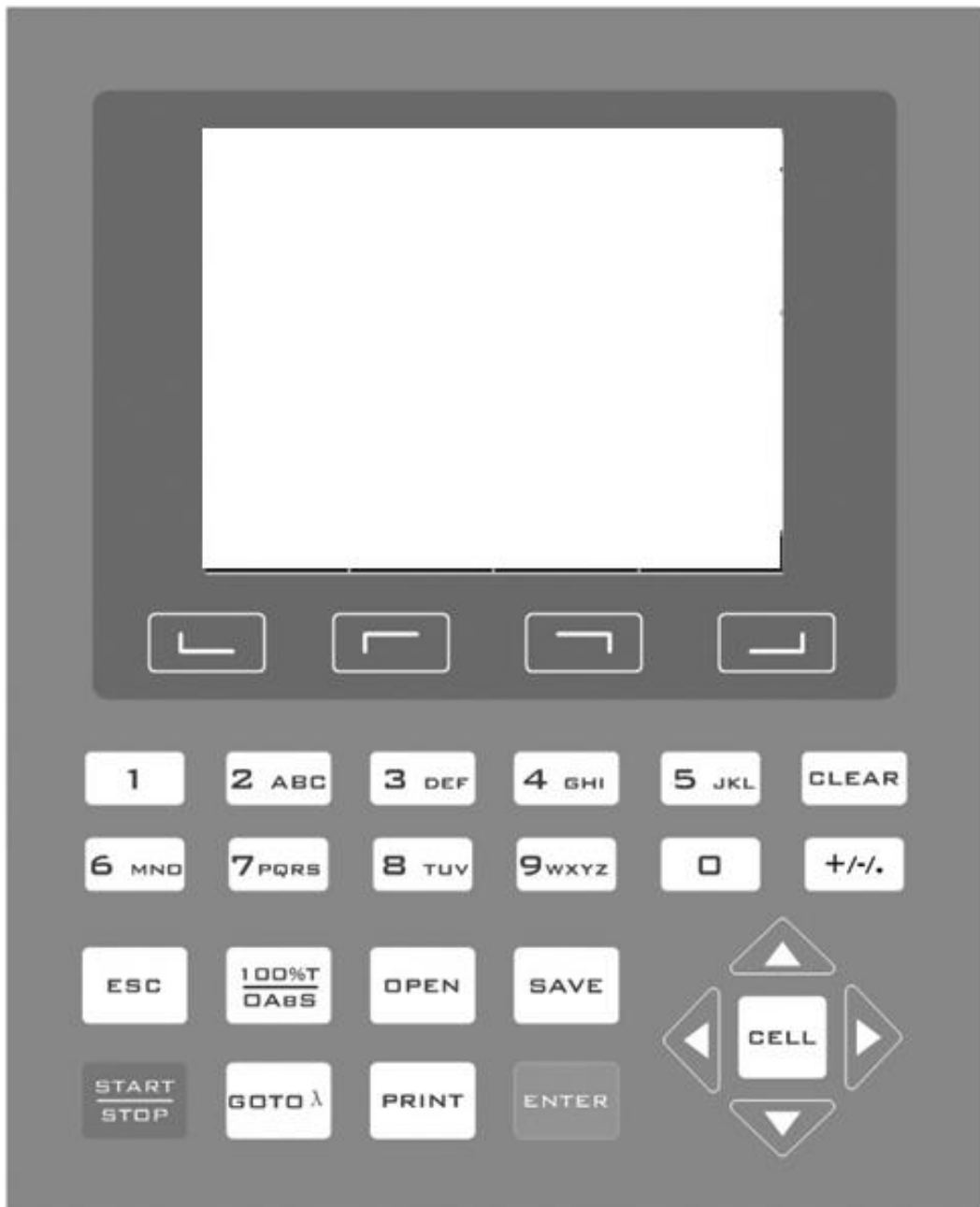
Front View



Rear View

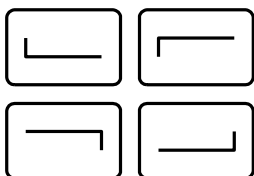


Operational Keys

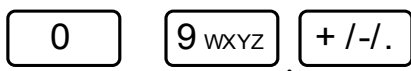


Key

Functions



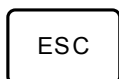
Function Keys: Functions on-screen prompts



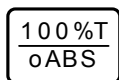
Numeric Keys: Enter numbers and letters



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 Key: Print measuring result



ENTER Key: Confirm operation



CELL Key: Select/Deselect Auto-cell Holder



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



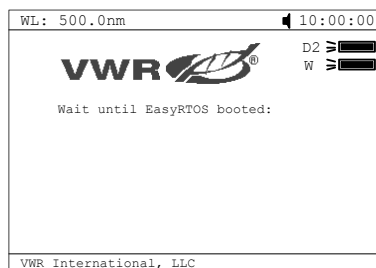
UP, DOWN Keys: Scroll menu/data and set Y scale

Getting Started

The following chart describes the basic operation of the instrument.

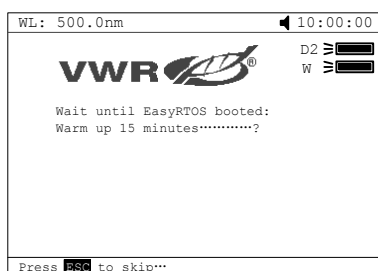
Turn On and Self-check

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

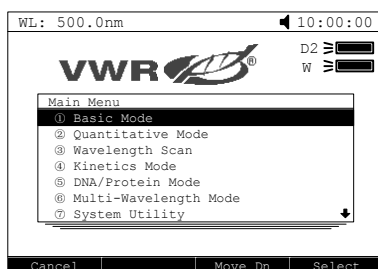
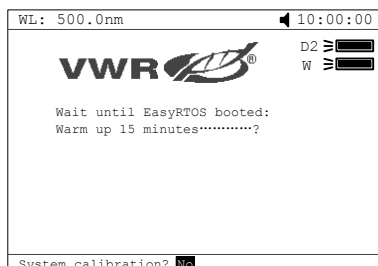


Turn on lamps → RAM Check → Start RTOS kernel → Initialize Comm. Port → Initialize

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  to enter into.

Set Wavelength

Press  to set wavelength, use numeric keys to input the values, press  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  to enter into, press  to return.

Set Auto-cell Holder

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

Delete the Input Value

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

Delete the Test Results and Stored data

Press  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  to do blank.

Measure Samples

Put the samples in the light path, press  to measure.

Print the Test Results

Press  to print the test results.

Store the Test Results

Press  to store the test results, input the file name by numeric keys and press  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  to go into file selecting interface, press ,  to choose the file you want, press  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.

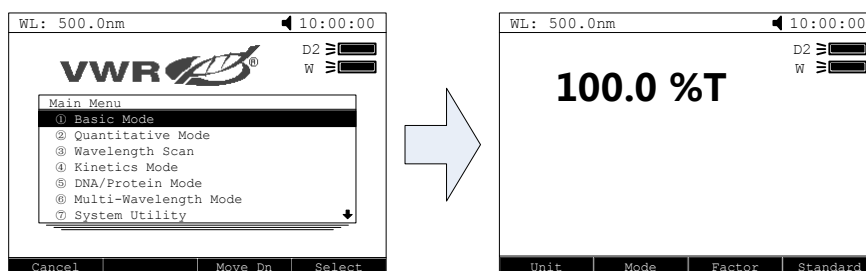
Check the cuvettes

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 or ,  to choose "Basic Mode", then press to go into.



2. Set Photometric Mode

Press to set photometric mode. Press ,  to choose "Abs.", "T%" or

"Conc./Factor" and press 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  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  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  to confirm, then it displays on the screen.

5. Set Wavelength

Press  to set wavelength, input the value by the numeric keypad followed with  pressed to confirm.

6. Blank

Put the Reference in the light path and press  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  to print the Test Results.

Basic Mode Test Report

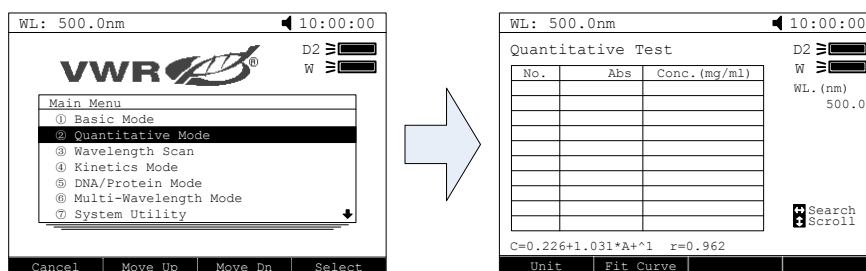
Wavelength: 500.0nm
 Result: 0.000 Abs
 Date & Time: mm-dd-yyyy, hh:mm:ss

Model: V-3000PC
 SN: VLAXXXXXXXX
 Version: Ax.xxx
 VWR International, LLC

Quantitative Mode

1. Enter into Quantitative Mode

Main menu, press  or press ,  to choose “Quantitative Mode” followed with  pressed to confirm.

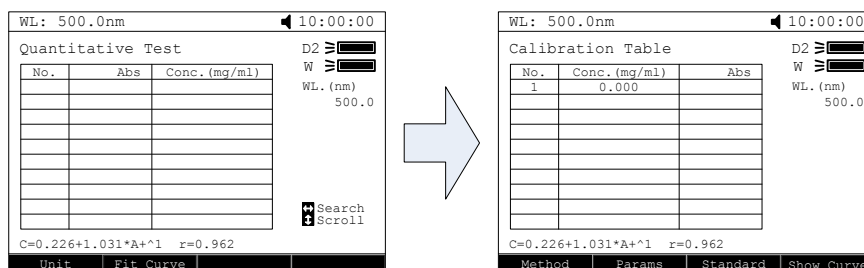


2. Set Unit

Press  to set concentration unit, press ,  to choose and press  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:

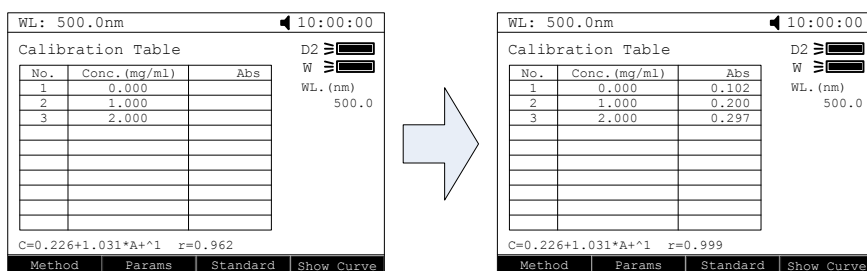
Method 1: Input Regression Equation

- 1) **Set Fit Curve Method.** Press  to set Fit method, use ,  to choose the method and press  to confirm.
- 2) **Set Wavelength.** Press  to set wavelength. Use ,  to choose measure method, then press  to confirm. Input the wavelength value you need and press  to confirm.
- 3) **Input the Factor of the Regression Equation.** Press  and input the factors, press  to confirm.

Method 2: Use Standard Samples

- 1) Set Fit Method.** Press  to set fit method, press ,  to choose fit method, then press  to confirm.
- 2) Set Wavelength.** Press  to go into wavelength setting interface, press ,  to select measure method and press  to confirm. Input the value of the wavelength and press  to confirm.
- 3) Blank.** Put the Reference Sample in the light path and press  to do blank.
- 4) Setup Standard Samples.** Press  to setup standard, input the concentrations of corresponding standard samples according the indication and press  to confirm. Users can use ,  to choose the value you just input and press  to delete, then input a new value, press  to confirm. Press  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  to measure. Then the Abs. value would appear in the corresponding table.

