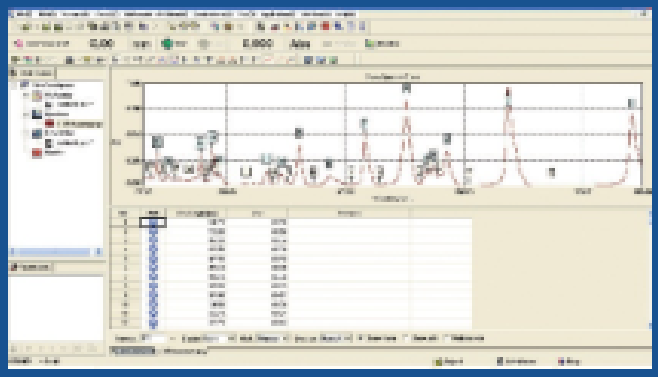
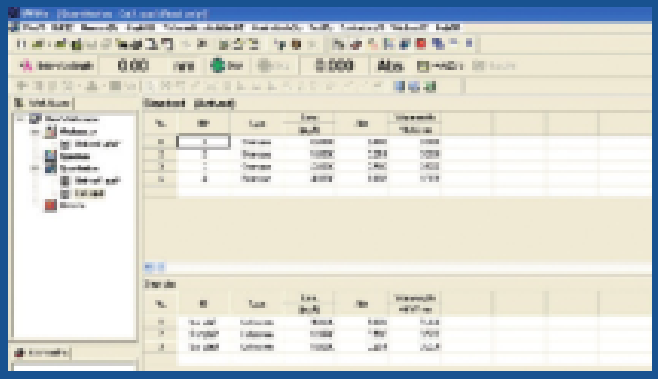




UV-Win6

OPERATION MANUAL

A powerful, intuitive software product used for connectivity to the PG Instruments range of bench top UV-VIS Spectrophotometers.

pg instruments

Foreword

1. Introduction in general

UVWin6 is the new analysis software of UV-VIS Spectrophotometers developed by our company after UVWin5. Its main functions are controlling, measurement, analysis and data processing. Comparing with its former version, UVWin6 includes more functions, such as spectral bandwidth scanning, quantitative data upload etc. UVWin6 is designed to be compliant with GLP, including data file encryption, instrument validation etc. UVWin6 is a universal software, which is suitable to all the UVS products produced by PG Instruments, especially for the data disposal of T110 and T112.

2. Brief outline for the manual

The manual contains 11 chapters, covering from Installation Environment, User Interface, Instrument Control, Measurement, and Results Processing etc. It gives the complete description of UVWin6 Application and Data Processing. Below are the contents of each chapter:

- Chapter One “Software installation and configuration”. It introduces you about operating environment and installation of UVWin6. You’ll learn how to install UVWin6 onto your PC correctly.

- Chapter Two “Software environment”. It gives you introduction of User interface, Functions Menu, Configuration, Communication port and other appearance settings.

- Chapter Three “Instrument Control”. It tells some methods of controlling UV-VIS Spectrophotometers with UVWin6. You’ll learn how to use the offered functions to control instrument, to accomplish setting instrument and instrument correction.

- Chapter Four “Photometric measurement”. It describes how to use Photometry to accomplish your measurement. You’ll learn the usage relevant to photometric measurement and its parameter settings.

- Chapter Five “Spectrum Scan”. It describes how to use Spectrum Scan to accomplish scan qualitative analysis of samples. You’ll learn the methods of spectrum scan functions and its parameter settings.

- Chapter Six “Quantitative”. It describes how to use Quantitative Measurement to accomplish your quantitative analysis of samples. You’ll learn the methods of quantitative measurement functions, its parameter settings, setup and application of calibration curves.

- Chapter Seven “Kinetics”. It describes how to use Kinetics to perform measurement of samples. You’ll learn the methods of Kinetics and its parameter settings.

- Chapter Eight “Spectral bandwidth scanning”. It describes how to use Spectral bandwidth scanning to scan samples. You’ll learn the methods of spectral bandwidth scanning, its parameter settings.

- Chapter Nine “DNA Protein Determination”. It gives you introduction of how to use DNA Protein

Determination to perform analysis on samples. You'll learn the usage and parameters setting of DNA Protein Determination.

- Chapter Ten "Pesticide Residual Determination". It describes how to use Pesticide Residual Determination to perform analysis of samples. You'll learn the usage and parameters setting of Pesticide Residual Determination.

- Chapter Eleven "Graphic Process". It gives you introduction of how to process spectra after scanning.

- Chapter Twelve "Data Export". It gives you introduction of how to export results data to other format files and database.

- Chapter Thirteen "Administration". It describes contents relevant to administration of UVWin6. You'll learn how to create a new user account and a new group, how to set up safety system and how to make logging.

- Chapter Fourteen "Conclusion". It gives a brief conclusion of the manual.

3. Convention of the manual

UVWin6 is universal software for UV-VIS Spectrophotometers. For each model, the contents of it might be different. Therefore, the manual explains all functions of the software mainly upon one model and inserts some introduction of other models' features. Should you be aware of it and read the manual carefully before using instrument.

Contents

Chapter 1 Software Installation and Configuration

Key points

This chapter, will show the following contents: UVWin6 operating environment, How to install UVWin6 onto your PC, and how to use Configuration program to setup the software's external parameters.

It includes:

- Installation of UVWin6 software
- Configuration program
- Chapter summary

1.1 Installation of UVWin6 software

UVWin6 can run on Microsoft Windows98/2000/XP/Win7 Desktop and NoteBook PC, Win7/Win8 Tablet PC. For your PC hardware, the least requirements are over 1.5GHz CPU, over 2GB Memory, screen resolution over 1280×1024 pixels, and CD-ROM or DVD-ROM drive. For the tablet PC, the least requirements are over 1.5GHz CPU, over 2GB RAM, screen resolution over 1280×800, and HD over 32GB.

Recommended configuration: Pentium1.4G CPU, 2GB Memory, 32M Graph Display Card, 17 inch Color Display, CD-ROM or DVD-ROM. Among the above, Graph Display Card is mainly for 3D Display. So if you do not have much need for 3D Display, you could reduce the requirement of Display Card. A usual Display Card is enough. Besides, UVWin6 requires at least 20M hard disk spaces. So you should assure enough hard disk space for installation of the software.

UVWin6 installation is not complex. What you should do is running Setup.exe in Installation Disk to enter Installation Program. Please refer to Figure 1-1.

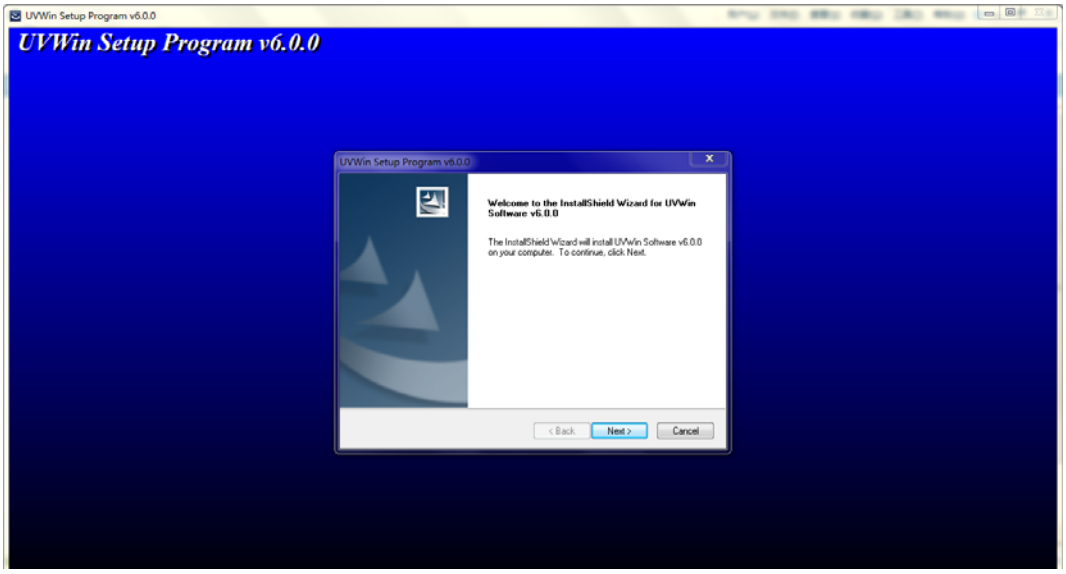


Figure 1-1 UVWin6 Setup Window

Follow to the prompt of Installation Program to finish setup. You can choose “all users” or “only for me” according to your demand when it’s prompted to choose application authority. Please refer to Figure 1-2. The serial number of software is kept in Installation Pack. Please input the serial number when it is prompted.

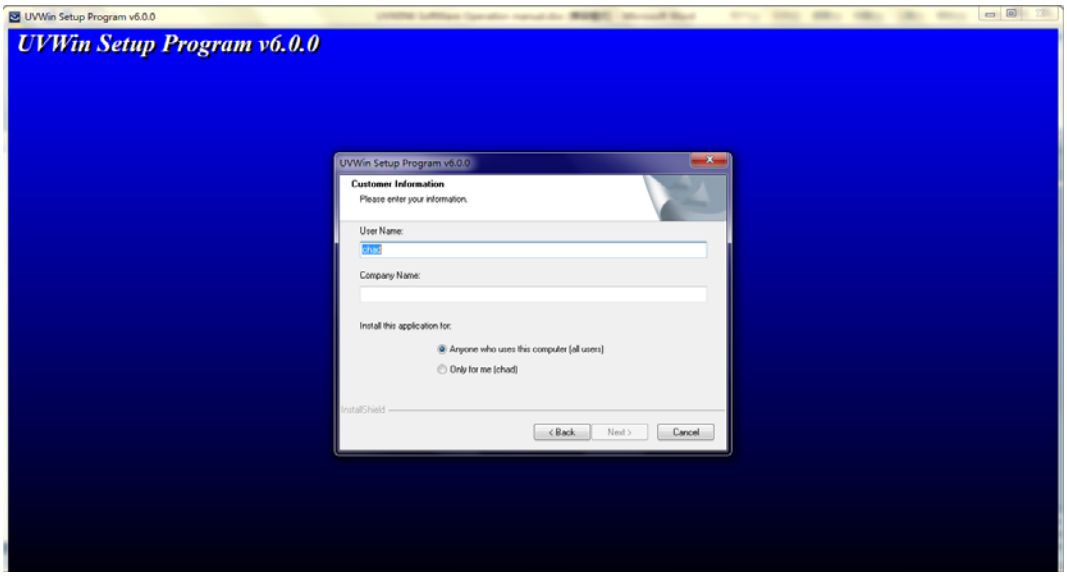


Figure 1-2 User authority choice

After installation, a shortcut of the software is created on desktop. Besides, a folder of the software is created in Program Group on Start Menu. The folder includes the shortcuts of UVWin6, configuration program, and uninstall. Please refer to Figure 1-3. You can enter into the main interface of UVWin6 directly without connection by pressing “Start UVWin6 Offline”. You can’t control the instrument but process and re-load the data when offline.

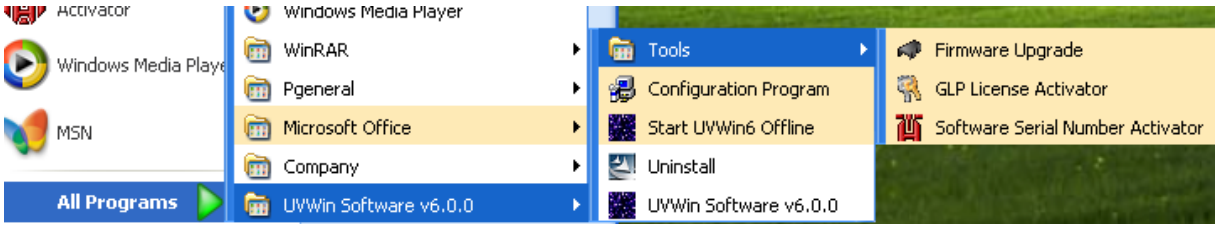


Figure 1-3 UVWin6 Program Group and Shortcut

As UVWin6 is universal software for UV-VIS Spectrophotometers, its installation program may varies with different instrument models. And the shortcut and folder created by the installation program may vary respectively.

If you need to remove UVWin6 from your PC, you could run Uninstall in UVWin6 Folder on Program Group. Windows System will remove UVWin6 from your PC automatically. Please notice that before you remove the software, you should backup your measurement data in advance so as not to lose them accidentally.

The default folder of measurement data files is: “C:\Program Files\UV-VIS\UVWin Software v6.0.0\Data” .It may vary with different instrument models. So you’d better to find the relevant folder from UVWin6 shortcut on desktop.

Tips: "Shortcut"

If you do not know the file path that the shortcut links to, you could point at the shortcut and click right button of mouse. On pop-up menu, select Attribute to open the Shortcut Attribute Window. In the Attribute Window, click the Search Object to open the Windows Explorer and go to the file folder that the shortcut links.

1.2 Configuration Program

UVWin6 Configuration Program is a tool of setting UVWin6 operation conditions. You could start it by Selecting [Start]-> [Program]-> [UVWin Software v6.0.0]-> [Configuration Program]. The operation dialog box of Configuration Program is as shown in Figure 1-4.

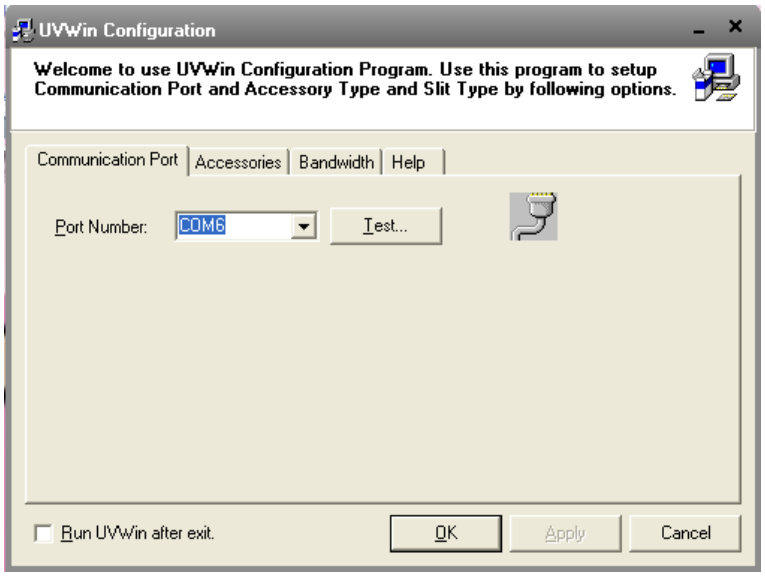


Figure 1-4 Setting Communication Port

- **Communication Port Tab**

Setting the communication port between PC and instrument. After you choose a port, click on "Test" button to test if it exists and show test status. When it shows on, it indicates that the port exists. Otherwise, please test another one. Please notice that status of online meaning the port exists. But other program may use it. So you have to run UVWin6 to confirm it.

- **Accessories Tab**

Selecting accessories that the instrument uses. The option includes "8-Cell Holder", "5-Cell Holder", "Fixed Cell Holder", "Fixed Flow Cell Holder" and "Integrating Sphere", as shown in Figure 1-5. You may select it according to instrument outfit.

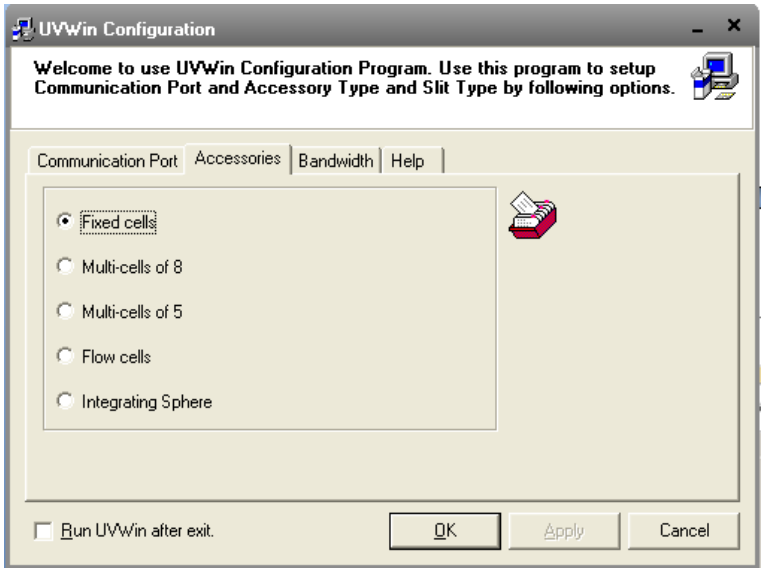


Figure 1-5 Setting Accessories

- **Bandwidth Tab**

Setting a slit value for instruments with changeable slit. If your instrument is fixed slit, you can set slit value of the instrument here. As shown in Figure 1-6. The value will be kept with your measurement data files. And it is also used with printout.

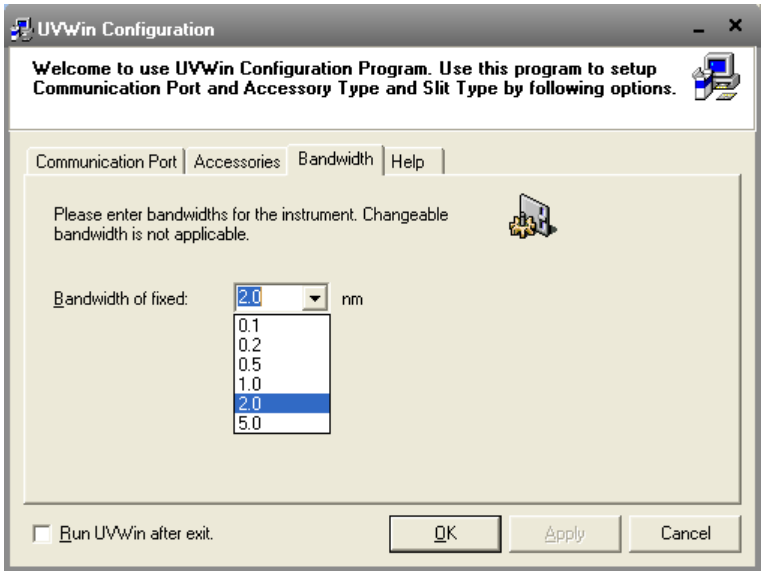


Figure 1-6 Setting fixed slit value

- **Help Tab**

In this option, you can get description of how to use UVWin6 configuration program.

After you finish configuration, click on OK to save settings and exit. If you want to quit settings, click Cancel or close the dialog box directly. If you check the option box of Run UVWin after exit, System will run UVWin6 automatically after you exit with OK.

Chapter 2 Software Environment

Key points

In this chapter, we'll tell of the following contents: UVWin6 user interface, menu functions, and environmental parameters setting.

- Startup of UVWin6
- Getting familiar with UVWin6 Layout
- Setting UVWin6 Operation Environment

2.1 Startup of UVWin6

When you are going to run UVWin6, be sure that connection between UV-VIS Spectrophotometer and PC is good and instrument is turned on. Here, you can click UVWin6 shortcut to start it. The startup window is shown as Figure 2-1.

Figure 2-1 UVWin6 Startup Window

If instrument works normally, it shows the instrument initialization window as shown in Figure 2-2. (Please refer to 3.1 Instrument Performances for details of initialization)

Figure 2-2 UVWin6 Initialization

After initialization, enter into the UVWin6 main user window. If initialization fails, the System will display message, as shown in Figure 2-3. Select "Yes" to enter into System, or "No" to exit. Please notice that when initialization fails, do not enter into the System to operate the instrument as initialization failures have various causes, it is possible that there are some problems on an instrument component. If you do some work on defective components, you may make some needless damages. So it is best to exit the System after initialization fails.

Figure 2-3 Initialization Failure Message

If instrument does not work well, or connection between instrument and PC has a problem, it would cause the phenomenon of unable to be online. A message about it will display as shown in Figure 2-4. At this time, you should check if communication cable is connected correctly or not and if instrument is turned on or not. Besides, if your settings of communication port have problems, it may cause the above phenomenon too. In this case, you should select Cancel to exit the program and run UVWin6 Configuration to reset communication port, and startup UVWin6 again (Please refer to 1.2 Configuration Program for UVWin6 Configuration Application).

Select "Ignore" to enter into System offline. You are unable to operate instrument in this case.

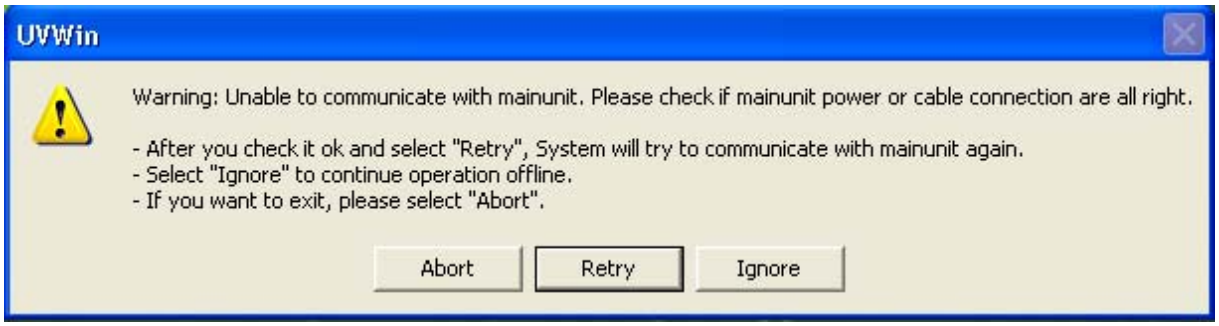


Figure 2-4 Unable to Be Online

2.2 Getting familiar with UVWin6 Layout

No matter with which method introduced in last section you choose to enter into UVWin6, UVWin6 Main User Interface will open in front of you finally. As Shown in Figure 2-5.

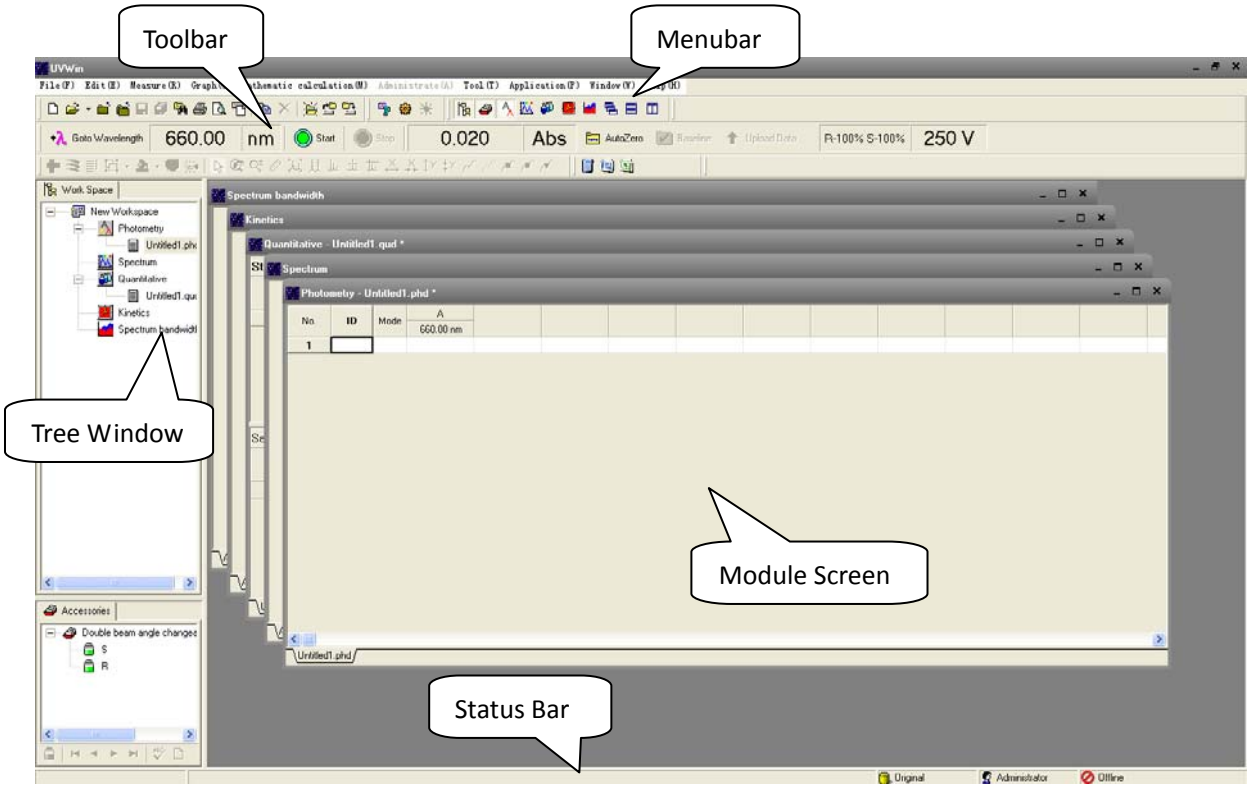


Figure 2-5 UVWin6 Main User Interface

Main User Interface adopts a multi-file tree structure layout. This kind of layout not only has orderly structure and good looking, but also eases for users to operate. From above figure, you could find that UVWin6 main user interface include the parts of Menubar, Toolbar, Statusbar, Tree Structure Window, and Module Window. Following is the introduction of these composing parts.

- **Menubar**

For most of software, Menu is absolutely necessary. It is necessary for UVWin6 too. A majority of

functions in the software are provided in Menubar. Menubar include submenus of File, Edit, Measure, Graph, Mathematic Calculation, Administrate, Tools, Application, Window, and Help. As shown in Figure 2-6. You can use menu functions provided in Menubar to accomplish its corresponding setting for software. In the following chapters, the manual will give introduction of menu functions combined with its software functions introduction.

Figure 2-6 UVWin6 Menu bar

Tips: "Shortcut Key"

In Windows Systems, there are many methods to open menu. Besides clicking a mouse, you can also press Alt Key and those underlined letters of Menu words. For example, for File(A) Menu you can press Alt+A Key to open File Menu. In addition, in some menus, there are specific tags after their headers, such as Print(P) Ctrl+P, or Parameters Setting … F4. Among them, Ctrl+P and F4 are hot keys for corresponding menus. What you are required to do is simply to press the hot key to select function of corresponding menu. So for Print(P) Ctrl+P Menu, just hold Ctrl key and hit P.

- **Toolbar**

The role of Toolbar is listing those commonly used functions together as tool buttons. In this way, users can achieve menu functions by single press of these tool buttons, so as to dispense with those trivial menu operations. UVWin6 Toolbar consists of General Toolbar, Configuration Toolbar, Window Toolbar, Graph Toolbar, Control Toolbar, and Kit Toolbar. Shown as Figure 2-7. Between each Toolbar, there is a partition line. When cursor moves over the partition line, cursor changes to the "↔" shape. At this time, hold pressing left button of mouse and drag the partition line to change its position. As shown in Figure 2-8.

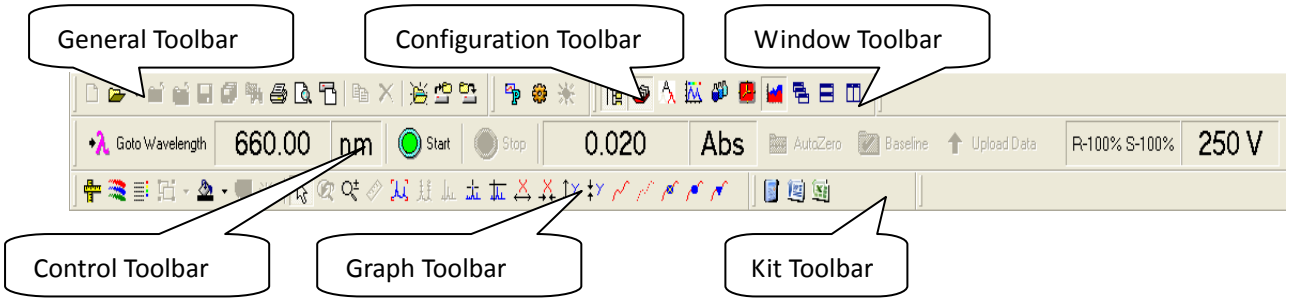


Figure 2-7 UVWin6 Toolbar

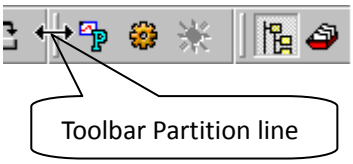


Figure 2-8 Dragging Toolbar

- **Status Bar**

Status Bar locates at the bottom of whole window, which is used for display of status message in software. For example, status of command execution, data file type, current username, file call schedule,

etc. In the spectrum window and the time course measurement window, Status Bar also displays actual coordinate values of current cursor located. As shown in Figure 2-9. In addition, if your main interface window is not maximum, there is a " " sign at the right lower of Status Bar. You can drag with cursor the moving sign to adjust the window size.

Figure 2-9 UVWin6 Status bar

- **Tree Type Window**

The Tree Type Window is a structure of commonly applied in software design. Its characteristics are more visual, convenient, and framework clear. In UVWin6, there are two tree type windows. One is used for display of each performance module files and workspace, Called "Work Space Window". Another one is used for display and control of instrument accessories (Please refer to 3.7 Accessories Setting for instrument accessories introduction), Called "Accessories Window". As shown in Figure 2-10. Regarding detailed application of "Accessories Window", it'll be introduced in next Chapter.

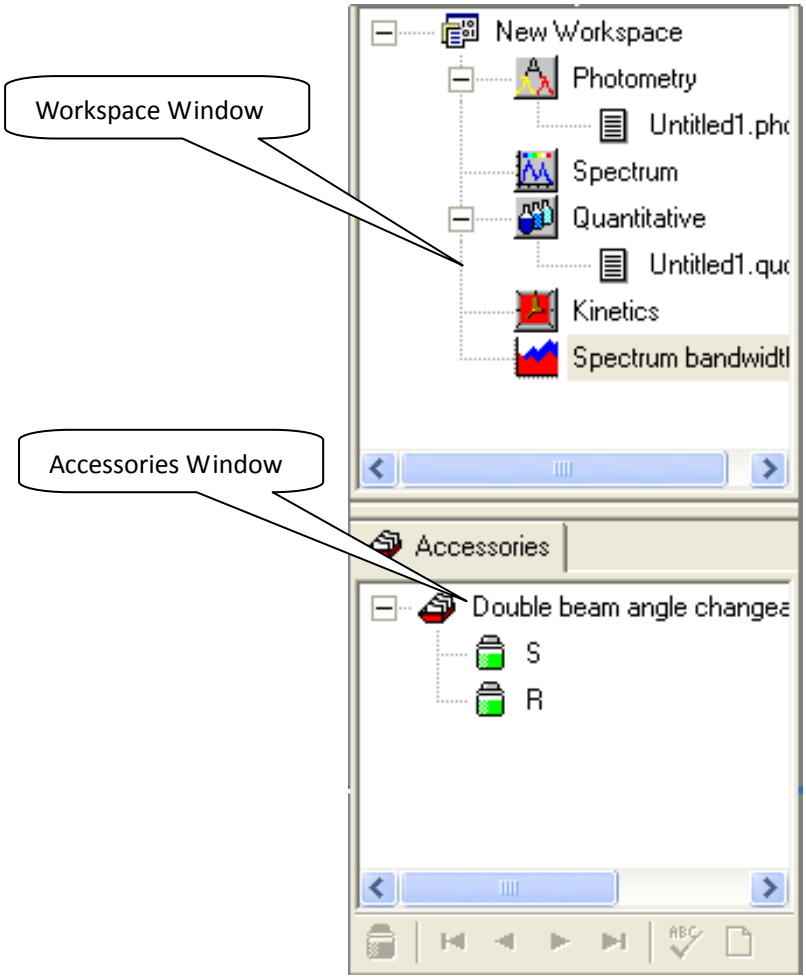


Figure 2-10 Work Space Window (Upper) and Accessories Window (lower)

- **Module Window**

As a matter of fact, the Module Window is a sub-window of main interface window. The fact to call it as Module, is that each window can accomplish different measurement functions. The Module Window consists of the Photometry Window, the Spectrum Window, the Quantitative Window, the Kinetics Measurement Window, and the Spectral Bandwidth Scanning Window. As shown in Figure 2-11. You can enable each Module Window by using mouse to hit Window Title Bar, or by selecting corresponding Module Name in “Work Space”.

