pg instruments

UV/VISIBLE SECTROPHOTOMER

DPA-WIN

SOFTWARE OPERATION MANUAL

Analytical
Instruments
for
Science

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1 Introduction

DPA-WIN analysis software is a new version of PC software for the T85/T85+ UV/Visible Spectrophotometers built and supplied by PG Instruments.

The DPA-WIN analysis software has powerful functions, such as instrument control, measurement, data analysis, data processing, user management, file security and 3D spectrogram.

The main multi-function measurement Parameters are Photometric Analysis, Quantitative Analysis, Kinetics Analysis, Wavelength Scan, Multi-wavelength Analysis and DNA/Protein Analysis.

2 Installation

This chapter will show the requirement of the system configuration, the installation steps and uninstall procedure, if required, for the DPA-WIN analysis software.

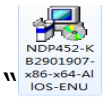
2.1 System Configuration Requirement

Following system configuration of PC is required:

- ✧ Core minimum i3 dual-core, or faster, processor
- ✧ CD-ROM drive or solid-state drive.
- ✧ 2 x USB
- ✧ >2G RAM
- ✧ >1G hard disk space
- ✧ Microsoft Windows 7 or Windows 10 operating system.

2.2 Software Installation

Open the installation file folder to install the DPA-Win analysis software using the following steps:

Step 1: Double-click " 

" to install the Microsoft .NET Framework. If it's already installed, please ignore this step.

Step 2: Install the communication port driver. Please install "

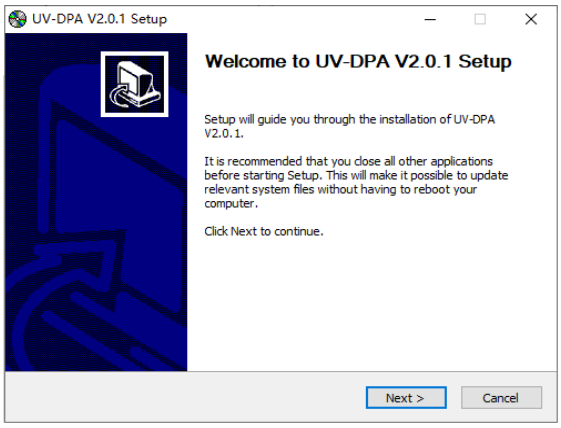
" for 32-bit operating system or install "

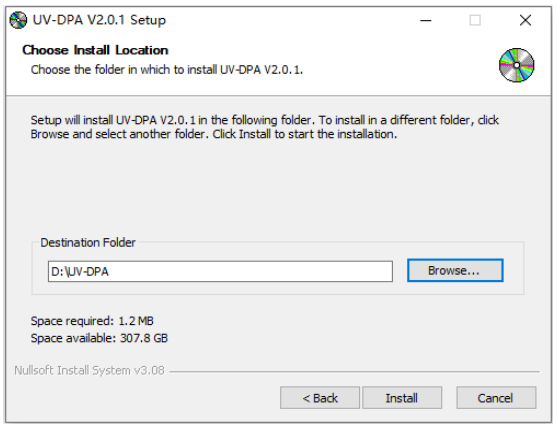
" for 64-bit operating system.

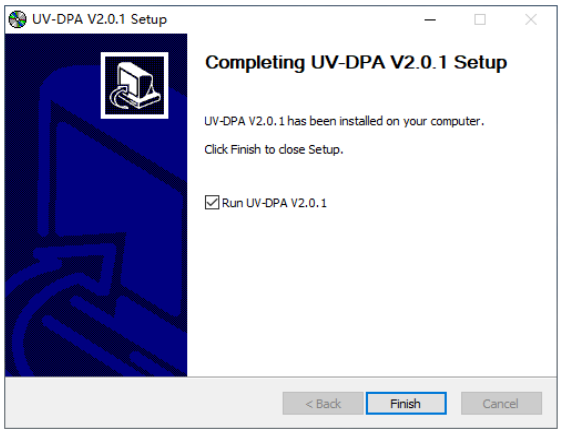
Step 3: Double-click "

" and follow the instructions to install the software. A shortcut icon "

" will be created automatically on the desktop after completing the installation.







2.3 Software Uninstall

You can uninstall the DPA-WIN analysis software using following method:

In the [**Start**] menu, select [***DPA-WIN***] and [***Uninstall DPA-WIN***] in [***All Programs***], and the uninstall progress will automatically be carried out.

3 Basic Application

This chapter will show the basic application of the DPA-WIN analysis software of how to run the software, be familiar with the interface, access tools and manage the user information.

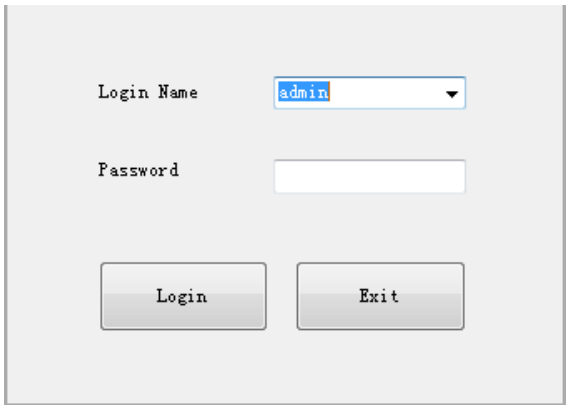
3.1 Run the Software

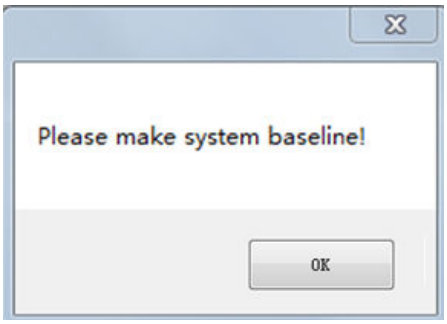
Make sure that the UV key has already been inserted into computer, then, run UV-SPA analysis software.

Double-click the shortcut icon

on the desktop to run the program.

For the first launch, login the system with the user name "admin" without password.





Note: System baseline calibration and dark current calibration should be done before measuring. For detail operation, please refer to chapter 4.2 and 4.3.

