ESPECTROFOTÓMETRO UV/VIS 4510/7
4510/7 UV/VIS SPECTROPHOTOMETER
SPECTROPHOTOMÈTRE UV/VIS 4510/7

Este manual es parte inseparable del aparato por lo que debe estar disponible a todos los usuarios del equipo. Le recomendamos leer atentamente el presente manual y seguir rigurosamente los procedimientos de uso para obtener las máximas prestaciones y una mayor duración del mismo.

This manual should be available for all users of these equipments. To get the best results and a higher duration of this equipment it is advisable to read carefully this manual and follow the processes of use.

Ce manuel est une partie indissociable de l'appareil et doit être mis à la disposition de tous les utilisateurs de l'équipement. Nous vous recommandons de lire attentivement ce manuel et de suivre scrupuleusement les procédures d'utilisation afin d'obtenir des performances maximales et une plus longue durée de vie de l'appareil.

LANGUAGE INDEX

TABLE OF CONTENTS

SAFETY INFORMATION

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

- Do not open the device.
- Disconnect the device from the mains supply before carrying out maintenance work or changing the fuses.
- The inside of the device is a high-voltage area Danger!
- Do not use the device if it is damaged, especially if the main power cable way is in any damaged or defective.
- Repairs may only be carried out by the service technicians from our company.
- The device must be connected to a power outlet that has a protective ground connection.

- If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.
- Do not allow any liquid to enter into the device.
- Do not operate the device in a hazardous location or potentially explosive environment.

PACKAGE CONTENTS

Description	Quantity
Spectrophotometer	1 pc
Power cord	1 pc
Glass cuvette	4 pcs
Quartz cuvette	2 pcs
Dust cover	1 pc
Instruction Manual	1 pc

UNPACKING

Open the package and carefully check the packing list items; if you find missing or damaged items please contact your distributor.

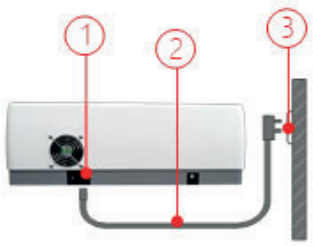
INSTALLATION

■ Placement

Place the instrument on the stable table carefully.

■ Connect the power cord

Check to confirm instrument power switch is turned off. Plug the female of the power cord into the power inlet of the instrument and plug the male into the power outlet.



1 - Power inlet
2 - Power cord
3 - Power outlet

■ Connect to a computer

Plug one end of the USB cable into the instrument's USB port (Type B, square) and the other end into the computer's USB port (Type A, flat).

Note: The USB cable is an accessory for the PC application and is not supplied with the instrument.

1 – USB port of computer (Type A, flat)
2 – USB port of instrument (Type B, square)

■ Connect other peripherals

1 – HDMI (Connect HD external display)
2 – VGA (Connect external display)
3 – Ethernet (connected to the network)
4 – USB (Connect USB flash drive, keyboard, mouse, WIFI, printer, etc.)
5 – Temperature controller port

SYMBOLS AND CONVENTIONS

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

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

OVERVIEW

4510/7 spectrophotometer used in Chemistry, Pharmaceuticals, Biochemical, Metallurgy, Light Industry, Textile, Material, Environments, Medical, Education and some other fields for Quality Control laboratories.

SPECIFICATIONS

Model	4510/7
Reference	HJD016
Optical system	Double beam, 1200 l/mm grating
Light source	Flash Xenon lamp
Detector	Dual silicon photodiode
Spectral bandwidth	1.8nm
Wavelength range	190-1100nm
Wavelength accuracy	±0.3nm
Wavelength repeatability	≤0.1 nm
Wavelength resolution	0.1 nm
Wavelength swing speed	10000 nm/min
Wavelength scanning speed	20-3200 nm/min
Photometric range	-0.3 to 3A, 0 to 200%T, 0 to 9999.9C
Photometric accuracy	±0.002 A @ 0.0 ~ 0.5 A, ±0.004 A @ 0.5 ~ 1 A, ±0.3 %T @ 0 ~ 100 %T
Photometric repeatability	≤0.001 A @ 0.0 ~ 0.5 A, ≤0.002 A @ 0.5 ~ 1 A, ≤0.1 %T @ 0 ~ 100 %T
Stray light	≤0.05%T @ 220nm & 340nm
Noise	≤0.0005 A @ 0.0 A, 260 nm, ≤0.001 A @ 1 A, 260 nm, ≤0.002 A @ 2 A, 260 nm
Baseline flatness	±0.001 A
Sample compartment	Reference holder (for 1 cuvette of 10 mm), sample holder (for 1 cuvette of 10 mm)
Display	10.1-inch IPS color capacitive touch screen, resolution 1280 x 800
Storage	64GB (built-in)
Interface	USB-A x 3, USB-B x 1, HDMI, VGA, Ethernet
Modes	Photometry, Multi Wavelength, Kinetics, Time Scanning, Quantitation, Spectrum Scanning, DNA/Protein
Power supply	100-240V AC, 50/60Hz
Dimensions	580×420×230mm
Weight	15 kg

GETTING STARTED

The following chart describes the basic operation of the instrument.

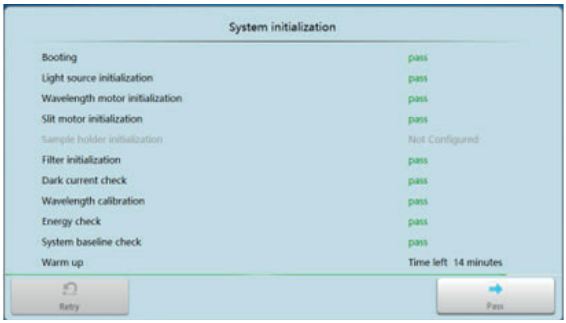
Turn the instrument power on/off

Switch on the power on the back of the instrument. Press the start/stop button on the front of the instrument to start.

Note: Do not turn the instrument on and off continuously and quickly. Wait at least 30 seconds before turning the instrument back on, otherwise the electrical and mechanical systems may be damaged.

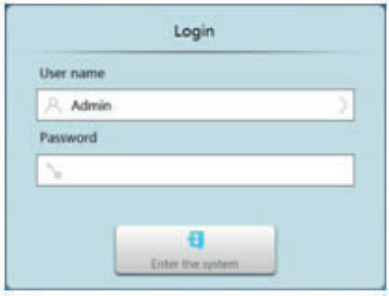
Self-check and calibration

Check the instrument sample chamber and remove anything from the light path. Launch the application **UV Studio** after double-clicking the icon on the Windows desktop. The instrument starts self-test. Self-check includes the following steps: Turn on lamp and positioning light source switching mechanism - Positioning filter disc - Positioning slit switching mechanism (If Installed) - Positioning automatic sample holder (If Installed) - Get dark current - Positioning wavelength - Checking energy - Checking system baseline.



User login

If the user has selected the “User Management and Audit Trail” module, after the self-test is completed, enter the “User Login” interface, select the user name and enter the password and press “Login” to enter the system.



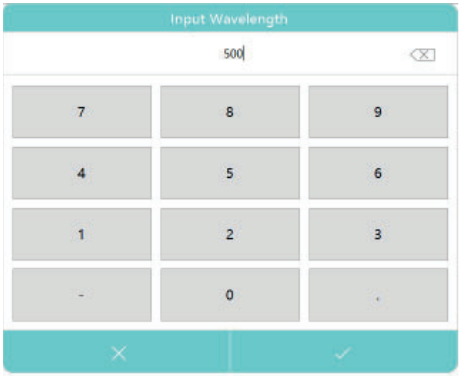
GENERAL OPERATING INSTRUCTIONS

■Touch screen using tips

The entire screen can be started with a touch. To make a choice, use your nails, fingertips, pencil, or stylus to press the screen. Don't press the screen with sharp objects (such as ball point).

■Using the keyboard

The instrument provides two kinds of keyboards for different situations. The numeric keypad is used to input parameters, and the full keyboard is used to input user information and file names.



Basic Operation

- Enter an application module

Main interface, press an application icon.

	Photometry Measure the photometric value of a sample at a single wavelength.
	Multi wavelength Measure the photometric value of a sample at multiple wavelengths.
	Kinetics Measure the change in absorbance or absorbance change rate over time at a specified wavelength.
	Time scanning Measure the change of photometric value with time at a single wavelength.
	Quantitation Establish a standard curve and measure the concentration of the sample using a standard curve.
	Biological measurement Measure DNA, RNA and protein concentrations using built-in methods or new methods.
	Spectrum scanning Measure the photometric curve of a sample over a range of spectrum.
	User management Assign user rights, operate log management.
	Performance verification Verify the technical performance of the instrument.
	File management Efficient management of user files, browsing, copying, renaming, and deleting operations.
	Custom method Users can add calculation methods for special applications or exploratory studies according to their needs.
	System Set system parameters and system calibration.

- Back to main interface
Measurement interface, press  back to main interface.

- Return to previous interface
Method/Settings/Data list/Curve list interface, press  back to previous interface.

- Measure the sample
Measurement interface, put the reference in the reference cuvette holder and the sample in the sample cuvette holder; read the value shown in the screen or press the button ▶ to perform the measurement.

- Enter data/curve list
Measurement interface, press to enter data/curve list.

■Measurement Results Operation

	**Open** Open a stored file, load data or parameters.
	**Save** Save data, parameters to storage.
	**Print** Print test report.
	**Export to MS Word** Export file to MS Word format.
	**Export to MS Word file format** Export file to MS Excel format.
	**Export to PDF** Export file to PDF format.
	**Delete** Delete the selected results.