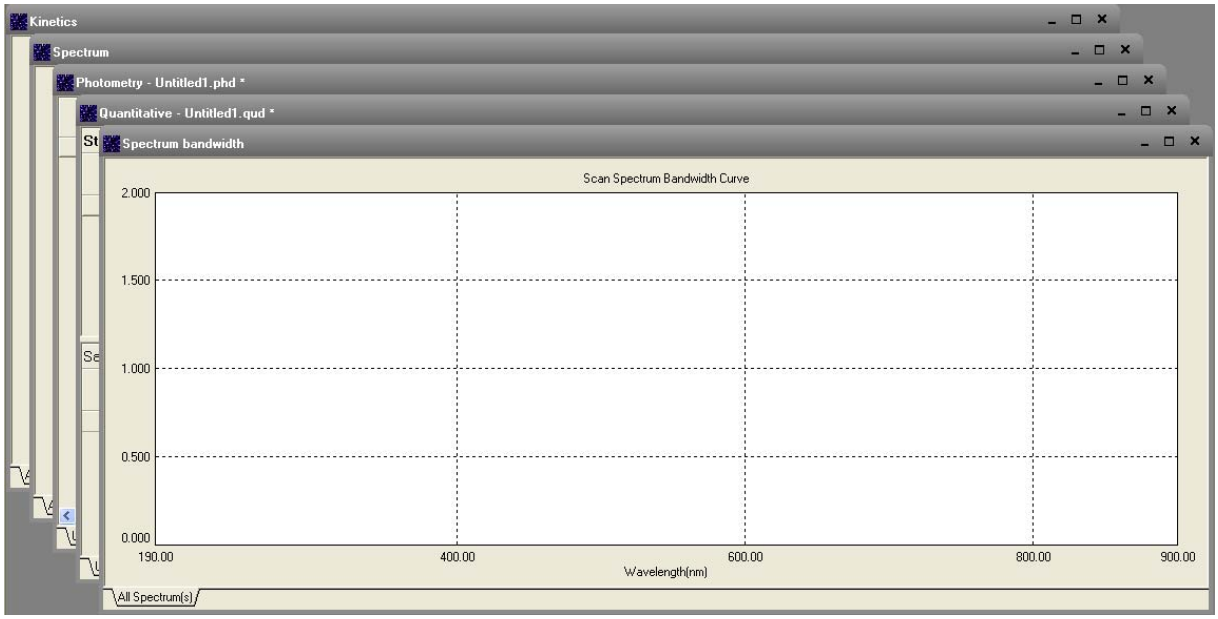


Figure 2-11 Module Window

Tips: “Window”

In Windows, nearly all messages are showed with “Window”. Here, “Window” not only stands for those windows, which have Title bar and can be dragged and whose sizes can be adjusted, but also stands for all layout which could display messages. For example, Resource Manager is a standard window. And Toolbar of Resource Manager is also a window. But the toolbar is only subject to Resource Manager’s main window. So the toolbar is called one of son-windows of Resource Manager. And Resource Manager is called father-window. In this way, tool button of Toolbar is also a window. Its father-window is Toolbar. Resource Manager is a single-file program. So, its sub-windows can but lay on settled position, or make simple moves. But for multi-file program, it can setup one or several son-windows as a standard window. In this way, the son-windows can be dragged, change their sizes, and hold their own title bar as their father-window. Of cause, its active area is within its father window. UVWin6 adopts multi-file structure. Each module is set as movable son-window, which makes its operation more flexible, and convenient.

2.3 Setting UVWin6 Operation Environment

UVWin6 working environment consists of Environment Options, Toolbar Setting, Window Setting, Self-defined Tool Setting, and Communication Port Setting. With these setup functions, it would make your routine operation easier. And it would also bring certain convenience to your work. Next，it’ll give you introduction of detailed settings of these functions.

2.3.1 Environment Options

Environment Options will provide you setting working environment. It includes Indication Settings, File Option, Recent File List, Data Format, Default Directory, Menu Setting, Network Service etc. As shown in Figure 2-12.

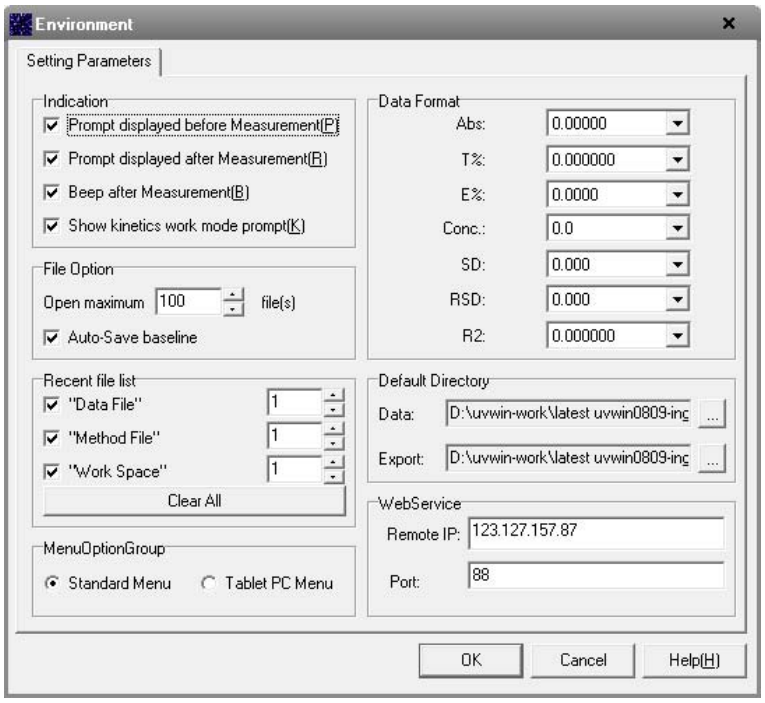


Figure 2-12 Environment Options

- **Indication**

Prompt before Measurement: When you press Measurement Button, a prompt message will be displayed to indicate you to put in sample. After you confirm it, measurement continues. Otherwise, it does not continue to start measurement.

Prompt after Measurement: Similar to Prompt Before Measurement, but a prompt window will be displayed after measurement to indicate you that measurement is over.

Beep after Measurement: Similar to Prompt after Measurement, but instead of displaying a prompt window, a beep will be made after measurement to remind you that measurement is over. If your PC is fitted with audio card, and acoustics, or earphone, is open, sound would be sent out from acoustics or earphone. If there is not audio card in PC, PC speaker will send out a short beep.

The promote message of displaying kinetics scanning mode: choose this and choose multi cell scanning as work mode from the kinetics scanning parameters, the promote message will be shown “It need 2 seconds to switch between every cell holder, so please set Time interval longer. For example, Time interval should be longer than 4 seconds if choose 2 cell holders, while 16 seconds for 4 cell holders. Continue or not?”

- **File Option**

Maximum open files: Setting files number that each module can hold simultaneously. For example, in Spectrum Scan, it means maximum number of spectra displayed at a time.

Auto-Save Baseline as a file: The function is designed only for Spectrum Scan Module. If you choose

the function, System will save calibration data to a disk file automatically, after each baseline correction finishes. And System will load the saved baseline data automatically when UVWin6 runs next time. In this way, you can do spectrum scan directly without doing baseline correction.

For general UV-VIS spectrophotometer, wide range spectrum scan is time consuming relatively. And baseline correction takes nearly same time as that of spectrum scan. So, baseline data saving could not only save your working time and also reduce wear and tear of instrument. It is a double profit. On the other hand, being affected by working conditions and environmental factors, operating status of UV-VIS spectrophotometer may be different to some extent. So, if you do not think scanning result is satisfactory, you have to do baseline correction again.

For CCD Fast UV Spectrophotometers, the effect of this function does not work much. As fast UV Spectrophotometer's CCD detector receives spectra reflected by grating directly, and CCD is very sensitive to changes of environmental conditions, so instrument must do baseline correction before to start spectrum scan. And it is a matter of no account that whether to save or not baseline data.

- **Recent File List**

Recent file list is keeping recent saving filenames recorded for convenient referring to. Recorded file name will be listed in Recent files Submenu of File Menu. If you want to view one of them, just click on corresponding menu item.

- **Data File:** All measured data files.
- **Method File:** All measured parameters files.
- **Work Space:** All Work Space Files.

If you want to clear recent file records, you can press Clear All to delete all records.

- **Data Format**

Data Format allows you to set related data display format in UVWin6. Mainly they are decimal digits for display. For example, "0.00" is two decimal digits for display. The data being able to be set its decimal digits include:

- **Abs:** Absorption
- **T% :** Transmittance
- **E%:** Energy
- **Conc.:** Concentration in Quantitative measurement.
- **SD:** Standard Deviation in Quantitative measurement.
- **RSD:** Relative Standard Deviation in Quantitative measurement.
- **R2:** Standard Linear Relativity.

- **Default Directory**

Setting default directory for files access. That is original directory displayed in dialog box, when you save, or open a file. "Data" indicates directory for all data files saving. "Export" represents default directory for exporting files. You can select corresponding directory through pressing "…" buttons.

- **Menu Setting**

For running UVWin6 on PC, please choose [Standard Menu]; For running UVWin6 on Tablet PC, please choose [Tablet PC Menu].

- **Web Service**

- **Remote IP:** the address used to upload quantitative data.
- **Port:** the port number we used to upload data.

2.3.2 Custom Tool

Maybe you have noticed, there is one Toolbar named Tool, out of 6 Toolbars in UVWin6. This toolbar has function of calling some other application programs, such as MS paint, Calculator, and etc. You can select Configuration Tool under Tool Menu to setup "Tool" toolbar functions. Configuration Tool is shown as Figure 2-13.

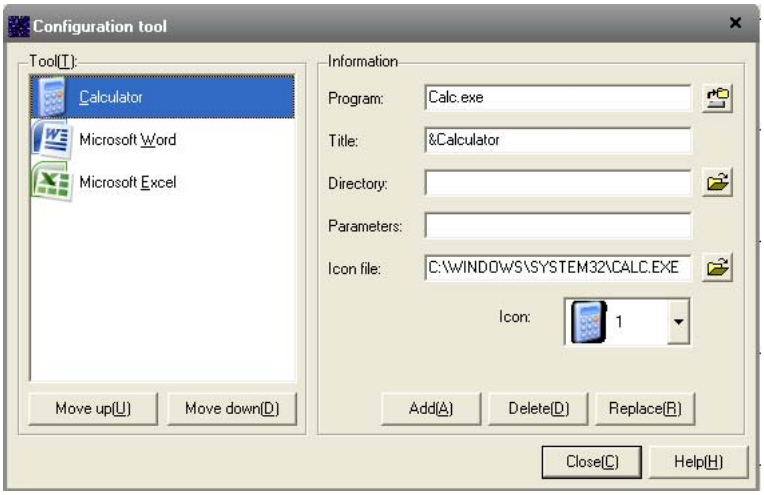


Figure 2-13 Configuration Tool

Left window shows all tools list, while right side shows relevant tool info. Tool info includes some info about program files called by tools.

- **Program:** Executive program called by current tool. It could be executable file (.EXE), or page file (HTM). You can click on the button right to program edit box to select program file.
- **Title:** Title text showed by the tool.
- **Directory:** The working folder of called program. The default working folder is the directory in which the program is saved. When you select a program file, System will set the parameter to a default.
- **Parameters:** Operation parameters of called program. For example, you want to setup a tool to open the "hh.txt" file in C Disk root directory, with Windows Notepad. You should set Program as "C:\Windows\Notepad.exe", and Parameters as "C:\hh.txt".
- **Icon file:** Icon file is used to provide display icon for Toolbar. Default icon file is program file. You also are able to click on the button right to icon file edit box to select icon file.
- **Icon:** For an icon file of "ICO" extension name, it only includes one icon. But for a file of "EXE" or "DLL", it may include many icons. So, you can select some other icons in the icon file through this option.

If you want to add a tool, you can do it by editing tool info directly and press Add button. After you finish some tools info modification, you can press "Replace" to update them. "Delete" button is used for deleting current tool. After you finish tool configuration, you close the window and buttons of "Tool" toolbar in main interface are refreshed.

2.3.3 Communication Port

Communication port is only interface of PC and instrument connection, which is essential condition for instrument control. Therefore, if communication port is set incorrectly, it cannot accomplish communication with instrument. When you need to change communication port setting, you can select Communication Port Submenu under Tool Menu. System will pop up the Communication Port Setting Window, shown as Figure 2-14.

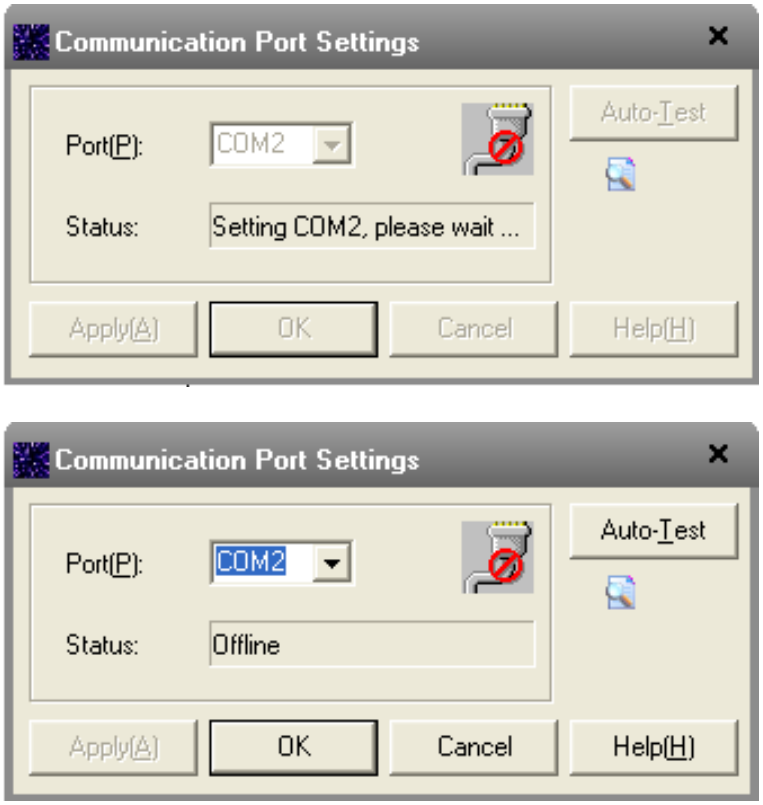


Figure 2-14 Communication Port Setting Window - Online (Up); Offline (Down)

You can select a port name in pull-down box of Port, and then press OK button. If you are not sure which port connecting with instrument, you could click on Auto-Test button and System will test all ports automatically. If it finds the port connecting with instrument, it would be online automatically.

Support USB communication, choose the correct port and connect with the PC.

Tips: "Serial Interface"

Now Serial Communication Interface Standards have several versions by its usage and development. But they are all come from improvement of Standard RS-232. Therefore, our introduction is mainly on RS-232C. RS-323C Standard is Communication Protocol released on 1969, which was developed by American EIA(Electronic Industries Association), BELL, and some other companies. It is fit for communication of data transmission rate of 0-20000b/s. The standard defines relevant aspects of serial communication interface, such as, functions of signal lines, electronic characteristics. As communication equipments manufacturers produce their communication devices compatible with RS-232C, so it has been adopted widely in PC Communication Interface.

2.4 Chapter Summary

This chapter gives introduction of UVWin6 working interface and environmental setting. You can setup UVWin6 operation environment by using Environment Setting functions. In addition, you also be able to make your future operation easier by utilizing Custom Tool to setup Toolbars. After reading of this chapter, you must have a preliminary knowledge about UVWin6. In the next chapter, it'll give you description of other functions.

Chapter 3 Instrument Control

Key points

In this chapter, we'll tell of the following contents: Instrument parameters setting, instrument correction, instrument validation, instrument accessories, and etc.

It includes:

- Instrument performance
- Energy setting
- Baseline correction
- Instrument parameters correction
- Wavelength correction
- Goto wavelength
- Accessories setting
- Multi-Cell blank correction
- Instrument initialization
- Instrument validation
- Chapter Summary

3.1 Instrument Performance

For UV-VIS spectrophotometers, optics system is a core of whole instrument. As today's instruments hold powerful automation, so many additional options for optics system setting would make operation easier and control more flexible. UVWin6 Instrument Performance Option will provide you a function of setting instrument optics system parameters. Selecting "Instrument Performance" submenu under "Measure" Menu, or clicking on toolbar button, System will pop up the Instrument Performance Setting Window. In the window, you can set status of light source, and some characteristics of optics system. As shown in figure 3-1.

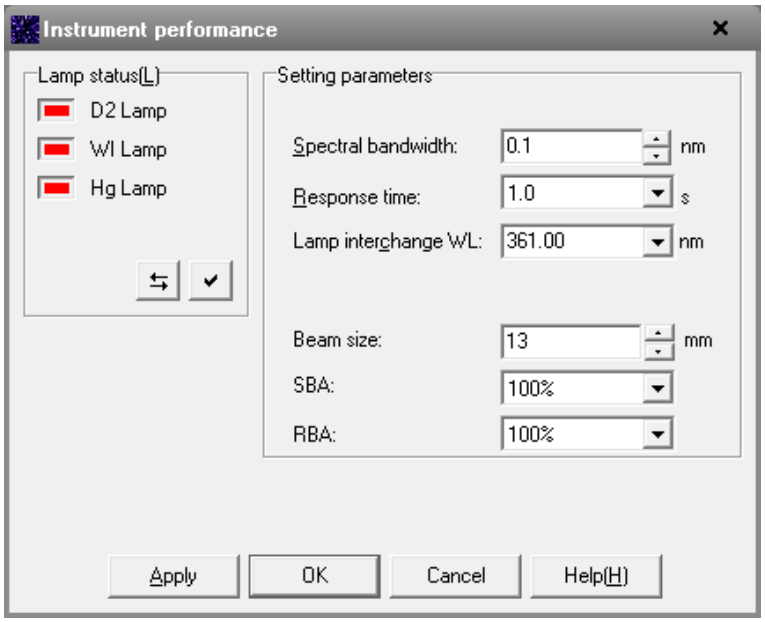


Figure 3-1 Instrument Performance Window

- **Lamp Status**

Setting on-off switch of Deuterium lamp and Tungsten lamp. It is on when button is red, while it is off when button is grey.

- **Spectral bandwidth**

Setting spectral bandwidth of instrument slit. The optional range from 0.1 to 5nm. Not all the model include 0.1nm bandwidth, choose as the specification of the instrument. For fixed slit instruments, it needn't to set the parameter. If you want to change spectral bandwidth of fixed slit instrument, please refer to 1.2 Configuration Program.

- **Response time**

Setting instrument sampling response time. More time it is set, more accurate datum is sampled. The parameter is only usable for general UV-VIS spectrophotometers. For CCD Fast UV Spectrophotometers, there is not such parameter.

- **Lamp interchange wavelength**

Setting instrument interchange wavelength for deuterium lamp and tungsten lamp. Those wavelengths smaller than this interchange wavelength is considered belong to ultraviolet range and instrument changeover to deuterium lamp automatically. And those wavelengths larger than this interchange wavelength is considered belong to visible range and instrument changeover to tungsten lamp automatically. The parameter is only usable for general UV-VIS spectrophotometers. For CCD Fast UV Spectrophotometers, there is not such parameter.

- **Beam size**

Set the size of the beam.

- **SBA**

Set the size of attenuator for sample beam.

- **RBA**

  Set the size of attenuator for reference beam.

3.2 Energy Setting

For UV-VIS spectrophotometers, photometric mode includes absorption (Abs), and transmittance (T%) generally. Sometimes energy mode is required to be used for energy distribution analysis of samples. In this case, photometric mode is required to be set to energy mode. For energy mode, there are some special settings. After you choose Energy Mode, you can select Energy submenu under Measure Menu, or click on tool button, to open the energy settings window. As shown in Figure 3-2.

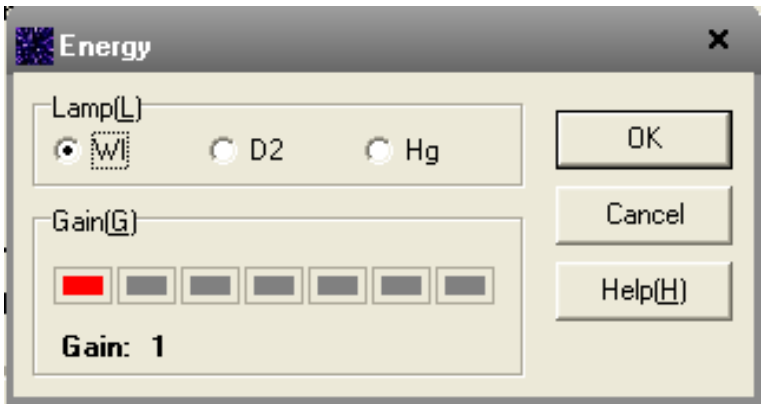


Figure 3-2 Energy Setting Window

- **Lamp**

Setting lamp used under energy mode. For general UV-VIS spectrophotometers, it is set as deuterium lamp, tungsten lamp or mercury lamp. For the instrument which adopts see-through type deuterium lamp, there is no need to set lamp for energy mode.

Tips: "see-through type deuterium lamp"

See-through type deuterium lamp is a rising light source technology. Its principle is to open an aperture on center of general deuterium lamp, to allow the light from a secondary source to pass through the same light path as the deuterium lamp. With this technology. it can leave out light mirror in old light source and adopts stray light-line arrangement of the tungsten lamp and deuterium lamp.

- **Gain**

Setting a gain value under energy mode. The gain value range varies with different instrument models. For example, UV-VIS split beam spectrophotometer has gain value range of 0-15 with 16 steps. And UV-VIS double beam spectrophotometer (PMT) has gain value range of 1-7 with 7 steps. The role of gain is to amplify measured signal, so as to perform observation and measurement on spectra of low energy. But gain amplification would affect data quality, that is, more gain it is, more noise data signal has. Presenting on spectra is that curve's serration becomes larger. Measured data are relatively inaccurate.

After energy setting is finished, press OK to update energy parameters of the instrument. If the lamp source is the first time set to Hg, it will choose the Hg lamp as the source.

3.3 Baseline Correction

Baseline correction is a kind of correction function of UV-VIS spectrophotometers. The function is performed under the absorption mode, or under the transmittance mode. Also it is a typical correction function of spectrum scan. As measurement under the two photometric modes requires correction to blank solution or blank solvent, so baseline correction should be performed before scan. Besides, baseline correction should be performed again after you change scan parameter settings.

3.4 Instrument Parameters Correction

Instrument Parameters Correction includes the dark current correction, Wavelength correction with multi-points, attenuator correction and spectral bandwidth correction. Open this window by click [Measure]-[Instrument Parameters Correction] menu, shown as figure 3-3.

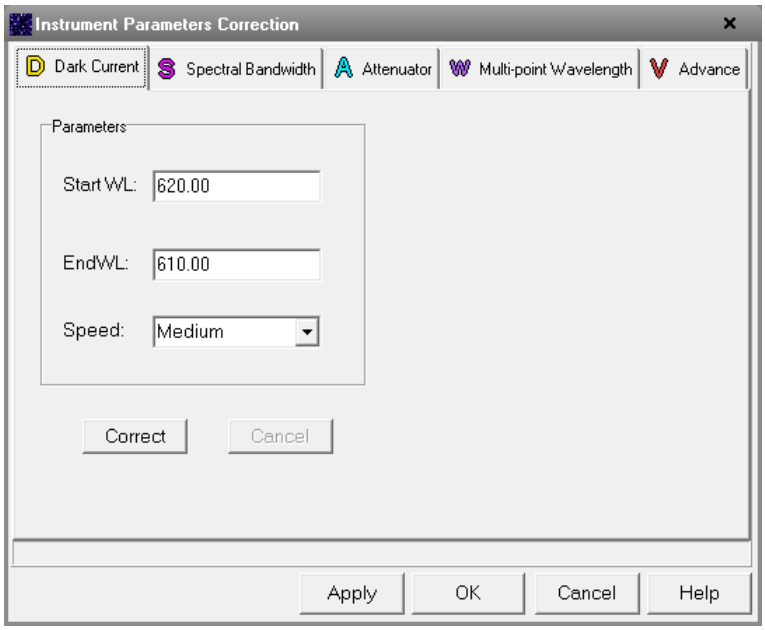


Figure 3-3 Instrument Parameters Correction

- **Dark current correction tab**

Dark current correction is used to correct the instrument circuit noise. Therefore, you are required to put a black block into cell holder to perform dark current correction. Only in this way, it can achieve correction purpose as figure 3-3 shown.

- **Parameters**
  Set the start wavelength, end wavelength and speed.
- **Correct**
  Click this button to do the dark current correction.
- **Cancel**
  Click this button to stop the dark current correction.

- **Spectral Bandwidth Correction Tab**

Spectral Bandwidth Correction is used to correct the accuracy of spectral bandwidth, only used for continuously selectable slit instruments. It can be used if the error over 20%. Keep the cell holder clear when doing this operation as figure 3-4 shown.

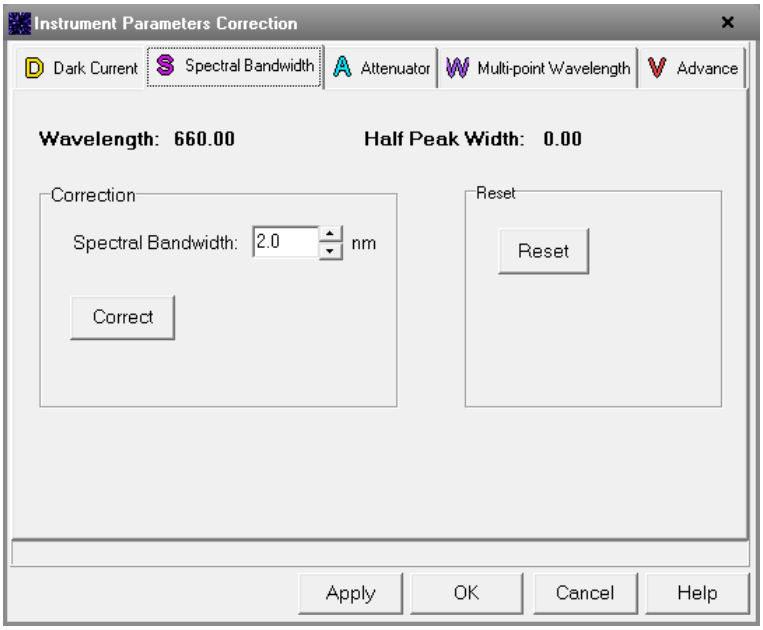


Figure 3-4 Spectral bandwidth Correction

- **Wavelength**
  Display the current wavelength when doing spectral bandwidth correction.
- **Half Peak width**
  Display the half peak width after scanning and calculating.
- **Spectral Bandwidth**
  Input the correct value.
- **Correct**
  Click this button to start correction. There will be some prompt if success. Please contact with the Supplier if failed.
- **Reset**
  Click this button to restore the default settings.
  Notice: Be caution when using this function, all the data store in the chips will be clear and the spectral bandwidth need to re-correct.

Attenuation Correction Tab

Attenuation Correction is to measure the attenuation value of sample attenuator and reference attenuator between 1% to 10%, and send to the instrument, as figure 3-5 shown.

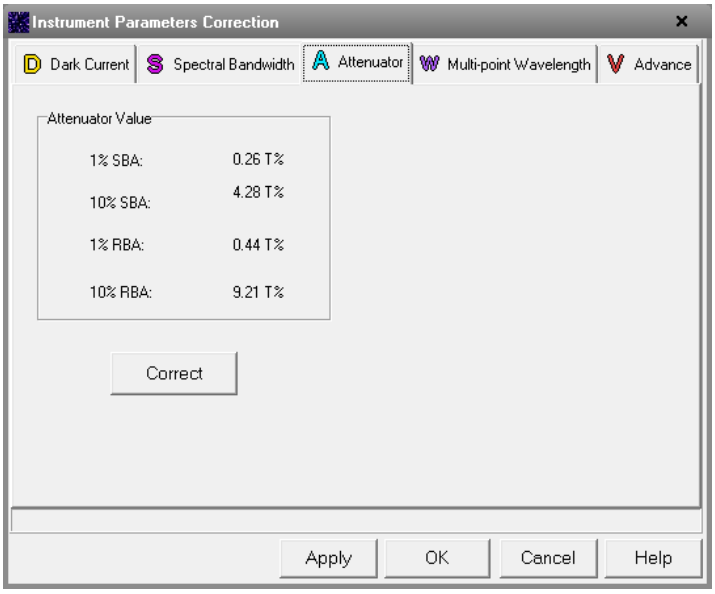


Figure 3-5 Attenuation Correction

- **Attenuator value**
  Display the attenuator value of sample and reference from 1% to 10%.
- **Correct**
  Click this button to do the attenuation correction, and then check the validity, if yes send to the instrument.

Wavelength correction with multi-point Tab

[Wavelength correction with multi-point] is to use the character spectrum of mercury lamp or the other standard material as the basic point to correct the wavelength. This function only can be used for specified model which support writing and reading wavelength correction checking list. For the others still use the [Wavelength correction] function. Choose [Wavelength correction with multi-point] from [Measurement] menu to open the correction window as the following figure shown.

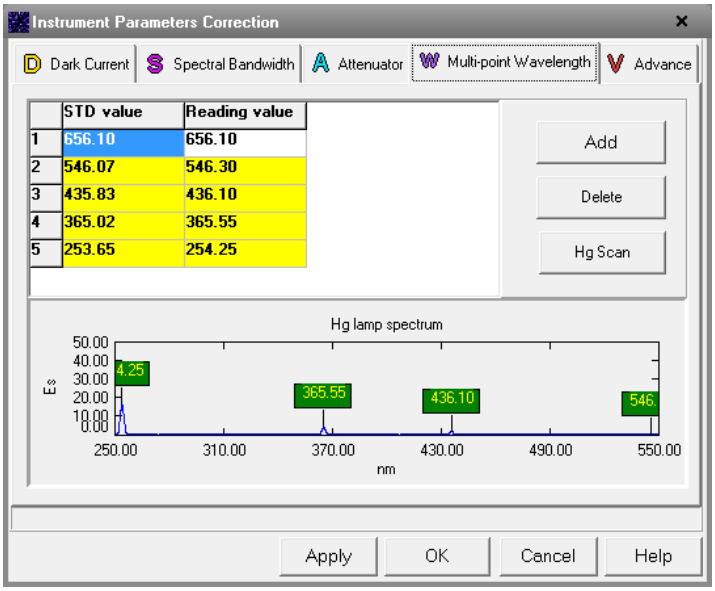


Figure 3-6 Wavelength Correction with multi-point

- **Add**
  Click this button to add a new line in the wavelength list.
- **Delete**
  Click this button to delete a line in the wavelength list.
- **Hg scan**
  Click this button to scan the energy of mercury lamp from 250nm-550nm, the spectrum and wavelength will be shown in the window.