3.2 Main Interface

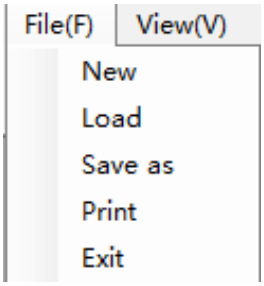
3.3 Menu Bar and Toolbar

The menu bar and toolbar to facilitate use of different functions.

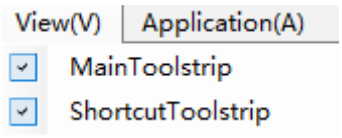
3.3.1 Menu Bar

The menu bar contains File（F）、View（V）、Application（A）、User（U）、Device（D）、Windows（W），respectively as follows:

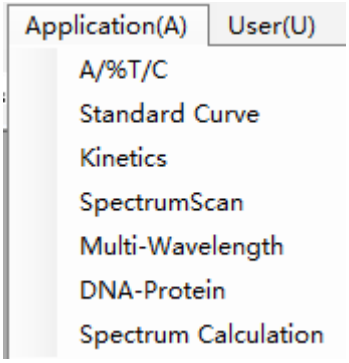
1) File drop-down menu



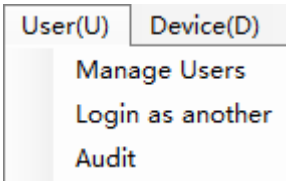
2) View drop-down menu



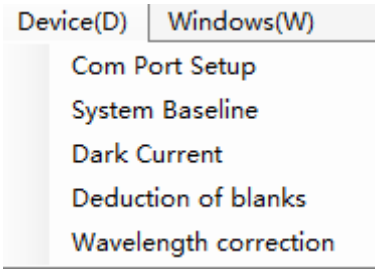
3) Application drop-down menu



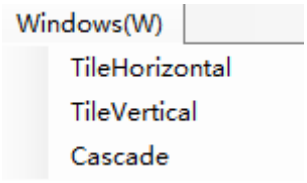
4) User drop-down menu



5) Device drop-down menu



6) Windows drop-down menu



3.3.2 Toolbar

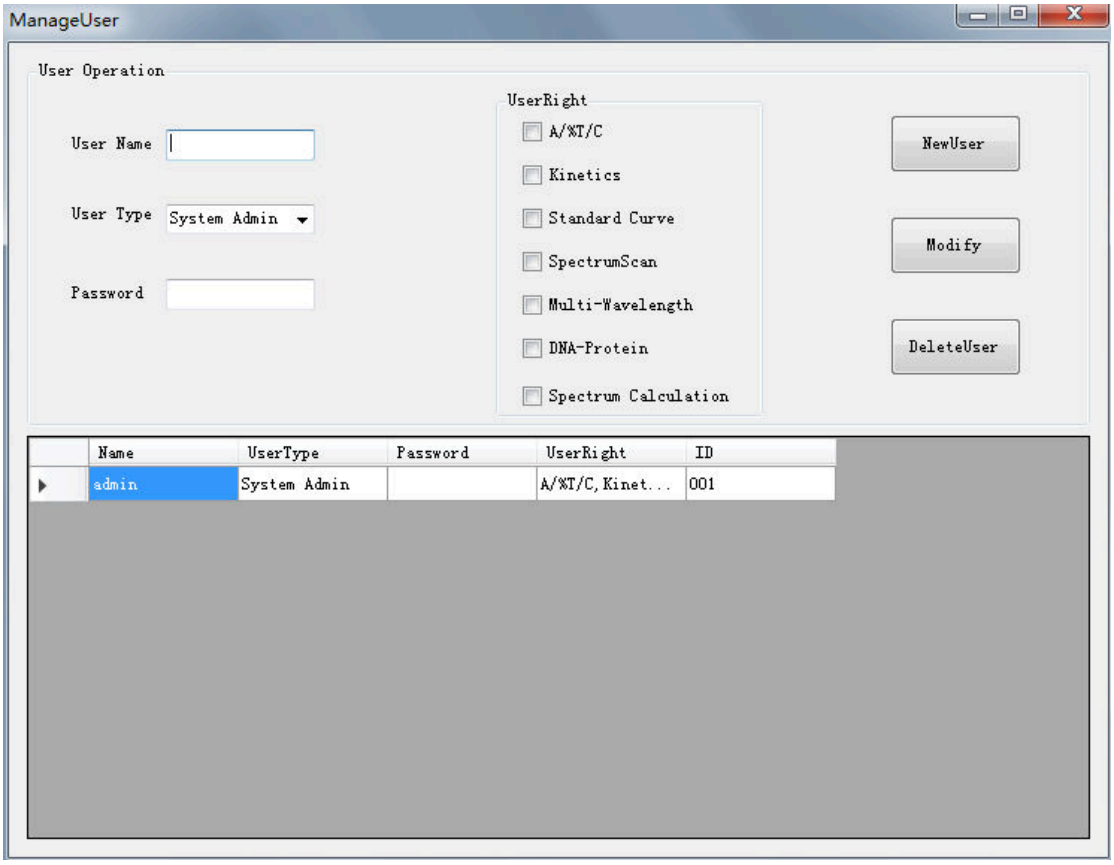
The toolbar contains icons described as follows:

List	Icon	Descriptions
New		Create a new file.
Open		Open the file with saved test data.
Save		Save the file with test data.
Print		Print the test report.
Zero / Baseline		Set zero, blank calibration or baseline calibration.
Dark current		Dark current.
Connect		Connect the device.
Release		Release the device.

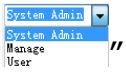
3.4 User and User Management

3.4.1 User Management

Click " Manage Users " in the drop-down menu of User and the following window will open:



3.4.1.1 New User Creation

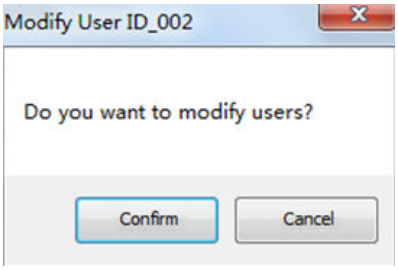
Input the username, select user type " 

" or input a customized user type directly and input the password. Tick the relevant user rights and click "

". The new user will be listed in the user information table.