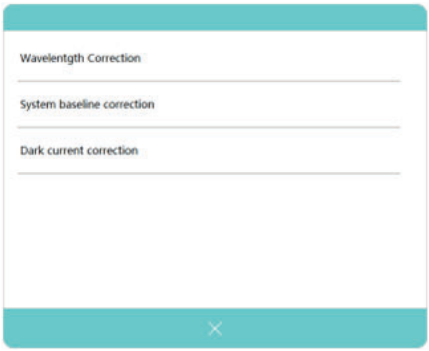
CALIBRATION AND SYSTEM SETTINGS

Select the icon in the main interface. Display options to calibrate the system and configure the basic instrument settings.

■ Calibration:

Select the tab **Calibration** in the System interface. Remove something from the measurement channel, close the sample chamber cover, and select the item **Wavelength calibration, System baseline calibration or Dark current calibration** to do calibration.

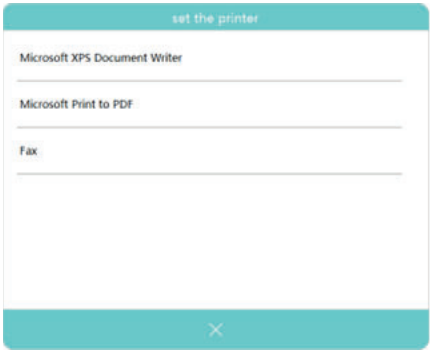
Important! Before performing the calibration, you must remove something from the measurement channel, close the sample chamber cover, and maintain this state throughout the calibration process.



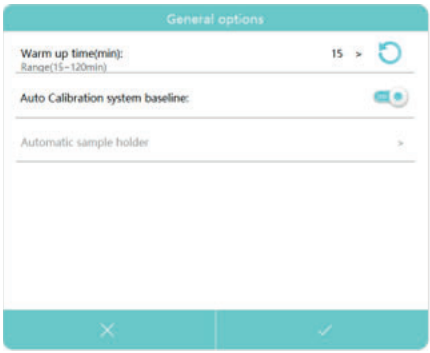
■ **Result resolution setting:**
Press the tab **Result resolution.** Select the resolution of the required display digits according to different measurement modes.

■ **Language setting:**
Press the tab **Language** and select the desired language.

■ **Printer setting:**
Press the tab **Printer** and select the installed printer.



■ **General settings:**
Press the tab **General options** to enter.



- Warm up:
Press “Warm up time”, pop up numeric keyboard, input value 1～120 minutes, and press the button ✓ to complete the setting.

- Calibration of system baseline when boot:
Press the icon to turn on/off the “Calibration of system baseline when boot” option.

MEASUREMENT

■ **Important Guidelines**

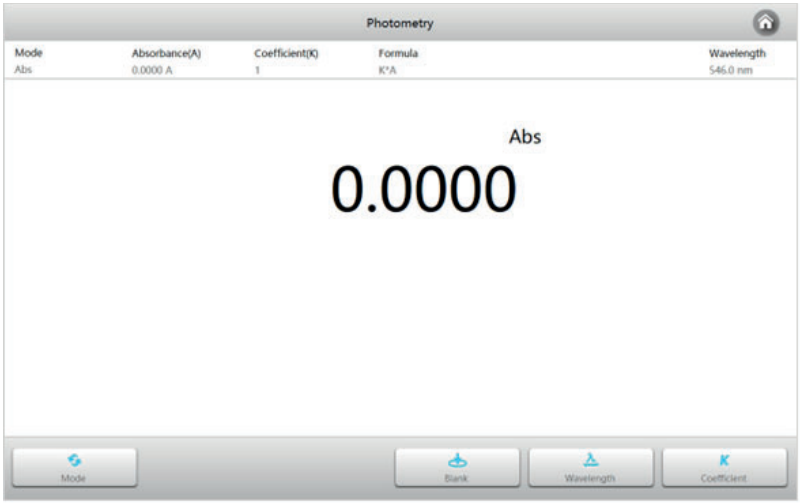
- Reagents and dilution buffers can cause cauterization and other damage to health.
- Samples (nucleic acids, proteins, bacteria cultures) can be infectious and cause serious damage to health.
- During sample preparation, measuring procedures and maintenance and cleaning work, observe all local laboratory safety precautions (e.g. wear protective clothing and gloves, use of disinfectant) regarding the handling of sample material.
- Dispose of measuring solutions and cleaning and disinfectant materials in accordance with the relevant local laboratory regulations.

■ **Check the cuvettes**
The cuvettes must be clear and there’s no remains of the samples on the surface of it. **Only Quartz cuvettes are permitted to be used in the UV region.**

■ Photometry

Photometry mode is used to measure the photometric value of the sample at a single wavelength.

- Main interface, press the icon to start a **Photometry** application.



1. Press the icon to switch to the measurement mode.

Abs	Measure absorbance value of the sample(s).
%T	Measure transmittance value of the sample(s).
%R	Measure reflectance value of the sample(s).

2. Press the button to set wavelength, key in the measurement wavelength.

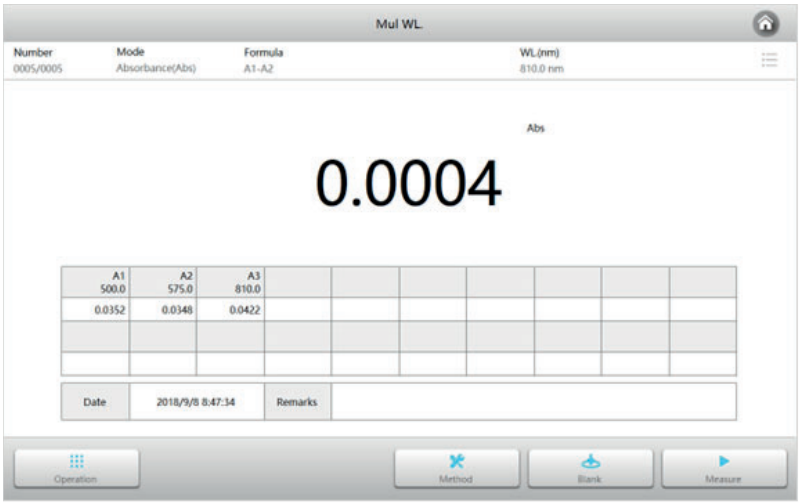
3. If the selection mode is Abs, you can calculate K*A by pressing the button to set the coefficient K.

4. Put the reference in the reference cuvette holder and the sample in the sample cuvette holder, close the sample chamber lid and read the value shown in the screen.

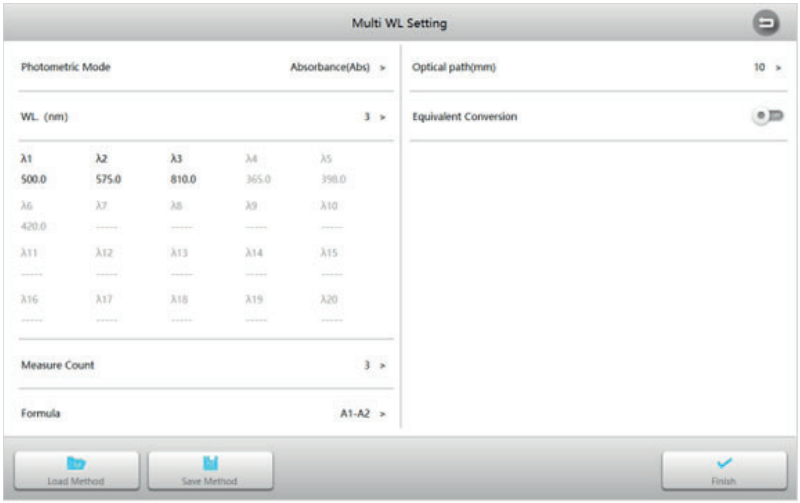
■Multi wavelength

Multi wavelength mode is used to measure the photometric value of the sample at multiple wavelengths.

- **Main** interface, press the icon to start a **Multi wavelength** application.



1. **Multi wavelength** interface, press the button to set the measurement parameters. The method can be saved or directly called from the memory. Press to accept the new parameters and return to the measurement interface.

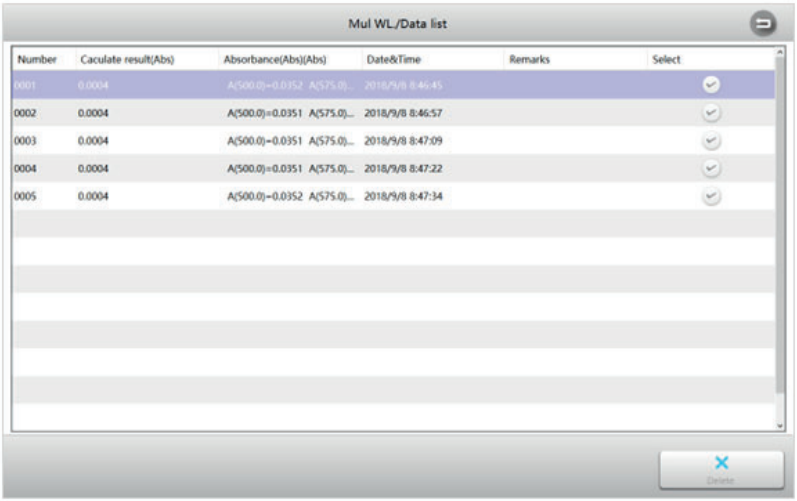


Photometric mode	3 photometric modes: Abs, %T and %R.
Wavelength	1~20 wavelengths are available, wavelength range: 190~1100nm.
Cycles	1, 2, 3, 5, 10, 20, 30, 50 times can be selected, the instrument will calculate the average as the final output.
Calculation formula	The instrument can choose to embed the calculation formula to directly calculate the result. The formula can support user customization (in the custom method module).
Light path length	The width of the cuvette used for the measurement.
Equivalent conversion	When activated, the instrument automatically converts measurements from different path cuvettes to values in the 10mm light path length.