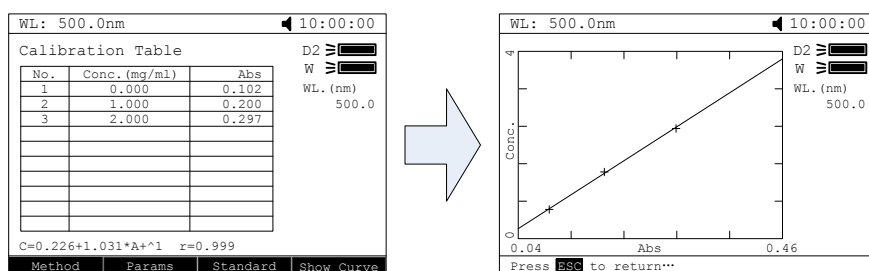


Load the Stored Curves

In the “Calibration Table” interface, press  to go into files select interface. Use

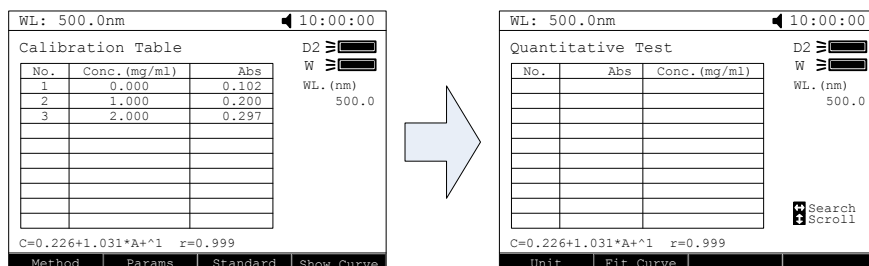
,  to select the curve you need and press  to load. Users can press

 to view the curve, press  to cancel.



4. Return the sample measurement interface

In the “Calibration Table” interface, press  to return the Quantitative Test interface.

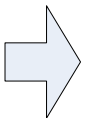


5. Blank

Put the Reference Sample in the light path, press  to do blank.

6. Measure Samples

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



WL: 500.0nm 10:00:00

Calibration Table

No.	Conc. (mg/ml)	Abs
1	0.000	0.102
2	1.000	0.200
3	2.000	0.297

C=0.226+1.031*A+^1 r=0.999

Method Params Standard Show Curve

WL: 500.0nm 10:00:00

Quantitative Test

No.	Abs	Conc. (mg/ml)
1	0.158	1.601
2	0.155	1.598
* 3	0.160	1.614

C=0.226+1.031*A+^1 r=0.999

Unit Fit Curve

7. Print the Test Results

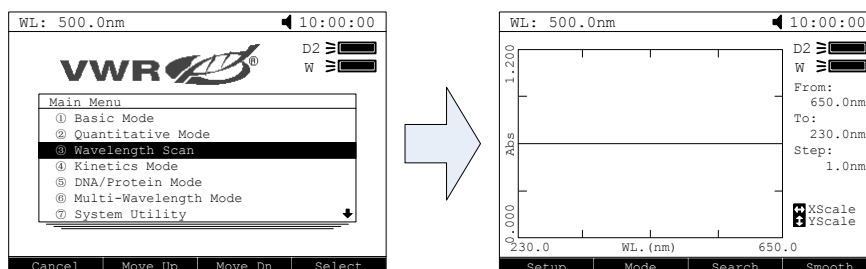
Press  to print the Test Results.

Quantitative Test Report			
File Name: Abc			
Date & Time: mm-dd-yyyy, hh:mm:ss			
No.	500.0nm	Abs(ef)	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: VLAXXXXXXX			
Version: Ax.xxx			
VWR International, LLC			

Wavelength Scan

1. Enter into Wavelength Scan

Main menu, press numeric key or ,  to choose "Wavelength Scan" and press to enter.



2. Parameters Setup

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

press  to confirm.

3. Set Photometric Mode

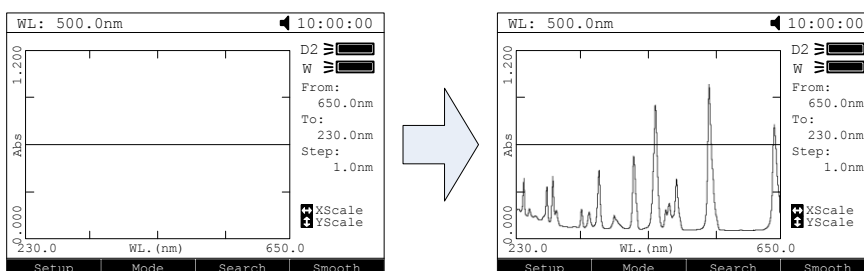
Press  to set photometric mode, choose “T%”, “Abs.” or “E” and press  to confirm.

4. Scan Baseline

Put Reference Sample in the light path, press  to scan the baseline, press  to cancel.

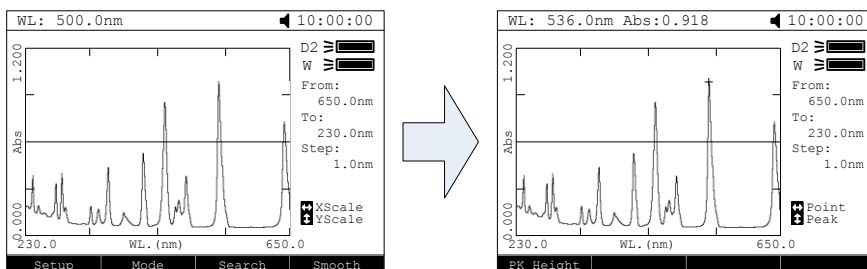
5. Scan Samples

Put the samples in the light path, press  to scan the sample, press  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  to confirm. Press ,  to display the value of every wavelength point. Press ,  to display the value of every peak.



7. Smooth the Curve

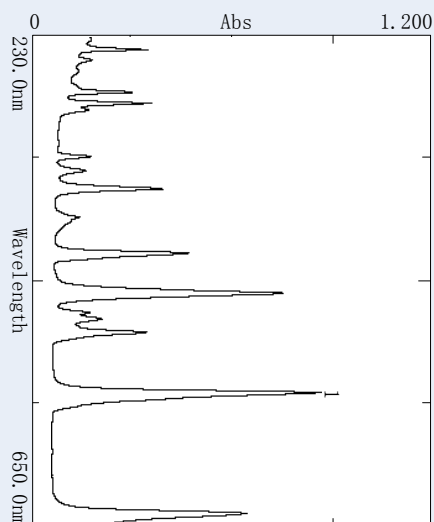
After scanned, if there are many burrs on it, press  to smooth the curve.

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: VLAXXXXXXX
Version: Ax.xxx
VWR International, LLC



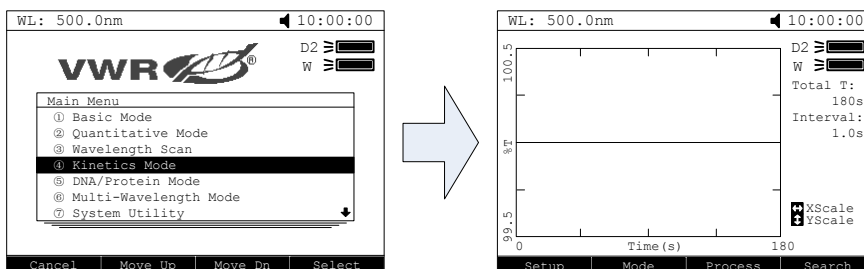
Peak list

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  to confirm.

3. Set Photometric Mode

Press  to set photometric mode, choose “T%” or “Abs.” and press  to confirm.

4. Set Wavelength

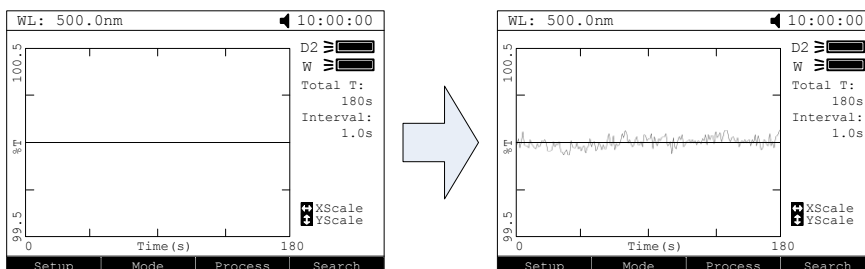
Press  to set wavelength, input the value of the wavelength by numeric keypad and press  to confirm.

5. Blank

Put the Reference Sample in the light path, press  to do blank.

6. Measure Samples

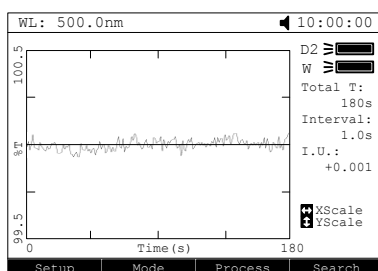
Put the sample in the light path and press  to begin the test, press  to cancel.



7. Calculate Response Rate

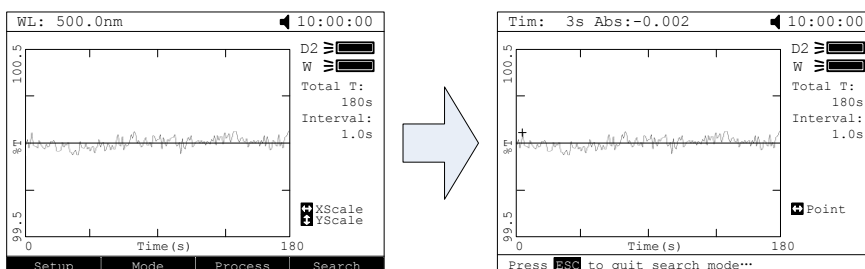
After time scanned, if users want to calculate the response rate of some period, you can

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.



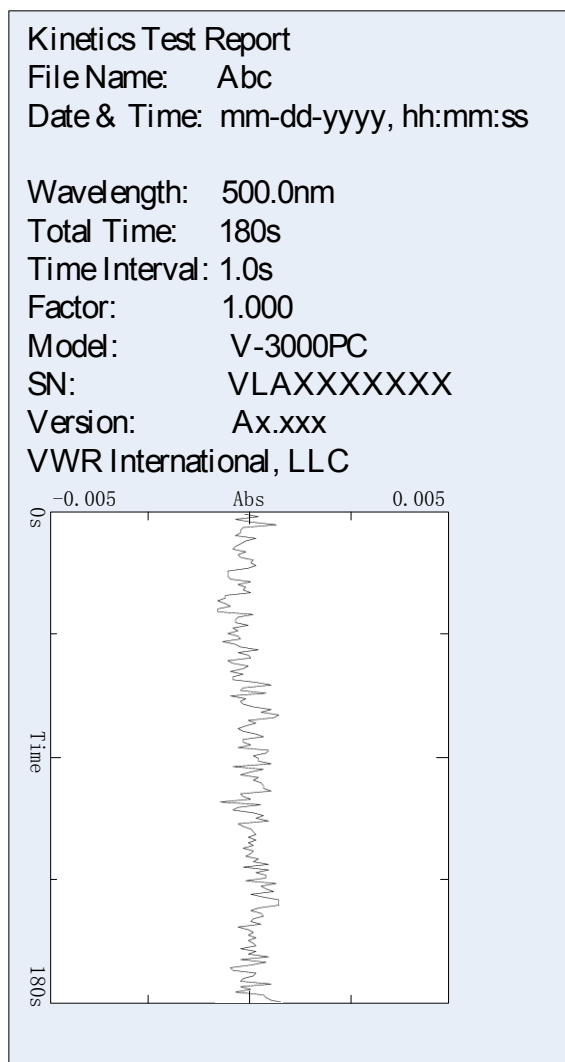
8. Search Peaks

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



9. Print the Test Results

Press  to print the Test Results.