3.4.1.2 User Information Modification

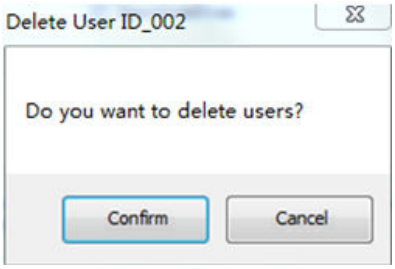
Move the cursor to the user information table and click on the target row. Modify the username, user type, password and user rights as required. Click " Modify " and " Confirm " to complete the modification.



Note: User should login with "admin" to modify the user information.

3.4.1.3 User Deletion

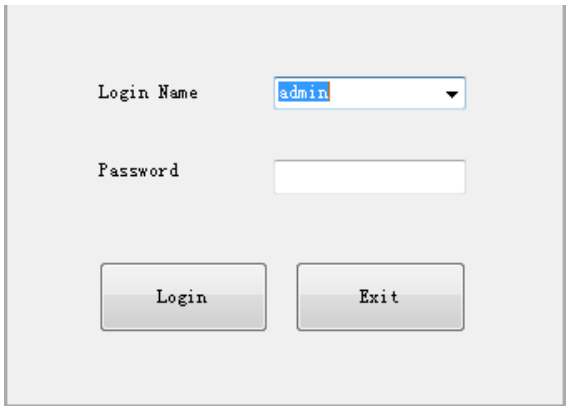
Move the cursor to the user information table and click on the target row，then click " DeleteUser " and " Confirm " to complete user deletion.



Note: User should login with "admin" to delete user information.

3.4.2 Switching User Login

Click the menu bar " User(U) " and click " Login as another " in the drop-down menu. Select login name and enter the password. Click " Login " to complete another user login.



3.4.3 Audit

3.4.4 Audit Records Processing

Click the shortcut icon " " in the toolbar to save the audit records.

The file will be saved in Excel format. Click " " to print the audit records.

4 Instrument Control

This chapter will show how to control the instrument with DPA-WIN analysis software. Items will include connecting or releasing to PC, system baseline calibration, dark current calibration, blank calibration and wavelength calibration.

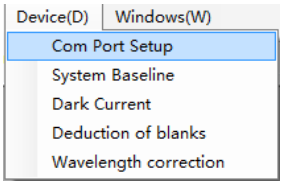
4.1 Connecting/Releasing the PC

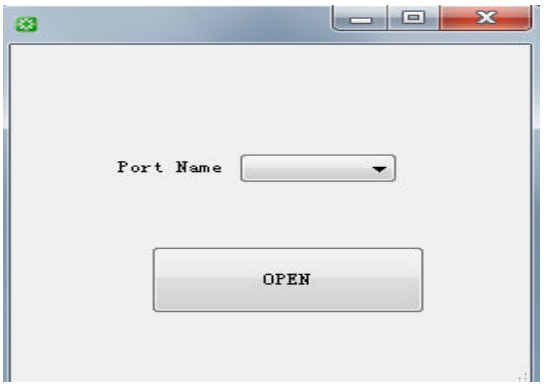
4.1.1 Connecting to PC

Connect the instrument with the PC using the USB cable and insert the UV key into a spare USB in the computer. Switch on the power of the instrument. After completing the diagnostic program and warm up procedure, the instrument will open the main menu. Double click the shortcut icon "

" on the desktop, login to open the DPA-WIN analysis software operation interface.

Set the communication port. Click " Device(D) " on the menu bar and select" Com Port Setup" in the drop-down menu. Click "open" when the port name appears，then click " Connect ". If the port isn't found, plug the USB cable again and reconnect to PC. The button " Connect " will switch to " Connected " after connecting to PC successfully.





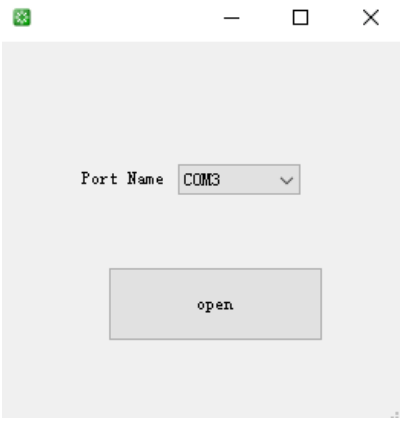
4.1.2 Releasing PC:

Click “ Connected ” in the toolbar to release the instrument.

4.1.3 Set com port

4.1.3.1 Steps of com port setting

Step 1: Click " Device(D) ", then choose and click " Com Port Setup " in the submenu, the interface below appears.

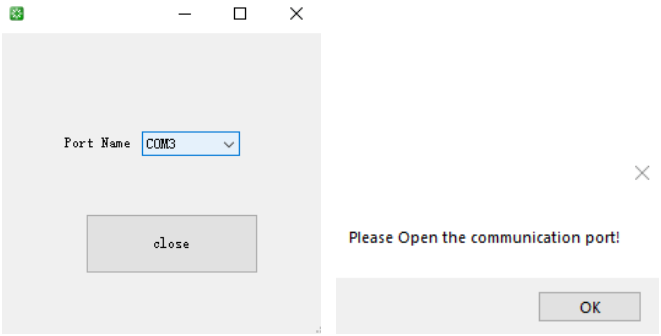


Step 2: The current available com ports will be shown in Port Name. Select an available com port and click "open".

Step 3: Click " Connect " to connect with the device.

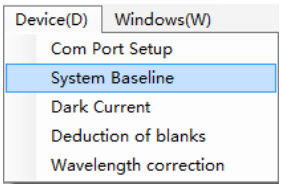
4.1.3.2

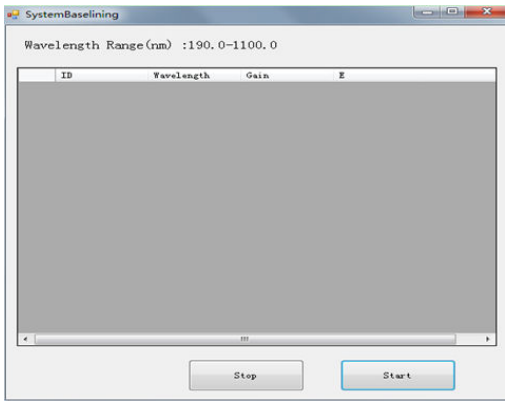
Do not close the COM port directly when software and instrument are connected. If this occurs, a prompt window will appear as shown in the picture below. In this case, reset the COM port according to the steps above to reconnect to the instrument.