2. Put the reference in the reference cuvette holder and the sample in the sample cuvette holder, close the sample chamber lid and press the button ▶ to measure and get calculation results.

3. Repeat step 2 to measure more samples.

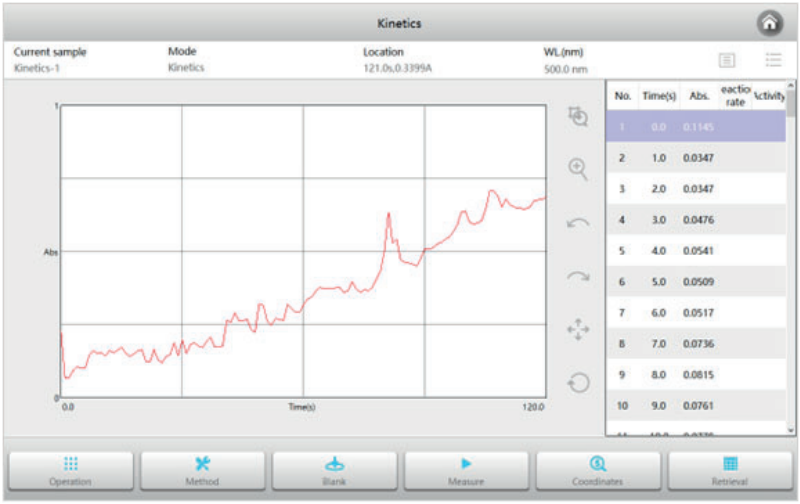
4. Press ☰ to switch to list mode to browse the list of measurement results.



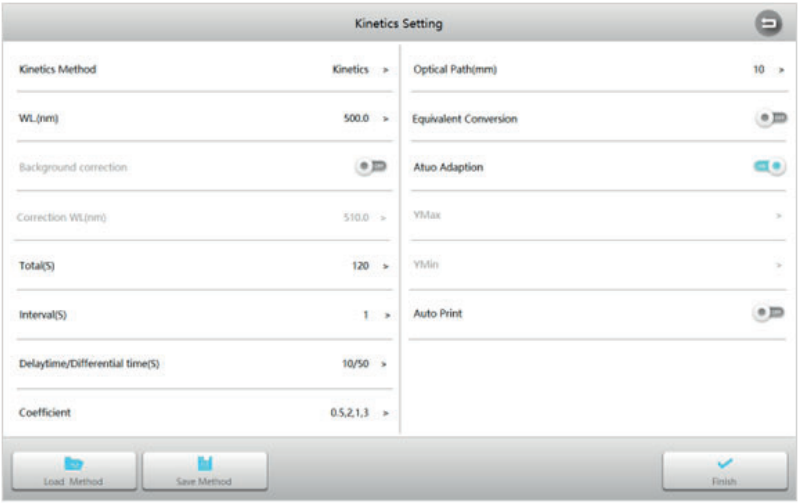
■Kinetics

Kinetics mode is used to measure the rate of change of the sample.

- **Main** interface, press the icon to start a **Kinetics** application.



1. **Kinetics** interface, press the button to set the measurement parameters. The method can be saved or directly called from the memory. Press the button to accept the new parameters and return to the measurement interface.



Measurement mode	2 measurement modes: kinetics, kinetic rate.
Wavelength	Measurement wavelength, range: 190~1100nm.
Background correction	Background correction switch, can be set according to actual needs.
Corrected wavelength	Background corrected wavelength, range: 190~1100nm.
Total	Total sampling time required.
Interval	Sampling interval.
Delay/Derivative	Waiting time before starting sampling/time of participating activity calculation.
Coefficient	Coefficient of activity calculation equation.
Light path length	The width of the cuvette used for the measurement.
Equivalent conversion	When activated, the instrument automatically converts measurements from different path cuvettes to values in the 10mm light path length.
Auto scale	Whether to automatically adjust the coordinates based on the data.
Y max	Maximum value of the ordinate (valid only when the coordinates are fixed).
Y min	Minimum value of the ordinate (valid only when the coordinates are fixed).
Automatic printing	Automatically print curves and results after measurement is complete.
Automatic save	Automatically save curves and results after measurement is complete.

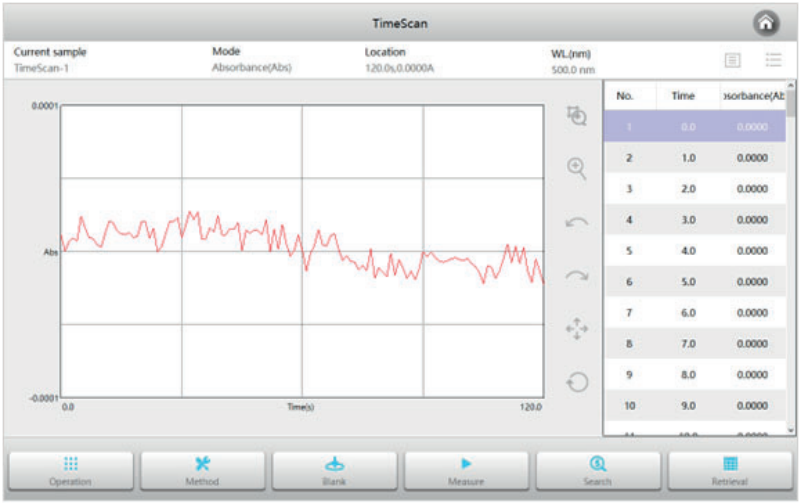
2. Put the reference in the reference cuvette holder and the sample in the sample cuvette holder, close the sample chamber lid and press the button ▶ to measure and get sampled data and draw the curve.

3. Repeat step 2 to measure more samples.

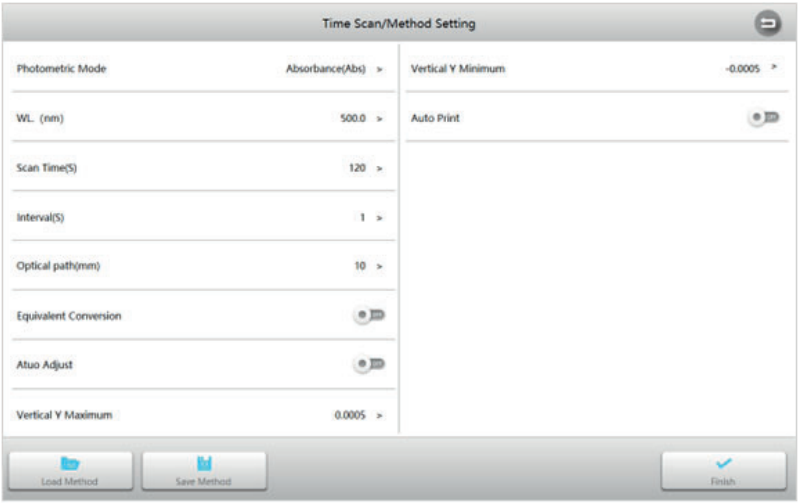
■Time scanning

Time scanning mode is used to measure photometric value changes of the sample.

- **Main** interface, press the icon to start a **Time scanning** application.



1. **Time scanning** interface, press the button to set the measurement parameters. The method can be saved or directly called from the memory. Press to accept the new parameters and return to the measurement interface.



Photometric mode	3 photometric modes: Abs, %T and %R.
Wavelength	Measurement wavelength, range: 190~1100nm.
Scan time	Total sampling time required.
Interval	Sampling interval.
Light path length	The width of the cuvette used for the measurement.
Equivalent conversion	When activated, the instrument automatically converts measurements from different path cuvettes to values in the 10mm light path length.
Auto scale	Whether to automatically adjust the coordinates based on the data.
Y max	Maximum value of the ordinate (valid only when the coordinates are fixed).
Y min	Minimum value of the ordinate (valid only when the coordinates are fixed).
Automatic printing	Automatically print curves and results after measurement is complete.
Automatic save	Automatically save curves and results after measurement is complete.

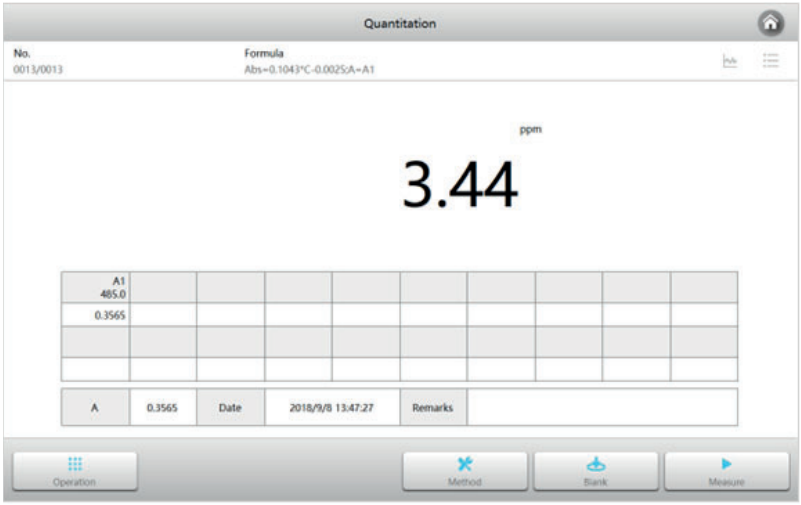
2. Put the reference in the reference cuvette holder and the sample in the sample cuvette holder, close the sample chamber lid and press the button ▶ to measure and get sampled data and draw the curve.