- **Advanced Tab**

The wavelength status can be set in this tab, as figure 3-7 shown.

- **Not correct**
  Scan without referring the corrected wavelength list
- **Corrected**
  Scan according to the corrected wavelength list

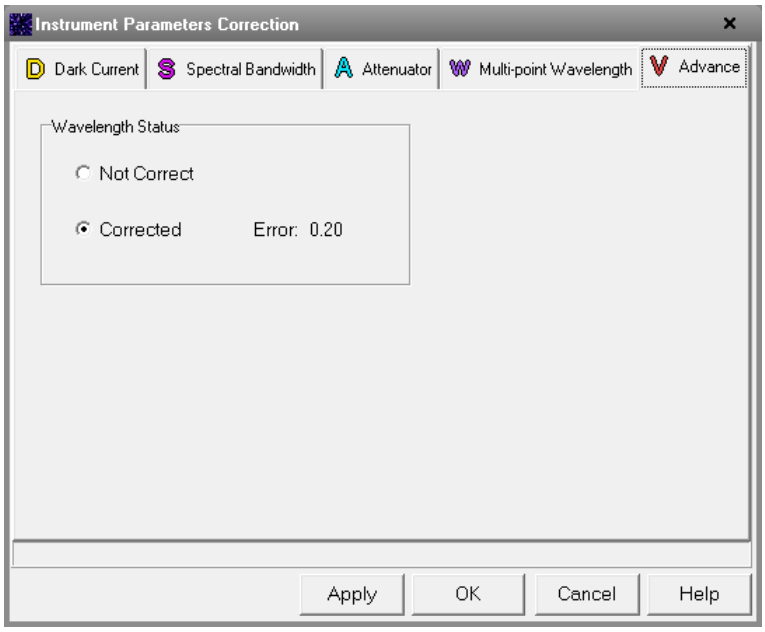


Figure 3-7 Advanced tab

3.5 Wavelength Correction

Wavelength correction is correction to instrument wavelength accuracy. As UV-VIS spectrophotometer has a strict requirement to its wavelength accuracy, in case its wavelength has large deviation, measurement results would be influenced directly. But because of instrument structure and its principle, wavelength deviation is hardly to be avoided. Therefore, it is necessary to use wavelength correction to adjust it.

3.6 Goto Wavelength

Goto wavelength is moving current instrument wavelength to your set position. Select Goto

Wavelength submenu under Measure Menu to open the Goto Wavelength Window as shown in Figure 3-8. In this window, input wavelength you want to set and press OK button to confirm it.

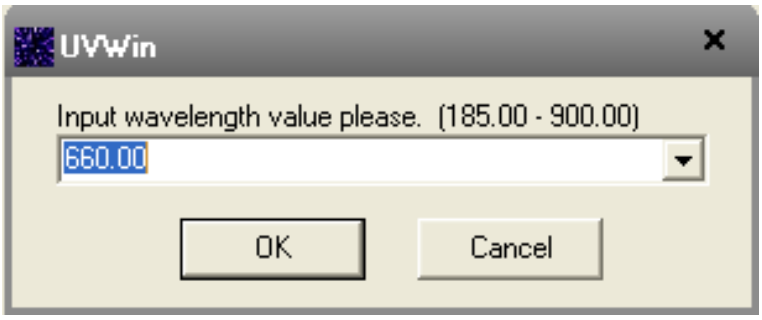


Figure 3-8 Goto Wavelength

3.7 Accessories Setting

Accessories setting allows you to setup accessories that instrument uses. At present, the optional accessories include Fixed Cell Holder, Flow Cell, Integrating Sphere, 5 Cell Holder, and 8 Cell Holder. Select Accessories submenu under Measure Menu to open the Accessories window as shown in Figure 3-9. In this window, you can select a type of accessories and setup sample types accordingly. If you select multiple cell holder, you can click on Position to set corresponding cells as "●", so as to setup it as current sample cell.

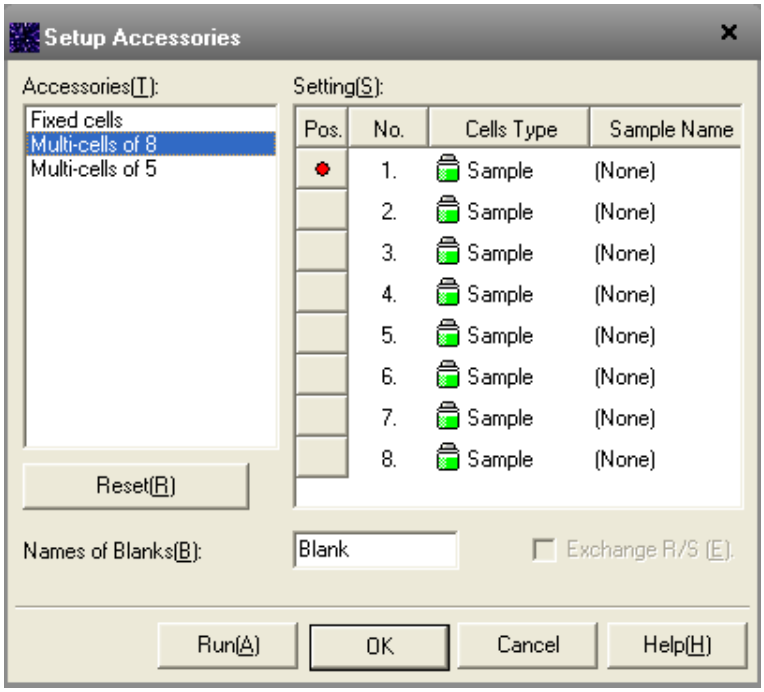


Figure 3-9 Accessories Setting Window

- **Type**

Corresponding to sample type of each cell. If one cell is set as Blank sample, System will move to it to do correction when baseline correction is going to be done. If one cell is set as Unused, System will never

move to it during measurement.

- **Sample Name**

Setting sample name of corresponding cell. The name will be saved with measurement file and be able to be printed out.

3.8 Multi-Cell Blank Correction

If the instrument is equipped with multi-cell holder (5-cell holder or 8-cell holder), you could do the blank correction to every blank sample in the cell holders alone as shown in figure 3-10.

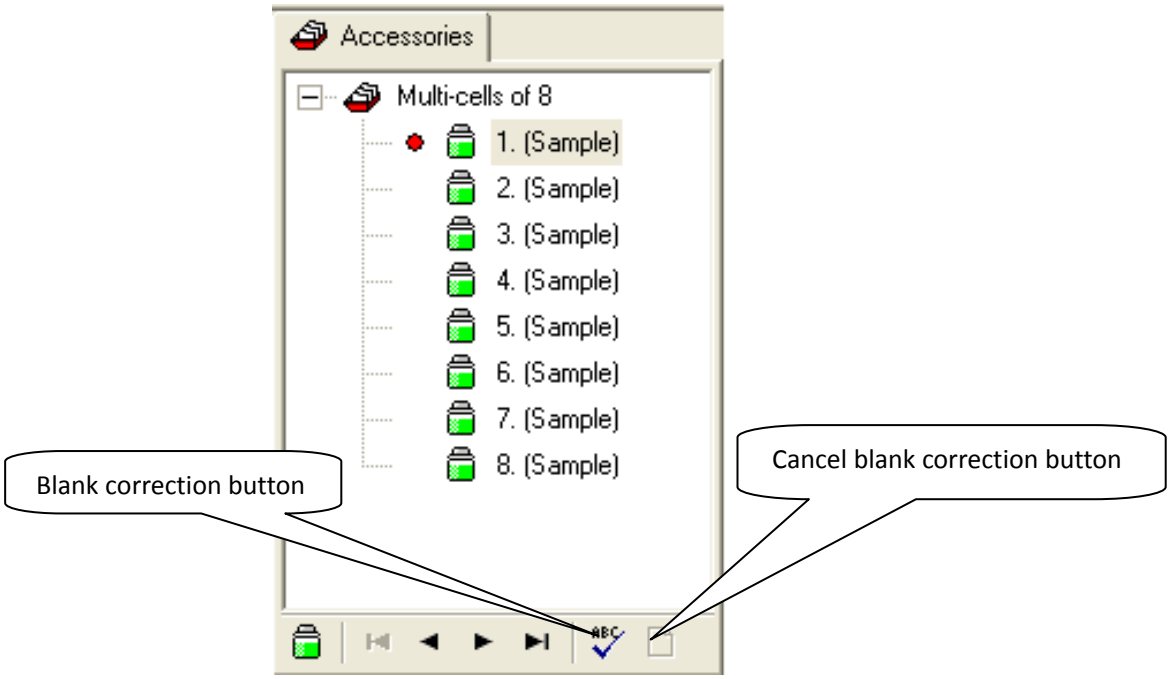


Figure 3-10 Accessories window

You could click on “Blank correction” button in the accessories window to do the multi-cell blank correction. But you have to put the blank sample or blank cell into the cell holder before this operation, and the system will finish correction automatically. You also could eliminate the blank correction value by clicking “clear blank correction value” button to reset it.

3.9 Instrument Initialization

Select Initialization submenu under Measure Menu to do instrument initialization again, as shown in Figure 3-11. In the initialization window, UVWin6’ll initialize some instrument automation mechanisms. The automation mechanisms may vary with different instrument models. For example, instrument with variable slit will initialize its slit motor, while instrument with fixed slit will not. UVWin6 initialization window covers whole screen. Its background shows some info about the software. In the initialization window, it shows instrument name, instrument serial number, and initialization items. In initialization procedure, passed items show “✓” sign, while failed items show “✗” sign. Please refer to instrument service manual for detailed causality of initialization failure and its troubleshooting.

Figure 3-11 Instrument Initialization

3.10 Instrument Validation

Instrument validation will help you accomplish instrument performance check automatically. Select Instrument validation submenu under Measure Menu to open the Instrument validation window as shown in Figure 3-12.

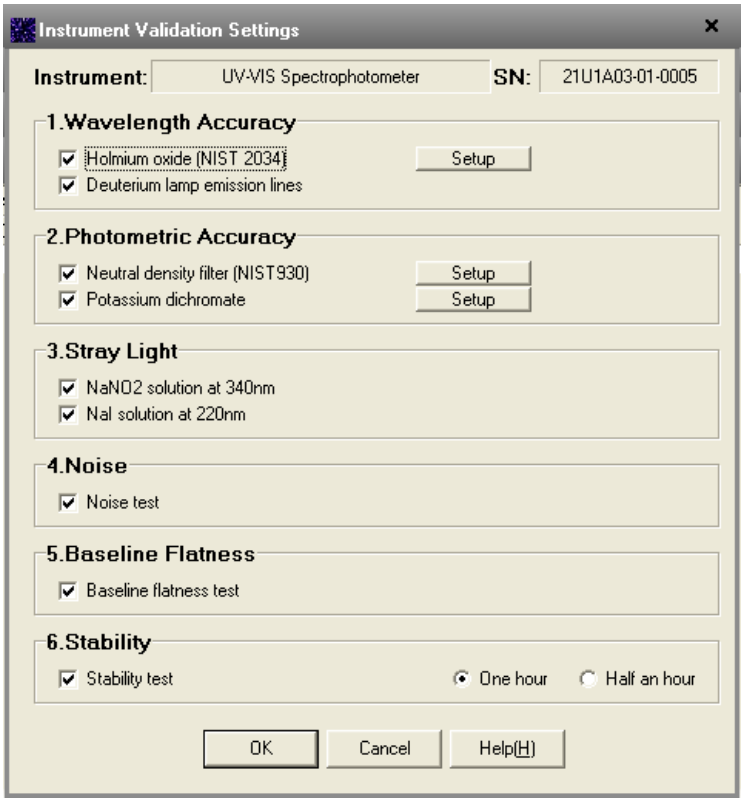


Figure 3-12 Instrument Validation Window

Instrument Validation includes 6 items: “Wavelength accuracy”, “Photometric accuracy”, “Stray light”, “Noise”, “Baseline flatness”, and “Stability”. You are able to select and setup each of them.

- **Wavelength Accuracy**

Using characteristic spectral lines of “Holmium filter” or “Deuterium lamp” to calibrate instrument wavelength accuracy. You can click on Setting button to make small amendment on characteristic wavelength.

- **Photometric Accuracy**

Using characteristic spectral lines of “Medium density filter” or “Potassium dichromate solution” to calibrate instrument photometric accuracy. You also can click on Setting button to make small amendment on characteristic absorption.

- **Stray light**

Using “Nitrous acid sodium” or “Sodium iodide” solutions to calibrate instrument stray light.

- **Noise Level**

Measure instrument noise level in 120 seconds.

- **Baseline Flatness**

Measure instrument baseline flatness

- **Stability**

Measure instrument stability. You can select measurement of one hour or half an hour.

If you do not want to perform some items check, you can undo the check boxes before the items. After you finish validation setting, press OK button and System will form a validation wizard according to your settings. You are able to accomplish instrument validation with instruction of the wizard, as shown in Figure 3-13.

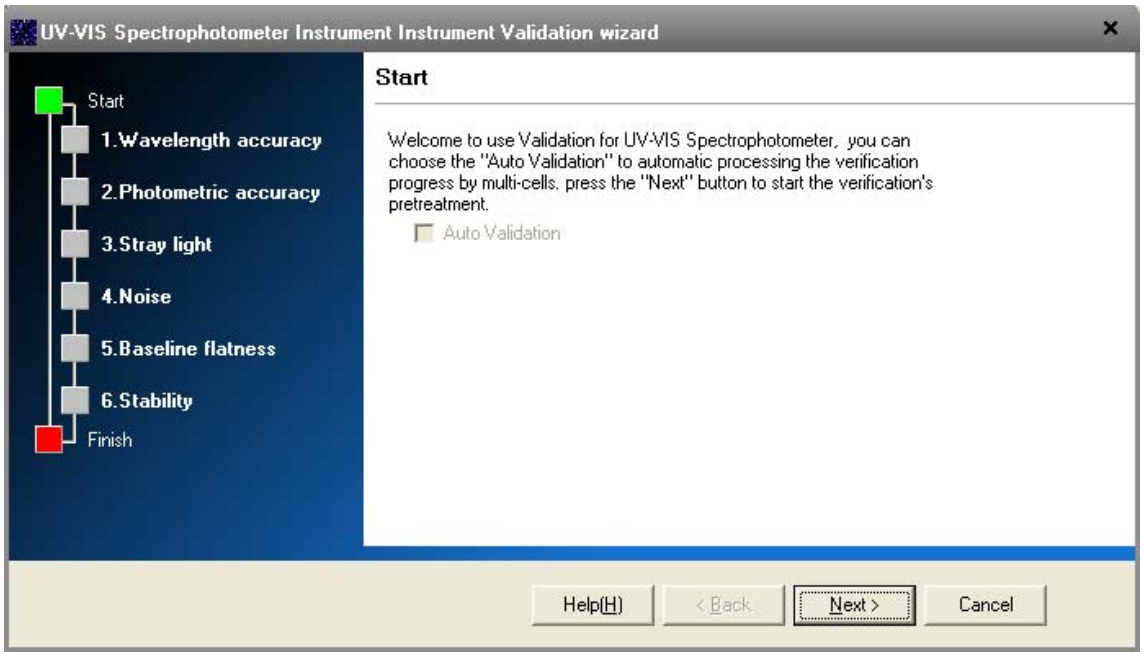


Figure 3-13 Instrument Validation Wizard

If your instrument has Multiple cell holder, you can select Auto Validation in the first page of validation wizard and setup cell positions for relevant samples. Press Next and System will start validation automatically. If you do not select Auto Validation, you need to continue validation procedure step by step. In process of validation, System will mark failed items. In the last page of validation wizard, you can click Print Results Report button to print out validation results. When printout, System will give different marks to data and results of each check item. Passed items will be signed by System with “ ”. Otherwise, there is not such sign.

3.11 Chapter Summary

This chapter mainly gives you introduction of how to control instrument through UVWin6 provided functions. After reading this chapter, you must have some more knowledge of instrument manipulation with software. Hope you can learn how to use the software through practice on instrument.

Chapter 4 Photometric Measurement

Key points

In this chapter, we'll tell of the following contents: What's photometric measurement? How to setup parameters for photometric measurement? How to perform photometric measurement? How to save and printout measured results?

It includes:

- Brief introduction of Photometric measurement
- Setting of photometric measurement parameters
- Photometric measurement
- Saving and printout of measured results
- Chapter Summary

4.1 Brief introduction of Photometric measurement

"Photometric measurement" is readout of measuring data at the wavelength points you set. In UVWin6, you can set multiple wavelength points for photometric measurement. Furthermore, you can do some simple calculation on measured data. Please refer to next section about this.

4.2 Setting of Photometric measurement parameters

To enable Photometric Measurement, you should click on the Photometry tab in Work Space. Select Parameters settings submenu under Measure Menu to activate the Photometric measurement setting dialog box, as shown in Figure 4-1. In this dialog box, there are 5 tabs, and you can setup them according to your various needs.

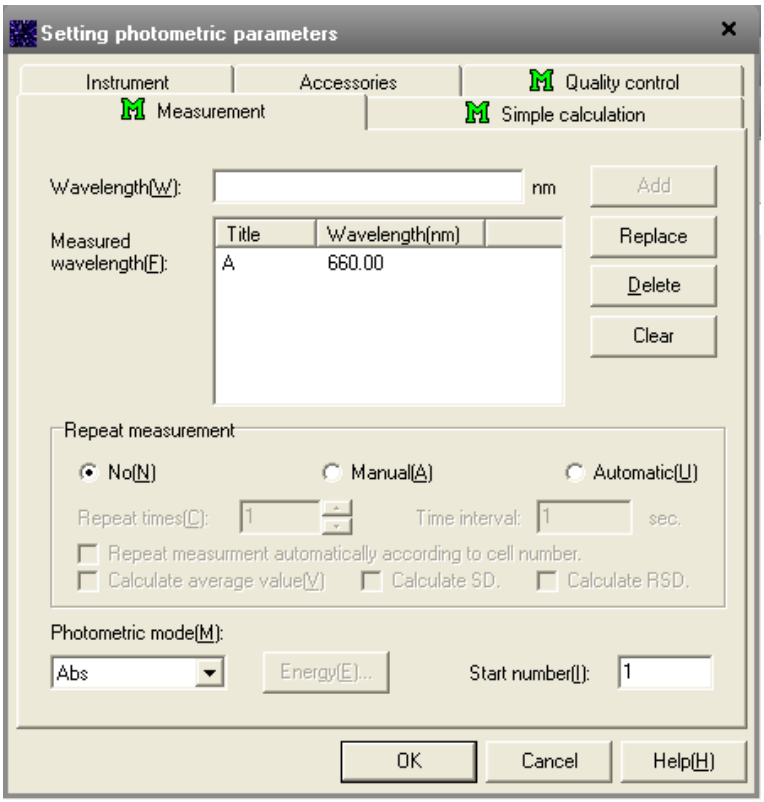


Figure 4-1 Photometric Parameters Settings (Measurement Tab)

- **Measurement Tab**

  - **Wavelengths**

In measurement tab, you can input in Wavelength Edit Box the wavelengths at which you want to measure. Then click Add button to add it into its below wavelength list. The number of measuring wavelengths can be up to 26, while one is least. If you need to delete wavelength points, or clear the wavelength list, you can press Delete Button, or Clear Button. After you choose a wavelength in wavelength list, there shows the same wavelength in Wavelength Edit Box. Here, you can amend the wavelength and press Replace Button to update it correspondingly in Wavelength list.

  - **Repeat Measurement**

Photometric measurement enables you to select number of repeat measurements. If you do not require repeat measurement, select No in Repeat Measurement Option. If manual repeat measurement is required, select Manual in the same. And then input number of repeat measurements in Repeat Times Edit Box. Same as that of Manual, Automatic is also performing repeat measurement. And for Automatic, it accomplishes multiple repeat measurements automatically, without each press of Measure Button. What Automatic requires specifically is to set a time interval for measurement, that is, waiting time between every two measurements. This interval could be zero, which means to perform continuous measurement without pause. If you have chosen Automatic Repeat, you are also able to check the option box of “Repeat measurement automatically according to cell number”, which will do once measurement over all samples in cells. In this way, there is no need to set repeat times, which will be forbidden. If you set cell holder type as fixed cell holder, you cannot check the option box. Anyway, the main purpose of repeat measurement is in fact for averaging of repeat measurement data. So you can check “Calculate average value” to enable average calculation. Then System will calculate and display the average

automatically in results table.

- **Photometric Mode**

Photometric mode means instrument current operation mode, which has options of Abs. (Absorption), T% (Transmittance), Es (Sample Energy), Er (Reference Energy), and R% (Reflectance).

- **Start Number**

Setting a start point of sample serial number. What is input here can be any number.

Simple Calculation Tab

The option facilitates greatly calculation on measured results. By this function, you can work out some professional data and analytic results. Its setting window is shown as Figure 4-2. You can check the option box of "Enable Simple Calculation" to open the simple calculation function.

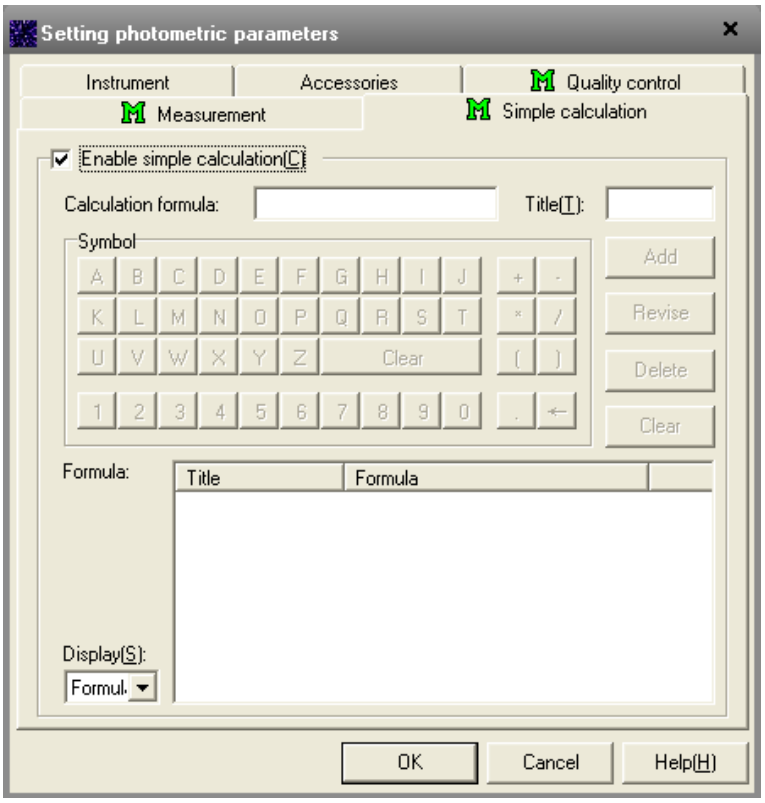


Figure 4-2 Photometric Settings (Simple Calculation Tab)

- **Calculation formula**

In "Calculation formula" edit box, you can input required formula for results calculation. In formula, letters of A, B, C, and D…represent measured data of corresponding wavelengths. For example, you input two wavelength points in Wavelength list of Measurement Tab, which are 600nm and 500nm. When you want to calculate the ratio of measured data of these two wavelength points, you can input A/B in Formula Edit Box of Simple Calculation Tab. Then press Add Button. The default title of calculation formula is "Result 1", "Result2"… If you want to specify a title, you can input it, at same time when you input calculation formula, in Title Edit Box. If you need to amend a formula, select it correspondingly in formula list, and revise it in formula edit box. Press Revise Button to make it effective. If you want to delete or clear the content of formula list, press Delete Button or Clear Button. Number of Formula can be up to 10.

- **Characters**

The role of Characters here is for input imitating as keyboard. Press a character button so as to input the corresponding character equivalently.

- **Display**

The role of Display option here is for selection of different display modes for calculation formula. Pull-down box offers two choices, formula and title. Formula here means calculation formula will be displayed in result table as title. Title here means the default title or user set title will be displayed.

Instrument Tab

The content of Instrument Tab is same as that of Instrument Performance Settings. Please refer to 3.1 Instrument Performance about it.

Accessories Tab

The content of Accessories Tab is same as that of Accessories Settings. Please refer to 3.7 Accessories Setting about it.

Quality Control Tab

Saying quality, you may think of what a product's quality is about. For example, you bought an instrument from a factory, which got problems soon. You can think its quality is not good, as your judgment criterion is that its quality is not good if a new instrument gets problems shortly. Yes, quality is used to describe merchandise good or not. And quality is also able to be used to describe data good or not. For example, you measured a datum of 0.1, while its normal value should be around 1, and at the utmost it should be not less than 0.8. Obviously, the measured result is not right, or is out of request. And you can say its quality is not good, as your judgment criterion is not less than 0.8 at the utmost.

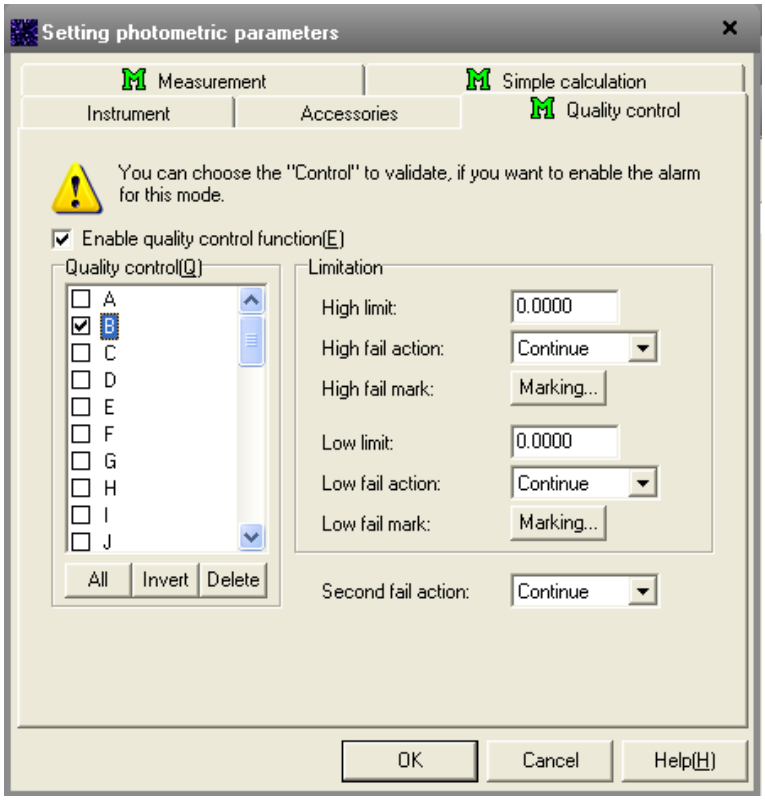


Figure 4-3 Quality Control Settings

Quality Control is a new function offered by UVWin6. Its role is quality monitoring on measured data. In case there are abnormal data measured, System will prompt or act according to your preset. Of cause, judgment way for data can be preset. Shown as in Figure 4-3.

In the quality control window, you can set Quality Control on or off through “Enable quality control function” option.

- **Quality Control List**

Set items for quality control. Letters of A, B, C, D… express columns of measuring wavelength points, result1, result2, result3…, and calculating results. Click at All Button to select all items, while click on Invert Button invert selection of all items. Click on Clear Button to clear all selections.

- **Limitation**

In limitation box, you can input High Limit and Low Limit for control of selected items. Fail Action could be set for System to act when data out of limits occur. The optional actions include: Continue – continue to measure, Stop – stop measurement, and Re-measure – Measure current sample again. If you need to make a mark on result out of limits in result table, click on Marking Button to set mark type, as shown in Figure 4-4.

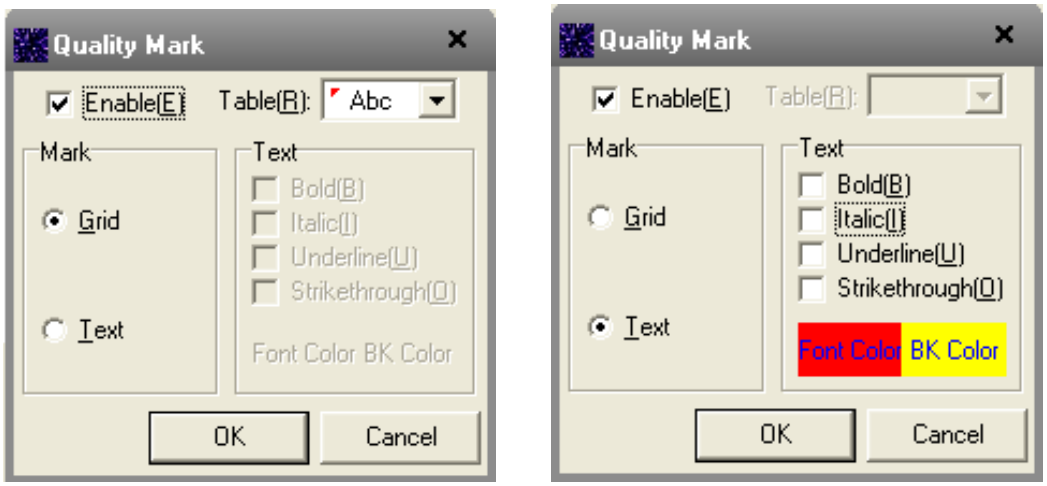


Figure 4-4 Quality Mark Marking Grid (Left) Marking Text(Right)

Check the Enable Option to open marking function. In Mark box, you can select marking mode for those data out of limits. “Grid” is marking the grid data located in. The optional marks can be selected from pull-down list of Grid. If you choose “Text”, color and font of text can be setup.

- **Second fail action**

Second fail action means that System would take what action when there are successively twice of out of limits. The optional actions include “Continue” and “Stop”.

4.3 Photometric Measurement

The measuring procedure of Photometric Measurement is very simple. Just click on Start button to finish a measure. The measured result is displayed in result table. If you want to delete a measured result, use mouse to click on it and select Delete submenu under Edit Menu to delete it. If you need to recall the deleted results, you can click right button of mouse in result table. In popup menu, select the Cancel Deleting Submenu under the Delete Menu to recall the deleted results. If you want to hide the deleted

results, uncheck the Display Deleted Sample under the Delete Menu.

4.4 Saving and Printout

For measured results, they are not only able to be saved to a file, but also be able to be printed out. After you finish analytic measurement, you can select Save submenu under File Menu, or click on button. System would pop up the Save File Window, as shown in Figure 4-5. Input a filename you want to save to and press Save button to save files to a specified location.