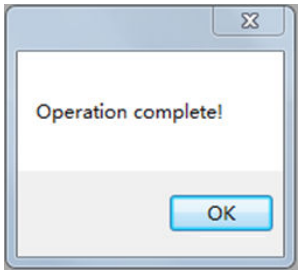
4.2 System Baseline Calibration

Click " Device(D) " on the menu bar and select " System Baseline" in the drop-down menu. Following window will open.





Click " Start " to start the system baseline calibration. Click " Stop " to stop the calibration if required. A dialog box will open after completing the calibration. Click " OK " to exit the dialog box.



4.3 Dark Current Calibration

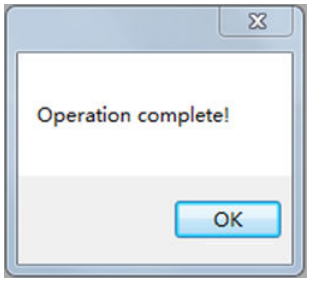
Click " Device(D) " on the menu bar and select " Dark Current" in the drop-down menu or click " " on the toolbar to carry out dark current correction.

4.4 Blank Calibration

Click " Device(D) " on the menu bar and select "Deduction of blanks" in the drop-down menu or click " " on the toolbar to carry out blank calibration.

4.5 Wavelength Calibration

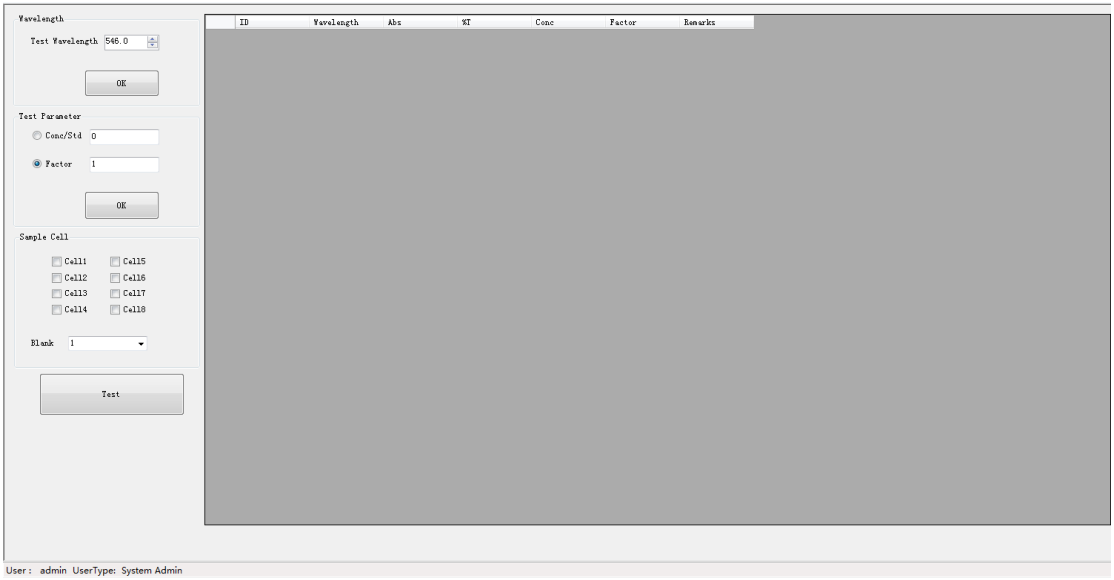
Click " Device(D) " on the menu bar and select "Wavelength correction" in the drop-down menu. A dialog box will open after completing the calibration. Click " OK " to exit the dialog box.

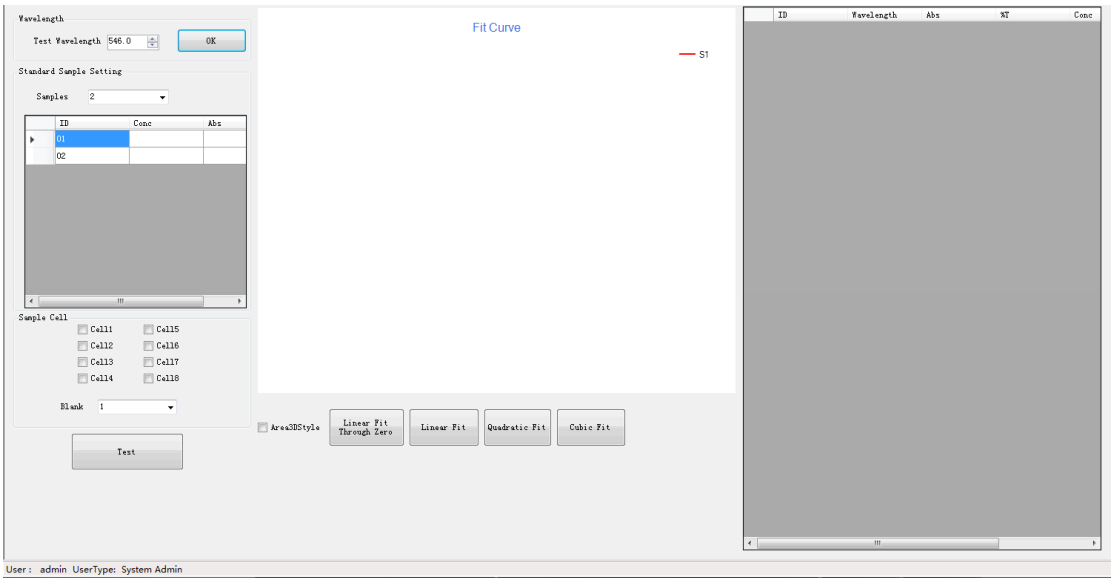


4.6 Automatic Cells Holder Control and Measurement

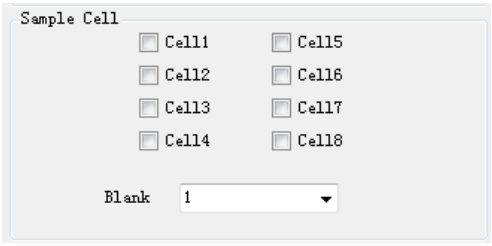
Note: Only available for the instruments fitted with the accessory of automatic 8 cell holder.

The software system will automatically identify the automatic cell holder when connecting to PC. Automatic measurement is only available with photometric analysis or quantitative analysis.