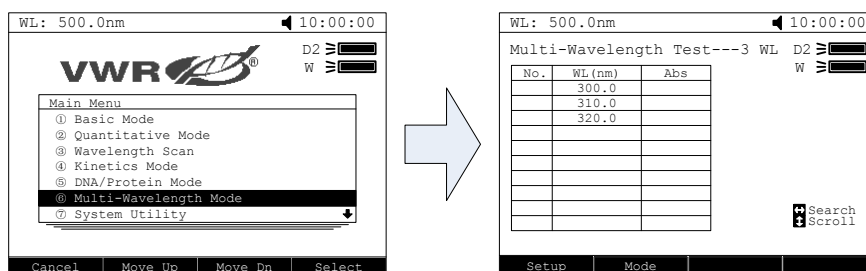


Multi Wavelength Mode

1. Enter into Multi Wavelength Measurement

Main Menu, press  or ,  to choose “Multi Wavelength Measurement” and

then press  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  to confirm, press  to return.

3. Set Photometric Mode

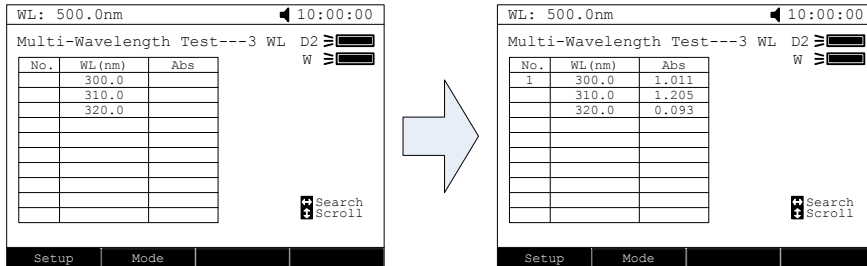
Press  to set the photometric mode, use ,  to select “Abs.” or “T%” mode, press  to confirm.

4. Blank

Place the Reference Sample in the light path, press  to do blank.

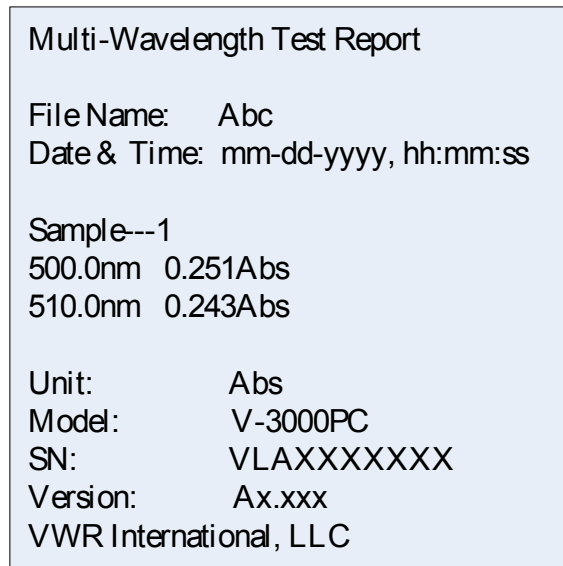
5. Measure Samples

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



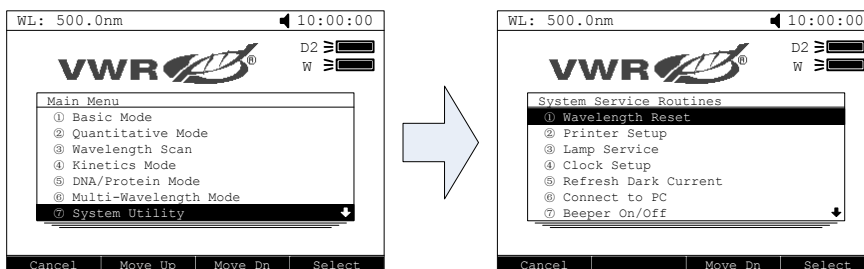
6. Print the Test Results

Press  to print the Test Results.



System Utility

Main menu, press  or use ,  to select "System Utility" and press  to confirm.

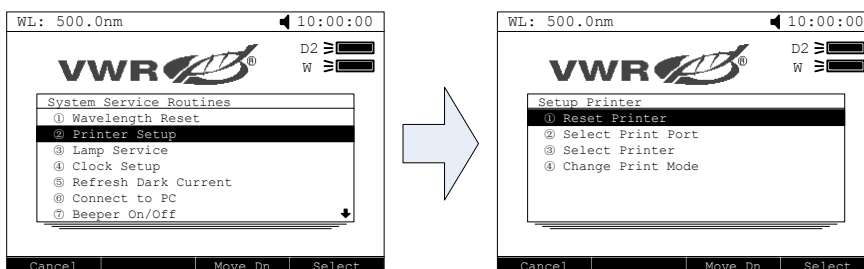


Wavelength Reset

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**

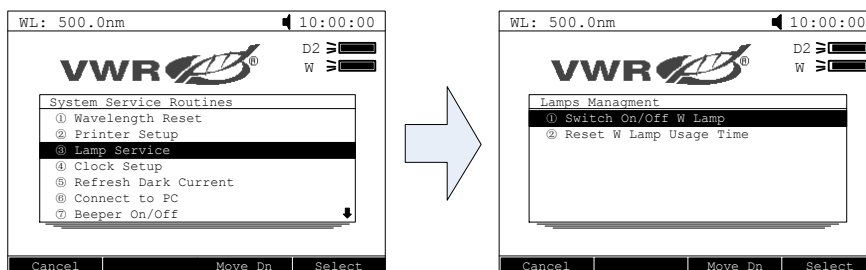
Press **3 DEF** or use ,  to choose “Select printer” and press **ENTER** to confirm. Use ,  to select the printer’s model and then press **ENTER** to confirm.

▪ **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 W lamp**

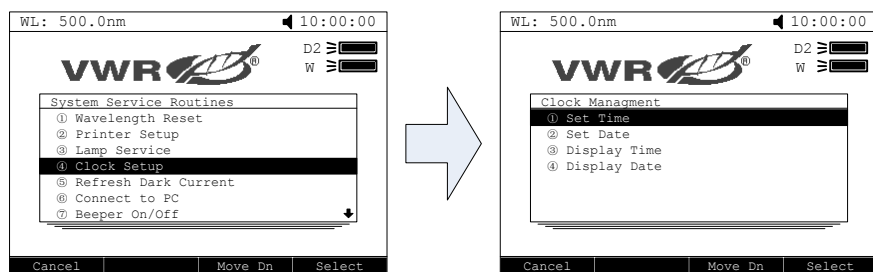
Press **1** or use ,  to choose “Reset W lamp usage time” and press **ENTER**. Then users can find the W lamp’s usage time and the system will ask you if are sure to reset the usage time.

- **Reset the W lamp usage time**

Press or use ,  to choose “Reset W lamp usage time” and press . 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 to confirm. The system will record the usage time from zero.

Clock Setup

Press or use ,  to choose “Clock Setup”, then press to go into “Clock Management” Interface.



- **Set Time**

Press or ,  to choose “Set Time” and press to confirm.

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

- **Set Date**

Press or use ,  to choose “Set Date” and press to

confirm. Input the Date(Year, Month, Day) by numeric keypad, press

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.

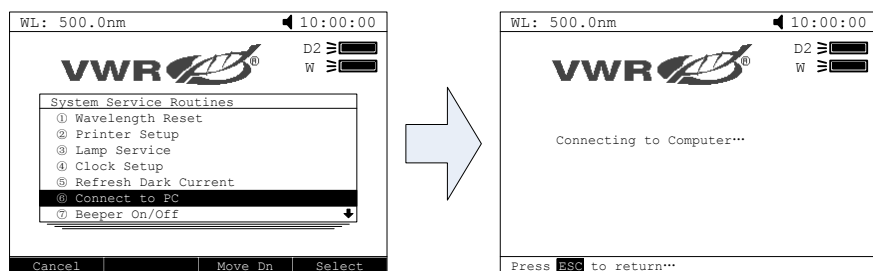
Refresh Dark Current

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  or use ,  to choose “Beeper on/off” and press  to switch on or switch off the beeper.

Language Selection

Press  or use ,  to choose “Language Selection” and press  to go into language selection interface, press ,  to choose language (English, French, German, Spanish) and press  to confirm. Then the interface will change into the language you just select.

Refresh System Baseline

Press  or use ,  to choose “Refresh System Baseline” and press  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  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  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
	Sample is not Stable	Improve the sample
	The concentration of sample is too high	Diluted sample
	Power Supply Voltage Low or not Stable	Improve the Power Supply
	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: 320nm

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, 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

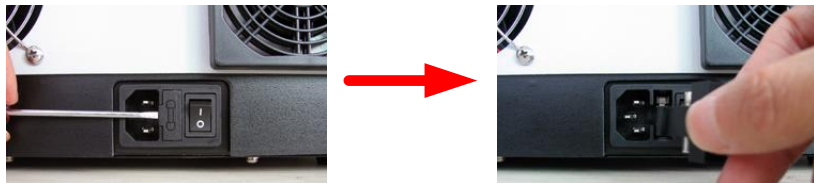
Prepare a 3×75 Flat Blade screwdriver.

2. Switch Off the power supply

Switch off the power supply, and unplug the socket.

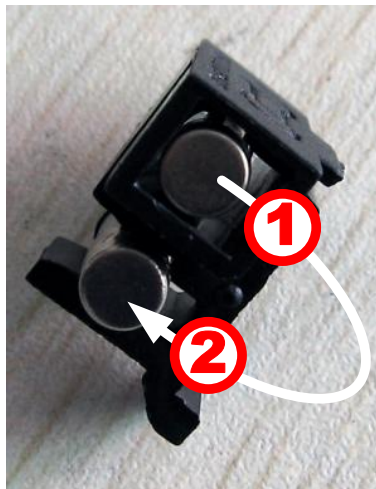
3. Take out the Fuse Seat

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.

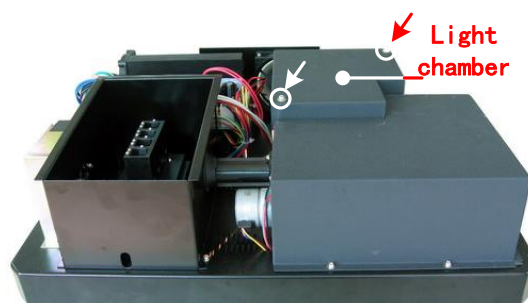
3. Open the cover

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



4. Open the cover of the light chamber

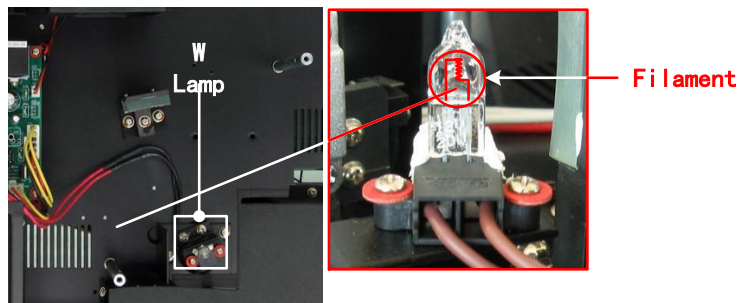
Unscrew the 2 screws on the light chamber cover and remove it.