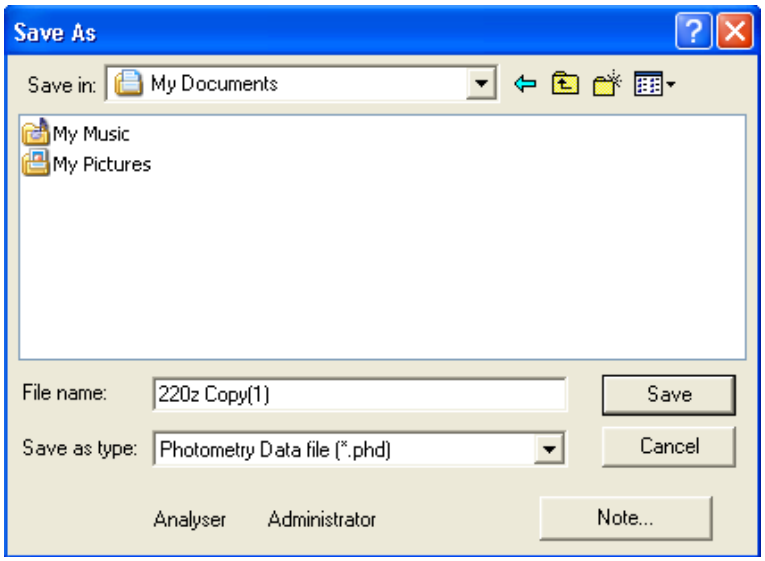


Figure 4-5 Save File Window

In lower part of the window, it shows current analyzer. Click on Note Button to make a note on measured results. Shown as Figure 4-6.

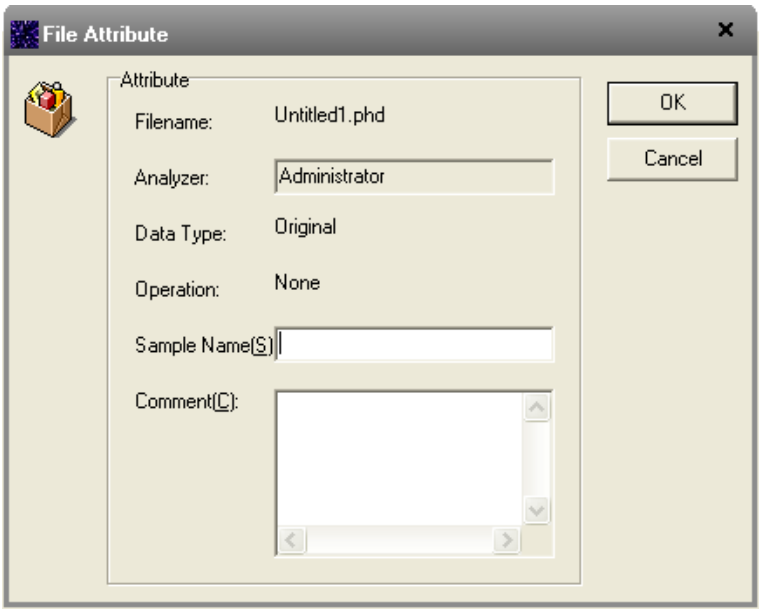


Figure 4-6 Note Window

You are able to input measuring sample name in Sample Name edit box, input notes on measured results in Comments edit box. All info above will be saved to measuring files for future reference.

If you want to print out measured results, you can select Print submenu under File Menu, or click on button to print them out. Naturally, you must to ensure that your PC has already installed a printer. If not, System will give an error prompt. An addition, if you want to modify printout format, you can select Page Settings submenu under File Menu, or click on button to open the Page Setting Window. Shown as Figure 4-7.

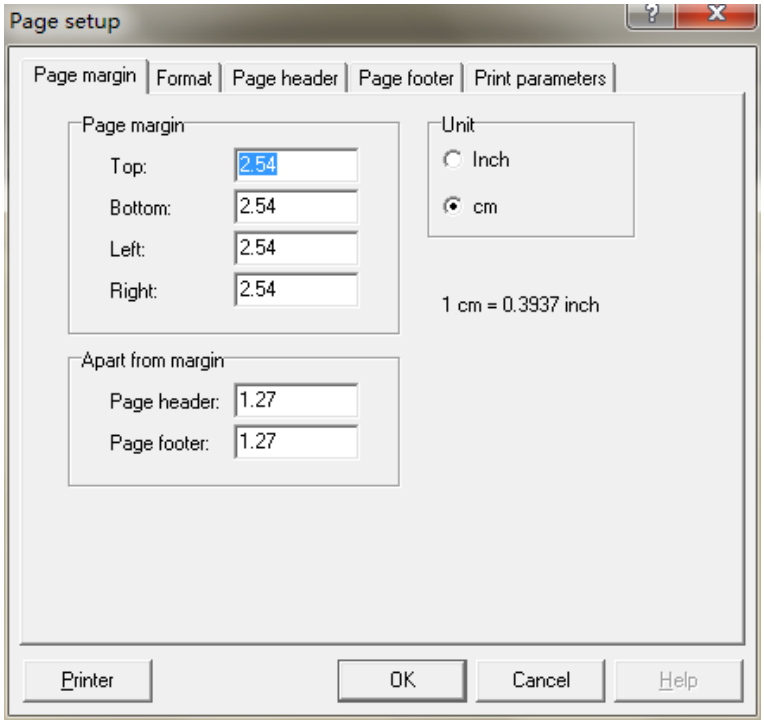


Figure 4-7 Page Settings Window

Page Margin Tab

The contents of Page Margin Tab are mainly setting parameters relating to interval. Shown as the above figure. First you are able to set the unit of margin, which has two choices of Inch and Centimeter. Then you are able to input four margins of top, bottom, left, and right in Margin Box. That is, the interval of text apart from paper edges. Apart from margin box is used to set the interval of page header and page footer apart from paper edges.

Format Tab

The contents of Format Tab are mainly setting the format, font, table, and direction of page output. Shown as 4-8.

- **Text**

Setting text printing format. The optional formats include Normal, Simple, and Table. “Normal” means printing out in text, without any decoration. “Simple” is to underline sort headers, to highlight headers. “Table” means printing out in table. In addition, you are also able to click on Font Button to set print fonts.

- **Row Spacing**

Setting the interval of each text row. The optional row spacing includes “Minimum”, “0.5 Word”, “1

Word", "1.5 Word", and "Double Word".

- **Line Width**

Setting the thickness of table lines. The optional line widths include "Thin" and "Thick".

- **Date/Time Format**

Setting time format and date format for printout. The optional formats include "Weekday, MM DD, YYYY HH:MM:SS", "MM/DD/YY HH:MM:SS", "MM/DD/YY", and "HH:MM:SS". Except the first option, the year of date format is two digits.

- **Page Number Format**

Setting page number for printout. The optional page number formats include "1, 2, 3…", "-1-, -2-, -3-…","<1>, <2>, <3>…", and "(1), (2), (3)…". The meaning of these formats is respectively: direct page number printout, adding hyphens to both sides of page number, adding angle brackets to both sides of page number, and adding parentheses to both sides of page number.

- **Direction**

Setting direction of printing paper as Portrait (vertical print) or Landscape (horizontal print).

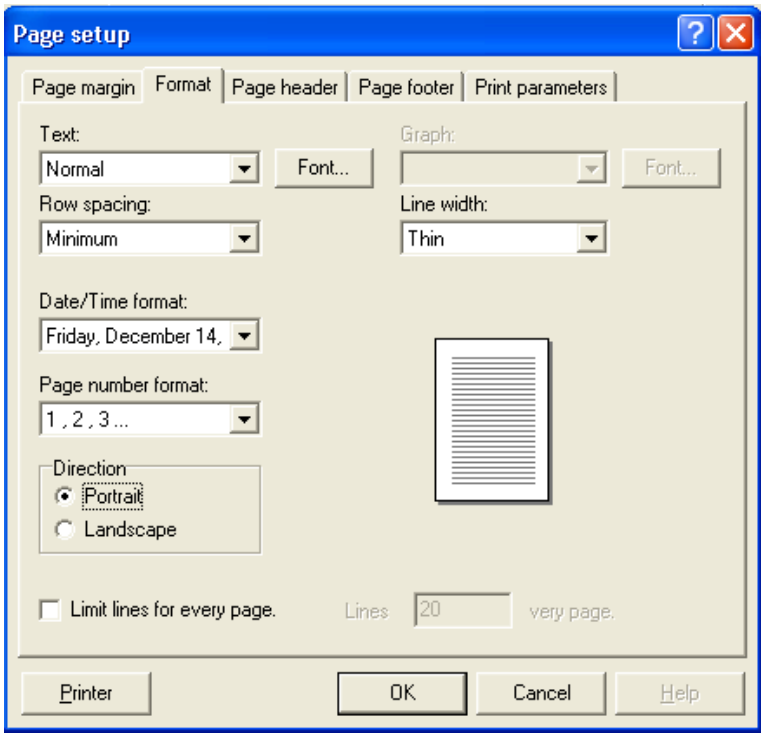


Figure 4-8 Format Tab

- **Page Header / Page Footer Tabs**

Setting for Header and Footer is the same. But Header is printed on the top of text, while Footer on the bottom of text. For Header and Footer, there are also three positions to select printing contents. Shown as Figure 4-9.

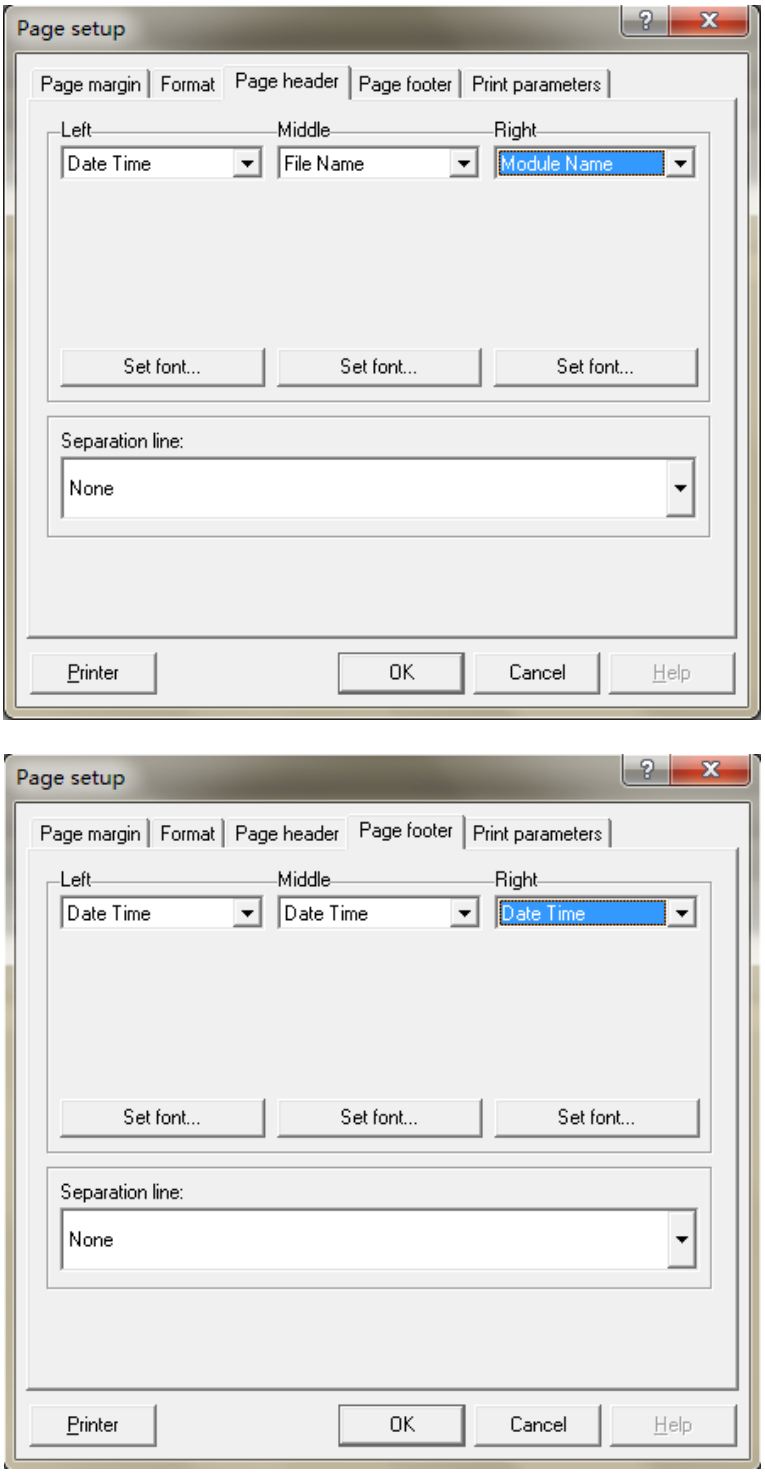


Figure 4-9 Header(Up) and Footer(Down) Setting

- **Left, Middle, Right**

"Left", "Middle", and "Right" represent three parts of left, middle, and right of header or footer. You can select from pull-down menu to set printing contents. The optional contents include:

"None": Not to print any word.

"Date/Time": To print current date and time. The format of date and time can be set in Format Tab.

"Filename": To print the filename of measurement file.

"Module Name": To print the name of current measurement module, such as Photometric, Spectrum Scan, etc.

"Instrument Name/Number": To print the name and serial number of current instrument, such as UV-VIS Spectrophotometer/01-1901-01-0001.

"Analyser": To print current login username.

"Company": To print current user's company name.

"Page Number": To print current page number.

"Custom": To print custom text. If you choose this option, bellow the pull-down menu, there is an Edit Box, in which you can input custom text.

If you have input relevant contents, you can click on "Font" Button to set its font. In addition, you also can select Separation Line to draw separation lines among Header, Footer, and Text.

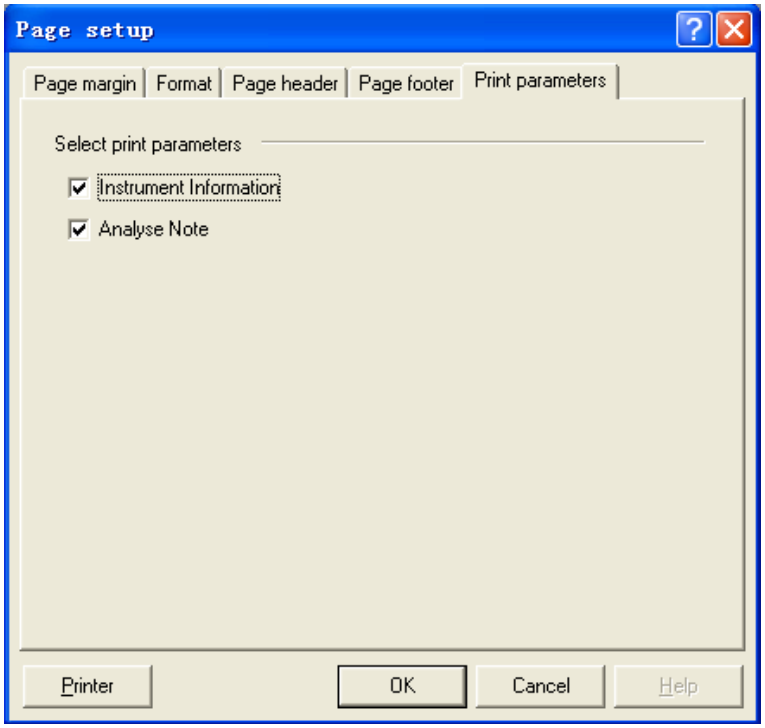
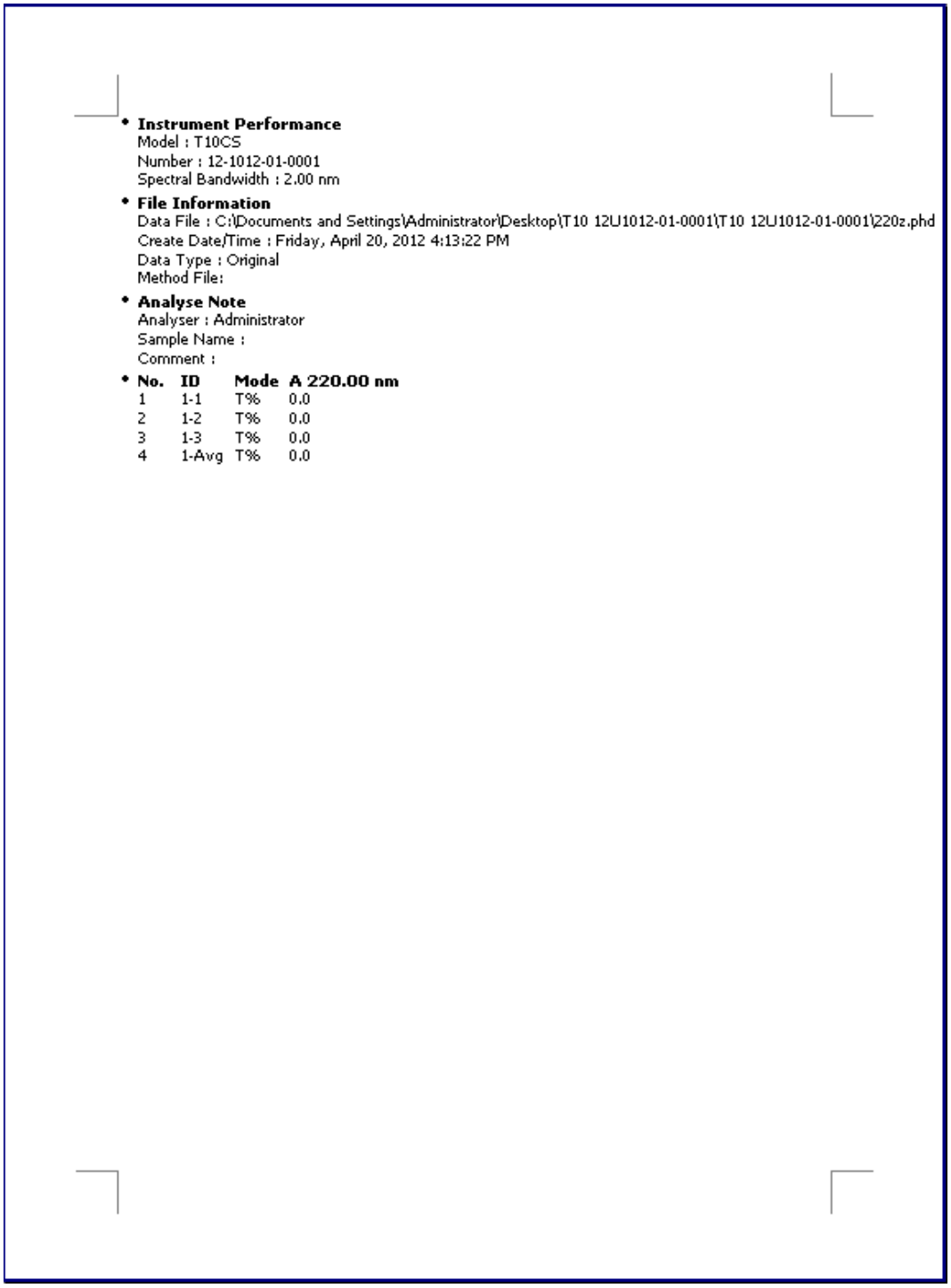


Figure 4-10 Print Parameters Setting

- **Print Parameters Tab**

Print Parameters Tab let you to select parameters relating to measurement to be printed out. The optional parameters include "Instrument Performances" and "Note". Instrument performances include instrument name, serial number, bandwidth, and etc, while Note includes analyzer, sample name and note.

If you want to see the result of page settings, or to preview the print result, you can select Print Preview Submenu under File Menu, or to click on  button, to perform print preview. Shown as Figure 4-11.



- **Instrument Performance**
  Model : T10CS
  Number : 12-1012-01-0001
  Spectral Bandwidth : 2.00 nm
- **File Information**
  Data File : C:\Documents and Settings\Administrator\Desktop\T10 12U1012-01-0001\T10 12U1012-01-0001\220z.phd
  Create Date/Time : Friday, April 20, 2012 4:13:22 PM
  Data Type : Original
  Method File:
- **Analyse Note**
  Analyser : Administrator
  Sample Name :
  Comment :
- **No. ID Mode A 220.00 nm**
  1 1-1 T% 0.0
  2 1-2 T% 0.0
  3 1-3 T% 0.0
  4 1-Avg T% 0.0

Figure 4-11 Print Preview

In the print preview window, click on or buttons to zoom the page. Click on button to print. Click on button to perform page settings.

4.5 Chapter Summary

This chapter mainly gives you introduction of how to setup and perform measurement in

Photometric. Further more, it tells functions of print settings and print preview, which are common for other operation in the software. Therefore, it will not give details about print operation in the following chapters.

Chapter 5 Spectrum Scan

Key points

In this chapter, we'll tell of the following contents: What's Spectrum Scan? How to setup parameters for Spectrum Scan? How to perform Spectrum Scan? How to view spectrum information? How to save and open spectrum files?

It includes:

- Brief introduction of Spectrum Scan
- Setting of Spectrum Scan parameters
- Spectrum Scan
- Viewing spectrum information
- Saving and Opening of spectrum files
- Chapter Summary

5.1 Brief introduction of Spectrum Scan

Spectrum Scan is scanning on a certain wavelength range with a definite wavelength interval. In the scanning course, it gives readout of measurement data with each wavelength changes and display the measured data in a graph of two dimensions for further analysis and study. Spectrum scan is mainly used for qualitative analysis of samples. With its visual graphic display, Spectrum scan is more clear for operators with samples' properties. So it is one of the absolutely necessary functions for UV-VIS Spectrophotometers.

5.2 Setting of Spectrum Scan parameters

If you want to perform spectrum scan, first you should set scanning parameters. To enable the Spectrum Scan Window, you should click on the Spectrum tab in Work Space. Select Parameters settings submenu under Measure Menu, or click on  button, to activate the Spectrum scan setting dialog box, as shown in Figure 5-1.

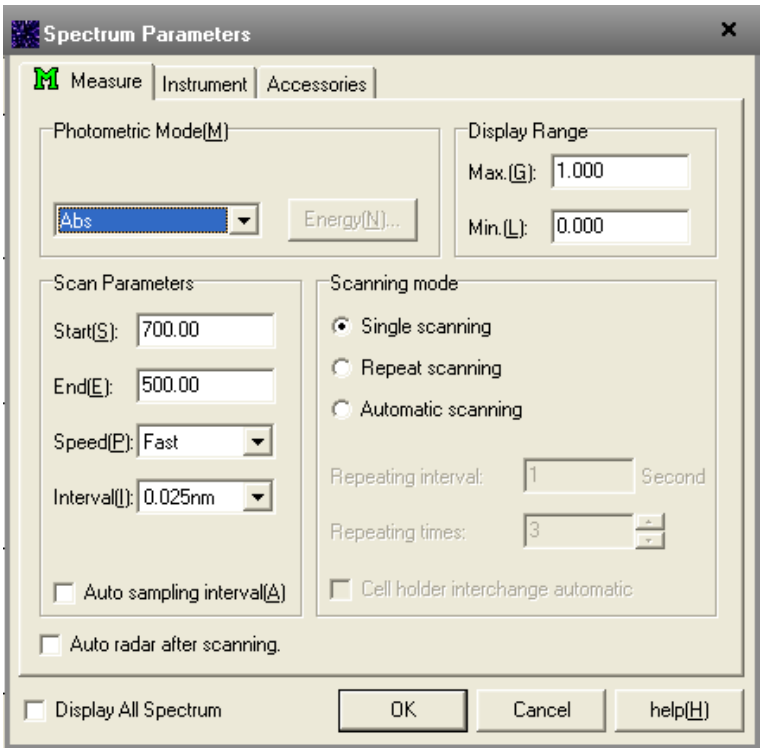


Figure 5-1 Spectrum Scan Parameters Setting

In this dialog box, there are 3 tabs: Measurement, Instrument, and Accessories. Among them, Measurement Tab is mainly for setting spectrum scanning parameters, while other two tabs are as same as those of Instrument Performance and Accessories Setting. Please refer to 3.1 Instrument Performance and 3.7 Accessories Setting for the details. Here'll not repeat anything more about it. The following will focus on scanning parameters setting.

- **Photometric Mode of Spectrum Scan**

Setting Photometric Mode of Spectrum Scan. Photometric mode means instrument current operation mode, which has options of Abs. (Absorption), T% (Transmittance), Es (Sample Energy), Er (Reference Energy), and R% (Reflectance). If you choose Energy mode (Er, Es), you can click on Energy Button continuously to set Energy Parameters.

- **Display Range**

Setting the Y-axis range for spectrum scan. You can input relevant values in Maximum and Minimum Edit boxes.

- **Scanning Parameters**

Setting scanning parameters of wavelength range, wavelength interval, speed, and etc. Wavelength range consists of Start and End. Speed expresses Scanning speed. Faster scanning speed will give comparatively less data quality, while slower scanning speed will give comparatively better data quality. Interval expresses scanning wavelength interval. That is, at an interval of how many nanometer to sample each data. The optional scanning intervals are 0.1, 0.2, 0.5, 1.0, 2.0, and 5.0nm. The role of Auto Sampling Interval is selecting a scanning interval for you automatically according to scanning range set by you.

- **Scanning Mode**

Scanning mode is setting repeat scanning mode for spectrum scan. Single Scanning means performing scan only one times, no repeat. Repeat Scanning means performing multiple repetitive scanning. Automatic Scanning is performing scanning according to cell number of accessories you select. If you choose Repeat Scanning, you should set Time Interval and Repeating Times for scanning. If you choose Automatic Scanning, you need not to set Repeat Times. Only Time Interval is required to be set.

5.3 Spectrum Scan

Select Start Submenu under Measure Menu, or click on Start button, to start spectrum scan. In the procedure of scanning, System will draw dynamically scanning data and wavelength on the Spectrum Scan Window in graphic mode. Furthermore, data will be also displayed in Toolbar. If you want to cancel scanning, click on Stop Button or press ESC Key.

5.4 Viewing spectrum information

Select Spectrum Information Submenu under Graph Menu, or click on button, to open the spectrum information window. Shown as Figure 5-2. In the window, all spectral items will be displayed in the list. You can click on any of them and its details will be shown in right window. You can also click on Color button to change the display color of corresponding spectrum.

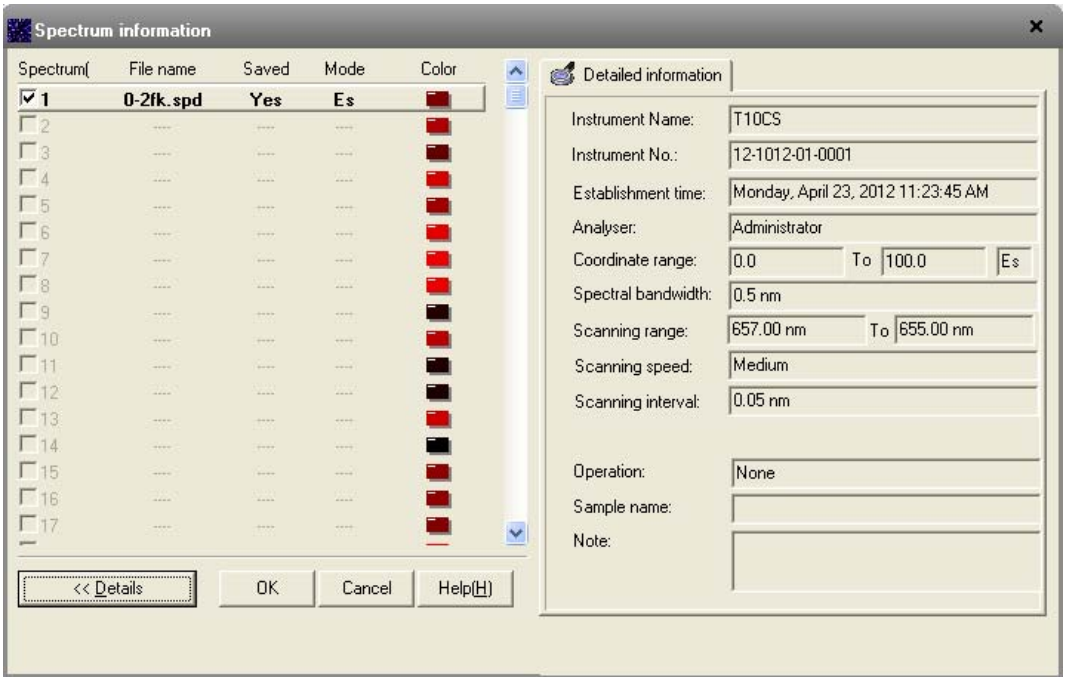


Figure 5-2 Spectrum Information Window

5.5 Saving and Opening of spectrum files

If you want to save a spectrum, you can select Save Submenu under File Menu, or click on the

button to popup the Save Window. In the window, you should input a saving filename and press OK Button. When you want to view the saved spectrum files, you can select Open Submenu under File Menu, or click on the Button to popup the Spectrum File Window, as shown in Figure 5-3.

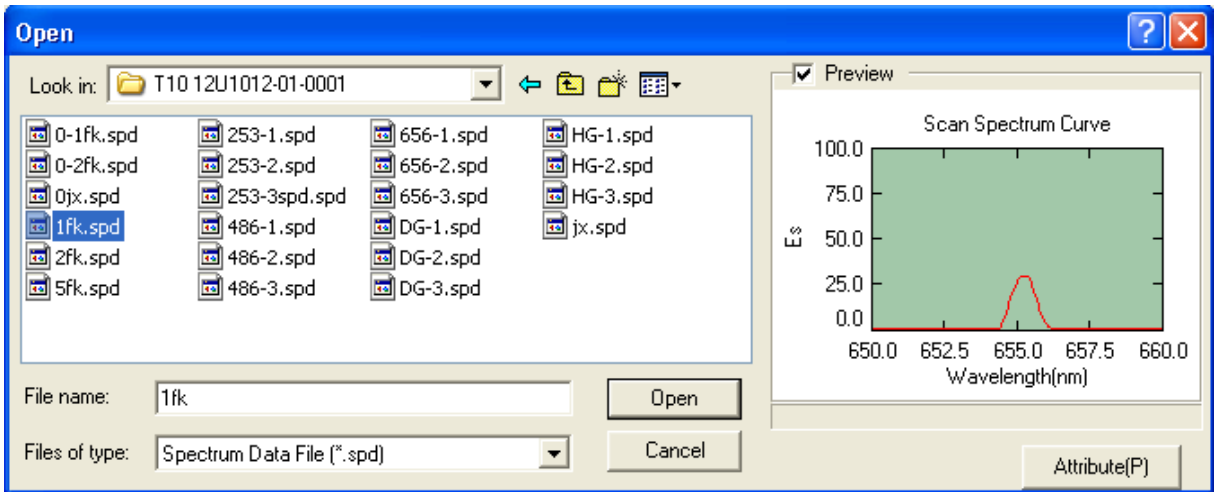


Figure 5-3 Open Spectrum Files Window

In this window, you can select the spectrum that you want to open. The right graph is the preview window. Click on Attribute Button to see the details of a spectrum file.

5.6 Chapter Summary

This chapter mainly tells you of some contents about spectrum scan. We trust you have got more knowledge of spectrum scan application. Hope you could be gradually familiar with software usage through practice of instrument application.

Chapter 6 Quantitative

Key points

In this chapter, we'll tell of the following contents: What's quantitative? How to setup parameters for quantitative? How to perform quantitative? How to save measurement files?

It includes:

- Brief introduction of Quantitative
- Setting of quantitative parameters
- Quantitative
- Saving measurement files
- Chapter Summary

6.1 Brief introduction of Quantitative

Quantitative is a determination method by comparison of measured values of standards and samples to calculate sample concentration. Quantitative has many measurement methods, such as single wavelength, double wavelength, three wavelength, first order derivation, second order derivation, third order derivation, and etc.

6.2 Setting of quantitative parameters

To enable the Quantitative Window, you should click on the Quantitative tab in Work Space. Select Parameters settings submenu under Measure Menu, or click on  button, to activate the Quantitative setting dialog box, as shown in Figure 6-1.