Click the cell number in the toolbar to control the sample cell position independently. Select the cells with samples to be measured in the window to run the measurements. Select the cell with reference as blanking position. Click " " to deduct the blank value. Click " " and the system will run sample measurements automatically.



5 Measurement Operation

This chapter will show the main measurement functions of the software such as Photometric Analysis, Quantitative Analysis, Kinetic Analysis, Wavelength Scan, Photometric Multi-wavelength Analysis and DNA/Protein Analysis. It contains all the procedures of each measurement function. Operation of Spectrum Calculation is also described.

5.1 Photometric Analysis

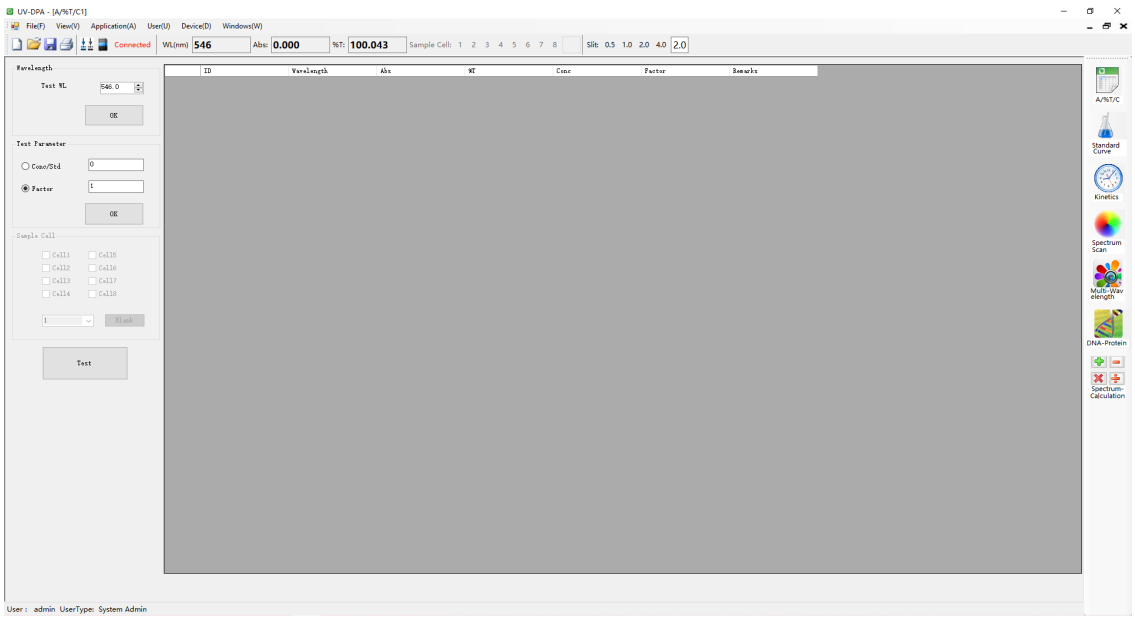
The values of Absorbance (Abs) and Transmittance (%T) are available

with this function. The value of concentration is also available by setting the concentration test parameter.

Measurement procedures for Photometric Analysis:

1. Click the icon "

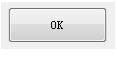
" in the studio directly to enter the photometric analysis interface. On the left pane is the photometric analysis settings.



2. Input the wavelength value in the left pane and click "

" to save the setting. If concentration measurement is required, set the concentration test parameter in the left pane. There are two setting methods: First way, select "

", and input the standard sample concentration to be tested. Second way, select "

", and input the value of concentration factor (k) that is calculated by the formula A=k*C. Then, click " 

" to confirm the setting.

3. Put the reference solutions into the sample cell holder and reference cell holder. Click the shortcut icon " " in the toolbar. The system will calibrate the blank and set it to 0.000Abs/100.0%T.

4. Put the sample solution into the sample cell holder only. Click "Test" to start the measurement. The result containing Absorbance (Abs.) and Transmittance (%T) will be displayed in the data sheet. If the Concentration test parameter is set, the Concentration (Conc.) result will be displayed also.

5. After the measurement is completed, click the shortcut icon " " in the toolbar to save the test data. The file will be saved in Excel format. Click " " to print the test report.

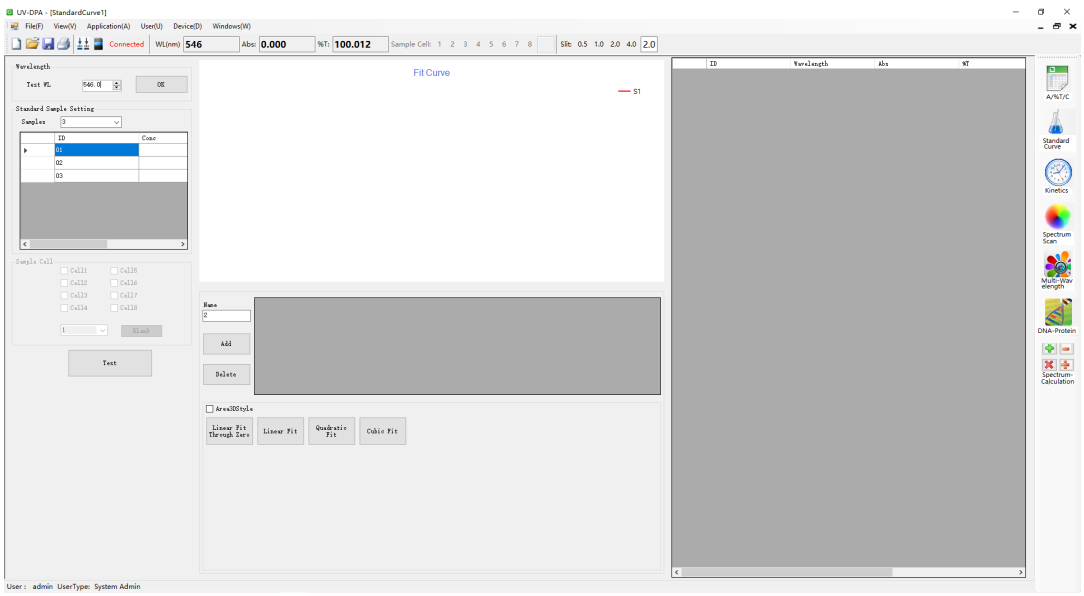
5.2 Quantitative Analysis

A calibration curve will be established by measuring the absorbance of several standard solutions. Four fitting methods can be chosen to establish the standard curve: Linear fit through zero, Linear fit, Quadratic fit and Cubic fit.