3. Repeat step 2 to measure more samples.

■Quantitation

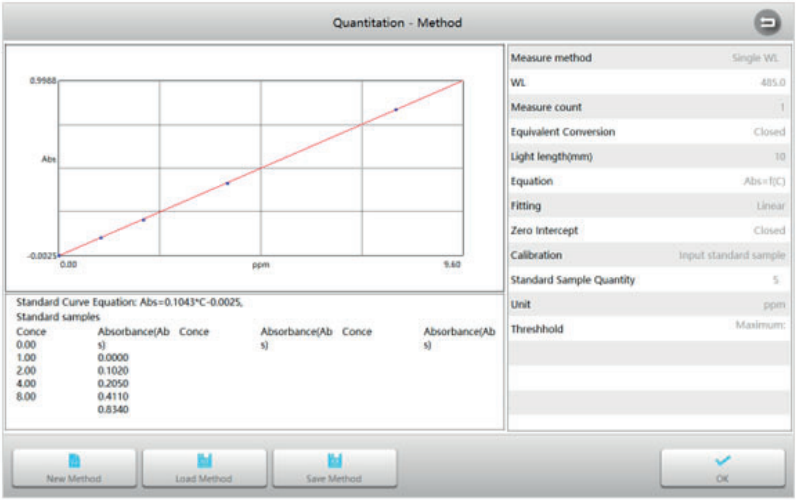
Quantitation mode is used to measure sample concentration by establishing and using a standard curve.

- **Main** interface, press the icon to start a **Quantitation** application.

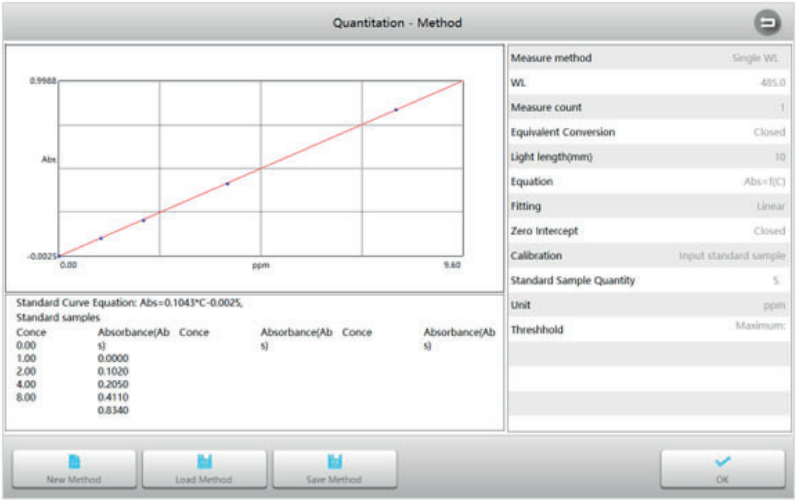


Establish quantitative methods

1. **Quantitation** interface, press the button to enter into **Method** interface.



2. **Method** interface, press the button to start a new measurement method and enter the parameter setting interface.



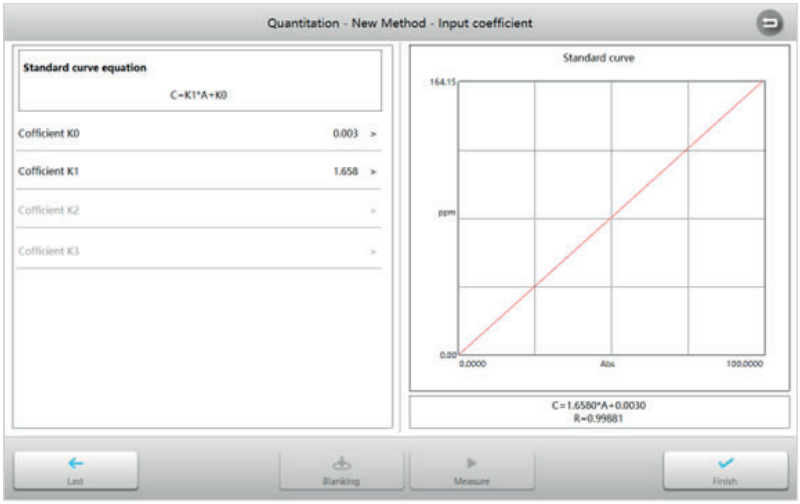
Measurement method	Built-in single wavelength, dual wavelength difference, dual wavelength ratio, three wavelengths, area 5 ways, and support custom formula.
Wavelength	Measuring wavelength, range: 190~1100nm.
Cycles	1, 2, 3, 5, 10, 20, 30, 50 times can be selected, the instrument will calcu-late the average as the final output.
Light path length	The width of the cuvette used for the measurement.
Equivalent conver-sion	When activated, the instrument automatically converts measurements from different path cuvettes to values in the 10mm light path length.
Equation	Equation form: C=F(Abs) and Abs=F(C).
Fitting	Three ways of fitting are provided: first order, second order, third order.
Zero intercept	When turned on the representative fitting curve will directly cross the zero point, and when closed will represent the fitting curve without zero point.
Calibration	Three ways to generate a standard curve: inputting equation coefficient, meas-uring standard samples and inputting standard sample values.
Unit	Built-in 19 commonly used concentration units: -, %, ppm, ppb, g/l, mg/l, μg/l, ng/l, g/dl, mg/dl, μg/dl, mg/ml, μg/ml, ng/ml, μg/μl, ng/μl, mol/l, mmol/l, IU, and support input custom units.
Number of standard samples	The number of standard samples can be selected (only valid for standard sam-ple calibration and standard sample input), quantity: 2~20.
Threshold	Upper and lower limits of measurement results.

3. Establish the standard curve

3.1 Establish the standard curve by inputting the equation coefficient

1) Set **Calibration** to **Input Equation Coefficient,** set other measurement parameters according to measurement requirements, and press the button → to start.

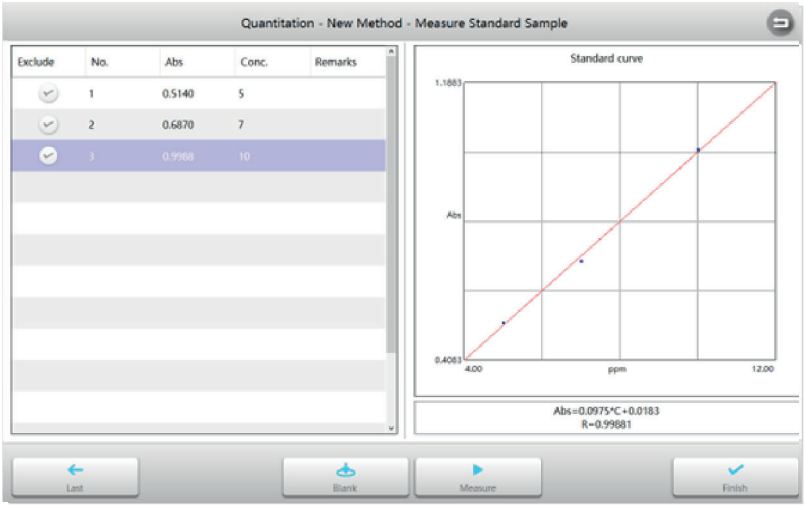
2 **Input Equation Coefficient** interface, press the coefficient K0～Kn to pop up the keyboard and enter the coefficient.



3) After the method is completed, the standard curve and related information are displayed. Press the button ✓ to complete and return to **Method** interface.

3.2 Establish the standard curve by measuring standard samples

1) Set **Calibration** to **Measure standard samples**, set other measurement parameters according to measurement requirements, and press the button → to start.



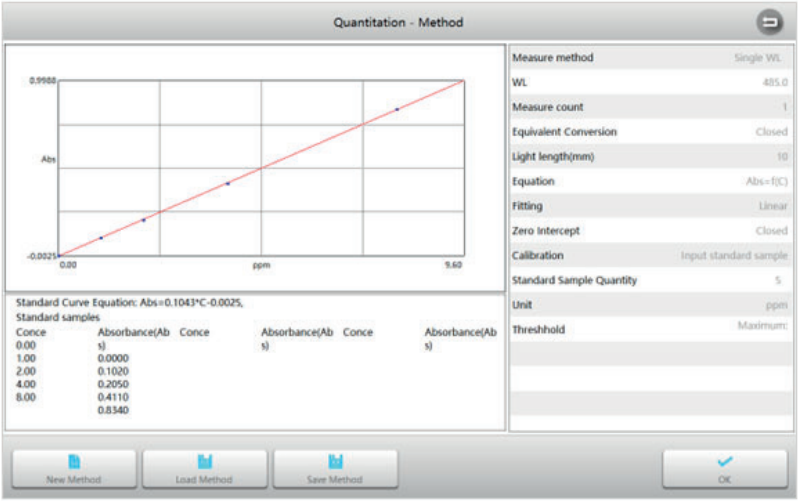
2) **Measure standard sample** interface, put the reference in the reference cuvette holder.

3) Put the standard sample in the sample cuvette holder, close the sample chamber lid and press the button ▶ to measure.

4) Repeat step 3 to measure all standard samples.