5. Replace W lamp

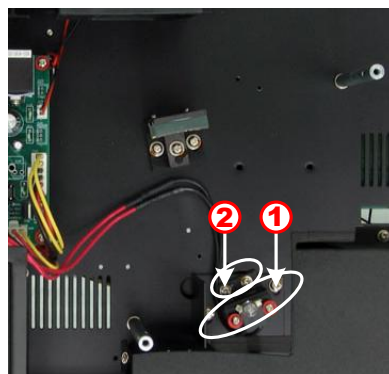
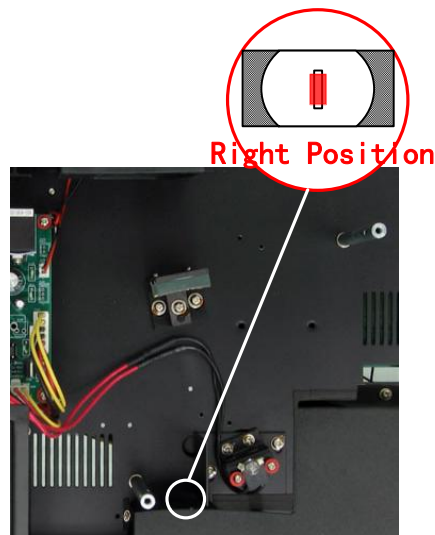
The Tungsten lamp is equipped with a blue-grey silicon coating by manufacturer. This coating is only a transport safety device. It can be removed with the first exchange of lamp.

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 be in the center of the entrance hole. If the facular deviates to Left or Right, then loosen the No.1 screws and move the lamp seat to Left or Right until it focuses on the center of the slot. Then fix the screws. If the facular deviates to Up and Down, then loosen the No.2 screws and move the lamp seat Up and Down until the facular focuses 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

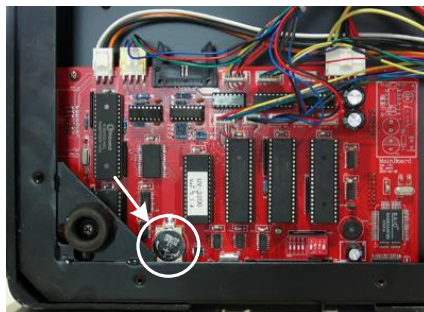
3. Open the Bottom cover plate

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	10037-444
CELL HOLDER, 4-CELL,10 TO 50MM	1PC	10037-446
CELL HOLDER, 4-CELL, 100MM	1PC	10037-448
CELL HOLDER, FOR CYLINDRICAL CELL	1PC	10037-450
CELL HOLDER, WATER-JACKETED, 1 CELL, 10MM	1PC	10037-452
CELL HOLDER FOR TEST TUBES	1PC	10037-454
CELL HOLDER,8-POSITION AUTO CELL CHANGER	1PC	10037-456
CELL HOLDER, SOLID SAMPLE	1PC	10037-458
CELL HOLDER, WATER-JACKED, 4 CELL, 10MM	1PC	10037-460
CUVETTE, SQUARE.GLASS,10MM	4PCS	10037-462
CUVETTE, SQUARE.GLASS,20MM	2PCS	10037-464
CUVETTE, SQUARE.GLASS,30MM	2PCS	10037-466
CUVETTE, SQUARE.GLASS,50MM	2PCS	10037-468
CUVETTE, SQUARE.GLASS,100MM	1PC	10037-470
LAMP, HALOGEN, 12V20W	1PC	10037-484
PRINTER, THERMAL PRINTER	1PC	10037-488
CELL HOLDER FOR MICRO CELLS	1PC	10037-490
THERMAL PAPER	1PC	10037-504
SILICON TUBE	1PC	10037-506
FLOW CELL, 5 MM, OPTICAL GLASS	1PC	10037-524
FLOW CELL, 10 MM, OPTICAL GLASS	1PC	10037-526
FLOW CELL, 20 MM, OPTICAL GLASS	1PC	10037-528
FLOW CELL, 30 MM, OPTICAL GLASS	1PC	10037-530
PELTIER UNIT	1PC	10037-540
SIPPER UNIT WITHOUT TEMP. CONTROL	1PC	10037-542
SIPPER UNIT WITH PELTIER TEMP. CONTROL	1PC	10037-544
DUST COVER	1PC	10037-546

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 purchase. 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 handing 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 through 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

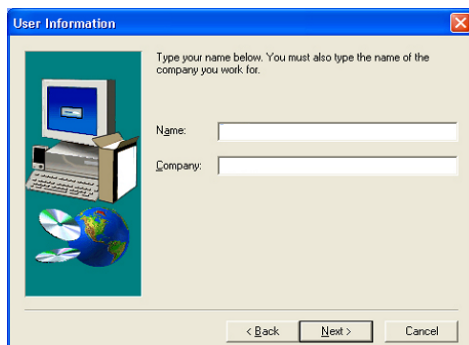
- Pentium or above PC;
- CD-ROM;
- USB Ports.
- 32MB Memory(256MB or Above is strongly recommended);
- 50MB or above hard disc Space;
- Microsoft Windows 2000/XP/Vista/7.

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**;



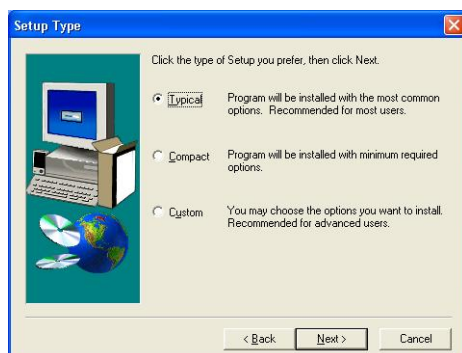
3. Input user's information, click **Next**;



4. Choose install path, then click **Next**;



5. Select setup type, then click **Next**;



6. Select program fold. Click **Next** to copy files to PC;



7. Click **Finish** to finish the installation.



Uninstall UV-Vis Analyst

Start→Control Panel→Add or Remove Programs→Select **UV-Vis Analyst**→Change/Remove.

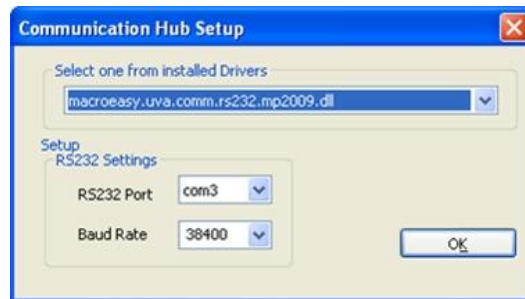
Run UV-Vis Analyst

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

- Double-click shortcut icon  on the desktop.
- Start→All Program→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), click **OK**.

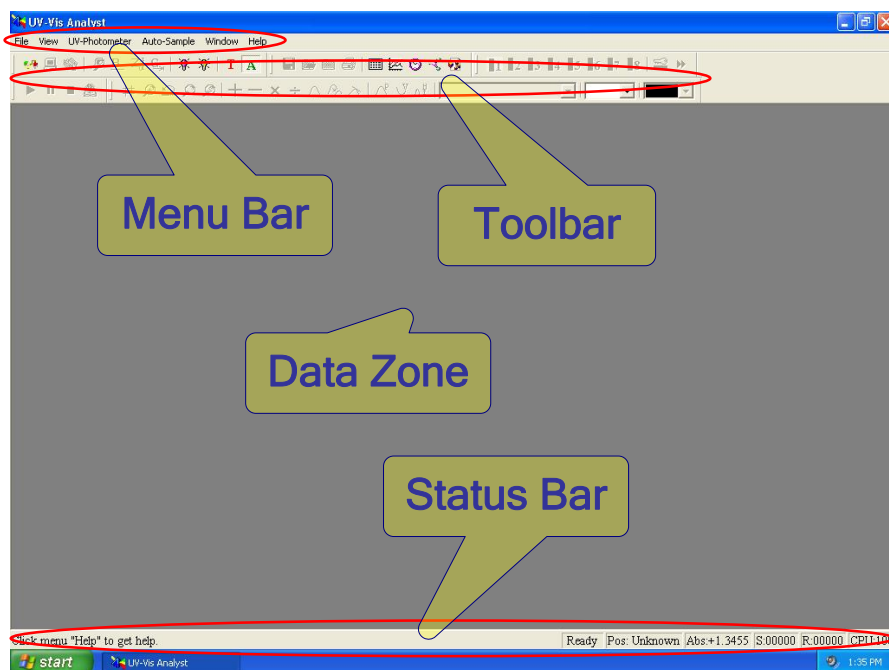


Introduction

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, 1.0, 2.0,
	Set Unit		Set unit
	Turn on/off W lamp		Turn on/off W lamp
	Turn on/off D2 lamp		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 cascade
	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

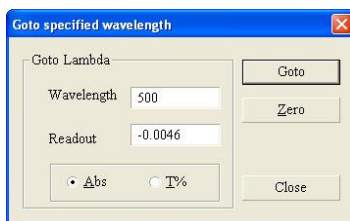
Operation

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.

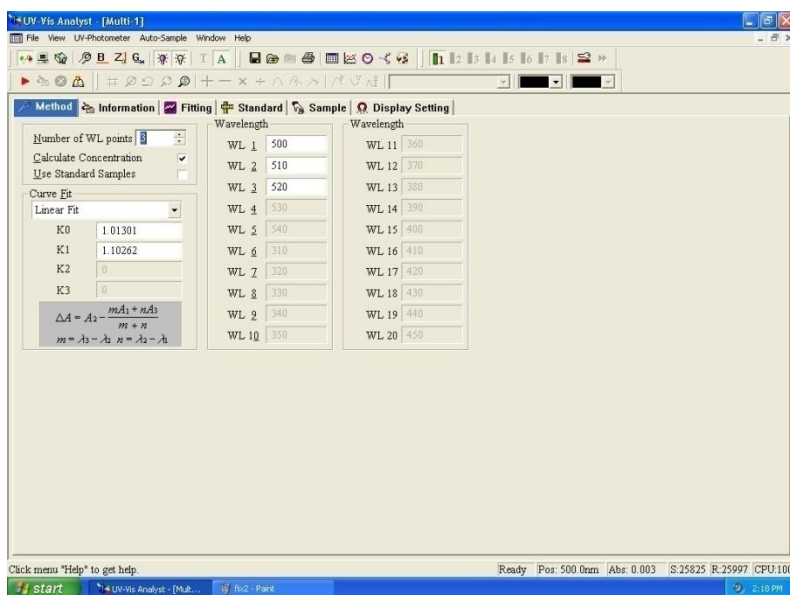
- Place a reference in the sample compartment, click **Zero**.
- Place a sample in the sample compartment. The wavelength position and photometric value will be displayed in the **Readout** box.