Measurement procedures for Quantitative Analysis:

1. Click the icon "

" in the studio directly to enter the quantitative analysis interface.



2. Input the wavelength value in the left pane and click "

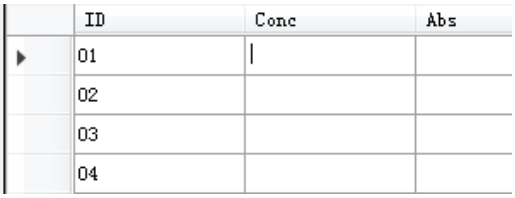
" to save the setting.

3. Set up the standard samples parameter: Select the number of

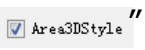
standard samples or input the number directly. Input the concentration of standard samples. Click the setting bar and input the value of the standard concentration when the cursor points to the conc. Column. Press Enter key to confirm each setting.

4. Put the reference solution of standard samples into the sample and reference cell holders. Click the shortcut icon " " in the toolbar. The system will calibrate the blank and set it to 0.000Abs/100.0%T.

5. Measure the standard samples: Put one standard sample solution into the sample cell holder and double-click when the cursor points to the corresponding Abs column. The measured Abs value will be recorded. Measure other standard sample solutions with the same operations.



6. Establish the fitting curve: After completing the standard sample measurements, click "

" to establish a standard curve with linear fit through zero. Linear fit. Quadratic fit or cubic fit is also available. View the standard curve in graphics area with 3D effect if " 

" is selected.

7. Measure samples: Put the sample reference solution into the sample cell holder and click the shortcut icon " ". The system will calibrate the blank. Then, put the sample solution into the sample cell holder and click " ". The testing results will be recorded in the data sheet.

8. After the measurement is completed, click the shortcut icon " " in the toolbar to save the test data. The file will be saved in Excel format. Click " " to print the test report.

5.3 Kinetics Analysis

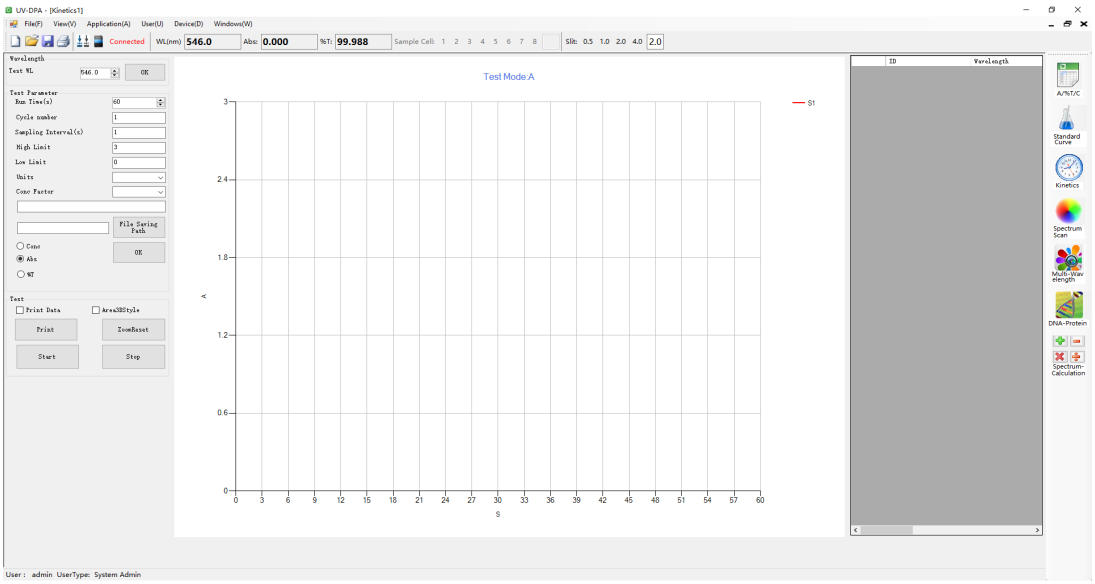
Kinetics Analysis is used to view the variation tendency of a sample at a specific wavelength in a certain time range. Carry out time scan with

absorbance or transmittance mode. Time scan with concentration mode is also available by setting concentration parameter.

Measurement procedures for Kinetics Analysis:

1. Click the icon "

" in the studio directly to open the kinetics analysis interface.



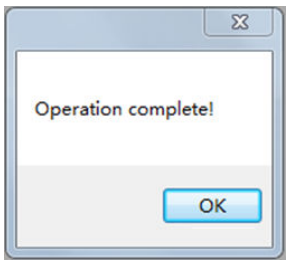
2. Set parameters for test wavelength, total scanning time, and sampling interval. Input the concentration factor when "Abs*F" is chosen and select the concentration unit. Then, click "

" to confirm the settings.

3. Put the reference solution into the sample and reference cell holders, click the shortcut icon "
" in the toolbar and the system will calibrate the blank to set to 0.000Abs/100.0%T.

4. Put the sample solution into the sample cell holder and click "

". There will be a real-time spectrum in the graphics area. When the scan is completed, there will be a dialog box as follows:



Click "OK" to exit the dialog box.