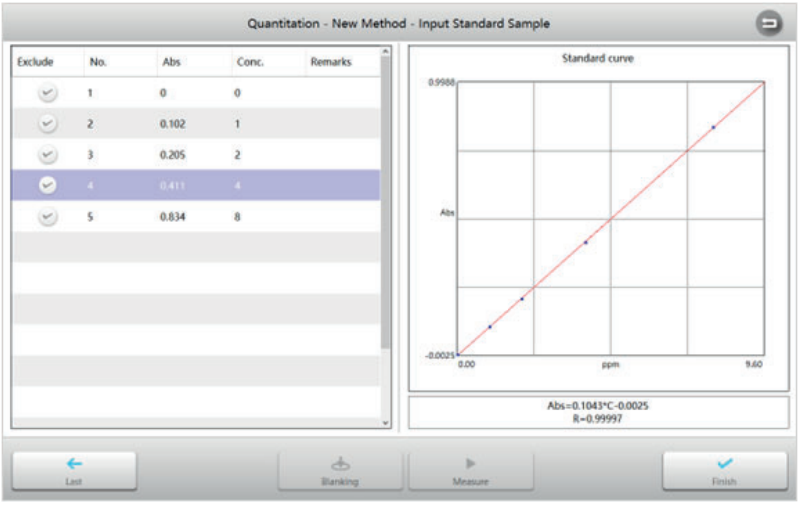
5) Press the concentration cell to enter the corresponding concentration value.

6) After the method is completed, the standard curve and related information are displayed. Press the button ✔ to complete and return to **Method** interface.



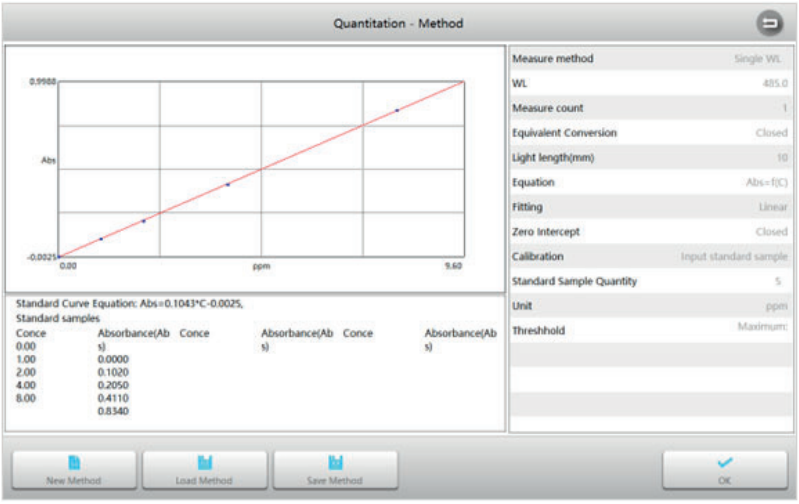
3.3 Establish the standard curve by inputting standard samples

1) Set **Calibration** to **Input standard samples**, set other measurement parameters according to measurement requirements, and press the button → to start.



2) Press the **Abs** cell to input absorbance value and press **Conc** cell to input the corresponding concentration value.

3) After the method is completed, the standard curve and related information are displayed. Press the button ✓ to complete and return to **Method** interface.



Measure sample

1. **Quantitation** interface, press the button to enter into **Method** interface.

2. **Method** interface, load a method or establish a new method, press the button to accept and return to measurement interface.

3. Put the reference in the reference cuvette holder.

4. Put the sample in the sample cuvette holder, close the sample chamber lid and press the button to measure and get calculation results.

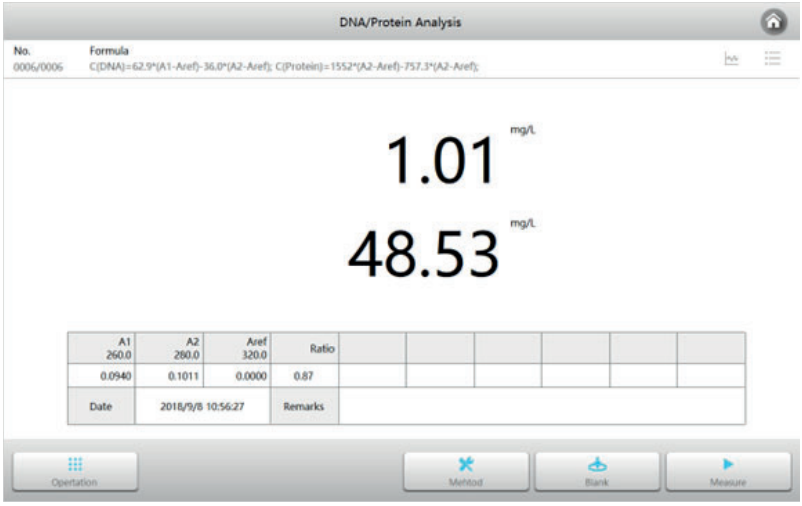
5. Repeat step 4 to measure more samples.

6. Press to switch to list mode to browse the list of measurement results.

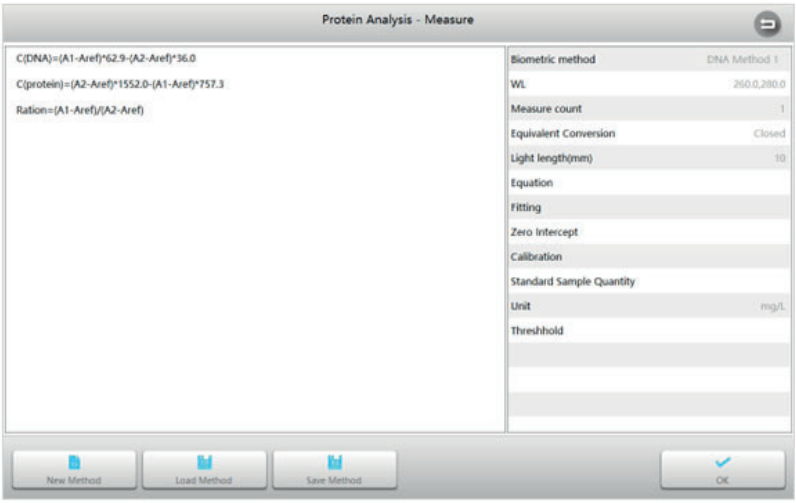
■ Biological measurement

Biological measurement mode is used to measure DNA, RNA and protein concentrations using built-in methods or new methods.

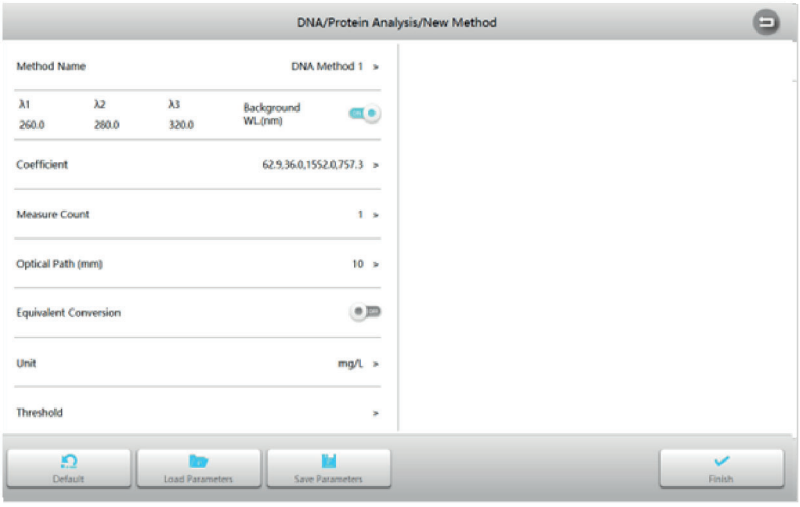
- **Main** interface, press the icon to start a **Biological measurement** application.



1 **Biological measurement** interface, press the button to enter into **Method** interface.



2 **Method** interface, press the button to start a new measurement method and enter the parameter setting interface.



Measurement method	Built-in 7methods: DNA-1(260/280), DNA-2(260/230), UV method, Lowry method, BCA method, CBB method, Biuret method.
Wavelength	Measure wavelength, range: 190~1100nm.
Coefficient	Calculate the coefficient required for concentration (related to the specific measurement method)
Light path length	The width of the cuvette used for the measurement.
Equivalent conversion	When activated, the instrument automatically converts measurements from different path cuvettes to values in the 10mm light path length.
Unit	Built-in 19 commonly used concentration units: -, %, ppm, ppb, g/l, mg/l, μg/l, ng/l, g/dl, mg/dl, μg/dl, mg/ml, μg/ml, ng/ml, μg/μl, ng/μl, mol/l, mmol/l, IU, and support input custom units.
Threshold	Upper and lower limits of measurement results.

3 **Method** interface, load a method or establish a new method, press the button to accept and return to measurement interface.

4 Put the reference in the reference cuvette holder.

5 Put the sample in the sample cuvette holder, close the sample chamber lid and press the button to measure and get calculation results.

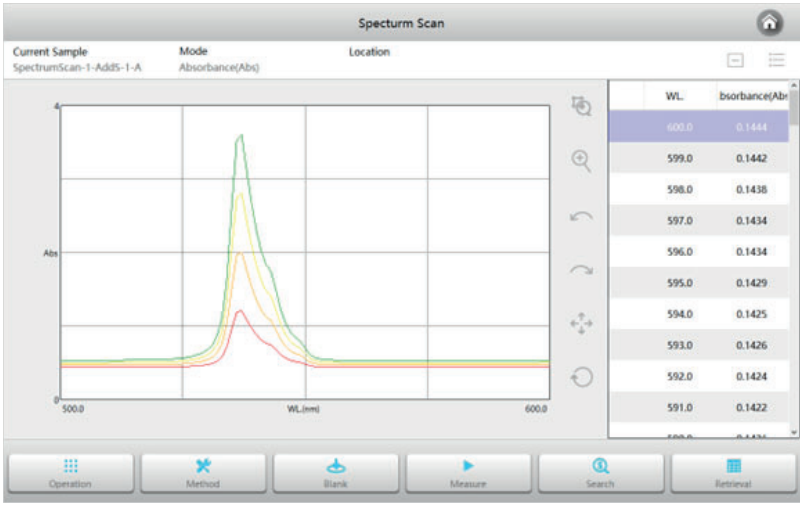
6 Repeat step 5 to measure more samples.