Fixed Point Measurement

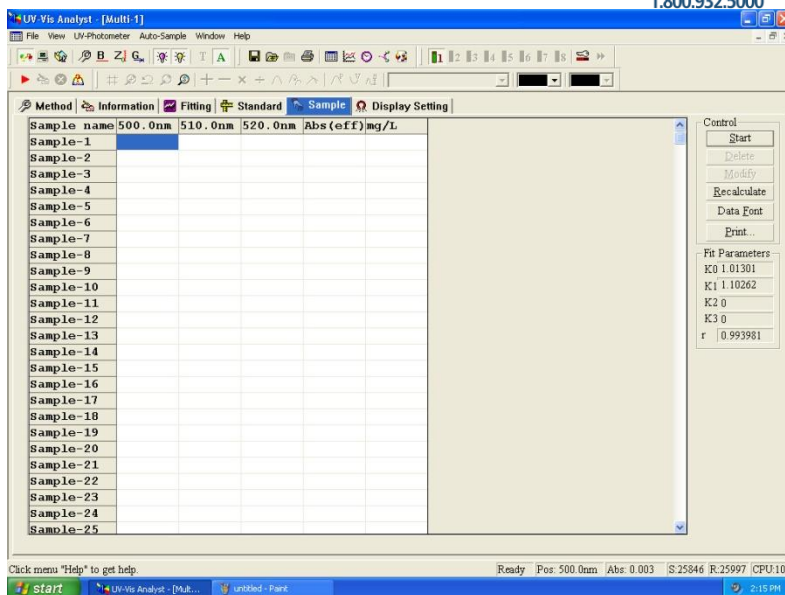
This UV-Vis Analyst performs fixed wavelength measurement at 1-20 points and how to analyze unknown compounds against calibration standards.

Multi-wavelength Photometric Measurement

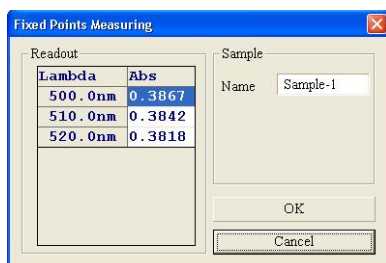
- Click  on the toolbar, appears follow form.



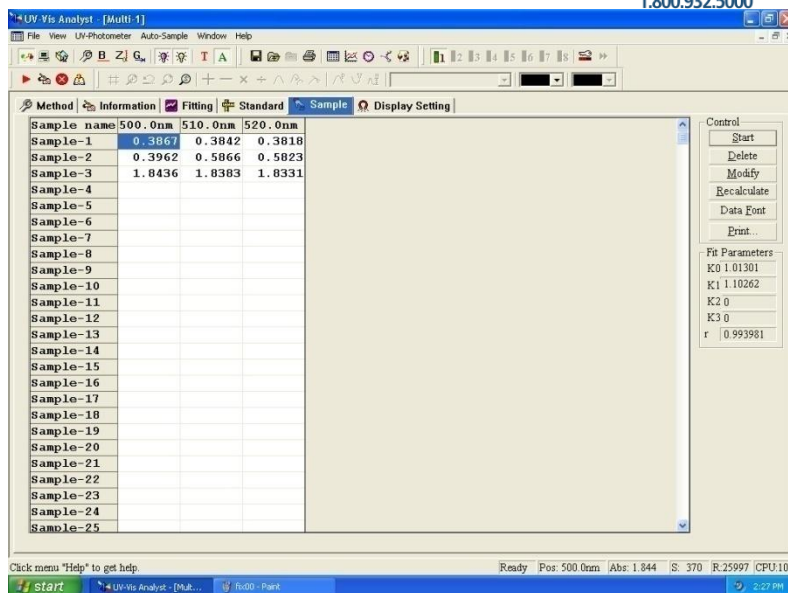
- Click the **Method** tab.
- Type the number of wavelength points in the **Number of WL Points** box, or click the **up/down** arrows next to the box set the wavelength points. Leave the two boxes **Calculate Concentration** and **Use Standard Samples**.
- Key in the wavelength in the **Wavelength** box.
- Place a reference in the sample compartment. Click  to do blank.
- 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

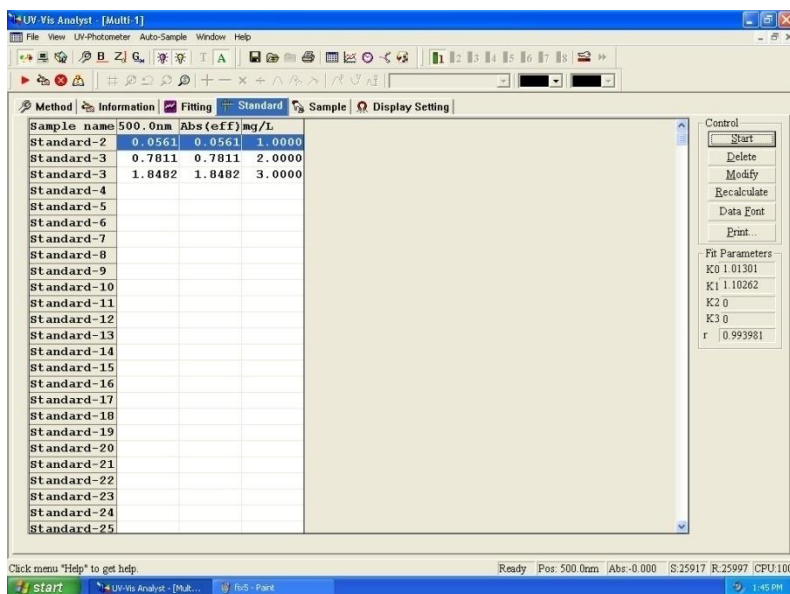
Set Up Linear Regression Curve

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.

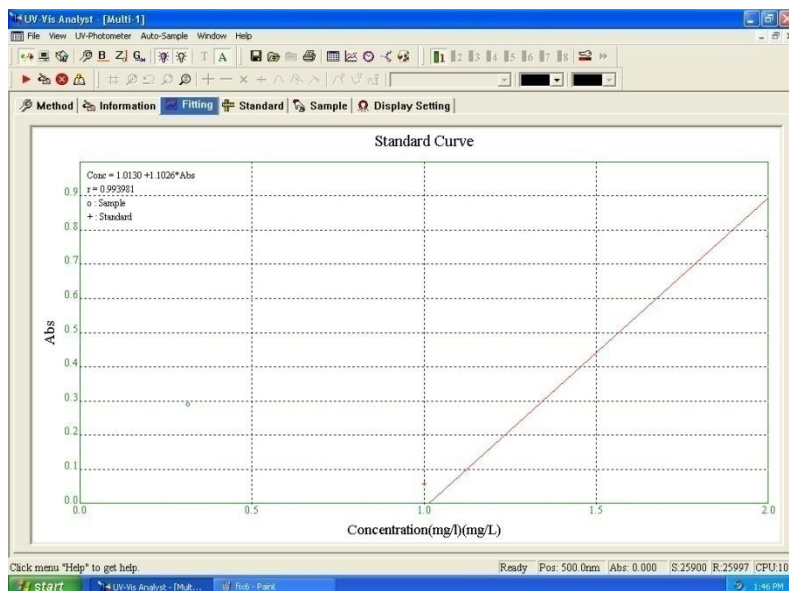
1. Click  on the toolbar.
2. Click the **Method** tab.
3. Enter the number of wavelength points in the **Number of Points** box, or click the **up/down** arrow next to this box. With 2 wavelengths, the absorbance at the second reference wavelength is subtracted from the first to correct for background 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.

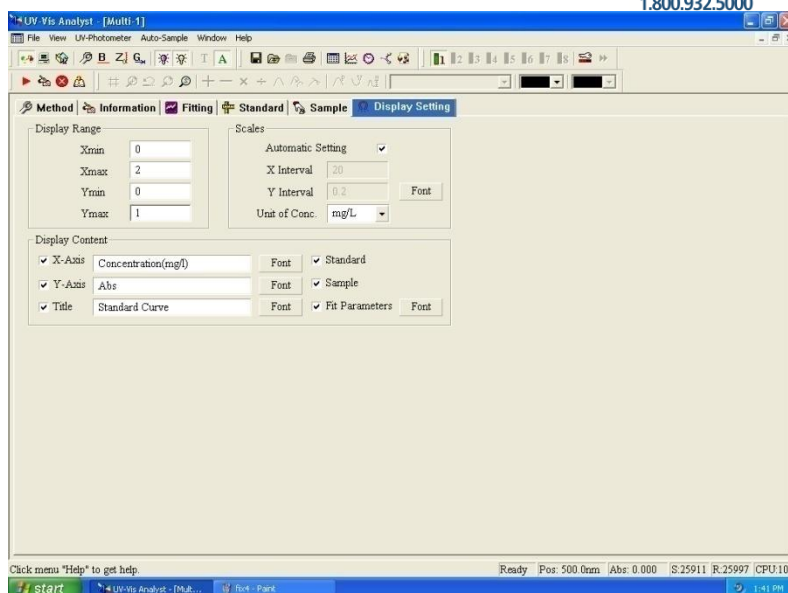
Method 1: Set up the linear regression curve with prepared standards.

- (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.

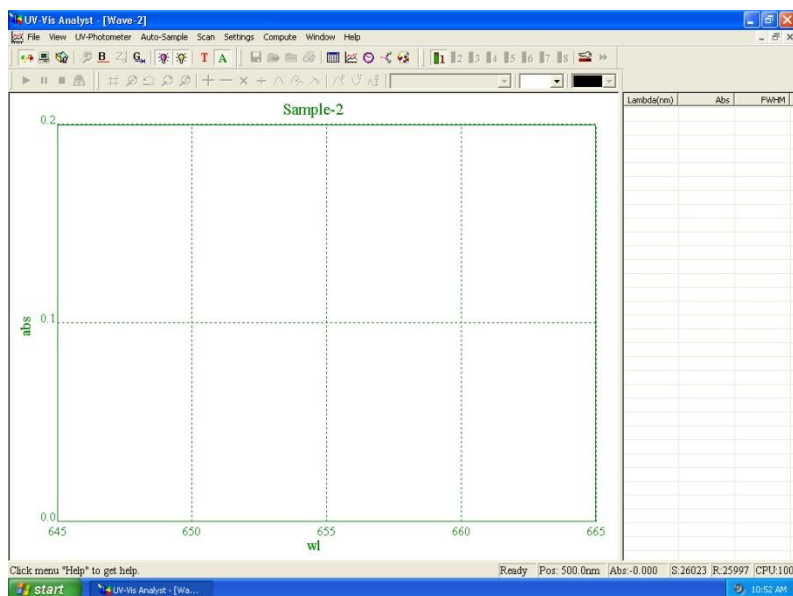




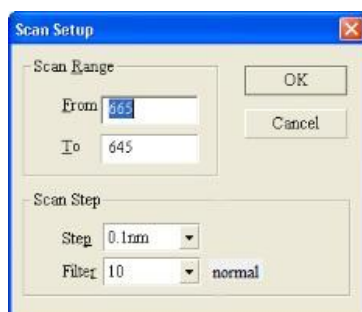
Measure Concentration by Using The Linear Regression Curve

The following procedure shows how to measure concentration of samples.

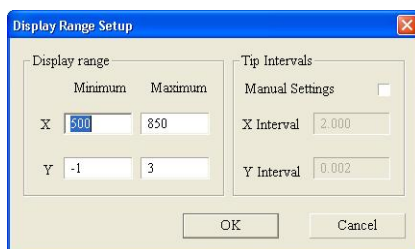
1. Set up linear regression curve or click  to open a file of linear regression curve (*.QUA).
2. Place reference into the sample holder. Click  to do blank.
3. Click the **Sample** tab.
4. Place Sample 1 into the sample holder.
5. Click **Start** to run a measurement.
6. UV-Vis Application Software 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.