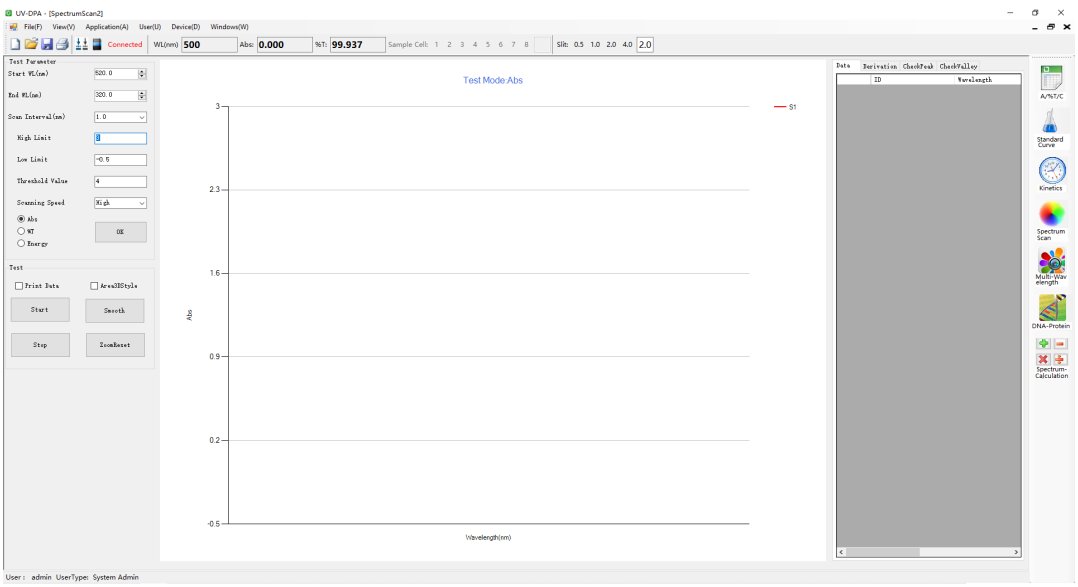
5. After the measurement is complete, view the time scanning data in the data sheet. Drag the graph by clicking on it and zooming in or out. Click " ZoomReset " to reset the graph. Click the shortcut icon "" in the toolbar to save the test data and the file will be saved in Excel format. Click "" to print the test report.

5.4 Wavelength Scan

A trace of absorbance, transmittance or energy in a wavelength range is carried out with wavelength scan. Qualitative analysis is also possible to determine components of a simple sample by this function.

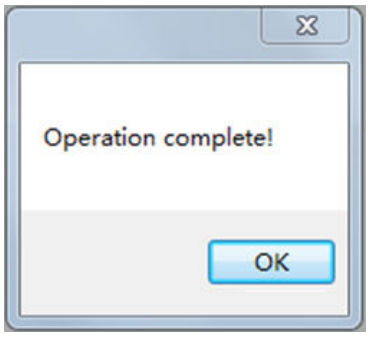
Measurement procedures for Wavelength Scan:

1. Click the icon " Spectrum Scan " in the studio to enter the wavelength scan interface.



2. Set parameters such as start wavelength, end wavelength, scan interval (nm) and scan speed, select the display mode such as Abs, %T and Energy. Then, click "OK" to confirm the settings.

3. Put the reference solution into the sample and reference cell holder, click the shortcut icon " " in the toolbar, the system will calibrate the baseline in the setting wavelength range. After the baseline calibration is completed, there will be a dialog as following:



Click "OK" to exit the dialog box.

4. Put the sample solution into the sample cell holder and click "Start" for wavelength scan. A real-time spectrum will be displayed in the graphics area. Click "Stop" to stop the wavelength scan if required.

5. After the measurement is complete, view the wavelength scanning data in the data sheet. Drag the graph by clicking on it and zooming in or out. Click "ZoomReset" to reset the graph. Click "Smoothing" if the spectrum requires smoothing and a view of 3D can be opened by selecting "Area3DStyle" if required. View the peak data and derivative data in the data sheet. Click the shortcut icon " " in the toolbar to save the test data. The file will be saved in Excel format. Click " " to print the test report.

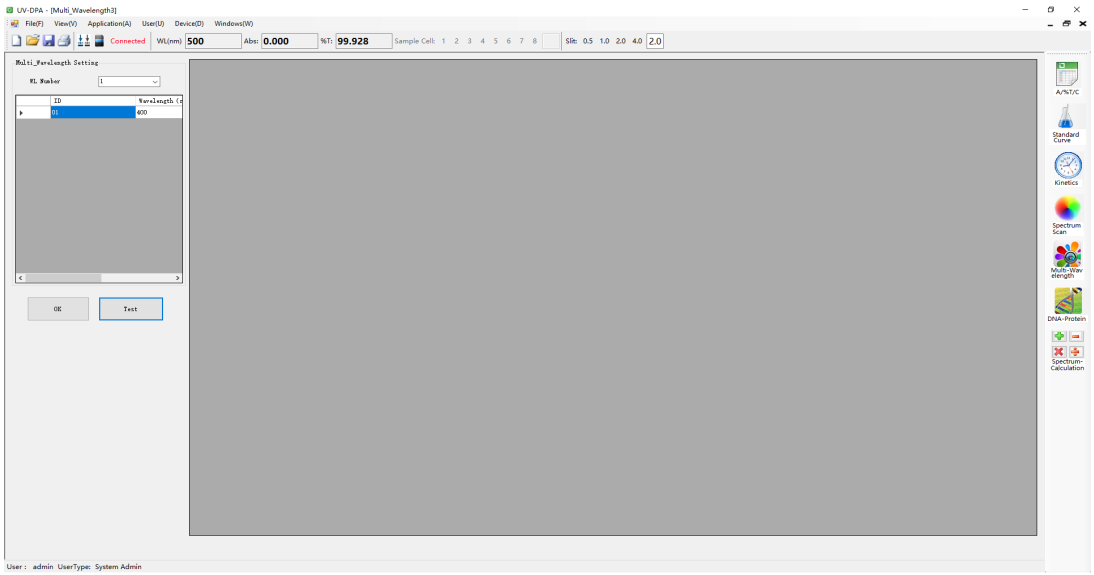
5.5 Multi-wavelength Analysis

Absorbance at several wavelengths can be quickly obtained with multi-wavelength Analysis and the Result (Abs.) can be calculated at the same time.

Measurement procedures for Multi-wavelength Analysis:

1. Click the icon "

" in the studio to open the multi-wavelength analysis interface.



2. Set up the wavelength(s) and calculation parameters in the window of wavelength list: Click the setting bar and input the wavelength value when the cursor points at it and press the Enter key to confirm the setting. Set the calculation parameter with the same operations. Click "

" to confirm the settings.

3. Put the reference solutions into the sample and reference cell holders click the shortcut icon "
" in the toolbar. The system will calibrate the blank and set to 0.000Abs/100.0%T at each wavelength.

4. Put the sample solution into the sample cell only and click "

" to start the measurement. Absorbance (Abs.) at each wavelength and the Result (Abs) will be displayed in the data sheet.

5. After the measurement is complete, click the shortcut icon " " in the toolbar to save the test data. The file will be saved in Excel format. Click " " to print the test report.