7 Press to switch to list mode to browse the list of measurement results.

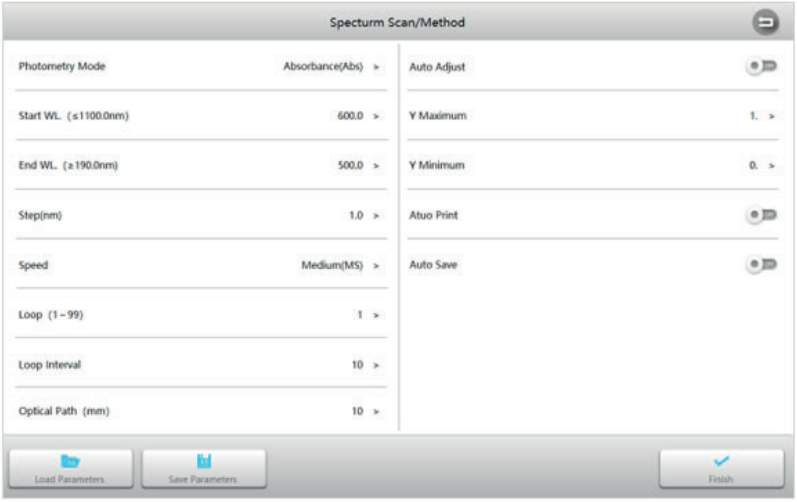
■ Spectrum scanning

Spectrum scanning mode is used to obtain the photometric curve of a sample in a wavelength range.

- **Main** interface, press the icon to start a **Spectrum scanning** application.



1. **Spectrum scanning** interface, press the button to enter into **Method** interface.



Photometry mode	3 photometric modes: Abs, %T and %R
Start wavelength	Scan start wavelength, range: 190~1100nm
End wavelength	Scan end wavelength, range: 190~1100nm
Step	6 wavelength intervals selectable: 0.1, 0.2, 0.5, 1.0, 2.0, 5.0 nm
Speed	3 scan speeds selectable□quick, medium, slow
Loop	Scan times
Loop interval	Interval between 2 scans
Light path length	The width of the cuvette used for the measurement
Auto scale	Whether to automatically adjust the coordinates based on the data
Y max	The maximum value of the ordinate (valid only when the coordinates are fixed)
Y min	Minimum value of the ordinate (valid only when the coordinates are fixed)
Automatic printing	Automatically print curves and results after measurement is complete
Automatic save	Automatically save curves and results after measurement is complete

2. Put the reference in the reference cuvette holder.

3. Put the sample in the sample cuvette holder, close the sample chamber lid and press the button ▶ to scan sample and draw the curve.

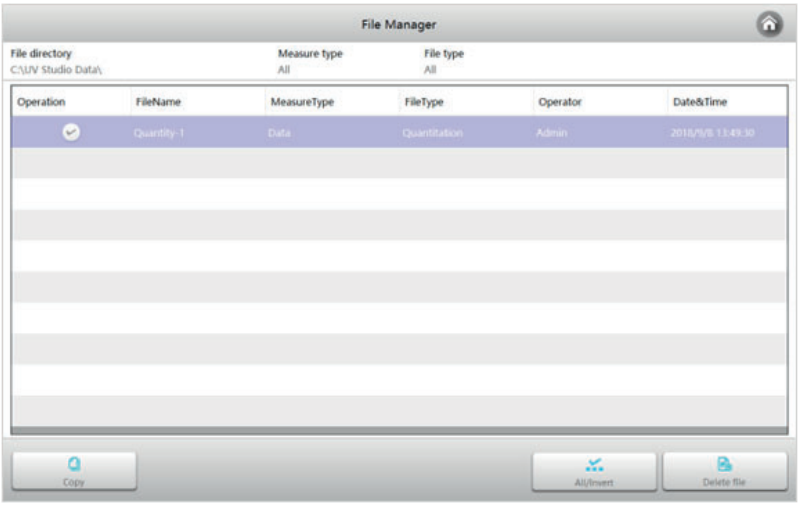
4. After the scan is complete, press the button to zoom the graph as needed.

5. Press the button to retrieve the value of each point (peak) of the curve and mark it for a specific point.

File management

File management is used to manage saved parameters, methods, and measurement files.

- **Main** interface, press the icon to start **File management.**



Browse file list:
File management interface displays the data files stored in the storage, including data, methods and parameters. Press **Measurement type and File type** to set the filter conditions and display the corresponding file types.

Delete files:
Select the file you want to delete and then press the button to delete it.

Copy files:
Select the file you want to copy, then press the button **Copy**, pop up the **Path selection** form, select target path and press the button .

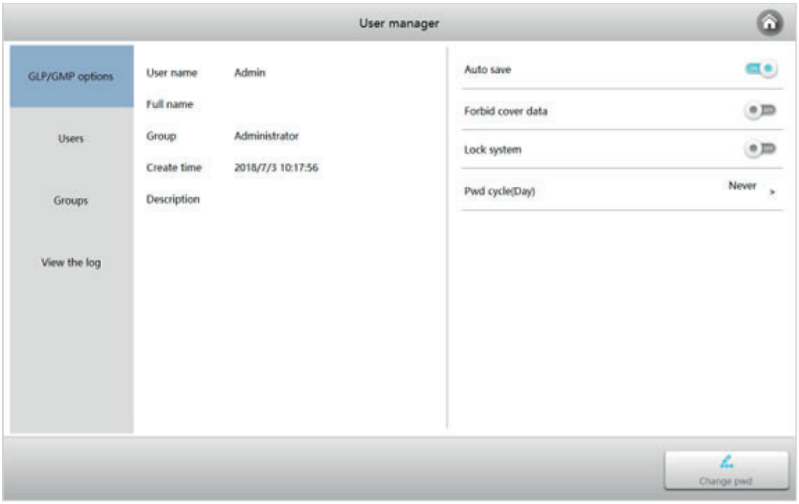
Rename file name:
Press the file name you want to rename, pop up the keyboard, enter a new file name, and press the button to complete the modification.

■User management and audit trail

User management is used to manage user permissions, operation logs, etc.

- Main interface, press the icon  to start **User management.**

Note: Only authorized users can enter the module to perform the corresponding operations. Usually, an administrator or some advanced users.

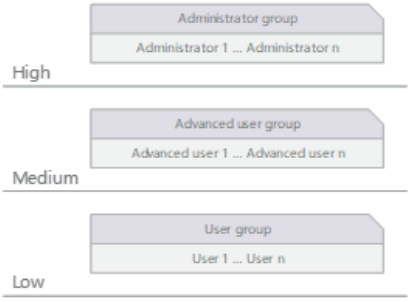


GLP/GMP options:

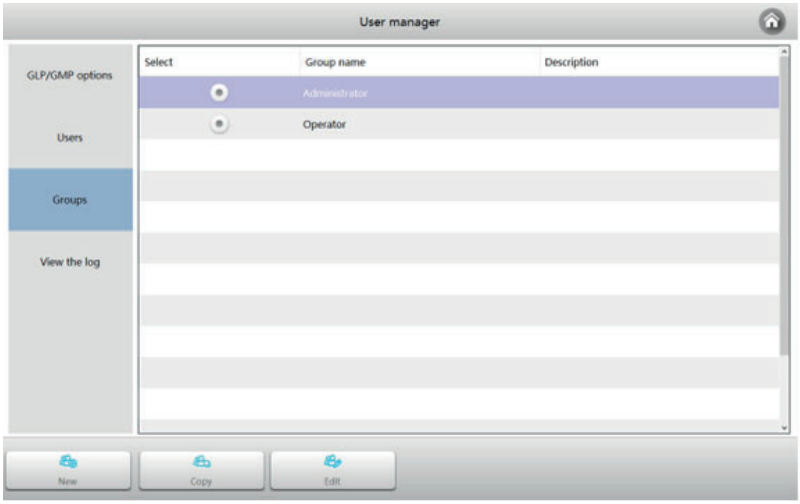
GLP/GMP options contains four options: “Automatic Data Saving”, “Disable Overwriting Data”, “Allow Locking System” and “Password Replacement Period”, which can be enabled/disabled by the administrator as needed.

Users and user groups:

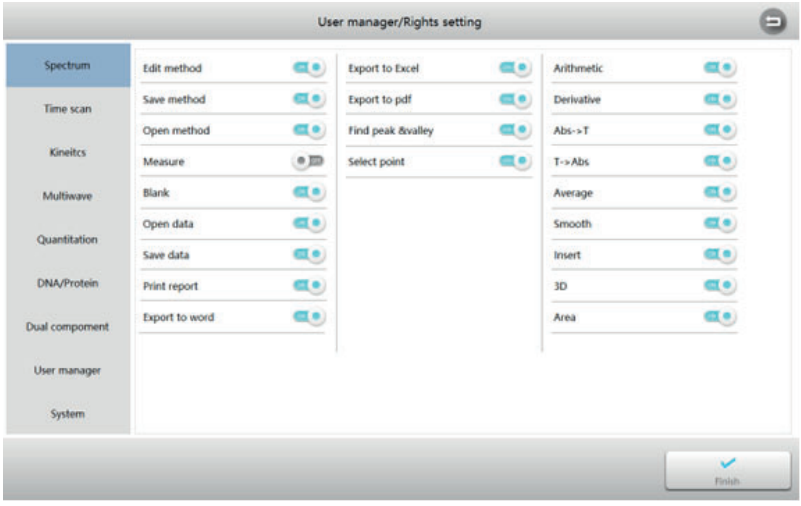
The module is divided into three layers of management structure. Each layer exists in the form of a group. All members belong to different groups. Group members in different levels can separately assign the permissions available for allocation within the level.