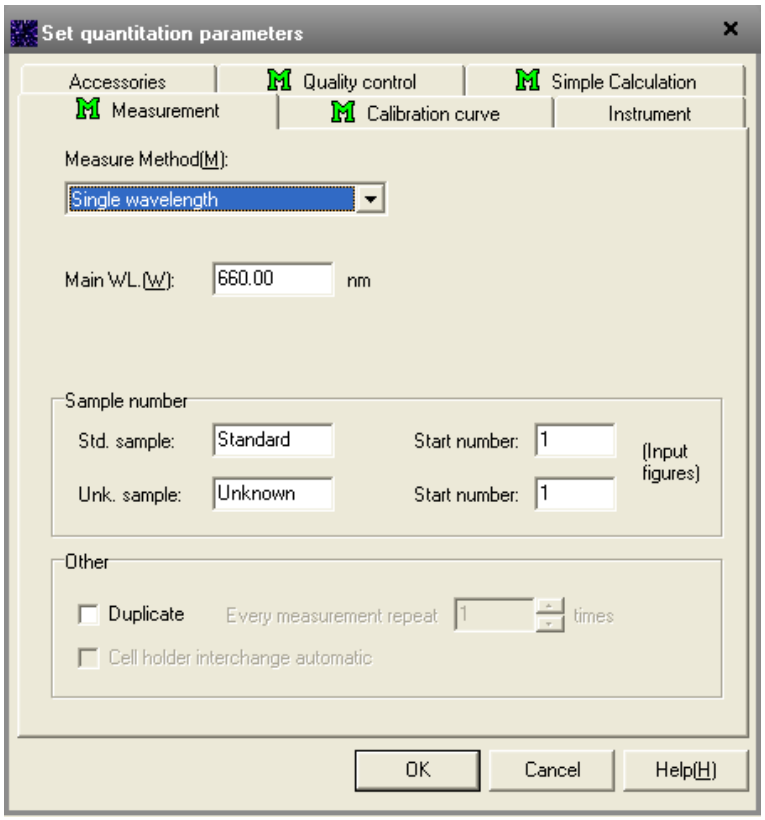


Figure 6-1 Quantitative Parameters Setting

In this dialog box, there are 6 tabs: Measurement, Calibration Curve, Instrument, Accessories, Quality Control and Simple Calculation. Among them, Instrument and Accessories tabs are as same as those of Instrument Performance and Accessories Setting. Please refer to 3.1 Instrument Performance and 3.7 Accessories Setting for the details.

● Measure Tab

Measure Tab mainly provides setting of quantitative methods, wavelength points, repeat measurement, and etc. You can select different measurement methods for various determination requirements. Meanwhile, you can also set sample number and measurement repeat times. Shown as the above.

- **Measurement Method**

Setting measurement method for quantitative. The optional measurement methods are: single wavelength, double wavelength, double wavelength with coefficient, three wavelength, first order derivation, second order derivation, third order derivation, and fourth order derivation. You can select a method according to various measurement requirements. If you choose the single wavelength method, you should input measuring wavelength in Main Wavelength Edit Box. If you choose the double wavelength method, or the three-wavelength method, you should input baseline wavelengths in Baseline Wavelength1 and Baseline Wavelength2 Edit Boxes. Please refer to Appendix A Application Methods of Quantitative for details of Quantitative methods.

- **Sample Number**

Setting Identifier and Number for standards and samples.

- **Others**

In Others Setting, you can set duplicate measurement for samples. Duplicate measurement is performing multiple measurements on a sample. And then take the average of the multiple measurement results into content calculation. Therefore, if you check the Duplicate Measurement Option, you are also required to input the necessary repeat measurement times, so as to achieve the purpose of repeat measurement, more accurate measured data. But It is sure to take some more time than usual measurement. Furthermore, if your instrument is equipped Multi-cell holder, you can choose Cell Holder Interchange Automatic option. Then, System would move to next cell after it finishes one sample measurement. What you have to do is placing samples in their orders.

- **Calibration Curve Tab**

Calibration Curve Tab allows you to set parameters for calibration curves. The optional parameters are: Curve Equation, Equation Order, Concentration Unit, Zero Interception, Curve Evaluation, Calibration Method, and etc. Shown as the bellow.

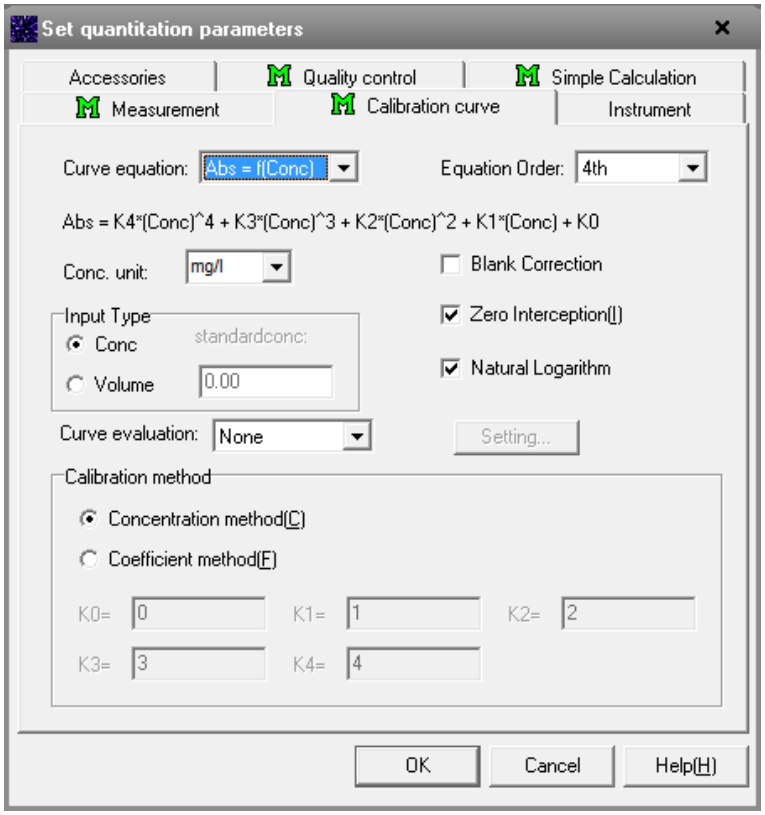


Figure 6-2 Calibration Curve Setting

- **Curve Equation**

Setting an equation used for calibration curve. The optional equations have two: C=f(Abs) and Abs=f(C). The former is taking absorption as variable to compute concentration, while the latter is an inverse function of the former, mainly used for computing absorption coefficient.

- **Equation Order**

Equation order expresses that of calibration curve, that is, the order of a polynomial. The optional orders are: First, Second, Third, and Fourth. Among them, first order equation is called linear equation, while others are called nonlinear equation. As UV-VIS Spectrophotometers have good photometric accuracy and photometric repeatability, the measured data in the allowed absorption range are linear

with their concentrations. So linear equation has the wider range of application. You can select different equations according to your actual situation. Shown as Figure 6-3 and Figure 6-4.

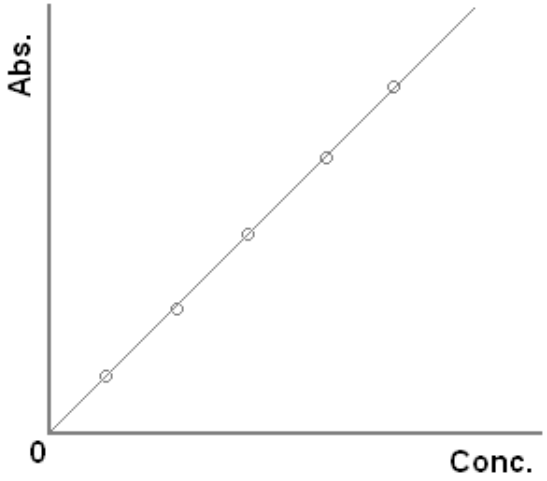


Figure 6-3 Linear Calibration Curve

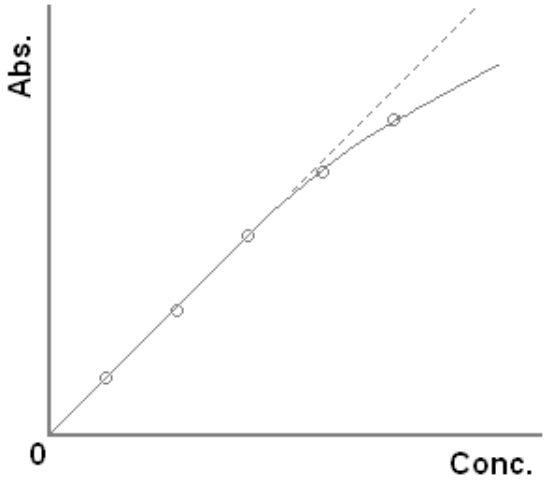


Figure 6-4 Nonlinear Calibration Curve

- **Input type**

Conc. (Concentration)

Input the concentration of standard sample before measuring it, then measure the Abs reading. The software will fit the calibration curve synchronously by taking concentration as abscissa and abs as ordinate. Then measuring the Abs reading of unknown sample and calculate the concentration by the calibration curve.

Volume

Input the volume and concentration of standard sample before measuring it, to get the mass of standard sample, then measure the Abs reading. The software will fit the calibration curve synchronously by taking concentration as abscissa and abs as ordinate. For unknown sample, input the volume, and measure the Abs reading, then calculate the mass by the calibration curve, so get the concentration according to the mass and volume.

- **Blank correction**

If "Blank correction" is chosen, the △Abs will be got by sample Abs reading subtract blank reading. And the ordinate of calibration curve will be △Abs.

Blank setting

Choose the corresponding sample and set as Blank.

- **Natural logarithm**

If "Natural logarithm" is chosen, calculate ln Abs and take as the ordinate of calibration curve.

If "Natural logarithm" and "Blank correction" are chosen together, calculate ln△Abs and take as the ordinate of calibration curve.

- **Concentration Unit**

Setting concentration unit for samples. The default concentration units have: ng/ul, ng/ml, ug/ul, ug/ml, mg/l, ppb, ppm, and mol/l. If there is not concentration unit that you need, you can input a new concentration unit manually.

- **Zero Interception**

Zero Interception is to add a standard point of both zero values for concentration and absorption before the first standard. The zero point would be taken into fitting calculation.

- **Curve Evaluation**

Curve Evaluation is to evaluate curve quality (that is, correlation coefficient). The evaluation result will be displayed in the Preferences Window of Quantitative Window. If you need to evaluate calibration curve, you can set Curve Evaluation Option as R2, Correlation Coefficient. Then click on Setting Button to popup the Curve Evaluation Setting Window, as shown in Figure 6-5.

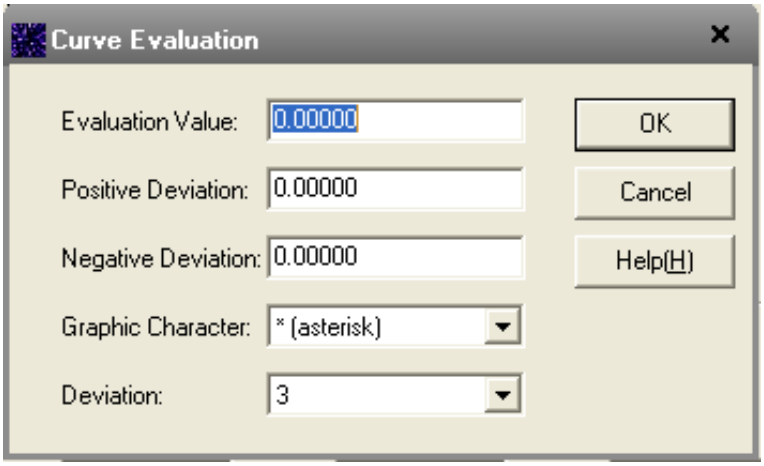
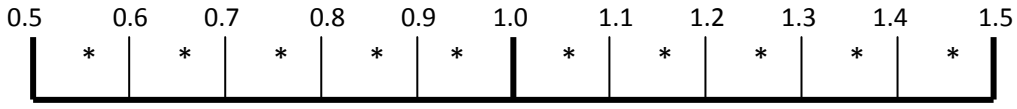


Figure 6-5 Calibration Curve Evaluation Setting

In the setting window, you can set Evaluation Value and Positive Deviation as 1.0 and 0.0. As the correlation of calibration curve is expressed with percentage, so it should take 100% as evaluation value. Then the correlation will never be larger than 100%, and Positive Deviation will never be generated. So Positive Deviation is set as 0.0. Negative Deviation means the negative deviation, which is allowed to generate on the basic of evaluation value. For example, you can set Negative Deviation as 0.001, which means that your evaluation lower limit is 1.0-0.001=0.999. Your evaluation range is 1.0--0.999. The values out of this range are deemed as unqualified data.

Graphic Character is used for display of evaluation result. Deviation Number means number of displayed characters. For example, you set evaluation value as 1.0, positive deviation as 1.5, negative deviation as 0.5, graphic character as "*", and deviation number as 5. Then if you evaluate the value of 0.5,

you'll get one of "*", while if you evaluate the value of 1.0, you'll get five of "*". It is because that you set deviation number as 5, which indicates that the difference of positive deviation and evaluation value, and the difference of negative deviation and evaluation value, are averagely divided into 5 sections and each section is expressed with one of "*". Shown as the bellow.



The evaluation procedure is as follows: first to judge whether the evaluated value, comparing to evaluation value, is positive deviation, or negative deviation. That is, the one larger than evaluation value is positive deviation, while the one smaller than evaluation value is negative deviation. After confirming it is positive, or negative, it starts evaluation. The evaluation process is actually to see how close the evaluated value is apart from evaluation value. More closer, more "*" it gets. For example, combining with the above figure, the procedure of evaluating the value of 0.85 is: as judging that 0.85 is positive deviation, so taking 0.5--1.0 as evaluation range. First, seeing if 0.85 is between 0.5 and 0.6. If not, adding one of "*". Then seeing if it is between 0.6 and 0.7. If not, adding another one of "*". Continue the procedure in the same. When the judgment goes to the range of 0.8 to 0.9, it ends, because 0.85 is between 0.8 and 0.9. Thus, there are totally 4 of "*". Of cause, the whole procedure is accomplished by System automatically, without any exterior calculation. You need not care the detail. It is well if you understand the basic function of curve evaluation, that is, more "*", more better it proves the curve correlation is. Of cause, these "*" will be displayed in the Preferences Window of Quantitative Window and can be printed out with calibration curve.

- **Calibration Method**

Calibration method is divided into two types: Concentration Method and Coefficient Method. Concentration Method requires you to input concentrations of standard solutions. After absorptions of standards are measured, the measured data, combining with input concentrations, are fitted to compute factors of equation and correlation. Coefficient Method would require you to input directly the factors of equation, without measurement of standards. For example, if you set equation order as second, and select coefficient method, then you need to input three factors of K0, K1, and K2. K0 expresses constant, and K1 expresses the factor of first order, and K2 expresses the factor of second order.

Quality Control Tab

The usage of Quality Control Tab here is same as that of Photometric Measurement. Please refer to 4.2 Setting of Photometric measurement parameters.

Simple Calibration Tab

The option facilitates greatly calculation on measured results. By this function, you can work out some professional data and analytic results. Its setting window is shown as Figure 6-6. You can check the option box of "Enable Simple Calculation" to open the simple calculation function.

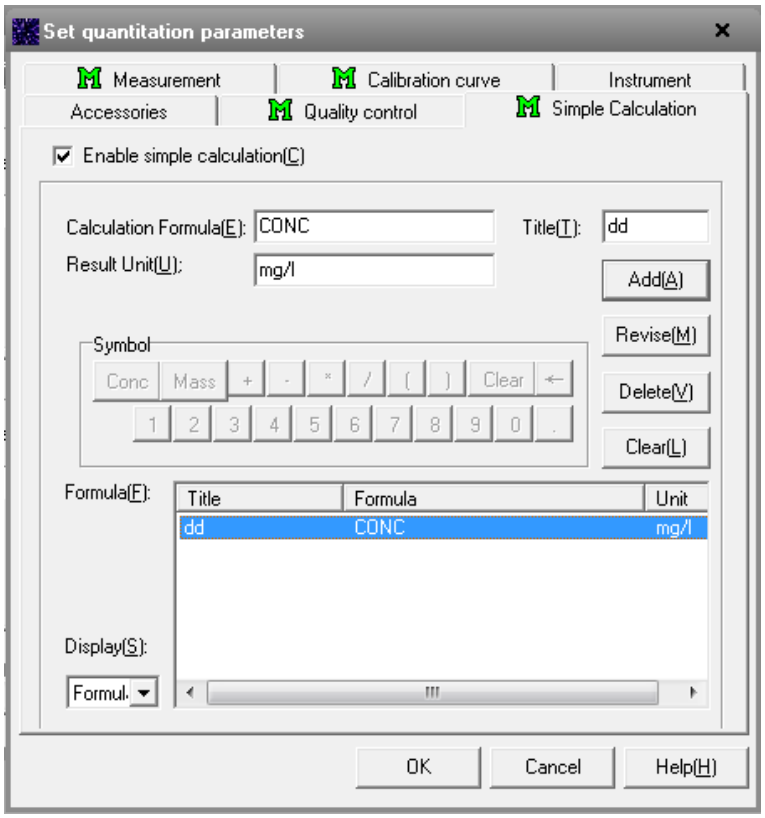


Figure 6-6 Simple Calculation Setting

- **Calculation formula**

In "Calculation formula" edit box, you can input required formula and unit for unknown sample's concentration. In formula, Conc. represents concentration of unknown sample. For example, the result you got take mg/l as unit, but the unit you need is g/l, then you should input Conc/1000 in the "Calculation formula" edit box, and g/l in the "Result unit" edit box. Then press Add Button. The default title of calculation formula is "Result 1", "Result2"… If you want to specify a title, you can input it, at same time when you input calculation formula, in Title Edit Box. If you need to amend a formula, select it correspondingly in formula list, and revise it in formula edit box. Press Revise Button to make it effective. If you want to delete or clear the content of formula list, press Delete Button or Clear Button. Number of Formula can be up to 10.

If the input type is "Volume", also you can add formula about "mass".

- **Characters**

The role of Characters here is for input imitating as keyboard. Press a character button so as to input the corresponding character equivalently.

- **Display**

The role of Display option here is for selection of different display modes for calculation formula. Pull-down box offers two choices, formula and title. Formula here means calculation formula will be displayed in result table as title. Title here means the default title or user set title will be displayed.

6.3 Quantitative

The Quantitative Measurement Window is divided into 4 parts: Standards Table, Unknown Samples Table, Calibration Curve, and Preferences. Shown as Figure 6-7.

Figure 6-7 Quantitative Window

- **Measurement Table**

Standards Table or Samples Table is used to display measuring results of standards or samples. Generally, the table holds 8 rows: Number, ID, Type, Concentration, Absorption, and Absorptions at Wavelength, Standard Deviation, and RSD. If you choose the double wavelength method, or the three wavelength method, there will be displayed other wavelength points in the table.

- **Number:** Indicating the number of standards or samples.
- **ID:** The identifier for standards or samples, which can be edited.
- **Type:** For standards, the type is Standard. For unknown samples, the type is Unknown.
- **Concentration:** The concentration values of standards or samples.
- **Absorption:** The final absorption values of standards or samples. The calculation formula is shown as Table 6-1.

Table 6-1 Quantitative Calculation Formula

Single Wavelength Method:	$Abs = A_1$
Double Wavelength Method:	$Abs = A_1 - A_2$
Double Wavelength Coefficient Method:	$Abs = A_1 - A_2 \bullet K$
Three Wavelength Method:	$Abs = A_1 - \frac{(W_1 - W_2) \times (A_2 - A_3)}{W_2 - W_3} - A_3$

In the table, “Abs” expresses the final absorption, “W_1” expresses first measuring wavelength, also called main wavelength. “W_2” is second measuring wavelength, also called baseline wavelength1. “W_3” is third measuring wavelength, also called baseline wavelength2. “A_1” is the absorption of main wavelength. “A_2” is the absorption of baseline wavelength1. “A_3” is the absorption of baseline wavelength2. “K” expresses the coefficient of Double Wavelength Coefficient Method.

- **Absorption at wavelength:** The absorption of standards or samples at corresponding wavelength points.
- **Standard Deviation:** The Standard Deviation of repeat measurement.
- **RSD:** The RSD of repeat measurement. If repeat measurement is not checked, Standard Deviation and RSD are both zero.

When performing standards measurement or unknown samples measurement, click on corresponding measurement table. At this time, the top of table displays Activated, which shows the table is enabled and all measurements are operated in the table.

Calibration Curve

Calibration Curve is used for graphic display of current calibration curve. If you do not perform standards measurement, there is no graph displayed.

Preferences

Preference is used for display of current quantitative settings, including curve equation, coefficients, and etc.

Measurement

If you set calibration method as concentration method in the quantitative settings, before measurement, you should have to input standards concentrations in the standards measurement table, and only then you are able to start measurement. There are two ways to input concentrations. First one: Double click on the blank box of ID Row. Input an ID and press Enter Key. System would add a new standard column in the table automatically. Then click on the concentration box of the standard and input its concentration. Second one: Not to input any concentration, but click directly at Start Button. At this time, System will prompt you input a concentration, as shown in Figure 6-8.

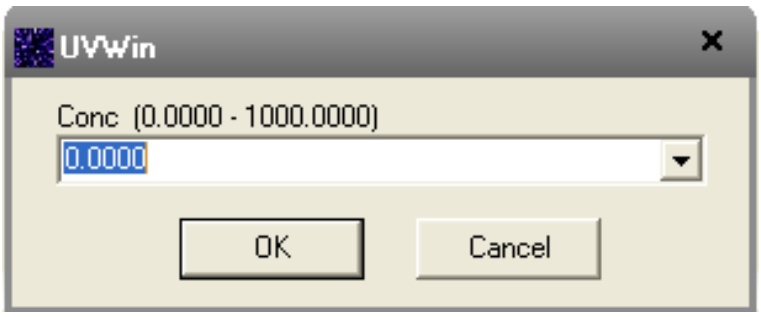


Figure 6-8 System prompting input of concentration

After input of concentration, click on OK Button. System will add a standard automatically, whose concentration is what you input, and then start measurement of the standard.

If you set calibration method as coefficient method in the quantitative settings, you need not to measure standards. You can start measurement of unknown samples directly.

6.4 Saving measurement files

The data of quantitative are sure to be saved to disk. Select Save Submenu under File Menu, or click on  Button to open the File Save Window. In the window, input the filename you want to save to and click on Save Button. If you want to add notes to the measurement file, click on Note Button to input comments and press OK Button.

6.5 Chapter Summary

This chapter mainly introduces you the usage of quantitative measurement. For UV-VIS Spectrophotometers, the quantitative is comparatively important function. Correct application of measurement methods in quantitative would be decisive of your analytic work.

Chapter 7 Kinetics

Key points

In this chapter, we'll tell of the following contents: What's kinetics? How to setup parameters for kinetics? How to perform kinetics? How to save?

It includes:

- Brief introduction of Kinetics
- Setting of Kinetics parameters
- Kinetics
- Saving time course curves to files
- Chapter Summary

7.1 Brief introduction of Kinetics

Kinetics is a measurement of continuous reading at a certain time interval and graphic display of measured data. The method is mainly used for observation of sample change trend with time.

7.2 Setting of Kinetics parameters

To enable the Kinetics Window, you should click on the Kinetics tab in Work Space. Select Parameters settings submenu under Measure Menu, or click on  button, to activate the Kinetics setting dialog box, as shown in Figure 7-1.

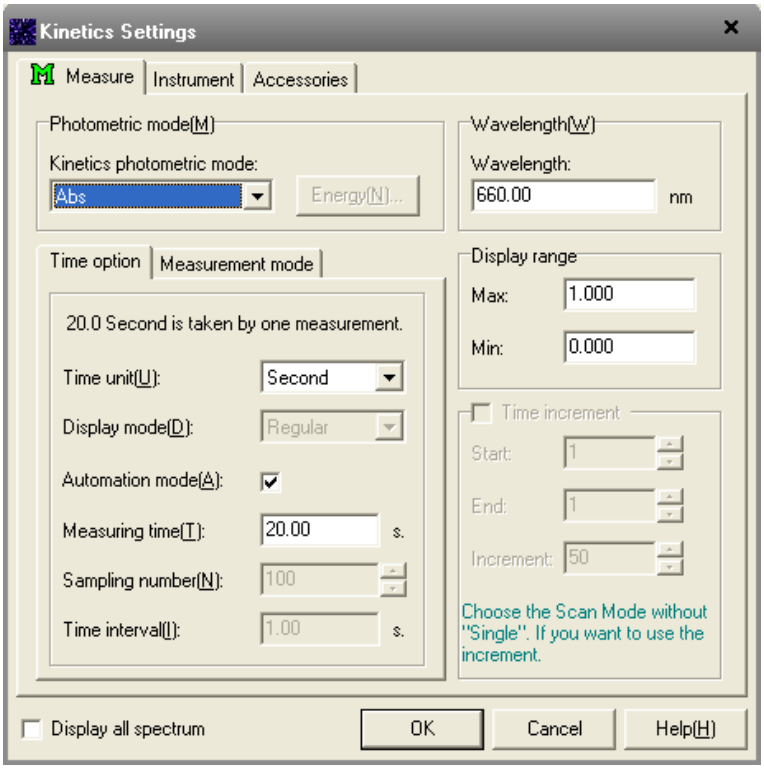


Figure 7-1 Kinetics Parameters Setting

In this dialog box, there are 3 tabs: Measurement, Instrument, and Accessories. Among them, Instrument Tab and Accessories Tab are as same as those of Instrument Performance and Accessories Setting. Please refer to 3.1 Instrument Performance and 3.7 Accessories Setting for the details. The following will focus on Kinetics parameters setting.

- **Photometric Mode of Kinetics**

Setting Photometric Mode of Kinetics. You can specify the Photometric mode as one of Abs. (Absorption), T% (Transmittance), Es (Sample Energy), Er (Reference Energy), and R% (Reflectance). System will perform measurement according to your selection of photometric mode.

- **Wavelengths**

Setting wavelength points at which Kinetics runs. As Kinetics takes sample readings continuously at determinate wavelength points, so you should specify a wavelength for data reading.

- **Display Range**

Setting the Y-axis range for Kinetics. You can set the display range according to the values created by samples.

- **Time Option**

Time Option allows you to specify for kinetics the parameters of measuring time, sampling number, and time interval.

- **Time Unit**

Setting the minimum time unit for Kinetics. The optional time units are: Minute and Second. For example, you specify the time interval as 1, the time unit as minute. It indicates that reading will be taken

one times per minute. If the time unit is set as second, it means that reading will be taken one times per second.

- **Display Mode**

If you specify the time unit as minute, you are able to select the display mode. That is, during measurement procedure, if you select Regular, System will display time in regular way of number, like 50, 120, 300, and etc. If you select Clock, System will display time in clock way, like 00:00:50, 00:01:00, 00:05:00, and etc.

- **Automation Mode**

Automation Mode lets System select for you an appropriate set of the sampling number and the time interval. What you need to specify is only Measuring Time. If you do not check the Automation Mode, you need to specify the sampling number and the time interval either.

- **Measuring Time**

Measuring Time is the total time over which kinetics runs. The option is only usable when the Automation Mode is specified.

- **Sampling Number**

Sampling Number is the total number of readings, which Kinetics will take. The sampling number multiplying by the time interval is equal to the total time over which Kinetics will run.

- **Time Interval**

Setting the time interval for readings. It is also called as Sampling Frequency.

Measurement Mode

In Kinetics, you are also able to perform repeat measurement. You can select the Measurement Mode Tab to set parameters for repeat measurement. Shown as in Figure 7-2.

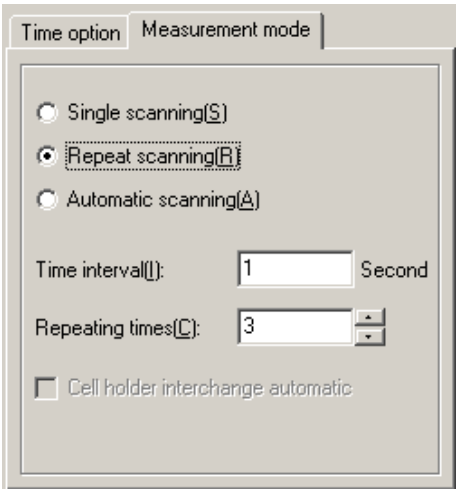


Figure 7-2 Setting Measurement Mode

- **Single Measure**

No repeat. That is, the Kinetics run is performed just once.

- **Repeat Measure**

Here is Able to set Repeat Times and Time Interval. System would perform repeat measurements according to your settings of Repeat Times, and each run is separated with a determinate time, which is decided by Time Interval. If your instrument equipped with an auto multi-cell holder, you can also select Cell Holder Interchange Automatic. In this case, System will switch automatically to next cell and then run

kinetics before each measure.

- **Automatic Measure**

If your instrument is equipped with an auto multi-cell holder, you can select Automatic Measure. The role of automatic measure is performing kinetics on each cell of samples. That is, if you install an auto 8-cell holder, System will, after you commence kinetics, measure 8 time curves with automatic interchange cell holder during measurement.

- **Time Increment**

If you select repeat measure or automatic measure, you can also set another option of Time Increment. The role of the time Increment is adding a time increment to the total measure time.

- **Start:** It expresses the repeat times at which the time increment starts to be effective. That is, the time increment starts to be added at which times that the repeat measurements have been performed.
- **End:** It has the same meaning as that of Start. End expresses the repeat times at which the time increment is to be ineffective.
- **Increment:** It expresses the time being added each time. The time is the percentage relative to the last measure time.

7.3 Kinetics

If you are going to run kinetics, you can select Start Submenu under Measure Menu, or click on Start Button to commence the measurement. During the measure procedure, System would display results graphically, as shown in Figure 7-3.

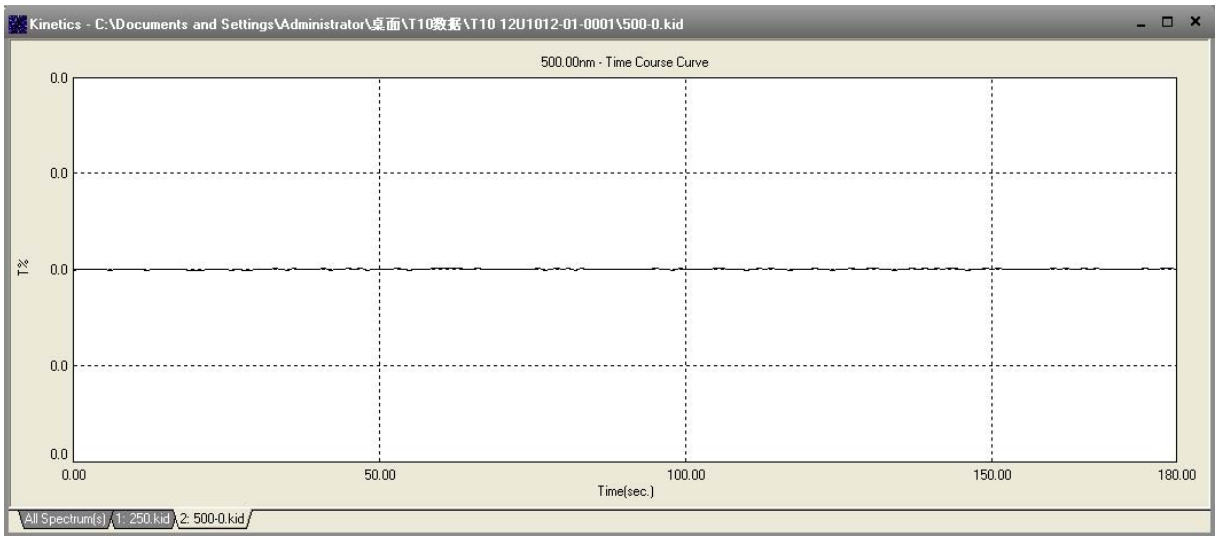


Figure 7-3 Kinetics Window

7.4 Saving time course curves to files

The time curves of Kinetics can be saved as well. Selecting Save Submenu under File Menu, or click on Button to open File Save Window. You can input the filename you want to save to and press Save

button to save it.