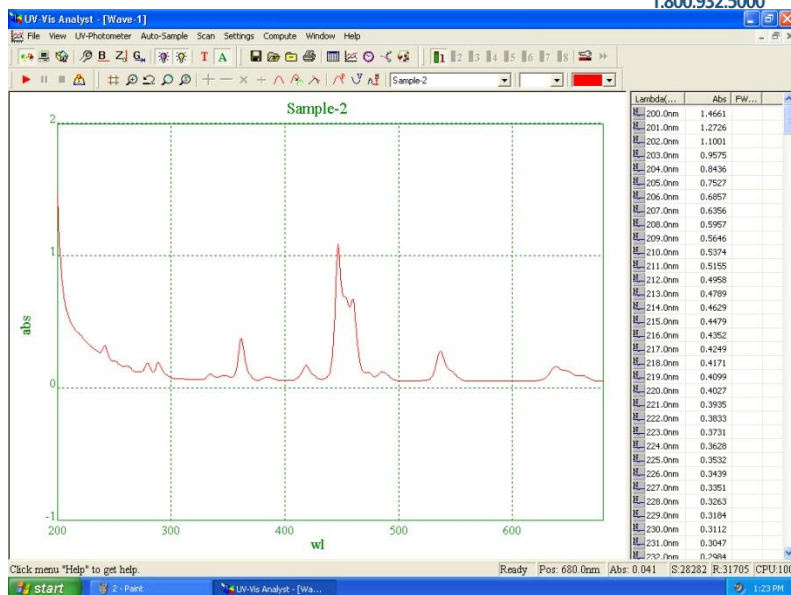
From box (range: 190-1100nm), end wavelength in **To** box (range: 190-1100nm), select scan interval (0.1, 0.2, 0.5, 1.0, 2.0 or 5.0nm) and Filter times (1, 3, 5, 10 or 30), click **OK**.



3. Click  on the toolbar to select %Transmittance mode or click  to select Absorbance mode.
4. Click  on the toolbar to set display parameters.



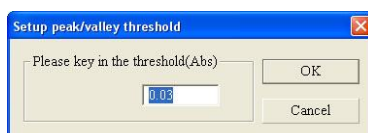
5. Place reference into the sample holder. Click  to scan baseline.
6. Place sample into the sample holder. Click  to scan sample, the real time spectrum will be displayed. Click  to cancel while scanning.



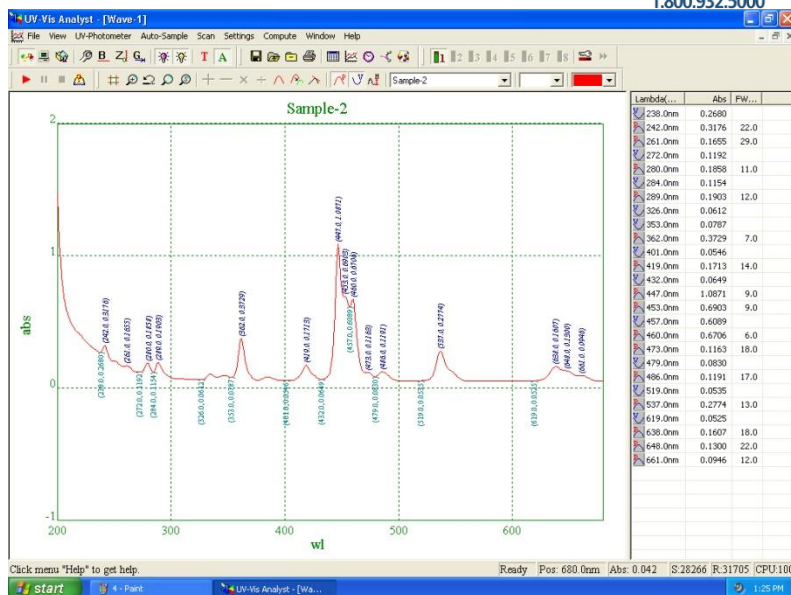
Auto List Peaks and Valleys

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.



The dialog box is titled 'Setup peak/valley threshold'. It contains a text input field with the label 'Please key in the threshold(Abs)' and a value of '0.03'. There are 'OK' and 'Cancel' buttons.



Rescale

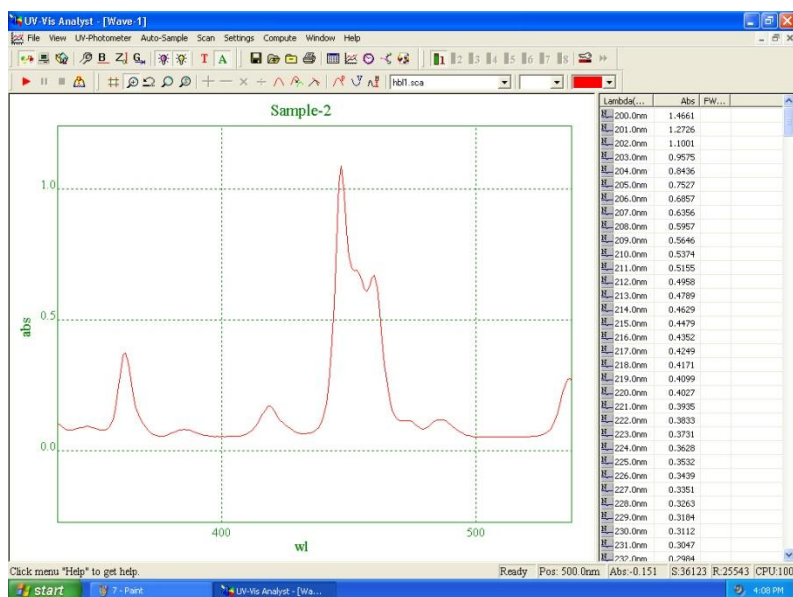
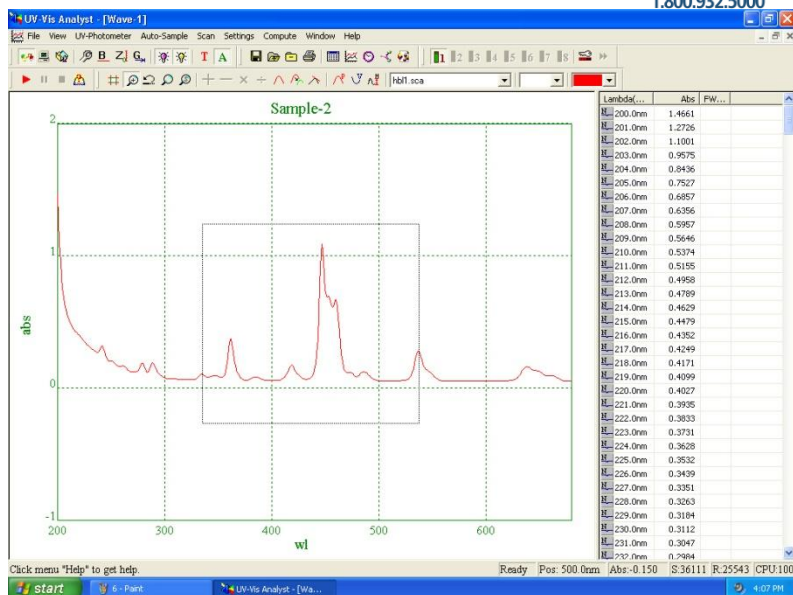
Click  on the toolbar to set the new parameters for display.

Original Scales

Click  on the toolbar to restore the default display settings.

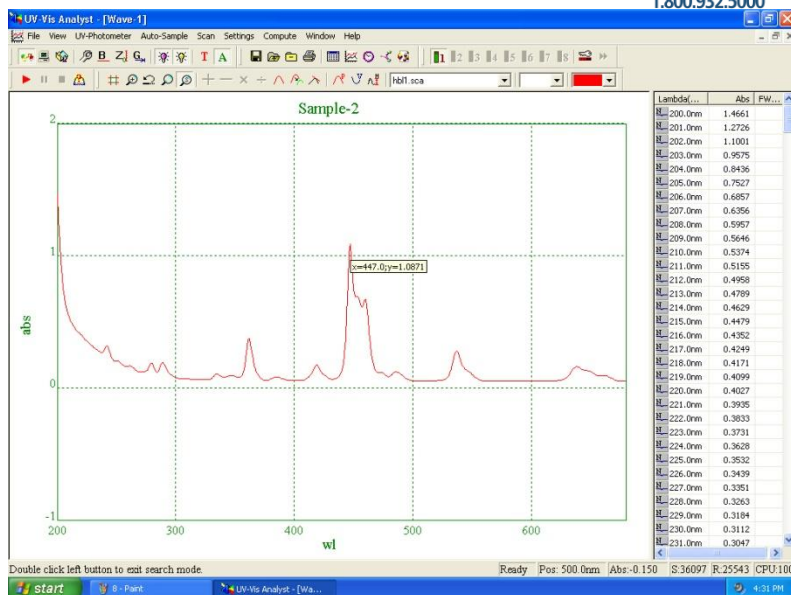
Zoom Selected Area

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.



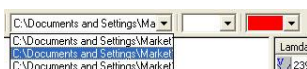
Trace a Spectrum

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.



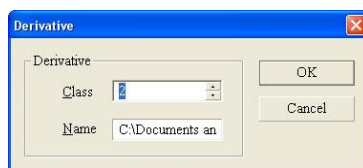
Select a Spectrum as Current

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**.

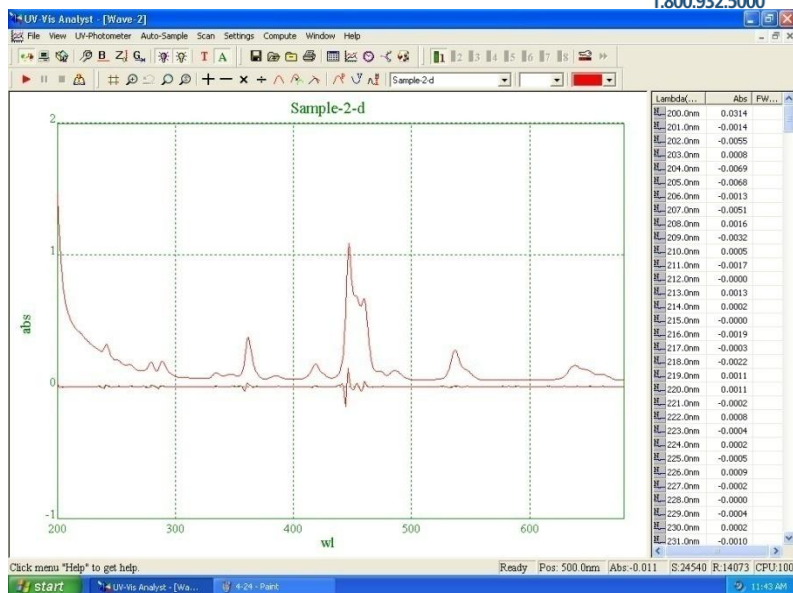


Derivative

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.



The image shows the 'Derivative' dialog box. It has a title bar 'Derivative' and a close button. Inside, there is a 'Derivative' section with a 'Class' dropdown menu set to '1' and a 'Name' text box containing 'C:\Documents an...'. There are 'OK' and 'Cancel' buttons on the right side of the dialog.