1) Operation of user groups:
User management interface, press the tab **Groups** to enter user group management.



- Create a new user group
Press the button to create a new user group, assign the permissions that the group has, and press the button when done.



- Copy a user group
Select the user group you want to copy, then press the button to copy a user group with the same permissions and press the button to complete.

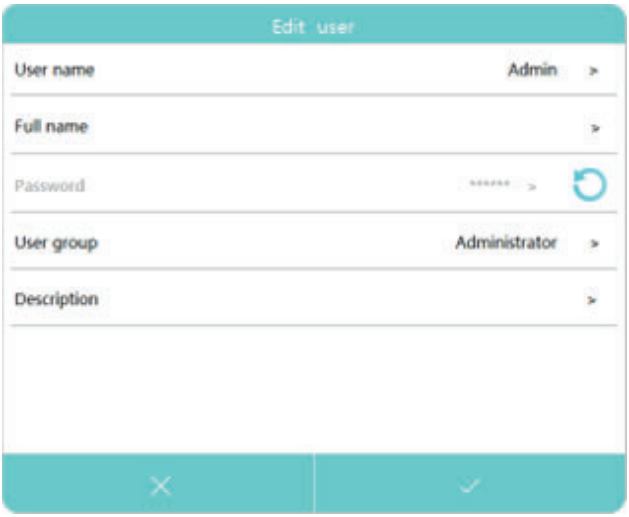
- Edit a user group
Select the user group you want to edit, then press the button to edit a user group and press the button to complete.

2) Operation of user:

User management interface, press the tab **Users** to enter user management.

- Copy a user
Select the user you want to copy, then press the button to copy a user with the same permissions and press the button to complete.

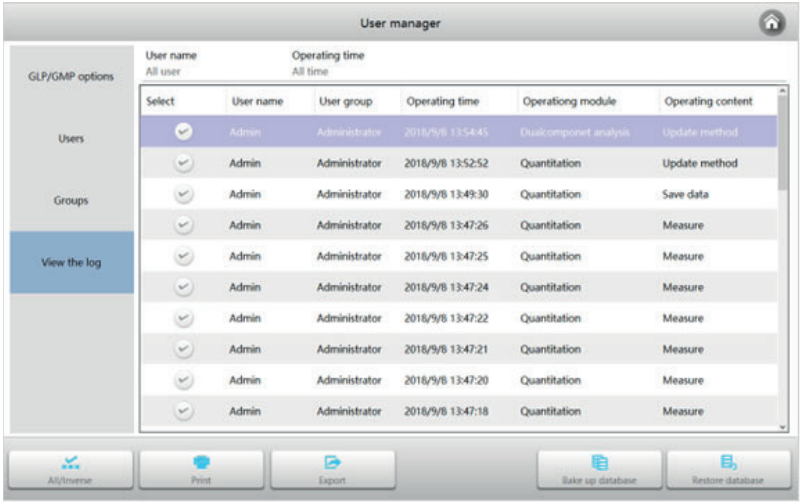
- Edit a user
Select the user you want to edit, then press the button to edit user name, description information, password, etc., and press the button to complete.



- Lock/unlock user:
Select the user who needs to lock/unlock, and then press the button to lock the original active user. It is temporarily unavailable. If you need to re-enable it, select the user to press the button again.

Audit trail:

User management interface, press the tab **Log** to enter log management.



3) Browse operation log
Press **User Name** to select the user who needs to browse the log. Press **Operation Time** to select the time range for viewing the operation log of one or all users.

4) Print log
Select the log content you want to print and press the button to print the log contents.

5) Export log
Select the log content you want to export, press the button , and select the export path to export the log content.

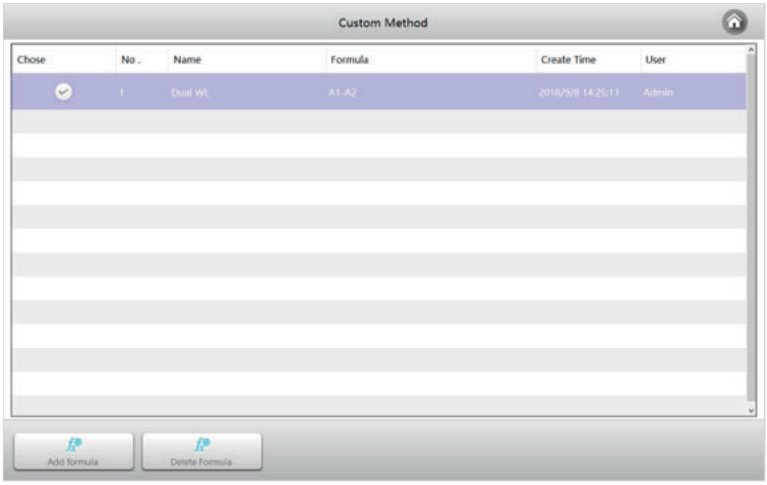
6) Database backup
Press the button to back up the database to other storage after selecting the backup path.

7) Database recovery
Press the button to select the backed-up database file to restore the database to the instrument default storage location.

■ Formula editor

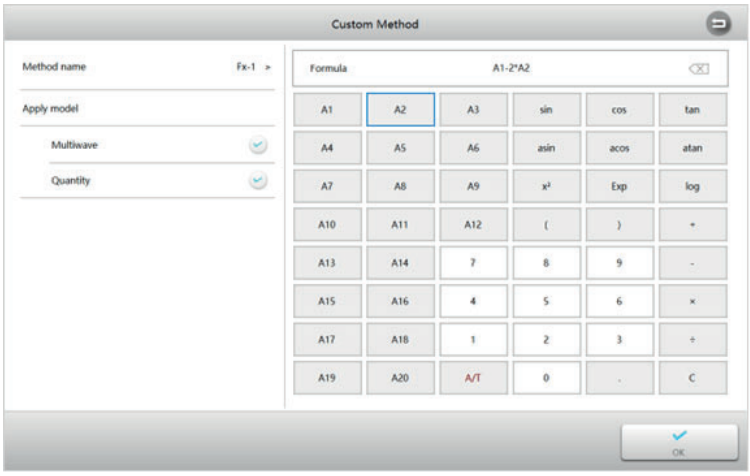
Method editor is used to write formulas for photometric calculations.

- Main interface, press the icon  to start **Formula editor.**



Add calculation formula:

Formula list interface, press the button **Add formula** to enter to **Formula editor** interface. Enter the formula name as required by pressing the label **Formula Name**, select the applied module, enter the calculation formula and press the button  to complete.



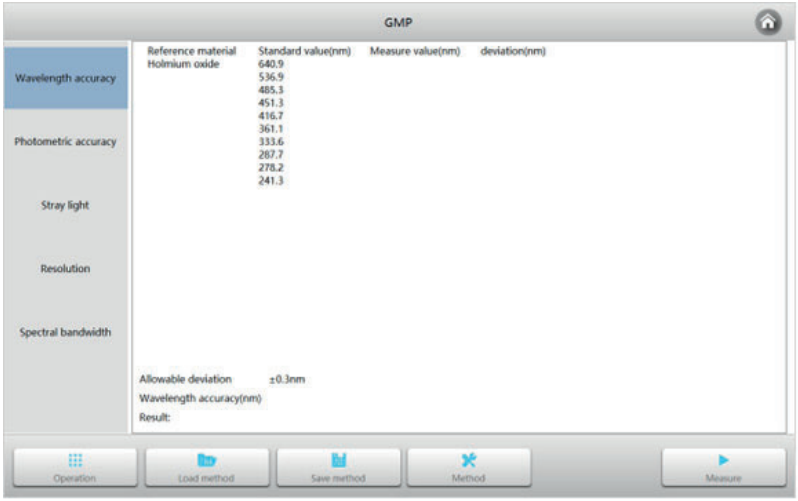
Delete calculation formula

Formula list interface, select the method you want to delete and press the button **Delete formula** to delete the method.

■ Performance verification

Performance verification is used to verify that the instrument's performance indicators are good.

- **Main** interface, press the icon to start **Performance verification.**



1) Preparing

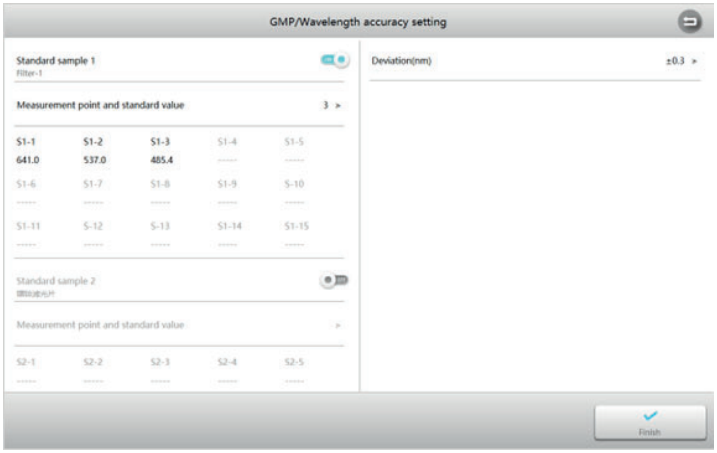
- The instrument must be warmed up for more than 30 minutes before performing performance verification.
- The instrument must first calibrate the dark current and the system baseline before verification.
- The reference material used for verification must be within the validity period of the test.