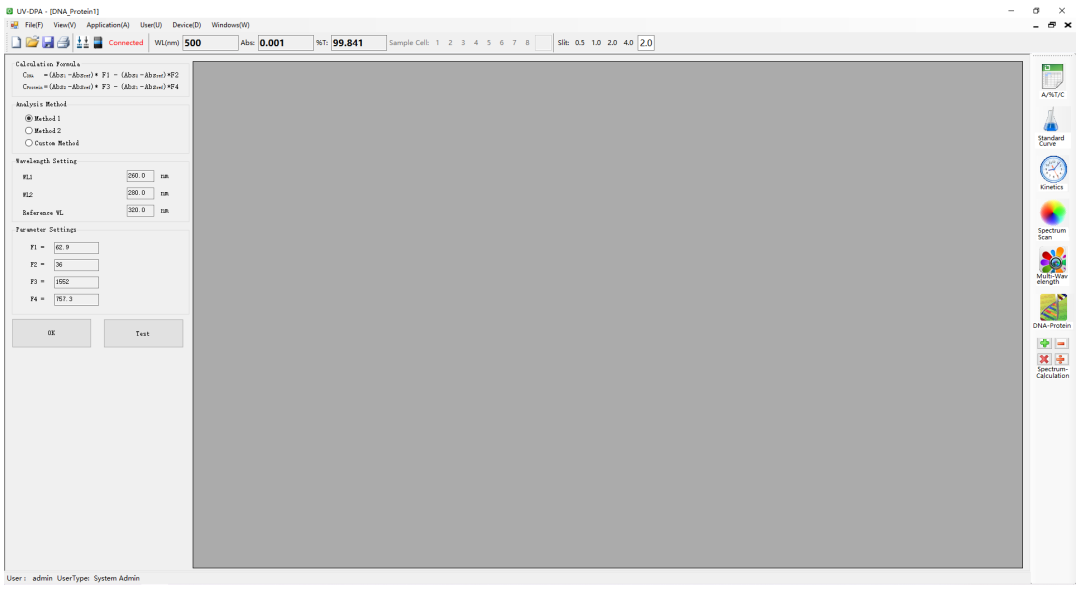
5.6 DNA/Protein Analysis

Quantitative analysis and purity test for DNA and protein can be carried out with DNA/Protein Analysis. There are three calculation methods to choose from: Method 1, Method 2, and Custom method. The concentration of DNA and protein and the ratio result depend on the chosen calculation method.

Measurement procedures for DNA/Protein Analysis:

1. Click the icon "

" in the studio to open the DNA/Protein analysis interface.



2. Select the calculation method. Input the wavelengths and calculation factors if the custom method is chosen. Click "

" to confirm the settings.

3. Put the reference solution into the sample and reference cells, click the shortcut icon " " in the toolbar. The system will calibrate blank and set to 0.000Abs/100.0%T at each wavelength.

4. Put the sample solution into the sample cell holder and click "Test" to start the measurement. Absorbance (Abs.) at each wavelength, the concentration of DNA (DNA Conc.), the concentration of protein (Protein Conc.) and the ratio will be displayed in the data sheet.

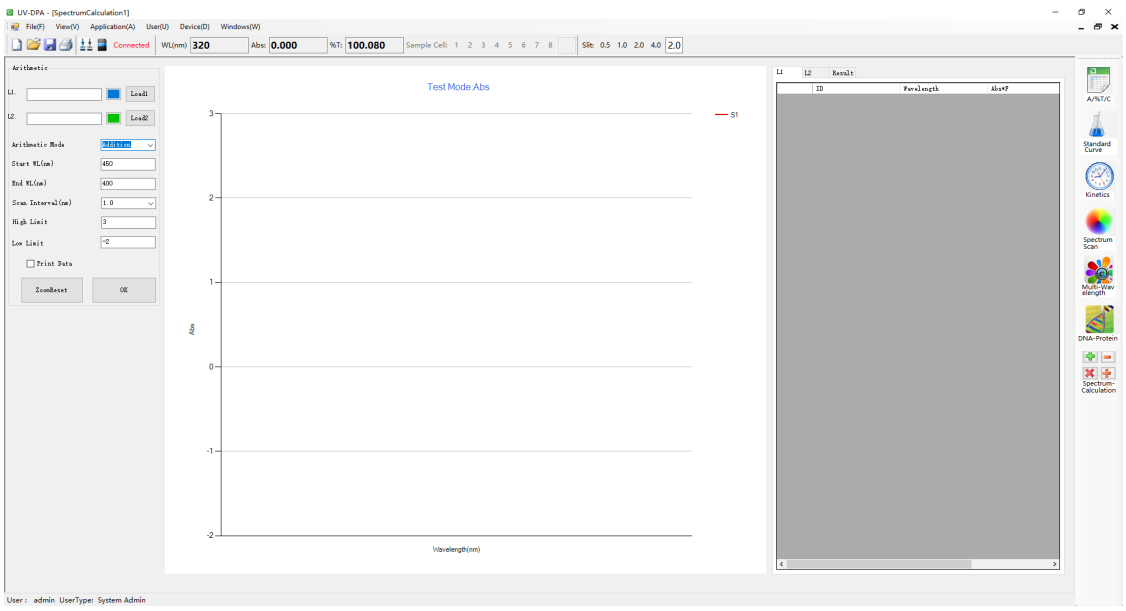
5. After the measurement is complete, click "" in the toolbar to save the test data. The file will be saved in Excel format. Click "" to print the test report.

5.7 Spectrum Calculation

For spectrums with the same scanning parameters, user can compare with each two spectrums. Obtain the spectrum calculation result with arithmetic mode.

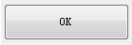
Operation procedures for Spectrum Calculation:

1. Click the icon "Spectrum-Calculation" in the studio to open the Spectrum calculation interface.



2. Load the spectrum: Click "" to change display color of each

spectrum. Click " " to load the first spectrum and click " " to load the second spectrum.

3. Set parameters of arithmetic mode, wavelength range for calculation that contains start wavelength and end wavelength and scan interval (nm). Click "  " to confirm the settings.

4. Data processing: View the spectrum calculation result in the data sheet. Drag the graph by clicking on it and zoom in or out. click " " to reset the graph. Click the shortcut icon " " in the toolbar to save the test data. The file will be saved in Excel format. Click " " to print the test report.

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