7.5 Chapter Summary

This chapter mainly gives you introduction of some functions of Kinetics. Kinetics is a good method to observe the samples changes with time. Reasonable application of Kinetics would help your work much. Furthermore, you can also realize various analysis by combining Kinetics and Graphic Process, which is going to be introduced in next chapter.

Chapter 8 Spectral bandwidth scanning

Key points

In this chapter, we will discuss the following content mainly: what's called spectral bandwidth scanning, how to set parameters for spectral bandwidth scanning, how to do spectral bandwidth scanning, how to find the best spectral bandwidth and how to save spectral bandwidth files.

Detailed content includes:

- Brief introduction of spectral bandwidth scanning
- Spectral bandwidth scanning parameters setting
- Spectral bandwidth scanning
- Find the best spectral bandwidth
- Save spectral bandwidth files
- Chapter summary

8.1 Brief introduction of spectral bandwidth scanning

When analyzing samples by the spectrophotometer, the accuracy of result is mainly affect by the spectral bandwidth value, choosing the best spectral bandwidth is one of the main factors to obtain the real absorbance and transmittance. The standard of best spectral bandwidth is to get the maximum absorbance at where, or the minimum transmittance. Spectral bandwidth scanning is a measure method that to do the spectrum scanning continuously according to some spectral bandwidth interval, and display these spectrums together, and find the spectral bandwidth value with maximum absorbance and minimum transmittance.

8.2 Spectral bandwidth scanning parameters setting

If the spectral bandwidth scanning is needed, firstly set the scanning parameters. Click on the Spectral bandwidth scanning tab in Work Space. Choose [Parameters] from [Measurement], or click  button to open the spectral bandwidth scanning parameters setting, as figure 8-1 shown.

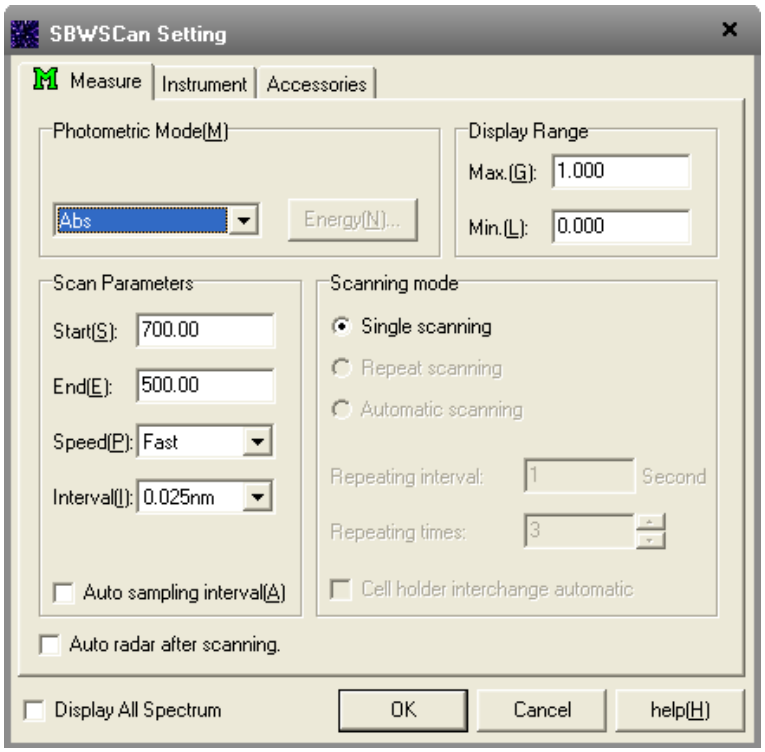


Figure 8-1 Bandwidth scanning parameters setting

In this dialog box, there are 3 tabs: Measurement, Instrument, and Accessories. Among them, Instrument Tab and Accessories Tab are as same as those of Instrument Performance and Accessories Setting. Please refer to 3.1 Instrument Performance and 3.7 Accessories Setting for the details. The following will focus on Spectral bandwidth scanning parameters setting.

- **Measurement tab**

  - **Photometric mode**

  Set photometric mode of spectral bandwidth scanning. You can specify the Photometric mode as one of Abs. (Absorption), T% (Transmittance. System will perform measurement according to your selection of photometric mode.

  - **Display range**

  Setting the Y-axis range for spectral bandwidth scanning. You can input the [Max.] and [Min.] value according to the values created by samples.

  - **Scan parameters**

  Setting scanning parameters of wavelength range, wavelength interval, speed, and etc. The setting is the same as spectrum scan parameters, please refer to 5.2 Spectrum scan parameters setting for more information.

  - **Scanning Mode**

  Only [Single Scanning] can be chose.

- **Accessories tab**

  Please choose fix cell holder.

8.3 Spectral bandwidth scanning

Choose [Start] from [Measurement] menu, or click Start button to start scan. In the procedure of scanning, System will draw dynamically scanning data and wavelength on the Spectral bandwidth Scan Window in graphic mode. As figure 8-2 shown.

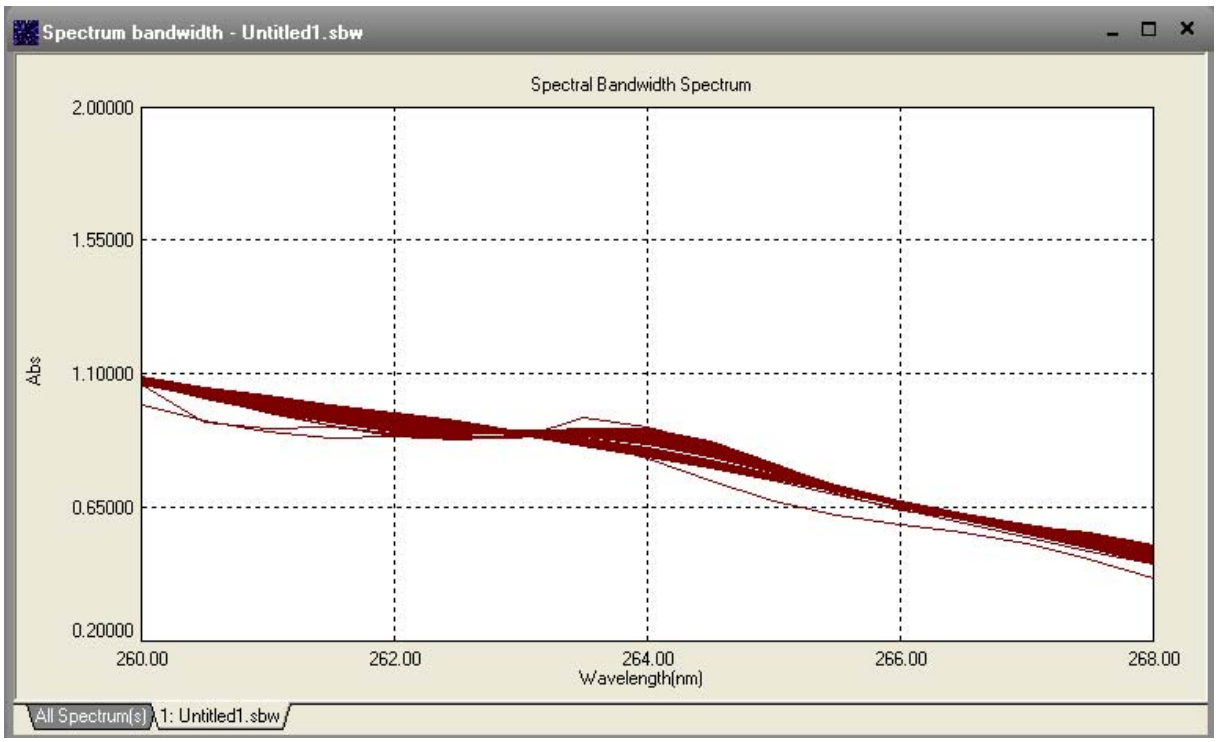


Figure 8-2 Spectral bandwidth scanning spectrum

8.4 Choose the best spectral bandwidth

The best spectral bandwidth is at where the absorbance is the maximum or transmittance is the minimum when measure the specified sample at given wavelength. Shown as figure 8-3, 1.5nm is the best spectral bandwidth, because the absorbance is as high as 1.093 at the located wavelength.

Choose [Read Spectrum] mode, locate the lines at that wavelength that you want to check the Abs, it will show you the correspondence spectral bandwidth and Abs value in checking list form. If the list is too long to display all of them, you can drag the mouse to change the position in the list area to check all the information. Shown as figure 8-3.

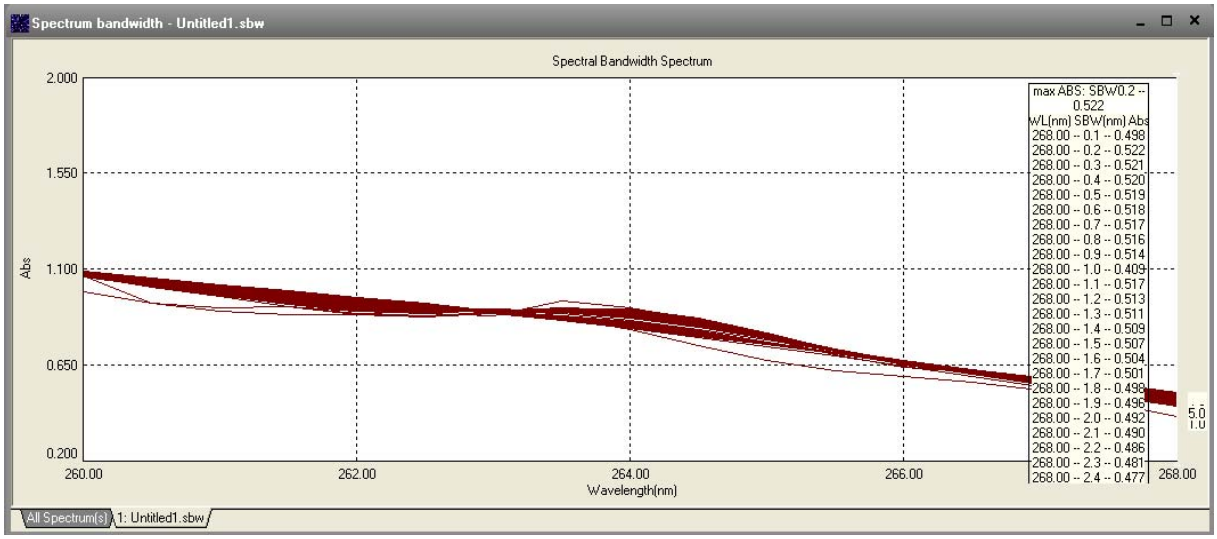


Figure 8-3 Find the best spectral bandwidth

8.5 Saving spectral bandwidth scanning files

The Spectral bandwidth scanning files can be saved as well. Selecting Save Submenu under File Menu, or click on Button to open File Save Window. You can input the filename you want to save to and press Save button to save it.

8.6 Application

There is a character absorbance peak at 264nm of benzylpenicillin potassium, so the analyzer is care about the absorbance at this wavelength when measuring it. Here is an example about how to use spectral bandwidth scanning when analyzing benzylpenicillin potassium.

Instrument: T92+ Double beam UV Spectrophotometer,

Sample: Benzylpenicillin potassium

Spectral bandwidth range: 0.1nm-5nm take 0.1nm as interval

Here is the operation procedure:

① Power on the instrument

Power on the computer firstly, confirm there is nothing block the light in the sample compartment, power on the T92+, start the UVWin6 control software, after initialization it will come to the main interface of software, warm up 60 minutes.

② Reagent preparation

Weight 0.0470g benzylpenicillin potassium and dissolved into 25mL pure water, then the concentration is 1.88mg/mL.

③ Parameters setting

Choose “Spectral Bandwidth scanning” mode, enter into parameters setting page, set as following:

Figure 8-1

Measure	
Photometric mode	Abs
Display range	0.0~1.0
Wavelength range	260nm~270nm
Scanning interval	0.1nm
Scanning speed	Slow
Instrument	
Spectral bandwidth	0.1nm~5.0nm
Bandwidth interval	0.1nm

④ Sample measurement

Put the sample into Sample cell holder, and the blank into Reference cell holder. Press “Start” button to scan. Now the measurement interface will prompt scanning and show the current process, also the spectrum will be shown. Please wait until the scanning finish automatically with patient, it will take long time. When scanning it’s not allowed to do the other operation except stop scanning, press “Stop” button if needed, the spectrum that got before stop will be saved.

⑤ Result analysis

Choose [Read Screen] to locate at 264nm, and the Abs value of different bandwidth will be got, and shown as list from 0.1nm~5.0nm. (Shown as figure 8-4, the Abs at 0.5nm is 0.8690 which is the maximum, so 0.5nm is the best spectral bandwidth for sample analysis).

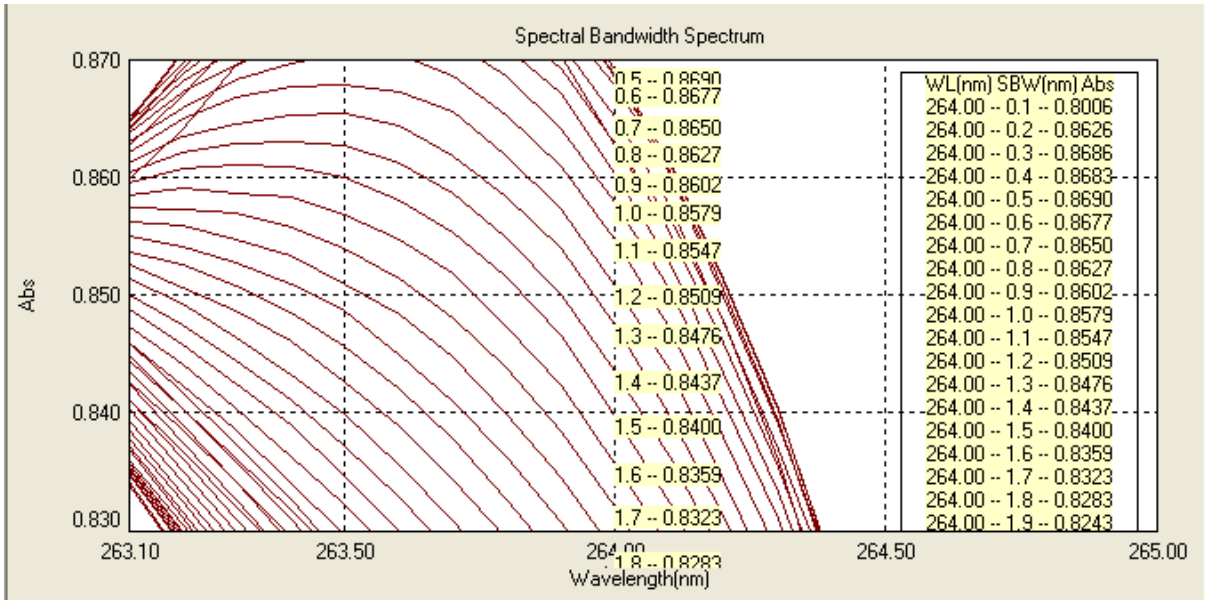


Figure 8-4 Spectral Bandwidth scanning spectrum of Benzylpenicillin potassium

⑥ Result output

The spectrum can be saved as UVWin special format file, or printed out.

8.7 Chapter Summary

This chapter mainly discusses the spectral bandwidth scanning function of UVWin6. It’s the good

method to find the best spectral bandwidth for different sample, save a lot of time for fast degradation speed sample especially.

Chapter 9 DNA Protein Determination

Key points

In this chapter, we will discuss the following content mainly: the use of DNA protein determination function, how to set measure parameters, how to measure and how to process the measured result.

Detailed content includes:

- The use of DNA protein determination function
- Start DNA protein determination function
- Set measure parameters
- Process measurement result
- Chapter Summary

9.1 The use of DNA protein determination function

Introduction: As the internal structure of DNA and the secret of genetic mechanism are gradually exposed, especially when people have learnt that genetic code is transcribed and expressed by RNA, biologists are no longer satisfied with exploring and suggesting the secrets of biological inheritance, but they are trying to intervene the generic characters of organism at the molecule level. If a generic code segment from the DNA of an organism is connected to the DNA sequence of another kind of organism, and after reorganization of DNA, a new generic material will be designed according to human desire, and even a new organism type will be created. This process is totally different with traditional method of cultivating organisms to reproduce offspring. According to human demand, “rebuilding” the “gene” of one organism with the “gene” of another to create a new combination of genes and create a new organism, the approach is just like engineering design in technological science. Such a biological technology of creating new organism from reassembling genes according to human desire is called “gene engineering”, or “genetic engineering”. As an important branch of biological engineering, gene engineering, together with cell engineering, enzyme engineering, protein engineering and Microbiological engineering, forms biological engineering.

From the above introduction, it can be easily seen that gene analysis is a complex yet significant job. Gene engineering plays an important role to all human kind. Study on human genes has become an important scientific research subject for developed countries. In gene analysis, analysis tools play an important role. Only with good analysis tools, can one accomplish the analysis successfully. Therefore, in software UVWin6, DNA/protein determination function is added. Users can measure the density of DNA/protein, and different analysis methods can be set to satisfy different demands.

9.2 Start DNA protein determination function

If you want to analyze DNA protein, you can choose “DNA protein analysis” submenu under “application” menu, then the system will pop up a window for DNA protein determination. As shown in figure 9-1, the window is divided into two parts. The central part is the display window, showing the

current measured result. The bottom part is a control panel, where you can start functions by clicking corresponding buttons.

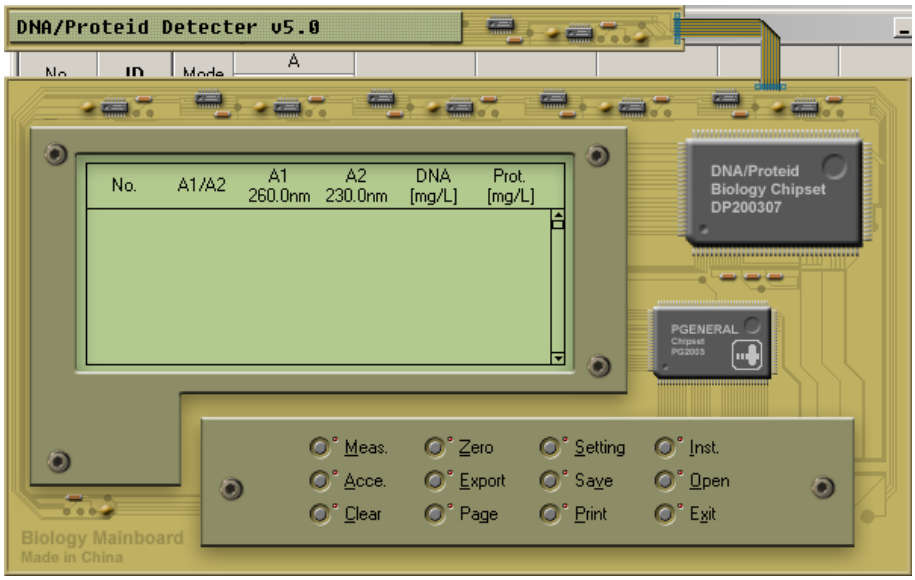


Figure 9-1 DNA protein determination window

9.3 Set measure parameters

In buttons on the control panel, there is a button named “setting”. You can open parameter setting window as shown in figure 9-2 by clicking this button.

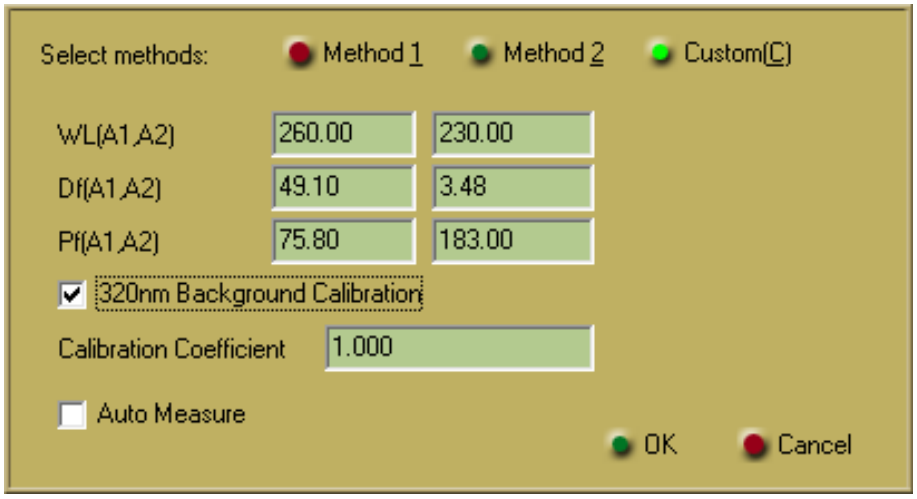


Figure 9-2 DNA protein parameter setting

- **WL (A1, A2):** stands for the two measured wavelength of DNA protein.
- **Df (A1, A2):** stands for two coefficients of DNA.
- **Pf (A1, A2):** stands for two coefficients of protein.

If you want to have 320nm background correction, you can click “320nm background correction” check box, and input relevant correction coefficient.

DNA protein can be calculated in the following way:

- **Without 320nm correction**

Density of DNA=Df1×A1－Df2×A2

Density of protein=Pf2×A2－Pf1×A1

- **With 320nm correction**

(A1=A1－A320, A2=A2－A320)

Density of DNA=Df1×A1－Df2×A2

Density of protein=Pf2×A2－Pf1×A1

9.4 Process measurement result

The measurement of DNA protein is quite simple. You simply put samples into the sample pool, then click “measure” button on the control panel, and the measurement is finished. If you want to print the measurement result, click “print” button on the control panel. If you want to export measurement result, you can click “export” button.

9.5 Chapter Summary

This chapter mainly discusses the determination method of DNA protein. You can set parameters according to specific requirements.

Chapter 10 Pesticide Residual Determination

Key points

In this chapter, we'll tell of the following contents: pesticide residual introduction, file operation, parameters setting, how to do pesticide residual analysis and report printing.

It includes:

- Use of Pesticide Residual determination
- Start Pesticide Residual determination
- File operation
- Pesticide measurement
- Printing report
- Chapter Summary

10.1 Use of Pesticide Residual determination

It's forbidden to use the pesticide that contains organic phosphor and carbamate for vegetable crop. The Pesticide Residual determination function of UVWin6 can detect organic phosphor and carbamate residual of vegetable very quickly, in order to control the vegetable with high pesticide residual coming into the market, to ensure the safety of our food.

This method is according to the inhibition ratio of enzyme to determine the organic phosphor and carbamate in vegetable which is based on the National Standard. The principle is: organic phosphor and carbamate pesticide will inhibit the normal function of cholinesterase, there is some positive relativity between inhibition ratio and pesticide concentration. Normally enzyme can catalyze the hydrolyzation of nerve conduction metabolites, and the hydrolysate will react with developer and produce yellow color matter. So the UV spectrometer can be used to monitor the changing value of Abs according to the time, and calculate inhibition ratio. Then the inhibition ratio can be used to determine if there is organic phosphor or carbamate pesticide exists or not. The detection limit of this method is: methamidophos 0.8mg/L, dipterex 0.25mg/L, carbofuran 0.002mg/L.

10.2 Start Pesticide Residual determination

Start UVWin6 after connecting with instrument, choose "Pesticide Residual Determination V1.0" from "Application" to enter into the main interface shown as figure 10-1. On the left is the function button panel; on the right is sample information list. For the function button panel there are "File", "Measurement" and "Print" three area. Next is the introduction of these three function.

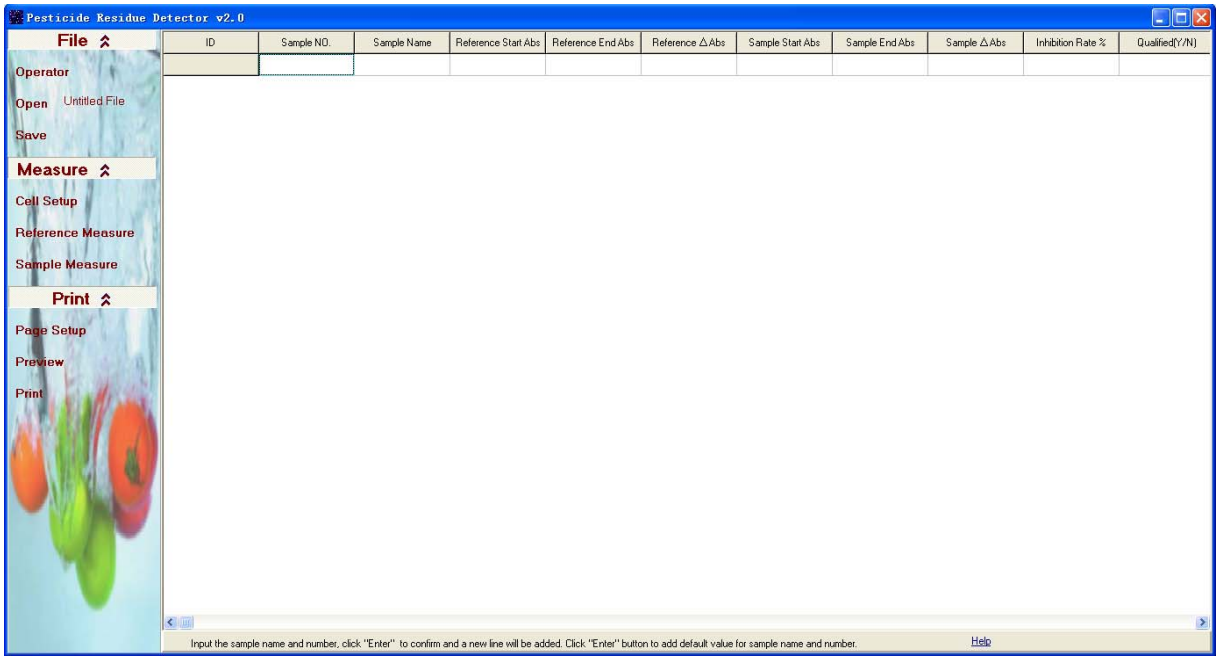


Figure 10-1 Pesticide Residual determination main interface

10.3 File Operation

- **Operator**

Click this button, then input the name of operator in the textbox on the right as one of the content of current file.

- **Open**

Open the pesticide residual determination result file (end as ".pmd"). If there is some sample information in the current list, there will be a prompting information said "Confirm to delete the current sample", and it will be overwrite if click OK.

- **Save**

The data will be saved as .pmd file into the hard disk.

10.4 Pesticide measurement

- **Sample holder settings**

There will be a number drop-down list on the right, choose the number of multi-cell holder as your requirement (5-cell holder, 8-cell holder, fixed cell holder).

Add sample before measurement. Input the sample name and NO. in the sample list directly, and click "Enter" to finish input, and the sample ID is generated automatically according to the cell holder number. After adding a new sample, click the sample name or number of next line to generate default value for the next sample, click "Enter" to confirm this value or input a new value. Choose the sample line before measurement to make the sample information display in red.

- **Reference solution measurement**

Put the reference solution into the cell holder which is prepared according to the pesticide residual determination operation procedure, put into NO.1 for multi cell holder. Then press "Measure Reference"

button to start measurement, there will be a Timer display on the right of button. Stop measurement to press “Measure Reference” button. After 3 minutes, the Timer is stop and measurement is finished. If the difference of Abs between start and end bigger than 0.3, that’s meaning measurement is passed, the result will be displayed in the list as reference value. If smaller that’s meaning it’s failed, also warning information will be prompt, please re-prepare the reference sample.

- **Sample measurement**

  Take the reference solution out, and put the sample that prepared according to pesticide residual determination operation procedure into cell holder in turn, press “Measure Sample” button to start measurement, and after 3 minutes the result will be displayed in the list which is the same as reference measurement.

10.5 Print report

- **Page setting**

  Adjust the layout of print page.
- **Preview**

  Preview of the report.
- **Print**

  Print out the report.

10.6 Chapter Summary

This chapter mainly gives you introduction of Pesticide Residual determination, set the parameters as your requirement.

Chapter 11 Graphic Process

Key points

In this chapter, we'll tell of the following contents: Purpose of graphic process. How to perform graphic process on spectrum? How to perform simple calculations? How to perform complicated calculations?

It includes:

- Use of graphic process
- Analysis of spectra
- Creating of 3D spectrum
- Display settings
- Chapter Summary

11.1 Use of graphic process

With the uninterrupted development of computer technologies, it has melted into many fields. Manufacturers can write more professional processing software with the aid of PC high operation speed to make analysis more convenient, more timesaving. With the dozen's development of UV-VIS spectrophotometers, the early instruments performed processing of measured spectra by means of electric devices and plotting equipments. Today, with fast-developed computer technologies, we can do any graphic process with PC's powerful abilities.

11.2 Analysis of spectra

11.2.1 Display settings

Selecting Setting Graphic Parameters Submenu under Graph Menu to open display settings window, as shown in Figure 11-1.

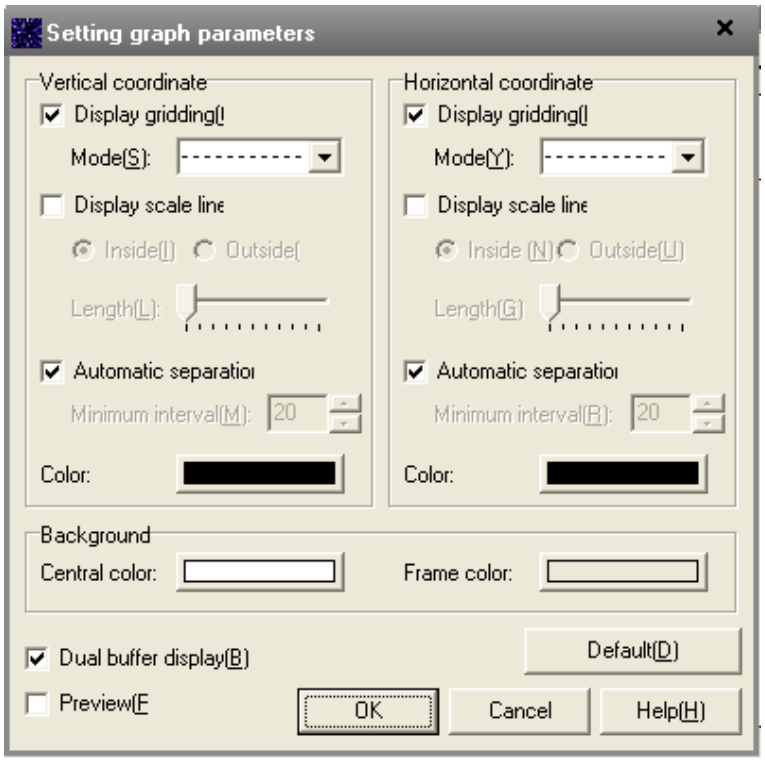


Figure 11-1 Display Settings Window

- **Display Gridding**

Setting display or hiding of gridding line. If you check the Display Gridding, you are able to specify the type of grading line.