Note: Standard filters used to verify the performance of the instrument can be purchased separately, they are not supplied with the instrument.

2) Wavelength accuracy and wavelength repeatability verification:

- Standard material: Holmium oxide solution or equivalent filter
- Verification:

1: **Performance Verification** interface, press the tab **Wavelength accuracy,** press the button **Method** to enter into the **Setting** interface, set parameters and press the button to accept and back.



2: Remove anything in the measurement channel, close the sample chamber lid, press the button ▶ and select the tab **Wavelength accuracy** to start the measurement.

3: According to the instructions of the instrument, put the reference and the standard material into the measurement channels; after completion the test result is displayed.

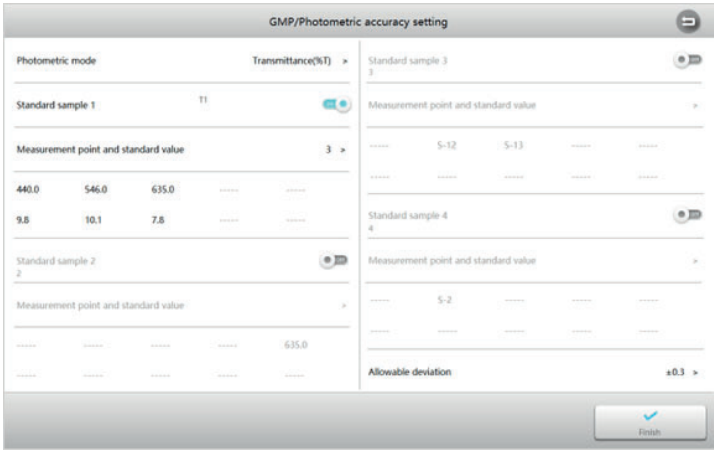
3) Photometric accuracy and photometric repeatability verification

- Standard material:

  NIST 930D or equivalent filter

- Verification:

  1: **Performance Verification** interface, press the tab **Photometric accuracy**, press the button **Method** to enter into the **Setting** interface, set parameters and press the button ✔ to accept and back.



2: Remove anything in the measurement channel, close the sample chamber lid, press the button ▶ and select the tab **Photometric accuracy** to start the measurement.

3: According to the instructions of the instrument, put the reference and the standard material into the measurement channels; after completion the test result is displayed.

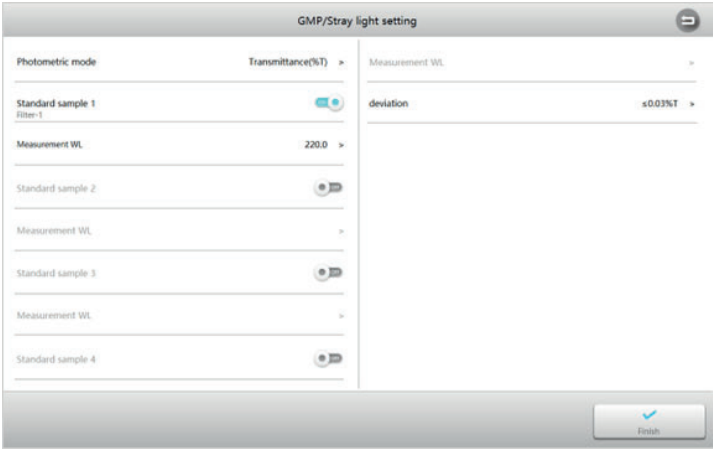
4) Stray light verification

- Standard material:

  10g/L NaI solution or equivalent filter (220nm), 50g/L $NaNO_2$ solution or equivalent filter (340 or 360nm).

- Verification:

  1: **Performance Verification** interface, press the tab **Stray light,** press the button **Method** to enter into the **Setting** interface, set parameters and press the button ✔ to accept and back.



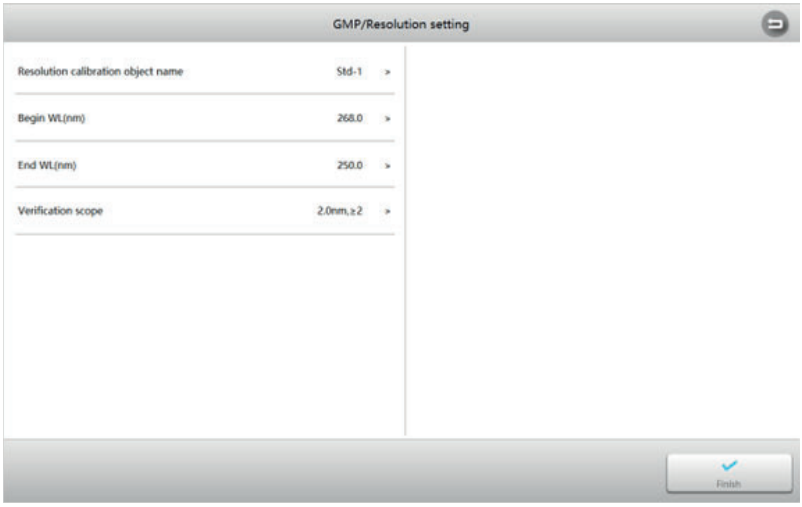
2: Remove anything in the measurement channel, close the sample chamber lid, press the button ▶ and select the tab **Stray light** to start the measurement.

3: According to the instructions of the instrument, put the reference and the standard material into the measurement channels; after completion the test result is displayed.

5) Resolution verification

- Standard material: Toluene-hexane
- Verification:

1: **Performance Verification** interface, press the tab **Resolution**, press the button **Method** to enter into the **Setting** interface, set parameters and press the button ✔ to accept and back.



2: Remove anything in the measurement channel, close the sample chamber lid, press the button ▶ and select the tab **Resolution** to start the measurement.

3: According to the instructions of the instrument, put the reference and the standard material into the measurement channels; after completion the test result is displayed.

REPAIR AND MAINTENANCE

In order to keep the instrument in optimal working condition, the daily maintenance of the instrument must be done. This chapter introduces some things you need to pay special attention to so that you can easily solve some minor problems.

■Daily Maintain

1- Check the compartment:

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

2- Cleaning of the instrument surface:

If paint drops fall on the surface of the instrument, wipe them off immediately with a damp towel. Organic solution is forbidden to be used to clean the surface. Please wipe off the dirt on the surface timely.

3- Cleaning of the cuvettes:

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

■Troubleshooting

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

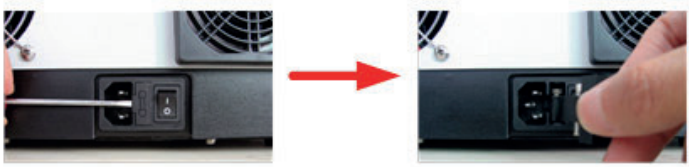
Problem	Cause	Solution
Power on, no response	Power cord connection is not reliable	Improve connection
	Fuse burning	Replace fuse
Measurement uncertainty	Sample is not stable	Improve the sample
	Glass cuvettes used in UV region	Use quartz cuvettes
	The sample concentration is too high	Dilute the sample
	Power supply voltage low or not stable	Improve the power supply
	Lamp damage or lamp life maturity	Replace lamp
Dark current error when self-check	The lid of the compartment is open during self-check	Close the lid, restart
System calibration failed	Something blocks the light path	Remove it, calibrate again
Inaccurate measurements	Cuvettes were contaminated	Clean the cuvettes
	Samples were contaminated	Improve the samples
	Bad matching of the cuvettes	Improve the matching of the cuvettes
	Dark current error	Resample dark current

SPARE PARTS REPLACEMENT

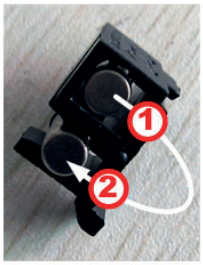
■ Fuse replacement

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

Tools preparation: Prepare a 3×75 flat blade screwdriver.
Switch off the power supply: Switch off the power supply and unplug the socket.
Take out the fuse seat: Use the screwdriver to pry and open the fuse holder.



Replace the fuse: Pick out the spare fuse (position 1) and place it in position 2. Install the fuse holder back to the instrument power outlet.



Power on: Plug the socket and switch on the power.

WARRANTY

AUXILAB S.L. warrant that this product will be free from defects in material and workmanship for a period of 2 years from date of delivery except the lamps. Lamps have a warranty of 1000 hours usage time or 6 months max. This warranty does not apply if the product has been damaged by accident, abuse, misuse, or misapplication, or from ordinary wear and tear. If the required maintenance and inspection services are not performed according to the manuals and any local regulations, such warranty turns invalid, except to the extent, the defect of the product is not due to such non-performance.

Compliance with local laws and regulations
The customer is responsible for applying for and obtaining the necessary regulatory approvals or other authorizations necessary to use the product in its local environment. We will not be held liable for any related omission or for not obtaining the required approval or authorization, unless any refusal is due to a defect of the product.

EQUIPMENT DISPOSAL

This equipment is marked with the crossed out wheeled bin symbol to indicate that this equipment must not be disposed of with unsorted waste.
It's your responsibility to correctly dispose of your equipment at lifecycle -end by handling it over to an authorized facility for separate collection and recycling. It's also your responsibility to decontaminate the equipment in case of biological, chemical and/or radiological contamination, so as to protect from health hazards the persons involved in the disposal and recycling of the equipment.
For more information about where you can drop off your waste of equipment, please contact your local dealer from whom you originally purchased this equipment.
By doing so, you will help to conserve natural and environmental resources and you will ensure that your equipment is recycled in a manner that protects human health.
Thank you!