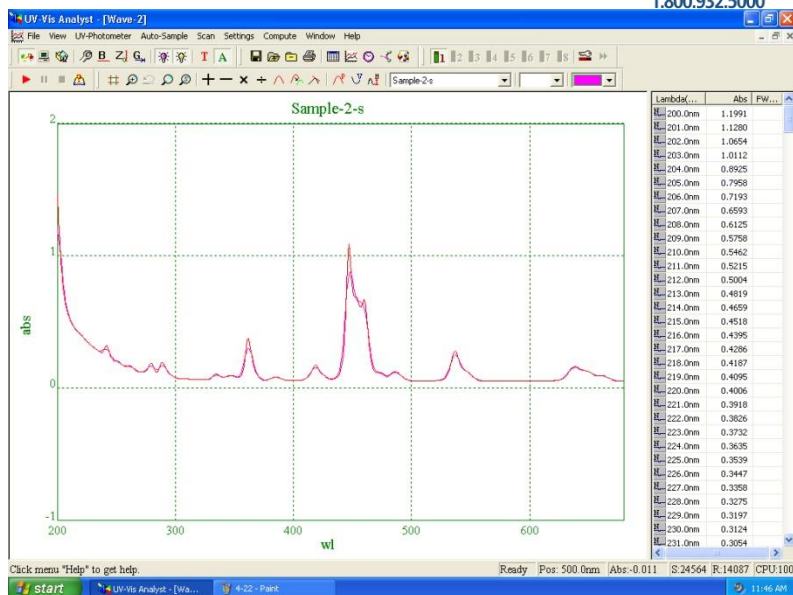


4.3.2.1 Moving Window Averaging

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.



The 'Smooth the spectrum' dialog box is shown. It has a title bar 'Smooth the spectrum' with a close button. Inside, there is a 'Smooth' section with a 'Range' box (containing '5') and a 'Name' box (containing 'Sample-2-s'). There are 'OK' and 'Cancel' buttons on the right.



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.

Smooth the spectrum

Smooth

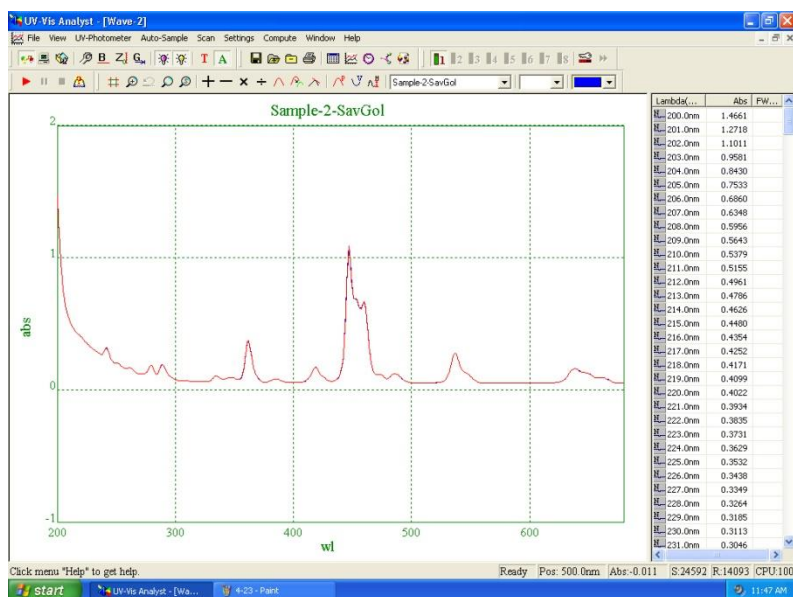
Range

Name

Sample-2-s

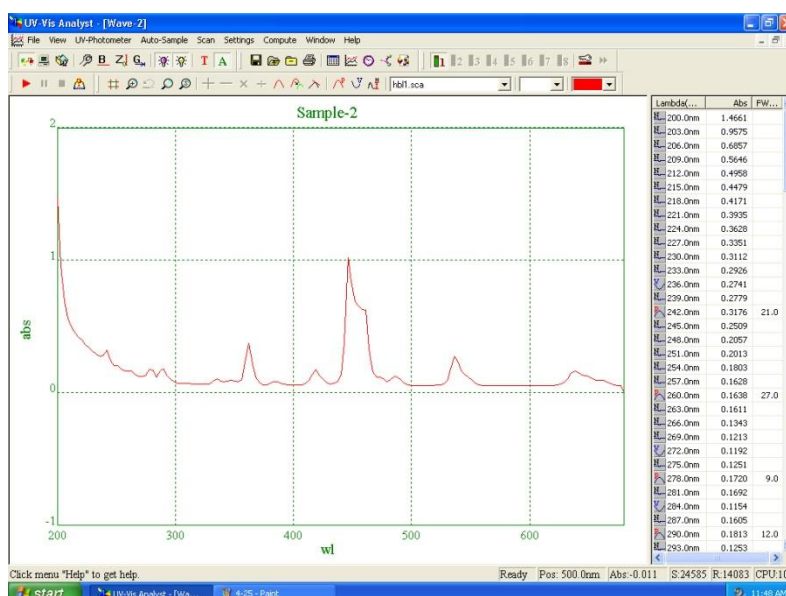
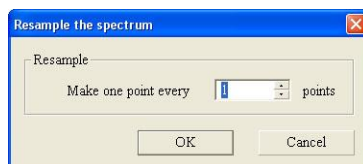
OK

Cancel



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.



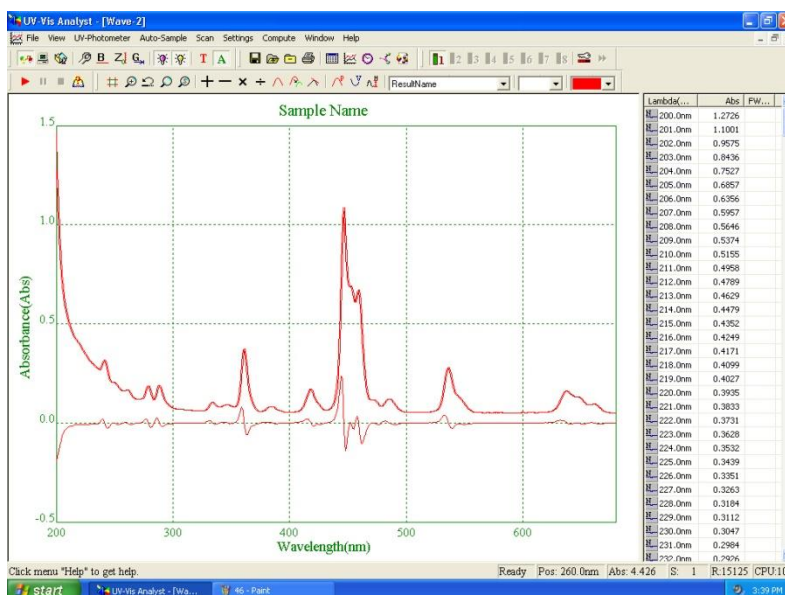
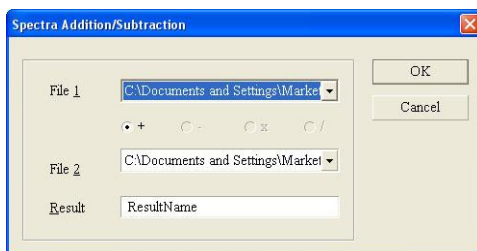
Spectrum Addition

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.



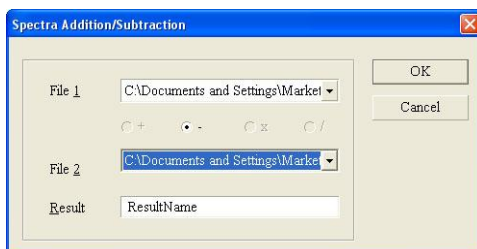
UV-Vis Analyst will only add, subtract, multiply and divide two spectrums that are already displayed on the screen. Before arithmetic processing, load or collect two spectrums from memory.

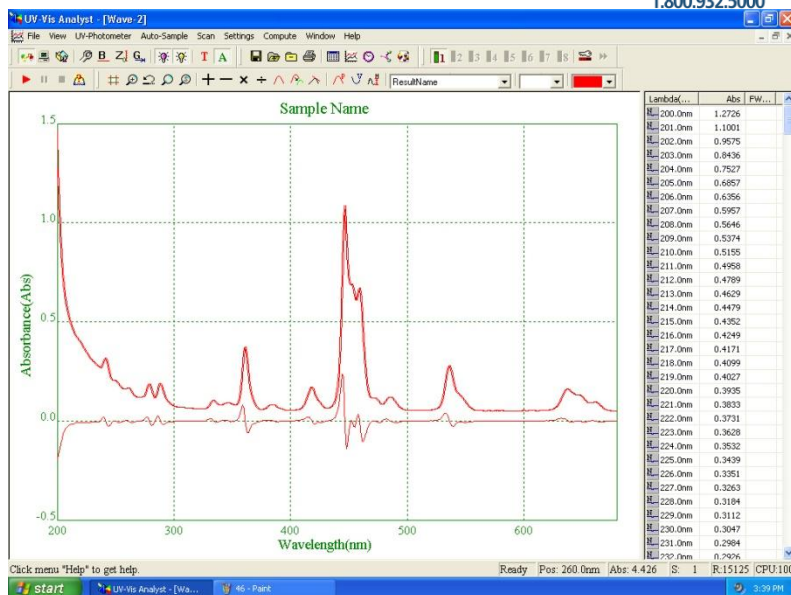


Spectrum Subtraction

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.

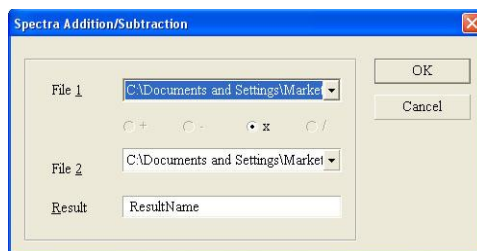




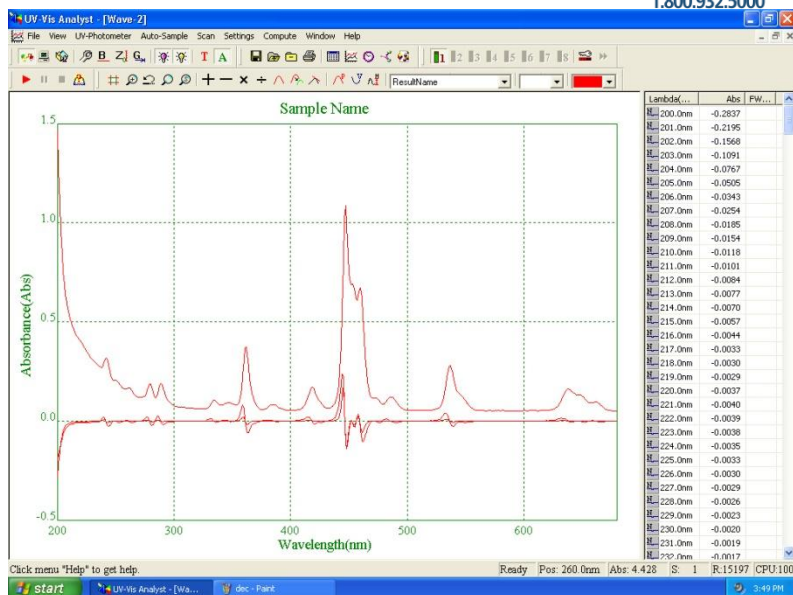
Spectrum Multiplication

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.