- **Display Scale Line**

Setting display or hiding of scale lines of coordinate axis. If you check the Display Scale Line, you are able to specify whether the scale lines are drawn inside or outside the coordinates frame. The length of scale lines can also be set.

- **Automatic Separation**

Setting the way separating grading lines. If you check the Automatic Separation, System will distribute the grading lines automatically. If you want to specify a separation value, you can uncheck the Automatic Separation and set the Minimum Interval. The Minimum Interval is input as percentage, that is, the percent of each gridding vs the whole coordinate axis. If you set the Minimum Interval as 10%, System will draw 9 gridding lines to divide the whole coordinate axis into 10 sections. If you set the Minimum Interval as 20%, System will draw 4 gridding lines to separate the whole coordinate axis into 5 sections.

- **Color**

Setting the color of gridding lines and scale lines.

- **Central Color**

Setting the color of central graph.

- **Frame Color**

Setting the color of graph frame section, that is, displayed coordinate values and its title.

- **Preview**

If you want to preview what it is like while you is changing settings, you can check Preview. System will offer live preview on the graph.

- **Default**

Restore the default settings.

11.2.2 General Observation

- **Zoom Window**

Spectrum chart can be zoomed at will. You can select the Zoom Window submenu under the Graph menu, or click on Button, System will show it as . At this time, you can move mouse to any position on the graph and press the mouse left key. Hold it and drag the mouse to draw a rectangle of zoom area. Release the mouse to zoom in. If reverting is required, you can select the Delete Zoom submenu, or click on Button. In addition, you can also select the Coordinates Range submenu under the Graph menu, or click on Button to open the Coordinates Range Window, as shown in Figure 11-2. In this window, you can set the coordinates range required and press OK Button to realize zoom effect in the same.

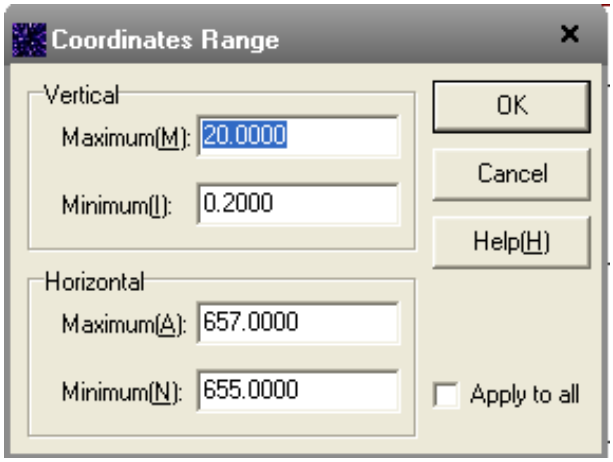


Figure 11-2 Setting Coordinates Range

- **Measure Distance**

Select the Measure Distance submenu under the Graph menu, or click on Button. The system cursor will show as . At this time, you can click the mouse left key at any position (P0) on the graph. Then move the mouse to another position (P1) and click the mouse left key again. System will give you automatically the calculation result of the line distance, the vertical distance, and the horizontal distance of the two points of P0 and P1, as shown in Figure 11-3.

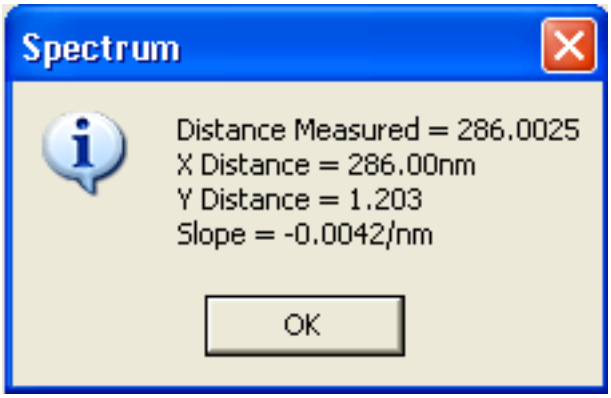


Figure 11-3 Distance Measuring Result

- **Fit in Window**

Select the Fit in Window submenu under the Graph menu, or click on Button. System will automatically regulate the coordinate range of spectrum graph to bring all spectra displayed normally.

- **Peak-Picking**

Peak-Picking detects all peaks and valleys on a spectrum and labels those peaks and valleys accordant with picking conditions. Opening a scan spectrum and selecting the Peak-Picking submenu under the Graph menu, or clicking on the Button, System will automatically detect peaks and valleys on the spectra and show the results in a table, as shown in Figure 11-4.

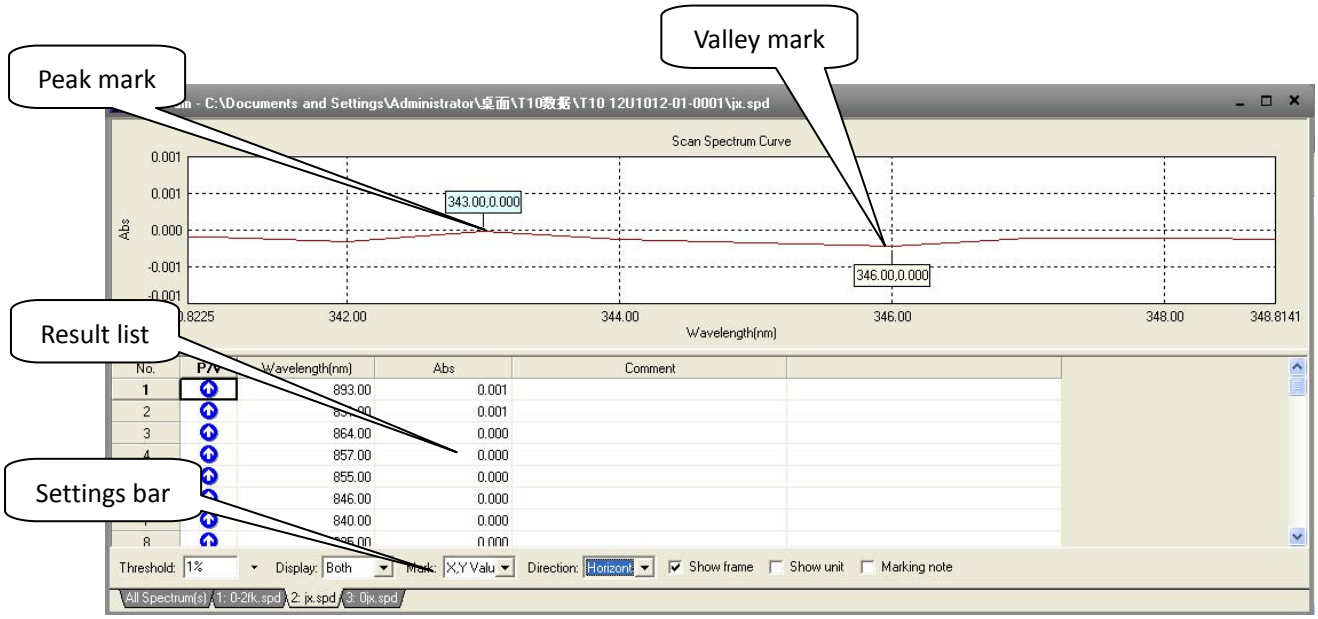


Figure 11-4 Peak-Picking

After peak picking, spectrum window is divided into three parts: Spectrum window, Result list, and Settings bar. In the Spectrum window, it shows marks of each picked peak and valley. The result list displays the wavelengths, measured values and comments of each picked peak and valley. You can improve the effect of peak-picking through amending parameters in settings bar, as shown in Figure 11-5.

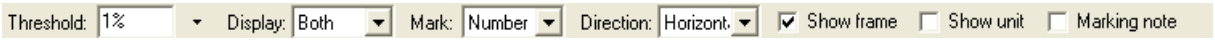


Figure 11-5 Settings bar of Peak-Picking

Threshold: Setting minimum percent limit of height of picked peaks and valleys, which is the percentage relative to the difference between the maximum value and the minimum value of a spectrum. Those peaks and valleys of height larger than the percentage are picked out. You can input directly a threshold in the Threshold Edit Box and press Return, or click on the ▼ button right to the edit box. In the poll-down menu, select a relevant threshold.

Display: Setting display only of peaks or valleys, or both of them.

Marks: Setting mark type of picked peaks and valleys as value or number. The mark value expresses that of peaks or valleys. The number is serial number of peaks or valleys.

Direction: Setting marking direction. The optional direction is Vertical or Horizontal.

Frame: Setting whether marks have a frame or not.

Marking Note: Using the contents in the Comment Column to replace that of marks of peaks and valleys. You can input the comment message for each of peaks and valleys and then check the Marking

Note option.

- **Read Spectrum**

The function of Read Spectrum is using a vertical line to do scan on a spectrum and then get readout of data at the cross point of the vertical line with the spectrum. You can select the Read Spectrum submenu under the Graph menu, or click on the  button. System will draw a vertical line on a spectrum. You can use mouse to drag the line, or use keys of ← and → to move the line, to read out spectrum data.

- **Read Screen**

Read Screen is getting readout of data at which mouse points at. Select the Read Screen submenu under the Graph menu, or click on the  button. System will change cursor as +. In the meantime, you can move cursor on spectral graph and System will show the corresponding coordinate values.

- **Display Cursor**

Display Cursor has similar effect as that of Read Spectrum, that is, reading out of coordinate values. But cursor will be showed as cross cursor. Select the Read Screen submenu under the Graph menu, or click on the  button. System will draw a cross cursor in the center of spectral graph. You can move mouse to the center of cursor and the cursor will be displayed as  . Click mouse left key to drag the cursor moved. Click again to fix cursor at the appointed position.

- **Horizontal Stretch, Horizontal Shrink, Vertical Stretch, Vertical Shrink**

Stretch and Shrink are zoom on coordinate axes separately. You can select the Scale Zoom submenu under the Graph menu and choose the zoom action you require in the submenu. Or you can click on corresponding button on toolbar:  -- Horizontal Stretch,  -- Horizontal Shrink,  -- Vertical Stretch, and  -- Vertical Shrink.

- **Curve Display**

Curve Display offers you the various options for curve display. The optional display modes include: line, point, cross point, dot, and triangle point. You can select the Curve Display submenu ender the Graph menu and choose one of display modes. Or you can click on corresponding button on toolbar:  -- line,  -- point,  -- cross point,  -- dot, and  -- triangle point.

- **Combination Display**

Combination Display allows you to display multiple spectra in a graph. If your graph holds over two spectra, you can select the Combination submenu under the Graph menu and choose the Build Combination in the submenu, or click on the  button to open the Combination Spectrum Window, as shown in Figure 11-6.

In the window, you can select the spectra being combined and press OK Button. If you want to delete a combination display, you can select the Delete Combination next to the Build Combination, or select the Delete All Combination.

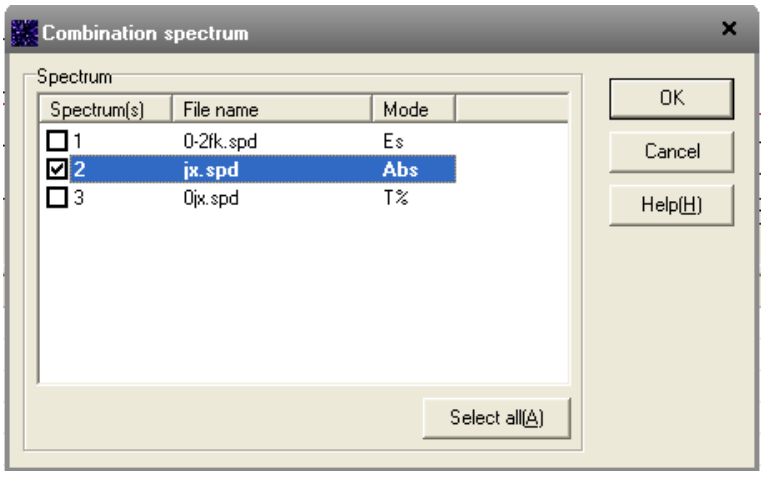


Figure 11-6 Combination Window

- **Display All Spectra**

The role of Display All Spectra is to display all spectra together in a graph, so that you can easily do comparison on spectra. Select the Display All Spectra submenu under the Graph, or click on the button.

11.2.3 Mathematic Calculation

Mathematic Calculation is a commonly used method for spectral analysis. Especially when qualitative analysis is performed for those samples with base interference, Mathematic Calculation plays an important role in it. In UVWin6, there are three kinds of calculation functions: basic, advance, and additive.

- **Basic Calculation**

Basic calculation includes Addition, Subtraction, Multiplication, and Division. You can select the Addition submenu, the Subtraction submenu, the Multiplication submenu, or the Division submenu under the Mathematic Calculation menu to open setting window, as shown in Figure 11-7.

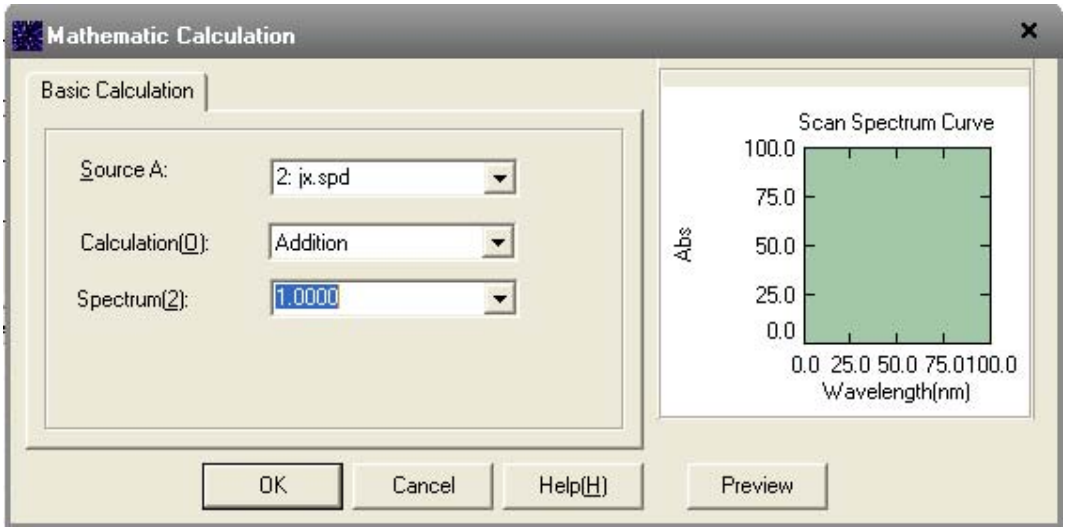


Figure 11-7 Basic Math Calculation

- **Source:** Choosing a spectrum being to be calculated.
- **Calculation:** Choosing an operation
- **Spectrum:** In this box, if you input a value, it expresses that the constant is operated. If you choose a spectrum, it expresses that the spectrum is operated.

After your setting and pressing OK Button, System will display graphically a new curve with calculation results.

Advanced Calculation

Advanced Calculation mainly provides operations of Smoothing, First Order Derivative, Second Derivative, Third Derivative, and Fourth Derivative. You can select the Smooth submenu or the Differential submenu under the Mathematic Calculation menu. System will open the Math Calculation Setting Window, as shown in Figure 11-8.

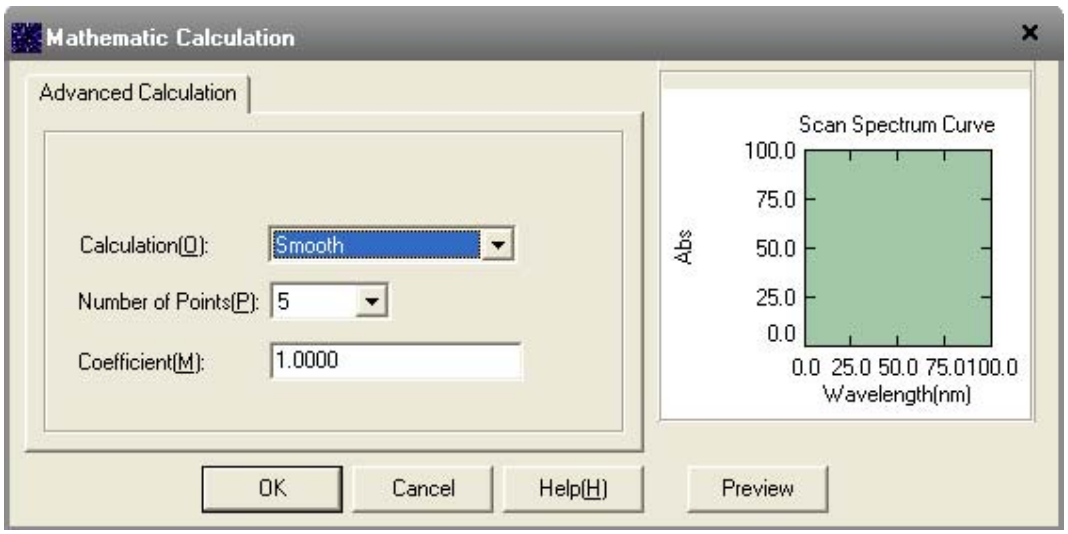


Figure 11-8 Advanced Math Calculation

- **Spectrum:** Selecting a spectrum to be calculated.
- **Calculation:** Choosing a calculation method.
- **Number of Points:** Selecting number of points for smooth or differential operation. The bigger the number the better the result is calculated.
- **Coefficient:** Setting the multiple value of magnifying calculated results. The setting of 1 expresses no magnification, while that of less than 1 expresses narrow and that of bigger than 1 expresses magnification.

Additive Calculation

Additive Calculation mainly provides operations of Logarithm, Reciprocal, and Transform between Abs and T%. You can choose the Logarithm submenu, the Reciprocal submenu, and the Transform submenu under the Mathematic Calculation menu. System will open a setting window, as shown in Figure 11-9.

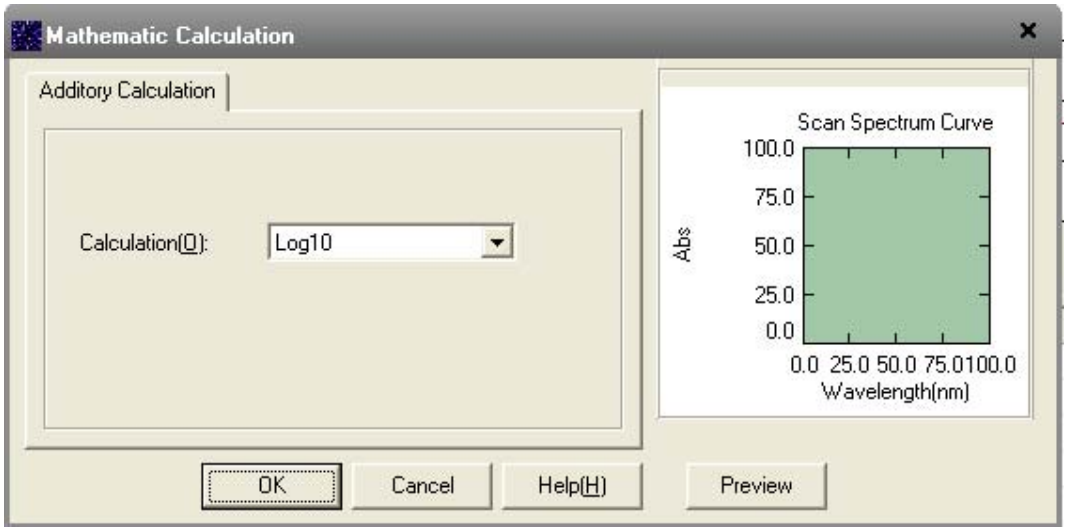


Figure 11-9 Additive Mathematic Calculation

- **Spectrum:** Selecting a spectrum to be calculated.
- **Calculation:** Choosing a calculation method.

11.2.4 3D Spectra

3D Spectra is a new adding function in UVWin6. Its role is combining multiple spectra into 3D display. In this way, it can perform qualitative analysis on samples through graph observation. If you have scanned several spectra, or have recalled some spectra, you can select the Establish 3D Spectrum submenu under the Graph menu, or click on the button to open the 3D Spectra Window, as shown in Figure 11-10.

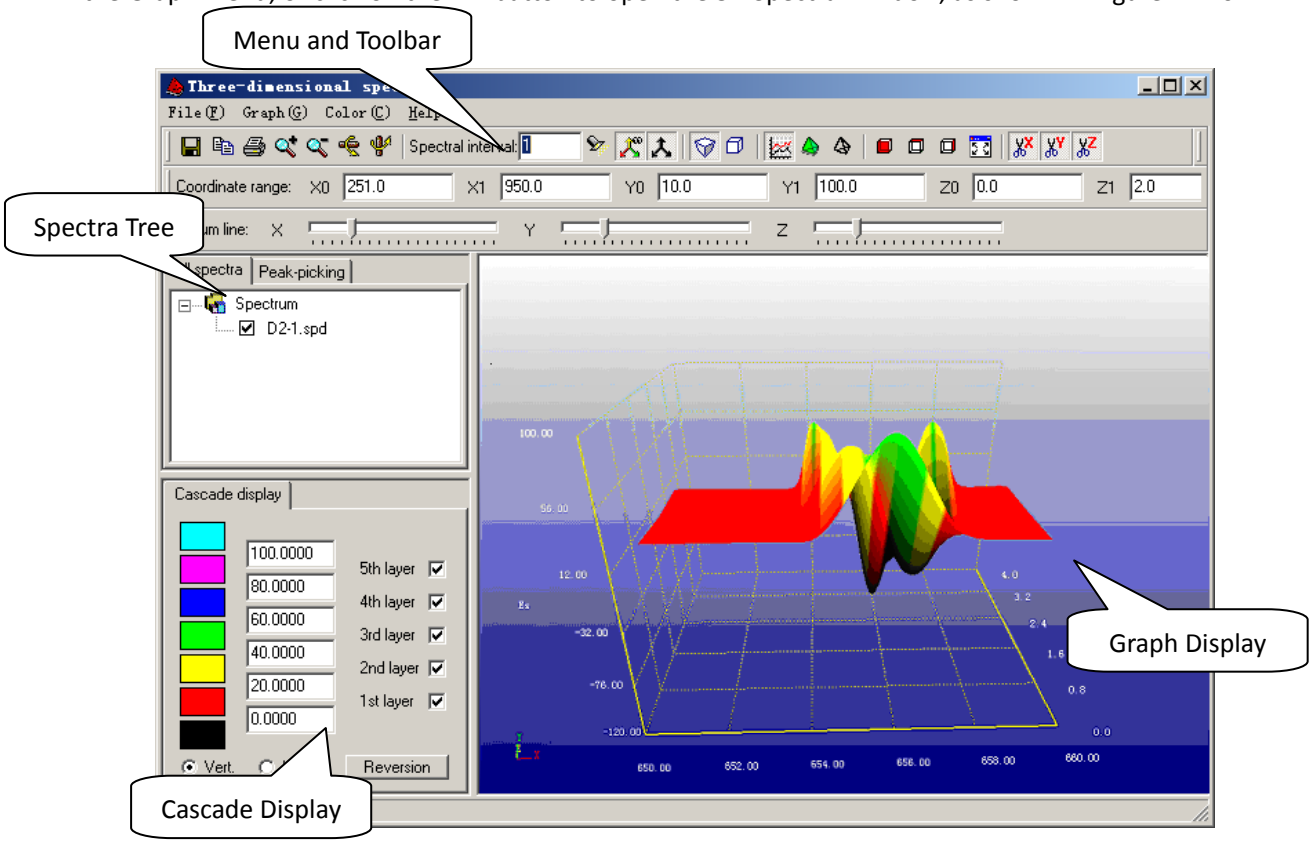


Figure 11-10 3D Spectra

The 3D spectra window is divided into 4 parts: Menu and Toolbar, Spectra Tree, Color Cascade, and Graph Display.

Menu and Toolbar

Menu and Toolbar provide most functions of 3D Spectra. Bellow is the function introduction of each menu item.

File:

- **Save as bitmap:** Saving 3D spectra as a bitmap file.
- **Copy to Clipboard:** Copying 3D spectra to System's clipboard, so as to be pasted by other editors from clipboard to its relevant position.
- **Print:** Printing 3D spectra out. As 3D spectra holds various colors, it is impossible for a black and white printer to distinguish the different colors. Therefore, it is recommended that you'd better use a color printer for 3d spectra printout.
- **Exit:** Quitting the 3D spectra window.

Graph:

- **Original Viewing Angle:** Reset the viewing angle to the best of all.
- **Perspective Projection:** Setting the projection mode as perspective.
- **Orthographic Projection:** Setting the projection mode as orthographic.

Tips: "Projection Mode"

"Projection Mode" is an important concept for 3D system. Its role is making 3D graph more real. For example, in the real world, the objects you see are all in the situation that the object near to you looks larger than that far from you. This is because of angle of view, which produce such situation. Therefore, in 3D system, it can use some projection modes to achieve imitating the real angle of view of the actual world. Projection Modes include Perspective Projection and Orthographic Projection. Perspective Projection is performing projection with imitating the real angle of view of the actual world. Perspective Projection is commonly used in 3D scene design software, such as 3DSMAX, House design software, and etc. Orthographic Projection does not imitate the real angle of view of the actual world. It shows graph directly. The graph displayed with Orthographic Projection, whatever far and near a object is, its size is impossible to be changed. So Orthographic Projection is mostly used in CAD software development.

- **Zoom in:** Magnifying a 3D graph.
- **Zoom out:** Minifying a 3D graph.
- **Vertical rotation:** Performing rotation round the X axis.
- **Horizontal rotation:** Performing rotation round the Y axis.
- **Show mini-coordinate axis:** Displaying mini-coordinate axes in the lower left corner of the window.
- **Show spectrum coordinate axis:** Displaying a coordinate axes and its gridding.
- **Display spectral curves:** Displaying 3D spectra as curves.
- **Display spectral surface:** Displaying 3D spectra as surface.
- **Display spectral wire frame:** Displaying 3D spectra as wire frame.
- **Illumination effect:** Adding illumination effect onto 3D spectra. It is only in the spectra surface mode that illumination effect can be observable.
- **Front view:** Adjusting visual angle to front view position.

- **Top view:** Adjusting visual angle to top view position.
- **Side view:** Adjusting visual angle to side view position.

Color

- **Coordinates color:** Setting the color of coordinate axes.
- **Character color:** Setting the color of text in spectral graph.
- **Background color:** Setting the background color of 3D spectral graph.

Spectra Tree

Spectra tree is used for displaying the names of current spectra. You can display or hide spectra by selecting check boxes before spectral headers.

Peak-Picking

If you want to perform peak-picking on 3D spectra, select the Peak-Picking option, and then input a detection threshold in the Edit Box and press the Pick button. System will perform peaks detection automatically and display the detection results in the peak-picking table. Shown as Figure 11-11. If you want to close peak-picking, check the Close Display option. System will close the display of labeling 3D spectra peaks.

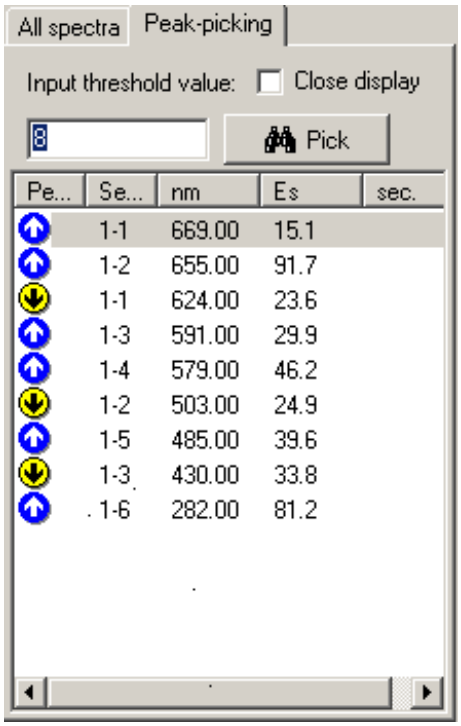


Figure 11-11 Peak-Picking of 3D Spectra

Layering Display

Layering display is separating 3D spectra into several layers by different colors so as to let you observe the change trend of spectra more clearly. Here 3D facility offers five layers and you can setup according to your requirement. Shown as 11-12.

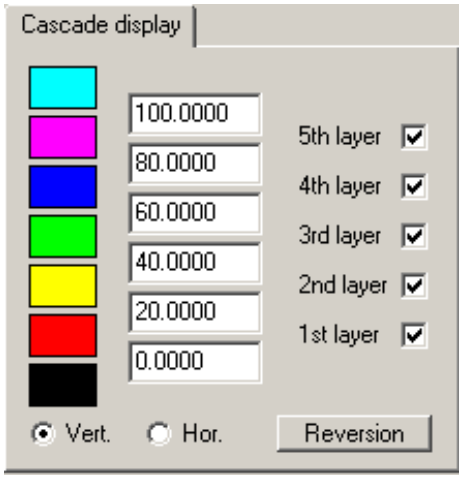


Figure 11-12 Layers Setting

In layers setting window, you can set on/off for each layer. Also you are able to specify value range and color for each layer. Each layer holds an upper limit, a lower limit, and a color to be set. For example, the first layer in the above figure holds a lower limit as 0.000, an upper limit as 30.0000, and a color as red. It expresses that in 3D spectral graph, the data of bigger than 0 and smaller than 30 are considered as the first layer and are displayed in red. The second layer, which is located above the first layer, has its lower limit as the upper limit of the first layer and its upper limit is 60.000, its color is yellow. This expresses that the data of bigger than 30 and smaller than 60 are considered as the second layer and are displayed in yellow. Accordingly, similar are the rest up to the fifth. If you want to set the layer's color, click on the color tab. The bottom color tab expresses that of those data that are smaller than the lower limit of the first layer, while the top color tab expresses that of those data that are bigger than the limit of the fifth layer.

Layering not only can be lengthwise, but also transverse. You can choose the Vertical button or the Horizontal button for the Layering direction. In addition, click on the Reversion button to reverse the order of color tabs.

- **Graph Display Window**

The Graph Display Window accomplishes the display of 3D spectra and operation on spectra with a mouse. You can hold pressing the left button of a mouse and move the mouse to make the 3D spectra rotated as the mouse moves. Similarly, if you hold pressing the right button of a mouse and move the mouse to zoom in and zoom out the 3D spectra.

11.3 Chapter Summary

This chapter mainly gives you some introduction of graphic process in UVWin6. Graphic process facility could help you perform some professional analysis. Appropriate application of this facility would be much of assistance to your work.

Chapter 12 Data Export

Key points

In this chapter, we'll tell of the following contents: What's Data Export? What kind of data can be exported? How to perform data export? How to perform data export? How to handle the exported data files?

It includes:

- Brief introduction of Data Export
- Data Exportable
- Data Export
- Handling exported data files
- Chapter Summary

12.1 Brief introduction of Data Export

Whatever to perform chemical analysis or to do scientific research, Data are all an important concept. Only with data, you can do analyzing and studying. Furthermore, sharing data has been becoming a giant trend of Today's scientific and technical development. With the uninterrupted development of computer technologies, data sharing is being realized. For example, a tabular we make with Excel can be insert into Word for purpose of data sharing. And sometimes we also need to share the measured data or analyzing data with other editing software. As general analyzing software do not offer such data sharing functions, it is very difficult to perform such data sharing. UVWin6 software achieves data sharing with editing software of Excel and Word by its Export function based on Windows OLE, which makes your analysis more easy and convenient.

Tips: "OLE"

OLE is the abbreviation of Object linking and embedding. It is a standard interface for programming supplied by Windows Operating System. An application program can use the interface to access to those applications that offer OLE function. As Word and Excel supply OLE function, so other applications can operate on them through OLE.

12.2 Data Exportable

In UVWin6, data able to be exported are mainly measured data. Of cause there are some special data that are exportable, like instrument information. You can select the last submenu of Information under the Measure Menu to open the Instrument Info Window, as shown in figure 12-1. In the window, it shows the information about current instrument hardware, including: Model, Serial Number, Wavelength Range, Spectral Bandwidth. In the lower left corner of the window, there is an Export Button. Pressing the button will export the information in the window into relevant files.

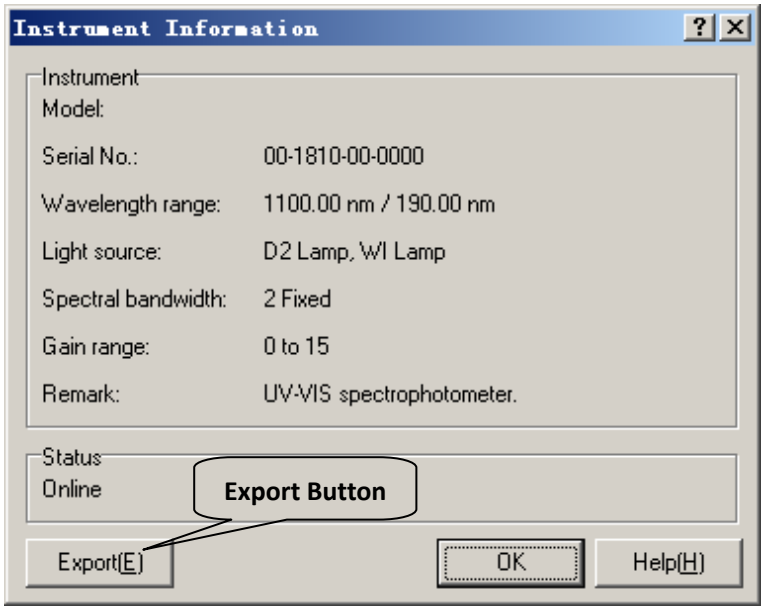


Figure 12-1 Exporting instrument info

12.3 Data Export

Exporting data is easy and simple. You only need to select the Export Data Submenu under the File Menu. System will open the Data Export Window, as shown in Figure 12-2. In the window, you can specify the file type for export through the option of Export Type (please refer to Table 12-1 for exportable file types). In the edit box of Export File, input the filename being exported, or click on the "…" button right to it to specify a file. After setting, click the Export button. System will export all data to the appointed file according to your settings. If you check the option box of Open Files Automatically After Export, System will open the exported file automatically after export finishes.

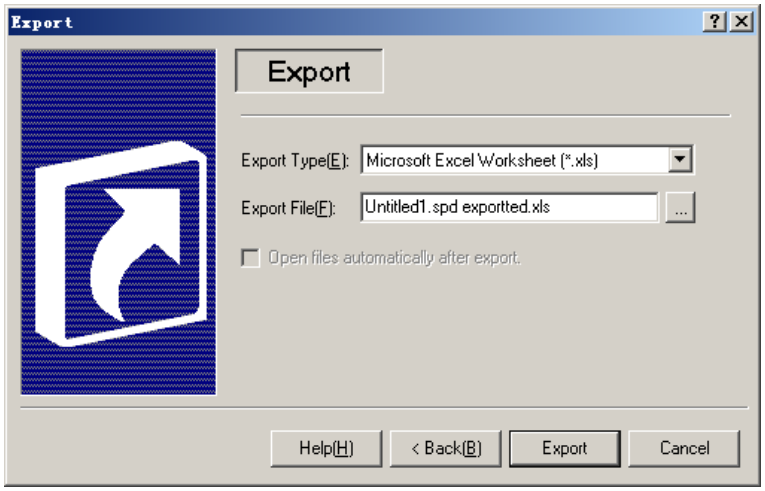


Figure 12-2 Data Export Window

Table 12-1 Exportable File Types and Descriptions

File Type	Description	Format	Remark
Word File	Microsoft Word Documents **Extension: "**.doc"	Row 1: Title Title Title… Row 2: Data Data Data… … Row n: Data Data Data…	Microsoft Word is required.
Excel File	Microsoft Excel Worksheet **Extension: "**.xls"		Microsoft Excel is required
Text File (Comma Separated values)	The Text File of comma (,) delimited between each datum, which is able to be opened with Excel. **Extension: "**.csv"	Row 1: Title, Title, Title… Row 2: Data, Data, Data… … Row n: Data, Data, Data…	
Text File	The Text File of Tab delimited between each datum. **Extension: "**.txt"	Row 1: Title<Tab>Title<Tab>Title… Row 2: Data<Tab>Data<Tab>Data… … Row n: Data<Tab>Data<Tab>Data…	
ASC File	A non-delimited ASCII (ASC) file **Extension: "**.asc"	Row 1: Data 1 Row 2: Data 2 … Row n: Data n	

12.4 Handling exported data files

Once data are exported, it would be flexible to handle them. For example, if you need to compose some papers and you think that the data reports printed out with UVWin6 do not meet your requirement about their format, you can export the data to a Word file. Then you edit the word file, as you want. In the same way, for those requirements of complicated calculation, you can export data to an Excel file. Then you specify calculations on the data.

12.5 Chapter Summary

This chapter mainly gives you introduction of the Export function of UVWin6 and its usage. It is sure that you have learned about it to a certain extent. And hope the function would afford facilities for your work.

Chapter 13 Administration

Key points

In this chapter, we'll tell of the following contents: Why should we have the Administration Facility in the software? How to setup users and groups? How to set security parameters? How to setup and browse the operation log file?

It includes:

- Brief introduction of Administration Facility
- Create a user account
- Create a user group
- Set security parameters
- Setup and browse the operation log file
- Chapter Summary

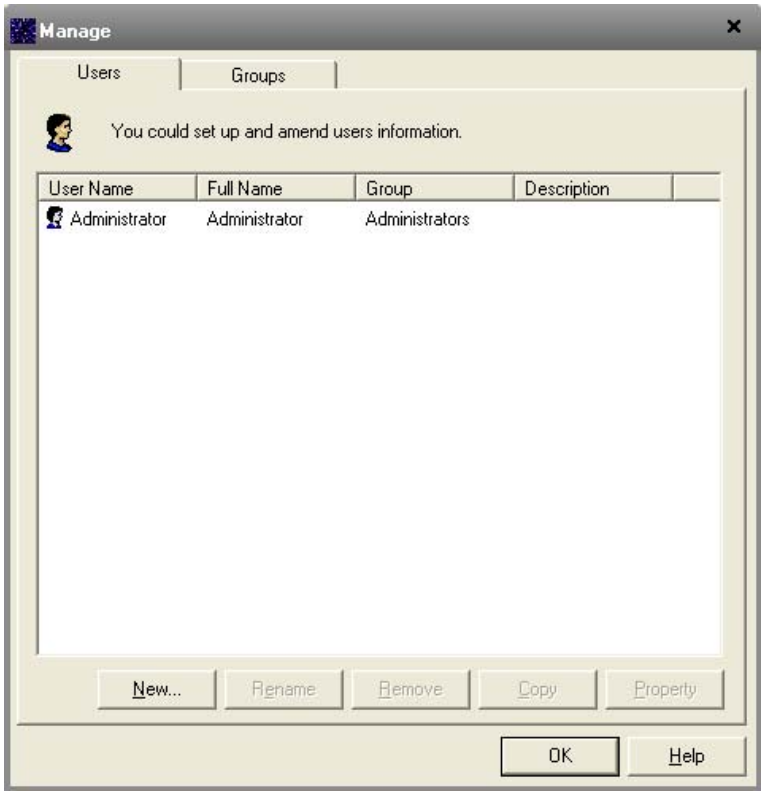
13.1 Brief introduction of Administration

The users of Microsoft Windows should know that, in Windows system, you are able to setup different users to log on the system. And you can use Administrator to create users with different privileges. Actually this is an embodiment of Administration Facility. For more details, please refer to the related books of Windows.

Administration Facility is to make systematic control on software or operation system with some administrating methods. Its main usage is multiple users management mentioned above. In UVWin6, it includes Multiple User Management, Security System, Log Management, and etc. All these functions would be helpful for you.

13.2 User Management

User Management is a basic administration function in UVWin6. This function will assist you in creating users and groups and setting relevant parameters. You can select the User Group submenu under the Administrate menu to open the Management Window. In the window, there are two tabs: Users Tab and Groups Tab. You can create users and change users' settings in the User Tab, and create groups and modify groups' settings in the Group Tab, as shown in Figure 13-1.



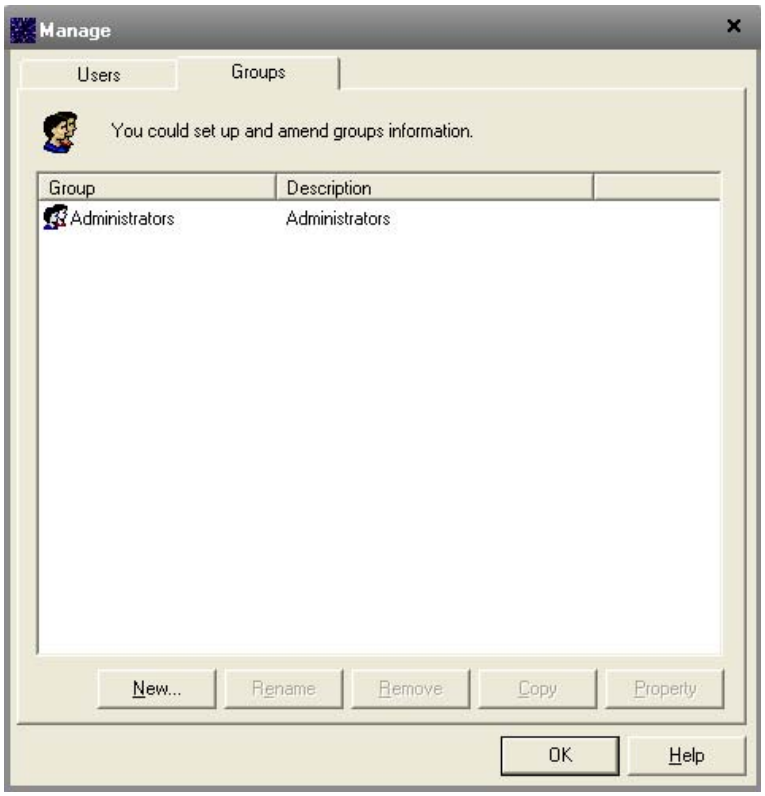


Figure 13-1 User Management (Up) and Group Management (Down)

13.2.1 User Management

Selecting the User Tab in the Management Window, you are able to manage users. You can create a

new user, and delete or modify each user's settings.

- **Create**

The function of New allows you to create a new user. Click on the New Button, and System will pop up the New User Window, as shown in Figure 13-2. In the window, you can enter a user name in the User Name Box and specify a group for the new user in the pull-down list of the Group Box. The role of a group is to manage various users by grouping and setting different privileges. For the details of a group, please refer to the next section.

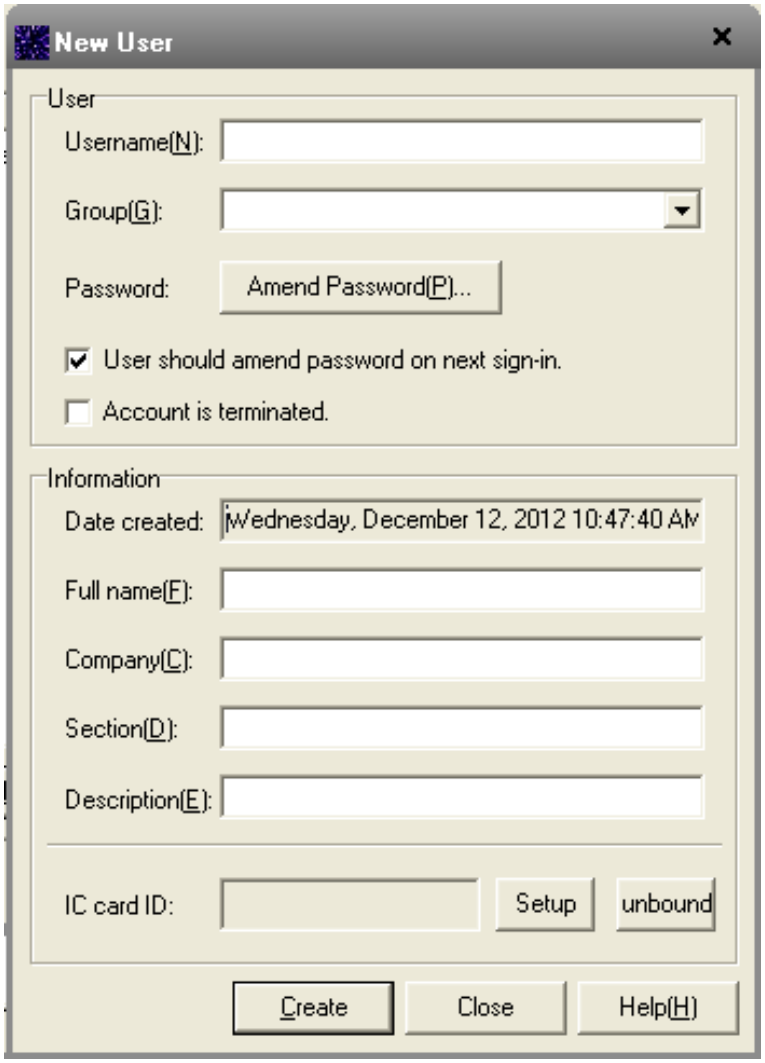


Figure 13-2 New User Window

If you need to create a password for a new user, click on the Amend Password Button. System will open the Password Window, as shown in Figure 13-3. What You need to do are only to enter the password you want in the Password Box and the Confirm Password Box, and then click OK. If you want to prompt the user to change its password on its next sign in, you can check the option box of User Should Amend Password On Next Sign-In. If you want to terminate the user account, check the option box of Account is terminated.

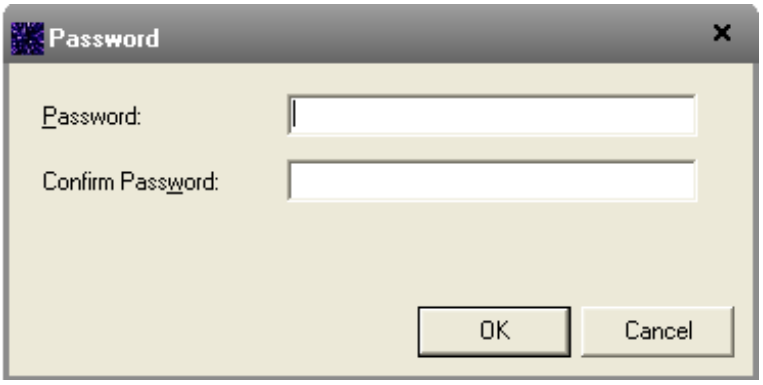


Figure 13-3 Enter Password Window

Additionally, you can also input the relevant information of a new user in the Information Boxes. The information includes: Full Name, Company, Section, and Description.

After you finish the setup of a new user, click on the Create Button. System will establish a new user account according to your settings. Then you can log on with this user account by entering the user name and its password in your next sign-in.

- **Rename**

The Rename function can change the name of current user. In the user list, specify the user being renamed and click on the Rename Button. System will prompt you to input a new username. Shown as in Figure 13-4. After you enter a new name, click OK to return.

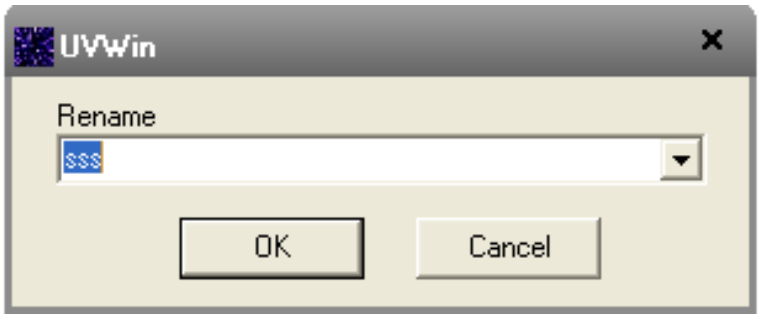


Figure 13-4 Rename Username

- **Remove**

The Remove Function allows you to delete a specified user. In the user list, specify the user being deleted and click on the Remove Button. System will prompt you to confirm the deletion. Select OK to delete the user you specify. If the user you specify is the current log on user, System will prompt you unable to delete. In this case, you need to use other user to log on to delete this user.

- **Copy**

The Copy Function creates for you a copy of current specified user. Apart from the username, other settings are the same as the user you specify.

- **Property**

The Property Function allows you to view the user information. Click on the Property Button, and System will open the User Attribute Window. The window is nearly same as that of creating a user. In the window, you can modify the relevant information of a user.

13.2.2 Group Management

Selecting the Group Tab in the Management Window, you are able to manage groups. You can create a new group, and delete or modify each group's settings.

- **Create**

The function of New allows you to create a new group. Click on the New Button, and System will pop up the New Group Window, as shown in Figure 13-5. In the window, you can enter a group name in the Group Name Box and input the description information for the new group in the Description Box.

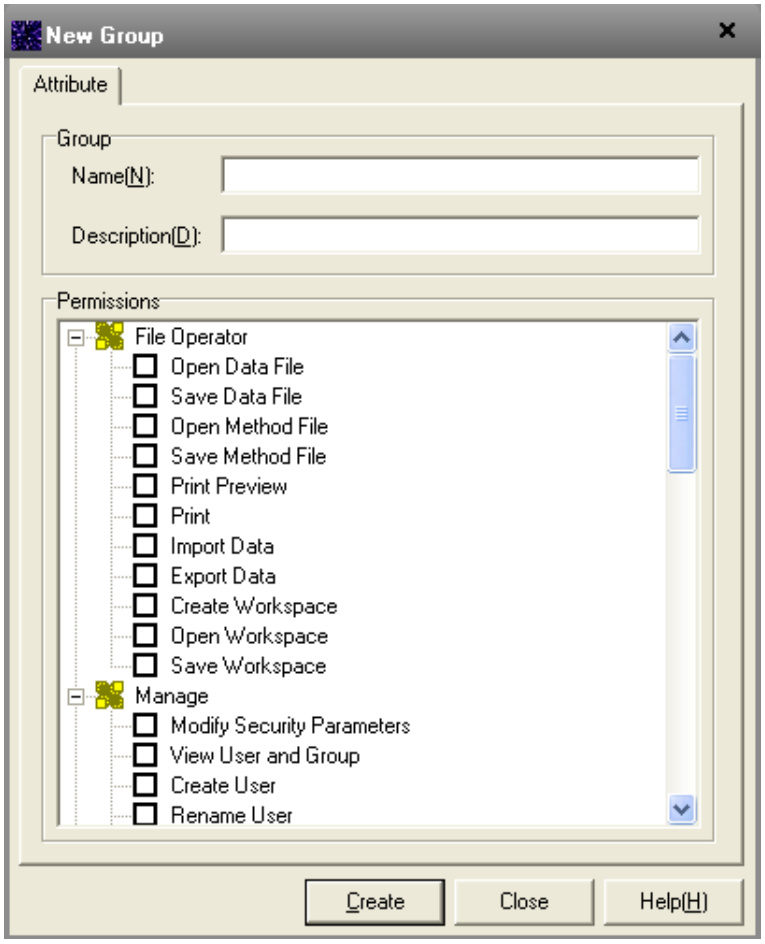


Figure 13-5 New Group Window

For a group, the most important is its privilege. As you may see in the New Group Window, there are all managing permissions of UVWin6. You can setup a set of permissions for a group according to its requirements. These privileges will be applicable for each user subject to this group. That is, if a user is part of the group, when the user logs on, its useable function will be limited within the permissions of the group. In the group privilege, those functions that are not specified are unavailable.

- **Rename**

The Rename function can change the name of current group. In the group list, specify the group being renamed and click on the Rename Button. System will prompt you to input a group username. After you enter a new name, click OK to return.

- **Remove**

The Remove Function allows you to delete a specified group. In the group list, specify the group

being deleted and click on the Remove Button. System will prompt you to confirm the deletion. Select OK to delete the group you specify. If the group you specify includes the current log on user, System will prompt you unable to delete. In this case, you need to use other group user to log on to delete this group.

- **Copy**

The Copy function creates for you a copy of current specified group. Apart from the group name, other settings are the same as the group you specify.

- **Property**

The Property Function allows you to view the group information. Click on the Property Button, and System will open the Group Attribute Window. The window is nearly same as that of creating a group. In the window, you can modify the relevant information of a group.

13.3 Security

Security is an important word for all things. Only on the premise of security being guaranteed, works required can be done. With the development of computer technologies, the security of information should not have been neglected any more. Therefore UVWin6 software introduces the concept of Security. You can achieve data protection by security setting. Select the Safety Settings submenu under the Administrate menu to open the Security Window, as shown in Figure 13-6.

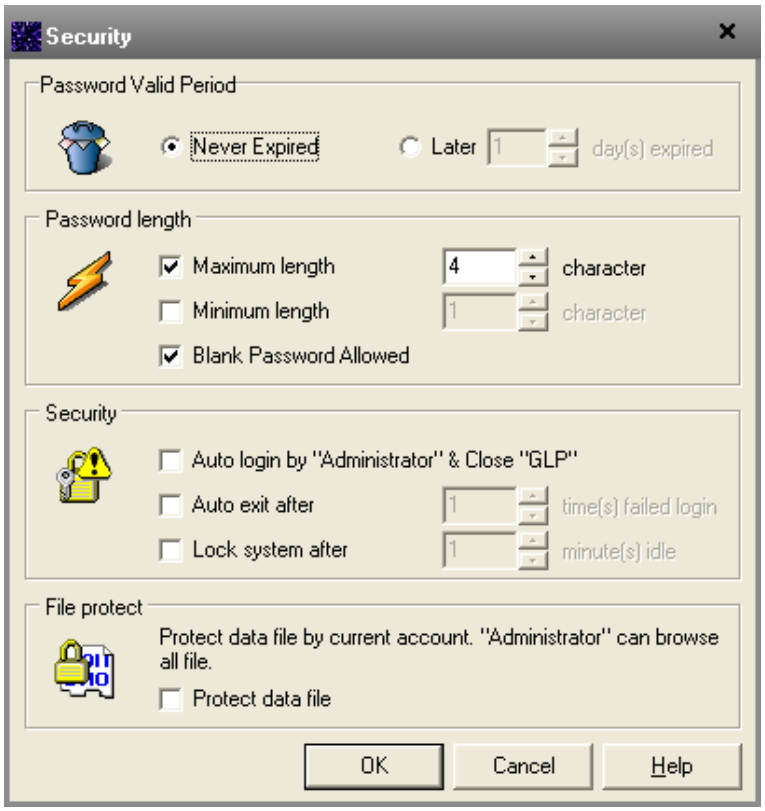


Figure 13-6 Security Settings

- **Password Valid Period**

Just as its name implies, the Password Valid Period is to set the active period for a password. That is, how long a user password can be used for. If you want to use a password undated, you can specify the

Never Expired. If you want a user to change his password each 30 days, then you should choose the other option and enter the corresponding number of days in its edit box.

- **Password Length**

The password length is used for setting the length of a user password. You can specify the maximum length and the minimum length. In addition, if you do not specify the minimum length, the blank password allowed is to be selected. In this case, a user can use a blank password, which is no password.

- **Security**

The function of the Auto Login By Administrator is to start UVWin6 software without displaying the login window. System will use the administrator account to log in. For the single user system, it is more convenient without entering a password to log in.

If you do not check the option, it means you need to enter an account and its password for each login. Then you are able to set the times for failed login. That is, System will count your wrong entering of an account and its password. Once the times of your failed login reach the number you set, System will exit automatically.

If you wish to lock the UVWin6 system after a period of time being idle, then check the Lock System Option and specify a time for automatic lock.

- **File Protection**

The function of file protection is to protect those files of measure data. Its role is that the data files created by each user cannot be read each other. Only its creator or administrator can read and open a measure data file.

13.4 Operation Log

The log function is to record all your operation. You can select the View Log submenu under the Administrate menu to open the Operation Log Window, as shown in Figure 13-7.

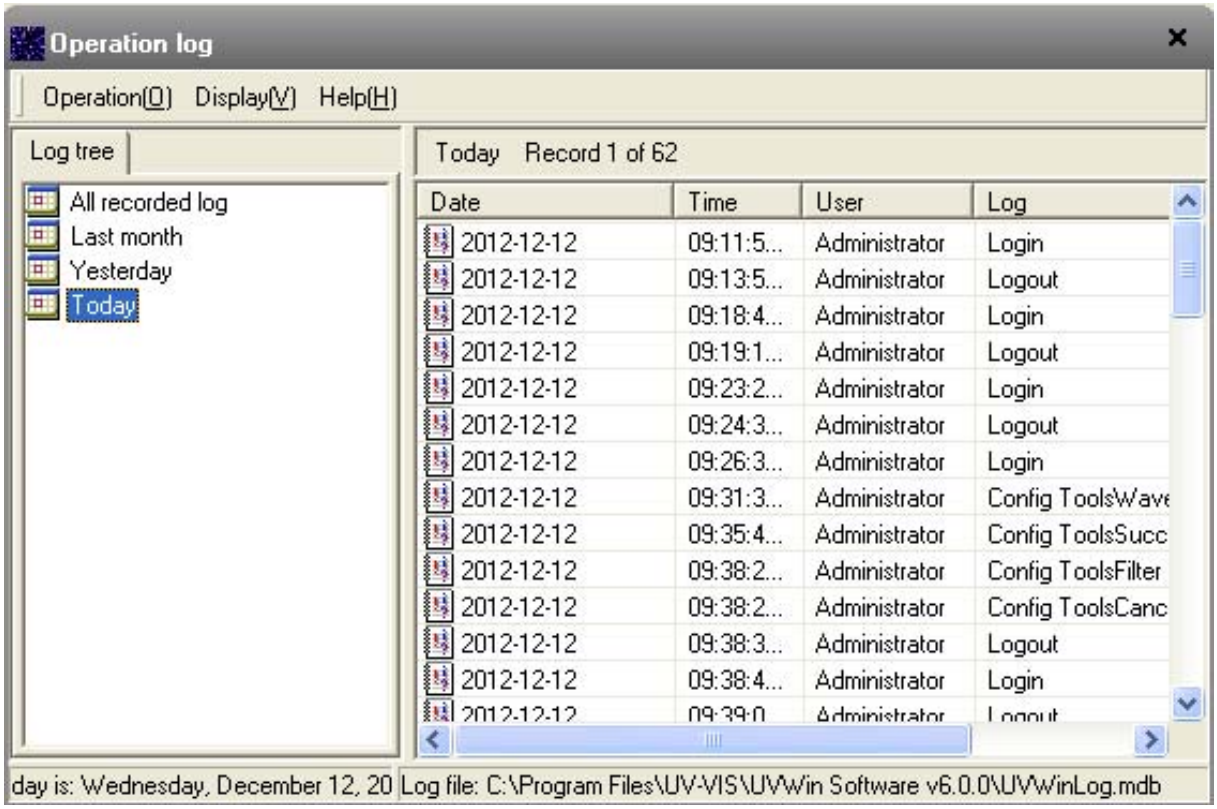


Figure 13-7 Operation Log Window

You are able to select the type of log on the left window, and the details of log are displayed on the right window. If you want to set the log parameters, you can select the Option submenu under the Operation menu, System will open the Log Option Window, as shown in Figure 13-8.

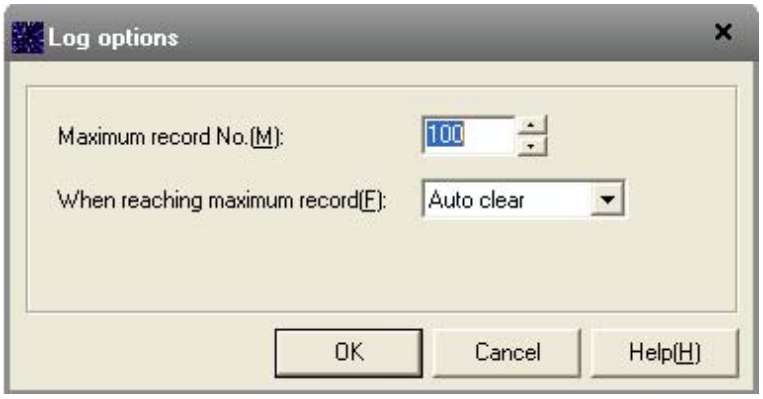


Figure 13-8 Log Option Window

Save in: Setting the path for Log File saving. For example, you can save the log file in other hard disk, to prevent from data lost.

Maximum Record Number: Setting the maximum record number allowed for Log File to save. When the record number is reached, System will act according to your choice.

13.5 Other Administrating Functions

13.5.1 User-Defined Log

If you want to input a self-defined log record, you can select the Record Log submenu under the Administrate menu. System will open an input window. Enter what you want to record and click OK. System will save your input into the log database.

13.5.2 Lock System

As we mentioned above, you can lock the system by using the Lock System After Idle in Security Settings. If you want to lock the system at any moment you want, you can select the Lock System submenu under the Administrate menu, or press the Combo Key Ctrl+Alt+Space, to lock the system. After the system is locked, you'll be required to enter the correct password to release the lock. Shown as in Figure 13-9.

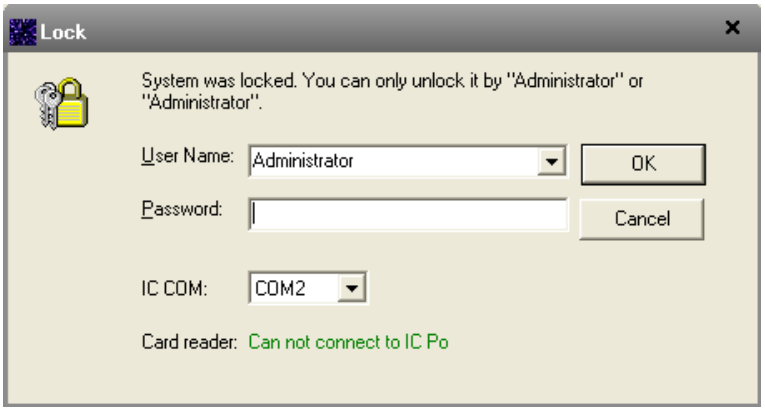


Figure 13-9 System is locked

Only the current user or the administrator can release the status of the system lock. If you enter the wrong password, System is unable to release the lock. If you choose Cancel, System will exit automatically.

13.6 Chapter Summary

This chapter mainly gives you introduction of Administration in UVWin6. It is sure that you have learned more about it. The Administration is a new function. Hope the function would afford facilities for your work and make your software system safer.

Chapter 14 Conclusion

Up to now, we have given you all information about UVWin6 functions. It is sure that you have learned more about the software. It is certain that getting familiar with software needs time. Hope you could know well it by reading the book and your practices. It would be our pleasure if the software would provide you more convenience and assistance for your work.

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