The screenshot shows the 'Spectra Addition/Subtraction' dialog box. It has a title bar with a close button. Inside, there are three rows: 'File 1', 'File 2', and 'Result'. Each row has a dropdown menu. The 'File 1' and 'File 2' dropdowns are currently set to 'C:\Documents and Settings\Market'. Between the 'File 1' and 'File 2' dropdowns, there are four radio buttons: a plus sign (+), a minus sign (-), a multiply sign (x), and a divide sign (/). The 'Result' row has a text input field containing 'ResultName'. On the right side of the dialog, there are two buttons: 'OK' and 'Cancel'.

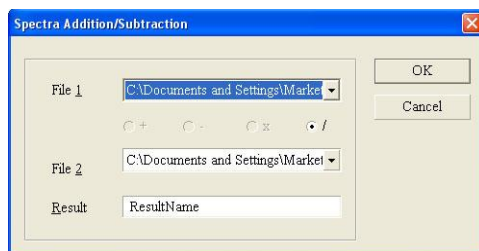


Spectrum Division

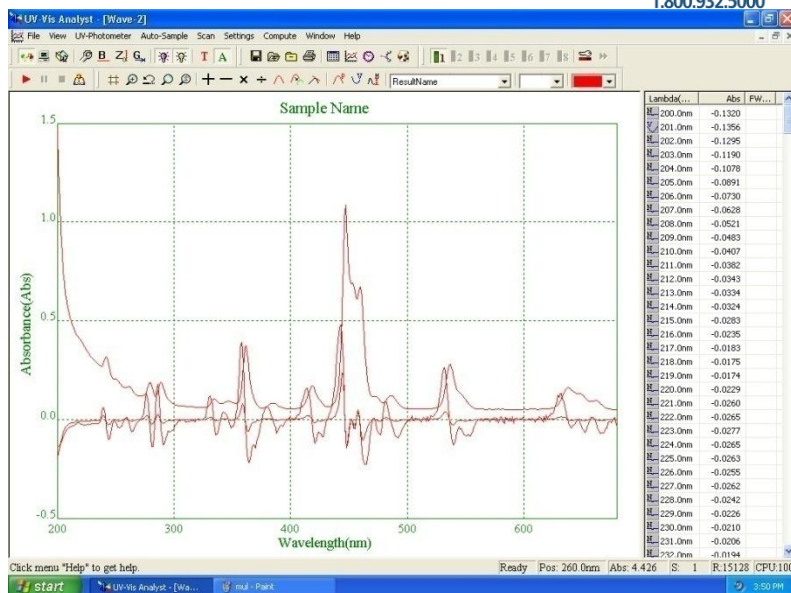
Dividing one spectrum from another has been a classical technique to offset spectrum interference from the spectrum of interest.



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.



The screenshot shows the 'Spectra Addition/Subtraction' dialog box. It has a title bar with a close button. Inside, there are three rows: 'File 1', 'File 2', and 'Result'. Each row has a dropdown menu. The 'File 1' and 'File 2' dropdowns are currently set to 'C:\Documents and Settings\Market'. Between the 'File 1' and 'File 2' dropdowns are four radio buttons: '+', '-', 'x', and '/'. The '/' radio button is selected. The 'Result' row has a text input field containing 'ResultName'. On the right side of the dialog are 'OK' and 'Cancel' buttons.

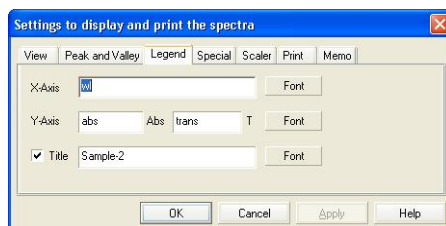


Unload a Spectrum

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

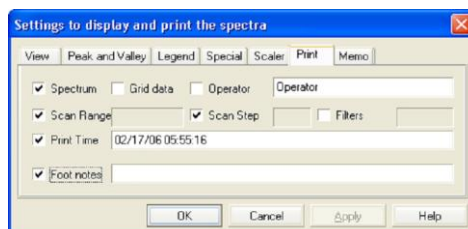
Click  on the toolbar, appears the **Settings to display and print the spectra** form, click the **Legend** tab, type the information for display.



The screenshot shows the 'Settings to display and print the spectra' dialog box. The 'Legend' tab is selected. The dialog box contains fields for 'X-Axis' (set to 'W'), 'Y-Axis' (set to 'abs'), and 'Title' (set to 'Sample-2'). There are 'Font' buttons next to each field. At the bottom, there are 'OK', 'Cancel', 'Apply', and 'Help' buttons.

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.

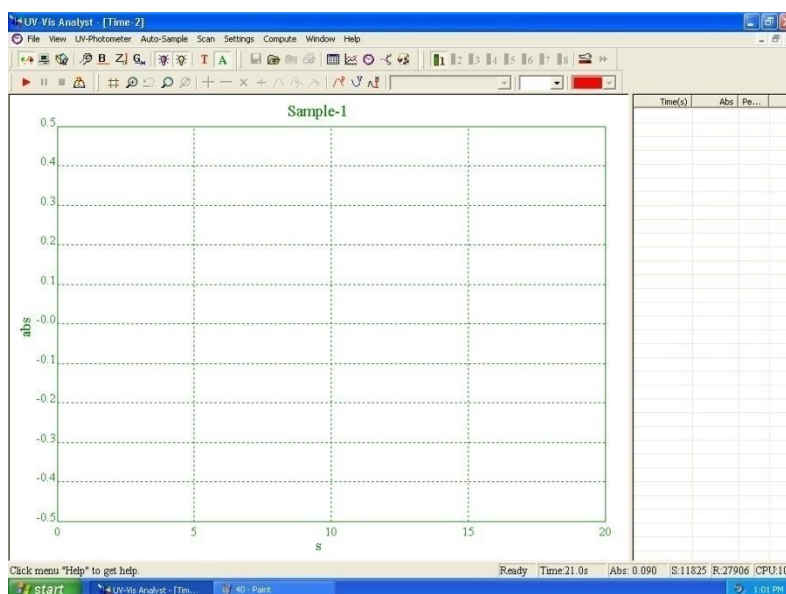


Time Scanning (Kinetic Analysis)

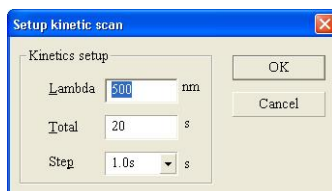
This chapter tells you how to obtain the absorbance or transmittance value for a sample as a function of time at a given wavelength.

Scan Sample

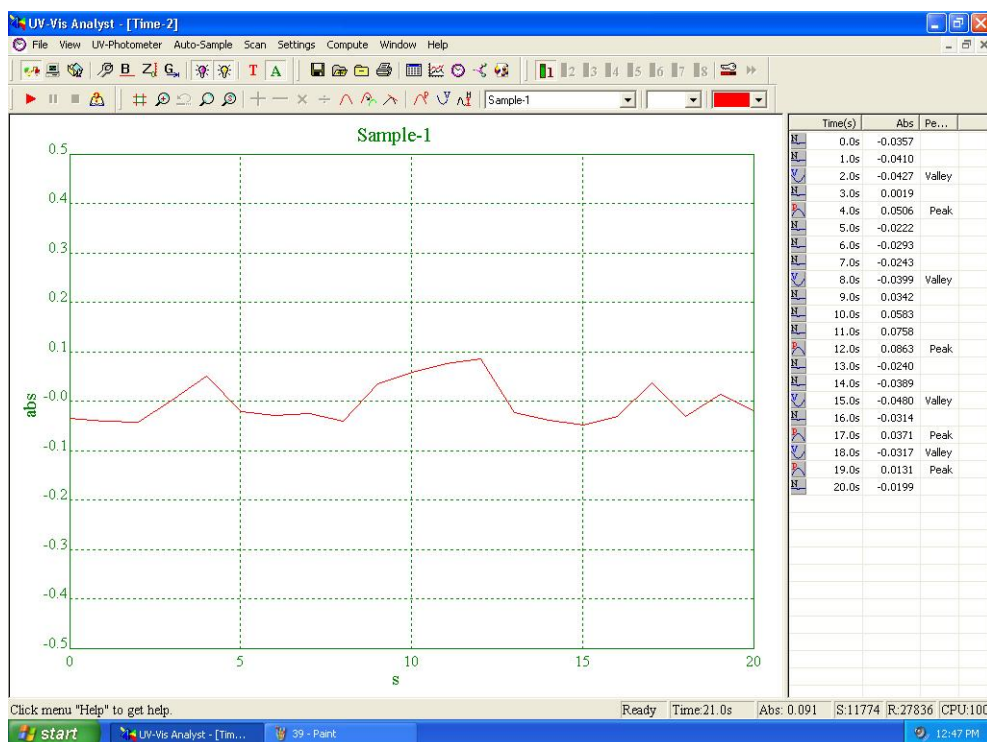
1. Click  on the toolbar, the following dialog box will appear.



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**.

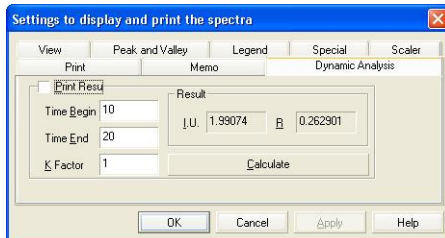


4. Place a reference in the sample holder. Click  on the toolbar.
5. Take out the blank in the sample holder, place a sample in it and close the cover.
6. Place a sample in the sample holder. Click  on the toolbar. The instrument will start scanning automatically. The graph will be displayed on the screen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



Settings to display and print the spectra

View Peak and Valley Legend Special Scaler

Print Memo Dynamic Analysis

☐ Print Result

Time Begin 10

Time End 20

K Factor 1

Result

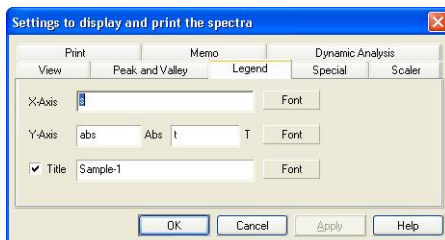
I.U. 1.99074 B 0.262901

Calculate

OK Cancel Apply Help

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.



Settings to display and print the spectra

View Peak and Valley Legend Special Scaler

Print Memo Dynamic Analysis

X-Axis t Font

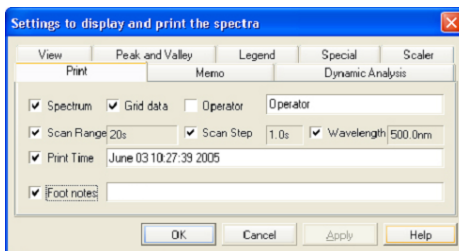
Y-Axis abs Abs t T Font

☒ Title Sample-1 Font

OK Cancel Apply Help

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.



Settings to display and print the spectra

View Peak and Valley Legend Special Scaler

Print Memo Dynamic Analysis

☒ Spectrum ☒ Grid data ☐ Operator Operator

☒ Scan Range 20s ☒ Scan Step 1.0s ☒ Wavelength 500.0nm

☒ Print Time June 03 10:27:39 2005

☒ Foot notes

OK Cancel Apply Help

Appendix 1

Methods of Quantitative Analysis

Single Wavelength Method: $Abs.=A_1$

Double Wavelengths Method: $Abs.=m \cdot A_1 - n \cdot A_2$

Three Wavelengths Method: $Abs.=A_1 - (W_1 - W_2) \cdot (A_2 - A_3) / (W_2 - W_3) - A_3$